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REFERENCE: **Contract W9133L-14-D-0007, Delivery Order 0011, FY17 Phase III Regional Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations**

SUBJECT: **Final Site Inspection Report for Great Falls ANGB**

Mr. Crow

Attached please find the above referenced document.

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FINAL

SITE INSPECTION REPORT
FOR
PERFLUOROOCTANE SULFONATE AND PERFLUOROOCTANOIC ACID
AT
GREAT FALLS AIR NATIONAL GUARD BASE
GREAT FALLS, MONTANA

120th Airlift Wing
Great Falls Air National Guard Base
Great Falls, Montana

February 2019

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120th Airlift Wing
Great Falls Air National Guard Base
Great Falls, Montana

February 2019

Contract Number W9133L-14-D-0007
Task Order Number 0011

Prepared for

Air National Guard
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ACRONYMS

µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
AFFF	Aqueous Film-Forming Foam
AMSL	Above Mean Sea level
ANG	Air National Guard
ANGB	Air National Guard Base
AW	Airlift Wing
BB&E	BB&E, Inc.
BGS	Below Ground Surface
COC	Chemical of Concern
COPC	Chemical of Potential Concern
DI	Deionized
DoD	U.S. Department of Defense
DQO	Data Quality Objective
EDR	Environmental Data Resources
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
FD	Fire Department
FSS	Fire Suppression System
FTA	Fire Training Area
HA	Health Advisory
HDPE	High-Density Polyethylene
HEF	High Expansion Foam
IDW	Investigation-Derived Waste
IRP	Installation Restoration Program
mg/kg	Milligrams per Kilogram
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MTDEQ	Montana Department of Environmental Quality
NFA	No Further Action
ng/L	Nanograms per Liter
OWS	Oil/Water Separator
PA	Preliminary Assessment
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutane Sulfonate
PFHpA	Perfluoroheptanoic Acid
PFHxS	Perfluorohexane Sulfonate
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PRL	Potential Release Location
QA	Quality Assurance
QC	Quality Control
QSM	Quality Systems Manual
RI	Remedial Investigation
RSL	Regional Screening Level
SI	Site Inspection
TestAmerica	TestAmerica Analytical Laboratories, Inc.

UCMR3	Third Unregulated Contaminant Monitoring Rule
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
USFWS	U.S. Fish and Wildlife Service
WP	Work Plan

EXECUTIVE SUMMARY

Leidos was contracted to conduct Phase III regional site inspections (SIs) for perfluorinated compounds at multiple Air National Guard Bases (ANGBs). This report documents SI activities conducted at eight potential release locations (PRLs) at the 120th Airlift Wing (AW) of the Montana Air National Guard (ANG) at Great Falls International Airport, Montana (herein referred to as Great Falls ANGB). The primary objective of the SI was to determine the presence or absence of perfluorinated compounds, more specifically per- and polyfluoroalkyl substances (PFAS) on the U.S. Environmental Protection Agency (EPA) Third Unregulated Contaminant Monitoring Rule (UCMR3), including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and perfluorohexane sulfonate (PFHxS), herein collectively referred to as PFOS/PFOA at each PRL, and based on the findings:

- Determine if PFOS/PFOA-contaminated groundwater has reached the Installation boundary;
- Provide a defensible no further action (NFA) decision for qualifying PRLs; and
- Develop data quality objectives (DQOs) for additional investigation for PRLs not meeting the NFA criteria or an interim response action, if appropriate.

To meet the objectives, Leidos performed SIs at the following 8 PRLs:

- PRL 3: Aqueous Film-Forming Foam (AFFF) Retention Pond,
- PRL 4: Building 25 – Main Hangar,
- PRL 5: Building 38 – Fuel Cell Shop,
- PRL 6: Buildings 23 and 24 – Old Fire Station,
- PRL 7: Building 11 – Current Fire Station,
- PRL 8: Fire Department (FD) Nozzle Testing Area,
- PRL 9: Stormwater Outfall 001, and
- PRL 10: Crash Site.

Based on recommendations from the April 2016 preliminary assessment (PA) that documented the site visit conducted by BB&E, Inc. (BB&E), soil, groundwater, sediment, and surface water samples were collected from eight PRLs between July 9 and July 19, 2018. Collected samples were analyzed for PFOS/PFOA compounds. The detected PFOS/PFOA concentrations were compared against the more stringent screening criteria for PFOS, PFOA, and PFBS, including the EPA lifetime drinking water Health Advisory (HA) for PFOS and PFOA, the EPA Regional Screening Level (RSL) for PFBS in tap water, the EPA RSL for PFBS in residential soil, and calculated screening levels using the EPA screening level calculator for PFOS and PFOA in soil and sediment, as presented in Table ES-1.

Table ES-1. PFOS/PFOA SI Screening Criteria

Parameter	Chemical Abstract Service Number	EPA RSL for Tap Water[a] (ng/L) HQ=1	EPA Health Advisory[b] (ng/L)	Residential Risk-based Soil Screening Level[c] (µg/kg) HQ=0.1
PFOS	1763-23-1	NA	70.0[d]	126
PFOA	335-67-1	NA		126
PFBS	375-73-5	400,000[e]	NA	126,000

[a] EPA RSL for tap water, November 2018. Target HQ = 1 was used per MTDEQ guidance.
[b] *Drinking Water Health Advisory for Perfluorooctane Sulfonate* (EPA 2016a) and *Drinking Water Health Advisory for Perfluorooctanoic Acid* (EPA 2016b).
[c] Residential risk-based soil screening levels determined by using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) and the November 2018 EPA RSL tables (https://epa.gov/risk/regional-screening-levels-rsls-generic-tables) for soil and sediment. Target HQ = 0.1 was used per MTDEQ guidance.
[d] When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 70-ng/L health advisory value.
[e] PFBS analytical results for groundwater and surface water have been compared to the tap water screening levels.

µg/kg = Micrograms per kilogram.
EPA = U.S. Environmental Protection Agency.
HQ = Hazard quotient.
MTDEQ = Montana Department of Environmental Quality.
NA = Not available.
ng/L = Nanograms per liter.
PFBS = Perfluorobutane sulfonate.
PFOA = Perfluorooctanoic acid.
PFOS = Perfluorooctane sulfonate.
RSL = Regional screening level.
SI = Site inspection.

Based on comparison of analytical data to the screening criteria in Table ES-1, Leidos recommends further investigations at all eight PRLs. Additional investigations are recommended for soil and groundwater at PRLs 3 through 10, and surface water/sediment at PRL 9. The recommendations are summarized in Table ES-2 and described briefly below:

- Further investigation at all eight PRLs is necessary to determine the nature and extent of PFOS/PFOA contamination due to detectable levels at all PRLs.
- Evaluate the former FTA (ERP Site 1) located off Great Falls ANGB. This PRL was not investigated during the 2018 SI because of its off-Base location.
- Develop an expanded conceptual site model that considers localized groundwater and surface water flow paths to select future sampling locations.
- Complete the delineation of nature and extent of PFAS as part of an Expanded SI or a remedial investigation (RI) that could consist of:
    - Additional soil and sediment sampling and analysis of an expanded list of PFAS constituents (in addition to the six UCMR3 constituents) to determine if significant source areas related to precursor substances are present. Precursor substances have been demonstrated to oxidize into PFOS and PFOA, and thus, could provide a lingering source of these compounds to soil and groundwater.

- Expanded groundwater sampling program (including analysis of an expanded list of PFAS constituents) to complete horizontal and vertical delineation of the PFAS impacts. Further groundwater investigation at the Base boundary is recommended due to the presence of PFAS in groundwater above their respective screening criteria.

- The installation and sampling of upgradient and downgradient off-Base monitoring wells to better define the upgradient source of PFAS as well as PFAS concentrations that have migrated off Base.

- Conduct preliminary site-specific risk assessment calculations in order to identify chemicals of potential concern (COPCs) in every medium and establish preliminary remedial goals for screening purposes.

DQOs are proposed based on the results of the SI and are presented in Table ES-2. In general, additional samples are required at each PRL in order to establish the nature and extent of PFAS constituents for each applicable medium and determine if a complete receptor pathway exists. For soil, additional samples are proposed to determine if a source area exists, and if so, to determine the vertical and horizontal extent for both the vadose and saturated zones. For groundwater, additional samples are proposed to quantify potential impacts from upgradient sources and assess the nature and extent of PFAS concentrations beyond the Base boundary. Additional surface water and sediment samples should be collected at PRL 9 (including analysis of an expanded list of PFAS constituents) to further evaluate PFAS concentrations in surface water and sediment.

Table ES-2. SI Recommendation Summary Table

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
3	AFFF Retention Pond	**Soil:** PFOS **Groundwater:** PFOS + PFOA	**Soil:** Determine the nature and extent both vertically and horizontally through additional surface and subsurface soil sampling. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
4	Building 25 – Main Hangar	**Groundwater:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
5	Building 38 – Fuel Cell Shop	**Groundwater:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
6	Buildings 23 and 24 – Old Fire Station	**Groundwater:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
7	Building 11 – Current Fire Station	**Soil:** PFOS **Groundwater:** PFOS + PFOA	**Soil:** Determine the nature and extent both vertically and horizontally through additional surface and subsurface soil sampling. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
8	FD Nozzle Testing Area	**Soil:** PFOS **Groundwater:** PFOS + PFOA	**Soil:** Determine the nature and extent both vertically and horizontally through additional surface and subsurface soil sampling. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.

Table ES-2. SI Recommendation Summary Table (continued)

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
9	Stormwater Outfall 001	**Surface Water:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Although screening criteria were not exceeded, additional groundwater samples are proposed to determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells. **Surface Water and Sediment**: Determine the nature and extent of PFOS/PFOA concentrations upgradient of and downgradient from the stormwater outfall through additional sampling of surface water and sediment.
10	Crash Site	**None**	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Although screening criteria were not exceeded, additional groundwater samples are proposed to determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
General			**Soil:** Collect additional surface and subsurface soil samples to determine the nature and extent both vertically and horizontally of PFAS contamination. Analyze for an expanded list of PFAS compounds to evaluate for potential precursor compounds. **Groundwater:** (1) Collect additional groundwater samples in upgradient locations to quantify potential impacts from upgradient sources; (2) collect additional groundwater samples off Base through the installation of a limited number of new monitoring wells to assess the nature and extent of PFAS impacts beyond the Base boundary. **Surface Water/Sediment:** (1) Collect additional surface water and sediment samples in upgradient locations to quantify potential impacts from upgradient sources; (2) collect additional surface water and sediment samples off Base to determine the nature and extent of PFAS beyond the Base boundary.

AFFF = Aqueous film-forming foam.
FD = Fire Department.
PFAS = Per- and polyfluoroalkyl substances.
PFOA = Perfluorooctanoic acid.
PFOS = Perfluorooctane sulfonate.
PRL = Potential release location.
SI = Site inspection.

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1.0 INTRODUCTION

Leidos has prepared this Site Inspection (SI) Report to satisfy the requirements of Task Order 0011 of National Guard Bureau Contract Number W9133L-14-D-0007. Under this Task Order, Leidos was contracted to conduct Phase III regional SIs for perfluorinated compounds at multiple Air National Guard Bases (ANGBs). This report documents SI activities conducted between July 9 and July 19, 2018, at eight potential release locations (PRLs) at the 120th Airlift Wing (AW) of the Montana Air National Guard (ANG) at Great Falls International Airport, Montana (herein referred to as Great Falls ANGB) (Figure 1). Note that all tables and figures are presented after Section 7. All field activities were conducted in accordance with the *Work Plan for Fiscal Year 2017 Phase III Regional Site Inspections for Perfluorooctane Sulfonate and Perfluorooctanoic Acid at Great Falls Air National Guard Base, Great Falls, Montana* (Leidos 2018).

1.1 PROJECT OBJECTIVES AND SCOPE

The primary objective of the SI was to determine the presence or absence of perfluorinated compounds, more specifically per- and polyfluoroalkyl substances (PFAS) on the U.S. Environmental Protection Agency (EPA) Third Unregulated Contaminant Monitoring Rule (UCMR3), including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and perfluorohexane sulfonate (PFHxS), herein collectively referred to as PFOS/PFOA.

Surface and subsurface soil, groundwater (downgradient from the PRL), and surface water and sediment (if available) were sampled and analyzed to determine the presence or absence of PFOS/PFOA in environmental media at the PRLs identified during the 2016 preliminary assessment (PA) (BB&E 2016) and to:

- Determine if PFOS/PFOA-contaminated groundwater has reached the Installation boundary;
- Provide a defensible no further action (NFA) decision for qualifying PRLs; and
- Develop data quality objectives (DQOs) for additional investigation for PRLs not meeting the NFA criteria or an interim response action, if appropriate.

The scope of work consisted of three inter-related tasks: (1) prepare an SI Work Plan (WP), (2) conduct SI and data collection activities, and (3) evaluate data from the field effort and applicable historical information to present conclusions and recommendations in an SI Report.

All sampling was performed on ANG property with the exception of sampling at PRLs 8, 9, and 10 located near the Base boundary. PRLs 8, 9, and 10 are located on the adjacent Airport property. Sampling of drinking water sources (other than the on-Base potable water supply that was used for decontamination activities) was not included, and determination of nature and extent of any identified contamination was not within the scope of this SI.

Eight PRLs, as listed in Table 1 and depicted in Figure 2, were selected for SI activities based upon the PA and site visit conducted by BB&E, Inc. (BB&E) in November 2015 and reported in the *Perfluorinated Compounds Preliminary Assessment Site Visit Report, Montana Air National Guard Base, Great Falls, Montana* (BB&E 2016). This SI Report briefly summarizes the PA, describes SI field activities, presents analytical results of environmental sampling, and provides recommendations for each PRL.

1.2 REGULATORY OVERVIEW AND SCREENING CRITERIA

In 2012, EPA published the UCMR3, which required public water supplies across the country to sample for a list of 30 unregulated contaminants, including 6 chemicals of concern (COCs) relevant to this SI (PFOS, PFOA, PFBS, PFNA, PFHpA, and PFHxS; i.e., PFOS/PFOA). Results of UCMR3-required sampling indicated detections of PFOS/PFOA at numerous locations, including several near U.S. Department of Defense (DoD) facilities. PFOS/PFOA detections at DoD facilities are often linked to the use of aqueous film-forming foam (AFFF), which may contain one or more of these chemicals. AFFF is a firefighting agent used to suppress fires involving petroleum hydrocarbons.

Detected concentrations of PFOS/PFOA in environmental samples collected during the Great Falls ANGB SI were compared against soil and water screening criteria for PFOS, PFOA, and PFBS, as described below and listed in Table 2.

The November 2018 EPA generic regional screening level (RSL) table lists a residential risk-based screening level for tap water for PFBS of 400 micrograms per liter (µg/L) (400,000 nanograms per liter [ng/L]; target hazard quotient = 1). Currently, no legally enforceable federal standards exist for PFOS/PFOA in water. However, under the Safe Drinking Water Act, EPA issued a series of Health Advisories (HAs) for PFOS/PFOA, including the most recent in May 2016. To provide Americans, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOS/PFOA in drinking water, EPA established an HA level for PFOS and PFOA (combined) of 70 ng/L. The HA of 70 ng/L applies to PFOS and PFOA individually as well as combined. If an individual compound is detected >70 ng/L, the screening criteria is exceeded. However, if individual compounds are <70 ng/L but the sum of the compounds is >70 ng/L, the screening criteria is exceeded. For example, if PFOS = 50 ng/L and PFOA = 25 ng/L, the screening criteria is exceeded. Therefore, screening levels for groundwater and surface water are as follows:

- PFOS and PFOA = 70 ng/L; and
- PFBS = 400,000 ng/L.

No legally enforceable federal standards exist for PFOS/PFOA in soil or sediment. The November 2018 EPA generic RSL table lists a residential risk-based screening level for soil for PFBS of 130 milligrams per kilogram (mg/kg) (130,000 micrograms per kilogram [µg/kg]; target hazard quotient = 0.1) (EPA 2018). Following the process utilized at other ANG Installations around the country, Leidos will use resident risk-based screening levels for soil determined using the EPA RSL calculator and the November 2018 RSL tables. The calculated screening value for PFBS is slightly less than the value listed in the generic RSL table. RSLs are only available for three of the six COCs listed above. The calculated screening levels for these three COCs are as follows:

- PFOS = 126 µg/kg;
- PFOA = 126 µg/kg; and
- PFBS = 126,000 µg/kg.

As of the preparation of this SI Report, no site-specific soil screening levels have been developed in Montana. Furthermore, no surface water or sediment screening criteria have been established by EPA or the Montana Department of Environmental Quality (MTDEQ) at this time.

MTDEQ is currently engaged in rulemaking to add PFOS/PFOA to Montana's DEQ-7 human health standards for groundwater at the EPA HA level. Any remedy will be required to meet applicable or relevant and appropriate requirements, which will include attainment of DEQ-7 standards. State

standards for PFOS/PFOA do not exist; however, MTDEQ rules provide for the use of the EPA RSLs for screening and MTDEQ will require that any remedy demonstrate protectiveness by attaining risk-based cleanup levels in soil and sediment.

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2.0 INSTALLATION DESCRIPTION

2.1 LOCATION

Great Falls ANGB is the home of the 120th AW in Great Falls, Montana. Great Falls ANGB is located at the Great Falls International Airport, which covers roughly 2,110 acres, has three asphalt runways, and is located 3 miles southwest of downtown Great Falls in Cascade County. The Base's facilities consist of more than 50 buildings, occupying approximately 125 acres on the southeastern corner of the airport. Great Falls ANGB has been leasing the Base's land from the Great Falls International Airport since 1948. The area immediately south of the Base is designated for industrial and commercial uses. Part of the open area southwest of the airport is used for active outdoor recreation. Residential areas are located on and below the Sun River bench east and northeast of the Base. The site location is shown in Figure 1.

2.2 ORGANIZATION AND HISTORY

Great Falls International Airport started as a municipal airport in the late 1920s. The 120th AW of the Montana ANG was first organized as the 186th Fighter Squadron at Great Falls Airport in 1947 after the conclusion of World War II. The squadron maintained an active role in air combat and national defense missions until early 2014 when the Base was converted to the 120th AW. From 1940 to 1948, all airport facilities were leased to the United States military to support the war effort in Europe. In 1948, the city of Great Falls regained control of the airfield for commercial air travel, with an exception that space would be leased to ANG to accommodate their operations. During this time, the airfield was renamed Great Falls International Airport. Today, Great Falls International Airport is still an active civil-military airport that supports air freight and services roughly 170,000 passengers annually. The 120th AW currently is an air reserve component of the U.S. Air Force and flies the C-130 Hercules cargo plane.

DoD began investigations at military Bases under the Installation Restoration Program (IRP) with the goal of identifying, evaluating, and remediating areas of contamination (the program is now referred to as the Environmental Restoration Program [ERP]). These investigations included PAs, site investigations, removal action investigations, and remedial investigations (RIs). Prior to the BB&E 2016 PA, potential releases of PFOS/PFOA from use and storage of AFFF had not been evaluated at Great Falls ANGB.

Base operations that could have contributed to contamination of soil, groundwater, sediment, and surface water include fire training areas (FTAs) and non-FTAs. FTA PRLs are sites where AFFF was likely used for fire suppression during training activities. Two former FTAs were evaluated for the Great Falls ANGB property. Non-FTA PRLs identified at Great Falls ANGB are sites where AFFF was stored, released, and/or likely to have been released, and include the AFFF Retention Pond (PRL 3), fire suppression systems at the main hangar (PRL 4) and fuel cell shop (PRL 5), the old and current fire stations (PRL 6 and PRL 7), the Fire Department (FD) nozzle testing area (PRL 8), the stormwater outfall (PRL 9), and the crash site (PRL 10) (BB&E 2016).

When AFFF is released to the environment, PFOS/PFOA can migrate into soil and groundwater. The amount of PFOS/PFOA that migrates to groundwater depends on the type and amount of AFFF used, where it was used, the type of soil, and other factors. PFOS/PFOA may migrate readily from soil to groundwater. The primary exposure pathway for PFOS/PFOA is the ingestion of contaminated drinking water.

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3.0 ENVIRONMENTAL SETTING

3.1 CLIMATE

Great Falls ANGB is situated in a semi-arid climate zone subject to high snowfall in the winters and warm dry summers. The area is subject to thunderstorms in early spring and summer and receives about 70% of the annual total rainfall between April and September. The average temperature of Great Falls is 45.2°F, which is on par for most of Montana and is much lower than the national average temperature of 54.45°F. Annual rainfall amounts in Great Falls are 12.88 in. with 35.02 days of 0.1 in. of rain or more of precipitation. Average annual snowfall in the area is 47.1 in. Average wind speed for the area is 24.27 miles per hour and is usually out of the southwest and west-southwest (USA.com 2017).

3.2 TOPOGRAPHY

Great Falls ANGB is located on a generally low topographical gradient within the northern Great Plains region, 100 miles south of the U.S.-Canada border. Great Falls is situated within the Missouri River Basin and is intersected by the Missouri River and Sun River, whose confluence is 2 miles northeast of the Base. The topography of Great Falls generally slopes to the Missouri River, which runs through the town and receives all stormwater drainage. Great Falls International Airport is 3,680 ft above mean sea level (AMSL) with Great Falls ANGB averaging approximately the same elevation.

3.3 GEOLOGY

The Base is located on the northeastern edge of the Sun River bench, a plateau or cuesta of Cretaceous age rocks on the northwestern flank of the Sweetgrass Arch; it rises about 350 ft above Great Falls and dips gently off toward the northwest. The rock units underlying the Base consist of, in descending order, the Taft Hill and Flood Members of the Blackleaf Formation of the Colorado Group and the Kootenai Formation. Both the Blackleaf and Kootenai are Cretaceous in age. These are underlain in turn by the Morrison and Swift Formations of Jurassic age and the Madison Group of Mississippian age (HAZWRAP 1997).

Erosional remnants of the Taft Hill Member outcrop at and around the Base and make up the majority of the unconsolidated and consolidated material found in the upper 15 to 20 ft underlying the Base. At the type locality for the Taft Hill located to the west of the Base, the member is reported to be 250 ft thick with beds thinning to the east. The member consists predominantly of marine strata with medium gray, soft bentonitic clayey to silty shales and greenish gray, glauconitic sandstones (HAZWRAP 1997).

The upper sandstone forms the cliffs around the edge of the Sun River bench southwest of Great Falls. It consists of light-gray, very fine- to medium-grained quartz and chert sandstone. The sandstone weathers tan-brown to red-brown and has either a clayey matrix or siliceous cement. The sandstone is characterized by massive bedding in the lower part with distinct vertical and horizontal joints; the upper part is characterized by irregular vertical joints and bedding plane partings. The contact between the upper and middle unit of the Flood Member is gradational (HAZWRAP 1997).

The middle unit of the Flood Member consists of interbedded sandstone and shales. The sandstone is tan and fine- to medium-grained and weathers to a light tan gray; some sandstone beds are siliceously cemented, others are argillaceous and friable. The shale beds are dark gray and weather light gray, are both sandy and silty, and generally are calcareous. Occasionally, coal laminae may be present (HAZWRAP 1997). The surface soil at the Base consists of yellowish-brown sand with occasional very thin gravel interpreted to be from the Taft Hill Member of the Colorado Group. Thickness of the surface soils ranges from approximately 4 to 15 ft across the Base, and the soils are underlain by weathered

siltstone to fine sandstone. The unconsolidated deposits are underlain by weathered siltstone to fine sandstone of the Flood Member. The depth to competent siltstone/sandstone encountered in the well borings ranges from 8 to 55 ft below ground surface (BGS) (TetraTech 2018). The thickness of the sandstone ranges from 38 to 44 ft. Relatively flat-lying gray siltstone-shale bedrock of the Flood Member with no major structural displacement lies beneath the competent sandstone (SAIC 2008).

3.4 SOIL

Soils at Great Falls ANGB have been classified by the Soil Conservation Service as Tally-Azaar-Litten soils. Of this group, about 45% is Tally soils, 20% Azaar soils, 15% Litten soils, and 20% minor soils. These silty and sandy loams typically have a low shrink-swell potential and a high infiltration rate, with estimated permeabilities ranging from 2 to 6 and 6 to 20 in. per hour. The low clay content of the soils results in a low available water capacity. In a typical soil profile, the surface layer is approximately 7 in. thick and consists of a dark grayish brown fine sandy loam and an underlying material of light brown and grayish brown fine sandy to silty clay loam. Total thickness of the soil ranges from 20 in. to greater than 40 in. Tally-Azaar-Litten soils are present in developed areas and have been disturbed by development activities, including excavation, filling, and grading (ESI 1990).

3.5 SURFACE WATER HYDROLOGY

No natural or significant surface water bodies, navigable waterways, or wetlands are present at Great Falls ANGB. Seasonal surface water may appear in the drainage ditch associated with Stormwater Outfall 001 (PRL 9) depending on precipitation events (ANGRC 1988). Surface water flow at Great Falls ANGB is dictated by the Base's man-made surface drainage system. Stormwater is captured by drainage ditches located throughout the property and directed southwest off Base (Leidos 2018).

3.6 HYDROGEOLOGY

Great Falls ANGB is located outside the established drinking water aquifers in Cascade County and is supplied water from the city of Great Falls Public Works Department. The shallowest groundwater at the Base is typically encountered at the contact between upper sandstone and the underlying shale of the Flood Member Group, which occurs nearest to the ground surface at approximately 40 to 45 ft BGS. Depth to groundwater at the facility may be shallower than 45 ft BGS, such as at IRP Site 4, which is located on the western portion of Great Falls ANGB. Groundwater flow at the Base is generally north to northwest with an average gradient of 95 ft per mile (Leidos 2014).

3.7 CRITICAL HABITATS AND ENDANGERED/THREATENED SPECIES

According to the U.S. Fish and Wildlife Service (USFWS), the following federally listed threatened, endangered, or proposed species are known to or are believed to occur in Cascade County, Montana (USFWS 2017):

- Mammals:
  - Grizzly bear (*Ursus arctos horribilis*) – Threatened,
  - Canada lynx (*Lynx Canadensis*) – Threatened,
  - Gray wolf (*Canis lupus*) – Recovery, and
  - North American wolverine (*Gulo gulo luscus*) – Proposed Threatened.

- Birds:
  - Red knot (*Calidris canutus rufa*) – Threatened, and
  - Bald eagle (*Haliaeetus leucocephalus*) – Recovery.

- Fish:
  - Pallid sturgeon (*Scaphirhynchus albus*) – Endangered.

The potential for these species to occur in Cascade County does not mean they are present at Great Falls ANGB.

No wetlands are located at, or in the immediate vicinity of, Great Falls ANGB (USAF 1999).

3.8 WATER WELLS

The PA Report (BB&E 2016) indicates no potable water wells are on Base. The Base currently receives drinking water from the local water utility (Great Falls Department of Public Works). A review of the Environmental Data Resources (EDR) Radius Map™ Report with Geocheck® dated November 3, 2015 shows no public water supply wells within a 1-mile radius of the Base (EDR 2015). Nine potential private wells and 94 test/monitoring/remediation wells are located within a 1-mile radius of the Base.

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4.0 PRELIMINARY ASSESSMENT

In 2016, BB&E conducted a PA to identify potential sites of historical environmental releases of PFOS/PFOA related to AFFF usage and storage at Great Falls ANGB (BB&E 2016). The PA evaluated a total of 10 PRLs and recommended 8 of these for further investigation under an SI (Table 1; see also Figure 1). At the time of the 2016 PA, no documentation was available showing that soil, groundwater, sediment, and surface water at Great Falls ANGB were previously tested for PFOS/PFOA; therefore, these compounds could be present in media at any of these PRLs.

BB&E researched the potential existence of any documented FTAs or any other use or release of AFFF. Two former FTAs were identified within the footprint of the Great Falls ANGB site boundary. The PA concluded that the FTAs require NFA based on the years of operation (ERP Site 4 [1956 to 1963] and ERP Site 5 [1964 to 1966]). The PA Report also notes that ANG utilized two off-Base FTAs (ERP Site 1 and ERP Site 3). However, because these two FTAs are located off Great Falls ANGB, they were not evaluated during the PA and are not considered PRLs for the purpose of the Phase III SI.

The PA site visit included on-site interviews with active and former personnel from the ANG Installation and other parties with relevant historical site knowledge. The sections below briefly describe the operational history and waste characteristics of the PRLs included in this SI, as presented in the PA Report (BB&E 2016). PRL numbers correspond to the area of concern designation used in the PA Report (BB&E 2016).

4.1 PRL 1: FORMER FTA – ERP SITE 4

This FTA (also known as FTA No. 1) was located in what is now the northwestern corner of the existing Hush House (Building 71). Site 4 was used for one fire training exercise per month from 1959 to 1963. Approximately 1,200 to 1,500 gal of fuel were used for each exercise. Assuming a 70% burn rate, up to 20,000 gal of unburned fuel may have been deposited at the site. This area was reworked and partially paved during construction of the hush house and runway extension. Reportedly, some soils from this area were removed and clean soils were imported to the site during various construction activities. A Decision Document was prepared proposing NFA for soils and groundwater under an industrial use and closure scenario (SAIC 2004). The site is currently undergoing active groundwater monitoring and evaluation. Previous investigations at Site 4 did not include perfluorochemical analysis; however, based on the dates of use of this area as an FTA, it is not expected that AFFF was used at this location. NFA was recommended in the PA Report (BB&E 2016), and this PRL will not be discussed further or evaluated in this SI Report.

4.2 PRL 2: FORMER FTA – ERP SITE 5

This FTA (also known as FTA No. 2) was located approximately 400 ft northeast of the FTA at ERP Site 4 and northwest of the Alert Barns (Buildings 45 through 48) and commenced use once Site 4 was closed. Site 5 was used for one fire training exercise per month from 1964 to 1966. Approximately 500 to 600 gal of fuel were used for each exercise. Assuming a 70% burn rate, up to 6,500 gal of unburned fuel may have been deposited at the site. This area has been partially paved. A DD was prepared proposing NFA for soils and groundwater under an industrial use and closure scenario (SAIC 2004). The site is currently undergoing an evaluation for closure. Previous investigations at Site 5 did not include PFC analysis; however, based on the dates of use of this area as an FTA, it is not expected that AFFF was used at this location. NFA was recommended in the PA Report (BB&E 2016), and this PRL will not be discussed further or evaluated in this SI Report.

4.3 PRL 3: AFFF RETENTION POND

An AFFF retention pond measuring approximately 20 by 40 ft was previously located west of former Building 40. The AFFF pond was removed during the installation of a parking lot in approximately 2006. The AFFF pond received any releases of AFFF from Buildings 25 and 38. Underground piping was routed to the retention pond from Buildings 25 and 38 to enable gravity drainage of any potential AFFF releases at these locations. It also served as a fire equipment test area serving as a location to conduct annual foam tests up to 2007. Typically, any AFFF that accumulated within the retention pond was allowed to evaporate and dissipate. During the Installation kickoff meeting held on August 30, 2017, the Base Civil Engineer noted that the AFFF retention pond had a liner (Leidos 2017).

4.4 PRL 4: BUILDING 25 – MAIN HANGAR

Building 25 is the Main Hangar on Base. AFFF was previously used in the Main Hangar from approximately the early 1990s to approximately 2008. High expansion foam (HEF) is currently used in the fire suppression system (FSS). Historical releases of AFFF (prior to 2006) from the Main Hangar would have been collected within the building via floor and trench drains and gravity drained to the former AFFF retention pond (PRL 3). No documentation was available regarding any specific AFFF release.

4.5 PRL 5: BUILDING 38 – FUEL CELL SHOP

Building 38 is the Base Fuel Cell Shop. The Fuel Cell Shop was constructed in the early 1990s with an AFFF FSS. AFFF was previously used in the FSS within this building from approximately the early 1990s to approximately 2008, when the system was removed. There is currently no FSS. A release of AFFF occurred in approximately 2003. Any AFFF releases would have collected in the building floor or trench drains and gravity drained to the AFFF retention pond (PRL 3).

4.6 PRL 6: BUILDINGS 23 AND 24 – OLD FIRE STATION

The Former Fire Station (now demolished) was located immediately east of the Main Hangar (Building 25). The Former Fire Station was utilized from the mid-1950s until approximately 1995, when the current Fire Station (Building 11) was completed. Buildings 23 and 24 were connected and collectively served as the former corrosion control shop, paint shop, and fire station. Due to the site use as a Fire Station and timeframe, AFFF was likely utilized in firefighting equipment at this location.

Floor drains within these facilities previously discharged to a former dry well associated with ERP Site 7. The dry well was located within 10 ft of the northwestern wall of Building 23 (ANGRC 1988). The dry well was reportedly used from 1955 until 1964 for disposal of motor pool waste oils and fuels through an underground pipe to the dry well. In October 2003, approximately 1,600 gal of wastewater and 850 gal of sludge were removed from the dry well, after which the dry well was properly abandoned. Groundwater sampling conducted at Site 7 has indicated the presence of benzene, ethylbenzene, and naphthalene at concentrations exceeding the MTDEQ Groundwater Cleanup Standards. Volatile petroleum hydrocarbons and extractable petroleum hydrocarbons also exceeded their respective MTDEQ Groundwater Cleanup Standards (Leidos 2014). The remediation systems at ERP Site 7 consist of a groundwater bioremediation system and a bioventing system (Tetra Tech 2018). A groundwater monitoring program has been in place at ERP Site 7 since October 2008.

Incidental releases of AFFF may have entered the Site 7 dry well or the sanitary sewer, depending on the exact dates of use. There are no known documented releases of AFFF from this site. Previous investigations at ERP Site 7 did not include PFOS/PFOA analysis.

4.7 PRL 7: BUILDING 11 – CURRENT FIRE STATION

The Current Fire Station is located in Building 11. This Fire Station became active in approximately 1995. The Fire Station serves as a joint use facility serving both the needs of ANG and the Great Falls International Airport. All fire fighters are employed by the guard. The airport does not provide any separate firefighting services. AFFF is currently stored in five different firefighting vehicles and one storage tank located at the Fire Station. Approximately 1,600 gal of AFFF are maintained within the Fire Station. There are no documented releases of AFFF associated with this facility. Incidental spills of AFFF within the Fire Station would be captured by floor drains, which drain to an oil/water separator (OWS) and ultimately discharge to the sanitary sewer system. Fire equipment is routinely cleaned within Bay No. 6 of this facility.

4.8 PRL 8: FD NOZZLE TESTING AREA

Per FD personnel, a small grassy area in front of the Current Fire Station (Building 11) has been used for annual FD equipment testing since the 2006 removal of the AFFF retention pond discussed in Section 4.3. Small quantities of AFFF (<1 gal) are likely utilized during these brief testing events. AFFF released during these events likely infiltrates into shallow permeable surface soils.

4.9 PRL 9: STORMWATER OUTFALL 001

The Stormwater Outfall 001 serves as the primary stormwater drain for the Base. Buried stormwater lines throughout the Base discharge to an open ditch at this location. Potential releases of AFFF on the flight apron and surrounding paved and concrete areas would likely ultimately discharge to this location. AFFF utilized during a civilian plane crash in the late 1990s possibly discharged directly to this location.

4.10 PRL 10: CRASH SITE

A civilian airplane crash occurred at the intersection of Alpha and Taxiway 11 in the late 1990s. FD personnel responded to this incident and used an estimated 50 to 100 gal of AFFF. The crash site is in close proximity to the Stormwater Outfall 001. AFFF utilized during this incident potentially discharged to the outfall or drained off the edges of the concrete surfaces at this location and infiltrated into shallow permeable soils.

4.11 NOTABLE OFF-SITE FTAs

4.11.1 Former FTA – ERP Site 1

ERP Site 1 is located on Great Falls International Airport property on the western side of the airport, northwest of the small arms range and power check pad. Site 1 was used as an FTA from 1968 until early 1989. The site consisted of one large and three smaller FTAs. The original PA (ANGRC 1988) reported stained soil in all areas and cans, wood, metal, and tire debris in the smaller areas. As much as 30,000 gal of fuel and other flammable liquids may have seeped into the soil at this site. Remediation of site soils was conducted in 1994, which included the excavation and on-site treatment of approximately 11,300 cubic yards of soil in a bioremediation treatment cell located adjacent to the excavation area. Treated soils were reportedly returned to the original excavation following treatment (AGI 1995). MTDEQ approved Site 1 for closure in 1995. Previous investigations at Site 1 did not include PFOS/PFOA analysis; however, based on the dates of use of this area as a FTA, it is expected that AFFF was likely used at this location. Because of its off-site location, ERP Site 1 was not included in the SI scope. However, based on likely AFFF use, this site may be investigated for PFOS/PFOA in the future.

4.11.2 Former FTA – ERP Site 3

ERP Site 3 is located on the northern end of the airport (north of the abandoned taxiway) and was referred to as the North Disposal and Fire Training Pit. Three sources of waste released in or near a pit located at Site 3 were identified, including contaminated jet fuel from 1957 to 1960; waste fuels, oils, thinners, and solvents from FTA activities from 1966 to 1968; and unknown quantities of flammable liquids disposed of in the pit and surrounding areas over the life of the site. The site was investigated and determined to not pose a risk to human health and the environment. A Decision Document was prepared proposing NFA for soils and groundwater under an industrial use and closure scenario (SAIC 2000). MTDEQ approved the site for closure on June 21, 2000. Previous investigations at Site 3 did not include PFOS/PFOA analysis; however, based on the dates of use of this area as an FTA, it is not expected that AFFF was used at this location.

5.0 SITE INVESTIGATION FIELD PROGRAM

This section summarizes the SI field activities, including soil, groundwater, surface water, and sediment sampling, at Great Falls ANGB. Analytical results for each PRL are presented and identify the presence or absence of PFOS/PFOA and results for PFOS, PFOA, and PFBS that exceed the screening criteria shown in Table 2 and described in Section 1.2 of this SI Report.

The SI field activities were conducted between July 9 and 19, 2018. All sampling and analytical activities were conducted in accordance with the procedures specified in the Final SI WP (Leidos 2018), except as noted in Section 5.1.2. Boring logs and monitoring well construction logs are provided in Appendix A and groundwater sampling logs are provided in Appendix B. The groundwater monitoring well survey report is included in Appendix C. The data validation report is provided in Appendix D. The full data package is provided in Appendix E.

5.1 GENERAL APPROACH

5.1.1 Field Sampling

SI field activities included the following:

- Surface and subsurface soil sampling;
- Water level measurements from existing monitoring wells at Great Falls ANGB to confirm local groundwater flow direction;
- Sampling of existing monitoring wells at Great Falls ANGB and installation and sampling of groundwater from new monitoring wells located downgradient from the PRLs and/or at the Installation boundary;
- Sediment and surface water sampling (if available); and
- Global Positioning System survey of soil borings, sediment, and surface water locations (the horizontal location and elevation of all newly installed wells were surveyed by a professional licensed surveyor).

Soil, groundwater, sediment, and surface water sampling locations were based on known historical or potential releases and site conditions as observed during the PA. Table 3 summarizes the SI sampling activities at Great Falls ANGB. Figure 2 shows an overview of the Great Falls ANGB SI sample locations. Prior to intrusive activities, an underground utility locator marked and cleared all boring locations.

A total of 24 soil borings were installed. Borings were installed in areas of known or likely discharges/spills. The borings were drilled using a hand auger to refusal. All soil borings were logged for soil lithology. Boring logs are included in Appendix A. Because of the shallow bedrock encountered at the PRLs, two grab soil samples were collected from each boring when possible—one from within the 0- to 0.5-ft BGS interval, and one from >2 ft BGS. At borings where refusal was encountered at < 2 ft BGS, an additional boring was advanced at the PRL if possible and a surface soil sample was collected.

All sample depths were measured from ground surface; therefore, the depth reported for some surface samples extend below 0.5 ft BGS due to the presence of asphalt and road base material. However, the

upper soil samples were collected within the 0- to 0.5-ft interval occurring just below the asphalt and road base (i.e., the first soil interval available for sampling).

All soil samples were screened by a photoionization detector as a health and safety precaution. Following collection of soil samples, boreholes not co-located with monitoring wells were abandoned by backfilling with bentonite. Holes were capped with either concrete or soil flush to surface.

Water level data from existing monitoring wells at Great Falls ANGB were used to confirm that the local groundwater flow direction is to the north/northwest, as documented in the historical reports. Groundwater samples were collected from six existing monitoring wells and three newly installed permanent monitoring wells. The new monitoring wells were developed and sampled following ANG guidance, as prescribed in the SI WP (Leidos 2018).

Sediment and surface water sampling locations were based on the presence of drainage ditches or stormwater outfalls. One sediment and one surface water sample (if available) were planned to be collected at the Stormwater Outfall 001. Additional details on the field activities for each PRL are provided in Section 5.3.

5.1.2 Deviations from the Work Plan

The following minor deviations were observed during field activities:

- At PRL 4, a groundwater sample was not collected from E/I -5-PRL04 as proposed in the SI WP (Leidos 2018) due to the presence of existing tubing and equipment in the well. A groundwater sample was collected from 7-MW4-PRL04 in the vicinity of PRL 4 to meet the SI objectives.

- At PRL 6, a groundwater sample was not collected from 7-MW19-PRL06 as proposed in the SI WP (Leidos 2018) due to the historical presence of free product in this well. A groundwater sample was collected from 7-MW34-PRL04 to meet the SI objectives.

5.1.3 Data Analysis

5.1.3.1 Laboratory

Environmental samples were submitted to TestAmerica Analytical Laboratories, Inc. (TestAmerica), in West Sacramento, California. TestAmerica is accredited under the DoD Environmental Laboratory Accreditation Program and maintains a National Environmental Laboratory Accreditation Program certification.

5.1.3.2 Screening criteria

Analytical data for three of the 2012 EPA UCMR3 COCs (PFOS, PFOA, PFBS) were compared to appropriate HA or risk-based screening criteria (Section 1.2) to determine whether further investigation is required. No HA or RSL criteria currently exist for PFHpA, PFHxS, or PFNA.

5.1.3.3 Data validation

A Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) was developed for this project as Appendix A of the SI WP (Leidos 2018). The UFP-QAPP was written to apply to all 15 Installations included in the scope of the Phase III SI contract. Specifics on the number and type of samples to be collected in characterizing the site, and the number and type of quality assurance/quality control (QA/QC)

samples to be used to evaluate the quality of the data obtained, were included in the SI WP. Soil and sediment were collected in one 4-oz. high-density polyethylene (HDPE) container with HDPE cap. Groundwater and surface water samples were collected in two 250-mL HDPE containers with HDPE caps. The following samples were collected during the Great Falls ANGB SI sampling conducted in July 2018:

- 27 soil samples,
- 1 sediment sample,
- 9 groundwater samples,
- 1 surface water sample,
- 3 soil field duplicate samples,
- 1 groundwater field duplicate sample,
- 2 soil matrix spike/matrix spike duplicate (MS/MSD) pairs,
- 2 water MS/MSD pairs,
- 6 equipment rinsates,
- 1 reagent blank,
- 1 deionized (DI) field blank, and
- 1 tap water field blank.

The results of the data quality evaluation indicate that the overall quality of the data enables its use to confirm the presence or absence of contamination. Through data verification, validation, and review, the analytical information has been qualified as appropriate. Data are considered usable if results are unqualified or qualified as estimated. For groundwater and surface water, 100% of the data was considered usable. For sediment and soil, 100% of the data was considered usable. The overall quality of the data meets or exceeds the established project objectives.

Quality Control

Table B-15 of the DoD Quality Systems Manual (QSM) Version 5.1 (DoD 2017) was followed for QA/QC protocols rather than EPA Method 537 Version 1.1. Three soil field duplicate and one groundwater duplicate were collected. Field duplicate analytical results were generally consistent with their associated parent samples, indicating no significant issues with field and laboratory precision. Data are not qualified on the basis of field duplicate results alone, since the *Contract Laboratory Program National Functional Guidelines for the Organic Data Review* (EPA 1999), and DoD QSM Version 5.1 (DoD 2017) do not include control limits for field duplicate relative percent difference values. Four MS/MSD pairs were collected, two for water and two for soil. The MS/MSD results are discussed in the "PFOS/PFOA" section of this data quality assessment.

Six equipment rinsate samples (four for soil/sediment, one for surface water, and one for groundwater) were collected and analyzed for PFOS/PFOA. One reagent blank was collected following the procedure outlined in the SI WP (Leidos 2018). One PFHpA was detected at a low estimated concentration in the reagent blank. All sample results either were non-detections or above the reagent blank concentration, and no additional qualification was required. All results were non-detect for the water equipment rinse blank samples. One PFOS was detected at a low concentration in the soil equipment rinse blank GRE-ER-SB-03. All sample results either were non-detections or above the associated equipment rinse blank concentration, and no additional qualification was required. Field blank samples were collected from both a DI water source (GRE-FB-DI-01) and a potable water source (GRE-FB-POT-01) and analyzed for PFOS/PFOA. The potable water source sample was collected from a fire hydrant located northeast of the Hush House. Potable water and DI water field blanks were free from contamination. Field QC sample results are presented in Table 9. Note that decontamination procedures were followed in the field,

including washing with laboratory grade, non-phosphate detergent; rinsing with potable water; final rinsing with DI, analyte free water; and air drying. For these reasons, SI data quality was not impacted.

PFOS/PFOA

Some perfluorinated compounds were qualified as estimated due to minor QC outliers. Five results were qualified as estimated (J) due to surrogate recovery results outside control limits. Forty-one PFOS/PFOA results were qualified as estimated (J) due to injection internal standard outliers. Two PFNA and two PFHxS results in the associated parent samples were qualified as estimated (J) due to MS/MSD recovery outliers. One PFHxS result for sample GRE-ER-MW-01 was qualified as non-detect due to continuing calibration blank contamination. The PFOS result for sample GRE08-SB4-01 was qualified as estimated due to results reported above the calibration range after maximum dilution. No other QC outliers resulted in qualification of the data during the data validation process.

Except as noted above, data produced for this investigation demonstrate that it can withstand scientific scrutiny; are appropriate for its intended purpose; are technically defensible; and are of known and acceptable sensitivity, precision, and accuracy. Data integrity has been documented through proper implementation of QA and QC measures. The environmental information presented has an established confidence that allows utilization for the project objectives and provides data for future needs.

5.2 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) was managed in compliance with the Final SI WP (Leidos 2018). Four drums of non-hazardous soil IDW and two drums of non-hazardous water IDW were transported to a designated drum staging area located on-site. Two IDW samples (one aqueous and one solid) were collected for this event, and the IDW sample results in conjunction with the PFOS/PFOA results and historical site process knowledge were used for characterization of generated IDW. Following approval of the waste profile, the IDW drums were transported to US Ecology of Idaho, Grand View, Idaho, for disposal.

5.3 PRL 3: AFFF RETENTION POND

Five soil borings (GRE03-SB1 through GRE03-SB5) and one groundwater monitoring well (MW-GRE03-01) were installed at PRL 3. Soil samples from the five borings and groundwater samples from an existing well (8-MW12-PRL03) and the new well (MW-GRE03-01) were collected to evaluate PRL 3. PRL 3 is co-located with PRL 5 (Building 38 – Fuel Shop).

5.3.1 Sampling Activities

5.3.1.1 Soil sampling

Five soil borings were advanced on July 10 and 11, 2018, to evaluate PRL 3. The soil borings were advanced at the locations shown in Figure 3. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of six soil samples, including a field duplicate, were collected and analyzed for PFOS/PFOA.

5.3.1.2 Groundwater

MW-GRE03-01 was drilled on July 10 and 11, 2018. Well construction details are presented in Table 4. The well construction diagram is included in Appendix A.

MW-GRE03-01 was developed on July 15, 2018, and sampled on July 18, 2018. In addition, an existing well 8-MW12-PRL03 was sampled on July 17, 2018. Water levels are presented in Table 5, and water

quality parameters are presented in Table 6. Groundwater samples MW-GRE03-01-01 and 8-MW12-PRL03-01 were collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring well MW-GRE03-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.3.2 Analytical Results

5.3.2.1 Soil

Six soil samples, including a field duplicate, were collected and analyzed from PRL 3, as described in Section 5.3.1. Five of these samples were collected from the surface interval (0 to 0.5 ft BGS). All six PFOS/PFOA compounds were detected above the laboratory detection limits in the surface soil samples, with the exception of PFNA at GRE03-SB3-01. No screening criteria exist for PFHxS, PFHpA, and PFNA. PFOS exceeded the soil screening criteria (126 µg/kg) at GRE03-SB2 (150J µg/kg) and GRE03-SB5 (330J µg/kg).

One subsurface soil sample (GRE03-SB3-02) was collected from a depth of 2.4 ft BGS. PFOS, PFOA, PFHpA, and PFHxS were detected above the laboratory detection limits. No screening criteria exist for PFHxS and PFHpA. PFOS and PFOA did not exceed the soil screening criteria in the subsurface soil sample. Soil analytical results for PRL 3 are presented in Table 7 and shown in Figure 3.

5.3.2.2 Groundwater

One groundwater sample was collected from MW-GRE03-01 and 8-MW12-PRL03, respectively, and analyzed as described in Section 5.3.1. All six PFOS/PFOA compounds were detected above laboratory detection limits in 8-MW12-PRL03, and five of the six PFOS/PFOA compounds were detected above the laboratory detection limits in MW-GRE03-01. PFNA was not detected in this well. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS and PFOA concentrations in 8-MW12-PRL03 exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b) at concentrations of 1,100J and 760J ng/L, respectively. The combined PFOS and PFOA concentration at this location is 1,860 ng/L. The PFOS and PFOA concentrations in MW-GRE03-01 did not exceed screening criteria. Groundwater analytical results for PRL 3 are presented in Table 8 and shown in Figure 5.

5.4 PRL 4: BUILDING 25 – MAIN HANGAR

Three soil borings (GRE04-SB1, GRE0403-SB2, GRE04-SB3) were installed at PRL 4. Soil samples were collected from the three borings and groundwater samples were collected from two existing wells (7-MW04-PRL04, 8-MW14-PRL04) to evaluate PRL 4.

5.4.1 Sampling Activities

5.4.1.1 Soil

The three soil borings were advanced on July 11 through 13, 2018, to evaluate the soil at PRL 4. The soil borings were advanced at the locations shown in Figure 4. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of three soil samples were collected and analyzed for PFOS/PFOA.

5.4.1.2 Groundwater

Existing monitoring well 8-MW14-PRL04 was sampled on July 16, 2018, and existing monitoring well 7-MW04-PRL04 was sampled on July 17, 2018. Water levels are presented in Table 5, and water quality parameters are presented in Table 6. Groundwater samples 7-MW04-PRL04-01 and 8-MW14-PRL04-01 were collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

5.4.2 Analytical Results

5.4.2.1 Soil

Three surface soil samples were collected from GRE04-SB1, GRE04-SB2, and GRE04-SB3 and analyzed as described in Section 5.4.1. PFOS/PFOA compounds were detected in each of the soil samples. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS, PFOS, and PFOA concentrations detected above the laboratory detection limits did not exceed the soil screening criteria. PRL 4 soil analytical results are presented in Table 7 and shown in Figure 4.

5.4.2.2 Groundwater

One groundwater sample was collected from 7-MW04-PRL04 and 8-MW14-PRL04, respectively, and analyzed as described in Section 5.4.1. All six PFOS/PFOA compounds were detected above laboratory detection limits in 8-MW14-PRL04, and five of the six PFOS/PFOA compounds were detected above the laboratory detection limits in 7-MW04-PRL04. PFNA was not detected in this well. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentrations did not exceed the RSL of 400,000 ng/L. Although individual PFOS and PFOA concentrations did not exceed the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b), the combined PFOS and PFOA concentration at 7-MW04-PRL04 (80 ng/L) and 8-MW14-PRL04 (73 ng/L [74 ng/L duplicate]) exceeded the screening criteria. Groundwater analytical results for PRL 4 are presented in Table 8 and shown in Figure 5.

5.5 PRL 5: BUILDING 38 – FUEL CELL SHOP

Two soil borings (GRE05-SB1, GRE05-SB2) were advanced at PRL 5. PRL 5 is co-located with PRL 3. Soil samples from the two borings and groundwater samples from the PRL 3 wells will be used to evaluate PRL 5.

5.5.1 Sampling Activities

5.5.1.1 Soil

Two soil borings were advanced on July 13, 2018, to evaluate PRL 5. The soil borings were advanced at the locations shown in Figure 3. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of two soil samples were collected and analyzed for PFOS/PFOA.

5.5.1.2 Groundwater

PRL 5 is co-located with PRL 3. Groundwater samples from the two PRL 3 wells (MW-GRE03-01, 8-MW12-PRL03) will be used for the evaluation of PRL 5.

5.5.2 Analytical Results

5.5.2.1 Soil

Two surface soil samples were collected from GRE05-SB1 and GRE05-SB2 and analyzed as described in Section 5.5.1. PFOS/PFOA compounds were detected in each of the soil samples. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS, PFOS, and PFOA concentrations detected above the laboratory detection limits did not exceed the soil screening criteria. Soil analytical results for PRL 5 are presented in Table 7 and shown in Figure 3.

5.5.2.2 Groundwater

One groundwater sample was collected from MW-GRE03-01 and 8-MW12-PRL03, respectively, and analyzed as described in Section 5.3.1. All six PFOS/PFOA compounds were detected above laboratory detection limits in 8-MW12-PRL03, and five of the six PFOS/PFOA compounds were detected above the laboratory detection limits in MW-GRE03-01. PFNA was not detected in this well. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentrations did not exceed the RSL of 400,000 ng/L. The PFOS and PFOA concentrations in 8-MW12-PRL03 exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b) at concentrations of 1,100J and 760J ng/L, respectively. The combined PFOS and PFOA concentration at this location is 1,860 ng/L. The PFOS and PFOA concentrations in MW-GRE03-01 did not exceed screening criteria. Groundwater analytical results for the co-located PRL 3 and PRL 5 are presented in Table 8 and shown in Figure 5.

5.6 PRL 6: BUILDINGS 23 AND 24 – OLD FIRE STATION

Two soil borings (GRE06-SB1, GRE06-SB2) were advanced at PRL 6. Soil samples from the two borings and groundwater samples from two existing wells (7-MW1-PRL06, 7-MW34-PRL06) were collected to evaluate PRL 6.

5.6.1 Sampling Activities

5.6.1.1 Soil

Two soil borings were advanced on July 11, 2018, to evaluate PRL 6. The soil borings were advanced at the locations shown in Figure 4. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of three soil samples, including a field duplicate, were collected and analyzed for PFOS/PFOA.

5.6.1.2 Groundwater

Existing monitoring well 7-MW01-PRL06 was sampled on July 16, 2018. Existing monitoring well 7-MW34-PRL06 was sampled on July 18, 2018. Water levels are presented in Table 5, and water quality parameters are presented in Table 6. Groundwater samples 7-MW01-PRL06 and 7-MW34-PRL06 were collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

5.6.2 Analytical Results

5.6.2.1 Soil

Three surface soil samples, including a field duplicate, were collected from GRE06-SB1 and GRE06-SB2 and analyzed as described in Section 5.6.1. All six PFOS/PFOA compounds were detected in each of the

soil samples. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria. PRL 6 soil analytical results are presented in Table 7 and shown in Figure 4.

5.6.2.2 Groundwater

One groundwater sample was collected from 7-MW1-PRL06 and 7-MW34-PRL06, respectively, and analyzed as described in Section 5.6.1. All six PFOS/PFOA compounds were detected above laboratory detection limits in both wells. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentrations did not exceed the RSL of 400,000 ng/L. The PFOS and PFOA concentrations in 7-MW1-PRL06 exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b) at concentrations of 120J and 3,900J ng/L, respectively. The combined PFOS and PFOA concentration at this location is 4,020 ng/L. The PFOA concentration in 7-MW34-PRL06 exceeded the 70-ng/L EPA drinking water HA (EPA 2016b) at a concentration of 300 ng/L. The combined PFOS and PFOA concentration at this location is 313 ng/L. Groundwater analytical results for PRL 6 are presented in Table 8 and shown in Figure 5.

5.7 PRL 7: BUILDING 11 – CURRENT FIRE STATION

Three soil borings (GRE07-SB1, GRE07-SB2, GRE07-SB3) were advanced at PRL 7. Soil samples from the three borings and groundwater sample from one existing well (7-MW28-PRL07) were collected to evaluate PRL 7.

5.7.1 Sampling Activities

5.7.1.1 Soil

Three soil borings were advanced on July 11 through 13, 2018, to evaluate PRL 7. The soil borings were advanced at the locations shown in Figure 4. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of four soil samples were collected and analyzed for PFOS/PFOA.

5.7.1.2 Groundwater

Existing monitoring well 7-MW28-PRL07 was sampled on July 16, 2018. Water levels are presented in Table 5, and water quality parameters are presented in Table 6. Groundwater sample 7-MW28-PRL07 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

5.7.2 Analytical Results

5.7.2.1 Soil

Four soil samples were collected and analyzed from PRL 7, as described in Section 5.7.1. Three of these samples were collected from the surface interval (0 to 0.5 ft BGS). All six PFOS/PFOA compounds were detected above the laboratory detection limits in the surface soil samples. No screening criteria exist for PFHxS, PFHpA, and PFNA. PFBS and PFOA did not exceed the soil screening criteria. PFOS exceeded the soil screening criteria (126 µg/kg) at GRE07-SB1 (520J µg/kg), GRE07-SB2 (1,700J µg/kg), and GRE07-SB3 (220J µg/kg).

One subsurface soil sample (GRE07-SB1-02) was collected from a depth of 2.7 ft BGS. All six PFOS/PFOA compounds were detected above the laboratory detection limits. No screening criteria exist

for PFHxS and PFHpA. PFBS, PFOS, and PFOA did not exceed the soil screening criteria in the subsurface soil sample. Soil analytical results for PRL 7 are presented in Table 7 and shown in Figure 4.

5.7.2.2 Groundwater

One groundwater sample was collected from 7-MW28-PRL07 and analyzed as described in Section 5.7.1. All six PFOS/PFOA compounds were detected above laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentration did not exceed the RSL of 400,000 ng/L. PFOS and PFOA exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b) in 7-MW28-PRL07 at concentrations of 250 and 550J ng/L, respectively. The combined PFOS/PFOA concentration at this location is 800 ng/L. Groundwater analytical results for PRL 7 are presented in Table 8 and shown in Figure 5.

5.8 PRL 8: FD NOZZLE TESTING AREA

Four soil borings (GRE08-SB1 through GRE08-SB4) and one groundwater monitoring well (MW-GRE08-01) were installed at PRL 8. Soil samples from the four borings and a groundwater sample from the monitoring well were collected to evaluate PRL 8.

5.8.1 Sampling Activities

5.8.1.1 Soil

Four soil borings were advanced on July 12 and 13, 2018, at the locations shown in Figure 4. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of four soil samples were collected and analyzed for PFOS/PFOA.

5.8.1.2 Groundwater

MW-GRE08-01 was drilled on July 11 and 12, 2018. Well construction details are presented in Table 4. The well construction diagram is included in Appendix A.

MW- GRE08-01 was developed on July 18, 2018, and sampled on July 19, 2018. Water levels are presented in Table 5, and water quality parameters are presented in Table 6. Groundwater sample MW-GRE08-01-01 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring well MW- GRE08-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.8.2 Analytical Results

5.8.2.1 Soil

Four surface soil samples were collected at PRL 8 and analyzed as described in Section 5.8.1. All six PFOS/PFOA compounds were detected in each of the soil samples. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFOA and PFBS concentrations did not exceed the soil screening criteria. PFOS exceeded the soil screening criteria (126J µg/kg) at GRE08-SB1 (310J µg/kg), GRE08-SB2 (600J µg/kg), GRE08-SB3 (1,300J µg/kg), and GRE08-SB4 (2,800J µg/kg). PRL 8 soil analytical results are presented in Table 7 and shown in Figure 4

5.8.2.2 Groundwater

One groundwater sample was collected from MW-GRE08-01 and analyzed as described in Section 5.8.1. All six PFOS/PFOA compounds were detected above laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentration did not exceed the RSL of 400,000 ng/L and the PFOA concentration did not exceed the 70-ng/L EPA drinking water HA (EPA 2016b). PFOS exceeded the 70-ng/L EPA drinking water HA (EPA 2016a) at a concentration of 600 ng/L. The combined PFOS/PFOA concentration at this location is 617 ng/L. Groundwater analytical results for PRL 8 are presented in Table 8 and shown in Figure 5.

5.9 PRL 9: STORMWATER OUTFALL 001

Two soil borings (GRE09-SB1, GRE09-SB2) were advanced at PRL 9. Soil samples from the two borings, one sediment sample (GRE09-SD1), and one surface water sample (GRE09-SW1) were collected to evaluate PRL 9. PRL 9 is co-located with PRL 10. The new monitoring well installed at PRL 10 (MW-GRE10-01) was used to assess the groundwater at PRL 9.

5.9.1 Sampling Activities

5.9.1.1 Soil

Two soil borings were advanced on July 9, 2018, at the locations shown in Figure 3. Soil lithology descriptions were logged on the soil boring log (Appendix A). A total of three soil samples, including a field duplicate, were collected and analyzed for PFOS/PFOA.

5.9.1.2 Groundwater

PRL 9 is co-located with PRL 10. Groundwater samples from the PRL 10 well (MW-GRE10-01) will be used for the evaluation of PRL 9.

5.9.1.3 Surface Water

Surface water sample GRE09-SW1 was collected on July 17, 2018, from the location shown in Figure 5. The last precipitation event was 0.05 in. on July 3, 2018. GRE09-SW1was analyzed for PFOS/PFOA.

5.9.1.4 Sediment

Sediment sample GRE09-SD1 was collected on July 17, 2018, from the location shown in Figure 3. GRE09-SD1was analyzed for PFOS/PFOA.

5.9.2 Analytical Results

5.9.2.1 Soil

Three surface soil samples, including a field duplicate, were collected from GRE09-SB1 and GRE09-SB2 and analyzed as described in Section 5.9.1. PFOS/PFOA compounds were detected in the surface soil samples. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria. PRL 9 soil analytical results are presented in Table 7 and shown in Figure 3.

5.9.2.2 Groundwater

One groundwater sample was collected from MW-GRE10-01 and analyzed as described in Section 5.10.1. PFOS/PFOA compounds (except PFNA) were detected above laboratory detection limits in the groundwater sample. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS and PFOA did not exceed the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b). Groundwater analytical results are presented in Table 8 and shown in Figure 5.

5.9.2.3 Surface water

Surface water sample GRE09-SW1 was collected and analyzed as described in Section 5.9.1. All six PFOS/PFOA compounds were detected at concentrations above the laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS and PFOA exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b) at concentrations of 5,300J and 6,200J ng/L, respectively. The combined PFOS/PFOA concentration at this location is 11,500 ng/L. PRL 9 surface water analytical results are presented in Table 8 and shown in Figure 5.

5.9.2.4 Sediment

Sediment sample GRE09-SD1 was collected and analyzed as described in Section 5.9.1. All six PFOS/PFOA compounds were detected. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria in the sediment sample at PRL 9. PRL 9 sediment analytical results are presented in Table 7 and shown in Figure 3.

5.10 PRL 10: CRASH SITE

Three soil borings (GRE10-SB1, GRE10-SB2, GRE10-SB3) and one groundwater monitoring well (MW-GRE10-01) was installed at PRL 10. Soil samples from the three borings and a groundwater sample from the monitoring well were collected to evaluate PRL 10.

5.10.1 Sampling Activities

5.10.1.1 Soil

The three soil borings were advanced on July 9, 2018, to evaluate PRL 10. The soil borings were advanced at the locations shown in Figure 3. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of five soil samples, including a field duplicate, were collected and analyzed for PFOS/PFOA.

5.10.1.2 Groundwater

MW-GRE10-01 was drilled on July 10 and 11, 2018. Well construction details are presented in Table 4. The well construction diagram is included in Appendix A.

MW-GRE10-01 was developed on July 17, 2018, and sampled on July 18, 2018. Water levels are presented in Table 5, and water quality parameters are presented in Table 6. Groundwater sample MW-GRE10-01-01 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring well MW-GRE10-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.10.2 Analytical Results

5.10.2.1 Soil

Four surface soil samples, including a field duplicate, and one subsurface soil sample were collected from PRL 10. PFOS/PFOA compounds were detected above laboratory detection limits in the surface and subsurface soil samples. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria. PRL 10 soil analytical results are presented in Table 7 and shown in Figure 3.

5.10.2.2 Groundwater

One groundwater sample was collected from MW-GRE10-01 and analyzed as described in Section 5.10.1. PFOS/PFOA compounds (except PFNA) were detected above laboratory detection limits in the groundwater sample. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS and PFOA did not exceed the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b). Groundwater analytical results for PRL 10 are presented in Table 8 and shown in Figure 5.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

This section presents the SI conclusions for each PRL and an evaluation of PFOS/PFOA contamination near the Installation boundary. The recommended DQOs are based on data collected by Leidos during this SI and an evaluation of the analytical results compared to applicable screening criteria.

6.1.1 PRL 3: AFFF Retention Pond

PFOS/PFOA compounds were detected in PRL 3 soil and groundwater samples. Evaluation of soil analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOA. However, the PFOS concentrations in GRE03-SB2-01 (150J µg/kg) and GRE03-SB5-01 (330J µg/kg) exceeded the screening criteria (126 µg/kg) for soil in PRL 3.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the EPA HA (70 ng/L) in 8-MW12-PRL03 for PFOS and PFOA (combined), with a result of 1,860 ng/L. The PFOS and PFOA concentrations in MW-GRE03-01 were below the EPA HA.

Based on the SI results, the following DQOs are recommended for PRL 3:

- Additional surface and subsurface soil samples to determine the extent of PFOS exceedances in soil (both laterally and vertically); and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 3.

6.1.2 PRL 4: Building 25 – Main Hangar

Although PFOS/PFOA compounds were detected in PRL 4 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOS and PFOA for soil in PRL 4.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the EPA HA (70 ng/L) in 7-MW04-PRL04 and 8-MW14-PRL04 for PFOS and PFOA (combined), with results of 80 ng/L (73 ng/L in duplicate) and 74 ng/L, respectively.

Based on the SI results, the following DQOs are recommended for PRL 4:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 4.

6.1.3 PRL 5: Building 38 – Fuel Cell Shop

Although PFOS/PFOA compounds were detected in PRL 5 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOS or PFOA for soil in PRL 5.

PRL 5 is co-located with PRL 3. Evaluation of groundwater data compared to screening criteria indicates an exceedance of the EPA HA (70 ng/L) in 8-MW12-PRL03 for PFOS and PFOA (combined), with a result of 1,860 ng/L. The PFOS and PFOA concentrations in MW-GRE03-01 were below the EPA HA.

Based on the SI results, the following DQOs are recommended for PRL 5:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and

- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 5.

6.1.4 PRL 6: Buildings 23 and 24 – Old Fire Station

Although PFOS/PFOA compounds were detected in PRL 6 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOA for soil in PRL 6.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the EPA HA (70 ng/L) in 7-MW1-PRL06 and 7-MW34-PRL06 for PFOS and PFOA (combined), with results of 4,020 and 313 ng/L, respectively.

Based on the SI results, the following DQOs are recommended for PRL 6:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and

- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 6.

6.1.5 PRL 7: Building 11 – Current Fire Station

PFOS/PFOA compounds were detected in PRL 7 soil and groundwater samples. Evaluation of soil analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOA. However, the PFOS concentrations in GRE07-SB1-01 (520J µg/kg), GRE07-SB2-01 (1,700J µg/kg), and GRE07-SB3-01 (220J µg/kg) exceeded the screening criteria (126 µg/kg) for soil in PRL 7.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the EPA HA (70 ng/L) in 7-MW28-PRL07 for PFOS and PFOA (combined), with a result of 800 ng/L.

Based on the SI results, the following DQOs are recommended for PRL 7:

- Additional surface and subsurface soil samples to determine the extent of PFOS exceedances in soil (both laterally and vertically); and

- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 7.

6.1.6 PRL 8: FD Nozzle Testing Area

PFOS/PFOA compounds were detected in PRL 8 soil and groundwater samples. Evaluation of soil analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOA. However, the PFOS concentrations in GRE08-SB1-01 (310J µg/kg), GRE08-SB2-01 (600J µg/kg), GRE08-SB3-01 (1,300J µg/kg), and GRE08-SB4-01 (2,800J µg/kg) exceeded the screening criteria (126 µg/kg) for soil in PRL 8.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the EPA HA (70 ng/L) in MW-GRE08-01 for PFOS and PFOA (combined), with a result of 617 ng/L.

Based on the SI results, the following DQOs are recommended for PRL 8:

- Additional surface and subsurface soil samples to determine the extent of PFOS exceedances in soil (both laterally and vertically); and

- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 8.

6.1.7 PRL 9: Stormwater Outfall 001

Although the PFOS/PFOA concentrations were above the laboratory detection limits in soil and sediment at PRL 9, evaluation of soil and sediment analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOS or PFOA for soil and sediment in PRL 9.

PRL 9 is co-located with PRL 10. The monitoring well installed at PRL 10 was used to evaluate the groundwater at PRL 9. There was no exceedance of the EPA HA (70 ng/L) in MW-GRE10-01 for PFOS, PFOA, or PFOS and PFOA (combined).

All six PFOS/PFOA compounds were present at concentrations above the laboratory detection limit in surface water location GRE09-SW1. Evaluation of surface water results compared to screening criteria indicated an exceedance of the EPA HA at PRL 9 for PFOS and PFOA (combined), with a result of 11,500 ng/L.

Based on the SI results, the following DQOs are recommended for PRL 9:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the PFAS concentrations in groundwater;

- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRLs 9; and

- Additional investigation to confirm the concentrations of PFAS in surface water, which should include additional sampling of surface water and sediment to further evaluate the nature and extent of PFOS/PFOA upgradient of and downgradient from PRL 9.

6.1.8 PRL 10: Crash Site

Although PFOS/PFOA compounds were detected in PRL 10 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no EPA RSL exceedances for PFBS and no calculated residential risk-based screening level exceedances for PFOS or PFOA for soil in PRL 10.

Evaluation of groundwater data compared to screening criteria indicates no exceedance of the EPA HA (70 ng/L) in MW-GRE10-01 for PFOS, PFOA, or PFOS and PFOA (combined).

Based on the SI results, the following DQOs are recommended for PRL 10:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the PFAS concentrations in groundwater; and

- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 10.

6.1.9 PFOS/PFOA Contamination Near Installation Boundary

Samples from five monitoring wells (8-MW12-PRL03, 7-MW34-PRL06, 7-MW28-PRL07, MW-GRE08-01, MW-GRE10-01) and one surface water sample (GRE09-SW1) were used to evaluate the PFOS/PFOA contamination near the Installation boundary. The screening results indicate the consistent presence of PFOS and PFOA at concentrations exceeding the 70-ng/L EPA drinking water HA (EPA 2016a and EPA 2016b) in the wells near the Installation boundary (except MW-GRE10-01), and in the surface water sample. The highest PFOS and PFOA concentrations were detected in the surface water sample from PRL 9 (Stormwater Outfall 001). The PFBS concentrations did not exceed the RSL at any of the groundwater or surface water sample locations. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFOS/PFOA compounds are likely migrating off-site given their presence and magnitude in groundwater and surface water near the Installation boundary.

6.2 SUMMARY AND RECOMMENDATIONS

Based on comparison of analytical data to the screening criteria in Table 2, Leidos recommends further investigations at all eight PRLs. Additional investigations are recommended for soil and groundwater at PRLs 3 through 10, and surface water/sediment at PRL 9. The recommendations are summarized in Table 10 and described briefly below:

- Further investigation at all eight PRLs is necessary to determine the nature and extent of PFOS/PFOA contamination due to detectable levels at all PRLs.

- Evaluate the former FTA (ERP Site 1) located off Great Falls ANGB. This FTA was not investigated during the 2018 SI because of its off-Base location.

- Develop an expanded conceptual site model that considers localized groundwater and surface water flow paths to select future sampling locations.

- Complete the delineation of nature and extent of PFAS as part of an Expanded SI or an RI that could consist of:

    - Additional soil and sediment sampling and analysis of an expanded list of PFAS constituents (in addition to the six UCMR3 constituents) to determine if significant source areas related to precursor substances are present. Precursor substances have been demonstrated to oxidize into PFOS and PFOA, and thus, could provide a lingering source of these compounds to soil and groundwater.

    - Expanded groundwater sampling program (including analysis of an expanded list of PFAS constituents) to complete horizontal and vertical delineation of the PFAS impacts. Further groundwater investigation at the Base boundary is recommended due to the presence of PFAS in groundwater above their respective screening criteria.

    - The installation and sampling of upgradient and downgradient off-Base monitoring wells to better define the upgradient source of PFAS as well as impacts of PFAS that have migrated off Base.

    - Conduct preliminary site-specific risk assessment calculations in order to identify chemicals of potential concern (COPCs) in every medium and establish preliminary remedial goals for screening purposes.

DQOs are proposed based on the results of the SI and are presented in Table 10. In general, additional samples are required at each PRL in order to establish the nature and extent of PFAS constituents for each applicable medium and determine if a complete receptor pathway exists. For soil, additional samples are proposed to determine if a source area exists, and if so, to determine the vertical and horizontal extent for both the vadose and saturated zones. For groundwater, additional samples are proposed to quantify potential impacts from upgradient sources and assess the nature and extent of PFAS concentrations beyond the Base boundary. Additional surface water and sediment samples should be collected at PRL 9 (including analysis of an expanded list of PFAS constituents) to further evaluate PFAS concentrations in surface water and sediment.

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TABLES

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Table 1. Preliminary Assessment Report Summary and Recommendations

PRL Number	Potential AFFF PRL	Rationale	Recommendation
1	Former FTA – ERP Site 4	Former on-Base FTA used from 1959 to1963, prior to AFFF use on Base.	NFA
2	Former FTA – ERP Site 5	Former on-Base FTA used from 1964 to1966, prior to AFFF use on Base.	NFA
3	AFFF Retention Pond	Received any AFFF releases from Building 25 or 38 and also from the FD nozzle testing.	Proceed to SI. Focus on soil and groundwater.
4	Building 25 – Main Hangar	AFFF FSS previously located at the Hangar.	Proceed to SI. Focus on soil and groundwater.
5	Building 38 – Fuel Cell Shop	AFFF FSS previously located at the Fuel Shop. Known accidental release of AFFF in 2003.	Proceed to SI. Focus on soil and groundwater
6	Buildings 23 and 24 – Old Fire Station	Potential releases of AFFF to the dry well associated with ERP Site 7.	Proceed to SI. Focus on soil and groundwater.
7	Building 11 – Current Fire Station	Potential AFFF releases.	Proceed to SI. Focus on soil and groundwater.
8	FD Nozzle Testing Area	Area directly north of Building 11. Known periodic fire equipment test area using AFFF.	Proceed to SI. Focus on soil and groundwater.
9	Stormwater Outfall 001	General stormwater drainage location for entire apron and ANG footprint.	Proceed to SI. Focus on sediment and surface water.
10	Crash Site	Civilian plane crash at intersection of Alpha and Taxiway 11 in 1991 or 1992, estimated 50 to100 gal of AFFF used.	Proceed to SI. Focus on soil and groundwater.

AFFF = Aqueous film-forming foam.
ANG = Air National Guard.
ERP = Environmental Restoration Program.
FD = Fire Department
FSS = Fire suppression system.
FTA = Fire training area.
NFA = No further action.
PRL = Potential release location.
SI = Site inspection.

Table 2. PFOS/PFOA SI Screening Criteria

Parameter	Chemical Abstract Service Number	EPA RSL for Tap Water[a] (ng/L) HQ=1	EPA Health Advisory[b] (ng/L)	Residential Risk-based Soil Screening Level[c] (µg/kg) HQ=0.1
PFOS	1763-23-1	NA	70.0[d]	126
PFOA	335-67-1	NA		126
PFBS	375-73-5	400,000[e]	NA	126,000

[a] EPA RSL for tap water, November 2018. Target HQ = 1 was used per MTDEQ guidance.
[b] *Drinking Water Health Advisory for Perfluorooctane Sulfonate* (EPA 2016a) and *Drinking Water Health Advisory for Perfluorooctanoic Acid* (EPA 2016b).
[c] Residential risk-based soil screening levels determined by using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) and the November 2018 EPA RSL tables (https://epa.gov/risk/regional-screening-levels-rsls-generic-tables) for soil and sediment. Target HQ = 0.1 was used per MTDEQ guidance.
[d] When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 70-ng/L health advisory value.
[e] PFBS analytical results for groundwater and surface water have been compared to the tap water screening levels.

µg/kg = Micrograms per kilogram.
EPA = U.S. Environmental Protection Agency.
HQ = Hazard quotient.
MTDEQ = Montana Department of Environmental Quality.
NA = Not available.
ng/L = Nanograms per liter.
PFBS = Perfluorobutane sulfonate.
PFOA = Perfluorooctanoic acid.
PFOS = Perfluorooctane sulfonate.
RSL = Regional screening level.
SI = Site inspection.

Table 3. Summary of SI Activities

PRL Name	Analyzed Parameters[a]	Soil Borings	Soil Samples[b]	Groundwater Samples[b]	Surface Water Samples	Sediment Samples
3: AFFF Retention Pond	PFOS/PFOA	5	6	2	NA	NA
4: Building 25 – Main Hangar	PFOS/PFOA	3	3	3	NA	NA
5: Building 38 – Fuel Cell Shop	PFOS/PFOA	2	2	0[c]	NA	NA
6: Buildings 23 and 24 – Old Fire Station	PFOS/PFOA	2	3	2	NA	NA
7: Building 11 – Current Fire Station	PFOS/PFOA	3	4	1	NA	NA
8: FD Nozzle Testing Area	PFOS/PFOA	4	4	1	NA	NA
9: Stormwater Outfall 001	PFOS/PFOA	2	3	0[d]	1	1
10: Crash Site	PFOS/PFOA	3	5	1	NA	NA

[a] PFOS/PFOA is used generically in this SI Report to include the following six 2012 UCMR3 Rule emerging contaminants: PFOS, PFOA, perfluorobutane sulfonate, perfluorononanoic acid, perfluoroheptanoic acid, and perfluorohexane sulfonate. All samples were analyzed for PFOS/PFOA using EPA Method 537, revision 1.1.
[b] Includes field duplicates.
[c] Co-located with PRL 3 – AFFF Retention Pond.
[d] Co-located with PRL 10 – Crash Site.

AFFF = Aqueous film-forming foam.
EPA = U.S. Environmental Protection Agency.
FD = Fire Department.
NA = Not available.
PFOA = Perfluorooctanoic acid.
PFOS = Perfluorooctane sulfonate.
PRL = Potential release location.
SI = Site inspection.
UCMR3 = Third Unregulated Contaminant Monitoring Rule.

Table 4. Well Construction Details for Great Falls ANGB SI

Monitoring Well	Top of Casing Elevation[a] (ft AMSL)	Ground Elevation[b] (ft AMSL)	Screened Interval (ft BGS)	Total Well Depth (ft BTOC)	Well Diameter (in.)	Casing
PRL 3						
MW-GRE03-01	3,675.234	3,675.599	50.5-70.5	71.7	2	PVC
PRL 8						
MW-GRE08-01	3,671.984	3,672.261	55.2-75.2	75.5	2	PVC
PRL 10						
MW-GRE10-01	3,668.526	3,668.877	40.5-60.5	61	2	PVC

Source: TOC elevation and ground surface elevation data are from the monitoring well survey on July 23, 2018 by Mark Leo (Big Sky Civil & Environmental, Inc.), Surveyor (see Appendix C). Screened interval, total depth, and well diameter data in this table were obtained from the well construction diagrams are provided in Appendix A.

AMSL = Above mean sea level.
ANGB = Air National Guard Base.
BGS = Below ground surface.
BTOC = Below top of casing.
PRL = Potential release location.
PVC = Polyvinyl chloride.
SI = Site inspection.
TOC = Top of casing.

Table 5. Water Level Measurements

Monitoring Well Identifier	TOC Elevation (ft AMSL)	Screened Interval	July 2018	
			Depth to Water (ft BTOC)	Groundwater Elevation (ft AMSL)
New Wells[a]				
MW-GRE03-01	3,675.234	50.5-70.5	37.73	3,637.504
MW-GRE08-01	3,671.984	55.2-75.2	72	3,599.984
MW-GRE10-01	3,668.526	40.5-60.5	33.11	3,635.416
Existing Wells[b]				
8-MW12-PRL03-01	3,673.52	44.5-64.5	45,73	3,627.79
7-MW04-PRL04-01	3,675.84	38.5–58.5	44.96	3,630.88
8-MW14-PRL04-01	3,678.98	45-65	44.68	3,634.3
7-MW1-PRL06-01	3,675.17	42-62	44.41	3,630.76
7-MW34-PRL06-01	3,673.16	40-60	44.02	3,629.14
7-MW28-PRL07-01	3,675.31	40-60	43.47	3,631.84

[a] Source: TOC elevation data are from the monitoring well survey on July 23, 2018 by Mark Leo (Big Sky Civil & Environmental, Inc.), Surveyor (see Appendix C). Screened interval data were obtained from the well construction diagrams provided in Appendix A. Depth to water data were obtained from groundwater sampling logs provided in Appendix B.
[b] Source: TOC elevation data are from the Revised Final Supplemental Remedial Investigation Report (Tetra Tech 2018). Screened interval data were obtained from groundwater sampling longs in Appendix B.

AMSL = Above mean sea level.
BTOC = Below top of casing.
TOC = Top of casing.

Table 6. Water Quality Parameters

Parameter	Groundwater				
	MW-GRE03-01	8-MW12-PRL03-01	7-MW04-PRL04-01	8-MW14-PRL04-01	7-MW1-PRL06-01
Dissolved oxygen (mg/L)	0.74	5.27	0.59	0.26	1.89
ORP (mV)	83	95	-103	-206	40
pH (S.U.)	7.22	7.31	7.12	7.24	7.11
Conductivity (mS/cm)	1.027	0.891	0.795	0.960	1.029
Temperature (ºC)	20.67	15.53	23.10	23.51	26.80
Turbidity (NTU)	9.21	5.63	15.3	175	7.98

Parameter	Groundwater				Surface Water
	7-MW34-PRL06-01	7-MW28-PRL07-01	MW-GRE08-01	MW-GRE10-01	GRE09-SW1-01
Dissolved oxygen (mg/L)	0.50	4.46	8.42	7.75	6.07
ORP (mV)	-27	169	231	93	146
pH (S.U.)	7.36	7.08	6.26	7.60	6.53
Conductivity (mS/cm)	0.768	0.749	2.25	2.06	0.769
Temperature (ºC)	23.76	39.82	22.54	15.62	18.36
Turbidity (NTU)	133	38.5	578	6.70	34.4

mg/L = Milligrams per liter.
mS/cm = MilliSiemens per centimeter.
mV = Millivolt.
NTU = Nephelometric turbidity unit.
ORP = Oxidation-reduction potential.
S.U. = Standard unit.

Table 7. Summary of Soil and Sediment Analytical Results

					Analyte	Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorobutane Sulfonate (PFBS)	Perfluoroheptanoic Acid (PFHpA)	Perfluorohexane Sulfonate (PFHxS)	Perfluorononanoic Acid (PFNA)
					Screening Level[a]	126	126	126,000	NA	NA	NA
PRL	Location	Sample Identifier	Sample Date	Sample Depth (ft)	Sample Type	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
					Soil						
3	GRE03-SB1	GRE03-SB1-01	7/11/18	0	REG	**110 J**	**2.6**	**0.092 J**	**0.56**	**1.7**	**2**
	GRE03-SB2	GRE03-SB2-01	7/11/18	0	REG	**150 J**	**2.6**	**0.16 J**	**0.66**	**6.7**	**3**
	GRE03-SB3	GRE03-SB3-01`	7/10/18	0.4	REG	**4.3**	**0.33**	**0.12 J**	**0.27 J**	**0.86**	0.22 U
	GRE03-SB3	GRE03-SB3-02	7/10/18	2.4	REG	**0.57 J**	**0.47**	0.19 U	**0.11 J**	**0.23 J**	0.21 U
	GRE03-SB4	GRE03-SB4-01	7/11/18	0	REG	**74 J**	**2.8**	**0.29 J**	**0.56**	**3.8**	**2.6**
	GRE03-SB5	GRE03-SB5-01	7/11/18	0	REG	**330 J**	**2.4**	**0.38 J**	**0.6**	**6.8**	**1.3**
4	GRE04-SB1	GRE04-SB1-01	7/10/18	0.6	REG	**8.5**	**0.11 J**	0.19 U	0.21 U	**0.45**	0.21 U
	GRE04-SB2	GRE04-SB2-01	7/12/18	0.2	REG	**14**	**0.45**	**0.07 J**	**0.1 J**	**5**	0.21 U
	GRE04-SB3	GRE04-SB3-01`	7/13/18	0	REG	**6.6**	**0.78**	0.19 U	**0.11 J**	**1.1**	**0.38**
5	GRE05-SB1	GRE05-SB1-01	7/13/18	0	REG	**46 J**	**0.93**	0.19 U	**0.23 J**	**0.74**	**1.3**
	GRE05-SB2	GRE05-SB2-01	7/13/18	0	REG	**67 J**	**0.87**	0.19 U	**0.22 J**	**0.93**	**3.4**
6	GRE06-SB1	GRE06-SB1-01	7/11/18	0.4	REG	**60 J**	**4.4**	**0.24 J**	**0.35**	**3.4**	**0.17 J**
	GRE06-SB1	GRE06-SB1-01D	7/11/18	0.4	FD	**56 J**	**4.4**	**0.36 J**	**0.62**	**3.4**	**3.4**
	GRE06-SB2	GRE06-SB2-01	7/11/18	0.4	REG	**25 J**	**13**	**0.6**	**0.42**	**16**	**0.11 J**
7	GRE07-SB1	GRE07-SB1-01	7/11/18	0	REG	**520 J**	**14**	**1.6**	**3.1**	**37 J**	**5.1 J**
	GRE07-SB1	GRE07-SB1-02	7/11/18	2.7	REG	**72 J**	**5.6**	**0.12 J**	**0.59**	**10**	**1**
	GRE07-SB2	GRE07-SB2-01	7/12/18	0	REG	**1,700 J**	**45 J**	**45 J**	**5.5**	**280 J**	**4.2**
	GRE07-SB3	GRE07-SB3-01	7/13/18	0	REG	**220 J**	**2.2**	**0.37 J**	**0.77**	**7.3**	**2.3**
8	GRE08-SB1	GRE08-SB1-01	7/12/18	0	REG	**310 J**	**7.6**	**1**	**2.1**	**14**	**1.4**
	GRE08-SB2	GRE08-SB2-01	7/12/18	0	REG	**600 J**	**6.7**	**0.82**	**1.7**	**16**	**1.3 J**
	GRE08-SB3	GRE08-SB3-01	7/12/18	0	REG	**1,300 J**	**6.6**	**0.79 J**	**1.3**	**26 J**	**0.79**
	GRE08-SB4	GRE08-SB4-01	7/13/18	0	REG	**2,800 J**	**7.6**	**0.27 J**	**0.87**	**13**	**4.2 J**

Table 7. Summary of Soil and Sediment Analytical Results (continued)

					Analyte	Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorobutane Sulfonate (PFBS)	Perfluoroheptanoic Acid (PFHpA)	Perfluorohexane Sulfonate (PFHxS)	Perfluorononanoic Acid (PFNA)
					Screening Level[a]	**126**	**126**	**126,000**	**NA**	**NA**	**NA**
PRL	**Location**	**Sample Identifier**	**Sample Date**	**Sample Depth (ft)**	**Sample Type**	**(µg/kg)**	**(µg/kg)**	**(µg/kg)**	**(µg/kg)**	**(µg/kg)**	**(µg/kg)**
9	GRE09-SB1	GRE09-SB1-01	7/9/18	0	REG	**16**	**0.33**	0.19 U	0.22 U	**1.7**	**0.18 J**
	GRE09-SB1	GRE09-SB1-01D	7/9/18	0	FD	**15**	**0.33**	0.19 U	0.21 U	**1.7**	**0.19 J**
	GRE09-SB2	GRE09-SB2-01	7/9/18	0	REG	**6.8**	**0.22 J**	0.19 U	0.21 U	**0.69**	0.21 U
10	GRE10-SB1	GRE10-SB1-01	7/9/18	0	REG	**12**	**1.4**	0.18 U	**0.21 J**	**1.8**	**0.78**
	GRE10-SB1	GRE10-SB1-01D	7/9/18	0	FD	**13**	**1.4**	0.18 U	**0.18 J**	**1.9**	**0.74**
	GRE10-SB2	GRE10-SB2-01	7/9/18	0	REG	**16**	**0.44**	0.19 U	0.21 U	**3.2 J**	**0.13 J**
	GRE10-SB2	GRE10-SB2-02	7/9/18	2.4	REG	**4**	**1.9**	**0.13 J**	**0.53**	**41 J**	0.23 U
	GRE10-SB3	GRE10-SB3-01	7/9/18	0	REG	**12**	**0.35**	0.19 U	0.21 U	**2**	**0.16 J**
Sediment											
9	GRE09-SD1	GRE09-SD1	7/17/18	0	REG	**33**	**8**	**0.34 J**	**1.1**	**8.6**	**0.29J**

*EPA residential risk-based soil screening level determined using the EPA RSL calculator and November 2018 EPA RSL tables at HQ = 0.1.
Bold denotes detected concentration.
Bold highlighted denotes concentration that exceeds screening criteria.

µg/kg = Micrograms per kilogram.
EPA = U.S. Environmental Protection Agency.
FD = Field duplicate.
HQ = Hazard quotient.
NA = Not applicable.
PRL = Potential release location.
REG = Regular.
RSL = Regional screening level.

Data Qualifiers:
J = Estimated concentration.
U = Chemical not detected above the laboratory detection limit.

Table 8. Summary of Groundwater and Surface Water Analytical Results

					Analyte	Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)	PFOS+PFOA	Perfluorobutane Sulfonate (PFBS)	Perfluoroheptanoic Acid (PFHpA)	Perfluorohexane Sulfonate (PFHxS)	Perfluorononanoic Acid (PFNA)
					Health Advisory[a]	**70**	**70**	**70**	**NA**	**NA**	**NA**	**NA**
					EPA RSL Tap Water[b]	**NA**	**NA**	**NA**	**400,000**	**NA**	**NA**	**NA**
PRL	**Location**	**Sample Identifier**	**Sample Date**	**Sample Depth (ft)**	**Sample Type**	**(ng/L)**	**(ng/L)**	**(ng/L)**	**(ng/L)**	**(ng/L)**	**(ng/L)**	**(ng/L)**
					Groundwater							
3 and 5	MW-GRE03-01	MW-GRE03-01-01	7/18/18	60	REG	**7.4**	**3.7**	**11.1**	**3.2**	**4.6**	**15**	1.2 U
	8-MW12-PRL03	8-MW12-PRL03-01	7/17/18	55	REG	**1,100 J**	**760J**	**1,860**	**130**	**630 J**	**2,100 J**	**48 J**
4	7-MW04-PRL04	7-MW04-PRL04-01	7/17/18	52	REG	**11**	**69**	**80**	**43**	**150**	**170**	1.3 U
	7-MW04-PRL04	7-MW04-PRL04-01	7/17/18	52	FD	**10**	**63**	**73**	**41**	**160**	**160**	1.3 U
	8-MW14-PRL04	8-MW14-PRL04-01	7/16/18	55	REG	**30**	**44**	**74**	**38**	**58**	**200**	**0.67 J**
6	7-MW1-PRL06	7-MW1-PRL06-01	7/16/18	53	REG	**120 J**	**3,900 J**	**4,020**	**950 J**	**3,900 J**	**20,000 J**	**6.7 J**
	7-MW34-PRL06	7-MW34-PRL06-01	7/18/18	52	REG	**13**	**300**	**313**	**160**	**460**	**1,300 J**	**1.1 J**
7	7-MW28-PRL07	7-MW28-PRL07-01	7/16/18	50	REG	**250**	**550 J**	**800**	**1,300 J**	**730 J**	**3,200 J**	**3**
8	MW-GRE08-01	MW-GRE08-01-01	7/19/18	72	REG	**600 J**	**17**	**617**	**45**	**16**	**160**	**0.8 J**
9 and 10	MW-GRE10-01	MW-GRE10-01-01	7/18/18	50	REG	**1.6 J**	**1.4 J**	**3**	**1.5 J**	**0.66 J**	**2.6**	1.2 U
					Surface Water							
9	GRE09-SW1	GRE09-SW1-01	7/17/18	0	REG	**5,300 J**	**6,200 J**	**11,500**	**360 J**	**1,300 J**	**8,400 J**	**110**

[a] May 2016 EPA health advisory for PFOS/PFOA combined.
[b] November 2018 EPA RSL for tap water at HQ = 1.
Bold denotes detected concentration.
Bold highlighted denotes concentration that exceeds screening criteria.

Table 8. Summary of Groundwater and Surface Water Analytical Results (continued)

EPA = U.S. Environmental Protection Agency.
FD = Field duplicate.
HQ = Hazard quotient.
NA = Not applicable.
ng/L = Nanograms per liter.
PFOA = Perfluorooctanoic acid.
PFOS = Perfluorooctane sulfonate.
PRL = Potential release location.
REG = Regular.
RSL = Regional screening level.

Data Qualifiers:
J = Estimated concentration.
U = Chemical not detected above the laboratory detection limit.

Table 9. Field QC Results

Parameter / Sample ID / Sample Type / Sample Date	Units	GRE-ER-MW-01 RNSW 07/17/2018	GRE-ER-SB-01 RNSW 07/09/2018	GRE-ER-SB-02 RNSW 07/10/2018	GRE-ER-SB-03 RNSW 07/11/2018
Perfluorobutanesulfonic acid	ng/L	0.86 U	0.8 U	0.89 U	0.91 U
Perfluoroheptanoic acid	ng/L	1.3 U	1.2 U	1.3 U	1.4 U
Perfluorohexanesulfonic acid	ng/L	0.86 U	0.8 U	0.89 U	0.91 U
Perfluorononanoic acid	ng/L	1.3 U	1.2 U	1.3 U	1.4 U
Perfluorooctane sulfonate	ng/L	2.6 U	2.4 U	2.7 U	**10**
Perfluorooctanoic acid	ng/L	1.3 U	1.2 U	1.3 U	1.4 U

Parameter / Sample ID / Sample Type / Sample Date	Units	GRE-ER-SD-01 RNSW 07/17/2018	GRE-ER-SW-01 RNSW 07/17/2018	GRE-FB-DI-01 FBLK 07/10/2018	GRE-FB-POT-01 FBLK 07/09/2018	GRE-RB-01 RBLK 07/18/2018
Perfluorobutanesulfonic acid	ng/L	0.92 U	0.87 U	0.85 U	0.76 U	0.92 U
Perfluoroheptanoic acid	ng/L	1.4 U	1.3 U	1.3 U	1.1 U	**0.98 J**
Perfluorohexanesulfonic acid	ng/L	0.92 U	0.87 U	0.85 U	0.76 U	0.92 U
Perfluorononanoic acid	ng/L	1.4 U	1.3 U	1.3 U	1.1 U	1.4 U
Perfluorooctane sulfonate	ng/L	2.8 U	2.6 U	2.6 U	2.3 U	2.8 U
Perfluorooctanoic acid	ng/L	1.4 U	1.3 U	1.3 U	1.1 U	1.4 U

FBLK = Field Blank.
ID = Identifier.
RBLK = Reagent Blank.
RNSW = Rinse Water.

Table 10. SI Recommendation Summary Table

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
3	AFFF Retention Pond	**Soil:** PFOS **Groundwater:** PFOS + PFOA	**Soil:** Determine the nature and extent both vertically and horizontally through additional surface and subsurface soil sampling. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
4	Building 25 – Main Hangar	**Groundwater:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
5	Building 38 – Fuel Cell Shop	**Groundwater:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
6	Buildings 23 and 24 – Old Fire Station	**Groundwater:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
7	Building 11 – Current Fire Station	**Soil:** PFOS **Groundwater:** PFOS + PFOA	**Soil:** Determine the nature and extent both vertically and horizontally through additional surface and subsurface soil sampling. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
8	FD Nozzle Testing Area	**Soil:** PFOS **Groundwater:** PFOS + PFOA	**Soil:** Determine the nature and extent both vertically and horizontally through additional surface and subsurface soil sampling. **Groundwater:** Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.

Table 10. SI Recommendation Summary Table (continued)

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
9	Stormwater Outfall 001	**Surface Water:** PFOS + PFOA	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Although screening criteria were not exceeded, additional groundwater samples are proposed to determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells. **Surface Water and Sediment**: Determine the nature and extent of PFOS/PFOA concentrations upgradient of and downgradient from the stormwater outfall through additional sampling of surface water and sediment.
10	Crash Site	**None**	**Soil:** Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. **Groundwater:** Although screening criteria were not exceeded, additional groundwater samples are proposed to determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
General			**Soil:** Collect additional surface and subsurface soil samples to determine the nature and extent both vertically and horizontally of PFAS contamination. Analyze for an expanded list of PFAS compounds to evaluate for potential precursor compounds. **Groundwater:** (1) Collect additional groundwater samples in upgradient locations to quantify potential impacts from upgradient sources; (2) collect additional groundwater samples off Base through the installation of a limited number of new monitoring wells to assess the nature and extent of PFAS impacts beyond the Base boundary. **Surface Water/Sediment:** (1) Collect additional surface water and sediment samples in upgradient locations to quantify potential impacts from upgradient sources; (2) collect additional surface water and sediment samples off Base to determine the nature and extent of PFAS beyond the Base boundary.

AFFF = Aqueous film-forming foam.
FD = Fire Department.
PFAS = Per- and polyfluoroalkyl substances.
PFOA = Perfluorooctanoic acid.
PFOS = Perfluorooctane sulfonate.
PRL = Potential release location.
SI = Site inspection.

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FIGURES

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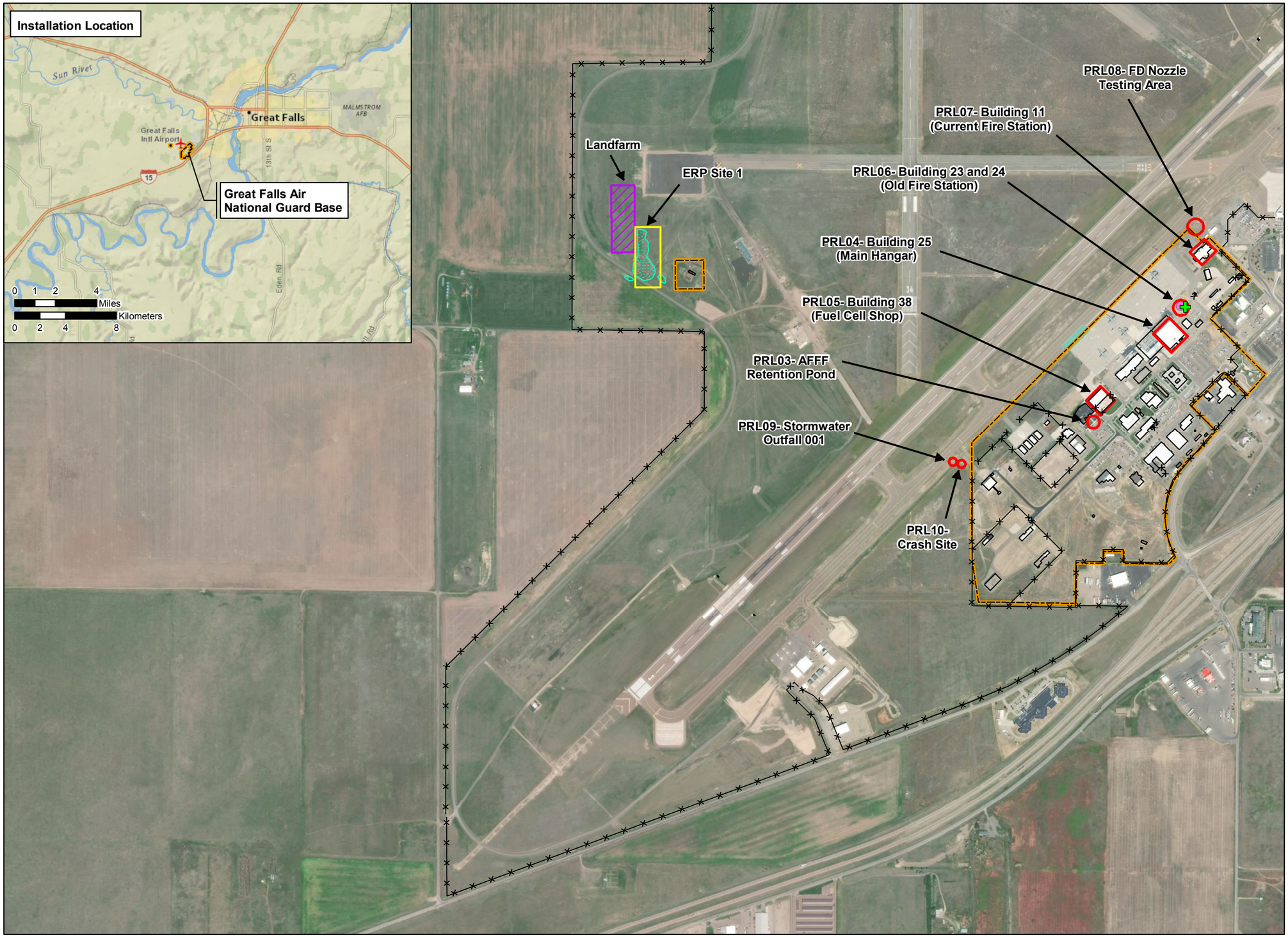


LEGEND:

- ERP Site 7 Location
- Former Dry Well Location
- ERP Site 1 Location
- Landfarm Location
- ERP Site 1 Excavation Boundary
- Potential Release Location (PRL)
- Installation Boundary*
- Building*
- Fence*

NOTES:

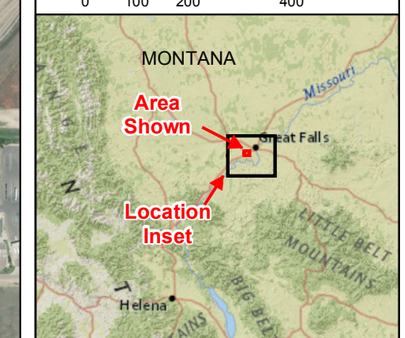
* Source: Common Installation Picture (CIP) geodatabase provided by ANG GeoBase on 07/26/2017.

1. Background Source: ESRI World Imagery (DigitalGlobe, 06/2016).

N W E S

0 250 500 1,000 Feet

0 100 200 400 Meters



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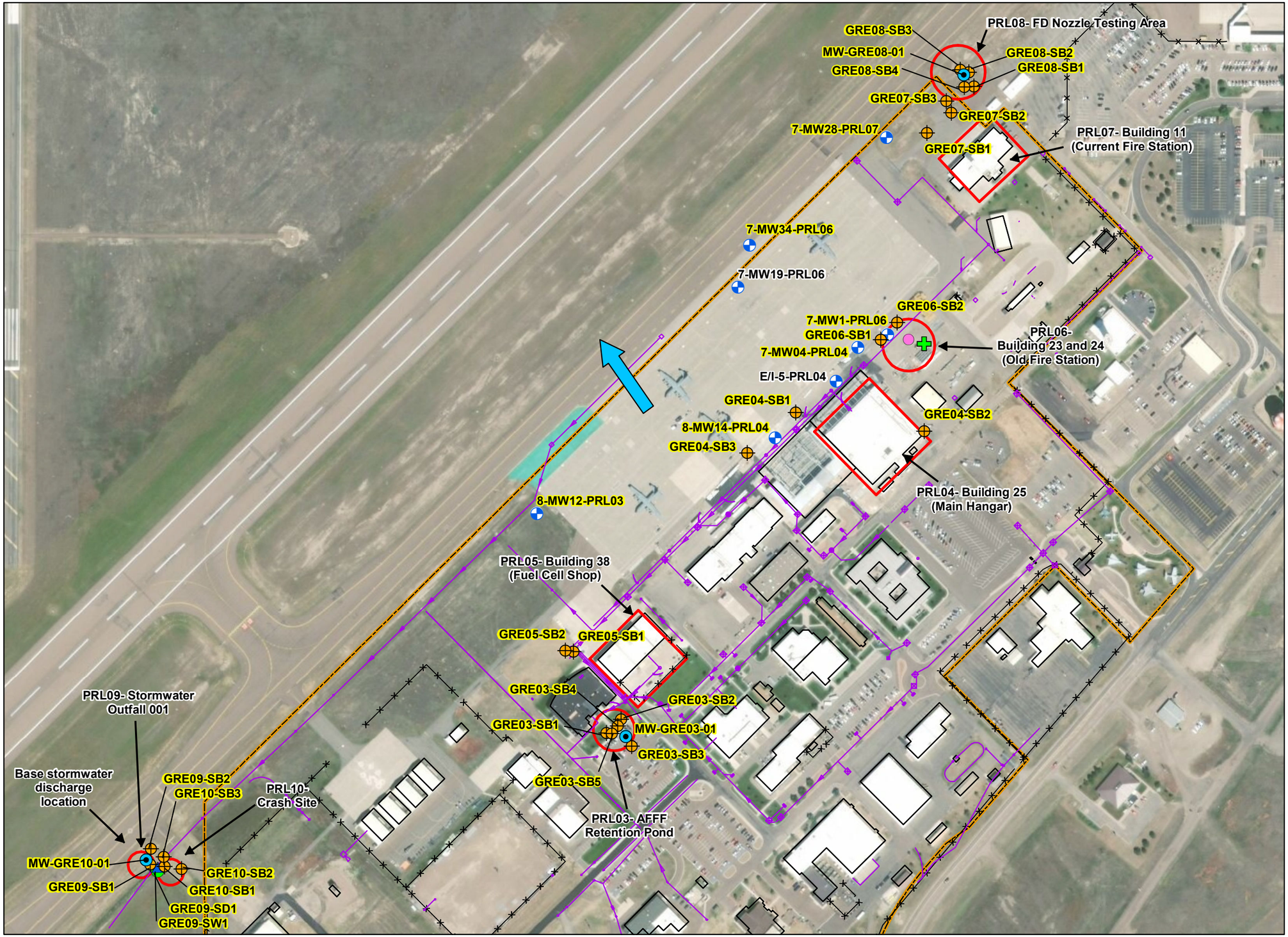
GREAT FALLS AIR NATIONAL GUARD BASE
GREAT FALLS, MONTANA

GREAT FALLS ANGB
LOCATION MAP

FIGURE: 1	DATE: 10/26/2018

PROJECT: \827Projects\ANG Phase 3 SI for PFCs\z_GIS\GreatFalls\Projects\SI\Figure 1 Great Falls Location Map_11x17.mxd



LEGEND:

- SI Monitoring Well
- Soil Boring
- Surface Water Sample
- Sediment Sample
- Existing Well
- ERP Site 7 Location
- Former Dry Well Location
- Potential Release Location (PRL)
- Installation Boundary*
- Building*
- Storm Sewer Line
- Fence*
- Inferred Regional Groundwater Flow
- GRE03-SB1 Location Identifier

NOTES:

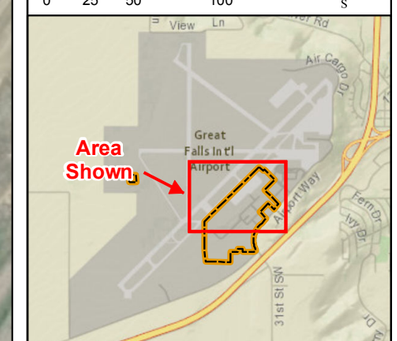
* Source: Common Installation Picture (CIP) geodatabase provided by ANG GeoBase on 07/26/2017.

1. The general groundwater flow direction was inferred using historical and 2018 SI water level measurements.
2. Existing monitoring wells 7-MW19-PRL06 and E/I-5-PRL04 were not sampled. See Section 5.1.2 of the report for details.
3. Background Source: ESRI World Imagery (DigitalGlobe, 6/2016).

0 100 200 400 Feet

0 25 50 100 Meters

N W E S



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GREAT FALLS AIR NATIONAL GUARD BASE
GREAT FALLS, MONTANA

GREAT FALLS ANGB
SI SAMPLING OVERVIEW MAP

FIGURE: 2	DATE: 10/26/2018

PROJECT: \827Projects\ANG Phase 3 SI for PFCs\z_GIS\GreatFalls\Projects\SI\Figure 2 Sample Location Overview_11x17.mxd

Soil Screening Criteria[a]	Residential Risk-based Soil Screening Level[a] HQ=0.1
	µg/kg
PFOS	126
PFOA	126
PFBS	126,000

[a]Residential risk-based soil screening levels determined by using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) and the November 2018 EPA RSL tables (https://epa.gov/risk/regional-screening-levels-rsls-generic-tables) for soil and sediment.

GRE03-SB2	REG
	µg/kg
Sample Date	7/11/2018
Sample Depth (ft.)	0
PFBS	**0.16 J**
PFHpA	**0.66**
PFHxS	**6.7**
PFNA	**3**
PFOS	**150 J**
PFOA	**2.6**

GRE05-SB2	REG
	µg/kg
Sample Date	7/13/2018
Sample Depth (ft.)	0
PFBS	0.19 U
PFHpA	**0.22 J**
PFHxS	**0.93**
PFNA	**3.4**
PFOS	**67 J**
PFOA	**0.87**

GRE05-SB1	REG
	µg/kg
Sample Date	7/13/2018
Sample Depth (ft.)	0
PFBS	0.19 U
PFHpA	**0.23 J**
PFHxS	**0.74**
PFNA	**1.3**
PFOS	**46 J**
PFOA	**0.93**

GRE10-SB3	REG
	µg/kg
Sample Date	7/9/2018
Sample Depth (ft.)	0
PFBS	0.19 U
PFHpA	0.21 U
PFHxS	**2**
PFNA	**0.16 J**
PFOS	**12**
PFOA	**0.35**

GRE10-SB1	REG	DUP
	µg/kg	µg/kg
Sample Date	7/9/2018	7/9/2018
Sample Depth (ft.)	0	0
PFBS	0.18 U	0.18 U
PFHpA	**0.21 J**	**0.18 J**
PFHxS	**1.8**	**1.9**
PFNA	**0.78**	**0.74**
PFOS	**12**	**13**
PFOA	**1.4**	**1.4**

GRE03-SB4	REG
	µg/kg
Sample Date	7/11/2018
Sample Depth (ft.)	0
PFBS	**0.29 J**
PFHpA	**0.56**
PFHxS	**3.8**
PFNA	**2.6**
PFOS	**74 J**
PFOA	**2.8**

GRE09-SB2	REG
	µg/kg
Sample Date	7/9/2018
Sample Depth (ft.)	0
PFBS	0.19 U
PFHpA	0.21 U
PFHxS	**0.69**
PFNA	0.21 U
PFOS	**6.8**
PFOA	**0.22 J**

GRE03-SB1	REG
	µg/kg
Sample Date	7/11/2018
Sample Depth (ft.)	0
PFBS	**0.092 J**
PFHpA	**0.56**
PFHxS	**1.7**
PFNA	**2**
PFOS	**110 J**
PFOA	**2.6**

GRE10-SB2	REG	REG
	µg/kg	µg/kg
Sample Date	7/9/2018	7/9/2018
Sample Depth (ft.)	0	2.4
PFBS	0.19 U	**0.13 J**
PFHpA	0.21 U	**0.53**
PFHxS	**3.2 J**	**41 J**
PFNA	**0.13 J**	0.23 U
PFOS	**16**	**4**
PFOA	**0.44**	**1.9**

GRE03-SB3	REG	REG
	µg/kg	µg/kg
Sample Date	7/10/2018	7/10/2018
Sample Depth (ft.)	0.4	2.4
PFBS	**0.12 J**	0.19 U
PFHpA	**0.27 J**	**0.11 J**
PFHxS	**0.86**	**0.23 J**
PFNA	0.22 U	0.21 U
PFOS	**4.3**	**0.57 J**
PFOA	**0.33**	**0.47**

GRE03-SB5	REG
	µg/kg
Sample Date	7/11/2018
Sample Depth (ft.)	0
PFBS	**0.38 J**
PFHpA	**0.6**
PFHxS	**6.8**
PFNA	**1.3**
PFOS	**330 J**
PFOA	**2.4**

GRE09-SB1	REG	DUP
	µg/kg	µg/kg
Sample Date	7/9/2018	7/9/2018
Sample Depth (ft.)	0	0
PFBS	0.19 U	0.19 U
PFHpA	0.22 U	0.21 U
PFHxS	**1.7**	**1.7**
PFNA	**0.18 J**	**0.19 J**
PFOS	**16**	**15**
PFOA	**0.33**	**0.33**

GRE09-SD1	REG
	µg/kg
Sample Date	7/17/2018
Sample Depth (ft.)	0
PFBS	**0.34 J**
PFHpA	**1.1**
PFHxS	**8.6**
PFNA	**0.29 J**
PFOS	**33**
PFOA	**8**

TABLE NOTES:

J = Estimated concentration
PFOS = Perfluorooctane sulfonate
PFOA = Perfluorooctanoic acid
PFBS = Perfluorobutanesulfonic acid
PFHpA = Perfluoroheptanoic acid
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
U = Chemical not detected above the laboratory detection limit
BOLD = Detected concentration
BOLD+highlight = exceeds criteria

8-MW12-PRL03
PRL05- Building 38 (Fuel Cell Shop)
GRE05-SB2
GRE05-SB1
GRE03-SB2
PRL03- AFFF Retention Pond
GRE03-SB1
GRE03-SB4
MW-GRE03-01
GRE03-SB3
GRE03-SB5
GRE09-SB2
GRE10-SB3
GRE10-SB1
GRE10-SB2
MW-GRE10-01
PRL09- Stormwater Outfall 001
GRE09-SB1
PRL10- Crash Site
GRE09-SD1
GRE09-SW1

LEGEND:

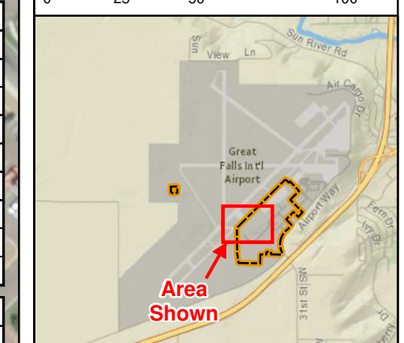
- SI Monitoring Well
- Soil Boring
- Surface Water Sample
- Sediment Sample
- Existing Well
- Potential Release Location (PRL)
- Installation Boundary*
- Building*
- Fence*
- **GRE03-SB1** Location Identifier

NOTES:

* Source: Common Installation Picture (CIP) geodatabase provided by ANG GeoBase on 07/26/2017.
1. Background Source: ESRI World Imagery (DigitalGlobe, 6/2016).

N W E S

0 50 100 200 Feet
0 25 50 100 Meters



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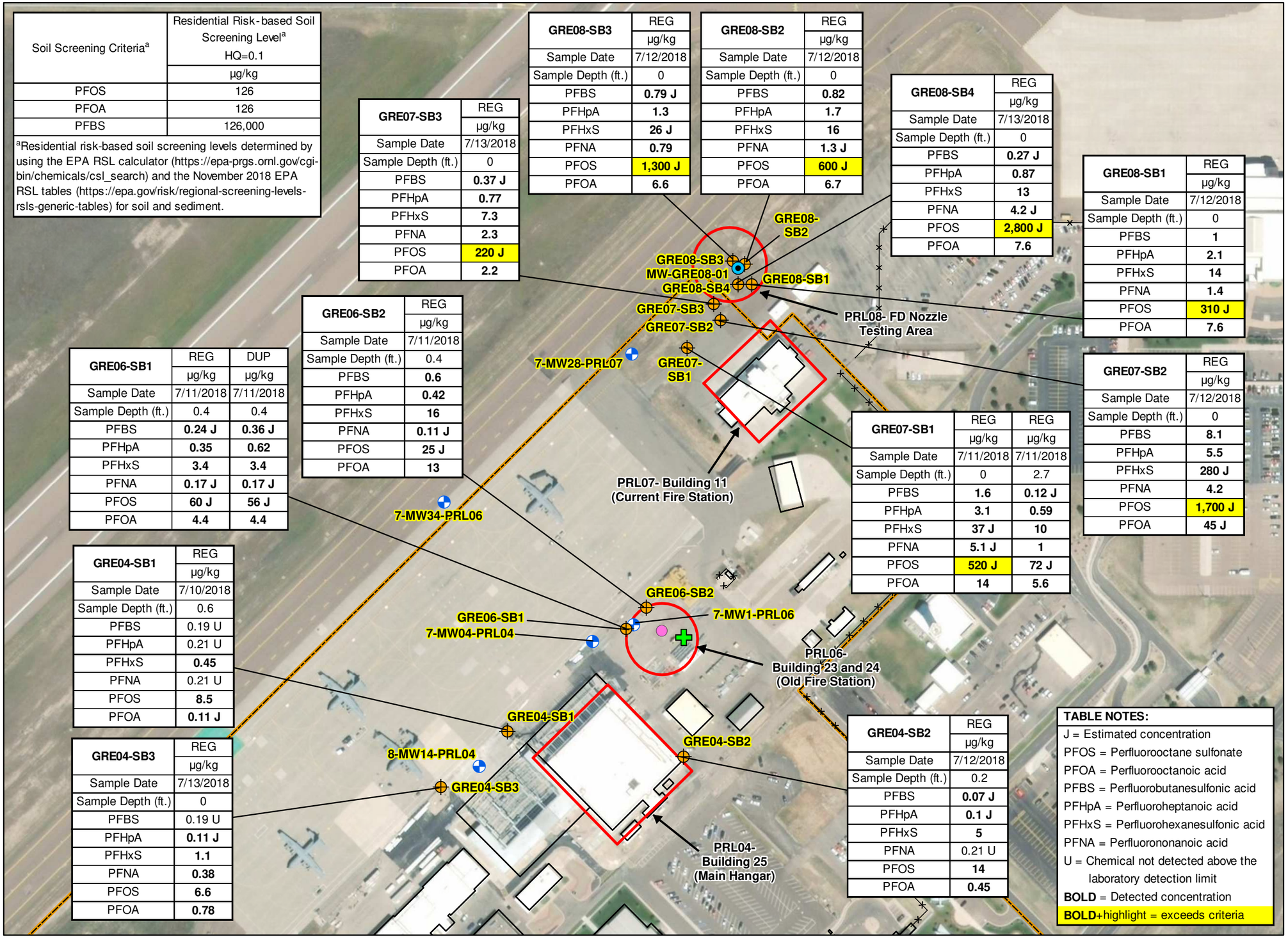
GREAT FALLS AIR NATIONAL GUARD BASE
GREAT FALLS, MONTANA

PRLs 3, 5, 9, AND 10
SI SOIL AND SEDIMENT
ANALYTICAL RESULTS

FIGURE: 3 | DATE: 1/9/2019

PROJECT: \827Projects\ANG Phase 3 SI for PFCs\z_GIS\GreatFalls\Projects\SI\Figure 3 PRL 03 05 09 10 Soil Sediment Results_11x17.mxd



Soil Screening Criteria[a]	Residential Risk-based Soil Screening Level[a] HQ=0.1
	µg/kg
PFOS	126
PFOA	126
PFBS	126,000

[a]Residential risk-based soil screening levels determined by using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) and the November 2018 EPA RSL tables (https://epa.gov/risk/regional-screening-levels-rsls-generic-tables) for soil and sediment.

GRE08-SB3	REG
	µg/kg
Sample Date	7/12/2018
Sample Depth (ft.)	0
PFBS	**0.79 J**
PFHpA	**1.3**
PFHxS	**26 J**
PFNA	**0.79**
PFOS	**1,300 J**
PFOA	**6.6**

GRE08-SB2	REG
	µg/kg
Sample Date	7/12/2018
Sample Depth (ft.)	0
PFBS	**0.82**
PFHpA	**1.7**
PFHxS	**16**
PFNA	**1.3 J**
PFOS	**600 J**
PFOA	**6.7**

GRE07-SB3	REG
	µg/kg
Sample Date	7/13/2018
Sample Depth (ft.)	0
PFBS	**0.37 J**
PFHpA	**0.77**
PFHxS	**7.3**
PFNA	**2.3**
PFOS	**220 J**
PFOA	**2.2**

GRE08-SB4	REG
	µg/kg
Sample Date	7/13/2018
Sample Depth (ft.)	0
PFBS	**0.27 J**
PFHpA	**0.87**
PFHxS	**13**
PFNA	**4.2 J**
PFOS	**2,800 J**
PFOA	**7.6**

GRE08-SB1	REG
	µg/kg
Sample Date	7/12/2018
Sample Depth (ft.)	0
PFBS	**1**
PFHpA	**2.1**
PFHxS	**14**
PFNA	**1.4**
PFOS	**310 J**
PFOA	**7.6**

GRE06-SB2	REG
	µg/kg
Sample Date	7/11/2018
Sample Depth (ft.)	0.4
PFBS	**0.6**
PFHpA	**0.42**
PFHxS	**16**
PFNA	**0.11 J**
PFOS	**25 J**
PFOA	**13**

GRE06-SB1	REG	DUP
	µg/kg	µg/kg
Sample Date	7/11/2018	7/11/2018
Sample Depth (ft.)	0.4	0.4
PFBS	**0.24 J**	**0.36 J**
PFHpA	**0.35**	**0.62**
PFHxS	**3.4**	**3.4**
PFNA	**0.17 J**	**0.17 J**
PFOS	**60 J**	**56 J**
PFOA	**4.4**	**4.4**

GRE07-SB2	REG
	µg/kg
Sample Date	7/12/2018
Sample Depth (ft.)	0
PFBS	**8.1**
PFHpA	**5.5**
PFHxS	**280 J**
PFNA	**4.2**
PFOS	**1,700 J**
PFOA	**45 J**

GRE07-SB1	REG	REG
	µg/kg	µg/kg
Sample Date	7/11/2018	7/11/2018
Sample Depth (ft.)	0	2.7
PFBS	**1.6**	**0.12 J**
PFHpA	**3.1**	**0.59**
PFHxS	**37 J**	**10**
PFNA	**5.1 J**	**1**
PFOS	**520 J**	**72 J**
PFOA	**14**	**5.6**

GRE04-SB1	REG
	µg/kg
Sample Date	7/10/2018
Sample Depth (ft.)	0.6
PFBS	0.19 U
PFHpA	0.21 U
PFHxS	**0.45**
PFNA	0.21 U
PFOS	**8.5**
PFOA	**0.11 J**

GRE04-SB3	REG
	µg/kg
Sample Date	7/13/2018
Sample Depth (ft.)	0
PFBS	0.19 U
PFHpA	**0.11 J**
PFHxS	**1.1**
PFNA	**0.38**
PFOS	**6.6**
PFOA	**0.78**

GRE04-SB2	REG
	µg/kg
Sample Date	7/12/2018
Sample Depth (ft.)	0.2
PFBS	**0.07 J**
PFHpA	**0.1 J**
PFHxS	**5**
PFNA	0.21 U
PFOS	**14**
PFOA	**0.45**

TABLE NOTES:

J = Estimated concentration
PFOS = Perfluorooctane sulfonate
PFOA = Perfluorooctanoic acid
PFBS = Perfluorobutanesulfonic acid
PFHpA = Perfluoroheptanoic acid
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
U = Chemical not detected above the laboratory detection limit
BOLD = Detected concentration
BOLD+highlight = exceeds criteria

LEGEND:

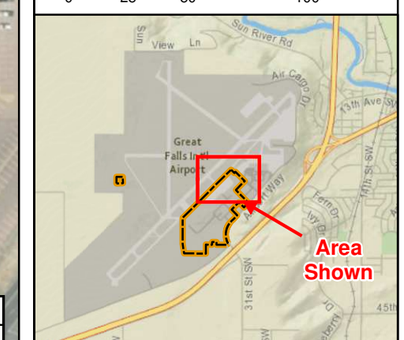
- SI Monitoring Well
- Soil Boring
- Existing Well
- ERP Site 7 Location
- Former Dry Well Location
- Potential Release Location (PRL)
- Installation Boundary*
- Building*
- Fence*
- **GRE04-SB1** Location Identifier

NOTES:

* Source: Common Installation Picture (CIP) geodatabase provided by ANG GeoBase on 07/26/2017.
1. Background Source: ESRI World Imagery (DigitalGlobe, 6/2016).

N W E S

0 50 100 200 Feet
0 25 50 100 Meters



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GREAT FALLS AIR NATIONAL GUARD BASE
GREAT FALLS, MONTANA

PRLs 4, 6, 7, AND 8
SI SOIL
ANALYTICAL RESULTS

FIGURE: 4 | DATE: 1/9/2019

PROJECT: \827Projects\ANG Phase 3 SI for PFCs\z_GIS\GreatFalls\Projects\SI\Figure 4 PRL 04 06 07 08 Soil Results_11x17.mxd

Groundwater/Surface Water Screening Criteria	Tap water RSL[a] HQ=1	EPA Health Advisory[b]
	ng/L	ng/L
PFOS	NA	70.0[c]
PFOA	NA	
PFBS	400,000	NA

[a] EPA RSL for tap water, November 2018.

[b] *Drinking Water Health Advisory for Perfluorooctane Sulfonate* (EPA 2016a) and *Drinking Water Health Advisory for Perfluorooctanoic Acid* (EPA 2016b).

[c] When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 70 ng/L health advisory value. Analytical results for groundwater and surface water have been compared to the tap water screening levels.

7-MW34-PRL06	REG
	ng/L
Sample Date	7/18/2018
Sample Depth (ft.)	52
PFBS	**160**
PFHpA	**460**
PFHxS	**1,300 J**
PFNA	**1.1 J**
PFOS	**13**
PFOA	**300**
PFOS+PFOA	**313**

7-MW28-PRL07	REG
	ng/L
Sample Date	7/16/2018
Sample Depth (ft.)	50
PFBS	**1,300 J**
PFHpA	**730 J**
PFHxS	**3,200 J**
PFNA	**3**
PFOS	**250**
PFOA	**550 J**
PFOS+PFOA	**800**

MW-GRE08-01	REG
	ng/L
Sample Date	7/19/2018
Sample Depth (ft.)	72
PFBS	**45**
PFHpA	**16**
PFHxS	**160**
PFNA	**0.8 J**
PFOS	**600 J**
PFOA	**17**
PFOS+PFOA	**617**

7-MW1-PRL06	REG
	ng/L
Sample Date	7/16/2018
Sample Depth (ft.)	53
PFBS	**950 J**
PFHpA	**3,900 J**
PFHxS	**20,000 J**
PFNA	**6.7 J**
PFOS	**120 J**
PFOA	**3,900 J**
PFOS+PFOA	**4,020**

8-MW12-PRL03	REG
	ng/L
Sample Date	7/17/2018
Sample Depth (ft.)	55
PFBS	**130**
PFHpA	**630 J**
PFHxS	**2,100 J**
PFNA	**48 J**
PFOS	**1,100 J**
PFOA	**760 J**
PFOS+PFOA	**1,860**

GRE09-SW1	REG
	ng/L
Sample Date	7/17/2018
Sample Depth (ft.)	0
PFBS	**360 J**
PFHpA	**1,300 J**
PFHxS	**8,400 J**
PFNA	**110**
PFOS	**5,300 J**
PFOA	**6,200 J**
PFOS+PFOA	**11,500**

MW-GRE10-01	REG
	ng/L
Sample Date	7/18/2018
Sample Depth (ft.)	50
PFBS	**1.5 J**
PFHpA	**0.66 J**
PFHxS	**2.6**
PFNA	1.2 U
PFOS	**1.6 J**
PFOA	**1.4 J**
PFOS+PFOA	**3**

7-MW04-PRL04	REG	DUP
	ng/L	ng/L
Sample Date	7/17/2018	7/17/2018
Sample Depth (ft.)	52	52
PFBS	**43**	**41**
PFHpA	**150**	**160**
PFHxS	**170**	**160**
PFNA	1.3 U	1.3 U
PFOS	**11**	**10**
PFOA	**69**	**63**
PFOS+PFOA	**80**	**73**

8-MW14-PRL04	REG
	ng/L
Sample Date	7/16/2018
Sample Depth (ft.)	55
PFBS	**38**
PFHpA	**58**
PFHxS	**200**
PFNA	**0.67 J**
PFOS	**30**
PFOA	**44**
PFOS+PFOA	**74**

MW-GRE03-01	REG
	ng/L
Sample Date	7/18/2018
Sample Depth (ft.)	60
PFBS	**3.2**
PFHpA	**4.6**
PFHxS	**15**
PFNA	1.2 U
PFOS	**7.4**
PFOA	**3.7**
PFOS+PFOA	**11.1**

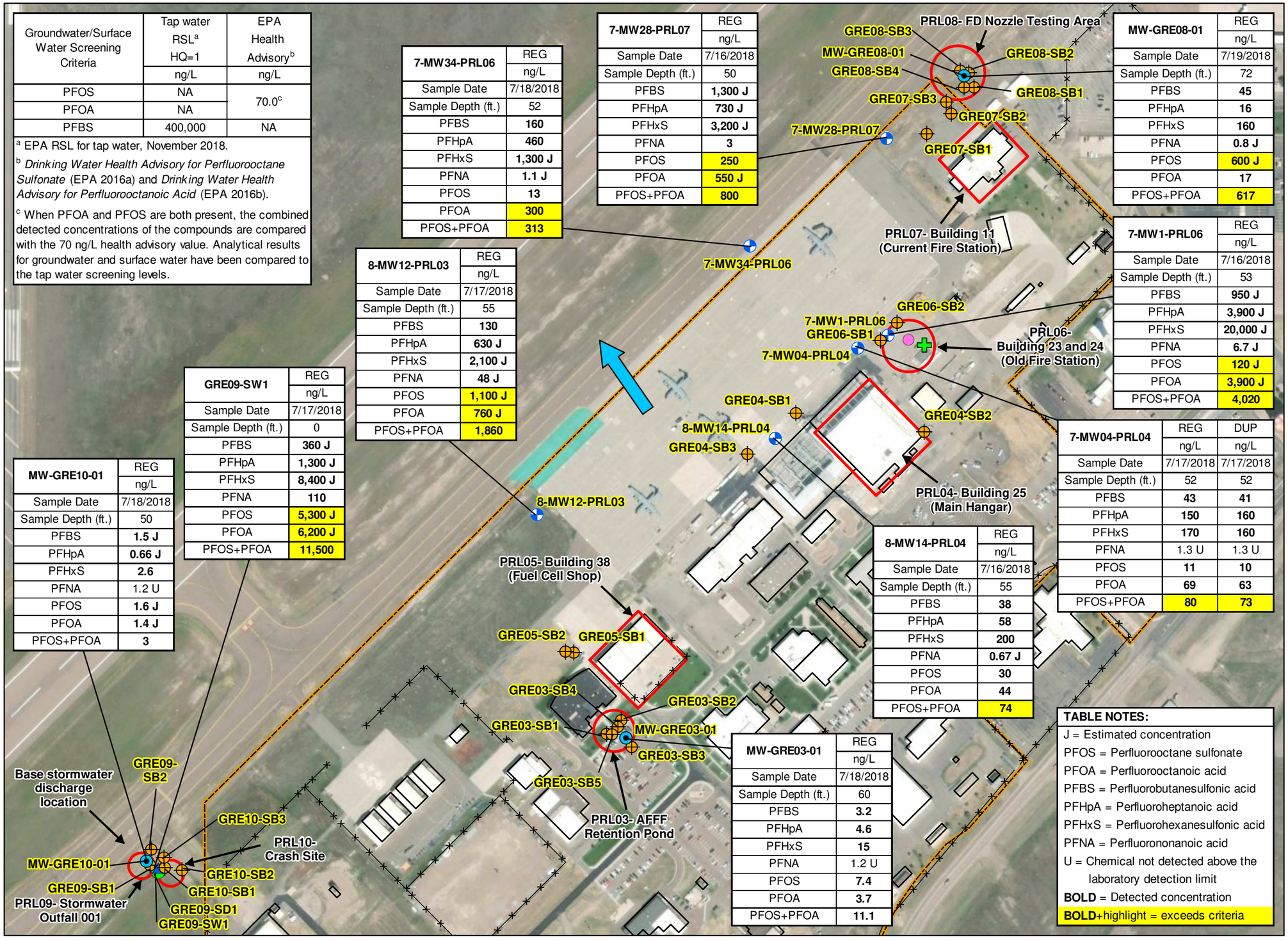


TABLE NOTES:

J = Estimated concentration
PFOS = Perfluorooctane sulfonate
PFOA = Perfluorooctanoic acid
PFBS = Perfluorobutanesulfonic acid
PFHpA = Perfluoroheptanoic acid
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
U = Chemical not detected above the laboratory detection limit
BOLD = Detected concentration
BOLD+highlight = exceeds criteria

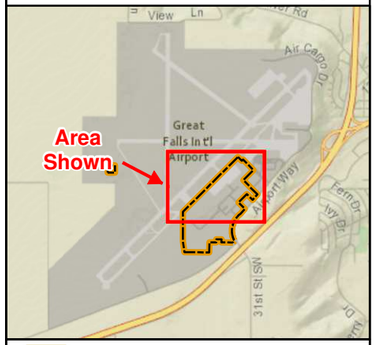
LEGEND:

- SI Monitoring Well
- Soil Boring
- Surface Water Sample
- Sediment Sample
- Existing Well
- ERP Site 7 Location
- Former Dry Well Location
- Potential Release Location (PRL)
- Installation Boundary*
- Building*
- Fence*
- Inferred Regional Groundwater Flow
- **GRE03-SB1** Location Identifier

NOTES:

* Source: Common Installation Picture (CIP) geodatabase provided by ANG GeoBase on 07/26/2017.
1. The general groundwater flow direction was inferred using historical and 2018 SI water level measurements.
2. Background Source: ESRI World Imagery (DigitalGlobe, 6/2016).

0 100 200 400 Feet
0 25 50 100 Meters



leidos

GREAT FALLS AIR NATIONAL GUARD BASE
GREAT FALLS, MONTANA

PRLs 3, 4, 5, 6, 7, 8, 9, AND 10
SI GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS

FIGURE: 5 | DATE: 1/9/2019

PROJECT: \827Projects\ANG Phase 3 SI for PFCs\z_GIS\GreatFalls\Projects\SI\Figure 5 PRL 3 4 5 6 7 8 9 10 GW SW Results_11x17.mxd

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APPENDIX A

SOIL BORINGS AND WELL CONSTRUCTION LOGS

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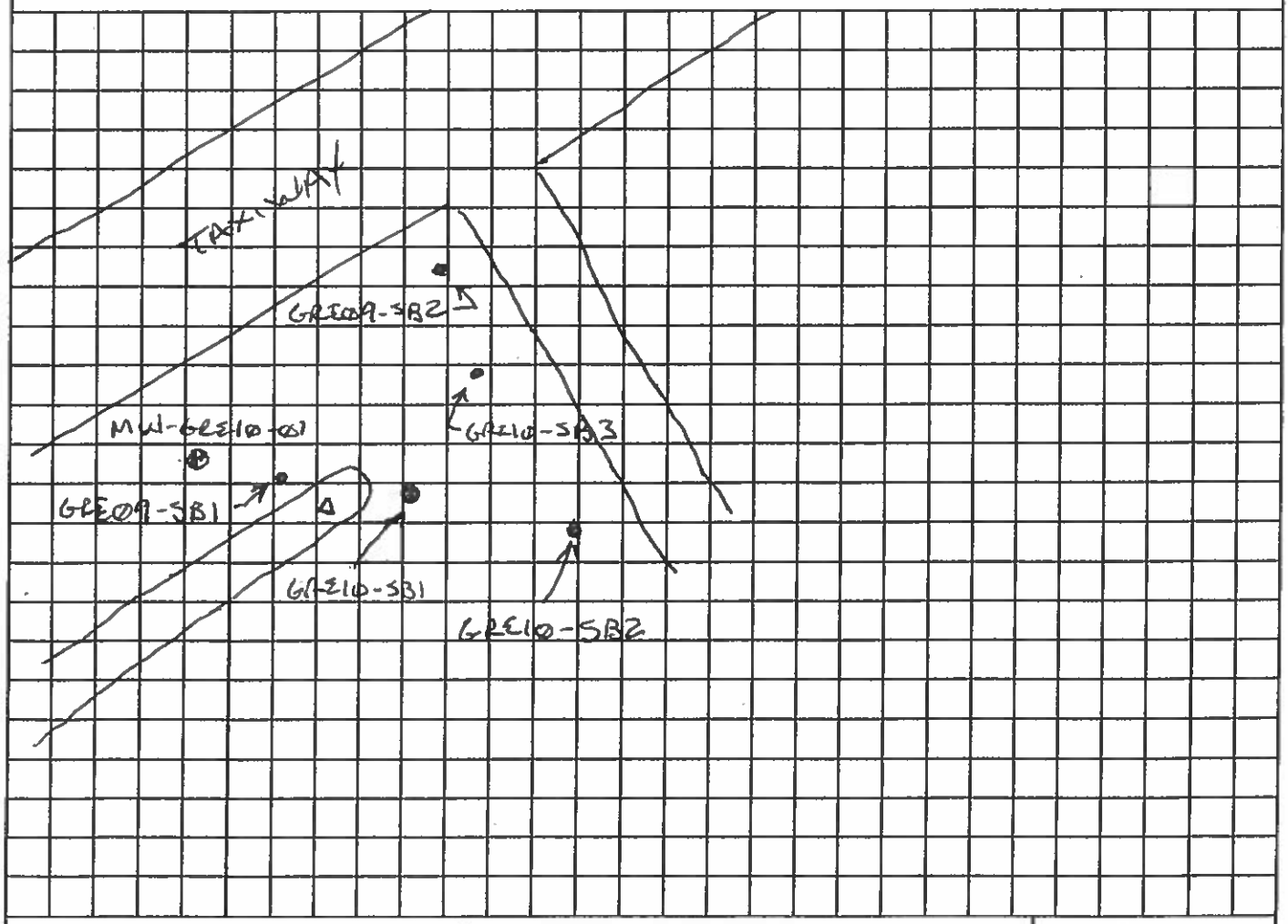
HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER GRE09/10-BORING
1. COMPANY NAME: LEIDOS	2. DRILL SUBCONTRACTOR: N/A	SHEET 1 OF 2
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRLS GRE09 AND GRE10	
5. NAME OF DRILLER: N/A	6. MANUFACTURERS DESIGNATION OF DRILL: N/A	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: HAND AUGER	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 7/9/18	11. DATE COMPLETED: 7/9/18
12. OVERBURDEN THICKNESS ~2.6 FT	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE 2.6 FT FOR GRE10-SB2	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY N/A
	—	—	PFAS	—	—	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
	X	—	—			

LOCATION SKETCH/COMMENTS

SCALE: NOT TO SCALE



PROJECT:

HOLE NUMBER

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI	INSPECTOR M. KLIDZEJS	SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0-2.6FT			GRE10-SB2-01 0.0-0.5FT w/ MS/MSD	HAND AUGER
	1	SILT, SAND, GRAVEL (GM). APPROX. 60% SILT, 20% SAND, 10% GRAVEL.	HUE= 0.0PPM			
		LOOSE IN SAMPLE AFTER AUGERING, BUT LIKELY VERY (V) DENSE ~~IN SAMP~~ MK 7/14/18 IN-SITU. SAND				
	2	FRACTION FINE GRAINED. GRAVEL IS FINE TO COARSE AND SUB-ROUNDED. PALE BROWN (10YR6/3). DRY			MK ~~GRE-10~~ GRE10-SB2-02 2.4-2.6FT	TD = 2.6FT CANNOT ADVANCE HAND AUGER BEYOND 2.6FT
	3					
	4					
	5					
	6					
	7					
	8					
	9					

PROJECT: HOLE NUMBER

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER GRE03-SB3
1. COMPANY NAME: Leidos	2. DRILL SUBCONTRACTOR: N/A	SHEET 1 OF 2
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRL GRE03	
5. NAME OF DRILLER: N/A	6. MANUFACTURERS DESIGNATION OF DRILL: N/A	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: HAND AUGER	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 7/10/18	11. DATE COMPLETED: 7/10/18
12. OVERBURDEN THICKNESS: 2.9 FT	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 2.9 FT	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

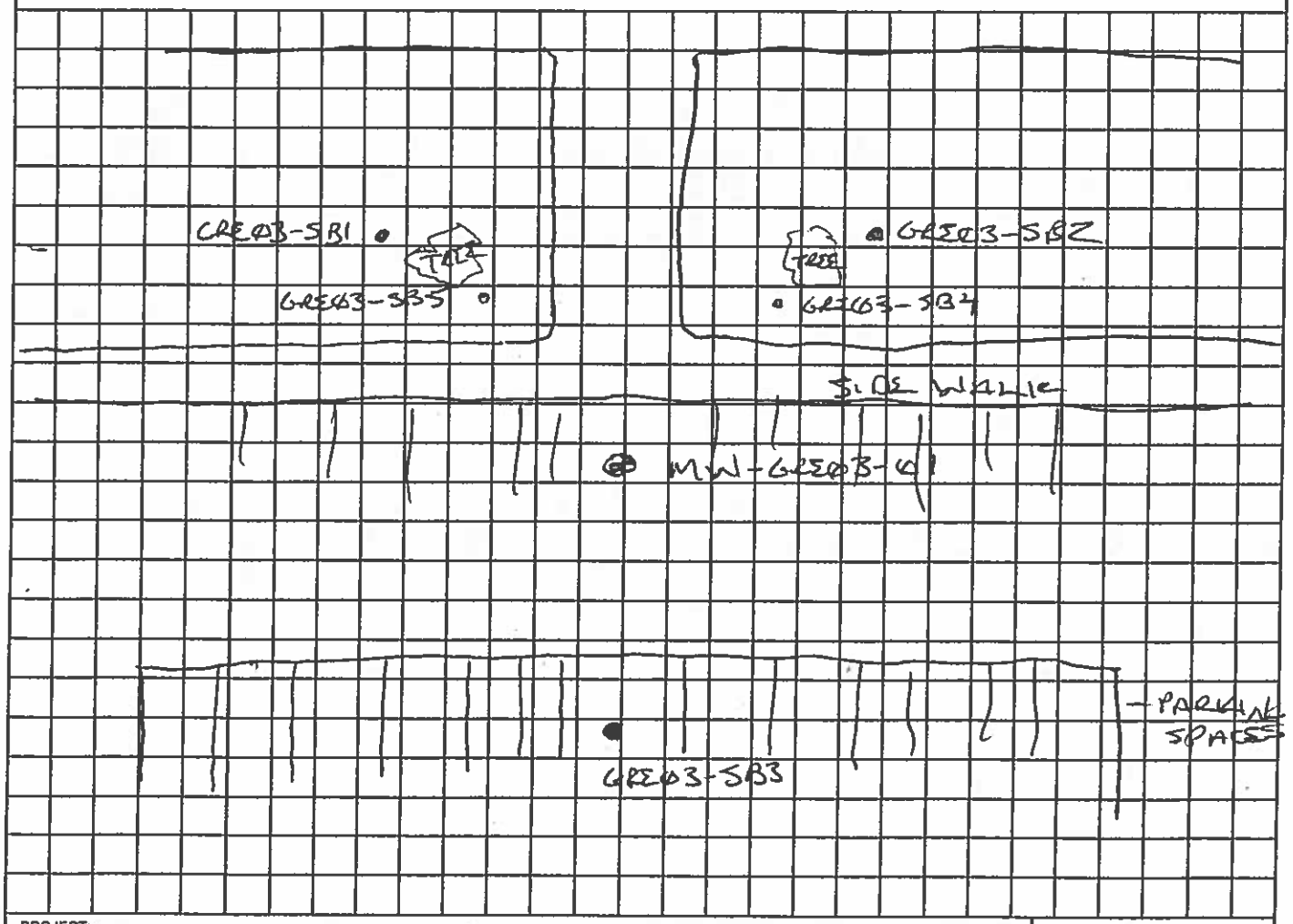
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: N/A
	—	—	PFAS	X	X	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X	—	—	[signature]

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT:

HOLE NUMBER GRE03-SB3

HTRW DRILLING LOG

HOLE NUMBER SB3

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0 - 0.4 FT: ASPHALT	PID IN BOREHOLE = 0.0 PPM		GRE03-SB3-01 0.4 - 0.9FT	
	1	0.4 - 1.6FT: SANDY, SILT, AND GRAVEL (GM), ~~[illegible]~~ GRAVEL FINE TO COARSE, LOOSE, MOIST (FROM COOLING) YELLOWISH BROWN (10YR 5/4)				
	2					
	3	1.6 - 2.9 FT: SANDY SILT (SM) TRACE FINE GRAVEL. FINE GRAINED WELL SORTED LOOSE IN SAMPLE. LIKELY DENSE IN-SITU, BROWN (10YR 5/3) DRY				
	4		BOREHOLE = 0.0 PPM		GRE03-SB3-02 2.4 - 2.9FT	
	5					AUGERING VERY DIFFICULT BELOW ~2.2FT
	6					TD = 2.9 FT
	7					
	8					
	9					

PROJECT: | HOLE NUMBER GRE03-SB3

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI	INSPECTOR M. KLIDZEJS	SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0 – 1.6FT:			GRE03-SB1-01 0.0-0.5FT	HAND AUGER
		CLAY, SAND, SILT AND GRAVEL (GM) ~40% GRAVEL LOOSE, DARK YELLOWISH BROWN GRAVEL AT DEPTH IS SANDSTONE W/ FRAGMENTS UP TO 3-in DRY	BOREHOLE = 0.1 ppm			TD = 1.6FT

PROJECT: HOLE NUMBER

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER GREO4 BORINGS
1. COMPANY NAME: LEIDOS	2. DRILL SUBCONTRACTOR: N/A	SHEET 1 OF 2
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRL GREO4	
5. NAME OF DRILLER: N/A	6. MANUFACTURERS DESIGNATION OF DRILL: N/A	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: HAND AUGER	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: SEE BELOW	11. DATE COMPLETED: SEE BELOW
12. OVERBURDEN THICKNESS: 2.1 FT MAX	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 2.1 FT MAX	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: N/A
	—	—	PFAS	—	—	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
	X	—	—	[signature]		

LOCATION SKETCH/COMMENTS

SCALE:

- GREO4-SB1 COMPLETED ON 7/10/18 TD = 2.1 FT
- GREO4-SB2 COMPLETED ON 7/12/18 TD = 1.8 FT
- GREO4-SB3 COMPLETED ON 7/13/18 TD = 0.5 FT

PROJECT:

HOLE NUMBER

HTRW DRILLING LOG

HOLE NUMBER GRE04-SB1

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0-0.6FT: ASPHALT			GRE04-SB1-01 0.6-1.1FT	HAND AUGER
		0.6-2.1FT SILT, SAND, GRAVEL (GM) ~40% GRAVEL, LOOSE BROWN (10YR5/3) MOIST FROM CORING	BOREHOLE =0.0PPM			
						CANNOT HAND AUGER PAST 2.1 FT

PROJECT: | HOLE NUMBER

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI	INSPECTOR M. KLIDZEJS	SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.00-0.2FT:			GA004-SB2-01	
		ASPHALT				
		0.2-1.8FT			0.2-	
	1	SILT, SAND, CLAY GRAVEL (GM) LOOSE, BROWN (10YR5/1), DRY.	BOREHOLE = 0.0ppm			
	2	GRAVEL CONTENT DECREASES W/ DEPTH.				
	3	WEATHERED SANDSTONE IN LAST CUTTINGS				TOR AT 1.8FT TD = 1.8FT
	4					
	5					
	6					
	7					
	8					
	9					

PROJECT: HOLE NUMBER

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER GREØ5 BORINGS
1. COMPANY NAME: LEIDOS	2. DRILL SUBCONTRACTOR: N/A	SHEET 1 OF 2
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRL GREØ5	
5. NAME OF DRILLER: N/A	6. MANUFACTURERS DESIGNATION OF DRILL: N/A	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: HAND AUGER	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED:	11. DATE COMPLETED:
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED:	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY N/A
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		

LOCATION SKETCH/COMMENTS SCALE:

GREØ5-SB1 COMPLETED ON 7/13/18. TD=Ø.8 FT (REFUSAL)
GREØ5-SB2 COMPLETED ON 7/13/18 TD=Ø.5 FT

PROJECT: HOLE NUMBER GREØ5 BORINGS

HTRW DRILLING LOG

HOLE NUMBER GR2005 (SB1)

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		GR2005-SB1				HAND AUGER
		0.0-0.8FT:				
	1	SILT, SAND, AND GRAVEL (GM) LOOSE, BROWN, DRY. SIGNIFICANT COARSE GRAVEL	BOREHOLE = 0.0 ppm			TD= 0.8FT GRAVEL PROHIBITS FURTHER AUGER ADVANCEMENT
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					

PROJECT: | HOLE NUMBER

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER GREOG-BORINGS
1. COMPANY NAME: LEIDOS	2. DRILL SUBCONTRACTOR: N/A	SHEET 1 OF 2
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRL GREOG	
5. NAME OF DRILLER:	6. MANUFACTURERS DESIGNATION OF DRILL: N/A	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: HAND AUGER	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 7/11/18	11. DATE COMPLETED: 7/11/18
12. OVERBURDEN THICKNESS: UNKNOWN	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: N/A
—	—	—	PFAS	—	—	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
—	X	—	—	[signature]		

LOCATION SKETCH/COMMENTS

SCALE:

- GREOG-SB1 AND -SB2 COMPLETED ON 7/11/18
- ASPHALT COVERING SURFACE IN THIS AREA
- GREOG-SB1: ASPHALT FROM 0.0-0.4 FT, SAMPLE 0.4-0.9 FT
- GREOG-SB2: ASPHALT FROM 0.0-0.4 FT, SAMPLE 0.4-0.7 FT

PROJECT:

HOLE NUMBER GREOG BORINGS

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI	INSPECTOR M. KLIDZEJS	SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0-0.4 FT: ASPHALT				HAND AUGER
	1	0.4-0.9 FT SAND, SILT AND GRAVEL (GM) LOOSE, BROWN, DRY. SIGNIFICANT COARSE GRAVEL	BORING: 0.0 ppm			GRAVEL PROHIBITED AUGER ADVANCEMENT MUCH PAST SAMPLED DEPTHS
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					

PROJECT: HOLE NUMBER GZ24 BORINGS

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER GREØ7 Borings
1. COMPANY NAME: Leidos	2. DRILL SUBCONTRACTOR: N/A	SHEET 1 OF 2
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION:	
5. NAME OF DRILLER:	6. MANUFACTURERS DESIGNATION OF DRILL:	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED:	11. DATE COMPLETED:
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED:	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY N/A	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR			

LOCATION SKETCH/COMMENTS SCALE:

- GREØ7-SB1 COMPLETED ON 7/11/18. SAMPLED FROM Ø.Ø-Ø.5 AND 2.7-2.9FT. TD=2.9FT
- GREØ7-SB2 COMPLETED ON 7/12/18. SAMPLED FROM Ø.Ø-Ø.5FT TD=Ø.6FT
- GREØ7-SB3 COMPLETED ON 7/13/18. SAMPLED FROM Ø.Ø-Ø.5FT TD=Ø.5FT

PROJECT: HOLE NUMBER

HTRW DRILLING LOG

HOLE NUMBER GX26 BGMW2

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0 – 2.9 FT (MAX DEPTH REACHED IN 3 BORINGS): SILT, SAND, AND GRAVEL (GM) LOOSE, BROWN, DRY				

PROJECT: | HOLE NUMBER

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER MW-GRE03-01
1. COMPANY NAME: LEIDOS	2. DRILL SUBCONTRACTOR: BOLAND DRILLING	SHEET 1 OF 8
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRL GRE03	
5. NAME OF DRILLER: TREVER MARKO	6. MANUFACTURERS DESIGNATION OF DRILL: GARDNER-DENVER HPS 1000 AIR RIG	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4 1/4-IN OD, 20 FT LENGTH RODS. - 6-IN DIAM, 4.9 FT LENGTH AIR HAMMER - INGERSOL RAND 9000 AIR COMPRESSOR - CUTTINGS DIVERTER BOX	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 7/10/18	11. DATE COMPLETED:
12. OVERBURDEN THICKNESS: 2.6 FT	15. DEPTH GROUNDWATER ENCOUNTERED: AFTER DRILLING TO TD OF 71.7 FT	
13. DEPTH DRILLED INTO ROCK: 69.1 FT	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 37.51 FT BTOC, PRIOR TO DEVELOPMENT ON 7/15/18	
14. TOTAL DEPTH OF HOLE: 71.7 FT	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 37.73 FT BTOC, PRIOR TO SAMPLING ON 7/18/18	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY N/A
	—	—	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	—	X	—	[signature]

LOCATION SKETCH/COMMENTS

SCALE: N/A

ALSO SEE LOG FOR ~~MW~~ GRE03-SB3

PROJECT:

HOLE NUMBER MW-GRE03-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI	INSPECTOR M. KLIDZEJS	HOLE NUMBER	SHEET 2 OF 8

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0-0.4 FT: ASPHALT 0.4-2.6 FT: SILT, SAND AND GRAVEL (GM)				HYDRO-VAC TO 2.6 FT
	1	(~30-40% FINE TO COARSE, LOOSE PALE BROWN CLAYR (L/3) WET FROM HYDRO-VACING	PID IN BOREHOLE AT 2.6 FT = 0.1 ppm			1:26 BEGIN DRILLING (ST 100) BORING LOGGED FROM AIR-HAMMER CUTTINGS
	2	2.6 - ~5 FT: SANDSTONE, FINE-GRAINED, WEATHERED, WEAKLY CEMENTED, (CRUMBLES IN HAND) DRY				
	3					
	4					
	5					
		SANDSTONE AND MUD/CLAY STONE	BZ= 0.0 ppm			
	6	SANDSTONE IS WELL CEMENTED, FINE GRAINED.				
	7	MUDSTONE GENERALLY REDUCED TO CLAY BY DRILLING BUT SOME FRAGMENTS BREAK UP TO 2-IN THICK				
	8	LIGHT YELLOWISH BROWN (10YR 6/4) DRY	BZ= 0.0 ppm			
	9					

PROJECT: HOLE NUMBER MW-GFS02-01

HTRW DRILLING LOG

HOLE NUMBER MW-GFED3-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 3 OF 8

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12		BZ= 0.0ppm			
		SAME AS ABOVE				
	13					
	14					
	15					
	16					
	17		BZ= 0.0ppm			
	18					
	19					

PROJECT:

HOLE NUMBER MW-GFED3-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 4 OF 8

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21	SAME AS ABOVE	BZ= 0.0ppm			18:53 BEGIN DRILLING 2ND ROD.
	22					
	23					
	24					
	25					
	26	PRIMARILY CLAY/MUDSTONE BELOW 25FT DRY				
	27					
	28					
	29					

PROJECT: | HOLE NUMBER

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 5 OF 8

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32		BZ=0.0ppm			
	33					
	34	PRIMARILY CLAY/MUDSTONE. CUTTINGS OCCUR AS PREDOMINANT CLAY w/ SOME 1/4 - 1/2 IN FRAGMENTS				
	35					
	36					
	37		BZ= 0.0ppm			
	38					
	39					

PROJECT: | HOLE NUMBER MW-GFCC03-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 6 OF 8

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	41		BZ = 0.0PPM			19:15 BEGIN DRILLING 3RD ROD
	42	SAME AS ABOVE. PRIMARILY CLAY/MUDSTONE				
	43	SOME MOIST FRAGMENTS				
	44					
	45					
	46					
	47					
	48					
	49					

PROJECT: | HOLE NUMBER MW-GREAT-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 7 OF 8

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	50					
	51					
	52		BZ = 0.0ppm			
	53					
	54					
	55	AT ~ 55FT RETURN GREATER AMOUNT OF FINE-GRAINED, HARD, FRESH, GRAY (10YR5/1) SANDSTONE CUTTINGS UP TO 1/2-in				
	56					
	57	SOME FRAGMENTS SHOW YELLOWISH BROWN WEATHERING	BZ = 0.0ppm			
	58					
	59					
	60					

PROJECT: | HOLE NUMBER MW-GREED3-01

HTRW DRILLING LOG

HOLE NUMBER MW-GR03-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 8 OF 8

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	61					1930 REACH 61FT TURN OFF AIR COMPRESSOR TO SEE IF ANY WATER ACCUMULATES IN HOLE
	62					1945 BEGIN DRILLING 4TH ROD
	63	DRILLING AT ~62FT RETURN SOME WET CUTTINGS				
	64	DARK GRAY/ SANDSTONE IN ~ 1/4-IN FRAGMENTS MINOR CLAY. SOME WET FRAGMENTS				
	65					
	66					
	67					
	68					
	69					
						TD = 71.7FT

PROJECT: | HOLE NUMBER

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER MW-GREIO-01
1. COMPANY NAME: LEIDOS	2. DRILL SUBCONTRACTOR: BOLAND DRILLING	SHEET 1 OF 7
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRL GREIO	
5. NAME OF DRILLER: TREVER MARKO	6. MANUFACTURERS DESIGNATION OF DRILL: CARONER-DENVER HPS10000 AIR RIG	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: -4 1/4-in O.D., 20 FT LENGTH RODS - 6-in DIAM, 4.9 FT LENGTH AIR HAMMER - INGERSOL RAND 9000 AIR COMPRESSOR - CUTTINGS DIVERTER BOX	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 7/10/18	11. DATE COMPLETED: 7/11/18
12. OVERBURDEN THICKNESS: 3.8 FT	15. DEPTH GROUNDWATER ENCOUNTERED: ~57 FT	
13. DEPTH DRILLED INTO ROCK: 57.2 FT	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 33.14 FT BTOC on 7/17/18, PRIOR TO DEVELOPMENT	
14. TOTAL DEPTH OF HOLE: 61 FT	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 33.11 FT BTOC on 7/18/18 PRIOR TO SAMPLING	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY N/A
	—	—	—	—	—	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
	—	X	—	[signature]		

LOCATION SKETCH/COMMENTS

SCALE: N/A

ALSO SEE LOG FOR GAEO9/10 BORINGS

PROJECT:

HOLE NUMBER

HTRW DRILLING LOG

HOLE NUMBER MW-GRIC10-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 2 OF 7

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
						HYDRO-VAC TO 3.8 FT
	1					0835 BEGIN DRILLING LOGGED FROM AIR HAMMER CUTTINGS
	2		BZ= 0.0 PPM			
	3					
	4					
	5					TOP OF ROCK AT ~5 FT
	6	INTERBEDDED CLAY/MUDSTONE + SANDSTONE. CUTTINGS RETURNED AS CLAY AND 1/4-1/2-IN FRAGMENTS OF SANDSTONE PALE BROWN (10YR 6/3) MOIST TO 10 FT				
	7		BZ= 0.0 PPM			
	8					
	9					

PROJECT: | HOLE NUMBER MW-GRIC10-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 3 OF 7

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12	SAME AS ABOVE. DRY BELOW ~10 FT.	BZ= 0.0ppm			
	13					
	14					
	15					
	16					
	17	MK 7/10/18 ~~MORE~~ MOSTLY CLAY/MUDSTONE BELOW ~10 FT V. FEW SANDSTONE FRAGMENTS	BZ= 0.0ppm			
	18					
	19					

PROJECT: | HOLE NUMBER MW-GZ210-01

HTRW DRILLING LOG

HOLE NUMBER MW-GRE10-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEIS | SHEET 4 OF 7

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21					
	22		BZ= 0.0ppm			01:05 BEGIN DRILLING w/ 2ND ROD
	23	BELOW ~24 FT BEGIN ~~SEEING~~ MK 7/10/18 SEEING MORE FELY FINE-GRAINED, & V. PALE BROWN (10YR 7/3) SANDSTONE IN FRAGMENTS UP TO 3/4-IN. SANDSTONE MIXED w/ CLAYSTONE-				
	24					SL. HARDER DRILLING BELOW 24 FT.
	25					
	26					
	27					
	28					
	29					

PROJECT: | HOLE NUMBER MW-GRE10-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI	INSPECTOR M. KLIDZEJS	SHEET 5 OF 7

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	30					
		BELOW ~30FT GO BACK INTO PRIMARILY CLAY/MUDSTONE				
	31					SOFTER DRILLING
	32		BZ= 0.0 ppm			
	33					
	34					
	35					
	36					
	37					
	38		BZ= 0.0 ppm			
	39					
	40					

PROJECT: HOLE NUMBER MW-GFI0-01

HTRW DRILLING LOG

HOLE NUMBER MW-GRF10-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 6 OF 7

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
						40
		~40 FT SEE LARGER (1-2 IN)				
	41	~~FRAGMENTS~~ CLUMPS OF MK 7/11/18 SOFT, YELLOWISH				41
		BROWN (10YR 5/6) ~~SILTSTONE DRY~~ MK 7/11/18 SILT/CLAY/				
	42	CUTTINGS STILL PREDOM CLAY/SILT CLUMPS SUGGEST SOME MOISTURE				42 — 0130 BEGIN DRILLING w/ 3ED ROD
			BZ= 0.0 ppm			
	43					43
	44					44
	45					45
	46					46
	47					47
	48		BZ= 0.0 ppm			48
	49					49
						50

PROJECT: | HOLE NUMBER MW-GRF10-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 7 OF 7

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	50					
						DRILLING AT ~50FT DRILLER BEGINS INJECTING WATER. CLAY/SILT BEGINNING TO NOT CLEAN W/ AIR ALONE
	51	RETURNS NOW SILTY, CLAYEY MUD				
	52					
	53					
	54					
	55					
	56					RETURN HEAVY WATER BEGINNING AT ~57FT. DRILLER REPORTS FEELING FRACTURE NEAR THAT DEPTH
	57					
	58					
	59					~61 FT TD AT ~~62FT~~ MK 7/11/18
	60					

PROJECT: | HOLE NUMBER MW-GRFD-01

HTRW DRILLING LOG

DISTRICT: ANG		HOLE NUMBER MW-GR208-01
1. COMPANY NAME: LEIDOS	2. DRILL SUBCONTRACTOR: BOLANDS DRILLING	SHEET 1 OF 9
3. PROJECT: GREAT FALLS ANGB PFOS/PFOA SI	4. LOCATION: PRL GR208	
5. NAME OF DRILLER: TREVOR MARK	6. MANUFACTURERS DESIGNATION OF DRILL: GARDNER-DENVER HDS 1000 AIR RIG	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: -4 1/4-IN O.D., 20 FT LENGTH RODS -6 IN DIAM, 4.9 FT LENGTH AIR HAMMER -INGERSOL RAND 9000 AIR COMPRESSOR -CUTTINGS DIVERTER BOX	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 7/11/18	11. DATE COMPLETED: 7/12/18
12. OVERBURDEN THICKNESS: 1.2 FT	15. DEPTH GROUNDWATER ENCOUNTERED: NO INDICATION OF SIGNIFICANT WATER	
13. DEPTH DRILLED INTO ROCK: 74.3 FT	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 68.53 FT BTOC ON 7/18/18 PRIOR TO DEVELOPMENT	
14. TOTAL DEPTH OF HOLE: 75.5 FT	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: N/A
	—	—	—	—	—	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
	—	X	—			

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT:

HOLE NUMBER MW-GR208-01

HTRW DRILLING LOG

HOLE NUMBER MW-GREOB-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 2 OF 9

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
						HYDRO-VAC TO TOP OF ROCK AT 1.2 FT BGS
						2244 BEGIN DRILLING 1ST ROP
	1					
						LITHOLOGY LOGGED FROM AIR HAMMER CUTTINGS.
	2					
						TABLE HEIGHT = 3.0 FT
	3					
		CUTTINGS RETURNED PRIMARILY AS CLAY AND SILT w/ PARTICLES UP TO COARSE SAND-SIZED. SOME COARSE GRAVEL TO COBBLE-SIZED FRAGMENTS OF FINE-GRAINED SANDSTONE				
	4		BZ= 0.0 ppm			
	5					
		INTERBEDDED SANDSTONE + CLAY/MUDSTONE PREDOM PALE BROWN (10YR 6/3) DRY				
	6					
	7		BZ= 0.0 ppm			
	8					
	9					
	10					

PROJECT: | HOLE NUMBER MW-GREOB-01

HTRW DRILLING LOG

HOLE NUMBER MW1-GRE08-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 3 OF 9

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11		BZ= 0.0ppm			
	12					
	13					
	14					
	15	SAME AS ABOVE				
	16					
	17					
	18					
	19	SOME MINOR CLUMPS OF CLAY/SILT (SL. WET ZONE?)				

PROJECT:

HOLE NUMBER MW1-GRE08-01

HTRW DRILLING LOG

HOLE NUMBER MW-GREC08-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 4 OF 9

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	20					
	21		BZ= 0.00 ppm			
						2310 END 1ST RUN
	22					2314 BEGIN DRILLING 2ND ROD
	23		BZ= 0.0 ppm			
	24					
	25	SAME AS ABOVE PRIMARILY CLAY/SILT W/ LESSER AMOUNTS OF ~1/4-IN, FINE-GRAINED SANDSTONE FRAGMENTS. DRY				
	26					
	27					
	28					
	29					
	30					

PROJECT: | HOLE NUMBER MW-GREC08-01

HTRW DRILLING LOG

HOLE NUMBER MW-GFS08-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 5 OF 9

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34	SAME AS ABOVE				
	35		BZ = 0.2 - 0.8ppm			
	36					
	37					
	38					
	39					

PROJECT:

HOLE NUMBER MW-GFS08-01

HTRW DRILLING LOG

HOLE NUMBER MW-GR208-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 6 OF 9

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	40					
	41		BZE 0.2-0.4ppm			
	42					2352 END DRILLING 2ND ROD
		SAME AS ABOVE BUT FEWER AND SMALLER SANDSTONE FRAGMENTS DRY				2357 BEGIN DRILLING 3RD
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					

PROJECT: | HOLE NUMBER MW-GR208-01

HTRW DRILLING LOG

MW-6R2008-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 7 OF 9

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	51					
	52					
	53					
	54					
	55					
	56	~56 FT CUTTINGS ALMOST EXCLUSIVELY CLAY. COLOR CHANGES TO LIGHT GRAY (10YR 7/1) DRY				
	57					FASTER DRILLING IN LAST 10 FT OF RUN
	58					
	59					

PROJECT: | HOLE NUMBER MW-6R2008-01

HTRW DRILLING LOG

HOLE NUMBER MW-GREOB-01

PROJECT: GREAT FALLS PFAS SI | INSPECTOR M. KLIDZEJS | SHEET 8 OF 9

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	60					60
	61		BZ = 0.2 – 0.4ppm			61
	62					0012 END DRILLING 3RD ROD ~~BEGIN DRILLING WITH ROD~~ 62
	63					STAND BY TO SEE IF HOLE MAKES ANY WATER DRILLER BELIEVES DUST LESSENED 63
	64					AROUND 55FT 0032 BLOW HOLE NO WATER 0035 BEGIN DRILLING 4TH ROD 64
	65					65
	66					DUST GENERATION SIGNIFICANTLY LESSENED ~66FT 66
	67	CUTTINGS FROM BELOW ~66 CONSIST PRIMARILY OF DARK GRAY (10YR 4/1) SHALE – SOFT WHEN WETTED.				67
	68					68
	69					0045 STOP DRILLING AT ~70FT STAND BY TO SEE IF HOLE MAKES WATER 69
	70					70

PROJECT: | HOLE NUMBER MW-GREOB-01

HTRW DRILLING LOG

PROJECT: GREAT FALLS PFAS SI	INSPECTOR M. KLIDZEJS	SHEET 9 OF 9

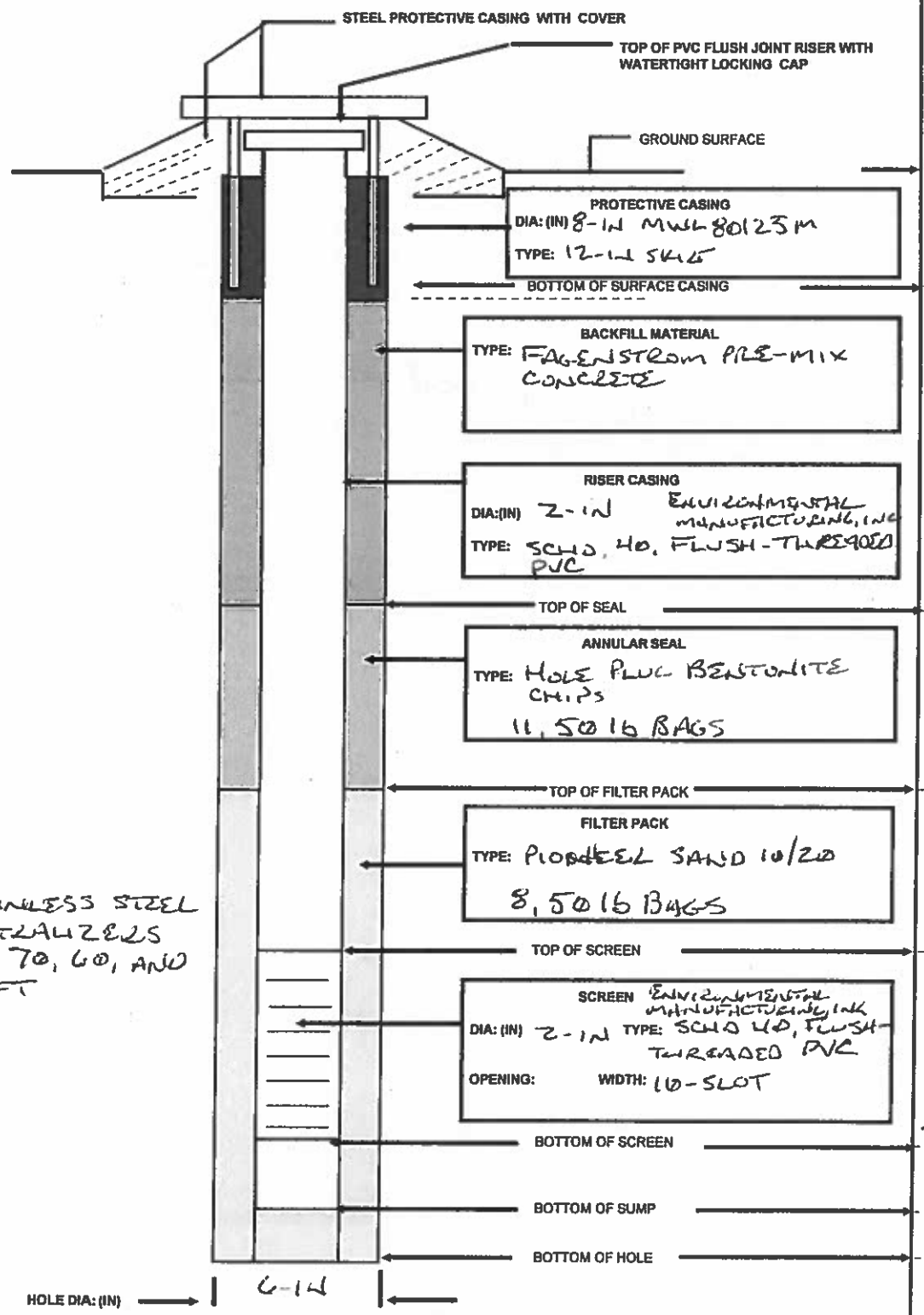
ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		CUTTINGS CONSIST OF SHALE FRAGMENTS				0101-0104 DRILL FROM 70-75 FT
	71					
	72					
	73					
	74					
	75					TD=75FT
	76					
	77					
	78					
	79					

PROJECT: HOLE NUMBER

MONITORING WELL (FLUSH)

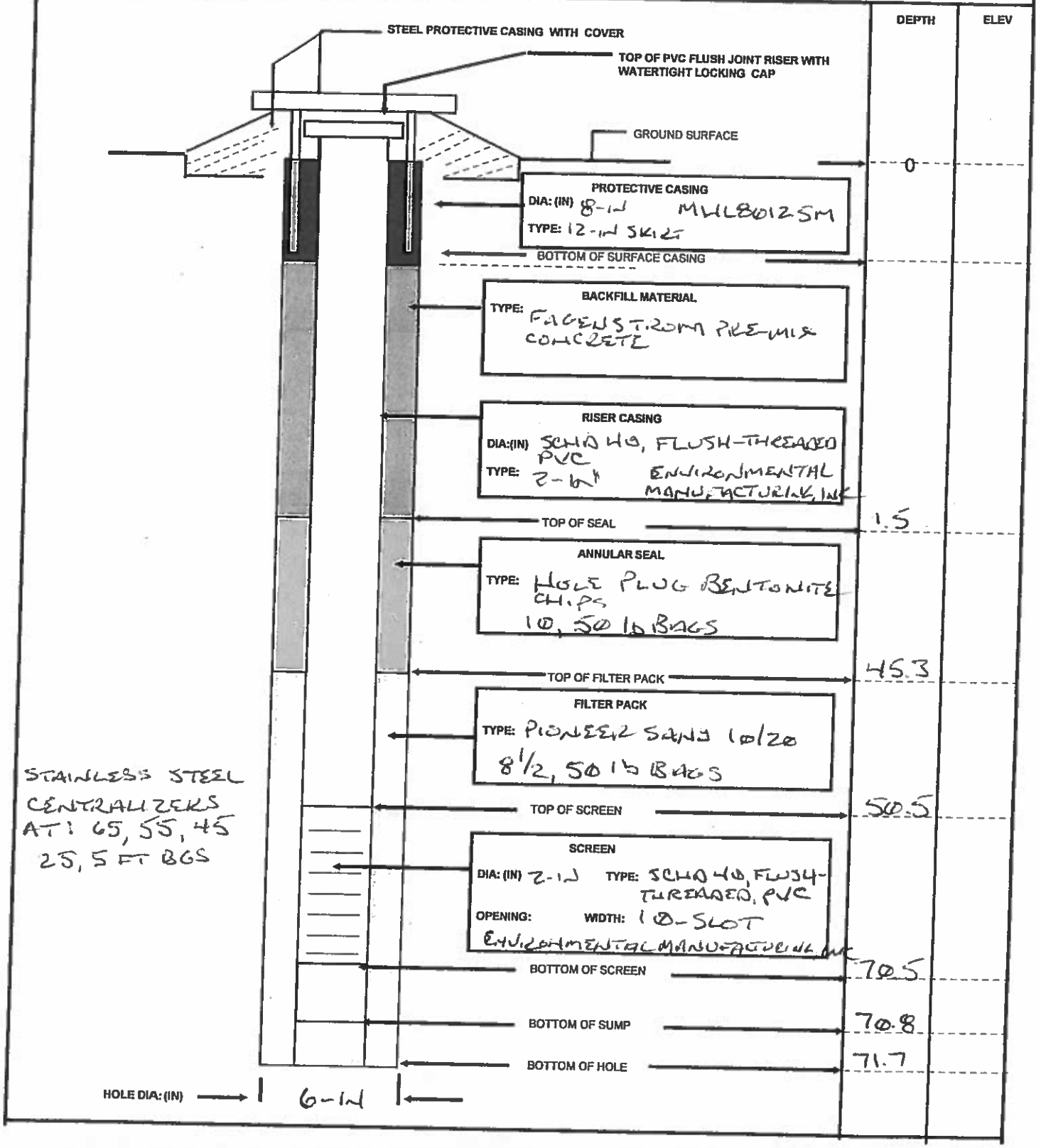
PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

WELL NUMBER: MW-GRE08-01	**BEGIN:** 7/11/18	**END:** 7/12/18
COORDINATES: N: E:	**REFERENCE POINT:**	**ELEVATION:**



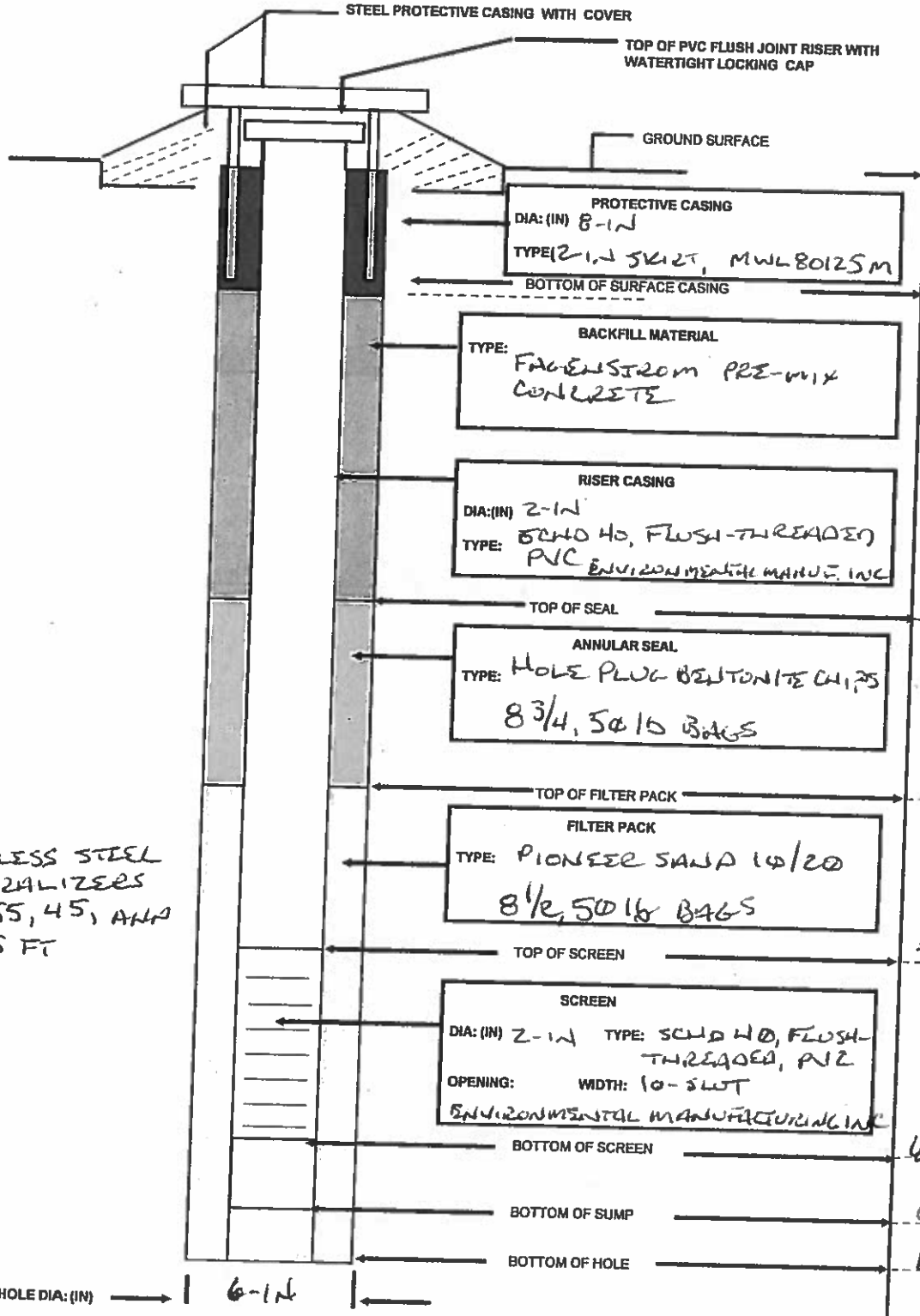
MONITORING WELL (FLUSH)

PROJECT NAME: GREAT FALLS PFAS SI		DELIVERY ORDER NO: 0011
WELL NUMBER: MW-GREØ3-Ø1	BEGIN: 7/10/18	END: 7/11/18
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION:



MONITORING WELL (FLUSH)

PROJECT NAME: GREAT FALLS PFAS SI		DELIVERY ORDER NO: 0011
WELL NUMBER: MW-GRE10-01	BEGIN: 7/10/18	END:
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION:



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APPENDIX B

GROUNDWATER SAMPLING LOGS

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GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/16/18 TIME: 1127

WELL ID NUMBER: 7-MW28-PRL007 WELL LOCATION: PRL 6250 7

DEPTH OF SCREENED INTERVAL(toc notch): ~40 ft. to ~60 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20 ~~PURGE SAVER~~ ID: 16369

MK WATER LEVEL INDICATOR ID: 223319

TURBIDITY ID: 83012

DEPTH TO WATER: 43.62 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: ~40 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 50 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 1023 PURGE END TIME: 1125

TOTAL VOLUME PURGED ~3L

SITE CONDITIONS DURING PURGING: NORMAL

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

MK 7/16/18 ~~NONE~~ ALL PARAMETERS EXCEPT TEMPERATURE STABLE - TEMPERATURE RISING W/ AMBIENT. PRODUCT ABSORBANT WAS FOUND HUNG IN WELL. REMOVED [illegible]

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [ ] YES [X] NO IF NO, WHY WAS A DEVIATION NECESSARY: TEMP COULD NOT BE STABILIZED DUE TO RISING AMBIENT TEMP.

RECORDED BY: [signature] 7/16/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

PROJECT NAME: GREAT FALLS PFAS SI

WELL ID: ZMW-28-PRL07

DELIVERY ORDER NO: 0011

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND ~~(umho/cm)~~ mS/cm	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
1028	1st WATER	100	201	27.53	6.70	0.758	6.37	22.1	43.80	INITIAL WL = 43.47 FT BTOC
1035	—	75	204	23.76	7.08	0.757	5.73	42.4	44.02	LOWER PURGE RATE AFTER READING
1045	—	60	187	26.36	7.11	0.763	5.35	40.3	44.17	LOWER PURGE RATE AFTER READING
1055	—	35	187	29.28	7.10	0.767	5.12	29.5	44.30	"
1105	—	10	183	33.23	7.08	0.766	4.65	29.5	44.24	
1115	—	15	179	37.89	7.08	0.749	4.47	40.5	44.20	
1120	—	15	179	38.07	7.08	0.758	4.47	39.1	44.20	
1125	~3 ~~3~~ MK 7/16/18	15	169	39.82	7.08	0.749	4.46	38.5	44.17	
	END PURGING - ALL PARAMETERS, EXCEPT TEMP, STABLE, TEMP RISING W/AMBIENT									
						MK	7/16/18			

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/16/18 TIME: 14:15

WELL ID NUMBER: 7-MW1-PRL606 WELL LOCATION: PRL 626606

DEPTH OF SCREENED INTERVAL(toc notch): ~42 ft. to ~62 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20
~~PURGE SAVER~~ MK ID: 16369

WATER LEVEL INDICATOR ID: 223319

TURBIDITY ID: 83012

DEPTH TO WATER: 44.53 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: ~42 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 53 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 1253 PURGE END TIME: 1355

TOTAL VOLUME PURGED ~2.3 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

~~WELL~~ ABSORBANT PIG HUNG IN WELL. REMOVED FOR SAMPLING

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [X] YES [ ] NO IF NO, WHY WAS A DEVIATION NECESSARY: N/A

MK 7/16/18

RECORDED BY: [signature] 7/16/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

WELL ID: 7-MW1-PRLOG2

PROJECT NAME: GREAT FALLS PFAS SI

DELIVERY ORDER NO: 0011

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND ~~(mmho/cm)~~ mS/cm	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
1304	1ST WATER	~30	77	34.17	6.68	1.056	4.48	21.2	44.41	INITIAL WL= 44.25 FT BTOC
1315	~.3	300	55	31.89	7.08	1.054	2.79	12.2	44.45	
1325	~.6	30	50	30.38	7.06	1.046	2.34	6.73	44.47	
1335	~.9	30	46	27.88	7.09	1.031	2.10	9.93	44.52	
1345	~1.6	70	42	27.00	7.11	1.038	1.94	10.7	44.59	CANNOT EXPLAIN RISE IN PURGE RATE
1350	~1.9	66	41	26.90	7.10	1.036	1.91	9.23	44.65	
1355	~2.3	70	40	26.80	7.11	1.029	1.89	7.98	44.65	
				PURGE COMPLETED						

LLK 7/16/18

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/16/18 TIME: 17:15

WELL ID NUMBER: 8-MW14-PRL004 WELL LOCATION: PRL GR004

DEPTH OF SCREENED INTERVAL(toc notch): ~45 ft. to ~65 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20

~~PURGE SAVER~~ ID: 16369

WATER LEVEL INDICATOR ID: 223319

TURBIDITY ID: 83012

DEPTH TO WATER: 44.80 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: ~45 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 55 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 1508 PURGE END TIME: 1700

TOTAL VOLUME PURGED ~7.1 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

TURBIDITY ELEVATED ABOVE 50 NTUs. AND WAS NOT STABLE.

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [ ] YES [X] NO IF NO, WHY WAS A DEVIATION NECESSARY: SEE ABOVE

— MK 7/16/18 —

RECORDED BY: [signature] 7/16/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

PROJECT NAME: GREAT FALLS PFAS SI

WELL ID: B-MW14-PRL04

DELIVERY ORDER NO: 0011

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND (~~µmho/cm~~ mS/cm)	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
1515	1ST WATER	85	-144	24.03	6.86	0.970	1.94	122	44.66	INITIAL WL = 44.68 FT BTOC
1525	~.85	85	-165	20.62	7.18	0.973	0.58	343	44.66	WL FLUCTUATING ~0.8 FT
1535	~1.7	85	-181	20.56	7.20	0.963	0.34	490	44.66	
1545	~2.6	~~85~~	-187	20.14	7.21	0.954	0.23	580	44.66	LOWER PUMP RATE IN ATTEMPT TO LOWER TURBIDITY
1555	~3.2	~~85~~ 60	-187	22.49	7.13	0.958	0.31	570	44.66	
1605	~3.8	60	-171	22.56	7.16	0.960	0.33	518	44.66	
1615	~4.4	60	-199	22.81	7.14	0.961	0.20	423	44.66	
1625	~5.0	60	-206	22.87	7.16	0.963	0.15	367	44.66	
1630	~5.3	60	-207	22.93	7.13	0.960	0.13	307	44.66	
1635	~5.6	60	-212	23.19	7.15	0.950	0.12	281	44.66	
1640	~5.9	60	-214	23.27	7.15	0.954	0.12	~~203~~ 263 mV/cm	44.66	
1645	~6.2	60	-214	23.50	7.15	0.953	0.11	250	44.66	
1650	~6.5	60	-210	23.97	7.17	0.961	0.13	231	44.66	
1655	~6.8	60	-209	23.63	7.20	0.961	0.20	218	44.66	
1700	~7.1	60	-206	23.51	7.24	0.960	0.24	175	44.66	

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/17/18 TIME: 09 : 15

WELL ID NUMBER: B-MW12-PRL03 WELL LOCATION: PRL GREO3

DEPTH OF SCREENED INTERVAL(toc notch): ~44.5 ft. to ~64.5 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20

~~PURGE SAVER~~ ID: 16369

WATER LEVEL INDICATOR ID: 223819

TURBIDITY ID: 83012

DEPTH TO WATER: 45.73 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: ~44.5 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 55 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 0742 PURGE END TIME: 0830

TOTAL VOLUME PURGED 5.5 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

NONE

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [X] YES [ ] NO IF NO, WHY WAS A DEVIATION NECESSARY: N/A

MK 7/22/18

RECORDED BY: 7/22/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

WELL ID: 8-MW12-PR03

PROJECT NAME:

DELIVERY ORDER NO:

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND ~~(µmho/cm)~~ mS/cm	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
0753	1ST WATER	105	217	16.36	7.50	0.683	6.09	36.3	45.73	INITIAL WL= 45.73 FT BTOC
0800	~1	105	157	14.63	7.40	0.762	5.89	23.7	45.73	
0810	~2	105	134	15.29	7.34	0.847	5.72	11.5	45.73	
0820	~3	105	105	15.50	7.30	0.885	5.33	6.63	45.73	
0825	~4	105	101	15.44	7.31	0.894	5.33	6.21	45.73	
0830	~5.5	105	95	15.53	7.31	0.891	5.27	5.63	45.73	

MK 7/17/19

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/17/18 TIME: 1330

WELL ID NUMBER: 7-MW4-PRL004 WELL LOCATION: PRL GREEN

DEPTH OF SCREENED INTERVAL(toc notch): ~38.5 ft. to 58.5 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20

~~PURGE SAVER~~ MK ID: 16369

WATER LEVEL INDICATOR ID: 223319

TURBIDITY ID: 83012

DEPTH TO WATER: 45.01 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: 38.5 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 52 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 1145 PURGE END TIME: 1240

TOTAL VOLUME PURGED 5 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

NONE

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [X] YES [ ] NO IF NO, WHY WAS A DEVIATION NECESSARY: N/A

MK 7/17/18

RECORDED BY: [signature] 7/17/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

WELL ID: 7-MW14-PRL04

PROJECT NAME:

DELIVERY ORDER NO:

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND ~~(µmho/cm)~~ mS/cm	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
1152	1ST WATER	105	-34	26.16	6.67	0.785	4.63	40.8	45.18	INITIAL WL = 44.96 FT BTOC
1200	~1	100	-71	24.02	6.93	0.796	2.37	27.3	45.20	
1210	~2	105	-86	22.90	7.04	0.803	0.92	83.1	45.21	
1220	~3	100	-95	23.44	7.09	0.794	0.78	30.6	45.21	
1230	~4	100	-100	23.32	7.11	0.803	0.63	17.2	45.22	
1235	~4.5	100	-103	23.25	7.12	0.804	0.63	15.5	45.22	
1240	~5	100	-103	23.10	7.12	0.795	0.59	15.3	45.22	
			PURGING COMPLETED							

MK

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/18/18 TIME: 08:36

WELL ID NUMBER: 7-MW34-PRL406 WELL LOCATION: PRL GREO 6

DEPTH OF SCREENED INTERVAL(toc notch): ~40 ft. to ~60 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20

~~PURGE SAVER~~ MP ID: 16369

WATER LEVEL INDICATOR ID: 223319

TURBIDITY ID: 83012

DEPTH TO WATER: 44.10 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: ~40 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 52 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 0708 PURGE END TIME: 0810

TOTAL VOLUME PURGED ~2.7 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

TURBIDITY GREATER THAN 50 NTUs BUT STABLE

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [X] YES [ ] NO IF NO, WHY WAS A DEVIATION NECESSARY: N/A

— MIL 7/18/18 —

RECORDED BY: [signature] 7/18/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

PROJECT NAME: GREAT FALLS PFAS SI

WELL ID: 7-MW34-PR0C

DELIVERY ORDER NO: 0011

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND ~~(µmho/cm)~~ mS/cm	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
0718	1st WATER	80	195	20.65	7.28	0.765	2.98	426	44.15	INITIAL WL> 44.02 FT BTOC
0725	~.5	40	48	20.00	7.29	0.768	0.98	197	44.24	LOWER RATE AFTER 1st READING
0735	~.9	40	9	21.52	7.32	0.770	0.64	132	44.30	
0745	~1.3	40	-4	22.39	7.36	0.769	0.67	135	44.34	
0755	~1.6	34	-15	23.41	7.35	0.765	0.55	140	44.39	
0800	~2	40	-21	23.76	7.34	0.765	0.54	137	44.40	
0805	~2.3	34	-24	23.63	7.37	0.769	0.50	147	44.42	
0810	~2.7	34	-27	23.74	7.36	0.768	0.50	133	44.49	

HW 2/18/18

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/18/18 TIME: 12:35

WELL ID NUMBER: MW-GRE10-01 WELL LOCATION: PRL GRE10

DEPTH OF SCREENED INTERVAL(toc notch): ~40 ft. to ~60 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20

~~PURGE SAVER~~ ID: 16369

MK

WATER LEVEL INDICATOR ID: 223319

TURBIDITY ID: 83012

DEPTH TO WATER: 33.11 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: ~40 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 50 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 1126 PURGE END TIME: 1210

TOTAL VOLUME PURGED ~8.8 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

NONE

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [X] YES [ ] NO IF NO, WHY WAS A DEVIATION NECESSARY: N/A

MK 7/18/18

RECORDED BY: [signature] 7/18/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

WELL ID: MW-GFS10-01

PROJECT NAME: GREAT FALLS PFAS SI

DELIVERY ORDER NO: 0011

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND (umhos/cm)	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
1130	1ST WATER	~~130~~ WATER	99	28.32	7.58	1.70 ~~0.9~~	7.60	18.2	33.11	INITIAL WL = 33.11 FT BTOC
1140	~2.2	220 ~~100~~	96	16.17	7.62	2.07	7.50	8.05	33.11	
1150	~4.4	220 ~~100~~	92	16.01	7.61	2.05	7.52	11.2	33.11	
1200	~6.6	220 ~~100~~	91	15.87	7.60	2.06	7.73	6.79	33.11	
1210	~8.8	220 ~~100~~	93	15.62	7.60	2.06	7.75	6.70	33.11	

7/18/19

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/18/18 TIME: 14 : 25

WELL ID NUMBER: MW-GRE03-01 WELL LOCATION: PRL GRE03

DEPTH OF SCREENED INTERVAL(toc notch): ~50 ft. to ~70 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20
~~PURGE SAVER~~ ID: 16369
MK
WATER LEVEL INDICATOR ID: 223319
TURBIDITY ID: 83012

DEPTH TO WATER: 37.73 FT FROM MEASURE POINT
DEPTH TO TOP OF SCREEN: ~50 FT FROM MEASURE POINT
DEPTH TO PUMP INTAKE: 60 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type QED SAMPLE PRO PUMP ID: N/A

PURGE START TIME: 1255 PURGE END TIME: 1345

TOTAL VOLUME PURGED 5 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

NONE

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [X] YES [ ] NO IF NO, WHY WAS A DEVIATION NECESSARY: N/A

MK 7/18/18

RECORDED BY: [signature] 7/18/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

WELL ID: MW-GF805-001

PROJECT NAME: GREAT FALLS PFAS SI

DELIVERY ORDER NO: 0011

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND ~~(µmho/cm)~~ (mS/cm)	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
1305	1ST WATER	72	103	29.52	7.28	1.032	3.50	31.2	37.75	37.73 FT BTOC
1315	~1	100	103	21.40	7.29	1.036	1.36	20.0	37.74	
1325	2	96	93	22.70	7.23	1.022	0.91	9.71	37.74	
1335	3	100 ~~80~~	88	19.96	7.27	1.020	0.96	8.68	37.75	NOW HAVE CLOUD COVER
1340	4	100	87	20.66	7.23	1.022	0.80	8.48	37.74	BACK IN SUN
1345	5	100	83	20.67	7.22	1.027	0.74	9.21	37.74	

KW 7/19/18

GROUND WATER MICRO PURGE SHEET

PROJECT NAME: GREAT FALLS PFAS SI **DELIVERY ORDER NO:** 0011

DATE (mm/dd/yy): 7/19/18 TIME: 08:53

WELL ID NUMBER: MW-GRE08-01 WELL LOCATION: PRL GRE08

DEPTH OF SCREENED INTERVAL(toc notch): ~55 ft. to ~75 ft.

INNER CASING: TYPE PVC ID: 2 inches

QED MP-20 ~~PURGE SAVER~~ ID: 16369

MK WATER LEVEL INDICATOR ID: 223319

TURBIDITY ID: 83012

DEPTH TO WATER: N/A FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: ~55 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: N/A FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: [ ] Bailer [X] Bladder Pump [ ] Pump Type N/A PUMP ID: N/A

MK 7/19/18

PURGE START TIME: 0830 PURGE END TIME: 0844

TOTAL VOLUME PURGED ~~0844LS~~ MK 7/19/18 ~3 LITERS

SITE CONDITIONS DURING PURGING:

NOTE: IF WELL HAS A DEDICATED PUMP, IT IS TO BE USED.

FIELD OBSERVATIONS:

WELL BAILED DRY, ALLOWED TO RECHARGE, THEN SAMPLED.

S&A PLAN SAMPLING PROCEDURE FOLLOWED: [X] YES [ ] NO IF NO, WHY WAS A DEVIATION NECESSARY: N/A

MK 7/19/18

RECORDED BY: [signature] 7/19/18 QA CHECKED BY:

GROUND WATER MICRO PURGE LOG

WELL ID: MW-GRE08-01

PROJECT NAME: GREAT FALLS PFAS SI

DELIVERY ORDER NO: 0011

TIME	L REMOVED	PURGE RATE (mL/min)	ORP (mv)	TEMP (C)	pH (s.u.)	COND (µmho/cm)	DO (mg/L)	TURBIDITY (NTU)	DEPTH TO WATER (FT BTOC)	COMMENTS
0833	1.5 WATER	BAILING	231	22.54	6.26	2.25	8.42	578	N/A	
0844	3	—	WELL BAILED DRY							

7/19/18

APPENDIX C

SURVEY REPORT FOR NEW MONITORING WELLS

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BIG SKY CIVIL & ENVIRONMENTAL, INC

July 24, 2018

Leidos
Selvam Arunachalam, P.E.
Project Manager | Environmental Restoration
arunachalams@leidos.com

RE: Big Sky PO10212994 – MT ANG Monitoring Wells (July 2018)

Mr. Arunachalam,

A survey was performed locating three (3) monitoring wells at the Montana Air National Guard per *Leidos' Request*. Trimble R8, survey grade, GPS was utilized for the survey. The base control point utilized for the survey was a 60d nail set as part of this survey. The temporary base point is located at *Lat: 47°28'32.55683"N, Long: 111°21'38.98573"W, ellipsoid Ht: 3634.01, and an elevation of 3680.31*. This control point was post processed utilizing the NGS administered Online Positioning User Service (OPUS) solution with data logged for approximately 2.1 hours while conducting the survey. The horizontal datum is **US State Plane 1983, Montana 2500**, and the vertical datum is **NAVD88**.

The vertical datum is based on an existing NGS Benchmark with the designation of Q 430, and a PID of SS1239 (attached).

Three measurements were taken for each monitoring well with a shot taken on the center of the monitoring well lid (designated in the point list as LID) and another taken on the northerly rim of the PVC casing with the specific locations marked with a black sharpie marker (designated in the point list as N PVC). Also, an adjacent ground shot was collected next to each monitoring well (designated in the point list as AG). Attached are two point lists with one having latitude, longitude, ellipsoid height, and description and the other list having State Plane northing, easting, ground elevation (NAVD88), description. Point lists are supplied in PDF documents, and Excel Spreadsheets.

I, Mark Leo, a registered professional engineer and land surveyor in the state of Montana, registration number 12920ES, hereby certify that monitoring wells were located in accordance with specifications provided by Leidos on July 23, 2018 for monitoring wells at the Montana Air National Guard.

Mark Leo

Mark Leo, ES

7/23/2018
Date

MONTANA
MARK
LEO
No. 12920ES
LICENSED
PROF. ENGINEER - LAND SURVEYOR

1324 13th Ave. SW | PO Box 3625 | Great Falls, MT 59403 | PH (406) 727-2185 | FAX (406) 727-3656

Project file data		Coordinate System	
Name:	G:\2018 Small Jobs\18CM-ANG Monitoring Wells\18CM-7-24-18(STPL-USE).vce	Name:	United States/State Plane 1983
Size:	47 KB	Datum:	NAD 1983 (Conus)
Modified:	7/24/2018 2:01:22 PM (UTC:-6)	Zone:	Montana 2500
Time zone:	Mountain Standard Time	Geoid:	GEOID03 (Conus)
Reference number:		Vertical datum:	
Description:			
Comment 1:			
Comment 2:			
Comment 3:			

Point List

ID	Northing (International foot)	Easting (International foot)	Ground Elevation (International foot)	Feature Code	Combined Scale Factor
1BSCE	1181424.909	1508620.824	3680.310	60D NAIL	0.9992520482
10	1181509.205	1506097.572	3668.927	MW-GRE10-01-LID	0.9992526027
11	1181507.848	1506098.738	3668.877	MW-GRE10-01-AG	0.9992526045
12	1181509.349	1506097.554	3668.526	MW-GRE10-01-N	0.9992526218
13	1181845.075	1507516.802	3675.583	MW-GRE03-01-LID	0.9992524286
14	1181845.815	1507517.745	3675.599	MW-GRE03-01-AG	0.9992524281
15	1181845.056	1507516.771	3675.234	MW-GRE03-01-NPVC	0.9992524452
16	1183772.920	1508549.286	3672.230	MW-GRE08-01-LID	0.9992533513
17	1183771.305	1508550.123	3672.261	MW-GRE08-01-AG	0.9992533492
18	1183773.022	1508549.290	3671.984	MW-GRE08-01-NPVC	0.9992533631
19	1180036.127	1508882.923	3685.612	MDT AC	0.9992512635
20	1180082.077	1508824.734	3685.766	OPC	0.9992512733
BM1	1177822.249	1505178.615	3697.140	SS1239	0.9992498359

Project file data		Coordinate System	
Name:	G:\2018 Small Jobs\18CM-ANG Monitoring Wells\18CM-7-24-18(STPL-USE).vce	Name:	United States/State Plane 1983
Size:	47 KB	Datum:	NAD 1983 (Conus)
Modified:	7/24/2018 2:01:22 PM (UTC:-6)	Zone:	Montana 2500
Time zone:	Mountain Standard Time	Geoid:	GEOID03 (Conus)
Reference number:		Vertical datum:	
Description:			
Comment 1:			
Comment 2:			
Comment 3:			

Point List

ID	Latitude (Local)	Longitude (Local)	Ellipsoid Ht.	Feature Code	Combined Scale Factor
1BSCE	N47°28'32.55683"	W111°21'38.98573"	3634.117	60D NAIL	0.9992520482
10	N47°28'32.79548"	W111°22'15.75660"	3622.680	MW-GRE10-01-LID	0.9992526027
11	N47°28'32.78236"	W111°22'15.73914"	3622.630	MW-GRE10-01-AG	0.9992526045
12	N47°28'32.79690"	W111°22'15.75692"	3622.278	MW-GRE10-01-N	0.9992526218
13	N47°28'36.44552"	W111°21'55.20736"	3629.338	MW-GRE03-01-LID	0.9992524286
14	N47°28'36.45304"	W111°21'55.19388"	3629.355	MW-GRE03-01-AG	0.9992524281
15	N47°28'36.44532"	W111°21'55.20780"	3628.989	MW-GRE03-01-NPVC	0.9992524452
16	N47°28'55.72024"	W111°21'40.84005"	3625.964	MW-GRE08-01-LID	0.9992533513
17	N47°28'55.70449"	W111°21'40.82731"	3625.995	MW-GRE08-01-AG	0.9992533492
18	N47°28'55.72124"	W111°21'40.84004"	3625.718	MW-GRE08-01-NPVC	0.9992533631
19	N47°28'18.90784"	W111°21'34.68903"	3639.401	MDT AC	0.9992512635
20	N47°28'19.34783"	W111°21'35.55215"	3639.554	OPC	0.9992512733
BM1	N47°27'56.17994"	W111°22'27.85270"	3650.940	SS1239	0.9992498359

7/24/2018 2:05:35 PM	G:\2018 Small Jobs\18CM-ANG Monitoring Wells\18CM-7-24-18(STPL-USE).vce	Trimble Business Center

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.12.5
1         National Geodetic Survey,   Retrieval Date = JULY 23, 2018
 SS1239 ***********************************************************************
 SS1239  FBN         -  This is a Federal Base Network Control Station.
 SS1239  DESIGNATION -  Q 430
 SS1239  PID         -  SS1239
 SS1239  STATE/COUNTY-  MT/CASCADE
 SS1239  COUNTRY     -  US
 SS1239  USGS QUAD   -  SOUTHWEST GREAT FALL (1994)
 SS1239
 SS1239                        *CURRENT SURVEY CONTROL
 SS1239  ______________________________________________________________________
 SS1239* NAD 83(2011) POSITION- 47 27 56.18060(N) 111 22 27.85508(W)   ADJUSTED
 SS1239* NAD 83(2011) ELLIP HT-  1112.766 (meters)        (06/27/12)   ADJUSTED
 SS1239* NAD 83(2011) EPOCH   -  2010.00
 SS1239* NAVD 88 ORTHO HEIGHT -  1126.889 (meters)     3697.14  (feet) ADJUSTED
 SS1239  ______________________________________________________________________
 SS1239  GEOID HEIGHT    -        -14.122 (meters)                     GEOID12B
 SS1239  NAD 83(2011) X  - -1,574,630.810 (meters)                     COMP
 SS1239  NAD 83(2011) Y  - -4,023,273.914 (meters)                     COMP
 SS1239  NAD 83(2011) Z  -  4,677,733.433 (meters)                     COMP
 SS1239  LAPLACE CORR    -          0.68 (seconds)                     DEFLEC12B
 SS1239  DYNAMIC HEIGHT  -       1126.800 (meters)     3696.84  (feet) COMP
 SS1239  MODELED GRAVITY -    980,495.0  (mgal)                        NAVD 88
 SS1239
 SS1239  VERT ORDER      -  FIRST     CLASS II
 SS1239
 SS1239  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 SS1239  Standards:
 SS1239         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 SS1239            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 SS1239  ---------------------------------------------------------------------
 SS1239  NETWORK    0.62   1.23           0.26   0.25   0.63      0.03086840
 SS1239  ---------------------------------------------------------------------
 SS1239  Click here for local accuracies and other accuracy information.
 SS1239
 SS1239
 SS1239.The horizontal coordinates were established by GPS observations
 SS1239.and adjusted by the National Geodetic Survey in June 2012.
 SS1239
 SS1239.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 SS1239.been affixed to the stable North American tectonic plate. See
 SS1239.NA2011 for more information.
 SS1239
 SS1239.The horizontal coordinates are valid at the epoch date displayed above
 SS1239.which is a decimal equivalence of Year/Month/Day.
 SS1239
 SS1239.The orthometric height was determined by differential leveling and
 SS1239.adjusted by the NATIONAL GEODETIC SURVEY
 SS1239.in June 1991.
 SS1239
```

```
SS1239.Significant digits in the geoid height do not necessarily reflect accuracy.
SS1239.GEOID12B height accuracy estimate available here.
SS1239
SS1239.The X, Y, and Z were computed from the position and the ellipsoidal ht.
SS1239
SS1239.The Laplace correction was computed from DEFLEC12B derived deflections.
SS1239
SS1239.The ellipsoidal height was determined by GPS observations
SS1239.and is referenced to NAD 83.
SS1239
SS1239.The dynamic height is computed by dividing the NAVD 88
SS1239.geopotential number by the normal gravity value computed on the
SS1239.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
SS1239.degrees latitude (g = 980.6199 gals.).
SS1239
SS1239.The modeled gravity was interpolated from observed gravity values.
SS1239
SS1239. The following values were computed from the NAD 83(2011) position.
SS1239
SS1239;                     North         East     Units Scale Factor Converg.
SS1239;SPC MT       -   359,000.243   458,778.393   MT  0.99942386   -1 22 16.1
SS1239;SPC MT       - 1,177,822.32  1,505,178.45   iFT  0.99942386   -1 22 16.1
SS1239;UTM  12      - 5,256,975.231   471,783.943   MT  0.99960978   -0 16 33.2
SS1239
SS1239!             -  Elev Factor  x  Scale Factor =   Combined Factor
SS1239!SPC MT       -   0.99982561  x   0.99942386  =   0.99924957
SS1239!UTM  12      -   0.99982561  x   0.99960978  =   0.99943546
SS1239
SS1239_U.S. NATIONAL GRID SPATIAL ADDRESS: 12TVT7178356975(NAD 83)
SS1239
SS1239                           SUPERSEDED SURVEY CONTROL
SS1239
SS1239  NAD 83(2007)-  47 27 56.18046(N)    111 22 27.85617(W) AD(2002.00) 0
SS1239  ELLIP H (02/10/07) 1112.789  (m)                       GP(2002.00)
SS1239  NAD 83(1999)-  47 27 56.18057(N)    111 22 27.85651(W) AD(       ) A
SS1239  ELLIP H (10/12/00) 1112.811  (m)                       GP(       ) 3 1
SS1239  NAD 83(1986)-  47 27 56.18142(N)    111 22 27.83778(W) AD(       ) 1
SS1239  NAD 83(1992)-  47 27 56.17991(N)    111 22 27.85521(W) AD(       ) B
SS1239  NAD 27      -  47 27 56.33593(N)    111 22 24.93767(W) AD(       ) 1
SS1239  ELLIP H (05/15/92) 1112.889  (m)                       GP(       ) 4 2
SS1239  NAVD 88            1126.89   (m)         3697.1    (f) LEVELING    3
SS1239  NAVD 88            1126.79   (m)         3696.8    (f) LEVELING    3
SS1239  NAVD 88            1126.89   (m)         3697.1    (f) LEVELING    3
SS1239  NGVD 29            1125.95   (m)         3694.1    (f) LEVELING    3
SS1239
SS1239.Superseded values are not recommended for survey control.
SS1239
SS1239.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
SS1239.See file dsdata.pdf to determine how the superseded data were derived.
SS1239
SS1239_MARKER: DV = VERTICAL CONTROL DISK
SS1239_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
SS1239_STAMPING: Q 430 1979
SS1239_MARK LOGO: NGS
SS1239_PROJECTION: FLUSH
SS1239_MAGNETIC: I = MARKER IS A STEEL ROD
SS1239_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
SS1239_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
SS1239+SATELLITE: SATELLITE OBSERVATIONS - June 23, 2010
SS1239_ROD/PIPE-DEPTH: 3.05 meters
```

```
SS1239
SS1239  HISTORY     - Date     Condition        Report By
SS1239  HISTORY     - 1979     MONUMENTED       NGS
SS1239  HISTORY     - 19910826 GOOD             NGS
SS1239  HISTORY     - 19941207 GOOD             MTDOT
SS1239  HISTORY     - 19951216 GOOD             MTDOT
SS1239  HISTORY     - 19960103 GOOD             MTDOT
SS1239  HISTORY     - 19990614 GOOD             NGS
SS1239  HISTORY     - 20010601 GOOD             NGS
SS1239  HISTORY     - 20061024 GOOD             ADACLA
SS1239  HISTORY     - 20100623 GOOD             WOOLPT
SS1239
SS1239                          STATION DESCRIPTION
SS1239
SS1239'DESCRIBED BY NATIONAL GEODETIC SURVEY 1979
SS1239'2.0 MI SW FROM GREAT FALLS.
SS1239'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.
SS1239'2.0 MILES SOUTHWEST ALONG INTERSTATE HIGHWAY 15 FROM THE TENTH AVENUE
SS1239'SOUTH OVERPASS IN GREAT FALLS, AT HIGHWAY MILE MARKER 277, 98.7
SS1239'FEET NORTHWEST OF THE CENTERLINE OF THE SOUTHBOUND LANES OF THE
SS1239'INTERSTATE HIGHWAY, 71.1 FEET NORTHWEST OF THE MILE MARKER, AND 1.6
SS1239'FEET SOUTHEAST OF A BARBED WIRE FENCE.  NOTE=DISK IS 4 INCHES BELOW
SS1239'THE GROUND, ACCESS IS THROUGH A 4 INCH PLASTIC SCREW PLUG.
SS1239'THE MARK IS 1.9 FT  NE FROM A WITNESS POST.
SS1239
SS1239                          STATION RECOVERY (1991)
SS1239
SS1239'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1991
SS1239'THE STATION IS LOCATED ON THE SOUTHWEST EDGE OF GREAT FALLS, ALONG THE
SS1239'NORTHWEST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 15, ABOUT 1.6 KM
SS1239'(1.0 MI) SOUTH OF THE INTERNATIONAL AIRPORT AND AT MILE MARKER 277.
SS1239'TO REACH THE STATION FROM THE JUNCTION OF INTERSTATE HIGHWAY 15 AND
SS1239'10TH AVENUE SOUTH, IN SOUTHWEST GREAT FALLS, GO SOUTHERLY ON
SS1239'INTERSTATE HIGHWAY 15 FOR 3.2 KM (2.0 MI) TO THE STATION ON THE RIGHT
SS1239'IN A FENCE ROW.
SS1239'THE STATION IS A BENCH MARK DISK SCREWED TO THE TOP OF A STAINLESS
SS1239'STEEL ROD AND ENCASED IN A 3.5 INCH PVC PIPE.  LOCATED 30.08 M
SS1239'(98.69 FT) NORTHWEST OF THE CENTER OF THE SOUTHBOUND LANE OF
SS1239'INTERSTATE HIGHWAY 15, 21.64 M (71.00 FT) NORTHWEST OF MILE MARKER
SS1239'277, 0.58 M (1.90 FT) NORTHEAST OF AND NEXT TO A METAL WITNESS POST
SS1239'AND 0.48 M (1.57 FT) SOUTHEAST OF THE HIGHWAY FENCE.
SS1239
SS1239                          STATION RECOVERY (1994)
SS1239
SS1239'RECOVERY NOTE BY MONTANA DEPARTMENT OF TRANSPORTATION 1994 (DRD)
SS1239'RECOVERED AS DESCRIBED.
SS1239
SS1239                          STATION RECOVERY (1995)
SS1239
SS1239'RECOVERY NOTE BY MONTANA DEPARTMENT OF TRANSPORTATION 1995 (DRD)
SS1239'RECOVERED AS DESCRIBED.
SS1239
SS1239                          STATION RECOVERY (1996)
SS1239
SS1239'RECOVERY NOTE BY MONTANA DEPARTMENT OF TRANSPORTATION 1996 (DRD)
SS1239'RECOVERED AS DESCRIBED.
SS1239
SS1239                          STATION RECOVERY (1999)
SS1239
SS1239'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)
```

```
SS1239'RECOVERED AS DESCRIBED.
SS1239
SS1239                          STATION RECOVERY (2001)
SS1239
SS1239'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2001 (RGH)
SS1239'THE STATION IS LOCATED NEAR THE SOUTHWEST EDGE OF GREAT FALLS
SS1239'ALONG THE NORTHWEST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 15,
SS1239'ABOUT 1.6 KM SOUTHWEST OF THE ENTRANCE TO THE GREAT FALLS
SS1239'INTERNATIONAL AIRPORT (EXIT 277), AT MILE MARKER 277 JUST SOUTHEAST
SS1239'OF THE RIGHT-OF-WAY FENCE.
SS1239'
SS1239'OWNERSHIP--MONTANA DEPARTMENT OF TRANSPORTATION.
SS1239'
SS1239'TO REACH THE STATION FROM THE JUNCTION OF INTERSTATE HIGHWAY 15
SS1239'AND AIRPORT DRIVE (EXIT 277) NEAR THE SOUTHWEST EDGE OF GREAT
SS1239'FALLS, GO SOUTHWESTERLY ON INTERSTATE 15 FOR 3.2 KM TO THE
SS1239'STATION ON THE RIGHT NEAR THE FENCE.
SS1239'
SS1239'NOTE--THE DATUM POINT IS THE CENTER OF A CROSS CAST IN THE TOP
SS1239'CENTER OF A STANDARD BRASS VERTICAL CONTROL DISK CRIMPED TO THE
SS1239'TOP OF A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF 3.05 M,
SS1239'ENCASED IN A 4.5-INCH PVC PIPE WITH SCREW PLUG SURROUNDED BY
SS1239'CONCRETE.  THE DISK IS RECESSED ABOUT 5-CM BELOW THE GROUND
SS1239'SURFACE AND THE PVC PIPE AND SCREW PLUG ARE FLUSH.
SS1239'
SS1239'STATION IS 30.08 M NORTHWEST OF THE SOUTHBOUND LANES CENTERLINE,
SS1239'21.64 M NORTHWEST OF MILE MARKER 277, 0.58 M NORTHEAST OF A METAL
SS1239'FENCE POST AND WITNESS SIGN, AND 0.48 M SOUTHEAST OF THE FENCE.  BY
SS1239'R.G. HAYES
SS1239
SS1239                          STATION RECOVERY (2006)
SS1239
SS1239'RECOVERY NOTE BY ADAMS AND CLARK INC 2006 (GMD)
SS1239'RECOVERED IN GOOD CONDITION.
SS1239
SS1239                          STATION RECOVERY (2010)
SS1239
SS1239'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2010 (JPD)
SS1239'RECOVERED AS DESCRIBED,

*** retrieval complete.
Elapsed Time = 00:00:05
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APPENDIX D

DATA VALIDATION REPORTS

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LEIDOS
Laboratory Data Verification Checklist

Project: Great Falls

SDG No: J41149

Analyte Group: PFCs

Sample Matrix: Soil/Water

EDD (Y/N):

Disposition of Data Package:

NCR No. (if applicable):

1. Case Narrative

Read SDG Case Narrative	Y
Check Laboratory sample ID vs. Project sample ID lists	Y
Check that discussion covers each analytical type included in the SDG	Y
Check for identified nonconforming items (e.g., missed holding times, etc.)	Y

2. Chain-of-Custody (COC)

Check COC sample collection, shipping, and receiving dates	Y
Check that COC signature blocks are complete	Y
Check COC project sample IDs vs. Lab IDs and Result Form IDs	Y
Match COC requested analyses with Case Narrative and with data package content (Result Forms)	Y

3. Analytical Results Form

Verify that a Result Form is present for each sample and analysis	Y
On each Result Form check:	
SDG No.	Y
Sample ID	Y
Lab ID	Y
Date Collected	Y
Date Extracted	Y
Date Analyzed	Y
Result Matrix	Y
Result Units	Y

4. Project Verification

Check project analyte list vs. analytes reported	Y
Check project requested methods vs. analytical methods performed	Y
Check analyte reporting levels vs. project reporting level goals	Y

5. Analytical Quality Control Information

Check for surrogate recovery results (e.g., org. form II)	Y
Check for LCS results (e.g., org. form III, inorg. form XII)	Y
Check for method blank results (e.g., org. form IV, inorg. form III)	Y
Check for MS/MSD results (e.g., inorg. form V)	Y
Check for laboratory duplicate results (e.g., inorg. form VI)	NA

Check for Method Calibration and Run Documentation

organic:	instrument performance check	Y
	initial calibration data	Y
	continuing calibration data	Y
	internal standard areas	Y
	internal standard retention times	Y
	sample clean-up documentation (org. forms V through X)	Y
metal:	initial calibration data	
	continuing calibration data	
	method detection limits	
	method linear range	
	sample run sequence (inorg. forms II, IV, and VIII through XIV)	
other:	initial calibration data	
	continuing calibration data	
	method detection limits	
	sample run sequence	

6. Incorrect Information

Identify missing items or incorrect information (i.e., missing forms, unsigned forms, incorrect sample IDs, etc.)

Contact the laboratory or project personnel to obtain missing information or correct information

Document corrections below:

7. Nonconforming Items

Document all nonconforming items that can not be resolved above in a Non-Conformance Report (NCR), complete form, file, and follow-up

NCR #	Item

Reviewed By: Brooke Francis Date: 8/10/18

QA Review By: Joseph C Peters Date: 8/29/18

LEIDOS
Laboratory Data Package Detail Form

Project: Great Falls

SDG No: J41149

Analyte Group: PFCs

SEE ATTACHED

Field Sample ID	Lab ID #	Matrix	Analysis	Notes:

Comments:

Sample Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41149-1	GRE-ER-SB-01	Water	07/09/18 12:50	07/14/18 09:10
320-41149-2	GRE10-SB2-01	Solid	07/09/18 14:10	07/14/18 09:10
320-41149-3	GRE10-SB2-02	Solid	07/09/18 14:35	07/14/18 09:10
320-41149-4	GRE10-SB1-01	Solid	07/09/18 15:10	07/14/18 09:10
320-41149-5	GRE10-SB1-01D	Solid	07/09/18 15:10	07/14/18 09:10
320-41149-6	GRE10-SB3-01	Solid	07/09/18 15:50	07/14/18 09:10
320-41149-7	GRE09-SB1-01	Solid	07/09/18 16:15	07/14/18 09:10
320-41149-8	GRE09-SB1-01D	Solid	07/09/18 16:15	07/14/18 09:10
320-41149-9	GRE09-SB2-01	Solid	07/09/18 16:30	07/14/18 09:10
320-41149-10	GRE-FB-POT-01	Water	07/09/18 17:05	07/14/18 09:10
320-41149-11	GRE-FB-DI-01	Water	07/10/18 09:15	07/14/18 09:10
320-41149-12	GRE-ER-SB-02	Water	07/10/18 09:20	07/14/18 09:10
320-41149-13	GRE03-SB3-01	Solid	07/10/18 10:30	07/14/18 09:10
320-41149-14	GRE03-SB3-02	Solid	07/10/18 11:05	07/14/18 09:10
320-41149-15	GRE04-SB1-01	Solid	07/10/18 11:45	07/14/18 09:10
320-41149-16	GRE06-SB1-01	Solid	07/11/18 13:05	07/14/18 09:10
320-41149-17	GRE06-SB1-01D	Solid	07/11/18 13:05	07/14/18 09:10
320-41149-18	GRE06-SB2-01	Solid	07/11/18 13:40	07/14/18 09:10
320-41149-19	GRE07-SB1-01	Solid	07/11/18 14:15	07/14/18 09:10
320-41149-20	GRE07-SB1-02	Solid	07/11/18 14:35	07/14/18 09:10
320-41149-21	GRE-ER-SB-03	Water	07/11/18 19:10	07/14/18 09:10
320-41149-22	GRE03-SB1-01	Solid	07/11/18 19:55	07/14/18 09:10
320-41149-23	GRE03-SB2-01	Solid	07/11/18 20:25	07/14/18 09:10
320-41149-24	GRE03-SB4-01	Solid	07/11/18 20:50	07/14/18 09:10
320-41149-25	GRE03-SB5-01	Solid	07/11/18 21:05	07/14/18 09:10
320-41149-26	GRE04-SB2-01	Solid	07/12/18 11:55	07/14/18 09:10
320-41149-27	GRE07-SB2-01	Solid	07/12/18 12:35	07/14/18 09:10
320-41149-28	GRE08-SB1-01	Solid	07/12/18 13:25	07/14/18 09:10
320-41149-29	GRE08-SB2-01	Solid	07/12/18 13:55	07/14/18 09:10
320-41149-30	GRE08-SB3-01	Solid	07/12/18 14:17	07/14/18 09:10
320-41149-31	GRE08-SB4-01	Solid	07/12/18 14:35	07/14/18 09:10
320-41149-32	GRE07-SB3-01	Solid	07/13/18 08:20	07/14/18 09:10
320-41149-33	GRE04-SB3-01	Solid	07/13/18 08:40	07/14/18 09:10
320-41149-34	GRE05-SB1-01	Solid	07/13/18 09:10	07/14/18 09:10
320-41149-35	GRE05-SB2-01	Solid	07/13/18 09:35	07/14/18 09:10
320-41149-36	GRE-IDW-S-01	Solid	07/13/18 10:55	07/14/18 09:10

*This validation checklist is for validation of PFAS compounds according to DOD QSM 5.1; Table B-15. It is not project specific.

Leidos
PFASs by LC/MS/MS Methods Data Verification/Validation

Project: Great Falls

SDG No: J41149

Analysis: PFC

Method: E537

Laboratory: Test America

Matrix: Water/Soil

The above data package has been reviewed and the analytical quality control/quality assurance performance data have been summarized. The general criteria used to assess the analytical integrityof the data were based on DOD QSM 5.1 guidance and examination of the following:

Case Narrative	Instrument Sensitivity Checks
Analytical Holding Times	Internal Standard Performance
Sample Preservation	MS/MSD Recoveries and Differences
Method Calibration	LCS Recoveries
Method and Project Blanks	Re-analysis and Secondary Dilution

Project Specific QA/QC or contract requirements may take priority over validation criteria in this procedure.

* **If this SDG requires full validation; recalculations from the raw data are required for one point for each ICAL, one CCV, one of each QC sample, and one field sample.**

Data verification and data validation are essentially identical, with the exception that validation requires results to be recalculated from the raw data.

Remarks: DoD QSM

Some results were qualified as estimated due to MS/MSD, IS, and/or surrogate discrepancies. See annotated Form I's.

QA review of validation found some rinse blank qualifier issues. Issues were resolved and corrected. No other discrepancies.

Results qualified were estimated and are considered usable for decision-making.

No results were rejected due to QC outliers.

Definition of Qualifiers:

"U", not detected at the associated level
"UJ", not detected and associated value estimated
"J", associated value estimated
"R", associated value unusable or analyte identity unfounded

Verification/Validation by: Brooke Francis Date: 8/10/18

QA Reviewed by: Joseph C Peters Date: 8/29/18

Case Narrative

Verify direct statements made within the Laboratory Case Narrative (note discrepancies).

Remarks: No additional discrepancies were noted

Re-analysis and Secondary Dilutions

Verify that re-analysis and secondary dilutions were performed and reported as necessary. Determine appropriate results to report.

Remarks: Some samples were reanalyzed at a dilution

Holding Times

Waters - Cool 4°C; 14 days to extraction; 28 days to analysis
collection. Note: Trizma preservative is recommended for aqueous samples, but not required.

Soils - Cool 4°C ; extraction within 28 days of sample collection; analysis within 28 days of sample extraction

Deviations:

Sample #	Date Collected	Date Analyzed	Comments

Actions:

1. If holding times are exceeded, all results are qualified as estimated (J/UJ)
2. If holding times are exceeded by more than 2X, reviewer may qualify non-detected results as unusable (R)

Remarks: All holding times were met

Injection Internal Standards (IS)

List any field samples, field QC samples, or laboratory QC samples where injection internal standards are not within 50 to 150% of the peak areas from the ICAL midpoint or daily initial CCV, as applicable.

Deviations:

Sample #	Injection IS/% Rec	Affected PFAS Compounds
	0…….+	

Actions:

If any injection IS is <25%, qualify detects as J; non-detects as R

If any Injection IS is > upper control limit; qualify detects as J, no action for non-detects

If any surrogate is ≥ 25%, but < the lower control limit, then qualify detects as J, non-detects as UJ

Injection IS - Target PFAS Compounds Associations:

13C3-PFBA: PFBS

13C2-PFOA: PFOA, PFHxS, PFHpA

13C4-PFOS: PFOS, PFNA

13C2-PFDA: No PFAS project compounds

Remarks: **SEE ATTACHED**

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: CCV 320-237043/3 Date Analyzed: 07/31/2018 15:52

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.30LLBB_064. Heated Purge: (Y/N) N

Calibration ID: 40409

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2932741	2.59				
UPPER LIMIT		4399112	2.79				
LOWER LIMIT		1466371	2.39				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-237043/1		3476165	2.58				
CCVL 320-237043/2		3576137	2.59				
CCV 320-237052/1		3458240	2.58				
320-41149-19 DL	GRE07-SB1-01 DL	85540Q	2.58				
320-41149-19 MS DL	GRE07-SB1-01 MS DL	86700Q	2.58				
320-41149-19 MSD DL	GRE07-SB1-01 MSD DL	96092Q	2.59				
320-41149-27 DL	GRE07-SB2-01 DL	40564Q	2.59				
320-41149-28 DL	GRE08-SB1-01 DL	87953Q	2.58				
320-41149-29 DL	GRE08-SB2-01 DL	84244Q	2.59				
320-41149-30 DL	GRE08-SB3-01 DL	44499Q	2.58				
320-41149-31 DL	GRE08-SB4-01 DL	40700Q	2.58				
320-41149-32 DL	GRE07-SB3-01 DL	182636Q	2.58				
CCV 320-237052/12		3424997	2.57				
320-41149-34 DL	GRE05-SB1-01 DL	415044Q	2.59				
320-41149-35 DL	GRE05-SB2-01 DL	442078Q	2.59				
320-41149-27	GRE07-SB2-01	1740775	2.58				
CCV 320-237052/22		3269152	2.58				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: IC 320-237402/5 Date Analyzed: 08/01/2018 13:22

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.08.01LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 40449

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		3424441	2.58				
UPPER LIMIT		5136662	2.78				
LOWER LIMIT		1712221	2.38				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-237402/9		3483672	2.58				
ICV 320-237402/10		3437702	2.57				
CCV 320-237446/1		2952556	2.57				
320-41149-3 DL	GRE10-SB2-02 DL	811283Q	2.57				
320-41149-16 DL	GRE06-SB1-01 DL	384986Q	2.58				
320-41149-17 DL	GRE06-SB1-01D DL	373078Q	2.57				
320-41149-18 DL	GRE06-SB2-01 DL	751294Q	2.57				
CCV 320-237446/7		3255357	2.57				
320-41149-20 DL	GRE07-SB1-02 DL	386143Q	2.57				
320-41149-22 DL	GRE03-SB1-01 DL	414904Q	2.57				
320-41149-23 DL	GRE03-SB2-01 DL	412647Q	2.57				
320-41149-24 DL	GRE03-SB4-01 DL	378478Q	2.57				
320-41149-25 DL	GRE03-SB5-01 DL	198942Q	2.57				
CCV 320-237446/16		3308081	2.57				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

Surrogates/Extraction Internal Standards (IS)

List any field samples, field QC samples, or laboratory QC samples where surrogates/extraction internal standards are not within 50% ± of their true value.
Note: Extraction Internal Standards and surrogates are the same thing. For purposes of data validation and applying validation reason codes, they will be treated as surrogates. Injection internal standards will be treated as internal standards and the use of internal standard reason codes will be used.

Deviations:

Sample #	Surrogate - % Rec	Affected PFAS Compounds
GRE08-SB2-01	PFNA 45%	PFNA
	PFOS 45%	PFOS ; Reported from a dilution; not qualified for surrogate
GRE08-SB3-01	PFNA 34%	PFNA
	PFOS 32%	PFOS ; reported from a dilution; not qualified for surrogate
GRE08-SB4-01	PFNA 27%	PFNA
	PFOS 22%	PFOS ; reported from a dilution; not qualified for surrogate

Actions:

If any injection IS is <25%, qualify detects as J; non-detects as R

If any Injection IS is > upper control limit; qualify detects as J, no action for non-detects

If any surrogate is ≥ 25%, but < the lower control limit, then qualify detects as J, non-detects as UJ

Surrogate - Target PFAS Compounds Associations:

13C3-PFBS - PFBS
13C3-PFHxS - PFHxS
13C4-PFHpA - PFHpA
13C8-PFOA - PFOA
13C9-PFNA - PFNA
13C8-PFOS - PFOS

Remarks:

Above PFNA detects were qualified as estimated; surrogate outliers due not warrant rejection of the data. Above PFOS detects were re-analyzed at a dilution with acceptable associated surrogate recoveries. No qualifiers were applied due to surrogate outliers for PFOS.

VI. Blanks

A method blank was reported for each aqueous analytical batch and one method blank was reported for each soil extraction batch? (Y/N)
Review associated laboratory and project blank samples. List documented contamination below:

Laboratory Method Blanks: All laboratory method blanks were free of contamination.

Date:	Sample ID #	Compound	Conc.

Associated Project Blanks (e.g., equipment rinsates, field reagent blanks, source blanks, etc.)

Date	Sample ID #	Compound	Conc.
7/11/18	GRE-ER-SB-03	PFOS	10 ng/L

Remarks: All other field QC blanks were free of contamination.

GRE-ER-SB-03 is the equipment rinse blank associated with all soil boring collected on 7/11. As documented on the next page, all soil samples collected on 7/11 had PFOS detections above the rinse blank action level.

VI. Blanks (continued)

Calculate the action level based on 5X the highest blank concentration

Sample weights, volumes, and dilution factors must be taken into account when applying the 5X criteria.

0.0104 ng/mL * 10mL/0.250L =

0.0104 ng/mL * 10mL/5g * 1000g/1kg * 1ug/1000ng =

10ng/L * 0.010L/5g * 1000g/1kg * 1 ug/1000ng =

Deviations:

Compound	Maximum Conc. Detected, (ppb)	Action Level (ppb)	Samples Affected
PFHxS (CCB)	0.0104 ng/mL	2.08 ng/L 0.104 ug/kg	All samples **
PFOS (equip. rinse blank)	10 ng/L	0.10 ug/kg	ER-03 (7/11) All results>AL, no qual

Actions:

1. If compound results exceed the action levels, the data are not qualified
2. If compound results are below the required reporting level, report results as non-detect (U) at the LOD
3. If the compound is detected above the reporting level, but below the action level, qualify as not-detected (U)
4. If contamination exists in method blanks < 1/2 LOQ, samples must be re-extracted and reanalyzed. Unlesss the MB results are < 1/10 the amount in associated samples or < 10 the action level, which ever is greater

Remarks:

Any field sample PFHxS results less than the action level were qualified U, w/reason code F06

No soil results were qualified due to rinse blank result because the sample results for PFOS were above the action level. **No field samples had detections below the action level.

VII. Initial & Contining Calibration

Date of initial calibration: _____

%RSD of RFs < 20% or $r^2 \geq 0.99$ for each analyte?
Analytes within 70-130% of their true value in each ICAL standard?
ICV within ± 30% of true value?

Date(s) of continuing calibration: _____

CCV analyzed at beginning and end of analytical sequence and after every 10 field samples?
CCV within ± 30% of true value?

Instrument sensitivity check (ISC) performed at the LOQ prior to analysis and every 12 hours?
ICS within ± 30% of true value?

Deviations:

Compound	Date	r value	%Drift	Samples Affected

Actions:

1. If initial calibration curve criteria are not met, qualify positive results as estimated (J) and non-detects as estimated (UJ), using professional judgement (i.e. if only the low standard is out, and the higher stards are in, then only qualify those results near the low standard).
2. Only evaluate the ICV if it brackets field samples. If the ICV does bracket field samples, then CCV actions apply
3. If a CCV is above the upper control limit, qualify detects as estimated (J). Nondects require no action.
4. If a CCV is below the lower control limit but > 40% recovery, qualify results as estimated (J/UJ).
5. If a CCV is ≤ 40% recovery, qualify detects as estimated (J) and nondetects as rejected (R)
6. If CCVs were not analyzed at the proper frequency, use professional judgement.
7. If ISC is > UCL, estimate (J) detects, no action for non-detects; If ISC is < LCL, estimate data (J/UJ), if ISC is < 30% reject (R) non-detects

Remarks: All calibration results met control limits

IX. Matrix Spike/Matrix Spike Duplicate Information

General MS/MSD Criteria:
percent recovery (%R) in-house limits
relative percent difference (RPD) 30% RPD

Project Sample(s) Spiked: GRE10-SB2-01 GRE07-SB1-01 GRE07-SB1-01DL

Deviations:

Compound	%R	%R Limits	RPD	RPD Limits	Samples Affected
PFHxS	74/73%	75-121			GRE10-SB2-01 , J H02
PFOS	19/42%	69-131			>4x , no qualifier
PFHxS	123/-121	75-121			GRE07-SB1-01 >4x , no qualifier
PFOS	-466/-1973	69-131			>4x , no qualifier
PFNA	73	74-126			(J) , H02
PFOA	28	76-121			>4x , no qualifier
PFHxS	140/72	75-121			GRE07-SB1-01DL J, H02
PFOS	1490/-1883	69-131			>4x , no qualifier
PFOA	138/-25	76-121			>4x , no qualifier
PFNA	63/39	74-126			J H02

H02 - Low MS/MSD recovery

Actions:

1. If the spike recovery is above the upper control limit (UCL), qualify all positive values in the unspiked sample as estimated (J) and non-detects as estimated (UJ).
2. If the spike recovery is below the lower control limit (LCL), qualifty positive values as estimated (J). And non-detects as estimated (UJ).
3. If the spike recovery is <10%, qualify non-detect values as unusable (R)
4. If the RPD does not meet criteria, qualify positive values in the unspiked sample as estimated (J)
5. Use professional judgement to qualify additional samples in the analytical group based on MS/MSD results
6. Use professional judgement for qualification of data for unspiked compounds

* **If this SDG requires full validation; recalculate at least one % recovery and one % RPD from the raw data. Attach all calculations at the end of the validation checklist.**

Remarks: >4x denotes instances where the native concentration in the parent sample was greater than 4 times the spiking level and no conclusions can be drawn regarding accuracy and precision. The results that were qualified are estimated and considered usable for decision-making. No results required rejection due to MS/MSD recovery and RPD values.

X. Laboratory Control Sample Information

General LCS Criteria:
Percent recovery (%R) = in-house limits
RPD if LCSD performed = 30% RPD

Laboratory LCS Identifications: LCS 320-234633, LCS 280-234662, LCS/D 320-234634

Deviations:

Compound	Date	%R	Samples Affected/Qualifiers Applied

Actions:

*** If this SDG requires full validation; recalculate at least one % recovery and one % RPD (if LCSD was performed) from the raw data. Attach all calculations at the end of the validation checklist.**

Action should be based on both the number of compounds outside the criterion and the magnitude of the exceedance.

1. If the LCS recovery is below limits but > one- half the lower limit, qualify valves as estimated (J/UJ).
2. If the LCS recovery is < one-half the lower limit, qualify detect (J) and non-detects (R)
3. If the LCS recovery is greater than the upper limit, qualify positive valves for that analyte as estimated (J).

5. Use professional judgement for qualification of data for compounds with no LCS information

Remarks: All LCS/D %R and RPD results met control limits

LEIDOS
Laboratory Data Verification Checklist

Project: Great Falls

SDG No: J41333

Analyte Group: PFAS
Sample Matrix: Waters
EDD (Y/N):

Disposition of Data Package:
NCR No. (if applicable):

1. Case Narrative

Read SDG Case Narrative	Y
Check Laboratory sample ID vs. Project sample ID lists	Y
Check that discussion covers each analytical type included in the SDG	Y
Check for identified nonconforming items (e.g., missed holding times, etc.)	Y

2. Chain-of-Custody (COC)

Check COC sample collection, shipping, and receiving dates	Y
Check that COC signature blocks are complete	Y
Check COC project sample IDs vs. Lab IDs and Result Form IDs	Y
Match COC requested analyses with Case Narrative and with data package content (Result Forms)	Y

3. Analytical Results Form

Verify that a Result Form is present for each sample and analysis	Y
On each Result Form check:	
SDG No.	Y
Sample ID	Y
Lab ID	Y
Date Collected	Y
Date Extracted	Y
Date Analyzed	Y
Result Matrix	Y
Result Units	Y

4. Project Verification

Check project analyte list vs. analytes reported	Y
Check project requested methods vs. analytical methods performed	Y
Check analyte reporting levels vs. project reporting level goals	Y

5. Analytical Quality Control Information

Check for surrogate recovery results (e.g., org. form II)	Y
Check for LCS results (e.g., org. form III, inorg. form XII)	Y
Check for method blank results (e.g., org. form IV, inorg. form III)	Y
Check for MS/MSD results (e.g., inorg. form V)	Y
Check for laboratory duplicate results (e.g., inorg. form VI)	NA

Check for Method Calibration and Run Documentation

organic:	instrument performance check	Y
	initial calibration data	Y
	continuing calibration data	Y
	internal standard areas	Y
	internal standard retention times	Y
	sample clean-up documentation (org. forms V through X)	Y
metal:	initial calibration data	
	continuing calibration data	
	method detection limits	
	method linear range	
	sample run sequence (inorg. forms II, IV, and VIII through XIV)	
other:	initial calibration data	
	continuing calibration data	
	method detection limits	
	sample run sequence	

6. Incorrect Information

Identify missing items or incorrect information (i.e., missing forms, unsigned forms, incorrect sample IDs, etc.)

Contact the laboratory or project personnel to obtain missing information or correct information

Document corrections below:

7. Nonconforming Items

Document all nonconforming items that can not be resolved above in a Non-Conformance Report (NCR), complete form, file, and follow-up

NCR #	Item

Reviewed By: Brooke Francis Date: 8/28/18

QA Review By: Joseph C Peters Date: 8/29/18

LEIDOS
Laboratory Data Package Detail Form

Project: Great Falls

SDG No: J41333

Analyte Group: PFAs

** SEE ATTACHED**

Field Sample ID	Lab ID #	Matrix	Analysis	Notes:

Comments:

Sample Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41333-1	7-MW28-PRL07-01	Water	07/16/18 11:27	07/20/18 09:10
320-41333-2	7-MW1-PRL06-01	Water	07/16/18 13:57	07/20/18 09:10
320-41333-3	8-MW14-PRL04-01	Water	07/16/18 17:03	07/20/18 09:10
320-41333-4	GRE-ER-MW-01	Water	07/17/18 07:15	07/20/18 09:10
320-41333-5	8-MW12-PRL03-01	Water	07/17/18 08:33	07/20/18 09:10
320-41333-6	7-MW04-PRL04-01	Water	07/17/18 12:43	07/20/18 09:10
320-41333-7	7-MW04-PRL04-01D	Water	07/17/18 12:43	07/20/18 09:10
320-41333-8	GRE-ER-SD-01	Water	07/17/18 16:10	07/20/18 09:10
320-41333-9	GRE-ER-SW-01	Water	07/17/18 16:15	07/20/18 09:10
320-41333-10	GRE09-SW1-01	Water	07/17/18 16:17	07/20/18 09:10
320-41333-11	GRE09-SD1-01	Solid	07/17/18 16:30	07/20/18 09:10
320-41333-12	7-MW34-PRL06-01	Water	07/18/18 08:13	07/20/18 09:10
320-41333-13	MW-GRE10-01-01	Water	07/18/18 12:12	07/20/18 09:10
320-41333-14	MW-GRE03-01-01	Water	07/18/18 13:48	07/20/18 09:10
320-41333-15	GRE-IDW-W-01	Water	07/18/18 15:00	07/20/18 09:10
320-41333-16	GRE-RB-01	Water	07/18/18 15:15	07/20/18 09:10
320-41333-17	MW-GRE08-01-01	Water	07/19/18 14:35	07/20/18 09:10

Leidos
PFASs by LC/MS/MS Methods Data Verification/Validation

Project: Great Falls

SDG No: J41333

Analysis: PFC

Method: E537

Laboratory: Test America

Matrix: Water/Soil

The above data package has been reviewed and the analytical quality control/quality assurance performance data have been summarized. The general criteria used to assess the analytical integrityof the data were based on DOD QSM 5.1 guidance and examination of the following:

Case Narrative	Instrument Sensitivity Checks
Analytical Holding Times	Internal Standard Performance
Sample Preservation	MS/MSD Recoveries and Differences
Method Calibration	LCS Recoveries
Method and Project Blanks	Re-analysis and Secondary Dilution

Project Specific QA/QC or contract requirements may take priority over validation criteria in this procedure.

* **If this SDG requires full validation; recalculations from the raw data are required for one point for each ICAL, one CCV, one of each QC sample, and one field sample.**

Data verification and data validation are essentially identical, with the exception that validation requires results to be recalculated from the raw data.

Remarks: DoD QSM

Some results were qualified as estimated due to MS/MSD, Surrogate, and IS discrepancies

Some results were qualified as non-detect due to blank contamination

No results were rejected due to QC outliers; data is considered usable for decision-making.

QA review of validation found no discrepancies.

Definition of Qualifiers:

"U", not detected at the associated level
"UJ", not detected and associated value estimated
"J", associated value estimated
"R", associated value unusable or analyte identity unfounded

Verification/Validation by: Brooke Francis

Date: 8/28/18

QA Reviewed by: Joseph C Peters

Date: 8/29/18

Case Narrative

Verify direct statements made within the Laboratory Case Narrative (note discrepancies).

Remarks: No additional discrepancies were noted

Re-analysis and Secondary Dilutions

Verify that re-analysis and secondary dilutions were performed and reported as necessary. Determine appropriate results to report.

Remarks: Some samples were reanalyzed at a dilution

Holding Times

Waters - Cool 4°C; 14 days to extraction; 28 days to analysis
collection. Note: Trizma preservative is recommended for aqueous samples, but not required.

Soils - Cool 4°C ; extraction within 28 days of sample collection; analysis within 28 days of sample extraction

Deviations:

Sample #	Date Collected	Date Analyzed	Comments

Actions:

1. If holding times are exceeded, all results are qualified as estimated (J/UJ)
2. If holding times are exceeded by more than 2X, reviewer may qualify non-detected results as unusable (R)

Remarks: All holding times were met

Injection Internal Standards (IS)

List any field samples, field QC samples, or laboratory QC samples where injection internal standards are not within 50 to 150% of the peak areas from the ICAL midpoint or daily initial CCV, as applicable.

Deviations:

Sample #	Injection IS/% Rec	Affected PFAS Compounds
7-MW28-PRL07-01DL	PFOA 377193	(J) All analytes reported from the diluted analysis
8-MW12-PRL03-01DL	PFOA 269223	
7-MW34-PRL06-01DL	PFOA 489984	
MW-GRE08-01-01DL	PFOA 1081296	
7-MW1-PRL06-01DL	PFOA 46919	
GRE09-SW1-01DL	PFOA 114399	
	0…….+	

Actions:

If any injection IS is <25%, qualify detects as J; non-detects as R

If any Injection IS is > upper control limit; qualify detects as J, no action for non-detects

If any surrogate is ≥ 25%, but < the lower control limit, then qualify detects as J, non-detects as UJ

Injection IS - Target PFAS Compounds Associations:

13C3-PFBA: PFBS *Only one IS, associated with all results

13C2-PFOA: PFOA, PFHxS, PFHpA

13C4-PFOS: PFOS, PFNA

13C2-PFDA: No PFAS project compounds

Remarks:

Only one injection internal standard used for the 6 target PFAS compounds. Any action applies to all compounds from the analysis with the IS outlier.

Surrogates/Extraction Internal Standards (IS)

List any field samples, field QC samples, or laboratory QC samples where surrogates/extraction internal standards are not within 50% ± of their true value.
Note: Extraction Internal Standards and surrogates are the same thing. For purposes of data validation and applying validation reason codes, they will be treated as surrogates. Injection internal standards will be treated as internal standards and the use of internal standard reason codes will be used.

Deviations:

Sample #	Surrogate - % Rec	Affected PFAS Compounds
7-MW1-PRL06-01	PFNA 197%	(J)
↓	PFOS 185%	(J)
7-MW34-PRL06-01DL	PFOS 45%	Not reported

Actions:

If any injection IS is <25%, qualify detects as J; non-detects as R

If any Injection IS is > upper control limit; qualify detects as J, no action for non-detects

If any surrogate is ≥ 25%, but < the lower control limit, then qualify detects as J, non-detects as UJ

Surrogate - Target PFAS Compounds Associations:
13C3-PFBS - PFBS
13C3-PFHxS - PFHxS
13C4-PFHpA - PFHpA
13C8-PFOA - PFOA
13C9-PFNA - PFNA
13C8-PFOS - PFOS

Remarks:

VI. Blanks

A method blank was reported for each aqueous analytical batch and one method blank was reported for each soil extraction batch? (Y/N)
Review associated laboratory and project blank samples. List documented contamination below:

Laboratory Method Blanks: All method blanks free from contamination.

Date:	Sample ID #	Compound	Conc.

All field QC blanks associated with surface water, groundwater, and sediment had no contamination.

Associated Project Blanks (e.g., equipment rinsates, field reagent blanks, source blanks, etc.)

Date	Sample ID #	Compound	Conc.

Remarks: MB, equipment rinse and rinseate blanks were free from contamination

This SDG contained the surface water, groundwater, and sediment samples for this site.

VI. Blanks (continued)

Calculate the action level based on 5X the highest blank concentration

Sample weights, volumes, and dilution factors must be taken into account when applying the 5X criteria.

0.0104 ng/mL * 10mL/0.250L = 0.416 ng/L

Deviations:

Compound	Maximum Conc. Detected, (ppb)	Action Level (ppb)	Samples Affected
PFHxS (CCB)	0.0104 ng/mL	2.08 ng/L	All samples
			(only GRE-ER-MW-01 had detections
			below the action level)

Actions:

1. If compound results exceed the action levels, the data are not qualified
2. If compound results are below the required reporting level, report results as non-detect (U) at the LOD
3. If the compound is detected above the reporting level, but below the action level, qualify as not-detected (U)
4. If contamination exists in method blanks < 1/2 LOQ, samples must be re-extracted and reanalyzed. Unlesss the MB results are < 1/10 the amount in associated samples or < 10 the action level, which ever is greater

Remarks:

All PFHxS results in any field sample below the action level was qualified as non-detect (U), reason code F06

VII. Initial & Contining Calibration

Date of initial calibration: _____

%RSD of RFs < 20% or $r^2 \geq 0.99$ for each analyte?
Analytes within 70-130% of their true value in each ICAL standard?
ICV within ± 30% of true value?

Date(s) of continuing calibration: _____

CCV analyzed at beginning and end of analytical sequence and after every 10 field samples?
CCV within ± 30% of true value?

Instrument sensitivity check (ISC) performed at the LOQ prior to analysis and every 12 hours?
ICS within ± 30% of true value?

Deviations:

Compound	Date	r value	%Drift	Samples Affected

Actions:

1. If initial calibration curve criteria are not met, qualify positive results as estimated (J) and non-detects as estimated (UJ), using professional judgement (i.e. if only the low standard is out, and the higher stards are in, then only qualify those results near the low standard).
2. Only evaluate the ICV if it brackets field samples. If the ICV does bracket field samples, then CCV actions apply
3. If a CCV is above the upper control limit, qualify detects as estimated (J). Nondects require no action.
4. If a CCV is below the lower control limit but > 40% recovery, qualify results as estimated (J/UJ).
5. If a CCV is ≤ 40% recovery, qualify detects as estimated (J) and nondetects as rejected (R)
6. If CCVs were not analyzed at the proper frequency, use professional judgement.
7. If ISC is > UCL, estimate (J) detects, no action for non-detects; If ISC is < LCL, estimate data (J/UJ), if ISC is < 30% reject (R) non-detects

Remarks: All calibration results met control limits

IX. Matrix Spike/Matrix Spike Duplicate Information

General MS/MSD Criteria:
percent recovery (%R) in-house limits
relative percent difference (RPD) 30% RPD

Project Sample(s) Spiked: 8-MW12-PRL03-01 8-MW12-PRL03-01DL

Deviations:

Compound	%R	%R Limits	RPD	RPD Limits	Samples Affected
PFNA	115/128	83-113			8-MW12-PRL03-01DL J H01
PFNA	135	83-113			8-MW12-PRL03-01 J H01

Actions:

1. If the spike recovery is above the upper control limit (UCL), qualify all positive values in the unspiked sample as estimated (J) and non-detects as estimated (UJ).
2. If the spike recovery is below the lower control limit (LCL), qualifty positive values as estimated (J). And non-detects as estimated (UJ).
3. If the spike recovery is <10%, qualify non-detect values as unusable (R)
4. If the RPD does not meet criteria, qualify positive values in the unspiked sample as estimated (J)
5. Use professional judgement to qualify additional samples in the analytical group based on MS/MSD results
6. Use professional judgement for qualification of data for unspiked compounds

* **If this SDG requires full validation; recalculate at least one % recovery and one % RPD from the raw data. Attach all calculations at the end of the validation checklist.**

Remarks: Results >4x spike amount were not reviewed ; outliers above resulted in estimation of the affected analyte in the native sample. No results were rejected.

X. Laboratory Control Sample Information

General LCS Criteria:
Percent recovery (%R) = in-house limits
RPD if LCSD performed = 30% RPD

Laboratory LCS Identifications: LCS 320-236486 LCS 320-235966

Deviations:

Compound	Date	%R	Samples Affected/Qualifiers Applied

Actions:

*** If this SDG requires full validation; recalculate at least one % recovery and one % RPD (if LCSD was performed) from the raw data. Attach all calculations at the end of the validation checklist.**

Action should be based on both the number of compounds outside the criterion and the magnitude of the exceedance.

1. If the LCS recovery is below limits but > one- half the lower limit, qualify valves as estimated (J/UJ).
2. If the LCS recovery is < one-half the lower limit, qualify detect (J) and non-detects (R)
3. If the LCS recovery is greater than the upper limit, qualify positive valves for that analyte as estimated (J).

5. Use professional judgement for qualification of data for compounds with no LCS information

Remarks: All LCS %R results met control limits

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE-ER-SB-01

Lab Sample ID: 320-41149-1
Date Collected: 07/09/18 12:50
Matrix: Water
Date Received: 07/14/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.2	U	1.6	0.49	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorooctanoic acid (PFOA)	1.2	U	1.6	0.43	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorononanoic acid (PFNA)	1.2	U	1.6	0.42	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorobutanesulfonic acid (PFBS)	0.80	U	1.6	0.37	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorohexanesulfonic acid (PFHxS)	0.80	U	1.6	0.30	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorooctanesulfonic acid (PFOS)	2.4	U	3.2	0.88	ng/L		07/18/18 08:54	07/26/18 13:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*81*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
18O2 PFHxS	*89*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C4 PFOS	*84*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*

Client Sample ID: GRE10-SB2-01

Lab Sample ID: 320-41149-2
Date Collected: 07/09/18 14:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 95.4

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U M U	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorooctanoic acid (PFOA)	**0.44**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorononanoic acid (PFNA)	**0.13**	**J**	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M U	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorohexanesulfonic acid (PFHxS)	**3.2**	**J1** J H02	0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorooctanesulfonic acid (PFOS)	**16**	**J1**	1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C4-PFHpA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
18O2 PFHxS	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C4 PFOS	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*

Client Sample ID: GRE10-SB2-02

Lab Sample ID: 320-41149-3
Date Collected: 07/09/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 85.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.53**	**M** =	0.35	0.090	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorooctanoic acid (PFOA)	**1.9**	**M** =	0.35	0.12	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorononanoic acid (PFNA)	0.23	U M U	0.35	0.094	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorobutanesulfonic acid (PFBS)	**0.13**	**J**	0.46	0.068	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorohexanesulfonic acid (PFHxS)	**34**	**E** *	0.35	0.072	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1

Client Sample ID: GRE10-SB2-02

Lab Sample ID: 320-41149-3
Date Collected: 07/09/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 85.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**4.0**		1.2	0.28	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*75*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C4-PFHpA	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C4 PFOA	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C5 PFNA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
18O2 PFHxS	*75*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C4 PFOS	*78*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.49**	**J D M** *	1.7	0.45	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorooctanoic acid (PFOA)	**1.8**	**D M** *	1.7	0.58	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorononanoic acid (PFNA)	1.2	U *	1.7	0.47	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorobutanesulfonic acid (PFBS)	1.0	U *	2.3	0.34	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorohexanesulfonic acid (PFHxS)	**41**	**D** J K01	1.7	0.36	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorooctanesulfonic acid (PFOS)	**3.9**	**J D M** *	5.8	1.4	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*65*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C4-PFHpA	*86*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C5 PFNA	*86*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
18O2 PFHxS	*72*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C4 PFOS	*70*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*

Client Sample ID: GRE10-SB1-01

Lab Sample ID: 320-41149-4
Date Collected: 07/09/18 15:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.21**	**J M** J	0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorooctanoic acid (PFOA)	**1.4**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorononanoic acid (PFNA)	**0.78**		0.31	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorobutanesulfonic acid (PFBS)	0.18	U M U	0.41	0.060	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorohexanesulfonic acid (PFHxS)	**1.8**		0.31	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorooctanesulfonic acid (PFOS)	**12**	**M** =	1.0	0.24	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C4-PFHpA	*86*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
18O2 PFHxS	*80*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C4 PFOS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE10-SB1-01D

Lab Sample ID: 320-41149-5
Date Collected: 07/09/18 15:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 97.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.18**	**J M** J	0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorooctanoic acid (PFOA)	**1.4**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorononanoic acid (PFNA)	**0.74**	**M** =	0.31	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorobutanesulfonic acid (PFBS)	0.18	U M U	0.41	0.060	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorohexanesulfonic acid (PFHxS)	**1.9**		0.31	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorooctanesulfonic acid (PFOS)	**13**	**M** =	1.0	0.24	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C4-PFHpA	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
18O2 PFHxS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C4 PFOS	*78*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*

Client Sample ID: GRE10-SB3-01

Lab Sample ID: 320-41149-6
Date Collected: 07/09/18 15:50
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 91.9

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U	0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorooctanoic acid (PFOA)	**0.35**	**M** =	0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorononanoic acid (PFNA)	**0.16**	**J M** J	0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M U	0.43	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorohexanesulfonic acid (PFHxS)	**2.0**		0.32	0.066	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorooctanesulfonic acid (PFOS)	**12**		1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*80*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C4-PFHpA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C5 PFNA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
18O2 PFHxS	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C4 PFOS	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*

Client Sample ID: GRE09-SB1-01

Lab Sample ID: 320-41149-7
Date Collected: 07/09/18 16:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.22	U	0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorooctanoic acid (PFOA)	**0.33**		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorononanoic acid (PFNA)	**0.18**	**J M** J	0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M U	0.43	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorohexanesulfonic acid (PFHxS)	**1.7**		0.32	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1

Client Sample ID: GRE09-SB1-01

Lab Sample ID: 320-41149-7
Date Collected: 07/09/18 16:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**16**		1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C4-PFHpA	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C5 PFNA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
18O2 PFHxS	*75*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C4 PFOS	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*

Client Sample ID: GRE09-SB1-01D

Lab Sample ID: 320-41149-8
Date Collected: 07/09/18 16:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.3

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorooctanoic acid (PFOA)	**0.33**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorononanoic acid (PFNA)	**0.19**	**J M** J	0.31	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M U	0.42	0.062	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorohexanesulfonic acid (PFHxS)	**1.7**		0.31	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorooctanesulfonic acid (PFOS)	**15**		1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C4-PFHpA	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C5 PFNA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C4 PFOS	*78*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*

Client Sample ID: GRE09-SB2-01

Lab Sample ID: 320-41149-9
Date Collected: 07/09/18 16:30
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U M U	0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorooctanoic acid (PFOA)	**0.22**	**J M** J	0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorononanoic acid (PFNA)	0.21	U M U	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M U	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorohexanesulfonic acid (PFHxS)	**0.69**		0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorooctanesulfonic acid (PFOS)	**6.8**		1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
13C4-PFHpA	*86*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*

Client Sample ID: GRE09-SB2-01

Lab Sample ID: 320-41149-9

Date Collected: 07/09/18 16:30
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 96.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
13C4 PFOS	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*

Client Sample ID: GRE-FB-POT-01

Lab Sample ID: 320-41149-10

Date Collected: 07/09/18 17:05
Date Received: 07/14/18 09:10

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.1	U M U	1.5	0.46	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorooctanoic acid (PFOA)	1.1	U M U	1.5	0.41	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorononanoic acid (PFNA)	1.1	U	1.5	0.39	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorobutanesulfonic acid (PFBS)	0.76	U	1.5	0.35	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorohexanesulfonic acid (PFHxS)	0.76	U M U	1.5	0.29	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorooctanesulfonic acid (PFOS)	2.3	U	3.0	0.83	ng/L		07/18/18 08:54	07/22/18 10:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C4-PFHpA	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C4 PFOA	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
18O2 PFHxS	*97*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C4 PFOS	*95*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*

Client Sample ID: GRE-FB-DI-01

Lab Sample ID: 320-41149-11

Date Collected: 07/10/18 09:15
Date Received: 07/14/18 09:10

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U	1.7	0.52	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorooctanoic acid (PFOA)	1.3	U M U	1.7	0.46	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.44	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorobutanesulfonic acid (PFBS)	0.85	U	1.7	0.39	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorohexanesulfonic acid (PFHxS)	0.85	U	1.7	0.32	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.4	0.94	ng/L		07/18/18 08:54	07/22/18 10:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*86*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C5 PFNA	*91*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
18O2 PFHxS	*100*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C4 PFOS	*90*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*

Client Sample ID: GRE-ER-SB-02

Lab Sample ID: 320-41149-12

Date Collected: 07/10/18 09:20
Date Received: 07/14/18 09:10
Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U	1.8	0.55	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorooctanoic acid (PFOA)	1.3	U	1.8	0.48	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorononanoic acid (PFNA)	1.3	U	1.8	0.46	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorobutanesulfonic acid (PFBS)	0.89	U	1.8	0.41	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorohexanesulfonic acid (PFHxS)	0.89	U	1.8	0.34	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	0.98	ng/L		07/18/18 08:54	07/22/18 11:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*88*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
18O2 PFHxS	*90*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C4 PFOS	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*

Client Sample ID: GRE03-SB3-01

Lab Sample ID: 320-41149-13

Date Collected: 07/10/18 10:30
Date Received: 07/14/18 09:10
Matrix: Solid
Percent Solids: 92.0

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.27**	**J**	0.33	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorooctanoic acid (PFOA)	**0.33**		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorononanoic acid (PFNA)	0.22	U M U	0.33	0.088	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorobutanesulfonic acid (PFBS)	**0.12**	**J**	0.43	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorohexanesulfonic acid (PFHxS)	**0.86**		0.33	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorooctanesulfonic acid (PFOS)	**4.3**		1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*93*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C5 PFNA	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
18O2 PFHxS	*93*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C4 PFOS	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*

Client Sample ID: GRE03-SB3-02

Lab Sample ID: 320-41149-14

Date Collected: 07/10/18 11:05
Date Received: 07/14/18 09:10
Matrix: Solid
Percent Solids: 92.4

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.11**	**J**	0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorooctanoic acid (PFOA)	**0.47**		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorononanoic acid (PFNA)	0.21	U	0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.43	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**J**	0.32	0.066	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorooctanesulfonic acid (PFOS)	**0.57**	**J**	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	89		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C4-PFHpA	85		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C4 PFOA	87		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C5 PFNA	90		50 - 150	07/18/18 08:48	07/30/18 05:26	1
18O2 PFHxS	90		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C4 PFOS	92		50 - 150	07/18/18 08:48	07/30/18 05:26	1

Client Sample ID: GRE04-SB1-01 — Lab Sample ID: 320-41149-15

Date Collected: 07/10/18 11:45 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.8**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorooctanoic acid (PFOA)	**0.11**	**J**	0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorononanoic acid (PFNA)	0.21	U M U	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorohexanesulfonic acid (PFHxS)	**0.45**		0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorooctanesulfonic acid (PFOS)	**8.5**	**M =**	1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	96		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C4-PFHpA	93		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C4 PFOA	91		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C5 PFNA	96		50 - 150	07/18/18 08:48	07/30/18 05:34	1
18O2 PFHxS	96		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C4 PFOS	93		50 - 150	07/18/18 08:48	07/30/18 05:34	1

Client Sample ID: GRE06-SB1-01 — Lab Sample ID: 320-41149-16

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 89.5**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.35**		0.33	0.086	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorooctanoic acid (PFOA)	**4.4**		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorononanoic acid (PFNA)	**0.17**	**J**	0.33	0.090	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorobutanesulfonic acid (PFBS)	**0.24**	**J**	0.44	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorohexanesulfonic acid (PFHxS)	**3.4**		0.33	0.069	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorooctanesulfonic acid (PFOS)	**51**	**M E** *	1.1	0.27	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	94		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C4-PFHpA	93		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C4 PFOA	92		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C5 PFNA	84		50 - 150	07/18/18 08:48	07/30/18 05:42	1
18O2 PFHxS	97		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C4 PFOS	90		50 - 150	07/18/18 08:48	07/30/18 05:42	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.2	U *	3.3	0.86	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorooctanoic acid (PFOA)	**4.2**	**D** *	3.3	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10

Client Sample ID: GRE06-SB1-01

Lab Sample ID: 320-41149-16
Date Collected: 07/11/18 13:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 89.5

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	2.2	U *	3.3	0.90	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorobutanesulfonic acid (PFBS)	2.0	U *	4.4	0.65	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorohexanesulfonic acid (PFHxS)	**3.4**	**D ***	3.3	0.69	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorooctanesulfonic acid (PFOS)	**60**	**D M** J K01	11	2.7	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*76*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C4 PFOA	*96*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
18O2 PFHxS	*84*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C4 PFOS	*77*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*

Client Sample ID: GRE06-SB1-01D

Lab Sample ID: 320-41149-17
Date Collected: 07/11/18 13:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.62**		0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorooctanoic acid (PFOA)	**4.4**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorononanoic acid (PFNA)	**0.17**	**J**	0.31	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorobutanesulfonic acid (PFBS)	**0.36**	**J**	0.41	0.060	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorohexanesulfonic acid (PFHxS)	**3.4**		0.31	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorooctanesulfonic acid (PFOS)	**49**	**E ***	1.0	0.24	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C4-PFHpA	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
18O2 PFHxS	*93*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C4 PFOS	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.0	U M *	3.1	0.80	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorooctanoic acid (PFOA)	**4.4**	**D M ***	3.1	1.0	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorononanoic acid (PFNA)	2.0	U *	3.1	0.83	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorobutanesulfonic acid (PFBS)	1.8	U *	4.1	0.60	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorohexanesulfonic acid (PFHxS)	**3.6**	**D ***	3.1	0.63	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorooctanesulfonic acid (PFOS)	**56**	**D M** J K01	10	2.4	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*80*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:35*	*10*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:35*	*10*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:35*	*10*

Client Sample ID: GRE06-SB1-01D — Lab Sample ID: 320-41149-17

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.1**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	95		50 - 150	07/18/18 08:48	08/01/18 15:35	10
18O2 PFHxS	84		50 - 150	07/18/18 08:48	08/01/18 15:35	10
13C4 PFOS	84		50 - 150	07/18/18 08:48	08/01/18 15:35	10

Client Sample ID: GRE06-SB2-01 — Lab Sample ID: 320-41149-18

Date Collected: 07/11/18 13:40 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.6**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.42		0.32	0.082	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorooctanoic acid (PFOA)	13		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorononanoic acid (PFNA)	0.11	J	0.32	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorobutanesulfonic acid (PFBS)	0.60		0.42	0.062	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorohexanesulfonic acid (PFHxS)	16		0.32	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorooctanesulfonic acid (PFOS)	25	E *	1.1	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	88		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C4-PFHpA	89		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C4 PFOA	95		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C5 PFNA	89		50 - 150	07/18/18 08:48	07/30/18 05:57	1
18O2 PFHxS	89		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C4 PFOS	91		50 - 150	07/18/18 08:48	07/30/18 05:57	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.41	J D M *	1.6	0.41	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorooctanoic acid (PFOA)	13	D M *	1.6	0.53	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorononanoic acid (PFNA)	1.1	U *	1.6	0.43	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorobutanesulfonic acid (PFBS)	0.57	J D *	2.1	0.31	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorohexanesulfonic acid (PFHxS)	17	D *	1.6	0.33	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorooctanesulfonic acid (PFOS)	25	D M J K01	5.3	1.3	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	84		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C4-PFHpA	94		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C4 PFOA	95		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C5 PFNA	93		50 - 150	07/18/18 08:48	08/01/18 15:43	5
18O2 PFHxS	85		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C4 PFOS	82		50 - 150	07/18/18 08:48	08/01/18 15:43	5

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE07-SB1-01

Lab Sample ID: 320-41149-19
Date Collected: 07/11/18 14:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.3

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	3.1		0.31	0.082	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorooctanoic acid (PFOA)	14	J1	0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorononanoic acid (PFNA)	5.1	J1 J H02	0.31	0.085	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorobutanesulfonic acid (PFBS)	1.6	M =	0.42	0.062	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorohexanesulfonic acid (PFHxS)	35	E J1 *	0.31	0.065	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorooctanesulfonic acid (PFOS)	340	M E J1 *	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*89*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C4-PFHpA	*85*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C5 PFNA	*58*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C4 PFOS	*54*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	10	U M *	16	4.1	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorooctanoic acid (PFOA)	15	J J1 D M *	16	5.2	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorononanoic acid (PFNA)	6.6	J J1 D *	16	4.3	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorobutanesulfonic acid (PFBS)	9.4	U *	21	3.1	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorohexanesulfonic acid (PFHxS)	37	J1 D J H02 K01	16	3.3	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorooctanesulfonic acid (PFOS)	520	J1 D J K01	52	13	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*57*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C4-PFHpA	*90*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C5 PFNA	*80*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
18O2 PFHxS	*73*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C4 PFOS	*71*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*

Client Sample ID: GRE07-SB1-02

Lab Sample ID: 320-41149-20
Date Collected: 07/11/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 90.4

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.59		0.33	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorooctanoic acid (PFOA)	5.6		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorononanoic acid (PFNA)	1.0		0.33	0.088	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorobutanesulfonic acid (PFBS)	0.12	J	0.43	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorohexanesulfonic acid (PFHxS)	10		0.33	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorooctanesulfonic acid (PFOS)	62	E *	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE07-SB1-02

Lab Sample ID: 320-41149-20

Date Collected: 07/11/18 14:35
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 90.4

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*94*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
18O2 PFHxS	*98*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C4 PFOS	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.2	U M *	3.3	0.85	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorooctanoic acid (PFOA)	**6.0**	**D** *	3.3	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorononanoic acid (PFNA)	**1.1**	**J D** *	3.3	0.88	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorobutanesulfonic acid (PFBS)	2.0	U *	4.3	0.64	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorohexanesulfonic acid (PFHxS)	**10**	**D** *	3.3	0.67	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorooctanesulfonic acid (PFOS)	**72**	**D M** J K01	11	2.6	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*68*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C5 PFNA	*88*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
18O2 PFHxS	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C4 PFOS	*77*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*

Client Sample ID: GRE-ER-SB-03

Lab Sample ID: 320-41149-21

Date Collected: 07/11/18 19:10
Date Received: 07/14/18 09:10

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.4	U	1.8	0.56	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorooctanoic acid (PFOA)	1.4	U M U	1.8	0.49	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorobutanesulfonic acid (PFBS)	0.91	U	1.8	0.42	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorohexanesulfonic acid (PFHxS)	0.91	U	1.8	0.35	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorooctanesulfonic acid (PFOS)	**10**		3.7	1.0	ng/L		07/18/18 08:54	07/22/18 11:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*87*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
18O2 PFHxS	*95*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C4 PFOS	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE03-SB1-01

Lab Sample ID: 320-41149-22
Date Collected: 07/11/18 19:55
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.5

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.56		0.32	0.082	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorooctanoic acid (PFOA)	2.6		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorononanoic acid (PFNA)	2.0		0.32	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorobutanesulfonic acid (PFBS)	0.092	J M J	0.42	0.062	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorohexanesulfonic acid (PFHxS)	1.7		0.32	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorooctanesulfonic acid (PFOS)	84	E *	1.1	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C4-PFHpA	*87*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C5 PFNA	*71*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
18O2 PFHxS	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C4 PFOS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M *	3.2	0.82	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorooctanoic acid (PFOA)	2.6	J D *	3.2	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorononanoic acid (PFNA)	2.3	J D *	3.2	0.85	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U *	4.2	0.62	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorohexanesulfonic acid (PFHxS)	1.8	J D *	3.2	0.65	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorooctanesulfonic acid (PFOS)	110	D J K01	11	2.5	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*71*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C4-PFHpA	*91*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C5 PFNA	*87*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
18O2 PFHxS	*76*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C4 PFOS	*74*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*

Client Sample ID: GRE03-SB2-01

Lab Sample ID: 320-41149-23
Date Collected: 07/11/18 20:25
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.66		0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorooctanoic acid (PFOA)	2.6		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorononanoic acid (PFNA)	3.0		0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorobutanesulfonic acid (PFBS)	0.16	J M J	0.43	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorohexanesulfonic acid (PFHxS)	6.7		0.32	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorooctanesulfonic acid (PFOS)	100	E *	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1

Client Sample ID: GRE03-SB2-01

Lab Sample ID: 320-41149-23

Date Collected: 07/11/18 20:25
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 92.6

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C4-PFHpA	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C4 PFOA	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C5 PFNA	*64*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
18O2 PFHxS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C4 PFOS	*65*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M *	3.2	0.84	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorooctanoic acid (PFOA)	**2.6**	**J D M** *	3.2	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorononanoic acid (PFNA)	**3.4**	**D** *	3.2	0.87	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U *	4.3	0.63	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorohexanesulfonic acid (PFHxS)	**6.5**	**D** *	3.2	0.67	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorooctanesulfonic acid (PFOS)	**150**	**D** J K01	11	2.6	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*65*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
18O2 PFHxS	*73*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C4 PFOS	*71*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*

Client Sample ID: GRE03-SB4-01

Lab Sample ID: 320-41149-24

Date Collected: 07/11/18 20:50
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 94.0

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.56**		0.32	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorooctanoic acid (PFOA)	**2.8**		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorononanoic acid (PFNA)	**2.6**		0.32	0.086	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorobutanesulfonic acid (PFBS)	**0.29**	**J M** J	0.42	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorohexanesulfonic acid (PFHxS)	**3.8**		0.32	0.066	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorooctanesulfonic acid (PFOS)	**62**	**E** *	1.1	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*81*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C5 PFNA	*80*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
18O2 PFHxS	*81*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C4 PFOS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M *	3.2	0.83	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorooctanoic acid (PFOA)	**2.8**	**J D M** *	3.2	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10

Client Sample ID: GRE03-SB4-01

Lab Sample ID: 320-41149-24
Date Collected: 07/11/18 20:50
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.0

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**3.0**	**J D** *	3.2	0.86	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U *	4.2	0.63	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorohexanesulfonic acid (PFHxS)	**4.0**	**D** *	3.2	0.66	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorooctanesulfonic acid (PFOS)	**74**	**D** J K01	11	2.5	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*68*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C4-PFHpA	*96*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C5 PFNA	*86*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
18O2 PFHxS	*75*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C4 PFOS	*75*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*

Client Sample ID: GRE03-SB5-01

Lab Sample ID: 320-41149-25
Date Collected: 07/11/18 21:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 90.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.60**		0.33	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorooctanoic acid (PFOA)	**2.4**		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorononanoic acid (PFNA)	**1.3**		0.33	0.088	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorobutanesulfonic acid (PFBS)	**0.38**	**J M** J	0.44	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorohexanesulfonic acid (PFHxS)	**6.8**		0.33	0.068	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorooctanesulfonic acid (PFOS)	**190**	**M E** *	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C4-PFHpA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C5 PFNA	*51*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
18O2 PFHxS	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C4 PFOS	*56*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	4.4	U M *	6.5	1.7	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorooctanoic acid (PFOA)	**2.6**	**J D M** *	6.5	2.2	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorononanoic acid (PFNA)	4.4	U M *	6.5	1.8	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorobutanesulfonic acid (PFBS)	3.9	U *	8.7	1.3	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorohexanesulfonic acid (PFHxS)	**6.3**	**J D** *	6.5	1.4	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorooctanesulfonic acid (PFOS)	**330**	**D** J K01	22	5.2	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*74*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*

Client Sample ID: GRE03-SB5-01 — Lab Sample ID: 320-41149-25

Date Collected: 07/11/18 21:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 90.7**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
13C4 PFOS	*75*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*

Client Sample ID: GRE04-SB2-01 — Lab Sample ID: 320-41149-26

Date Collected: 07/12/18 11:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 95.8**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.10**	**J**	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorooctanoic acid (PFOA)	**0.45**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorononanoic acid (PFNA)	0.21	U	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorobutanesulfonic acid (PFBS)	**0.070**	**J**	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorohexanesulfonic acid (PFHxS)	**5.0**		0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorooctanesulfonic acid (PFOS)	**14**		1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*94*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C4 PFOA	*94*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C5 PFNA	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
18O2 PFHxS	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C4 PFOS	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*

Client Sample ID: GRE07-SB2-01 — Lab Sample ID: 320-41149-27

Date Collected: 07/12/18 12:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 83.6**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**5.5**		0.36	0.092	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorooctanoic acid (PFOA)	**48**	**E** *	0.36	0.12	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorononanoic acid (PFNA)	**4.2**	**M**	0.36	0.096	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorobutanesulfonic acid (PFBS)	**8.1**		0.47	0.070	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorohexanesulfonic acid (PFHxS)	**170**	**E** *	0.36	0.073	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorooctanesulfonic acid (PFOS)	**1000**	**E** *	1.2	0.28	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*146*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C4-PFHpA	*119*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C4 PFOA	*83*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C5 PFNA	*71*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
18O2 PFHxS	*122*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C4 PFOS	*66*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE07-SB2-01

Lab Sample ID: 320-41149-27
Date Collected: 07/12/18 12:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 83.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	24	U M *	36	9.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorooctanoic acid (PFOA)	**45**	**D** J K01	36	12	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorononanoic acid (PFNA)	24	U *	36	9.6	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorobutanesulfonic acid (PFBS)	**9.7**	**J D** *	47	7.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorohexanesulfonic acid (PFHxS)	**280**	**D** J K01	36	7.3	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorooctanesulfonic acid (PFOS)	**1700**	**D** J K01	120	28	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*58*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C4-PFHpA	*93*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C4 PFOA	*87*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C5 PFNA	*76*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
18O2 PFHxS	*69*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C4 PFOS	*69*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*

Client Sample ID: GRE08-SB1-01

Lab Sample ID: 320-41149-28
Date Collected: 07/12/18 13:25
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.5

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**2.1**		0.31	0.081	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorooctanoic acid (PFOA)	**7.6**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorononanoic acid (PFNA)	**1.4**		0.31	0.084	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorobutanesulfonic acid (PFBS)	**1.0**	**M** =	0.41	0.061	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorohexanesulfonic acid (PFHxS)	**14**		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorooctanesulfonic acid (PFOS)	**200**	**E** *	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*89*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C5 PFNA	*60*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C4 PFOS	*62*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	10	U M *	16	4.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorooctanoic acid (PFOA)	**8.2**	**J D** *	16	5.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorononanoic acid (PFNA)	10	U *	16	4.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorobutanesulfonic acid (PFBS)	9.3	U *	21	3.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorohexanesulfonic acid (PFHxS)	**15**	**J D** *	16	3.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorooctanesulfonic acid (PFOS)	**310**	**D** J K01	52	12	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE08-SB1-01

Lab Sample ID: 320-41149-28

Date Collected: 07/12/18 13:25
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 96.5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*73*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C5 PFNA	*83*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
18O2 PFHxS	*70*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C4 PFOS	*70*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*

Client Sample ID: GRE08-SB2-01

Lab Sample ID: 320-41149-29

Date Collected: 07/12/18 13:55
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 97.9

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**1.7**		0.31	0.080	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorooctanoic acid (PFOA)	**6.7**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorononanoic acid (PFNA)	**1.3**	**M** J G02	0.31	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorobutanesulfonic acid (PFBS)	**0.82**	**M** =	0.41	0.060	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorohexanesulfonic acid (PFHxS)	**16**		0.31	0.063	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorooctanesulfonic acid (PFOS)	**300**	**E** *	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C4-PFHpA	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C5 PFNA	*45*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
18O2 PFHxS	*78*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C4 PFOS	*45*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	10	U M *	15	4.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorooctanoic acid (PFOA)	**6.7**	**J D** *	15	5.1	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorononanoic acid (PFNA)	10	U *	15	4.1	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorobutanesulfonic acid (PFBS)	9.2	U *	20	3.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorohexanesulfonic acid (PFHxS)	**16**	**D** *	15	3.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorooctanesulfonic acid (PFOS)	**600**	**D M** J K01	51	12	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C4-PFHpA	*79*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C5 PFNA	*73*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
18O2 PFHxS	*67*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C4 PFOS	*64*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE08-SB3-01

Lab Sample ID: 320-41149-30
Date Collected: 07/12/18 14:17
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 89.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3		0.33	0.086	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorooctanoic acid (PFOA)	6.6		0.33	0.11	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorononanoic acid (PFNA)	0.79	J G02	0.33	0.090	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorobutanesulfonic acid (PFBS)	0.79	M =	0.44	0.065	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorohexanesulfonic acid (PFHxS)	29	E *	0.33	0.069	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorooctanesulfonic acid (PFOS)	540	E *	1.1	0.27	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*95*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C5 PFNA	*34*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
18O2 PFHxS	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C4 PFOS	*32*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	22	U M *	33	8.6	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorooctanoic acid (PFOA)	22	U *	33	11	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorononanoic acid (PFNA)	22	U M *	33	9.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorobutanesulfonic acid (PFBS)	20	U *	44	6.5	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorohexanesulfonic acid (PFHxS)	26	J D J K01	33	6.9	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorooctanesulfonic acid (PFOS)	1300	D J K01	110	27	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*79*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C4-PFHpA	*77*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C5 PFNA	*81*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
18O2 PFHxS	*80*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C4 PFOS	*74*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*

Client Sample ID: GRE08-SB4-01

Lab Sample ID: 320-41149-31
Date Collected: 07/12/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 87.2

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.87		0.34	0.088	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorooctanoic acid (PFOA)	7.6		0.34	0.11	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorononanoic acid (PFNA)	4.2	J G02	0.34	0.092	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorobutanesulfonic acid (PFBS)	0.27	J M J	0.45	0.067	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorohexanesulfonic acid (PFHxS)	13		0.34	0.070	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorooctanesulfonic acid (PFOS)	1000	E *	1.1	0.27	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1

Client Sample ID: GRE08-SB4-01

Lab Sample ID: 320-41149-31

Date Collected: 07/12/18 14:35
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 87.2

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*90*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C4-PFHpA	*98*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C4 PFOA	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C5 PFNA	*27*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
18O2 PFHxS	*89*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C4 PFOS	*22*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	23	U *	34	8.8	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorooctanoic acid (PFOA)	23	U *	34	11	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorononanoic acid (PFNA)	23	U *	34	9.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorobutanesulfonic acid (PFBS)	20	U *	45	6.7	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorohexanesulfonic acid (PFHxS)	**11**	**J D** *	34	7.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorooctanesulfonic acid (PFOS)	**2800**	**E D** J N03 K01	110	27	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*54*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C4-PFHpA	*81*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C4 PFOA	*94*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C5 PFNA	*70*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C4 PFOS	*72*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*

Client Sample ID: GRE07-SB3-01

Lab Sample ID: 320-41149-32

Date Collected: 07/13/18 08:20
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 97.2

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.77**	**M** =	0.31	0.080	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorooctanoic acid (PFOA)	**2.2**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorononanoic acid (PFNA)	**2.3**		0.31	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorobutanesulfonic acid (PFBS)	**0.37**	**J M** J	0.41	0.060	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorohexanesulfonic acid (PFHxS)	**7.3**		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorooctanesulfonic acid (PFOS)	**160**	**E** *	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*85*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C4-PFHpA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C5 PFNA	*66*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
18O2 PFHxS	*82*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C4 PFOS	*67*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	4.1	U M *	6.1	1.6	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorooctanoic acid (PFOA)	**2.1**	**J D M** *	6.1	2.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20

Client Sample ID: GRE07-SB3-01 — Lab Sample ID: 320-41149-32

Date Collected: 07/13/18 08:20 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.2**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**2.4**	**J D M** *	6.1	1.7	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorobutanesulfonic acid (PFBS)	3.7	U *	8.2	1.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorohexanesulfonic acid (PFHxS)	**7.7**	**D** *	6.1	1.3	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorooctanesulfonic acid (PFOS)	**220**	**D** J K01	20	4.9	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*78*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C4 PFOA	*93*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
18O2 PFHxS	*78*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C4 PFOS	*76*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*

Client Sample ID: GRE04-SB3-01 — Lab Sample ID: 320-41149-33

Date Collected: 07/13/18 08:40 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 93.8**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.11**	**J M** J	0.32	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorooctanoic acid (PFOA)	**0.78**		0.32	0.11	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorononanoic acid (PFNA)	**0.38**		0.32	0.086	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.43	0.063	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**		0.32	0.066	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorooctanesulfonic acid (PFOS)	**6.6**		1.1	0.26	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*63*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C4-PFHpA	*73*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C4 PFOA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C5 PFNA	*80*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
18O2 PFHxS	*64*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C4 PFOS	*66*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*

Client Sample ID: GRE05-SB1-01 — Lab Sample ID: 320-41149-34

Date Collected: 07/13/18 09:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.1**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.23**	**J M** J	0.31	0.080	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorooctanoic acid (PFOA)	**0.93**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorononanoic acid (PFNA)	**1.3**		0.31	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M U	0.41	0.061	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorohexanesulfonic acid (PFHxS)	**0.74**		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorooctanesulfonic acid (PFOS)	**42**	**E** *	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1

Client Sample ID: GRE05-SB1-01 — Lab Sample ID: 320-41149-34

Date Collected: 07/13/18 09:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.1**

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*71*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C4-PFHpA	*82*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C4 PFOA	*87*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C5 PFNA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
18O2 PFHxS	*78*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C4 PFOS	*73*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M *	3.1	0.80	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorooctanoic acid (PFOA)	**1.1**	**J D ***	3.1	1.0	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorononanoic acid (PFNA)	**1.4**	**J D ***	3.1	0.83	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U *	4.1	0.61	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorohexanesulfonic acid (PFHxS)	**0.80**	**J D ***	3.1	0.64	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorooctanesulfonic acid (PFOS)	**46**	**D** J K01	10	2.5	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*67*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C5 PFNA	*85*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
18O2 PFHxS	*73*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C4 PFOS	*69*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*

Client Sample ID: GRE05-SB2-01 — Lab Sample ID: 320-41149-35

Date Collected: 07/13/18 09:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.3**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.22**	**J M** J	0.31	0.081	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorooctanoic acid (PFOA)	**0.87**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorononanoic acid (PFNA)	**3.4**		0.31	0.084	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M U	0.41	0.061	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorohexanesulfonic acid (PFHxS)	**0.93**		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorooctanesulfonic acid (PFOS)	**59**	**E** *	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*69*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C4-PFHpA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C4 PFOA	*82*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C5 PFNA	*70*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
18O2 PFHxS	*70*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C4 PFOS	*69*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M *	3.1	0.81	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorooctanoic acid (PFOA)	2.1	U M *	3.1	1.0	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorononanoic acid (PFNA)	**3.8**	**D** *	3.1	0.84	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE05-SB2-01

Lab Sample ID: 320-41149-35
Date Collected: 07/13/18 09:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.3

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U *	4.1	0.61	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	**J D** *	3.1	0.64	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorooctanesulfonic acid (PFOS)	**67**	**D** J K01	10	2.5	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*59*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C4-PFHpA	*79*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C4 PFOA	*81*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C5 PFNA	*74*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
18O2 PFHxS	*61*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C4 PFOS	*61*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*

Client Sample ID: GRE-IDW-S-01

Lab Sample ID: 320-41149-36
Date Collected: 07/13/18 10:55
Matrix: Solid
Date Received: 07/14/18 09:10

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0040	U	0.010	0.0016	mg/L			08/06/18 11:30	1
2-Butanone (MEK)	0.040	U	0.10	0.018	mg/L			08/06/18 11:30	1
Carbon tetrachloride	0.0040	U	0.010	0.0019	mg/L			08/06/18 11:30	1
Chlorobenzene	0.0040	U	0.010	0.0017	mg/L			08/06/18 11:30	1
Chloroform	0.0040	U	0.010	0.0016	mg/L			08/06/18 11:30	1
1,2-Dichloroethane	0.0040	U	0.010	0.0013	mg/L			08/06/18 11:30	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			08/06/18 11:30	1
Tetrachloroethene	0.0040	U	0.010	0.0020	mg/L			08/06/18 11:30	1
Trichloroethene	0.0040	U	0.010	0.0016	mg/L			08/06/18 11:30	1
Vinyl chloride	0.0020	U	0.010	0.0010	mg/L			08/06/18 11:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*78 - 120*		*08/06/18 11:30*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*64 - 129*		*08/06/18 11:30*	*1*
4-Bromofluorobenzene (Surr)	*98*		*78 - 121*		*08/06/18 11:30*	*1*
Dibromofluoromethane (Surr)	*104*		*79 - 119*		*08/06/18 11:30*	*1*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: 7-MW28-PRL07-01

Lab Sample ID: 320-41333-1
Date Collected: 07/16/18 11:27
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	750	E *	1.7	0.50	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorooctanoic acid (PFOA)	550	E *	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorononanoic acid (PFNA)	3.0		1.7	0.43	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorobutanesulfonic acid (PFBS)	800	E *	1.7	0.38	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorohexanesulfonic acid (PFHxS)	2100	E *	1.7	0.31	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorooctanesulfonic acid (PFOS)	250		3.3	0.91	ng/L		07/24/18 17:51	07/29/18 05:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*77*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C4-PFHpA	*54*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C4 PFOA	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C5 PFNA	*90*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
18O2 PFHxS	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C4 PFOS	*89*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	730	D J K01	33	10	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorooctanoic acid (PFOA)	550	D J K01	33	8.9	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorononanoic acid (PFNA)	25	U *	33	8.6	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorobutanesulfonic acid (PFBS)	1300	D J K01	33	7.6	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorohexanesulfonic acid (PFHxS)	3200	D J K01	33	6.3	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorooctanesulfonic acid (PFOS)	240	D *	66	18	ng/L		07/24/18 17:51	08/03/18 06:40	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C4-PFHpA	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C4 PFOA	*68*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C5 PFNA	*63*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
18O2 PFHxS	*59*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C4 PFOS	*57*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*

Client Sample ID: 7-MW1-PRL06-01

Lab Sample ID: 320-41333-2
Date Collected: 07/16/18 13:57
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2700	E *	1.7	0.51	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorooctanoic acid (PFOA)	3000	E M *	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorononanoic acid (PFNA)	6.7	J G01	1.7	0.43	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorobutanesulfonic acid (PFBS)	770	E *	1.7	0.38	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorohexanesulfonic acid (PFHxS)	7400	E *	1.7	0.32	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorooctanesulfonic acid (PFOS)	120	J G01	3.3	0.92	ng/L		07/24/18 17:51	07/29/18 05:43	1

Client Sample ID: 7-MW1-PRL06-01

Lab Sample ID: 320-41333-2

Date Collected: 07/16/18 13:57
Matrix: Water
Date Received: 07/20/18 09:10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	137		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C4-PFHpA	64		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C4 PFOA	80		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C5 PFNA	197	Q	50 - 150	07/24/18 17:51	07/29/18 05:43	1
18O2 PFHxS	65		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C4 PFOS	185	Q	50 - 150	07/24/18 17:51	07/29/18 05:43	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	3900	D J K01	170	51	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorooctanoic acid (PFOA)	3900	D M J K01	170	45	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorononanoic acid (PFNA)	120	U *	170	43	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorobutanesulfonic acid (PFBS)	950	D J K01	170	38	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorohexanesulfonic acid (PFHxS)	20000	D J K01	170	32	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorooctanesulfonic acid (PFOS)	150	J D M *	330	92	ng/L		07/24/18 17:51	08/07/18 22:50	100

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	115	M	50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C4-PFHpA	83		50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C4 PFOA	81		50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C5 PFNA	86		50 - 150	07/24/18 17:51	08/07/18 22:50	100
18O2 PFHxS	89		50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C4 PFOS	75		50 - 150	07/24/18 17:51	08/07/18 22:50	100

Client Sample ID: 8-MW14-PRL04-01

Lab Sample ID: 320-41333-3

Date Collected: 07/16/18 17:03
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	58		1.7	0.53	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorooctanoic acid (PFOA)	44		1.7	0.47	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorononanoic acid (PFNA)	0.67	J	1.7	0.45	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorobutanesulfonic acid (PFBS)	38		1.7	0.40	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorohexanesulfonic acid (PFHxS)	200		1.7	0.33	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorooctanesulfonic acid (PFOS)	30		3.5	0.95	ng/L		07/24/18 17:51	08/03/18 07:03	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	58		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C4-PFHpA	60		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C4 PFOA	66		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C5 PFNA	65		50 - 150	07/24/18 17:51	08/03/18 07:03	1
18O2 PFHxS	58		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C4 PFOS	59		50 - 150	07/24/18 17:51	08/03/18 07:03	1

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: GRE-ER-MW-01

Lab Sample ID: 320-41333-4
Date Collected: 07/17/18 07:15
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U M U	1.7	0.53	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorooctanoic acid (PFOA)	1.3	U M U	1.7	0.47	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorononanoic acid (PFNA)	1.3	U M U	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorobutanesulfonic acid (PFBS)	0.86	U	1.7	0.40	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorohexanesulfonic acid (PFHxS)	0.86 **0.61**	**J** U F06	1.7	0.33	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	0.95	ng/L		07/24/18 17:51	07/29/18 05:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*78*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C4-PFHpA	*74*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C4 PFOA	*75*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C5 PFNA	*78*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C4 PFOS	*77*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*

Client Sample ID: 8-MW12-PRL03-01

Lab Sample ID: 320-41333-5
Date Collected: 07/17/18 08:33
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**660**	**E J1** *	1.6	0.49	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorooctanoic acid (PFOA)	**670**	**E J1** *	1.6	0.43	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorononanoic acid (PFNA)	**48**	**J1** J H01	1.6	0.42	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorobutanesulfonic acid (PFBS)	**130**		1.6	0.37	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorohexanesulfonic acid (PFHxS)	**1400**	**E J1** *	1.6	0.30	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorooctanesulfonic acid (PFOS)	**1000**	**E J1** *	3.2	0.88	ng/L		07/24/18 17:51	07/29/18 06:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*92*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C4-PFHpA	*65*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C4 PFOA	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C5 PFNA	*85*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
18O2 PFHxS	*74*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C4 PFOS	*90*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**630**	**J1 D** J K01	32	9.8	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorooctanoic acid (PFOA)	**760**	**J1 D** J K01	32	8.6	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorononanoic acid (PFNA)	**54**	**J1 D** *	32	8.3	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorobutanesulfonic acid (PFBS)	**140**	**J1 D** *	32	7.4	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorohexanesulfonic acid (PFHxS)	**2100**	**D J1** J K01	32	6.1	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorooctanesulfonic acid (PFOS)	**1100**	**J1 D** J K01	64	18	ng/L		07/24/18 17:51	08/03/18 07:11	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*57*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*

Client Sample ID: 8-MW12-PRL03-01 Lab Sample ID: 320-41333-5

Date Collected: 07/17/18 08:33 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*63*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
13C4 PFOA	*64*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
13C5 PFNA	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
18O2 PFHxS	*57*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
13C4 PFOS	*52*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*

Client Sample ID: 7-MW04-PRL04-01 Lab Sample ID: 320-41333-6

Date Collected: 07/17/18 12:43 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**150**		1.7	0.52	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorooctanoic acid (PFOA)	**69**	**M =**	1.7	0.46	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.45	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorobutanesulfonic acid (PFBS)	**43**		1.7	0.40	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorohexanesulfonic acid (PFHxS)	**170**		1.7	0.33	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorooctanesulfonic acid (PFOS)	**11**	**M =**	3.4	0.94	ng/L		07/24/18 17:51	08/03/18 07:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*58*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C4-PFHpA	*63*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C4 PFOA	*69*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C5 PFNA	*67*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
18O2 PFHxS	*65*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C4 PFOS	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*

Client Sample ID: 7-MW04-PRL04-01D Lab Sample ID: 320-41333-7

Date Collected: 07/17/18 12:43 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**160**		1.7	0.52	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorooctanoic acid (PFOA)	**63**		1.7	0.46	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorobutanesulfonic acid (PFBS)	**41**	**M =**	1.7	0.39	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorohexanesulfonic acid (PFHxS)	**160**		1.7	0.33	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorooctanesulfonic acid (PFOS)	**10**		3.4	0.94	ng/L		07/24/18 17:51	07/29/18 06:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*66*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C4-PFHpA	*62*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C4 PFOA	*68*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C5 PFNA	*72*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
18O2 PFHxS	*68*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C4 PFOS	*71*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*

Client Sample ID: GRE-ER-SD-01

Lab Sample ID: 320-41333-8

Date Collected: 07/17/18 16:10
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.4	U	1.8	0.56	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorooctanoic acid (PFOA)	1.4	U M U	1.8	0.50	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorobutanesulfonic acid (PFBS)	0.92	U	1.8	0.42	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorohexanesulfonic acid (PFHxS)	0.92	U	1.8	0.35	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	1.0	ng/L		07/24/18 17:51	08/03/18 07:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C4-PFHpA	*73*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C4 PFOA	*78*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C5 PFNA	*74*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
18O2 PFHxS	*72*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C4 PFOS	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*

Client Sample ID: GRE-ER-SW-01

Lab Sample ID: 320-41333-9

Date Collected: 07/17/18 16:15
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U	1.7	0.53	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorooctanoic acid (PFOA)	1.3	U M U	1.7	0.47	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.45	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorobutanesulfonic acid (PFBS)	0.87	U	1.7	0.40	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorohexanesulfonic acid (PFHxS)	0.87	U M U	1.7	0.33	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	0.96	ng/L		07/24/18 17:51	08/03/18 08:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C4-PFHpA	*66*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C4 PFOA	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C5 PFNA	*67*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
18O2 PFHxS	*62*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C4 PFOS	*60*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*

Client Sample ID: GRE09-SW1-01

Lab Sample ID: 320-41333-10

Date Collected: 07/17/18 16:17
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**1100**	**E** *	2.0	0.59	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorooctanoic acid (PFOA)	**3900**	**E** *	2.0	0.53	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorononanoic acid (PFNA)	**110**		2.0	0.51	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorobutanesulfonic acid (PFBS)	**370**	**E** *	2.0	0.45	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorohexanesulfonic acid (PFHxS)	**4200**	**E** *	2.0	0.37	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorooctanesulfonic acid (PFOS)	**4100**	**E** *	3.9	1.1	ng/L		07/24/18 17:51	07/29/18 07:09	1

Client Sample ID: GRE09-SW1-01 — Lab Sample ID: 320-41333-10

Date Collected: 07/17/18 16:17 **Matrix: Water**
Date Received: 07/20/18 09:10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	112		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C4-PFHpA	70		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C4 PFOA	59		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C5 PFNA	76		50 - 150	07/24/18 17:51	07/29/18 07:09	1
18O2 PFHxS	66		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C4 PFOS	89		50 - 150	07/24/18 17:51	07/29/18 07:09	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1300	D J K01	98	30	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorooctanoic acid (PFOA)	6200	D M J K01	98	26	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorononanoic acid (PFNA)	130	D *	98	25	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorobutanesulfonic acid (PFBS)	360	D J K01	98	22	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorohexanesulfonic acid (PFHxS)	8400	D J K01	98	19	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorooctanesulfonic acid (PFOS)	5300	D J K01	200	54	ng/L		07/24/18 17:51	08/07/18 22:58	50

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	74	M	50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C4-PFHpA	61		50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C4 PFOA	63		50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C5 PFNA	62		50 - 150	07/24/18 17:51	08/07/18 22:58	50
18O2 PFHxS	59		50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C4 PFOS	59		50 - 150	07/24/18 17:51	08/07/18 22:58	50

Client Sample ID: GRE09-SD1-01 — Lab Sample ID: 320-41333-11

Date Collected: 07/17/18 16:30 **Matrix: Solid**
Date Received: 07/20/18 09:10 **Percent Solids: 62.6**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.1	M =	0.47	0.12	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorooctanoic acid (PFOA)	8.0		0.47	0.16	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorononanoic acid (PFNA)	0.29	J M J	0.47	0.13	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorobutanesulfonic acid (PFBS)	0.34	J M J	0.63	0.092	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorohexanesulfonic acid (PFHxS)	8.6	M =	0.47	0.097	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorooctanesulfonic acid (PFOS)	32	E *	1.6	0.38	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	95		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C4-PFHpA	99		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C4 PFOA	90		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C5 PFNA	93		50 - 150	07/27/18 10:32	08/06/18 03:43	1
18O2 PFHxS	104		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C4 PFOS	93		50 - 150	07/27/18 10:32	08/06/18 03:43	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	D *	0.94	0.24	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2

Client Sample ID: GRE09-SD1-01 — Lab Sample ID: 320-41333-11

Date Collected: 07/17/18 16:30 — **Matrix: Solid**
Date Received: 07/20/18 09:10 — **Percent Solids: 62.6**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	7.7	D M *	0.94	0.31	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorononanoic acid (PFNA)	0.34	J D M *	0.94	0.25	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorobutanesulfonic acid (PFBS)	0.35	J D M *	1.3	0.18	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorohexanesulfonic acid (PFHxS)	8.7	D *	0.94	0.19	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorooctanesulfonic acid (PFOS)	33	D =	3.1	0.75	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C4-PFHpA	*81*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C4 PFOA	*87*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C5 PFNA	*92*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
18O2 PFHxS	*85*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C4 PFOS	*84*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*

Client Sample ID: 7-MW34-PRL06-01 — Lab Sample ID: 320-41333-12

Date Collected: 07/18/18 08:13 — **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	460		2.3	0.71	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorooctanoic acid (PFOA)	300	M =	2.3	0.63	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorononanoic acid (PFNA)	1.1	J	2.3	0.60	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorobutanesulfonic acid (PFBS)	160	M =	2.3	0.53	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorohexanesulfonic acid (PFHxS)	1100	E *	2.3	0.44	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorooctanesulfonic acid (PFOS)	13		4.6	1.3	ng/L		07/24/18 17:51	07/29/18 07:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*59*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C4-PFHpA	*51*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C4 PFOA	*56*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C5 PFNA	*62*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
18O2 PFHxS	*57*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C4 PFOS	*58*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	430	D *	23	7.1	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorooctanoic acid (PFOA)	310	D M *	23	6.3	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorononanoic acid (PFNA)	17	U *	23	6.0	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorobutanesulfonic acid (PFBS)	150	D M *	23	5.3	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorohexanesulfonic acid (PFHxS)	1300	D J K01	23	4.4	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorooctanesulfonic acid (PFOS)	35	U M *	46	13	ng/L		07/24/18 17:51	08/03/18 08:21	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*52*	*M*	*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*

Client Sample ID: 7-MW34-PRL06-01 Lab Sample ID: 320-41333-12

Date Collected: 07/18/18 08:13 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*58*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
13C4 PFOA	*55*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
13C5 PFNA	*54*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
18O2 PFHxS	*51*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
13C4 PFOS	*45*	*Q*	*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*

Client Sample ID: MW-GRE10-01-01 Lab Sample ID: 320-41333-13

Date Collected: 07/18/18 12:12 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.66**	**J**	1.6	0.49	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorooctanoic acid (PFOA)	**1.4**	**J**	1.6	0.43	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorononanoic acid (PFNA)	1.2	U	1.6	0.42	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorobutanesulfonic acid (PFBS)	**1.5**	**J**	1.6	0.37	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorohexanesulfonic acid (PFHxS)	**2.6**		1.6	0.30	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**J M** J	3.2	0.88	ng/L		07/24/18 17:51	08/03/18 08:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*69*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C4-PFHpA	*78*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C4 PFOA	*81*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C5 PFNA	*79*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C4 PFOS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*

Client Sample ID: MW-GRE03-01-01 Lab Sample ID: 320-41333-14

Date Collected: 07/18/18 13:48 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**4.6**		1.7	0.51	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorooctanoic acid (PFOA)	**3.7**		1.7	0.45	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorononanoic acid (PFNA)	1.2	U	1.7	0.43	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorobutanesulfonic acid (PFBS)	**3.2**		1.7	0.38	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorohexanesulfonic acid (PFHxS)	**15**		1.7	0.32	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorooctanesulfonic acid (PFOS)	**7.4**	**M** =	3.3	0.91	ng/L		07/24/18 17:51	08/03/18 08:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*68*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C4-PFHpA	*74*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C4 PFOA	*78*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C5 PFNA	*72*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
18O2 PFHxS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C4 PFOS	*68*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: GRE-IDW-W-01

Lab Sample ID: 320-41333-15
Date Collected: 07/18/18 15:00
Matrix: Water
Date Received: 07/20/18 09:10

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0040	U	0.010	0.0016	mg/L			08/06/18 12:31	1
2-Butanone (MEK)	0.040	U	0.10	0.018	mg/L			08/06/18 12:31	1
Carbon tetrachloride	0.0040	U	0.010	0.0019	mg/L			08/06/18 12:31	1
Chlorobenzene	0.0040	U	0.010	0.0017	mg/L			08/06/18 12:31	1
Chloroform	**0.0076**	**J**	0.010	0.0016	mg/L			08/06/18 12:31	1
1,2-Dichloroethane	0.0040	U	0.010	0.0013	mg/L			08/06/18 12:31	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			08/06/18 12:31	1
Tetrachloroethene	0.0040	U	0.010	0.0020	mg/L			08/06/18 12:31	1
Trichloroethene	0.0040	U	0.010	0.0016	mg/L			08/06/18 12:31	1
Vinyl chloride	0.0020	U	0.010	0.0010	mg/L			08/06/18 12:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*78 - 120*		*08/06/18 12:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*64 - 129*		*08/06/18 12:31*	*1*
4-Bromofluorobenzene (Surr)	*100*		*78 - 121*		*08/06/18 12:31*	*1*
Dibromofluoromethane (Surr)	*106*		*79 - 119*		*08/06/18 12:31*	*1*

Client Sample ID: GRE-RB-01

Lab Sample ID: 320-41333-16
Date Collected: 07/18/18 15:15
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.98**	**J**	1.8	0.56	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorooctanoic acid (PFOA)	1.4	U M U	1.8	0.50	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorobutanesulfonic acid (PFBS)	0.92	U	1.8	0.42	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorohexanesulfonic acid (PFHxS)	0.92	U	1.8	0.35	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	1.0	ng/L		07/24/18 17:51	08/03/18 08:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*64*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C4-PFHpA	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C4 PFOA	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C5 PFNA	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
18O2 PFHxS	*67*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C4 PFOS	*64*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*

Client Sample ID: MW-GRE08-01-01

Lab Sample ID: 320-41333-17
Date Collected: 07/19/18 14:35
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**16**		1.6	0.48	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorooctanoic acid (PFOA)	**17**		1.6	0.43	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorononanoic acid (PFNA)	**0.80**	**J**	1.6	0.41	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorobutanesulfonic acid (PFBS)	**45**	**M** =	1.6	0.37	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorohexanesulfonic acid (PFHxS)	**160**		1.6	0.30	ng/L		07/24/18 17:51	07/29/18 07:48	1

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: MW-GRE08-01-01

Date Collected: 07/19/18 14:35
Date Received: 07/20/18 09:10

Lab Sample ID: 320-41333-17

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	580	E *	3.2	0.87	ng/L		07/24/18 17:51	07/29/18 07:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*66*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C4-PFHpA	*63*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C4 PFOA	*62*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C5 PFNA	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
18O2 PFHxS	*68*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C4 PFOS	*65*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	14	D *	7.9	2.4	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorooctanoic acid (PFOA)	18	D M *	7.9	2.1	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorononanoic acid (PFNA)	6.0	U *	7.9	2.1	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorobutanesulfonic acid (PFBS)	48	D M *	7.9	1.8	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorohexanesulfonic acid (PFHxS)	160	D *	7.9	1.5	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorooctanesulfonic acid (PFOS)	600	D J K01	16	4.4	ng/L		07/24/18 17:51	08/03/18 08:53	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*51*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C4-PFHpA	*60*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C4 PFOA	*62*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C5 PFNA	*60*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
18O2 PFHxS	*58*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C4 PFOS	*52*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*

APPENDIX E

LABORATORY ANALYTICAL DATA REPORTS

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ANALYTICAL REPORT

Job Number: 320-41149-1

Job Description: Phase III, ANG - Great Falls

For:
Leidos, Inc.
11251 Roger Bacon Drive
Reston, VA 20190

Attention: Selvam Arunachalam

Approved for release.
Linda C. Laver
Project Manager II
8/8/2018 4:08 PM

Designee for
David R Alltucker, Project Manager I
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08/08/2018

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
M	Manual integrated compound.

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
M	Manual integrated compound.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.
D	The reported value is from a dilution.
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
Q	One or more quality control criteria failed.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job Narrative
320-41149-1

Receipt
The samples were received on 7/14/2018 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0º C.

Receipt Exceptions
The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): GRE10-SB1-01D (320-41149-5) and GRE07-SB2-01 (320-41149-27).

GRE10-SB1-01D (320-41149-5): container label had no ID, but date and time listed matched the date and time listed on the COC for GRE10-SB1-01D

GRE07-SB2-01 (320-41149-27): Time on listed on the container label was 13:35, while COC listed 12:35. Logged in based on COC.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC/MS Semi VOA
Method(s) EPA 537 (Mod): The following samples were diluted due to the abundance of target analytes : GRE07-SB1-01 (320-41149-19[MS]) and GRE07-SB1-01 (320-41149-19[MSD]). Because of this dilution, the matrix spike and matrix spike duplicate concentrations in the samples for Perfluorobutanesulfonic acid (PFBS) and Perfluoroheptanoic acid (PFHpA) was reduced to a level where the recovery calculation does not provide useful information.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

LCMS
Method(s) EPA 537 (Mod): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) EPA 537 (Mod): Due to the high concentration of Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic acid (PFOA), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-234662 and analytical batch 320-236778 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) EPA 537 (Mod): The concentration of Perfluorooctanesulfonic acid (PFOS) associated with the following samples exceeded the instrument calibration range: GRE08-SB1-01 (320-41149-28), GRE08-SB2-01 (320-41149-29), GRE08-SB4-01 (320-41149-31), GRE07-SB3-01 (320-41149-32), GRE05-SB1-01 (320-41149-34) and GRE05-SB2-01 (320-41149-35). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): The concentration of Perfluorooctanesulfonic acid (PFOS) and Perfluorohexanesulfonic acid (PFHxS) associated with the following samples exceeded the instrument calibration range: GRE07-SB1-01 (320-41149-19), GRE07-SB1-01 (320-41149-19[MS]), GRE07-SB1-01 (320-41149-19[MSD]) and GRE08-SB3-01 (320-41149-30). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): Due to the high concentration of Perfluorooctanesulfonic acid (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-234633 and analytical batch 320-236836 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) EPA 537 (Mod): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for Perfluorohexanesulfonic acid (PFHxS) for preparation batch 320-234633 and analytical batch 320-236836 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) EPA 537 (Mod): The concentration of Perfluorohexanesulfonic acid (PFHxS) associated with the following samples exceeded the instrument calibration range: GRE10-SB2-02 (320-41149-3). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): The concentration of Perfluorooctanesulfonic acid (PFOS) associated with the following samples exceeded the instrument calibration range: GRE06-SB1-01 (320-41149-16), GRE06-SB1-01D (320-41149-17), GRE06-SB2-01 (320-41149-18),RE07-SB1-02 (320-41149-20), GRE03-SB1-01 (320-41149-22), GRE03-SB2-01 (320-41149-23), GRE03-SB4-01 (320-41149-24) and GRE03-SB5-01 (320-41149-25). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): Results for samples GRE07-SB1-01 (320-41149-19), GRE07-SB1-01 (320-41149-19[MS]), GRE07-SB1-01 (320-41149-19[MSD]), GRE07-SB2-01 (320-41149-27), GRE08-SB1-01 (320-41149-28), GRE08-SB2-01 (320-41149-29), GRE08-SB3-01 (320-41149-30), GRE08-SB4-01 (320-41149-31), GRE07-SB3-01 (320-41149-32), GRE05-SB1-01 (320-41149-34) and GRE05-SB2-01 (320-41149-35) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were

within acceptance limits.

Method(s) EPA 537 (Mod): Isotope Dilution Analyte (IDA) recoveries are below the method recommended limit for 13C4 PFOS and 13C5 PFNA and in the following samples: GRE08-SB2-01 (320-41149-29), GRE08-SB3-01 (320-41149-30) and GRE08-SB4-01 (320-41149-31). This sample was re-analyzed at dilution with IDA recoveries within control limits. Both sets of data are reported. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method(s) EPA 537 (Mod): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for Perfluorononanoic acid (PFNA) for preparation batch 320-234662 and analytical batch 320-237052 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) EPA 537 (Mod): The matrix spike duplicate (MSD) recoveries for Perfluorobutanesulfonic acid (PFBS) for preparation batch 320-234662 and analytical batch 320-237052 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) EPA 537 (Mod): Due to the high concentration of several analytes, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-234662 and analytical batch 320-237052 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) EPA 537 (Mod): The concentration of several analytes associated with the following samples exceeded the instrument calibration range: GRE07-SB2-01 (320-41149-27). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): Results for samples GRE10-SB2-02 (320-41149-3), GRE06-SB1-01 (320-41149-16), GRE06-SB1-01D (320-41149-17), GRE06-SB2-01 (320-41149-18), GRE07-SB1-02 (320-41149-20), GRE03-SB1-01 (320-41149-22), GRE03-SB2-01 (320-41149-23), GRE03-SB4-01 (320-41149-24) and GRE03-SB5-01 (320-41149-25) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

Method(s) EPA 537 (Mod): The concentration of Perfluorooctanesulfonic acid (PFOS) associated with the following sample exceeded the instrument calibration range in the maximum 100x dilution: GRE08-SB4-01 (320-41149-31). This analyte has been qualified; however, the peaks did not saturate the instrument detector. The client was contacted and gave permission to report. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-234634.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE-ER-SB-01 — Lab Sample ID: 320-41149-1

No Detections.

Client Sample ID: GRE10-SB2-01 — Lab Sample ID: 320-41149-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.44		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.13	J	0.31	0.084	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.2	J1	0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	16	J1	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE10-SB2-02 — Lab Sample ID: 320-41149-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.53	M	0.35	0.090	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.9	M	0.35	0.12	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.13	J	0.46	0.068	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	34	E	0.35	0.072	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4.0		1.2	0.28	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.49	J D M	1.7	0.45	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1.8	D M	1.7	0.58	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	41	D	1.7	0.36	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	3.9	J D M	5.8	1.4	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE10-SB1-01 — Lab Sample ID: 320-41149-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.21	J M	0.31	0.080	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.78		0.31	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.8		0.31	0.063	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	12	M	1.0	0.24	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE10-SB1-01D — Lab Sample ID: 320-41149-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.18	J M	0.31	0.080	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.74	M	0.31	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.9		0.31	0.063	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	13	M	1.0	0.24	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE10-SB3-01 — Lab Sample ID: 320-41149-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.35	M	0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.16	J M	0.32	0.087	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.0		0.32	0.066	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	12		1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE09-SB1-01 — Lab Sample ID: 320-41149-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.33		0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.18	J M	0.32	0.087	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.7		0.32	0.067	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	16		1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE09-SB1-01D — Lab Sample ID: 320-41149-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.33		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.19	J M	0.31	0.085	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.7		0.31	0.065	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	15		1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE09-SB2-01 — Lab Sample ID: 320-41149-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.22	J M	0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.69		0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.8		1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE-FB-POT-01 — Lab Sample ID: 320-41149-10

No Detections.

Client Sample ID: GRE-FB-DI-01 — Lab Sample ID: 320-41149-11

No Detections.

Client Sample ID: GRE-ER-SB-02 — Lab Sample ID: 320-41149-12

No Detections.

Client Sample ID: GRE03-SB3-01 — Lab Sample ID: 320-41149-13

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.27	J	0.33	0.085	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.33		0.33	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.12	J	0.43	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.86		0.33	0.067	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4.3		1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE03-SB3-02 — Lab Sample ID: 320-41149-14

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.11	J	0.32	0.084	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.47		0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.23	J	0.32	0.066	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.57	J	1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE04-SB1-01 — Lab Sample ID: 320-41149-15

This Detection Summary does not include radiochemical test results.

Client Sample ID: GRE04-SB1-01 (Continued) — Lab Sample ID: 320-41149-15

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.11	J	0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.45		0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	8.5	M	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE06-SB1-01 — Lab Sample ID: 320-41149-16

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.35		0.33	0.086	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	4.4		0.33	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.17	J	0.33	0.090	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.24	J	0.44	0.065	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.4		0.33	0.069	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	51	M E	1.1	0.27	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	4.2	D	3.3	1.1	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	3.4	D	3.3	0.69	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	60	D M	11	2.7	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE06-SB1-01D — Lab Sample ID: 320-41149-17

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.62		0.31	0.080	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	4.4		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.17	J	0.31	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.36	J	0.41	0.060	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.4		0.31	0.063	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	49	E	1.0	0.24	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	4.4	D M	3.1	1.0	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	3.6	D	3.1	0.63	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	56	D M	10	2.4	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE06-SB2-01 — Lab Sample ID: 320-41149-18

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.42		0.32	0.082	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	13		0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.11	J	0.32	0.085	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.60		0.42	0.062	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	16		0.32	0.065	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	25	E	1.1	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.41	J D M	1.6	0.41	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	13	D M	1.6	0.53	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.57	J D	2.1	0.31	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	17	D	1.6	0.33	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	25	D M	5.3	1.3	ug/Kg	5	☼	EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE07-SB1-01 — Lab Sample ID: 320-41149-19

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	3.1		0.31	0.082	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	14	J1	0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	5.1	J1	0.31	0.085	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6	M	0.42	0.062	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	35	E J1	0.31	0.065	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	340	M E J1	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	15	J J1 D M	16	5.2	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	6.6	J J1 D	16	4.3	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	37	J1 D	16	3.3	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	520	J1 D	52	13	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE07-SB1-02 — Lab Sample ID: 320-41149-20

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.59		0.33	0.085	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	5.6		0.33	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	1.0		0.33	0.088	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.12	J	0.43	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	10		0.33	0.067	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	62	E	1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	6.0	D	3.3	1.1	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	1.1	J D	3.3	0.88	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	10	D	3.3	0.67	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	72	D M	11	2.6	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE-ER-SB-03 — Lab Sample ID: 320-41149-21

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	10		3.7	1.0	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: GRE03-SB1-01 — Lab Sample ID: 320-41149-22

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.56		0.32	0.082	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.0		0.32	0.085	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.092	J M	0.42	0.062	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.7		0.32	0.065	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	84	E	1.1	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2.6	J D	3.2	1.1	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	2.3	J D	3.2	0.85	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1.8	J D	3.2	0.65	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	110	D	11	2.5	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE03-SB2-01 — Lab Sample ID: 320-41149-23

This Detection Summary does not include radiochemical test results.

Client Sample ID: GRE03-SB2-01 (Continued) — Lab Sample ID: 320-41149-23

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.66		0.32	0.084	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	3.0		0.32	0.087	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.16	J M	0.43	0.063	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.7		0.32	0.067	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	100	E	1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2.6	J D M	3.2	1.1	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	3.4	D	3.2	0.87	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	6.5	D	3.2	0.67	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	150	D	11	2.6	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE03-SB4-01 — Lab Sample ID: 320-41149-24

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.56		0.32	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.8		0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.6		0.32	0.086	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.29	J M	0.42	0.063	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.8		0.32	0.066	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	62	E	1.1	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2.8	J D M	3.2	1.1	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	3.0	J D	3.2	0.86	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	4.0	D	3.2	0.66	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	74	D	11	2.5	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE03-SB5-01 — Lab Sample ID: 320-41149-25

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.60		0.33	0.085	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.4		0.33	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	1.3		0.33	0.088	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.38	J M	0.44	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.8		0.33	0.068	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	190	M E	1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2.6	J D M	6.5	2.2	ug/Kg	20	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	6.3	J D	6.5	1.4	ug/Kg	20	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	330	D	22	5.2	ug/Kg	20	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE04-SB2-01 — Lab Sample ID: 320-41149-26

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.10	J	0.31	0.081	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.45		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.070	J	0.41	0.061	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	5.0		0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	14		1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE07-SB2-01 — Lab Sample ID: 320-41149-27

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	5.5		0.36	0.092	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	48	E	0.36	0.12	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	4.2	M	0.36	0.096	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	8.1		0.47	0.070	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	170	E	0.36	0.073	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1000	E	1.2	0.28	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	45	D	36	12	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	9.7	J D	47	7.0	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	280	D	36	7.3	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1700	D	120	28	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE08-SB1-01 — Lab Sample ID: 320-41149-28

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	2.1		0.31	0.081	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	7.6		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	1.4		0.31	0.084	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.0	M	0.41	0.061	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	14		0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	200	E	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	8.2	J D	16	5.2	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	15	J D	16	3.2	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	310	D	52	12	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE08-SB2-01 — Lab Sample ID: 320-41149-29

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1.7		0.31	0.080	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	6.7		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	1.3	M	0.31	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.82	M	0.41	0.060	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	16		0.31	0.063	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	300	E	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	6.7	J D	15	5.1	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	16	D	15	3.2	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	600	D M	51	12	ug/Kg	50	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE08-SB3-01 — Lab Sample ID: 320-41149-30

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1.3		0.33	0.086	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	6.6		0.33	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.79		0.33	0.090	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.79	M	0.44	0.065	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	29	E	0.33	0.069	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: GRE08-SB3-01 (Continued) — Lab Sample ID: 320-41149-30

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	540	E	1.1	0.27	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	26	J D	33	6.9	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1300	D	110	27	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE08-SB4-01 — Lab Sample ID: 320-41149-31

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.87		0.34	0.088	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	7.6		0.34	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	4.2		0.34	0.092	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.27	J M	0.45	0.067	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	13		0.34	0.070	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1000	E	1.1	0.27	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	11	J D	34	7.0	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	2800	E D	110	27	ug/Kg	100	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE07-SB3-01 — Lab Sample ID: 320-41149-32

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.77	M	0.31	0.080	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.2		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.3		0.31	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.37	J M	0.41	0.060	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.3		0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	160	E	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2.1	J D M	6.1	2.0	ug/Kg	20	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	2.4	J D M	6.1	1.7	ug/Kg	20	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	7.7	D	6.1	1.3	ug/Kg	20	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	220	D	20	4.9	ug/Kg	20	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE04-SB3-01 — Lab Sample ID: 320-41149-33

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.11	J M	0.32	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.78		0.32	0.11	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.38		0.32	0.086	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.1		0.32	0.066	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.6		1.1	0.26	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE05-SB1-01 — Lab Sample ID: 320-41149-34

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.23	J M	0.31	0.080	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.93		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	1.3		0.31	0.083	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.74		0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE05-SB1-01 (Continued) — Lab Sample ID: 320-41149-34

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	42	E	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1.1	J D	3.1	1.0	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	1.4	J D	3.1	0.83	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	0.80	J D	3.1	0.64	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	46	D	10	2.5	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE05-SB2-01 — Lab Sample ID: 320-41149-35

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.22	J M	0.31	0.081	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.87		0.31	0.10	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	3.4		0.31	0.084	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.93		0.31	0.064	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	59	E	1.0	0.25	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	3.8	D	3.1	0.84	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1.1	J D	3.1	0.64	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	67	D	10	2.5	ug/Kg	10	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: GRE-IDW-S-01 — Lab Sample ID: 320-41149-36

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE-ER-SB-01

Lab Sample ID: 320-41149-1
Date Collected: 07/09/18 12:50
Matrix: Water
Date Received: 07/14/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.2	U	1.6	0.49	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorooctanoic acid (PFOA)	1.2	U	1.6	0.43	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorononanoic acid (PFNA)	1.2	U	1.6	0.42	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorobutanesulfonic acid (PFBS)	0.80	U	1.6	0.37	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorohexanesulfonic acid (PFHxS)	0.80	U	1.6	0.30	ng/L		07/18/18 08:54	07/26/18 13:37	1
Perfluorooctanesulfonic acid (PFOS)	2.4	U	3.2	0.88	ng/L		07/18/18 08:54	07/26/18 13:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*81*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
18O2 PFHxS	*89*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*
13C4 PFOS	*84*		*50 - 150*	*07/18/18 08:54*	*07/26/18 13:37*	*1*

Client Sample ID: GRE10-SB2-01

Lab Sample ID: 320-41149-2
Date Collected: 07/09/18 14:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 95.4

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U M	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorooctanoic acid (PFOA)	**0.44**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorononanoic acid (PFNA)	**0.13**	**J**	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorohexanesulfonic acid (PFHxS)	**3.2**	**J1**	0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1
Perfluorooctanesulfonic acid (PFOS)	**16**	**J1**	1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 03:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C4-PFHpA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
18O2 PFHxS	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*
13C4 PFOS	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:52*	*1*

Client Sample ID: GRE10-SB2-02

Lab Sample ID: 320-41149-3
Date Collected: 07/09/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 85.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.53**	**M**	0.35	0.090	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorooctanoic acid (PFOA)	**1.9**	**M**	0.35	0.12	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorononanoic acid (PFNA)	0.23	U M	0.35	0.094	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorobutanesulfonic acid (PFBS)	**0.13**	**J**	0.46	0.068	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1
Perfluorohexanesulfonic acid (PFHxS)	**34**	**E**	0.35	0.072	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1

Client Sample ID: GRE10-SB2-02

Lab Sample ID: 320-41149-3
Date Collected: 07/09/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 85.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**4.0**		1.2	0.28	ug/Kg	☼	07/18/18 08:48	07/30/18 04:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*75*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C4-PFHpA	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C4 PFOA	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C5 PFNA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
18O2 PFHxS	*75*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*
13C4 PFOS	*78*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:15*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.49**	**J D M**	1.7	0.45	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorooctanoic acid (PFOA)	**1.8**	**D M**	1.7	0.58	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorononanoic acid (PFNA)	1.2	U	1.7	0.47	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.3	0.34	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorohexanesulfonic acid (PFHxS)	**41**	**D**	1.7	0.36	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5
Perfluorooctanesulfonic acid (PFOS)	**3.9**	**J D M**	5.8	1.4	ug/Kg	☼	07/18/18 08:48	08/01/18 15:19	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*65*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C4-PFHpA	*86*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C5 PFNA	*86*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
18O2 PFHxS	*72*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*
13C4 PFOS	*70*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:19*	*5*

Client Sample ID: GRE10-SB1-01

Lab Sample ID: 320-41149-4
Date Collected: 07/09/18 15:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.21**	**J M**	0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorooctanoic acid (PFOA)	**1.4**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorononanoic acid (PFNA)	**0.78**		0.31	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorobutanesulfonic acid (PFBS)	0.18	U M	0.41	0.060	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorohexanesulfonic acid (PFHxS)	**1.8**		0.31	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1
Perfluorooctanesulfonic acid (PFOS)	**12**	**M**	1.0	0.24	ug/Kg	☼	07/18/18 08:48	07/30/18 04:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C4-PFHpA	*86*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
18O2 PFHxS	*80*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*
13C4 PFOS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:23*	*1*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE10-SB1-01D

Lab Sample ID: 320-41149-5
Date Collected: 07/09/18 15:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 97.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.18**	**J M**	0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorooctanoic acid (PFOA)	**1.4**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorononanoic acid (PFNA)	**0.74**	**M**	0.31	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorobutanesulfonic acid (PFBS)	0.18	U M	0.41	0.060	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorohexanesulfonic acid (PFHxS)	**1.9**		0.31	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1
Perfluorooctanesulfonic acid (PFOS)	**13**	**M**	1.0	0.24	ug/Kg	☼	07/18/18 08:48	07/30/18 04:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C4-PFHpA	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
18O2 PFHxS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*
13C4 PFOS	*78*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:31*	*1*

Client Sample ID: GRE10-SB3-01

Lab Sample ID: 320-41149-6
Date Collected: 07/09/18 15:50
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 91.9

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U	0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorooctanoic acid (PFOA)	**0.35**	**M**	0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorononanoic acid (PFNA)	**0.16**	**J M**	0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.43	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorohexanesulfonic acid (PFHxS)	**2.0**		0.32	0.066	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1
Perfluorooctanesulfonic acid (PFOS)	**12**		1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 04:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*80*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C4-PFHpA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C5 PFNA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
18O2 PFHxS	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*
13C4 PFOS	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:39*	*1*

Client Sample ID: GRE09-SB1-01

Lab Sample ID: 320-41149-7
Date Collected: 07/09/18 16:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.22	U	0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorooctanoic acid (PFOA)	**0.33**		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorononanoic acid (PFNA)	**0.18**	**J M**	0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.43	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1
Perfluorohexanesulfonic acid (PFHxS)	**1.7**		0.32	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1

Client Sample ID: GRE09-SB1-01

Lab Sample ID: 320-41149-7
Date Collected: 07/09/18 16:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**16**		1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 04:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C4-PFHpA	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C5 PFNA	*85*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
18O2 PFHxS	*75*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*
13C4 PFOS	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 04:47*	*1*

Client Sample ID: GRE09-SB1-01D

Lab Sample ID: 320-41149-8
Date Collected: 07/09/18 16:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.3

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorooctanoic acid (PFOA)	**0.33**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorononanoic acid (PFNA)	**0.19**	**J M**	0.31	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.42	0.062	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorohexanesulfonic acid (PFHxS)	**1.7**		0.31	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1
Perfluorooctanesulfonic acid (PFOS)	**15**		1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C4-PFHpA	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C5 PFNA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*
13C4 PFOS	*78*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:02*	*1*

Client Sample ID: GRE09-SB2-01

Lab Sample ID: 320-41149-9
Date Collected: 07/09/18 16:30
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U M	0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorooctanoic acid (PFOA)	**0.22**	**J M**	0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorononanoic acid (PFNA)	0.21	U M	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorohexanesulfonic acid (PFHxS)	**0.69**		0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1
Perfluorooctanesulfonic acid (PFOS)	**6.8**		1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*77*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
13C4-PFHpA	*86*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*

Client Sample ID: GRE09-SB2-01

Lab Sample ID: 320-41149-9

Date Collected: 07/09/18 16:30
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 96.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*
13C4 PFOS	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:10*	*1*

Client Sample ID: GRE-FB-POT-01

Lab Sample ID: 320-41149-10

Date Collected: 07/09/18 17:05
Date Received: 07/14/18 09:10

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.1	U M	1.5	0.46	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorooctanoic acid (PFOA)	1.1	U M	1.5	0.41	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorononanoic acid (PFNA)	1.1	U	1.5	0.39	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorobutanesulfonic acid (PFBS)	0.76	U	1.5	0.35	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorohexanesulfonic acid (PFHxS)	0.76	U M	1.5	0.29	ng/L		07/18/18 08:54	07/22/18 10:52	1
Perfluorooctanesulfonic acid (PFOS)	2.3	U	3.0	0.83	ng/L		07/18/18 08:54	07/22/18 10:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C4-PFHpA	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C4 PFOA	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
18O2 PFHxS	*97*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*
13C4 PFOS	*95*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:52*	*1*

Client Sample ID: GRE-FB-DI-01

Lab Sample ID: 320-41149-11

Date Collected: 07/10/18 09:15
Date Received: 07/14/18 09:10

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U	1.7	0.52	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorooctanoic acid (PFOA)	1.3	U M	1.7	0.46	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.44	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorobutanesulfonic acid (PFBS)	0.85	U	1.7	0.39	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorohexanesulfonic acid (PFHxS)	0.85	U	1.7	0.32	ng/L		07/18/18 08:54	07/22/18 10:59	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.4	0.94	ng/L		07/18/18 08:54	07/22/18 10:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*86*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C5 PFNA	*91*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
18O2 PFHxS	*100*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*
13C4 PFOS	*90*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:59*	*1*

Client Sample ID: GRE-ER-SB-02

Lab Sample ID: 320-41149-12

Date Collected: 07/10/18 09:20
Matrix: Water
Date Received: 07/14/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U	1.8	0.55	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorooctanoic acid (PFOA)	1.3	U	1.8	0.48	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorononanoic acid (PFNA)	1.3	U	1.8	0.46	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorobutanesulfonic acid (PFBS)	0.89	U	1.8	0.41	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorohexanesulfonic acid (PFHxS)	0.89	U	1.8	0.34	ng/L		07/18/18 08:54	07/22/18 11:07	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	0.98	ng/L		07/18/18 08:54	07/22/18 11:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*88*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
18O2 PFHxS	*90*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*
13C4 PFOS	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:07*	*1*

Client Sample ID: GRE03-SB3-01

Lab Sample ID: 320-41149-13

Date Collected: 07/10/18 10:30
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.0

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.27**	**J**	0.33	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorooctanoic acid (PFOA)	**0.33**		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorononanoic acid (PFNA)	0.22	U M	0.33	0.088	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorobutanesulfonic acid (PFBS)	**0.12**	**J**	0.43	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorohexanesulfonic acid (PFHxS)	**0.86**		0.33	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1
Perfluorooctanesulfonic acid (PFOS)	**4.3**		1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 05:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*93*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C5 PFNA	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
18O2 PFHxS	*93*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*
13C4 PFOS	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:18*	*1*

Client Sample ID: GRE03-SB3-02

Lab Sample ID: 320-41149-14

Date Collected: 07/10/18 11:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.4

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.11**	**J**	0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorooctanoic acid (PFOA)	**0.47**		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorononanoic acid (PFNA)	0.21	U	0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.43	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**J**	0.32	0.066	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1
Perfluorooctanesulfonic acid (PFOS)	**0.57**	**J**	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 05:26	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	89		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C4-PFHpA	85		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C4 PFOA	87		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C5 PFNA	90		50 - 150	07/18/18 08:48	07/30/18 05:26	1
18O2 PFHxS	90		50 - 150	07/18/18 08:48	07/30/18 05:26	1
13C4 PFOS	92		50 - 150	07/18/18 08:48	07/30/18 05:26	1

Client Sample ID: GRE04-SB1-01 — Lab Sample ID: 320-41149-15

Date Collected: 07/10/18 11:45 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.8**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.21	U	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorooctanoic acid (PFOA)	**0.11**	**J**	0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorononanoic acid (PFNA)	0.21	U M	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorohexanesulfonic acid (PFHxS)	**0.45**		0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1
Perfluorooctanesulfonic acid (PFOS)	**8.5**	**M**	1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:34	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	96		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C4-PFHpA	93		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C4 PFOA	91		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C5 PFNA	96		50 - 150	07/18/18 08:48	07/30/18 05:34	1
18O2 PFHxS	96		50 - 150	07/18/18 08:48	07/30/18 05:34	1
13C4 PFOS	93		50 - 150	07/18/18 08:48	07/30/18 05:34	1

Client Sample ID: GRE06-SB1-01 — Lab Sample ID: 320-41149-16

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 89.5**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.35**		0.33	0.086	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorooctanoic acid (PFOA)	**4.4**		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorononanoic acid (PFNA)	**0.17**	**J**	0.33	0.090	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorobutanesulfonic acid (PFBS)	**0.24**	**J**	0.44	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorohexanesulfonic acid (PFHxS)	**3.4**		0.33	0.069	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1
Perfluorooctanesulfonic acid (PFOS)	**51**	**M E**	1.1	0.27	ug/Kg	☼	07/18/18 08:48	07/30/18 05:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	94		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C4-PFHpA	93		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C4 PFOA	92		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C5 PFNA	84		50 - 150	07/18/18 08:48	07/30/18 05:42	1
18O2 PFHxS	97		50 - 150	07/18/18 08:48	07/30/18 05:42	1
13C4 PFOS	90		50 - 150	07/18/18 08:48	07/30/18 05:42	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.2	U	3.3	0.86	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorooctanoic acid (PFOA)	**4.2**	**D**	3.3	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10

Client Sample ID: GRE06-SB1-01

Lab Sample ID: 320-41149-16
Date Collected: 07/11/18 13:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 89.5

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	2.2	U	3.3	0.90	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorobutanesulfonic acid (PFBS)	2.0	U	4.4	0.65	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorohexanesulfonic acid (PFHxS)	**3.4**	**D**	3.3	0.69	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10
Perfluorooctanesulfonic acid (PFOS)	**60**	**D M**	11	2.7	ug/Kg	☼	07/18/18 08:48	08/01/18 15:27	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*76*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C4 PFOA	*96*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
18O2 PFHxS	*84*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*
13C4 PFOS	*77*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:27*	*10*

Client Sample ID: GRE06-SB1-01D

Lab Sample ID: 320-41149-17
Date Collected: 07/11/18 13:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.62**		0.31	0.080	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorooctanoic acid (PFOA)	**4.4**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorononanoic acid (PFNA)	**0.17**	**J**	0.31	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorobutanesulfonic acid (PFBS)	**0.36**	**J**	0.41	0.060	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorohexanesulfonic acid (PFHxS)	**3.4**		0.31	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1
Perfluorooctanesulfonic acid (PFOS)	**49**	**E**	1.0	0.24	ug/Kg	☼	07/18/18 08:48	07/30/18 05:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C4-PFHpA	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
18O2 PFHxS	*93*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*
13C4 PFOS	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 05:50*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.0	U M	3.1	0.80	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorooctanoic acid (PFOA)	**4.4**	**D M**	3.1	1.0	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorononanoic acid (PFNA)	2.0	U	3.1	0.83	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorobutanesulfonic acid (PFBS)	1.8	U	4.1	0.60	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorohexanesulfonic acid (PFHxS)	**3.6**	**D**	3.1	0.63	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10
Perfluorooctanesulfonic acid (PFOS)	**56**	**D M**	10	2.4	ug/Kg	☼	07/18/18 08:48	08/01/18 15:35	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*80*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:35*	*10*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:35*	*10*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*08/01/18 15:35*	*10*

Client Sample ID: GRE06-SB1-01D

Lab Sample ID: 320-41149-17
Date Collected: 07/11/18 13:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	95		50 - 150	07/18/18 08:48	08/01/18 15:35	10
18O2 PFHxS	84		50 - 150	07/18/18 08:48	08/01/18 15:35	10
13C4 PFOS	84		50 - 150	07/18/18 08:48	08/01/18 15:35	10

Client Sample ID: GRE06-SB2-01

Lab Sample ID: 320-41149-18
Date Collected: 07/11/18 13:40
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.42		0.32	0.082	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorooctanoic acid (PFOA)	13		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorononanoic acid (PFNA)	0.11	J	0.32	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorobutanesulfonic acid (PFBS)	0.60		0.42	0.062	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorohexanesulfonic acid (PFHxS)	16		0.32	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1
Perfluorooctanesulfonic acid (PFOS)	25	E	1.1	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 05:57	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	88		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C4-PFHpA	89		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C4 PFOA	95		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C5 PFNA	89		50 - 150	07/18/18 08:48	07/30/18 05:57	1
18O2 PFHxS	89		50 - 150	07/18/18 08:48	07/30/18 05:57	1
13C4 PFOS	91		50 - 150	07/18/18 08:48	07/30/18 05:57	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.41	J D M	1.6	0.41	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorooctanoic acid (PFOA)	13	D M	1.6	0.53	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorononanoic acid (PFNA)	1.1	U	1.6	0.43	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorobutanesulfonic acid (PFBS)	0.57	J D	2.1	0.31	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorohexanesulfonic acid (PFHxS)	17	D	1.6	0.33	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5
Perfluorooctanesulfonic acid (PFOS)	25	D M	5.3	1.3	ug/Kg	☼	07/18/18 08:48	08/01/18 15:43	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	84		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C4-PFHpA	94		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C4 PFOA	95		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C5 PFNA	93		50 - 150	07/18/18 08:48	08/01/18 15:43	5
18O2 PFHxS	85		50 - 150	07/18/18 08:48	08/01/18 15:43	5
13C4 PFOS	82		50 - 150	07/18/18 08:48	08/01/18 15:43	5

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE07-SB1-01

Lab Sample ID: 320-41149-19
Date Collected: 07/11/18 14:15
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.3

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	3.1		0.31	0.082	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorooctanoic acid (PFOA)	14	J1	0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorononanoic acid (PFNA)	5.1	J1	0.31	0.085	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorobutanesulfonic acid (PFBS)	1.6	M	0.42	0.062	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorohexanesulfonic acid (PFHxS)	35	E J1	0.31	0.065	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1
Perfluorooctanesulfonic acid (PFOS)	340	M E J1	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 01:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*89*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C4-PFHpA	*85*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C5 PFNA	*58*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*
13C4 PFOS	*54*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:24*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	10	U M	16	4.1	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorooctanoic acid (PFOA)	15	J J1 D M	16	5.2	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorononanoic acid (PFNA)	6.6	J J1 D	16	4.3	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorobutanesulfonic acid (PFBS)	9.4	U	21	3.1	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorohexanesulfonic acid (PFHxS)	37	J1 D	16	3.3	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50
Perfluorooctanesulfonic acid (PFOS)	520	J1 D	52	13	ug/Kg	☼	07/18/18 10:19	07/31/18 17:57	50

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*57*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C4-PFHpA	*90*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C5 PFNA	*80*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
18O2 PFHxS	*73*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*
13C4 PFOS	*71*		*50 - 150*	*07/18/18 10:19*	*07/31/18 17:57*	*50*

Client Sample ID: GRE07-SB1-02

Lab Sample ID: 320-41149-20
Date Collected: 07/11/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 90.4

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.59		0.33	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorooctanoic acid (PFOA)	5.6		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorononanoic acid (PFNA)	1.0		0.33	0.088	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorobutanesulfonic acid (PFBS)	0.12	J	0.43	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorohexanesulfonic acid (PFHxS)	10		0.33	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1
Perfluorooctanesulfonic acid (PFOS)	62	E	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 06:05	1

Client Sample ID: GRE07-SB1-02

Lab Sample ID: 320-41149-20

Date Collected: 07/11/18 14:35
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 90.4

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*94*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
18O2 PFHxS	*98*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*
13C4 PFOS	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:05*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.2	U M	3.3	0.85	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorooctanoic acid (PFOA)	**6.0**	**D**	3.3	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorononanoic acid (PFNA)	**1.1**	**J D**	3.3	0.88	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorobutanesulfonic acid (PFBS)	2.0	U	4.3	0.64	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorohexanesulfonic acid (PFHxS)	**10**	**D**	3.3	0.67	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10
Perfluorooctanesulfonic acid (PFOS)	**72**	**D M**	11	2.6	ug/Kg	☼	07/18/18 08:48	08/01/18 16:22	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*68*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C5 PFNA	*88*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
18O2 PFHxS	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*
13C4 PFOS	*77*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:22*	*10*

Client Sample ID: GRE-ER-SB-03

Lab Sample ID: 320-41149-21

Date Collected: 07/11/18 19:10
Date Received: 07/14/18 09:10

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.4	U	1.8	0.56	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorooctanoic acid (PFOA)	1.4	U M	1.8	0.49	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorobutanesulfonic acid (PFBS)	0.91	U	1.8	0.42	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorohexanesulfonic acid (PFHxS)	0.91	U	1.8	0.35	ng/L		07/18/18 08:54	07/22/18 11:14	1
Perfluorooctanesulfonic acid (PFOS)	**10**		3.7	1.0	ng/L		07/18/18 08:54	07/22/18 11:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*87*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C5 PFNA	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
18O2 PFHxS	*95*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*
13C4 PFOS	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 11:14*	*1*

Client Sample ID: GRE03-SB1-01

Lab Sample ID: 320-41149-22
Date Collected: 07/11/18 19:55
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.5

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.56		0.32	0.082	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorooctanoic acid (PFOA)	2.6		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorononanoic acid (PFNA)	2.0		0.32	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorobutanesulfonic acid (PFBS)	0.092	J M	0.42	0.062	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorohexanesulfonic acid (PFHxS)	1.7		0.32	0.065	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1
Perfluorooctanesulfonic acid (PFOS)	84	E	1.1	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 06:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*79*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C4-PFHpA	*87*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C4 PFOA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C5 PFNA	*71*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
18O2 PFHxS	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*
13C4 PFOS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:13*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M	3.2	0.82	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorooctanoic acid (PFOA)	2.6	J D	3.2	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorononanoic acid (PFNA)	2.3	J D	3.2	0.85	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.2	0.62	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorohexanesulfonic acid (PFHxS)	1.8	J D	3.2	0.65	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10
Perfluorooctanesulfonic acid (PFOS)	110	D	11	2.5	ug/Kg	☼	07/18/18 08:48	08/01/18 16:30	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*71*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C4-PFHpA	*91*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C4 PFOA	*89*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C5 PFNA	*87*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
18O2 PFHxS	*76*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*
13C4 PFOS	*74*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:30*	*10*

Client Sample ID: GRE03-SB2-01

Lab Sample ID: 320-41149-23
Date Collected: 07/11/18 20:25
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 92.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.66		0.32	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorooctanoic acid (PFOA)	2.6		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorononanoic acid (PFNA)	3.0		0.32	0.087	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorobutanesulfonic acid (PFBS)	0.16	J M	0.43	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorohexanesulfonic acid (PFHxS)	6.7		0.32	0.067	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1
Perfluorooctanesulfonic acid (PFOS)	100	E	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 06:29	1

Client Sample ID: GRE03-SB2-01

Lab Sample ID: 320-41149-23

Date Collected: 07/11/18 20:25
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 92.6

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C4-PFHpA	*84*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C4 PFOA	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C5 PFNA	*64*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
18O2 PFHxS	*74*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*
13C4 PFOS	*65*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:29*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M	3.2	0.84	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorooctanoic acid (PFOA)	**2.6**	**J D M**	3.2	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorononanoic acid (PFNA)	**3.4**	**D**	3.2	0.87	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.3	0.63	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorohexanesulfonic acid (PFHxS)	**6.5**	**D**	3.2	0.67	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10
Perfluorooctanesulfonic acid (PFOS)	**150**	**D**	11	2.6	ug/Kg	☼	07/18/18 08:48	08/01/18 16:37	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*65*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
18O2 PFHxS	*73*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*
13C4 PFOS	*71*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:37*	*10*

Client Sample ID: GRE03-SB4-01

Lab Sample ID: 320-41149-24

Date Collected: 07/11/18 20:50
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 94.0

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.56**		0.32	0.083	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorooctanoic acid (PFOA)	**2.8**		0.32	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorononanoic acid (PFNA)	**2.6**		0.32	0.086	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorobutanesulfonic acid (PFBS)	**0.29**	**J M**	0.42	0.063	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorohexanesulfonic acid (PFHxS)	**3.8**		0.32	0.066	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1
Perfluorooctanesulfonic acid (PFOS)	**62**	**E**	1.1	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 06:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*81*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C5 PFNA	*80*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
18O2 PFHxS	*81*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*
13C4 PFOS	*76*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:36*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M	3.2	0.83	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorooctanoic acid (PFOA)	**2.8**	**J D M**	3.2	1.1	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10

Client Sample ID: GRE03-SB4-01

Lab Sample ID: 320-41149-24
Date Collected: 07/11/18 20:50
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 94.0

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**3.0**	**J D**	3.2	0.86	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.2	0.63	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorohexanesulfonic acid (PFHxS)	**4.0**	**D**	3.2	0.66	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10
Perfluorooctanesulfonic acid (PFOS)	**74**	**D**	11	2.5	ug/Kg	☼	07/18/18 08:48	08/01/18 16:45	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*68*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C4-PFHpA	*96*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C4 PFOA	*91*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C5 PFNA	*86*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
18O2 PFHxS	*75*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*
13C4 PFOS	*75*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:45*	*10*

Client Sample ID: GRE03-SB5-01

Lab Sample ID: 320-41149-25
Date Collected: 07/11/18 21:05
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 90.7

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.60**		0.33	0.085	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorooctanoic acid (PFOA)	**2.4**		0.33	0.11	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorononanoic acid (PFNA)	**1.3**		0.33	0.088	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorobutanesulfonic acid (PFBS)	**0.38**	**J M**	0.44	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorohexanesulfonic acid (PFHxS)	**6.8**		0.33	0.068	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1
Perfluorooctanesulfonic acid (PFOS)	**190**	**M E**	1.1	0.26	ug/Kg	☼	07/18/18 08:48	07/30/18 06:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C4-PFHpA	*91*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C5 PFNA	*51*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
18O2 PFHxS	*82*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*
13C4 PFOS	*56*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:44*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	4.4	U M	6.5	1.7	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorooctanoic acid (PFOA)	**2.6**	**J D M**	6.5	2.2	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorononanoic acid (PFNA)	4.4	U M	6.5	1.8	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorobutanesulfonic acid (PFBS)	3.9	U	8.7	1.3	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorohexanesulfonic acid (PFHxS)	**6.3**	**J D**	6.5	1.4	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20
Perfluorooctanesulfonic acid (PFOS)	**330**	**D**	22	5.2	ug/Kg	☼	07/18/18 08:48	08/01/18 16:53	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*74*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
13C4-PFHpA	*92*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*

Client Sample ID: GRE03-SB5-01 — Lab Sample ID: 320-41149-25

Date Collected: 07/11/18 21:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 90.7**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*82*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*
13C4 PFOS	*75*		*50 - 150*	*07/18/18 08:48*	*08/01/18 16:53*	*20*

Client Sample ID: GRE04-SB2-01 — Lab Sample ID: 320-41149-26

Date Collected: 07/12/18 11:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 95.8**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.10**	**J**	0.31	0.081	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorooctanoic acid (PFOA)	**0.45**		0.31	0.10	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorononanoic acid (PFNA)	0.21	U	0.31	0.084	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorobutanesulfonic acid (PFBS)	**0.070**	**J**	0.41	0.061	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorohexanesulfonic acid (PFHxS)	**5.0**		0.31	0.064	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1
Perfluorooctanesulfonic acid (PFOS)	**14**		1.0	0.25	ug/Kg	☼	07/18/18 08:48	07/30/18 06:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*94*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C4 PFOA	*94*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C5 PFNA	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
18O2 PFHxS	*92*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*
13C4 PFOS	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 06:52*	*1*

Client Sample ID: GRE07-SB2-01 — Lab Sample ID: 320-41149-27

Date Collected: 07/12/18 12:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 83.6**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**5.5**		0.36	0.092	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorooctanoic acid (PFOA)	**48**	**E**	0.36	0.12	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorononanoic acid (PFNA)	**4.2**	**M**	0.36	0.096	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorobutanesulfonic acid (PFBS)	**8.1**		0.47	0.070	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorohexanesulfonic acid (PFHxS)	**170**	**E**	0.36	0.073	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1
Perfluorooctanesulfonic acid (PFOS)	**1000**	**E**	1.2	0.28	ug/Kg	☼	07/18/18 10:19	07/31/18 19:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*146*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C4-PFHpA	*119*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C4 PFOA	*83*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C5 PFNA	*71*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
18O2 PFHxS	*122*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*
13C4 PFOS	*66*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:46*	*1*

Client Sample ID: GRE07-SB2-01

Lab Sample ID: 320-41149-27
Date Collected: 07/12/18 12:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 83.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	24	U M	36	9.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorooctanoic acid (PFOA)	**45**	**D**	36	12	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorononanoic acid (PFNA)	24	U	36	9.6	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorobutanesulfonic acid (PFBS)	**9.7**	**J D**	47	7.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorohexanesulfonic acid (PFHxS)	**280**	**D**	36	7.3	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100
Perfluorooctanesulfonic acid (PFOS)	**1700**	**D**	120	28	ug/Kg	☼	07/18/18 10:19	07/31/18 18:20	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*58*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C4-PFHpA	*93*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C4 PFOA	*87*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C5 PFNA	*76*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
18O2 PFHxS	*69*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*
13C4 PFOS	*69*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:20*	*100*

Client Sample ID: GRE08-SB1-01

Lab Sample ID: 320-41149-28
Date Collected: 07/12/18 13:25
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 96.5

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**2.1**		0.31	0.081	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorooctanoic acid (PFOA)	**7.6**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorononanoic acid (PFNA)	**1.4**		0.31	0.084	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorobutanesulfonic acid (PFBS)	**1.0**	**M**	0.41	0.061	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorohexanesulfonic acid (PFHxS)	**14**		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1
Perfluorooctanesulfonic acid (PFOS)	**200**	**E**	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 01:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*89*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C4-PFHpA	*88*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C5 PFNA	*60*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*
13C4 PFOS	*62*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:55*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	10	U M	16	4.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorooctanoic acid (PFOA)	**8.2**	**J D**	16	5.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorononanoic acid (PFNA)	10	U	16	4.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorobutanesulfonic acid (PFBS)	9.3	U	21	3.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorohexanesulfonic acid (PFHxS)	**15**	**J D**	16	3.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50
Perfluorooctanesulfonic acid (PFOS)	**310**	**D**	52	12	ug/Kg	☼	07/18/18 10:19	07/31/18 18:28	50

Client Sample ID: GRE08-SB1-01

Lab Sample ID: 320-41149-28

Date Collected: 07/12/18 13:25
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 96.5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*73*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C5 PFNA	*83*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
18O2 PFHxS	*70*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*
13C4 PFOS	*70*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:28*	*50*

Client Sample ID: GRE08-SB2-01

Lab Sample ID: 320-41149-29

Date Collected: 07/12/18 13:55
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 97.9

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**1.7**		0.31	0.080	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorooctanoic acid (PFOA)	**6.7**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorononanoic acid (PFNA)	**1.3**	**M**	0.31	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorobutanesulfonic acid (PFBS)	**0.82**	**M**	0.41	0.060	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorohexanesulfonic acid (PFHxS)	**16**		0.31	0.063	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1
Perfluorooctanesulfonic acid (PFOS)	**300**	**E**	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C4-PFHpA	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C5 PFNA	*45*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
18O2 PFHxS	*78*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*
13C4 PFOS	*45*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:03*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	10	U M	15	4.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorooctanoic acid (PFOA)	**6.7**	**J D**	15	5.1	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorononanoic acid (PFNA)	10	U	15	4.1	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorobutanesulfonic acid (PFBS)	9.2	U	20	3.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorohexanesulfonic acid (PFHxS)	**16**	**D**	15	3.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50
Perfluorooctanesulfonic acid (PFOS)	**600**	**D M**	51	12	ug/Kg	☼	07/18/18 10:19	07/31/18 18:36	50

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C4-PFHpA	*79*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C5 PFNA	*73*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
18O2 PFHxS	*67*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*
13C4 PFOS	*64*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:36*	*50*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE08-SB3-01

Lab Sample ID: 320-41149-30
Date Collected: 07/12/18 14:17
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 89.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3		0.33	0.086	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorooctanoic acid (PFOA)	6.6		0.33	0.11	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorononanoic acid (PFNA)	0.79		0.33	0.090	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorobutanesulfonic acid (PFBS)	0.79	M	0.44	0.065	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorohexanesulfonic acid (PFHxS)	29	E	0.33	0.069	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1
Perfluorooctanesulfonic acid (PFOS)	540	E	1.1	0.27	ug/Kg	☼	07/18/18 10:19	07/29/18 02:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*95*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C4 PFOA	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C5 PFNA	*34*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
18O2 PFHxS	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*
13C4 PFOS	*32*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:11*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	22	U M	33	8.6	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorooctanoic acid (PFOA)	22	U	33	11	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorononanoic acid (PFNA)	22	U M	33	9.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorobutanesulfonic acid (PFBS)	20	U	44	6.5	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorohexanesulfonic acid (PFHxS)	26	J D	33	6.9	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100
Perfluorooctanesulfonic acid (PFOS)	1300	D	110	27	ug/Kg	☼	07/18/18 10:19	07/31/18 18:44	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*79*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C4-PFHpA	*77*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C4 PFOA	*92*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C5 PFNA	*81*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
18O2 PFHxS	*80*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*
13C4 PFOS	*74*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:44*	*100*

Client Sample ID: GRE08-SB4-01

Lab Sample ID: 320-41149-31
Date Collected: 07/12/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 87.2

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.87		0.34	0.088	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorooctanoic acid (PFOA)	7.6		0.34	0.11	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorononanoic acid (PFNA)	4.2		0.34	0.092	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorobutanesulfonic acid (PFBS)	0.27	J M	0.45	0.067	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorohexanesulfonic acid (PFHxS)	13		0.34	0.070	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1
Perfluorooctanesulfonic acid (PFOS)	1000	E	1.1	0.27	ug/Kg	☼	07/18/18 10:19	07/29/18 02:19	1

Client Sample ID: GRE08-SB4-01

Lab Sample ID: 320-41149-31

Date Collected: 07/12/18 14:35
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 87.2

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*90*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C4-PFHpA	*98*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C4 PFOA	*83*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C5 PFNA	*27*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
18O2 PFHxS	*89*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*
13C4 PFOS	*22*	*Q*	*50 - 150*	*07/18/18 10:19*	*07/29/18 02:19*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	23	U	34	8.8	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorooctanoic acid (PFOA)	23	U	34	11	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorononanoic acid (PFNA)	23	U	34	9.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorobutanesulfonic acid (PFBS)	20	U	45	6.7	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorohexanesulfonic acid (PFHxS)	**11**	**J D**	34	7.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100
Perfluorooctanesulfonic acid (PFOS)	**2800**	**E D**	110	27	ug/Kg	☼	07/18/18 10:19	07/31/18 18:52	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*54*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C4-PFHpA	*81*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C4 PFOA	*94*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C5 PFNA	*70*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
18O2 PFHxS	*83*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*
13C4 PFOS	*72*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:52*	*100*

Client Sample ID: GRE07-SB3-01

Lab Sample ID: 320-41149-32

Date Collected: 07/13/18 08:20
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 97.2

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.77**	**M**	0.31	0.080	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorooctanoic acid (PFOA)	**2.2**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorononanoic acid (PFNA)	**2.3**		0.31	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorobutanesulfonic acid (PFBS)	**0.37**	**J M**	0.41	0.060	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorohexanesulfonic acid (PFHxS)	**7.3**		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1
Perfluorooctanesulfonic acid (PFOS)	**160**	**E**	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*85*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C4-PFHpA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C5 PFNA	*66*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
18O2 PFHxS	*82*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*
13C4 PFOS	*67*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:35*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	4.1	U M	6.1	1.6	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorooctanoic acid (PFOA)	**2.1**	**J D M**	6.1	2.0	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20

Client Sample ID: GRE07-SB3-01

Lab Sample ID: 320-41149-32
Date Collected: 07/13/18 08:20
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 97.2

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	2.4	J D M	6.1	1.7	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorobutanesulfonic acid (PFBS)	3.7	U	8.2	1.2	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorohexanesulfonic acid (PFHxS)	7.7	D	6.1	1.3	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20
Perfluorooctanesulfonic acid (PFOS)	220	D	20	4.9	ug/Kg	☼	07/18/18 10:19	07/31/18 18:59	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*78*	*M*	*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C4-PFHpA	*95*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C4 PFOA	*93*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C5 PFNA	*89*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
18O2 PFHxS	*78*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*
13C4 PFOS	*76*		*50 - 150*	*07/18/18 10:19*	*07/31/18 18:59*	*20*

Client Sample ID: GRE04-SB3-01

Lab Sample ID: 320-41149-33
Date Collected: 07/13/18 08:40
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 93.8

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.11	J M	0.32	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorooctanoic acid (PFOA)	0.78		0.32	0.11	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorononanoic acid (PFNA)	0.38		0.32	0.086	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.43	0.063	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorohexanesulfonic acid (PFHxS)	1.1		0.32	0.066	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1
Perfluorooctanesulfonic acid (PFOS)	6.6		1.1	0.26	ug/Kg	☼	07/18/18 10:19	07/29/18 02:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*63*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C4-PFHpA	*73*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C4 PFOA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C5 PFNA	*80*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
18O2 PFHxS	*64*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*
13C4 PFOS	*66*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:42*	*1*

Client Sample ID: GRE05-SB1-01

Lab Sample ID: 320-41149-34
Date Collected: 07/13/18 09:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 97.1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.23	J M	0.31	0.080	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorooctanoic acid (PFOA)	0.93		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorononanoic acid (PFNA)	1.3		0.31	0.083	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.061	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorohexanesulfonic acid (PFHxS)	0.74		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1
Perfluorooctanesulfonic acid (PFOS)	42	E	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:50	1

Client Sample ID: GRE05-SB1-01 — Lab Sample ID: 320-41149-34

Date Collected: 07/13/18 09:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.1**

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*71*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C4-PFHpA	*82*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C4 PFOA	*87*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C5 PFNA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
18O2 PFHxS	*78*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*
13C4 PFOS	*73*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:50*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M	3.1	0.80	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorooctanoic acid (PFOA)	**1.1**	**J D**	3.1	1.0	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorononanoic acid (PFNA)	**1.4**	**J D**	3.1	0.83	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.1	0.61	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorohexanesulfonic acid (PFHxS)	**0.80**	**J D**	3.1	0.64	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10
Perfluorooctanesulfonic acid (PFOS)	**46**	**D**	10	2.5	ug/Kg	☼	07/18/18 10:19	07/31/18 19:23	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*67*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C4 PFOA	*85*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C5 PFNA	*85*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
18O2 PFHxS	*73*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*
13C4 PFOS	*69*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:23*	*10*

Client Sample ID: GRE05-SB2-01 — Lab Sample ID: 320-41149-35

Date Collected: 07/13/18 09:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.3**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.22**	**J M**	0.31	0.081	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorooctanoic acid (PFOA)	**0.87**		0.31	0.10	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorononanoic acid (PFNA)	**3.4**		0.31	0.084	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.061	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorohexanesulfonic acid (PFHxS)	**0.93**		0.31	0.064	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1
Perfluorooctanesulfonic acid (PFOS)	**59**	**E**	1.0	0.25	ug/Kg	☼	07/18/18 10:19	07/29/18 02:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*69*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C4-PFHpA	*81*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C4 PFOA	*82*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C5 PFNA	*70*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
18O2 PFHxS	*70*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*
13C4 PFOS	*69*		*50 - 150*	*07/18/18 10:19*	*07/29/18 02:58*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2.1	U M	3.1	0.81	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorooctanoic acid (PFOA)	2.1	U M	3.1	1.0	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorononanoic acid (PFNA)	**3.8**	**D**	3.1	0.84	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10

Client Sample ID: GRE05-SB2-01

Lab Sample ID: 320-41149-35

Date Collected: 07/13/18 09:35
Date Received: 07/14/18 09:10

Matrix: Solid
Percent Solids: 96.3

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.1	0.61	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	**J D**	3.1	0.64	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10
Perfluorooctanesulfonic acid (PFOS)	**67**	**D**	10	2.5	ug/Kg	☼	07/18/18 10:19	07/31/18 19:31	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*59*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C4-PFHpA	*79*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C4 PFOA	*81*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C5 PFNA	*74*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
18O2 PFHxS	*61*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*
13C4 PFOS	*61*		*50 - 150*	*07/18/18 10:19*	*07/31/18 19:31*	*10*

Client Sample ID: GRE-IDW-S-01

Lab Sample ID: 320-41149-36

Date Collected: 07/13/18 10:55
Date Received: 07/14/18 09:10

Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0040	U	0.010	0.0016	mg/L			08/06/18 11:30	1
2-Butanone (MEK)	0.040	U	0.10	0.018	mg/L			08/06/18 11:30	1
Carbon tetrachloride	0.0040	U	0.010	0.0019	mg/L			08/06/18 11:30	1
Chlorobenzene	0.0040	U	0.010	0.0017	mg/L			08/06/18 11:30	1
Chloroform	0.0040	U	0.010	0.0016	mg/L			08/06/18 11:30	1
1,2-Dichloroethane	0.0040	U	0.010	0.0013	mg/L			08/06/18 11:30	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			08/06/18 11:30	1
Tetrachloroethene	0.0040	U	0.010	0.0020	mg/L			08/06/18 11:30	1
Trichloroethene	0.0040	U	0.010	0.0016	mg/L			08/06/18 11:30	1
Vinyl chloride	0.0020	U	0.010	0.0010	mg/L			08/06/18 11:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*78 - 120*		*08/06/18 11:30*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*64 - 129*		*08/06/18 11:30*	*1*
4-Bromofluorobenzene (Surr)	*98*		*78 - 121*		*08/06/18 11:30*	*1*
Dibromofluoromethane (Surr)	*104*		*79 - 119*		*08/06/18 11:30*	*1*

Default Detection Limits

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Leach: 1311

Analyte	LOQ	DL	Units	Method
1,1-Dichloroethene	0.010	0.0023	mg/L	8260B
1,2-Dichloroethane	0.010	0.0013	mg/L	8260B
2-Butanone (MEK)	0.10	0.018	mg/L	8260B
Benzene	0.010	0.0016	mg/L	8260B
Carbon tetrachloride	0.010	0.0019	mg/L	8260B
Chlorobenzene	0.010	0.0017	mg/L	8260B
Chloroform	0.010	0.0016	mg/L	8260B
Tetrachloroethene	0.010	0.0020	mg/L	8260B
Trichloroethene	0.010	0.0016	mg/L	8260B
Vinyl chloride	0.010	0.0010	mg/L	8260B

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.46	ng/L	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	2.0	0.61	ng/L	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.38	ng/L	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	4.0	1.1	ng/L	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	2.0	0.54	ng/L	EPA 537 (Mod)

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Prep: SHAKE

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.40	0.059	ug/Kg	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	0.30	0.078	ug/Kg	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	0.30	0.062	ug/Kg	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	0.30	0.081	ug/Kg	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	1.0	0.24	ug/Kg	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	0.30	0.10	ug/Kg	EPA 537 (Mod)

Surrogate Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	BFB	DBFM
Lab Sample ID	**Client Sample ID**	**(78-120)**	**(64-129)**	**(78-121)**	**(79-119)**
320-41149-36	GRE-IDW-S-01	106	102	98	104
LB 280-423316/1-A	Method Blank	107	103	99	105
LCS 280-423316/2-A	Lab Control Sample	101	103	94	103

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Isotope Dilution Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)					
		3C3-PFBS	PFHpA	PFOA	PFNA	PFHxS	PFOS
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-41149-2	GRE10-SB2-01	79	90	89	92	84	83
320-41149-2 MS	GRE10-SB2-01	79	86	89	91	81	83
320-41149-2 MSD	GRE10-SB2-01	75	84	85	87	78	81
320-41149-3	GRE10-SB2-02	75	77	84	85	75	78
320-41149-3 - DL	GRE10-SB2-02	65	86	85	86	72	70
320-41149-4	GRE10-SB1-01	77	86	85	92	80	79
320-41149-5	GRE10-SB1-01D	74	84	90	92	79	78
320-41149-6	GRE10-SB3-01	80	90	92	91	82	84
320-41149-7	GRE09-SB1-01	74	83	85	85	75	77
320-41149-8	GRE09-SB1-01D	76	83	89	88	76	78
320-41149-9	GRE09-SB2-01	77	86	90	92	76	83
320-41149-13	GRE03-SB3-01	93	88	91	96	93	95
320-41149-14	GRE03-SB3-02	89	85	87	90	90	92
320-41149-15	GRE04-SB1-01	96	93	91	96	96	93
320-41149-16	GRE06-SB1-01	94	93	92	84	97	90
320-41149-16 - DL	GRE06-SB1-01	76	92	96	89	84	77
320-41149-17	GRE06-SB1-01D	92	96	89	82	93	90
320-41149-17 - DL	GRE06-SB1-01D	80	95	91	95	84	84
320-41149-18	GRE06-SB2-01	88	89	95	89	89	91
320-41149-18 - DL	GRE06-SB2-01	84	94	95	93	85	82
320-41149-19	GRE07-SB1-01	89	85	88	58	83	54
320-41149-19 - DL	GRE07-SB1-01	57 M	90	88	80	73	71
320-41149-19 MS	GRE07-SB1-01	94	81	84	53	80	53
320-41149-19 MS - DL	GRE07-SB1-01	64 M	75	82	79	72	67
320-41149-19 MSD	GRE07-SB1-01	90	83	81	53	80	54
320-41149-19 MSD - DL	GRE07-SB1-01	58 M	77	81	68	63	61
320-41149-20	GRE07-SB1-02	94	95	91	82	98	88
320-41149-20 - DL	GRE07-SB1-02	68	88	88	88	85	77
320-41149-22	GRE03-SB1-01	79	87	88	71	84	74
320-41149-22 - DL	GRE03-SB1-01	71	91	89	87	76	74
320-41149-23	GRE03-SB2-01	76	84	82	64	74	65
320-41149-23 - DL	GRE03-SB2-01	65	92	85	82	73	71
320-41149-24	GRE03-SB4-01	81	88	91	80	81	76
320-41149-24 - DL	GRE03-SB4-01	68	96	91	86	75	75
320-41149-25	GRE03-SB5-01	83	91	86	51	82	56
320-41149-25 - DL	GRE03-SB5-01	74	92	85	82	83	75
320-41149-26	GRE04-SB2-01	94	89	94	96	92	95
320-41149-27	GRE07-SB2-01	146	119	83	71	122	66
320-41149-27 - DL	GRE07-SB2-01	58 M	93	87	76	69	69
320-41149-28	GRE08-SB1-01	89	88	85	60	83	62
320-41149-28 - DL	GRE08-SB1-01	73 M	89	86	83	70	70
320-41149-29	GRE08-SB2-01	86	83	86	45 Q	78	45 Q
320-41149-29 - DL	GRE08-SB2-01	83 M	79	85	73	67	64
320-41149-30	GRE08-SB3-01	95	95	86	34 Q	86	32 Q
320-41149-30 - DL	GRE08-SB3-01	79 M	77	92	81	80	74
320-41149-31	GRE08-SB4-01	90	98	83	27 Q	89	22 Q
320-41149-31 - DL	GRE08-SB4-01	54 M	81	94	70	83	72
320-41149-32	GRE07-SB3-01	85	81	90	66	82	67
320-41149-32 - DL	GRE07-SB3-01	78 M	95	93	89	78	76

Isotope Dilution Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)					
		3C3-PFBS	PFHpA	PFOA	PFNA	PFHxS	PFOS
Lab Sample ID	**Client Sample ID**	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-41149-33	GRE04-SB3-01	63	73	81	80	64	66
320-41149-34	GRE05-SB1-01	71	82	87	81	78	73
320-41149-34 - DL	GRE05-SB1-01	67	89	85	85	73	69
320-41149-35	GRE05-SB2-01	69	81	82	70	70	69
320-41149-35 - DL	GRE05-SB2-01	59	79	81	74	61	61
LCS 320-234633/2-A	Lab Control Sample	101	98	95	100	99	98
LCS 320-234662/2-A	Lab Control Sample	101	97	93	102	102	99
MB 320-234633/1-A	Method Blank	95	89	90	95	96	96
MB 320-234662/1-A	Method Blank	87	86	87	87	86	89

Surrogate Legend

13C3-PFBS = 13C3-PFBS
PFHpA = 13C4-PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)					
		3C3-PFBS	PFHpA	PFOA	PFNA	PFHxS	PFOS
Lab Sample ID	**Client Sample ID**	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-41149-1	GRE-ER-SB-01	81	89	92	89	89	84
320-41149-10	GRE-FB-POT-01	83	93	93	92	97	95
320-41149-11	GRE-FB-DI-01	86	92	91	91	100	90
320-41149-12	GRE-ER-SB-02	88	92	90	89	90	93
320-41149-21	GRE-ER-SB-03	87	89	92	92	95	93
LCS 320-234634/2-A	Lab Control Sample	90	89	94	93	92	91
LCSD 320-234634/3-A	Lab Control Sample Dup	91	94	97	93	99	94
MB 320-234634/1-A	Method Blank	92	94	97	90	99	93

Surrogate Legend

13C3-PFBS = 13C3-PFBS
PFHpA = 13C4-PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: LB 280-423316/1-A
Matrix: Solid
Analysis Batch: 424938

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0040	U	0.010	0.0016	mg/L			08/06/18 09:28	1
2-Butanone (MEK)	0.040	U	0.10	0.018	mg/L			08/06/18 09:28	1
Carbon tetrachloride	0.0040	U	0.010	0.0019	mg/L			08/06/18 09:28	1
Chlorobenzene	0.0040	U	0.010	0.0017	mg/L			08/06/18 09:28	1
Chloroform	0.0040	U	0.010	0.0016	mg/L			08/06/18 09:28	1
1,2-Dichloroethane	0.0040	U	0.010	0.0013	mg/L			08/06/18 09:28	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			08/06/18 09:28	1
Tetrachloroethene	0.0040	U	0.010	0.0020	mg/L			08/06/18 09:28	1
Trichloroethene	0.0040	U	0.010	0.0016	mg/L			08/06/18 09:28	1
Vinyl chloride	0.0020	U	0.010	0.0010	mg/L			08/06/18 09:28	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*107*		*78 - 120*		*08/06/18 09:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*64 - 129*		*08/06/18 09:28*	*1*
4-Bromofluorobenzene (Surr)	*99*		*78 - 121*		*08/06/18 09:28*	*1*
Dibromofluoromethane (Surr)	*105*		*79 - 119*		*08/06/18 09:28*	*1*

Lab Sample ID: LCS 280-423316/2-A
Matrix: Solid
Analysis Batch: 424938

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.0500	0.0484		mg/L		97	74 - 135
2-Butanone (MEK)	0.200	0.173	M	mg/L		87	44 - 150
Carbon tetrachloride	0.0500	0.0447		mg/L		89	67 - 135
Chlorobenzene	0.0500	0.0456		mg/L		91	76 - 135
Chloroform	0.0500	0.0491		mg/L		98	76 - 120
1,2-Dichloroethane	0.0500	0.0493		mg/L		99	70 - 135
1,1-Dichloroethene	0.0500	0.0459		mg/L		92	71 - 136
Tetrachloroethene	0.0500	0.0440		mg/L		88	70 - 135
Trichloroethene	0.0500	0.0467		mg/L		93	73 - 135
Vinyl chloride	0.0500	0.0500		mg/L		100	40 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*78 - 120*
1,2-Dichloroethane-d4 (Surr)	*103*		*64 - 129*
4-Bromofluorobenzene (Surr)	*94*		*78 - 121*
Dibromofluoromethane (Surr)	*103*		*79 - 119*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Lab Sample ID: MB 320-234633/1-A
Matrix: Solid
Analysis Batch: 236836

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 234633

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.20	U	0.30	0.078	ug/Kg		07/18/18 08:48	07/30/18 03:36	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: MB 320-234633/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 236836 — **Prep Batch: 234633**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.20	U M	0.30	0.10	ug/Kg		07/18/18 08:48	07/30/18 03:36	1
Perfluorononanoic acid (PFNA)	0.20	U	0.30	0.081	ug/Kg		07/18/18 08:48	07/30/18 03:36	1
Perfluorobutanesulfonic acid (PFBS)	0.18	U	0.40	0.059	ug/Kg		07/18/18 08:48	07/30/18 03:36	1
Perfluorohexanesulfonic acid (PFHxS)	0.20	U	0.30	0.062	ug/Kg		07/18/18 08:48	07/30/18 03:36	1
Perfluorooctanesulfonic acid (PFOS)	0.50	U M	1.0	0.24	ug/Kg		07/18/18 08:48	07/30/18 03:36	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:36*	*1*
13C4-PFHpA	*89*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:36*	*1*
13C4 PFOA	*90*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:36*	*1*
13C5 PFNA	*95*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:36*	*1*
18O2 PFHxS	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:36*	*1*
13C4 PFOS	*96*		*50 - 150*	*07/18/18 08:48*	*07/30/18 03:36*	*1*

Lab Sample ID: LCS 320-234633/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 236836 — **Prep Batch: 234633**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	2.00	1.73		ug/Kg		86	76 - 124
Perfluorooctanoic acid (PFOA)	2.00	1.65		ug/Kg		82	76 - 121
Perfluorononanoic acid (PFNA)	2.00	1.68		ug/Kg		84	74 - 126
Perfluorobutanesulfonic acid (PFBS)	1.77	1.57		ug/Kg		89	73 - 142
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.50		ug/Kg		82	75 - 121
Perfluorooctanesulfonic acid (PFOS)	1.86	1.80		ug/Kg		97	69 - 131

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3-PFBS	*101*		*50 - 150*
13C4-PFHpA	*98*		*50 - 150*
13C4 PFOA	*95*		*50 - 150*
13C5 PFNA	*100*		*50 - 150*
18O2 PFHxS	*99*		*50 - 150*
13C4 PFOS	*98*		*50 - 150*

Lab Sample ID: 320-41149-2 MS — **Client Sample ID: GRE10-SB2-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 236836 — **Prep Batch: 234633**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	0.21	U M	2.08	1.98		ug/Kg	☼	95	76 - 124
Perfluorooctanoic acid (PFOA)	0.44		2.08	2.13		ug/Kg	☼	81	76 - 121
Perfluorononanoic acid (PFNA)	0.13	J	2.08	1.92		ug/Kg	☼	86	74 - 126
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	1.84	1.71		ug/Kg	☼	93	73 - 142
Perfluorohexanesulfonic acid (PFHxS)	3.2	J1	1.89	4.63	J1	ug/Kg	☼	74	75 - 121

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-41149-2 MS — **Client Sample ID: GRE10-SB2-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 236836 — **Prep Batch: 234633**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	16	J1	1.93	16.1	4	ug/Kg	☼	19	69 - 131

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C3-PFBS	*79*		*50 - 150*
13C4-PFHpA	*86*		*50 - 150*
13C4 PFOA	*89*		*50 - 150*
13C5 PFNA	*91*		*50 - 150*
18O2 PFHxS	*81*		*50 - 150*
13C4 PFOS	*83*		*50 - 150*

Lab Sample ID: 320-41149-2 MSD — **Client Sample ID: GRE10-SB2-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 236836 — **Prep Batch: 234633**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	0.21	U M	2.06	1.97		ug/Kg	☼	95	76 - 124	1	30
Perfluorooctanoic acid (PFOA)	0.44		2.07	2.08		ug/Kg	☼	79	76 - 121	3	30
Perfluorononanoic acid (PFNA)	0.13	J	2.06	1.93		ug/Kg	☼	87	74 - 126	1	30
Perfluorobutanesulfonic acid (PFBS)	0.19	U M	1.82	1.73		ug/Kg	☼	95	73 - 142	1	30
Perfluorohexanesulfonic acid (PFHxS)	3.2	J1	1.88	4.59	J1	ug/Kg	☼	73	75 - 121	1	30
Perfluorooctanesulfonic acid (PFOS)	16	J1	1.91	16.6	4	ug/Kg	☼	42	69 - 131	3	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C3-PFBS	*75*		*50 - 150*
13C4-PFHpA	*84*		*50 - 150*
13C4 PFOA	*85*		*50 - 150*
13C5 PFNA	*87*		*50 - 150*
18O2 PFHxS	*78*		*50 - 150*
13C4 PFOS	*81*		*50 - 150*

Lab Sample ID: MB 320-234634/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 235512 — **Prep Batch: 234634**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		07/18/18 08:54	07/22/18 10:22	1
Perfluorooctanoic acid (PFOA)	1.5	U	2.0	0.54	ng/L		07/18/18 08:54	07/22/18 10:22	1
Perfluorononanoic acid (PFNA)	1.5	U	2.0	0.52	ng/L		07/18/18 08:54	07/22/18 10:22	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		07/18/18 08:54	07/22/18 10:22	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		07/18/18 08:54	07/22/18 10:22	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	1.1	ng/L		07/18/18 08:54	07/22/18 10:22	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*92*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:22*	*1*
13C4-PFHpA	*94*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:22*	*1*
13C4 PFOA	*97*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:22*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: MB 320-234634/1-A
Matrix: Water
Analysis Batch: 235512

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 234634

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*90*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:22*	*1*
18O2 PFHxS	*99*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:22*	*1*
13C4 PFOS	*93*		*50 - 150*	*07/18/18 08:54*	*07/22/18 10:22*	*1*

Lab Sample ID: LCS 320-234634/2-A
Matrix: Water
Analysis Batch: 235512

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 234634

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	40.0	40.5		ng/L		101	80 - 113
Perfluorooctanoic acid (PFOA)	40.0	38.0		ng/L		95	80 - 107
Perfluorononanoic acid (PFNA)	40.0	38.4		ng/L		96	83 - 113
Perfluorobutanesulfonic acid (PFBS)	35.4	34.5		ng/L		98	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	36.4	31.1		ng/L		85	81 - 106
Perfluorooctanesulfonic acid (PFOS)	37.1	34.7		ng/L		93	82 - 112

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3-PFBS	*90*		*50 - 150*
13C4-PFHpA	*89*		*50 - 150*
13C4 PFOA	*94*		*50 - 150*
13C5 PFNA	*93*		*50 - 150*
18O2 PFHxS	*92*		*50 - 150*
13C4 PFOS	*91*		*50 - 150*

Lab Sample ID: LCSD 320-234634/3-A
Matrix: Water
Analysis Batch: 235512

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 234634

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	40.0	38.3		ng/L		96	80 - 113	6	30
Perfluorooctanoic acid (PFOA)	40.0	37.3		ng/L		93	80 - 107	2	30
Perfluorononanoic acid (PFNA)	40.0	39.3		ng/L		98	83 - 113	2	30
Perfluorobutanesulfonic acid (PFBS)	35.4	34.9		ng/L		99	87 - 120	1	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	30.9		ng/L		85	81 - 106	1	30
Perfluorooctanesulfonic acid (PFOS)	37.1	33.4		ng/L		90	82 - 112	4	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3-PFBS	*91*		*50 - 150*
13C4-PFHpA	*94*		*50 - 150*
13C4 PFOA	*97*		*50 - 150*
13C5 PFNA	*93*		*50 - 150*
18O2 PFHxS	*99*		*50 - 150*
13C4 PFOS	*94*		*50 - 150*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: MB 320-234662/1-A
Matrix: Solid
Analysis Batch: 236778

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 234662

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.20	U	0.30	0.078	ug/Kg		07/18/18 10:19	07/29/18 01:08	1
Perfluorooctanoic acid (PFOA)	0.20	U M	0.30	0.10	ug/Kg		07/18/18 10:19	07/29/18 01:08	1
Perfluorononanoic acid (PFNA)	0.20	U	0.30	0.081	ug/Kg		07/18/18 10:19	07/29/18 01:08	1
Perfluorobutanesulfonic acid (PFBS)	0.18	U	0.40	0.059	ug/Kg		07/18/18 10:19	07/29/18 01:08	1
Perfluorohexanesulfonic acid (PFHxS)	0.20	U	0.30	0.062	ug/Kg		07/18/18 10:19	07/29/18 01:08	1
Perfluorooctanesulfonic acid (PFOS)	0.50	U M	1.0	0.24	ug/Kg		07/18/18 10:19	07/29/18 01:08	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*87*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:08*	*1*
13C4-PFHpA	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:08*	*1*
13C4 PFOA	*87*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:08*	*1*
13C5 PFNA	*87*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:08*	*1*
18O2 PFHxS	*86*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:08*	*1*
13C4 PFOS	*89*		*50 - 150*	*07/18/18 10:19*	*07/29/18 01:08*	*1*

Lab Sample ID: LCS 320-234662/2-A
Matrix: Solid
Analysis Batch: 236778

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 234662

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	2.00	1.77		ug/Kg		88	76 - 124
Perfluorooctanoic acid (PFOA)	2.00	1.75		ug/Kg		87	76 - 121
Perfluorononanoic acid (PFNA)	2.00	1.71		ug/Kg		85	74 - 126
Perfluorobutanesulfonic acid (PFBS)	1.77	1.55		ug/Kg		87	73 - 142
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.43		ug/Kg		79	75 - 121
Perfluorooctanesulfonic acid (PFOS)	1.86	1.67		ug/Kg		90	69 - 131

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3-PFBS	*101*		*50 - 150*
13C4-PFHpA	*97*		*50 - 150*
13C4 PFOA	*93*		*50 - 150*
13C5 PFNA	*102*		*50 - 150*
18O2 PFHxS	*102*		*50 - 150*
13C4 PFOS	*99*		*50 - 150*

Lab Sample ID: 320-41149-19 MS
Matrix: Solid
Analysis Batch: 236778

Client Sample ID: GRE07-SB1-01
Prep Type: Total/NA
Prep Batch: 234662

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	3.1		2.08	4.73		ug/Kg	☼	81	76 - 124
Perfluorooctanoic acid (PFOA)	14	J1	2.08	16.0	4	ug/Kg	☼	105	76 - 121
Perfluorononanoic acid (PFNA)	5.1	J1	2.08	6.91		ug/Kg	☼	86	74 - 126
Perfluorobutanesulfonic acid (PFBS)	1.6	M	1.84	3.05		ug/Kg	☼	81	73 - 142
Perfluorohexanesulfonic acid (PFHxS)	35	E J1	1.89	37.3	E 4	ug/Kg	☼	123	75 - 121

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-41149-19 MS — **Client Sample ID: GRE07-SB1-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 236778 — **Prep Batch: 234662**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	340	M E J1	1.93	326	E 4	ug/Kg	☼	-466	69 - 131

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C3-PFBS	*94*		*50 - 150*
13C4-PFHpA	*81*		*50 - 150*
13C4 PFOA	*84*		*50 - 150*
13C5 PFNA	*53*		*50 - 150*
18O2 PFHxS	*80*		*50 - 150*
13C4 PFOS	*53*		*50 - 150*

Lab Sample ID: 320-41149-19 MSD — **Client Sample ID: GRE07-SB1-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 236778 — **Prep Batch: 234662**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	3.1		2.11	4.94		ug/Kg	☼	89	76 - 124	4	30
Perfluorooctanoic acid (PFOA)	14	J1	2.11	14.4	4	ug/Kg	☼	28	76 - 121	10	30
Perfluorononanoic acid (PFNA)	5.1	J1	2.11	6.66	J1	ug/Kg	☼	73	74 - 126	4	30
Perfluorobutanesulfonic acid (PFBS)	1.6	M	1.86	3.15	M	ug/Kg	☼	85	73 - 142	3	30
Perfluorohexanesulfonic acid (PFHxS)	35	E J1	1.92	32.7	E 4	ug/Kg	☼	-121	75 - 121	13	30
Perfluorooctanesulfonic acid (PFOS)	340	M E J1	1.96	297	E 4	ug/Kg	☼	-1973	69 - 131	10	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C3-PFBS	*90*		*50 - 150*
13C4-PFHpA	*83*		*50 - 150*
13C4 PFOA	*81*		*50 - 150*
13C5 PFNA	*53*		*50 - 150*
18O2 PFHxS	*80*		*50 - 150*
13C4 PFOS	*54*		*50 - 150*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Lab Sample ID: 320-41149-19 MS — **Client Sample ID: GRE07-SB1-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 237052 — **Prep Batch: 234662**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA) - DL	10	U M	2.08	5.02	J D M	ug/Kg	☼	NC	76 - 124
Perfluorooctanoic acid (PFOA) - DL	15	J1 D M	2.08	17.9	4 D	ug/Kg	☼	138	76 - 121
Perfluorononanoic acid (PFNA) - DL	6.6	J1 D	2.08	7.92	J J1 D	ug/Kg	☼	63	74 - 126
Perfluorobutanesulfonic acid (PFBS) - DL	9.4	U	1.84	3.49	J D	ug/Kg	☼	NC	73 - 142
Perfluorohexanesulfonic acid (PFHxS) - DL	37	J1 D	1.89	40.1	4 D	ug/Kg	☼	140	75 - 121

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Lab Sample ID: 320-41149-19 MS — **Client Sample ID: GRE07-SB1-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 237052 — **Prep Batch: 234662**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS) - DL	520	J1 D	1.93	553	4 D	ug/Kg	☼	1490	69 - 131

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C3-PFBS - DL	*64*	*M*	*50 - 150*
13C4-PFHpA - DL	*75*		*50 - 150*
13C4 PFOA - DL	*82*		*50 - 150*
13C5 PFNA - DL	*79*		*50 - 150*
18O2 PFHxS - DL	*72*		*50 - 150*
13C4 PFOS - DL	*67*		*50 - 150*

Lab Sample ID: 320-41149-19 MSD — **Client Sample ID: GRE07-SB1-01**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 237052 — **Prep Batch: 234662**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA) - DL	10	U M	2.11	4.60	J D M	ug/Kg	☼	NC	76 - 124	9	30
Perfluorooctanoic acid (PFOA) - DL	15	J1 D M	2.11	14.5	J 4 D	ug/Kg	☼	-25	76 - 121	21	30
Perfluorononanoic acid (PFNA) - DL	6.6	J1 D	2.11	7.42	J D J1	ug/Kg	☼	39	74 - 126	7	30
Perfluorobutanesulfonic acid (PFBS) - DL	9.4	U	1.86	3.35	J D	ug/Kg	☼	NC	73 - 142	4	30
Perfluorohexanesulfonic acid (PFHxS) - DL	37	J1 D	1.92	38.9	4 D	ug/Kg	☼	72	75 - 121	3	30
Perfluorooctanesulfonic acid (PFOS) - DL	520	J1 D	1.96	487	4 D	ug/Kg	☼	-1883	69 - 131	13	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C3-PFBS - DL	*58*	*M*	*50 - 150*
13C4-PFHpA - DL	*77*		*50 - 150*
13C4 PFOA - DL	*81*		*50 - 150*
13C5 PFNA - DL	*68*		*50 - 150*
18O2 PFHxS - DL	*63*		*50 - 150*
13C4 PFOS - DL	*61*		*50 - 150*

QC Association Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

GC/MS VOA

Leach Batch: 423316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-36	GRE-IDW-S-01	TCLP	Solid	1311	
LB 280-423316/1-A	Method Blank	TCLP	Solid	1311	
LCS 280-423316/2-A	Lab Control Sample	TCLP	Solid	1311	

Analysis Batch: 424938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-36	GRE-IDW-S-01	TCLP	Solid	8260B	423316
LB 280-423316/1-A	Method Blank	TCLP	Solid	8260B	423316
LCS 280-423316/2-A	Lab Control Sample	TCLP	Solid	8260B	423316

LCMS

Prep Batch: 234633

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-2	GRE10-SB2-01	Total/NA	Solid	SHAKE	
320-41149-3	GRE10-SB2-02	Total/NA	Solid	SHAKE	
320-41149-3 - DL	GRE10-SB2-02	Total/NA	Solid	SHAKE	
320-41149-4	GRE10-SB1-01	Total/NA	Solid	SHAKE	
320-41149-5	GRE10-SB1-01D	Total/NA	Solid	SHAKE	
320-41149-6	GRE10-SB3-01	Total/NA	Solid	SHAKE	
320-41149-7	GRE09-SB1-01	Total/NA	Solid	SHAKE	
320-41149-8	GRE09-SB1-01D	Total/NA	Solid	SHAKE	
320-41149-9	GRE09-SB2-01	Total/NA	Solid	SHAKE	
320-41149-13	GRE03-SB3-01	Total/NA	Solid	SHAKE	
320-41149-14	GRE03-SB3-02	Total/NA	Solid	SHAKE	
320-41149-15	GRE04-SB1-01	Total/NA	Solid	SHAKE	
320-41149-16 - DL	GRE06-SB1-01	Total/NA	Solid	SHAKE	
320-41149-16	GRE06-SB1-01	Total/NA	Solid	SHAKE	
320-41149-17 - DL	GRE06-SB1-01D	Total/NA	Solid	SHAKE	
320-41149-17	GRE06-SB1-01D	Total/NA	Solid	SHAKE	
320-41149-18	GRE06-SB2-01	Total/NA	Solid	SHAKE	
320-41149-18 - DL	GRE06-SB2-01	Total/NA	Solid	SHAKE	
320-41149-20	GRE07-SB1-02	Total/NA	Solid	SHAKE	
320-41149-20 - DL	GRE07-SB1-02	Total/NA	Solid	SHAKE	
320-41149-22 - DL	GRE03-SB1-01	Total/NA	Solid	SHAKE	
320-41149-22	GRE03-SB1-01	Total/NA	Solid	SHAKE	
320-41149-23 - DL	GRE03-SB2-01	Total/NA	Solid	SHAKE	
320-41149-23	GRE03-SB2-01	Total/NA	Solid	SHAKE	
320-41149-24	GRE03-SB4-01	Total/NA	Solid	SHAKE	
320-41149-24 - DL	GRE03-SB4-01	Total/NA	Solid	SHAKE	
320-41149-25	GRE03-SB5-01	Total/NA	Solid	SHAKE	
320-41149-25 - DL	GRE03-SB5-01	Total/NA	Solid	SHAKE	
320-41149-26	GRE04-SB2-01	Total/NA	Solid	SHAKE	
MB 320-234633/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-234633/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-41149-2 MS	GRE10-SB2-01	Total/NA	Solid	SHAKE	
320-41149-2 MSD	GRE10-SB2-01	Total/NA	Solid	SHAKE	

LCMS (Continued)

Prep Batch: 234634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-1	GRE-ER-SB-01	Total/NA	Water	3535	
320-41149-10	GRE-FB-POT-01	Total/NA	Water	3535	
320-41149-11	GRE-FB-DI-01	Total/NA	Water	3535	
320-41149-12	GRE-ER-SB-02	Total/NA	Water	3535	
320-41149-21	GRE-ER-SB-03	Total/NA	Water	3535	
MB 320-234634/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-234634/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-234634/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Prep Batch: 234662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-19 - DL	GRE07-SB1-01	Total/NA	Solid	SHAKE	
320-41149-19	GRE07-SB1-01	Total/NA	Solid	SHAKE	
320-41149-27 - DL	GRE07-SB2-01	Total/NA	Solid	SHAKE	
320-41149-27	GRE07-SB2-01	Total/NA	Solid	SHAKE	
320-41149-28	GRE08-SB1-01	Total/NA	Solid	SHAKE	
320-41149-28 - DL	GRE08-SB1-01	Total/NA	Solid	SHAKE	
320-41149-29 - DL	GRE08-SB2-01	Total/NA	Solid	SHAKE	
320-41149-29	GRE08-SB2-01	Total/NA	Solid	SHAKE	
320-41149-30	GRE08-SB3-01	Total/NA	Solid	SHAKE	
320-41149-30 - DL	GRE08-SB3-01	Total/NA	Solid	SHAKE	
320-41149-31 - DL	GRE08-SB4-01	Total/NA	Solid	SHAKE	
320-41149-31	GRE08-SB4-01	Total/NA	Solid	SHAKE	
320-41149-32 - DL	GRE07-SB3-01	Total/NA	Solid	SHAKE	
320-41149-32	GRE07-SB3-01	Total/NA	Solid	SHAKE	
320-41149-33	GRE04-SB3-01	Total/NA	Solid	SHAKE	
320-41149-34 - DL	GRE05-SB1-01	Total/NA	Solid	SHAKE	
320-41149-34	GRE05-SB1-01	Total/NA	Solid	SHAKE	
320-41149-35 - DL	GRE05-SB2-01	Total/NA	Solid	SHAKE	
320-41149-35	GRE05-SB2-01	Total/NA	Solid	SHAKE	
MB 320-234662/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-234662/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-41149-19 MS	GRE07-SB1-01	Total/NA	Solid	SHAKE	
320-41149-19 MS - DL	GRE07-SB1-01	Total/NA	Solid	SHAKE	
320-41149-19 MSD	GRE07-SB1-01	Total/NA	Solid	SHAKE	
320-41149-19 MSD - DL	GRE07-SB1-01	Total/NA	Solid	SHAKE	

Analysis Batch: 235512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-10	GRE-FB-POT-01	Total/NA	Water	EPA 537 (Mod)	234634
320-41149-11	GRE-FB-DI-01	Total/NA	Water	EPA 537 (Mod)	234634
320-41149-12	GRE-ER-SB-02	Total/NA	Water	EPA 537 (Mod)	234634
320-41149-21	GRE-ER-SB-03	Total/NA	Water	EPA 537 (Mod)	234634
MB 320-234634/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	234634
LCS 320-234634/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	234634
LCSD 320-234634/3-A	Lab Control Sample Dup	Total/NA	Water	EPA 537 (Mod)	234634

Analysis Batch: 236374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-1	GRE-ER-SB-01	Total/NA	Water	EPA 537 (Mod)	234634

LCMS (Continued)

Analysis Batch: 236778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-19	GRE07-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-28	GRE08-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-29	GRE08-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-30	GRE08-SB3-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-31	GRE08-SB4-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-32	GRE07-SB3-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-33	GRE04-SB3-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-34	GRE05-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-35	GRE05-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234662
MB 320-234662/1-A	Method Blank	Total/NA	Solid	EPA 537 (Mod)	234662
LCS 320-234662/2-A	Lab Control Sample	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-19 MS	GRE07-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-19 MSD	GRE07-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662

Analysis Batch: 236836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-2	GRE10-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-3	GRE10-SB2-02	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-4	GRE10-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-5	GRE10-SB1-01D	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-6	GRE10-SB3-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-7	GRE09-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-8	GRE09-SB1-01D	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-9	GRE09-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-13	GRE03-SB3-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-14	GRE03-SB3-02	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-15	GRE04-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-16	GRE06-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-17	GRE06-SB1-01D	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-18	GRE06-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-20	GRE07-SB1-02	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-22	GRE03-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-23	GRE03-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-24	GRE03-SB4-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-25	GRE03-SB5-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-26	GRE04-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
MB 320-234633/1-A	Method Blank	Total/NA	Solid	EPA 537 (Mod)	234633
LCS 320-234633/2-A	Lab Control Sample	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-2 MS	GRE10-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-2 MSD	GRE10-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633

Analysis Batch: 237052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-19 - DL	GRE07-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-27 - DL	GRE07-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-27	GRE07-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-28 - DL	GRE08-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-29 - DL	GRE08-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-30 - DL	GRE08-SB3-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-31 - DL	GRE08-SB4-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-32 - DL	GRE07-SB3-01	Total/NA	Solid	EPA 537 (Mod)	234662

LCMS (Continued)

Analysis Batch: 237052 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-34 - DL	GRE05-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-35 - DL	GRE05-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-19 MS - DL	GRE07-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662
320-41149-19 MSD - DL	GRE07-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234662

Analysis Batch: 237446

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-3 - DL	GRE10-SB2-02	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-16 - DL	GRE06-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-17 - DL	GRE06-SB1-01D	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-18 - DL	GRE06-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-20 - DL	GRE07-SB1-02	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-22 - DL	GRE03-SB1-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-23 - DL	GRE03-SB2-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-24 - DL	GRE03-SB4-01	Total/NA	Solid	EPA 537 (Mod)	234633
320-41149-25 - DL	GRE03-SB5-01	Total/NA	Solid	EPA 537 (Mod)	234633

General Chemistry

Analysis Batch: 234562

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-2	GRE10-SB2-01	Total/NA	Solid	D 2216	
320-41149-3	GRE10-SB2-02	Total/NA	Solid	D 2216	
320-41149-4	GRE10-SB1-01	Total/NA	Solid	D 2216	
320-41149-5	GRE10-SB1-01D	Total/NA	Solid	D 2216	
320-41149-6	GRE10-SB3-01	Total/NA	Solid	D 2216	
320-41149-7	GRE09-SB1-01	Total/NA	Solid	D 2216	
320-41149-8	GRE09-SB1-01D	Total/NA	Solid	D 2216	
320-41149-9	GRE09-SB2-01	Total/NA	Solid	D 2216	
320-41149-13	GRE03-SB3-01	Total/NA	Solid	D 2216	
320-41149-14	GRE03-SB3-02	Total/NA	Solid	D 2216	
320-41149-15	GRE04-SB1-01	Total/NA	Solid	D 2216	
320-41149-16	GRE06-SB1-01	Total/NA	Solid	D 2216	
320-41149-17	GRE06-SB1-01D	Total/NA	Solid	D 2216	
320-41149-18	GRE06-SB2-01	Total/NA	Solid	D 2216	
320-41149-19	GRE07-SB1-01	Total/NA	Solid	D 2216	
320-41149-20	GRE07-SB1-02	Total/NA	Solid	D 2216	
320-41149-22	GRE03-SB1-01	Total/NA	Solid	D 2216	

Analysis Batch: 234563

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-23	GRE03-SB2-01	Total/NA	Solid	D 2216	
320-41149-24	GRE03-SB4-01	Total/NA	Solid	D 2216	
320-41149-25	GRE03-SB5-01	Total/NA	Solid	D 2216	
320-41149-26	GRE04-SB2-01	Total/NA	Solid	D 2216	
320-41149-27	GRE07-SB2-01	Total/NA	Solid	D 2216	
320-41149-28	GRE08-SB1-01	Total/NA	Solid	D 2216	
320-41149-29	GRE08-SB2-01	Total/NA	Solid	D 2216	
320-41149-30	GRE08-SB3-01	Total/NA	Solid	D 2216	
320-41149-31	GRE08-SB4-01	Total/NA	Solid	D 2216	

General Chemistry (Continued)

Analysis Batch: 234563 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41149-32	GRE07-SB3-01	Total/NA	Solid	D 2216	
320-41149-33	GRE04-SB3-01	Total/NA	Solid	D 2216	
320-41149-34	GRE05-SB1-01	Total/NA	Solid	D 2216	
320-41149-35	GRE05-SB2-01	Total/NA	Solid	D 2216	
320-41149-23 DU	GRE03-SB2-01	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE-ER-SB-01 — Lab Sample ID: 320-41149-1

Date Collected: 07/09/18 12:50
Matrix: Water
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			234634	07/18/18 08:54	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236374	07/26/18 13:37	ABH	TAL SAC

Client Sample ID: GRE10-SB2-01 — Lab Sample ID: 320-41149-2

Date Collected: 07/09/18 14:10
Matrix: Solid
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE10-SB2-01 — Lab Sample ID: 320-41149-2

Date Collected: 07/09/18 14:10
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 95.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 03:52	S1M	TAL SAC

Client Sample ID: GRE10-SB2-02 — Lab Sample ID: 320-41149-3

Date Collected: 07/09/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE10-SB2-02 — Lab Sample ID: 320-41149-3

Date Collected: 07/09/18 14:35
Matrix: Solid
Date Received: 07/14/18 09:10
Percent Solids: 85.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 04:15	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	5	237446	08/01/18 15:19	S1M	TAL SAC

Client Sample ID: GRE10-SB1-01 — Lab Sample ID: 320-41149-4

Date Collected: 07/09/18 15:10
Matrix: Solid
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE10-SB1-01 — Lab Sample ID: 320-41149-4

Date Collected: 07/09/18 15:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 04:23	S1M	TAL SAC

Client Sample ID: GRE10-SB1-01D — Lab Sample ID: 320-41149-5

Date Collected: 07/09/18 15:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE10-SB1-01D — Lab Sample ID: 320-41149-5

Date Collected: 07/09/18 15:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 04:31	S1M	TAL SAC

Client Sample ID: GRE10-SB3-01 — Lab Sample ID: 320-41149-6

Date Collected: 07/09/18 15:50 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE10-SB3-01 — Lab Sample ID: 320-41149-6

Date Collected: 07/09/18 15:50 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 91.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 04:39	S1M	TAL SAC

Client Sample ID: GRE09-SB1-01 — Lab Sample ID: 320-41149-7

Date Collected: 07/09/18 16:15 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE09-SB1-01 — Lab Sample ID: 320-41149-7

Date Collected: 07/09/18 16:15 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 92.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 04:47	S1M	TAL SAC

Client Sample ID: GRE09-SB1-01D — Lab Sample ID: 320-41149-8

Date Collected: 07/09/18 16:15 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE09-SB1-01D — Lab Sample ID: 320-41149-8

Date Collected: 07/09/18 16:15 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:02	S1M	TAL SAC

Client Sample ID: GRE09-SB2-01 — Lab Sample ID: 320-41149-9

Date Collected: 07/09/18 16:30 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE09-SB2-01 — Lab Sample ID: 320-41149-9

Date Collected: 07/09/18 16:30 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:10	S1M	TAL SAC

Client Sample ID: GRE-FB-POT-01 — Lab Sample ID: 320-41149-10

Date Collected: 07/09/18 17:05 — **Matrix: Water**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			234634	07/18/18 08:54	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	235512	07/22/18 10:52	S1M	TAL SAC

Client Sample ID: GRE-FB-DI-01 — Lab Sample ID: 320-41149-11

Date Collected: 07/10/18 09:15 — **Matrix: Water**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			234634	07/18/18 08:54	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	235512	07/22/18 10:59	S1M	TAL SAC

Client Sample ID: GRE-ER-SB-02 — Lab Sample ID: 320-41149-12

Date Collected: 07/10/18 09:20 — **Matrix: Water**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			234634	07/18/18 08:54	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	235512	07/22/18 11:07	S1M	TAL SAC

Client Sample ID: GRE03-SB3-01 — Lab Sample ID: 320-41149-13

Date Collected: 07/10/18 10:30 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE03-SB3-01 — Lab Sample ID: 320-41149-13

Date Collected: 07/10/18 10:30 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 92.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:18	S1M	TAL SAC

Client Sample ID: GRE03-SB3-02 — Lab Sample ID: 320-41149-14

Date Collected: 07/10/18 11:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE03-SB3-02 — Lab Sample ID: 320-41149-14

Date Collected: 07/10/18 11:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 92.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:26	S1M	TAL SAC

Client Sample ID: GRE04-SB1-01 — Lab Sample ID: 320-41149-15

Date Collected: 07/10/18 11:45 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE04-SB1-01 — Lab Sample ID: 320-41149-15

Date Collected: 07/10/18 11:45 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:34	S1M	TAL SAC

Client Sample ID: GRE06-SB1-01 — Lab Sample ID: 320-41149-16

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE06-SB1-01 — Lab Sample ID: 320-41149-16

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 89.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:42	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237446	08/01/18 15:27	S1M	TAL SAC

Client Sample ID: GRE06-SB1-01D — Lab Sample ID: 320-41149-17

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE06-SB1-01D — Lab Sample ID: 320-41149-17

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:50	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC

Client Sample ID: GRE06-SB1-01D — Lab Sample ID: 320-41149-17

Date Collected: 07/11/18 13:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237446	08/01/18 15:35	S1M	TAL SAC

Client Sample ID: GRE06-SB2-01 — Lab Sample ID: 320-41149-18

Date Collected: 07/11/18 13:40 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE06-SB2-01 — Lab Sample ID: 320-41149-18

Date Collected: 07/11/18 13:40 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 05:57	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	5	237446	08/01/18 15:43	S1M	TAL SAC

Client Sample ID: GRE07-SB1-01 — Lab Sample ID: 320-41149-19

Date Collected: 07/11/18 14:15 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE07-SB1-01 — Lab Sample ID: 320-41149-19

Date Collected: 07/11/18 14:15 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 01:24	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	50	237052	07/31/18 17:57	S1M	TAL SAC

Client Sample ID: GRE07-SB1-02 — Lab Sample ID: 320-41149-20

Date Collected: 07/11/18 14:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE07-SB1-02 — Lab Sample ID: 320-41149-20

Date Collected: 07/11/18 14:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 90.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 06:05	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237446	08/01/18 16:22	S1M	TAL SAC

Client Sample ID: GRE-ER-SB-03 — Lab Sample ID: 320-41149-21

Date Collected: 07/11/18 19:10 — **Matrix: Water**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			234634	07/18/18 08:54	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	235512	07/22/18 11:14	S1M	TAL SAC

Client Sample ID: GRE03-SB1-01 — Lab Sample ID: 320-41149-22

Date Collected: 07/11/18 19:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234562	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE03-SB1-01 — Lab Sample ID: 320-41149-22

Date Collected: 07/11/18 19:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 06:13	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237446	08/01/18 16:30	S1M	TAL SAC

Client Sample ID: GRE03-SB2-01 — Lab Sample ID: 320-41149-23

Date Collected: 07/11/18 20:25 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE03-SB2-01 — Lab Sample ID: 320-41149-23

Date Collected: 07/11/18 20:25 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 92.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 06:29	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237446	08/01/18 16:37	S1M	TAL SAC

Client Sample ID: GRE03-SB4-01 — Lab Sample ID: 320-41149-24

Date Collected: 07/11/18 20:50 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE03-SB4-01 — Lab Sample ID: 320-41149-24

Date Collected: 07/11/18 20:50 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 94.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 06:36	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237446	08/01/18 16:45	S1M	TAL SAC

Client Sample ID: GRE03-SB5-01 — Lab Sample ID: 320-41149-25

Date Collected: 07/11/18 21:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE03-SB5-01 — Lab Sample ID: 320-41149-25

Date Collected: 07/11/18 21:05 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 90.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 06:44	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	20	237446	08/01/18 16:53	S1M	TAL SAC

Client Sample ID: GRE04-SB2-01 — Lab Sample ID: 320-41149-26

Date Collected: 07/12/18 11:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE04-SB2-01 — Lab Sample ID: 320-41149-26

Date Collected: 07/12/18 11:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 95.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234633	07/18/18 08:48	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236836	07/30/18 06:52	S1M	TAL SAC

Client Sample ID: GRE07-SB2-01 — Lab Sample ID: 320-41149-27

Date Collected: 07/12/18 12:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE07-SB2-01 — Lab Sample ID: 320-41149-27

Date Collected: 07/12/18 12:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 83.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	100	237052	07/31/18 18:20	S1M	TAL SAC
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237052	07/31/18 19:46	S1M	TAL SAC

Client Sample ID: GRE08-SB1-01 — Lab Sample ID: 320-41149-28

Date Collected: 07/12/18 13:25 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE08-SB1-01 — Lab Sample ID: 320-41149-28

Date Collected: 07/12/18 13:25 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 01:55	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC

Client Sample ID: GRE08-SB1-01 — Lab Sample ID: 320-41149-28

Date Collected: 07/12/18 13:25 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 537 (Mod)	DL	50	237052	07/31/18 18:28	S1M	TAL SAC

Client Sample ID: GRE08-SB2-01 — Lab Sample ID: 320-41149-29

Date Collected: 07/12/18 13:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE08-SB2-01 — Lab Sample ID: 320-41149-29

Date Collected: 07/12/18 13:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 02:03	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	50	237052	07/31/18 18:36	S1M	TAL SAC

Client Sample ID: GRE08-SB3-01 — Lab Sample ID: 320-41149-30

Date Collected: 07/12/18 14:17 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE08-SB3-01 — Lab Sample ID: 320-41149-30

Date Collected: 07/12/18 14:17 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 89.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 02:11	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	100	237052	07/31/18 18:44	S1M	TAL SAC

Client Sample ID: GRE08-SB4-01 — Lab Sample ID: 320-41149-31

Date Collected: 07/12/18 14:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE08-SB4-01 — Lab Sample ID: 320-41149-31

Date Collected: 07/12/18 14:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 87.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 02:19	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	100	237052	07/31/18 18:52	S1M	TAL SAC

Client Sample ID: GRE07-SB3-01 — Lab Sample ID: 320-41149-32

Date Collected: 07/13/18 08:20 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE07-SB3-01 — Lab Sample ID: 320-41149-32

Date Collected: 07/13/18 08:20 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 02:35	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	20	237052	07/31/18 18:59	S1M	TAL SAC

Client Sample ID: GRE04-SB3-01 — Lab Sample ID: 320-41149-33

Date Collected: 07/13/18 08:40 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE04-SB3-01 — Lab Sample ID: 320-41149-33

Date Collected: 07/13/18 08:40 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 93.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 02:42	S1M	TAL SAC

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Client Sample ID: GRE05-SB1-01 — Lab Sample ID: 320-41149-34

Date Collected: 07/13/18 09:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE05-SB1-01 — Lab Sample ID: 320-41149-34

Date Collected: 07/13/18 09:10 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 97.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 02:50	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237052	07/31/18 19:23	S1M	TAL SAC

Client Sample ID: GRE05-SB2-01 — Lab Sample ID: 320-41149-35

Date Collected: 07/13/18 09:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	234563	07/17/18 16:46	TCS	TAL SAC

Client Sample ID: GRE05-SB2-01 — Lab Sample ID: 320-41149-35

Date Collected: 07/13/18 09:35 — **Matrix: Solid**
Date Received: 07/14/18 09:10 — **Percent Solids: 96.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236778	07/29/18 02:58	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		234662	07/18/18 10:19	KJP	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237052	07/31/18 19:31	S1M	TAL SAC

Client Sample ID: GRE-IDW-S-01 — Lab Sample ID: 320-41149-36

Date Collected: 07/13/18 10:55 — **Matrix: Solid**
Date Received: 07/14/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			423316	07/23/18 17:36	DFB1	TAL DEN
TCLP	Analysis	8260B		1	424938	08/06/18 11:30	TAW	TAL DEN

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-29-19

Analysis Method	Prep Method	Matrix	Analyte

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	01-08-19
Arizona	State Program	9	AZ0713	12-20-18
California	State Program	9	2513	01-18-19
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-19
Georgia	State Program	4	N/A	01-08-19 *
Illinois	NELAP	5	200017	04-30-19
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-19
Louisiana	NELAP	6	02096	06-30-19
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-18
New Hampshire	NELAP	1	205310	04-28-19
New Jersey	NELAP	2	CO004	06-30-19
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-08-19
Oklahoma	State Program	6	8614	08-31-18
Oregon	NELAP	10	4025	01-08-19
South Carolina	State Program	4	72002001	01-08-19
Texas	NELAP	6	T104704183-17-14	09-30-18
US Fish & Wildlife	Federal			07-31-19
USDA	Federal			03-26-21
Utah	NELAP	8	QUAN5	06-30-13 *
Virginia	NELAP	3	460232	06-14-19
West Virginia DEP	State Program	3	354	12-31-18
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
1311	TCLP Extraction	SW846	TAL DEN
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
5030B	Purge and Trap	SW846	TAL DEN
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG - Great Falls

TestAmerica Job ID: 320-41149-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41149-1	GRE-ER-SB-01	Water	07/09/18 12:50	07/14/18 09:10
320-41149-2	GRE10-SB2-01	Solid	07/09/18 14:10	07/14/18 09:10
320-41149-3	GRE10-SB2-02	Solid	07/09/18 14:35	07/14/18 09:10
320-41149-4	GRE10-SB1-01	Solid	07/09/18 15:10	07/14/18 09:10
320-41149-5	GRE10-SB1-01D	Solid	07/09/18 15:10	07/14/18 09:10
320-41149-6	GRE10-SB3-01	Solid	07/09/18 15:50	07/14/18 09:10
320-41149-7	GRE09-SB1-01	Solid	07/09/18 16:15	07/14/18 09:10
320-41149-8	GRE09-SB1-01D	Solid	07/09/18 16:15	07/14/18 09:10
320-41149-9	GRE09-SB2-01	Solid	07/09/18 16:30	07/14/18 09:10
320-41149-10	GRE-FB-POT-01	Water	07/09/18 17:05	07/14/18 09:10
320-41149-11	GRE-FB-DI-01	Water	07/10/18 09:15	07/14/18 09:10
320-41149-12	GRE-ER-SB-02	Water	07/10/18 09:20	07/14/18 09:10
320-41149-13	GRE03-SB3-01	Solid	07/10/18 10:30	07/14/18 09:10
320-41149-14	GRE03-SB3-02	Solid	07/10/18 11:05	07/14/18 09:10
320-41149-15	GRE04-SB1-01	Solid	07/10/18 11:45	07/14/18 09:10
320-41149-16	GRE06-SB1-01	Solid	07/11/18 13:05	07/14/18 09:10
320-41149-17	GRE06-SB1-01D	Solid	07/11/18 13:05	07/14/18 09:10
320-41149-18	GRE06-SB2-01	Solid	07/11/18 13:40	07/14/18 09:10
320-41149-19	GRE07-SB1-01	Solid	07/11/18 14:15	07/14/18 09:10
320-41149-20	GRE07-SB1-02	Solid	07/11/18 14:35	07/14/18 09:10
320-41149-21	GRE-ER-SB-03	Water	07/11/18 19:10	07/14/18 09:10
320-41149-22	GRE03-SB1-01	Solid	07/11/18 19:55	07/14/18 09:10
320-41149-23	GRE03-SB2-01	Solid	07/11/18 20:25	07/14/18 09:10
320-41149-24	GRE03-SB4-01	Solid	07/11/18 20:50	07/14/18 09:10
320-41149-25	GRE03-SB5-01	Solid	07/11/18 21:05	07/14/18 09:10
320-41149-26	GRE04-SB2-01	Solid	07/12/18 11:55	07/14/18 09:10
320-41149-27	GRE07-SB2-01	Solid	07/12/18 12:35	07/14/18 09:10
320-41149-28	GRE08-SB1-01	Solid	07/12/18 13:25	07/14/18 09:10
320-41149-29	GRE08-SB2-01	Solid	07/12/18 13:55	07/14/18 09:10
320-41149-30	GRE08-SB3-01	Solid	07/12/18 14:17	07/14/18 09:10
320-41149-31	GRE08-SB4-01	Solid	07/12/18 14:35	07/14/18 09:10
320-41149-32	GRE07-SB3-01	Solid	07/13/18 08:20	07/14/18 09:10
320-41149-33	GRE04-SB3-01	Solid	07/13/18 08:40	07/14/18 09:10
320-41149-34	GRE05-SB1-01	Solid	07/13/18 09:10	07/14/18 09:10
320-41149-35	GRE05-SB2-01	Solid	07/13/18 09:35	07/14/18 09:10
320-41149-36	GRE-IDW-S-01	Solid	07/13/18 10:55	07/14/18 09:10

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235668

Lab Sample ID: IC 320-235668/2 Client Sample ID:

Date Analyzed: 07/23/18 16:11 Lab File ID: 2018.07.23LLICAL_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.64	Baseline	hannigana	07/23/18 16:44
Perfluorohexanoic acid (PFHxA)	1.92	Assign Peak	hannigana	07/23/18 16:43
Perfluorononanoic acid (PFNA)	2.96	Baseline	hannigana	07/23/18 17:20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.47	Assign Peak	hannigana	07/23/18 16:45

Lab Sample ID: IC 320-235668/3 Client Sample ID:

Date Analyzed: 07/23/18 16:19 Lab File ID: 2018.07.23LLICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.95	Baseline	hannigana	07/23/18 16:48
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.63	Isomers	hannigana	07/23/18 16:48

Lab Sample ID: IC 320-235668/4 Client Sample ID:

Date Analyzed: 07/23/18 16:26 Lab File ID: 2018.07.23LLICAL_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.64	Baseline	hannigana	07/23/18 16:49

Lab Sample ID: IC 320-235668/8 Client Sample ID:

Date Analyzed: 07/23/18 16:58 Lab File ID: 2018.07.23LLICAL_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.95	Isomers	hannigana	07/23/18 17:10

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236773

Lab Sample ID: CCB 320-236773/1 Client Sample ID:

Date Analyzed: 07/28/18 19:47 Lab File ID: 2018.07.28LLAA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.59	Assign Peak	ruangyotsakuld	07/30/18 14:40

Lab Sample ID: CCVL 320-236773/2 Client Sample ID:

Date Analyzed: 07/28/18 19:55 Lab File ID: 2018.07.28LLAA_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.39	Baseline	ruangyotsakuld	07/30/18 14:41
Perfluoropentanoic acid (PFPeA)	1.64	Baseline	ruangyotsakuld	07/30/18 14:42

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236778

Lab Sample ID: MB 320-234662/1-A Client Sample ID:

Date Analyzed: 07/29/18 01:08 Lab File ID: 2018.07.28LLB_015.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.58	Baseline	ruangyots akuld	07/30/18 15:54
Perfluorooctanesulfonic acid (PFOS)	2.95	Baseline	ruangyots akuld	07/30/18 15:54

Lab Sample ID: 320-41149-19 Client Sample ID: GRE07-SB1-01

Date Analyzed: 07/29/18 01:24 Lab File ID: 2018.07.28LLB_017.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	ruangyots akuld	07/30/18 15:56
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	ruangyots akuld	07/30/18 15:57

Lab Sample ID: 320-41149-19 MSD Client Sample ID: GRE07-SB1-01 MSD

Date Analyzed: 07/29/18 01:40 Lab File ID: 2018.07.28LLB_019.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	ruangyots akuld	07/30/18 16:01

Lab Sample ID: 320-41149-28 Client Sample ID: GRE08-SB1-01

Date Analyzed: 07/29/18 01:55 Lab File ID: 2018.07.28LLB_021.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	ruangyots akuld	07/30/18 15:41

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236778

Lab Sample ID: 320-41149-29 Client Sample ID: GRE08-SB2-01

Date Analyzed: 07/29/18 02:03 Lab File ID: 2018.07.28LLB_022.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	ruangyotsakuld	07/30/18 15:43
Perfluorononanoic acid (PFNA)	2.95	Baseline	ruangyotsakuld	07/30/18 15:47

Lab Sample ID: 320-41149-30 Client Sample ID: GRE08-SB3-01

Date Analyzed: 07/29/18 02:11 Lab File ID: 2018.07.28LLB_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	ruangyotsakuld	07/30/18 15:50

Lab Sample ID: 320-41149-31 Client Sample ID: GRE08-SB4-01

Date Analyzed: 07/29/18 02:19 Lab File ID: 2018.07.28LLB_024.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	ruangyotsakuld	07/30/18 15:50

Lab Sample ID: 320-41149-32 Client Sample ID: GRE07-SB3-01

Date Analyzed: 07/29/18 02:35 Lab File ID: 2018.07.28LLB_026.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	ruangyotsakuld	07/30/18 15:51
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	ruangyotsakuld	07/30/18 15:51

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236778

Lab Sample ID: 320-41149-33 Client Sample ID: GRE04-SB3-01

Date Analyzed: 07/29/18 02:42 Lab File ID: 2018.07.28LLB_027.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	ruangyots akuld	07/30/18 15:51

Lab Sample ID: 320-41149-34 Client Sample ID: GRE05-SB1-01

Date Analyzed: 07/29/18 02:50 Lab File ID: 2018.07.28LLB_028.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.66	Baseline	ruangyots akuld	07/30/18 15:52
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	ruangyots akuld	07/30/18 15:53

Lab Sample ID: 320-41149-35 Client Sample ID: GRE05-SB2-01

Date Analyzed: 07/29/18 02:58 Lab File ID: 2018.07.28LLB_029.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	ruangyots akuld	07/30/18 15:52
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	ruangyots akuld	07/30/18 15:53

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236836

Lab Sample ID: CCVL 320-236836/2 Client Sample ID:

Date Analyzed: 07/30/18 03:21 Lab File ID: 2018.07.30LLA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.63	Baseline	roycea	07/30/18 11:52
Perfluorohexanoic acid (PFHxA)	1.90	Assign Peak	roycea	07/30/18 11:52
Perfluorooctanesulfonic acid (PFOS)	2.94	Baseline	roycea	07/30/18 11:52

Lab Sample ID: CCV 320-236836/3 CCVIS Client Sample ID:

Date Analyzed: 07/30/18 03:28 Lab File ID: 2018.07.30LLA_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.39	Incomplete Integration	roycea	07/30/18 11:53

Lab Sample ID: MB 320-234633/1-A Client Sample ID:

Date Analyzed: 07/30/18 03:36 Lab File ID: 2018.07.30LLA_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.59	Baseline	mongkols	07/31/18 09:45
Perfluorooctanesulfonic acid (PFOS)	2.95	Baseline	mongkols	07/31/18 09:45

Lab Sample ID: 320-41149-2 Client Sample ID: GRE10-SB2-01

Date Analyzed: 07/30/18 03:52 Lab File ID: 2018.07.30LLA_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.66	Baseline	mongkols	07/31/18 09:47
Perfluoroheptanoic acid (PFHpA)	2.21	Baseline	mongkols	07/31/18 09:47

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236836

Lab Sample ID: 320-41149-3 Client Sample ID: GRE10-SB2-02

Date Analyzed: 07/30/18 04:15 Lab File ID: 2018.07.30LLA_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	07/31/18 09:52
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	07/31/18 09:52
Perfluorononanoic acid (PFNA)	2.94	Baseline	mongkols	07/31/18 09:52

Lab Sample ID: 320-41149-4 Client Sample ID: GRE10-SB1-01

Date Analyzed: 07/30/18 04:23 Lab File ID: 2018.07.30LLA_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 09:53
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	mongkols	07/31/18 09:53
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	07/31/18 09:53

Lab Sample ID: 320-41149-5 Client Sample ID: GRE10-SB1-01D

Date Analyzed: 07/30/18 04:31 Lab File ID: 2018.07.30LLA_013.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.66	Baseline	mongkols	07/31/18 09:54
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	mongkols	07/31/18 09:54
Perfluorononanoic acid (PFNA)	2.94	Isomers	mongkols	07/31/18 09:55
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	07/31/18 09:54

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236836

Lab Sample ID: 320-41149-6 Client Sample ID: GRE10-SB3-01

Date Analyzed: 07/30/18 04:39 Lab File ID: 2018.07.30LLA_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 09:55
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	07/31/18 09:56
Perfluorononanoic acid (PFNA)	2.94	Baseline	mongkols	07/31/18 09:56

Lab Sample ID: 320-41149-7 Client Sample ID: GRE09-SB1-01

Date Analyzed: 07/30/18 04:47 Lab File ID: 2018.07.30LLA_015.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.66	Baseline	mongkols	07/31/18 09:56
Perfluorononanoic acid (PFNA)	2.94	Baseline	mongkols	07/31/18 09:57

Lab Sample ID: 320-41149-8 Client Sample ID: GRE09-SB1-01D

Date Analyzed: 07/30/18 05:02 Lab File ID: 2018.07.30LLA_017.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.66	Baseline	mongkols	07/31/18 09:58
Perfluorononanoic acid (PFNA)	2.94	Baseline	mongkols	07/31/18 09:58

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236836

Lab Sample ID: 320-41149-9 Client Sample ID: GRE09-SB2-01

Date Analyzed: 07/30/18 05:10 Lab File ID: 2018.07.30LLA_018.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 09:59
Perfluoroheptanoic acid (PFHpA)	2.24	Baseline	mongkols	07/31/18 09:59
Perfluorooctanoic acid (PFOA)	2.59	Baseline	mongkols	07/31/18 09:59
Perfluorononanoic acid (PFNA)	2.95	Baseline	mongkols	07/31/18 09:59

Lab Sample ID: 320-41149-13 Client Sample ID: GRE03-SB3-01

Date Analyzed: 07/30/18 05:18 Lab File ID: 2018.07.30LLA_019.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.94	Baseline	mongkols	07/31/18 10:00

Lab Sample ID: 320-41149-15 Client Sample ID: GRE04-SB1-01

Date Analyzed: 07/30/18 05:34 Lab File ID: 2018.07.30LLA_021.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.94	Isomers	mongkols	07/31/18 10:02
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	07/31/18 10:01

Lab Sample ID: 320-41149-16 Client Sample ID: GRE06-SB1-01

Date Analyzed: 07/30/18 05:42 Lab File ID: 2018.07.30LLA_022.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	07/31/18 10:02

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236836

Lab Sample ID: 320-41149-22 Client Sample ID: GRE03-SB1-01

Date Analyzed: 07/30/18 06:13 Lab File ID: 2018.07.30LLA_026.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 10:04

Lab Sample ID: 320-41149-23 Client Sample ID: GRE03-SB2-01

Date Analyzed: 07/30/18 06:29 Lab File ID: 2018.07.30LLA_028.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 10:05

Lab Sample ID: 320-41149-24 Client Sample ID: GRE03-SB4-01

Date Analyzed: 07/30/18 06:36 Lab File ID: 2018.07.30LLA_029.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 10:05

Lab Sample ID: 320-41149-25 Client Sample ID: GRE03-SB5-01

Date Analyzed: 07/30/18 06:44 Lab File ID: 2018.07.30LLA_030.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 10:06
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	07/31/18 10:06

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236979

Lab Sample ID: IC 320-236979/2 Client Sample ID:

Date Analyzed: 07/30/18 15:14 Lab File ID: 2018.07.30LLICA_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	1.94	Assign Peak	westendorfc	07/30/18 16:13
Perfluoroheptanoic acid (PFHpA)	2.27	Baseline	westendorfc	07/30/18 16:14
Perfluorooctanoic acid (PFOA)	2.62	Baseline	westendorfc	07/30/18 16:14
Perfluoroheptanesulfonic Acid (PFHpS)	2.64	Baseline	westendorfc	07/30/18 16:14
Perfluorononanoic acid (PFNA)	2.99	Baseline	westendorfc	07/30/18 16:14
Perfluorooctanesulfonic acid (PFOS)	2.99	Baseline	westendorfc	07/30/18 16:14
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.52	Assign Peak	westendorfc	07/30/18 16:14
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.68	Assign Peak	westendorfc	07/30/18 16:14

Lab Sample ID: IC 320-236979/3 Client Sample ID:

Date Analyzed: 07/30/18 15:21 Lab File ID: 2018.07.30LLICA_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.27	Baseline	westendorfc	07/30/18 16:15
Perfluoroheptanesulfonic Acid (PFHpS)	2.65	Baseline	westendorfc	07/30/18 16:15
Perfluorooctanesulfonic acid (PFOS)	3.00	Baseline	westendorfc	07/30/18 16:15
Perfluorononanoic acid (PFNA)	3.01	Baseline	westendorfc	07/30/18 16:15

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236979

Lab Sample ID: IC 320-236979/4 Client Sample ID:

Date Analyzed: 07/30/18 15:29 Lab File ID: 2018.07.30LLICA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.66	Baseline	westendorfc	07/30/18 16:16
Perfluoroheptanoic acid (PFHpA)	2.27	Baseline	westendorfc	07/30/18 16:16
Perfluorononanoic acid (PFNA)	3.00	Baseline	westendorfc	07/30/18 16:16
Perfluorooctanesulfonic acid (PFOS)	3.00	Isomers	westendorfc	07/30/18 16:16
Perfluorododecanoic acid (PFDoA)	3.99	Baseline	westendorfc	07/30/18 16:16

Lab Sample ID: IC 320-236979/5 ICIS Client Sample ID:

Date Analyzed: 07/30/18 15:37 Lab File ID: 2018.07.30LLICA_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.00	Baseline	westendorfc	07/30/18 16:17

Lab Sample ID: IC 320-236979/6 Client Sample ID:

Date Analyzed: 07/30/18 15:45 Lab File ID: 2018.07.30LLICA_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.00	Baseline	westendorfc	07/30/18 16:18
Perfluorooctanesulfonic acid (PFOS)	3.00	Isomers	westendorfc	07/30/18 16:18

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236979

Lab Sample ID: IC 320-236979/7 Client Sample ID:

Date Analyzed: 07/30/18 15:53 Lab File ID: 2018.07.30LLICA_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.00	Baseline	westendorfc	07/30/18 16:18
Perfluorooctanesulfonic acid (PFOS)	3.00	Isomers	westendorfc	07/30/18 16:18

Lab Sample ID: ICB 320-236979/9 Client Sample ID:

Date Analyzed: 07/30/18 16:08 Lab File ID: 2018.07.30LLICA_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)		Invalid Compound ID	westendorfc	07/30/18 16:40
Perfluorononanoic acid (PFNA)		Invalid Compound ID	westendorfc	07/30/18 16:40

Lab Sample ID: ICV 320-236979/10 Client Sample ID:

Date Analyzed: 07/30/18 16:16 Lab File ID: 2018.07.30LLICA_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.03	Baseline	westendorfc	07/30/18 16:40

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237043

Lab Sample ID: CCVL 320-237043/2 Client Sample ID:

Date Analyzed: 07/31/18 15:44 Lab File ID: 2018.07.31LLA_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.40	Baseline	mongkols	08/01/18 09:03
Perfluoroheptanoic acid (PFHpA)	2.24	Baseline	barnettj	07/31/18 16:13
Perfluorooctanesulfonic acid (PFOS)	2.96	Baseline	barnettj	07/31/18 16:14
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.47	Missed Peak	barnettj	07/31/18 16:14

Lab Sample ID: CCV 320-237043/3 CCVIS Client Sample ID:

Date Analyzed: 07/31/18 15:52 Lab File ID: 2018.07.30LLBB_064.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.64	Baseline	mongkols	08/01/18 09:05

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237052

Lab Sample ID: 320-41149-19 DL Client Sample ID: GRE07-SB1-01 DL

Date Analyzed: 07/31/18 17:57 Lab File ID: 2018.07.31LLA_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.67	Assign Peak	mongkols	08/01/18 12:23
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	mongkols	08/01/18 12:25
Perfluorooctanoic acid (PFOA)	2.58	Baseline	mongkols	08/01/18 12:25

Lab Sample ID: 320-41149-19 MS DL Client Sample ID: GRE07-SB1-01 MS DL

Date Analyzed: 07/31/18 18:05 Lab File ID: 2018.07.31LLA_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.67	Assign Peak	mongkols	08/01/18 12:27
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:28

Lab Sample ID: 320-41149-19 MSD DL Client Sample ID: GRE07-SB1-01 MSD DL

Date Analyzed: 07/31/18 18:13 Lab File ID: 2018.07.31LLA_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.68	Assign Peak	mongkols	08/01/18 12:30
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:30

Lab Sample ID: 320-41149-27 DL Client Sample ID: GRE07-SB2-01 DL

Date Analyzed: 07/31/18 18:20 Lab File ID: 2018.07.31LLA_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.68	Assign Peak	mongkols	08/01/18 12:32
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:33

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237052

Lab Sample ID: 320-41149-28 DL Client Sample ID: GRE08-SB1-01 DL

Date Analyzed: 07/31/18 18:28 Lab File ID: 2018.07.31LLA_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.66	Assign Peak	mongkols	08/01/18 12:33
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:34

Lab Sample ID: 320-41149-29 DL Client Sample ID: GRE08-SB2-01 DL

Date Analyzed: 07/31/18 18:36 Lab File ID: 2018.07.31LLA_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.67	Assign Peak	mongkols	08/01/18 12:36
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:36
Perfluorooctanesulfonic acid (PFOS)	2.95	Baseline	mongkols	08/01/18 12:36

Lab Sample ID: 320-41149-30 DL Client Sample ID: GRE08-SB3-01 DL

Date Analyzed: 07/31/18 18:44 Lab File ID: 2018.07.31LLA_013.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.67	Assign Peak	mongkols	08/01/18 12:37
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:37
Perfluorononanoic acid (PFNA)		Invalid Compound ID	mongkols	08/01/18 12:37

Lab Sample ID: 320-41149-31 DL Client Sample ID: GRE08-SB4-01 DL

Date Analyzed: 07/31/18 18:52 Lab File ID: 2018.07.31LLA_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.67	Assign Peak	mongkols	08/01/18 12:37

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237052

Lab Sample ID: 320-41149-32 DL Client Sample ID: GRE07-SB3-01 DL

Date Analyzed: 07/31/18 18:59 Lab File ID: 2018.07.31LLA_015.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.66	Assign Peak	mongkols	08/01/18 12:38
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:38
Perfluorooctanoic acid (PFOA)	2.58	Baseline	mongkols	08/01/18 12:38
Perfluorononanoic acid (PFNA)	2.94	Baseline	mongkols	08/01/18 12:38

Lab Sample ID: 320-41149-34 DL Client Sample ID: GRE05-SB1-01 DL

Date Analyzed: 07/31/18 19:23 Lab File ID: 2018.07.31LLA_018.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:41

Lab Sample ID: 320-41149-35 DL Client Sample ID: GRE05-SB2-01 DL

Date Analyzed: 07/31/18 19:31 Lab File ID: 2018.07.31LLA_019.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/01/18 12:41
Perfluorooctanoic acid (PFOA)	2.59	Baseline	mongkols	08/01/18 12:41

Lab Sample ID: 320-41149-27 Client Sample ID: GRE07-SB2-01

Date Analyzed: 07/31/18 19:46 Lab File ID: 2018.07.31LLA_021.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.94	Split Peak	mongkols	08/01/18 12:43

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237402

Lab Sample ID: IC 320-237402/2 Client Sample ID:

Date Analyzed: 08/01/18 12:59 Lab File ID: 2018.08.01LLICAL_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.40	Baseline	roycea	08/01/18 14:23
Perfluorohexanoic acid (PFHxA)	1.90	Assign Peak	roycea	08/01/18 14:24
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	roycea	08/01/18 14:24
Perfluorooctanoic acid (PFOA)	2.58	Baseline	roycea	08/01/18 14:23
Perfluorononanoic acid (PFNA)	2.95	Baseline	roycea	08/01/18 14:25
Perfluorooctanesulfonic acid (PFOS)	2.95	Assign Peak	roycea	08/01/18 14:24
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.47	Baseline	roycea	08/01/18 14:25
Perfluorodecanesulfonic acid (PFDS)	3.63	Baseline	roycea	08/01/18 14:26
Perfluoroundecanoic acid (PFUnA)	3.64	Baseline	roycea	08/01/18 14:27
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.65	Baseline	roycea	08/01/18 14:26

Lab Sample ID: IC 320-237402/3 Client Sample ID:

Date Analyzed: 08/01/18 13:06 Lab File ID: 2018.08.01LLICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	1.91	Baseline	roycea	08/01/18 14:29
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	roycea	08/01/18 14:29
Perfluorooctanoic acid (PFOA)	2.59	Baseline	roycea	08/01/18 14:28
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.47	Assign Peak	roycea	08/01/18 14:29

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237402

Lab Sample ID: IC 320-237402/5 ICIS Client Sample ID:

Date Analyzed: 08/01/18 13:22 Lab File ID: 2018.08.01LLICAL_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.95	Isomers	roycea	08/01/18 14:33

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237446

Lab Sample ID: 320-41149-3 DL Client Sample ID: GRE10-SB2-02 DL

Date Analyzed: 08/01/18 15:19 Lab File ID: 2018.08.01LLB_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/02/18 11:52
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	08/02/18 11:52
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	08/02/18 11:52

Lab Sample ID: 320-41149-16 DL Client Sample ID: GRE06-SB1-01 DL

Date Analyzed: 08/01/18 15:27 Lab File ID: 2018.08.01LLB_015.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	08/02/18 13:23

Lab Sample ID: 320-41149-17 DL Client Sample ID: GRE06-SB1-01D DL

Date Analyzed: 08/01/18 15:35 Lab File ID: 2018.08.01LLB_016.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	mongkols	08/02/18 13:23
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	08/02/18 13:24
Perfluorooctanesulfonic acid (PFOS)	2.93	Isomers	mongkols	08/02/18 13:24

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237446

Lab Sample ID: 320-41149-18 DL Client Sample ID: GRE06-SB2-01 DL

Date Analyzed: 08/01/18 15:43 Lab File ID: 2018.08.01LLB_017.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.21	Baseline	mongkols	08/02/18 13:24
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	08/02/18 13:24
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	08/02/18 13:25

Lab Sample ID: CCV 320-237446/7 Client Sample ID:

Date Analyzed: 08/01/18 15:51 Lab File ID: 2018.08.01LLB_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	08/02/18 13:25
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.62	Isomers	mongkols	08/02/18 13:25

Lab Sample ID: 320-41149-20 DL Client Sample ID: GRE07-SB1-02 DL

Date Analyzed: 08/01/18 16:22 Lab File ID: 2018.08.01LLBB_018.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/02/18 13:26
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	08/02/18 13:26

Lab Sample ID: 320-41149-22 DL Client Sample ID: GRE03-SB1-01 DL

Date Analyzed: 08/01/18 16:30 Lab File ID: 2018.08.01LLBB_019.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	mongkols	08/02/18 13:27

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237446

Lab Sample ID: 320-41149-23 DL Client Sample ID: GRE03-SB2-01 DL

Date Analyzed: 08/01/18 16:37 Lab File ID: 2018.08.01LLBB_020.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	mongkols	08/02/18 13:27
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	08/02/18 13:27

Lab Sample ID: 320-41149-24 DL Client Sample ID: GRE03-SB4-01 DL

Date Analyzed: 08/01/18 16:45 Lab File ID: 2018.08.01LLBB_021.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	08/02/18 13:28
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	08/02/18 13:28

Lab Sample ID: 320-41149-25 DL Client Sample ID: GRE03-SB5-01 DL

Date Analyzed: 08/01/18 16:53 Lab File ID: 2018.08.01LLBB_022.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.22	Baseline	mongkols	08/02/18 13:28
Perfluorooctanoic acid (PFOA)	2.57	Baseline	mongkols	08/02/18 13:28
Perfluorononanoic acid (PFNA)	2.94	Baseline	mongkols	08/02/18 13:28

Lab Sample ID: CCV 320-237446/16 Client Sample ID:

Date Analyzed: 08/01/18 17:01 Lab File ID: 2018.08.01LLBB_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.94	Isomers	mongkols	08/02/18 13:29

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 235323

Lab Sample ID: IC 320-235323/2 Client Sample ID:

Date Analyzed: 07/20/18 19:32 Lab File ID: 2018.07.20LLA_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
4:2 FTS	2.06	Baseline	roycea	07/21/18 09:52
Perfluorononanoic acid (PFNA)	3.19	Baseline	roycea	07/21/18 09:52
Perfluorooctanesulfonic acid (PFOS)	3.19	Assign Peak	roycea	07/21/18 09:50
Perfluorodecanoic acid (PFDA)	3.55	Baseline	roycea	07/21/18 09:52
Perfluorododecanoic acid (PFDoA)	4.17	Baseline	roycea	07/21/18 09:53
Perfluorotridecanoic Acid (PFTriA)	4.43	Baseline	roycea	07/21/18 09:53
Perfluorotetradecanoic acid (PFTeA)	4.67	Baseline	roycea	07/21/18 09:53

Lab Sample ID: IC 320-235323/3 Client Sample ID:

Date Analyzed: 07/20/18 19:40 Lab File ID: 2018.07.20LLA_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorodecanoic acid (PFDA)	3.55	Baseline	roycea	07/21/18 09:55
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.87	Baseline	roycea	07/21/18 09:55
Perfluorododecanoic acid (PFDoA)	4.16	Baseline	roycea	07/21/18 09:55

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 235506

Lab Sample ID: CCVL 320-235506/2 Client Sample ID:

Date Analyzed: 07/22/18 06:14 Lab File ID: 2018.07.22LLA_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Baseline	mongkols	07/25/18 08:29
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.86	Baseline	mongkols	07/25/18 08:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 235512

Lab Sample ID: 320-41149-10 Client Sample ID: GRE-FB-POT-01

Date Analyzed: 07/22/18 10:52 Lab File ID: 2018.07.22LLA_042.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.44	Baseline	mongkols	07/25/18 09:48
Perfluorohexanesulfonic acid (PFHxS)	2.46	Baseline	mongkols	07/25/18 09:48
Perfluorooctanoic acid (PFOA)	2.81	Baseline	mongkols	07/25/18 09:48

Lab Sample ID: 320-41149-11 Client Sample ID: GRE-FB-DI-01

Date Analyzed: 07/22/18 10:59 Lab File ID: 2018.07.22LLA_043.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.81	Baseline	mongkols	07/25/18 09:48

Lab Sample ID: 320-41149-21 Client Sample ID: GRE-ER-SB-03

Date Analyzed: 07/22/18 11:14 Lab File ID: 2018.07.22LLA_045.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Baseline	mongkols	07/25/18 09:49

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Instrument ID: VMS_MS1 Analysis Batch Number: 424541

Lab Sample ID: STD003 280-424541/12 IC Client Sample ID:

Date Analyzed: 08/02/18 08:53 Lab File ID: MS1_5075.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)		Invalid Compound ID	wickhamt	08/02/18 11:48
2-Chloroethyl vinyl ether		Invalid Compound ID	wickhamt	08/02/18 11:34

Lab Sample ID: STD02 280-424541/14 IC Client Sample ID:

Date Analyzed: 08/02/18 09:33 Lab File ID: MS1_5077.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:48

Lab Sample ID: STD05 280-424541/15 IC Client Sample ID:

Date Analyzed: 08/02/18 09:53 Lab File ID: MS1_5078.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:47

Lab Sample ID: STD10 280-424541/16 IC Client Sample ID:

Date Analyzed: 08/02/18 10:14 Lab File ID: MS1_5079.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:47

Lab Sample ID: STD30 280-424541/17 IC Client Sample ID:

Date Analyzed: 08/02/18 10:34 Lab File ID: MS1_5080.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:46

8260B

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Instrument ID: VMS_MS1 Analysis Batch Number: 424541

Lab Sample ID: STD60 280-424541/18 IC Client Sample ID:

Date Analyzed: 08/02/18 10:54 Lab File ID: MS1_5081.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
TBA-d9 (IS)	5.59	Assign Peak	wickhamt	08/02/18 11:40
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:45
m-Xylene & p-Xylene	9.93	Wrong peak	wickhamt	08/02/18 11:42

Lab Sample ID: ICV 280-424541/19 Client Sample ID:

Date Analyzed: 08/02/18 11:35 Lab File ID: MS1_5083.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 12:31

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Instrument ID: VMS_MS1 Analysis Batch Number: 424938

Lab Sample ID: CCV 280-424938/2 Client Sample ID:

Date Analyzed: 08/06/18 07:47 Lab File ID: MS1_5228.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/06/18 08:08

Lab Sample ID: LCS 280-423316/2-A Client Sample ID:

Date Analyzed: 08/06/18 09:08 Lab File ID: MS1_5232.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/06/18 09:27

Lab Sample ID: CCVC 280-424938/33 Client Sample ID:

Date Analyzed: 08/06/18 16:15 Lab File ID: MS1_5253.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/07/18 06:52

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00085	12/13/18	06/14/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM3HFPO-DA_00003	200 uL	13C3 HFPO-DA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA_00003	05/18/21	WELLINGTON, Lot M3HFPODA0518			(Purchased Reagent)		13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-IS_00059	12/13/18	06/13/18	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC-IS_00065	12/13/18	06/14/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00009	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00009	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCPFC_LL0_00007	12/01/18	06/05/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00075	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00007	12/01/18	06/05/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL0_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL1_00006	11/18/18	06/05/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00151	500 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.02335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.02395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutyric acid	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid	0.025 ng/mL
							Perfluorododecanoic acid	0.025 ng/mL
							Perfluorodecane Sulfonic acid	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic acid	0.0238 ng/mL
							Perfluorohexanoic acid	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025025 ng/mL
							Perfluorononanesulfonic acid	0.024 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide	0.025 ng/mL
							Perfluoropentanoic acid	0.025 ng/mL
							Perfluoropentanesulfonic acid	0.02345 ng/mL
							Perfluorotetradecanoic acid	0.025 ng/mL
							Perfluorotridecanoic acid	0.025 ng/mL
							Perfluoroundecanoic acid	0.025 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00151	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LCPFCSP_00148	200 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.00934 ug/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.00948 ug/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.00958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							Perfluorobutyric acid	0.01 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.00884 ug/mL
							Perfluorodecanoic acid	0.01 ug/mL
							Perfluorododecanoic acid	0.01 ug/mL
							Perfluorodecane Sulfonic acid	0.00964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.01 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanesulfonic acid	0.00952 ug/mL
							Perfluorohexanoic acid	0.01 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0091 ug/mL
							Perfluorononanoic acid (PFNA)	0.01 ug/mL
							Perfluorooctanoic acid (PFOA)	0.01001 ug/mL
							Perfluorononanesulfonic acid	0.0096 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.00928 ug/mL
							Perfluorooctane Sulfonamide	0.01 ug/mL
							Perfluoropentanoic acid	0.01 ug/mL
							Perfluoropentanesulfonic acid	0.00938 ug/mL
							Perfluorotetradecanoic acid	0.01 ug/mL
							Perfluorotridecanoic acid	0.01 ug/mL
							Perfluoroundecanoic acid	0.01 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
...LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
...LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
...LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
...LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL2_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00151	1000 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.0467 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0474 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutyric acid	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid	0.05 ng/mL
							Perfluorododecanoic acid	0.05 ng/mL
							Perfluorodecane Sulfonic acid	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic acid	0.0476 ng/mL
							Perfluorohexanoic acid	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorononanesulfonic acid	0.048 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide	0.05 ng/mL
							Perfluoropentanoic acid	0.05 ng/mL
							Perfluoropentanesulfonic acid	0.0469 ng/mL
							Perfluorotetradecanoic acid	0.05 ng/mL
							Perfluorotridecanoic acid	0.05 ng/mL
							Perfluoroundecanoic acid	0.05 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00151	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LCPFCSP_00148	200 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.00934 ug/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.00948 ug/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.00958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							Perfluorobutyric acid	0.01 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.00884 ug/mL
							Perfluorodecanoic acid	0.01 ug/mL
							Perfluorododecanoic acid	0.01 ug/mL
							Perfluorodecane Sulfonic acid	0.00964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.01 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanesulfonic acid	0.00952 ug/mL
							Perfluorohexanoic acid	0.01 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0091 ug/mL
							Perfluorononanoic acid (PFNA)	0.01 ug/mL
							Perfluorooctanoic acid (PFOA)	0.01001 ug/mL
							Perfluorononanesulfonic acid	0.0096 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.00928 ug/mL
							Perfluorooctane Sulfonamide	0.01 ug/mL
							Perfluoropentanoic acid	0.01 ug/mL
							Perfluoropentanesulfonic acid	0.00938 ug/mL
							Perfluorotetradecanoic acid	0.01 ug/mL
							Perfluorotridecanoic acid	0.01 ug/mL
							Perfluoroundecanoic acid	0.01 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
...LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
...LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
...LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
...LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL2_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL2_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFC_LL3_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.2335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.2395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutyric acid	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL
							Perfluorodecanoic acid	0.25 ng/mL
							Perfluorododecanoic acid	0.25 ng/mL
							Perfluorodecane Sulfonic acid	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic acid	0.238 ng/mL
							Perfluorohexanoic acid	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25025 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide	0.25 ng/mL
							Perfluoropentanoic acid	0.25 ng/mL
							Perfluoropentanesulfonic acid	0.2345 ng/mL
							Perfluorotetradecanoic acid	0.25 ng/mL
							Perfluorotridecanoic acid	0.25 ng/mL
							Perfluoroundecanoic acid	0.25 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL4_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	400 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.934 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.948 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.958 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1.001 ng/mL
							Perfluorononanesulfonic acid	0.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL5_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	1000 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	2.335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	2.37 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	2.395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutyric acid	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid	2.5 ng/mL
							Perfluorododecanoic acid	2.5 ng/mL
							Perfluorodecane Sulfonic acid	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic acid	2.38 ng/mL
							Perfluorohexanoic acid	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorononanesulfonic acid	2.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide	2.5 ng/mL
							Perfluoropentanoic acid	2.5 ng/mL
							Perfluoropentanesulfonic acid	2.345 ng/mL
							Perfluorotetradecanoic acid	2.5 ng/mL
							Perfluorotridecanoic acid	2.5 ng/mL
							Perfluoroundecanoic acid	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL6_00006	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	2 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	4.67 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	4.74 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	4.79 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5.005 ng/mL
							Perfluorononanesulfonic acid	4.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluoropentanesulfonic acid	4.69 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL7_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	4 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	9.34 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	9.48 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	9.58 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutyric acid	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid	10 ng/mL
							Perfluorododecanoic acid	10 ng/mL
							Perfluorodecane Sulfonic acid	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic acid	9.52 ng/mL
							Perfluorohexanoic acid	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10.01 ng/mL
							Perfluorononanesulfonic acid	9.6 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide	10 ng/mL
							Perfluoropentanoic acid	10 ng/mL
							Perfluoropentanesulfonic acid	9.38 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid	10 ng/mL
							Perfluorotridecanoic acid	10 ng/mL
							Perfluoroundecanoic acid	10 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_FULL_00012	12/05/18	07/05/18	MeOH/H2O, Lot 09285	10 mL	LCMPFC_ALL_SU_00075	0.5 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFCIC_FULL_00012	12/05/18	07/05/18	MeOH/H2O, Lot 09285	10 mL	LCMPFC_ALL_SU_00075	0.5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00155	1.25 mL	Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00155	12/17/18	06/17/18	Methanol, Lot 180632	250 mL	LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFCSP_00161	01/16/19	07/16/18	Methanol, Lot 180632	250 mL	LC11CIPF3OUdS_00002	100 uL	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	0.01884 ug/mL
					LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LC9CI-PF3ONS_00002	100 uL	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	0.01864 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCDONA_00002	100 uL	ADONA	0.02 ug/mL
					LCHFPO-DA_00002	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL
					LCPFHxDA_00010	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFODA_00010	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
.LC11CIPF3OUdS_00002	09/30/21	Wellington Labs, Lot 11CIPF3OUdS0916			(Purchased Reagent)		11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	47.1 ug/mL
.LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
.LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
.LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
.LC9CI-PF3ONS_00002	09/30/21	Wellington Labs, Lot 9CIPF3ONS0916			(Purchased Reagent)		9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	46.6 ug/mL
.LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCDONA_00002	03/26/23	WELLINGTON, Lot NADONA0318			(Purchased Reagent)		ADONA	50 ug/mL
.LCHFPO-DA_00002	03/26/21	WELLINGTON, Lot HFPODA0318			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL
.LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
.LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00010	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
.LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
.LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00010	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
.LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
MV-2cleve+AVA_00037	10/31/18	07/20/18	P&T Methanol, Lot 177891	10 mL	MV-568720_00022	202.5 uL	Acrolein	399.938 ug/mL
					MV-569723_00004	160 uL	2-Chloroethyl vinyl ether	40 ug/mL
					MV-569724_00016	160 uL	Vinyl acetate	80 ug/mL
.MV-568720_00022	10/31/18	RESTEK, Lot A0137497			(Purchased Reagent)		Acrolein	19750 ug/mL
.MV-569723_00004	12/31/20	RESTEK, Lot A0133302			(Purchased Reagent)		2-Chloroethyl vinyl ether	2500 ug/mL
.MV-569724_00016	10/31/18	RESTEK, Lot A0137562			(Purchased Reagent)		Vinyl acetate	5000 ug/mL
MV-568718-D_00014	05/31/22	RESTEK, Lot A0127975			(Purchased Reagent)		1,4-Dichlorobenzene-d4	250 ug/mL
							Chlorobenzene-d5	250 ug/mL
							Fluorobenzene	250 ug/mL
							TBA-d9 (IS)	5000 ug/mL
MV-ARCH SS A_00101	01/25/19	07/25/18	P&T Methanol, Lot 177891	50 mL	MV-567650_00027	5 mL	1,2-Dichloroethane-d4 (Surr)	250 ug/mL
							4-Bromofluorobenzene (Surr)	250 ug/mL
							Dibromofluoromethane (Surr)	250 ug/mL
							Toluene-d8 (Surr)	250 ug/mL
.MV-567650_00027	01/31/22	Restek, Lot A0124069			(Purchased Reagent)		1,2-Dichloroethane-d4 (Surr)	2500 ug/mL
							4-Bromofluorobenzene (Surr)	2500 ug/mL
							Dibromofluoromethane (Surr)	2500 ug/mL
							Toluene-d8 (Surr)	2500 ug/mL
MV-BFB_00026							1,2-Dichloroethene, Total	
							1,2-Dichloroethene, Total (URS)	
							1,3-Dichloropropene, Total	
							TAH	
							Tentatively Identified Compound	
							Total BTEX	
							Trihalomethanes, Total	
							Xylenes, Total	
							Xylenes, Total (URS)	
					MV-STS110N1_00066	1.25 mL	BFB	50 ug/mL
.MV-STS110N1_00066	10/31/19	Ultra Scientific, Lot CH-3248Z			(Purchased Reagent)		BFB	2000 ug/mL
MV-Gas/Ket A_00075	12/30/18	06/30/18	P&T Methanol, Lot 178178	10 mL	MV-569721_00006	128 uL	2-Butanone (MEK)	160 ug/mL
					MV-569722_00008	160 uL	Vinyl chloride	40 ug/mL
.MV-569721_00006	10/31/20	RESTEK, Lot A0131486			(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
.MV-569722_00008	10/31/20	RESTEK, Lot A0131502			(Purchased Reagent)		Vinyl chloride	2500 ug/mL
MV-Gas/Ket A_00076	01/25/19	07/25/18	P&T Methanol, Lot 178178	10 mL	MV-569721_00006	128 uL	2-Butanone (MEK)	160 ug/mL
							2-Hexanone	160 ug/mL
							4-Methyl-2-pentanone (MIBK)	160 ug/mL
							Acetone	160 ug/mL
					MV-569722_00008	160 uL	Bromomethane	40 ug/mL
							Chloroethane	40 ug/mL
							Chloromethane	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dichlorodifluoromethane	40 ug/mL
							Dichlorofluoromethane	40 ug/mL
							Trichlorofluoromethane	40 ug/mL
							Vinyl chloride	40 ug/mL
					MV-569727_00006	640 uL	Cyclohexanone	1600 ug/mL
.MV-569721_00006	10/31/20		RESTEK, Lot A0131486		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
							2-Hexanone	12500 ug/mL
							4-Methyl-2-pentanone (MIBK)	12500 ug/mL
							Acetone	12500 ug/mL
.MV-569722_00008	10/31/20		RESTEK, Lot A0131502		(Purchased Reagent)		Bromomethane	2500 ug/mL
							Chloroethane	2500 ug/mL
							Chloromethane	2500 ug/mL
							Dichlorodifluoromethane	2500 ug/mL
							Dichlorofluoromethane	2500 ug/mL
							Trichlorofluoromethane	2500 ug/mL
							Vinyl chloride	2500 ug/mL
.MV-569727_00006	03/31/19		RESTEK, Lot A0118487		(Purchased Reagent)		Cyclohexanone	25000 ug/mL
MV-Gas/Ket B_00043	11/30/18	05/28/18	P&T Methanol, Lot 177891	10 mL	MV-569721.sec_00005	128 uL	2-Butanone (MEK)	160 ug/mL
					MV-569722.sec_00004	160 uL	Vinyl chloride	40 ug/mL
.MV-569721.sec_00005	01/31/20		RESTEK, Lot A0113880		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
.MV-569722.sec_00004	01/31/20		RESTEK, Lot A0124116		(Purchased Reagent)		Vinyl chloride	2500 ug/mL
MV-Gas/Ket B_00044	11/30/18	07/17/18	P&T Methanol, Lot 177891	10 mL	MV-569721.sec_00005	128 uL	2-Butanone (MEK)	160 ug/mL
					MV-569722.sec_00004	160 uL	Vinyl chloride	40 ug/mL
.MV-569721.sec_00005	01/31/20		RESTEK, Lot A0113880		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
.MV-569722.sec_00004	01/31/20		RESTEK, Lot A0124116		(Purchased Reagent)		Vinyl chloride	2500 ug/mL
MV-Main A_00037	12/31/18	06/30/18	P&T Methanol, Lot 177891	20 mL	MV-571992_00001	320 uL	1,1,1,2-Tetrachloroethane	40 ug/mL
							1,1,1-Trichloroethane	40 ug/mL
							1,1,2,2-Tetrachloroethane	40 ug/mL
							1,1,2-Trichloro-1,2,2-trifluoroethane	40 ug/mL
							1,1,2-Trichloroethane	40 ug/mL
							1,1-Dichloroethane	40 ug/mL
							1,1-Dichloroethene	40 ug/mL
							1,1-Dichloropropene	40 ug/mL
							1,2,3-Trichlorobenzene	40 ug/mL
							1,2,3-Trichloropropane	40 ug/mL
							1,2,4-Trichlorobenzene	40 ug/mL
							1,2,4-Trimethylbenzene	40 ug/mL
							1,2-Dibromo-3-Chloropropane	40 ug/mL
							1,2-Dichlorobenzene	40 ug/mL
							1,2-Dichloroethane	40 ug/mL
							1,2-Dichloropropane	40 ug/mL
							1,3,5-Trimethylbenzene	40 ug/mL
							1,3-Dichlorobenzene	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,3-Dichloropropane	40 ug/mL
							1,4-Dichlorobenzene	40 ug/mL
							1,4-Dioxane	800 ug/mL
							2,2-Dichloropropane	40 ug/mL
							2-Chlorotoluene	40 ug/mL
							2-Methyl-2-propanol	400 ug/mL
							3-Chloro-1-propene	40 ug/mL
							4-Chlorotoluene	40 ug/mL
							4-Isopropyltoluene	40 ug/mL
							Acrylonitrile	400 ug/mL
							Benzene	40 ug/mL
							Bromobenzene	40 ug/mL
							Bromoform	40 ug/mL
							Carbon disulfide	40 ug/mL
							Carbon tetrachloride	40 ug/mL
							Chlorobenzene	40 ug/mL
							Chlorobromomethane	40 ug/mL
							Chlorodibromomethane	40 ug/mL
							Chloroform	40 ug/mL
							cis-1,2-Dichloroethene	40 ug/mL
							cis-1,3-Dichloropropene	40 ug/mL
							Cyclohexane	40 ug/mL
							Dibromomethane	40 ug/mL
							Dichlorobromomethane	40 ug/mL
							Ethyl ether	40 ug/mL
							Ethyl methacrylate	40 ug/mL
							Ethylbenzene	40 ug/mL
							Ethylene Dibromide	40 ug/mL
							Hexachlorobutadiene	40 ug/mL
							Hexane	40 ug/mL
							Iodomethane	40 ug/mL
							Isobutyl alcohol	1000 ug/mL
							Isopropylbenzene	40 ug/mL
							m-Xylene & p-Xylene	40 ug/mL
							Methyl acetate	80 ug/mL
							Methyl tert-butyl ether	40 ug/mL
							Methylcyclohexane	40 ug/mL
							Methylene Chloride	40 ug/mL
							n-Butylbenzene	40 ug/mL
							N-Propylbenzene	40 ug/mL
							Naphthalene	40 ug/mL
							o-Xylene	40 ug/mL
							sec-Butylbenzene	40 ug/mL
							Styrene	40 ug/mL
							tert-Butylbenzene	40 ug/mL
							Tetrachloroethene	40 ug/mL
							Tetrahydrofuran	80 ug/mL
							Toluene	40 ug/mL

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							trans-1,2-Dichloroethene	40 ug/mL
							trans-1,3-Dichloropropene	40 ug/mL
							trans-1,4-Dichloro-2-butene	40 ug/mL
							Trichloroethene	40 ug/mL
					MV-CUS17739_00002	800 uL	1-Chlorohexane	40 ug/mL
							2-Pentanone	160 ug/mL
							sec-Butyl Alcohol	1200 ug/mL
.MV-571992_00001	12/31/18		RESTEK, Lot A0123711		(Purchased Reagent)		1,1,1,2-Tetrachloroethane	2500 ug/mL
							1,1,1-Trichloroethane	2500 ug/mL
							1,1,2,2-Tetrachloroethane	2500 ug/mL
							1,1,2-Trichloro-1,2,2-trifluor oethane	2500 ug/mL
							1,1,2-Trichloroethane	2500 ug/mL
							1,1-Dichloroethane	2500 ug/mL
							1,1-Dichloroethene	2500 ug/mL
							1,1-Dichloropropene	2500 ug/mL
							1,2,3-Trichlorobenzene	2500 ug/mL
							1,2,3-Trichloropropane	2500 ug/mL
							1,2,4-Trichlorobenzene	2500 ug/mL
							1,2,4-Trimethylbenzene	2500 ug/mL
							1,2-Dibromo-3-Chloropropane	2500 ug/mL
							1,2-Dichlorobenzene	2500 ug/mL
							1,2-Dichloroethane	2500 ug/mL
							1,2-Dichloropropane	2500 ug/mL
							1,3,5-Trimethylbenzene	2500 ug/mL
							1,3-Dichlorobenzene	2500 ug/mL
							1,3-Dichloropropane	2500 ug/mL
							1,4-Dichlorobenzene	2500 ug/mL
							1,4-Dioxane	50000 ug/mL
							2,2-Dichloropropane	2500 ug/mL
							2-Chlorotoluene	2500 ug/mL
							2-Methyl-2-propanol	25000 ug/mL
							3-Chloro-1-propene	2500 ug/mL
							4-Chlorotoluene	2500 ug/mL
							4-Isopropyltoluene	2500 ug/mL
							Acrylonitrile	25000 ug/mL
							Benzene	2500 ug/mL
							Bromobenzene	2500 ug/mL
							Bromoform	2500 ug/mL
							Carbon disulfide	2500 ug/mL
							Carbon tetrachloride	2500 ug/mL
							Chlorobenzene	2500 ug/mL
							Chlorobromomethane	2500 ug/mL
							Chlorodibromomethane	2500 ug/mL
							Chloroform	2500 ug/mL
							cis-1,2-Dichloroethene	2500 ug/mL
							cis-1,3-Dichloropropene	2500 ug/mL
							Cyclohexane	2500 ug/mL

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibromomethane	2500 ug/mL
							Dichlorobromomethane	2500 ug/mL
							Ethyl ether	2500 ug/mL
							Ethyl methacrylate	2500 ug/mL
							Ethylbenzene	2500 ug/mL
							Ethylene Dibromide	2500 ug/mL
							Hexachlorobutadiene	2500 ug/mL
							Hexane	2500 ug/mL
							Iodomethane	2500 ug/mL
							Isobutyl alcohol	62500 ug/mL
							Isopropylbenzene	2500 ug/mL
							m-Xylene & p-Xylene	2500 ug/mL
							Methyl acetate	5000 ug/mL
							Methyl tert-butyl ether	2500 ug/mL
							Methylcyclohexane	2500 ug/mL
							Methylene Chloride	2500 ug/mL
							n-Butylbenzene	2500 ug/mL
							N-Propylbenzene	2500 ug/mL
							Naphthalene	2500 ug/mL
							o-Xylene	2500 ug/mL
							sec-Butylbenzene	2500 ug/mL
							Styrene	2500 ug/mL
							tert-Butylbenzene	2500 ug/mL
							Tetrachloroethene	2500 ug/mL
							Tetrahydrofuran	5000 ug/mL
							Toluene	2500 ug/mL
							trans-1,2-Dichloroethene	2500 ug/mL
							trans-1,3-Dichloropropene	2500 ug/mL
							trans-1,4-Dichloro-2-butene	2500 ug/mL
							Trichloroethene	2500 ug/mL
.MV-CUS17739_00002	07/31/19		Ultra, Lot CR-2819		(Purchased Reagent)		1-Chlorohexane	1000 ug/mL
							2-Pentanone	4000 ug/mL
							sec-Butyl Alcohol	30000 ug/mL
MV-Main B_00022	12/31/18	08/01/18	P&T Methanol, Lot 127999	20 mL	MV-571992.sec_00001	320 uL	1,1-Dichloroethene	40 ug/mL
							1,2-Dichloroethane	40 ug/mL
							Benzene	40 ug/mL
							Carbon tetrachloride	40 ug/mL
							Chlorobenzene	40 ug/mL
							Chloroform	40 ug/mL
							Tetrachloroethene	40 ug/mL
							Trichloroethene	40 ug/mL
.MV-571992.sec_00001	12/31/18		RESTEK, Lot A0123775		(Purchased Reagent)		1,1-Dichloroethene	2500 ug/mL
							1,2-Dichloroethane	2500 ug/mL
							Benzene	2500 ug/mL
							Carbon tetrachloride	2500 ug/mL
							Chlorobenzene	2500 ug/mL
							Chloroform	2500 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Tetrachloroethene	2500 ug/mL
							Trichloroethene	2500 ug/mL
MV-Supp A_00031	11/20/18	06/30/18	P&T Methanol, Lot 12799	10 mL	mv-570808_00004	160 uL	1,2,3-Trimethylbenzene	40 ug/mL
							2-Chloro-1,3-butadiene	40 ug/mL
							2-Nitropropane	80 ug/mL
							Isopropyl alcohol	400 ug/mL
							Methacrylonitrile	400 ug/mL
							n-Butanol	1000 ug/mL
					mv-570809_00004	160 uL	Ethyl acetate	80 ug/mL
							Methyl methacrylate	80 ug/mL
					mv-571993_00002	160 uL	Acetonitrile	400 ug/mL
							Isopropyl ether	40 ug/mL
							Propionitrile	400 ug/mL
							Tert-amyl methyl ether	40 ug/mL
							Tert-butyl ethyl ether	40 ug/mL
					mv-571994_00002	240 uL	Ethanol	2400 ug/mL
					mv-VO-TAOH-5_00005	800 uL	cis-1,4-Dichloro-2-butene	80 ug/mL
.mv-570808_00004	05/31/19	Restek, Lot A0132816			(Purchased Reagent)		1,2,3-Trimethylbenzene	2500 ug/mL
							2-Chloro-1,3-butadiene	2500 ug/mL
							2-Nitropropane	5000 ug/mL
							Isopropyl alcohol	25000 ug/mL
							Methacrylonitrile	25000 ug/mL
							n-Butanol	62500 ug/mL
.mv-570809_00004	04/30/19	Restek, Lot A0131668			(Purchased Reagent)		Ethyl acetate	5000 ug/mL
							Methyl methacrylate	5000 ug/mL
.mv-571993_00002	11/30/19	RESTEK, Lot A0132831			(Purchased Reagent)		Acetonitrile	25000 ug/mL
							Isopropyl ether	2500 ug/mL
							Propionitrile	25000 ug/mL
							Tert-amyl methyl ether	2500 ug/mL
							Tert-butyl ethyl ether	2500 ug/mL
.mv-571994_00002	11/30/20	RESTEK, Lot A0132270			(Purchased Reagent)		Ethanol	100000 ug/mL
.mv-VO-TAOH-5_00005	11/20/18	SPEX, Lot EN180524019			(Purchased Reagent)		cis-1,4-Dichloro-2-butene	1000 ug/mL

Reagent

LC11CIPF3OUdS_00002

h: 4/18/18 SKJ

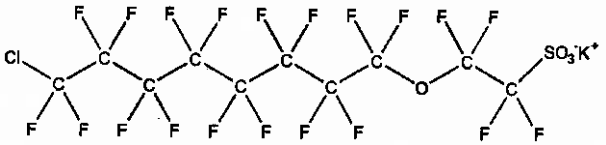
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 11Cl-PF3OUdS **LOT NUMBER:** 11ClPF3OUdS0916

COMPOUND: Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate

STRUCTURE: **CAS #:** 83329-89-9



MOLECULAR FORMULA: $C_{10}F_{20}ClSO_4K$ **MOLECULAR WEIGHT:** 670.69

CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol

47.1 ± 2.4 µg/ml (11Cl-PF3OUdS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 09/30/2016

EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This compound is a minor component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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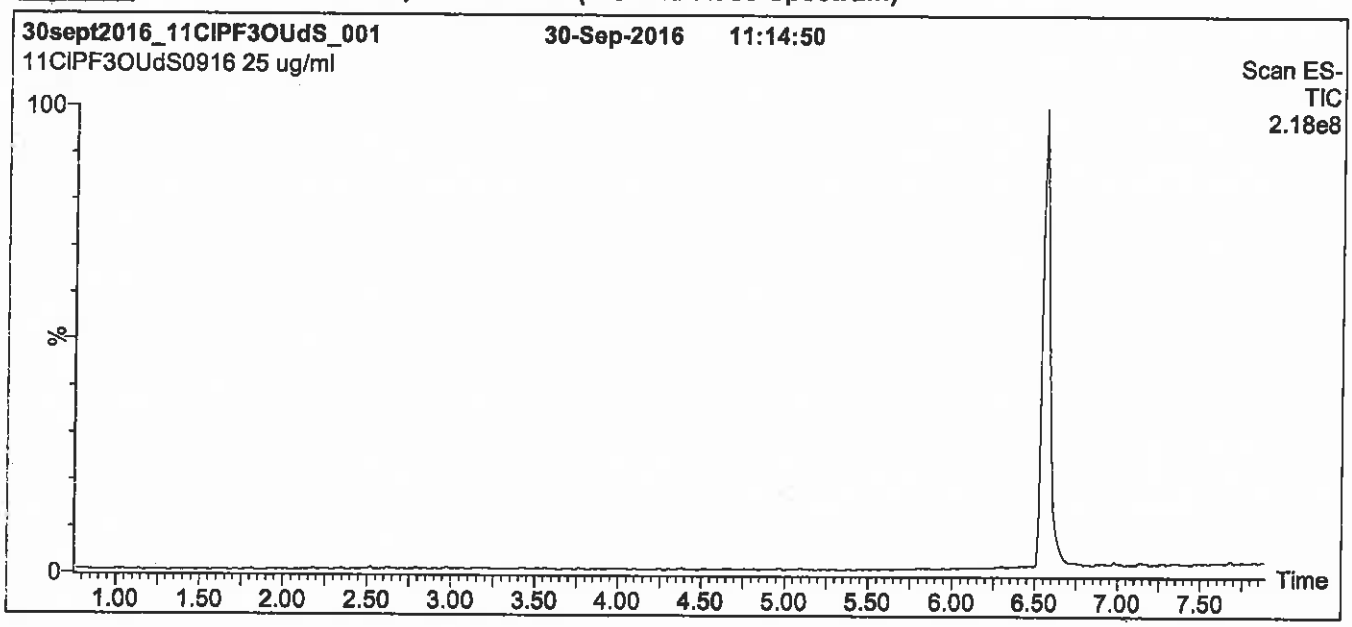
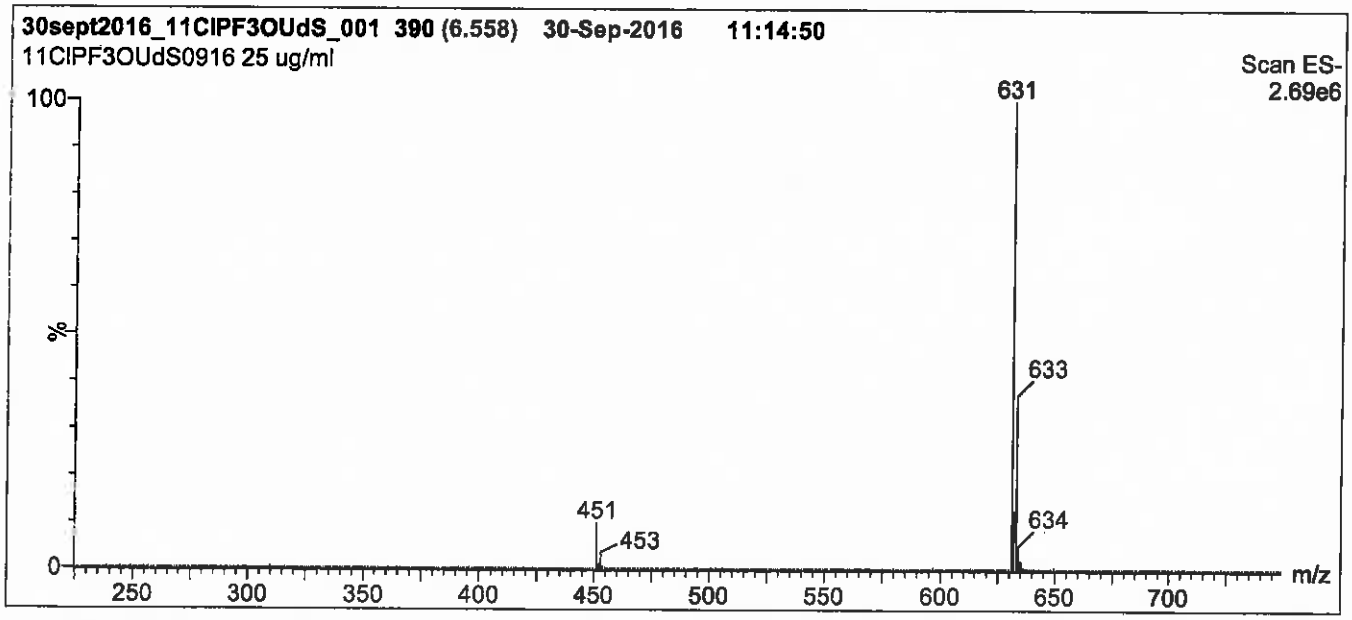
Figure 1: **11Cl-PF3OUdS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

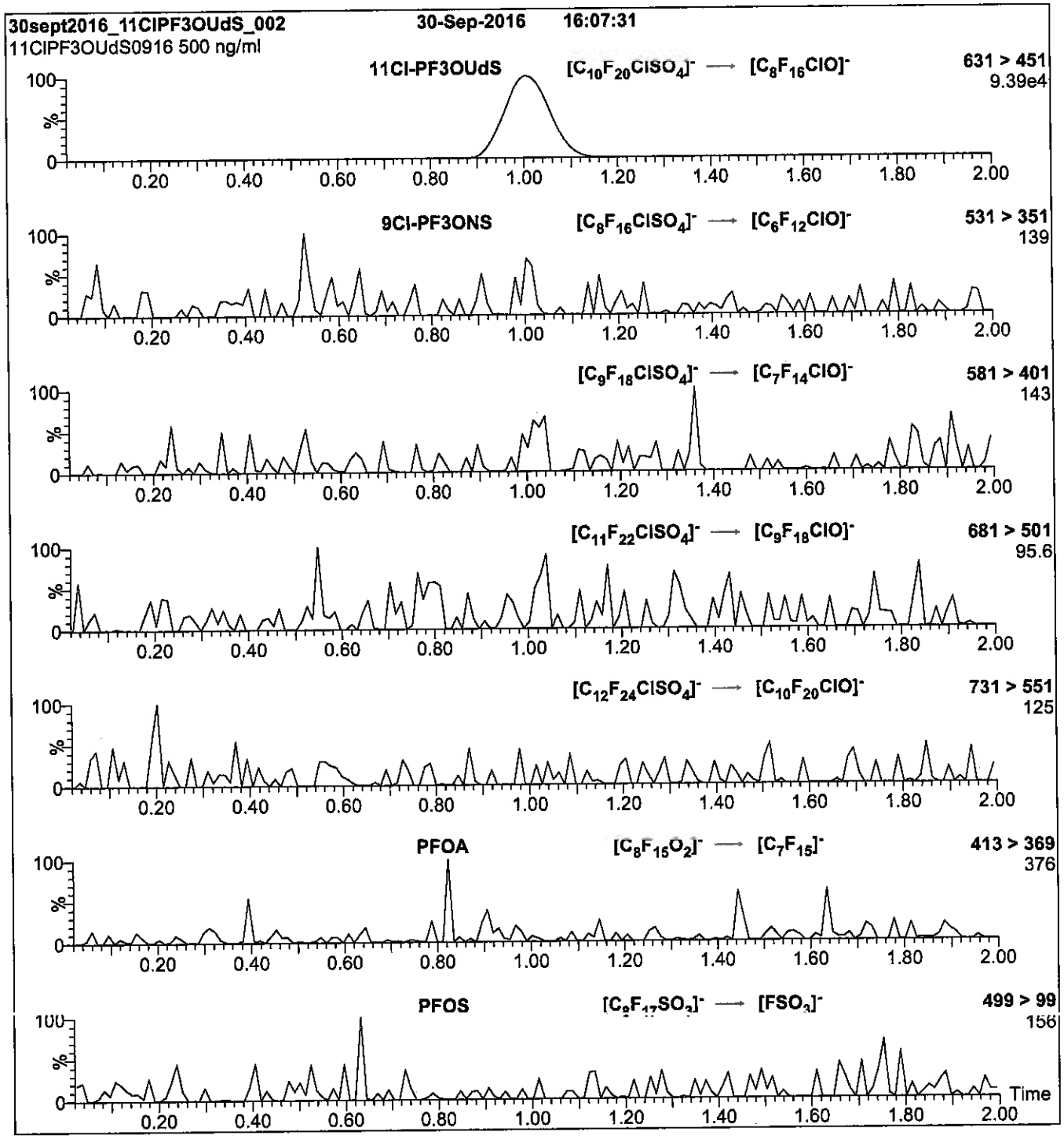
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 45.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **11Cl-PF3OUdS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 11Cl-PF3OUdS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 20

Reagent

LC4:2FTS_00005

r: 9/21/17 SKV

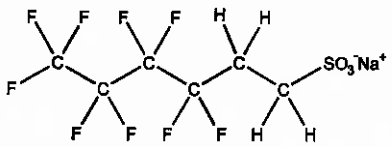
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216

COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_6H_4F_9SO_3Na$ **MOLECULAR WEIGHT:** 350.13

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

46.7 ± 2.3 µg/ml (4:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 12/12/2016

EXPIRY DATE: (mm/dd/yyyy) 12/12/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/21/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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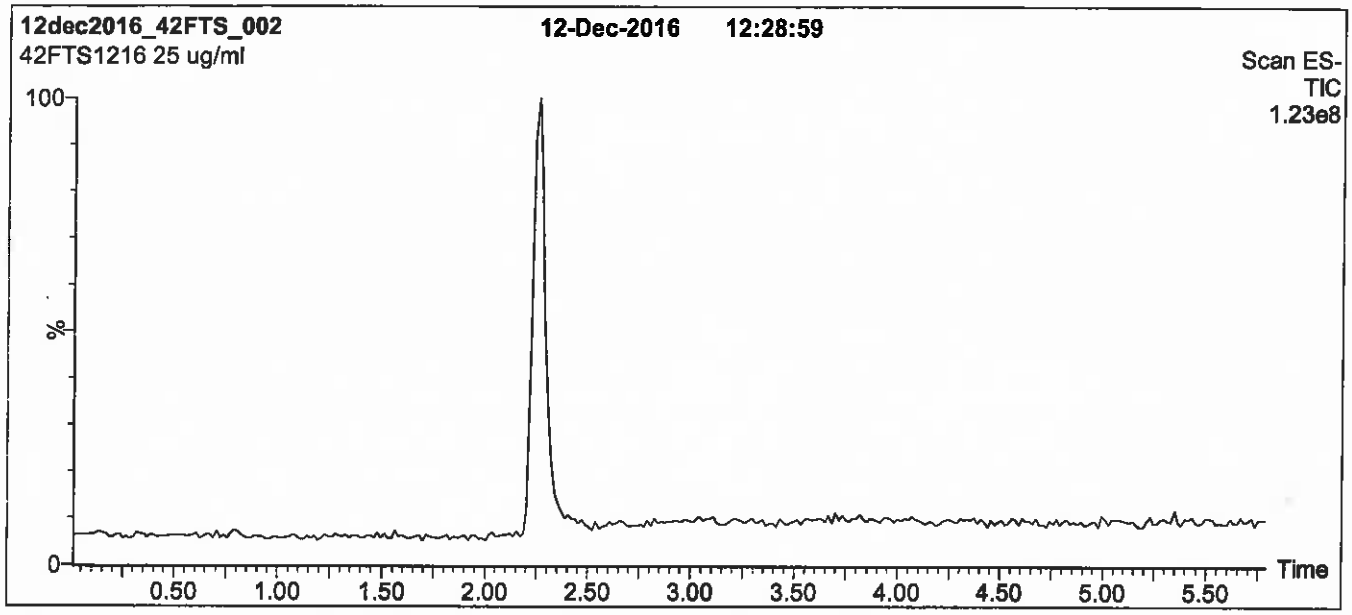
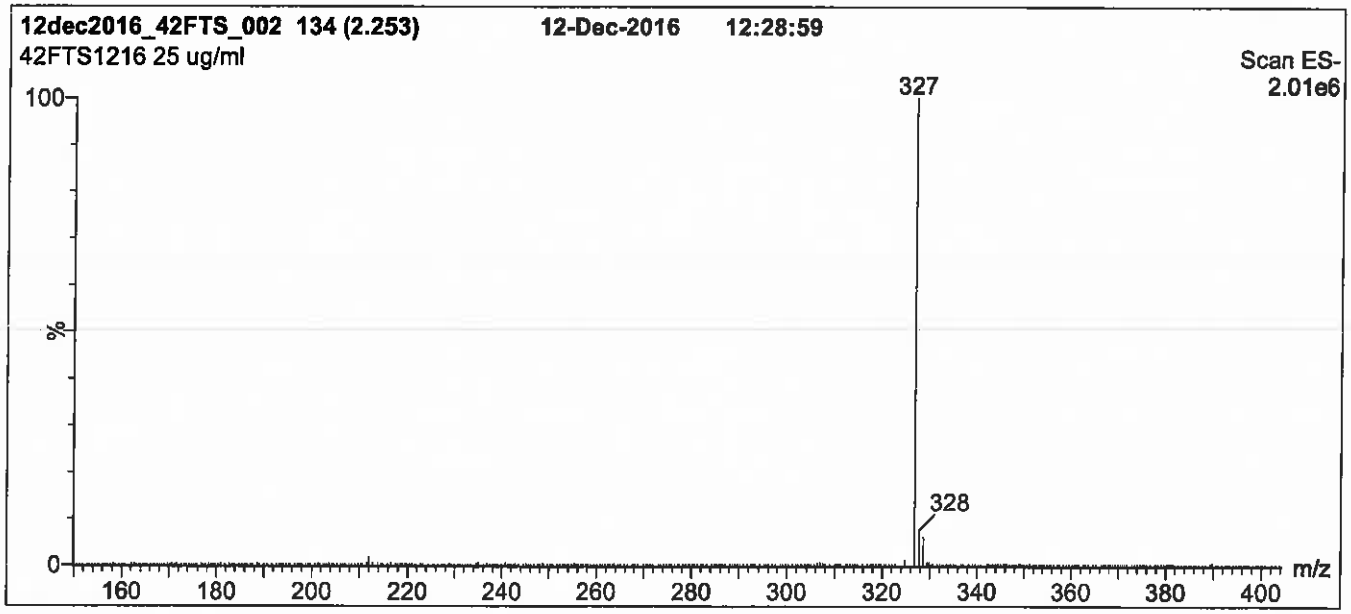
Figure 1: **4:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

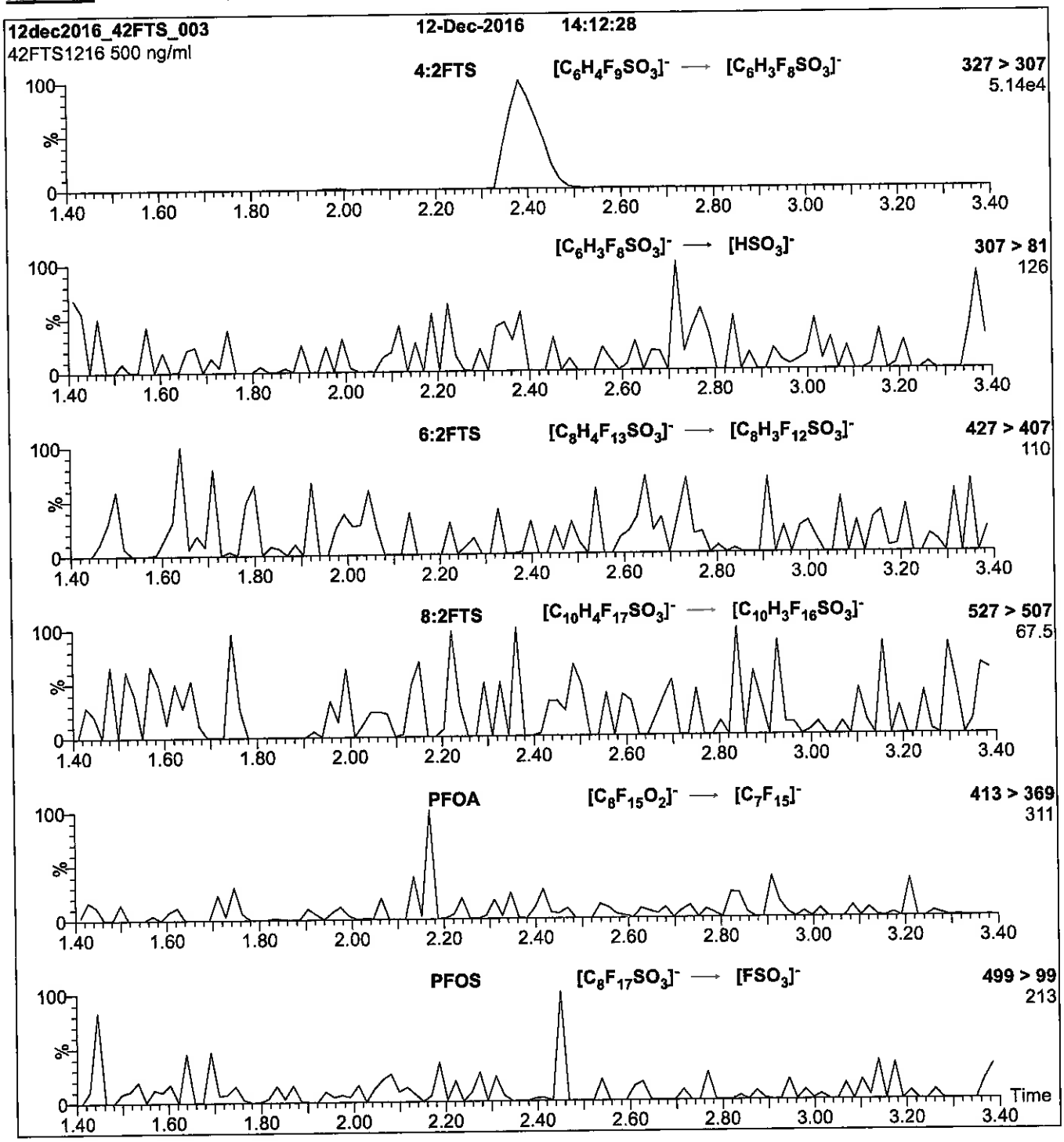
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 4:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 25

Reagent

LC6:2FTS_00007

r: 9/21/17 SKW

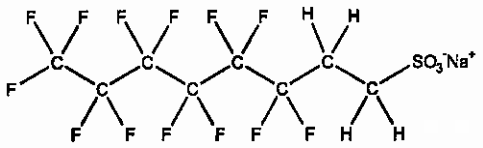
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0417

COMPOUND: Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_8H_4F_{13}SO_3Na$ **MOLECULAR WEIGHT:** 450.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.4 ± 2.4 µg/ml (6:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 04/20/2017

EXPIRY DATE: (mm/dd/yyyy) 04/20/2022

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/24/2017 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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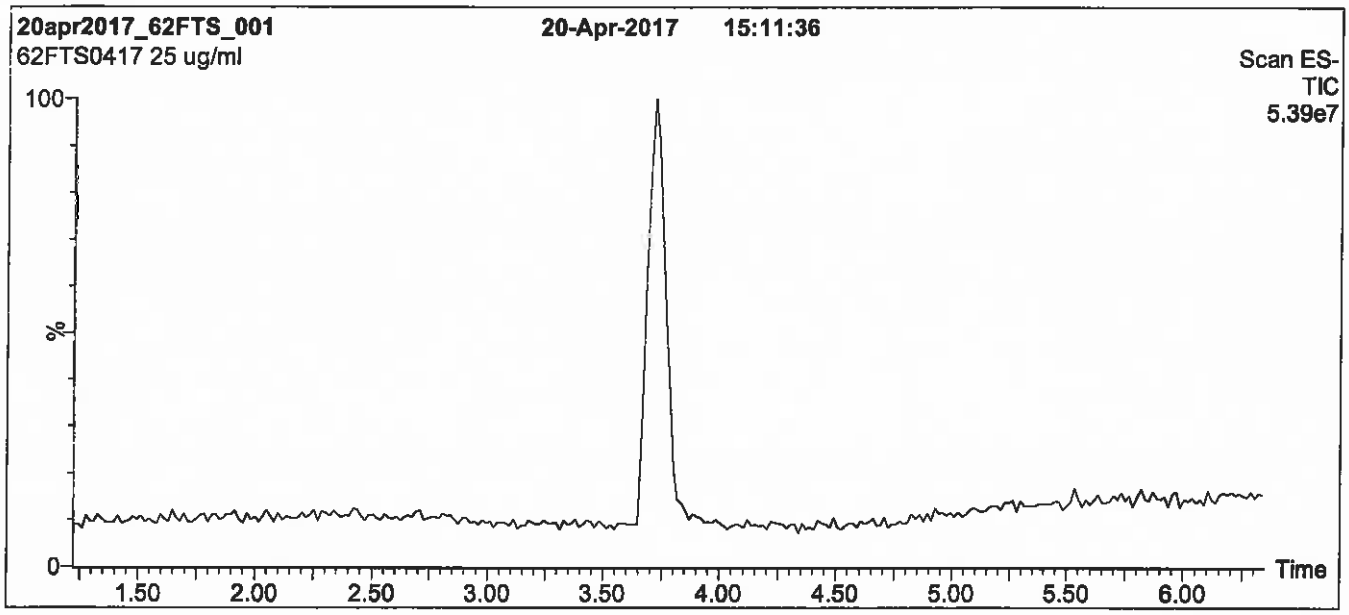
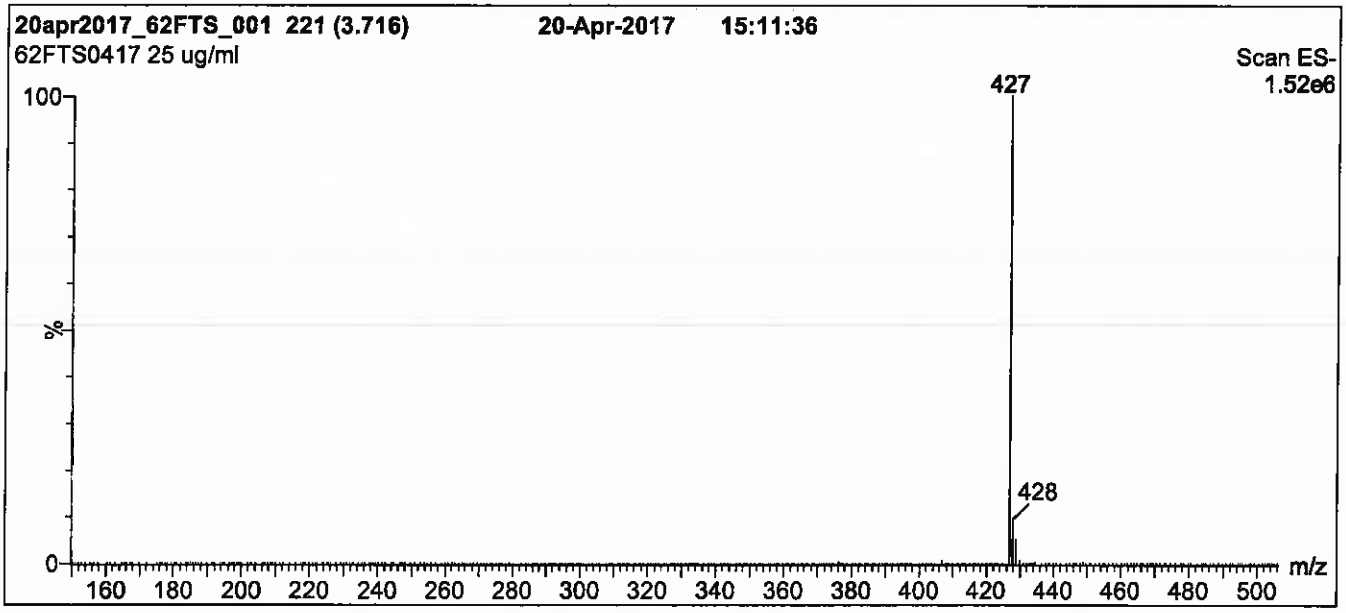
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

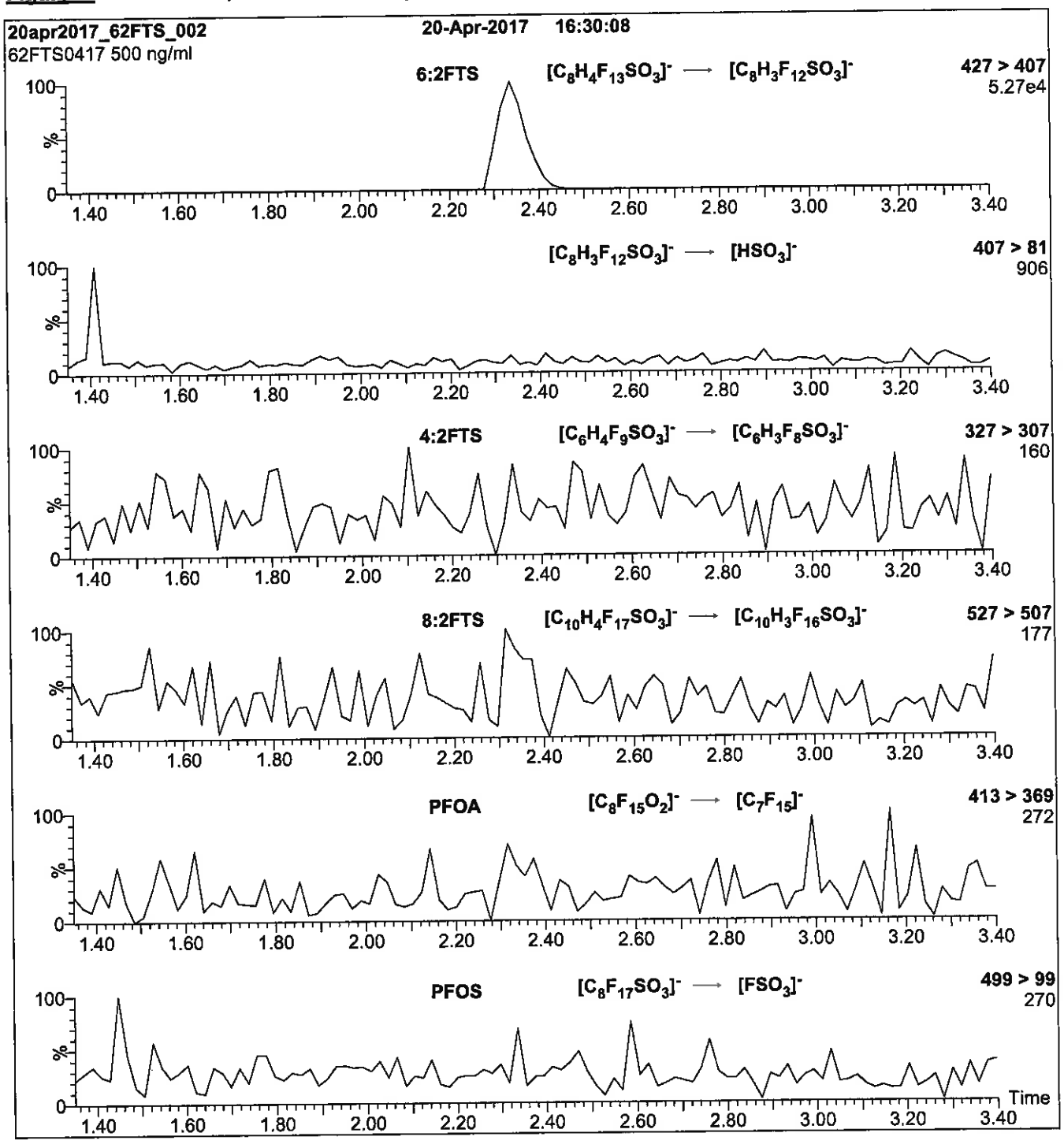
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LC8:2FTS_00007

r: 9/21/17 SK

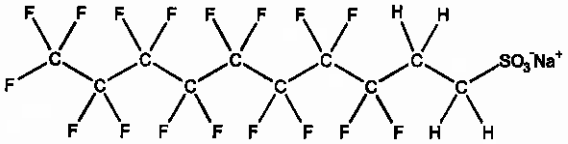
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1216

COMPOUND: Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{10}H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 550.16

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.9 ± 2.4 µg/ml (8:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 12/12/2016

EXPIRY DATE: (mm/dd/yyyy) 12/12/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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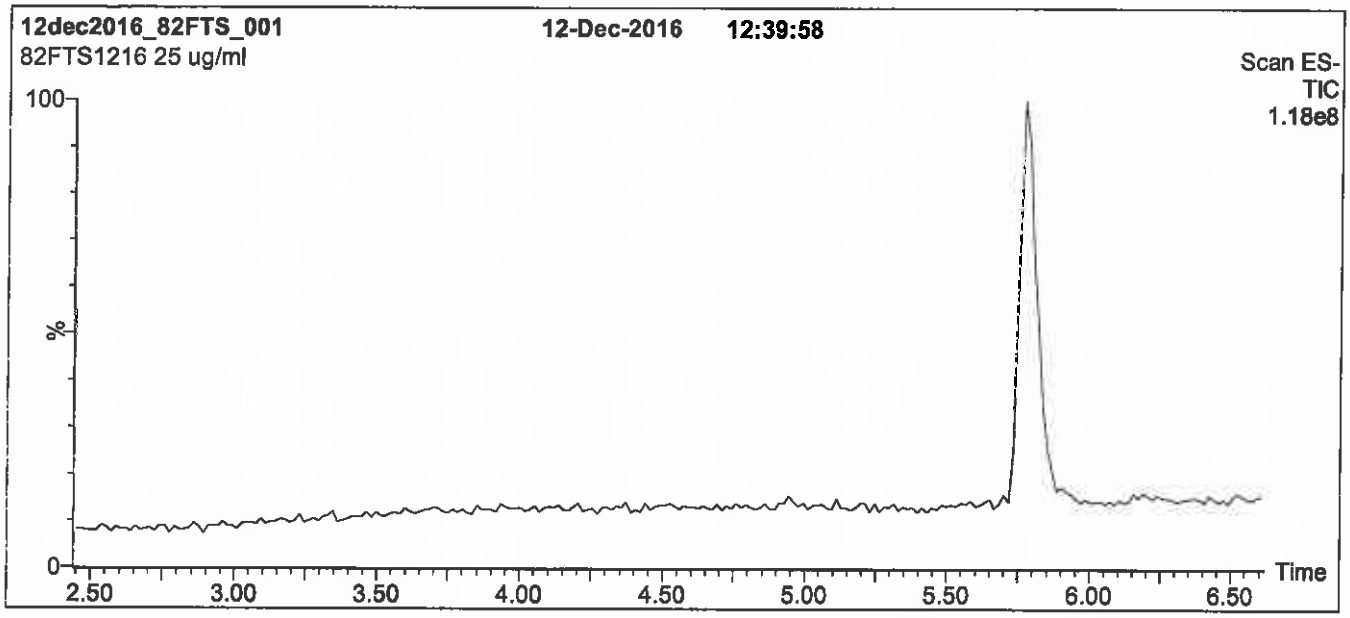
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

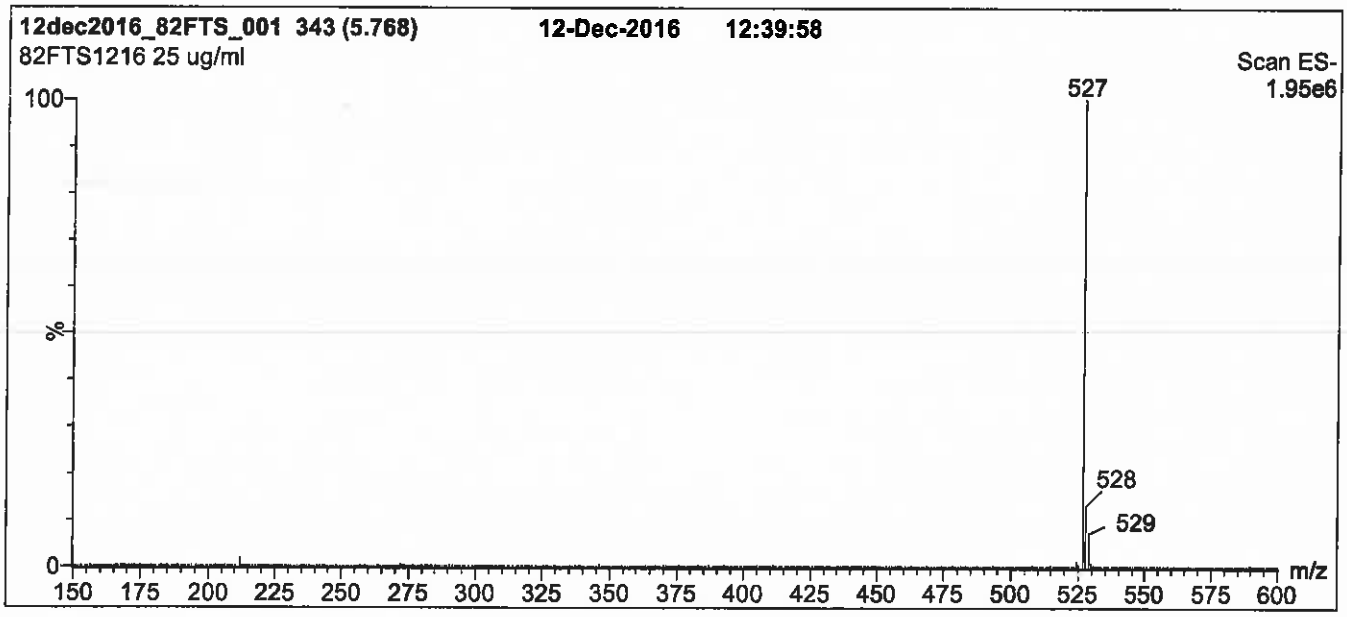
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

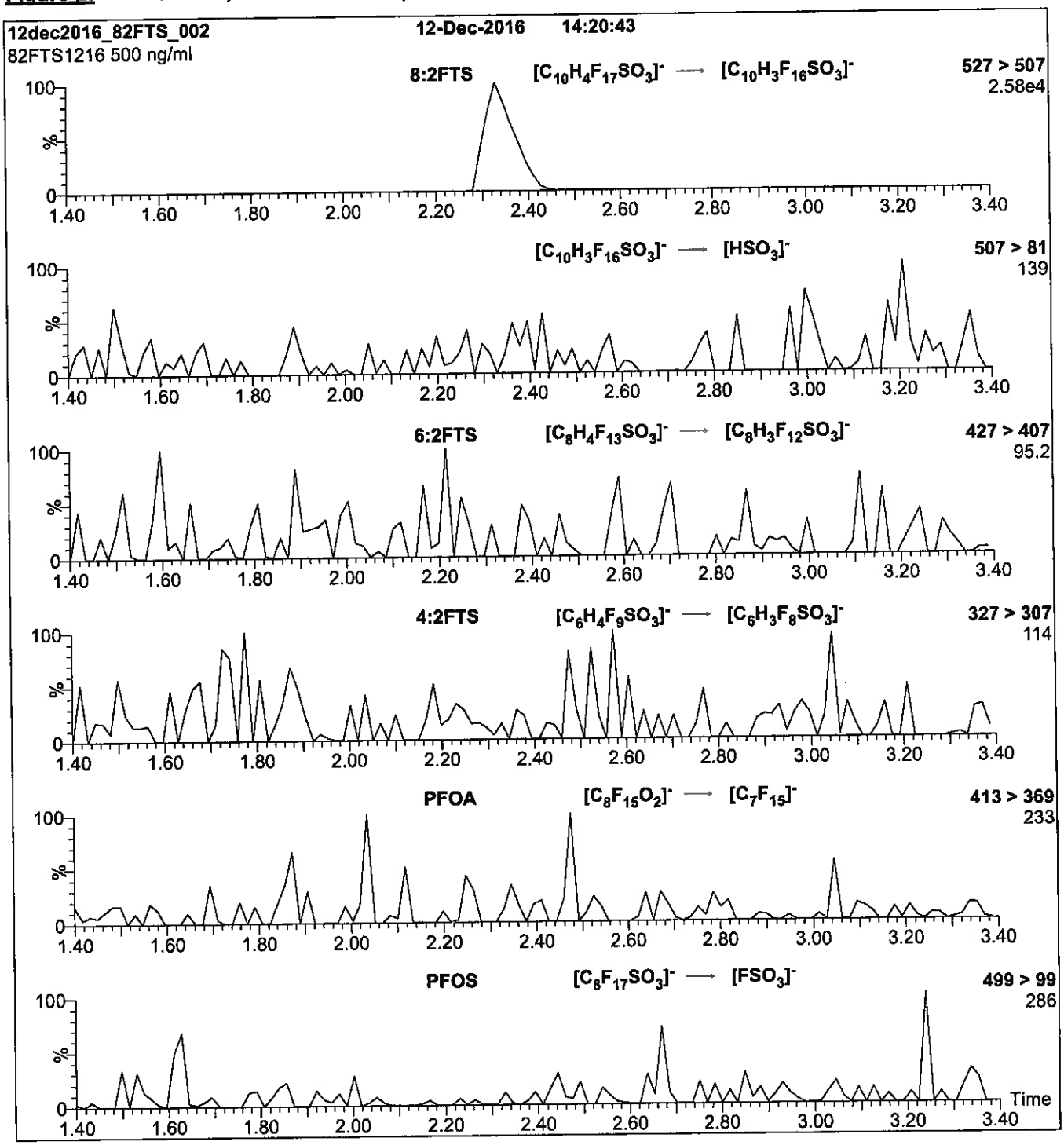
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 30

Reagent

LC9CI-PF3ONS_00002

P: 4/25/18 SKV

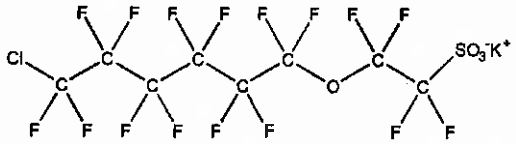
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 9Cl-PF3ONS **LOT NUMBER:** 9ClPF3ONS0916

COMPOUND: Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate

STRUCTURE: **CAS #:** 73606-19-6



MOLECULAR FORMULA: $C_8F_{16}ClSO_4K$ **MOLECULAR WEIGHT:** 570.67

CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol

46.6 ± 2.3 µg/ml (9Cl-PF3ONS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 09/30/2016

EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This compound is the major component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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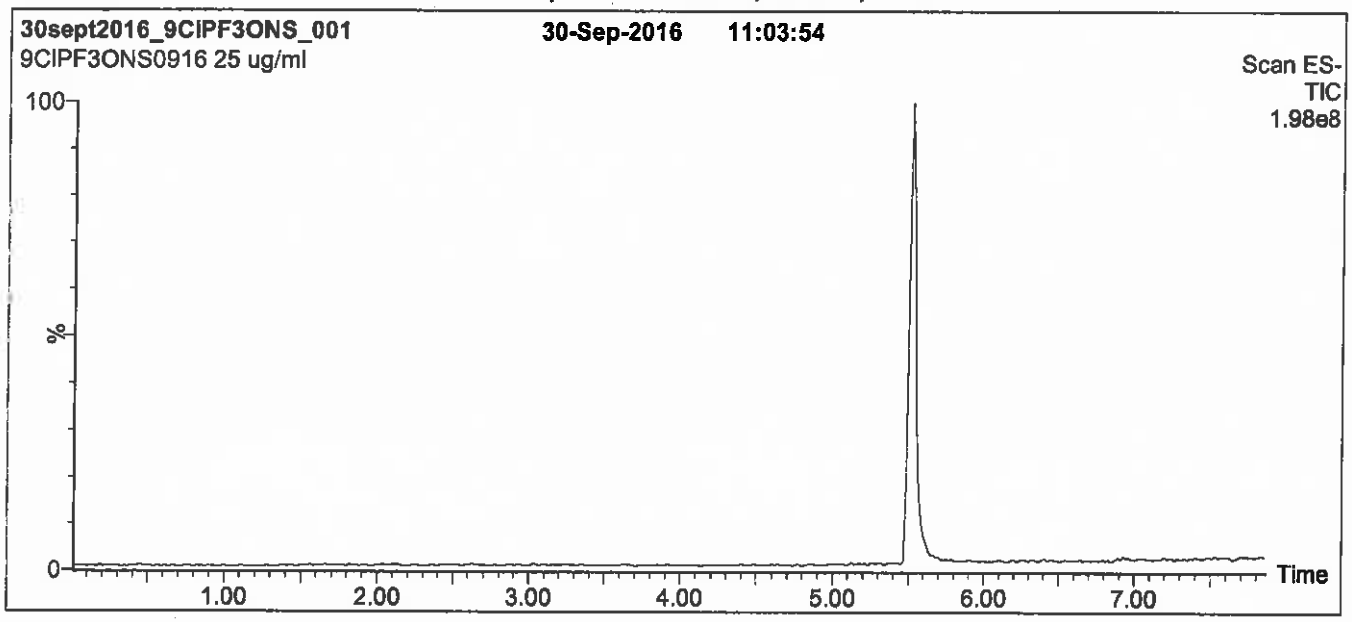
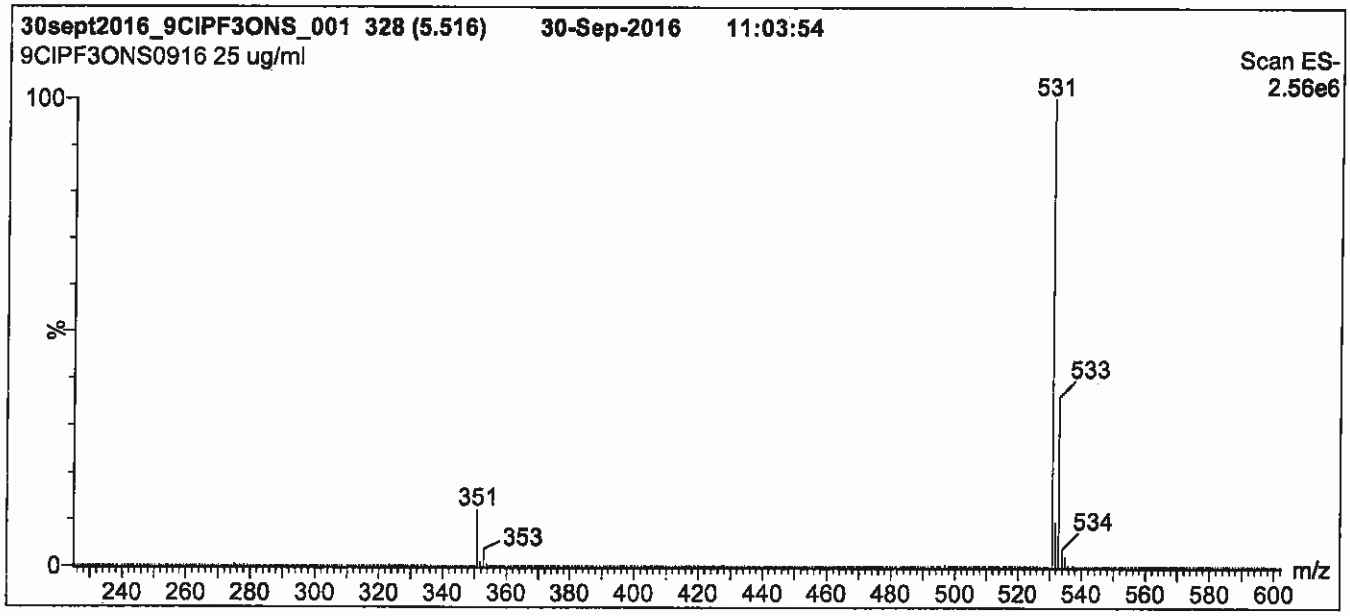
Figure 1: **9Cl-PF3ONS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

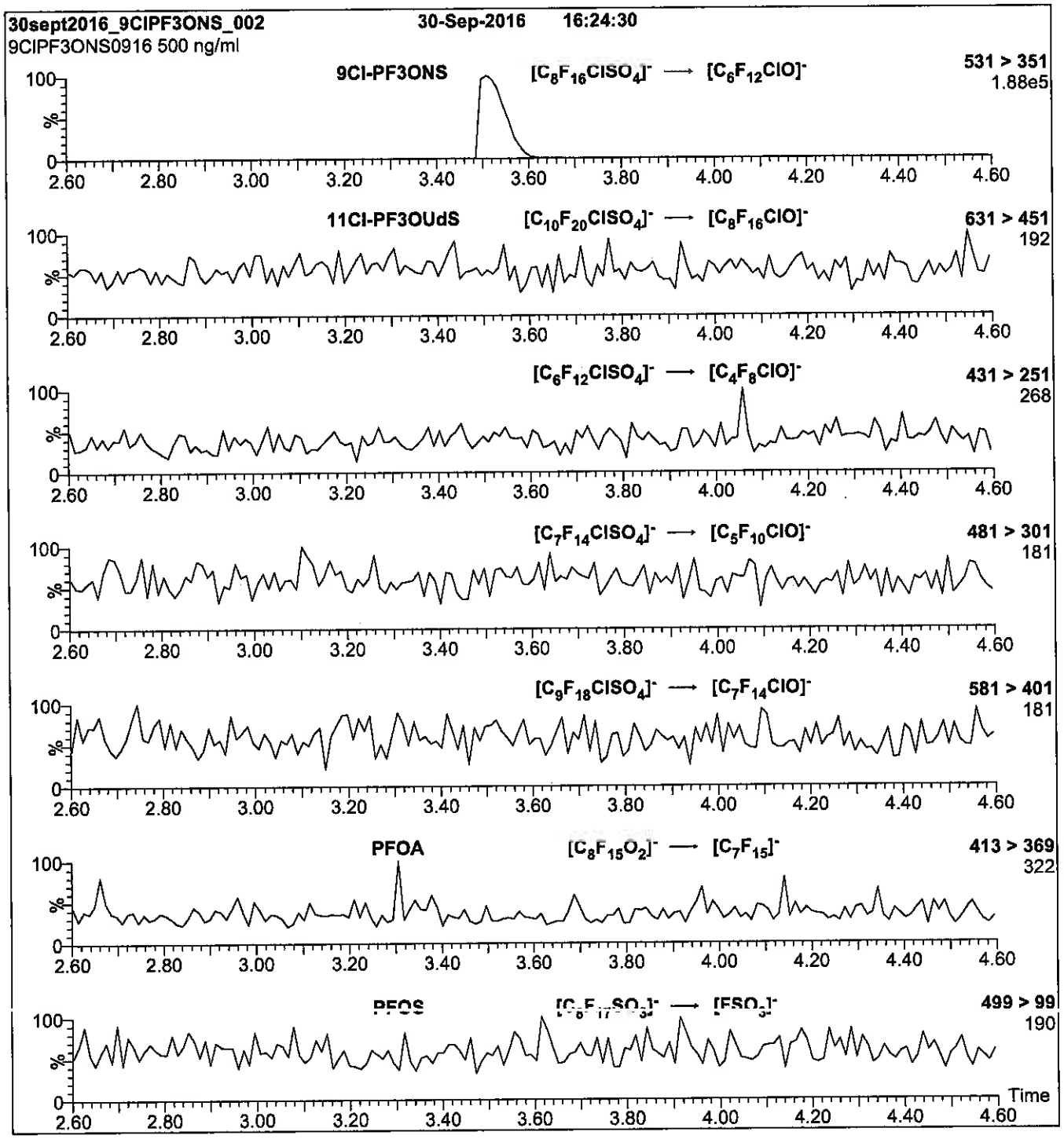
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **9Cl-PF3ONS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 9Cl-PF3ONS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LCbr-NEtFOSAA_00001

DF 4/18/18 SEV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NEtFOSAA
LOT NUMBER:	brNEtFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid moiety to its respective methyl ester.

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Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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Table A: **br-NEtFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

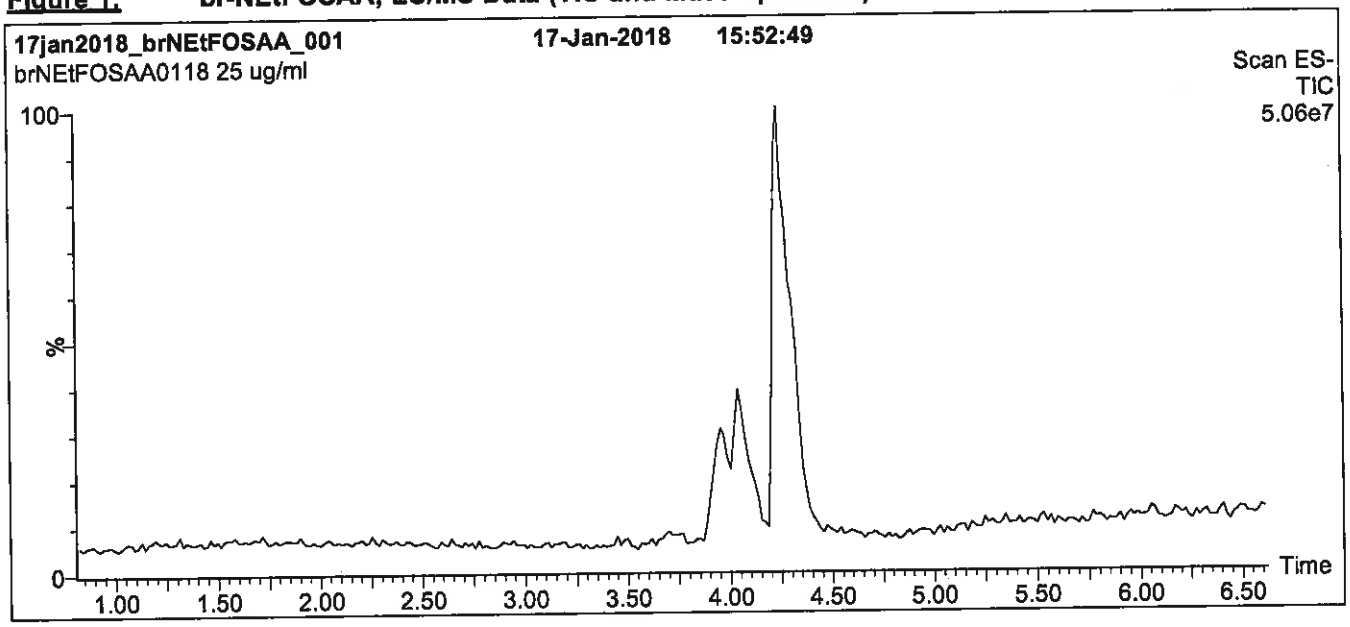
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(C_2H_5)CH_2CO_2H$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	2.2
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	5.4
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(C_2H_5)CH_2CO_2H$	10.4
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	0.3
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	0.3
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF_2CF(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	0.3
9	Other Unidentified Isomers		1.3

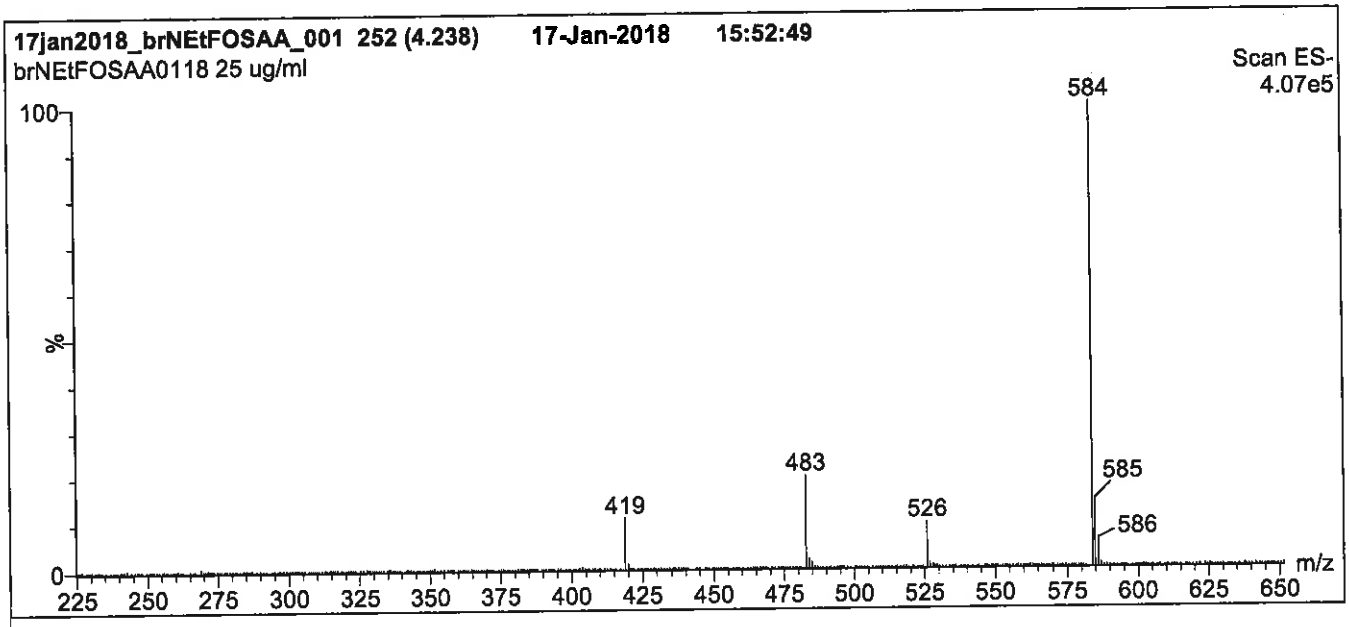
* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 03/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: **br-NEtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

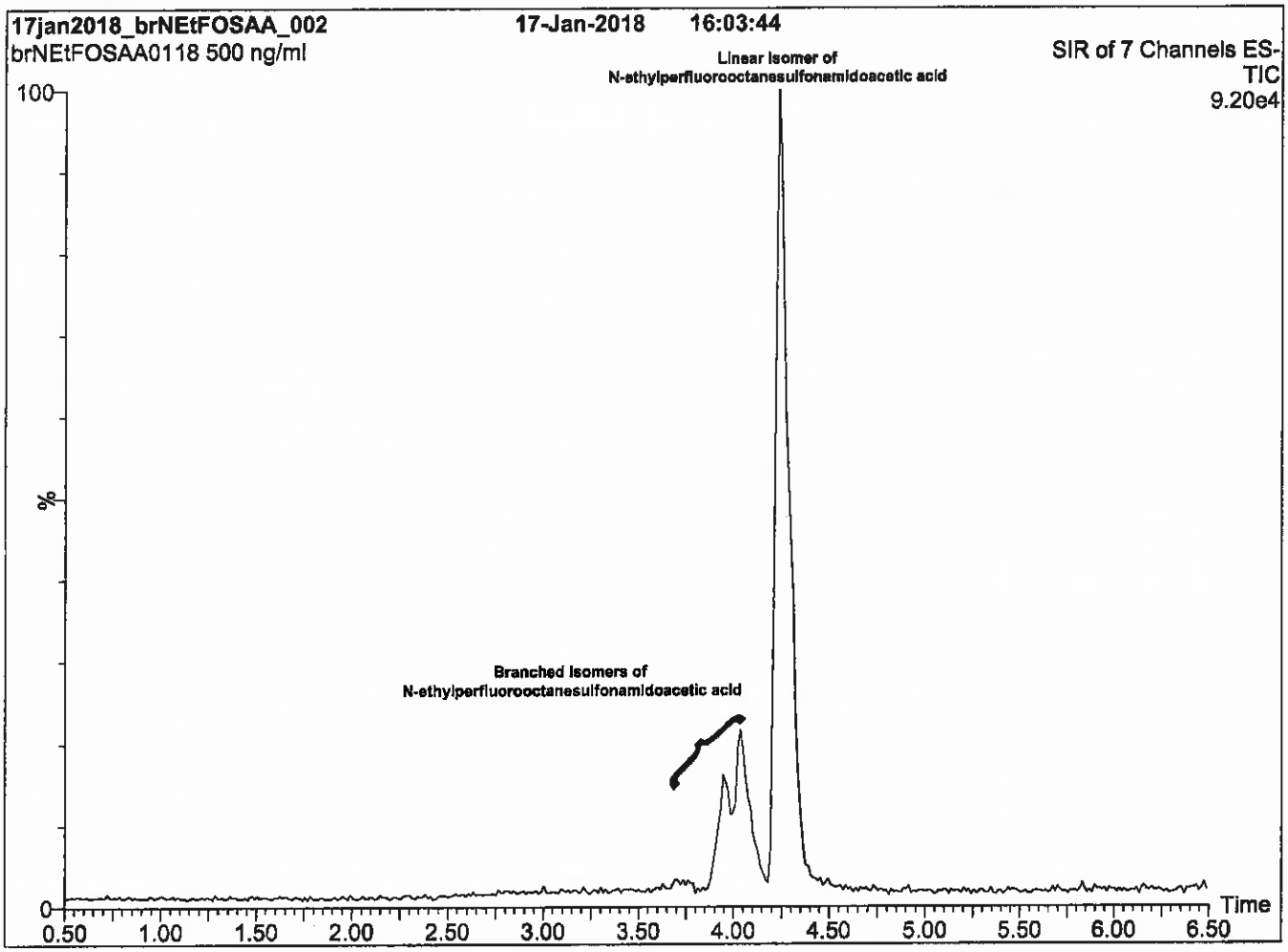
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: br-NEtFOSAA; LC/MS Data (SIR)



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

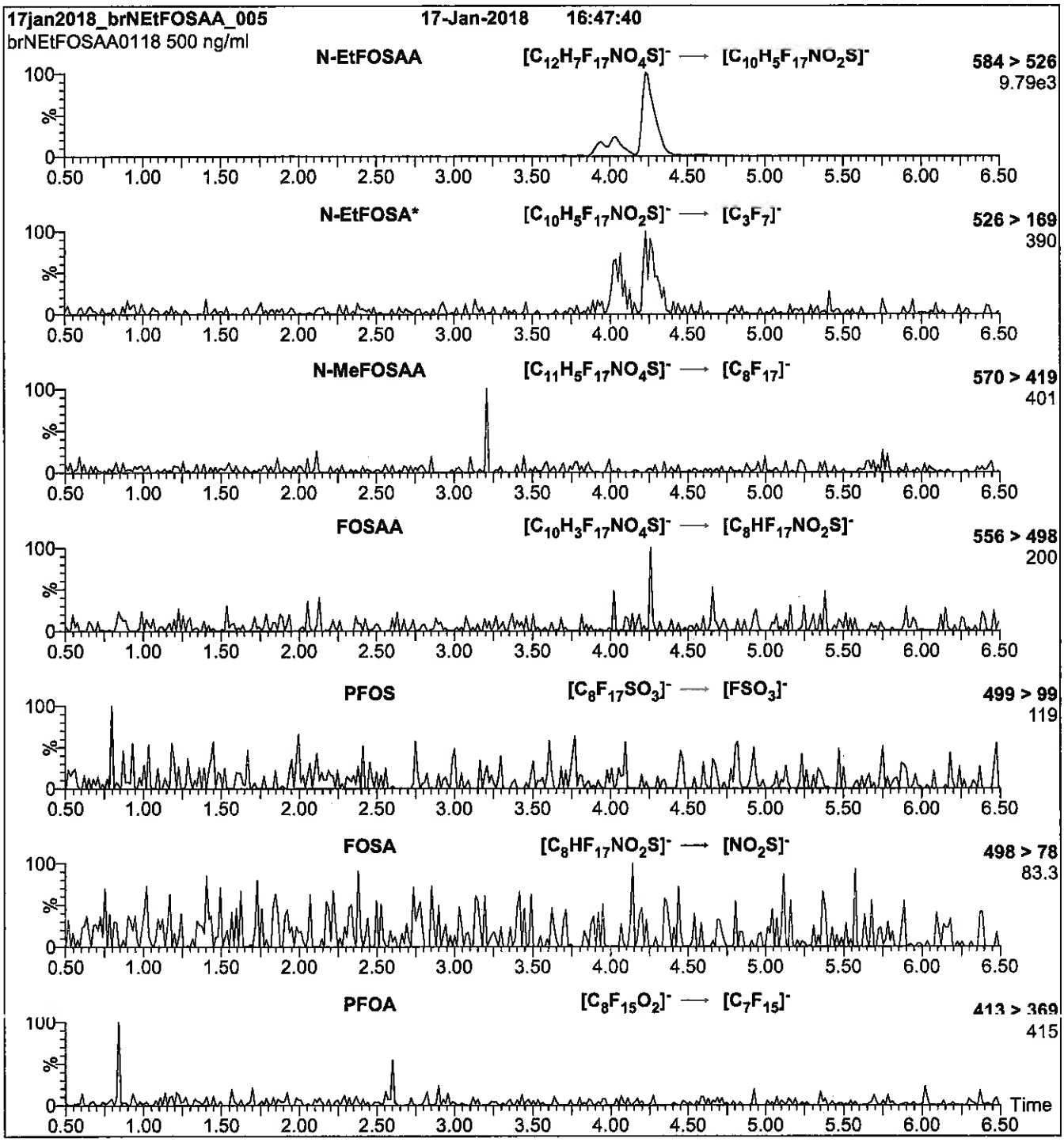
Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-NEtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



*Note: N-EtFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection:	On-column	**MS Parameters**	
Mobile phase:	Same as Figure 2	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 11-40 (variable)	
Flow:	300 µl/min		

Reagent

LCbr-NMeFOSAA_00001

r. 4/18/18 SKD

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NMeFOSAA
LOT NUMBER:	brNMeFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-methylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid molety to its respective methyl ester.

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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Table A: **br-NMeFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

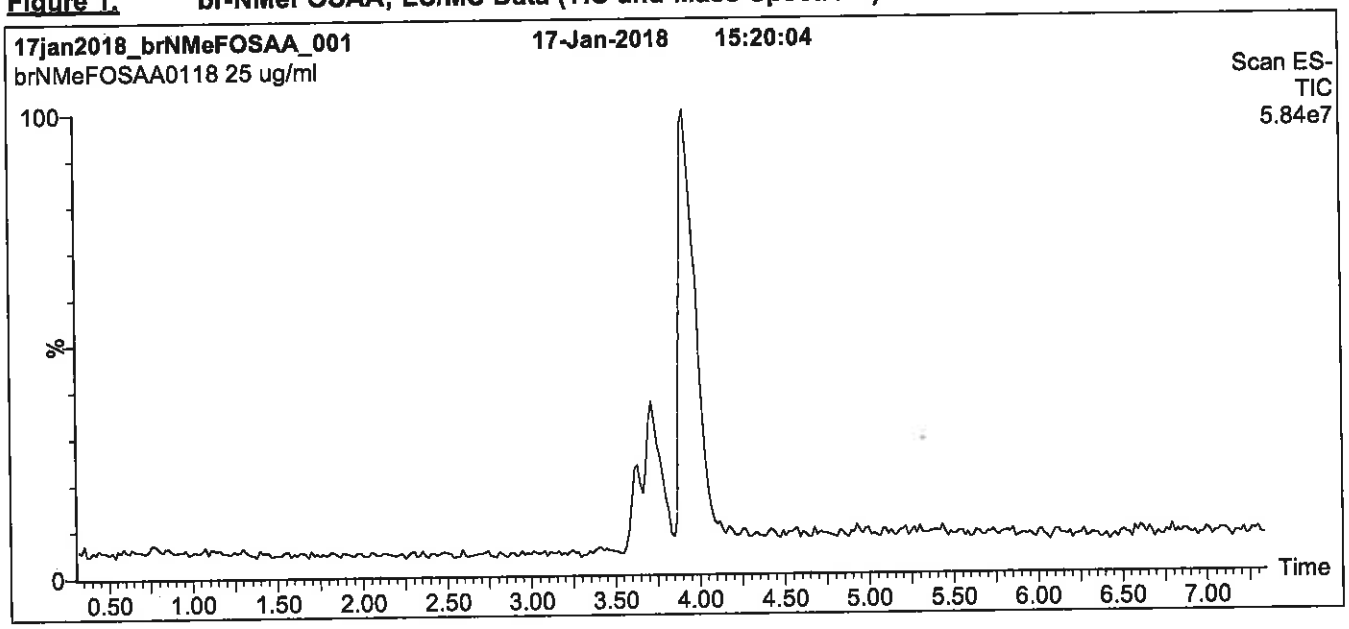
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(CH_3)CH_2CO_2H$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(CH_3)CH_2CO_2H$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(CH_3)CH_2CO_2H$	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(CH_3)CH_2CO_2H$	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	0.2
7	Other Unidentified Isomers		1.1

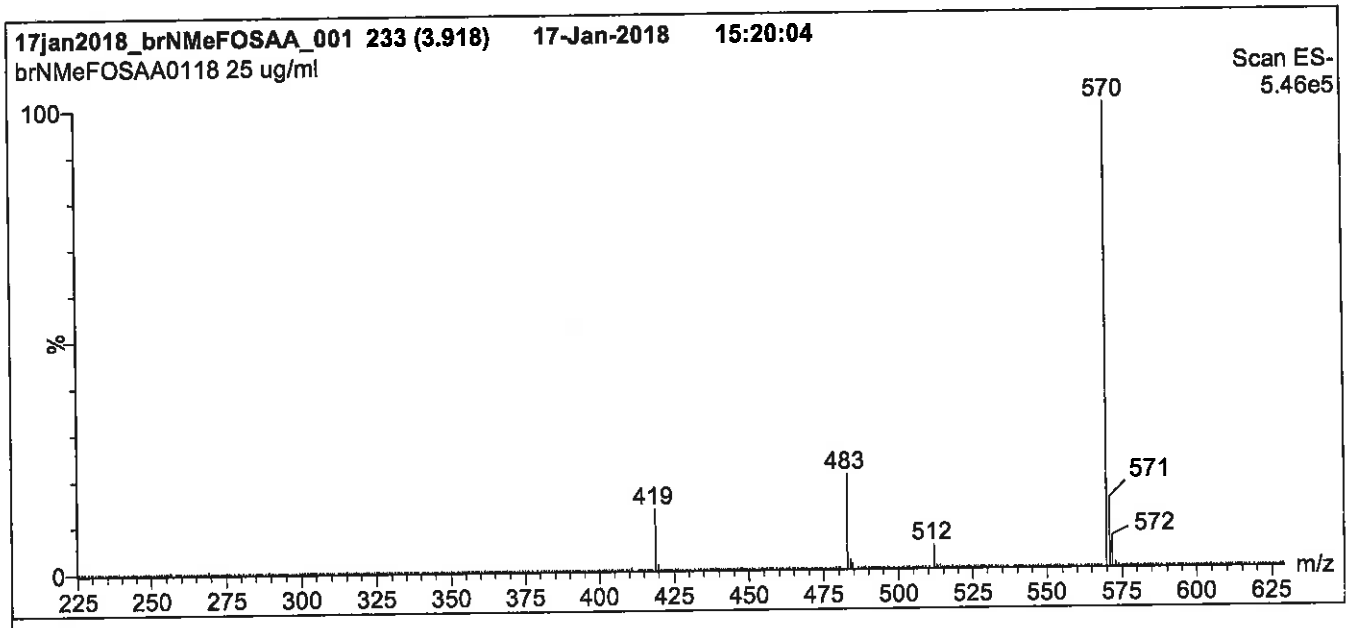
* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 03/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: **br-NMeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

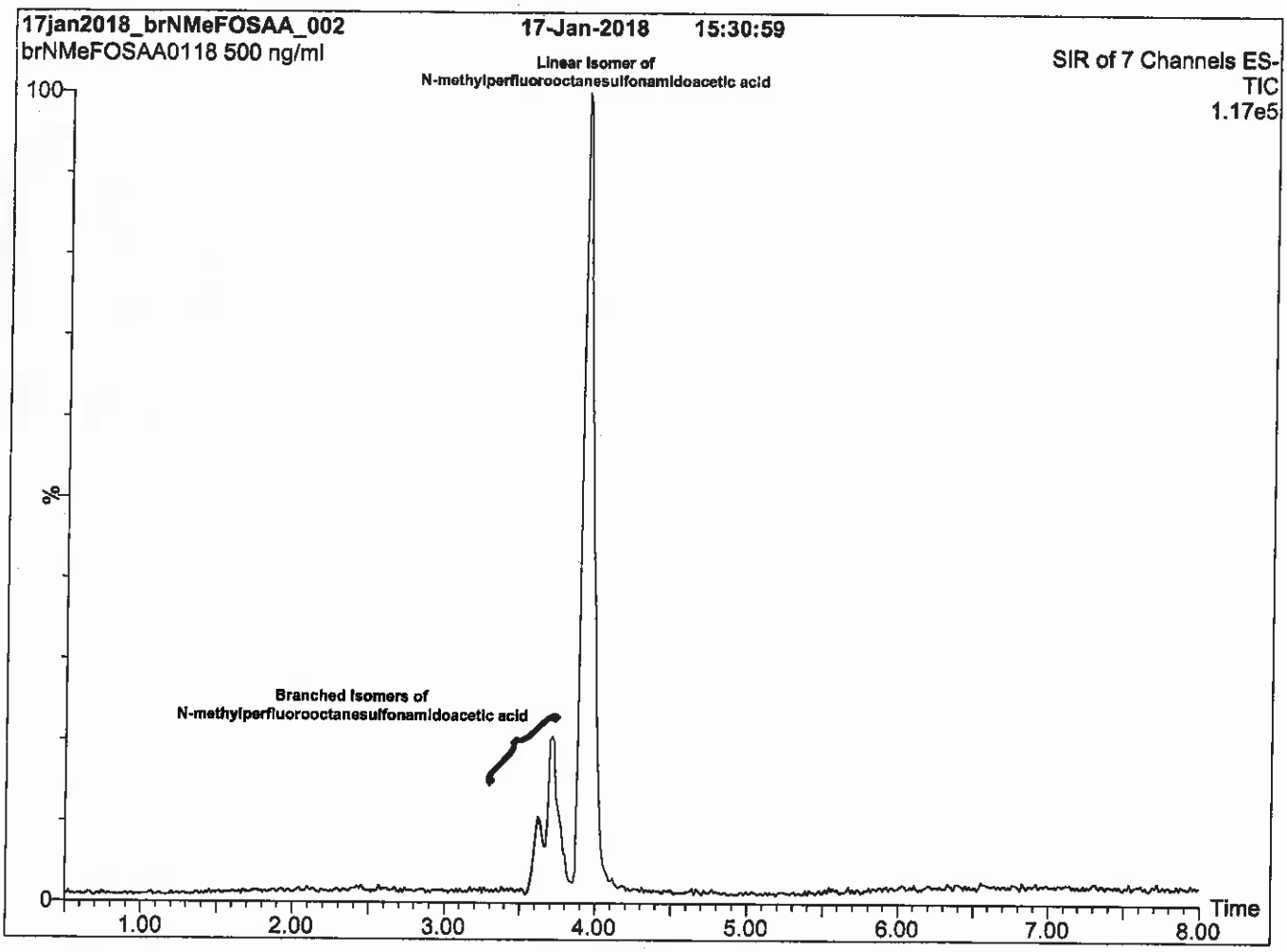
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-NMeFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

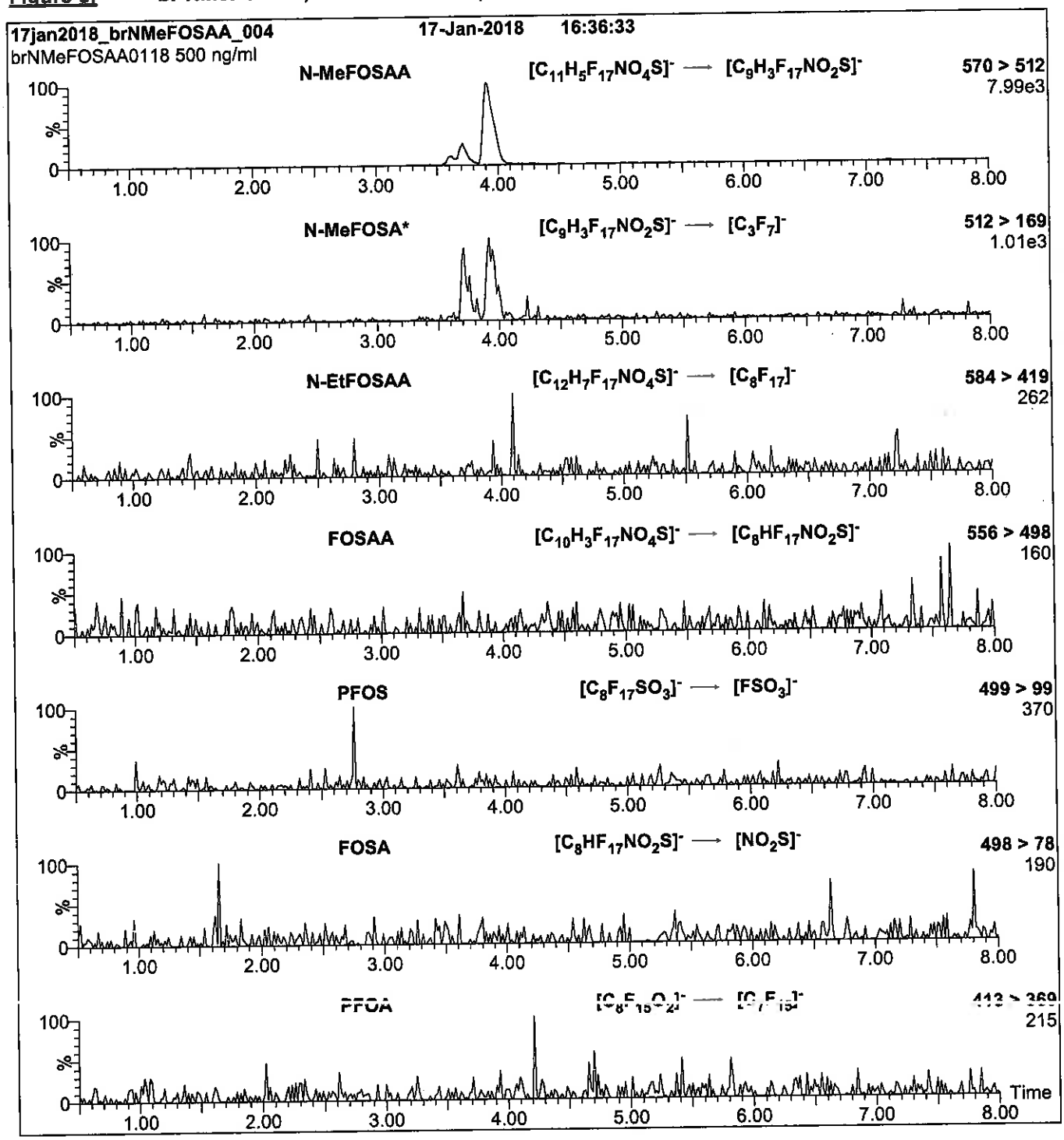
Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-NMeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



***Note**: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11-40 (variable)

Reagent

LCd3-NMeFOSAA_00008

R: 5/30/18 CBW

1263171
ID: LCd3-NMeFOSAA_00008
Exp:11/06/22 Prpd:CBW Opn:05/30/18
d3-N-MeFOSAA

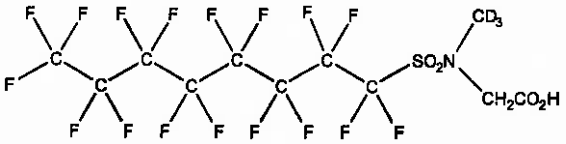
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1117

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{11}D_3H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 574.23

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_3$

LAST TESTED: (mm/dd/yyyy) 11/08/2017

EXPIRY DATE: (mm/dd/yyyy) 11/08/2022

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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CALA

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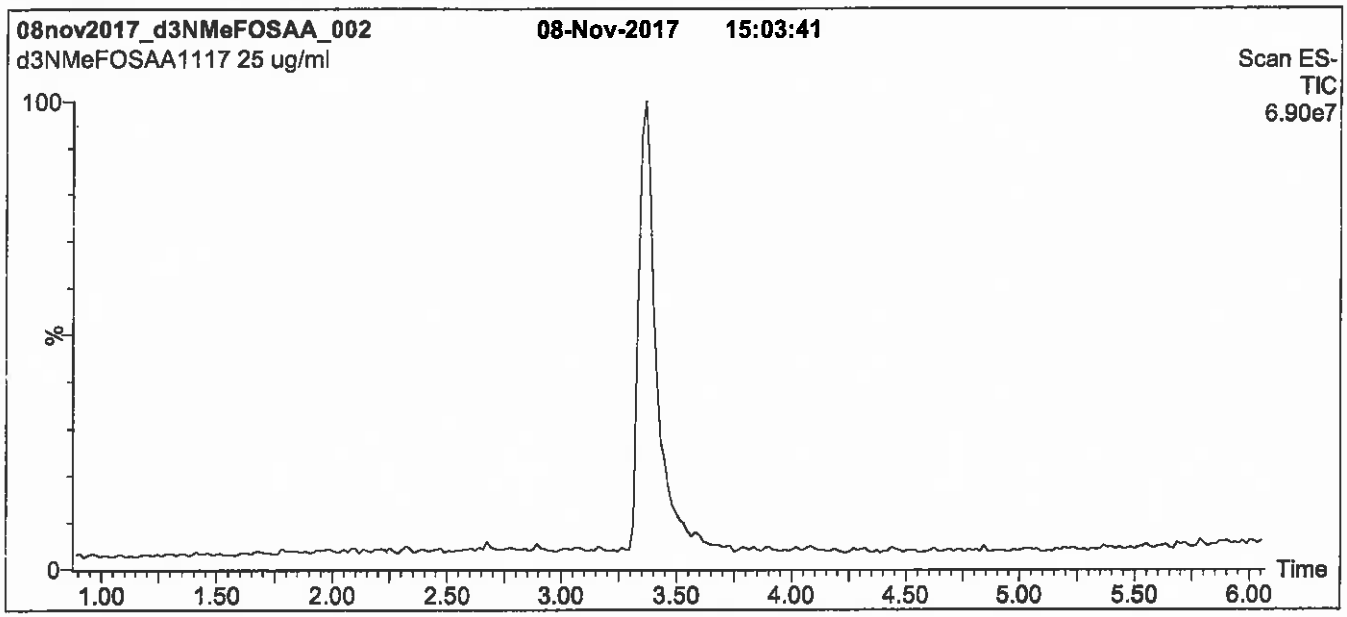
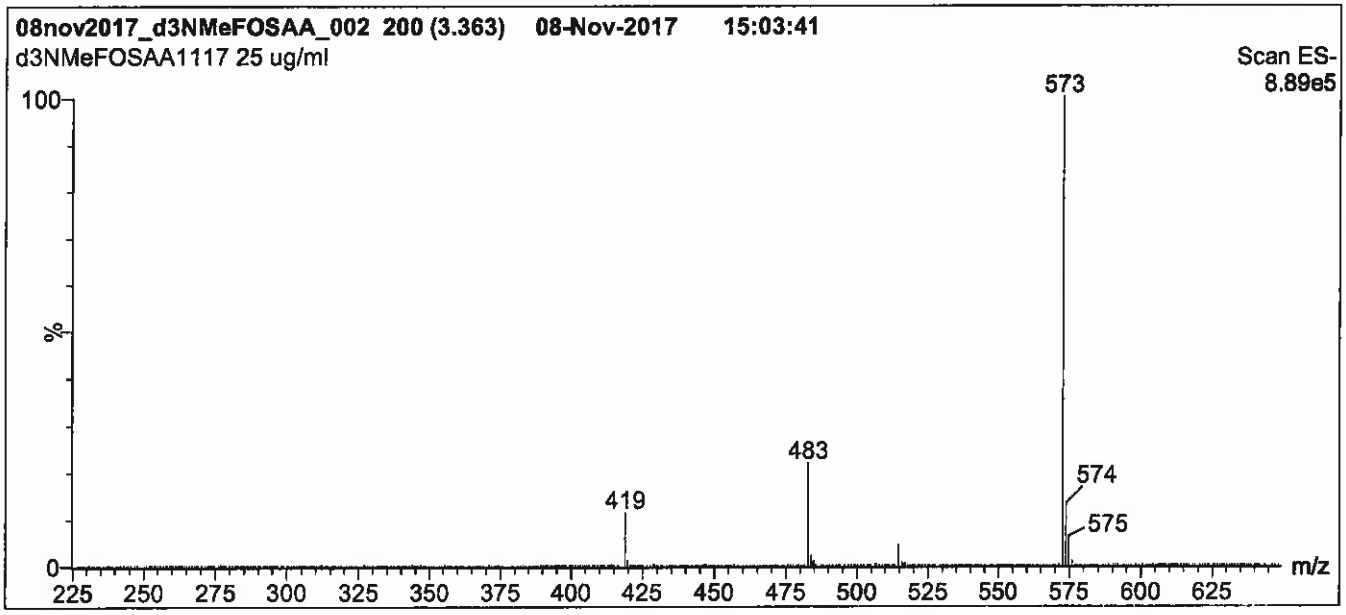
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
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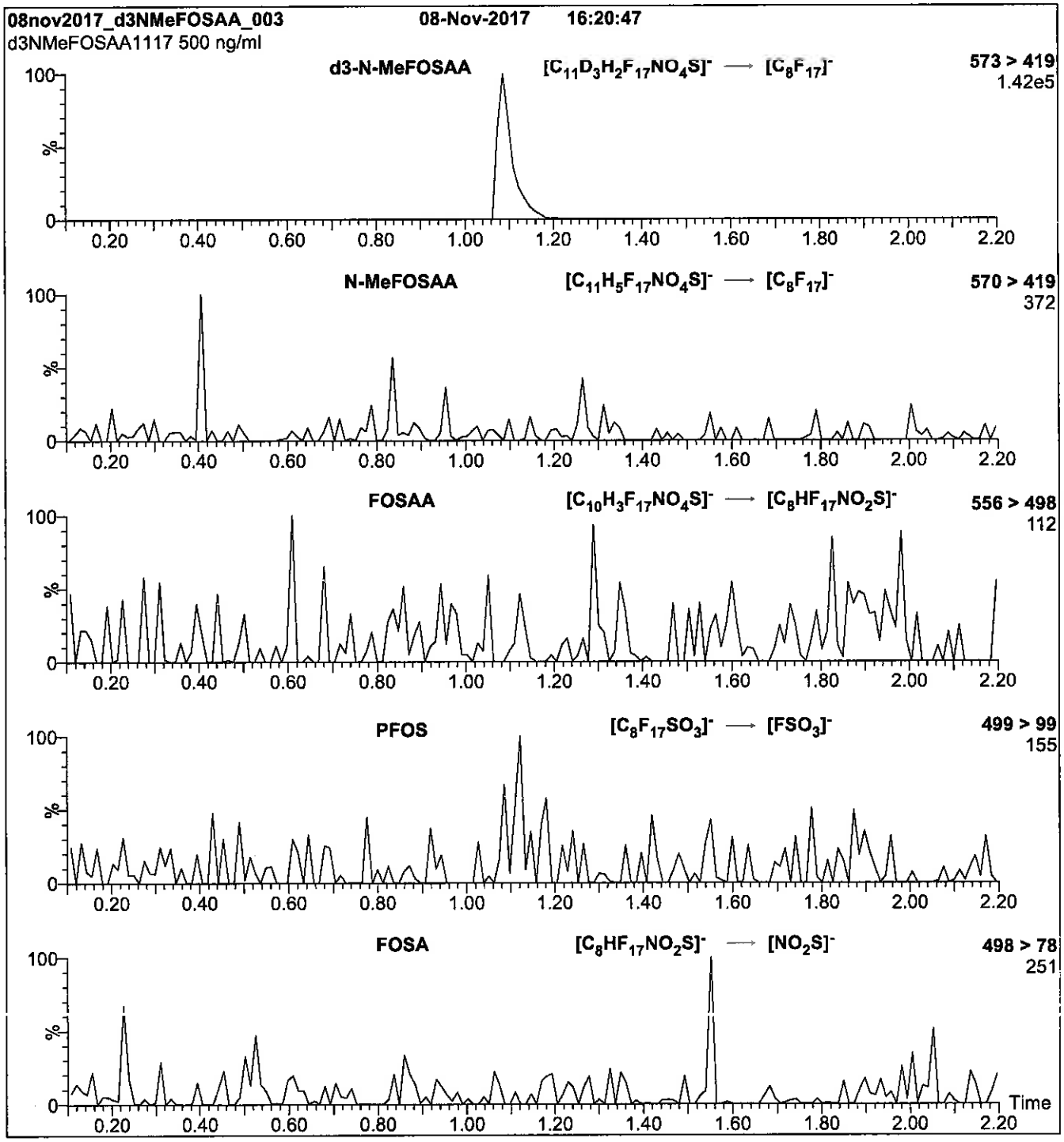
Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d3-N-MeFOSAA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 20
Flow:	300 µl/min	

Reagent

LCd3-NMeFOSAA_00009

1287340
ID: LCd3-NMeFOSAA_00009
Exp:11/08/22 Prpd:CBW Opr:06/26/18
d3-N-MeFOSAA

R: 6/26/18 CBW

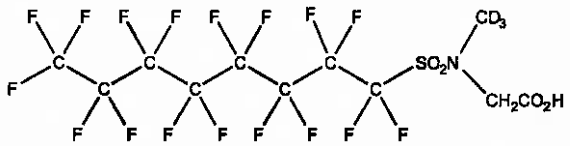
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1117

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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ADDITIONAL INFORMATION:

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B.G. Chittim, General Manager

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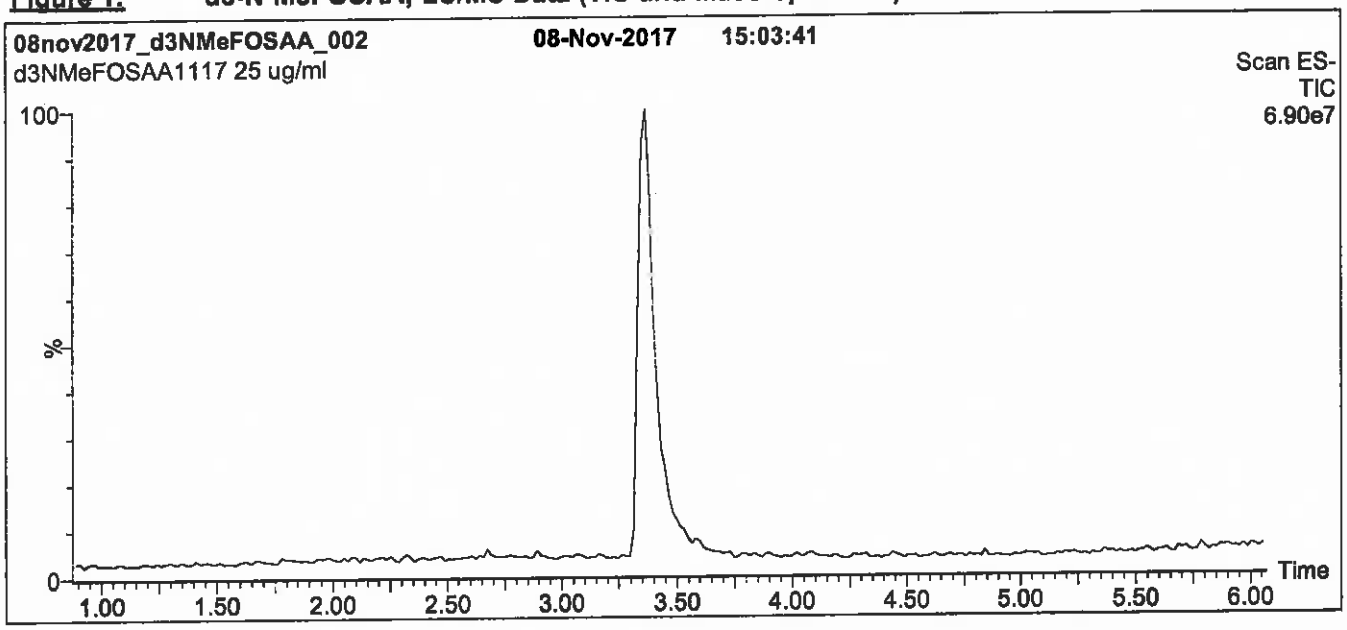

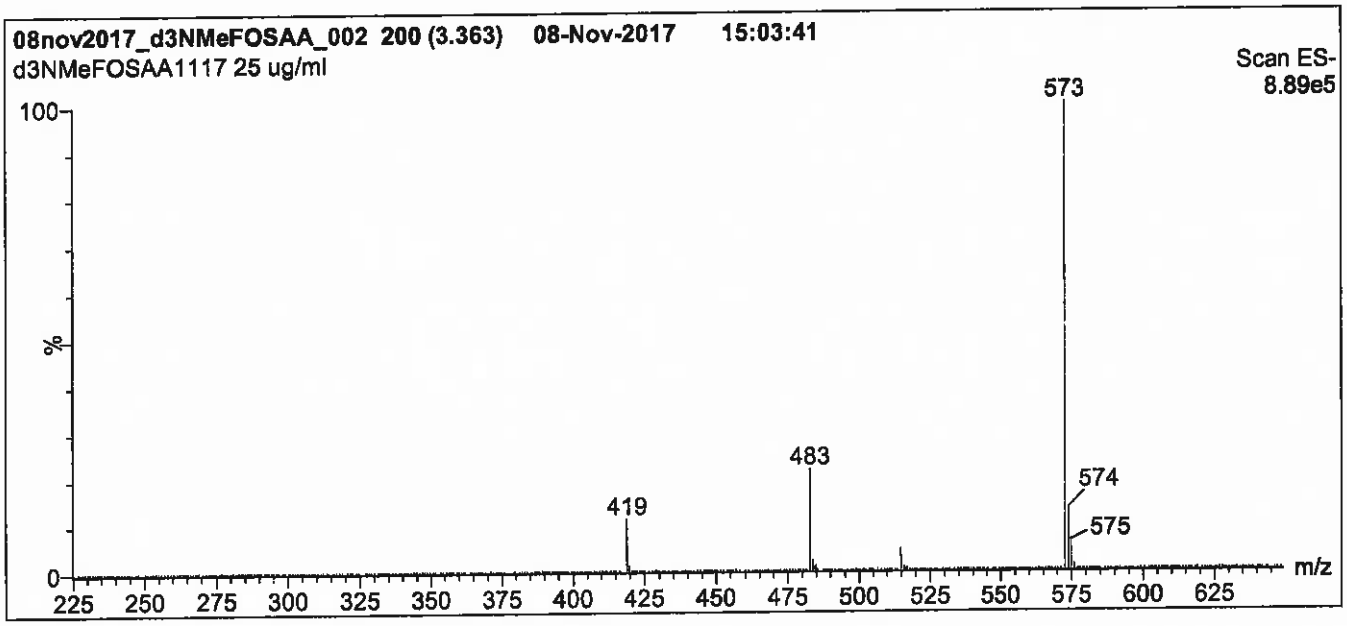

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before returning to initial conditions in 0.5 min.
Time: 10 min

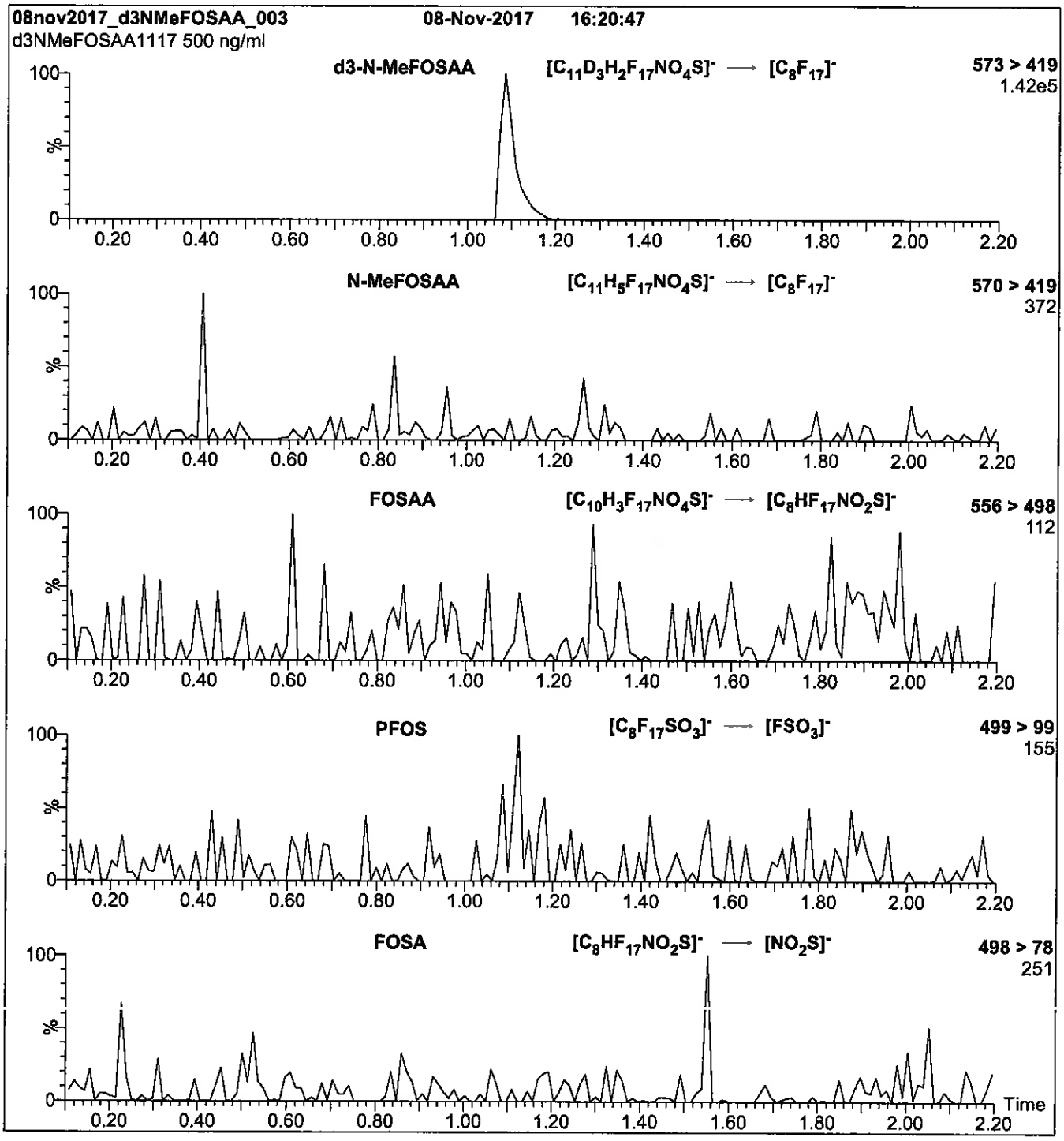
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d3-N-MeFOSAA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 20
Flow:	300 µl/min	

Reagent

LCd5-NEtFOSAA_00008

K: 5/30/18 CBW

1263180
ID: LCd5-NEtFOSAA_00008
Exp:11/08/22 Prpd:CBW Opn:05/30/18
d5-N-EtFOSAA

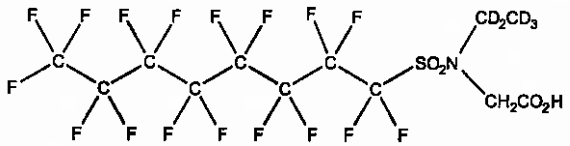
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1117

COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 590.26

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_5$

LAST TESTED: (mm/dd/yyyy) 11/08/2017

EXPIRY DATE: (mm/dd/yyyy) 11/08/2022

RECOMMENDED STORAGE: Refrigerate ampoule

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

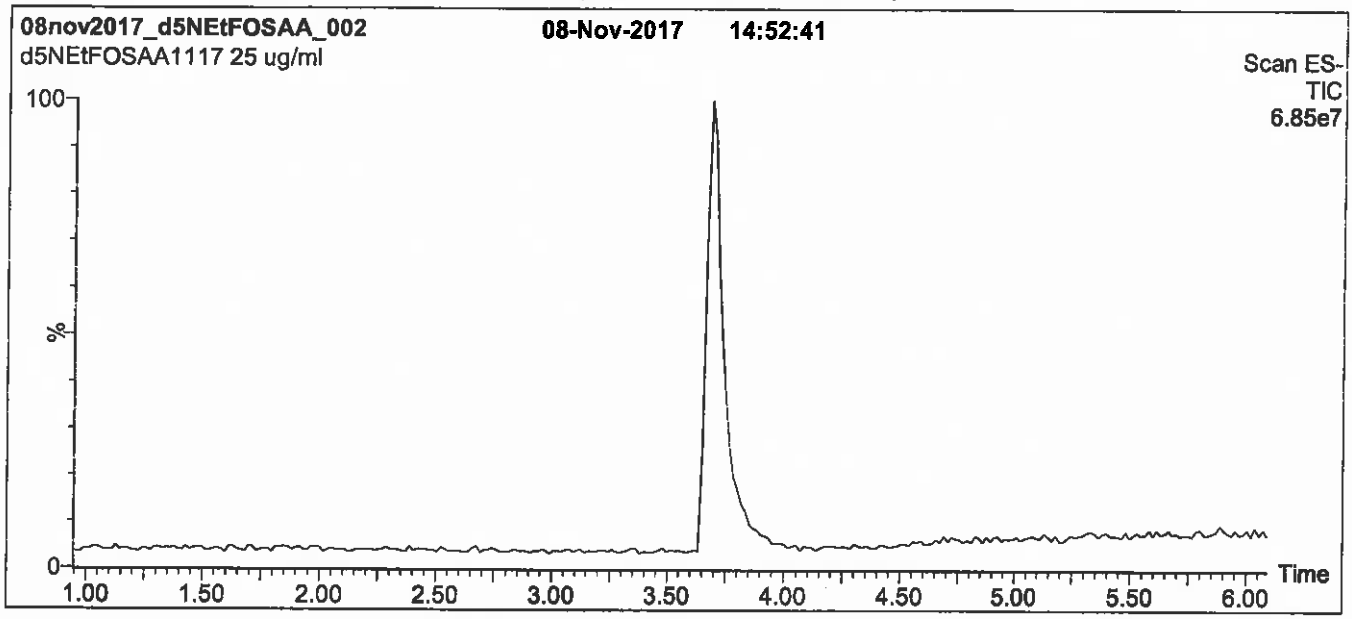
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

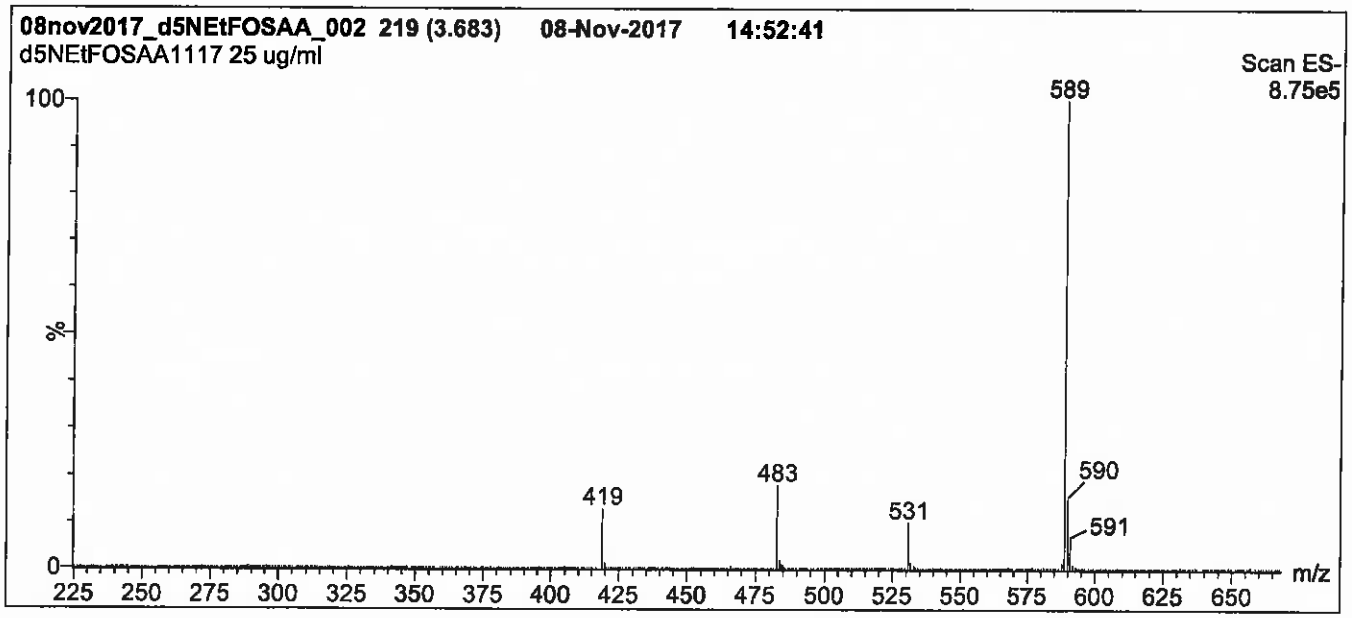
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

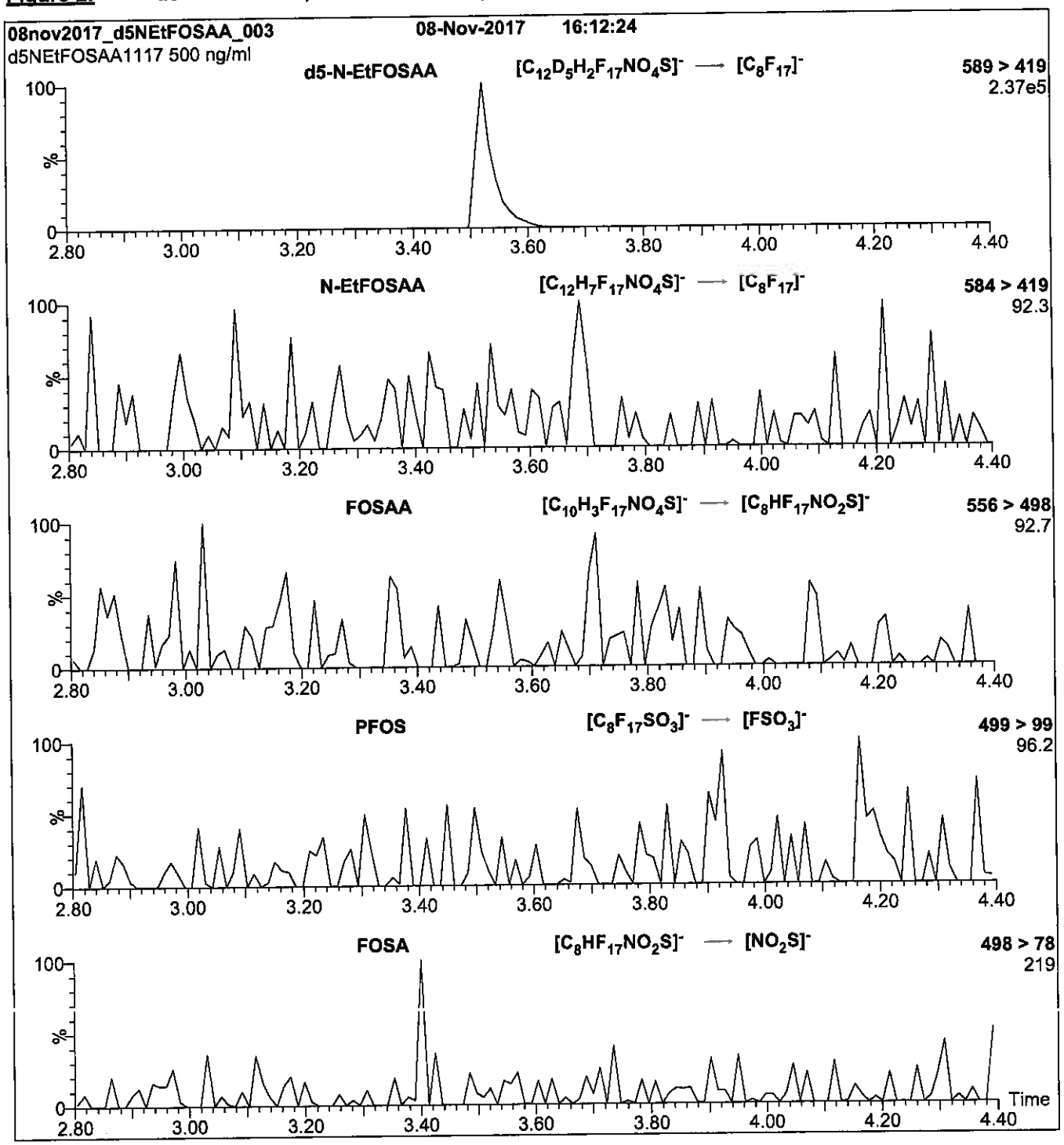
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 20

Reagent

LCd5-NEtFOSAA_00009

1287349
ID: LCd5-NEtFOSAA_00009
Exp:11/08/22 Prpd:CBW Opn:05/26/18
d5-N-EtFOSAA

R: 6/26/18 CBW

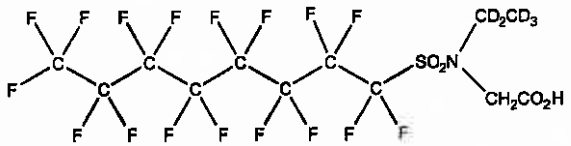
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1117

COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 590.26

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_5$

LAST TESTED: (mm/dd/yyyy) 11/08/2017

EXPIRY DATE: (mm/dd/yyyy) 11/08/2022

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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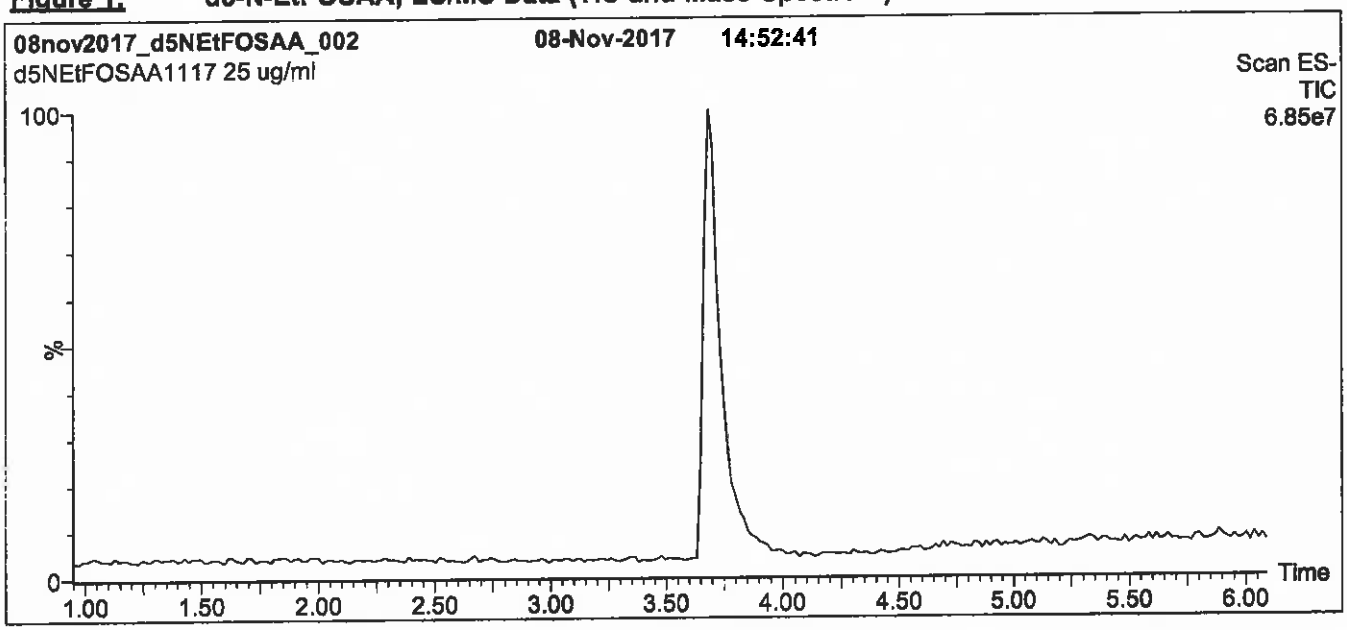
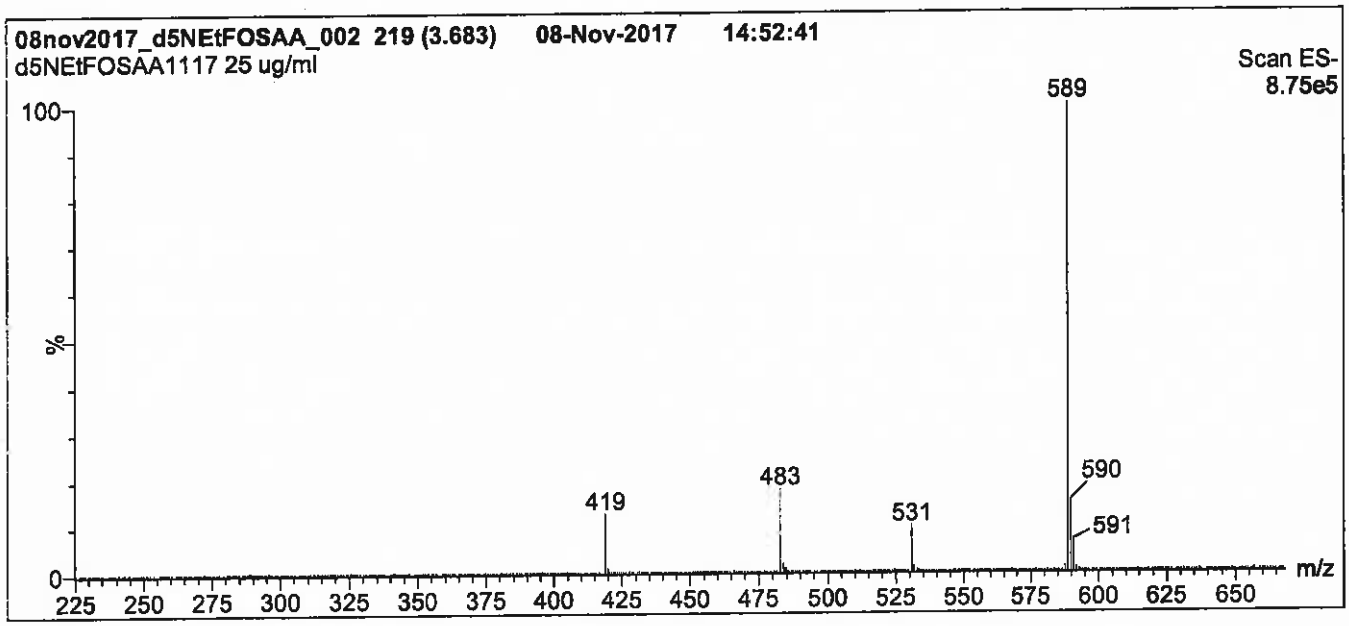
Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

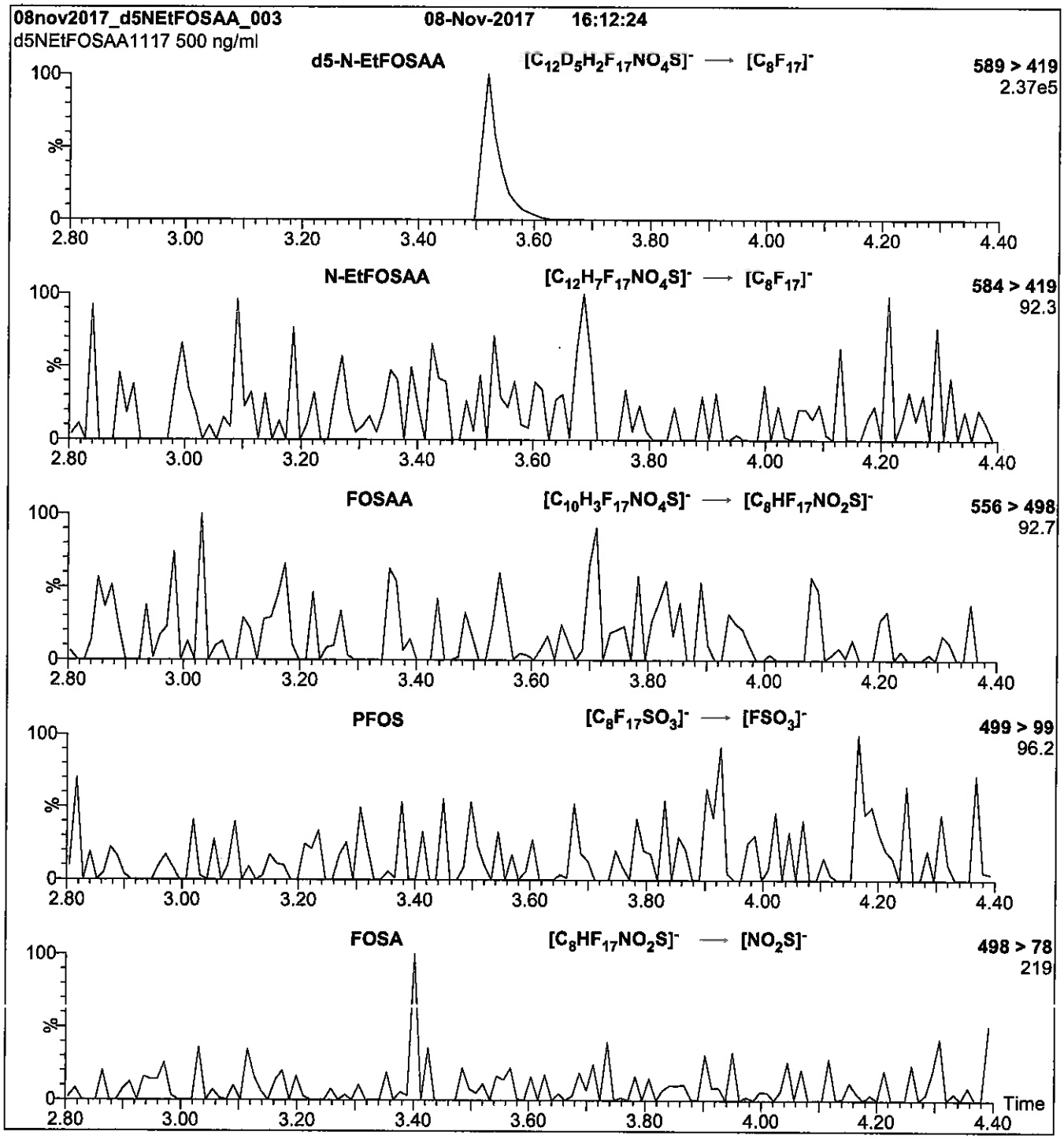
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 20

Reagent

LCDONA_00002

r: 4/18/18 SKD

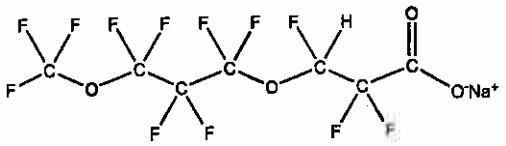
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: NaDONA
LOT NUMBER: NaDONA0318
COMPOUND: Sodium dodecafluoro-3H-4,8-dioxanonanoate

STRUCTURE:

CAS #: 958445-44-8 (ammonium salt)



MOLECULAR FORMULA: $C_7HF_{12}O_4Na$
MOLECULAR WEIGHT: 400.05
CONCENTRATION: 50 ± 2.5 µg/ml (Na Salt)
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/26/2018
EXPIRY DATE: (mm/dd/yyyy) 03/26/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as ADONA.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/27/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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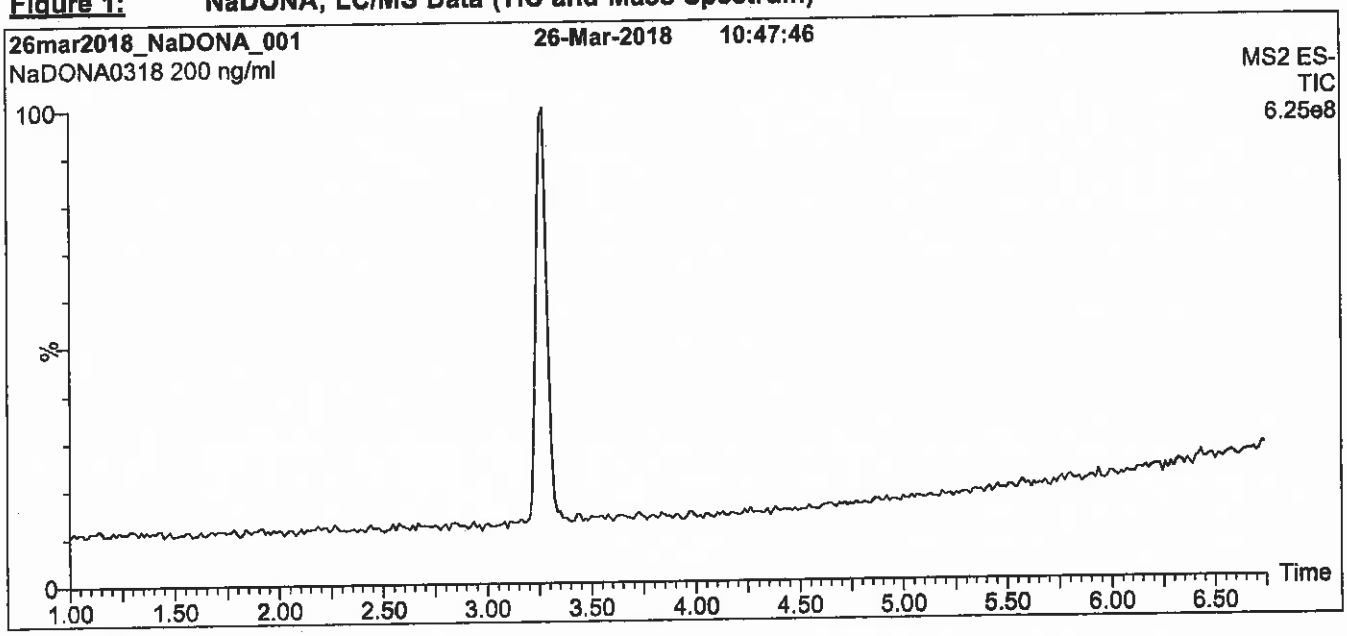
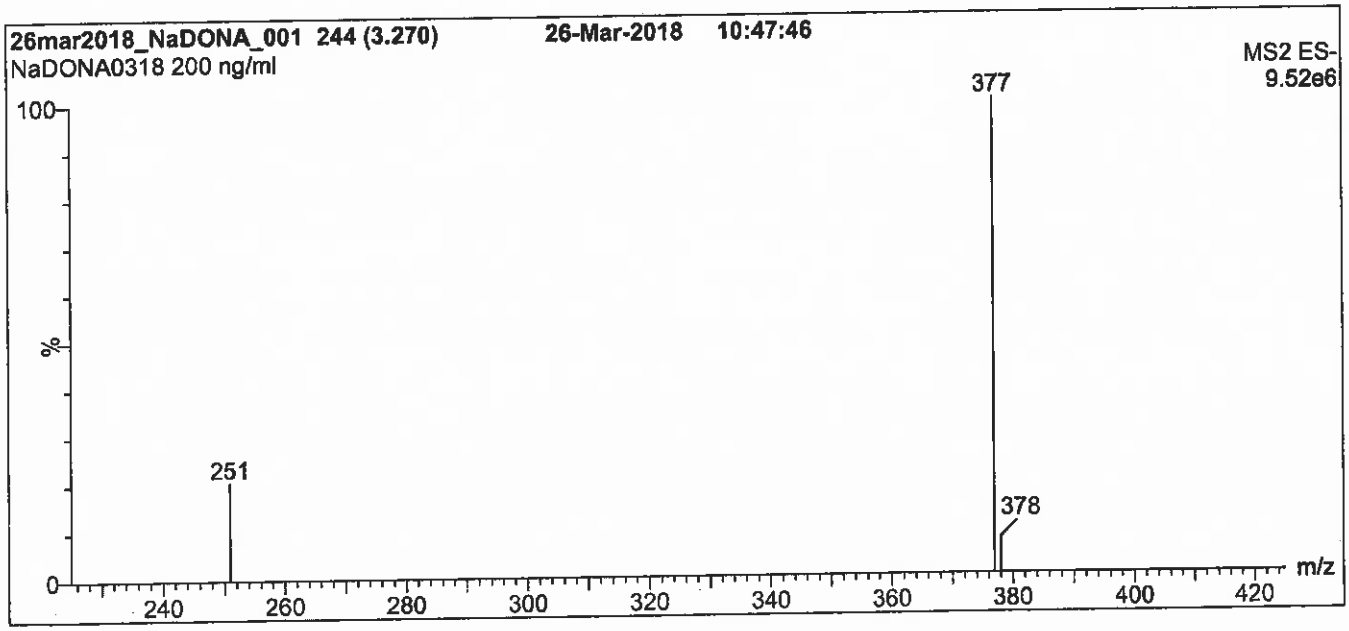
Figure 1: NaDONA; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

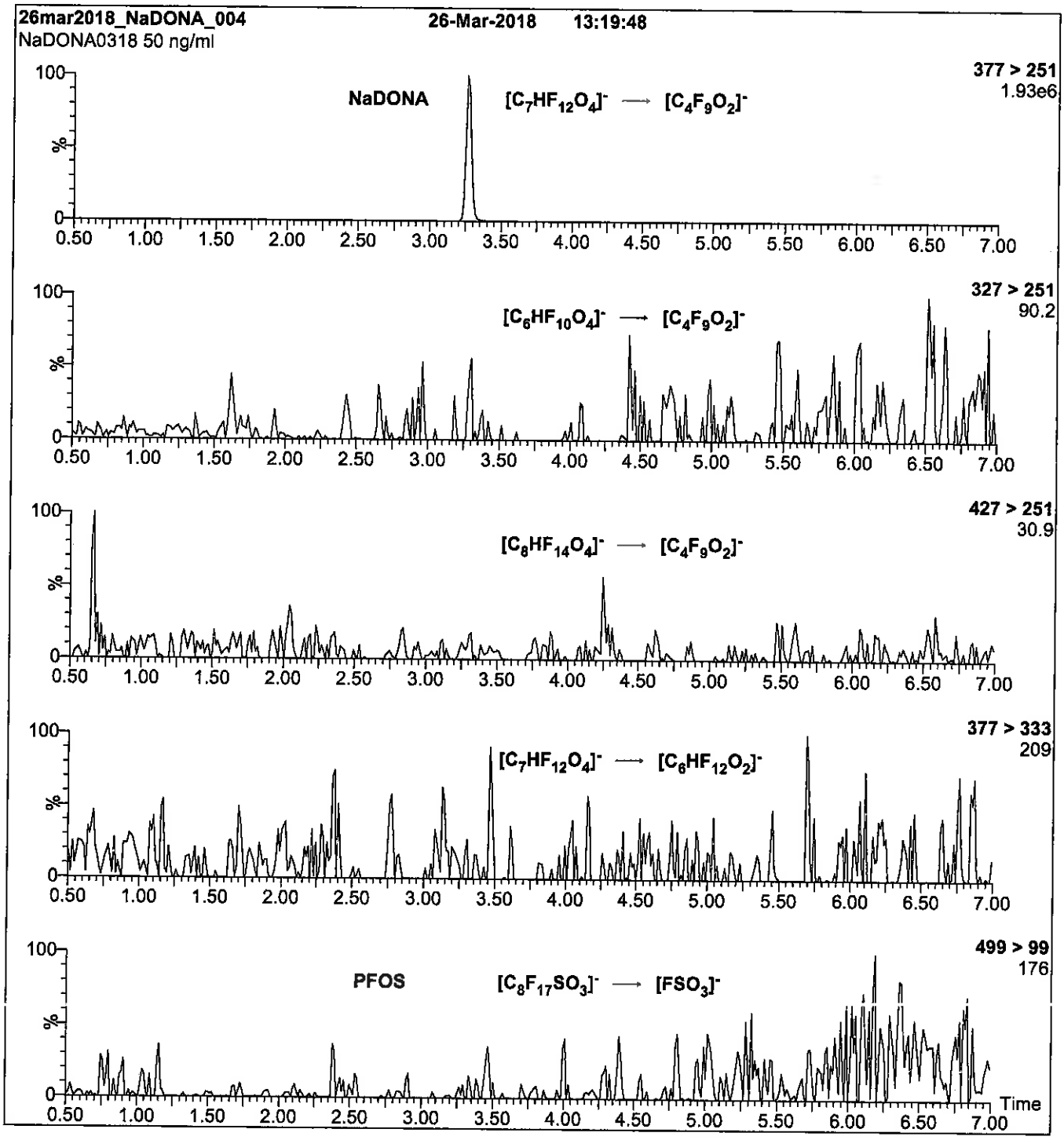
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.70
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **NaDONA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (NaDONA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.65e-3
Collision Energy (eV) = 10

Reagent

LCHFPO-DA_00002

N: 4/18/18 SW

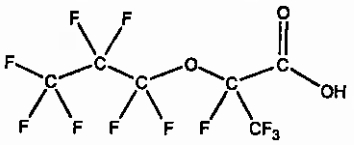
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: HFPO-DA **LOT NUMBER:** HFPODA0318

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid

STRUCTURE: **CAS #:** 13252-13-6



MOLECULAR FORMULA: $C_6HF_{11}O_3$ **MOLECULAR WEIGHT:** 330.05

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 03/26/2018

EXPIRY DATE: (mm/dd/yyyy) 03/26/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/28/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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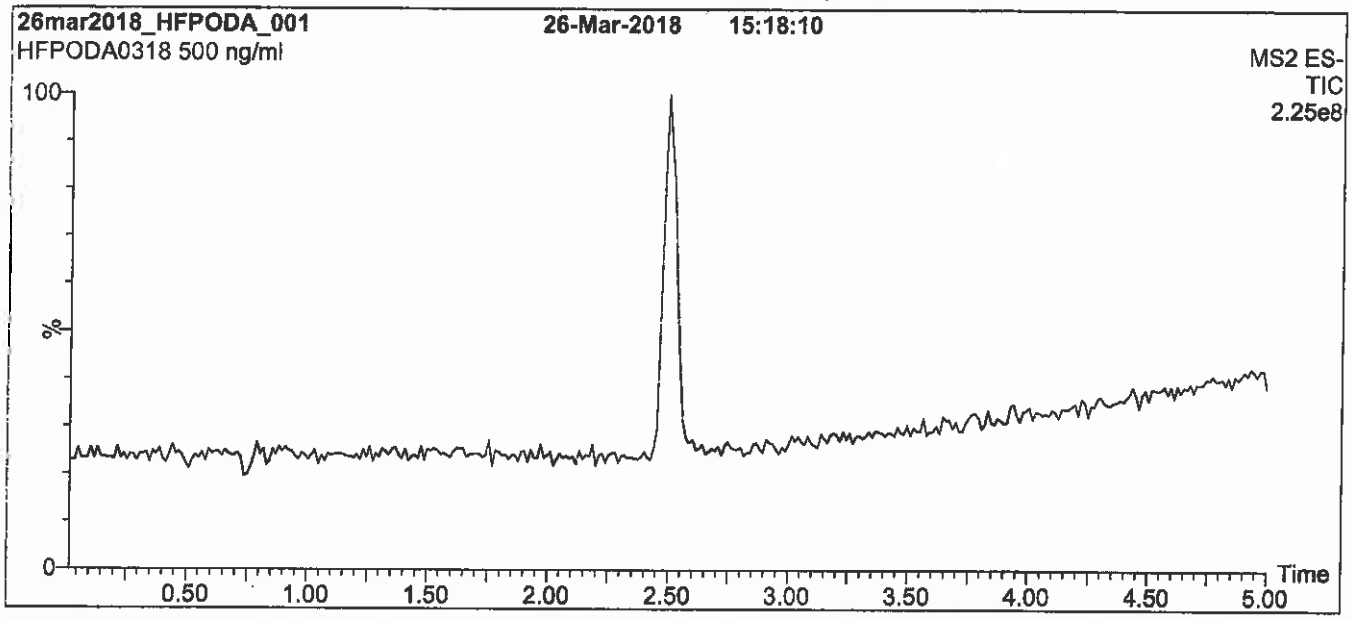
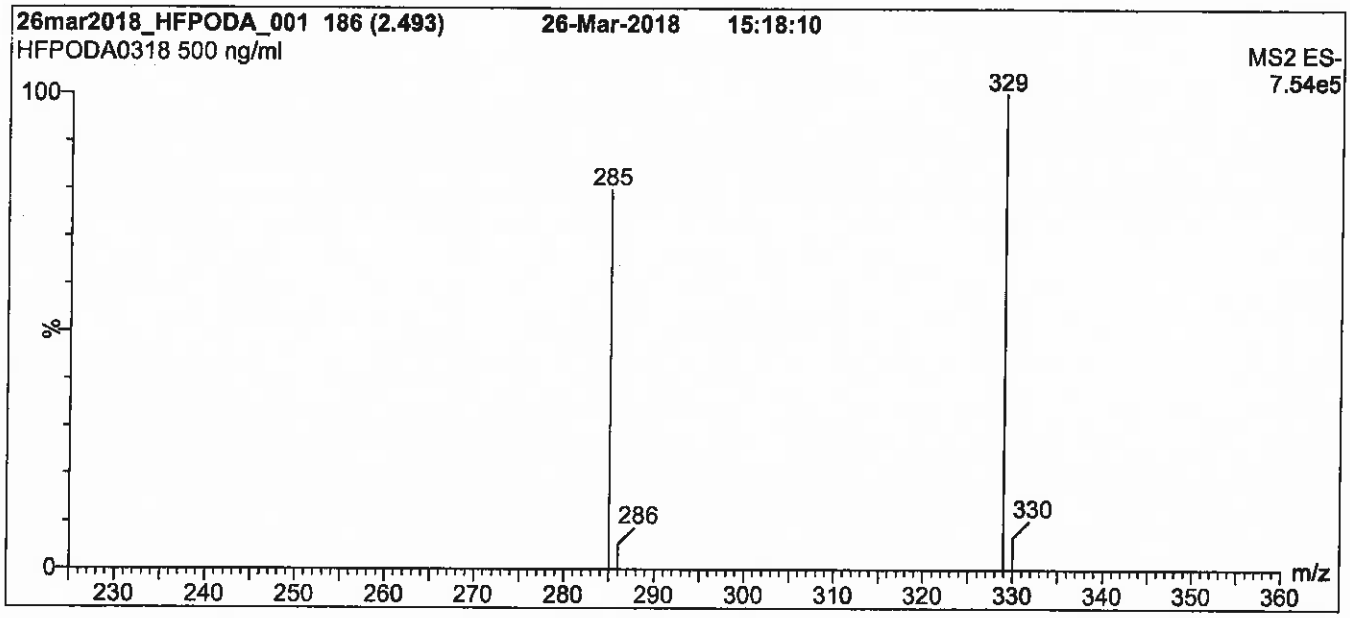
Figure 1: **HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

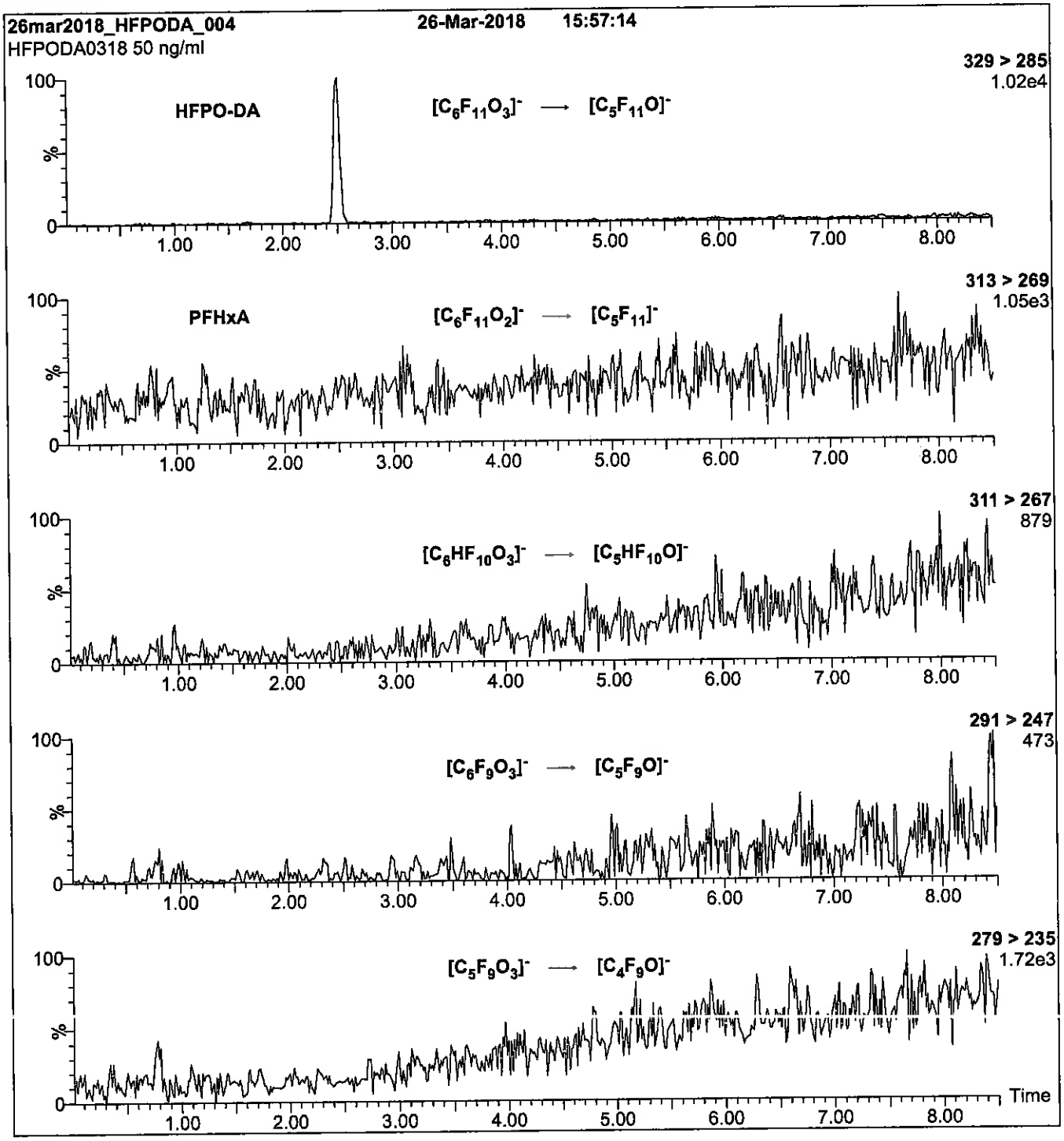
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

Figure 2: **HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.69e-3
Collision Energy (eV) = 6

Reagent

LCM2-6:FTS_00008

R: 5/30/18 CBW

1263197
ID: LCM2-6:FTS_00008
Exp:02/16/23 Prpd:CBW Opn:05/30/18
M2-6:2FTS

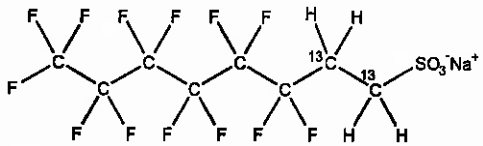
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0218

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HANDLING:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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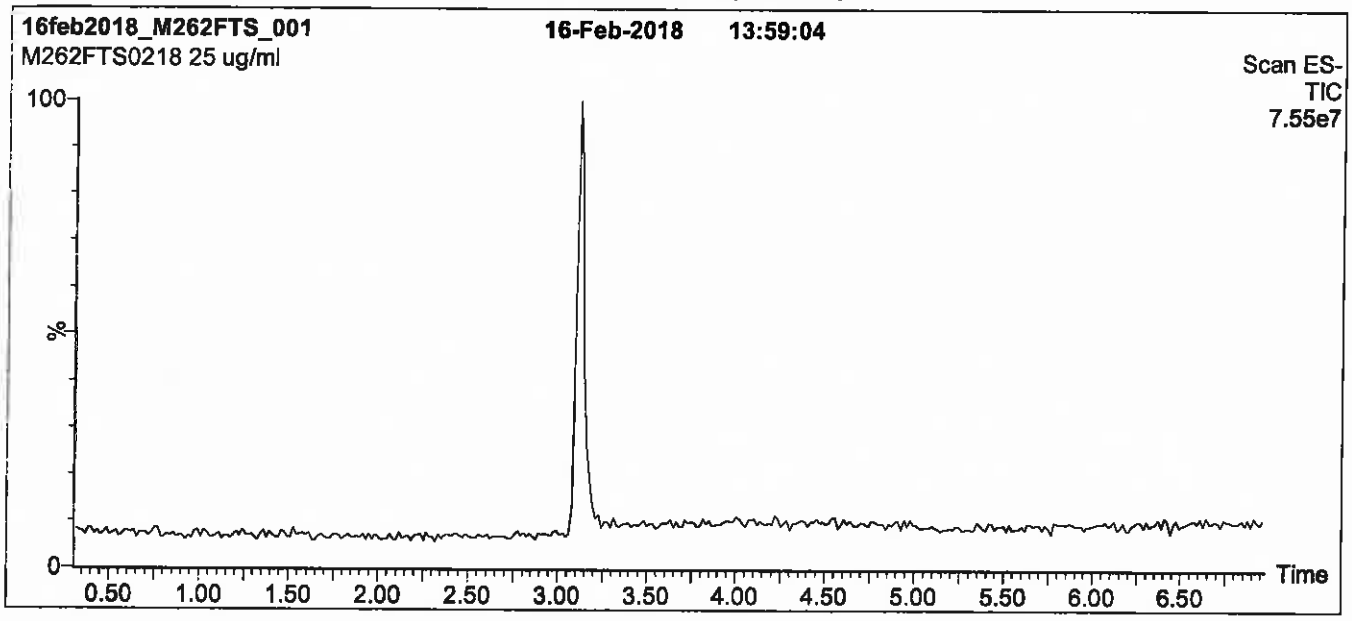
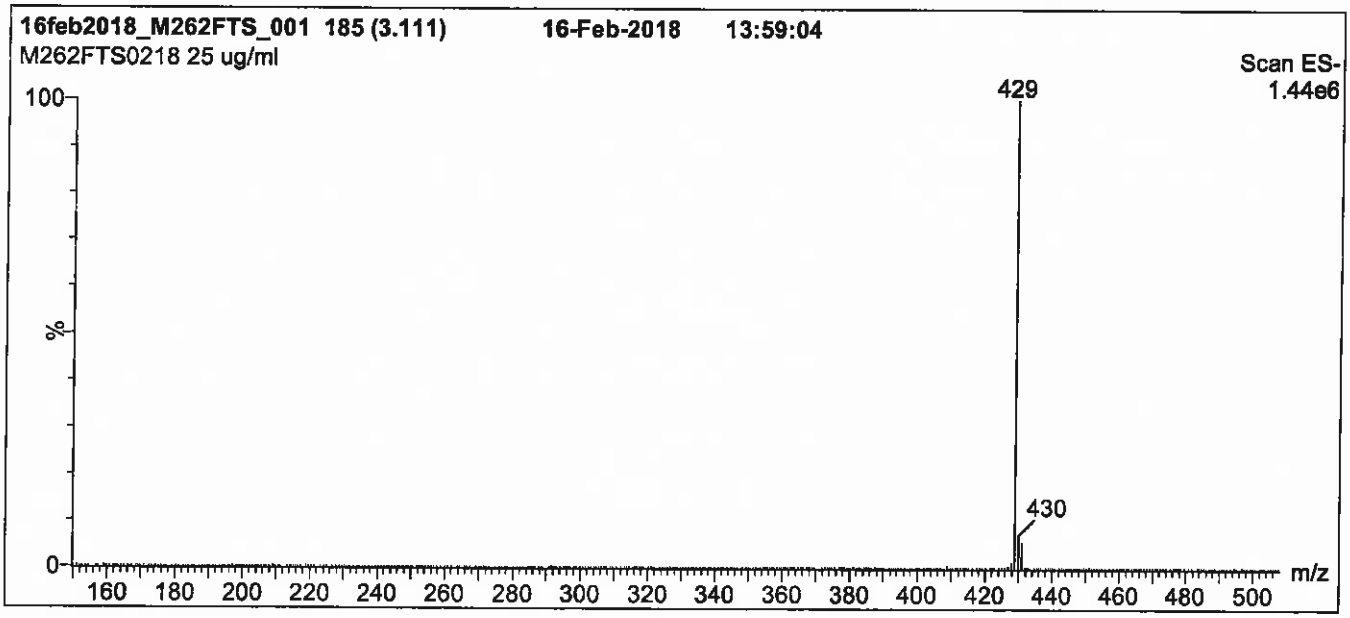




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

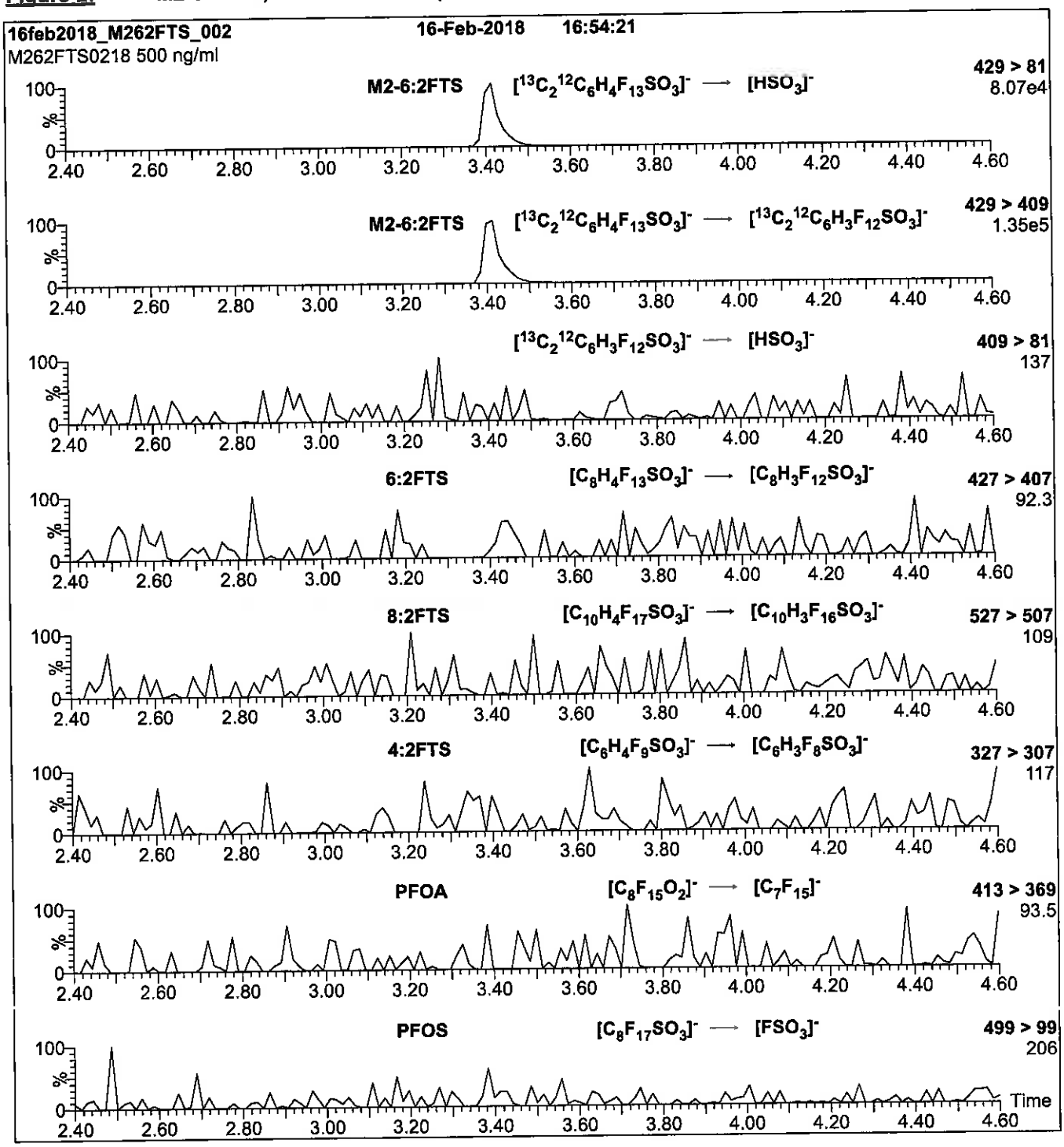
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCM2-6:FTS_00009

1287352
ID: LCM2-6:FTS_00009
Exp:02/16/23 Prpd:CBW Opn:06/26/18
M2-6:2FTS

R: 6/26/18 EBC

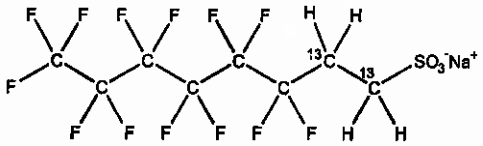
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0218

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.5 ± 2.4 µg/ml (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
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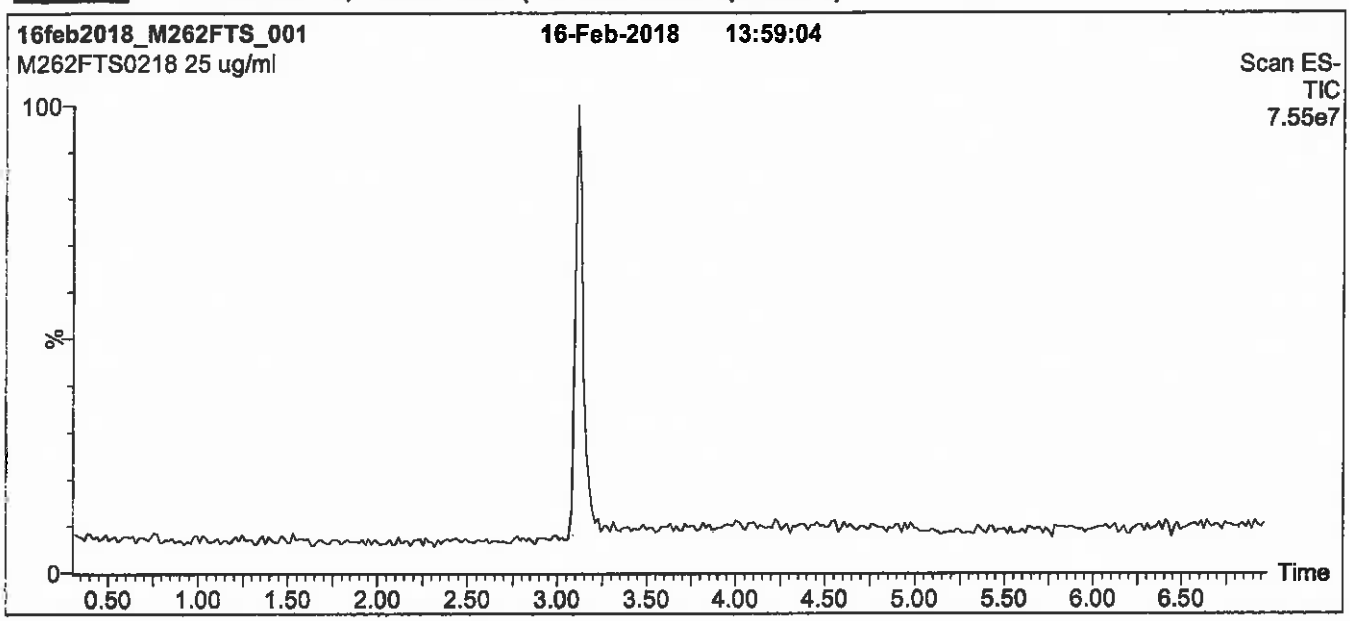
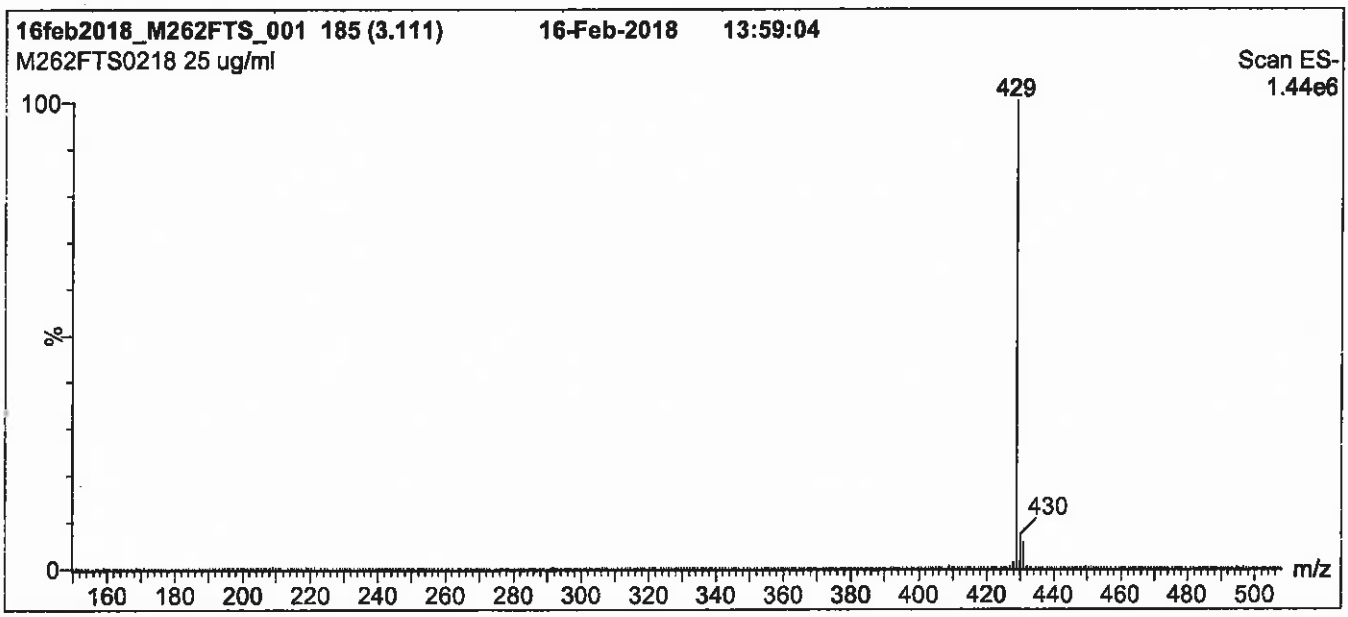




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

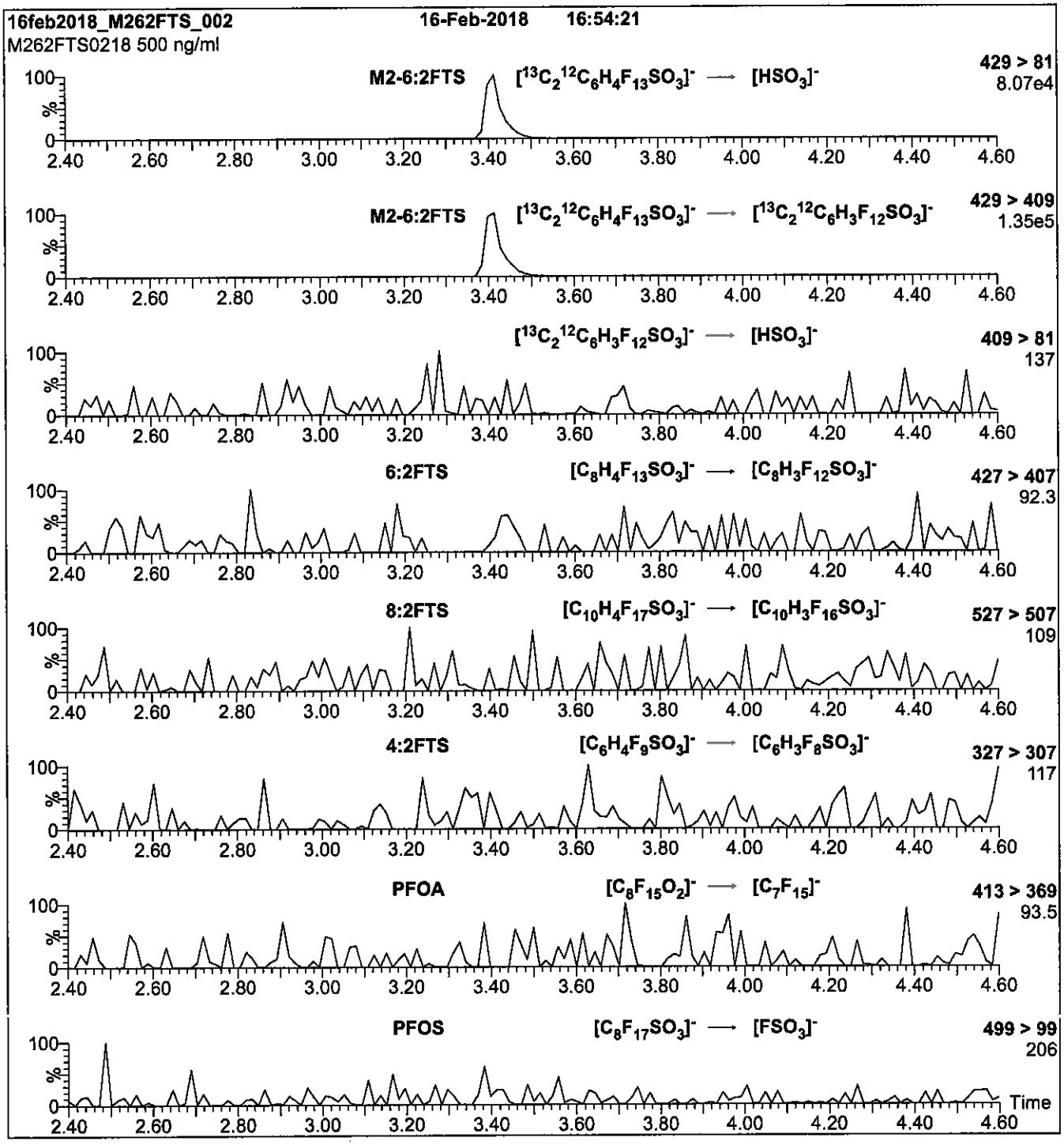
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2-6:2FTS)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 25
Flow:	300 µl/min	

Reagent

LCM2-8:2FTS_00010

1263198
ID: LCM2-8:2FTS_00010
Exp:01/24/23 Prpd:CBW Opn:05/30/18
M2-8:2FTS

R: 5/30/18 CBW

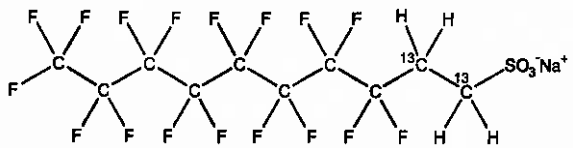
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 552.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.9 ± 2.4 µg/ml (M2-8:2FTS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2-$^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 01/24/2018

EXPIRY DATE: (mm/dd/yyyy) 01/24/2023

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

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- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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CALA

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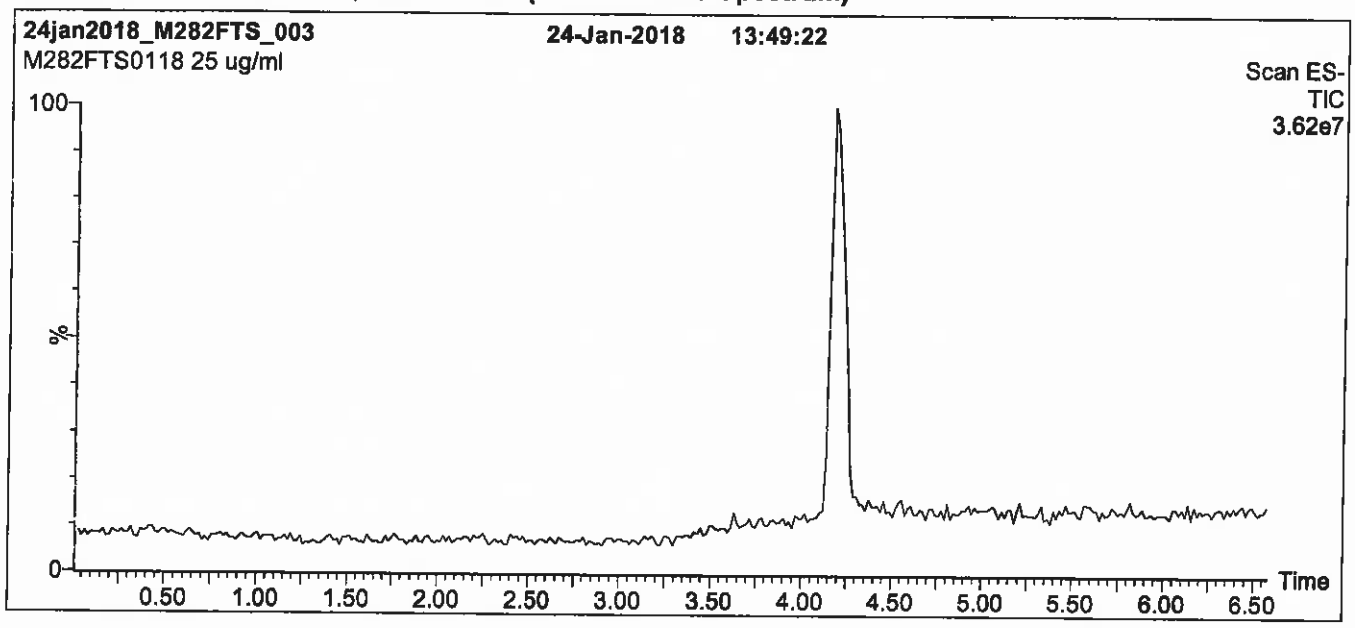
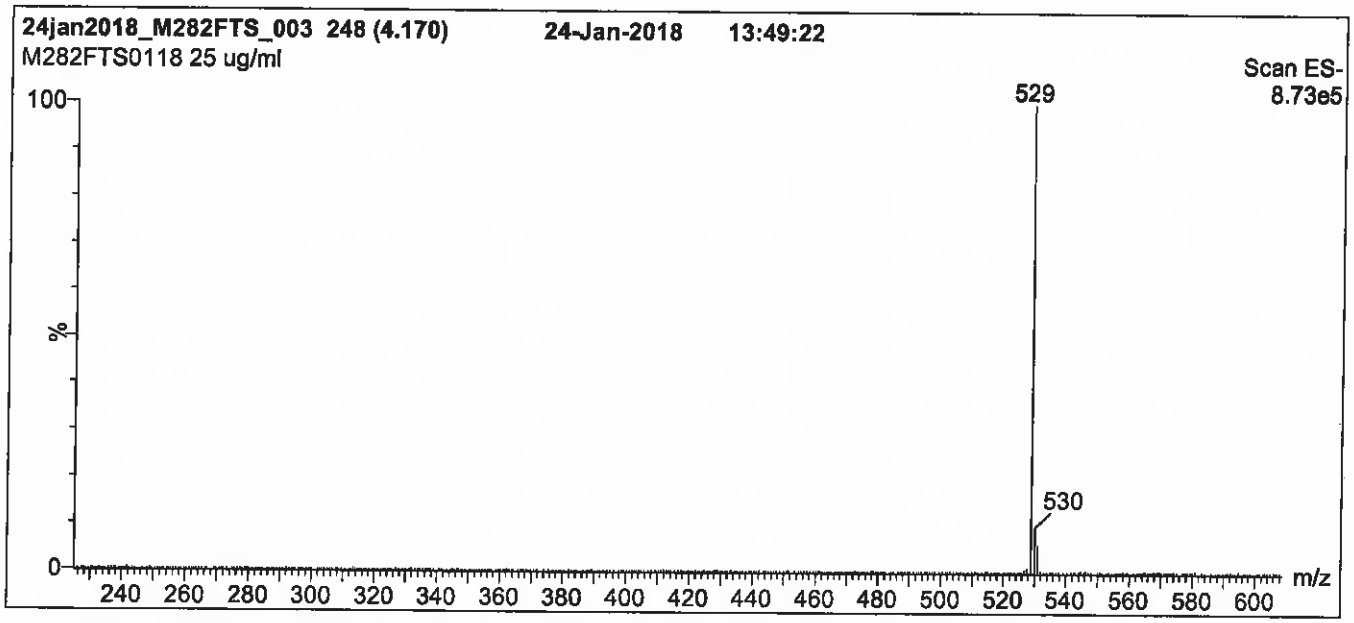
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

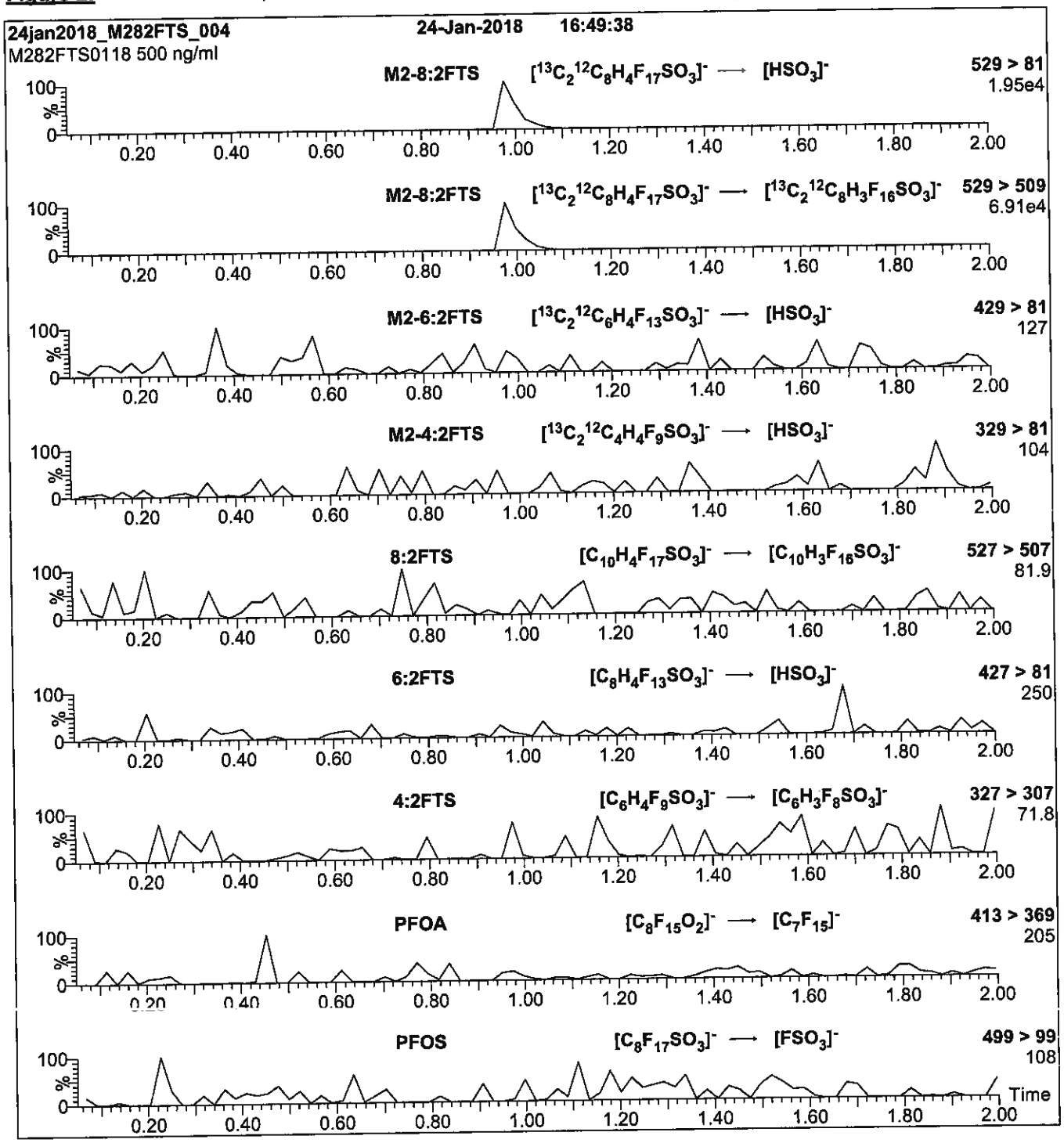
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00011

1287355
ID: LCM2-8:2FTS_03011
Exp:01/24/23 Prpd:CBW Opn:06/26/18
M2-8:2FTS

R: 6/26/18 CBW

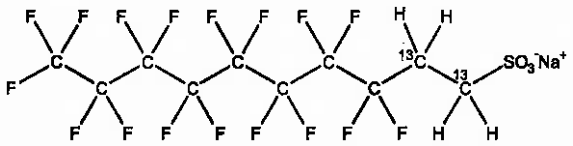
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C
LAST TESTED: (mm/dd/yyyy)	01/24/2018		(1,2-$^{13}C_2$)
EXPIRY DATE: (mm/dd/yyyy)	01/24/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/26/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

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CALA

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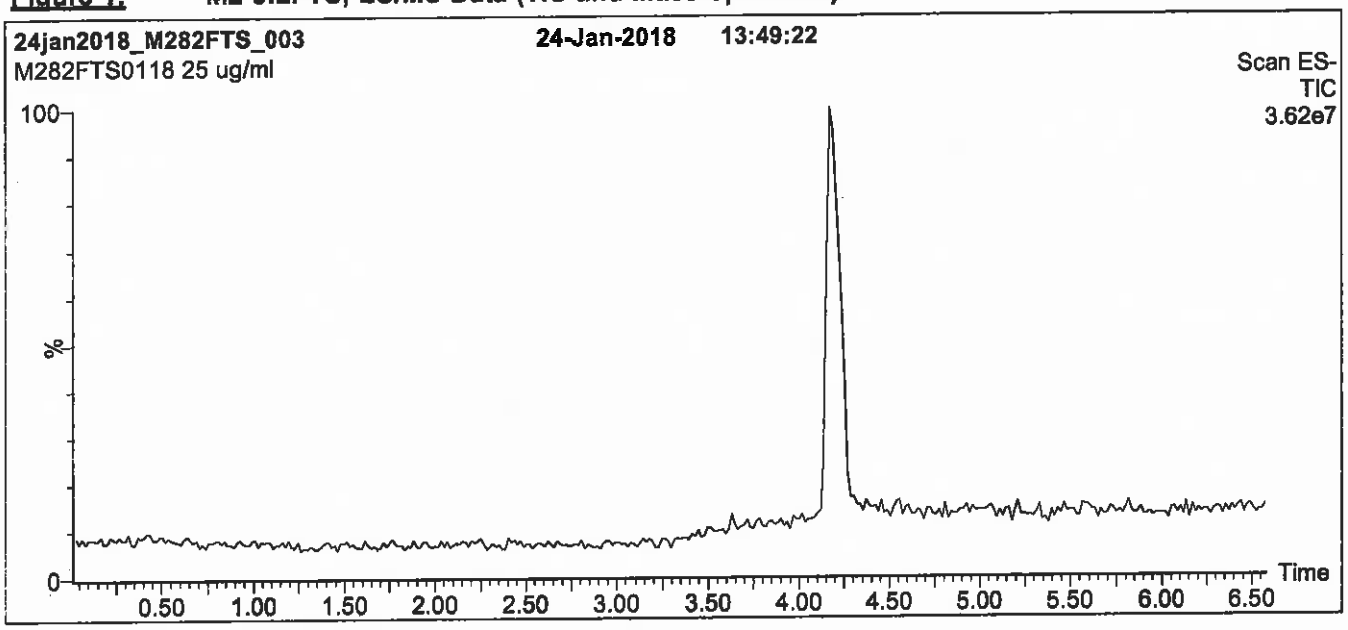
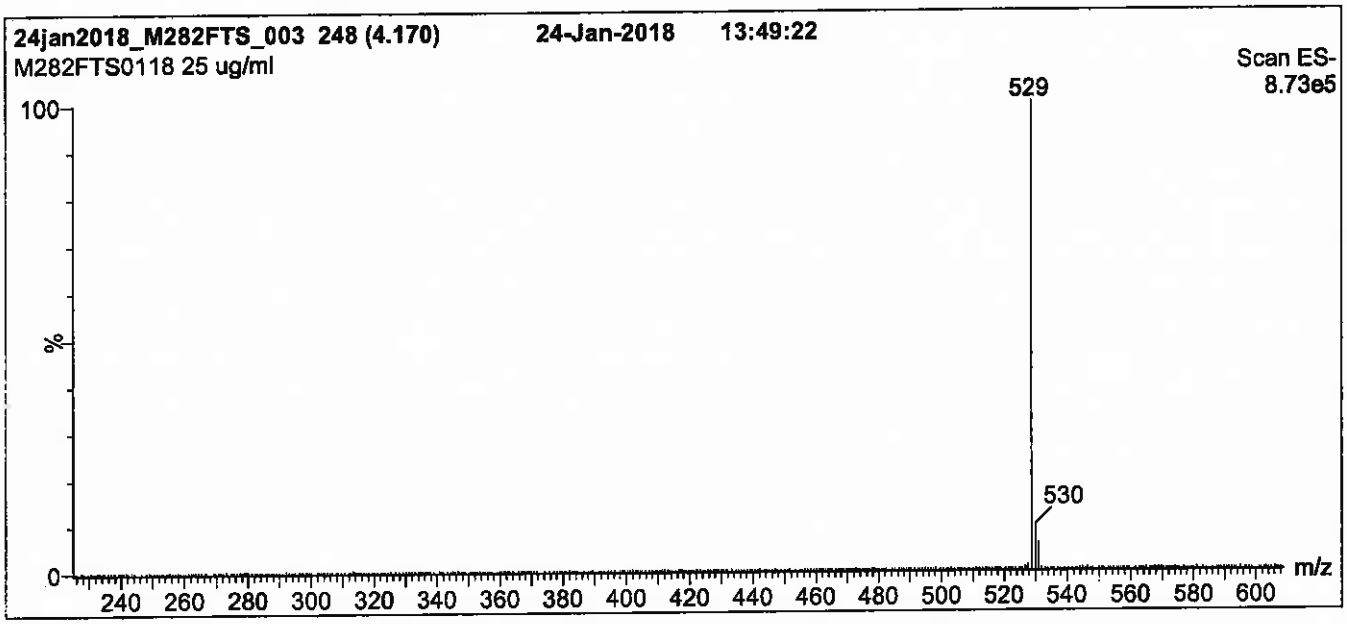




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

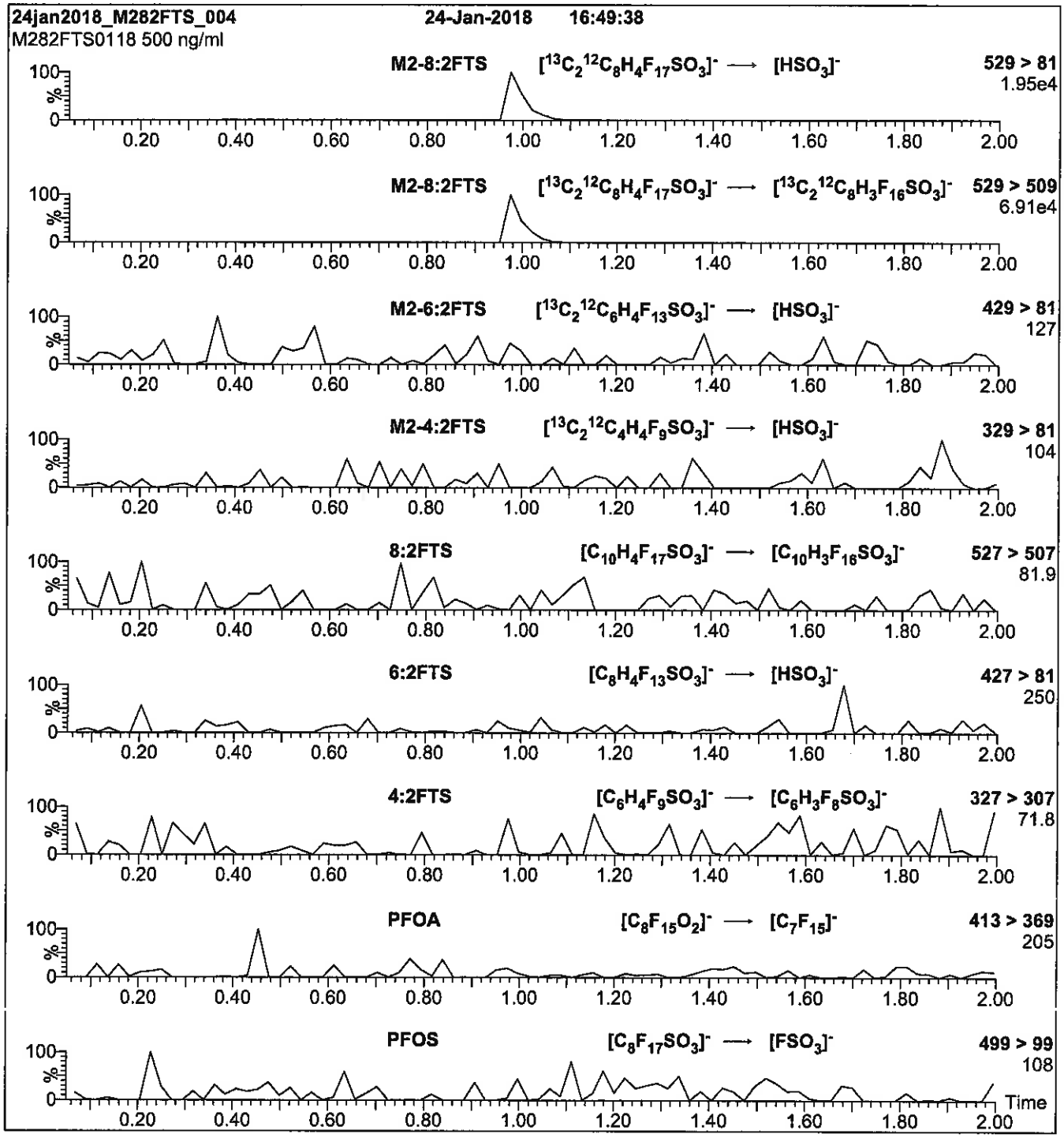
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2-8:2FTS)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25
Flow:	300 µl/min	

Reagent

LCM2PFHxDA_00016

1263133
ID: LCM2PFHxDA_00016
Exp:07/13/22 Prpd:CBW Opn:06/30/18
13C2-PFHxDA at 50ug/mL

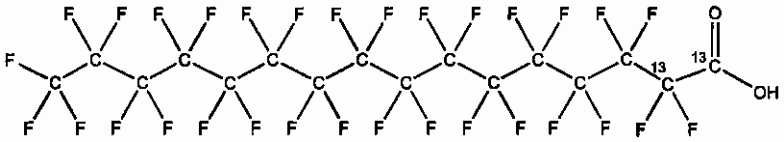
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA0717
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{14}HF_{31}O_2$
MOLECULAR WEIGHT: 816.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

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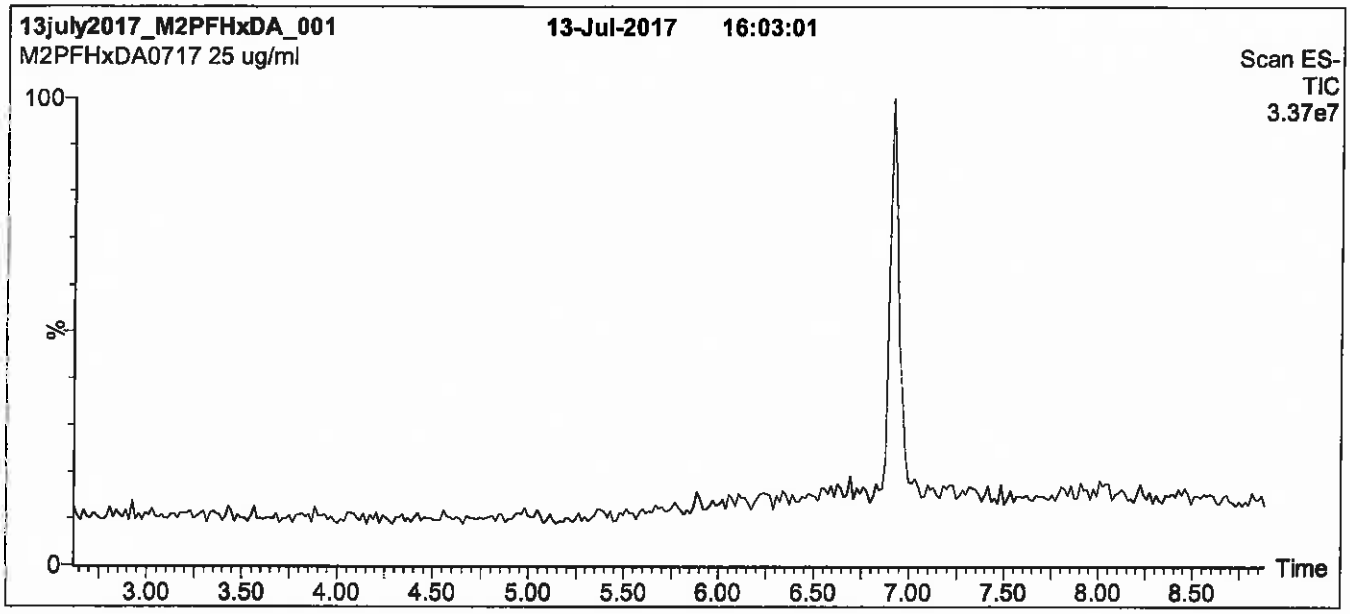
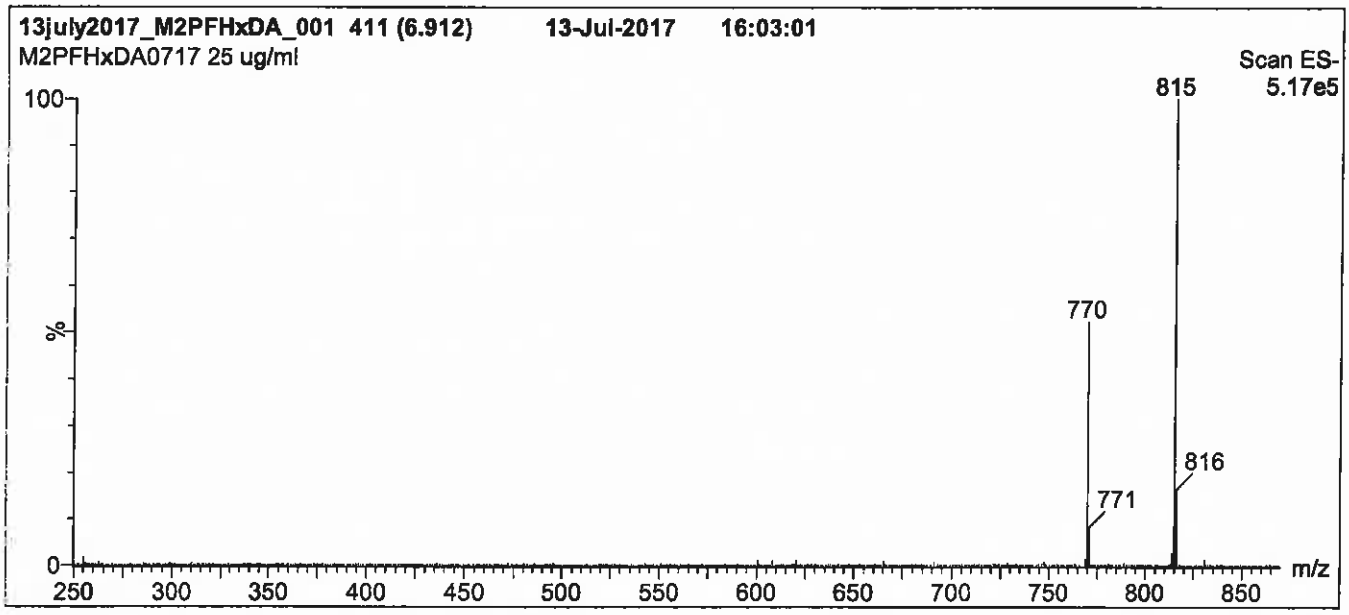
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

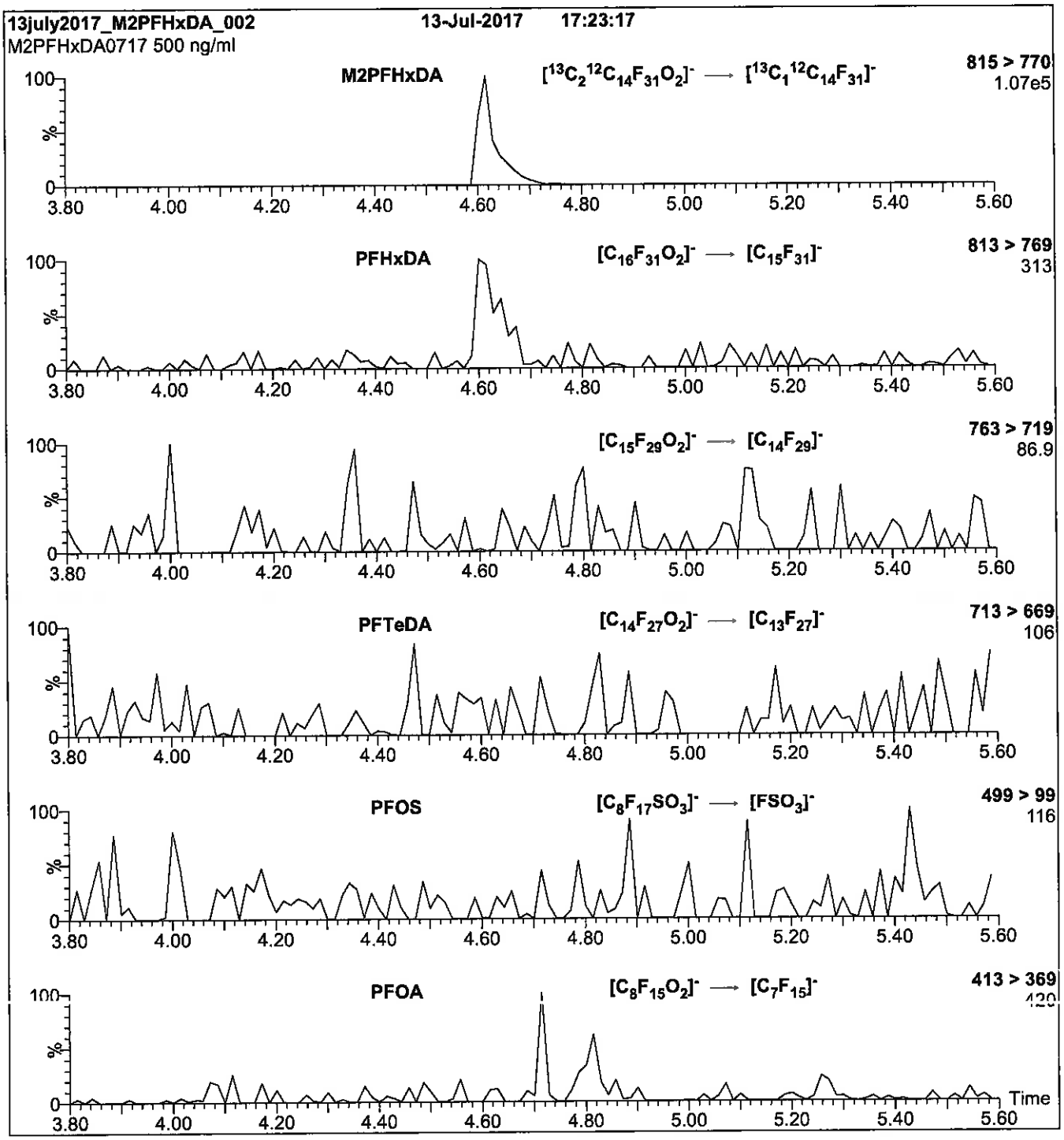
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCM2PFHxDA_00017

1287278
ID: LCM2PFHxDA_00017
Exp:07/13/22 Prpd:CBW Opn:06/26/18
13C2-PFHxDA at 50ug/mL.

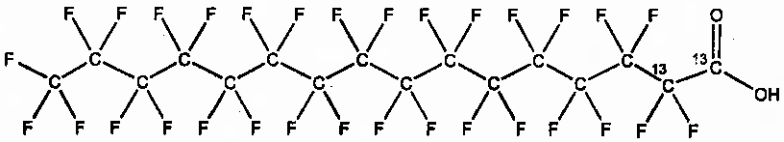
R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA0717
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

STRUCTURE:
CAS #: Not available



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SOLVENT(S): Methanol
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CHEMICAL PURITY: >98%
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LAST TESTED: (mm/dd/yyyy) 07/13/2017
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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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CALA

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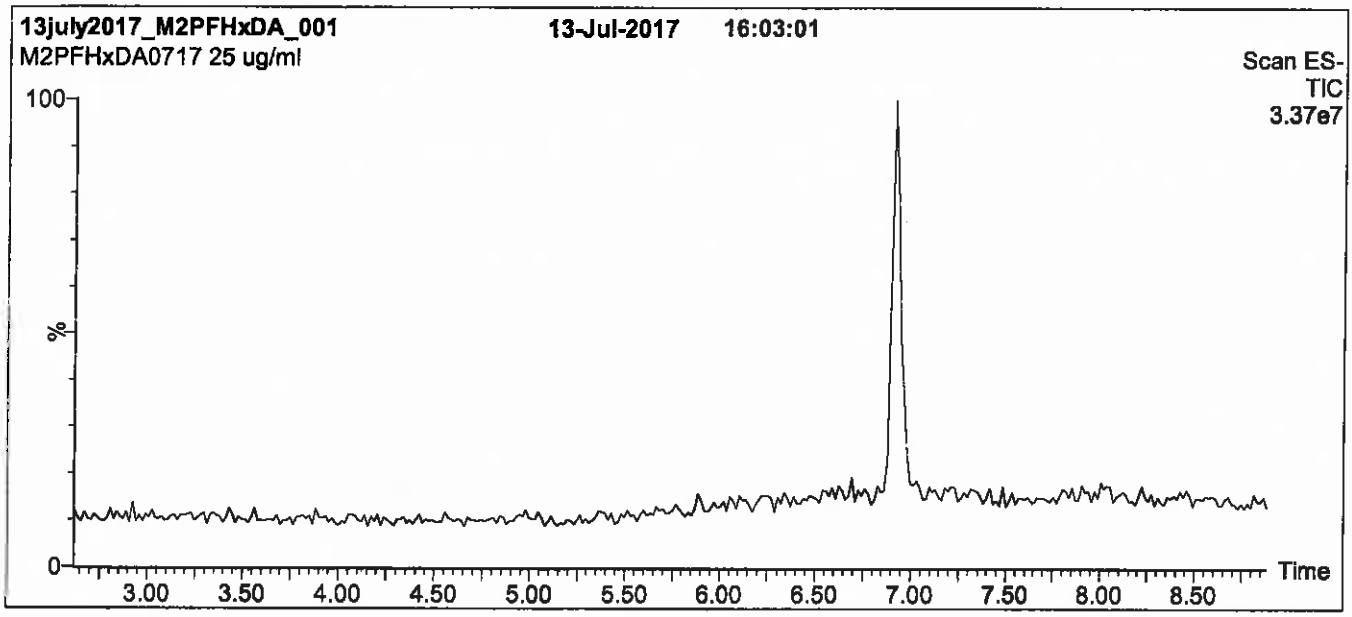
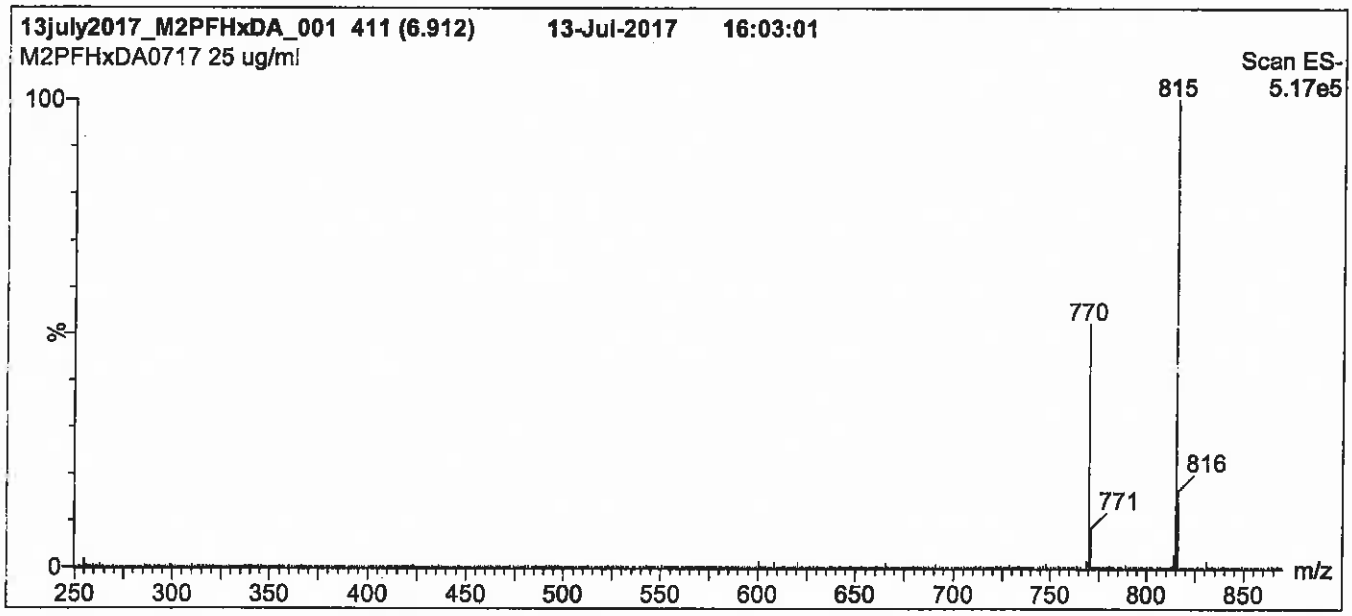
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

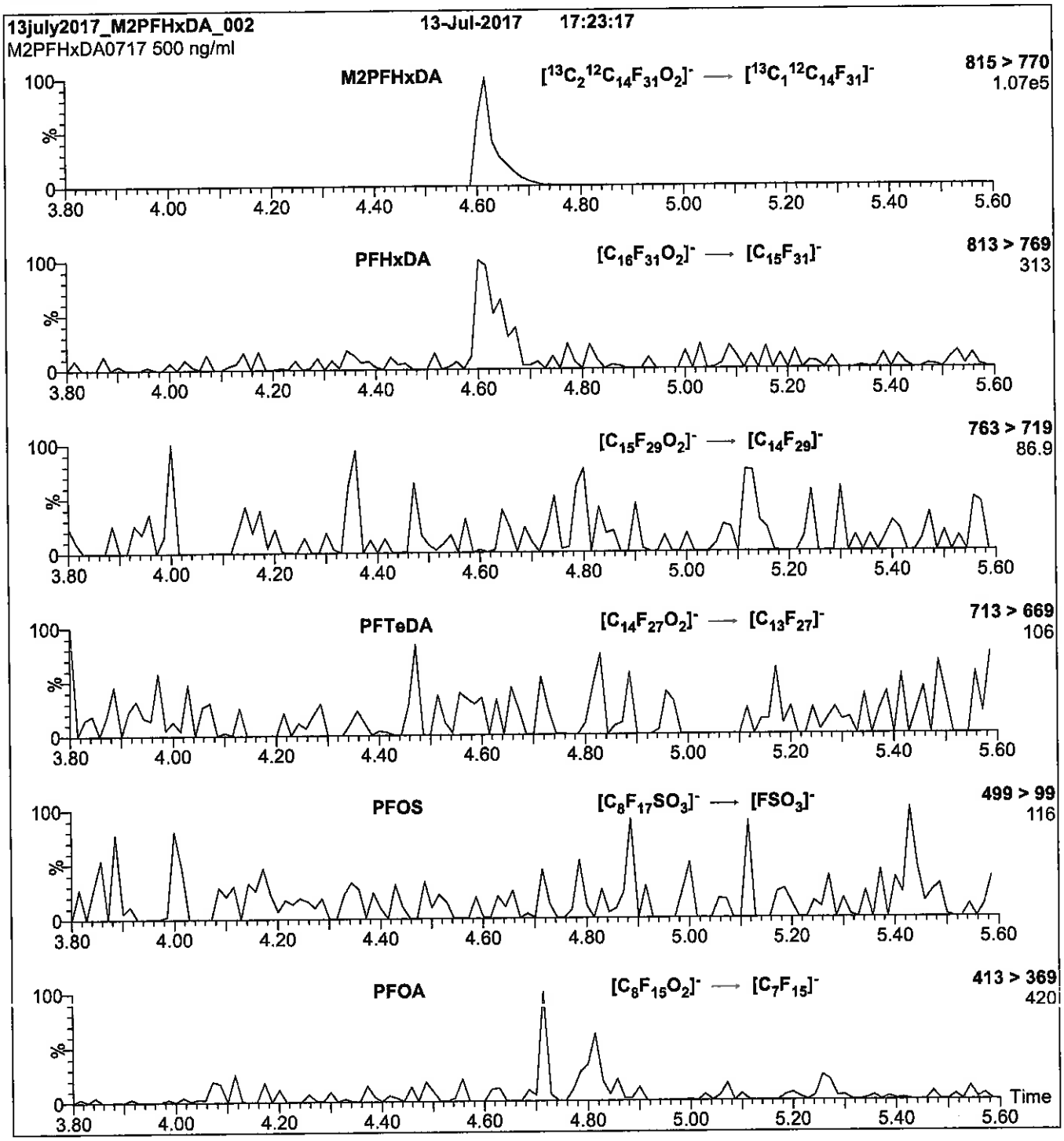
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCM2PFOA_00008

r. 5/3/17 SKW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

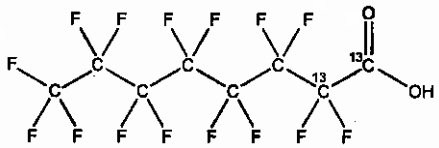
PRODUCT CODE: M2PFOA

LOT NUMBER: M2PFOA0216

COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6HF_{16}O_2$

MOLECULAR WEIGHT: 416.05

CONCENTRATION: 50 ± 2.5 µg/ml

SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 02/12/2016

EXPIRY DATE: (mm/dd/yyyy) 02/12/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/24/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB

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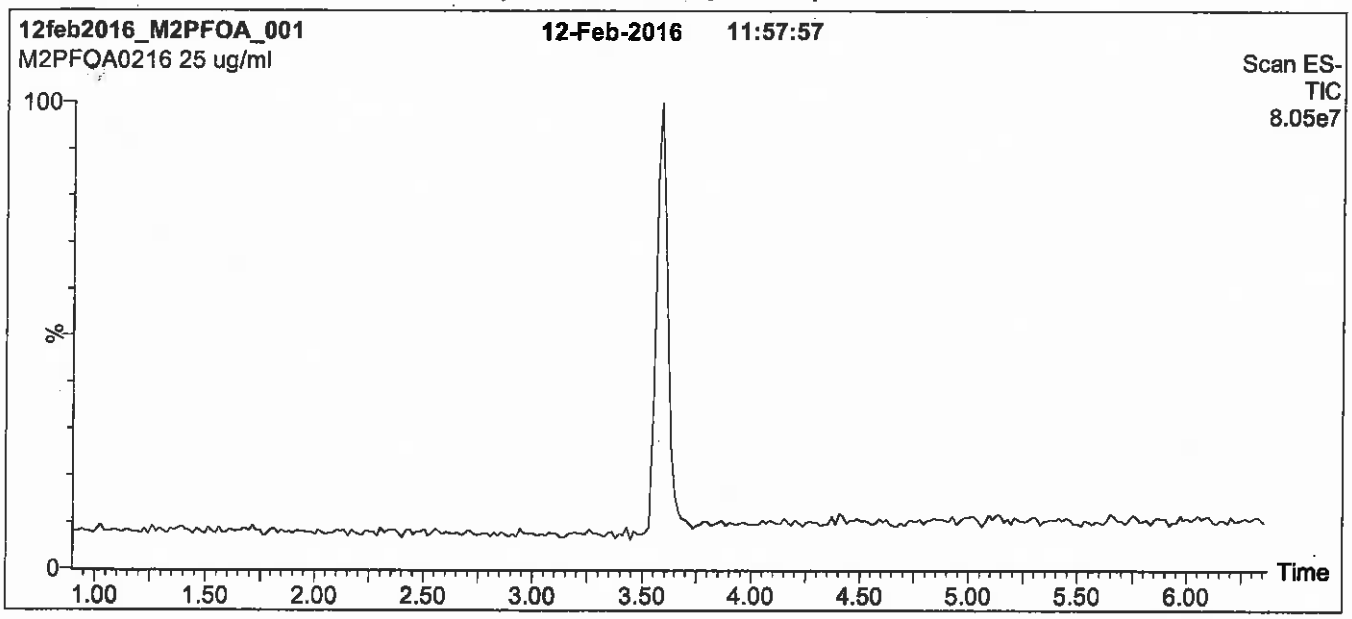
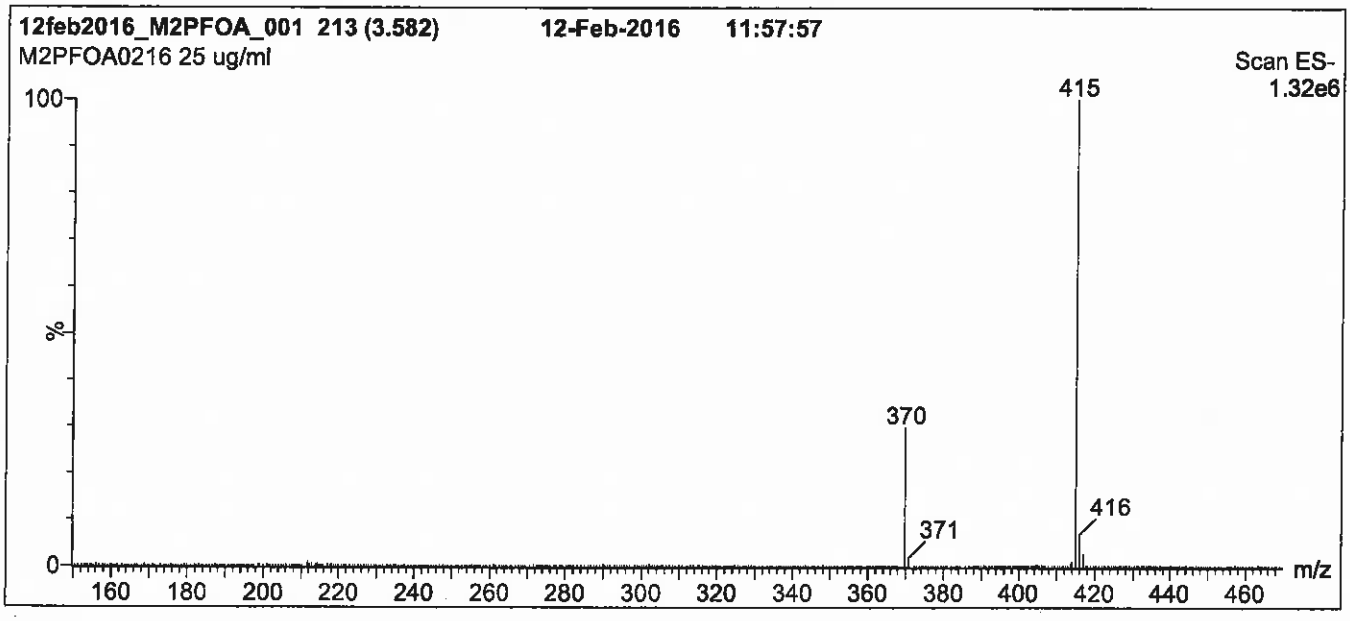
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

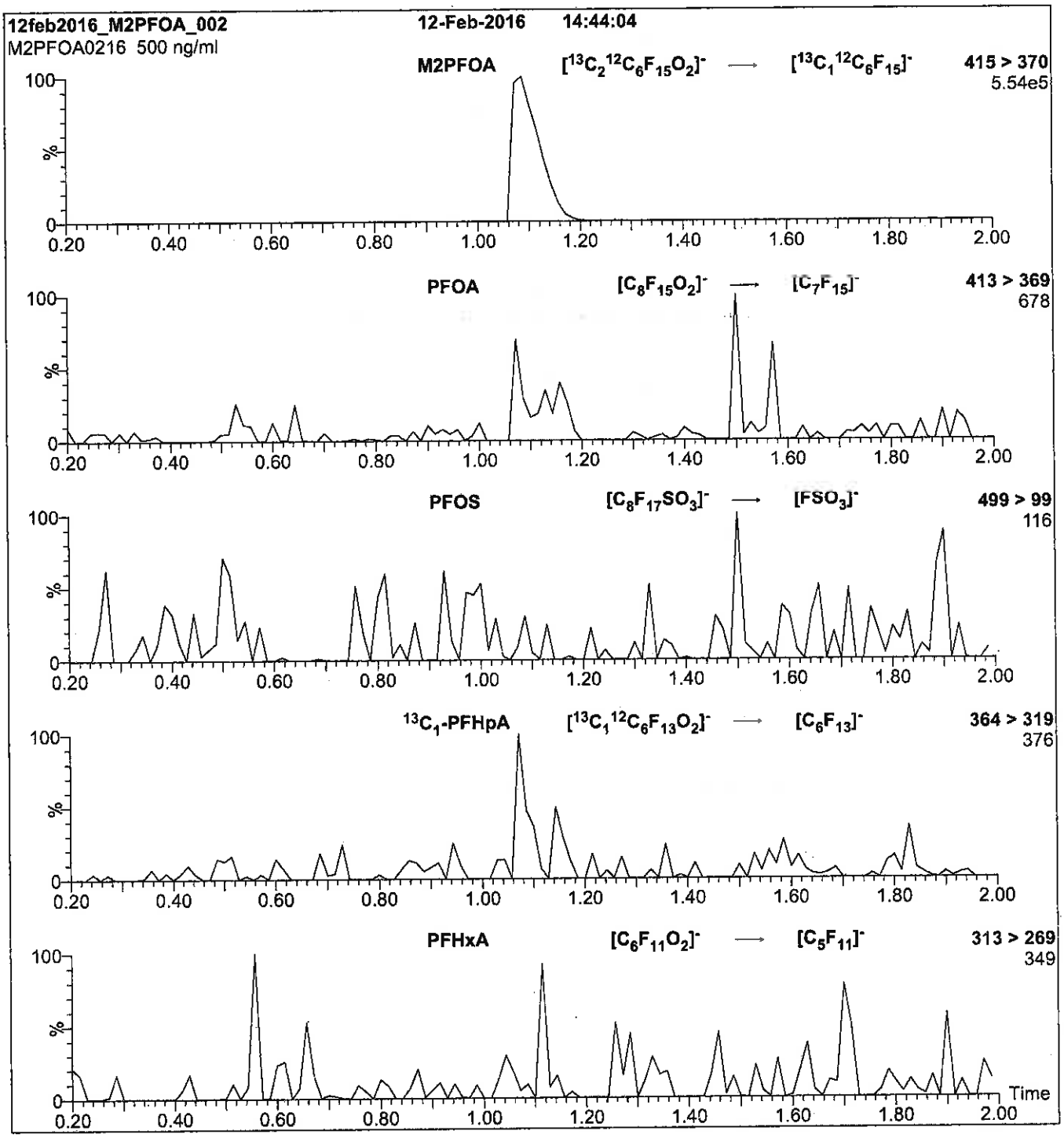
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

Reagent

LCM2PFOA_00009

r: 7/5/17 SW

WELLINGTON LABORATORIES

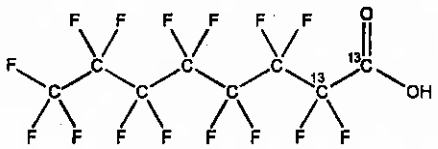
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

LOT NUMBER: M2PFOA0216

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 416.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/24/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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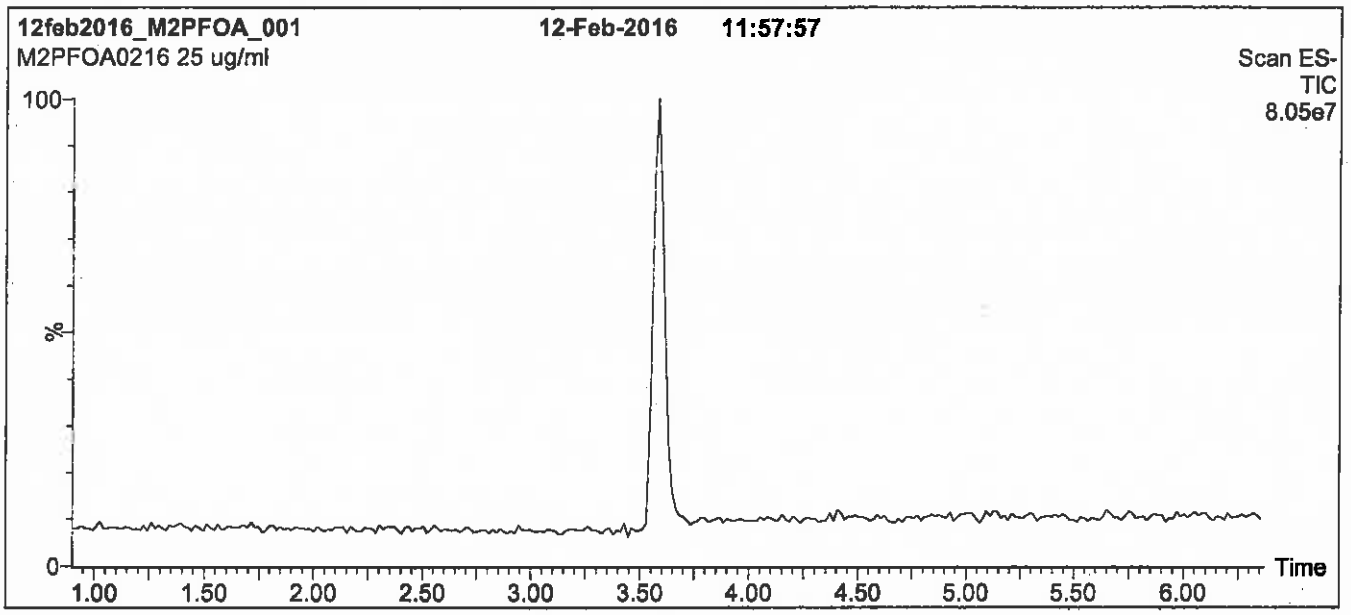
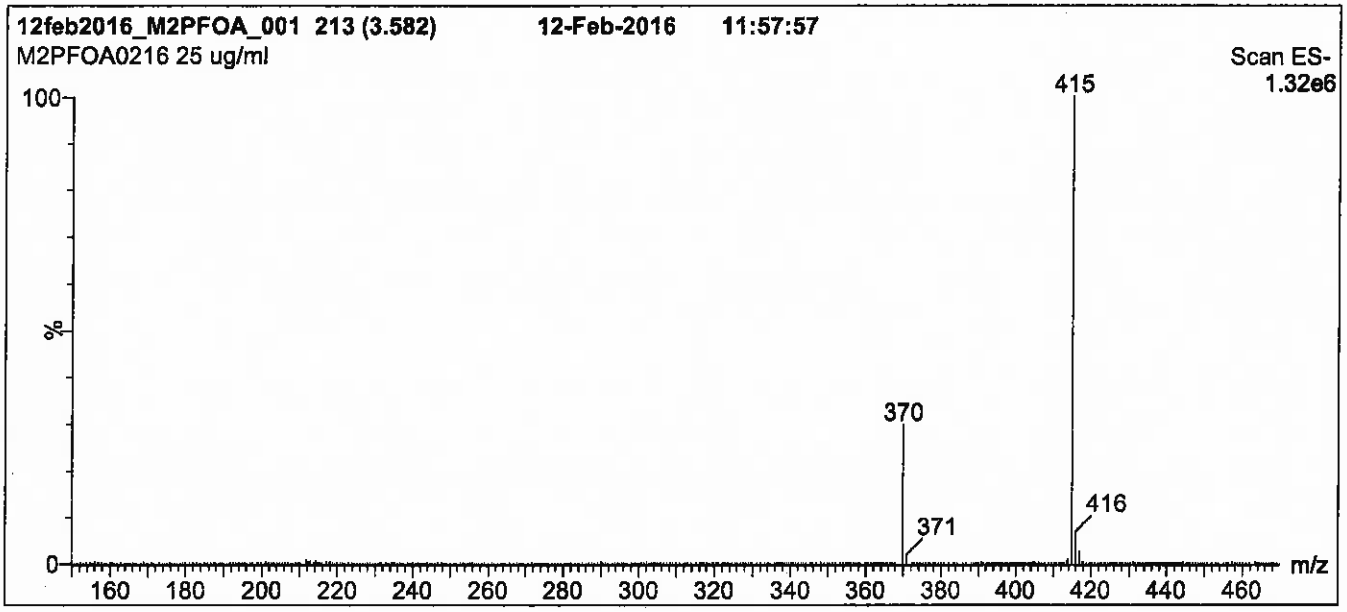
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

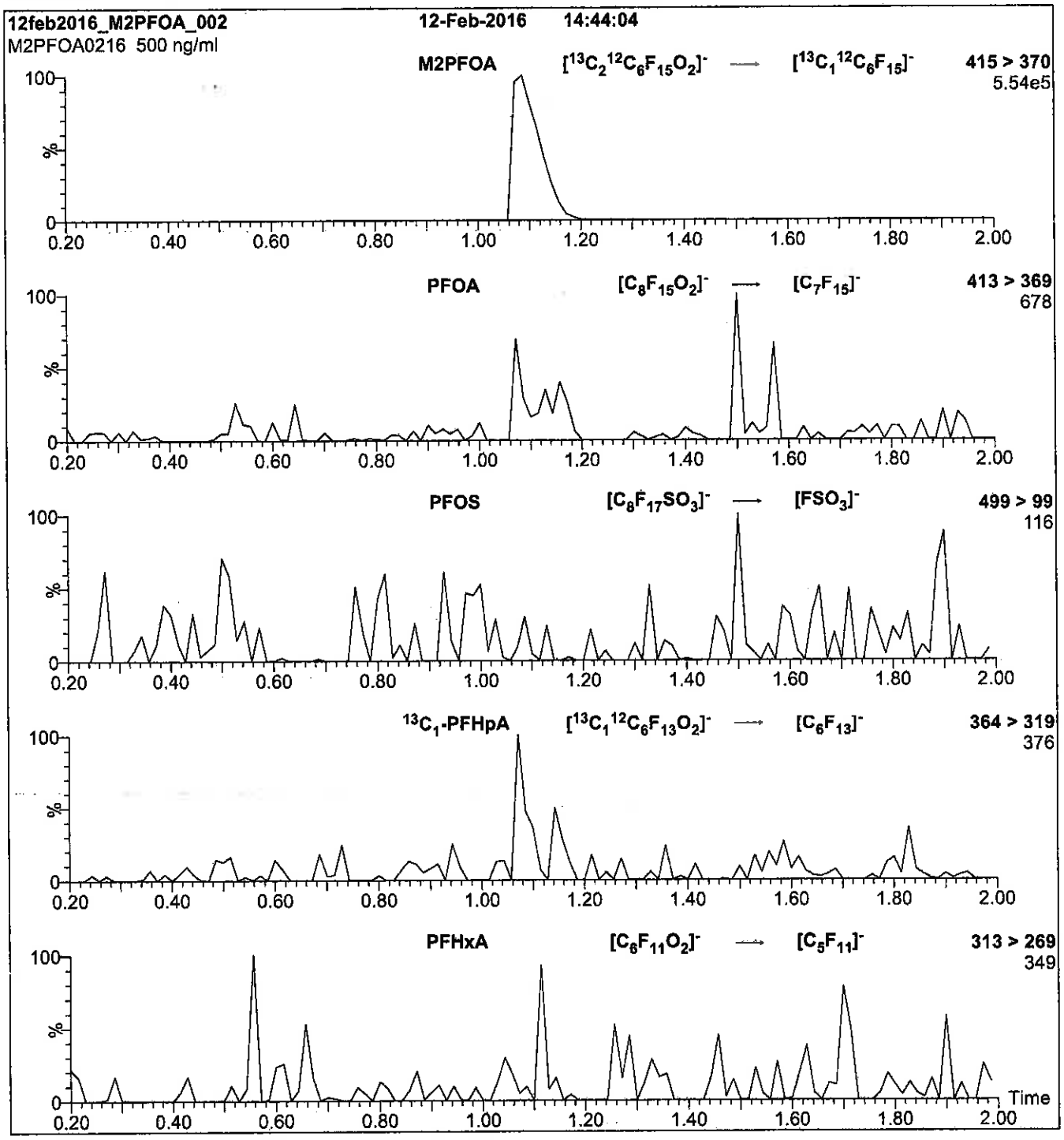
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

Reagent

LCM2PFOA_00012

1287307
ID: LCM2PFOA_00012
Exp:10/26/22 Prpd:CBW Opn:06/26/18
13C2-PFOA Stock 50ug/mL

R: 6/26/18 CBW

WELLINGTON LABORATORIES

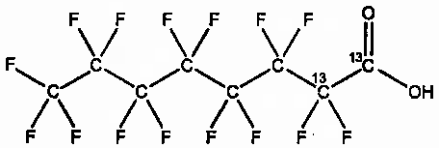
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

LOT NUMBER: M2PFOA1017

STRUCTURE:

CAS #: Not available



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Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/26/2017
EXPIRY DATE: (mm/dd/yyyy) 10/26/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

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Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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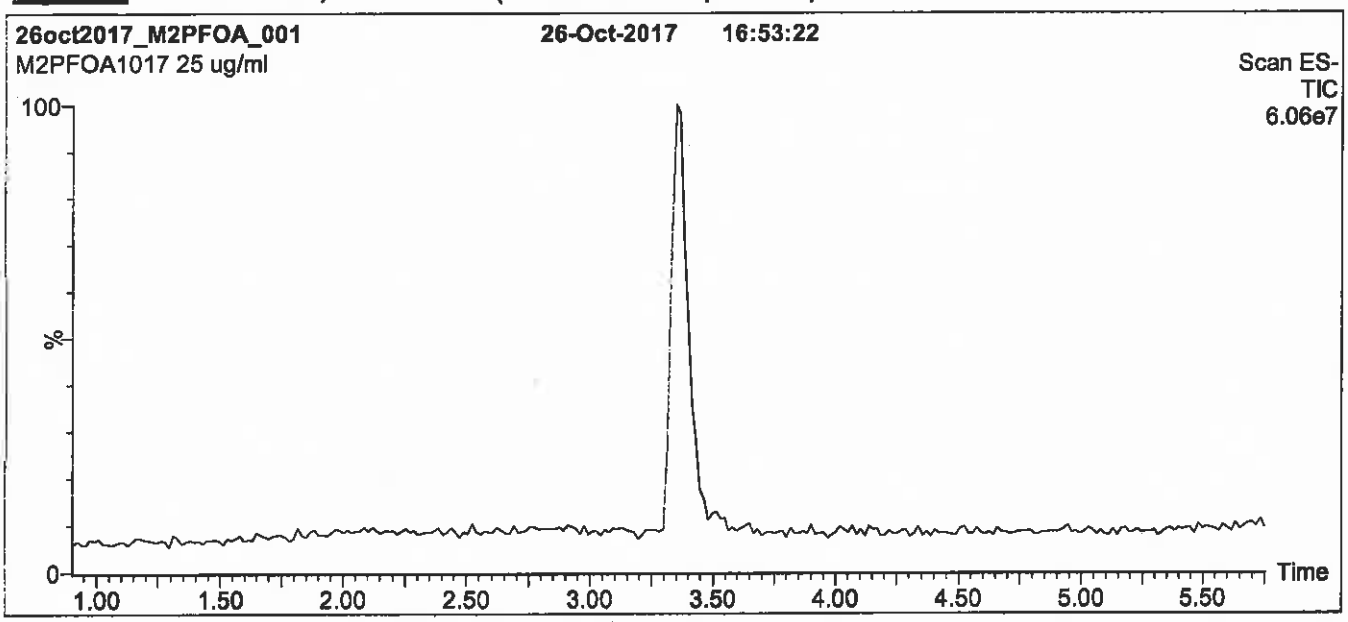

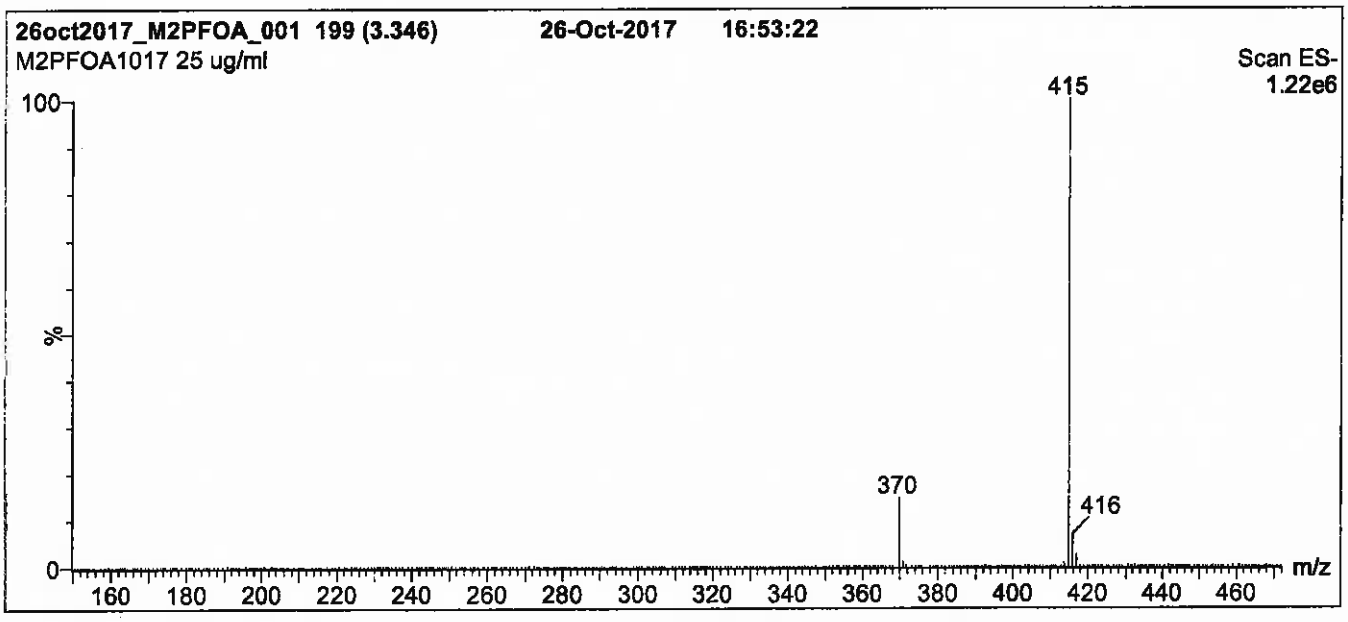

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Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

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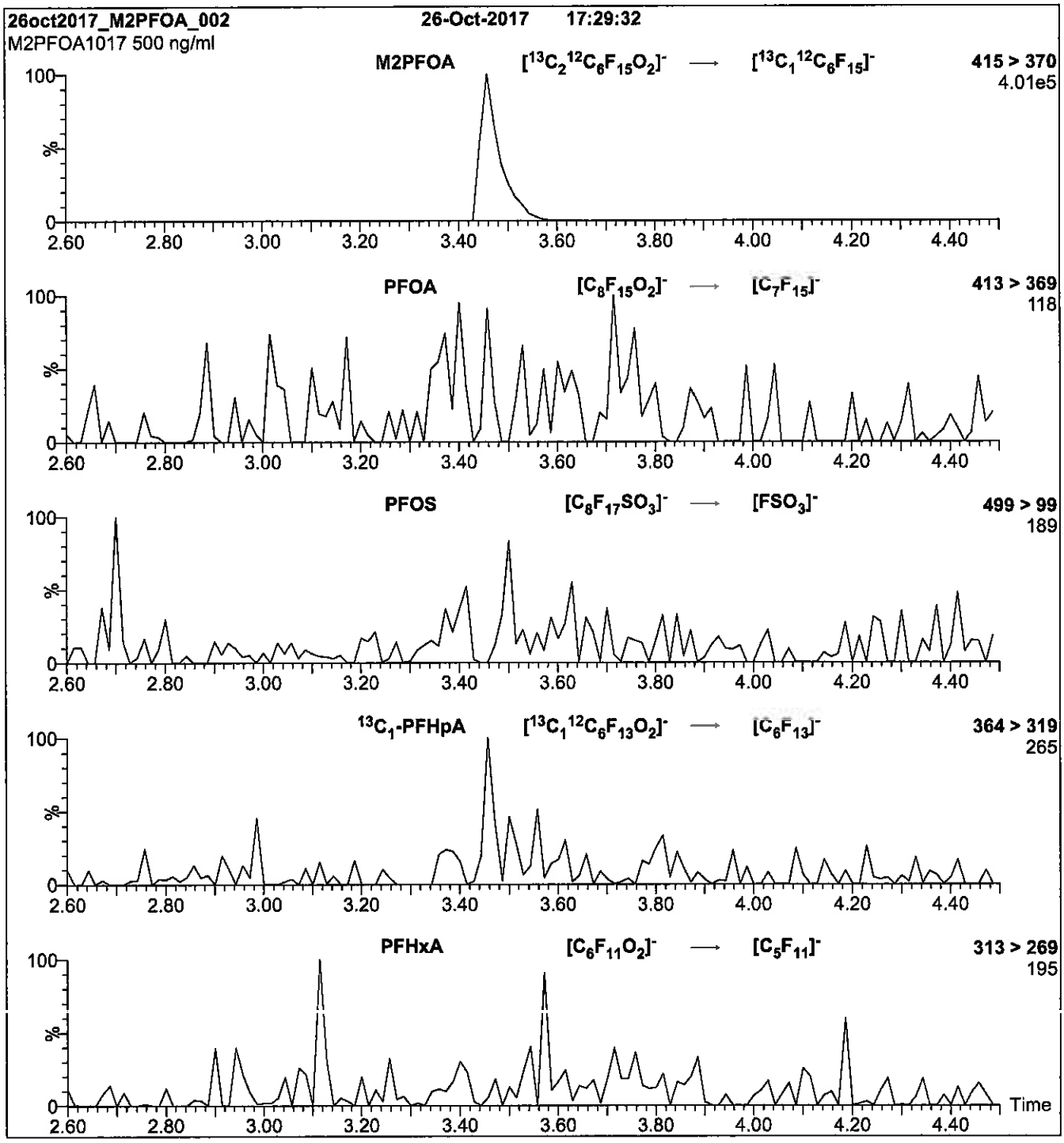
Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

Reagent

LCM2PFTeDA_00014

1263136
ID: LCM2PFTeDA_00014
Exp:11/30/22 Prpd:CBW Opn:05/30/18
13C2-PFTeDA at 50ug/mL

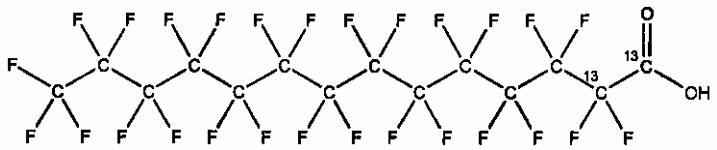
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{12}HF_{27}O_2$
MOLECULAR WEIGHT: 716.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 11/30/2017
EXPIRY DATE: (mm/dd/yyyy) 11/30/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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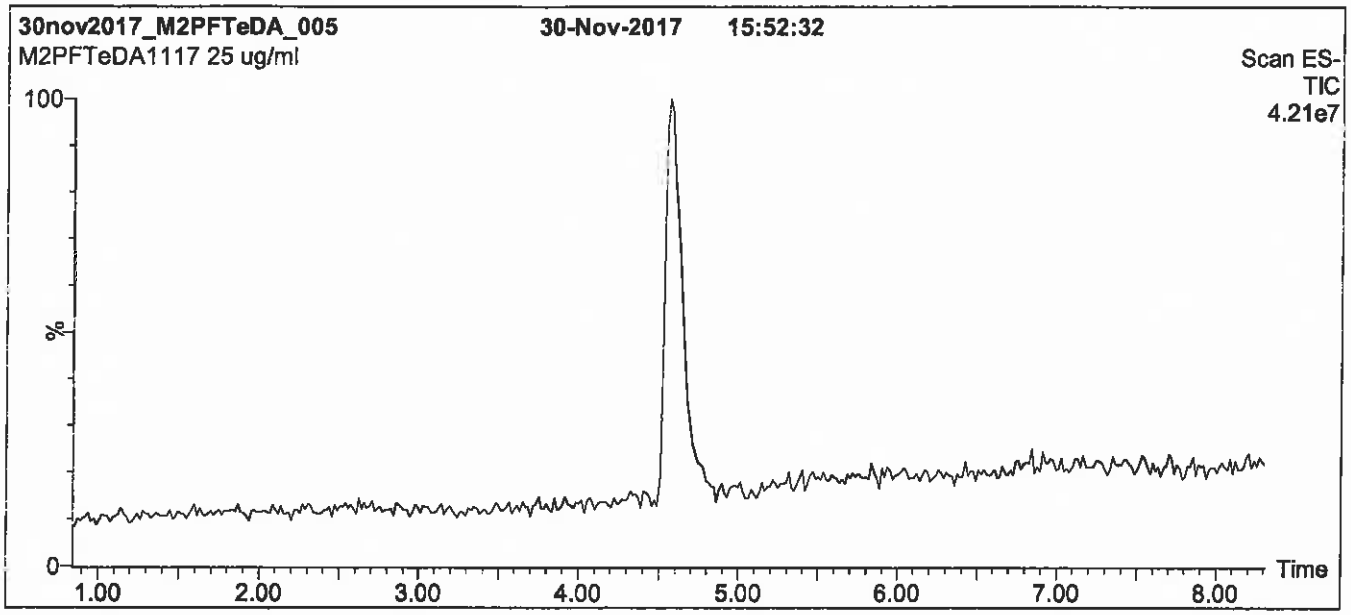
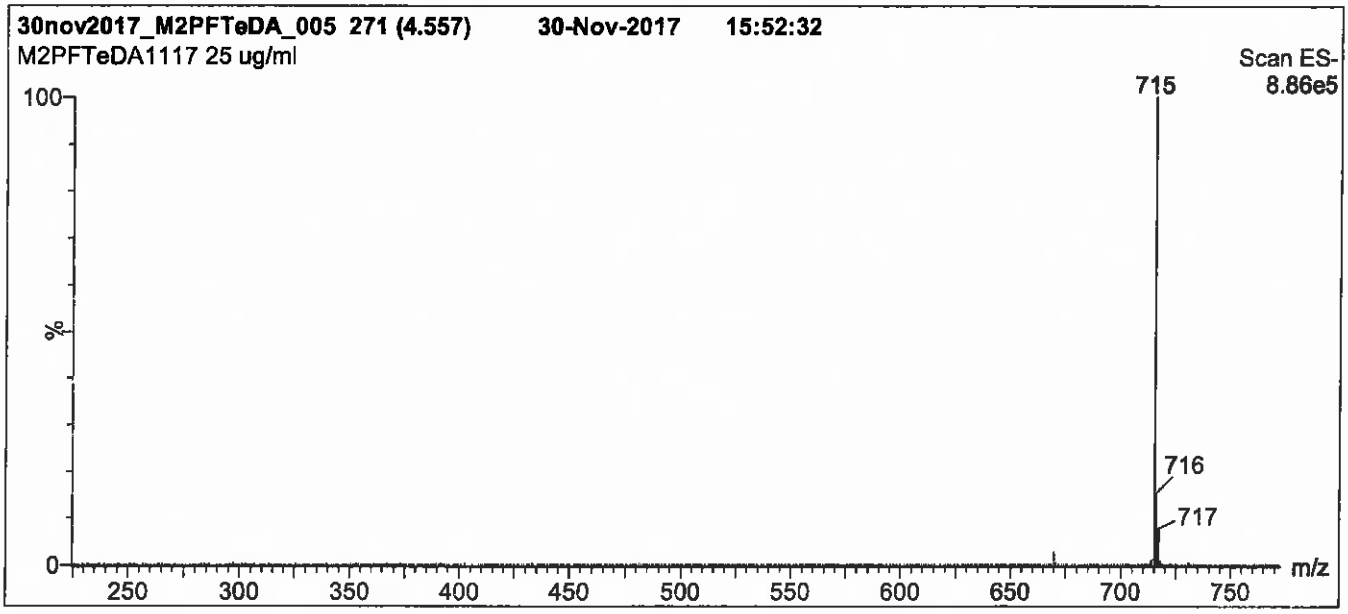
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

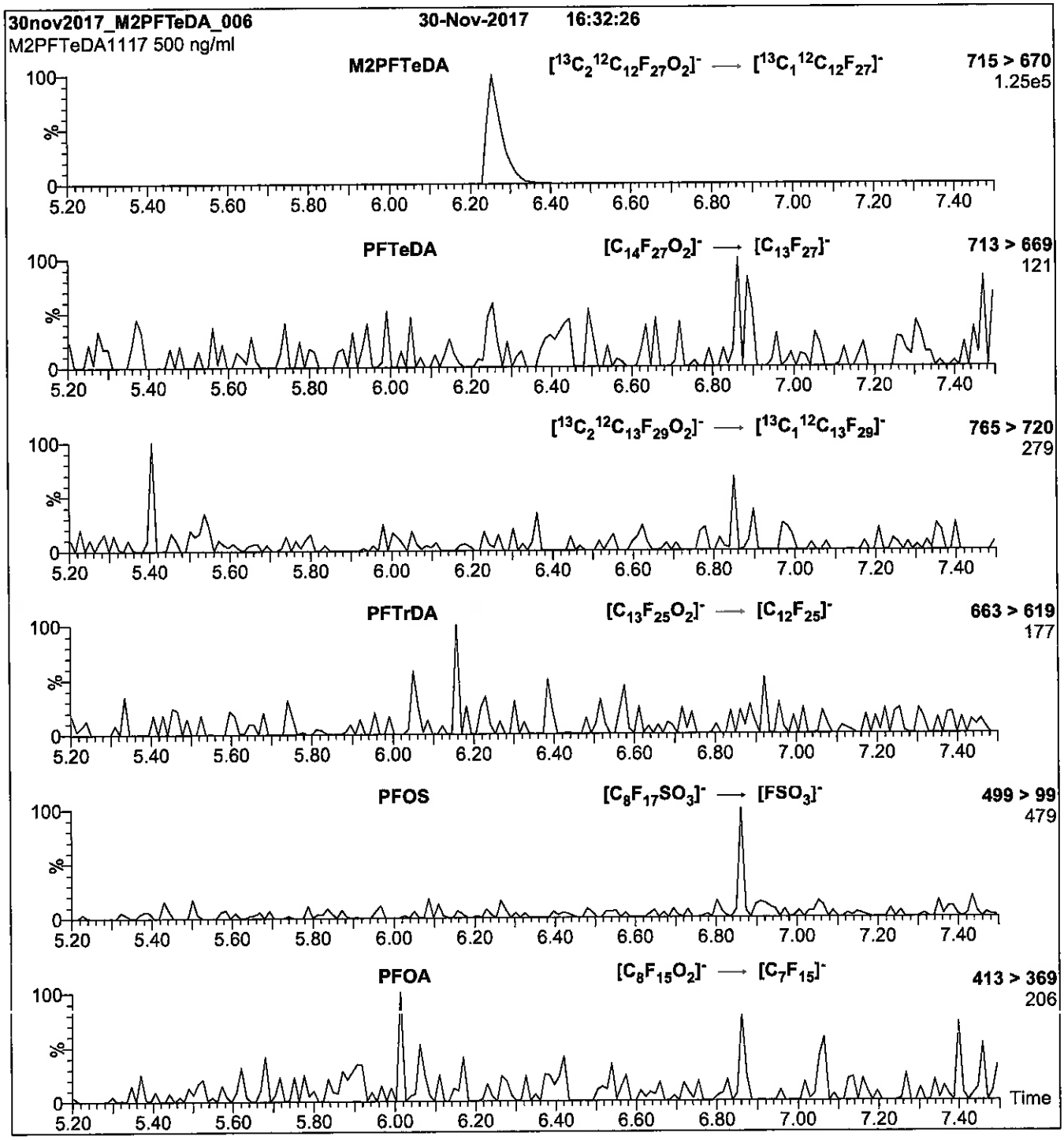
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFTeDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

Reagent

LCM2PFTeDA_00015

1287281
ID: LCM2PFTeDA_00015
Exp:11/30/22 Prpd:CBW Opn:06/26/18
13C2-PFTeDA at 50ug/mL

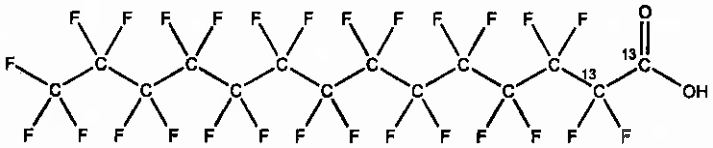
R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{12}HF_{27}O_2$
MOLECULAR WEIGHT: 716.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 11/30/2017
EXPIRY DATE: (mm/dd/yyyy) 11/30/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

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Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

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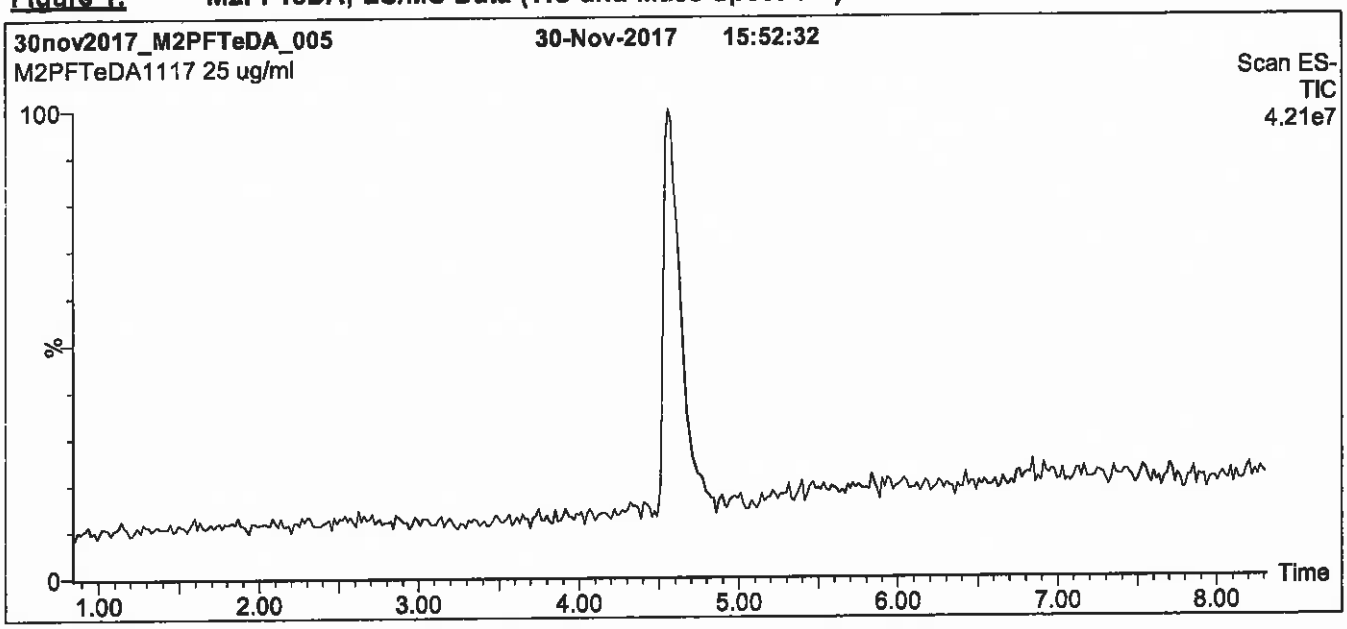
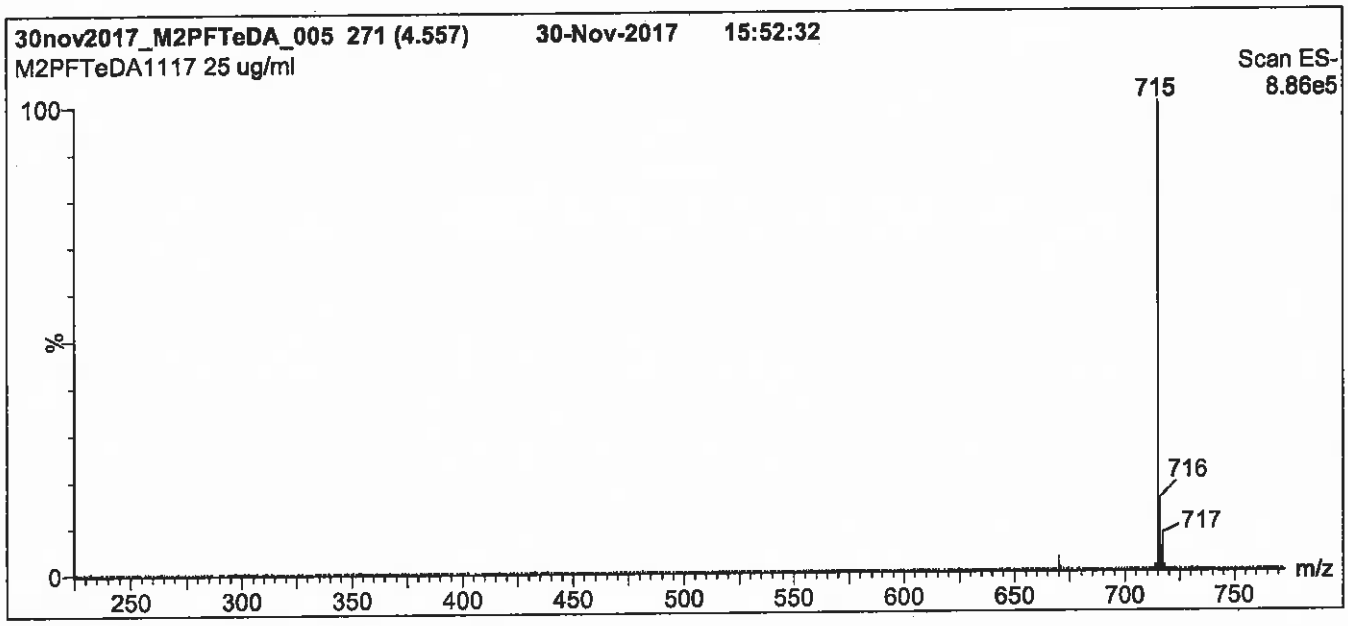
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

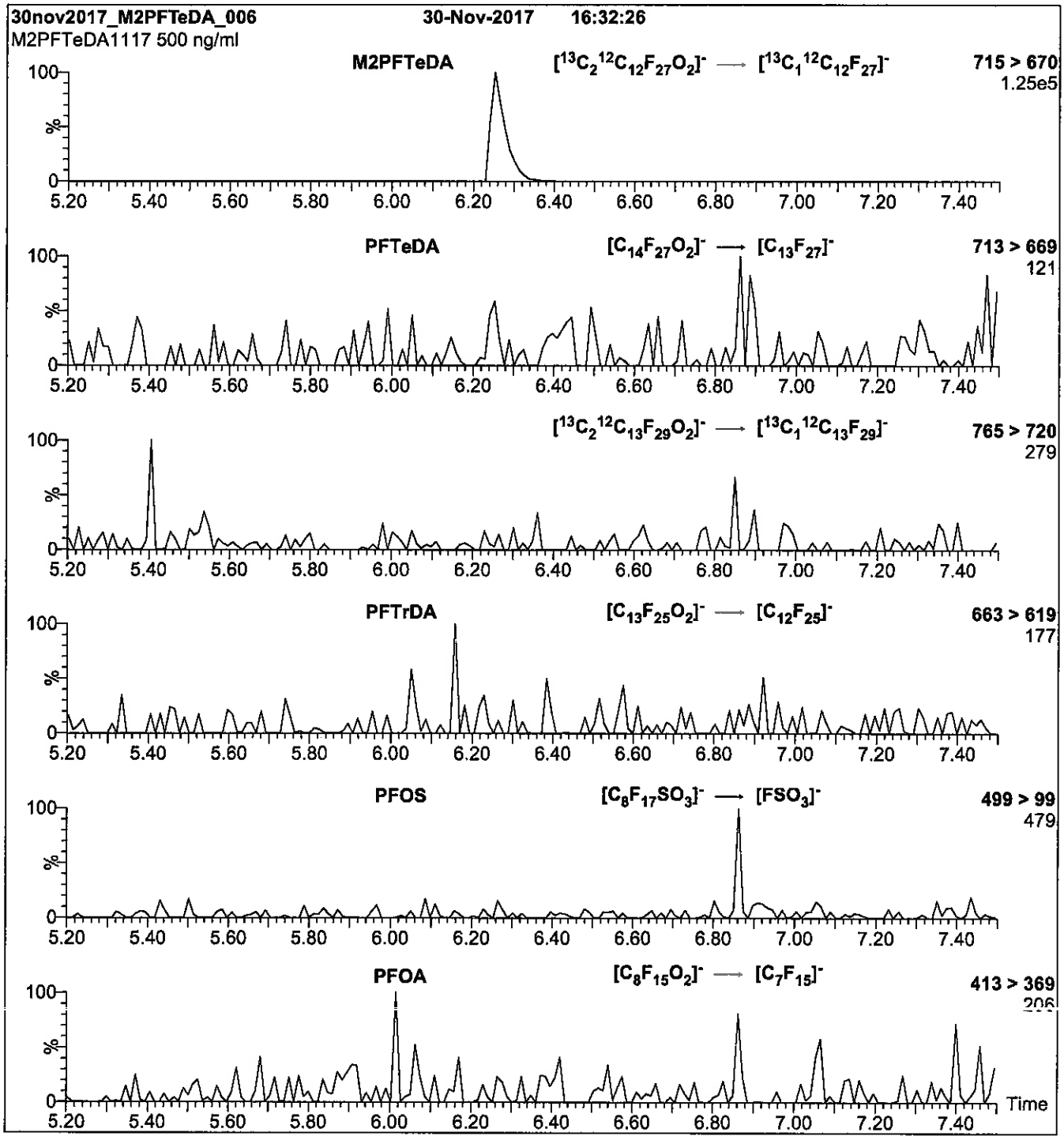
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFTeDA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.31e-3 Collision Energy (eV) = 14
Flow:	300 µl/min	

Reagent

LCM3HFPO-DA_00003

1263201
ID: LCM3HFPO-DA_00003
Exp:05/18/21 Prpd:CBW Opn:05/30/18
M3HFPO-DA

RA 5/30/18 CBW

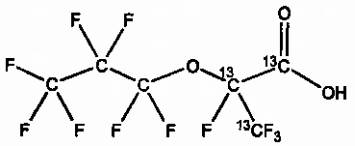
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA0518

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-$^{13}C_3$-propanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3HF_{11}O_3$	**MOLECULAR WEIGHT:**	333.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	05/18/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.5% of two constitutional isomers.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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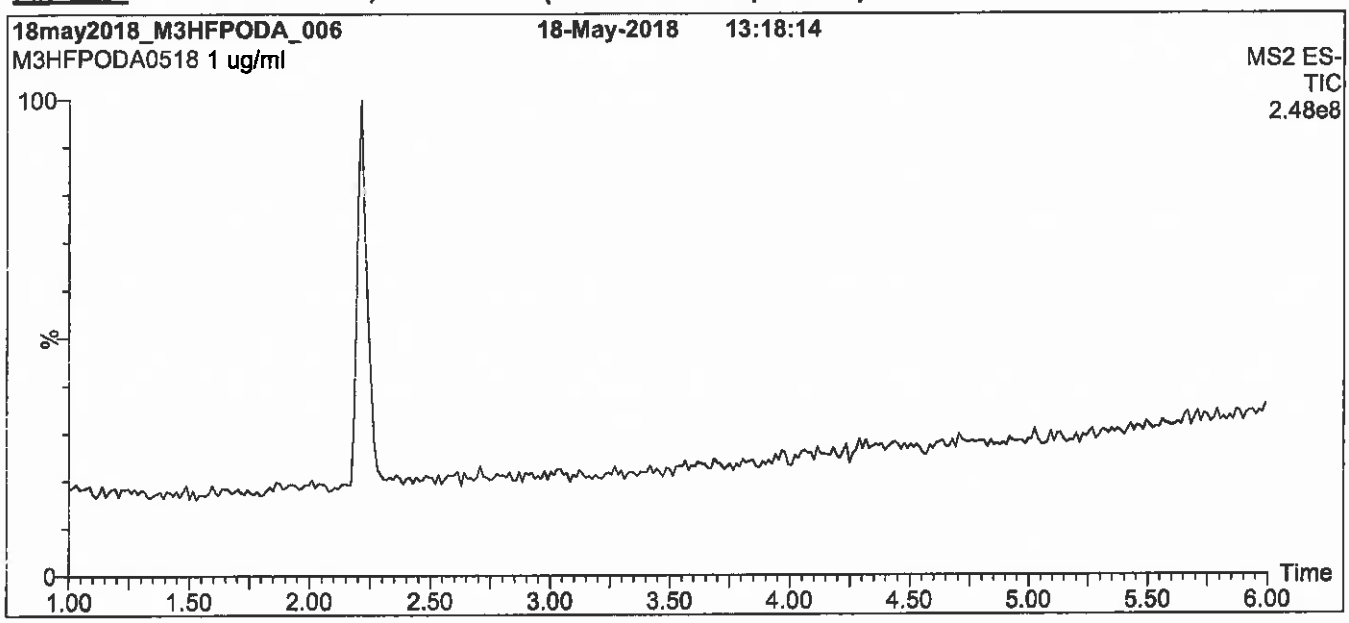
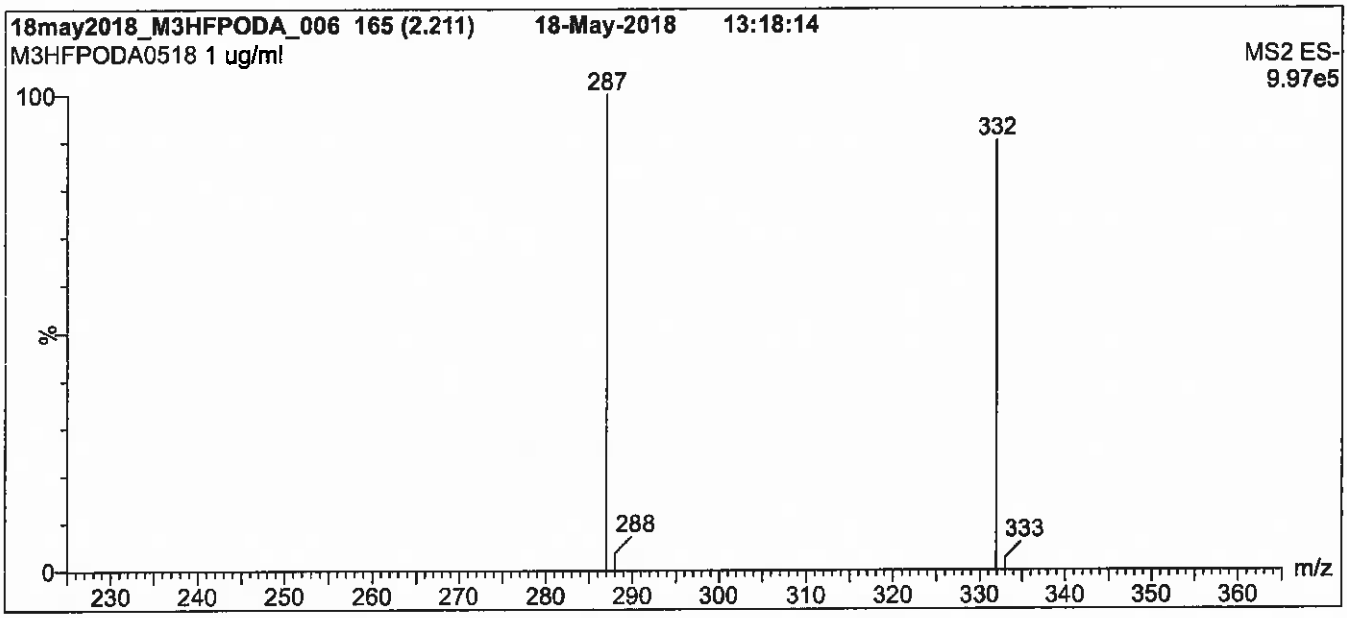
Figure 1: **M3HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

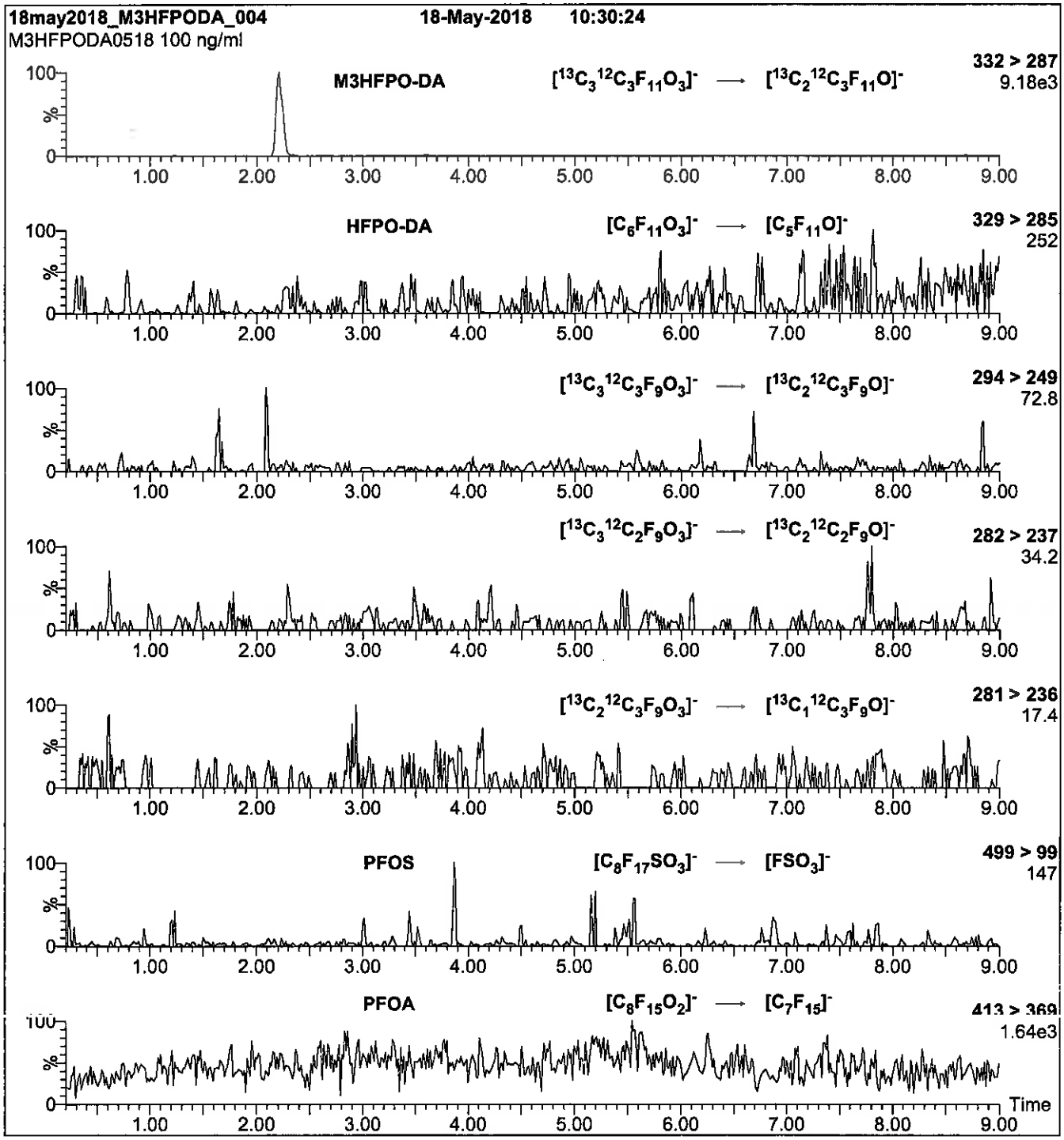
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M3HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M3HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 6

Reagent

LCM4PFHPA_00014

1263142
ID: LCM4PFHPA_00014
Exp:05/03/22 Prpd:CBW Opn:05/30/18
13C4-Perfluoroheptanoic a

R: 12T 5/30/18 CBW

WELLINGTON LABORATORIES

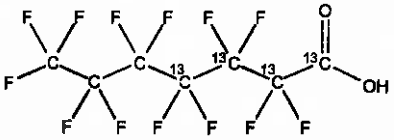
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/03/2017
EXPIRY DATE: (mm/dd/yyyy) 05/03/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/11/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

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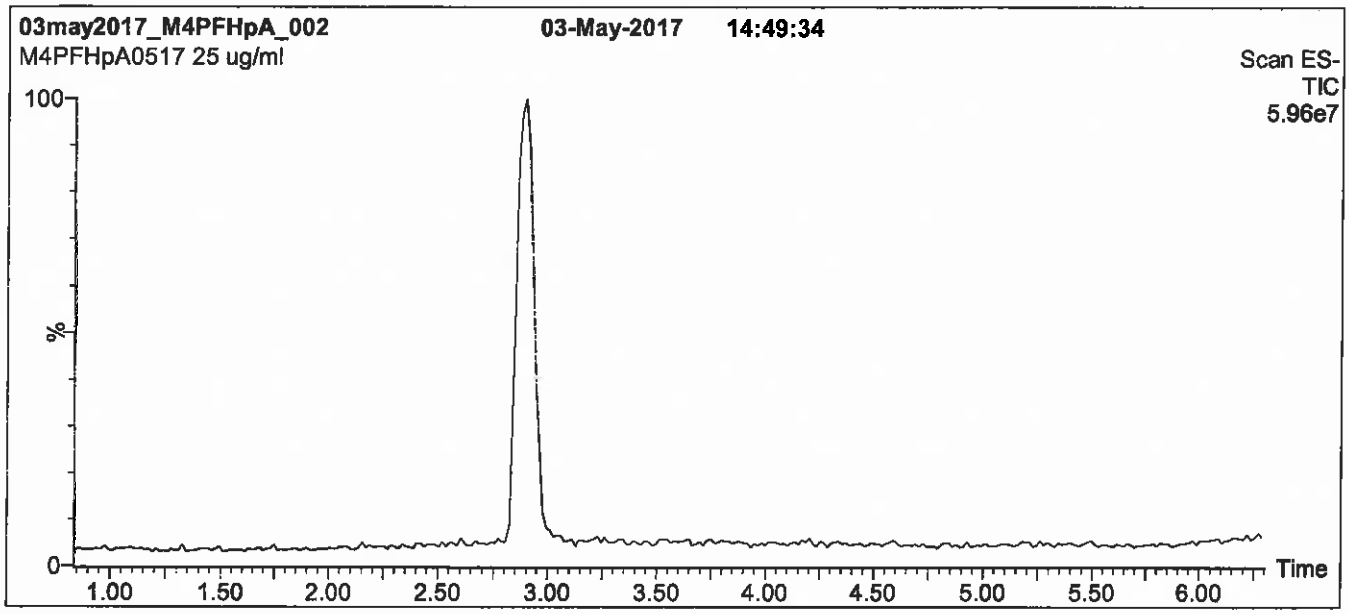
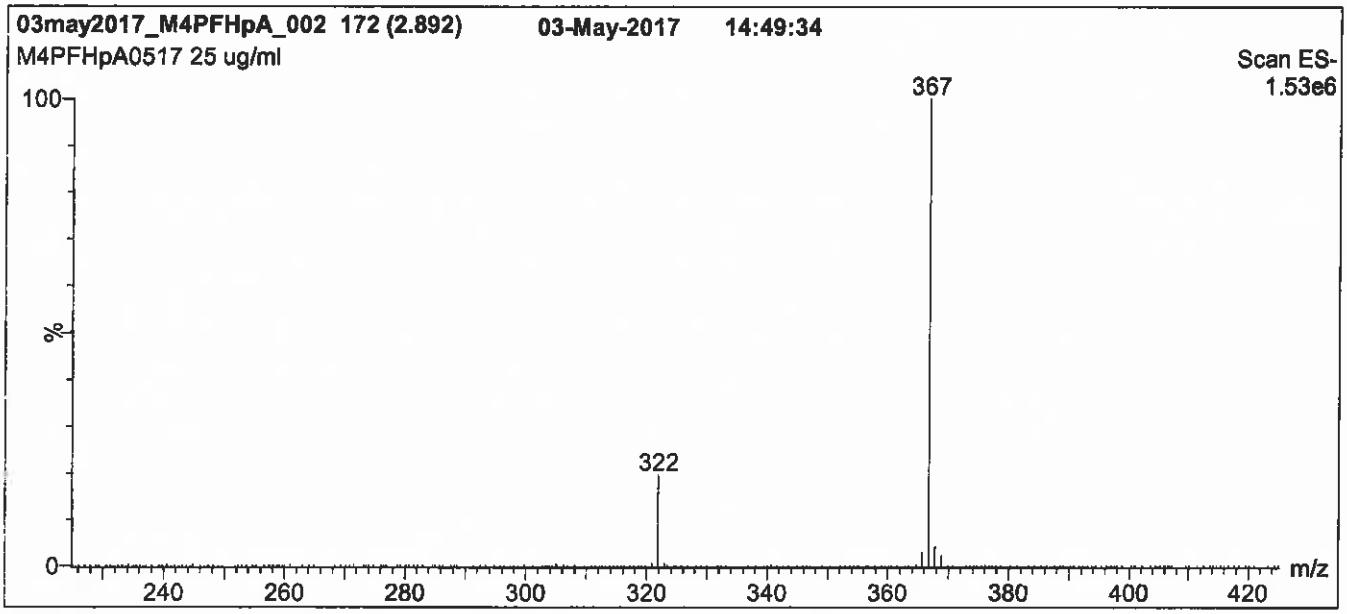
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

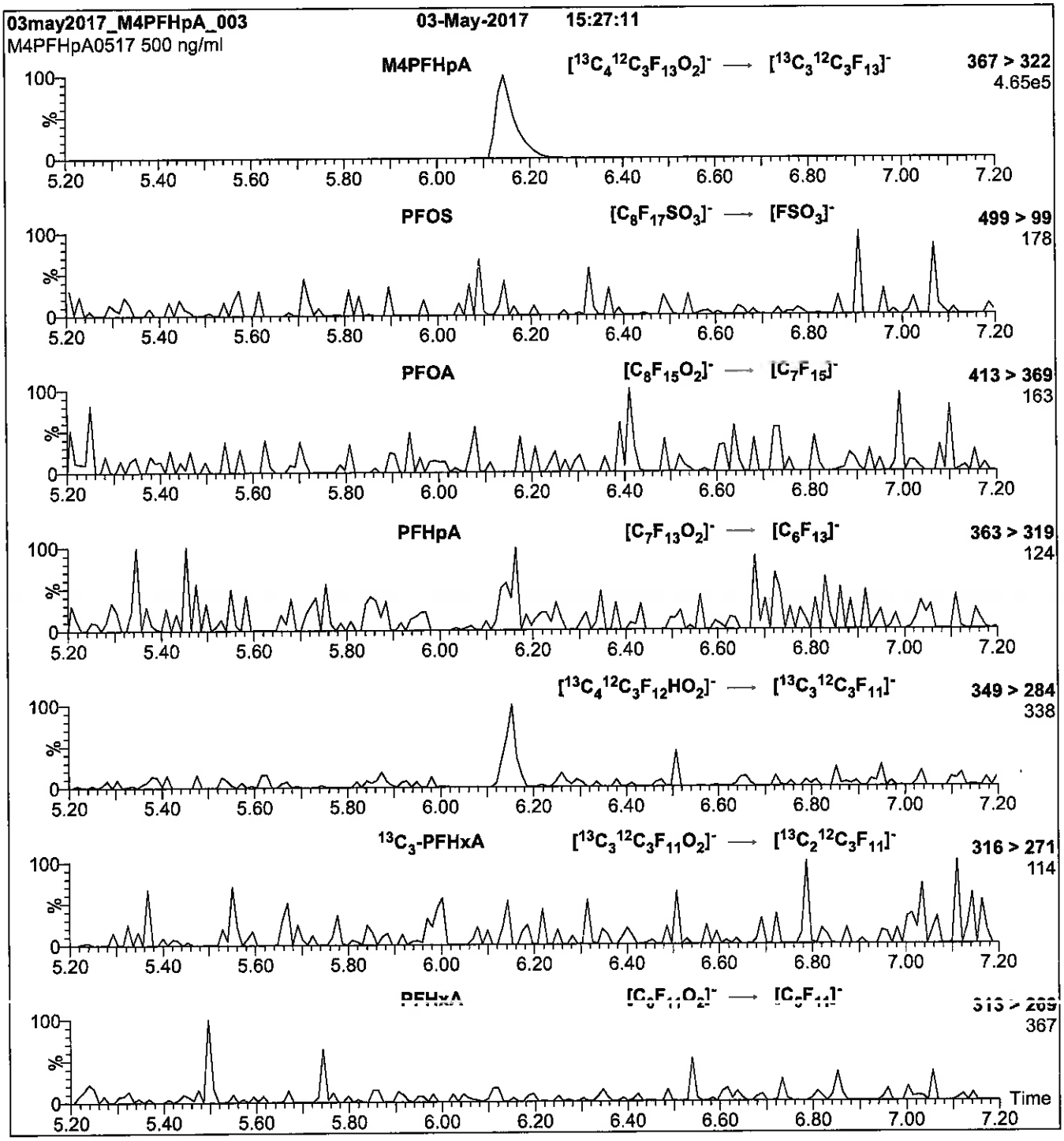
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 9

Reagent

LCM4PFHPA_00015

1287287
ID: LCM4PFHPA_00015
Exp:05/03/22 Prpd:CBW Opn:06/26/18
13C4-Perfluoroheptanoic a

R 6/26/18 CBW

WELLINGTON LABORATORIES

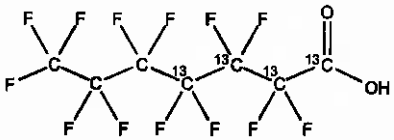
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/03/2017
EXPIRY DATE: (mm/dd/yyyy) 05/03/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

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CALA

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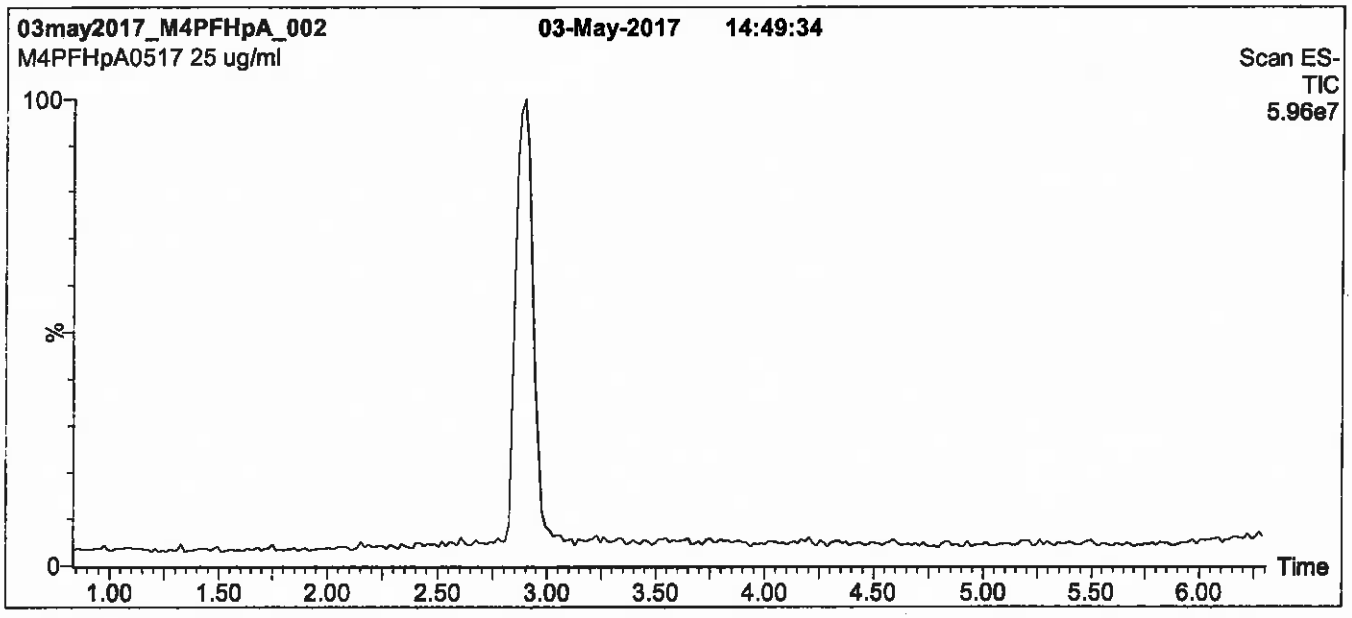
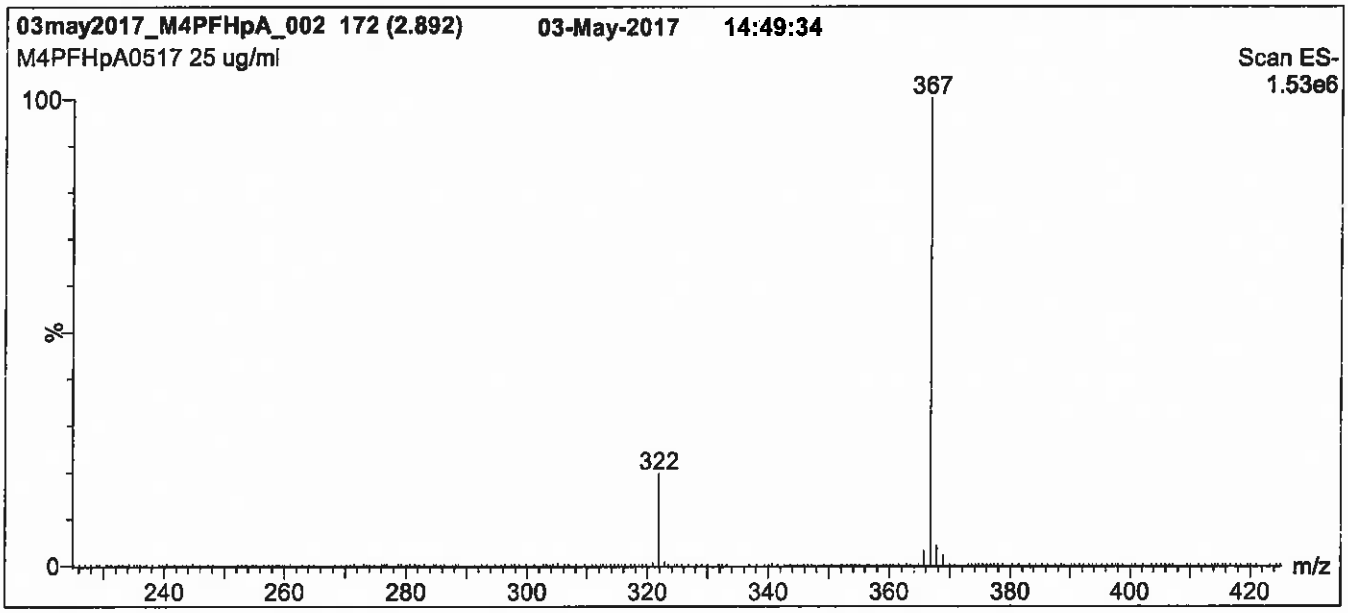




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

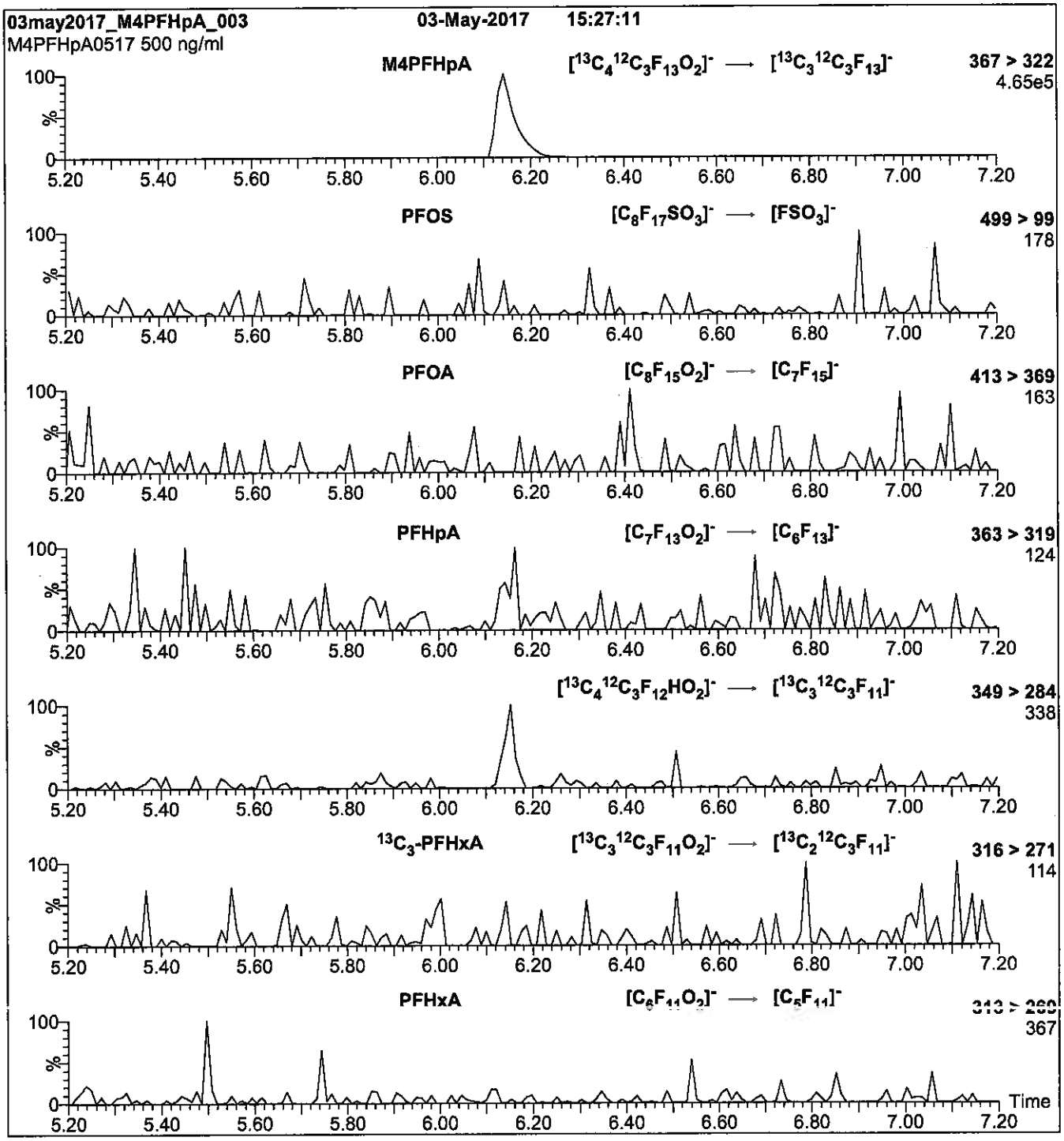
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M4PFHpA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCM5PFPEA_00015

1263145
ID: LCM5PFPEA_00015
Exp:07/20/22 Prpd:CBW Opn:05/30/18
13C5-Perfluoropentanoic a

R: 5/30/18 CBW

WELLINGTON LABORATORIES

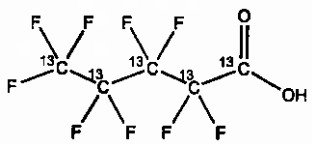
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 269.01
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/20/2017
EXPIRY DATE: (mm/dd/yyyy) 07/20/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_5$)

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ADDITIONAL INFORMATION:

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- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-pentanoic acid.

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Certified By: _____ **Date:** 07/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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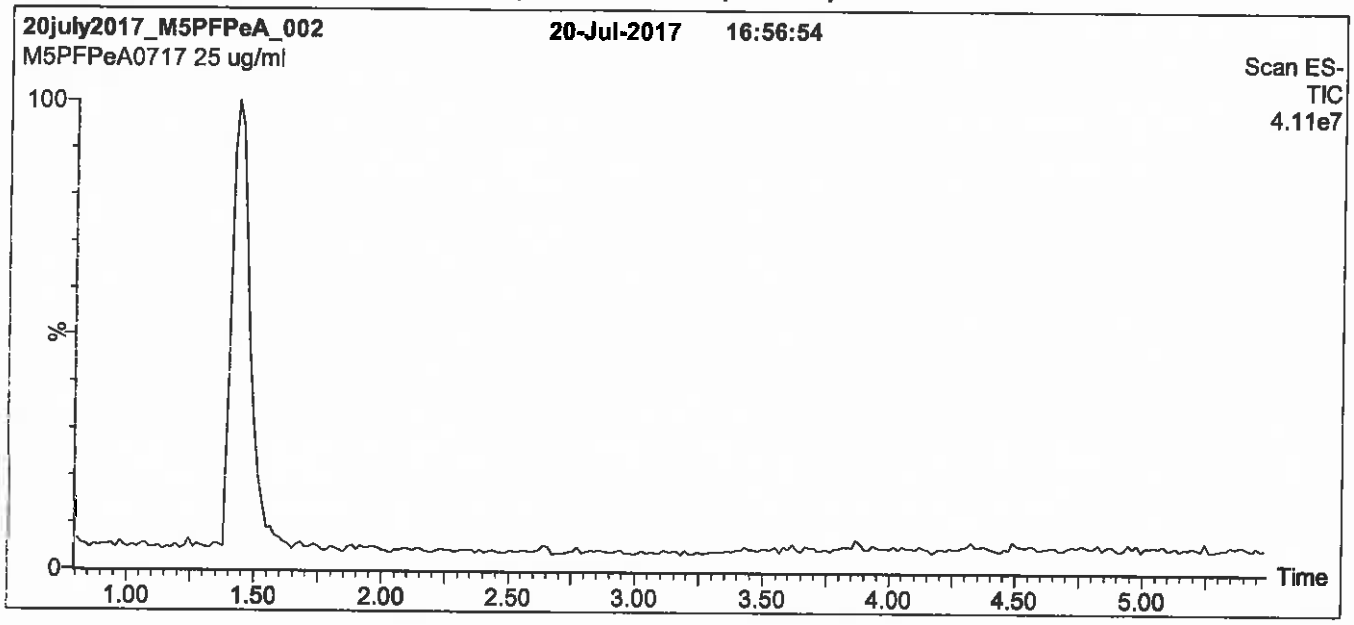

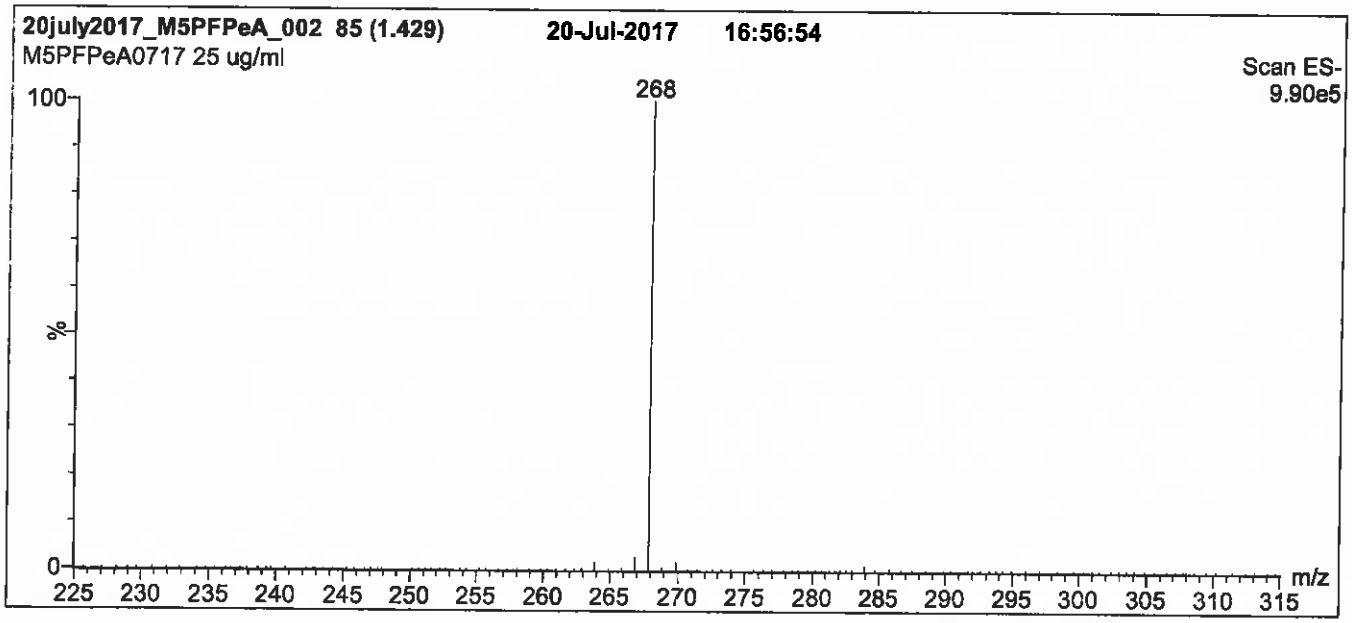

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MS: Micromass Quattro *micro* API MS

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Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

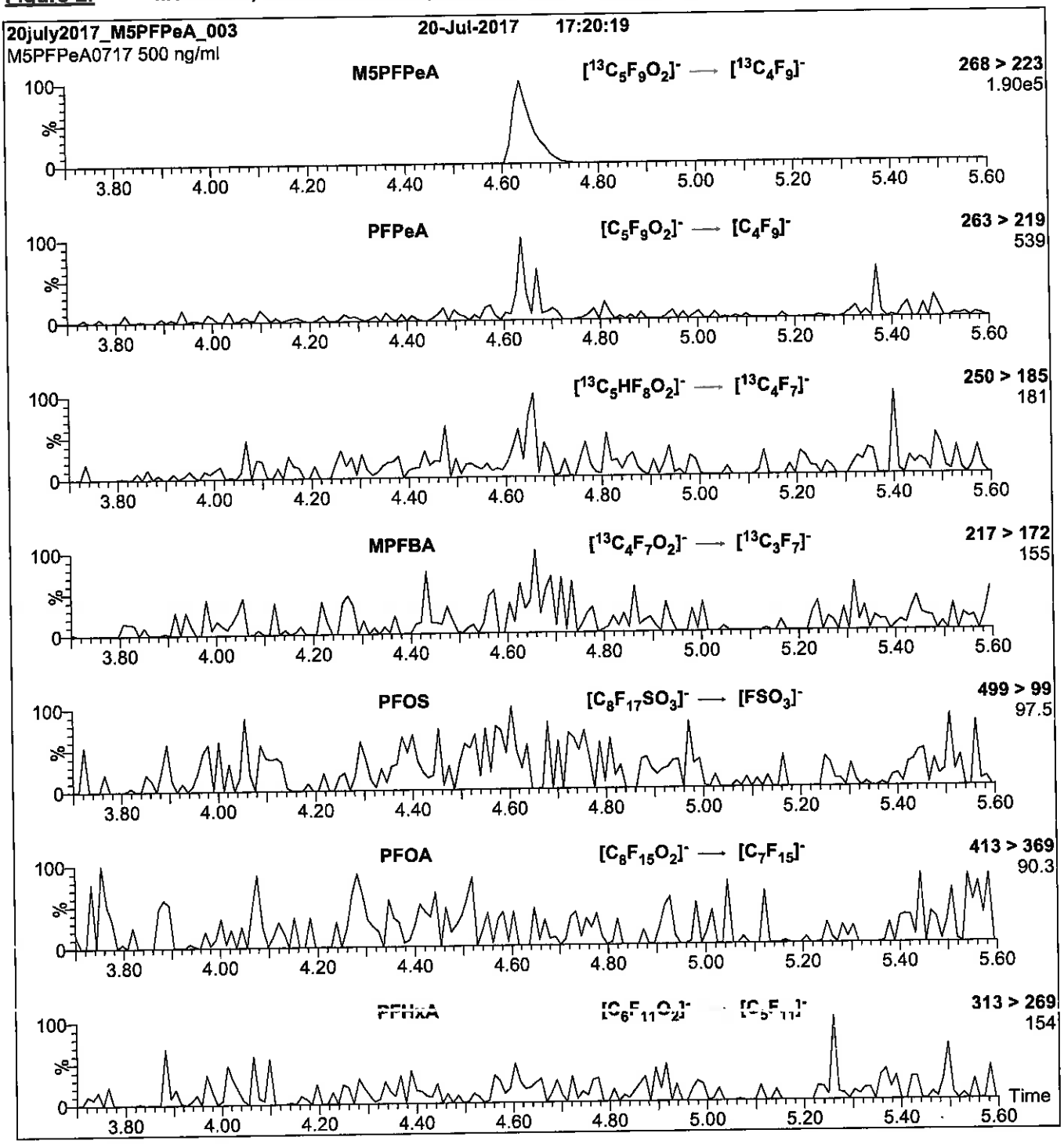
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 9

Reagent

LCM5PFPEA_00016

1287290
ID: LCM5PFPEA_00016
Exp:07/20/22 Prpd:CBW Opn:06/26/18
13C5-Perfluoropentanoic a

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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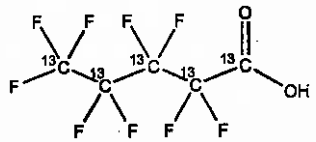
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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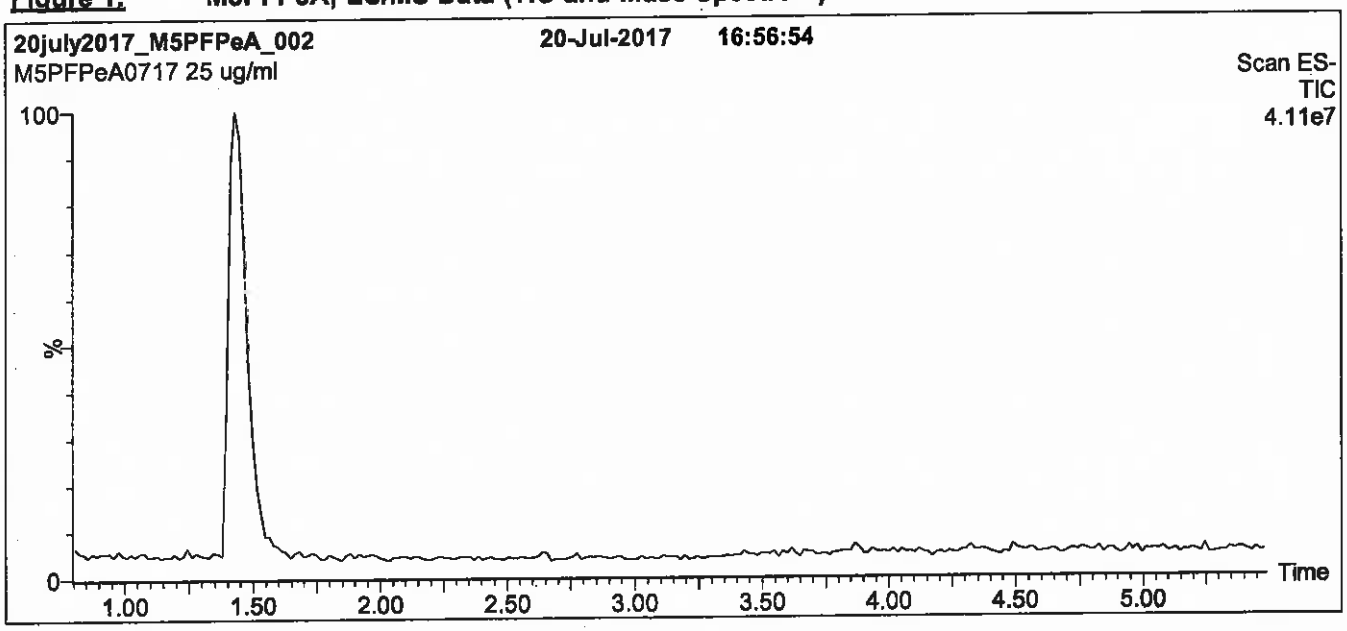
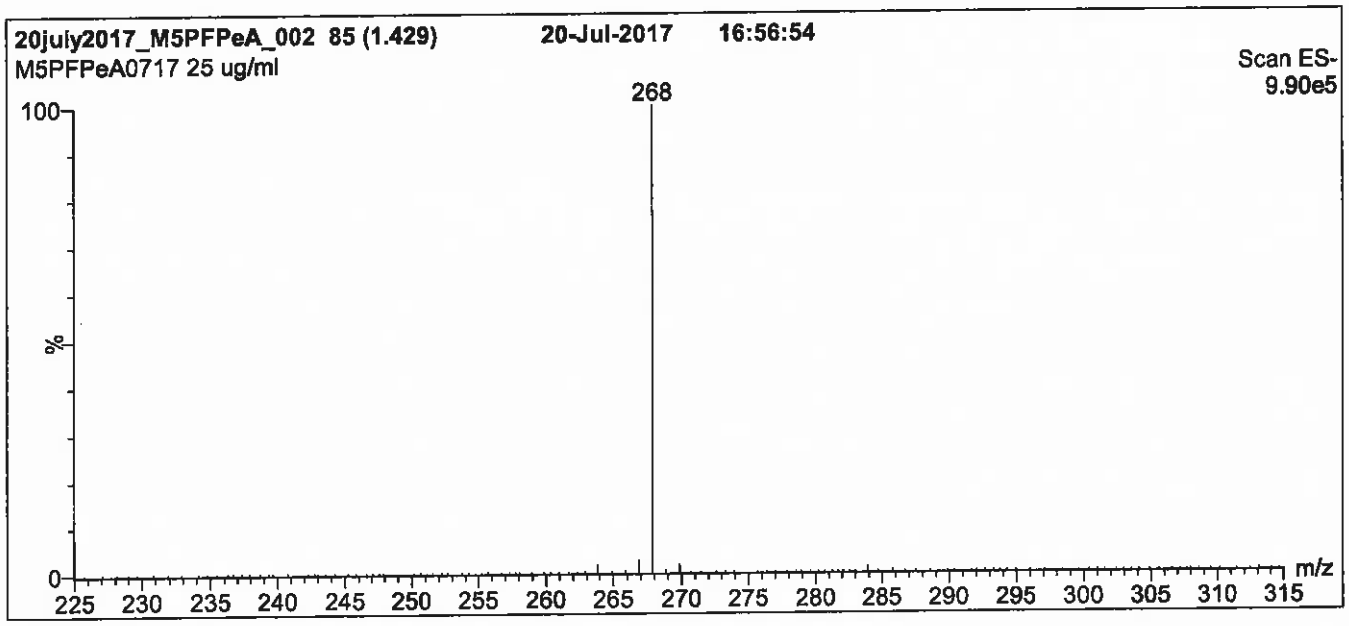
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

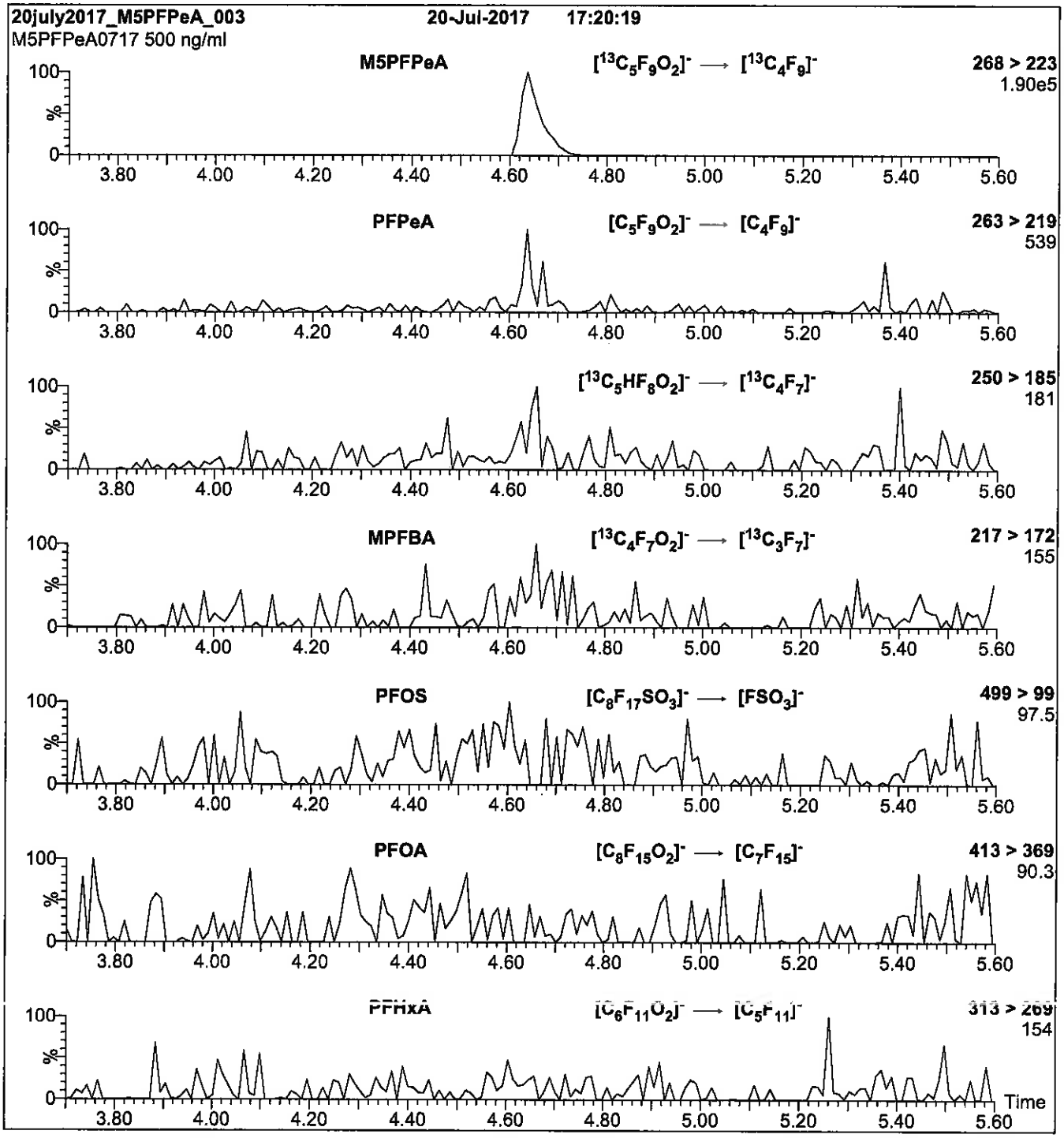
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M5PFPeA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCM8FOSA_00019

1263151
ID: LCM8FOSA_00019
Exp:10/11/22 Prpd:CBW Opn:05/30/18
13C8-Perfluorooctanesulfo

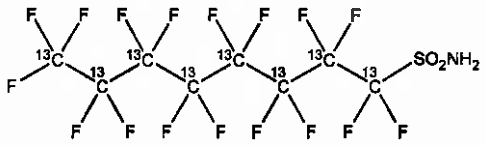
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
LOT NUMBER: M8FOSA1017I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_8H_2F_{17}NO_2S$
MOLECULAR WEIGHT: 507.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Isopropanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy) 10/11/2017
EXPIRY DATE: (mm/dd/yyyy) 10/11/2022
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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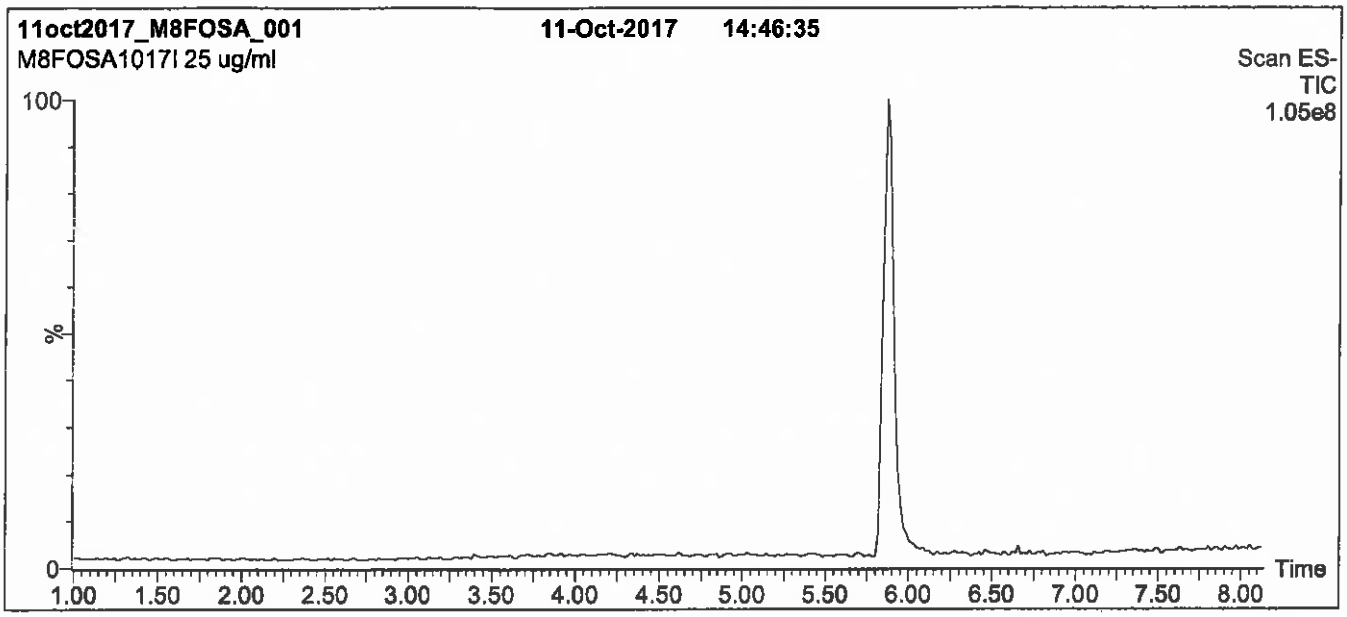
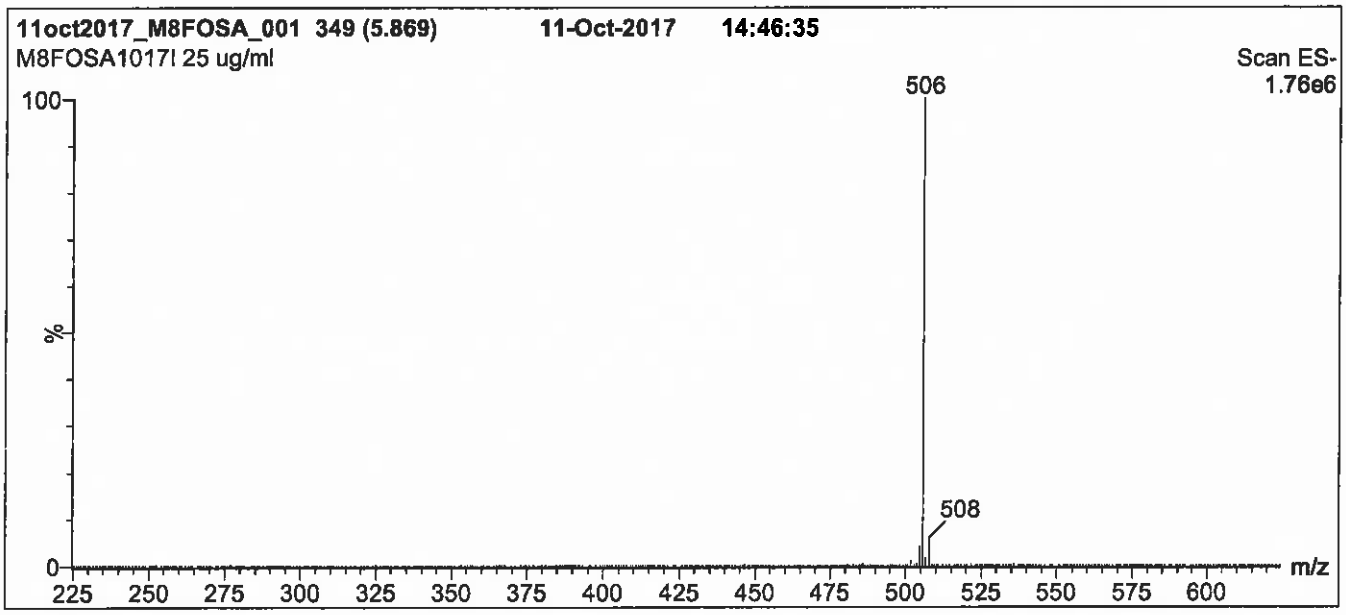
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

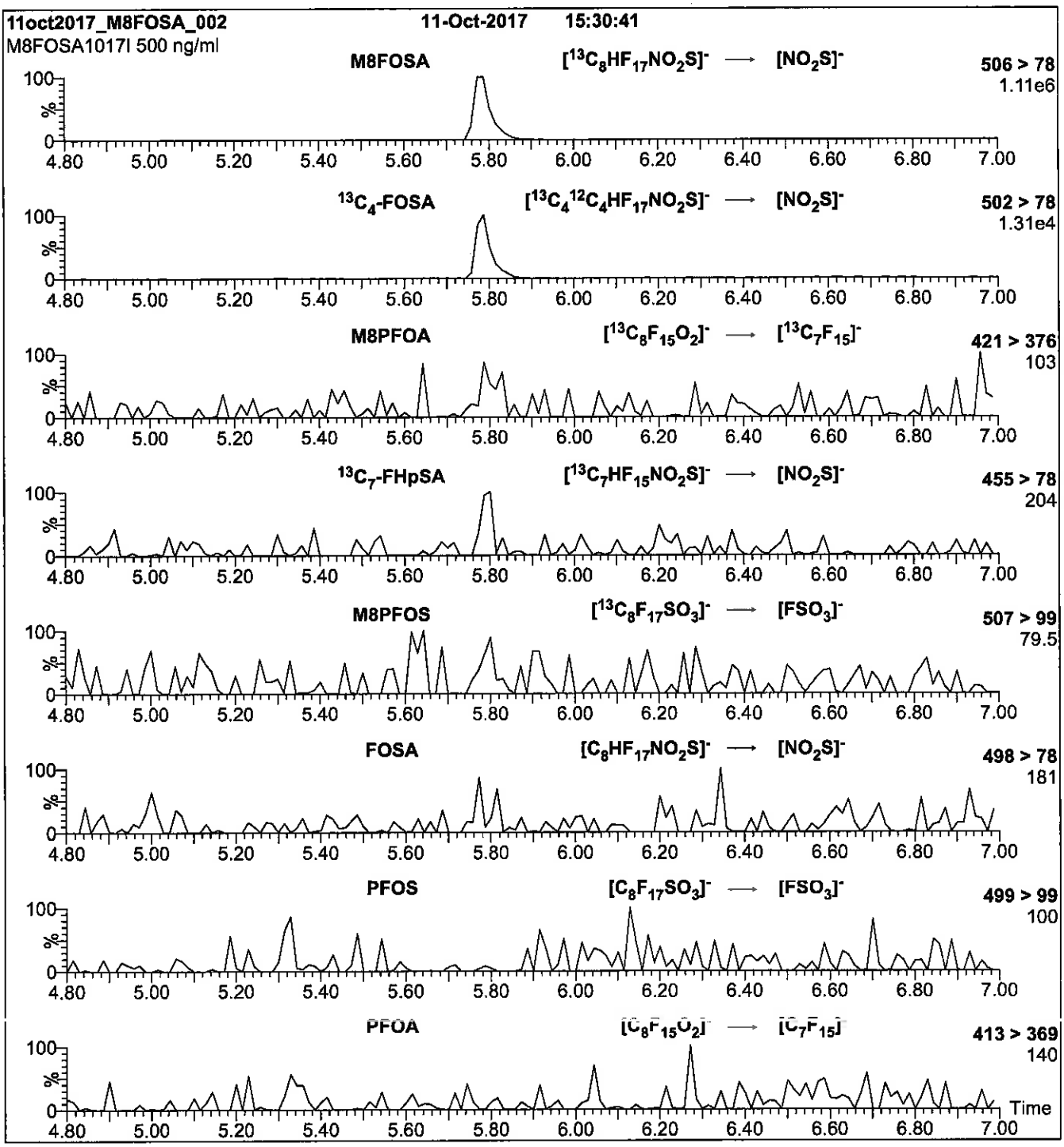
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M8FOSA-I)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCM8FOSA_00020

1287296
ID: LCM8FOSA_00020
Exp:10/11/22 Pipd:CBW Opn:06/26/18
13C8-Perfluorooctanesulfo

R: 6/26/18 CBW

WELLINGTON LABORATORIES

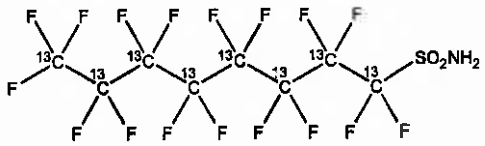
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1017I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_8H_2F_{17}NO_2S$
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/11/2017
EXPIRY DATE: (mm/dd/yyyy) 10/11/2022
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_8$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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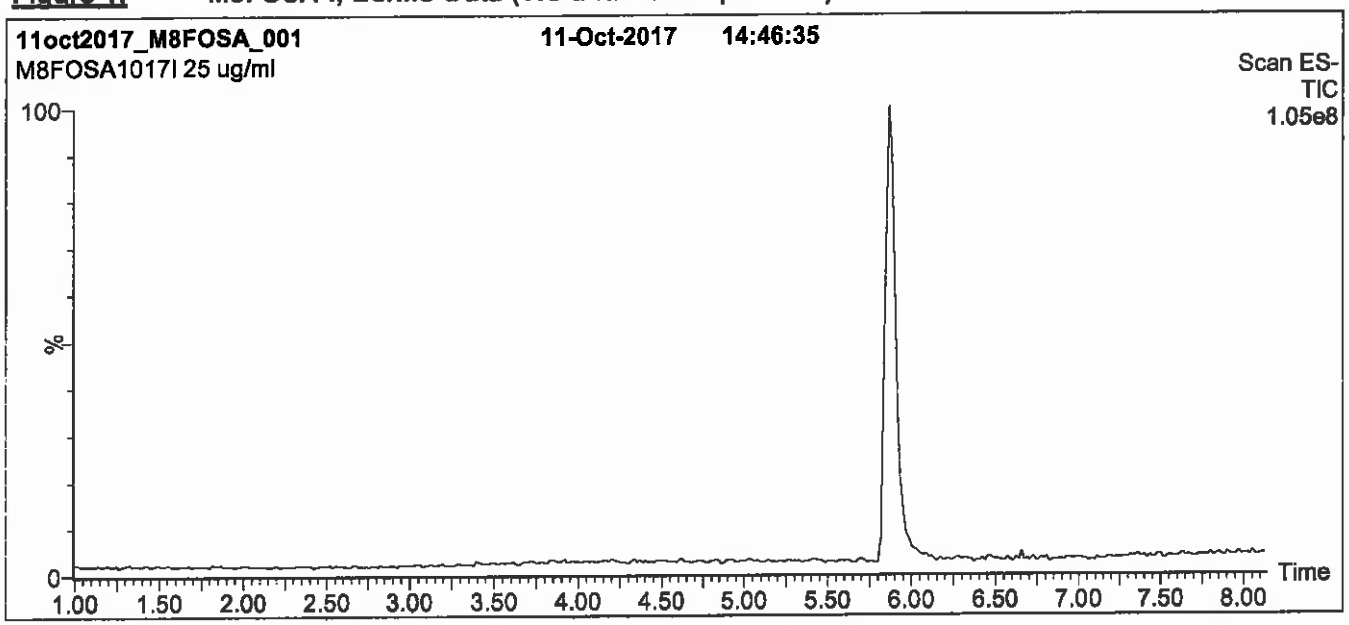

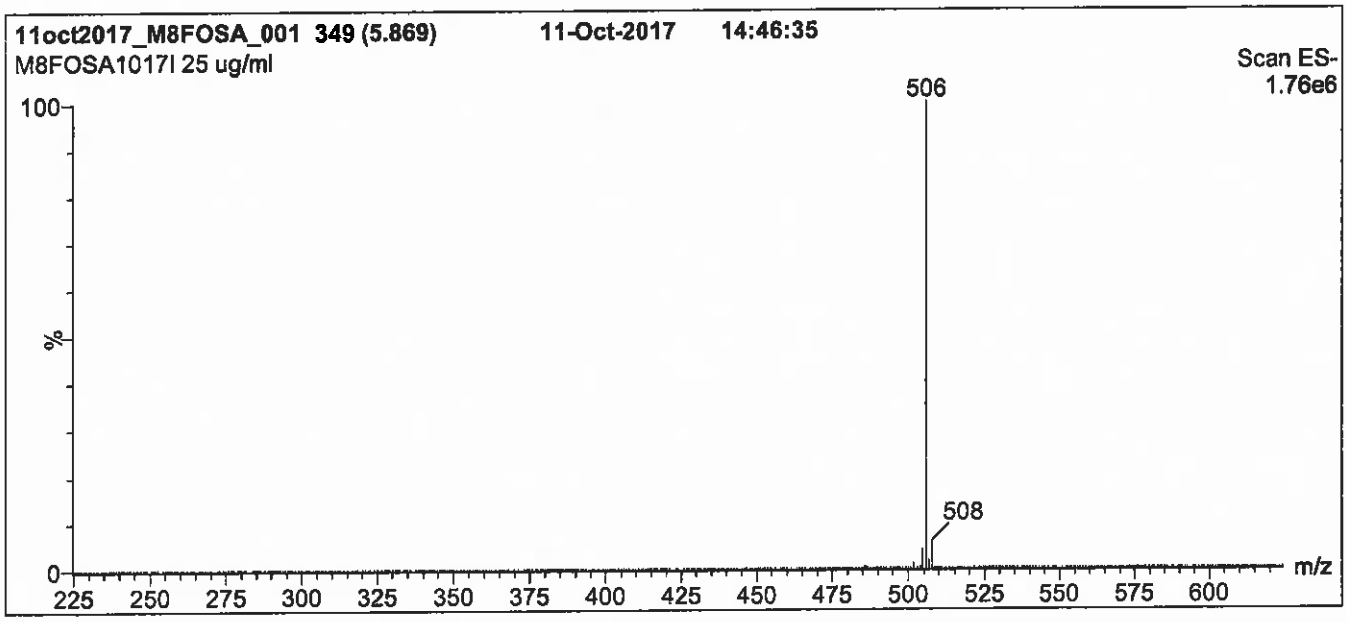

Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

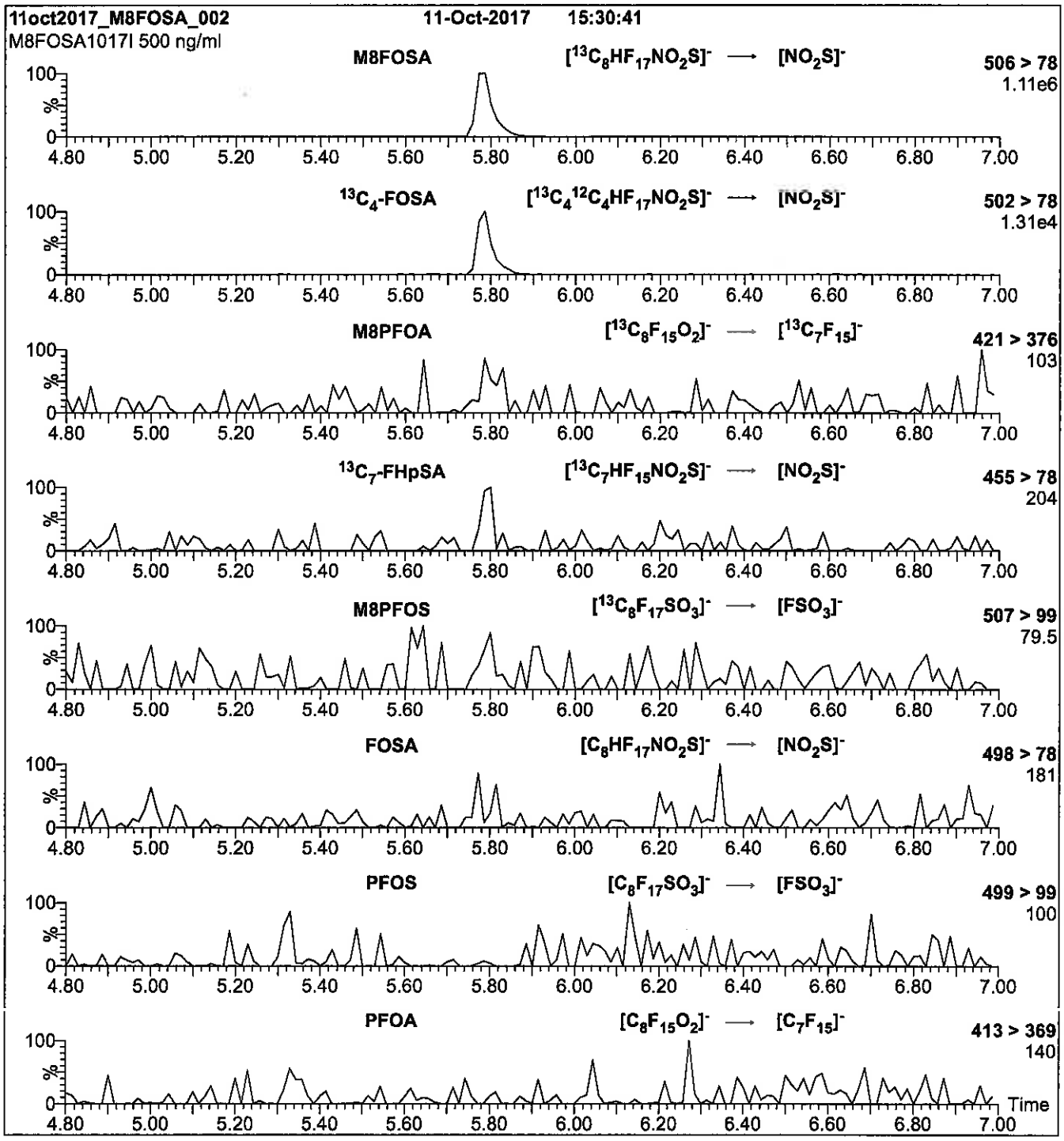
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00015

1263154
ID: LCMPFBA_00015
Exp:02/16/23 Prpd:CBW Opn:05/30/18
13C4-Perfluorobutanoic ac

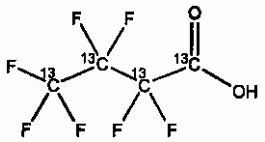
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFBA
LOT NUMBER: MPFBA0218
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid

STRUCTURE:



CAS #: Not available

MOLECULAR FORMULA: $^{13}C_4HF_7O_2$
MOLECULAR WEIGHT: 218.01
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 02/22/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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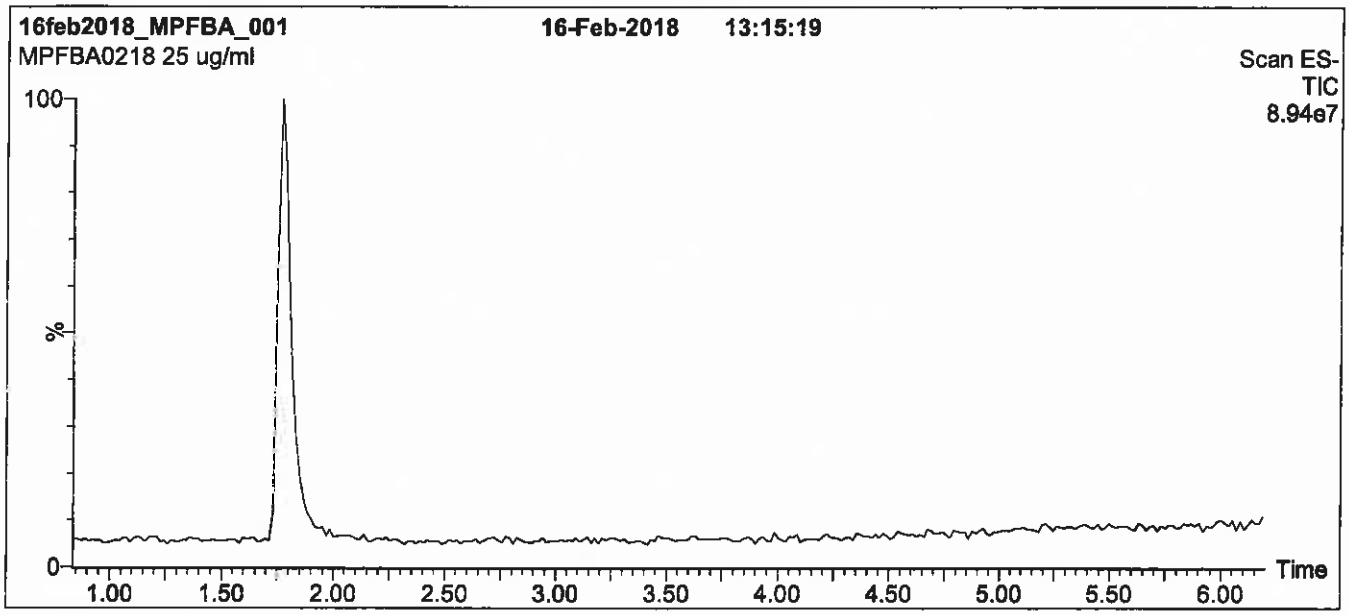
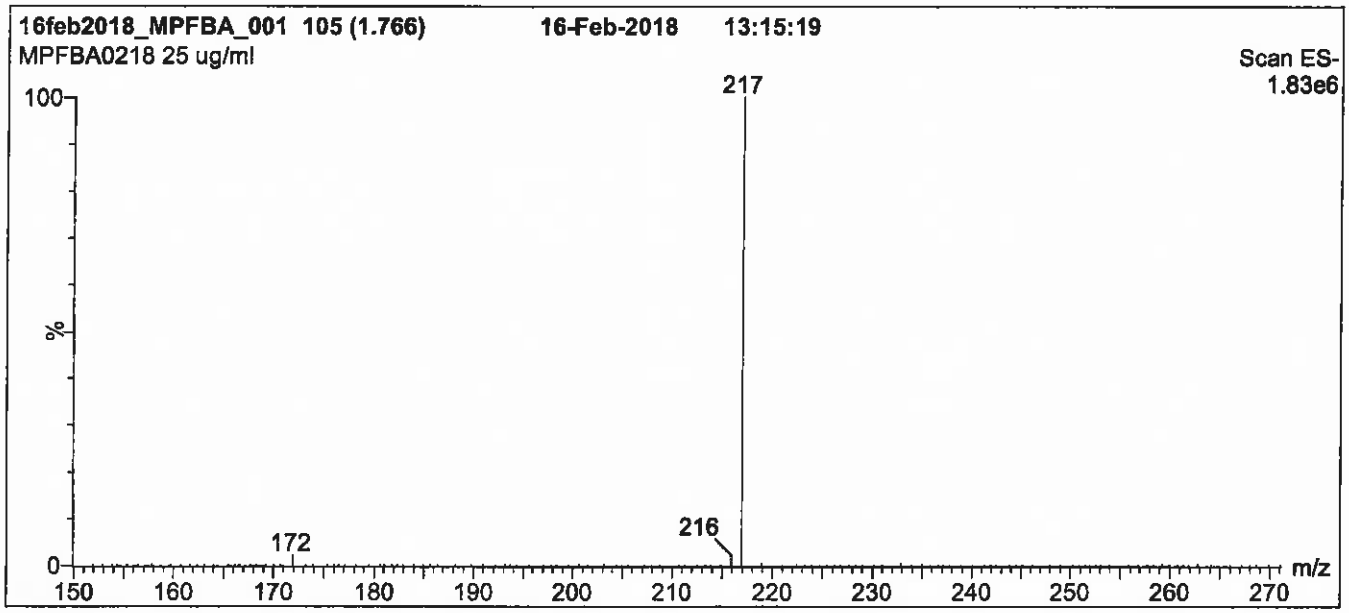
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

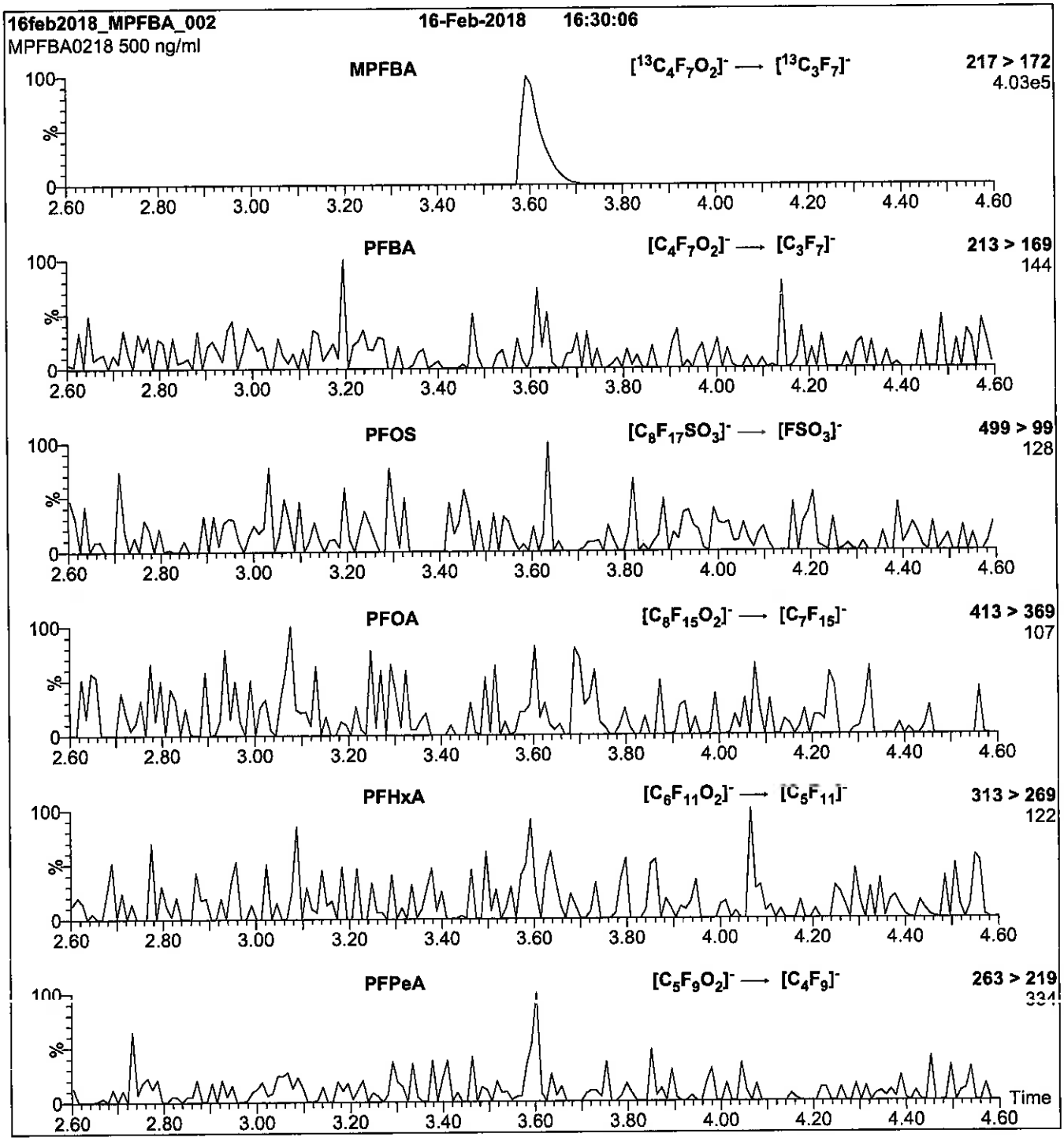
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 10

Reagent

LCMPFBA_00016

1287299
ID: LCMPFBA_00016
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorobutanoic ac

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

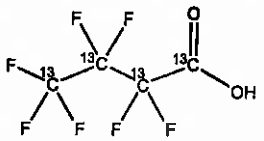
PRODUCT CODE: MPFBA

LOT NUMBER: MPFBA0218

COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4HF_7O_2$

MOLECULAR WEIGHT: 218.01

CONCENTRATION: 50 ± 2.5 µg/ml

SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 02/16/2018

EXPIRY DATE: (mm/dd/yyyy) 02/16/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 02/22/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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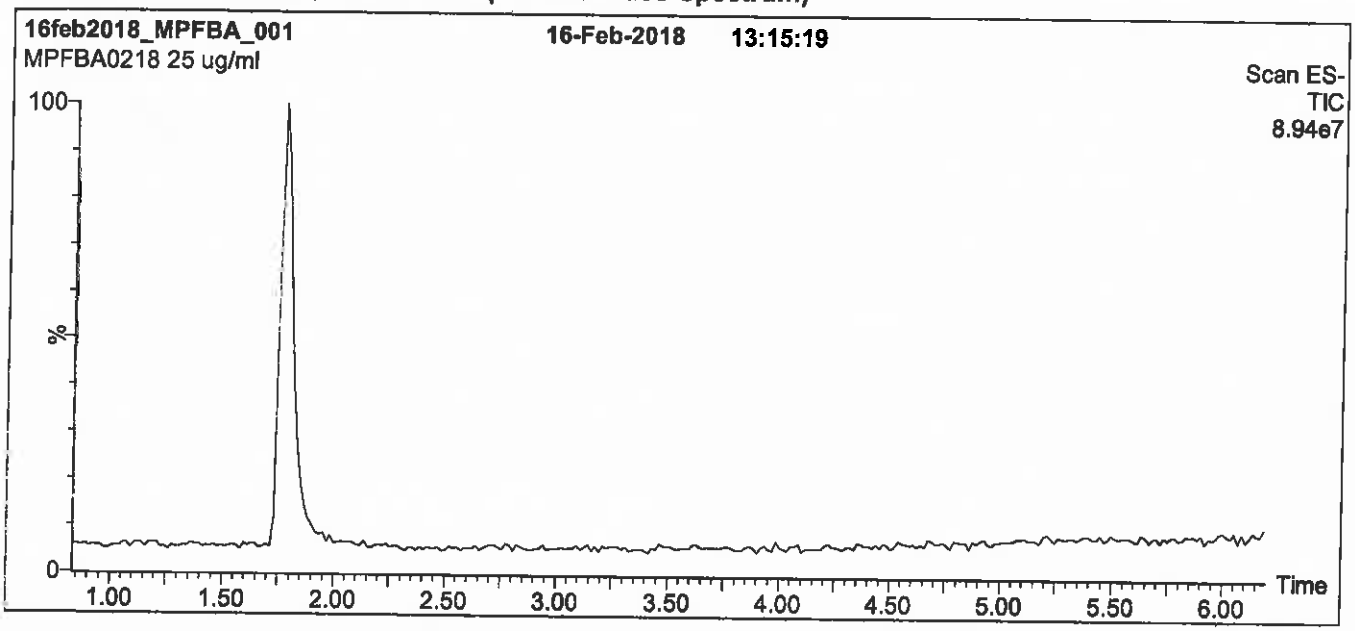

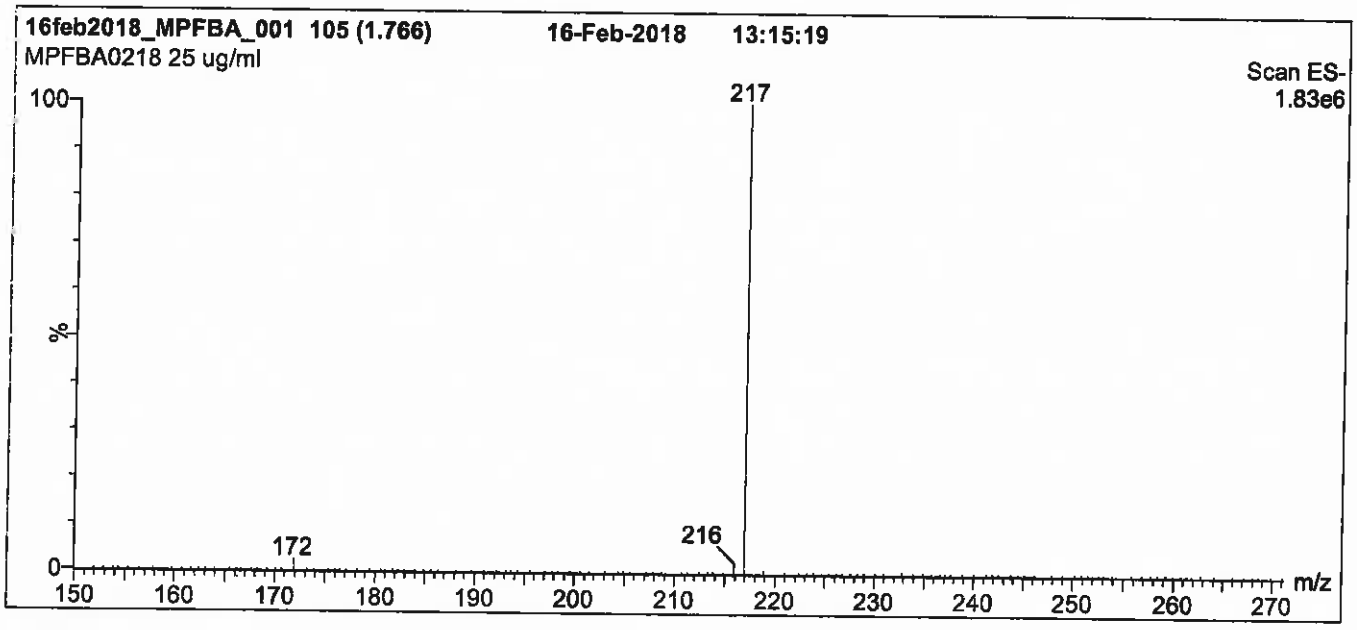

Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
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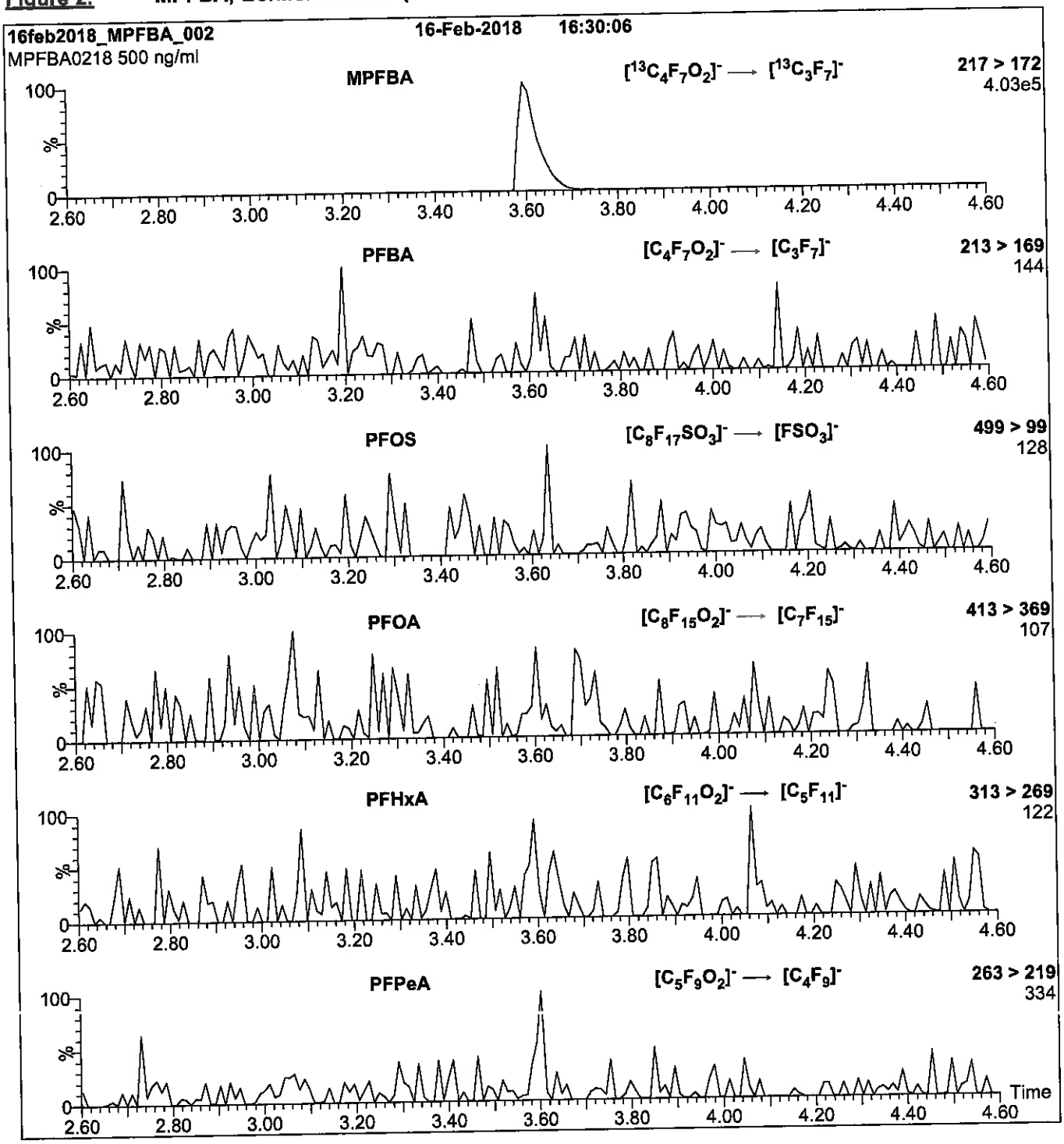


Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 10

Reagent

LCMPFBS_00008

1263177
ID: LCMPFBS_00008
Exp:02/15/23 Prpd:CBW Opn:05/30/18
13C3-Perfluorobutanesulfo

R: 5/30/18 CBW

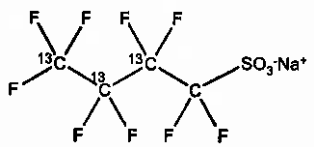
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBS **LOT NUMBER:** M3PFBS0218

COMPOUND: Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_3{}^{12}CF_9SO_3Na$ **MOLECULAR WEIGHT:** 325.06

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
46.5 ± 2.3 µg/ml (M3PFBS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (2,3,4-$^{13}C_3$)

LAST TESTED: (mm/dd/yyyy) 02/15/2018

EXPIRY DATE: (mm/dd/yyyy) 02/15/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 02/16/2018 (mm/dd/yyyy)
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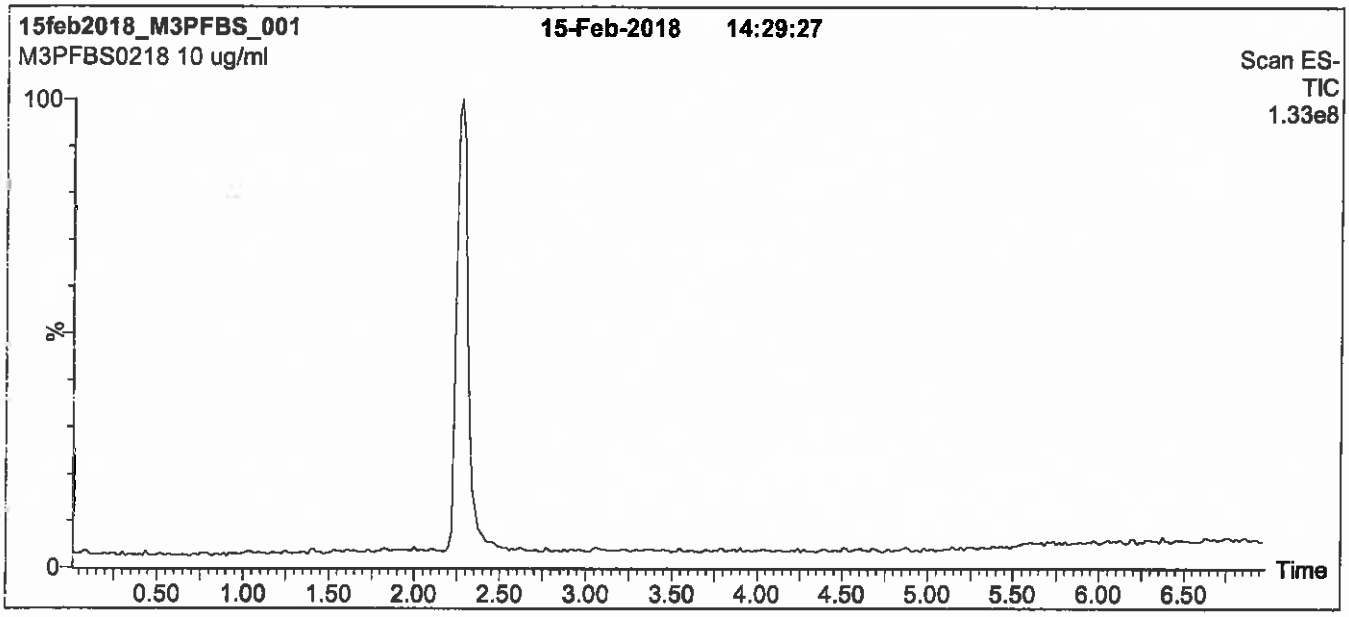

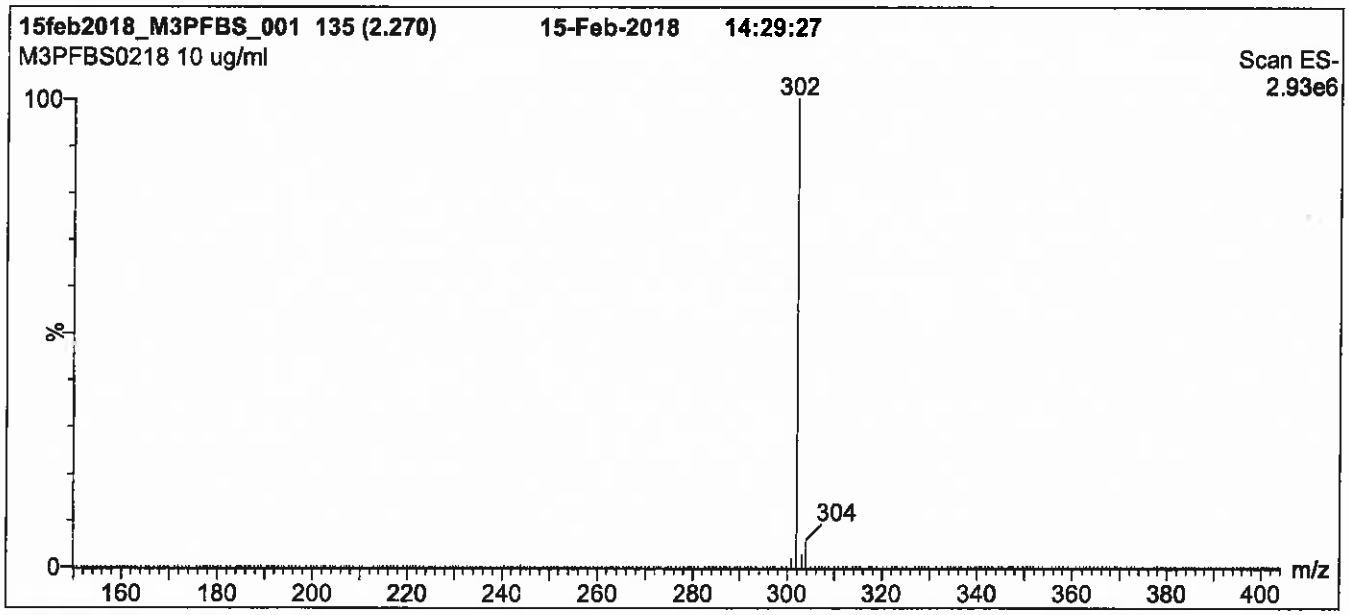

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Time: 10 min

Flow: 300 µl/min

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Experiment: Full Scan (150 - 850 amu)

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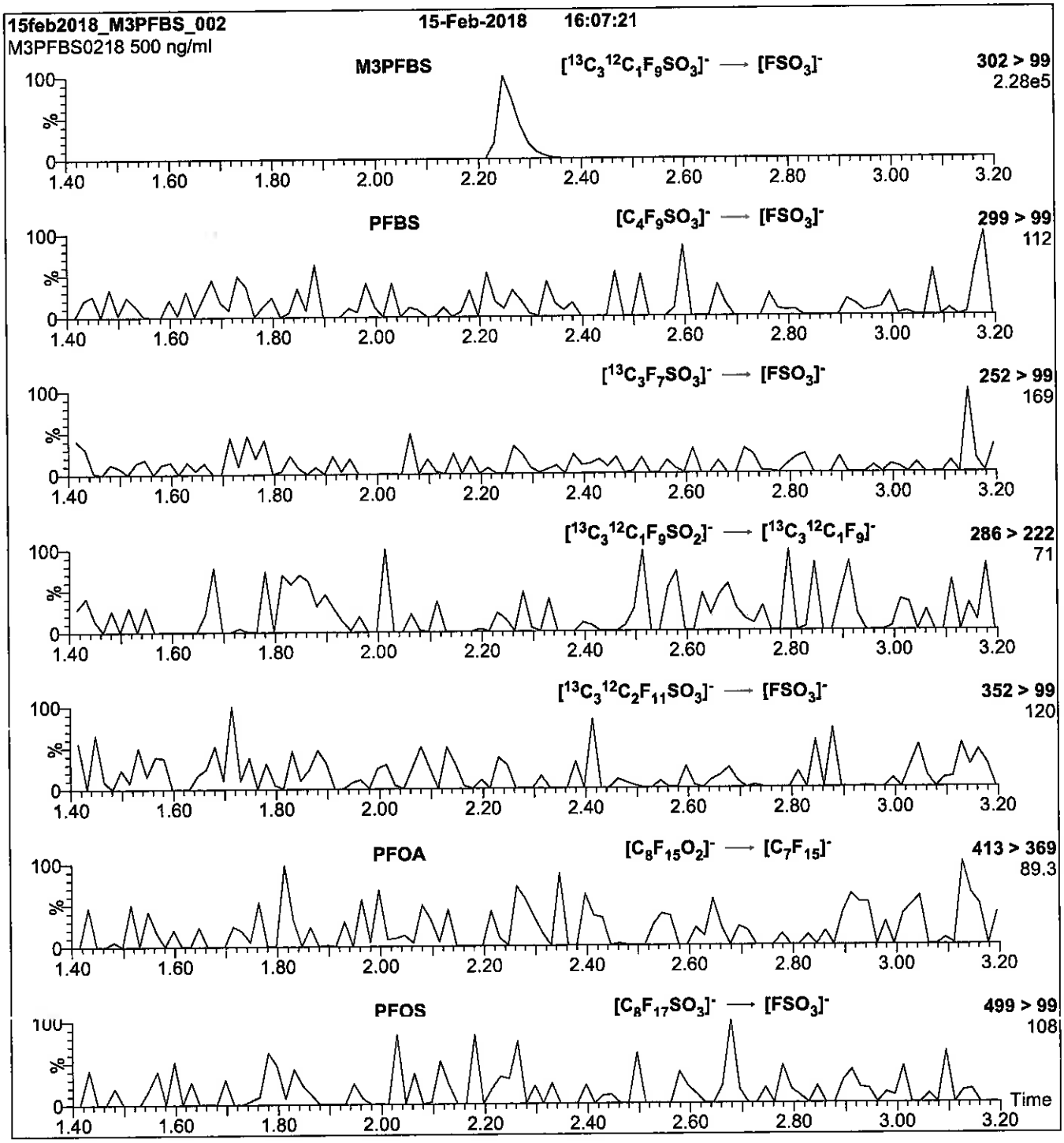
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 25

Reagent

LCMPFBS_00009

1287346
ID: LCMPFBS_00009
Exp:02/15/23 Prpd:CBW Opn:06/26/18
13C3-Perfluorobutanesulfo

R-6/26/18 cbw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBS
LOT NUMBER: M3PFBS0218
COMPOUND: Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate

STRUCTURE:
CAS #: Not available

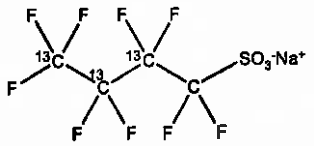


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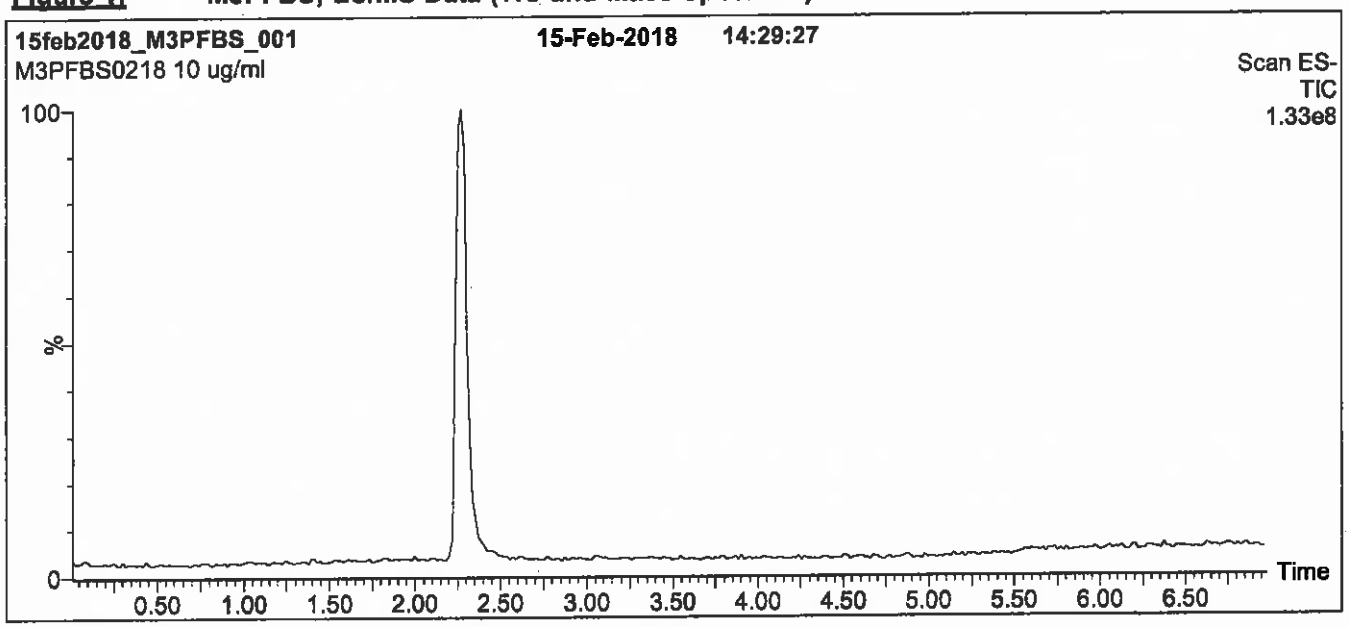
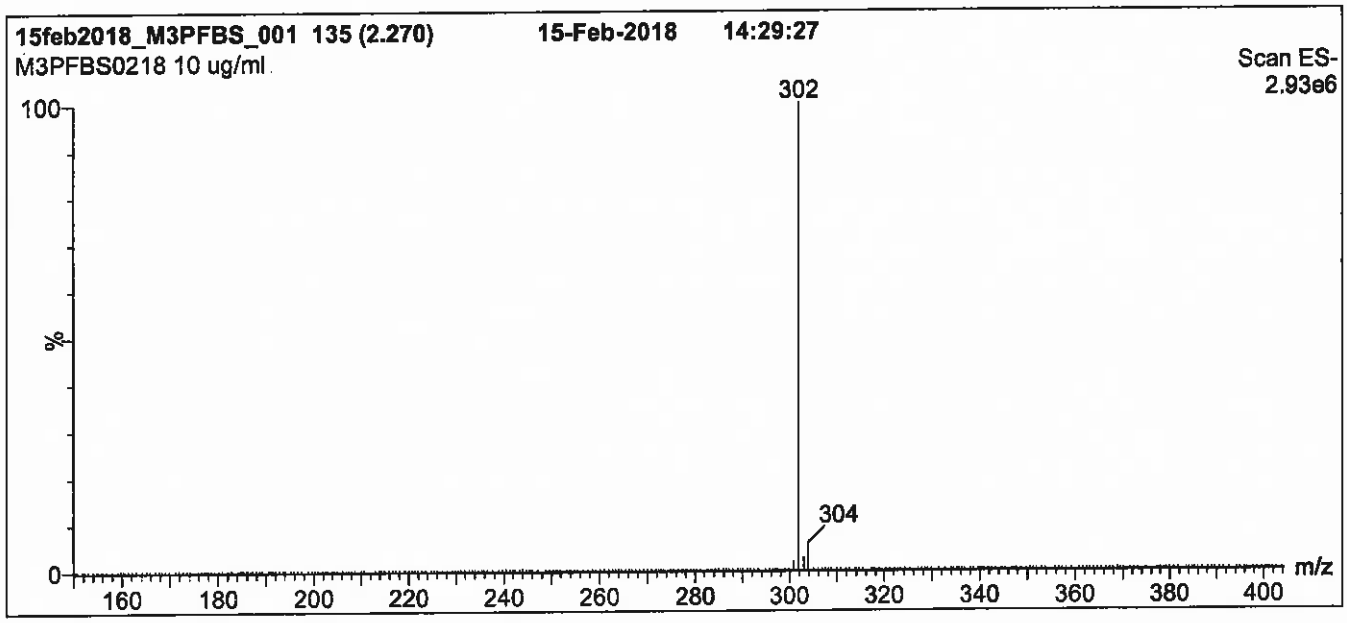
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

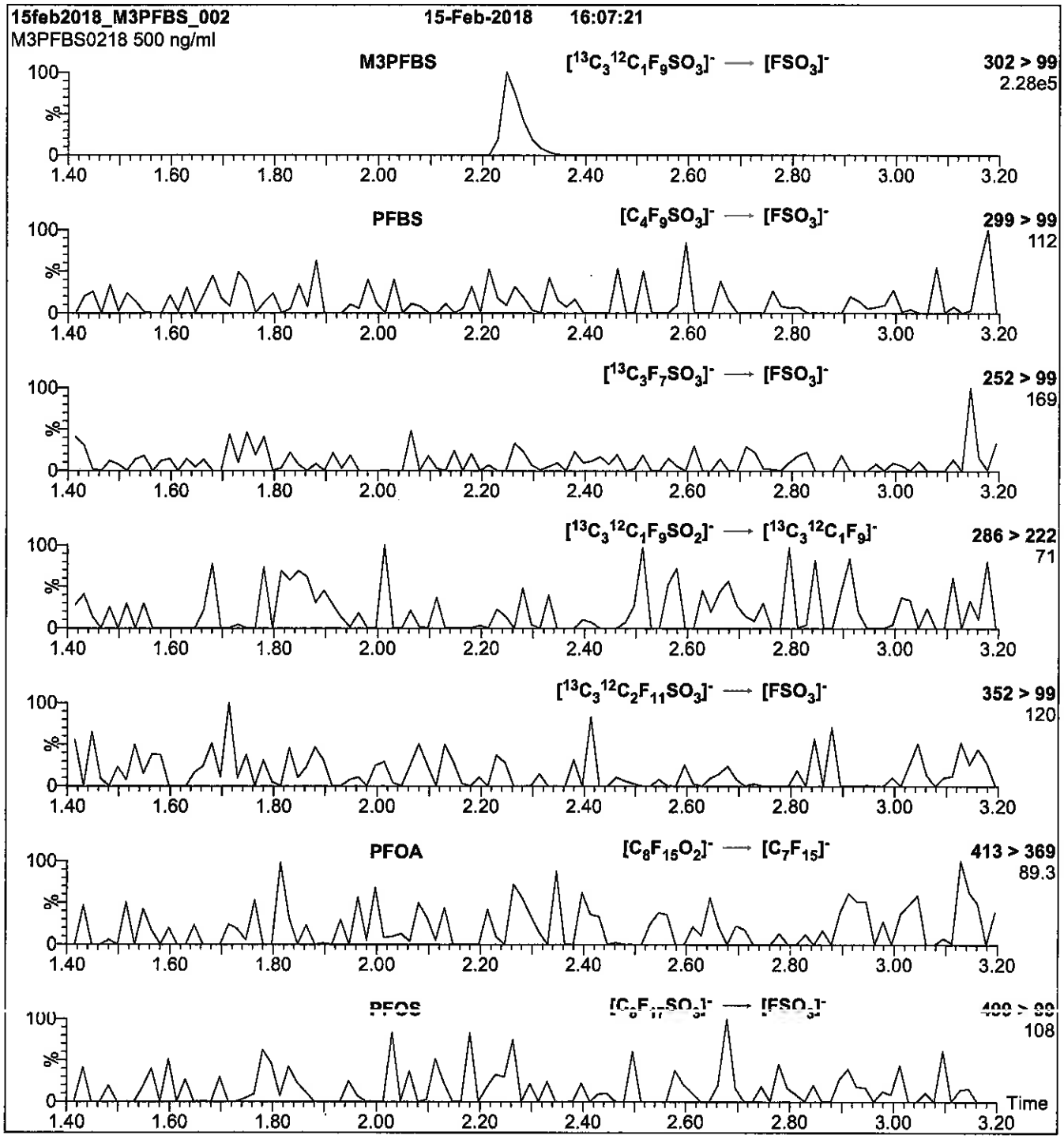
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M3PFBS)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.17e-3 Collision Energy (eV) = 25
Flow:	300 µl/min	

Reagent

LCMPFDA_00020

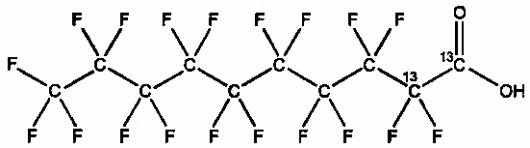
R: 5/30/18 CEW

1263165
ID: LCMPFDA_00020
Exp:02/16/23 Prpd:CBW Opn:05/30/18
13C2-Perfluoromodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0218
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
MOLECULAR WEIGHT: 516.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

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Certified By: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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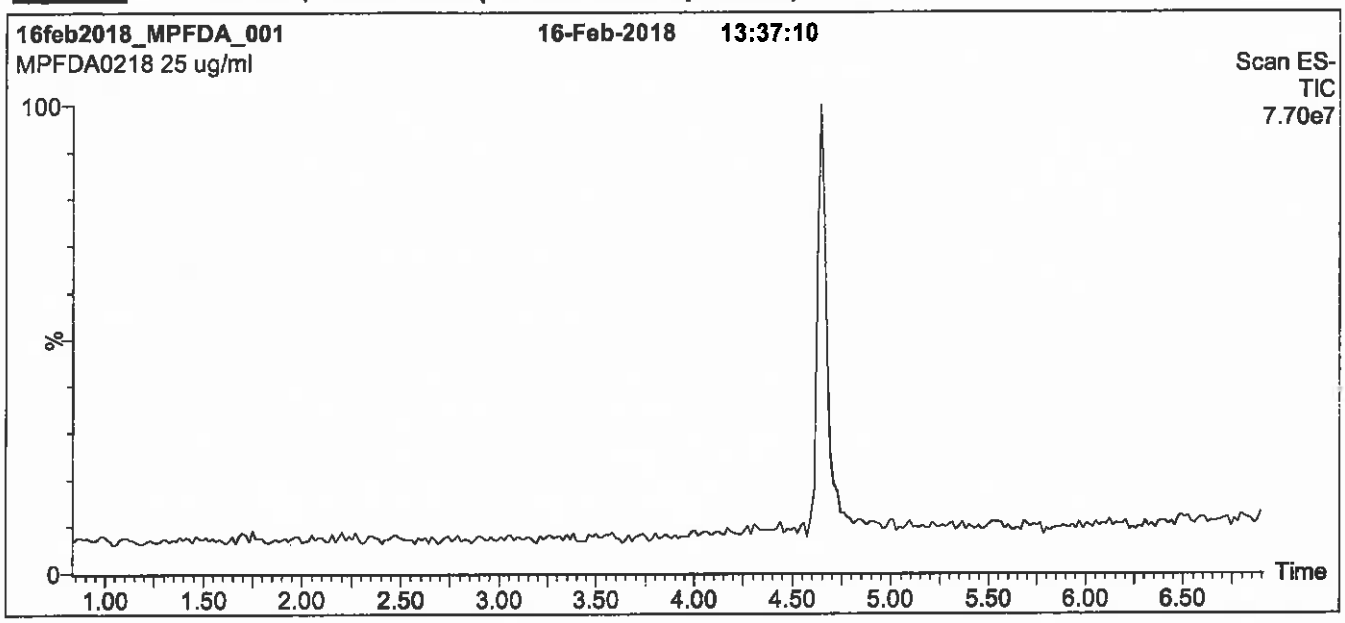
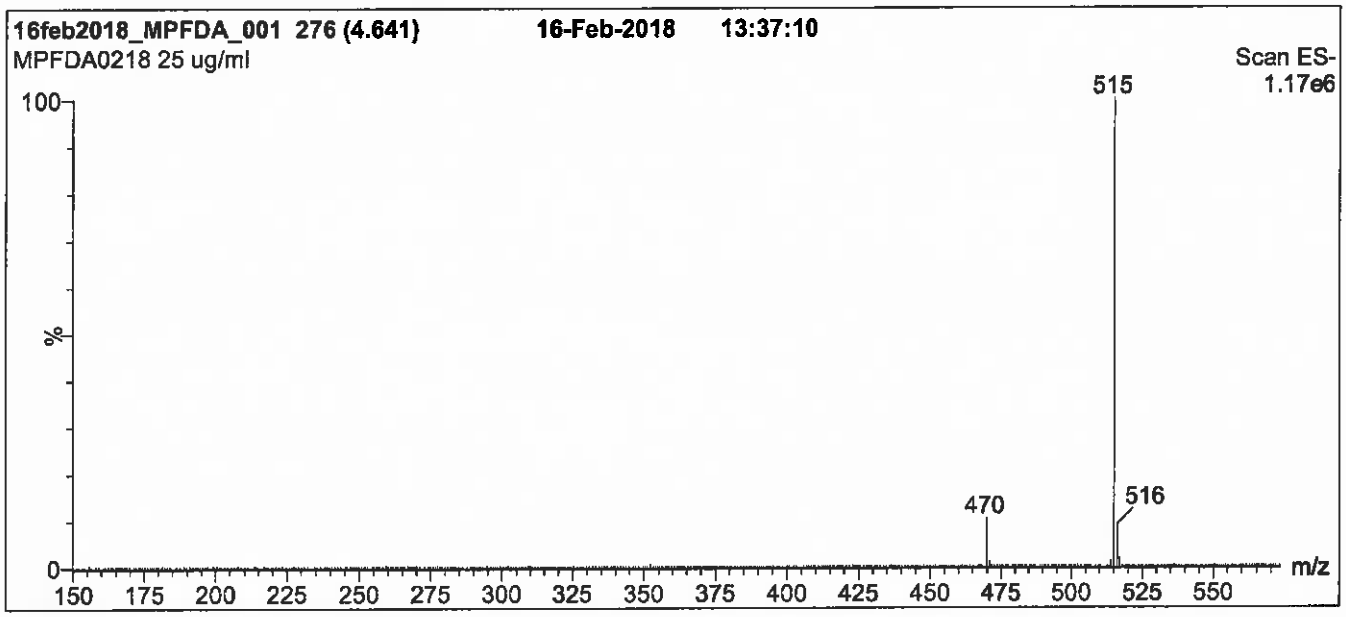
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

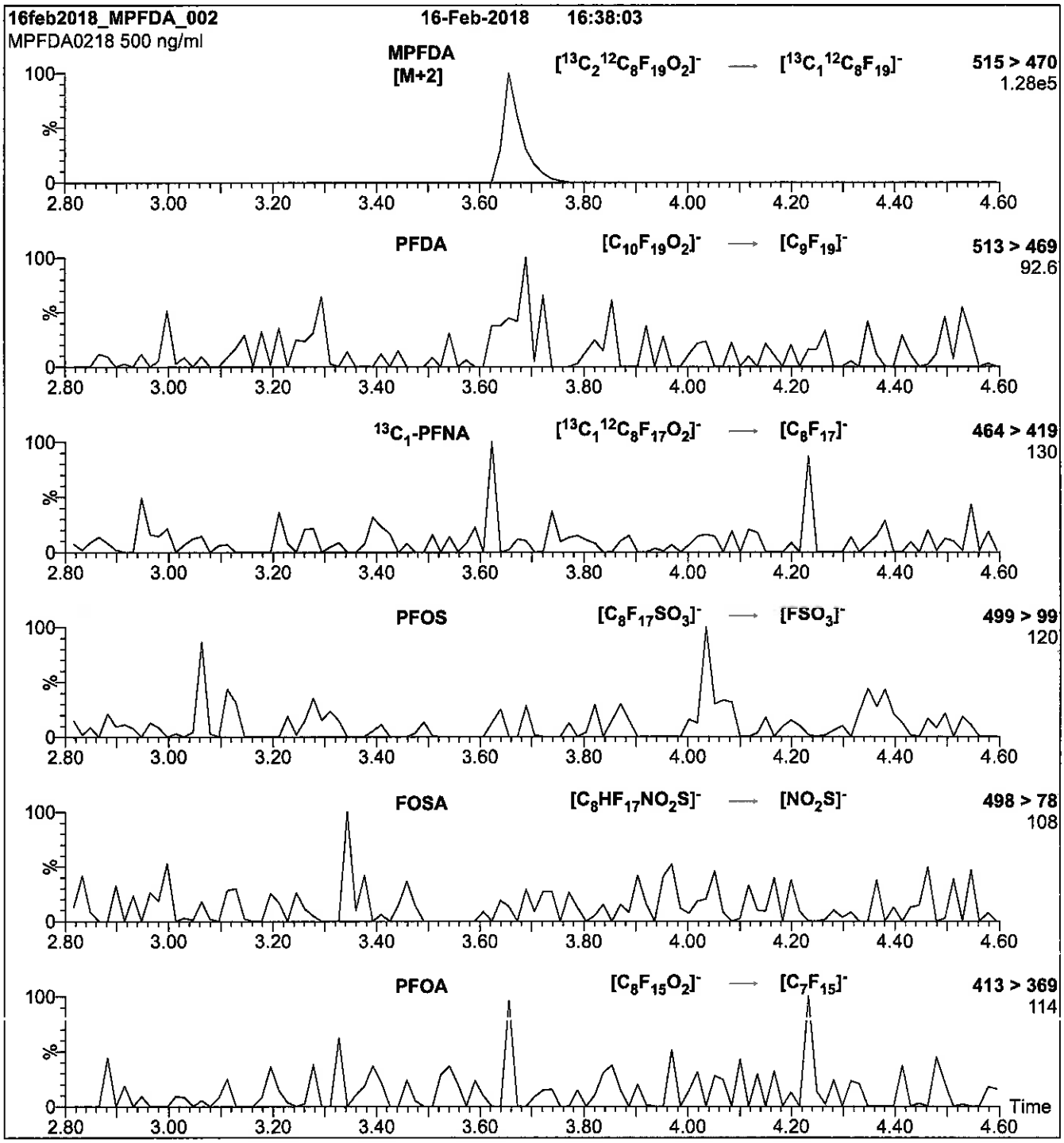
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFDA_00021

1287334
ID: LCMPFDA_00021
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C2-Perfluorodecanoic a

R:6/26/18 CBW

WELLINGTON LABORATORIES

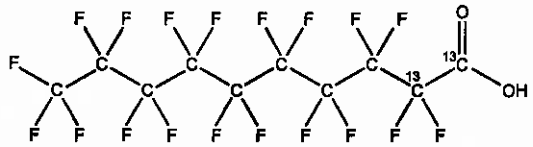
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

LOT NUMBER: MPFDA0218

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 516.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

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Certified By: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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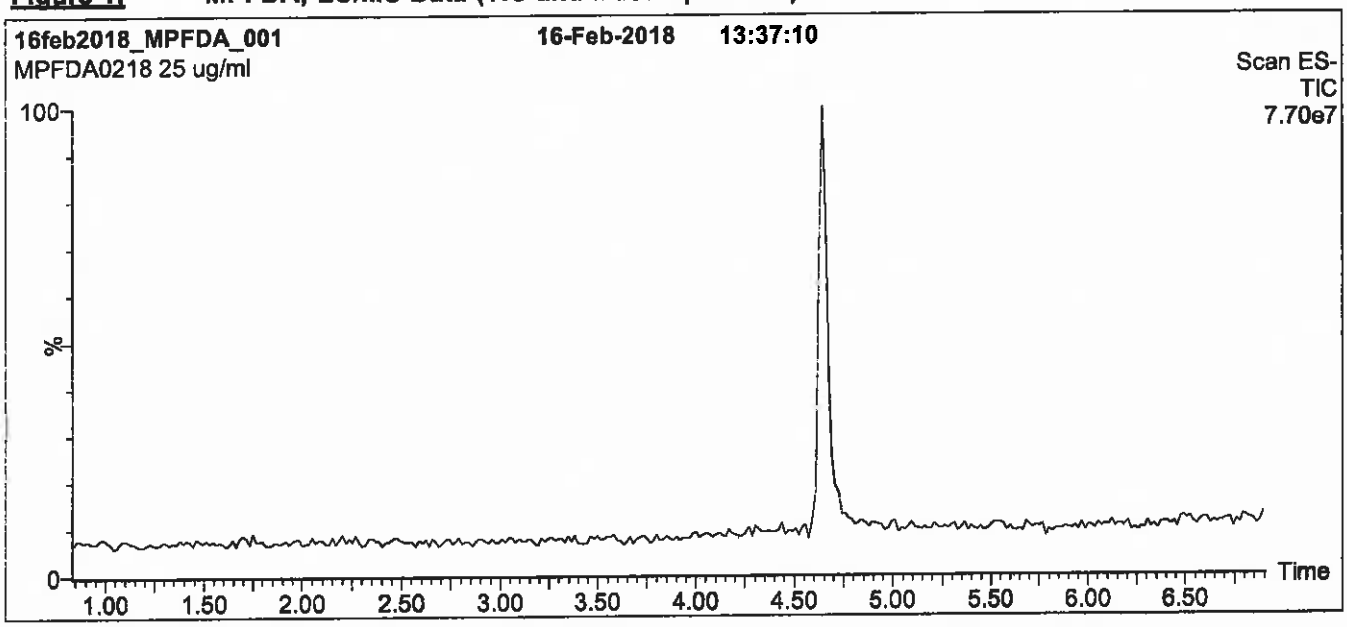
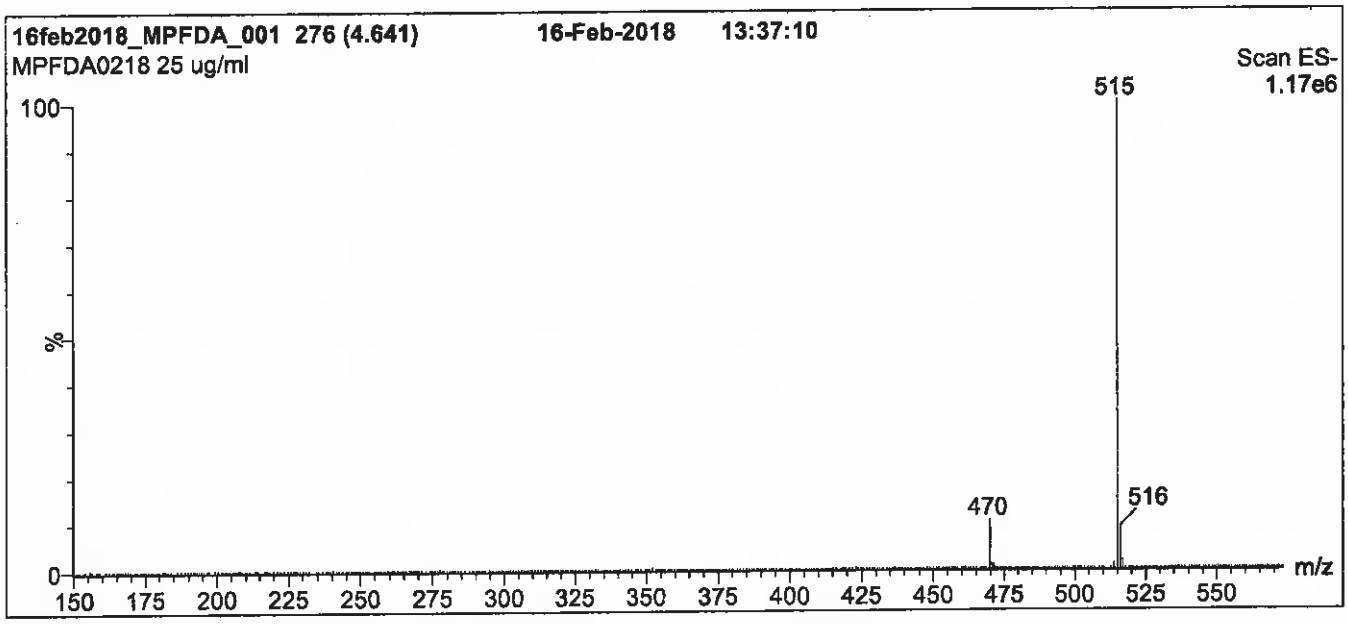
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

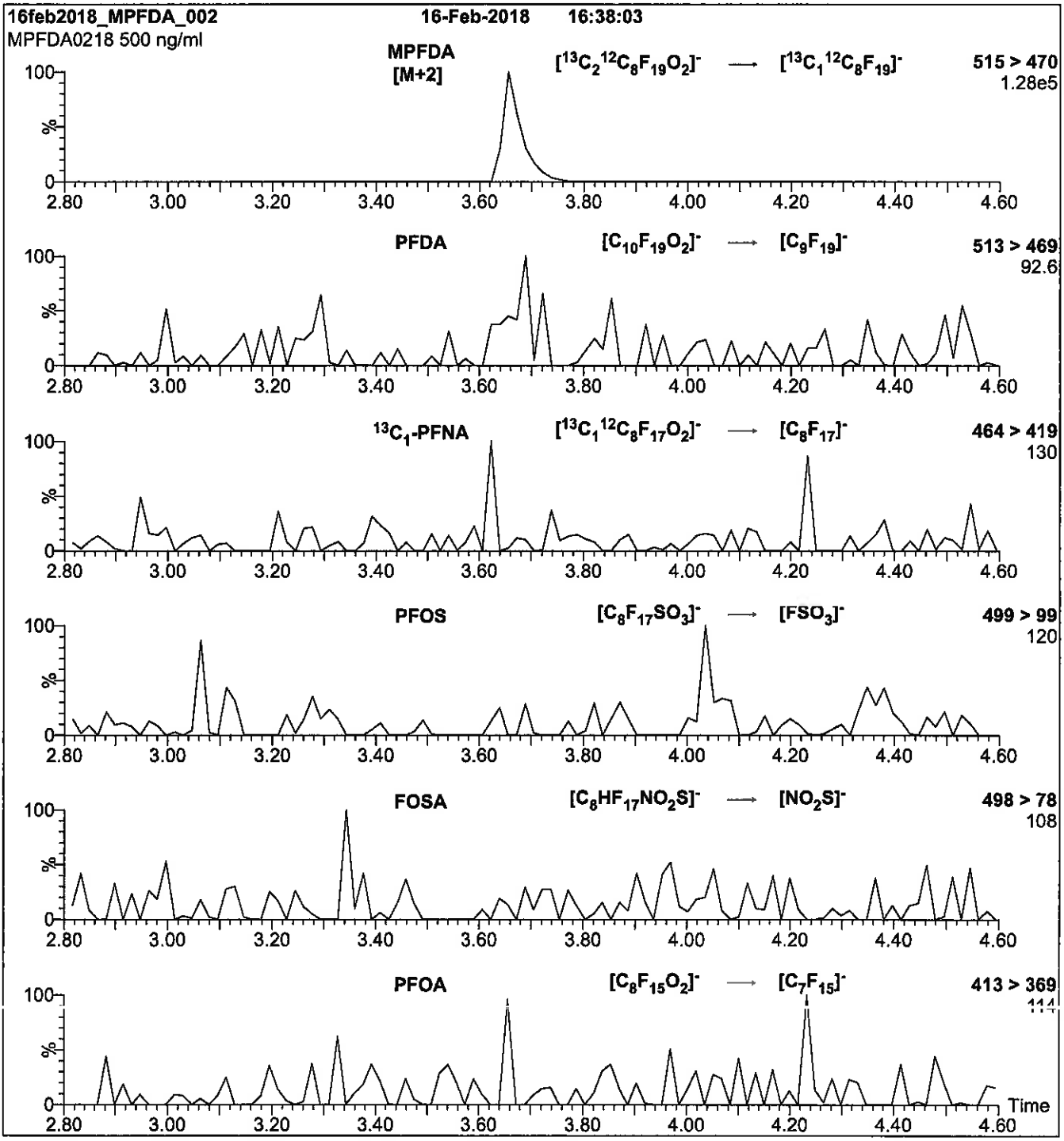
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 13
Flow:	300 µl/min	

Reagent

LCMPFDoA_00015

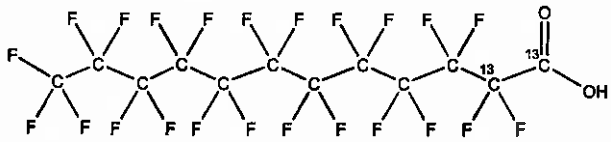
1263139
ID: LCMPFDoA_00015
Exp:02/16/23 Prpd:CBW Opn:05/30/18
13C2-Perfluorododecanoic

R: 5/30/18 cbw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA
LOT NUMBER: MPFDoA0218
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{10}HF_{23}O_2$
MOLECULAR WEIGHT: 616.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 02/23/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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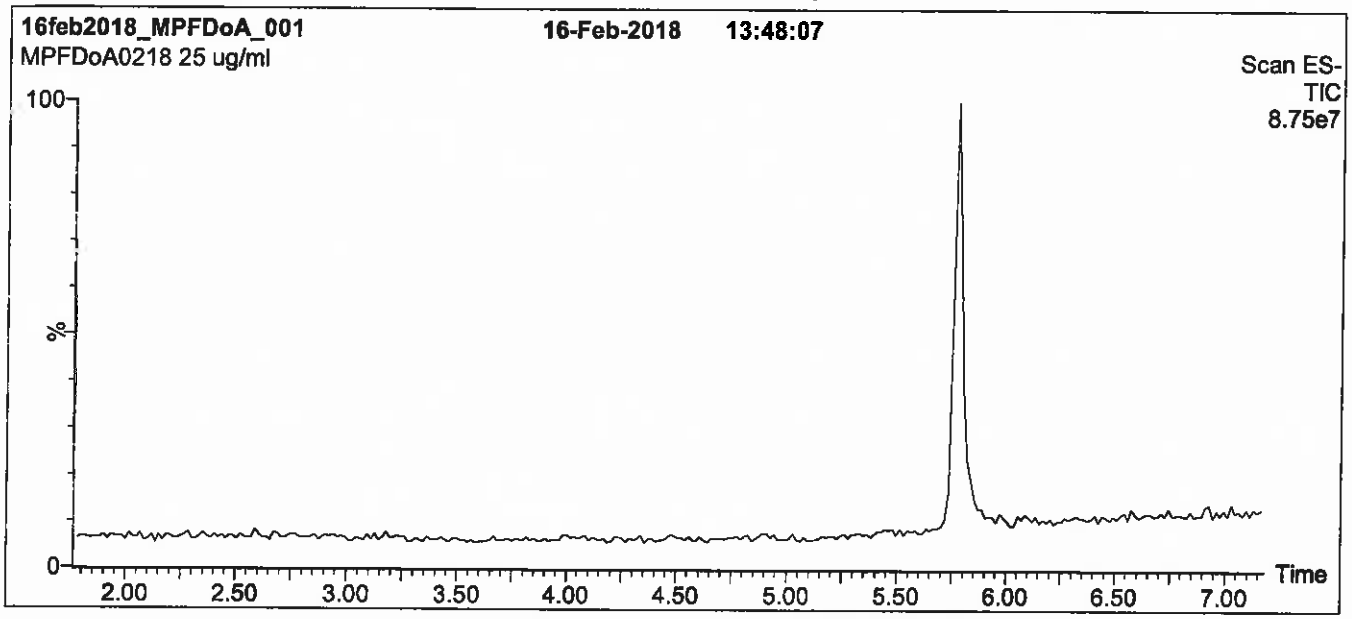
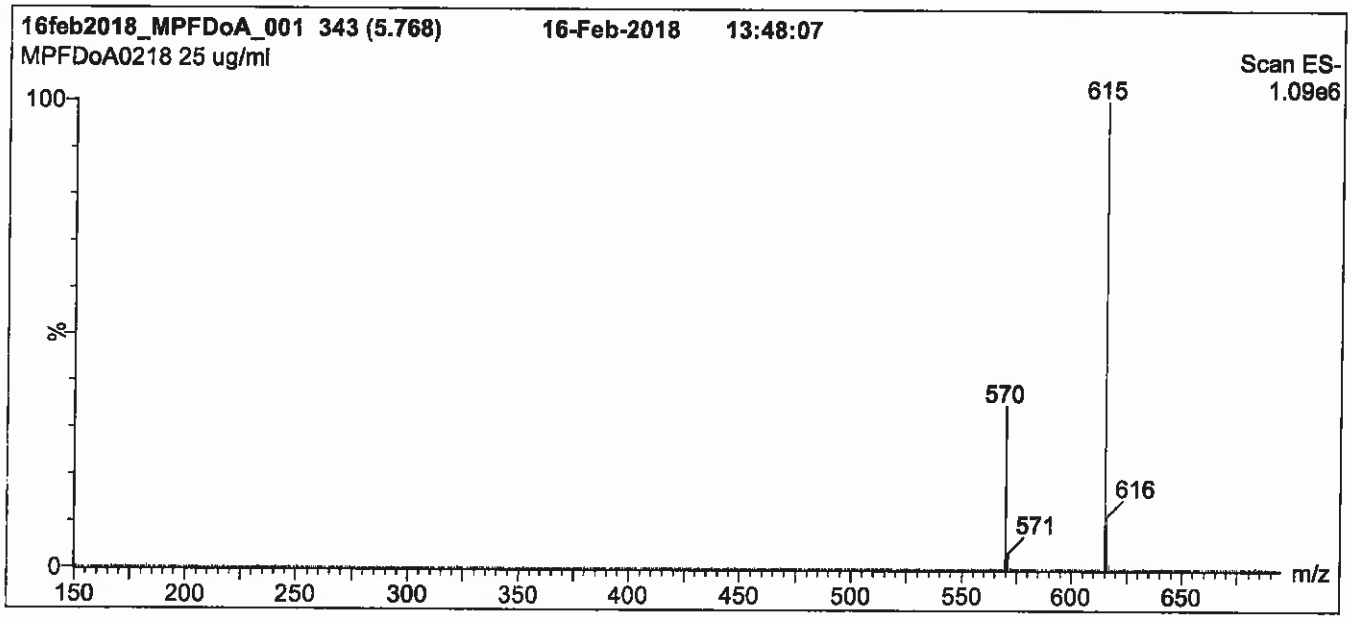
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

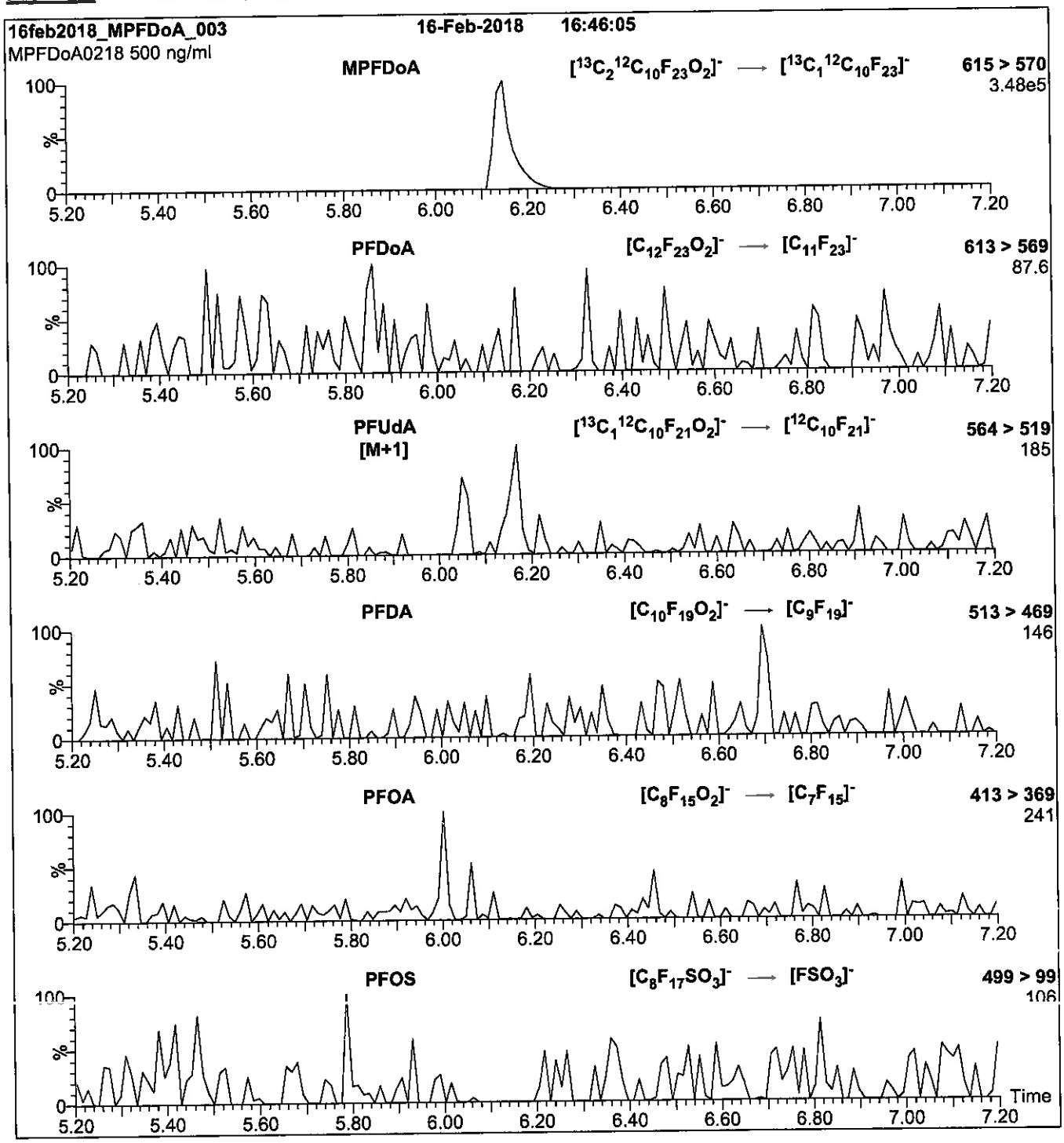
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00016

1287284
ID: LCMPFDoA_00016
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C2-Perfluorododecanoic

#6/26/18 CBW

WELLINGTON LABORATORIES

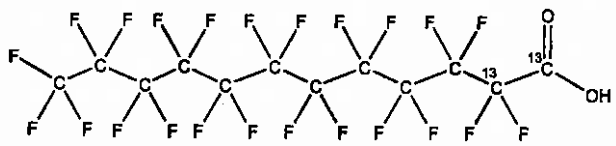
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0218

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{10}HF_{23}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 616.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/23/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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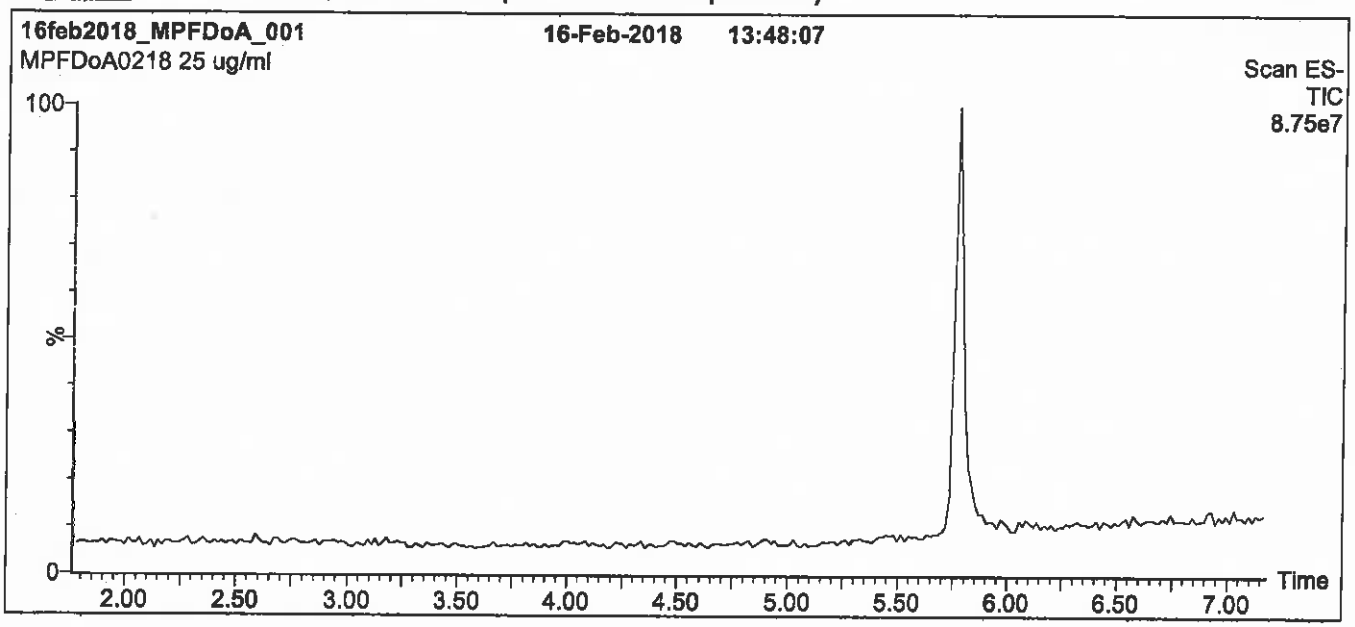
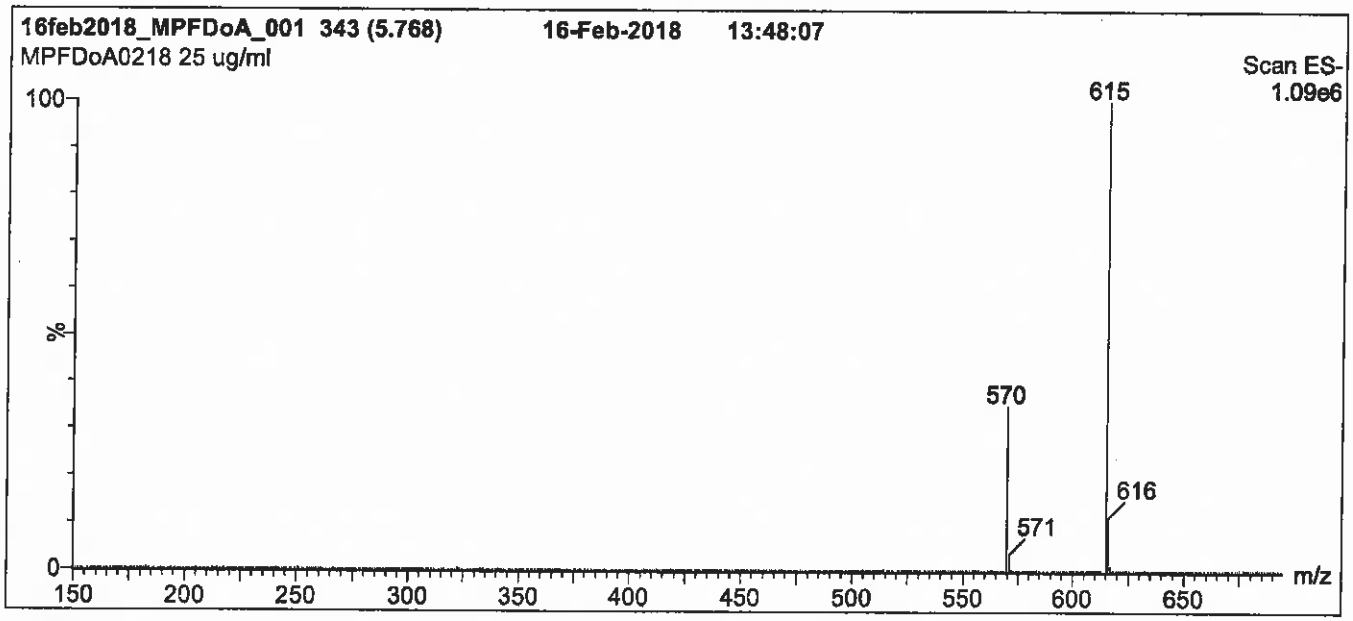
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

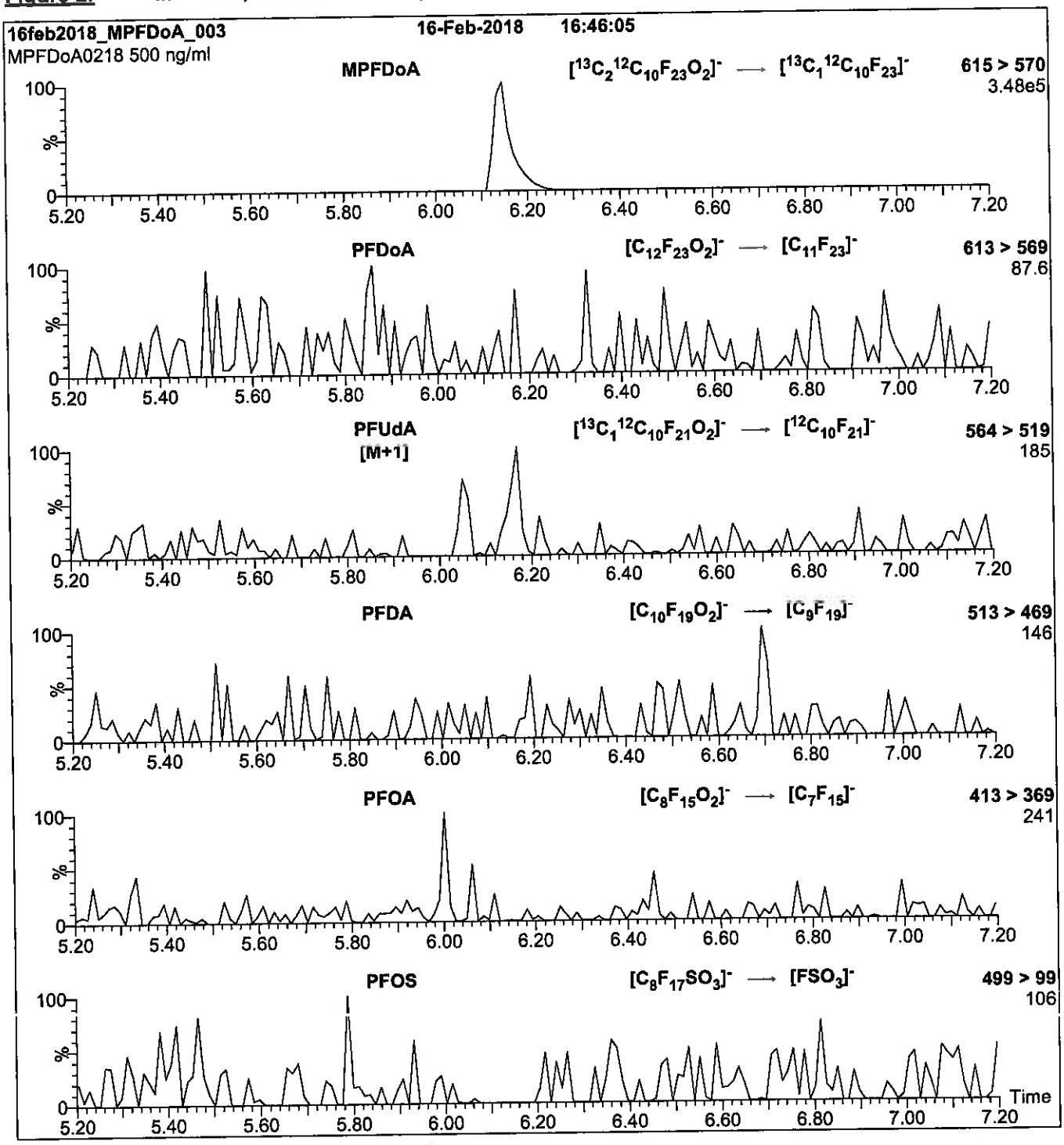
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00022

R: 5/30/18 CBW

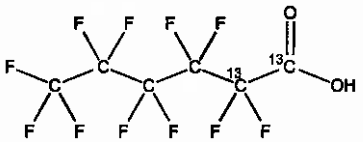
1263168
ID: LCMPFHxA_00022
Exp:10/27/22 Prpd:CBW Opn:05/30/18
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA1017
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
MOLECULAR WEIGHT: 316.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 10/27/2017
EXPIRY DATE: (mm/dd/yyyy) 10/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and < 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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CALA

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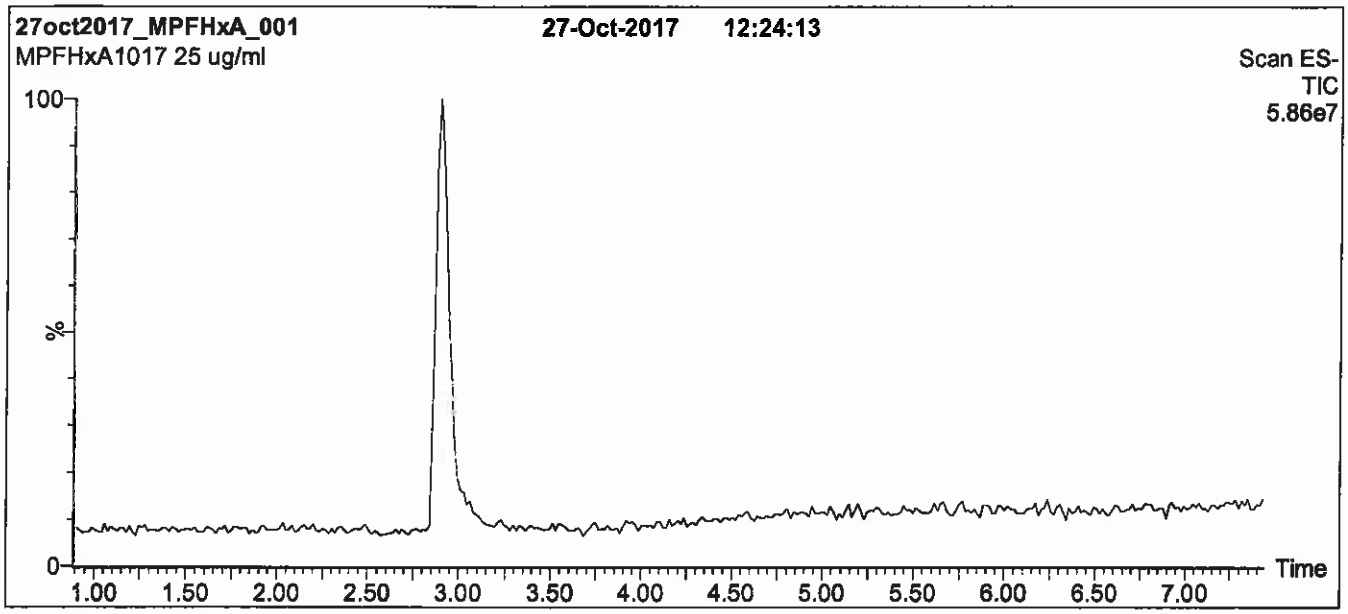
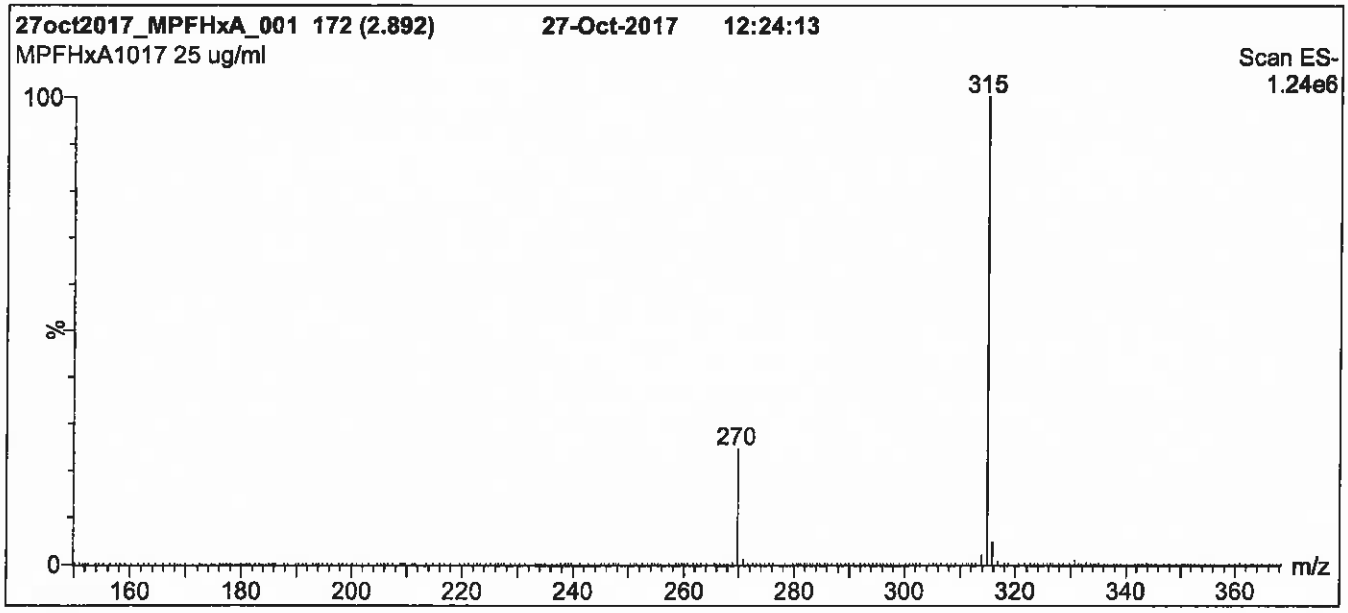
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

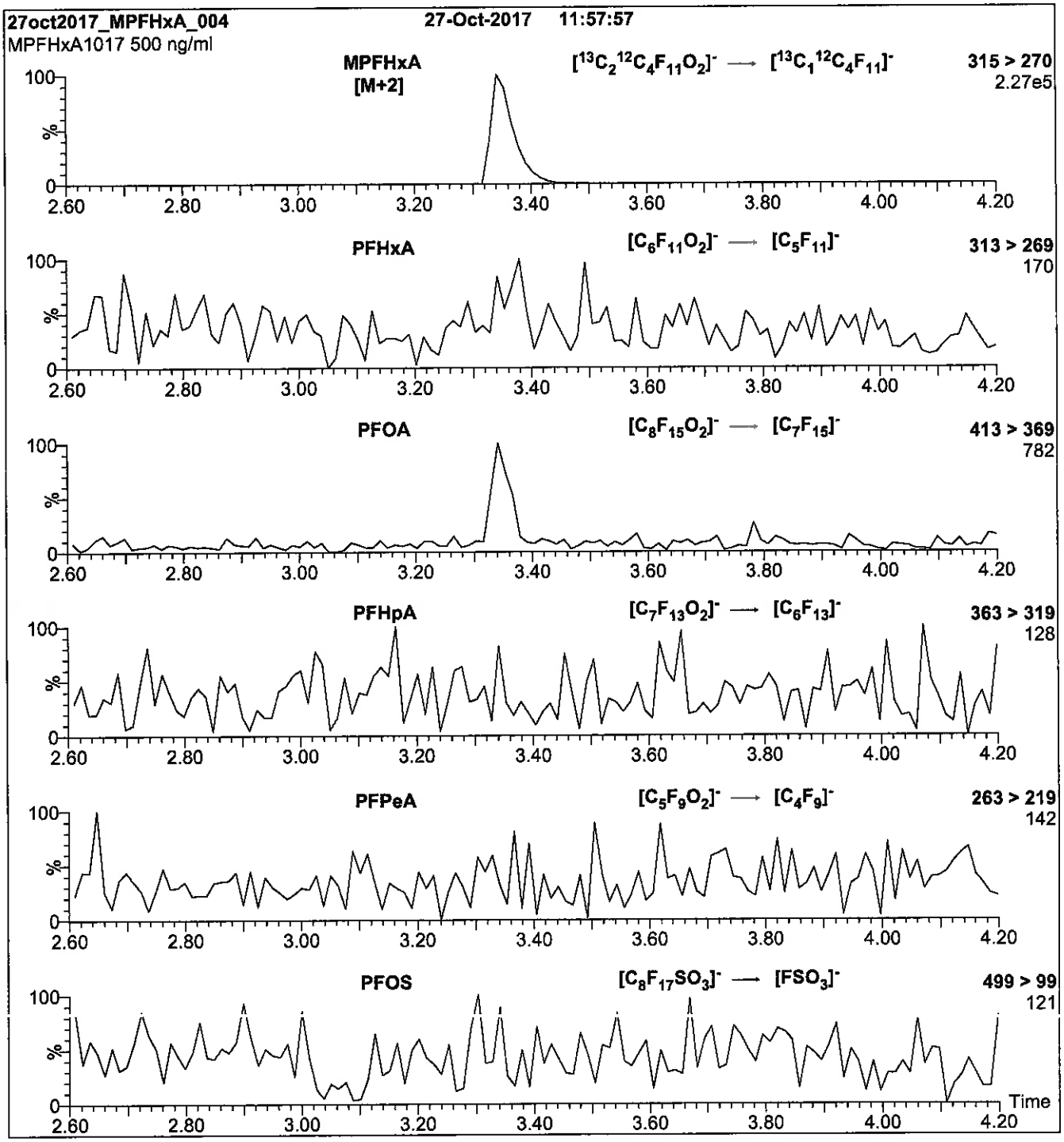
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxA_00023

1287337
ID: LCMPFHxA_00023
Exp:10/27/22 Prpd:CBW Opn:06/26/18
13C2-Perfluorohexanoic ac

R: 6/26/18 CBW

WELLINGTON LABORATORIES

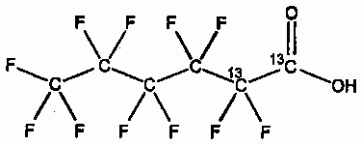
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

LOT NUMBER: MPFHxA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/27/2017
EXPIRY DATE: (mm/dd/yyyy) 10/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 316.04
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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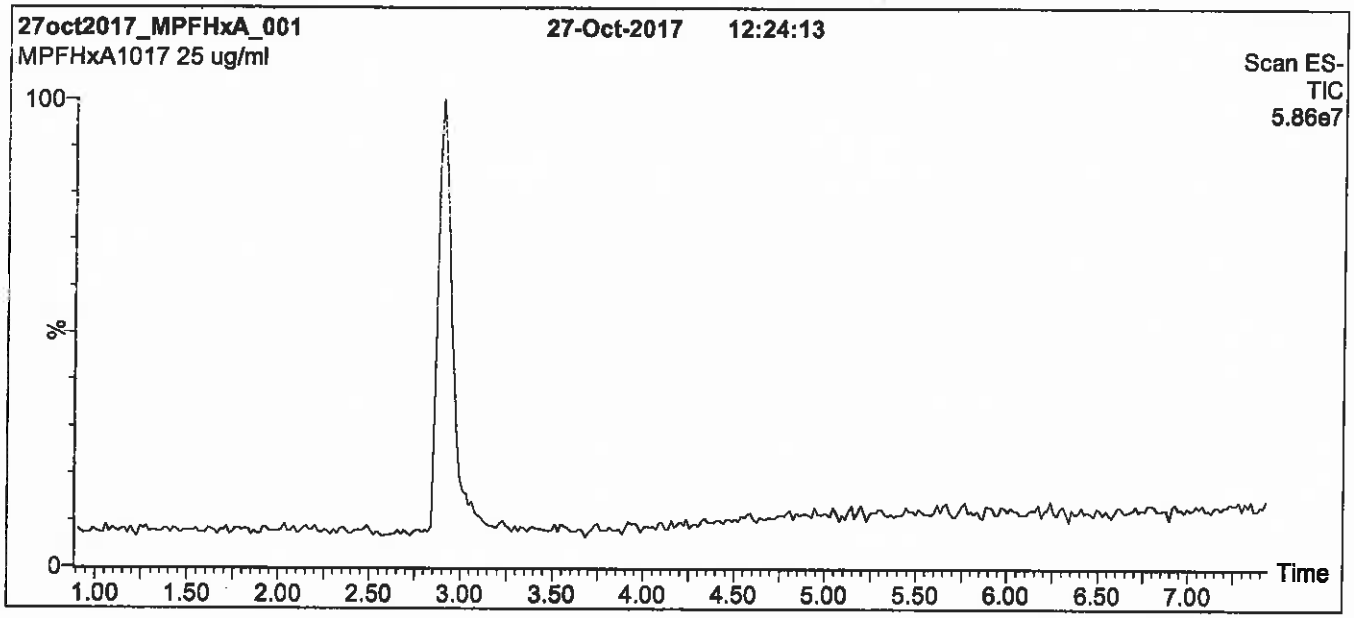

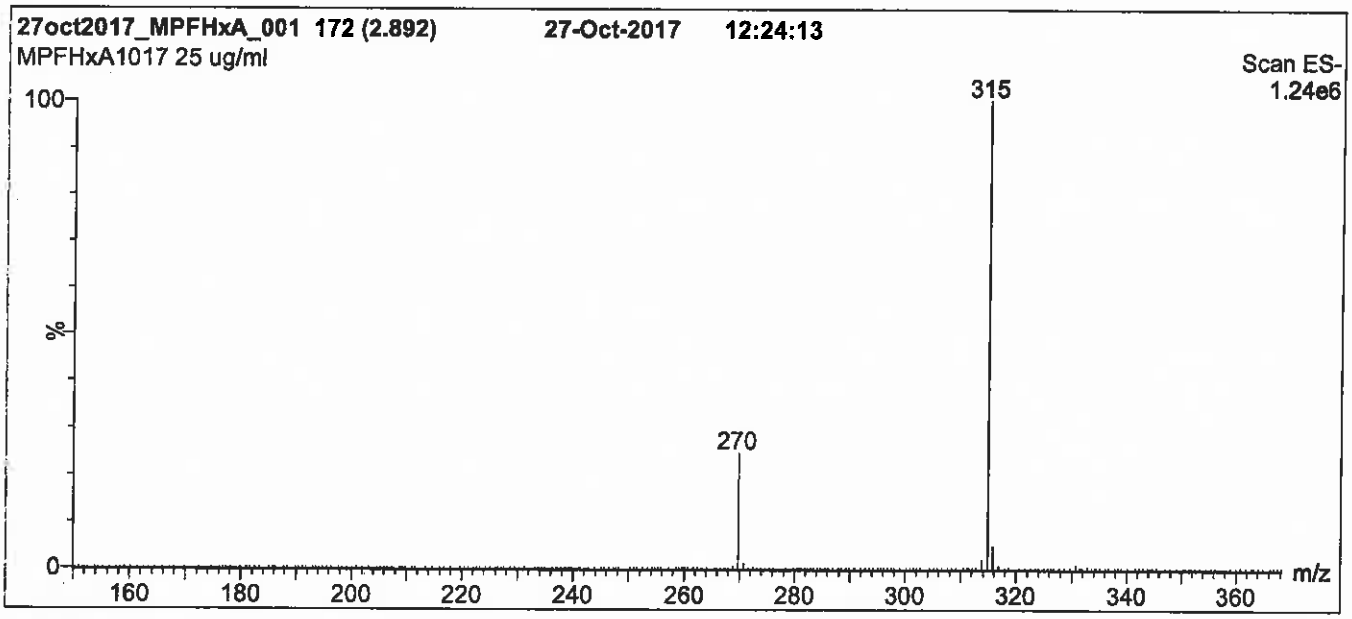

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MS: Micromass Quattro *micro* API MS

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
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Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

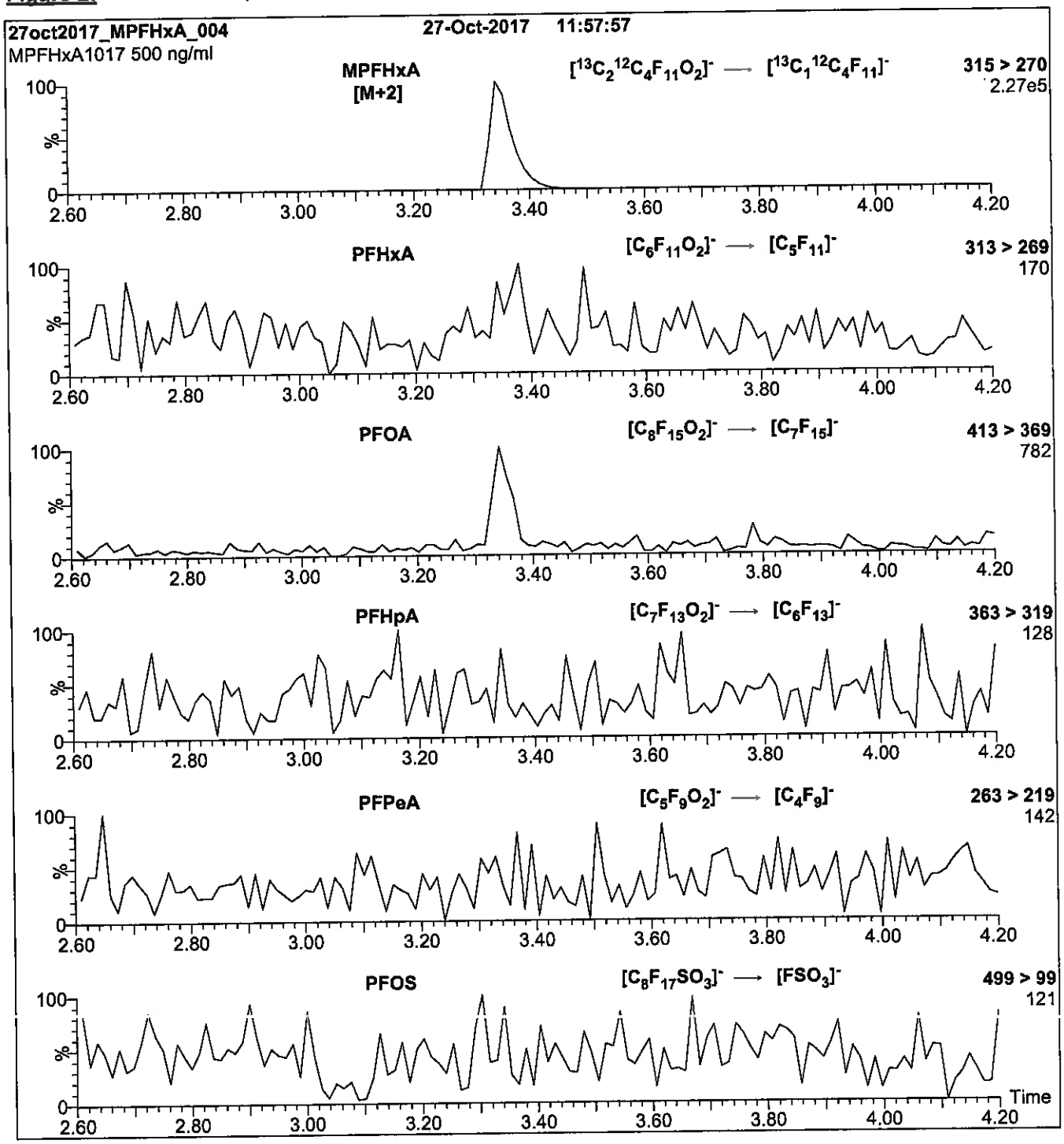
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFHxA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxS_00015

R: 5/30/18 CBW

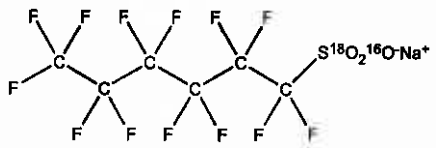
1263157
ID: LCMPFHxS_00015
Exp:03/22/23 Prpd:CBW Opn:05/30/18
18O2-Perfluorohexanesulfo

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS
LOT NUMBER: MPFHxS0318
COMPOUND: Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $C_6F_{13}S^{18}O_2{}^{16}ONa$
MOLECULAR WEIGHT: 426.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (MPFHxS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: >94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy) 03/22/2018
EXPIRY DATE: (mm/dd/yyyy) 03/22/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFHpS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/27/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

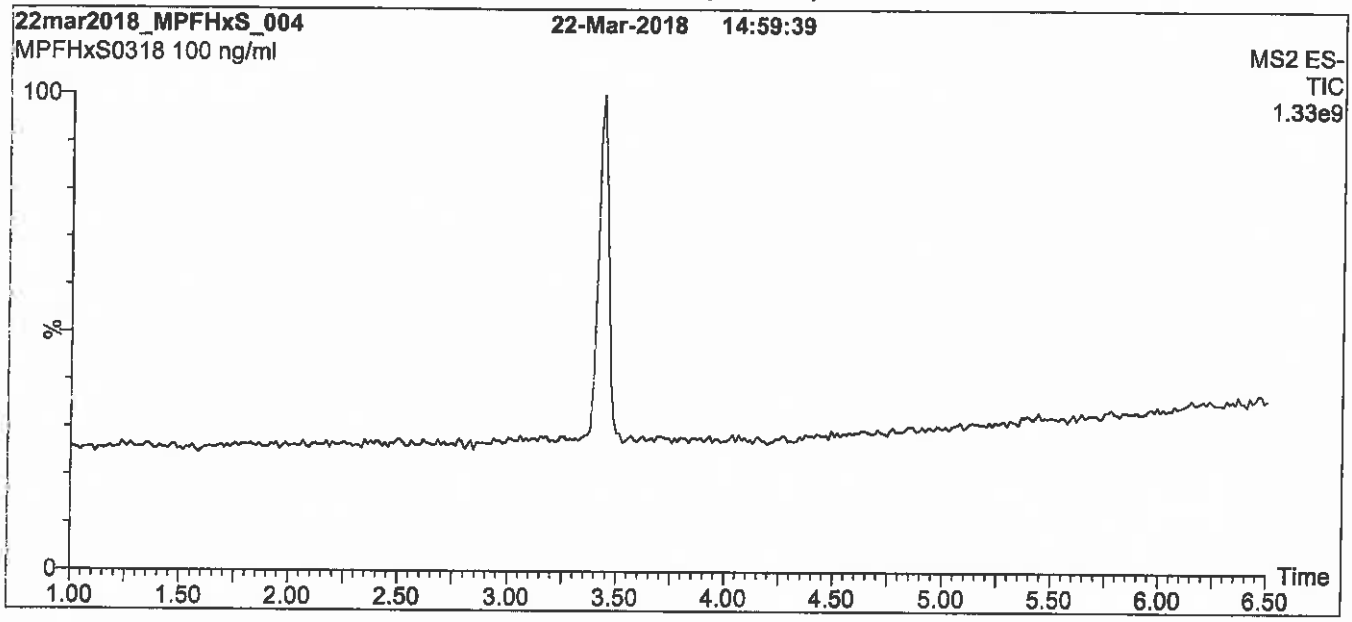
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

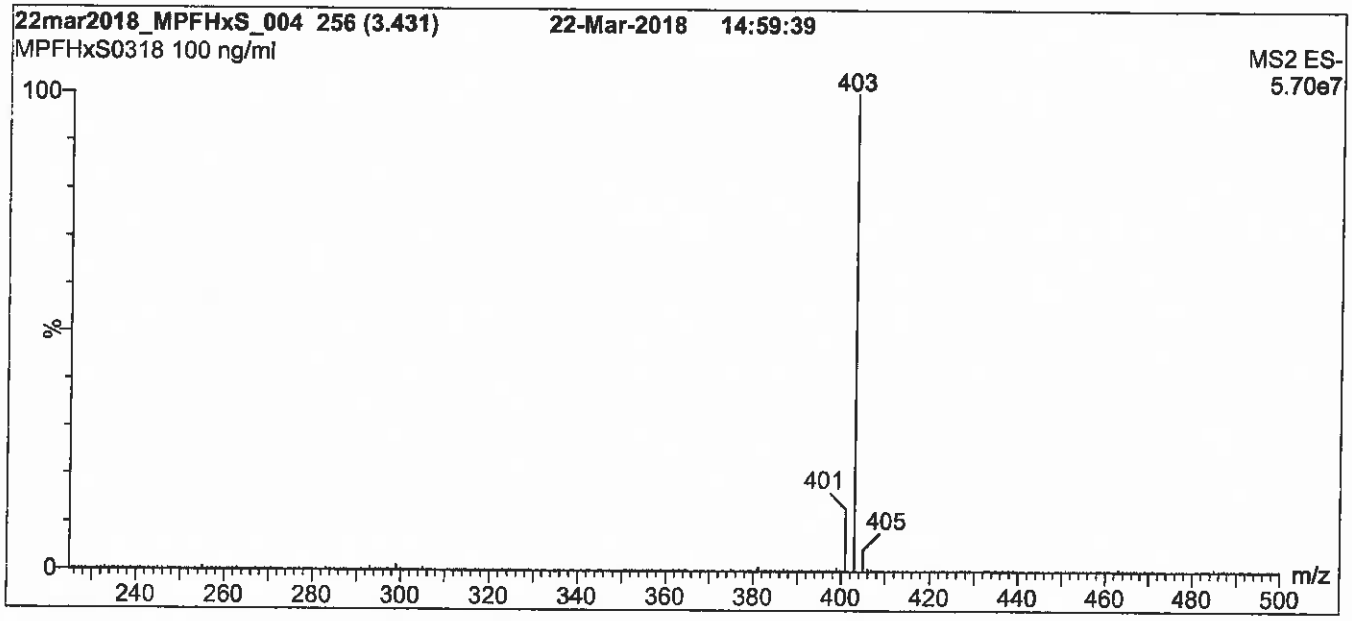
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

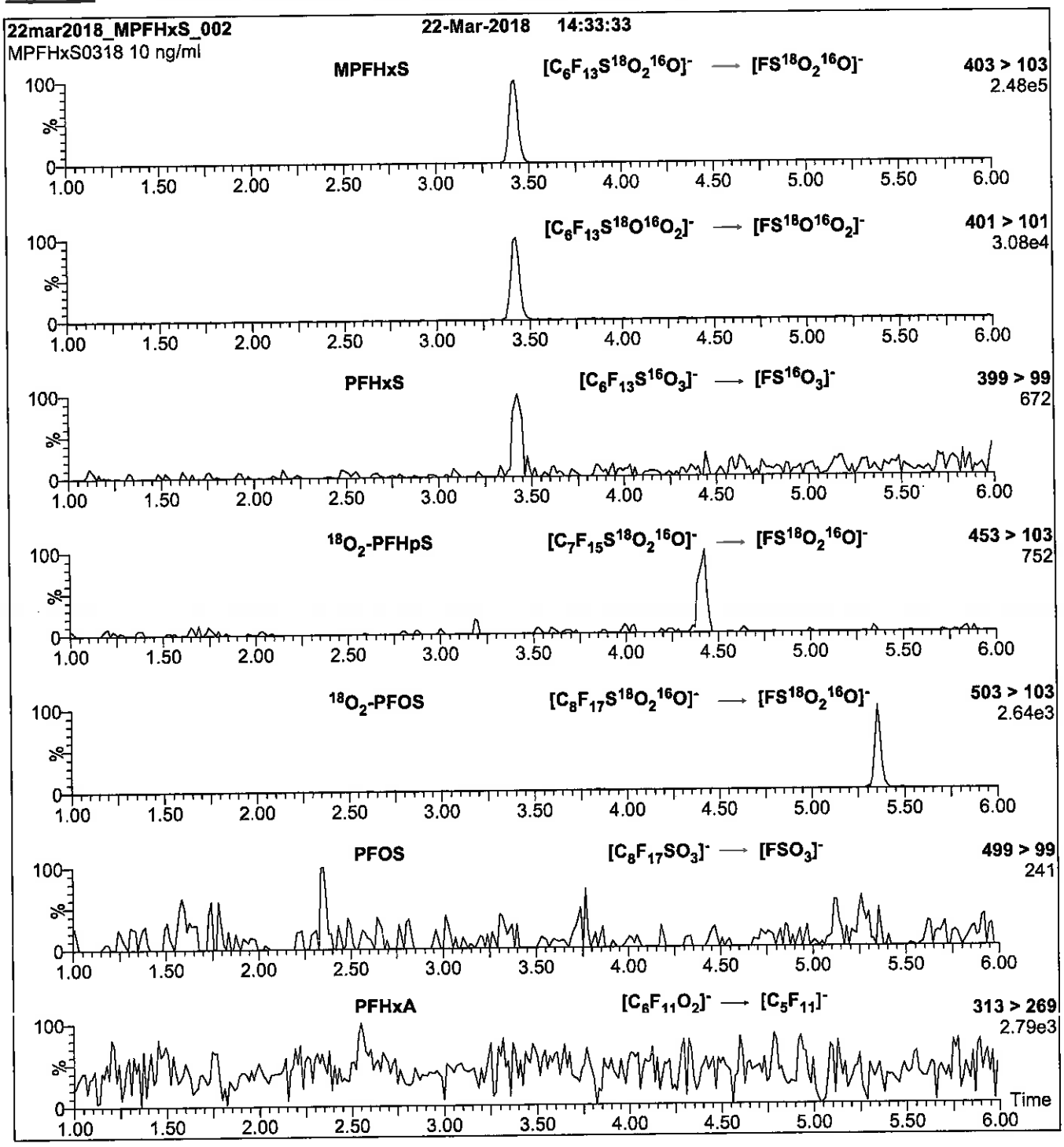
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.64e-3
Collision Energy (eV) = 32

Reagent

LCMPFHxS_00016

1287304
ID: LCMPFHxS_00016
Exp:03/22/23 Prpd:CBW Opn:06/26/18
18O2-Perfluorohexanesulfo

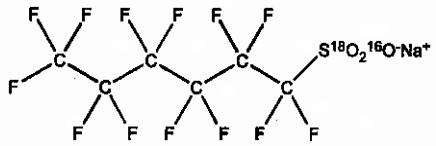
R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS
LOT NUMBER: MPFHxS0318
COMPOUND: Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate

STRUCTURE:
CAS #: 1585941-14-5



MOLECULAR FORMULA: $C_6F_{13}S^{18}O_2{}^{16}ONa$
MOLECULAR WEIGHT: 426.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (MPFHxS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: >94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy) 03/22/2018
EXPIRY DATE: (mm/dd/yyyy) 03/22/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFHpS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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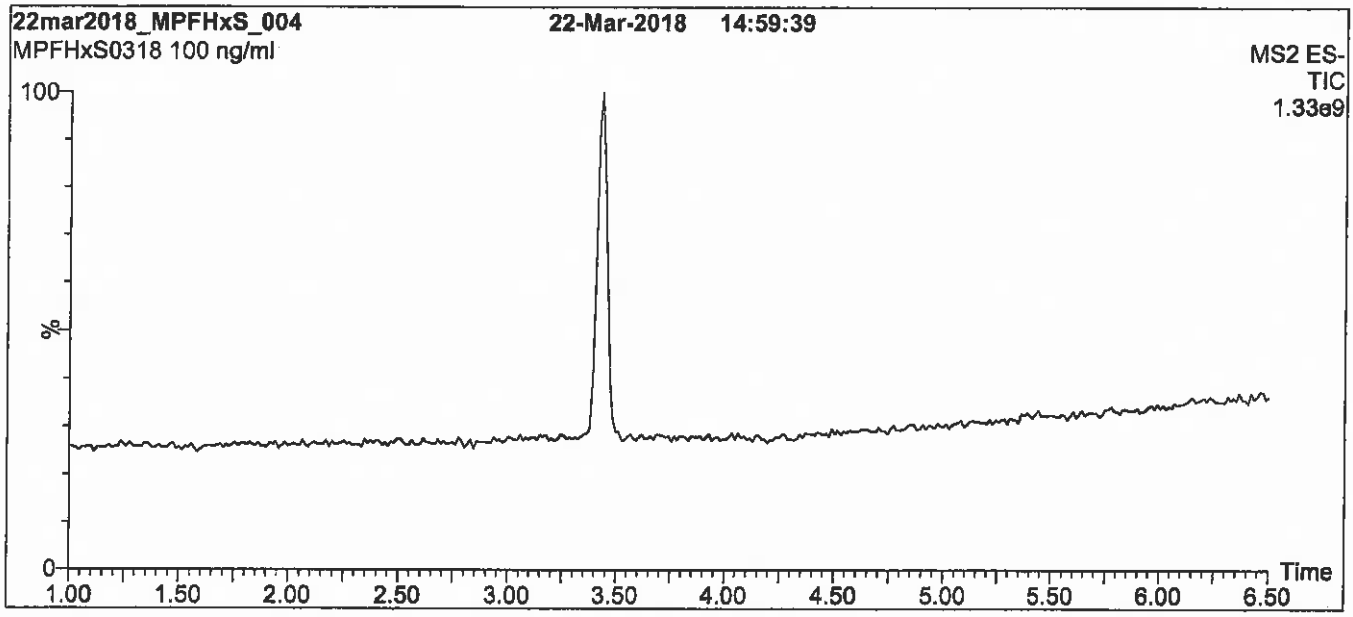
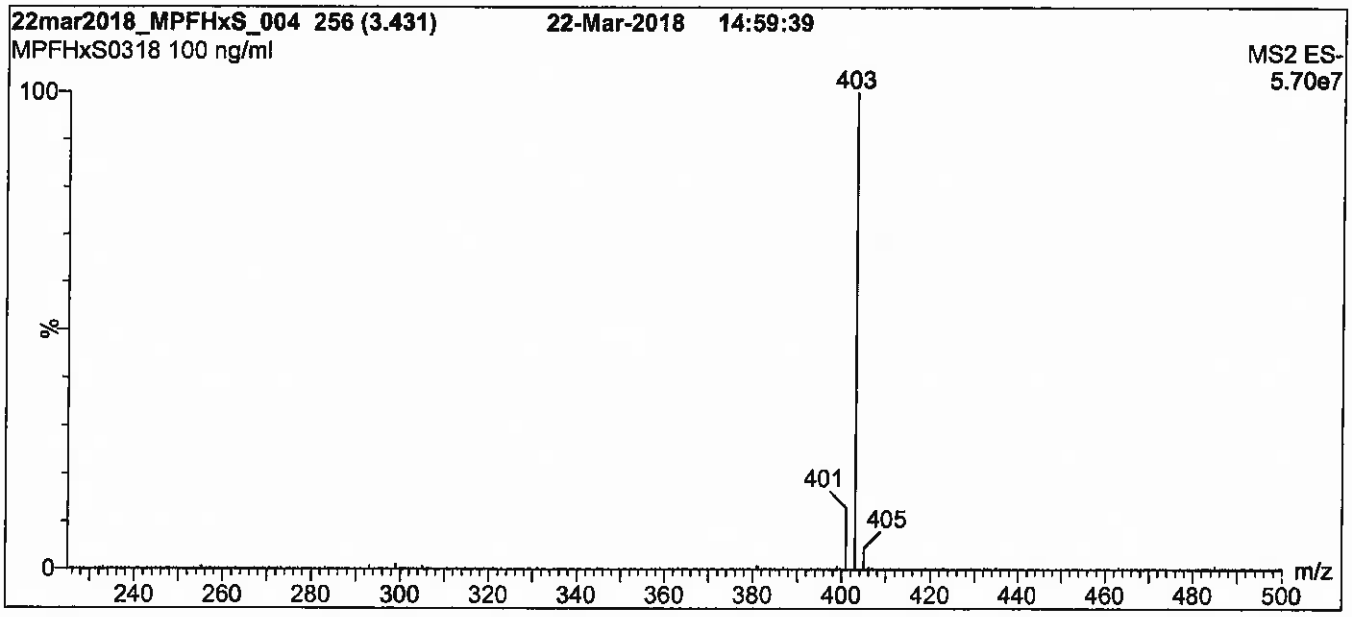
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

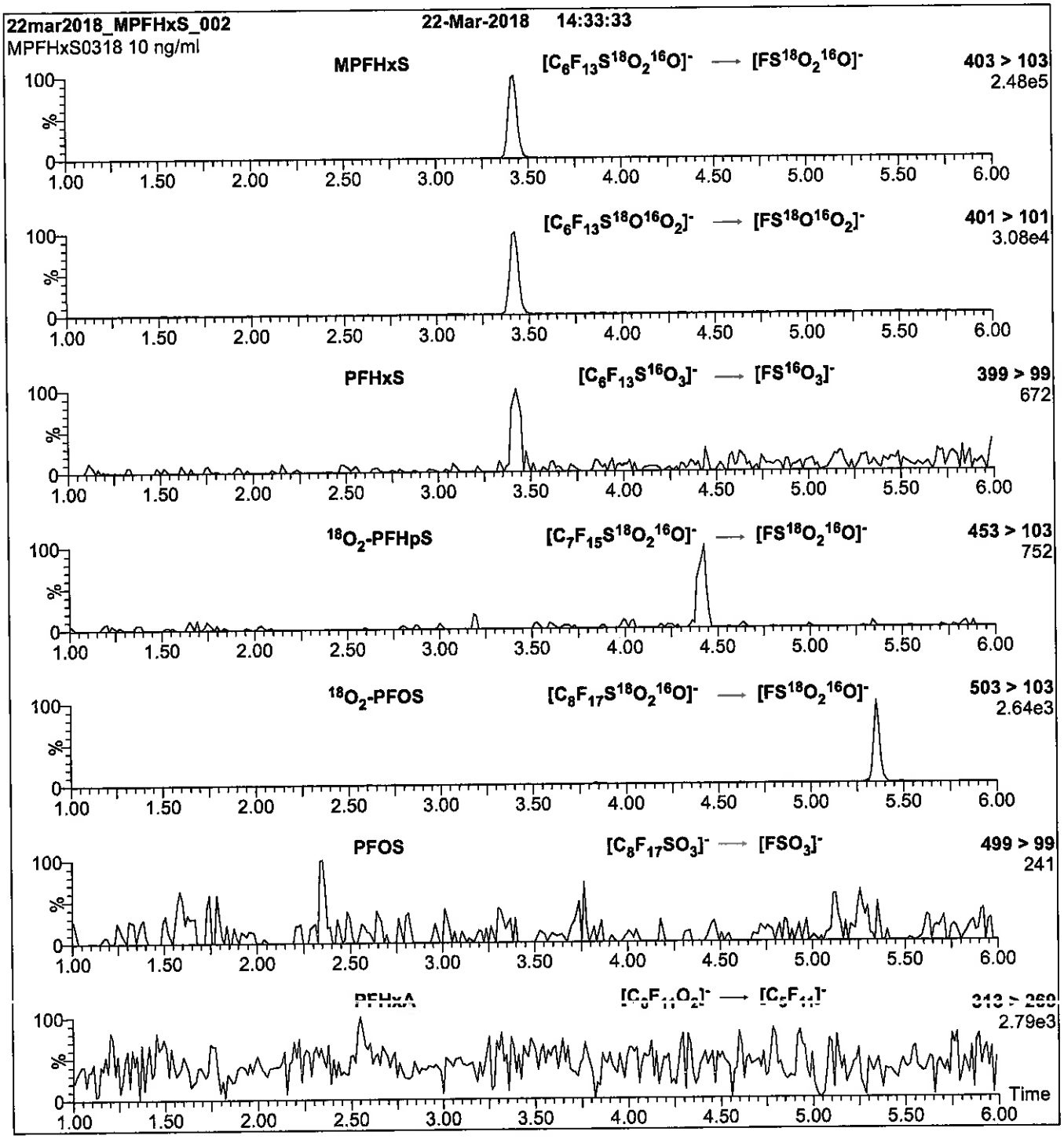
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.64e-3
Collision Energy (eV) = 32

Reagent

LCMPFNA_00015

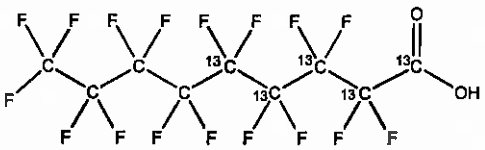
1263148
ID: LCMPFNA_00015
Exp:12/14/22 Rpd:CBW Opn:05/30/18
13C5-Perfluorononanoic aci

R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFNA
LOT NUMBER: MPFNA1217
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5{}^{12}C_4HF_{17}O_2$
MOLECULAR WEIGHT: 469.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy) 12/14/2017
EXPIRY DATE: (mm/dd/yyyy) 12/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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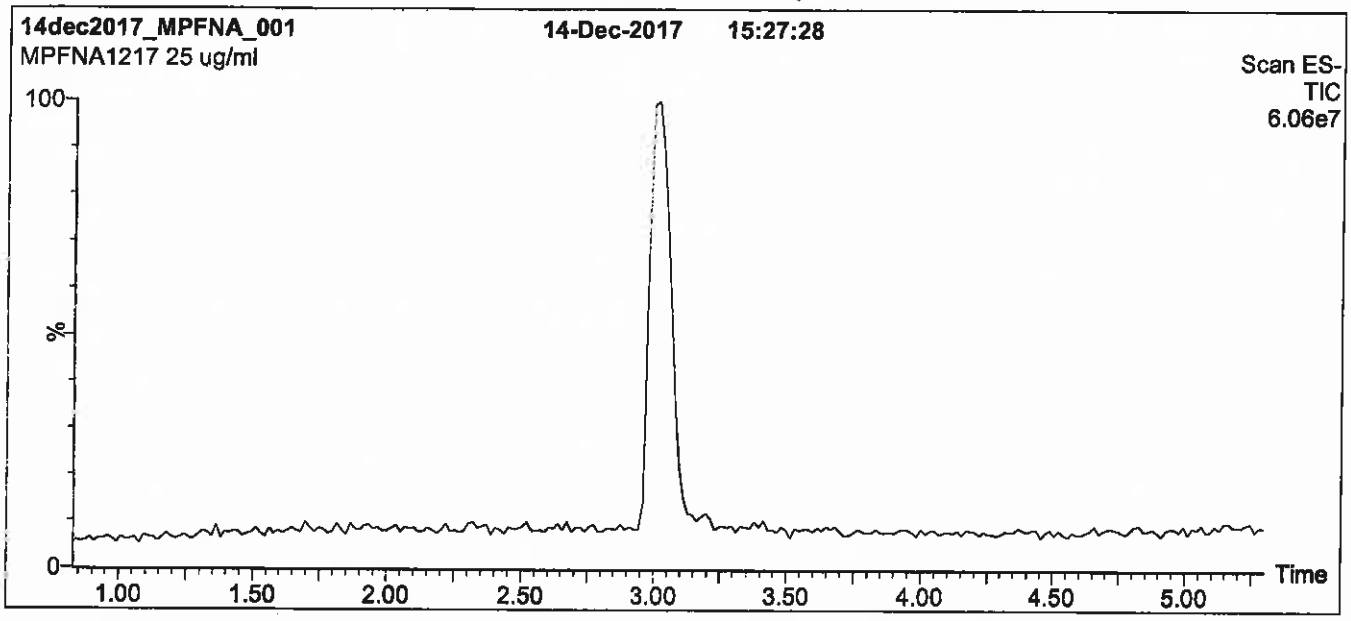
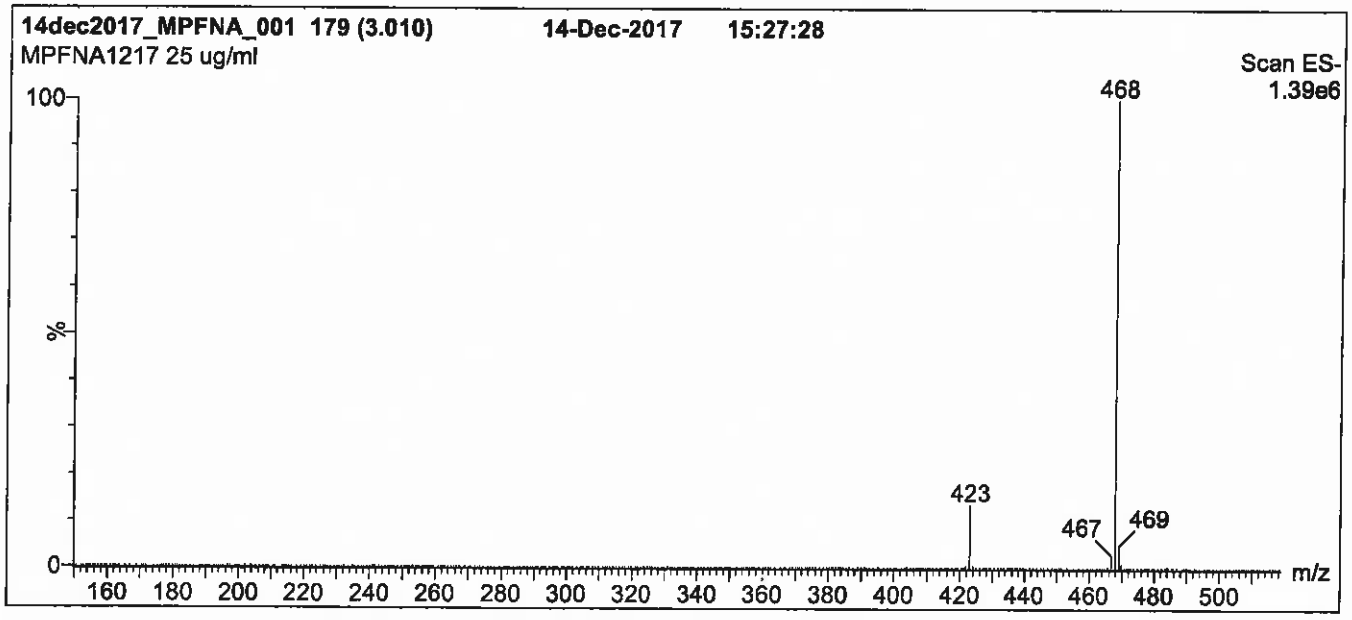
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

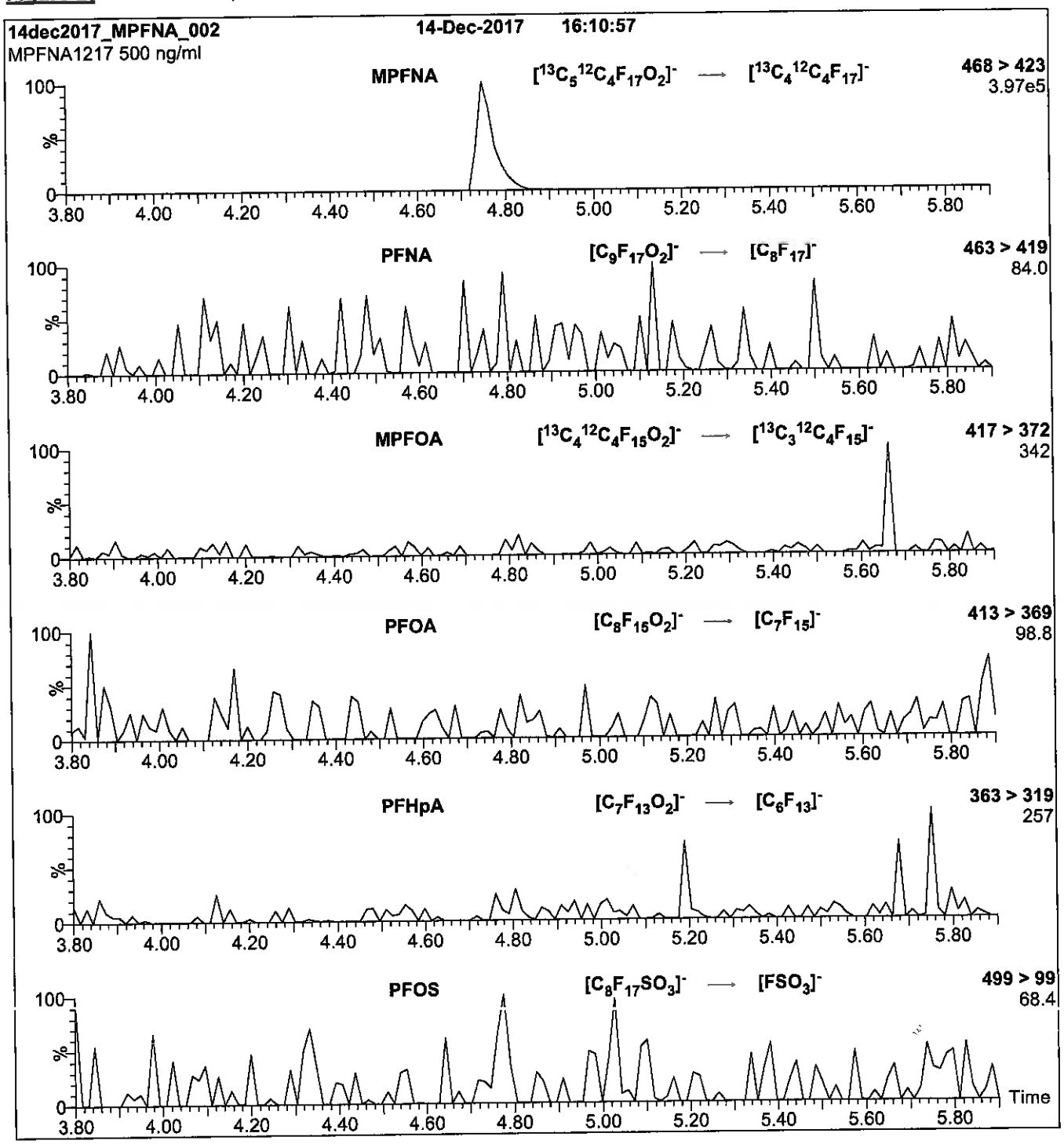
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

Reagent

LCMPFNA_00016

1287293
ID: LCMPFNA_00016
Exp:12/14/22 Prpd:CBW Opn:06/26/18
13C5-Perfluorononanoic acid

R: 6/26/18 CBW

WELLINGTON LABORATORIES

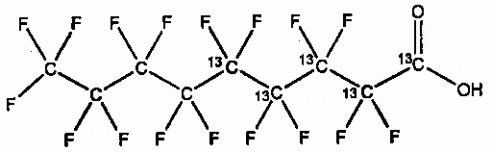
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid

LOT NUMBER: MPFNA1217

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5{}^{12}C_4HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 469.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/14/2017
EXPIRY DATE: (mm/dd/yyyy) 12/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

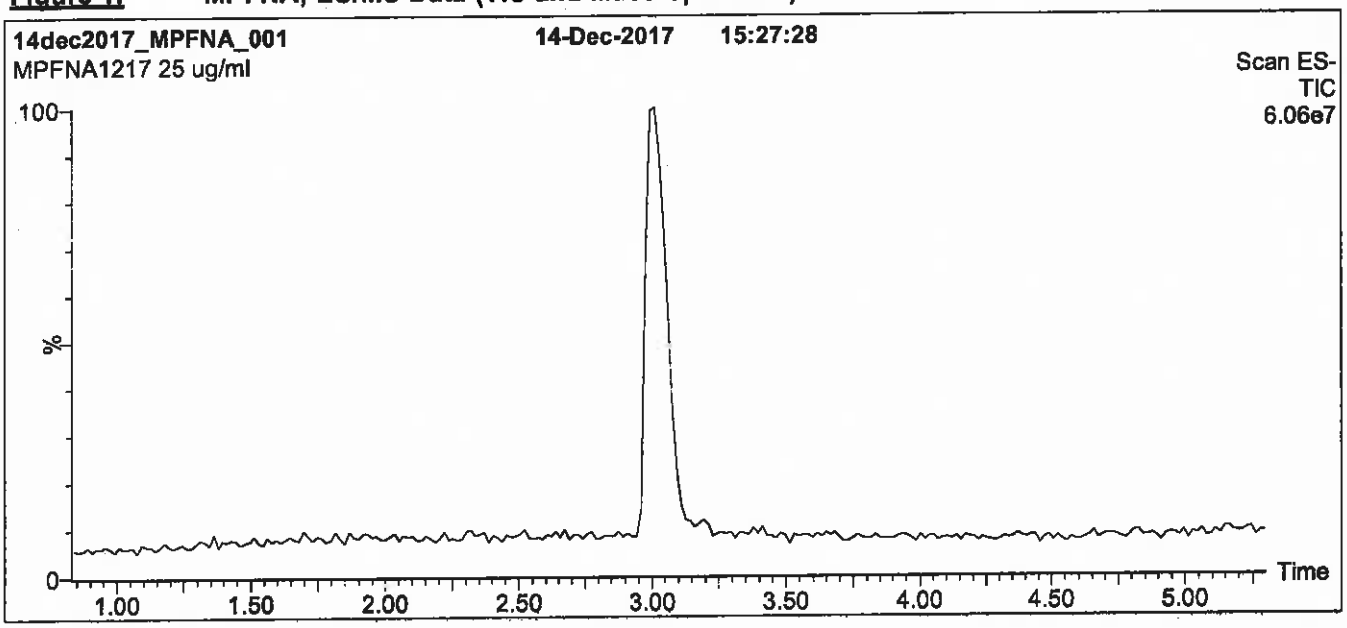
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

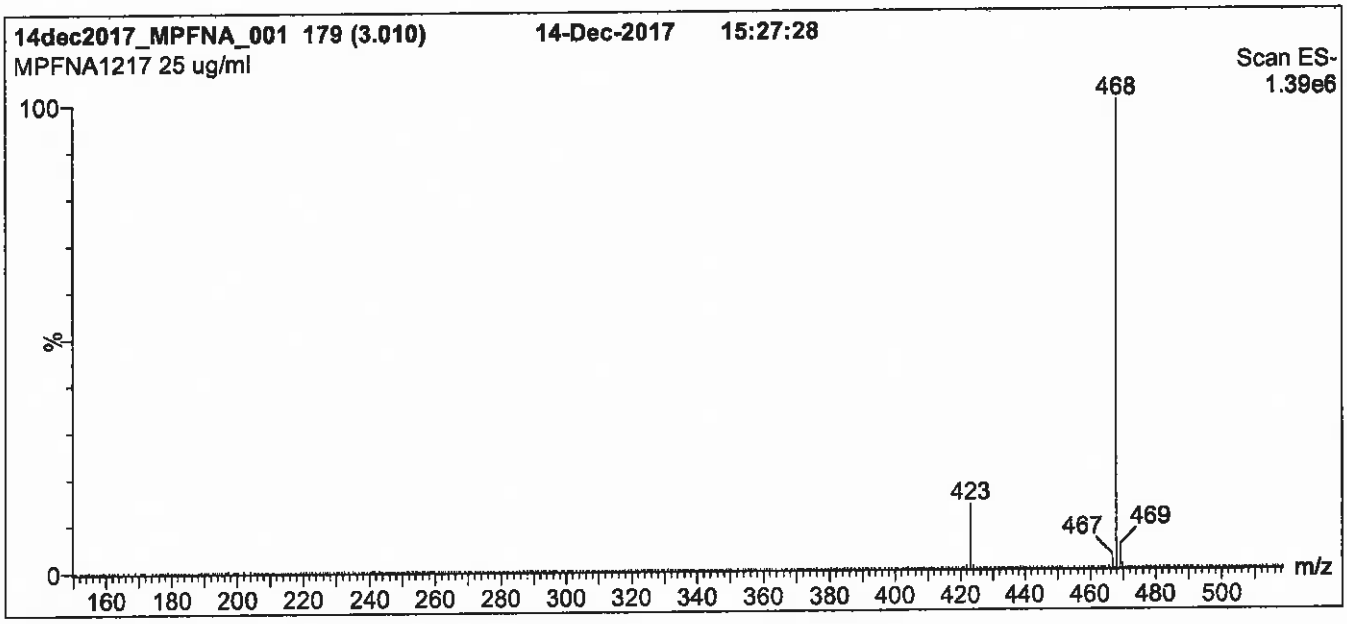
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

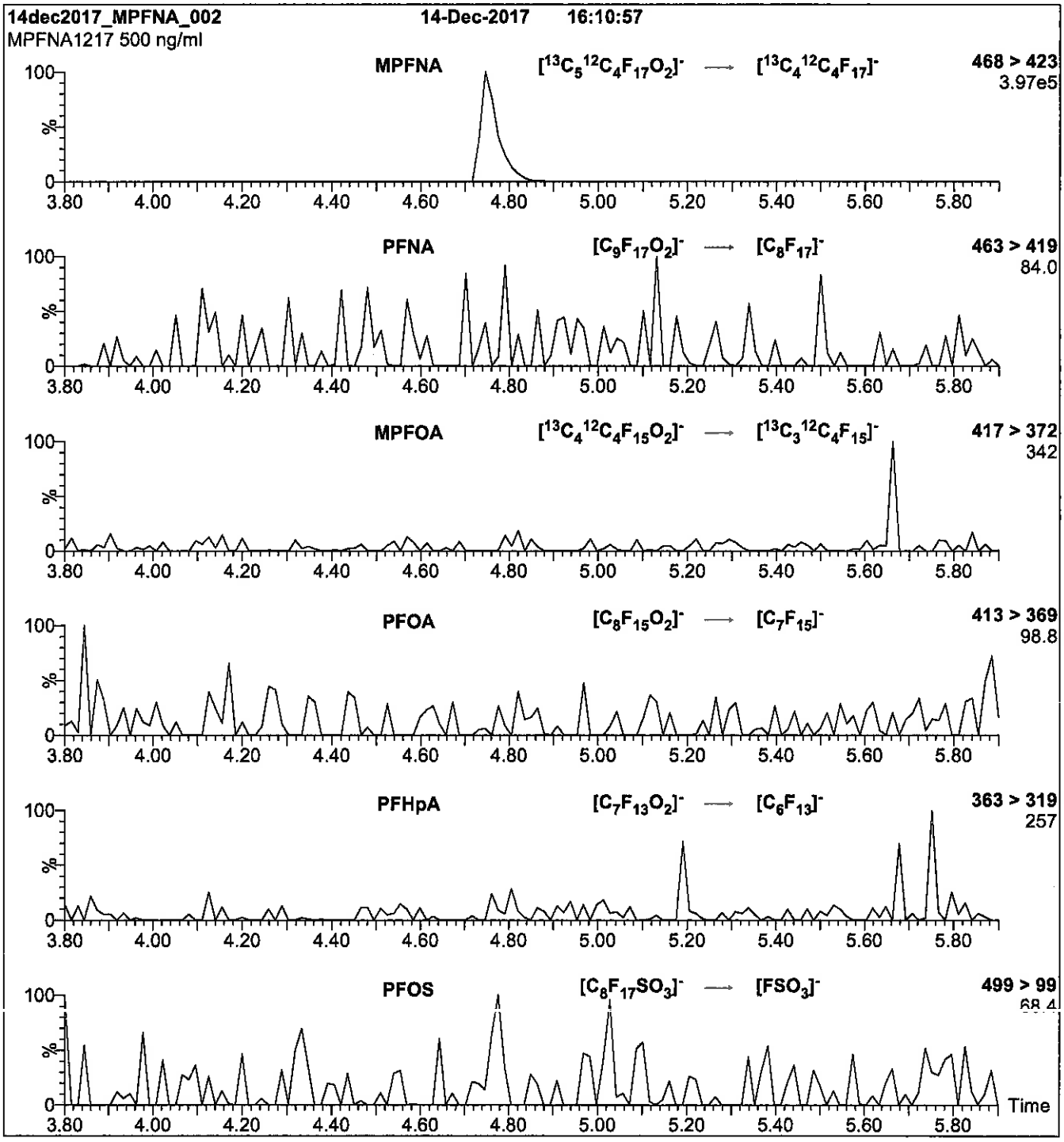
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFNA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 11
Flow:	300 µl/min	

Reagent

LCMPFOA_00019

1263125
ID: LCMPFOA_00019
Exp:05/04/23 Prpd:CBW Opn:05/30/18
13C4-Perfluorooctanoic ac

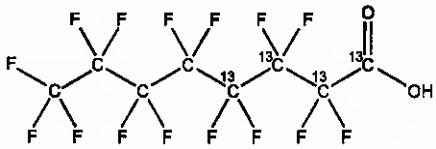
r: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
LOT NUMBER: MPFOA0418
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$
MOLECULAR WEIGHT: 418.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 05/04/2018
EXPIRY DATE: (mm/dd/yyyy) 05/04/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/17/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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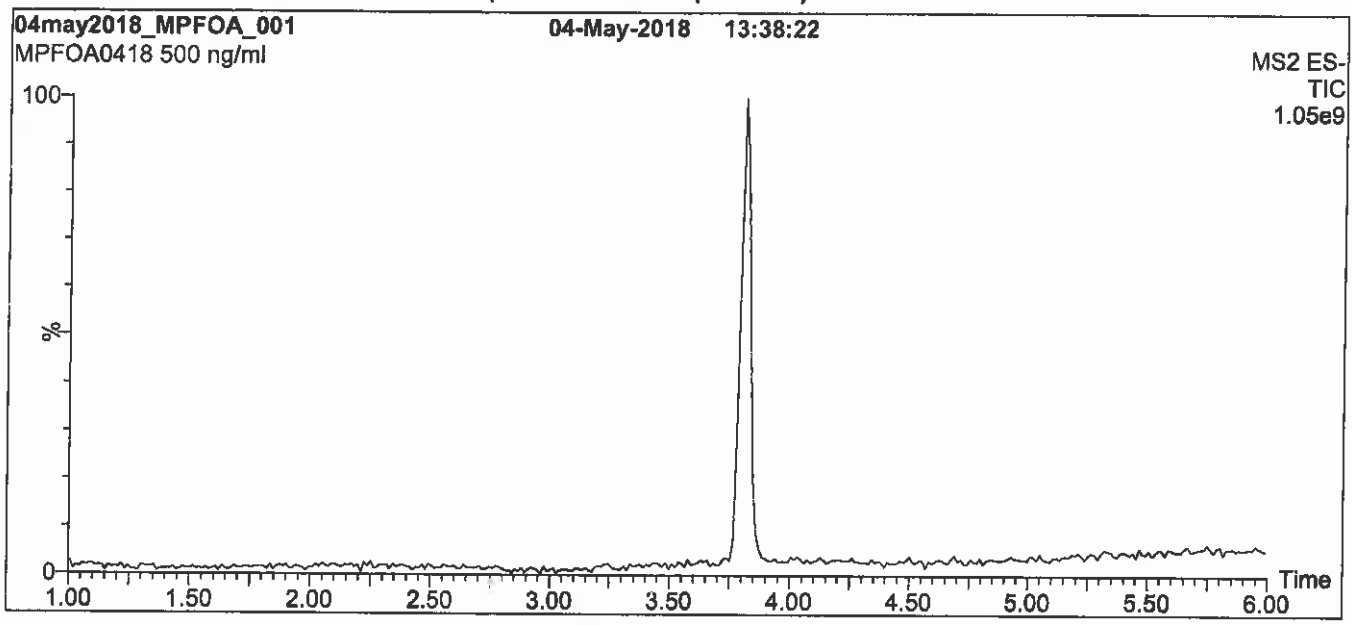
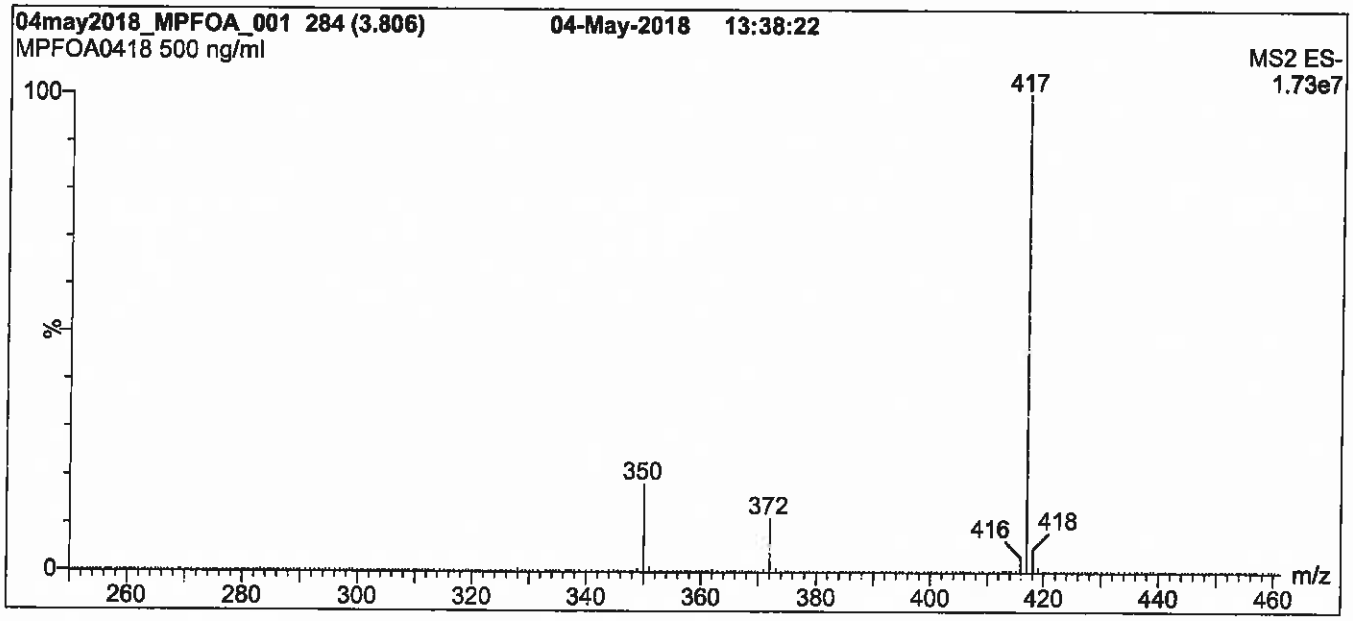
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

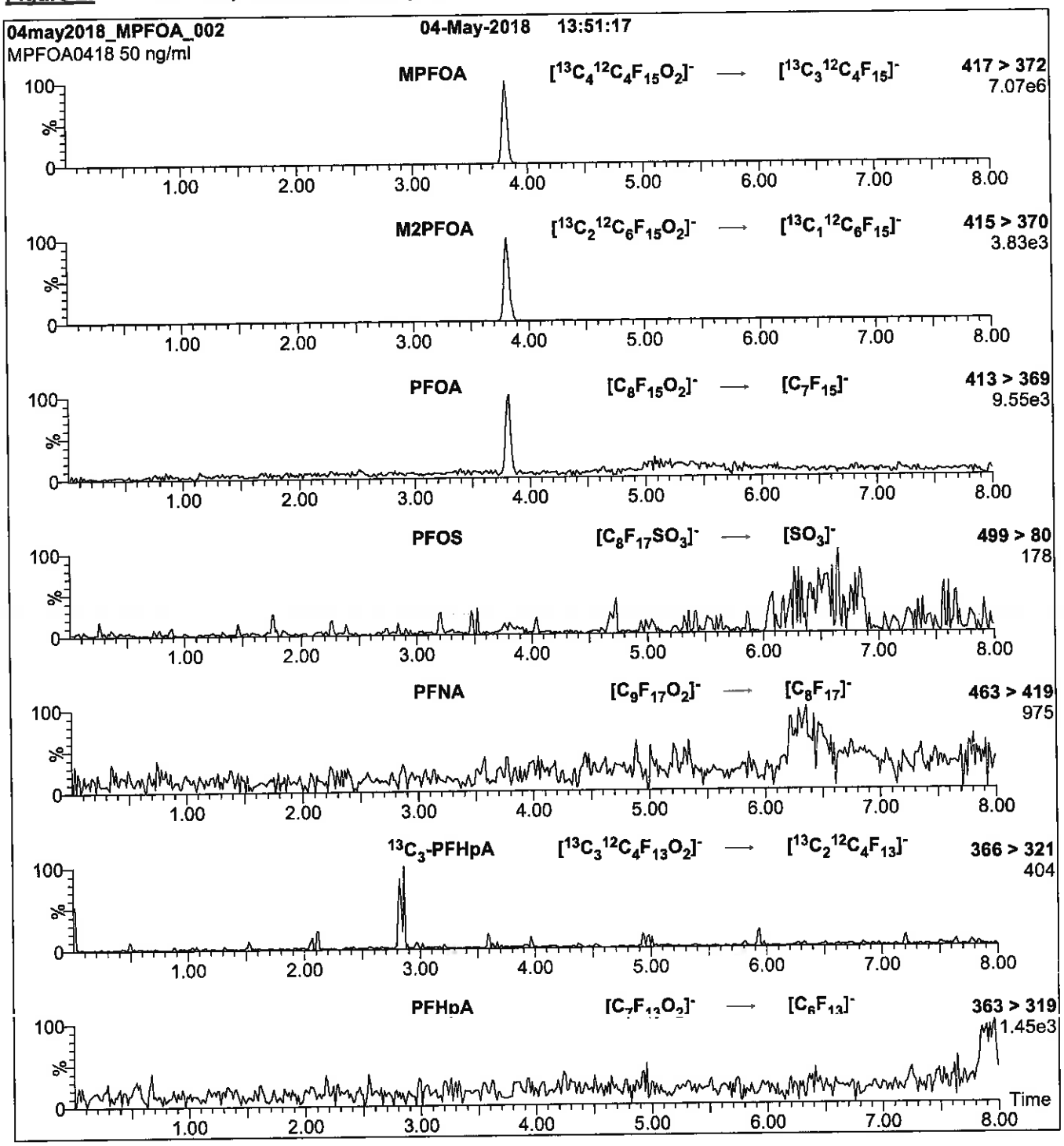
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFOA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 8

Reagent

LCMPFOA_00020

1287275
ID: LCMPFOA_00020
Exp:05/04/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorooctanoic ac

R: CBW 6/26/18

WELLINGTON LABORATORIES

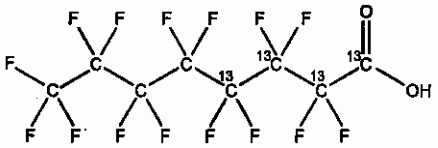
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

LOT NUMBER: MPFOA0418

STRUCTURE:

CAS #: 960315-48-4



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/04/2018
EXPIRY DATE: (mm/dd/yyyy) 05/04/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C
(1,2,3,4-$^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/13/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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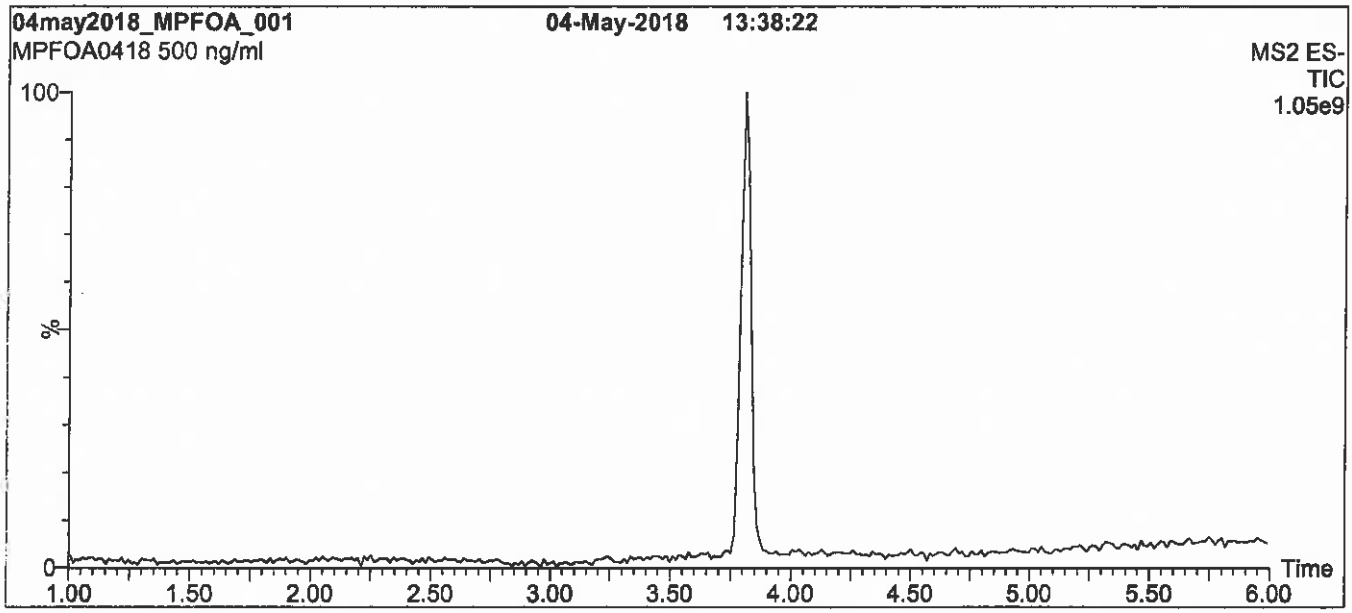
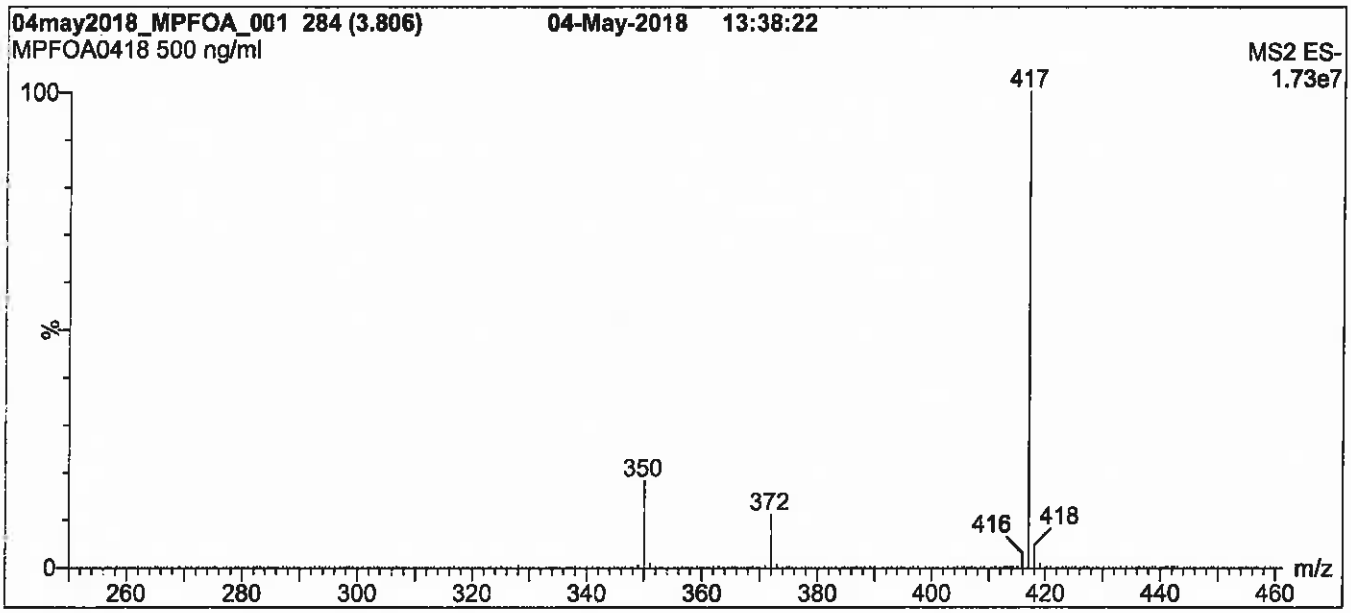




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

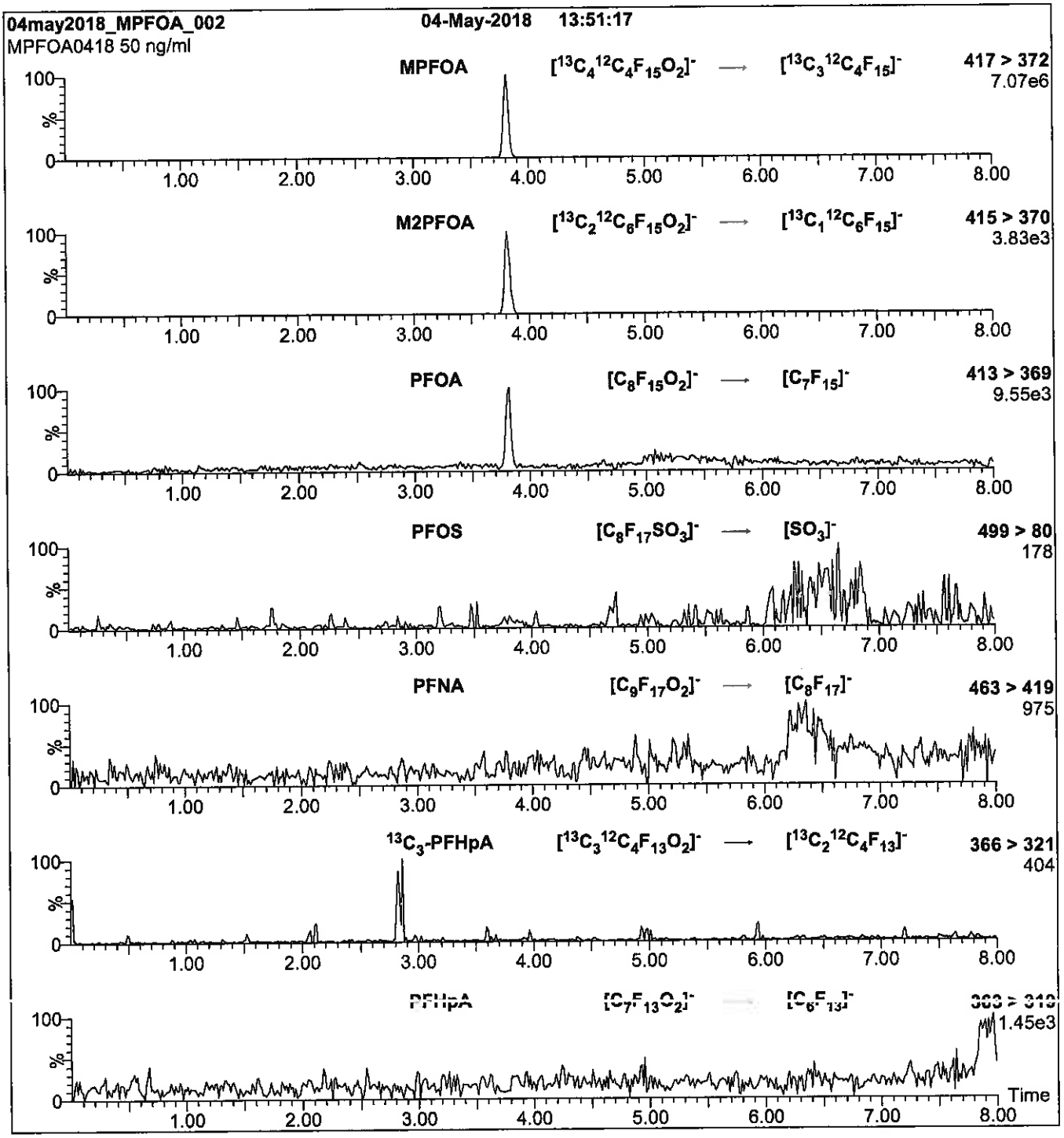
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFOA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 8

Reagent

LCMPFOS_00027

1263174
ID: LCMPFOS_00027
Exp:02/15/23 Prpd:CBW Opn:05/30/18
13C4-Perfluorooctanesulfo

K: 5/30/18 CBW

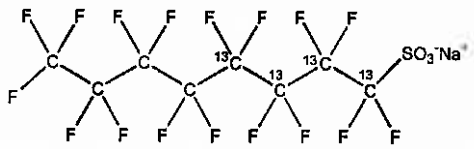
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0218

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 526.08

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 02/15/2018

EXPIRY DATE: (mm/dd/yyyy) 02/15/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.6% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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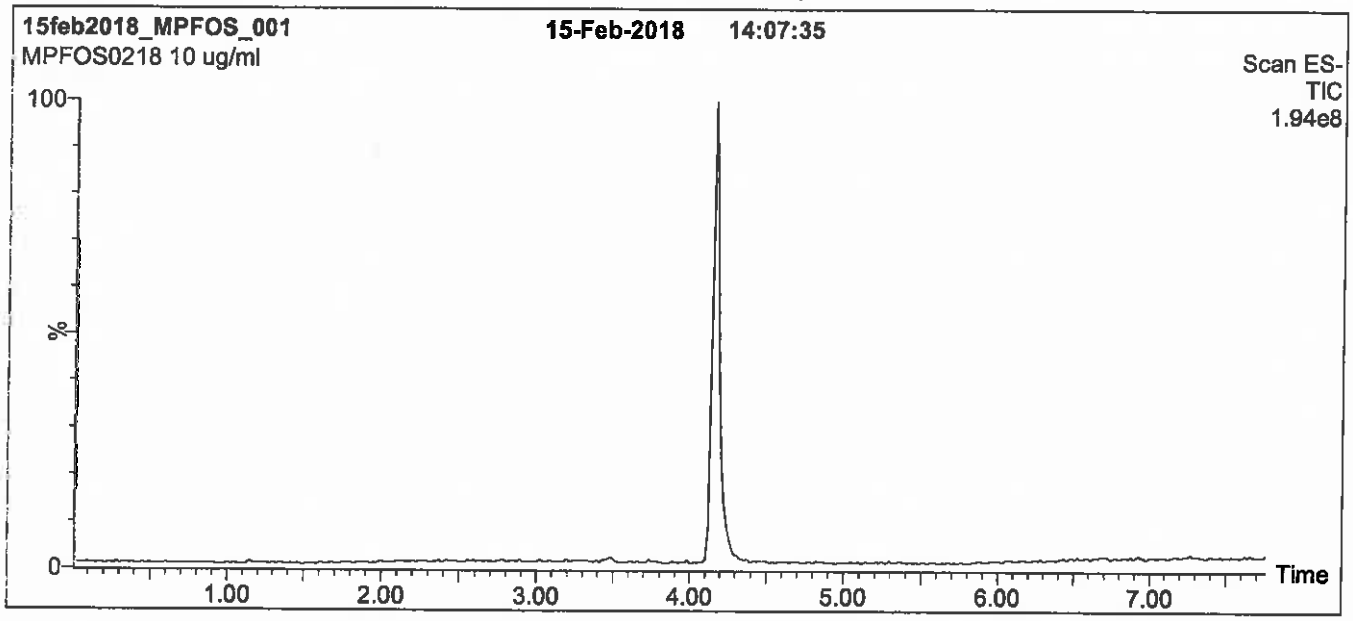
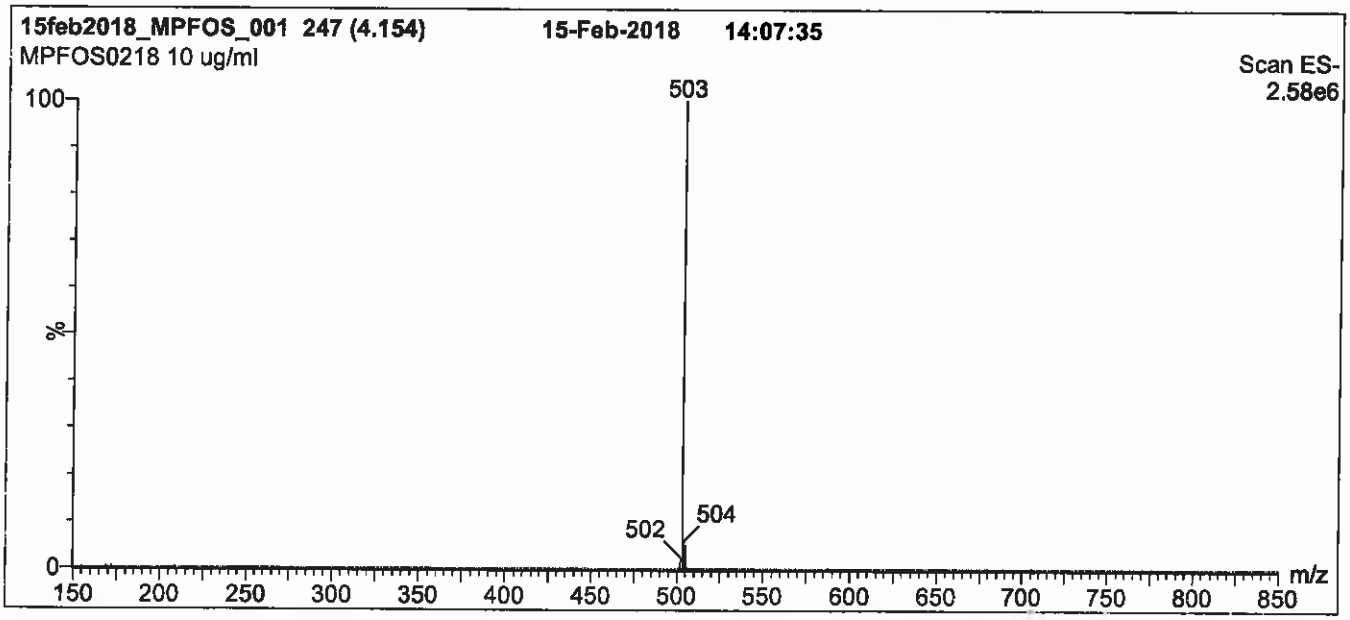
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

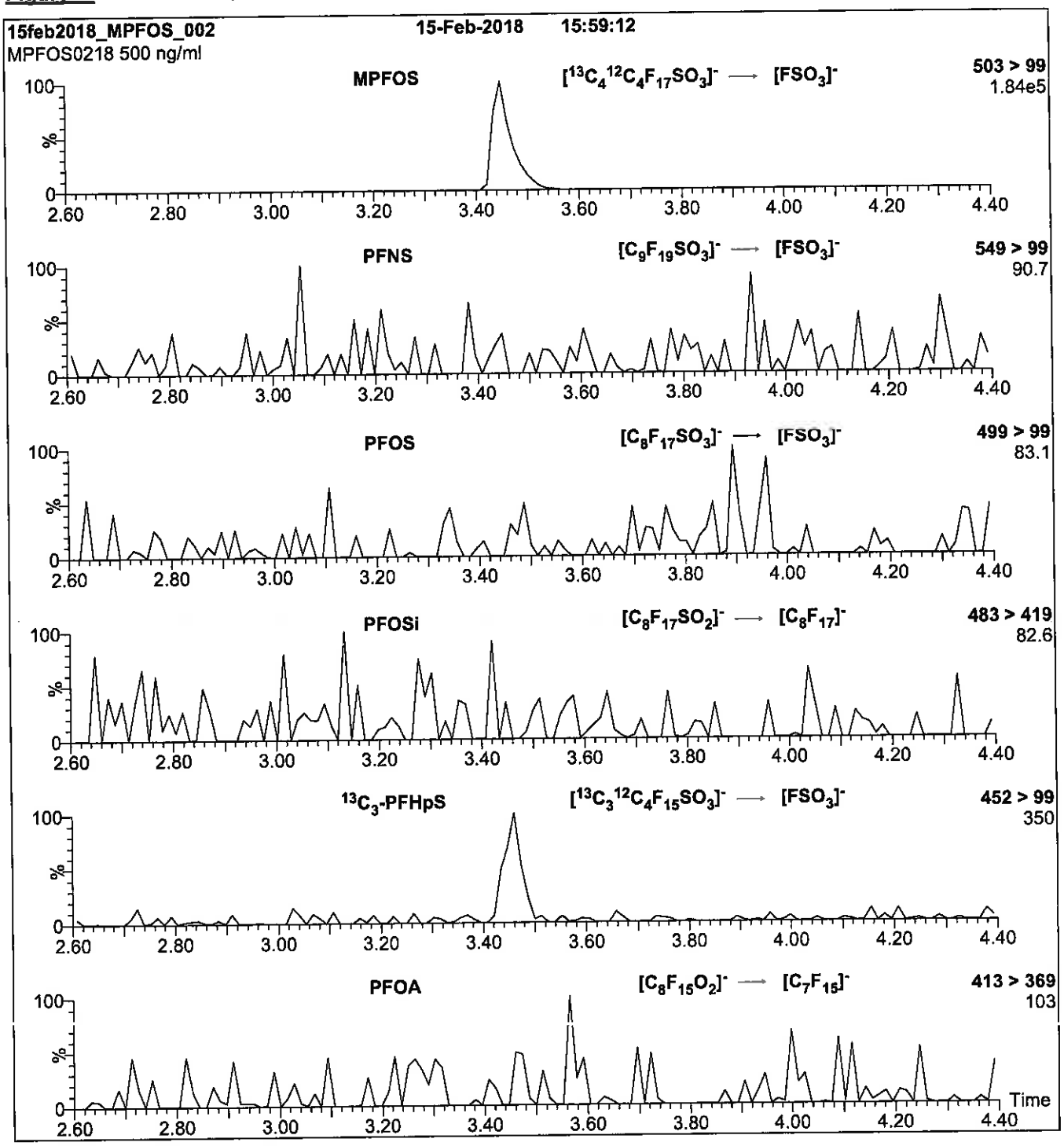
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00028

1287343
ID: LCMPFOS_00028
Exp:06/15/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorooctanesulfo

R=6/26/18 CBW

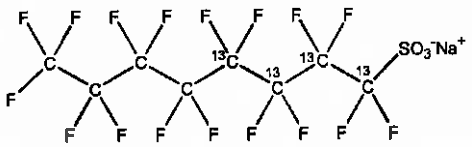
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0618

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 526.08

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 06/15/2018

EXPIRY DATE: (mm/dd/yyyy) 06/15/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/18/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

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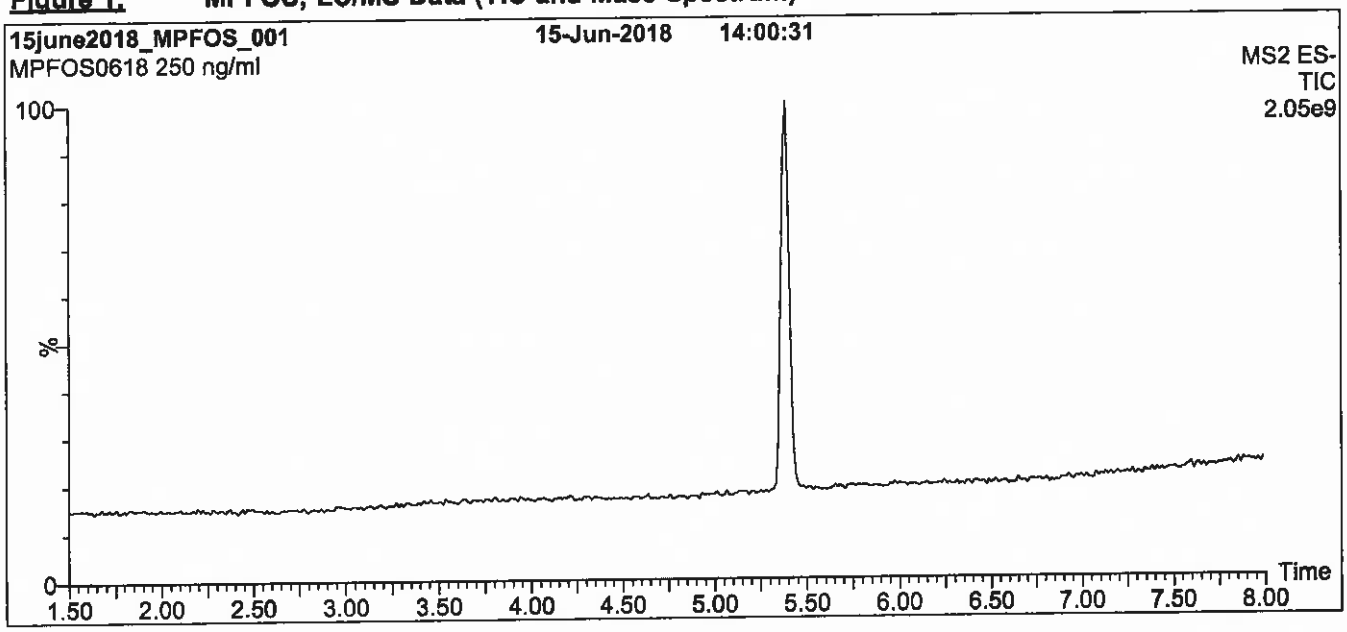
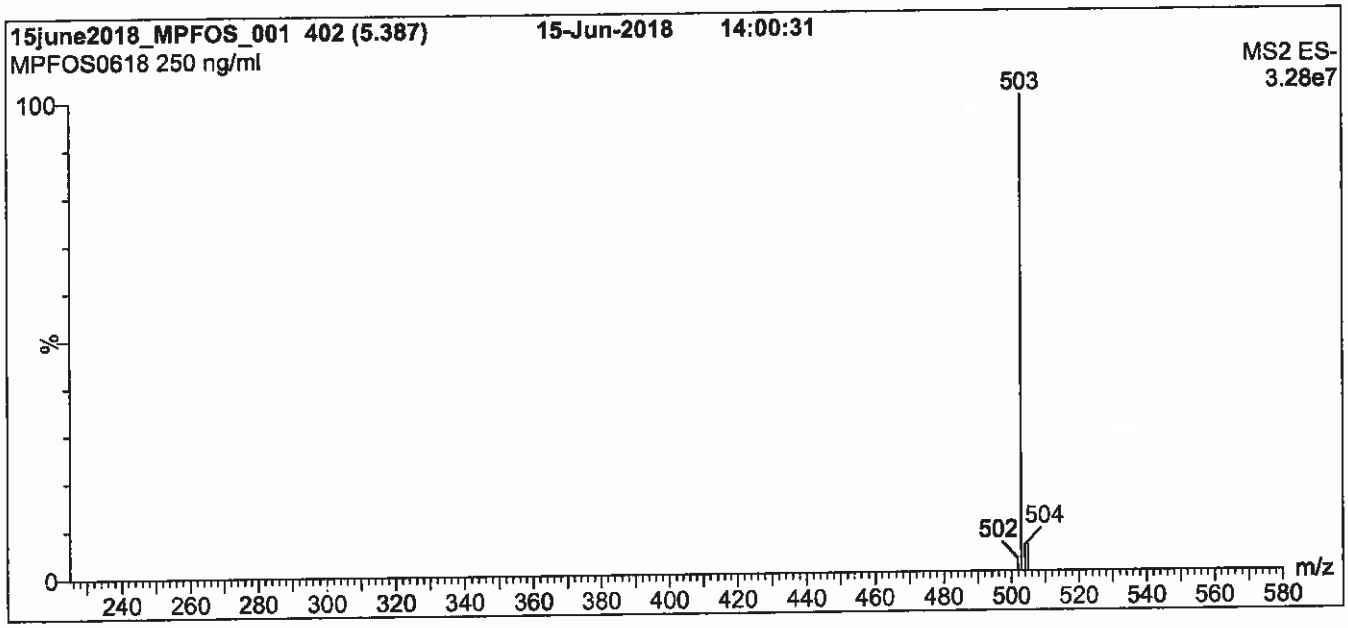




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

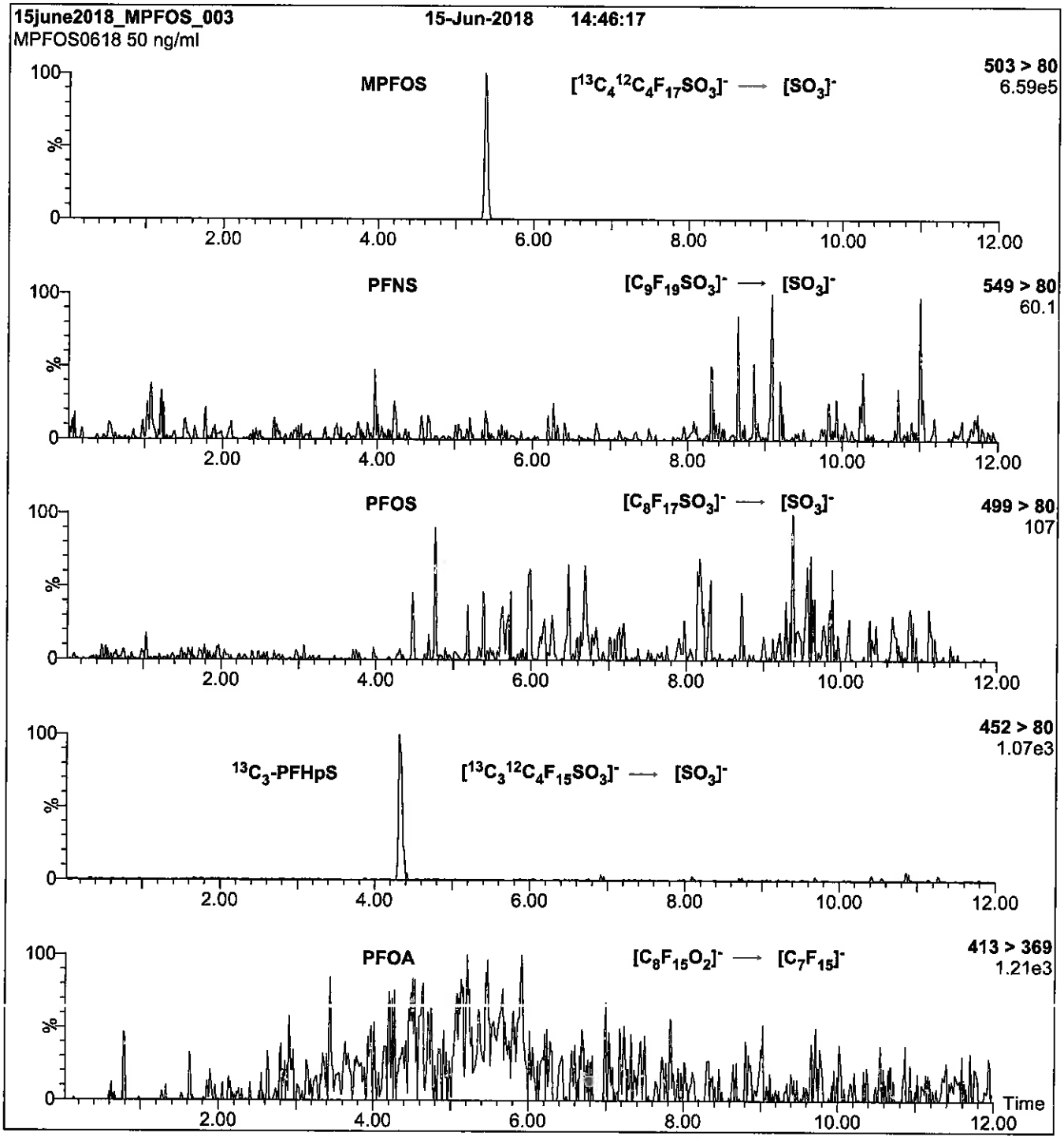
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFOS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.41e-3
Collision Energy (eV) = 42

Reagent

LCMPFUdA_00017

R: 5/30/18 CBW

1263162
ID: LCMPFUdA_00017
Exp:11/22/21 Prpd:CBW Opn:05/30/18
13C2-Perfluoroundecanoic

WELLINGTON LABORATORIES

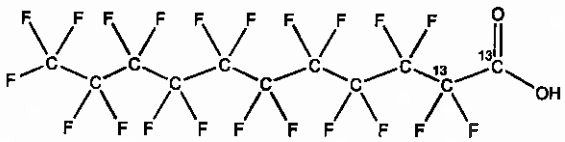
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

LOT NUMBER: MPFUdA1116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_9HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/07/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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CALA

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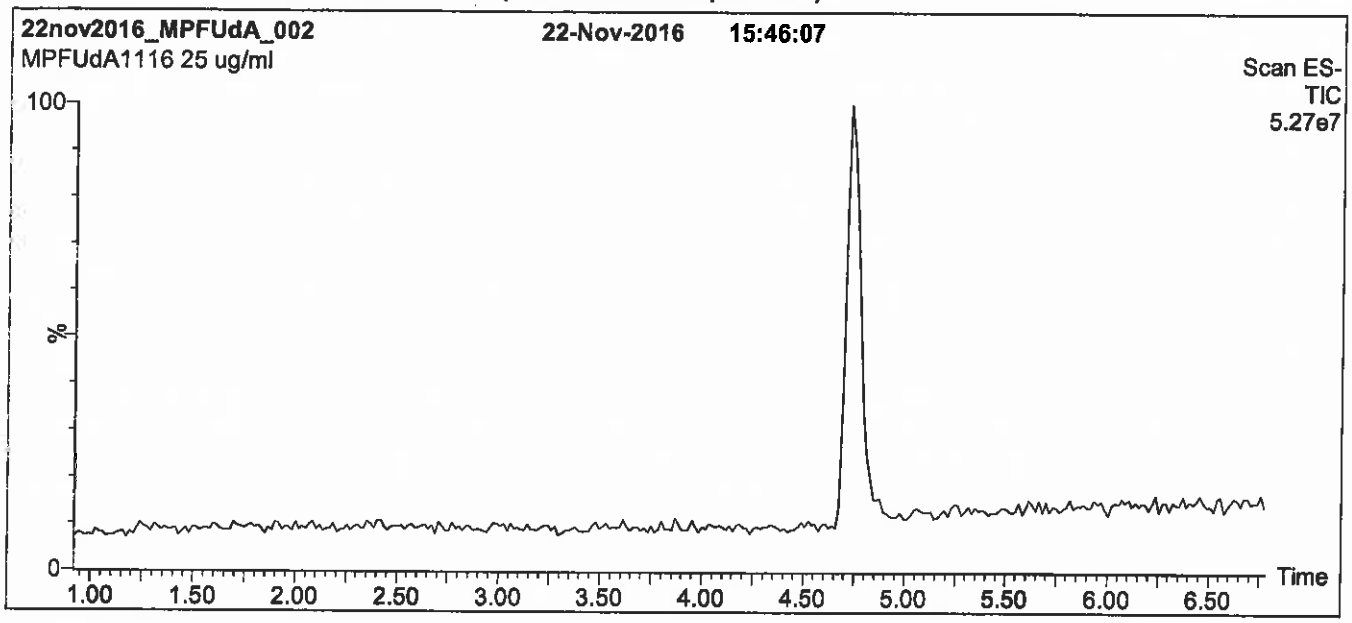
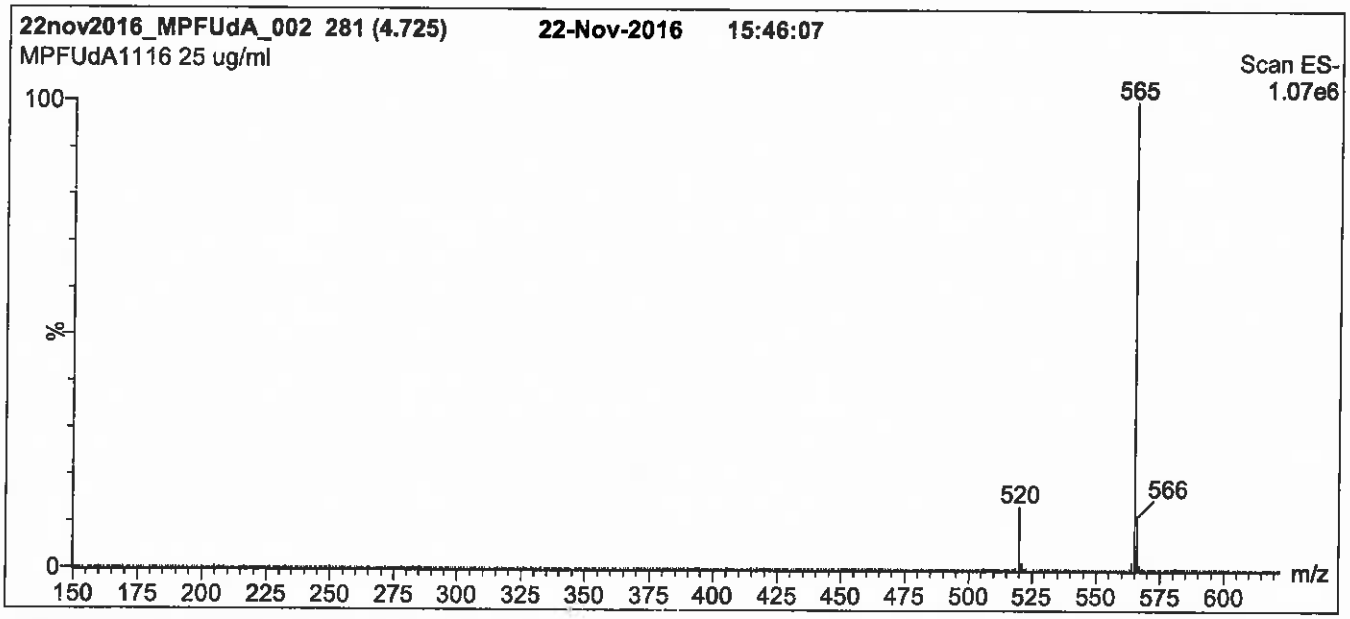
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

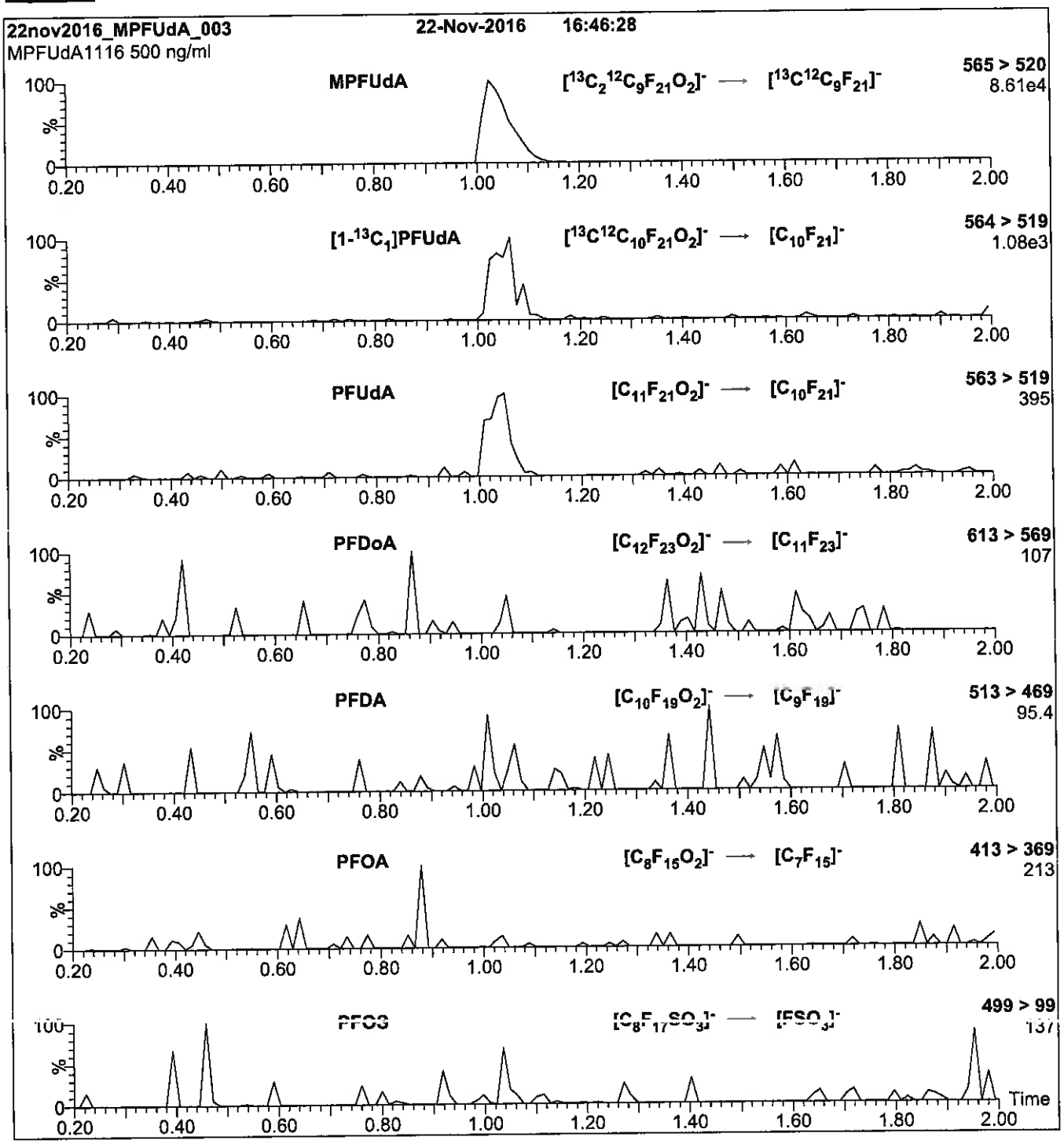
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFUdA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 11
Flow:	300 µl/min	

Reagent

LCMPFUdA_00018

1287321
ID: LCMPFUdA_00018
Exp:05/11/23 Prpd:CBW Opn:06/26/18
13C2-Perfluoroundecanoic

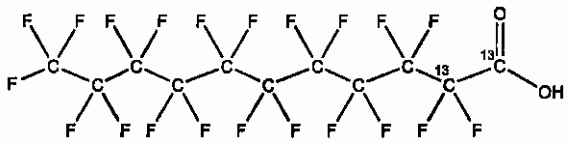
R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
LOT NUMBER: MPFUdA0518
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

STRUCTURE:
CAS #: Not available



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MOLECULAR WEIGHT: 566.08
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SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 05/11/2018
EXPIRY DATE: (mm/dd/yyyy) 05/11/2023
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Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

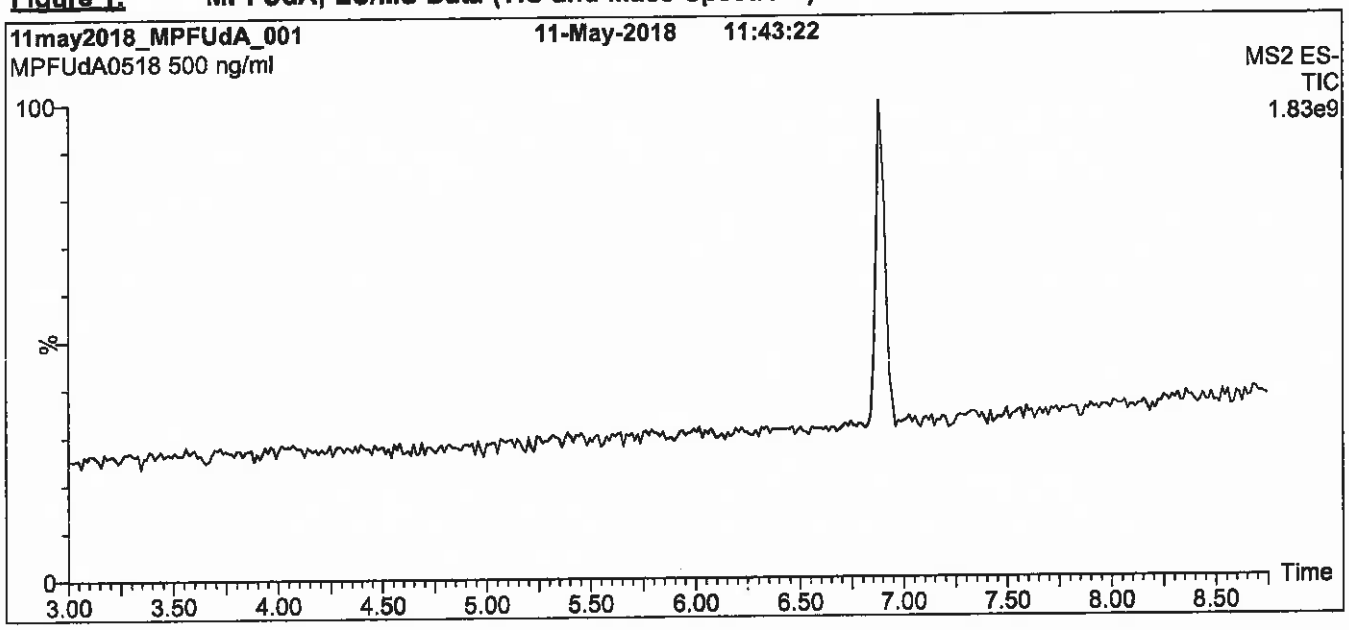
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

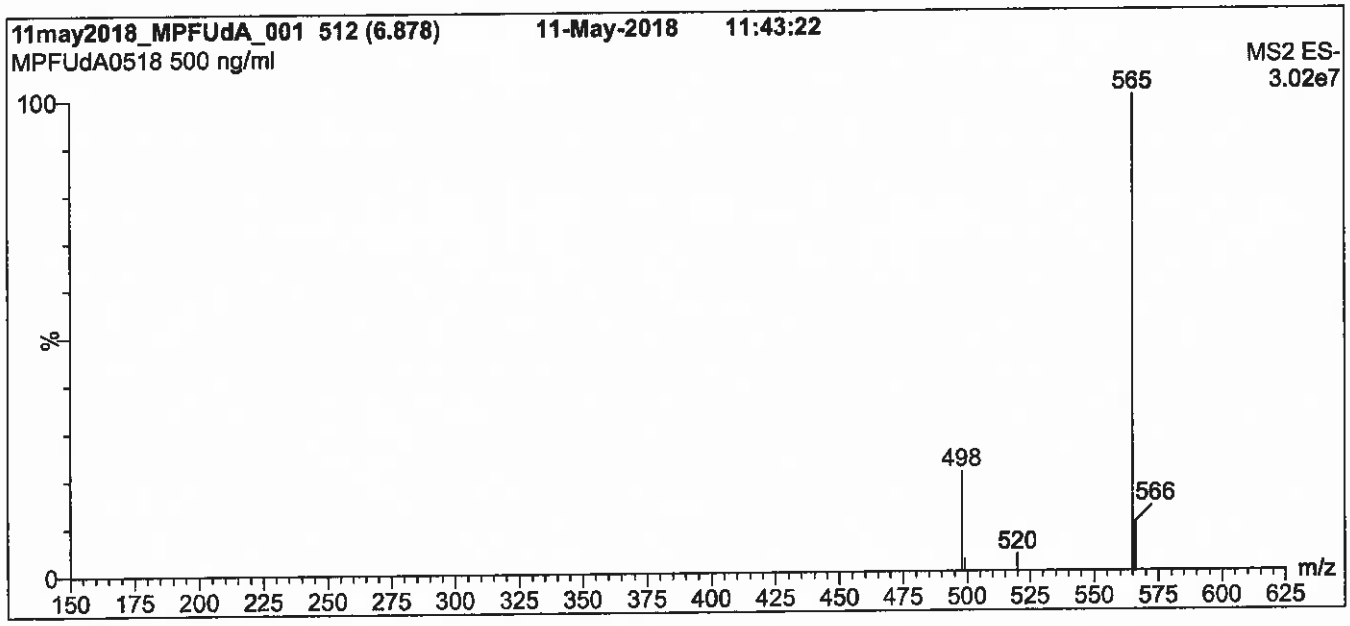
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

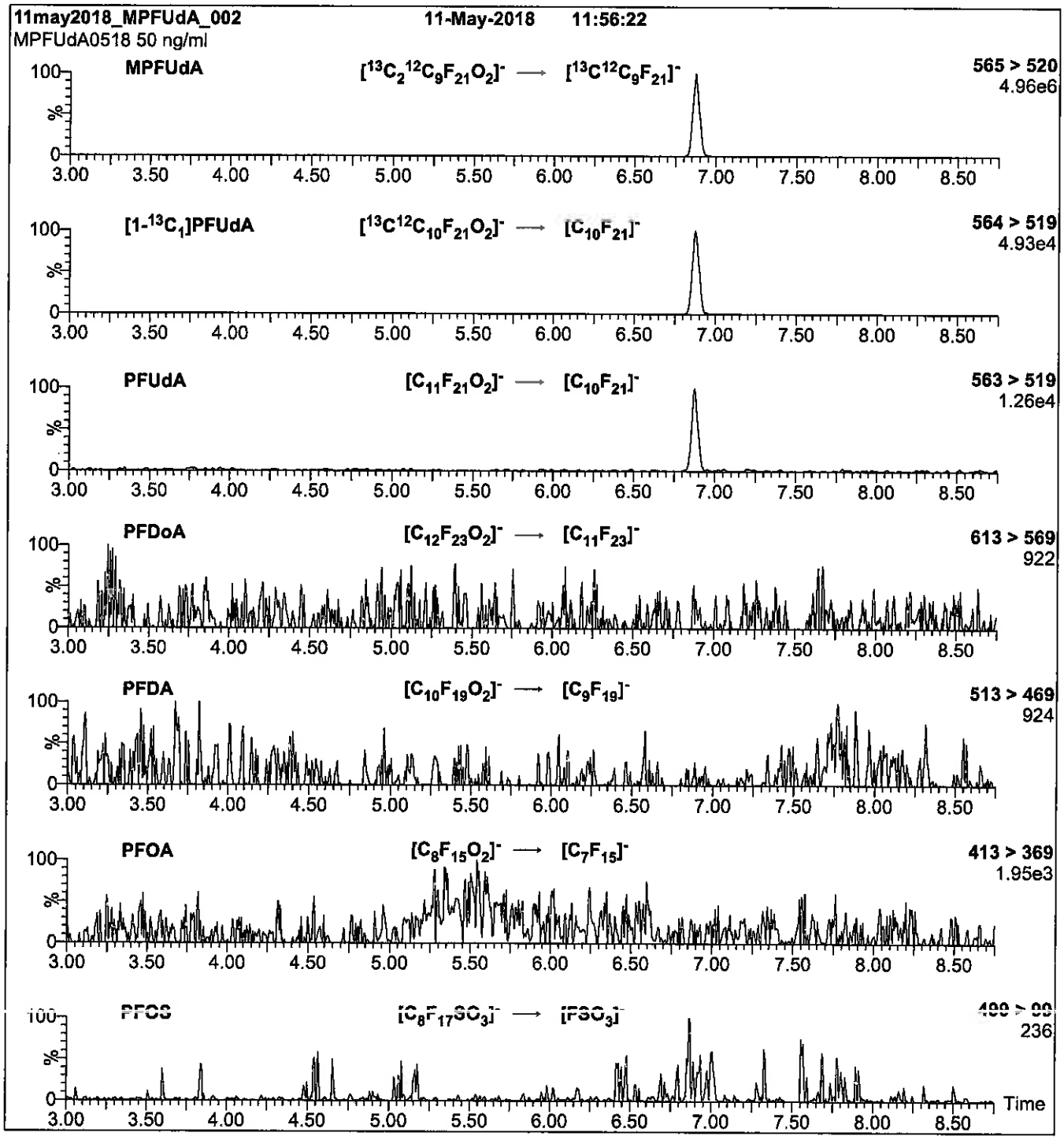
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFUdA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.51e-3
Collision Energy (eV) = 12

Reagent

LCPFBA_00008

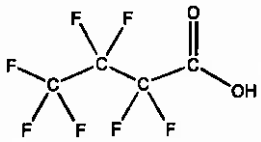
P: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
LOT NUMBER: PFBA0517
COMPOUND: Perfluoro-n-butanoic acid

STRUCTURE:
CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
MOLECULAR WEIGHT: 214.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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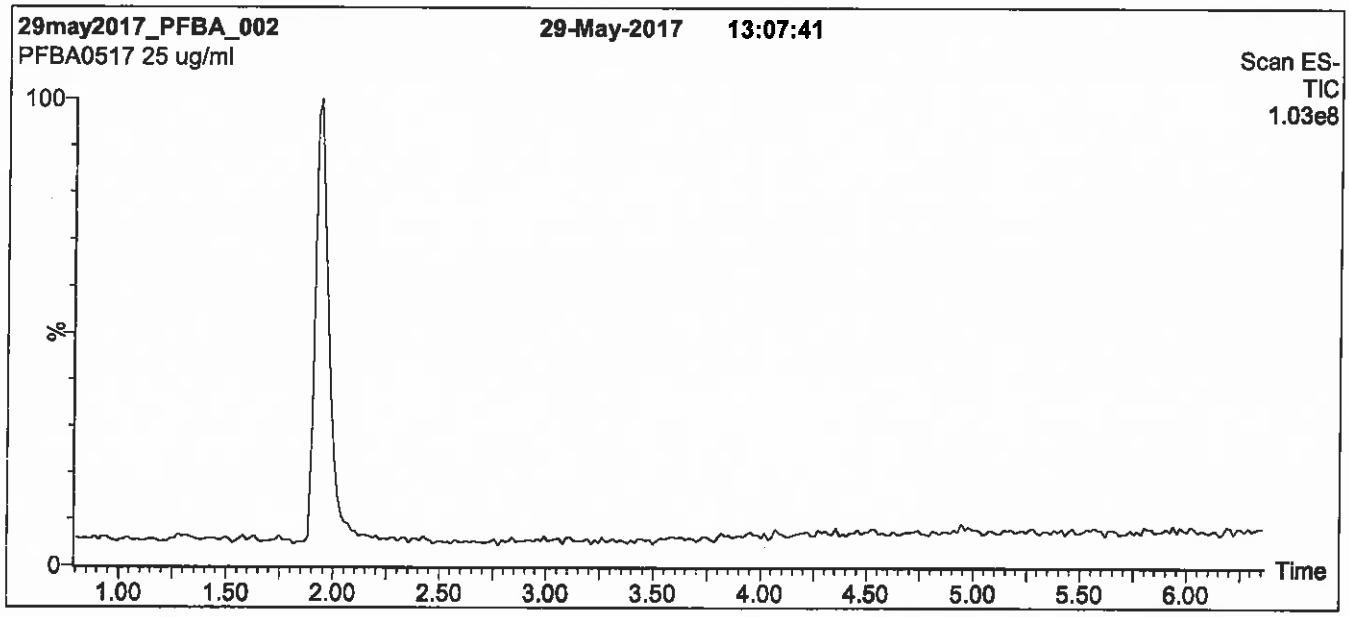
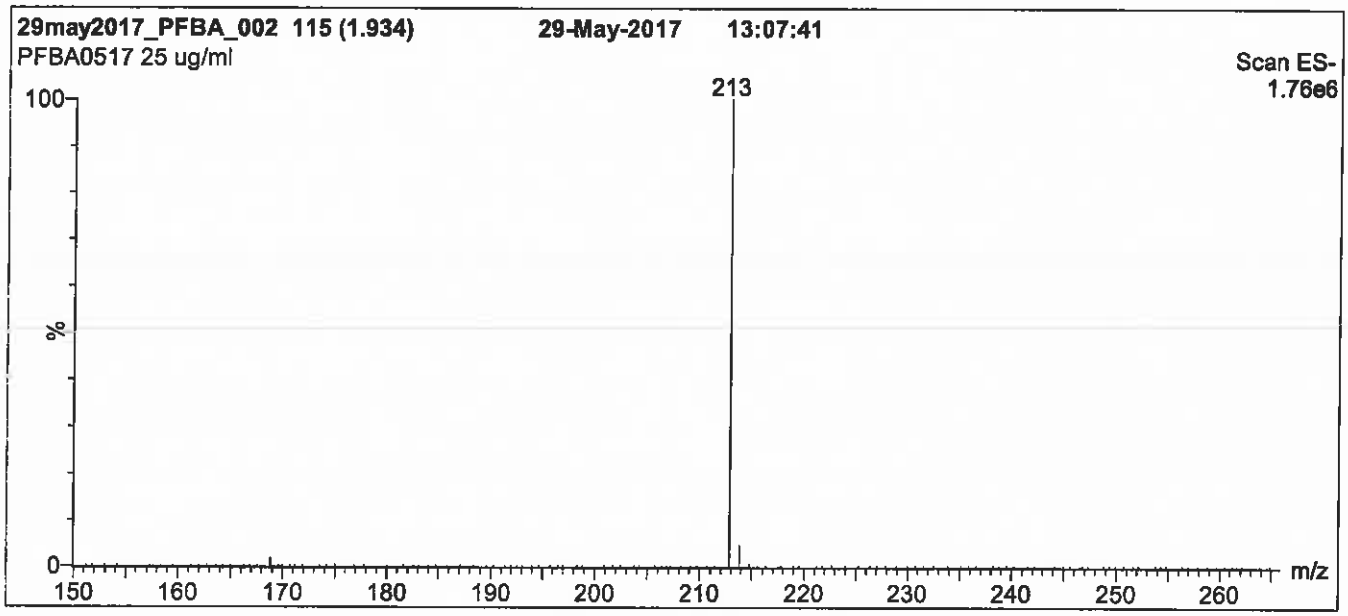
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

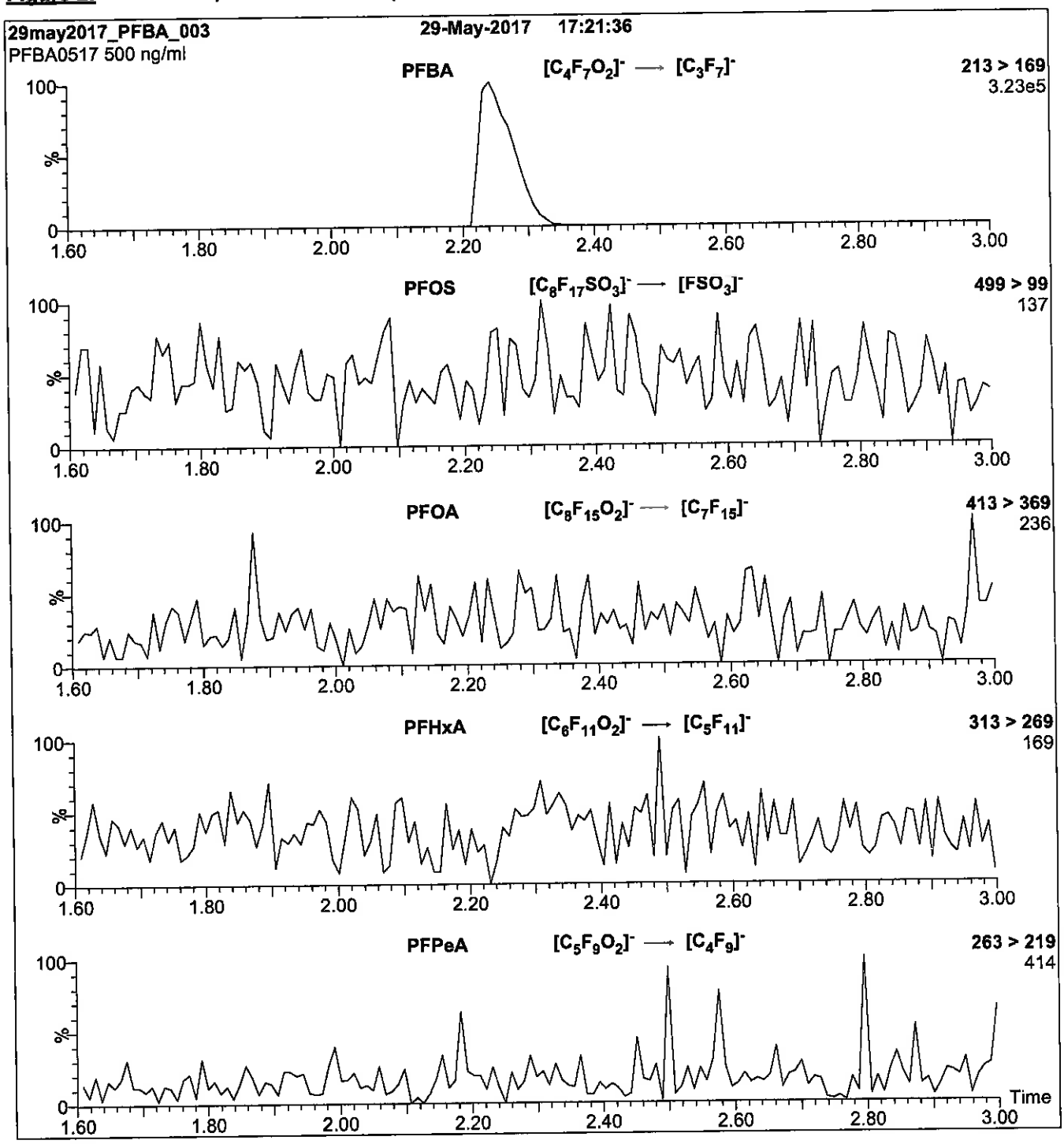
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00009

D: 2/16/18 SW

WELLINGTON LABORATORIES

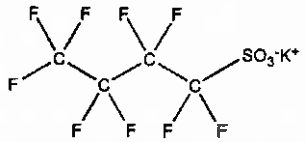
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
COMPOUND: Potassium perfluoro-1-butanesulfonate

LOT NUMBER: LPFBS0917

STRUCTURE:

CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/21/2017
EXPIRY DATE: (mm/dd/yyyy) 09/21/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 338.19
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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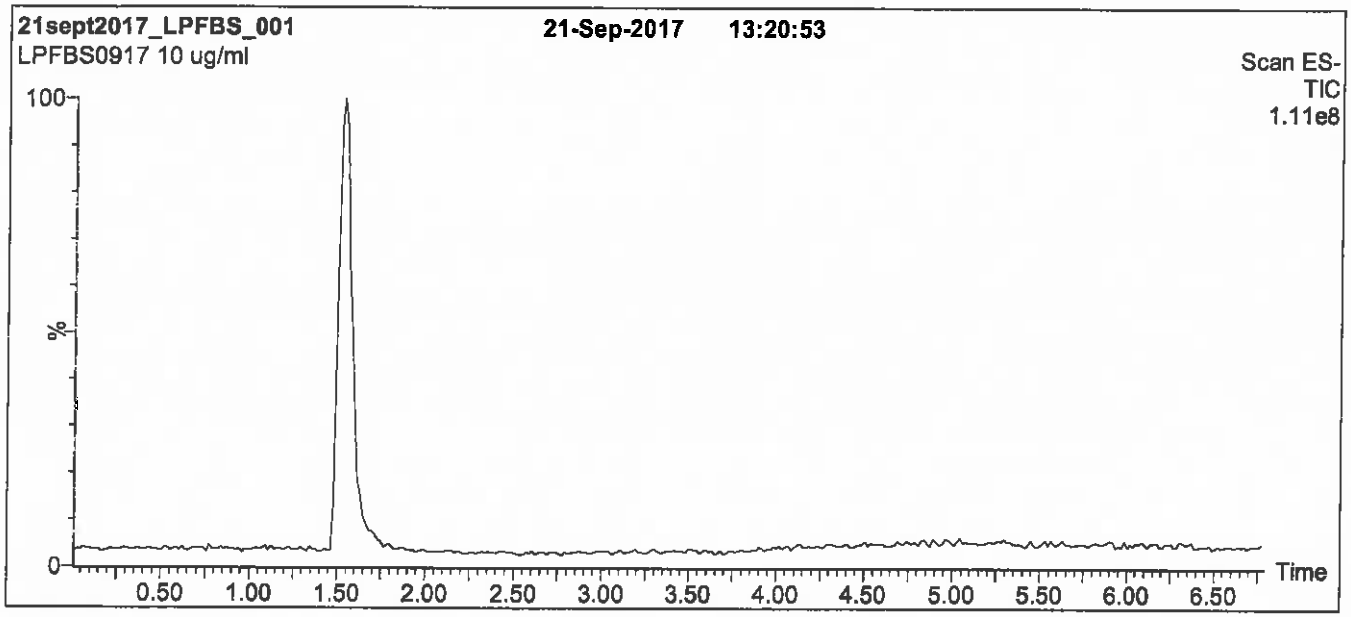
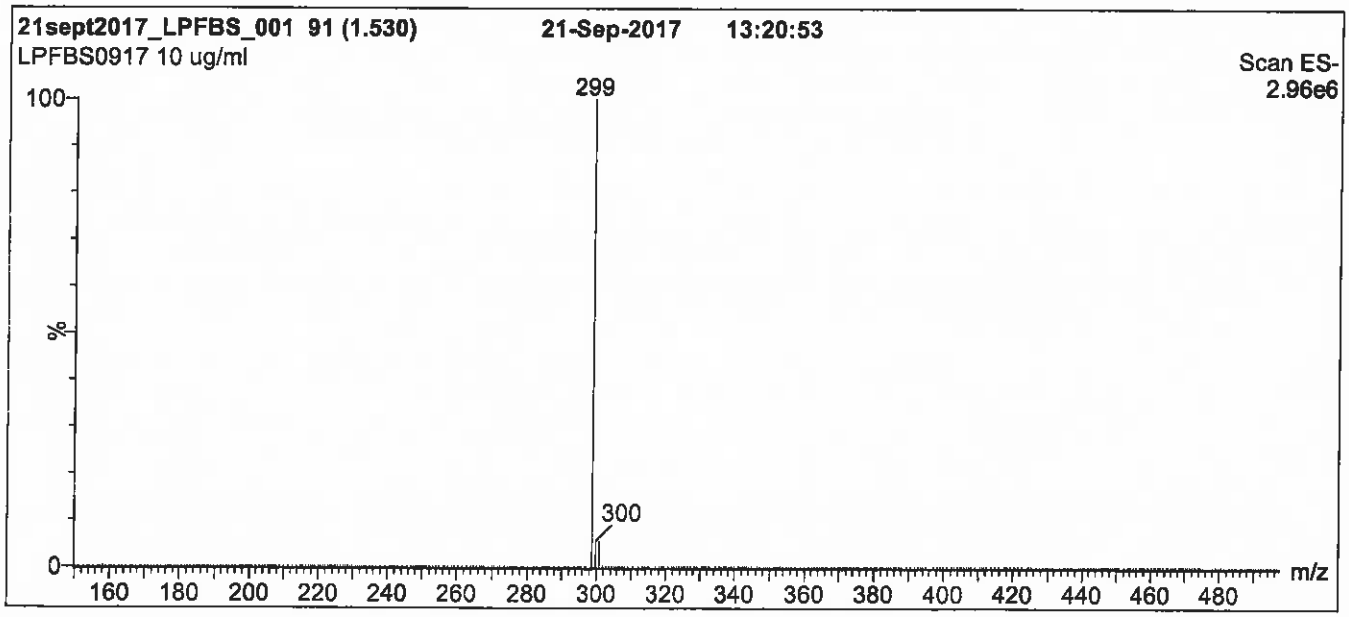
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

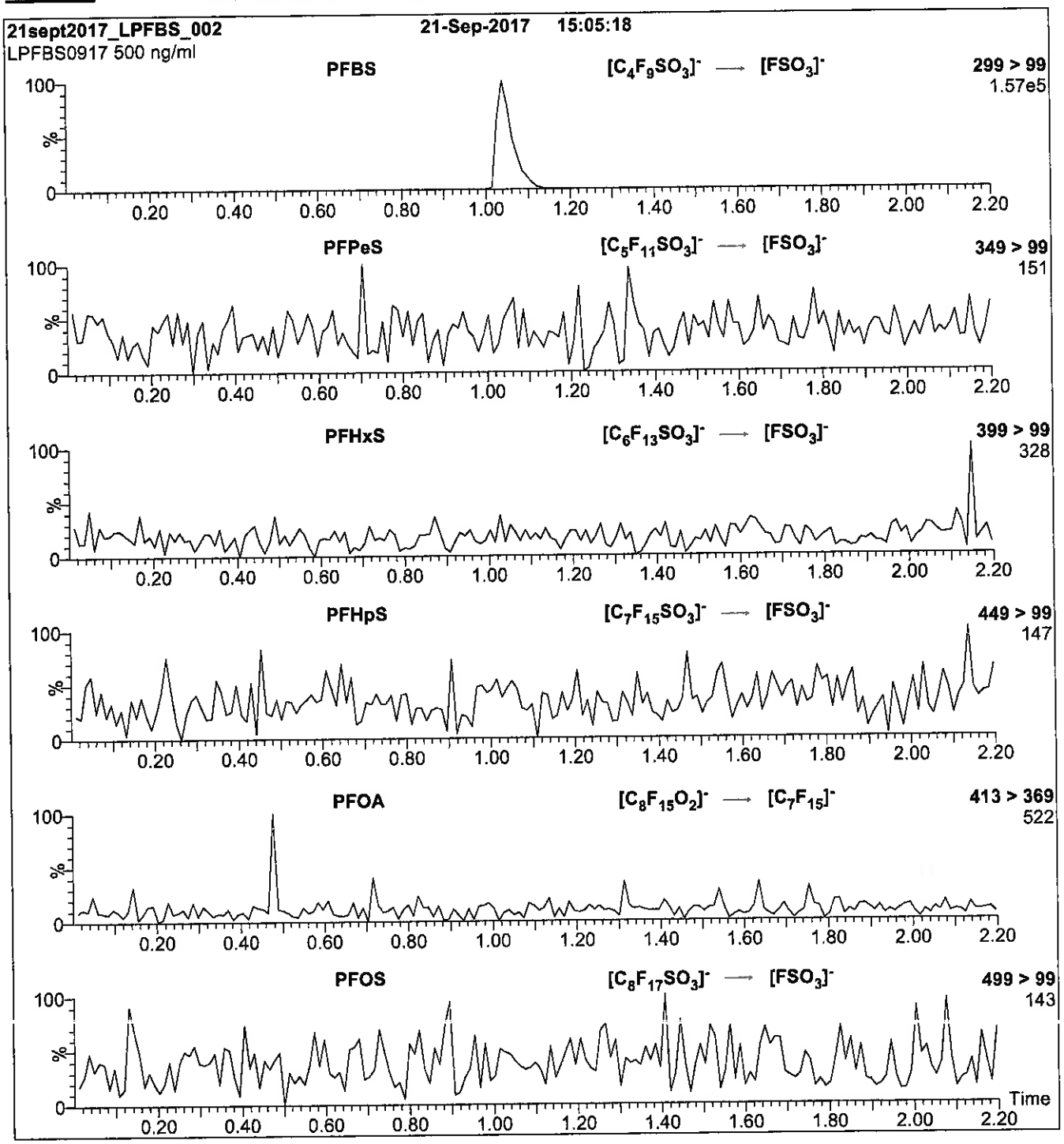
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00008

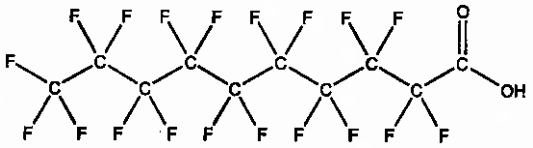
n: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA0517

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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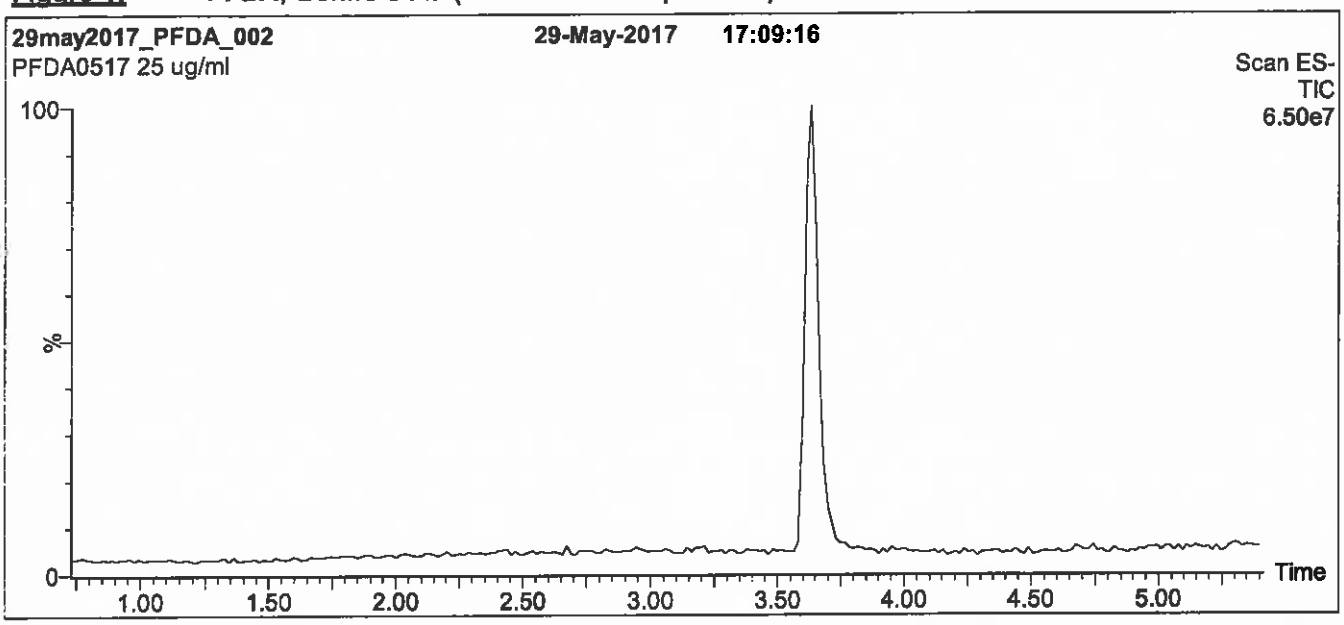
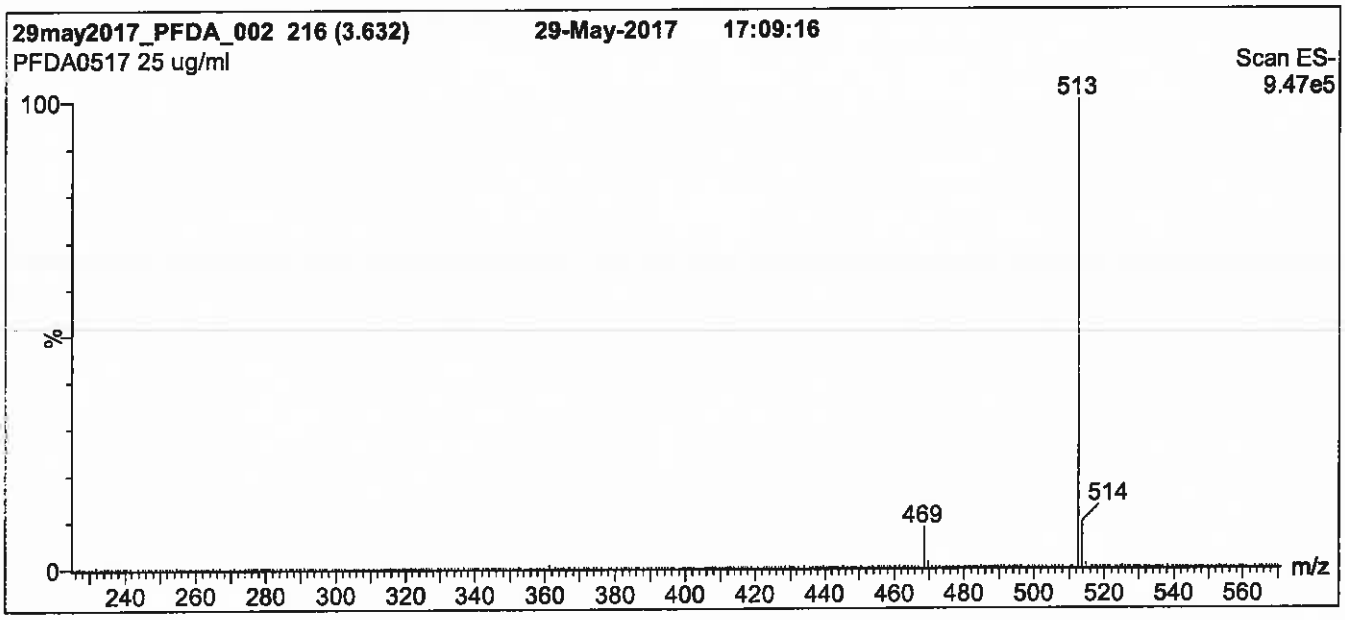
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

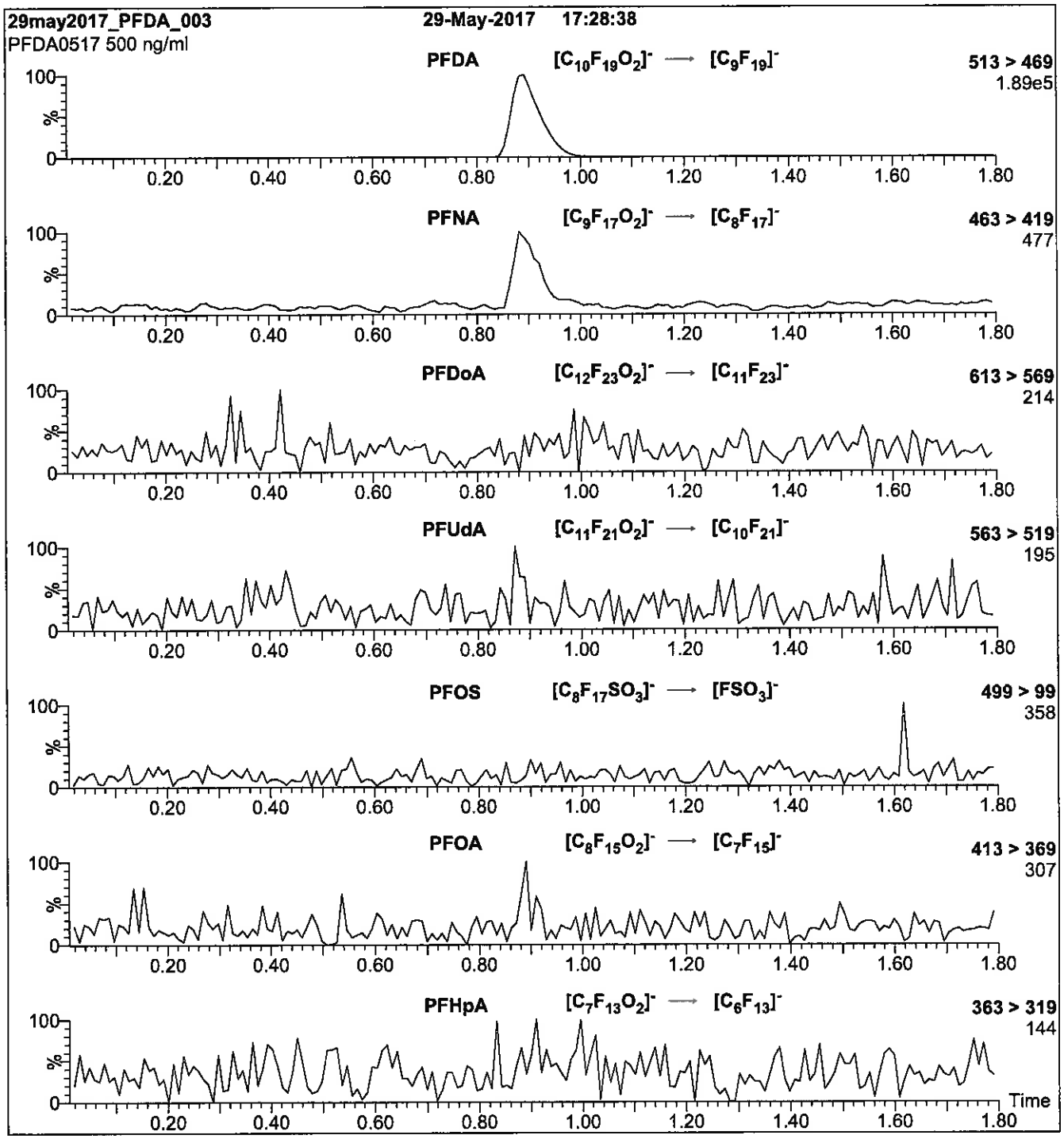
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00008

r: 10/20/17 SKV

WELLINGTON LABORATORIES

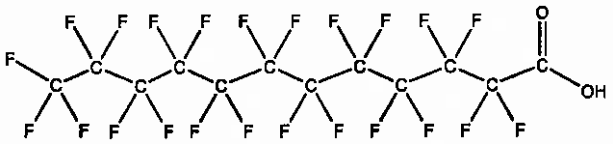
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDoA
COMPOUND: Perfluoro-n-dodecanoic acid

LOT NUMBER: PFDoA0517

STRUCTURE:

CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 614.10
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

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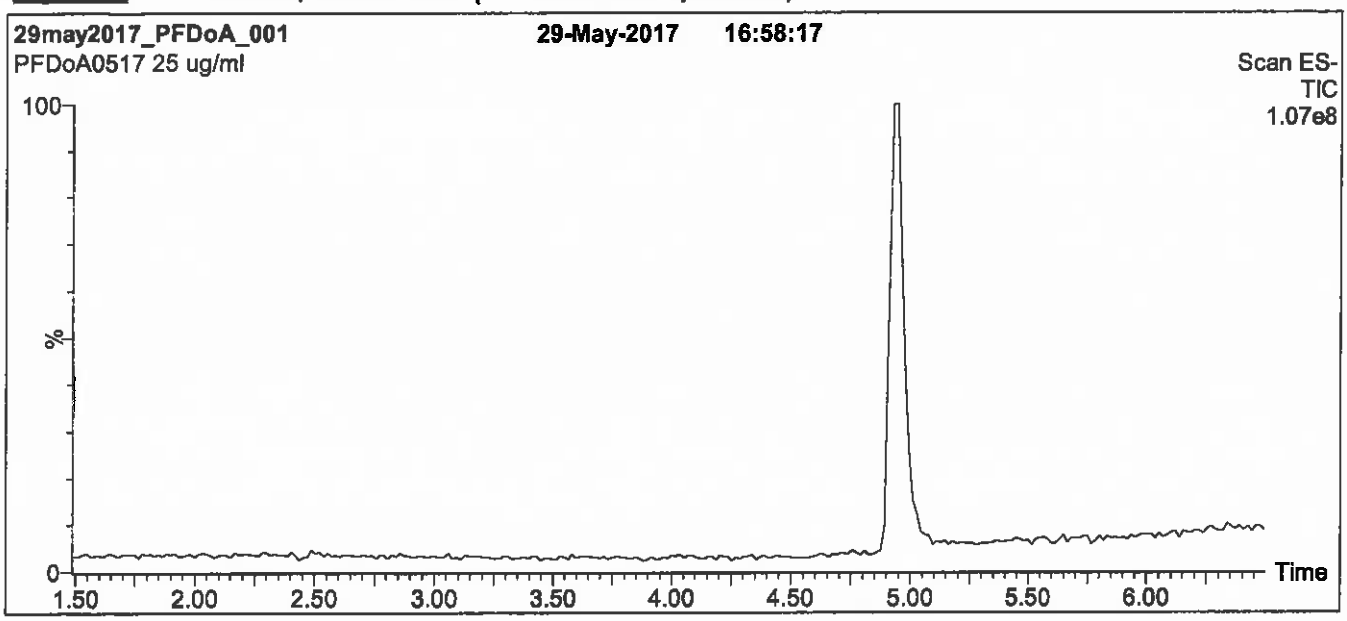

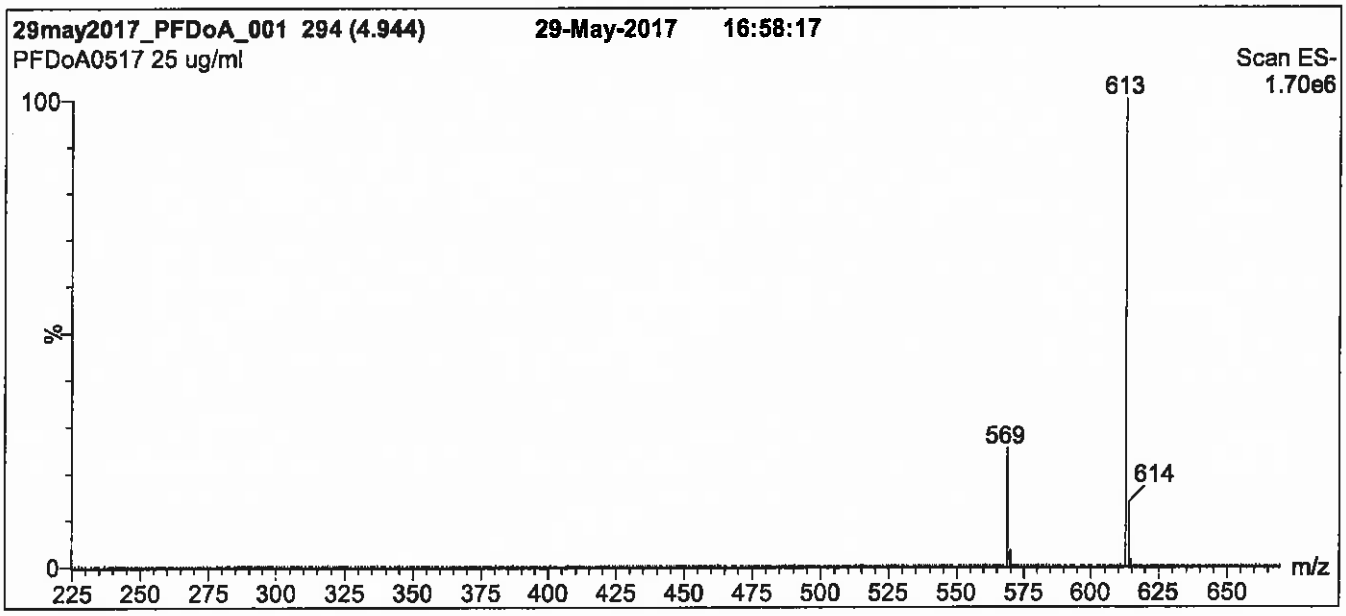

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Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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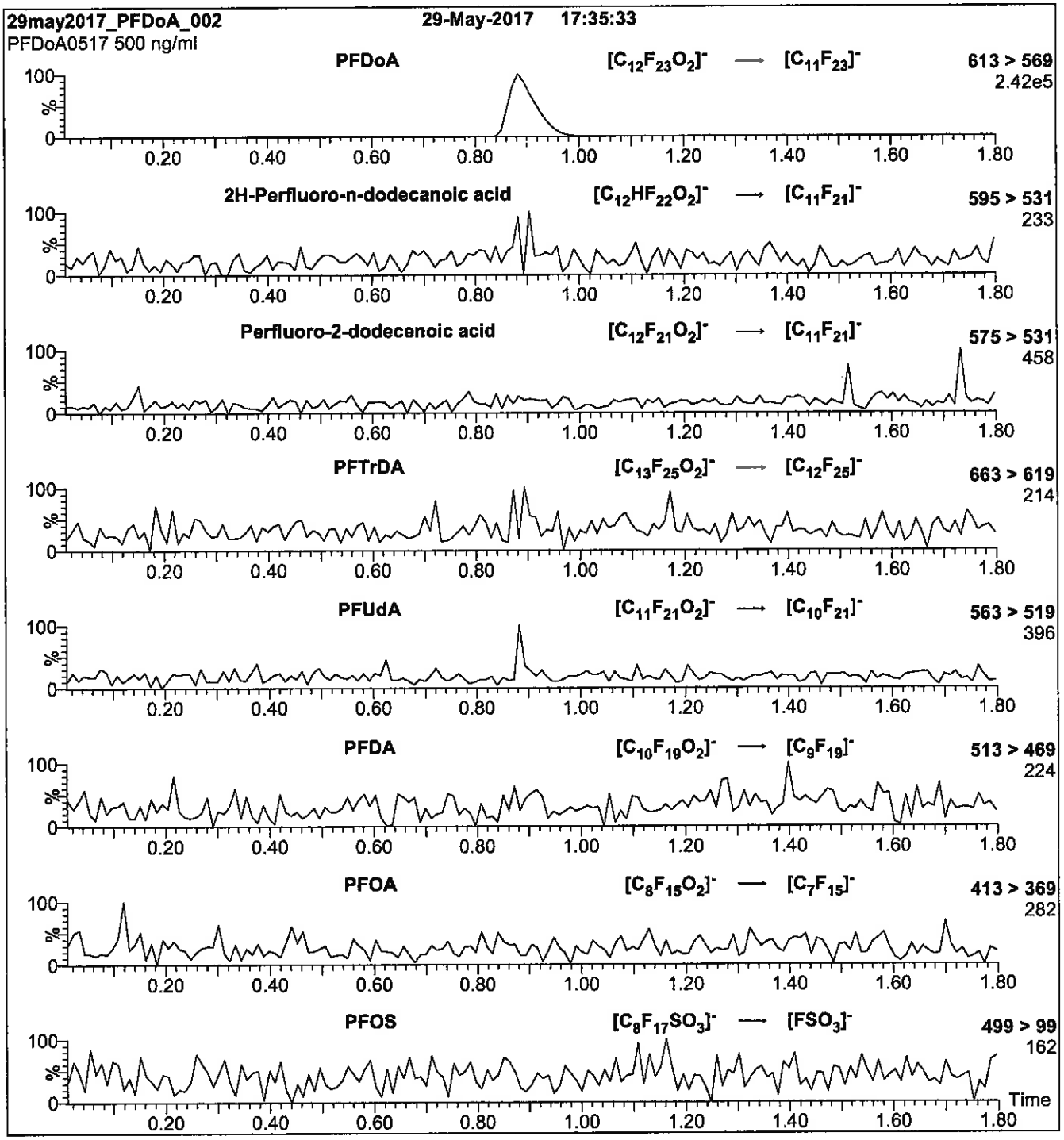
Figure 2: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00010

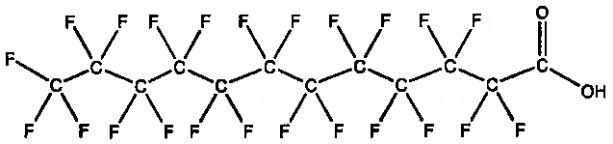
r: 10/20/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDoA
LOT NUMBER: PFDoA0517
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE:
CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
MOLECULAR WEIGHT: 614.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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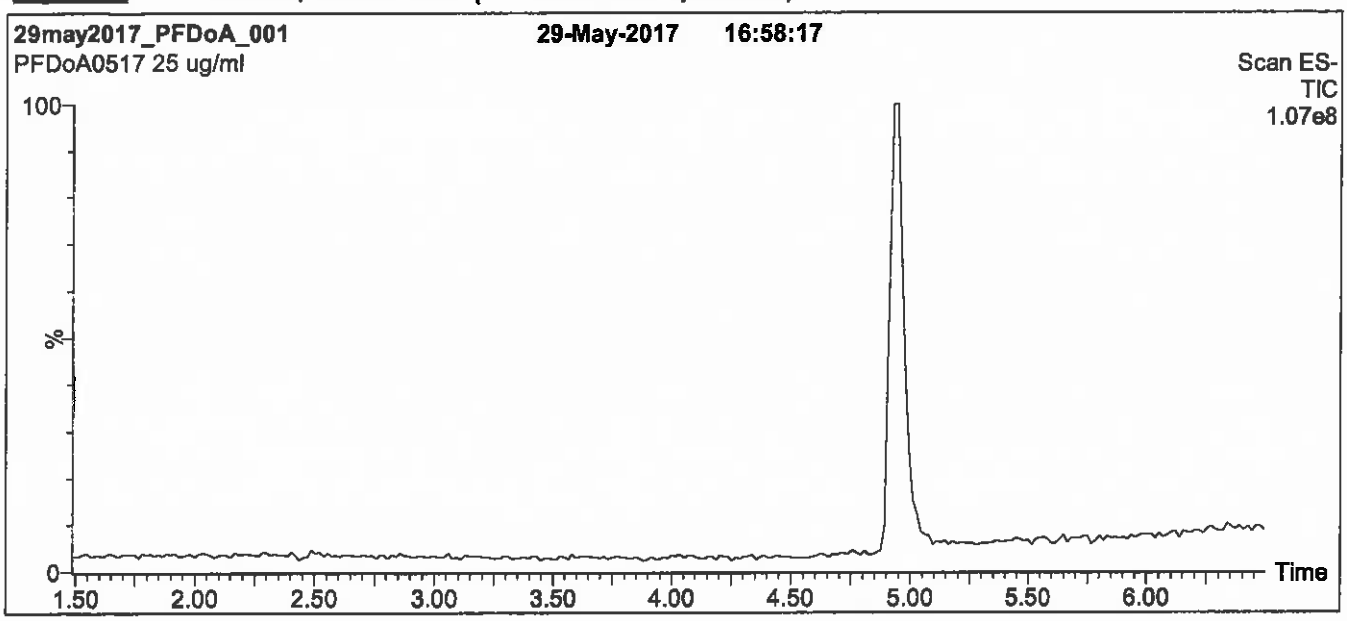

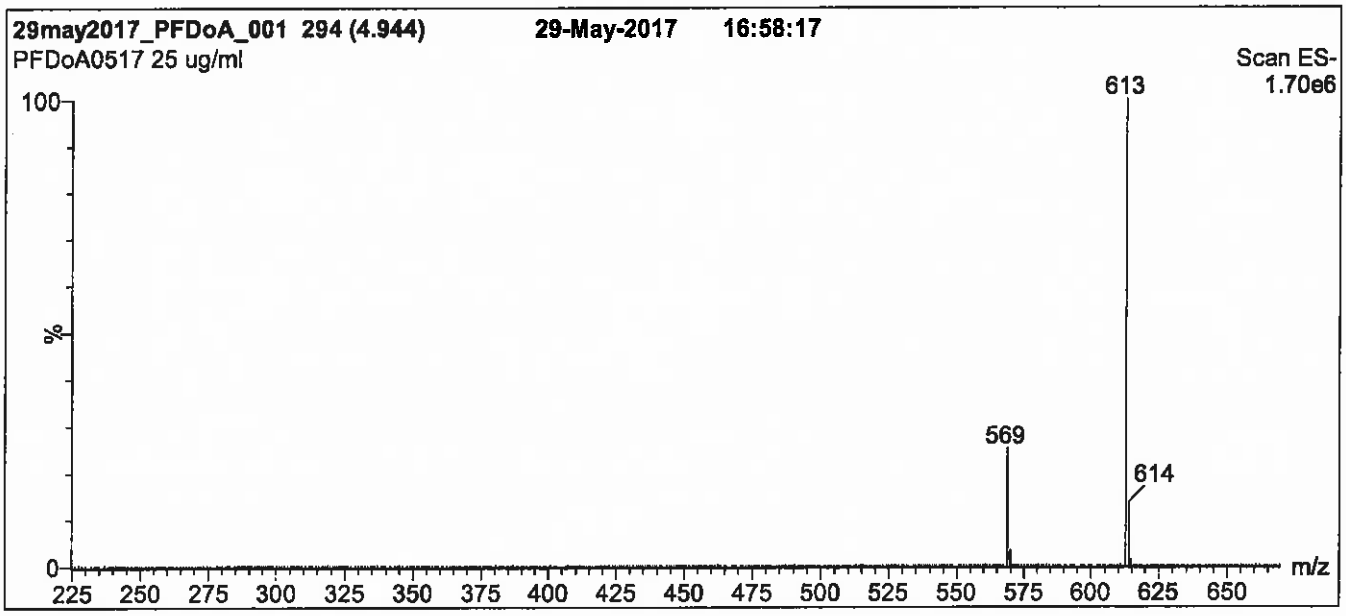

Conditions for Figure 1:

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

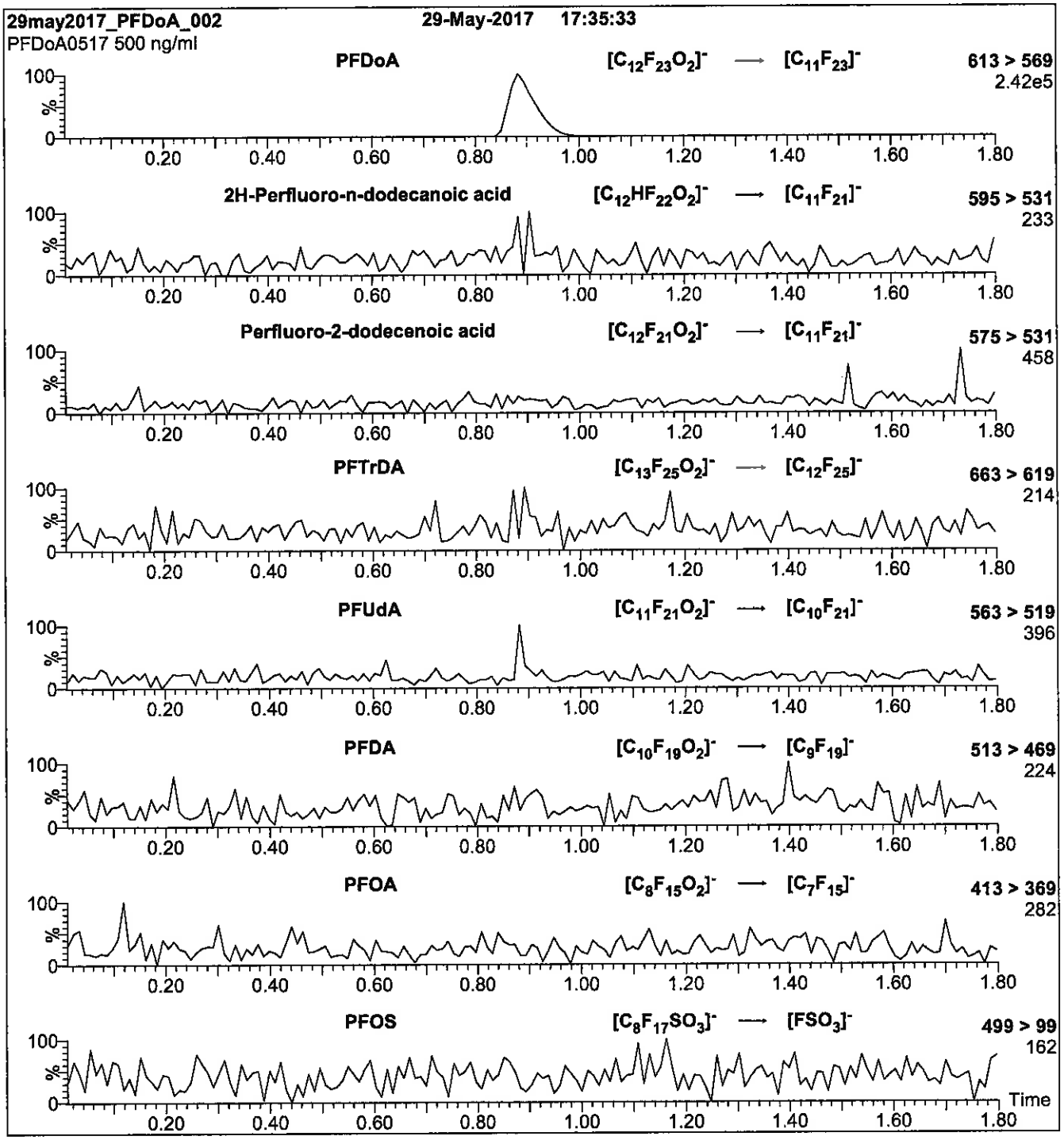
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCPFDS_00008

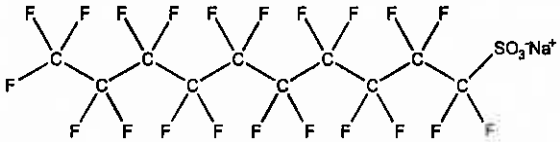
P: 2/16/18 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS1117
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:
CAS #: 2806-15-7



MOLECULAR FORMULA: $C_{10}F_{21}SO_3Na$
MOLECULAR WEIGHT: 622.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
48.2 ± 2.4 µg/ml (PFDS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/08/2017
EXPIRY DATE: (mm/dd/yyyy) 11/08/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

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Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED

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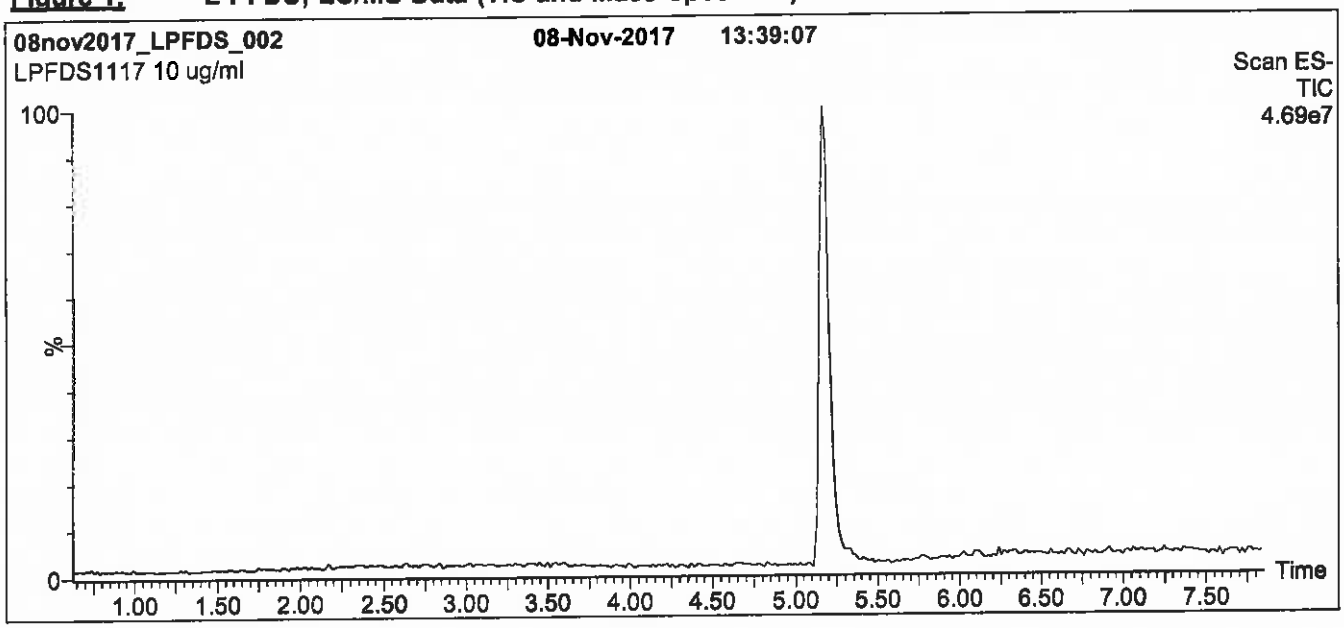
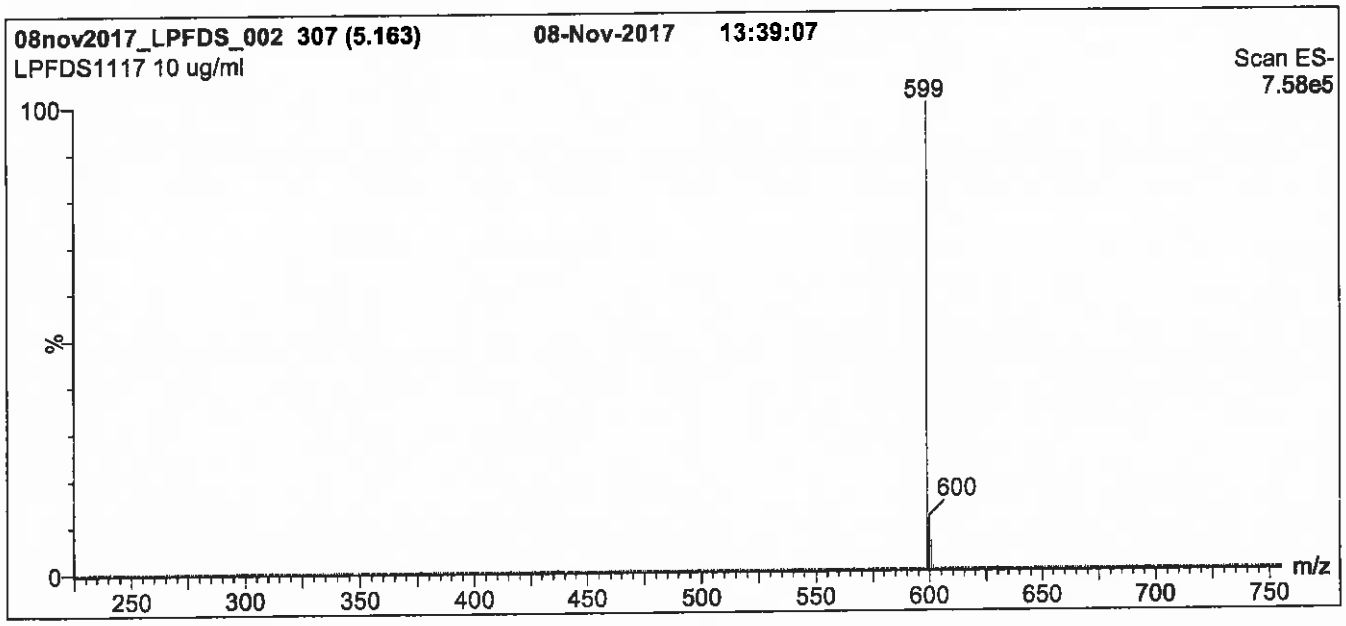
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





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2 min before returning to initial conditions in 0.5 min.
Time: 10 min

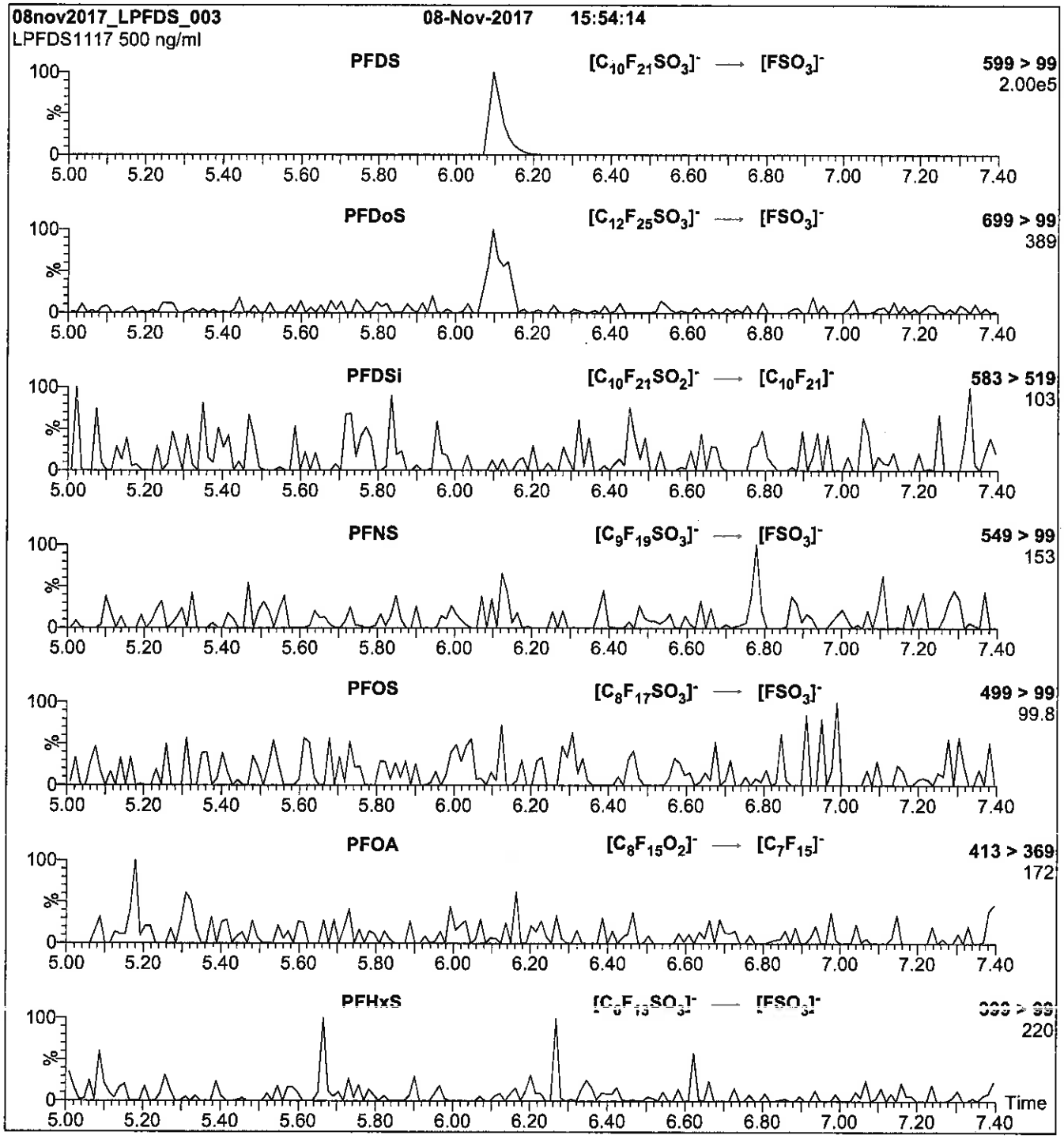
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFDS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFDS)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 50
Flow:	300 µl/min	

Reagent

LCPFHpA_00011

P 2/16/18 SKJ

WELLINGTON LABORATORIES

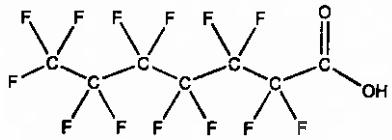
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0917

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/29/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_r(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

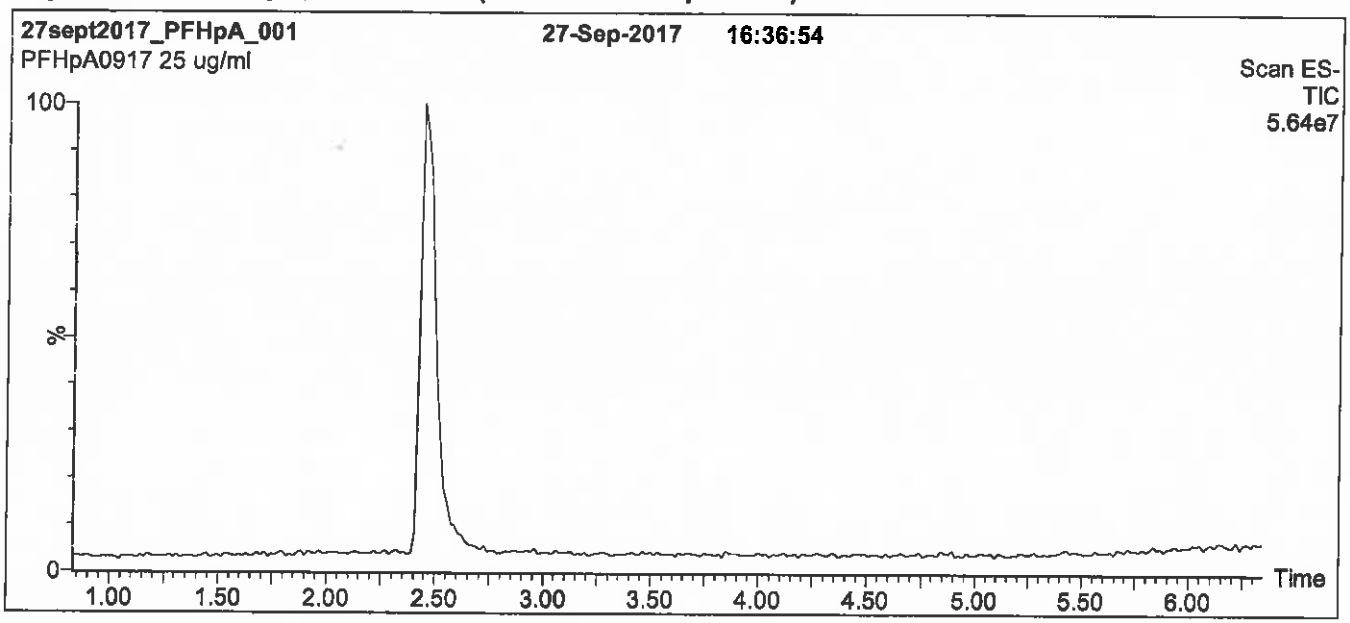
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

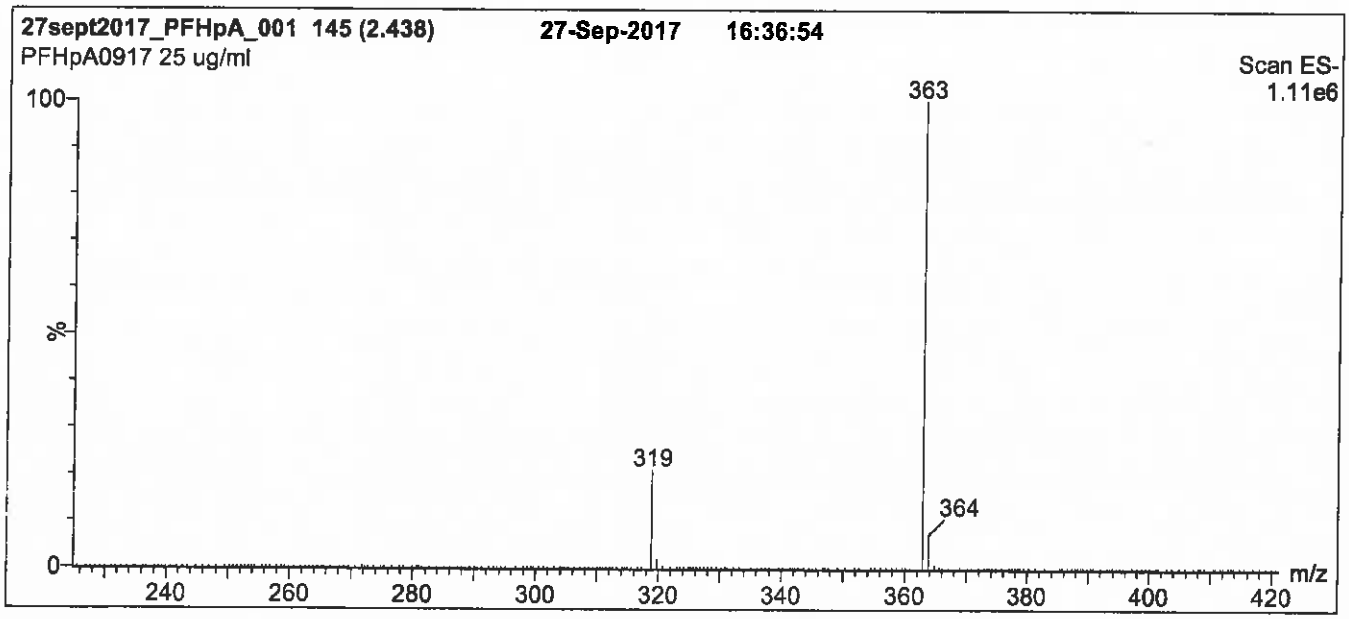
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

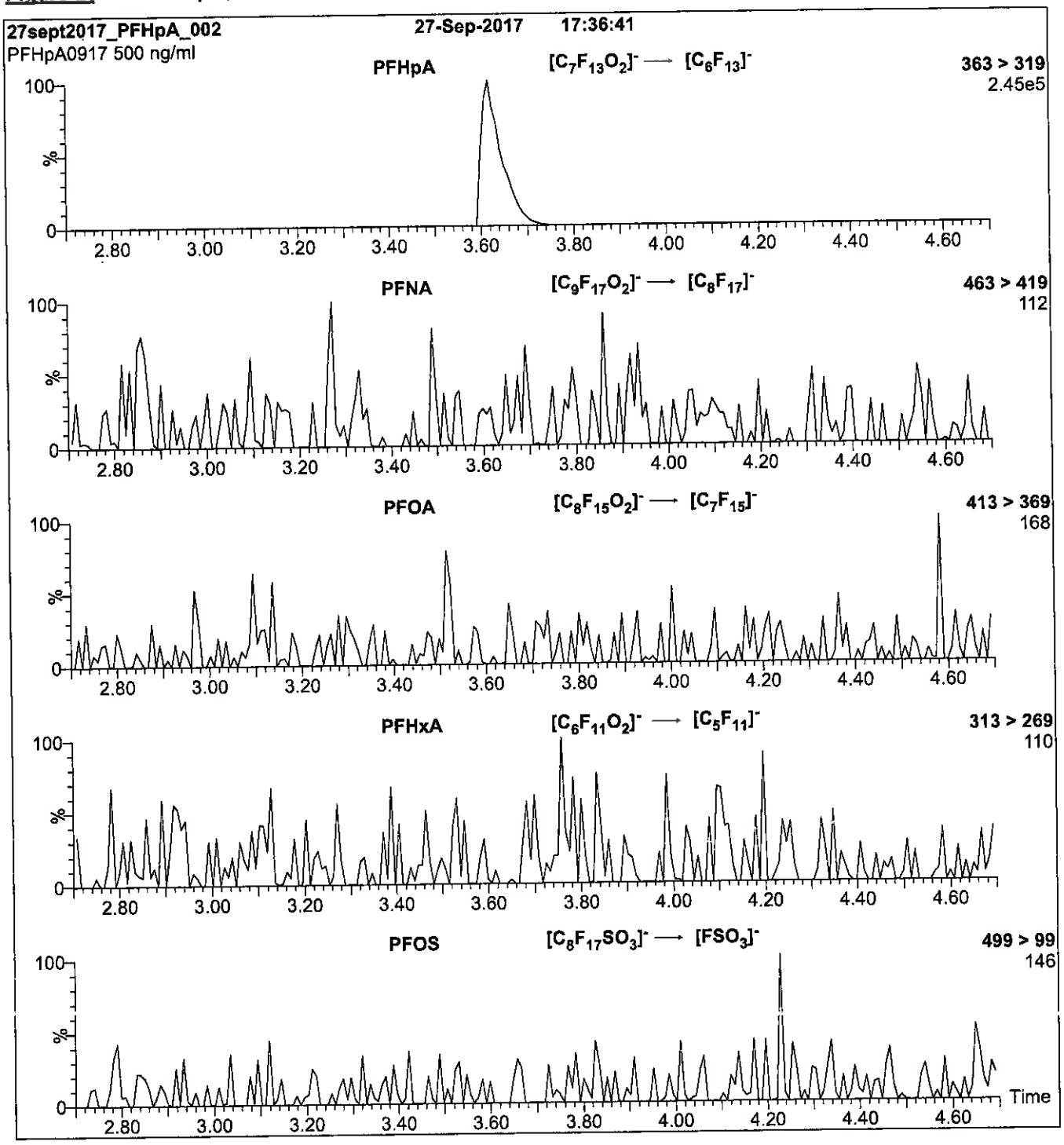
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

Reagent

LCPFHpSA_00003

R: 9/21/17 SKV

WELLINGTON LABORATORIES

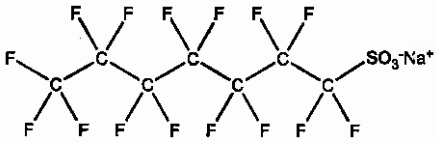
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate

LOT NUMBER: LPFHpS0817

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $C_7F_{15}SO_3Na$
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.6 ± 2.4 µg/ml (PFHpS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/01/2017
EXPIRY DATE: (mm/dd/yyyy) 09/01/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 472.10
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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HOMOGENEITY:

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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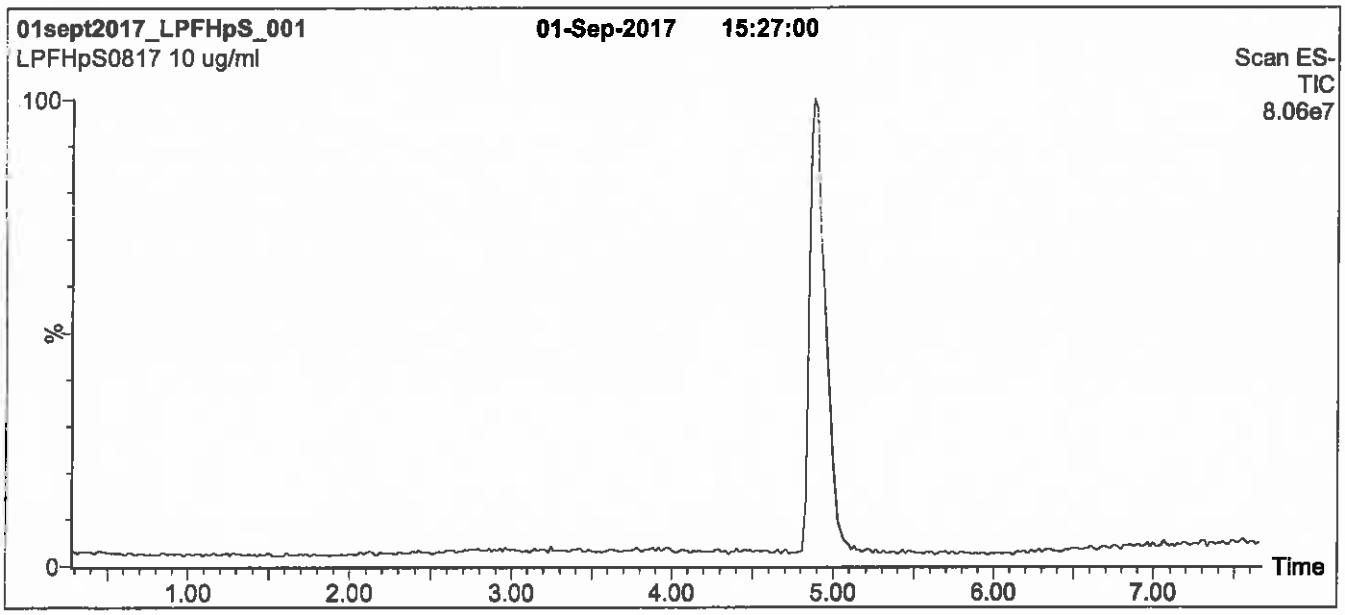
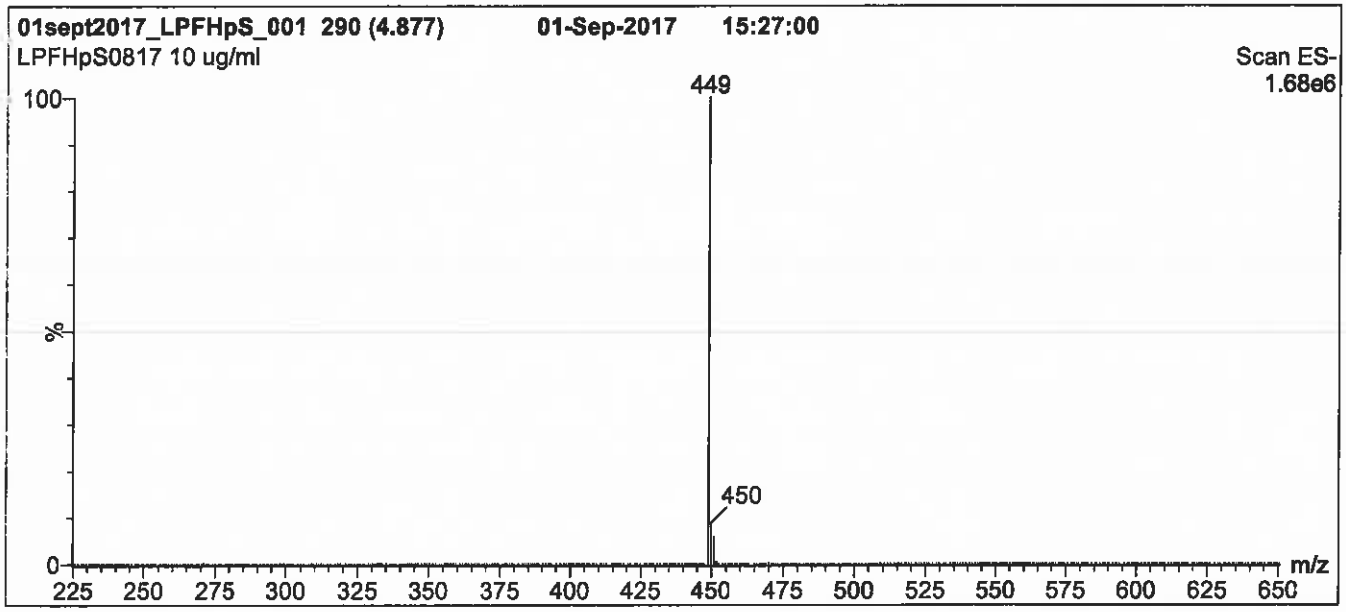
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **L-PFHpS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

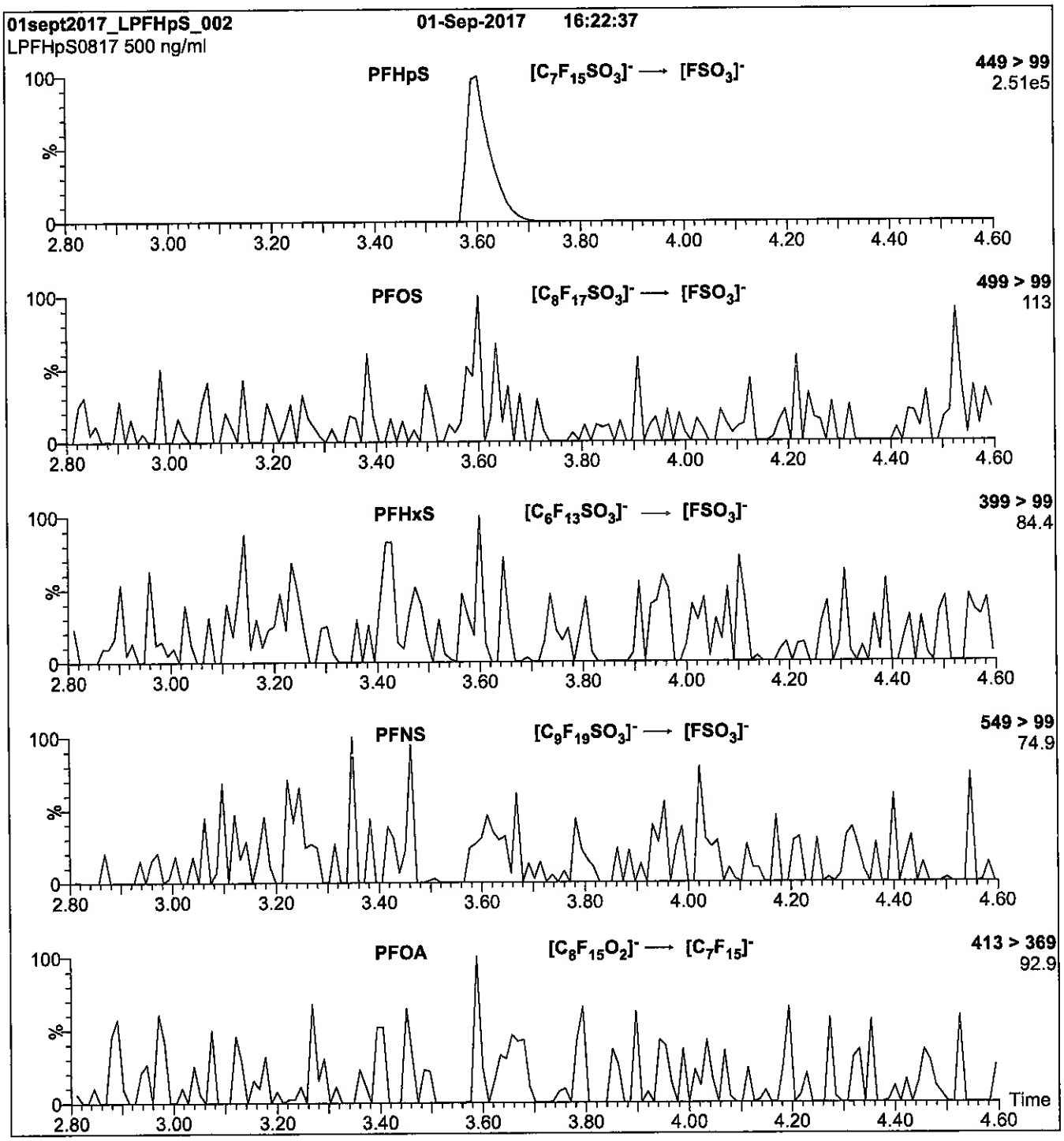
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFHpS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00010

r: 2/16/18 SKJ

WELLINGTON LABORATORIES

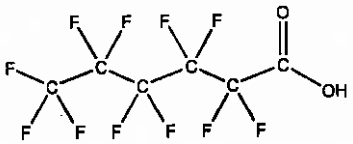
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA0917

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 1.0% of branched isomers.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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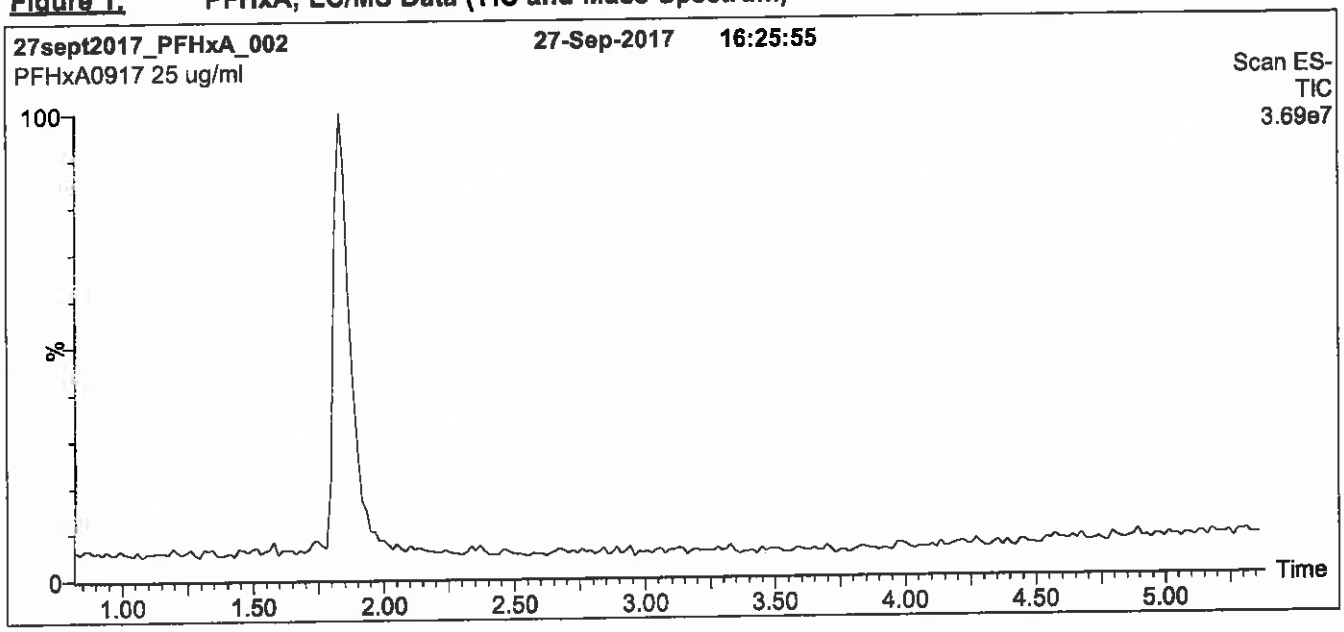
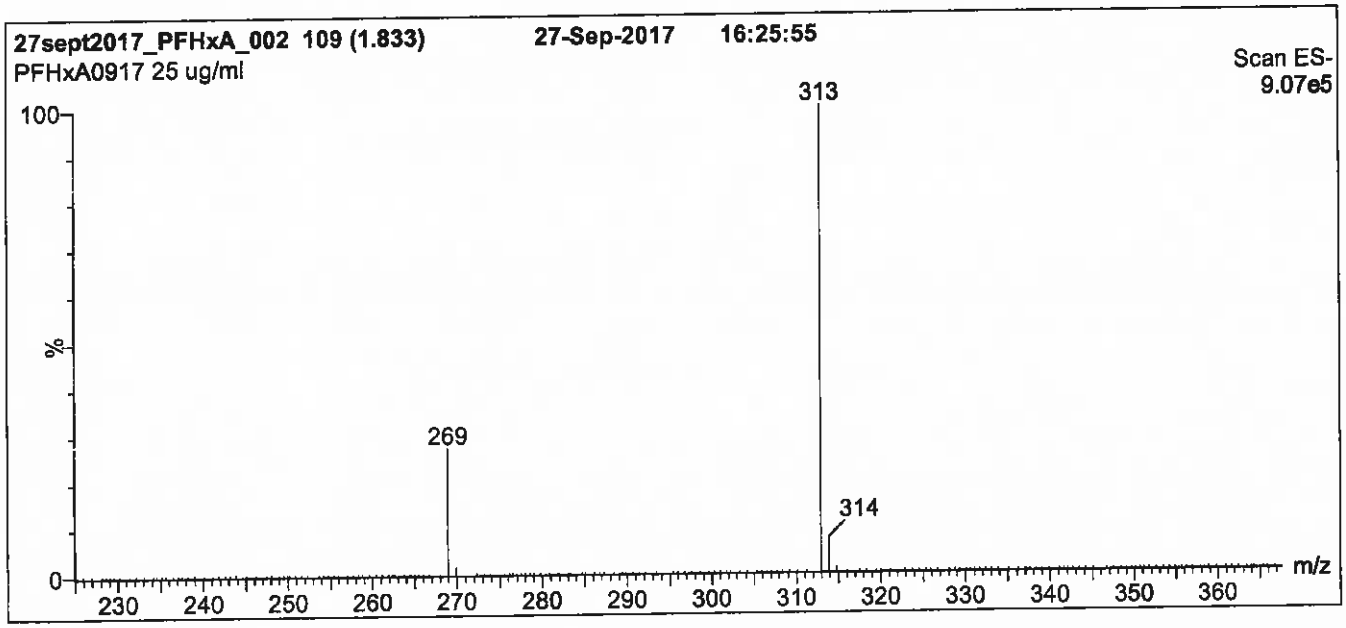
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

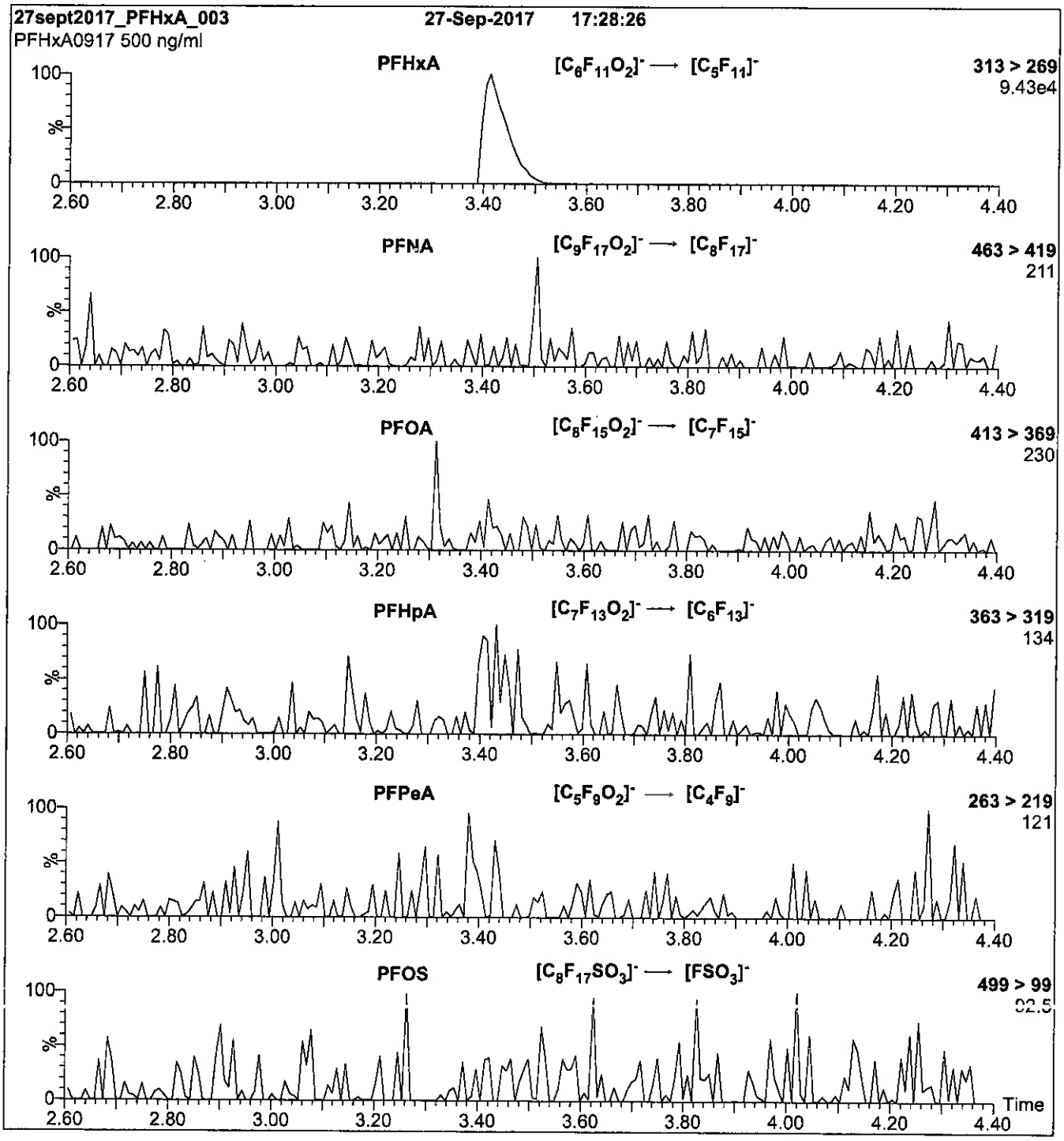
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFHxA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 10
Flow:	300 µl/min	

Reagent

LCPFHxDA_00010

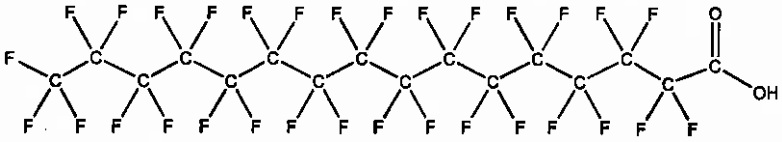
r: 9/21/17 SCJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA
COMPOUND: Perfluoro-n-hexadecanoic acid
LOT NUMBER: PFHxDA0717

STRUCTURE:
CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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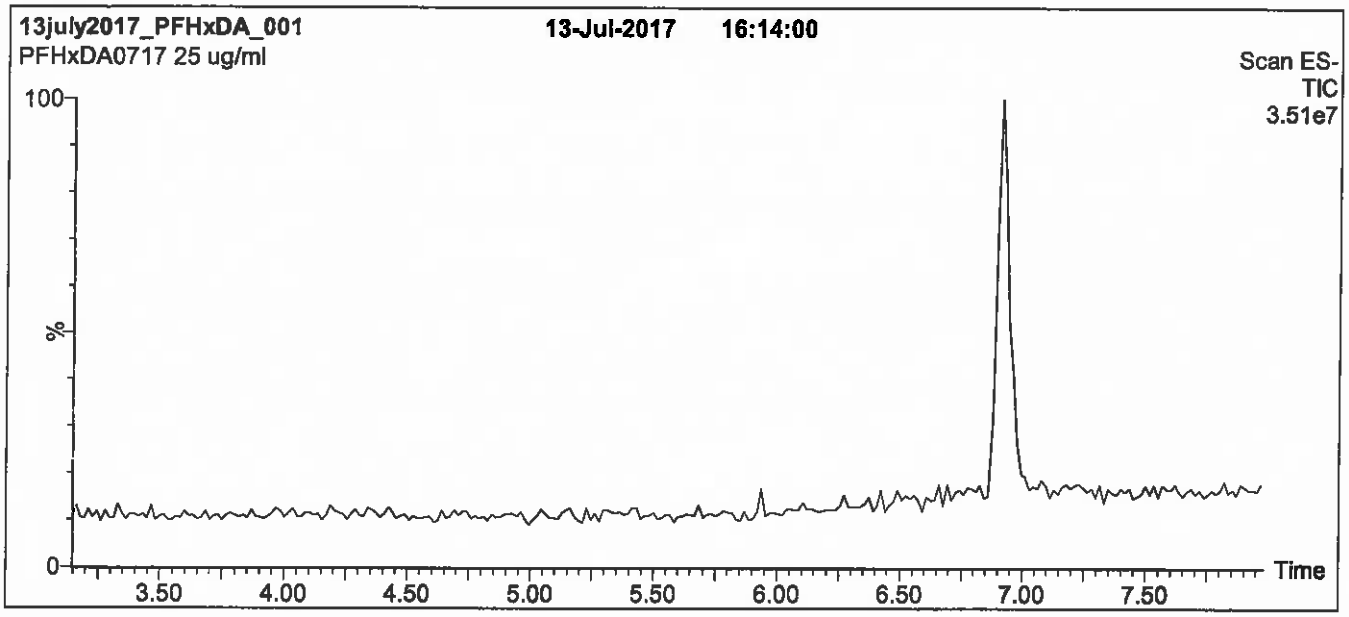
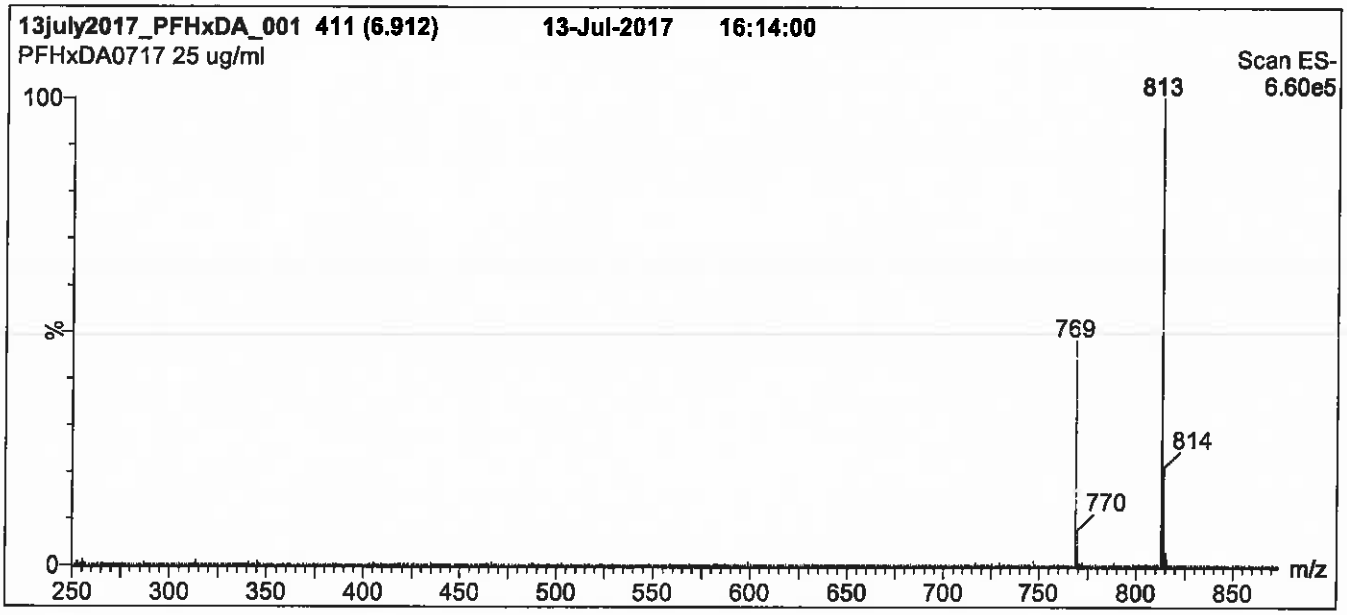
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

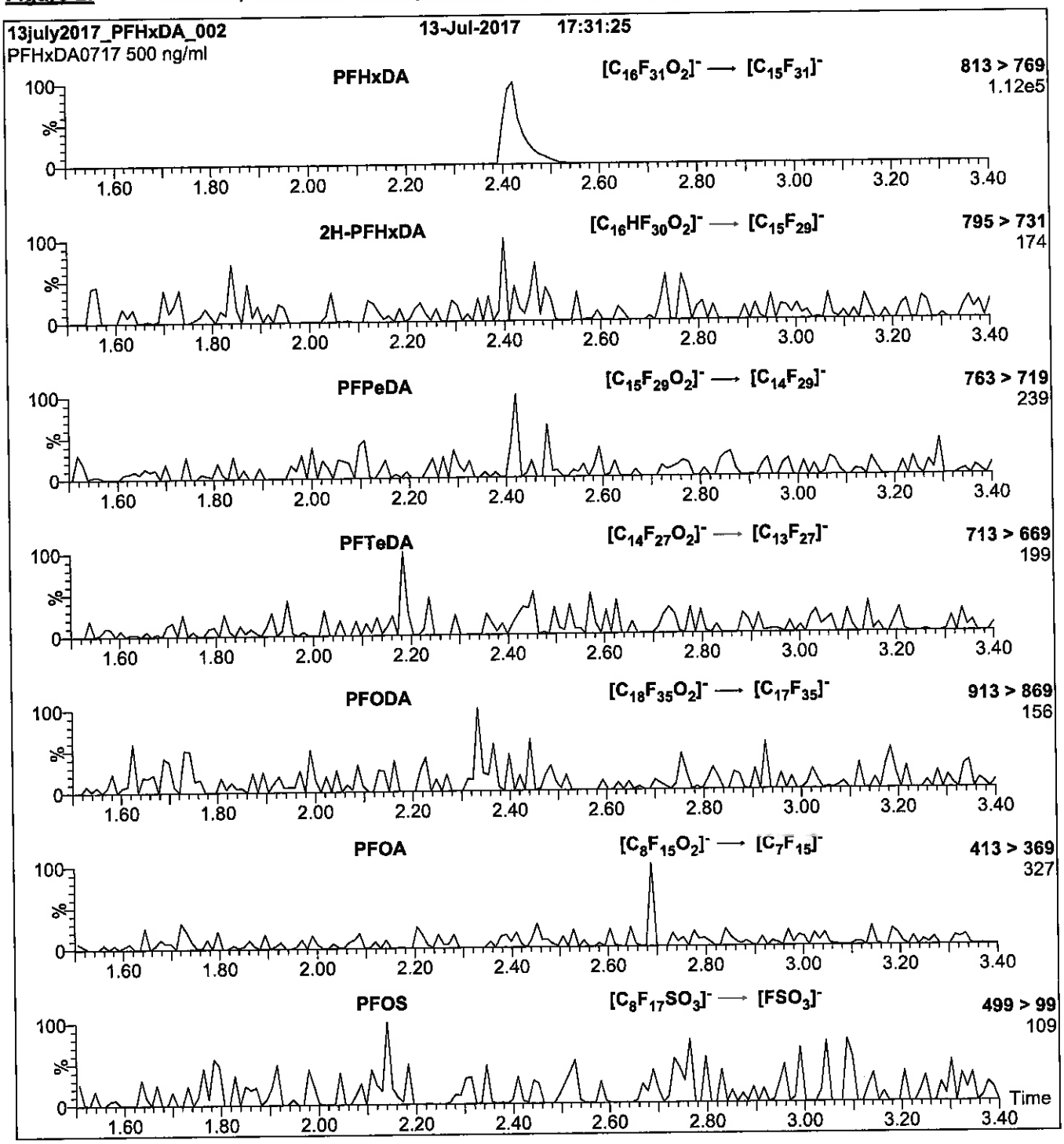
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.13e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00006

P: 10/201A SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0117
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/03/2017
LAST TESTED: (mm/dd/yyyy)	01/04/2017
EXPIRY DATE: (mm/dd/yyyy)	01/04/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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CALA

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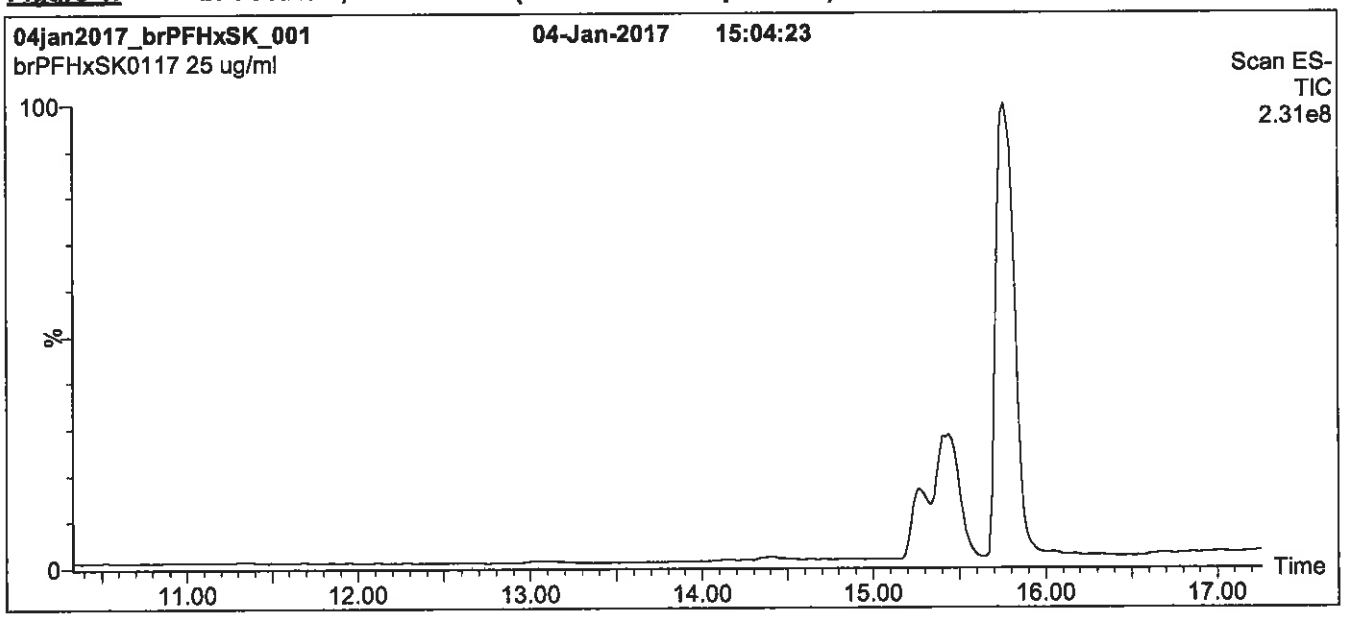
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

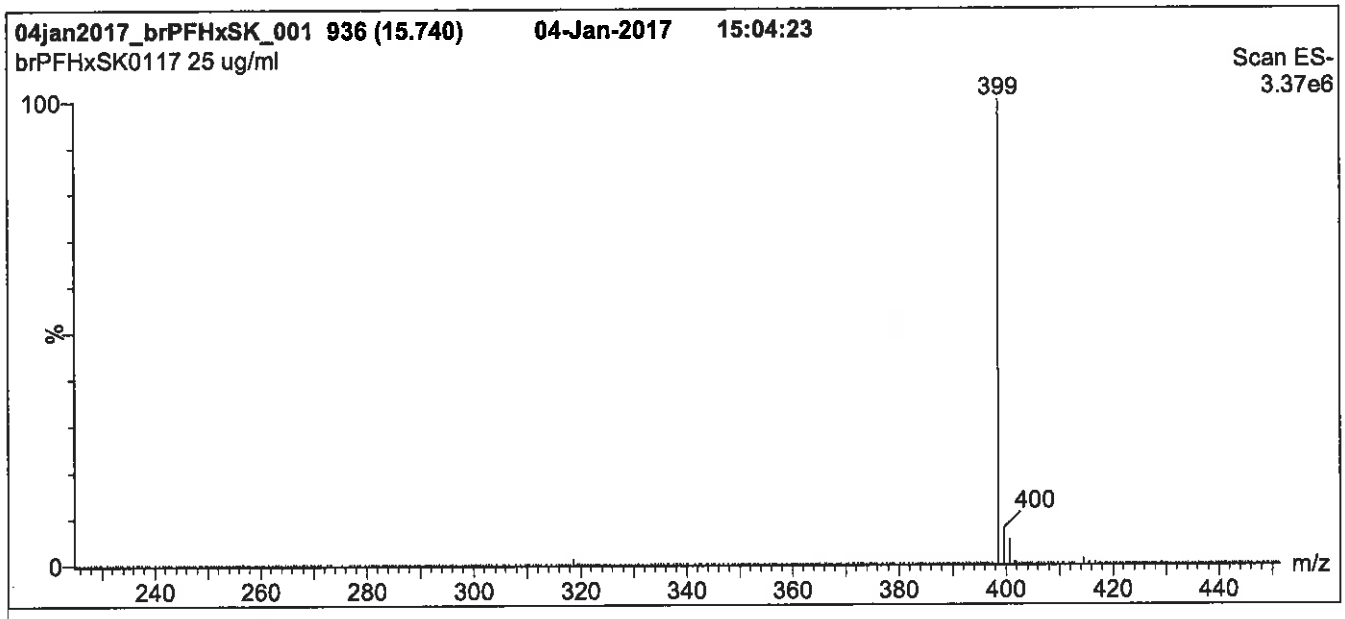
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 01/20/2017 (mm/dd/yyyy)

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

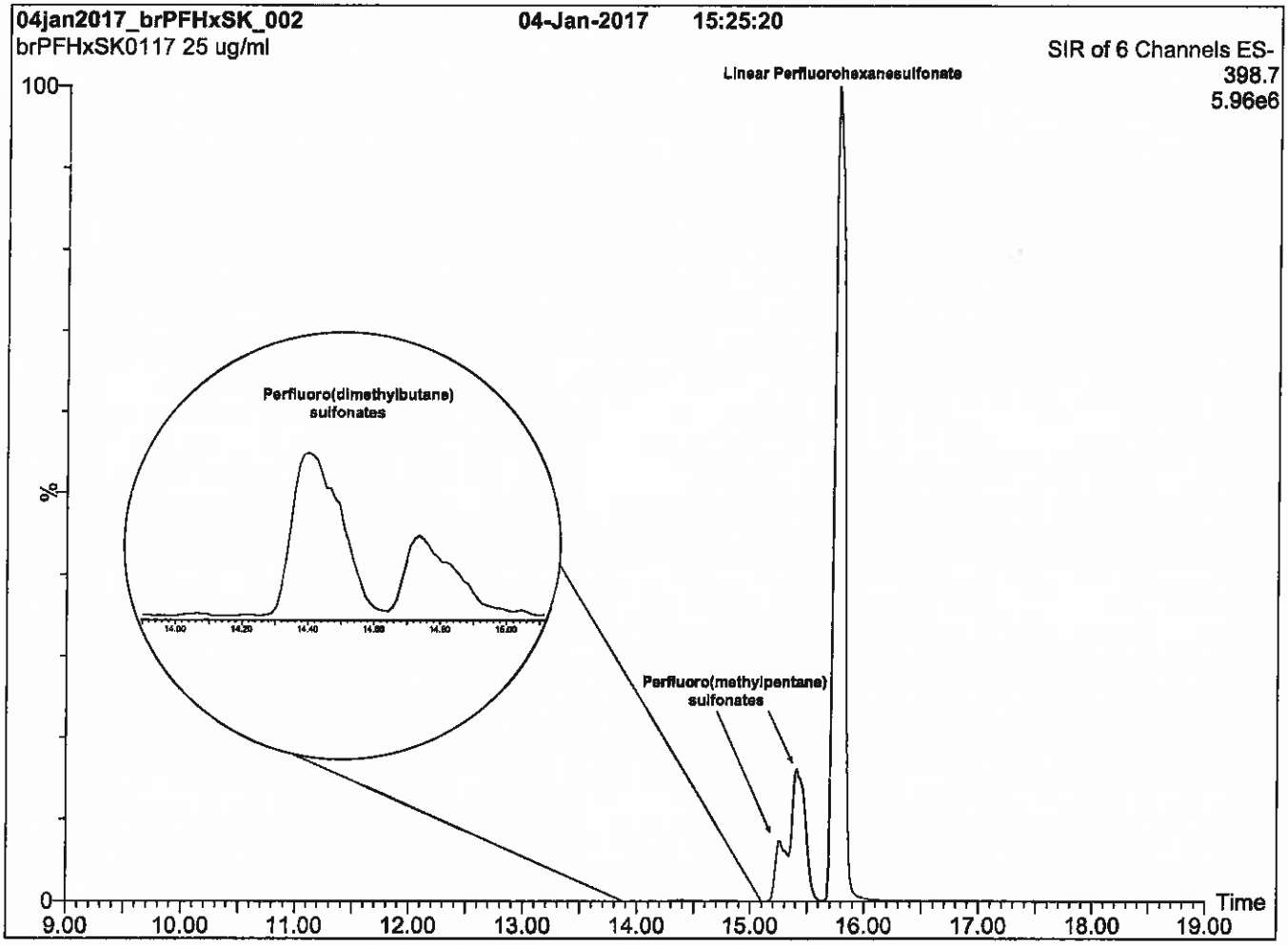
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFHxSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

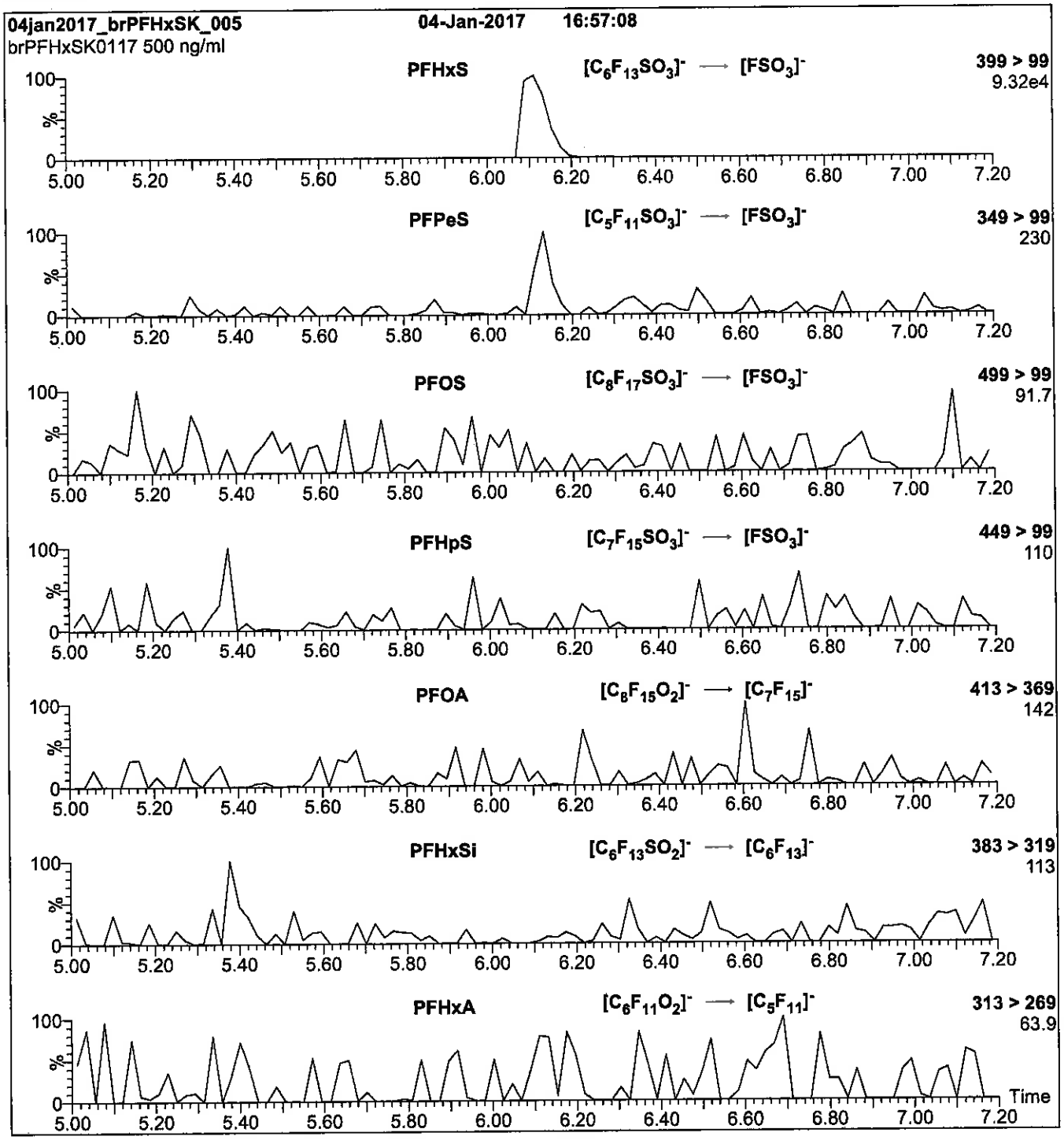
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00010

r: 2/16/18 SKJ

WELLINGTON LABORATORIES

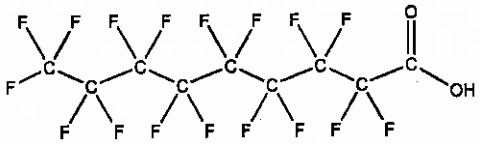
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA0717

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/20/2017
EXPIRY DATE: (mm/dd/yyyy) 07/20/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED

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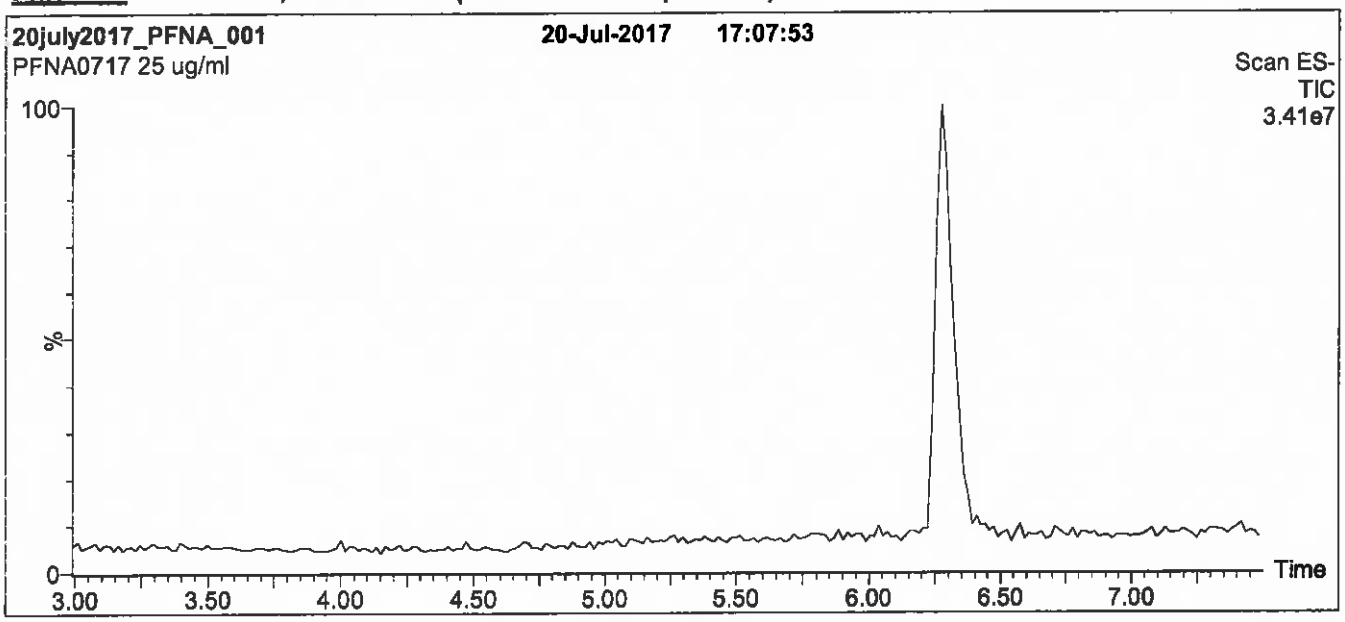

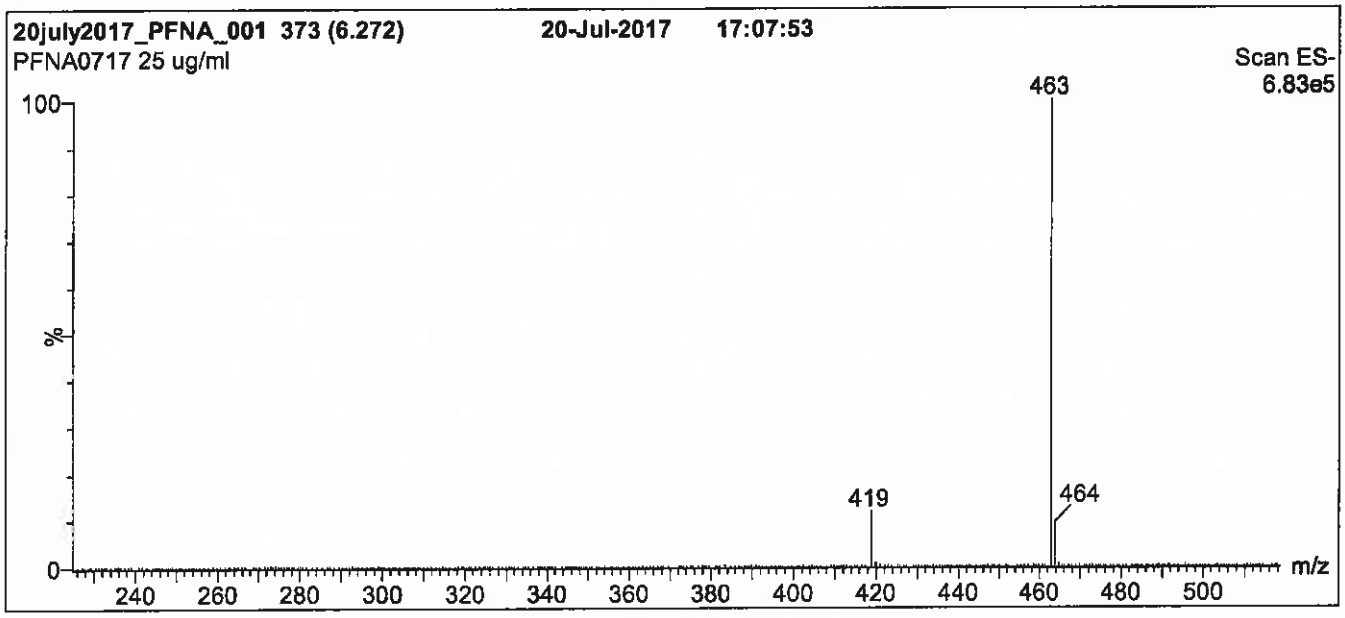

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Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

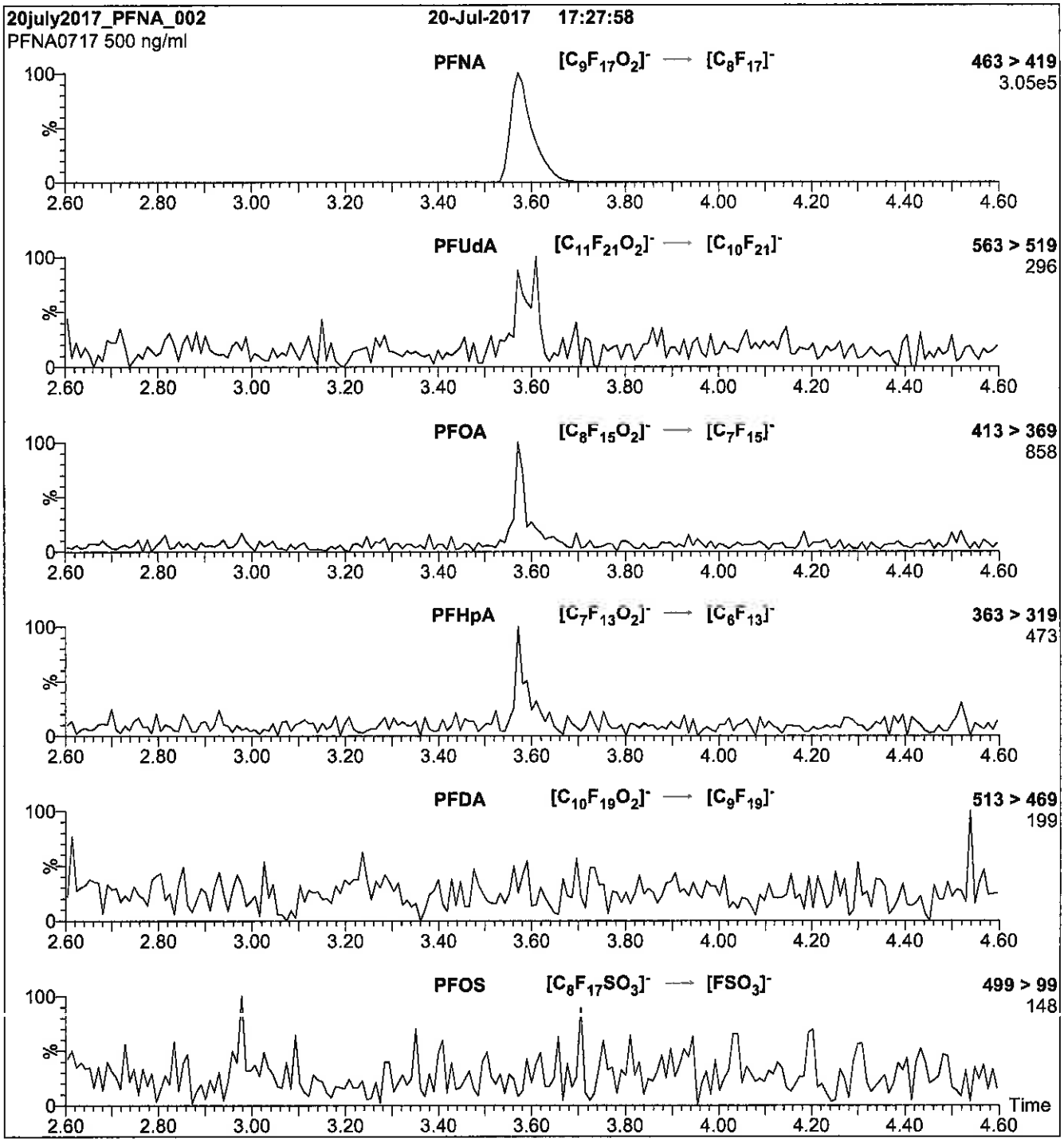
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFNS_00003

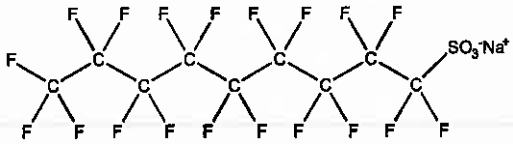
1106804
ID: LCPFNS_00003
Exp: 09/27/22 Prpd: SKV
L-PFNS at 48.0ug/mL

r: 12/4/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFNS
LOT NUMBER: LPFNS0917
COMPOUND: Sodium perfluoro-1-nonanesulfonate
STRUCTURE:
CAS #: 98789-57-2



MOLECULAR FORMULA: $C_9F_{19}SO_3Na$
MOLECULAR WEIGHT: 572.12
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
48.0 ± 2.4 µg/ml (PFNS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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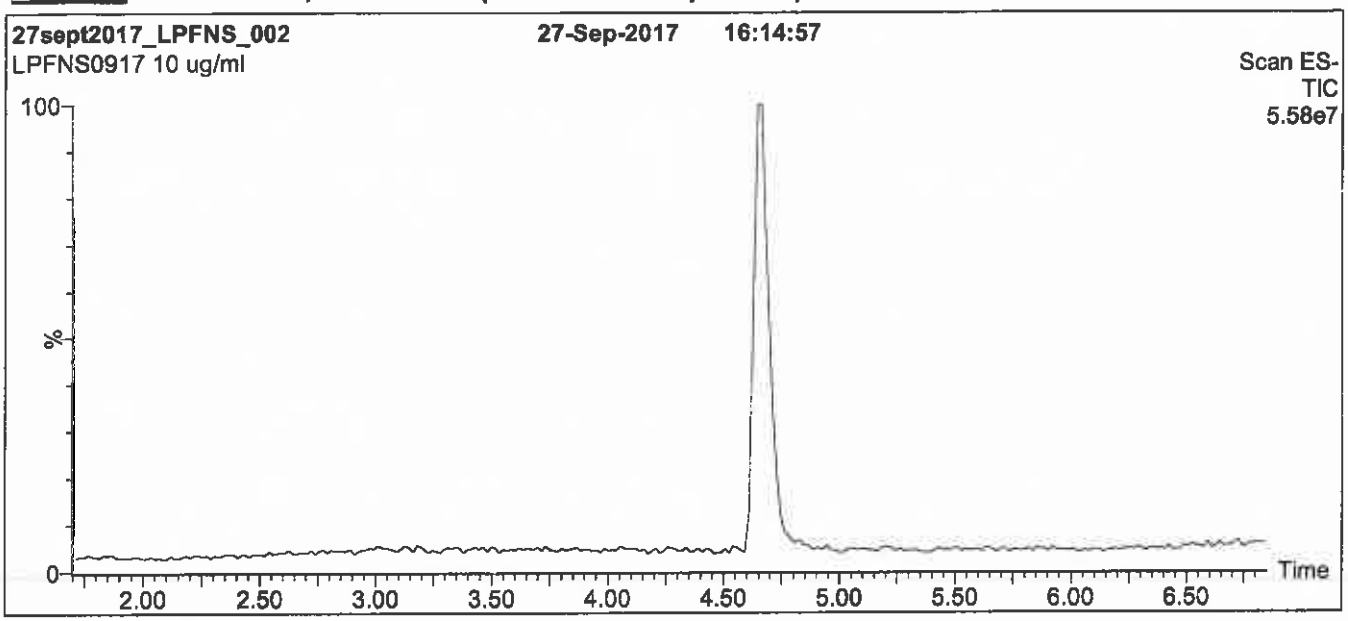
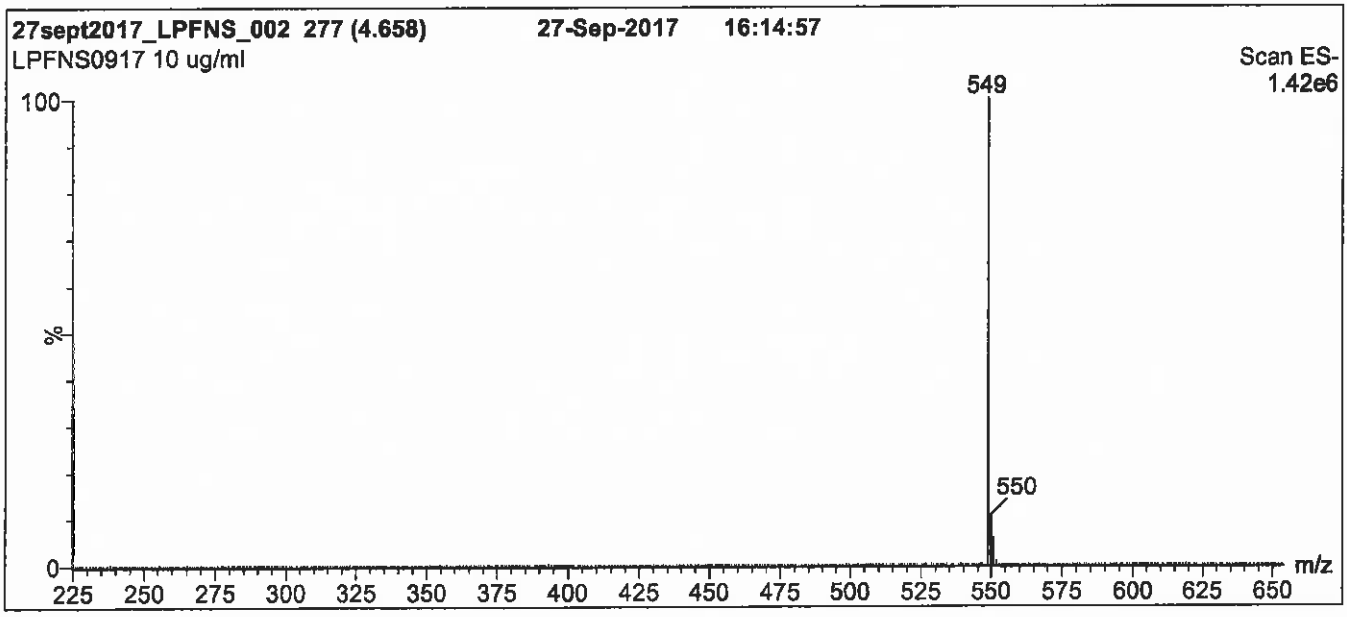
Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

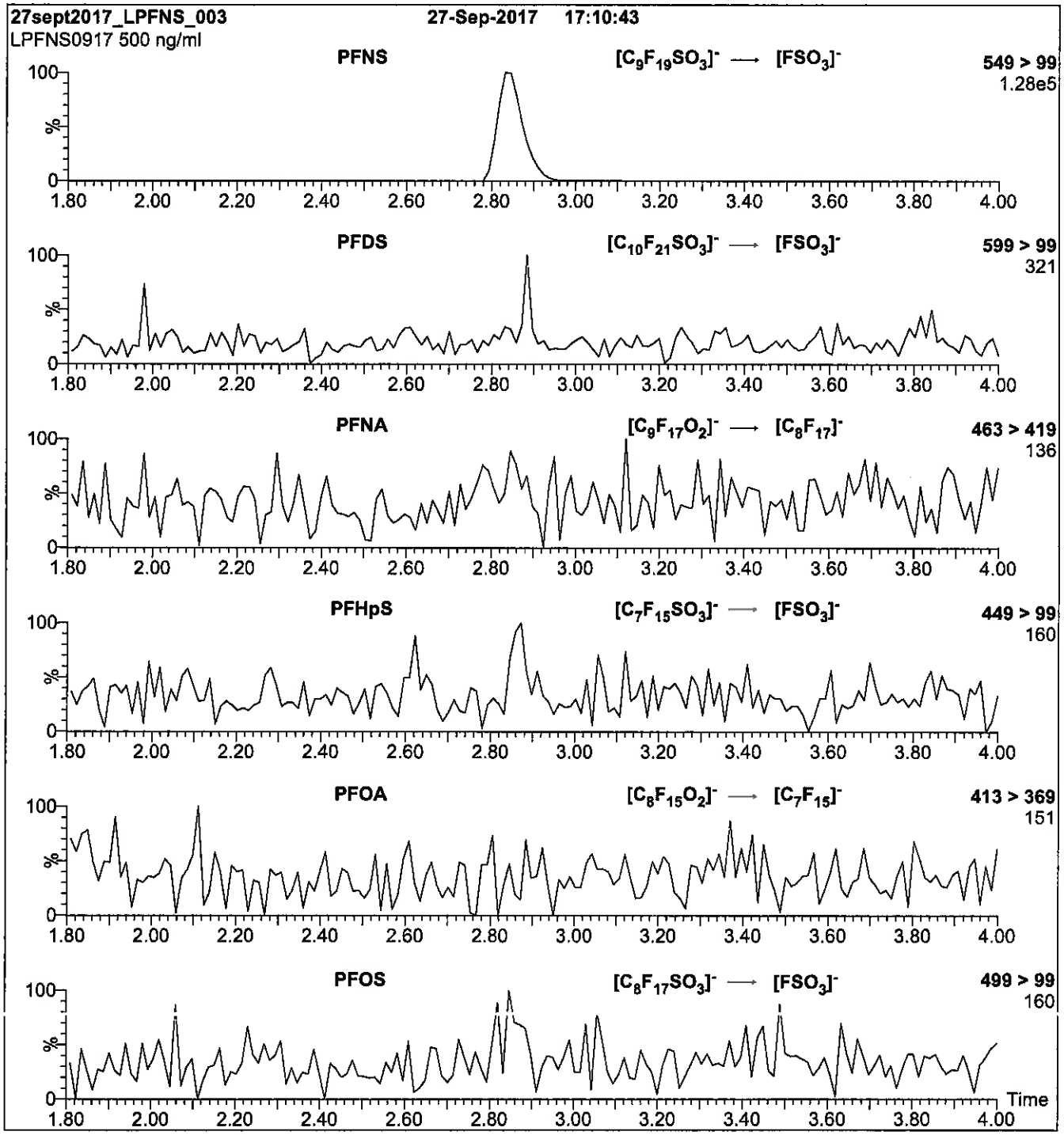
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFNS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 45

Reagent

LCPFOA_00011

P: 10/20/17 SKV

WELLINGTON LABORATORIES

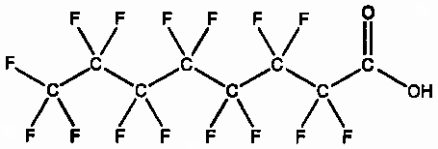
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA0917

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)
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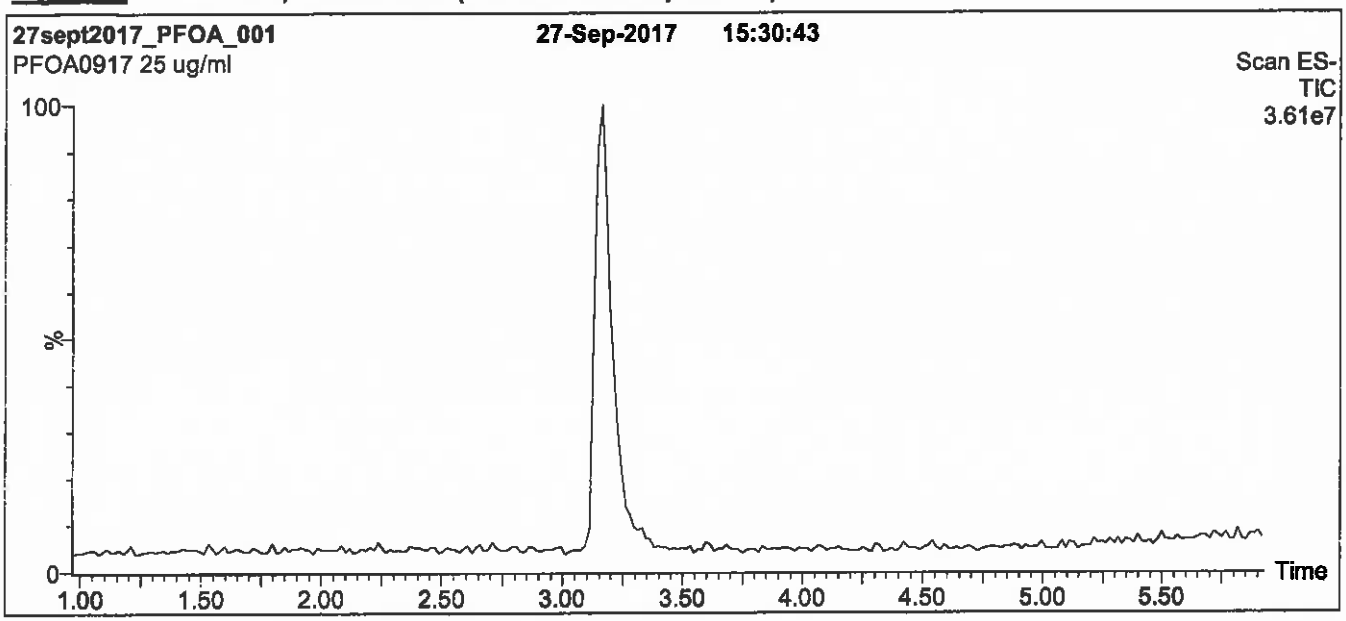
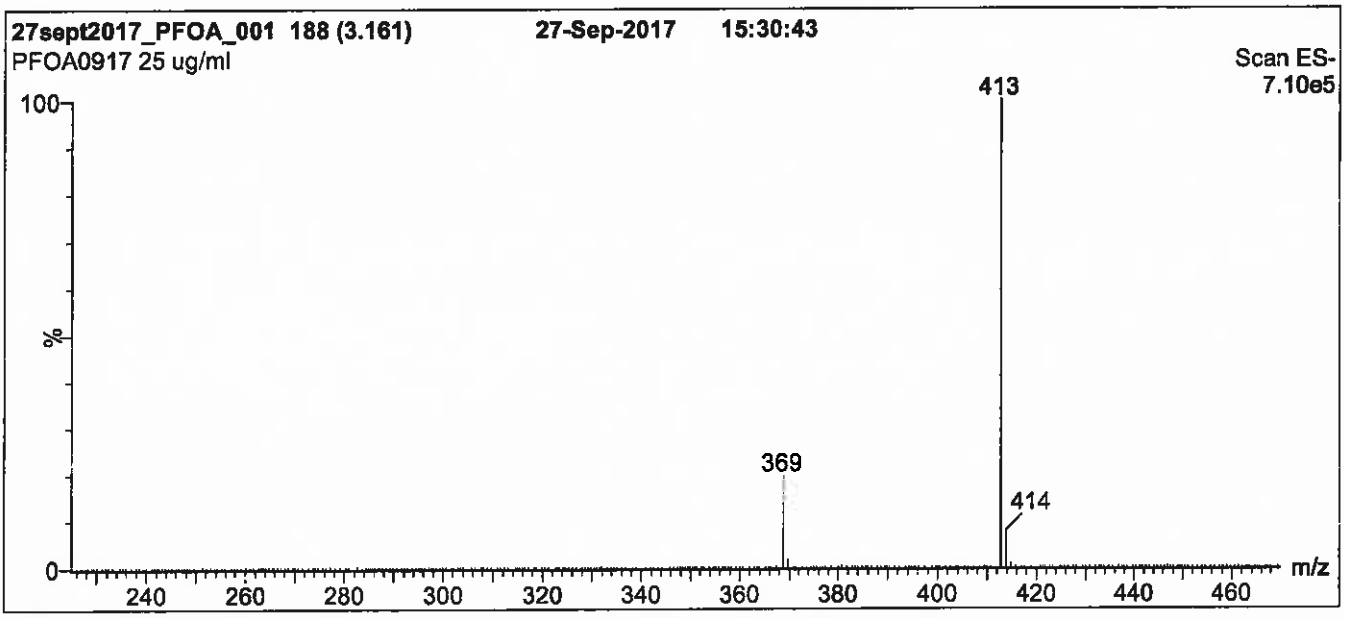
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

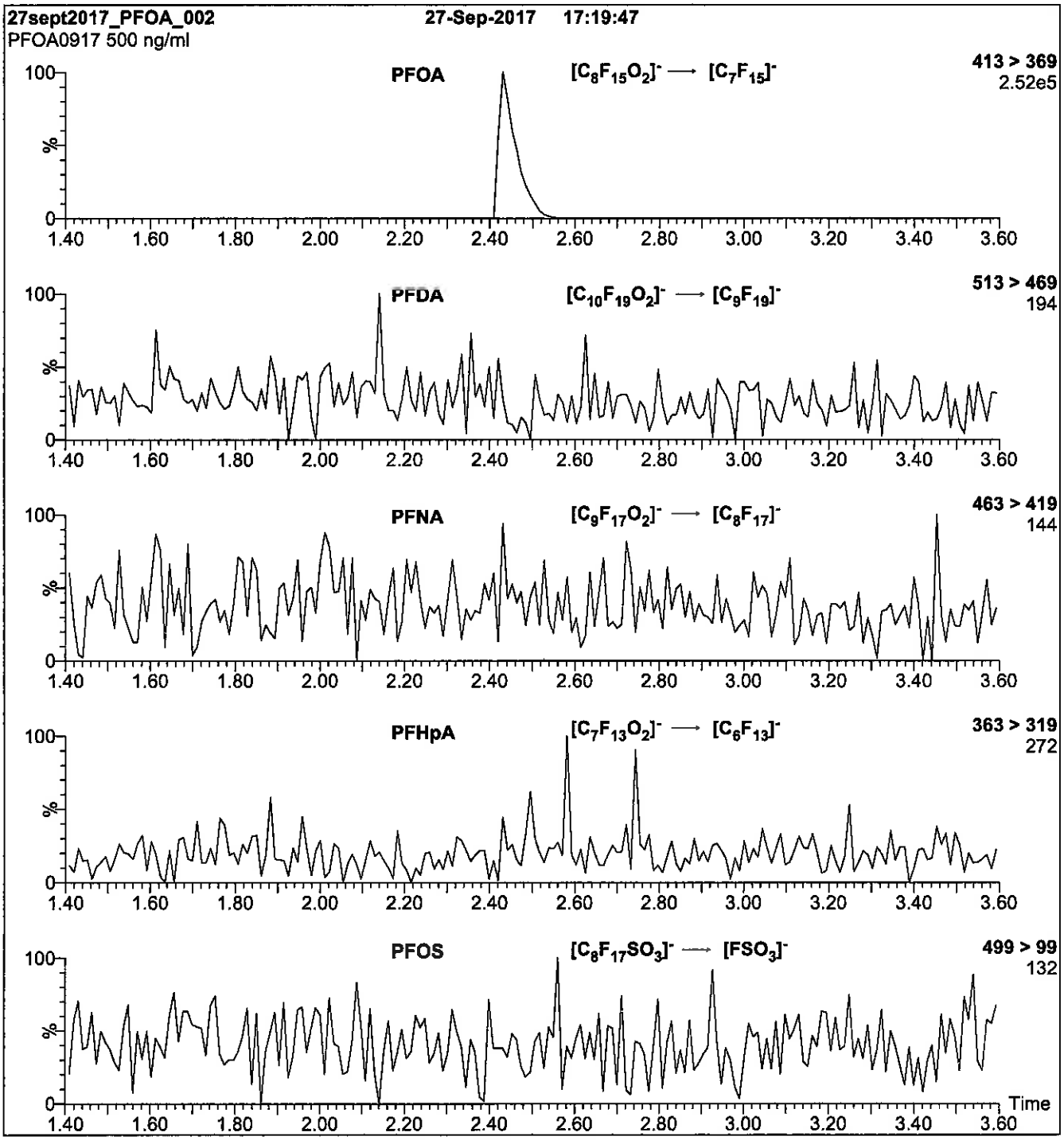
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFOA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 11
Flow:	300 µl/min	

Reagent

LCPFODA_00010

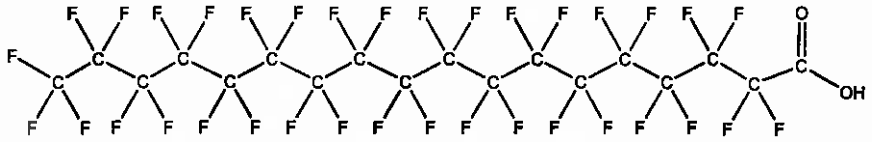
r. 9/2/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
LOT NUMBER: PFODA0717
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
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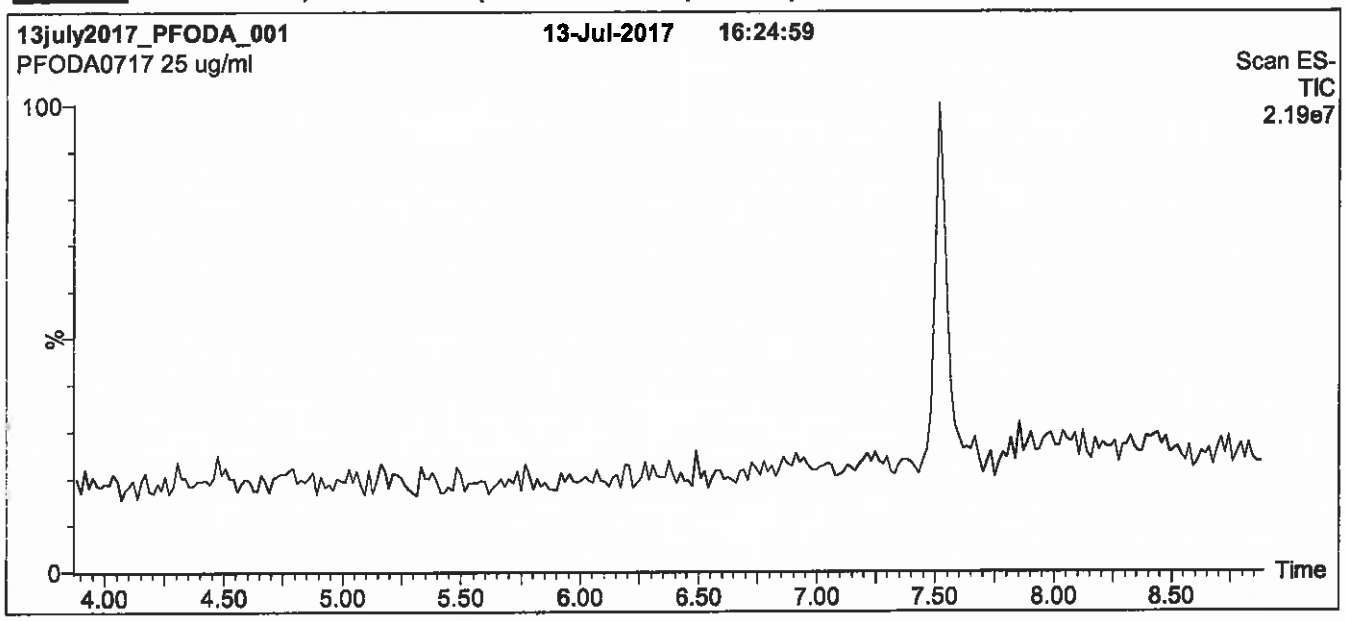
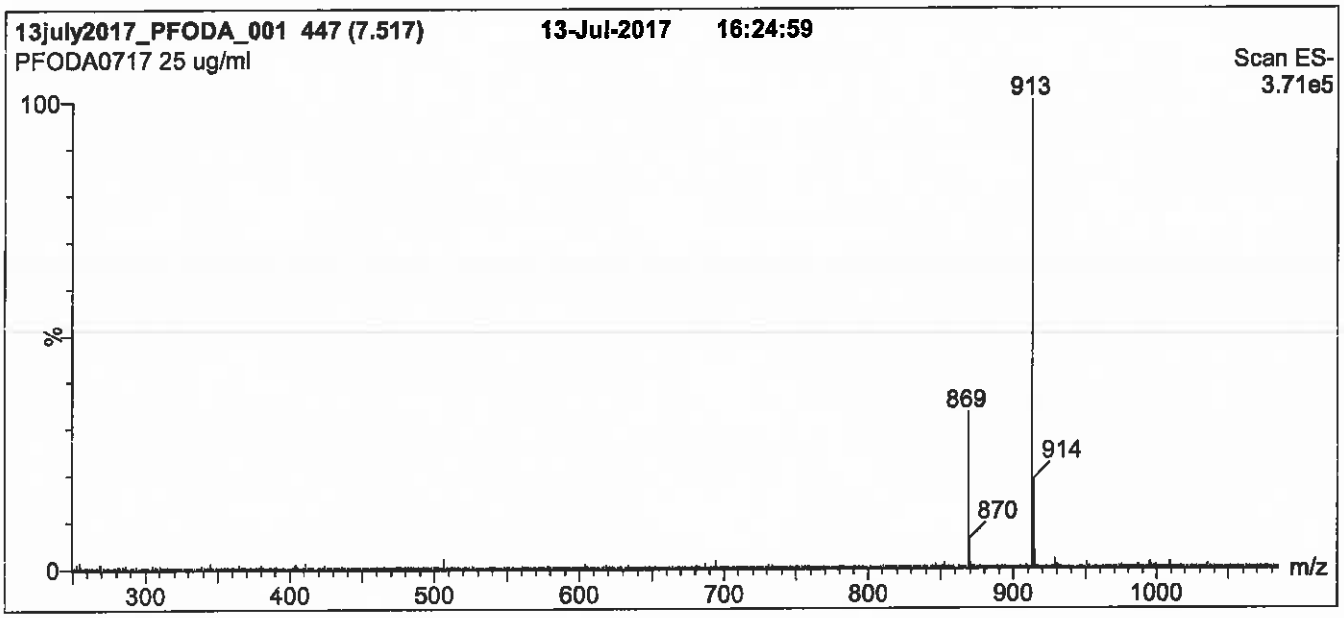




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

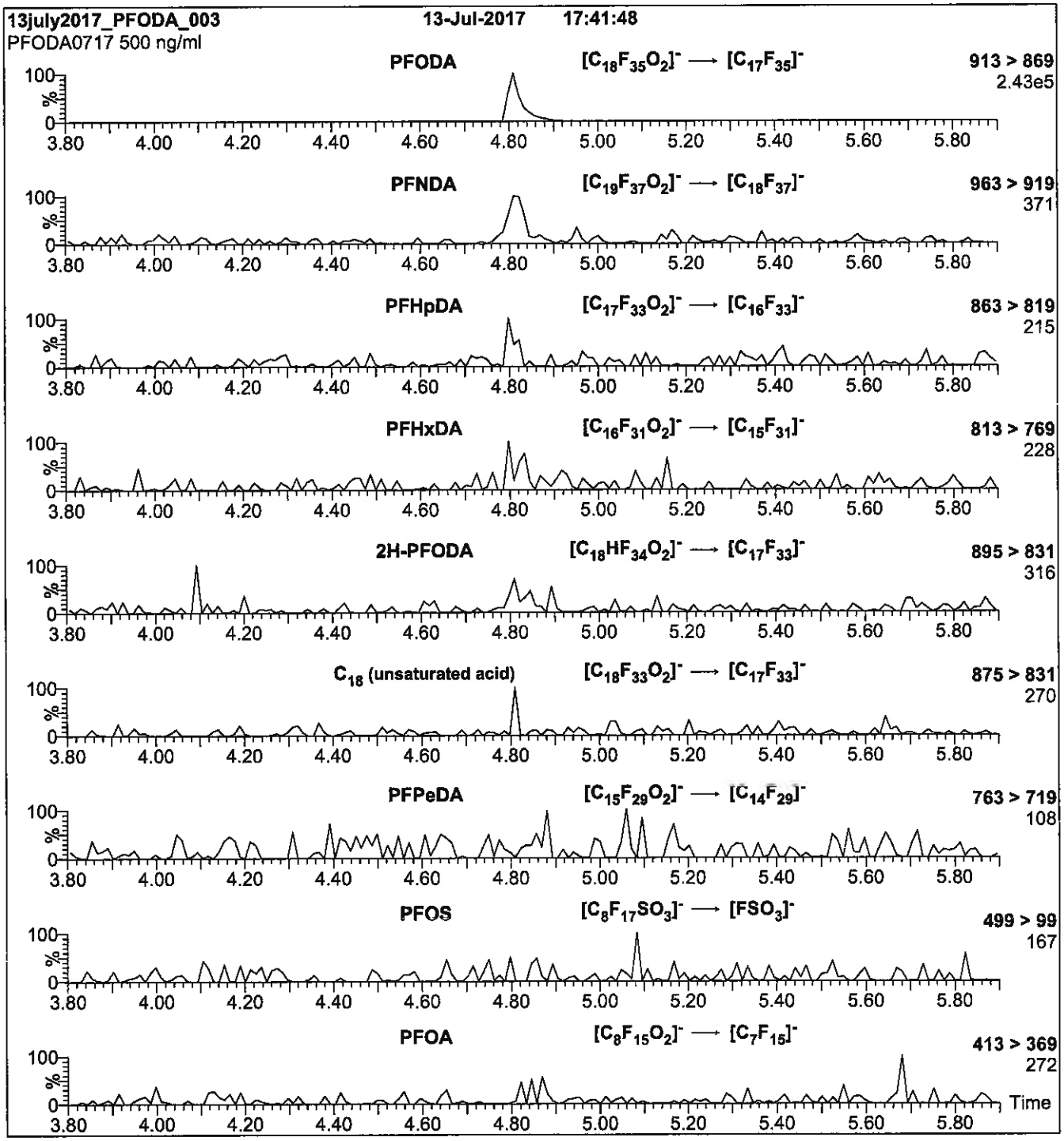
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00007

P: 10/20/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0117
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/09/2017
LAST TESTED: (mm/dd/yyyy)	01/12/2017
EXPIRY DATE: (mm/dd/yyyy)	01/12/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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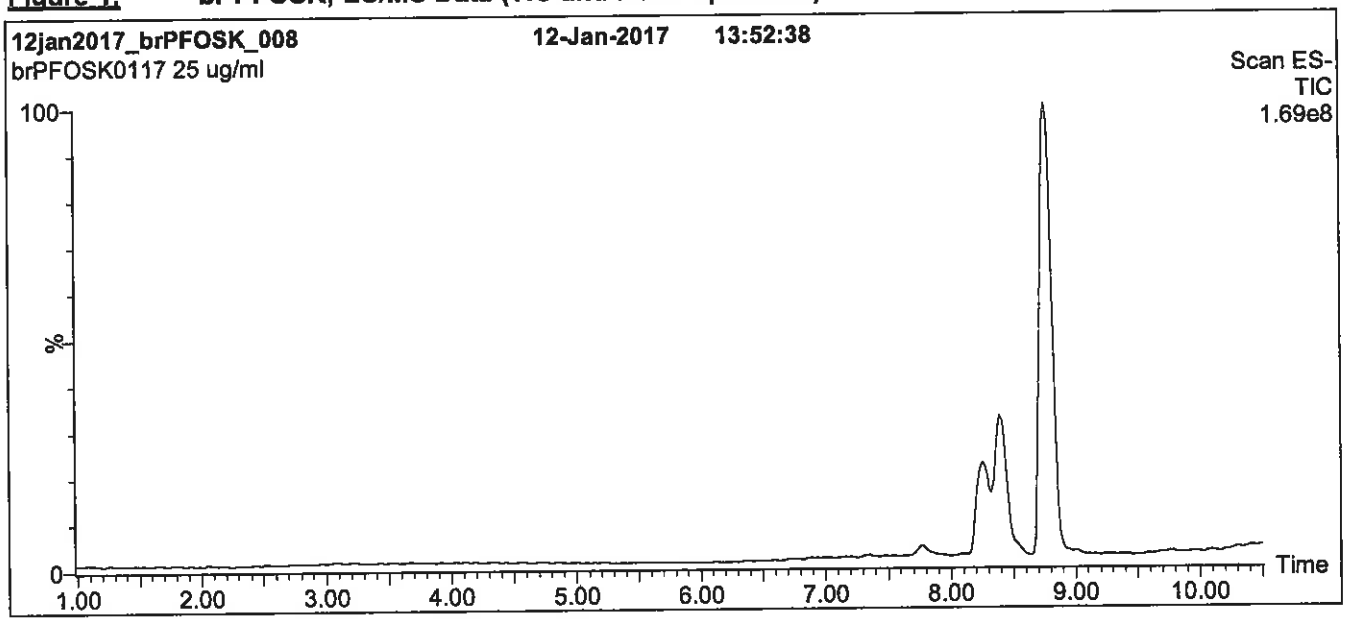
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

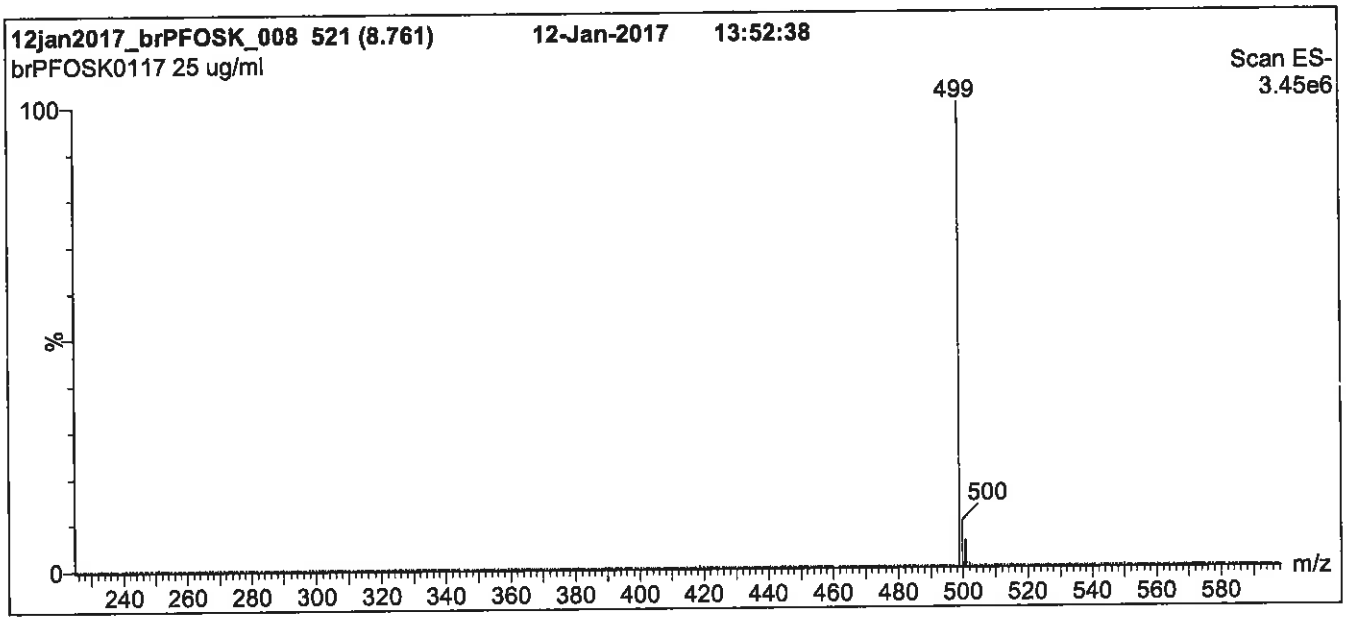
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 01/20/2017 (mm/dd/yyyy)

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

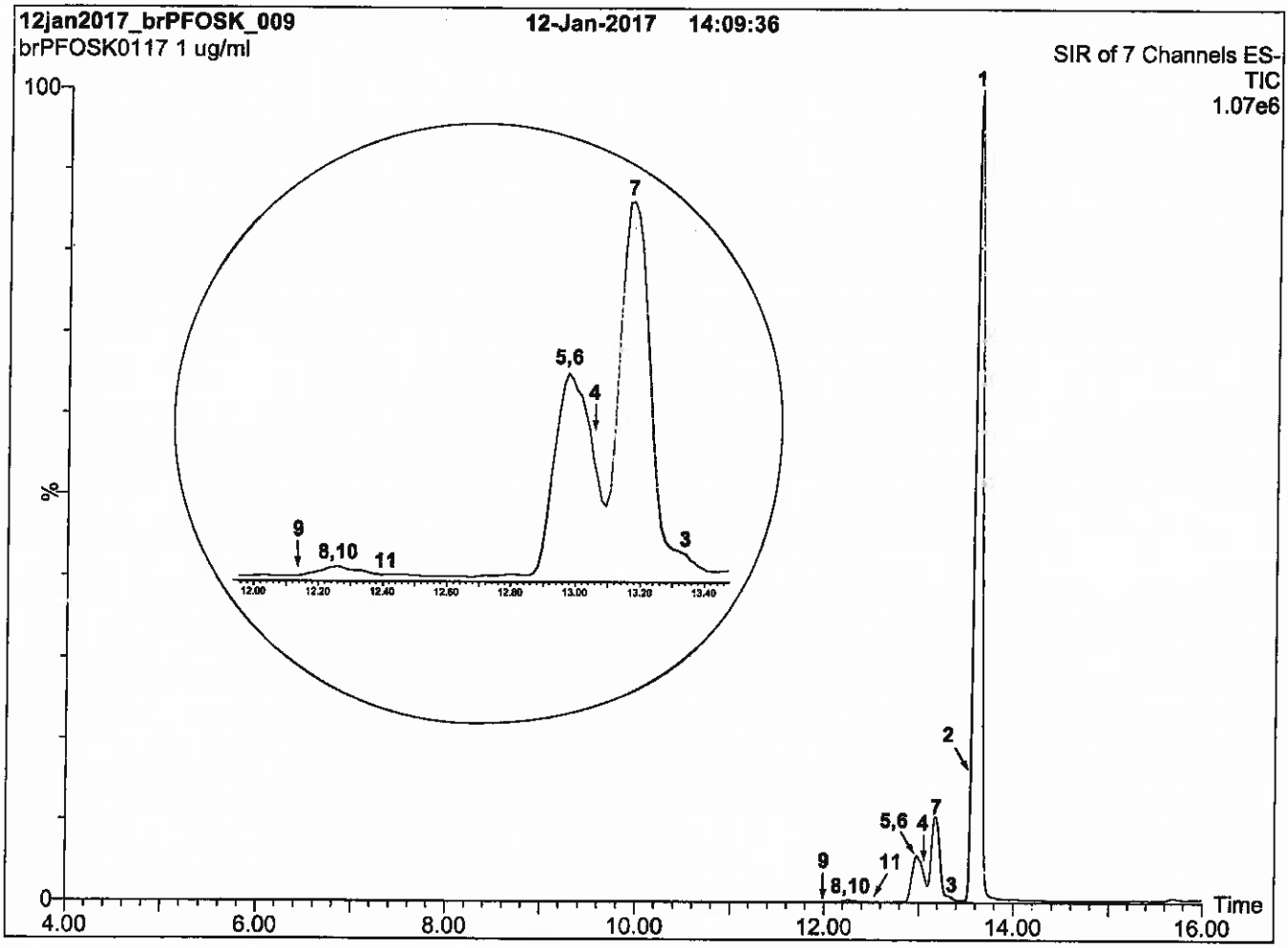
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

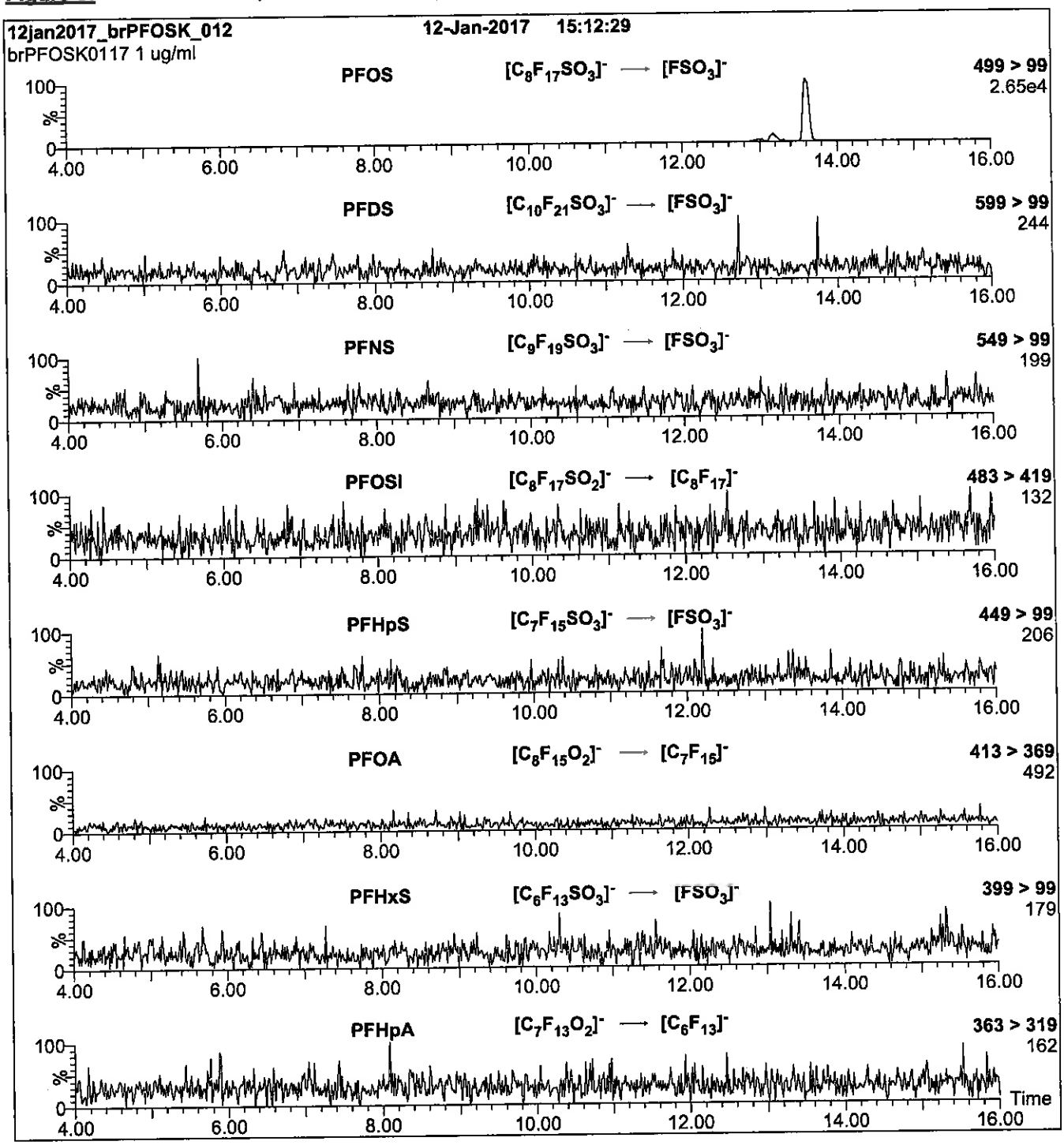
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00013

r: 2/6/16 SK

WELLINGTON LABORATORIES

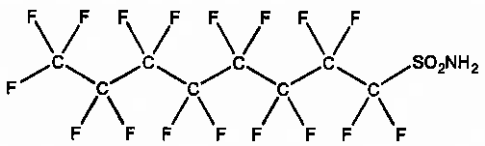
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0817I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA: $C_8H_2F_{17}NO_2S$
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/01/2017
EXPIRY DATE: (mm/dd/yyyy) 09/01/2022
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 499.14
SOLVENT(S): Isopropanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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CALA

ANAB ACCREDITED

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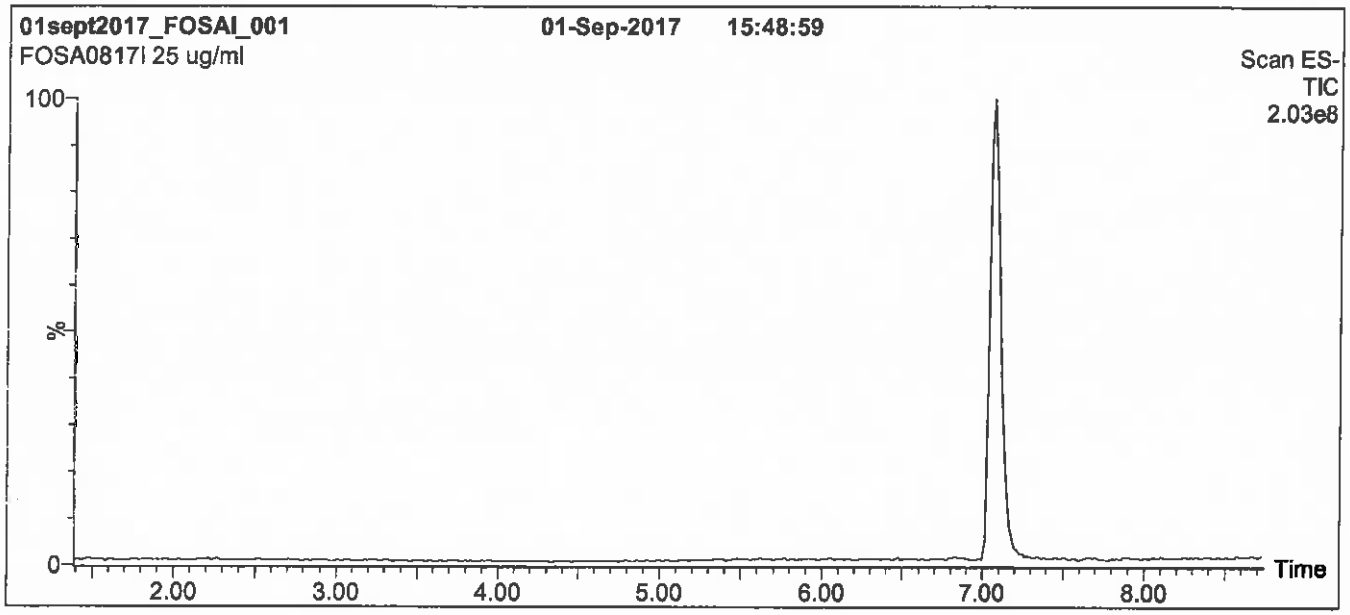
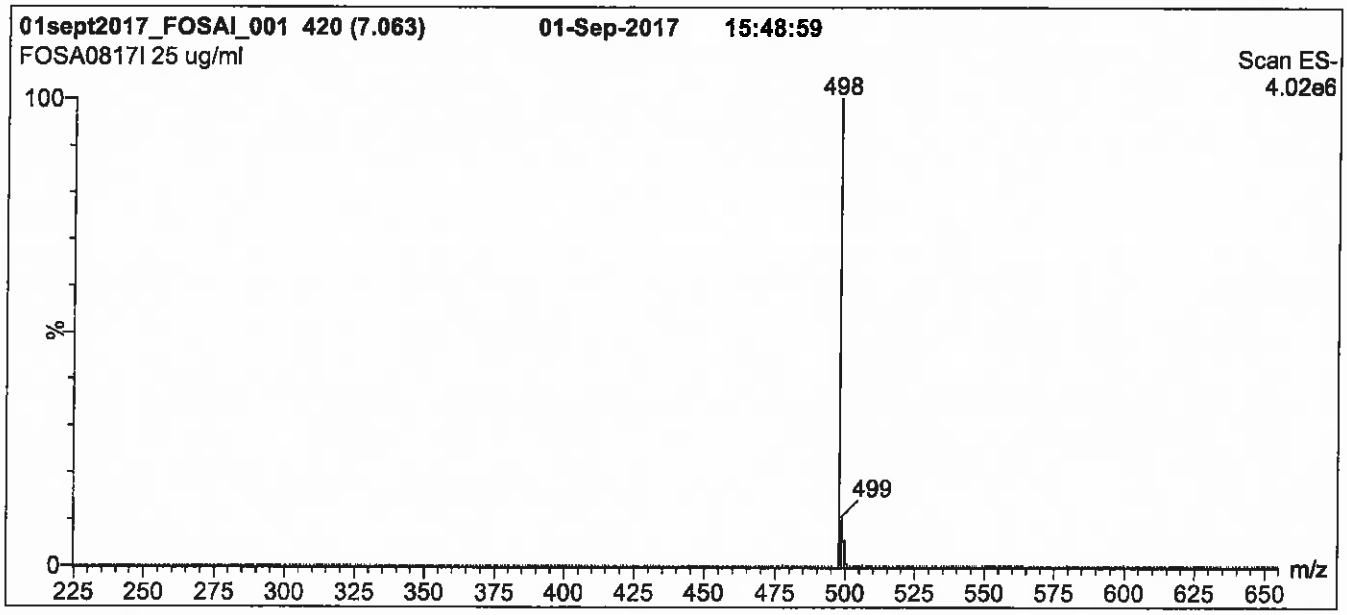
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

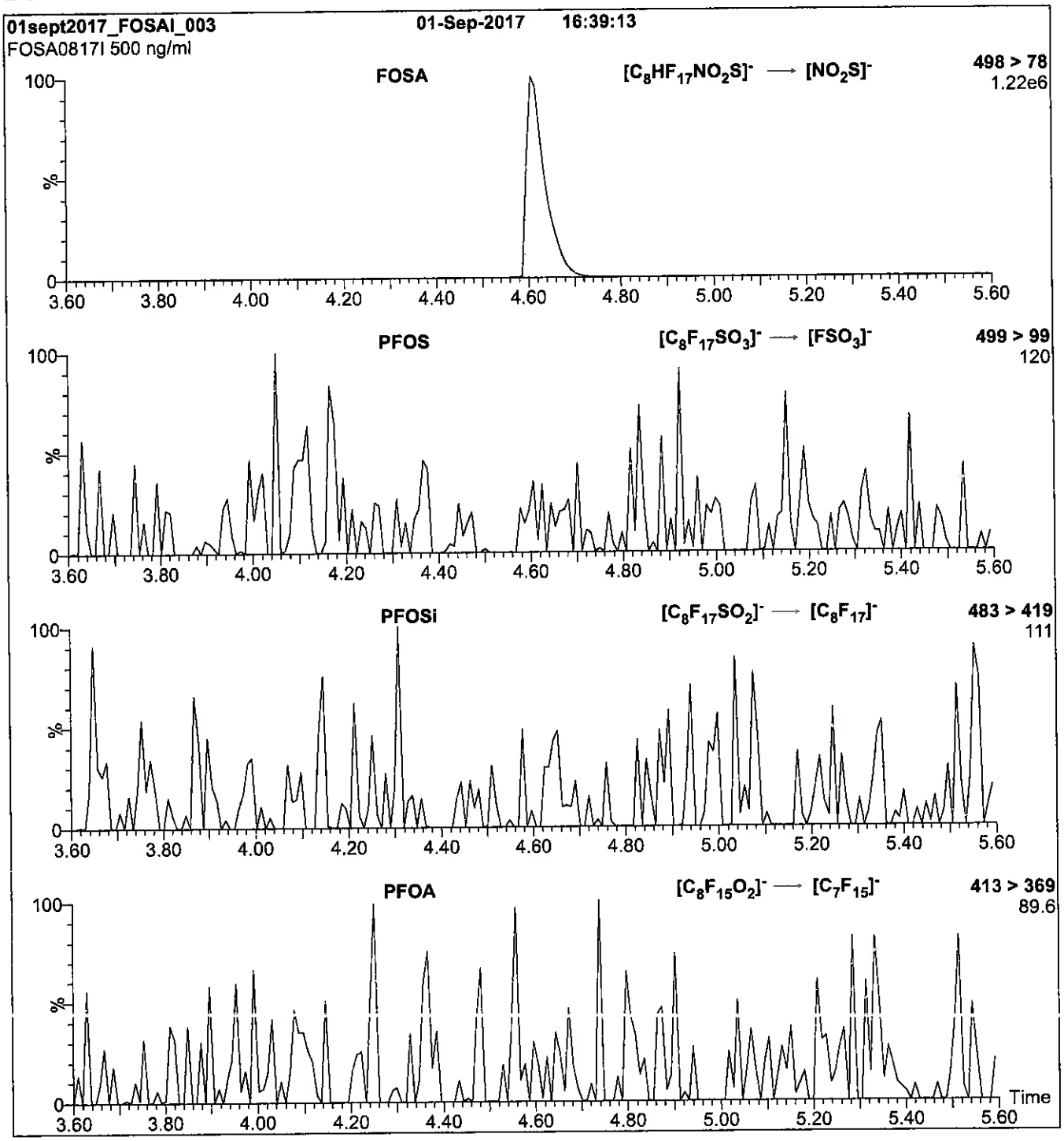
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml FOSA-I)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCPFPeA_00008

r: 10/20/17 SW

WELLINGTON LABORATORIES

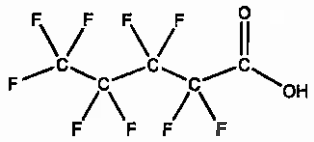
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0617

STRUCTURE:

CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 264.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/14/2017
EXPIRY DATE: (mm/dd/yyyy) 06/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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where x is expressed as a relative standard uncertainty of the individual parameter.

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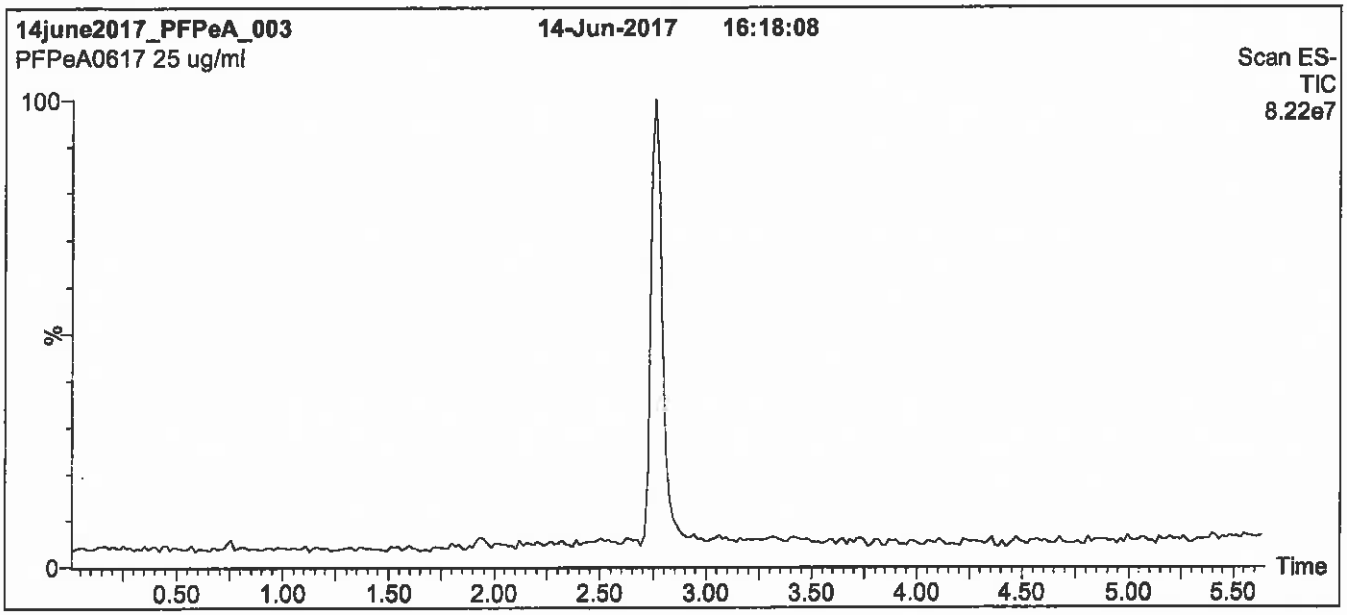
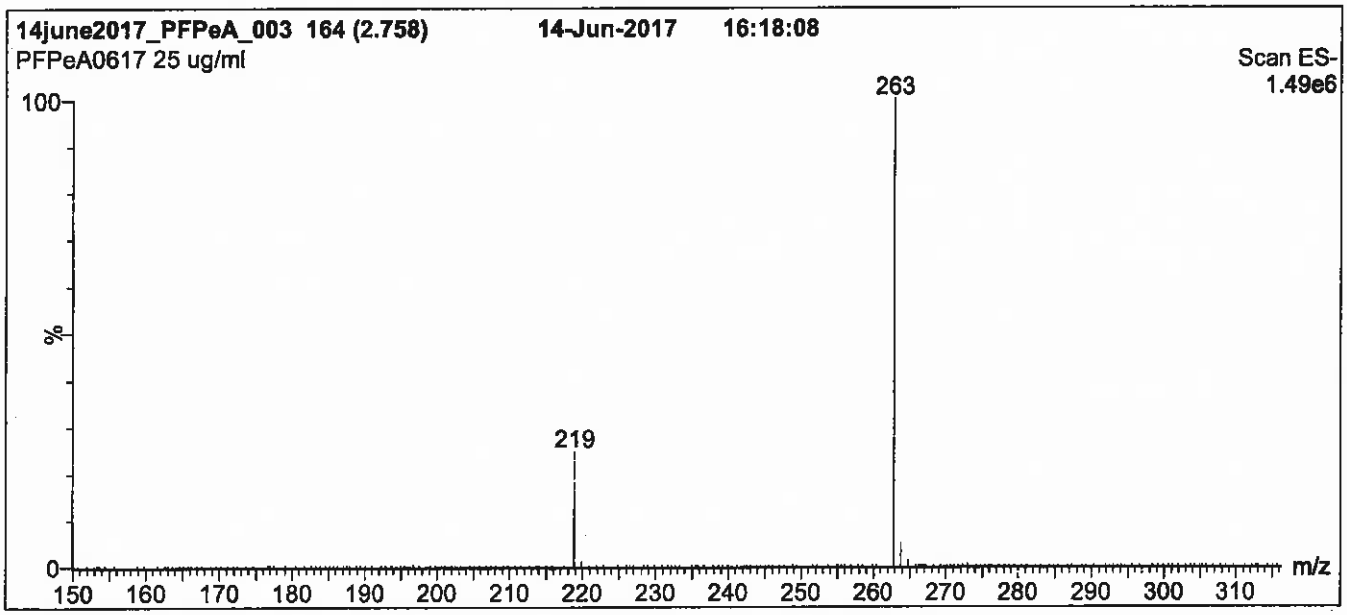
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

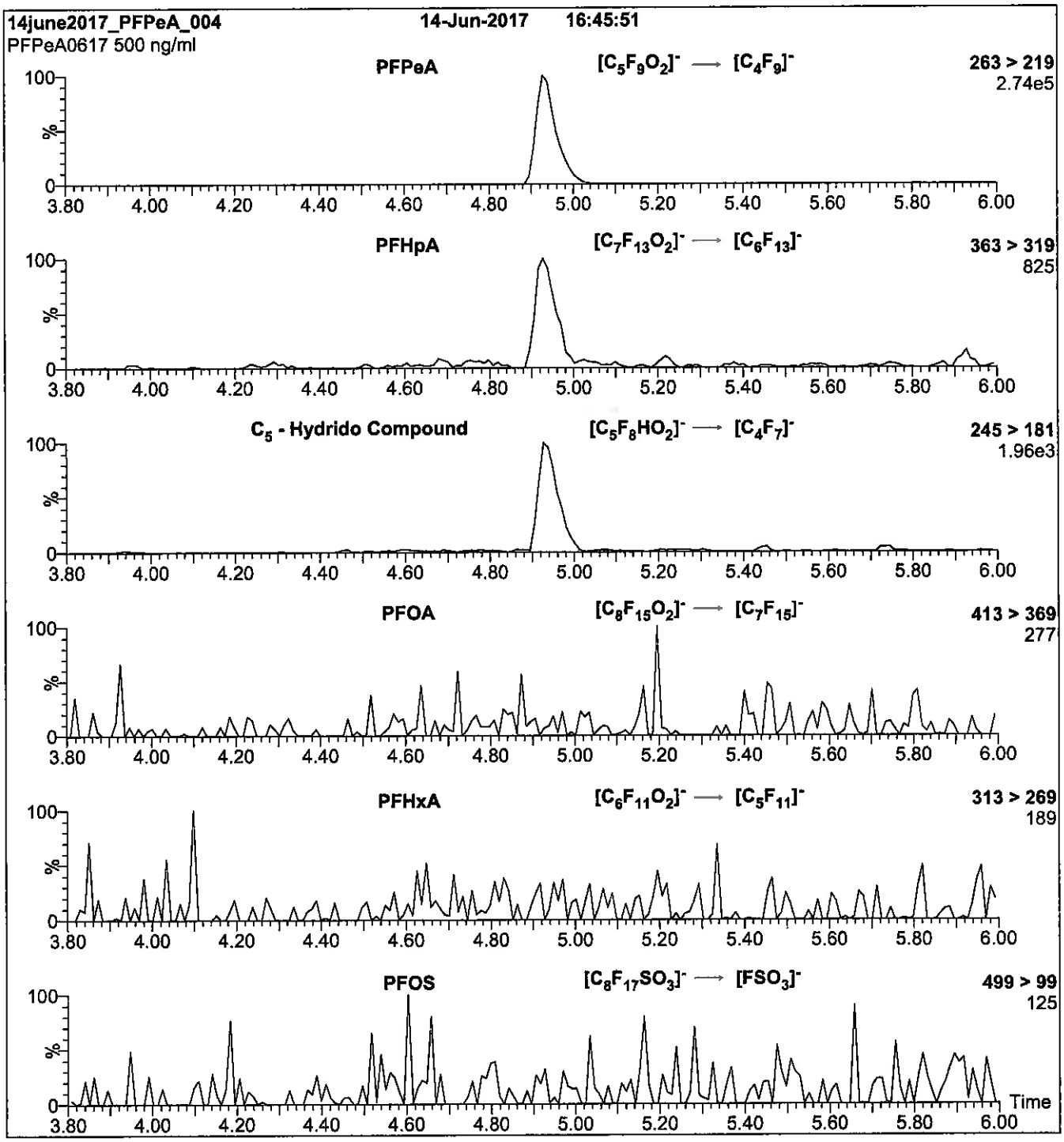
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFPeA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCPFPeA_00010

r: 10/20/17 SW

WELLINGTON LABORATORIES

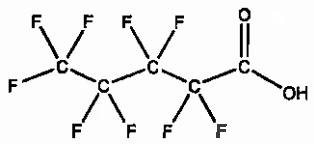
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0617

STRUCTURE:

CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 264.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/14/2017
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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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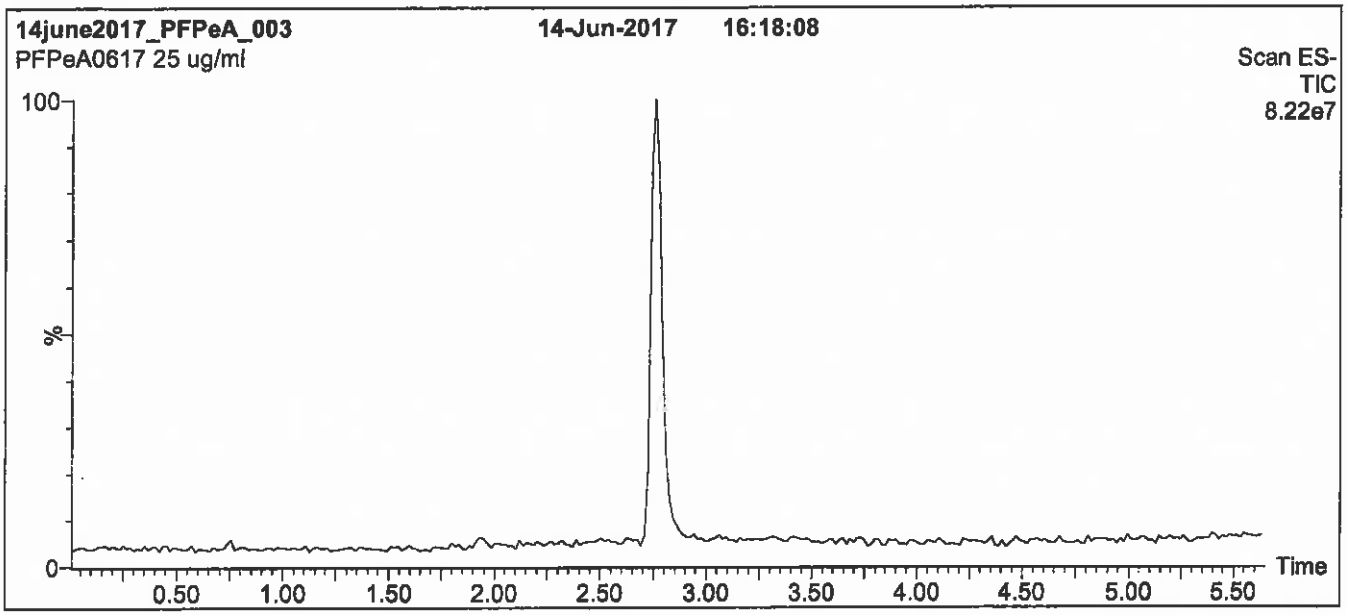
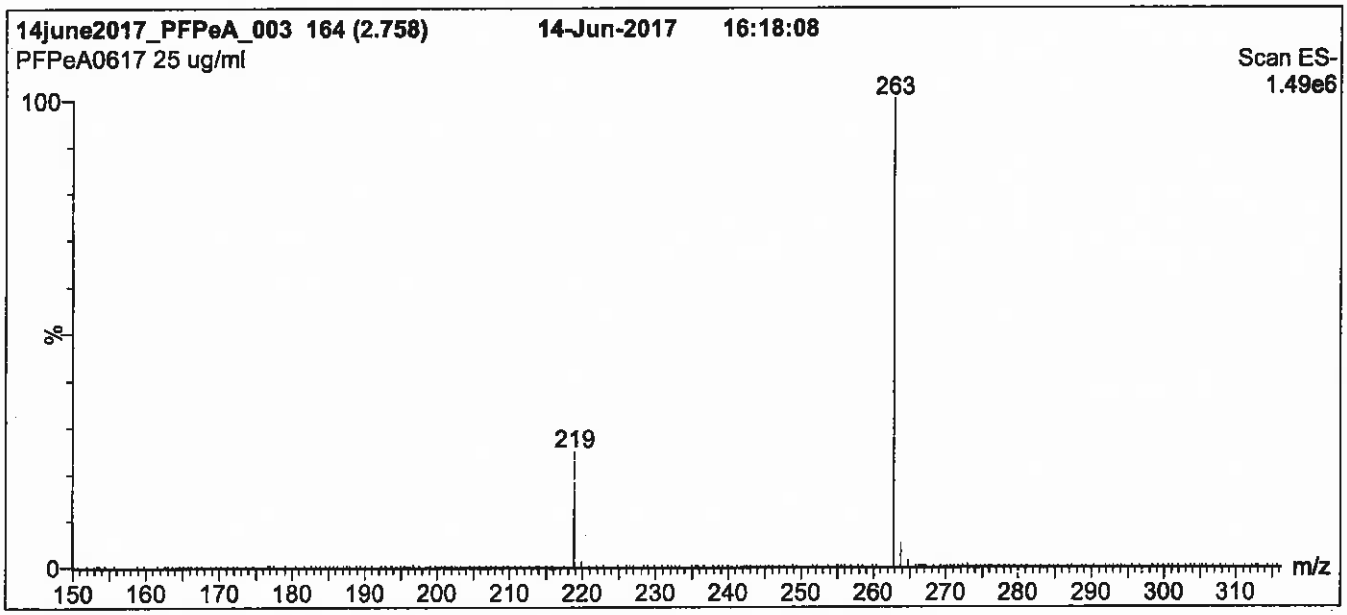
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

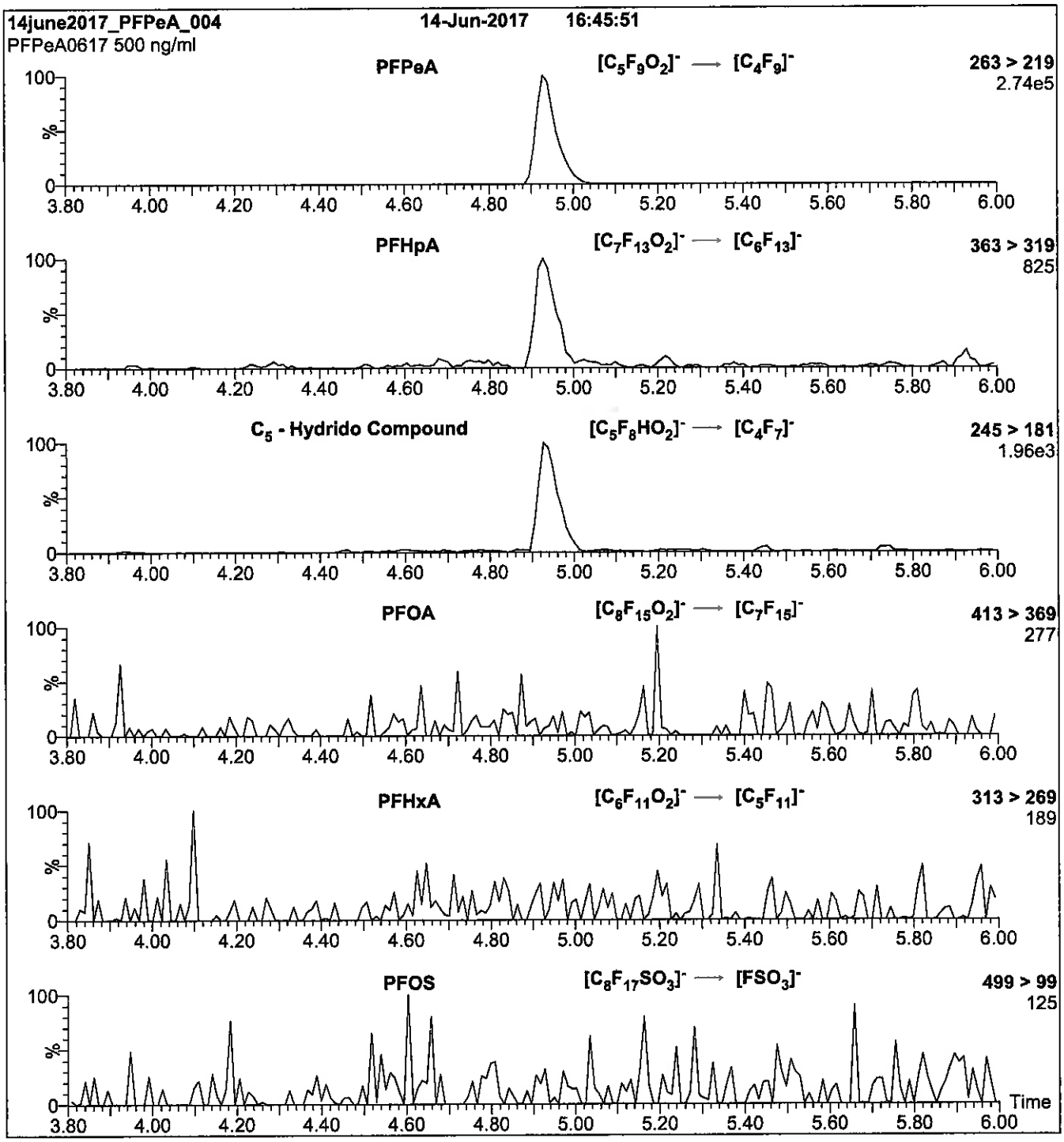
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFPeA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCPFPeS_00003

1106801
ID: LCPFPeS_00003
Exp: 01/11/22 Prpd: SKV
PF-1-pentanesulfonate Na

P: 12/4/17 SKV

WELLINGTON LABORATORIES

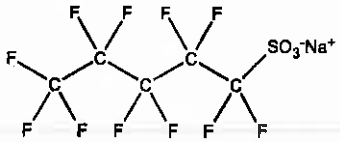
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate

LOT NUMBER: LPFPeS0117

STRUCTURE:

CAS #: 630402-22-1



MOLECULAR FORMULA: $C_5F_{11}SO_3Na$
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
46.9 ± 2.3 µg/ml (PFPeS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/11/2017
EXPIRY DATE: (mm/dd/yyyy) 01/11/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 372.09
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/06/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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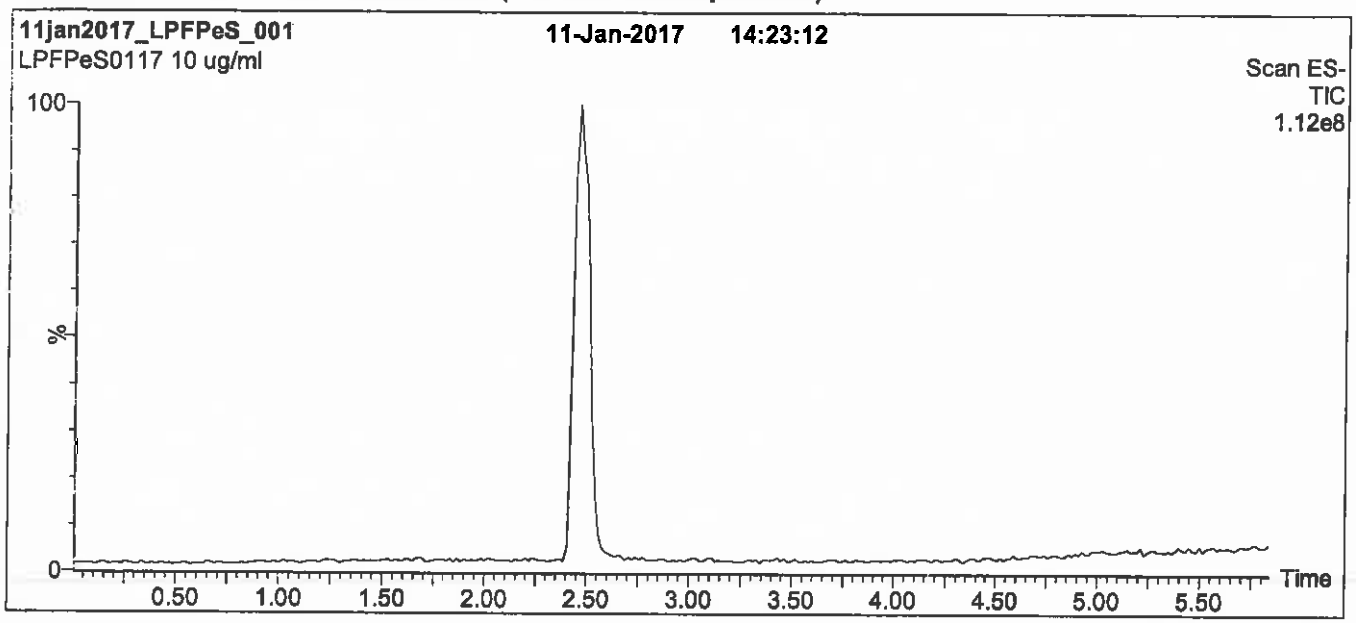
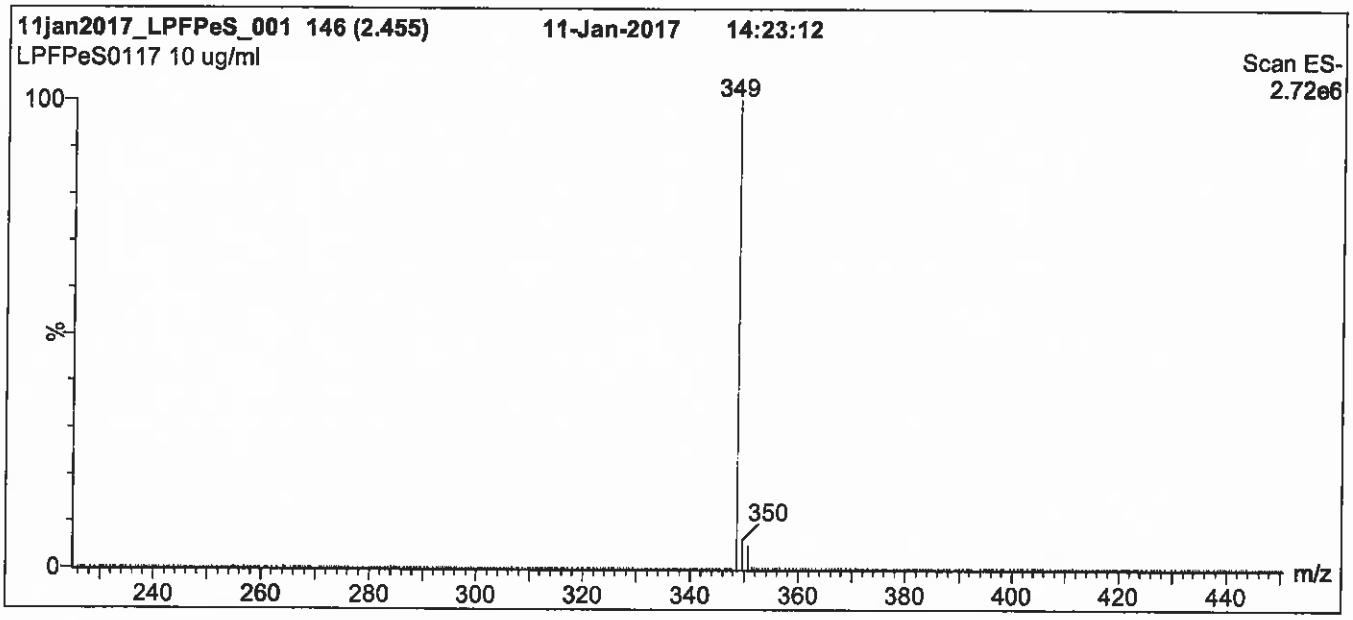
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions over 0.5 min.
Time: 10 min

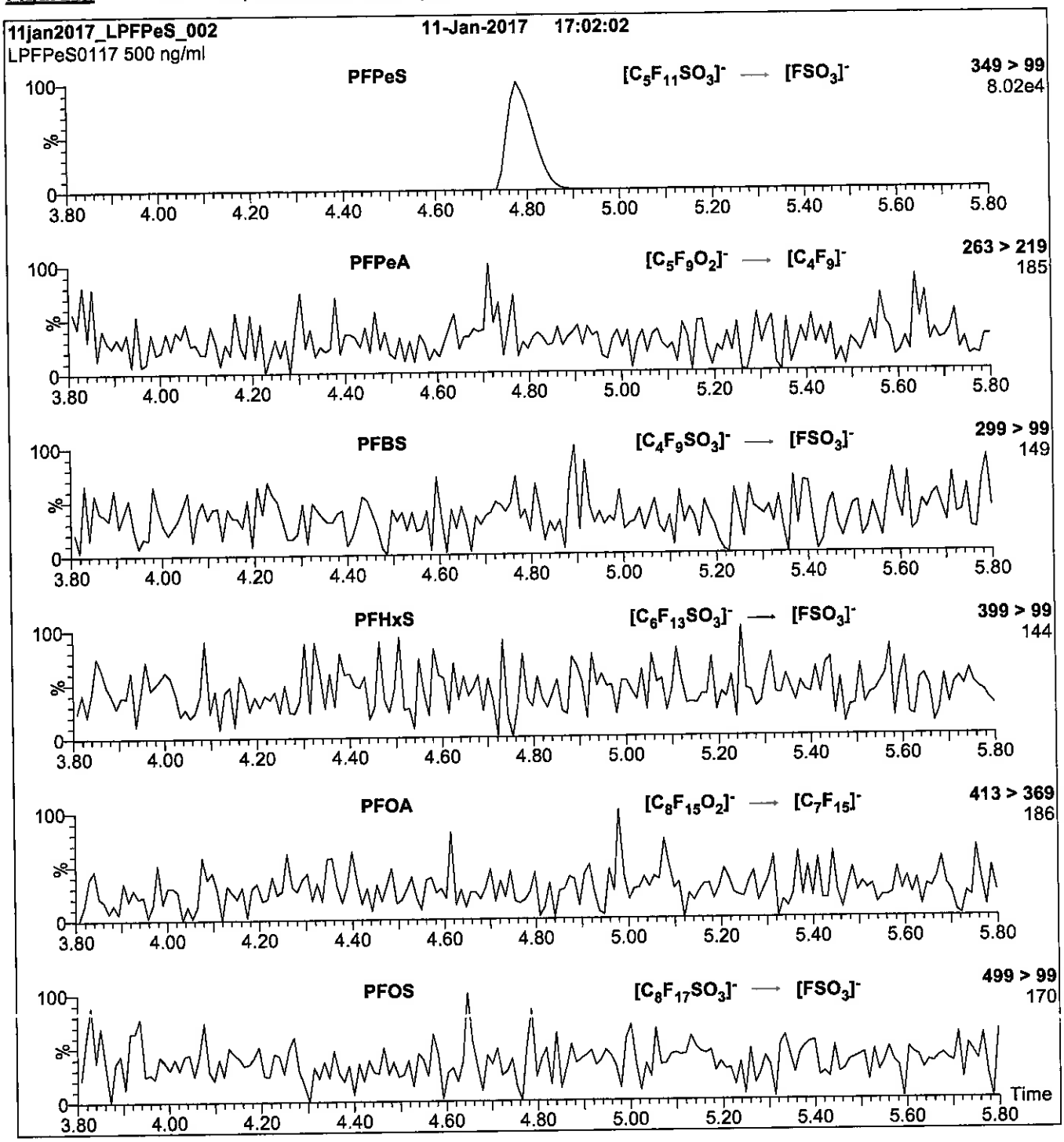
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFPeS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

Reagent

LCPFTeDA_00008

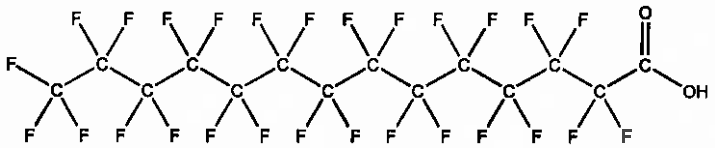
P: 9/21/17 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid
LOT NUMBER: PFTeDA0916

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/05/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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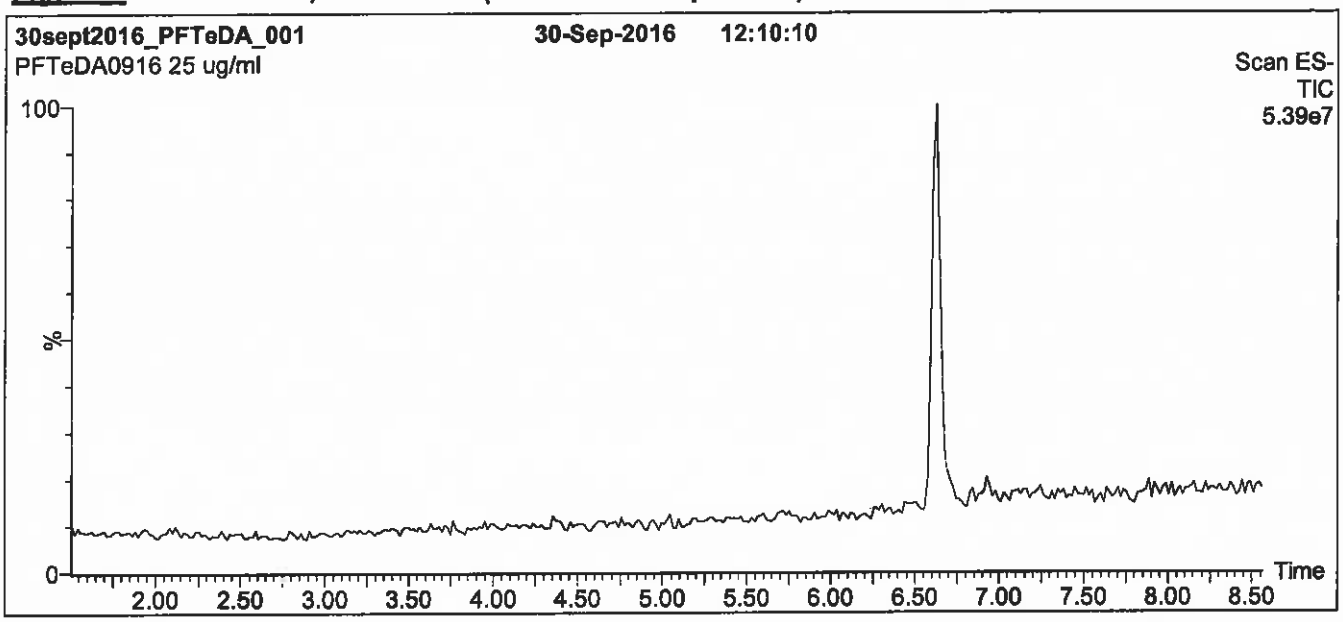
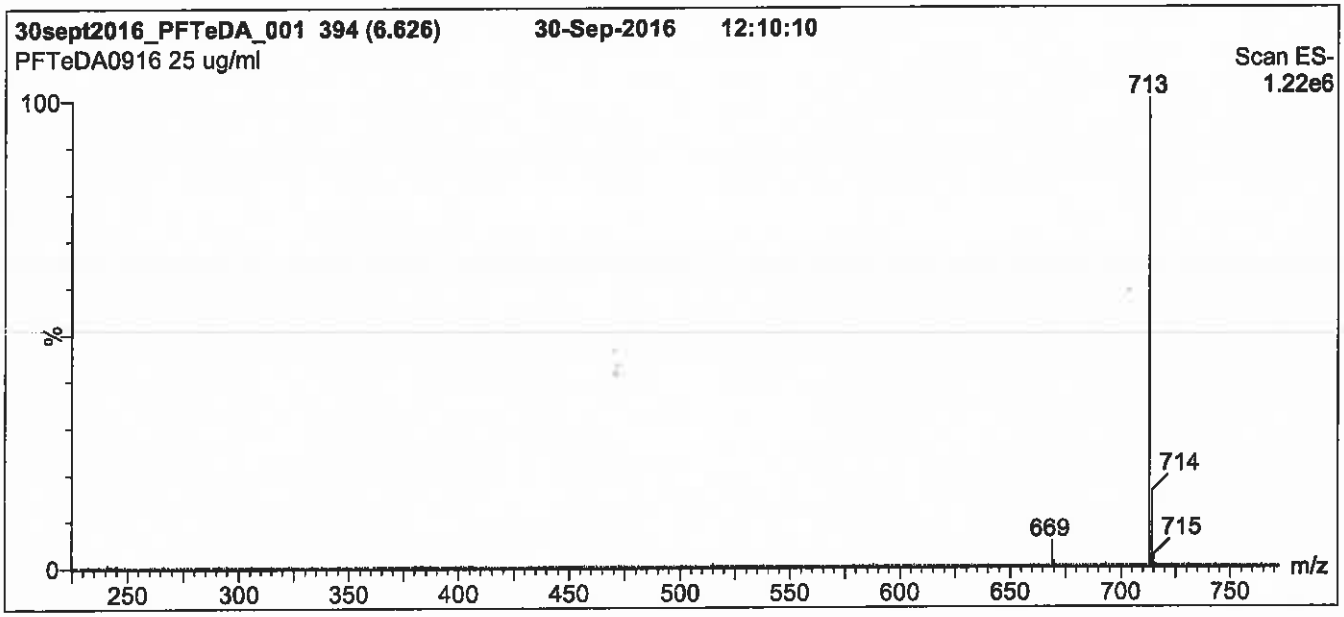
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

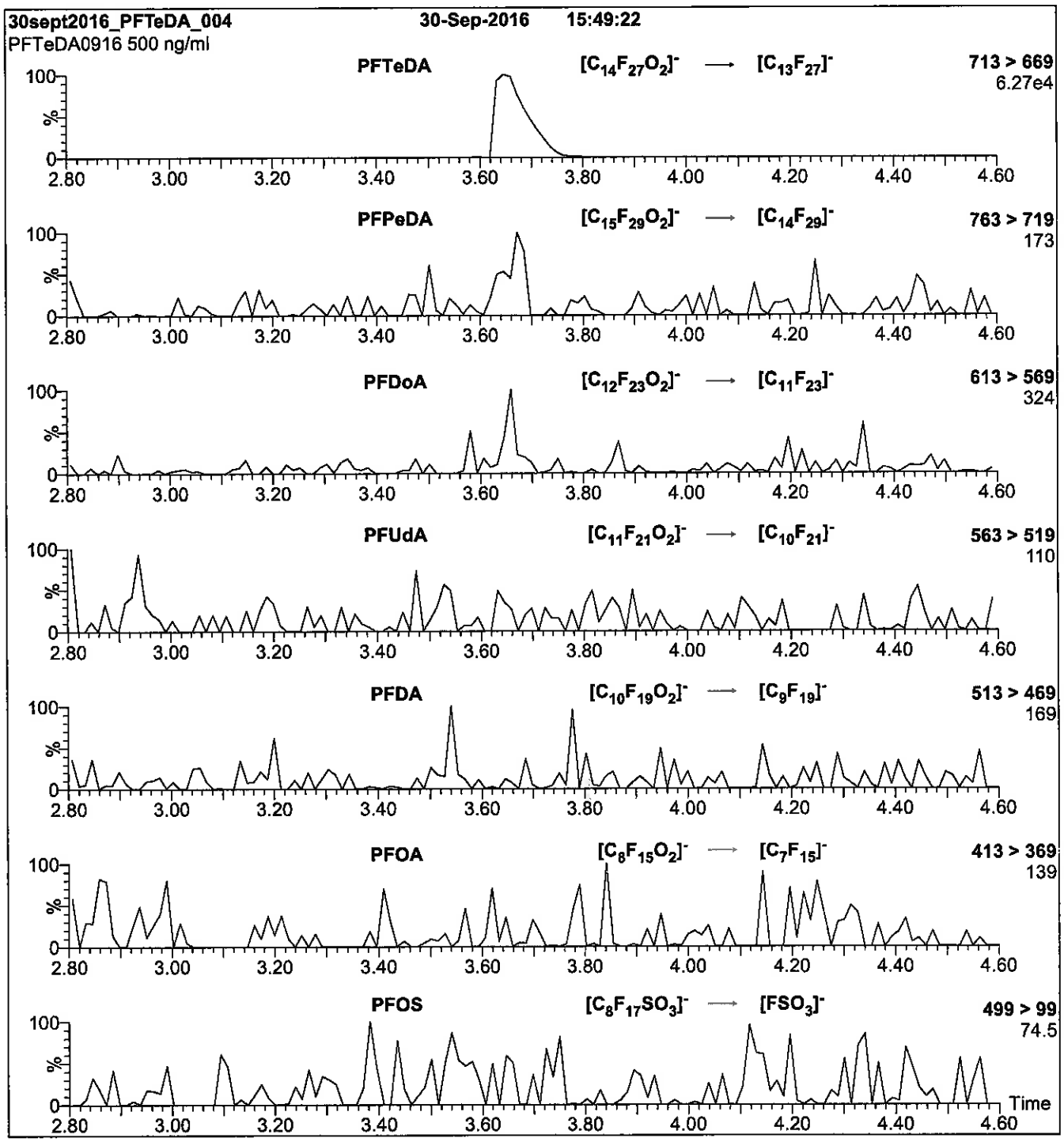
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00009

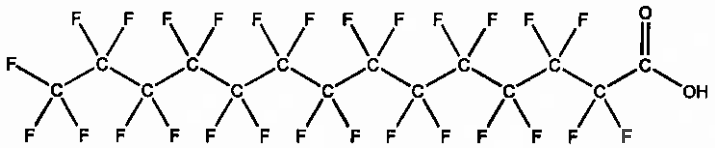
P: 9/21/17 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA0916
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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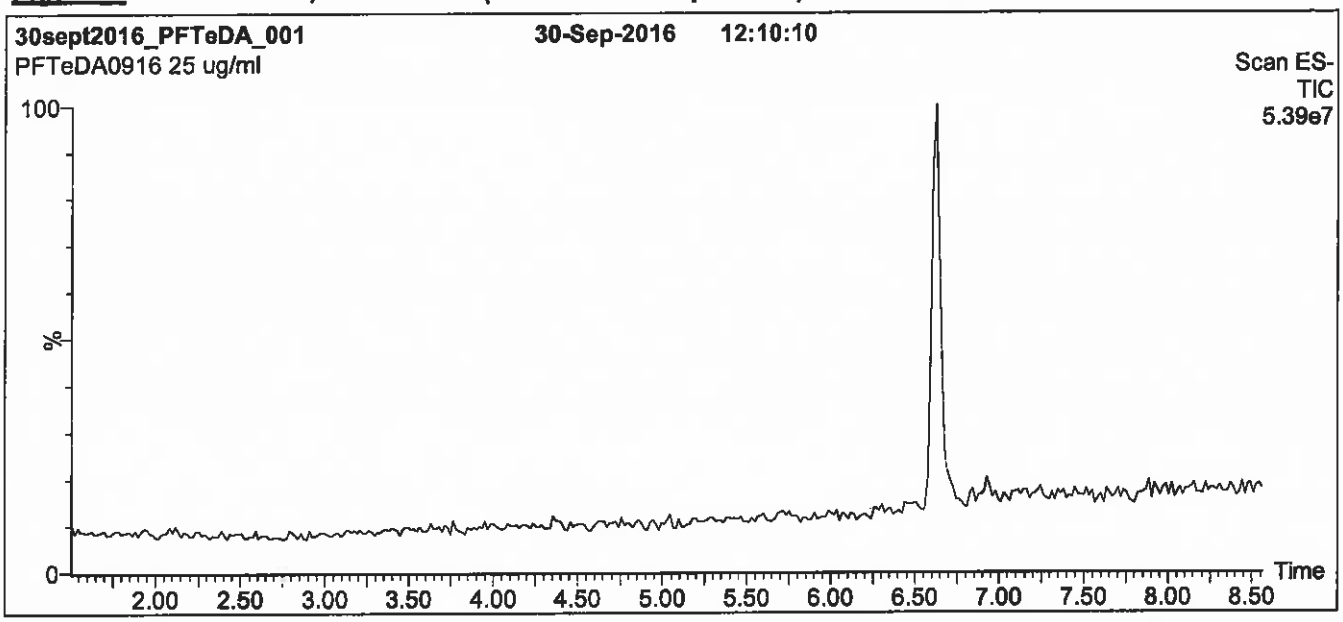
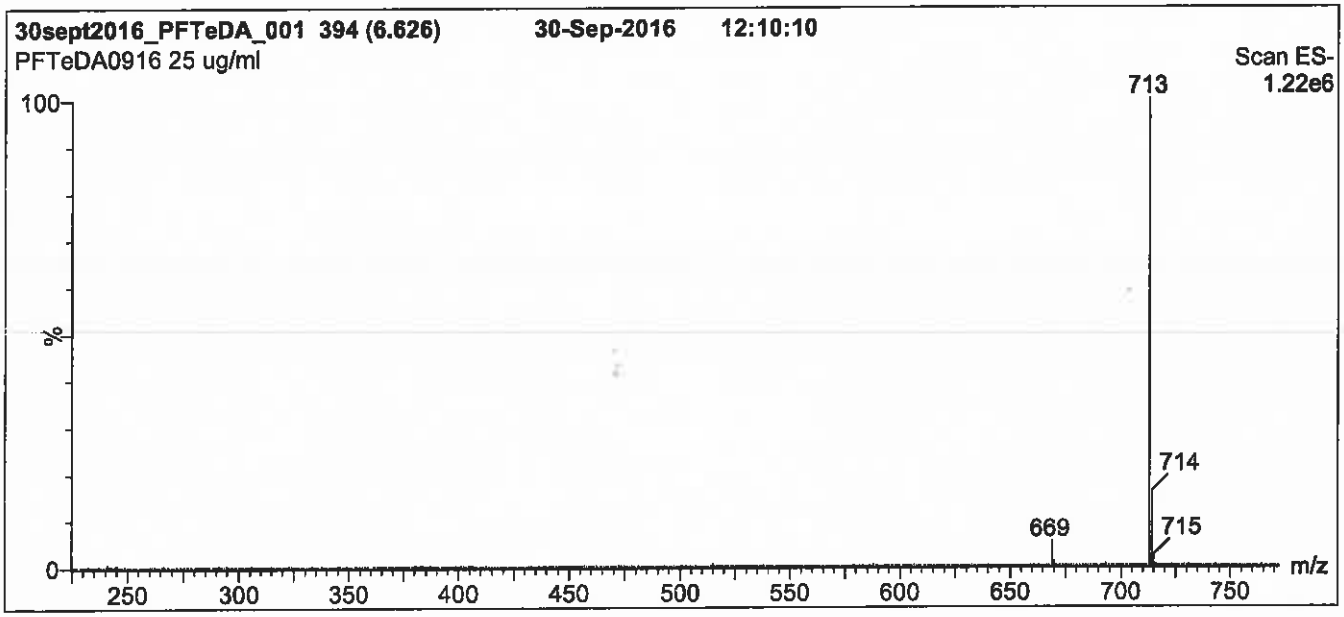
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

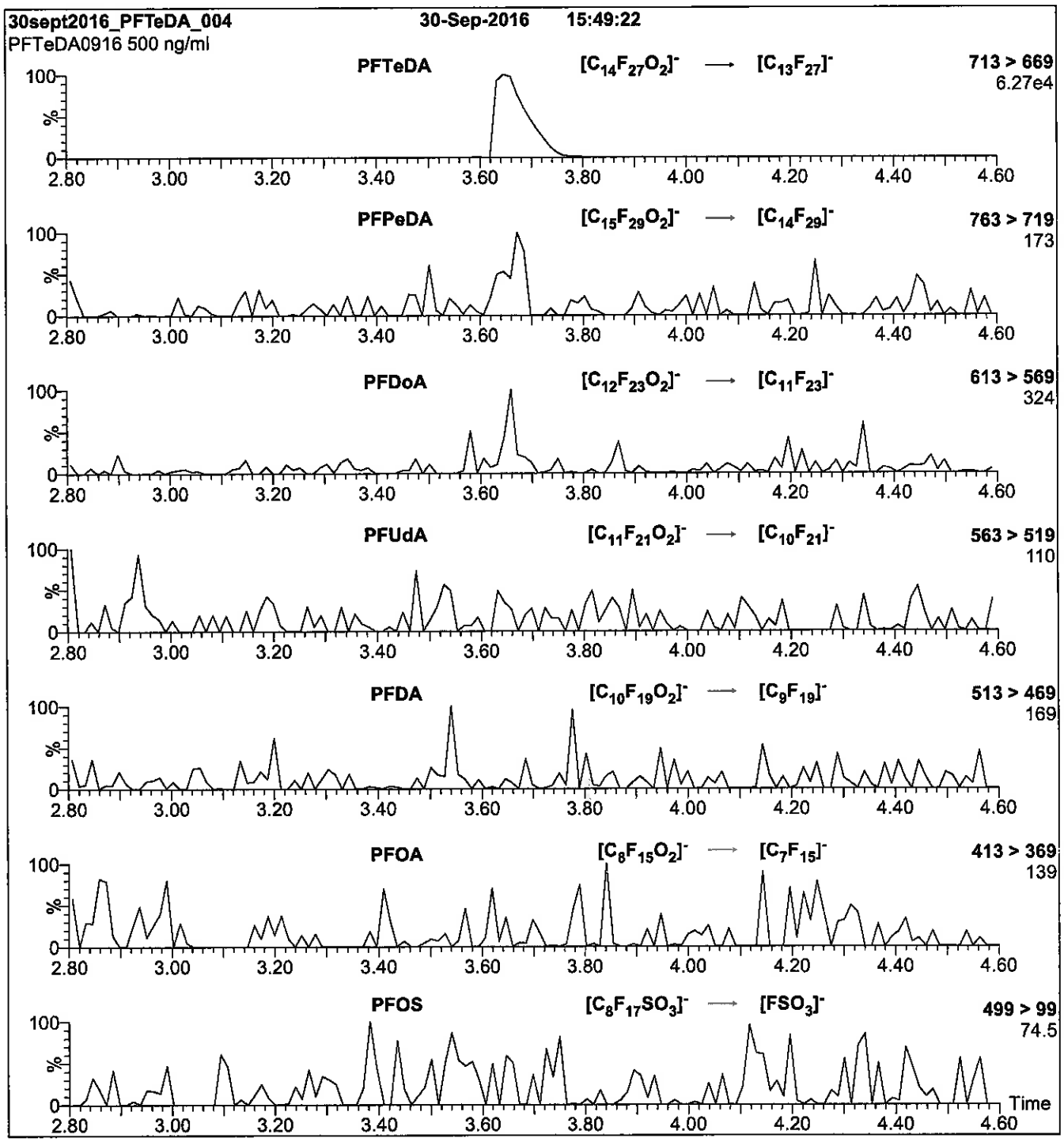
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00008

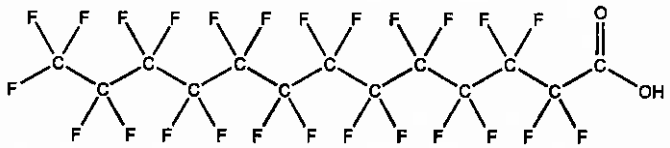
r: 9/21/17 SAN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid
LOT NUMBER: PFTrDA0517

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/02/2017
EXPIRY DATE: (mm/dd/yyyy) 05/02/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

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Certified By: _____ **Date:** 05/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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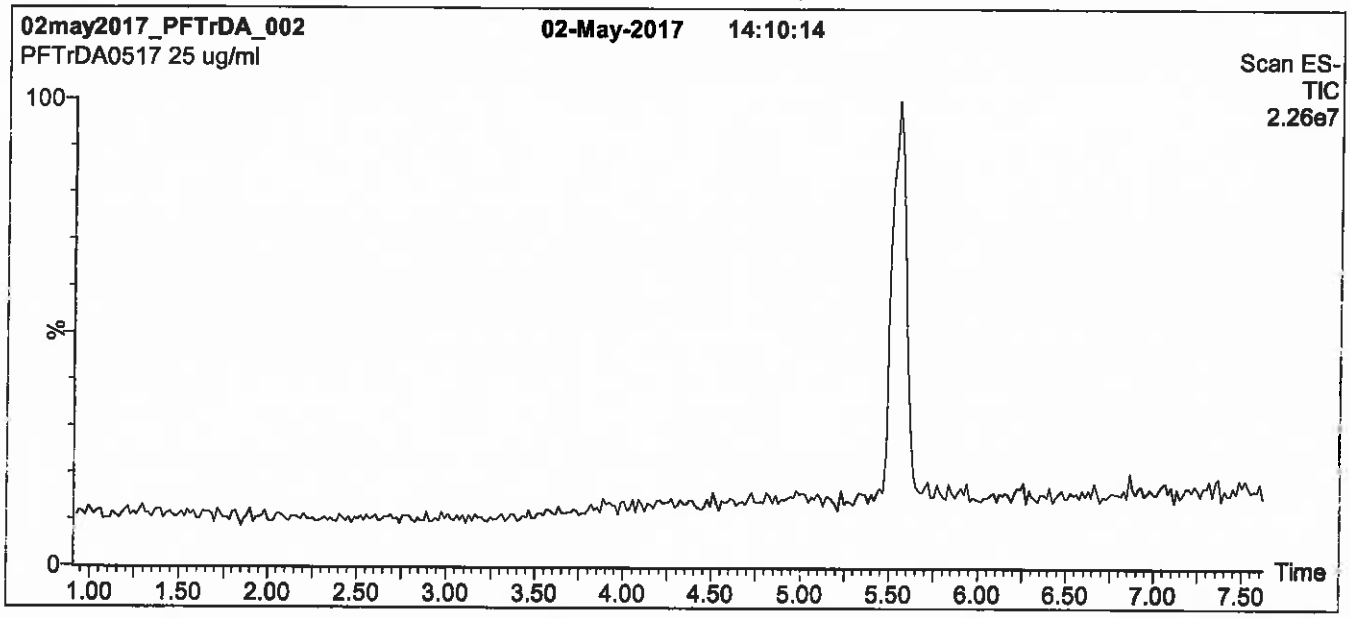

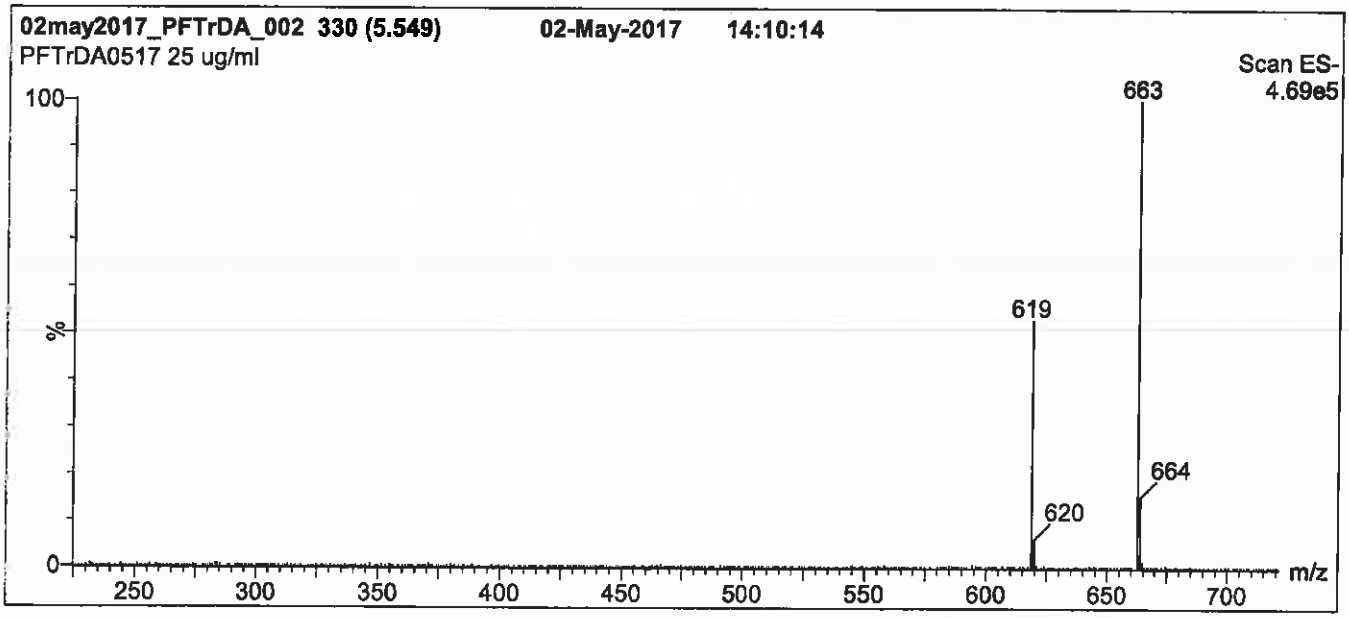

Conditions for Figure 1:

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MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min .

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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Cone Gas Flow (l/hr) = 60
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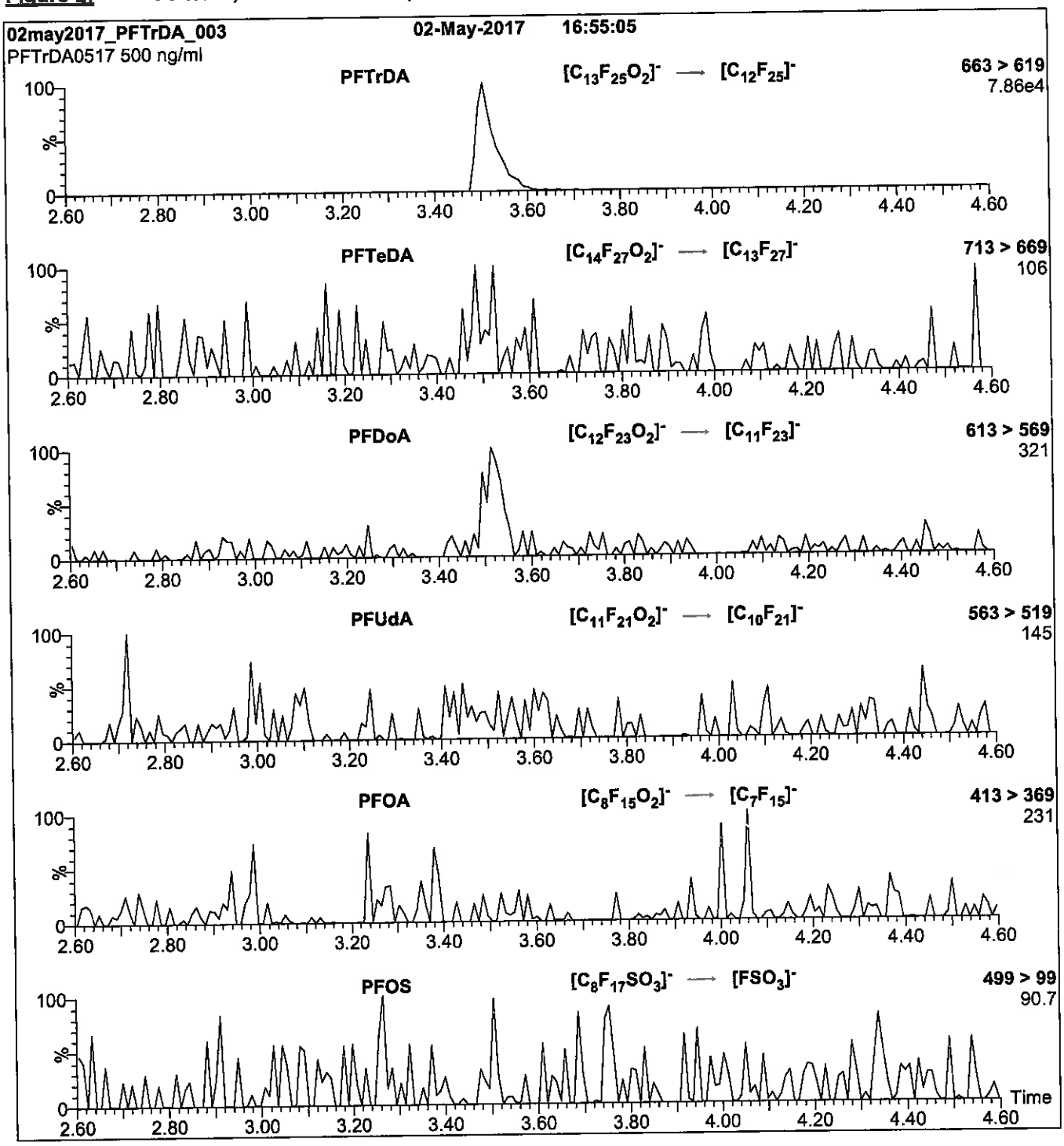


Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 15

Reagent

LCPFTrDA_00009

r: 9/21/17 SAN

WELLINGTON LABORATORIES

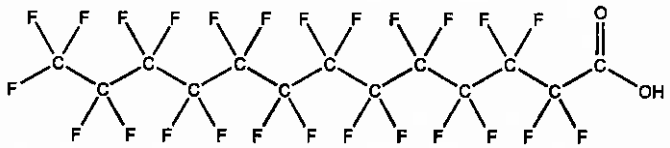
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid

LOT NUMBER: PFTrDA0517

STRUCTURE:

CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 664.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/02/2017
EXPIRY DATE: (mm/dd/yyyy) 05/02/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
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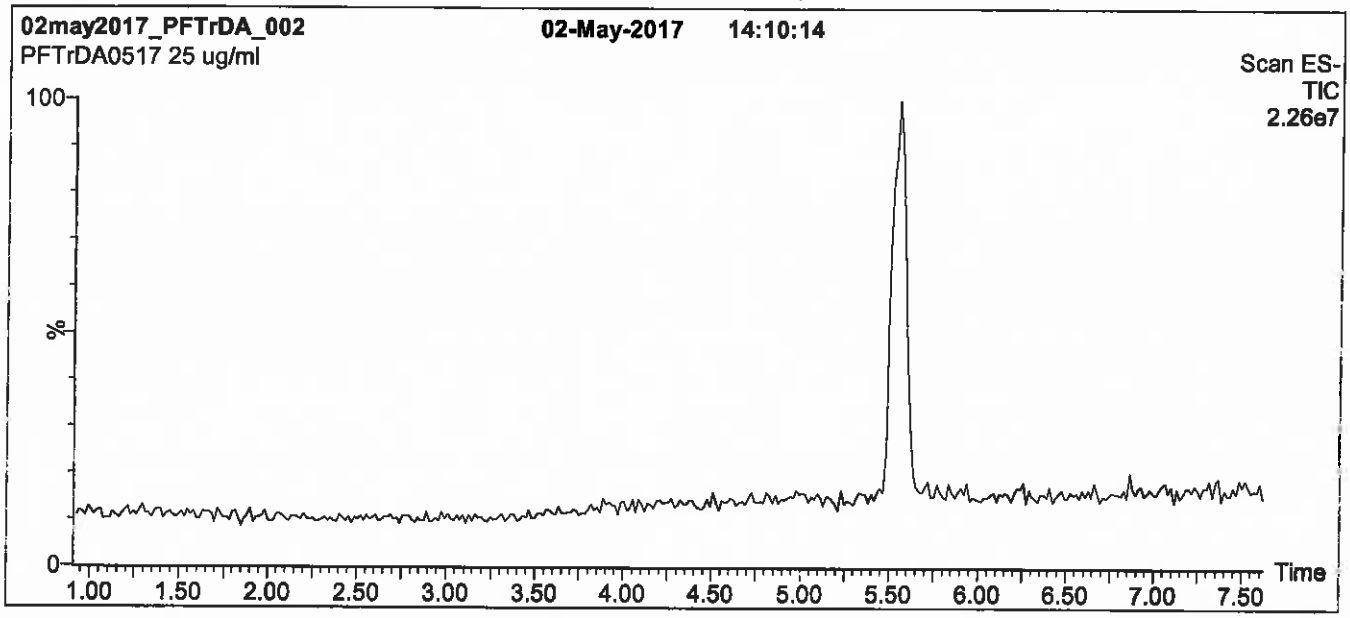
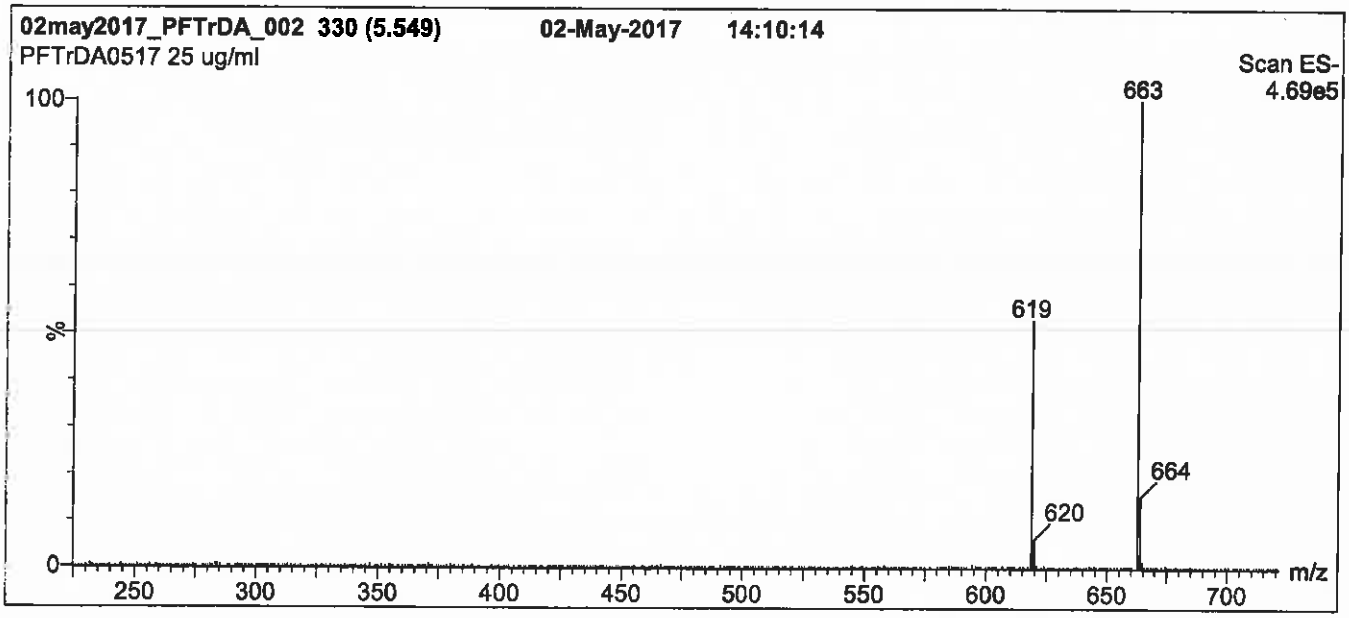




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

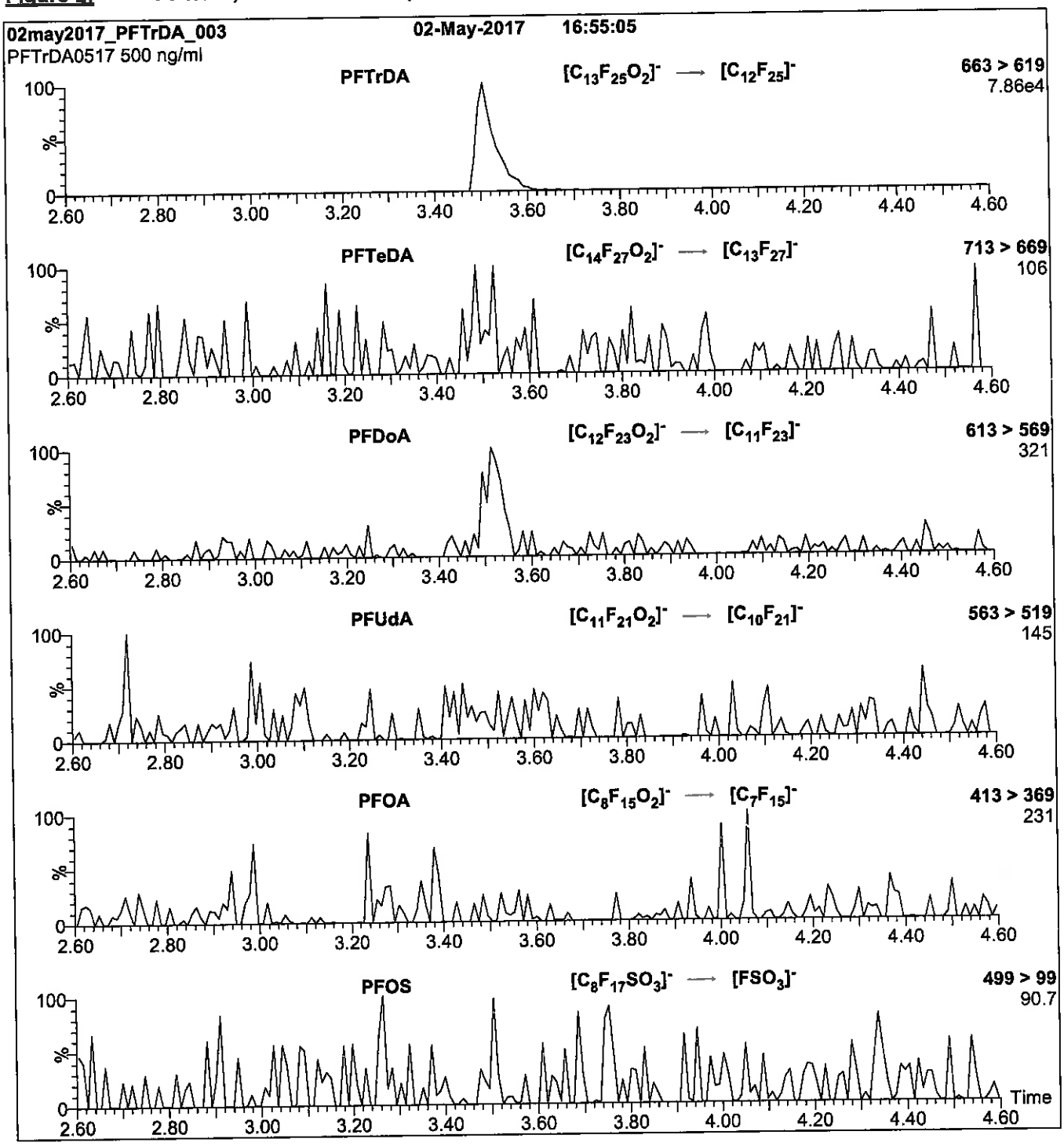
Flow: 300 µl/min .

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00008

r: 9/21/17 SKJ

WELLINGTON LABORATORIES

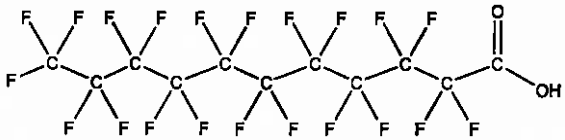
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid

LOT NUMBER: PFUdA1016

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 564.09
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/18/2016
EXPIRY DATE: (mm/dd/yyyy) 10/18/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

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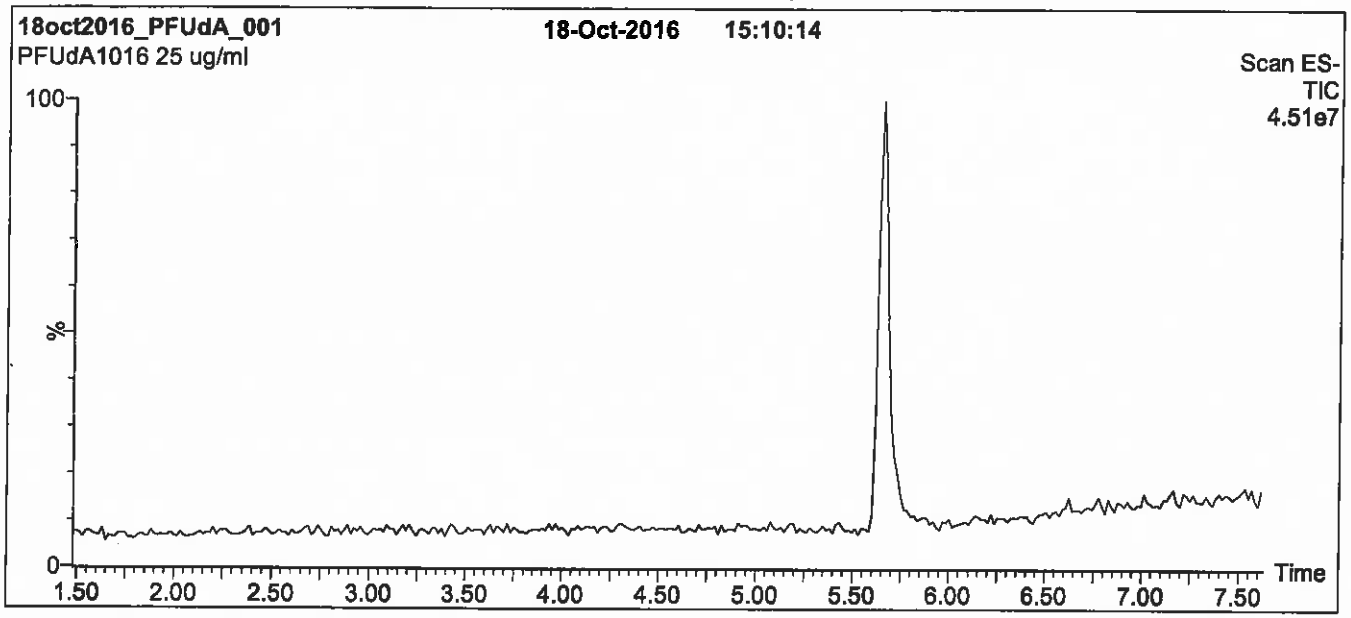

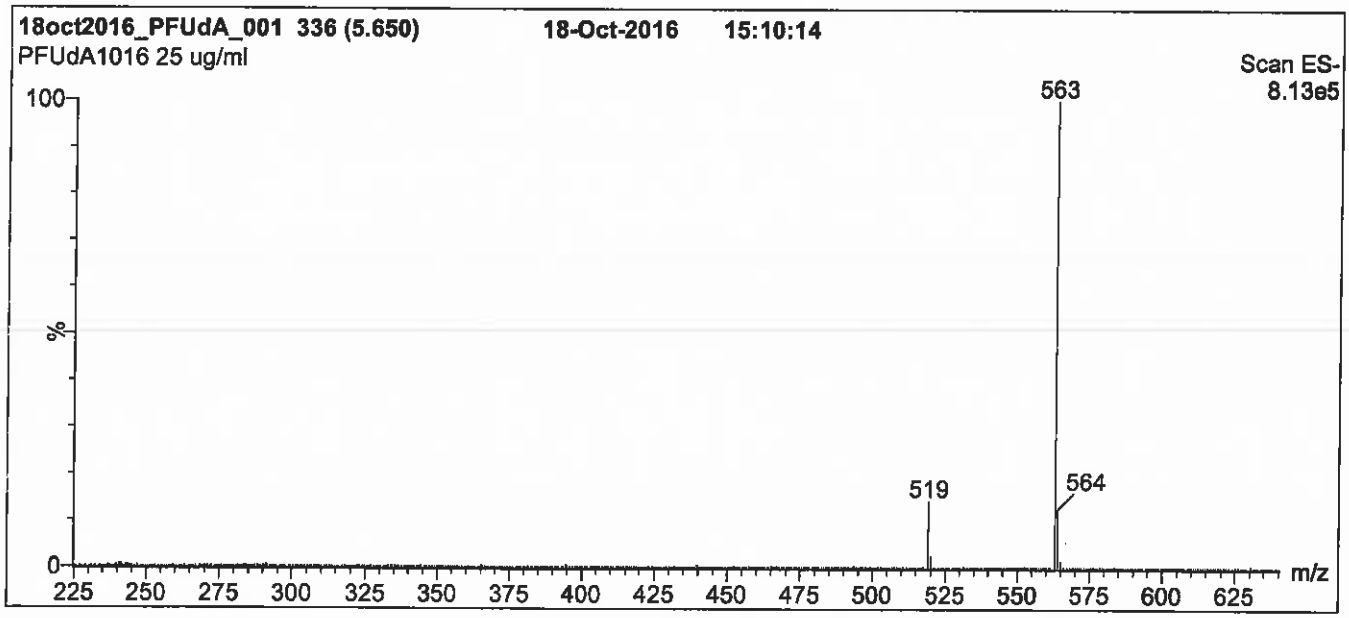

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

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Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
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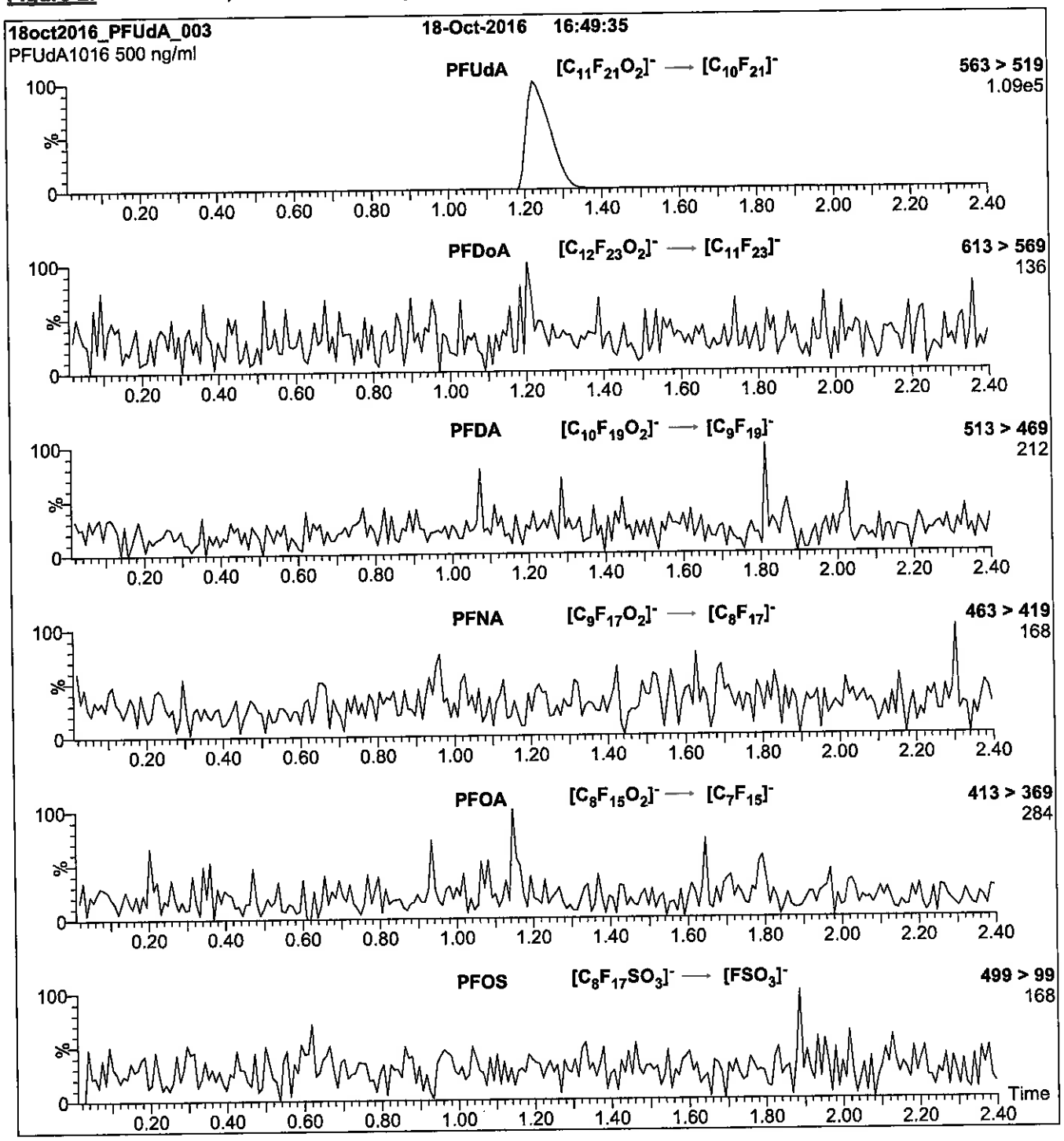
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFUdA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Reagent

MV-567650_00027

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FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 567650 **Lot No.:** A0124069

Description : 8260 Surrogate Standard

8260 Surrogate Standard 2,500 ug/ml, P&T Methanol, 5 ml/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2022 **Storage:** 0°C or colder

C E R T I F I E D V A L U E S

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Dibromofluoromethane		2,521.2 µg/mL	+/- 14.6582	µg/mL	Gravimetric
	CAS # 1868-53-7	(Lot 0012016)		+/- 141.3584	µg/mL	Unstressed
	Purity 99%			+/- 144.6660	µg/mL	Stressed
2	1,2-Dichloroethane-d4		2,513.8 µg/mL	+/- 14.6157	µg/mL	Gravimetric
	CAS # 17060-07-0	(Lot PR-25433)		+/- 140.9489	µg/mL	Unstressed
	Purity 98%			+/- 144.2469	µg/mL	Stressed
3	Toluene-d8		2,519.4 µg/mL	+/- 14.6480	µg/mL	Gravimetric
	CAS # 2037-26-5	(Lot PR-27311)		+/- 141.2603	µg/mL	Unstressed
	Purity 99%			+/- 144.5656	µg/mL	Stressed
4	1-Bromo-4-fluorobenzene (BFB)		2,520.8 µg/mL	+/- 14.6559	µg/mL	Gravimetric
	CAS # 460-00-4	(Lot 20401KOV)		+/- 141.3360	µg/mL	Unstressed
	Purity 99%			+/- 144.6430	µg/mL	Stressed

Solvent: P&T Methanol
CAS # 67-56-1
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

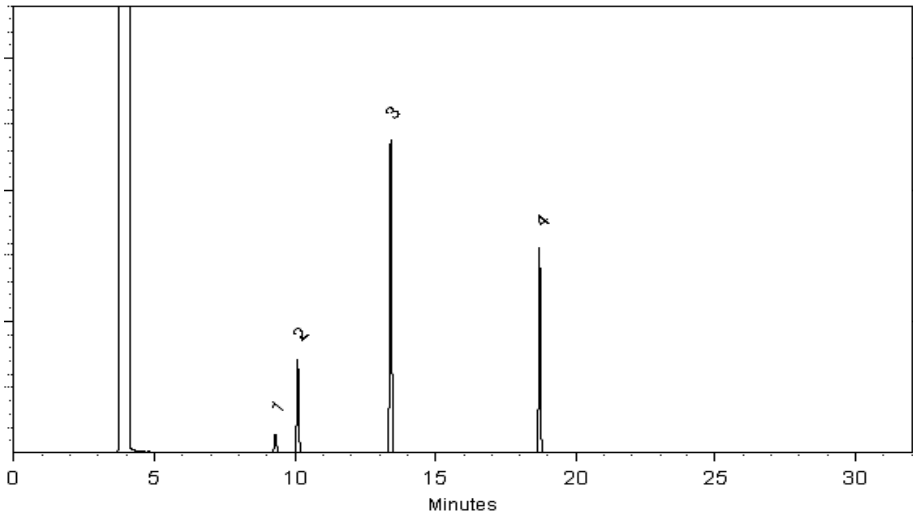
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Isaiah Harrison - Mix Technician

Date Mixed: 09-Jan-2017 **Balance:** 1128342314

Amanda Miller - Operations Tech-ARM QC

Date Passed: 11-Jan-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-568718-D_00014

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FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

rec'd 3/1/18

Catalog No. : 568718 **Lot No.:** A0127975

Description : 8260 Internal Standard 2014

8260 Internal Standard 2014 250-5,000 ug/ml, P&T Methanol, 5 ml/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : May 31, 2022 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)		Expanded Uncertainty (95% C.L.; K=2)			
1	tert-Butyl-d9-alcohol		5,022.1	µg/mL	+/-	29.1976	µg/mL	Gravimetric
	CAS # 25725-11-5	(Lot I-201)			+/-	107.5241	µg/mL	Unstressed
	Purity 99%				+/-	110.6500	µg/mL	Stressed
2	2-Butanone-d5		1,257.5	µg/mL	+/-	7.3114	µg/mL	Gravimetric
	CAS # 24313-50-6	(Lot M-276)			+/-	26.9239	µg/mL	Unstressed
	Purity 99%				+/-	27.7067	µg/mL	Stressed
3	Fluorobenzene		250.8	µg/mL	+/-	1.4613	µg/mL	Gravimetric
	CAS # 462-06-6	(Lot BCBK8171V)			+/-	5.3699	µg/mL	Unstressed
	Purity 99%				+/-	5.5259	µg/mL	Stressed
4	1,4-Dioxane-d8		5,009.4	µg/mL	+/-	29.1236	µg/mL	Gravimetric
	CAS # 17647-74-4	(Lot I-19942)			+/-	107.2514	µg/mL	Unstressed
	Purity 99%				+/-	110.3694	µg/mL	Stressed
5	Chlorobenzene-d5		251.7	µg/mL	+/-	1.4666	µg/mL	Gravimetric
	CAS # 3114-55-4	(Lot PR-21944)			+/-	5.3891	µg/mL	Unstressed
	Purity 99%				+/-	5.5458	µg/mL	Stressed
6	1,4-Dichlorobenzene-d4		251.3	µg/mL	+/-	1.4645	µg/mL	Gravimetric
	CAS # 3855-82-1	(Lot PR-18488)			+/-	5.3813	µg/mL	Unstressed
	Purity 99%				+/-	5.5377	µg/mL	Stressed

Solvent: P&T Methanol/Water (90:10)
CAS # 67-56-1/7732-18-5
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

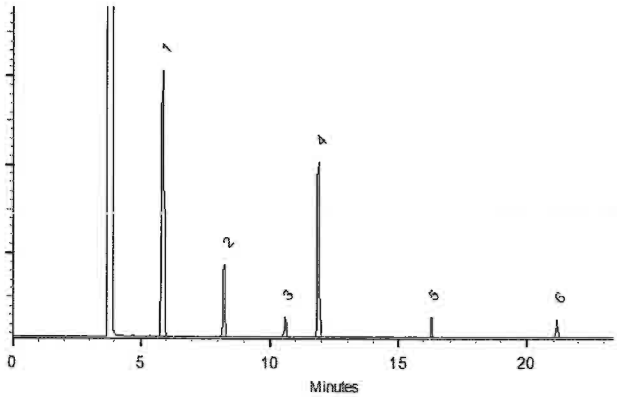
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Matt Fragassi - Mix Technician

Date Mixed: 30-May-2017 **Balance:** 1128342314

Justine Albertson - Operations Tech-ARM QC

Date Passed: 06-Jun-2017

Manufactured under Restek's ISO 9001:2008 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569721.sec_00005

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Testing Laboratory
Certificate #3222.02

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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569721.sec **Lot No.:** A0123880

Description : 8260 List 1/ Std #2 Ketones (2015)

8260 List 1/ Std #2 Ketones (2015) 12,500 µg/ml, P&T Methanol/Water (90:10), 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

C E R T I F I E D V A L U E S

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Acetone **CAS #** 67-64-1.SEC (Lot P14A572) **Purity** 99%	12,501.6 µg/mL	+/- 73.1996 µg/mL +/- 754.3267 µg/mL +/- 756.1173 µg/mL	Gravimetric Unstressed Stressed
2	2-Butanone (MEK) **CAS #** 78-93-3.SEC (Lot RA58J) **Purity** 99%	12,503.6 µg/mL	+/- 73.2113 µg/mL +/- 754.4473 µg/mL +/- 756.2383 µg/mL	Gravimetric Unstressed Stressed
3	4-Methyl-2-pentanone (MIBK) **CAS #** 108-10-1.SEC (Lot E29T040) **Purity** 99%	12,506.0 µg/mL	+/- 73.2254 µg/mL +/- 754.5921 µg/mL +/- 756.3834 µg/mL	Gravimetric Unstressed Stressed
4	2-Hexanone **CAS #** 591-78-6.SEC (Lot V3NRA) **Purity** 99%	12,504.0 µg/mL	+/- 73.2137 µg/mL +/- 754.4715 µg/mL +/- 756.2625 µg/mL	Gravimetric Unstressed Stressed

Solvent: P&T Methanol/Water (90:10)
CAS # 67-56-1/7732-18-5
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

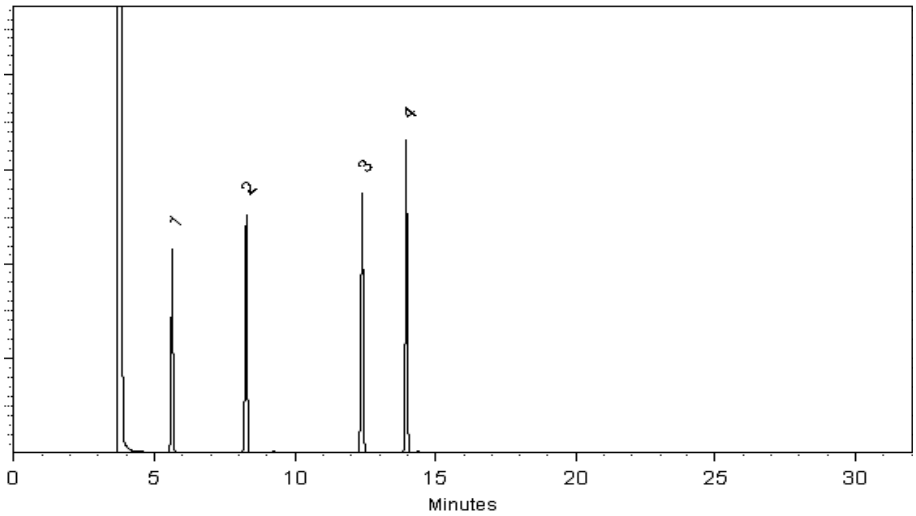
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Date Mixed: 03-Jan-2017 **Balance:** 1127510105

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 05-Jan-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
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0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569722.sec_00004

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Certificate of Analysis

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Certificate #3222.01

ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569722.SEC **Lot No.:** A0124116

Description : 8260 List 1 / Std #3 Gases (2015)

8260 List 1 / Std #3 Gases (2015) 2,500 ug/ml, P&T Methanol, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

C E R T I F I E D V A L U E S

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Dichlorodifluoromethane (CFC-12)	2,503.4 µg/mL	+/- 19.5506	µg/mL	Gravimetric
	CAS # 75-71-8.SEC (Lot 23586)		+/- 140.9699	µg/mL	Unstressed
	Purity 99%		+/- 144.2404	µg/mL	Stressed
2	Chloromethane (methyl chloride)	2,508.1 µg/mL	+/- 21.1963	µg/mL	Gravimetric
	CAS # 74-87-3.SEC (Lot 18343)		+/- 141.4639	µg/mL	Unstressed
	Purity 99%		+/- 144.7353	µg/mL	Stressed
3	Vinyl chloride	2,518.6 µg/mL	+/- 19.4186	µg/mL	Gravimetric
	CAS # 75-01-4.SEC (Lot MKBK6872V)		+/- 141.7924	µg/mL	Unstressed
	Purity 99%		+/- 145.0836	µg/mL	Stressed
4	1,3-Butadiene	2,504.0 µg/mL	+/- 20.5722	µg/mL	Gravimetric
	CAS # 106-99-0.SEC (Lot 22331)		+/- 141.1450	µg/mL	Unstressed
	Purity 99%		+/- 144.4130	µg/mL	Stressed
5	Bromomethane (methyl bromide)	2,498.5 µg/mL	+/- 19.9806	µg/mL	Gravimetric
	CAS # 74-83-9.SEC (Lot Q119-46)		+/- 140.7602	µg/mL	Unstressed
	Purity 99%		+/- 144.0229	µg/mL	Stressed
6	Chloroethane (ethyl chloride)	2,494.9 µg/mL	+/- 17.8868	µg/mL	Gravimetric
	CAS # 75-00-3.SEC (Lot 00004202)		+/- 140.2786	µg/mL	Unstressed
	Purity 99%		+/- 143.5429	µg/mL	Stressed
7	Dichlorofluoromethane (CFC-21)	2,503.4 µg/mL	+/- 20.0421	µg/mL	Gravimetric
	CAS # 75-43-4.SEC (Lot SHBC0858V)		+/- 141.0350	µg/mL	Unstressed
	Purity 99%		+/- 144.3039	µg/mL	Stressed

8	Trichlorofluoromethane (CFC-11)		2,503.2	µg/mL	+/-	18.7037	µg/mL	Gravimetric
	CAS # 75-69-4.SEC	(Lot Q12B-59)			+/-	140.8450	µg/mL	Unstressed
	Purity 99%				+/-	144.1179	µg/mL	Stressed

Solvent: P&T Methanol
CAS # 67-56-1
Purity 99%

Column:
60m x 0.25mm x 1.4µm
Rtx-502.2 (cat.#10916)

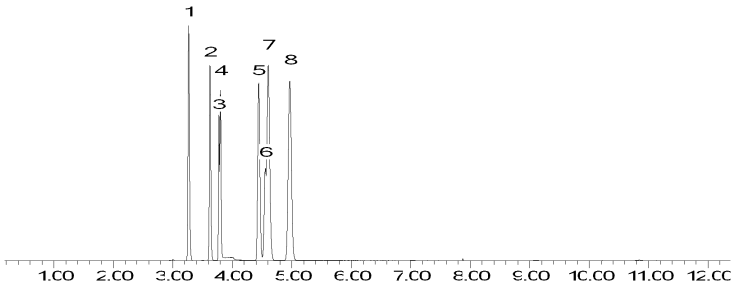
Carrier Gas:
helium-constant flow 2.0 mL/min.

Temp. Program:
40°C (hold 6 min.) to 100°C
@ 6°C/min.

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Brandon Reish - Mix Technician

Date Mixed: 12-Jan-2017 **Balance:** 1127510105

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 17-Jan-2017

Manufactured under Restek's ISO 9001:2008 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569727_00006

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ISO Guide 34 Accredited
Reference Material Producer
Certificate #3222.01

ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569727 **Lot No.:** A0118487

Description : 8260 List 2/ Std #3 Cyclohexanone (2015)

8260 List 2/ Std #3 Cyclohexanone (2015) 25,000 µg/ml, Water, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : March 31, 2019 **Storage:** 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Cyclohexanone	25,000.4 µg/mL	+/- 146.3826 µg/mL	Gravimetric
	CAS # 108-94-1 (Lot MKBN5282V)		+/- 1,508.4819 µg/mL	Unstressed
	Purity 99%		+/- 1,512.0629 µg/mL	Stressed

Solvent: Water
CAS # 7732-18-5
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

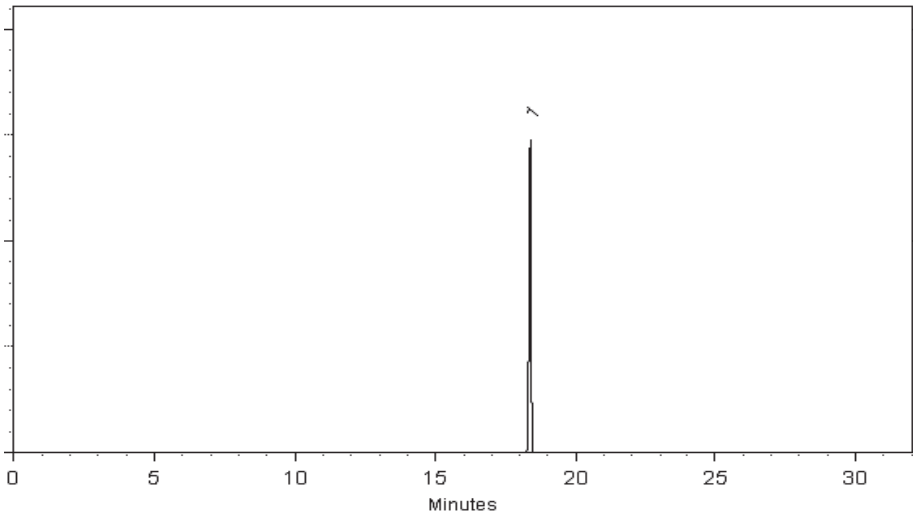
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Joseph Jaglowski - Mix Technician

Date Mixed: 31-Mar-2016 **Balance:** B442140311

Jodi E. Breon - QA Analyst

Date Passed: 04-Apr-2016

Manufactured under Restek's ISO 9001:2008 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-CUS17739_00002

Certificate of Analysis

Custom Standard

Product Number: CUS-17739 **Page:** 1 of 1

Lot Number: CR-2819 **Lot Issue Date:** 19-Jun-2017 **Expiration Date:** 31-Jul-2019

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with ULTRA Scientific's ISO 9001 registered quality system. A review of the gravimetric preparation data by our ISO 17025 accredited laboratory serves to verify the concentration of each analyte. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
1-chlorohexane	000544-10-5	RM04263	998.8 ± 5.0 µg/mL
2-pentanone	000107-87-9	RM03775	4020 ± 20 µg/mL
sec-butanol	000078-92-2	RM01299	30116 ± 151 µg/mL

Matrix: methanol (purge & trap grade)

Storage: Store Frozen (-25° to -10°C).

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

ISO 9001
Registered
TUV USA, Inc.

John Russo
President

Monica Bourgeois
Director of QA/RA

250 SMITH STREET ▪ NORTH KINGSTOWN, RHODE ISLAND 02852 ▪ WWW.ULTRASCI.COM

Reagent

MV-STS110N1_00066

Certificate of Analysis

4-Bromofluorobenzene Solution

Product Number: STS-110N **Page:** 1 of 1

Lot Number: CH-3248Z **Lot Issue Date:** 31-Aug-2016 **Expiration Date:** 31-Oct-2019

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
4-bromofluorobenzene	000460-00-4	RM03365	2005 ± 10 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store Frozen (-25° to -10°C).

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

John Russo
President

Vincent Wang, Ph.D.
Director of QA/RA

ISO 9001
Registered
TUV USA, Inc.

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Method 8260B

Volatile Organic Compounds (GC/MS) by Method 8260B

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Matrix: Solid (TCLP) Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TOL #	BFB #
GRE-IDW-S-01	320-41149-36	104	102	106	98
	LB 280-423316/1-A	105	103	107	99
	LCS 280-423316/2-A	103	103	101	94

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	79-119
DCA = 1,2-Dichloroethane-d4 (Surr)	64-129
TOL = Toluene-d8 (Surr)	78-120
BFB = 4-Bromofluorobenzene (Surr)	78-121

Column to be used to flag recovery values

FORM II 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Matrix: Solid (TCLP) Level: Low Lab File ID: MS1_5232.D

Lab ID: LCS 280-423316/2-A Client ID:

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC	QC LIMITS REC	#
Benzene	0.0500	0.0484	97	74-135	
2-Butanone (MEK)	0.200	0.173	87	44-150	M
Carbon tetrachloride	0.0500	0.0447	89	67-135	
Chlorobenzene	0.0500	0.0456	91	76-135	
Chloroform	0.0500	0.0491	98	76-120	
1,2-Dichloroethane	0.0500	0.0493	99	70-135	
1,1-Dichloroethene	0.0500	0.0459	92	71-136	
Tetrachloroethene	0.0500	0.0440	88	70-135	
Trichloroethene	0.0500	0.0467	93	73-135	
Vinyl chloride	0.0500	0.0500	100	40-144	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab File ID: MS1_5072.D BFB Injection Date: 08/02/2018

Instrument ID: VMS_MS1 BFB Injection Time: 07:34

Analysis Batch No.: 424541

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.1	
75	30.0 - 60.0 % of mass 95	49.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.7	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	50.0 - 120.00 % of mass 95	74.3	
175	5.0 - 9.0 % of mass 174	5.9	(7.9) 1
176	95.0 - 101.0 % of mass 174	72.7	(97.9) 1
177	5.0 - 9.0 % of mass 176	5.7	(7.8) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD003 280-424541/12	MS1_5075.D	08/02/2018	08:53
	STD01 280-424541/13	MS1_5076.D	08/02/2018	09:13
	STD02 280-424541/14	MS1_5077.D	08/02/2018	09:33
	STD05 280-424541/15	MS1_5078.D	08/02/2018	09:53
	STD10 280-424541/16	MS1_5079.D	08/02/2018	10:14
	STD30 280-424541/17	MS1_5080.D	08/02/2018	10:34
	STD60 280-424541/18	MS1_5081.D	08/02/2018	10:54
	ICV 280-424541/19	MS1_5083.D	08/02/2018	11:35
	STD01 280-424541/20	MS1_5084.D	08/02/2018	11:55
	STD02 280-424541/21	MS1_5085.D	08/02/2018	12:15
	STD05 280-424541/22	MS1_5086.D	08/02/2018	12:36
	ICIS 280-424541/23	MS1_5087.D	08/02/2018	12:56
	STD30 280-424541/24	MS1_5088.D	08/02/2018	13:16
	STD60 280-424541/25	MS1_5089.D	08/02/2018	13:37
	ICV 280-424541/26	MS1_5091.D	08/02/2018	14:17

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab File ID: MS1_5226.D BFB Injection Date: 08/06/2018

Instrument ID: VMS_MS1 BFB Injection Time: 07:02

Analysis Batch No.: 424938

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.3	
75	30.0 - 60.0 % of mass 95	50.5	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	50.0 - 120.00 % of mass 95	77.1	
175	5.0 - 9.0 % of mass 174	5.8	(7.6) 1
176	95.0 - 101.0 % of mass 174	76.4	(99.1) 1
177	5.0 - 9.0 % of mass 176	4.9	(6.4) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-424938/2	MS1_5228.D	08/06/2018	07:47
	CCV 280-424938/3	MS1_5229.D	08/06/2018	08:07
	LCS 280-423316/2-A	MS1_5232.D	08/06/2018	09:08
	LB 280-423316/1-A	MS1_5233.D	08/06/2018	09:28
GRE-IDW-S-01	320-41149-36	MS1_5239.D	08/06/2018	11:30
	CCVC 280-424938/33	MS1_5253.D	08/06/2018	16:15

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Sample No.: ICIS 280-424541/23 Date Analyzed: 08/02/2018 12:56

Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): MS1_5087.D Heated Purge: (Y/N) N

Calibration ID: 33279

		TBAd9		FB		CBNZd5	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		201981	5.60	2198487	7.53	442983	9.79
UPPER LIMIT		403962	6.10	4396974	8.03	885966	10.29
LOWER LIMIT		100991	5.10	1099244	7.03	221492	9.29
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-424541/26		204330	5.59	2158753	7.53	435634	9.79
CCV 280-424938/2		171503	5.58	2111006	7.53	444184	9.79
CCV 280-424938/3		178279	5.59	2172779	7.53	449004	9.79
LCS 280-423316/2-A		163777	5.60	2064361	7.53	439723	9.79
LB 280-423316/1-A		160367	5.60	2105036	7.53	437807	9.79
320-41149-36	GRE-IDW-S-01	156557	5.59	2125875	7.53	440695	9.79
CCVC 280-424938/33		177062	5.59	2067090	7.53	446910	9.79

TBAd9 = TBA-d9 (IS)
FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Sample No.: ICIS 280-424541/23 Date Analyzed: 08/02/2018 12:56

Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): MS1_5087.D Heated Purge: (Y/N) N

Calibration ID: 33279

		DCBd4					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		615228	11.60				
UPPER LIMIT		1230456	12.10				
LOWER LIMIT		307614	11.10				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-424541/26		604764	11.60				
CCV 280-424938/2		661102	11.60				
CCV 280-424938/3		628175	11.60				
LCS 280-423316/2-A		632160	11.60				
LB 280-423316/1-A		610235	11.60				
320-41149-36	GRE-IDW-S-01	600553	11.60				
CCVC 280-424938/33		648746	11.60				

DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE-IDW-S-01 | Lab Sample ID: 320-41149-36

Matrix: Solid (TCLP) | Lab File ID: MS1_5239.D

Analysis Method: 8260B | Date Collected: 07/13/2018 10:55

Sample wt/vol: 2(mL) | Date Analyzed: 08/06/2018 11:30

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-624 (60.25) ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 424938 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0040	U	0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.040	U	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0040	U	0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0040	U	0.010	0.0040	0.0017
67-66-3	Chloroform	0.0040	U	0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0040	U	0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0080	U	0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0040	U	0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0040	U	0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0020	U	0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	106		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		64-129
460-00-4	4-Bromofluorobenzene (Surr)	98		78-121
1868-53-7	Dibromofluoromethane (Surr)	104		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5239.D				
Lims ID:	320-41149-A-36-A				
Client ID:	GRE-IDW-S-01				
Sample Type:	Client				
Inject. Date:	06-Aug-2018 11:30:30	ALS Bottle#:	22	Worklist Smp#:	19
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	320-41149-A-36-A 2ml				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 12:19:09

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.584	0.001	35	156557	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2125875	12.5	
* 149 1,4-Dioxane-d8	96	8.727	8.773	-0.046	0	18893	0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	440695	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	600553	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	466016	12.7	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.274	-0.014	99	390185	12.5	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	94	2206087	13.0	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	644110	12.0	
27 Vinyl chloride	62		4.286				ND	
43 1,1-Dichloroethene	96		5.361				ND	
61 2-Butanone (MEK)	43		6.590				ND	
68 Chloroform	83		6.855				ND	
74 Carbon tetrachloride	117		7.233				ND	
75 1,2-Dichloroethane	62		7.330				ND	
77 Benzene	78		7.358				ND	
79 Trichloroethene	95		7.819				ND	
97 Tetrachloroethene	164		9.202				ND	
102 Chlorobenzene	112		9.816				ND	

Reagents:

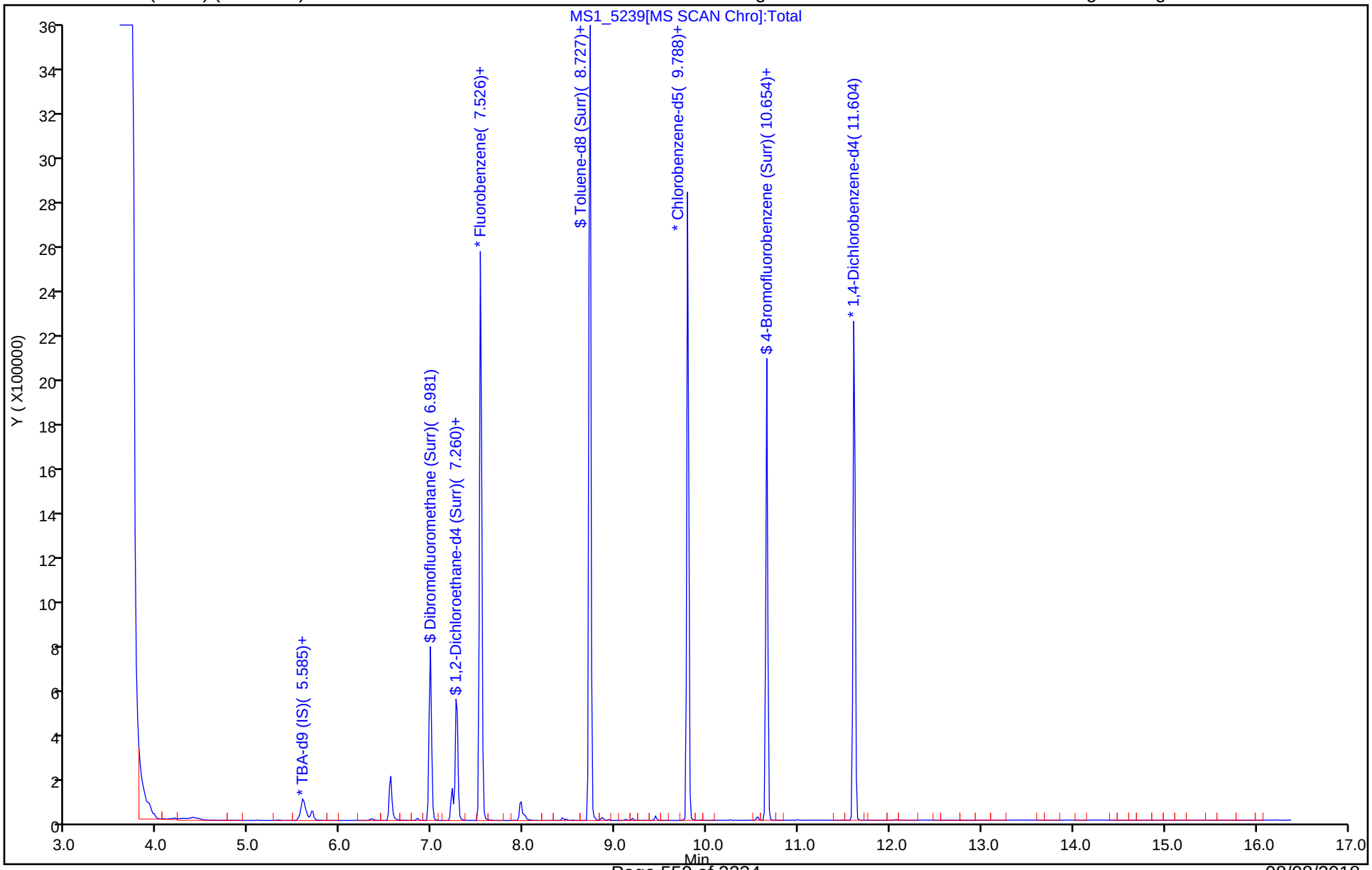
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5239.D				
Injection Date:	06-Aug-2018 11:30:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	320-41149-A-36-A	Lab Sample ID:	280-41149-36	Worklist Smp#:	19
Client ID:	GRE-IDW-S-01				
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	22
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5239.D				
Lims ID:	320-41149-A-36-A				
Client ID:	GRE-IDW-S-01				
Sample Type:	Client				
Inject. Date:	06-Aug-2018 11:30:30	ALS Bottle#:	22	Worklist Smp#:	19
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	320-41149-A-36-A 2ml				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 12:19:09

Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	12.7	103.56
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	12.5	102.05
$ 7 Toluene-d8 (Surr)	12.3	13.0	106.16
$ 8 4-Bromofluorobenzene (Surr)	12.3	12.0	97.97

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD003 280-424541/12	MS1_5075.D
Level 2	STD01 280-424541/13	MS1_5076.D
Level 3	STD02 280-424541/14	MS1_5077.D
Level 4	STD05 280-424541/15	MS1_5078.D
Level 5	STD10 280-424541/16	MS1_5079.D
Level 6	STD30 280-424541/17	MS1_5080.D
Level 7	STD60 280-424541/18	MS1_5081.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Dichlorodifluoromethane	0.2474 0.3097	0.2548 0.3123	0.2273	0.3086	0.3220	Ave		0.2832				13.6		15.0			
Chloromethane	0.4412 0.3178	0.3234 0.3202	0.3316	0.3383	0.3361	Ave		0.3441			0.1000	12.7		15.0			
Vinyl chloride	0.3351 0.3205	0.3221 0.3106	0.3376	0.3396	0.3457	Ave		0.3302				3.8		30.0			
Bromomethane	0.2341 0.2434	0.2350 0.2357	0.2422	0.2507	0.2471	Ave		0.2412				2.7		15.0			
Chloroethane	0.2572 0.2342	0.2375 0.2245	0.2420	0.2456	0.2446	Ave		0.2408				4.2		15.0			
Dichlorofluoromethane	0.5465 0.5206	0.5108 0.5254	0.5674	0.5419	0.5459	Ave		0.5369				3.6		15.0			
Trichlorofluoromethane	0.4288 0.4203	0.4082 0.4243	0.4255	0.4161	0.4351	Ave		0.4226				2.1		15.0			
Ethyl ether	0.1305 0.1135	0.1203 0.1278	0.1233	0.1284	0.1276	Ave		0.1245				4.8		15.0			
Acrolein	0.0140 0.0145	0.0147 0.0147	0.0160	0.0151	0.0149	Ave		0.0148				4.2		15.0			
Acetone	0.0505 0.0193	0.0276 0.0192	0.0258	0.0216	0.0203	Lin2	0.0371	0.0195							0.9980		0.9900
1,1,2-Trichloro-1,2,2-trifluoroethane	0.1777 0.1818	0.1891 0.2071	0.1966	0.1862	0.2056	Ave		0.1920				6.0		15.0			
1,1-Dichloroethene	0.2748 0.2465	0.2695 0.2777	0.2760	0.2627	0.2783	Ave		0.2694				4.3		30.0			
Iodomethane	0.3975 0.3885	0.4040 0.4341	0.4148	0.4340	0.4314	Ave		0.4149				4.5		15.0			
Methyl acetate	0.0765 0.0507	0.0632 0.0562	0.0586	0.0566	0.0565	Ave		0.0597				13.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
3-Chloro-1-propene	0.5030 0.4549	0.5191 0.4880	0.5163	0.5204	0.5192	Ave		0.5030				4.8		15.0			
Carbon disulfide	1.2562 1.0916	1.2002 1.1637	1.2385	1.2105	1.2475	Ave		1.2012				4.8		15.0			
t-Butyl alcohol	1.0596 1.1813	1.1885 1.3433	1.2293	1.2686	1.2508	Ave		1.2173				7.3		15.0			
Methylene Chloride	0.6068 0.2281	0.3200 0.2539	0.2851	0.2698	0.2591	Lin2	0.1086	0.2372							0.9950		0.9900
Acrylonitrile	0.0296 0.0275	0.0296 0.0304	0.0306	0.0308	0.0305	Ave		0.0299				3.8		15.0			
Methyl tert-butyl ether	0.3239 0.3073	0.3303 0.3450	0.3298	0.3416	0.3347	Ave		0.3304				3.8		15.0			
trans-1,2-Dichloroethene	0.3066 0.2748	0.3083 0.3096	0.3040	0.3032	0.3079	Ave		0.3021				4.0		15.0			
Hexane	3.0378 2.2415	2.4803 2.4360	2.6496	2.3470	2.6427	Ave		2.5478				10.3		15.0			
Vinyl acetate	0.1954 0.2172	0.2122 0.2227	0.2174	0.2260	0.2304	Ave		0.2173				5.3		15.0			
1,1-Dichloroethane	0.5263 0.4788	0.5215 0.5274	0.5382	0.5435	0.5453	Ave		0.5259			0.1000	4.3		15.0			
2-Butanone (MEK)	+++++ 0.0309	0.0411 0.0309	0.0304	0.0296	0.0297	Ave		0.0321				13.9		15.0			
sec-Butyl Alcohol	1.2217 1.1062	1.1785 1.2261	1.0333	1.0942	1.1443	Ave		1.1435				6.2		15.0			
cis-1,2-Dichloroethene	0.3040 0.2780	0.3044 0.3123	0.3116	0.3103	0.3090	Ave		0.3042				3.9		15.0			
2,2-Dichloropropane	0.4490 0.3921	0.4275 0.4367	0.4306	0.4186	0.4346	Ave		0.4270				4.2		15.0			
Bromochloromethane	0.0874 0.0843	0.0875 0.0966	0.0902	0.0926	0.0925	Ave		0.0901				4.6		15.0			
Chloroform	0.4556 0.4212	0.4560 0.4691	0.4676	0.4726	0.4725	Ave		0.4592				4.0		30.0			
Tetrahydrofuran	+++++ 0.0199	0.0337 0.0222	0.0292	0.0251	0.0228	Lin2	0.0259	0.0215							0.9950		0.9900
Isobutyl alcohol	0.5820 0.4192	0.4699 0.4787	0.4294	0.4417	0.4394	Ave		0.4657				11.9		15.0			
1,1,1-Trichloroethane	0.4303 0.4034	0.4285 0.4489	0.4471	0.4310	0.4525	Ave		0.4345				3.9		15.0			
Cyclohexane	0.6000 0.5306	0.6010 0.5728	0.6222	0.5492	0.6127	Ave		0.5841				5.9		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
1,1-Dichloropropene	0.4287 0.3921	0.4216 0.4362	0.4398	0.4121	0.4419	Ave		0.4246				4.2		15.0			
Carbon tetrachloride	0.3862 0.3434	0.3538 0.3882	0.3776	0.3526	0.3801	Ave		0.3689				5.0		15.0			
1,2-Dichloroethane	+++++ 0.2061	0.2285 0.2295	0.2291	0.2296	0.2287	Ave		0.2252				4.2		15.0			
Benzene	1.1751 1.0534	1.1849 1.1263	1.2231	1.1961	1.2018	Ave		1.1658				5.0		15.0			
Trichloroethene	0.2920 0.2726	0.2860 0.3085	0.3030	0.2949	0.3052	Ave		0.2946				4.3		15.0			
2-Pentanone	0.0545 0.0533	0.0509 0.0599	0.0557	0.0572	0.0582	Ave		0.0557				5.5		15.0			
1,2-Dichloropropane	0.2715 0.2401	0.2644 0.2677	0.2649	0.2663	0.2675	Ave		0.2632				4.0		30.0			
Methylcyclohexane	0.4873 0.4247	0.4780 0.4593	0.4918	0.4407	0.4868	Ave		0.4669				5.6		15.0			
1,4-Dioxane	+++++ 0.0008	0.0006 0.0009	0.0006	0.0007	0.0008	Ave		0.0007				14.6		15.0			
Dibromomethane	0.0862 0.0810	0.0862 0.0922	0.0894	0.0909	0.0890	Ave		0.0878				4.3		15.0			
Bromodichloromethane	0.2769 0.2631	0.2704 0.2968	0.2814	0.2824	0.2871	Ave		0.2797				3.9		15.0			
2-Chloroethyl vinyl ether	+++++ 0.0423	0.0300 0.0484	0.0327	0.0356	0.0375	Lin1	-0.027	0.0461							0.9930		0.9900
cis-1,3-Dichloropropene	1.4543 1.5173	1.5514 1.6887	1.5772	1.6380	1.6562	Ave		1.5833				5.3		15.0			
4-Methyl-2-pentanone (MIBK)	0.0605 0.0736	0.0682 0.0737	0.0715	0.0747	0.0755	Ave		0.0711				7.4		15.0			
Toluene	1.2457 1.0643	1.1971 1.1153	1.2451	1.2024	1.2099	Ave		1.1828				5.8		30.0			
Ethyl methacrylate	0.7147 0.6327	0.6380 0.7262	0.6359	0.6777	0.6900	Ave		0.6736				5.8		15.0			
trans-1,3-Dichloropropene	0.1989 0.2240	0.2109 0.2544	0.2237	0.2346	0.2406	Ave		0.2267				8.2		15.0			
1,1,2-Trichloroethane	0.1131 0.1078	0.1149 0.1208	0.1204	0.1188	0.1183	Ave		0.1163				4.0		15.0			
2-Hexanone	0.2119 0.2342	0.2105 0.2340	0.2180	0.2348	0.2415	Ave		0.2264				5.6		15.0			
1,3-Dichloropropane	1.0725 1.0273	1.1179 1.1398	1.1355	1.1369	1.1264	Ave		1.1080				3.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Tetrachloroethene	1.1404 1.0353	1.0880 1.1710	1.1186	1.0192	1.1532	Ave		1.1037				5.3		15.0			
Dibromochloromethane	0.5925 0.6536	0.6210 0.7456	0.6445	0.6700	0.6859	Ave		0.6590				7.4		15.0			
1,2-Dibromoethane (EDB)	0.4596 0.4897	0.5176 0.5521	0.5275	0.5296	0.5389	Ave		0.5164				6.1		15.0			
1-Chlorohexane	2.1880 1.9326	2.0846 2.1154	2.1378	1.8924	2.1728	Ave		2.0748				5.6		15.0			
Chlorobenzene	3.2818 3.0733	3.3694 3.3399	3.4230	3.3094	3.3934	Ave		3.3129			0.3000	3.5		15.0			
1,1,1,2-Tetrachloroethane	0.9448 0.9984	0.9625 1.1494	0.9839	1.0170	1.0515	Ave		1.0154				6.8		15.0			
Ethylbenzene	2.1109 2.0203	2.0983 2.2108	2.1627	2.0650	2.1800	Ave		2.1211				3.2		30.0			
m-Xylene & p-Xylene	2.6219 2.3858	2.5791 2.5901	2.5850	2.4915	2.6204	Ave		2.5534				3.4		15.0			
o-Xylene	2.2994 2.2757	2.3643 2.4297	2.3865	2.3724	2.4571	Ave		2.3693				2.7		15.0			
Styrene	3.0577 3.4425	3.2492 3.6439	3.4438	3.5799	3.6841	Ave		3.4430				6.5		15.0			
Bromoform	0.2234 0.3042	0.2475 0.3543	0.2738	0.2867	0.3112	Lin2	-0.029	0.3073			0.1000				0.9910		0.9900
Isopropylbenzene	5.0866 4.2873	4.8721 4.3246	4.9832	4.6706	4.9061	Ave		4.7329				6.7		15.0			
Cyclohexanone	0.0076 0.0113	0.0089 0.0118	0.0095	0.0106	0.0108	Ave		0.0101				14.7		15.0			
1,1,2,2-Tetrachloroethane	0.4082 0.3687	0.3877 0.4091	0.4259	0.4193	0.4123	Ave		0.4045			0.3000	4.9		15.0			
trans-1,4-Dichloro-2-butene	0.0897 0.0949	0.0944 0.1083	0.0988	0.0990	0.0997	Ave		0.0978				5.9		15.0			
1,2,3-Trichloropropane	0.0993 0.0994	0.1104 0.1116	0.1079	0.1141	0.1102	Ave		0.1076				5.5		15.0			
Bromobenzene	0.7721 0.8075	0.8448 0.9301	0.8641	0.8665	0.8749	Ave		0.8515				5.9		15.0			
N-Propylbenzene	1.3664 1.2538	1.3231 1.4009	1.3819	1.2715	1.3768	Ave		1.3392				4.3		15.0			
1,3,5-Trimethylbenzene	4.0279 3.6744	3.9519 3.7575	4.0787	3.9182	4.0510	Ave		3.9228				3.9		15.0			
2-Chlorotoluene	1.0038 1.0013	1.0331 1.1198	1.0779	1.0486	1.0861	Ave		1.0530				4.2		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
4-Chlorotoluene	1.0349 0.9760	1.0488 1.0793	1.0639	1.0200	1.0545	Ave		1.0396				3.3		15.0			
tert-Butylbenzene	3.8976 3.5732	3.8861 3.8014	4.0172	3.7298	3.9876	Ave		3.8418				4.0		15.0			
1,2,4-Trimethylbenzene	3.9629 3.5429	3.9271 3.7110	4.0963	3.8356	3.9443	Ave		3.8600				4.7		15.0			
sec-Butylbenzene	1.0092 0.9999	1.0674 1.0929	1.0945	0.9810	1.0874	Ave		1.0475				4.7		15.0			
4-Isopropyltoluene	4.4928 3.9938	4.3874 4.0462	4.5347	4.1731	4.4802	Ave		4.3012				5.3		15.0			
1,3-Dichlorobenzene	1.8108 1.7067	1.8416 1.8570	1.8932	1.8361	1.8774	Ave		1.8318				3.4		15.0			
1,4-Dichlorobenzene	1.7428 1.6152	1.7799 1.7668	1.8067	1.7435	1.7741	Ave		1.7470				3.6		15.0			
n-Butylbenzene	4.3936 3.9891	4.4440 3.9665	4.6073	4.1007	4.4732	Ave		4.2821				6.0		15.0			
1,2-Dichlorobenzene	1.3893 1.3156	1.4202 1.4439	1.4589	1.4414	1.4486	Ave		1.4168				3.5		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.0498	0.0352 0.0574	0.0480	0.0514	0.0518	Lin2	-0.018	0.0545							0.9960		0.9900
1,2,4-Trichlorobenzene	0.8711 0.8835	0.9195 0.9511	0.9422	0.9638	0.9552	Ave		0.9266				3.9		15.0			
Hexachlorobutadiene	0.7623 0.7394	0.7695 0.7834	0.7934	0.7179	0.7860	Ave		0.7646				3.6		15.0			
Naphthalene	1.0167 1.0639	1.0999 1.1367	1.1331	1.1871	1.1784	Ave		1.1165				5.5		15.0			
1,2,3-Trichlorobenzene	0.6204 0.6394	0.6807 0.6743	0.6878	0.7044	0.7005	Ave		0.6725				4.7		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD003 280-424541/12	MS1_5075.D
Level 2	STD01 280-424541/13	MS1_5076.D
Level 3	STD02 280-424541/14	MS1_5077.D
Level 4	STD05 280-424541/15	MS1_5078.D
Level 5	STD10 280-424541/16	MS1_5079.D
Level 6	STD30 280-424541/17	MS1_5080.D
Level 7	STD60 280-424541/18	MS1_5081.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Dichlorodifluoromethane	FB	Ave	12700 1607609	44046 3295611	77457	262015	564155	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chloromethane	FB	Ave	22645 1649433	55899 3378862	113002	287230	588713	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Vinyl chloride	FB	Ave	17197 1663573	55674 3276951	115053	288301	605543	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromomethane	FB	Ave	12014 1263233	40617 2487024	82533	212846	432819	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chloroethane	FB	Ave	13199 1215873	41063 2368826	82454	208499	428415	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Dichlorofluoromethane	FB	Ave	28050 2702237	88299 5543482	193349	460095	956401	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Trichlorofluoromethane	FB	Ave	22007 2181784	70561 4476447	144994	353258	762226	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Ethyl ether	FB	Ave	6697 589044	20792 1348510	42022	109027	223449	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Acrolein	FB	Ave	7177 754395	25428 1545886	54542	128287	261551	3.00 300	10.00 600	20.0	50.0	100.0
Acetone	FB	Lin2	10363 401189	19102 809150	35136	73297	142461	1.20 120	4.00 240	8.00	20.0	40.0
1,1,2-Trichloro-1,2,2-trifluoroetha ne	FB	Ave	9123 943667	32680 2185427	67004	158047	360256	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1-Dichloroethene	FB	Ave	14103 1279482	46581 2929771	94056	223075	487569	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Iodomethane	FB	Ave	20404 2016771	69836 4580085	141353	368517	755810	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Methyl acetate	FB	Ave	7849 526019	21852 1185621	39913	96138	198097	0.600 60.0	2.00 120	4.00	10.0	20.0
3-Chloro-1-propene	FB	Ave	25817 2361056	89729 5148897	175913	441817	909580	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Carbon disulfide	FB	Ave	64477 5666306	207465 12279155	422013	1027781	2185345	0.300 30.0	1.00 60.0	2.00	5.00	10.0
t-Butyl alcohol	TBAd 9	Ave	2294 262033	8512 618695	17233	47895	95029	3.00 300	10.0 600	20.0	50.0	100
Methylene Chloride	FB	Lin2	31143 1184219	55320 2678804	97146	229104	453852	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Acrylonitrile	FB	Ave	15171 1427463	51204 3207740	104191	261884	534223	3.00 300	10.0 600	20.0	50.0	100
Methyl tert-butyl ether	FB	Ave	16623 1594990	57090 3640553	112364	289997	586404	0.300 30.0	1.00 60.0	2.00	5.00	10.0
trans-1,2-Dichloroethene	FB	Ave	15738 1426670	53301 3267087	103588	257423	539385	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Hexane	CBNZ d5	Ave	31098 2356635	85907 5250704	183126	405524	933281	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Vinyl acetate	FB	Ave	20057 2254728	73369 4699784	148146	383823	807364	0.600 60.0	2.00 120	4.00	10.0	20.0
1,1-Dichloroethane	FB	Ave	27015 2485350	90139 5564790	183375	461484	955292	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Butanone (MEK)	FB	Ave	+++++ 640657	28429 1302396	41493	100443	208155	+++++ 120	4.00 240	8.00	20.0	40.0
sec-Butyl Alcohol	TBAd 9	Ave	7935 736148	25321 1694104	43455	123938	260819	9.00 900	30.0 1800	60.0	150	300
cis-1,2-Dichloroethene	FB	Ave	15605 1443283	52624 3295665	106162	263432	541403	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2,2-Dichloropropane	FB	Ave	23044 2035165	73905 4607883	146736	355420	761324	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromochloromethane	FB	Ave	4486 437412	15128 1019268	30721	78637	161964	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chloroform	FB	Ave	23384 2186138	78819 4950029	159333	401244	827738	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Tetrahydrofuran	FB	Lin2	+++++ 207066	11644 469376	19913	42560	79975	+++++ 60.0	2.00 120	4.00	10.0	20.0
Isobutyl alcohol	TBAd 9	Ave	3150 232449	8413 551153	15048	41687	83466	7.50 750	25.0 1500	50.0	125	250
1,1,1-Trichloroethane	FB	Ave	22085 2094001	74070 4736877	152331	365896	792643	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Cyclohexane	FB	Ave	30794 2754325	103890 6043382	212024	466257	1073292	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1-Dichloropropene	FB	Ave	22001 2035350	72878 4602816	149854	349914	774076	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Carbon tetrachloride	FB	Ave	19824 1782446	61167 4095789	128677	299384	665835	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1,2-Dichloroethane	FB	Ave	+++++ 1069725	39492 2421140	78066	194972	400706	+++++ 30.0	1.00 60.0	2.00	5.00	10.0
Benzene	FB	Ave	60313 5467947	204816 11883656	416772	1015513	2105308	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Trichloroethene	FB	Ave	14989 1414865	49445 3254862	103252	250410	534671	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Pentanone	FB	Ave	11194 1107233	35223 2526845	75914	194363	407613	1.20 120	4.00 240	8.00	20.0	40.0
1,2-Dichloropropane	FB	Ave	13937 1246070	45696 2824297	90254	226060	468579	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Methylcyclohexane	FB	Ave	25013 2204443	82622 4846395	167587	374200	852769	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,4-Dioxane	FB	Ave	+++++ 78499	2195 182854	4025	12733	29075	+++++ 600	20.0 1200	40.0	100	200
Dibromomethane	FB	Ave	4425 420276	14906 972742	30446	77167	155855	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromodichloromethane	FB	Ave	14210 1365855	46734 3131431	95902	239790	502920	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Chloroethyl vinyl ether	FB	Lin1	+++++ 219639	5179 510394	11144	30251	65666	+++++ 30.0	1.00 60.0	2.00	5.00	10.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	14888 1595241	53734 3639978	109008	283019	584896	0.300 30.0	1.00 60.0	2.00	5.00	10.0
4-Methyl-2-pentanone (MIBK)	FB	Ave	12417 1528689	47145 3109898	97429	253596	528863	1.20 120	4.00 240	8.00	20.0	40.0
Toluene	FB	Ave	63938 5524520	206925 11767863	424249	1020901	2119622	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Ethyl methacrylate	CBNZ d5	Ave	7316 665198	22096 1565228	43949	117097	243658	0.300 30.0	1.00 60.0	2.00	5.00	10.0
trans-1,3-Dichloropropene	FB	Ave	10211 1162612	36456 2684455	76214	199217	421536	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1,2-Trichloroethane	FB	Ave	5807 559577	19857 1274746	41015	100846	207294	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Hexanone	CBNZ d5	Ave	8677 984750	29170 2017731	60268	162252	341167	1.20 120	4.00 240	8.00	20.0	40.0
1,3-Dichloropropane	CBNZ d5	Ave	10979 1080009	38720 2456863	78479	196436	397780	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Tetrachloroethene	CBNZ d5	Ave	11674 1088504	37682 2524145	77313	176096	407265	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Dibromochloromethane	CBNZ d5	Ave	6065 687122	21508 1607038	44546	115760	242209	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2-Dibromoethane (EDB)	CBNZ d5	Ave	4705 514796	17928 1190133	36459	91506	190306	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1-Chlorohexane	CBNZ d5	Ave	22399 2031866	72202 4559602	147755	326975	767322	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chlorobenzene	CBNZ d5	Ave	33596 3231093	116700 7199151	236578	571821	1198370	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Ave	9672 1049644	33337 2477455	68003	175726	371334	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Ethylbenzene	CBNZ d5	Ave	21609 2124084	72676 4765351	149473	356805	769867	0.300 30.0	1.00 60.0	2.00	5.00	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	26840 2508264	89330 5582840	178662	430496	925395	0.300 30.0	1.00 60.0	2.00	5.00	10.0
o-Xylene	CBNZ d5	Ave	23539 2392581	81889 5237199	164944	409924	867725	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Styrene	CBNZ d5	Ave	31302 3619275	112539 7854293	238015	618546	1301023	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromoform	CBNZ d5	Lin2	2287 319845	8574 763589	18925	49542	109895	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Isopropylbenzene	DCBd 4	Ave	70873 6327757	231347 13051965	467529	1087749	2382186	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Cyclohexanone	CBNZ d5	Ave	3117 476407	12290 1017930	26350	73302	153088	12.0 1200	40.0 2400	80.0	200	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	5688 544180	18410 1234693	39960	97663	200198	0.300 30.0	1.00 60.0	2.00	5.00	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	1250 140039	4483 326861	9267	23057	48429	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	1383 146713	5241 336848	10121	26573	53523	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromobenzene	DCBd 4	Ave	10758 1191870	40116 2807153	81075	201811	424825	0.300 30.0	1.00 60.0	2.00	5.00	10.0
N-Propylbenzene	DCBd 4	Ave	19038 1850570	62827 4228117	129652	296132	668508	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	56122 5423026	187654 11340451	382672	912523	1966980	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Chlorotoluene	DCBd 4	Ave	13986 1477889	49057 3379698	101132	244211	527365	0.300 30.0	1.00 60.0	2.00	5.00	10.0
4-Chlorotoluene	DCBd 4	Ave	14419 1440429	49802 3257500	99812	237560	512020	0.300 30.0	1.00 60.0	2.00	5.00	10.0
tert-Butylbenzene	DCBd 4	Ave	54306 5273697	184528 11472922	376895	868638	1936218	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	55217 5229068	186475 11199960	384319	893281	1915213	0.300 30.0	1.00 60.0	2.00	5.00	10.0
sec-Butylbenzene	DCBd 4	Ave	14061 1475759	50686 3298491	102684	228466	527982	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
4-Isopropyltoluene	DCBd 4	Ave	62600 5894557	208331 12211753	425447	971889	2175391	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	25231 2518936	87445 5604443	177625	427610	911595	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	24283 2383941	84516 5332369	169505	406037	861432	0.300 30.0	1.00 60.0	2.00	5.00	10.0
n-Butylbenzene	DCBd 4	Ave	61218 5887503	211017 11971153	432266	955019	2172024	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	19358 1941765	67437 4357629	136872	335681	703378	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Lin2	+++++ 73435	1673 173215	4508	11972	25148	+++++ 30.0	1.00 60.0	2.00	5.00	10.0
1,2,4-Trichlorobenzene	DCBd 4	Ave	12138 1303964	43662 2870406	88397	224468	463813	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Hexachlorobutadiene	DCBd 4	Ave	10622 1091279	36541 2364233	74442	167192	381635	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Naphthalene	DCBd 4	Ave	14166 1570155	52226 3430633	106307	276470	572176	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	8644 943710	32321 2035072	64531	164057	340129	0.300 30.0	1.00 60.0	2.00	5.00	10.0

Curve Type Legend:

Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D
Lims ID: std003
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 02-Aug-2018 08:53:30 ALS Bottle#: 12 Worklist Smp#: 12
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std003
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:49 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:35:23

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.598	0.000	84	180421	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2138567	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	426543	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	580556	12.5	12.5	
24 Dichlorodifluoromethane	85	3.922	3.922	0.000	49	12700	0.3000	0.2621	
26 Chloromethane	50	4.174	4.174	0.000	95	22645	0.3000	0.3847	
27 Vinyl chloride	62	4.299	4.300	-0.001	91	17197	0.3000	0.3045	
29 Bromomethane	94	4.635	4.635	0.000	90	12014	0.3000	0.2912	
31 Chloroethane	64	4.704	4.705	-0.001	98	13199	0.3000	0.3204	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	96	28050	0.3000	0.3053	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	97	22007	0.3000	0.3044	
36 Ethyl ether	59	5.096	5.096	0.000	92	6697	0.3000	0.3145	
39 Acrolein	56	5.221	5.221	0.000	93	7177	3.00	2.83	
40 Acetone	43	5.319	5.319	0.000	98	10363	1.20	1.20	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	92	9123	0.3000	0.2777	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	14103	0.3000	0.3060	
45 Iodomethane	142	5.529	5.529	-0.001	99	20404	0.3000	0.2874	
46 Methyl acetate	43	5.556	5.557	-0.001	96	7849	0.6000	0.7678	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	25817	0.3000	0.3000	
48 Carbon disulfide	76	5.626	5.626	0.000	98	64477	0.3000	0.3138	
49 2-Methyl-2-propanol	59	5.668	5.654	0.014	32	2294	3.00	2.61	
50 Methylene Chloride	84	5.696	5.696	0.000	95	31143	0.3000	0.3098	
51 Acrylonitrile	53	5.836	5.836	0.000	96	15171	3.00	2.97	
52 Methyl tert-butyl ether	73	5.892	5.892	0.000	96	16623	0.3000	0.2941	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	96	15738	0.3000	0.3045	
54 Hexane	57	6.101	6.101	0.000	92	31098	0.3000	0.3577	
55 Vinyl acetate	43	6.171	6.157	0.014	96	20057	0.6000	0.5394	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	95	27015	0.3000	0.3003	
61 2-Butanone (MEK)	43		6.590				ND	ND	U
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	47	7935	9.00	9.62	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	80	15605	0.3000	0.2998	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	90	23044	0.3000	0.3154	
67 Chlorobromomethane	128	6.841	6.841	0.000	90	4486	0.3000	0.2909	
68 Chloroform	83	6.855	6.855	0.000	95	23384	0.3000	0.2976	
69 Tetrahydrofuran	42		6.883				ND	ND	
70 Isobutyl alcohol	41	7.065	7.051	0.014	38	3150	7.50	9.37	
71 1,1,1-Trichloroethane	97	7.093	7.079	0.014	98	22085	0.3000	0.2971	
72 Cyclohexane	56	7.163	7.163	0.000	0	30794	0.3000	0.3082	
73 1,1-Dichloropropene	75	7.190	7.191	-0.001	95	22001	0.3000	0.3028	
74 Carbon tetrachloride	117	7.232	7.232	0.000	95	19824	0.3000	0.3141	
75 1,2-Dichloroethane	62		7.330				ND	ND	
77 Benzene	78	7.358	7.358	0.000	96	60313	0.3000	0.3024	
9 n-Heptane	43	7.456	7.456	0.000	92	29357	0.3000	0.3279	
79 Trichloroethene	95	7.819	7.819	0.000	98	14989	0.3000	0.2974	
80 2-Pentanone	43	7.861	7.847	0.014	97	11194	1.20	1.18	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	94	13937	0.3000	0.3095	
83 Methylcyclohexane	55	8.028	8.029	-0.001	0	25013	0.3000	0.3131	
84 1,4-Dioxane	88		8.056				ND	ND	
85 Dibromomethane	93	8.098	8.098	0.000	93	4425	0.3000	0.2945	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	14210	0.3000	0.2969	
88 2-Chloroethyl vinyl ether	63		8.308				ND	ND	U
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	94	14888	0.3000	0.2756	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	93	12417	1.20	1.02	
91 Toluene	91	8.783	8.769	0.014	98	63938	0.3000	0.3160	
92 Ethyl methacrylate	69	8.852	8.853	-0.001	55	7316	0.3000	0.3183	
93 trans-1,3-Dichloropropene	75	8.866	8.867	0.000	96	10211	0.3000	0.2632	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	86	5807	0.3000	0.2918	
95 2-Hexanone	43	9.146	9.132	0.014	91	8677	1.20	1.12	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	94	10979	0.3000	0.2904	
97 Tetrachloroethene	164	9.202	9.202	0.000	97	11674	0.3000	0.3100	
98 Chlorodibromomethane	129	9.341	9.341	0.000	87	6065	0.3000	0.2697	
100 Ethylene Dibromide	107	9.481	9.467	0.014	94	4705	0.3000	0.2670	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	22399	0.3000	0.3164	
102 Chlorobenzene	112	9.816	9.816	0.000	96	33596	0.3000	0.2972	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	75	9672	0.3000	0.2792	
104 Ethylbenzene	106	9.858	9.858	0.000	98	21609	0.3000	0.2985	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	99	26840	0.3000	0.3080	
106 Styrene	104	10.249	10.249	0.000	81	31302	0.3000	0.2664	
109 o-Xylene	106	10.249	10.249	0.000	91	23539	0.3000	0.2911	
107 Bromoform	173	10.445	10.445	0.000	90	2287	0.3000	0.3123	
108 Isopropylbenzene	105	10.514	10.515	-0.001	96	70873	0.3000	0.3224	
111 Cyclohexanone	55	10.626	10.626	0.000	87	3117	12.0	9.06	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	87	5688	0.3000	0.3028	
113 trans-1,4-Dichloro-2-buten	53	10.738	10.724	0.014	1	1250	0.3000	0.2751	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	81	1383	0.3000	0.2769	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	19038	0.3000	0.3061	
116 Bromobenzene	156	10.822	10.822	0.000	51	10758	0.3000	0.2720	
120 1,3,5-Trimethylbenzene	105	10.933	10.934	-0.001	94	56122	0.3000	0.3080	
117 2-Chlorotoluene	126	10.947	10.947	0.000	95	13986	0.3000	0.2860	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	14419	0.3000	0.2986	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	54306	0.3000	0.3044	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	55217	0.3000	0.3080	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	14061	0.3000	0.2890	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	62600	0.3000	0.3134	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	96	25231	0.3000	0.2966	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	93	24283	0.3000	0.2993	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	61218	0.3000	0.3078	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	95	19358	0.3000	0.2942	
129 1,2-Dibromo-3-Chloropropan	157		12.707				ND	ND	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	92	12138	0.3000	0.2820	
131 Hexachlorobutadiene	225	13.824	13.825	-0.001	94	10622	0.3000	0.2991	
132 Naphthalene	128	14.006	14.006	0.000	94	14166	0.3000	0.2732	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	91	8644	0.3000	0.2768	
S 140 1,2-Dichloroethene, Total	96				0		0.6000	0.6043	
S 134 Trihalomethanes, Total	1				0		1.20	1.18	
S 139 Xylenes, Total (URS)	1				0		0.6000	0.5992	
S 138 Xylenes, Total	106				0		0.6000	0.5992	
S 136 1,2-Dichloroethene, Total	1				0		0.6000	0.6043	
S 135 1,3-Dichloropropene, Total	1				0		0.6000	0.5388	
S 137 Total BTEX	1				0			1.52	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	0.15	Units: uL
MV-2cleve+AVA_00037	Amount Added:	0.15	Units: uL
MV-Gas/Ket A_00076	Amount Added:	0.15	Units: uL

Report Date: 02-Aug-2018 13:04:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D

Injection Date: 02-Aug-2018 08:53:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

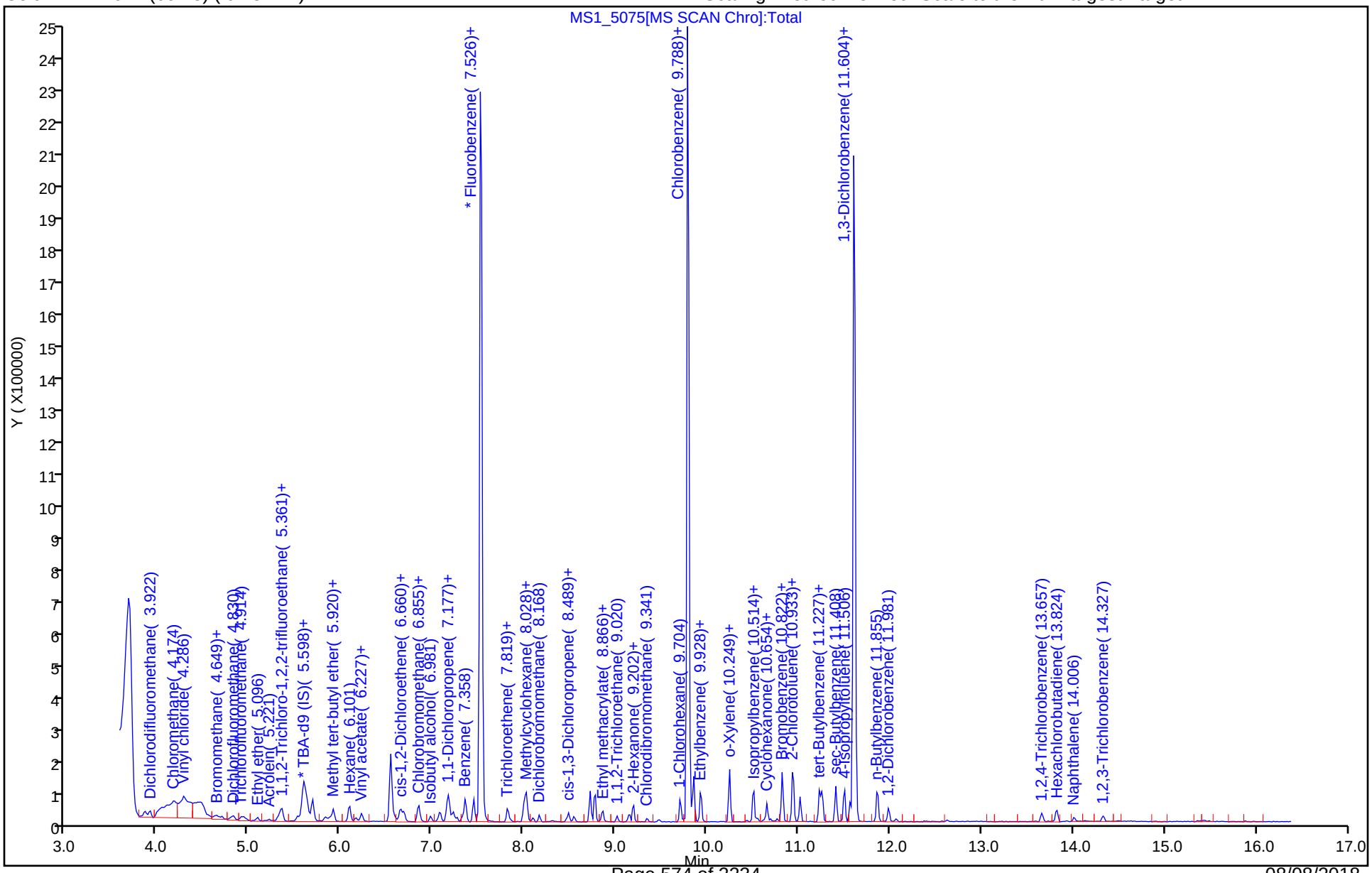
Lims ID: std003 Worklist Smp#: 12

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 12

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



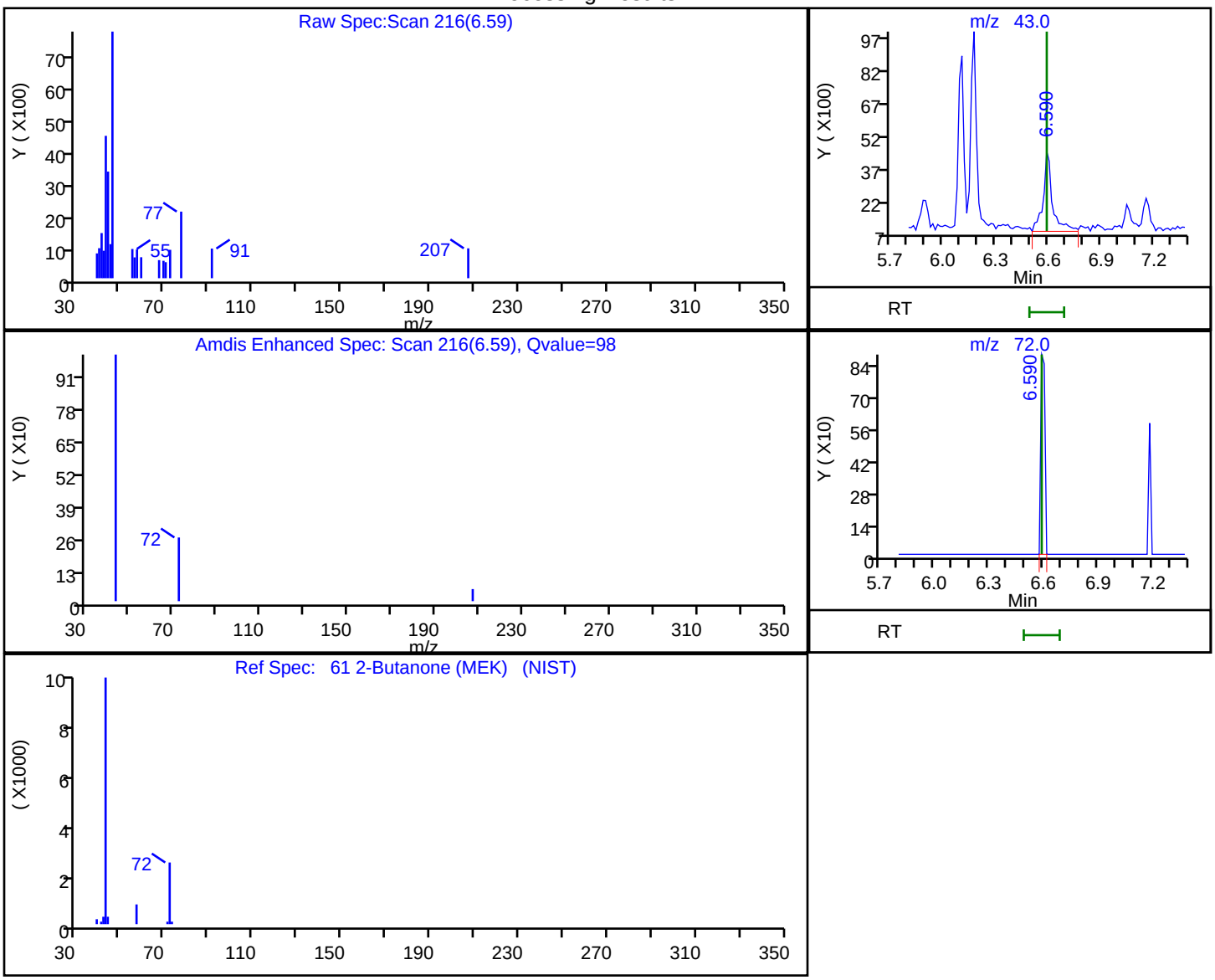
User Disabled Compound Report

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D				
Injection Date:	02-Aug-2018 08:53:30	Instrument ID:	VMS_MS1		
Lims ID:	std003				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	12	Worklist Smp#:	12
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Processing Results



RT	Mass	Response	Amount
6.59	43.00	13677	1.212010
6.59	72.00	1454	

Reviewer: wickhamt, 02-Aug-2018 11:48:39

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

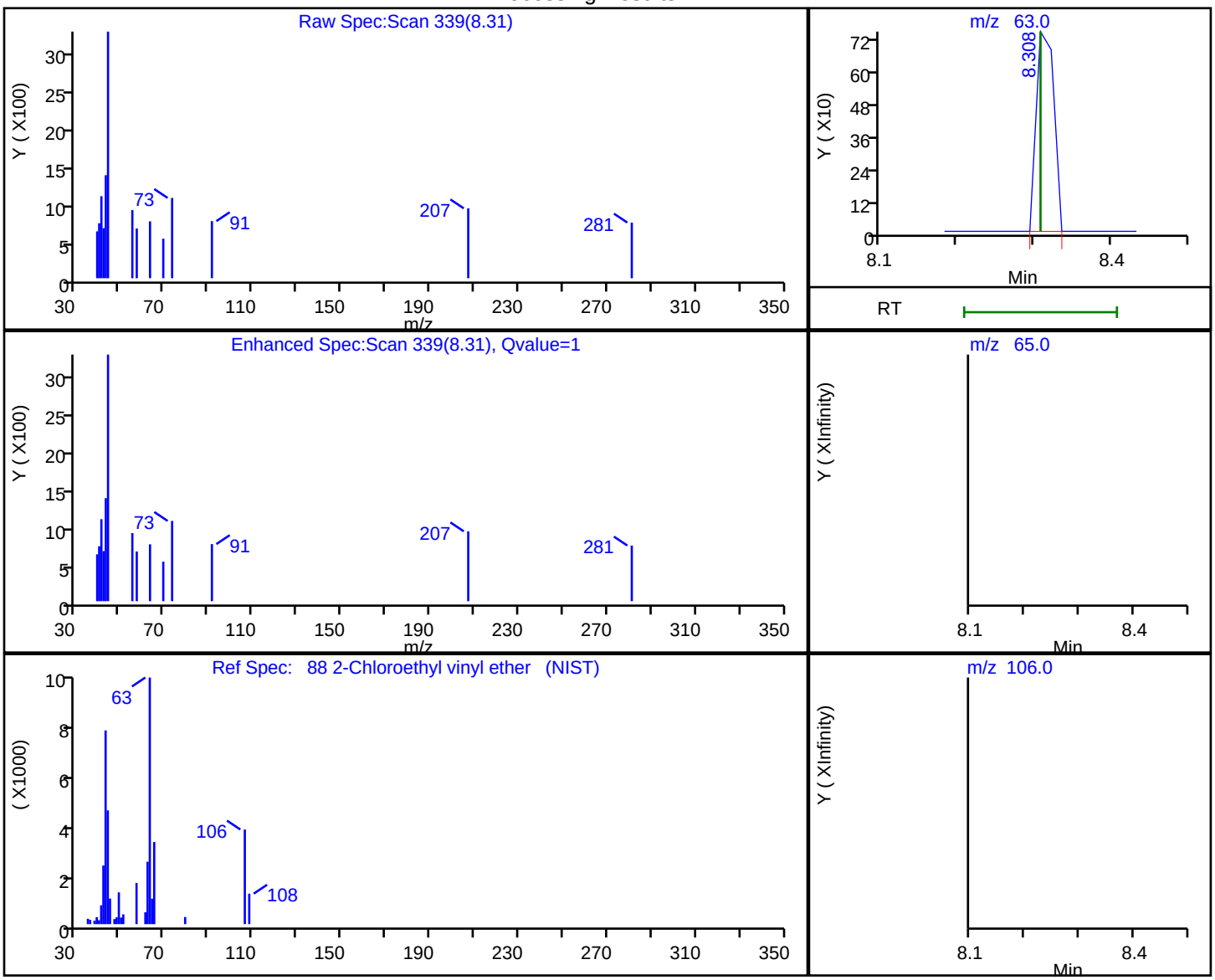
User Disabled Compound Report

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D				
Injection Date:	02-Aug-2018 08:53:30	Instrument ID:	VMS_MS1		
Lims ID:	std003				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	12	Worklist Smp#:	12
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

88 2-Chloroethyl vinyl ether, CAS: 110-75-8

Processing Results



RT	Mass	Response	Amount
8.31	63.00	1191	0.305634
8.31	65.00	0	
8.31	106.00	0	

Reviewer: wickhamt, 02-Aug-2018 11:34:32

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5076.D
Lims ID: std01
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 02-Aug-2018 09:13:30 ALS Bottle#: 13 Worklist Smp#: 13
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std01
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:51 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:36:29

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	84	179047	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2160770	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	432947	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	593551	12.5	12.5	
24 Dichlorodifluoromethane	85	3.909	3.922	-0.013	99	44046	1.00	0.8998	
26 Chloromethane	50	4.160	4.174	-0.014	98	55899	1.00	0.9398	
27 Vinyl chloride	62	4.286	4.300	-0.014	94	55674	1.00	0.9755	
29 Bromomethane	94	4.635	4.635	0.000	91	40617	1.00	0.9743	
31 Chloroethane	64	4.691	4.705	-0.014	99	41063	1.00	0.9865	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	88299	1.00	0.9513	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	70561	1.00	0.9659	
36 Ethyl ether	59	5.082	5.096	-0.014	93	20792	1.00	0.9663	
39 Acrolein	56	5.221	5.221	0.000	99	25428	10.0	9.91	
40 Acetone	43	5.319	5.319	0.000	99	19102	4.00	3.77	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	97	32680	1.00	0.9845	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	98	46581	1.00	1.00	
45 Iodomethane	142	5.529	5.529	0.000	99	69836	1.00	0.9737	
46 Methyl acetate	43	5.543	5.557	-0.014	95	21852	2.00	2.12	
47 3-Chloro-1-propene	41	5.599	5.612	-0.013	88	89729	1.00	1.03	
48 Carbon disulfide	76	5.626	5.626	0.000	99	207465	1.00	1.00	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	91	8512	10.0	9.76	
50 Methylene Chloride	84	5.696	5.696	0.000	94	55320	1.00	0.8916	
51 Acrylonitrile	53	5.836	5.836	0.000	98	51204	10.0	9.92	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	96	57090	1.00	1.00	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	53301	1.00	1.02	
54 Hexane	57	6.087	6.101	-0.014	93	85907	1.00	0.9735	
55 Vinyl acetate	43	6.157	6.157	0.000	97	73369	2.00	1.95	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	90139	1.00	0.99	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	28429	4.00	5.12	
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	25321	30.0	30.9	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	82	52624	1.00	1.00	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	88	73905	1.00	1.00	
67 Chlorobromomethane	128	6.842	6.841	0.001	93	15128	1.00	0.9708	
68 Chloroform	83	6.856	6.855	0.001	94	78819	1.00	0.99	
69 Tetrahydrofuran	42	6.883	6.883	0.000	88	11644	2.00	1.93	
70 Isobutyl alcohol	41	7.051	7.051	0.000	92	8413	25.0	25.2	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	74070	1.00	0.9861	
72 Cyclohexane	56	7.163	7.163	0.000	0	103890	1.00	1.03	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	97	72878	1.00	0.99	
74 Carbon tetrachloride	117	7.233	7.232	0.001	98	61167	1.00	0.9593	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	39492	1.00	1.01	
77 Benzene	78	7.358	7.358	0.000	96	204816	1.00	1.02	
9 n-Heptane	43	7.456	7.456	0.000	91	91370	1.00	1.01	
79 Trichloroethene	95	7.819	7.819	0.000	98	49445	1.00	0.9709	
80 2-Pentanone	43	7.847	7.847	0.000	98	35223	4.00	3.66	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	95	45696	1.00	1.00	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	82622	1.00	1.02	
84 1,4-Dioxane	88	8.057	8.056	0.001	81	2195	20.0	17.2	
85 Dibromomethane	93	8.099	8.098	0.000	94	14906	1.00	0.9818	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	46734	1.00	0.9665	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	86	5179	1.00	1.24	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	53734	1.00	0.9798	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	95	47145	4.00	3.84	
91 Toluene	91	8.769	8.769	0.000	98	206925	1.00	1.01	
92 Ethyl methacrylate	69	8.853	8.853	0.000	90	22096	1.00	0.9471	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	36456	1.00	0.9301	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	90	19857	1.00	0.9877	
95 2-Hexanone	43	9.132	9.132	0.000	95	29170	4.00	3.72	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	95	38720	1.00	1.01	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	37682	1.00	0.9858	
98 Chlorodibromomethane	129	9.342	9.341	0.001	90	21508	1.00	0.9423	
100 Ethylene Dibromide	107	9.467	9.467	0.000	97	17928	1.00	1.00	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	72202	1.00	1.00	
102 Chlorobenzene	112	9.816	9.816	0.000	97	116700	1.00	1.02	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	87	33337	1.00	0.9479	
104 Ethylbenzene	106	9.858	9.858	0.000	99	72676	1.00	0.9892	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	89330	1.00	1.01	
109 o-Xylene	106	10.249	10.249	0.000	90	81889	1.00	1.00	
106 Styrene	104	10.249	10.249	0.000	84	112539	1.00	0.9437	
107 Bromoform	173	10.445	10.445	0.000	95	8574	1.00	0.8997	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	231347	1.00	1.03	
111 Cyclohexanone	55	10.626	10.626	0.000	92	12290	40.0	35.2	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	91	18410	1.00	0.9586	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	71	4483	1.00	0.9650	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	83	5241	1.00	1.03	
116 Bromobenzene	156	10.822	10.822	0.000	52	40116	1.00	0.99	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	62827	1.00	0.9880	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	187654	1.00	1.01	
117 2-Chlorotoluene	126	10.948	10.947	0.001	96	49057	1.00	0.9812	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	49802	1.00	1.01	
119 tert-Butylbenzene	119	11.227	11.227	0.000	94	184528	1.00	1.01	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	97	186475	1.00	1.02	
122 sec-Butylbenzene	134	11.409	11.408	0.000	95	50686	1.00	1.02	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	208331	1.00	1.02	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	87445	1.00	1.01	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	84516	1.00	1.02	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	211017	1.00	1.04	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	67437	1.00	1.00	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	76	1673	1.00	0.9778	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	43662	1.00	0.99	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	36541	1.00	1.01	
132 Naphthalene	128	14.020	14.006	0.014	97	52226	1.00	0.9851	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	32321	1.00	1.01	
S 140 1,2-Dichloroethene, Total	96				0		2.00	2.02	
S 135 1,3-Dichloropropene, Total	1				0		2.00	1.91	
S 137 Total BTEX	1				0			5.03	
S 136 1,2-Dichloroethene, Total	1				0		2.00	2.02	
S 134 Trihalomethanes, Total	1				0		4.00	3.80	
S 139 Xylenes, Total (URS)	1				0		2.00	2.01	
S 138 Xylenes, Total	106				0		2.00	2.01	

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	0.50	Units: uL
MV-2cleve+AVA_00037	Amount Added:	0.50	Units: uL
MV-Gas/Ket A_00076	Amount Added:	0.50	Units: uL

Report Date: 02-Aug-2018 13:04:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5076.D

Injection Date: 02-Aug-2018 09:13:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

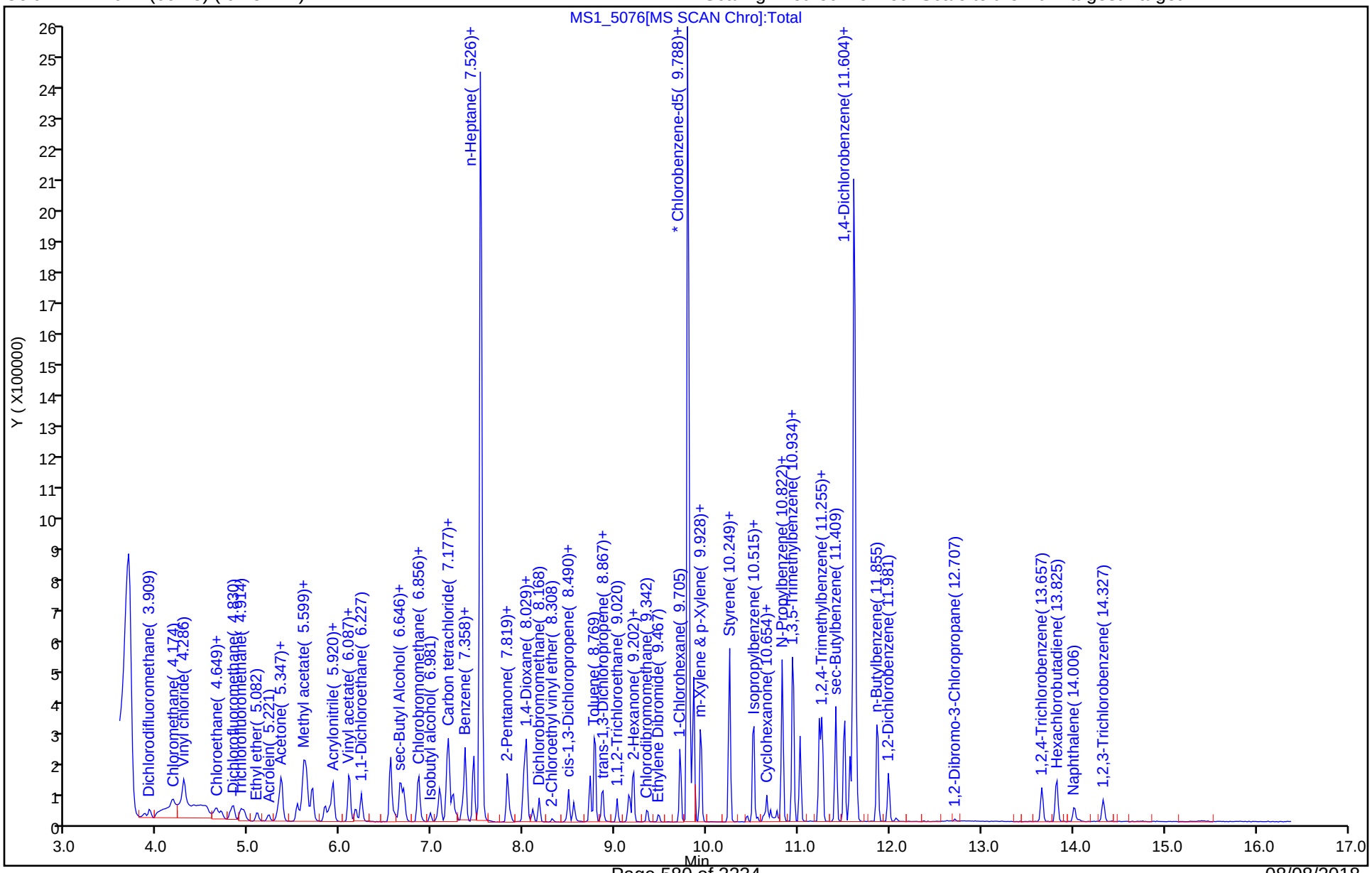
Lims ID: std01 Worklist Smp#: 13

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 13

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5077.D
Lims ID: std02
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 02-Aug-2018 09:33:30 ALS Bottle#: 14 Worklist Smp#: 14
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std02
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:54 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:37:25

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	85	175228	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2129666	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	431963	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	586383	12.5	12.5	
24 Dichlorodifluoromethane	85	3.909	3.922	-0.013	100	77457	2.00	1.61	
26 Chloromethane	50	4.160	4.174	-0.014	99	113002	2.00	1.93	
27 Vinyl chloride	62	4.286	4.300	-0.014	92	115053	2.00	2.05	
29 Bromomethane	94	4.635	4.635	0.000	89	82533	2.00	2.01	
31 Chloroethane	64	4.691	4.705	-0.014	100	82454	2.00	2.01	
32 Dichlorofluoromethane	67	4.816	4.830	-0.014	98	193349	2.00	2.11	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	100	144994	2.00	2.01	
36 Ethyl ether	59	5.082	5.096	-0.014	93	42022	2.00	1.98	
39 Acrolein	56	5.207	5.221	-0.014	99	54542	20.0	21.6	
40 Acetone	43	5.305	5.319	-0.014	100	35136	8.00	8.69	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	96	67004	2.00	2.05	
43 1,1-Dichloroethene	96	5.347	5.361	-0.014	97	94056	2.00	2.05	
45 Iodomethane	142	5.529	5.529	0.000	99	141353	2.00	2.00	
46 Methyl acetate	43	5.543	5.557	-0.014	95	39913	4.00	3.92	
47 3-Chloro-1-propene	41	5.598	5.612	-0.014	88	175913	2.00	2.05	
48 Carbon disulfide	76	5.626	5.626	0.000	99	422013	2.00	2.06	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	17233	20.0	20.2	
50 Methylene Chloride	84	5.696	5.696	0.000	95	97146	2.00	1.95	
51 Acrylonitrile	53	5.822	5.836	-0.014	99	104191	20.0	20.5	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	96	112364	2.00	2.00	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	103588	2.00	2.01	
54 Hexane	57	6.087	6.101	-0.014	93	183126	2.00	2.08	
55 Vinyl acetate	43	6.157	6.157	0.000	97	148146	4.00	4.00	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	183375	2.00	2.05	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	41493	8.00	7.59	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	95	43455	60.0	54.2	
64 cis-1,2-Dichloroethene	96	6.646	6.660	-0.014	83	106162	2.00	2.05	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	146736	2.00	2.02	
67 Chlorobromomethane	128	6.841	6.841	0.000	96	30721	2.00	2.00	
68 Chloroform	83	6.855	6.855	0.000	95	159333	2.00	2.04	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	19913	4.00	4.23	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	15048	50.0	46.1	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	99	152331	2.00	2.06	
72 Cyclohexane	56	7.163	7.163	0.000	0	212024	2.00	2.13	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	98	149854	2.00	2.07	
74 Carbon tetrachloride	117	7.233	7.232	0.001	98	128677	2.00	2.05	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	78066	2.00	2.03	
77 Benzene	78	7.358	7.358	0.000	96	416772	2.00	2.10	
9 n-Heptane	43	7.456	7.456	0.000	92	188925	2.00	2.12	
79 Trichloroethene	95	7.819	7.819	0.000	98	103252	2.00	2.06	
80 2-Pentanone	43	7.847	7.847	0.000	99	75914	8.00	8.00	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	90254	2.00	2.01	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	167587	2.00	2.11	
84 1,4-Dioxane	88	8.057	8.056	0.001	89	4025	40.0	32.0	
85 Dibromomethane	93	8.098	8.098	0.000	95	30446	2.00	2.03	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	95902	2.00	2.01	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	88	11144	2.00	2.01	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	109008	2.00	1.99	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	95	97429	8.00	8.04	
91 Toluene	91	8.769	8.769	0.000	98	424249	2.00	2.11	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	43949	2.00	1.89	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	98	76214	2.00	1.97	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	41015	2.00	2.07	
95 2-Hexanone	43	9.132	9.132	0.000	97	60268	8.00	7.70	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	94	78479	2.00	2.05	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	77313	2.00	2.03	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	44546	2.00	1.96	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	36459	2.00	2.04	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	147755	2.00	2.06	
102 Chlorobenzene	112	9.816	9.816	0.000	96	236578	2.00	2.07	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	91	68003	2.00	1.94	
104 Ethylbenzene	106	9.858	9.858	0.000	98	149473	2.00	2.04	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	178662	2.00	2.02	
106 Styrene	104	10.249	10.249	0.000	85	238015	2.00	2.00	
109 o-Xylene	106	10.249	10.249	0.000	89	164944	2.00	2.01	
107 Bromoform	173	10.445	10.445	0.000	94	18925	2.00	1.88	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	467529	2.00	2.11	
111 Cyclohexanone	55	10.626	10.626	0.000	93	26350	80.0	75.6	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	93	39960	2.00	2.11	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	82	9267	2.00	2.02	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	81	10121	2.00	2.01	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	129652	2.00	2.06	
116 Bromobenzene	156	10.822	10.822	0.000	51	81075	2.00	2.03	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	382672	2.00	2.08	
117 2-Chlorotoluene	126	10.948	10.947	0.001	95	101132	2.00	2.05	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	99812	2.00	2.05	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	376895	2.00	2.09	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	384319	2.00	2.12	
122 sec-Butylbenzene	134	11.408	11.408	0.000	94	102684	2.00	2.09	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	425447	2.00	2.11	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	177625	2.00	2.07	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	96	169505	2.00	2.07	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	432266	2.00	2.15	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	136872	2.00	2.06	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	79	4508	2.00	2.09	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	88397	2.00	2.03	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	74442	2.00	2.08	
132 Naphthalene	128	14.006	14.006	0.000	98	106307	2.00	2.03	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	94	64531	2.00	2.05	
S 140 1,2-Dichloroethene, Total	96				0		4.00	4.06	
S 134 Trihalomethanes, Total	1				0		8.00	7.88	
S 139 Xylenes, Total (URS)	1				0		4.00	4.04	
S 138 Xylenes, Total	106				0		4.00	4.04	
S 136 1,2-Dichloroethene, Total	1				0		4.00	4.06	
S 135 1,3-Dichloropropene, Total	1				0		4.00	3.97	
S 137 Total BTEX	1				0			10.3	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	1.00	Units: uL
MV-2cleve+AVA_00037	Amount Added:	1.00	Units: uL
MV-Gas/Ket A_00076	Amount Added:	1.00	Units: uL

Report Date: 02-Aug-2018 13:04:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5077.D

Injection Date: 02-Aug-2018 09:33:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

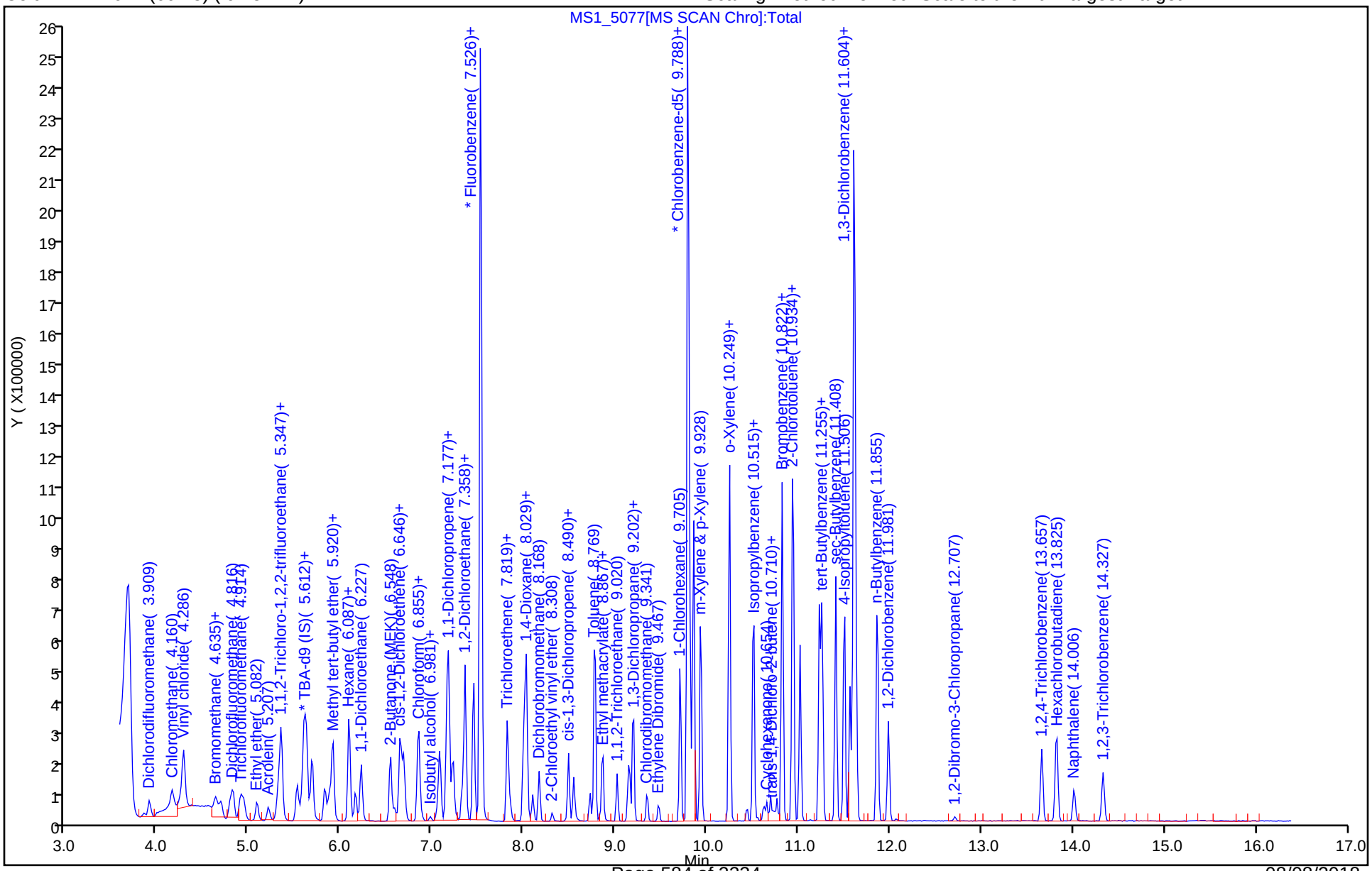
Lims ID: std02 Worklist Smp#: 14

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 14

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

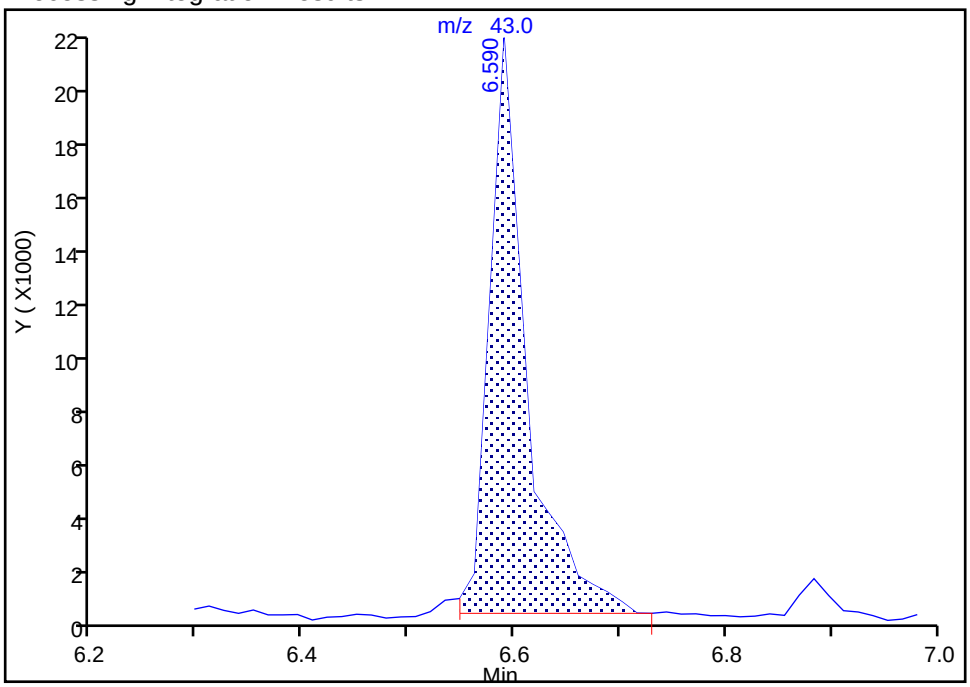
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5077.D				
Injection Date:	02-Aug-2018 09:33:30	Instrument ID:	VMS_MS1		
Lims ID:	std02				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	14	Worklist Smp#:	14
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

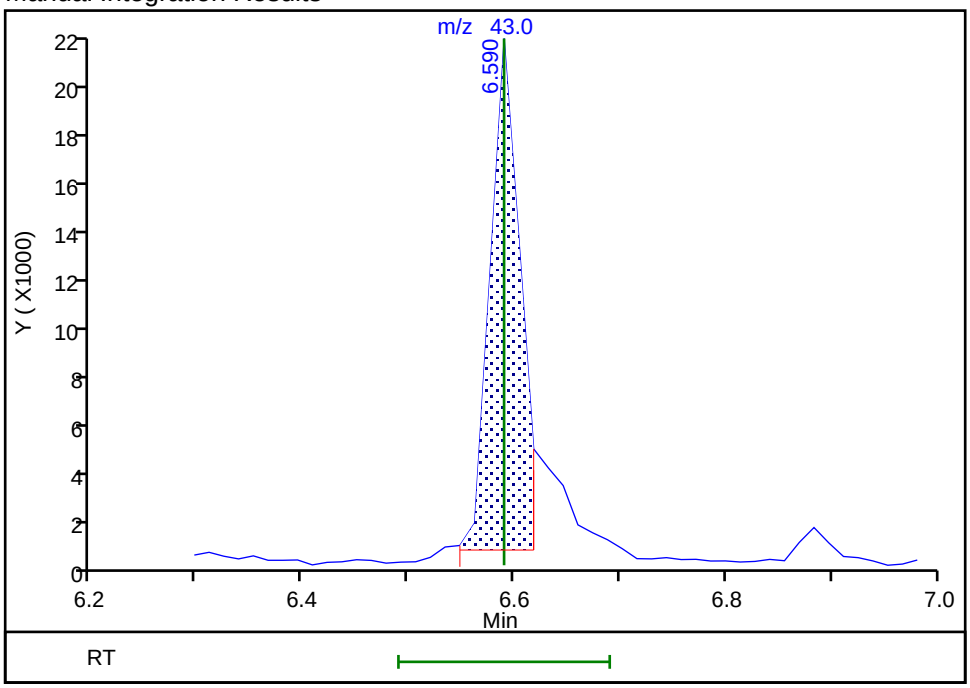
Processing Integration Results

RT: 6.59
Area: 51916
Amount: 8.706078
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 41493
Amount: 7.588832
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:48:12
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5078.D
Lims ID: std05
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 02-Aug-2018 09:53:30 ALS Bottle#: 15 Worklist Smp#: 15
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std05
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:57 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:39:16

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	88	188777	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2122554	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	431963	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	582229	12.5	12.5	
24 Dichlorodifluoromethane	85	3.922	3.922	0.000	100	262015	5.00	5.45	
26 Chloromethane	50	4.160	4.174	-0.014	99	287230	5.00	4.92	
27 Vinyl chloride	62	4.286	4.300	-0.014	92	288301	5.00	5.14	
29 Bromomethane	94	4.635	4.635	0.000	91	212846	5.00	5.20	
31 Chloroethane	64	4.691	4.705	-0.014	100	208499	5.00	5.10	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	460095	5.00	5.05	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	353258	5.00	4.92	
36 Ethyl ether	59	5.096	5.096	0.000	92	109027	5.00	5.16	
39 Acrolein	56	5.221	5.221	0.000	99	128287	50.0	50.9	
40 Acetone	43	5.319	5.319	0.000	100	73297	20.0	20.3	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	97	158047	5.00	4.85	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	223075	5.00	4.88	
45 Iodomethane	142	5.529	5.529	0.000	99	368517	5.00	5.23	
46 Methyl acetate	43	5.543	5.557	-0.014	96	96138	10.0	9.48	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	85	441817	5.00	5.17	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1027781	5.00	5.04	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	47895	50.0	52.1	
50 Methylene Chloride	84	5.696	5.696	0.000	95	229104	5.00	5.23	
51 Acrylonitrile	53	5.836	5.836	0.000	99	261884	50.0	51.7	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	96	289997	5.00	5.17	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	257423	5.00	5.02	
54 Hexane	57	6.087	6.101	-0.014	92	405524	5.00	4.61	
55 Vinyl acetate	43	6.157	6.157	0.000	97	383823	10.0	10.4	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	461484	5.00	5.17	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	100443	20.0	18.4	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	96	123938	150.0	143.5	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	82	263432	5.00	5.10	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	355420	5.00	4.90	
67 Chlorobromomethane	128	6.841	6.841	0.000	96	78637	5.00	5.14	
68 Chloroform	83	6.855	6.855	0.000	95	401244	5.00	5.15	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	42560	10.0	10.5	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	41687	125.0	118.5	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	365896	5.00	4.96	
72 Cyclohexane	56	7.163	7.163	0.000	0	466257	5.00	4.70	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	97	349914	5.00	4.85	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	299384	5.00	4.78	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	194972	5.00	5.10	
77 Benzene	78	7.358	7.358	0.000	96	1015513	5.00	5.13	
9 n-Heptane	43	7.456	7.456	0.000	92	425559	5.00	4.79	
79 Trichloroethene	95	7.819	7.819	0.000	98	250410	5.00	5.01	
80 2-Pentanone	43	7.847	7.847	0.000	99	194363	20.0	20.6	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	97	226060	5.00	5.06	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	374200	5.00	4.72	
84 1,4-Dioxane	88	8.056	8.056	0.000	91	12733	100.0	101.6	
85 Dibromomethane	93	8.098	8.098	0.000	96	77167	5.00	5.17	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	239790	5.00	5.05	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	30251	5.00	4.45	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	283019	5.00	5.17	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	253596	20.0	21.0	
91 Toluene	91	8.769	8.769	0.000	98	1020901	5.00	5.08	
92 Ethyl methacrylate	69	8.853	8.853	0.000	70	117097	5.00	5.03	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	199217	5.00	5.17	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	100846	5.00	5.11	
95 2-Hexanone	43	9.132	9.132	0.000	95	162252	20.0	20.7	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	196436	5.00	5.13	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	176096	5.00	4.62	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	115760	5.00	5.08	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	91506	5.00	5.13	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	326975	5.00	4.56	
102 Chlorobenzene	112	9.816	9.816	0.000	94	571821	5.00	4.99	
103 1,1,1,2-Tetrachloroethane	131	9.858	9.844	0.014	94	175726	5.00	5.01	
104 Ethylbenzene	106	9.858	9.858	0.000	98	356805	5.00	4.87	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	430496	5.00	4.88	
109 o-Xylene	106	10.249	10.249	0.000	89	409924	5.00	5.01	
106 Styrene	104	10.249	10.249	0.000	86	618546	5.00	5.20	
107 Bromoform	173	10.445	10.445	0.000	96	49542	5.00	4.76	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1087749	5.00	4.93	
111 Cyclohexanone	55	10.626	10.626	0.000	92	73302	200.0	210.3	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	94	97663	5.00	5.18	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	86	23057	5.00	5.06	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	26573	5.00	5.30	
116 Bromobenzene	156	10.822	10.822	0.000	53	201811	5.00	5.09	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	296132	5.00	4.75	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	912523	5.00	4.99	
117 2-Chlorotoluene	126	10.947	10.947	0.000	96	244211	5.00	4.98	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	237560	5.00	4.91	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	868638	5.00	4.85	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	893281	5.00	4.97	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	228466	5.00	4.68	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	971889	5.00	4.85	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	427610	5.00	5.01	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	406037	5.00	4.99	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	955019	5.00	4.79	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	335681	5.00	5.09	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	79	11972	5.00	5.05	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	224468	5.00	5.20	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	167192	5.00	4.69	
132 Naphthalene	128	14.006	14.006	0.000	97	276470	5.00	5.32	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	164057	5.00	5.24	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.1	
S 135 1,3-Dichloropropene, Total	1				0		10.0	10.3	
S 137 Total BTEX	1				0			25.0	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.1	
S 134 Trihalomethanes, Total	1				0		20.0	20.0	
S 139 Xylenes, Total (URS)	1				0		10.0	9.89	
S 138 Xylenes, Total	106				0		10.0	9.89	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

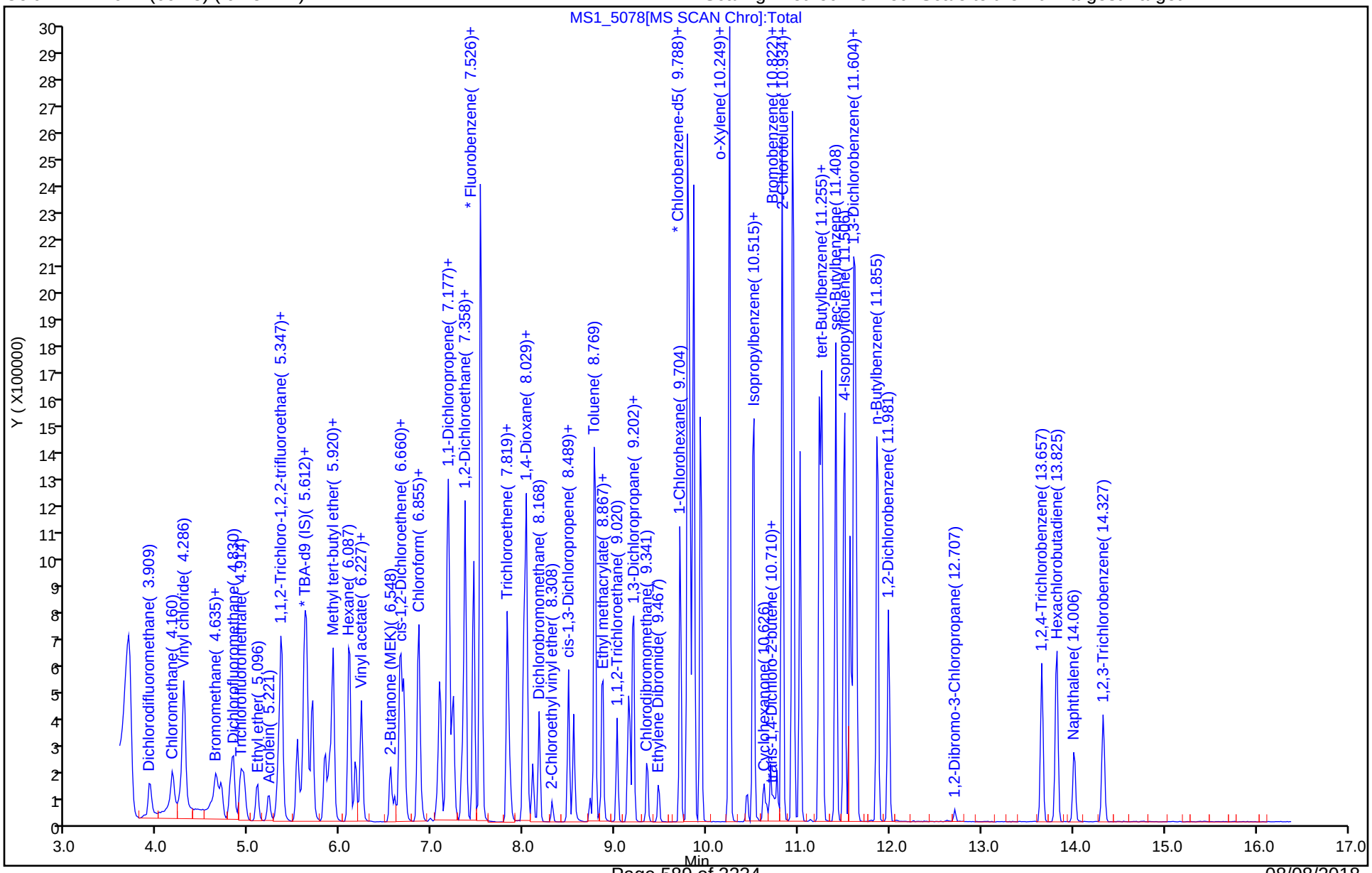
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	2.50	Units: uL
MV-2cleve+AVA_00037	Amount Added:	2.50	Units: uL
MV-Gas/Ket A_00076	Amount Added:	2.50	Units: uL

Report Date: 02-Aug-2018 13:04:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5078.D				
Injection Date:	02-Aug-2018 09:53:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std05			Worklist Smp#:	15
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	15
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

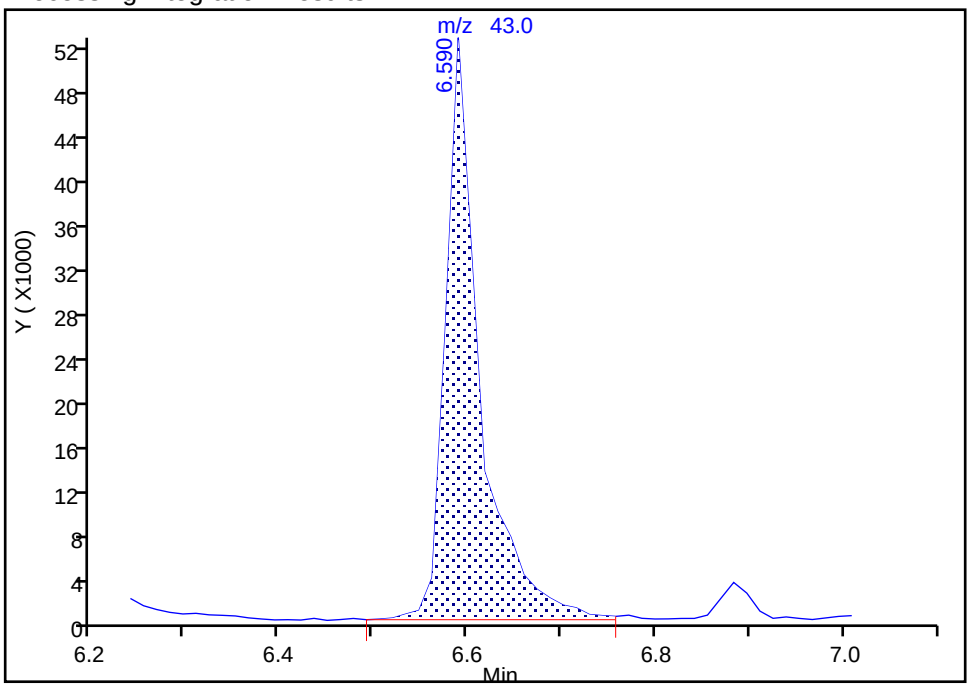
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5078.D				
Injection Date:	02-Aug-2018 09:53:30	Instrument ID:	VMS_MS1		
Lims ID:	std05				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	15	Worklist Smp#:	15
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

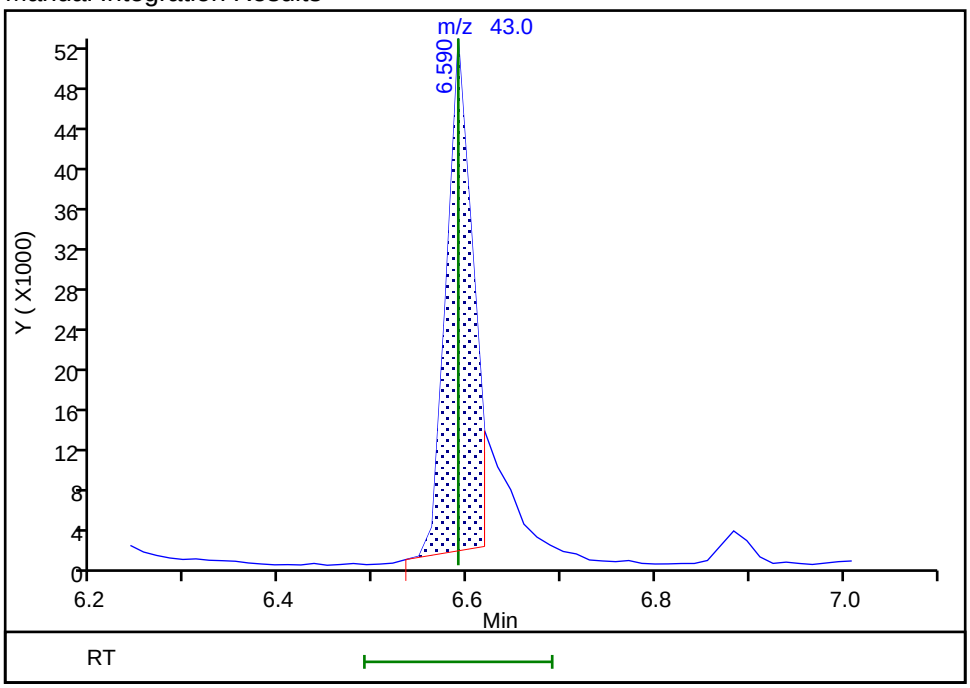
Processing Integration Results

RT: 6.59
Area: 131560
Amount: 23.156389
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 100443
Amount: 18.432002
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:47:46
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5079.D
Lims ID: std10
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 02-Aug-2018 10:14:30 ALS Bottle#: 16 Worklist Smp#: 16
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std10
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:00 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:33:36

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.598	0.000	87	189941	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2189799	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	92	441437	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	606950	12.5	12.5	
24 Dichlorodifluoromethane	85	3.922	3.922	0.000	100	564155	10.0	11.4	
26 Chloromethane	50	4.174	4.174	0.000	99	588713	10.0	9.77	
27 Vinyl chloride	62	4.300	4.300	0.000	97	605543	10.0	10.5	
29 Bromomethane	94	4.635	4.635	0.000	91	432819	10.0	10.2	
31 Chloroethane	64	4.705	4.705	0.000	100	428415	10.0	10.2	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	956401	10.0	10.2	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	762226	10.0	10.3	
36 Ethyl ether	59	5.096	5.096	0.000	92	223449	10.0	10.2	
39 Acrolein	56	5.221	5.221	0.000	100	261551	100.0	100.5	
40 Acetone	43	5.319	5.319	0.000	100	142461	40.0	39.9	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.347	0.000	96	360256	10.0	10.7	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	98	487569	10.0	10.3	
45 Iodomethane	142	5.529	5.529	0.000	99	755810	10.0	10.4	
46 Methyl acetate	43	5.557	5.557	0.000	97	198097	20.0	18.9	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	87	909580	10.0	10.3	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2185345	10.0	10.4	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	93	95029	100.0	102.7	
50 Methylene Chloride	84	5.696	5.696	0.000	94	453852	10.0	10.5	
51 Acrylonitrile	53	5.836	5.836	0.000	99	534223	100.0	102.1	
52 Methyl tert-butyl ether	73	5.892	5.892	0.000	96	586404	10.0	10.1	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	539385	10.0	10.2	
54 Hexane	57	6.101	6.101	0.000	91	933281	10.0	10.4	
55 Vinyl acetate	43	6.157	6.157	0.000	97	807364	20.0	21.2	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	955292	10.0	10.4	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	208155	40.0	37.0	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	94	260819	300.0	300.2	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	82	541403	10.0	10.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	91	761324	10.0	10.2	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	161964	10.0	10.3	
68 Chloroform	83	6.855	6.855	0.000	95	827738	10.0	10.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	90	79975	20.0	20.0	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	83466	250.0	235.9	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	792643	10.0	10.4	
72 Cyclohexane	56	7.163	7.163	0.000	0	1073292	10.0	10.5	
73 1,1-Dichloropropene	75	7.191	7.191	0.000	98	774076	10.0	10.4	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	665835	10.0	10.3	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	400706	10.0	10.2	
77 Benzene	78	7.358	7.358	0.000	96	2105308	10.0	10.3	
9 n-Heptane	43	7.456	7.456	0.000	92	951643	10.0	10.4	
79 Trichloroethene	95	7.819	7.819	0.000	98	534671	10.0	10.4	
80 2-Pentanone	43	7.847	7.847	0.000	99	407613	40.0	41.8	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	97	468579	10.0	10.2	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	852769	10.0	10.4	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	29075	200.0	224.9	
85 Dibromomethane	93	8.098	8.098	0.000	95	155855	10.0	10.1	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	502920	10.0	10.3	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	65666	10.0	8.71	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	584896	10.0	10.5	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	528863	40.0	42.5	
91 Toluene	91	8.769	8.769	0.000	98	2119622	10.0	10.2	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	243658	10.0	10.2	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	421536	10.0	10.6	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	207294	10.0	10.2	
95 2-Hexanone	43	9.132	9.132	0.000	96	341167	40.0	42.7	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	397780	10.0	10.2	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	407265	10.0	10.4	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	242209	10.0	10.4	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	190306	10.0	10.4	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	767322	10.0	10.5	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1198370	10.0	10.2	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	371334	10.0	10.4	
104 Ethylbenzene	106	9.858	9.858	0.000	98	769867	10.0	10.3	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	925395	10.0	10.3	
106 Styrene	104	10.249	10.249	0.000	86	1301023	10.0	10.7	
109 o-Xylene	106	10.249	10.249	0.000	89	867725	10.0	10.4	
107 Bromoform	173	10.445	10.445	0.000	98	109895	10.0	10.2	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	2382186	10.0	10.4	
111 Cyclohexanone	55	10.626	10.626	0.000	92	153088	400.0	429.9	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	200198	10.0	10.2	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	93	48429	10.0	10.2	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	86	53523	10.0	10.2	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	668508	10.0	10.3	
116 Bromobenzene	156	10.822	10.822	0.000	97	424825	10.0	10.3	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1966980	10.0	10.3	
117 2-Chlorotoluene	126	10.947	10.947	0.000	96	527365	10.0	10.3	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	512020	10.0	10.1	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	1936218	10.0	10.4	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1915213	10.0	10.2	
122 sec-Butylbenzene	134	11.408	11.408	0.000	94	527982	10.0	10.4	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	2175391	10.0	10.4	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	911595	10.0	10.2	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	861432	10.0	10.2	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2172024	10.0	10.4	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	703378	10.0	10.2	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	81	25148	10.0	9.83	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	463813	10.0	10.3	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	381635	10.0	10.3	
132 Naphthalene	128	14.006	14.006	0.000	97	572176	10.0	10.6	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	340129	10.0	10.4	
S 140 1,2-Dichloroethene, Total	96				0		20.0	20.4	
S 134 Trihalomethanes, Total	1				0		40.0	41.2	
S 139 Xylenes, Total (URS)	1				0		20.0	20.6	
S 138 Xylenes, Total	106				0		20.0	20.6	
S 136 1,2-Dichloroethene, Total	1				0		20.0	20.4	
S 135 1,3-Dichloropropene, Total	1				0		20.0	21.1	
S 137 Total BTEX	1				0			51.4	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	5.00	Units: uL
MV-2cleve+AVA_00037	Amount Added:	5.00	Units: uL
MV-Gas/Ket A_00076	Amount Added:	5.00	Units: uL

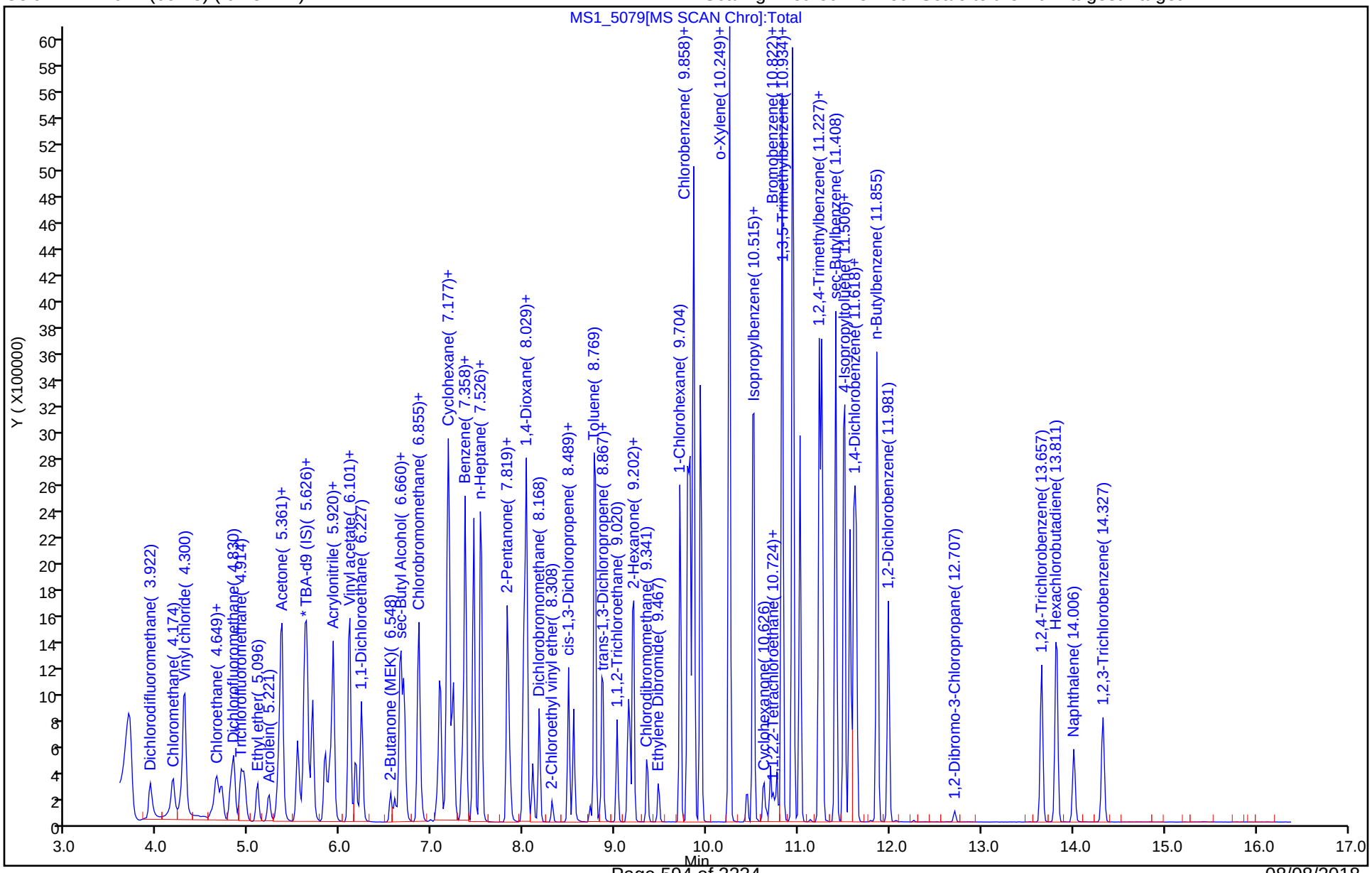
Report Date: 02-Aug-2018 13:05:01 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5079.D

Injection Date:	02-Aug-2018 10:14:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std10			Worklist Smp#:	16
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	16
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

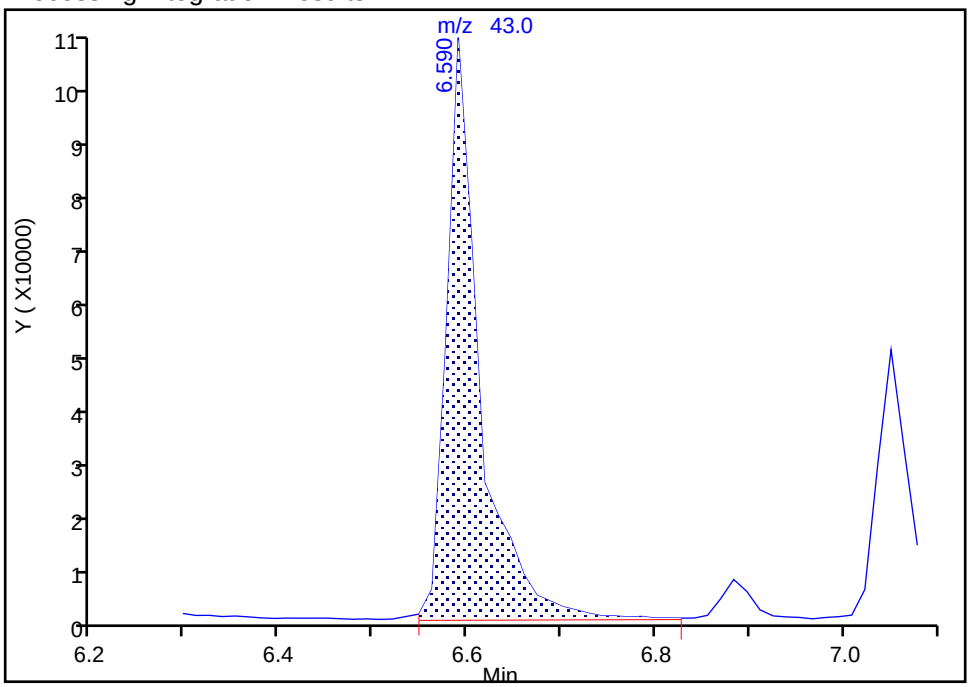
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5079.D				
Injection Date:	02-Aug-2018 10:14:30	Instrument ID:	VMS_MS1		
Lims ID:	std10				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	16	Worklist Smp#:	16
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

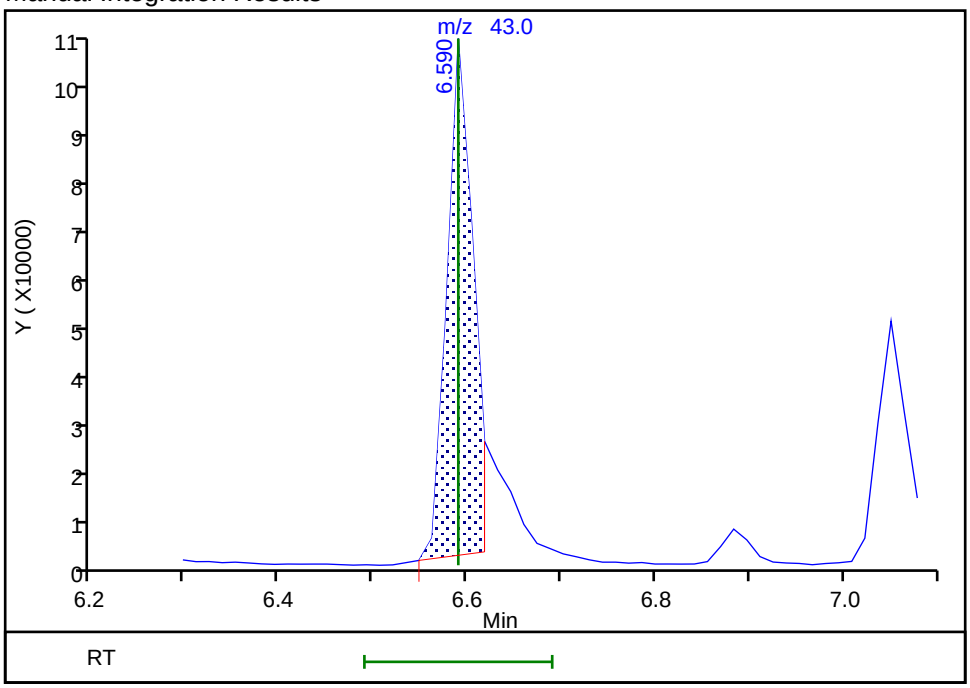
Processing Integration Results

RT: 6.59
Area: 268882
Amount: 44.826127
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 208155
Amount: 37.024924
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:47:00
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5080.D
Lims ID: std30
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 02-Aug-2018 10:34:30 ALS Bottle#: 17 Worklist Smp#: 17
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std30
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:03 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:40:43

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	90	184853	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2162852	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	91	438061	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	97	614964	12.5	12.5	
24 Dichlorodifluoromethane	85	3.923	3.922	0.000	100	1607609	30.0	32.8	
26 Chloromethane	50	4.160	4.174	-0.014	99	1649433	30.0	27.7	
27 Vinyl chloride	62	4.286	4.300	-0.014	98	1663573	30.0	29.1	
29 Bromomethane	94	4.635	4.635	0.000	90	1263233	30.0	30.3	
31 Chloroethane	64	4.691	4.705	-0.014	100	1215873	30.0	29.2	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	2702237	30.0	29.1	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	2181784	30.0	29.8	
36 Ethyl ether	59	5.096	5.096	0.000	91	589044	30.0	27.3	
39 Acrolein	56	5.207	5.221	-0.014	100	754395	300.0	293.6	
40 Acetone	43	5.319	5.319	0.000	100	401189	120.0	117.3	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.347	0.000	96	943667	30.0	28.4	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	1279482	30.0	27.5	
45 Iodomethane	142	5.529	5.529	0.000	99	2016771	30.0	28.1	
46 Methyl acetate	43	5.543	5.557	-0.014	97	526019	60.0	50.9	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	88	2361056	30.0	27.1	
48 Carbon disulfide	76	5.626	5.626	0.000	99	5666306	30.0	27.3	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	262033	300.0	291.1	
50 Methylene Chloride	84	5.696	5.696	0.000	94	1184219	30.0	28.4	
51 Acrylonitrile	53	5.822	5.836	-0.014	99	1427463	300.0	276.3	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	95	1594990	30.0	27.9	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	1426670	30.0	27.3	
54 Hexane	57	6.101	6.101	0.000	90	2356635	30.0	26.4	
55 Vinyl acetate	43	6.157	6.157	0.000	97	2254728	60.0	60.0	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	2485350	30.0	27.3	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	640657	120.0	115.4	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	97	736148	900.0	870.7	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	81	1443283	30.0	27.4	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	91	2035165	30.0	27.5	
67 Chlorobromomethane	128	6.841	6.841	0.000	93	437412	30.0	28.0	
68 Chloroform	83	6.855	6.855	0.000	95	2186138	30.0	27.5	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	207066	60.0	54.4	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	232449	750.0	675.0	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	2094001	30.0	27.9	
72 Cyclohexane	56	7.163	7.163	0.000	0	2754325	30.0	27.3	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	98	2035350	30.0	27.7	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	1782446	30.0	27.9	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	1069725	30.0	27.4	
77 Benzene	78	7.358	7.358	0.000	97	5467947	30.0	27.1	
9 n-Heptane	43	7.456	7.456	0.000	91	2421389	30.0	26.7	
79 Trichloroethene	95	7.819	7.819	0.000	99	1414865	30.0	27.8	
80 2-Pentanone	43	7.847	7.847	0.000	99	1107233	120.0	114.9	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	98	1246070	30.0	27.4	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	2204443	30.0	27.3	
84 1,4-Dioxane	88	8.057	8.056	0.000	91	78499	600.0	614.8	
85 Dibromomethane	93	8.098	8.098	0.000	96	420276	30.0	27.7	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	1365855	30.0	28.2	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	219639	30.0	28.1	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	97	1595241	30.0	28.7	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	1528689	120.0	124.3	
91 Toluene	91	8.769	8.769	0.000	99	5524520	30.0	27.0	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	665198	30.0	28.2	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	1162612	30.0	29.6	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	559577	30.0	27.8	
95 2-Hexanone	43	9.132	9.132	0.000	96	984750	120.0	124.1	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	95	1080009	30.0	27.8	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	1088504	30.0	28.1	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	687122	30.0	29.8	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	514796	30.0	28.4	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	2031866	30.0	27.9	
102 Chlorobenzene	112	9.816	9.816	0.000	94	3231093	30.0	27.8	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	1049644	30.0	29.5	
104 Ethylbenzene	106	9.858	9.858	0.000	98	2124084	30.0	28.6	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	2508264	30.0	28.0	
109 o-Xylene	106	10.249	10.249	0.000	88	2392581	30.0	28.8	
106 Styrene	104	10.249	10.249	0.000	87	3619275	30.0	30.0	
107 Bromoform	173	10.445	10.445	0.000	98	319845	30.0	29.8	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	6327757	30.0	27.2	
111 Cyclohexanone	55	10.612	10.626	-0.014	94	476407	1200.0	1348.0	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	544180	30.0	27.3	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	96	140039	30.0	29.1	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	86	146713	30.0	27.7	
116 Bromobenzene	156	10.822	10.822	0.000	97	1191870	30.0	28.5	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	1850570	30.0	28.1	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	95	5423026	30.0	28.1	
117 2-Chlorotoluene	126	10.948	10.947	0.001	96	1477889	30.0	28.5	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	1440429	30.0	28.2	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	5273697	30.0	27.9	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	5229068	30.0	27.5	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	1475759	30.0	28.6	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	5894557	30.0	27.9	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	2518936	30.0	28.0	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	2383941	30.0	27.7	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	5887503	30.0	27.9	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	1941765	30.0	27.9	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	82	73435	30.0	27.7	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	1303964	30.0	28.6	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	1091279	30.0	29.0	
132 Naphthalene	128	14.006	14.006	0.000	97	1570155	30.0	28.6	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	943710	30.0	28.5	
S 140 1,2-Dichloroethene, Total	96				0		60.0	54.7	
S 135 1,3-Dichloropropene, Total	1				0		60.0	58.4	
S 137 Total BTEX	1				0			139.5	
S 136 1,2-Dichloroethene, Total	1				0		60.0	54.7	
S 134 Trihalomethanes, Total	1				0		120.0	115.3	
S 139 Xylenes, Total (URS)	1				0		60.0	56.8	
S 138 Xylenes, Total	106				0		60.0	56.8	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-Main A_00037	Amount Added: 15.00	Units: uL
MV-2cleve+AVA_00037	Amount Added: 15.00	Units: uL
MV-Gas/Ket A_00076	Amount Added: 15.00	Units: uL

Report Date: 02-Aug-2018 13:05:04 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5080.D

Injection Date: 02-Aug-2018 10:34:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

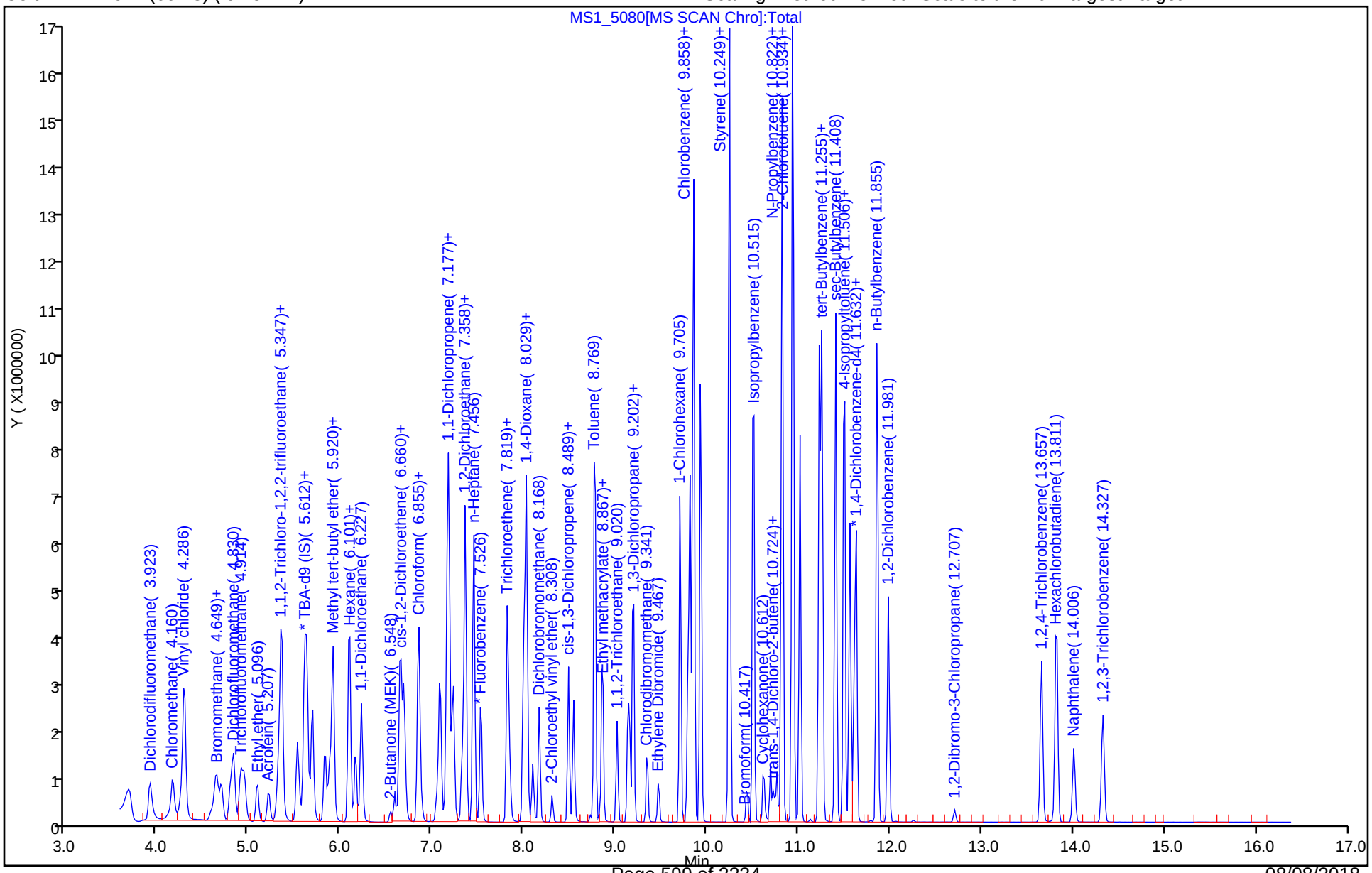
Lims ID: std30 Worklist Smp#: 17

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 17

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver

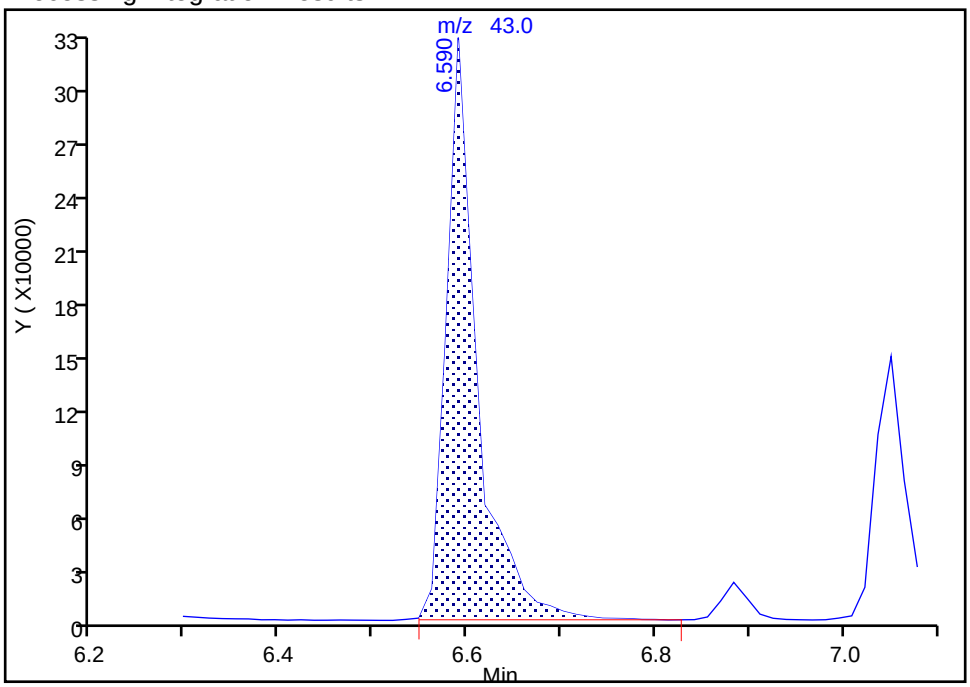
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5080.D				
Injection Date:	02-Aug-2018 10:34:30	Instrument ID:	VMS_MS1		
Lims ID:	std30				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	17	Worklist Smp#:	17
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

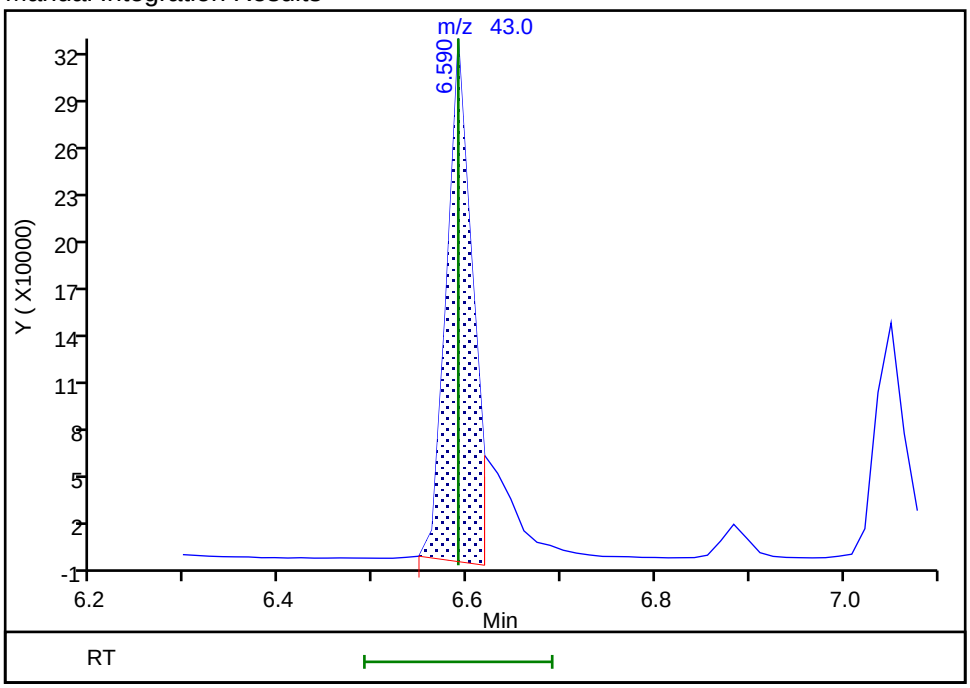
Processing Integration Results

RT: 6.59
Area: 745302
Amount: 124.1607
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 640657
Amount: 115.3746
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:46:19
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D
Lims ID: std60
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 02-Aug-2018 10:54:30 ALS Bottle#: 18 Worklist Smp#: 18
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std60
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:05 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:43:48

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	86	191906	250.0	250.0	a
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2198213	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	449059	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.618	11.604	0.014	96	628762	12.5	12.5	
24 Dichlorodifluoromethane	85	3.923	3.922	0.001	100	3295611	60.0	66.2	
26 Chloromethane	50	4.160	4.174	-0.014	99	3378862	60.0	55.8	
27 Vinyl chloride	62	4.286	4.300	-0.014	98	3276951	60.0	56.4	
29 Bromomethane	94	4.635	4.635	0.000	90	2487024	60.0	58.6	
31 Chloroethane	64	4.691	4.705	-0.014	100	2368826	60.0	55.9	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	5543482	60.0	58.7	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	4476447	60.0	60.2	
36 Ethyl ether	59	5.096	5.096	0.000	91	1348510	60.0	61.6	
39 Acrolein	56	5.207	5.221	-0.014	100	1545886	599.9	592.0	
40 Acetone	43	5.319	5.319	0.000	100	809150	240.0	234.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.347	0.000	97	2185427	60.0	64.7	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	2929771	60.0	61.9	
45 Iodomethane	142	5.529	5.529	0.000	99	4580085	60.0	62.8	
46 Methyl acetate	43	5.543	5.557	-0.014	97	1185621	120.0	112.8	
47 3-Chloro-1-propene	41	5.599	5.612	-0.013	89	5148897	60.0	58.2	
48 Carbon disulfide	76	5.626	5.626	0.000	99	12279155	60.0	58.1	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	618695	600.0	662.1	
50 Methylene Chloride	84	5.696	5.696	0.000	97	2678804	60.0	63.8	
51 Acrylonitrile	53	5.836	5.836	0.000	99	3207740	600.0	610.9	
52 Methyl tert-butyl ether	73	5.892	5.892	0.000	95	3640553	60.0	62.7	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	99	3267087	60.0	61.5	
54 Hexane	57	6.101	6.101	0.000	89	5250704	60.0	57.4	
55 Vinyl acetate	43	6.157	6.157	0.000	97	4699784	120.0	123.0	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	5564790	60.0	60.2	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	1302396	240.0	230.8	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	97	1694104	1800.0	1930.0	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	80	3295665	60.0	61.6	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	90	4607883	60.0	61.4	
67 Chlorobromomethane	128	6.842	6.841	0.001	95	1019268	60.0	64.3	
68 Chloroform	83	6.855	6.855	0.000	94	4950029	60.0	61.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	90	469376	120.0	122.9	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	551153	1500.0	1541.6	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	4736877	60.0	62.0	
72 Cyclohexane	56	7.163	7.163	0.000	0	6043382	60.0	58.8	
73 1,1-Dichloropropene	75	7.191	7.191	0.000	98	4602816	60.0	61.6	
74 Carbon tetrachloride	117	7.233	7.232	0.001	98	4095789	60.0	63.1	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	2421140	60.0	61.1	
77 Benzene	78	7.358	7.358	0.000	98	11883656	60.0	58.0	
9 n-Heptane	43	7.456	7.456	0.000	91	5245197	60.0	57.0	
79 Trichloroethene	95	7.819	7.819	0.000	99	3254862	60.0	62.8	
80 2-Pentanone	43	7.847	7.847	0.000	99	2526845	240.0	258.1	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	2824297	60.0	61.0	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	4846395	60.0	59.0	
84 1,4-Dioxane	88	8.057	8.056	0.001	93	182854	1200.0	1409.0	
85 Dibromomethane	93	8.098	8.098	0.000	96	972742	60.0	63.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	3131431	60.0	63.7	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	510394	60.0	63.5	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	97	3639978	60.0	64.0	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	95	3109898	240.0	248.8	
91 Toluene	91	8.783	8.769	0.014	99	11767863	60.0	56.6	
92 Ethyl methacrylate	69	8.853	8.853	0.000	91	1565228	60.0	64.7	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	2684455	60.0	67.3	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	1274746	60.0	62.3	
95 2-Hexanone	43	9.132	9.132	0.000	95	2017731	240.0	248.1	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	90	2456863	60.0	61.7	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	2524145	60.0	63.7	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	1607038	60.0	67.9	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	1190133	60.0	64.1	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	4559602	60.0	61.2	
102 Chlorobenzene	112	9.816	9.816	0.000	93	7199151	60.0	60.5	
103 1,1,1,2-Tetrachloroethane	131	9.858	9.844	0.014	96	2477455	60.0	67.9	
104 Ethylbenzene	106	9.858	9.858	0.000	97	4765351	60.0	62.5	e
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	97	5582840	60.0	60.9	eM
106 Styrene	104	10.249	10.249	0.000	86	7854293	60.0	63.5	
109 o-Xylene	106	10.249	10.249	0.000	86	5237199	60.0	61.5	
107 Bromoform	173	10.445	10.445	0.000	99	763589	60.0	69.3	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	13051965	60.0	54.8	
111 Cyclohexanone	55	10.626	10.626	0.000	92	1017930	2400.0	2809.7	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	1234693	60.0	60.7	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	95	326861	60.0	66.4	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	86	336848	60.0	62.3	
115 N-Propylbenzene	120	10.822	10.822	0.000	96	4228117	60.0	62.8	
116 Bromobenzene	156	10.822	10.822	0.000	96	2807153	60.0	65.5	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	96	11340451	60.0	57.5	
117 2-Chlorotoluene	126	10.948	10.947	0.001	97	3379698	60.0	63.8	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	3257500	60.0	62.3	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	11472922	60.0	59.4	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	11199960	60.0	57.7	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	3298491	60.0	62.6	e

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	95	12211753	60.0	56.4	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	96	5604443	60.0	60.8	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	93	5332369	60.0	60.7	
127 n-Butylbenzene	91	11.855	11.855	0.000	96	11971153	60.0	55.6	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	4357629	60.0	61.1	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	82	173215	60.0	63.5	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	2870406	60.0	61.6	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	2364233	60.0	61.5	
132 Naphthalene	128	14.006	14.006	0.000	98	3430633	60.0	61.1	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	2035072	60.0	60.2	
S 140 1,2-Dichloroethene, Total	96				0		120.0	123.1	
S 134 Trihalomethanes, Total	1				0		240.0	262.1	
S 139 Xylenes, Total (URS)	1				0		120.0	122.4	
S 138 Xylenes, Total	106				0		120.0	122.4	
S 136 1,2-Dichloroethene, Total	1				0		120.0	123.1	
S 135 1,3-Dichloropropene, Total	1				0		120.0	131.3	
S 137 Total BTEX	1				0			299.5	

QC Flag Legend

Processing Flags
- e - Potential Peak Saturated

Review Flags
- M - Manually Integrated
- a - User Assigned ID

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-Main A_00037	Amount Added: 30.00	Units: uL
MV-2cleve+AVA_00037	Amount Added: 30.00	Units: uL
MV-Gas/Ket A_00076	Amount Added: 30.00	Units: uL

Report Date: 02-Aug-2018 13:05:06 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Injection Date: 02-Aug-2018 10:54:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

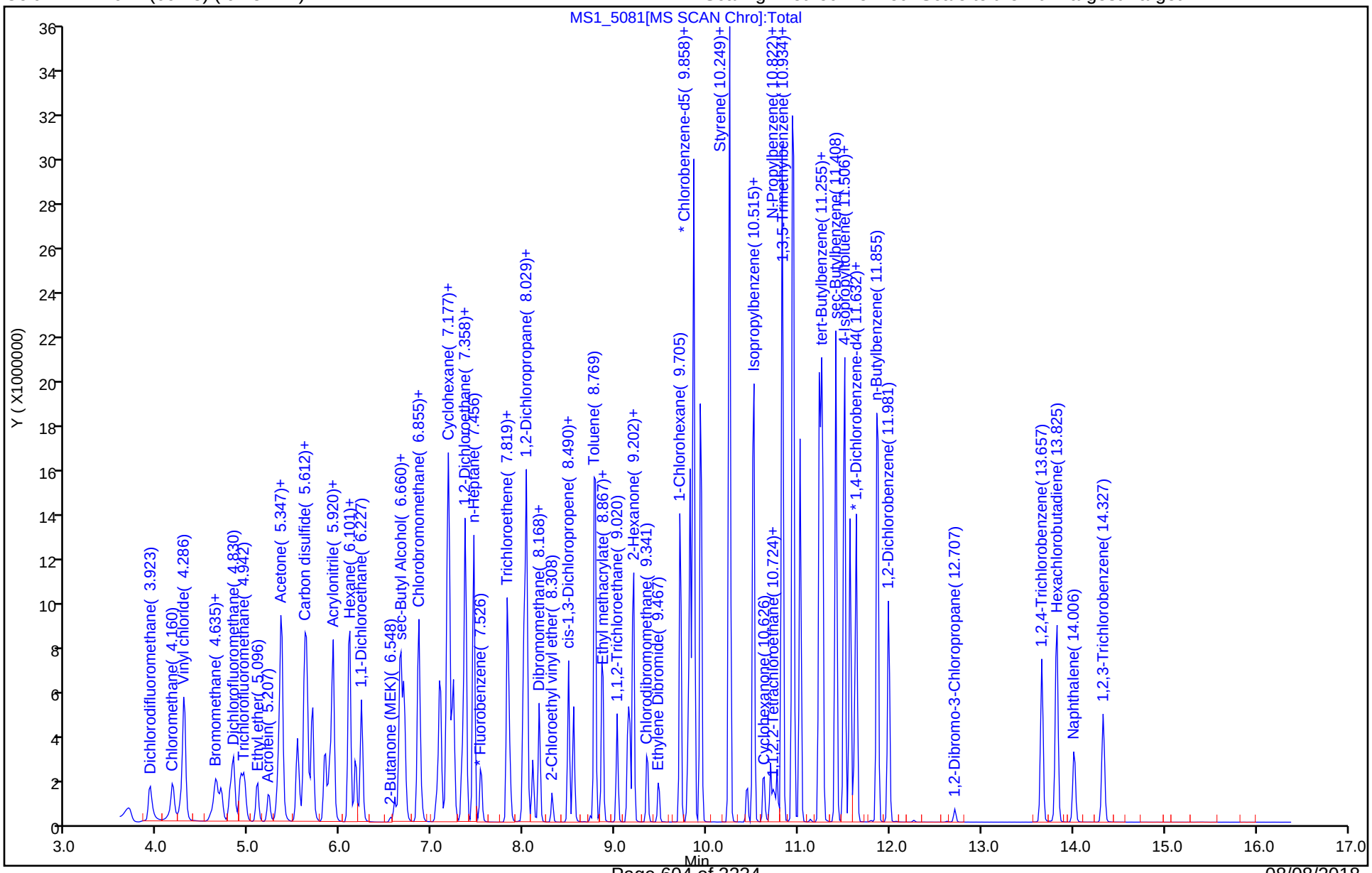
Lims ID: std60 Worklist Smp#: 18

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 18

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

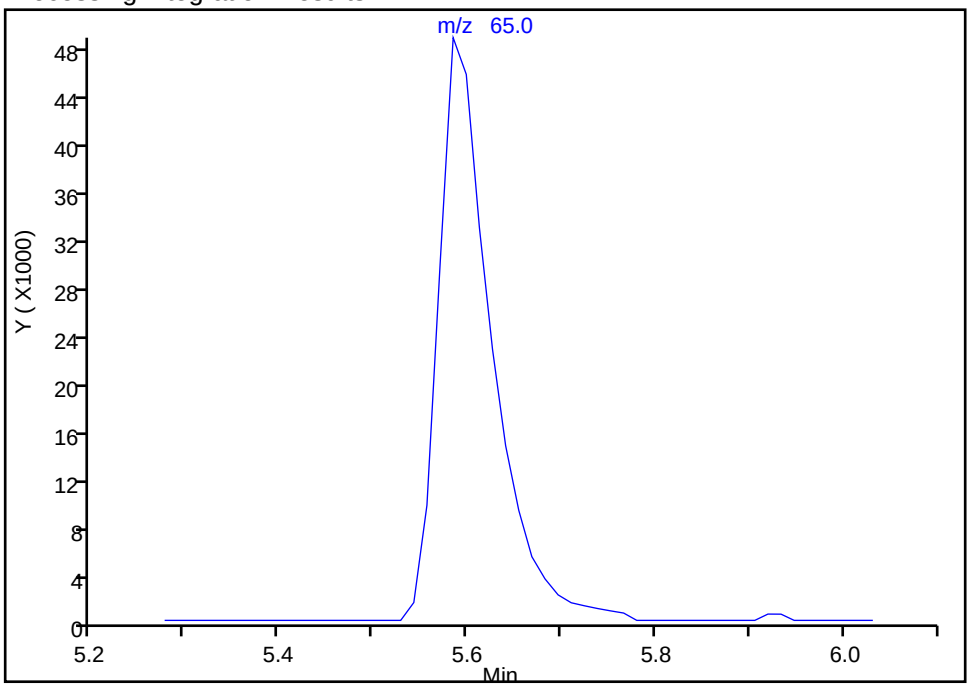
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Injection Date:	02-Aug-2018 10:54:30	Instrument ID:	VMS_MS1		
Lims ID:	std60				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	18	Worklist Smp#:	18
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

* 150 TBA-d9 (IS), CAS: 25725-11-5

Signal: 1

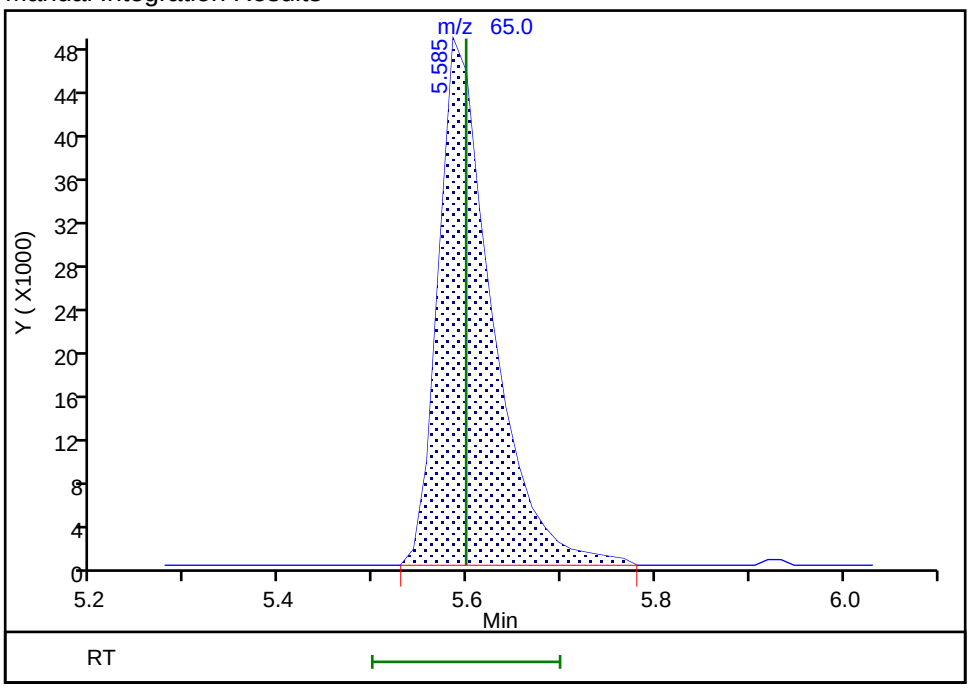
Not Detected
Expected RT: 5.60

Processing Integration Results



RT: 5.58
Area: 191906
Amount: 250.0000
Amount Units: ug/l

Manual Integration Results



Reviewer: wickhamt, 02-Aug-2018 11:40:55
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Denver

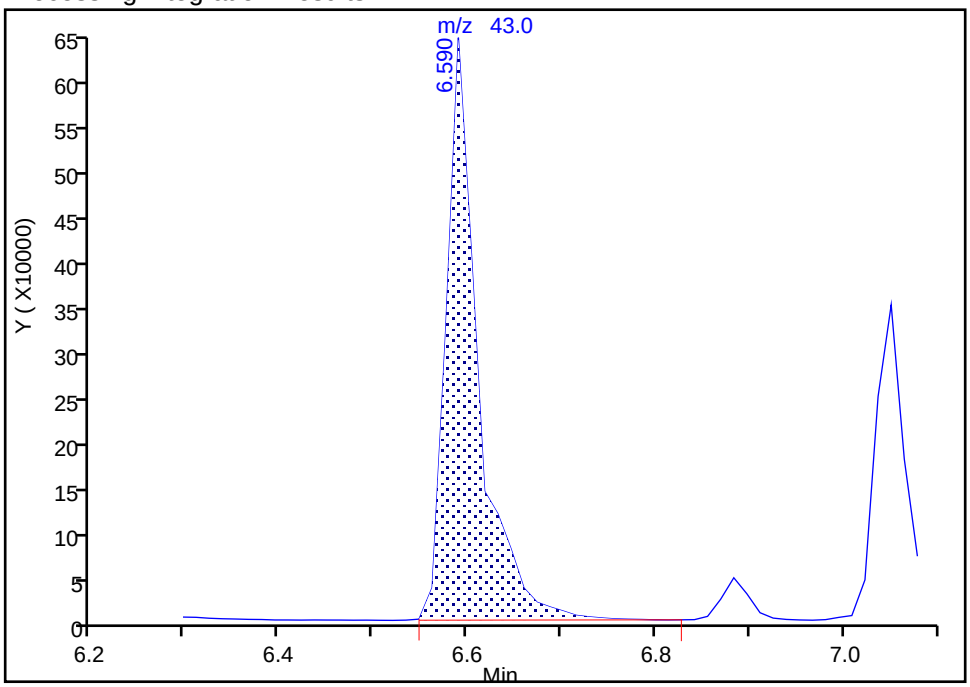
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Injection Date:	02-Aug-2018 10:54:30	Instrument ID:	VMS_MS1		
Lims ID:	std60				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	18	Worklist Smp#:	18
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

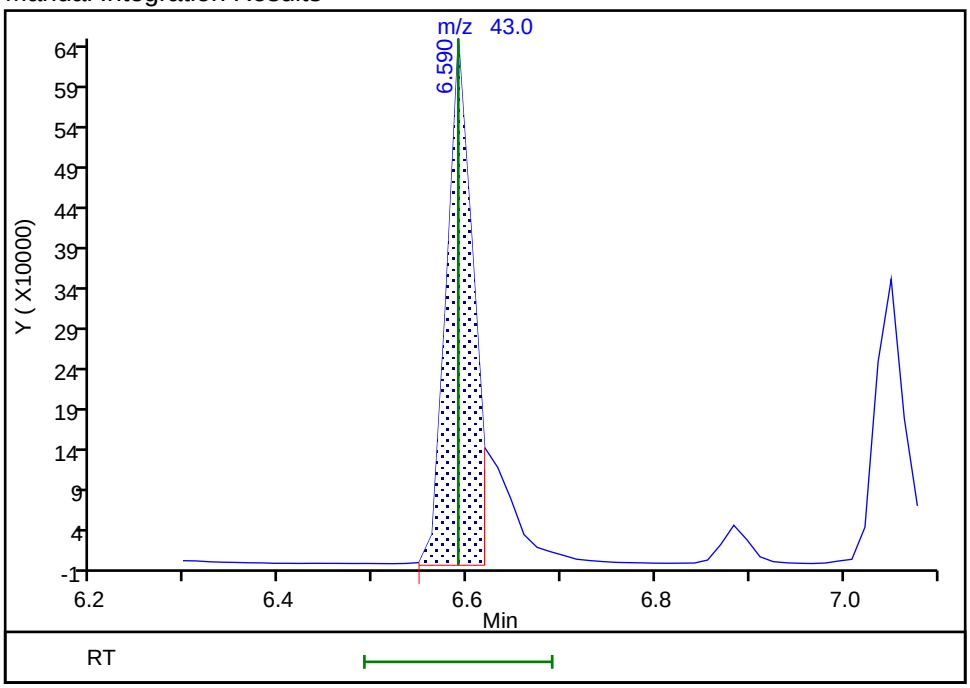
Processing Integration Results

RT: 6.59
Area: 1533988
Amount: 244.6028
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 1302396
Amount: 230.7729
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:45:51
Audit Action: Assigned New Baseline Audit Reason: Shouldering

Manual Integration/User Assign Peak Report

TestAmerica Denver

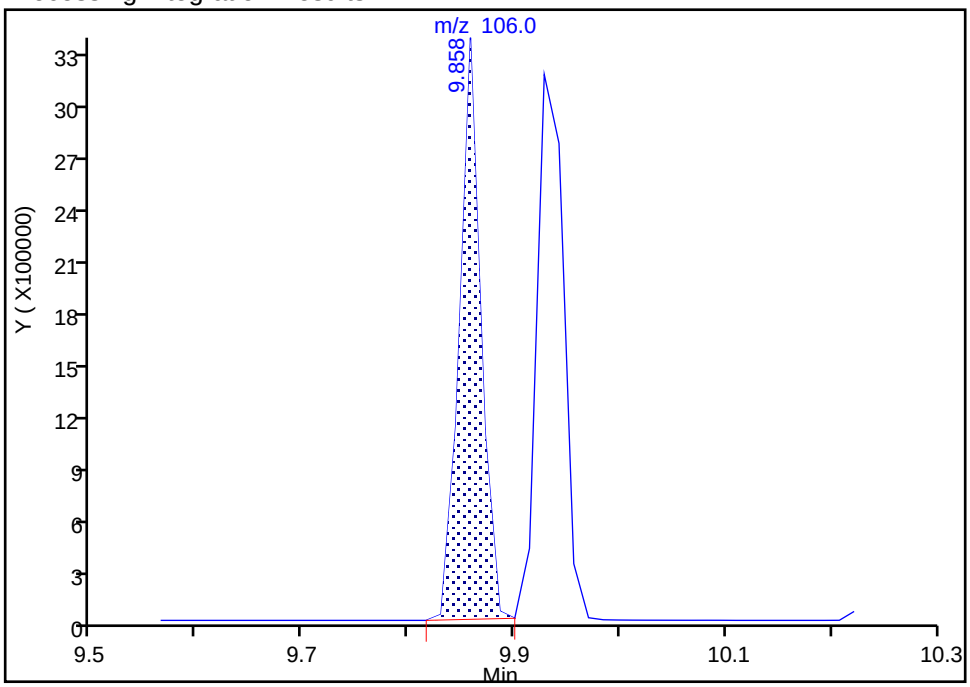
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Injection Date:	02-Aug-2018 10:54:30	Instrument ID:	VMS_MS1		
Lims ID:	std60				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	18	Worklist Smp#:	18
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

105 m-Xylene & p-Xylene, CAS: 179601-23-1

Signal: 1

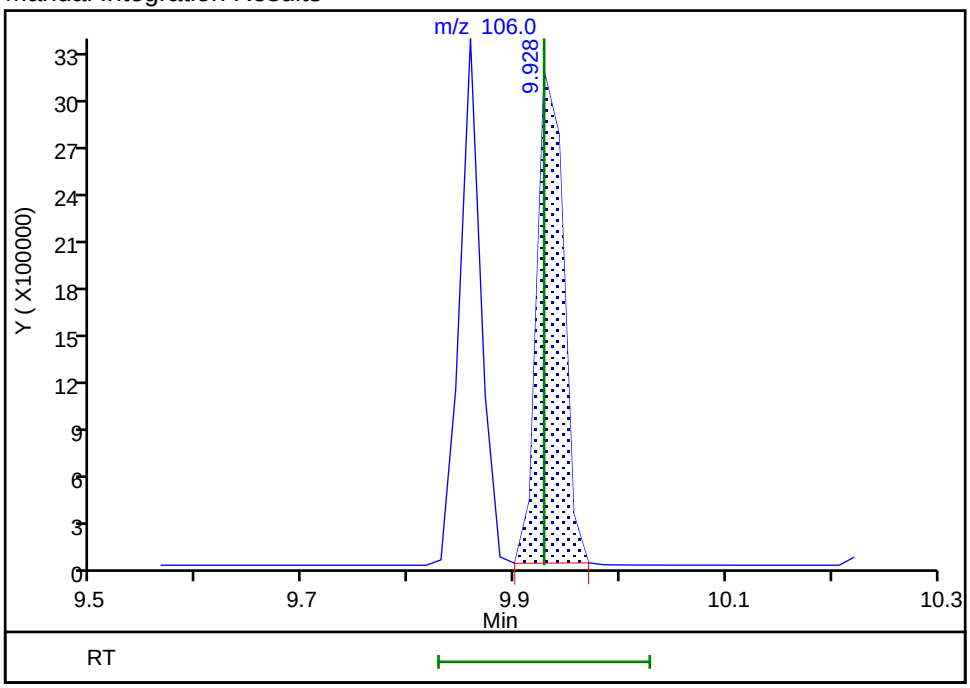
Processing Integration Results

RT: 9.86
Area: 4765351
Amount: 53.076000
Amount Units: ug/l



Manual Integration Results

RT: 9.93
Area: 5582840
Amount: 60.861700
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:42:28
Audit Action: Manually Integrated Audit Reason: Wrong peak

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD01 280-424541/20	MS1_5084.D
Level 2	STD02 280-424541/21	MS1_5085.D
Level 3	STD05 280-424541/22	MS1_5086.D
Level 4	ICIS 280-424541/23	MS1_5087.D
Level 5	STD30 280-424541/24	MS1_5088.D
Level 6	STD60 280-424541/25	MS1_5089.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethanol	0.1761 0.1732	0.1947	0.1836	0.1794	0.1635	Ave		0.1784				5.9		15.0			
Isopropyl alcohol	1.1357 0.9564	1.1385	1.0370	0.9929	0.9104	Ave		1.0285				9.1		15.0			
Acetonitrile	0.0097 0.0095	0.0106	0.0095	0.0096	0.0091	Ave		0.0097				5.1		15.0			
Isopropyl ether	0.1730 0.1936	0.1833	0.1866	0.1879	0.1799	Ave		0.1841				3.9		15.0			
2-Chloro-1,3-butadiene	0.4613 0.4653	0.4725	0.4817	0.4267	0.4397	Ave		0.4579				4.5		15.0			
Tert-butyl ethyl ether	0.4749 0.5210	0.4903	0.5101	0.5098	0.4872	Ave		0.4989				3.5		15.0			
Ethyl acetate	0.0890 0.0732	0.0758	0.0755	0.0726	0.0701	Ave		0.0760				8.8		15.0			
Propionitrile	0.0098 0.0109	0.0109	0.0109	0.0107	0.0103	Ave		0.0106				4.1		15.0			
Methacrylonitrile	0.0528 0.0487	0.0510	0.0507	0.0514	0.0483	Ave		0.0505				3.4		15.0			
Tert-amyl methyl ether	0.3396 0.4012	0.3483	0.3750	0.3811	0.3710	Ave		0.3694				6.1		15.0			
n-Butanol	1.0534 0.4667	0.7774	0.5045	0.4699	0.4194	Lin2	16.198	0.4154							0.9910		0.9900
Methyl methacrylate	0.0191 0.0267	0.0224	0.0236	0.0243	0.0244	Ave		0.0234				10.8		15.0			
2-Nitropropane	0.0122 0.0159	0.0129	0.0134	0.0143	0.0145	Ave		0.0139				9.6		15.0			
cis-1,4-Dichloro-2-butene	0.0666 0.0814	0.0680	0.0718	0.0748	0.0751	Ave		0.0730				7.4		15.0			
1,2,3-Trimethylbenzene	3.5072 3.5102	3.5992	3.6257	3.5036	3.3945	Ave		3.5234				2.3		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Dibromofluoromethane (Surr)	0.2283 0.2184	0.2188	0.2082	0.2141	0.2083	Ave		0.2160				3.5		15.0			
1,2-Dichloroethane-d4 (Surr)	0.2001 0.1770	0.1912	0.1799	0.1803	0.1726	Ave		0.1835				5.6		15.0			
Toluene-d8 (Surr)	5.3744 4.5645	5.0531	4.6361	4.6967	4.5442	Ave		4.8115				6.9		15.0			
4-Bromofluorobenzene (Surr)	1.2428 1.1066	1.1602	1.0758	1.0665	1.0507	Ave		1.1171				6.5		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD01 280-424541/20	MS1_5084.D
Level 2	STD02 280-424541/21	MS1_5085.D
Level 3	STD05 280-424541/22	MS1_5086.D
Level 4	ICIS 280-424541/23	MS1_5087.D
Level 5	STD30 280-424541/24	MS1_5088.D
Level 6	STD60 280-424541/25	MS1_5089.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Ethanol	TBAd 9	Ave	7876 521255	16598	44942	86986	239384	60.0 3600	120	300	600	1800
Isopropyl alcohol	TBAd 9	Ave	8468 479753	16176	42304	80218	222176	10.0 600	20.0	50.0	100	300
Acetonitrile	FB	Ave	16579 1006766	36113	83525	168947	475795	10.0 600	20.0	50.0	100	300
Isopropyl ether	FB	Ave	29611 2053371	62657	164088	330511	944084	1.00 60.0	2.00	5.00	10.0	30.0
2-Chloro-1,3-butadiene	FB	Ave	78937 4935095	161516	423473	750446	2307309	1.00 60.0	2.00	5.00	10.0	30.0
Tert-butyl ethyl ether	FB	Ave	81263 5526566	167600	448448	896554	2556087	1.00 60.0	2.00	5.00	10.0	30.0
Ethyl acetate	FB	Ave	30469 1552943	51805	132681	255301	735645	2.00 120	4.00	10.0	20.0	60.0
Propionitrile	FB	Ave	16819 1155098	37155	95680	189066	539219	10.0 600	20.0	50.0	100	300
Methacrylonitrile	FB	Ave	90296 5163340	174367	445708	903897	2531824	10.0 600	20.0	50.0	100	300
Tert-amyl methyl ether	FB	Ave	58110 4255749	119060	329720	670325	1946776	1.00 60.0	2.00	5.00	10.0	30.0
n-Butanol	TBAd 9	Lin2	19635 585244	27613	51457	94916	255873	25.0 1500	50.0	125	250	750
Methyl methacrylate	FB	Ave	6544 566315	15342	41466	85370	255604	2.00 120	4.00	10.0	20.0	60.0
2-Nitropropane	FB	Ave	4161 338106	8831	23572	50306	152333	2.00 120	4.00	10.0	20.0	60.0
cis-1,4-Dichloro-2-butene	DCBd 4	Ave	6258 488257	12662	34897	73667	220875	2.00 120	4.00	10.0	20.0	60.0
1,2,3-Trimethylbenzene	DCBd 4	Ave	164753 10529378	334872	881111	1724400	4990319	1.00 60.0	2.00	5.00	10.0	30.0
Dibromofluoromethane (Surr)	FB	Ave	39061 2316592	74790	183009	376542	1092910	1.00 60.0	2.00	5.00	10.0	30.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41149-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
1,2-Dichloroethane-d4 (Surr)	FB	Ave	34250 1876880	65375	158176	317167	905428	1.00 60.0	2.00	5.00	10.0	30.0
Toluene-d8 (Surr)	CBNZ d5	Ave	183279 9802890	344888	813774	1664432	4817041	1.00 60.0	2.00	5.00	10.0	30.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	58379 3319369	107948	261441	524912	1544602	1.00 60.0	2.00	5.00	10.0	30.0

Curve Type Legend:

Ave = Average ISTD
Lin2 = Linear 1/conc^2 ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5084.D
Lims ID: std01
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 02-Aug-2018 11:55:30 ALS Bottle#: 21 Worklist Smp#: 20
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std01
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:50 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:23:37

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	70	186397	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2139093	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	426277	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	587188	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	39061	1.00	1.06	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.274	-0.014	98	34250	1.00	1.09	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	183279	1.00	1.12	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	58379	1.00	1.11	
28 Ethylene oxide	43	4.565	4.565	0.000	99	54632	100.0	109.3	
34 Ethanol	45	4.928	4.928	0.000	47	7876	60.0	59.2	
38 Propene oxide	58	5.179	5.179	0.000	0	217253	100.0	95.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	96	8468	10.0	11.0	
44 Acetonitrile	41	5.529	5.529	0.000	98	16579	10.0	10.0	
56 Isopropyl ether	87	6.199	6.199	0.000	95	29611	1.00	0.9401	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	78937	1.00	1.01	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	81263	1.00	0.9519	
60 Ethyl acetate	43	6.590	6.590	0.000	96	30469	2.00	2.34	
63 Propionitrile	54	6.632	6.632	0.000	98	16819	10.0	9.29	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	90296	10.0	10.5	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	96	58110	1.00	0.9193	
78 n-Butanol	56	7.526	7.554	-0.028	83	19635	25.0	24.4	
81 Methyl methacrylate	100	7.959	7.945	0.014	93	6544	2.00	1.63	
87 2-Nitropropane	41	8.294	8.294	0.000	96	4161	2.00	1.75	
99 Tetrahydrothiophene	60		9.397				ND	ND	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	89	6258	2.00	1.83	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	164753	1.00	1.00	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	64997	1.00	0.9735	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Reagents:

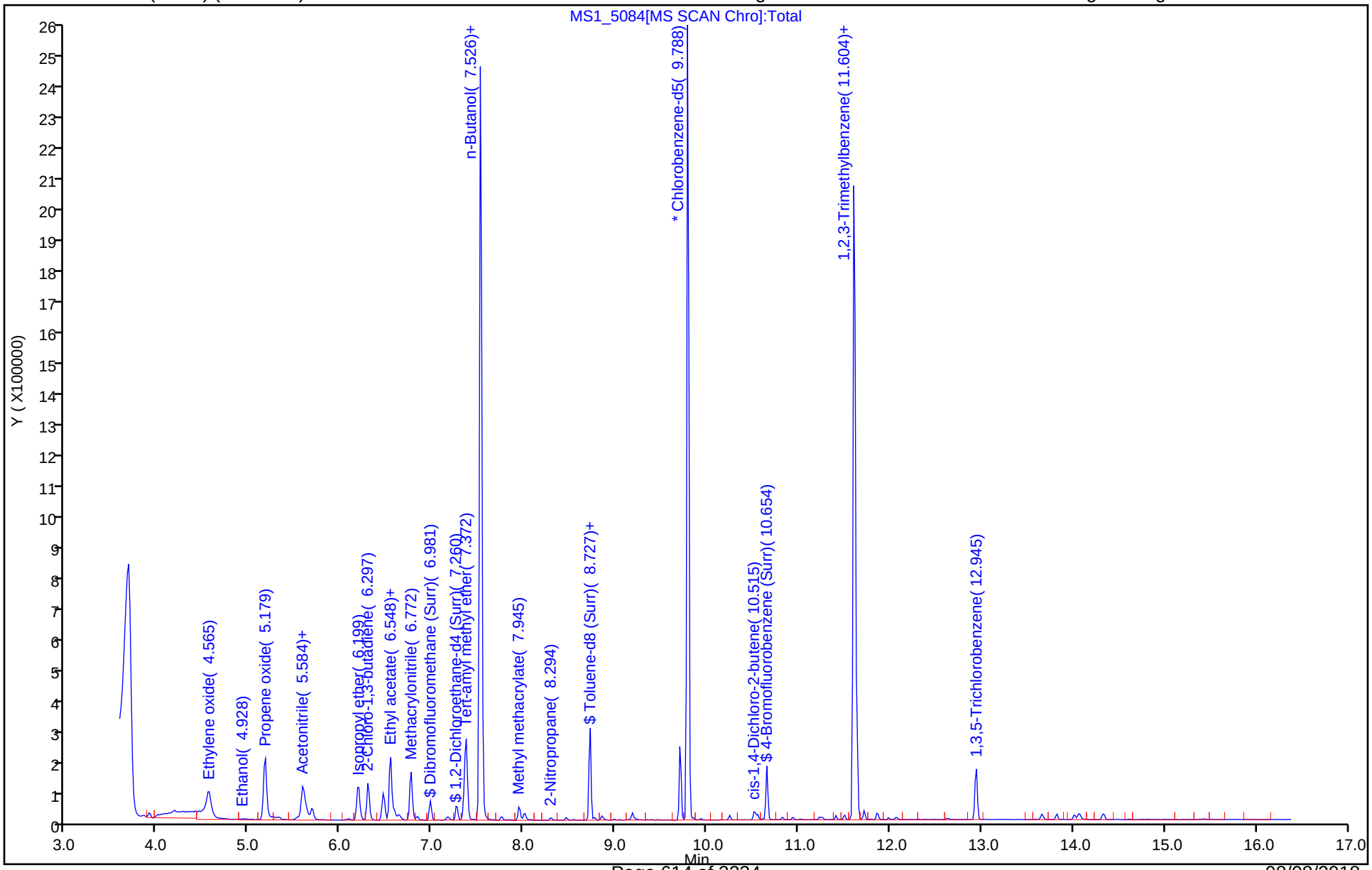
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.08	Units: uL
MV-Supp A_00031	Amount Added:	0.50	Units: uL

Report Date: 03-Aug-2018 06:40:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5084.D				
Injection Date:	02-Aug-2018 11:55:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std01			Worklist Smp#:	20
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	21
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5085.D
Lims ID: std02
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 02-Aug-2018 12:15:30 ALS Bottle#: 22 Worklist Smp#: 21
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std02
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:51 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:23:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	70	177596	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2136526	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	426580	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	581501	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	74790	2.00	2.03	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	65375	2.00	2.08	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	344888	2.00	2.10	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	107948	2.00	2.08	
28 Ethylene oxide	43	4.565	4.565	0.000	99	112843	200.0	210.2	
34 Ethanol	45	4.928	4.928	0.000	96	16598	120.0	131.0	
38 Propene oxide	58	5.180	5.179	0.001	0	455271	200.0	200.9	
41 Isopropyl alcohol	45	5.333	5.333	0.000	94	16176	20.0	22.1	
44 Acetonitrile	41	5.529	5.529	0.000	99	36113	20.0	21.9	
56 Isopropyl ether	87	6.199	6.199	0.000	95	62657	2.00	1.99	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	161516	2.00	2.06	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	167600	2.00	1.97	
60 Ethyl acetate	43	6.590	6.590	0.000	96	51805	4.00	3.99	
63 Propionitrile	54	6.632	6.632	0.000	98	37155	20.0	20.5	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	174367	20.0	20.2	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	96	119060	2.00	1.89	
78 n-Butanol	56	7.540	7.554	-0.014	86	27613	50.0	54.6	
81 Methyl methacrylate	100	7.959	7.945	0.014	91	15342	4.00	3.83	
87 2-Nitropropane	41	8.294	8.294	0.000	98	8831	4.00	3.72	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	85	3106	4.00	3.64	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	88	12662	4.00	3.73	
125 1,2,3-Trimethylbenzene	105	11.646	11.632	0.014	97	334872	2.00	2.04	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	134637	2.00	2.04	

Reagents:

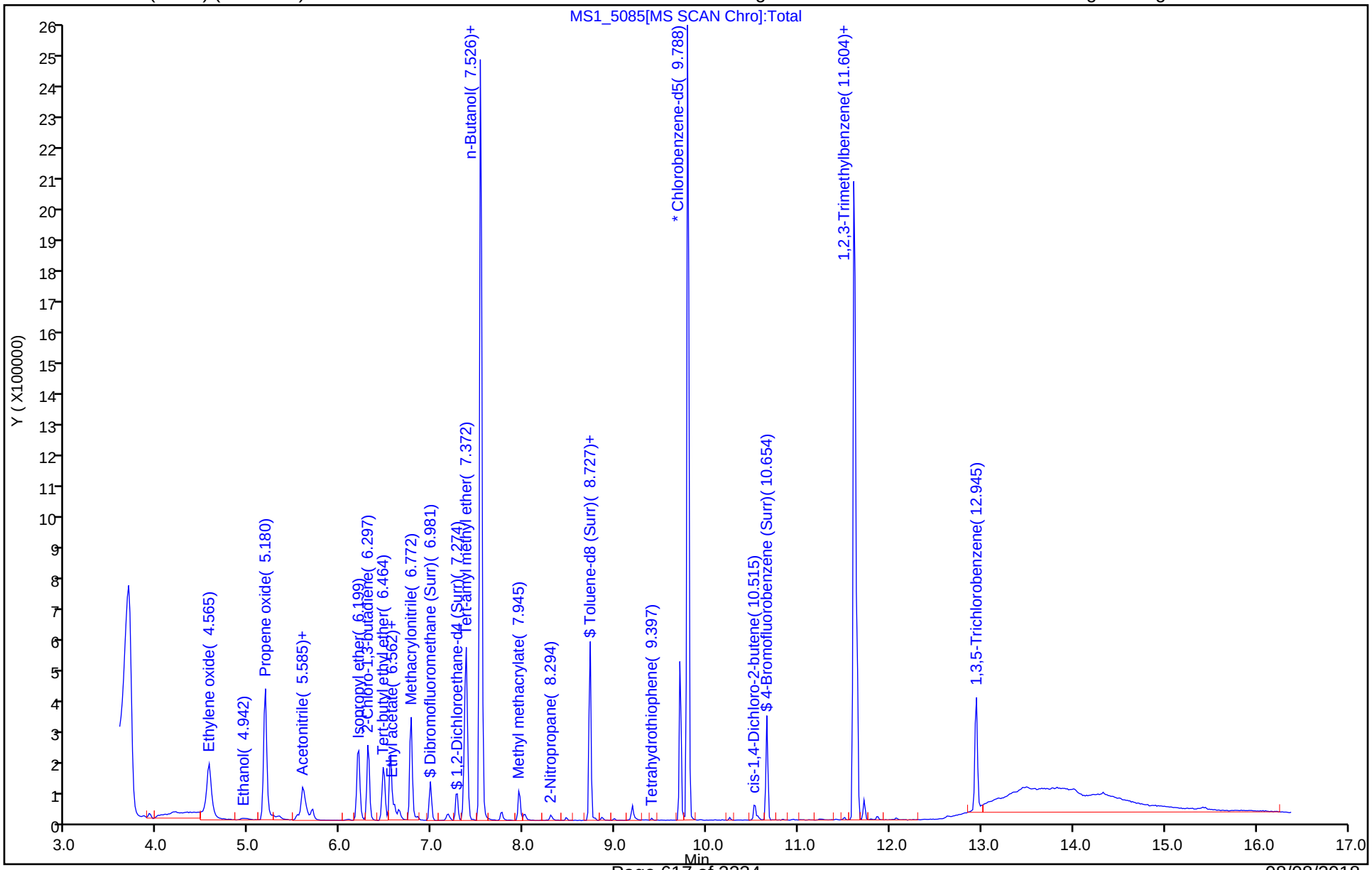
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.16	Units: uL
MV-Supp A_00031	Amount Added:	1.00	Units: uL

Report Date: 03-Aug-2018 06:40:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5085.D				
Injection Date:	02-Aug-2018 12:15:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std02			Worklist Smp#:	21
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	22
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5086.D
Lims ID: std05
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 02-Aug-2018 12:36:30 ALS Bottle#: 23 Worklist Smp#: 22
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std05
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:52 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:24:26

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	68	203979	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2197853	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	438825	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	607539	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	183009	5.00	4.82	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	158176	5.00	4.90	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	813774	5.00	4.82	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	261441	5.00	4.82	
28 Ethylene oxide	43	4.565	4.565	0.000	99	279639	500.0	488.1	
34 Ethanol	45	4.928	4.928	0.000	99	44942	300.0	308.7	
38 Propene oxide	58	5.179	5.179	0.000	0	1200509	500.0	515.0	
41 Isopropyl alcohol	45	5.333	5.333	0.000	98	42304	50.0	50.4	
44 Acetonitrile	41	5.529	5.529	0.000	99	83525	50.0	49.2	
56 Isopropyl ether	87	6.199	6.199	0.000	95	164088	5.00	5.07	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	92	423473	5.00	5.26	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	448448	5.00	5.11	
60 Ethyl acetate	43	6.590	6.590	0.000	99	132681	10.0	9.93	
63 Propionitrile	54	6.632	6.632	0.000	99	95680	50.0	51.4	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	445708	50.0	50.2	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	97	329720	5.00	5.08	
78 n-Butanol	56	7.554	7.554	0.000	87	51457	125.0	112.8	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	41466	10.0	10.1	
87 2-Nitropropane	41	8.294	8.294	0.000	98	23572	10.0	9.66	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	93	8740	10.0	9.96	
110 cis-1,4-Dichloro-2-butene	53	10.514	10.515	0.000	85	34897	10.0	9.84	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	881111	5.00	5.15	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	345854	5.00	5.01	

Reagents:

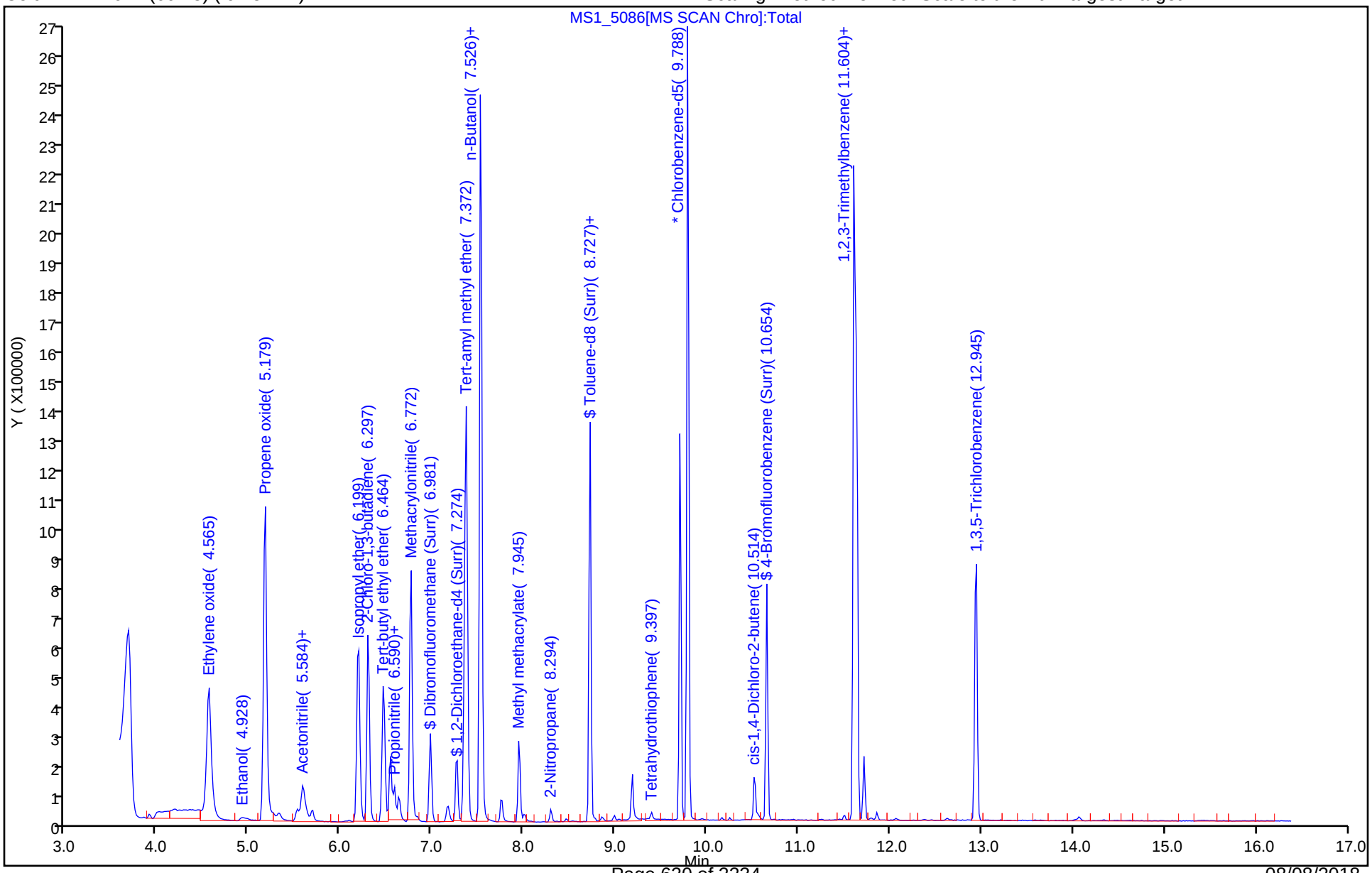
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.40	Units: uL
MV-Supp A_00031	Amount Added:	2.50	Units: uL

Report Date: 03-Aug-2018 06:40:53 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5086.D				
Injection Date:	02-Aug-2018 12:36:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std05			Worklist Smp#:	22
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	23
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5087.D
Lims ID: icis
Client ID:
Sample Type: ICIS Calib Level: 5
Inject. Date: 02-Aug-2018 12:56:30 ALS Bottle#: 24 Worklist Smp#: 23
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: icis
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:53 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:23:13

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.598	0.000	74	201981	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2198487	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	442983	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	615228	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	376542	10.0	9.91	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	317167	10.0	9.83	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	1664432	10.0	9.76	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	524912	10.0	9.55	
28 Ethylene oxide	43	4.565	4.565	0.000	99	550287	1000.0	986.0	
34 Ethanol	45	4.928	4.928	0.000	99	86986	600.0	603.5	
38 Propene oxide	58	5.179	5.179	0.000	0	2494080	1000.0	1069.7	
41 Isopropyl alcohol	45	5.333	5.333	0.000	97	80218	100.0	96.5	
44 Acetonitrile	41	5.529	5.529	0.000	99	168947	100.0	99.5	
56 Isopropyl ether	87	6.199	6.199	0.000	95	330511	10.0	10.2	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	92	750446	10.0	9.32	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	896554	10.0	10.2	
60 Ethyl acetate	43	6.590	6.590	0.000	99	255301	20.0	19.1	
63 Propionitrile	54	6.632	6.632	0.000	99	189066	100.0	101.6	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	903897	100.0	101.8	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	97	670325	10.0	10.3	
78 n-Butanol	56	7.554	7.554	0.000	87	94916	250.0	243.8	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	85370	20.0	20.7	
87 2-Nitropropane	41	8.294	8.294	0.000	99	50306	20.0	20.6	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	93	17446	20.0	19.7	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	85	73667	20.0	20.5	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	1724400	10.0	9.94	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	674856	10.0	9.65	

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.80	Units: uL
MV-Supp A_00031	Amount Added:	5.00	Units: uL

Report Date: 03-Aug-2018 06:40:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5087.D

Injection Date: 02-Aug-2018 12:56:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

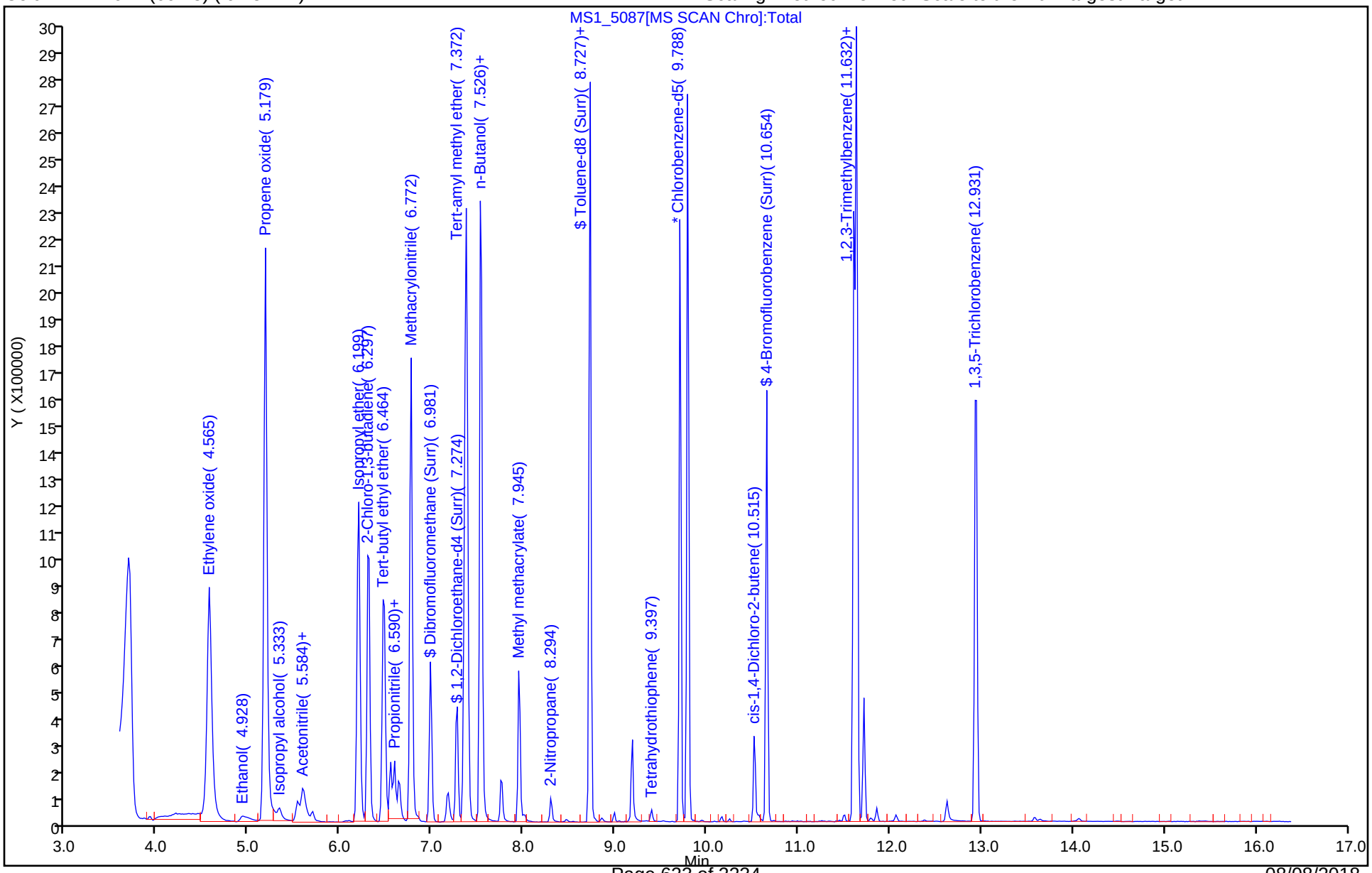
Lims ID: icis Worklist Smp#: 23

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 24

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5088.D
Lims ID: std30
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 02-Aug-2018 13:16:30 ALS Bottle#: 25 Worklist Smp#: 24
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std30
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:54 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 14:05:32

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	69	203378	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2186225	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	441685	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	612555	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	1092910	30.0	28.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.274	-0.014	99	905428	30.0	28.2	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	4817041	30.0	28.3	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	1544602	30.0	28.2	
28 Ethylene oxide	43	4.551	4.565	-0.014	99	1419157	3000.0	3061.6	
34 Ethanol	45	4.928	4.928	0.000	99	239384	1800.0	1649.3	
38 Propene oxide	58	5.179	5.179	0.000	0	6890500	3000.0	2971.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	99	222176	300.0	265.5	
44 Acetonitrile	41	5.529	5.529	0.000	99	475795	300.0	281.8	
56 Isopropyl ether	87	6.199	6.199	0.000	94	944084	30.0	29.3	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	2307309	30.0	28.8	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	2556087	30.0	29.3	
60 Ethyl acetate	43	6.590	6.590	0.000	99	735645	60.0	55.3	
63 Propionitrile	54	6.632	6.632	0.000	99	539219	300.0	291.3	
66 Methacrylonitrile	41	6.772	6.772	0.000	90	2531824	300.0	286.8	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	98	1946776	30.0	30.1	
78 n-Butanol	56	7.540	7.554	-0.014	87	255873	750.0	718.1	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	255604	60.0	62.4	
87 2-Nitropropane	41	8.294	8.294	0.000	97	152333	60.0	62.8	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	92	52212	60.0	59.1	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	81	220875	60.0	61.8	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	4990319	30.0	28.9	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	2019354	30.0	29.0	

Reagents:

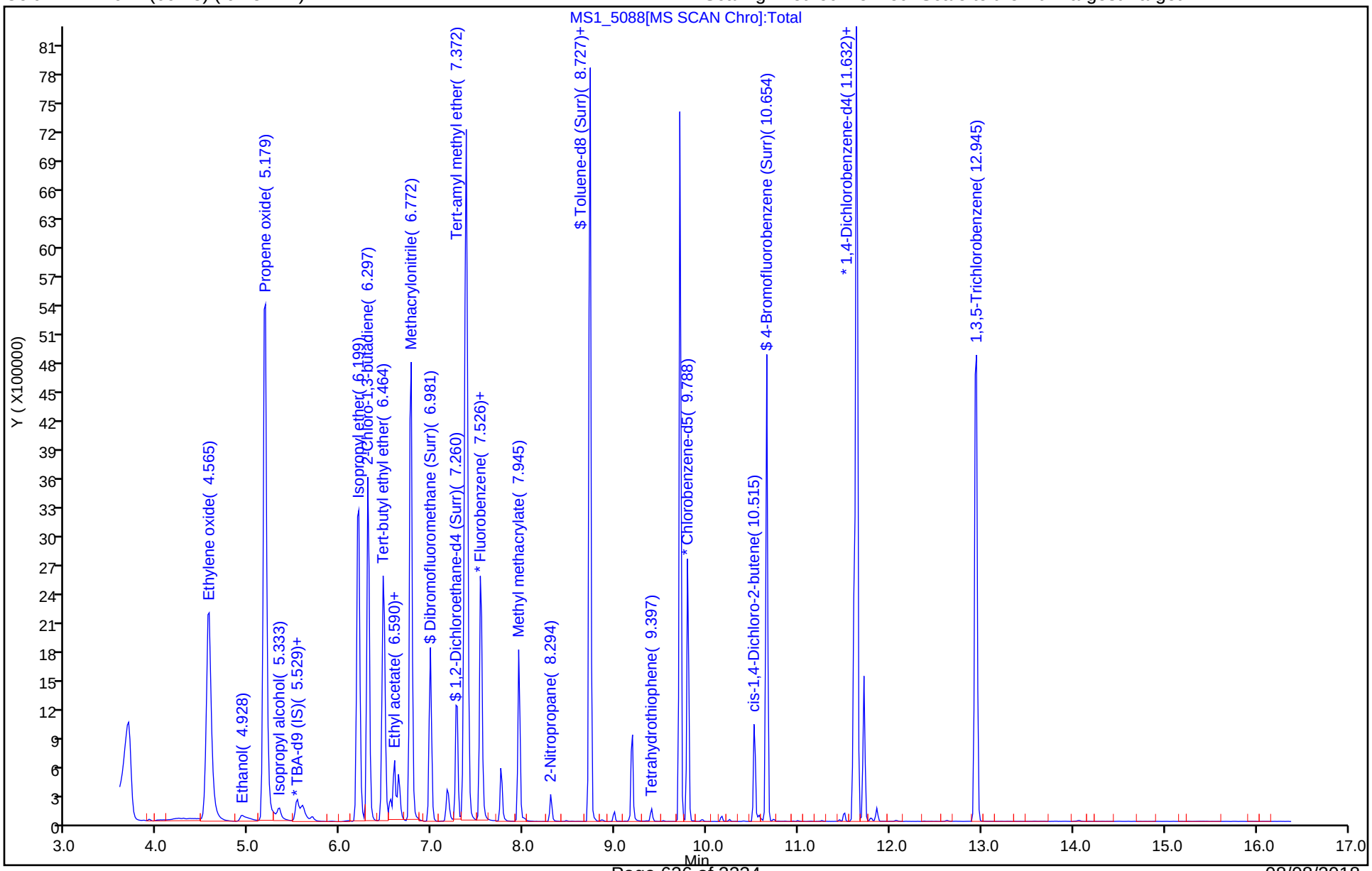
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	2.40	Units: uL
MV-Supp A_00031	Amount Added:	15.00	Units: uL

Report Date: 03-Aug-2018 06:40:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5088.D				
Injection Date:	02-Aug-2018 13:16:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std30			Worklist Smp#:	24
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	25
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D
Lims ID: std60
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 02-Aug-2018 13:37:30 ALS Bottle#: 26 Worklist Smp#: 25
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std60
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:55 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 14:08:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	68	209015	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2209748	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	447426	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	624935	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	2316592	60.0	60.7	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.261	7.274	-0.013	99	1876880	60.0	57.9	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	92	9802890	60.0	56.9	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	3319369	60.0	59.4	
28 Ethylene oxide	43	4.565	4.565	0.000	100	2087025	6000.0	3806.4	
34 Ethanol	45	4.928	4.928	0.000	100	521255	3600.0	3494.5	
38 Propene oxide	58	5.166	5.179	-0.013	0	13322770	6000.0	5684.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	99	479753	600.0	557.9	
44 Acetonitrile	41	5.529	5.529	0.000	99	1006766	600.0	590.0	
56 Isopropyl ether	87	6.199	6.199	0.000	94	2053371	60.0	63.1	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	4935095	60.0	61.0	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	5526566	60.0	62.7	
60 Ethyl acetate	43	6.590	6.590	0.000	99	1552943	120.0	115.6	
63 Propionitrile	54	6.632	6.632	0.000	99	1155098	600.0	617.4	
66 Methacrylonitrile	41	6.772	6.772	0.000	90	5163340	600.0	578.8	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	98	4255749	60.0	65.2	
78 n-Butanol	56	7.540	7.554	-0.014	87	585244	1500.0	1646.0	
81 Methyl methacrylate	100	7.945	7.945	0.000	90	566315	120.0	136.8	
87 2-Nitropropane	41	8.294	8.294	0.000	97	338106	120.0	137.9	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	92	120809	120.0	135.0	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	79	488257	120.0	133.8	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	10529378	60.0	59.8	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	4587055	60.0	64.6	

Reagents:

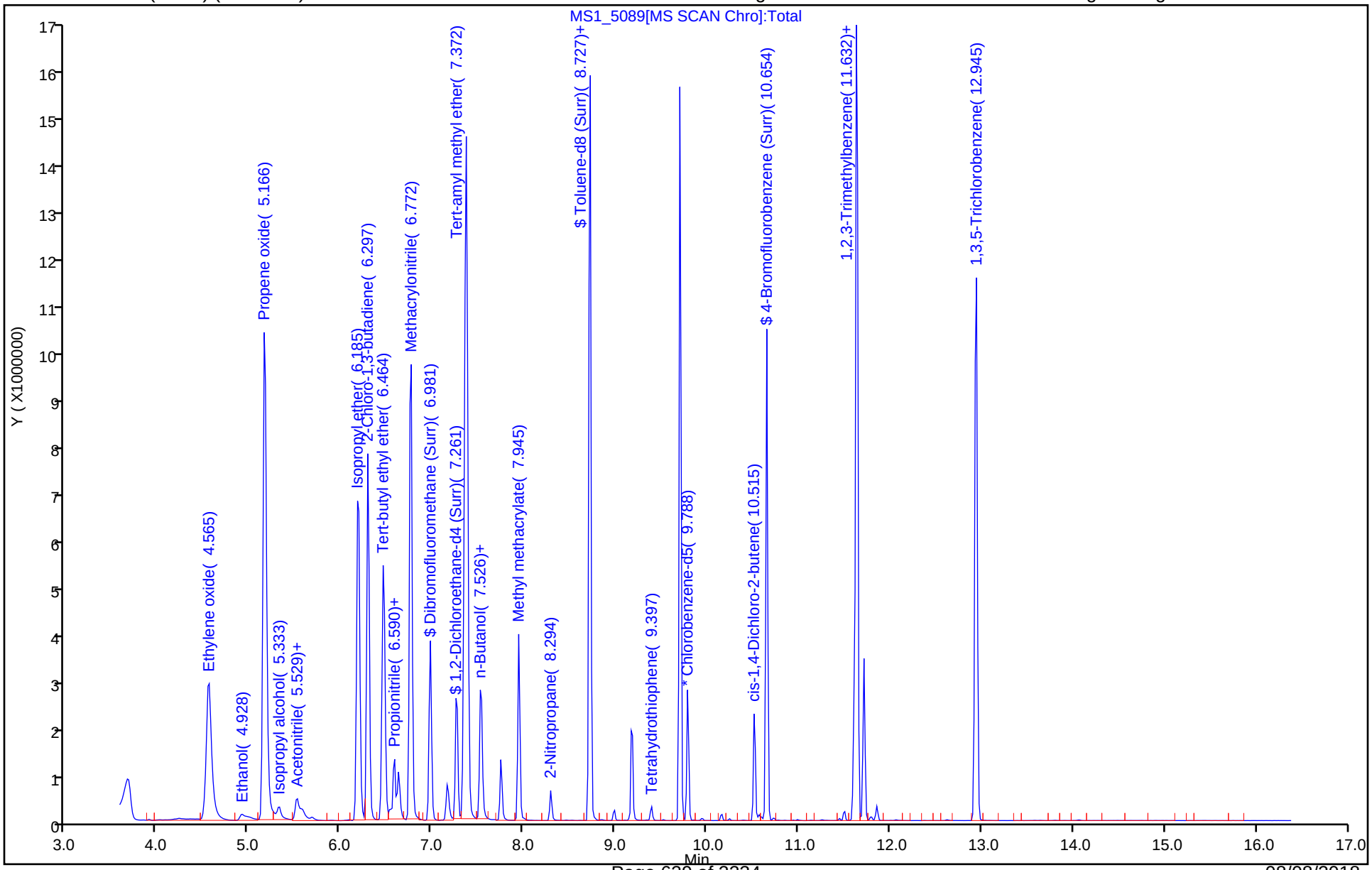
MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00101	Amount Added: 4.80	Units: uL
MV-Supp A_00031	Amount Added: 30.00	Units: uL

Report Date: 03-Aug-2018 06:40:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Injection Date:	02-Aug-2018 13:37:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std60			Worklist Smp#:	25
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	26
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 280-424541/19 Calibration Date: 08/02/2018 11:35

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5083.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2832	0.2893		0.0102	0.0100	2.2	20.0
Chloromethane	Ave	0.3441	0.3273	0.1000	0.00951	0.0100	-4.9	20.0
Vinyl chloride	Ave	0.3302	0.3312		0.0100	0.0100	0.3	20.0
Bromomethane	Ave	0.2412	0.2524		0.0105	0.0100	4.6	20.0
Chloroethane	Ave	0.2408	0.2412		0.0100	0.0100	0.2	20.0
Trichlorofluoromethane	Ave	0.4226	0.4192		0.00992	0.0100	-0.8	20.0
Acetone	Lin2		0.0220		0.0433	0.0400	8.2	20.0
1,1-Dichloroethene	Ave	0.2694	0.2730		0.0101	0.0100	1.4	20.0
Carbon disulfide	Ave	1.201	1.229		0.0102	0.0100	2.3	20.0
Methylene Chloride	Lin2		0.2581		0.0104	0.0100	4.3	20.0
Methyl tert-butyl ether	Ave	0.3304	0.3416		0.0103	0.0100	3.4	20.0
trans-1,2-Dichloroethene	Ave	0.3021	0.3108		0.0103	0.0100	2.9	20.0
1,1-Dichloroethane	Ave	0.5259	0.5285	0.1000	0.0101	0.0100	0.5	20.0
2-Butanone (MEK)	Ave	0.0321	0.0323		0.0402	0.0400	0.5	20.0
cis-1,2-Dichloroethene	Ave	0.3042	0.3056		0.0100	0.0100	0.4	20.0
2,2-Dichloropropane	Ave	0.4270	0.4062		0.00951	0.0100	-4.9	20.0
Bromochloromethane	Ave	0.0901	0.0935		0.0104	0.0100	3.7	20.0
Chloroform	Ave	0.4592	0.4605		0.0100	0.0100	0.3	20.0
1,1,1-Trichloroethane	Ave	0.4345	0.4358		0.0100	0.0100	0.3	20.0
1,1-Dichloropropene	Ave	0.4246	0.4173		0.00983	0.0100	-1.7	20.0
Carbon tetrachloride	Ave	0.3689	0.3614		0.00980	0.0100	-2.0	20.0
1,2-Dichloroethane	Ave	0.2252	0.2276		0.0101	0.0100	1.0	20.0
Benzene	Ave	1.166	1.162		0.00997	0.0100	-0.3	20.0
Trichloroethene	Ave	0.2946	0.2935		0.00996	0.0100	-0.4	20.0
1,2-Dichloropropane	Ave	0.2632	0.2689		0.0102	0.0100	2.2	20.0
Dibromomethane	Ave	0.0878	0.0878		0.0100	0.0100	-0.0	20.0
Bromodichloromethane	Ave	0.2797	0.2826		0.0101	0.0100	1.0	20.0
cis-1,3-Dichloropropene	Ave	1.583	1.638		0.0103	0.0100	3.4	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.0711	0.0752		0.0423	0.0400	5.7	20.0
Toluene	Ave	1.183	1.187		0.0100	0.0100	0.4	20.0
trans-1,3-Dichloropropene	Ave	0.2267	0.2362		0.0104	0.0100	4.2	20.0
1,1,2-Trichloroethane	Ave	0.1163	0.1221		0.0105	0.0100	5.0	20.0
2-Hexanone	Ave	0.2264	0.2319		0.0410	0.0400	2.4	20.0
1,3-Dichloropropane	Ave	1.108	1.100		0.00993	0.0100	-0.7	20.0
Tetrachloroethene	Ave	1.104	1.048		0.00950	0.0100	-5.0	20.0
Dibromochloromethane	Ave	0.6590	0.6782		0.0103	0.0100	2.9	20.0
1,2-Dibromoethane (EDB)	Ave	0.5164	0.5181		0.0100	0.0100	0.3	20.0
Chlorobenzene	Ave	3.313	3.237	0.3000	0.00977	0.0100	-2.3	20.0
1,1,1,2-Tetrachloroethane	Ave	1.015	1.006		0.00991	0.0100	-0.9	20.0
Ethylbenzene	Ave	2.121	2.036		0.00960	0.0100	-4.0	20.0
m-Xylene & p-Xylene	Ave	2.553	2.464		0.00965	0.0100	-3.5	20.0

FORM VII 8260B

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 280-424541/19 Calibration Date: 08/02/2018 11:35

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5083.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
o-Xylene	Ave	2.369	2.347		0.00990	0.0100	-1.0	20.0
Styrene	Ave	3.443	3.435		0.00998	0.0100	-0.2	20.0
Bromoform	Lin2		0.3042	0.1000	0.00999	0.0100	-0.0	20.0
Isopropylbenzene	Ave	4.733	4.700		0.00993	0.0100	-0.7	20.0
1,1,2,2-Tetrachloroethane	Ave	0.4045	0.4101	0.3000	0.0101	0.0100	1.4	20.0
1,2,3-Trichloropropane	Ave	0.1076	0.1122		0.0104	0.0100	4.3	20.0
Bromobenzene	Ave	0.8515	0.8615		0.0101	0.0100	1.2	20.0
N-Propylbenzene	Ave	1.339	1.322		0.00987	0.0100	-1.3	20.0
1,3,5-Trimethylbenzene	Ave	3.923	3.888		0.00991	0.0100	-0.9	20.0
2-Chlorotoluene	Ave	1.053	1.060		0.0101	0.0100	0.7	20.0
4-Chlorotoluene	Ave	1.040	1.035		0.00996	0.0100	-0.4	20.0
tert-Butylbenzene	Ave	3.842	3.823		0.00995	0.0100	-0.5	20.0
1,2,4-Trimethylbenzene	Ave	3.860	3.794		0.00983	0.0100	-1.7	20.0
sec-Butylbenzene	Ave	1.047	1.042		0.00995	0.0100	-0.5	20.0
4-Isopropyltoluene	Ave	4.301	4.356		0.0101	0.0100	1.3	20.0
1,3-Dichlorobenzene	Ave	1.832	1.826		0.00997	0.0100	-0.3	20.0
1,4-Dichlorobenzene	Ave	1.747	1.754		0.0100	0.0100	0.4	20.0
n-Butylbenzene	Ave	4.282	4.270		0.00997	0.0100	-0.3	20.0
1,2-Dichlorobenzene	Ave	1.417	1.444		0.0102	0.0100	1.9	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0521		0.00990	0.0100	-1.0	20.0
1,2,4-Trichlorobenzene	Ave	0.9266	0.9672		0.0104	0.0100	4.4	20.0
Hexachlorobutadiene	Ave	0.7646	0.7847		0.0103	0.0100	2.6	20.0
Naphthalene	Ave	1.117	1.189		0.0107	0.0100	6.5	20.0
1,2,3-Trichlorobenzene	Ave	0.6725	0.7213		0.0107	0.0100	7.3	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5083.D
Lims ID: icv
Client ID:
Sample Type: ICV
Inject. Date: 02-Aug-2018 11:35:30 ALS Bottle#: 20 Worklist Smp#: 19
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: icv
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist:

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:05 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:02:55

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	87	182490	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2135348	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	447202	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	606158	12.5	12.5	
24 Dichlorodifluoromethane	85	3.908	3.922	-0.014	100	494150	10.0	10.2	
26 Chloromethane	50	4.160	4.174	-0.014	99	559100	10.0	9.51	
27 Vinyl chloride	62	4.285	4.300	-0.015	94	565776	10.0	10.0	
29 Bromomethane	94	4.635	4.635	0.000	90	431102	10.0	10.5	
31 Chloroethane	64	4.691	4.705	-0.015	100	412090	10.0	10.0	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	925993	10.0	10.1	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	716143	10.0	9.92	
36 Ethyl ether	59	5.082	5.096	-0.014	92	230025	10.0	10.8	
39 Acrolein	56	5.207	5.221	-0.014	99	257081	100.0	101.4	
40 Acetone	43	5.305	5.319	-0.014	100	150132	40.0	43.3	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	97	339498	10.0	10.3	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	466401	10.0	10.1	
45 Iodomethane	142	5.528	5.529	-0.001	99	741869	10.0	10.5	
46 Methyl acetate	43	5.542	5.557	-0.015	96	196328	20.0	19.2	
47 3-Chloro-1-propene	41	5.598	5.612	-0.014	90	869466	10.0	10.1	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2099622	10.0	10.2	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	96340	100.0	108.4	
50 Methylene Chloride	84	5.696	5.696	0.000	94	440946	10.0	10.4	
51 Acrylonitrile	53	5.822	5.836	-0.014	99	529376	100.0	103.8	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	95	583471	10.0	10.3	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	531006	10.0	10.3	
54 Hexane	57	6.087	6.101	-0.014	92	860633	10.0	9.44	
55 Vinyl acetate	43	6.157	6.157	0.000	97	798195	20.0	21.5	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	902873	10.0	10.1	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	220477	40.0	40.2	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	96	263963	300.0	316.2	
64 cis-1,2-Dichloroethene	96	6.646	6.660	-0.014	83	522062	10.0	10.0	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	91	693863	10.0	9.51	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	159698	10.0	10.4	
68 Chloroform	83	6.855	6.855	0.000	94	786654	10.0	10.0	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	77292	20.0	19.8	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	81809	250.0	240.6	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	99	744391	10.0	10.0	
72 Cyclohexane	56	7.163	7.163	0.000	0	979795	10.0	9.82	
73 1,1-Dichloropropene	75	7.176	7.191	-0.015	98	712922	10.0	9.83	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	617447	10.0	9.80	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	388734	10.0	10.1	
77 Benzene	78	7.358	7.358	0.000	96	1984918	10.0	9.97	
9 n-Heptane	43	7.456	7.456	0.000	92	868947	10.0	9.72	
79 Trichloroethene	95	7.819	7.819	0.000	99	501351	10.0	9.96	
80 2-Pentanone	43	7.847	7.847	0.000	99	405088	40.0	42.6	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	97	459404	10.0	10.2	
83 Methylcyclohexane	55	8.028	8.029	-0.001	0	764786	10.0	9.59	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	29592	200.0	234.7	
85 Dibromomethane	93	8.098	8.098	0.000	96	149999	10.0	10.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	482794	10.0	10.1	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	90	61539	10.0	8.40	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	585903	10.0	10.3	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	513651	40.0	42.3	
91 Toluene	91	8.769	8.769	0.000	98	2027918	10.0	10.0	
92 Ethyl methacrylate	69	8.852	8.853	-0.001	89	233923	10.0	9.71	
93 trans-1,3-Dichloropropene	75	8.866	8.867	0.000	98	403557	10.0	10.4	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	208619	10.0	10.5	
95 2-Hexanone	43	9.132	9.132	0.000	96	331914	40.0	41.0	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	393671	10.0	9.93	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	375067	10.0	9.50	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	242626	10.0	10.3	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	185356	10.0	10.0	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	710381	10.0	9.57	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1157917	10.0	9.77	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	360044	10.0	9.91	
104 Ethylbenzene	106	9.858	9.858	0.000	98	728496	10.0	9.60	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	881658	10.0	9.65	
109 o-Xylene	106	10.249	10.249	0.000	89	839497	10.0	9.90	
106 Styrene	104	10.249	10.249	0.000	86	1228878	10.0	9.98	
107 Bromoform	173	10.445	10.445	0.000	98	108814	10.0	10.0	
108 Isopropylbenzene	105	10.514	10.515	-0.001	96	2279065	10.0	9.93	
111 Cyclohexanone	55	10.626	10.626	0.000	92	154381	400.0	427.9	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	198881	10.0	10.1	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	91	48567	10.0	10.2	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	54407	10.0	10.4	
116 Bromobenzene	156	10.822	10.822	0.000	52	417777	10.0	10.1	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	641075	10.0	9.87	
120 1,3,5-Trimethylbenzene	105	10.933	10.934	-0.001	94	1885323	10.0	9.91	
117 2-Chlorotoluene	126	10.947	10.947	0.000	96	514155	10.0	10.1	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	501949	10.0	9.96	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1853726	10.0	9.95	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1839857	10.0	9.83	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	505286	10.0	9.95	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	2112568	10.0	10.1	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	885401	10.0	9.97	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	850676	10.0	10.0	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2070706	10.0	9.97	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	700455	10.0	10.2	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	80	25286	10.0	9.90	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	469002	10.0	10.4	
131 Hexachlorobutadiene	225	13.824	13.825	-0.001	98	380537	10.0	10.3	
132 Naphthalene	128	14.006	14.006	0.000	97	576787	10.0	10.7	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	349791	10.0	10.7	
S 140 1,2-Dichloroethene, Total	96				0		20.0	20.3	
S 135 1,3-Dichloropropene, Total	1				0		20.0	20.8	
S 136 1,2-Dichloroethene, Total	1				0		20.0	20.3	
S 134 Trihalomethanes, Total	1				0		40.0	40.4	
S 139 Xylenes, Total (URS)	1				0		20.0	19.6	
S 138 Xylenes, Total	106				0		20.0	19.6	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main B_00022	Amount Added:	5.00	Units: uL
MV-SS 2-Cleve_00046	Amount Added:	5.00	Units: uL
MV-Gas/Ket B_00044	Amount Added:	5.00	Units: uL

Report Date: 02-Aug-2018 13:05:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5083.D

Injection Date: 02-Aug-2018 11:35:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

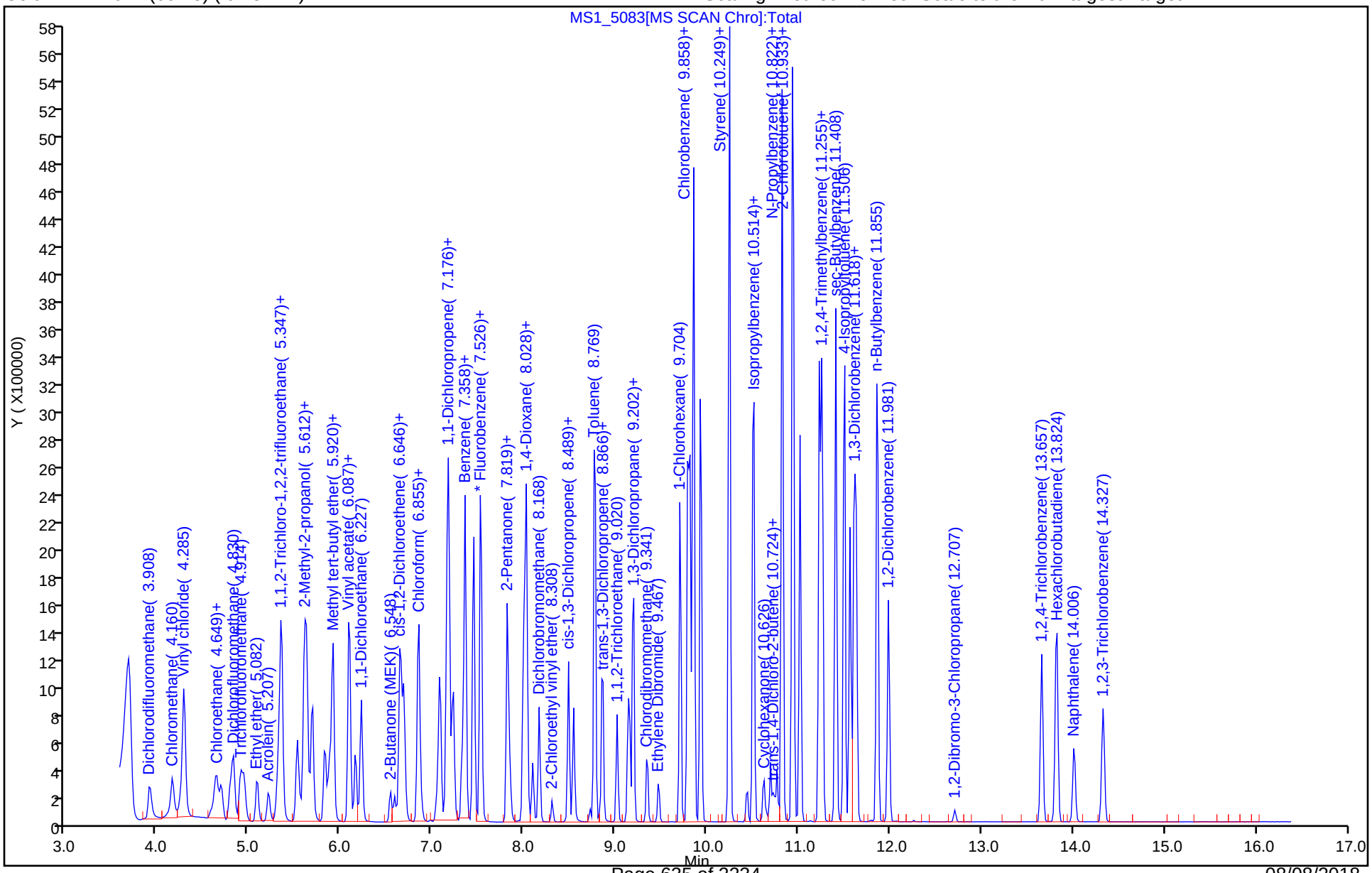
Lims ID: icv Worklist Smp#: 19

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 20

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

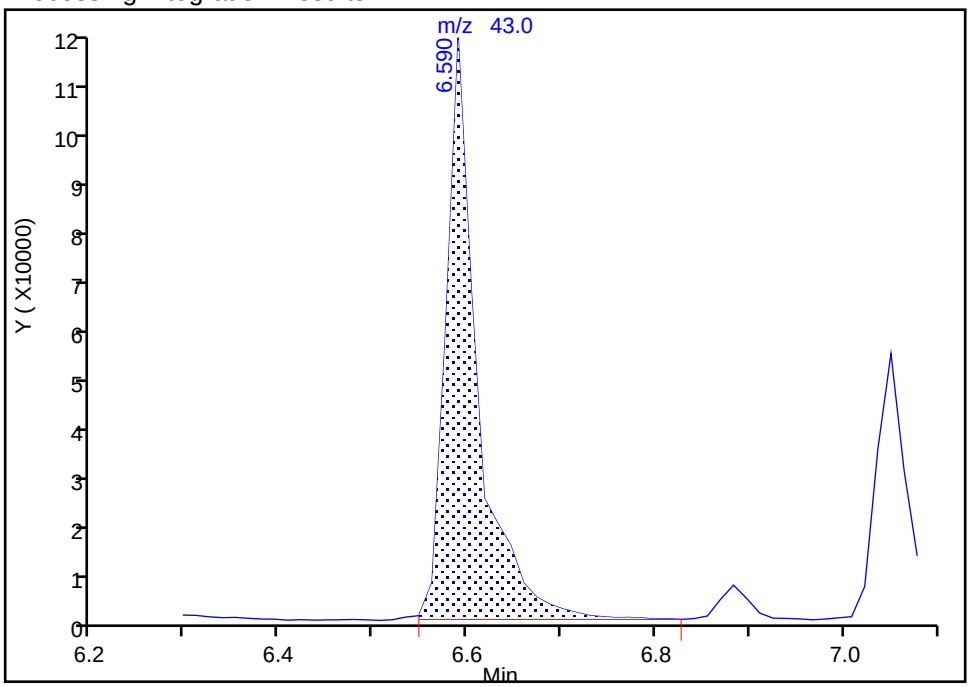
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5083.D				
Injection Date:	02-Aug-2018 11:35:30	Instrument ID:	VMS_MS1		
Lims ID:	icv				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	20	Worklist Smp#:	19
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

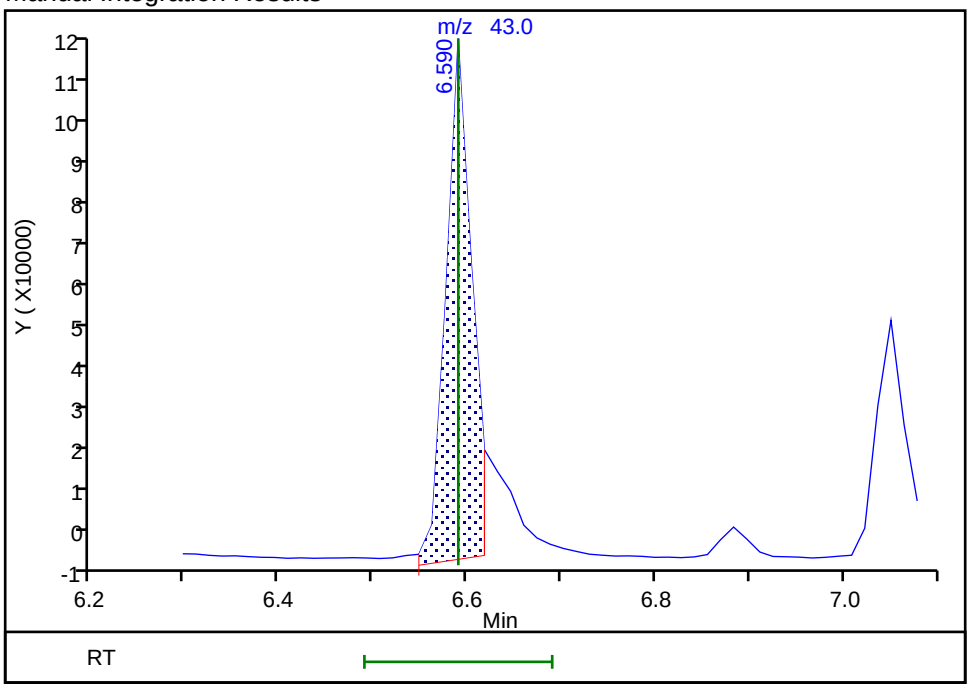
Processing Integration Results

RT: 6.59
Area: 261759
Amount: 47.746829
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 220477
Amount: 40.216679
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 12:31:17
Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 280-424541/26 Calibration Date: 08/02/2018 14:17

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 13:37

Lab File ID: MS1_5091.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Isopropyl ether	Ave	0.1841	0.1861		0.0101	0.0100	1.1	20.0
Dibromofluoromethane (Surr)	Ave	0.2160	0.2120		0.00982	0.0100	-1.8	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.1835	0.1802		0.00982	0.0100	-1.8	20.0
Toluene-d8 (Surr)	Ave	4.811	4.602		0.00957	0.0100	-4.3	20.0
4-Bromofluorobenzene (Surr)	Ave	1.117	1.048		0.00938	0.0100	-6.2	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5091.D
Lims ID: icv
Client ID:
Sample Type: ICV
Inject. Date: 02-Aug-2018 14:17:30 ALS Bottle#: 28 Worklist Smp#: 26
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: icv
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist:

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:59:44 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 03-Aug-2018 06:59:44

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	68	204330	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2158753	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	435634	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	604764	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	366138	10.0	9.82	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	311263	10.0	9.82	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	1603998	10.0	9.57	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	507044	10.0	9.38	
28 Ethylene oxide	43	4.565	4.565	0.000	99	418930	1000.0	782.1	
34 Ethanol	45	4.928	4.928	0.000	99	80313	600.0	550.8	
38 Propene oxide	58	5.180	5.179	0.001	0	2099052	1000.0	916.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	97	77926	100.0	92.7	
44 Acetonitrile	41	5.529	5.529	0.000	100	164780	100.0	98.8	
56 Isopropyl ether	87	6.199	6.199	0.000	95	321338	10.0	10.1	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	92	742315	10.0	9.39	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	850127	10.0	9.87	
60 Ethyl acetate	43	6.590	6.590	0.000	98	233894	20.0	17.8	
63 Propionitrile	54	6.632	6.632	0.000	99	183020	100.0	100.1	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	881952	100.0	101.2	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	97	629405	10.0	9.87	
78 n-Butanol	56	7.554	7.554	0.000	86	89197	250.0	223.7	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	81358	20.0	20.1	
87 2-Nitropropane	41	8.294	8.294	0.000	98	43315	20.0	18.1	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	92	23181	20.0	26.6	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	86	51703	20.0	14.6	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	1607264	10.0	9.43	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	616227	10.0	8.96	

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.80	Units: uL
MV-Supp B_00021	Amount Added:	5.00	Units: uL

Report Date: 03-Aug-2018 06:59:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5091.D

Injection Date: 02-Aug-2018 14:17:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

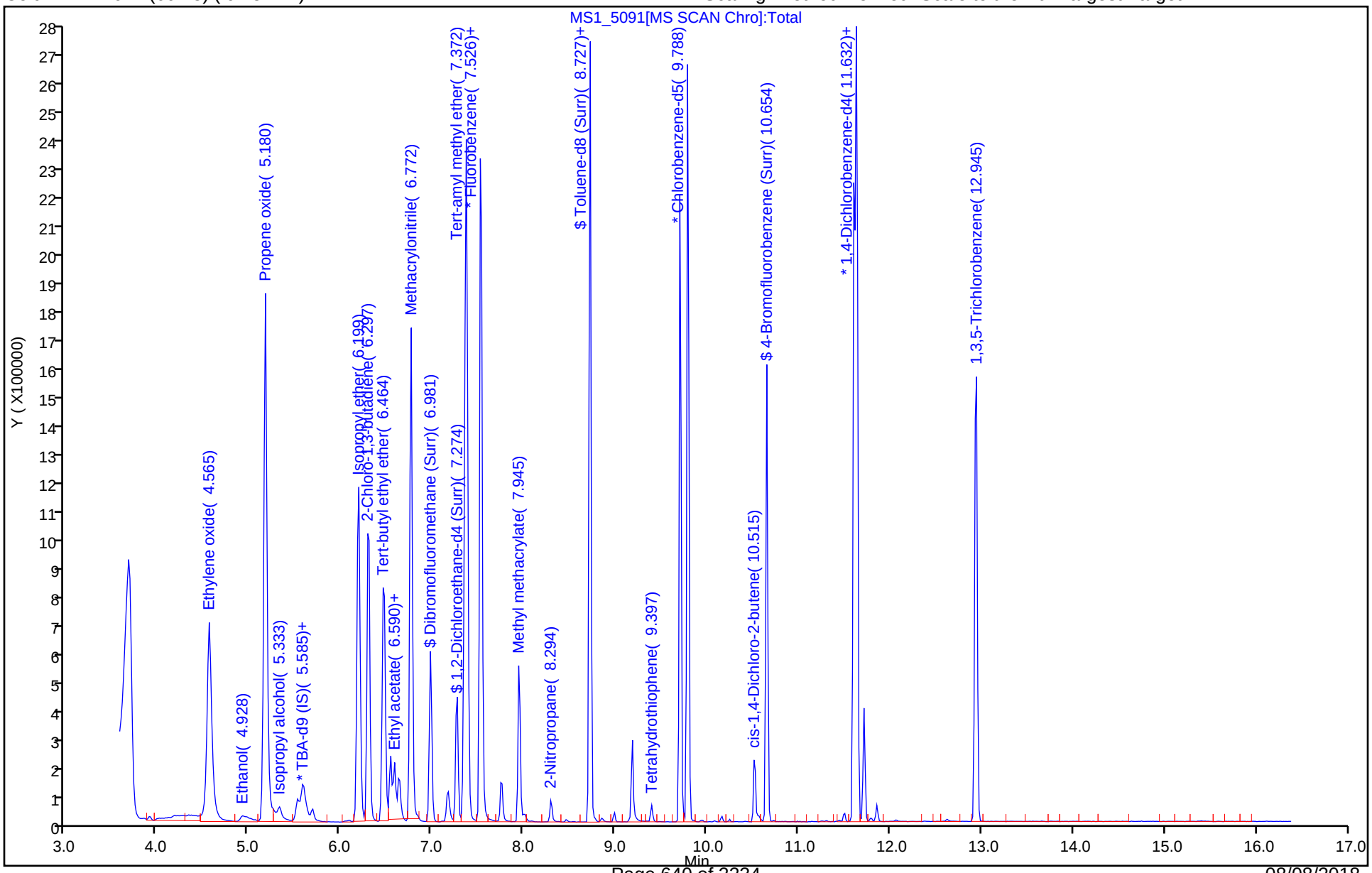
Lims ID: icv Worklist Smp#: 26

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 28

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 280-424938/2 Calibration Date: 08/06/2018 07:47

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5228.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2832	0.2938		0.0104	0.0100	3.7	20.0
Chloromethane	Ave	0.3441	0.3398	0.1000	0.00987	0.0100	-1.3	20.0
Vinyl chloride	Ave	0.3302	0.3497		0.0106	0.0100	5.9	20.0
Bromomethane	Ave	0.2412	0.2374		0.00985	0.0100	-1.5	20.0
Chloroethane	Ave	0.2408	0.2355		0.00978	0.0100	-2.2	20.0
Trichlorofluoromethane	Ave	0.4226	0.4215		0.00997	0.0100	-0.3	20.0
Acetone	Lin2		0.0213		0.0418	0.0400	4.5	20.0
1,1-Dichloroethene	Ave	0.2694	0.2628		0.00976	0.0100	-2.4	20.0
Carbon disulfide	Ave	1.201	1.185		0.00986	0.0100	-1.4	20.0
Methylene Chloride	Lin2		0.2558		0.0103	0.0100	3.3	20.0
Methyl tert-butyl ether	Ave	0.3304	0.3183		0.00963	0.0100	-3.7	20.0
trans-1,2-Dichloroethene	Ave	0.3021	0.3011		0.00997	0.0100	-0.3	20.0
1,1-Dichloroethane	Ave	0.5259	0.5394	0.1000	0.0103	0.0100	2.6	20.0
2-Butanone (MEK)	Ave	0.0321	0.0308		0.0384	0.0400	-4.1	20.0
cis-1,2-Dichloroethene	Ave	0.3042	0.3034		0.00997	0.0100	-0.3	20.0
2,2-Dichloropropane	Ave	0.4270	0.4380		0.0103	0.0100	2.6	20.0
Bromochloromethane	Ave	0.0901	0.0902		0.0100	0.0100	0.0	20.0
Chloroform	Ave	0.4592	0.4747		0.0103	0.0100	3.4	20.0
1,1,1-Trichloroethane	Ave	0.4345	0.4519		0.0104	0.0100	4.0	20.0
1,1-Dichloropropene	Ave	0.4246	0.4344		0.0102	0.0100	2.3	20.0
Carbon tetrachloride	Ave	0.3689	0.3752		0.0102	0.0100	1.7	20.0
1,2-Dichloroethane	Ave	0.2252	0.2297		0.0102	0.0100	2.0	20.0
Benzene	Ave	1.166	1.188		0.0102	0.0100	1.9	20.0
Trichloroethene	Ave	0.2946	0.3004		0.0102	0.0100	2.0	20.0
1,2-Dichloropropane	Ave	0.2632	0.2627		0.00998	0.0100	-0.2	20.0
Dibromomethane	Ave	0.0878	0.0880		0.0100	0.0100	0.1	20.0
Bromodichloromethane	Ave	0.2797	0.2868		0.0103	0.0100	2.5	20.0
cis-1,3-Dichloropropene	Ave	1.583	1.528		0.00965	0.0100	-3.5	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.0711	0.0741		0.0417	0.0400	4.2	20.0
Toluene	Ave	1.183	1.226		0.0104	0.0100	3.6	20.0
trans-1,3-Dichloropropene	Ave	0.2267	0.2315		0.0102	0.0100	2.1	20.0
1,1,2-Trichloroethane	Ave	0.1163	0.1119		0.00962	0.0100	-3.8	20.0
2-Hexanone	Ave	0.2264	0.2221		0.0392	0.0400	-1.9	20.0
1,3-Dichloropropane	Ave	1.108	1.054		0.00951	0.0100	-4.9	20.0
Tetrachloroethene	Ave	1.104	1.091		0.00989	0.0100	-1.1	20.0
Dibromochloromethane	Ave	0.6590	0.6342		0.00962	0.0100	-3.8	20.0
1,2-Dibromoethane (EDB)	Ave	0.5164	0.4893		0.00947	0.0100	-5.3	20.0
Chlorobenzene	Ave	3.313	3.270	0.3000	0.00987	0.0100	-1.3	20.0
1,1,1,2-Tetrachloroethane	Ave	1.015	1.020		0.0100	0.0100	0.5	20.0
Ethylbenzene	Ave	2.121	2.124		0.0100	0.0100	0.1	20.0
m-Xylene & p-Xylene	Ave	2.553	2.530		0.00991	0.0100	-0.9	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 280-424938/2 Calibration Date: 08/06/2018 07:47

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5228.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
o-Xylene	Ave	2.369	2.372		0.0100	0.0100	0.1	20.0
Styrene	Ave	3.443	3.504		0.0102	0.0100	1.8	20.0
Bromoform	Lin2		0.2723	0.1000	0.00895	0.0100	-10.5	20.0
Isopropylbenzene	Ave	4.733	4.443		0.00939	0.0100	-6.1	20.0
1,1,2,2-Tetrachloroethane	Ave	0.4045	0.3564	0.3000	0.00881	0.0100	-11.9	20.0
1,2,3-Trichloropropane	Ave	0.1076	0.0993		0.00923	0.0100	-7.7	20.0
Bromobenzene	Ave	0.8515	0.8019		0.00942	0.0100	-5.8	20.0
N-Propylbenzene	Ave	1.339	1.254		0.00936	0.0100	-6.4	20.0
1,3,5-Trimethylbenzene	Ave	3.923	3.755		0.00957	0.0100	-4.3	20.0
2-Chlorotoluene	Ave	1.053	1.019		0.00968	0.0100	-3.2	20.0
4-Chlorotoluene	Ave	1.040	0.9768		0.00940	0.0100	-6.0	20.0
tert-Butylbenzene	Ave	3.842	3.635		0.00946	0.0100	-5.4	20.0
1,2,4-Trimethylbenzene	Ave	3.860	3.711		0.00961	0.0100	-3.9	20.0
sec-Butylbenzene	Ave	1.047	1.002		0.00957	0.0100	-4.3	20.0
4-Isopropyltoluene	Ave	4.301	4.131		0.00960	0.0100	-4.0	20.0
1,3-Dichlorobenzene	Ave	1.832	1.754		0.00958	0.0100	-4.2	20.0
1,4-Dichlorobenzene	Ave	1.747	1.669		0.00955	0.0100	-4.5	20.0
n-Butylbenzene	Ave	4.282	4.185		0.00977	0.0100	-2.3	20.0
1,2-Dichlorobenzene	Ave	1.417	1.325		0.00935	0.0100	-6.5	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0390		0.00748	0.0100	-25.2*	20.0
1,2,4-Trichlorobenzene	Ave	0.9266	0.8603		0.00928	0.0100	-7.2	20.0
Hexachlorobutadiene	Ave	0.7646	0.7272		0.00951	0.0100	-4.9	20.0
Naphthalene	Ave	1.117	0.9174		0.00822	0.0100	-17.8	20.0
1,2,3-Trichlorobenzene	Ave	0.6725	0.6110		0.00909	0.0100	-9.1	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 06-Aug-2018 07:47:30 ALS Bottle#: 11 Worklist Smp#: 2
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccv m
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:53 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 08:25:12

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	88	171503	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2111006	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	444184	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	661102	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	476672	12.3	13.1	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.260	0.000	99	387600	12.3	12.5	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2264865	12.3	13.2	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	693735	12.3	11.7	
24 Dichlorodifluoromethane	85	3.909	3.909	0.000	100	496092	10.0	10.4	
26 Chloromethane	50	4.160	4.160	0.000	99	573788	10.0	9.87	
27 Vinyl chloride	62	4.286	4.286	0.000	98	590524	10.0	10.6	
29 Bromomethane	94	4.635	4.635	0.000	91	400976	10.0	9.85	
31 Chloroethane	64	4.691	4.691	0.000	100	397736	10.0	9.78	
32 Dichlorofluoromethane	67	4.816	4.816	0.000	98	945530	10.0	10.4	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	711834	10.0	9.97	
36 Ethyl ether	59	5.082	5.082	0.000	93	196079	10.0	9.33	
39 Acrolein	56	5.207	5.207	0.000	100	241564	100.0	96.3	
40 Acetone	43	5.305	5.305	0.000	100	143541	40.0	41.8	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.333	0.000	98	328761	10.0	10.1	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	443883	10.0	9.76	
45 Iodomethane	142	5.529	5.529	0.000	99	694406	10.0	9.91	
46 Methyl acetate	43	5.543	5.543	0.000	97	178489	20.0	17.7	
47 3-Chloro-1-propene	41	5.598	5.598	0.000	89	843598	10.0	9.93	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2000747	10.0	9.86	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	85461	100.0	102.3	
50 Methylene Chloride	84	5.696	5.696	0.000	94	431987	10.0	10.3	
51 Acrylonitrile	53	5.822	5.822	0.000	98	487561	100.0	96.7	
52 Methyl tert-butyl ether	73	5.878	5.878	0.000	96	537458	10.0	9.63	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	508525	10.0	9.97	
54 Hexane	57	6.087	6.087	0.000	93	825593	10.0	9.12	
55 Vinyl acetate	43	6.157	6.157	0.000	97	742773	20.0	20.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	910979	10.0	10.3	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	207966	40.0	38.4	M
62 sec-Butyl Alcohol	45	6.632	6.632	0.000	96	222530	300.0	283.7	
64 cis-1,2-Dichloroethene	96	6.646	6.646	0.000	84	512445	10.0	9.97	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	739687	10.0	10.3	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	152372	10.0	10.0	
68 Chloroform	83	6.855	6.855	0.000	95	801691	10.0	10.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	87	64680	20.0	16.6	
70 Isobutyl alcohol	41	7.051	7.051	0.000	92	85206	250.0	266.7	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	763220	10.0	10.4	
72 Cyclohexane	56	7.163	7.163	0.000	0	961860	10.0	9.75	
73 1,1-Dichloropropene	75	7.177	7.177	0.000	97	733650	10.0	10.2	
74 Carbon tetrachloride	117	7.232	7.232	0.000	98	633689	10.0	10.2	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	387841	10.0	10.2	
77 Benzene	78	7.358	7.358	0.000	97	2006543	10.0	10.2	
9 n-Heptane	43	7.456	7.456	0.000	92	873851	10.0	9.89	
79 Trichloroethene	95	7.819	7.819	0.000	97	507283	10.0	10.2	
80 2-Pentanone	43	7.847	7.847	0.000	99	336778	40.0	35.8	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	443603	10.0	9.98	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	789142	10.0	10.0	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	25092	200.0	201.3	
85 Dibromomethane	93	8.098	8.098	0.000	95	148536	10.0	10.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	484308	10.0	10.3	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	75103	10.0	10.2	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	543062	10.0	9.65	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	500343	40.0	41.7	
91 Toluene	91	8.769	8.769	0.000	99	2069771	10.0	10.4	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	204468	10.0	8.54	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	391016	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	188995	10.0	9.62	
95 2-Hexanone	43	9.132	9.132	0.000	96	315754	40.0	39.2	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	374388	10.0	9.51	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	387826	10.0	9.89	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	225354	10.0	9.62	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	173874	10.0	9.47	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	705938	10.0	9.57	
102 Chlorobenzene	112	9.816	9.816	0.000	94	1162123	10.0	9.87	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	362598	10.0	10.0	
104 Ethylbenzene	106	9.858	9.858	0.000	98	754848	10.0	10.0	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	899170	10.0	9.91	
106 Styrene	104	10.249	10.249	0.000	85	1245265	10.0	10.2	
109 o-Xylene	106	10.249	10.249	0.000	89	843028	10.0	10.0	
107 Bromoform	173	10.445	10.445	0.000	97	96747	10.0	8.95	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	2349978	10.0	9.39	
111 Cyclohexanone	55	10.626	10.626	0.000	92	138604	400.0	386.8	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	188492	10.0	8.81	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	89	40785	10.0	7.88	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	52504	10.0	9.23	
116 Bromobenzene	156	10.822	10.822	0.000	52	424088	10.0	9.42	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	663012	10.0	9.36	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1985764	10.0	9.57	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	538914	10.0	9.68	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	516605	10.0	9.40	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1922580	10.0	9.46	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1962735	10.0	9.61	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	529908	10.0	9.57	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	2184939	10.0	9.60	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	927667	10.0	9.58	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	882694	10.0	9.55	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2213244	10.0	9.77	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	700843	10.0	9.35	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	20601	10.0	7.48	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	454991	10.0	9.28	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	384624	10.0	9.51	
132 Naphthalene	128	14.006	14.006	0.000	97	485187	10.0	8.22	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	323133	10.0	9.09	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.9	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.9	
S 134 Trihalomethanes, Total	1				0		40.0	39.2	
S 139 Xylenes, Total (URS)	1				0		20.0	19.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.9	
S 138 Xylenes, Total	106				0		20.0	19.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D

Injection Date: 06-Aug-2018 07:47:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

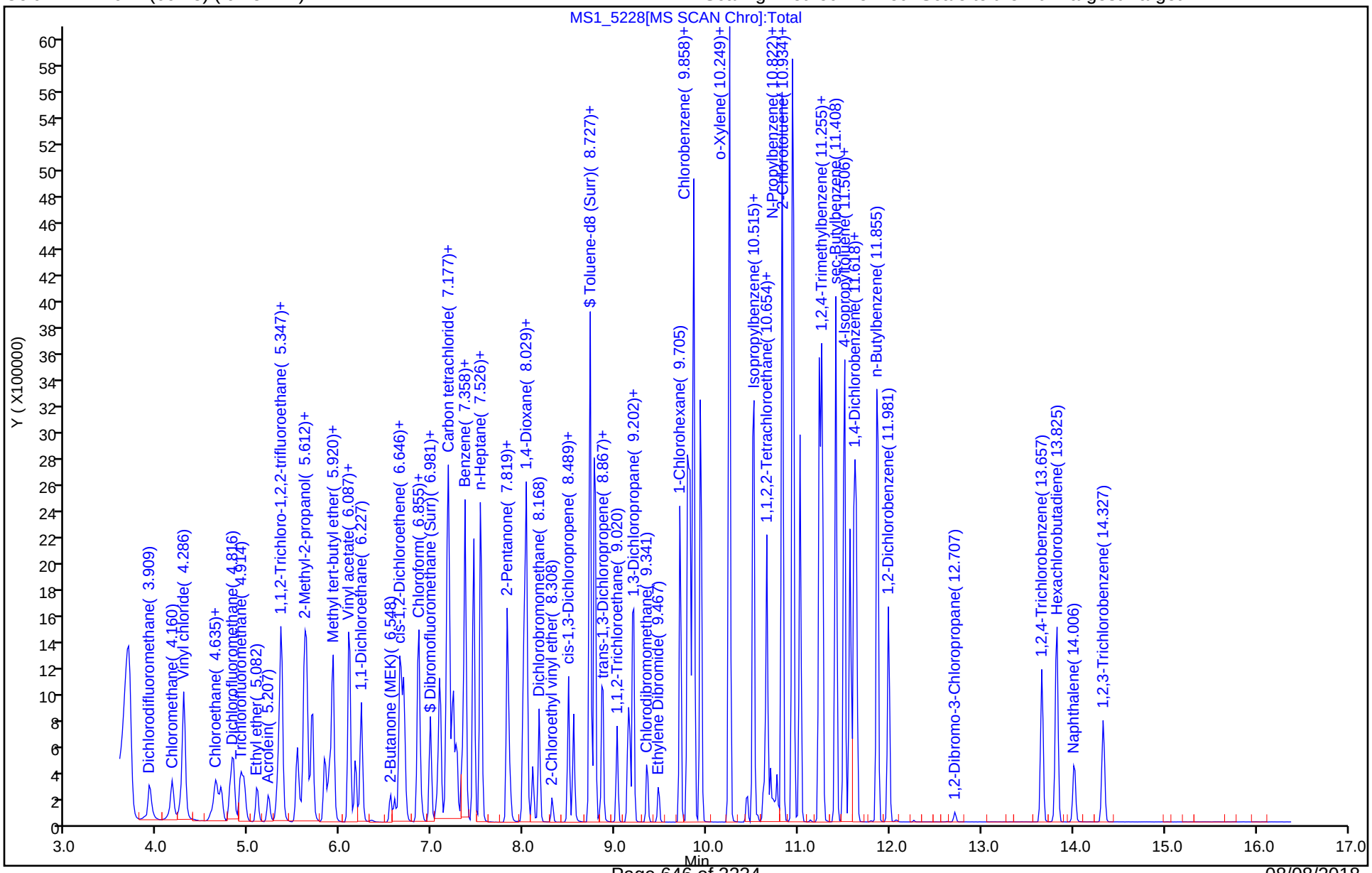
Lims ID: CCV Worklist Smp#: 2

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 11

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

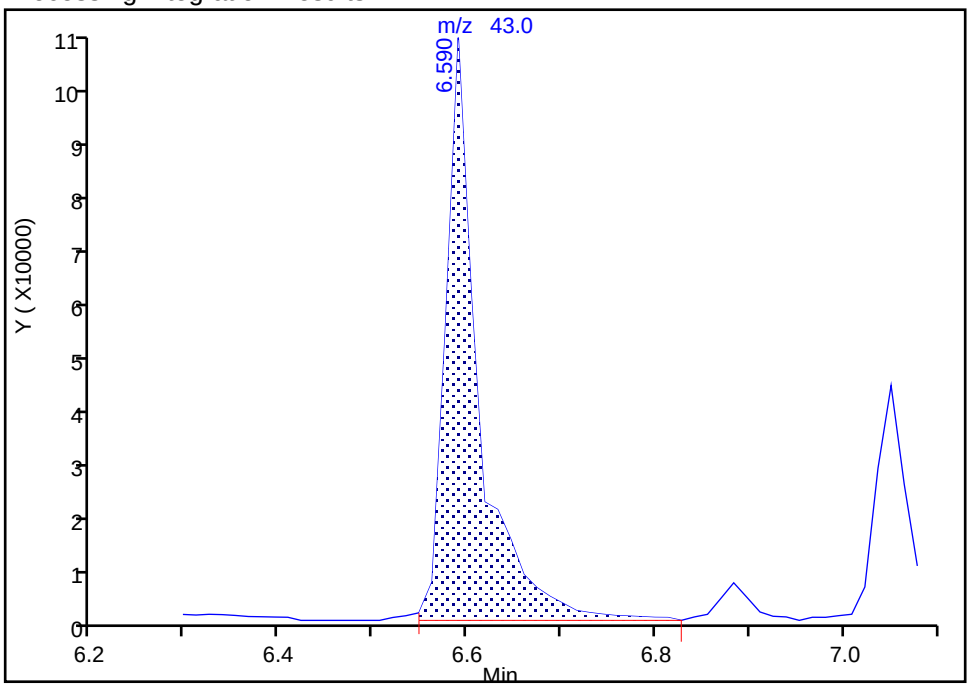
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D				
Injection Date:	06-Aug-2018 07:47:30	Instrument ID:	VMS_MS1		
Lims ID:	CCV				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	11	Worklist Smp#:	2
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

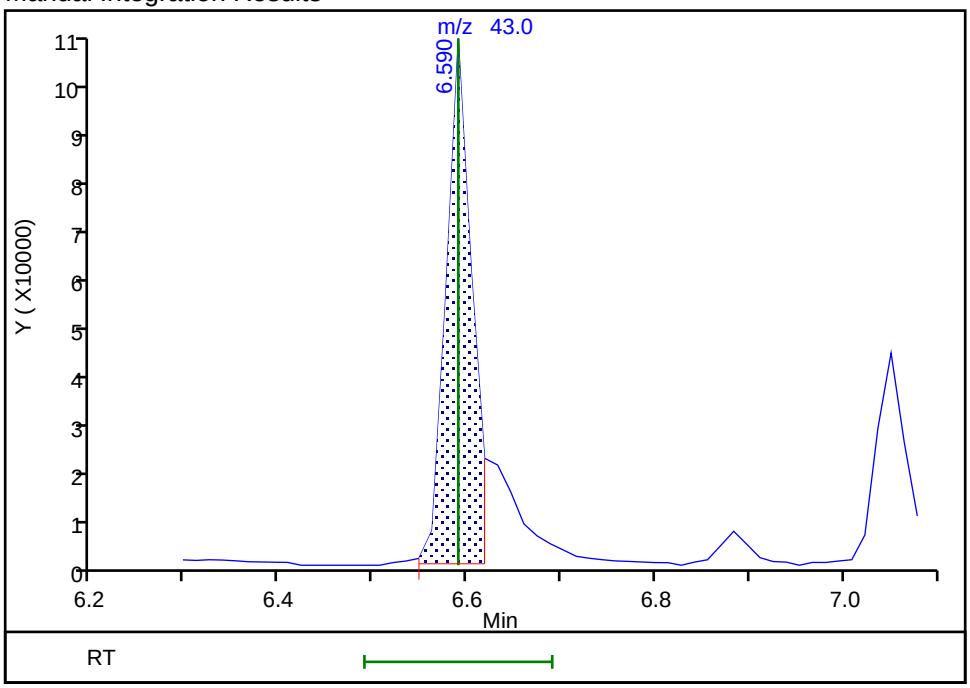
Processing Integration Results

RT: 6.59
Area: 263926
Amount: 48.697233
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 207966
Amount: 38.372001
Amount Units: ug/l



Reviewer: wickhamt, 06-Aug-2018 08:08:25
Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 280-424938/2 Calibration Date: 08/06/2018 07:47

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 13:37

Lab File ID: MS1_5228.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dibromofluoromethane (Surr)	Ave	0.2160	0.2304		0.0131	0.0123	6.7	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.1835	0.1874		0.0125	0.0123	2.1	20.0
Toluene-d8 (Surr)	Ave	4.811	5.203		0.0132	0.0123	8.1	20.0
4-Bromofluorobenzene (Surr)	Ave	1.117	1.071		0.0117	0.0123	-4.1	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 06-Aug-2018 07:47:30 ALS Bottle#: 11 Worklist Smp#: 2
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccv m
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:53 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 08:25:12

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	88	171503	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2111006	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	444184	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	661102	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	476672	12.3	13.1	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.260	0.000	99	387600	12.3	12.5	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2264865	12.3	13.2	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	693735	12.3	11.7	
24 Dichlorodifluoromethane	85	3.909	3.909	0.000	100	496092	10.0	10.4	
26 Chloromethane	50	4.160	4.160	0.000	99	573788	10.0	9.87	
27 Vinyl chloride	62	4.286	4.286	0.000	98	590524	10.0	10.6	
29 Bromomethane	94	4.635	4.635	0.000	91	400976	10.0	9.85	
31 Chloroethane	64	4.691	4.691	0.000	100	397736	10.0	9.78	
32 Dichlorofluoromethane	67	4.816	4.816	0.000	98	945530	10.0	10.4	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	711834	10.0	9.97	
36 Ethyl ether	59	5.082	5.082	0.000	93	196079	10.0	9.33	
39 Acrolein	56	5.207	5.207	0.000	100	241564	100.0	96.3	
40 Acetone	43	5.305	5.305	0.000	100	143541	40.0	41.8	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.333	0.000	98	328761	10.0	10.1	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	443883	10.0	9.76	
45 Iodomethane	142	5.529	5.529	0.000	99	694406	10.0	9.91	
46 Methyl acetate	43	5.543	5.543	0.000	97	178489	20.0	17.7	
47 3-Chloro-1-propene	41	5.598	5.598	0.000	89	843598	10.0	9.93	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2000747	10.0	9.86	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	85461	100.0	102.3	
50 Methylene Chloride	84	5.696	5.696	0.000	94	431987	10.0	10.3	
51 Acrylonitrile	53	5.822	5.822	0.000	98	487561	100.0	96.7	
52 Methyl tert-butyl ether	73	5.878	5.878	0.000	96	537458	10.0	9.63	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	508525	10.0	9.97	
54 Hexane	57	6.087	6.087	0.000	93	825593	10.0	9.12	
55 Vinyl acetate	43	6.157	6.157	0.000	97	742773	20.0	20.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	910979	10.0	10.3	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	207966	40.0	38.4	M
62 sec-Butyl Alcohol	45	6.632	6.632	0.000	96	222530	300.0	283.7	
64 cis-1,2-Dichloroethene	96	6.646	6.646	0.000	84	512445	10.0	9.97	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	739687	10.0	10.3	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	152372	10.0	10.0	
68 Chloroform	83	6.855	6.855	0.000	95	801691	10.0	10.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	87	64680	20.0	16.6	
70 Isobutyl alcohol	41	7.051	7.051	0.000	92	85206	250.0	266.7	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	763220	10.0	10.4	
72 Cyclohexane	56	7.163	7.163	0.000	0	961860	10.0	9.75	
73 1,1-Dichloropropene	75	7.177	7.177	0.000	97	733650	10.0	10.2	
74 Carbon tetrachloride	117	7.232	7.232	0.000	98	633689	10.0	10.2	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	387841	10.0	10.2	
77 Benzene	78	7.358	7.358	0.000	97	2006543	10.0	10.2	
9 n-Heptane	43	7.456	7.456	0.000	92	873851	10.0	9.89	
79 Trichloroethene	95	7.819	7.819	0.000	97	507283	10.0	10.2	
80 2-Pentanone	43	7.847	7.847	0.000	99	336778	40.0	35.8	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	443603	10.0	9.98	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	789142	10.0	10.0	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	25092	200.0	201.3	
85 Dibromomethane	93	8.098	8.098	0.000	95	148536	10.0	10.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	484308	10.0	10.3	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	75103	10.0	10.2	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	543062	10.0	9.65	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	500343	40.0	41.7	
91 Toluene	91	8.769	8.769	0.000	99	2069771	10.0	10.4	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	204468	10.0	8.54	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	391016	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	188995	10.0	9.62	
95 2-Hexanone	43	9.132	9.132	0.000	96	315754	40.0	39.2	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	374388	10.0	9.51	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	387826	10.0	9.89	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	225354	10.0	9.62	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	173874	10.0	9.47	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	705938	10.0	9.57	
102 Chlorobenzene	112	9.816	9.816	0.000	94	1162123	10.0	9.87	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	362598	10.0	10.0	
104 Ethylbenzene	106	9.858	9.858	0.000	98	754848	10.0	10.0	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	899170	10.0	9.91	
106 Styrene	104	10.249	10.249	0.000	85	1245265	10.0	10.2	
109 o-Xylene	106	10.249	10.249	0.000	89	843028	10.0	10.0	
107 Bromoform	173	10.445	10.445	0.000	97	96747	10.0	8.95	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	2349978	10.0	9.39	
111 Cyclohexanone	55	10.626	10.626	0.000	92	138604	400.0	386.8	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	188492	10.0	8.81	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	89	40785	10.0	7.88	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	52504	10.0	9.23	
116 Bromobenzene	156	10.822	10.822	0.000	52	424088	10.0	9.42	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	663012	10.0	9.36	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1985764	10.0	9.57	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	538914	10.0	9.68	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	516605	10.0	9.40	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1922580	10.0	9.46	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1962735	10.0	9.61	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	529908	10.0	9.57	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	2184939	10.0	9.60	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	927667	10.0	9.58	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	882694	10.0	9.55	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2213244	10.0	9.77	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	700843	10.0	9.35	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	20601	10.0	7.48	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	454991	10.0	9.28	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	384624	10.0	9.51	
132 Naphthalene	128	14.006	14.006	0.000	97	485187	10.0	8.22	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	323133	10.0	9.09	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.9	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.9	
S 134 Trihalomethanes, Total	1				0		40.0	39.2	
S 139 Xylenes, Total (URS)	1				0		20.0	19.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.9	
S 138 Xylenes, Total	106				0		20.0	19.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D

Injection Date: 06-Aug-2018 07:47:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

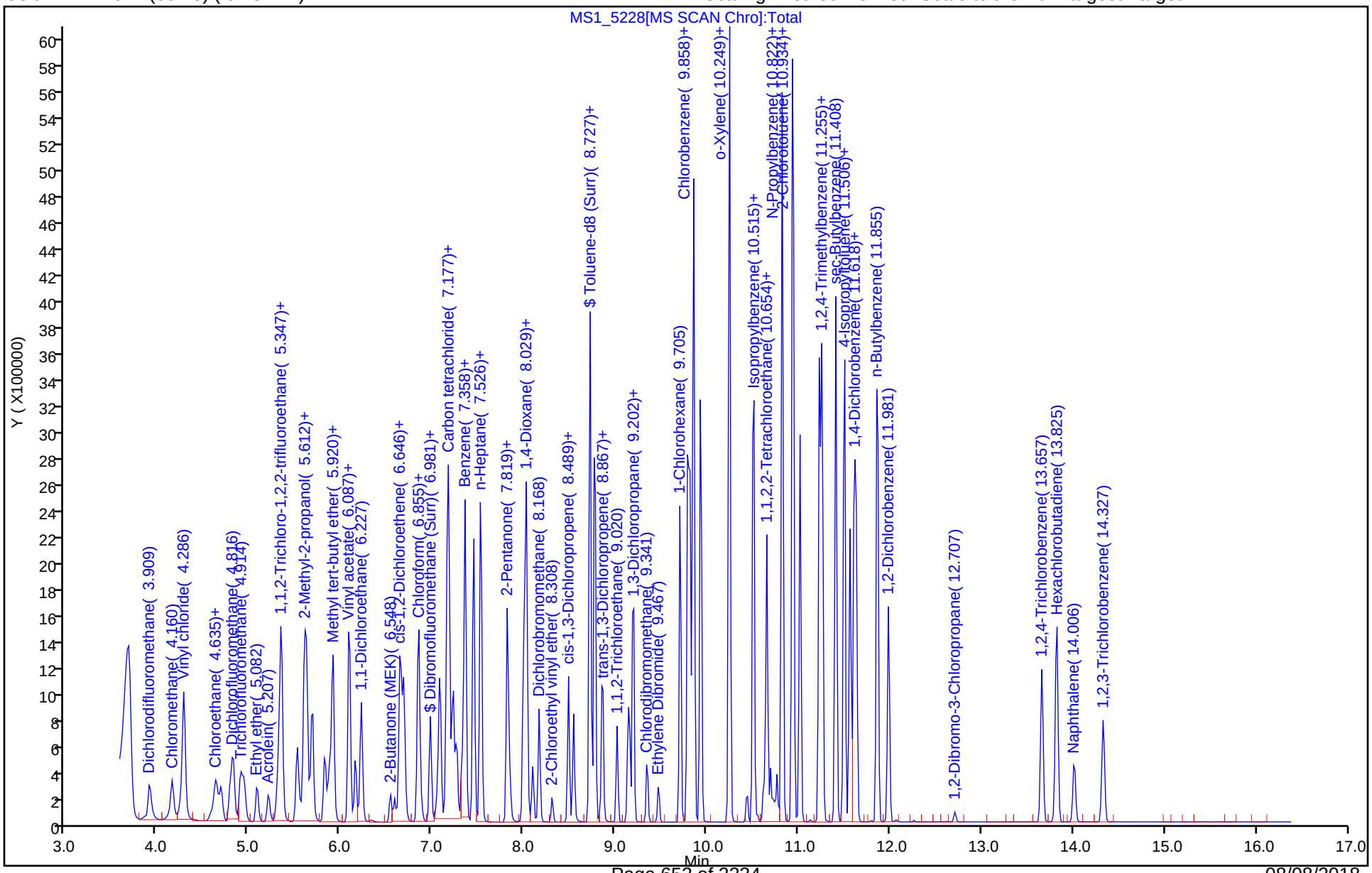
Lims ID: CCV Worklist Smp#: 2

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 11

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVC 280-424938/33 Calibration Date: 08/06/2018 16:15

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5253.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2832	0.2064		0.00729	0.0100	-27.1	50.0
Chloromethane	Ave	0.3441	0.2981	0.1000	0.00866	0.0100	-13.4	50.0
Vinyl chloride	Ave	0.3302	0.2879		0.00872	0.0100	-12.8	50.0
Bromomethane	Ave	0.2412	0.2256		0.00935	0.0100	-6.5	50.0
Chloroethane	Ave	0.2408	0.2154		0.00894	0.0100	-10.6	50.0
Trichlorofluoromethane	Ave	0.4226	0.3298		0.00780	0.0100	-22.0	50.0
Acetone	Lin2		0.0226		0.0446	0.0400	11.6	50.0
1,1-Dichloroethene	Ave	0.2694	0.2328		0.00864	0.0100	-13.6	50.0
Carbon disulfide	Ave	1.201	1.073		0.00893	0.0100	-10.7	50.0
Methylene Chloride	Lin2		0.2622		0.0106	0.0100	6.0	50.0
Methyl tert-butyl ether	Ave	0.3304	0.3396		0.0103	0.0100	2.8	50.0
trans-1,2-Dichloroethene	Ave	0.3021	0.2865		0.00948	0.0100	-5.2	50.0
1,1-Dichloroethane	Ave	0.5259	0.5255	0.1000	0.00999	0.0100	-0.0	50.0
2-Butanone (MEK)	Ave	0.0321	0.0324		0.0404	0.0400	1.0	50.0
cis-1,2-Dichloroethene	Ave	0.3042	0.3011		0.00990	0.0100	-1.0	50.0
2,2-Dichloropropane	Ave	0.4270	0.3806		0.00891	0.0100	-10.9	50.0
Bromochloromethane	Ave	0.0901	0.0931		0.0103	0.0100	3.3	50.0
Chloroform	Ave	0.4592	0.4696		0.0102	0.0100	2.3	50.0
1,1,1-Trichloroethane	Ave	0.4345	0.4027		0.00927	0.0100	-7.3	50.0
1,1-Dichloropropene	Ave	0.4246	0.3802		0.00895	0.0100	-10.5	50.0
Carbon tetrachloride	Ave	0.3689	0.3215		0.00872	0.0100	-12.8	50.0
1,2-Dichloroethane	Ave	0.2252	0.2360		0.0105	0.0100	4.8	50.0
Benzene	Ave	1.166	1.144		0.00981	0.0100	-1.9	50.0
Trichloroethene	Ave	0.2946	0.2763		0.00938	0.0100	-6.2	50.0
1,2-Dichloropropane	Ave	0.2632	0.2600		0.00988	0.0100	-1.2	50.0
Dibromomethane	Ave	0.0878	0.0910		0.0104	0.0100	3.6	50.0
Bromodichloromethane	Ave	0.2797	0.2813		0.0101	0.0100	0.6	50.0
cis-1,3-Dichloropropene	Ave	1.583	1.443		0.00911	0.0100	-8.9	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.0711	0.0789		0.0444	0.0400	11.0	50.0
Toluene	Ave	1.183	1.157		0.00978	0.0100	-2.2	50.0
trans-1,3-Dichloropropene	Ave	0.2267	0.2316		0.0102	0.0100	2.2	50.0
1,1,2-Trichloroethane	Ave	0.1163	0.1189		0.0102	0.0100	2.2	50.0
2-Hexanone	Ave	0.2264	0.2313		0.0409	0.0400	2.1	50.0
1,3-Dichloropropane	Ave	1.108	1.074		0.00969	0.0100	-3.1	50.0
Tetrachloroethene	Ave	1.104	0.9159		0.00830	0.0100	-17.0	50.0
Dibromochloromethane	Ave	0.6590	0.6250		0.00948	0.0100	-5.2	50.0
1,2-Dibromoethane (EDB)	Ave	0.5164	0.4936		0.00956	0.0100	-4.4	50.0
Chlorobenzene	Ave	3.313	3.033	0.3000	0.00915	0.0100	-8.5	50.0
1,1,1,2-Tetrachloroethane	Ave	1.015	0.9580		0.00944	0.0100	-5.6	50.0
Ethylbenzene	Ave	2.121	1.878		0.00885	0.0100	-11.5	50.0
m-Xylene & p-Xylene	Ave	2.553	2.228		0.00873	0.0100	-12.7	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVC 280-424938/33 Calibration Date: 08/06/2018 16:15

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5253.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
o-Xylene	Ave	2.369	2.179		0.00920	0.0100	-8.0	50.0
Styrene	Ave	3.443	3.254		0.00945	0.0100	-5.5	50.0
Bromoform	Lin2		0.2700	0.1000	0.00888	0.0100	-11.2	50.0
Isopropylbenzene	Ave	4.733	3.833		0.00810	0.0100	-19.0	50.0
1,1,2,2-Tetrachloroethane	Ave	0.4045	0.3787	0.3000	0.00936	0.0100	-6.4	50.0
1,2,3-Trichloropropane	Ave	0.1076	0.1042		0.00969	0.0100	-3.1	50.0
Bromobenzene	Ave	0.8515	0.7798		0.00916	0.0100	-8.4	50.0
N-Propylbenzene	Ave	1.339	1.064		0.00795	0.0100	-20.5	50.0
1,3,5-Trimethylbenzene	Ave	3.923	3.317		0.00846	0.0100	-15.4	50.0
2-Chlorotoluene	Ave	1.053	0.9299		0.00883	0.0100	-11.7	50.0
4-Chlorotoluene	Ave	1.040	0.8879		0.00854	0.0100	-14.6	50.0
tert-Butylbenzene	Ave	3.842	3.107		0.00809	0.0100	-19.1	50.0
1,2,4-Trimethylbenzene	Ave	3.860	3.315		0.00859	0.0100	-14.1	50.0
sec-Butylbenzene	Ave	1.047	0.8087		0.00772	0.0100	-22.8	50.0
4-Isopropyltoluene	Ave	4.301	3.460		0.00805	0.0100	-19.5	50.0
1,3-Dichlorobenzene	Ave	1.832	1.633		0.00891	0.0100	-10.9	50.0
1,4-Dichlorobenzene	Ave	1.747	1.573		0.00900	0.0100	-10.0	50.0
n-Butylbenzene	Ave	4.282	3.354		0.00783	0.0100	-21.7	50.0
1,2-Dichlorobenzene	Ave	1.417	1.311		0.00925	0.0100	-7.5	50.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0425		0.00812	0.0100	-18.8	50.0
1,2,4-Trichlorobenzene	Ave	0.9266	0.8483		0.00915	0.0100	-8.5	50.0
Hexachlorobutadiene	Ave	0.7646	0.5673		0.00742	0.0100	-25.8	50.0
Naphthalene	Ave	1.117	1.029		0.00921	0.0100	-7.9	50.0
1,2,3-Trichlorobenzene	Ave	0.6725	0.6390		0.00950	0.0100	-5.0	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D
Lims ID: ccvc
Client ID:
Sample Type: CCVC
Inject. Date: 06-Aug-2018 16:15:30 ALS Bottle#: 36 Worklist Smp#: 33
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccvc
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:50 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 07-Aug-2018 06:52:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.584	0.001	87	177062	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2067090	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	446910	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	648746	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	459434	12.3	12.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	392953	12.3	12.9	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2129743	12.3	12.4	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	666021	12.3	11.5	
24 Dichlorodifluoromethane	85	3.923	3.923	0.001	100	341261	10.0	7.29	
26 Chloromethane	50	4.174	4.160	0.014	99	493001	10.0	8.66	
27 Vinyl chloride	62	4.300	4.286	0.014	98	476067	10.0	8.72	
29 Bromomethane	94	4.649	4.635	0.014	91	373053	10.0	9.35	
31 Chloroethane	64	4.705	4.691	0.014	100	356154	10.0	8.94	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	855808	10.0	9.64	
33 Trichlorofluoromethane	101	4.942	4.914	0.028	100	545300	10.0	7.80	
36 Ethyl ether	59	5.096	5.096	0.000	93	210141	10.0	10.2	
39 Acrolein	56	5.221	5.221	0.000	100	245148	100.0	99.8	
40 Acetone	43	5.319	5.319	0.000	100	149730	40.0	44.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	256128	10.0	8.07	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	384891	10.0	8.64	
45 Iodomethane	142	5.529	5.529	0.000	100	672408	10.0	9.80	
46 Methyl acetate	43	5.557	5.557	0.000	97	195624	20.0	19.8	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	798694	10.0	9.60	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1773890	10.0	8.93	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	93977	100.0	109.0	
50 Methylene Chloride	84	5.696	5.696	0.000	95	433619	10.0	10.6	
51 Acrylonitrile	53	5.836	5.836	0.000	98	518502	100.0	105.0	
52 Methyl tert-butyl ether	73	5.892	5.878	0.014	97	561603	10.0	10.3	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	473767	10.0	9.48	
54 Hexane	57	6.101	6.101	0.000	92	614041	10.0	6.74	
55 Vinyl acetate	43	6.171	6.157	0.014	97	763382	20.0	21.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	869044	10.0	10.0	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	214467	40.0	40.4	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	250975	300.0	309.9	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	82	497886	10.0	9.90	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	93	629456	10.0	8.91	
67 Chlorobromomethane	128	6.842	6.841	0.001	93	154010	10.0	10.3	
68 Chloroform	83	6.855	6.855	0.000	95	776626	10.0	10.2	
69 Tetrahydrofuran	42	6.883	6.883	0.000	88	73098	20.0	19.3	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	93164	250.0	282.4	
71 1,1,1-Trichloroethane	97	7.093	7.079	0.014	99	665975	10.0	9.27	
72 Cyclohexane	56	7.163	7.163	0.000	0	746129	10.0	7.73	
73 1,1-Dichloropropene	75	7.191	7.177	0.014	97	628715	10.0	8.95	
74 Carbon tetrachloride	117	7.233	7.233	0.001	97	531592	10.0	8.72	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	390195	10.0	10.5	
77 Benzene	78	7.358	7.358	0.000	97	1891810	10.0	9.81	
9 n-Heptane	43	7.456	7.456	0.000	92	646461	10.0	7.47	
79 Trichloroethene	95	7.819	7.819	0.000	98	456821	10.0	9.38	
80 2-Pentanone	43	7.847	7.847	0.000	99	373346	40.0	40.5	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	429933	10.0	9.88	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	587300	10.0	7.61	
84 1,4-Dioxane	88	8.057	8.057	0.000	95	28259	200.0	231.6	
85 Dibromomethane	93	8.098	8.098	0.000	95	150519	10.0	10.4	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	465172	10.0	10.1	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	79696	10.0	11.0	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	515885	10.0	9.11	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	522101	40.0	44.4	
91 Toluene	91	8.783	8.769	0.014	98	1912864	10.0	9.78	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	221395	10.0	9.19	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	383027	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	196606	10.0	10.2	
95 2-Hexanone	43	9.132	9.132	0.000	97	330722	40.0	40.9	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	383992	10.0	9.69	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	327471	10.0	8.30	
98 Chlorodibromomethane	129	9.355	9.341	0.014	90	223455	10.0	9.48	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	176474	10.0	9.56	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	538949	10.0	7.27	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1084224	10.0	9.15	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	342523	10.0	9.44	
104 Ethylbenzene	106	9.858	9.858	0.000	98	671445	10.0	8.85	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	796652	10.0	8.73	
106 Styrene	104	10.249	10.249	0.000	86	1163550	10.0	9.45	
109 o-Xylene	106	10.249	10.249	0.000	89	779091	10.0	9.20	
107 Bromoform	173	10.445	10.445	0.000	96	96529	10.0	8.88	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1989230	10.0	8.10	
111 Cyclohexanone	55	10.626	10.626	0.000	92	153231	400.0	425.0	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	96	196525	10.0	9.36	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	87	45226	10.0	8.91	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	54067	10.0	9.69	
116 Bromobenzene	156	10.822	10.822	0.000	55	404736	10.0	9.16	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	552272	10.0	7.95	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1721529	10.0	8.46	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	482602	10.0	8.83	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	460828	10.0	8.54	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1612438	10.0	8.09	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1720230	10.0	8.59	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	419713	10.0	7.72	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	1795928	10.0	8.05	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	847508	10.0	8.91	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	816127	10.0	9.00	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	1740711	10.0	7.83	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	680422	10.0	9.25	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	22033	10.0	8.12	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	440244	10.0	9.15	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	294440	10.0	7.42	
132 Naphthalene	128	14.020	14.006	0.014	97	533806	10.0	9.21	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	331662	10.0	9.50	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.4	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.4	
S 134 Trihalomethanes, Total	1				0		40.0	38.6	
S 137 Total BTEX	1				0			46.4	
S 139 Xylenes, Total (URS)	1				0		20.0	17.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.3	
S 138 Xylenes, Total	106				0		20.0	17.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

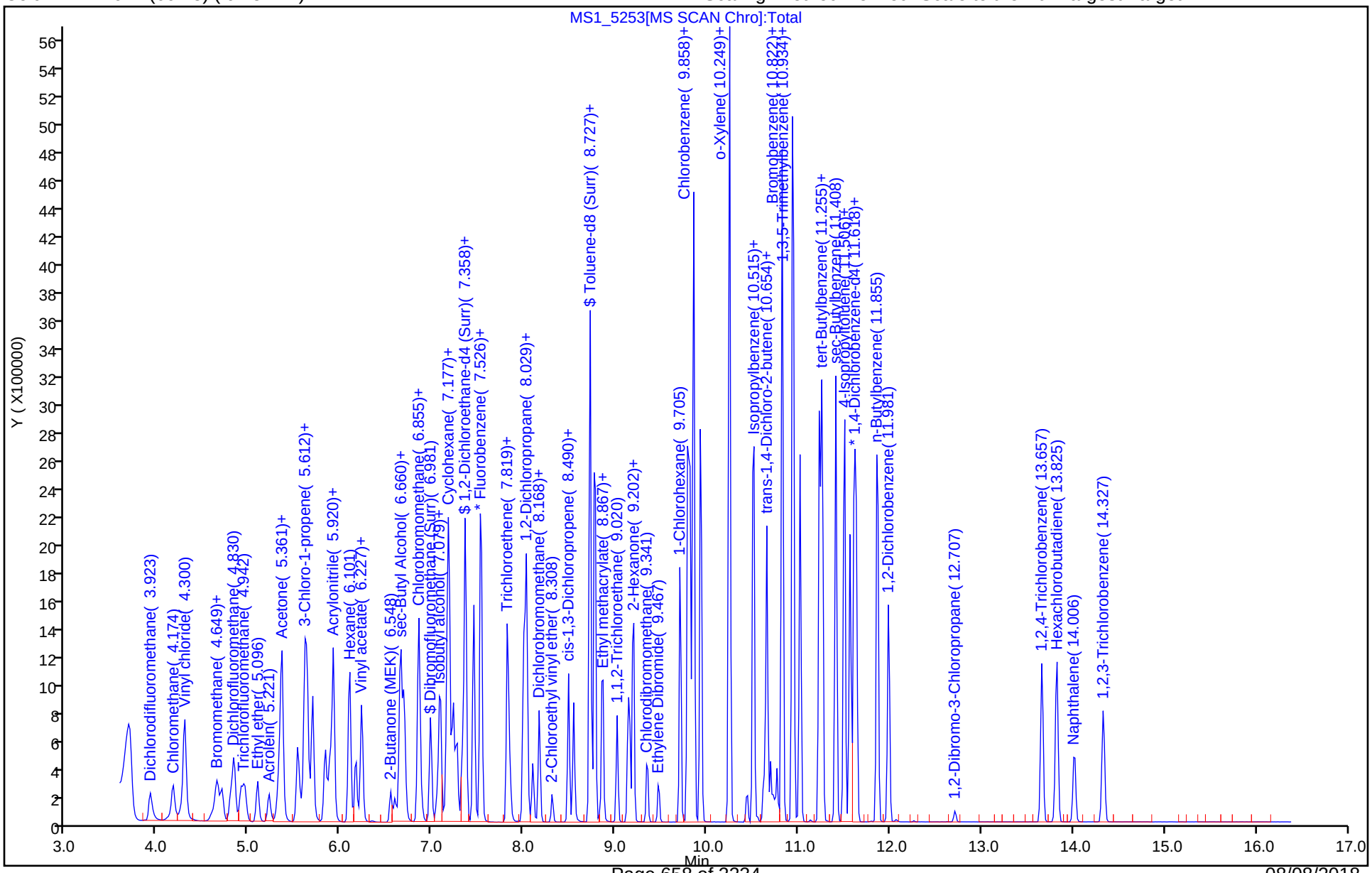
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D				
Injection Date:	06-Aug-2018 16:15:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	ccvc			Worklist Smp#:	33
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	36
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

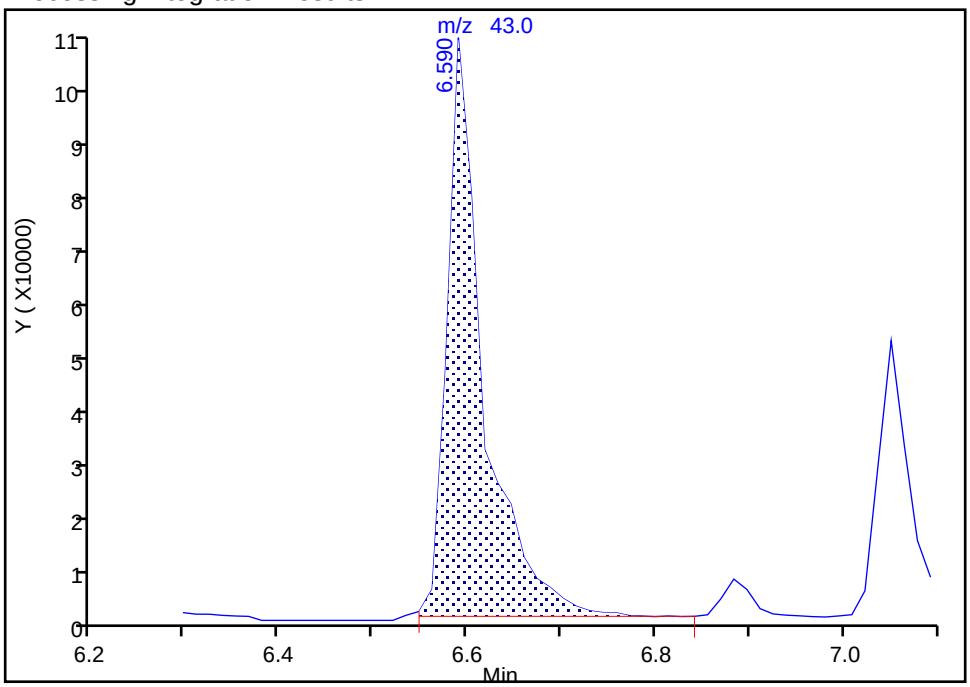
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D				
Injection Date:	06-Aug-2018 16:15:30	Instrument ID:	VMS_MS1		
Lims ID:	ccvc				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	36	Worklist Smp#:	33
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

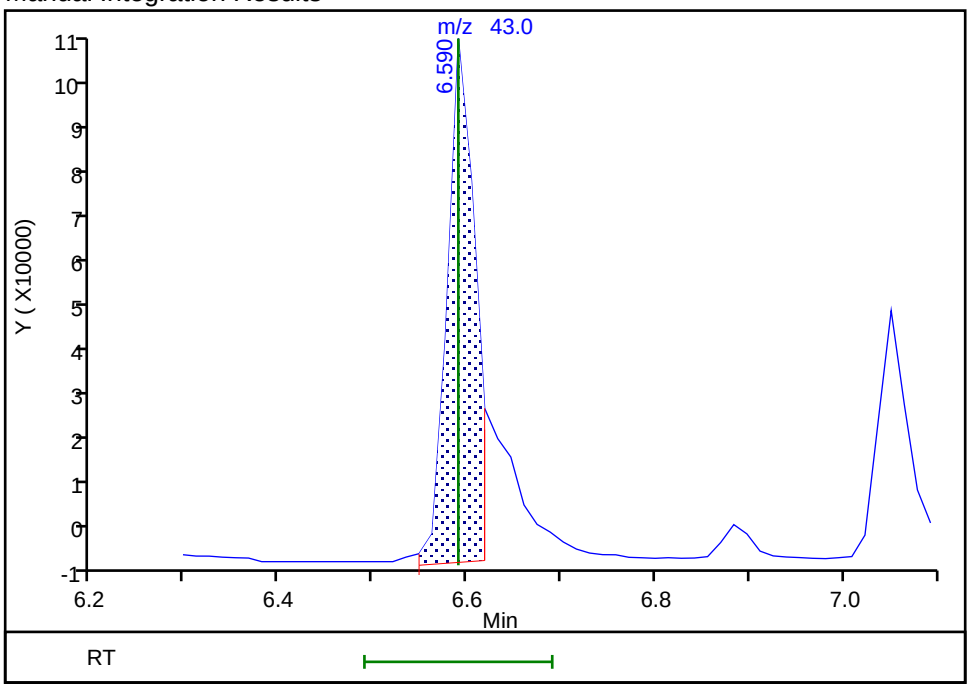
Processing Integration Results

RT: 6.59
Area: 269759
Amount: 50.830939
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 214467
Amount: 40.412216
Amount Units: ug/l



Reviewer: wickhamt, 07-Aug-2018 06:52:02

Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVC 280-424938/33 Calibration Date: 08/06/2018 16:15

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 13:37

Lab File ID: MS1_5253.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dibromofluoromethane (Surr)	Ave	0.2160	0.2268		0.0129	0.0123	5.0	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.1835	0.1940		0.0129	0.0123	5.7	50.0
Toluene-d8 (Surr)	Ave	4.811	4.863		0.0124	0.0123	1.1	50.0
4-Bromofluorobenzene (Surr)	Ave	1.117	1.048		0.0115	0.0123	-6.2	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D
Lims ID: ccvc
Client ID:
Sample Type: CCVC
Inject. Date: 06-Aug-2018 16:15:30 ALS Bottle#: 36 Worklist Smp#: 33
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccvc
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:50 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 07-Aug-2018 06:52:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.584	0.001	87	177062	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2067090	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	446910	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	648746	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	459434	12.3	12.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	392953	12.3	12.9	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2129743	12.3	12.4	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	666021	12.3	11.5	
24 Dichlorodifluoromethane	85	3.923	3.923	0.001	100	341261	10.0	7.29	
26 Chloromethane	50	4.174	4.160	0.014	99	493001	10.0	8.66	
27 Vinyl chloride	62	4.300	4.286	0.014	98	476067	10.0	8.72	
29 Bromomethane	94	4.649	4.635	0.014	91	373053	10.0	9.35	
31 Chloroethane	64	4.705	4.691	0.014	100	356154	10.0	8.94	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	855808	10.0	9.64	
33 Trichlorofluoromethane	101	4.942	4.914	0.028	100	545300	10.0	7.80	
36 Ethyl ether	59	5.096	5.096	0.000	93	210141	10.0	10.2	
39 Acrolein	56	5.221	5.221	0.000	100	245148	100.0	99.8	
40 Acetone	43	5.319	5.319	0.000	100	149730	40.0	44.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	256128	10.0	8.07	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	384891	10.0	8.64	
45 Iodomethane	142	5.529	5.529	0.000	100	672408	10.0	9.80	
46 Methyl acetate	43	5.557	5.557	0.000	97	195624	20.0	19.8	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	798694	10.0	9.60	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1773890	10.0	8.93	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	93977	100.0	109.0	
50 Methylene Chloride	84	5.696	5.696	0.000	95	433619	10.0	10.6	
51 Acrylonitrile	53	5.836	5.836	0.000	98	518502	100.0	105.0	
52 Methyl tert-butyl ether	73	5.892	5.878	0.014	97	561603	10.0	10.3	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	473767	10.0	9.48	
54 Hexane	57	6.101	6.101	0.000	92	614041	10.0	6.74	
55 Vinyl acetate	43	6.171	6.157	0.014	97	763382	20.0	21.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	869044	10.0	10.0	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	214467	40.0	40.4	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	250975	300.0	309.9	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	82	497886	10.0	9.90	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	93	629456	10.0	8.91	
67 Chlorobromomethane	128	6.842	6.841	0.001	93	154010	10.0	10.3	
68 Chloroform	83	6.855	6.855	0.000	95	776626	10.0	10.2	
69 Tetrahydrofuran	42	6.883	6.883	0.000	88	73098	20.0	19.3	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	93164	250.0	282.4	
71 1,1,1-Trichloroethane	97	7.093	7.079	0.014	99	665975	10.0	9.27	
72 Cyclohexane	56	7.163	7.163	0.000	0	746129	10.0	7.73	
73 1,1-Dichloropropene	75	7.191	7.177	0.014	97	628715	10.0	8.95	
74 Carbon tetrachloride	117	7.233	7.233	0.001	97	531592	10.0	8.72	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	390195	10.0	10.5	
77 Benzene	78	7.358	7.358	0.000	97	1891810	10.0	9.81	
9 n-Heptane	43	7.456	7.456	0.000	92	646461	10.0	7.47	
79 Trichloroethene	95	7.819	7.819	0.000	98	456821	10.0	9.38	
80 2-Pentanone	43	7.847	7.847	0.000	99	373346	40.0	40.5	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	429933	10.0	9.88	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	587300	10.0	7.61	
84 1,4-Dioxane	88	8.057	8.057	0.000	95	28259	200.0	231.6	
85 Dibromomethane	93	8.098	8.098	0.000	95	150519	10.0	10.4	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	465172	10.0	10.1	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	79696	10.0	11.0	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	515885	10.0	9.11	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	522101	40.0	44.4	
91 Toluene	91	8.783	8.769	0.014	98	1912864	10.0	9.78	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	221395	10.0	9.19	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	383027	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	196606	10.0	10.2	
95 2-Hexanone	43	9.132	9.132	0.000	97	330722	40.0	40.9	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	383992	10.0	9.69	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	327471	10.0	8.30	
98 Chlorodibromomethane	129	9.355	9.341	0.014	90	223455	10.0	9.48	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	176474	10.0	9.56	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	538949	10.0	7.27	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1084224	10.0	9.15	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	342523	10.0	9.44	
104 Ethylbenzene	106	9.858	9.858	0.000	98	671445	10.0	8.85	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	796652	10.0	8.73	
106 Styrene	104	10.249	10.249	0.000	86	1163550	10.0	9.45	
109 o-Xylene	106	10.249	10.249	0.000	89	779091	10.0	9.20	
107 Bromoform	173	10.445	10.445	0.000	96	96529	10.0	8.88	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1989230	10.0	8.10	
111 Cyclohexanone	55	10.626	10.626	0.000	92	153231	400.0	425.0	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	96	196525	10.0	9.36	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	87	45226	10.0	8.91	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	54067	10.0	9.69	
116 Bromobenzene	156	10.822	10.822	0.000	55	404736	10.0	9.16	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	552272	10.0	7.95	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1721529	10.0	8.46	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	482602	10.0	8.83	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	460828	10.0	8.54	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1612438	10.0	8.09	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1720230	10.0	8.59	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	419713	10.0	7.72	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	1795928	10.0	8.05	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	847508	10.0	8.91	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	816127	10.0	9.00	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	1740711	10.0	7.83	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	680422	10.0	9.25	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	22033	10.0	8.12	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	440244	10.0	9.15	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	294440	10.0	7.42	
132 Naphthalene	128	14.020	14.006	0.014	97	533806	10.0	9.21	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	331662	10.0	9.50	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.4	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.4	
S 134 Trihalomethanes, Total	1				0		40.0	38.6	
S 137 Total BTEX	1				0			46.4	
S 139 Xylenes, Total (URS)	1				0		20.0	17.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.3	
S 138 Xylenes, Total	106				0		20.0	17.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

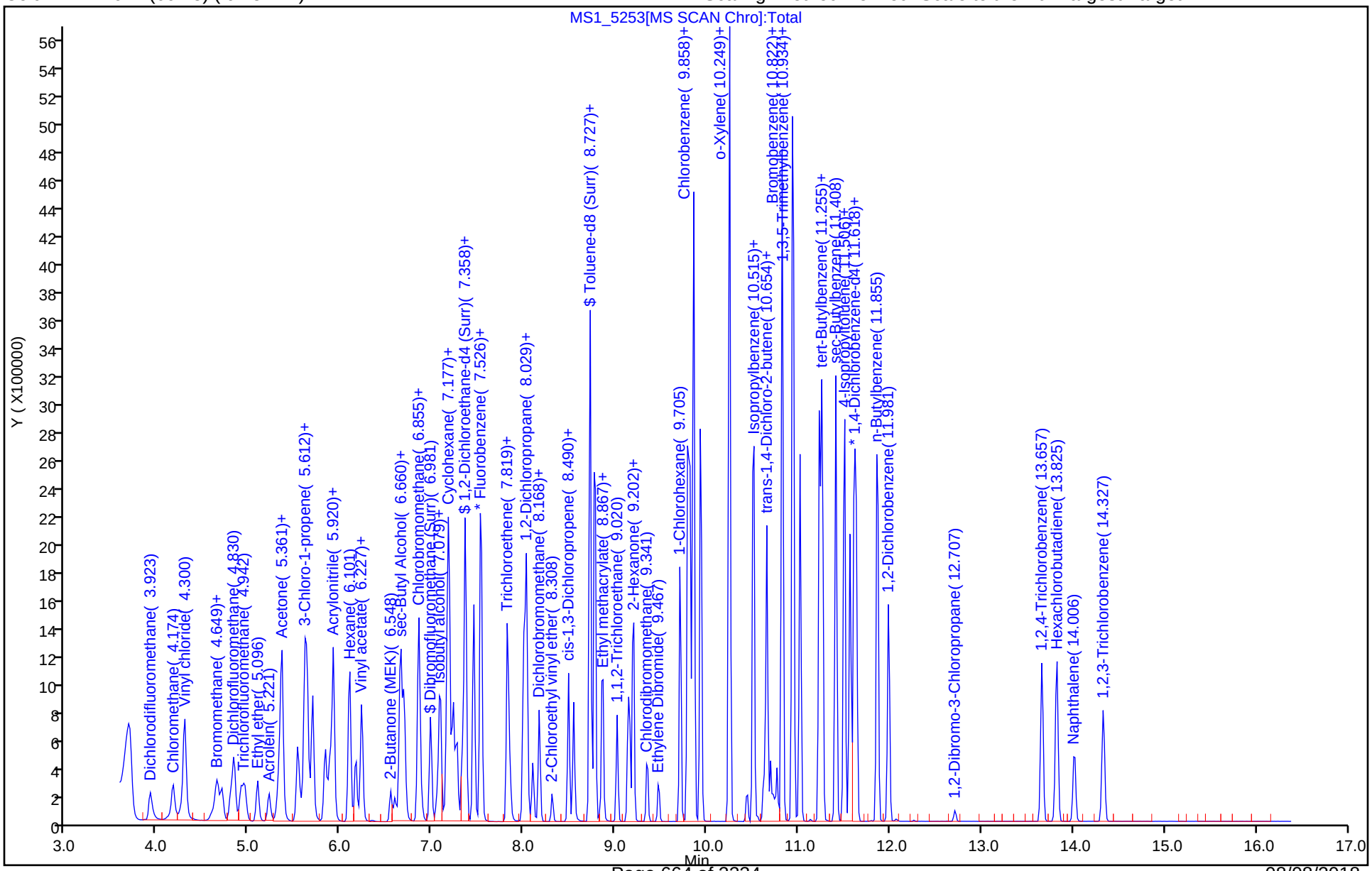
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D				
Injection Date:	06-Aug-2018 16:15:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	ccvc			Worklist Smp#:	33
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	36
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D				
Lims ID:	BFB				
Client ID:					
Sample Type:	BFB				
Inject. Date:	02-Aug-2018 07:34:30	ALS Bottle#:	100	Worklist Smp#:	1
Injection Vol:	1.0 uL	Dil. Factor:	1.0000		
Sample Info:	bfb				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	02-Aug-2018 13:05:09	Calib Date:	02-Aug-2018 10:54:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0314				
First Level Reviewer: wickhamt		Date:	02-Aug-2018 08:13:23		

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
$ 4 BFB	95	4.597	4.597	0.000	93	59992	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

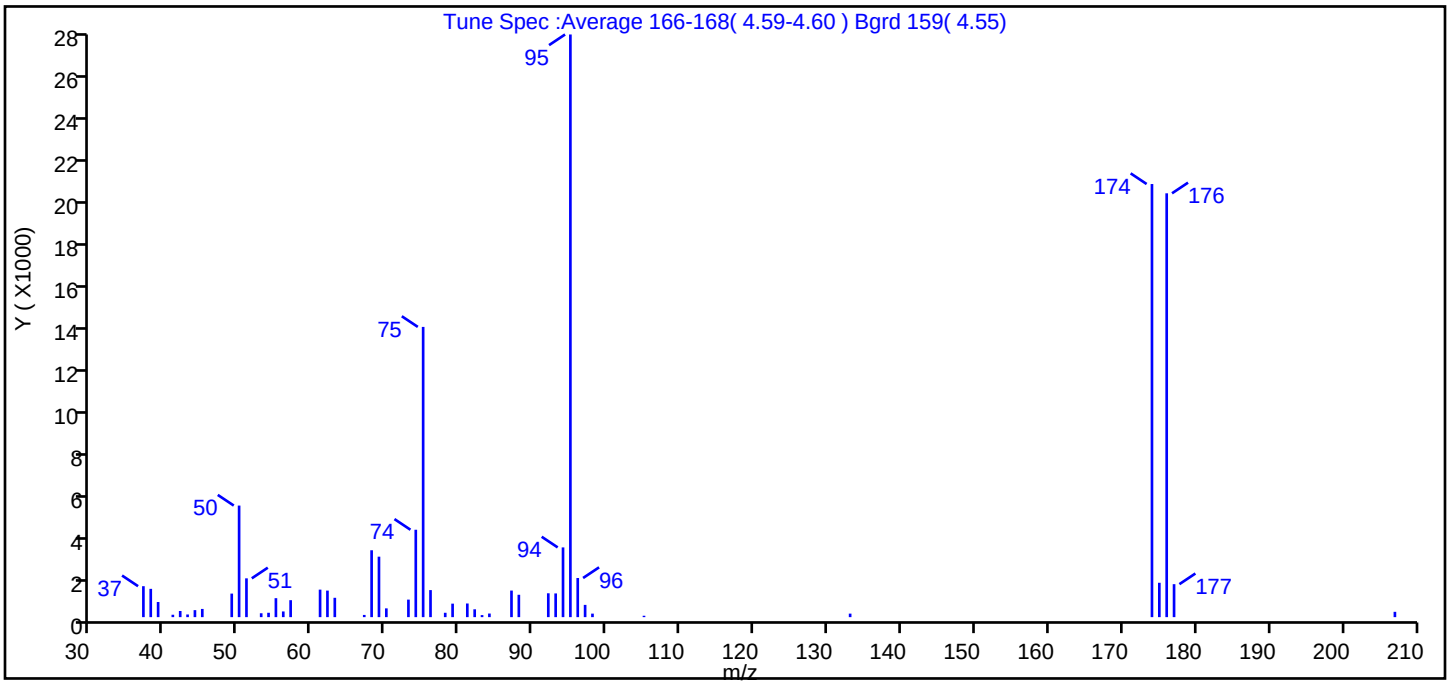
MV-BFB_00026 Amount Added: 1.00 Units: uL

MS Tune Report

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D
Injection Date: 02-Aug-2018 07:34:30 Instrument ID: VMS_MS1
Lims ID: BFB
Client ID:
Operator ID: wickhamt ALS Bottle#: 100 Worklist Smp#: 1
Injection Vol: 1.0 uL Dil. Factor: 1.0000
Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid
Tune Method: BFB Method 8260

$ 4 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base peak, 100% relative abundance	100.0
50	15 to 40% of m/z 95	19.1
75	30 to 60% of m/z 95	49.8
96	5 to 9% of m/z 95	6.7
173	Less than 2% of m/z 174	0.0 (0.0)
174	50 to 120% of m/z 95	74.3
175	5 to 9% of m/z 174	5.9 (7.9)
176	Greater than 95% but less than 101% of m/z 174	72.7 (97.9)
177	5 to 9% of m/z 176	5.7 (7.8)

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D\AQ_VMS1_8260.rslt\spectra.
Injection Date: 02-Aug-2018 07:34:30
Spectrum: Tune Spec :Average 166-168(4.59-4.60) Bgrd 159(4.55)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 49

m/z	Y	m/z	Y	m/z	Y	m/z	Y
37.00	1467	55.00	899	76.00	1282	96.00	1855
38.00	1341	56.00	270	78.00	207	97.00	581
39.00	717	57.00	804	79.00	640	98.00	167
41.00	114	61.00	1304	81.00	647	105.00	66
42.00	291	62.00	1258	82.00	372	133.00	167
43.00	126	63.00	917	83.00	97	174.00	20528
44.00	332	67.00	105	84.00	171	175.00	1629
45.00	389	68.00	3170	87.00	1260	176.00	20088
49.00	1116	69.00	2866	88.00	1060	177.00	1563
50.00	5288	70.00	416	92.00	1131	207.00	252
51.00	1839	73.00	831	93.00	1124		
53.00	184	74.00	4142	94.00	3305		
54.00	207	75.00	13756	95.00	27616		

Report Date: 02-Aug-2018 13:05:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D

Injection Date: 02-Aug-2018 07:34:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

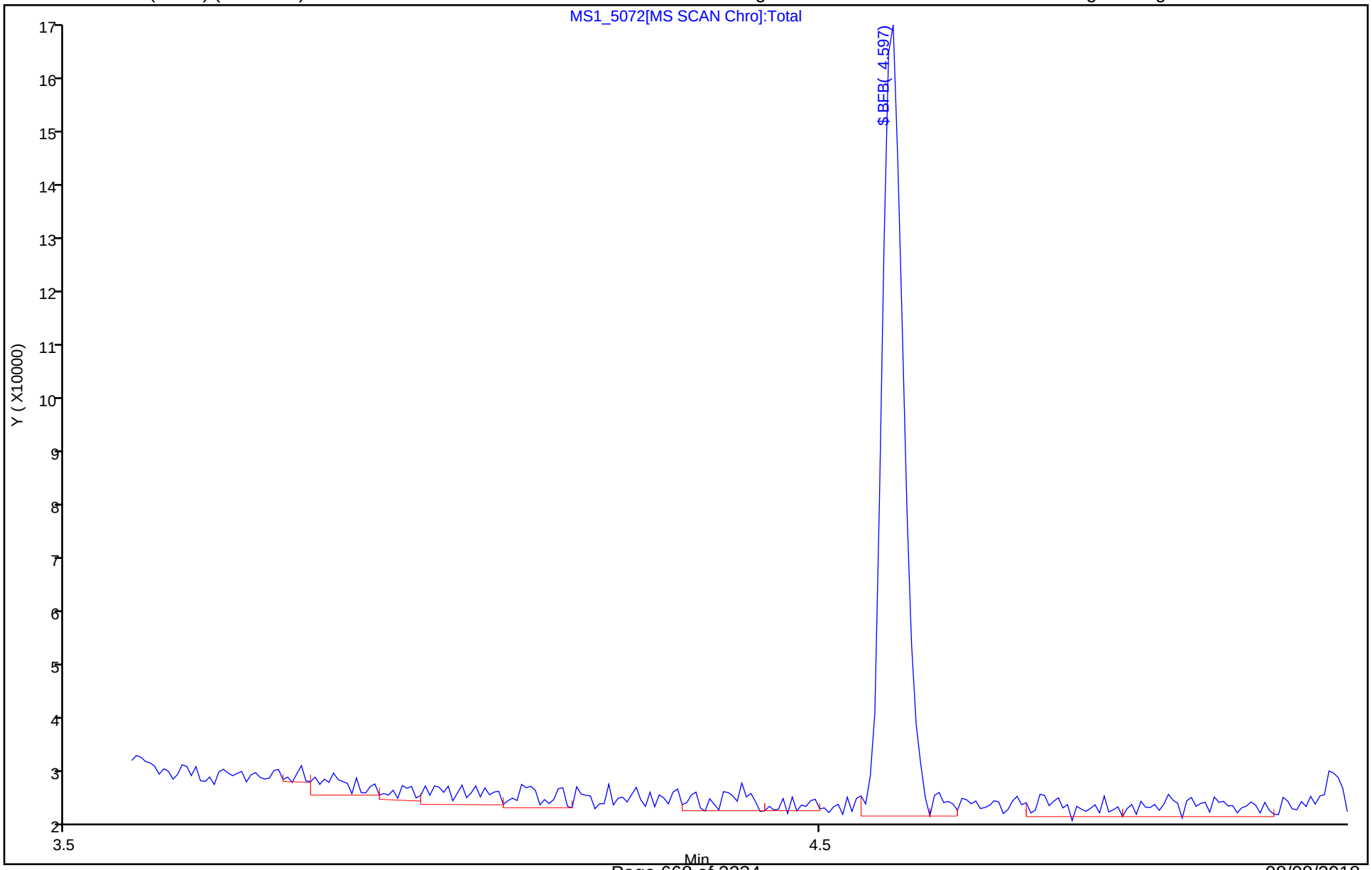
Lims ID: BFB Worklist Smp#: 1

Client ID:

Injection Vol: 1.0 uL Dil. Factor: 1.0000 ALS Bottle#: 100

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D				
Lims ID:	BFB				
Client ID:					
Sample Type:	BFB				
Inject. Date:	06-Aug-2018 07:02:30	ALS Bottle#:	100	Worklist Smp#:	1
Injection Vol:	1.0 uL	Dil. Factor:	1.0000		
Sample Info:	bfb				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:54:52	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				
First Level Reviewer: wickhamt		Date:	06-Aug-2018 08:06:48		

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
$ 4 BFB	95	4.591	4.591	0.000	92	118858	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

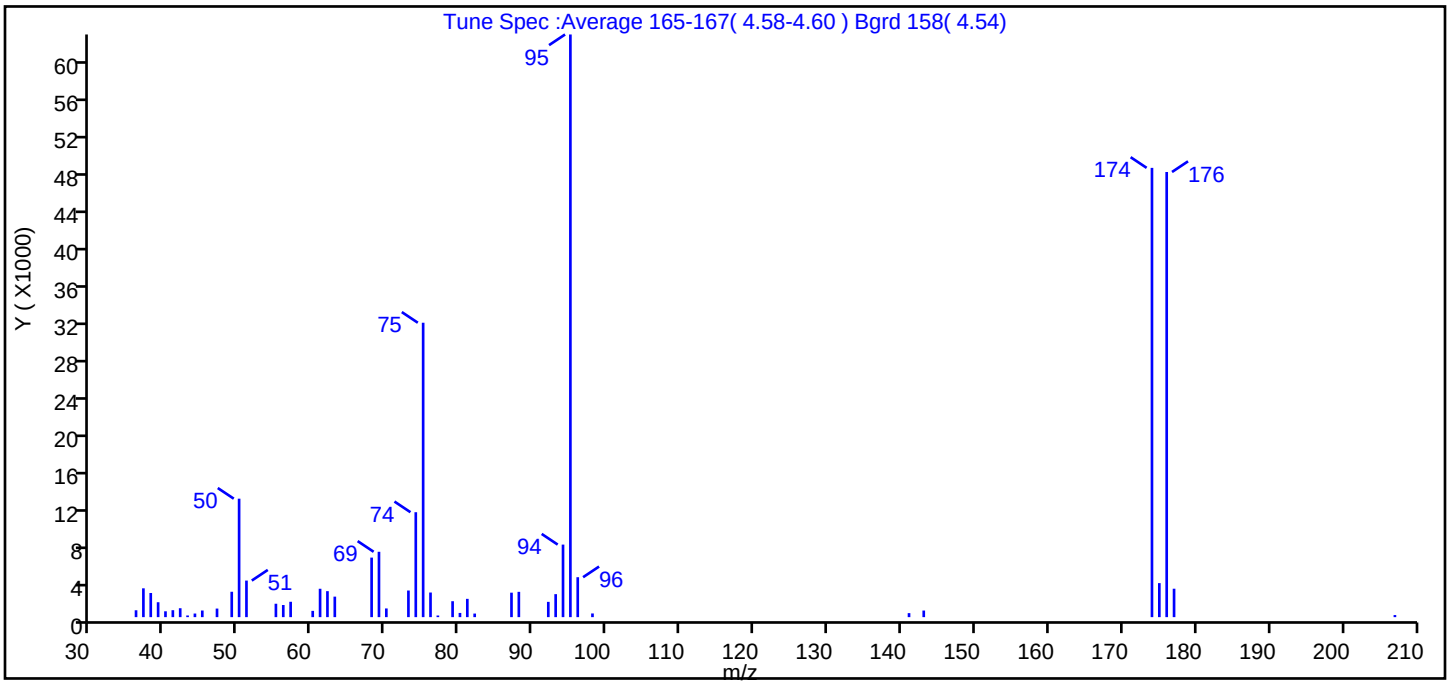
MV-BFB_00026 Amount Added: 1.00 Units: uL

MS Tune Report

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D
Injection Date: 06-Aug-2018 07:02:30 Instrument ID: VMS_MS1
Lims ID: BFB
Client ID:
Operator ID: wickhamt ALS Bottle#: 100 Worklist Smp#: 1
Injection Vol: 1.0 uL Dil. Factor: 1.0000
Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid
Tune Method: BFB Method 8260

$ 4 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base peak, 100% relative abundance	100.0
50	15 to 40% of m/z 95	20.3
75	30 to 60% of m/z 95	50.5
96	5 to 9% of m/z 95	6.9
173	Less than 2% of m/z 174	0.0 (0.0)
174	50 to 120% of m/z 95	77.1
175	5 to 9% of m/z 174	5.8 (7.6)
176	Greater than 95% but less than 101% of m/z 174	76.4 (99.1)
177	5 to 9% of m/z 176	4.9 (6.4)

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D\AQ_VMS1_8260.rslt\spectra.
Injection Date: 06-Aug-2018 07:02:30
Spectrum: Tune Spec :Average 165-167(4.58-4.60) Bgrd 158(4.54)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 48

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	733	50.00	12618	73.00	2836	93.00	2449
37.00	3070	51.00	3895	74.00	11177	94.00	7728
38.00	2572	55.00	1428	75.00	31360	95.00	62064
39.00	1589	56.00	1292	76.00	2623	96.00	4254
40.00	623	57.00	1637	77.00	174	98.00	393
41.00	740	60.00	668	79.00	1697	141.00	427
42.00	949	61.00	3023	80.00	448	143.00	703
43.00	177	62.00	2768	81.00	1949	174.00	47856
44.00	384	63.00	2184	82.00	381	175.00	3624
45.00	707	68.00	6343	87.00	2607	176.00	47416
47.00	913	69.00	6962	88.00	2695	177.00	3028
49.00	2704	70.00	926	92.00	1628	207.00	222

Report Date: 07-Aug-2018 06:54:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D

Injection Date: 06-Aug-2018 07:02:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

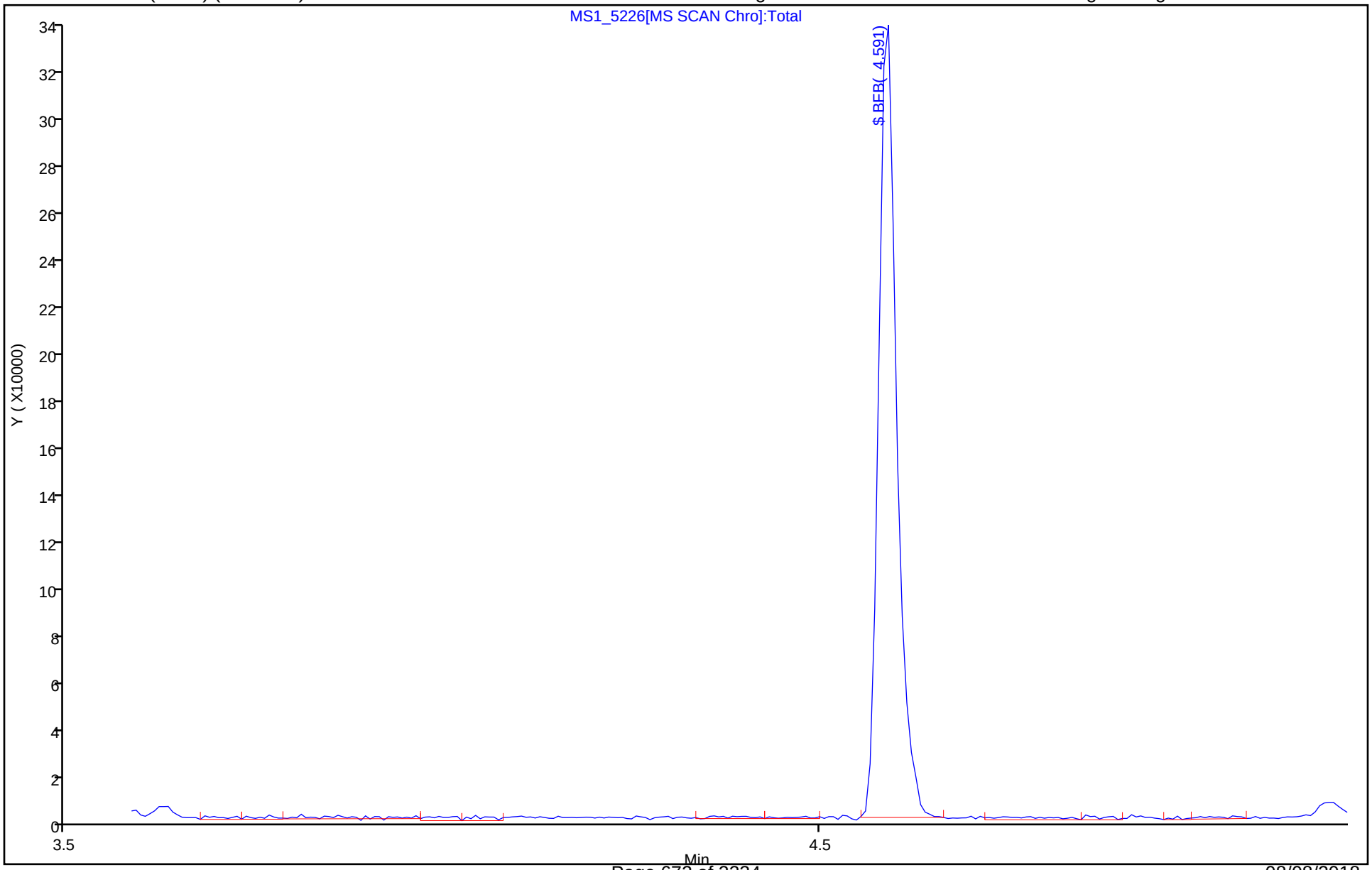
Lims ID: BFB Worklist Smp#: 1

Client ID:

Injection Vol: 1.0 uL Dil. Factor: 1.0000 ALS Bottle#: 100

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: LB 280-423316/1-A
Matrix: Solid (TCLP)
Lab File ID: MS1_5233.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 2(mL)
Date Analyzed: 08/06/2018 09:28
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 424938
Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0040	U	0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.040	U	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0040	U	0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0040	U	0.010	0.0040	0.0017
67-66-3	Chloroform	0.0040	U	0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0040	U	0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0080	U	0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0040	U	0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0040	U	0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0020	U	0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	107		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		64-129
460-00-4	4-Bromofluorobenzene (Surr)	99		78-121
1868-53-7	Dibromofluoromethane (Surr)	105		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5233.D
Lims ID: LB 280-423316/1-A
Client ID:
Sample Type: LB
Inject. Date: 06-Aug-2018 09:28:30 ALS Bottle#: 16 Worklist Smp#: 13
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LB 280-423316/1-A 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 10:12:54

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.599	5.584	0.015	35	160367	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2105036	12.5	12.5	
* 149 1,4-Dioxane-d8	96	8.727	8.773	-0.046	0	18424		0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	437807	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	610235	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	467625	12.3	12.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	390499	12.3	12.6	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2217102	12.3	13.2	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	661310	12.3	12.1	
$ 152 Trifluorotoluene (Surr)	1		0.000					ND	
$ 4 BFB	95		4.591					ND	
24 Dichlorodifluoromethane	85		3.923					ND	
26 Chloromethane	50		4.160					ND	
22 Chlorotrifluoroethene	116		4.248					ND	
27 Vinyl chloride	62		4.286					ND	
25 1,2-Dichloro-1,1,2,2-tetra	85		4.472					ND	
28 Ethylene oxide	43		4.565					ND	
29 Bromomethane	94		4.635					ND	
31 Chloroethane	64		4.691					ND	
23 2-Chloro-1,1,1-Trifluoroet	118		4.737					ND	
32 Dichlorofluoromethane	67		4.830					ND	
33 Trichlorofluoromethane	101		4.914					ND	
34 Ethanol	45		4.928					ND	
36 Ethyl ether	59		5.096					ND	
38 Propene oxide	58		5.180					ND	
39 Acrolein	56		5.221					ND	
40 Acetone	43		5.319					ND	
42 1,1,2-Trichloro-1,2,2-trif	151		5.333					ND	
41 Isopropyl alcohol	45		5.333					ND	
43 1,1-Dichloroethene	96		5.361					ND	
35 1,2-Dichloro-1,1,2-trifluo	117		5.505					ND	
45 Iodomethane	142		5.529					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
44 Acetonitrile	41		5.529					ND	U
37 1,1,1-Trifluoro-2,2-dichlo	83		5.533					ND	
46 Methyl acetate	43	5.557	5.557	0.000	98	28327		2.82	
47 3-Chloro-1-propene	41		5.612					ND	U
48 Carbon disulfide	76		5.626					ND	U
49 2-Methyl-2-propanol	59		5.654					ND	U
50 Methylene Chloride	84		5.696					ND	
51 Acrylonitrile	53		5.836					ND	
52 Methyl tert-butyl ether	73		5.878					ND	
53 trans-1,2-Dichloroethene	96		5.920					ND	
54 Hexane	57		6.101					ND	
55 Vinyl acetate	43		6.157					ND	
56 Isopropyl ether	87		6.199					ND	
57 1,1-Dichloroethane	63		6.227					ND	
58 2-Chloro-1,3-butadiene	53		6.297					ND	
59 Tert-butyl ethyl ether	59		6.464					ND	
61 2-Butanone (MEK)	43		6.590					ND	
60 Ethyl acetate	43		6.590					ND	U
63 Propionitrile	54		6.632					ND	
62 sec-Butyl Alcohol	45		6.646					ND	U
64 cis-1,2-Dichloroethene	96		6.646					ND	
65 2,2-Dichloropropane	77		6.688					ND	
66 Methacrylonitrile	41		6.772					ND	
67 Chlorobromomethane	128		6.841					ND	
68 Chloroform	83		6.855					ND	
69 Tetrahydrofuran	42		6.883					ND	
70 Isobutyl alcohol	41		7.051					ND	
71 1,1,1-Trichloroethane	97		7.079					ND	
72 Cyclohexane	56		7.163					ND	
73 1,1-Dichloropropene	75		7.177					ND	
74 Carbon tetrachloride	117		7.233					ND	
19 2,2-Dimethylpentane	57		7.251					ND	
17 2,4-Dimethylpentane	43		7.293					ND	
75 1,2-Dichloroethane	62		7.330					ND	
77 Benzene	78		7.358					ND	
76 Tert-amyl methyl ether	73		7.358					ND	
9 n-Heptane	43		7.456					ND	
10 2,2,3-Trimethylbutane	57		7.502					ND	
78 n-Butanol	56		7.554					ND	U
12 3,3-Dimethylpentane	43		7.768					ND	
18 2-Methylhexane	43		7.810					ND	
79 Trichloroethene	95		7.819					ND	
80 2-Pentanone	43		7.847					ND	
81 Methyl methacrylate	100		7.945					ND	
15 3-Methylhexane	43	7.973	7.949	0.024	68	116148		NC	
11 2,3-Dimethylpentane	56		7.949					ND	
82 1,2-Dichloropropane	63		8.001					ND	
83 Methylcyclohexane	55		8.029					ND	
84 1,4-Dioxane	88		8.057					ND	
85 Dibromomethane	93		8.098					ND	
86 Dichlorobromomethane	83		8.168					ND	
20 3-Ethylpentane	43		8.214					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
87 2-Nitropropane	41		8.294					ND	
88 2-Chloroethyl vinyl ether	63		8.308					ND	
89 cis-1,3-Dichloropropene	75		8.489					ND	
90 4-Methyl-2-pentanone (MIBK	43		8.545					ND	
91 Toluene	91		8.769					ND	
92 Ethyl methacrylate	69		8.853					ND	
93 trans-1,3-Dichloropropene	75		8.867					ND	
94 1,1,2-Trichloroethane	97		9.020					ND	
95 2-Hexanone	43		9.132					ND	
96 1,3-Dichloropropane	76		9.160					ND	
97 Tetrachloroethene	164		9.202					ND	
98 Chlorodibromomethane	129		9.341					ND	
13 Dimethyl disulfide	94		9.388					ND	
99 Tetrahydrothiophene	60		9.397					ND	
100 Ethylene Dibromide	107		9.467					ND	
101 1-Chlorohexane	91		9.705					ND	U
102 Chlorobenzene	112		9.816					ND	
103 1,1,1,2-Tetrachloroethane	131		9.844					ND	
104 Ethylbenzene	106		9.858					ND	U
105 m-Xylene & p-Xylene	106		9.928					ND	
106 Styrene	104		10.249					ND	
109 o-Xylene	106		10.249					ND	
107 Bromoform	173		10.445					ND	
108 Isopropylbenzene	105		10.515					ND	U
110 cis-1,4-Dichloro-2-butene	53		10.515					ND	
111 Cyclohexanone	55		10.626					ND	U
112 1,1,2,2-Tetrachloroethane	83		10.696					ND	
113 trans-1,4-Dichloro-2-buten	53		10.724					ND	
114 1,2,3-Trichloropropane	110		10.766					ND	
116 Bromobenzene	156		10.822					ND	
115 N-Propylbenzene	120		10.822					ND	
120 1,3,5-Trimethylbenzene	105		10.934					ND	
117 2-Chlorotoluene	126		10.948					ND	
118 4-Chlorotoluene	126		11.017					ND	
119 tert-Butylbenzene	119		11.227					ND	
121 1,2,4-Trimethylbenzene	105		11.255					ND	
143 Pentachloroethane	167		11.283					ND	
122 sec-Butylbenzene	134		11.408					ND	
123 4-Isopropyltoluene	119		11.506					ND	
124 1,3-Dichlorobenzene	146		11.562					ND	
126 1,4-Dichlorobenzene	146		11.632					ND	
125 1,2,3-Trimethylbenzene	105		11.632					ND	
127 n-Butylbenzene	91		11.855					ND	
128 1,2-Dichlorobenzene	146		11.981					ND	
129 1,2-Dibromo-3-Chloropropan	157		12.707					ND	
21 1,3,5-Trichlorobenzene	180		12.945					ND	
14 n-Nonyl Aldehyde	57		13.340					ND	
130 1,2,4-Trichlorobenzene	180		13.657					ND	
131 Hexachlorobutadiene	225		13.825					ND	
132 Naphthalene	128		14.006					ND	
133 1,2,3-Trichlorobenzene	180		14.327					ND	
161 n-Nonane TIC	1		0.000					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
158 1-Chlorohexane TIC	1		0.000					ND	
160 Cyclohexane TIC	1		0.000					ND	
159 Methyl cyclohexane TIC	1		0.000					ND	
S 140 1,2-Dichloroethene, Total	96		2.000					ND	
S 136 1,2-Dichloroethene, Total	1		0.000					ND	
S 134 Trihalomethanes, Total	1		0.000					ND	
S 137 Total BTEX	1		0.000					ND	
S 139 Xylenes, Total (URS)	1		0.000					ND	
S 135 1,3-Dichloropropene, Total	1		0.000					ND	
S 153 TAH	1				0			0	
S 138 Xylenes, Total	106		0.000					ND	
T 141 Dichloroacetonitrile TIC	74		1.000					ND	
T 142 2,3-dichloro-1-propene TIC	75		1.000					ND	
T 30 Propene oxide TIC	58		5.334					ND	
T 156 4-Ethyltoluene TIC	1		0.000					ND	
T 157 1,3-Butadiene TIC	1		0.000					ND	
T 16 2-Butoxyethanol TIC	1		0.000					ND	
T 155 Dicyclopentadiene TIC	1		0.000					ND	
T 154 Propene TIC	1		0.000					ND	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

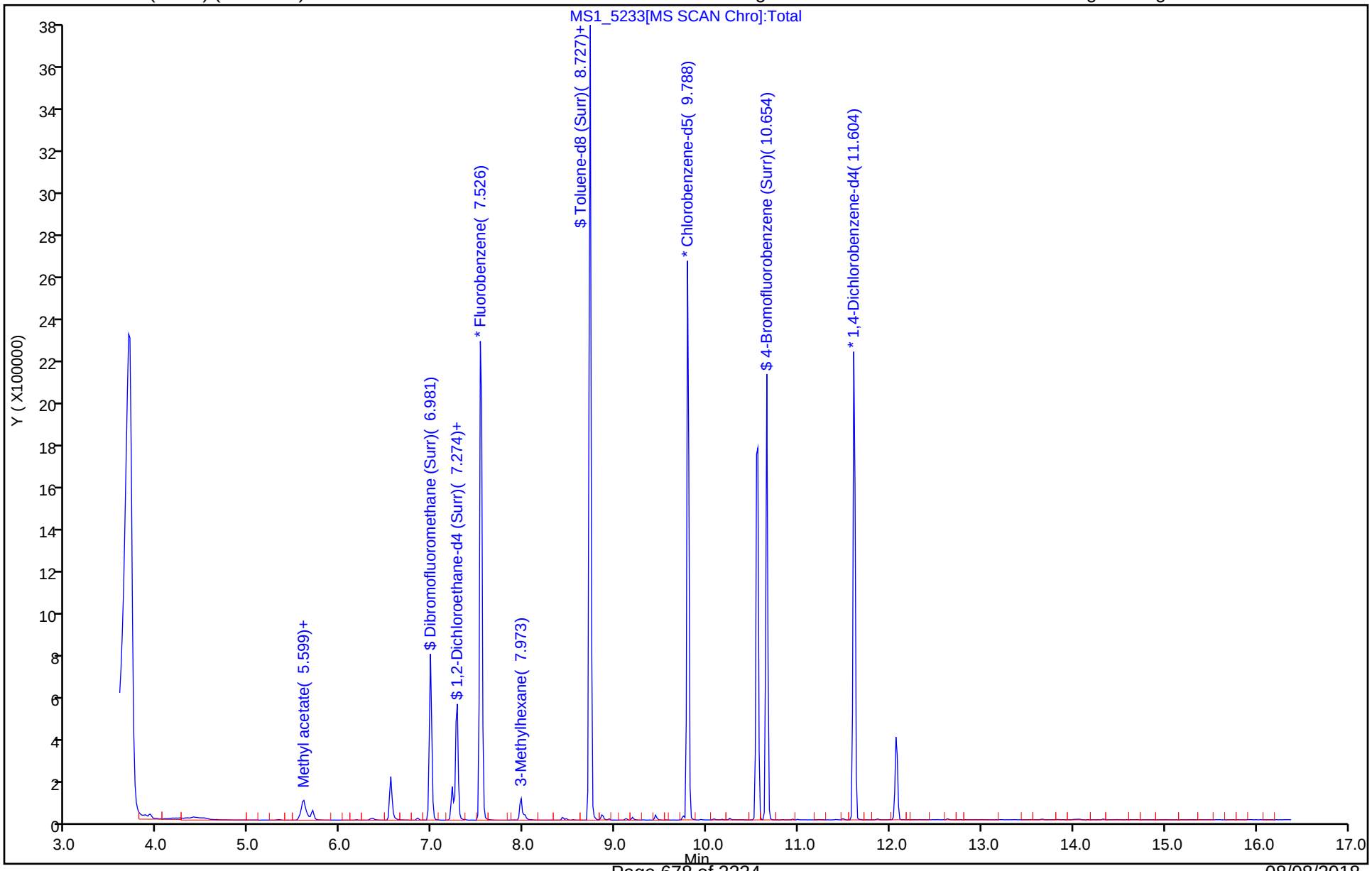
Report Date: 07-Aug-2018 06:54:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5233.D

Injection Date:	06-Aug-2018 09:28:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	LB 280-423316/1-A			Worklist Smp#:	13
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	16
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5233.D				
Lims ID:	LB 280-423316/1-A				
Client ID:					
Sample Type:	LB				
Inject. Date:	06-Aug-2018 09:28:30	ALS Bottle#:	16	Worklist Smp#:	13
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	LB 280-423316/1-A 2ml af				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 10:12:54

Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	12.9	104.94
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	12.6	103.14
$ 7 Toluene-d8 (Surr)	12.3	13.2	107.40
$ 8 4-Bromofluorobenzene (Surr)	12.3	12.1	98.99

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 280-423316/2-A
Matrix: Solid (TCLP)
Lab File ID: MS1_5232.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 2(mL)
Date Analyzed: 08/06/2018 09:08
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 424938
Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0484		0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.173	M	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0447		0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0456		0.010	0.0040	0.0017
67-66-3	Chloroform	0.0491		0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0493		0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0459		0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0440		0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0467		0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0500		0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	101		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		64-129
460-00-4	4-Bromofluorobenzene (Surr)	94		78-121
1868-53-7	Dibromofluoromethane (Surr)	103		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5232.D
Lims ID: LCS 280-423316/2-A
Client ID:
Sample Type: LCS
Inject. Date: 06-Aug-2018 09:08:30 ALS Bottle#: 15 Worklist Smp#: 12
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LCS 280-423316/2-A 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 10:05:41

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.584	0.014	88	163777	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2064361	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	439723	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	632160	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	451652	12.3	12.7	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	380608	12.3	12.6	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2092015	12.3	12.4	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	653213	12.3	11.6	
24 Dichlorodifluoromethane	85	3.922	3.923	0.000	100	213223	5.00	4.56	
26 Chloromethane	50	4.174	4.160	0.014	99	265029	5.00	4.66	
27 Vinyl chloride	62	4.300	4.286	0.014	98	272426	5.00	5.00	
29 Bromomethane	94	4.649	4.635	0.014	91	191040	5.00	4.80	
31 Chloroethane	64	4.705	4.691	0.014	100	182310	5.00	4.58	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	448730	5.00	5.06	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	100	324629	5.00	4.65	
36 Ethyl ether	59	5.096	5.096	0.000	92	99472	5.00	4.84	
39 Acrolein	56	5.221	5.221	0.000	100	113480	50.0	46.3	
40 Acetone	43	5.319	5.319	0.000	100	69169	20.0	19.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	143104	5.00	4.51	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	204378	5.00	4.59	
45 Iodomethane	142	5.529	5.529	0.000	100	332806	5.00	4.86	
46 Methyl acetate	43	5.557	5.557	0.000	97	116544	10.0	11.8	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	396014	5.00	4.77	
48 Carbon disulfide	76	5.626	5.626	0.000	99	938084	5.00	4.73	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	93	41393	50.0	51.9	
50 Methylene Chloride	84	5.696	5.696	0.000	94	218106	5.00	5.11	
51 Acrylonitrile	53	5.836	5.836	0.000	99	238548	50.0	48.4	
52 Methyl tert-butyl ether	73	5.892	5.878	0.014	97	261453	5.00	4.79	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	239975	5.00	4.81	
54 Hexane	57	6.101	6.101	0.000	92	340647	5.00	3.80	
55 Vinyl acetate	43	6.171	6.157	0.014	97	352048	10.0	9.81	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	423803	5.00	4.88	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	91804	20.0	17.3	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	103640	150.0	138.4	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	83	236447	5.00	4.71	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	93	325400	5.00	4.61	
67 Chlorobromomethane	128	6.841	6.841	0.000	95	72065	5.00	4.84	
68 Chloroform	83	6.855	6.855	0.000	95	372140	5.00	4.91	
69 Tetrahydrofuran	42	6.883	6.883	0.000	88	32326	10.0	7.90	
70 Isobutyl alcohol	41	7.051	7.051	0.000	90	40376	125.0	132.3	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	339056	5.00	4.72	
72 Cyclohexane	56	7.163	7.163	0.000	0	404279	5.00	4.19	
73 1,1-Dichloropropene	75	7.191	7.177	0.014	98	317264	5.00	4.52	
74 Carbon tetrachloride	117	7.232	7.233	0.000	96	272358	5.00	4.47	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	183298	5.00	4.93	
77 Benzene	78	7.358	7.358	0.000	97	932590	5.00	4.84	
9 n-Heptane	43	7.456	7.456	0.000	92	351512	5.00	4.07	
79 Trichloroethene	95	7.819	7.819	0.000	97	227128	5.00	4.67	
80 2-Pentanone	43	7.847	7.847	0.000	99	149580	20.0	16.3	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	95	209713	5.00	4.83	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	309969	5.00	4.02	
84 1,4-Dioxane	88	8.056	8.057	-0.001	88	11420	100.0	93.7	
85 Dibromomethane	93	8.098	8.098	0.000	94	70257	5.00	4.84	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	214520	5.00	4.64	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	89	29172	5.00	4.42	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	252830	5.00	4.54	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	222516	20.0	19.0	
91 Toluene	91	8.783	8.769	0.014	98	950960	5.00	4.87	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	89596	5.00	3.78	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	175348	5.00	4.68	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	93	94004	5.00	4.89	
95 2-Hexanone	43	9.132	9.132	0.000	97	136824	20.0	17.2	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	95	178242	5.00	4.57	
97 Tetrachloroethene	164	9.202	9.202	0.000	99	170741	5.00	4.40	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	102929	5.00	4.44	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	82033	5.00	4.52	
101 1-Chlorohexane	91	9.705	9.705	-0.001	0	295001	5.00	4.04	
102 Chlorobenzene	112	9.816	9.816	0.000	96	531843	5.00	4.56	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	93	160200	5.00	4.49	
104 Ethylbenzene	106	9.858	9.858	0.000	98	327575	5.00	4.39	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	99	389295	5.00	4.33	
106 Styrene	104	10.249	10.249	0.000	84	514086	5.00	4.24	
109 o-Xylene	106	10.249	10.249	0.000	90	375099	5.00	4.50	
107 Bromoform	173	10.445	10.445	0.000	96	42954	5.00	4.07	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1036780	5.00	4.33	
111 Cyclohexanone	55	10.626	10.626	0.000	93	60133	200.0	169.5	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	89971	5.00	4.40	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	82	19490	5.00	3.94	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	86	24455	5.00	4.50	
116 Bromobenzene	156	10.822	10.822	0.000	52	190357	5.00	4.42	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	287508	5.00	4.25	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	855518	5.00	4.31	
117 2-Chlorotoluene	126	10.947	10.948	-0.001	96	237669	5.00	4.46	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	232929	5.00	4.43	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	829180	5.00	4.27	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	854637	5.00	4.38	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	220904	5.00	4.17	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	951594	5.00	4.37	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	418279	5.00	4.52	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	397520	5.00	4.50	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	946167	5.00	4.37	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	327921	5.00	4.58	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	76	9570	5.00	3.80	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	95	206346	5.00	4.40	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	167234	5.00	4.33	
132 Naphthalene	128	14.006	14.006	0.000	97	222635	5.00	3.94	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	154276	5.00	4.54	
S 140 1,2-Dichloroethene, Total	96				0		10.0	9.52	
S 136 1,2-Dichloroethene, Total	1				0		10.0	9.52	
S 134 Trihalomethanes, Total	1				0		20.0	18.1	
S 139 Xylenes, Total (URS)	1				0		10.0	8.83	
S 135 1,3-Dichloropropene, Total	1				0		10.0	9.22	
S 138 Xylenes, Total	106				0		10.0	8.83	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-Main B_00022	Amount Added:	2.50	Units: uL	
MV-SS 2-Cleve_00046	Amount Added:	2.50	Units: uL	
MV-Gas/Ket B_00043	Amount Added:	2.50	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:11 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5232.D

Injection Date: 06-Aug-2018 09:08:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

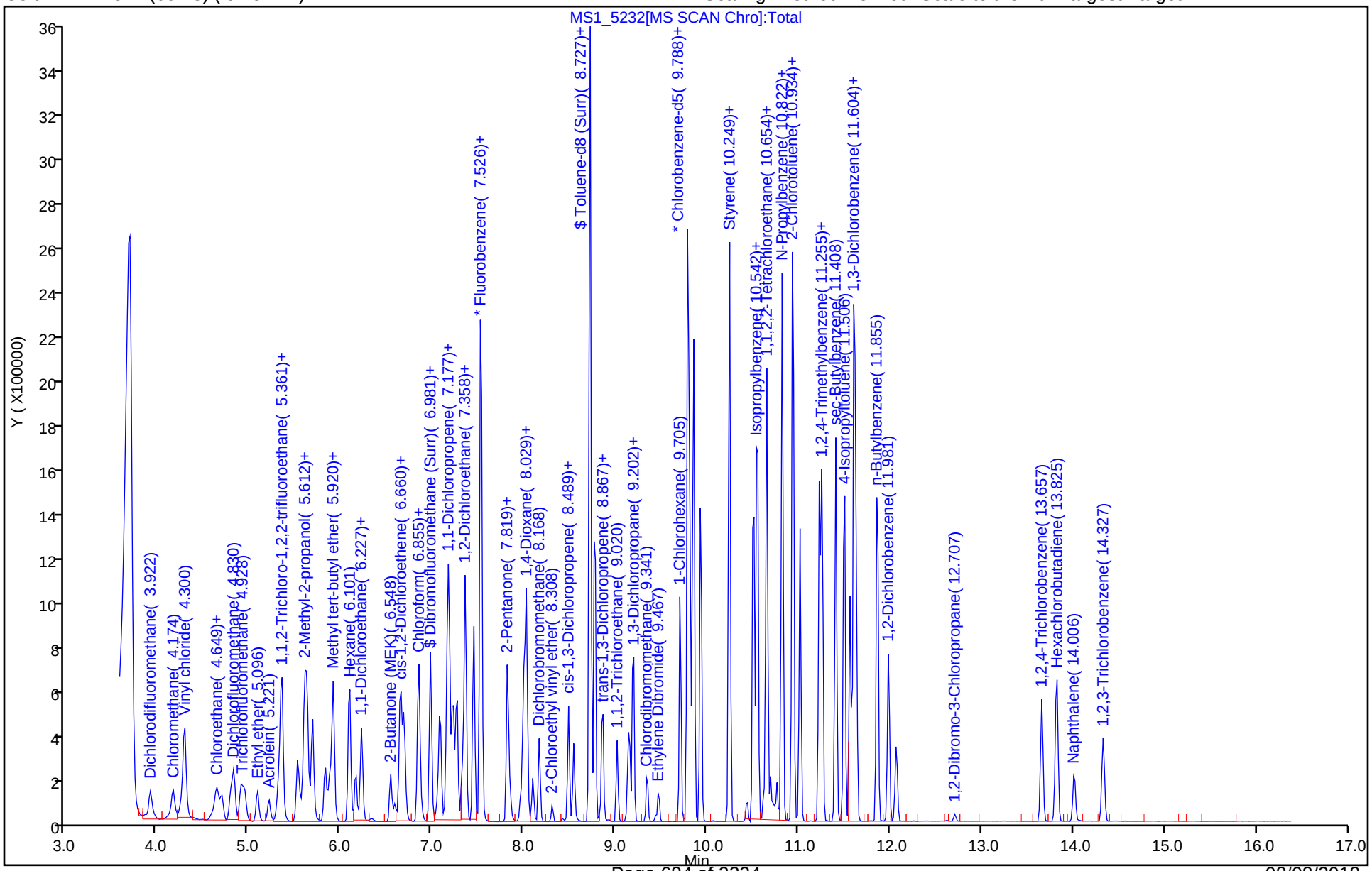
Lims ID: LCS 280-423316/2-A Worklist Smp#: 12

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 15

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5232.D				
Lims ID:	LCS 280-423316/2-A				
Client ID:					
Sample Type:	LCS				
Inject. Date:	06-Aug-2018 09:08:30	ALS Bottle#:	15	Worklist Smp#:	12
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	LCS 280-423316/2-A 2ml af				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 10:05:41

Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	12.7	103.36
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	12.6	102.51
$ 7 Toluene-d8 (Surr)	12.3	12.4	100.90
$ 8 4-Bromofluorobenzene (Surr)	12.3	11.6	94.39

Manual Integration/User Assign Peak Report

TestAmerica Denver

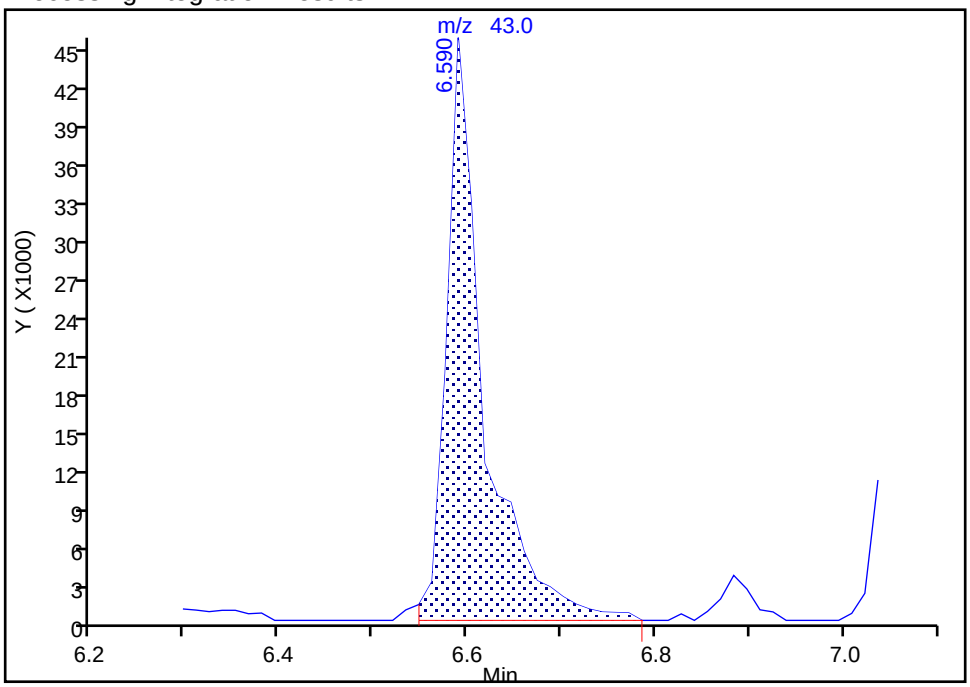
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5232.D				
Injection Date:	06-Aug-2018 09:08:30	Instrument ID:	VMS_MS1		
Lims ID:	LCS 280-423316/2-A				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	15	Worklist Smp#:	12
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

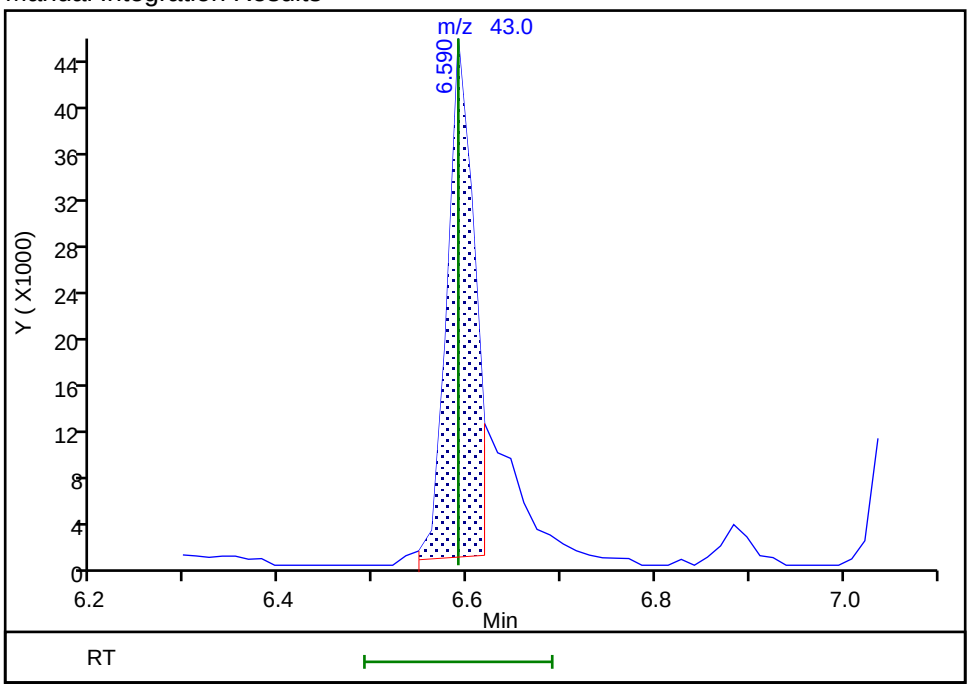
Processing Integration Results

RT: 6.59
Area: 125171
Amount: 23.617268
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 91804
Amount: 17.321581
Amount Units: ug/l



Reviewer: wickhamt, 06-Aug-2018 09:27:52
Audit Action: Assigned New Baseline Audit Reason: Shouldering

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 08/02/2018 07:34

Analysis Batch Number: 424541 End Date: 08/02/2018 19:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-424541/1		08/02/2018 07:34	1	MS1_5072.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 08:32	1		DB-624 (60.25) 0.25(mm)
STD003 280-424541/12 IC		08/02/2018 08:53	1	MS1_5075.D	DB-624 (60.25) 0.25(mm)
STD01 280-424541/13 IC		08/02/2018 09:13	1	MS1_5076.D	DB-624 (60.25) 0.25(mm)
STD02 280-424541/14 IC		08/02/2018 09:33	1	MS1_5077.D	DB-624 (60.25) 0.25(mm)
STD05 280-424541/15 IC		08/02/2018 09:53	1	MS1_5078.D	DB-624 (60.25) 0.25(mm)
STD10 280-424541/16 IC		08/02/2018 10:14	1	MS1_5079.D	DB-624 (60.25) 0.25(mm)
STD30 280-424541/17 IC		08/02/2018 10:34	1	MS1_5080.D	DB-624 (60.25) 0.25(mm)
STD60 280-424541/18 IC		08/02/2018 10:54	1	MS1_5081.D	DB-624 (60.25) 0.25(mm)
ICV 280-424541/19		08/02/2018 11:35	1	MS1_5083.D	DB-624 (60.25) 0.25(mm)
STD01 280-424541/20 IC		08/02/2018 11:55	1	MS1_5084.D	DB-624 (60.25) 0.25(mm)
STD02 280-424541/21 IC		08/02/2018 12:15	1	MS1_5085.D	DB-624 (60.25) 0.25(mm)
STD05 280-424541/22 IC		08/02/2018 12:36	1	MS1_5086.D	DB-624 (60.25) 0.25(mm)
ICIS 280-424541/23		08/02/2018 12:56	1	MS1_5087.D	DB-624 (60.25) 0.25(mm)
STD30 280-424541/24 IC		08/02/2018 13:16	1	MS1_5088.D	DB-624 (60.25) 0.25(mm)
STD60 280-424541/25 IC		08/02/2018 13:37	1	MS1_5089.D	DB-624 (60.25) 0.25(mm)
ICV 280-424541/26		08/02/2018 14:17	1	MS1_5091.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 15:17	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 15:37	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 15:57	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 16:18	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 16:38	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 16:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 17:19	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 17:39	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 18:00	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 18:20	1		DB-624 (60.25) 0.25(mm)
CCVC 280-424541/43		08/02/2018 18:40	1		DB-624 (60.25) 0.25(mm)
CCVC 280-424541/44		08/02/2018 19:01	1		DB-624 (60.25) 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 08/06/2018 07:02

Analysis Batch Number: 424938 End Date: 08/06/2018 16:15

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-424938/1		08/06/2018 07:02	1	MS1_5226.D	DB-624 (60.25) 0.25(mm)
CCV 280-424938/2		08/06/2018 07:47	1	MS1_5228.D	DB-624 (60.25) 0.25(mm)
CCV 280-424938/3		08/06/2018 08:07	1	MS1_5229.D	DB-624 (60.25) 0.25(mm)
LCS 280-423316/2-A		08/06/2018 09:08	1	MS1_5232.D	DB-624 (60.25) 0.25(mm)
LB 280-423316/1-A		08/06/2018 09:28	1	MS1_5233.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 09:48	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 10:09	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 10:29	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 10:49	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 11:10	1		DB-624 (60.25) 0.25(mm)
320-41149-36		08/06/2018 11:30	1	MS1_5239.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 11:50	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 12:11	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 12:31	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 12:51	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 13:12	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 13:32	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 13:52	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 14:13	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 14:33	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 14:53	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 15:14	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 15:34	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 15:54	1		DB-624 (60.25) 0.25(mm)
CCVC 280-424938/33		08/06/2018 16:15	1	MS1_5253.D	DB-624 (60.25) 0.25(mm)

8260B

Sequence Name: C:\msdchem\1\sequence\080618am.s
Comment:
Operator: wickhamt
Data Path: C:\MSDCHEM\1\DATA\080618am\
Instrument Control Pre-Seq Cmd:
Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:
Data Analysis Post-Seq Cmd:

Test America Denver
Instrument: MS1
DV-MS-0010 (8260B/624) (Circle)
Purge Volume: (20mL/5mL/5g) (Circle)
Tune Time: 07:02 - 16:15
Lims Batch: 424938

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

Sequence Barcode Options
(X) On Mismatch, Inject Anyway
( ) On Mismatch, Don't Inject
( ) Barcode Disabled

8-7-18
Taw

Line			Sample Name/Misc Info		
1)	Sample	100	MS1_5226	BFB	bfb 07:02
2)	Sample	10	MS1_5227	8260	blank
3)	Pause				
4)	Sample	11	MS1_5228	8260	ccv m
5)	Sample	12	MS1_5229	8260	ccv s
6)	Sample	13	MS1_5230	8260	lcs af
7)	Sample	14	MS1_5231	8260	mb af
8)	Sample	15	MS1_5232	8260	LCS 280-423316/2-A 2ml af
9)	Sample	16	MS1_5233	8260	LB 280-423316/1-A 2ml af
10)	Sample	17	MS1_5234	8260	160-29498-C-2-A 2ml
11)	Sample	18	MS1_5235	8260	160-29498-C-2-A ms 2ml
12)	Sample	19	MS1_5236	8260	160-29498-C-2-A msd 2ml
13)	Sample	20	MS1_5237	8260	280-112230-C-1-A 2ml
14)	Sample	21	MS1_5238	8260	280-112289-E-1-A 2ml
15)	Sample	22	MS1_5239	8260	320-41149-A-36-A 2ml
16)	Sample	23	MS1_5240	8260	LCS 280-423614/2-A 2ml af
17)	Sample	24	MS1_5241	8260	LB3 280-423614/1-A 2ml af
18)	Sample	25	MS1_5242	8260	320-41333-A-15-A 2ml af
19)	Sample	26	MS1_5243	8260	320-41333-A-15-A ms 2ml af
20)	Sample	27	MS1_5244	8260	320-41333-A-15-A msd 2ml af
21)	Sample	28	MS1_5245	8260	280-112146-U-2-A 2ml af
22)	Sample	29	MS1_5246	8260	LCS 280-424099/2-A 2ml af
23)	Sample	30	MS1_5247	8260	LB 280-424099/1-A 2ml af
24)	Sample	31	MS1_5248	8260	280-112363-A-1-A 2ml
25)	Sample	32	MS1_5249	8260	320-41401-a-1-a 2ml
26)	Sample	33	MS1_5250	8260	320-41401-a-1-a ms 2ml
27)	Sample	34	MS1_5251	8260	320-41401-a-1-a msd 2ml
28)	Sample	35	MS1_5252	8260	320-41554-A-9-A 2ml
29)	Sample	36	MS1_5253	8260	ccvc 16:15

TestAmerica Laboratories
Worklist Report

Worklist Name: 080618am
Instrument Name: VMS_MS1
Purge Volume: 20.00
Analysis Type: VOA
Batch Directory: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b
Upload Directory: \\CorpTALSAPP16\280-DN-RawData\Organics\MS\VMS_MS1
Run Reagent: MV-568718-D_00014
Run Reagent: MV-ARCH SS A_00101

Worklist Number: 72706
Chrom Method: AQ_VMS1_8260
Units: mL
Amount Added: 1.000, Units: uL
Amount Added: 0.980, Units: uL

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072706-001	# 1 BFB	MV-BFB_00026	BFB	voaWater	1.000	uL	1.000
280-0072706-002	# 2 CCV	MV-2cleve+AVA_00036 MV-Main A_00037 MV-Gas/Ket A_00075	CCV	voaWater	20.00	mL	1.000
280-0072706-003	# 3 CCV	MV-Supp A_00031 MV-568718-D_00014	CCV	voaWater	20.00	mL	1.000
280-0072706-004	# 4 LCS	MV-Gas/Ket B_00043 MV-Main B_00022 MV-SS 2-Cleve_00046	LCS	voaWater	20.00	mL	1.000
280-0072706-005	# 5 LCSD	MV-Gas/Ket B_00043 MV-Main B_00022 MV-SS 2-Cleve_00046	LCSD	voaWater	20.00	mL	1.000
280-0072706-006	# 6 LCS	MV-Supp B_00021	LCS	voaWater	20.00	mL	1.000
280-0072706-007	# 7 LCSD	MV-Supp B_00021	LCSD	voaWater	20.00	mL	1.000
280-0072706-008	# 8 MB		MB	voaWater	20.00	mL	1.000
280-0072706-009	# 9 280-108595-A-1		Client	voaWater	20.00	mL	1.000
280-0072706-010	#10 280-108595-A-2		Client	voaWater	20.00	mL	1.000
280-0072706-011	#11 280-108595-A-3		Client	voaWater	20.00	mL	1.000
280-0072706-012	#12 LCS 280-423316/2-A	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	LCS	voaWater	2.000	mL	1.000
280-0072706-013	#13 LB 280-423316/1-A		LB	voaWater	2.000	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072706-014	#14 160-29498-C-2-A		Client	voaWater	2.000	mL	1.000
280-0072706-015	#15 160-29498-C-2-A MS	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MS	voaWater	2.000	mL	1.000
280-0072706-016	#16 160-29498-C-2-A MSD	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MSD	voaWater	2.000	mL	1.000
280-0072706-017	#17 280-112230-C-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-018	#18 280-112289-E-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-019	#19 320-41149-A-36-A		Client	voaWater	2.000	mL	1.000
280-0072706-020	#20 LCS 280-423614/2-A	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	LCS	voaWater	2.000	mL	1.000
280-0072706-021	#21 LB3 280-423614/1-A		LB3	voaWater	2.000	mL	1.000
280-0072706-022	#22 320-41333-A-15-A		Client	voaWater	2.000	mL	1.000
280-0072706-023	#23 320-41333-A-15-A MS	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MS	voaWater	2.000	mL	1.000
280-0072706-024	#24 320-41333-A-15-A MSD	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MSD	voaWater	2.000	mL	1.000
280-0072706-025	#25 280-112146-U-2-A		Client	voaWater	2.000	mL	1.000
280-0072706-026	#26 LCS 280-424099/2-A	MV-Main B_00022 MV-Gas/Ket B_00043 MV-SS 2-Cleve_00046	LCS	voaWater	2.000	mL	1.000
280-0072706-027	#27 LB 280-424099/1-A		LB	voaWater	2.000	mL	1.000
280-0072706-028	#28 280-112363-A-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-029	#29 320-41401-A-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-030	#30 320-41401-A-1-A MS	MV-Main B_00022 MV-Gas/Ket B_00043 MV-SS 2-Cleve_00046	MS	voaWater	2.000	mL	1.000
280-0072706-031	#31 320-41401-A-1-A MSD	MV-Main B_00022 MV-Gas/Ket B_00043 MV-SS 2-Cleve_00046	MSD	voaWater	2.000	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072706-032	#32 320-41554-A-9-A		Client	voaWater	2.000	mL	1.000
280-0072706-033	#33 ccvc	MV-Main A_00037 MV-Gas/Ket A_00075 MV-2cleve+AVA_00036	CCVC	voaWater	20.00	mL	1.000
280-0072706-034	#34 Samp 34		Client	voaWater	2.000	mL	1.000

MS1

Sample Request Form: 49334

den_msvoa_totalbacklog 8/6/2018 1:14:47 PM Assigned to:Wickham, Tom A

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
160-29498-2 2	CRC-B21-0205		8260B	TCLP 8260B	07/26 23:59	08/07/18	CYLS	IL	180	Level 1 radioactive
M RAD SCREEENS REQUIRED PRIOR TO SHIPPING!										
280-112146-2 2	Outfall 001	5mL Lab	8260B	TCLP 8260B	08/08 23:59	08/06/18	DMH	AR	WC Dpt & 96 & MS-Strge & Mtls-Strge	Unconfirmed
280-112230-1 2	SD052-04_0718_IDW		8260B_DOD5	TCLP 8260B_DOD5	08/06 23:59	08/07/18	SKR	NY	103 & WC Dpt & OP Dpt	Unconfirmed
M Q5/DIL3										
280-112289-1 2	IDW-1-0718		8260B_DOD5	TCLP 8260B_DOD5	08/06 23:59	08/13/18	PJM	IA	114	Unconfirmed
320-41149-36 2	GRE-IDW-S-01		8260B_DOD5	TCLP 8260B_DOD5	08/06 23:59	08/01/18	DRA	VA	178	Unconfirmed
320-41333-15 2	GRE-IDW-W-01	5mL at	8260B_DOD5	TCLP 8260B_DOD5	08/08 23:59	08/05/18	DRA	VA	MS-Strge	Unconfirmed
320-41401-1 2	IDW-Soil-01		8260B_DOD5	TCLP 8260B_DOD5	08/12 23:59	08/09/18	DRA	VA	Quarantine 4	Unconfirmed
320-41554-9 2	IDW-SOIL		8260B_DOD5	TCLP 8260B_DOD5	08/12 23:59	08/12/18	DRA	VA	158	Unconfirmed

1311_Z Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 280-423316

Analyst: Bourgery, David F

Batch Open: 7/23/2018 5:36:00PM

Batch End: 7/24/2018 9:54:00AM

HT 8-6

TCLP Extraction 8-6-18 TAW

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1	LB~280-423316/1 N/A	N/A		2		N/A	N/A	N/A	In Lab	LB 280-423316/1-A
2	LCS~280-423316/2 N/A	N/A		2		N/A	N/A	N/A	In Lab	LCS 280-423316/2-A
3	160-29498-C-2 (8260B)	N/A (160-29498-1)	Solid	2		8/7/18	25_Days	4		160-29498-C-2-A
4	280-112230-C-1 (8260B_DOD5)	N/A (280-112230-1)	Solid	2		8/7/18	12_Days	4		280-112230-C-1-A
5	280-112289-E-1 (8260B_DOD5)	N/A (280-112289-1)	Solid	2		8/13/18	15_Days	4		280-112289-E-1-A
6	320-41149-A-36 (8260B_DOD5)	N/A (320-41149-1)	Solid	2		8/1/18	16_Days	4		320-41149-A-36-A
7	N/A	N/A				N/A	N/A	N/A		
8	N/A	N/A				N/A	N/A	N/A		
9	N/A	N/A				N/A	N/A	N/A		
10	N/A	N/A				N/A	N/A	N/A		
11	N/A	N/A				N/A	N/A	N/A		
12	N/A	N/A				N/A	N/A	N/A		
13	N/A	N/A				N/A	N/A	N/A		
14	N/A	N/A				N/A	N/A	N/A		

MAY CONTAIN RADIOACTIVE MATERIALS
CAT-1
Return all empty sample containers to their original storage location

1311_Z Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 280-423614

Analyst: Bourgery, David F

Batch Open: 7/25/2018 11:55:00AM

Batch End: 7/25/2018 12:55:00PM

HT 8-8

TCLP Extraction 8-6-18 TAW

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	LB3~280-423614/1 N/A	N/A		2		N/A	N/A	N/A	1mL af	LB3 280-423614/1-A
2	LCS~280-423614/2 N/A	N/A		2		N/A	N/A	N/A	1mL af	LCS 280-423614/2-A
3	280-112146-U-2 (8260B)	N/A (280-112146-1)	Water	2		8/6/18	12_Day_Rush	2	used V too 5mL af	280-112146-U-2-A
4	320-41333-A-15 (8260B_DOD5)	N/A (320-41333-1)	Water	2		8/5/18	16_Days	4	used B too 5mL af	320-41333-A-15-A

1311_Z Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 280-424099

Analyst: Bourgery, David F

Batch Open: 7/29/2018 3:42:00PM

Batch End: 7/30/2018 9:30:00AM

TCLP Extraction

HT 872

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	LB~280-424099/1 N/A	N/A		2		N/A	N/A	N/A	8-6-18 Tuesday Sm Lab	LB 280-424099/1-A
2	LCS~280-424099/2 N/A	N/A		2		N/A	N/A	N/A	Sm Lab	LCS 280-424099/2-A
3	280-112363-A-1 N/A	N/A		2		N/A	N/A	N/A		280-112363-A-1-A
4	320-41401-A-1 (8260B_DOD5)	N/A (320-41401-1)	Solid	2		8/9/18	16_Days	4		320-41401-A-1-A
	320-41554-A-9 (8260B_DOD5)	N/A (320-41554-1)	Solid	2		8/12/18	16_Days	4		320-41554-A-9-A

Sequence Name: C:\msdchem\1\sequence\080218am.s
Comment:
Operator: wickhamt
Data Path: C:\MSDCHEM\1\DATA\080218am\
Instrument Control Pre-Seq Cmd:
Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:
Data Analysis Post-Seq Cmd:

Test America Denver
Instrument: MS1
DV-MS-0010 (8260B/624) (Circle)
Purge Volume: (20mL/5mL/5g) (Circle)
Tune Time: 07:34 - 19:01
Lime Batch: 424541

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

Sequence Barcode Options
(X) On Mismatch, Inject Anyway
( ) On Mismatch, Don't Inject
( ) Barcode Disabled

8-3-18 TAW

Line			Sample Name/Misc Info			
1)	Sample	51	MS1_5070	8260	primer	
2)	Sample	100	MS1_5071	BFB	bfb	
3)	Sample	100	MS1_5072	BFB	bfb 07:34	
4)	Sample	10	MS1_5073	8260	blank	
5)	Sample	11	MS1_5074	8260	blank	
6)	Sample	12	MS1_5075	8260	std003	main ICAL
7)	Sample	13	MS1_5076	8260	std01	
8)	Sample	14	MS1_5077	8260	std02	
9)	Sample	15	MS1_5078	8260	std05	
10)	Sample	16	MS1_5079	8260	std10	
11)	Sample	17	MS1_5080	8260	std30	
12)	Sample	18	MS1_5081	8260	std60	
13)	Sample	19	MS1_5082	8260	blank	
14)	Sample	20	MS1_5083	8260	icv	
15)	Sample	21	MS1_5084	8260	std01	Supp ICAL
16)	Sample	22	MS1_5085	8260	std02	
17)	Sample	23	MS1_5086	8260	std05	
18)	Sample	24	MS1_5087	8260	icis	
19)	Sample	25	MS1_5088	8260	std30	
20)	Sample	26	MS1_5089	8260	std60	
21)	Sample	27	MS1_5090	8260	blank	
22)	Sample	28	MS1_5091	8260	icv	
23)	Sample	29	MS1_5092	8260	lcs m	
24)	Sample	30	MS1_5093	8260	lcsd m	
25)	Sample	31	MS1_5094	8260	lcs s	
26)	Sample	32	MS1_5095	8260	lcsd s	
27)	Sample	33	MS1_5096	8260	280-112244-C-1E ,DNR,RR dil @2mL	
28)	Sample	34	MS1_5097	8260	280-112244-D-2	
29)	Sample	35	MS1_5098	8260	280-112244-B-7	
30)	Sample	36	MS1_5099	8260	280-112244-D-8	
31)	Sample	37	MS1_5100	8260	280-112225-e-2 pH2	
32)	Sample	38	MS1_5101	8260	280-112225-d-3 pH2	
33)	Sample	39	MS1_5102	8260	ccvc m	
34)	Sample	40	MS1_5103	8260	ccvc s 19:01	

MAIN ICAL
calib ID: 33278
WL: 72600
ICV: 19
good for Q4/Q5

1st level: TAW 8-3-18
2nd level: JC 8/3/18

SUPP ICAL
calib ID: 33279
WL: 72600
ICIS: 23
ICV: 26
good for Q4/Q5 EXCEPT: ethylene oxide -21.8%
tetrahydrothiophene 33%
cis-1,4-dichloro-2-butene -26.8%

TestAmerica Laboratories
Worklist Report

Worklist Name: 080218am
Worklist Number: 72600
Instrument Name: VMS_MS1
Chrom Method: AQ_VMS1_8260
Purge Volume: 20.00
Units: mL
Analysis Type: VOA
Batch Directory: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b
Upload Directory: \\CorpTALSAPP16\280-DN-RawData\Organics\MS\VMS_MS1
Run Reagent: MV-568718-D_00014 Amount Added: 1.000, Units: uL
Run Reagent: MV-ARCH SS A_00101 Amount Added: 0.980, Units: uL

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072600-001	# 1 BFB	MV-BFB_00026	BFB		voaWater	1.000	uL	1.000
280-0072600-002	# 2 CCV	MV-2cleve+AVA_00036 MV-Main A_00037 MV-Gas/Ket A_00075	CCV		voaWater	20.00	mL	1.000
280-0072600-003	# 3 CCV	MV-Supp A_00031 MV-568718-D_00014	CCV		voaWater	20.00	mL	1.000
280-0072600-004	# 4 LCS	MV-2cleve+AVA_00036 MV-Gas/Ket B_00043	LCS		voaWater	20.00	mL	1.000
280-0072600-005	# 5 LCSD	MV-2cleve+AVA_00036 MV-Gas/Ket B_00043	LCSD		voaWater	20.00	mL	1.000
280-0072600-006	# 6 LCS	MV-Supp B_00021 mv-pentachloB_00008	LCS		voaWater	20.00	mL	1.000
280-0072600-007	# 7 LCSD	MV-Supp B_00021 mv-pentachloB_00008	LCSD		voaWater	20.00	mL	1.000
280-0072600-008	# 8 MB		MB		voaWater	20.00	mL	1.000
280-0072600-009	# 9 280-108595-A-1		Client		voaWater	20.00	mL	1.000
280-0072600-010	#10 280-108595-A-2		Client		voaWater	20.00	mL	1.000
280-0072600-011	#11 280-108595-A-3		Client		voaWater	20.00	mL	1.000
280-0072600-012	#12 std003	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	1	voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072600-013	#13 std01	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	2	voaWater	20.00	mL	1.000
280-0072600-014	#14 std02	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	3	voaWater	20.00	mL	1.000
280-0072600-015	#15 std05	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	4	voaWater	20.00	mL	1.000
280-0072600-016	#16 std10	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	5	voaWater	20.00	mL	1.000
280-0072600-017	#17 std30	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	6	voaWater	20.00	mL	1.000
280-0072600-018	#18 std60	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	7	voaWater	20.00	mL	1.000
280-0072600-019	#19 icv	MV-568718-D_00014 MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00044	ICV		voaWater	20.00	mL	1.000
280-0072600-020	#20 std01	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	2	voaWater	20.00	mL	1.000
280-0072600-021	#21 std02	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	3	voaWater	20.00	mL	1.000
280-0072600-022	#22 std05	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	4	voaWater	20.00	mL	1.000
280-0072600-023	#23 icis	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	ICIS	5	voaWater	20.00	mL	1.000
280-0072600-024	#24 std30	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	6	voaWater	20.00	mL	1.000
280-0072600-025	#25 std60	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	7	voaWater	20.00	mL	1.000
280-0072600-026	#26 icv	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp B_00021	ICV		voaWater	20.00	mL	1.000
280-0072600-033	#33 lcs	MV-Gas/Ket B_00044 MV-SS 2-Cleve_00046 MV-Main B_00022	LCS		voaWater	20.00	mL	1.000
280-0072600-034	#34 lcsd	MV-Gas/Ket B_00044 MV-SS 2-Cleve_00046 MV-Main B_00022	LCSD		voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072600-035	#35 lcs	MV-Supp B_00021	LCS		voaWater	20.00	mL	1.000
280-0072600-036	#36 lcsd	MV-Supp B_00021	LCSD		voaWater	20.00	mL	1.000
280-0072600-037	#37 280-112244-C-1		Client		voaWater	20.00	mL	1.000
280-0072600-038	#38 280-112244-D-2		Client		voaWater	20.00	mL	1.000
280-0072600-039	#39 280-112244-B-7		Client		voaWater	20.00	mL	1.000
280-0072600-040	#40 280-112244-D-8		Client		voaWater	20.00	mL	1.000
280-0072600-041	#41 280-112225-E-2		Client		voaWater	20.00	mL	1.000
280-0072600-042	#42 280-112225-D-3		Client		voaWater	20.00	mL	1.000
280-0072600-043	#43 ccvc	MV-2cleve+AVA_00036 MV-Main A_00037 MV-Gas/Ket A_00075	CCVC		voaWater	20.00	mL	1.000
280-0072600-044	#44 ccvc	MV-Supp A_00031	CCVC		voaWater	20.00	mL	1.000
280-0072600-045	#45 Samp 45		Client		voaWater	20.00	mL	1.000

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Batch Number: 423316 Batch Start Date: 07/23/18 17:36 Batch Analyst: Bourgery, David F

Batch Method: 1311 Batch End Date: 07/24/18 09:54

Lab Sample ID	Client Sample ID	Method Chain	Basis	ExtractFluid					
LB 280-423316/1		1311, 8260B		t1					
LCS 280-423316/2		1311, 8260B		t1					
320-41149-A-36	GRE-IDW-S-01	1311, 8260B	P	t1					

Batch Notes	
First End time	07/24/18 09:54
First Start time	07/23/18 17:36

Basis	Basis Description
P	TCLP

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^oC)										
Thermometer Correction Factor	0									
Oven Temp Actual (^oC)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

DV-IP-0012
TCLP/SPLP Worksheet No. 3
Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**#VALUE!**	**TCLP 1**	**TCLP 2**	**TCLP 2**	**TCLP 1**	**TCLP 1**	**#VALUE!**	**#VALUE!**	**TCLP 1**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID	1000645053
User ID	TCLP (+0.0)
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Name of file	TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location	C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID	1000645053
User ID	TCLP (+0.0)
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Name of file	TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location	C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-2cleve+AVA 00037	MV-568718-D 00014	MV-ARCH SS A 00101	MV-BFB 00026
BFB 280-424541/1		8260B		1 uL	1 uL				1 uL
STD003 280-424541/12 IC		8260B		20 mL	20 mL	0.15 uL	1 uL		
STD01 280-424541/13 IC		8260B		20 mL	20 mL	0.5 uL	1 uL		
STD02 280-424541/14 IC		8260B		20 mL	20 mL	1 uL	1 uL		
STD05 280-424541/15 IC		8260B		20 mL	20 mL	2.5 uL	1 uL		
STD10 280-424541/16 IC		8260B		20 mL	20 mL	5 uL	1 uL		
STD30 280-424541/17 IC		8260B		20 mL	20 mL	15 uL	1 uL		
STD60 280-424541/18 IC		8260B		20 mL	20 mL	30 uL	1 uL		
ICV 280-424541/19		8260B		20 mL	20 mL		1 uL		
STD01 280-424541/20 IC		8260B		20 mL	20 mL		1 uL	0.08 uL	
STD02 280-424541/21 IC		8260B		20 mL	20 mL		1 uL	0.16 uL	
STD05 280-424541/22 IC		8260B		20 mL	20 mL		1 uL	0.4 uL	
ICIS 280-424541/23		8260B		20 mL	20 mL		1 uL	0.8 uL	
STD30 280-424541/24 IC		8260B		20 mL	20 mL		1 uL	2.4 uL	
STD60 280-424541/25 IC		8260B		20 mL	20 mL		1 uL	4.8 uL	

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-2cleve+AVA 00037	MV-568718-D 00014	MV-ARCH SS A 00101	MV-BFB 00026
ICV 280-424541/26		8260B		20 mL	20 mL		1 uL	0.8 uL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas/Ket A 00076	MV-Gas/Ket B 00044	MV-Main A 00037	MV-Main B 00022	MV-SS 2-Cleve 00046	MV-Supp A 00031
BFB 280-424541/1		8260B							
STD003 280-424541/12 IC		8260B		0.15 uL		0.15 uL			
STD01 280-424541/13 IC		8260B		0.5 uL		0.5 uL			
STD02 280-424541/14 IC		8260B		1 uL		1 uL			
STD05 280-424541/15 IC		8260B		2.5 uL		2.5 uL			
STD10 280-424541/16 IC		8260B		5 uL		5 uL			
STD30 280-424541/17 IC		8260B		15 uL		15 uL			
STD60 280-424541/18 IC		8260B		30 uL		30 uL			
ICV 280-424541/19		8260B			5 uL		5 uL	5 uL	
STD01 280-424541/20 IC		8260B							0.5 uL
STD02 280-424541/21 IC		8260B							1 uL
STD05 280-424541/22 IC		8260B							2.5 uL
ICIS 280-424541/23		8260B							5 uL

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas/Ket A 00076	MV-Gas/Ket B 00044	MV-Main A 00037	MV-Main B 00022	MV-SS 2-Cleve 00046	MV-Supp A 00031
STD30 280-424541/24 IC		8260B							15 uL
STD60 280-424541/25 IC		8260B							30 uL
ICV 280-424541/26		8260B							

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Supp B 00021					
BFB 280-424541/1		8260B							
STD003 280-424541/12 IC		8260B							
STD01 280-424541/13 IC		8260B							
STD02 280-424541/14 IC		8260B							
STD05 280-424541/15 IC		8260B							
STD10 280-424541/16 IC		8260B							
STD30 280-424541/17 IC		8260B							
STD60 280-424541/18 IC		8260B							
ICV 280-424541/19		8260B							
STD01 280-424541/20 IC		8260B							
STD02 280-424541/21 IC		8260B							

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Supp B 00021					
STD05 280-424541/22 IC		8260B							
ICIS 280-424541/23		8260B							
STD30 280-424541/24 IC		8260B							
STD60 280-424541/25 IC		8260B							
ICV 280-424541/26		8260B		5 uL					

Batch Notes	

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41149-1

SDG No.:

Batch Number: 424938 Batch Start Date: 08/06/18 07:02 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-2cleve+AVA 00036	MV-568718-D 00014	MV-ARCH SS A 00101	MV-BFB 00026
BFB 280-424938/1		8260B		1 uL	1 uL				1 uL
CCV 280-424938/2		8260B		20 mL	20 mL	5 uL	1 uL	0.98 uL	
CCV 280-424938/3		8260B		20 mL	20 mL		1 uL		
LCS 280-423316/2-A		8260B		2 mL	20 mL		1 uL	0.98 uL	
LB 280-423316/1-A		8260B		2 mL	20 mL		1 uL	0.98 uL	
320-41149-A-36-A	GRE-IDW-S-01	8260B	P	2 mL	20 mL		1 uL	0.98 uL	
CCVC 280-424938/33		8260B		20 mL	20 mL	5 uL	1 uL	0.98 uL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas/Ket A 00075	MV-Gas/Ket B 00043	MV-Main A 00037	MV-Main B 00022	MV-SS 2-Cleve 00046	MV-Supp A 00031
BFB 280-424938/1		8260B							
CCV 280-424938/2		8260B		5 uL		5 uL			
CCV 280-424938/3		8260B							5 uL
LCS 280-423316/2-A		8260B			2.5 uL		2.5 uL	2.5 uL	
LB 280-423316/1-A		8260B							
320-41149-A-36-A	GRE-IDW-S-01	8260B	P						
CCVC 280-424938/33		8260B		5 uL		5 uL			

Batch Notes	

Basis	Basis Description
P	TCLP

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by Method PFAS_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBS #	PFHpA #	PFHxS #	PFOA #	PFNA #	PFOS #
GRE10-SB2-01	320-41149-2	79	90	84	89	92	83
GRE10-SB2-02	320-41149-3	75	77	75	84	85	78
GRE10-SB2-02 DL	320-41149-3 DL	65	86	72	85	86	70
GRE10-SB1-01	320-41149-4	77	86	80	85	92	79
GRE10-SB1-01D	320-41149-5	74	84	79	90	92	78
GRE10-SB3-01	320-41149-6	80	90	82	92	91	84
GRE09-SB1-01	320-41149-7	74	83	75	85	85	77
GRE09-SB1-01D	320-41149-8	76	83	76	89	88	78
GRE09-SB2-01	320-41149-9	77	86	76	90	92	83
GRE03-SB3-01	320-41149-13	93	88	93	91	96	95
GRE03-SB3-02	320-41149-14	89	85	90	87	90	92
GRE04-SB1-01	320-41149-15	96	93	96	91	96	93
GRE06-SB1-01	320-41149-16	94	93	97	92	84	90
GRE06-SB1-01 DL	320-41149-16 DL	76	92	84	96	89	77
GRE06-SB1-01D	320-41149-17	92	96	93	89	82	90
GRE06-SB1-01D DL	320-41149-17 DL	80	95	84	91	95	84
GRE06-SB2-01	320-41149-18	88	89	89	95	89	91
GRE06-SB2-01 DL	320-41149-18 DL	84	94	85	95	93	82
GRE07-SB1-01	320-41149-19	89	85	83	88	58	54
GRE07-SB1-01 DL	320-41149-19 DL	57 M	90	73	88	80	71
GRE07-SB1-02	320-41149-20	94	95	98	91	82	88
GRE07-SB1-02 DL	320-41149-20 DL	68	88	85	88	88	77
GRE03-SB1-01	320-41149-22	79	87	84	88	71	74
GRE03-SB1-01 DL	320-41149-22 DL	71	91	76	89	87	74
GRE03-SB2-01	320-41149-23	76	84	74	82	64	65
GRE03-SB2-01 DL	320-41149-23 DL	65	92	73	85	82	71
GRE03-SB4-01	320-41149-24	81	88	81	91	80	76
GRE03-SB4-01 DL	320-41149-24 DL	68	96	75	91	86	75
GRE03-SB5-01	320-41149-25	83	91	82	86	51	56
GRE03-SB5-01 DL	320-41149-25 DL	74	92	83	85	82	75
GRE04-SB2-01	320-41149-26	94	89	92	94	96	95
GRE07-SB2-01	320-41149-27	146	119	122	83	71	66
GRE07-SB2-01 DL	320-41149-27 DL	58 M	93	69	87	76	69
GRE08-SB1-01	320-41149-28	89	88	83	85	60	62
GRE08-SB1-01 DL	320-41149-28 DL	73 M	89	70	86	83	70

	QC LIMITS
PFBS = 13C3-PFBS	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFOS = 13C4 PFOS	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBS #	PFHpA #	PFHxS #	PFOA #	PFNA #	PFOS #
GRE08-SB2-01	320-41149-29	86	83	78	86	45 Q	45 Q
GRE08-SB2-01 DL	320-41149-29 DL	83 M	79	67	85	73	64
GRE08-SB3-01	320-41149-30	95	95	86	86	34 Q	32 Q
GRE08-SB3-01 DL	320-41149-30 DL	79 M	77	80	92	81	74
GRE08-SB4-01	320-41149-31	90	98	89	83	27 Q	22 Q
GRE08-SB4-01 DL	320-41149-31 DL	54 M	81	83	94	70	72
GRE07-SB3-01	320-41149-32	85	81	82	90	66	67
GRE07-SB3-01 DL	320-41149-32 DL	78 M	95	78	93	89	76
GRE04-SB3-01	320-41149-33	63	73	64	81	80	66
GRE05-SB1-01	320-41149-34	71	82	78	87	81	73
GRE05-SB1-01 DL	320-41149-34 DL	67	89	73	85	85	69
GRE05-SB2-01	320-41149-35	69	81	70	82	70	69
GRE05-SB2-01 DL	320-41149-35 DL	59	79	61	81	74	61
	MB 320-234633/1-A	95	89	96	90	95	96
	MB 320-234662/1-A	87	86	86	87	87	89
	LCS 320-234633/2-A	101	98	99	95	100	98
	LCS 320-234662/2-A	101	97	102	93	102	99
GRE10-SB2-01 MS	320-41149-2 MS	79	86	81	89	91	83
GRE07-SB1-01 MS	320-41149-19 MS	94	81	80	84	53	53
GRE07-SB1-01 MS DL	320-41149-19 MS DL	64 M	75	72	82	79	67
GRE10-SB2-01 MSD	320-41149-2 MSD	75	84	78	85	87	81
GRE07-SB1-01 MSD	320-41149-19 MSD	90	83	80	81	53	54
GRE07-SB1-01 MSD DL	320-41149-19 MSD DL	58 M	77	63	81	68	61

	QC LIMITS
PFBS = 13C3-PFBS	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFOS = 13C4 PFOS	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFBS #	PFHpA #	PFHxS #	PFOA #	PFNA #	PFOS #
GRE-ER-SB-01	320-41149-1	81	89	89	92	89	84
GRE-FB-POT-01	320-41149-10	83	93	97	93	92	95
GRE-FB-DI-01	320-41149-11	86	92	100	91	91	90
GRE-ER-SB-02	320-41149-12	88	92	90	90	89	93
GRE-ER-SB-03	320-41149-21	87	89	95	92	92	93
	MB 320-234634/1-A	92	94	99	97	90	93
	LCS 320-234634/2-A	90	89	92	94	93	91
	LCSD 320-234634/3-A	91	94	99	97	93	94

	QC LIMITS
PFBS = 13C3-PFBS	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFOS = 13C4 PFOS	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.30LLA_007.d

Lab ID: LCS 320-234633/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.00	1.73	86	76-124	
Perfluorooctanoic acid (PFOA)	2.00	1.65	82	76-121	
Perfluorononanoic acid (PFNA)	2.00	1.68	84	74-126	
13C3-PFBS	4.65	4.69	101	50-150	
Perfluorobutanesulfonic acid (PFBS)	1.77	1.57	89	73-142	
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.50	82	75-121	
Perfluorooctanesulfonic acid (PFOS)	1.86	1.80	97	69-131	
13C4-PFHpA	5.00	4.88	98	50-150	
13C4 PFOA	5.00	4.77	95	50-150	
13C5 PFNA	5.00	5.02	100	50-150	
18O2 PFHxS	4.73	4.68	99	50-150	
13C4 PFOS	4.78	4.66	98	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.07.22LLA_039.d

Lab ID: LCS 320-234634/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	40.0	40.5	101	80-113	
Perfluorooctanoic acid (PFOA)	40.0	38.0	95	80-107	
Perfluorononanoic acid (PFNA)	40.0	38.4	96	83-113	
13C3-PFBS	93.0	83.7	90	50-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.5	98	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	31.1	85	81-106	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.7	93	82-112	
13C4-PFHpA	100	89.4	89	50-150	
13C4 PFOA	100	93.8	94	50-150	
13C5 PFNA	100	92.8	93	50-150	
18O2 PFHxS	94.6	86.9	92	50-150	
13C4 PFOS	95.6	86.8	91	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.28LLB_016.d

Lab ID: LCS 320-234662/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.00	1.77	88	76-124	
Perfluorooctanoic acid (PFOA)	2.00	1.75	87	76-121	
Perfluorononanoic acid (PFNA)	2.00	1.71	85	74-126	
13C3-PFBS	4.65	4.68	101	50-150	
Perfluorobutanesulfonic acid (PFBS)	1.77	1.55	87	73-142	
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.43	79	75-121	
Perfluorooctanesulfonic acid (PFOS)	1.86	1.67	90	69-131	
13C4-PFHpA	5.00	4.83	97	50-150	
13C4 PFOA	5.00	4.66	93	50-150	
13C5 PFNA	5.00	5.12	102	50-150	
18O2 PFHxS	4.73	4.83	102	50-150	
13C4 PFOS	4.78	4.75	99	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.07.22LLA_040.d

Lab ID: LCSD 320-234634/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	40.0	38.3	96	6	30	80-113	
Perfluorooctanoic acid (PFOA)	40.0	37.3	93	2	30	80-107	
Perfluorononanoic acid (PFNA)	40.0	39.3	98	2	30	83-113	
13C3-PFBS	93.0	84.6	91			50-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.9	99	1	30	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	30.9	85	1	30	81-106	
Perfluorooctanesulfonic acid (PFOS)	37.1	33.4	90	4	30	82-112	
13C4-PFHpA	100	94.2	94			50-150	
13C4 PFOA	100	96.8	97			50-150	
13C5 PFNA	100	93.4	93			50-150	
18O2 PFHxS	94.6	93.5	99			50-150	
13C4 PFOS	95.6	90.2	94			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.30LLA_009.d

Lab ID: 320-41149-2 MS Client ID: GRE10-SB2-01 MS

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.08	0.21 U	1.98	95	76-124	
Perfluorooctanoic acid (PFOA)	2.08	0.44	2.13	81	76-121	
Perfluorononanoic acid (PFNA)	2.08	0.13 J	1.92	86	74-126	
13C3-PFBS	4.83	3.8	3.80	79	50-150	
Perfluorobutanesulfonic acid (PFBS)	1.84	0.19 U	1.71	93	73-142	
Perfluorohexanesulfonic acid (PFHxS)	1.89	3.2	4.63	74	75-121	J1
Perfluorooctanesulfonic acid (PFOS)	1.93	16	16.1	19	69-131	4
13C4-PFHpA	5.20	4.6	4.48	86	50-150	
13C4 PFOA	5.20	4.6	4.61	89	50-150	
13C5 PFNA	5.20	4.8	4.73	91	50-150	
18O2 PFHxS	4.92	4.1	3.96	81	50-150	
13C4 PFOS	4.97	4.1	4.13	83	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.28LLB_018.d

Lab ID: 320-41149-19 MS Client ID: GRE07-SB1-01 MS

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.08	3.1	4.73	81	76-124	
Perfluorooctanoic acid (PFOA)	2.08	14	16.0	105	76-121	4
Perfluorononanoic acid (PFNA)	2.08	5.1	6.91	86	74-126	
13C3-PFBS	4.83	4.3	4.54	94	50-150	
Perfluorobutanesulfonic acid (PFBS)	1.84	1.6	3.05	81	73-142	
Perfluorohexanesulfonic acid (PFHxS)	1.89	35	37.3	123	75-121	E 4
Perfluorooctanesulfonic acid (PFOS)	1.93	340	326	-466	69-131	E 4
13C4-PFHpA	5.20	4.5	4.23	81	50-150	
13C4 PFOA	5.20	4.6	4.36	84	50-150	
13C5 PFNA	5.20	3.1	2.77	53	50-150	
18O2 PFHxS	4.92	4.1	3.92	80	50-150	
13C4 PFOS	4.97	2.7	2.65	53	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.31LLA_008.d

Lab ID: 320-41149-19 MS DL Client ID: GRE07-SB1-01 MS DL

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.08	10 U	5.02 J	NC	76-124	D M
Perfluorooctanoic acid (PFOA)	2.08	15 J	17.9	138	76-121	4 D
Perfluorononanoic acid (PFNA)	2.08	6.6 J	7.92 J	63	74-126	J1 D
13C3-PFBS	4.83	2.8	3.11	64	50-150	M
Perfluorobutanesulfonic acid (PFBS)	1.84	9.4 U	3.49 J	NC	73-142	D
Perfluorohexanesulfonic acid (PFHxS)	1.89	37	40.1	140	75-121	4 D
Perfluorooctanesulfonic acid (PFOS)	1.93	520	553	1490	69-131	4 D
13C4-PFHpA	5.20	4.7	3.92	75	50-150	
13C4 PFOA	5.20	4.6	4.26	82	50-150	
13C5 PFNA	5.20	4.2	4.08	79	50-150	
18O2 PFHxS	4.92	3.6	3.54	72	50-150	
13C4 PFOS	4.97	3.6	3.32	67	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.30LLA_010.d

Lab ID: 320-41149-2 MSD Client ID: GRE10-SB2-01 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.06	1.97	95	1	30	76-124	
Perfluorooctanoic acid (PFOA)	2.07	2.08	79	3	30	76-121	
Perfluorononanoic acid (PFNA)	2.06	1.93	87	1	30	74-126	
13C3-PFBS	4.80	3.57	75			50-150	
Perfluorobutanesulfonic acid (PFBS)	1.82	1.73	95	1	30	73-142	
Perfluorohexanesulfonic acid (PFHxS)	1.88	4.59	73	1	30	75-121	J1
Perfluorooctanesulfonic acid (PFOS)	1.91	16.6	42	3	30	69-131	4
13C4-PFHpA	5.16	4.32	84			50-150	
13C4 PFOA	5.16	4.40	85			50-150	
13C5 PFNA	5.16	4.48	87			50-150	
18O2 PFHxS	4.88	3.82	78			50-150	
13C4 PFOS	4.93	4.02	81			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.28LLB_019.d

Lab ID: 320-41149-19 MSD Client ID: GRE07-SB1-01 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.11	4.94	89	4	30	76-124	
Perfluorooctanoic acid (PFOA)	2.11	14.4	28	10	30	76-121	4
Perfluorononanoic acid (PFNA)	2.11	6.66	73	4	30	74-126	J1
13C3-PFBS	4.90	4.39	90			50-150	
Perfluorobutanesulfonic acid (PFBS)	1.86	3.15	85	3	30	73-142	M
Perfluorohexanesulfonic acid (PFHxS)	1.92	32.7	-121	13	30	75-121	E 4
Perfluorooctanesulfonic acid (PFOS)	1.96	297	-1973	10	30	69-131	E 4
13C4-PFHpA	5.27	4.36	83			50-150	
13C4 PFOA	5.27	4.28	81			50-150	
13C5 PFNA	5.27	2.80	53			50-150	
18O2 PFHxS	4.98	4.01	80			50-150	
13C4 PFOS	5.04	2.70	54			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.07.31LLA_009.d

Lab ID: 320-41149-19 MSD DL Client ID: GRE07-SB1-01 MSD DL

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.11	4.60 J	NC	9	30	76-124	D M
Perfluorooctanoic acid (PFOA)	2.11	14.5 J	-25	21	30	76-121	4 D
Perfluorononanoic acid (PFNA)	2.11	7.42 J	39	7	30	74-126	D J1
13C3-PFBS	4.90	2.85	58			50-150	M
Perfluorobutanesulfonic acid (PFBS)	1.86	3.35 J	NC	4	30	73-142	D
Perfluorohexanesulfonic acid (PFHxS)	1.92	38.9	72	3	30	75-121	4 D
Perfluorooctanesulfonic acid (PFOS)	1.96	487	-1883	13	30	69-131	4 D
13C4-PFHpA	5.27	4.04	77			50-150	
13C4 PFOA	5.27	4.26	81			50-150	
13C5 PFNA	5.27	3.58	68			50-150	
18O2 PFHxS	4.98	3.13	63			50-150	
13C4 PFOS	5.04	3.09	61			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab File ID: 2018.07.30LLA_006.d Lab Sample ID: MB 320-234633/1-A

Matrix: Solid Date Extracted: 07/18/2018 08:48

Instrument ID: A8_N Date Analyzed: 07/30/2018 03:36

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-234633/2-A	2018.07.30LLA_007.d	07/30/2018 03:44
GRE10-SB2-01	320-41149-2	2018.07.30LLA_008.d	07/30/2018 03:52
GRE10-SB2-01 MS	320-41149-2 MS	2018.07.30LLA_009.d	07/30/2018 04:00
GRE10-SB2-01 MSD	320-41149-2 MSD	2018.07.30LLA_010.d	07/30/2018 04:08
GRE10-SB2-02	320-41149-3	2018.07.30LLA_011.d	07/30/2018 04:15
GRE10-SB1-01	320-41149-4	2018.07.30LLA_012.d	07/30/2018 04:23
GRE10-SB1-01D	320-41149-5	2018.07.30LLA_013.d	07/30/2018 04:31
GRE10-SB3-01	320-41149-6	2018.07.30LLA_014.d	07/30/2018 04:39
GRE09-SB1-01	320-41149-7	2018.07.30LLA_015.d	07/30/2018 04:47
GRE09-SB1-01D	320-41149-8	2018.07.30LLA_017.d	07/30/2018 05:02
GRE09-SB2-01	320-41149-9	2018.07.30LLA_018.d	07/30/2018 05:10
GRE03-SB3-01	320-41149-13	2018.07.30LLA_019.d	07/30/2018 05:18
GRE03-SB3-02	320-41149-14	2018.07.30LLA_020.d	07/30/2018 05:26
GRE04-SB1-01	320-41149-15	2018.07.30LLA_021.d	07/30/2018 05:34
GRE06-SB1-01	320-41149-16	2018.07.30LLA_022.d	07/30/2018 05:42
GRE06-SB1-01D	320-41149-17	2018.07.30LLA_023.d	07/30/2018 05:50
GRE06-SB2-01	320-41149-18	2018.07.30LLA_024.d	07/30/2018 05:57
GRE07-SB1-02	320-41149-20	2018.07.30LLA_025.d	07/30/2018 06:05
GRE03-SB1-01	320-41149-22	2018.07.30LLA_026.d	07/30/2018 06:13
GRE03-SB2-01	320-41149-23	2018.07.30LLA_028.d	07/30/2018 06:29
GRE03-SB4-01	320-41149-24	2018.07.30LLA_029.d	07/30/2018 06:36
GRE03-SB5-01	320-41149-25	2018.07.30LLA_030.d	07/30/2018 06:44

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab File ID: 2018.07.30LLA_006.d Lab Sample ID: MB 320-234633/1-A

Matrix: Solid Date Extracted: 07/18/2018 08:48

Instrument ID: A8_N Date Analyzed: 07/30/2018 03:36

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
GRE04-SB2-01	320-41149-26	2018.07.30LLA_031.d	07/30/2018 06:52
GRE10-SB2-02 DL	320-41149-3 DL	2018.08.01LLB_014.d	08/01/2018 15:19
GRE06-SB1-01 DL	320-41149-16 DL	2018.08.01LLB_015.d	08/01/2018 15:27
GRE06-SB1-01D DL	320-41149-17 DL	2018.08.01LLB_016.d	08/01/2018 15:35
GRE06-SB2-01 DL	320-41149-18 DL	2018.08.01LLB_017.d	08/01/2018 15:43
GRE07-SB1-02 DL	320-41149-20 DL	2018.08.01LLBB_018.d	08/01/2018 16:22
GRE03-SB1-01 DL	320-41149-22 DL	2018.08.01LLBB_019.d	08/01/2018 16:30
GRE03-SB2-01 DL	320-41149-23 DL	2018.08.01LLBB_020.d	08/01/2018 16:37
GRE03-SB4-01 DL	320-41149-24 DL	2018.08.01LLBB_021.d	08/01/2018 16:45
GRE03-SB5-01 DL	320-41149-25 DL	2018.08.01LLBB_022.d	08/01/2018 16:53

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab File ID: 2018.07.22LLA_038.d Lab Sample ID: MB 320-234634/1-A

Matrix: Water Date Extracted: 07/18/2018 08:54

Instrument ID: A9 Date Analyzed: 07/22/2018 10:22

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-234634/2-A	2018.07.22LLA_039.d	07/22/2018 10:29
	LCSD 320-234634/3-A	2018.07.22LLA_040.d	07/22/2018 10:37
GRE-FB-POT-01	320-41149-10	2018.07.22LLA_042.d	07/22/2018 10:52
GRE-FB-DI-01	320-41149-11	2018.07.22LLA_043.d	07/22/2018 10:59
GRE-ER-SB-02	320-41149-12	2018.07.22LLA_044.d	07/22/2018 11:07
GRE-ER-SB-03	320-41149-21	2018.07.22LLA_045.d	07/22/2018 11:14
GRE-ER-SB-01	320-41149-1	2018.07.26LLBB_063.d	07/26/2018 13:37

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab File ID: 2018.07.28LLB_015.d Lab Sample ID: MB 320-234662/1-A

Matrix: Solid Date Extracted: 07/18/2018 10:19

Instrument ID: A8_N Date Analyzed: 07/29/2018 01:08

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-234662/2-A	2018.07.28LLB_016.d	07/29/2018 01:16
GRE07-SB1-01	320-41149-19	2018.07.28LLB_017.d	07/29/2018 01:24
GRE07-SB1-01 MS	320-41149-19 MS	2018.07.28LLB_018.d	07/29/2018 01:32
GRE07-SB1-01 MSD	320-41149-19 MSD	2018.07.28LLB_019.d	07/29/2018 01:40
GRE08-SB1-01	320-41149-28	2018.07.28LLB_021.d	07/29/2018 01:55
GRE08-SB2-01	320-41149-29	2018.07.28LLB_022.d	07/29/2018 02:03
GRE08-SB3-01	320-41149-30	2018.07.28LLB_023.d	07/29/2018 02:11
GRE08-SB4-01	320-41149-31	2018.07.28LLB_024.d	07/29/2018 02:19
GRE07-SB3-01	320-41149-32	2018.07.28LLB_026.d	07/29/2018 02:35
GRE04-SB3-01	320-41149-33	2018.07.28LLB_027.d	07/29/2018 02:42
GRE05-SB1-01	320-41149-34	2018.07.28LLB_028.d	07/29/2018 02:50
GRE05-SB2-01	320-41149-35	2018.07.28LLB_029.d	07/29/2018 02:58
GRE07-SB1-01 DL	320-41149-19 DL	2018.07.31LLA_007.d	07/31/2018 17:57
GRE07-SB1-01 MS DL	320-41149-19 MS DL	2018.07.31LLA_008.d	07/31/2018 18:05
GRE07-SB1-01 MSD DL	320-41149-19 MSD DL	2018.07.31LLA_009.d	07/31/2018 18:13
GRE07-SB2-01 DL	320-41149-27 DL	2018.07.31LLA_010.d	07/31/2018 18:20
GRE08-SB1-01 DL	320-41149-28 DL	2018.07.31LLA_011.d	07/31/2018 18:28
GRE08-SB2-01 DL	320-41149-29 DL	2018.07.31LLA_012.d	07/31/2018 18:36
GRE08-SB3-01 DL	320-41149-30 DL	2018.07.31LLA_013.d	07/31/2018 18:44
GRE08-SB4-01 DL	320-41149-31 DL	2018.07.31LLA_014.d	07/31/2018 18:52
GRE07-SB3-01 DL	320-41149-32 DL	2018.07.31LLA_015.d	07/31/2018 18:59
GRE05-SB1-01 DL	320-41149-34 DL	2018.07.31LLA_018.d	07/31/2018 19:23

FORM IV EPA 537 (Mod)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab File ID: 2018.07.28LLB_015.d Lab Sample ID: MB 320-234662/1-A

Matrix: Solid Date Extracted: 07/18/2018 10:19

Instrument ID: A8_N Date Analyzed: 07/29/2018 01:08

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
GRE05-SB2-01 DL	320-41149-35 DL	2018.07.31LLA_019.d	07/31/2018 19:31
GRE07-SB2-01	320-41149-27	2018.07.31LLA_021.d	07/31/2018 19:46

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: IC 320-235668/5 Date Analyzed: 07/23/2018 16:34

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.23LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 40279

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		4466345	2.59				
UPPER LIMIT		6699518	2.79				
LOWER LIMIT		2233173	2.39				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-235668/9		4552759	2.59				
ICV 320-235668/10		4558188	2.58				
CCV 320-236773/3 CCVIS		3857843	2.58				
CCV 320-236836/3 CCVIS		3726307	2.57				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: CCV 320-236773/3 Date Analyzed: 07/28/2018 20:03

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.28LLAA_040. Heated Purge: (Y/N) N

Calibration ID: 40279

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3857843	2.58				
UPPER LIMIT		5786765	2.78				
LOWER LIMIT		1928922	2.38				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-236773/1		3907074	2.59				
CCVL 320-236773/2		4160224	2.58				
CCV 320-236778/1		3729840	2.58				
MB 320-234662/1-A		4904357	2.58				
LCS 320-234662/2-A		4388705	2.58				
320-41149-19	GRE07-SB1-01	3760961	2.57				
320-41149-19 MS	GRE07-SB1-01 MS	3957623	2.58				
320-41149-19 MSD	GRE07-SB1-01 MSD	4144664	2.58				
320-41149-28	GRE08-SB1-01	4007977	2.59				
320-41149-29	GRE08-SB2-01	4060159	2.58				
320-41149-30	GRE08-SB3-01	4060358	2.58				
320-41149-31	GRE08-SB4-01	3882722	2.59				
CCV 320-236778/12		3748252	2.58				
320-41149-32	GRE07-SB3-01	4366554	2.58				
320-41149-33	GRE04-SB3-01	5132898	2.59				
320-41149-34	GRE05-SB1-01	4756733	2.58				
320-41149-35	GRE05-SB2-01	4827059	2.58				
CCV 320-236778/23		3987714	2.59				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: CCV 320-236836/3 Date Analyzed: 07/30/2018 03:28

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.30LLA_005.d Heated Purge: (Y/N) N

Calibration ID: 40279

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3726307	2.57				
UPPER LIMIT		5589461	2.77				
LOWER LIMIT		1863154	2.37				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-236836/1		4019794	2.58				
CCVL 320-236836/2		3621327	2.57				
MB 320-234633/1-A		4382707	2.58				
LCS 320-234633/2-A		4179916	2.58				
320-41149-2	GRE10-SB2-01	4297870	2.57				
320-41149-2 MS	GRE10-SB2-01 MS	4417662	2.58				
320-41149-2 MSD	GRE10-SB2-01 MSD	4466558	2.57				
320-41149-3	GRE10-SB2-02	4776625	2.58				
320-41149-4	GRE10-SB1-01	4275435	2.57				
320-41149-5	GRE10-SB1-01D	4448625	2.57				
320-41149-6	GRE10-SB3-01	4102416	2.57				
320-41149-7	GRE09-SB1-01	4520592	2.58				
CCV 320-236836/14		3840557	2.58				
320-41149-8	GRE09-SB1-01D	4451929	2.57				
320-41149-9	GRE09-SB2-01	4570257	2.58				
320-41149-13	GRE03-SB3-01	4440372	2.58				
320-41149-14	GRE03-SB3-02	4500328	2.57				
320-41149-15	GRE04-SB1-01	4375264	2.57				
320-41149-16	GRE06-SB1-01	4223716	2.57				
320-41149-17	GRE06-SB1-01D	4236982	2.58				
320-41149-18	GRE06-SB2-01	4394972	2.58				
320-41149-20	GRE07-SB1-02	4108718	2.58				
320-41149-22	GRE03-SB1-01	4455491	2.58				
CCV 320-236836/25		3443034	2.58				
320-41149-23	GRE03-SB2-01	4727296	2.58				
320-41149-24	GRE03-SB4-01	4167382	2.58				
320-41149-25	GRE03-SB5-01	4466489	2.57				
320-41149-26	GRE04-SB2-01	4392244	2.58				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: CCV 320-236836/3 Date Analyzed: 07/30/2018 03:28

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.30LLA_005.d Heated Purge: (Y/N) N

Calibration ID: 40279

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3726307	2.57				
UPPER LIMIT		5589461	2.77				
LOWER LIMIT		1863154	2.37				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 320-236836/30		3810250	2.58				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: IC 320-236979/5 Date Analyzed: 07/30/2018 15:37

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.30LLICA_005 Heated Purge: (Y/N) N

Calibration ID: 40409

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		3546579	2.63				
UPPER LIMIT		5319869	2.83				
LOWER LIMIT		1773290	2.43				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-236979/9		3502239	2.65				
ICV 320-236979/10		3682587	2.65				
CCV 320-237043/3 CCVIS		2932741	2.59				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: CCV 320-237043/3 Date Analyzed: 07/31/2018 15:52

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.30LLBB_064. Heated Purge: (Y/N) N

Calibration ID: 40409

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2932741	2.59				
UPPER LIMIT		4399112	2.79				
LOWER LIMIT		1466371	2.39				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-237043/1		3476165	2.58				
CCVL 320-237043/2		3576137	2.59				
CCV 320-237052/1		3458240	2.58				
320-41149-19 DL	GRE07-SB1-01 DL	85540Q	2.58				
320-41149-19 MS DL	GRE07-SB1-01 MS DL	86700Q	2.58				
320-41149-19 MSD DL	GRE07-SB1-01 MSD DL	96092Q	2.59				
320-41149-27 DL	GRE07-SB2-01 DL	40564Q	2.59				
320-41149-28 DL	GRE08-SB1-01 DL	87953Q	2.58				
320-41149-29 DL	GRE08-SB2-01 DL	84244Q	2.59				
320-41149-30 DL	GRE08-SB3-01 DL	44499Q	2.58				
320-41149-31 DL	GRE08-SB4-01 DL	40700Q	2.58				
320-41149-32 DL	GRE07-SB3-01 DL	182636Q	2.58				
CCV 320-237052/12		3424997	2.57				
320-41149-34 DL	GRE05-SB1-01 DL	415044Q	2.59				
320-41149-35 DL	GRE05-SB2-01 DL	442078Q	2.59				
320-41149-27	GRE07-SB2-01	1740775	2.58				
CCV 320-237052/22		3269152	2.58				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: IC 320-237402/5 Date Analyzed: 08/01/2018 13:22

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.08.01LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 40449

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		3424441	2.58				
UPPER LIMIT		5136662	2.78				
LOWER LIMIT		1712221	2.38				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-237402/9		3483672	2.58				
ICV 320-237402/10		3437702	2.57				
CCV 320-237446/1		2952556	2.57				
320-41149-3 DL	GRE10-SB2-02 DL	811283Q	2.57				
320-41149-16 DL	GRE06-SB1-01 DL	384986Q	2.58				
320-41149-17 DL	GRE06-SB1-01D DL	373078Q	2.57				
320-41149-18 DL	GRE06-SB2-01 DL	751294Q	2.57				
CCV 320-237446/7		3255357	2.57				
320-41149-20 DL	GRE07-SB1-02 DL	386143Q	2.57				
320-41149-22 DL	GRE03-SB1-01 DL	414904Q	2.57				
320-41149-23 DL	GRE03-SB2-01 DL	412647Q	2.57				
320-41149-24 DL	GRE03-SB4-01 DL	378478Q	2.57				
320-41149-25 DL	GRE03-SB5-01 DL	198942Q	2.57				
CCV 320-237446/16		3308081	2.57				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: IC 320-235323/5 Date Analyzed: 07/20/2018 19:55

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.07.20LLA_007.d Heated Purge: (Y/N) N

Calibration ID: 40228

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		8917220	2.80				
UPPER LIMIT		13375830	3.00				
LOWER LIMIT		4458610	2.60				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-235323/9		9124760	2.81				
ICV 320-235323/10		4983916	2.81				
CCV 320-235506/3 CCVIS		10340626	2.80				
CCV 320-236275/3 CCVIS		8548152	2.84				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: CCV 320-235506/3 Date Analyzed: 07/22/2018 06:22

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.07.22LLA_006.d Heated Purge: (Y/N) N

Calibration ID: 40228

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		10340626	2.80				
UPPER LIMIT		15510939	3.00				
LOWER LIMIT		5170313	2.60				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-235506/1		10596275	2.80				
CCVL 320-235506/2		10370723	2.80				
MB 320-234634/1-A		10595163	2.80				
LCS 320-234634/2-A		10498649	2.80				
LCSD 320-234634/3-A		10446207	2.80				
320-41149-10	GRE-FB-POT-01	10808291	2.81				
320-41149-11	GRE-FB-DI-01	11016904	2.81				
320-41149-12	GRE-ER-SB-02	10985360	2.80				
320-41149-21	GRE-ER-SB-03	11140000	2.80				
CCV 320-235512/12		9721611	2.80				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Sample No.: CCV 320-236275/3 Date Analyzed: 07/26/2018 09:59

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.07.26LLA_006.d Heated Purge: (Y/N) N

Calibration ID: 40228

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		8548152	2.84				
UPPER LIMIT		12822228	3.04				
LOWER LIMIT		4274076	2.64				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-236275/1		7818446	2.84				
CCVL 320-236275/2		8283170	2.84				
CCV 320-236374/1		8280503	2.84				
320-41149-1	GRE-ER-SB-01	9108480	2.86				
CCV 320-236374/5		7868632	2.84				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE-ER-SB-01
Lab Sample ID: 320-41149-1
Matrix: Water
Lab File ID: 2018.07.26LLBB_063.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 12:50
Extraction Method: 3535
Date Extracted: 07/18/2018 08:54
Sample wt/vol: 311.5(mL)
Date Analyzed: 07/26/2018 13:37
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236374
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.2	U	1.6	1.2	0.49
335-67-1	Perfluorooctanoic acid (PFOA)	1.2	U	1.6	1.2	0.43
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U	1.6	1.2	0.42
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.80	U	1.6	0.80	0.37
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.80	U	1.6	0.80	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.4	U	3.2	2.4	0.88

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	81		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	89		50-150
STL00994	18O2 PFHxS	89		50-150
STL00991	13C4 PFOS	84		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\2018.07.26LLBB_063.d
Lims ID: 320-41149-A-1-A
Client ID: GRE-ER-SB-01
Sample Type: Client
Inject. Date: 26-Jul-2018 13:37:36 ALS Bottle#: 43 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-1-a (#234634)
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 26-Jul-2018 15:20:24 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK051

First Level Reviewer: hannigana Date: 26-Jul-2018 15:19:04

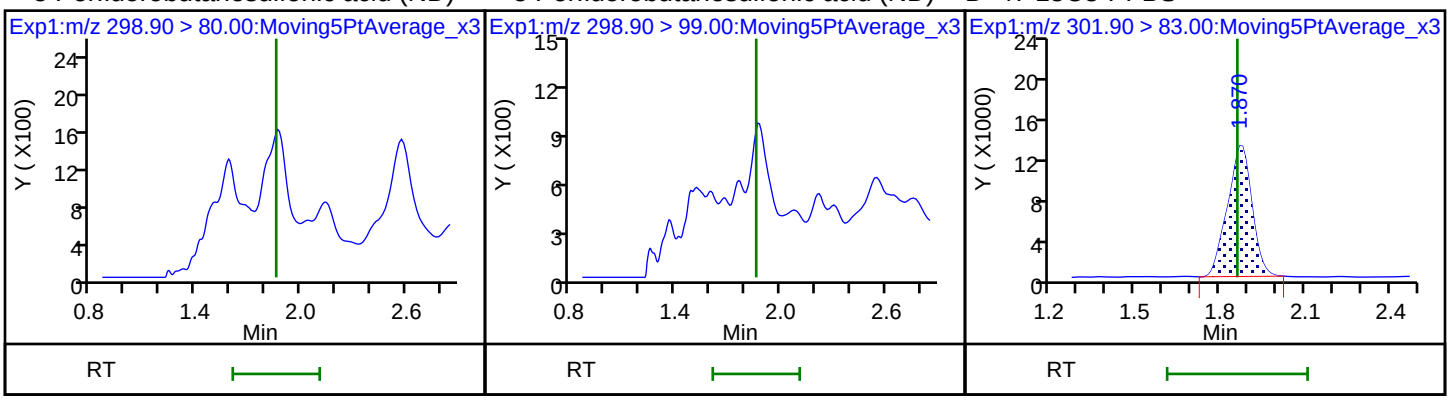
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.870	1.860	0.010	0.654	77497	1.88		80.9	647	
D 9 13C4-PFHpA										
367.00 > 322.00	2.487	2.474	0.013	0.870	8789164	2.21		88.6	23297	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.501	2.487	0.014	1.000	18535	0.006465			33.4	
399.00 > 99.00	2.501	2.487	0.014	1.000	5008		3.70(1.90-5.70)		10.4	
D 11 18O2 PFHxS										
403.00 > 84.00	2.501	2.487	0.014	0.874	5089213	2.11		89.1	30041	
* 62 13C2-PFOA										
415.00 > 370.00	2.859	2.844	0.015		9108480	2.50			20082	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.859	2.844	0.015	1.000	28451	0.007533			4.3	
413.00 > 169.00	2.859	2.844	0.015	1.000	7292		3.90(1.36-4.08)		16.2	
D 14 13C4 PFOA										
417.00 > 372.00	2.859	2.844	0.015	1.000	8196511	2.30		91.9	14045	
D 19 13C5 PFNA										
468.00 > 423.00	3.243	3.224	0.019	1.134	7492006	2.24		89.4	12146	
D 18 13C4 PFOS										
503.00 > 80.00	3.243	3.224	0.019	1.134	5198305	2.01		84.1	6613	

Report Date: 26-Jul-2018 15:20:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

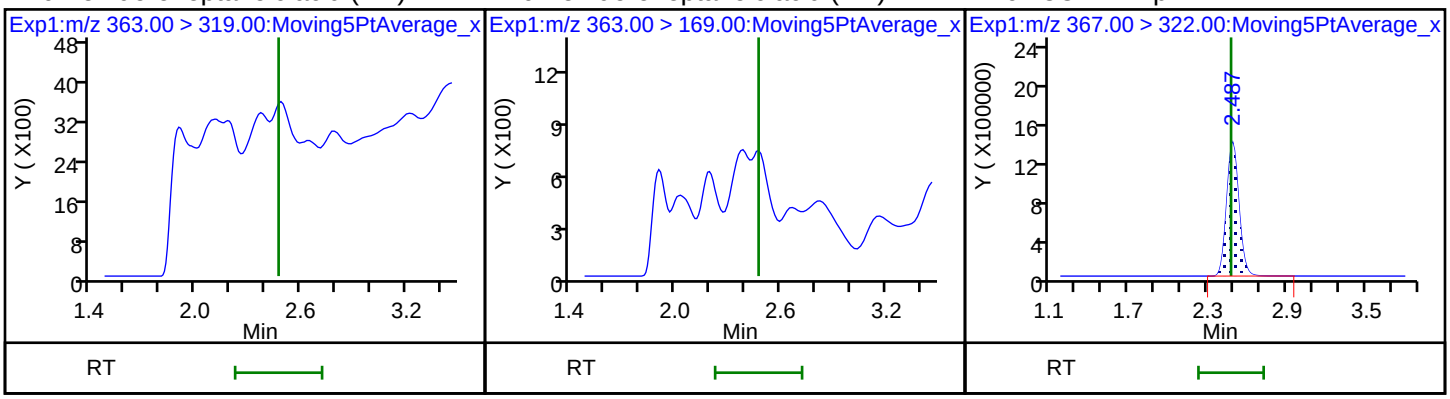
TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\2018.07.26LLBB_063.d				
Injection Date:	26-Jul-2018 13:37:36	Instrument ID:	A9		
Lims ID:	320-41149-A-1-A	Lab Sample ID:	320-41149-1		
Client ID:	GRE-ER-SB-01				
Operator ID:	A9\Administrator	ALS Bottle#:	43	Worklist Smp#:	4
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		

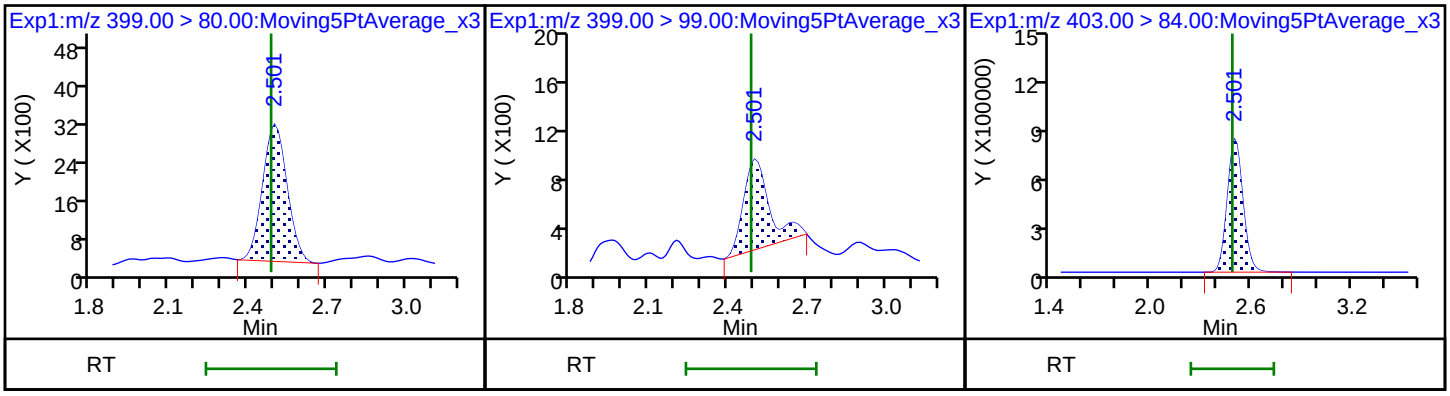
5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) D 47 13C3-PFBS



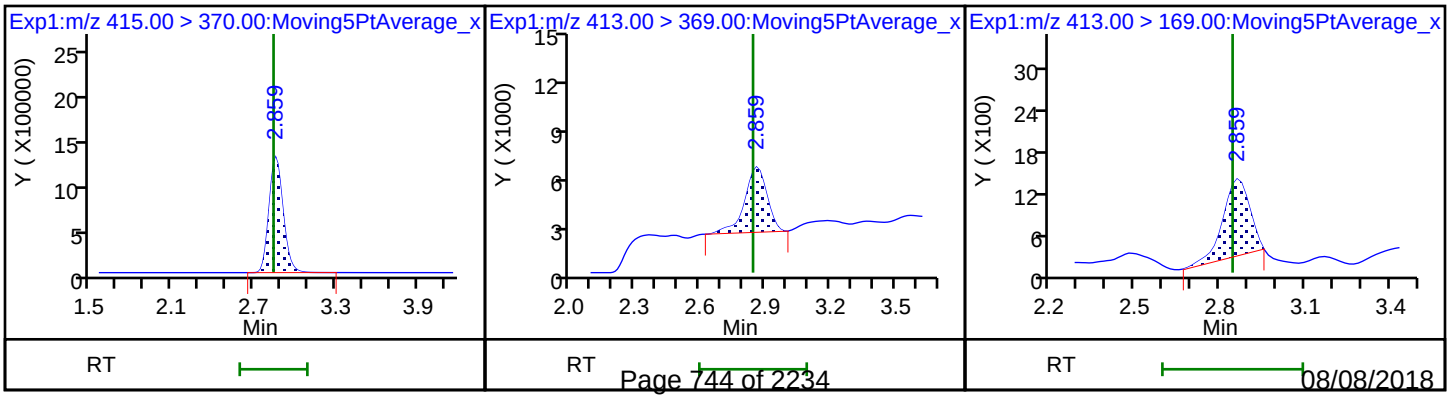
10 Perfluoroheptanoic acid (ND) 10 Perfluoroheptanoic acid (ND) D 9 13C4-PFHpA



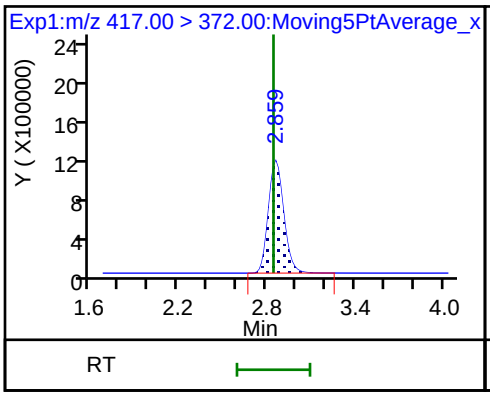
8 Perfluorohexanesulfonic acid 8 Perfluorohexanesulfonic acid D 11 18O2 PFHxS



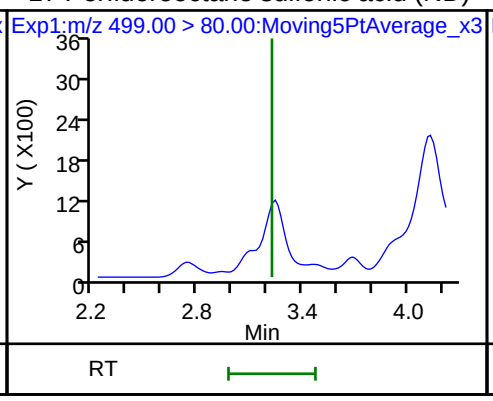
* 62 13C2-PFOA 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid



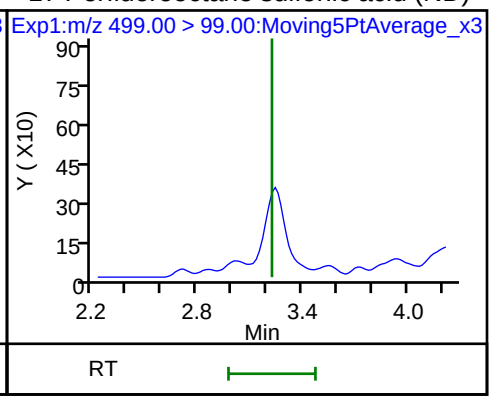
D 14 13C4 PFOA



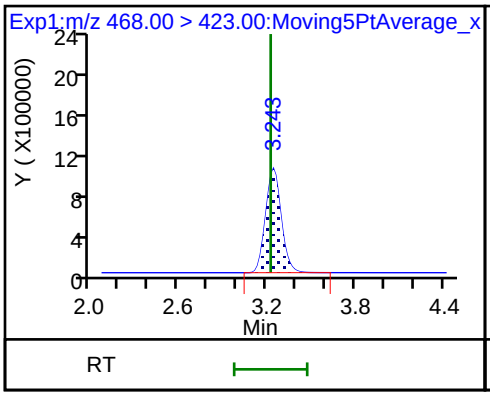
17 Perfluorooctane sulfonic acid (ND)



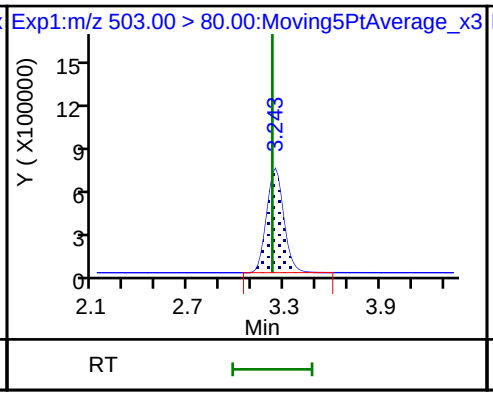
17 Perfluorooctane sulfonic acid (ND)



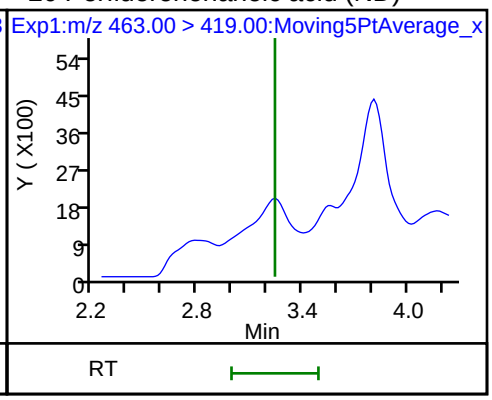
D 19 13C5 PFNA



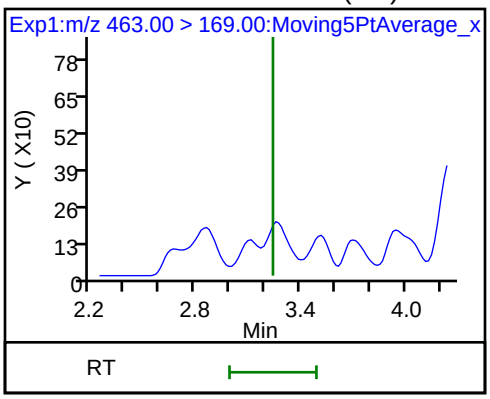
D 18 13C4 PFOS



20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE10-SB2-01
Lab Sample ID: 320-41149-2
Matrix: Solid
Lab File ID: 2018.07.30LLA_008.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 14:10
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.06(g)
Date Analyzed: 07/30/2018 03:52
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 4.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21	U M	0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	0.44		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.13	J	0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.2	J1	0.31	0.21	0.064
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J1	1.0	0.52	0.25

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	79		50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	84		50-150
STL00991	13C4 PFOS	83		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_008.d
Lims ID: 320-41149-A-2-A
Client ID: GRE10-SB2-01
Sample Type: Client
Inject. Date: 30-Jul-2018 03:52:25 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:49:02 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:49:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.389	1.389	0.0	1.000	153957	0.0816			11.9	
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.396	-0.007	0.540	4799768	2.41		96.3	172689	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.629	1.629	0.0	1.000	105248	0.0646			25.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.640	-0.011	0.634	3403084	2.45		97.8	40172	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.662	1.662	0.0	1.000	46010	0.0201			28.8	M
298.90 > 99.00	1.662	1.662	0.0	1.000	20808		2.21(1.25-3.74)		19.9	M
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.674	-0.012	0.647	67074	1.84		79.1	169	
D 60 M2-4:2FTS										
329.00 > 81.00	1.707	1.875	-0.168	0.664	11664	NC			4.2	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.892	1.902	-0.010	1.000	402811	0.2797			118	M
313.00 > 119.00	1.892	1.902	-0.010	1.000	34782		11.58(5.03-15.10)		210	
D 7 13C2 PFHxA										
315.00 > 270.00	1.892	1.916	-0.024	0.736	3397032	2.08		83.3	55139	
70 Perfluoropentanesulfonic acid										M
349.00 > 80.00	1.913	1.924	-0.011	1.151	45126	0.0220			33.3	M
349.00 > 99.00	1.913	1.924	-0.011	1.151	17875		2.52(1.36-4.07)		31.7	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.988	2.014	-0.026	0.773	286082	NC			6206	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.214	2.214	0.0	1.000	42165	0.0253			20.5	M
363.00 > 169.00	2.214	2.214	0.0	1.000	16661		2.53(1.13-3.40)		140	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.225	2.225	0.0	1.000	3282059	1.56			1920	
399.00 > 99.00	2.225	2.225	0.0	1.000	1076847		3.05(1.50-4.49)		1938	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.240	-0.026	0.861	3772064	2.24		89.8	65996	
D 11 18O2 PFHxS										
403.00 > 84.00	2.225	2.253	-0.028	0.866	4274899	1.98		83.7	66817	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.545	-0.001	1.000	33313	0.0523			364	
D 12 M2-6:2FTS										
429.00 > 81.00	2.544	2.564	-0.020	0.990	896165	1.91		80.4	2178	
* 62 13C2-PFOA										
415.00 > 370.00	2.571	2.571	0.0		4297870	2.50			60563	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.571	2.571	0.0	1.000	379677	0.2139			143	
413.00 > 169.00	2.571	2.571	0.0	1.000	212667		1.79(0.84-2.52)		1056	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.579	2.579	0.0	0.879	68987	0.0401			73.2	
449.00 > 99.00	2.579	2.579	0.0	0.879	18291		3.77(1.94-5.82)		64.6	M
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.588	-0.017	1.000	3656699	2.22		88.9	45675	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.935	2.935	0.0	1.000	10464161	7.61			15837	
499.00 > 99.00	2.935	2.935	0.0	1.000	2611855		4.01(2.31-6.93)		15170	
20 Perfluorononanoic acid										
463.00 > 419.00	2.935	2.935	0.0	1.002	91484	0.0612			72.2	
463.00 > 169.00	2.935	2.935	0.0	1.002	21243		4.31(1.90-5.69)		239	
D 19 13C5 PFNA										
468.00 > 423.00	2.930	2.953	-0.023	1.140	3272496	2.31		92.3	65054	
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.953	-0.018	1.142	2972471	1.98		82.8	5554	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.280	3.280	0.0	1.000	38108	0.0525			1506	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.287	3.287	0.0	1.120	104456	0.1125			50.3	
549.00 > 99.00	3.280	3.287	-0.007	1.117	36937		2.83(1.33-3.97)		100.0	
24 Perfluorodecanoic acid										RM
513.00 > 469.00	3.287	3.295	-0.008	0.998	90333	0.0676			52.3	RM
513.00 > 169.00	3.295	3.295	0.0	1.000	9365		9.65(2.36-7.09)		92.4	
D 26 M2-8:2FTS										
529.00 > 81.00	3.280	3.299	-0.019	1.276	1282552	2.62		109	2798	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.310	3.311	-0.001	1.002	739795	0.4405			156	
D 23 13C2 PFDA										
515.00 > 470.00	3.295	3.314	-0.019	1.282	3250010	2.88		115	55207	
D 21 13C8 FOSA										
506.00 > 78.00	3.303	3.322	-0.019	1.285	4221873	1.91		76.6	56336	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.444	3.467	-0.023	1.340	1195385	3.21		128	17772	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.607	3.607	0.0	1.229	103830	0.1259			38.0	
599.00 > 99.00	3.607	3.607	0.0	1.229	30926		3.36(1.39-4.16)		114	
31 Perfluoroundecanoic acid										Ma
563.00 > 519.00	3.618	3.628	-0.010	1.000	56949	0.0498			37.5	a
563.00 > 169.00	3.627	3.628	-0.001	1.003	9715		5.86(2.12-6.36)		39.0	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.618	3.628	-0.010	1.000	2615	0.006682			41.4	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.618	3.640	-0.022	1.407	1048700	2.68		107	5517	
D 30 13C2 PFUnA										
565.00 > 520.00	3.618	3.640	-0.022	1.407	2302566	2.53		101	48045	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.907	3.918	-0.011	1.000	26600	0.0266			2.9	
613.00 > 169.00	3.907	3.918	-0.011	1.000	8434		3.15(2.13-6.40)		23.0	
D 36 13C2 PFDoA										
615.00 > 570.00	3.907	3.930	-0.023	1.520	2306946	2.67		107	19263	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.404	4.437	-0.033	1.713	2029917	2.41		96.2	9642	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.823	0.0	1.000	32629	NC			5.9	
813.00 > 169.00	4.823	4.823	0.0	1.000	4855		6.72(2.86-8.58)		24.4	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.842	-0.019	1.876	3205437	2.50		100	9392	

QC Flag Legend

Processing Flags
- NC - Not Calibrated
- R - Failed Signal Ratio Test

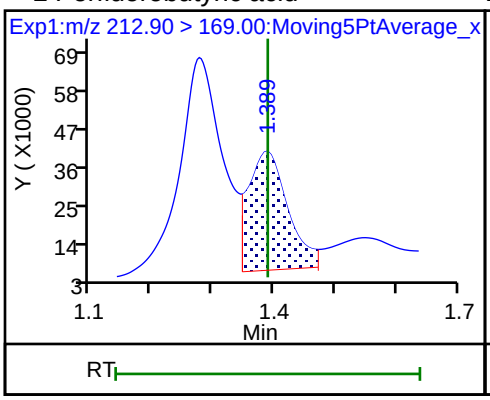
Review Flags
- M - Manually Integrated
- a - User Assigned ID

Report Date: 31-Jul-2018 09:49:03 Chrom Revision: 2.3 19-Jul-2018 15:14:50

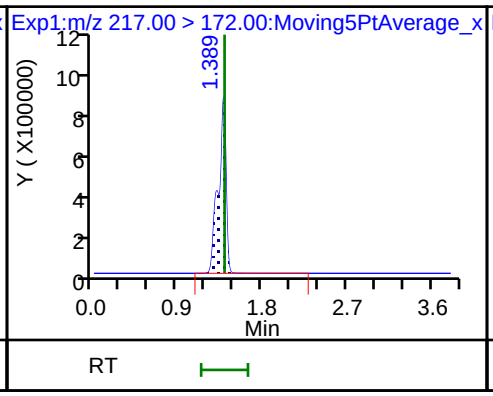
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_008.d				
Injection Date:	30-Jul-2018 03:52:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-2-A	Lab Sample ID:	320-41149-2		
Client ID:	GRE10-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

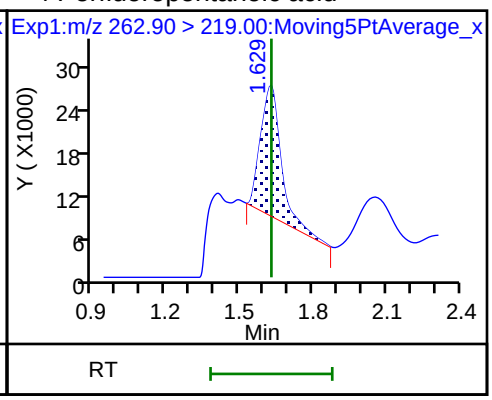
2 Perfluorobutyric acid



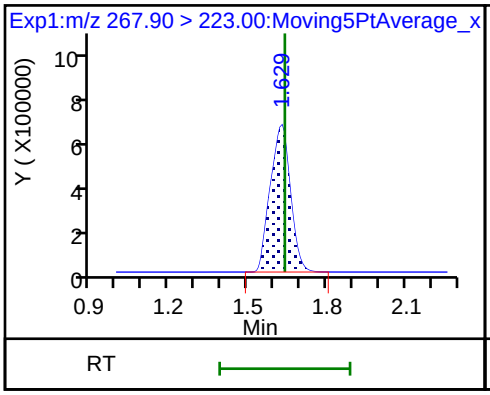
D 1 13C4 PFBA



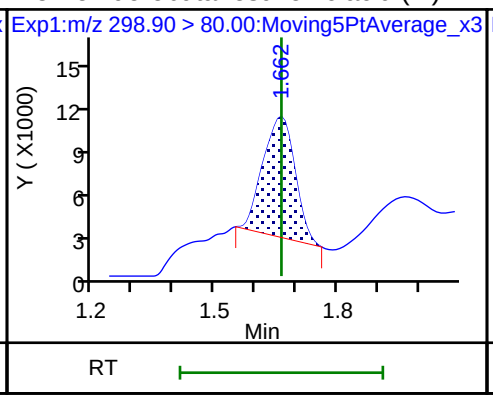
4 Perfluoropentanoic acid



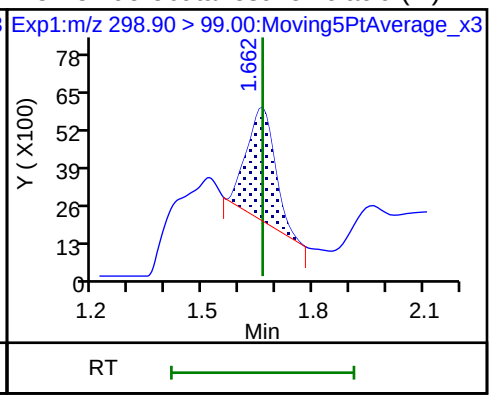
D 3 13C5-PFPeA



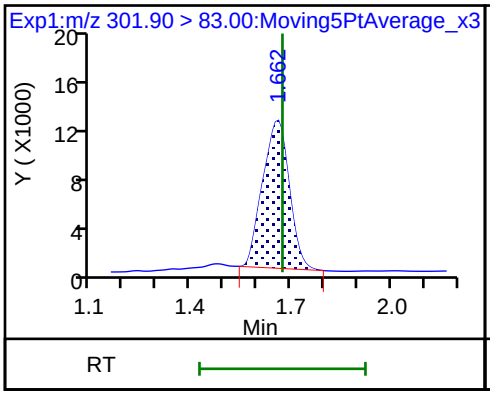
5 Perfluorobutanesulfonic acid (M)



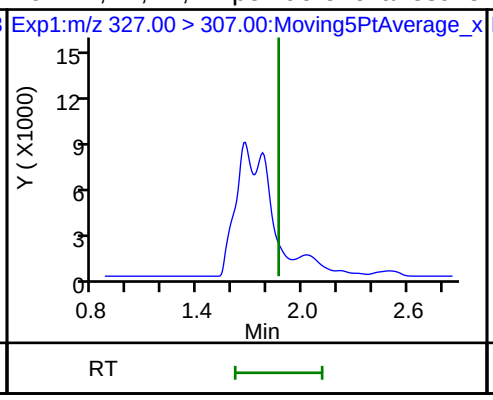
5 Perfluorobutanesulfonic acid (M)



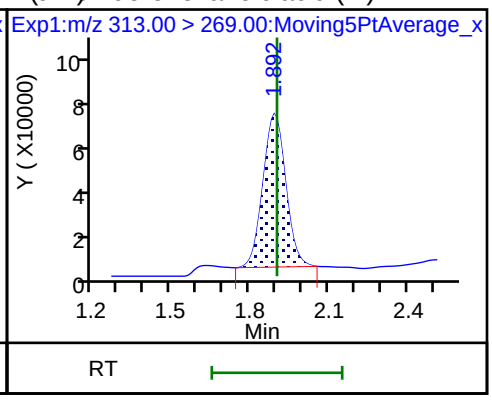
D 47 13C3-PFBS



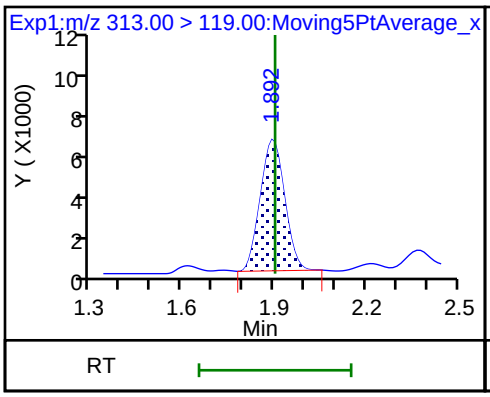
61 1H,1H,2H,2H-perfluorohexanesulfoni (M)



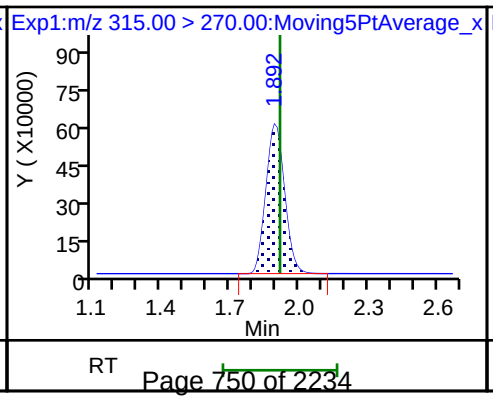
6 Perfluorohexanoic acid (M)



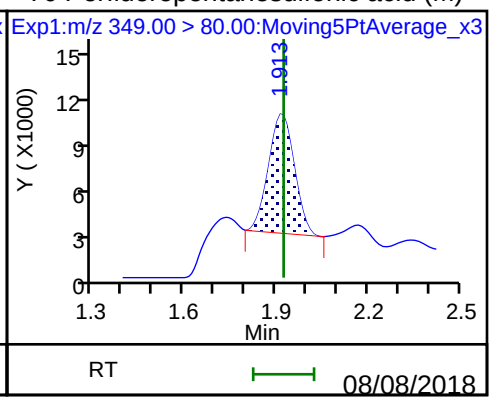
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

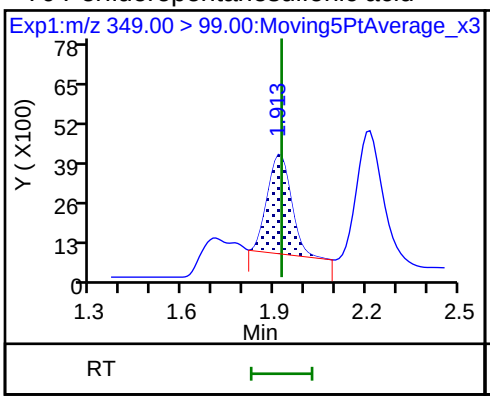


70 Perfluoropentanesulfonic acid (M)

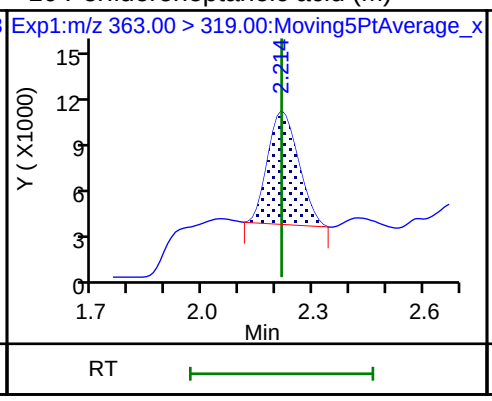


Report Date: 31-Jul-2018 09:49:03 Chrom Revision: 2.3 19-Jul-2018 15:14:50
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_008.d

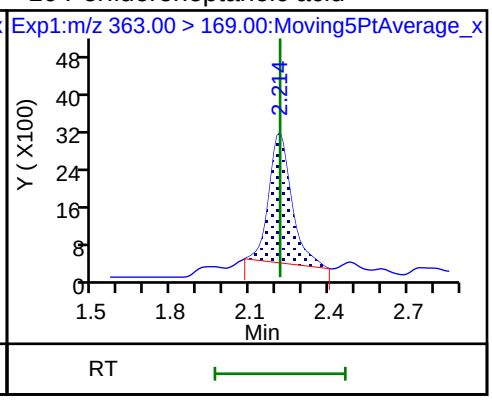
70 Perfluoropentanesulfonic acid



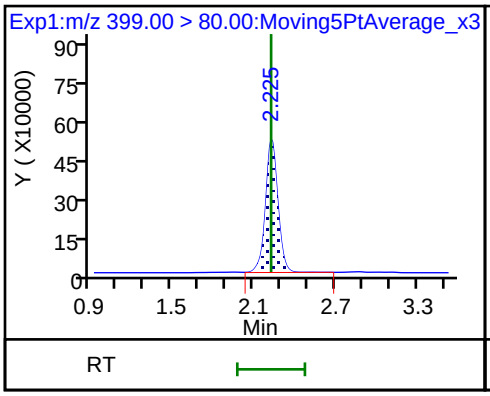
10 Perfluoroheptanoic acid (M)



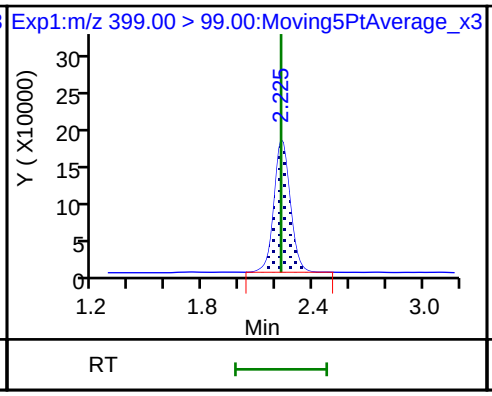
10 Perfluoroheptanoic acid



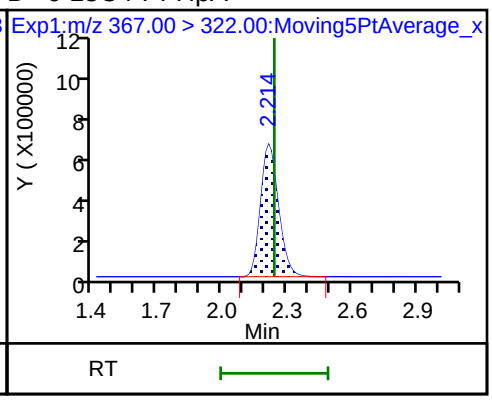
8 Perfluorohexanesulfonic acid



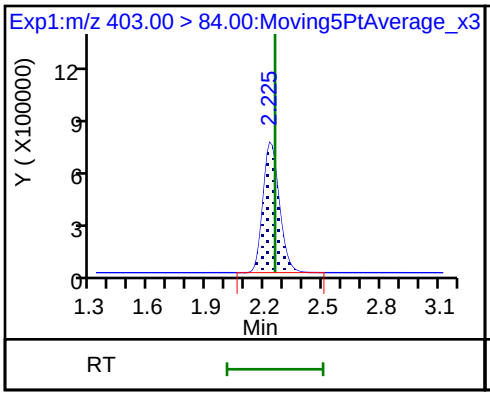
8 Perfluorohexanesulfonic acid



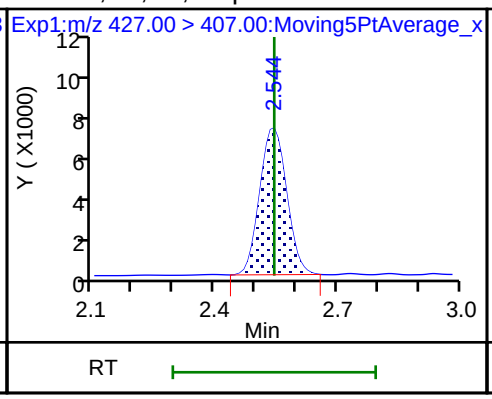
D 9 13C4-PFHpA



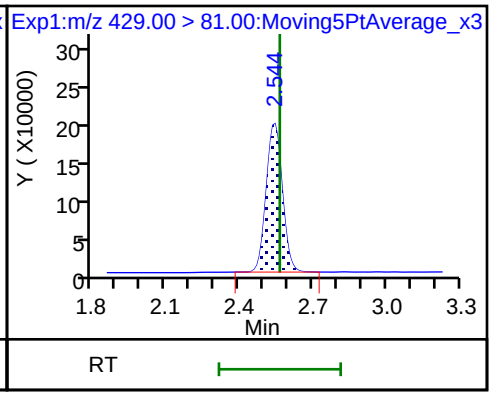
D 11 18O2 PFHxS



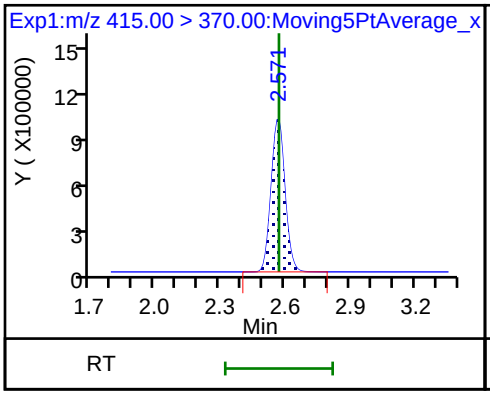
13 1H,1H,2H,2H-perfluorooctanesulfon



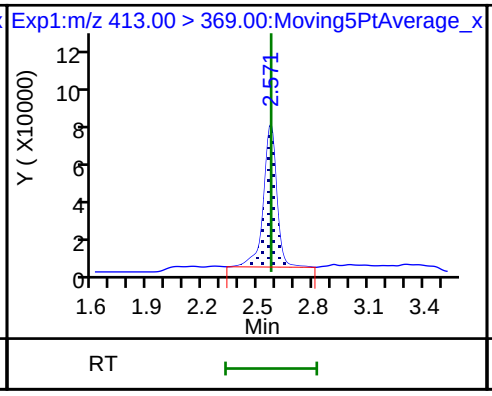
D 12 M2-6:2FTS



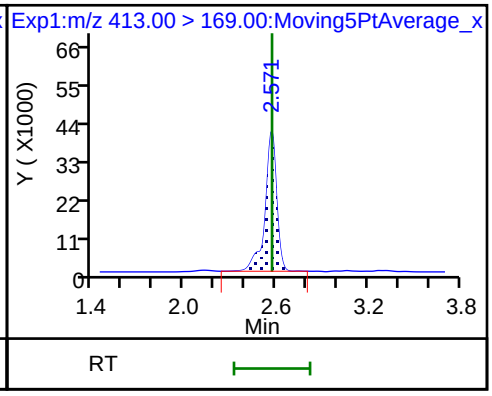
* 62 13C2-PFOA



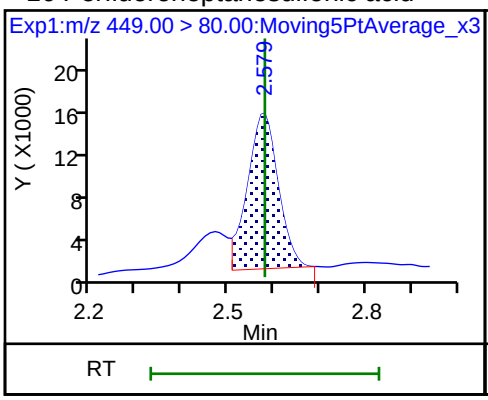
15 Perfluorooctanoic acid



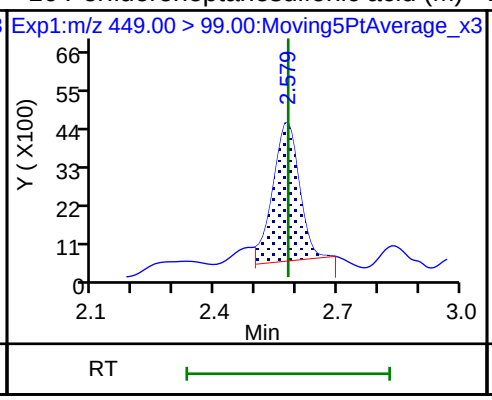
15 Perfluorooctanoic acid



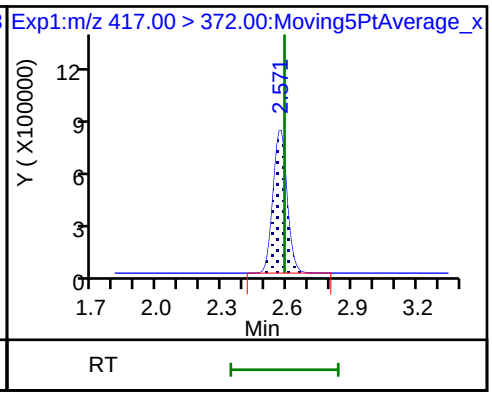
16 Perfluoroheptanesulfonic acid



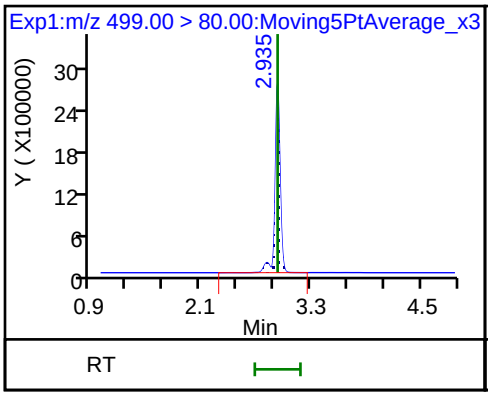
16 Perfluoroheptanesulfonic acid (M)



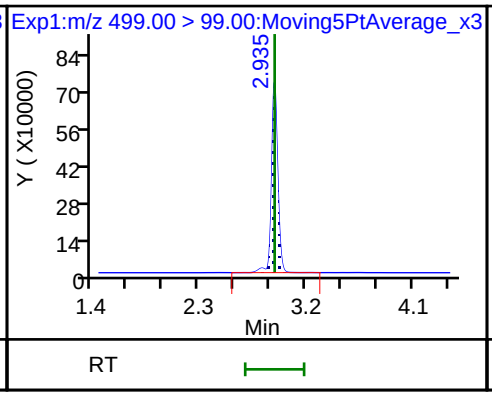
D 14 13C4 PFOA



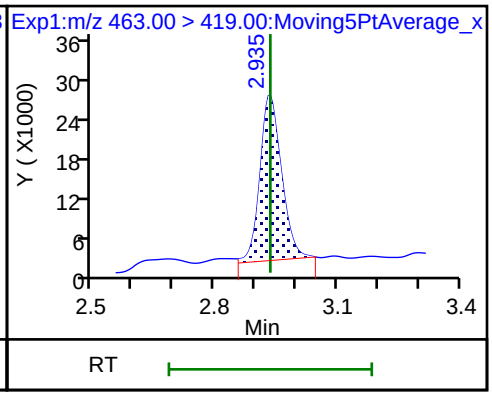
17 Perfluorooctane sulfonic acid



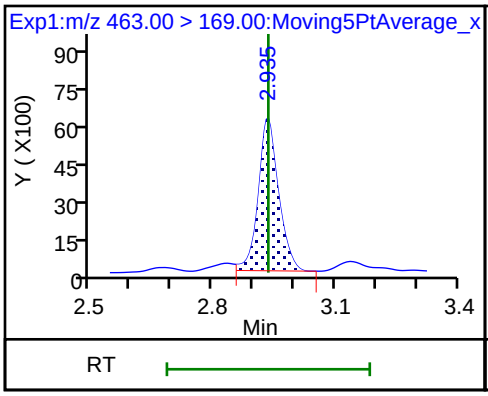
17 Perfluorooctane sulfonic acid



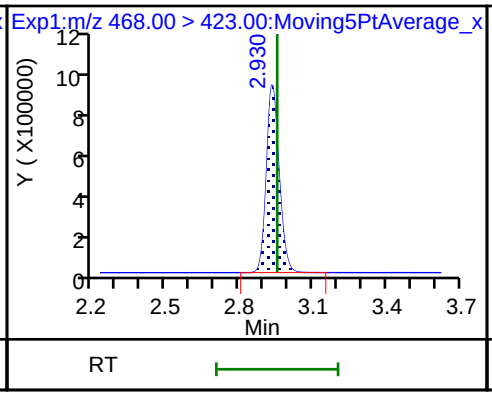
20 Perfluorononanoic acid



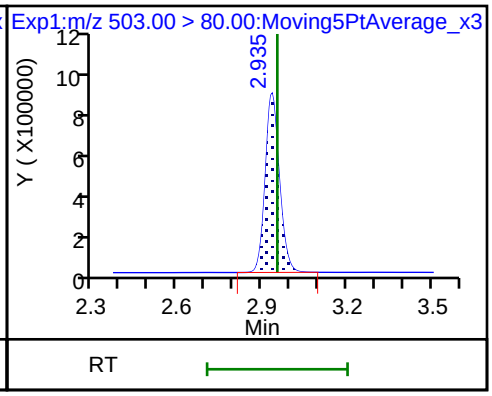
20 Perfluorononanoic acid



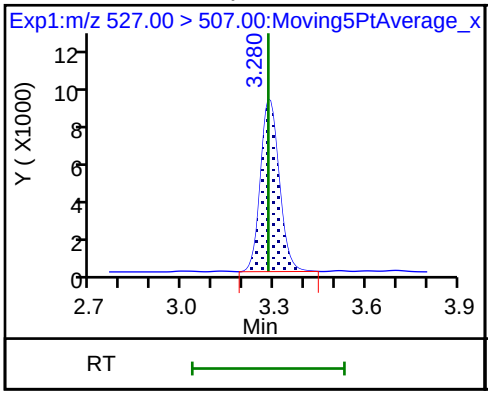
D 19 13C5 PFNA



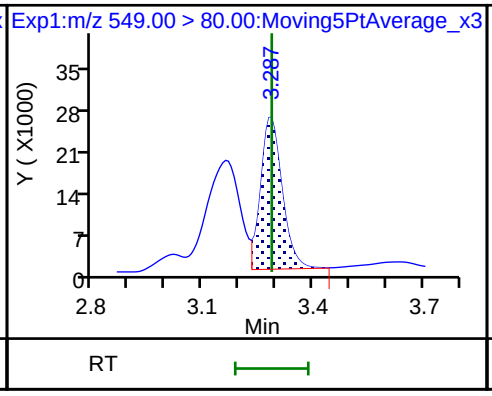
D 18 13C4 PFOS



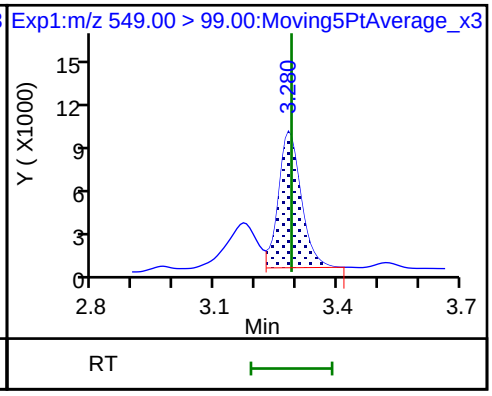
25 1H,1H,2H,2H-perfluorodecanesulfoni



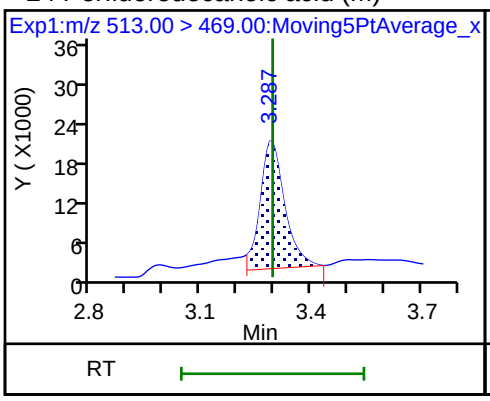
68 Perfluorononanesulfonic acid



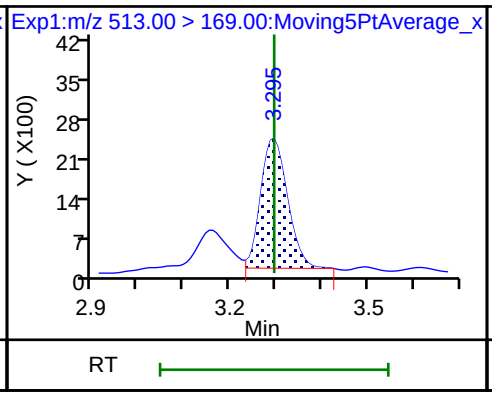
68 Perfluorononanesulfonic acid



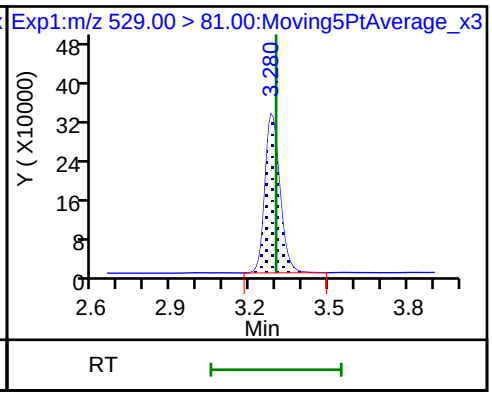
24 Perfluorodecanoic acid (M)



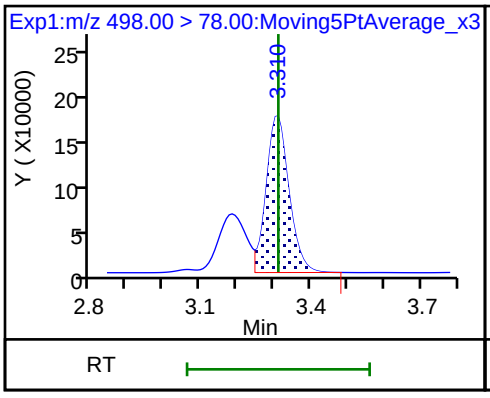
24 Perfluorodecanoic acid



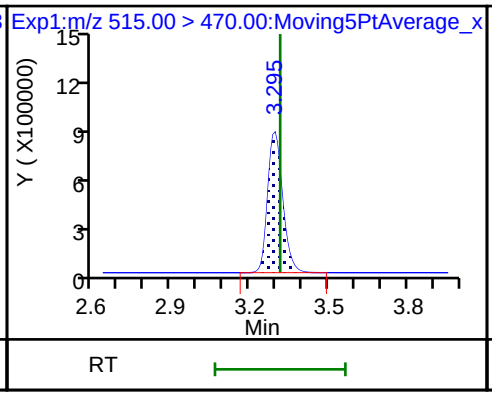
D 26 M2-8:2FTS



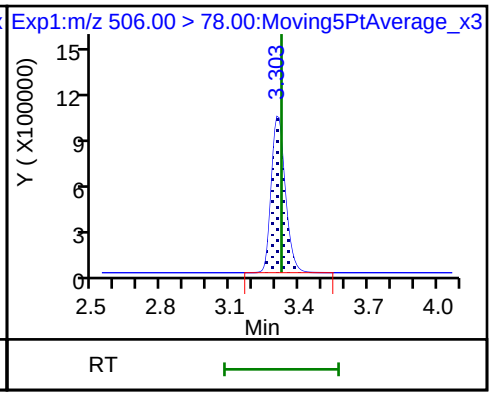
22 Perfluorooctane Sulfonamide



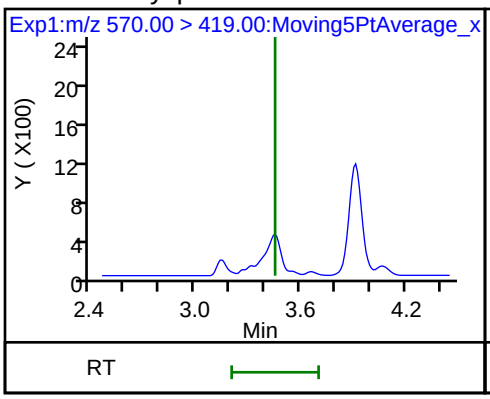
D 23 13C2 PFDA



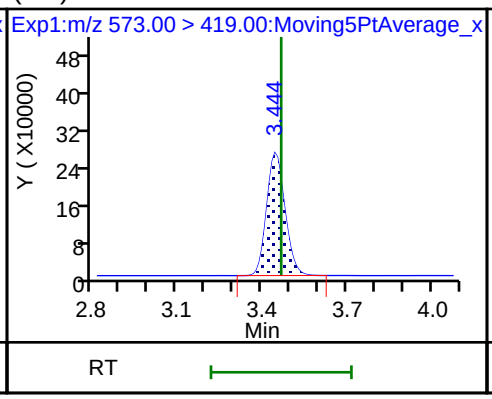
D 21 13C8 FOSA



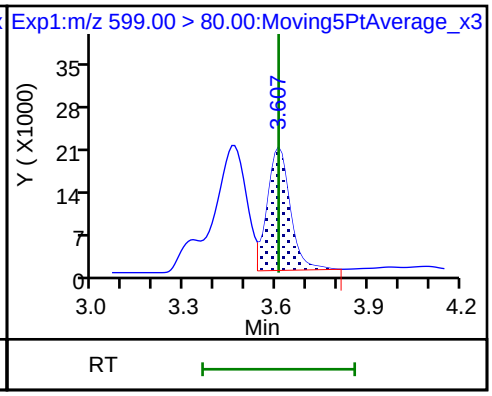
28 N-methyl perfluorooctane sulfonamid



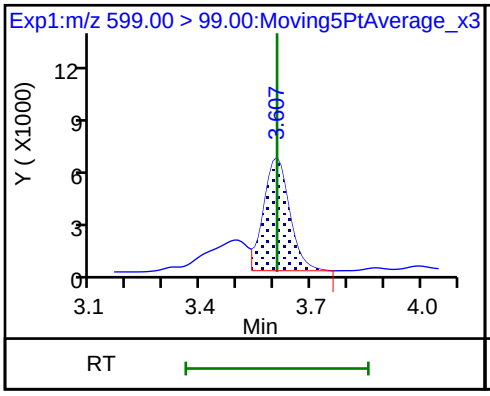
D 27 d3-NMeFOSAA



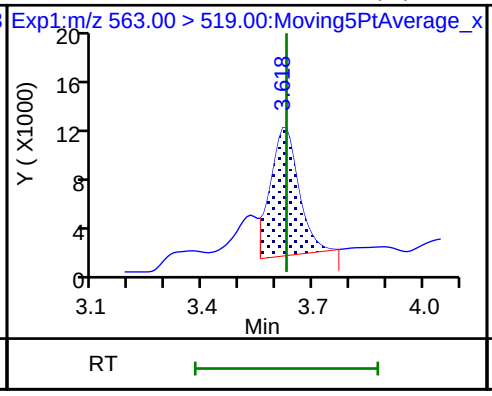
29 Perfluorodecane Sulfonic acid



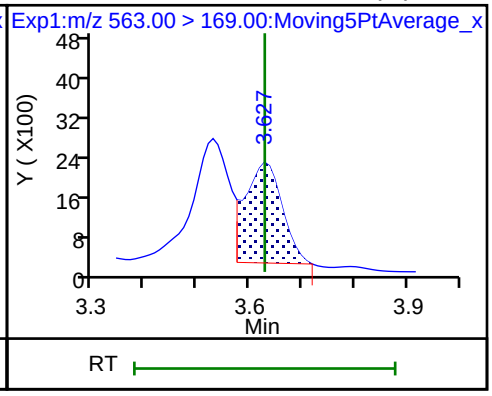
29 Perfluorodecane Sulfonic acid



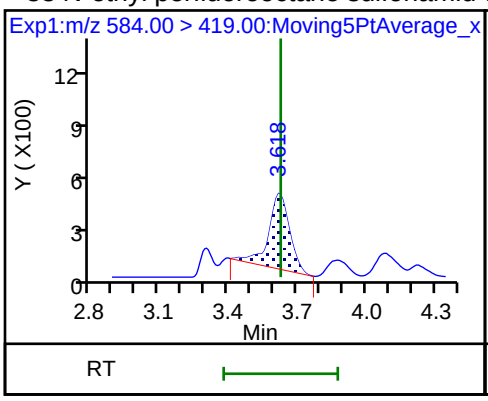
31 Perfluoroundecanoic acid (M)



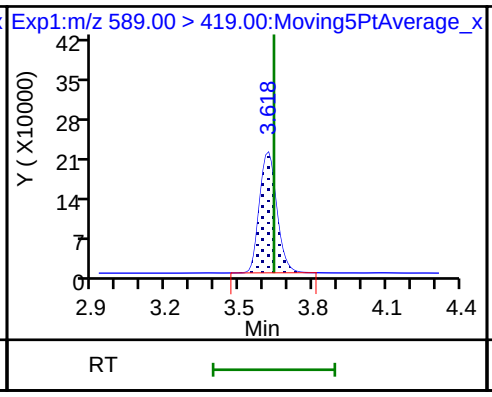
31 Perfluoroundecanoic acid (M)



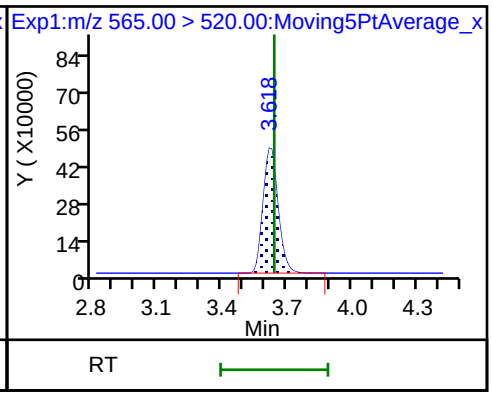
33 N-ethyl perfluorooctane sulfonamid



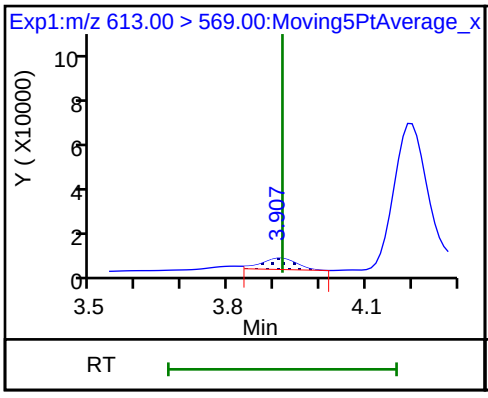
D 32 d5-NEtFOSAA



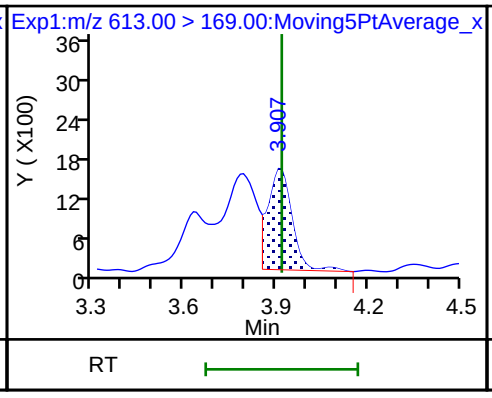
D 30 13C2 PFUnA



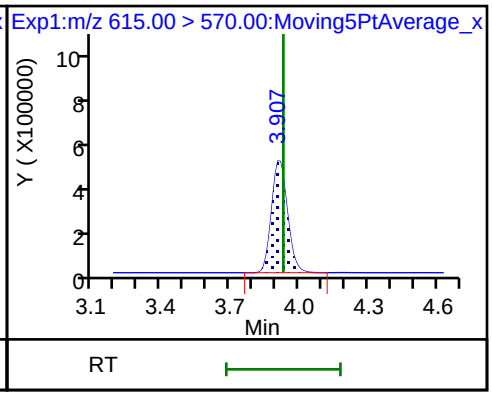
37 Perfluorododecanoic acid



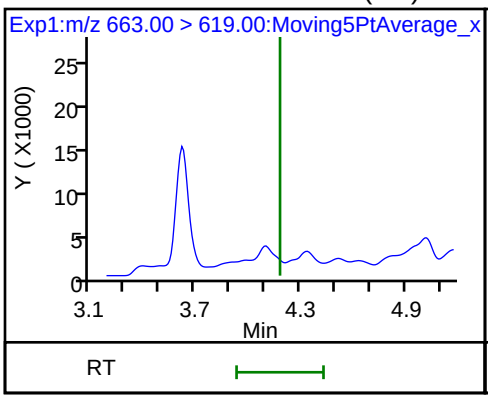
37 Perfluorododecanoic acid



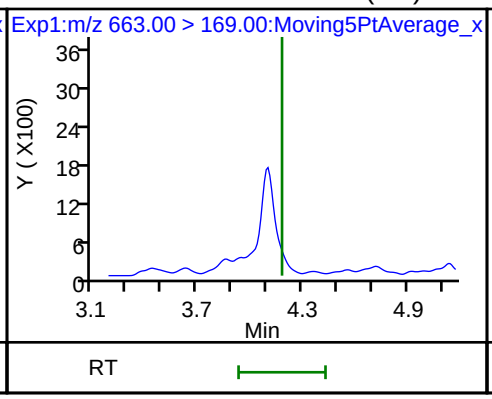
D 36 13C2 PFDoA



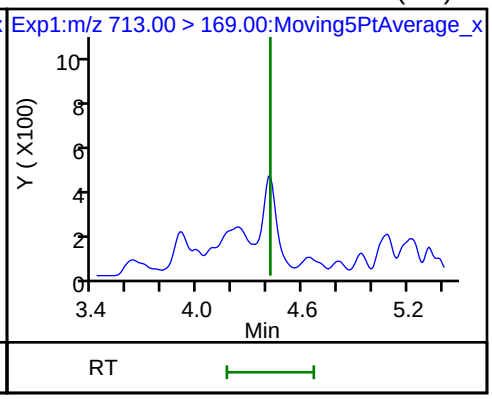
41 Perfluorotridecanoic acid (ND)



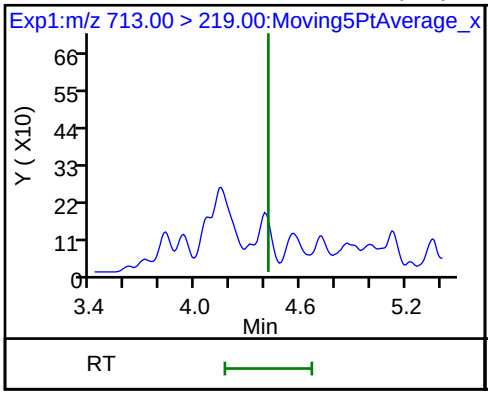
41 Perfluorotridecanoic acid (ND)



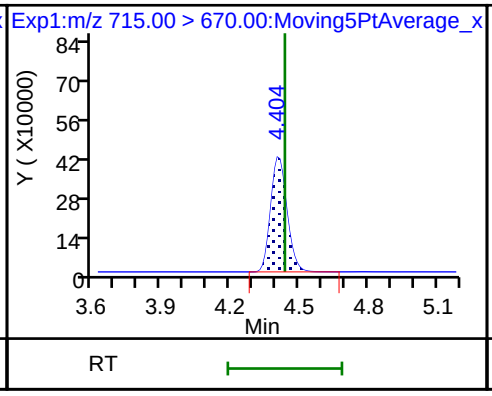
42 Perfluorotetradecanoic acid (ND)



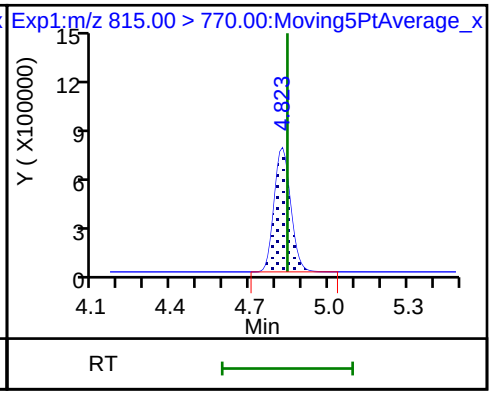
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

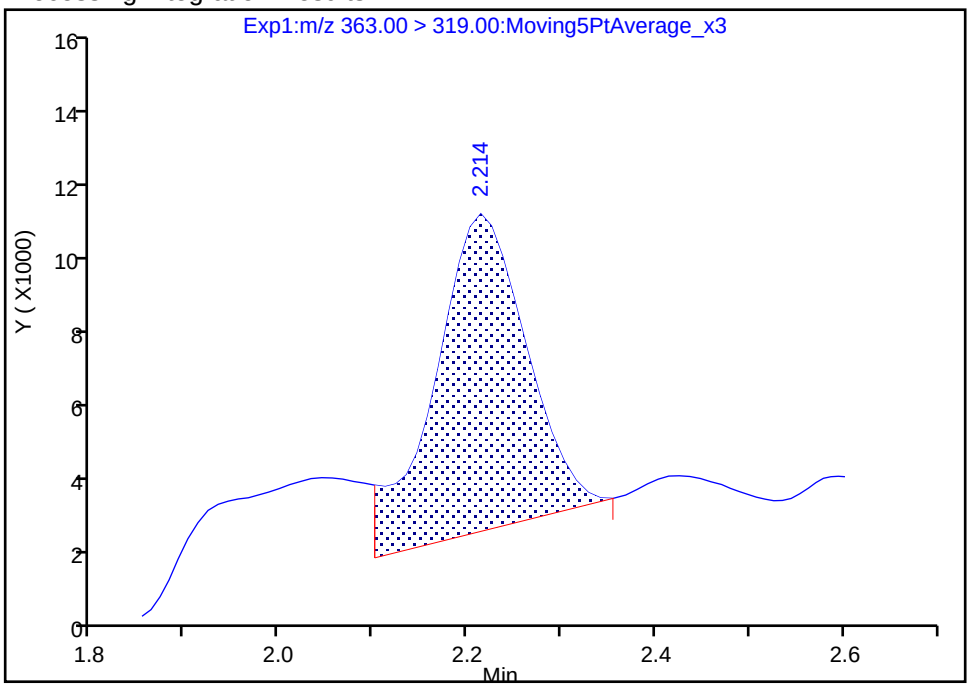
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_008.d				
Injection Date:	30-Jul-2018 03:52:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-2-A	Lab Sample ID:	320-41149-2		
Client ID:	GRE10-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

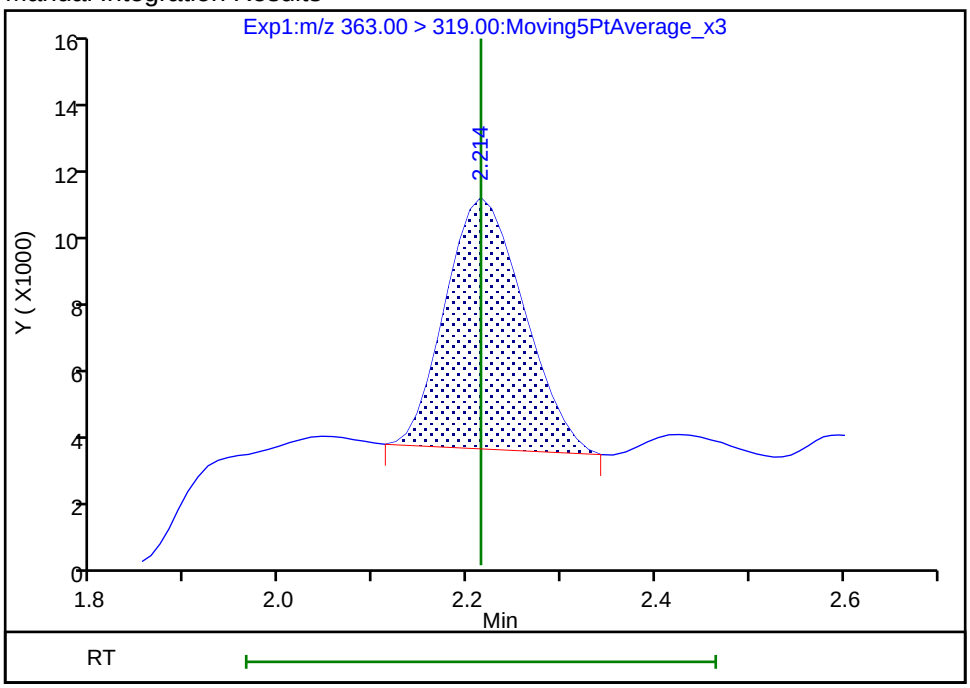
Processing Integration Results

RT: 2.21
Area: 56441
Amount: 0.033929
Amount Units: ng/ml



Manual Integration Results

RT: 2.21
Area: 42165
Amount: 0.025347
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:47:56

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

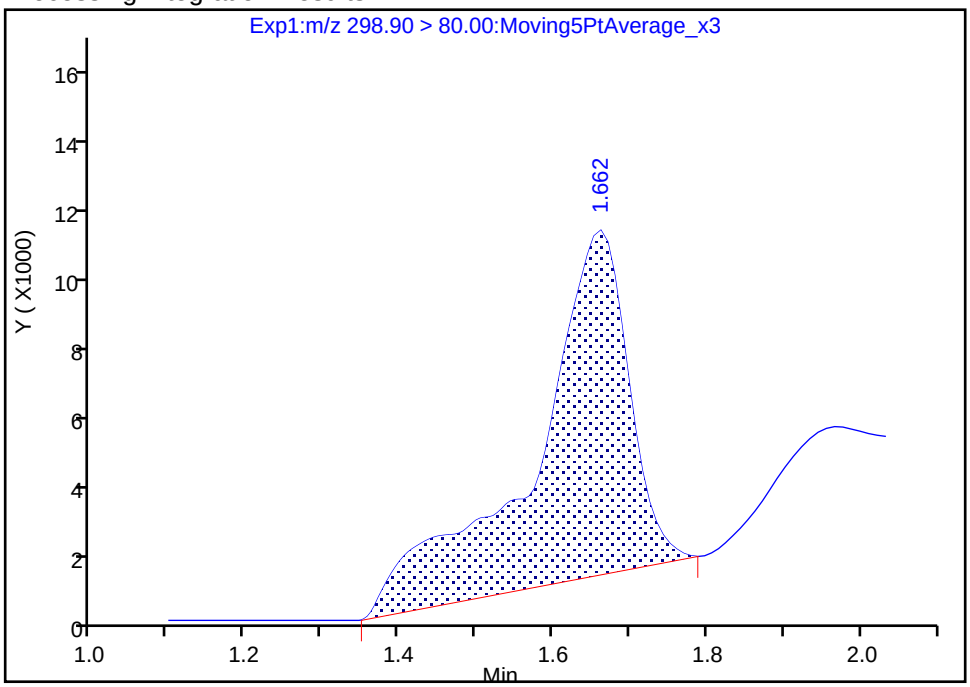
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_008.d				
Injection Date:	30-Jul-2018 03:52:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-2-A	Lab Sample ID:	320-41149-2		
Client ID:	GRE10-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

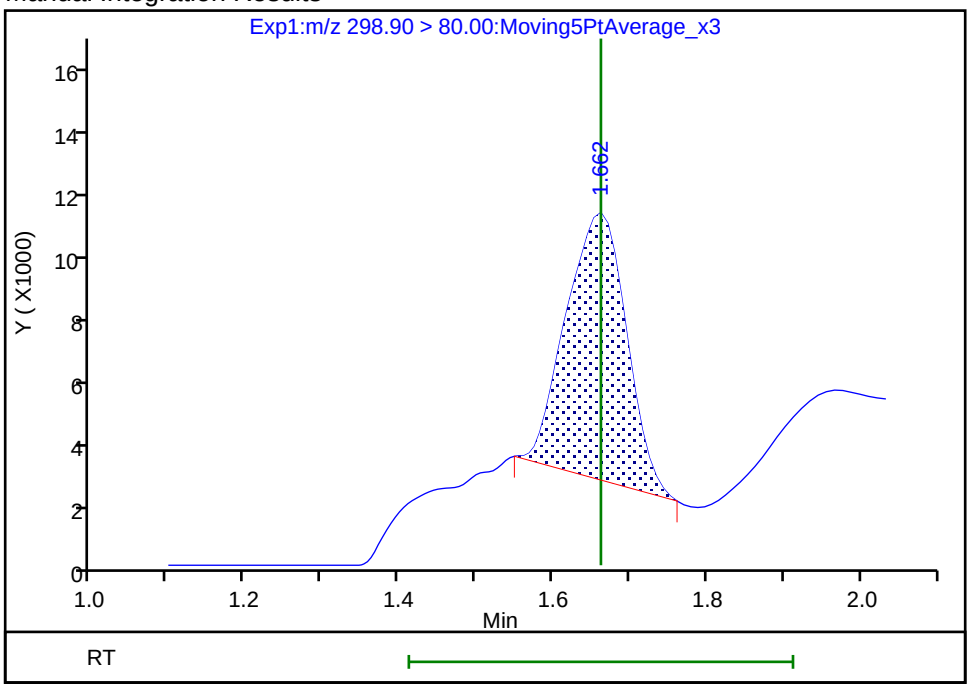
Processing Integration Results

RT: 1.66
Area: 85613
Amount: 0.037379
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 46010
Amount: 0.020088
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:47:27

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

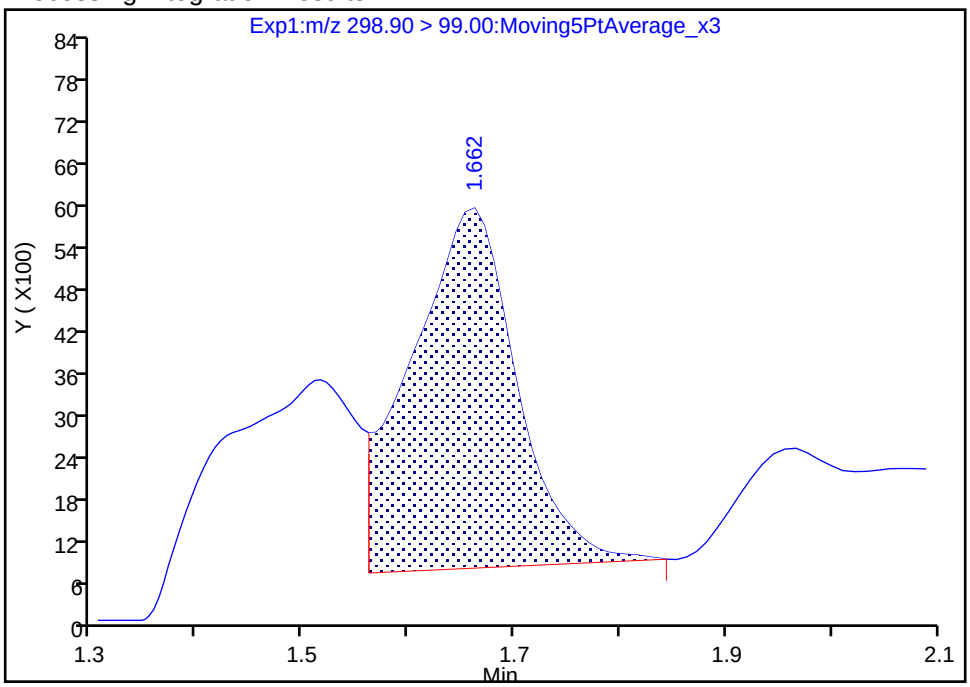
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_008.d				
Injection Date:	30-Jul-2018 03:52:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-2-A	Lab Sample ID:	320-41149-2		
Client ID:	GRE10-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

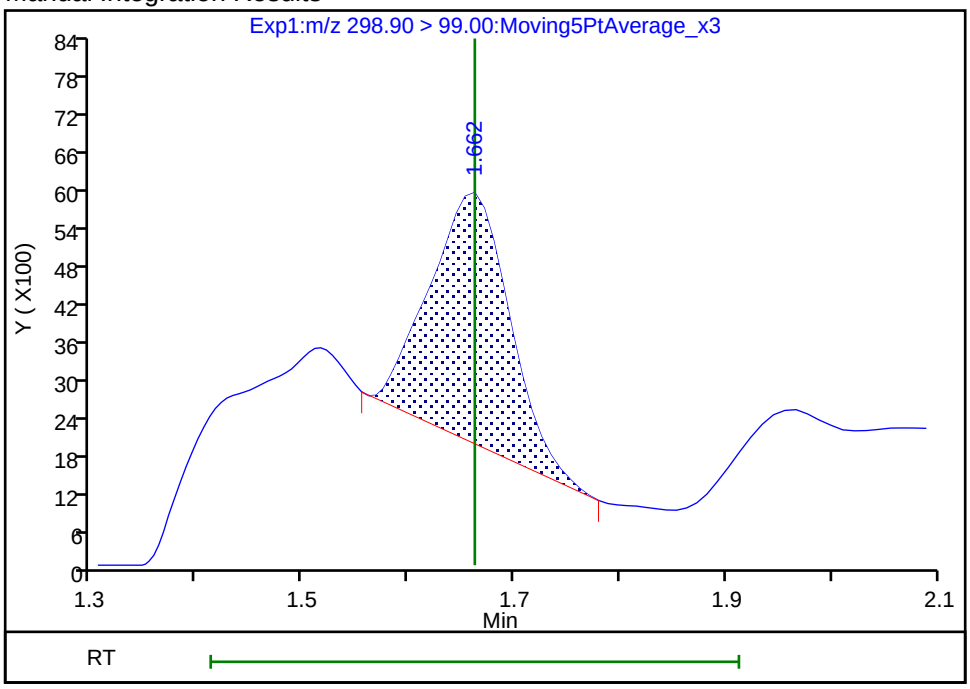
Processing Integration Results

RT: 1.66
Area: 35504
Amount: 0.037379
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 20808
Amount: 0.020088
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:47:30

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE10-SB2-02 | Lab Sample ID: 320-41149-3

Matrix: Solid | Lab File ID: 2018.07.30LLA_011.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/09/2018 14:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.05(g) | Date Analyzed: 07/30/2018 04:15

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 14.3 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.53	M	0.35	0.23	0.090
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	M	0.35	0.23	0.12
375-95-1	Perfluorononanoic acid (PFNA)	0.23	U M	0.35	0.23	0.094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.13	J	0.46	0.21	0.068
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*34*	*E*	*0.35*	0.23	*0.072*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	4.0		1.2	0.58	0.28

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	75		50-150
STL01892	13C4-PFHpA	77		50-150
STL00990	13C4 PFOA	84		50-150
STL00995	13C5 PFNA	85		50-150
STL00994	18O2 PFHxS	75		50-150
STL00991	13C4 PFOS	78		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_011.d
Lims ID: 320-41149-A-3-A
Client ID: GRE10-SB2-02
Sample Type: Client
Inject. Date: 30-Jul-2018 04:15:53 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:52:20 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:52:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.665	1.662	0.003	1.000	141488	0.0584			201	
298.90 > 99.00	1.665	1.662	0.003	1.000	58685		2.41(1.25-3.74)		101	
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.674	-0.009	0.645	71008	1.75		75.3	247	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.228	2.214	0.014	1.005	361695	0.2285			243	M
363.00 > 169.00	2.217	2.214	0.003	1.000	144096		2.51(1.13-3.40)		1613	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.240	2.225	0.015	1.000	30708571	14.6			26928	E
399.00 > 99.00	2.240	2.225	0.015	1.000	11099436		2.77(1.50-4.49)		24007	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.240	-0.023	0.859	3589772	1.92		76.9	77395	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.253	-0.013	0.868	4271180	1.78		75.2	74164	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.571	0.009		4776625	2.50			51874	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.572	2.571	0.001	1.000	1497706	0.8083			600	M
413.00 > 169.00	2.580	2.571	0.009	1.003	868551		1.72(0.84-2.52)		3369	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.588	-0.016	0.997	3816917	2.09		83.5	58365	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.936	2.935	0.001	1.000	2464972	1.72			4869	
499.00 > 99.00	2.936	2.935	0.001	1.000	542646		4.54(2.31-6.93)		3569	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.942	2.935	0.007	1.002	30968	0.0202			27.0	M
463.00 > 169.00	2.936	2.935	0.001	1.000	6379		4.85(1.90-5.69)		67.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.936	2.953	-0.017	1.138	3352010	2.13		85.1	56277	
D 18 13C4 PFOS										
503.00 > 80.00	2.936	2.953	-0.017	1.138	3102916	1.86		77.8	9356	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 09:52:21 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_011.d

Injection Date: 30-Jul-2018 04:15:53 Instrument ID: A8_N

Lims ID: 320-41149-A-3-A Lab Sample ID: 320-41149-3

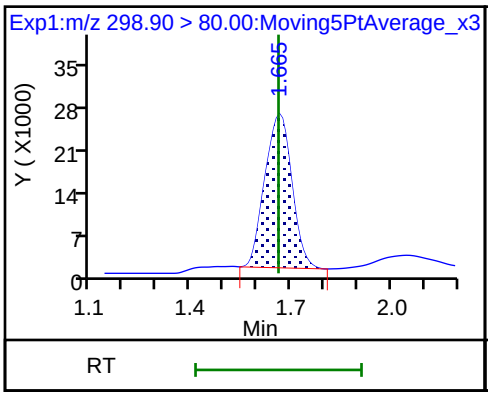
Client ID: GRE10-SB2-02

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 6 Worklist Smp#: 9

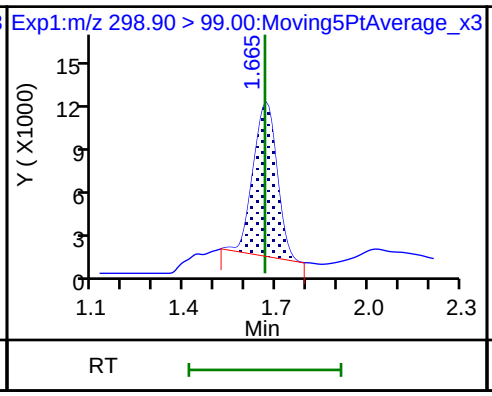
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

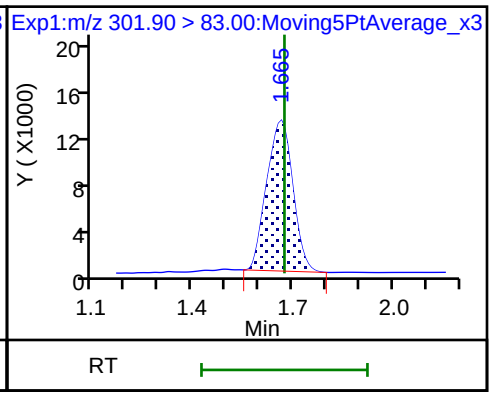
5 Perfluorobutanesulfonic acid



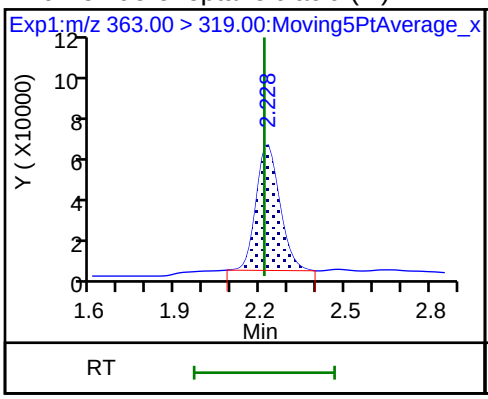
5 Perfluorobutanesulfonic acid



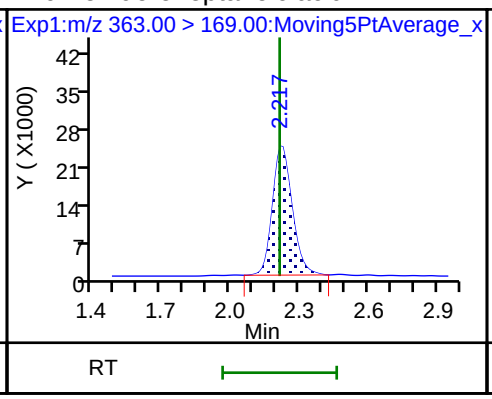
D 47 13C3-PFBS



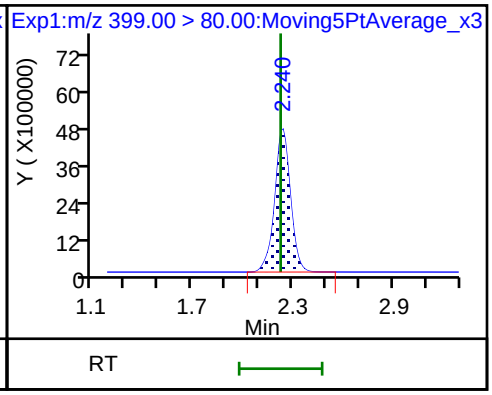
10 Perfluoroheptanoic acid (M)



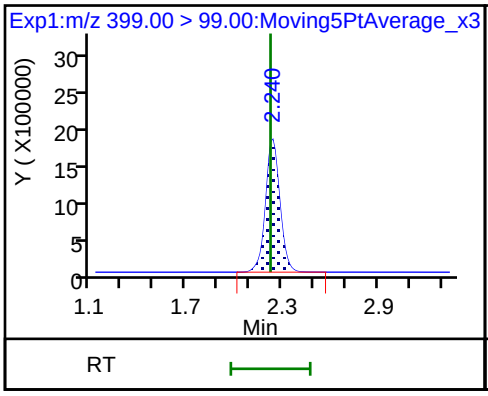
10 Perfluoroheptanoic acid



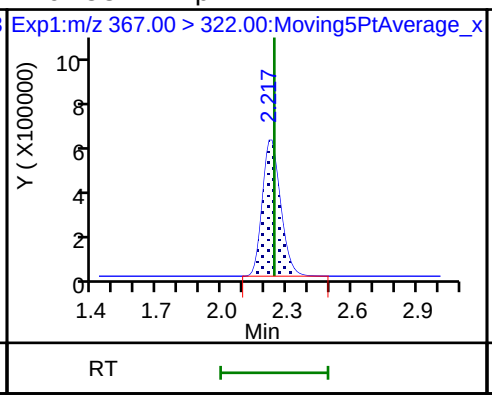
8 Perfluorohexanesulfonic acid



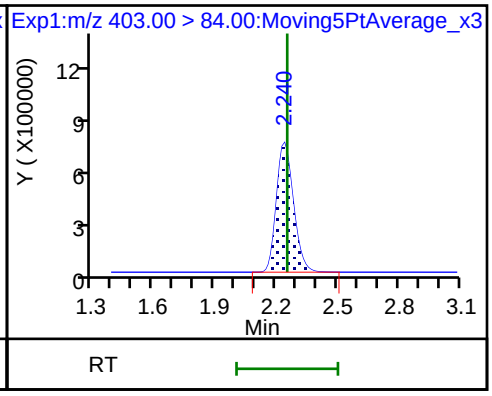
8 Perfluorohexanesulfonic acid



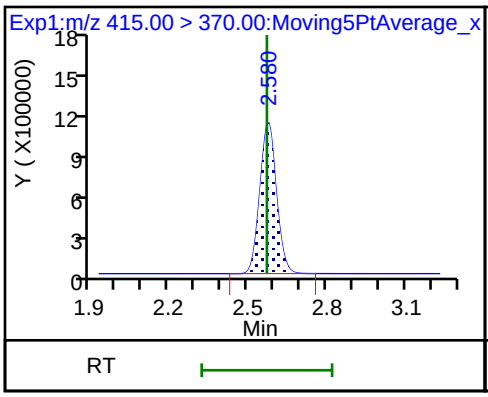
D 9 13C4-PFHpA



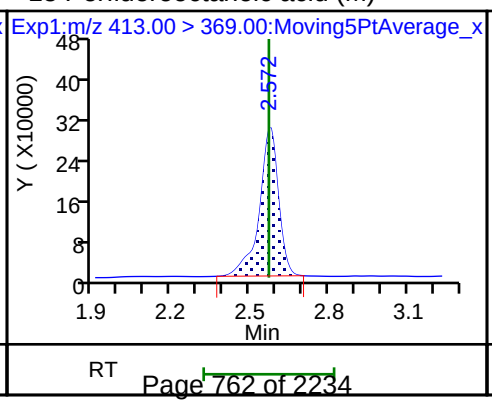
D 11 18O2 PFHxS



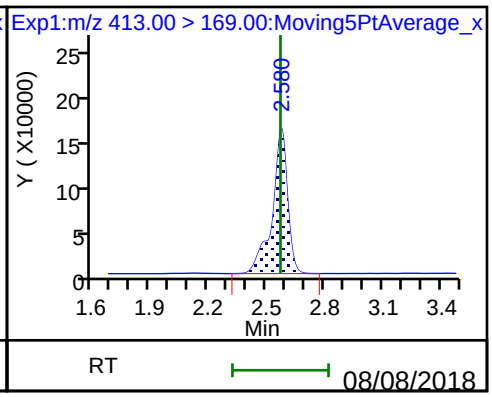
* 62 13C2-PFOA



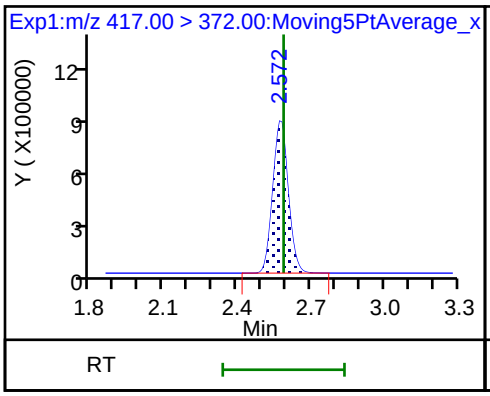
15 Perfluorooctanoic acid (M)



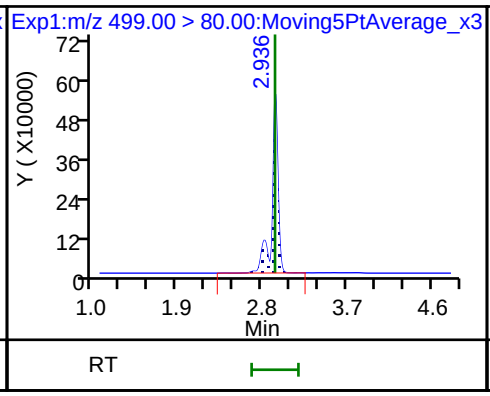
15 Perfluorooctanoic acid



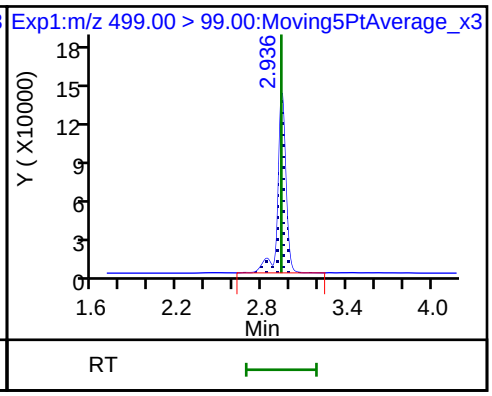
D 14 13C4 PFOA



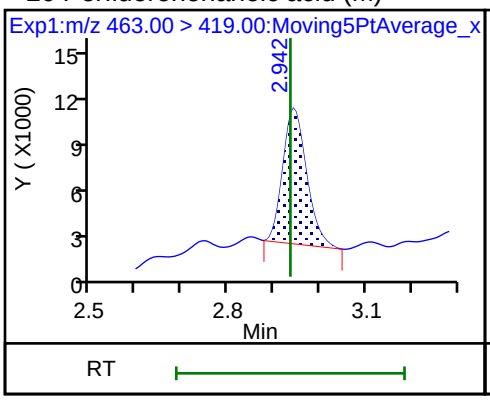
17 Perfluorooctane sulfonic acid



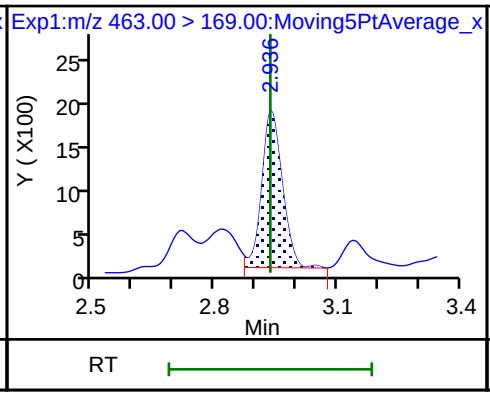
17 Perfluorooctane sulfonic acid



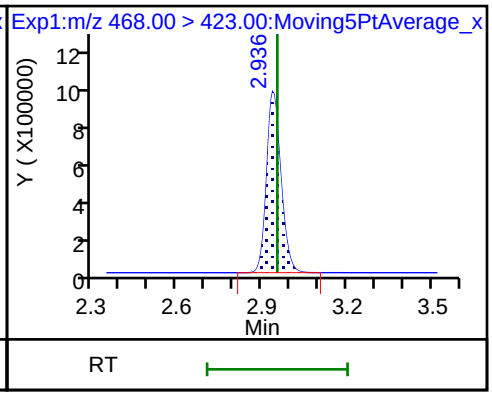
20 Perfluorononanoic acid (M)



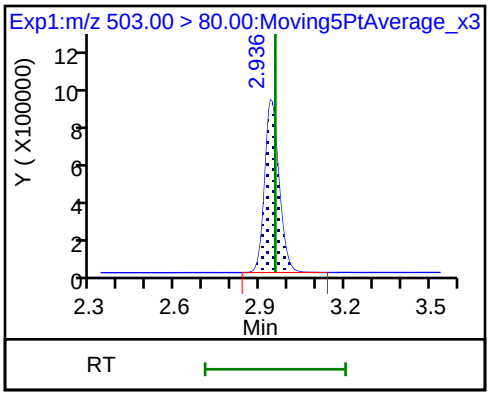
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

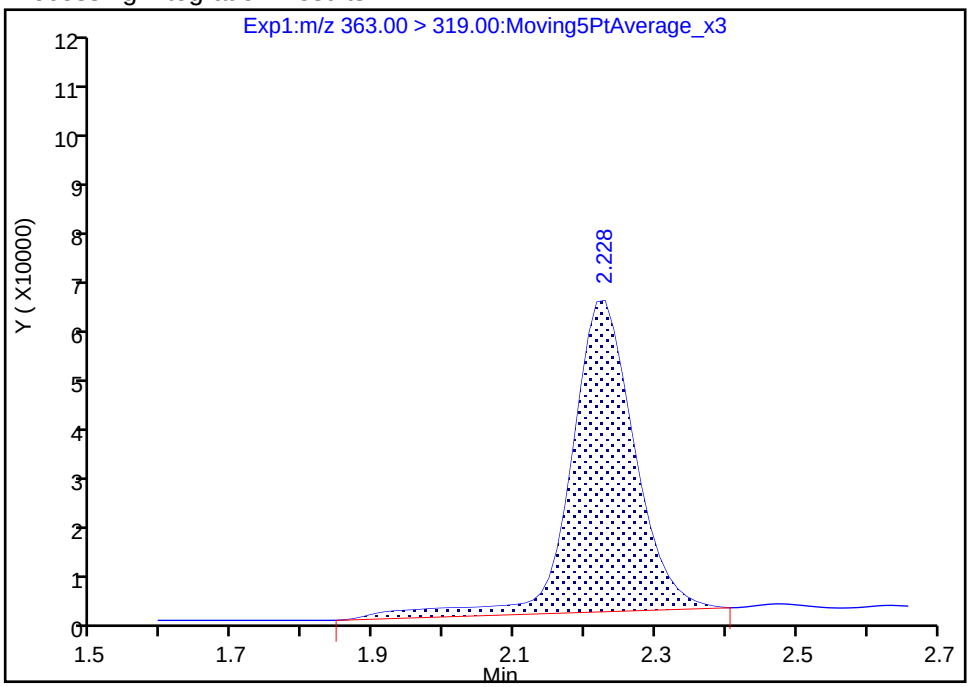
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_011.d				
Injection Date:	30-Jul-2018 04:15:53	Instrument ID:	A8_N		
Lims ID:	320-41149-A-3-A	Lab Sample ID:	320-41149-3		
Client ID:	GRE10-SB2-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

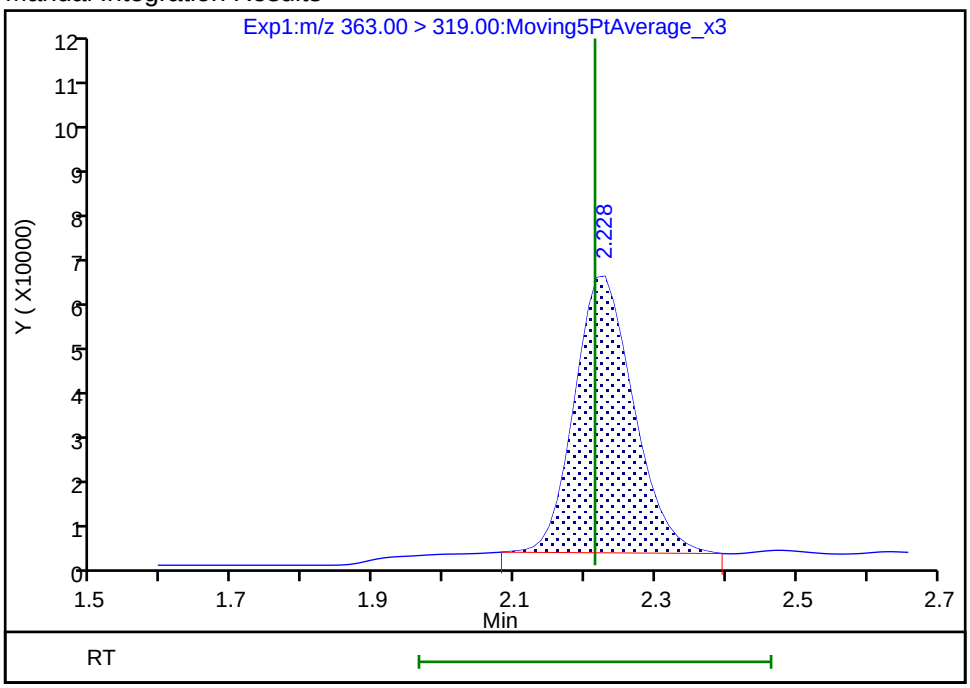
Processing Integration Results

RT: 2.23
Area: 399417
Amount: 0.252297
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 361695
Amount: 0.228470
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:52:03

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

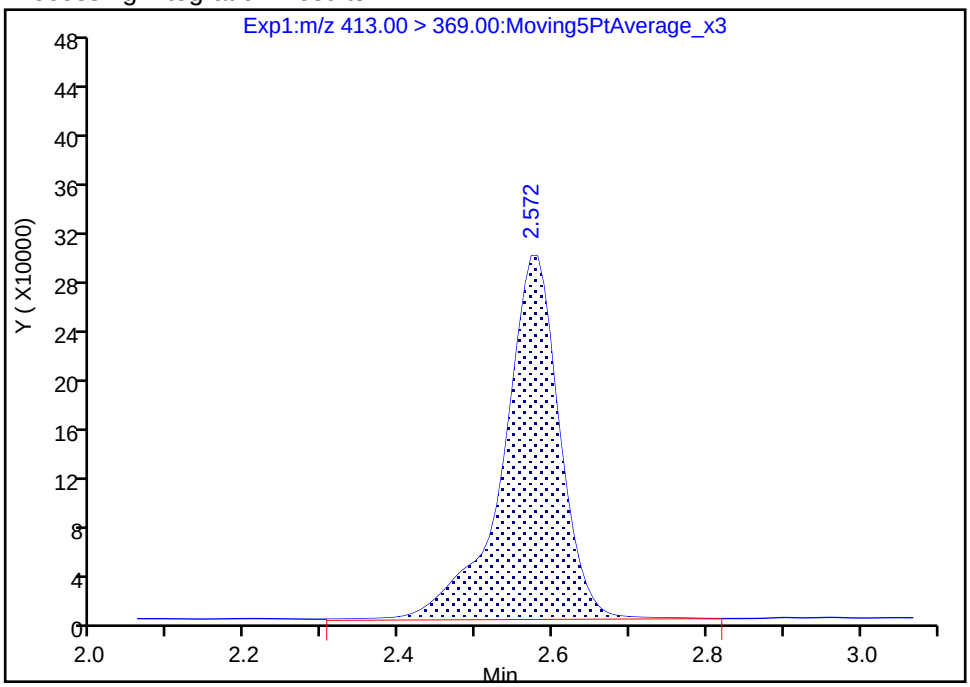
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_011.d				
Injection Date:	30-Jul-2018 04:15:53	Instrument ID:	A8_N		
Lims ID:	320-41149-A-3-A	Lab Sample ID:	320-41149-3		
Client ID:	GRE10-SB2-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

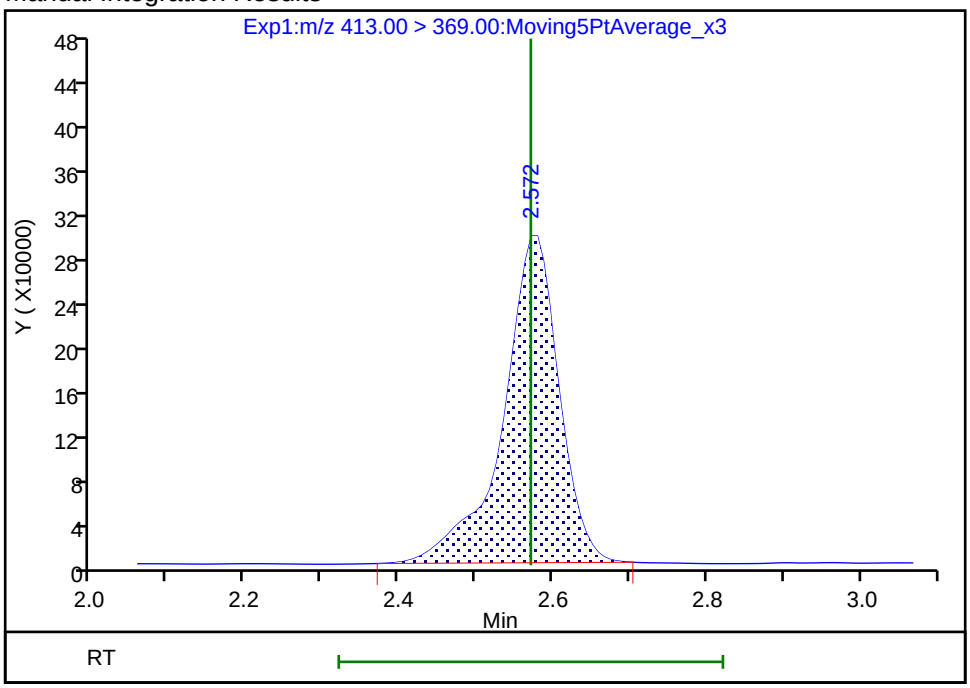
Processing Integration Results

RT: 2.57
Area: 1538250
Amount: 0.830179
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 1497706
Amount: 0.808298
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:52:10

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

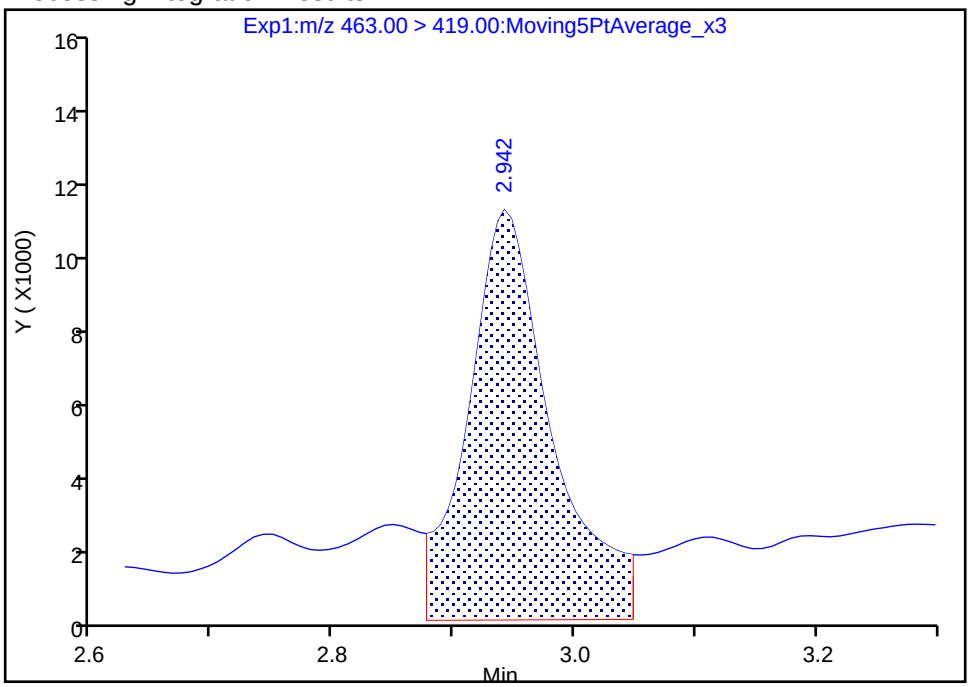
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_011.d				
Injection Date:	30-Jul-2018 04:15:53	Instrument ID:	A8_N		
Lims ID:	320-41149-A-3-A	Lab Sample ID:	320-41149-3		
Client ID:	GRE10-SB2-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

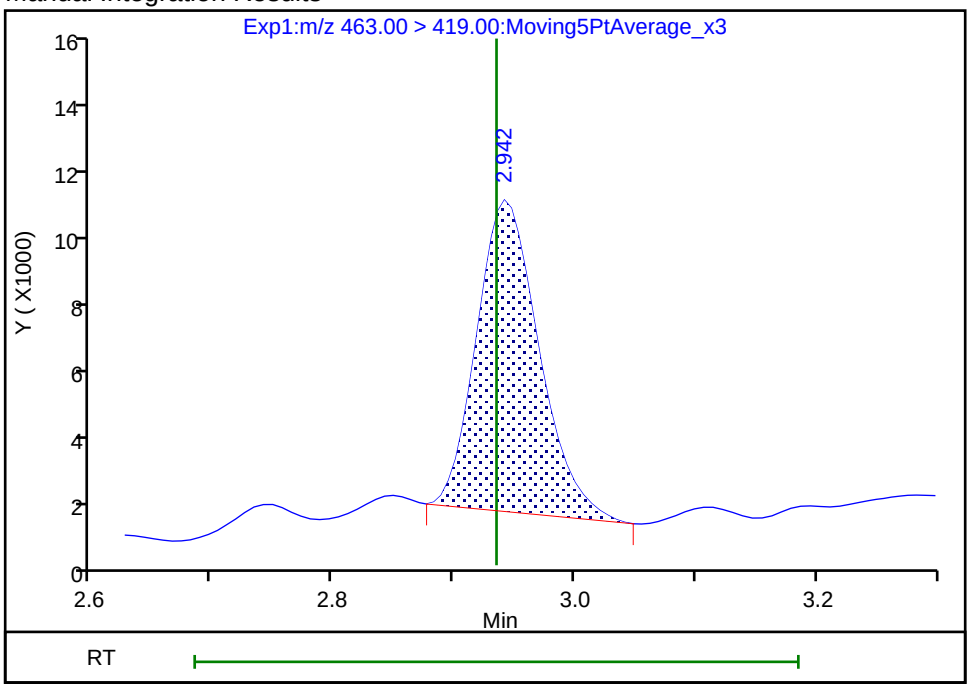
Processing Integration Results

RT: 2.94
Area: 51185
Amount: 0.033436
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 30968
Amount: 0.020229
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:52:17

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE10-SB2-02 DL
Lab Sample ID: 320-41149-3 DL
Matrix: Solid
Lab File ID: 2018.08.01LLB_014.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 14:35
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.05(g)
Date Analyzed: 08/01/2018 15:19
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 5
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 14.3
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237446
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.49*	*J D M*	*1.7*	1.2	*0.45*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1.8*	*D M*	*1.7*	1.2	*0.58*
375-95-1	*Perfluorononanoic acid (PFNA)*	*1.2*	*U*	*1.7*	1.2	*0.47*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*1.0*	*U*	*2.3*	1.0	*0.34*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	41	D	1.7	1.2	0.36
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*3.9*	*J D M*	*5.8*	2.9	*1.4*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	65		50-150
STL01892	13C4-PFHpA	86		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	86		50-150
STL00994	18O2 PFHxS	72		50-150
STL00991	13C4 PFOS	70		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_014.d
Lims ID: 320-41149-A-3-A
Client ID: GRE10-SB2-02
Sample Type: Client
Inject. Date: 01-Aug-2018 15:19:49 ALS Bottle#: 6 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 5.0000
Sample Info: 320-41149-a-3-a 5X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 11:52:49 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 11:52:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.662	1.662	0.0	1.000	31862	0.0145			105	
298.90 > 99.00	1.662	1.662	0.0	1.000	12929		2.46(1.25-3.74)		44.9	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.669	-0.007	0.646	13340	0.3016		64.9	53.6	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.225	2.214	0.011	1.005	68080	0.0423			23.5	M
363.00 > 169.00	2.213	2.214	-0.001	1.000	21955		3.10(1.13-3.40)		186	
D 9 13C4-PFHpA										
367.00 > 322.00	2.213	2.225	-0.012	0.861	693199	0.4297		85.9	19781	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.225	2.225	0.0	1.000	7101439	3.54			14421	
399.00 > 99.00	2.225	2.225	0.0	1.000	2238199		3.17(1.50-4.49)		3588	
D 11 18O2 PFHxS										
403.00 > 84.00	2.225	2.238	-0.013	0.866	821291	0.3388		71.6	22785	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.570	2.571	-0.001	1.000	238978	0.1560			111	M
413.00 > 169.00	2.570	2.571	-0.001	1.000	161163		1.48(0.84-2.52)		826	
* 62 13C2-PFOA										
415.00 > 370.00	2.570	2.571	-0.001		811283	0.5000			25794	
D 14 13C4 PFOA										
417.00 > 372.00	2.570	2.580	-0.010	1.000	662552	0.4254		85.1	18560	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.941	2.935	0.006	1.002	445867	0.3367			2457	M
499.00 > 99.00	2.941	2.935	0.006	1.002	109376		4.08(2.31-6.93)		654	
20 Perfluorononanoic acid										R
463.00 > 419.00	2.941	2.935	0.006	1.000	8824	0.007039			8.9	R
463.00 > 169.00	2.935	2.935	0.0	0.998	1249		7.06(1.90-5.69)		31.9	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.946	-0.011	1.142	563789	0.3367		70.4	3745	
D 19 13C5 PFNA										
468.00 > 423.00	2.941	2.948	-0.007	1.144	580466	0.4277		85.5	22664	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

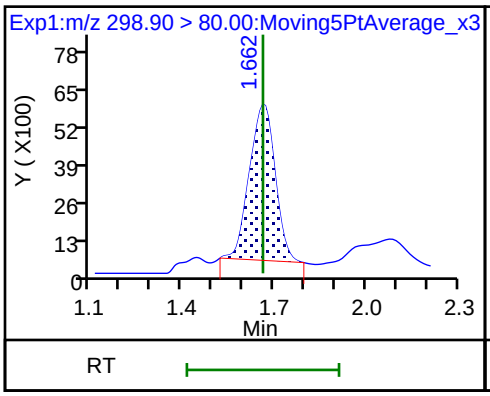
M - Manually Integrated

Report Date: 02-Aug-2018 11:52:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

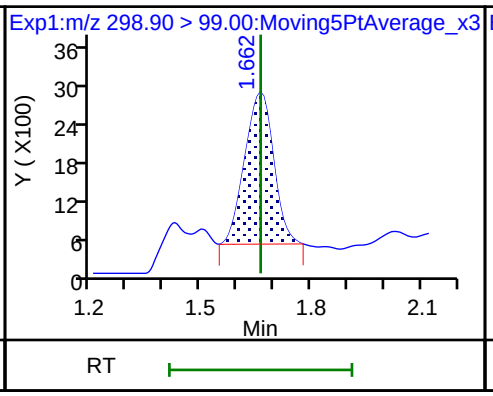
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_014.d				
Injection Date:	01-Aug-2018 15:19:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-3-A	Lab Sample ID:	320-41149-3		
Client ID:	GRE10-SB2-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

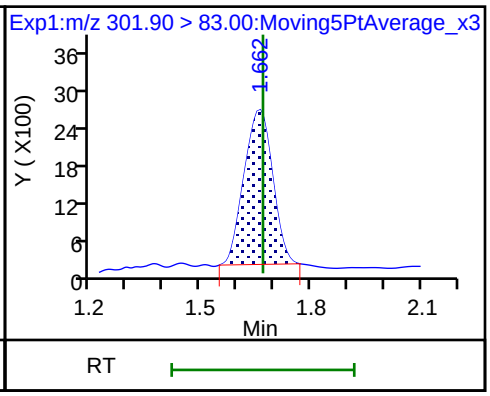
5 Perfluorobutanesulfonic acid



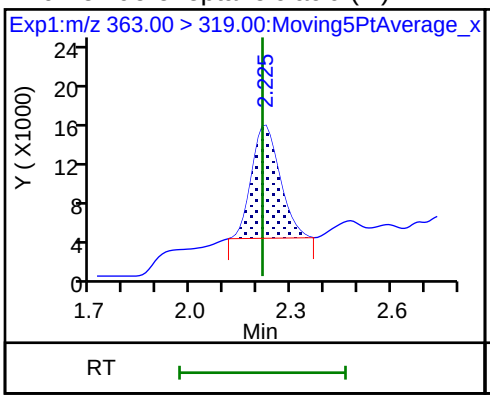
5 Perfluorobutanesulfonic acid



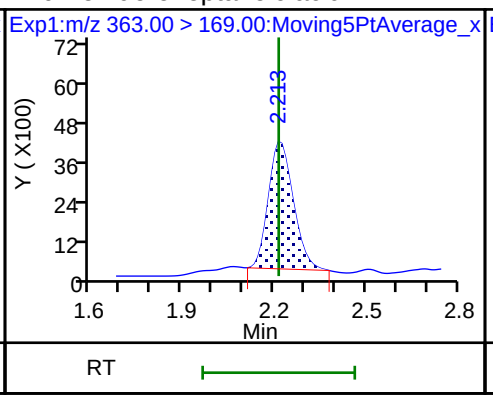
D 47 13C3-PFBS



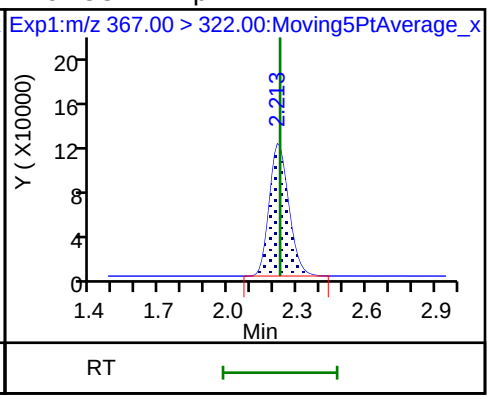
10 Perfluoroheptanoic acid (M)



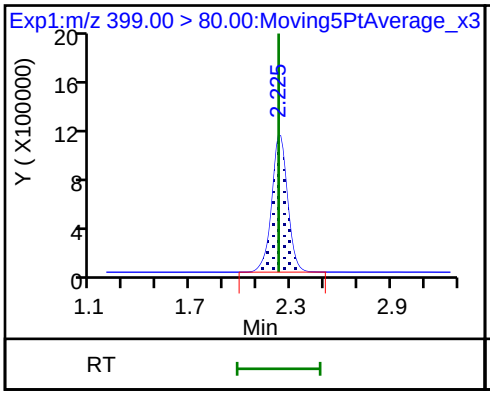
10 Perfluoroheptanoic acid



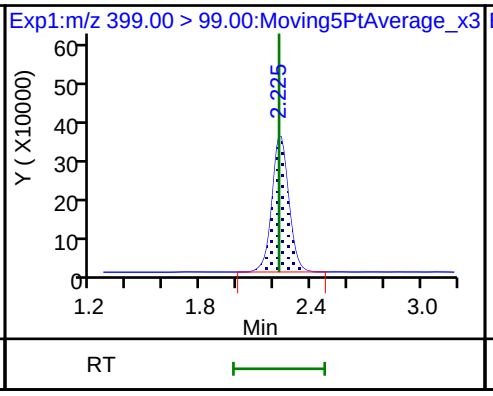
D 9 13C4-PFHpA



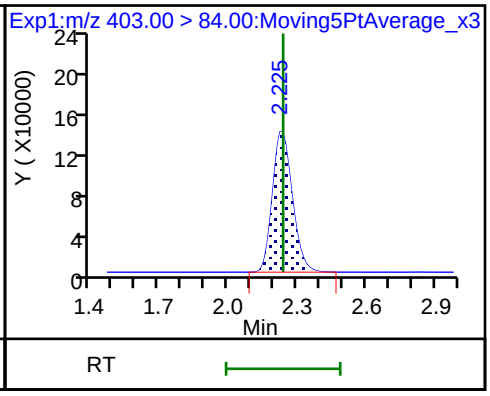
8 Perfluorohexanesulfonic acid



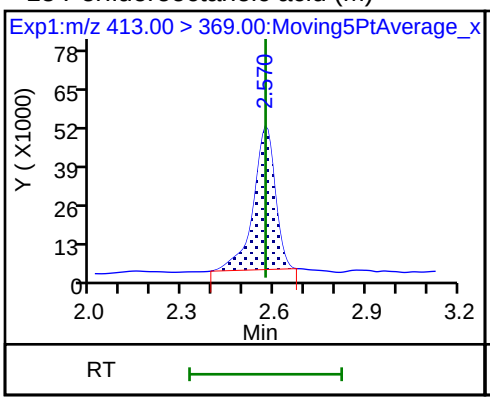
8 Perfluorohexanesulfonic acid



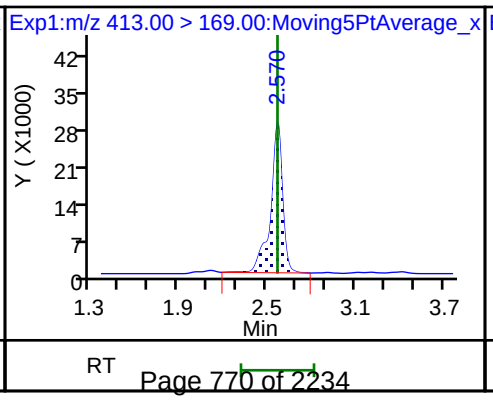
D 11 18O2 PFHxS



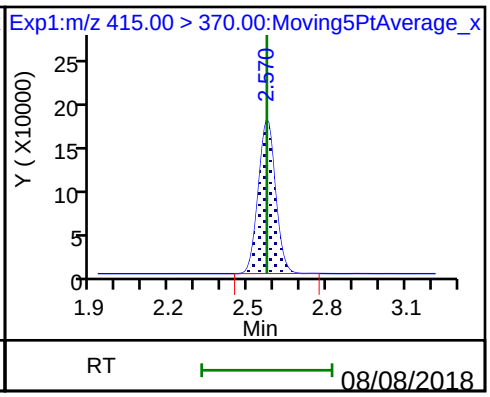
15 Perfluorooctanoic acid (M)



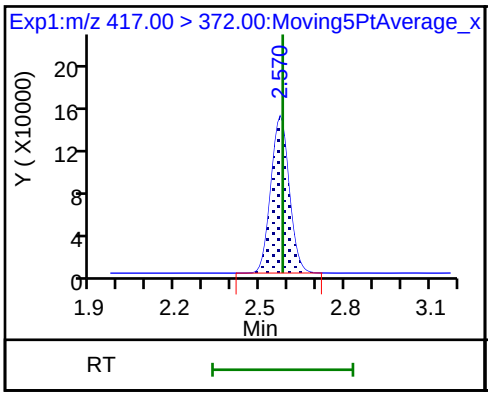
15 Perfluorooctanoic acid



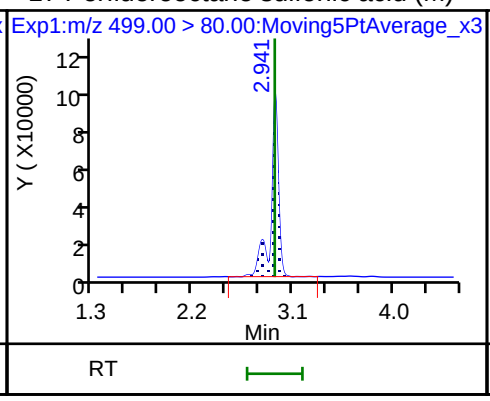
* 62 13C2-PFOA



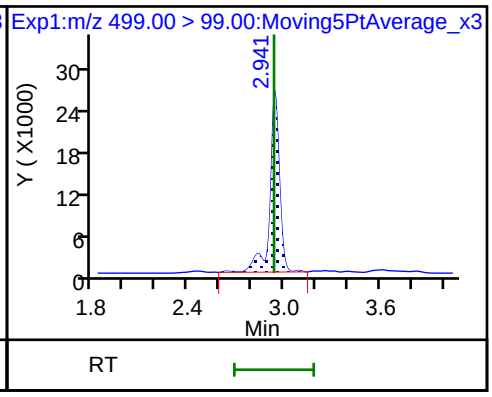
D 14 13C4 PFOA



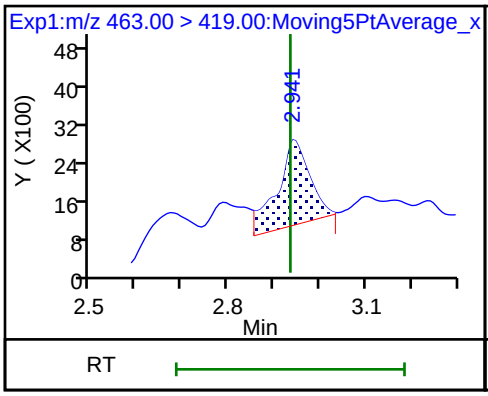
17 Perfluorooctane sulfonic acid (M)



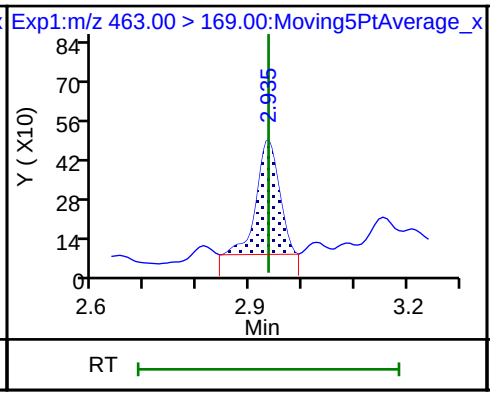
17 Perfluorooctane sulfonic acid



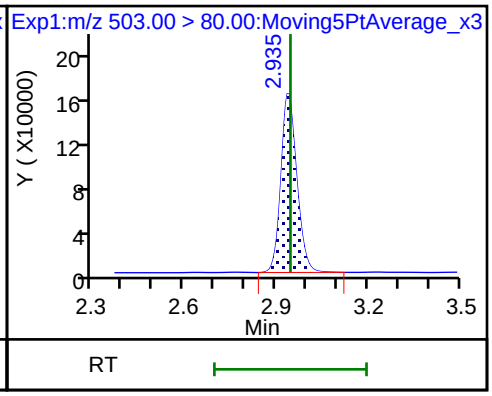
20 Perfluorononanoic acid



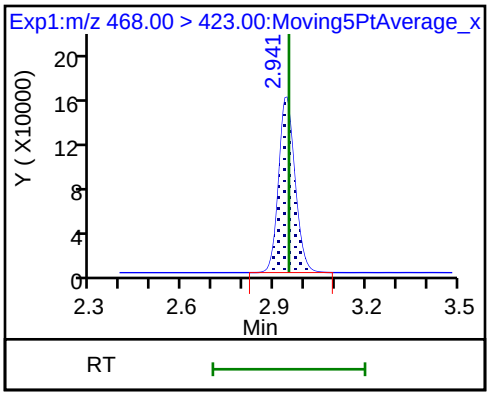
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

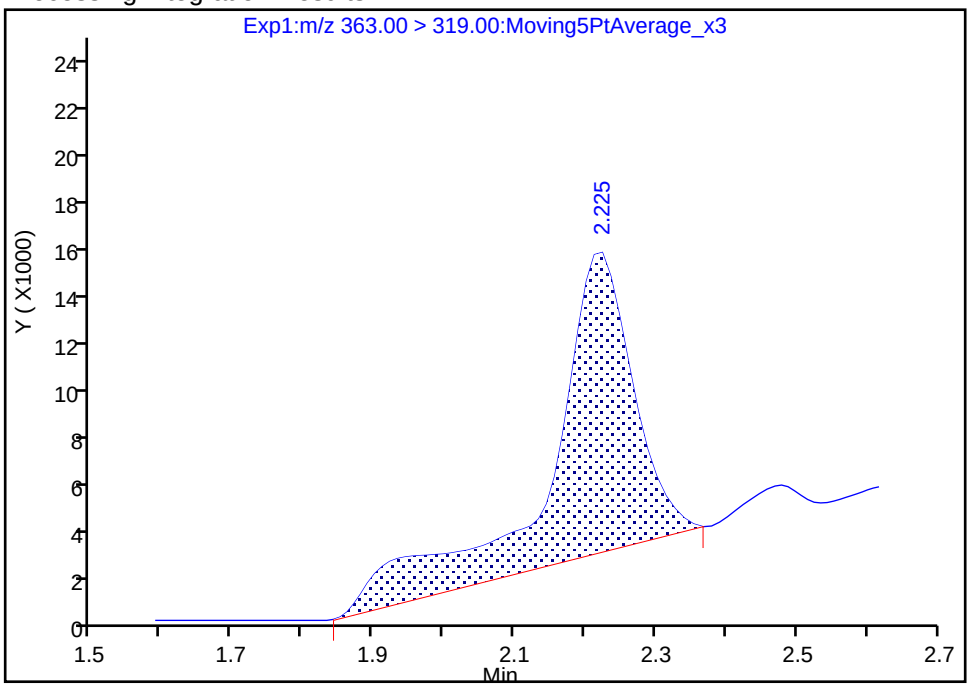
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_014.d				
Injection Date:	01-Aug-2018 15:19:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-3-A	Lab Sample ID:	320-41149-3		
Client ID:	GRE10-SB2-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

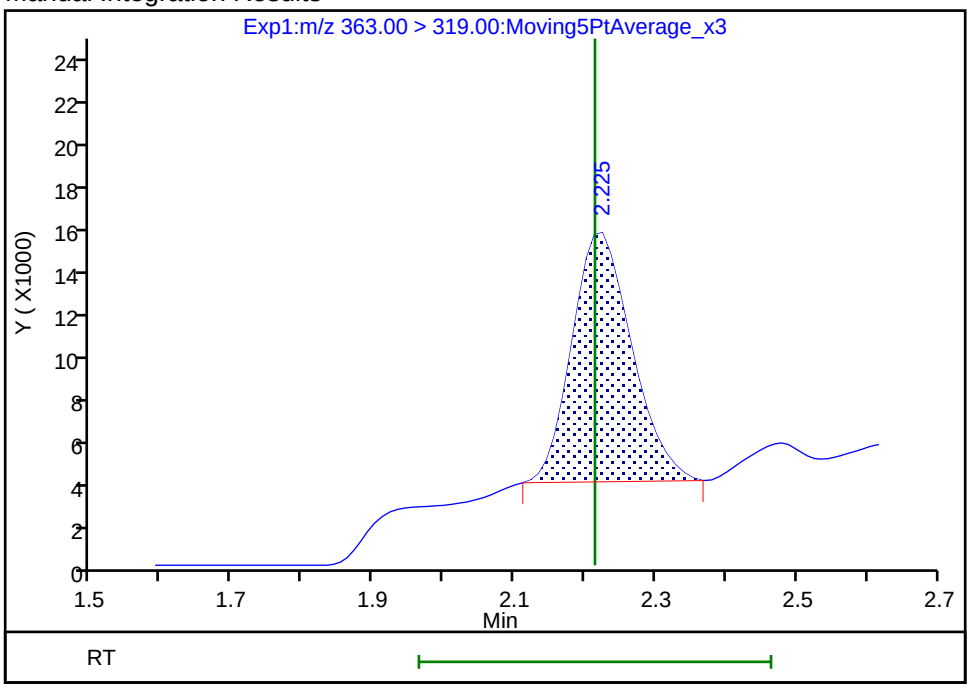
Processing Integration Results

RT: 2.22
Area: 105471
Amount: 0.065604
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 68080
Amount: 0.042346
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 11:52:25

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

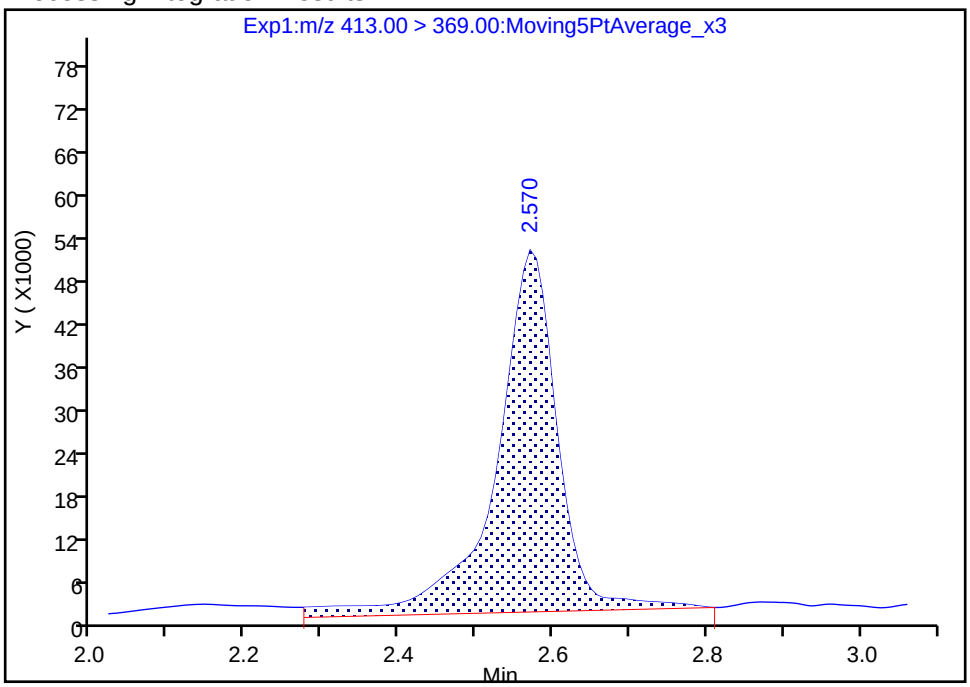
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_014.d				
Injection Date:	01-Aug-2018 15:19:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-3-A	Lab Sample ID:	320-41149-3		
Client ID:	GRE10-SB2-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

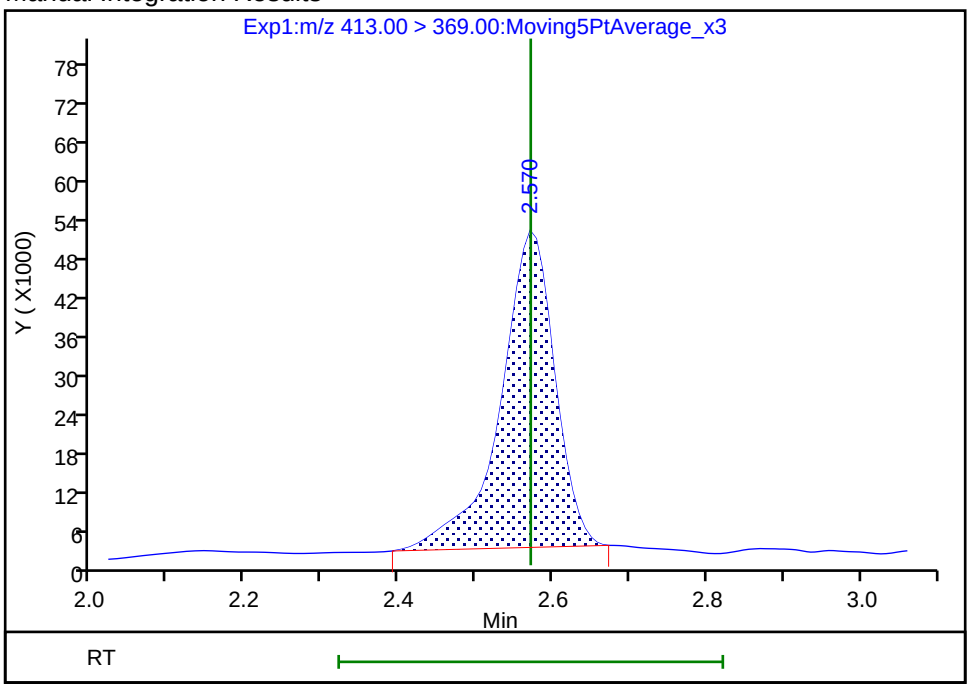
Processing Integration Results

RT: 2.57
Area: 282277
Amount: 0.184244
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 238978
Amount: 0.155982
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 11:52:37

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

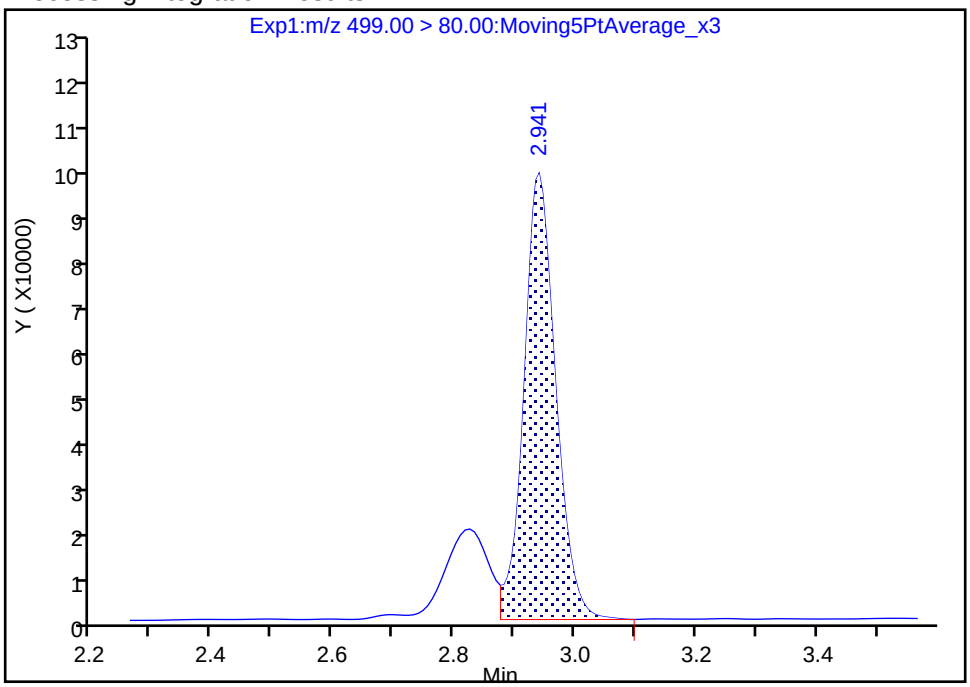
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_014.d				
Injection Date:	01-Aug-2018 15:19:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-3-A	Lab Sample ID:	320-41149-3		
Client ID:	GRE10-SB2-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

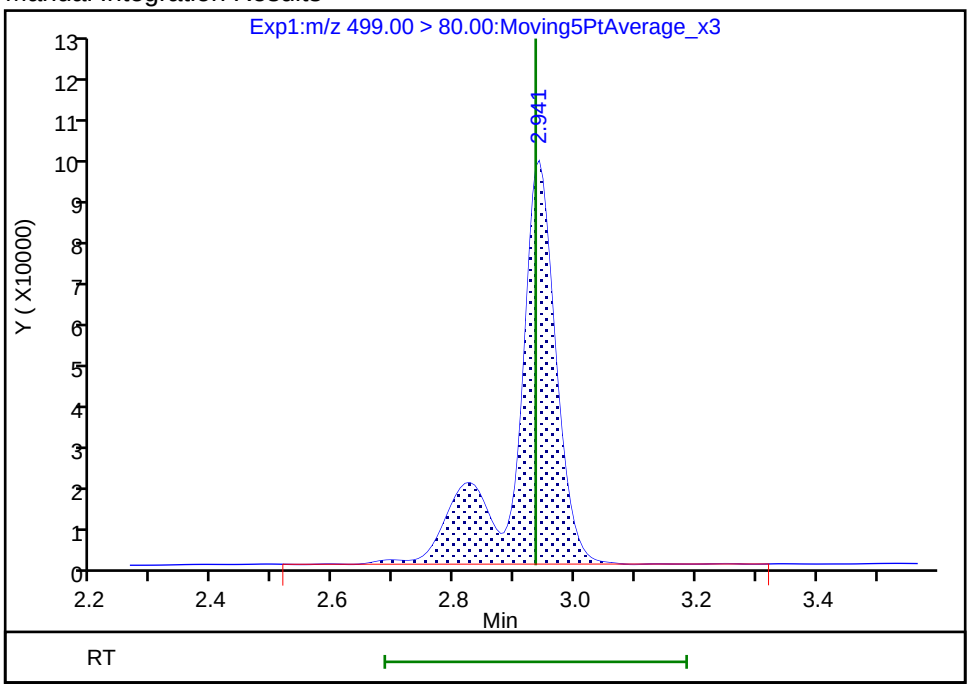
Processing Integration Results

RT: 2.94
Area: 348593
Amount: 0.263262
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 445867
Amount: 0.336725
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 11:52:45

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE10-SB1-01
Lab Sample ID: 320-41149-4
Matrix: Solid
Lab File ID: 2018.07.30LLA_012.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 15:10
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.07(g)
Date Analyzed: 07/30/2018 04:23
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 3.3
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21	J M	0.31	0.20	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	1.4		0.31	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.78		0.31	0.20	0.083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.18	U M	0.41	0.18	0.060
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8		0.31	0.20	0.063
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	12	M	1.0	0.51	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	77		50-150
STL01892	13C4-PFHpA	86		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	80		50-150
STL00991	13C4 PFOS	79		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_012.d
Lims ID: 320-41149-A-4-A
Client ID: GRE10-SB1-01
Sample Type: Client
Inject. Date: 30-Jul-2018 04:23:42 ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-4-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:53:23 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:53:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.665	1.662	0.003	1.005	34010	0.0153			29.6	
298.90 > 99.00	1.656	1.662	-0.006	1.000	13226		2.57(1.25-3.74)		11.8	M
D 47 13C3-PFBS										
301.90 > 83.00	1.656	1.674	-0.018	0.644	64993	1.79		77.0	170	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.217	2.214	0.003	1.000	164284	0.1033			93.4	M
363.00 > 169.00	2.217	2.214	0.003	1.000	55969		2.94(1.13-3.40)		472	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.228	2.225	0.003	1.000	1800760	0.9001			1209	
399.00 > 99.00	2.228	2.225	0.003	1.000	591434		3.04(1.50-4.49)		1028	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.240	-0.023	0.862	3605541	2.16		86.2	62429	
D 11 18O2 PFHxS										
403.00 > 84.00	2.228	2.253	-0.025	0.866	4055675	1.89		79.8	63243	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.571	0.001		4275435	2.50			58592	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.571	0.001	1.003	1145104	0.6803			471	
413.00 > 169.00	2.572	2.571	0.001	1.003	606146		1.89(0.84-2.52)		3282	
D 14 13C4 PFOA										
417.00 > 372.00	2.564	2.588	-0.024	0.997	3467575	2.12		84.8	50897	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.936	2.935	0.001	1.002	7952568	6.07			9433	M
499.00 > 99.00	2.936	2.935	0.001	1.002	1913515		4.16(2.31-6.93)		15701	
20 Perfluorononanoic acid										
463.00 > 419.00	2.936	2.935	0.001	1.002	569111	0.3829			675	
463.00 > 169.00	2.936	2.935	0.001	1.002	126473		4.50(1.90-5.69)		1959	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.931	2.953	-0.022	1.140	3254817	2.31		92.3	64491	
D 18 13C4 PFOS										
503.00 > 80.00	2.931	2.953	-0.022	1.140	2832996	1.90		79.4	6407	

QC Flag Legend

Review Flags

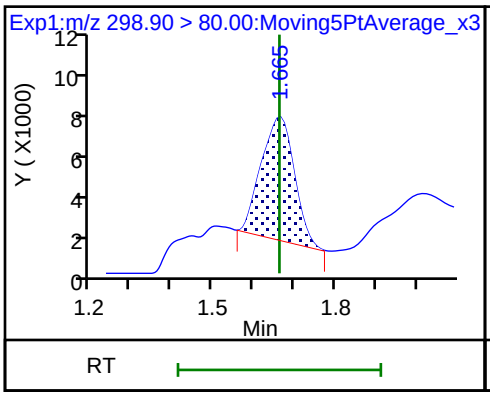
M - Manually Integrated

Report Date: 31-Jul-2018 09:53:24 Chrom Revision: 2.3 19-Jul-2018 15:14:50

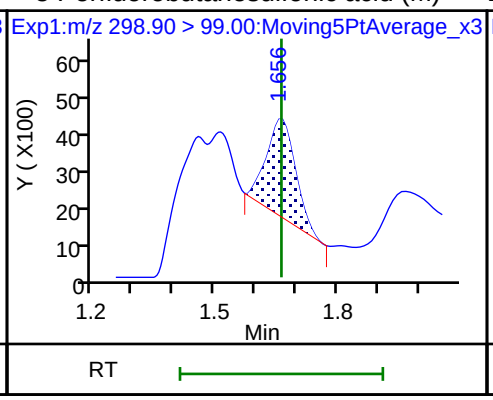
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_012.d				
Injection Date:	30-Jul-2018 04:23:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-4-A	Lab Sample ID:	320-41149-4		
Client ID:	GRE10-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

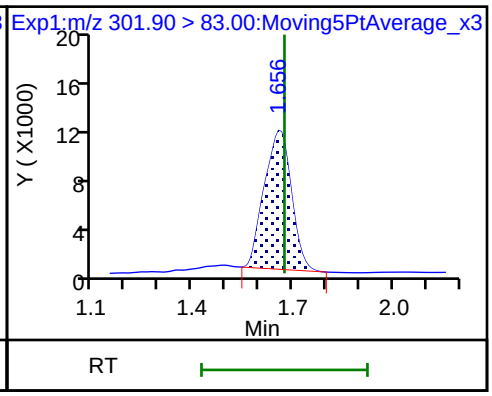
5 Perfluorobutanesulfonic acid



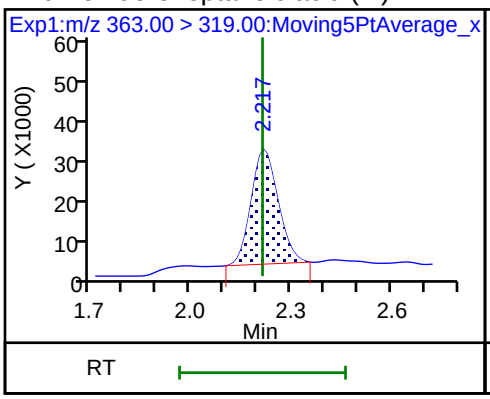
5 Perfluorobutanesulfonic acid (M)



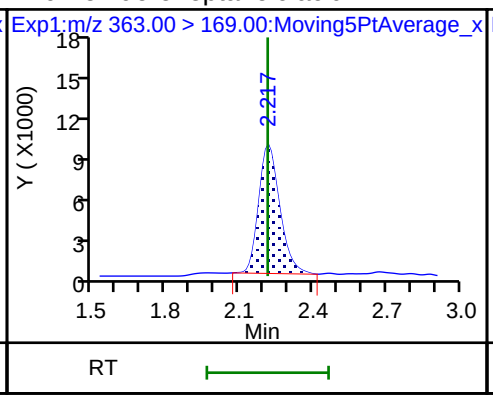
D 47 13C3-PFBS



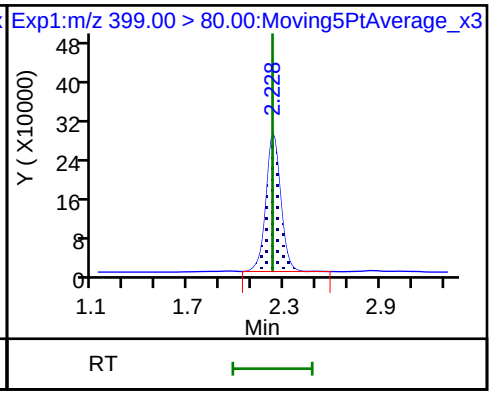
10 Perfluoroheptanoic acid (M)



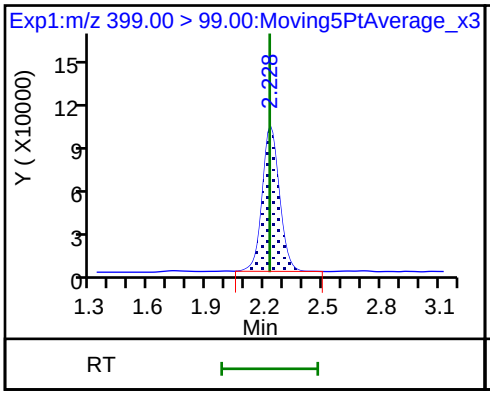
10 Perfluoroheptanoic acid



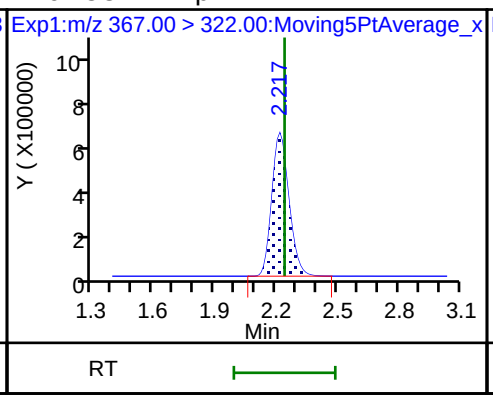
8 Perfluorohexanesulfonic acid



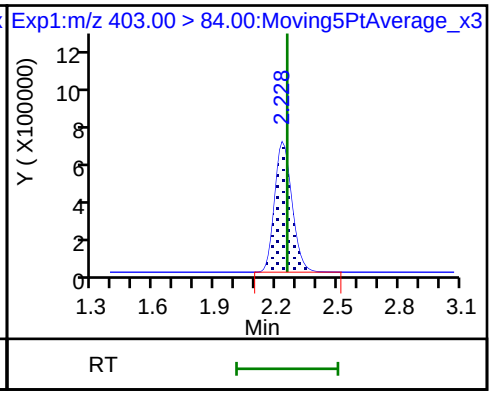
8 Perfluorohexanesulfonic acid



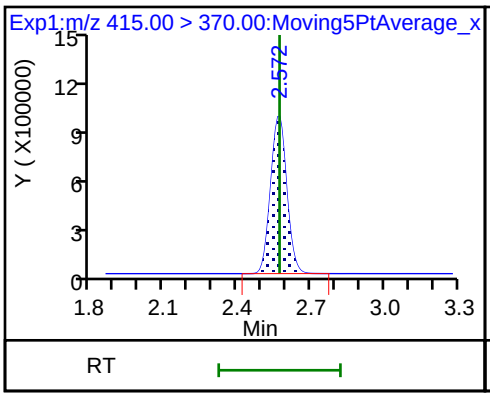
D 9 13C4-PFHpA



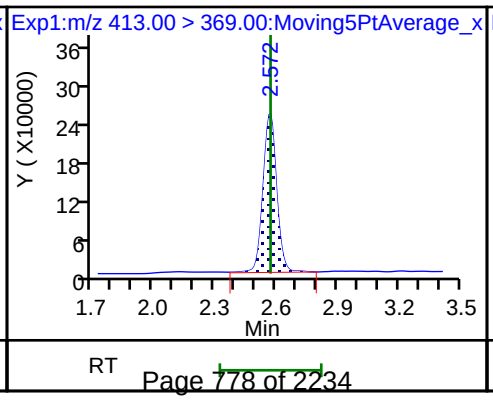
D 11 18O2 PFHxS



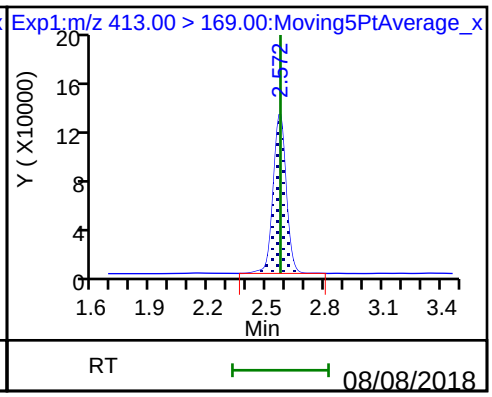
* 62 13C2-PFOA



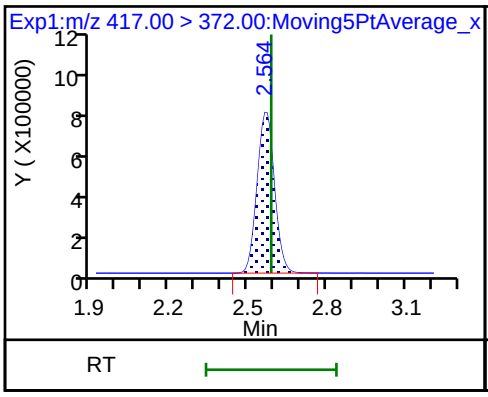
15 Perfluorooctanoic acid



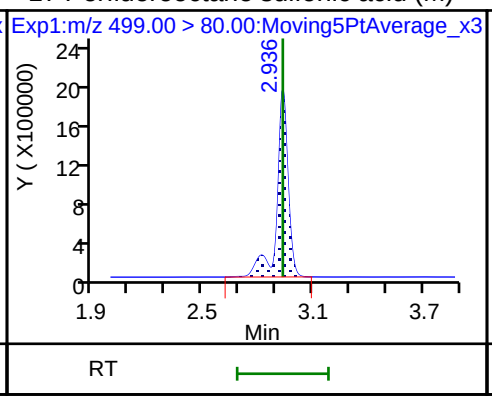
15 Perfluorooctanoic acid



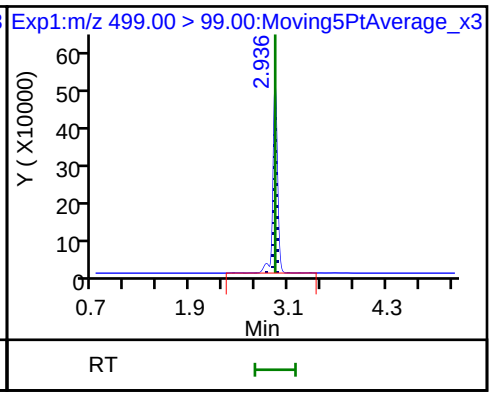
D 14 13C4 PFOA



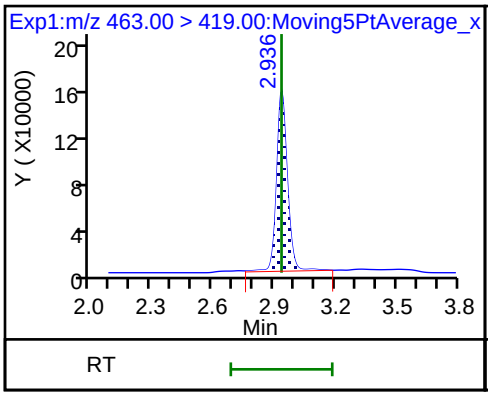
17 Perfluorooctane sulfonic acid (M)



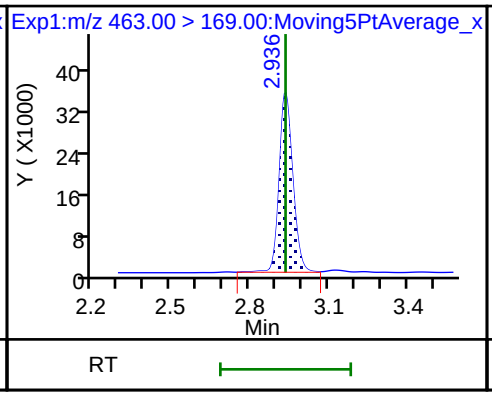
17 Perfluorooctane sulfonic acid



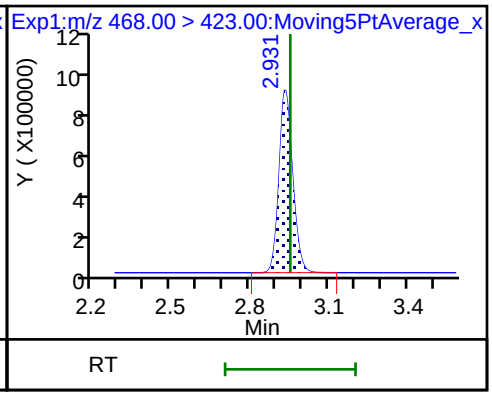
20 Perfluorononanoic acid



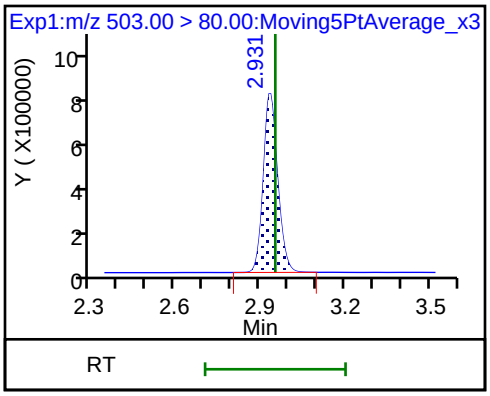
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

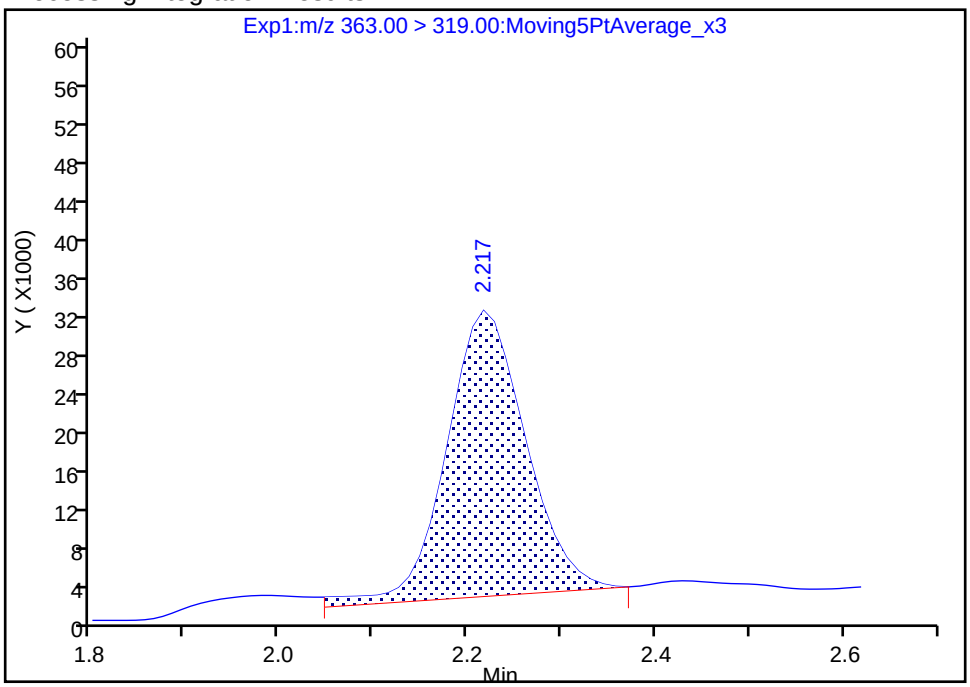
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_012.d				
Injection Date:	30-Jul-2018 04:23:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-4-A	Lab Sample ID:	320-41149-4		
Client ID:	GRE10-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

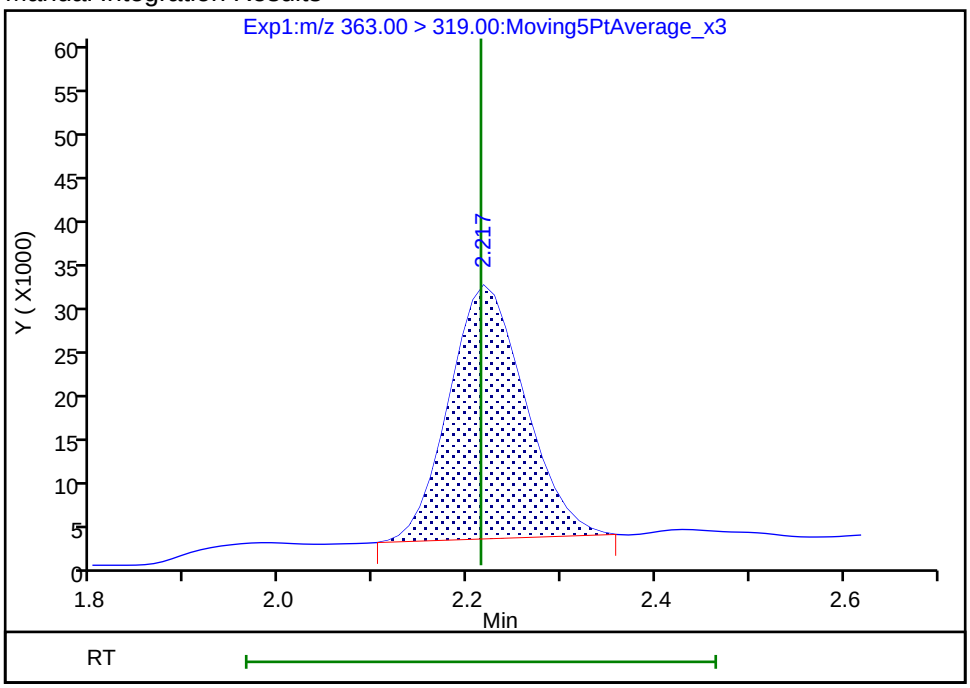
Processing Integration Results

RT: 2.22
Area: 175347
Amount: 0.110276
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 164284
Amount: 0.103318
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:53:08

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

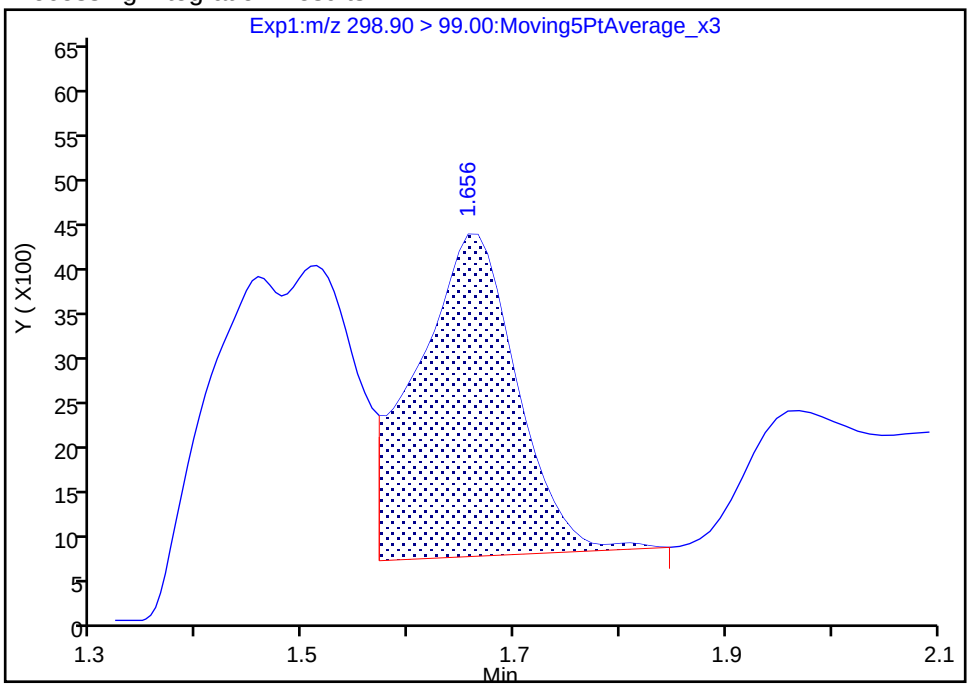
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_012.d				
Injection Date:	30-Jul-2018 04:23:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-4-A	Lab Sample ID:	320-41149-4		
Client ID:	GRE10-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

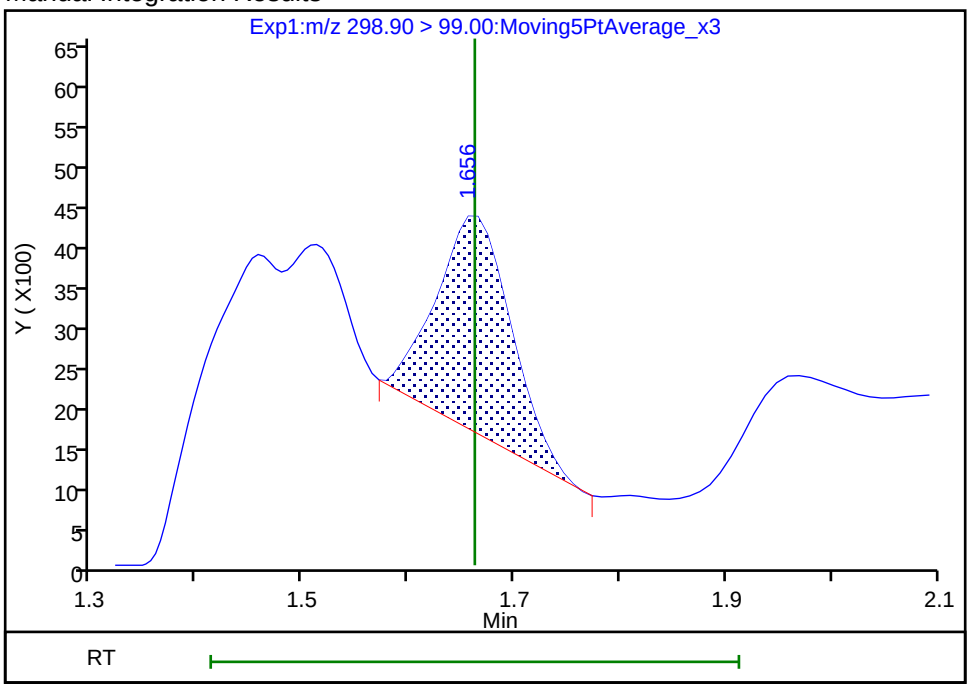
Processing Integration Results

RT: 1.66
Area: 23801
Amount: 0.015324
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 13226
Amount: 0.015324
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:53:01

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

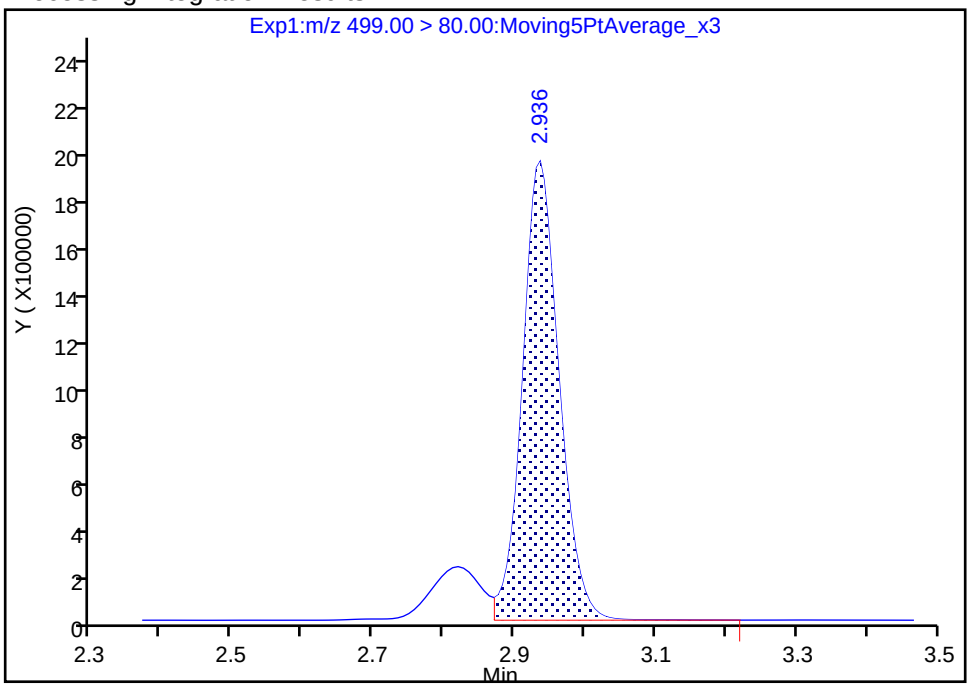
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_012.d				
Injection Date:	30-Jul-2018 04:23:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-4-A	Lab Sample ID:	320-41149-4		
Client ID:	GRE10-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

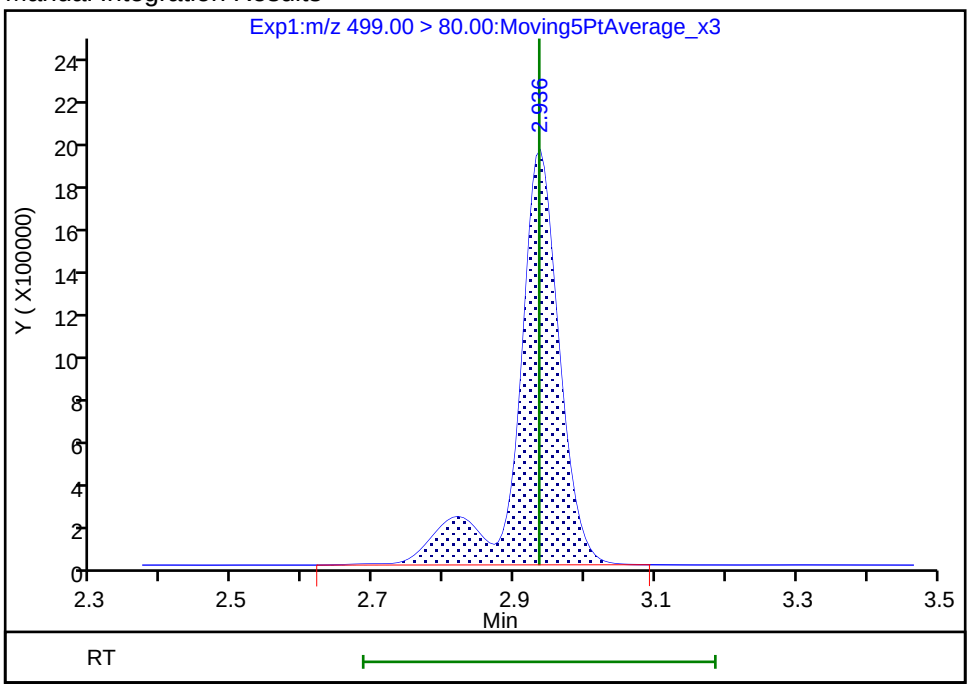
Processing Integration Results

RT: 2.94
Area: 6873657
Amount: 5.247872
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 7952568
Amount: 6.071595
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:53:19

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE10-SB1-01D | Lab Sample ID: 320-41149-5

Matrix: Solid | Lab File ID: 2018.07.30LLA_013.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/09/2018 15:10

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.02(g) | Date Analyzed: 07/30/2018 04:31

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 2.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.18	J M	0.31	0.20	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	1.4		0.31	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.74	M	0.31	0.20	0.083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.18	U M	0.41	0.18	0.060
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9		0.31	0.20	0.063
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13	M	1.0	0.51	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	74		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	79		50-150
STL00991	13C4 PFOS	78		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_013.d
Lims ID: 320-41149-A-5-A
Client ID: GRE10-SB1-01D
Sample Type: Client
Inject. Date: 30-Jul-2018 04:31:31 ALS Bottle#: 8 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-5-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:55:16 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:55:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.656	1.662	-0.006	1.000	35531	0.0160			30.8	
298.90 > 99.00	1.656	1.662	-0.006	1.000	11180		3.18(1.25-3.74)		8.5	M
D 47 13C3-PFBS										
301.90 > 83.00	1.656	1.674	-0.018	0.644	64993	1.72		74.0	137	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.217	2.214	0.003	1.000	144906	0.0896			84.9	M
363.00 > 169.00	2.217	2.214	0.003	1.000	63143		2.29(1.13-3.40)		666	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.228	2.225	0.003	1.000	1916691	0.9288			1157	
399.00 > 99.00	2.228	2.225	0.003	1.000	631966		3.03(1.50-4.49)		1011	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.240	-0.023	0.862	3666375	2.11		84.3	58200	
D 11 18O2 PFHxS										
403.00 > 84.00	2.228	2.253	-0.025	0.866	4183032	1.87		79.1	65620	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.571	0.001		4448625	2.50			63266	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.571	0.001	1.000	1251880	0.6703			593	
413.00 > 169.00	2.572	2.571	0.001	1.000	662464		1.89(0.84-2.52)		3605	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.588	-0.016	1.000	3847218	2.26		90.4	58087	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.936	2.935	0.001	1.000	8235177	6.17			8516	M
499.00 > 99.00	2.936	2.935	0.001	1.000	1938820		4.25(2.31-6.93)		9973	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.936	2.935	0.001	1.000	560112	0.3646			507	M
463.00 > 169.00	2.936	2.935	0.001	1.000	139135		4.03(1.90-5.69)		1621	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.936	2.953	-0.017	1.142	3364254	2.29		91.7	62913	
D 18 13C4 PFOS										
503.00 > 80.00	2.936	2.953	-0.017	1.142	2888881	1.86		77.8	5776	

QC Flag Legend

Review Flags

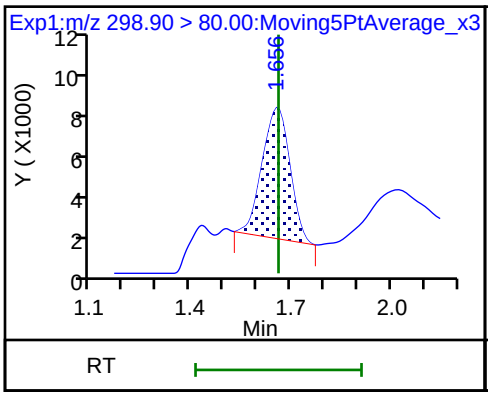
M - Manually Integrated

Report Date: 31-Jul-2018 09:55:16 Chrom Revision: 2.3 19-Jul-2018 15:14:50

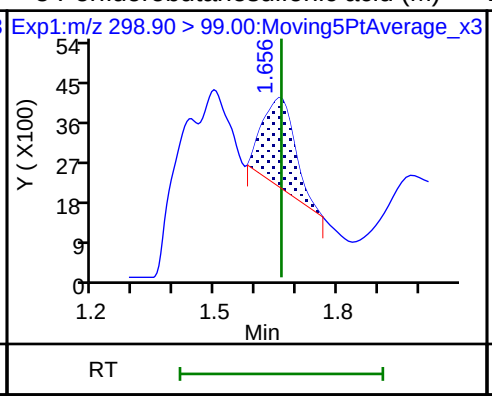
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_013.d				
Injection Date:	30-Jul-2018 04:31:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-5-A	Lab Sample ID:	320-41149-5		
Client ID:	GRE10-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

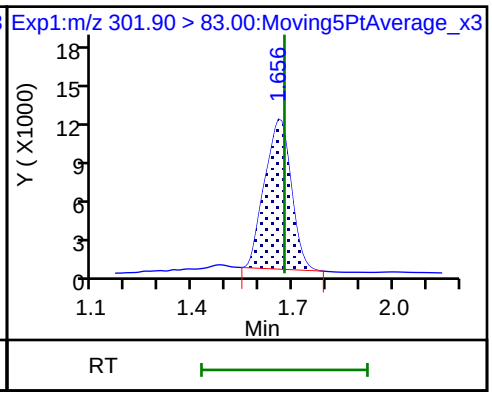
5 Perfluorobutanesulfonic acid



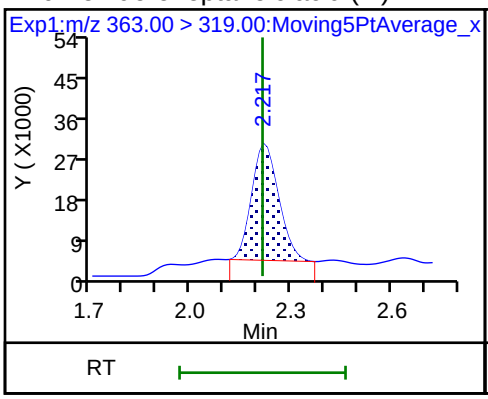
5 Perfluorobutanesulfonic acid (M)



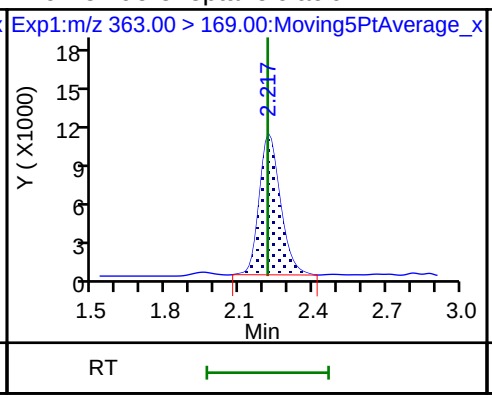
D 47 13C3-PFBS



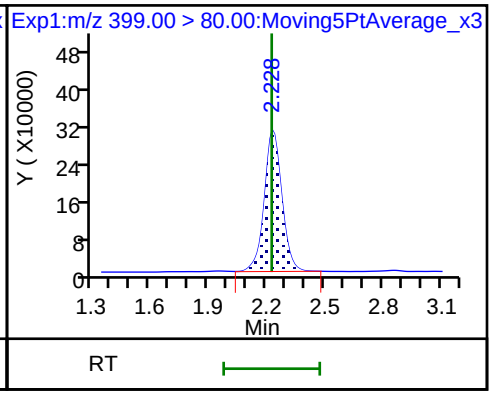
10 Perfluoroheptanoic acid (M)



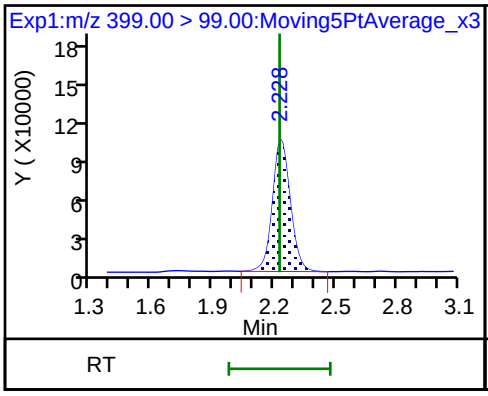
10 Perfluoroheptanoic acid



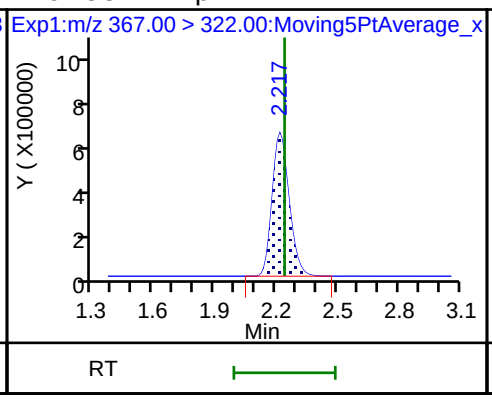
8 Perfluorohexanesulfonic acid



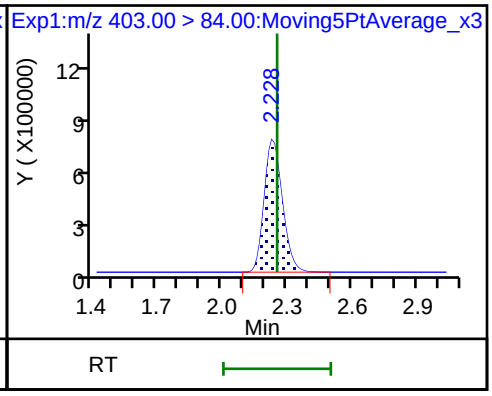
8 Perfluorohexanesulfonic acid



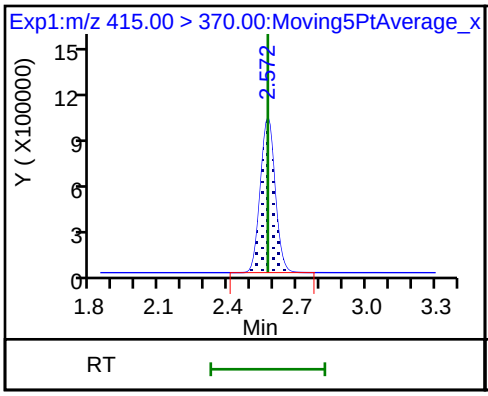
D 9 13C4-PFHpA



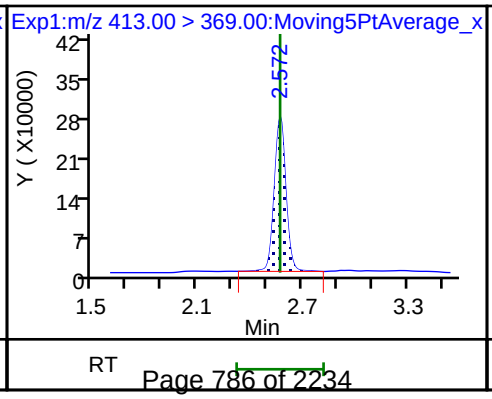
D 11 18O2 PFHxS



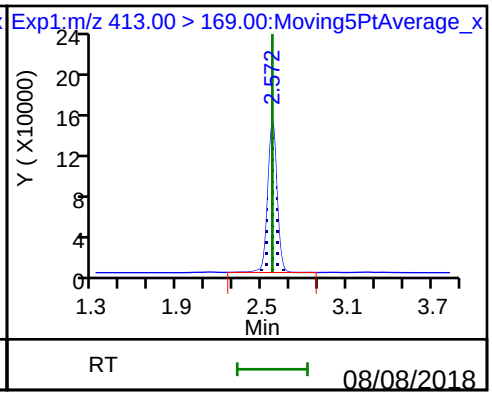
* 62 13C2-PFOA



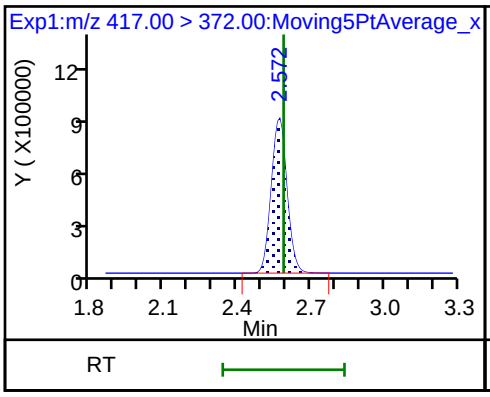
15 Perfluorooctanoic acid



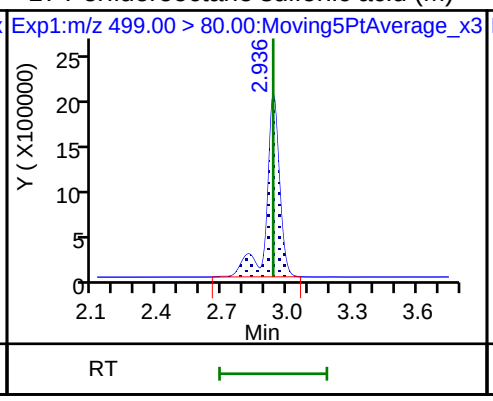
15 Perfluorooctanoic acid



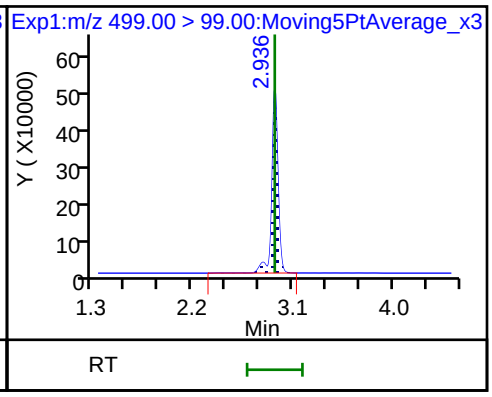
D 14 13C4 PFOA



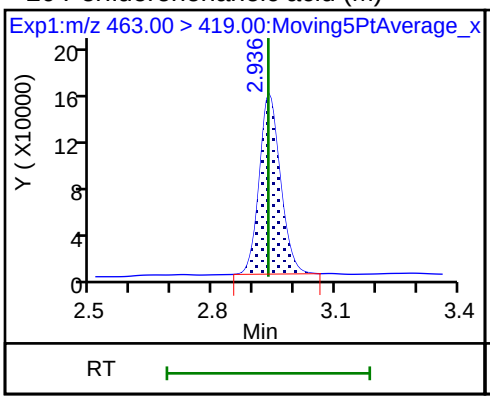
17 Perfluorooctane sulfonic acid (M)



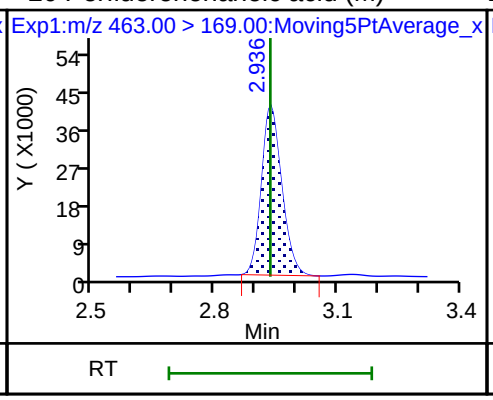
17 Perfluorooctane sulfonic acid



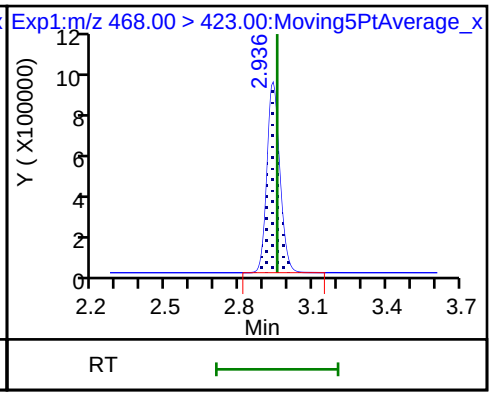
20 Perfluorononanoic acid (M)



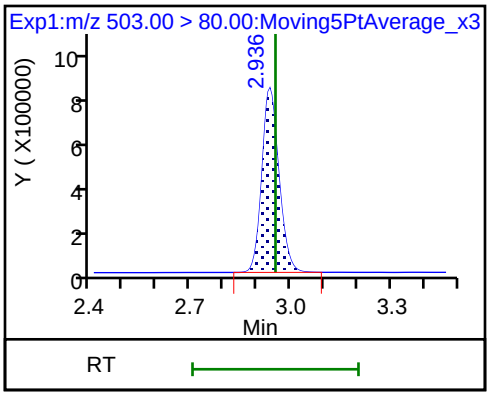
20 Perfluorononanoic acid (M)



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

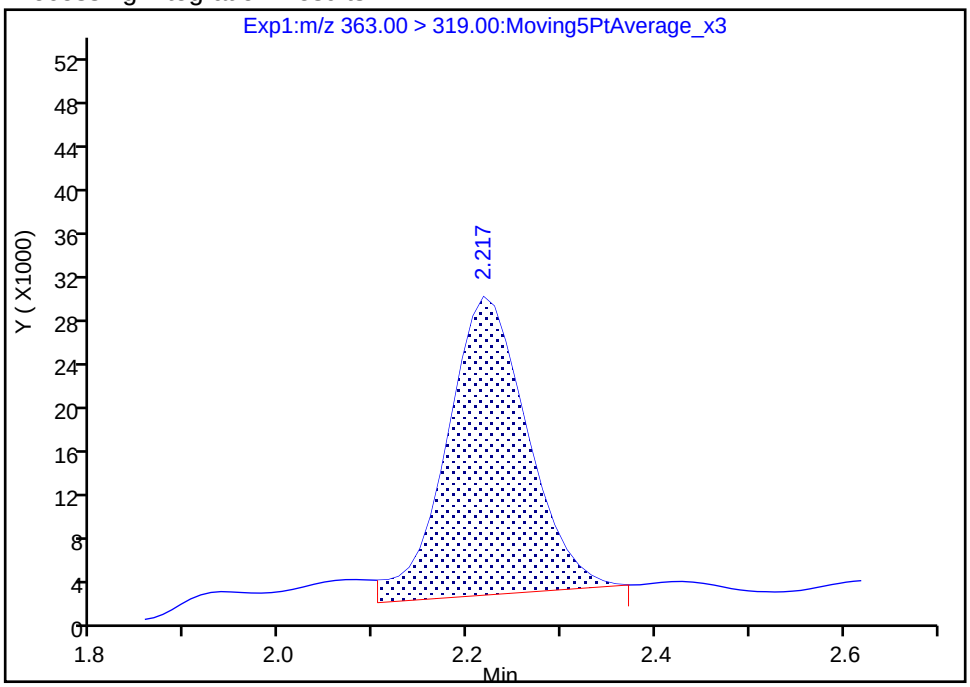
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_013.d				
Injection Date:	30-Jul-2018 04:31:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-5-A	Lab Sample ID:	320-41149-5		
Client ID:	GRE10-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

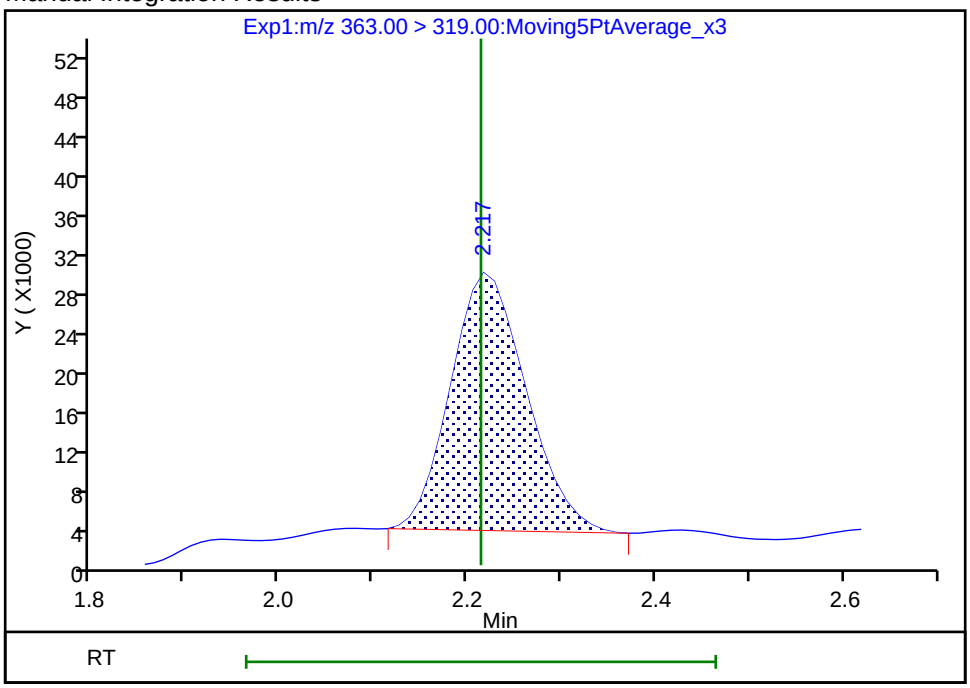
Processing Integration Results

RT: 2.22
Area: 161729
Amount: 0.100024
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 144906
Amount: 0.089619
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:54:45

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

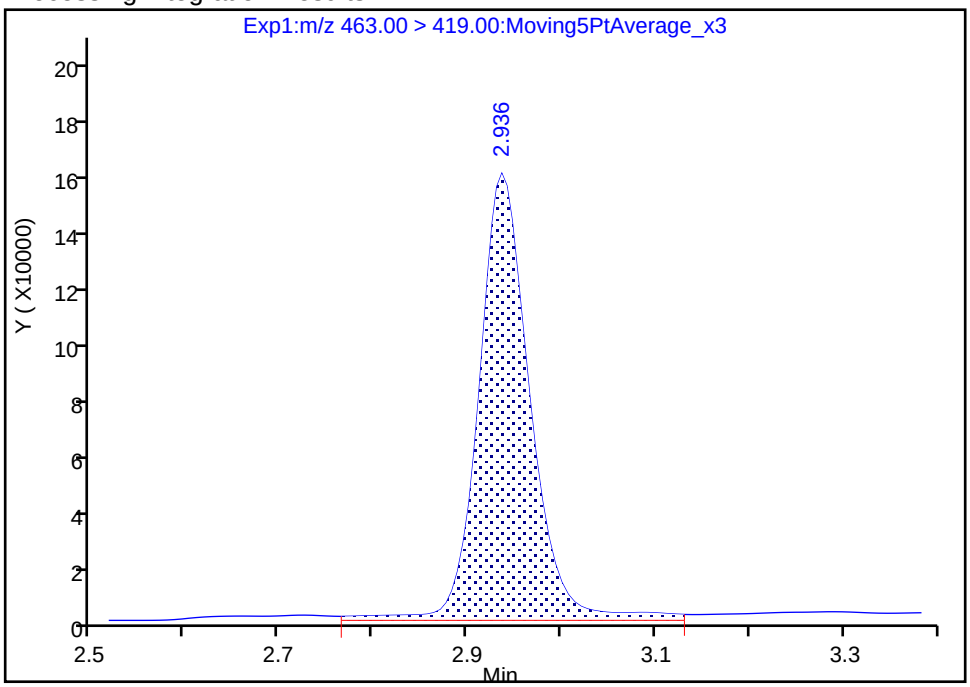
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_013.d				
Injection Date:	30-Jul-2018 04:31:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-5-A	Lab Sample ID:	320-41149-5		
Client ID:	GRE10-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

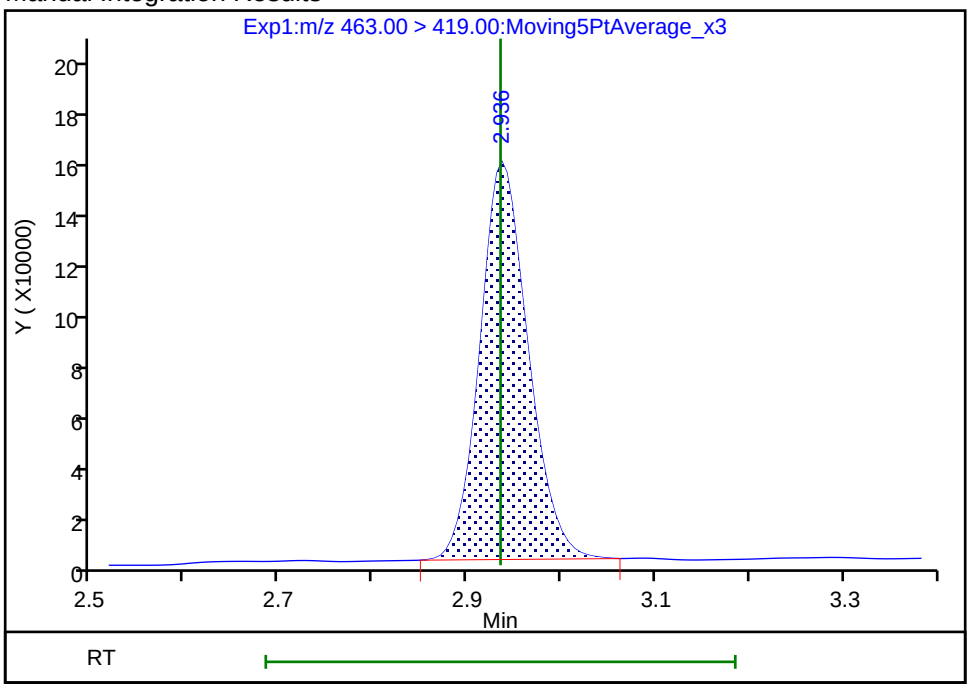
Processing Integration Results

RT: 2.94
Area: 608757
Amount: 0.396215
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 560112
Amount: 0.364554
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:55:05

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

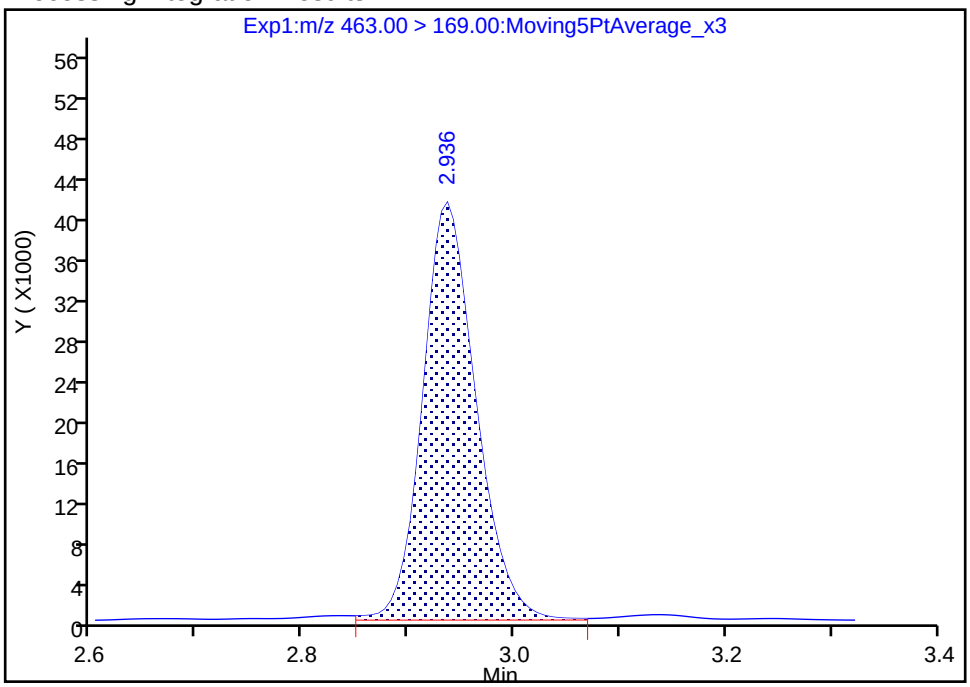
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_013.d				
Injection Date:	30-Jul-2018 04:31:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-5-A	Lab Sample ID:	320-41149-5		
Client ID:	GRE10-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

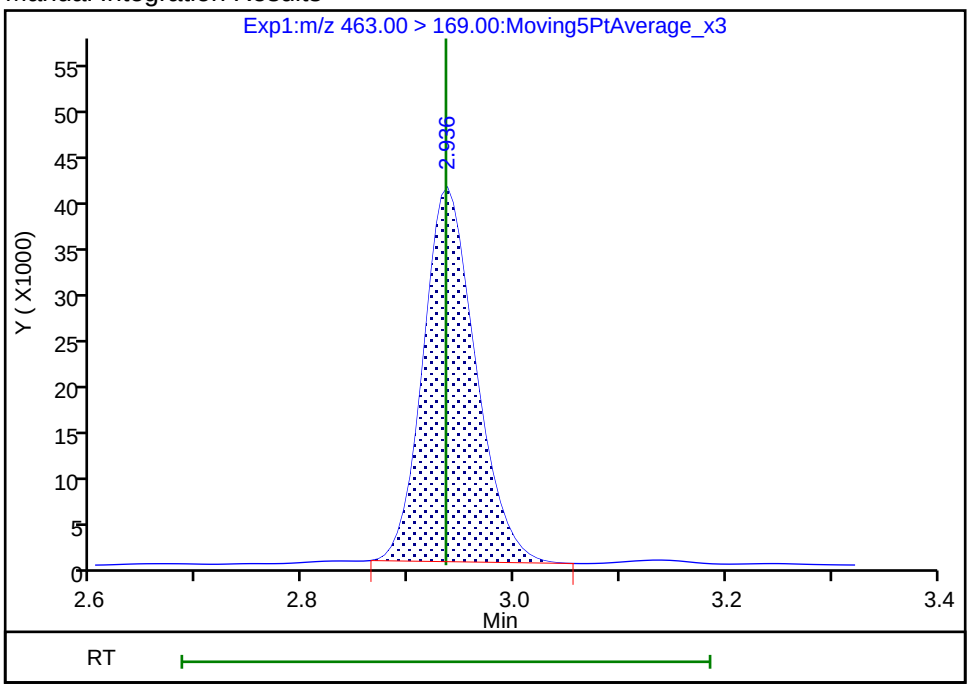
Processing Integration Results

RT: 2.94
Area: 143311
Amount: 0.396215
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 139135
Amount: 0.364554
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:55:13

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

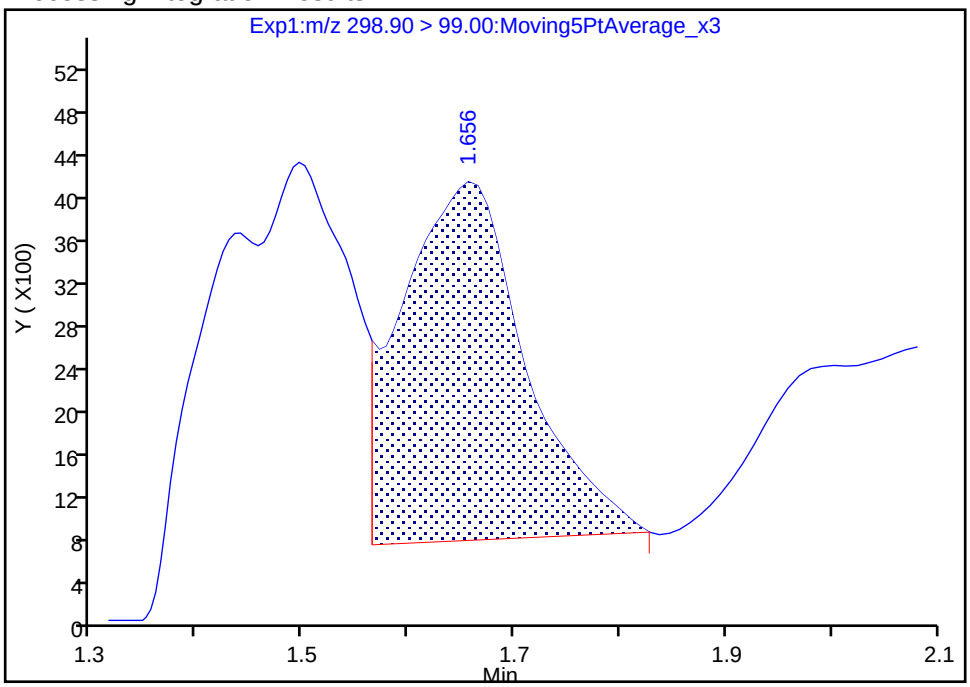
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_013.d				
Injection Date:	30-Jul-2018 04:31:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-5-A	Lab Sample ID:	320-41149-5		
Client ID:	GRE10-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

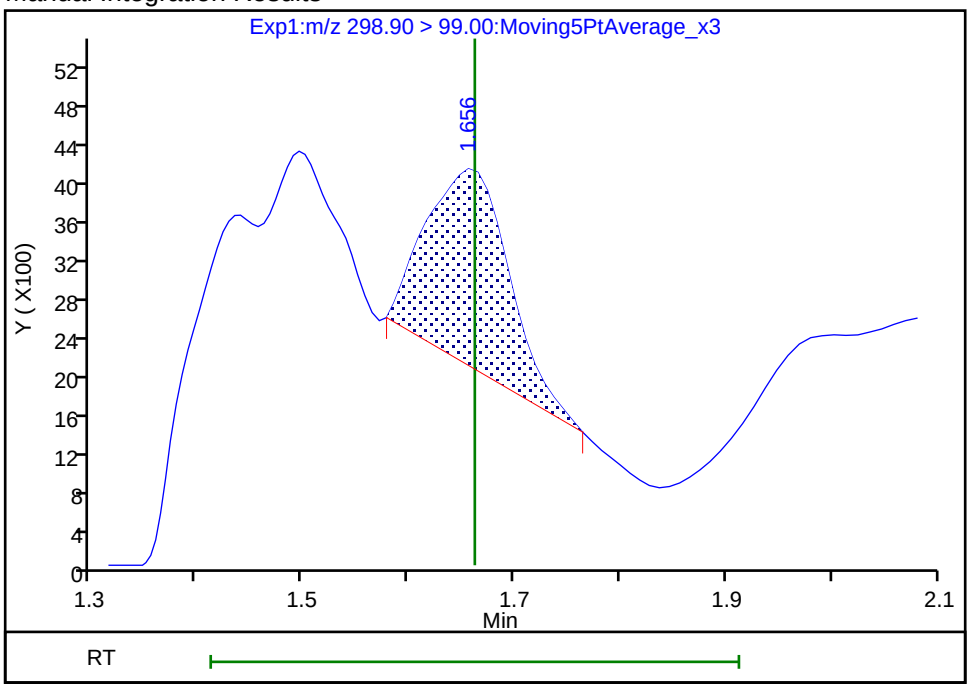
Processing Integration Results

RT: 1.66
Area: 27390
Amount: 0.016010
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 11180
Amount: 0.016010
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:54:38

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

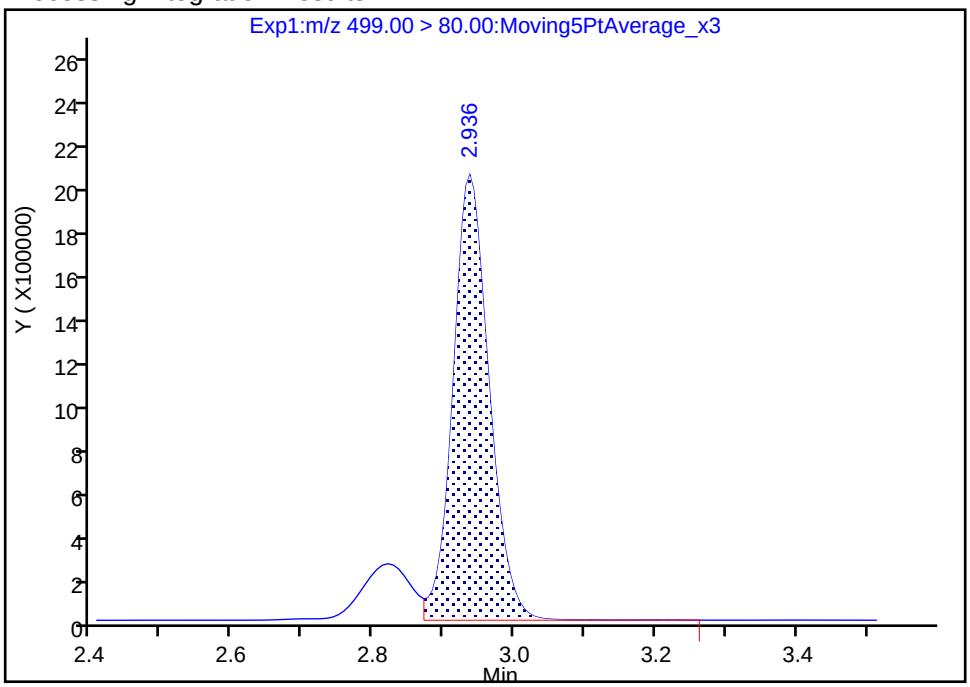
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_013.d				
Injection Date:	30-Jul-2018 04:31:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-5-A	Lab Sample ID:	320-41149-5		
Client ID:	GRE10-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

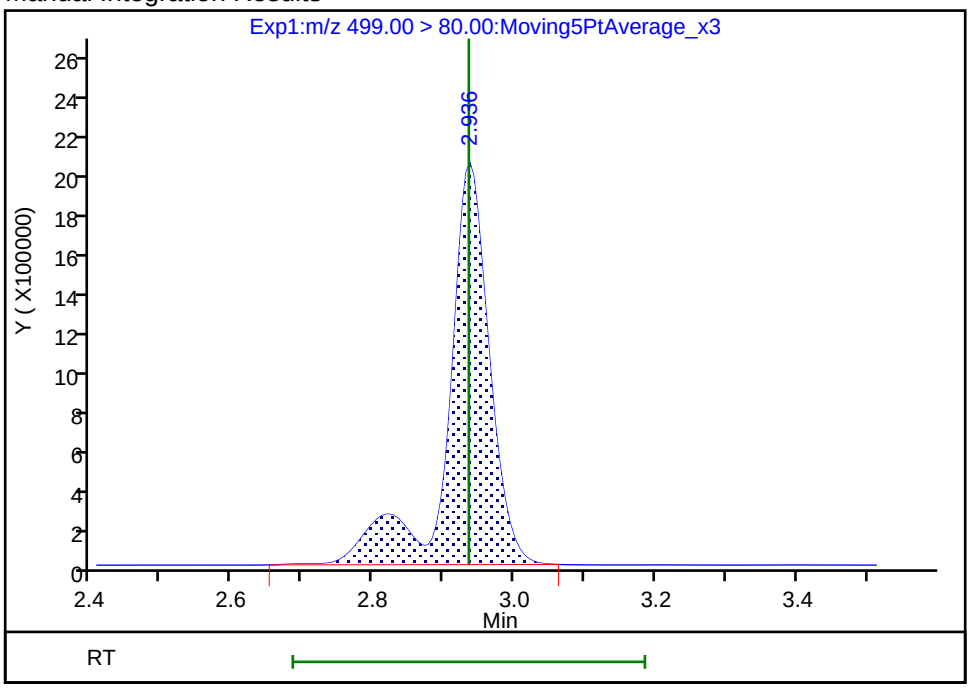
Processing Integration Results

RT: 2.94
Area: 7085059
Amount: 5.304631
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 8235177
Amount: 6.165732
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:54:55

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE10-SB3-01
Lab Sample ID: 320-41149-6
Matrix: Solid
Lab File ID: 2018.07.30LLA_014.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 15:50
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.08(g)
Date Analyzed: 07/30/2018 04:39
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 8.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21	U	0.32	0.21	0.084
335-67-1	Perfluorooctanoic acid (PFOA)	0.35	M	0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.16	J M	0.32	0.21	0.087
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.43	0.19	0.063
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0		0.32	0.21	0.066
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	12		1.1	0.54	0.26

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	80		50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	91		50-150
STL00994	18O2 PFHxS	82		50-150
STL00991	13C4 PFOS	84		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_014.d
Lims ID: 320-41149-A-6-A
Client ID: GRE10-SB3-01
Sample Type: Client
Inject. Date: 30-Jul-2018 04:39:20 ALS Bottle#: 9 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-6-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:56:23 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:56:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.665	1.662	0.003	1.000	33027	0.0150			31.2	
298.90 > 99.00	1.665	1.662	0.003	1.000	10473		3.15(1.25-3.74)		10.0	M
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.674	-0.009	0.647	64600	1.85		79.8	152	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.217	2.214	0.003	0.995	61562	0.0387			43.0	
363.00 > 169.00	2.228	2.214	0.014	1.000	26972		2.28(1.13-3.40)		272	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.225	0.015	1.000	1823770	0.9237			1308	
399.00 > 99.00	2.240	2.225	0.015	1.000	599869		3.04(1.50-4.49)		1117	
D 9 13C4-PFHpA										
367.00 > 322.00	2.228	2.240	-0.012	0.866	3610939	2.25		90.0	76335	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.253	-0.013	0.871	4002531	1.94		82.1	67473	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.571	0.001		4102416	2.50			51365	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.572	2.571	0.001	1.000	287339	0.1637			145	M
413.00 > 169.00	2.580	2.571	0.009	1.003	167063		1.72(0.84-2.52)		840	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.588	-0.016	1.000	3616628	2.30		92.2	47689	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.936	2.935	0.001	1.000	7314998	5.51			15711	
499.00 > 99.00	2.936	2.935	0.001	1.000	1761666		4.15(2.31-6.93)		9159	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.942	2.935	0.007	1.002	101962	0.0727			102	M
463.00 > 169.00	2.936	2.935	0.001	1.000	26266		3.88(1.90-5.69)		392	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.936	2.953	-0.017	1.142	3070057	2.27		90.7	53957	
D 18 13C4 PFOS										
503.00 > 80.00	2.936	2.953	-0.017	1.142	2870925	2.00		83.8	8282	

QC Flag Legend

Review Flags

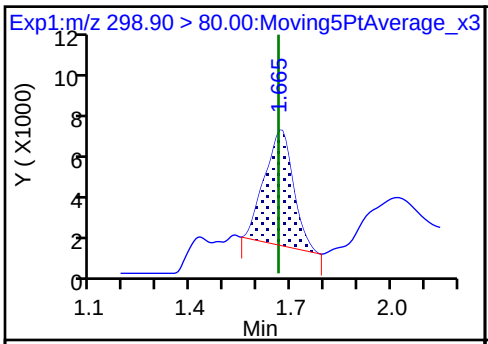
M - Manually Integrated

Report Date: 31-Jul-2018 09:56:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

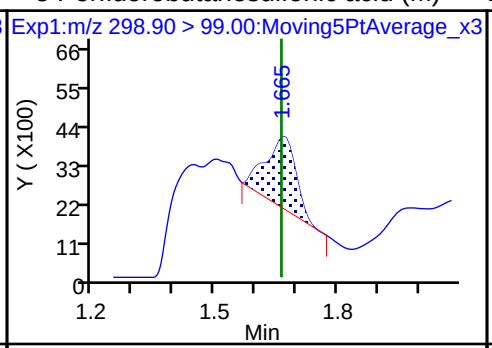
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_014.d				
Injection Date:	30-Jul-2018 04:39:20	Instrument ID:	A8_N		
Lims ID:	320-41149-A-6-A	Lab Sample ID:	320-41149-6		
Client ID:	GRE10-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

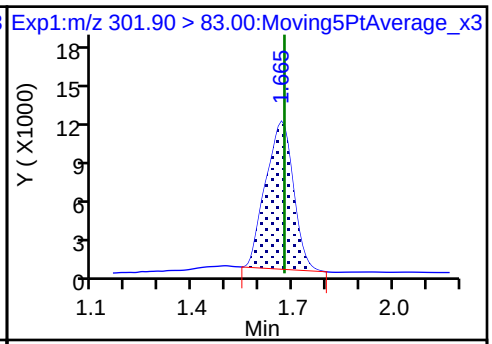
5 Perfluorobutanesulfonic acid



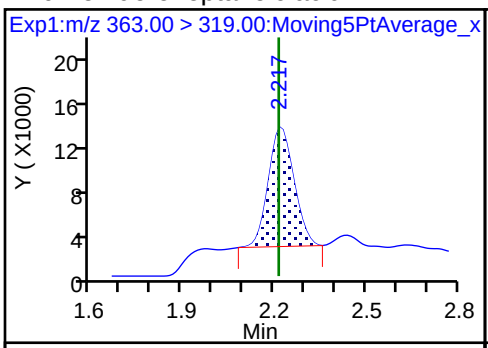
5 Perfluorobutanesulfonic acid (M)



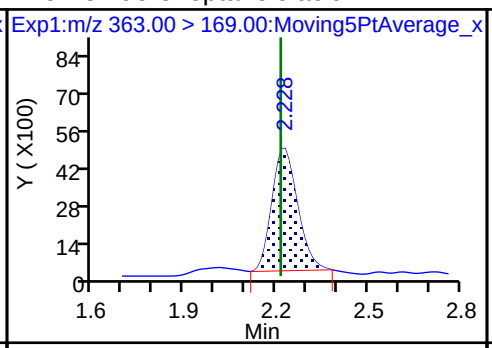
D 47 13C3-PFBS



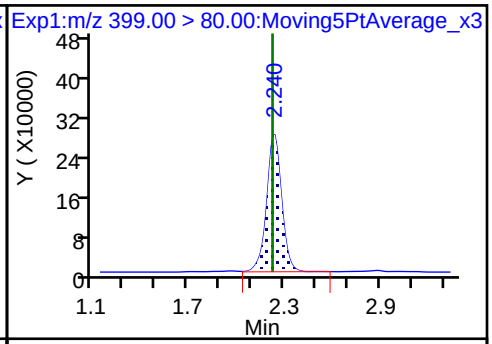
10 Perfluoroheptanoic acid



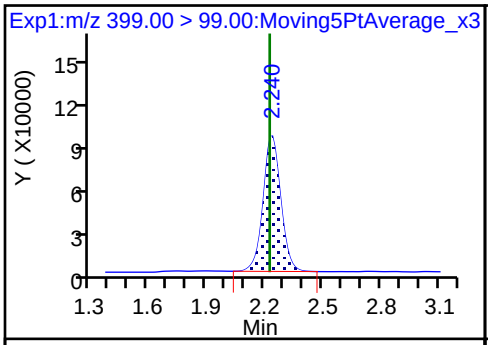
10 Perfluoroheptanoic acid



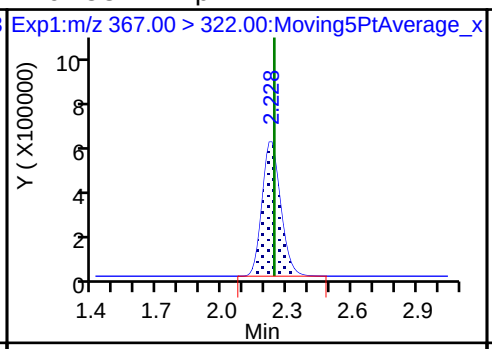
8 Perfluorohexanesulfonic acid



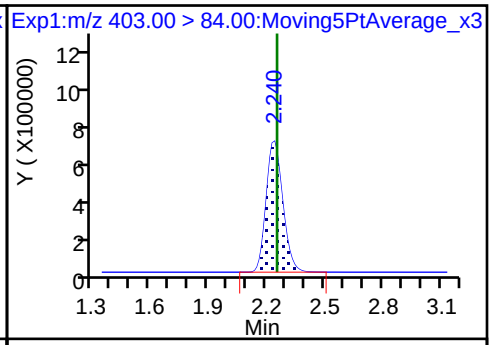
8 Perfluorohexanesulfonic acid



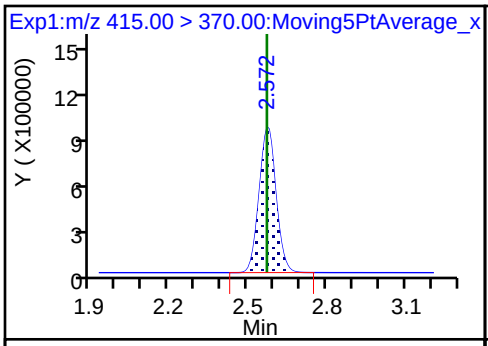
D 9 13C4-PFHpA



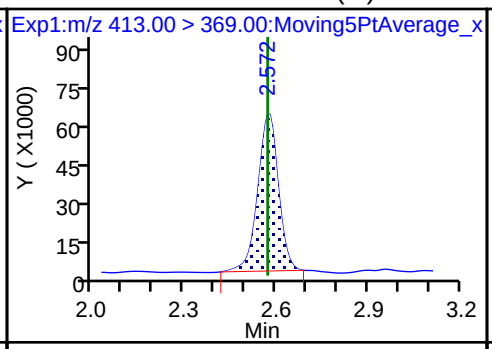
D 11 18O2 PFHxS



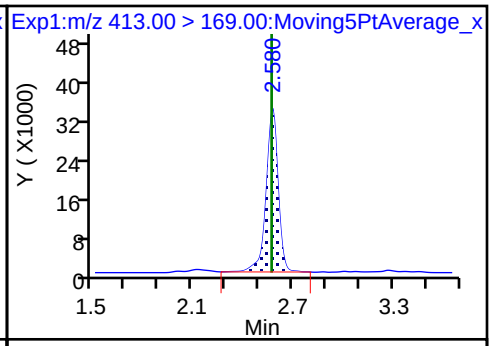
* 62 13C2-PFOA



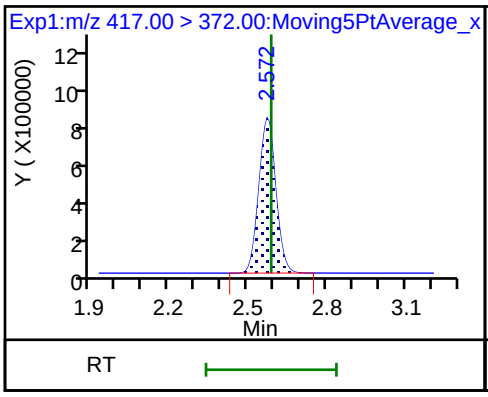
15 Perfluorooctanoic acid (M)



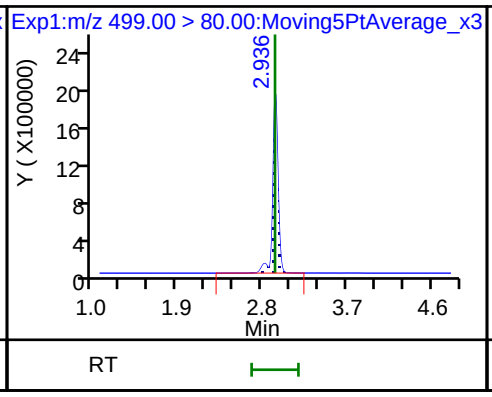
15 Perfluorooctanoic acid



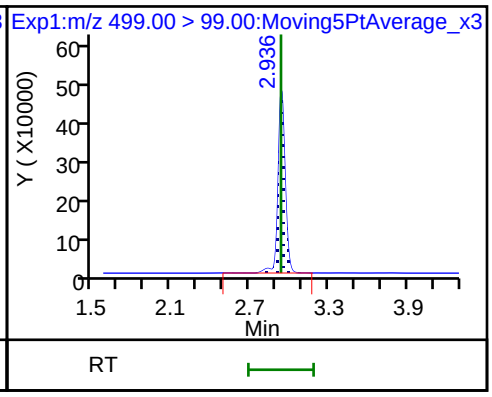
D 14 13C4 PFOA



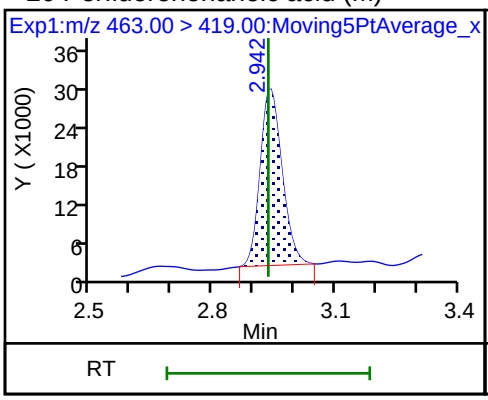
17 Perfluorooctane sulfonic acid



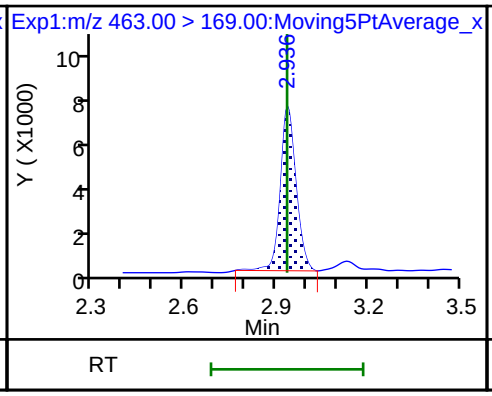
17 Perfluorooctane sulfonic acid



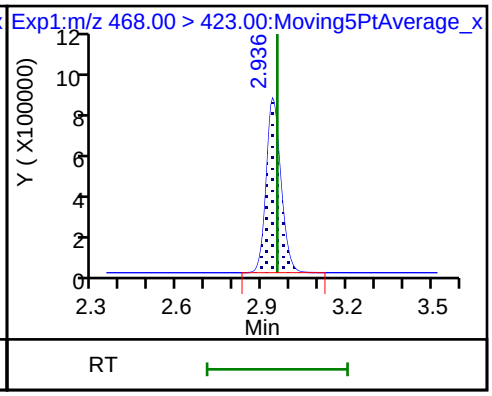
20 Perfluorononanoic acid (M)



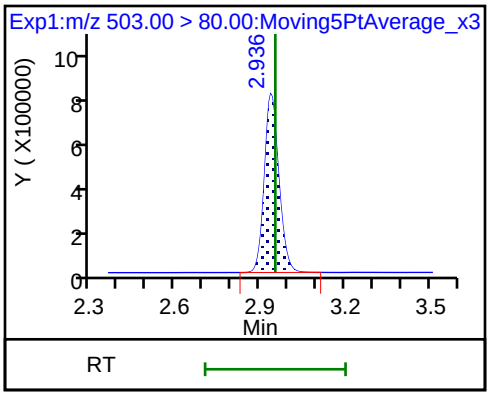
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

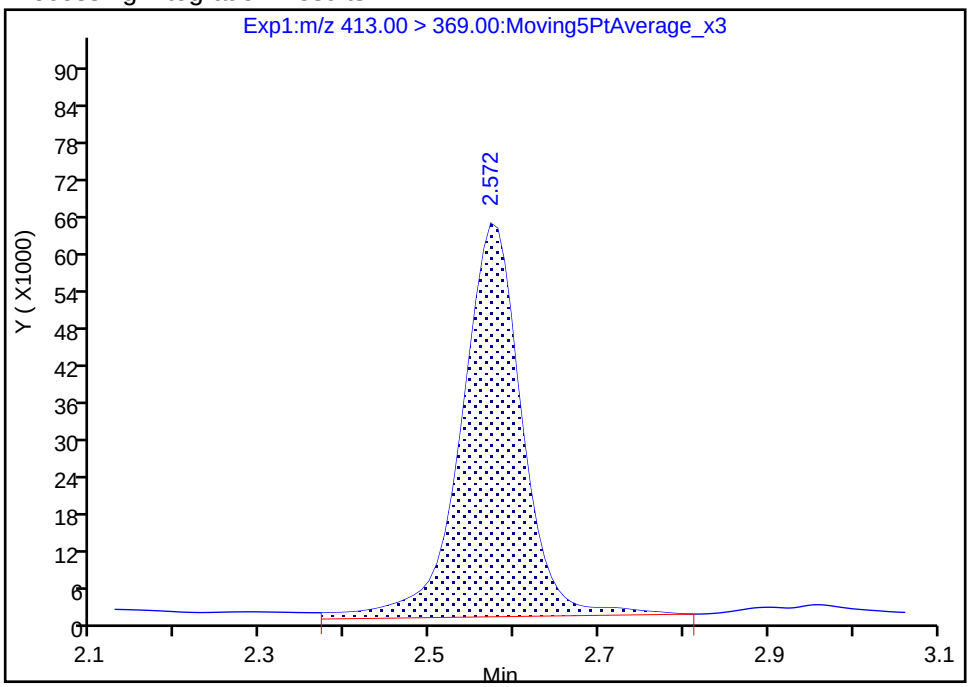
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_014.d				
Injection Date:	30-Jul-2018 04:39:20	Instrument ID:	A8_N		
Lims ID:	320-41149-A-6-A	Lab Sample ID:	320-41149-6		
Client ID:	GRE10-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

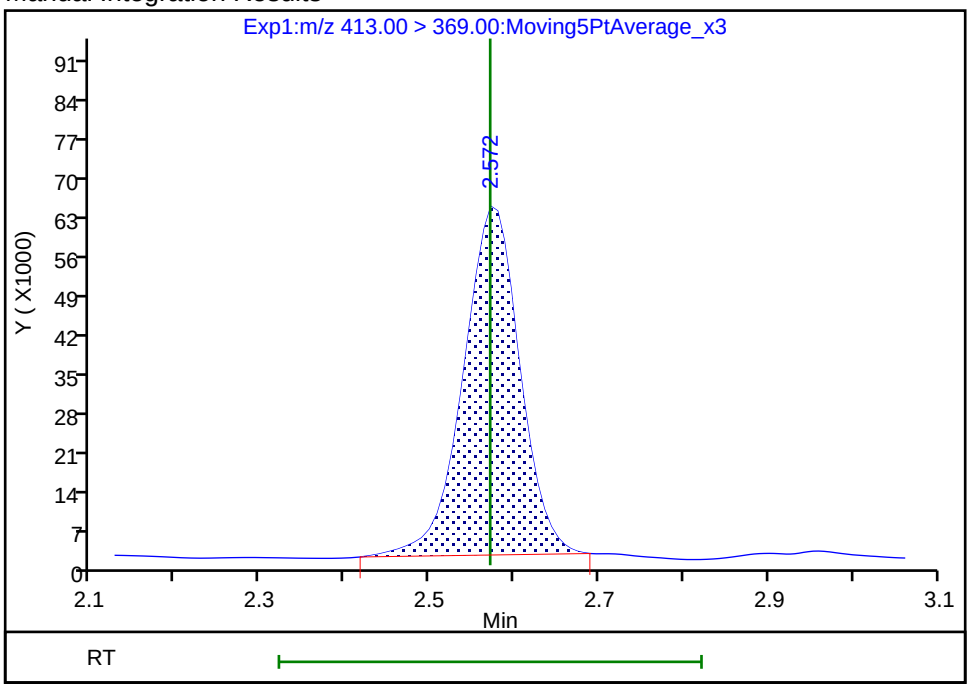
Processing Integration Results

RT: 2.57
Area: 315328
Amount: 0.179604
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 287339
Amount: 0.163662
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:56:01

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

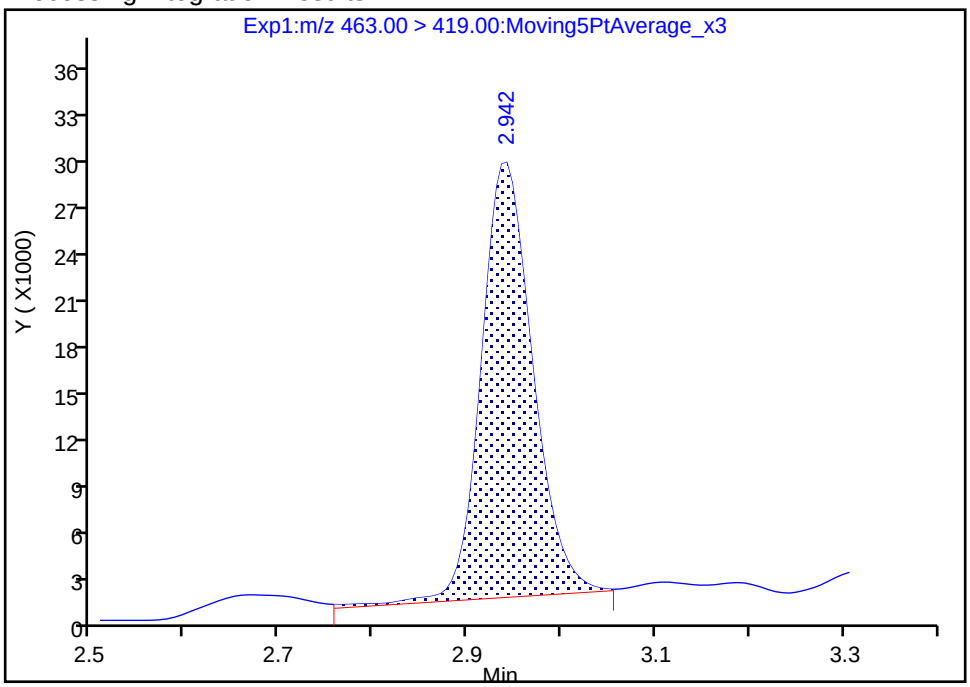
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_014.d				
Injection Date:	30-Jul-2018 04:39:20	Instrument ID:	A8_N		
Lims ID:	320-41149-A-6-A	Lab Sample ID:	320-41149-6		
Client ID:	GRE10-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

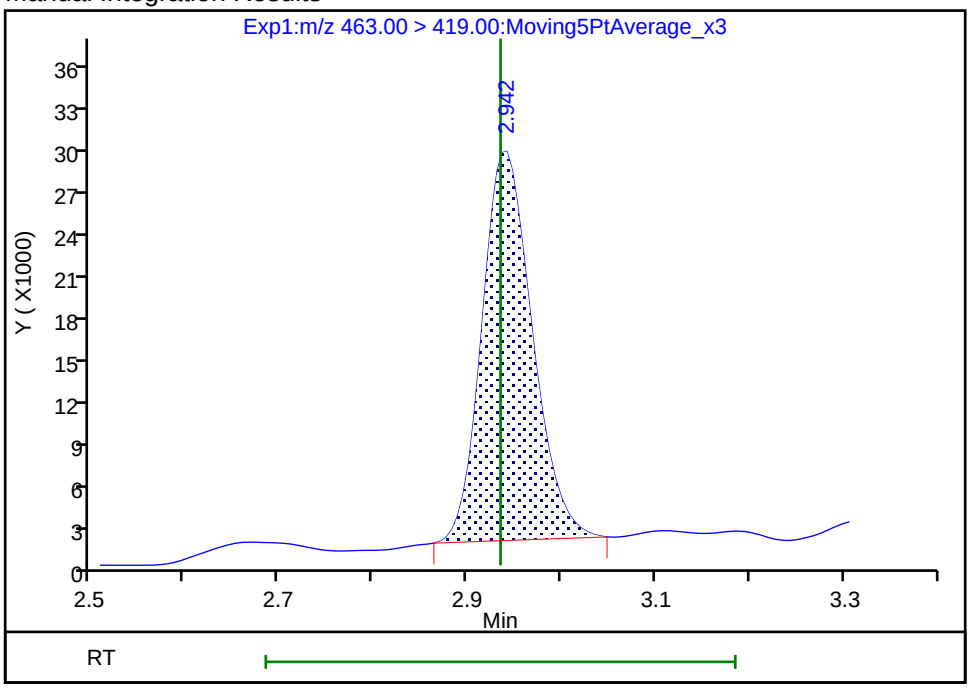
Processing Integration Results

RT: 2.94
Area: 106202
Amount: 0.075746
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 101962
Amount: 0.072722
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:56:10

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

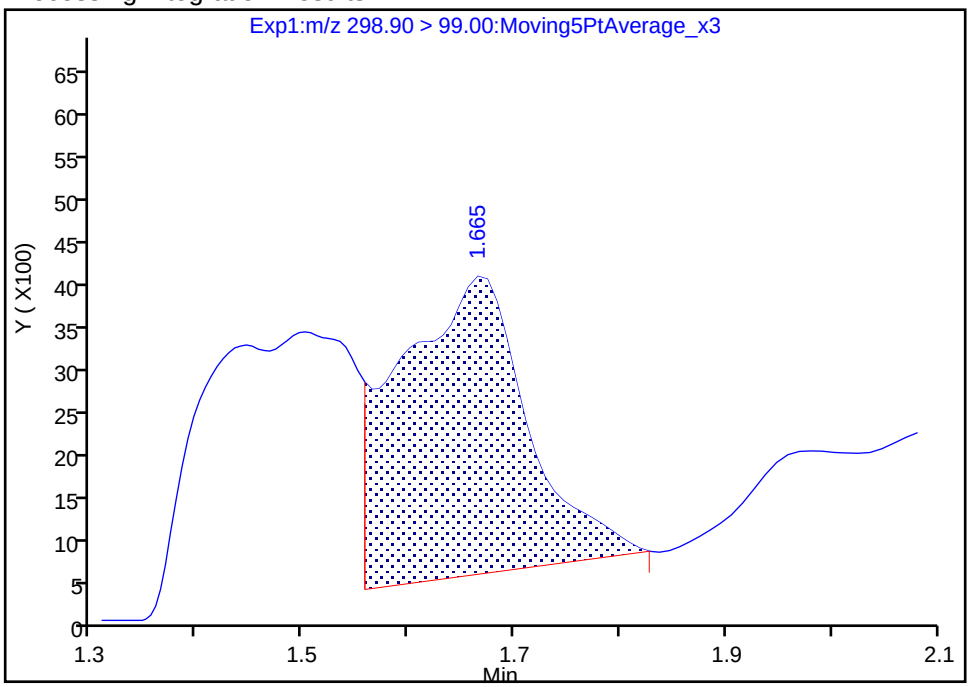
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_014.d				
Injection Date:	30-Jul-2018 04:39:20	Instrument ID:	A8_N		
Lims ID:	320-41149-A-6-A	Lab Sample ID:	320-41149-6		
Client ID:	GRE10-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

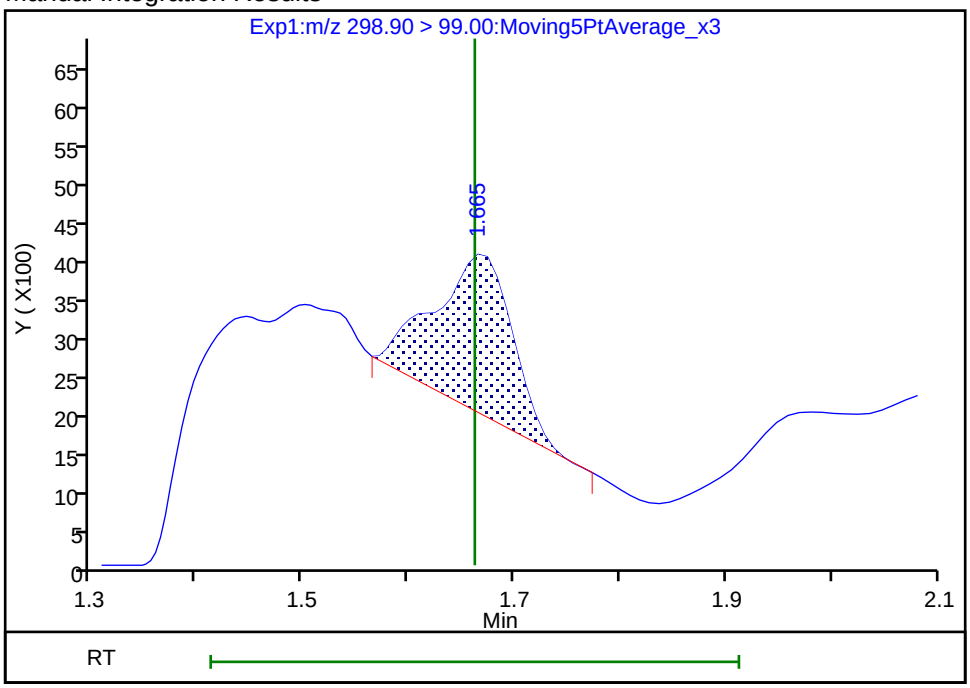
Processing Integration Results

RT: 1.67
Area: 29861
Amount: 0.014972
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 10473
Amount: 0.014972
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:55:53

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE09-SB1-01
Lab Sample ID: 320-41149-7
Matrix: Solid
Lab File ID: 2018.07.30LLA_015.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 16:15
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.00(g)
Date Analyzed: 07/30/2018 04:47
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 7.4
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.22	U	0.32	0.22	0.084
335-67-1	Perfluorooctanoic acid (PFOA)	0.33		0.32	0.22	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.18	J M	0.32	0.22	0.087
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.43	0.19	0.064
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7		0.32	0.22	0.067
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16		1.1	0.54	0.26

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	74		50-150
STL01892	13C4-PFHpA	83		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	85		50-150
STL00994	18O2 PFHxS	75		50-150
STL00991	13C4 PFOS	77		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_015.d
Lims ID: 320-41149-A-7-A
Client ID: GRE09-SB1-01
Sample Type: Client
Inject. Date: 30-Jul-2018 04:47:09 ALS Bottle#: 10 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-7-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:57:09 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:57:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.662	1.662	0.0	1.000	26560	0.0118			30.1	
298.90 > 99.00	1.629	1.662	-0.033	0.980	8795		3.02(1.25-3.74)		7.0	M
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.674	-0.012	0.645	65992	1.72		74.0	147	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.214	0.011	1.000	52131	0.0320			40.4	
363.00 > 169.00	2.225	2.214	0.011	1.000	17489		2.98(1.13-3.40)		152	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.225	0.012	1.000	1557488	0.7879			1451	
399.00 > 99.00	2.237	2.225	0.012	1.000	503036		3.10(1.50-4.49)		1029	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3688913	2.09		83.4	79318	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4007281	1.76		74.6	56326	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.571	0.008		4520592	2.50			63818	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.571	0.008	1.000	273862	0.1538			160	
413.00 > 169.00	2.579	2.571	0.008	1.000	146435		1.87(0.84-2.52)		783	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3668752	2.12		84.8	58727	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.940	2.935	0.005	1.000	10012869	7.47			23535	
499.00 > 99.00	2.940	2.935	0.005	1.000	2461610		4.07(2.31-6.93)		10952	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.940	2.935	0.005	1.000	123175	0.0846			151	M
463.00 > 169.00	2.940	2.935	0.005	1.000	30865		3.99(1.90-5.69)		477	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.953	-0.013	1.140	3186793	2.14		85.4	49681	
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.953	-0.013	1.140	2900771	1.84		76.8	9679	

QC Flag Legend

Review Flags

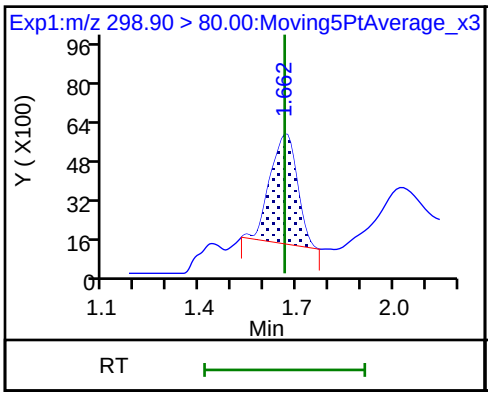
M - Manually Integrated

Report Date: 31-Jul-2018 09:57:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

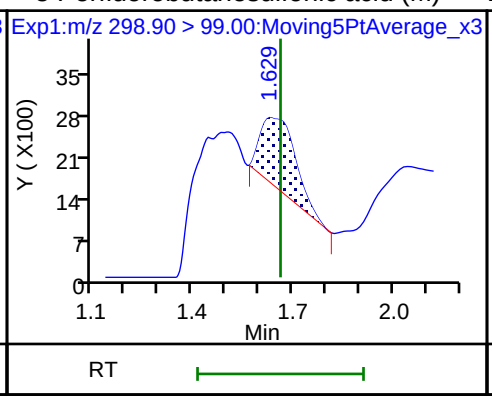
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_015.d				
Injection Date:	30-Jul-2018 04:47:09	Instrument ID:	A8_N		
Lims ID:	320-41149-A-7-A	Lab Sample ID:	320-41149-7		
Client ID:	GRE09-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

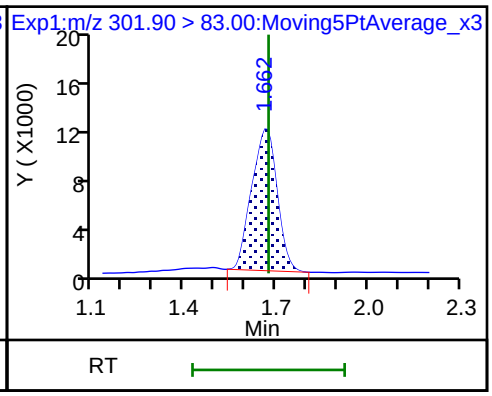
5 Perfluorobutanesulfonic acid



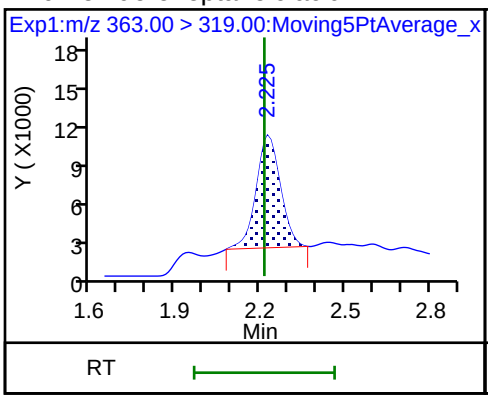
5 Perfluorobutanesulfonic acid (M)



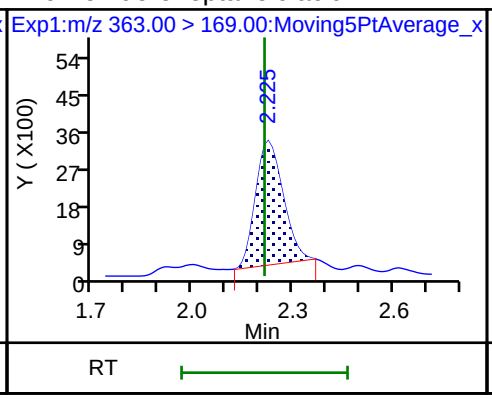
D 47 13C3-PFBS



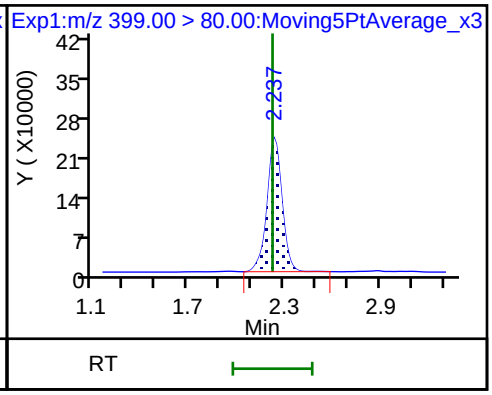
10 Perfluoroheptanoic acid



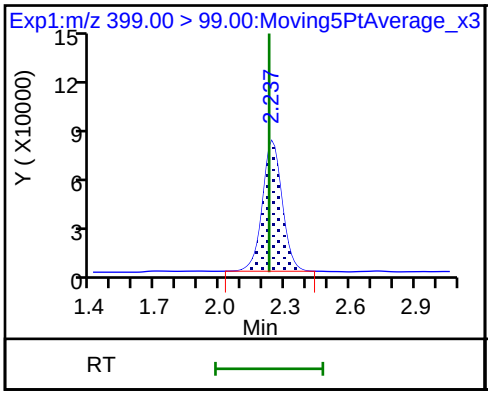
10 Perfluoroheptanoic acid



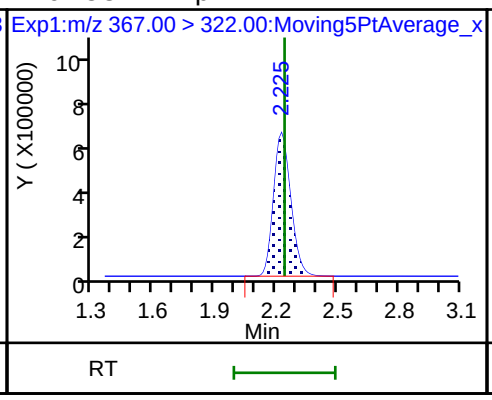
8 Perfluorohexanesulfonic acid



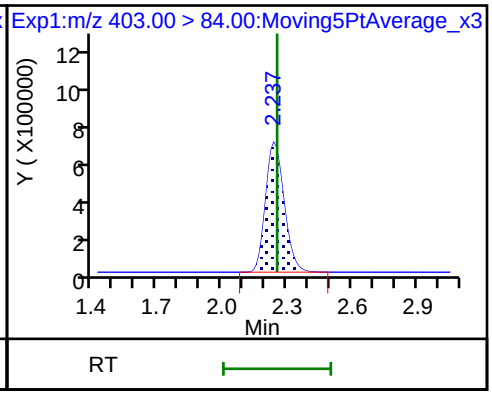
8 Perfluorohexanesulfonic acid



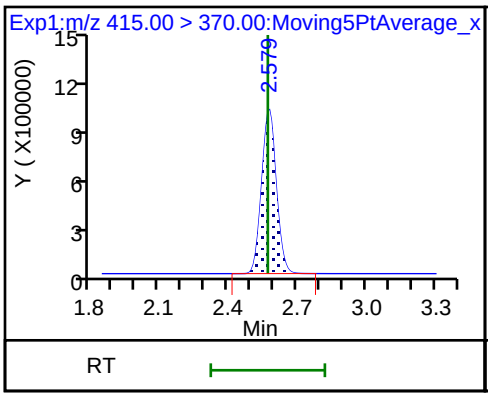
D 9 13C4-PFHpA



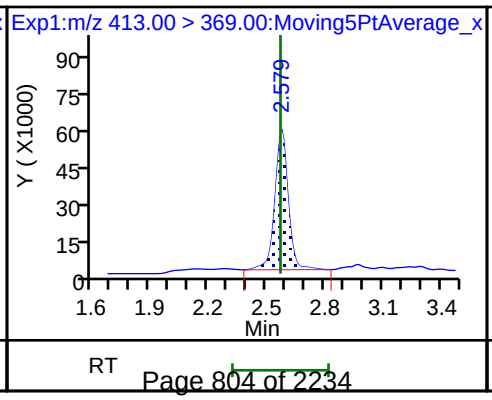
D 11 18O2 PFHxS



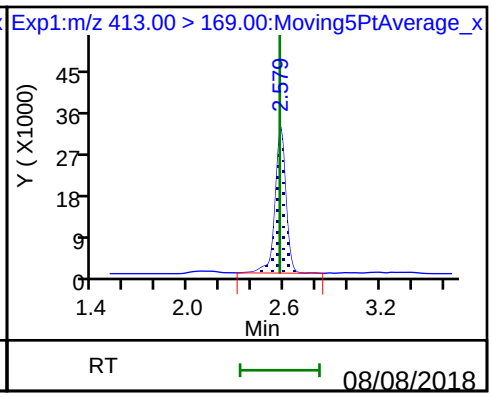
* 62 13C2-PFOA



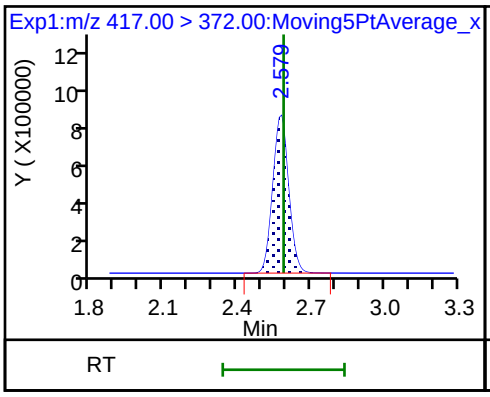
15 Perfluorooctanoic acid



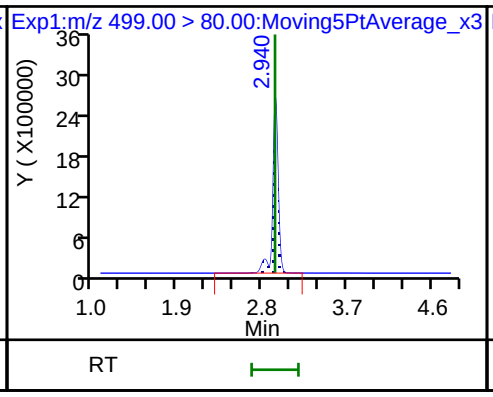
15 Perfluorooctanoic acid



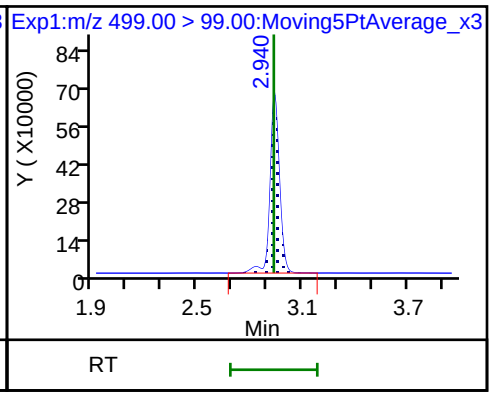
D 14 13C4 PFOA



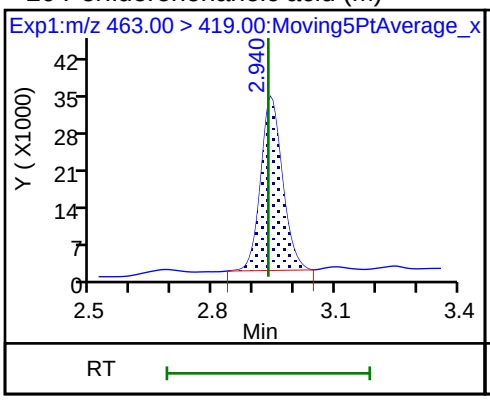
17 Perfluorooctane sulfonic acid



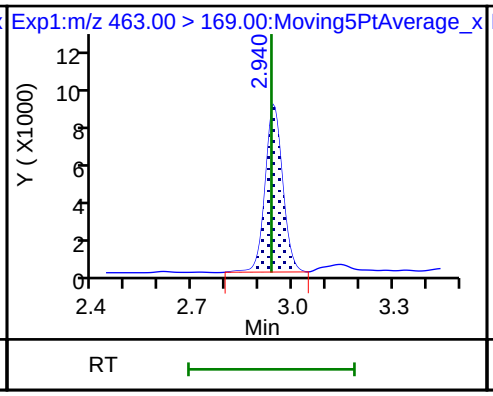
17 Perfluorooctane sulfonic acid



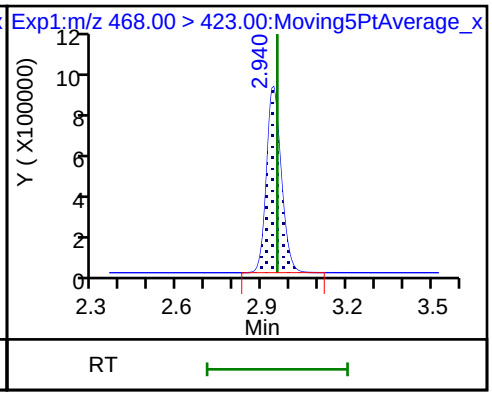
20 Perfluorononanoic acid (M)



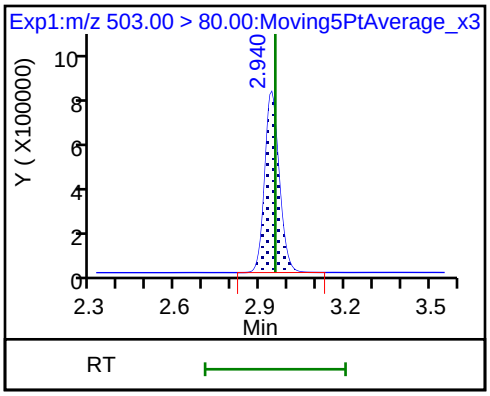
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

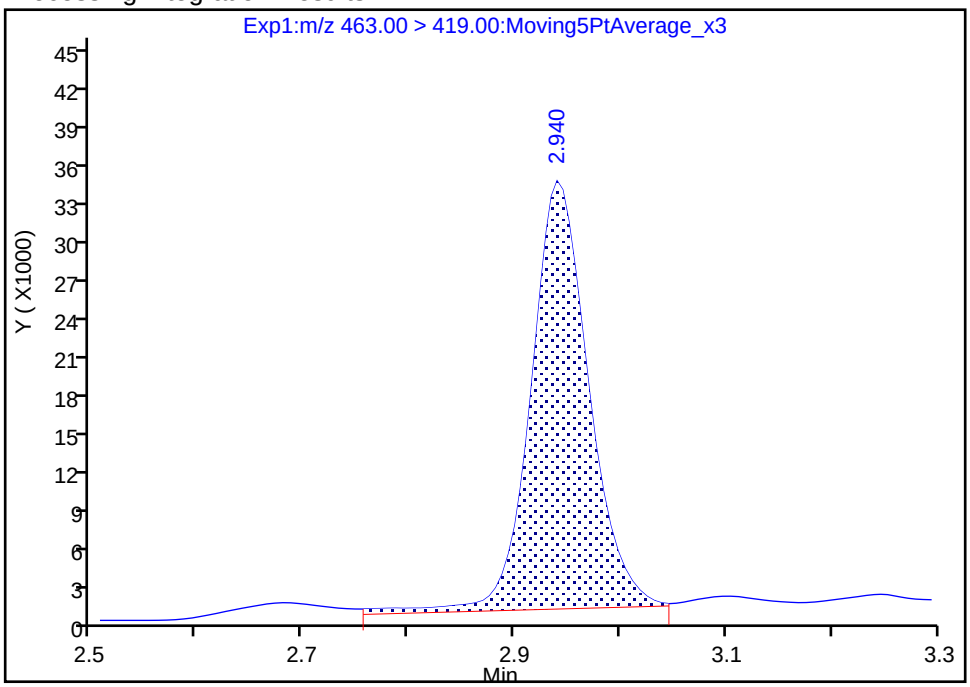
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_015.d				
Injection Date:	30-Jul-2018 04:47:09	Instrument ID:	A8_N		
Lims ID:	320-41149-A-7-A	Lab Sample ID:	320-41149-7		
Client ID:	GRE09-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

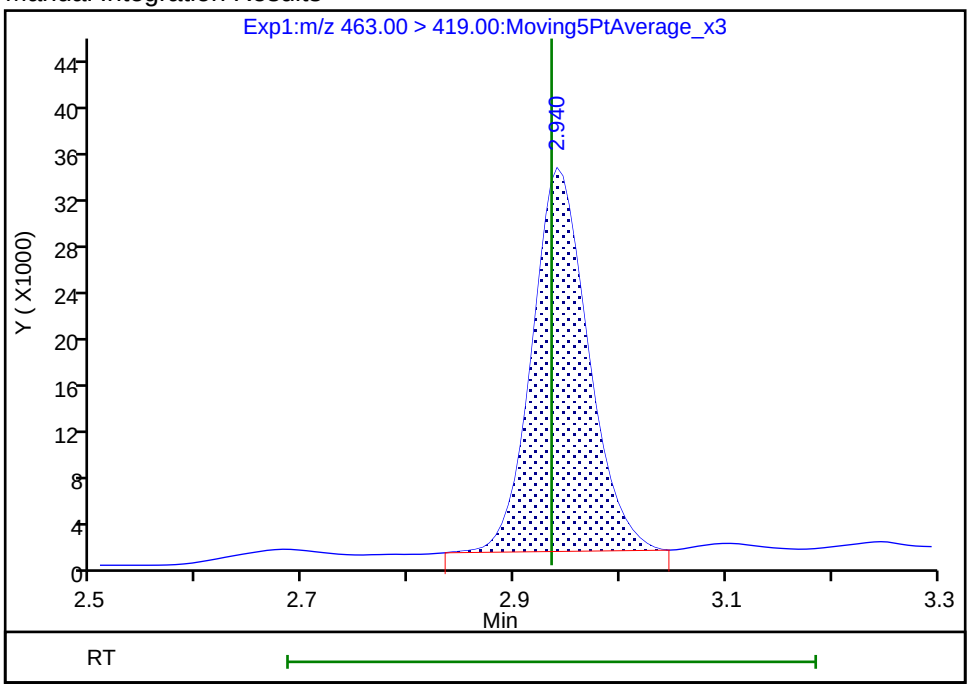
Processing Integration Results

RT: 2.94
Area: 128987
Amount: 0.088627
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 123175
Amount: 0.084634
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:57:07

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

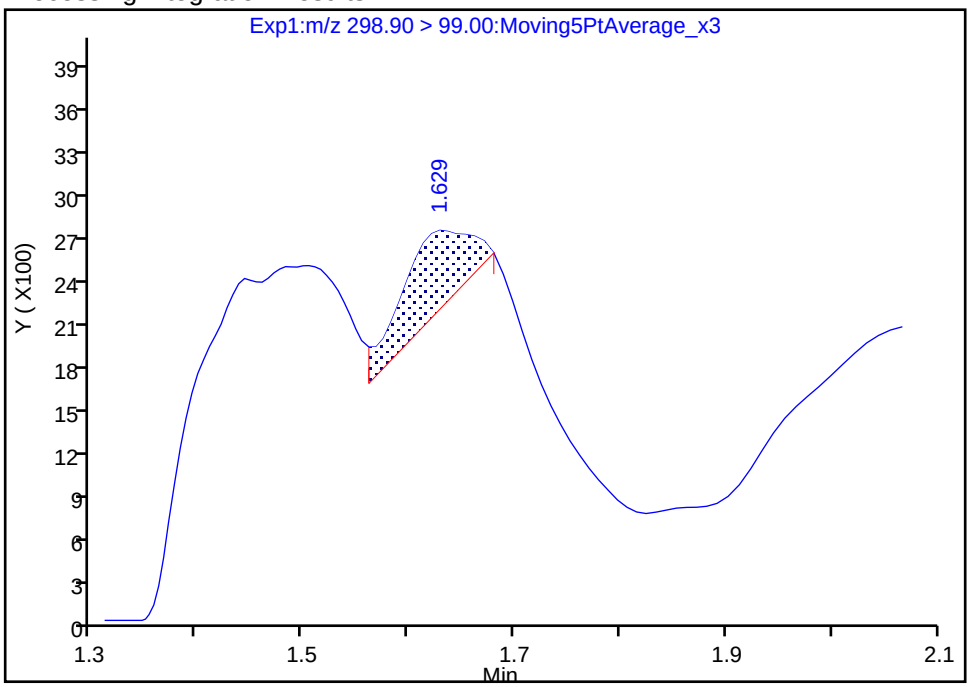
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_015.d				
Injection Date:	30-Jul-2018 04:47:09	Instrument ID:	A8_N		
Lims ID:	320-41149-A-7-A	Lab Sample ID:	320-41149-7		
Client ID:	GRE09-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

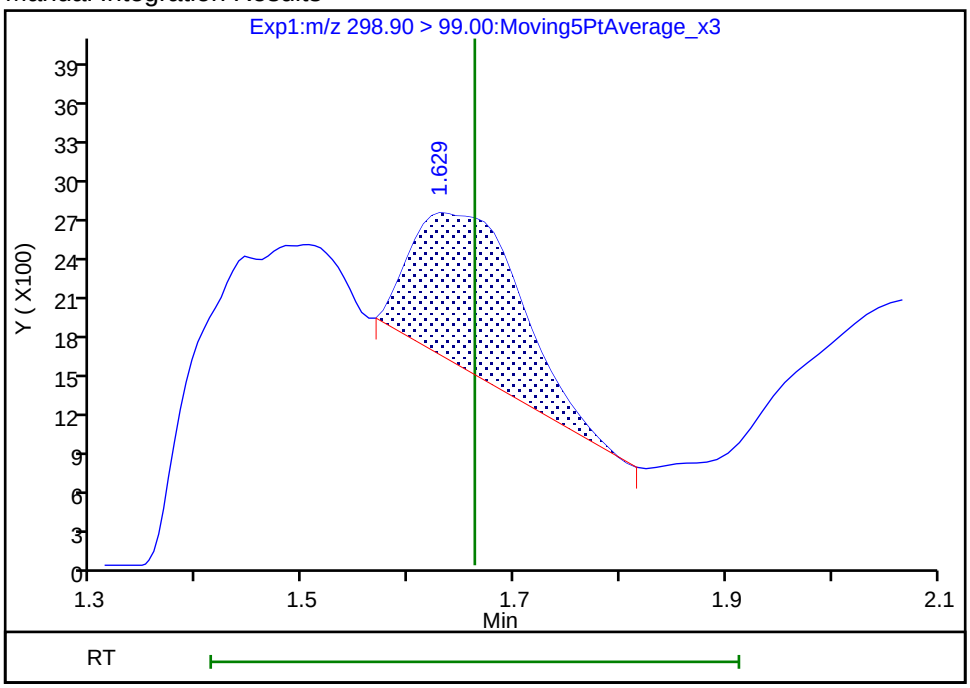
Processing Integration Results

RT: 1.63
Area: 2585
Amount: 0.011786
Amount Units: ng/ml



Manual Integration Results

RT: 1.63
Area: 8795
Amount: 0.011786
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:56:46

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE09-SB1-01D
Lab Sample ID: 320-41149-8
Matrix: Solid
Lab File ID: 2018.07.30LLA_017.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 16:15
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.08(g)
Date Analyzed: 07/30/2018 05:02
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 5.7
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21	U	0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	0.33		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.19	J M	0.31	0.21	0.085
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.42	0.19	0.062
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7		0.31	0.21	0.065
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15		1.0	0.52	0.25

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	76		50-150
STL01892	13C4-PFHpA	83		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	88		50-150
STL00994	18O2 PFHxS	76		50-150
STL00991	13C4 PFOS	78		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_017.d
Lims ID: 320-41149-A-8-A
Client ID: GRE09-SB1-01D
Sample Type: Client
Inject. Date: 30-Jul-2018 05:02:47 ALS Bottle#: 11 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-8-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:58:54 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:58:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.662	1.671	-0.009	1.000	34014	0.0150			38.7	
298.90 > 99.00	1.653	1.671	-0.018	0.995	11027		3.08(1.25-3.74)		9.9	M
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.674	-0.012	0.647	66375	1.76		75.5	172	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.214	2.225	-0.011	1.000	48055	0.0303			39.8	
363.00 > 169.00	2.226	2.225	0.001	1.005	16862		2.85(1.13-3.40)		180	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.238	2.237	0.001	1.000	1603473	0.8046			1456	
399.00 > 99.00	2.238	2.237	0.001	1.000	528497		3.03(1.50-4.49)		1071	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.240	-0.026	0.861	3591924	2.06		82.5	62392	
D 11 18O2 PFHxS										
403.00 > 84.00	2.238	2.253	-0.015	0.870	4039569	1.81		76.4	76966	
* 62 13C2-PFOA										
415.00 > 370.00	2.571	2.579	-0.008		4451929	2.50			72667	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.571	2.579	-0.008	1.000	286386	0.1565			167	
413.00 > 169.00	2.571	2.579	-0.008	1.000	152589		1.88(0.84-2.52)		761	
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.588	-0.017	1.000	3770492	2.21		88.5	66193	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.935	2.946	-0.011	1.000	9669335	7.22			23452	
499.00 > 99.00	2.935	2.946	-0.011	1.000	2359427		4.10(2.31-6.93)		12974	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.935	2.946	-0.011	1.000	132310	0.0897			168	M
463.00 > 169.00	2.935	2.946	-0.011	1.000	29701		4.45(1.90-5.69)		459	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.953	-0.018	1.142	3230622	2.20		88.0	56775	
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.953	-0.018	1.142	2896408	1.86		77.9	11354	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 09:58:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_017.d

Injection Date: 30-Jul-2018 05:02:47 Instrument ID: A8_N

Lims ID: 320-41149-A-8-A Lab Sample ID: 320-41149-8

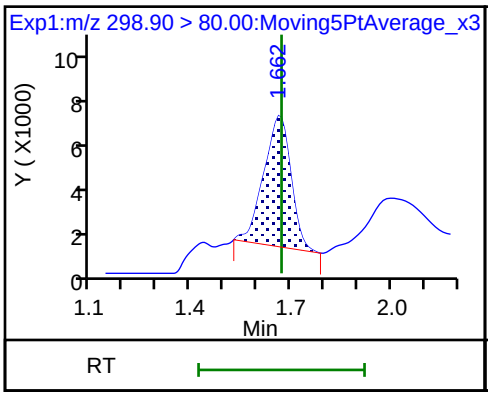
Client ID: GRE09-SB1-01D

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 11 Worklist Smp#: 15

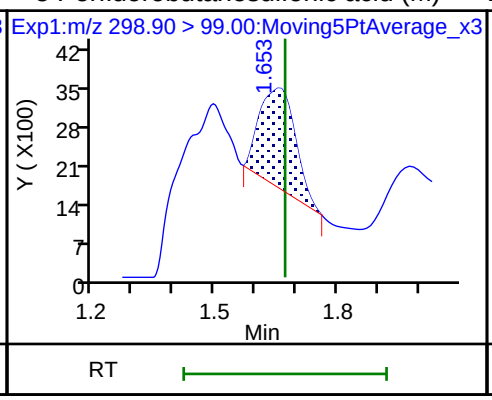
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

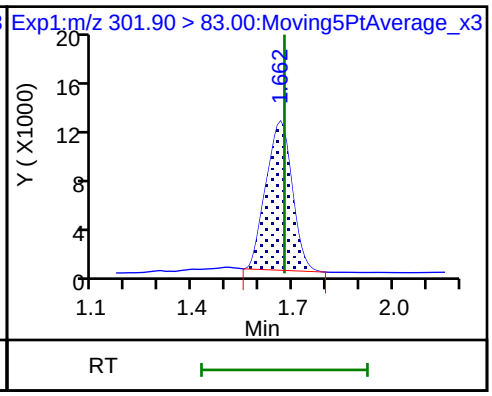
5 Perfluorobutanesulfonic acid



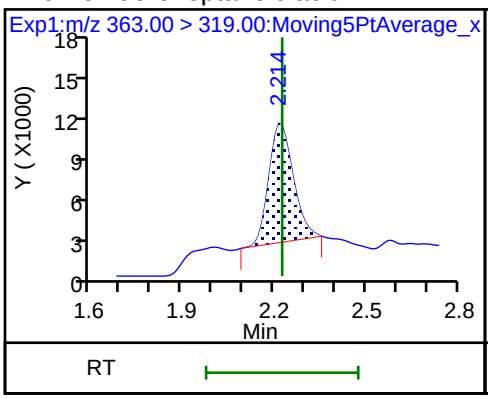
5 Perfluorobutanesulfonic acid (M)



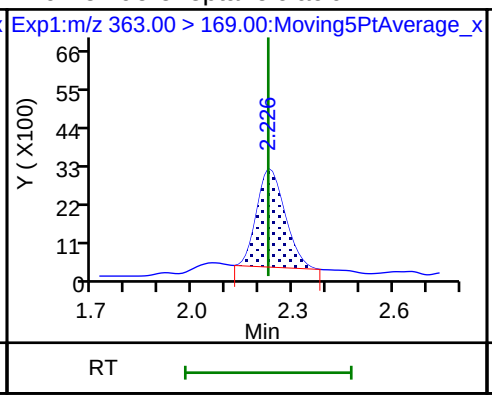
D 47 13C3-PFBS



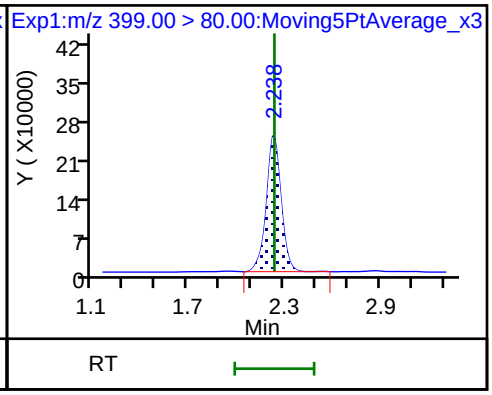
10 Perfluoroheptanoic acid



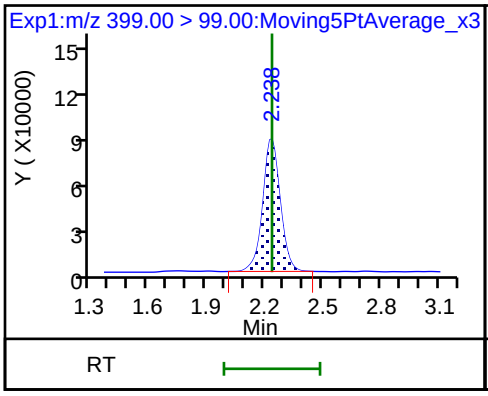
10 Perfluoroheptanoic acid



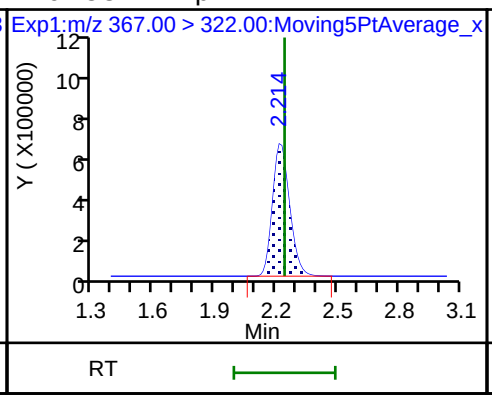
8 Perfluorohexanesulfonic acid



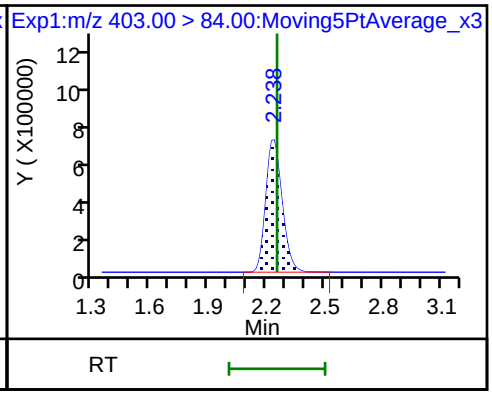
8 Perfluorohexanesulfonic acid



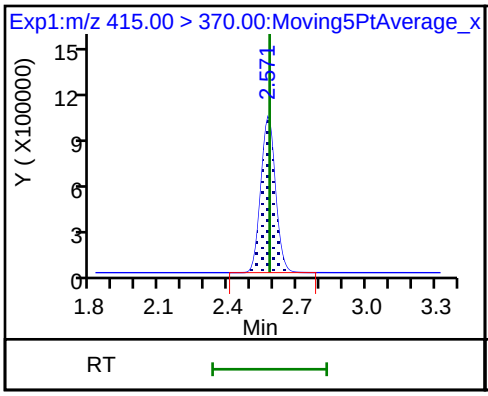
D 9 13C4-PFHpA



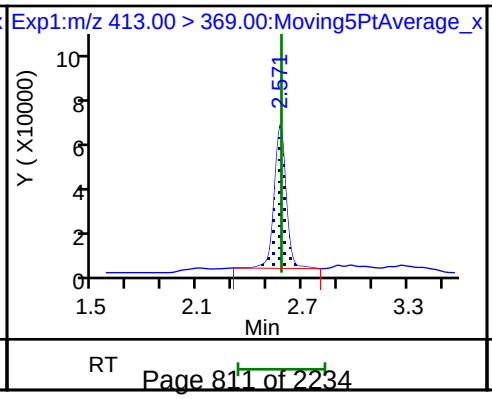
D 11 18O2 PFHxS



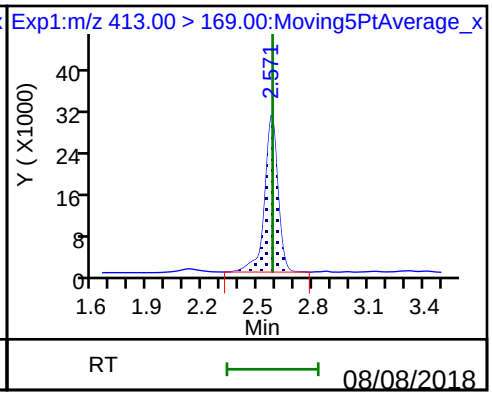
* 62 13C2-PFOA



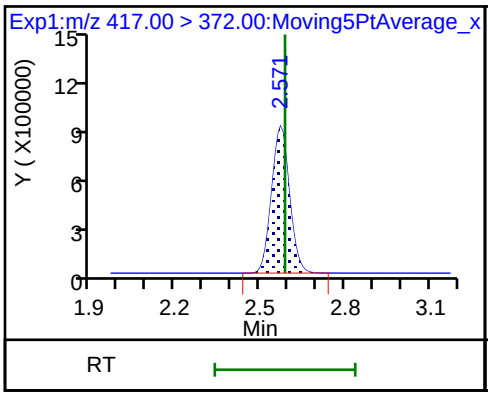
15 Perfluorooctanoic acid



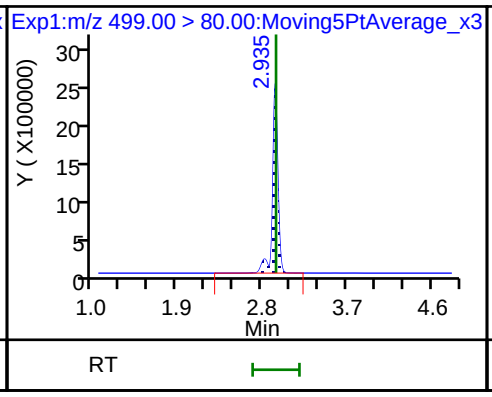
15 Perfluorooctanoic acid



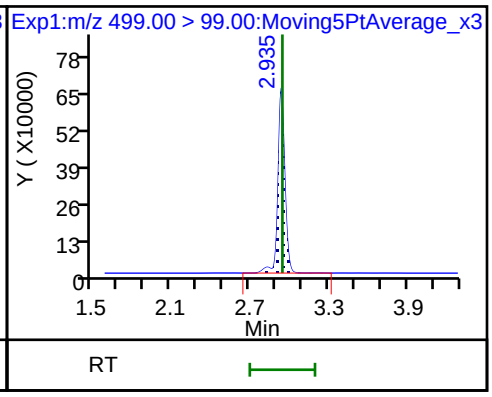
D 14 13C4 PFOA



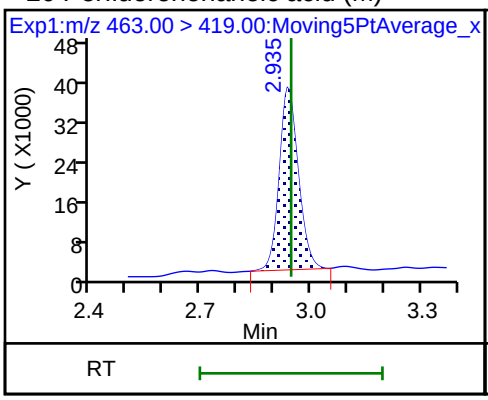
17 Perfluorooctane sulfonic acid



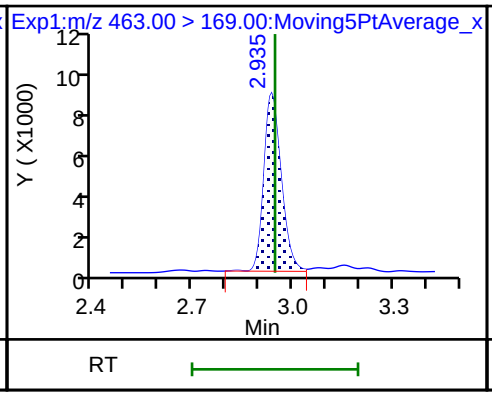
17 Perfluorooctane sulfonic acid



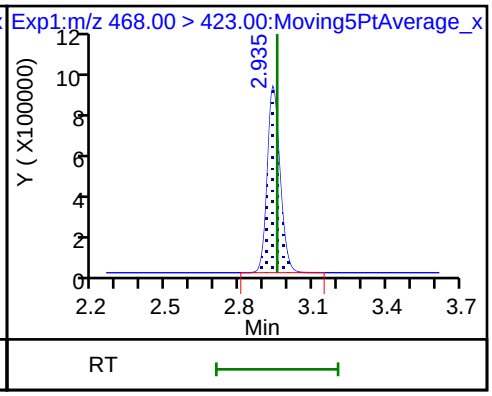
20 Perfluorononanoic acid (M)



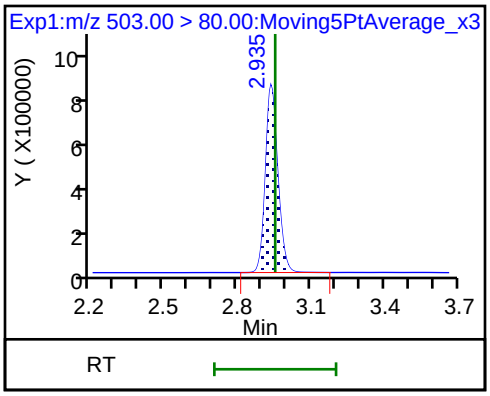
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

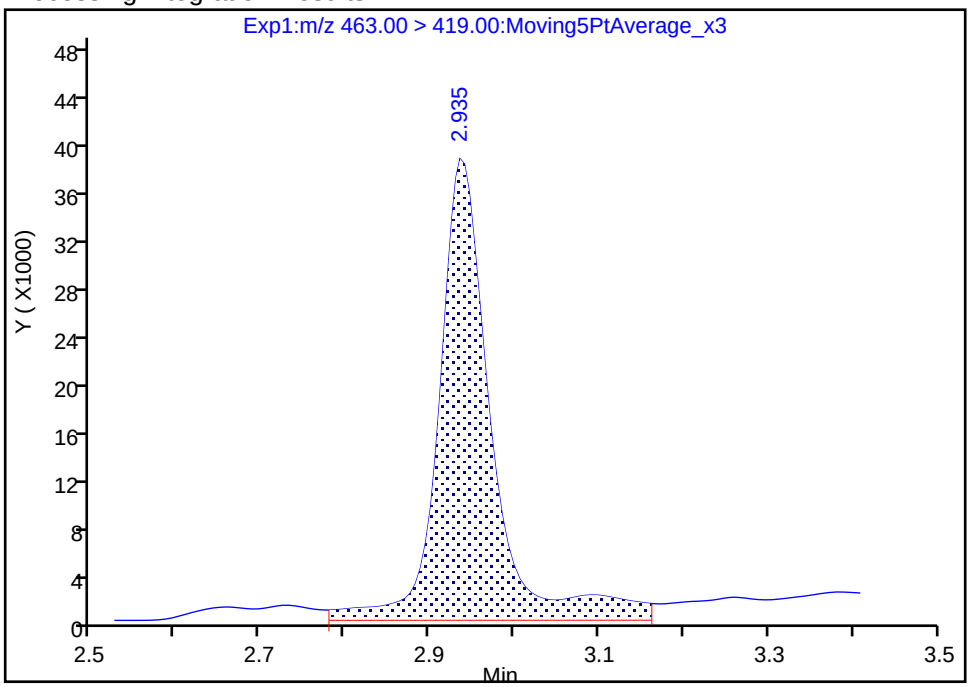
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_017.d				
Injection Date:	30-Jul-2018 05:02:47	Instrument ID:	A8_N		
Lims ID:	320-41149-A-8-A	Lab Sample ID:	320-41149-8		
Client ID:	GRE09-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

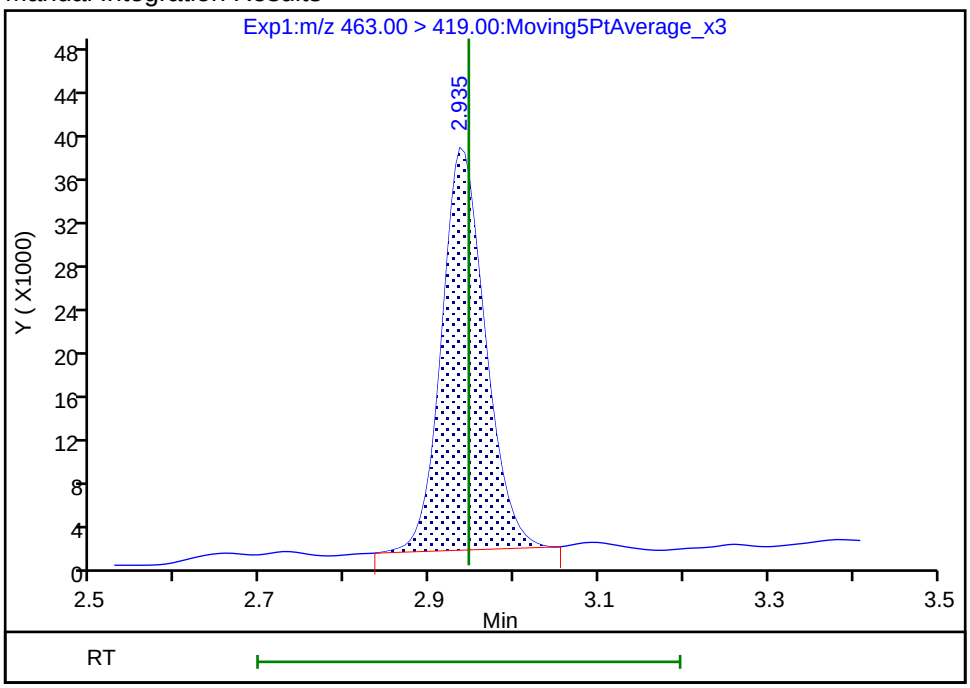
Processing Integration Results

RT: 2.94
Area: 165627
Amount: 0.112259
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 132310
Amount: 0.089677
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:58:48

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

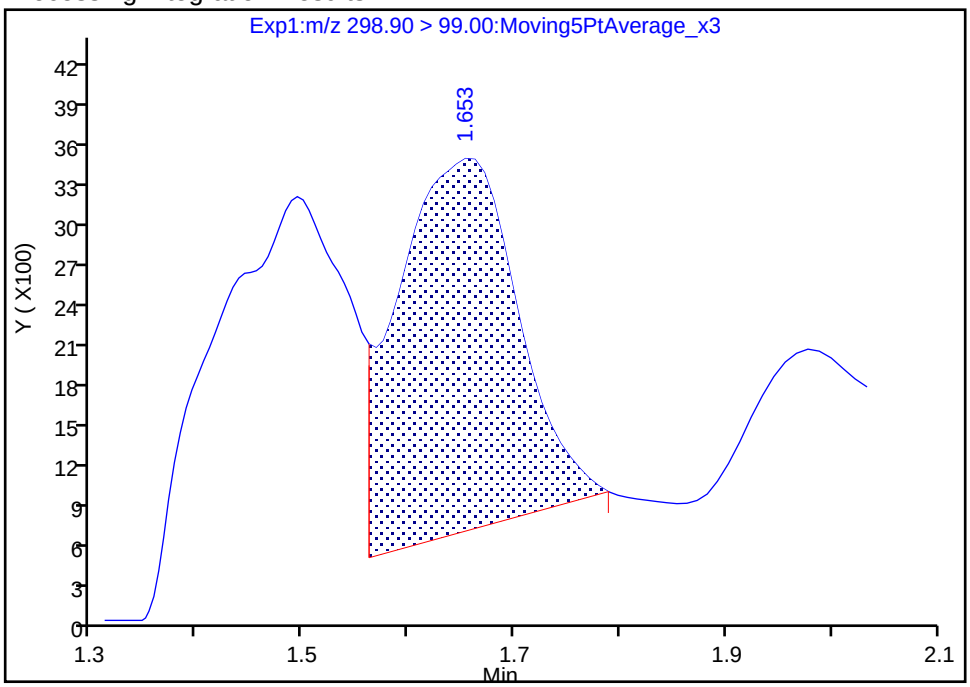
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_017.d				
Injection Date:	30-Jul-2018 05:02:47	Instrument ID:	A8_N		
Lims ID:	320-41149-A-8-A	Lab Sample ID:	320-41149-8		
Client ID:	GRE09-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

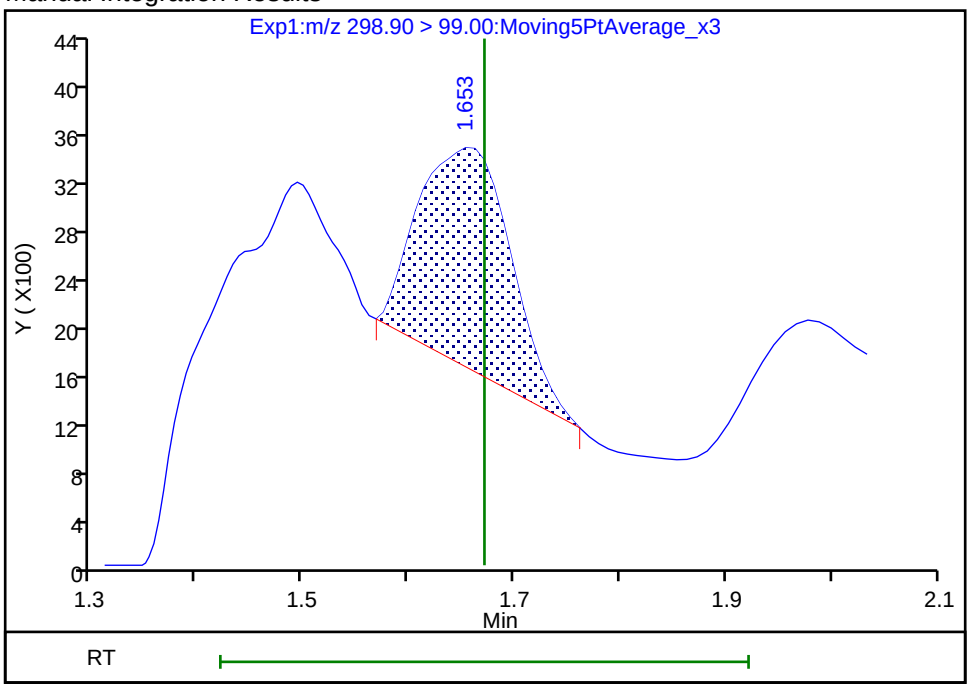
Processing Integration Results

RT: 1.65
Area: 22189
Amount: 0.015007
Amount Units: ng/ml



Manual Integration Results

RT: 1.65
Area: 11027
Amount: 0.015007
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:58:36

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE09-SB2-01 | Lab Sample ID: 320-41149-9

Matrix: Solid | Lab File ID: 2018.07.30LLA_018.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/09/2018 16:30

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.02(g) | Date Analyzed: 07/30/2018 05:10

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 3.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21	U M	0.31	0.21	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	0.22	J M	0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.21	U M	0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.69		0.31	0.21	0.064
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	6.8		1.0	0.52	0.25

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	77		50-150
STL01892	13C4-PFHpA	86		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	76		50-150
STL00991	13C4 PFOS	83		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_018.d
Lims ID: 320-41149-A-9-A
Client ID: GRE09-SB2-01
Sample Type: Client
Inject. Date: 30-Jul-2018 05:10:37 ALS Bottle#: 12 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-9-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:59:58 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:59:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.671	1.671	0.0	1.000	23212	0.009797			17.9	
298.90 > 99.00	1.671	1.671	0.0	1.000	7616		3.05(1.25-3.74)		7.0	M
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.674	-0.003	0.648	69386	1.79		76.9	175	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.237	2.225	0.012	1.005	12332	0.007262			8.2	M
363.00 > 169.00	2.237	2.225	0.012	1.005	6429		1.92(1.13-3.40)		47.4	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	0.994	681048	0.3338			398	
399.00 > 99.00	2.250	2.237	0.013	1.000	226439		3.01(1.50-4.49)		378	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3850682	2.15		86.2	56422	
D 11 18O2 PFHxS										
403.00 > 84.00	2.250	2.253	-0.003	0.873	4136217	1.80		76.2	71553	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		4570257	2.50			66836	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.587	2.579	0.008	1.003	199578	0.1044			82.9	M
413.00 > 169.00	2.587	2.579	0.008	1.003	124025		1.61(0.84-2.52)		585	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3936803	2.25		90.0	70683	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.946	2.946	0.0	1.000	4839408	3.30			9127	
499.00 > 99.00	2.946	2.946	0.0	1.000	1153624		4.19(2.31-6.93)		4613	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.946	2.946	0.0	1.000	45159	0.0284			39.5	M
463.00 > 169.00	2.940	2.946	-0.006	0.998	9895		4.56(1.90-5.69)		146	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.953	-0.007	1.142	3487437	2.31		92.5	58547	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.953	-0.007	1.142	3175575	1.99		83.2	6328	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 09:59:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_018.d

Injection Date: 30-Jul-2018 05:10:37 Instrument ID: A8_N

Lims ID: 320-41149-A-9-A Lab Sample ID: 320-41149-9

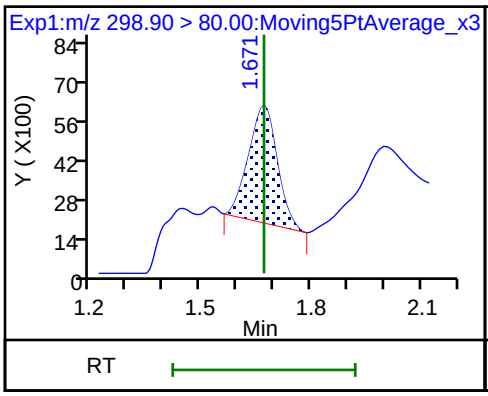
Client ID: GRE09-SB2-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 12 Worklist Smp#: 16

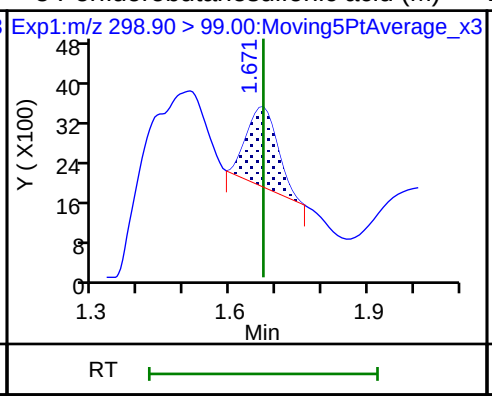
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

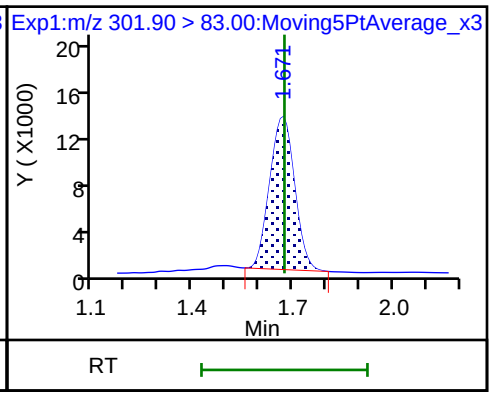
5 Perfluorobutanesulfonic acid



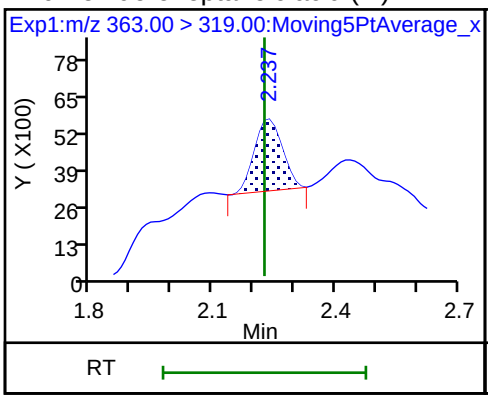
5 Perfluorobutanesulfonic acid (M)



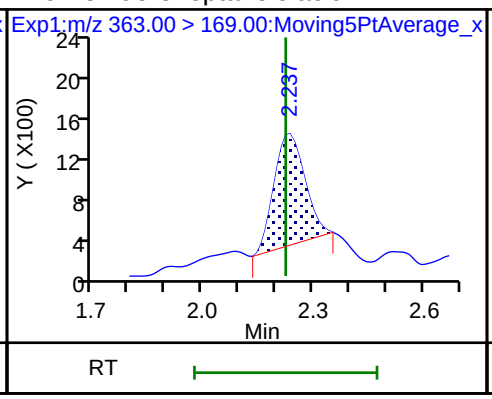
D 47 13C3-PFBS



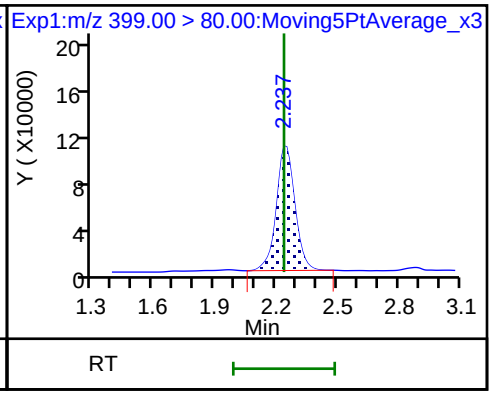
10 Perfluoroheptanoic acid (M)



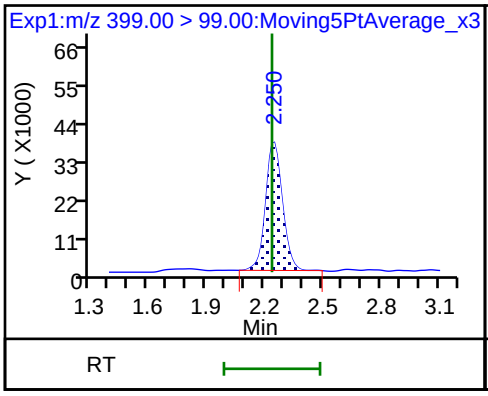
10 Perfluoroheptanoic acid



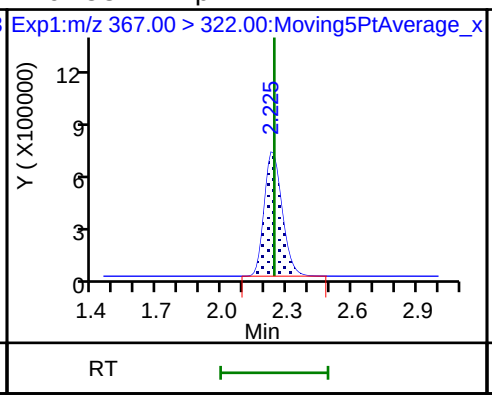
8 Perfluorohexanesulfonic acid



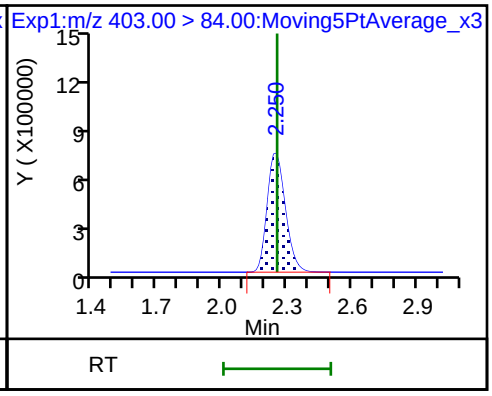
8 Perfluorohexanesulfonic acid



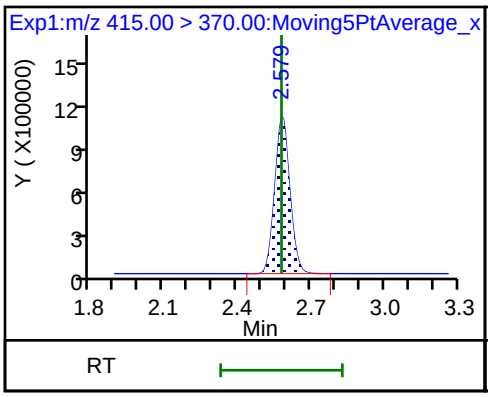
D 9 13C4-PFHpA



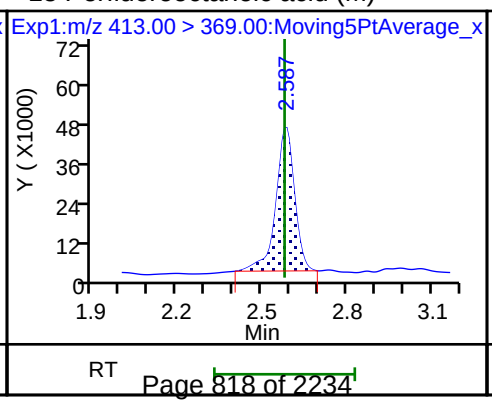
D 11 18O2 PFHxS



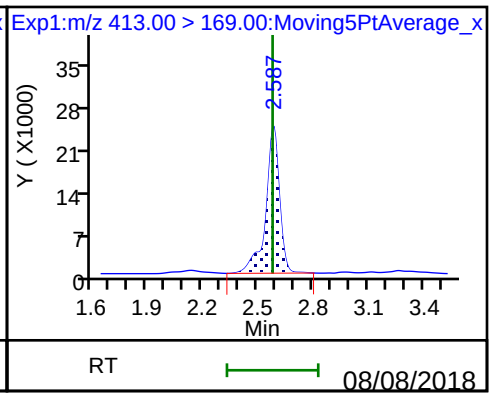
* 62 13C2-PFOA



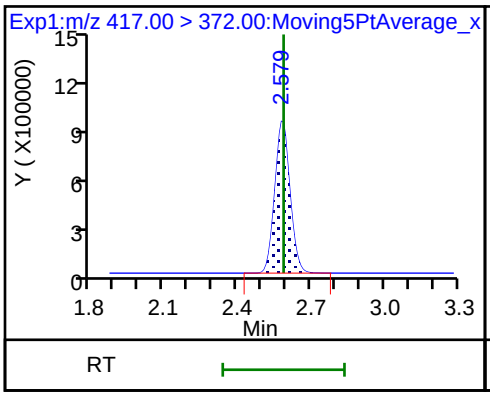
15 Perfluorooctanoic acid (M)



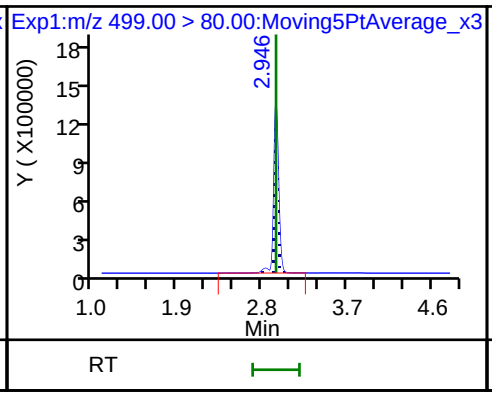
15 Perfluorooctanoic acid



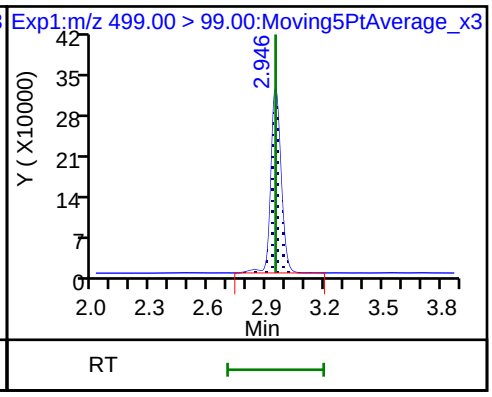
D 14 13C4 PFOA



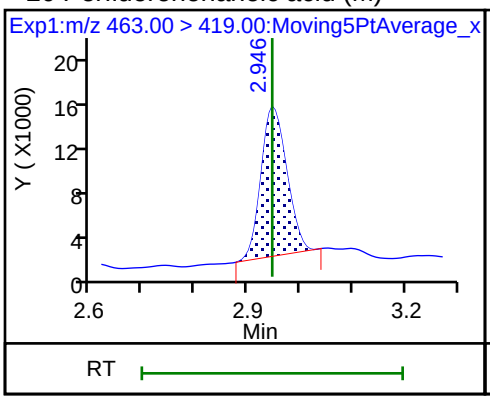
17 Perfluorooctane sulfonic acid



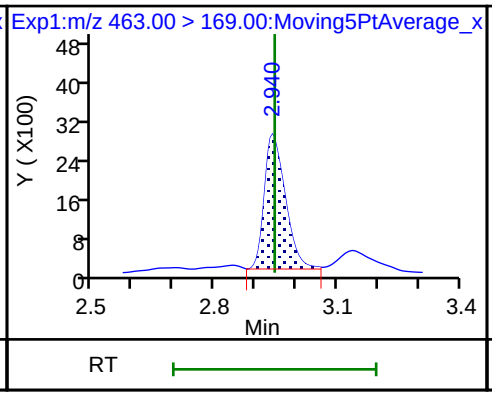
17 Perfluorooctane sulfonic acid



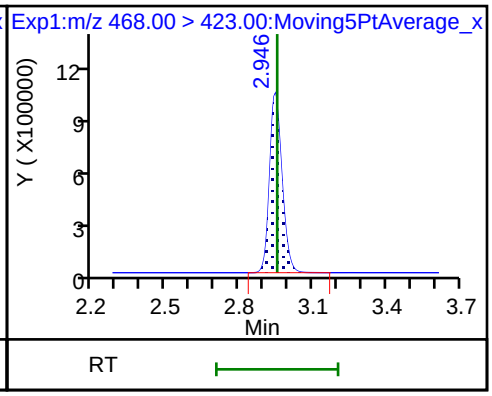
20 Perfluorononanoic acid (M)



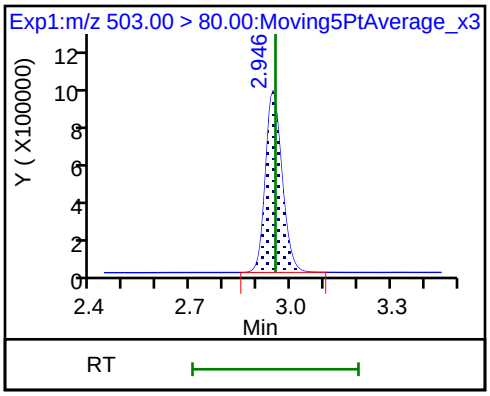
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

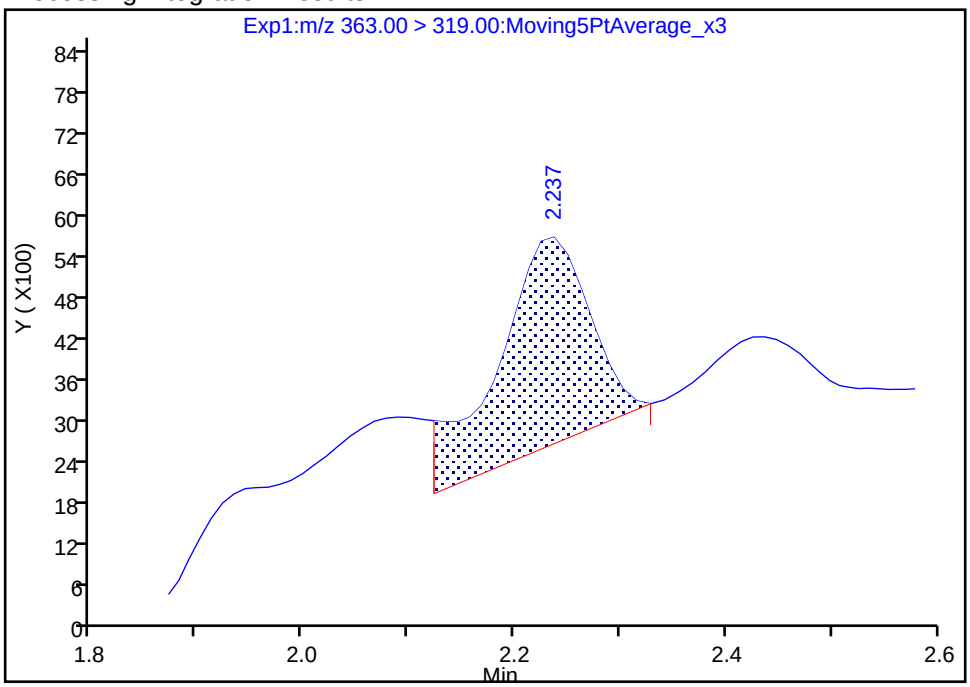
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_018.d				
Injection Date:	30-Jul-2018 05:10:37	Instrument ID:	A8_N		
Lims ID:	320-41149-A-9-A	Lab Sample ID:	320-41149-9		
Client ID:	GRE09-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

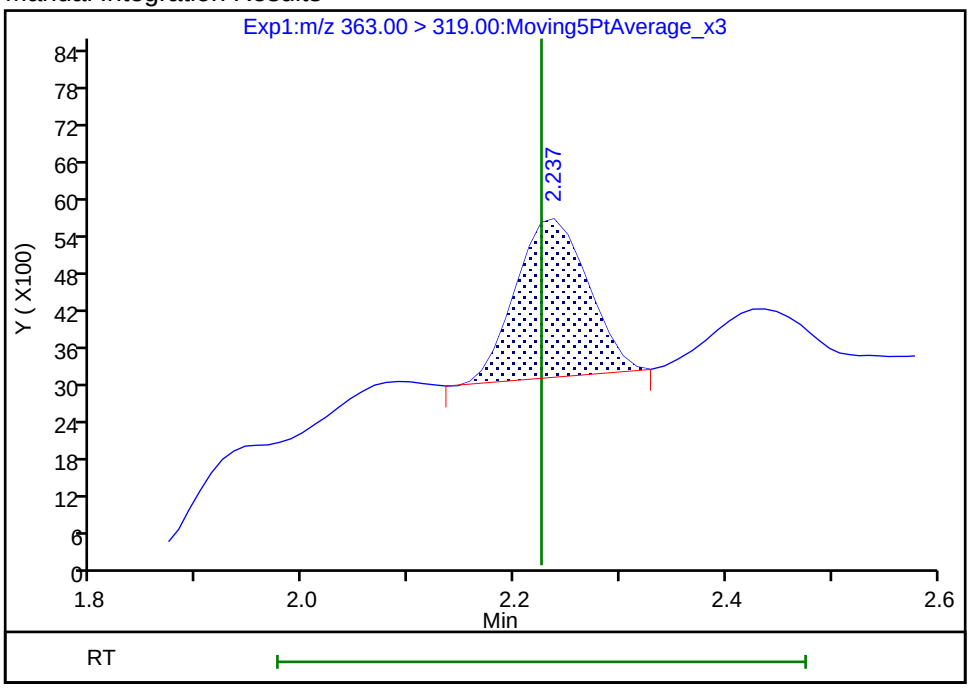
Processing Integration Results

RT: 2.24
Area: 18735
Amount: 0.011032
Amount Units: ng/ml



Manual Integration Results

RT: 2.24
Area: 12332
Amount: 0.007262
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:59:22

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

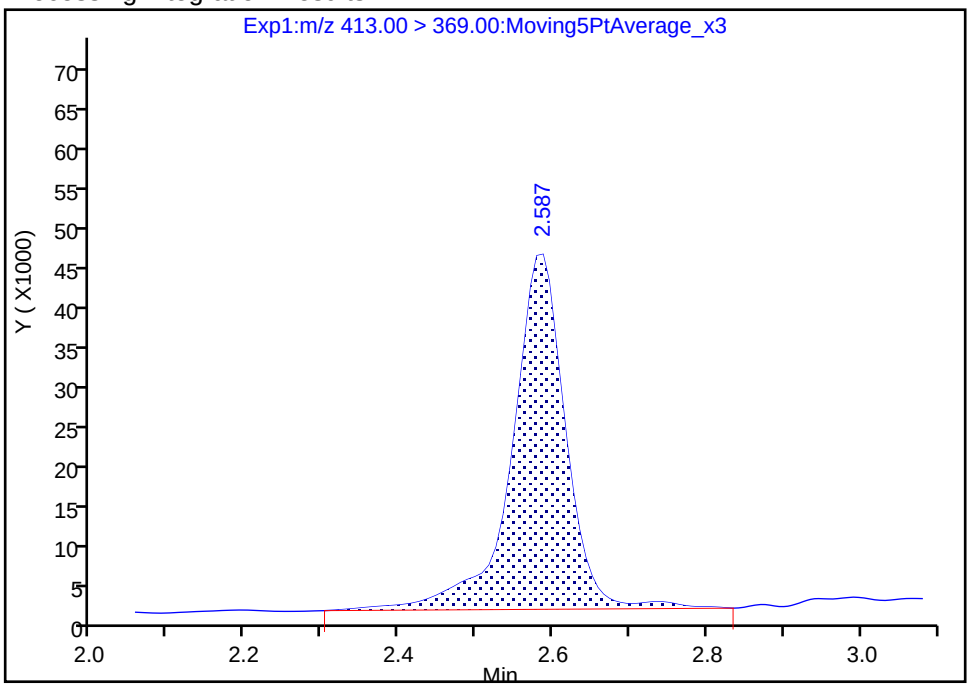
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_018.d				
Injection Date:	30-Jul-2018 05:10:37	Instrument ID:	A8_N		
Lims ID:	320-41149-A-9-A	Lab Sample ID:	320-41149-9		
Client ID:	GRE09-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

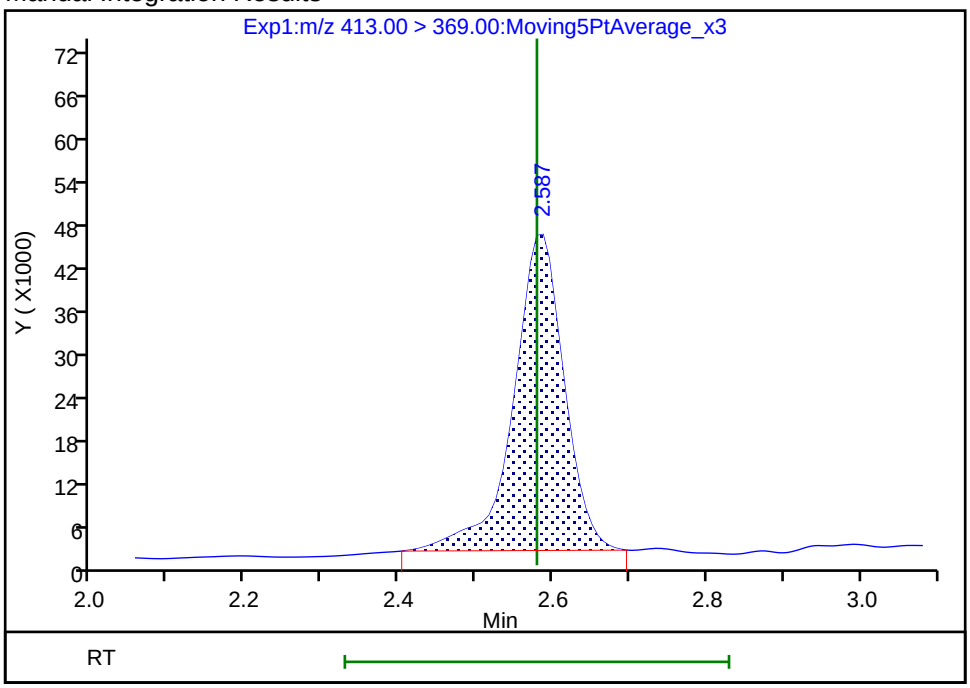
Processing Integration Results

RT: 2.59
Area: 216853
Amount: 0.113470
Amount Units: ng/ml



Manual Integration Results

RT: 2.59
Area: 199578
Amount: 0.104430
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:59:32

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

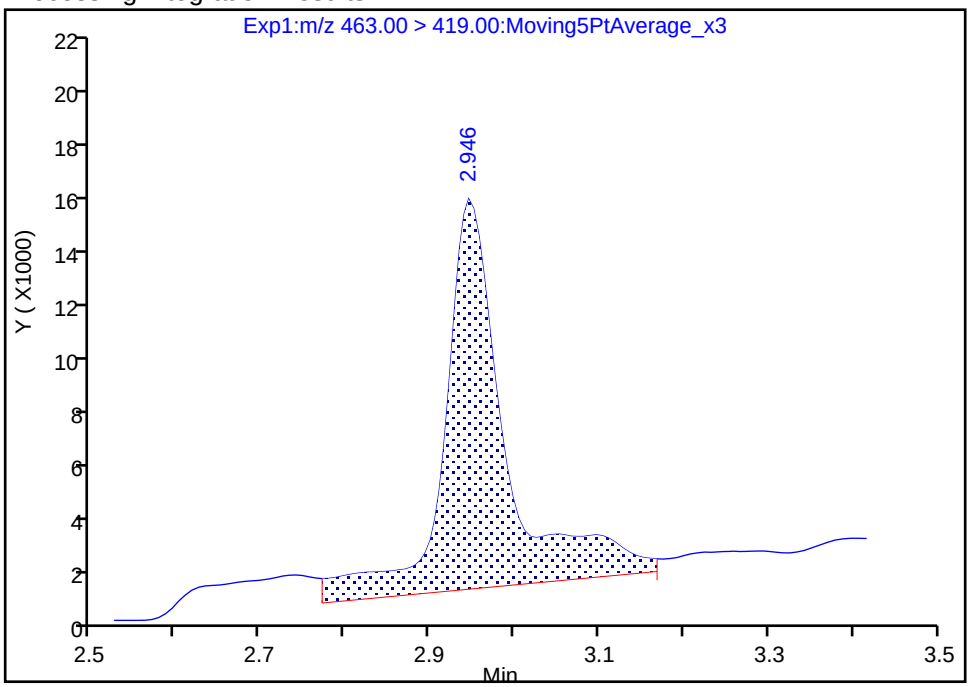
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_018.d				
Injection Date:	30-Jul-2018 05:10:37	Instrument ID:	A8_N		
Lims ID:	320-41149-A-9-A	Lab Sample ID:	320-41149-9		
Client ID:	GRE09-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

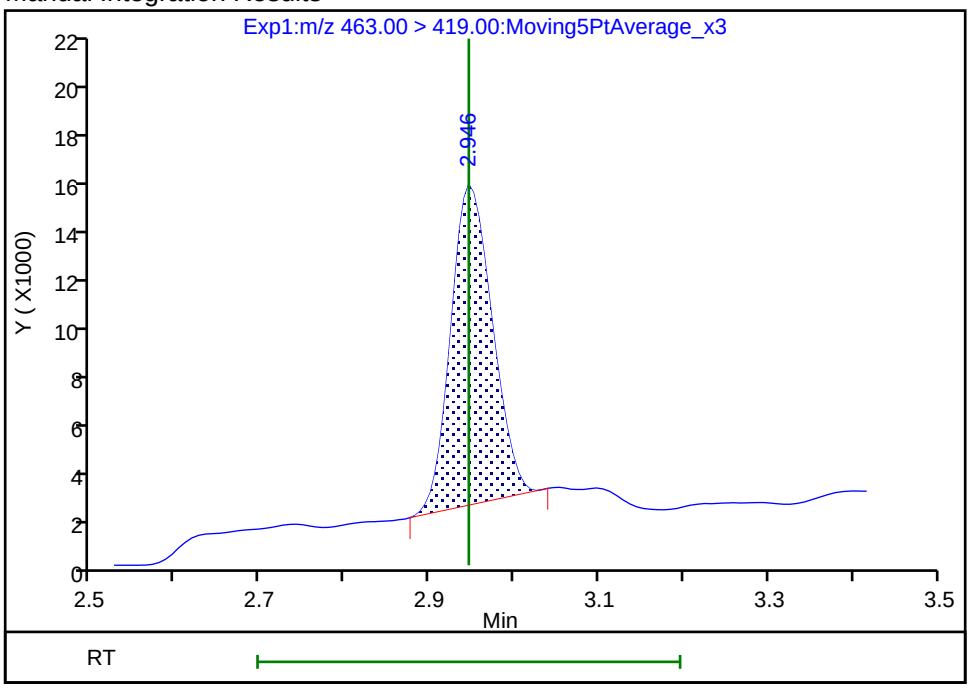
Processing Integration Results

RT: 2.95
Area: 74485
Amount: 0.046767
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 45159
Amount: 0.028354
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:59:40

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

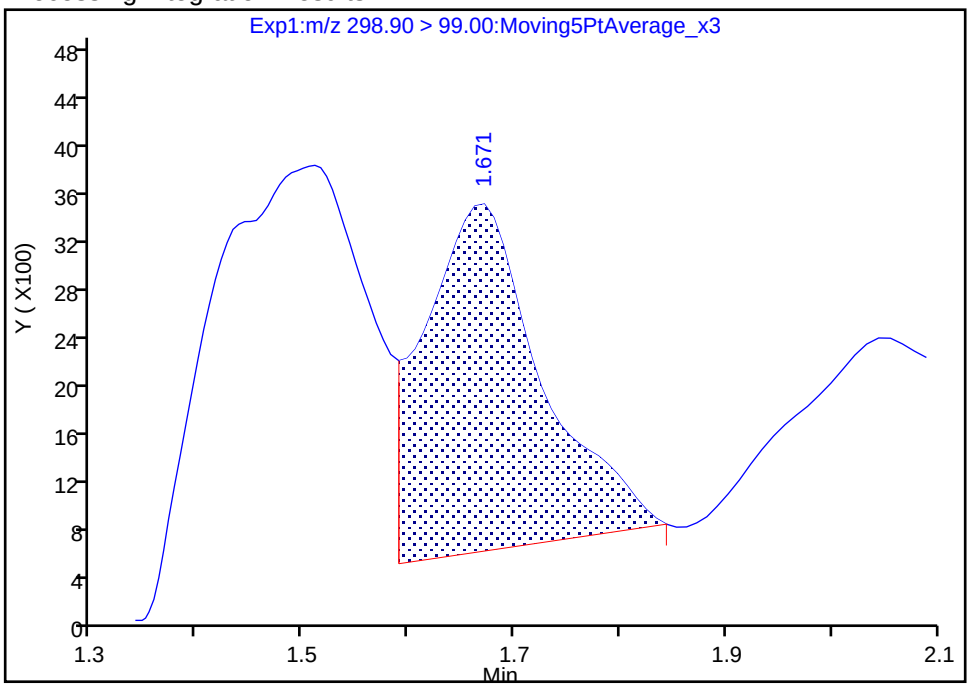
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_018.d				
Injection Date:	30-Jul-2018 05:10:37	Instrument ID:	A8_N		
Lims ID:	320-41149-A-9-A	Lab Sample ID:	320-41149-9		
Client ID:	GRE09-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

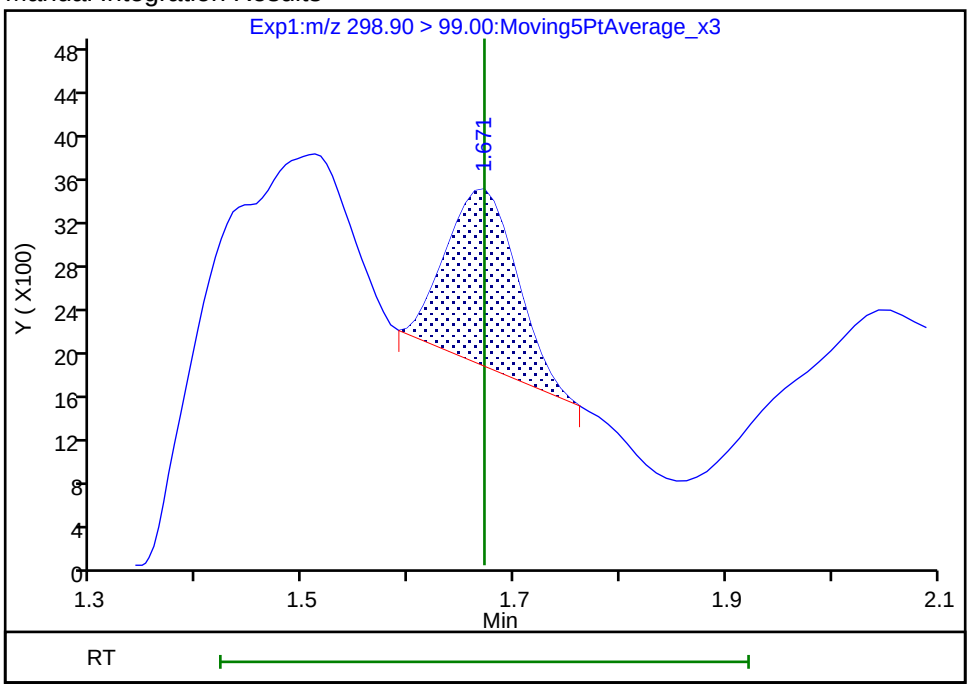
Processing Integration Results

RT: 1.67
Area: 22257
Amount: 0.009797
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 7616
Amount: 0.009797
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:59:16

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE-FB-POT-01 | Lab Sample ID: 320-41149-10

Matrix: Water | Lab File ID: 2018.07.22LLA_042.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/09/2018 17:05

Extraction Method: 3535 | Date Extracted: 07/18/2018 08:54

Sample wt/vol: 329.9(mL) | Date Analyzed: 07/22/2018 10:52

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 235512 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.1	U M	1.5	1.1	0.46
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	U M	1.5	1.1	0.41
375-95-1	Perfluorononanoic acid (PFNA)	1.1	U	1.5	1.1	0.39
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.76	U	1.5	0.76	0.35
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.76	U M	1.5	0.76	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.3	U	3.0	2.3	0.83

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	83		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	97		50-150
STL00991	13C4 PFOS	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_042.d
Lims ID: 320-41149-A-10-A
Client ID: GRE-FB-POT-01
Sample Type: Client
Inject. Date: 22-Jul-2018 10:52:15 ALS Bottle#: 31 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-10-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:48:29 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:48:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.834	1.833	0.001	0.652	93973	1.92		82.7	244	
D 9 13C4-PFHpA										
367.00 > 322.00	2.435	2.433	0.002	0.866	10957410	2.33		93.1	14497	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.435	2.436	-0.001	1.000	30145	0.006257			2.1	M
363.00 > 169.00	2.448	2.436	0.012	1.005	6664		4.52(2.17-6.52)		10.7	
D 11 18O2 PFHxS										
403.00 > 84.00	2.461	2.446	0.015	0.875	6590918	2.30		97.2	39572	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.461	2.448	0.013	1.000	30193	0.008132			23.6	M
399.00 > 99.00	2.461	2.448	0.013	1.000	9363		3.22(1.90-5.70)		8.7	
* 62 13C2-PFOA										
415.00 > 370.00	2.812	2.796	0.016		10808291	2.50			17221	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.812	2.796	0.016	1.000	40961	0.009055			5.6	M
413.00 > 169.00	2.812	2.796	0.016	1.000	15844		2.59(1.36-4.08)		31.4	
D 14 13C4 PFOA										
417.00 > 372.00	2.812	2.808	0.004	1.000	9817594	2.32		92.8	18300	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.135	9173535	2.31		92.3	17482	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.185	0.005	1.135	6989594	2.28		95.2	8610	

QC Flag Legend

Review Flags

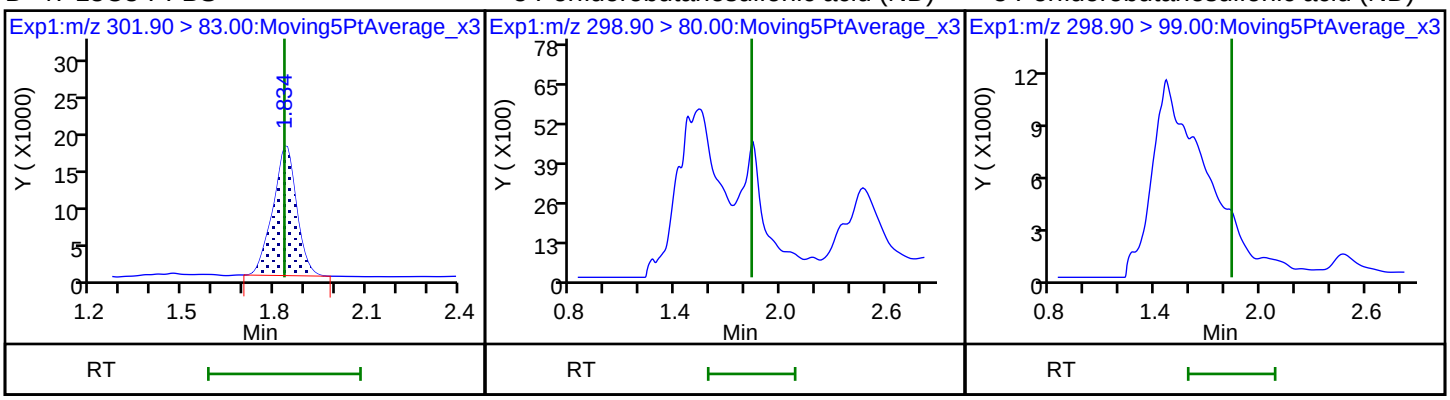
M - Manually Integrated

Report Date: 25-Jul-2018 09:48:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

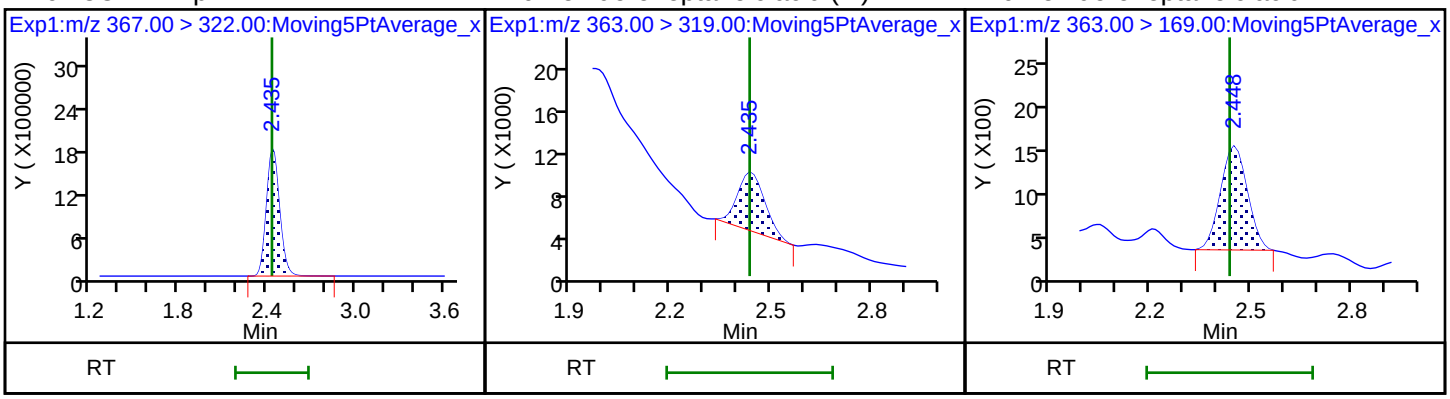
TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_042.d				
Injection Date:	22-Jul-2018 10:52:15	Instrument ID:	A9		
Lims ID:	320-41149-A-10-A	Lab Sample ID:	320-41149-10		
Client ID:	GRE-FB-POT-01				
Operator ID:	A9\Administrator	ALS Bottle#:	31	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		

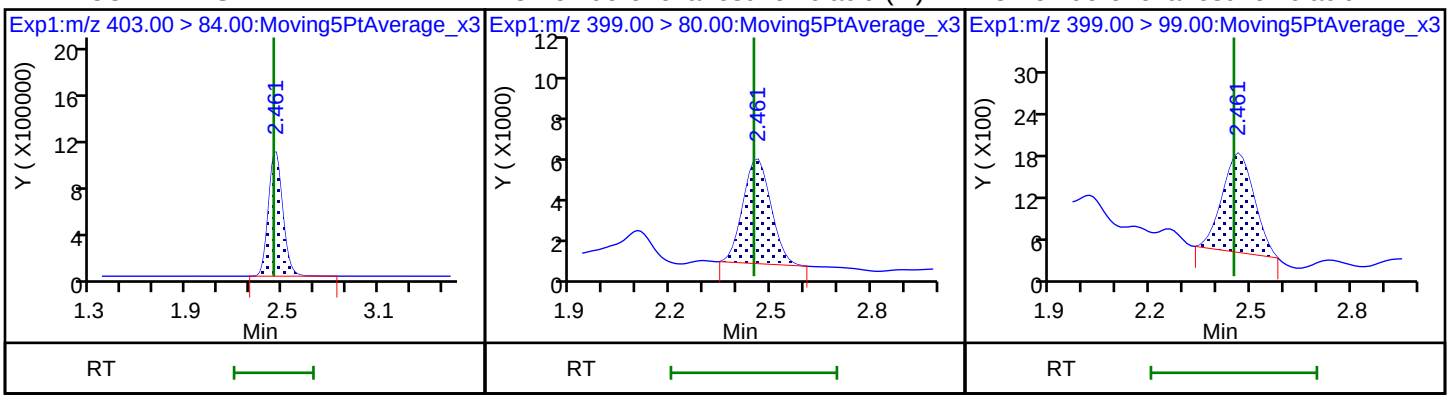
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (ND) | 5 Perfluorobutanesulfonic acid (ND)



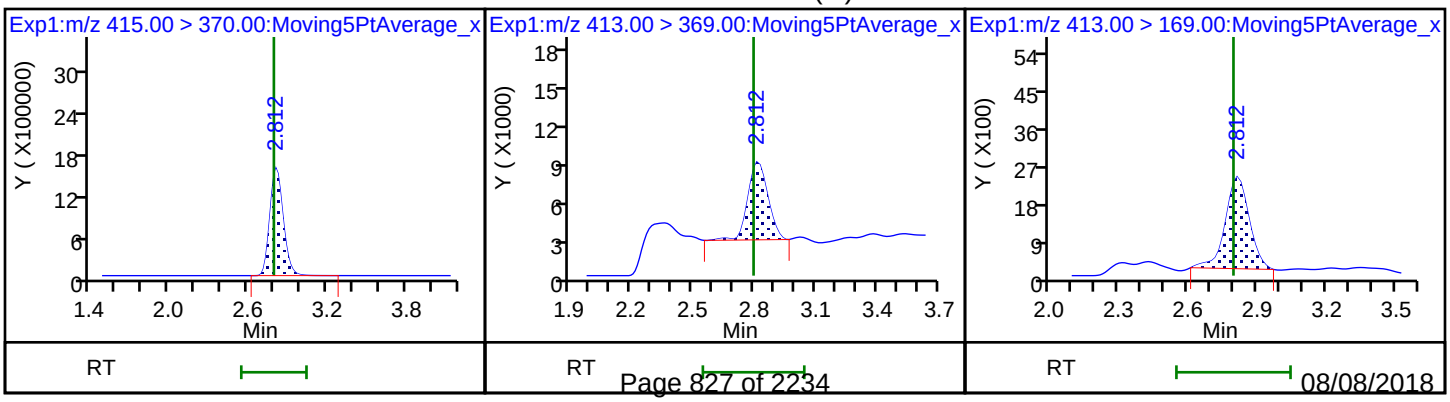
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid



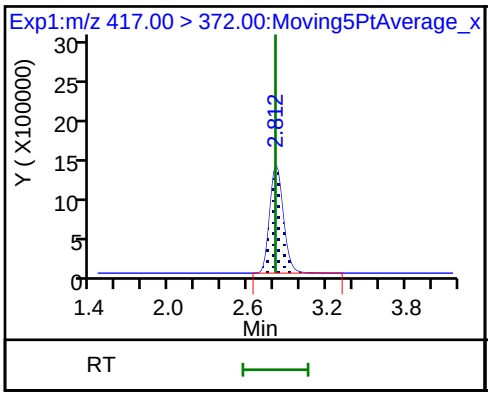
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid (M) | 8 Perfluorohexanesulfonic acid



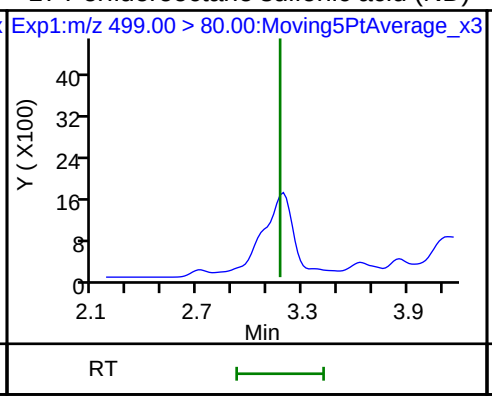
* 62 13C2-PFOA | 15 Perfluorooctanoic acid (M) | 15 Perfluorooctanoic acid



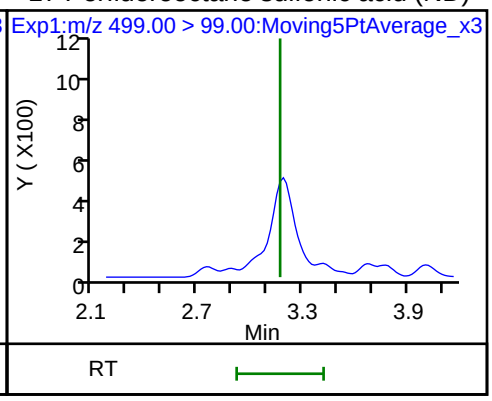
D 14 13C4 PFOA



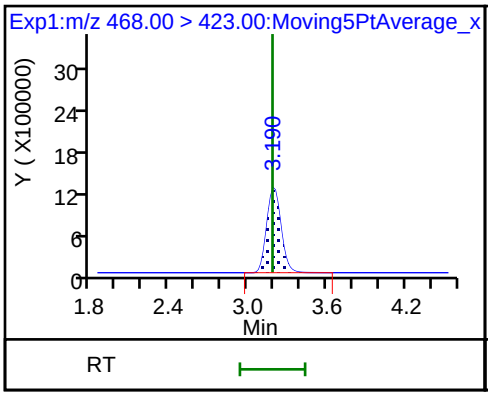
17 Perfluorooctane sulfonic acid (ND)



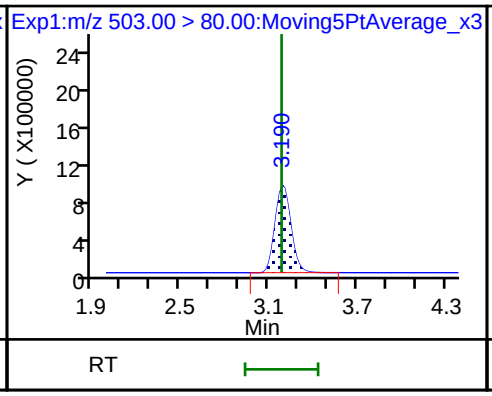
17 Perfluorooctane sulfonic acid (ND)



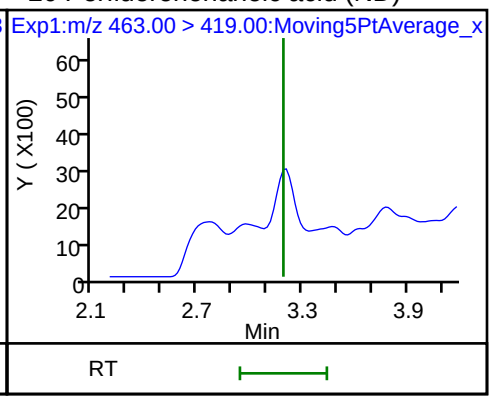
D 19 13C5 PFNA



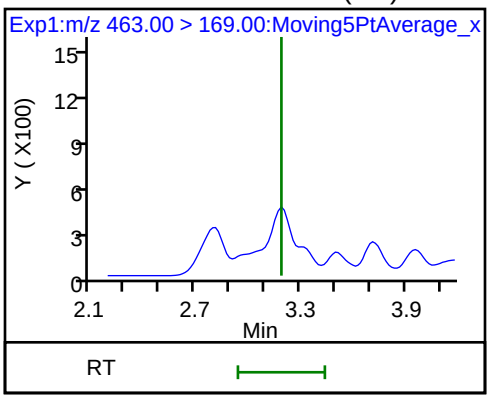
D 18 13C4 PFOS



20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

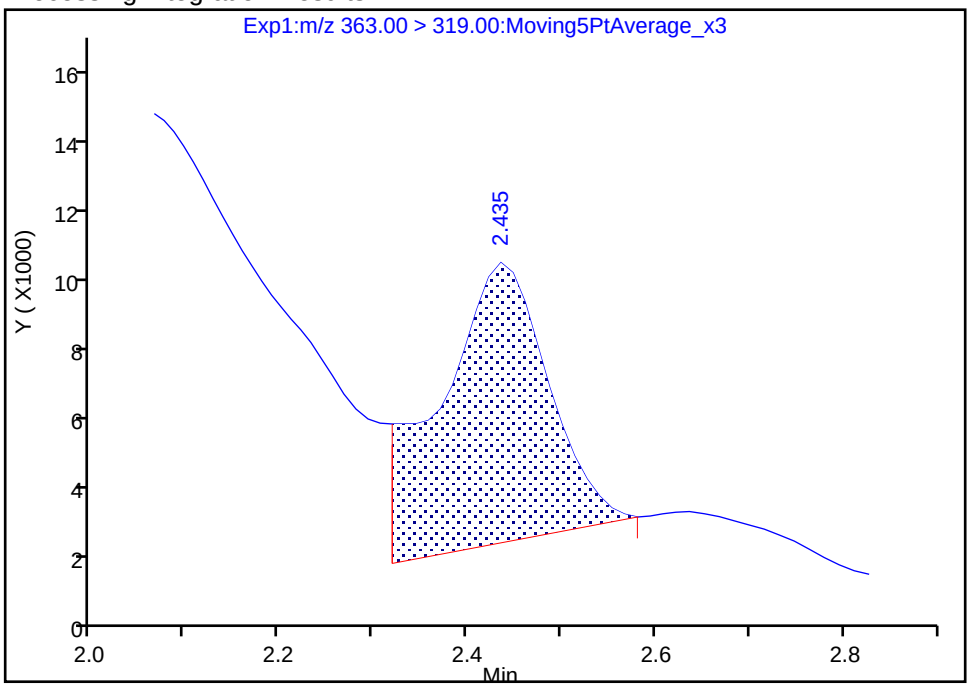
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_042.d				
Injection Date:	22-Jul-2018 10:52:15	Instrument ID:	A9		
Lims ID:	320-41149-A-10-A	Lab Sample ID:	320-41149-10		
Client ID:	GRE-FB-POT-01				
Operator ID:	A9\Administrator	ALS Bottle#:	31	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

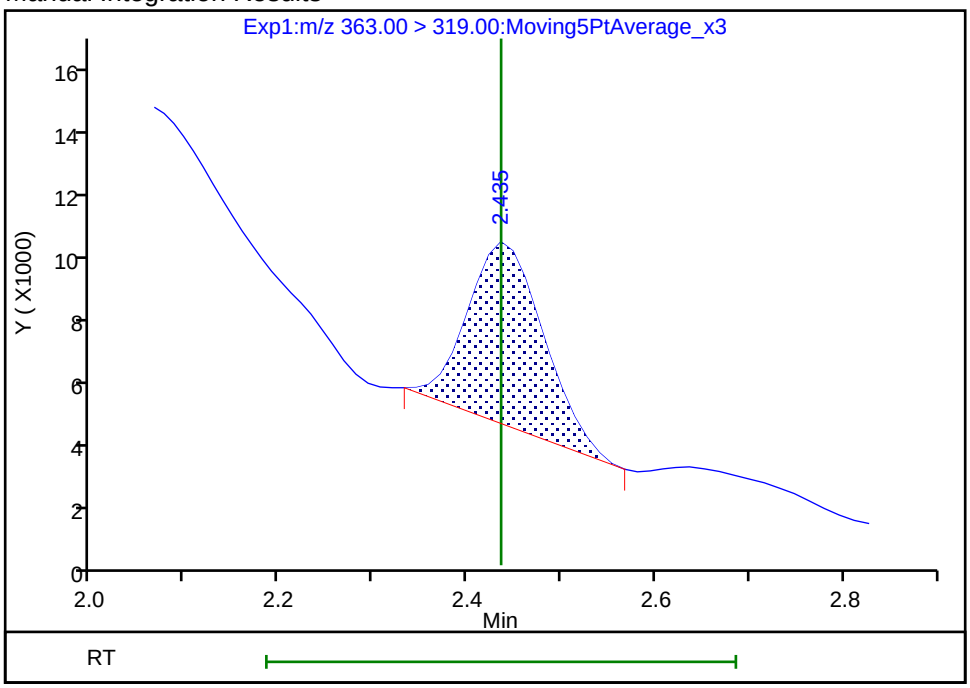
Processing Integration Results

RT: 2.44
Area: 59679
Amount: 0.012388
Amount Units: ng/ml



Manual Integration Results

RT: 2.44
Area: 30145
Amount: 0.006257
Amount Units: ng/ml



Reviewer: mongkols, 25-Jul-2018 09:48:07

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

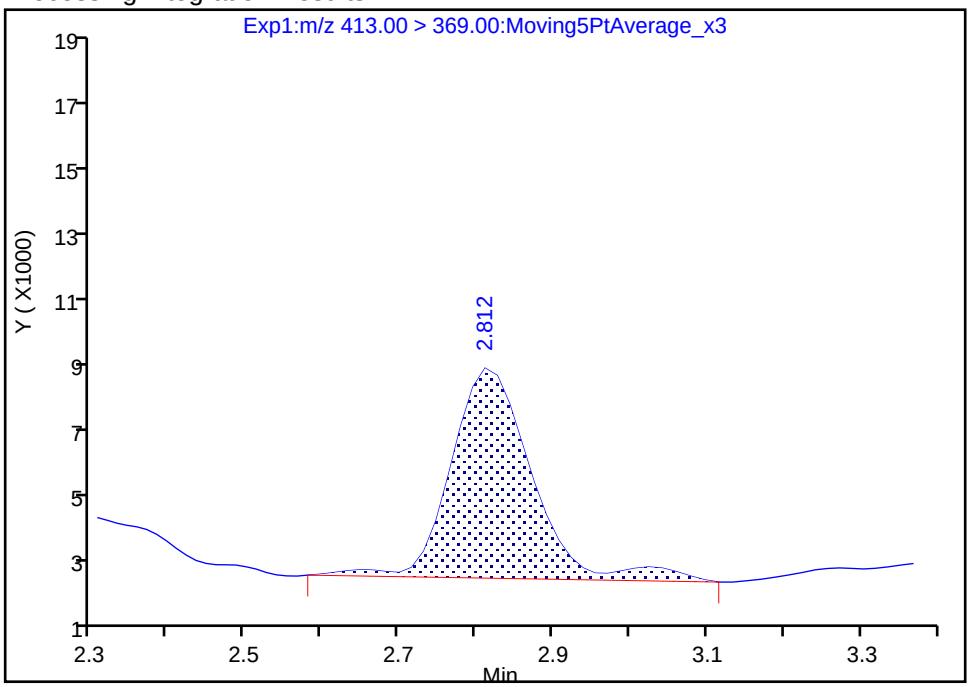
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_042.d				
Injection Date:	22-Jul-2018 10:52:15	Instrument ID:	A9		
Lims ID:	320-41149-A-10-A	Lab Sample ID:	320-41149-10		
Client ID:	GRE-FB-POT-01				
Operator ID:	A9\Administrator	ALS Bottle#:	31	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

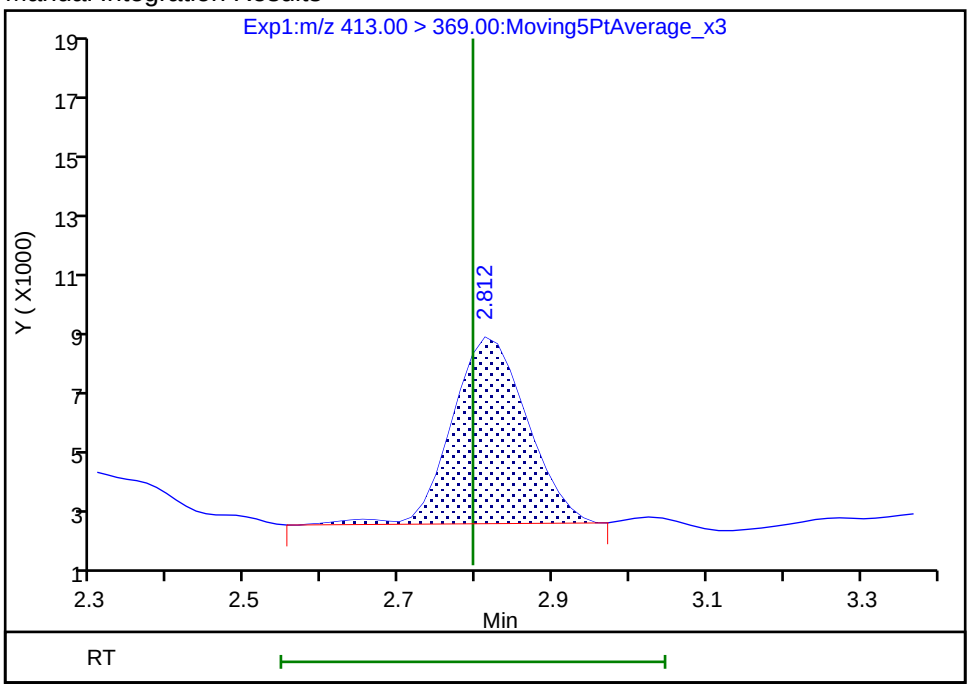
Processing Integration Results

RT: 2.81
Area: 45218
Amount: 0.009996
Amount Units: ng/ml



Manual Integration Results

RT: 2.81
Area: 40961
Amount: 0.009055
Amount Units: ng/ml



Reviewer: mongkols, 25-Jul-2018 09:48:22

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

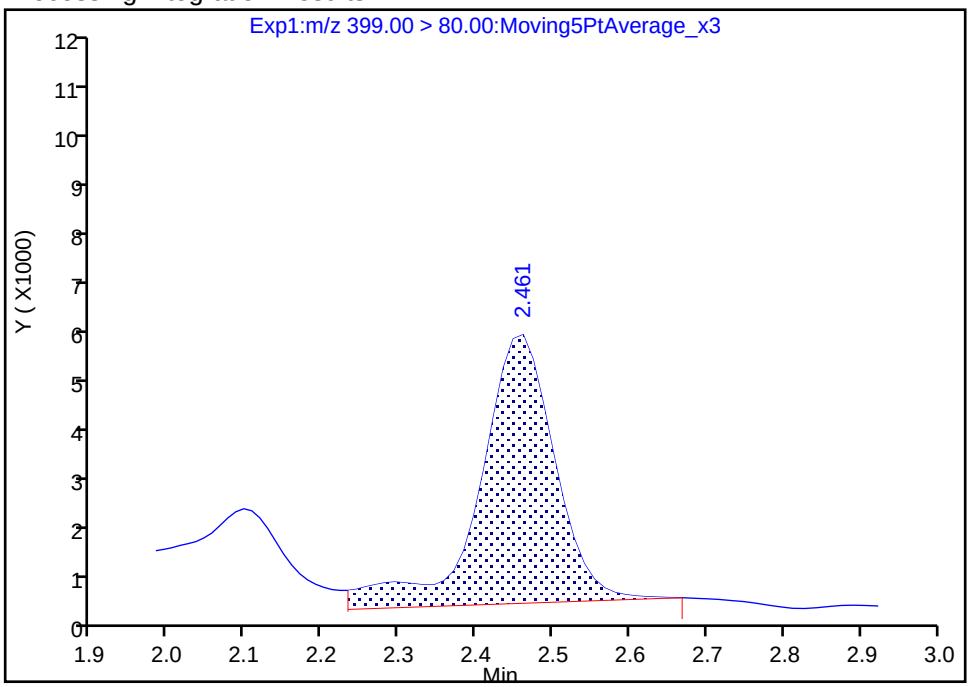
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_042.d				
Injection Date:	22-Jul-2018 10:52:15	Instrument ID:	A9		
Lims ID:	320-41149-A-10-A	Lab Sample ID:	320-41149-10		
Client ID:	GRE-FB-POT-01				
Operator ID:	A9\Administrator	ALS Bottle#:	31	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

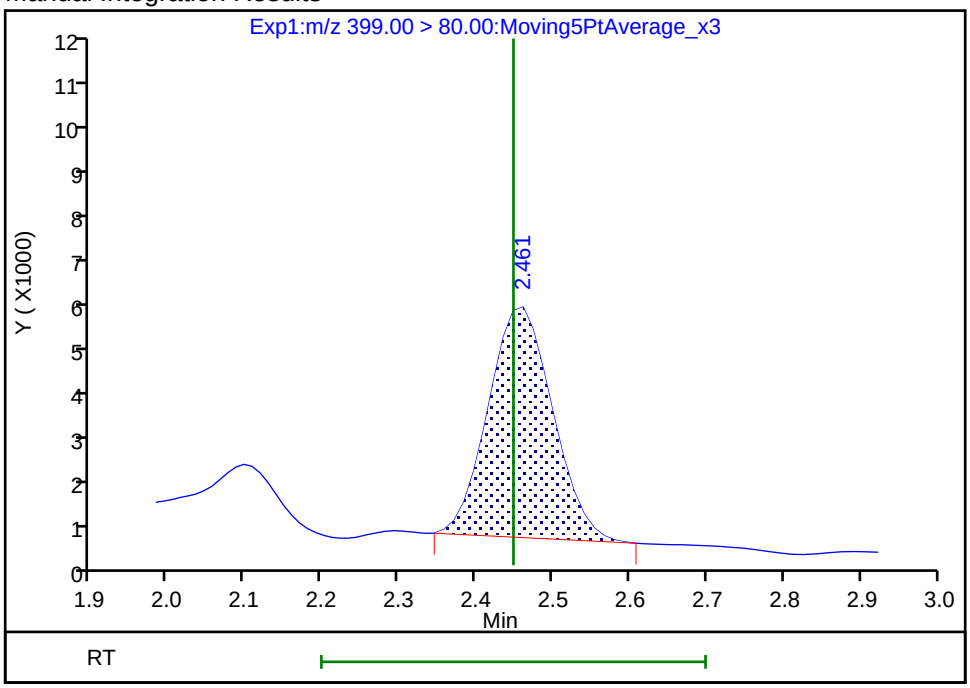
Processing Integration Results

RT: 2.46
Area: 37421
Amount: 0.010079
Amount Units: ng/ml



Manual Integration Results

RT: 2.46
Area: 30193
Amount: 0.008132
Amount Units: ng/ml



Reviewer: mongkols, 25-Jul-2018 09:48:15

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE-FB-DI-01 | Lab Sample ID: 320-41149-11

Matrix: Water | Lab File ID: 2018.07.22LLA_043.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/10/2018 09:15

Extraction Method: 3535 | Date Extracted: 07/18/2018 08:54

Sample wt/vol: 292.4(mL) | Date Analyzed: 07/22/2018 10:59

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 235512 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	U	1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	1.3	U M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.85	U	1.7	0.85	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.85	U	1.7	0.85	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.4	2.6	0.94

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	86		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	91		50-150
STL00994	18O2 PFHxS	100		50-150
STL00991	13C4 PFOS	90		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_043.d
Lims ID: 320-41149-A-11-A
Client ID: GRE-FB-DI-01
Sample Type: Client
Inject. Date: 22-Jul-2018 10:59:47 ALS Bottle#: 32 Worklist Smp#: 7
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-11-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:48:57 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:48:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.834	1.833	0.001	0.652	99337	1.99		85.8	942	
D 9 13C4-PFHpA										
367.00 > 322.00	2.435	2.433	0.002	0.866	11068821	2.31		92.2	17768	
D 11 18O2 PFHxS										
403.00 > 84.00	2.448	2.446	0.002	0.871	6895861	2.36		99.8	63759	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.448	2.448	0.0	1.000	22221	0.005720			51.7	
399.00 > 99.00	2.448	2.448	0.0	1.000	4583		4.85(1.90-5.70)		6.2	
* 62 13C2-PFOA										
415.00 > 370.00	2.812	2.796	0.016		11016904	2.50			20002	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.812	2.796	0.016	1.006	26535	0.005863			3.5	M
413.00 > 169.00	2.796	2.796	0.0	1.000	9946		2.67(1.36-4.08)		26.9	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	0.994	9823302	2.28		91.1	21248	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.135	9195417	2.27		90.7	21290	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.185	0.005	1.135	6738624	2.15		90.1	9139	

QC Flag Legend

Review Flags

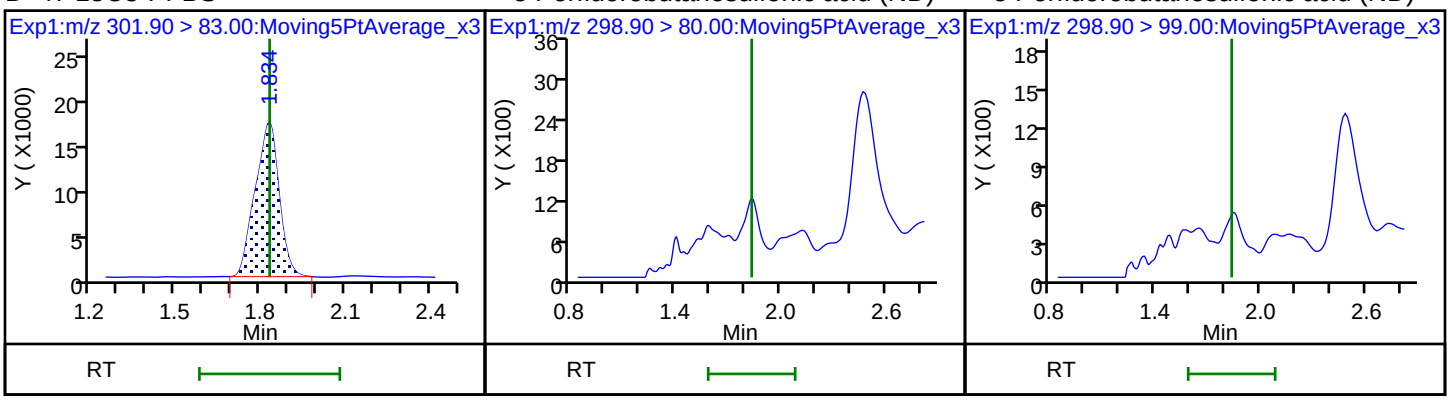
M - Manually Integrated

Report Date: 25-Jul-2018 09:48:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

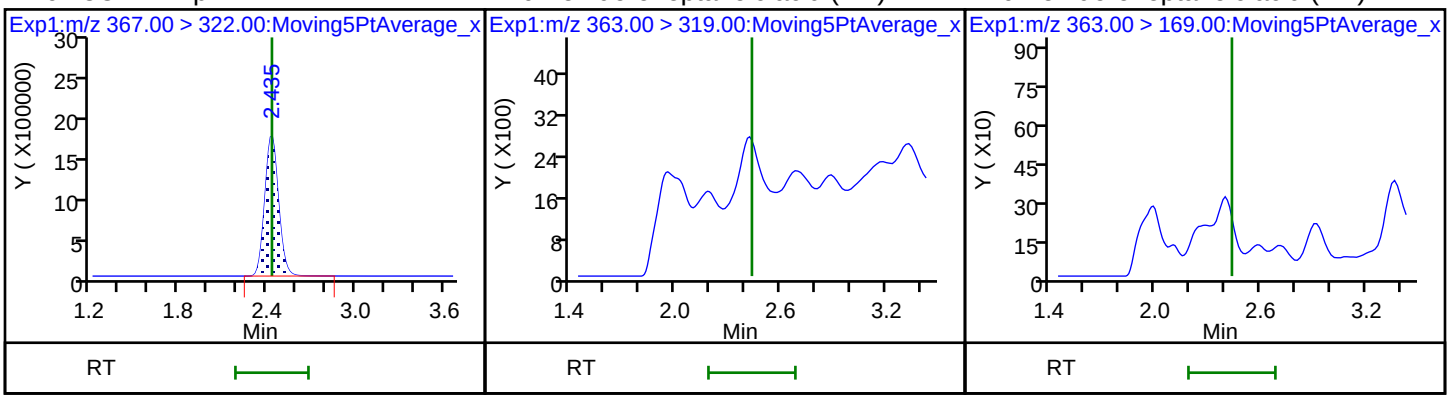
TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_043.d				
Injection Date:	22-Jul-2018 10:59:47	Instrument ID:	A9		
Lims ID:	320-41149-A-11-A	Lab Sample ID:	320-41149-11		
Client ID:	GRE-FB-DI-01				
Operator ID:	A9\Administrator	ALS Bottle#:	32	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		

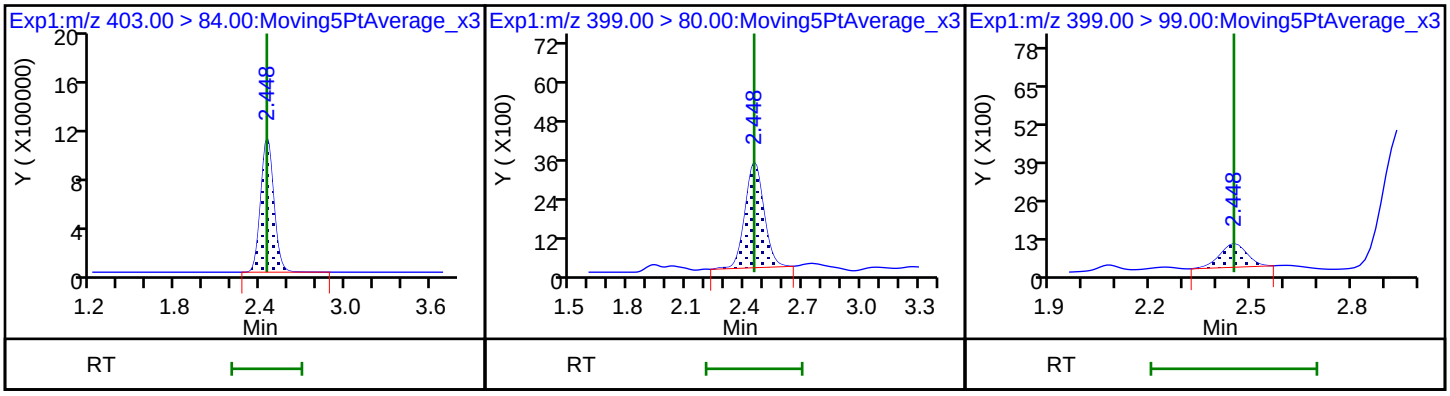
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (ND) | 5 Perfluorobutanesulfonic acid (ND)



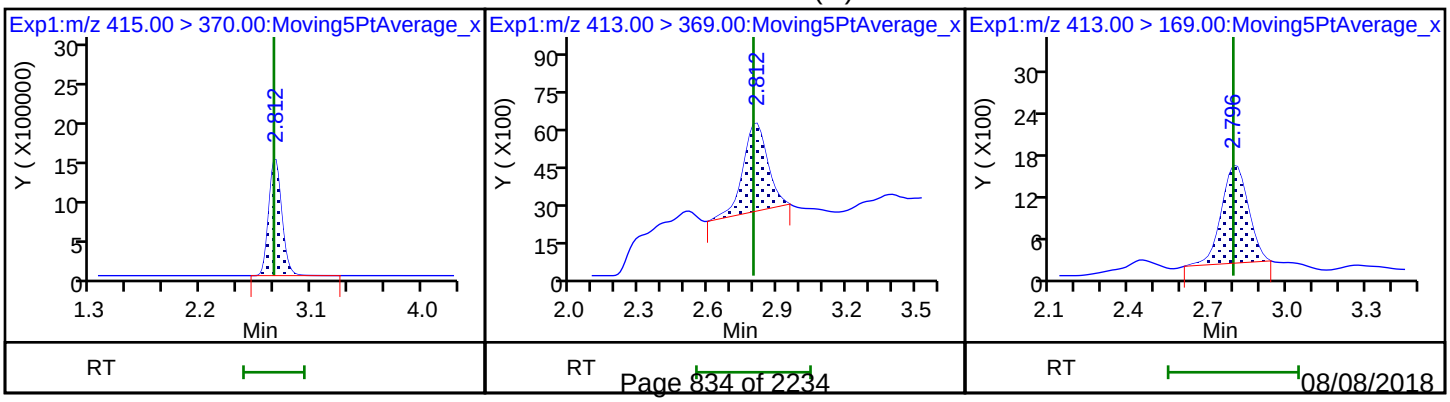
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (ND) | 10 Perfluoroheptanoic acid (ND)



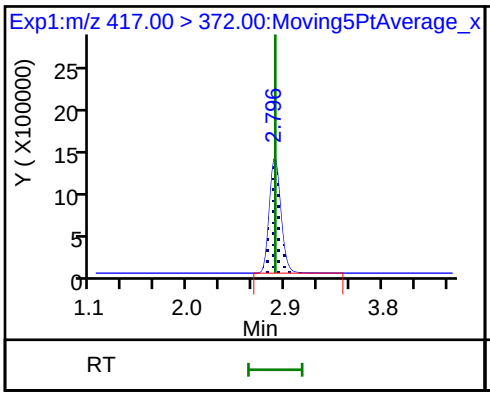
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



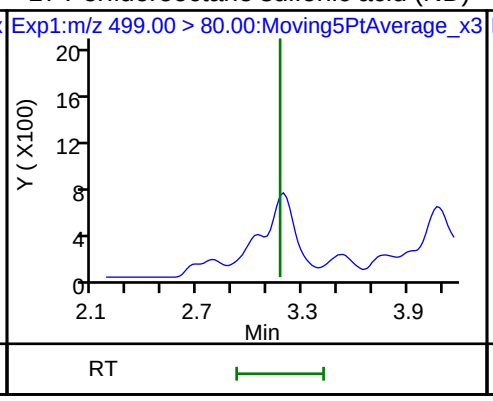
* 62 13C2-PFOA | 15 Perfluorooctanoic acid (M) | 15 Perfluorooctanoic acid



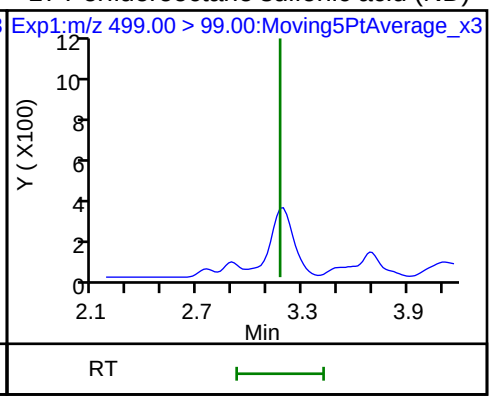
D 14 13C4 PFOA



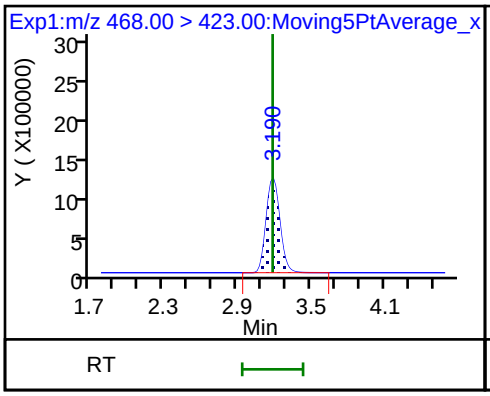
17 Perfluorooctane sulfonic acid (ND)



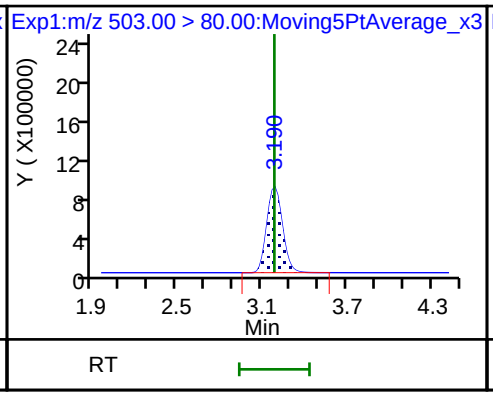
17 Perfluorooctane sulfonic acid (ND)



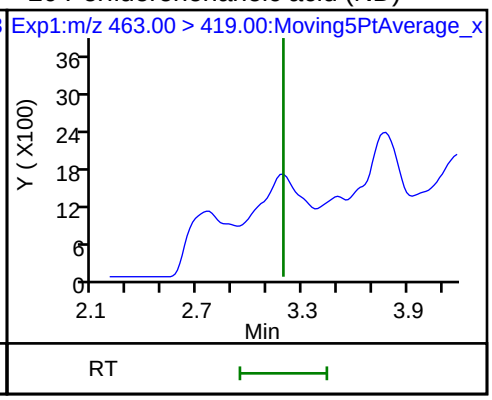
D 19 13C5 PFNA



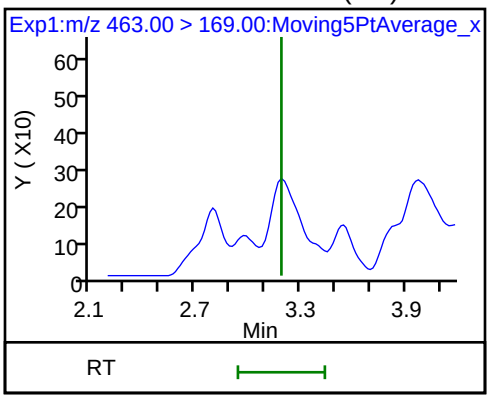
D 18 13C4 PFOS



20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

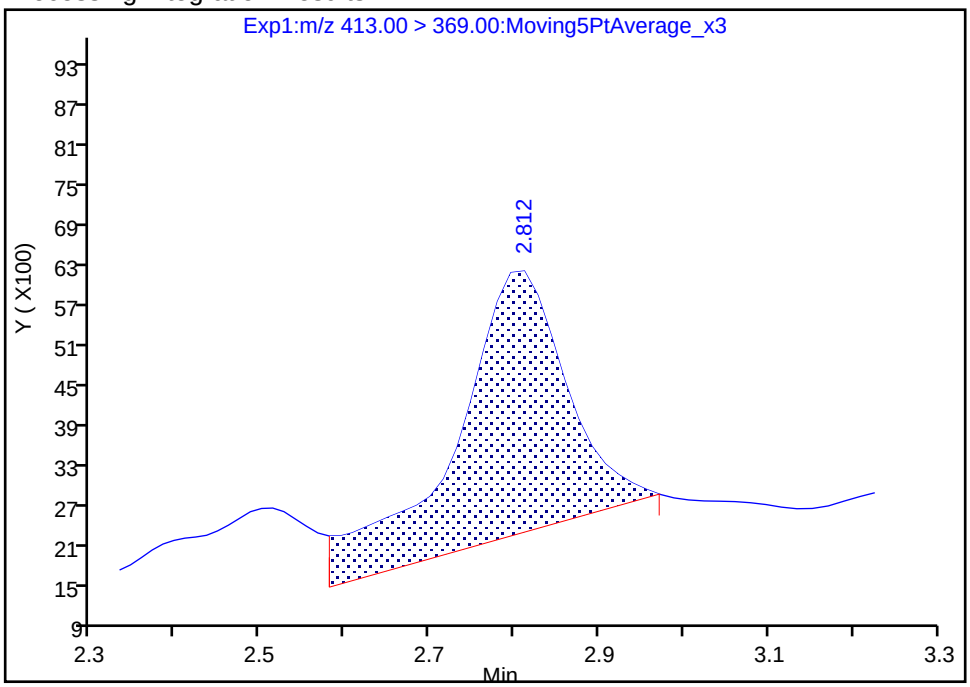
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_043.d				
Injection Date:	22-Jul-2018 10:59:47	Instrument ID:	A9		
Lims ID:	320-41149-A-11-A	Lab Sample ID:	320-41149-11		
Client ID:	GRE-FB-DI-01				
Operator ID:	A9\Administrator	ALS Bottle#:	32	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

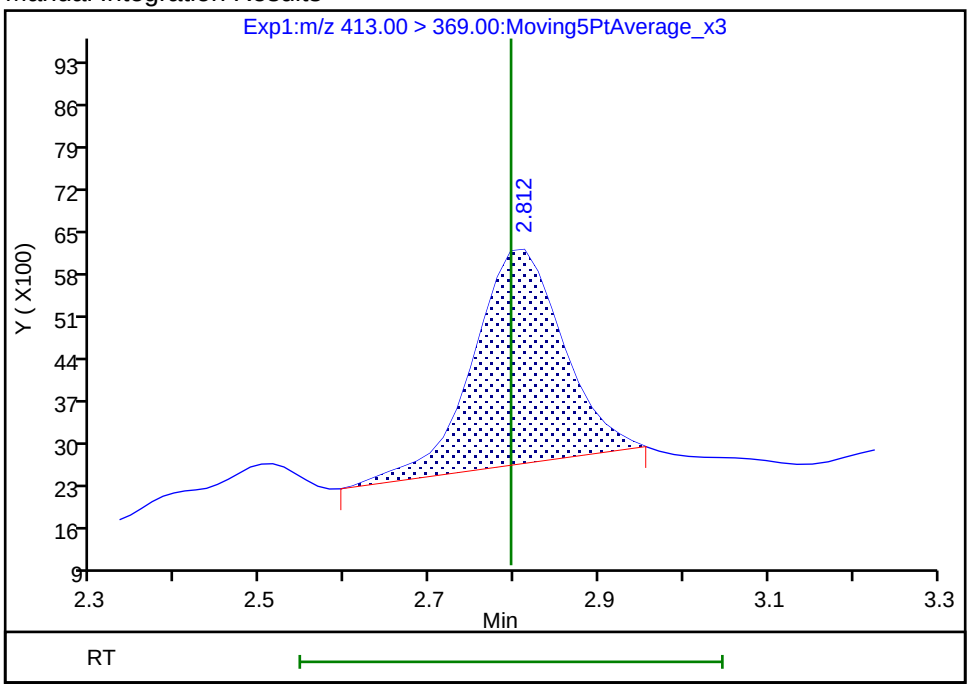
Processing Integration Results

RT: 2.81
Area: 36464
Amount: 0.008056
Amount Units: ng/ml



Manual Integration Results

RT: 2.81
Area: 26535
Amount: 0.005863
Amount Units: ng/ml



Reviewer: mongkols, 25-Jul-2018 09:48:49

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE-ER-SB-02 | Lab Sample ID: 320-41149-12

Matrix: Water | Lab File ID: 2018.07.22LLA_044.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/10/2018 09:20

Extraction Method: 3535 | Date Extracted: 07/18/2018 08:54

Sample wt/vol: 279.7(mL) | Date Analyzed: 07/22/2018 11:07

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 235512 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	U	1.8	1.3	0.55
335-67-1	Perfluorooctanoic acid (PFOA)	1.3	U	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.8	1.3	0.46
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.89	U	1.8	0.89	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.89	U	1.8	0.89	0.34
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	0.98

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	88		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	89		50-150
STL00994	18O2 PFHxS	90		50-150
STL00991	13C4 PFOS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_044.d
Lims ID: 320-41149-A-12-A
Client ID: GRE-ER-SB-02
Sample Type: Client
Inject. Date: 22-Jul-2018 11:07:19 ALS Bottle#: 33 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-12-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:48:57 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:49:12

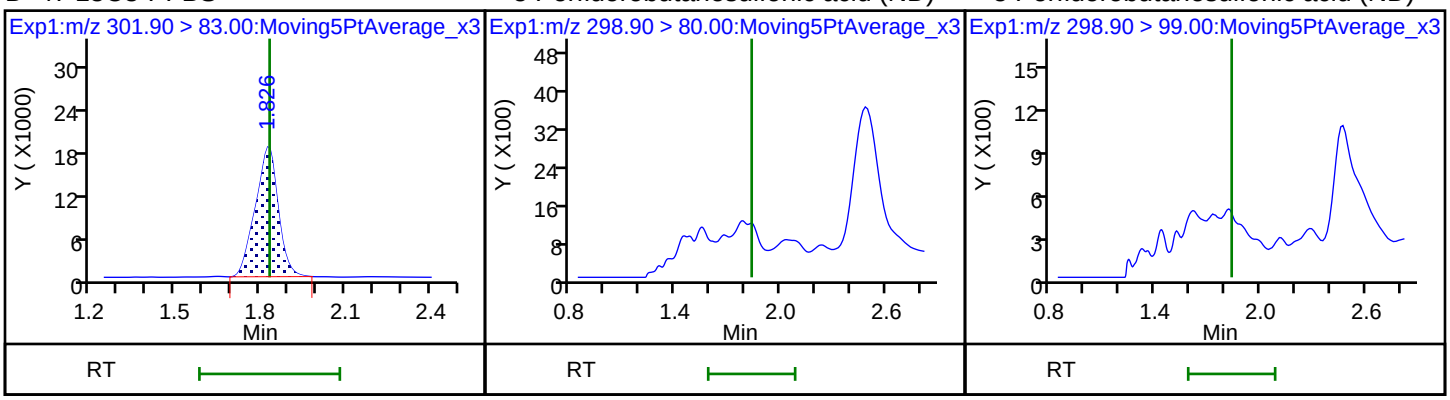
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.833	-0.007	0.653	102111	2.06		88.4	1011	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.433	-0.010	0.867	10957936	2.29		91.6	18852	
D 11 18O2 PFHxS										
403.00 > 84.00	2.449	2.446	0.003	0.876	6225667	2.14		90.4	45546	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.448	0.001	1.000	27387	0.007809			47.9	
399.00 > 99.00	2.449	2.448	0.001	1.000	7264		3.77(1.90-5.70)		16.2	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10985360	2.50			24103	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	27480	0.006130			3.9	
413.00 > 169.00	2.796	2.796	0.0	1.000	9181		2.99(1.36-4.08)		20.8	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	1.000	9730078	2.26		90.4	22359	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.141	9033843	2.23		89.4	20215	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.185	0.005	1.141	6915238	2.22		92.7	6704	

Report Date: 25-Jul-2018 09:49:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

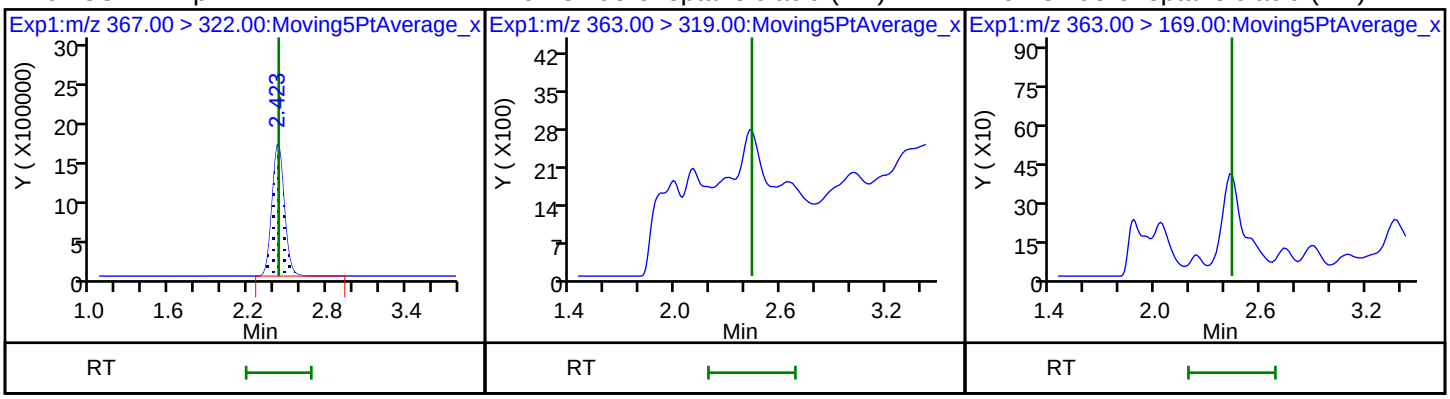
TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_044.d				
Injection Date:	22-Jul-2018 11:07:19	Instrument ID:	A9		
Lims ID:	320-41149-A-12-A	Lab Sample ID:	320-41149-12		
Client ID:	GRE-ER-SB-02				
Operator ID:	A9\Administrator	ALS Bottle#:	33	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		

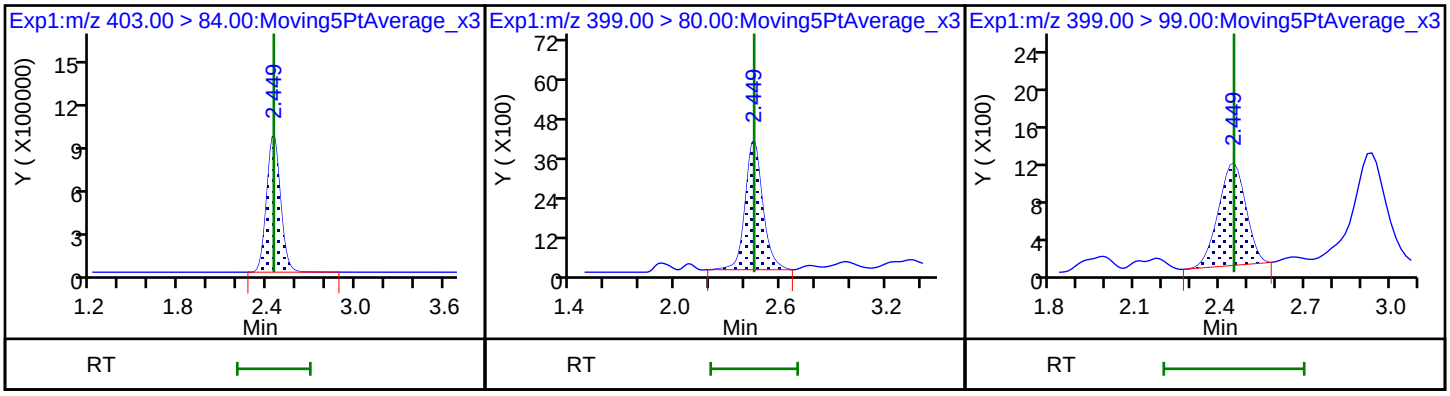
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (ND) | 5 Perfluorobutanesulfonic acid (ND)



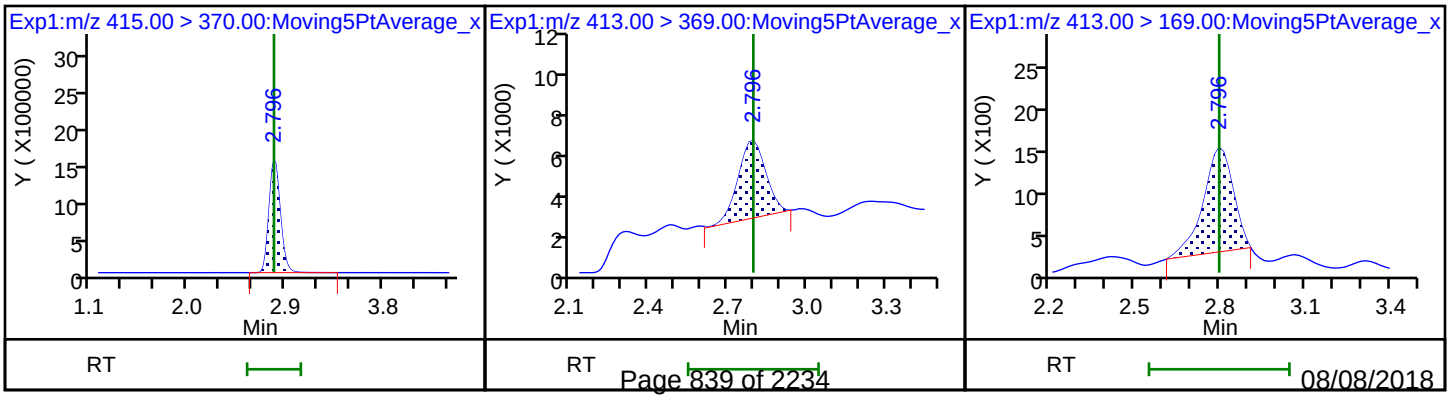
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (ND) | 10 Perfluoroheptanoic acid (ND)



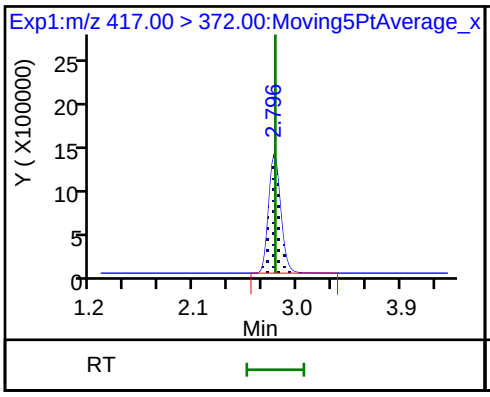
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



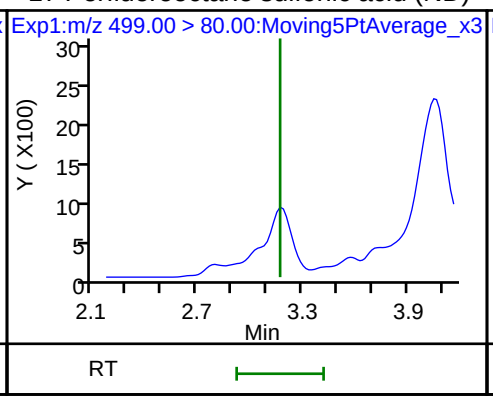
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



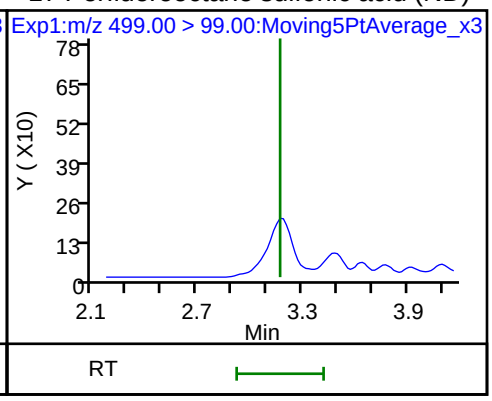
D 14 13C4 PFOA



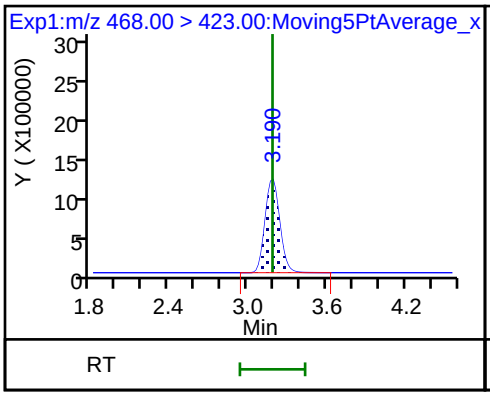
17 Perfluorooctane sulfonic acid (ND)



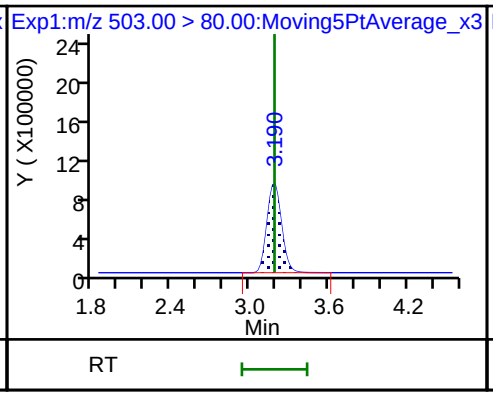
17 Perfluorooctane sulfonic acid (ND)



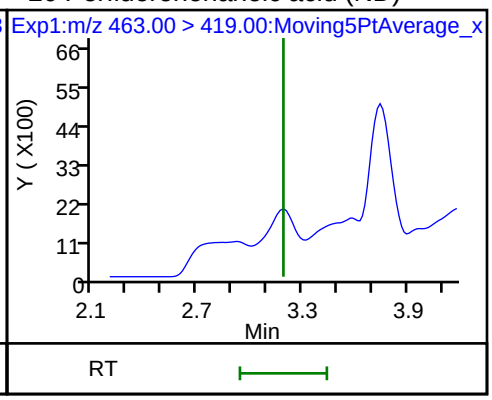
D 19 13C5 PFNA



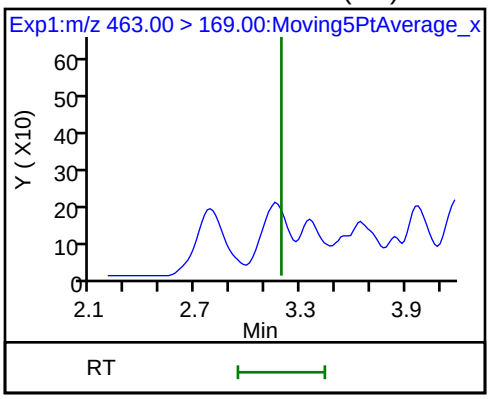
D 18 13C4 PFOS



20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE03-SB3-01
Lab Sample ID: 320-41149-13
Matrix: Solid
Lab File ID: 2018.07.30LLA_019.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/10/2018 10:30
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.00(g)
Date Analyzed: 07/30/2018 05:18
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 8.0
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.27	J	0.33	0.22	0.085
335-67-1	Perfluorooctanoic acid (PFOA)	0.33		0.33	0.22	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.22	U M	0.33	0.22	0.088
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.12	J	0.43	0.20	0.064
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.86		0.33	0.22	0.067
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	4.3		1.1	0.54	0.26

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	93		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	96		50-150
STL00994	18O2 PFHxS	93		50-150
STL00991	13C4 PFOS	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_019.d
Lims ID: 320-41149-A-13-A
Client ID: GRE03-SB3-01
Sample Type: Client
Inject. Date: 30-Jul-2018 05:18:28 ALS Bottle#: 13 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-13
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:00:48 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:00:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.665	1.671	-0.006	1.000	155455	0.0558			384	
298.90 > 99.00	1.665	1.671	-0.006	1.000	65345		2.38(1.25-3.74)		234	
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.674	-0.009	0.645	81560	2.16		93.1	561	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.217	2.225	-0.008	1.000	204818	0.1222			385	
363.00 > 169.00	2.229	2.225	0.004	1.005	75163		2.72(1.13-3.40)		998	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.237	0.004	1.000	955000	0.3942			6062	
399.00 > 99.00	2.241	2.237	0.004	1.000	309669		3.08(1.50-4.49)		1011	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.240	-0.023	0.859	3801143	2.19		87.5	73361	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.253	-0.012	0.868	4910723	2.20		93.1	65073	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.579	0.001		4440372	2.50			101995	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.579	0.001	1.000	286192	0.1520			352	
413.00 > 169.00	2.580	2.579	0.001	1.000	172980		1.65(0.84-2.52)		920	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3878417	2.28		91.3	63517	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.942	2.946	-0.004	1.000	3197510	1.96			18250	
499.00 > 99.00	2.942	2.946	-0.004	1.000	774770		4.13(2.31-6.93)		6163	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.942	2.946	-0.004	1.000	29855	0.0186			69.1	M
463.00 > 169.00	2.942	2.946	-0.004	1.000	6822		4.38(1.90-5.69)		257	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.942	2.953	-0.011	1.140	3517015	2.40		96.0	89957	
D 18 13C4 PFOS										
503.00 > 80.00	2.942	2.953	-0.011	1.140	3519956	2.27		94.9	33381	

QC Flag Legend

Review Flags

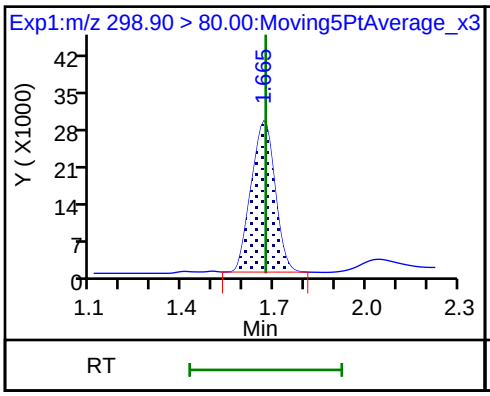
M - Manually Integrated

Report Date: 31-Jul-2018 10:00:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

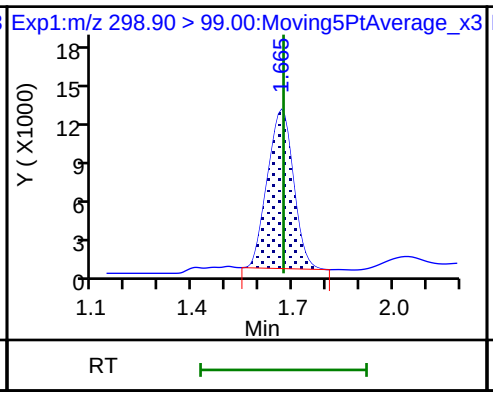
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_019.d				
Injection Date:	30-Jul-2018 05:18:28	Instrument ID:	A8_N		
Lims ID:	320-41149-A-13-A	Lab Sample ID:	320-41149-13		
Client ID:	GRE03-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

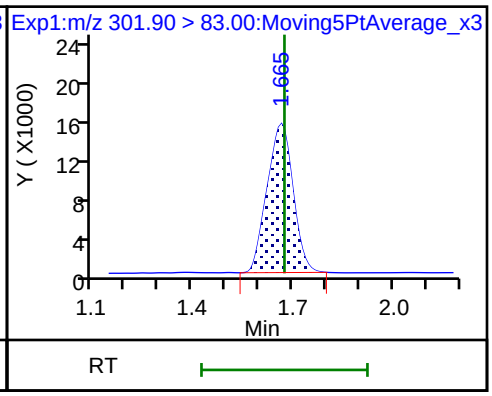
5 Perfluorobutanesulfonic acid



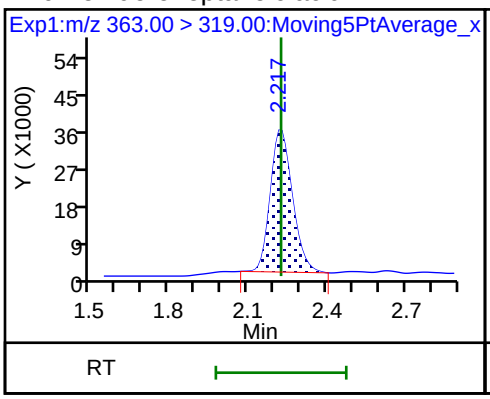
5 Perfluorobutanesulfonic acid



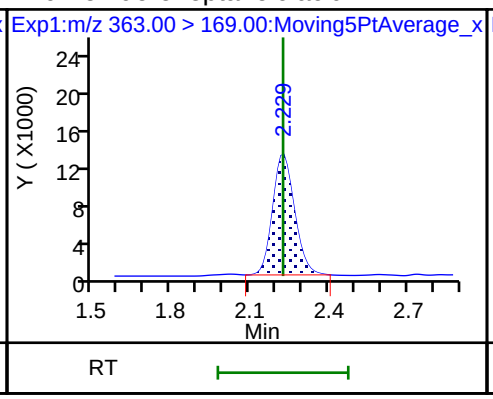
D 47 13C3-PFBS



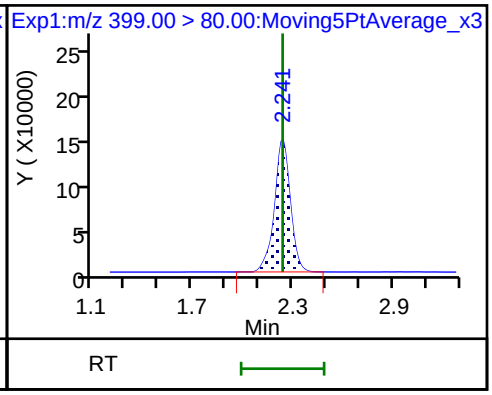
10 Perfluoroheptanoic acid



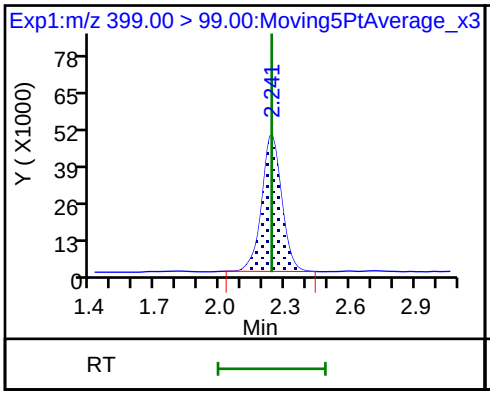
10 Perfluoroheptanoic acid



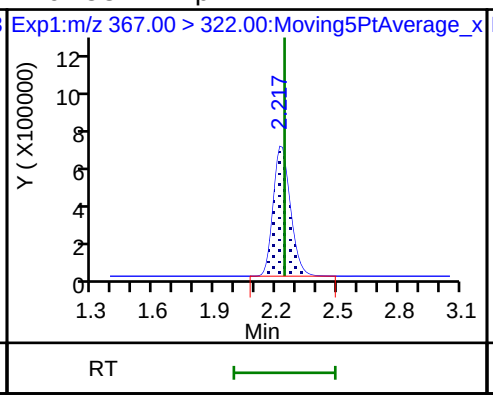
8 Perfluorohexanesulfonic acid



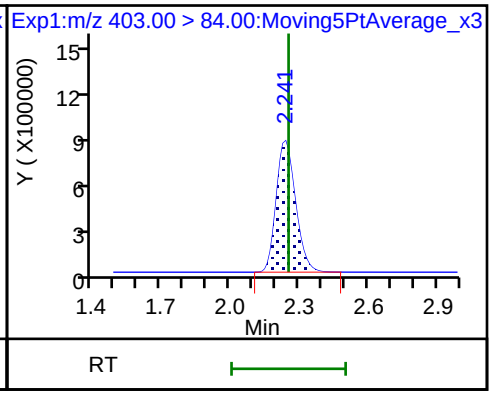
8 Perfluorohexanesulfonic acid



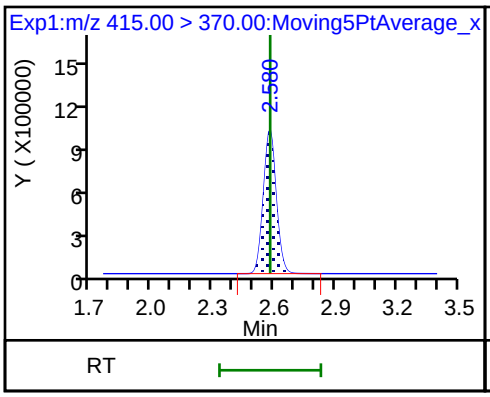
D 9 13C4-PFHpA



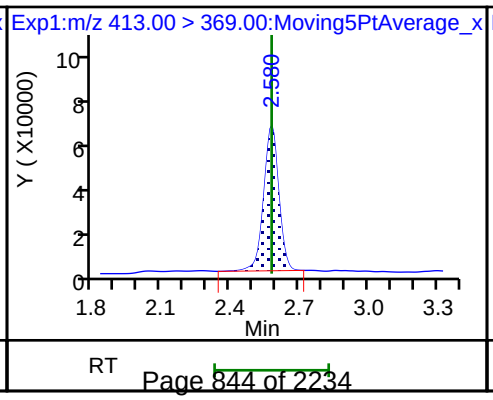
D 11 18O2 PFHxS



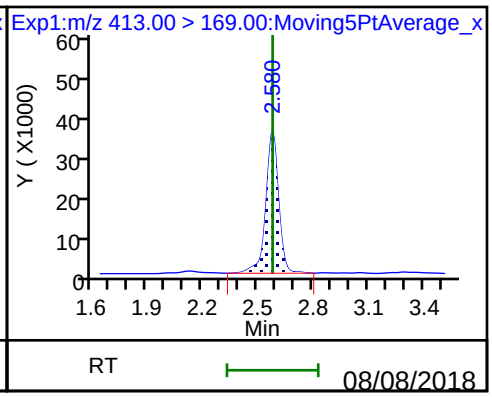
* 62 13C2-PFOA



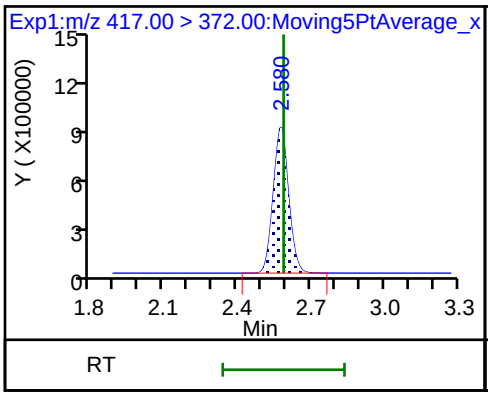
15 Perfluorooctanoic acid



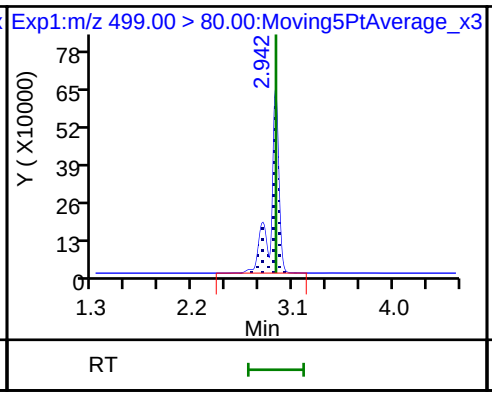
15 Perfluorooctanoic acid



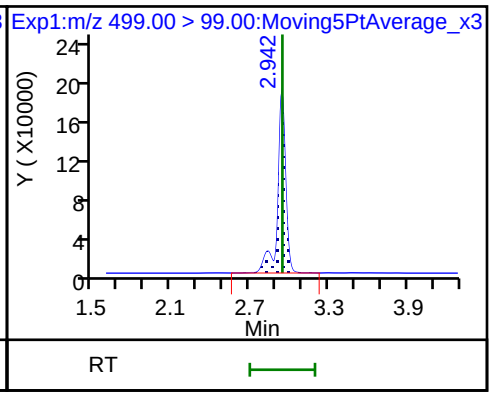
D 14 13C4 PFOA



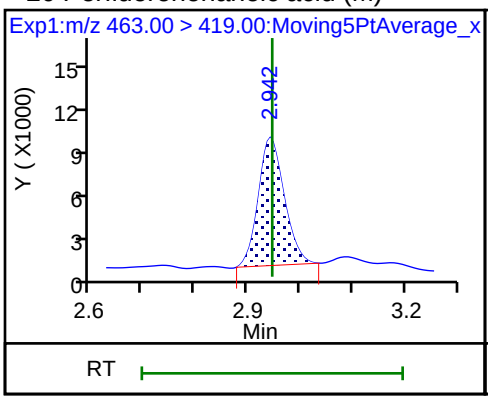
17 Perfluorooctane sulfonic acid



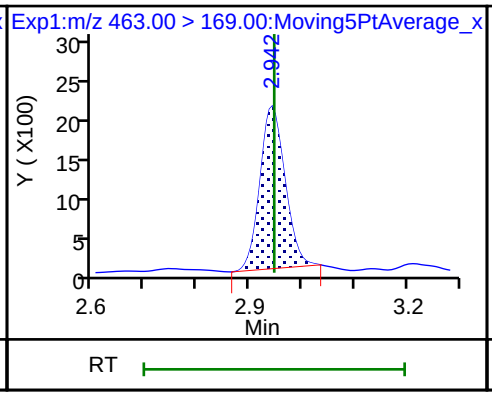
17 Perfluorooctane sulfonic acid



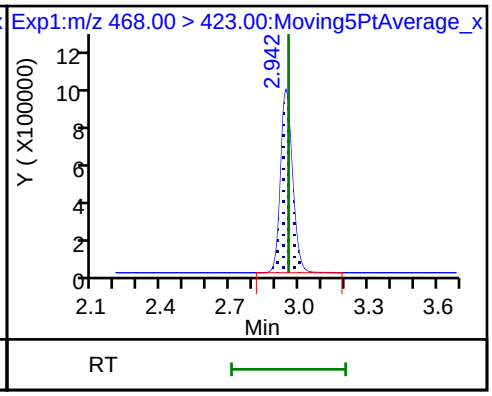
20 Perfluorononanoic acid (M)



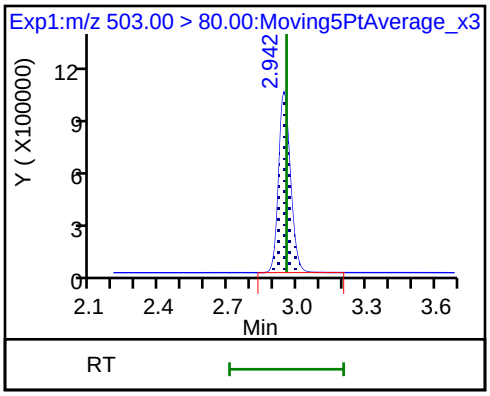
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

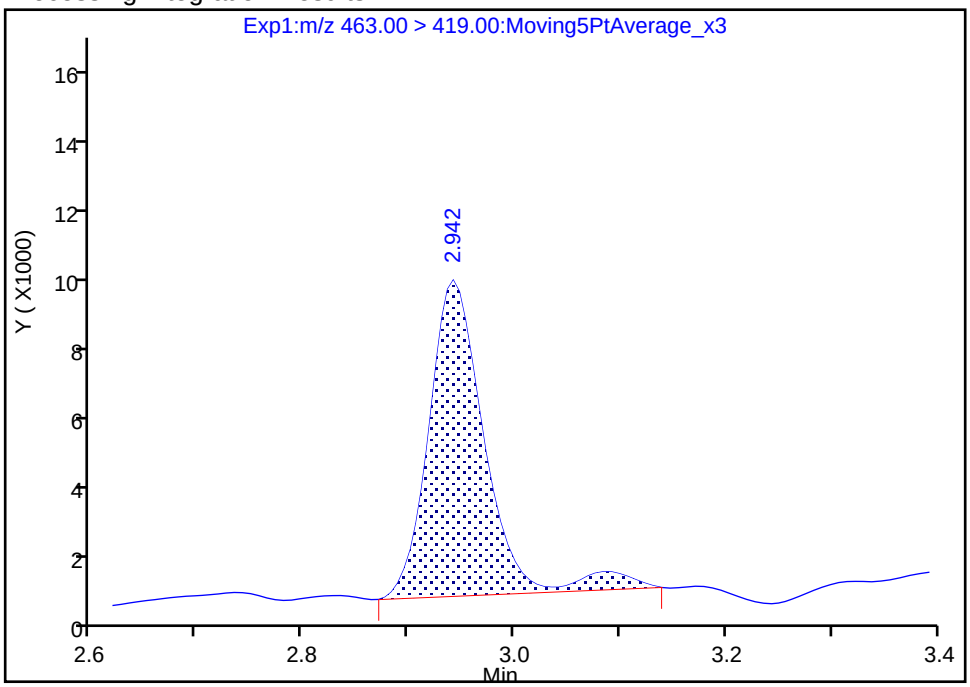
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_019.d				
Injection Date:	30-Jul-2018 05:18:28	Instrument ID:	A8_N		
Lims ID:	320-41149-A-13-A	Lab Sample ID:	320-41149-13		
Client ID:	GRE03-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

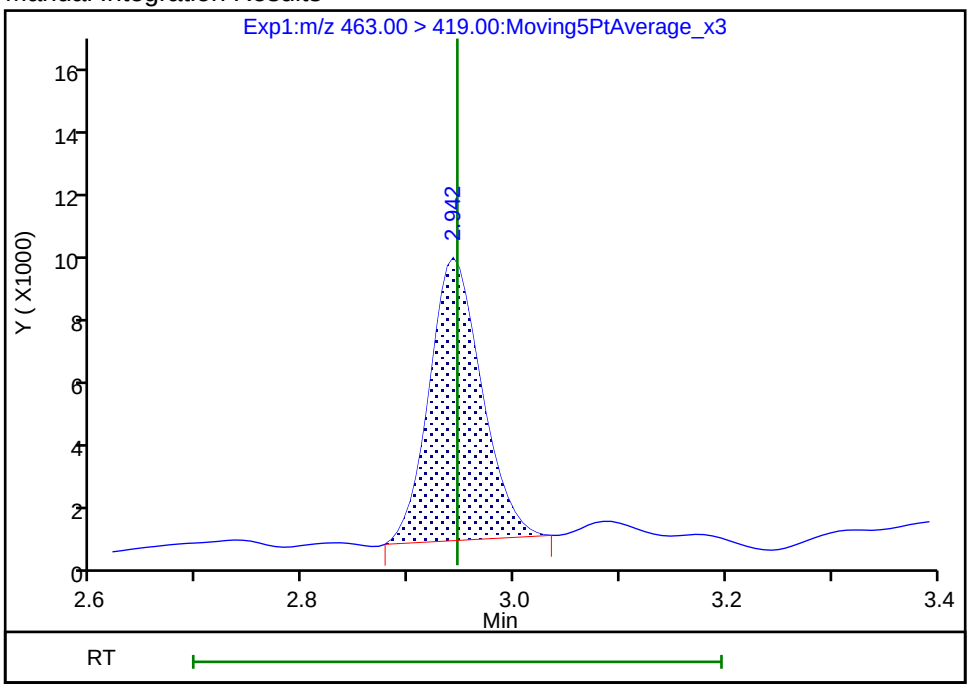
Processing Integration Results

RT: 2.94
Area: 32567
Amount: 0.020276
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 29855
Amount: 0.018587
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:00:44

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB3-02 | Lab Sample ID: 320-41149-14

Matrix: Solid | Lab File ID: 2018.07.30LLA_020.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/10/2018 11:05

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.05(g) | Date Analyzed: 07/30/2018 05:26

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 7.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.11	J	0.32	0.21	0.084
335-67-1	Perfluorooctanoic acid (PFOA)	0.47		0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.21	U	0.32	0.21	0.087
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.43	0.19	0.063
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.23	J	0.32	0.21	0.066
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.57	J	1.1	0.54	0.26

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	89		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	90		50-150
STL00994	18O2 PFHxS	90		50-150
STL00991	13C4 PFOS	92		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_020.d
Lims ID: 320-41149-A-14-A
Client ID: GRE03-SB3-02
Sample Type: Client
Inject. Date: 30-Jul-2018 05:26:22 ALS Bottle#: 14 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-14-
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:00:48 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:01:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.671	-0.004	1.000	52686	0.0196			173	
298.90 > 99.00	1.667	1.671	-0.004	1.000	20967		2.51(1.25-3.74)		82.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.674	-0.007	0.648	78722	2.06		88.6	505	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.231	2.225	0.005	1.005	84765	0.0512			181	
363.00 > 169.00	2.231	2.225	0.005	1.005	34658		2.45(1.13-3.40)		657	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.237	0.005	1.000	253774	0.1066			2543	
399.00 > 99.00	2.242	2.237	0.005	1.000	83710		3.03(1.50-4.49)		249	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.240	-0.021	0.862	3755172	2.13		85.3	58731	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.253	-0.011	0.871	4824562	2.13		90.2	82906	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.579	-0.005		4500328	2.50			72924	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.582	2.579	0.003	1.003	395421	0.2171			468	
413.00 > 169.00	2.582	2.579	0.003	1.003	219895		1.80(0.84-2.52)		1343	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.588	-0.014	1.000	3752469	2.18		87.2	70591	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.944	2.946	-0.002	1.000	423605	0.2659			6507	
499.00 > 99.00	2.939	2.946	-0.007	0.998	92555		4.58(2.31-6.93)		877	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.946	-0.007	0.998	11273	0.007372			34.4	
463.00 > 169.00	2.944	2.946	-0.002	1.000	2967		3.80(1.90-5.69)		93.7	

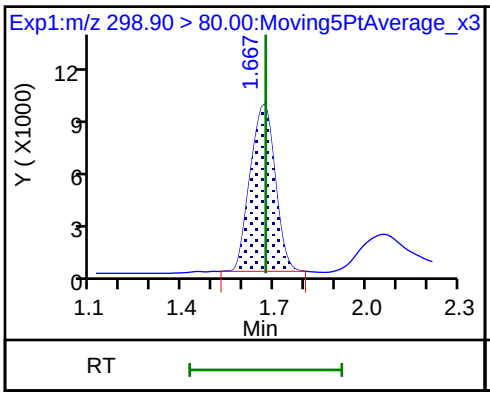
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.953	-0.009	1.144	3348263	2.25		90.2	58161	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.953	-0.009	1.144	3445467	2.19		91.7	61122	

Report Date: 31-Jul-2018 10:01:16 Chrom Revision: 2.3 19-Jul-2018 15:14:50

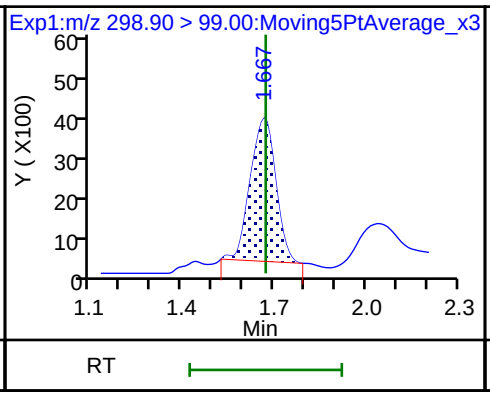
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_020.d				
Injection Date:	30-Jul-2018 05:26:22	Instrument ID:	A8_N		
Lims ID:	320-41149-A-14-A	Lab Sample ID:	320-41149-14		
Client ID:	GRE03-SB3-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

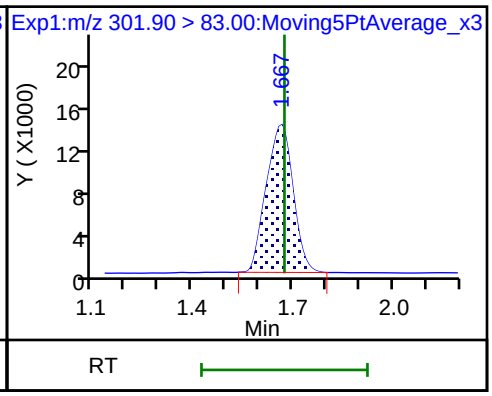
5 Perfluorobutanesulfonic acid



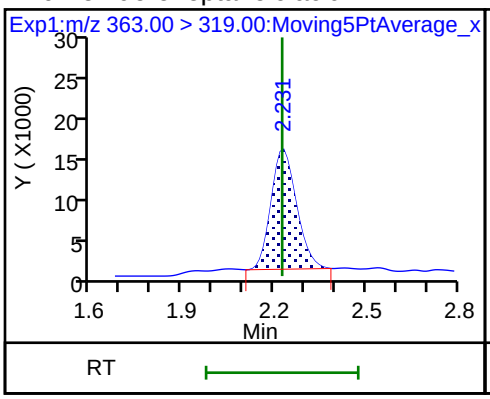
5 Perfluorobutanesulfonic acid



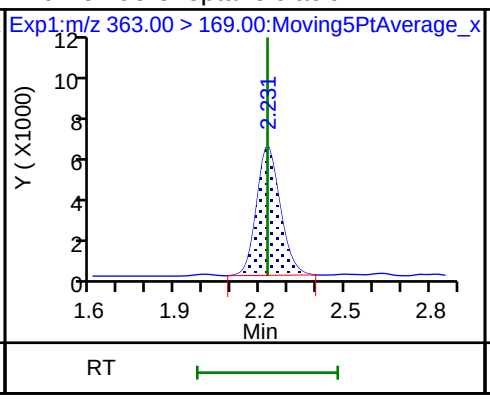
D 47 13C3-PFBS



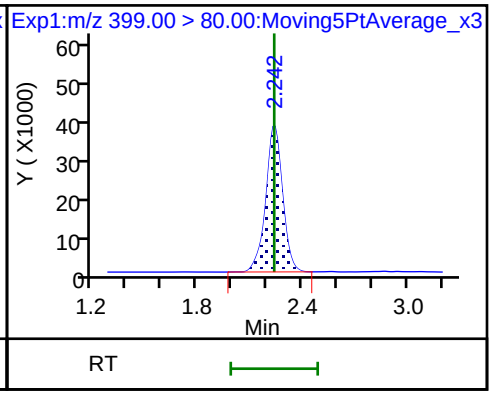
10 Perfluoroheptanoic acid



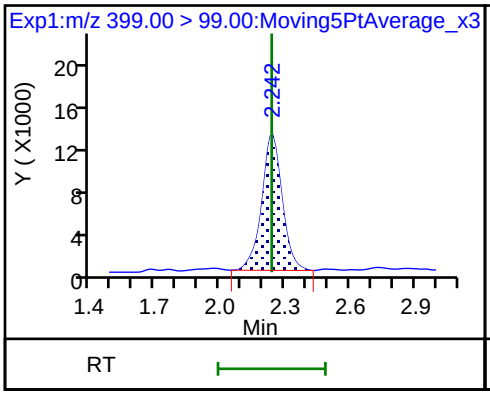
10 Perfluoroheptanoic acid



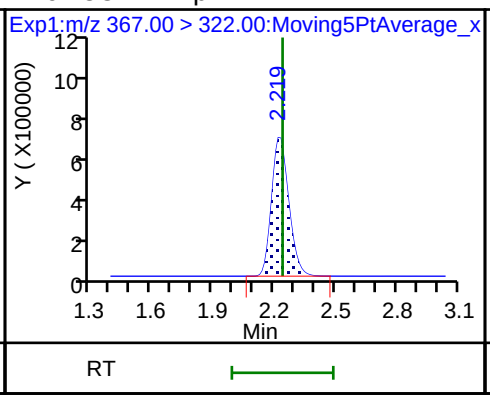
8 Perfluorohexanesulfonic acid



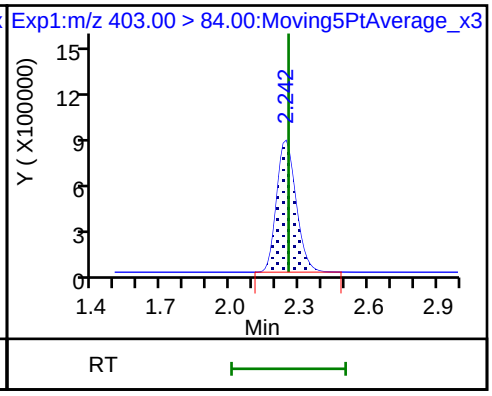
8 Perfluorohexanesulfonic acid



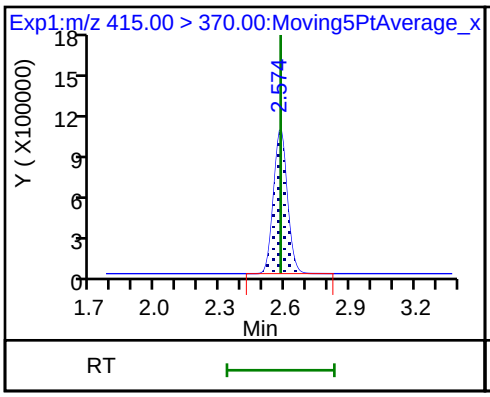
D 9 13C4-PFHpA



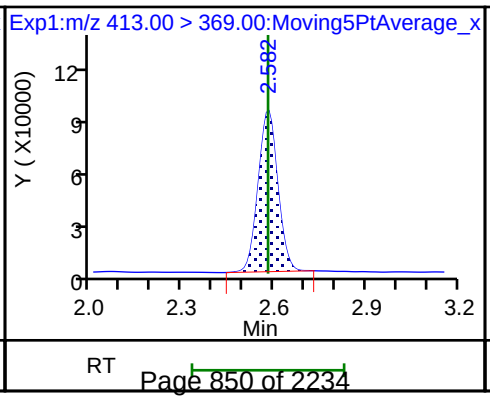
D 11 18O2 PFHxS



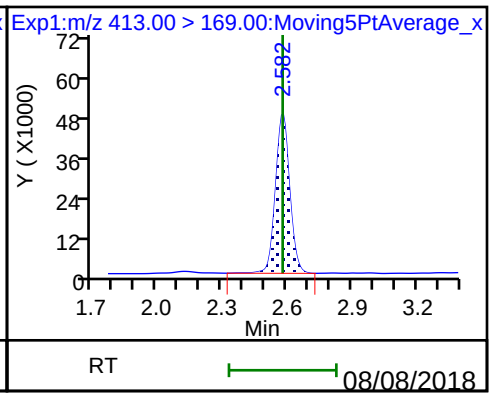
* 62 13C2-PFOA



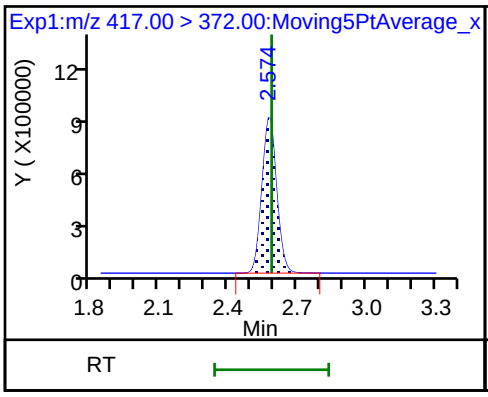
15 Perfluorooctanoic acid



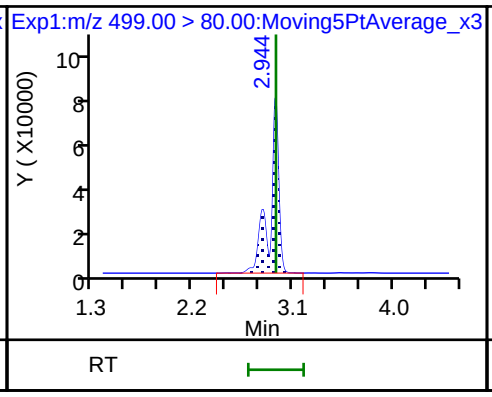
15 Perfluorooctanoic acid



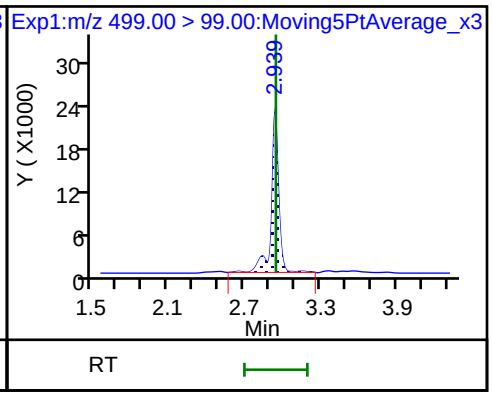
D 14 13C4 PFOA



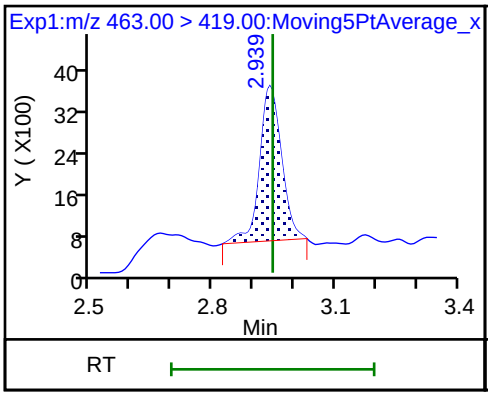
17 Perfluorooctane sulfonic acid



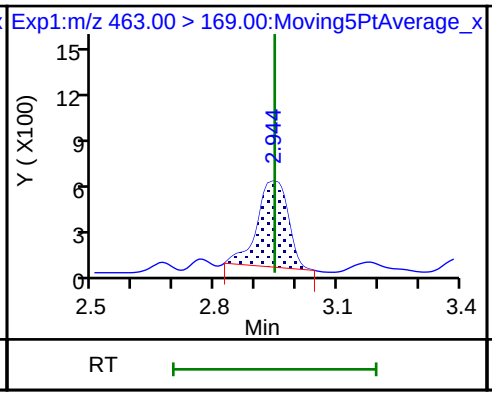
17 Perfluorooctane sulfonic acid



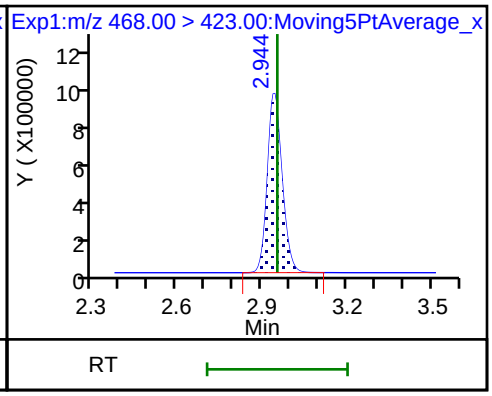
20 Perfluorononanoic acid



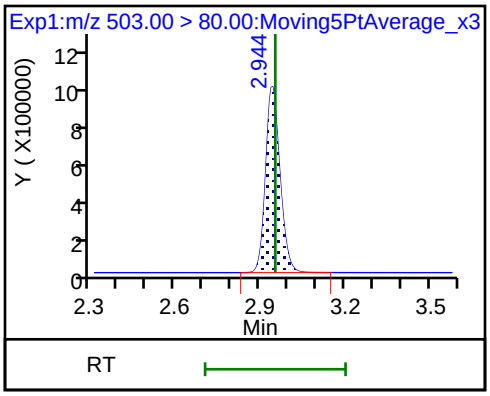
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE04-SB1-01
Lab Sample ID: 320-41149-15
Matrix: Solid
Lab File ID: 2018.07.30LLA_021.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/10/2018 11:45
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.09(g)
Date Analyzed: 07/30/2018 05:34
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 5.2
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21	U	0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	0.11	J	0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.21	U M	0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.45		0.31	0.21	0.064
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	8.5	M	1.0	0.52	0.25

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	96		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	96		50-150
STL00994	18O2 PFHxS	96		50-150
STL00991	13C4 PFOS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_021.d
Lims ID: 320-41149-A-15-A
Client ID: GRE04-SB1-01
Sample Type: Client
Inject. Date: 30-Jul-2018 05:34:14 ALS Bottle#: 15 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-15-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:02:04 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:02:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.663	1.674	-0.012	0.647	82686	2.23		95.7	558	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.214	2.225	-0.011	1.000	13501	0.007677			19.9	
363.00 > 169.00	2.214	2.225	-0.011	1.000	5581		2.42(1.13-3.40)		104	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.226	2.237	-0.011	0.995	534139	0.2169			1747	
399.00 > 99.00	2.226	2.237	-0.011	0.995	173822		3.07(1.50-4.49)		598	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.240	-0.026	0.861	3987915	2.33		93.2	99601	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.870	4991220	2.27		96.0	71478	
* 62 13C2-PFOA										
415.00 > 370.00	2.571	2.579	-0.008		4375264	2.50			71369	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.571	2.579	-0.008	1.000	97424	0.0527			87.3	
413.00 > 169.00	2.579	2.579	0.0	1.003	63604		1.53(0.84-2.52)		402	
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.588	-0.017	1.000	3809519	2.28		91.0	62055	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.935	2.946	-0.011	1.000	6437512	4.11			13248	M
499.00 > 99.00	2.935	2.946	-0.011	1.000	1565037		4.11(2.31-6.93)		12881	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.935	2.946	-0.011	1.000	14074	0.008887			32.4	M
463.00 > 169.00	2.935	2.946	-0.011	1.000	2967		4.74(1.90-5.69)		135	
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.953	-0.018	1.142	3467697	2.40		96.1	70214	
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.953	-0.018	1.142	3390407	2.22		92.8	27018	

QC Flag Legend

Review Flags

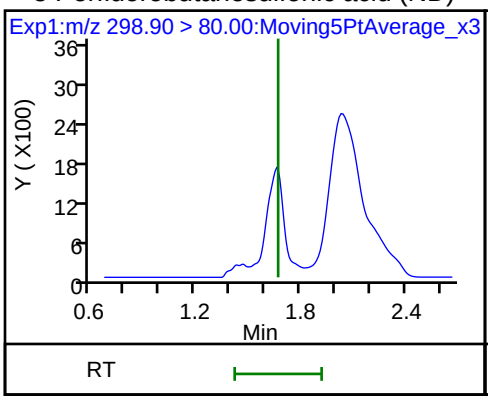
M - Manually Integrated

Report Date: 31-Jul-2018 10:02:06 Chrom Revision: 2.3 19-Jul-2018 15:14:50

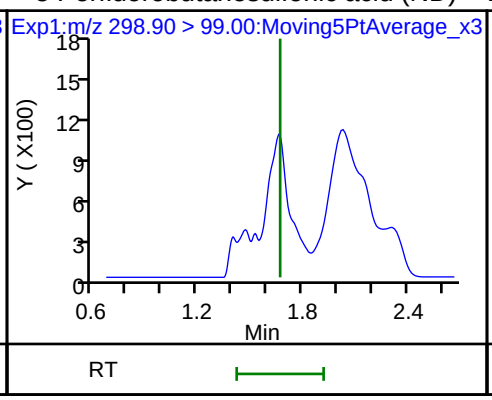
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_021.d				
Injection Date:	30-Jul-2018 05:34:14	Instrument ID:	A8_N		
Lims ID:	320-41149-A-15-A	Lab Sample ID:	320-41149-15		
Client ID:	GRE04-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

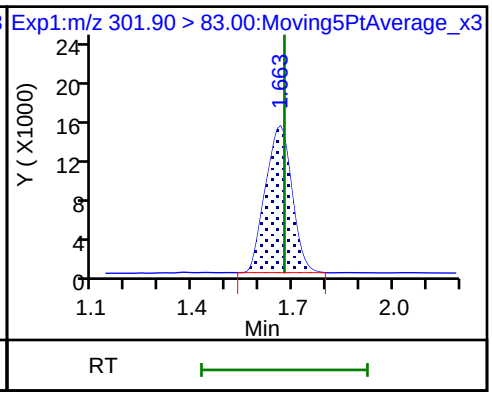
5 Perfluorobutanesulfonic acid (ND)



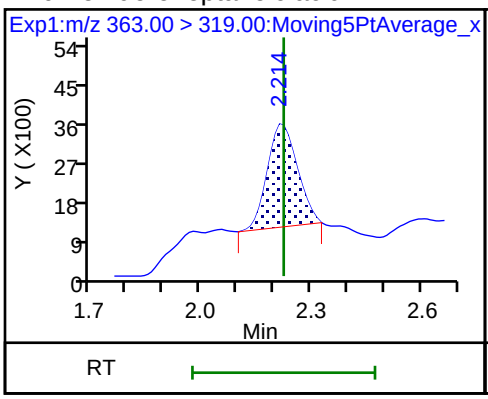
5 Perfluorobutanesulfonic acid (ND)



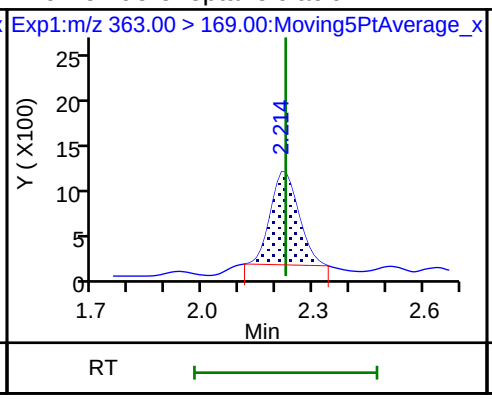
D 47 13C3-PFBS



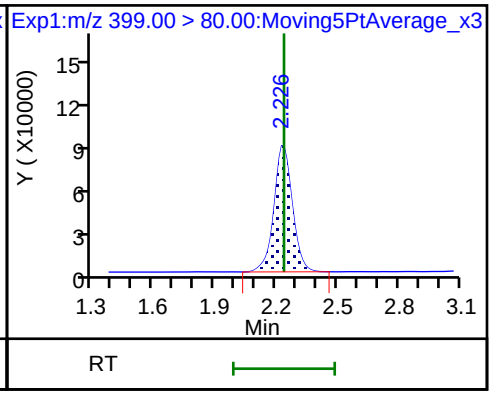
10 Perfluoroheptanoic acid



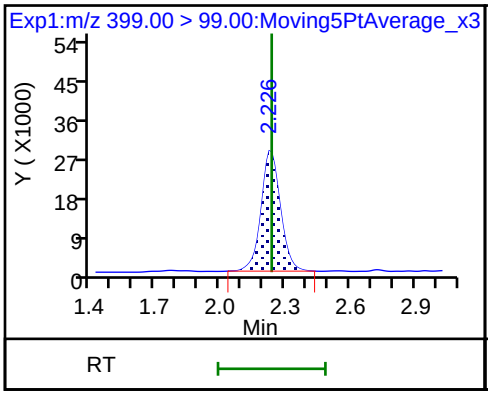
10 Perfluoroheptanoic acid



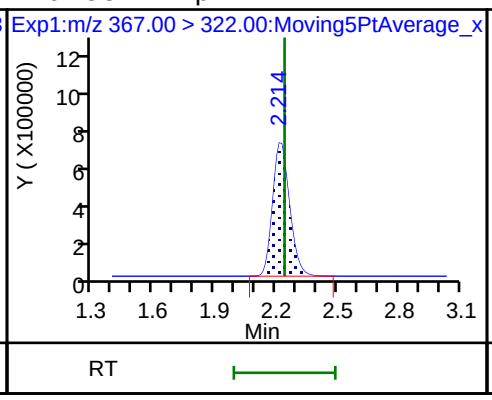
8 Perfluorohexanesulfonic acid



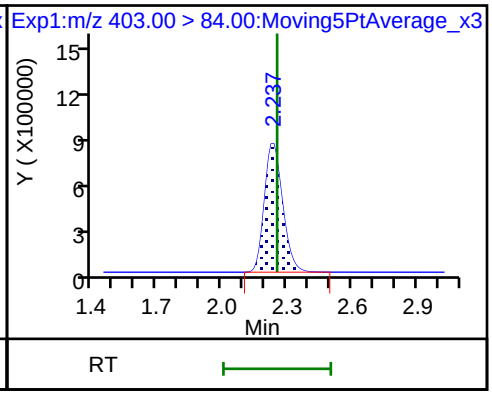
8 Perfluorohexanesulfonic acid



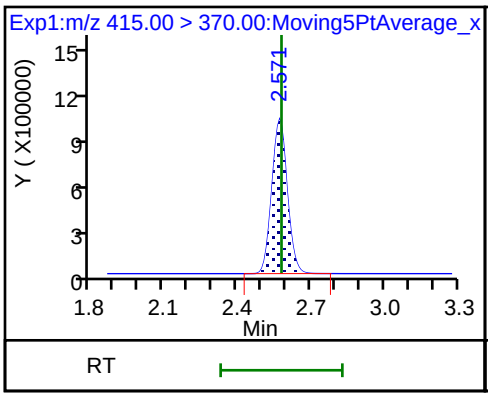
D 9 13C4-PFHpA



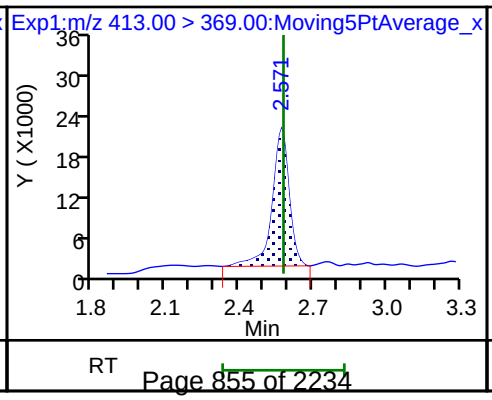
D 11 18O2 PFHxS



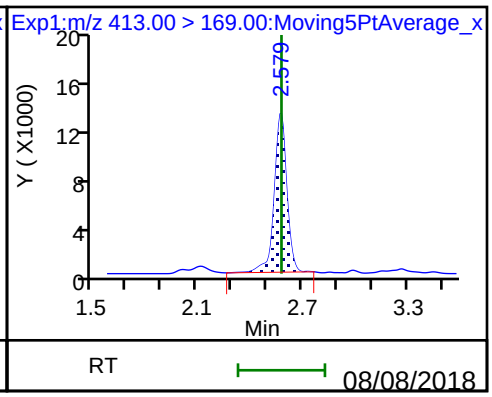
* 62 13C2-PFOA



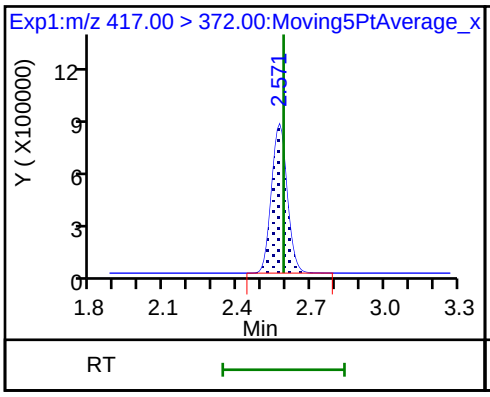
15 Perfluorooctanoic acid



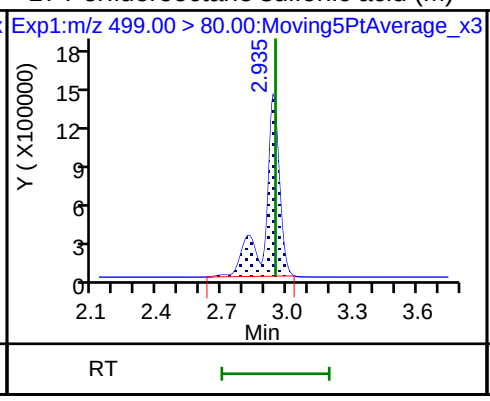
15 Perfluorooctanoic acid



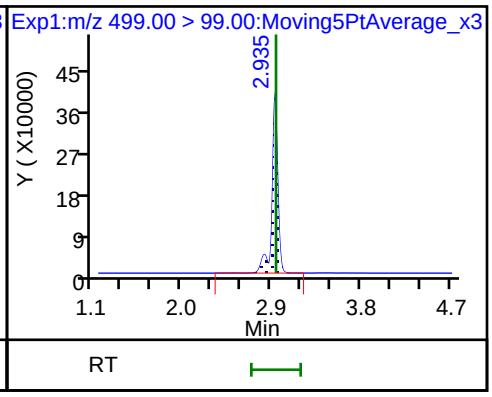
D 14 13C4 PFOA



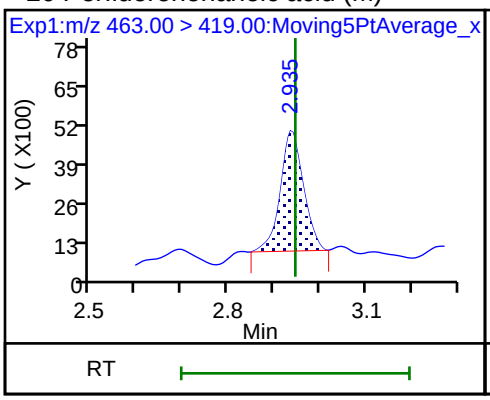
17 Perfluorooctane sulfonic acid (M)



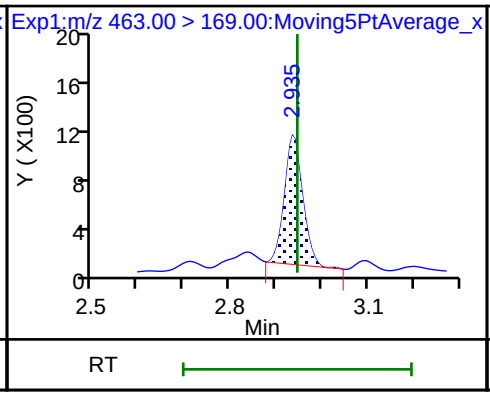
17 Perfluorooctane sulfonic acid



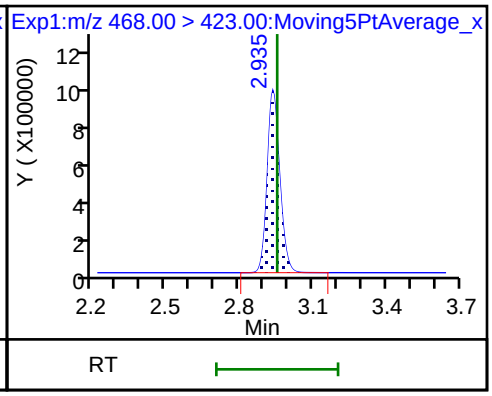
20 Perfluorononanoic acid (M)



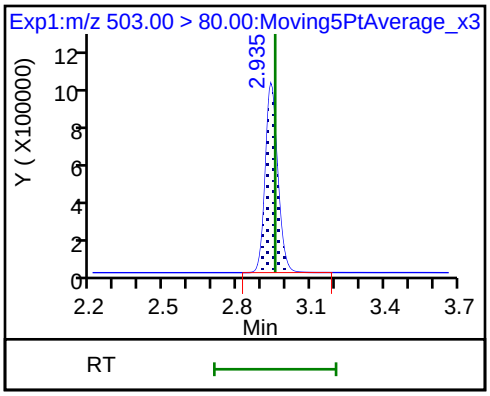
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

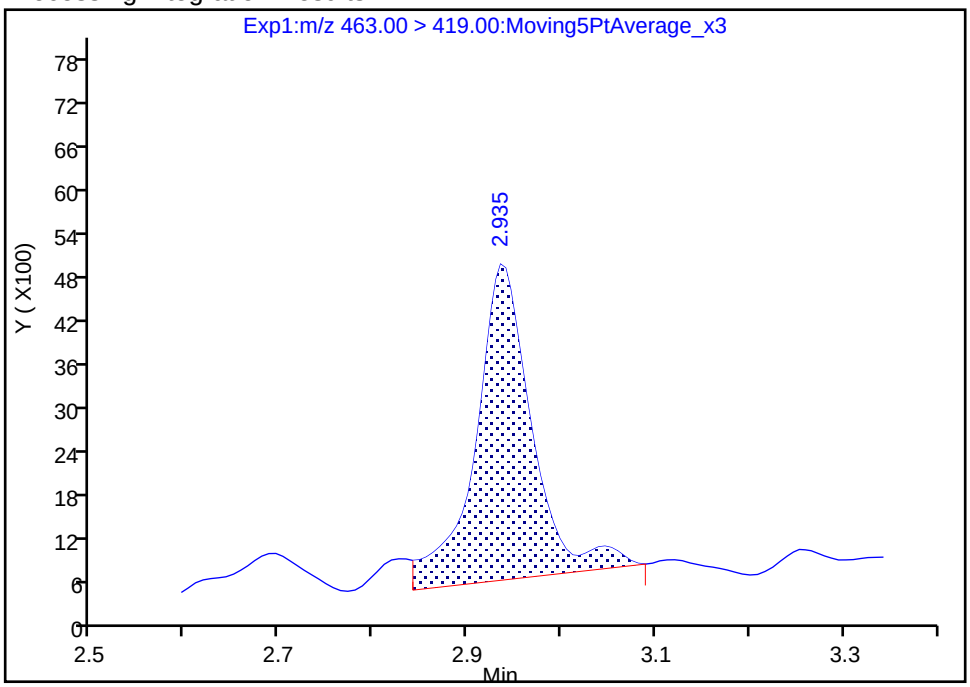
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_021.d				
Injection Date:	30-Jul-2018 05:34:14	Instrument ID:	A8_N		
Lims ID:	320-41149-A-15-A	Lab Sample ID:	320-41149-15		
Client ID:	GRE04-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

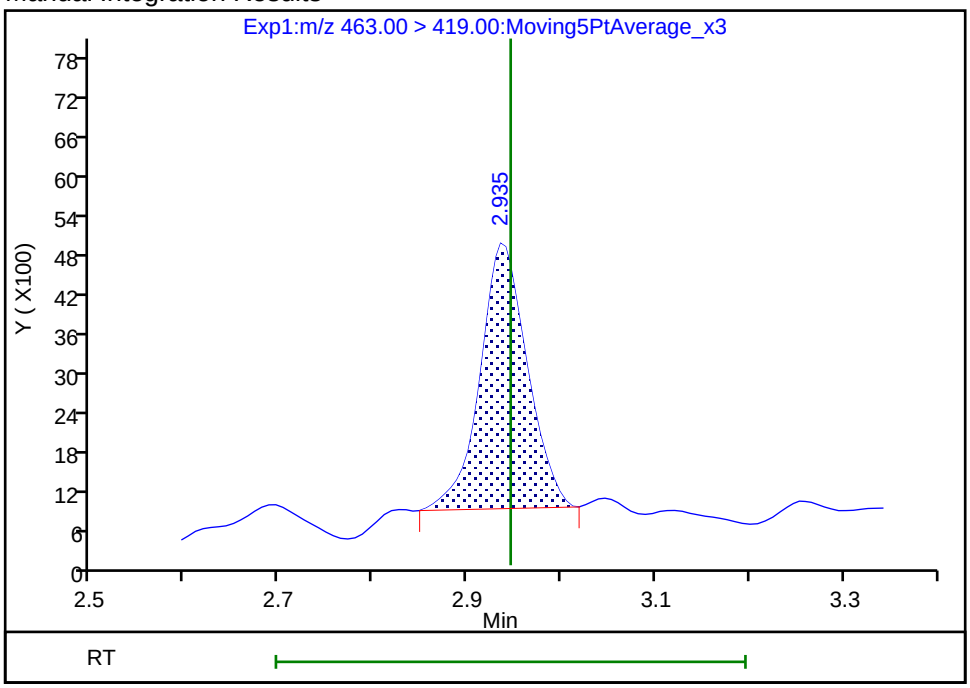
Processing Integration Results

RT: 2.94
Area: 18245
Amount: 0.011521
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 14074
Amount: 0.008887
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:02:01

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

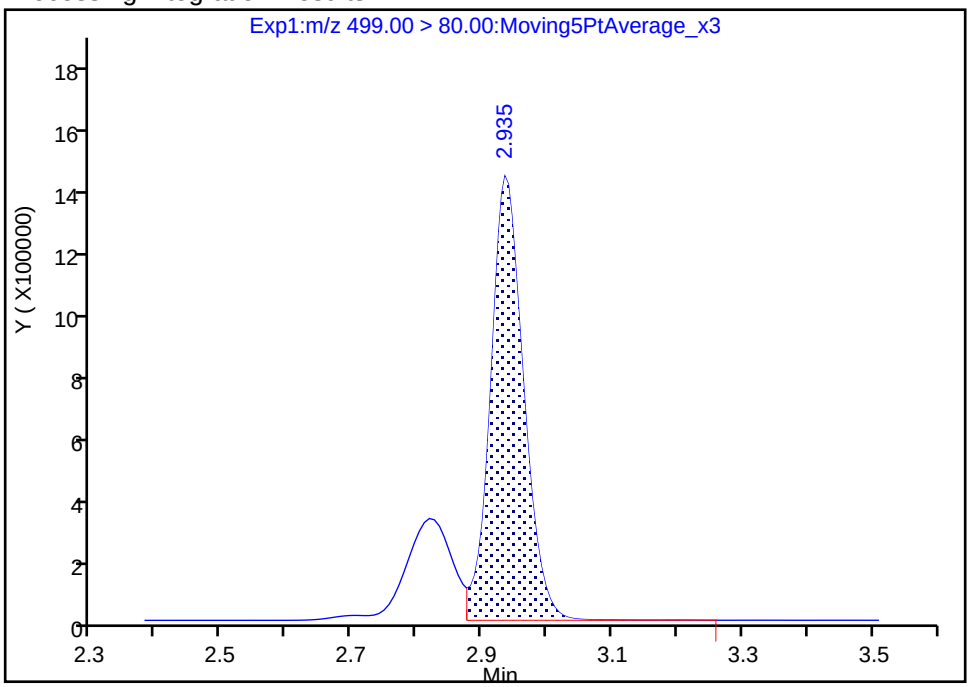
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_021.d				
Injection Date:	30-Jul-2018 05:34:14	Instrument ID:	A8_N		
Lims ID:	320-41149-A-15-A	Lab Sample ID:	320-41149-15		
Client ID:	GRE04-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

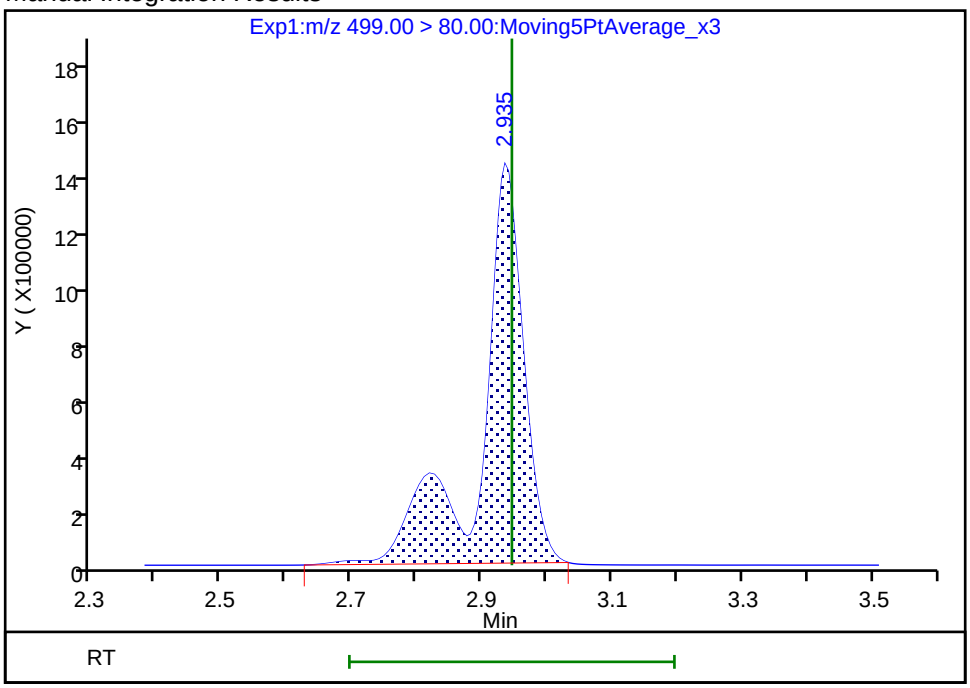
Processing Integration Results

RT: 2.94
Area: 4962562
Amount: 3.165887
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 6437512
Amount: 4.106838
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:01:47

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE06-SB1-01 | Lab Sample ID: 320-41149-16

Matrix: Solid | Lab File ID: 2018.07.30LLA_022.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 13:05

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.04(g) | Date Analyzed: 07/30/2018 05:42

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 10.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.35		0.33	0.22	0.086
335-67-1	Perfluorooctanoic acid (PFOA)	4.4		0.33	0.22	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.17	J	0.33	0.22	0.090
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.24	J	0.44	0.20	0.065
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.4		0.33	0.22	0.069
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*51*	*M E*	*1.1*	0.55	*0.27*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	94		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	84		50-150
STL00994	18O2 PFHxS	97		50-150
STL00991	13C4 PFOS	90		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_022.d
Lims ID: 320-41149-A-16-A
Client ID: GRE06-SB1-01
Sample Type: Client
Inject. Date: 30-Jul-2018 05:42:06 ALS Bottle#: 16 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-16-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:02:47 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:02:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.671	-0.004	1.000	290270	0.1088			729	
298.90 > 99.00	1.667	1.671	-0.004	1.000	128923		2.25(1.25-3.74)		428	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.674	-0.007	0.647	78163	2.18		93.8	543	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.225	-0.006	1.000	263016	0.1559			306	
363.00 > 169.00	2.219	2.225	-0.006	1.000	110201		2.39(1.13-3.40)		1432	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.237	-0.007	1.000	3650570	1.52			6191	
399.00 > 99.00	2.230	2.237	-0.007	1.000	1165515		3.13(1.50-4.49)		3661	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.240	-0.021	0.862	3826575	2.32		92.6	60818	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.253	-0.023	0.866	4860744	2.29		96.8	84114	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.579	-0.005		4223716	2.50			53808	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.579	-0.005	1.000	3582203	1.99			2357	
413.00 > 169.00	2.574	2.579	-0.005	1.000	1982757		1.81(0.84-2.52)		8508	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.588	-0.014	1.000	3705166	2.29		91.7	60333	
17 Perfluorooctane sulfonic acid										EM
499.00 > 80.00	2.938	2.946	-0.008	1.000	33824268	23.2			24482	EM
499.00 > 99.00	2.938	2.946	-0.008	1.000	9082053		3.72(2.31-6.93)		58842	
20 Perfluorononanoic acid										
463.00 > 419.00	2.938	2.946	-0.008	1.000	104115	0.0783			148	
463.00 > 169.00	2.938	2.946	-0.008	1.000	22575		4.61(1.90-5.69)		477	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.938	2.953	-0.015	1.142	2913291	2.09		83.6	46646	
D 18 13C4 PFOS										
503.00 > 80.00	2.938	2.953	-0.015	1.142	3158128	2.14		89.5	11103	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

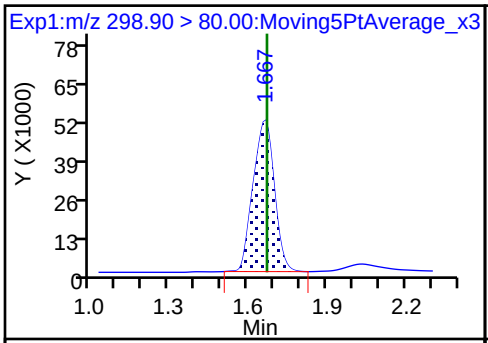
M - Manually Integrated

Report Date: 31-Jul-2018 10:02:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

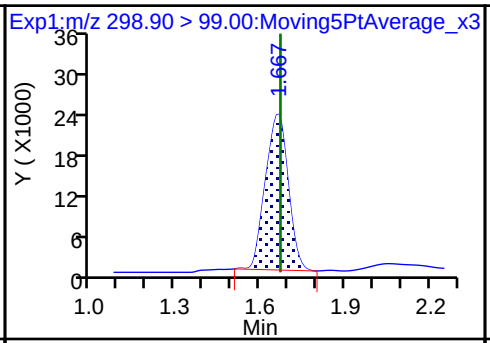
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_022.d				
Injection Date:	30-Jul-2018 05:42:06	Instrument ID:	A8_N		
Lims ID:	320-41149-A-16-A	Lab Sample ID:	320-41149-16		
Client ID:	GRE06-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	16	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

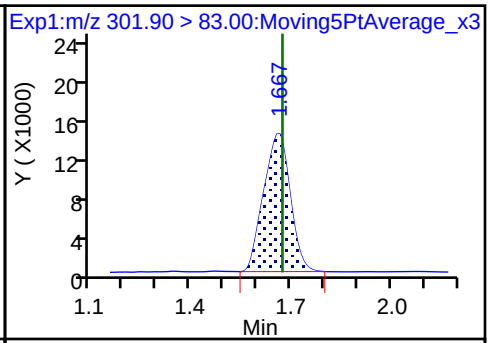
5 Perfluorobutanesulfonic acid



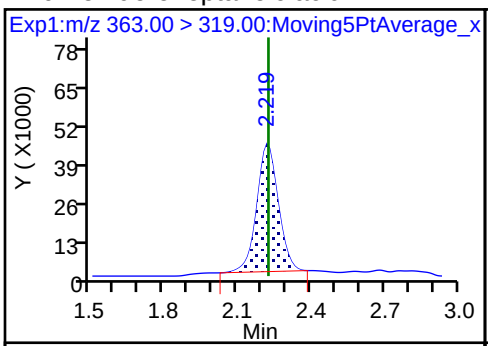
5 Perfluorobutanesulfonic acid



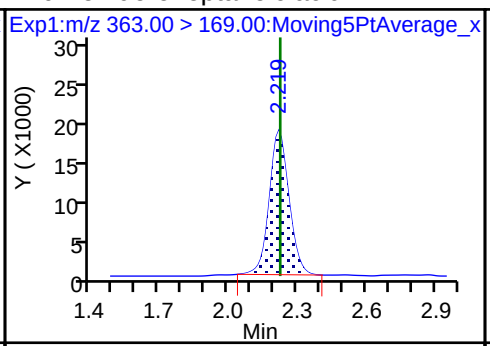
D 47 13C3-PFBS



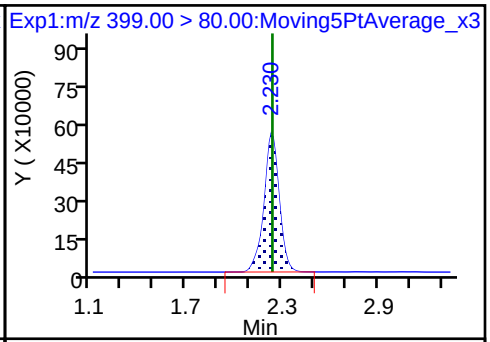
10 Perfluoroheptanoic acid



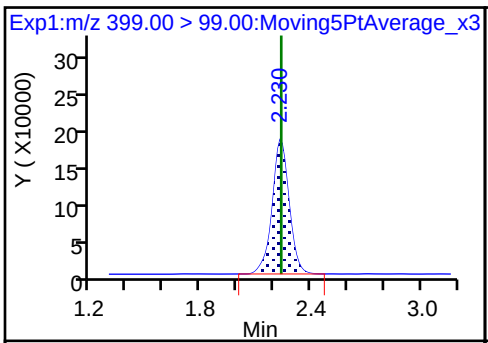
10 Perfluoroheptanoic acid



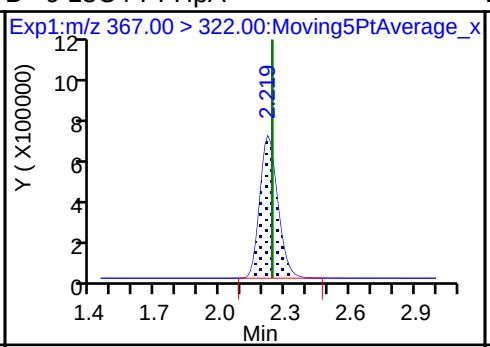
8 Perfluorohexanesulfonic acid



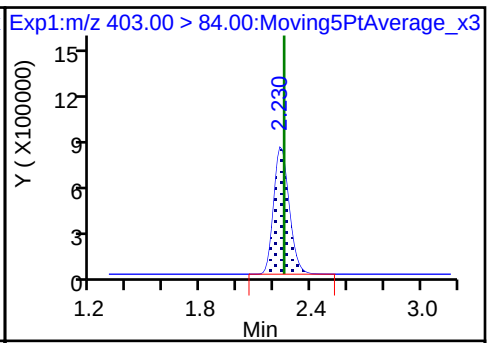
8 Perfluorohexanesulfonic acid



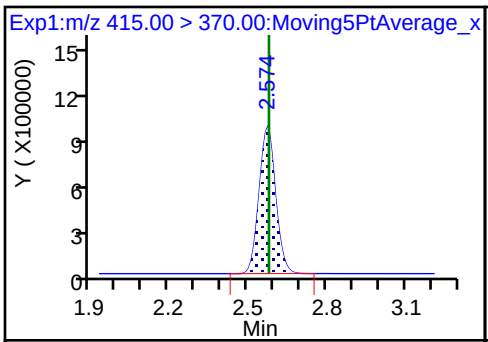
D 9 13C4-PFHpA



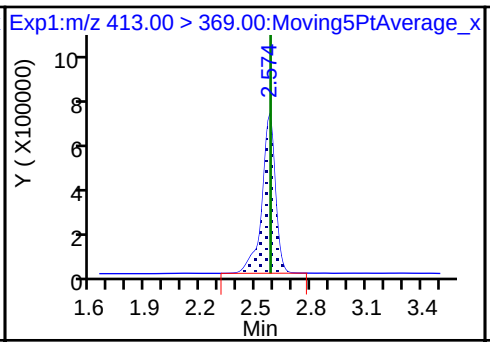
D 11 18O2 PFHxS



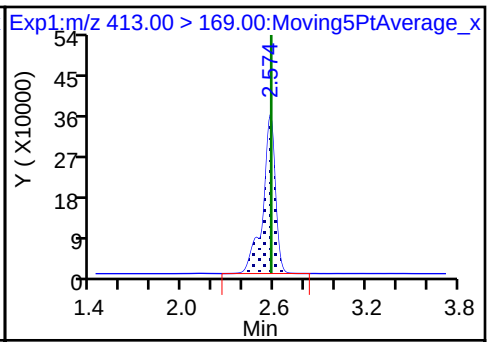
* 62 13C2-PFOA



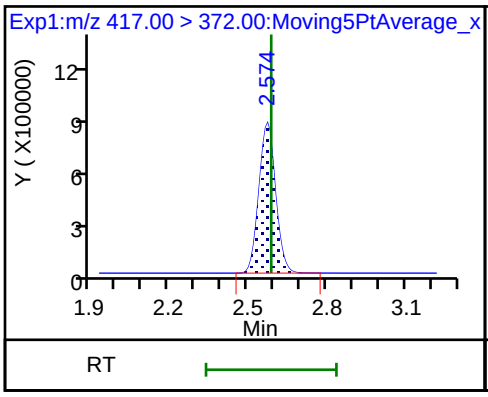
15 Perfluorooctanoic acid



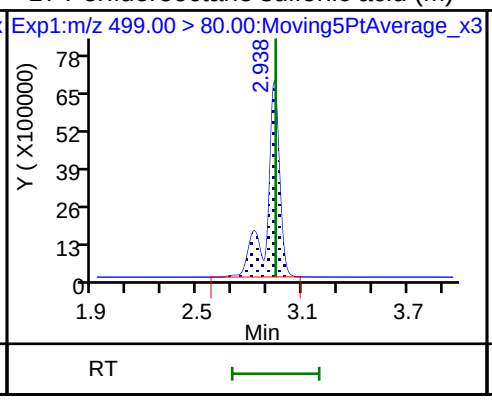
15 Perfluorooctanoic acid



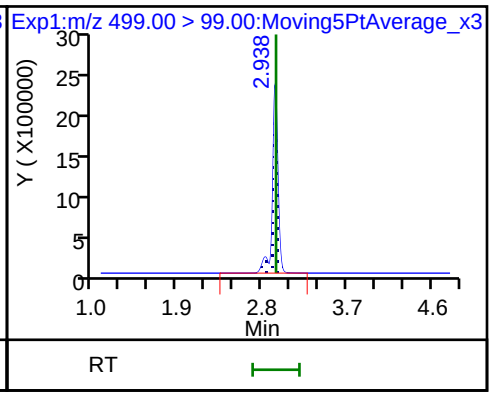
D 14 13C4 PFOA



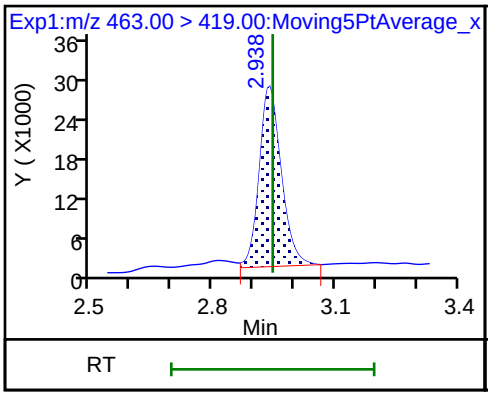
17 Perfluorooctane sulfonic acid (M)



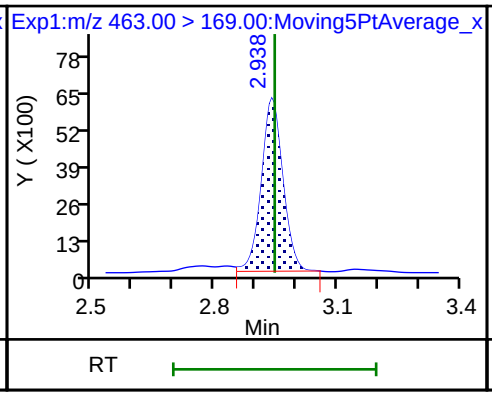
17 Perfluorooctane sulfonic acid



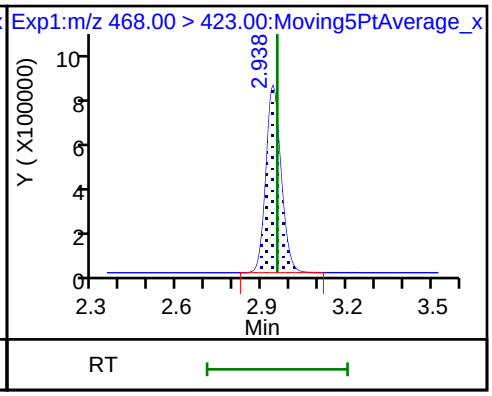
20 Perfluorononanoic acid



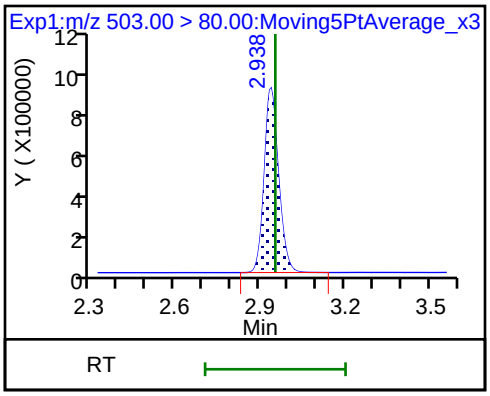
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

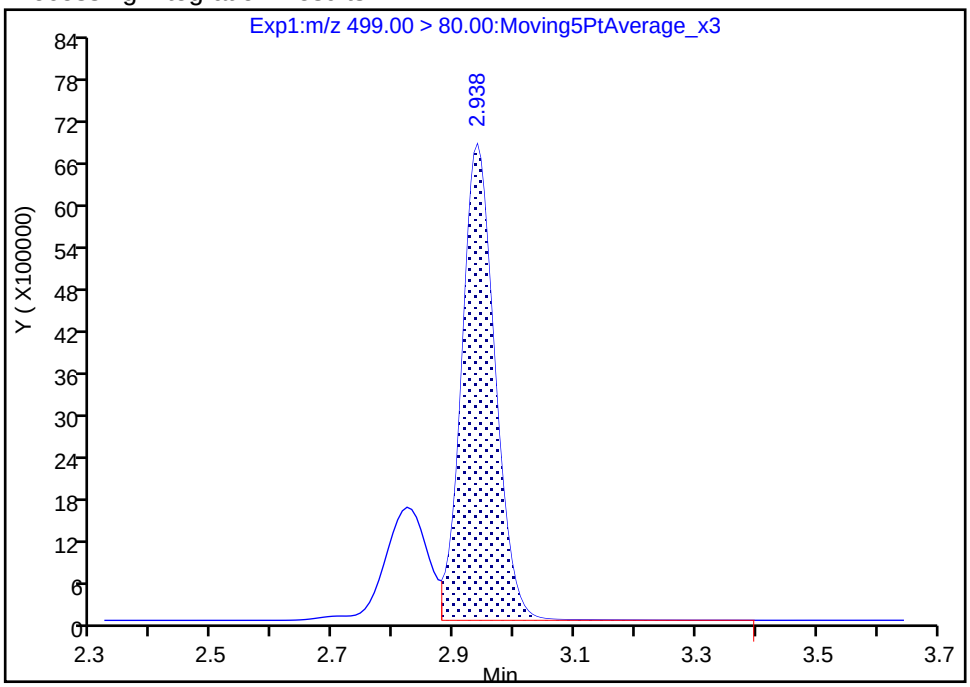
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_022.d				
Injection Date:	30-Jul-2018 05:42:06	Instrument ID:	A8_N		
Lims ID:	320-41149-A-16-A	Lab Sample ID:	320-41149-16		
Client ID:	GRE06-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	16	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

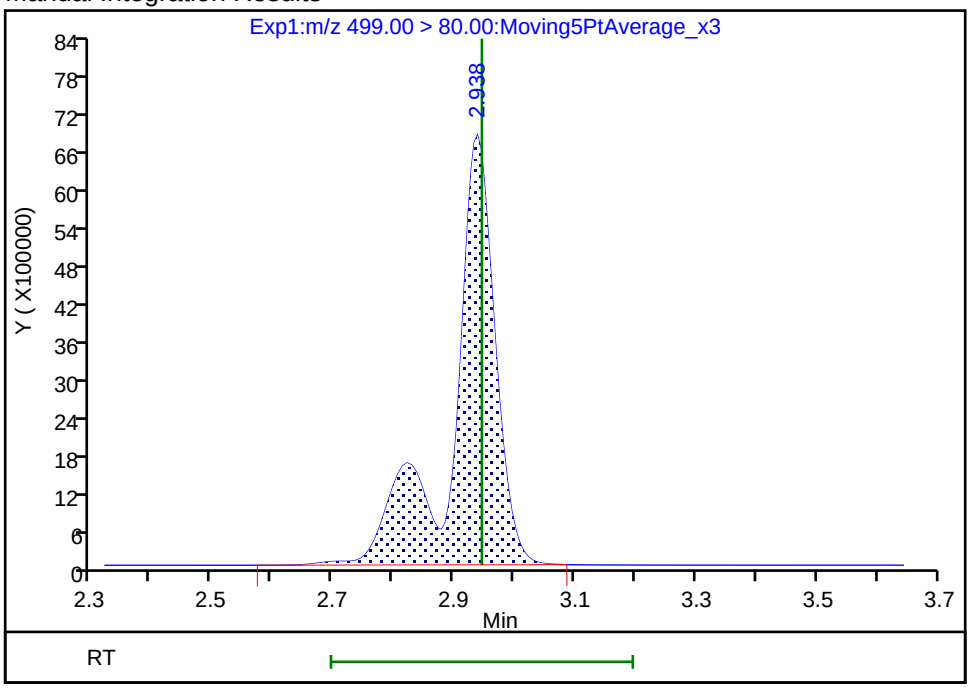
Processing Integration Results

RT: 2.94
Area: 25976445
Amount: 17.790630
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 33824268
Amount: 23.165412
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:02:43

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE06-SB1-01 DL | Lab Sample ID: 320-41149-16 DL

Matrix: Solid | Lab File ID: 2018.08.01LLB_015.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 13:05

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.04(g) | Date Analyzed: 08/01/2018 15:27

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 10.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.2*	*U*	*3.3*	2.2	*0.86*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*4.2*	*D*	*3.3*	2.2	*1.1*
375-95-1	*Perfluorononanoic acid (PFNA)*	*2.2*	*U*	*3.3*	2.2	*0.90*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*2.0*	*U*	*4.4*	2.0	*0.65*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*3.4*	*D*	*3.3*	2.2	*0.69*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	60	D M	11	5.5	2.7

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	76		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	96		50-150
STL00995	13C5 PFNA	89		50-150
STL00994	18O2 PFHxS	84		50-150
STL00991	13C4 PFOS	77		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_015.d
Lims ID: 320-41149-A-16-A
Client ID: GRE06-SB1-01
Sample Type: Client
Inject. Date: 01-Aug-2018 15:27:37 ALS Bottle#: 7 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-16-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:23:35 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:23:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.662	1.662	0.0	1.000	30400	0.0125			170	
298.90 > 99.00	1.662	1.662	0.0	1.000	13909		2.19(1.25-3.74)		60.3	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.669	-0.007	0.645	7395	0.1761		75.8	27.6	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.214	2.214	0.0	0.995	23807	0.0145			9.1	
363.00 > 169.00	2.225	2.214	0.011	1.000	9715		2.45(1.13-3.40)		107	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.225	0.0	0.863	353337	0.2308		92.3	12109	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.225	0.012	1.000	341739	0.1531			1217	
399.00 > 99.00	2.237	2.225	0.012	1.000	114168		2.99(1.50-4.49)		180	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.238	-0.001	0.868	456788	0.1985		84.0	12862	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.571	0.008	1.003	308739	0.1885			144	
413.00 > 169.00	2.579	2.571	0.008	1.003	178480		1.73(0.84-2.52)		848	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.571	0.008		384986	0.2500			12208	
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.580	-0.009	0.997	354217	0.2396		95.8	13246	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.940	2.935	0.005	1.000	3711919	2.70			21413	M
499.00 > 99.00	2.940	2.935	0.005	1.000	877623		4.23(2.31-6.93)		6724	
20 Perfluorononanoic acid										
463.00 > 419.00	2.935	2.935	0.0	0.998	11659	0.009435			23.5	
463.00 > 169.00	2.940	2.935	0.005	1.000	3440		3.39(1.90-5.69)		102	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.946	-0.006	1.140	292599	0.1841		77.0	5862	
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.948	-0.008	1.140	286079	0.2221		88.8	8845	

QC Flag Legend

Review Flags

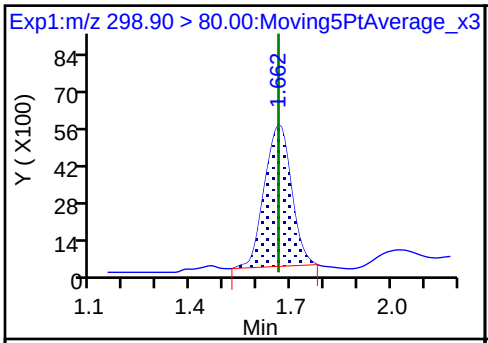
M - Manually Integrated

Report Date: 02-Aug-2018 13:23:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

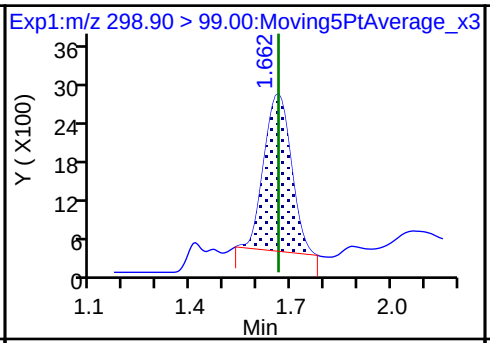
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_015.d				
Injection Date:	01-Aug-2018 15:27:37	Instrument ID:	A8_N		
Lims ID:	320-41149-A-16-A	Lab Sample ID:	320-41149-16		
Client ID:	GRE06-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

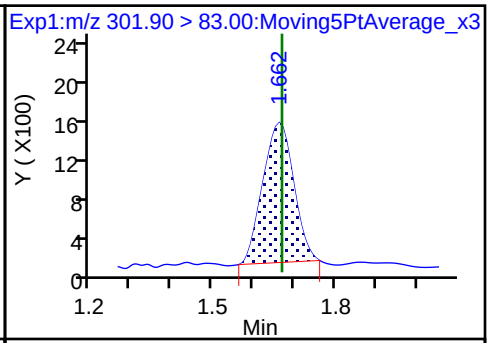
5 Perfluorobutanesulfonic acid



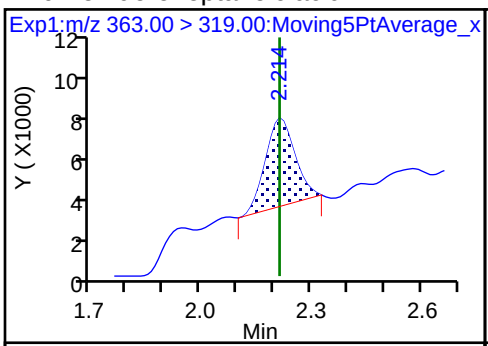
5 Perfluorobutanesulfonic acid



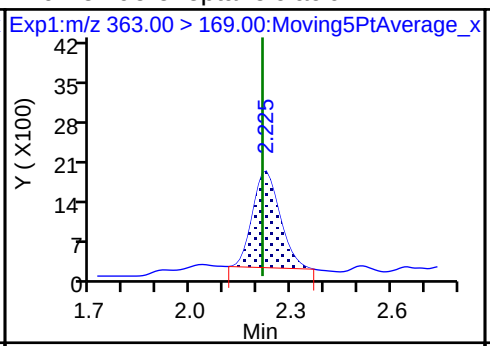
D 47 13C3-PFBS



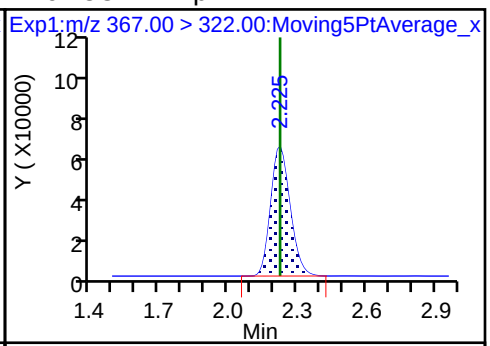
10 Perfluoroheptanoic acid



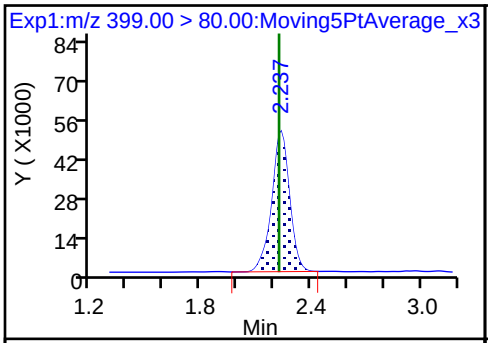
10 Perfluoroheptanoic acid



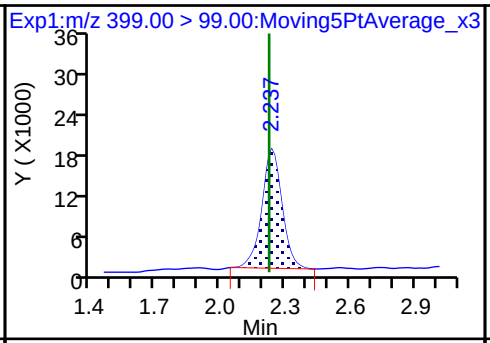
D 9 13C4-PFHpA



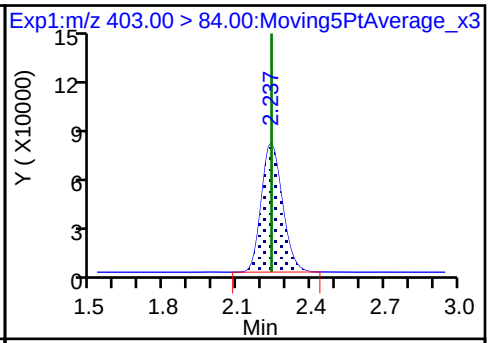
8 Perfluorohexanesulfonic acid



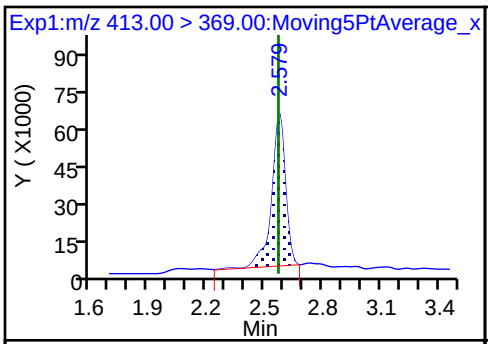
8 Perfluorohexanesulfonic acid



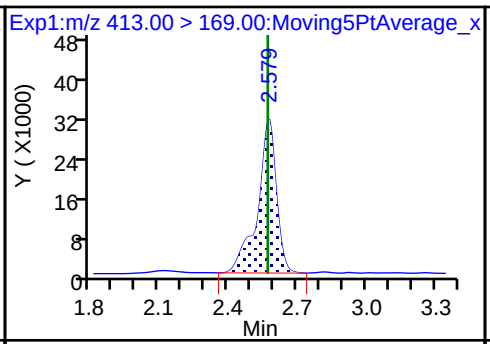
D 11 18O2 PFHxS



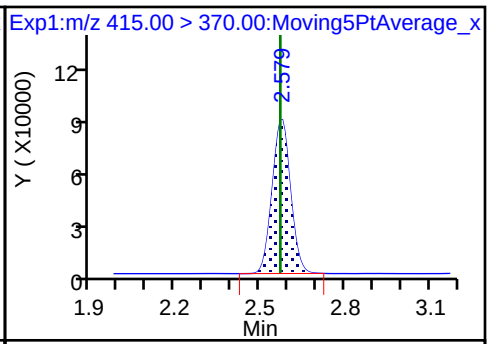
15 Perfluorooctanoic acid



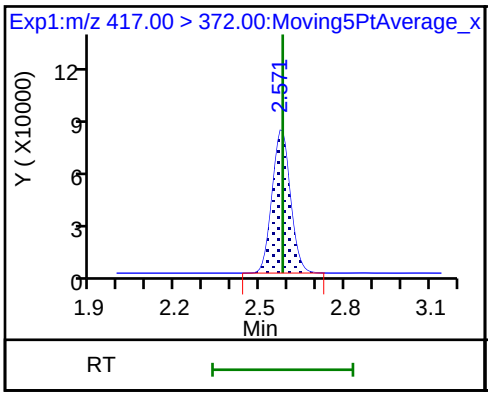
15 Perfluorooctanoic acid



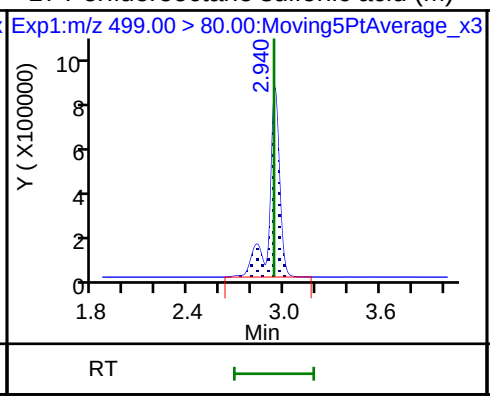
* 62 13C2-PFOA



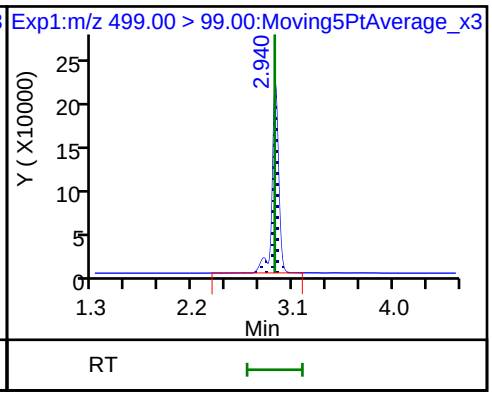
D 14 13C4 PFOA



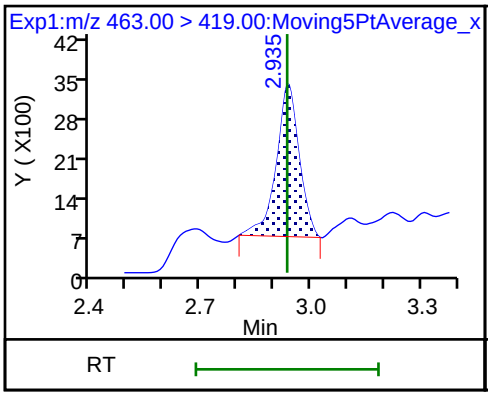
17 Perfluorooctane sulfonic acid (M)



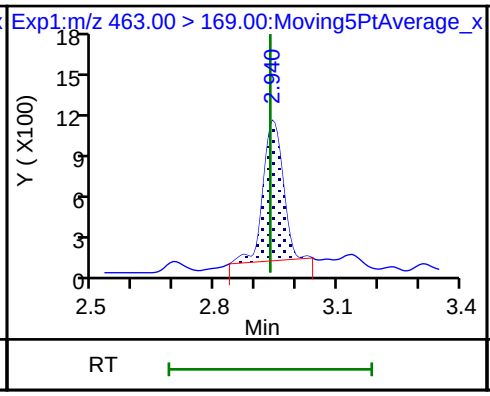
17 Perfluorooctane sulfonic acid



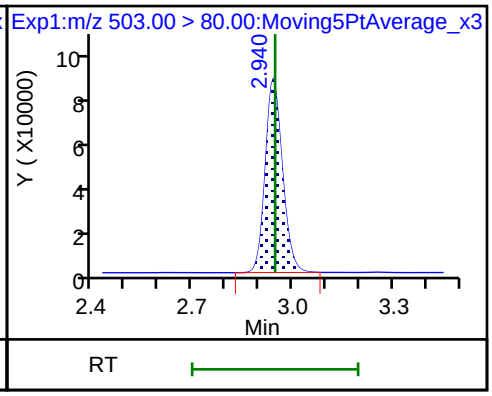
20 Perfluorononanoic acid



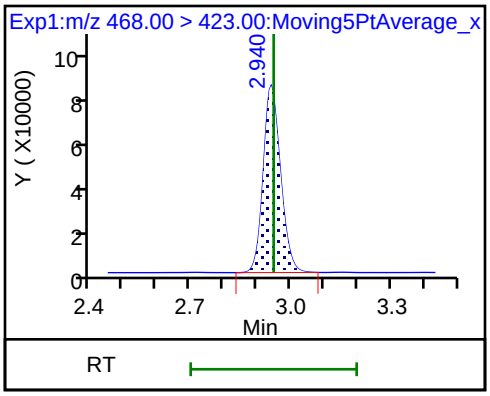
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

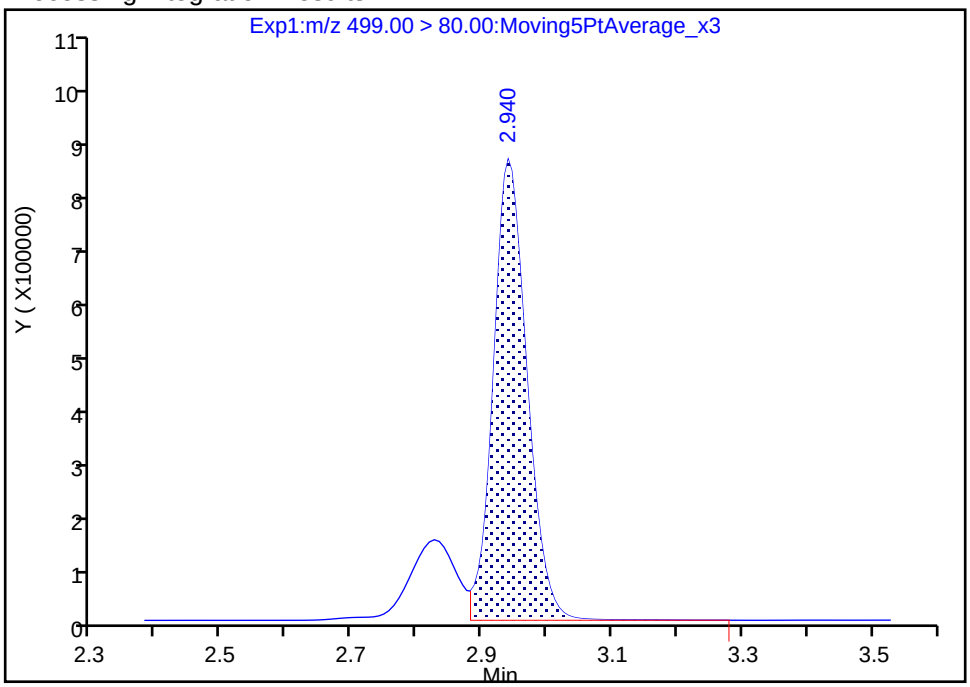
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_015.d				
Injection Date:	01-Aug-2018 15:27:37	Instrument ID:	A8_N		
Lims ID:	320-41149-A-16-A	Lab Sample ID:	320-41149-16		
Client ID:	GRE06-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

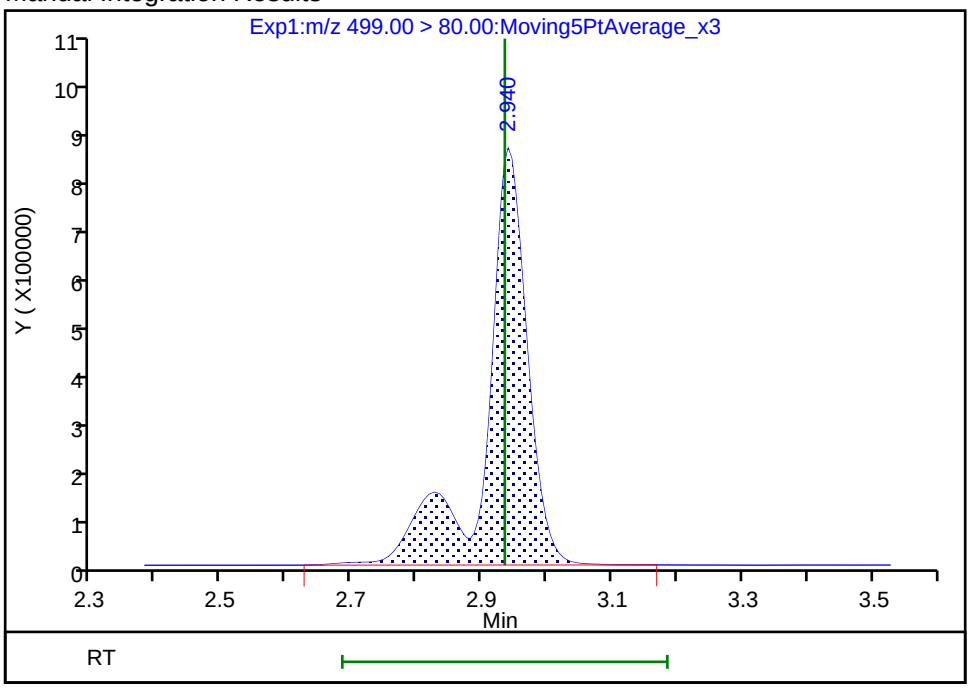
Processing Integration Results

RT: 2.94
Area: 2993465
Amount: 2.177998
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 3711919
Amount: 2.700734
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:23:28

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE06-SB1-01D
Lab Sample ID: 320-41149-17
Matrix: Solid
Lab File ID: 2018.07.30LLA_023.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/11/2018 13:05
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.10(g)
Date Analyzed: 07/30/2018 05:50
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 3.9
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.62		0.31	0.20	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	4.4		0.31	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.17	J	0.31	0.20	0.083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.36	J	0.41	0.18	0.060
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.4		0.31	0.20	0.063
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*49*	*E*	*1.0*	0.51	*0.24*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	92		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	82		50-150
STL00994	18O2 PFHxS	93		50-150
STL00991	13C4 PFOS	90		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_023.d
Lims ID: 320-41149-A-17-A
Client ID: GRE06-SB1-01D
Sample Type: Client
Inject. Date: 30-Jul-2018 05:50:00 ALS Bottle#: 17 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-17-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:02:47 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:03:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.665	1.671	-0.006	1.000	468612	0.1782			1090	
298.90 > 99.00	1.665	1.671	-0.006	1.000	205870		2.28(1.25-3.74)		772	
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.674	-0.009	0.645	77016	2.14		92.1	554	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.228	2.225	0.003	1.000	533679	0.3049			723	
363.00 > 169.00	2.228	2.225	0.003	1.000	200428		2.66(1.13-3.40)		2761	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.237	0.003	1.000	3874779	1.68			7318	
399.00 > 99.00	2.240	2.237	0.003	1.000	1214522		3.19(1.50-4.49)		4058	
D 9 13C4-PFHpA										
367.00 > 322.00	2.228	2.240	-0.012	0.864	3969287	2.40		95.8	77056	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.253	-0.013	0.868	4668417	2.19		92.7	101318	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.579	0.001		4236982	2.50			56966	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.579	0.001	1.000	3760668	2.16			3094	
413.00 > 169.00	2.580	2.579	0.001	1.000	2174425		1.73(0.84-2.52)		11182	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3592376	2.22		88.6	51298	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.941	2.946	-0.005	1.000	35121623	23.9			54421	E
499.00 > 99.00	2.941	2.946	-0.005	1.000	9547460		3.68(2.31-6.93)		51645	
20 Perfluorononanoic acid										
463.00 > 419.00	2.936	2.946	-0.010	0.998	111422	0.0847			189	
463.00 > 169.00	2.941	2.946	-0.005	1.000	28402		3.92(1.90-5.69)		854	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.941	2.953	-0.012	1.140	2879437	2.06		82.4	45834	
D 18 13C4 PFOS										
503.00 > 80.00	2.941	2.953	-0.012	1.140	3178979	2.15		89.9	12347	

QC Flag Legend

Processing Flags

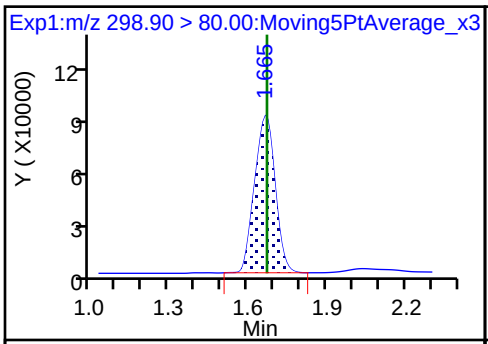
E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 10:03:04 Chrom Revision: 2.3 19-Jul-2018 15:14:50

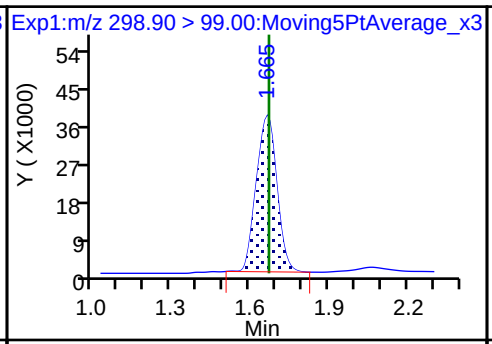
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_023.d				
Injection Date:	30-Jul-2018 05:50:00	Instrument ID:	A8_N		
Lims ID:	320-41149-A-17-A	Lab Sample ID:	320-41149-17		
Client ID:	GRE06-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	17	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

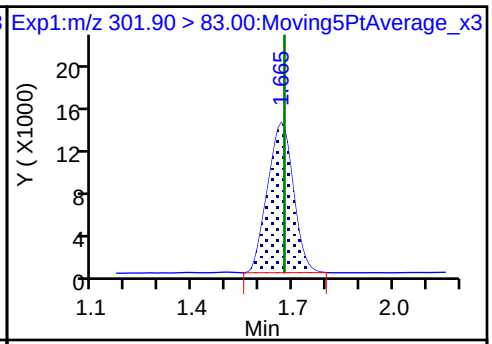
5 Perfluorobutanesulfonic acid



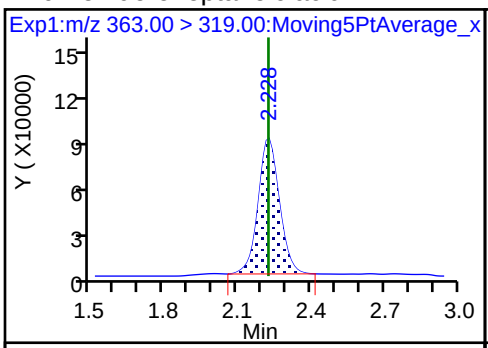
5 Perfluorobutanesulfonic acid



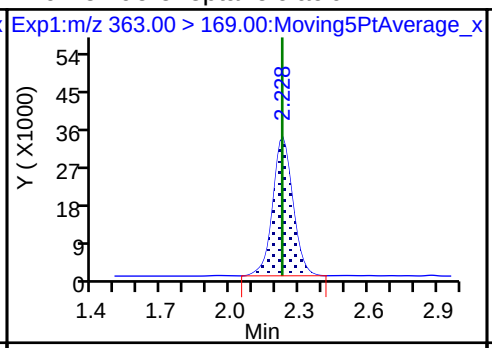
D 47 13C3-PFBS



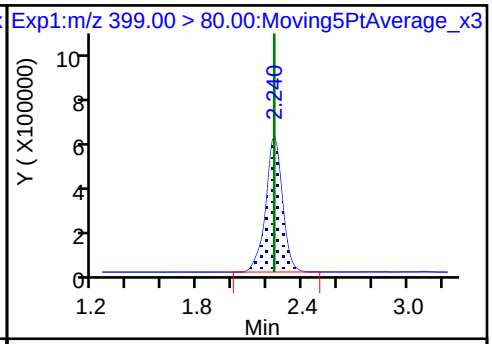
10 Perfluoroheptanoic acid



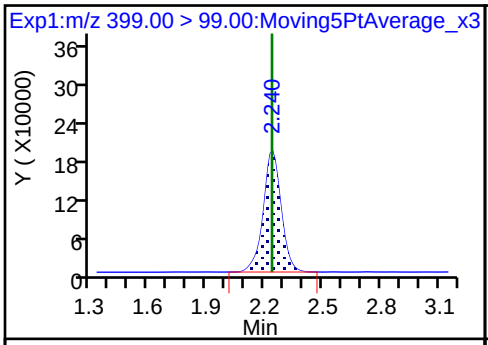
10 Perfluoroheptanoic acid



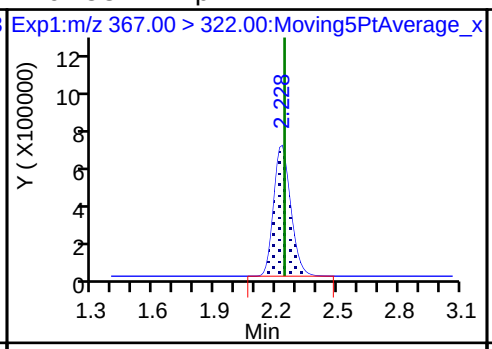
8 Perfluorohexanesulfonic acid



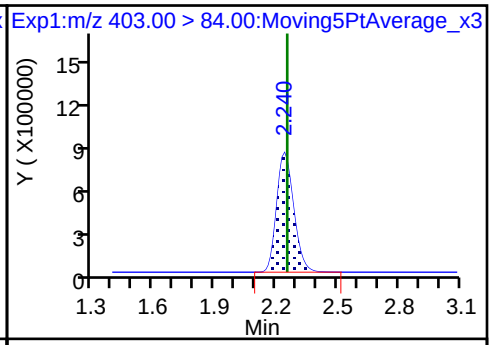
8 Perfluorohexanesulfonic acid



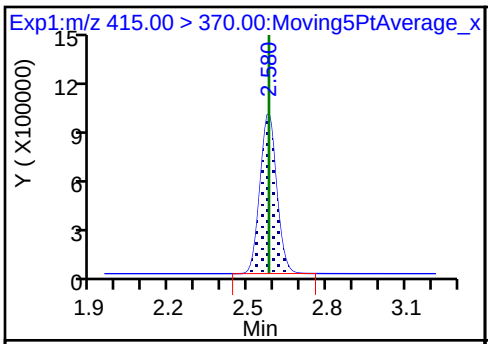
D 9 13C4-PFHpA



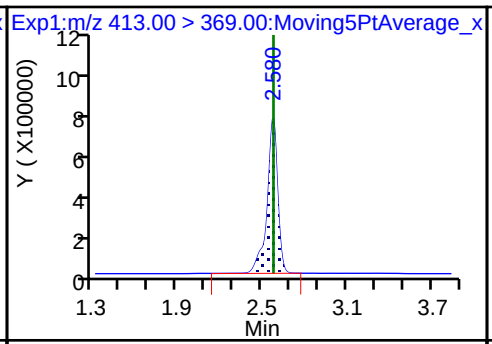
D 11 18O2 PFHxS



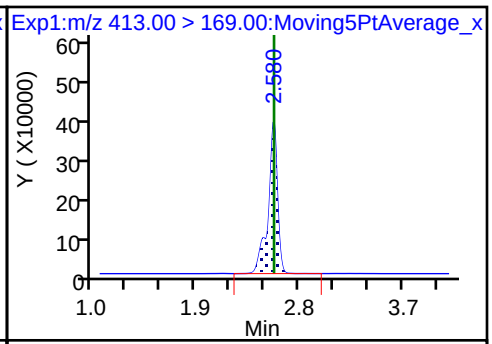
* 62 13C2-PFOA



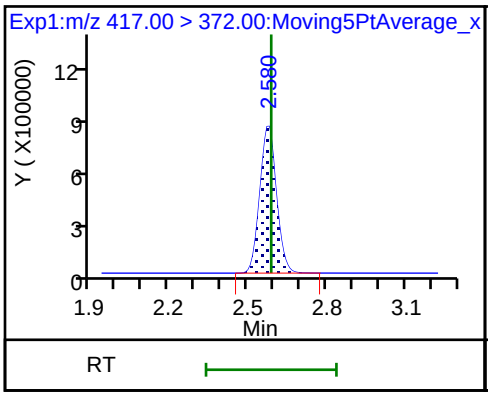
15 Perfluorooctanoic acid



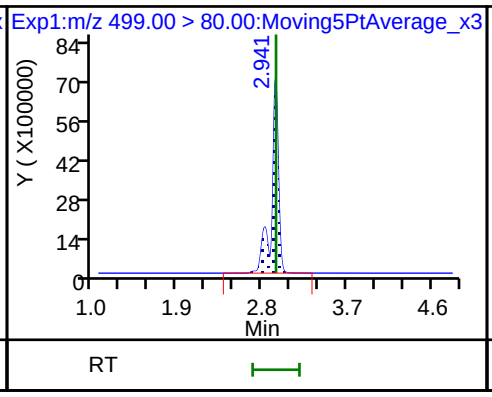
15 Perfluorooctanoic acid



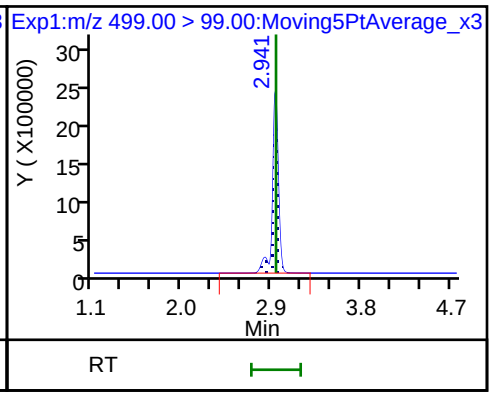
D 14 13C4 PFOA



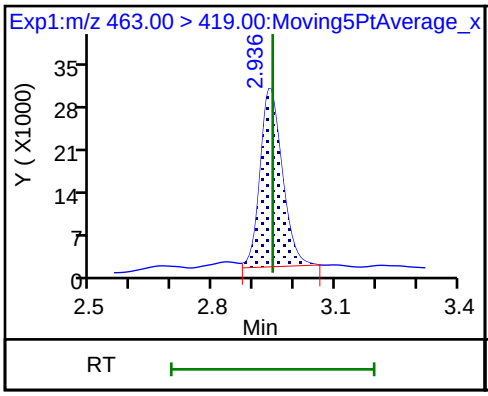
17 Perfluorooctane sulfonic acid



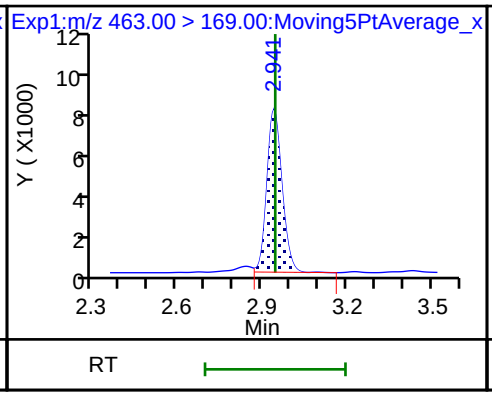
17 Perfluorooctane sulfonic acid



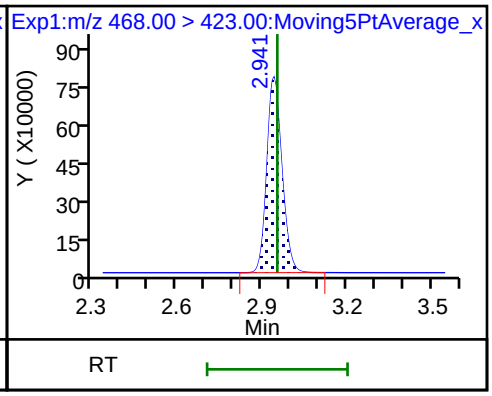
20 Perfluorononanoic acid



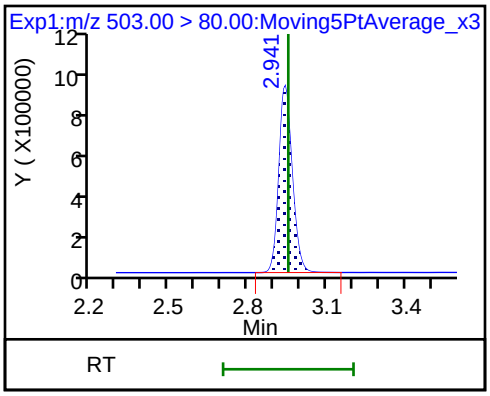
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE06-SB1-01D DL | Lab Sample ID: 320-41149-17 DL

Matrix: Solid | Lab File ID: 2018.08.01LLB_016.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 13:05

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.10(g) | Date Analyzed: 08/01/2018 15:35

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 3.9 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.0*	*U M*	*3.1*	2.0	*0.80*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*4.4*	*D M*	*3.1*	2.0	*1.0*
375-95-1	*Perfluorononanoic acid (PFNA)*	*2.0*	*U*	*3.1*	2.0	*0.83*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*1.8*	*U*	*4.1*	1.8	*0.60*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*3.6*	*D*	*3.1*	2.0	*0.63*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	56	D M	10	5.1	2.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	80		50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	95		50-150
STL00994	18O2 PFHxS	84		50-150
STL00991	13C4 PFOS	84		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_016.d
Lims ID: 320-41149-A-17-A
Client ID: GRE06-SB1-01D
Sample Type: Client
Inject. Date: 01-Aug-2018 15:35:25 ALS Bottle#: 8 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-17-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:24:20 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:24:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.665	1.662	0.003	1.000	52190	0.0209			328	
298.90 > 99.00	1.665	1.662	0.003	1.000	22600		2.31(1.25-3.74)		91.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.669	-0.004	0.649	7566	0.1860		80.0	30.7	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.217	2.214	0.003	1.000	37716	0.0230			14.8	M
363.00 > 169.00	2.217	2.214	0.003	1.000	16449		2.29(1.13-3.40)		140	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.225	-0.008	0.863	353775	0.2384		95.4	10088	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.228	2.225	0.003	1.000	379565	0.1754			1393	
399.00 > 99.00	2.228	2.225	0.003	1.000	124911		3.04(1.50-4.49)		199	
D 11 18O2 PFHxS										
403.00 > 84.00	2.228	2.238	-0.010	0.868	442721	0.1986		84.0	14937	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.567	2.571	-0.004	1.000	329601	0.2178			158	M
413.00 > 169.00	2.567	2.571	-0.004	1.000	206731		1.59(0.84-2.52)		938	
* 62 13C2-PFOA										
415.00 > 370.00	2.567	2.571	-0.004		373078	0.2500			16633	
D 14 13C4 PFOA										
417.00 > 372.00	2.567	2.580	-0.013	1.000	327262	0.2284		91.4	12267	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.933	2.935	-0.002	1.000	3958576	2.74			19121	M
499.00 > 99.00	2.933	2.935	-0.002	1.000	956261		4.14(2.31-6.93)		4970	
20 Perfluorononanoic acid										
463.00 > 419.00	2.933	2.935	-0.002	1.000	10654	0.008323			25.5	
463.00 > 169.00	2.928	2.935	-0.007	0.998	3413		3.12(1.90-5.69)		111	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.933	2.946	-0.013	1.142	307571	0.1997		83.6	4993	
D 19 13C5 PFNA										
468.00 > 423.00	2.933	2.948	-0.015	1.142	296346	0.2374		95.0	10137	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 02-Aug-2018 13:24:21 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_016.d

Injection Date: 01-Aug-2018 15:35:25 Instrument ID: A8_N

Lims ID: 320-41149-A-17-A Lab Sample ID: 320-41149-17

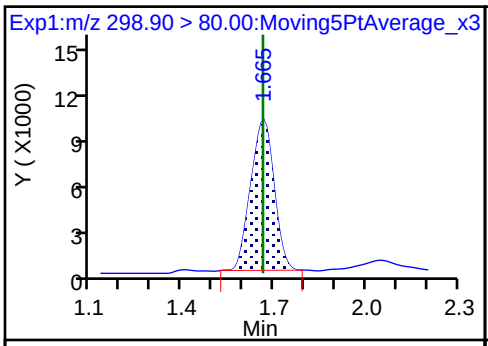
Client ID: GRE06-SB1-01D

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 8 Worklist Smp#: 5

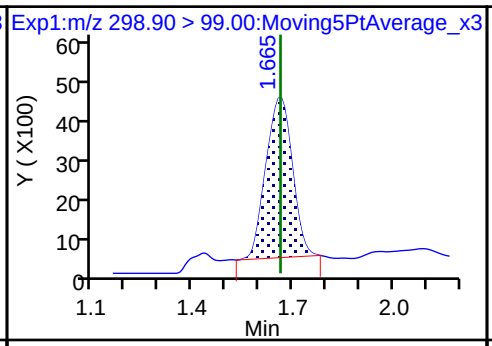
Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

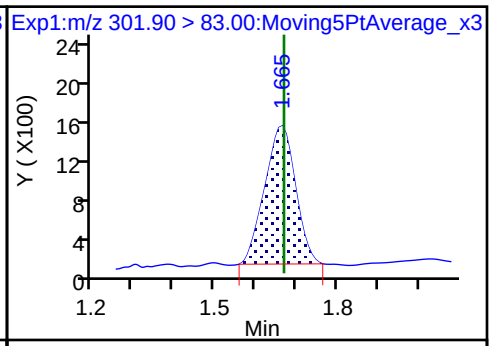
5 Perfluorobutanesulfonic acid



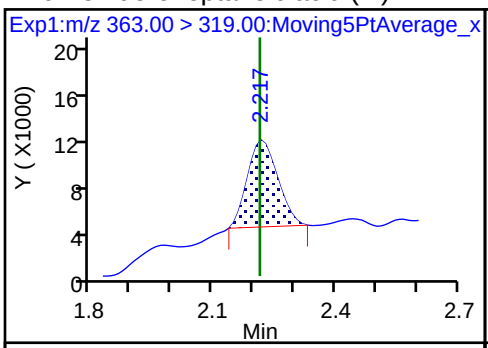
5 Perfluorobutanesulfonic acid



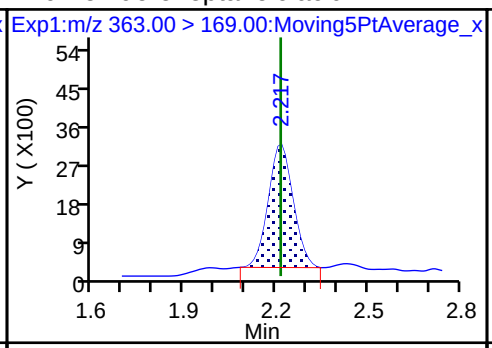
D 47 13C3-PFBS



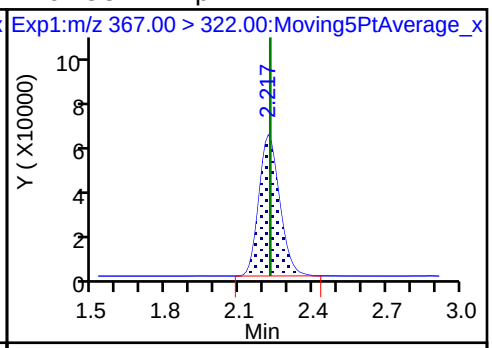
10 Perfluoroheptanoic acid (M)



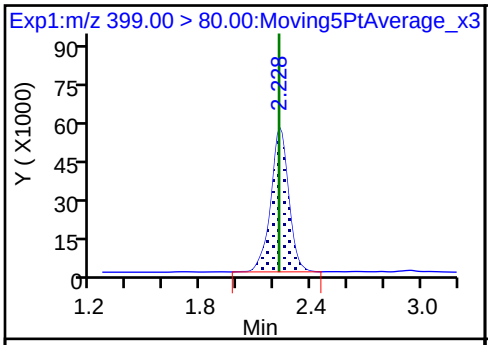
10 Perfluoroheptanoic acid



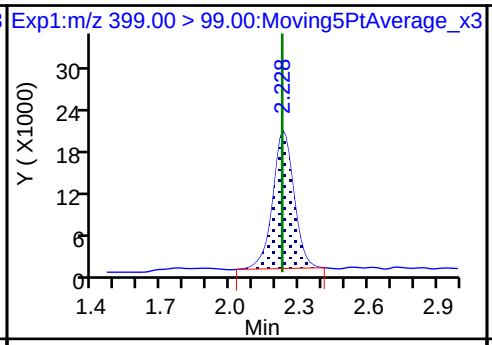
D 9 13C4-PFHpA



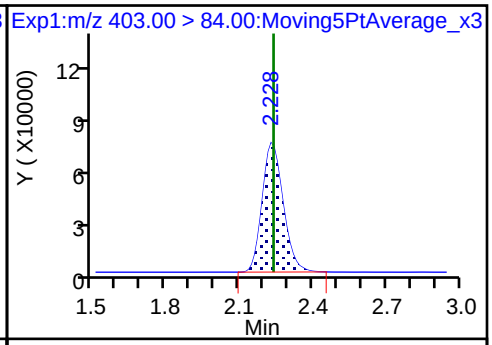
8 Perfluorohexanesulfonic acid



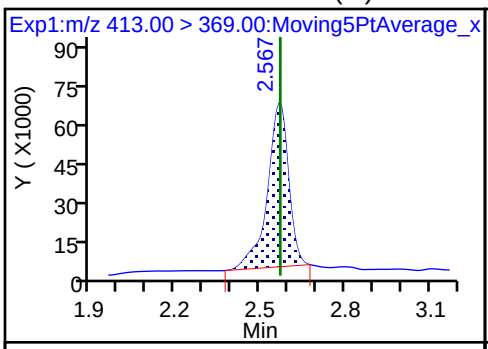
8 Perfluorohexanesulfonic acid



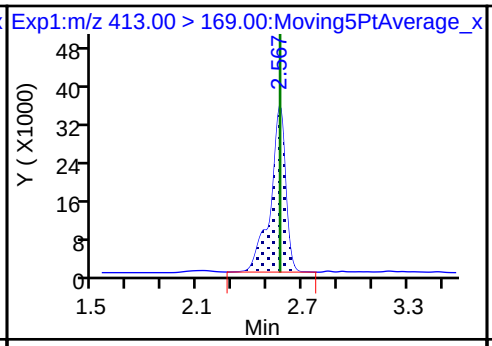
D 11 18O2 PFHxS



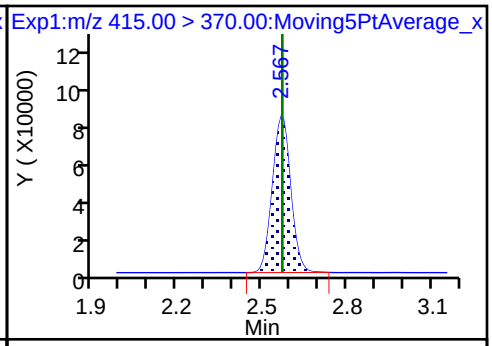
15 Perfluorooctanoic acid (M)



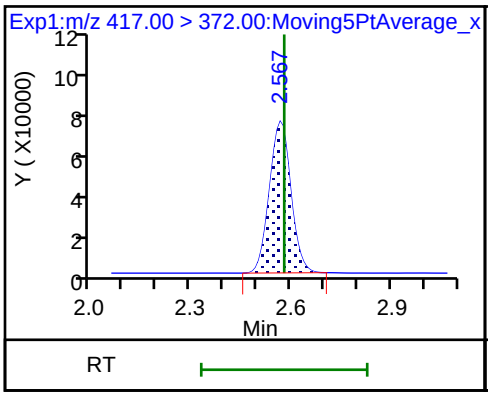
15 Perfluorooctanoic acid



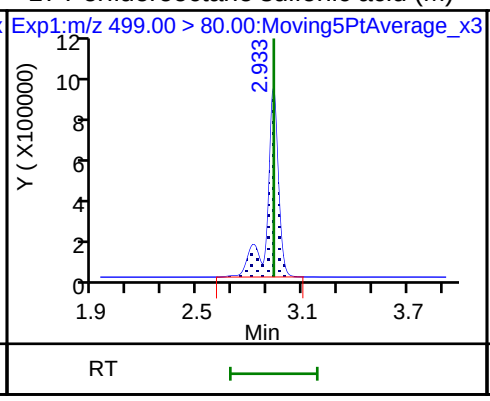
* 62 13C2-PFOA



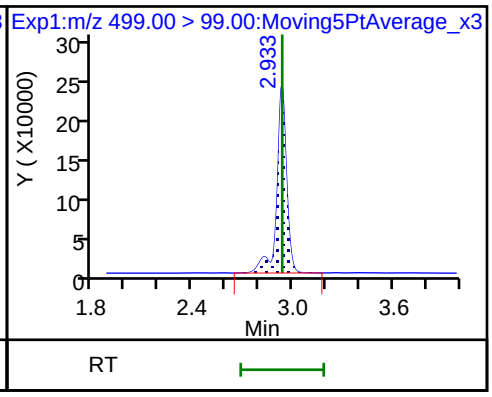
D 14 13C4 PFOA



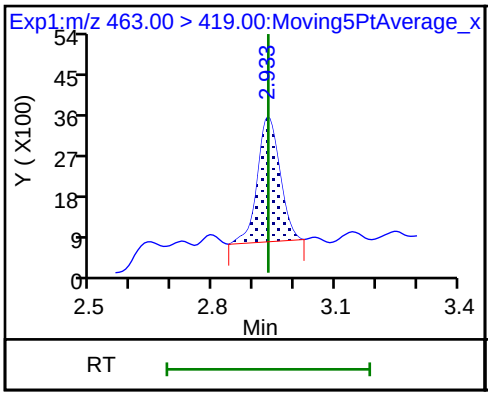
17 Perfluorooctane sulfonic acid (M)



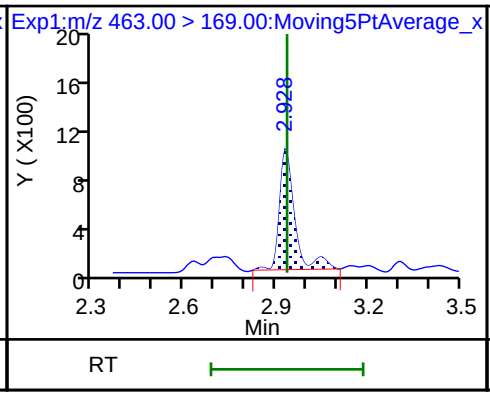
17 Perfluorooctane sulfonic acid



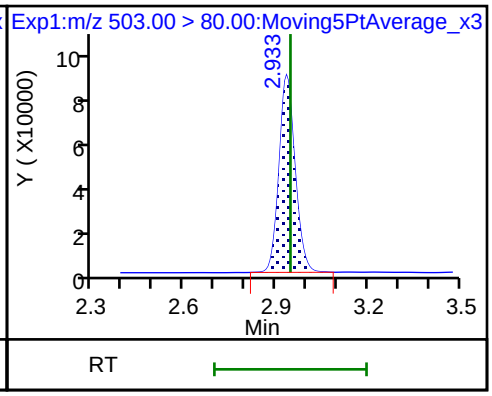
20 Perfluorononanoic acid



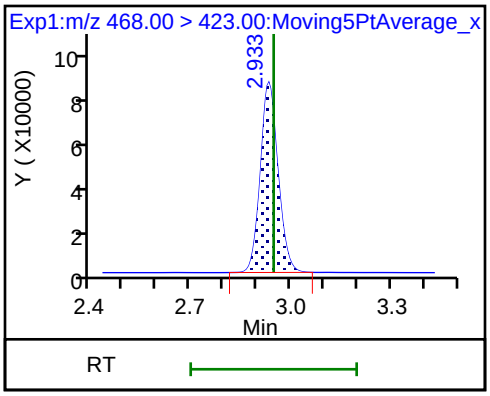
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

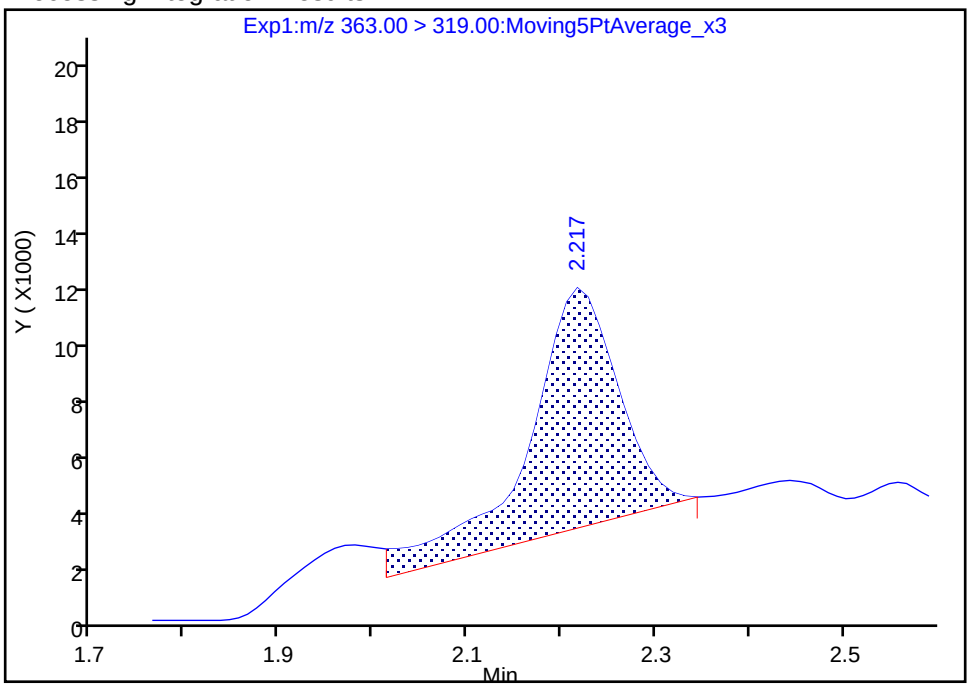
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_016.d				
Injection Date:	01-Aug-2018 15:35:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-17-A	Lab Sample ID:	320-41149-17		
Client ID:	GRE06-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

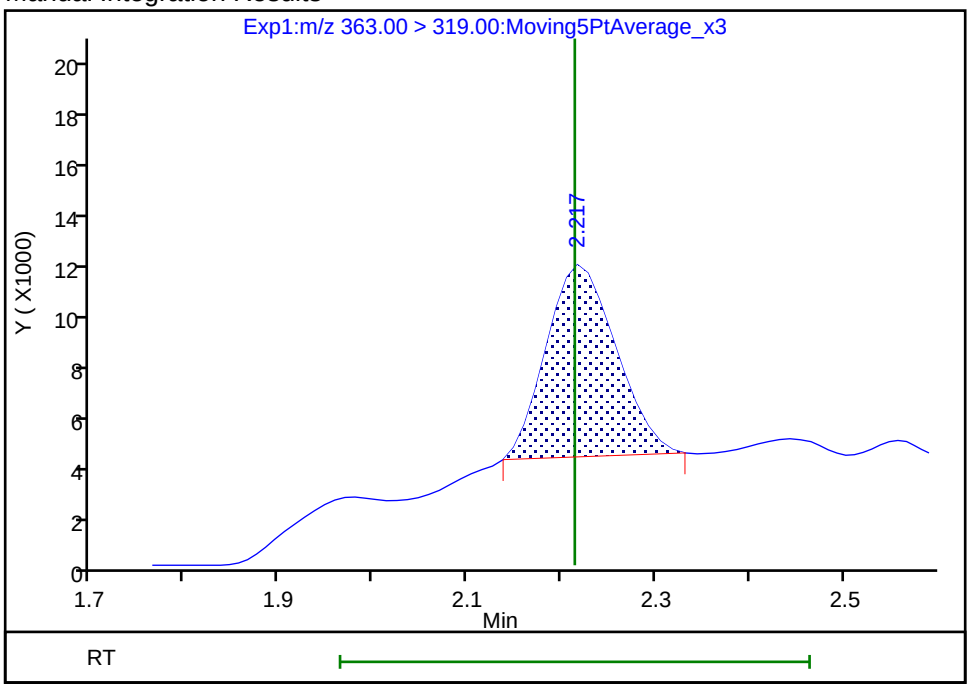
Processing Integration Results

RT: 2.22
Area: 55320
Amount: 0.033711
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 37716
Amount: 0.022984
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:23:59

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

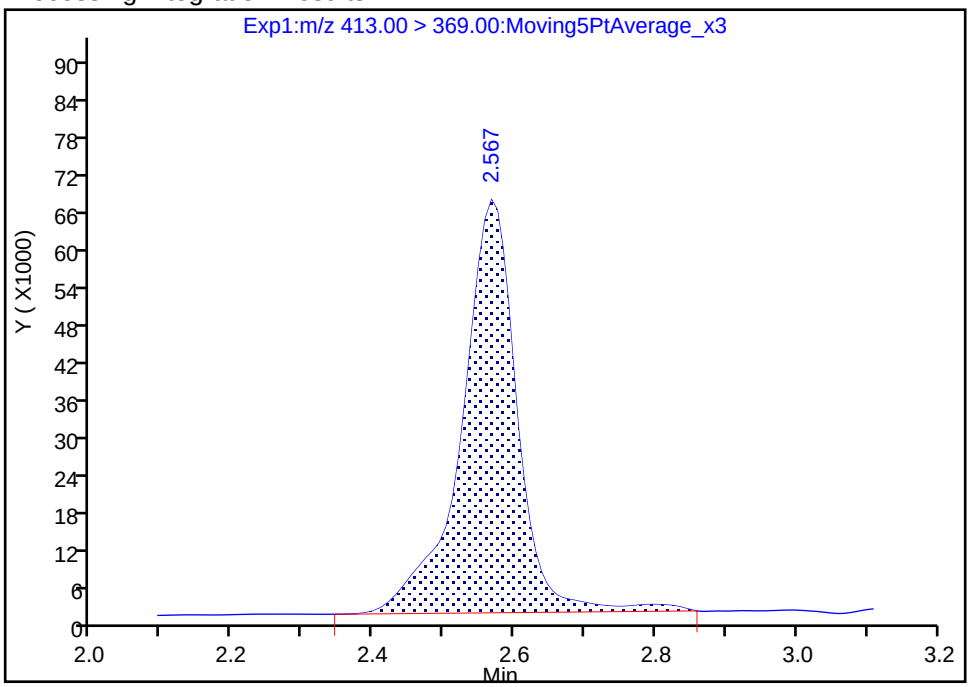
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_016.d				
Injection Date:	01-Aug-2018 15:35:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-17-A	Lab Sample ID:	320-41149-17		
Client ID:	GRE06-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

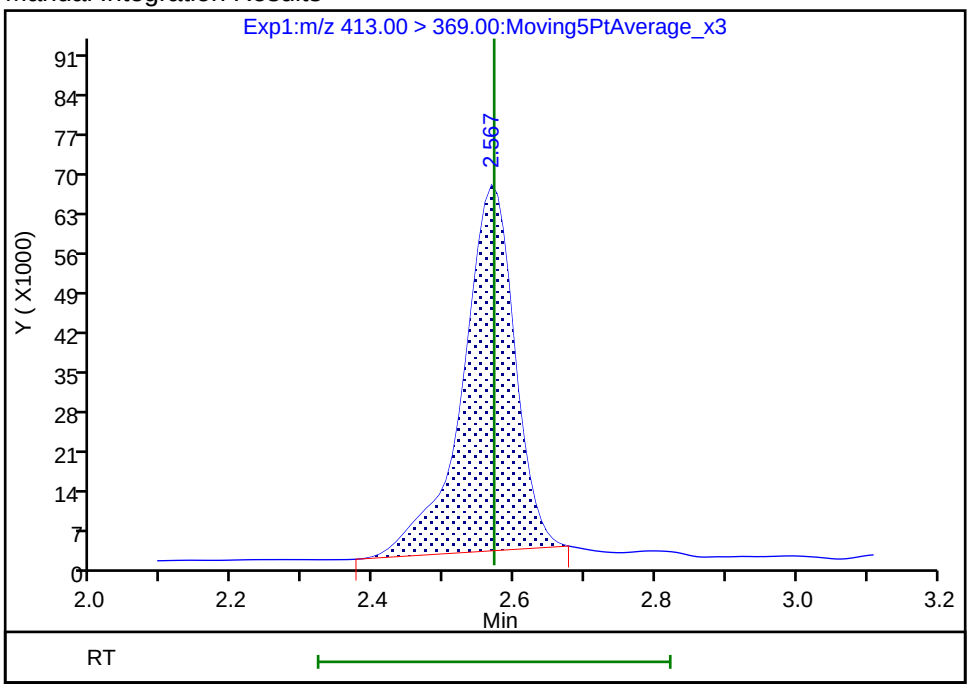
Processing Integration Results

RT: 2.57
Area: 359570
Amount: 0.237572
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 329601
Amount: 0.217771
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:24:07

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

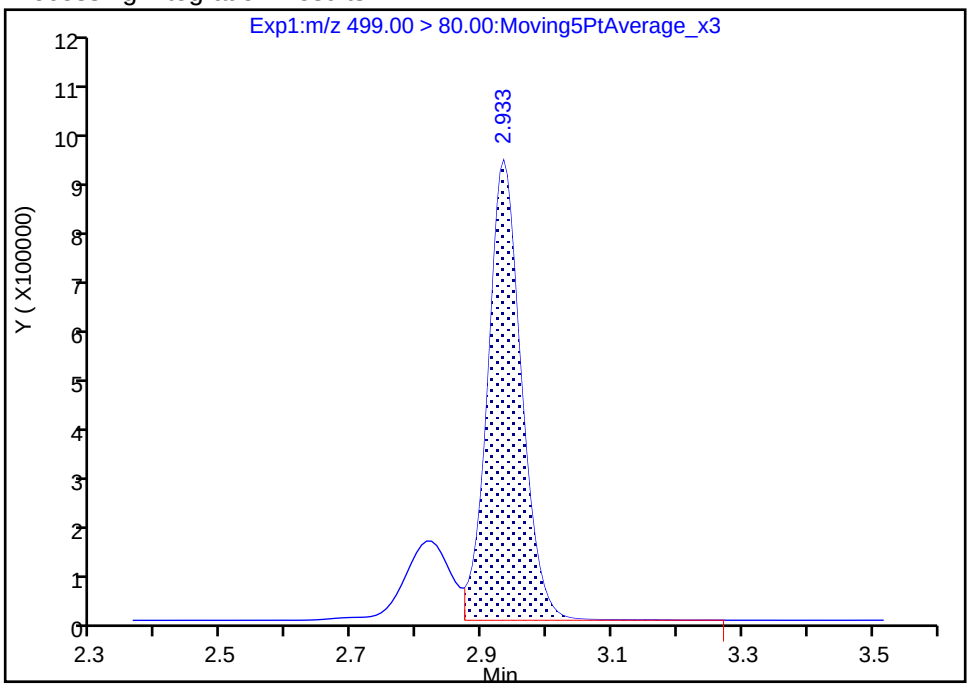
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_016.d				
Injection Date:	01-Aug-2018 15:35:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-17-A	Lab Sample ID:	320-41149-17		
Client ID:	GRE06-SB1-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

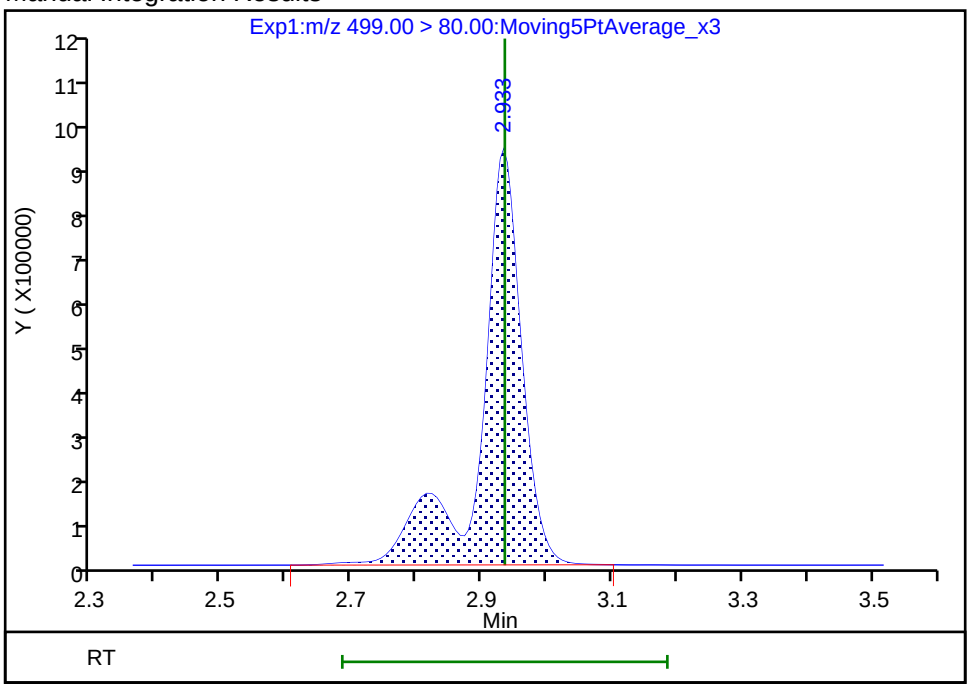
Processing Integration Results

RT: 2.93
Area: 3205048
Amount: 2.218428
Amount Units: ng/ml



Manual Integration Results

RT: 2.93
Area: 3958576
Amount: 2.739995
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:24:15

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE06-SB2-01 | Lab Sample ID: 320-41149-18

Matrix: Solid | Lab File ID: 2018.07.30LLA_024.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 13:40

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.03(g) | Date Analyzed: 07/30/2018 05:57

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.42		0.32	0.21	0.082
335-67-1	Perfluorooctanoic acid (PFOA)	13		0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.11	J	0.32	0.21	0.085
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.60		0.42	0.19	0.062
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	16		0.32	0.21	0.065
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*25*	*E*	*1.1*	0.53	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	88		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	89		50-150
STL00994	18O2 PFHxS	89		50-150
STL00991	13C4 PFOS	91		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_024.d
Lims ID: 320-41149-A-18-A
Client ID: GRE06-SB2-01
Sample Type: Client
Inject. Date: 30-Jul-2018 05:57:52 ALS Bottle#: 18 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-18-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:02:47 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:03:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.000	751454	0.2869			1414	
298.90 > 99.00	1.671	1.671	0.0	1.000	318882		2.36(1.25-3.74)		1073	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.674	-0.003	0.648	76698	2.06		88.4	444	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.225	0.0	1.000	333031	0.1985			315	
363.00 > 169.00	2.225	2.225	0.0	1.000	126400		2.63(1.13-3.40)		2184	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	17741374	7.76			28525	
399.00 > 99.00	2.237	2.237	0.0	1.000	5965390		2.97(1.50-4.49)		16071	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3804894	2.21		88.5	73739	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4632191	2.10		88.7	79376	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		4394972	2.50			59549	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	11500536	5.95			7622	
413.00 > 169.00	2.579	2.579	0.0	1.000	6461166		1.78(0.84-2.52)		36569	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3979941	2.37		94.7	57964	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.946	2.946	0.0	1.002	18617268	12.1			25188	E
499.00 > 99.00	2.940	2.946	-0.006	1.000	4804787		3.87(2.31-6.93)		32844	
20 Perfluorononanoic acid										
463.00 > 419.00	2.946	2.946	0.0	1.002	78483	0.0532			82.3	
463.00 > 169.00	2.946	2.946	0.0	1.002	17676		4.44(1.90-5.69)		161	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.953	-0.013	1.140	3228301	2.23		89.0	90616	
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.953	-0.013	1.140	3330790	2.17		90.8	13425	

QC Flag Legend

Processing Flags

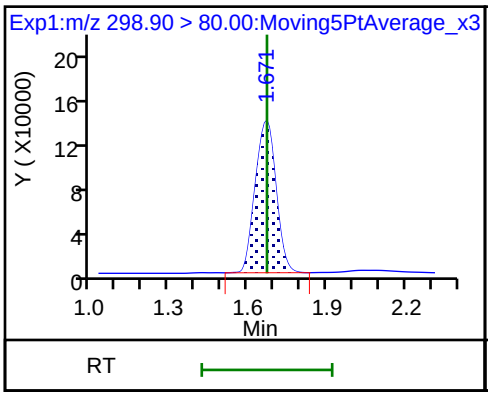
E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 10:03:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

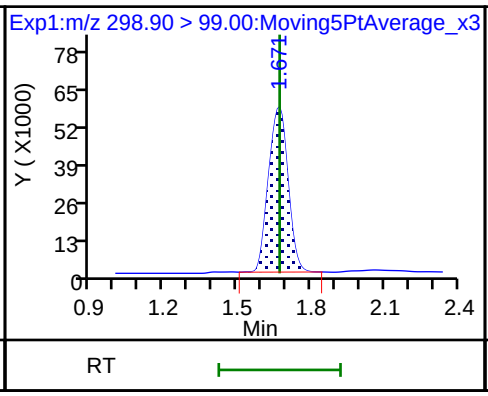
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_024.d				
Injection Date:	30-Jul-2018 05:57:52	Instrument ID:	A8_N		
Lims ID:	320-41149-A-18-A	Lab Sample ID:	320-41149-18		
Client ID:	GRE06-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	18	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

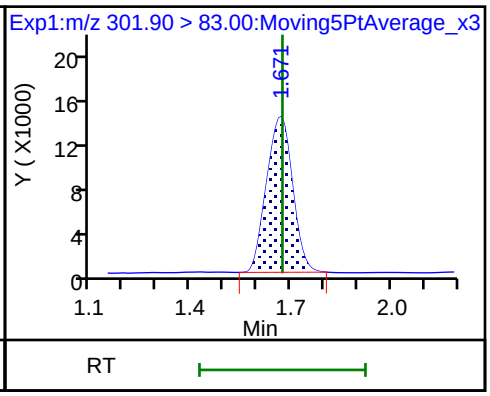
5 Perfluorobutanesulfonic acid



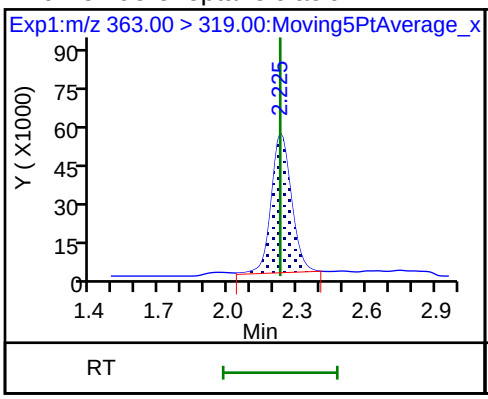
5 Perfluorobutanesulfonic acid



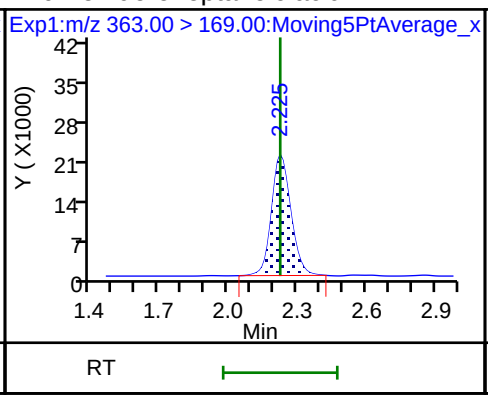
D 47 13C3-PFBS



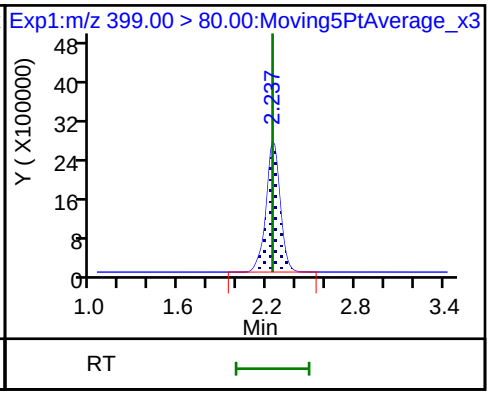
10 Perfluoroheptanoic acid



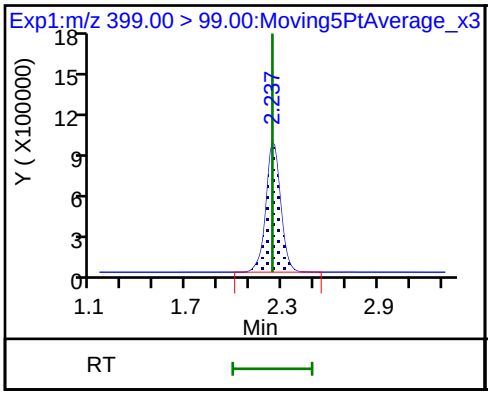
10 Perfluoroheptanoic acid



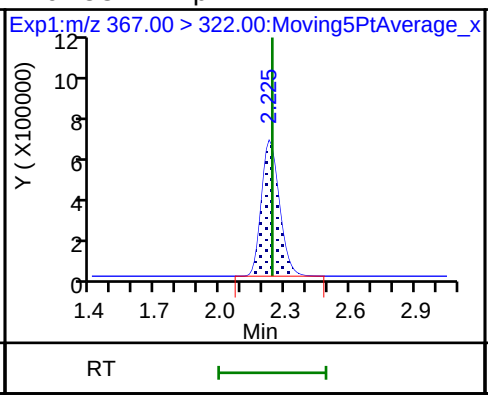
8 Perfluorohexanesulfonic acid



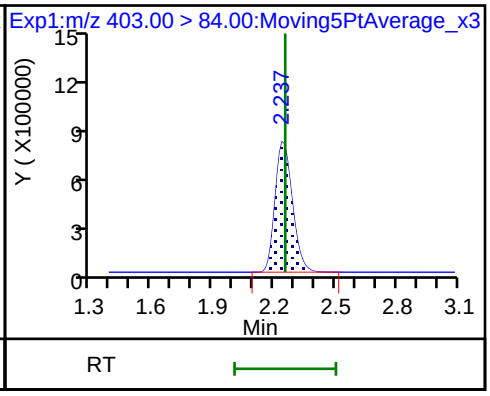
8 Perfluorohexanesulfonic acid



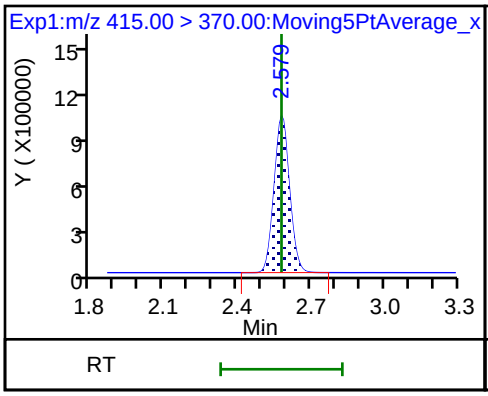
D 9 13C4-PFHpA



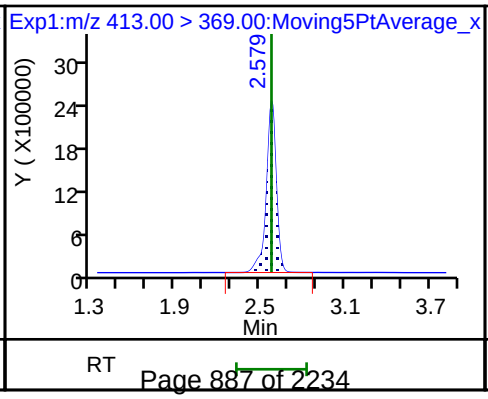
D 11 18O2 PFHxS



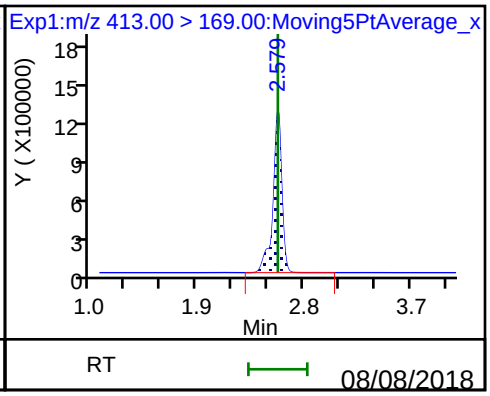
* 62 13C2-PFOA



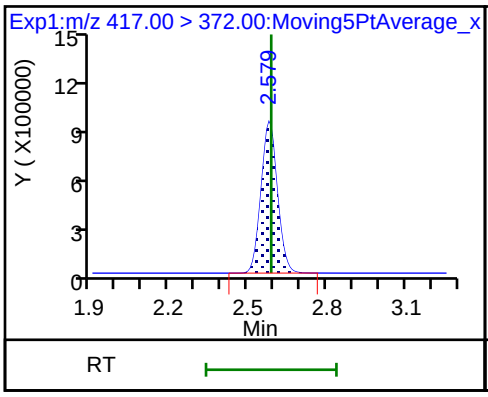
15 Perfluorooctanoic acid



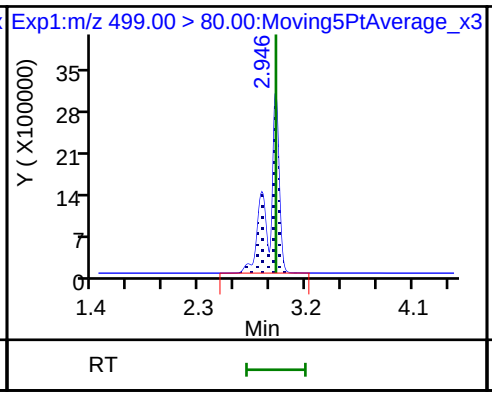
15 Perfluorooctanoic acid



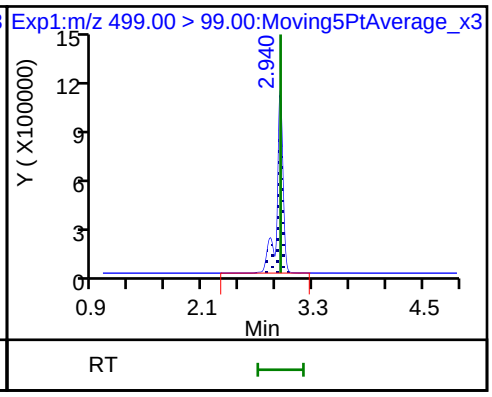
D 14 13C4 PFOA



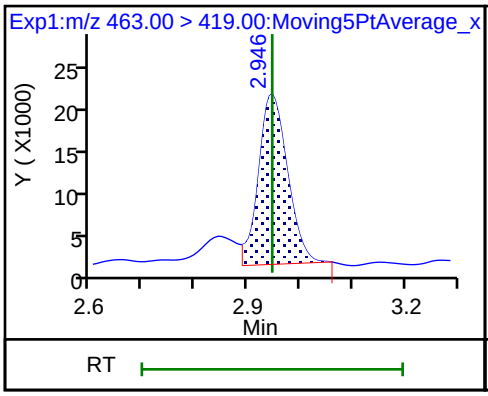
17 Perfluorooctane sulfonic acid



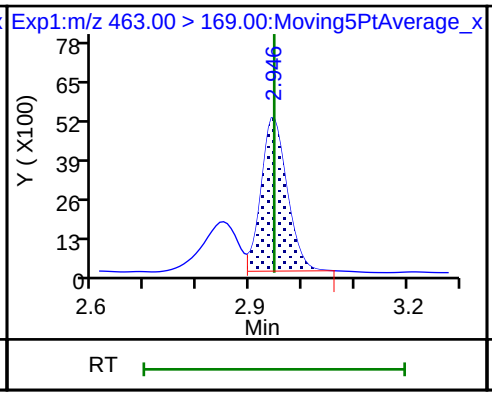
17 Perfluorooctane sulfonic acid



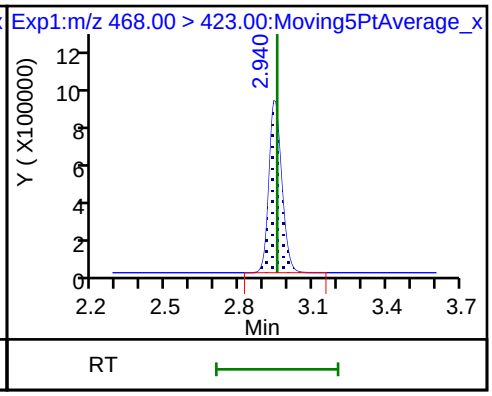
20 Perfluorononanoic acid



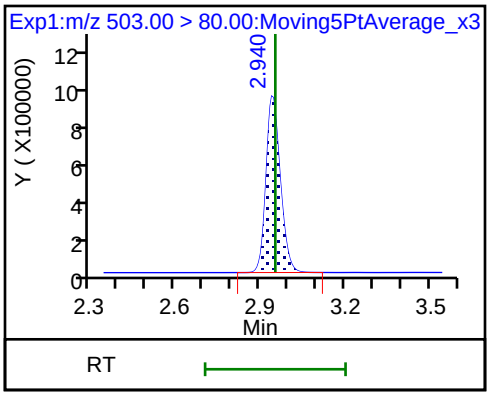
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE06-SB2-01 DL | Lab Sample ID: 320-41149-18 DL

Matrix: Solid | Lab File ID: 2018.08.01LLB_017.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 13:40

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.03(g) | Date Analyzed: 08/01/2018 15:43

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.41*	*J D M*	*1.6*	1.1	*0.41*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*13*	*D M*	*1.6*	1.1	*0.53*
375-95-1	*Perfluorononanoic acid (PFNA)*	*1.1*	*U*	*1.6*	1.1	*0.43*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.57*	*J D*	*2.1*	0.95	*0.31*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*17*	*D*	*1.6*	1.1	*0.33*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	25	D M	5.3	2.6	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	84		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	93		50-150
STL00994	18O2 PFHxS	85		50-150
STL00991	13C4 PFOS	82		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_017.d
Lims ID: 320-41149-A-18-A
Client ID: GRE06-SB2-01
Sample Type: Client
Inject. Date: 01-Aug-2018 15:43:13 ALS Bottle#: 9 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 5.0000
Sample Info: 320-41149-a-18-a 5X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:25:15 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:25:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.662	1.662	0.0	1.000	144786	0.0547			590	
298.90 > 99.00	1.662	1.662	0.0	1.000	62548		2.31(1.25-3.74)		230	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.669	-0.007	0.647	16064	0.3921		84.3	54.0	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.214	2.214	0.0	1.000	64191	0.0392			21.2	M
363.00 > 169.00	2.214	2.214	0.0	1.000	24487		2.62(1.13-3.40)		234	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.225	-0.011	0.861	705725	0.4724		94.5	23878	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.225	0.012	1.000	3619300	1.64			9921	
399.00 > 99.00	2.237	2.225	0.012	1.000	1172114		3.09(1.50-4.49)		1934	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.238	-0.001	0.870	901912	0.4018		84.9	30155	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.571	2.571	0.0	1.000	2002877	1.26			969	M
413.00 > 169.00	2.571	2.571	0.0	1.000	1111517		1.80(0.84-2.52)		4584	
* 62 13C2-PFOA										
415.00 > 370.00	2.571	2.571	0.0		751294	0.5000			27892	
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.580	-0.009	1.000	685652	0.4753		95.1	19252	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.935	2.935	0.0	1.000	3448319	2.40			12760	M
499.00 > 99.00	2.935	2.935	0.0	1.000	878860		3.92(2.31-6.93)		3457	M
20 Perfluorononanoic acid										R
463.00 > 419.00	2.940	2.935	0.005	1.002	15634	0.0124			28.0	R
463.00 > 169.00	2.940	2.935	0.005	1.002	2577		6.07(1.90-5.69)		60.7	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.946	-0.011	1.142	610748	0.3938		82.4	6501	
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.948	-0.013	1.142	582948	0.4638		92.8	16364	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

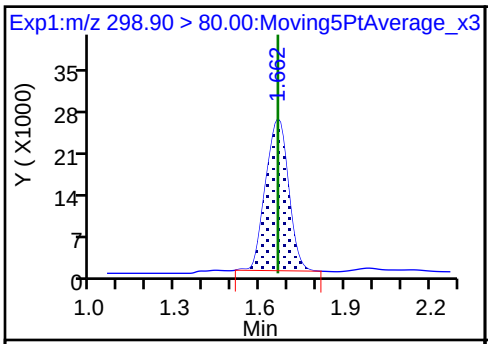
M - Manually Integrated

Report Date: 02-Aug-2018 13:25:18 Chrom Revision: 2.3 19-Jul-2018 15:14:50

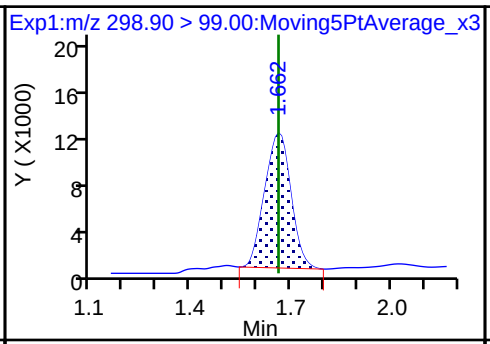
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_017.d				
Injection Date:	01-Aug-2018 15:43:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-18-A	Lab Sample ID:	320-41149-18		
Client ID:	GRE06-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

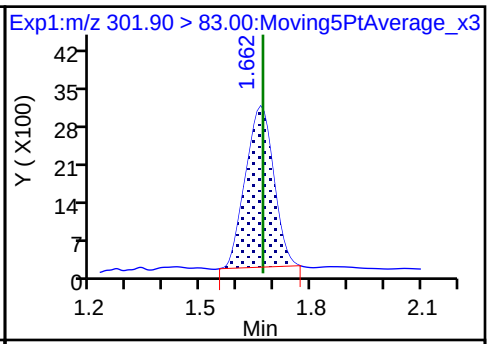
5 Perfluorobutanesulfonic acid



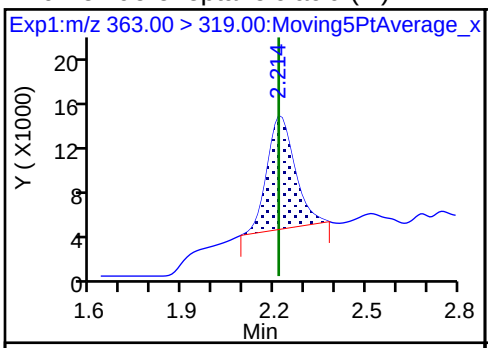
5 Perfluorobutanesulfonic acid



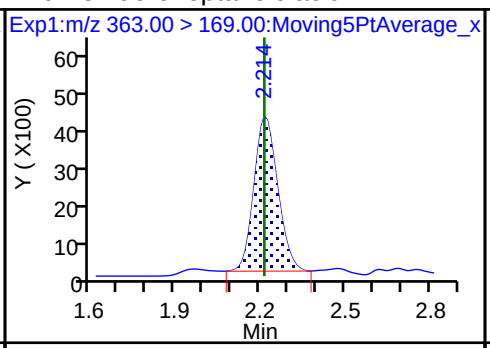
D 47 13C3-PFBS



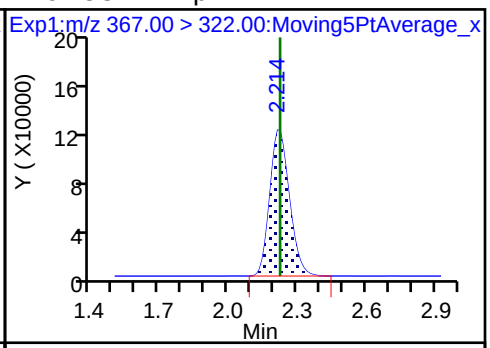
10 Perfluoroheptanoic acid (M)



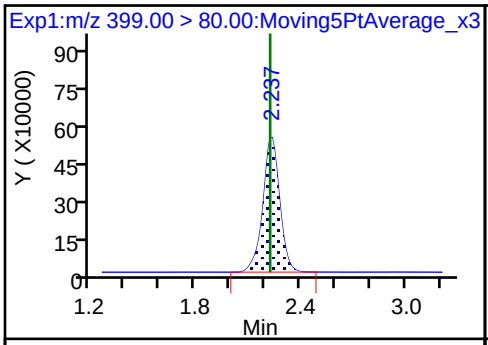
10 Perfluoroheptanoic acid



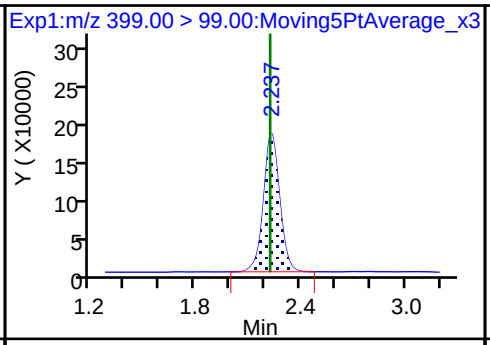
D 9 13C4-PFHpA



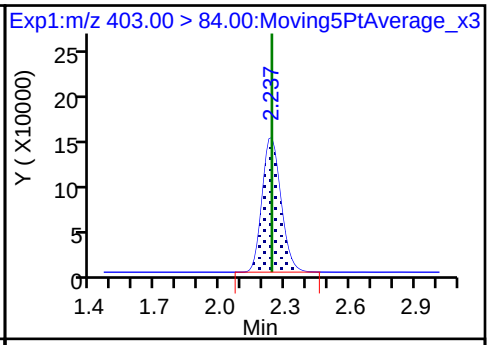
8 Perfluorohexanesulfonic acid



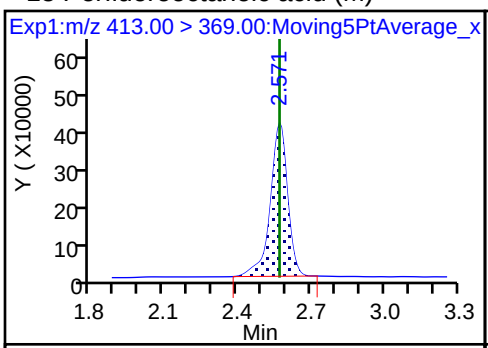
8 Perfluorohexanesulfonic acid



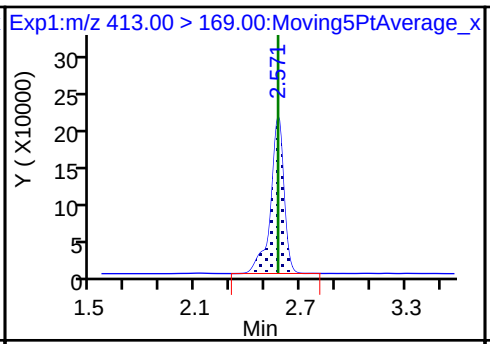
D 11 18O2 PFHxS



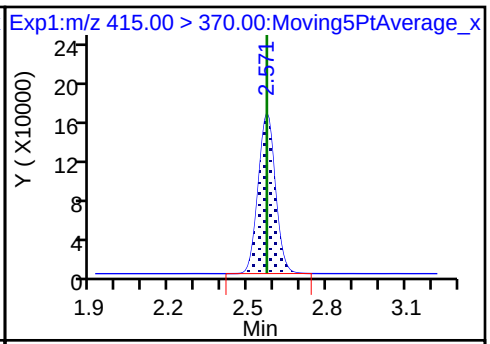
15 Perfluorooctanoic acid (M)



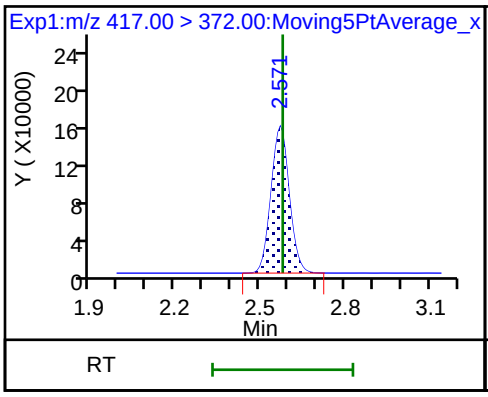
15 Perfluorooctanoic acid



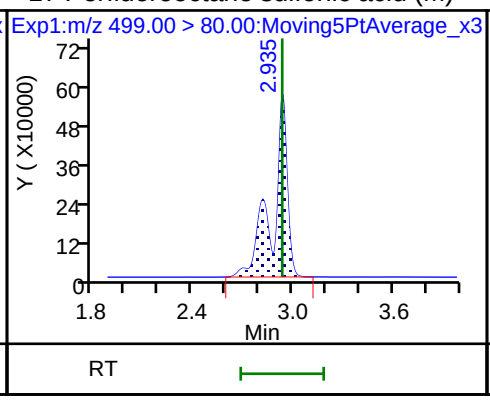
* 62 13C2-PFOA



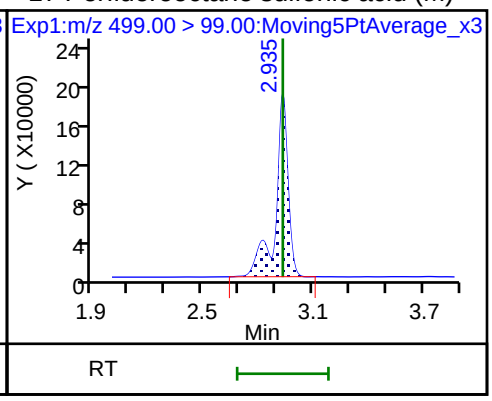
D 14 13C4 PFOA



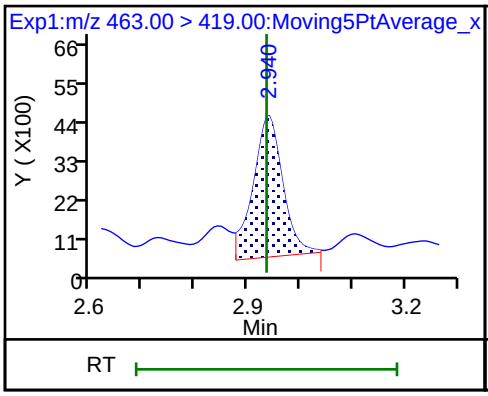
17 Perfluorooctane sulfonic acid (M)



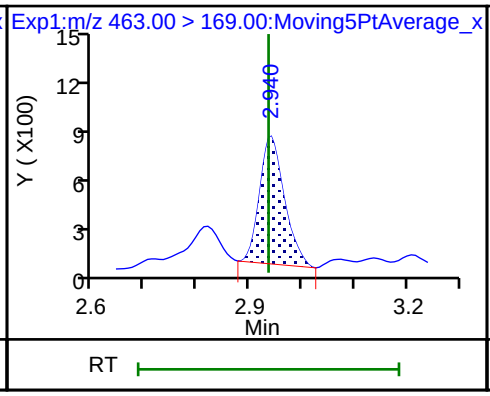
17 Perfluorooctane sulfonic acid (M)



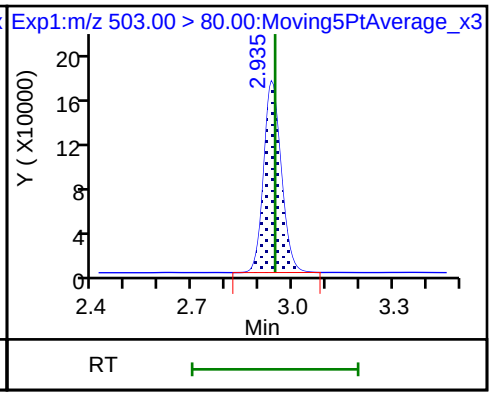
20 Perfluorononanoic acid



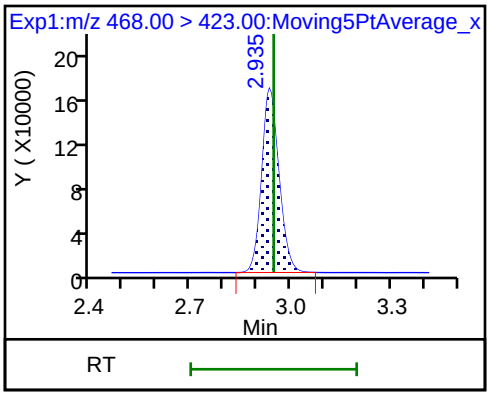
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

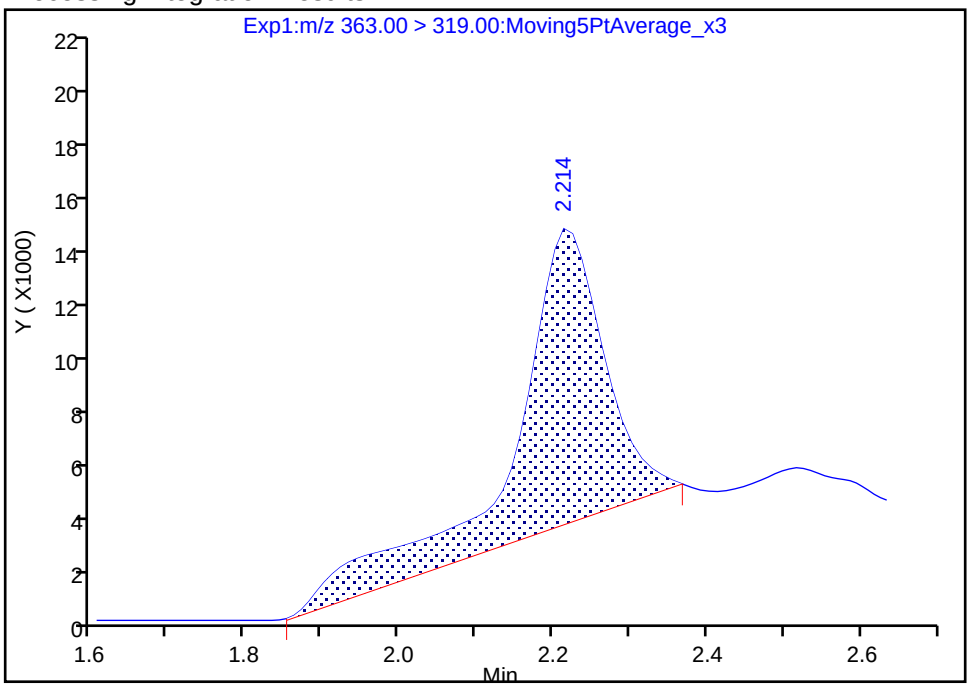
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_017.d				
Injection Date:	01-Aug-2018 15:43:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-18-A	Lab Sample ID:	320-41149-18		
Client ID:	GRE06-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

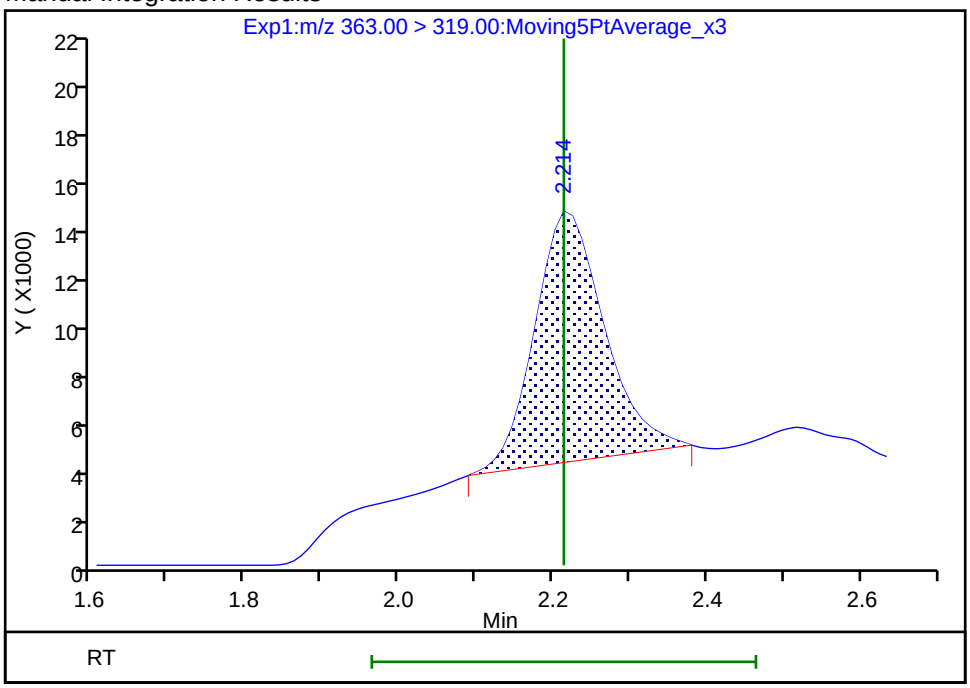
Processing Integration Results

RT: 2.21
Area: 89516
Amount: 0.054691
Amount Units: ng/ml



Manual Integration Results

RT: 2.21
Area: 64191
Amount: 0.039218
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:24:39

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

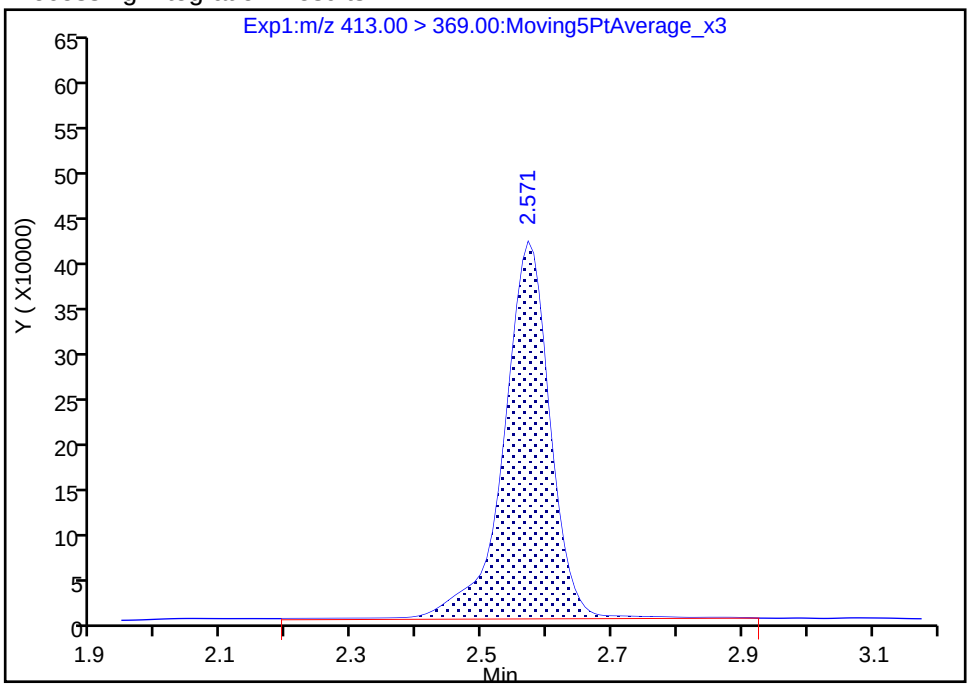
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_017.d				
Injection Date:	01-Aug-2018 15:43:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-18-A	Lab Sample ID:	320-41149-18		
Client ID:	GRE06-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

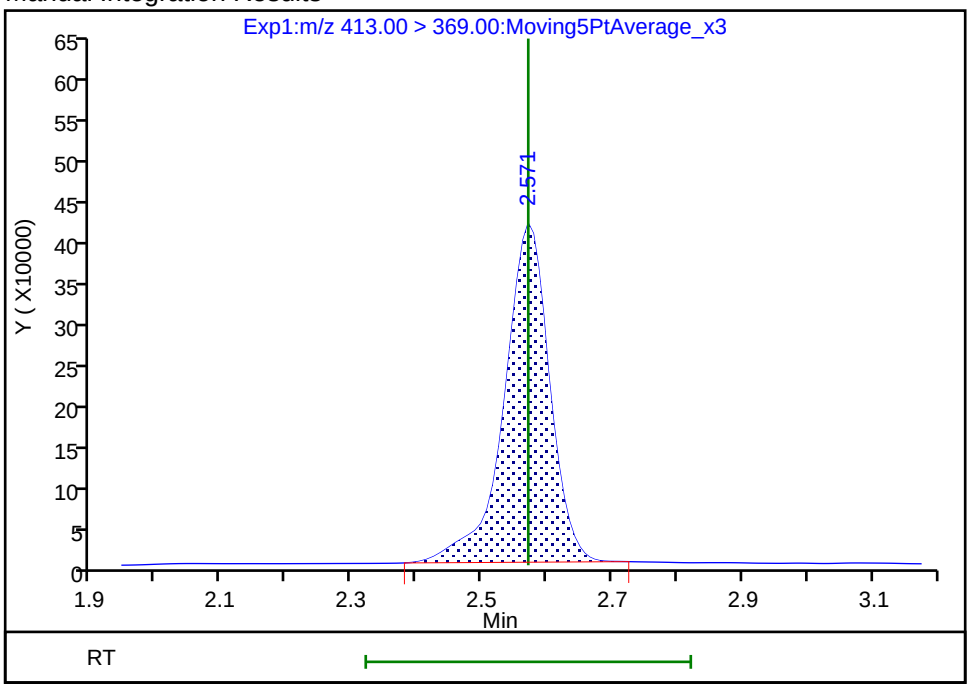
Processing Integration Results

RT: 2.57
Area: 2072855
Amount: 1.307383
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 2002877
Amount: 1.263247
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:24:52

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

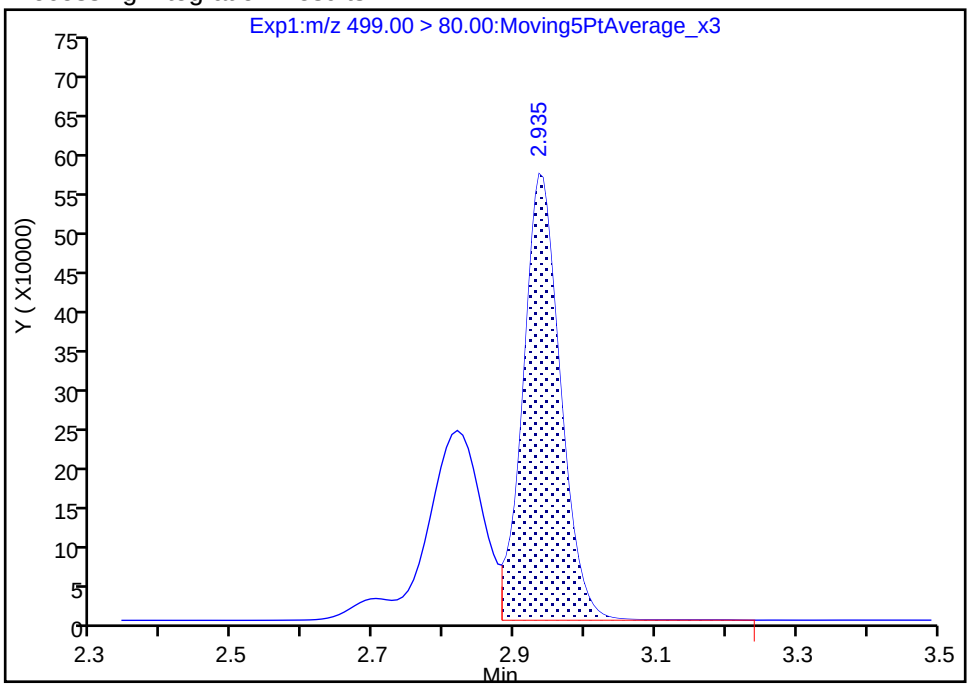
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_017.d				
Injection Date:	01-Aug-2018 15:43:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-18-A	Lab Sample ID:	320-41149-18		
Client ID:	GRE06-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

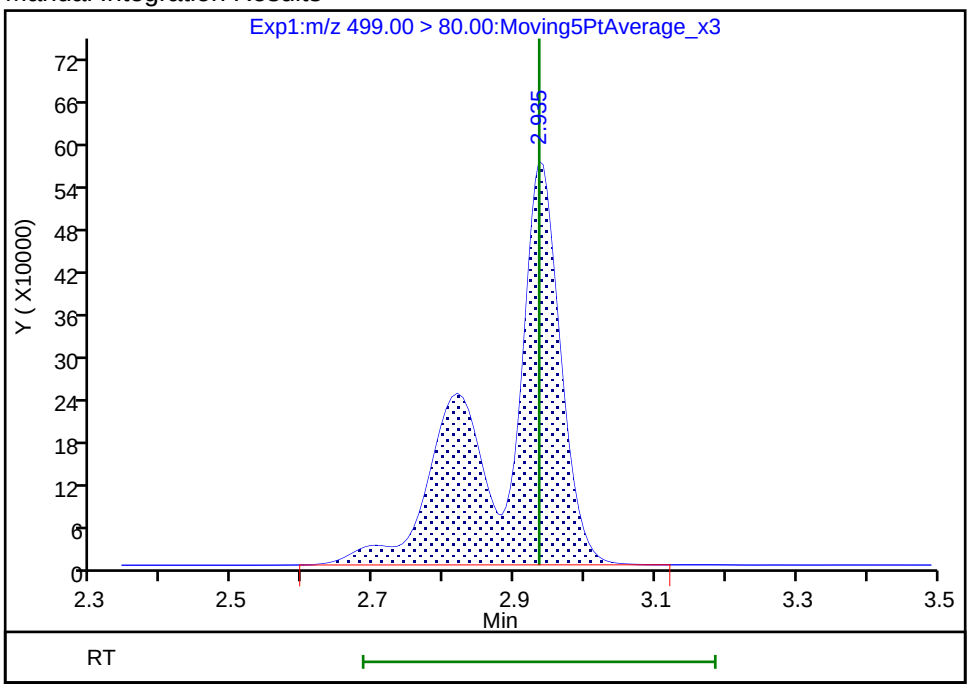
Processing Integration Results

RT: 2.93
Area: 2100459
Amount: 1.464328
Amount Units: ng/ml



Manual Integration Results

RT: 2.93
Area: 3448319
Amount: 2.403984
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:25:00

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

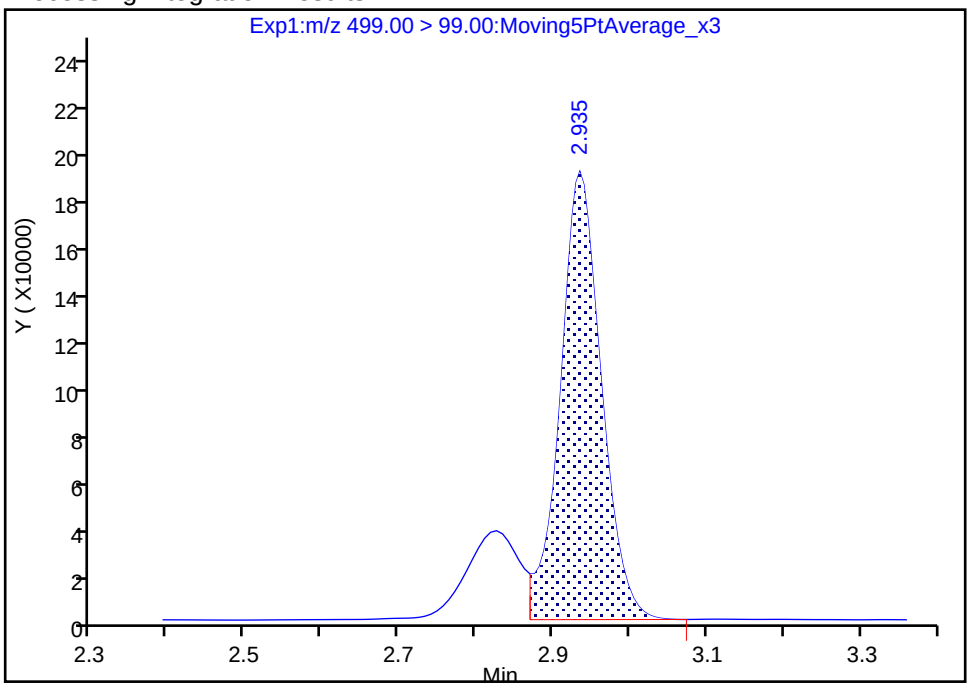
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_017.d				
Injection Date:	01-Aug-2018 15:43:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-18-A	Lab Sample ID:	320-41149-18		
Client ID:	GRE06-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

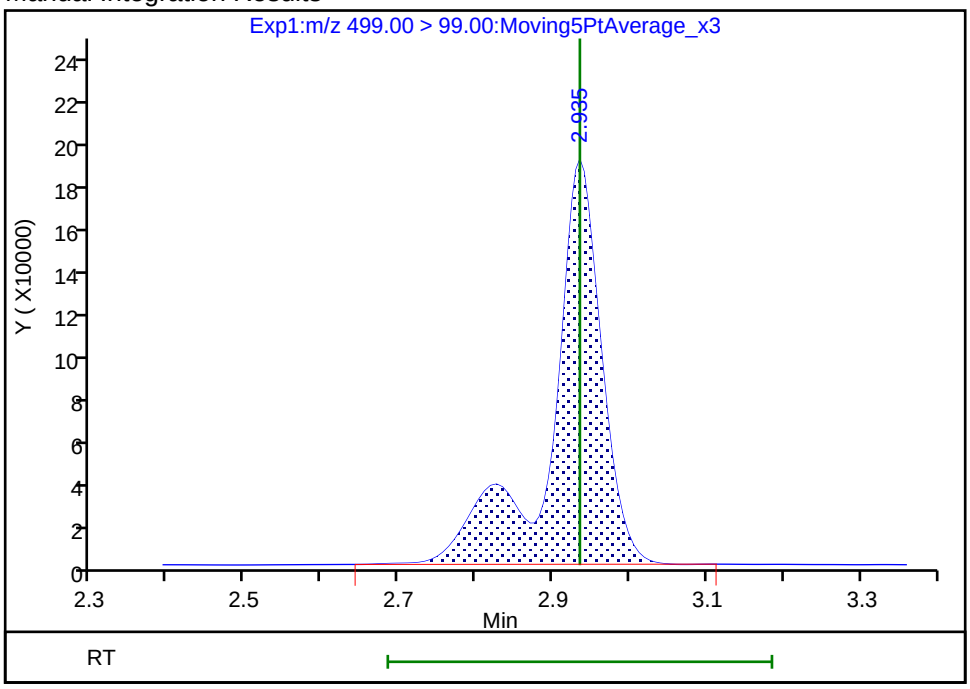
Processing Integration Results

RT: 2.93
Area: 702354
Amount: 1.464328
Amount Units: ng/ml



Manual Integration Results

RT: 2.93
Area: 878860
Amount: 2.403984
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:25:08

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB1-01 | Lab Sample ID: 320-41149-19

Matrix: Solid | Lab File ID: 2018.07.28LLB_017.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 14:15

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.05(g) | Date Analyzed: 07/29/2018 01:24

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.1		0.31	0.21	0.082
335-67-1	Perfluorooctanoic acid (PFOA)	14	J1	0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	5.1	J1	0.31	0.21	0.085
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	M	0.42	0.19	0.062
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*35*	*E J1*	*0.31*	0.21	*0.065*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*340*	*M E J1*	*1.0*	0.52	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	89		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	58		50-150
STL00994	18O2 PFHxS	83		50-150
STL00991	13C4 PFOS	54		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_017.d
Lims ID: 320-41149-A-19-A
Client ID: GRE07-SB1-01
Sample Type: Client
Inject. Date: 29-Jul-2018 01:24:25 ALS Bottle#: 10 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-19-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:58:22 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:58:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.391	1.397	-0.006	1.000	3446745	1.88			259	M
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.397	-0.006	0.541	4661981	2.67		107	66895	
D 3 13C5-PFPeA										
267.90 > 223.00	1.632	1.633	-0.001	0.635	3250941	2.67		107	30590	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.632	1.641	-0.009	1.000	2397930	1.54			300	M
D 47 13C3-PFBS										
301.90 > 83.00	1.656	1.667	-0.011	0.644	66143	2.07		89.1	113	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.665	1.676	-0.011	1.005	1681529	0.7445			1190	
298.90 > 99.00	1.665	1.676	-0.011	1.005	690080		2.44(1.25-3.74)		393	M
D 60 M2-4:2FTS										
329.00 > 81.00	1.773	1.875	-0.102	0.689	12755	NC			5.7	
61 1H,1H,2H,2H-perfluorohexanesulfoni										M
327.00 > 307.00	1.866	1.877	-0.011	1.127	233306	0.4797			161	M
D 7 13C2 PFHxA										
315.00 > 270.00	1.894	1.905	-0.011	0.737	3139324	2.20		88.0	54102	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.894	1.906	-0.012	1.000	5566805	4.18			1828	
313.00 > 119.00	1.894	1.906	-0.012	1.000	463943		12.00(5.03-15.10)		2236	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.916	1.928	-0.012	1.157	2174568	1.07			2707	
349.00 > 99.00	1.916	1.928	-0.012	1.157	799910		2.72(1.36-4.07)		1331	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.991	2.002	-0.011	0.774	308980	NC			6800	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.228	-0.011	0.862	3139313	2.13		85.4	48799	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.217	2.230	-0.013	1.000	2012007	1.45			1172	
363.00 > 169.00	2.217	2.230	-0.013	1.000	788024		2.55(1.13-3.40)		5334	
D 11 18O2 PFHxS										
403.00 > 84.00	2.228	2.240	-0.012	0.866	3704808	1.96		82.9	41735	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.228	2.242	-0.014	1.000	30498553	16.7			19989	E
399.00 > 99.00	2.228	2.242	-0.014	1.000	10843138		2.81(1.50-4.49)		11564	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.545	2.557	-0.012	1.000	27281249	45.4			87055	E
D 12 M2-6:2FTS										
429.00 > 81.00	2.545	2.564	-0.019	0.990	846508	2.06		86.8	1848	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.582	-0.010		3760961	2.50			48578	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.582	-0.010	1.000	10086062	6.59			3683	
413.00 > 169.00	2.572	2.582	-0.010	1.000	5509025		1.83(0.84-2.52)		8939	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.588	-0.016	1.000	3150988	2.19		87.6	43688	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.580	2.590	-0.010	0.879	1677017	1.71			201	
449.00 > 99.00	2.580	2.590	-0.010	0.879	472982		3.55(1.94-5.82)		668	M
D 18 13C4 PFOS										
503.00 > 80.00	2.936	2.947	-0.011	1.142	1697923	1.29		54.1	2628	
D 19 13C5 PFNA										
468.00 > 423.00	2.936	2.947	-0.011	1.142	1807551	1.46		58.3	26804	
20 Perfluorononanoic acid										
463.00 > 419.00	2.936	2.948	-0.012	1.000	2016563	2.44			1298	
463.00 > 169.00	2.936	2.948	-0.012	1.000	506533		3.98(1.90-5.69)		2376	
17 Perfluorooctane sulfonic acid										EM
499.00 > 80.00	2.936	2.948	-0.012	1.000	125331877	159.7			22716	EM
499.00 > 99.00	2.936	2.948	-0.012	1.000	42365503		2.96(2.31-6.93)		83182	
D 26 M2-8:2FTS										
529.00 > 81.00	3.283	3.298	-0.015	1.276	1264284	2.95		123	1977	
25 1H,1H,2H,2H-perfluorodecanesulfoni										E
527.00 > 507.00	3.291	3.300	-0.009	1.002	71907539	100.5			467828	E
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.291	3.300	-0.009	1.121	1574249	2.97			19.3	
549.00 > 99.00	3.283	3.300	-0.017	1.118	591644		2.66(1.33-3.97)		64.0	
D 23 13C2 PFDA										
515.00 > 470.00	3.299	3.314	-0.015	1.283	2120221	2.15		85.9	34028	
D 21 13C8 FOSA										
506.00 > 78.00	3.306	3.314	-0.008	1.286	3078537	1.60		63.8	863	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.315	-0.016	1.000	1882495	2.16			1044	
513.00 > 169.00	3.299	3.315	-0.016	1.000	340824		5.52(2.36-7.09)		793	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.314	3.315	-0.001	1.002	10130411	8.27			177	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.448	3.466	-0.018	1.341	916244	2.81		112	5048	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.457	3.469	-0.012	1.003	64260	0.1779			533	M
35 MeFOSA										
512.00 > 169.00	3.560	3.498	0.062		3253	NC			3.8	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.611	3.624	-0.013	1.230	2314164	4.91			41.5	
599.00 > 99.00	3.611	3.624	-0.013	1.230	794647		2.91(1.39-4.16)		190	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.620	3.629	-0.009	1.408	1051240	3.06		123	5566	
D 30 13C2 PFUnA										
565.00 > 520.00	3.630	3.639	-0.009	1.411	2435718	3.06		122	47306	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.630	3.643	-0.013	1.000	935028	0.7734			73.8	M
563.00 > 169.00	3.600	3.643	-0.043	0.992	153815		6.08(2.12-6.36)		17.8	M
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.630	3.643	-0.013	1.003	230107	0.5866			1918	
D 36 13C2 PFDoA										
615.00 > 570.00	3.909	3.930	-0.021	1.520	1953592	2.58		103	13693	
37 Perfluorododecanoic acid										M
613.00 > 569.00	3.909	3.935	-0.026	1.000	1120073	1.32			149	
613.00 > 169.00	3.909	3.935	-0.026	1.000	275064		4.07(2.13-6.40)		228	M
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.405	4.435	-0.030	1.000	93449	0.5302			250	
713.00 > 219.00	4.405	4.435	-0.030	1.000	62441		1.50(0.71-2.13)		228	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.405	4.437	-0.032	1.713	1757586	2.38		95.2	7505	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.840	-0.017	1.000	171299	NC			33.8	
813.00 > 169.00	4.823	4.840	-0.017	1.000	35047		4.89(2.86-8.58)		142	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.842	-0.019	1.875	2924955	2.61		104	9108	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.180	-0.007	1.073	54425	NC			14.7	
913.00 > 169.00	5.173	5.180	-0.007	1.073	7120		7.64(3.83-11.48)		42.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 30-Jul-2018 15:58:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_017.d

Injection Date: 29-Jul-2018 01:24:25 Instrument ID: A8_N

Lims ID: 320-41149-A-19-A Lab Sample ID: 320-41149-19

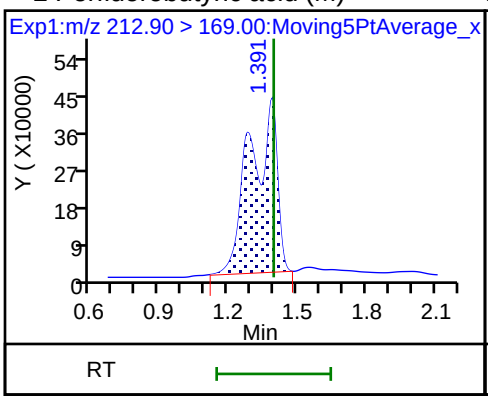
Client ID: GRE07-SB1-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 10 Worklist Smp#: 4

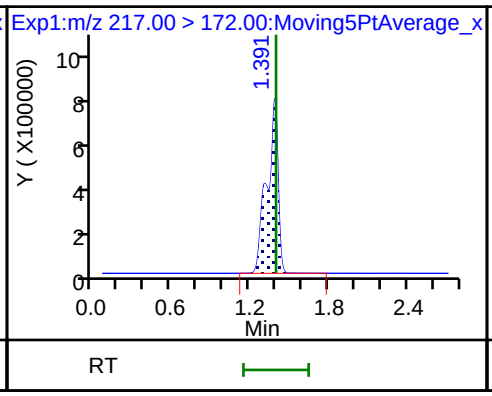
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

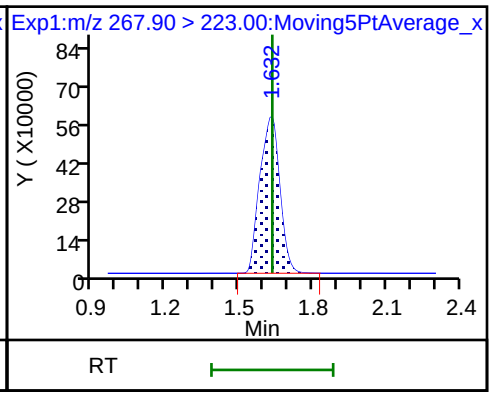
2 Perfluorobutyric acid (M)



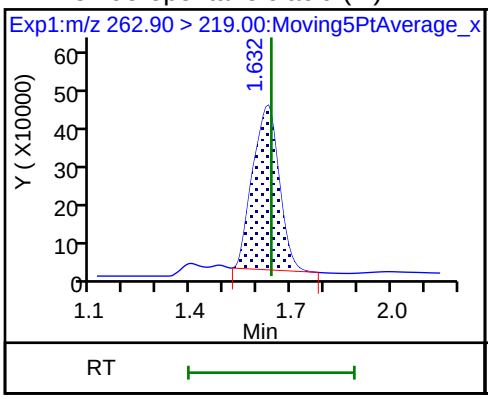
D 1 13C4 PFBA



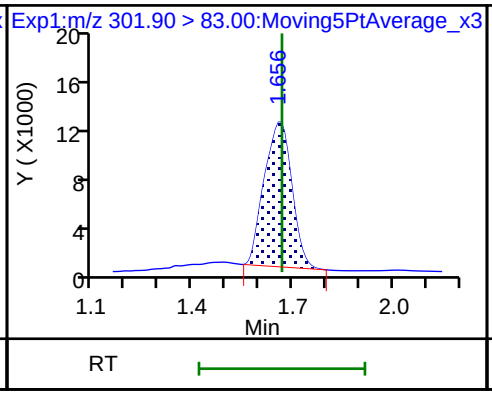
D 3 13C5-PFPeA



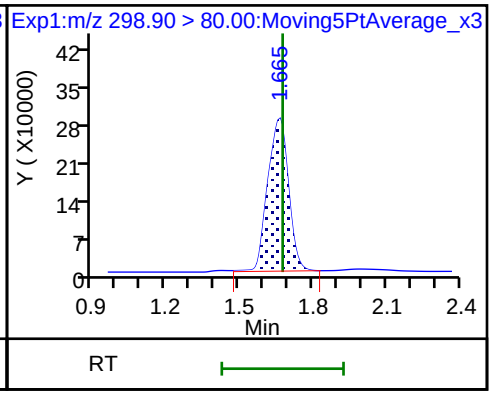
4 Perfluoropentanoic acid (M)



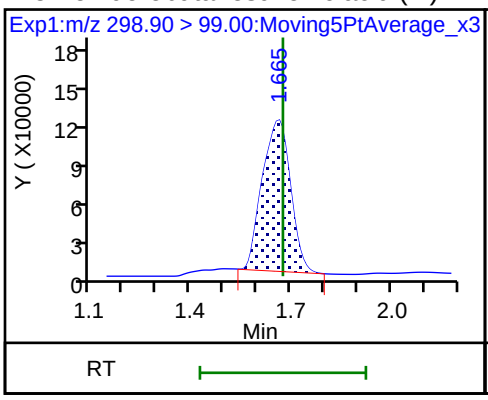
D 47 13C3-PFBS



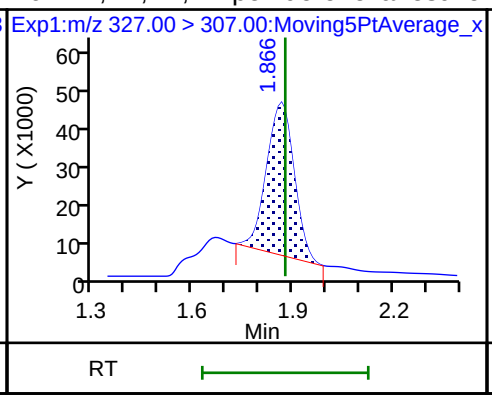
5 Perfluorobutanesulfonic acid



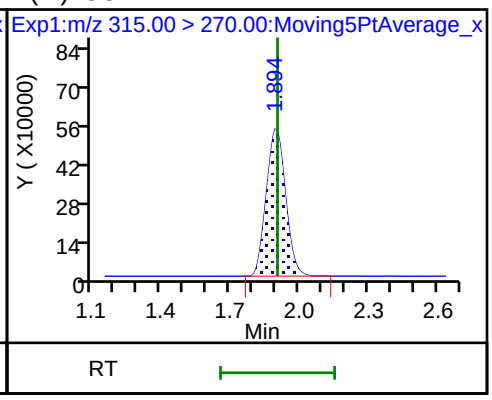
5 Perfluorobutanesulfonic acid (M)



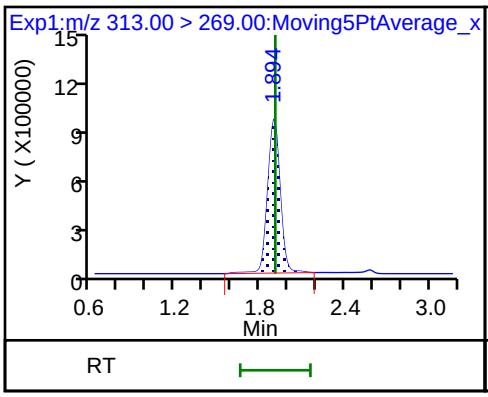
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (M)



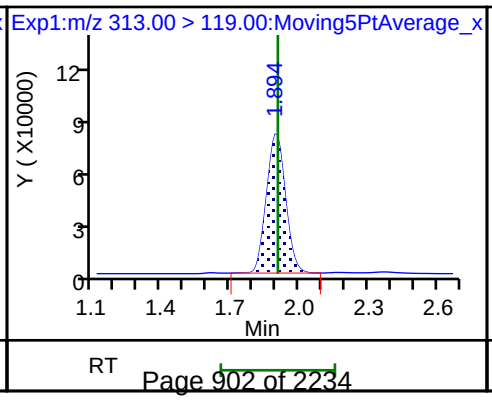
D 7 13C2 PFHxA



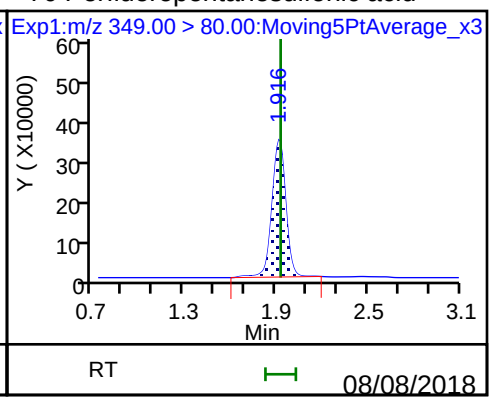
6 Perfluorohexanoic acid



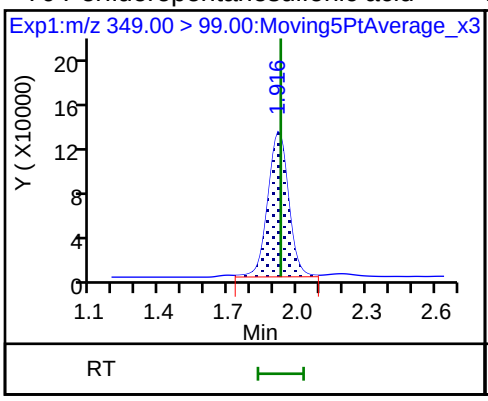
6 Perfluorohexanoic acid



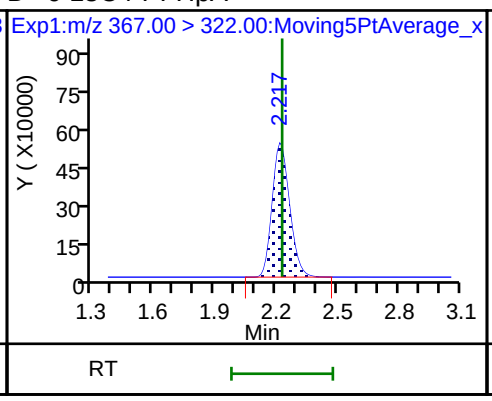
70 Perfluoropentanesulfonic acid



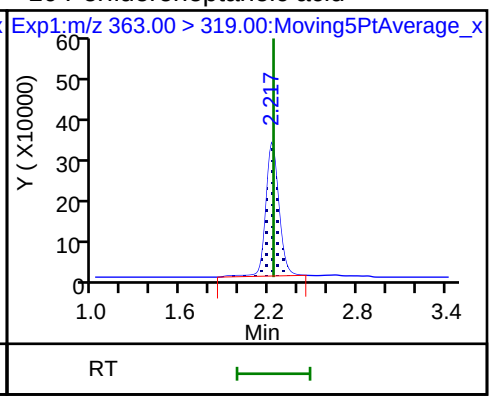
70 Perfluoropentanesulfonic acid



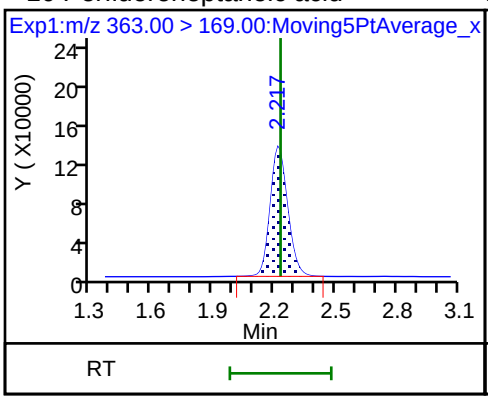
D 9 13C4-PFHpA



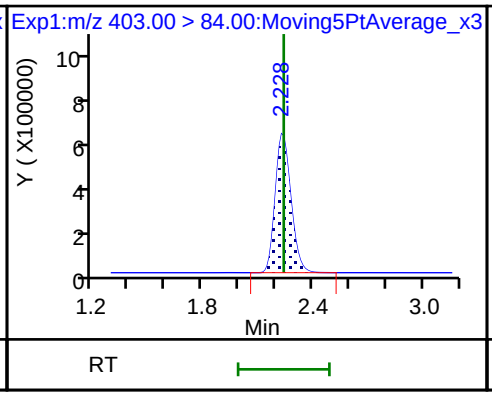
10 Perfluoroheptanoic acid



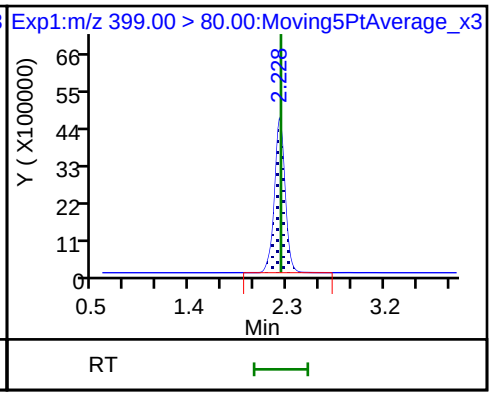
10 Perfluoroheptanoic acid



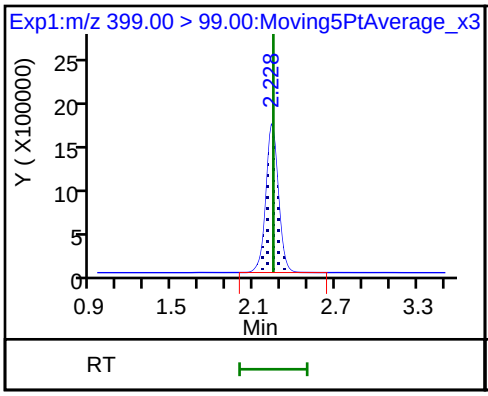
D 11 18O2 PFHxS



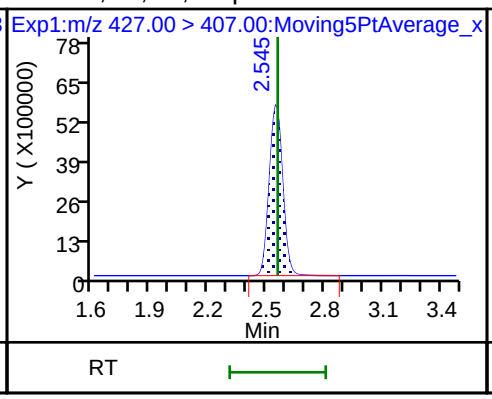
8 Perfluorohexanesulfonic acid



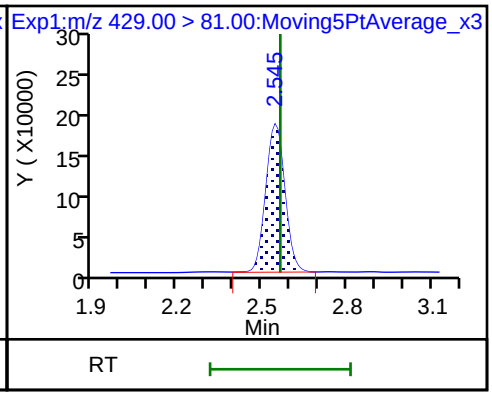
8 Perfluorohexanesulfonic acid



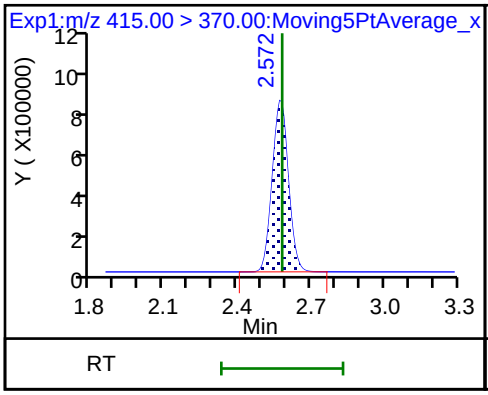
13 1H,1H,2H,2H-perfluorooctanesulfon



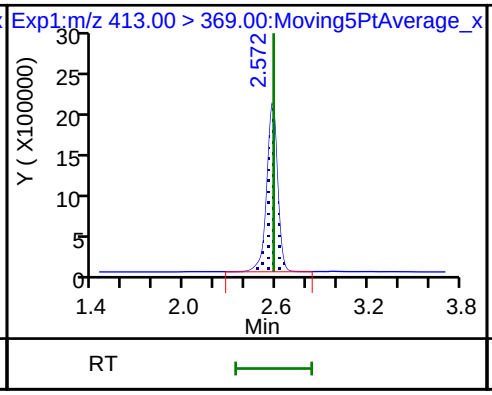
D 12 M2-6:2FTS



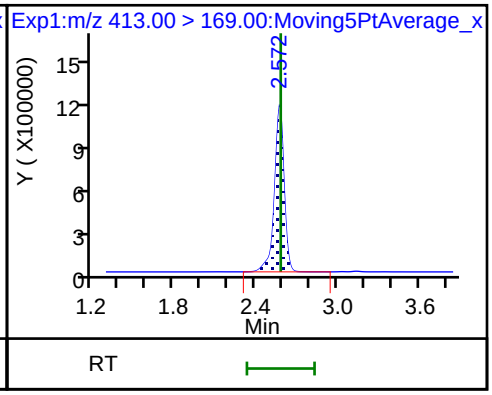
* 62 13C2-PFOA



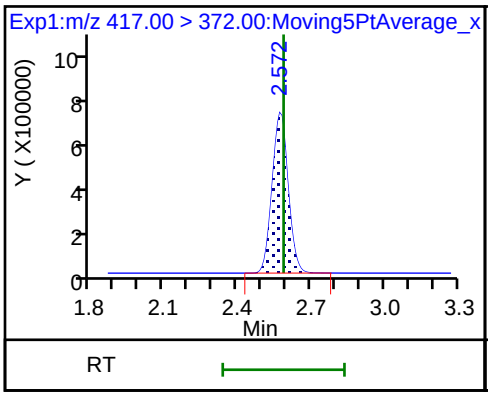
15 Perfluorooctanoic acid



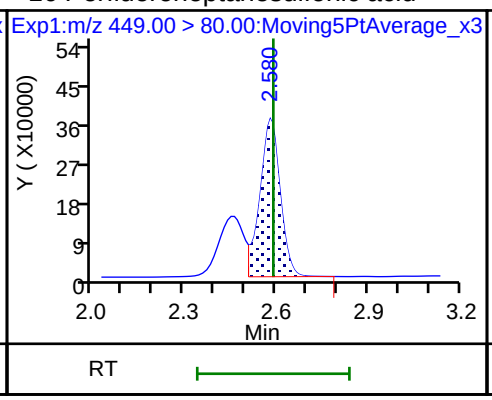
15 Perfluorooctanoic acid



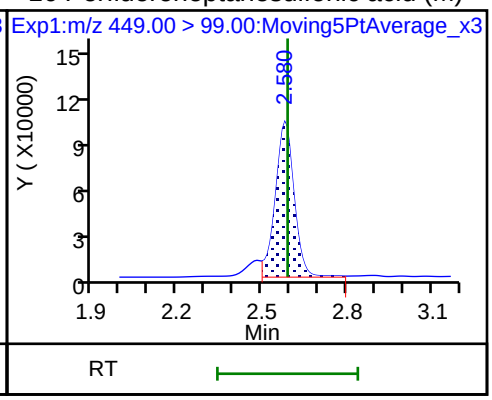
D 14 13C4 PFOA



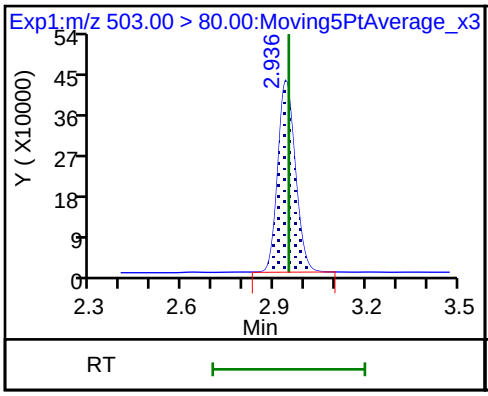
16 Perfluoroheptanesulfonic acid



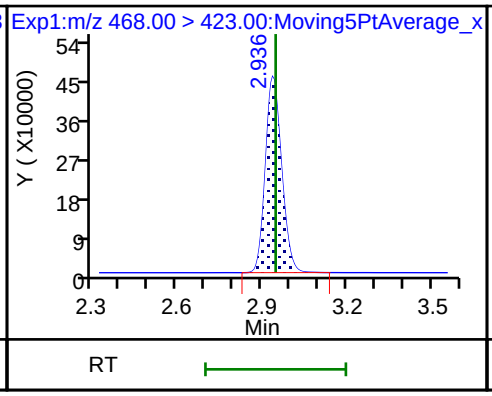
16 Perfluoroheptanesulfonic acid (M)



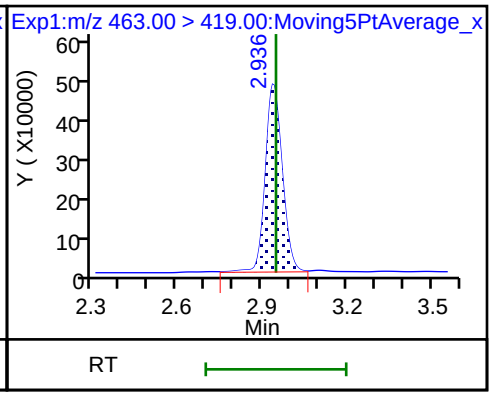
D 18 13C4 PFOS



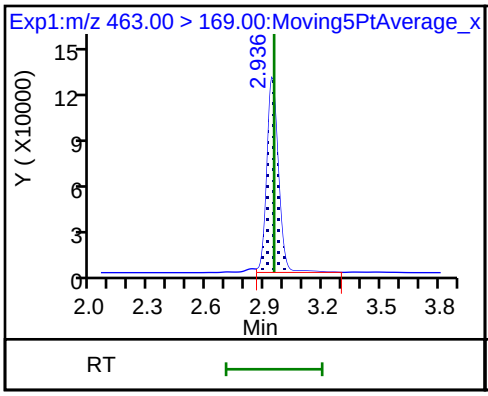
D 19 13C5 PFNA



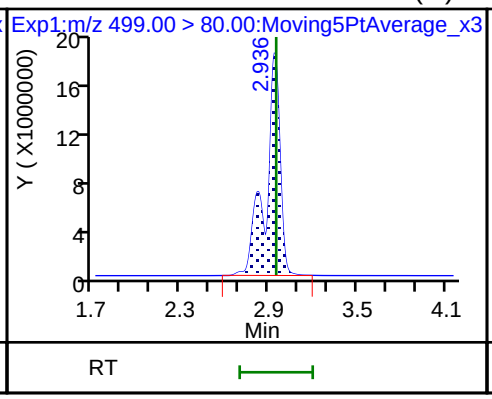
20 Perfluorononanoic acid



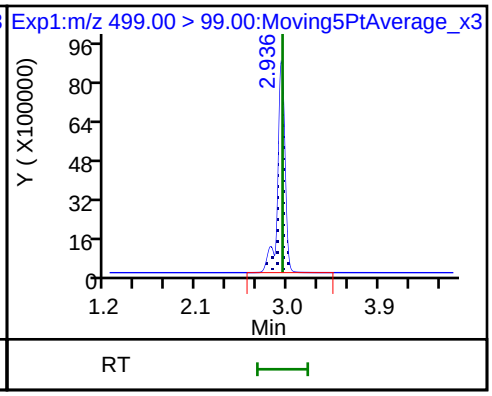
20 Perfluorononanoic acid



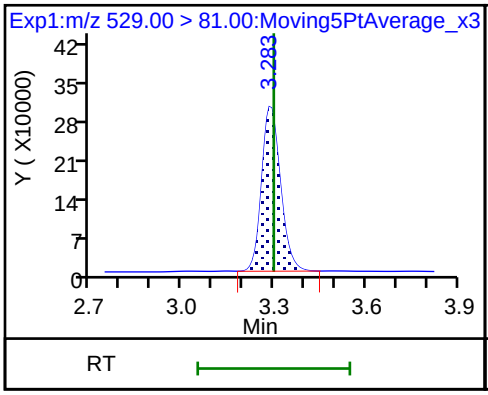
17 Perfluorooctane sulfonic acid (M)



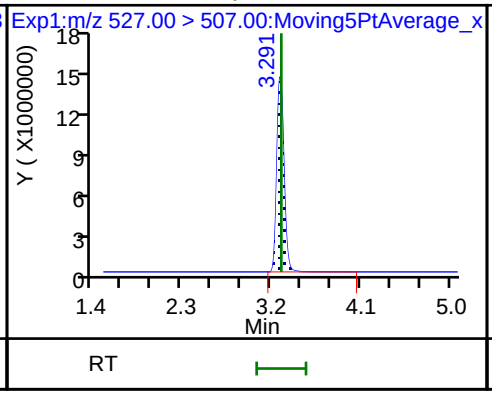
17 Perfluorooctane sulfonic acid



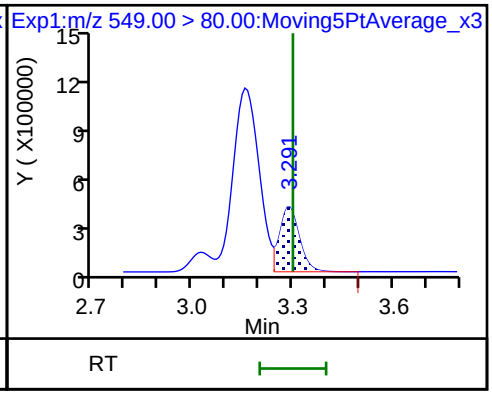
D 26 M2-8:2FTS



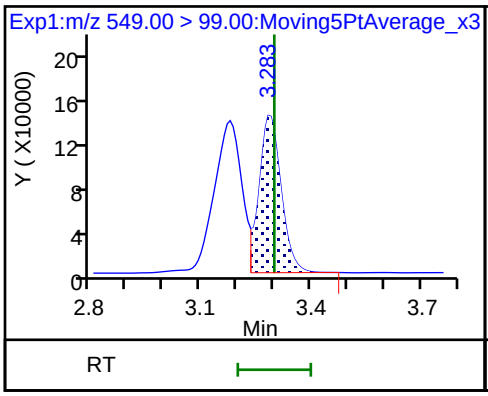
25 1H,1H,2H,2H-perfluorodecanesulfoni



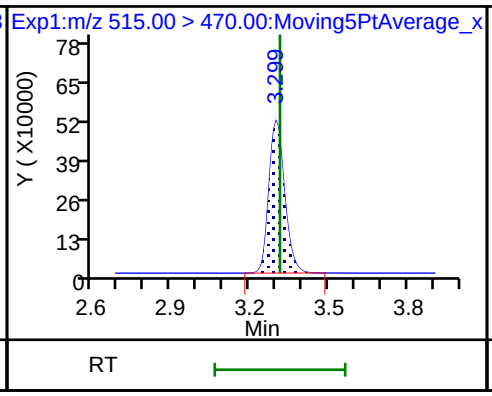
68 Perfluorononanesulfonic acid



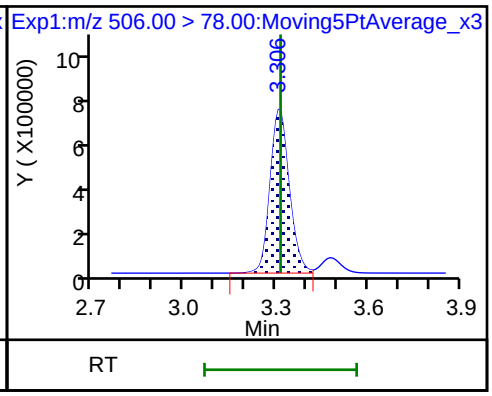
68 Perfluorononanesulfonic acid



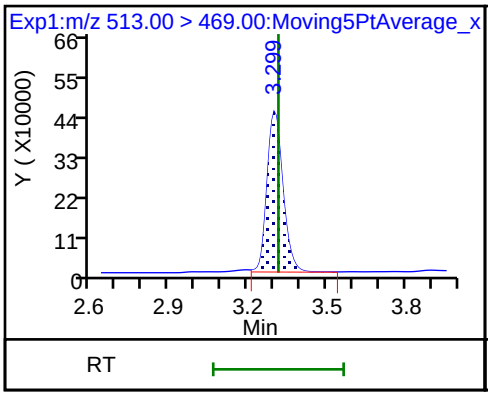
D 23 13C2 PFDA



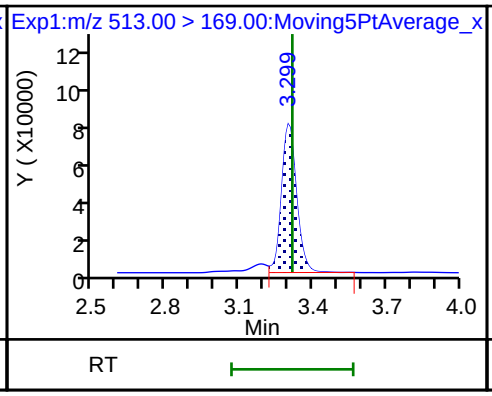
D 21 13C8 FOSA



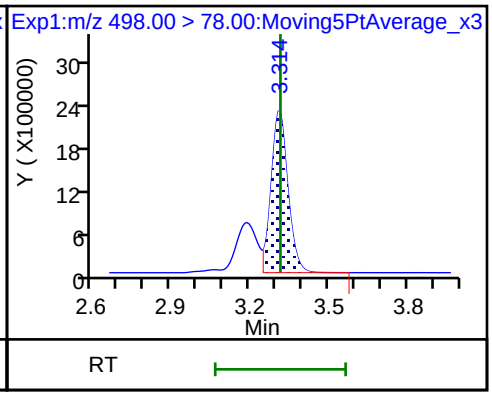
24 Perfluorodecanoic acid



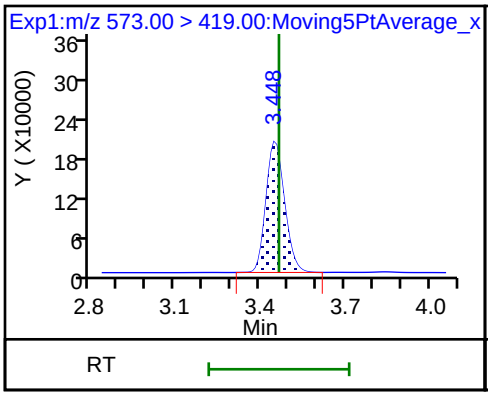
24 Perfluorodecanoic acid



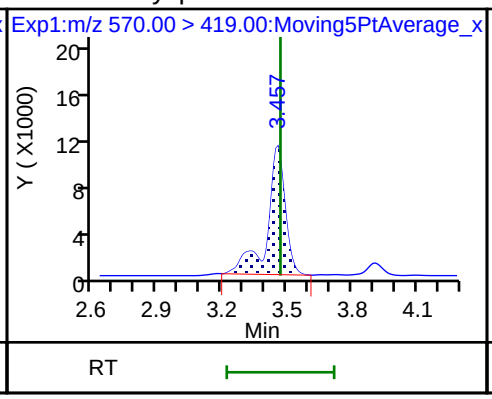
22 Perfluorooctane Sulfonamide



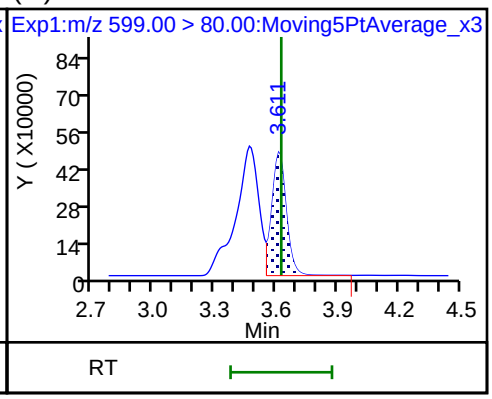
D 27 d3-NMeFOSAA



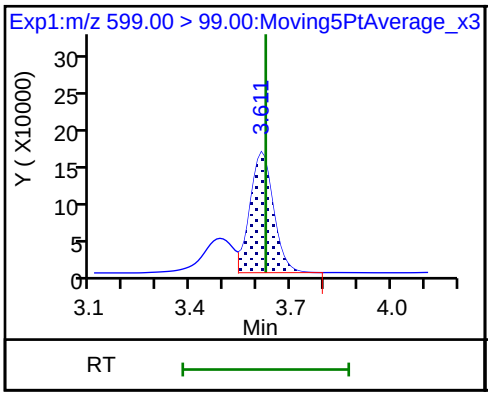
28 N-methyl perfluorooctane sulfonami (M)



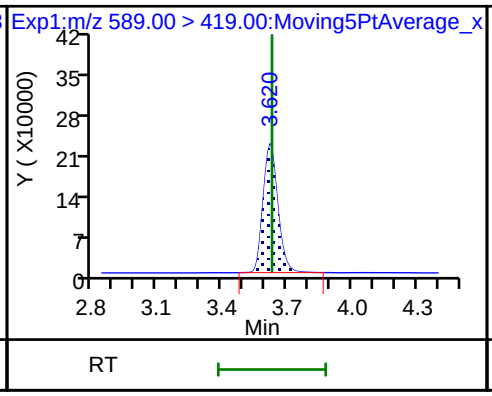
29 Perfluorodecane Sulfonic acid



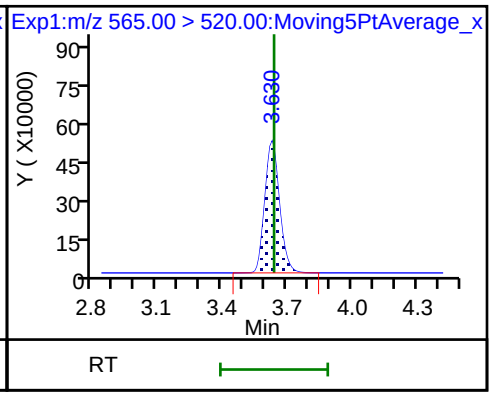
29 Perfluorodecane Sulfonic acid



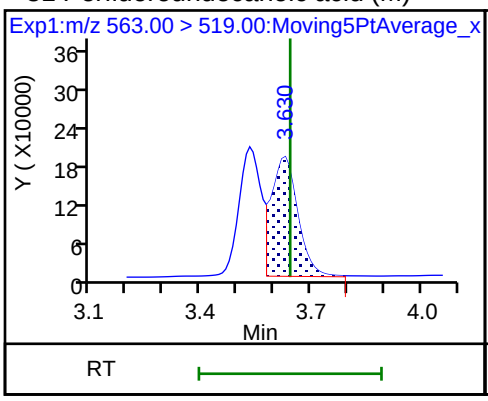
D 32 d5-NEtFOSAA



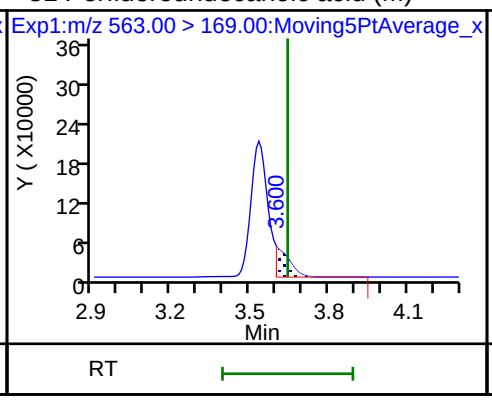
D 30 13C2 PFUnA



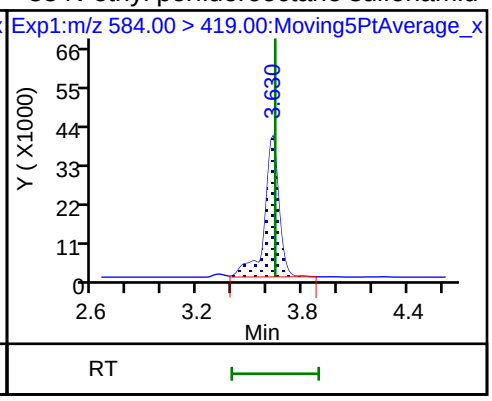
31 Perfluoroundecanoic acid (M)



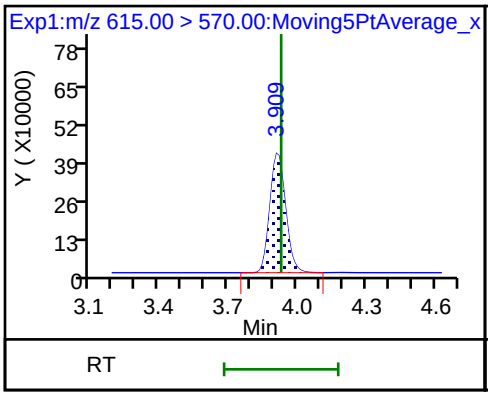
31 Perfluoroundecanoic acid (M)



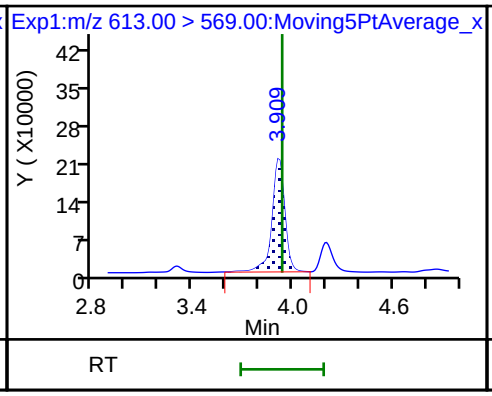
33 N-ethyl perfluorooctane sulfonamid



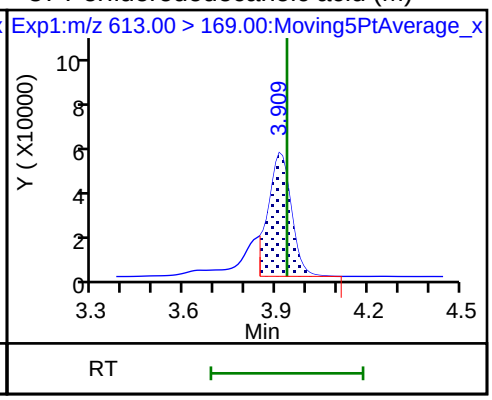
D 36 13C2 PFDoA



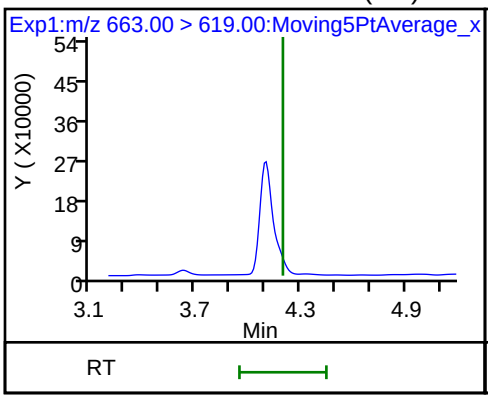
37 Perfluorododecanoic acid



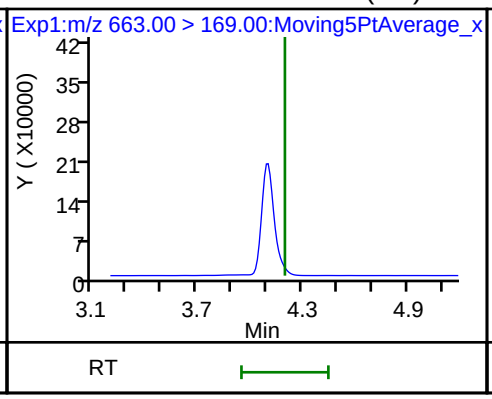
37 Perfluorododecanoic acid (M)



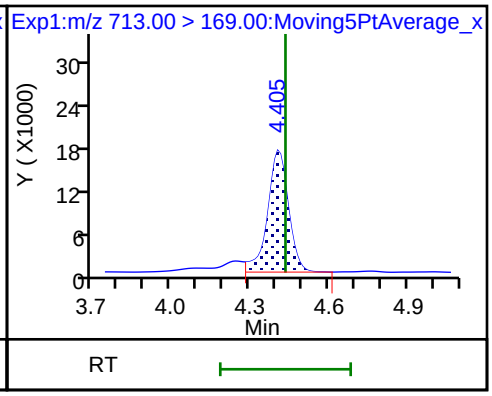
41 Perfluorotridecanoic acid (ND)



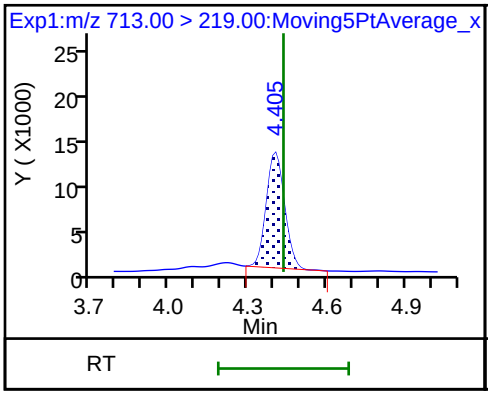
41 Perfluorotridecanoic acid (ND)



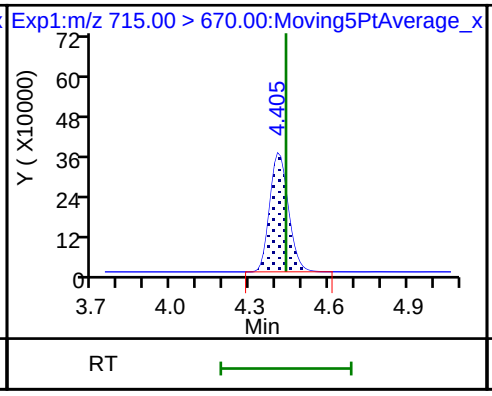
42 Perfluorotetradecanoic acid



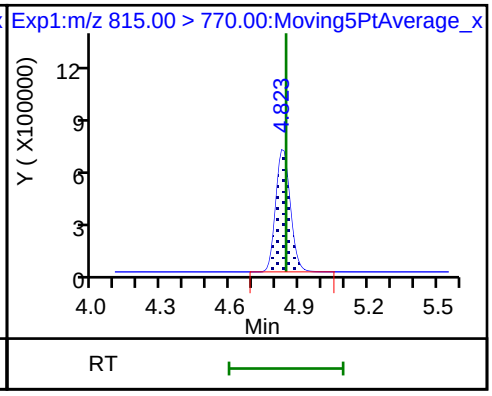
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

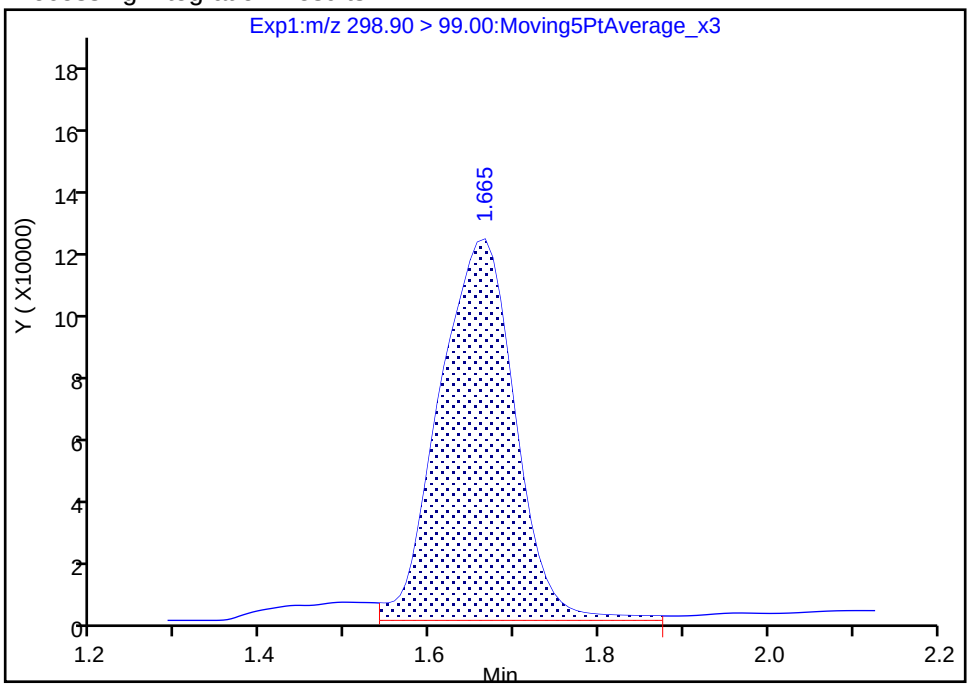
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_017.d				
Injection Date:	29-Jul-2018 01:24:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-A	Lab Sample ID:	320-41149-19		
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

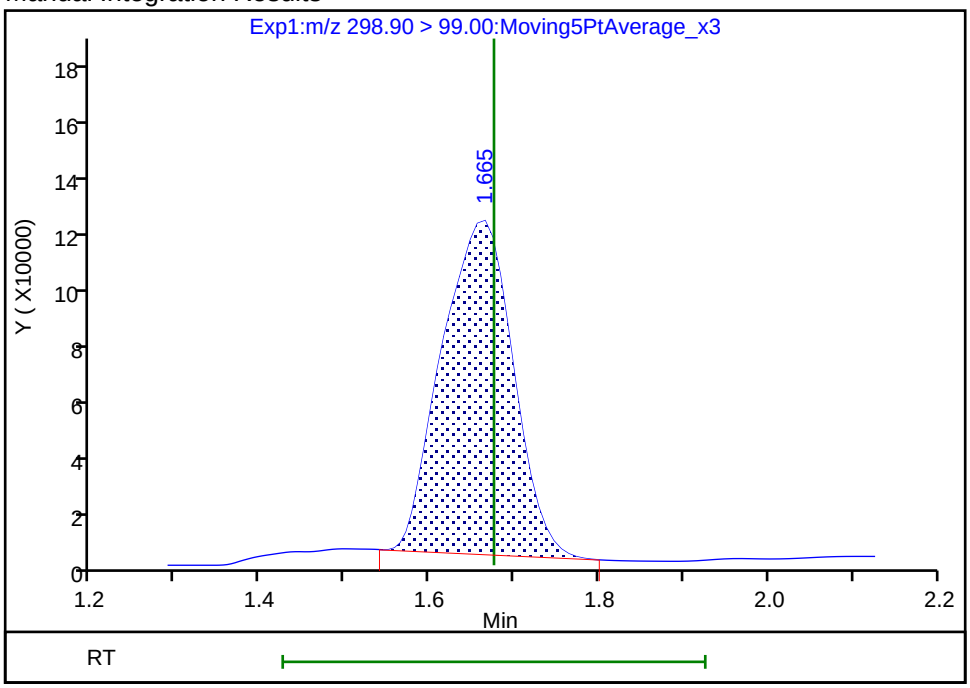
Processing Integration Results

RT: 1.67
Area: 753535
Amount: 0.744493
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 690080
Amount: 0.744493
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:56:40

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

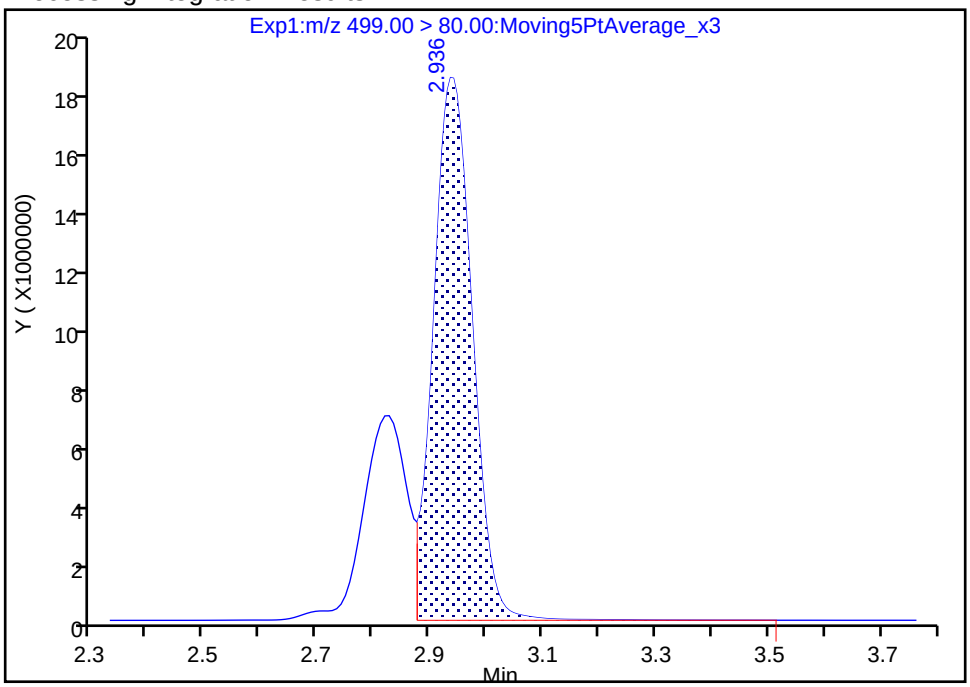
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_017.d				
Injection Date:	29-Jul-2018 01:24:25	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-A	Lab Sample ID:	320-41149-19		
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

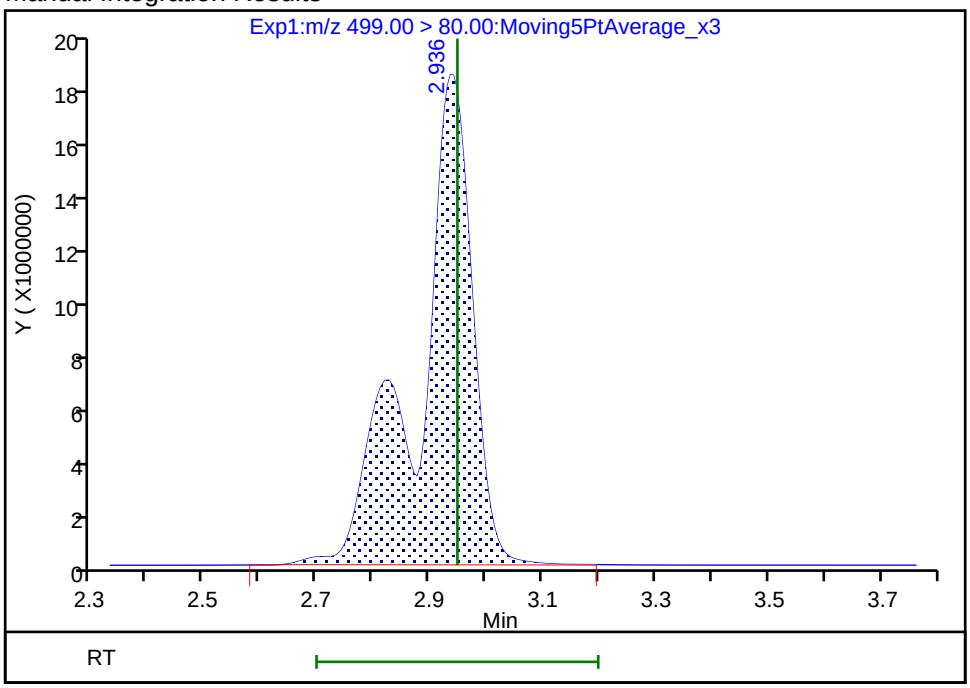
Processing Integration Results

RT: 2.94
Area: 88262750
Amount: 112.4348
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 125331877
Amount: 159.6559
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:57:21

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB1-01 DL | Lab Sample ID: 320-41149-19 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_007.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 14:15

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.05(g) | Date Analyzed: 07/31/2018 17:57

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 50

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*10*	*U M*	*16*	10	*4.1*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*15*	*J J1 D M*	*16*	10	*5.2*
375-95-1	*Perfluorononanoic acid (PFNA)*	*6.6*	*J J1 D*	*16*	10	*4.3*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*9.4*	*U*	*21*	9.4	*3.1*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	37	J1 D	16	10	3.3
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	520	J1 D	52	26	13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	57	M	50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	80		50-150
STL00994	18O2 PFHxS	73		50-150
STL00991	13C4 PFOS	71		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_007.d
Lims ID: 320-41149-A-19-A
Client ID: GRE07-SB1-01
Sample Type: Client
Inject. Date: 31-Jul-2018 17:57:27 ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 50.0000
Sample Info: 320-41149-a-19-a 50X (234662)
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:26:39 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:26:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.391	1.391	0.0	1.000	41463	0.0212			7.6	M
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.394	-0.003	0.539	95667	0.0413		82.6	1620	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.625	1.633	-0.008	1.000	46527	0.0314			17.2	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.625	1.636	-0.011	0.630	61332	0.0412		82.3	1254	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.658	1.666	-0.008	0.995	36860	0.0188			144	
298.90 > 99.00	1.658	1.666	-0.008	0.995	15808		2.33(1.25-3.74)		38.1	
D 47 13C3-PFBS										M
301.90 > 83.00	1.667	1.670	-0.003	0.646	1174	0.0266		57.1	4.7	M
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.866	0.011	1.126	3190	0.008281			42.8	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.896	1.906	-0.010	0.995	115245	0.0841			128	M
313.00 > 119.00	1.896	1.906	-0.010	0.995	8712		13.23(5.03-15.10)		96.1	M
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.911	-0.005	0.738	64258	0.0380		76.0	1962	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.917	1.927	-0.010	1.150	45306	0.0256			365	
349.00 > 99.00	1.917	1.927	-0.010	1.150	13832		3.28(1.36-4.07)		49.0	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.993	1.997	-0.004	0.772	4838	NC			187	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.223	-0.004	0.859	72652	0.0452		90.3	3155	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.219	2.229	-0.010	1.000	40102	0.0243			15.8	M
363.00 > 169.00	2.230	2.229	0.001	1.005	17629		2.27(1.13-3.40)		133	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.241	0.001	1.005	742837	0.3571			2818	
399.00 > 99.00	2.230	2.241	-0.011	1.000	241844		3.07(1.50-4.49)		345	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.248	-0.018	0.864	84665	0.0346		73.2	2432	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.553	0.004	1.000	572238	0.9617			6753	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.562	-0.005	0.990	16777	0.0333		70.1	187	
* 62 13C2-PFOA										
415.00 > 370.00	2.582	2.578	0.004		85540	0.0500			2452	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.582	2.578	0.004	1.000	241148	0.1430			163	M
413.00 > 169.00	2.582	2.578	0.004	1.000	120791		2.00(0.84-2.52)		506	
D 14 13C4 PFOA										
417.00 > 372.00	2.582	2.586	-0.004	1.000	72322	0.0440		88.0	3272	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.590	2.586	0.004	0.880	35926	0.0216			168	
449.00 > 99.00	2.582	2.586	-0.004	0.877	10102		3.56(1.94-5.82)		36.3	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.946	0.003	1.000	78693	0.0630			91.2	
463.00 > 169.00	2.943	2.946	-0.003	0.998	17323		4.54(1.90-5.69)		330	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.949	2.946	0.003	1.002	7126139	5.00			50611	
499.00 > 99.00	2.943	2.946	-0.003	1.000	1680208		4.24(2.31-6.93)		11648	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.952	-0.009	1.140	59826	0.0341		71.3	1094	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.952	-0.003	1.142	57895	0.0399		79.7	3184	
D 26 M2-8:2FTS										
529.00 > 81.00	3.294	3.296	-0.002	1.276	32510	0.0560		117	392	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.294	3.296	-0.002	1.000	3132190	3.48			155129	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.294	3.296	-0.002	1.119	40856	0.0417			29.9	
549.00 > 99.00	3.286	3.296	-0.010	1.116	12778		3.20(1.33-3.97)		37.9	
D 23 13C2 PFDA										
515.00 > 470.00	3.302	3.311	-0.009	1.279	50559	0.0420		84.1	2474	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.302	3.311	-0.009	1.000	41928	0.0381			60.6	R
513.00 > 169.00	3.302	3.311	-0.009	1.000	5177		8.10(2.36-7.09)		54.8	
D 21 13C8 FOSA										
506.00 > 78.00	3.309	3.319	-0.010	1.282	85760	0.0342		68.5	498	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.309	3.319	-0.010	1.000	285587	0.1682			231	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.452	3.464	-0.012	1.337	9685	0.0356		71.2	239	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.626	3.628	-0.002	1.404	12207	0.0410		82.1	144	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.616	3.628	-0.012	1.229	42694	0.0510			38.7	
599.00 > 99.00	3.616	3.628	-0.012	1.229	18986		2.25(1.39-4.16)		91.0	
D 30 13C2 PFUnA										
565.00 > 520.00	3.635	3.638	-0.003	1.408	33136	0.0355		71.0	1028	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.635	3.638	-0.003	1.003	2507	0.0112			41.9	
31 Perfluoroundecanoic acid										Ma
563.00 > 519.00	3.635	3.638	-0.003	1.000	16232	0.0273			25.9	a
563.00 > 169.00	3.605	3.638	-0.033	0.992	3831		4.24(2.12-6.36)		18.9	M
37 Perfluorododecanoic acid										
613.00 > 569.00	3.932	3.928	0.004	1.003	15957	0.0237			12.6	
613.00 > 169.00	3.932	3.928	0.004	1.003	2956		5.40(2.13-6.40)		38.4	
D 36 13C2 PFDoA										
615.00 > 570.00	3.921	3.928	-0.007	1.519	31241	0.0330		65.9	758	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.420	4.426	-0.006	1.712	24873	0.0288		57.6	179	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.828	4.833	-0.005	1.870	35450	0.0232		46.4	64.2	

QC Flag Legend

Processing Flags
- NC - Not Calibrated
- R - Failed Signal Ratio Test

Review Flags
- M - Manually Integrated
- a - User Assigned ID

Report Date: 01-Aug-2018 12:26:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_007.d

Injection Date: 31-Jul-2018 17:57:27 Instrument ID: A8_N

Lims ID: 320-41149-A-19-A Lab Sample ID: 320-41149-19

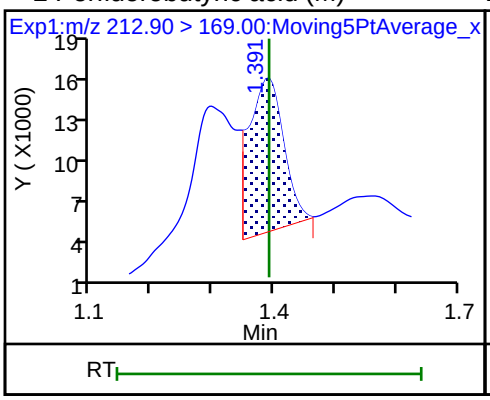
Client ID: GRE07-SB1-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 1 Worklist Smp#: 2

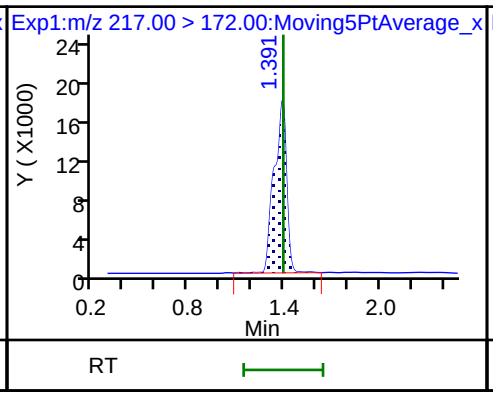
Injection Vol: 2.0 ul Dil. Factor: 50.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

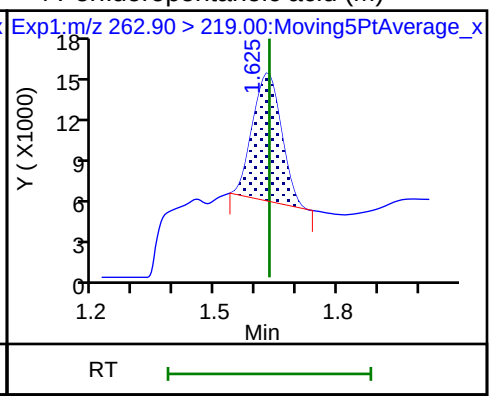
2 Perfluorobutyric acid (M)



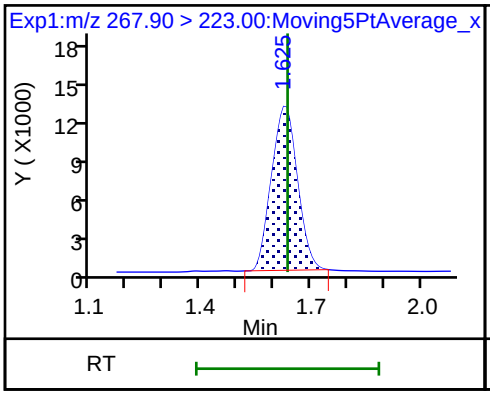
D 1 13C4 PFBA



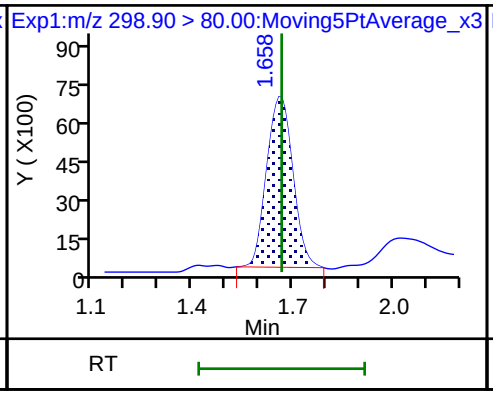
4 Perfluoropentanoic acid (M)



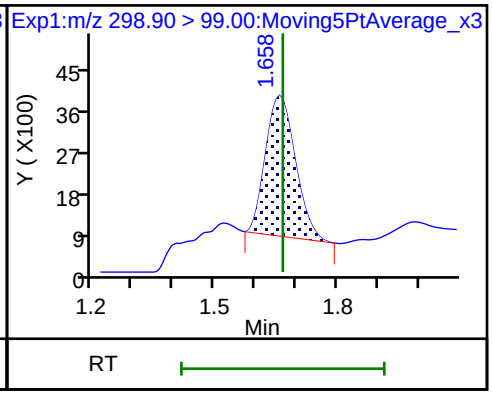
D 3 13C5-PFPeA



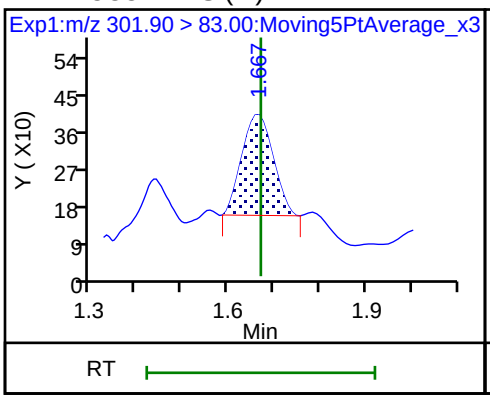
5 Perfluorobutanesulfonic acid



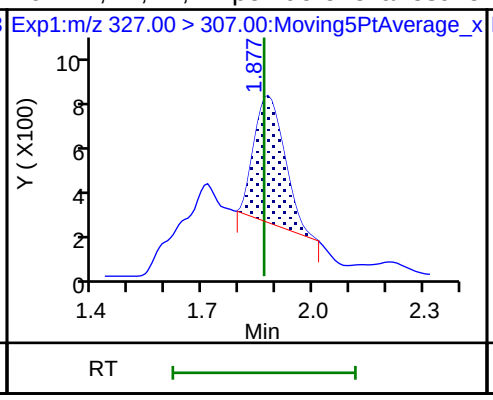
5 Perfluorobutanesulfonic acid



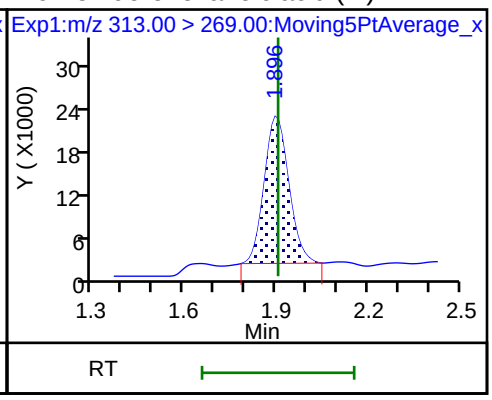
D 47 13C3-PFBS (M)



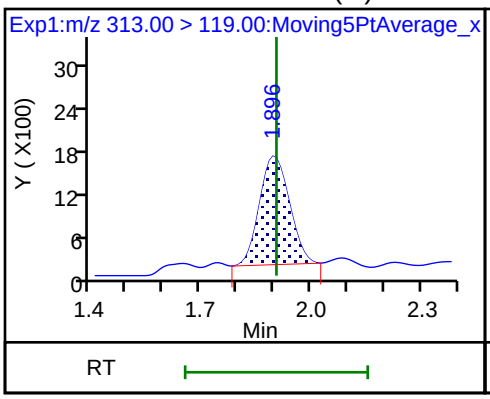
61 1H,1H,2H,2H-perfluorohexanesulfoni



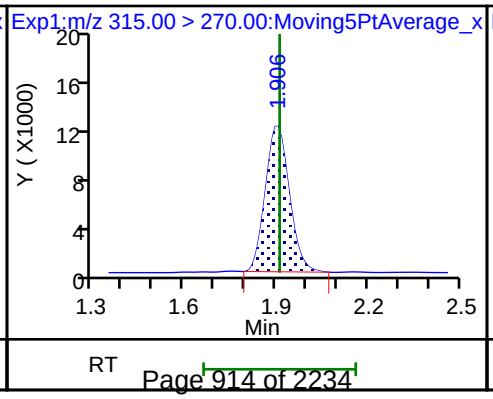
6 Perfluorohexanoic acid (M)



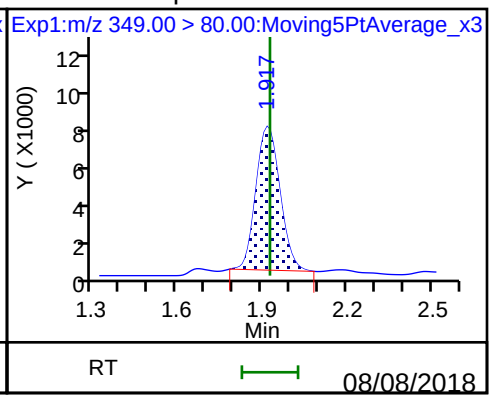
6 Perfluorohexanoic acid (M)



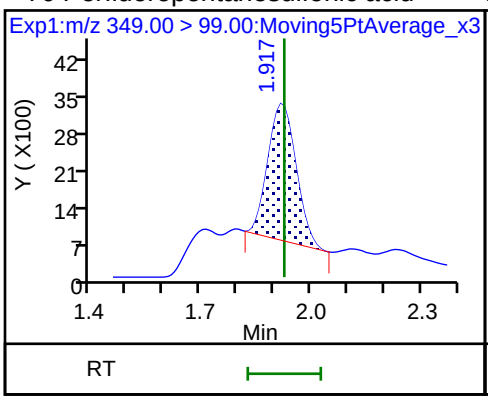
D 7 13C2 PFHxA



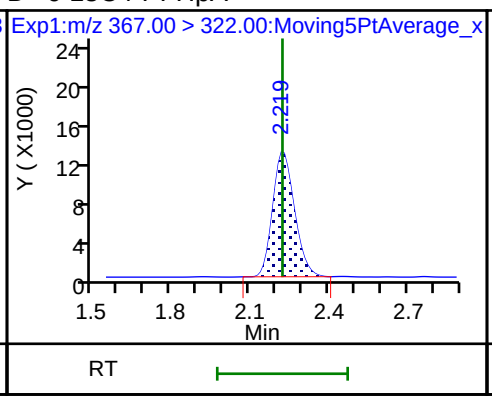
70 Perfluoropentanesulfonic acid



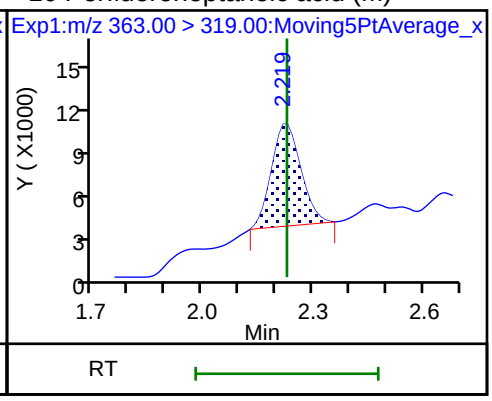
70 Perfluoropentanesulfonic acid



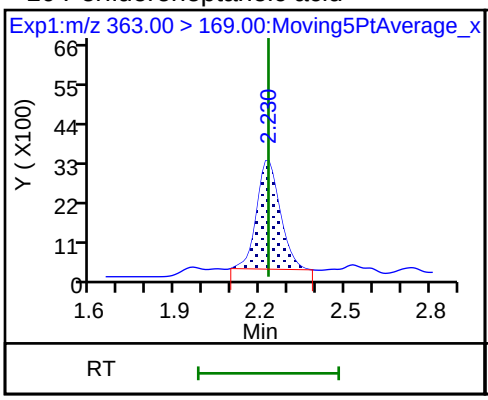
D 9 13C4-PFHpA



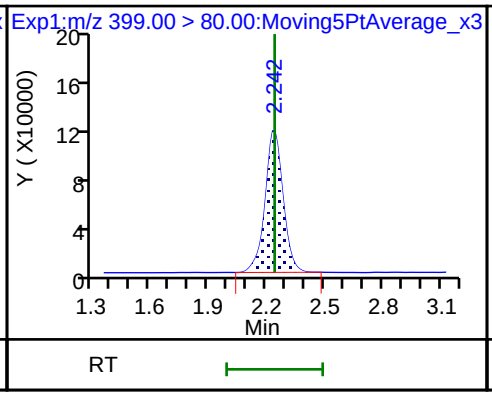
10 Perfluoroheptanoic acid (M)



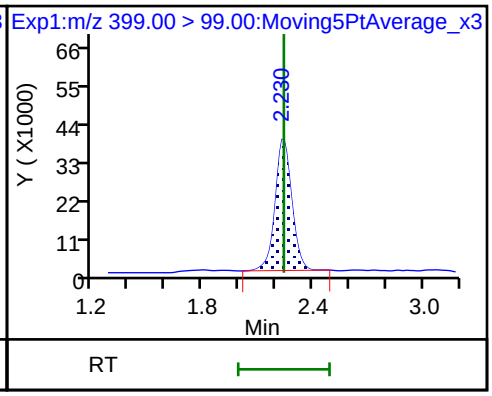
10 Perfluoroheptanoic acid



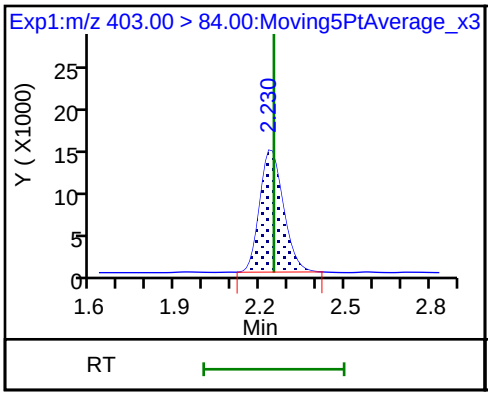
8 Perfluorohexanesulfonic acid



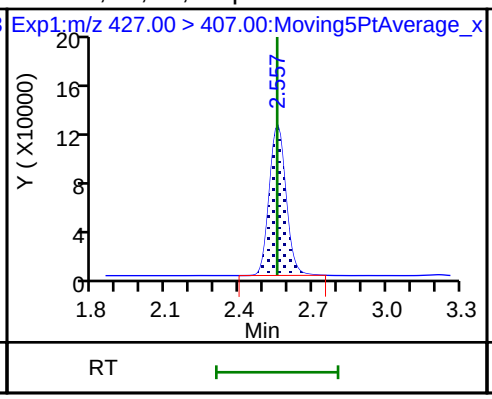
8 Perfluorohexanesulfonic acid



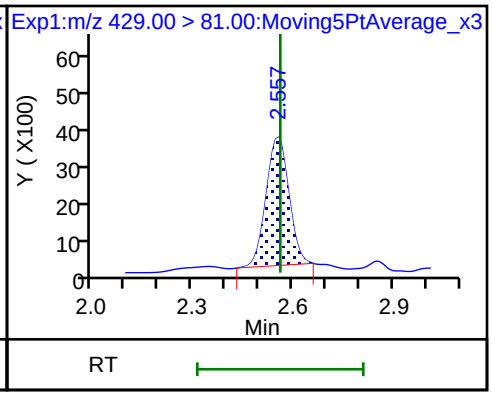
D 11 18O2 PFHxS



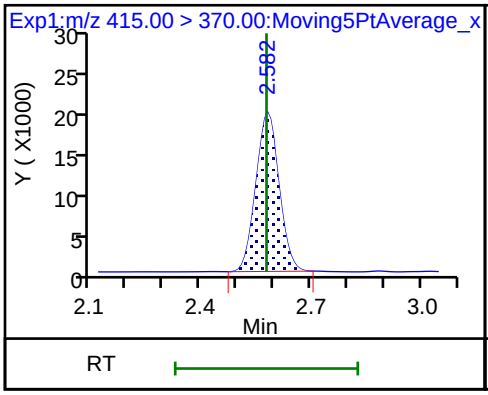
13 1H,1H,2H,2H-perfluorooctanesulfon



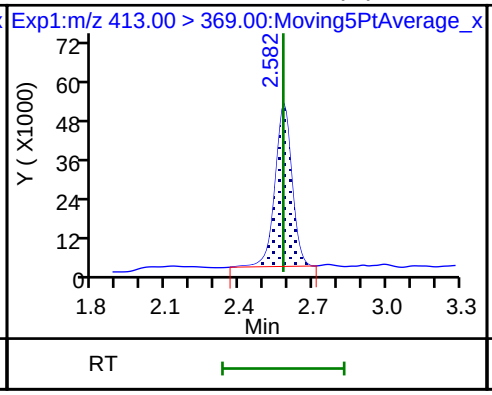
D 12 M2-6:2FTS



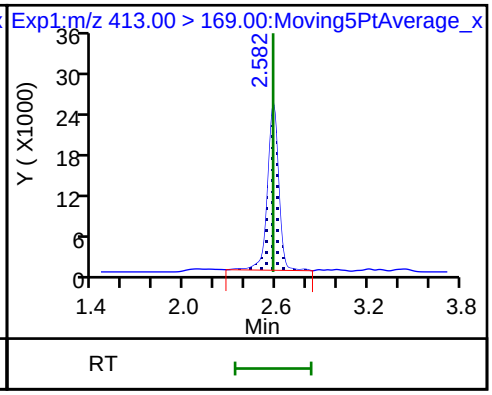
* 62 13C2-PFOA



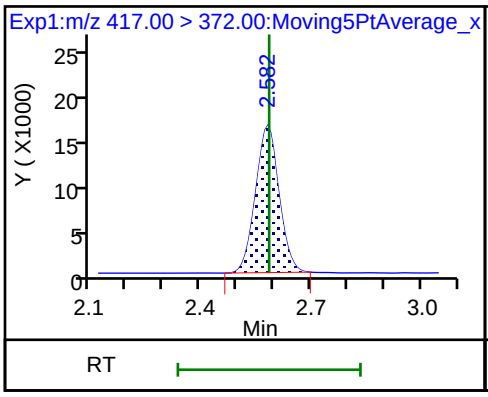
15 Perfluorooctanoic acid (M)



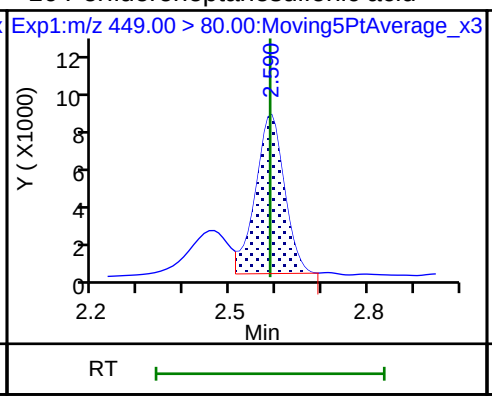
15 Perfluorooctanoic acid



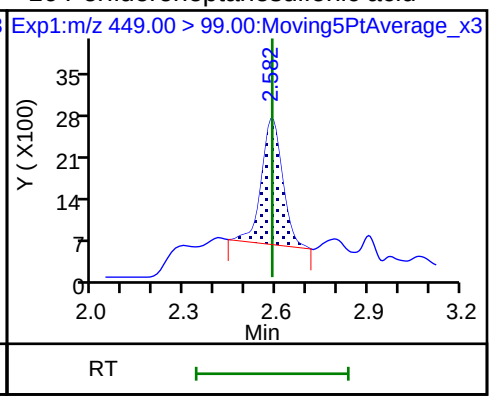
D 14 13C4 PFOA



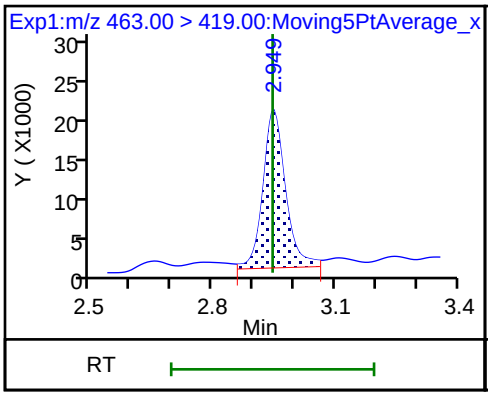
16 Perfluoroheptanesulfonic acid



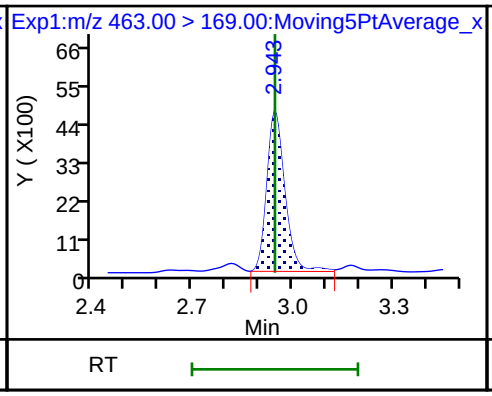
16 Perfluoroheptanesulfonic acid



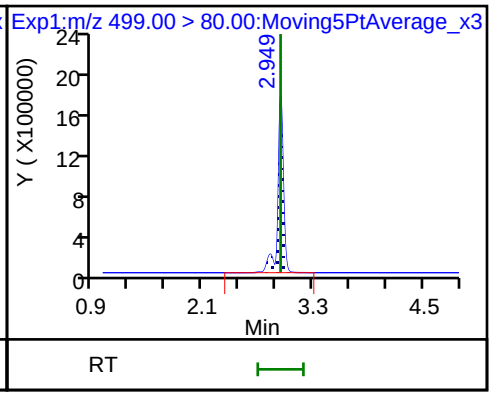
20 Perfluorononanoic acid



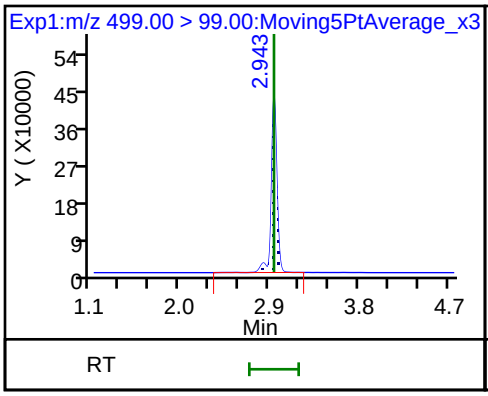
20 Perfluorononanoic acid



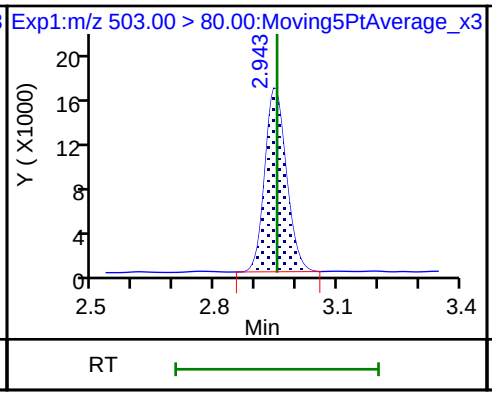
17 Perfluorooctane sulfonic acid



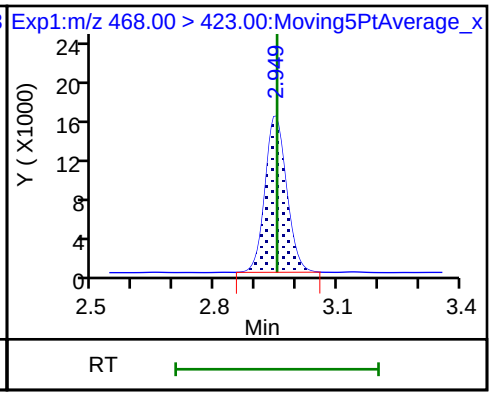
17 Perfluorooctane sulfonic acid



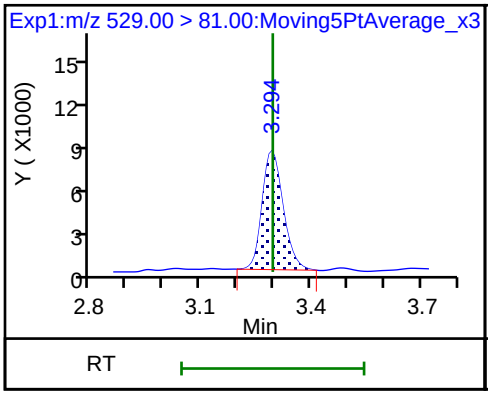
D 18 13C4 PFOS



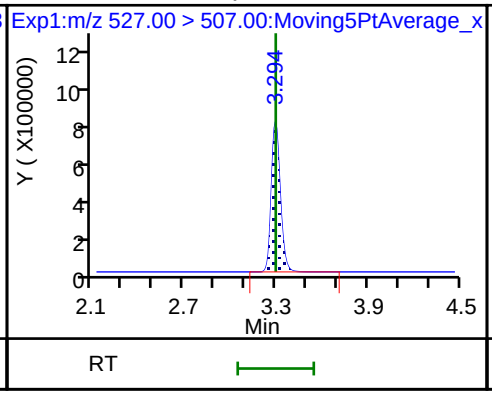
D 19 13C5 PFNA



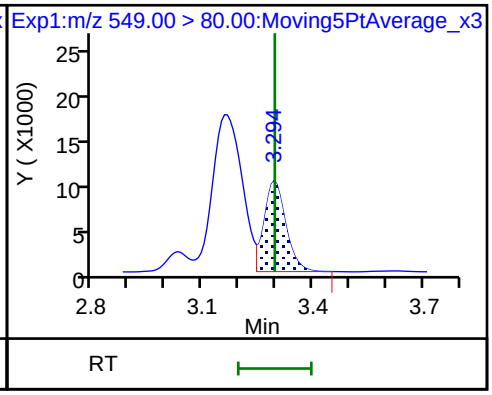
D 26 M2-8:2FTS



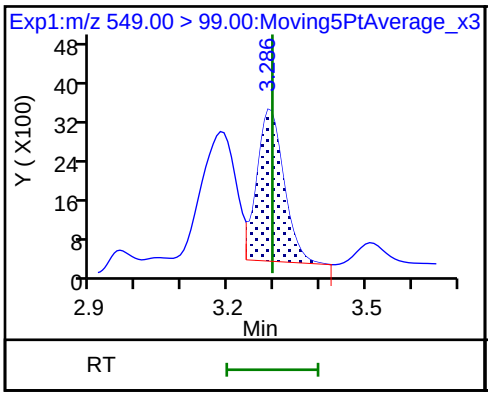
25 1H,1H,2H,2H-perfluorodecanesulfoni



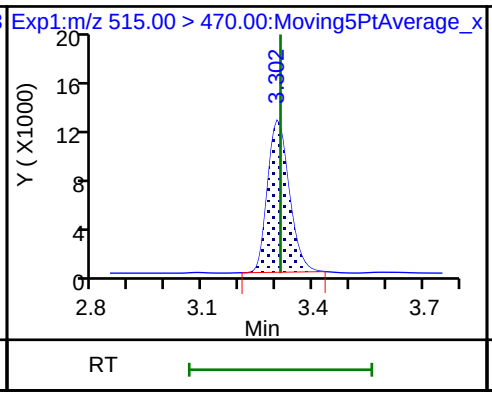
68 Perfluorononanesulfonic acid



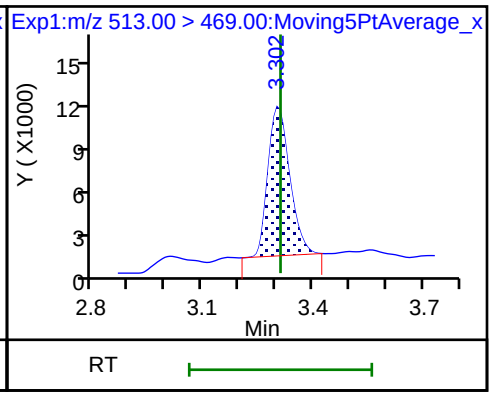
68 Perfluorononanesulfonic acid



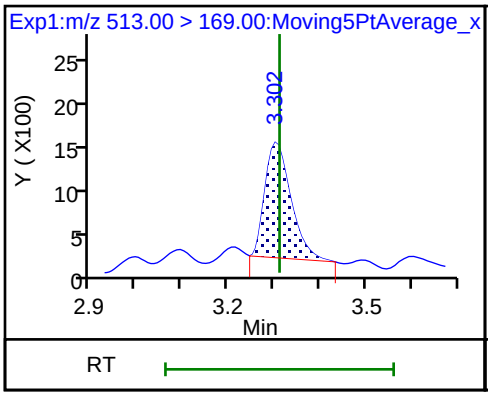
D 23 13C2 PFDA



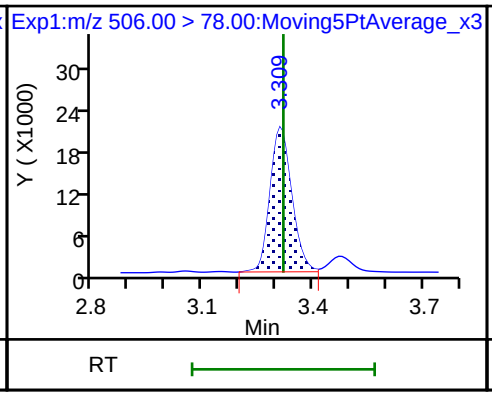
24 Perfluorodecanoic acid



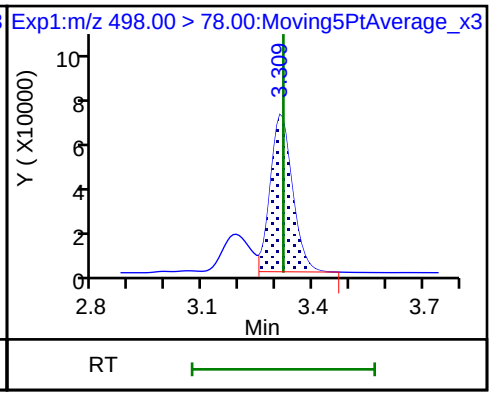
24 Perfluorodecanoic acid



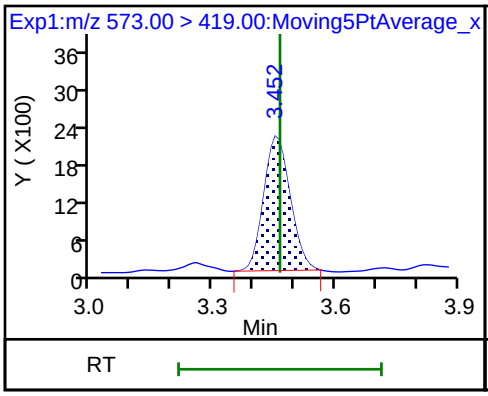
D 21 13C8 FOSA



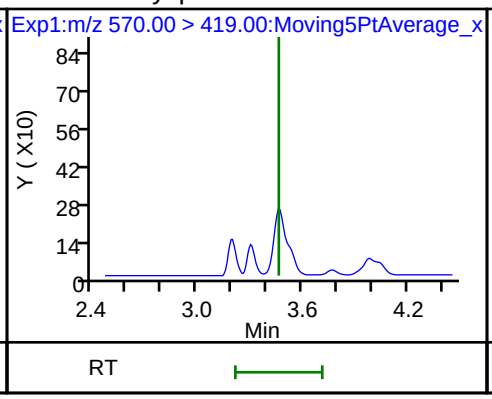
22 Perfluorooctane Sulfonamide



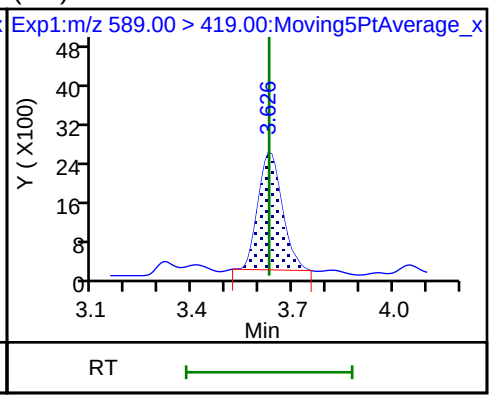
D 27 d3-NMeFOSAA



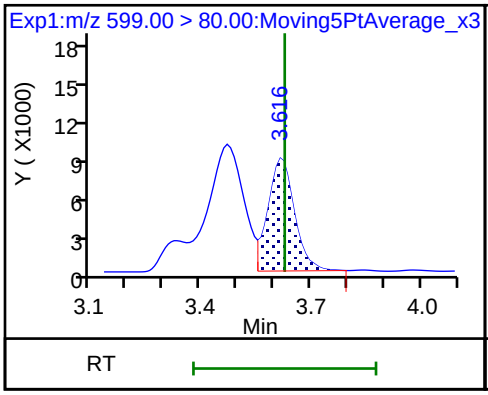
28 N-methyl perfluorooctane sulfonamidoNBZ



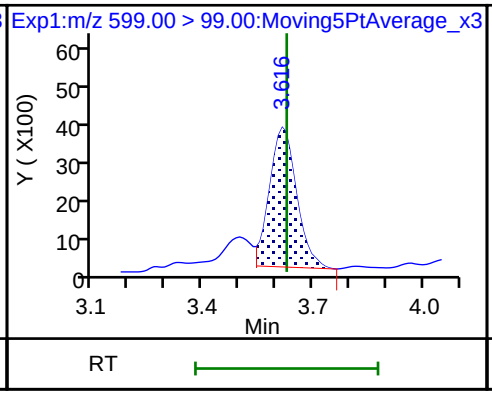
D 32 d5-NEtFOSAA



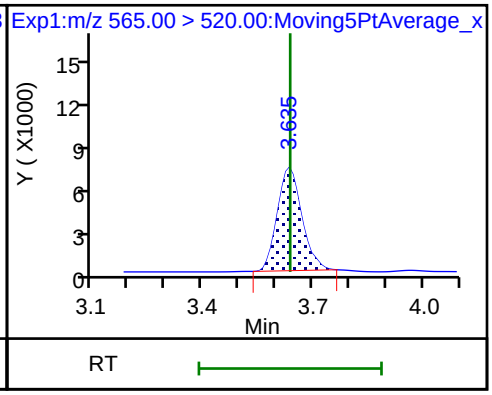
29 Perfluorodecane Sulfonic acid



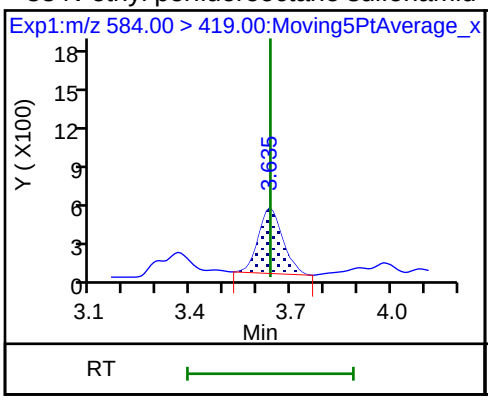
29 Perfluorodecane Sulfonic acid



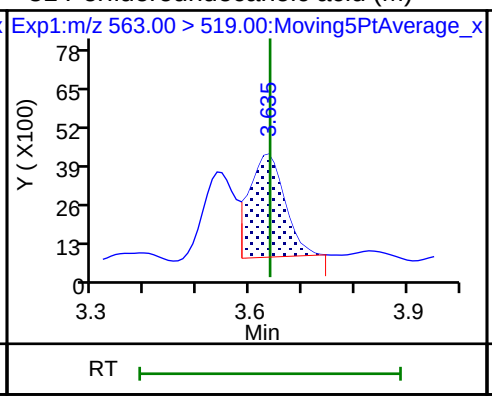
D 30 13C2 PFUnA



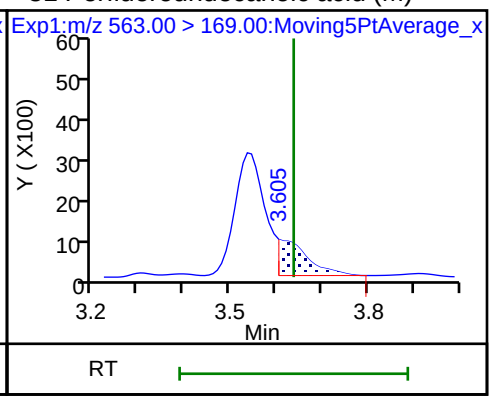
33 N-ethyl perfluorooctane sulfonamid



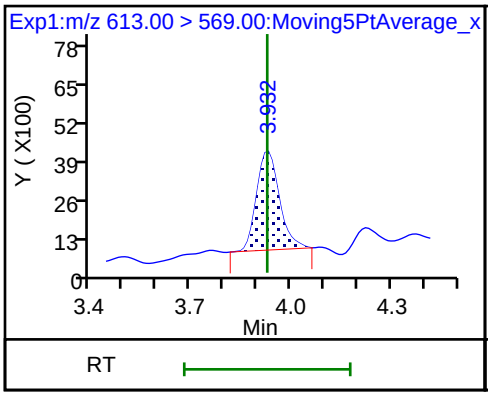
31 Perfluoroundecanoic acid (M)



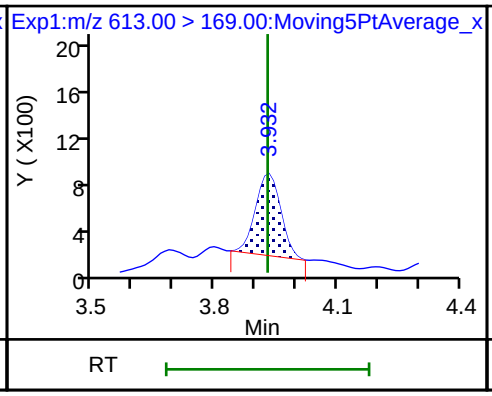
31 Perfluoroundecanoic acid (M)



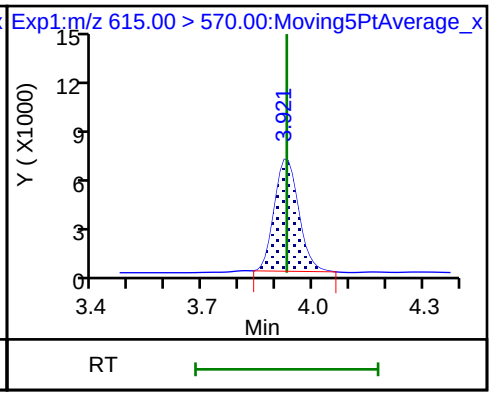
37 Perfluorododecanoic acid



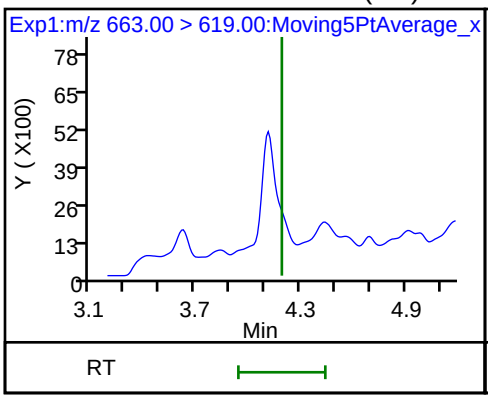
37 Perfluorododecanoic acid



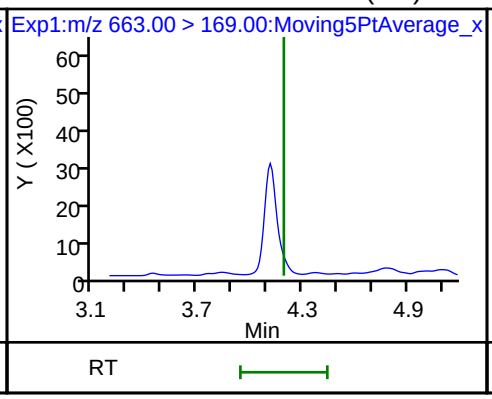
D 36 13C2 PFDoA



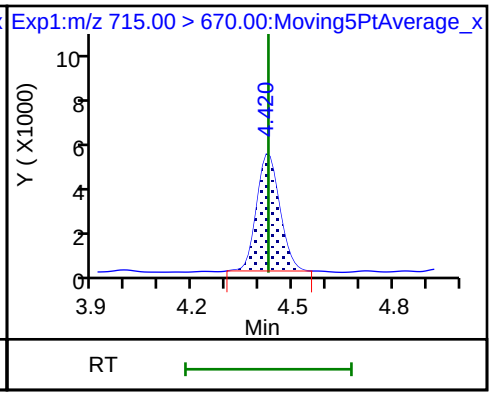
41 Perfluorotridecanoic acid (ND)



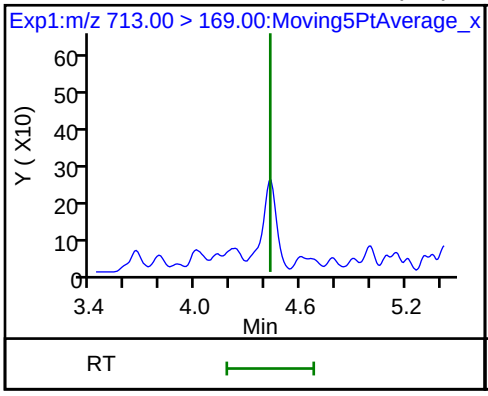
41 Perfluorotridecanoic acid (ND)



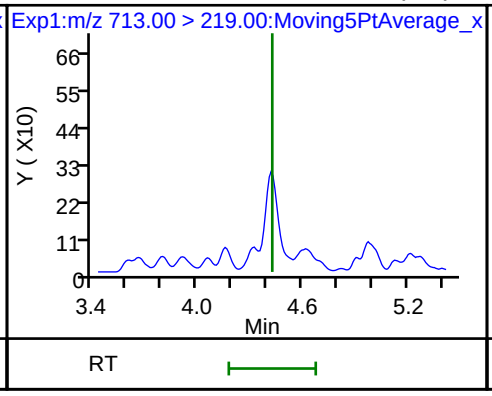
D 43 13C2-PFTeDA



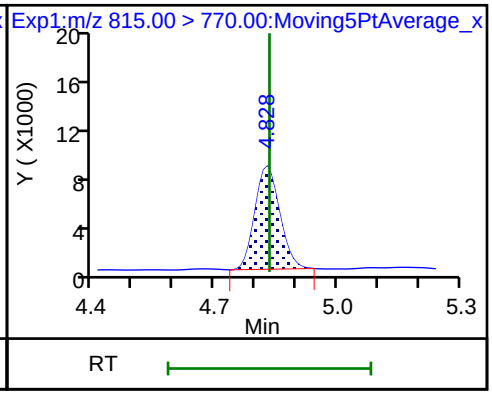
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

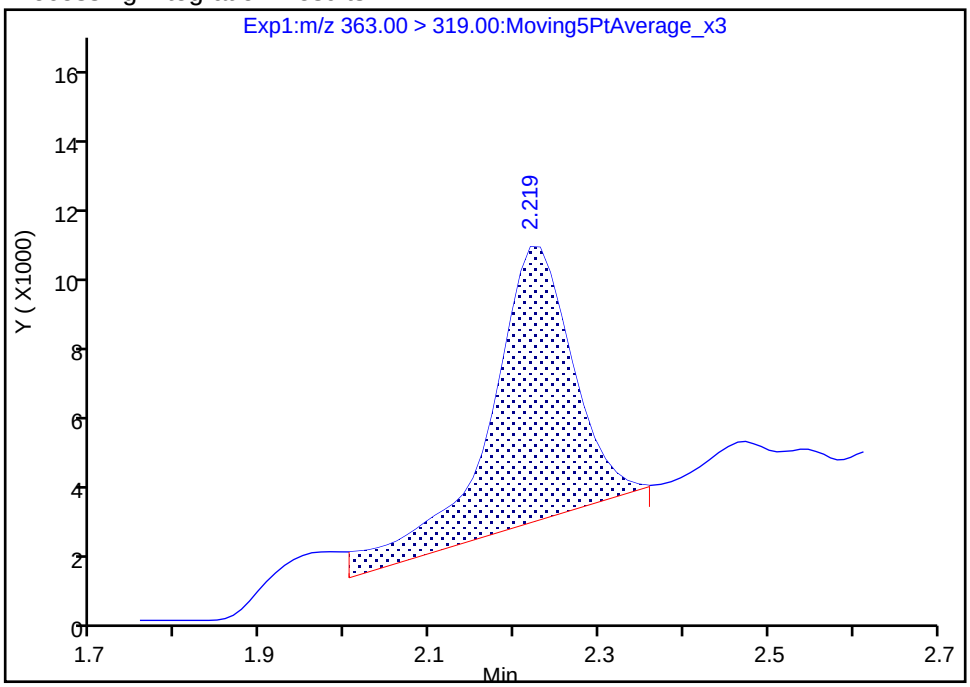
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_007.d				
Injection Date:	31-Jul-2018 17:57:27	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-A	Lab Sample ID:	320-41149-19		
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

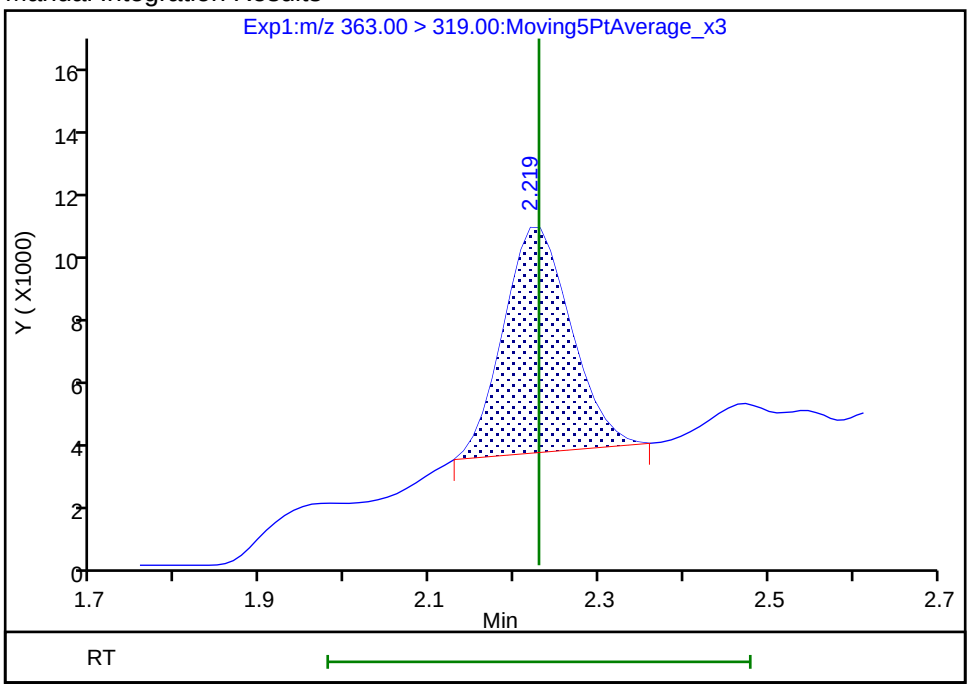
Processing Integration Results

RT: 2.22
Area: 54828
Amount: 0.033169
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 40102
Amount: 0.024261
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:25:09

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

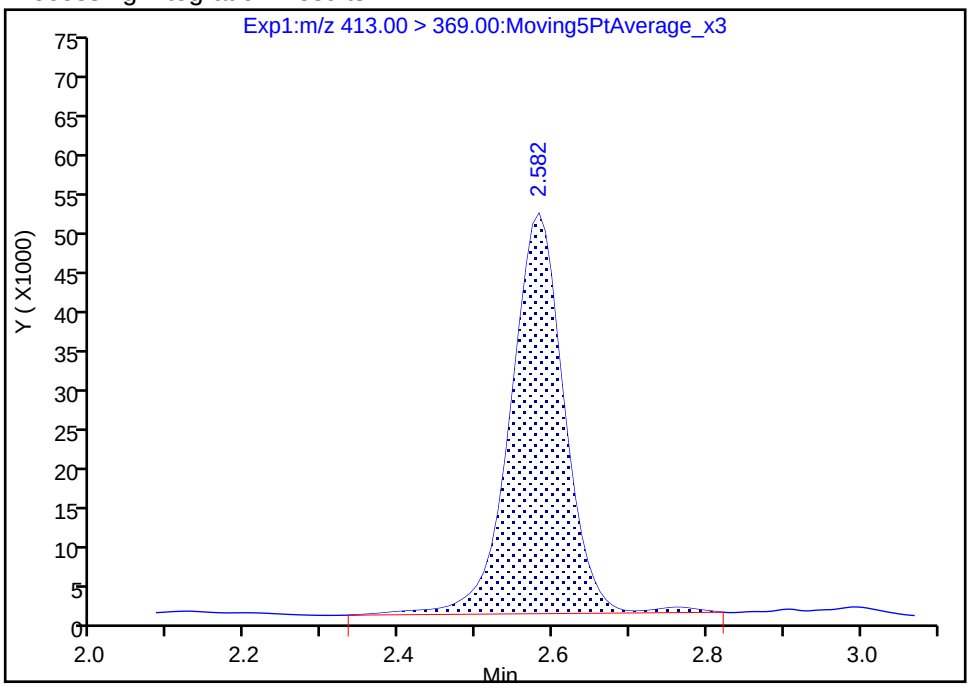
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_007.d				
Injection Date:	31-Jul-2018 17:57:27	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-A	Lab Sample ID:	320-41149-19		
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

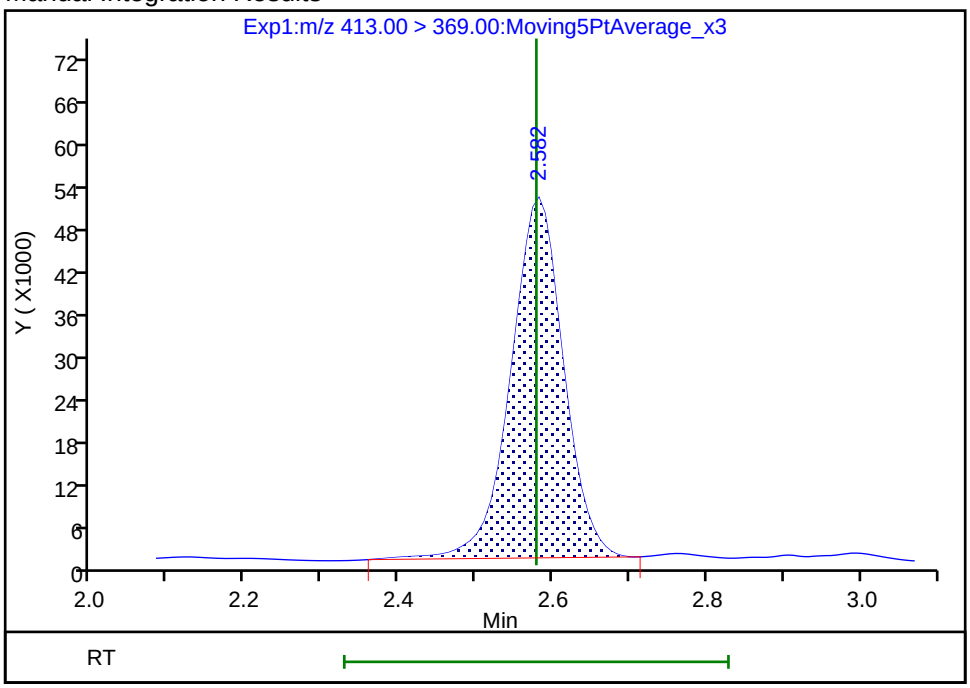
Processing Integration Results

RT: 2.58
Area: 247463
Amount: 0.146743
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 241148
Amount: 0.142999
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:25:19

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

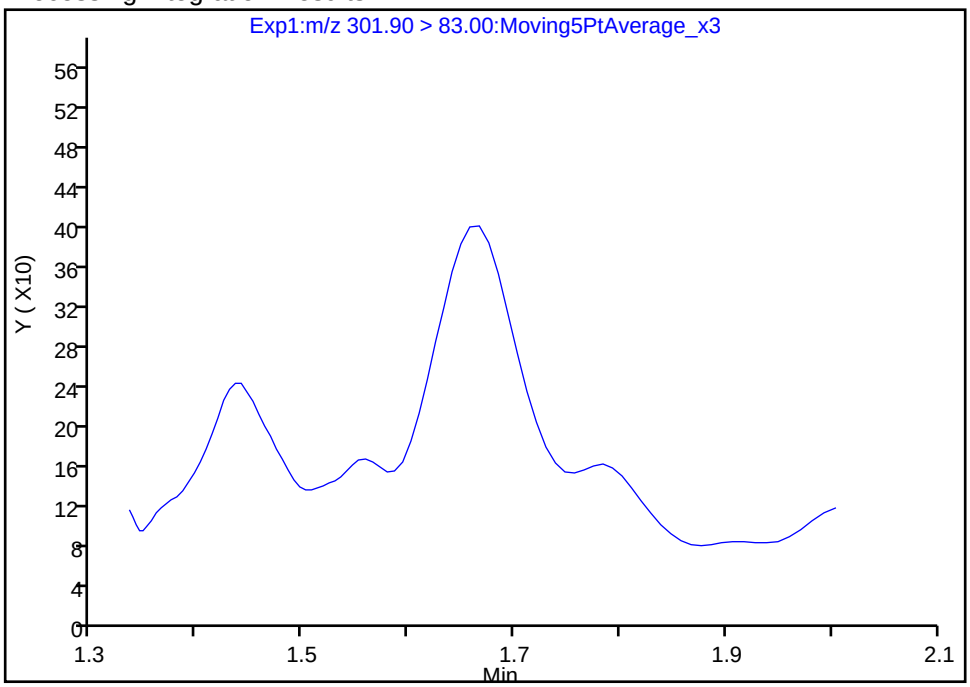
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_007.d				
Injection Date:	31-Jul-2018 17:57:27	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-A	Lab Sample ID:	320-41149-19		
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

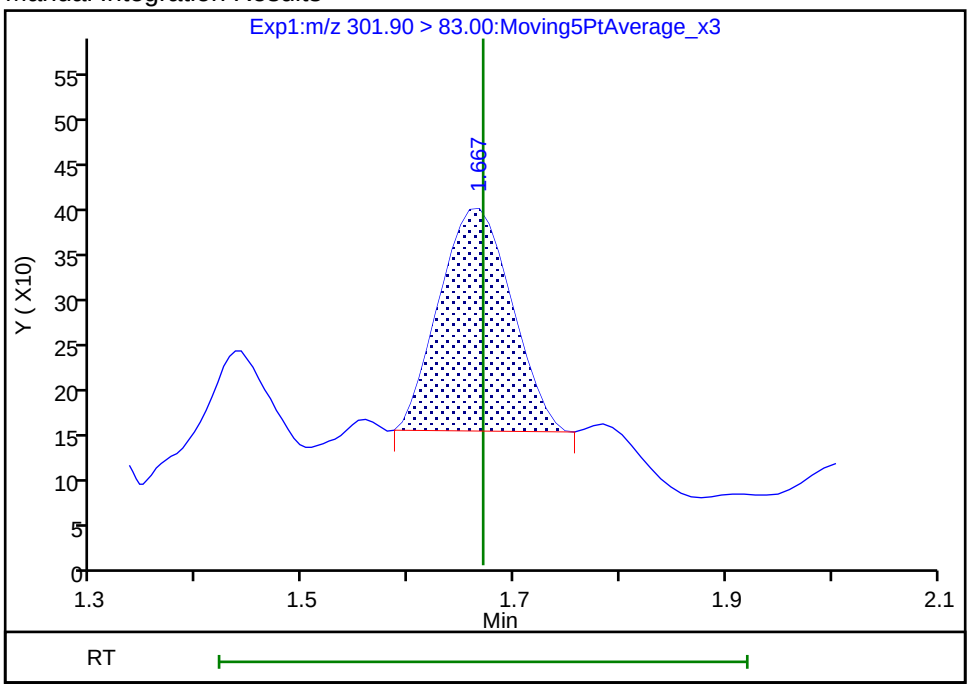
Not Detected
Expected RT: 1.67

Processing Integration Results



Manual Integration Results

RT: 1.67
Area: 1174
Amount: 0.026557
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:23:55
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE07-SB1-02
Lab Sample ID: 320-41149-20
Matrix: Solid
Lab File ID: 2018.07.30LLA_025.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/11/2018 14:35
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.10(g)
Date Analyzed: 07/30/2018 06:05
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 9.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.59		0.33	0.22	0.085
335-67-1	Perfluorooctanoic acid (PFOA)	5.6		0.33	0.22	0.11
375-95-1	Perfluorononanoic acid (PFNA)	1.0		0.33	0.22	0.088
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.12	J	0.43	0.20	0.064
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10		0.33	0.22	0.067
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*62*	*E*	*1.1*	0.54	*0.26*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	94		50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	82		50-150
STL00994	18O2 PFHxS	98		50-150
STL00991	13C4 PFOS	88		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_025.d
Lims ID: 320-41149-A-20-A
Client ID: GRE07-SB1-02
Sample Type: Client
Inject. Date: 30-Jul-2018 06:05:42 ALS Bottle#: 19 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-20-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:02:47 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:04:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.000	138384	0.0531			408	
298.90 > 99.00	1.671	1.671	0.0	1.000	59337		2.33(1.25-3.74)		209	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.674	-0.003	0.648	76311	2.19		94.1	567	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.225	0.0	1.000	456184	0.2720			978	
363.00 > 169.00	2.225	2.225	0.0	1.000	174801		2.61(1.13-3.40)		2675	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	11320067	4.79			43082	
399.00 > 99.00	2.237	2.237	0.0	1.000	3690654		3.07(1.50-4.49)		11549	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3802981	2.37		94.7	72314	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4790770	2.32		98.1	81224	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		4108718	2.50			58609	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	4467093	2.57			6050	
413.00 > 169.00	2.579	2.579	0.0	1.000	2295042		1.95(0.84-2.52)		9990	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3578207	2.28		91.0	74114	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.945	2.946	-0.001	1.000	39774257	28.5			111005	E
499.00 > 99.00	2.945	2.946	-0.001	1.000	11478155		3.47(2.31-6.93)		83053	
20 Perfluorononanoic acid										
463.00 > 419.00	2.945	2.946	-0.001	1.000	590944	0.4637			1434	
463.00 > 169.00	2.945	2.946	-0.001	1.000	140433		4.21(1.90-5.69)		2473	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.945	2.953	-0.008	1.142	2790311	2.06		82.3	57027	
D 18 13C4 PFOS										
503.00 > 80.00	2.945	2.953	-0.008	1.142	3021475	2.10		88.1	38209	

QC Flag Legend

Processing Flags

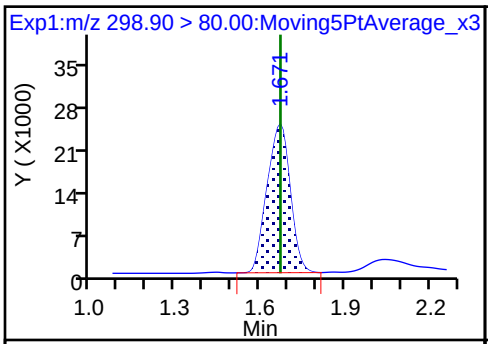
E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 10:04:03 Chrom Revision: 2.3 19-Jul-2018 15:14:50

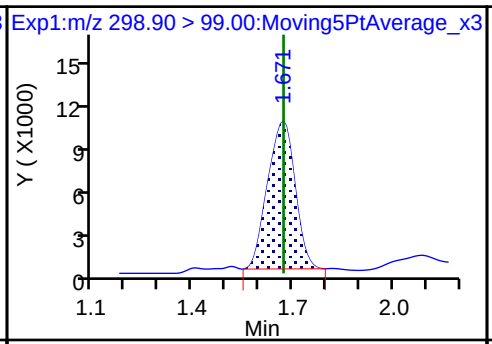
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_025.d				
Injection Date:	30-Jul-2018 06:05:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-20-A	Lab Sample ID:	320-41149-20		
Client ID:	GRE07-SB1-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	19	Worklist Smp#:	23
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

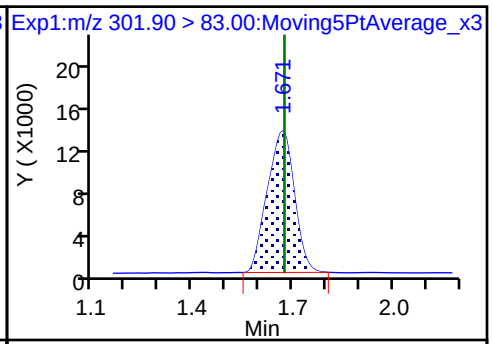
5 Perfluorobutanesulfonic acid



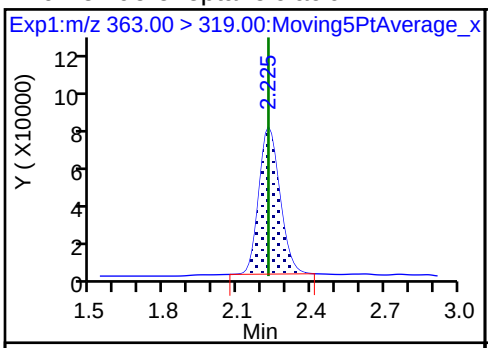
5 Perfluorobutanesulfonic acid



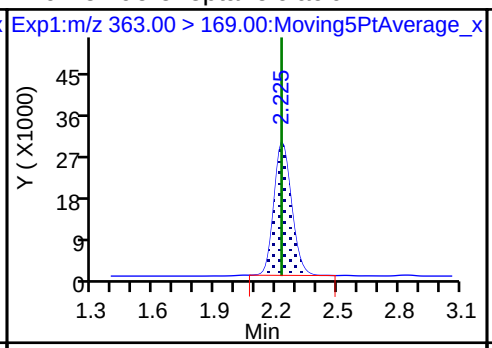
D 47 13C3-PFBS



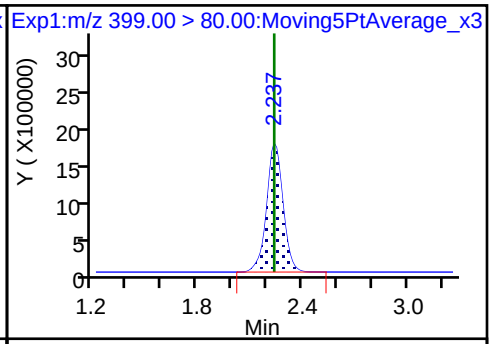
10 Perfluoroheptanoic acid



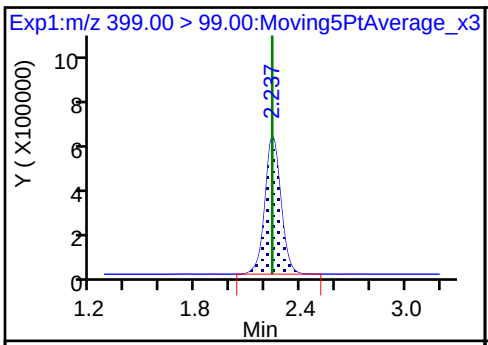
10 Perfluoroheptanoic acid



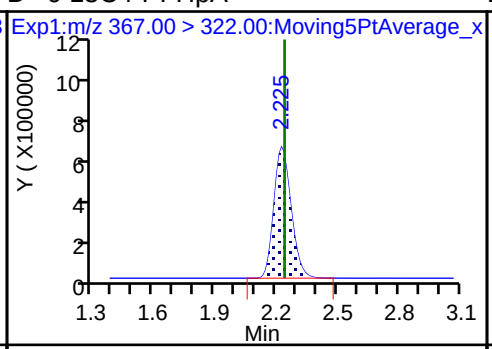
8 Perfluorohexanesulfonic acid



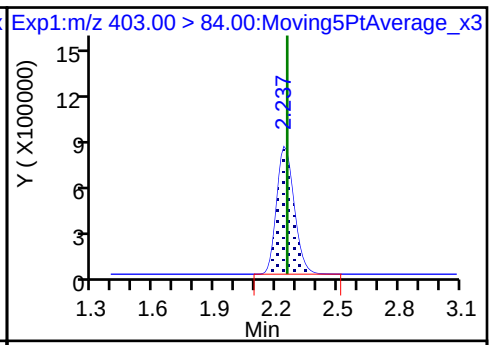
8 Perfluorohexanesulfonic acid



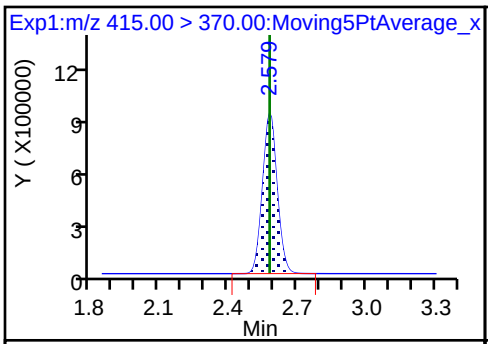
D 9 13C4-PFHpA



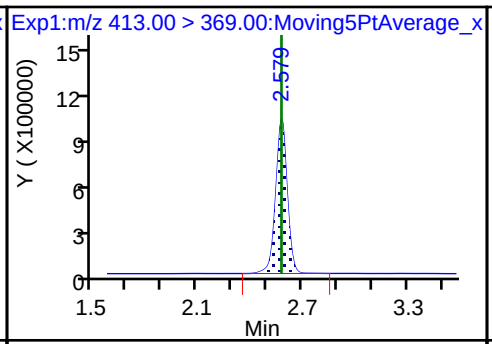
D 11 18O2 PFHxS



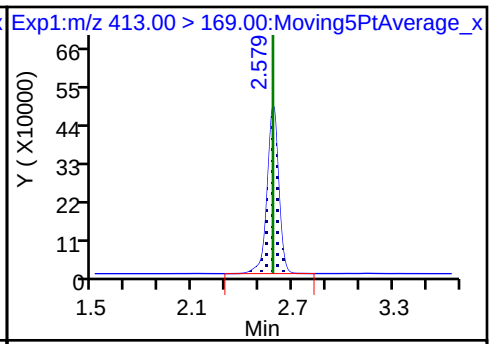
* 62 13C2-PFOA



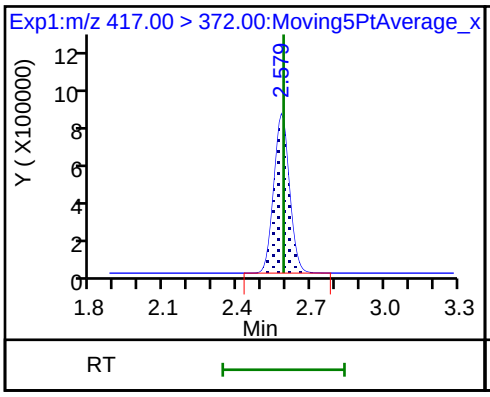
15 Perfluorooctanoic acid



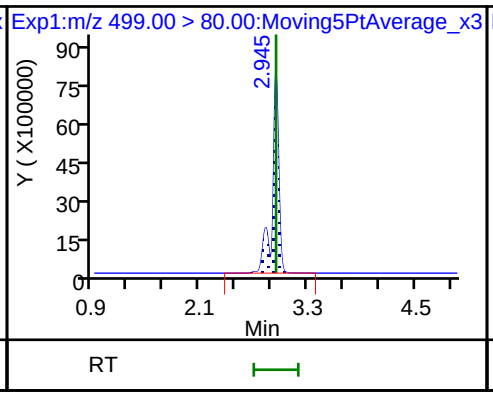
15 Perfluorooctanoic acid



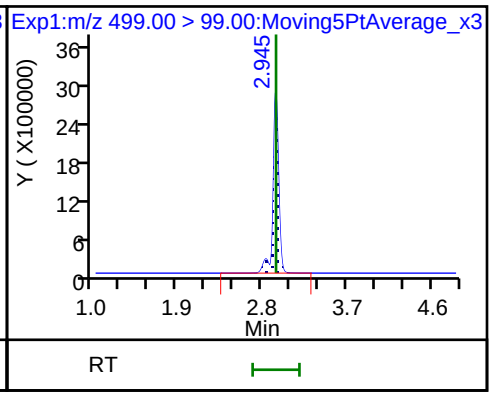
D 14 13C4 PFOA



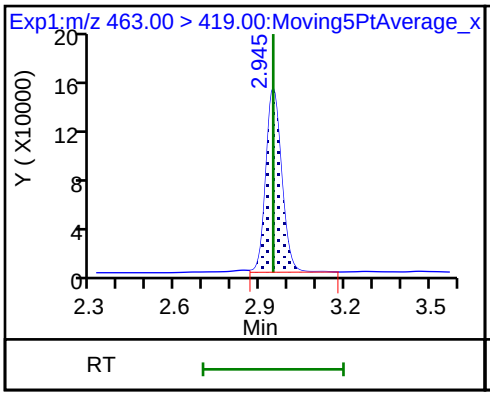
17 Perfluorooctane sulfonic acid



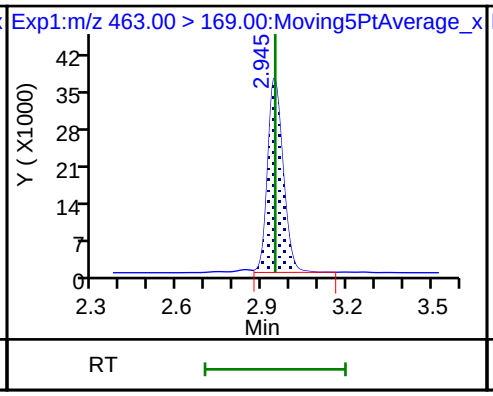
17 Perfluorooctane sulfonic acid



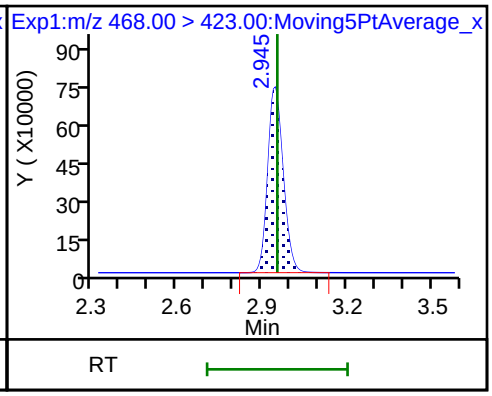
20 Perfluorononanoic acid



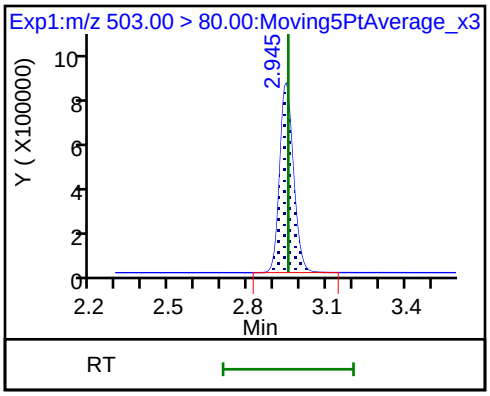
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB1-02 DL | Lab Sample ID: 320-41149-20 DL

Matrix: Solid | Lab File ID: 2018.08.01LLBB_018.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 14:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.10(g) | Date Analyzed: 08/01/2018 16:22

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 9.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.2*	*U M*	*3.3*	2.2	*0.85*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*6.0*	*D*	*3.3*	2.2	*1.1*
375-95-1	*Perfluorononanoic acid (PFNA)*	*1.1*	*J D*	*3.3*	2.2	*0.88*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*2.0*	*U*	*4.3*	2.0	*0.64*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*10*	*D*	*3.3*	2.2	*0.67*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	72	D M	11	5.4	2.6

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	68		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	88		50-150
STL00994	18O2 PFHxS	85		50-150
STL00991	13C4 PFOS	77		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_018.d
Lims ID: 320-41149-A-20-A
Client ID: GRE07-SB1-02
Sample Type: Client
Inject. Date: 01-Aug-2018 16:22:13 ALS Bottle#: 10 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-20-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:26:51 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:26:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.662	0.004	1.000	15462	0.007020			110	
298.90 > 99.00	1.675	1.662	0.013	1.005	7969		1.94(1.25-3.74)		32.9	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.648	6681	0.1587		68.2	24.4	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.214	0.015	1.005	46532	0.0298			17.1	M
363.00 > 169.00	2.218	2.214	0.004	1.000	16635		2.80(1.13-3.40)		183	
D 9 13C4-PFHpA										
367.00 > 322.00	2.218	2.225	-0.007	0.862	337040	0.2195		87.8	11349	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.225	0.016	1.000	1080939	0.4752			5046	
399.00 > 99.00	2.241	2.225	0.016	1.000	351952		3.07(1.50-4.49)		553	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.871	465371	0.2017		85.3	19628	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.571	0.009	1.003	417829	0.2755			251	
413.00 > 169.00	2.580	2.571	0.009	1.003	219514		1.90(0.84-2.52)		1323	
* 62 13C2-PFOA										
415.00 > 370.00	2.573	2.571	0.001		386143	0.2500			12355	
D 14 13C4 PFOA										
417.00 > 372.00	2.573	2.580	-0.008	1.000	327888	0.2211		88.5	10401	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.942	2.935	0.007	1.000	4606373	3.33			29945	M
499.00 > 99.00	2.942	2.935	0.007	1.000	1143663		4.03(2.31-6.93)		8695	
20 Perfluorononanoic acid										
463.00 > 419.00	2.942	2.935	0.007	1.000	60333	0.0493			170	
463.00 > 169.00	2.942	2.935	0.007	1.000	16691		3.61(1.90-5.69)		468	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.942	2.946	-0.004	1.144	294165	0.1845		77.2	8079	
D 19 13C5 PFNA										
468.00 > 423.00	2.942	2.948	-0.006	1.144	283376	0.2193		87.7	7767	

QC Flag Legend

Review Flags

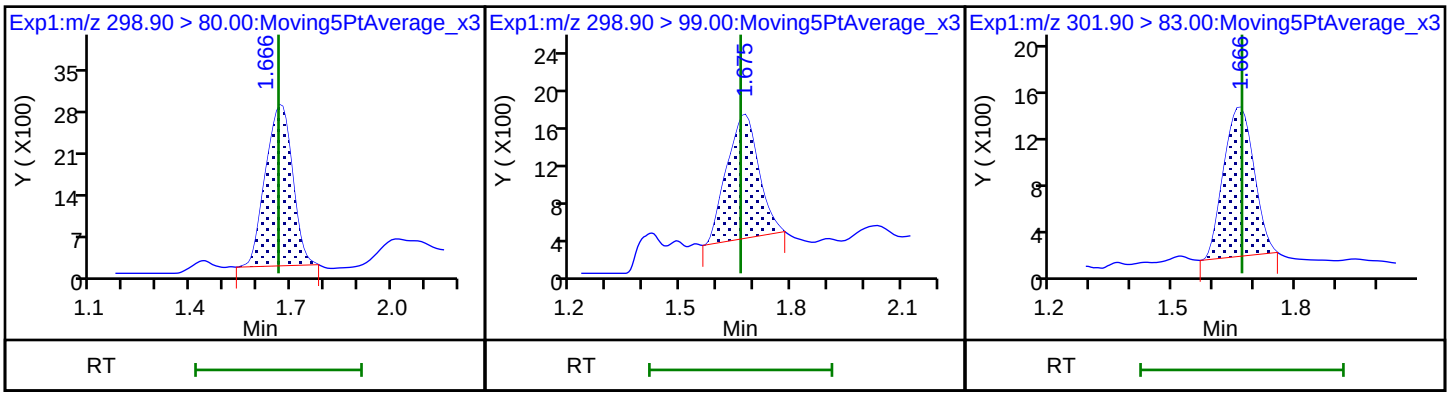
M - Manually Integrated

Report Date: 02-Aug-2018 13:26:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

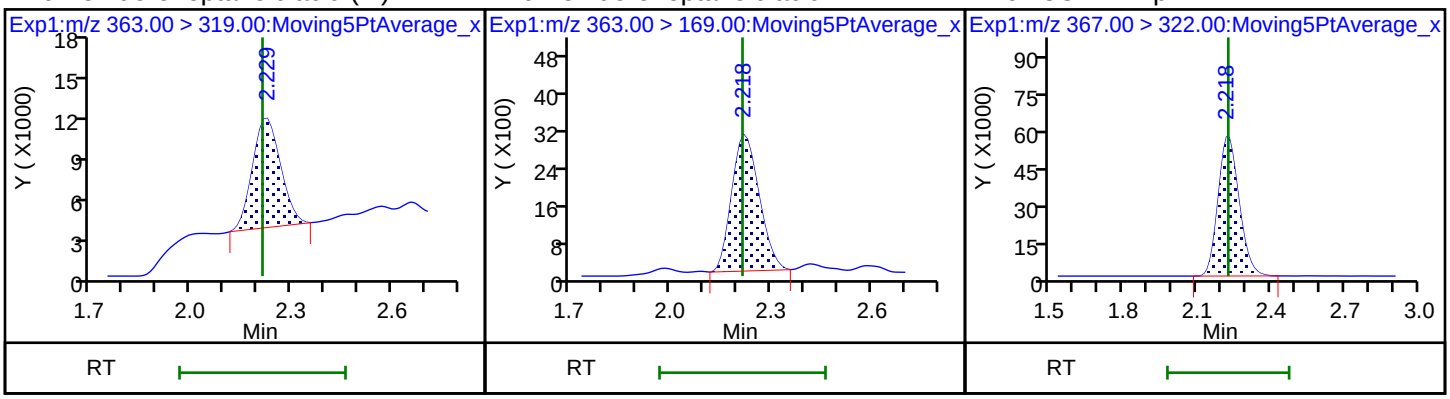
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_018.d				
Injection Date:	01-Aug-2018 16:22:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-20-A	Lab Sample ID:	320-41149-20		
Client ID:	GRE07-SB1-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

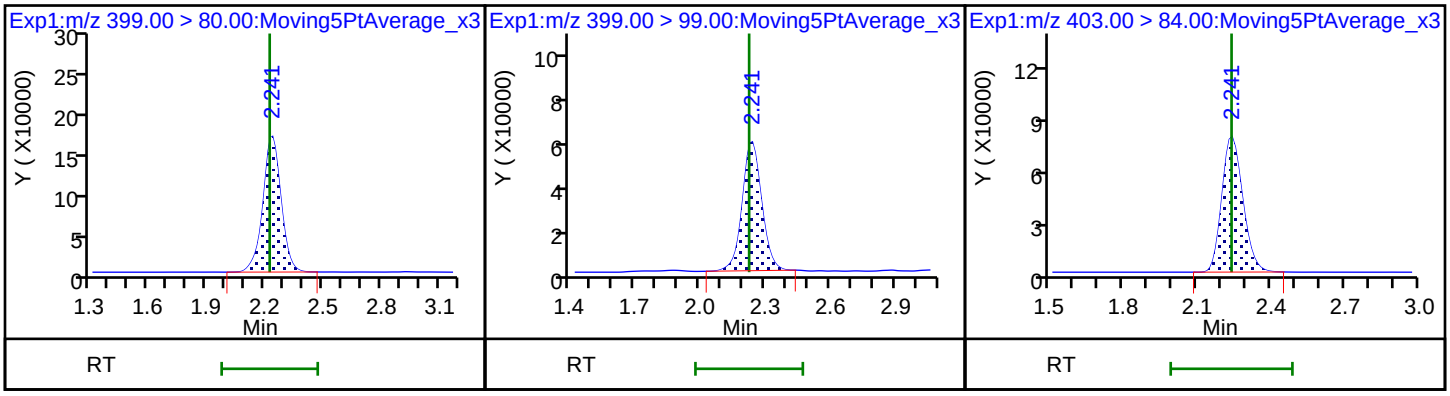
5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid | D 47 13C3-PFBS



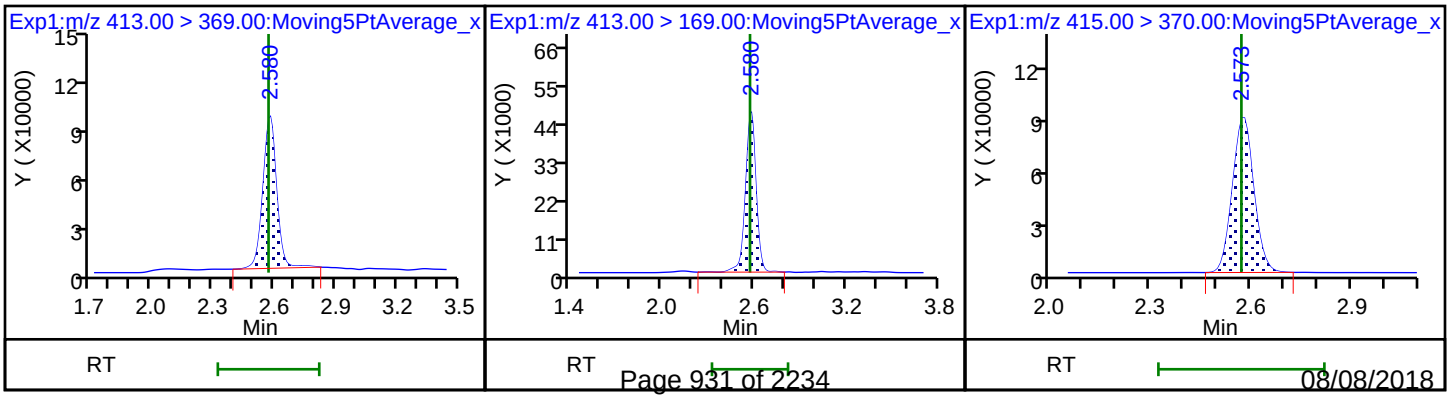
10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid | D 9 13C4-PFHpA



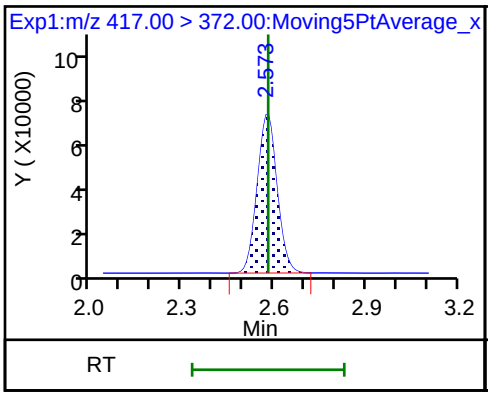
8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid | D 11 18O2 PFHxS



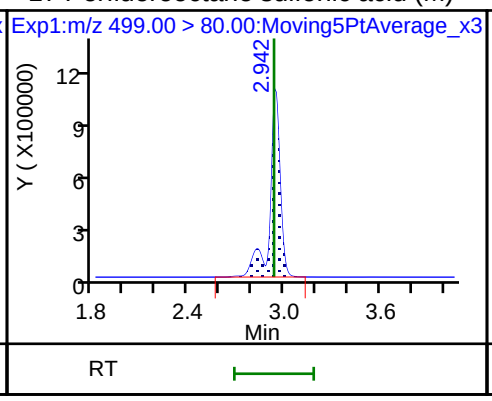
15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid | * 62 13C2-PFOA



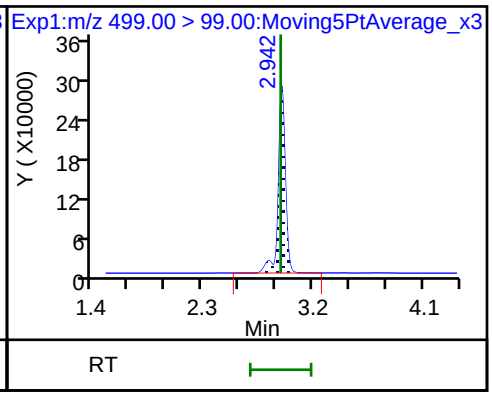
D 14 13C4 PFOA



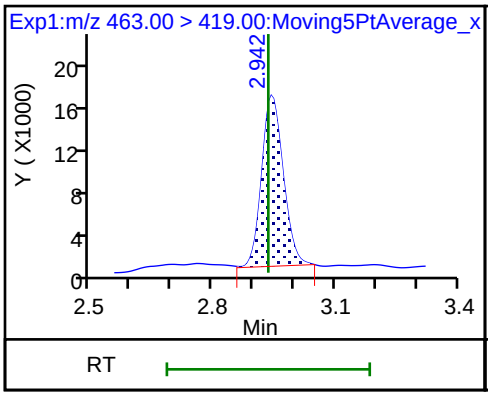
17 Perfluorooctane sulfonic acid (M)



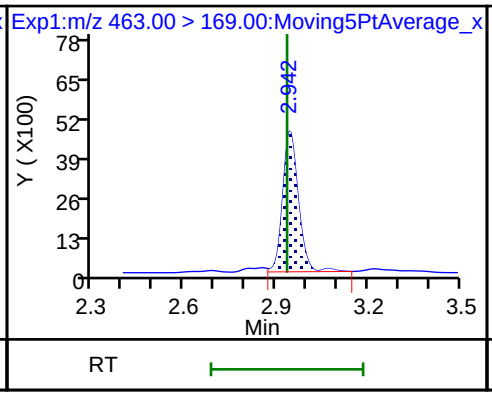
17 Perfluorooctane sulfonic acid



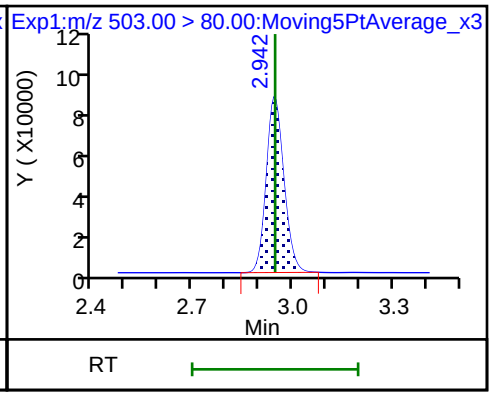
20 Perfluorononanoic acid



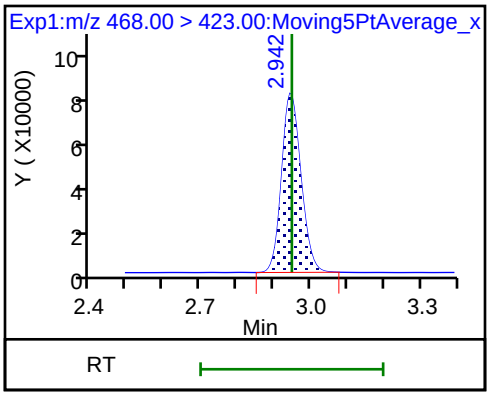
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

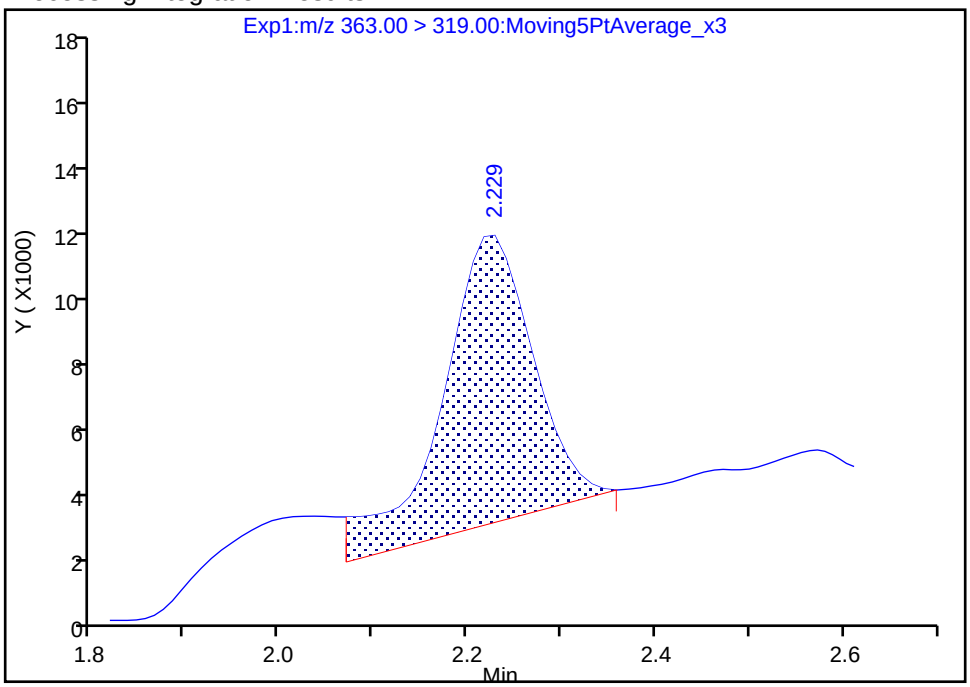
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_018.d				
Injection Date:	01-Aug-2018 16:22:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-20-A	Lab Sample ID:	320-41149-20		
Client ID:	GRE07-SB1-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

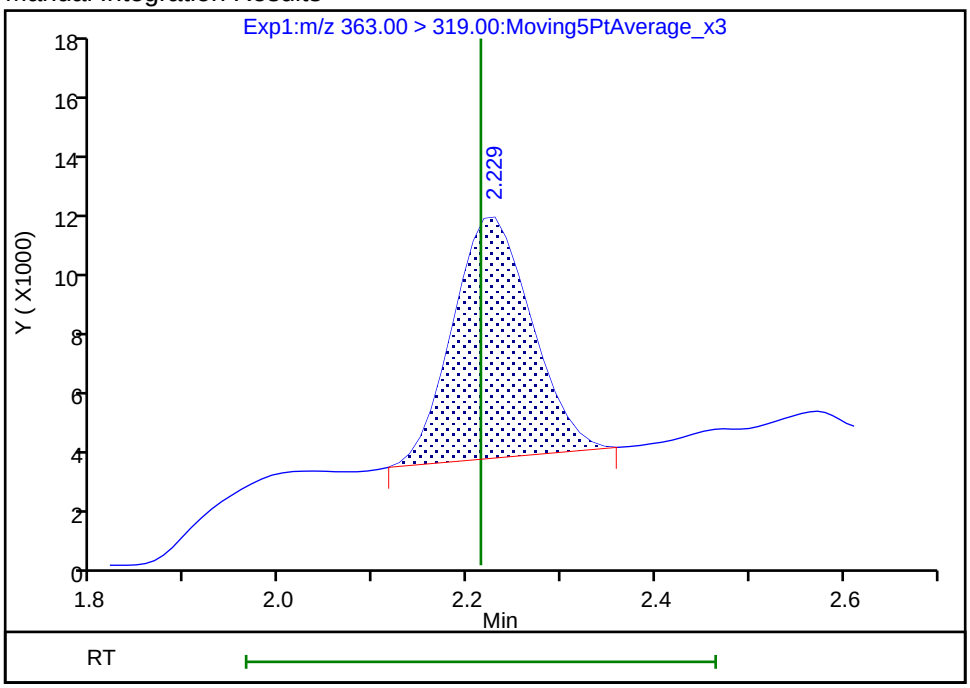
Processing Integration Results

RT: 2.23
Area: 58273
Amount: 0.037274
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 46532
Amount: 0.029764
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:26:36

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

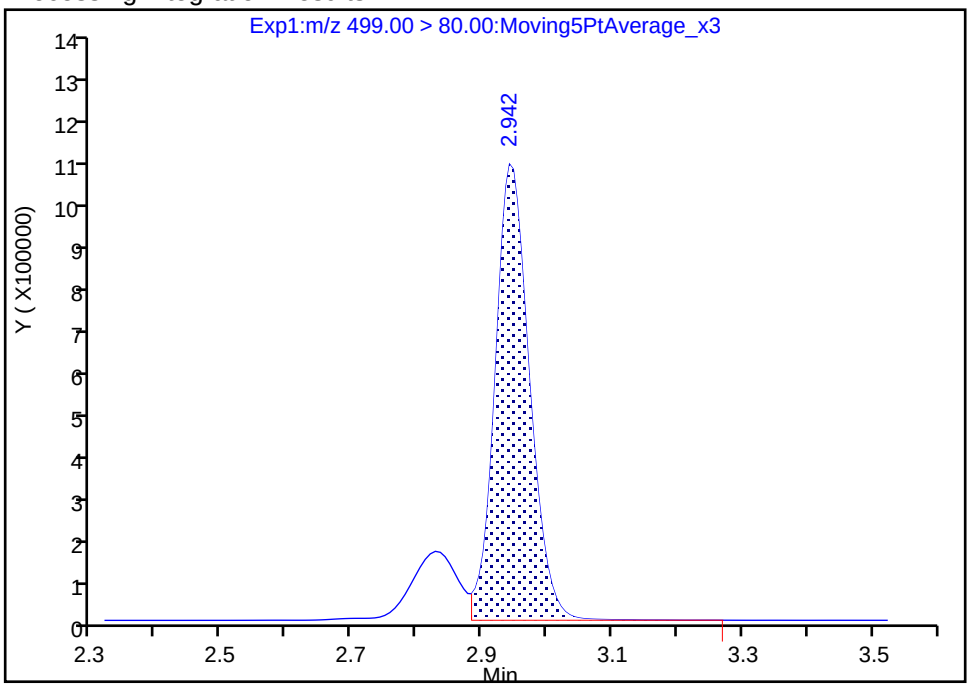
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_018.d				
Injection Date:	01-Aug-2018 16:22:13	Instrument ID:	A8_N		
Lims ID:	320-41149-A-20-A	Lab Sample ID:	320-41149-20		
Client ID:	GRE07-SB1-02				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

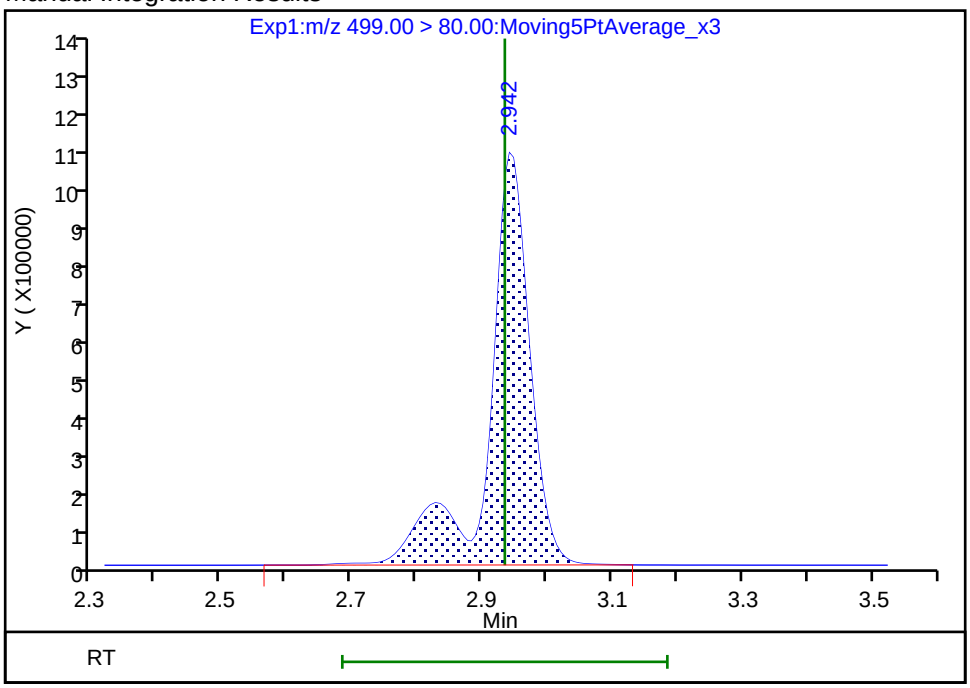
Processing Integration Results

RT: 2.94
Area: 3833732
Amount: 2.774514
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 4606373
Amount: 3.333683
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:26:46

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE-ER-SB-03 | Lab Sample ID: 320-41149-21

Matrix: Water | Lab File ID: 2018.07.22LLA_045.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 19:10

Extraction Method: 3535 | Date Extracted: 07/18/2018 08:54

Sample wt/vol: 273.4(mL) | Date Analyzed: 07/22/2018 11:14

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 235512 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.4	U	1.8	1.4	0.56
335-67-1	Perfluorooctanoic acid (PFOA)	1.4	U M	1.8	1.4	0.49
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.8	1.4	0.48
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.91	U	1.8	0.91	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.91	U	1.8	0.91	0.35
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10		3.7	2.7	1.0

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	87		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	95		50-150
STL00991	13C4 PFOS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_045.d
Lims ID: 320-41149-A-21-A
Client ID: GRE-ER-SB-03
Sample Type: Client
Inject. Date: 22-Jul-2018 11:14:48 ALS Bottle#: 34 Worklist Smp#: 9
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-21-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:49:36 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:49:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.833	-0.007	0.653	101611	2.02		86.8	927	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.433	-0.010	0.867	10754760	2.22		88.6	20946	
D 11 18O2 PFHxS										
403.00 > 84.00	2.436	2.446	-0.010	0.871	6652077	2.25		95.2	57736	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.436	2.448	-0.012	1.000	28939	0.007723			31.8	
399.00 > 99.00	2.449	2.448	0.001	1.005	7936		3.65(1.90-5.70)		21.4	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		11140000	2.50			19121	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.796	2.796	0.0	1.000	37330	0.008045			5.9	M
413.00 > 169.00	2.796	2.796	0.0	1.000	13686		2.73(1.36-4.08)		29.2	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	1.000	10071223	2.31		92.3	25547	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.171	0.0	1.000	932328	0.2811			395	
499.00 > 99.00	3.171	3.171	0.0	1.000	222794		4.18(2.04-6.12)		1480	
D 19 13C5 PFNA										
468.00 > 423.00	3.171	3.185	-0.014	1.134	9448798	2.31		92.2	21069	
D 18 13C4 PFOS										
503.00 > 80.00	3.171	3.185	-0.014	1.134	7041395	2.22		93.1	5514	

QC Flag Legend

Review Flags

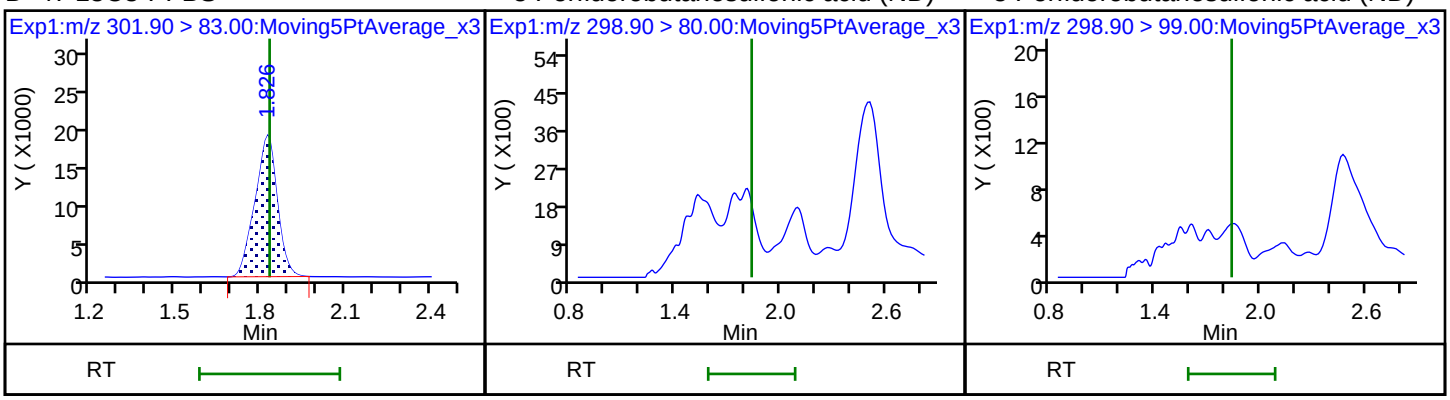
M - Manually Integrated

Report Date: 25-Jul-2018 09:49:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

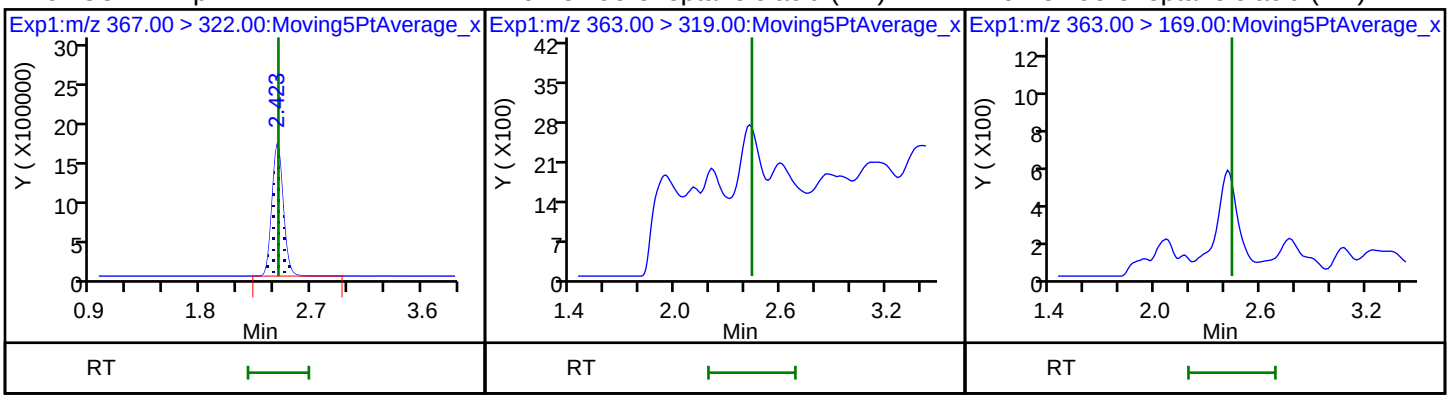
TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_045.d				
Injection Date:	22-Jul-2018 11:14:48	Instrument ID:	A9		
Lims ID:	320-41149-A-21-A	Lab Sample ID:	320-41149-21		
Client ID:	GRE-ER-SB-03				
Operator ID:	A9\Administrator	ALS Bottle#:	34	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		

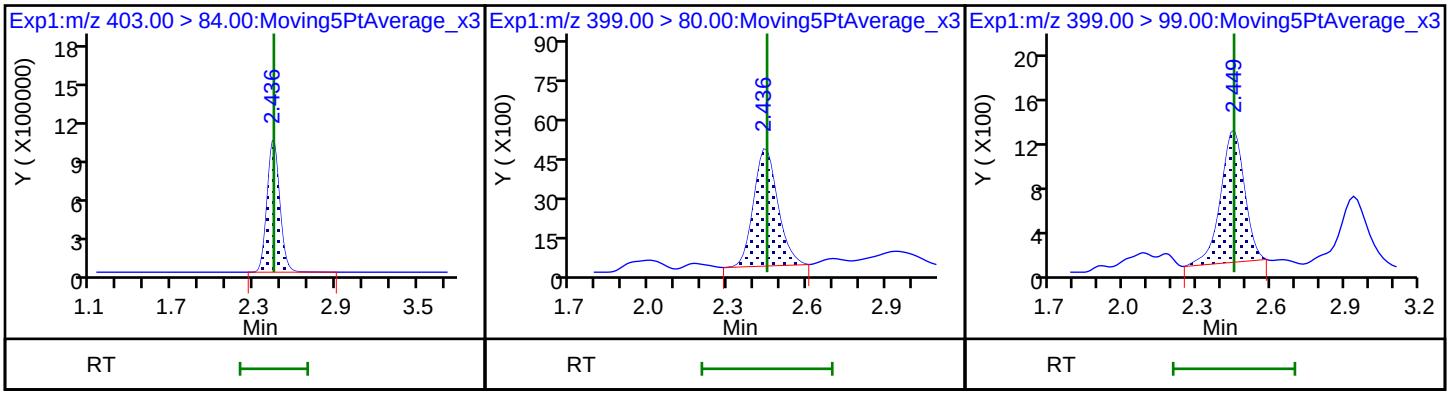
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (ND) | 5 Perfluorobutanesulfonic acid (ND)



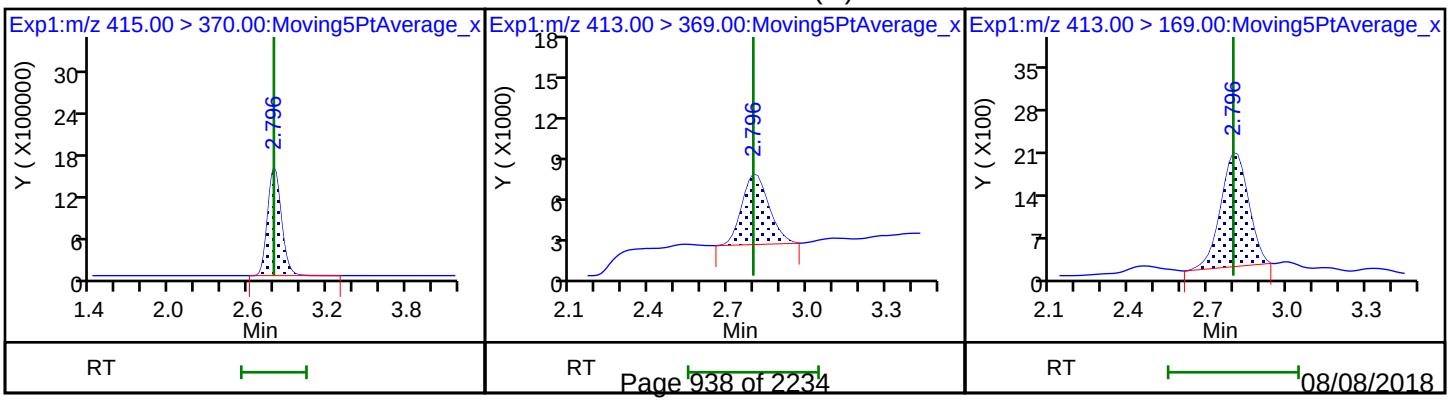
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (ND) | 10 Perfluoroheptanoic acid (ND)



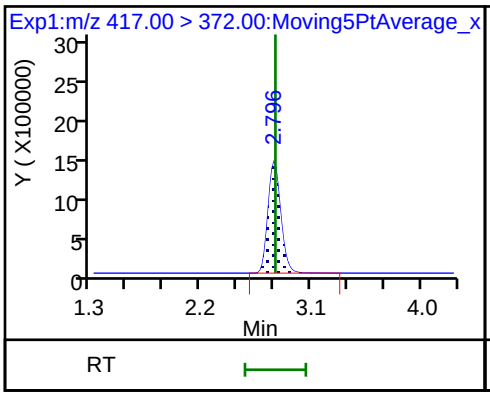
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



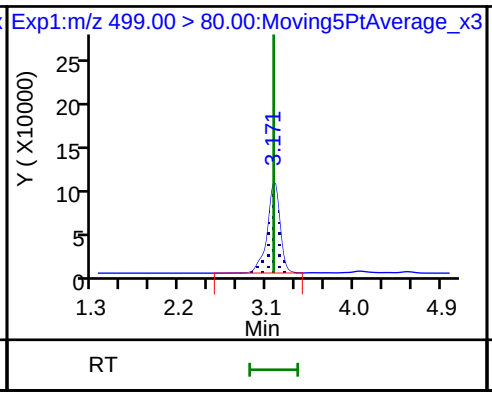
* 62 13C2-PFOA | 15 Perfluorooctanoic acid (M) | 15 Perfluorooctanoic acid



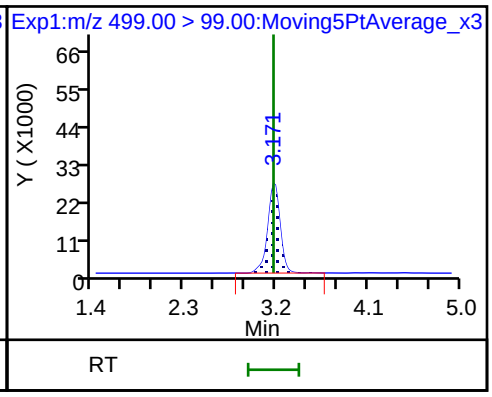
D 14 13C4 PFOA



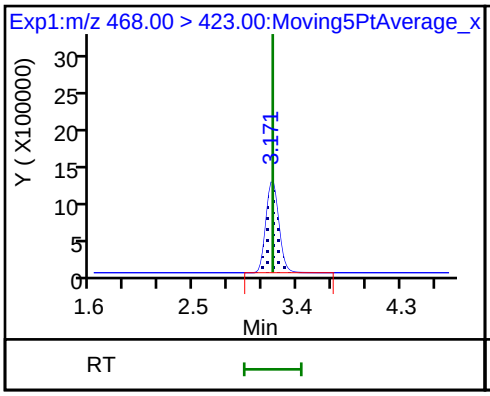
17 Perfluorooctane sulfonic acid



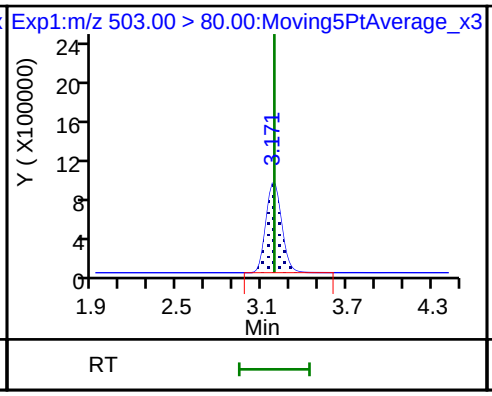
17 Perfluorooctane sulfonic acid



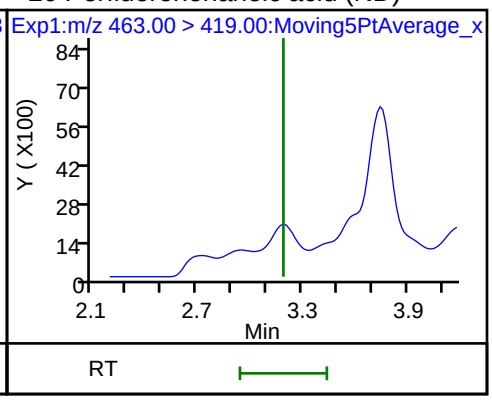
D 19 13C5 PFNA



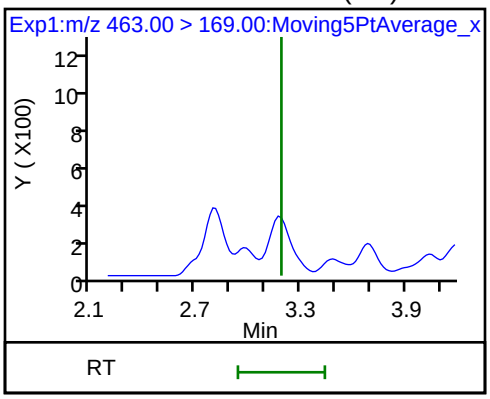
D 18 13C4 PFOS



20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

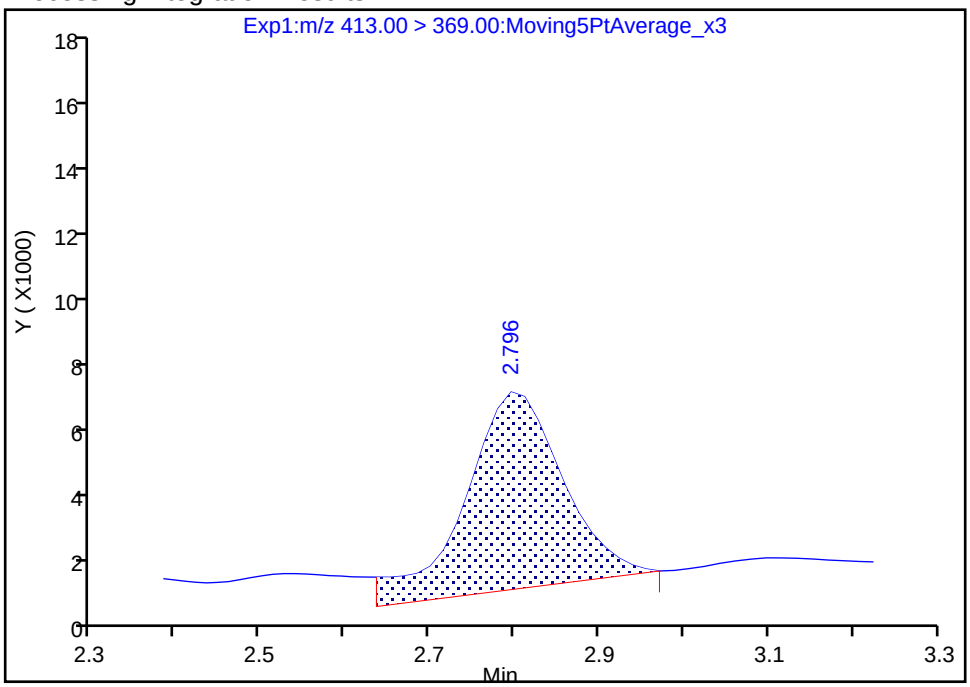
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_045.d				
Injection Date:	22-Jul-2018 11:14:48	Instrument ID:	A9		
Lims ID:	320-41149-A-21-A	Lab Sample ID:	320-41149-21		
Client ID:	GRE-ER-SB-03				
Operator ID:	A9\Administrator	ALS Bottle#:	34	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

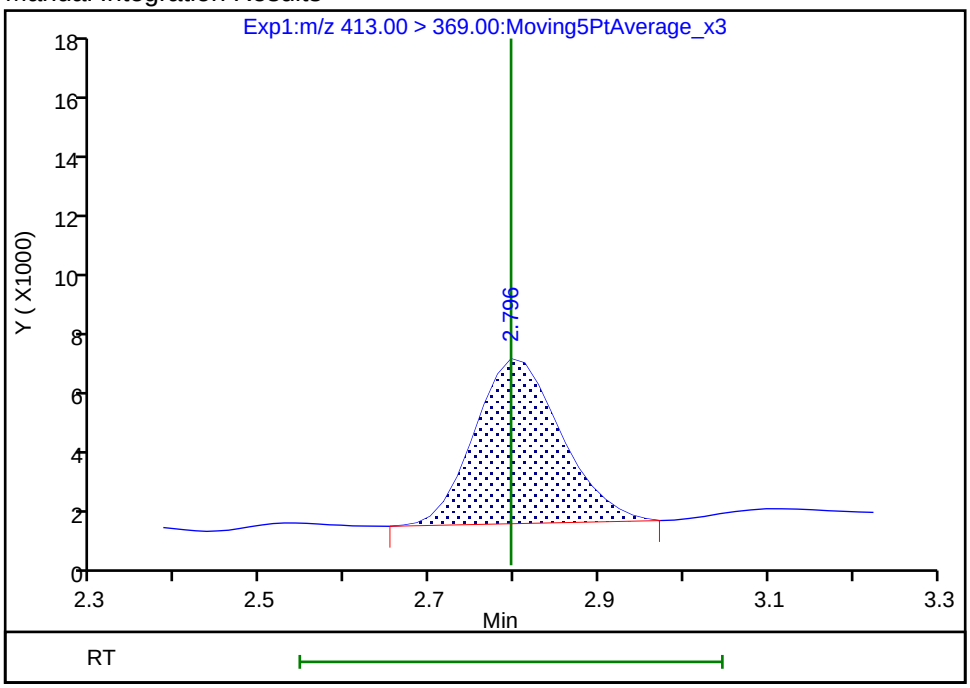
Processing Integration Results

RT: 2.80
Area: 45707
Amount: 0.009850
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 37330
Amount: 0.008045
Amount Units: ng/ml



Reviewer: mongkols, 25-Jul-2018 09:49:30

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB1-01 | Lab Sample ID: 320-41149-22

Matrix: Solid | Lab File ID: 2018.07.30LLA_026.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 19:55

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.03(g) | Date Analyzed: 07/30/2018 06:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.56		0.32	0.21	0.082
335-67-1	Perfluorooctanoic acid (PFOA)	2.6		0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	2.0		0.32	0.21	0.085
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.092	J M	0.42	0.19	0.062
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7		0.32	0.21	0.065
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*84*	*E*	*1.1*	0.53	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	79		50-150
STL01892	13C4-PFHpA	87		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	71		50-150
STL00994	18O2 PFHxS	84		50-150
STL00991	13C4 PFOS	74		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_026.d
Lims ID: 320-41149-A-22-A
Client ID: GRE03-SB1-01
Sample Type: Client
Inject. Date: 30-Jul-2018 06:13:32 ALS Bottle#: 20 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-22-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:04:28 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:04:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.671	1.671	0.0	1.005	103634	0.0436			217	
298.90 > 99.00	1.662	1.671	-0.009	1.000	44979		2.30(1.25-3.74)		53.0	M
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.674	-0.012	0.645	69562	1.84		79.1	233	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.225	0.0	1.000	445237	0.2673			610	
363.00 > 169.00	2.225	2.225	0.0	1.000	166677		2.67(1.13-3.40)		2344	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	1789371	0.8111			2285	
399.00 > 99.00	2.237	2.237	0.0	1.000	574977		3.11(1.50-4.49)		1208	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3777270	2.17		86.7	65129	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4472305	2.00		84.5	85621	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		4455491	2.50			101676	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	2250550	1.23			2555	
413.00 > 169.00	2.579	2.579	0.0	1.000	1230072		1.83(0.84-2.52)		6162	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3756625	2.20		88.1	85248	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.940	2.946	-0.006	1.000	50710155	39.8			206947	E
499.00 > 99.00	2.940	2.946	-0.006	1.000	16015996		3.17(2.31-6.93)		90759	
20 Perfluorononanoic acid										
463.00 > 419.00	2.940	2.946	-0.006	1.000	1135463	0.9577			2305	
463.00 > 169.00	2.940	2.946	-0.006	1.000	294456		3.86(1.90-5.69)		4557	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.953	-0.013	1.140	2595954	1.77		70.6	49391	
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.953	-0.013	1.140	2756117	1.77		74.1	17021	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 10:04:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_026.d

Injection Date: 30-Jul-2018 06:13:32 Instrument ID: A8_N

Lims ID: 320-41149-A-22-A Lab Sample ID: 320-41149-22

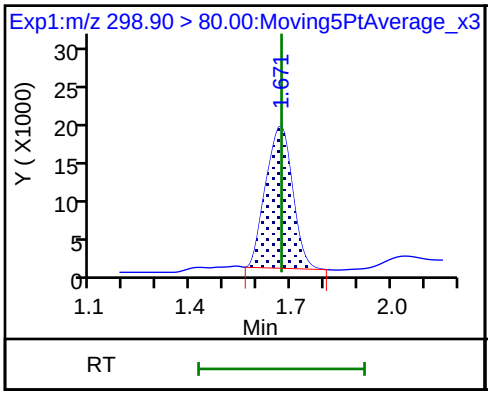
Client ID: GRE03-SB1-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 24

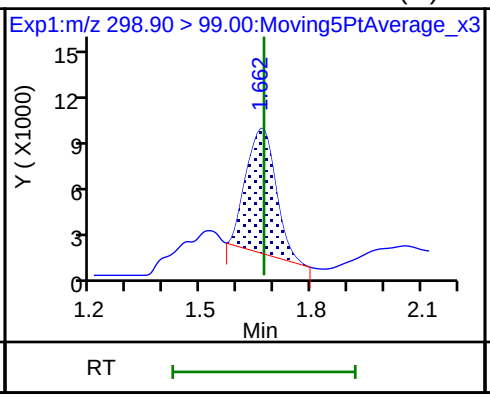
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

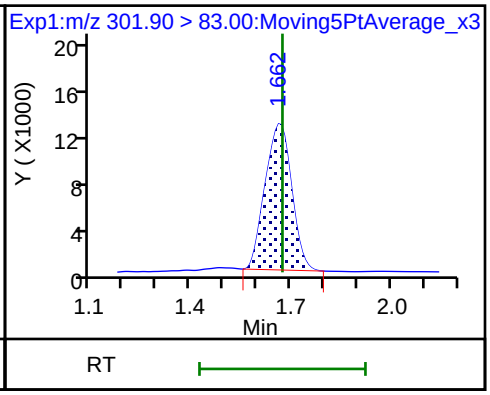
5 Perfluorobutanesulfonic acid



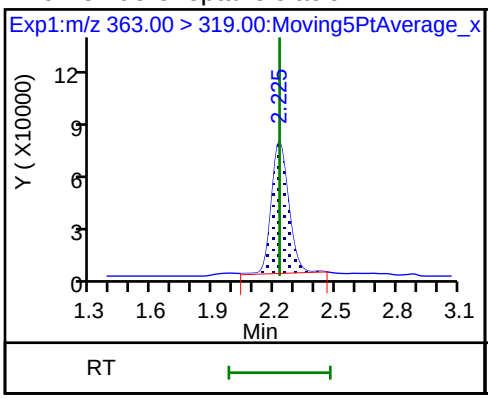
5 Perfluorobutanesulfonic acid (M)



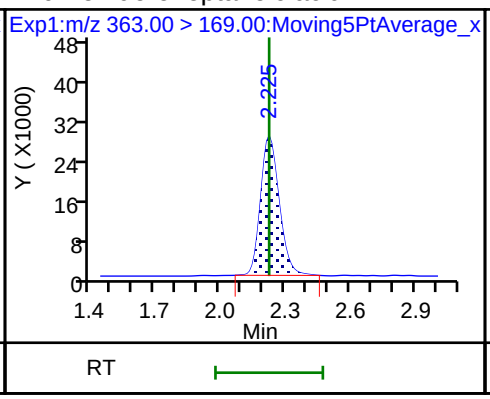
D 47 13C3-PFBS



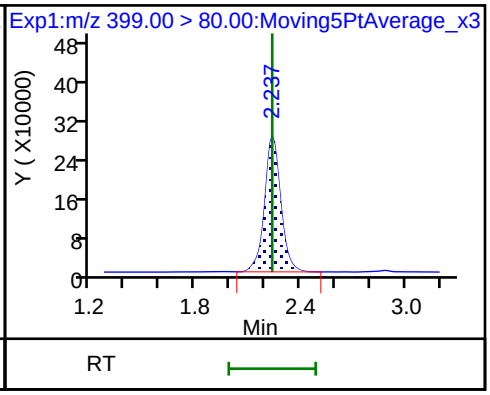
10 Perfluoroheptanoic acid



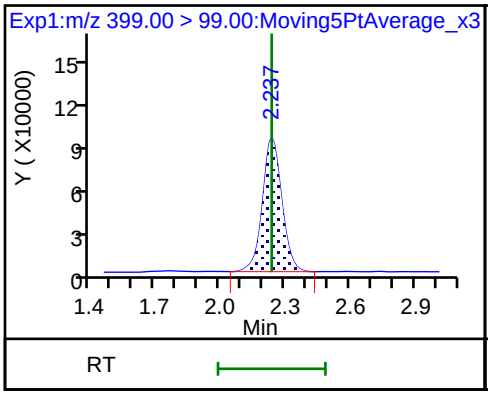
10 Perfluoroheptanoic acid



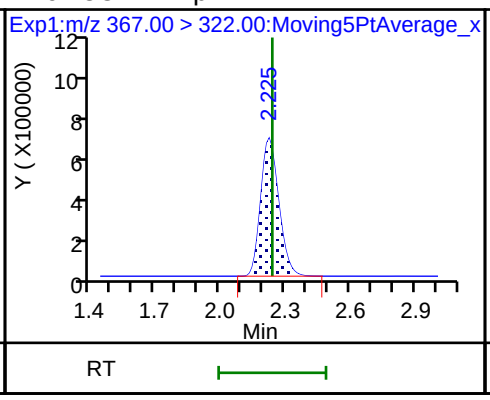
8 Perfluorohexanesulfonic acid



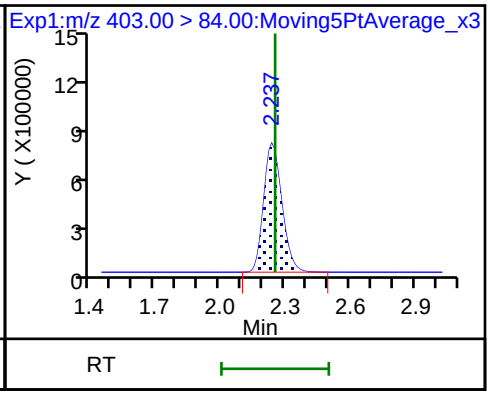
8 Perfluorohexanesulfonic acid



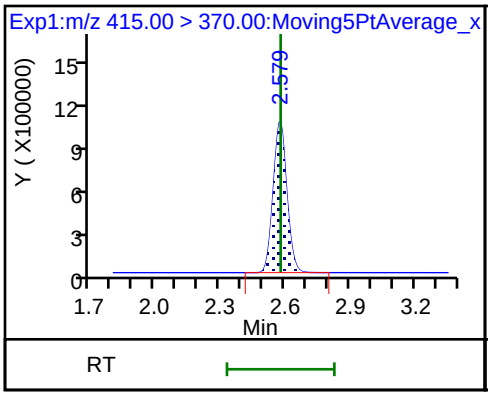
D 9 13C4-PFHpA



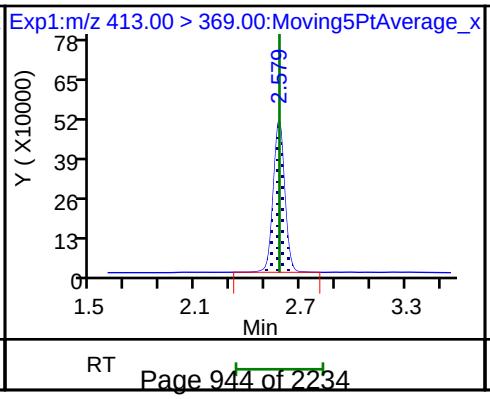
D 11 18O2 PFHxS



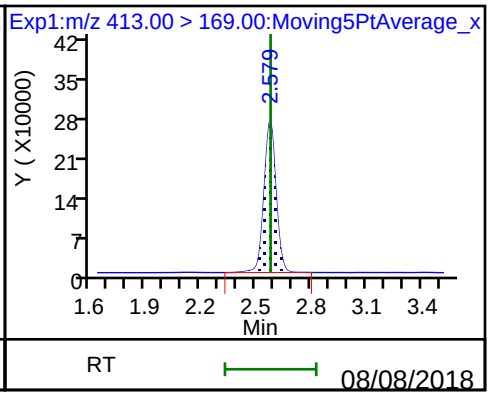
* 62 13C2-PFOA



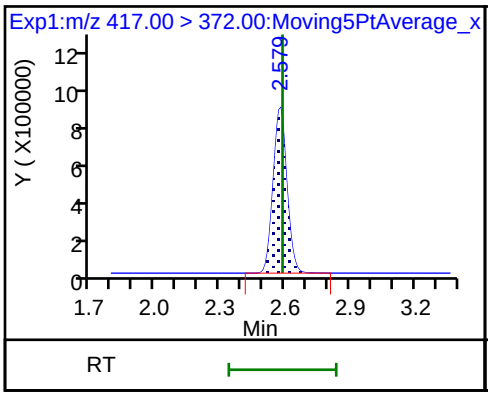
15 Perfluorooctanoic acid



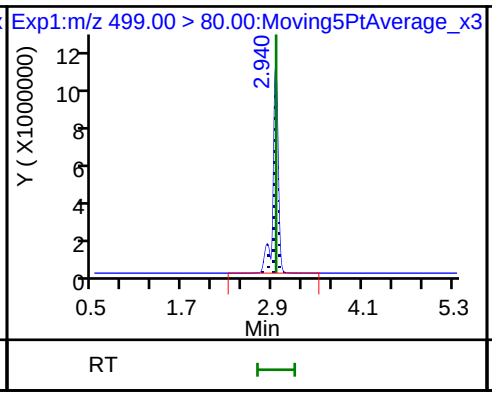
15 Perfluorooctanoic acid



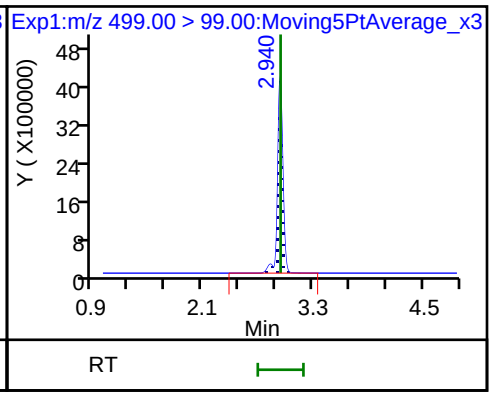
D 14 13C4 PFOA



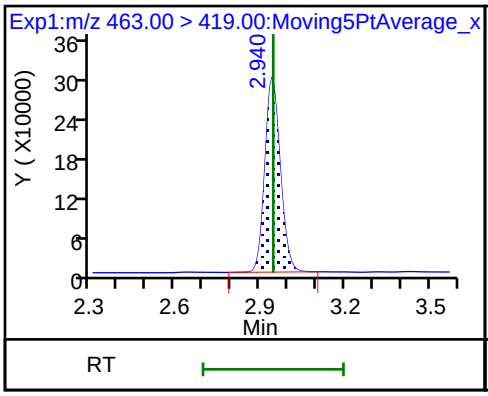
17 Perfluorooctane sulfonic acid



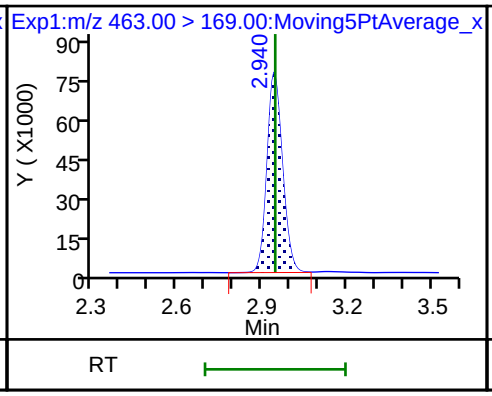
17 Perfluorooctane sulfonic acid



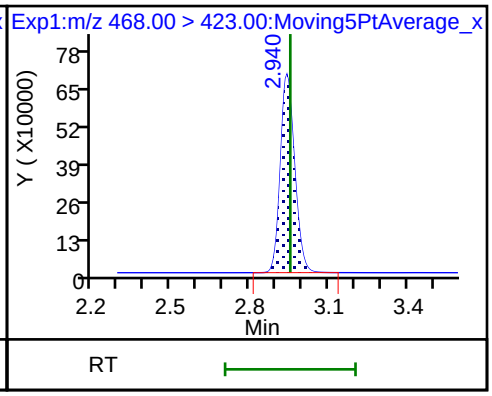
20 Perfluorononanoic acid



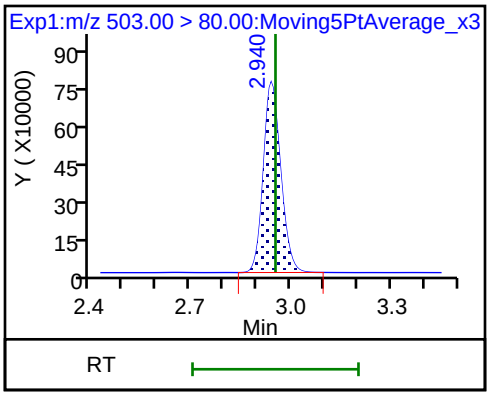
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

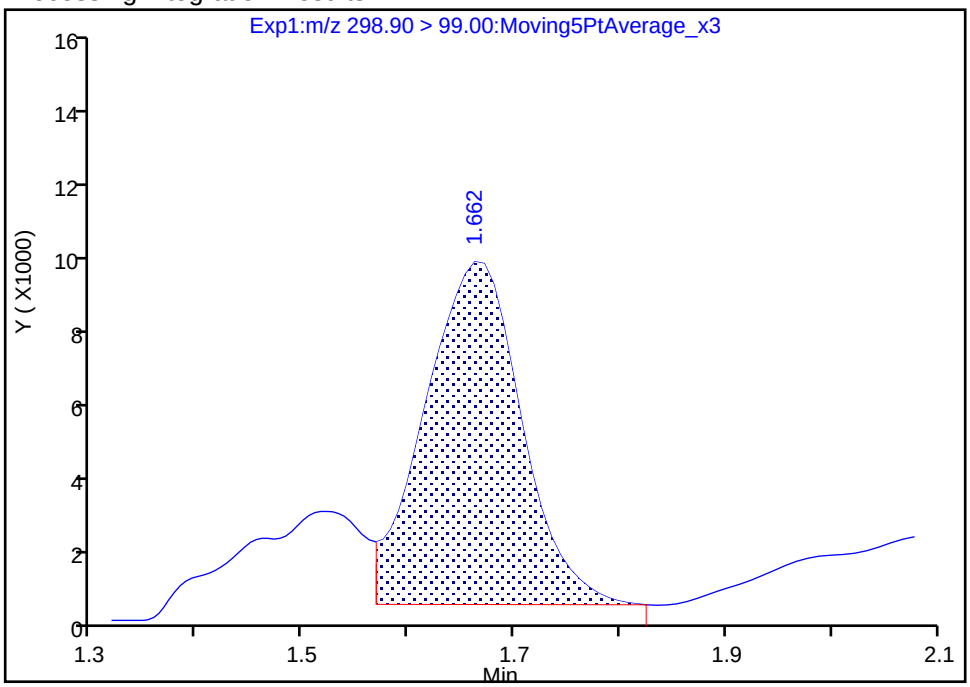
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_026.d				
Injection Date:	30-Jul-2018 06:13:32	Instrument ID:	A8_N		
Lims ID:	320-41149-A-22-A	Lab Sample ID:	320-41149-22		
Client ID:	GRE03-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	20	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

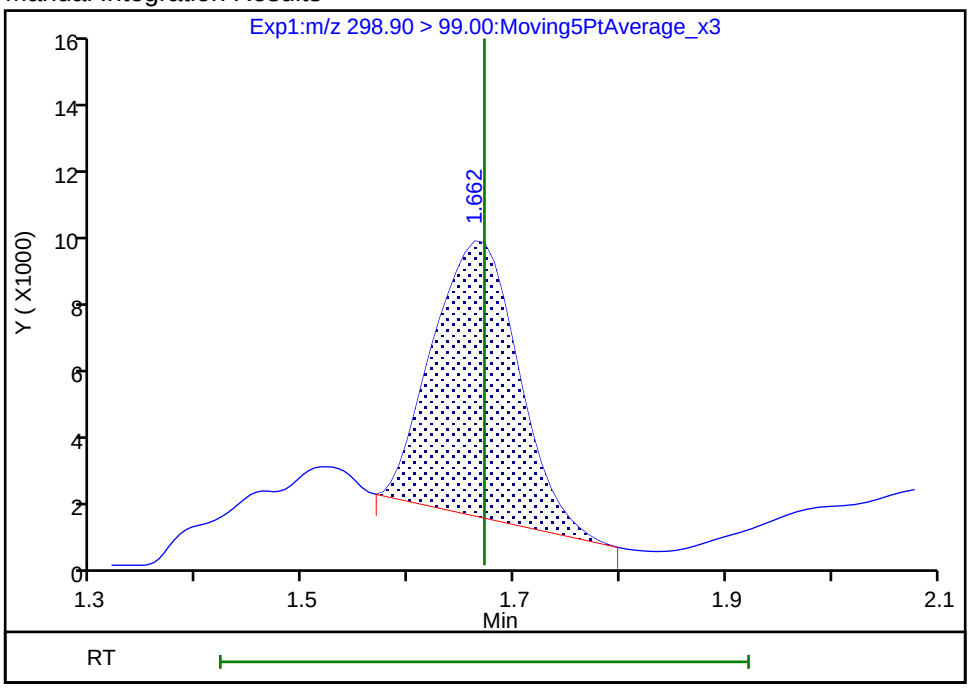
Processing Integration Results

RT: 1.66
Area: 56956
Amount: 0.043628
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 44979
Amount: 0.043628
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:04:20

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB1-01 DL | Lab Sample ID: 320-41149-22 DL

Matrix: Solid | Lab File ID: 2018.08.01LLBB_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 19:55

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.03(g) | Date Analyzed: 08/01/2018 16:30

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.1*	*U M*	*3.2*	2.1	*0.82*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*2.6*	*J D*	*3.2*	2.1	*1.1*
375-95-1	*Perfluorononanoic acid (PFNA)*	*2.3*	*J D*	*3.2*	2.1	*0.85*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*1.9*	*U*	*4.2*	1.9	*0.62*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*1.8*	*J D*	*3.2*	2.1	*0.65*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	110	D	11	5.3	2.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	71		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	87		50-150
STL00994	18O2 PFHxS	76		50-150
STL00991	13C4 PFOS	74		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_019.d
Lims ID: 320-41149-A-22-A
Client ID: GRE03-SB1-01
Sample Type: Client
Inject. Date: 01-Aug-2018 16:30:03 ALS Bottle#: 11 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-22-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:27:15 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:27:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.658	1.662	-0.004	1.000	13207	0.005380			84.8	
298.90 > 99.00	1.667	1.662	0.005	1.005	4456		2.96(1.25-3.74)		18.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.658	1.669	-0.011	0.644	7447	0.1646		70.8	30.2	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.219	2.214	0.005	1.000	43671	0.0251			16.9	M
363.00 > 169.00	2.219	2.214	0.005	1.000	14695		2.97(1.13-3.40)		151	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.225	-0.006	0.862	374960	0.2272		90.9	16160	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.225	0.005	1.000	190930	0.0879			688	
399.00 > 99.00	2.230	2.225	0.005	1.000	62577		3.05(1.50-4.49)		104	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.238	-0.008	0.866	444508	0.1793		75.8	15161	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.571	0.003	1.003	199560	0.1212			112	
413.00 > 169.00	2.574	2.571	0.003	1.003	117016		1.71(0.84-2.52)		610	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.571	0.003		414904	0.2500			15351	
D 14 13C4 PFOA										
417.00 > 372.00	2.566	2.580	-0.014	0.997	356084	0.2235		89.4	11256	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.938	2.935	0.003	1.000	7693022	5.41			58871	
499.00 > 99.00	2.938	2.935	0.003	1.000	1880951		4.09(2.31-6.93)		11765	
20 Perfluorononanoic acid										
463.00 > 419.00	2.938	2.935	0.003	1.002	142396	0.1089			415	
463.00 > 169.00	2.933	2.935	-0.002	1.000	33431		4.26(1.90-5.69)		707	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.938	2.946	-0.008	1.142	302667	0.1767		73.9	5663	
D 19 13C5 PFNA										
468.00 > 423.00	2.933	2.948	-0.015	1.140	302846	0.2182		87.3	14224	

QC Flag Legend

Review Flags

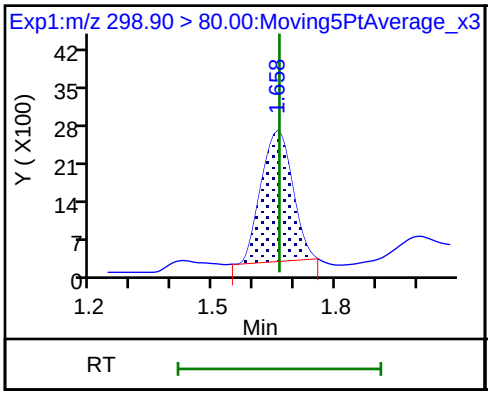
M - Manually Integrated

Report Date: 02-Aug-2018 13:27:16 Chrom Revision: 2.3 19-Jul-2018 15:14:50

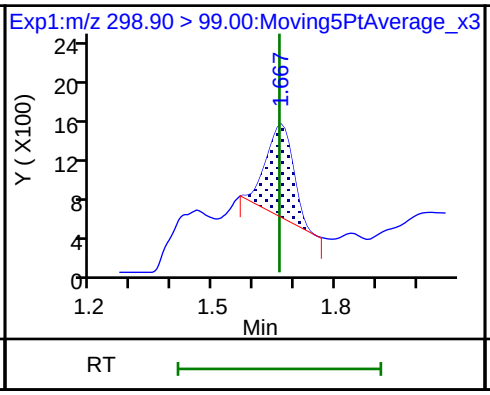
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_019.d				
Injection Date:	01-Aug-2018 16:30:03	Instrument ID:	A8_N		
Lims ID:	320-41149-A-22-A	Lab Sample ID:	320-41149-22		
Client ID:	GRE03-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

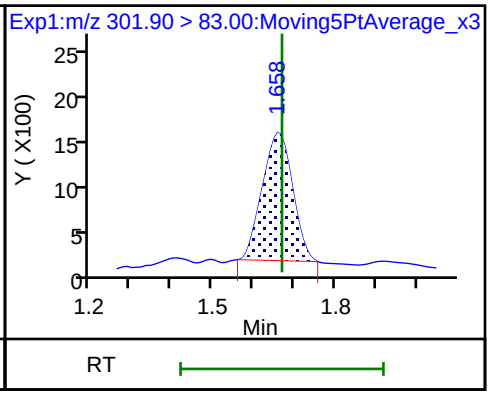
5 Perfluorobutanesulfonic acid



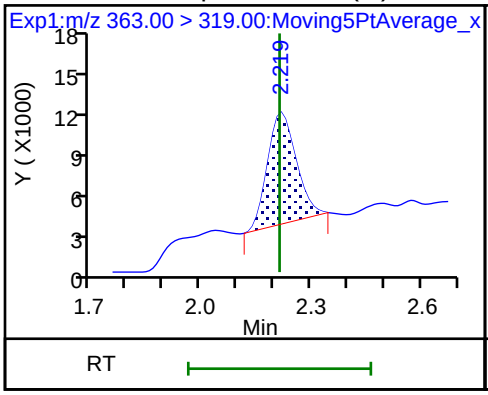
5 Perfluorobutanesulfonic acid



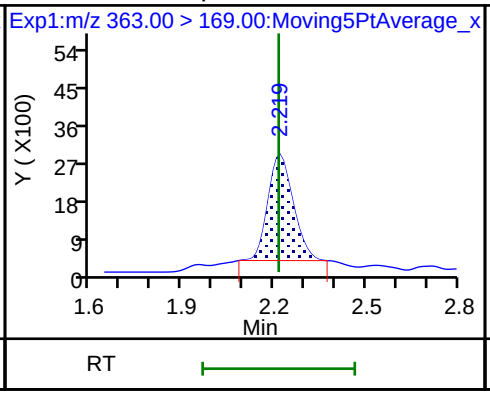
D 47 13C3-PFBS



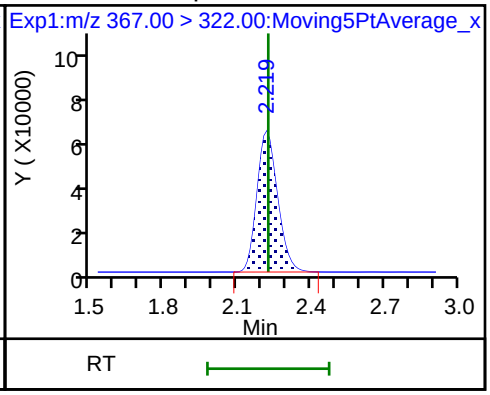
10 Perfluoroheptanoic acid (M)



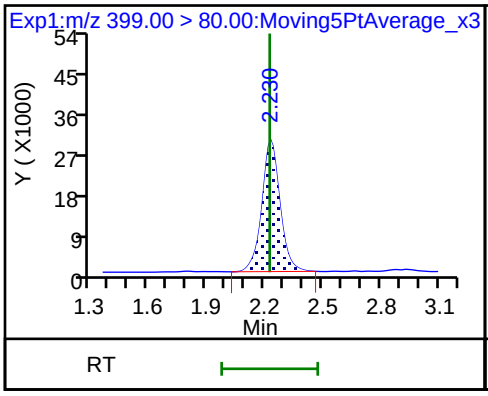
10 Perfluoroheptanoic acid



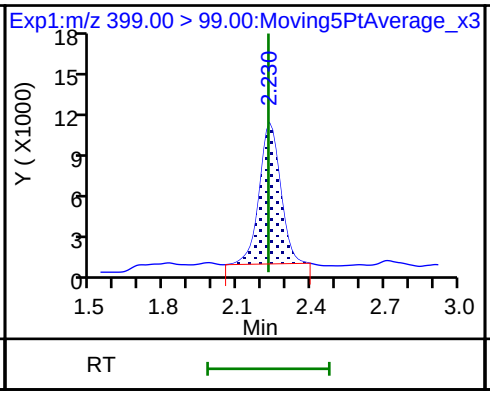
D 9 13C4-PFHpA



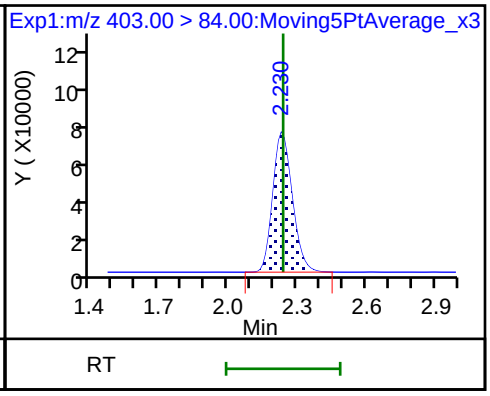
8 Perfluorohexanesulfonic acid



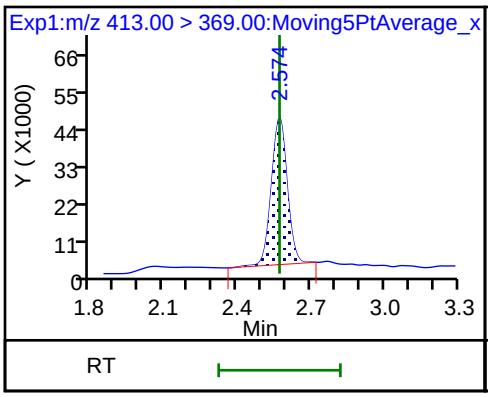
8 Perfluorohexanesulfonic acid



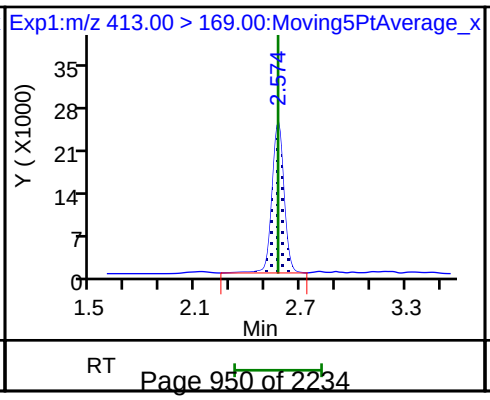
D 11 18O2 PFHxS



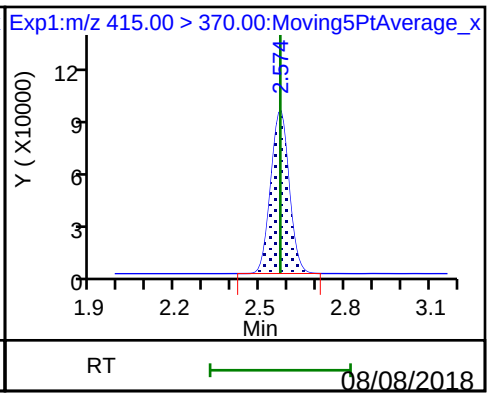
15 Perfluorooctanoic acid



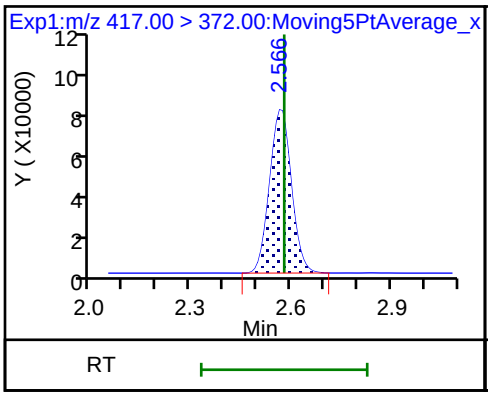
15 Perfluorooctanoic acid



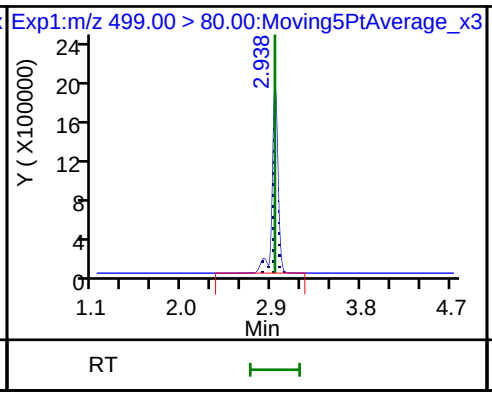
* 62 13C2-PFOA



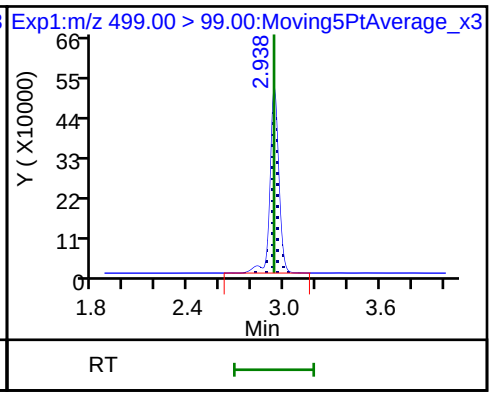
D 14 13C4 PFOA



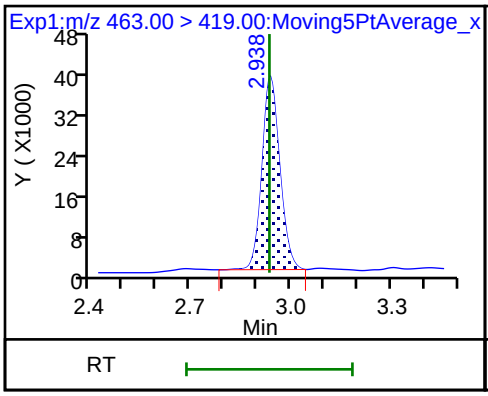
17 Perfluorooctane sulfonic acid



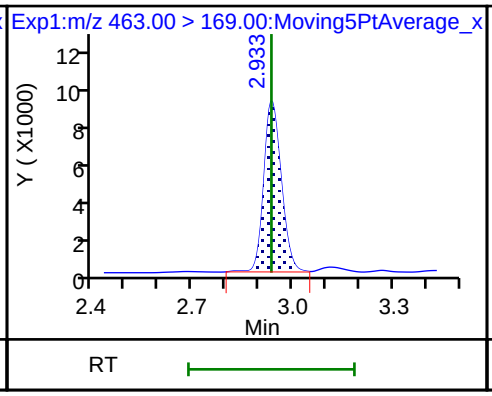
17 Perfluorooctane sulfonic acid



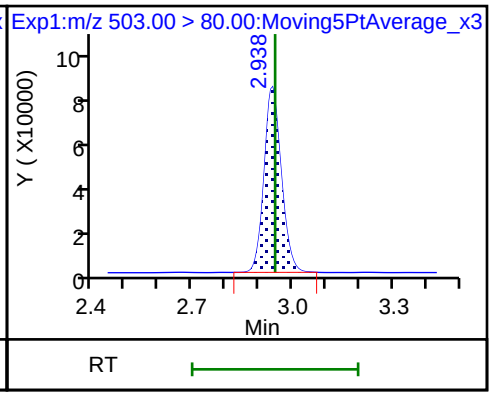
20 Perfluorononanoic acid



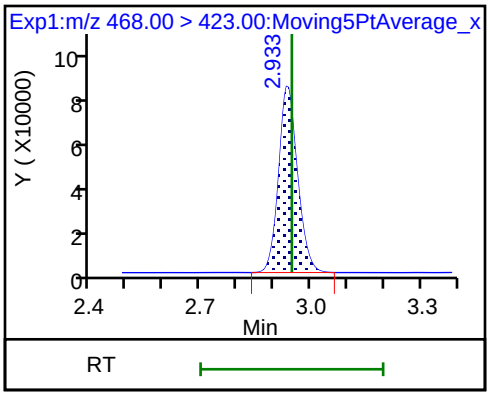
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

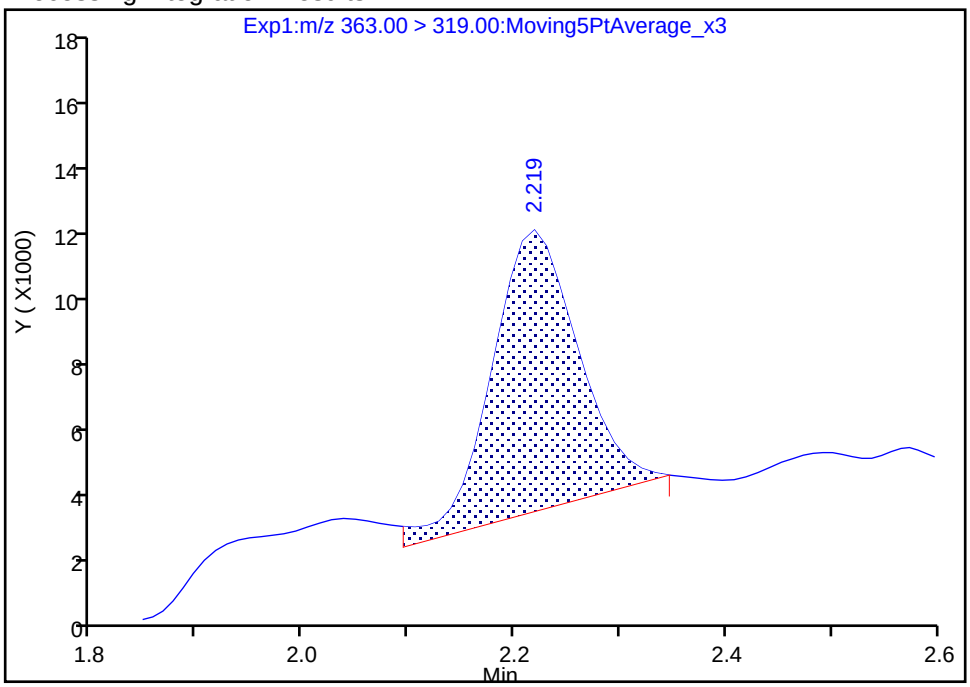
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_019.d				
Injection Date:	01-Aug-2018 16:30:03	Instrument ID:	A8_N		
Lims ID:	320-41149-A-22-A	Lab Sample ID:	320-41149-22		
Client ID:	GRE03-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

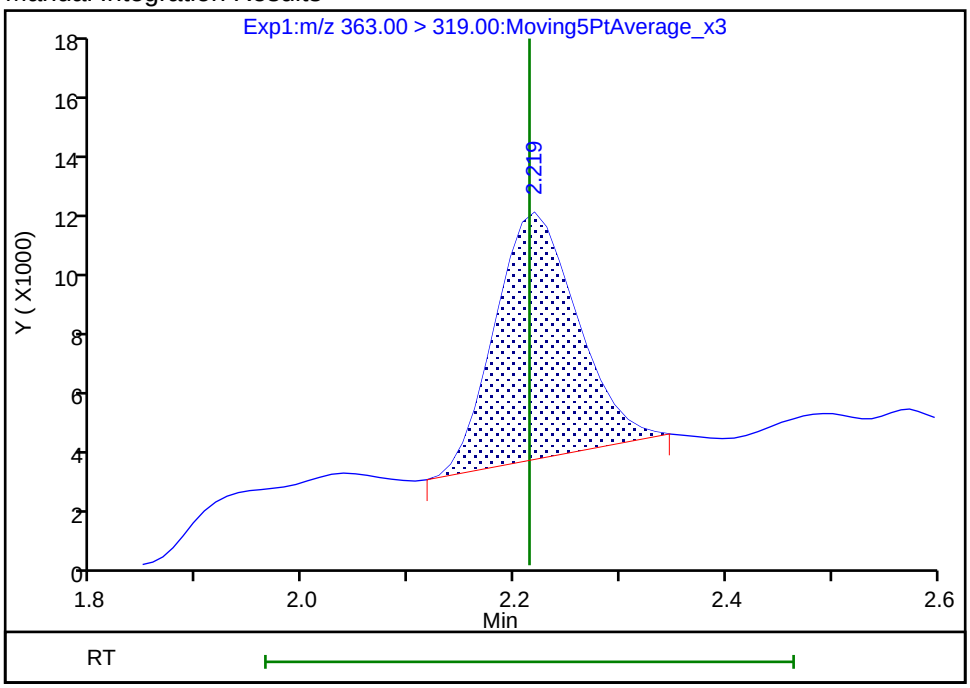
Processing Integration Results

RT: 2.22
Area: 47396
Amount: 0.027251
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 43671
Amount: 0.025109
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:27:09

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB2-01 | Lab Sample ID: 320-41149-23

Matrix: Solid | Lab File ID: 2018.07.30LLA_028.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 20:25

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.03(g) | Date Analyzed: 07/30/2018 06:29

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 7.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.66		0.32	0.21	0.084
335-67-1	Perfluorooctanoic acid (PFOA)	2.6		0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	3.0		0.32	0.21	0.087
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.16	J M	0.43	0.19	0.063
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.7		0.32	0.21	0.067
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*100*	*E*	*1.1*	0.54	*0.26*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	76		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	82		50-150
STL00995	13C5 PFNA	64		50-150
STL00994	18O2 PFHxS	74		50-150
STL00991	13C4 PFOS	65		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_028.d
Lims ID: 320-41149-A-23-A
Client ID: GRE03-SB2-01
Sample Type: Client
Inject. Date: 30-Jul-2018 06:29:10 ALS Bottle#: 21 Worklist Smp#: 26
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-23-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:05:23 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:05:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.665	1.666	-0.001	1.000	176521	0.0726			328	
298.90 > 99.00	1.674	1.666	0.008	1.005	71244		2.48(1.25-3.74)		76.2	M
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.674	-0.009	0.645	71211	1.77		76.3	228	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.228	2.229	-0.001	1.000	525998	0.3066			386	
363.00 > 169.00	2.228	2.229	-0.001	1.000	208682		2.52(1.13-3.40)		2557	
D 9 13C4-PFHpA										
367.00 > 322.00	2.228	2.240	-0.012	0.864	3890209	2.10		84.2	96323	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.241	-0.001	1.000	6454635	3.13			7269	
399.00 > 99.00	2.240	2.241	-0.001	1.000	2066305		3.12(1.50-4.49)		4423	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.253	-0.013	0.868	4178529	1.76		74.4	51182	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.581	-0.001		4727296	2.50			78234	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.581	-0.001	1.000	2185400	1.21			2443	
413.00 > 169.00	2.580	2.581	-0.001	1.000	1115813		1.96(0.84-2.52)		5399	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3730660	2.06		82.5	60798	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.942	2.943	-0.001	1.000	57606638	48.7			2960627	E
499.00 > 99.00	2.942	2.943	-0.001	1.000	18889907		3.05(2.31-6.93)		105230	
20 Perfluorononanoic acid										
463.00 > 419.00	2.942	2.943	-0.001	1.000	1603670	1.41			3613	
463.00 > 169.00	2.942	2.943	-0.001	1.000	408659		3.92(1.90-5.69)		11815	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.942	2.953	-0.011	1.140	2490986	1.60		63.9	49762	
D 18 13C4 PFOS										
503.00 > 80.00	2.942	2.953	-0.011	1.140	2557319	1.55		64.8	25154	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

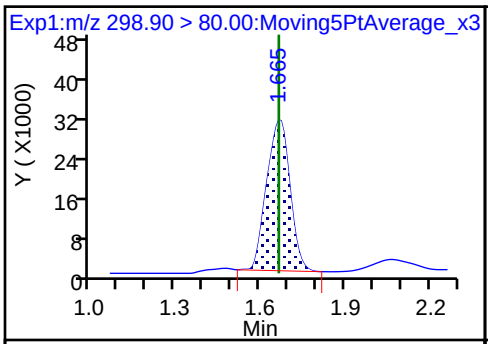
M - Manually Integrated

Report Date: 31-Jul-2018 10:05:24 Chrom Revision: 2.3 19-Jul-2018 15:14:50

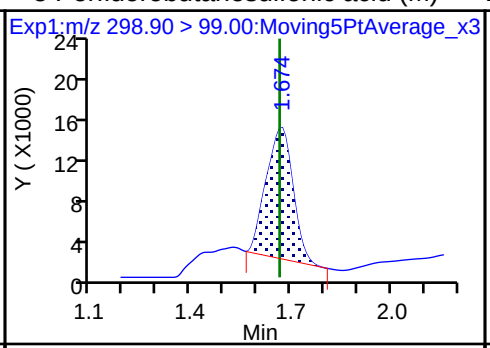
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_028.d				
Injection Date:	30-Jul-2018 06:29:10	Instrument ID:	A8_N		
Lims ID:	320-41149-A-23-A	Lab Sample ID:	320-41149-23		
Client ID:	GRE03-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	26
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

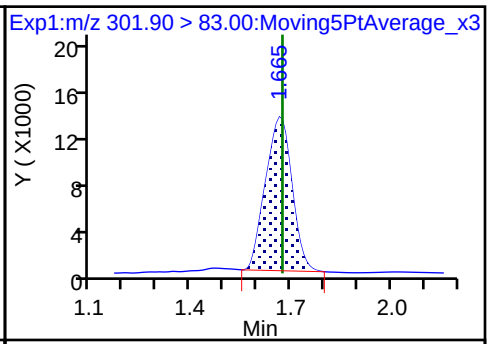
5 Perfluorobutanesulfonic acid



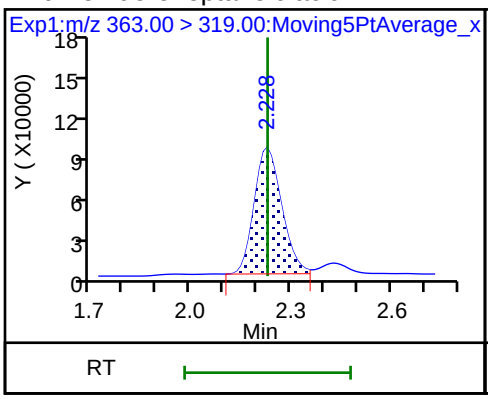
5 Perfluorobutanesulfonic acid (M)



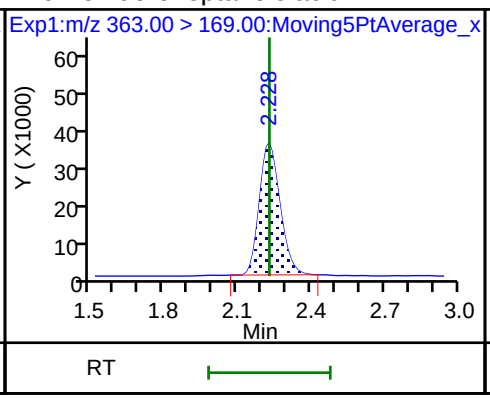
D 47 13C3-PFBS



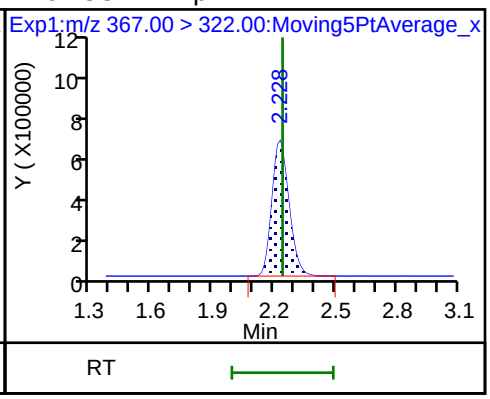
10 Perfluoroheptanoic acid



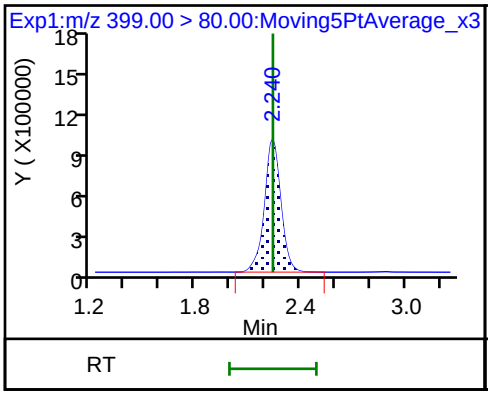
10 Perfluoroheptanoic acid



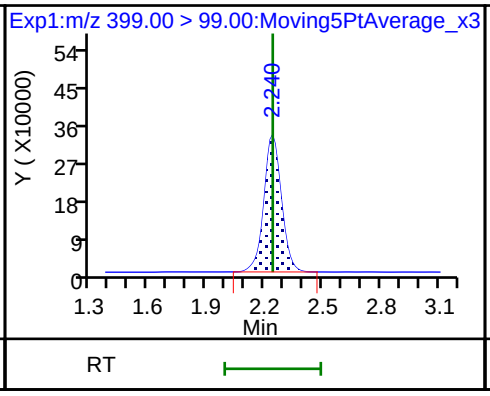
D 9 13C4-PFHpA



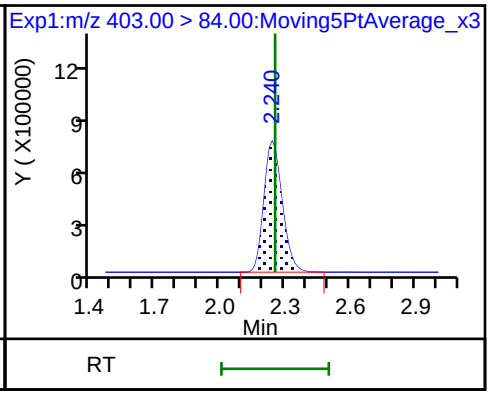
8 Perfluorohexanesulfonic acid



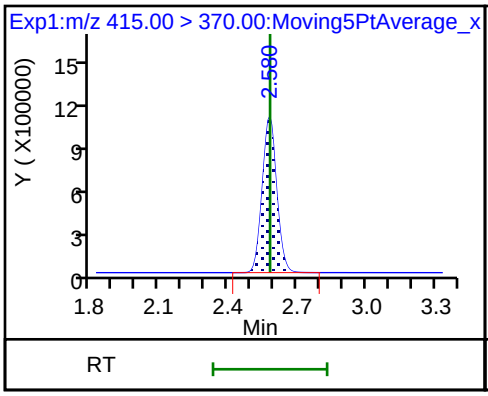
8 Perfluorohexanesulfonic acid



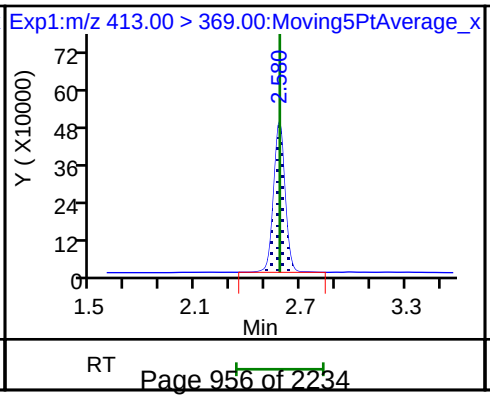
D 11 18O2 PFHxS



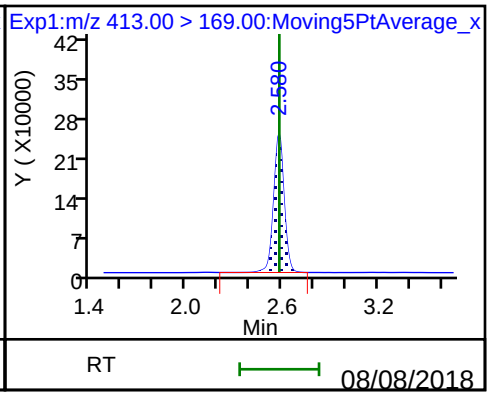
* 62 13C2-PFOA



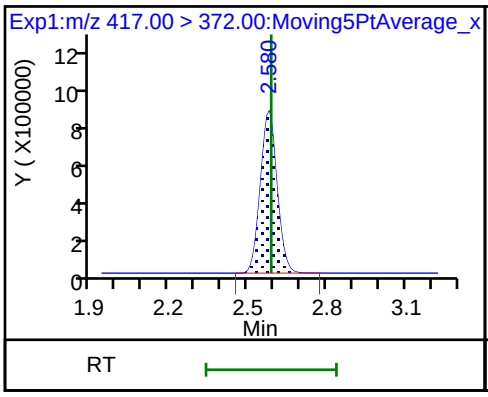
15 Perfluorooctanoic acid



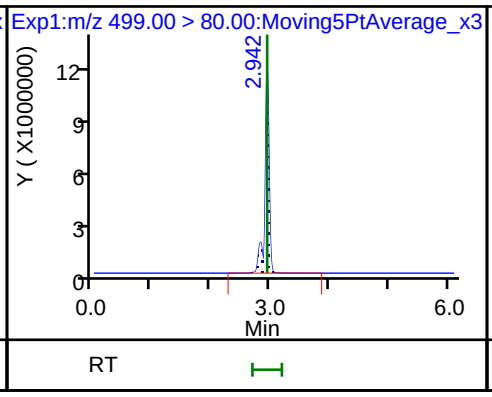
15 Perfluorooctanoic acid



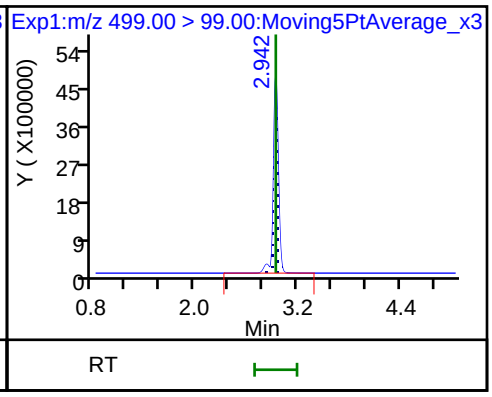
D 14 13C4 PFOA



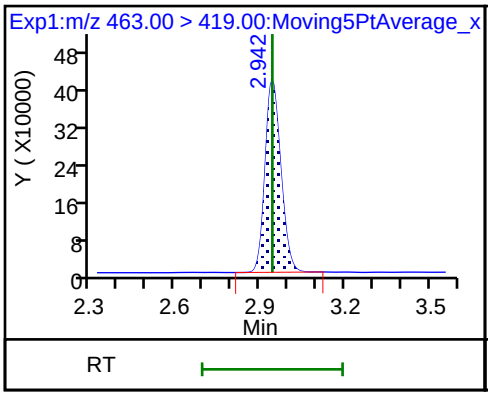
17 Perfluorooctane sulfonic acid



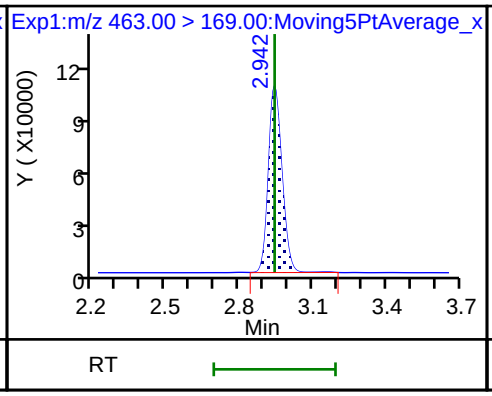
17 Perfluorooctane sulfonic acid



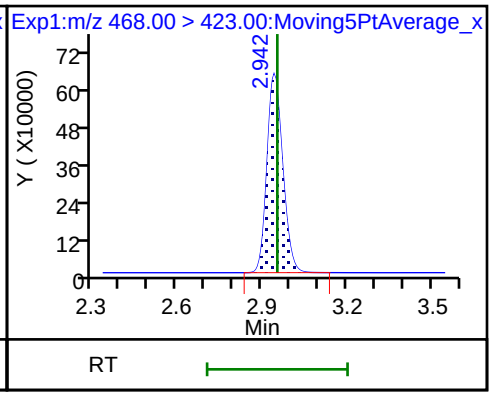
20 Perfluorononanoic acid



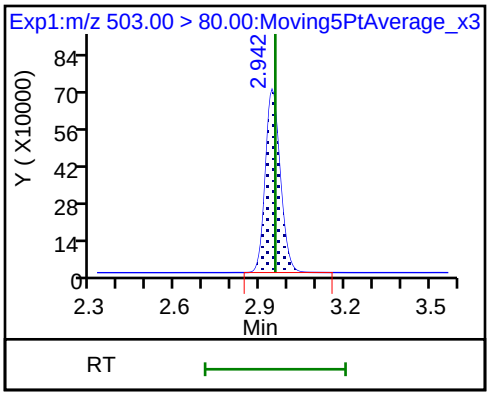
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

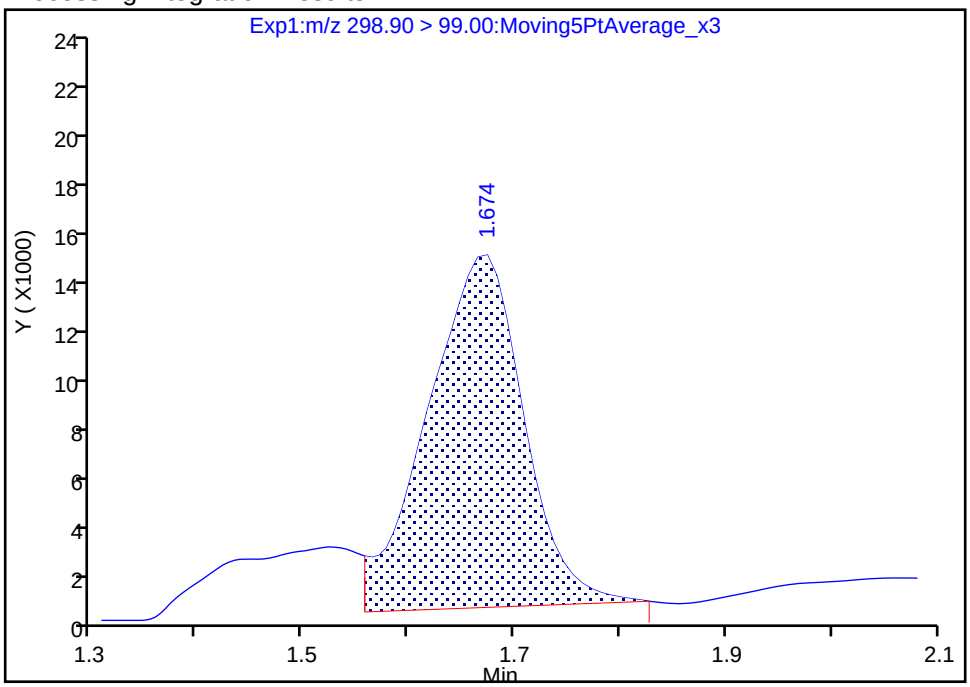
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_028.d				
Injection Date:	30-Jul-2018 06:29:10	Instrument ID:	A8_N		
Lims ID:	320-41149-A-23-A	Lab Sample ID:	320-41149-23		
Client ID:	GRE03-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	26
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

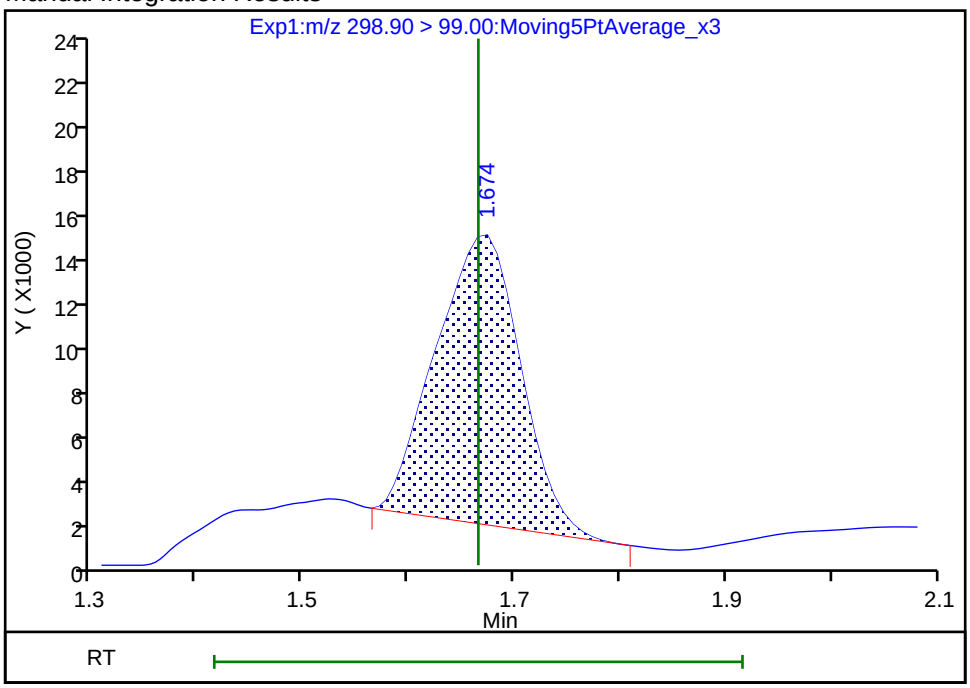
Processing Integration Results

RT: 1.67
Area: 89126
Amount: 0.072592
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 71244
Amount: 0.072592
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:05:14

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB2-01 DL | Lab Sample ID: 320-41149-23 DL

Matrix: Solid | Lab File ID: 2018.08.01LLBB_020.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 20:25

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.03(g) | Date Analyzed: 08/01/2018 16:37

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 7.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.1*	*U M*	*3.2*	2.1	*0.84*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*2.6*	*J D M*	*3.2*	2.1	*1.1*
375-95-1	*Perfluorononanoic acid (PFNA)*	*3.4*	*D*	*3.2*	2.1	*0.87*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*1.9*	*U*	*4.3*	1.9	*0.63*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*6.5*	*D*	*3.2*	2.1	*0.67*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	150	D	11	5.4	2.6

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	65		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	82		50-150
STL00994	18O2 PFHxS	73		50-150
STL00991	13C4 PFOS	71		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_020.d
Lims ID: 320-41149-A-23-A
Client ID: GRE03-SB2-01
Sample Type: Client
Inject. Date: 01-Aug-2018 16:37:52 ALS Bottle#: 12 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-23-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:27:44 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:27:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.662	0.005	1.005	25466	0.0113			190	
298.90 > 99.00	1.667	1.662	0.005	1.005	13052		1.95(1.25-3.74)		44.8	
D 47 13C3-PFBS										
301.90 > 83.00	1.658	1.669	-0.011	0.644	6806	0.1512		65.1	26.5	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.219	2.214	0.005	1.000	50331	0.0288			18.5	M
363.00 > 169.00	2.219	2.214	0.005	1.000	16483		3.05(1.13-3.40)		146	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.225	-0.006	0.862	377229	0.2299		91.9	13136	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.225	0.005	1.000	636608	0.3040			2205	
399.00 > 99.00	2.230	2.225	0.005	1.000	215942		2.95(1.50-4.49)		316	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.238	-0.008	0.867	428436	0.1737		73.5	14686	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.574	2.571	0.003	1.003	192140	0.1229			108	M
413.00 > 169.00	2.574	2.571	0.003	1.003	112953		1.70(0.84-2.52)		550	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.571	0.003		412647	0.2500			13248	
D 14 13C4 PFOA										
417.00 > 372.00	2.566	2.580	-0.014	0.997	338078	0.2134		85.3	12434	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.933	2.935	-0.002	1.000	9427983	6.93			73564	
499.00 > 99.00	2.933	2.935	-0.002	1.000	2344170		4.02(2.31-6.93)		19247	
20 Perfluorononanoic acid										
463.00 > 419.00	2.933	2.935	-0.002	1.000	194269	0.1582			541	
463.00 > 169.00	2.933	2.935	-0.002	1.000	46637		4.17(1.90-5.69)		1800	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.933	2.946	-0.013	1.140	289628	0.1700		71.1	7587	
D 19 13C5 PFNA										
468.00 > 423.00	2.933	2.948	-0.015	1.140	284293	0.2059		82.4	11404	

QC Flag Legend

Review Flags

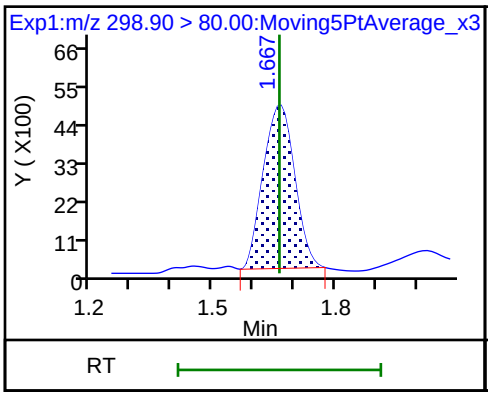
M - Manually Integrated

Report Date: 02-Aug-2018 13:27:44 Chrom Revision: 2.3 19-Jul-2018 15:14:50

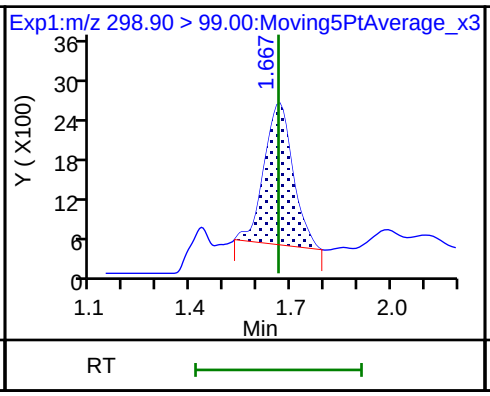
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_020.d				
Injection Date:	01-Aug-2018 16:37:52	Instrument ID:	A8_N		
Lims ID:	320-41149-A-23-A	Lab Sample ID:	320-41149-23		
Client ID:	GRE03-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

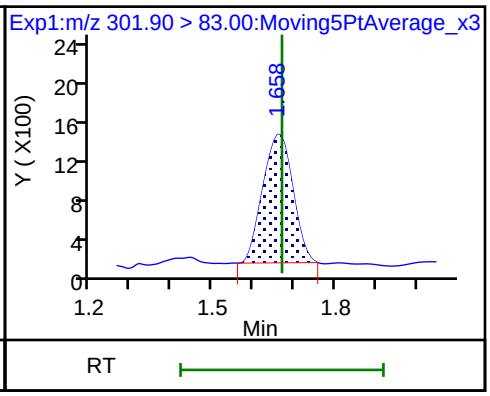
5 Perfluorobutanesulfonic acid



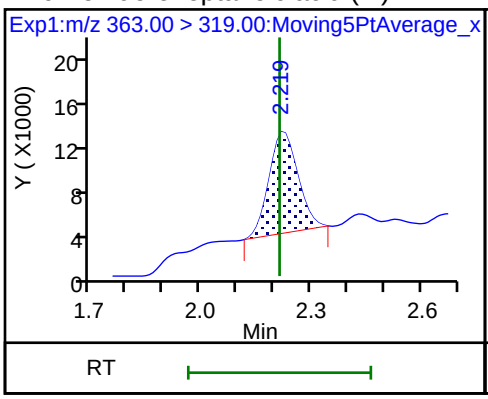
5 Perfluorobutanesulfonic acid



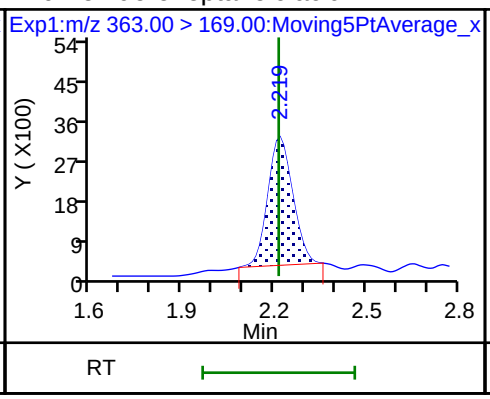
D 47 13C3-PFBS



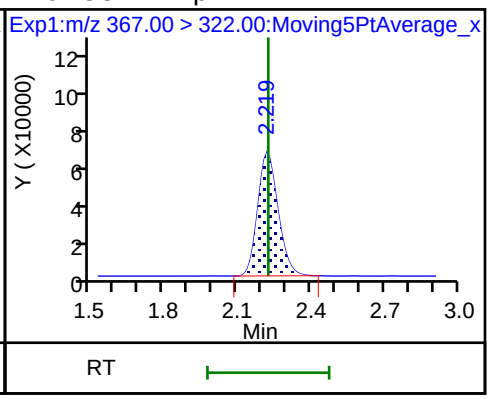
10 Perfluoroheptanoic acid (M)



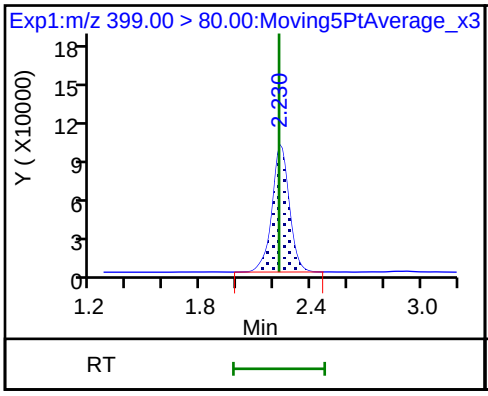
10 Perfluoroheptanoic acid



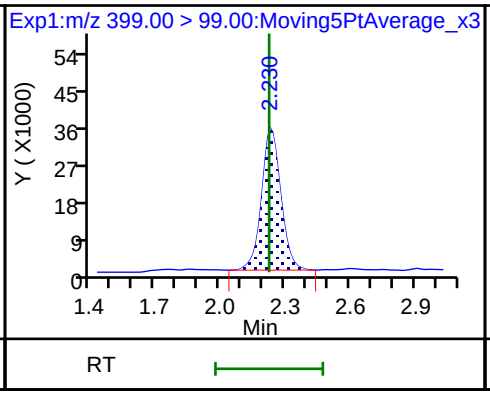
D 9 13C4-PFHpA



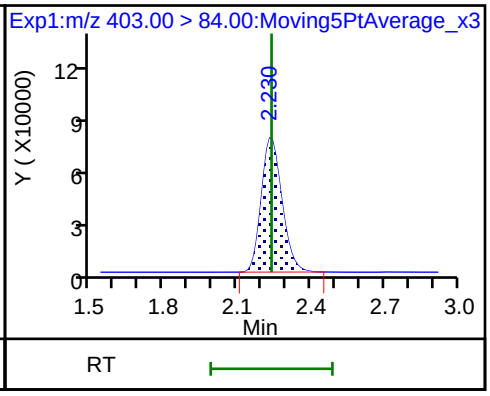
8 Perfluorohexanesulfonic acid



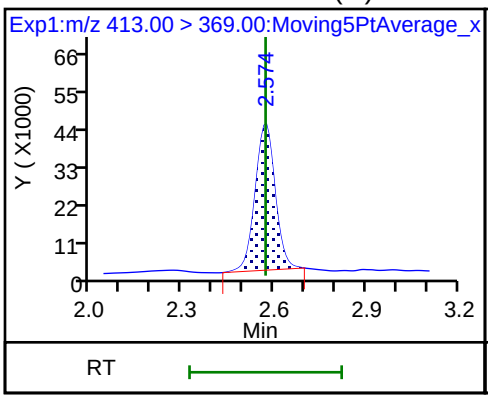
8 Perfluorohexanesulfonic acid



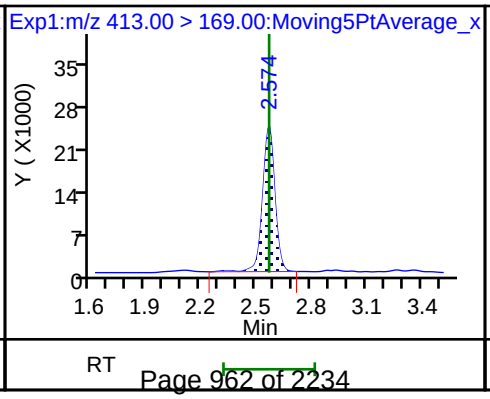
D 11 18O2 PFHxS



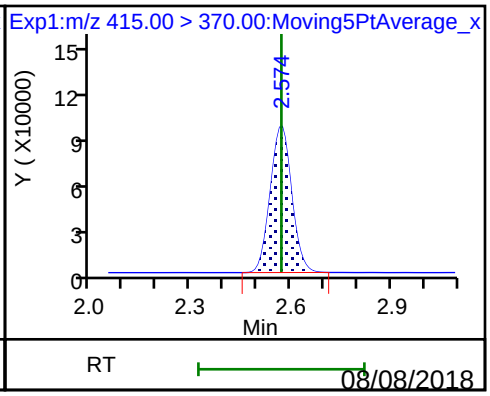
15 Perfluorooctanoic acid (M)



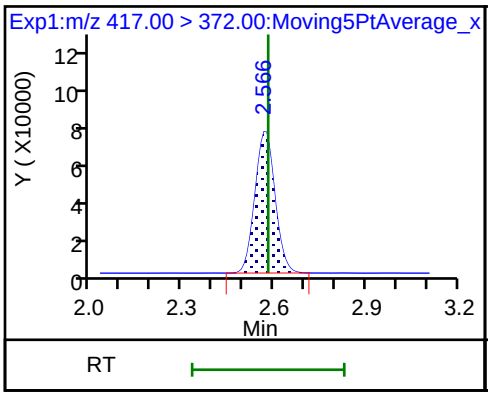
15 Perfluorooctanoic acid



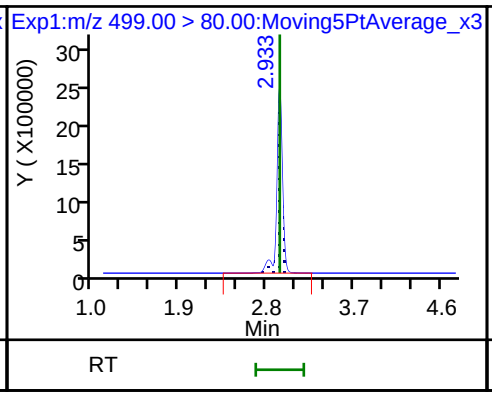
* 62 13C2-PFOA



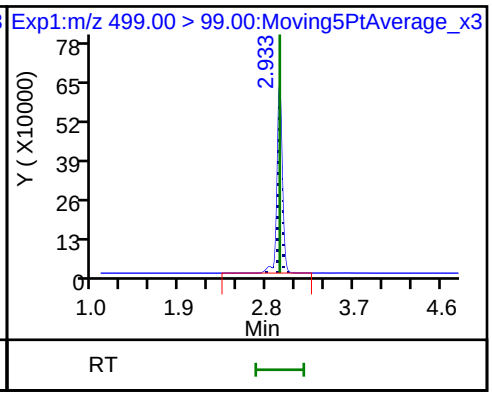
D 14 13C4 PFOA



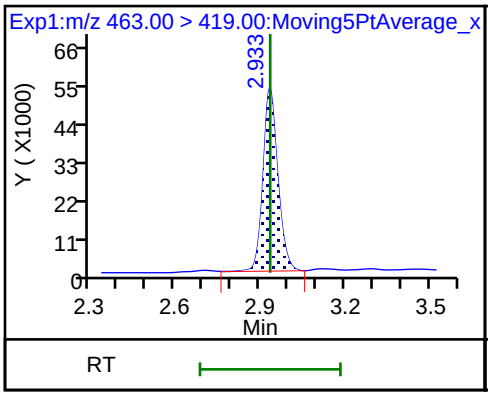
17 Perfluorooctane sulfonic acid



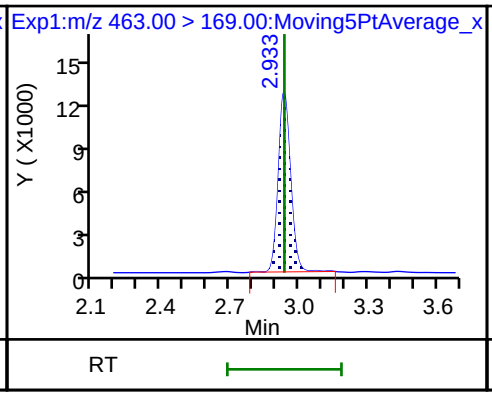
17 Perfluorooctane sulfonic acid



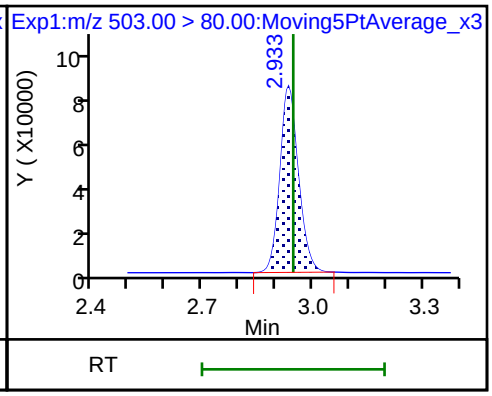
20 Perfluorononanoic acid



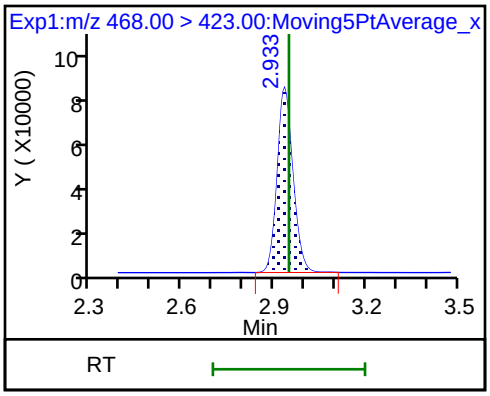
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

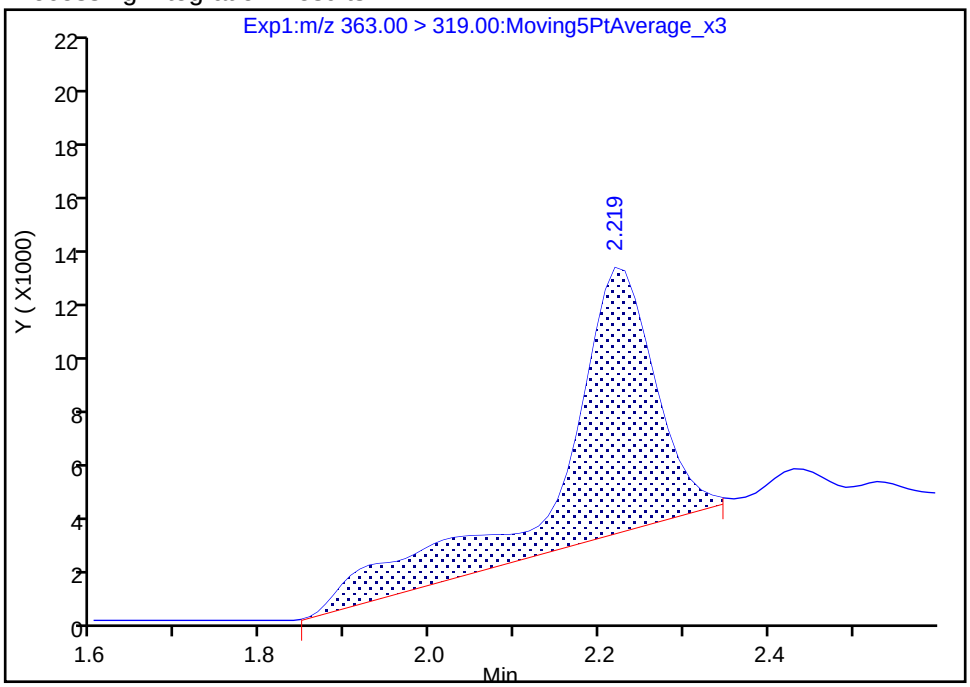
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_020.d				
Injection Date:	01-Aug-2018 16:37:52	Instrument ID:	A8_N		
Lims ID:	320-41149-A-23-A	Lab Sample ID:	320-41149-23		
Client ID:	GRE03-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

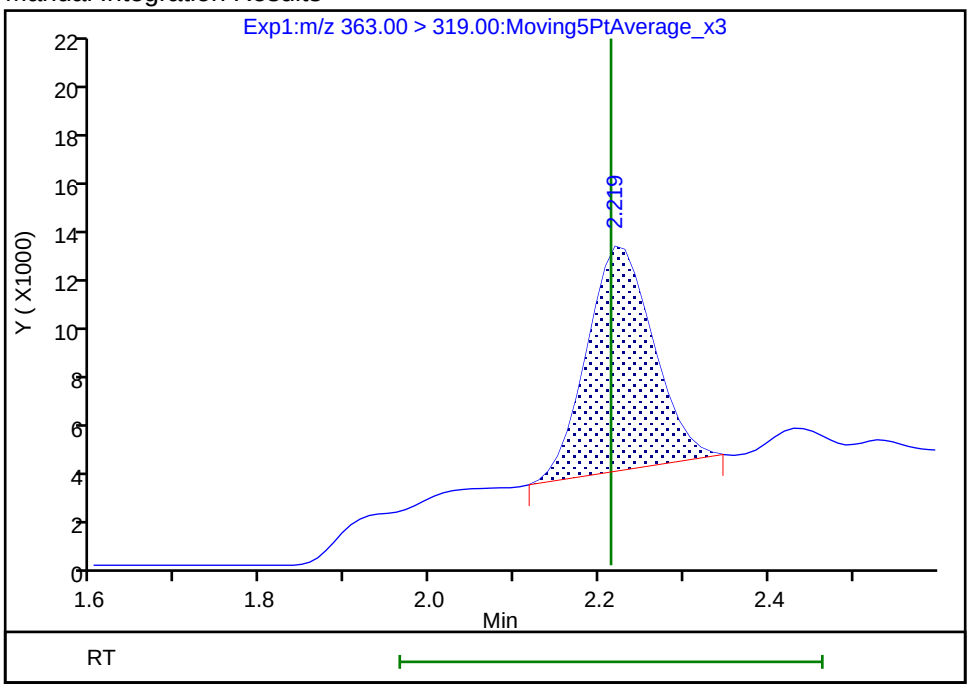
Processing Integration Results

RT: 2.22
Area: 76596
Amount: 0.043775
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 50331
Amount: 0.028764
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:27:33

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

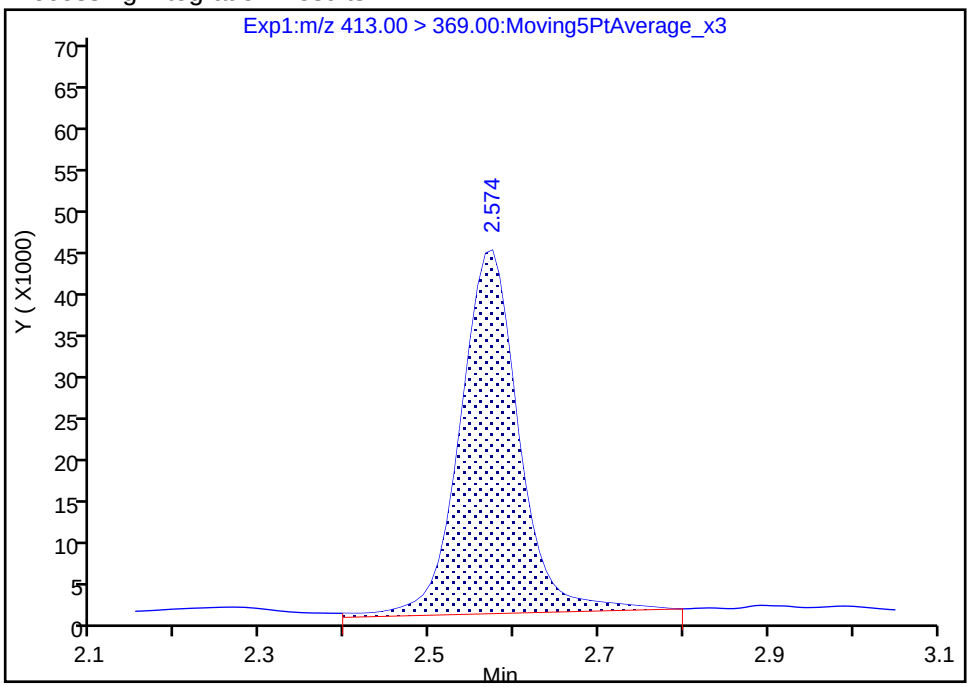
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_020.d				
Injection Date:	01-Aug-2018 16:37:52	Instrument ID:	A8_N		
Lims ID:	320-41149-A-23-A	Lab Sample ID:	320-41149-23		
Client ID:	GRE03-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

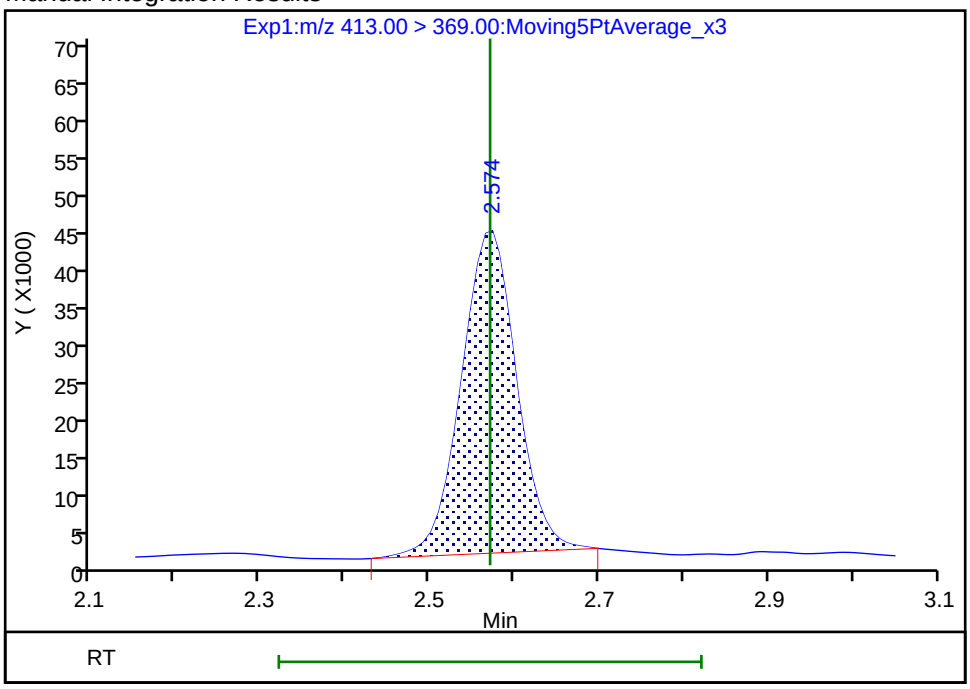
Processing Integration Results

RT: 2.57
Area: 208460
Amount: 0.133326
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 192140
Amount: 0.122888
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:27:39

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB4-01 | Lab Sample ID: 320-41149-24

Matrix: Solid | Lab File ID: 2018.07.30LLA_029.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 20:50

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.01(g) | Date Analyzed: 07/30/2018 06:36

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 6.0 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236836 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.56		0.32	0.21	0.083
335-67-1	Perfluorooctanoic acid (PFOA)	2.8		0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	2.6		0.32	0.21	0.086
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.29	J M	0.42	0.19	0.063
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.8		0.32	0.21	0.066
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*62*	*E*	*1.1*	0.53	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	81		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	80		50-150
STL00994	18O2 PFHxS	81		50-150
STL00991	13C4 PFOS	76		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_029.d
Lims ID: 320-41149-A-24-A
Client ID: GRE03-SB4-01
Sample Type: Client
Inject. Date: 30-Jul-2018 06:36:59 ALS Bottle#: 22 Worklist Smp#: 27
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-24-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:05:50 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:05:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.666	1.666	0.0	1.000	304000	0.1343			586	
298.90 > 99.00	1.666	1.666	0.0	1.000	129492		2.35(1.25-3.74)		157	M
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.674	-0.008	0.646	66292	1.87		80.6	223	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.229	0.0	1.000	420295	0.2649			614	
363.00 > 169.00	2.229	2.229	0.0	1.000	166704		2.52(1.13-3.40)		1646	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.240	-0.011	0.864	3597241	2.21		88.3	68548	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.241	0.0	1.000	3568455	1.80			5020	
399.00 > 99.00	2.241	2.241	0.0	1.000	1187827		3.00(1.50-4.49)		2736	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.253	-0.012	0.868	4028020	1.92		81.3	98475	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.581	-0.001		4167382	2.50			79047	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.581	-0.001	1.000	2325616	1.32			2516	
413.00 > 169.00	2.580	2.581	-0.001	1.000	1218755		1.91(0.84-2.52)		6130	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3625249	2.27		90.9	64186	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.948	2.943	0.005	1.000	36100056	29.4			135335	E
499.00 > 99.00	2.948	2.943	0.005	1.000	10425422		3.46(2.31-6.93)		76851	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.943	0.005	1.002	1512119	1.20			3118	
463.00 > 169.00	2.942	2.943	-0.001	1.000	379269		3.99(1.90-5.69)		5297	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.942	2.953	-0.011	1.140	2757632	2.01		80.2	35073	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.953	-0.005	1.142	2654238	1.82		76.3	20580	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

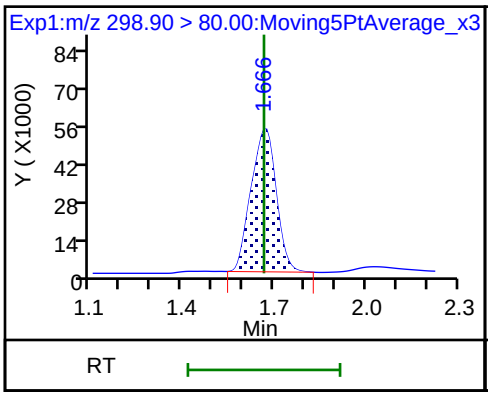
M - Manually Integrated

Report Date: 31-Jul-2018 10:05:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

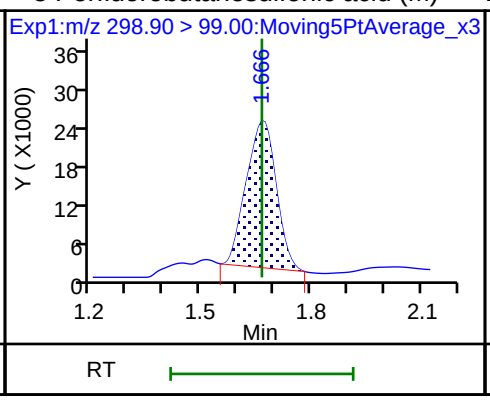
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_029.d				
Injection Date:	30-Jul-2018 06:36:59	Instrument ID:	A8_N		
Lims ID:	320-41149-A-24-A	Lab Sample ID:	320-41149-24		
Client ID:	GRE03-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	22	Worklist Smp#:	27
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

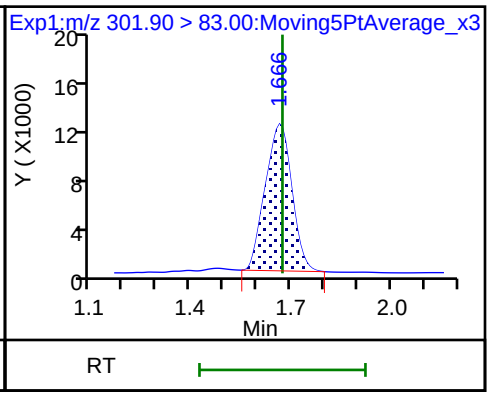
5 Perfluorobutanesulfonic acid



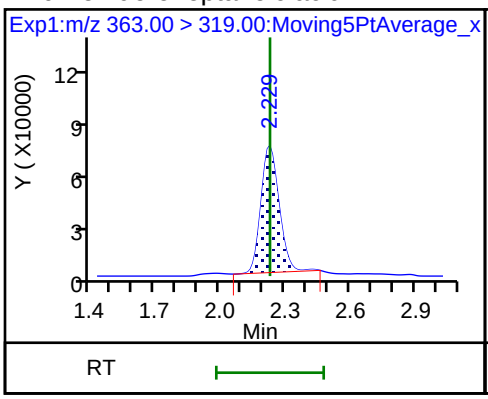
5 Perfluorobutanesulfonic acid (M)



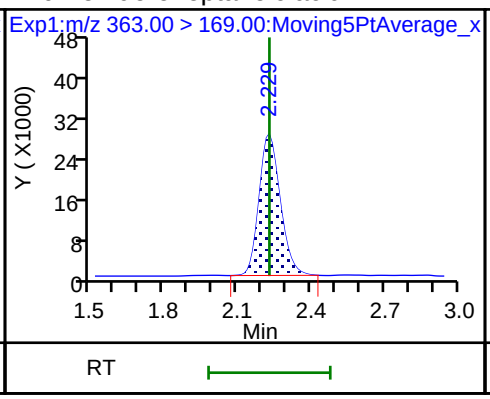
D 47 13C3-PFBS



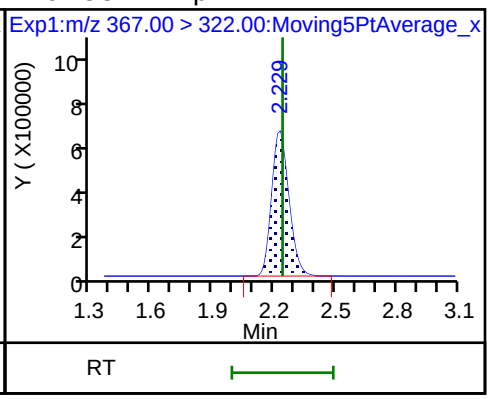
10 Perfluoroheptanoic acid



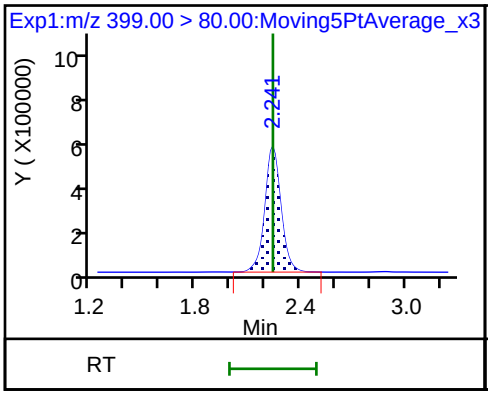
10 Perfluoroheptanoic acid



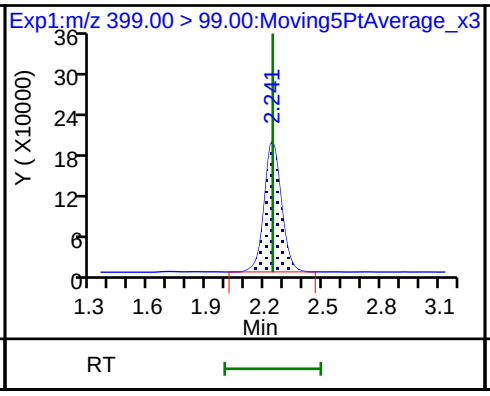
D 9 13C4-PFHpA



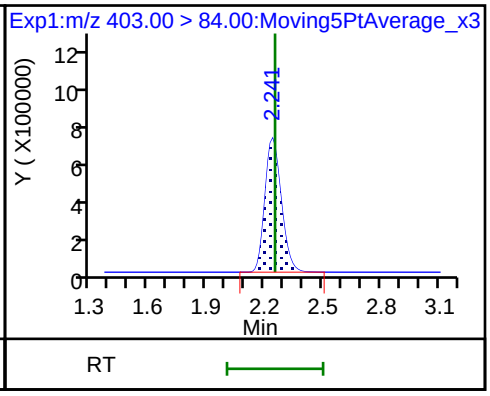
8 Perfluorohexanesulfonic acid



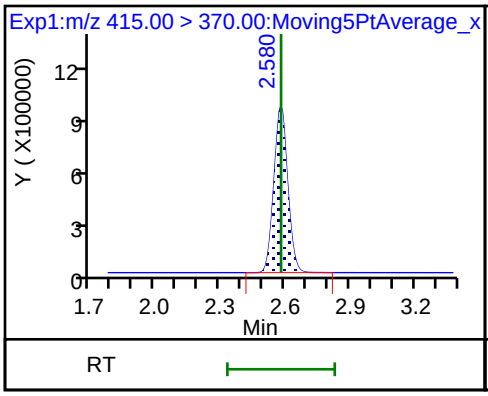
8 Perfluorohexanesulfonic acid



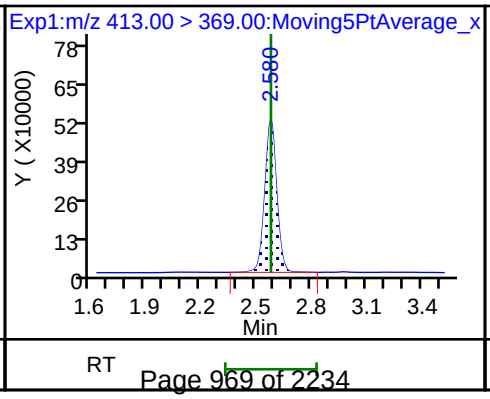
D 11 18O2 PFHxS



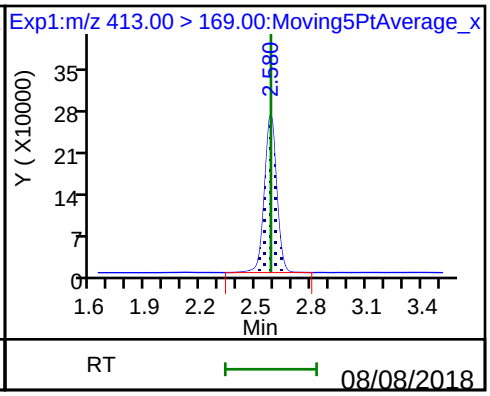
* 62 13C2-PFOA



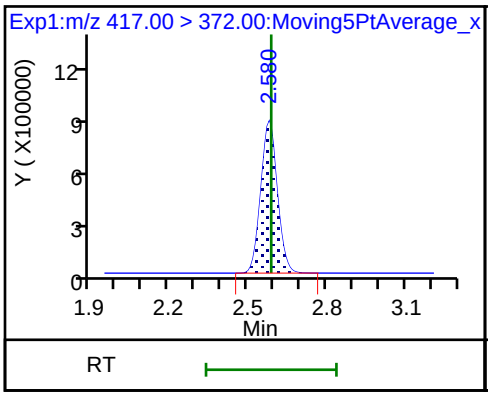
15 Perfluorooctanoic acid



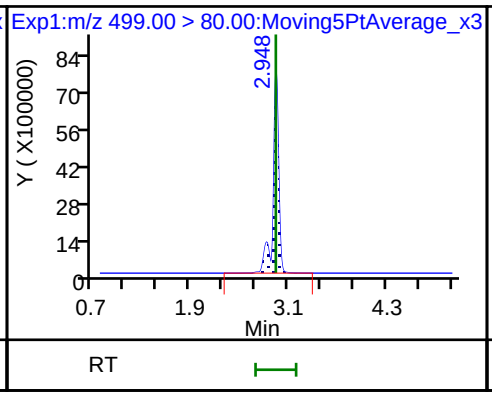
15 Perfluorooctanoic acid



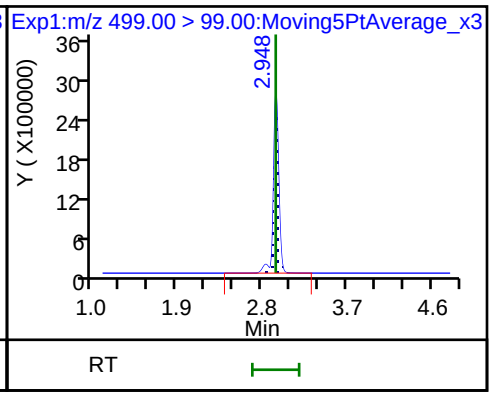
D 14 13C4 PFOA



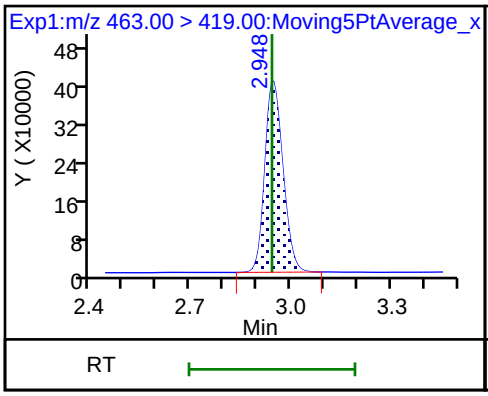
17 Perfluorooctane sulfonic acid



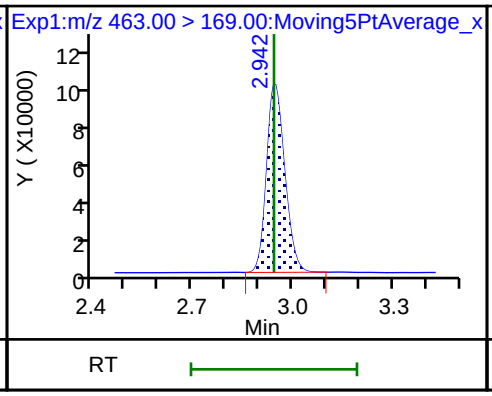
17 Perfluorooctane sulfonic acid



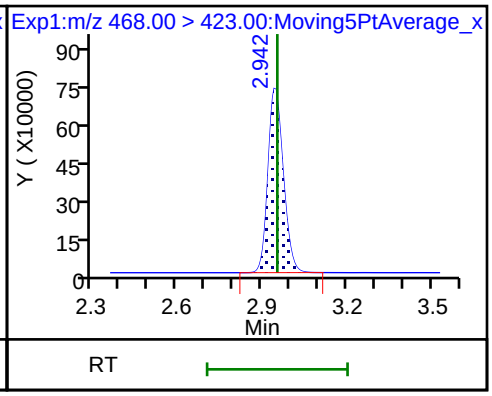
20 Perfluorononanoic acid



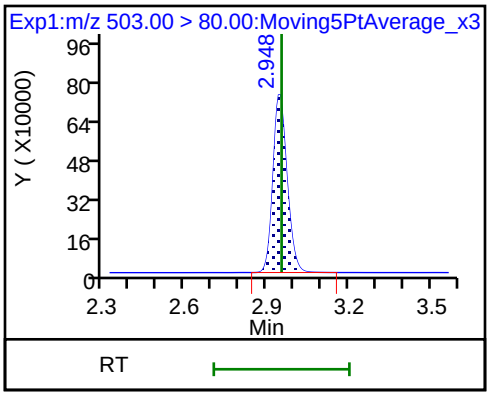
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

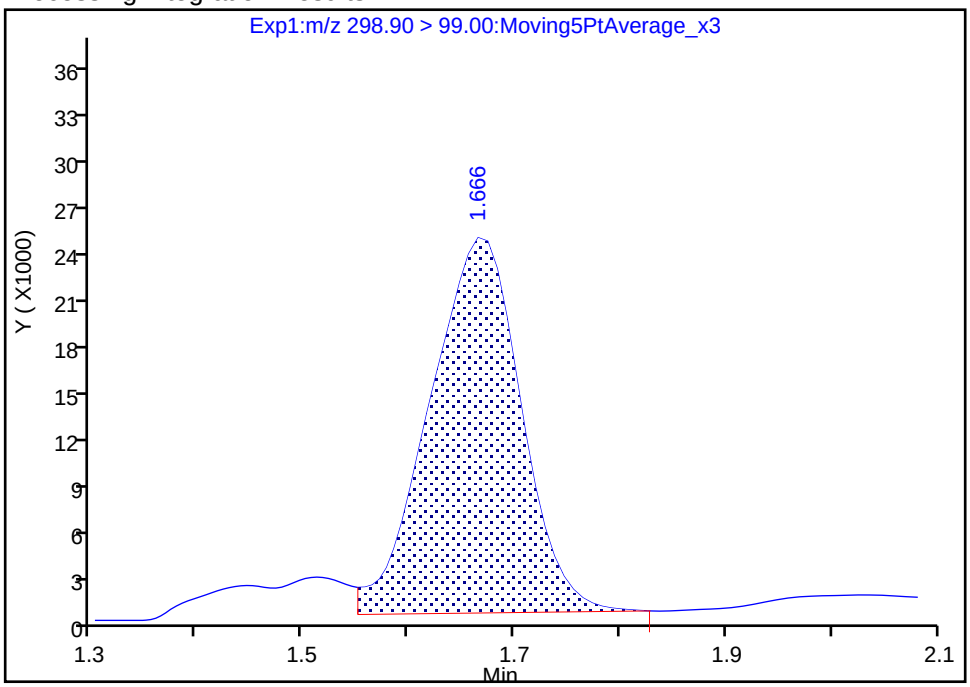
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_029.d				
Injection Date:	30-Jul-2018 06:36:59	Instrument ID:	A8_N		
Lims ID:	320-41149-A-24-A	Lab Sample ID:	320-41149-24		
Client ID:	GRE03-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	22	Worklist Smp#:	27
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

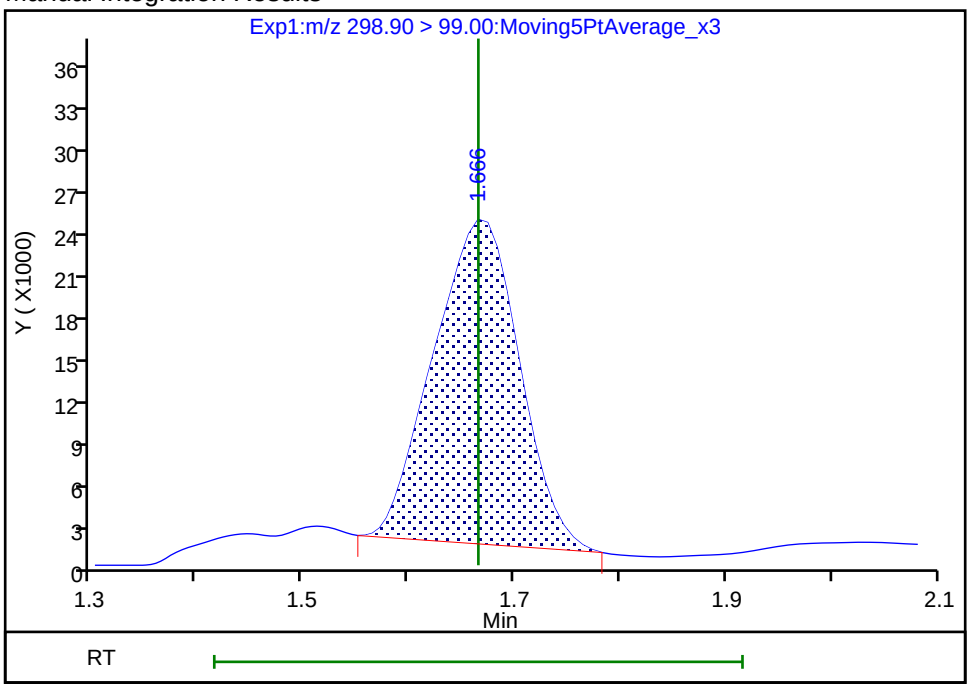
Processing Integration Results

RT: 1.67
Area: 144072
Amount: 0.134293
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 129492
Amount: 0.134293
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:05:39

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB4-01 DL | Lab Sample ID: 320-41149-24 DL

Matrix: Solid | Lab File ID: 2018.08.01LLBB_021.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 20:50

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.01(g) | Date Analyzed: 08/01/2018 16:45

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 6.0 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.1*	*U M*	*3.2*	2.1	*0.83*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*2.8*	*J D M*	*3.2*	2.1	*1.1*
375-95-1	*Perfluorononanoic acid (PFNA)*	*3.0*	*J D*	*3.2*	2.1	*0.86*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*1.9*	*U*	*4.2*	1.9	*0.63*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*4.0*	*D*	*3.2*	2.1	*0.66*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	74	D	11	5.3	2.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	68		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	86		50-150
STL00994	18O2 PFHxS	75		50-150
STL00991	13C4 PFOS	75		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_021.d
Lims ID: 320-41149-A-24-A
Client ID: GRE03-SB4-01
Sample Type: Client
Inject. Date: 01-Aug-2018 16:45:40 ALS Bottle#: 13 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-24-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:28:13 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:28:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.662	0.004	1.000	35263	0.0164			245	
298.90 > 99.00	1.666	1.662	0.004	1.000	14901		2.37(1.25-3.74)		53.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.647	6534	0.1583		68.1	22.5	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.214	0.015	1.005	32541	0.0194			12.3	M
363.00 > 169.00	2.218	2.214	0.004	1.000	17357		1.87(1.13-3.40)		131	
D 9 13C4-PFHpA										
367.00 > 322.00	2.218	2.225	-0.007	0.862	360993	0.2398		95.9	15624	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.225	0.004	0.995	367935	0.1867			1274	
399.00 > 99.00	2.241	2.225	0.016	1.000	125235		2.94(1.50-4.49)		197	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.871	403128	0.1782		75.4	17133	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.573	2.571	0.001	1.000	205861	0.1339			112	M
413.00 > 169.00	2.580	2.571	0.009	1.003	118849		1.73(0.84-2.52)		593	
* 62 13C2-PFOA										
415.00 > 370.00	2.573	2.571	0.001		378478	0.2500			17015	
D 14 13C4 PFOA										
417.00 > 372.00	2.573	2.580	-0.008	1.000	332308	0.2287		91.5	12424	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.942	2.935	0.007	1.002	4538016	3.47			48131	
499.00 > 99.00	2.937	2.935	0.002	1.000	1083535		4.19(2.31-6.93)		5282	
20 Perfluorononanoic acid										
463.00 > 419.00	2.942	2.935	0.007	1.002	164096	0.1400			490	
463.00 > 169.00	2.942	2.935	0.007	1.002	38270		4.29(1.90-5.69)		1068	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.937	2.946	-0.009	1.142	278505	0.1783		74.6	5525	
D 19 13C5 PFNA										
468.00 > 423.00	2.937	2.948	-0.011	1.142	271421	0.2143		85.7	9378	

QC Flag Legend

Review Flags

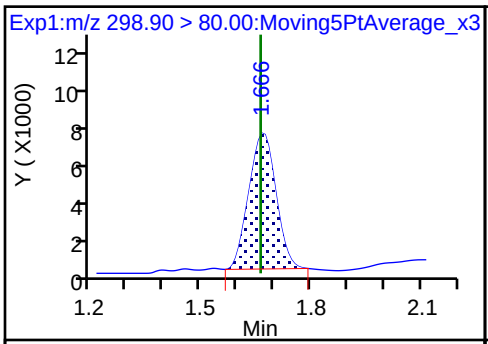
M - Manually Integrated

Report Date: 02-Aug-2018 13:28:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

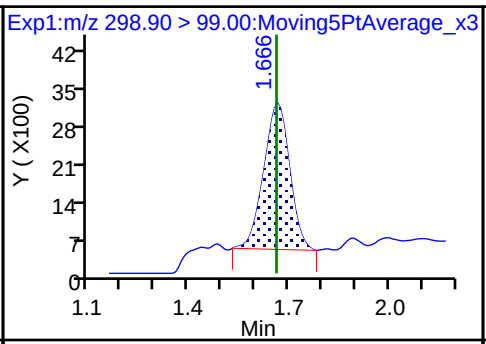
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_021.d				
Injection Date:	01-Aug-2018 16:45:40	Instrument ID:	A8_N		
Lims ID:	320-41149-A-24-A	Lab Sample ID:	320-41149-24		
Client ID:	GRE03-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

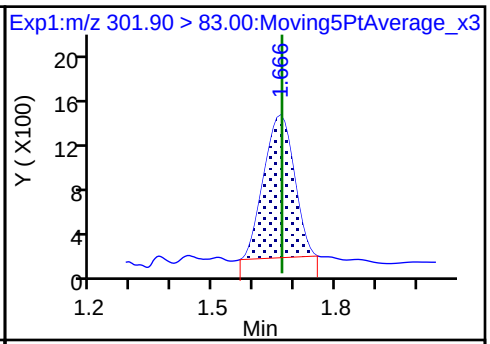
5 Perfluorobutanesulfonic acid



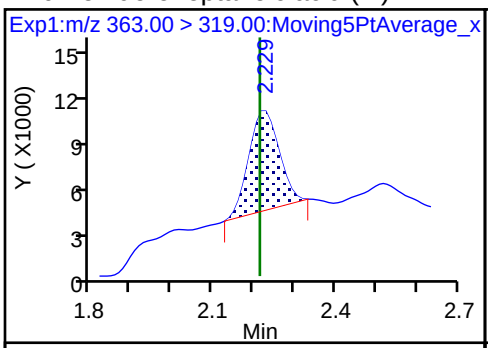
5 Perfluorobutanesulfonic acid



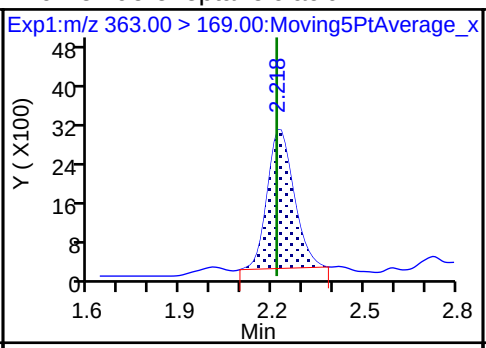
D 47 13C3-PFBS



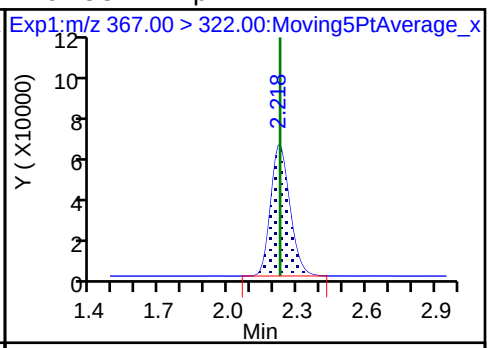
10 Perfluoroheptanoic acid (M)



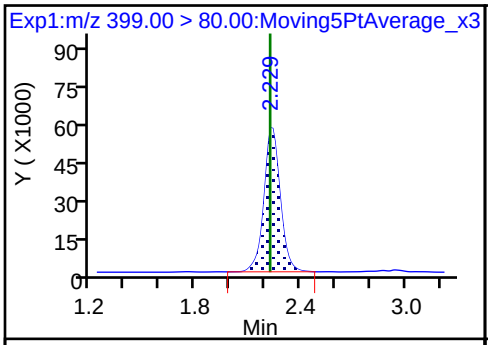
10 Perfluoroheptanoic acid



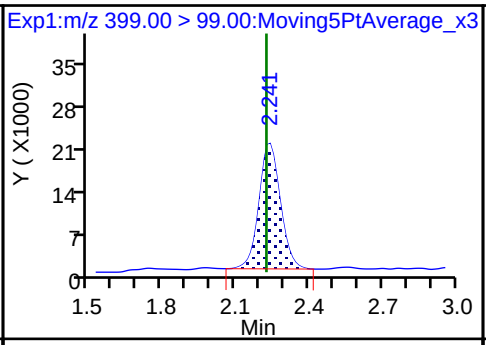
D 9 13C4-PFHpA



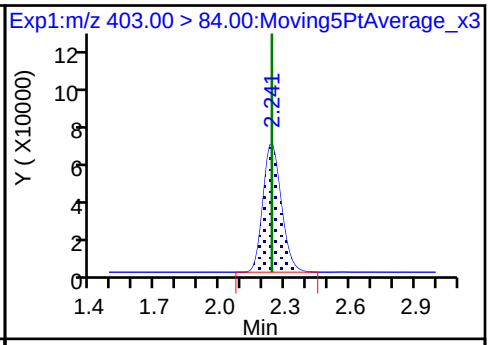
8 Perfluorohexanesulfonic acid



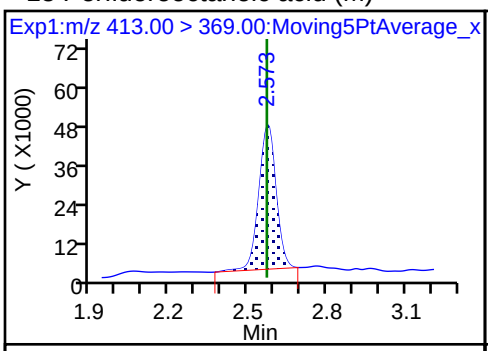
8 Perfluorohexanesulfonic acid



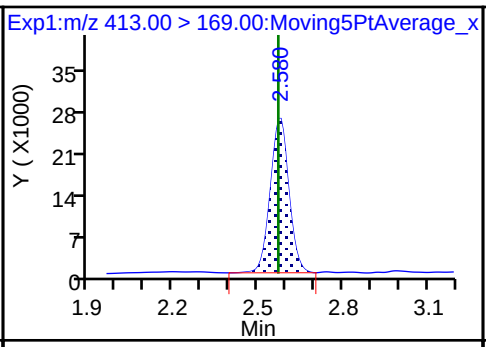
D 11 18O2 PFHxS



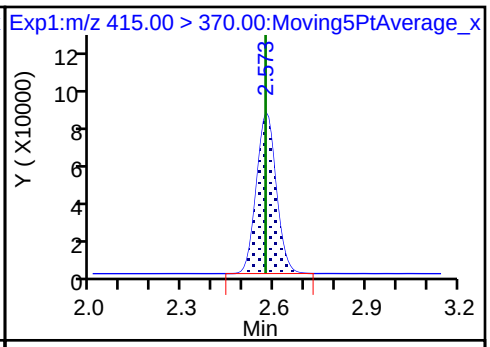
15 Perfluorooctanoic acid (M)



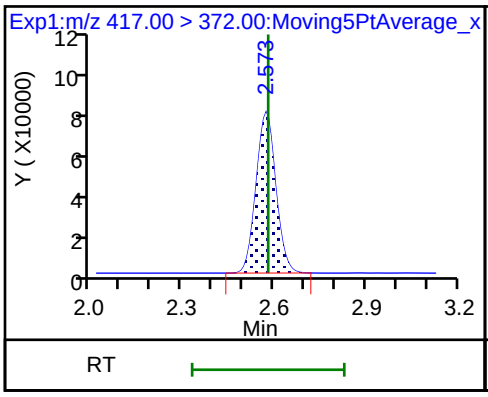
15 Perfluorooctanoic acid



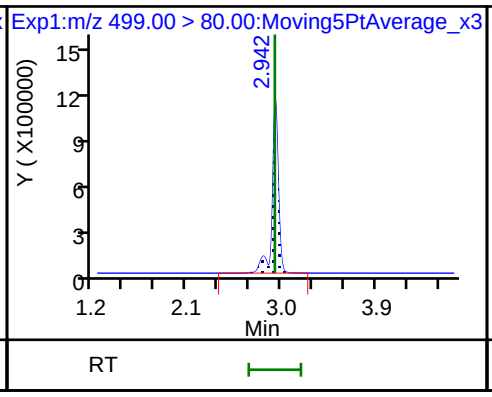
* 62 13C2-PFOA



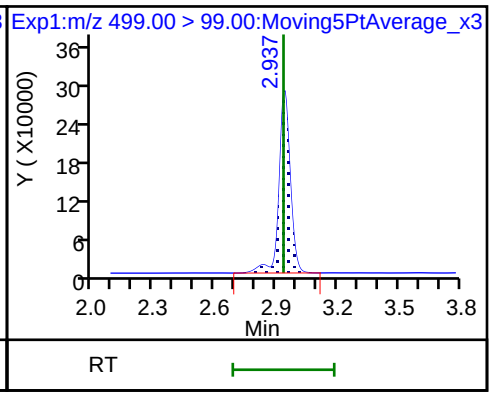
D 14 13C4 PFOA



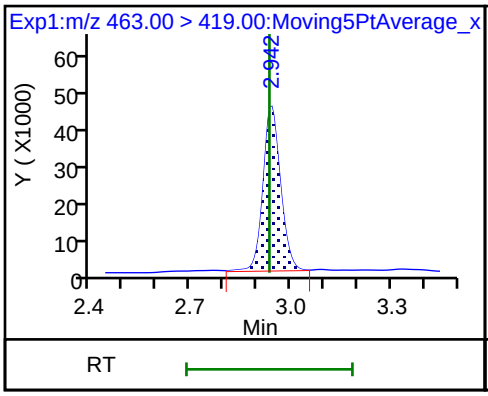
17 Perfluorooctane sulfonic acid



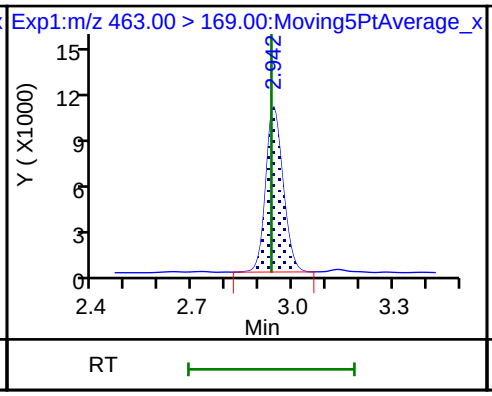
17 Perfluorooctane sulfonic acid



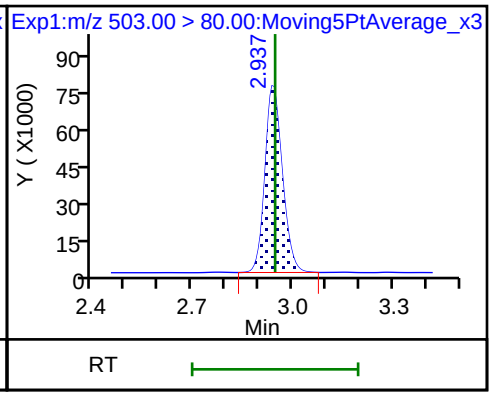
20 Perfluorononanoic acid



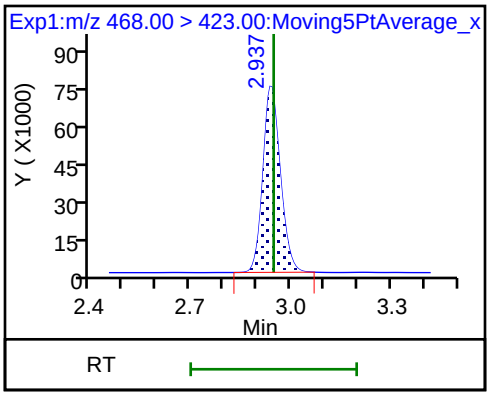
20 Perfluorononanoic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

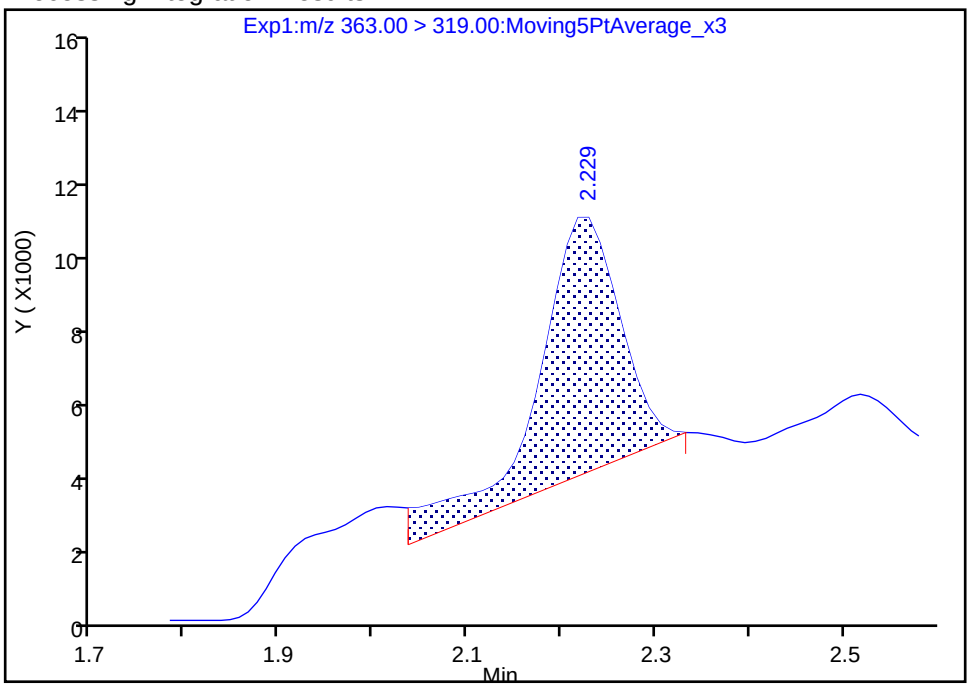
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_021.d				
Injection Date:	01-Aug-2018 16:45:40	Instrument ID:	A8_N		
Lims ID:	320-41149-A-24-A	Lab Sample ID:	320-41149-24		
Client ID:	GRE03-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

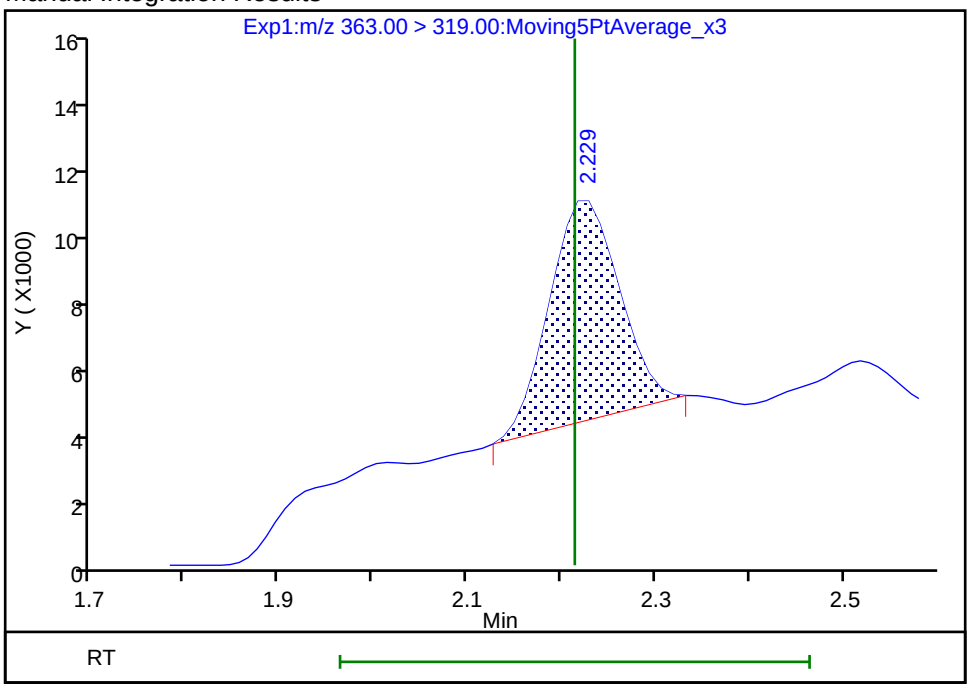
Processing Integration Results

RT: 2.23
Area: 40388
Amount: 0.024120
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 32541
Amount: 0.019434
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:28:00

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

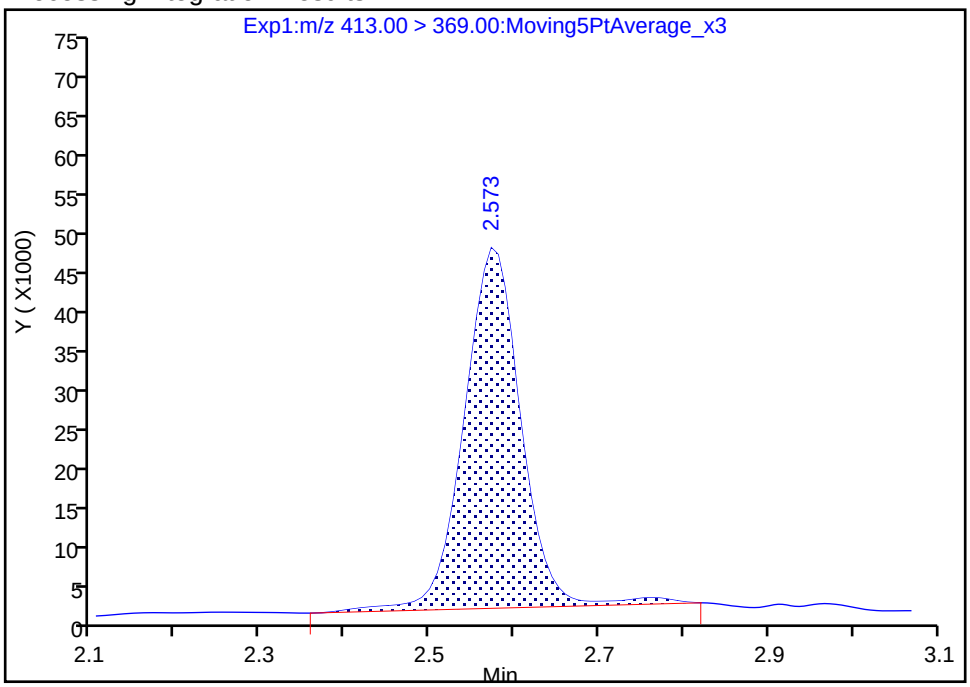
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_021.d				
Injection Date:	01-Aug-2018 16:45:40	Instrument ID:	A8_N		
Lims ID:	320-41149-A-24-A	Lab Sample ID:	320-41149-24		
Client ID:	GRE03-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

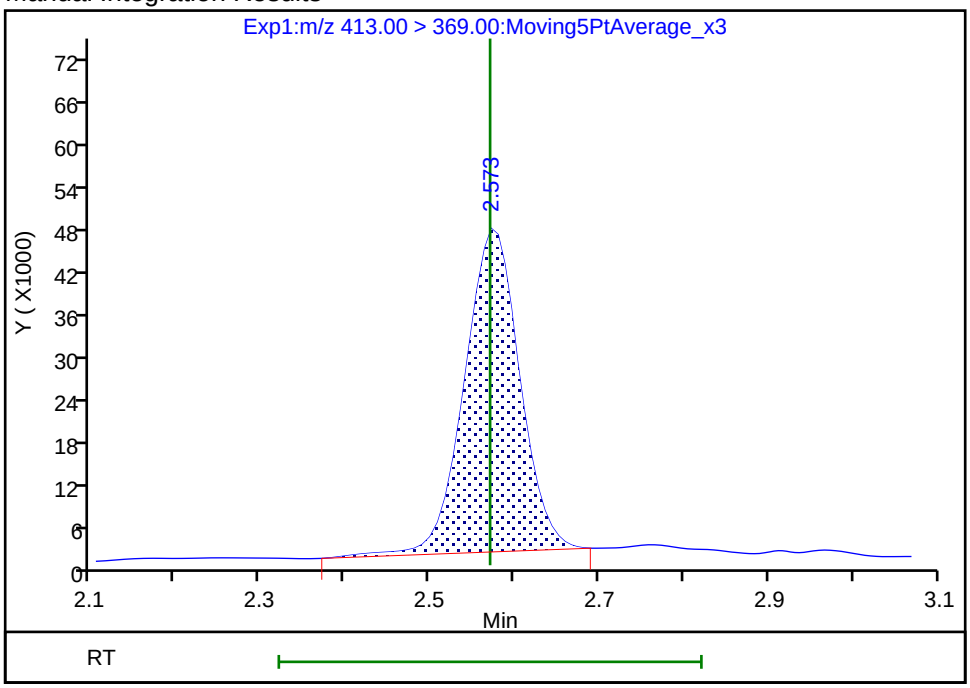
Processing Integration Results

RT: 2.57
Area: 214914
Amount: 0.139840
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 205861
Amount: 0.133949
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:28:08

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE03-SB5-01
Lab Sample ID: 320-41149-25
Matrix: Solid
Lab File ID: 2018.07.30LLA_030.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/11/2018 21:05
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.06(g)
Date Analyzed: 07/30/2018 06:44
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 9.3
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.60		0.33	0.22	0.085
335-67-1	Perfluorooctanoic acid (PFOA)	2.4		0.33	0.22	0.11
375-95-1	Perfluorononanoic acid (PFNA)	1.3		0.33	0.22	0.088
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.38	J M	0.44	0.20	0.064
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8		0.33	0.22	0.068
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*190*	*M E*	*1.1*	0.54	*0.26*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	83		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	86		50-150
STL00995	13C5 PFNA	51		50-150
STL00994	18O2 PFHxS	82		50-150
STL00991	13C4 PFOS	56		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_030.d
Lims ID: 320-41149-A-25-A
Client ID: GRE03-SB5-01
Sample Type: Client
Inject. Date: 30-Jul-2018 06:44:49 ALS Bottle#: 23 Worklist Smp#: 28
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-25-
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:06:37 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:06:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.666	1.666	0.0	1.000	433370	0.1731			821	
298.90 > 99.00	1.666	1.666	0.0	1.000	182259		2.38(1.25-3.74)		256	M
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.674	-0.008	0.647	73312	1.93		83.2	285	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.229	-0.010	1.000	479709	0.2747			579	
363.00 > 169.00	2.219	2.229	-0.010	1.000	197289		2.43(1.13-3.40)		2100	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.240	-0.021	0.862	3959714	2.27		90.7	75202	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.241	0.001	1.000	6671882	3.11			10628	
399.00 > 99.00	2.242	2.241	0.001	1.000	2165846		3.08(1.50-4.49)		5053	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.253	-0.011	0.871	4342372	1.93		81.8	122138	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.581	-0.007		4466489	2.50			77884	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.581	-0.007	1.000	1946151	1.09			2244	
413.00 > 169.00	2.574	2.581	-0.007	1.000	1039763		1.87(0.84-2.52)		6831	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.588	-0.014	1.000	3678984	2.15		86.1	69158	
17 Perfluorooctane sulfonic acid										EM
499.00 > 80.00	2.944	2.943	0.001	1.000	84506521	87.6			37705	EM
499.00 > 99.00	2.944	2.943	0.001	1.000	29831274		2.83(2.31-6.93)		151098	
20 Perfluorononanoic acid										
463.00 > 419.00	2.944	2.943	0.001	1.000	514242	0.5990			1078	
463.00 > 169.00	2.944	2.943	0.001	1.000	127888		4.02(1.90-5.69)		2121	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.953	-0.009	1.144	1879878	1.28		51.0	29698	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.953	-0.009	1.144	2085795	1.34		55.9	20760	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

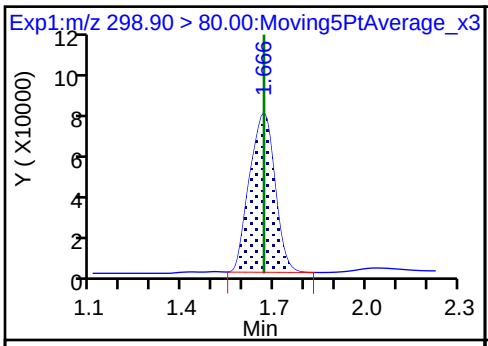
M - Manually Integrated

Report Date: 31-Jul-2018 10:06:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

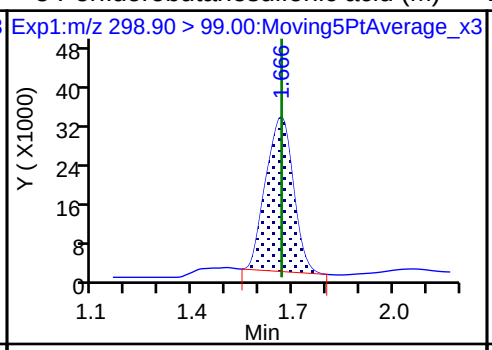
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_030.d				
Injection Date:	30-Jul-2018 06:44:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-25-A	Lab Sample ID:	320-41149-25		
Client ID:	GRE03-SB5-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	23	Worklist Smp#:	28
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

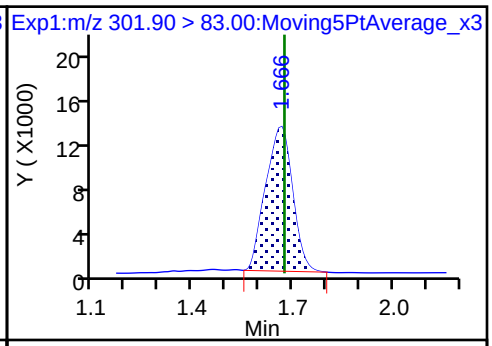
5 Perfluorobutanesulfonic acid



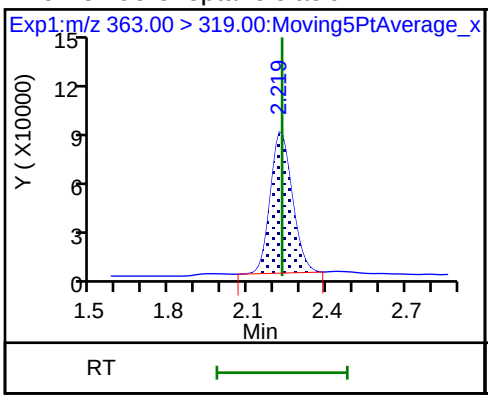
5 Perfluorobutanesulfonic acid (M)



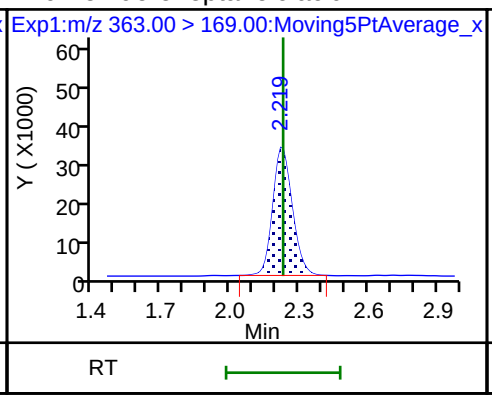
D 47 13C3-PFBS



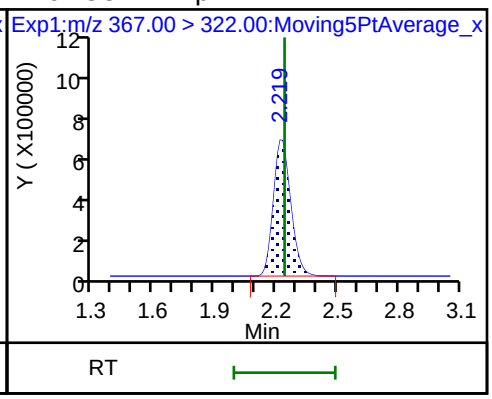
10 Perfluoroheptanoic acid



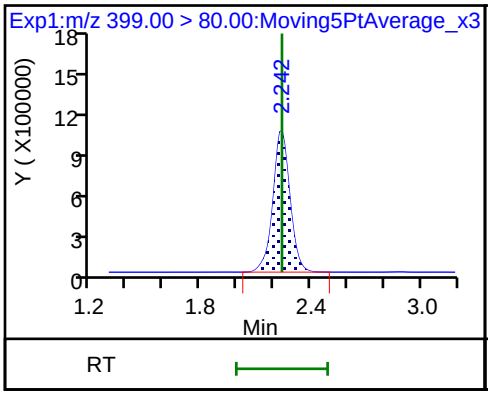
10 Perfluoroheptanoic acid



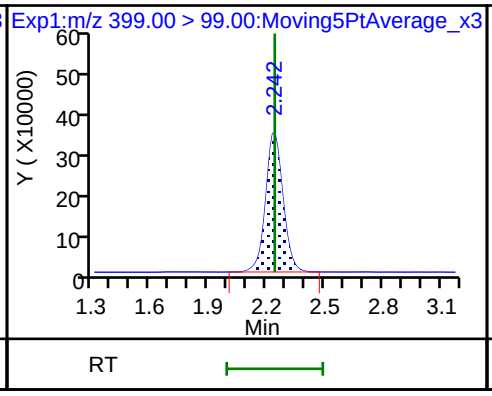
D 9 13C4-PFHpA



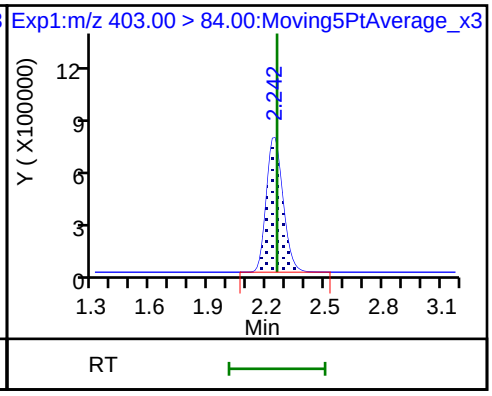
8 Perfluorohexanesulfonic acid



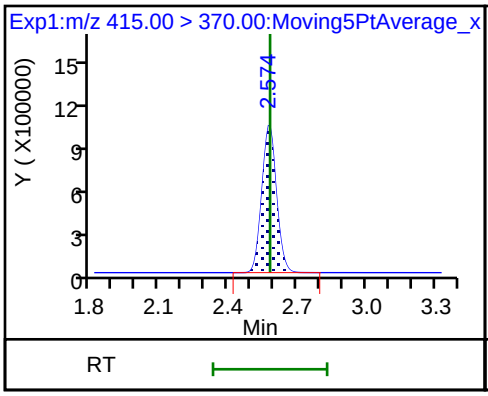
8 Perfluorohexanesulfonic acid



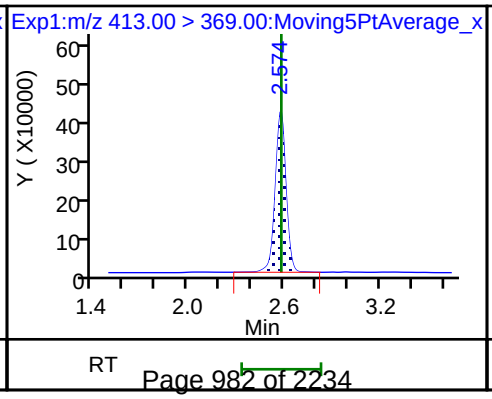
D 11 18O2 PFHxS



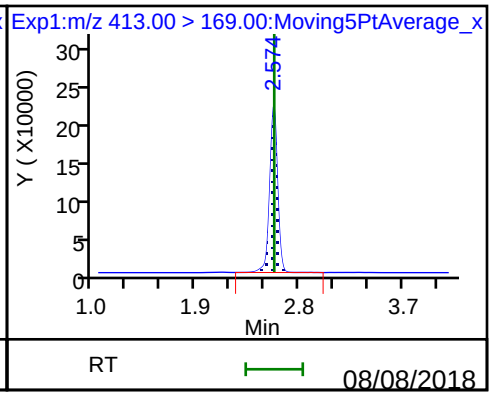
* 62 13C2-PFOA



15 Perfluorooctanoic acid

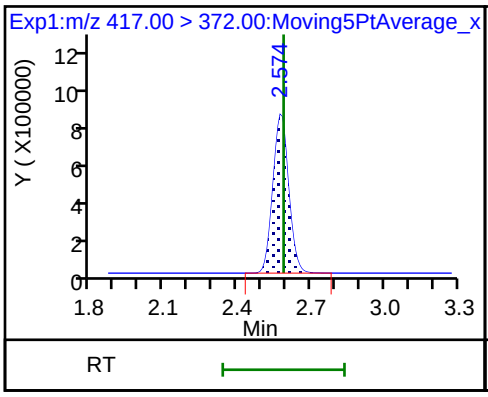


15 Perfluorooctanoic acid

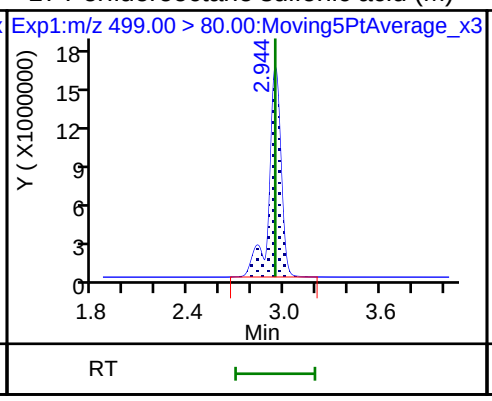


Report Date: 31-Jul-2018 10:06:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_030.d

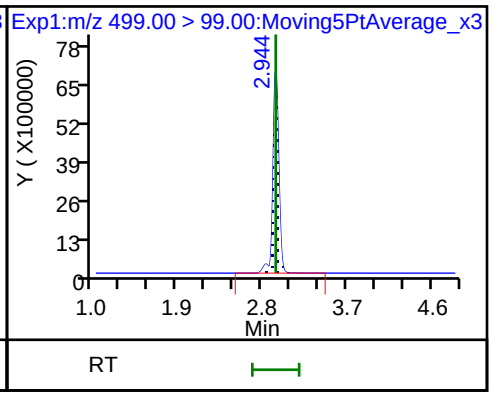
D 14 13C4 PFOA



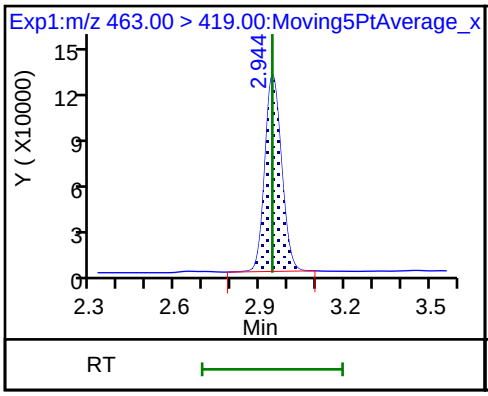
17 Perfluorooctane sulfonic acid (M)



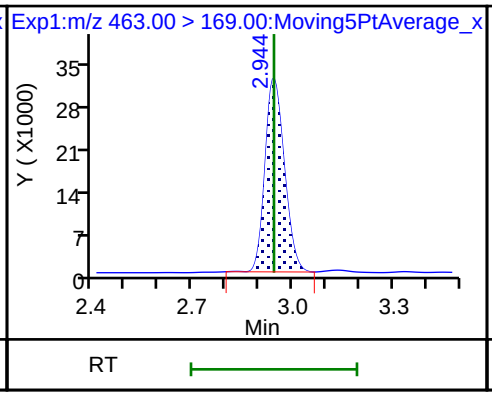
17 Perfluorooctane sulfonic acid



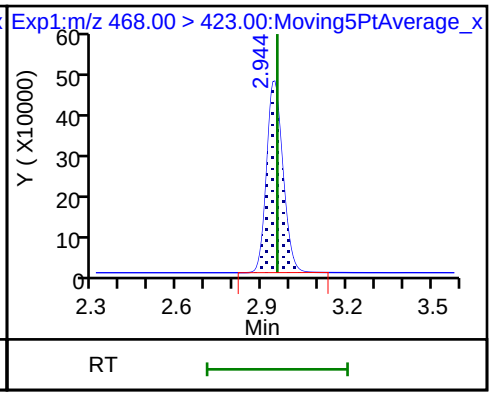
20 Perfluorononanoic acid



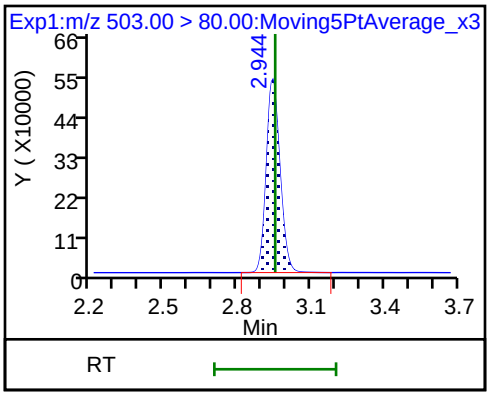
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

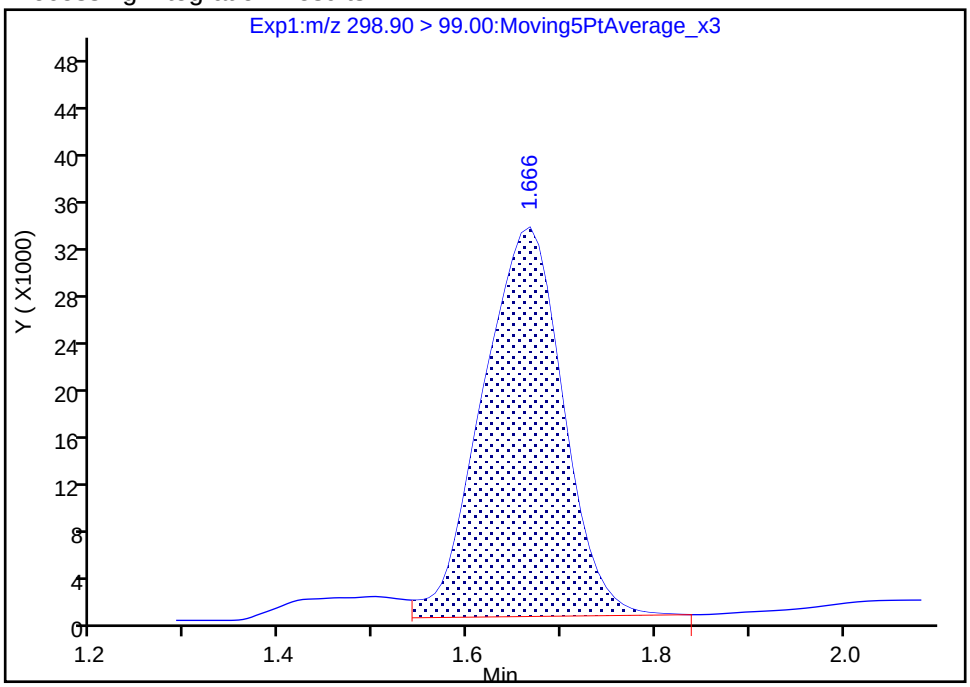
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_030.d				
Injection Date:	30-Jul-2018 06:44:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-25-A	Lab Sample ID:	320-41149-25		
Client ID:	GRE03-SB5-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	23	Worklist Smp#:	28
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

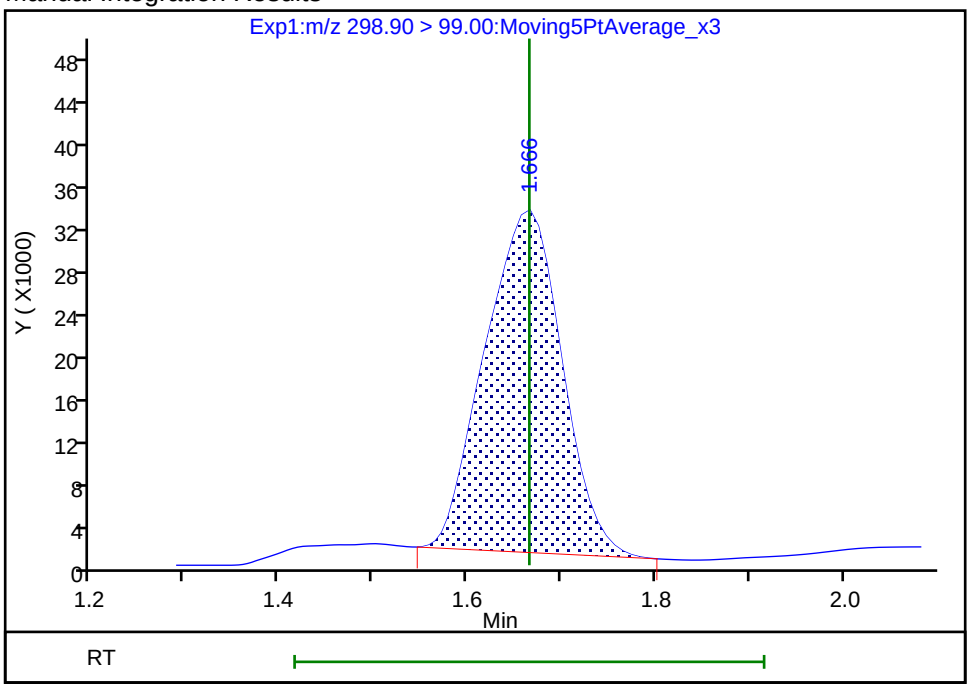
Processing Integration Results

RT: 1.67
Area: 195384
Amount: 0.173111
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 182259
Amount: 0.173111
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:06:16

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

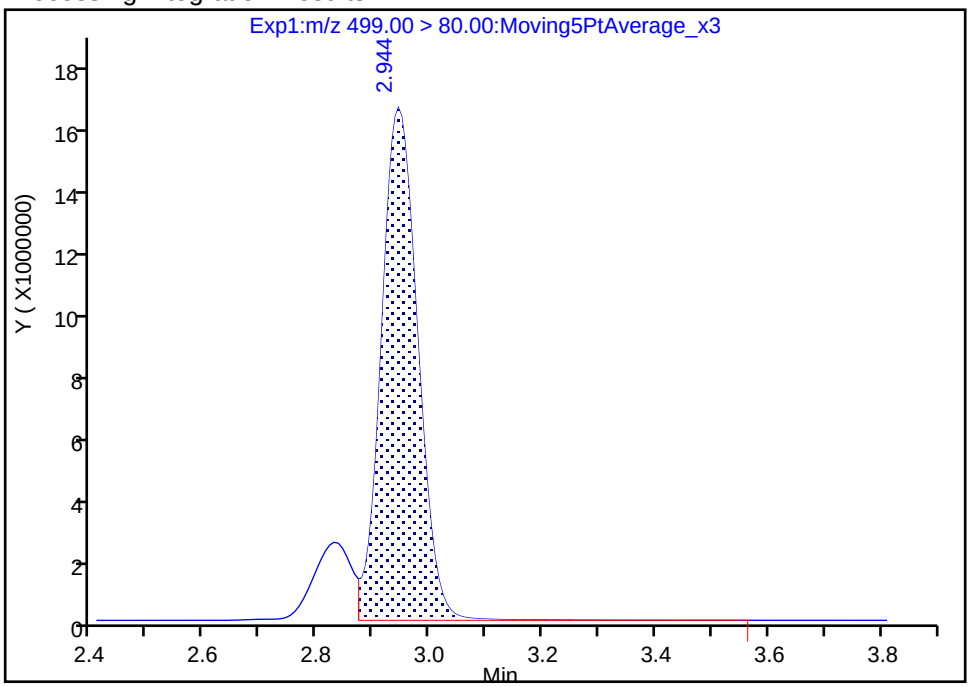
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_030.d				
Injection Date:	30-Jul-2018 06:44:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-25-A	Lab Sample ID:	320-41149-25		
Client ID:	GRE03-SB5-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	23	Worklist Smp#:	28
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

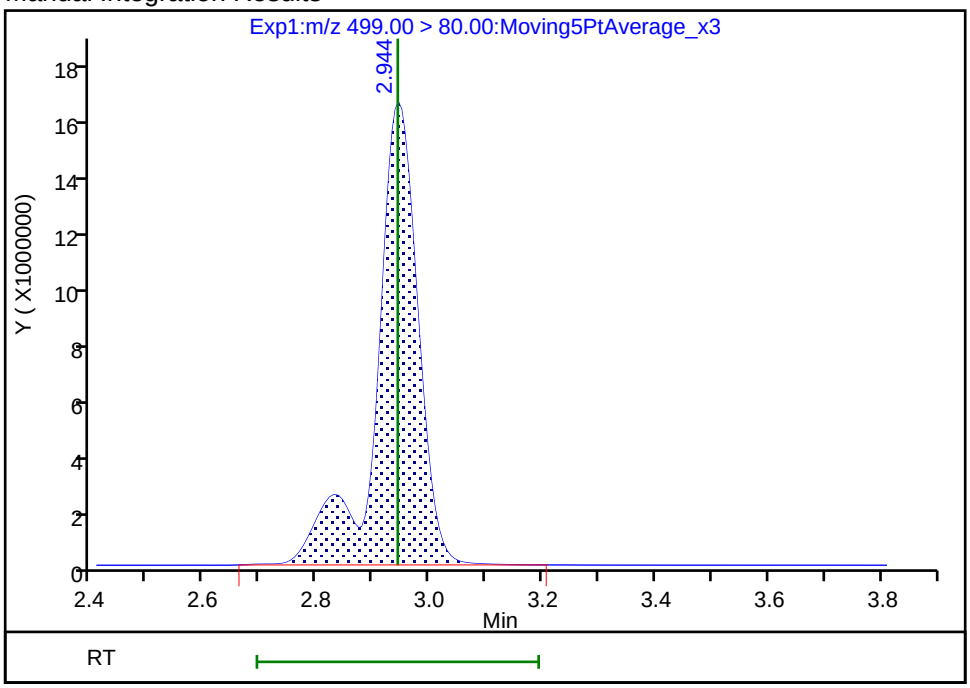
Processing Integration Results

RT: 2.94
Area: 73297044
Amount: 76.007454
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 84506521
Amount: 87.631440
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 10:06:29

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE03-SB5-01 DL | Lab Sample ID: 320-41149-25 DL

Matrix: Solid | Lab File ID: 2018.08.01LLBB_022.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 21:05

Extraction Method: SHAKE | Date Extracted: 07/18/2018 08:48

Sample wt/vol: 5.06(g) | Date Analyzed: 08/01/2018 16:53

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 9.3 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237446 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*4.4*	*U M*	*6.5*	4.4	*1.7*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*2.6*	*J D M*	*6.5*	4.4	*2.2*
375-95-1	*Perfluorononanoic acid (PFNA)*	*4.4*	*U M*	*6.5*	4.4	*1.8*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*3.9*	*U*	*8.7*	3.9	*1.3*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*6.3*	*J D*	*6.5*	4.4	*1.4*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	D	22	11	5.2

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	74		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	82		50-150
STL00994	18O2 PFHxS	83		50-150
STL00991	13C4 PFOS	75		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_022.d
Lims ID: 320-41149-A-25-A
Client ID: GRE03-SB5-01
Sample Type: Client
Inject. Date: 01-Aug-2018 16:53:29 ALS Bottle#: 14 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-41149-a-25-a 20X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:28:58 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:28:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.662	0.004	1.005	26670	0.0108			181	
298.90 > 99.00	1.666	1.662	0.004	1.005	10130		2.63(1.25-3.74)		41.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.669	-0.012	0.644	3754	0.0865		74.4	16.0	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.219	2.214	0.005	1.000	24282	0.0143			9.3	M
363.00 > 169.00	2.219	2.214	0.005	1.000	10584		2.29(1.13-3.40)		117	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.225	-0.006	0.862	182916	0.1156		92.5	6491	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.225	0.005	1.000	330130	0.1443			1761	
399.00 > 99.00	2.230	2.225	0.005	1.000	111728		2.95(1.50-4.49)		172	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.238	-0.008	0.866	234074	0.0984		83.2	13406	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.574	2.571	0.003	1.000	88918	0.0590			47.2	M
413.00 > 169.00	2.574	2.571	0.003	1.000	52553		1.69(0.84-2.52)		323	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.571	0.003		198942	0.1250			7466	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.580	-0.006	1.000	162878	0.1066		85.3	6152	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.938	2.935	0.003	1.000	10374434	7.48			78298	
499.00 > 99.00	2.938	2.935	0.003	1.000	2534005		4.09(2.31-6.93)		17816	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.938	2.935	0.003	1.000	35470	0.0300			90.0	M
463.00 > 169.00	2.938	2.935	0.003	1.000	11567		3.07(1.90-5.69)		314	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.938	2.946	-0.008	1.142	147655	0.0899		75.2	4633	
D 19 13C5 PFNA										
468.00 > 423.00	2.938	2.948	-0.010	1.142	136903	0.1028		82.3	5507	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 02-Aug-2018 13:28:59 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_022.d

Injection Date: 01-Aug-2018 16:53:29 Instrument ID: A8_N

Lims ID: 320-41149-A-25-A Lab Sample ID: 320-41149-25

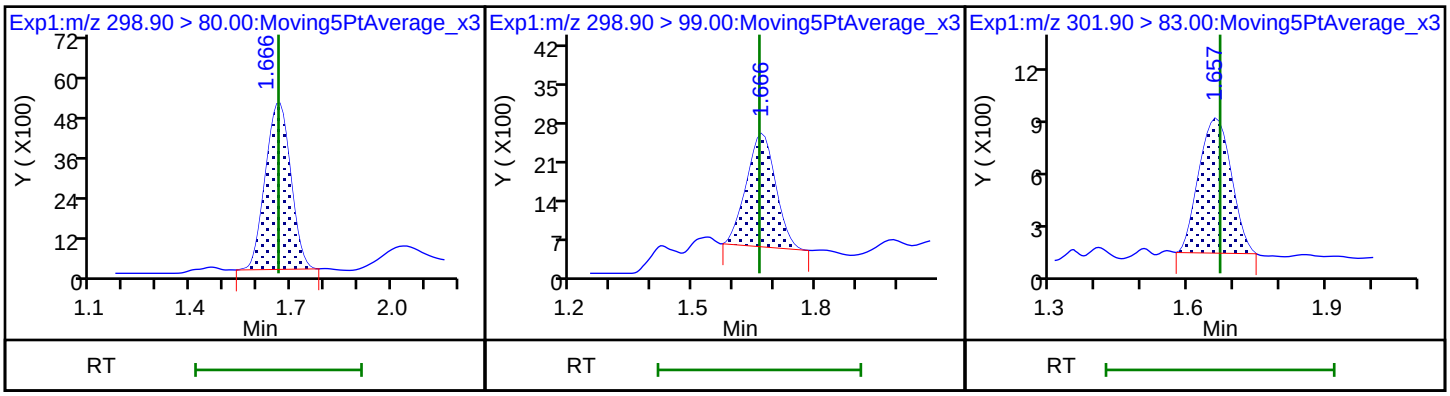
Client ID: GRE03-SB5-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 15

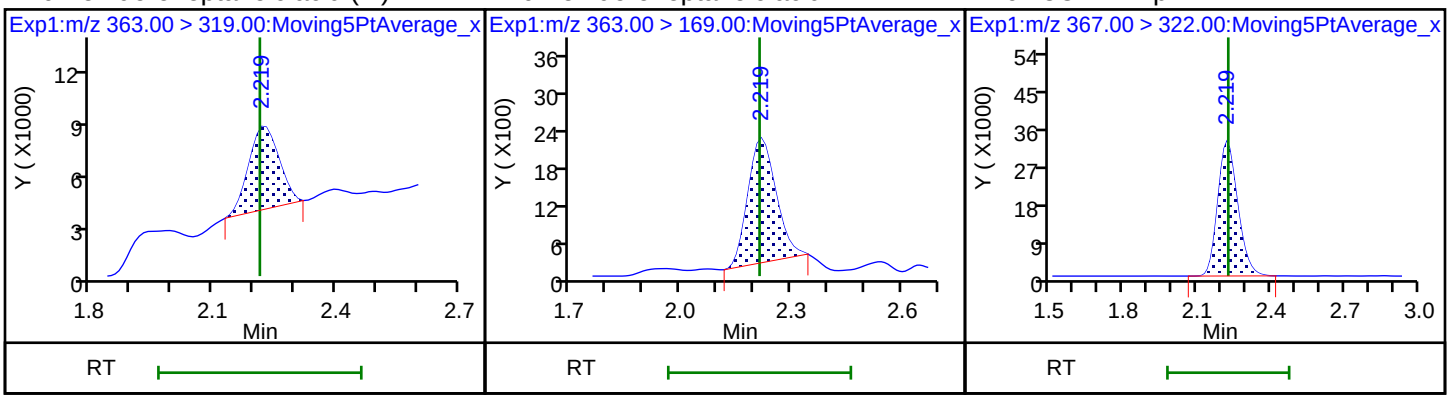
Injection Vol: 2.0 ul Dil. Factor: 20.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

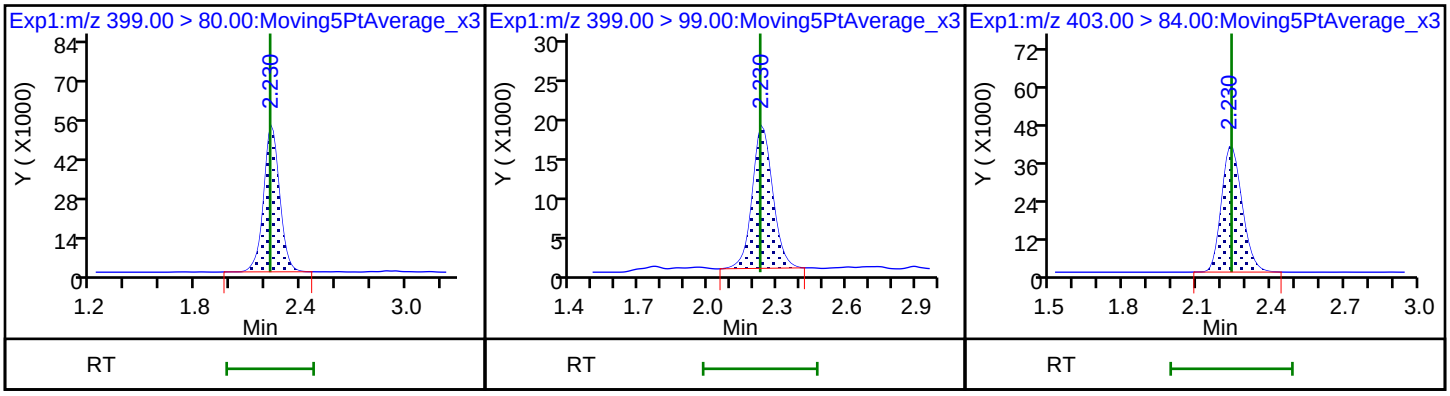
5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid | D 47 13C3-PFBS



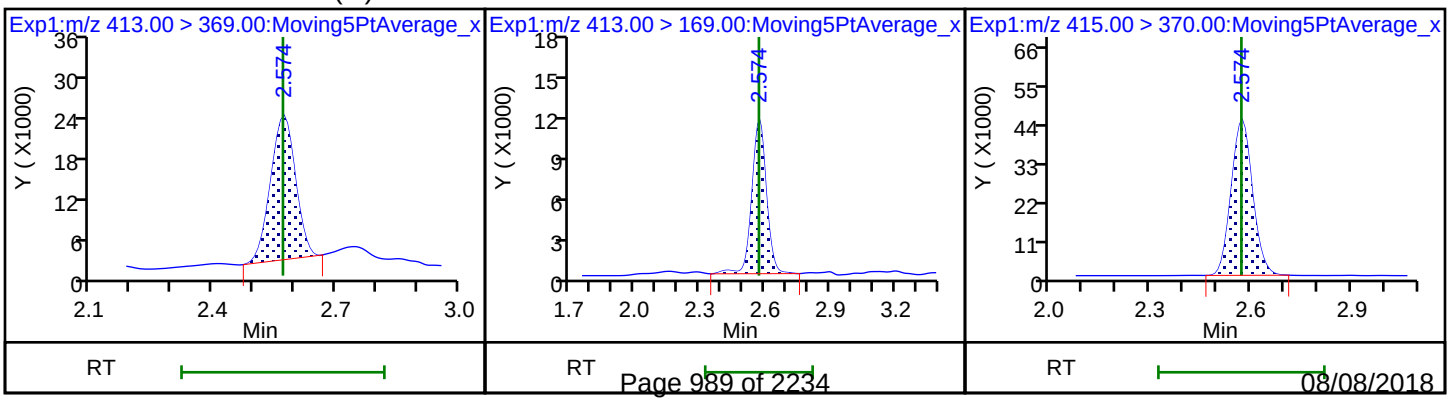
10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid | D 9 13C4-PFHpA



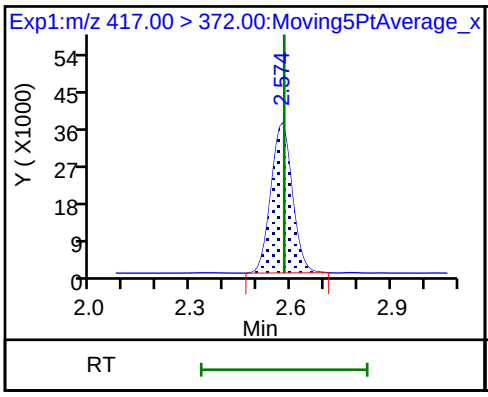
8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid | D 11 18O2 PFHxS



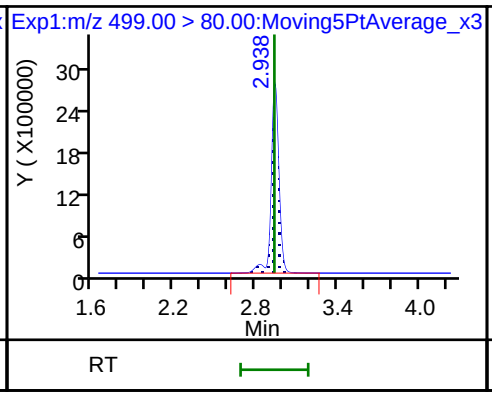
15 Perfluorooctanoic acid (M) | 15 Perfluorooctanoic acid | * 62 13C2-PFOA



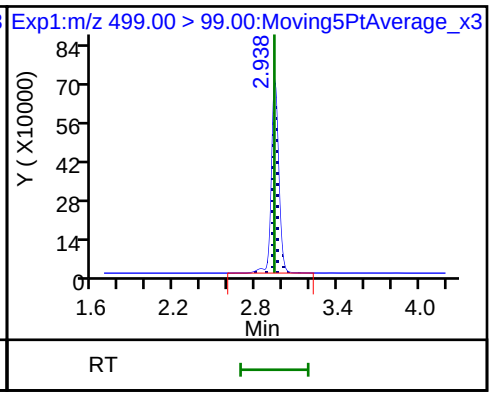
D 14 13C4 PFOA



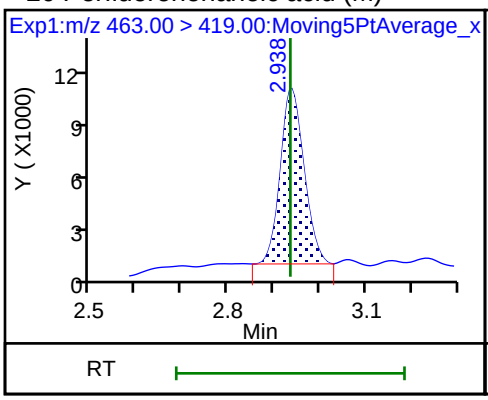
17 Perfluorooctane sulfonic acid



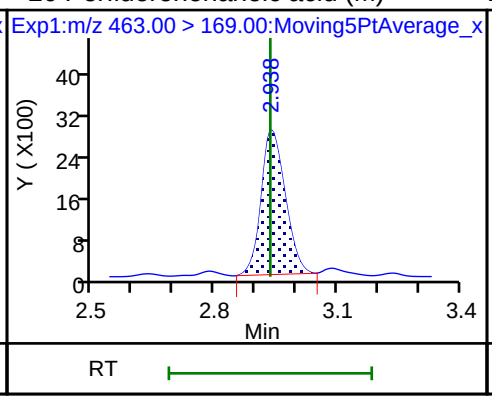
17 Perfluorooctane sulfonic acid



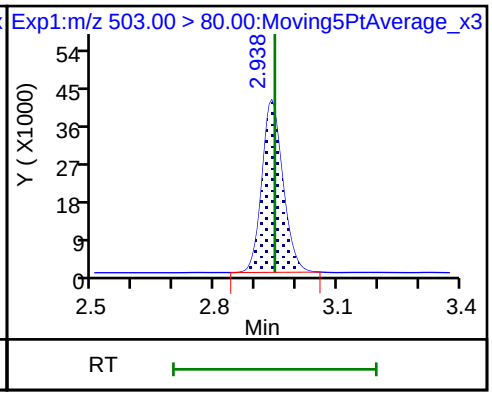
20 Perfluorononanoic acid (M)



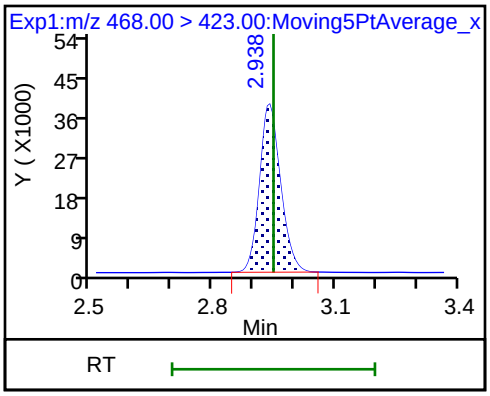
20 Perfluorononanoic acid (M)



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

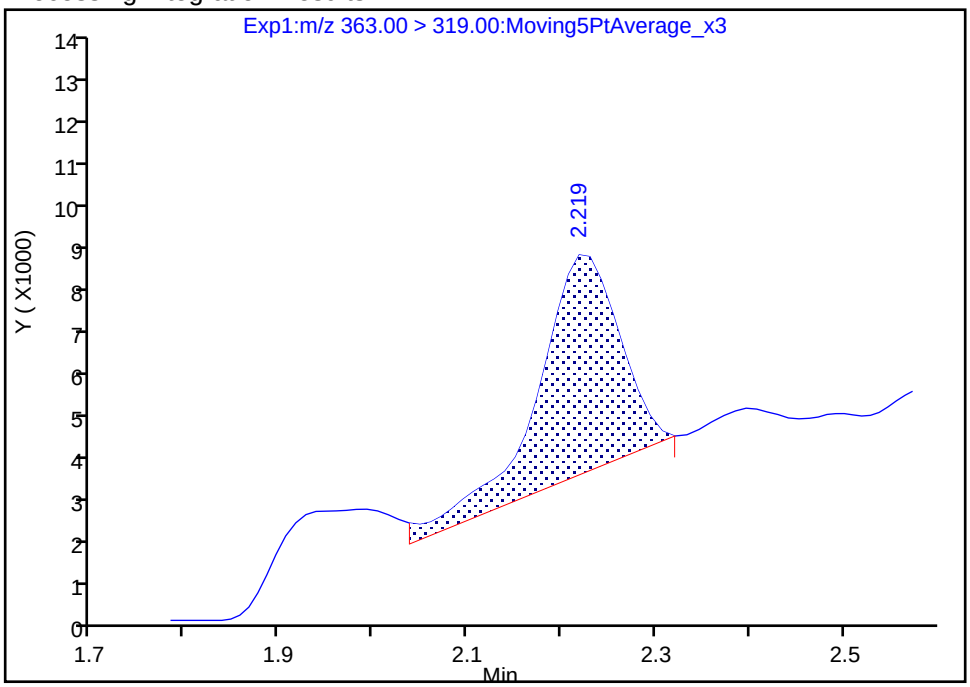
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_022.d				
Injection Date:	01-Aug-2018 16:53:29	Instrument ID:	A8_N		
Lims ID:	320-41149-A-25-A	Lab Sample ID:	320-41149-25		
Client ID:	GRE03-SB5-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

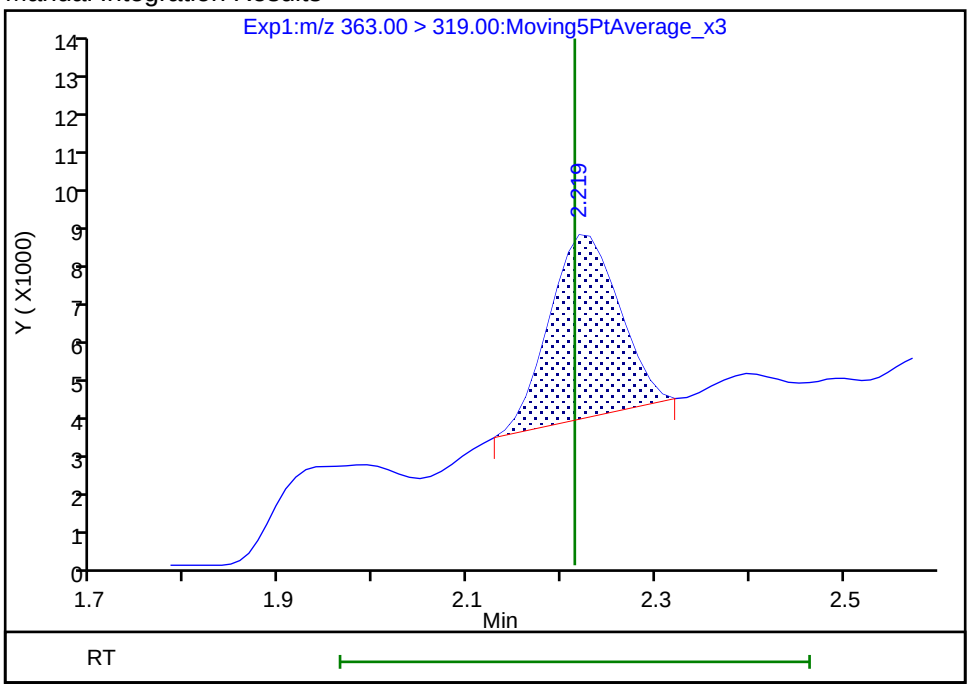
Processing Integration Results

RT: 2.22
Area: 30890
Amount: 0.018204
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 24282
Amount: 0.014310
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:28:30

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

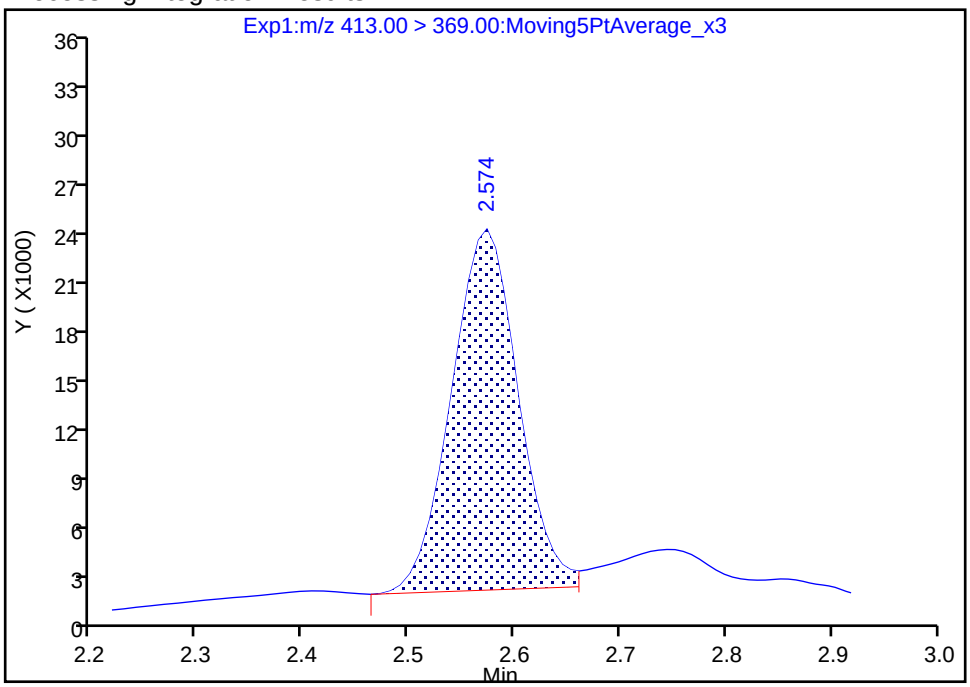
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_022.d				
Injection Date:	01-Aug-2018 16:53:29	Instrument ID:	A8_N		
Lims ID:	320-41149-A-25-A	Lab Sample ID:	320-41149-25		
Client ID:	GRE03-SB5-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

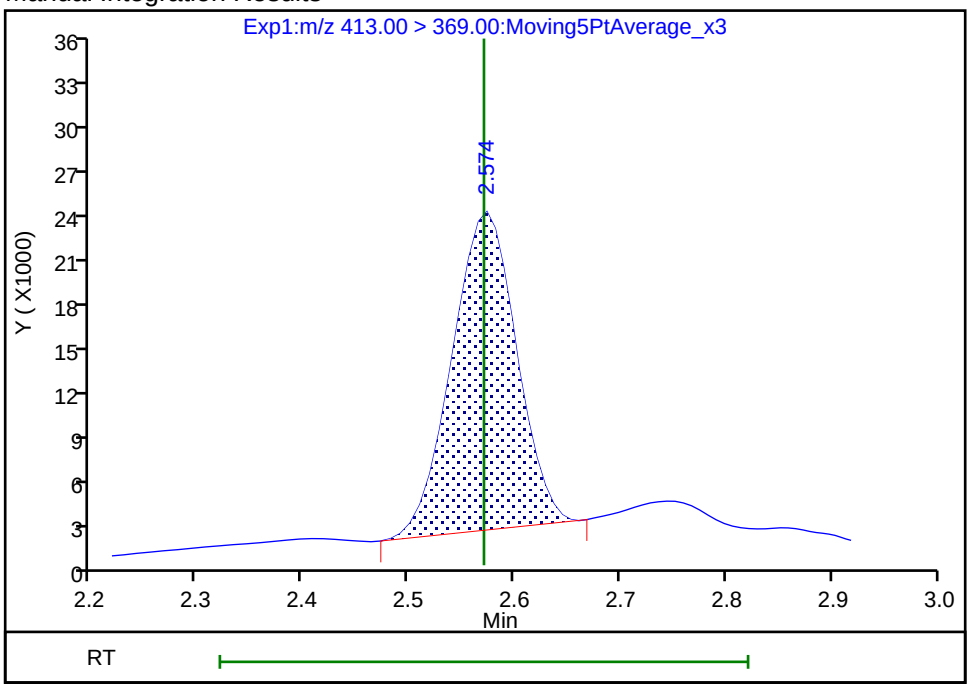
Processing Integration Results

RT: 2.57
Area: 94432
Amount: 0.062681
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 88918
Amount: 0.059021
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:28:38

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

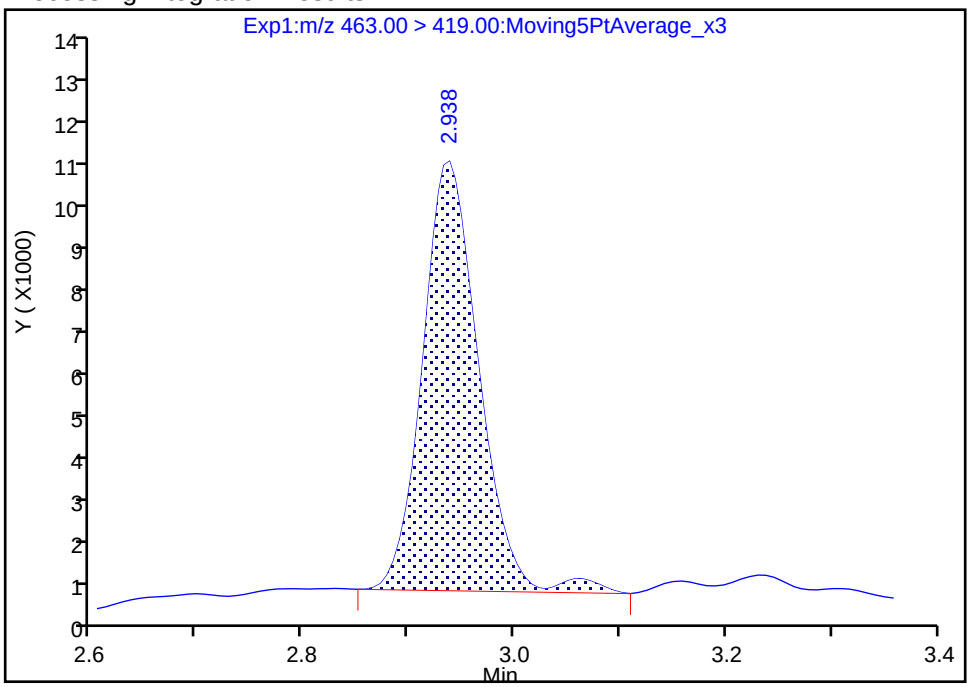
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_022.d				
Injection Date:	01-Aug-2018 16:53:29	Instrument ID:	A8_N		
Lims ID:	320-41149-A-25-A	Lab Sample ID:	320-41149-25		
Client ID:	GRE03-SB5-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

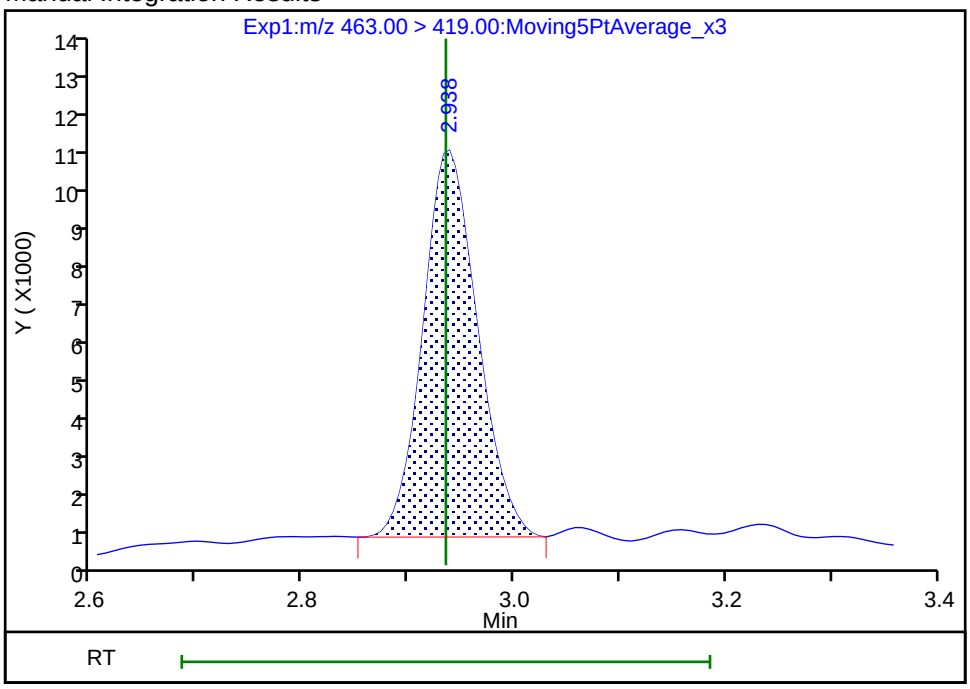
Processing Integration Results

RT: 2.94
Area: 36729
Amount: 0.031055
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 35470
Amount: 0.029991
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:28:50

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

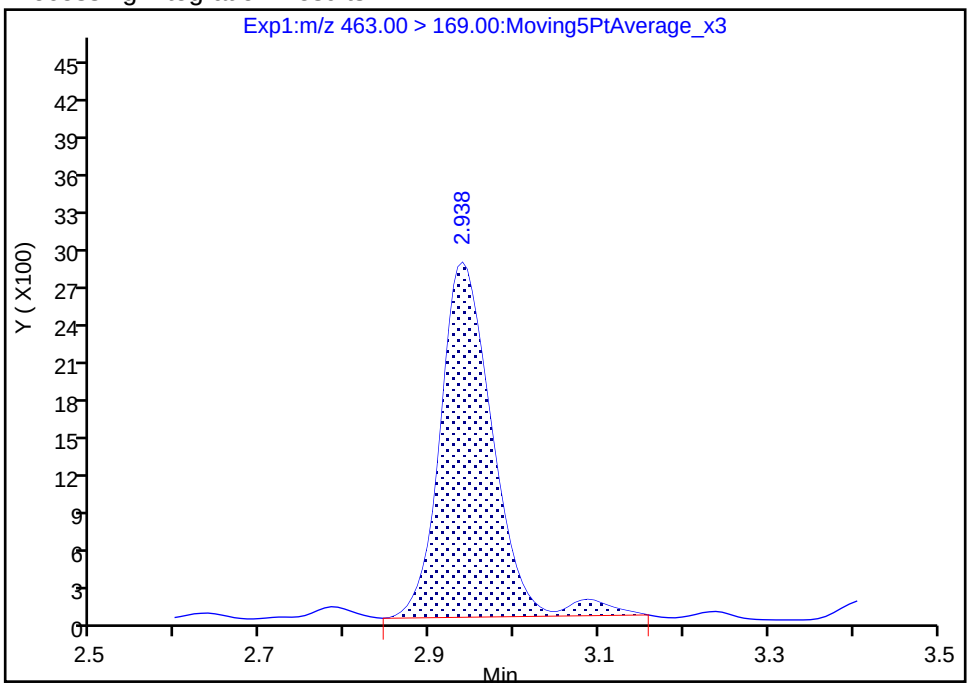
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_022.d				
Injection Date:	01-Aug-2018 16:53:29	Instrument ID:	A8_N		
Lims ID:	320-41149-A-25-A	Lab Sample ID:	320-41149-25		
Client ID:	GRE03-SB5-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

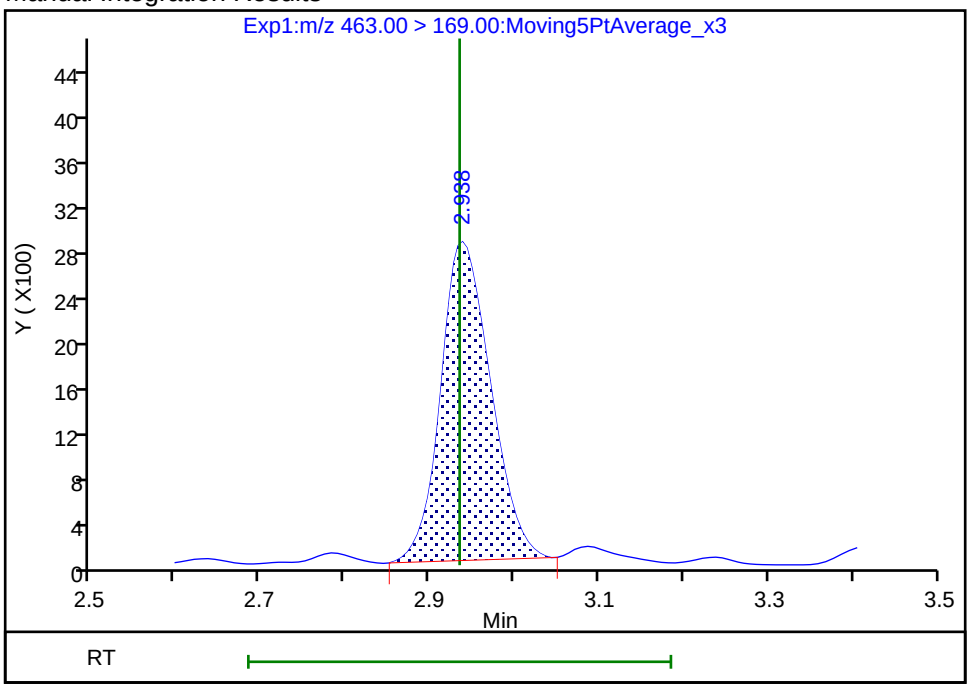
Processing Integration Results

RT: 2.94
Area: 12249
Amount: 0.031055
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 11567
Amount: 0.029991
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:28:55

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE04-SB2-01
Lab Sample ID: 320-41149-26
Matrix: Solid
Lab File ID: 2018.07.30LLA_031.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/12/2018 11:55
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.04(g)
Date Analyzed: 07/30/2018 06:52
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 4.2
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.10	J	0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	0.45		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.21	U	0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.070	J	0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.0		0.31	0.21	0.064
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14		1.0	0.52	0.25

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	94		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	96		50-150
STL00994	18O2 PFHxS	92		50-150
STL00991	13C4 PFOS	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_031.d
Lims ID: 320-41149-A-26-A
Client ID: GRE04-SB2-01
Sample Type: Client
Inject. Date: 30-Jul-2018 06:52:37 ALS Bottle#: 24 Worklist Smp#: 29
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-26-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:06:37 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:06:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.672	1.666	0.006	1.005	94892	0.0340			217	
298.90 > 99.00	1.663	1.666	-0.004	1.000	42873		2.21(1.25-3.74)		155	
D 47 13C3-PFBS										
301.90 > 83.00	1.663	1.674	-0.012	0.645	81840	2.19		94.4	549	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.226	2.229	-0.003	1.000	81897	0.0485			114	
363.00 > 169.00	2.226	2.229	-0.003	1.000	31579		2.59(1.13-3.40)		482	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.240	-0.014	0.863	3830537	2.23		89.2	83003	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.238	2.241	-0.003	1.000	5697832	2.41			14121	
399.00 > 99.00	2.238	2.241	-0.003	1.000	1811672		3.15(1.50-4.49)		5844	
D 11 18O2 PFHxS										
403.00 > 84.00	2.238	2.253	-0.015	0.868	4797184	2.17		91.9	102431	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.581	-0.002		4392244	2.50			66832	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.581	-0.002	1.000	419599	0.2177			408	
413.00 > 169.00	2.579	2.581	-0.002	1.000	228094		1.84(0.84-2.52)		1280	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3969730	2.36		94.5	53891	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.941	2.943	-0.002	1.000	10926896	6.79			19464	
499.00 > 99.00	2.941	2.943	-0.002	1.000	2571953		4.25(2.31-6.93)		24687	
20 Perfluorononanoic acid										
463.00 > 419.00	2.941	2.943	-0.002	1.000	5637	0.003555			10.1	
463.00 > 169.00	2.952	2.943	0.009	1.004	2097		2.69(1.90-5.69)		61.9	

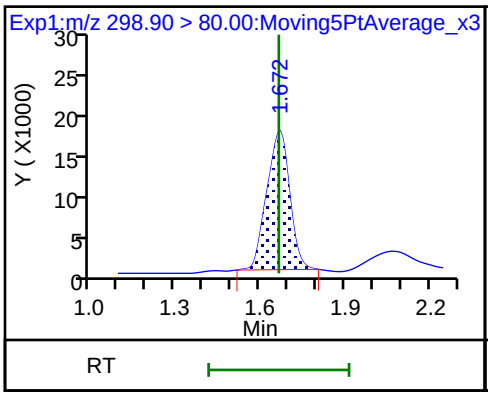
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.941	2.953	-0.012	1.140	3472066	2.40		95.8	74615	
D 18 13C4 PFOS										
503.00 > 80.00	2.941	2.953	-0.012	1.140	3481309	2.27		94.9	14193	

Report Date: 31-Jul-2018 10:06:59 Chrom Revision: 2.3 19-Jul-2018 15:14:50

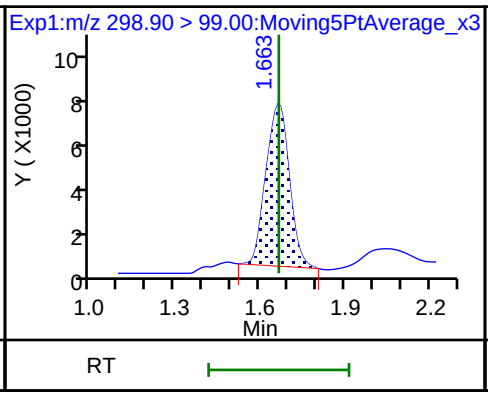
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_031.d				
Injection Date:	30-Jul-2018 06:52:37	Instrument ID:	A8_N		
Lims ID:	320-41149-A-26-A	Lab Sample ID:	320-41149-26		
Client ID:	GRE04-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	24	Worklist Smp#:	29
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

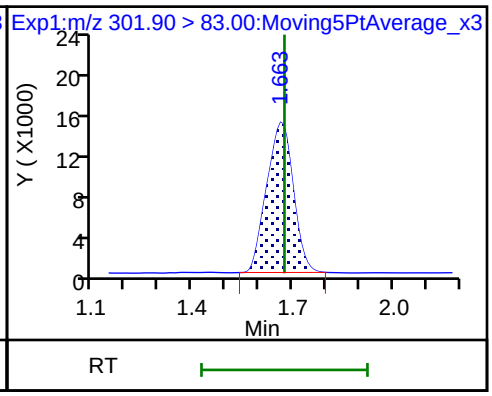
5 Perfluorobutanesulfonic acid



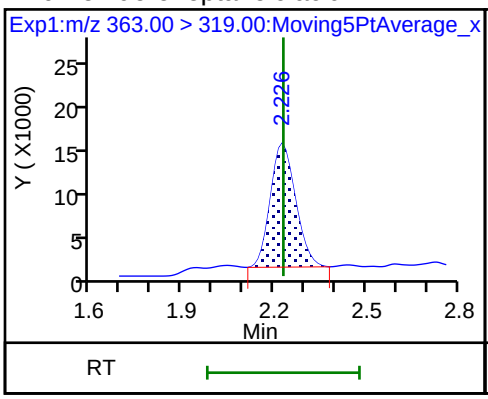
5 Perfluorobutanesulfonic acid



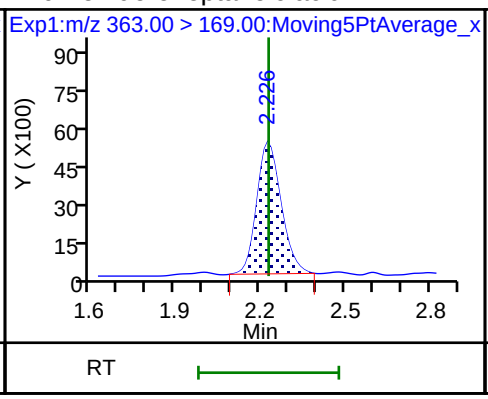
D 47 13C3-PFBS



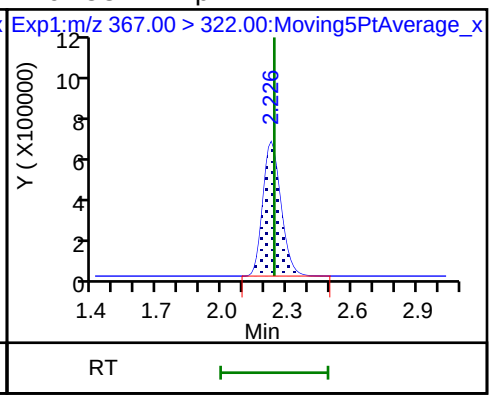
10 Perfluoroheptanoic acid



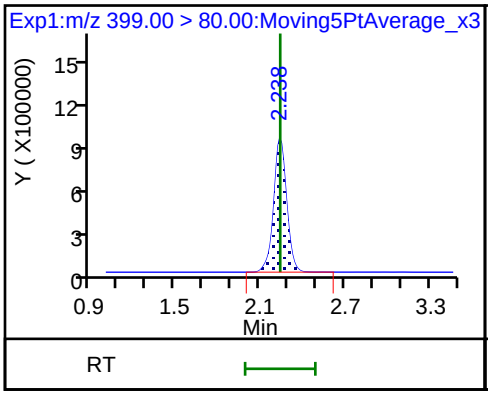
10 Perfluoroheptanoic acid



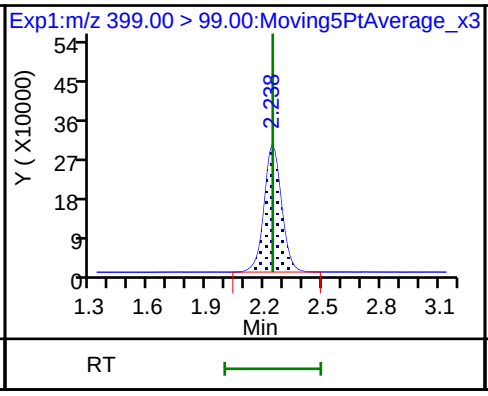
D 9 13C4-PFHpA



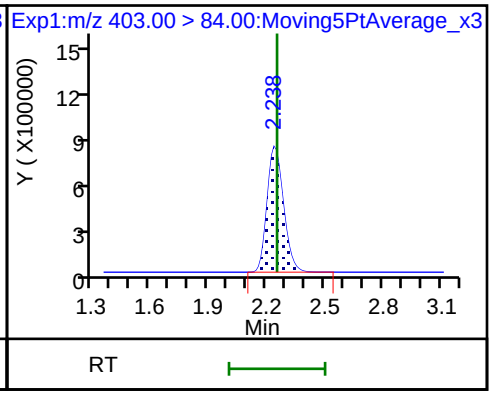
8 Perfluorohexanesulfonic acid



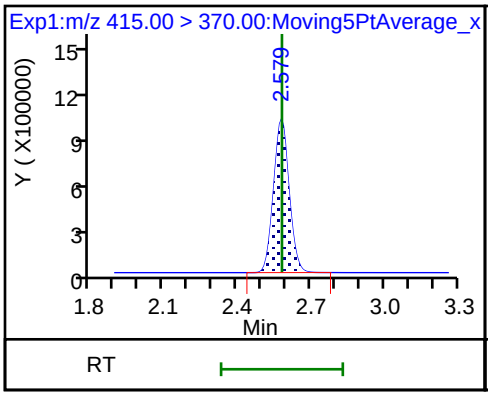
8 Perfluorohexanesulfonic acid



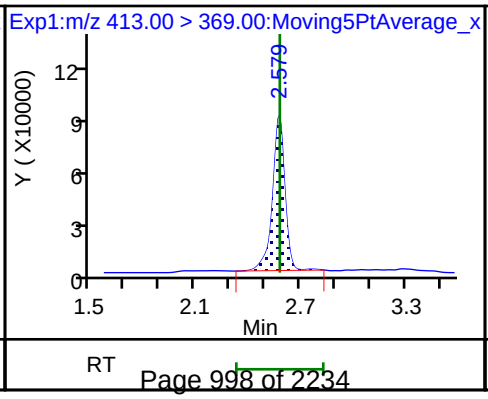
D 11 18O2 PFHxS



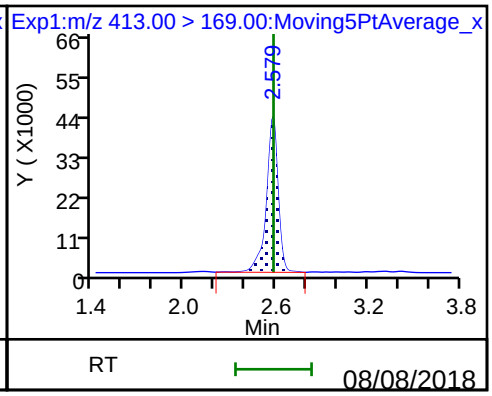
* 62 13C2-PFOA



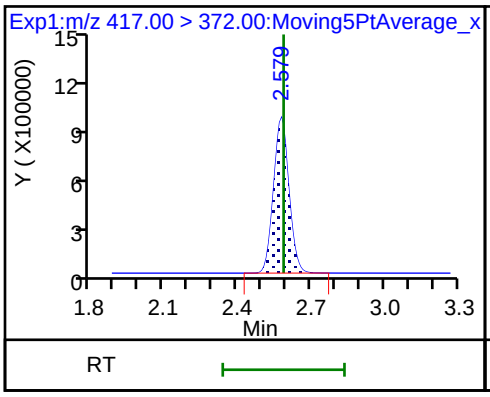
15 Perfluorooctanoic acid



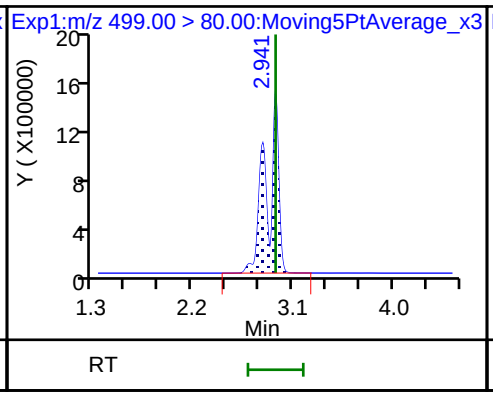
15 Perfluorooctanoic acid



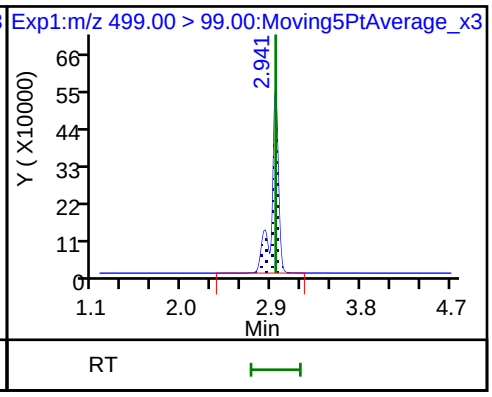
D 14 13C4 PFOA



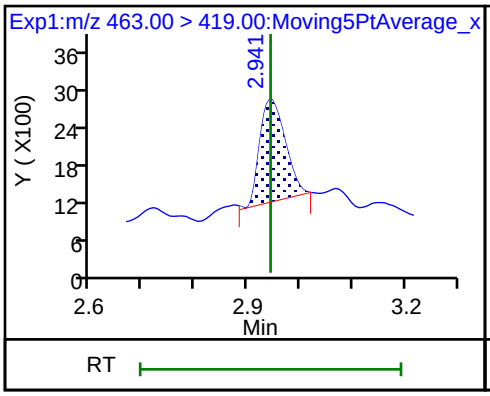
17 Perfluorooctane sulfonic acid



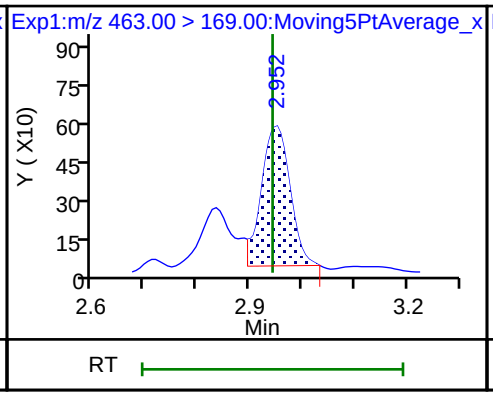
17 Perfluorooctane sulfonic acid



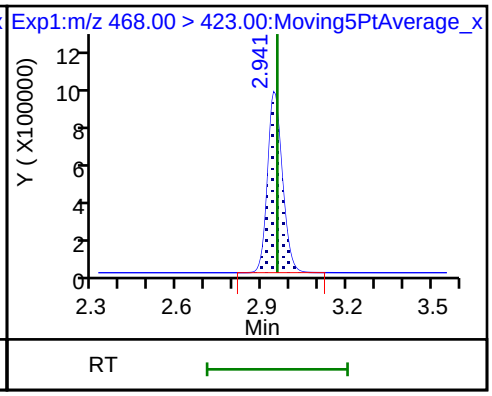
20 Perfluorononanoic acid



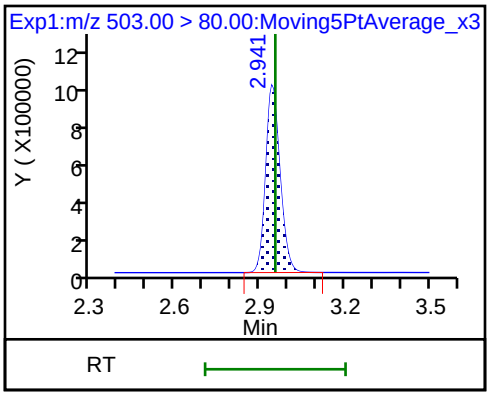
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB2-01 | Lab Sample ID: 320-41149-27

Matrix: Solid | Lab File ID: 2018.07.31LLA_021.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 12:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.05(g) | Date Analyzed: 07/31/2018 19:46

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 16.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.5		0.36	0.24	0.092
335-67-1	*Perfluorooctanoic acid (PFOA)*	*48*	*E*	*0.36*	0.24	*0.12*
375-95-1	Perfluorononanoic acid (PFNA)	4.2	M	0.36	0.24	0.096
375-73-5	Perfluorobutanesulfonic acid (PFBS)	8.1		0.47	0.21	0.070
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*170*	*E*	*0.36*	0.24	*0.073*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*1000*	*E*	*1.2*	0.59	*0.28*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	146		50-150
STL01892	13C4-PFHpA	119		50-150
STL00990	13C4 PFOA	83		50-150
STL00995	13C5 PFNA	71		50-150
STL00994	18O2 PFHxS	122		50-150
STL00991	13C4 PFOS	66		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_021.d
Lims ID: 320-41149-A-27-A
Client ID: GRE07-SB2-01
Sample Type: Client
Inject. Date: 31-Jul-2018 19:46:48 ALS Bottle#: 14 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-27-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:43:28 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:43:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.666	0.001	1.000	7011262	3.44			11151	
298.90 > 99.00	1.667	1.666	0.001	1.000	3076976		2.28(1.25-3.74)		7922	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	61173	3.40		146	173	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.223	-0.004	0.859	1955354	2.99		119	46937	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.229	-0.010	1.000	2071004	2.33			1241	
363.00 > 169.00	2.219	2.229	-0.010	1.000	751635		2.76(1.13-3.40)		5285	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.230	2.241	-0.011	1.000	99887351	70.8			38967	E
399.00 > 99.00	2.230	2.241	-0.011	1.000	45275250		2.21(1.50-4.49)		42570	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.248	-0.018	0.864	2870437	2.88		122	52203	
* 62 13C2-PFOA										
415.00 > 370.00	2.582	2.578	0.004		1740775	2.50			31352	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.582	2.578	0.004	1.000	13092820	20.2			10631	E
413.00 > 169.00	2.582	2.578	0.004	1.000	7713440		1.70(0.84-2.52)		3557	
D 14 13C4 PFOA										
417.00 > 372.00	2.582	2.586	-0.004	1.000	1386596	2.07		82.9	33437	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.943	2.946	-0.003	1.000	801630	1.78			776	M
463.00 > 169.00	2.943	2.946	-0.003	1.000	193923		4.13(1.90-5.69)		1014	M
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.943	2.946	-0.003	1.000	238824417	443.2			18620	E
499.00 > 99.00	2.938	2.946	-0.008	0.998	85833956		2.78(2.31-6.93)		198992	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.952	-0.009	1.140	1129935	1.58		66.2	4298	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.952	-0.009	1.140	1042333	1.76		70.5	25984	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

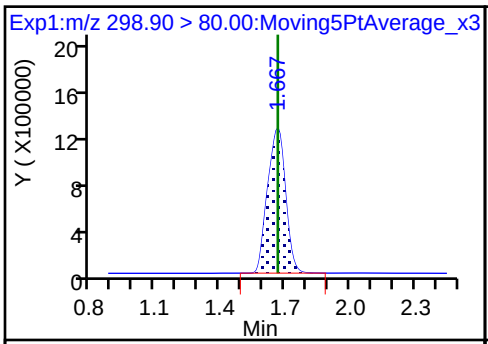
M - Manually Integrated

Report Date: 01-Aug-2018 12:43:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

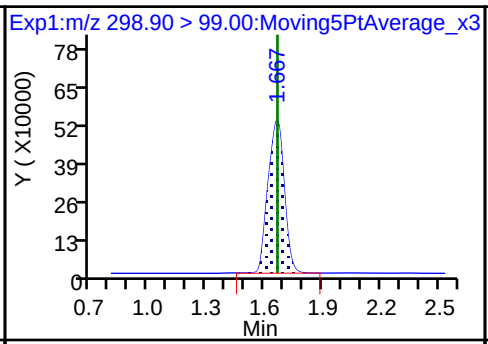
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_021.d				
Injection Date:	31-Jul-2018 19:46:48	Instrument ID:	A8_N		
Lims ID:	320-41149-A-27-A	Lab Sample ID:	320-41149-27		
Client ID:	GRE07-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

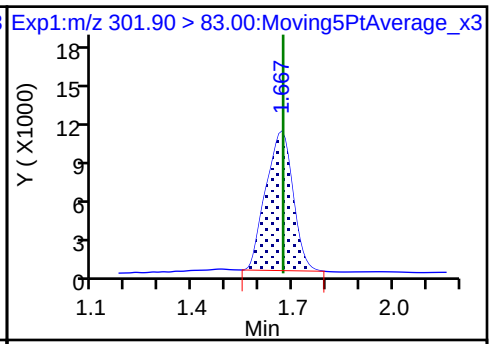
5 Perfluorobutanesulfonic acid



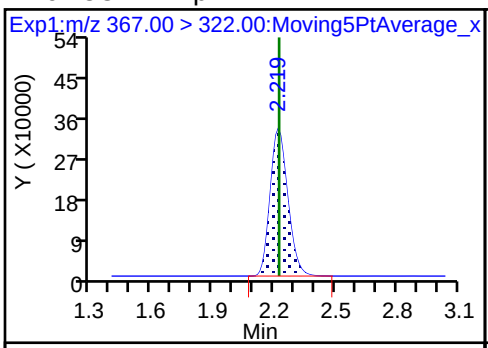
5 Perfluorobutanesulfonic acid



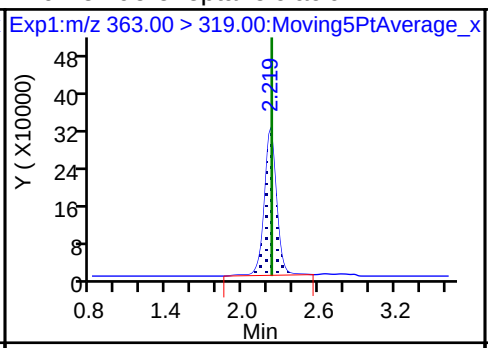
D 47 13C3-PFBS



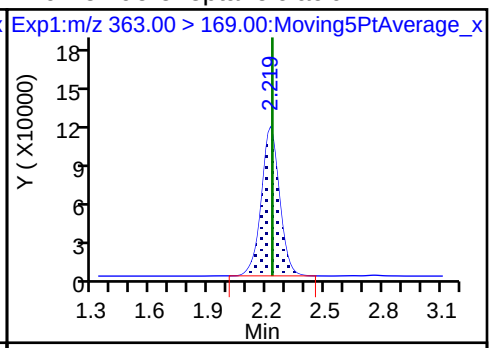
D 9 13C4-PFHpA



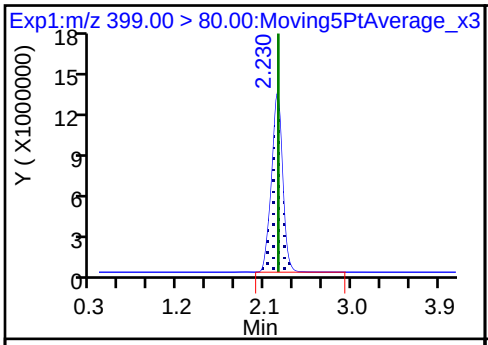
10 Perfluoroheptanoic acid



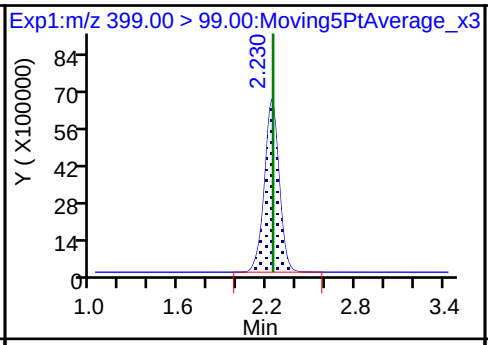
10 Perfluoroheptanoic acid



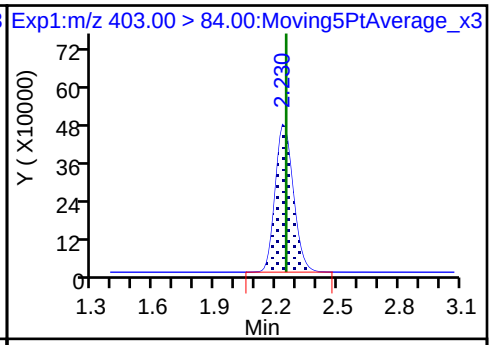
8 Perfluorohexanesulfonic acid



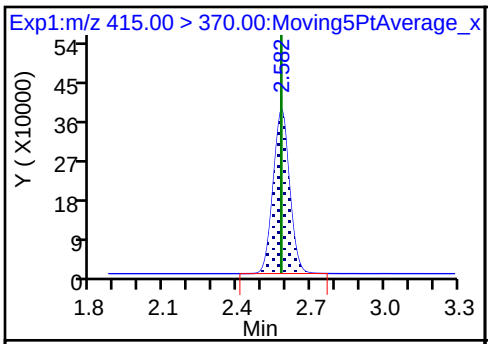
8 Perfluorohexanesulfonic acid



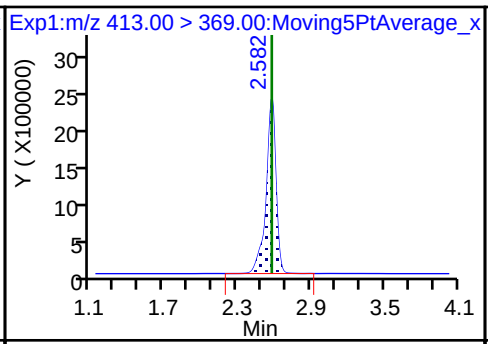
D 11 18O2 PFHxS



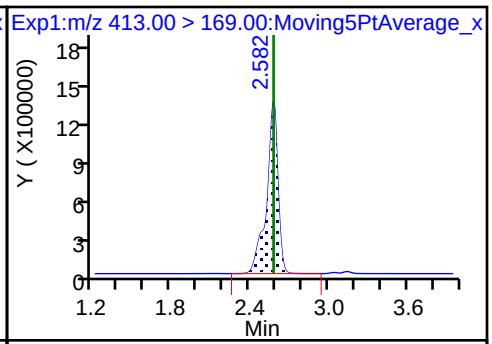
* 62 13C2-PFOA



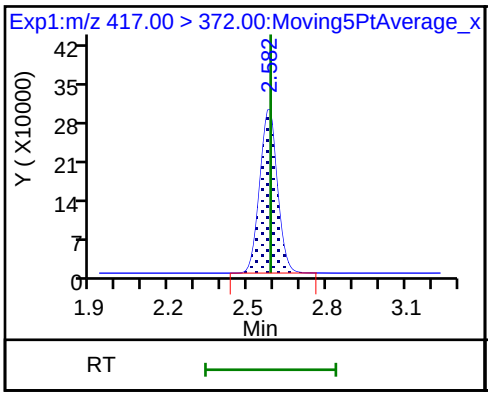
15 Perfluorooctanoic acid



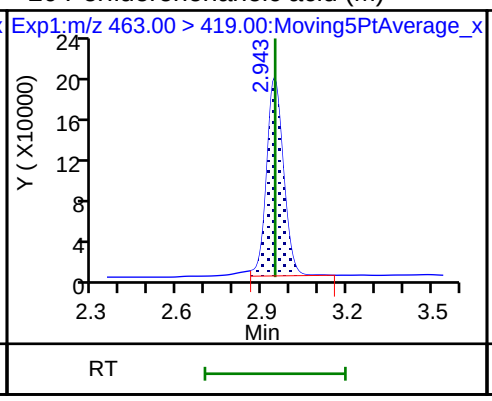
15 Perfluorooctanoic acid



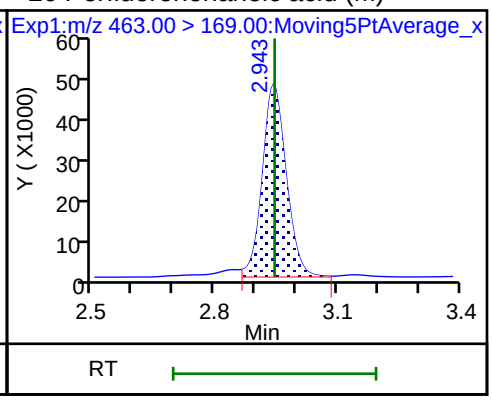
D 14 13C4 PFOA



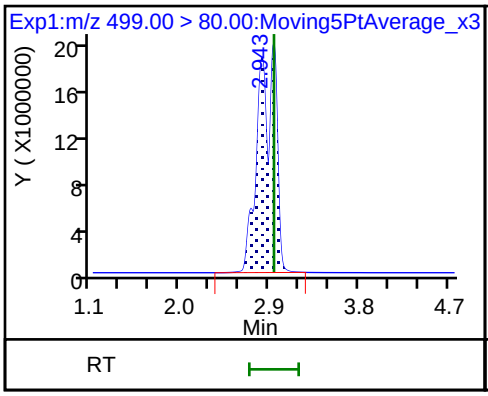
20 Perfluorononanoic acid (M)



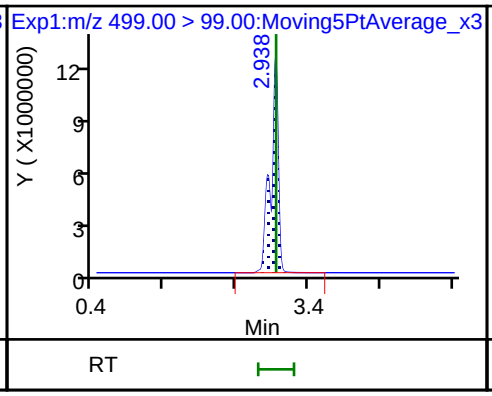
20 Perfluorononanoic acid (M)



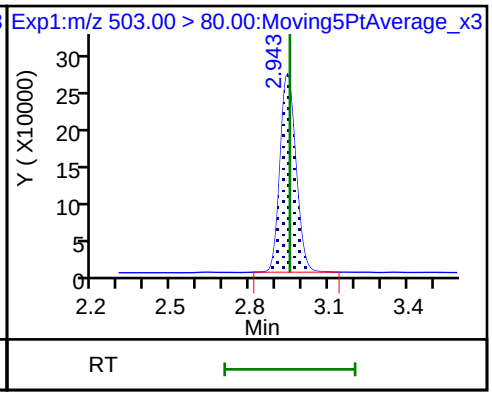
17 Perfluorooctane sulfonic acid



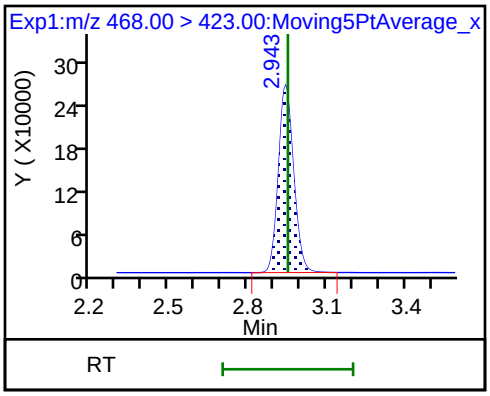
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

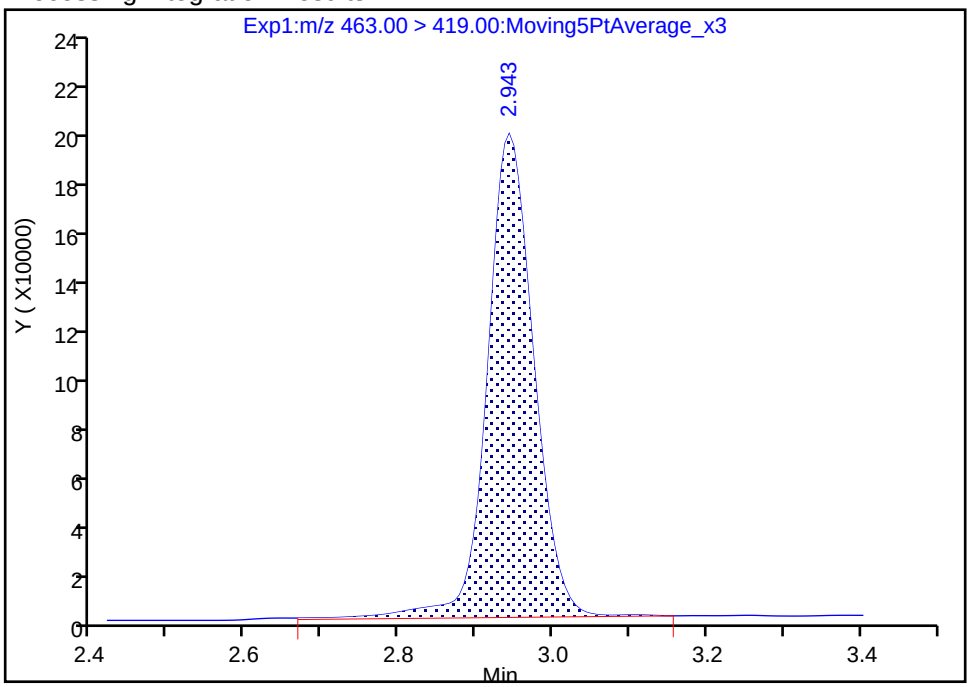
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_021.d				
Injection Date:	31-Jul-2018 19:46:48	Instrument ID:	A8_N		
Lims ID:	320-41149-A-27-A	Lab Sample ID:	320-41149-27		
Client ID:	GRE07-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

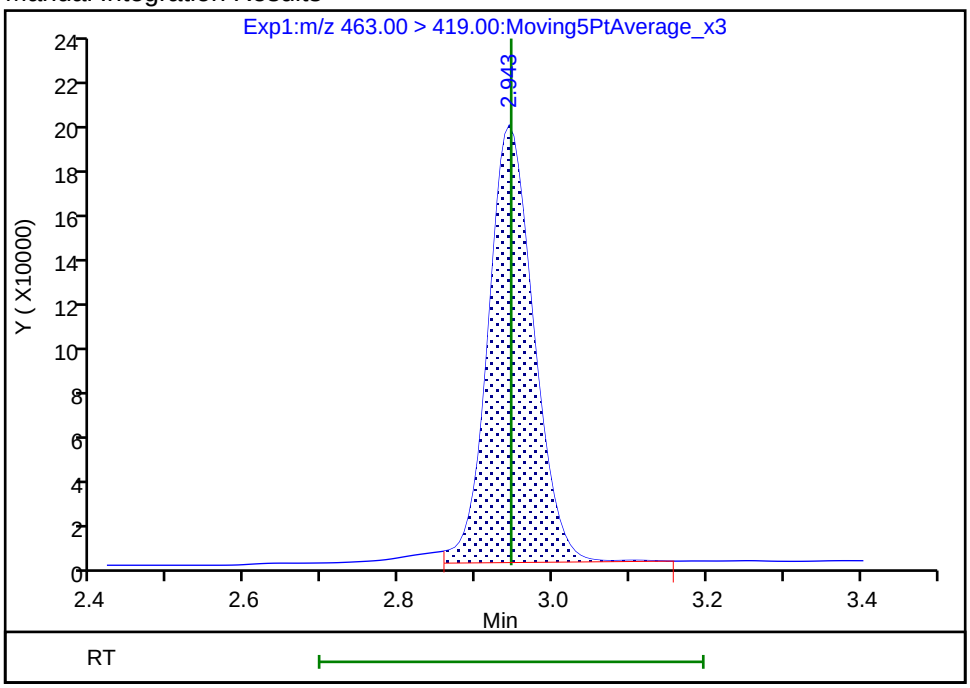
Processing Integration Results

RT: 2.94
Area: 824390
Amount: 1.832725
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 801630
Amount: 1.782127
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:43:18

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

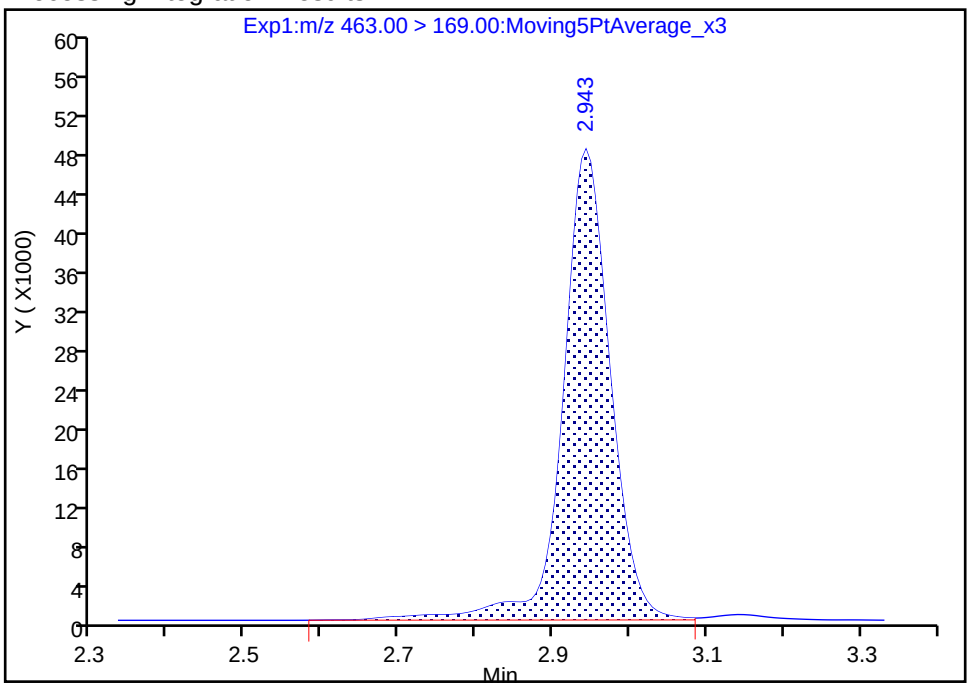
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_021.d				
Injection Date:	31-Jul-2018 19:46:48	Instrument ID:	A8_N		
Lims ID:	320-41149-A-27-A	Lab Sample ID:	320-41149-27		
Client ID:	GRE07-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

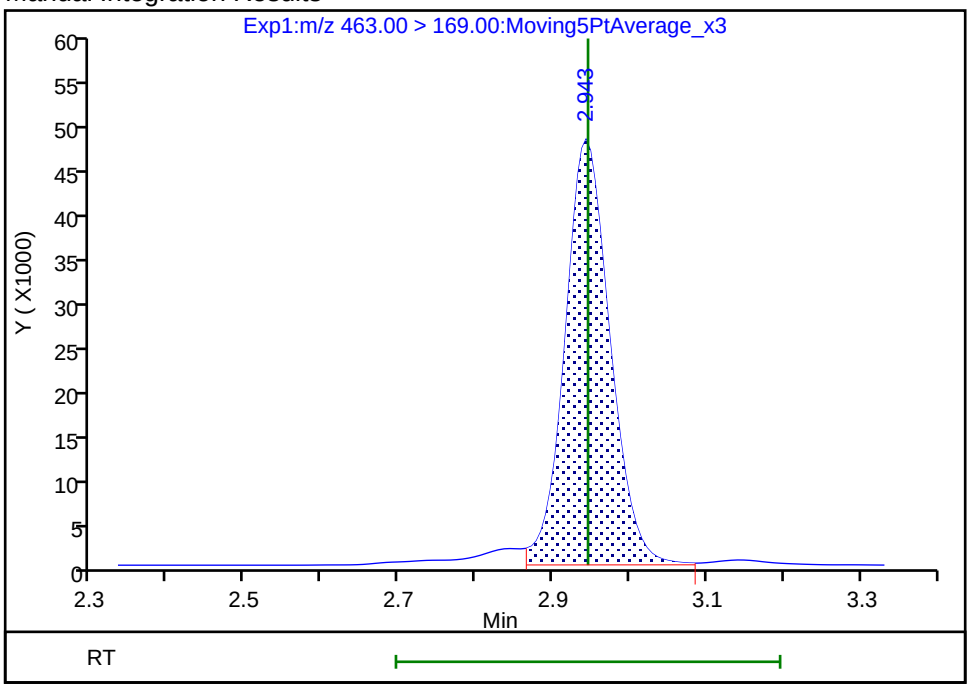
Processing Integration Results

RT: 2.94
Area: 204304
Amount: 1.832725
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 193923
Amount: 1.782127
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:43:22

Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB2-01 DL | Lab Sample ID: 320-41149-27 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_010.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 12:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.05(g) | Date Analyzed: 07/31/2018 18:20

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 100

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 16.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*24*	*U M*	*36*	24	*9.2*
335-67-1	Perfluorooctanoic acid (PFOA)	45	D	36	24	12
375-95-1	*Perfluorononanoic acid (PFNA)*	*24*	*U*	*36*	24	*9.6*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*9.7*	*J D*	*47*	21	*7.0*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	280	D	36	24	7.3
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1700	D	120	59	28

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	58	M	50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	76		50-150
STL00994	18O2 PFHxS	69		50-150
STL00991	13C4 PFOS	69		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_010.d
Lims ID: 320-41149-A-27-A
Client ID: GRE07-SB2-01
Sample Type: Client
Inject. Date: 31-Jul-2018 18:20:53 ALS Bottle#: 4 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 100.0000
Sample Info: 320-41149-a-27-a 100X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:33:09 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:33:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.666	0.010	1.000	77128	0.0409			367	
298.90 > 99.00	1.667	1.666	0.001	0.995	35620		2.17(1.25-3.74)		109	
D 47 13C3-PFBS										M
301.90 > 83.00	1.676	1.670	0.006	0.647	565	0.0135		58.0	2.7	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.223	0.007	0.861	35549	0.0233		93.2	1225	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.230	2.229	0.001	1.000	27470	0.0170			12.6	M
363.00 > 169.00	2.230	2.229	0.001	1.000	12793		2.15(1.13-3.40)		119	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.241	0.001	1.000	2182443	1.17			8795	
399.00 > 99.00	2.242	2.241	0.001	1.000	769035		2.84(1.50-4.49)		1125	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.248	-0.006	0.866	37928	0.0164		69.2	1290	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.578	0.012		40564	0.0250			2297	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.590	2.578	0.012	1.000	302260	0.1917			217	
413.00 > 169.00	2.590	2.578	0.012	1.000	175784		1.72(0.84-2.52)		760	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.586	0.004	1.000	33808	0.0217		86.8	1919	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.946	0.004	0.998	22909	0.0202			30.7	
463.00 > 169.00	2.955	2.946	0.009	1.000	4964		4.62(1.90-5.69)		137	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.955	2.946	0.009	1.000	9429599	7.17			33218	
499.00 > 99.00	2.950	2.946	0.004	0.998	2269706		4.15(2.31-6.93)		12108	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.955	2.952	0.003	1.141	27586	0.0166		69.3	758	
D 19 13C5 PFNA										
468.00 > 423.00	2.955	2.952	0.003	1.141	26320	0.0191		76.4	1217	

QC Flag Legend

Review Flags

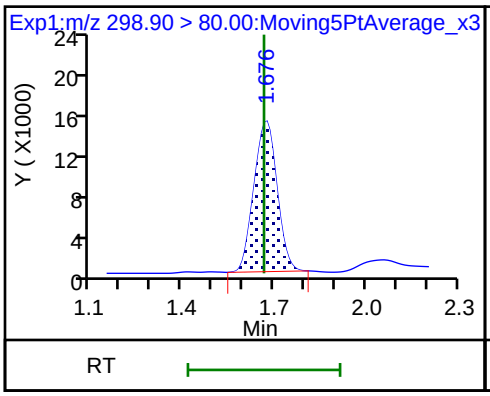
M - Manually Integrated

Report Date: 01-Aug-2018 12:33:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

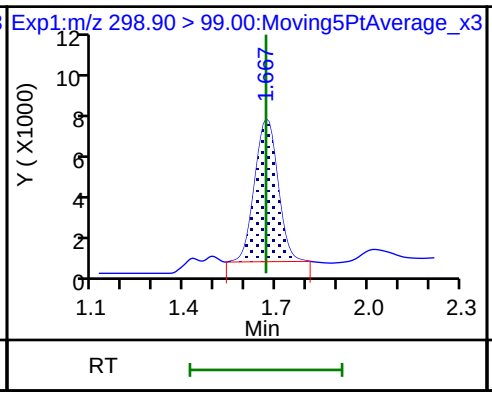
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_010.d				
Injection Date:	31-Jul-2018 18:20:53	Instrument ID:	A8_N		
Lims ID:	320-41149-A-27-A	Lab Sample ID:	320-41149-27		
Client ID:	GRE07-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

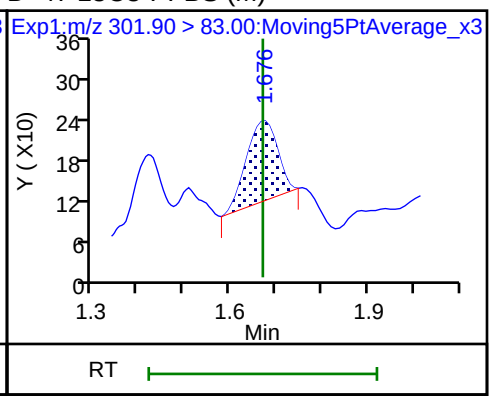
5 Perfluorobutanesulfonic acid



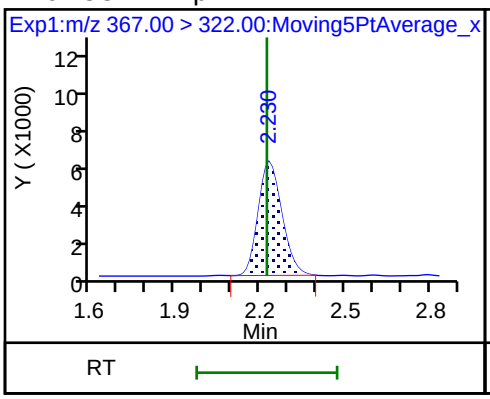
5 Perfluorobutanesulfonic acid



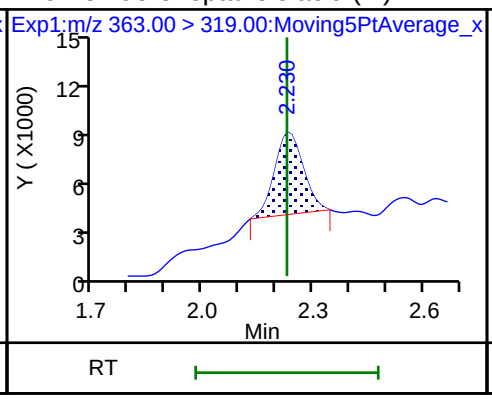
D 47 13C3-PFBS (M)



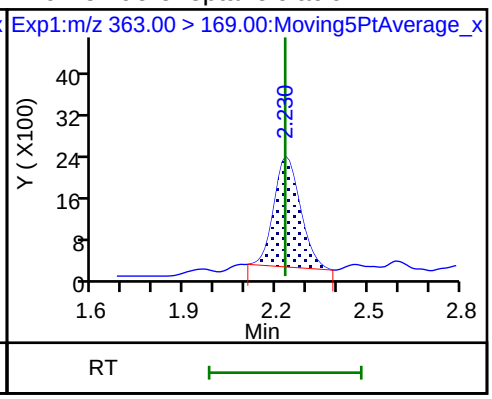
D 9 13C4-PFHpA



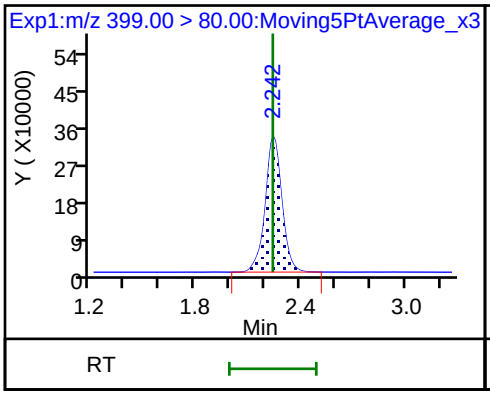
10 Perfluoroheptanoic acid (M)



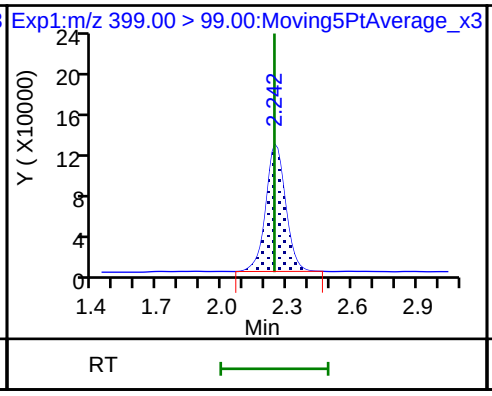
10 Perfluoroheptanoic acid



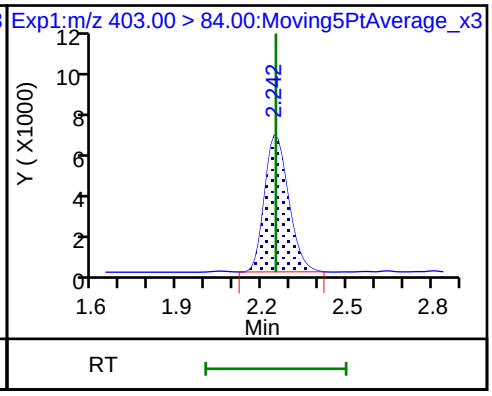
8 Perfluorohexanesulfonic acid



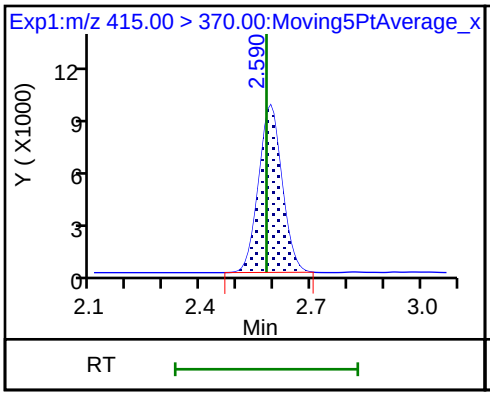
8 Perfluorohexanesulfonic acid



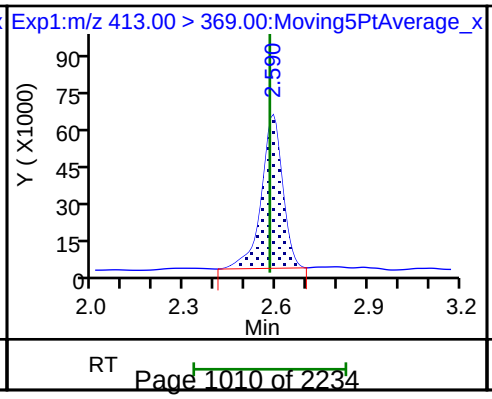
D 11 18O2 PFHxS



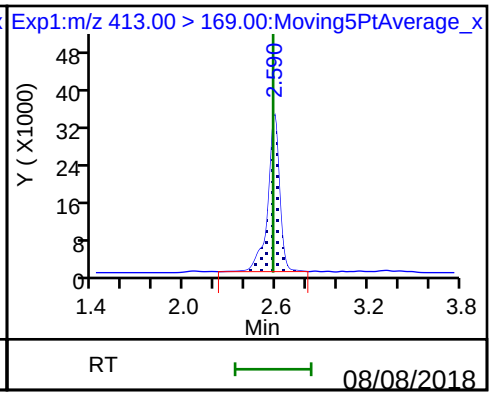
* 62 13C2-PFOA



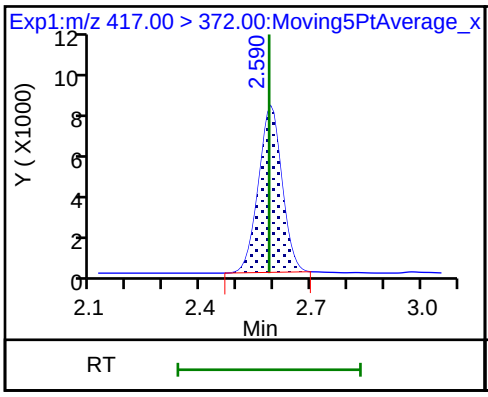
15 Perfluorooctanoic acid



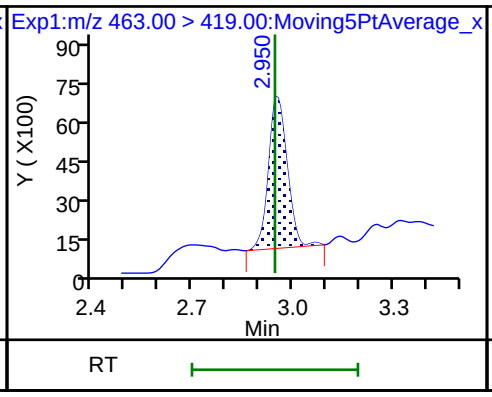
15 Perfluorooctanoic acid



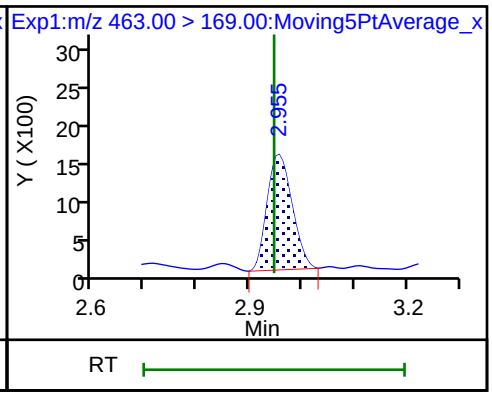
D 14 13C4 PFOA



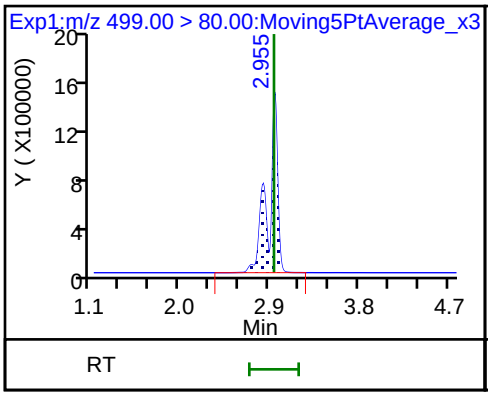
20 Perfluorononanoic acid



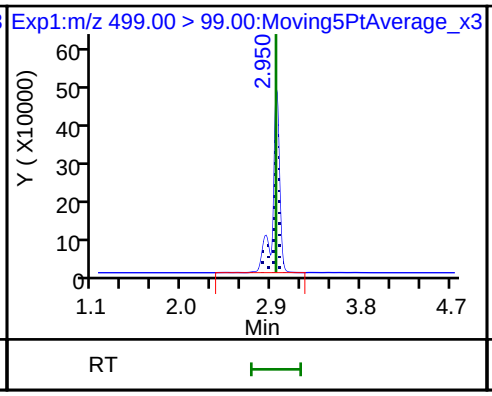
20 Perfluorononanoic acid



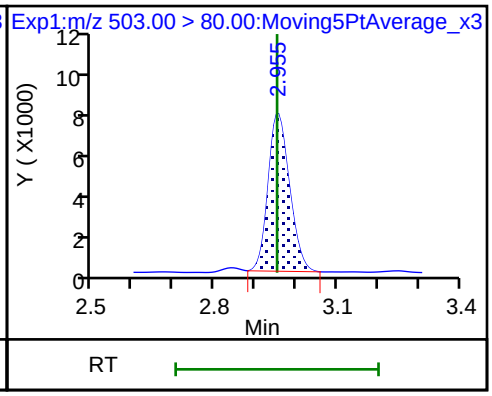
17 Perfluorooctane sulfonic acid



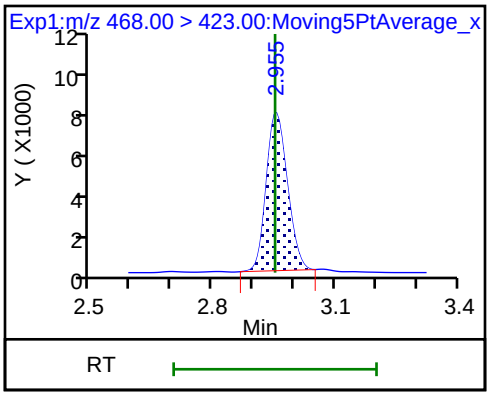
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

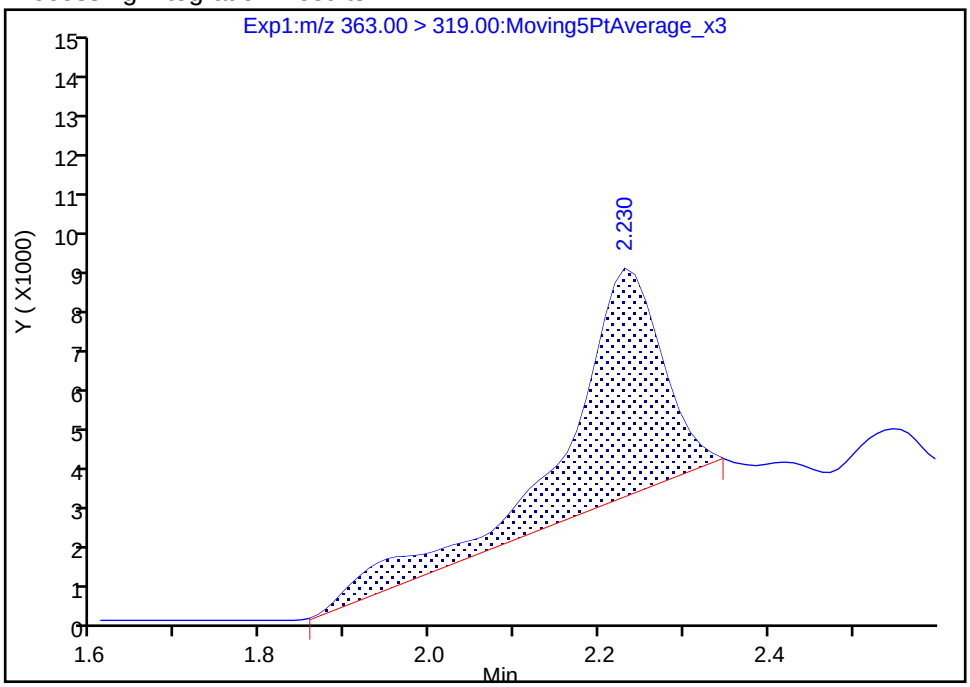
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_010.d				
Injection Date:	31-Jul-2018 18:20:53	Instrument ID:	A8_N		
Lims ID:	320-41149-A-27-A	Lab Sample ID:	320-41149-27		
Client ID:	GRE07-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

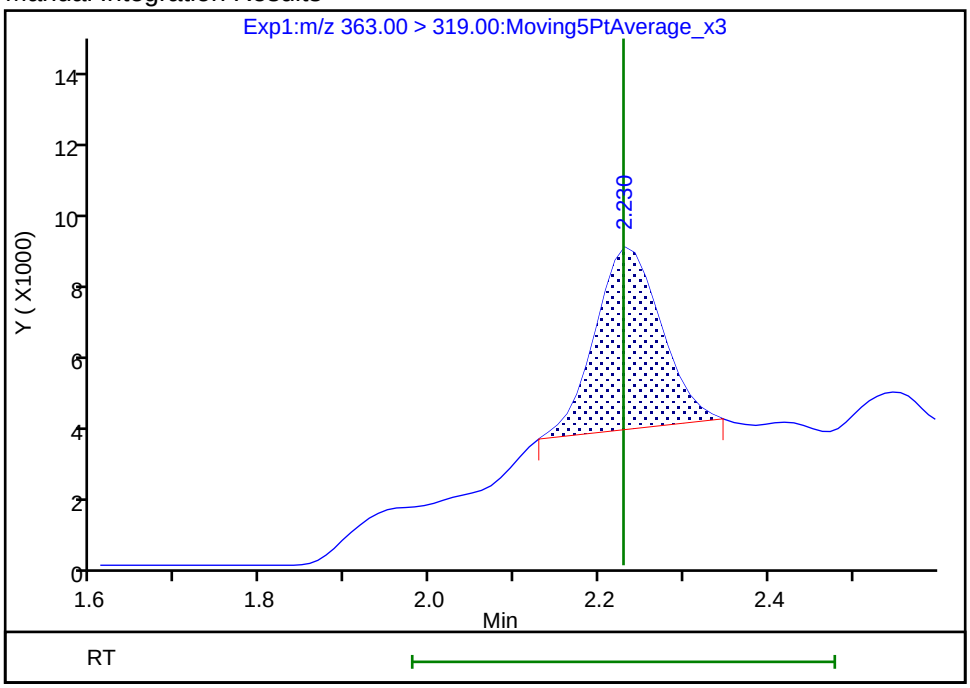
Processing Integration Results

RT: 2.23
Area: 44625
Amount: 0.027587
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 27470
Amount: 0.016982
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:33:00

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

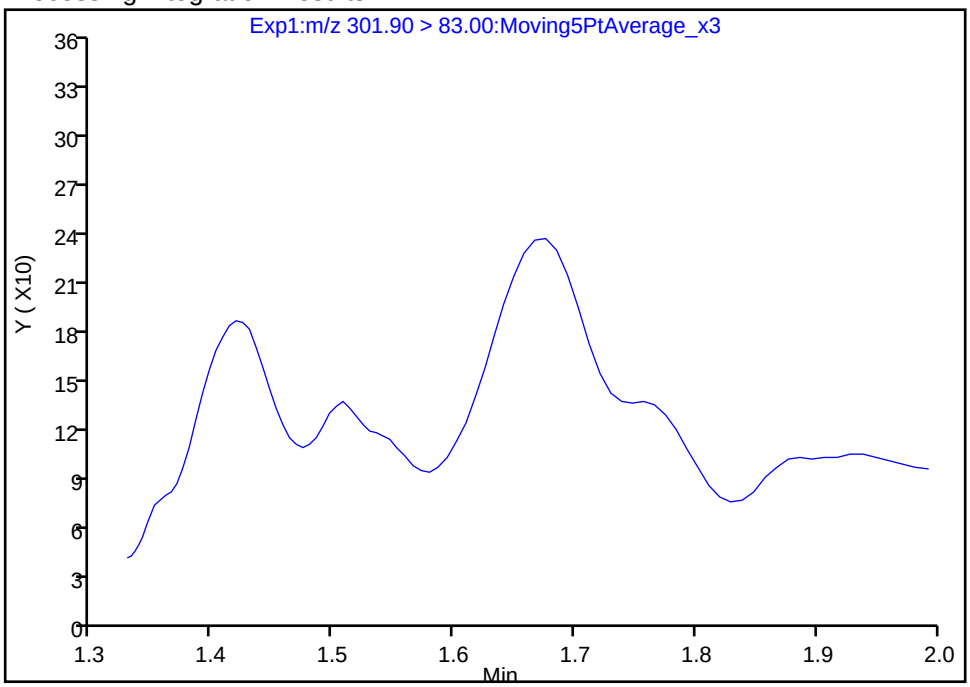
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_010.d				
Injection Date:	31-Jul-2018 18:20:53	Instrument ID:	A8_N		
Lims ID:	320-41149-A-27-A	Lab Sample ID:	320-41149-27		
Client ID:	GRE07-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

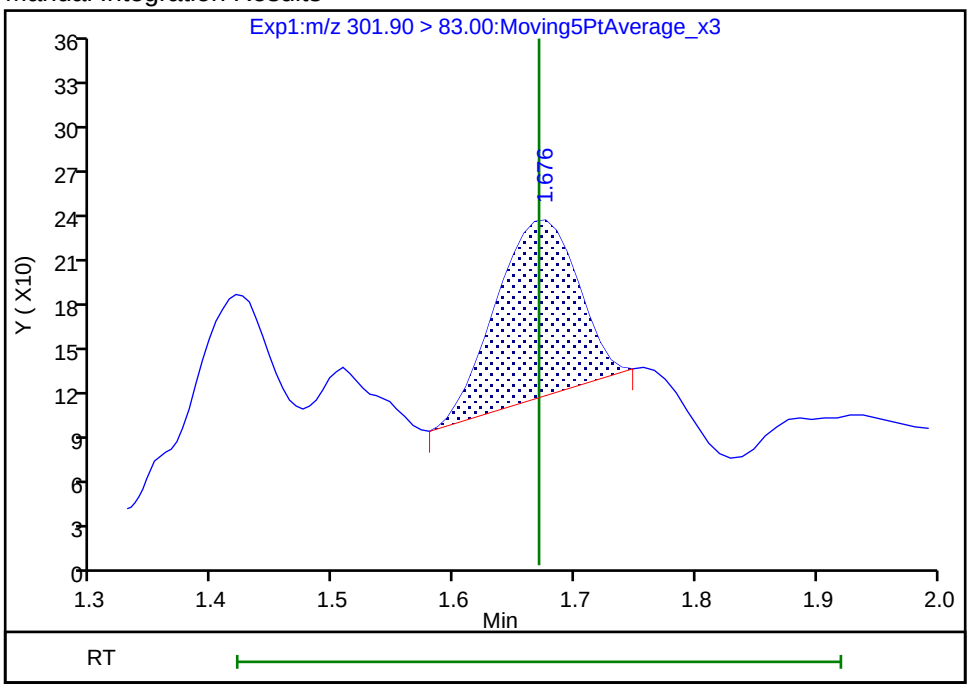
Not Detected
Expected RT: 1.67

Processing Integration Results



Manual Integration Results

RT: 1.68
Area: 565
Amount: 0.013476
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:32:39
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB1-01 | Lab Sample ID: 320-41149-28

Matrix: Solid | Lab File ID: 2018.07.28LLB_021.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 13:25

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.01(g) | Date Analyzed: 07/29/2018 01:55

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 3.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1		0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	7.6		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.4		0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	M	0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14		0.31	0.21	0.064
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*200*	*E*	*1.0*	0.52	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	89		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	60		50-150
STL00994	18O2 PFHxS	83		50-150
STL00991	13C4 PFOS	62		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_021.d
Lims ID: 320-41149-A-28-A
Client ID: GRE08-SB1-01
Sample Type: Client
Inject. Date: 29-Jul-2018 01:55:47 ALS Bottle#: 14 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-28-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:43:34 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:43:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.667	0.0	0.645	70613	2.08		89.3	131	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.676	1.676	0.0	1.005	1214719	0.5038			461	M
298.90 > 99.00	1.676	1.676	0.0	1.005	521193		2.33(1.25-3.74)		262	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.228	0.002	0.862	3464392	2.21		88.4	54502	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	1559848	1.02			754	
363.00 > 169.00	2.230	2.230	0.0	1.000	603790		2.58(1.13-3.40)		4593	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.240	0.002	0.867	3966673	1.97		83.3	47990	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.242	0.0	1.000	13230965	6.76			3431	
399.00 > 99.00	2.242	2.242	0.0	1.000	4371833		3.03(1.50-4.49)		5186	
* 62 13C2-PFOA										
415.00 > 370.00	2.586	2.582	0.004		4007977	2.50			58104	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.586	2.582	0.004	1.000	5785022	3.66			2117	
413.00 > 169.00	2.586	2.582	0.004	1.000	3087014		1.87(0.84-2.52)		8150	
D 14 13C4 PFOA										
417.00 > 372.00	2.586	2.588	-0.002	1.000	3253076	2.12		84.8	39536	
D 18 13C4 PFOS										
503.00 > 80.00	2.951	2.947	0.004	1.141	2080743	1.49		62.2	1974	
D 19 13C5 PFNA										
468.00 > 423.00	2.945	2.947	-0.002	1.139	1995508	1.51		60.3	23123	
20 Perfluorononanoic acid										
463.00 > 419.00	2.951	2.948	0.003	1.002	599455	0.6578			433	
463.00 > 169.00	2.951	2.948	0.003	1.002	149182		4.02(1.90-5.69)		1231	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.951	2.948	0.003	1.000	93828468	97.5			55875	E
499.00 > 99.00	2.951	2.948	0.003	1.000	31688111		2.96(2.31-6.93)		109063	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

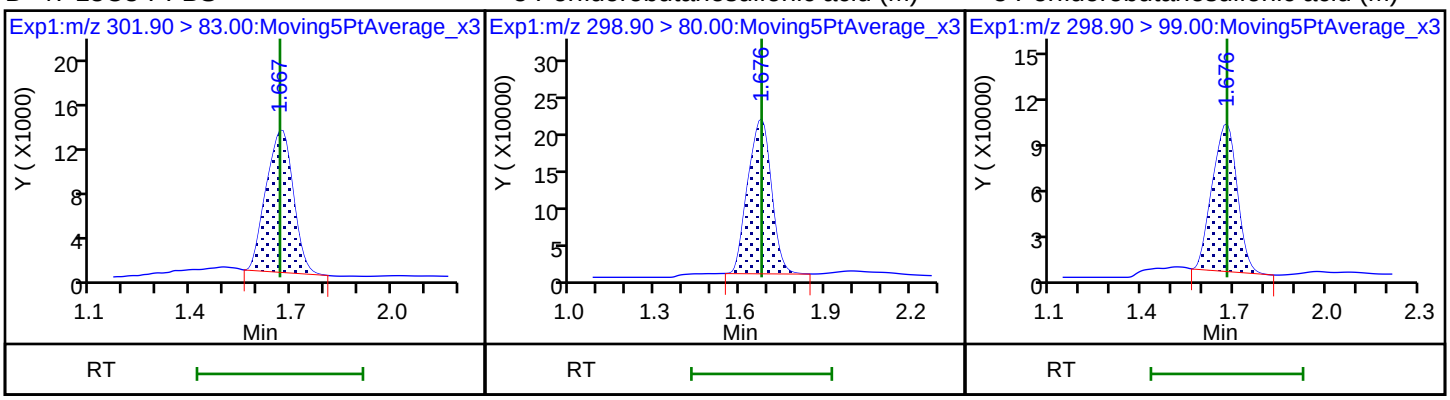
M - Manually Integrated

Report Date: 30-Jul-2018 15:43:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

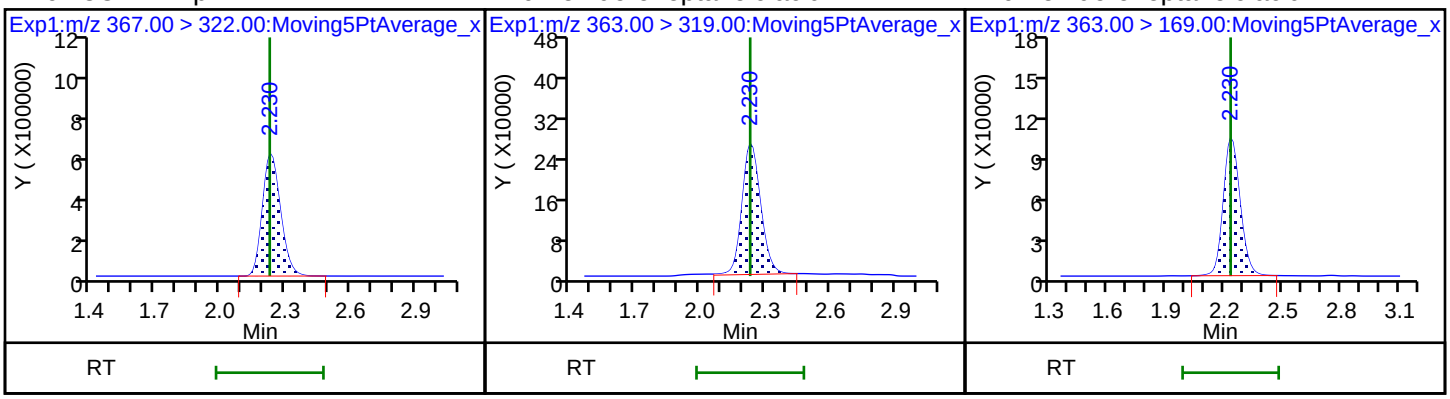
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_021.d				
Injection Date:	29-Jul-2018 01:55:47	Instrument ID:	A8_N		
Lims ID:	320-41149-A-28-A	Lab Sample ID:	320-41149-28		
Client ID:	GRE08-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

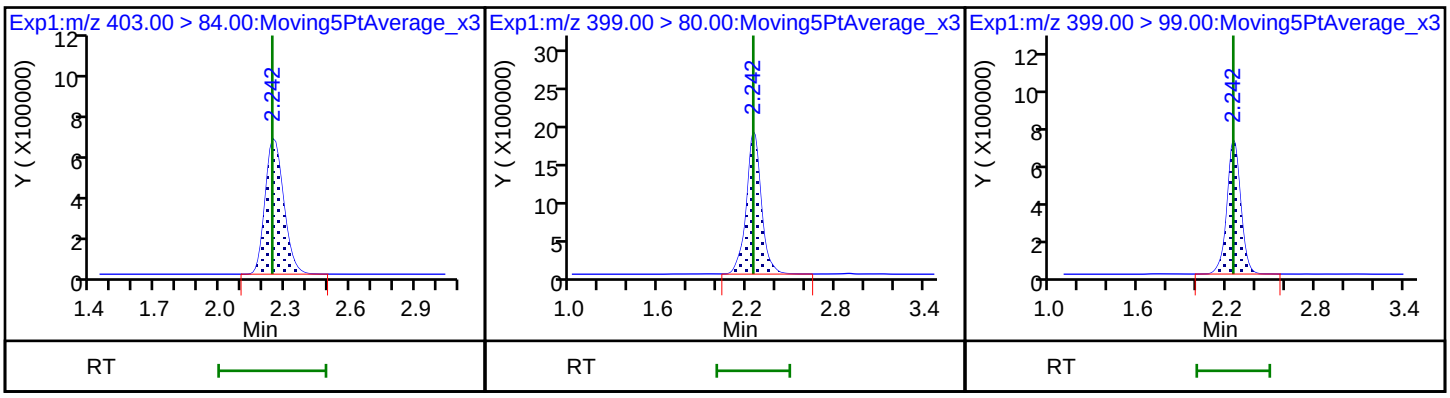
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (M) | 5 Perfluorobutanesulfonic acid (M)



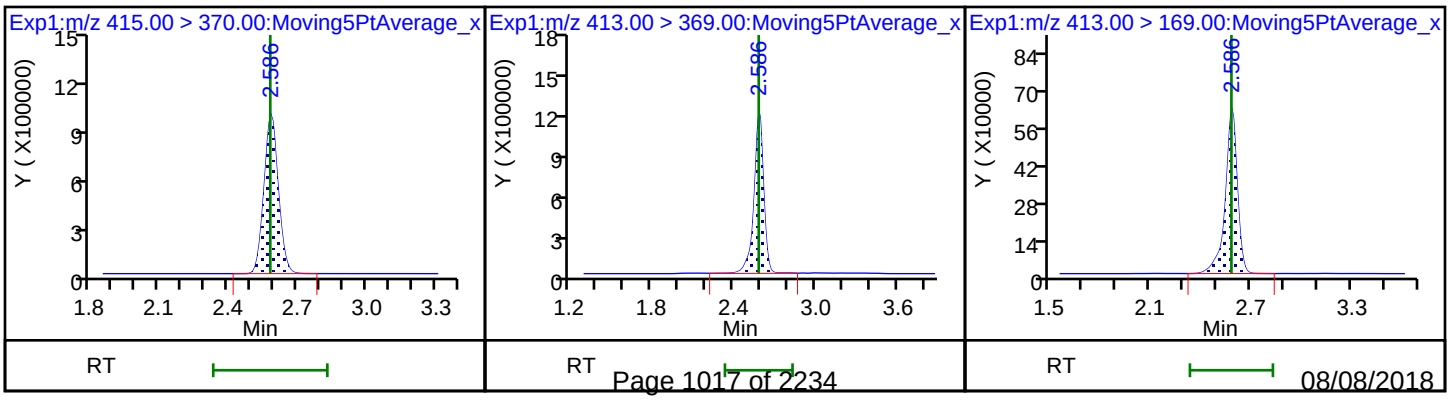
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



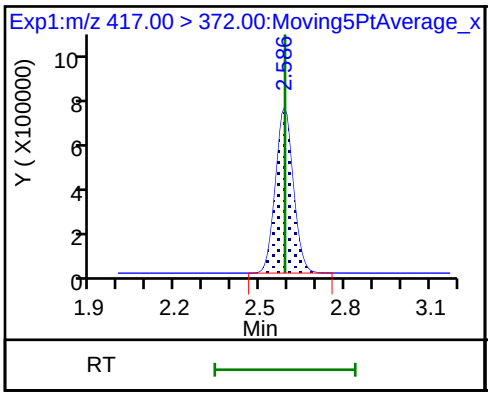
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



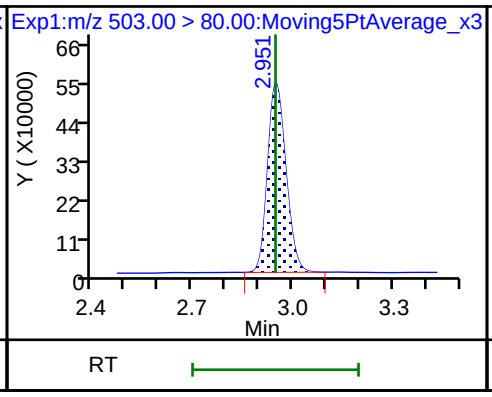
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



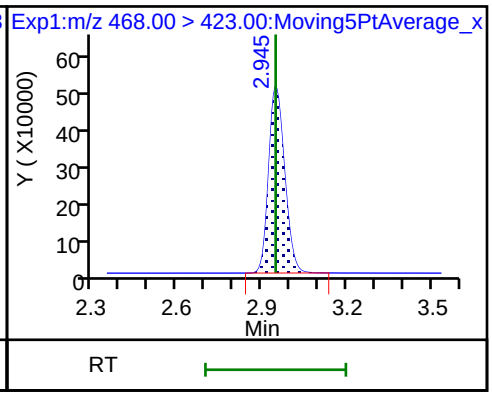
D 14 13C4 PFOA



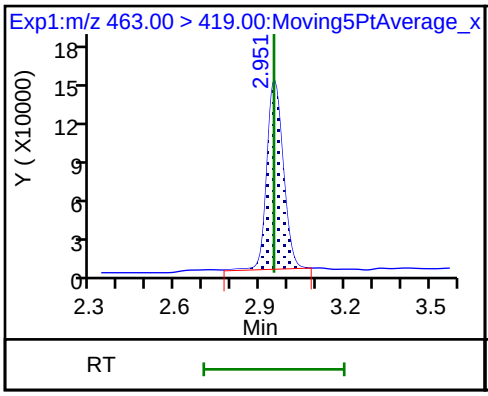
D 18 13C4 PFOS



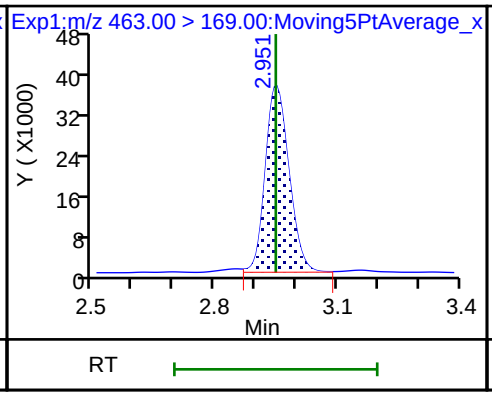
D 19 13C5 PFNA



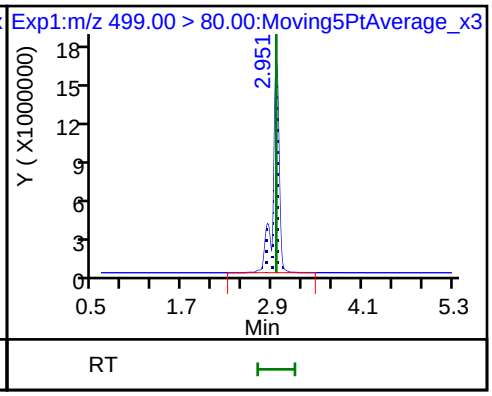
20 Perfluorononanoic acid



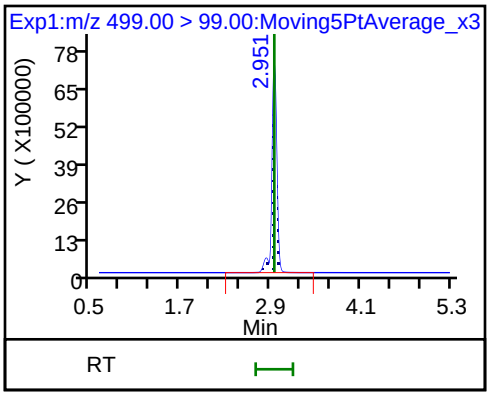
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

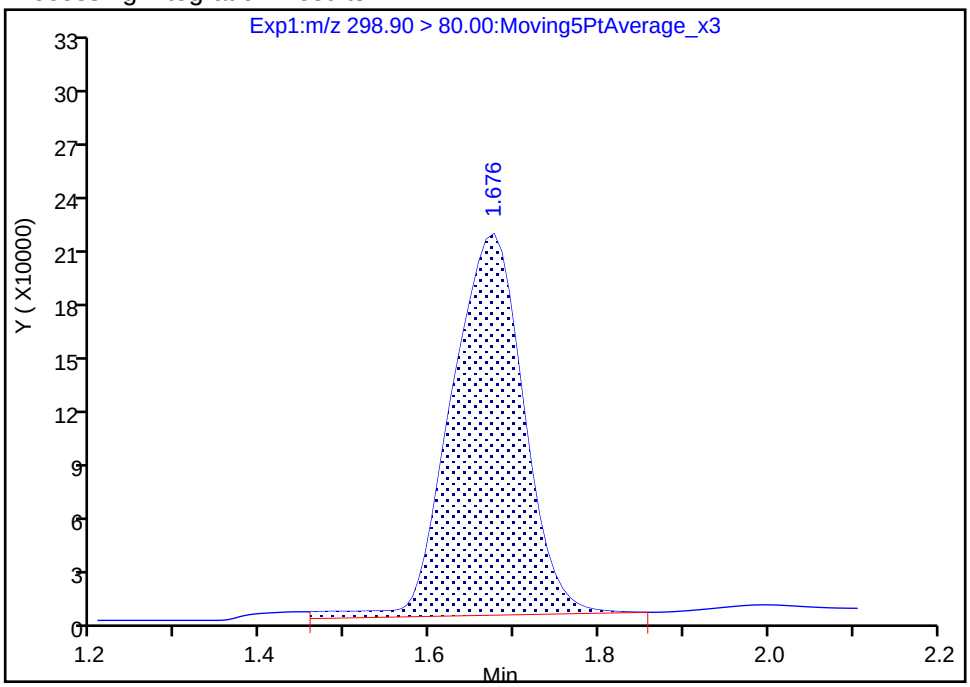
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_021.d				
Injection Date:	29-Jul-2018 01:55:47	Instrument ID:	A8_N		
Lims ID:	320-41149-A-28-A	Lab Sample ID:	320-41149-28		
Client ID:	GRE08-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

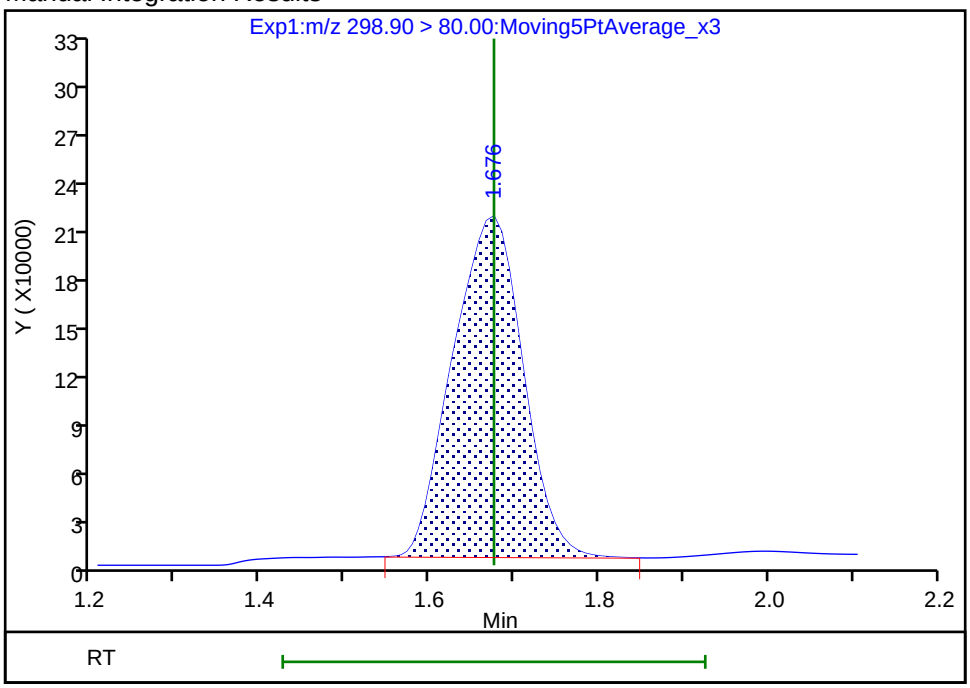
Processing Integration Results

RT: 1.68
Area: 1263416
Amount: 0.523964
Amount Units: ng/ml



Manual Integration Results

RT: 1.68
Area: 1214719
Amount: 0.503769
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:41:27

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

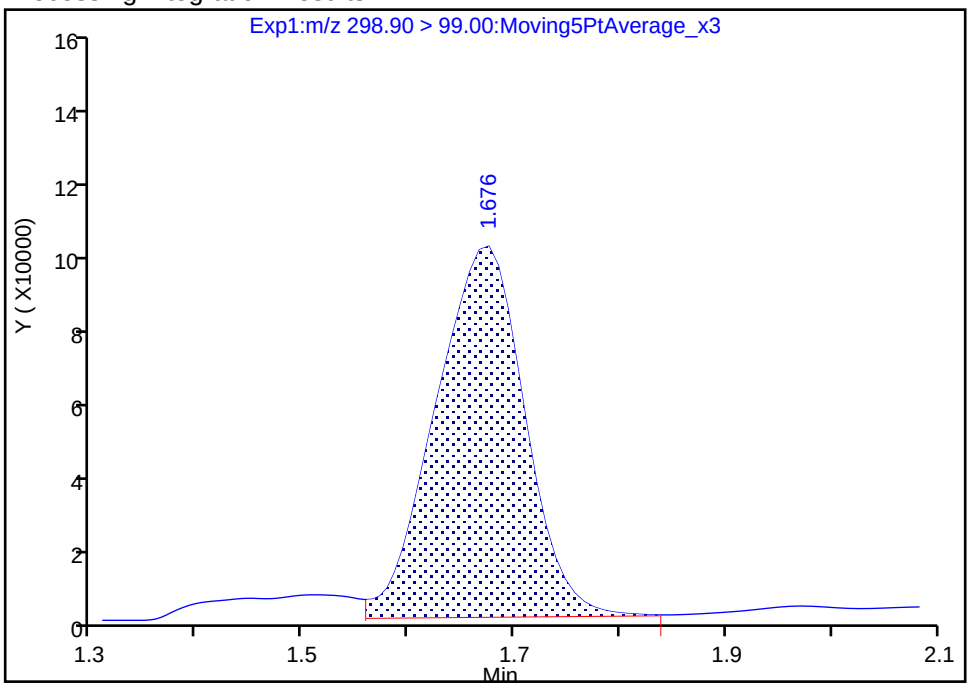
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_021.d				
Injection Date:	29-Jul-2018 01:55:47	Instrument ID:	A8_N		
Lims ID:	320-41149-A-28-A	Lab Sample ID:	320-41149-28		
Client ID:	GRE08-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

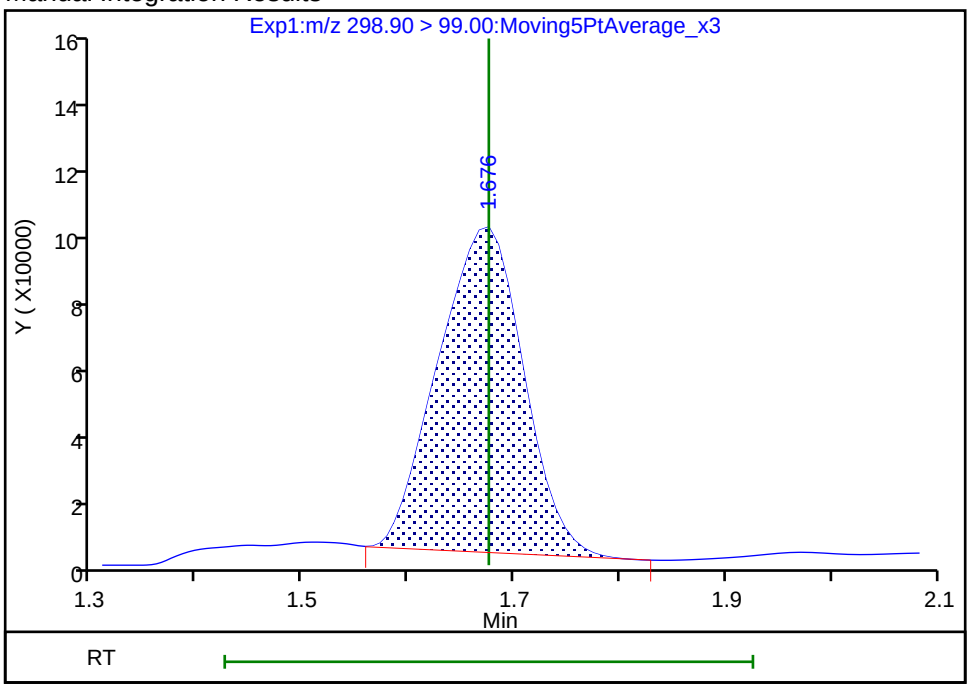
Processing Integration Results

RT: 1.68
Area: 562518
Amount: 0.523964
Amount Units: ng/ml



Manual Integration Results

RT: 1.68
Area: 521193
Amount: 0.503769
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:42:41

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB1-01 DL | Lab Sample ID: 320-41149-28 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_011.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 13:25

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.01(g) | Date Analyzed: 07/31/2018 18:28

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 50

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 3.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*10*	*U M*	*16*	10	*4.0*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*8.2*	*J D*	*16*	10	*5.2*
375-95-1	*Perfluorononanoic acid (PFNA)*	*10*	*U*	*16*	10	*4.2*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*9.3*	*U*	*21*	9.3	*3.0*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*15*	*J D*	*16*	10	*3.2*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	310	D	52	26	12

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	73	M	50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	86		50-150
STL00995	13C5 PFNA	83		50-150
STL00994	18O2 PFHxS	70		50-150
STL00991	13C4 PFOS	70		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_011.d
Lims ID: 320-41149-A-28-A
Client ID: GRE08-SB1-01
Sample Type: Client
Inject. Date: 31-Jul-2018 18:28:42 ALS Bottle#: 5 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 50.0000
Sample Info: 320-41149-a-28-a 50X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:34:18 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:34:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.672	1.666	0.006	1.005	24793	0.009678			98.0	
298.90 > 99.00	1.672	1.666	0.006	1.005	12774		1.94(1.25-3.74)		33.9	
D 47 13C3-PFBS										M
301.90 > 83.00	1.663	1.670	-0.008	0.645	1537	0.0338		72.7	5.7	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.223	0.003	0.863	73346	0.0443		88.7	2507	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.226	2.229	-0.003	1.000	32029	0.0192			13.3	M
363.00 > 169.00	2.226	2.229	-0.003	1.000	11964		2.68(1.13-3.40)		96.4	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.241	-0.004	1.000	287811	0.1416			861	
399.00 > 99.00	2.237	2.241	-0.004	1.000	92978		3.10(1.50-4.49)		135	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.248	-0.011	0.868	82750	0.0329		69.6	3577	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.578	0.001		87953	0.0500			3346	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.578	0.001	1.000	135179	0.0795			92.9	
413.00 > 169.00	2.579	2.578	0.001	1.000	77605		1.74(0.84-2.52)		325	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.586	-0.007	1.000	72926	0.0432		86.3	3316	
20 Perfluorononanoic acid										
463.00 > 419.00	2.946	2.946	0.0	1.002	19618	0.0147			21.9	
463.00 > 169.00	2.946	2.946	0.0	1.002	4056		4.84(1.90-5.69)		110	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.946	2.946	0.0	1.000	4340214	3.01			27923	
499.00 > 99.00	2.946	2.946	0.0	1.000	1042280		4.16(2.31-6.93)		6141	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.952	-0.006	1.142	60535	0.0335		70.1	857	
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.952	-0.012	1.140	61864	0.0414		82.8	3469	

QC Flag Legend

Review Flags

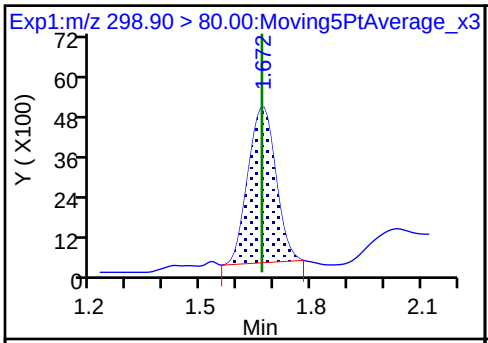
M - Manually Integrated

Report Date: 01-Aug-2018 12:34:20 Chrom Revision: 2.3 19-Jul-2018 15:14:50

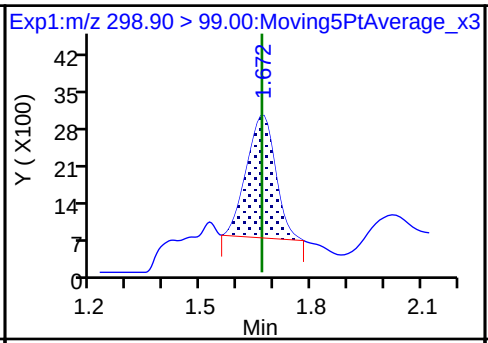
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_011.d				
Injection Date:	31-Jul-2018 18:28:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-28-A	Lab Sample ID:	320-41149-28		
Client ID:	GRE08-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	5	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

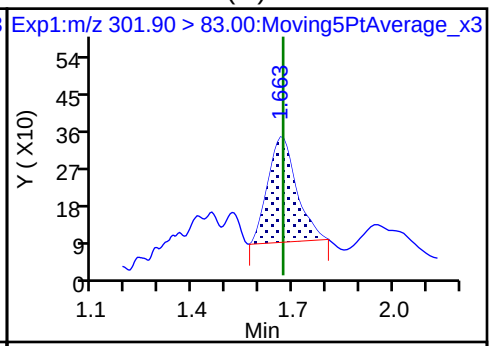
5 Perfluorobutanesulfonic acid



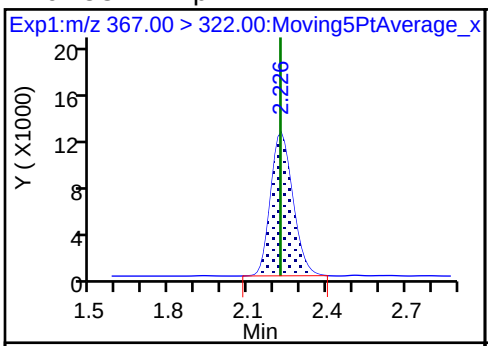
5 Perfluorobutanesulfonic acid



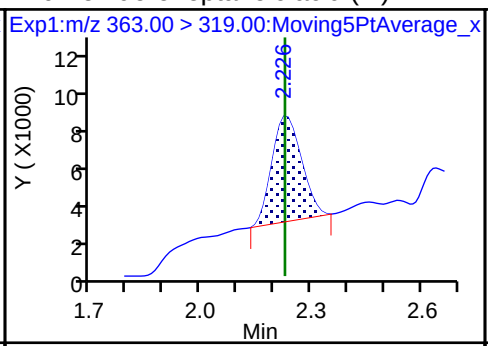
D 47 13C3-PFBS (M)



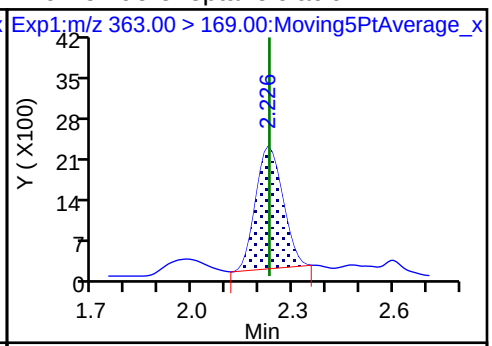
D 9 13C4-PFHpA



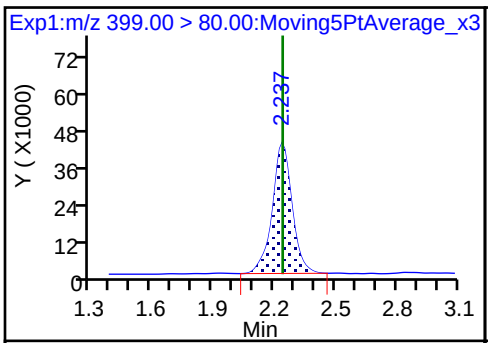
10 Perfluoroheptanoic acid (M)



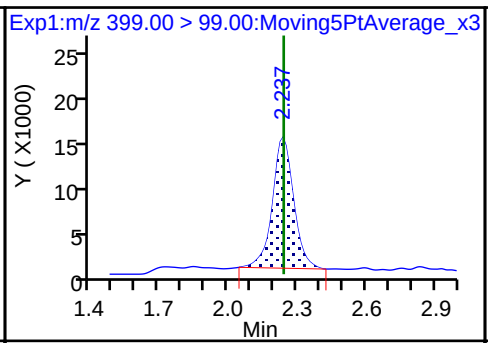
10 Perfluoroheptanoic acid



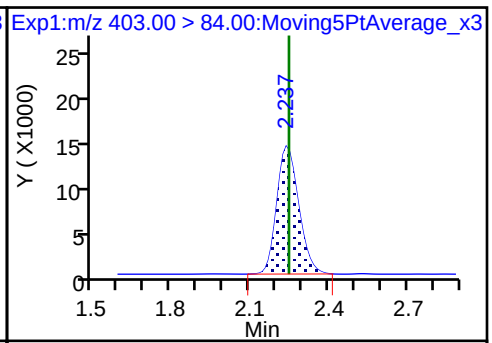
8 Perfluorohexanesulfonic acid



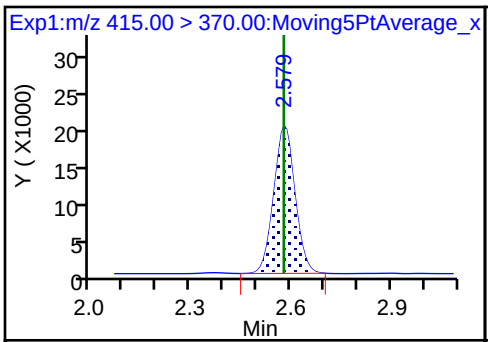
8 Perfluorohexanesulfonic acid



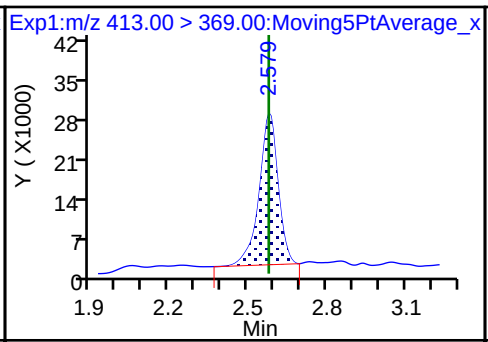
D 11 18O2 PFHxS



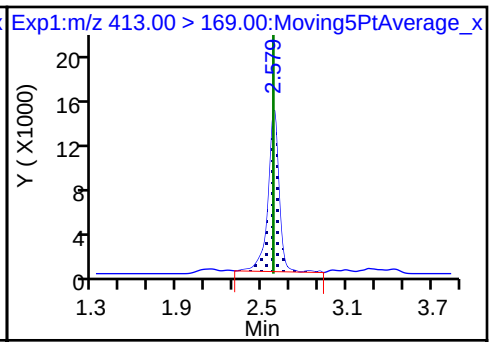
* 62 13C2-PFOA



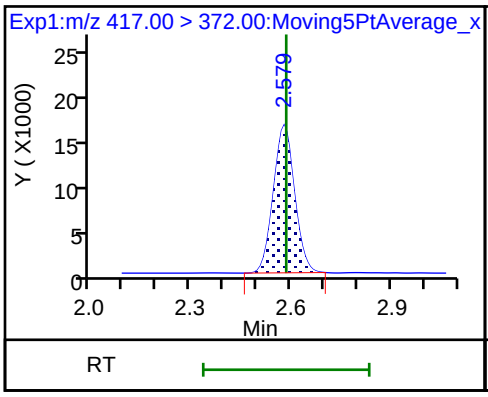
15 Perfluorooctanoic acid



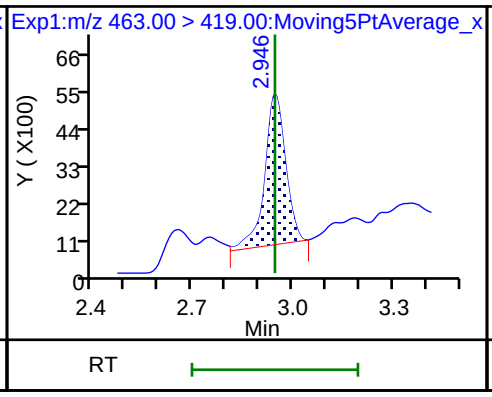
15 Perfluorooctanoic acid



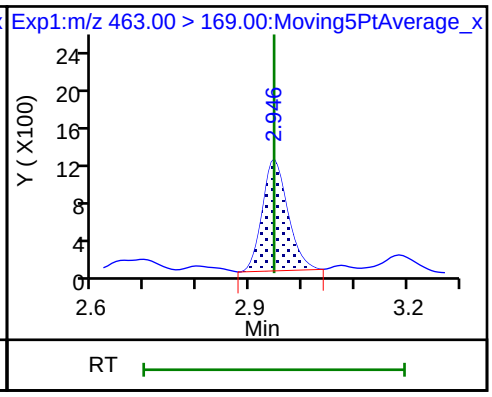
D 14 13C4 PFOA



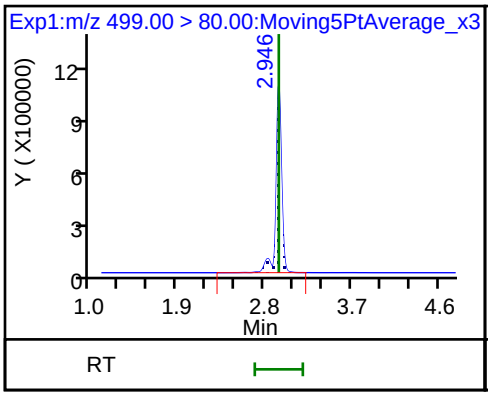
20 Perfluorononanoic acid



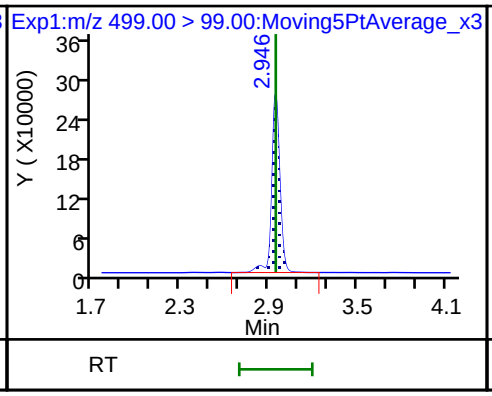
20 Perfluorononanoic acid



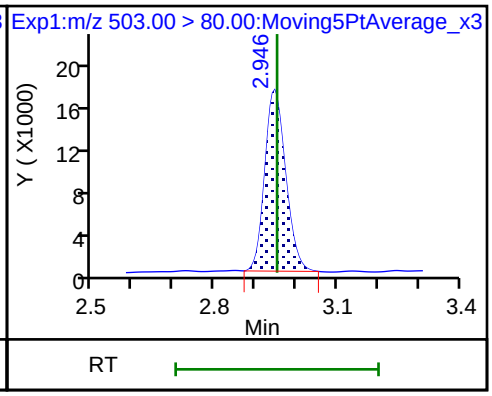
17 Perfluorooctane sulfonic acid



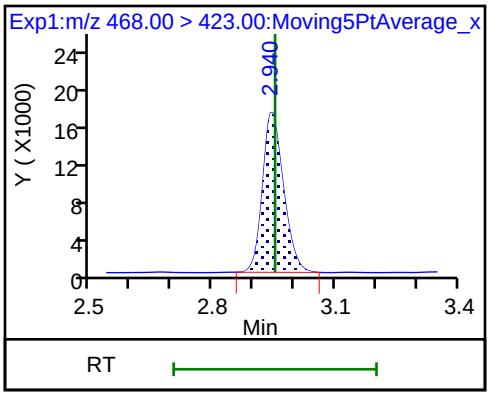
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

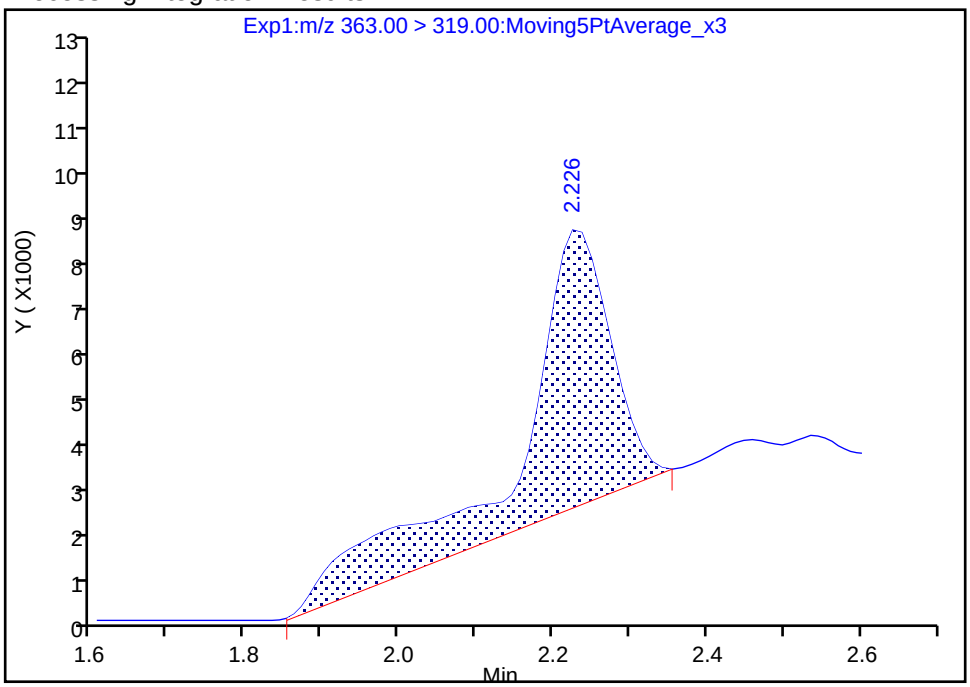
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_011.d				
Injection Date:	31-Jul-2018 18:28:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-28-A	Lab Sample ID:	320-41149-28		
Client ID:	GRE08-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	5	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

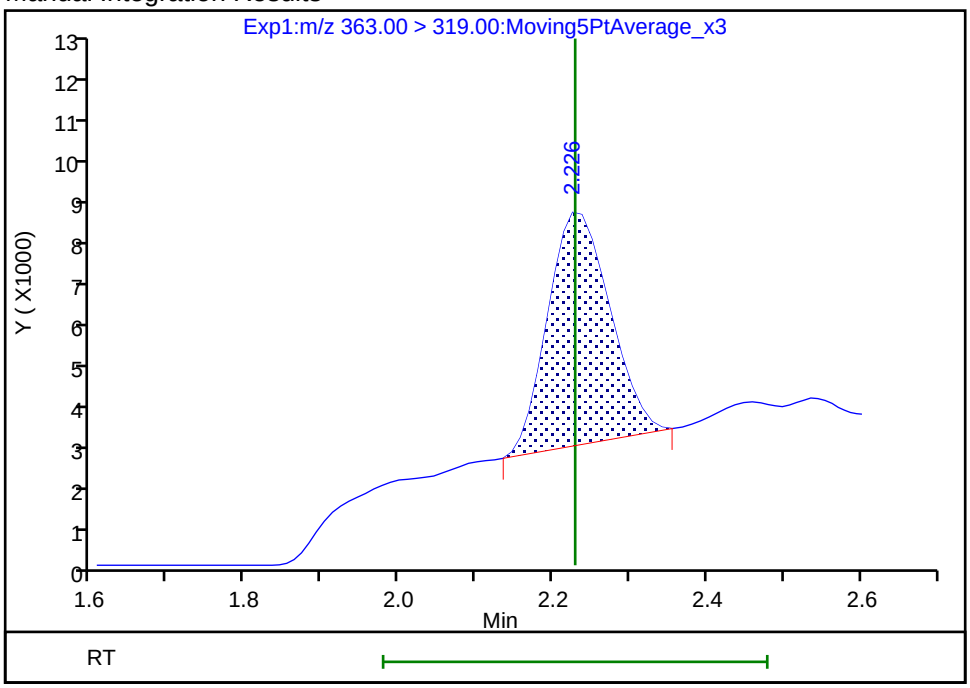
Processing Integration Results

RT: 2.23
Area: 51332
Amount: 0.030761
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 32029
Amount: 0.019193
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:34:10

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

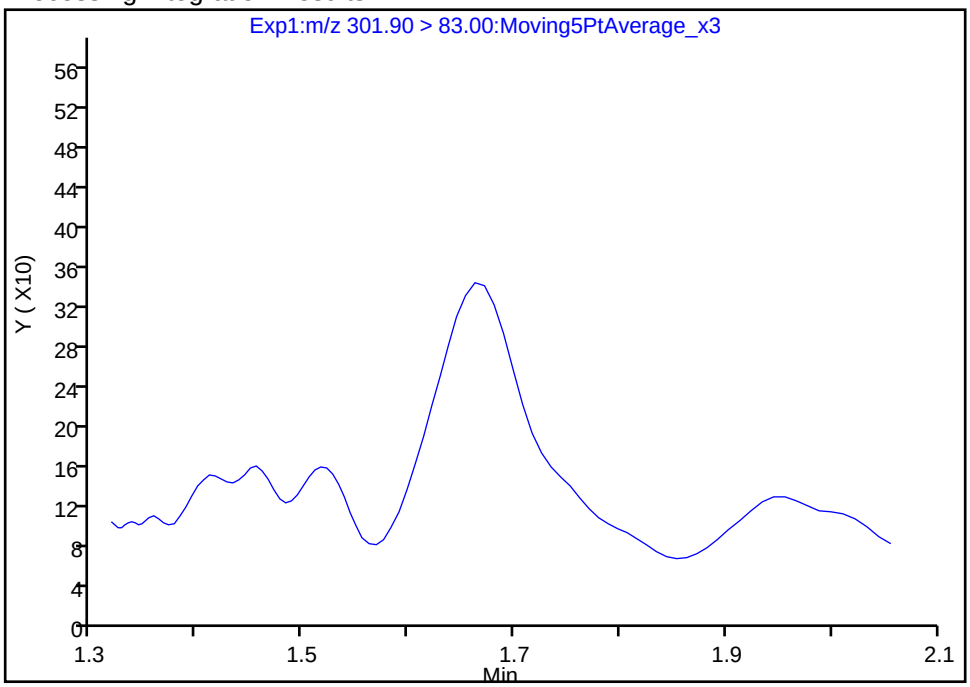
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_011.d				
Injection Date:	31-Jul-2018 18:28:42	Instrument ID:	A8_N		
Lims ID:	320-41149-A-28-A	Lab Sample ID:	320-41149-28		
Client ID:	GRE08-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	5	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

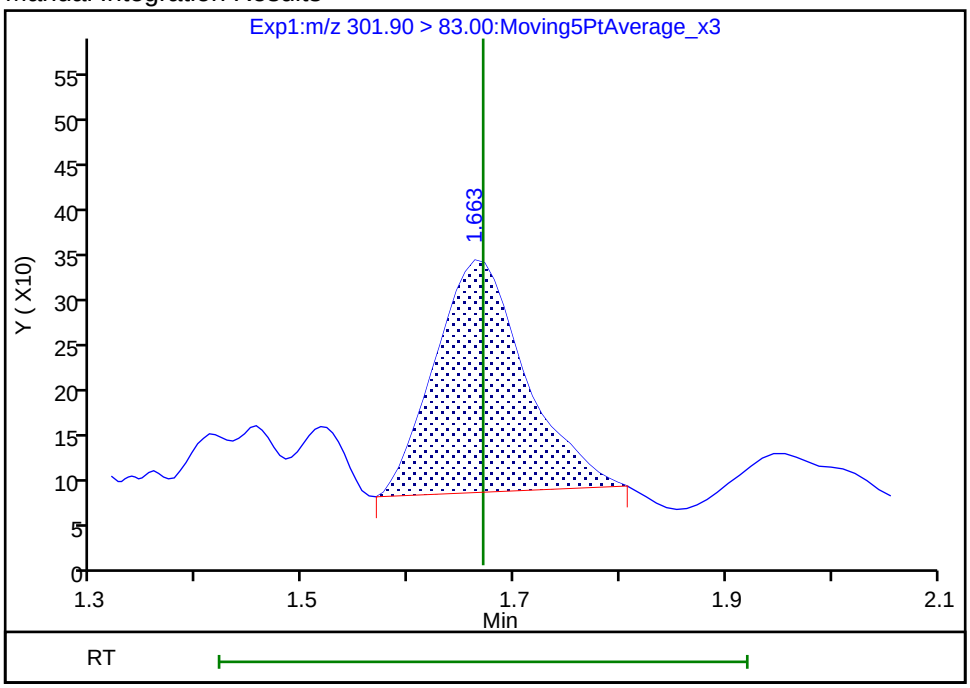
Processing Integration Results

Not Detected
Expected RT: 1.67



Manual Integration Results

RT: 1.66
Area: 1537
Amount: 0.033814
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:33:54
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB2-01 | Lab Sample ID: 320-41149-29

Matrix: Solid | Lab File ID: 2018.07.28LLB_022.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 13:55

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.00(g) | Date Analyzed: 07/29/2018 02:03

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 2.1 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.7		0.31	0.20	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	6.7		0.31	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.3	M	0.31	0.20	0.083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.82	M	0.41	0.18	0.060
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	16		0.31	0.20	0.063
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*300*	*E*	*1.0*	0.51	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	86		50-150
STL01892	13C4-PFHpA	83		50-150
STL00990	13C4 PFOA	86		50-150
STL00995	13C5 PFNA	45	Q	50-150
STL00994	18O2 PFHxS	78		50-150
STL00991	13C4 PFOS	45	Q	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_022.d
Lims ID: 320-41149-A-29-A
Client ID: GRE08-SB2-01
Sample Type: Client
Inject. Date: 29-Jul-2018 02:03:38 ALS Bottle#: 15 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-29-
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:47:33 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:47:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.667	-0.001	0.646	68534	1.99		85.5	129	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.675	1.676	-0.001	1.005	937467	0.4006			658	M
298.90 > 99.00	1.675	1.676	-0.001	1.005	382940		2.45(1.25-3.74)		292	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.864	3300845	2.08		83.1	62519	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.230	-0.001	1.000	1207360	0.8294			818	
363.00 > 169.00	2.229	2.230	-0.001	1.000	443050		2.73(1.13-3.40)		3357	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.868	3752608	1.84		77.8	80242	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.242	-0.001	1.000	14899437	8.05			7601	
399.00 > 99.00	2.241	2.242	-0.001	1.000	4840666		3.08(1.50-4.49)		7464	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.582	-0.002		4060159	2.50			65989	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.582	-0.002	1.000	5339644	3.29			2044	
413.00 > 169.00	2.580	2.582	-0.002	1.000	2807613		1.90(0.84-2.52)		7262	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3348277	2.16		86.2	47830	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.947	0.001	1.142	1525912	1.08		45.0	2479	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.947	0.001	1.142	1511127	1.13		45.1	18479	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.948	2.948	0.0	1.000	443040	0.6420			307	M
463.00 > 169.00	2.948	2.948	0.0	1.000	115450		3.84(1.90-5.69)		738	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.948	2.948	0.0	1.000	105244942	149.2			2367913	E
499.00 > 99.00	2.948	2.948	0.0	1.000	40866553		2.58(2.31-6.93)		333817	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

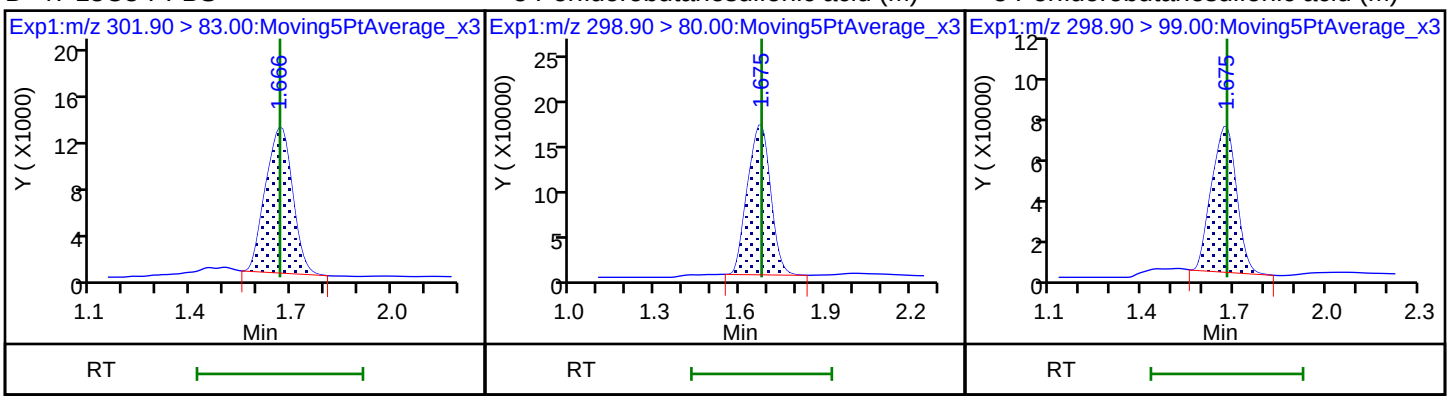
M - Manually Integrated

Report Date: 30-Jul-2018 15:47:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

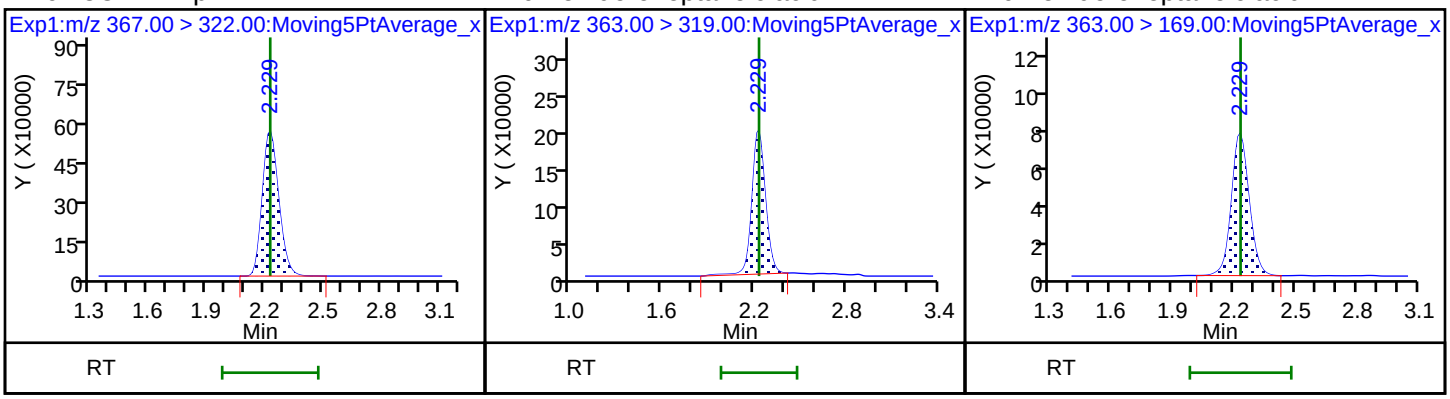
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_022.d				
Injection Date:	29-Jul-2018 02:03:38	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

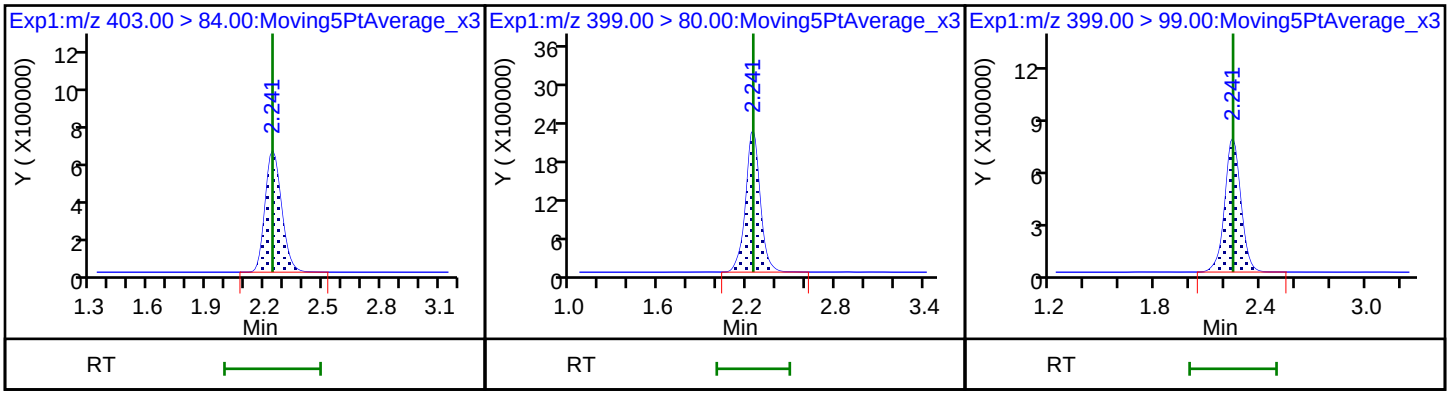
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (M) | 5 Perfluorobutanesulfonic acid (M)



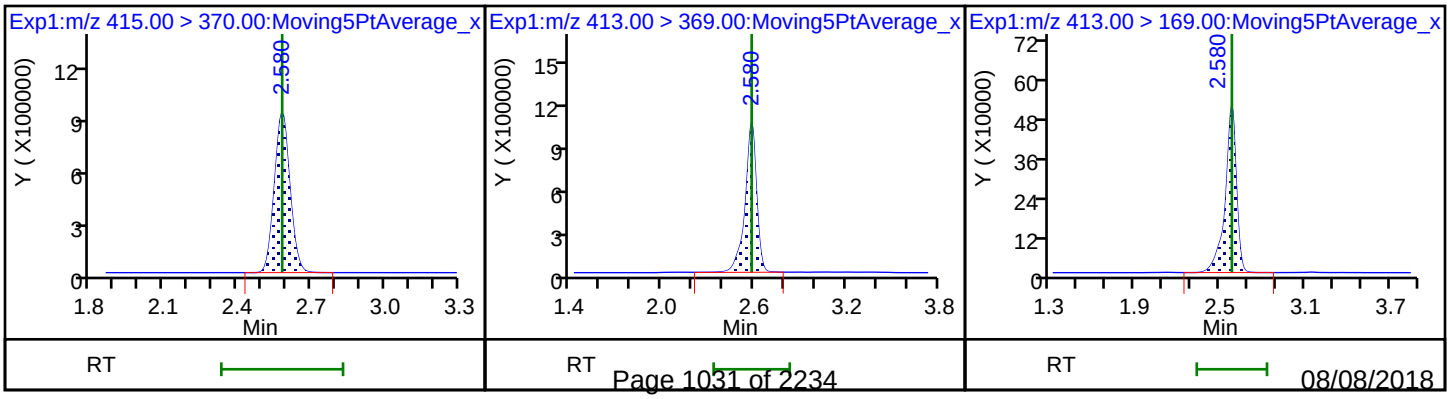
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



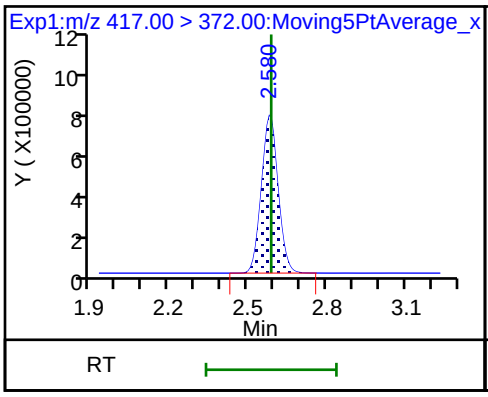
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



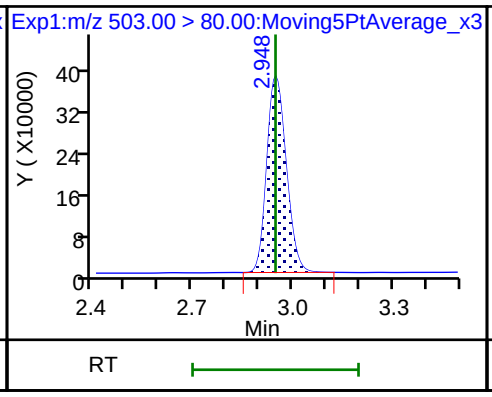
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



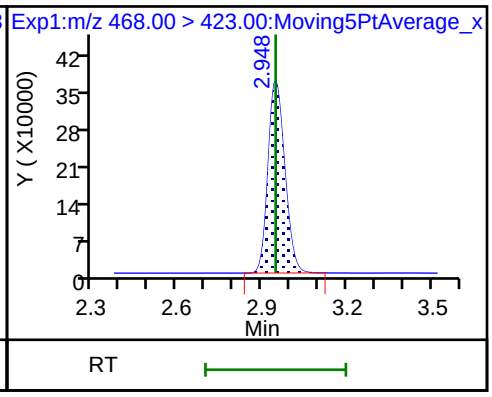
D 14 13C4 PFOA



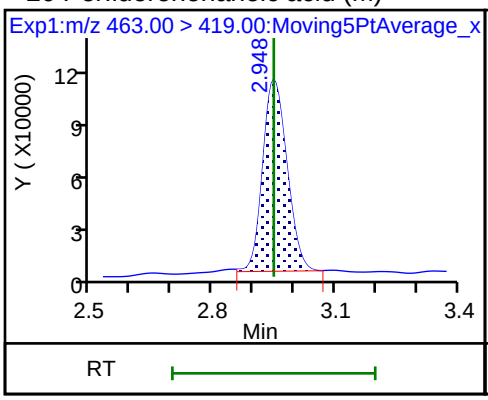
D 18 13C4 PFOS



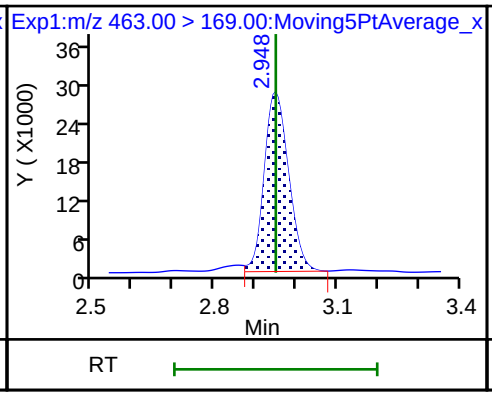
D 19 13C5 PFNA



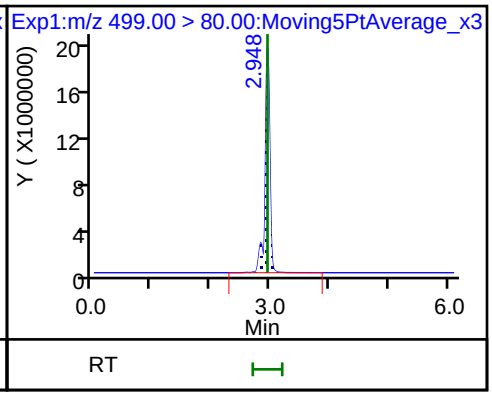
20 Perfluorononanoic acid (M)



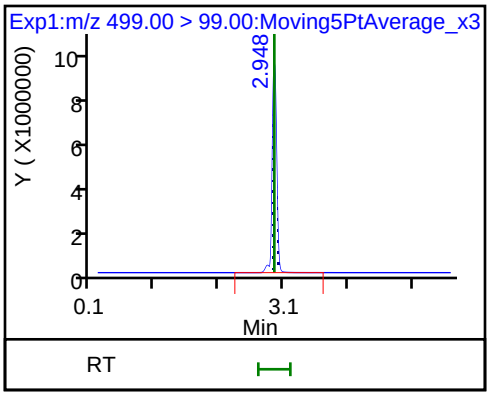
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

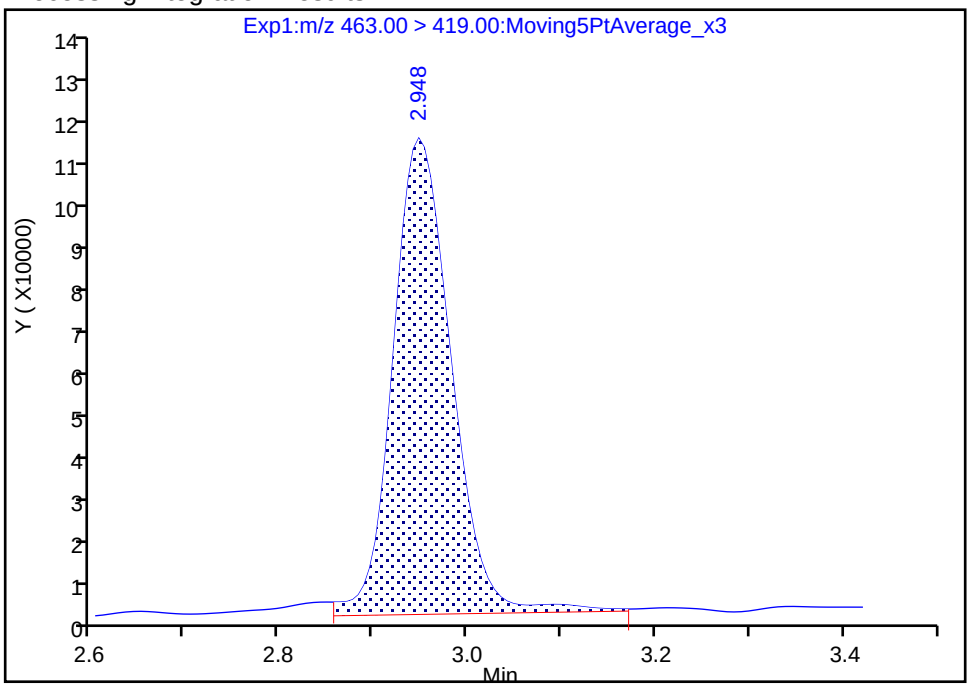
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_022.d				
Injection Date:	29-Jul-2018 02:03:38	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

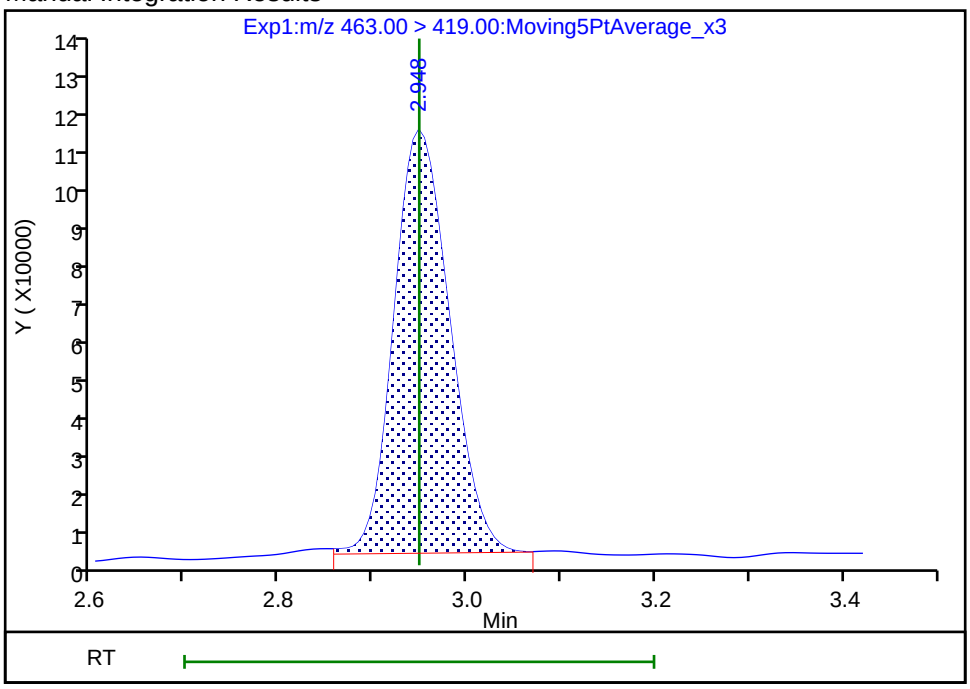
Processing Integration Results

RT: 2.95
Area: 471532
Amount: 0.683260
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 443040
Amount: 0.641974
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:47:29

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

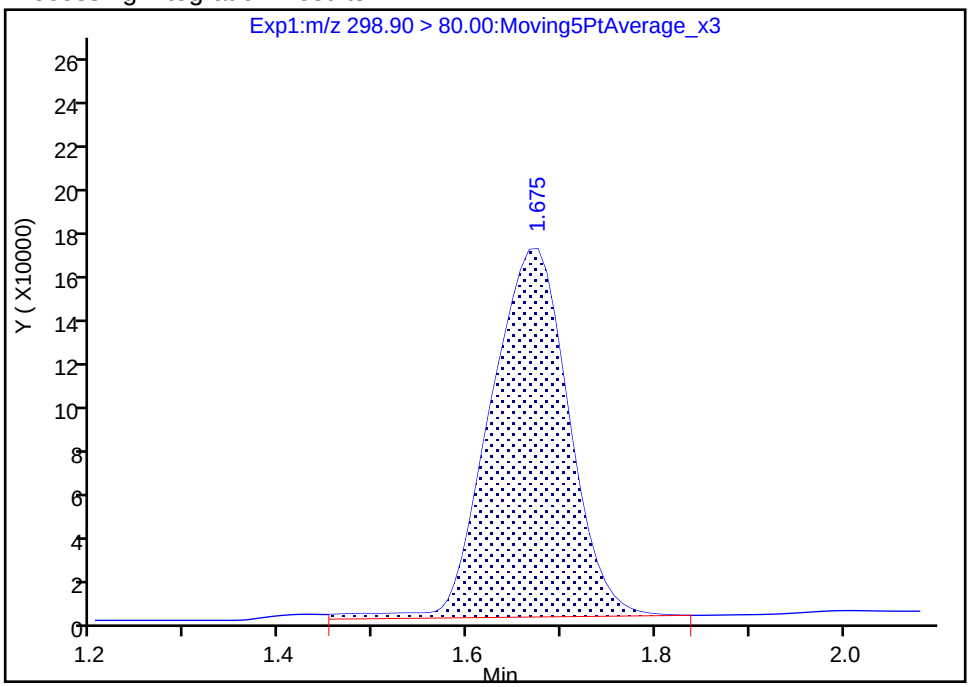
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_022.d				
Injection Date:	29-Jul-2018 02:03:38	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

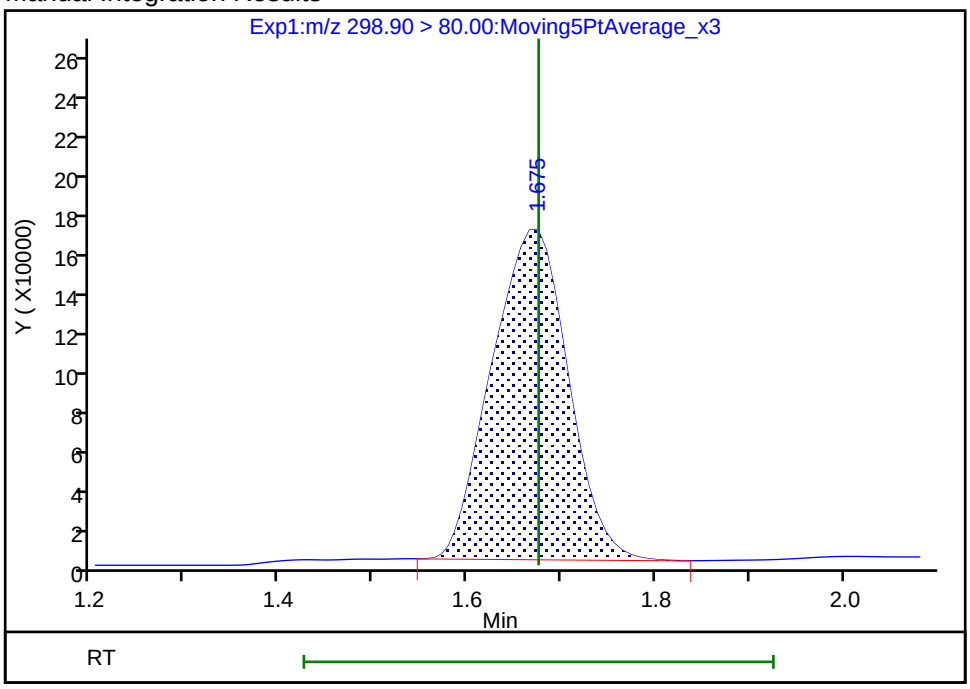
Processing Integration Results

RT: 1.67
Area: 968866
Amount: 0.413997
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 937467
Amount: 0.400581
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:43:50

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

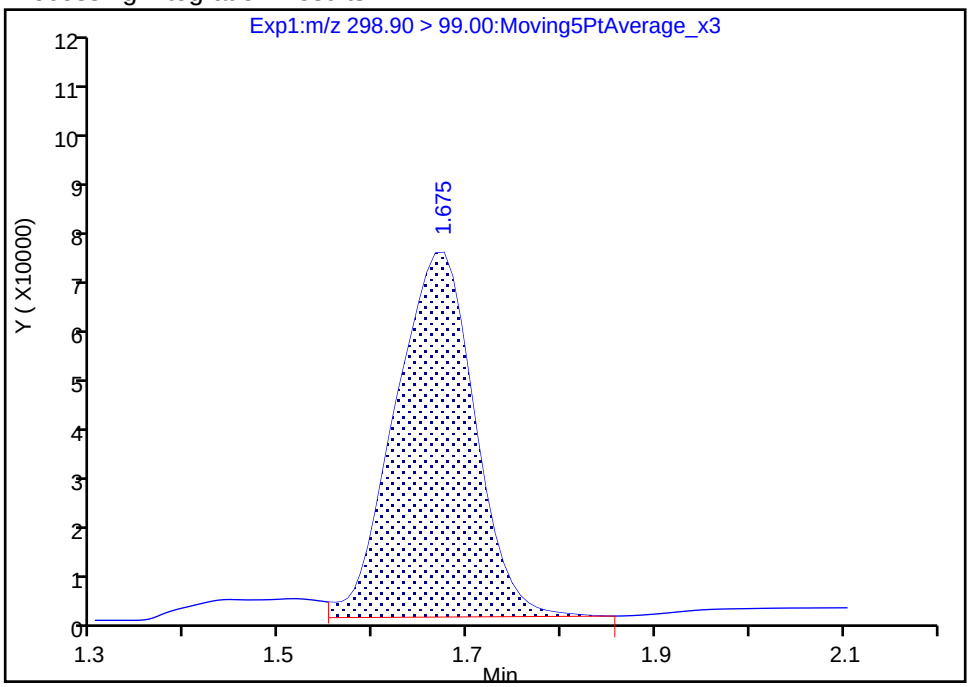
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_022.d				
Injection Date:	29-Jul-2018 02:03:38	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

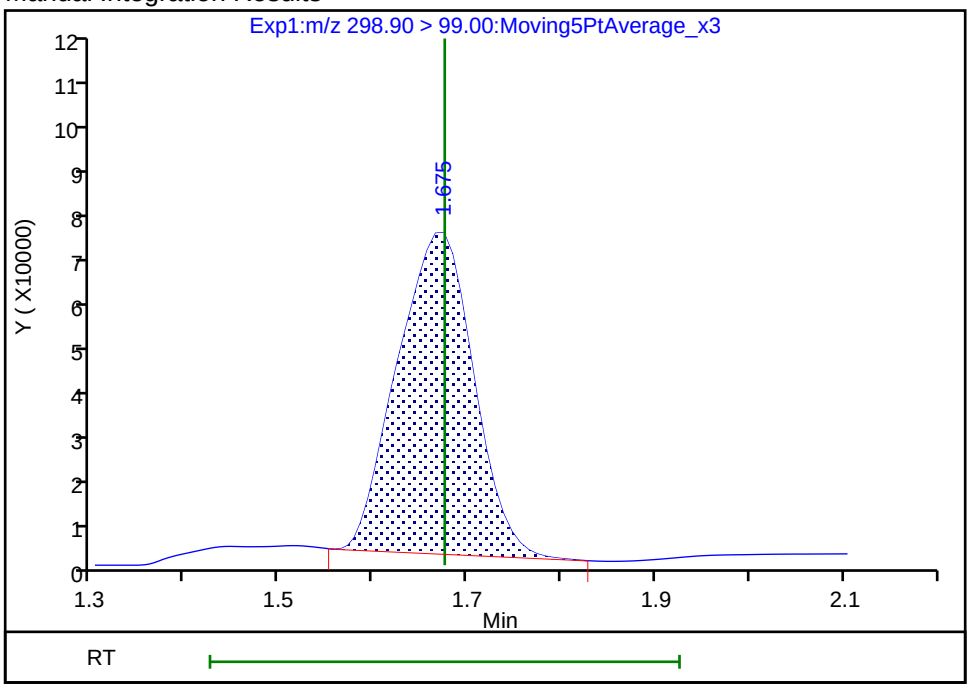
Processing Integration Results

RT: 1.67
Area: 407964
Amount: 0.413997
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 382940
Amount: 0.400581
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:43:57

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB2-01 DL | Lab Sample ID: 320-41149-29 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_012.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 13:55

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.00(g) | Date Analyzed: 07/31/2018 18:36

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 50

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 2.1 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*10*	*U M*	*15*	10	*4.0*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*6.7*	*J D*	*15*	10	*5.1*
375-95-1	*Perfluorononanoic acid (PFNA)*	*10*	*U*	*15*	10	*4.1*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*9.2*	*U*	*20*	9.2	*3.0*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*16*	*D*	*15*	10	*3.2*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	600	D M	51	26	12

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	83	M	50-150
STL01892	13C4-PFHpA	79		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	73		50-150
STL00994	18O2 PFHxS	67		50-150
STL00991	13C4 PFOS	64		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_012.d
Lims ID: 320-41149-A-29-A
Client ID: GRE08-SB2-01
Sample Type: Client
Inject. Date: 31-Jul-2018 18:36:31 ALS Bottle#: 6 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 50.0000
Sample Info: 320-41149-a-29-a 50X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:36:50 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:36:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.666	0.009	1.005	20358	0.007266			87.3	
298.90 > 99.00	1.675	1.666	0.009	1.005	8903		2.29(1.25-3.74)		25.7	
D 47 13C3-PFBS										M
301.90 > 83.00	1.666	1.670	-0.004	0.644	1681	0.0386		83.0	6.6	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.223	0.006	0.861	62469	0.0394		78.8	2695	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.229	0.0	1.000	24374	0.0171			9.9	M
363.00 > 169.00	2.229	2.229	0.0	1.000	7809		3.12(1.13-3.40)		78.3	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.241	-0.001	1.000	304734	0.1614			1191	
399.00 > 99.00	2.240	2.241	-0.001	1.000	96966		3.14(1.50-4.49)		146	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.248	-0.008	0.866	76858	0.0319		67.5	2614	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.578	0.010		84244	0.0500			3845	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.578	0.010	1.000	105247	0.0653			68.9	
413.00 > 169.00	2.588	2.578	0.010	1.000	61596		1.71(0.84-2.52)		257	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.586	0.002	1.000	69173	0.0427		85.5	3172	
20 Perfluorononanoic acid										
463.00 > 419.00	2.953	2.946	0.007	1.000	17143	0.0151			22.8	
463.00 > 169.00	2.953	2.946	0.007	1.000	3701		4.63(1.90-5.69)		104	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.953	2.946	0.007	1.000	7412386	5.90			19431	M
499.00 > 99.00	2.953	2.946	0.007	1.000	1799028		4.12(2.31-6.93)		14680	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.953	2.952	0.001	1.141	52647	0.0304		63.7	902	
D 19 13C5 PFNA										
468.00 > 423.00	2.953	2.952	0.001	1.141	52567	0.0367		73.5	2822	

QC Flag Legend

Review Flags

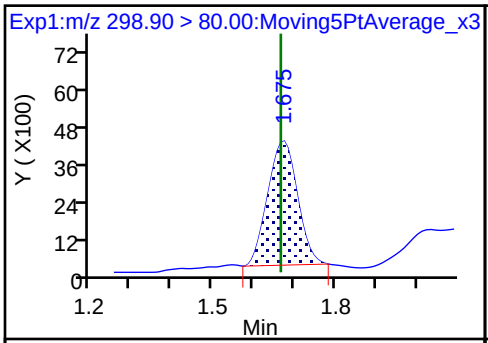
M - Manually Integrated

Report Date: 01-Aug-2018 12:36:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

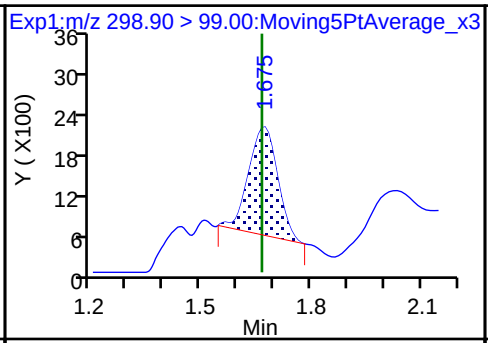
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_012.d				
Injection Date:	31-Jul-2018 18:36:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

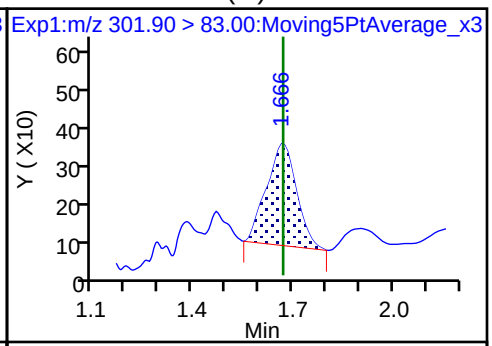
5 Perfluorobutanesulfonic acid



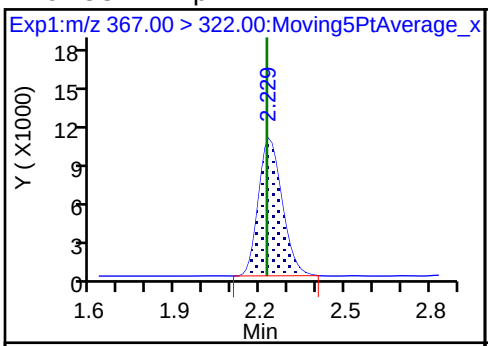
5 Perfluorobutanesulfonic acid



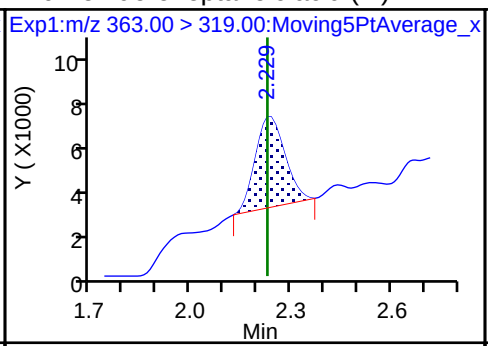
D 47 13C3-PFBS (M)



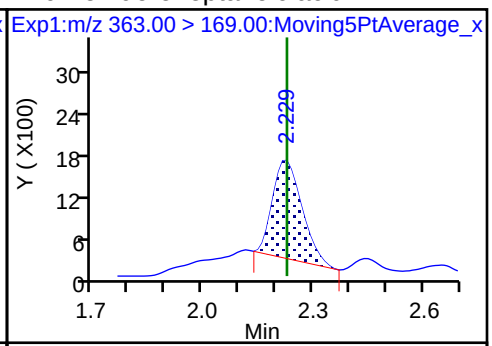
D 9 13C4-PFHpA



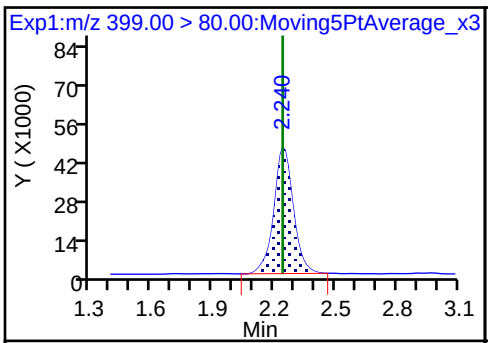
10 Perfluoroheptanoic acid (M)



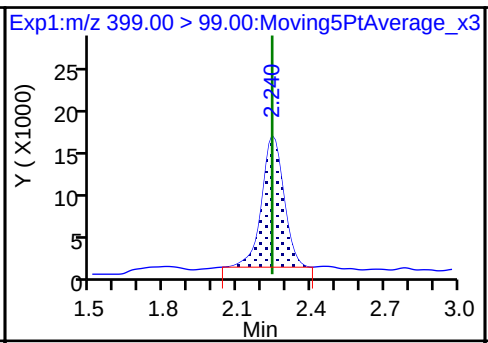
10 Perfluoroheptanoic acid



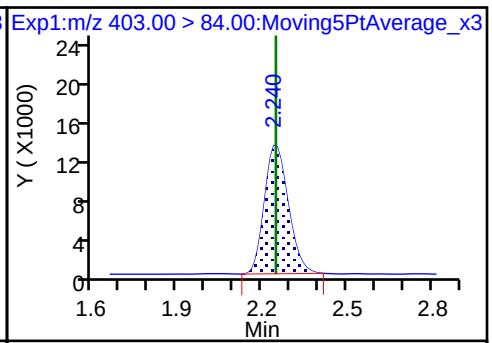
8 Perfluorohexanesulfonic acid



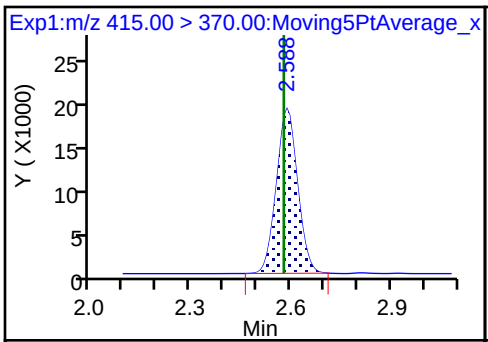
8 Perfluorohexanesulfonic acid



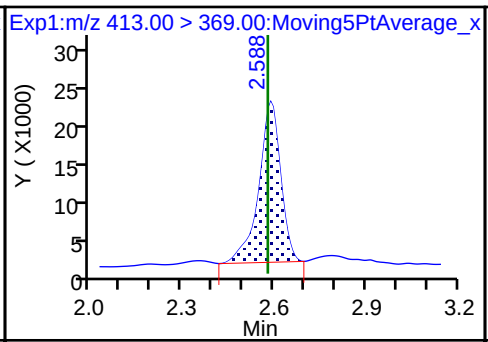
D 11 18O2 PFHxS



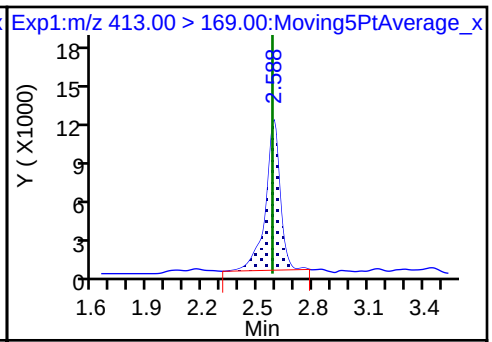
* 62 13C2-PFOA



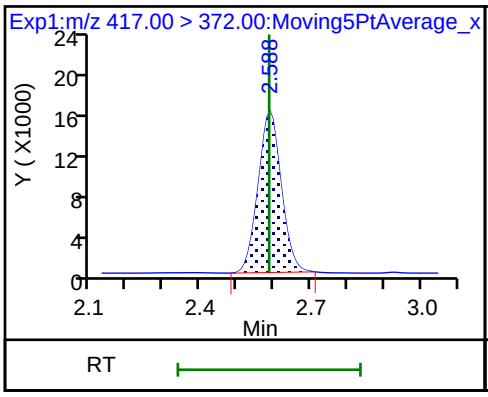
15 Perfluorooctanoic acid



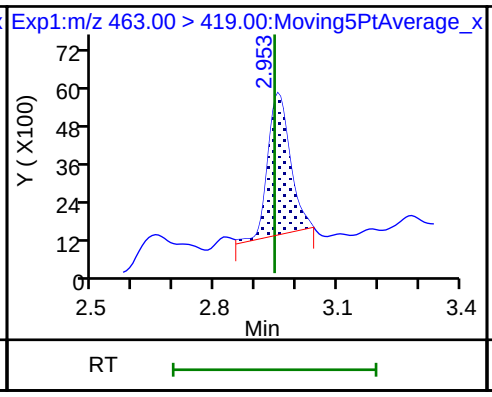
15 Perfluorooctanoic acid



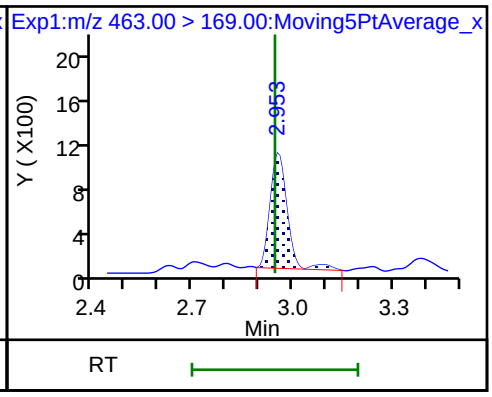
D 14 13C4 PFOA



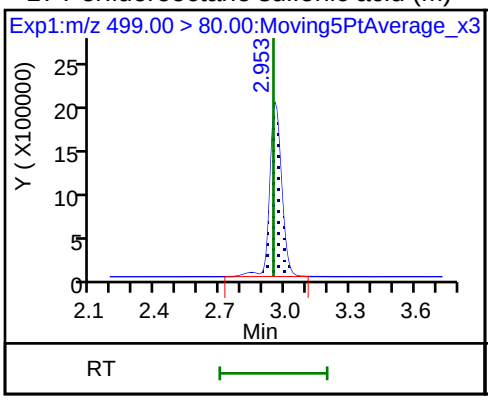
20 Perfluorononanoic acid



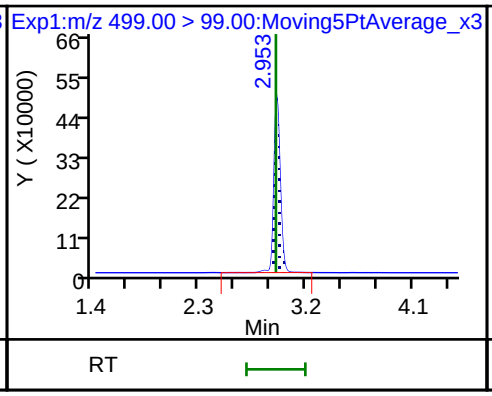
20 Perfluorononanoic acid



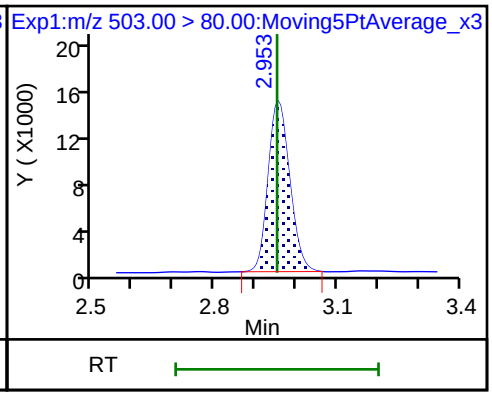
17 Perfluorooctane sulfonic acid (M)



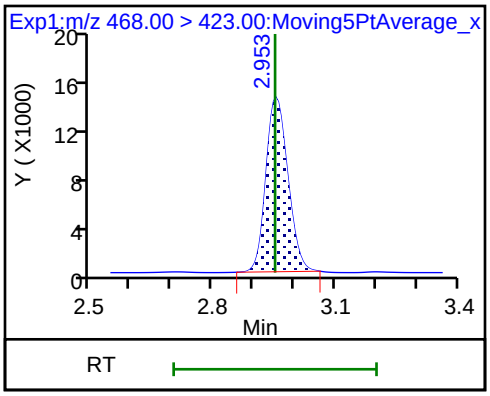
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

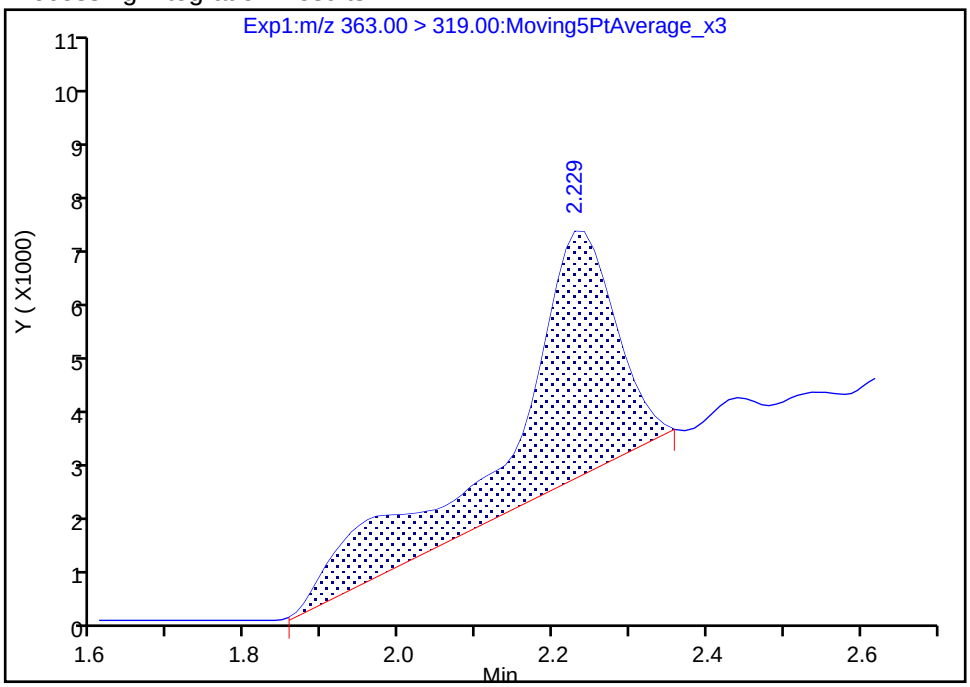
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_012.d				
Injection Date:	31-Jul-2018 18:36:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

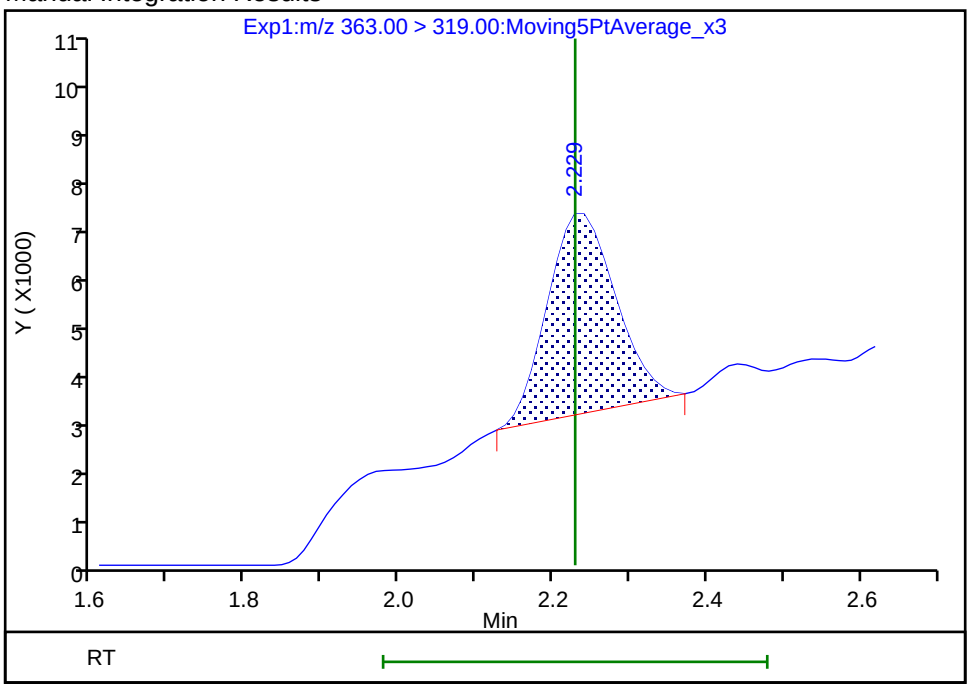
Processing Integration Results

RT: 2.23
Area: 41804
Amount: 0.029413
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 24374
Amount: 0.017149
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:36:36

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_012.d				
Injection Date:	31-Jul-2018 18:36:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

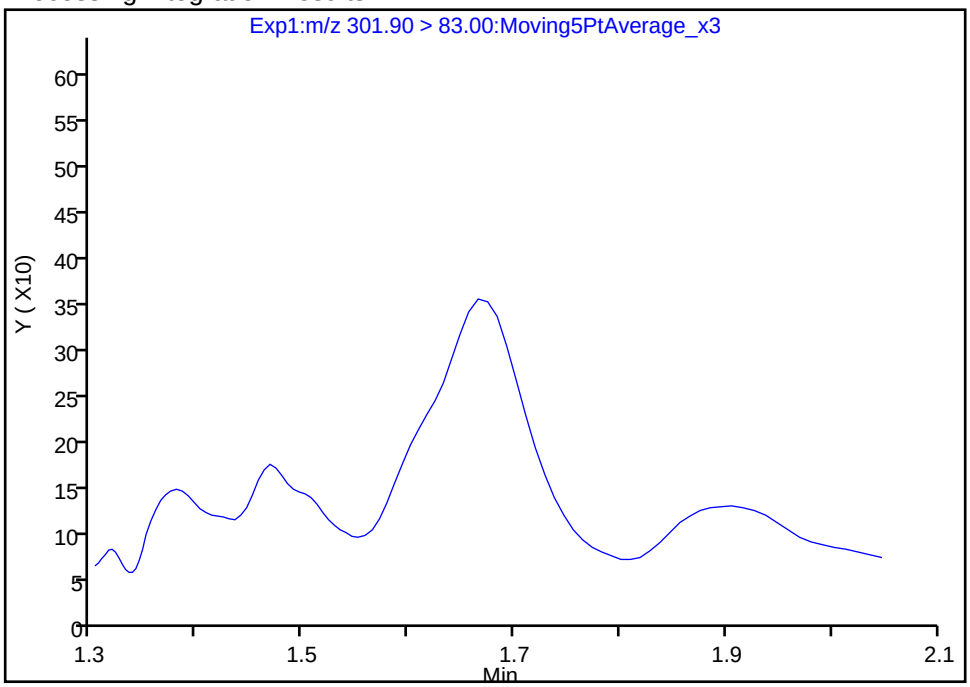
D 47 13C3-PFBS, CAS: STL02337

Signal: 1

Processing Integration Results

Not Detected

Expected RT: 1.67



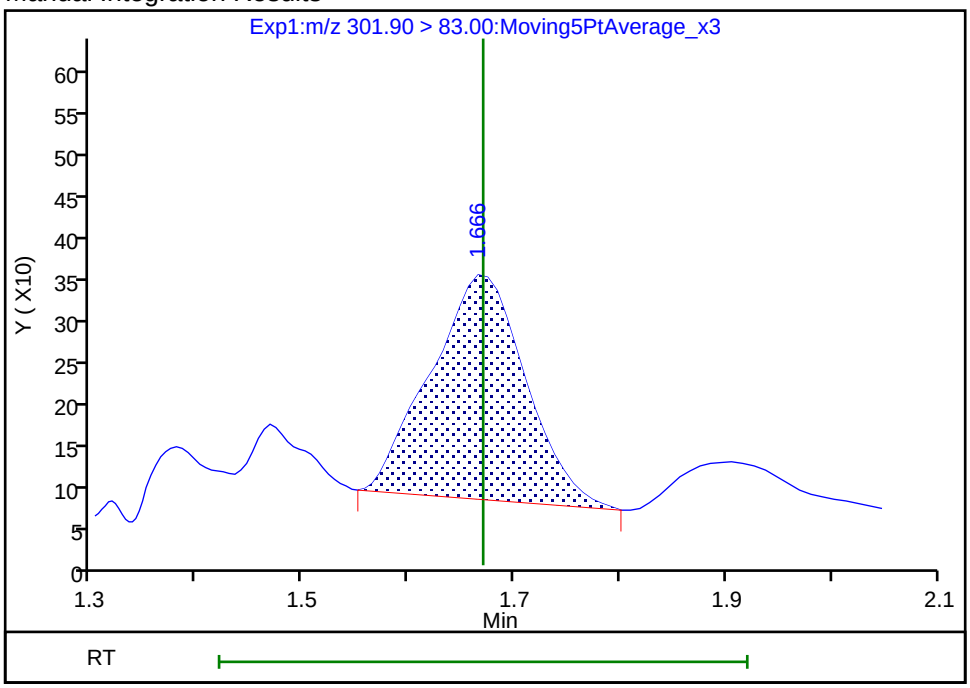
Manual Integration Results

RT: 1.67

Area: 1681

Amount: 0.038610

Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:36:23

Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

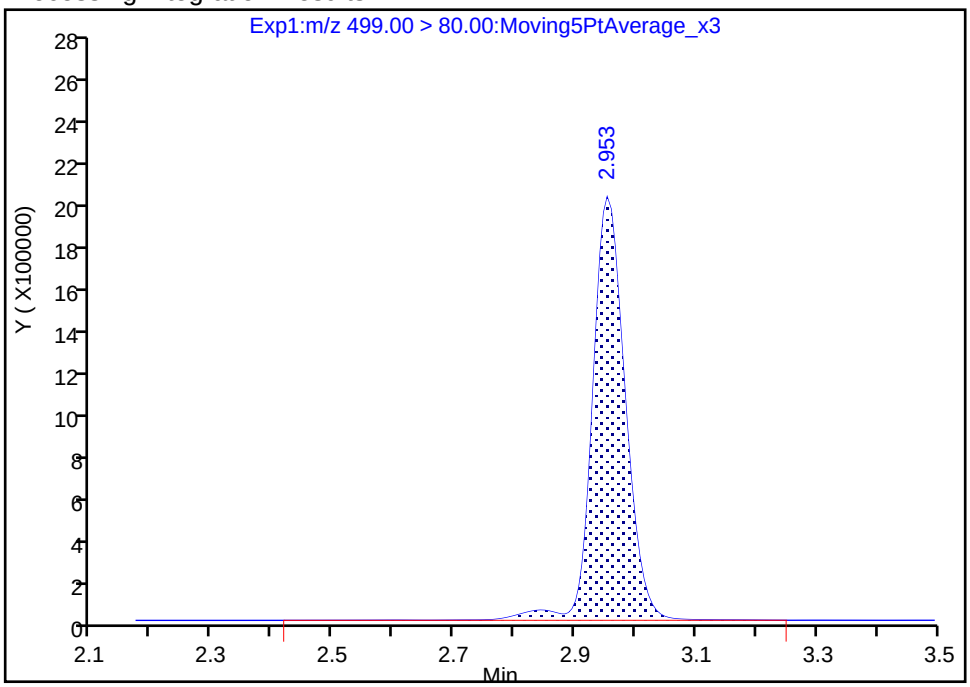
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_012.d				
Injection Date:	31-Jul-2018 18:36:31	Instrument ID:	A8_N		
Lims ID:	320-41149-A-29-A	Lab Sample ID:	320-41149-29		
Client ID:	GRE08-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

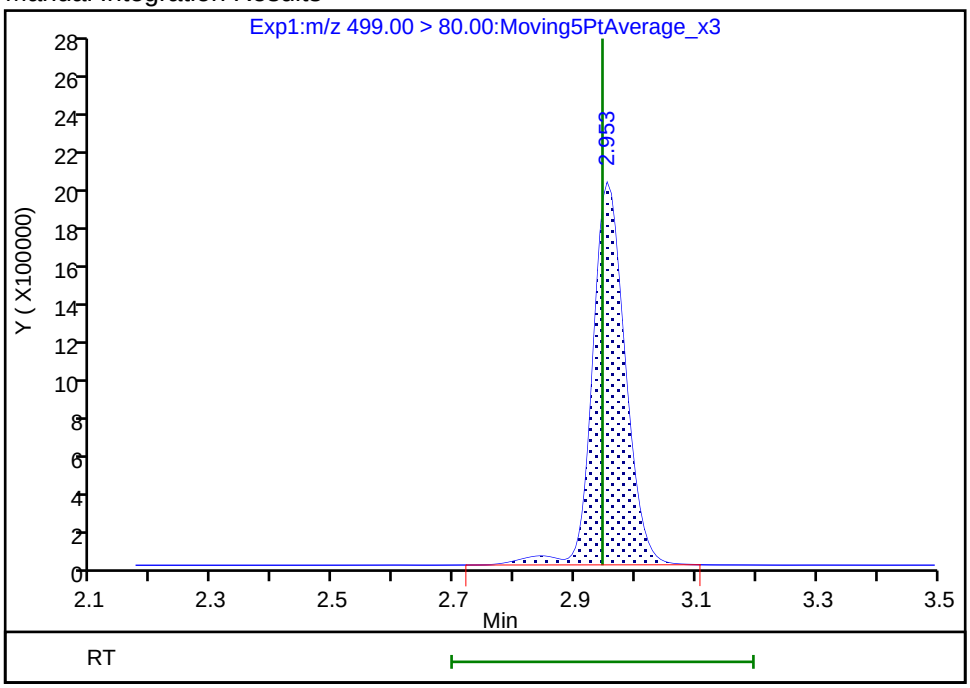
Processing Integration Results

RT: 2.95
Area: 7459326
Amount: 5.941638
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 7412386
Amount: 5.904248
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:36:45

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB3-01 | Lab Sample ID: 320-41149-30

Matrix: Solid | Lab File ID: 2018.07.28LLB_023.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 14:17

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.05(g) | Date Analyzed: 07/29/2018 02:11

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 10.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3		0.33	0.22	0.086
335-67-1	Perfluorooctanoic acid (PFOA)	6.6		0.33	0.22	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.79		0.33	0.22	0.090
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.79	M	0.44	0.20	0.065
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*29*	*E*	*0.33*	0.22	*0.069*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*540*	*E*	*1.1*	0.55	*0.27*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	95		50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	86		50-150
STL00995	13C5 PFNA	34	Q	50-150
STL00994	18O2 PFHxS	86		50-150
STL00991	13C4 PFOS	32	Q	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_023.d
Lims ID: 320-41149-A-30-A
Client ID: GRE08-SB3-01
Sample Type: Client
Inject. Date: 29-Jul-2018 02:11:30 ALS Bottle#: 16 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-30-
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:50:10 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:50:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.667	0.0	0.646	75791	2.20		94.6	313	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.676	1.676	0.0	1.005	920184	0.3555			1496	
298.90 > 99.00	1.676	1.676	0.0	1.005	376700		2.44(1.25-3.74)		491	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.228	0.002	0.864	3771676	2.37		95.0	64429	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	971086	0.5838			1088	
363.00 > 169.00	2.230	2.230	0.0	1.000	365713		2.66(1.13-3.40)		3665	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.240	0.002	0.868	4138923	2.03		85.8	86901	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.242	2.242	0.0	1.000	26399230	12.9			26502	E
399.00 > 99.00	2.242	2.242	0.0	1.000	9061050		2.91(1.50-4.49)		20864	
* 62 13C2-PFOA										
415.00 > 370.00	2.582	2.582	0.0		4060358	2.50			76369	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.582	2.582	0.0	1.000	4879245	3.00			3950	
413.00 > 169.00	2.582	2.582	0.0	1.000	2865004		1.70(0.84-2.52)		12864	
D 14 13C4 PFOA										
417.00 > 372.00	2.582	2.588	-0.006	1.000	3350946	2.16		86.3	83576	
D 18 13C4 PFOS										
503.00 > 80.00	2.950	2.947	0.003	1.142	1099426	0.7750		32.4	3230	
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.947	-0.003	1.140	1135116	0.8471		33.9	21396	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.948	0.002	1.002	184794	0.3565			211	
463.00 > 169.00	2.944	2.948	-0.004	1.000	52111		3.55(1.90-5.69)		259	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.955	2.948	0.007	1.002	124879393	245.7			23905	E
499.00 > 99.00	2.950	2.948	0.002	1.000	56560808		2.21(2.31-6.93)		3834722	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

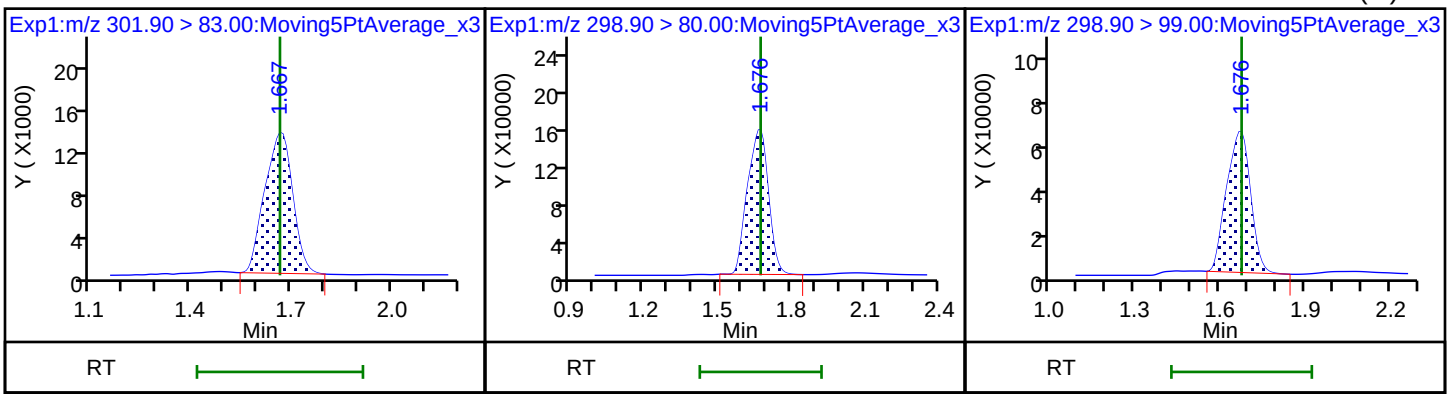
M - Manually Integrated

Report Date: 30-Jul-2018 15:50:11 Chrom Revision: 2.3 19-Jul-2018 15:14:50

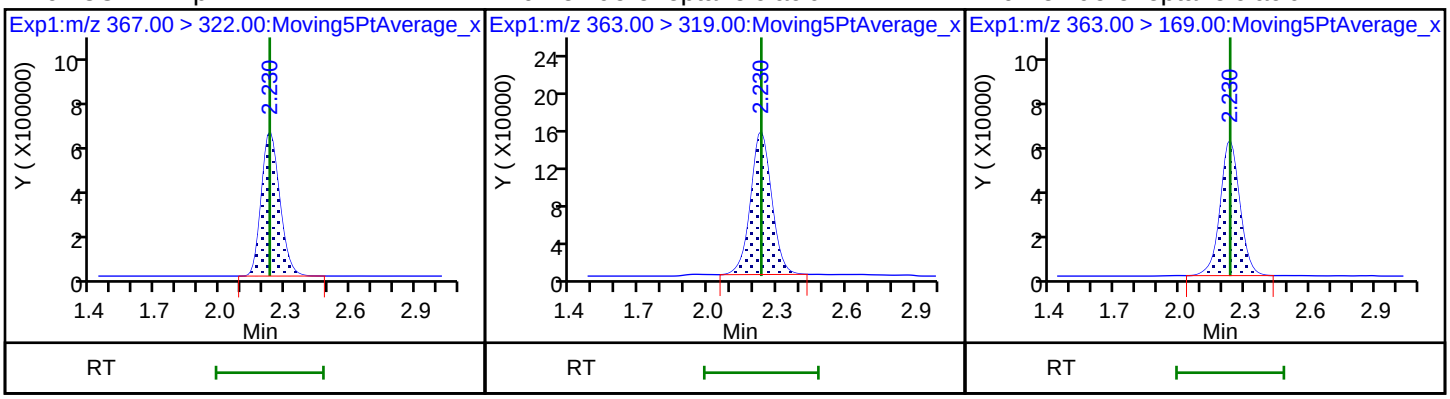
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_023.d				
Injection Date:	29-Jul-2018 02:11:30	Instrument ID:	A8_N		
Lims ID:	320-41149-A-30-A	Lab Sample ID:	320-41149-30		
Client ID:	GRE08-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	16	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

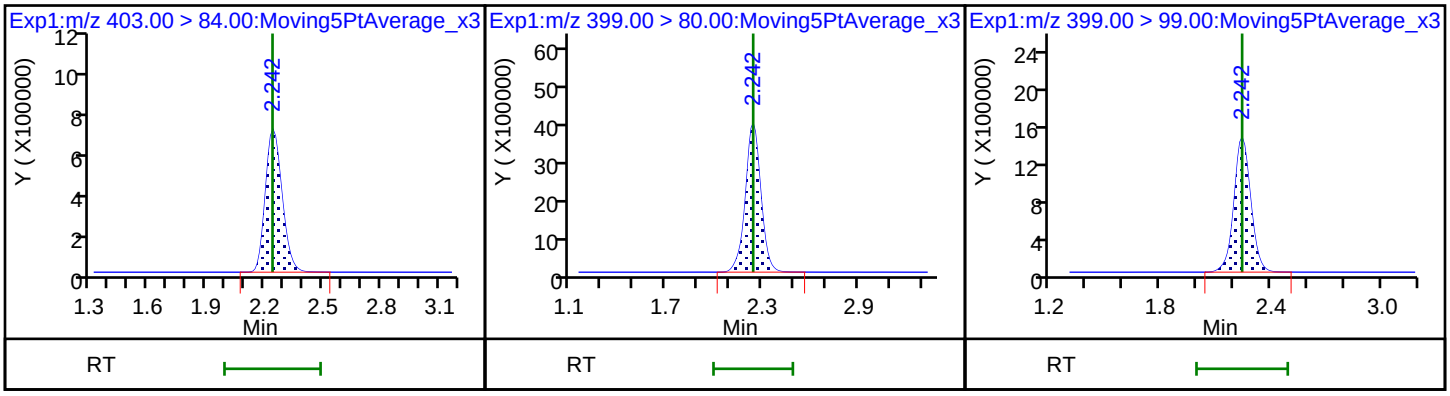
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid (M)



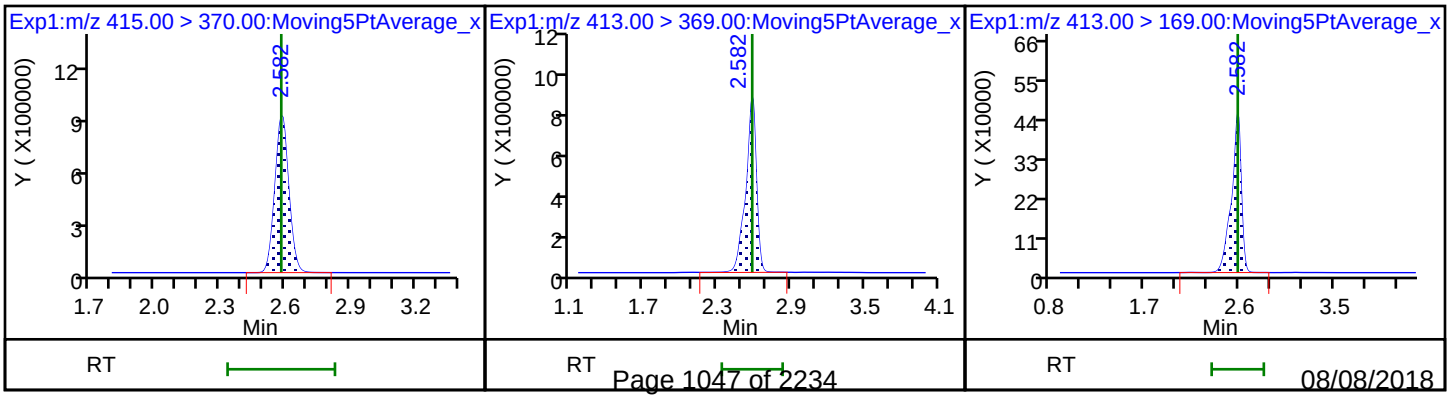
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



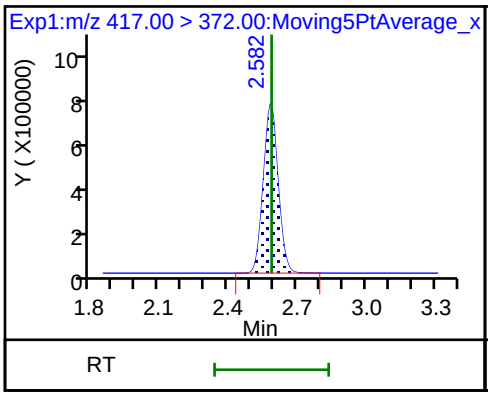
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



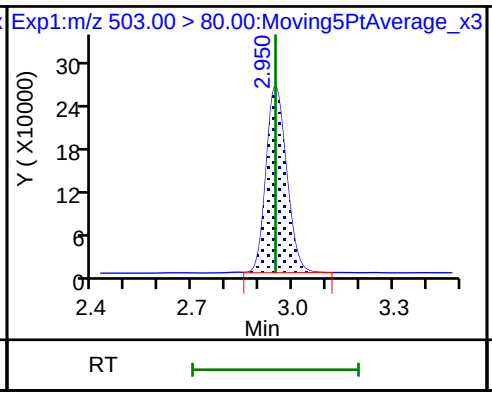
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



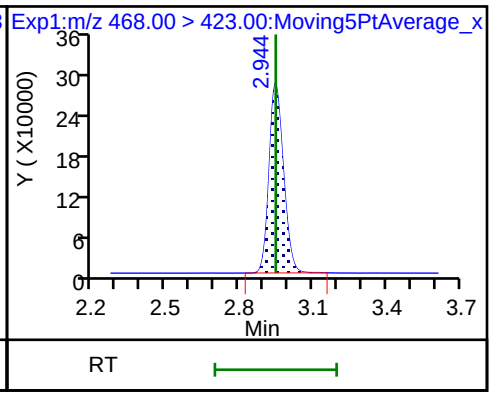
D 14 13C4 PFOA



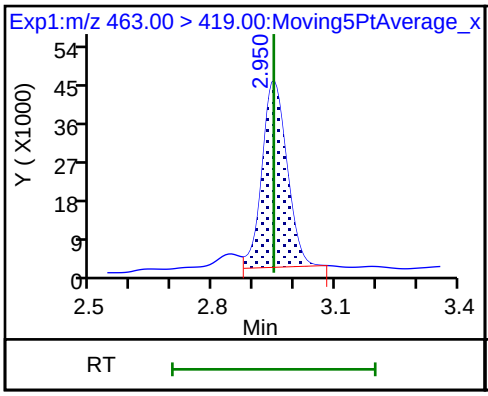
D 18 13C4 PFOS



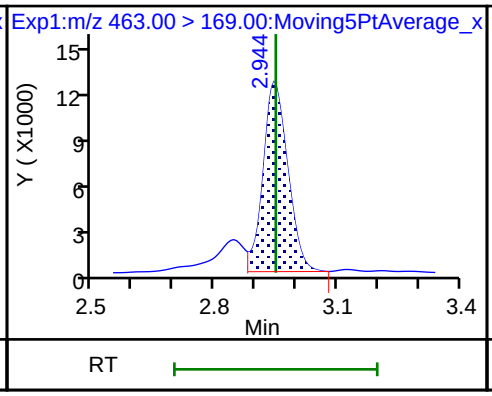
D 19 13C5 PFNA



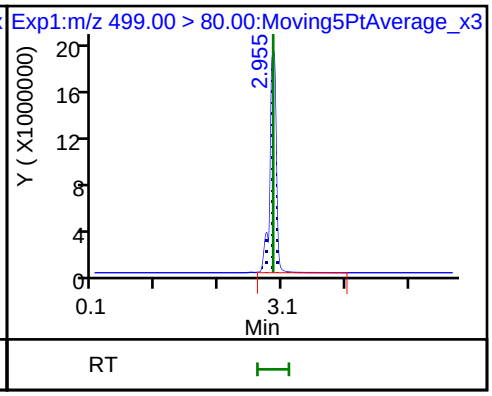
20 Perfluorononanoic acid



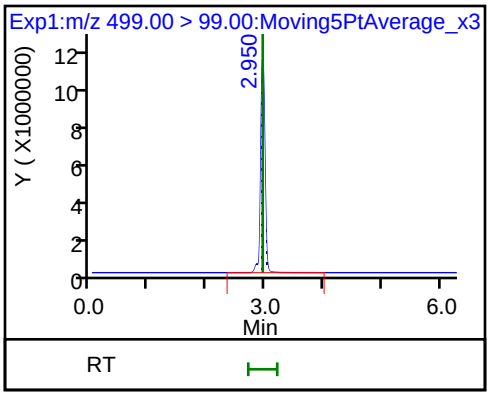
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

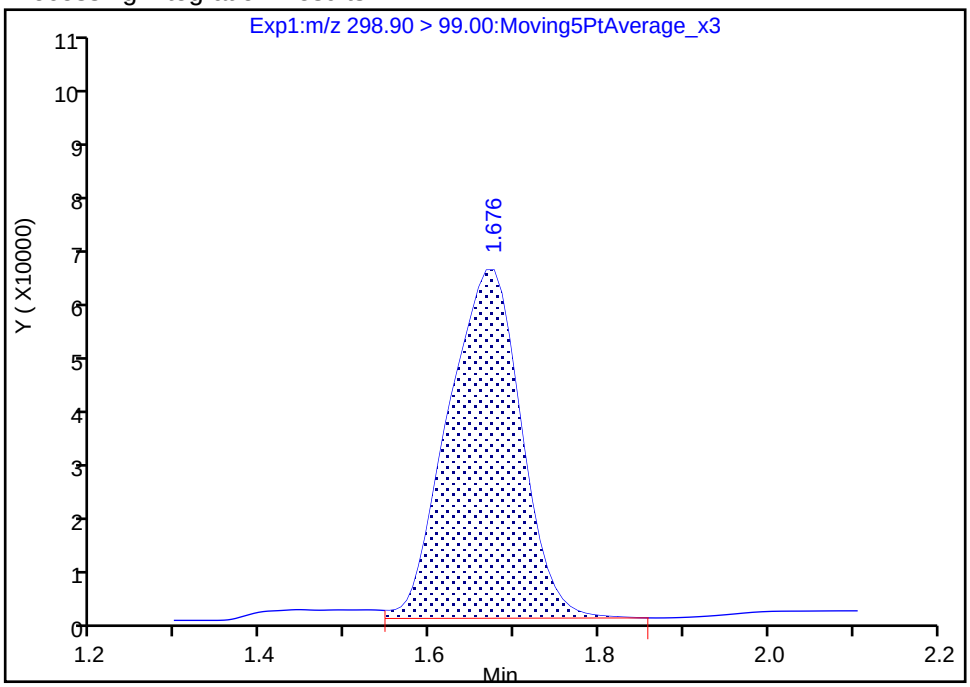
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_023.d				
Injection Date:	29-Jul-2018 02:11:30	Instrument ID:	A8_N		
Lims ID:	320-41149-A-30-A	Lab Sample ID:	320-41149-30		
Client ID:	GRE08-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	16	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

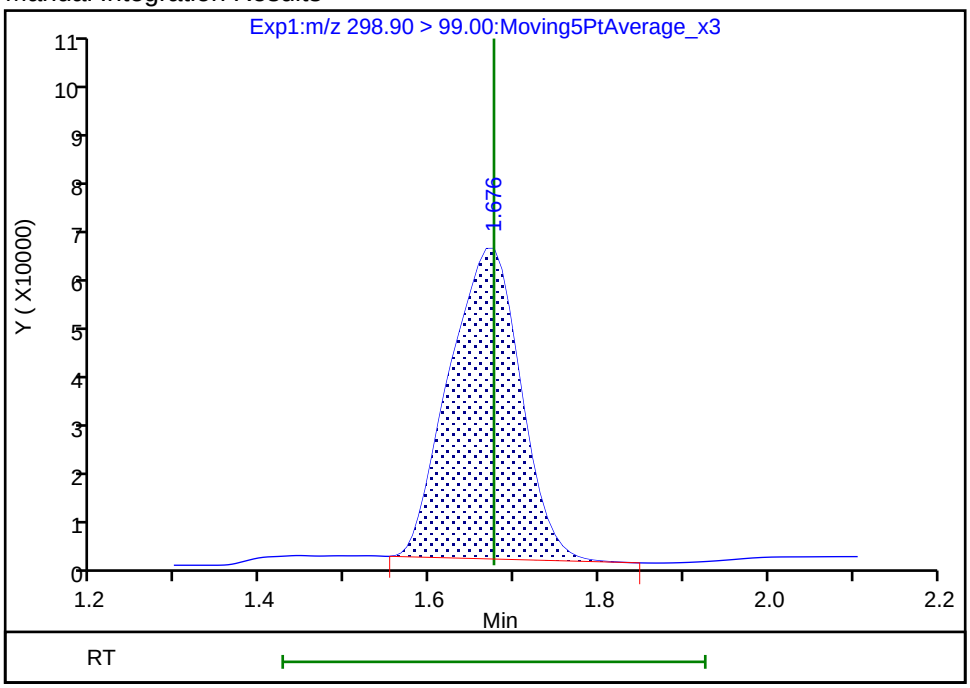
Processing Integration Results

RT: 1.68
Area: 390784
Amount: 0.355547
Amount Units: ng/ml



Manual Integration Results

RT: 1.68
Area: 376700
Amount: 0.355547
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:50:00

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB3-01 DL | Lab Sample ID: 320-41149-30 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_013.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 14:17

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.05(g) | Date Analyzed: 07/31/2018 18:44

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 100

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 10.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*22*	*U M*	*33*	22	*8.6*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*22*	*U*	*33*	22	*11*
375-95-1	*Perfluorononanoic acid (PFNA)*	*22*	*U M*	*33*	22	*9.0*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*20*	*U*	*44*	20	*6.5*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	26	J D	33	22	6.9
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1300	D	110	55	27

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	79	M	50-150
STL01892	13C4-PFHpA	77		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	81		50-150
STL00994	18O2 PFHxS	80		50-150
STL00991	13C4 PFOS	74		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_013.d
Lims ID: 320-41149-A-30-A
Client ID: GRE08-SB3-01
Sample Type: Client
Inject. Date: 31-Jul-2018 18:44:19 ALS Bottle#: 7 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 100.0000
Sample Info: 320-41149-a-30-a 100X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:37:36 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:37:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.665	1.666	-0.001	1.000	11219	0.003964			56.1	
298.90 > 99.00	1.674	1.666	0.008	1.005	3367		3.33(1.25-3.74)		11.5	
D 47 13C3-PFBS										M
301.90 > 83.00	1.665	1.670	-0.005	0.645	849	0.0185		79.4	3.9	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.232	2.223	0.009	0.864	32197	0.0192		76.9	943	
10 Perfluoroheptanoic acid										RM
363.00 > 319.00	2.232	2.229	0.003	1.000	11934	0.008146			4.3	RM
363.00 > 169.00	2.232	2.229	0.003	1.000	1966		6.07(1.13-3.40)		21.1	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.241	0.004	1.000	284646	0.1198			1776	
399.00 > 99.00	2.245	2.241	0.004	1.000	92116		3.09(1.50-4.49)		135	
D 11 18O2 PFHxS										
403.00 > 84.00	2.245	2.248	-0.003	0.869	48345	0.0190		80.4	2761	
* 62 13C2-PFOA										
415.00 > 370.00	2.583	2.578	0.005		44499	0.0250			1691	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.583	2.578	0.005	1.000	50668	0.0277			30.5	
413.00 > 169.00	2.583	2.578	0.005	1.000	32684		1.55(0.84-2.52)		140	
D 14 13C4 PFOA										
417.00 > 372.00	2.583	2.586	-0.003	1.000	39209	0.0229		91.7	2241	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.950	2.946	0.004	1.002	8817669	5.76			64186	
499.00 > 99.00	2.944	2.946	-0.002	1.000	2186773		4.03(2.31-6.93)		15318	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.952	-0.008	1.140	32113	0.0176		73.6	883	
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.952	-0.002	1.142	30446	0.0201		80.6	1674	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

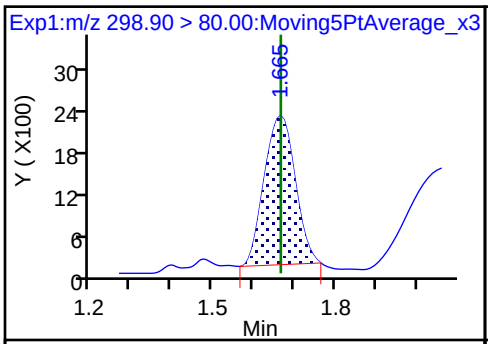
M - Manually Integrated

Report Date: 01-Aug-2018 12:37:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

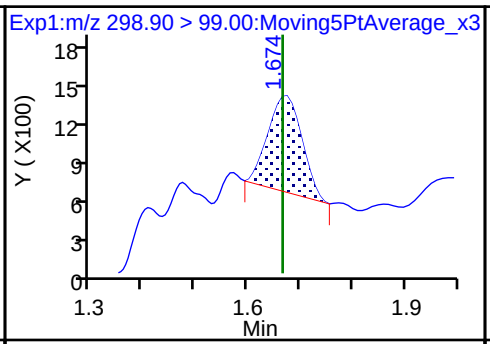
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_013.d				
Injection Date:	31-Jul-2018 18:44:19	Instrument ID:	A8_N		
Lims ID:	320-41149-A-30-A	Lab Sample ID:	320-41149-30		
Client ID:	GRE08-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

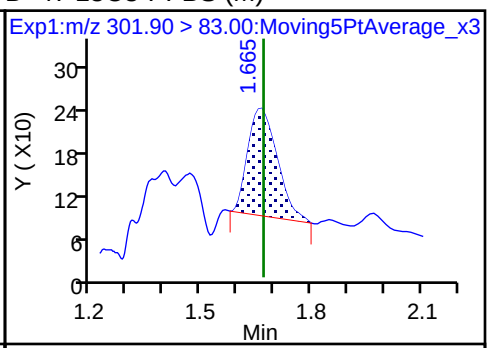
5 Perfluorobutanesulfonic acid



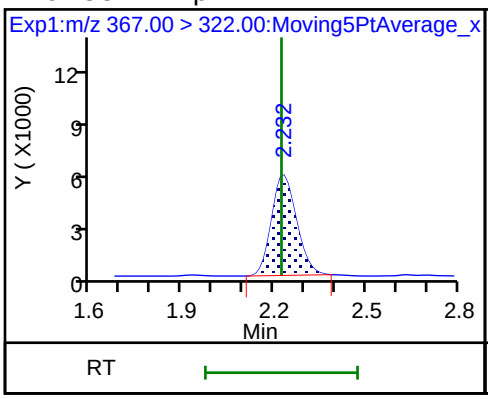
5 Perfluorobutanesulfonic acid



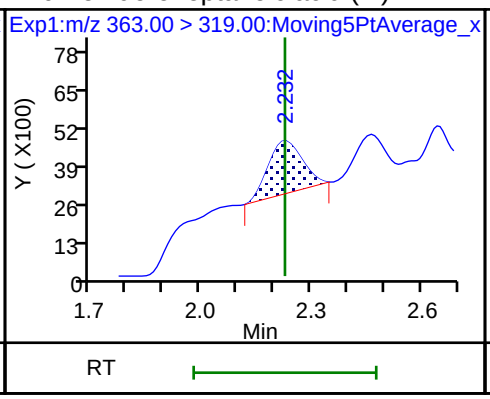
D 47 13C3-PFBS (M)



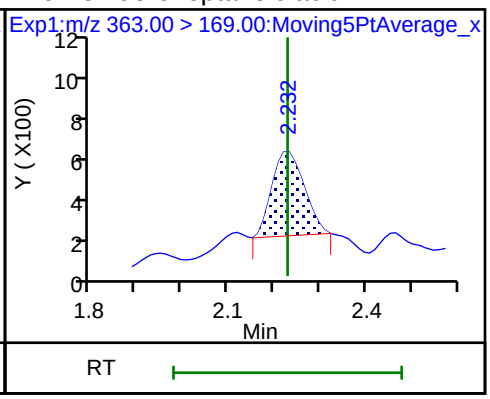
D 9 13C4-PFHpA



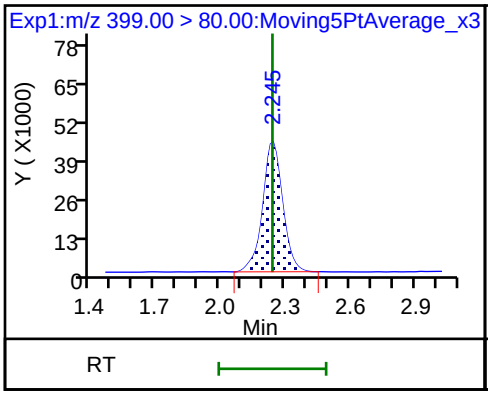
10 Perfluoroheptanoic acid (M)



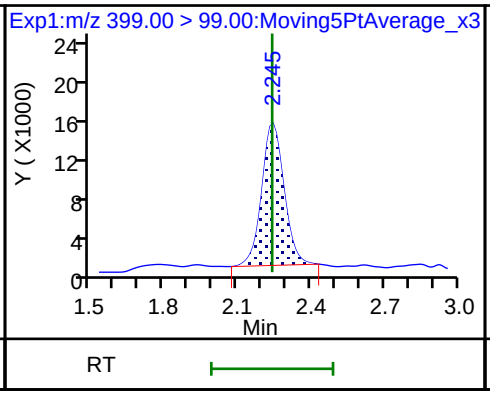
10 Perfluoroheptanoic acid



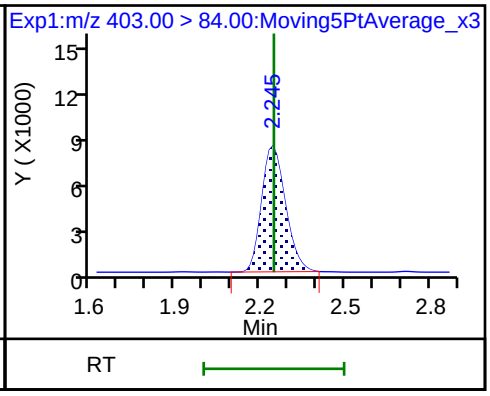
8 Perfluorohexanesulfonic acid



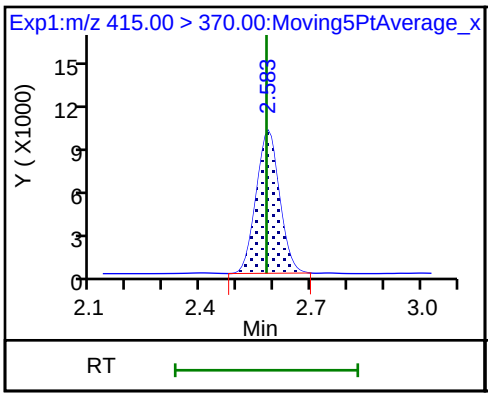
8 Perfluorohexanesulfonic acid



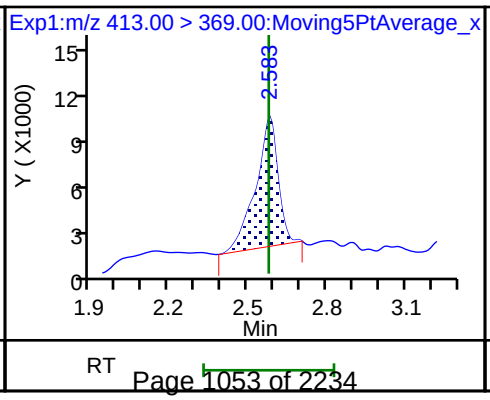
D 11 18O2 PFHxS



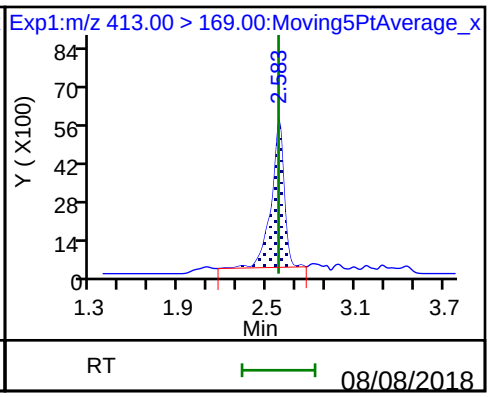
* 62 13C2-PFOA



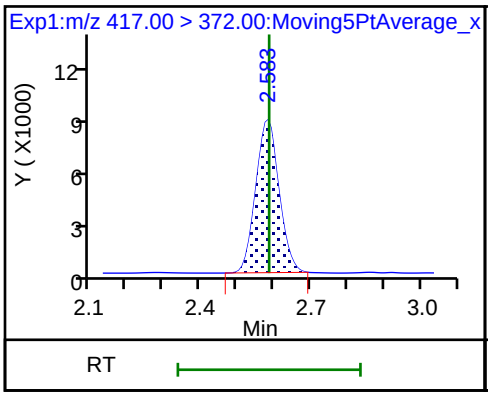
15 Perfluorooctanoic acid



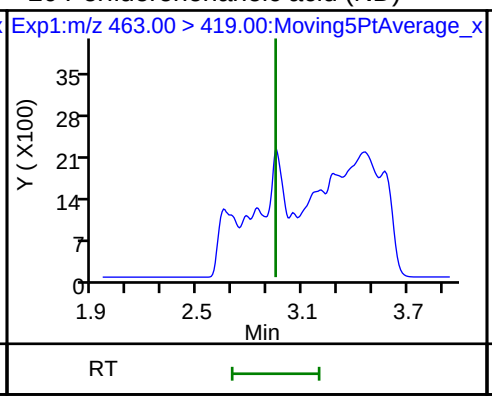
15 Perfluorooctanoic acid



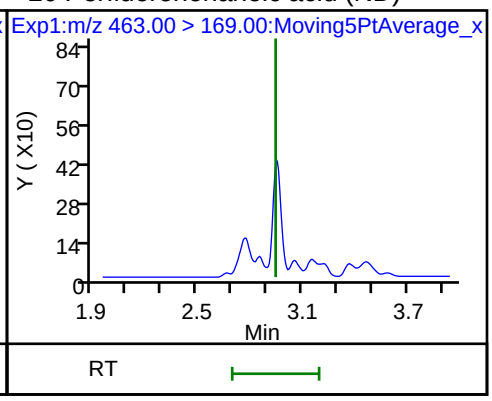
D 14 13C4 PFOA



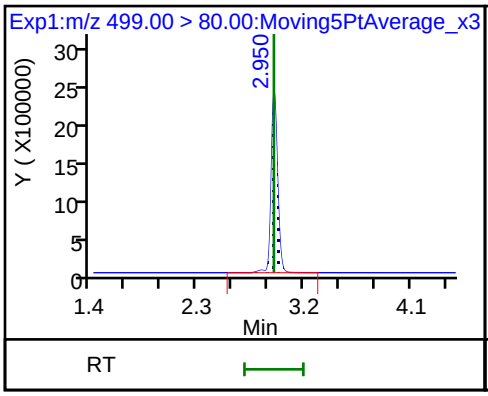
20 Perfluorononanoic acid (ND)



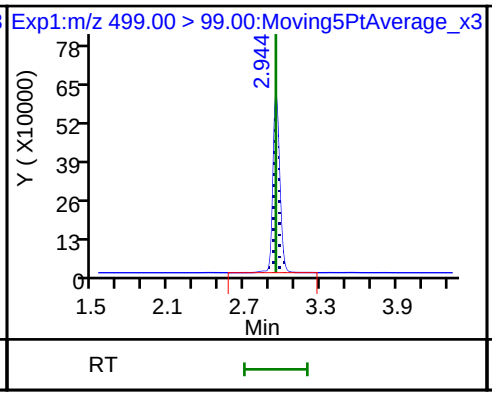
20 Perfluorononanoic acid (ND)



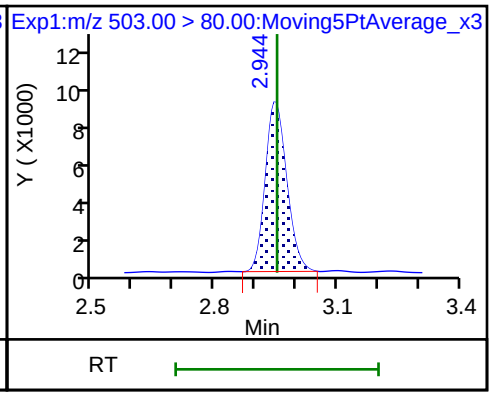
17 Perfluorooctane sulfonic acid



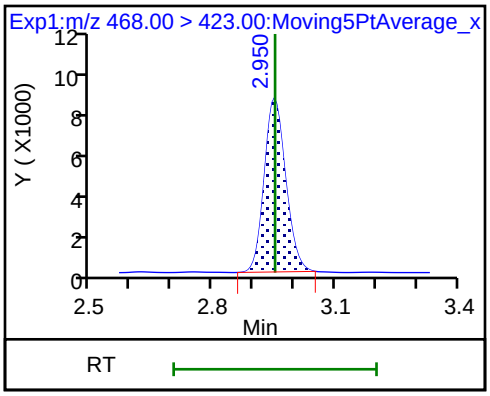
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

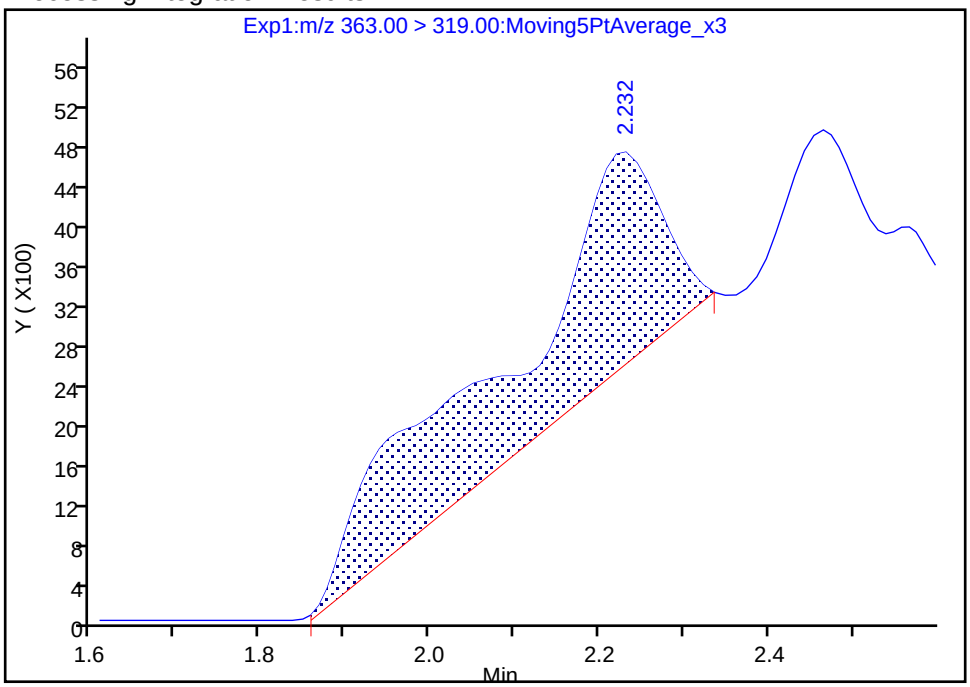
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_013.d				
Injection Date:	31-Jul-2018 18:44:19	Instrument ID:	A8_N		
Lims ID:	320-41149-A-30-A	Lab Sample ID:	320-41149-30		
Client ID:	GRE08-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

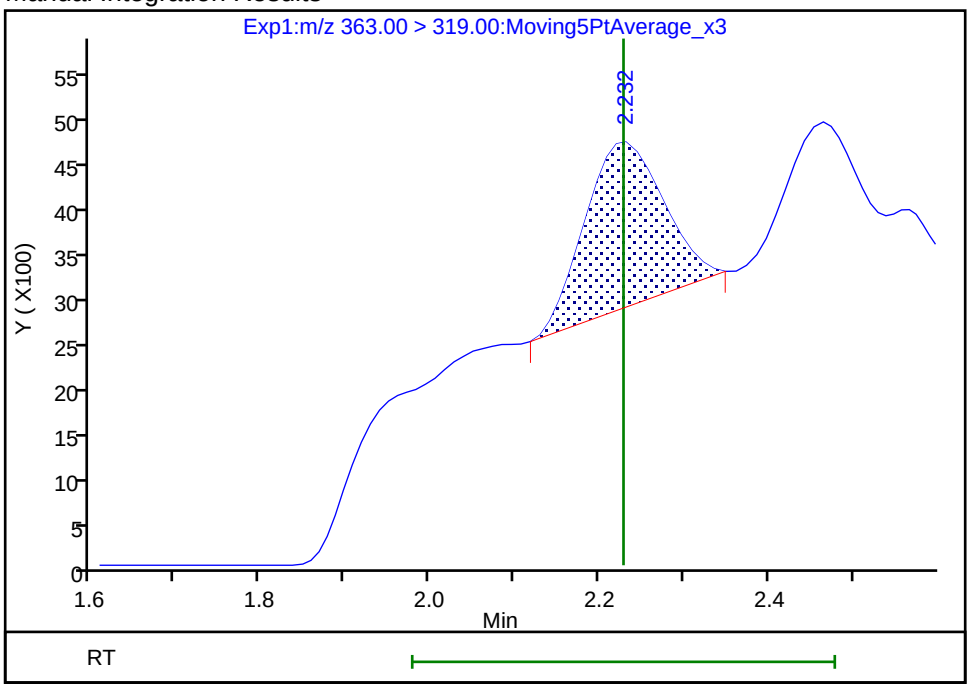
Processing Integration Results

RT: 2.23
Area: 29757
Amount: 0.020311
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 11934
Amount: 0.008146
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:37:22

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

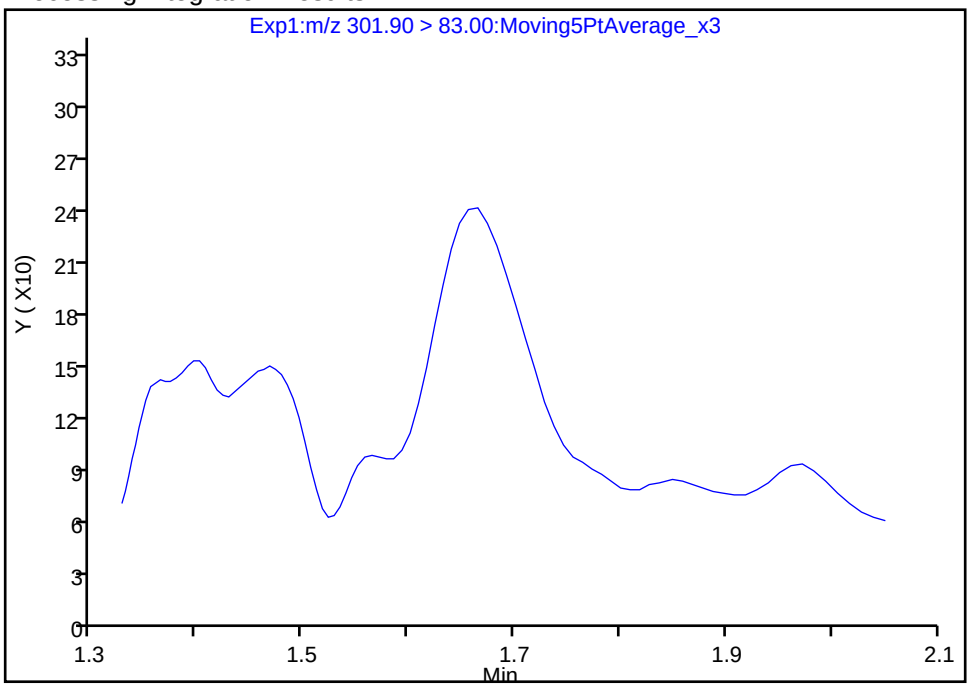
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_013.d				
Injection Date:	31-Jul-2018 18:44:19	Instrument ID:	A8_N		
Lims ID:	320-41149-A-30-A	Lab Sample ID:	320-41149-30		
Client ID:	GRE08-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

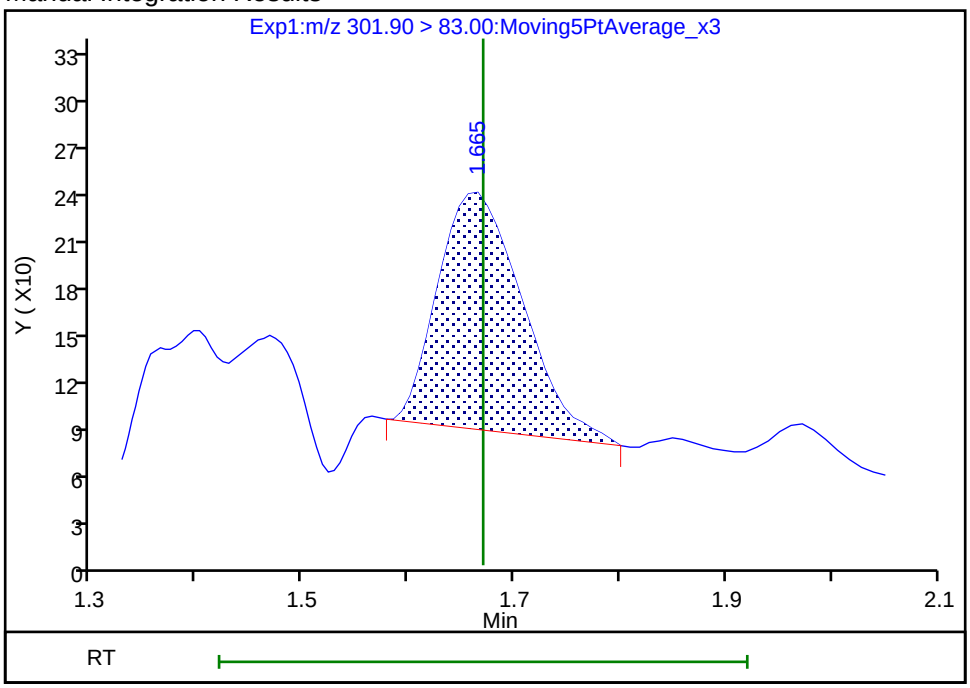
Processing Integration Results

Not Detected
Expected RT: 1.67



Manual Integration Results

RT: 1.67
Area: 849
Amount: 0.018459
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:37:07
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB4-01 | Lab Sample ID: 320-41149-31

Matrix: Solid | Lab File ID: 2018.07.28LLB_024.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 14:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.06(g) | Date Analyzed: 07/29/2018 02:19

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 12.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.87		0.34	0.23	0.088
335-67-1	Perfluorooctanoic acid (PFOA)	7.6		0.34	0.23	0.11
375-95-1	Perfluorononanoic acid (PFNA)	4.2		0.34	0.23	0.092
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.27	J M	0.45	0.20	0.067
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	13		0.34	0.23	0.070
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*1000*	*E*	*1.1*	0.57	*0.27*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	90		50-150
STL01892	13C4-PFHpA	98		50-150
STL00990	13C4 PFOA	83		50-150
STL00995	13C5 PFNA	27	Q	50-150
STL00994	18O2 PFHxS	89		50-150
STL00991	13C4 PFOS	22	Q	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_024.d
Lims ID: 320-41149-A-31-A
Client ID: GRE08-SB4-01
Sample Type: Client
Inject. Date: 29-Jul-2018 02:19:21 ALS Bottle#: 17 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-31-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:50:44 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:50:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.667	0.009	0.647	69339	2.10		90.5	238	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.676	1.676	0.0	1.000	286556	0.1210			305	
298.90 > 99.00	1.676	1.676	0.0	1.000	124994		2.29(1.25-3.74)		131	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.228	0.002	0.861	3720063	2.45		98.0	79585	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	633619	0.3862			583	
363.00 > 169.00	2.230	2.230	0.0	1.000	246304		2.57(1.13-3.40)		2570	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.240	0.002	0.866	4090644	2.10		88.7	69313	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.242	0.0	1.000	11518252	5.71			11970	
399.00 > 99.00	2.242	2.242	0.0	1.000	3709867		3.10(1.50-4.49)		7272	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.582	0.008		3882722	2.50			51779	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.590	2.582	0.008	1.000	5037886	3.37			3427	
413.00 > 169.00	2.590	2.582	0.008	1.000	2739511		1.84(0.84-2.52)		5725	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.588	0.002	1.000	3079349	2.07		82.9	69662	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.947	-0.003	1.137	717685	0.5291		22.1	1845	
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.947	0.003	1.139	853585	0.6662		26.6	9634	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.948	0.002	1.000	718005	1.84			929	
463.00 > 169.00	2.950	2.948	0.002	1.000	180034		3.99(1.90-5.69)		1057	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.968	2.948	0.020	1.008	149512994	450.6			5586793	E
499.00 > 99.00	2.950	2.948	0.002	1.002	74898635		2.00(2.31-6.93)		339423	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

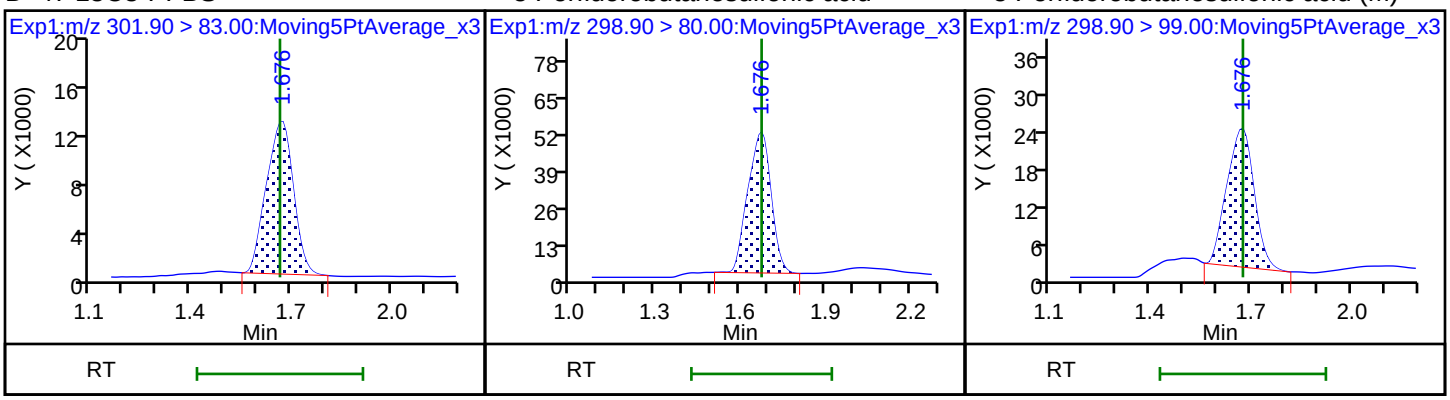
M - Manually Integrated

Report Date: 30-Jul-2018 15:50:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

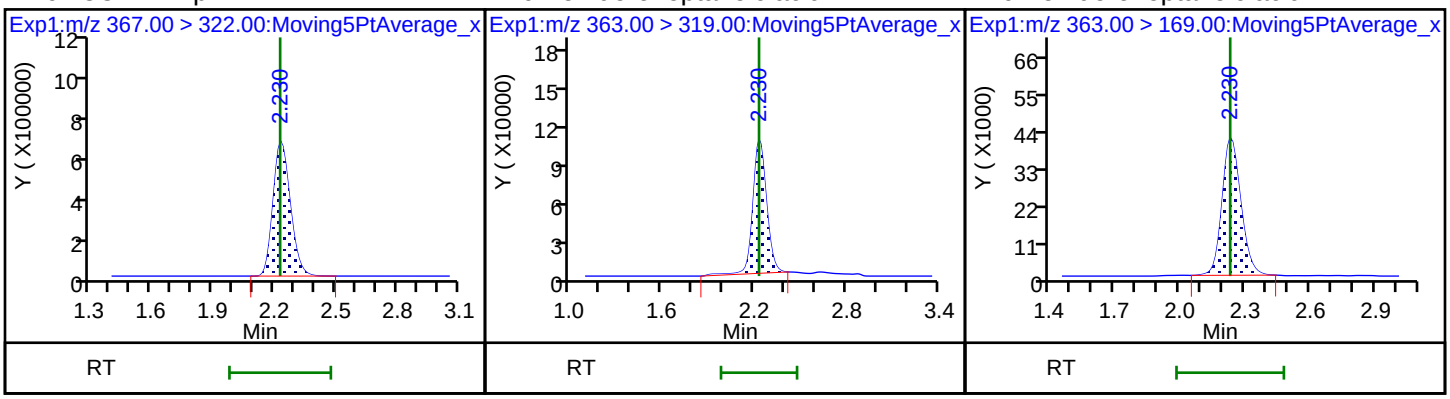
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_024.d				
Injection Date:	29-Jul-2018 02:19:21	Instrument ID:	A8_N		
Lims ID:	320-41149-A-31-A	Lab Sample ID:	320-41149-31		
Client ID:	GRE08-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	17	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

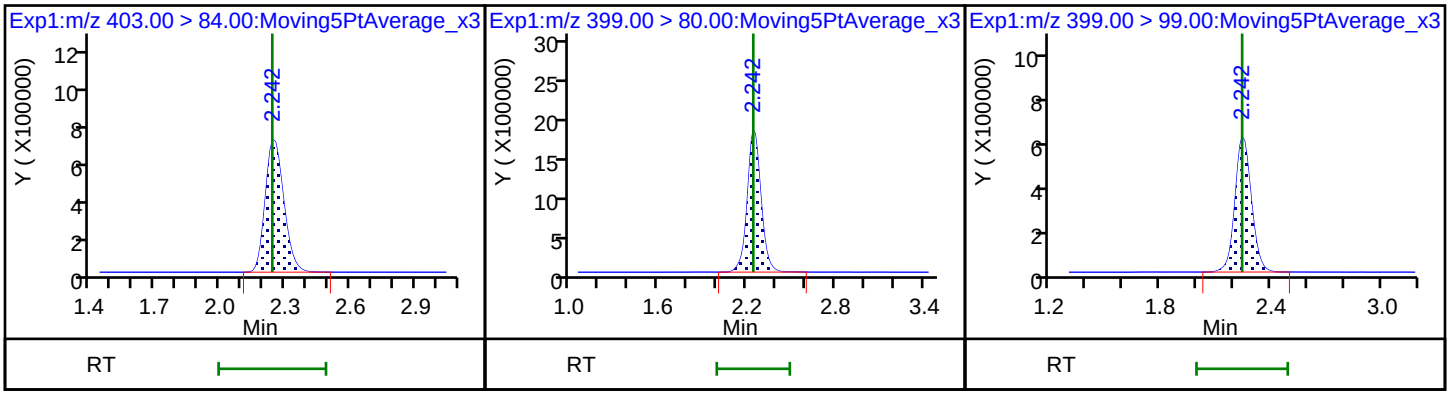
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid (M)



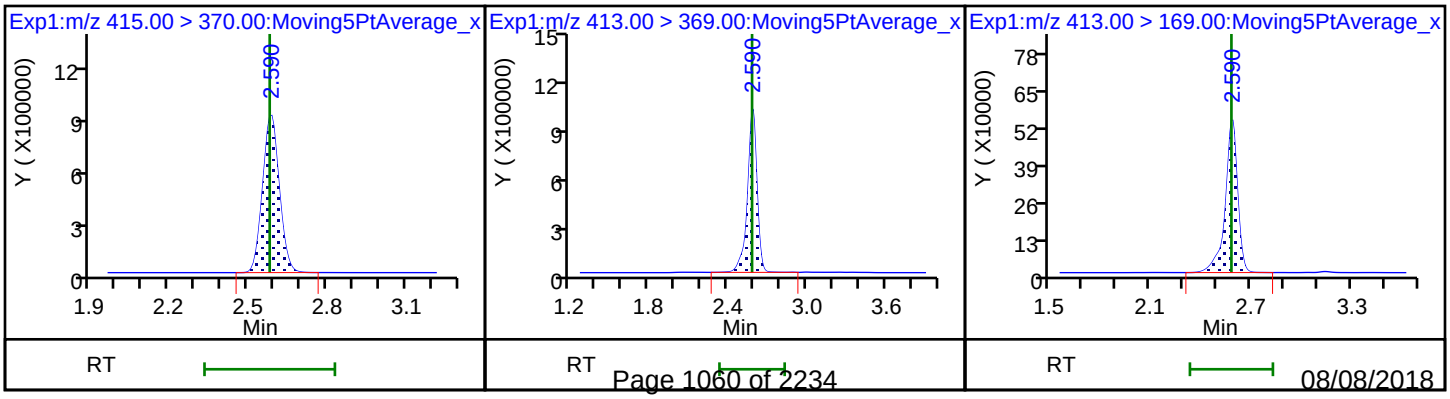
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



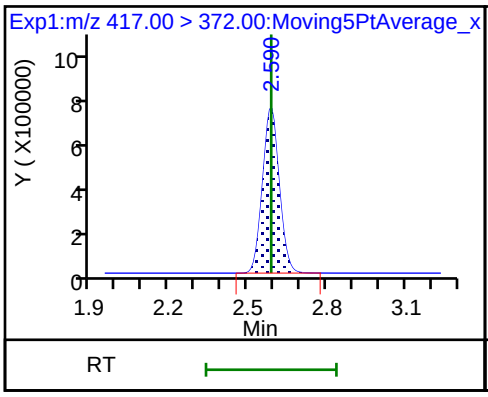
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



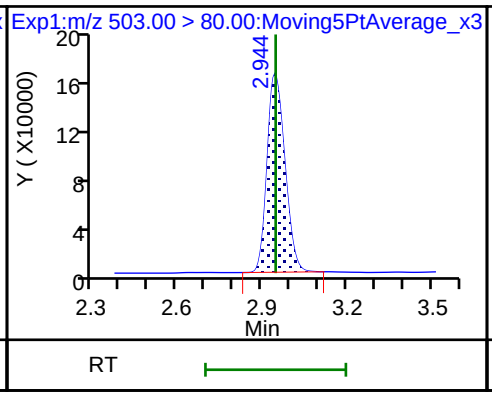
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



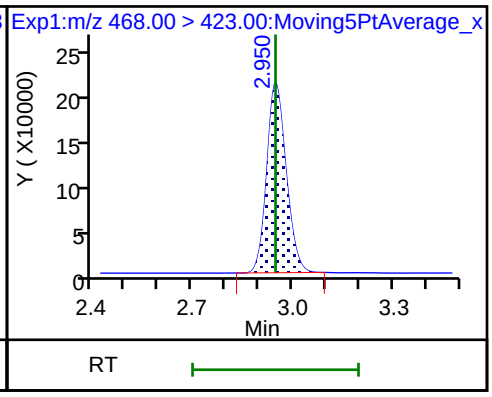
D 14 13C4 PFOA



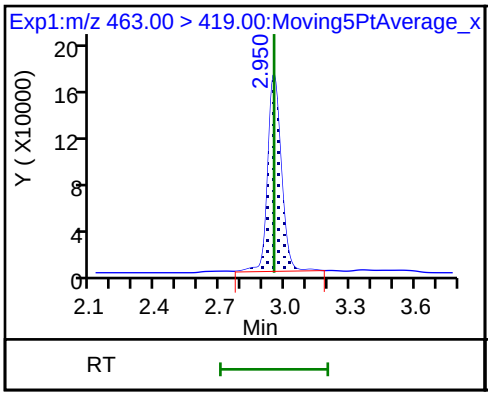
D 18 13C4 PFOS



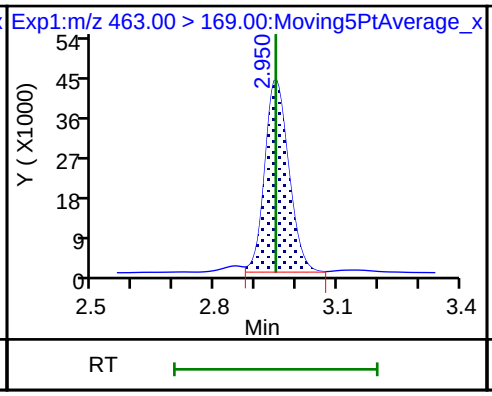
D 19 13C5 PFNA



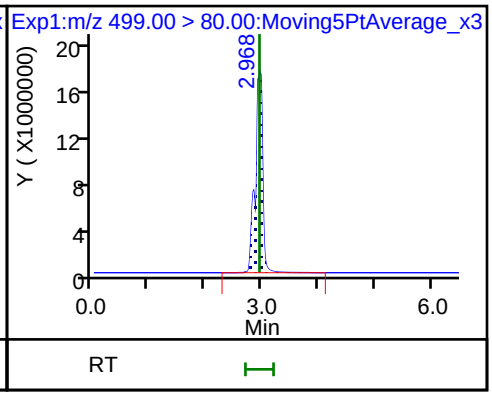
20 Perfluorononanoic acid



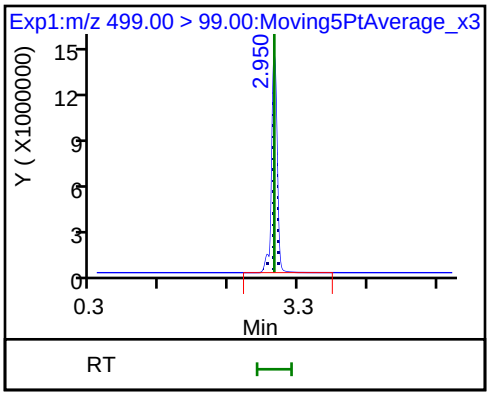
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

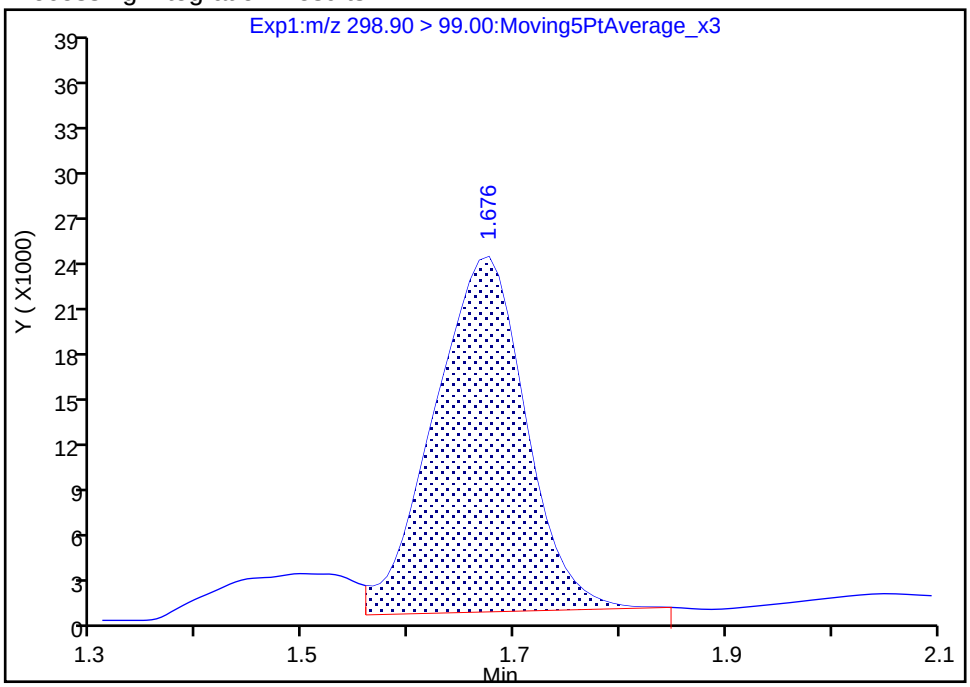
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_024.d				
Injection Date:	29-Jul-2018 02:19:21	Instrument ID:	A8_N		
Lims ID:	320-41149-A-31-A	Lab Sample ID:	320-41149-31		
Client ID:	GRE08-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	17	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

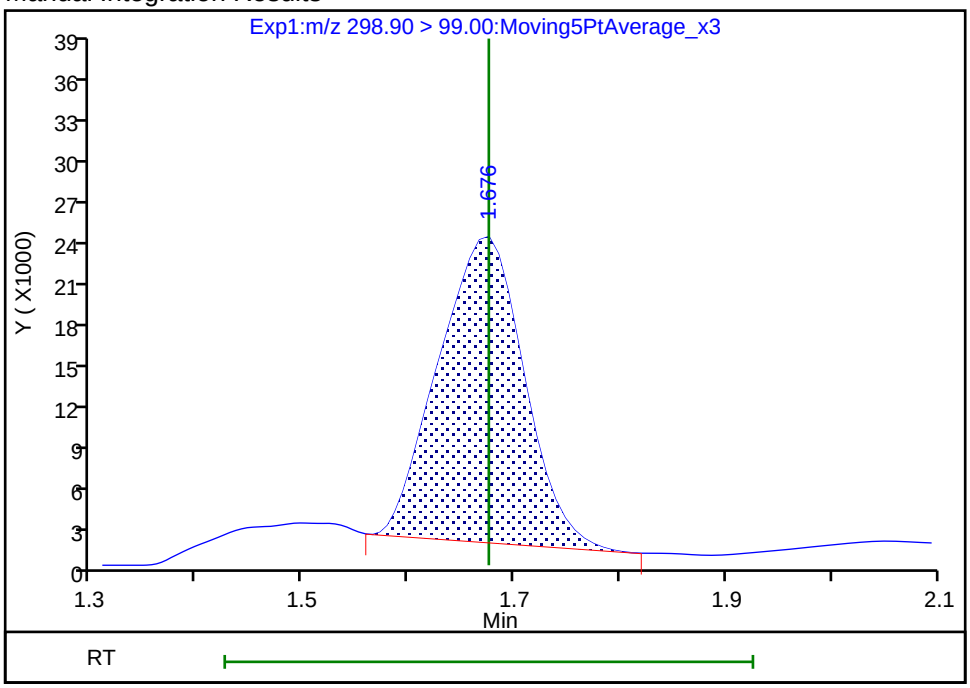
Processing Integration Results

RT: 1.68
Area: 140127
Amount: 0.121024
Amount Units: ng/ml



Manual Integration Results

RT: 1.68
Area: 124994
Amount: 0.121024
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:50:31

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE08-SB4-01 DL | Lab Sample ID: 320-41149-31 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_014.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/12/2018 14:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.06(g) | Date Analyzed: 07/31/2018 18:52

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 100

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 12.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*23*	*U*	*34*	23	*8.8*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*23*	*U*	*34*	23	*11*
375-95-1	*Perfluorononanoic acid (PFNA)*	*23*	*U*	*34*	23	*9.2*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*20*	*U*	*45*	20	*6.7*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*11*	*J D*	*34*	23	*7.0*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2800	E D	110	57	27

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	54	M	50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	70		50-150
STL00994	18O2 PFHxS	83		50-150
STL00991	13C4 PFOS	72		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_014.d
Lims ID: 320-41149-A-31-A
Client ID: GRE08-SB4-01
Sample Type: Client
Inject. Date: 31-Jul-2018 18:52:07 ALS Bottle#: 8 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 100.0000
Sample Info: 320-41149-a-31-a 100X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:38:02 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:38:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										M
301.90 > 83.00	1.666	1.670	-0.004	0.645	533	0.0127		54.5	2.9	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.223	0.007	0.864	30877	0.0202		80.7	1136	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.241	0.001	1.000	107957	0.0480			676	
399.00 > 99.00	2.242	2.241	0.001	1.000	38432		2.81(1.50-4.49)		61.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.248	-0.006	0.868	45822	0.0197		83.3	1963	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.578	0.003		40700	0.0250			1831	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.589	2.578	0.011	1.000	52590	0.0306			38.0	
413.00 > 169.00	2.589	2.578	0.011	1.000	35867		1.47(0.84-2.52)		125	
D 14 13C4 PFOA										
417.00 > 372.00	2.589	2.586	0.003	1.003	36906	0.0236		94.4	2818	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.946	0.003	0.998	24351	0.0234			29.5	
463.00 > 169.00	2.954	2.946	0.008	1.000	6905		3.53(1.90-5.69)		305	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.949	2.946	0.003	1.000	16721575	12.2			78181	E
499.00 > 99.00	2.949	2.946	0.003	1.000	4387272		3.81(2.31-6.93)		21946	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.952	-0.003	1.142	28676	0.0172		71.8	652	
D 19 13C5 PFNA										
468.00 > 423.00	2.954	2.952	0.002	1.145	24108	0.0174		69.8	1033	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

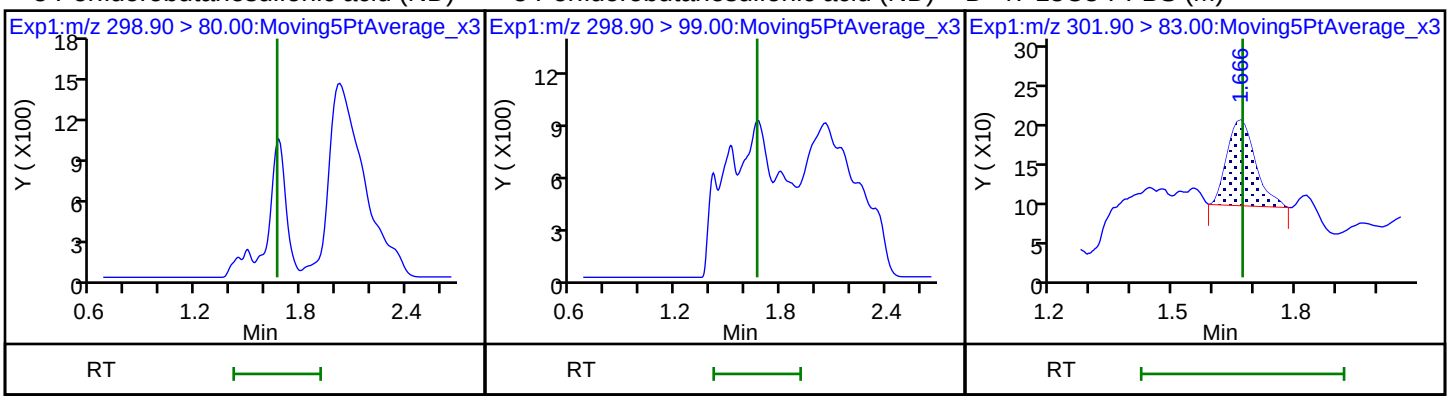
M - Manually Integrated

Report Date: 01-Aug-2018 12:38:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

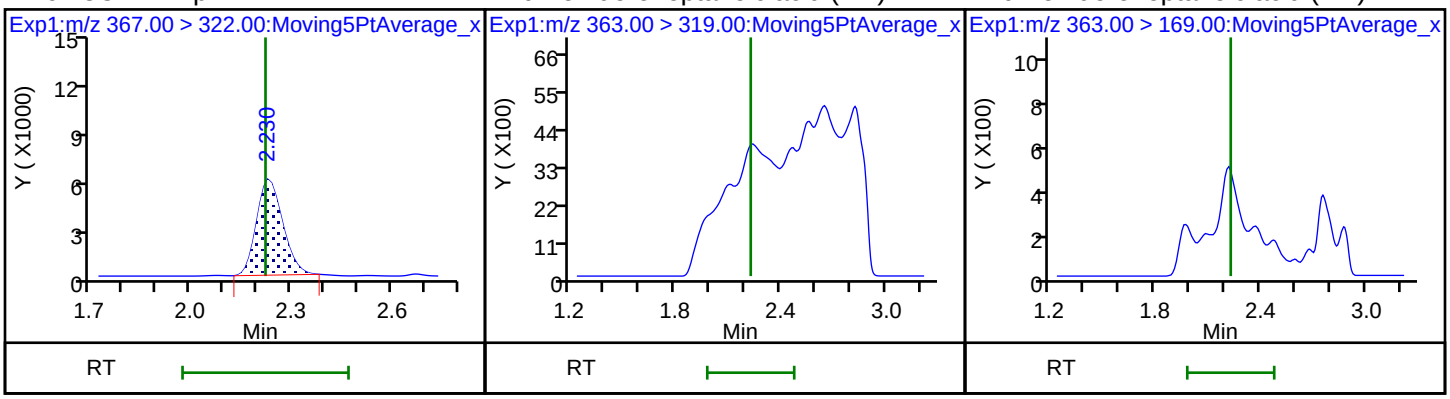
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_014.d				
Injection Date:	31-Jul-2018 18:52:07	Instrument ID:	A8_N		
Lims ID:	320-41149-A-31-A	Lab Sample ID:	320-41149-31		
Client ID:	GRE08-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

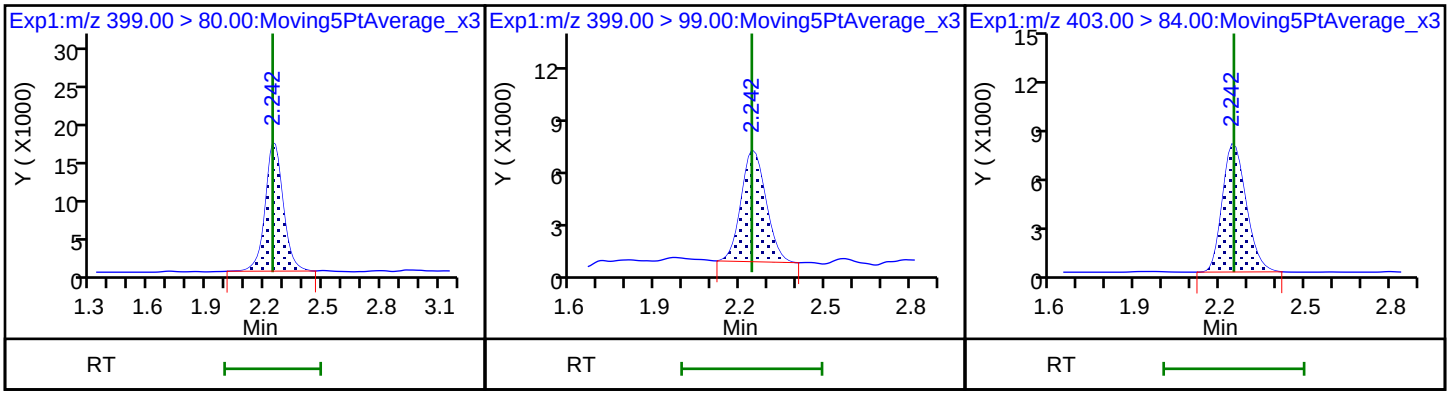
5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) D 47 13C3-PFBS (M)



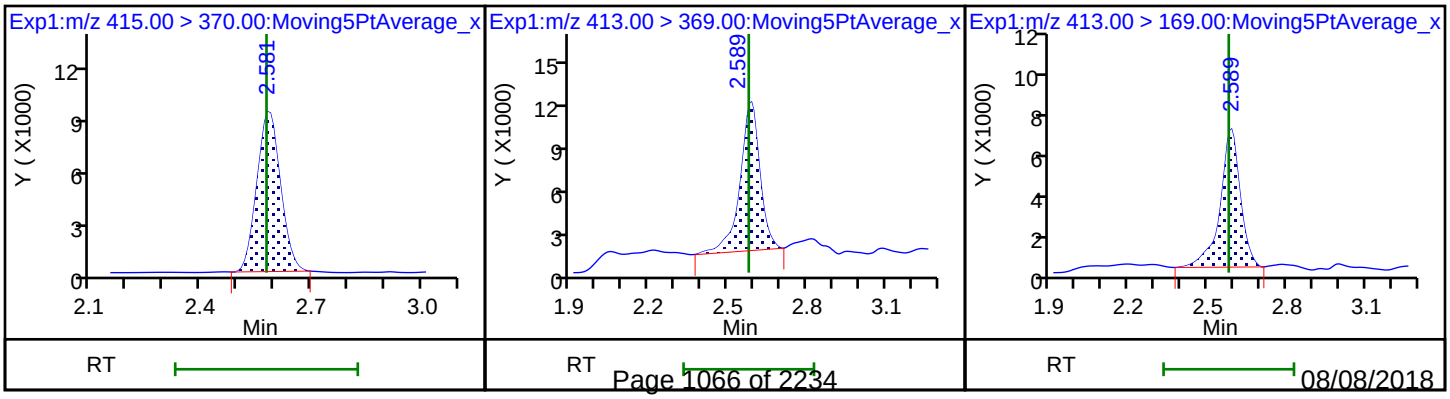
D 9 13C4-PFHpA 10 Perfluoroheptanoic acid (ND) 10 Perfluoroheptanoic acid (ND)



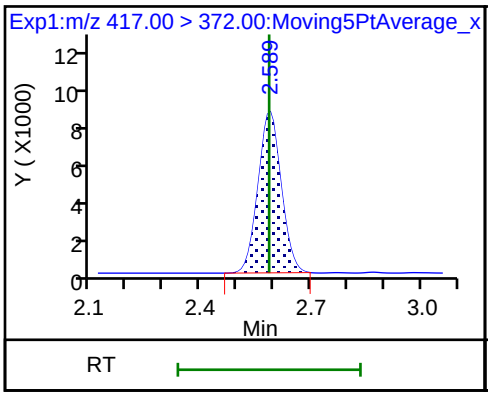
8 Perfluorohexanesulfonic acid 8 Perfluorohexanesulfonic acid D 11 18O2 PFHxS



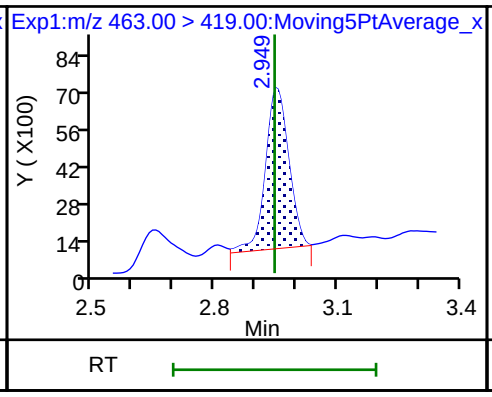
* 62 13C2-PFOA 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid



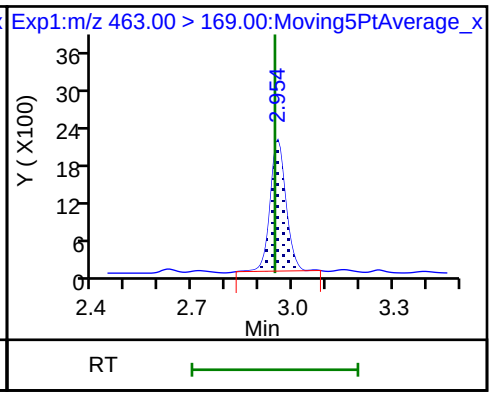
D 14 13C4 PFOA



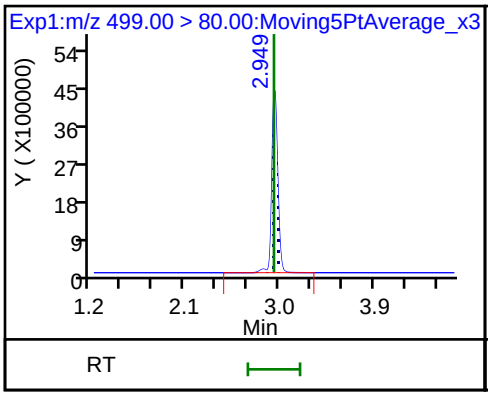
20 Perfluorononanoic acid



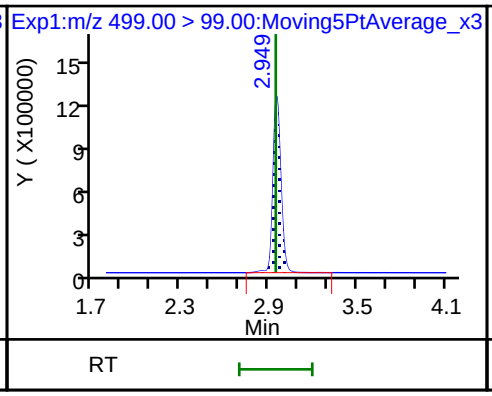
20 Perfluorononanoic acid



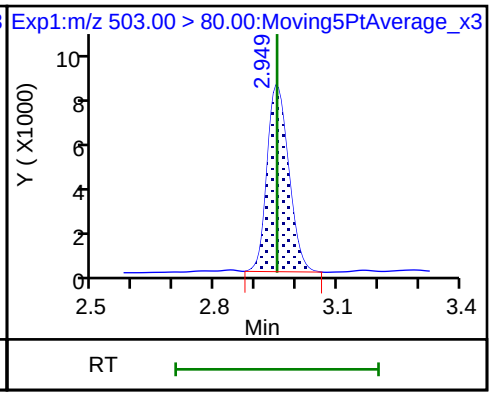
17 Perfluorooctane sulfonic acid



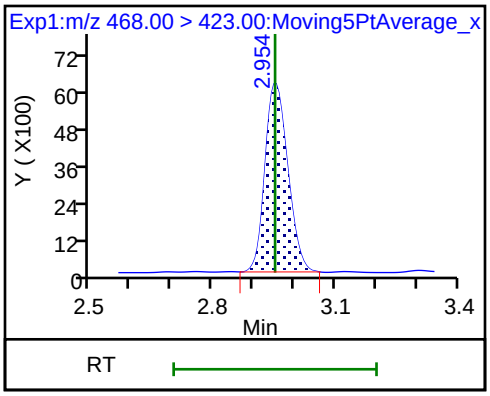
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_014.d				
Injection Date:	31-Jul-2018 18:52:07	Instrument ID:	A8_N		
Lims ID:	320-41149-A-31-A	Lab Sample ID:	320-41149-31		
Client ID:	GRE08-SB4-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

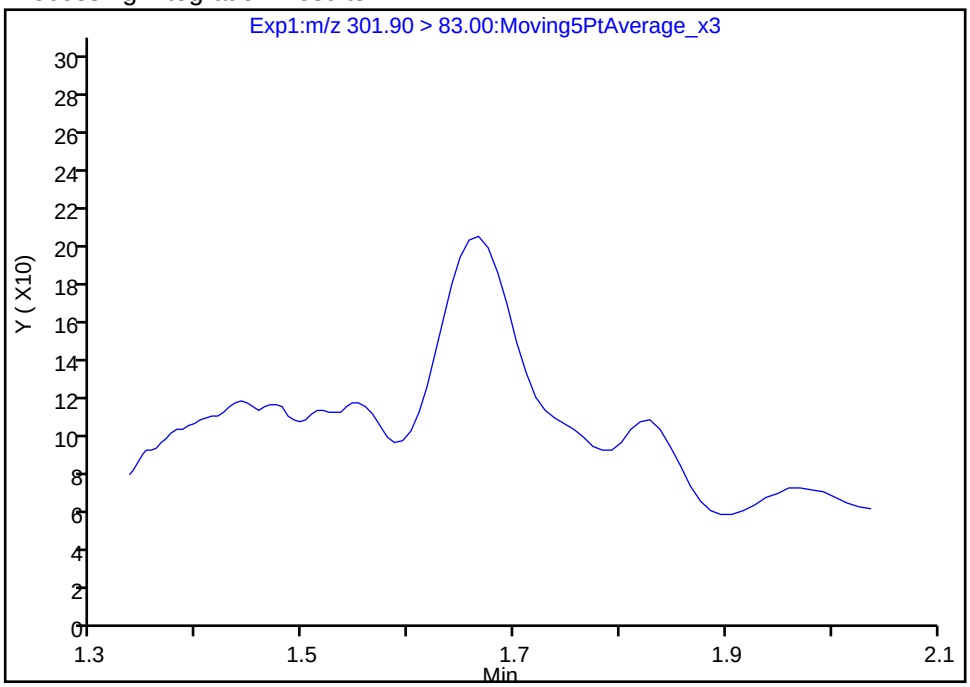
D 47 13C3-PFBS, CAS: STL02337

Signal: 1

Processing Integration Results

Not Detected

Expected RT: 1.67



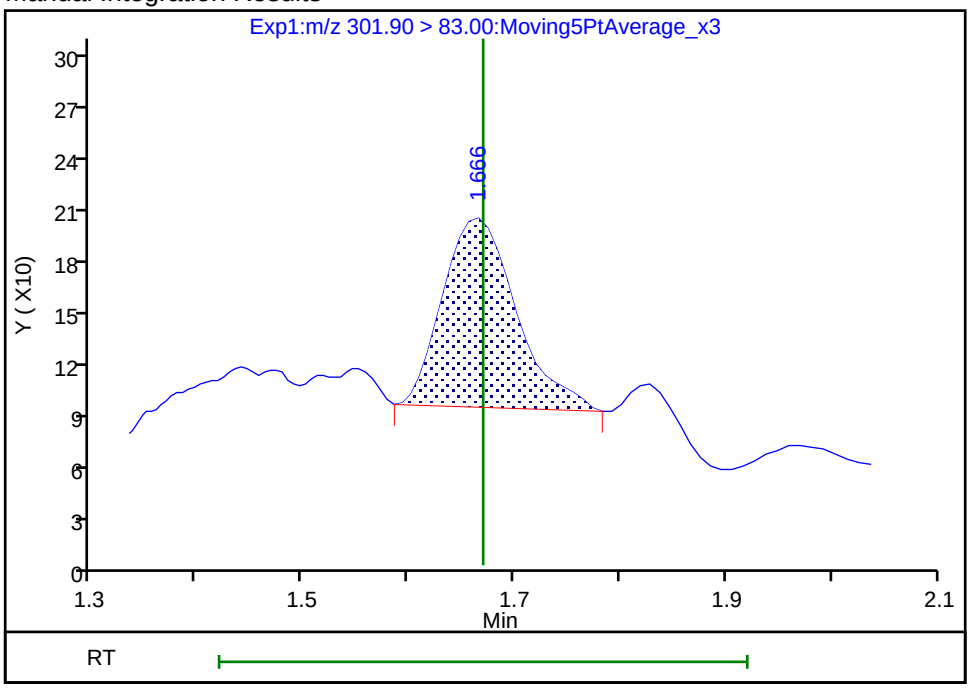
Manual Integration Results

RT: 1.67

Area: 533

Amount: 0.012670

Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:37:48

Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB3-01 | Lab Sample ID: 320-41149-32

Matrix: Solid | Lab File ID: 2018.07.28LLB_026.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 08:20

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.02(g) | Date Analyzed: 07/29/2018 02:35

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 2.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.77	M	0.31	0.20	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	2.2		0.31	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	2.3		0.31	0.20	0.083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.37	J M	0.41	0.18	0.060
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.3		0.31	0.20	0.064
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*160*	*E*	*1.0*	0.51	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	85		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	66		50-150
STL00994	18O2 PFHxS	82		50-150
STL00991	13C4 PFOS	67		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_026.d
Lims ID: 320-41149-A-32-A
Client ID: GRE07-SB3-01
Sample Type: Client
Inject. Date: 29-Jul-2018 02:35:00 ALS Bottle#: 18 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-32-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:51:21 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:51:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.667	0.008	0.649	73655	1.99		85.5	123	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.675	1.676	-0.001	1.000	459206	0.1826			126	M
298.90 > 99.00	1.675	1.676	-0.001	1.000	201203		2.28(1.25-3.74)		134	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.864	3462919	2.03		81.1	54052	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.230	-0.001	1.000	571063	0.3739			204	M
363.00 > 169.00	2.229	2.230	-0.001	1.000	219647		2.60(1.13-3.40)		1511	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.868	4266447	1.94		82.2	52170	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.242	-0.001	1.000	7534192	3.58			1961	
399.00 > 99.00	2.241	2.242	-0.001	1.000	2466034		3.06(1.50-4.49)		2939	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.582	-0.002		4366554	2.50			55800	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.582	-0.002	1.000	1971380	1.09			490	
413.00 > 169.00	2.580	2.582	-0.002	1.000	1033341		1.91(0.84-2.52)		3720	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3740169	2.24		89.5	57993	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.947	0.001	1.142	2444708	1.60		67.0	2049	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.947	0.001	1.142	2369792	1.64		65.8	30892	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.948	0.0	1.000	1206491	1.11			794	
463.00 > 169.00	2.948	2.948	0.0	1.000	287139		4.20(1.90-5.69)		2643	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.948	2.948	0.0	1.000	86446112	76.5			52531	E
499.00 > 99.00	2.948	2.948	0.0	1.000	27033424		3.20(2.31-6.93)		109443	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

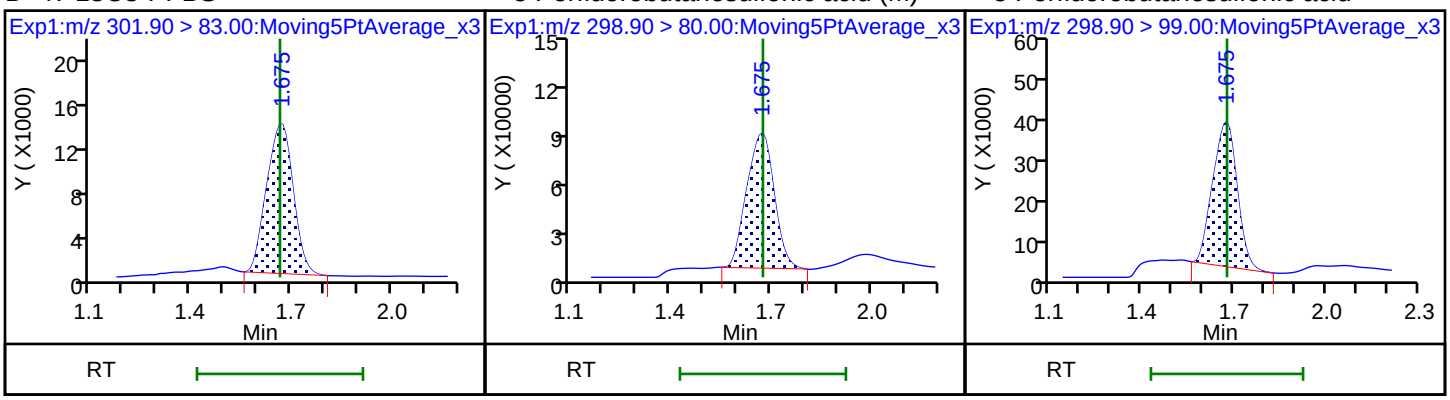
M - Manually Integrated

Report Date: 30-Jul-2018 15:51:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

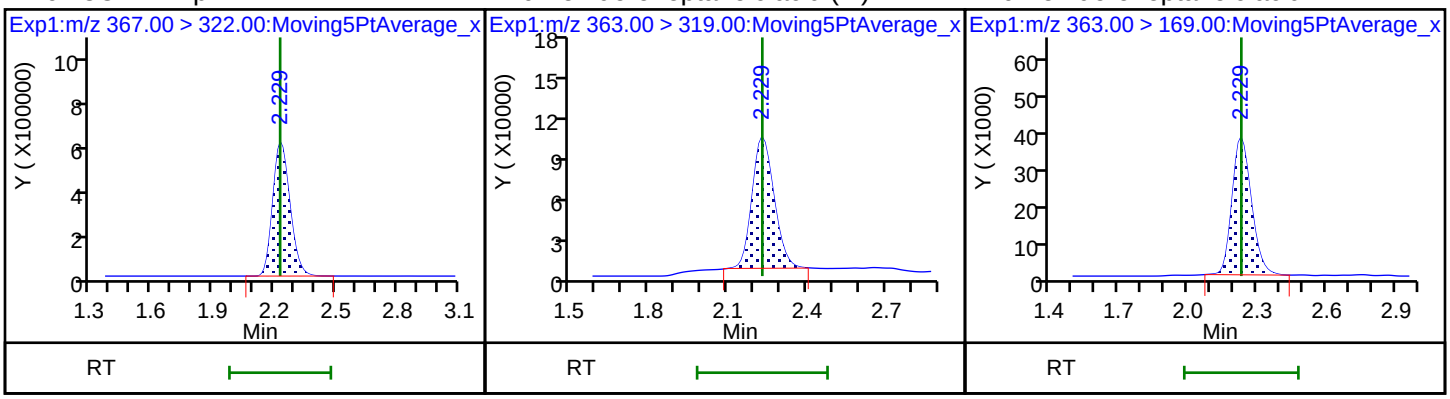
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_026.d				
Injection Date:	29-Jul-2018 02:35:00	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	18	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

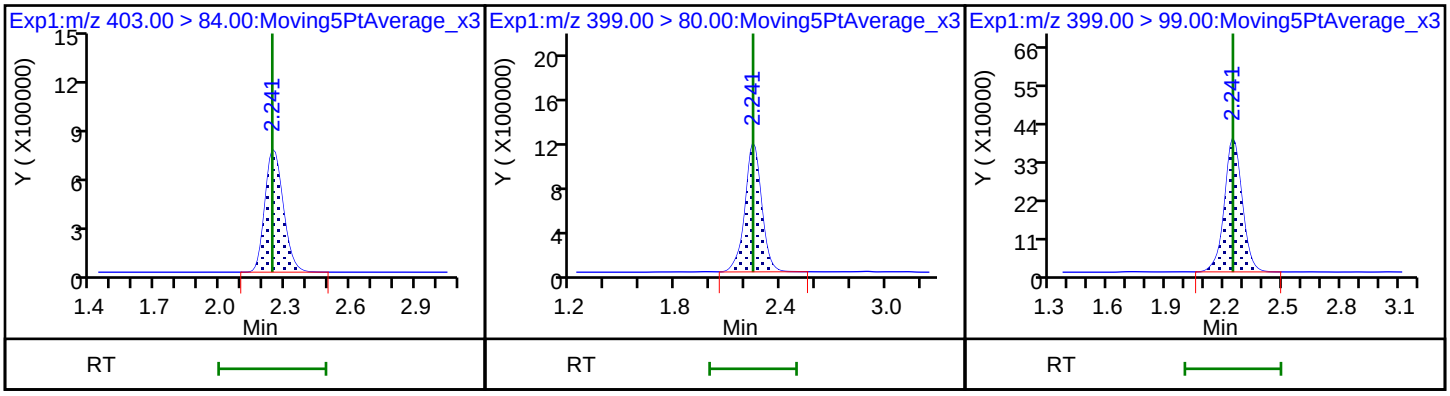
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (M) | 5 Perfluorobutanesulfonic acid



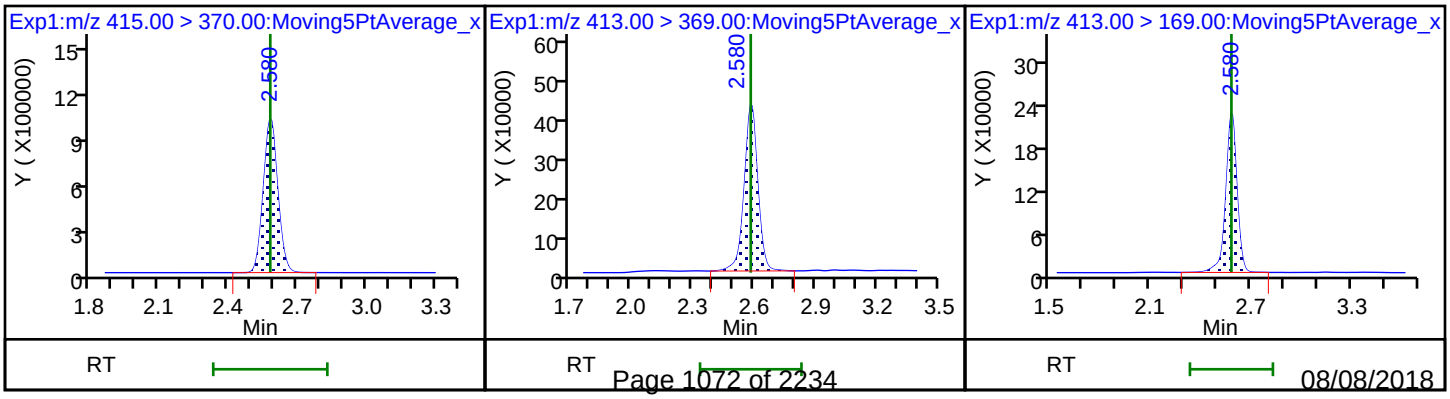
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid



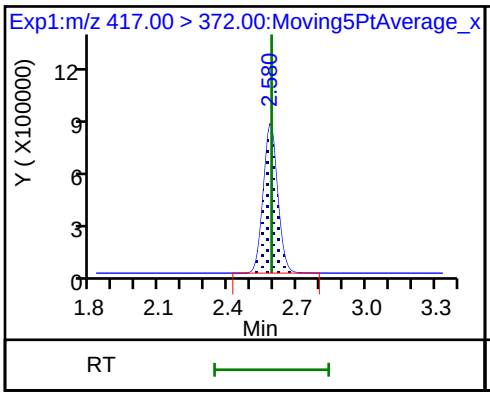
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



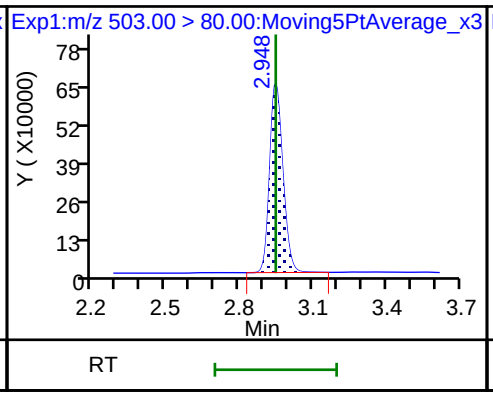
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



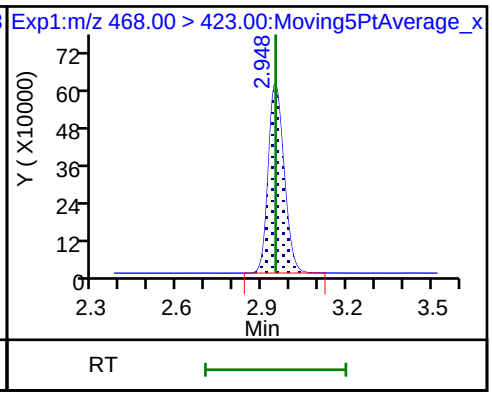
D 14 13C4 PFOA



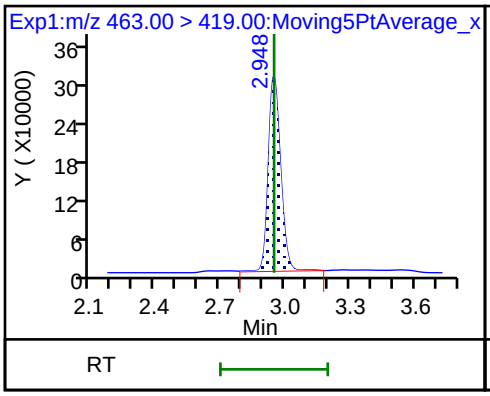
D 18 13C4 PFOS



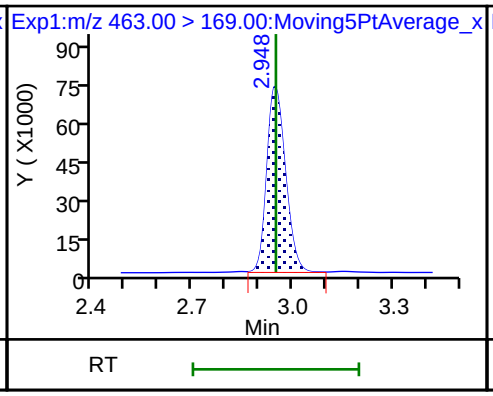
D 19 13C5 PFNA



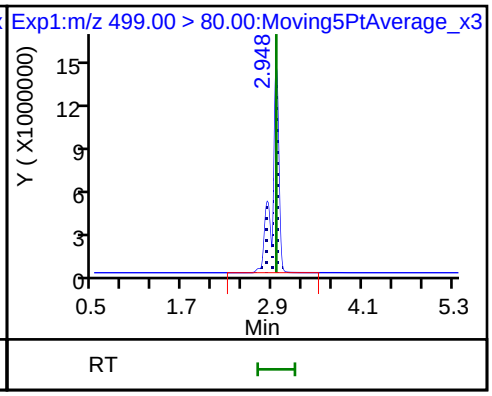
20 Perfluorononanoic acid



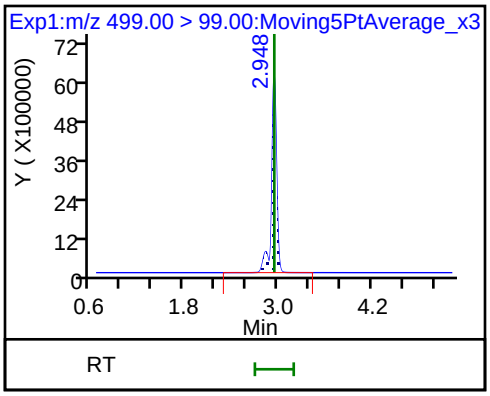
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

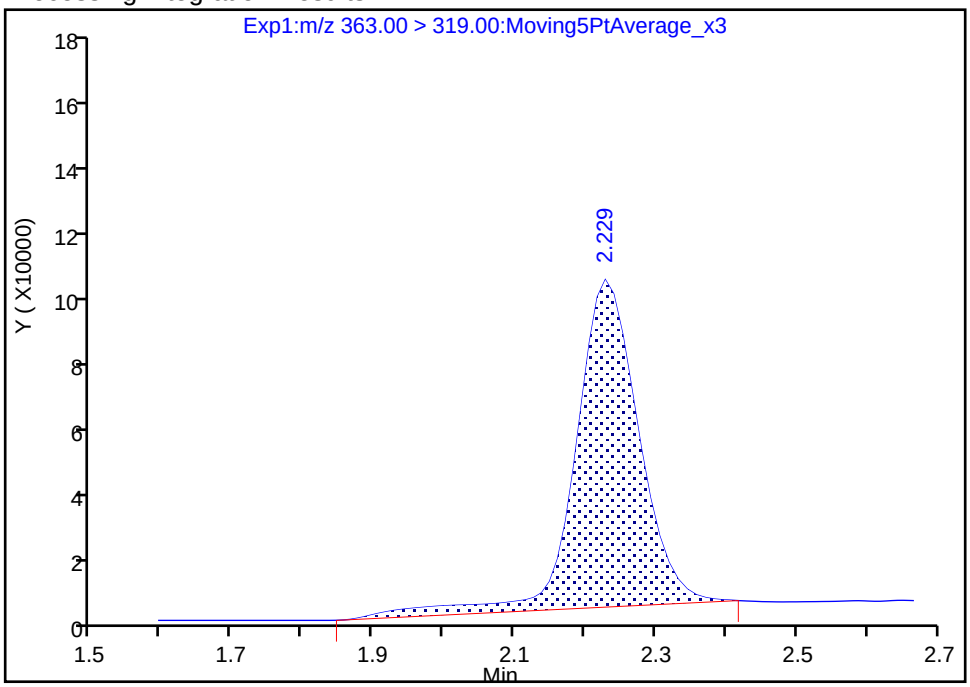
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_026.d				
Injection Date:	29-Jul-2018 02:35:00	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	18	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

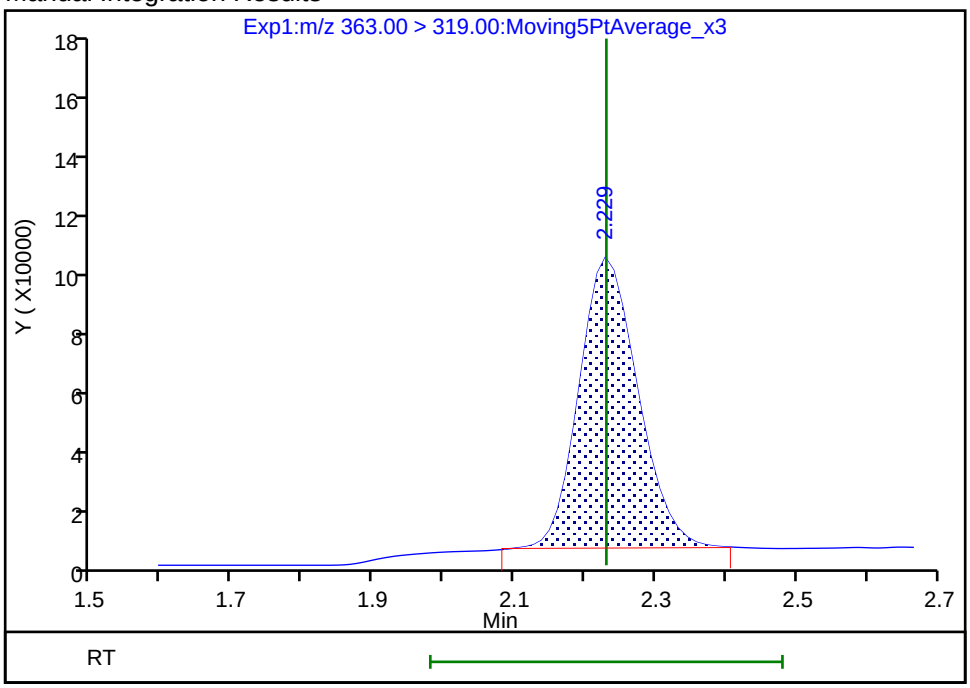
Processing Integration Results

RT: 2.23
Area: 631672
Amount: 0.413620
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 571063
Amount: 0.373933
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:51:14

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

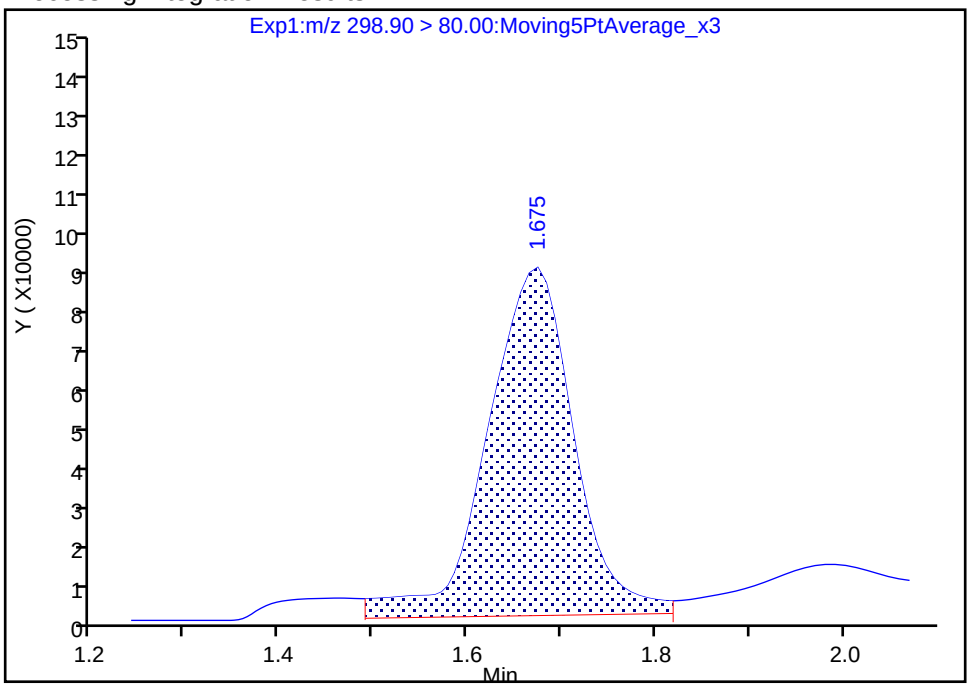
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_026.d				
Injection Date:	29-Jul-2018 02:35:00	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	18	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

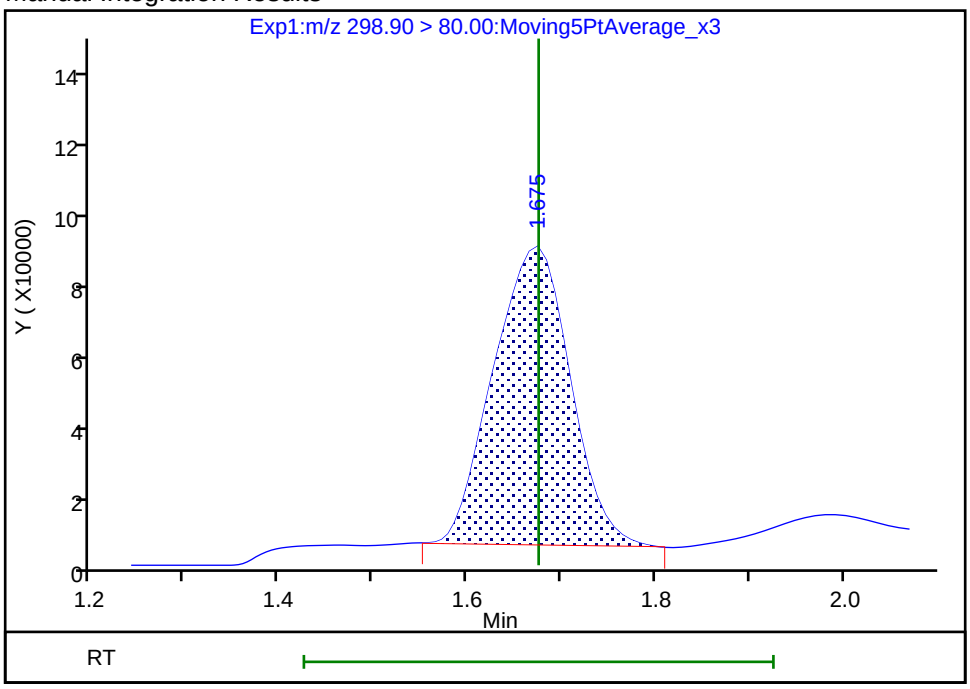
Processing Integration Results

RT: 1.67
Area: 545744
Amount: 0.216984
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 459206
Amount: 0.182577
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:51:07

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB3-01 DL | Lab Sample ID: 320-41149-32 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_015.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 08:20

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.02(g) | Date Analyzed: 07/31/2018 18:59

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 2.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*4.1*	*U M*	*6.1*	4.1	*1.6*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*2.1*	*J D M*	*6.1*	4.1	*2.0*
375-95-1	*Perfluorononanoic acid (PFNA)*	*2.4*	*J D M*	*6.1*	4.1	*1.7*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*3.7*	*U*	*8.2*	3.7	*1.2*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*7.7*	*D*	*6.1*	4.1	*1.3*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	220	D	20	10	4.9

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	78	M	50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	89		50-150
STL00994	18O2 PFHxS	78		50-150
STL00991	13C4 PFOS	76		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_015.d
Lims ID: 320-41149-A-32-A
Client ID: GRE07-SB3-01
Sample Type: Client
Inject. Date: 31-Jul-2018 18:59:54 ALS Bottle#: 9 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-41149-a-32-a 20X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:39:04 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:39:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.658	1.666	-0.008	1.000	25202	0.0110			58.1	
298.90 > 99.00	1.667	1.666	0.001	1.005	10344		2.44(1.25-3.74)		25.2	
D 47 13C3-PFBS										M
301.90 > 83.00	1.658	1.670	-0.012	0.642	3423	0.0907		78.0	15.2	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.223	-0.004	0.859	162821	0.1185		94.8	4649	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.230	2.229	0.001	1.005	23210	0.0157			9.4	M
363.00 > 169.00	2.219	2.229	-0.010	1.000	11462		2.02(1.13-3.40)		103	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.241	-0.011	0.995	353879	0.1876			703	
399.00 > 99.00	2.230	2.241	-0.011	0.995	122909		2.88(1.50-4.49)		179	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.248	-0.006	0.868	191937	0.0919		77.7	6544	
* 62 13C2-PFOA										
415.00 > 370.00	2.582	2.578	0.004		182636	0.1250			8188	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.582	2.578	0.004	1.003	78966	0.0521			51.8	M
413.00 > 169.00	2.582	2.578	0.004	1.003	46124		1.71(0.84-2.52)		178	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.586	-0.012	0.997	162412	0.1157		92.6	7314	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.944	2.946	-0.002	1.000	69012	0.0582			81.4	M
463.00 > 169.00	2.950	2.946	0.004	1.002	14967		4.61(1.90-5.69)		394	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.944	2.946	-0.002	1.000	7131560	5.49			26505	
499.00 > 99.00	2.944	2.946	-0.002	1.000	1721839		4.14(2.31-6.93)		17273	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.952	-0.008	1.140	136211	0.0908		76.0	1143	
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.952	-0.008	1.140	137387	0.1107		88.6	7489	

QC Flag Legend

Review Flags

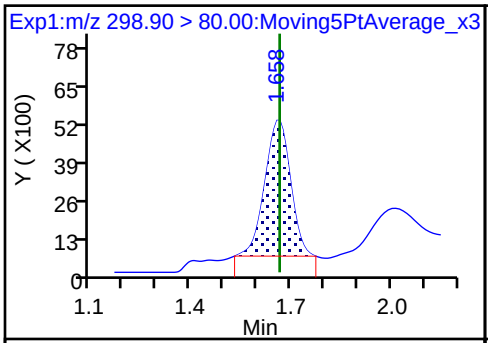
M - Manually Integrated

Report Date: 01-Aug-2018 12:39:04 Chrom Revision: 2.3 19-Jul-2018 15:14:50

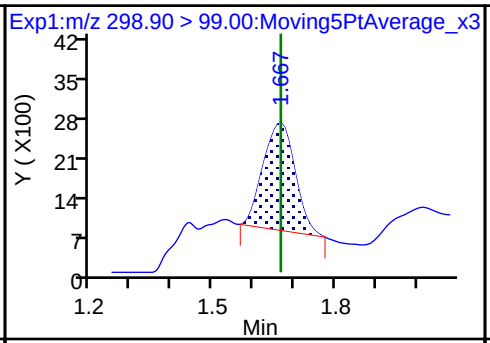
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_015.d				
Injection Date:	31-Jul-2018 18:59:54	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

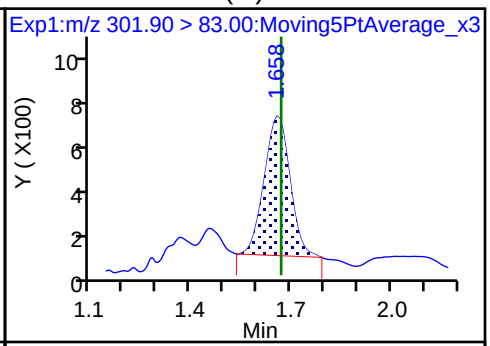
5 Perfluorobutanesulfonic acid



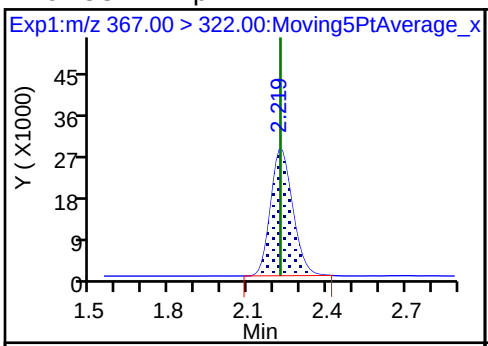
5 Perfluorobutanesulfonic acid



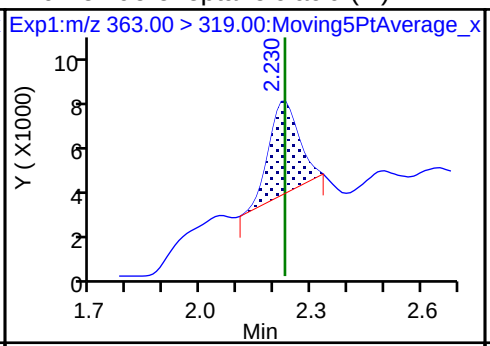
D 47 13C3-PFBS (M)



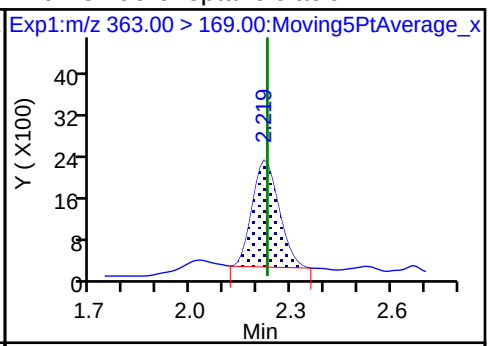
D 9 13C4-PFHpA



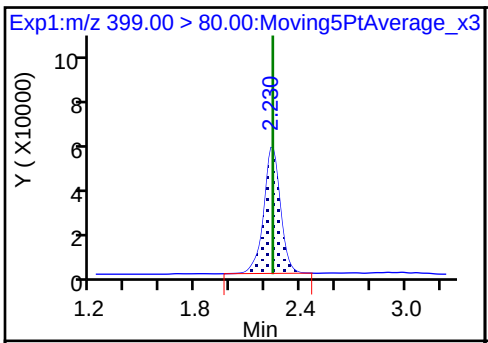
10 Perfluoroheptanoic acid (M)



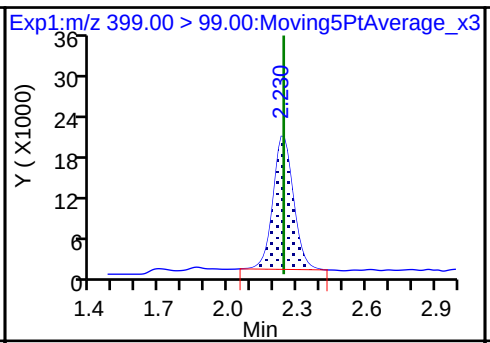
10 Perfluoroheptanoic acid



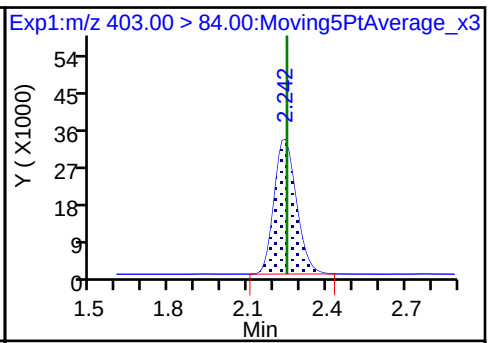
8 Perfluorohexanesulfonic acid



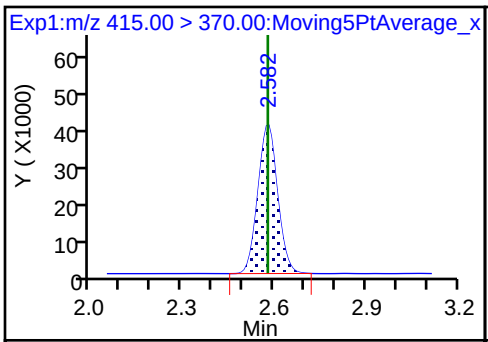
8 Perfluorohexanesulfonic acid



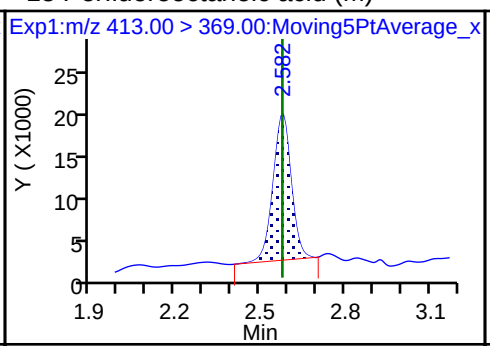
D 11 18O2 PFHxS



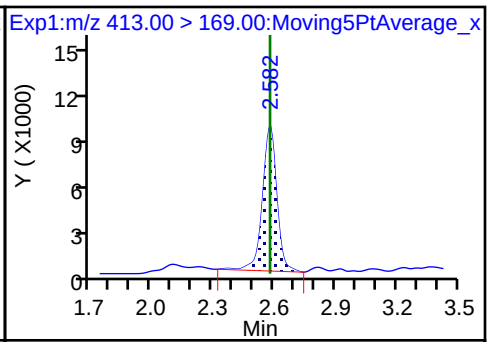
* 62 13C2-PFOA



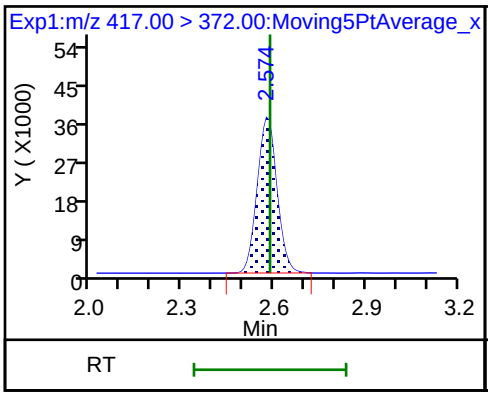
15 Perfluorooctanoic acid (M)



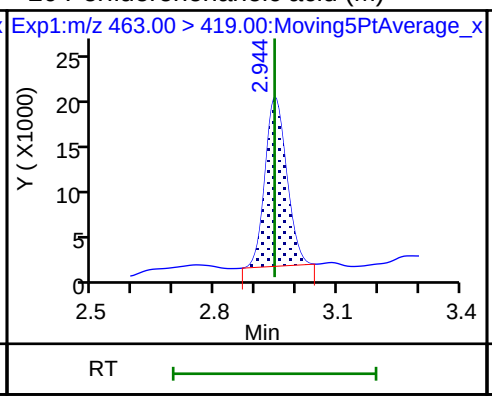
15 Perfluorooctanoic acid



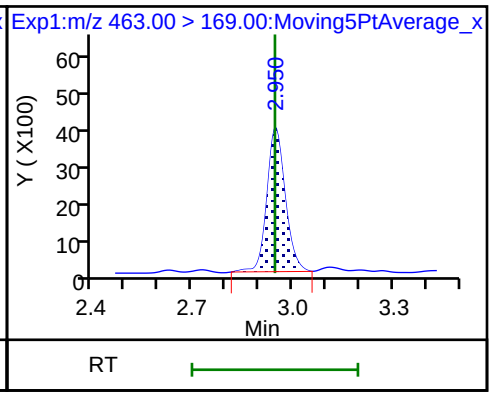
D 14 13C4 PFOA



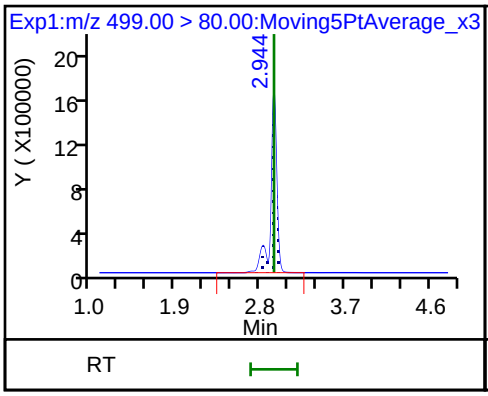
20 Perfluorononanoic acid (M)



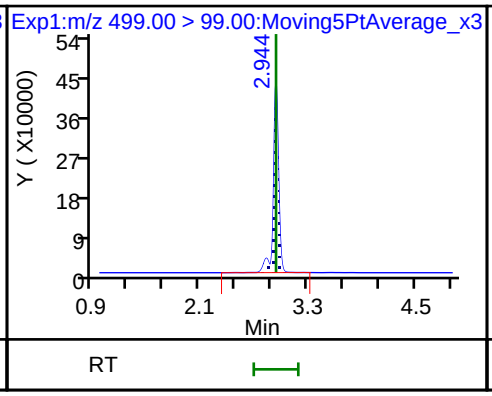
20 Perfluorononanoic acid



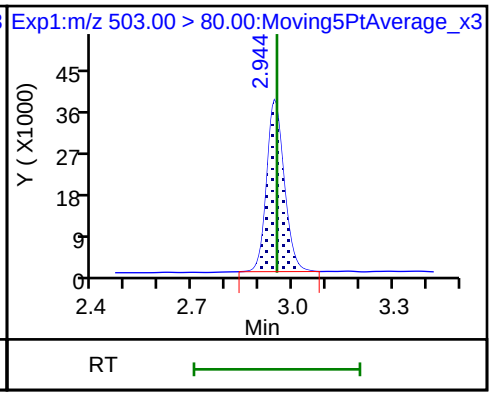
17 Perfluorooctane sulfonic acid



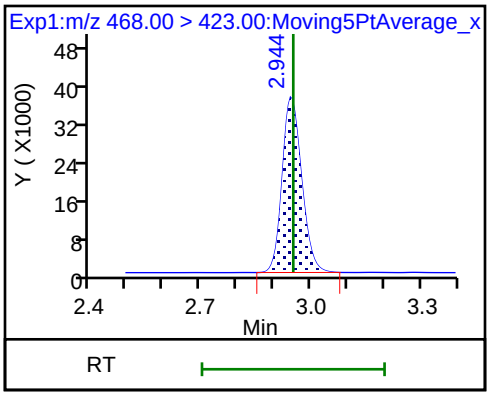
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

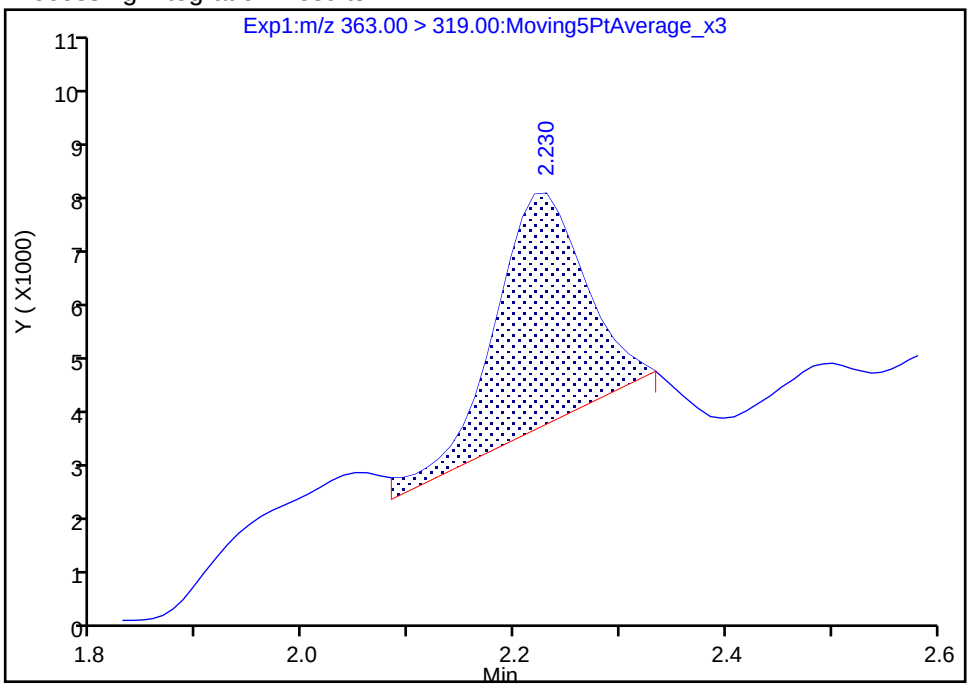
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_015.d				
Injection Date:	31-Jul-2018 18:59:54	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

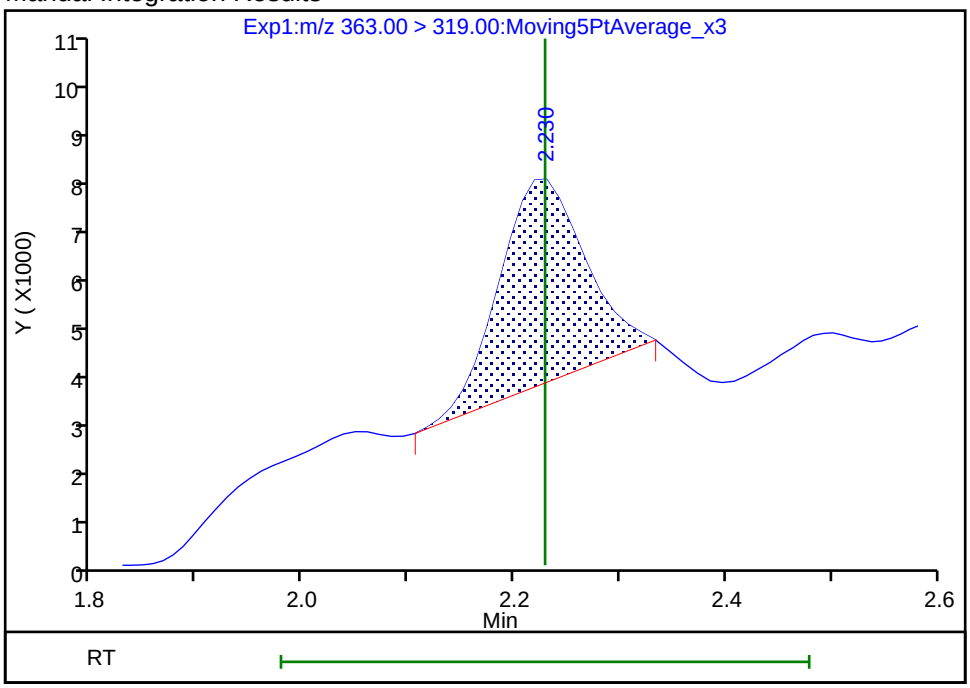
Processing Integration Results

RT: 2.23
Area: 25260
Amount: 0.017047
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 23210
Amount: 0.015663
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:38:40

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

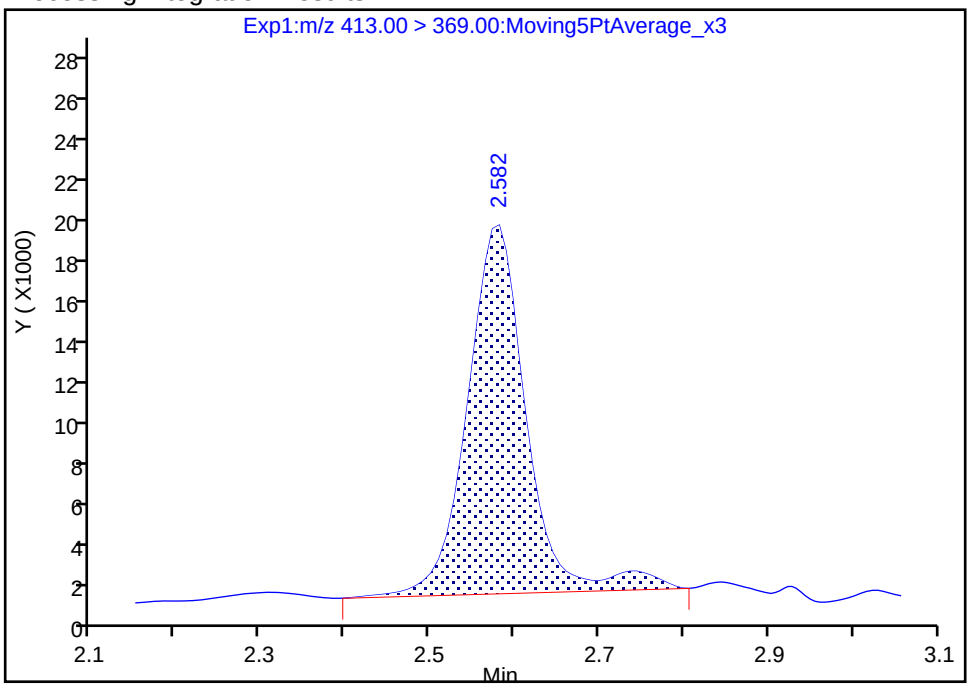
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_015.d				
Injection Date:	31-Jul-2018 18:59:54	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

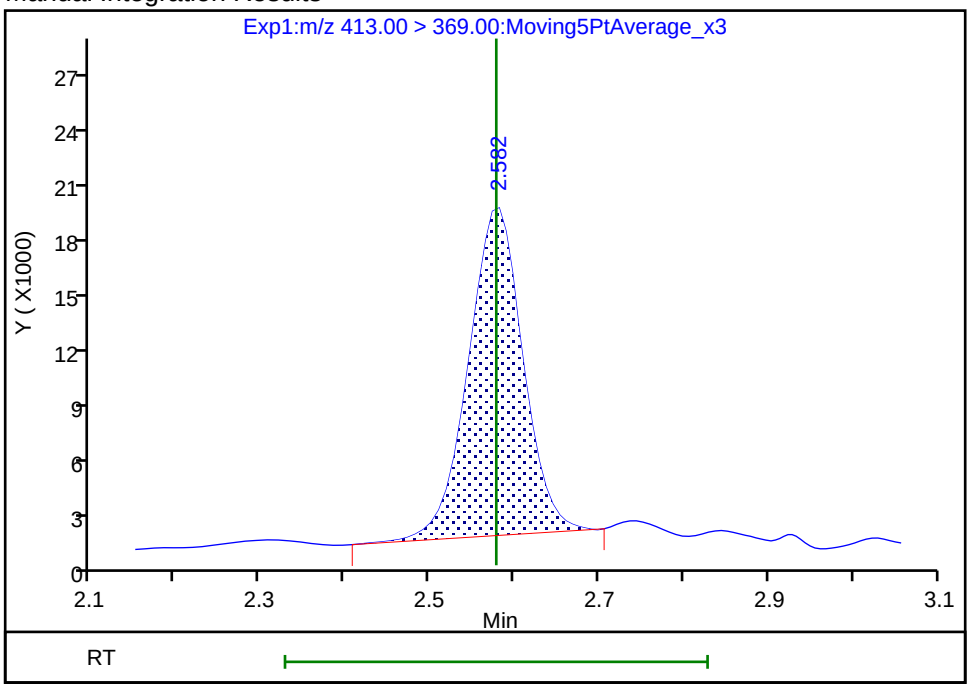
Processing Integration Results

RT: 2.58
Area: 87225
Amount: 0.057581
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 78966
Amount: 0.052129
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:38:48

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

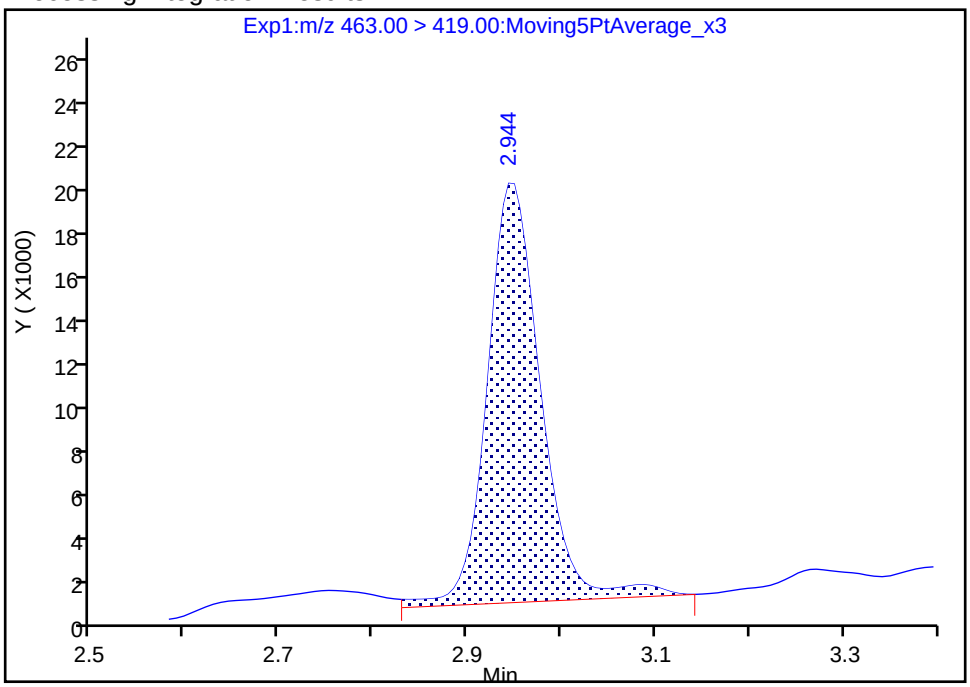
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_015.d				
Injection Date:	31-Jul-2018 18:59:54	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

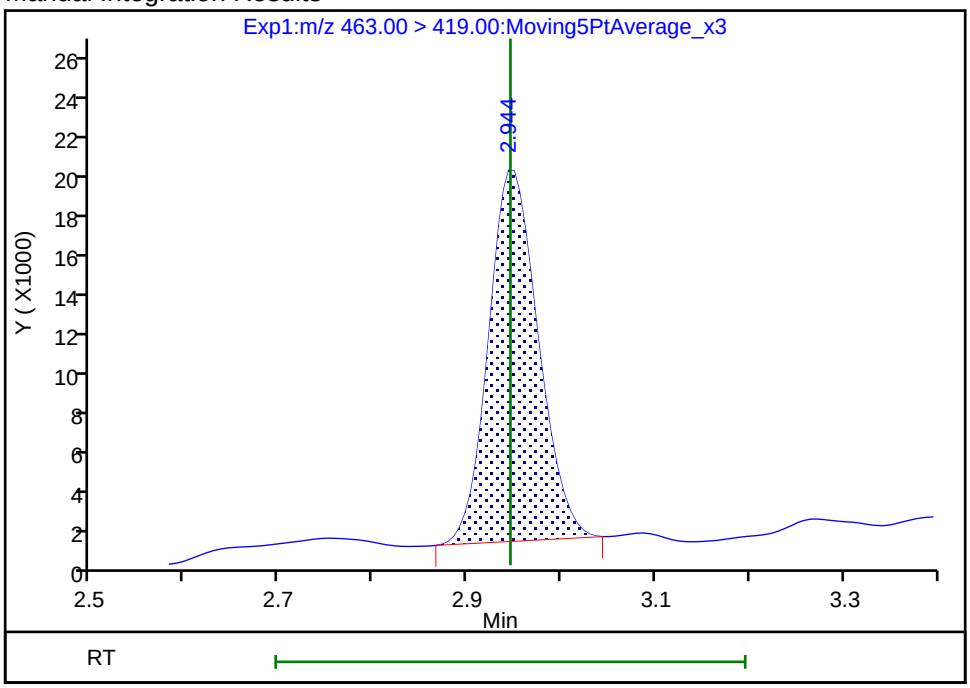
Processing Integration Results

RT: 2.94
Area: 76119
Amount: 0.064193
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 69012
Amount: 0.058200
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:38:58

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

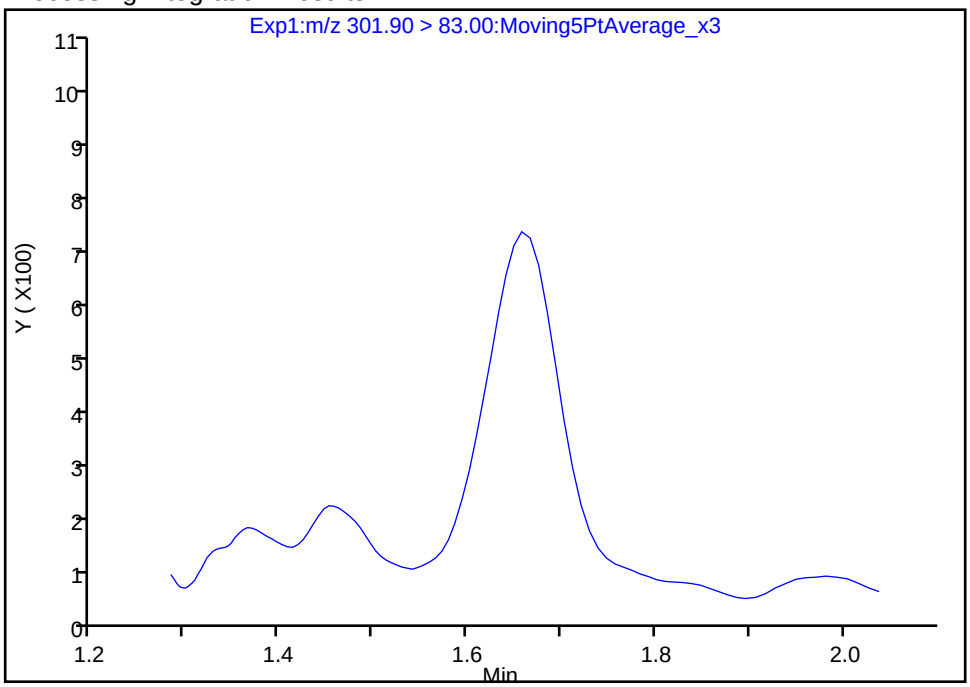
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_015.d				
Injection Date:	31-Jul-2018 18:59:54	Instrument ID:	A8_N		
Lims ID:	320-41149-A-32-A	Lab Sample ID:	320-41149-32		
Client ID:	GRE07-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	9	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

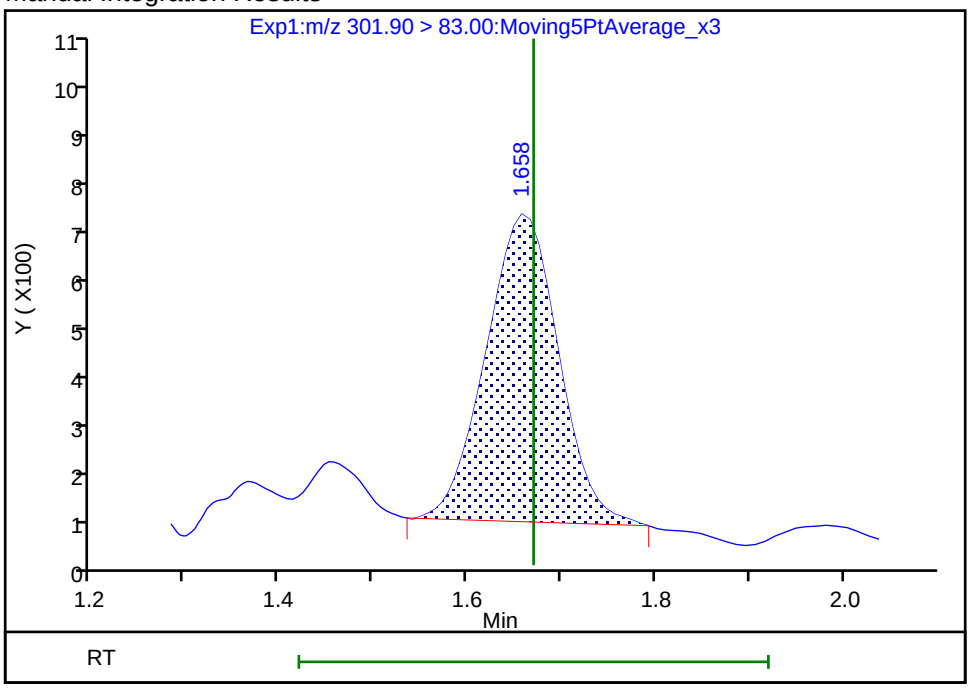
Not Detected
Expected RT: 1.67

Processing Integration Results



Manual Integration Results

RT: 1.66
Area: 3423
Amount: 0.090664
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:38:17
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE04-SB3-01
Lab Sample ID: 320-41149-33
Matrix: Solid
Lab File ID: 2018.07.28LLB_027.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/13/2018 08:40
Extraction Method: SHAKE
Date Extracted: 07/18/2018 10:19
Sample wt/vol: 5.01(g)
Date Analyzed: 07/29/2018 02:42
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 6.2
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236778
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.11	J M	0.32	0.21	0.083
335-67-1	Perfluorooctanoic acid (PFOA)	0.78		0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	0.38		0.32	0.21	0.086
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.43	0.19	0.063
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.1		0.32	0.21	0.066
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	6.6		1.1	0.53	0.26

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	63		50-150
STL01892	13C4-PFHpA	73		50-150
STL00990	13C4 PFOA	81		50-150
STL00995	13C5 PFNA	80		50-150
STL00994	18O2 PFHxS	64		50-150
STL00991	13C4 PFOS	66		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_027.d
Lims ID: 320-41149-A-33-A
Client ID: GRE04-SB3-01
Sample Type: Client
Inject. Date: 29-Jul-2018 02:42:49 ALS Bottle#: 19 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-33-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:52:06 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:52:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.667	0.008	0.647	63853	1.47		63.0	169	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.676	-0.001	1.000	24437	0.0112			37.1	
298.90 > 99.00	1.675	1.676	-0.001	1.000	12372		1.98(1.25-3.74)		13.1	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.861	3672380	1.83		73.2	62451	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.230	-0.001	1.000	81484	0.0503			58.9	M
363.00 > 169.00	2.241	2.230	0.011	1.005	33595		2.43(1.13-3.40)		271	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.866	3928417	1.52		64.4	54770	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.242	-0.001	1.000	1035643	0.5344			1071	
399.00 > 99.00	2.241	2.242	-0.001	1.000	358043		2.89(1.50-4.49)		707	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.582	0.006		5132898	2.50			69480	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.582	0.006	1.000	709975	0.3659			553	
413.00 > 169.00	2.588	2.582	0.006	1.000	370897		1.91(0.84-2.52)		1735	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	1.000	3996496	2.03		81.4	54262	
D 18 13C4 PFOS										
503.00 > 80.00	2.954	2.947	0.007	1.141	2814729	1.57		65.7	11209	
D 19 13C5 PFNA										
468.00 > 423.00	2.954	2.947	0.007	1.141	3397312	2.01		80.2	48640	
20 Perfluorononanoic acid										
463.00 > 419.00	2.954	2.948	0.006	1.000	278729	0.1796			441	
463.00 > 169.00	2.954	2.948	0.006	1.000	71022		3.92(1.90-5.69)		1212	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.954	2.948	0.006	1.000	4060154	3.12			11705	
499.00 > 99.00	2.954	2.948	0.006	1.000	958419		4.24(2.31-6.93)		4501	

QC Flag Legend

Review Flags

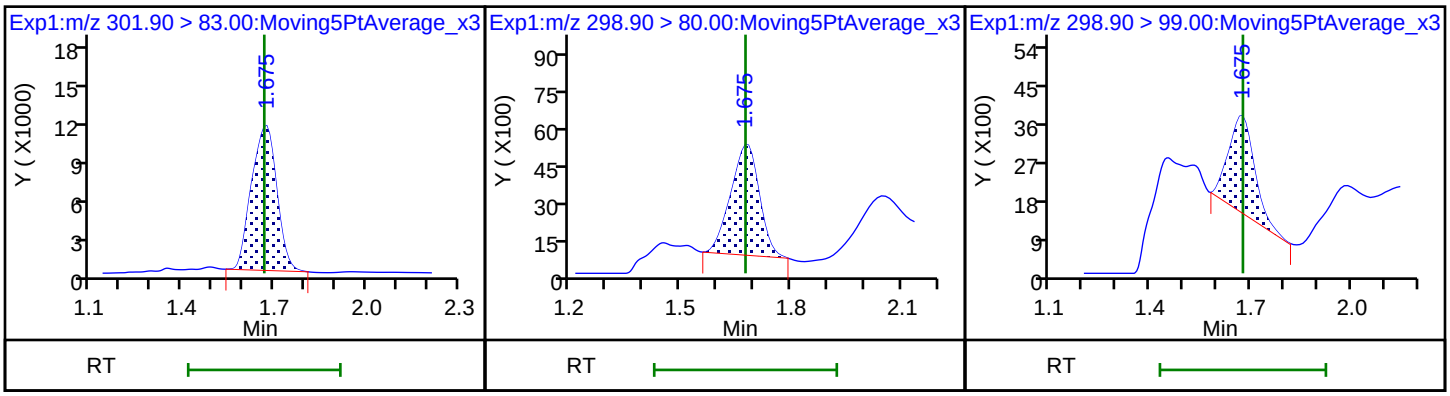
M - Manually Integrated

Report Date: 30-Jul-2018 15:52:07 Chrom Revision: 2.3 19-Jul-2018 15:14:50

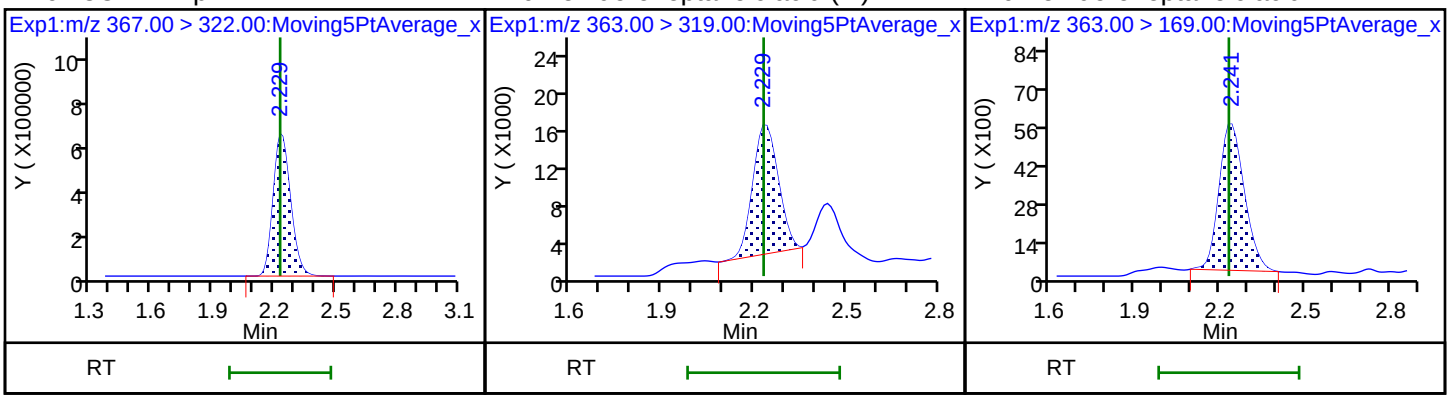
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_027.d				
Injection Date:	29-Jul-2018 02:42:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-33-A	Lab Sample ID:	320-41149-33		
Client ID:	GRE04-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	19	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

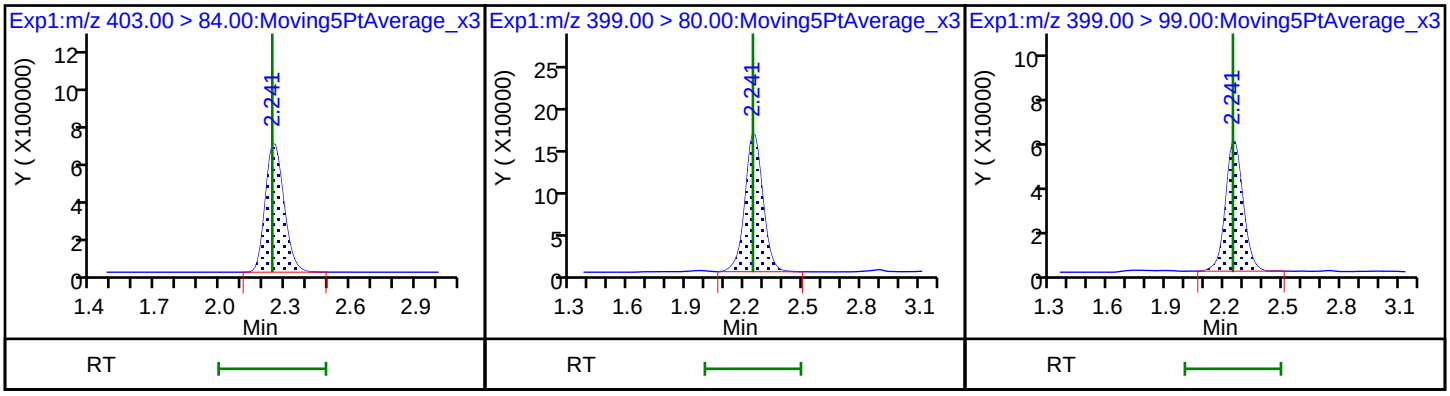
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



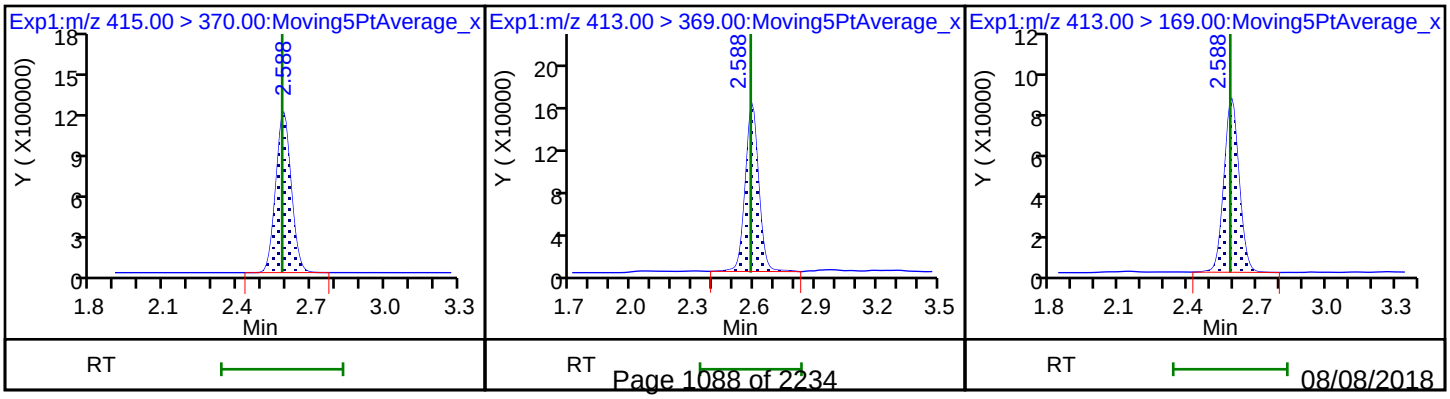
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid



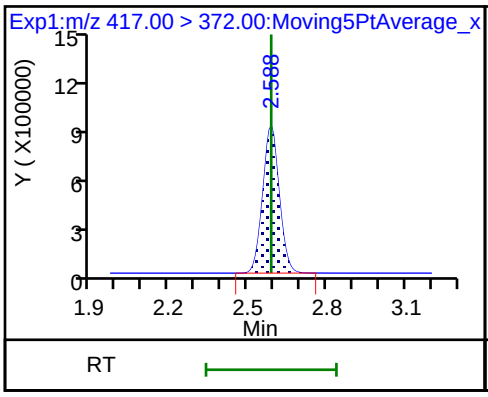
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



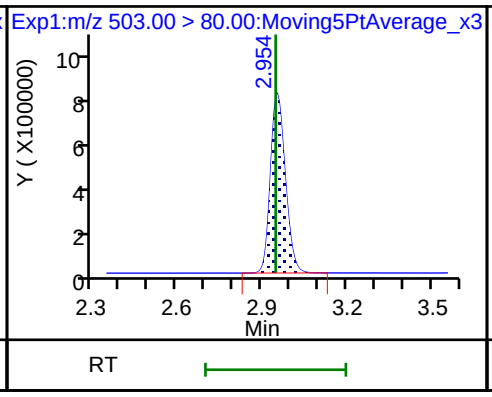
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



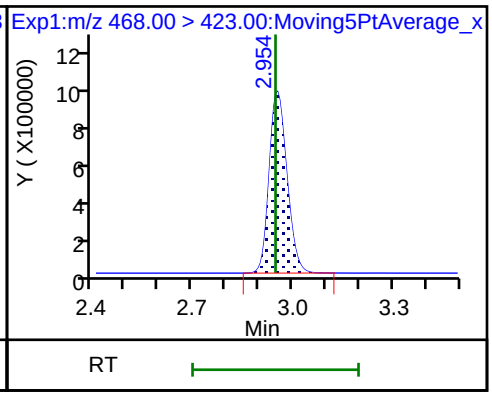
D 14 13C4 PFOA



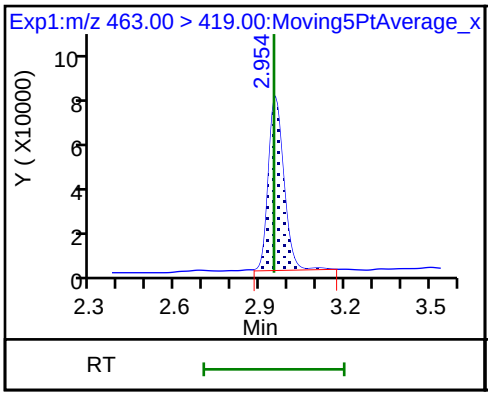
D 18 13C4 PFOS



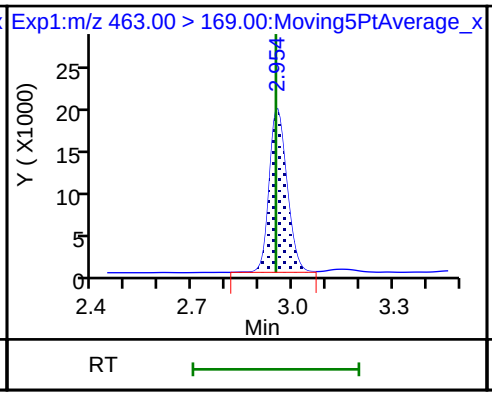
D 19 13C5 PFNA



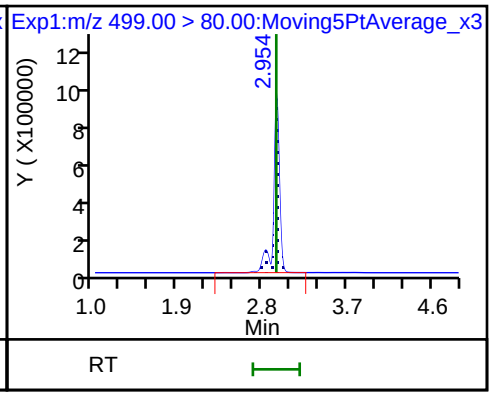
20 Perfluorononanoic acid



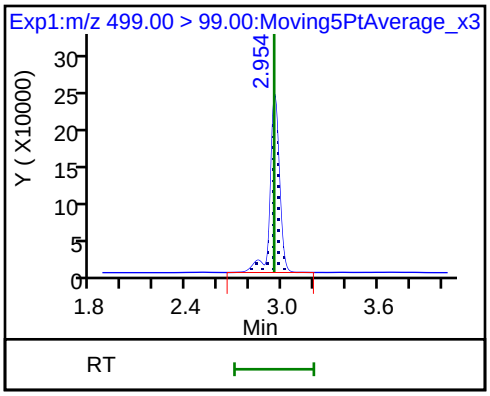
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

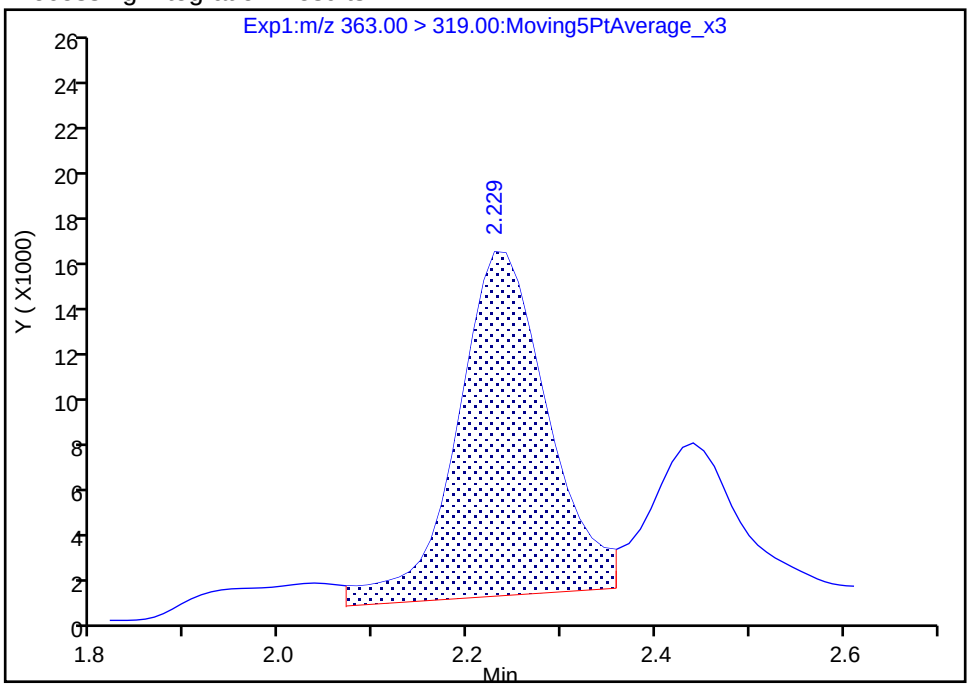
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_027.d				
Injection Date:	29-Jul-2018 02:42:49	Instrument ID:	A8_N		
Lims ID:	320-41149-A-33-A	Lab Sample ID:	320-41149-33		
Client ID:	GRE04-SB3-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	19	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

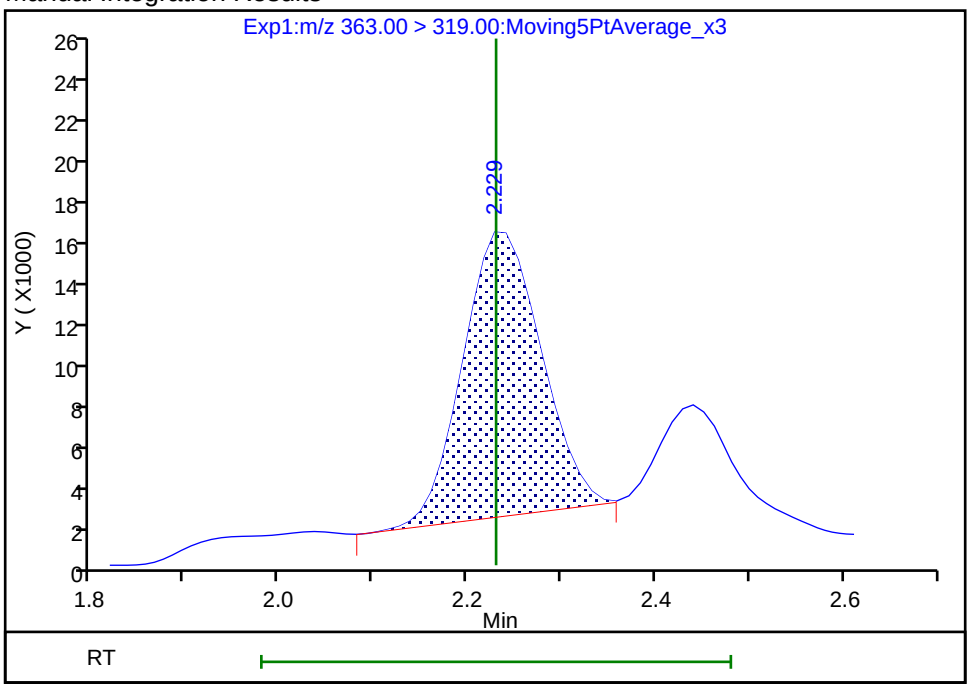
Processing Integration Results

RT: 2.23
Area: 102851
Amount: 0.063506
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 81484
Amount: 0.050313
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:51:54

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE05-SB1-01 | Lab Sample ID: 320-41149-34

Matrix: Solid | Lab File ID: 2018.07.28LLB_028.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 09:10

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.00(g) | Date Analyzed: 07/29/2018 02:50

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 2.9 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.23	J M	0.31	0.21	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	0.93		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.3		0.31	0.21	0.083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.74		0.31	0.21	0.064
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*42*	*E*	*1.0*	0.52	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	71		50-150
STL01892	13C4-PFHpA	82		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	81		50-150
STL00994	18O2 PFHxS	78		50-150
STL00991	13C4 PFOS	73		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_028.d
Lims ID: 320-41149-A-34-A
Client ID: GRE05-SB1-01
Sample Type: Client
Inject. Date: 29-Jul-2018 02:50:39 ALS Bottle#: 20 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-34
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:53:26 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:52:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.661	1.667	-0.006	0.644	67044	1.66		71.4	136	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.661	1.676	-0.015	1.000	26979	0.0118			36.8	
298.90 > 99.00	1.661	1.676	-0.015	1.000	9314		2.90(1.25-3.74)		6.9	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.223	2.228	-0.005	0.862	3835740	2.06		82.5	81565	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.223	2.230	-0.007	1.000	189558	0.1121			158	M
363.00 > 169.00	2.223	2.230	-0.007	1.000	75564		2.51(1.13-3.40)		783	
D 11 18O2 PFHxS										
403.00 > 84.00	2.235	2.240	-0.005	0.867	4403437	1.84		77.9	67932	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.235	2.242	-0.007	1.000	779470	0.3588			653	
399.00 > 99.00	2.235	2.242	-0.007	1.000	254879		3.06(1.50-4.49)		425	
* 62 13C2-PFOA										
415.00 > 370.00	2.577	2.582	-0.005		4756733	2.50			63408	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.577	2.582	-0.005	1.000	861102	0.4506			748	
413.00 > 169.00	2.577	2.582	-0.005	1.000	461708		1.87(0.84-2.52)		2313	
D 14 13C4 PFOA										
417.00 > 372.00	2.577	2.588	-0.011	1.000	3936971	2.16		86.5	64074	
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.947	-0.007	1.141	2901064	1.75		73.0	13933	
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.947	-0.007	1.141	3191148	2.03		81.3	72069	
20 Perfluorononanoic acid										
463.00 > 419.00	2.940	2.948	-0.008	1.000	915933	0.6285			1551	
463.00 > 169.00	2.940	2.948	-0.008	1.000	228449		4.01(1.90-5.69)		3085	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.945	2.948	-0.003	1.002	27155077	20.2			72849	E
499.00 > 99.00	2.940	2.948	-0.008	1.000	7397972		3.67(2.31-6.93)		35182	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

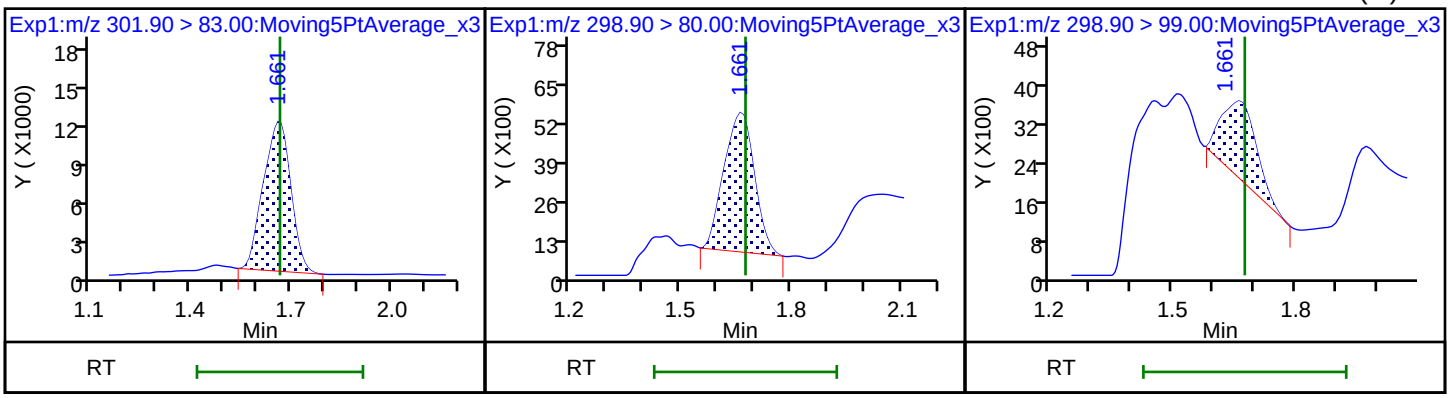
M - Manually Integrated

Report Date: 30-Jul-2018 15:53:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

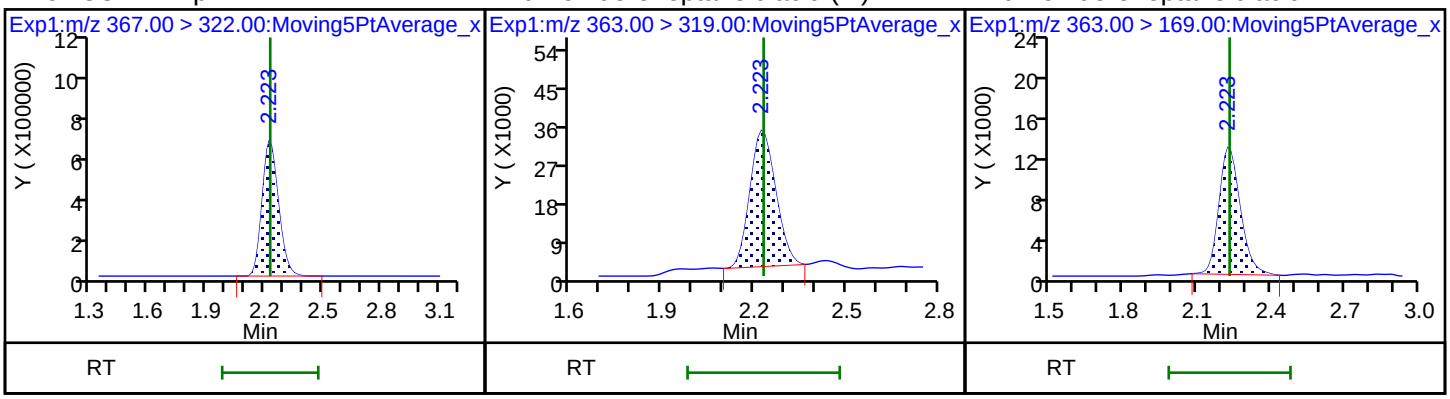
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_028.d				
Injection Date:	29-Jul-2018 02:50:39	Instrument ID:	A8_N		
Lims ID:	320-41149-A-34-A	Lab Sample ID:	320-41149-34		
Client ID:	GRE05-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	20	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

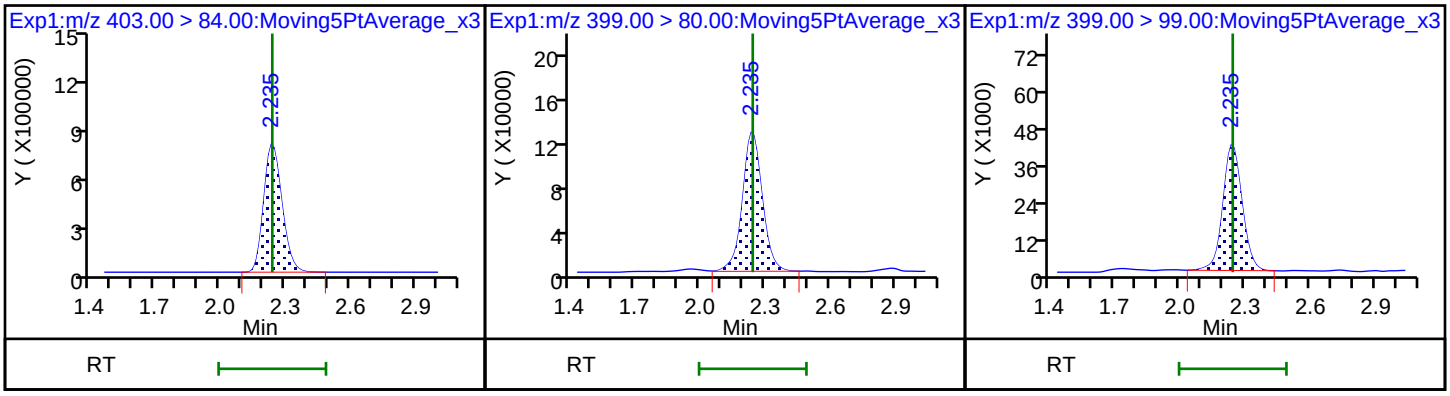
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid (M)



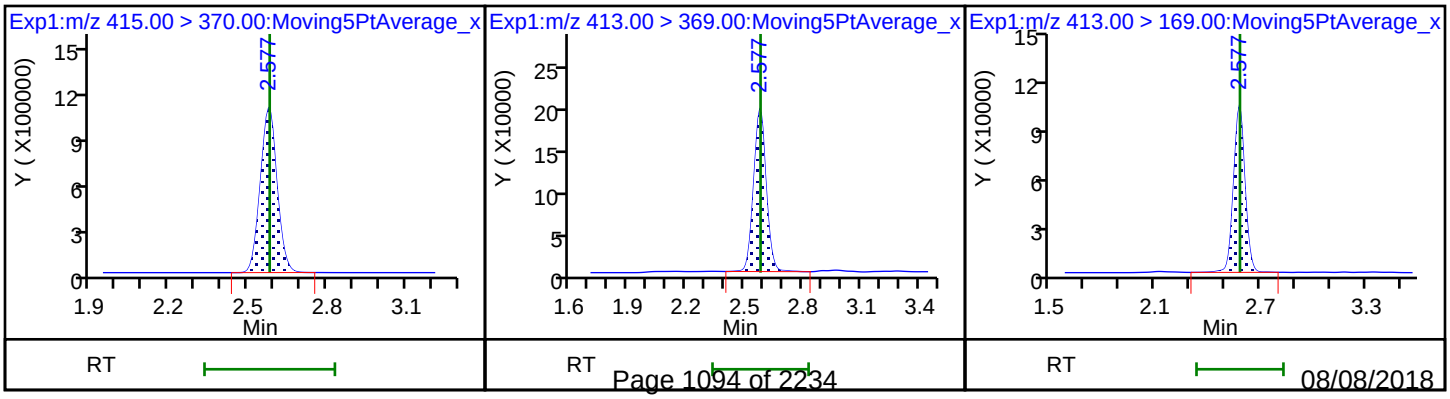
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid



D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid

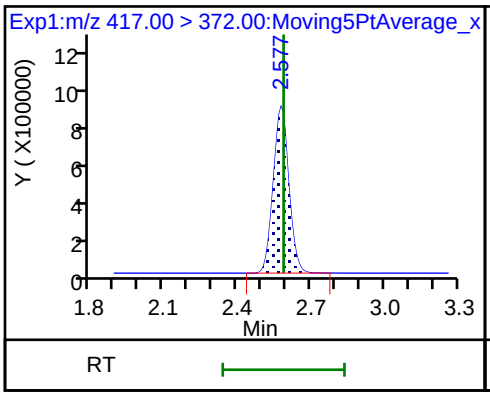


* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid

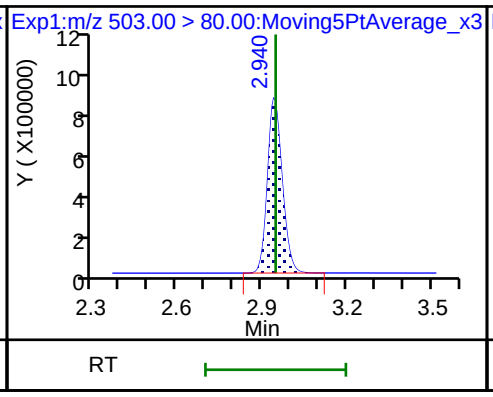


Report Date: 30-Jul-2018 15:53:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_028.d

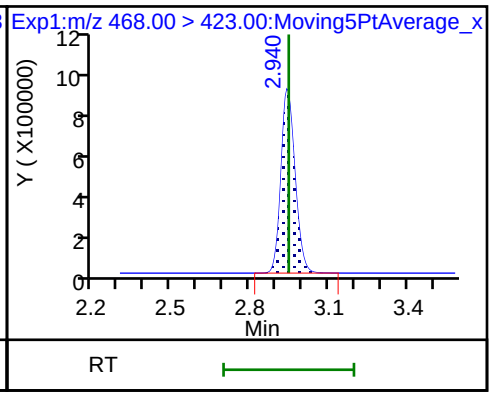
D 14 13C4 PFOA



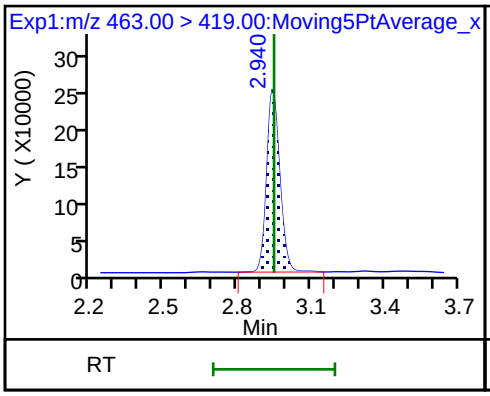
D 18 13C4 PFOS



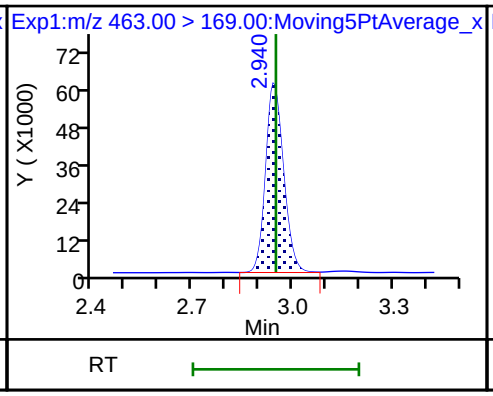
D 19 13C5 PFNA



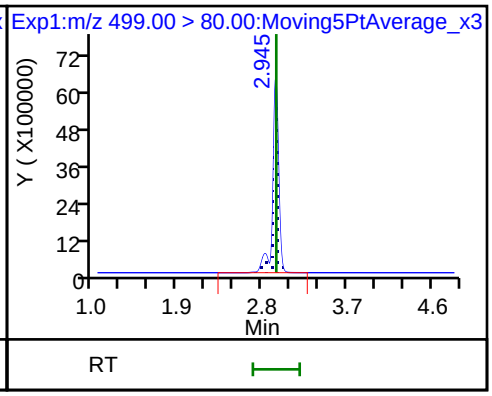
20 Perfluorononanoic acid



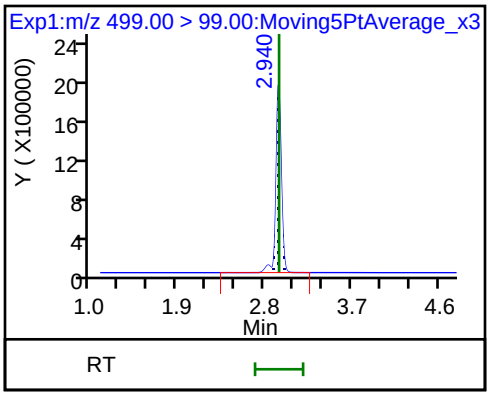
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

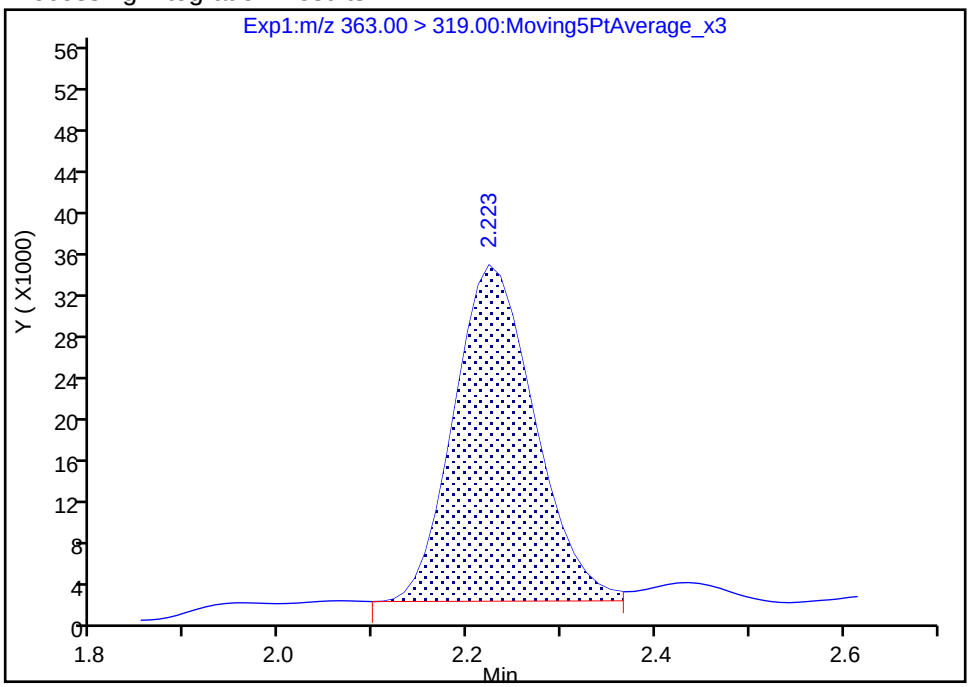
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_028.d				
Injection Date:	29-Jul-2018 02:50:39	Instrument ID:	A8_N		
Lims ID:	320-41149-A-34-A	Lab Sample ID:	320-41149-34		
Client ID:	GRE05-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	20	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

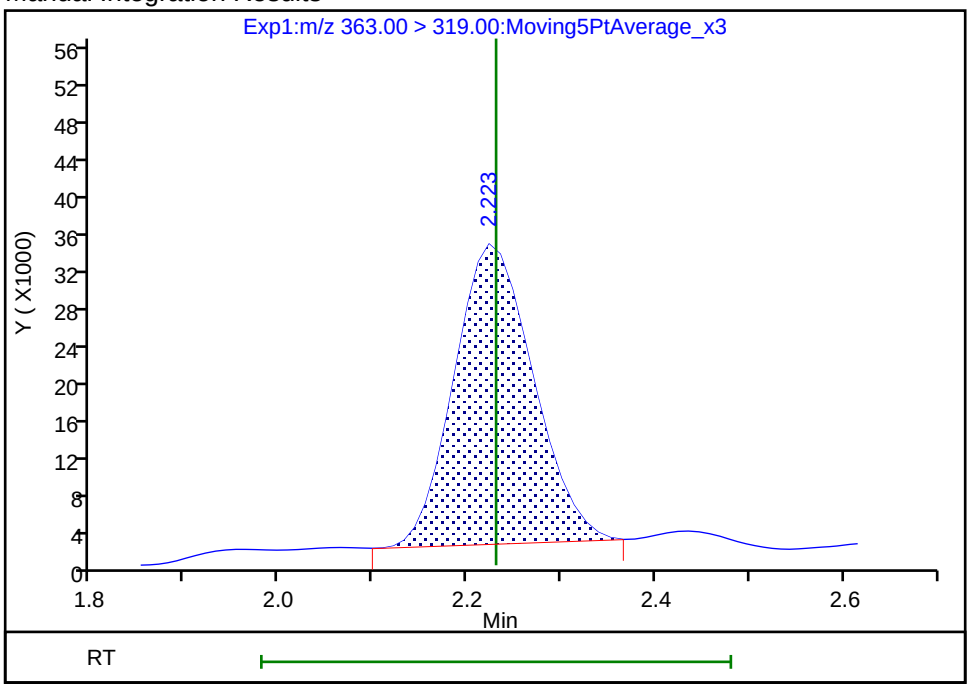
Processing Integration Results

RT: 2.22
Area: 196059
Amount: 0.115902
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 189558
Amount: 0.112059
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:53:24

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

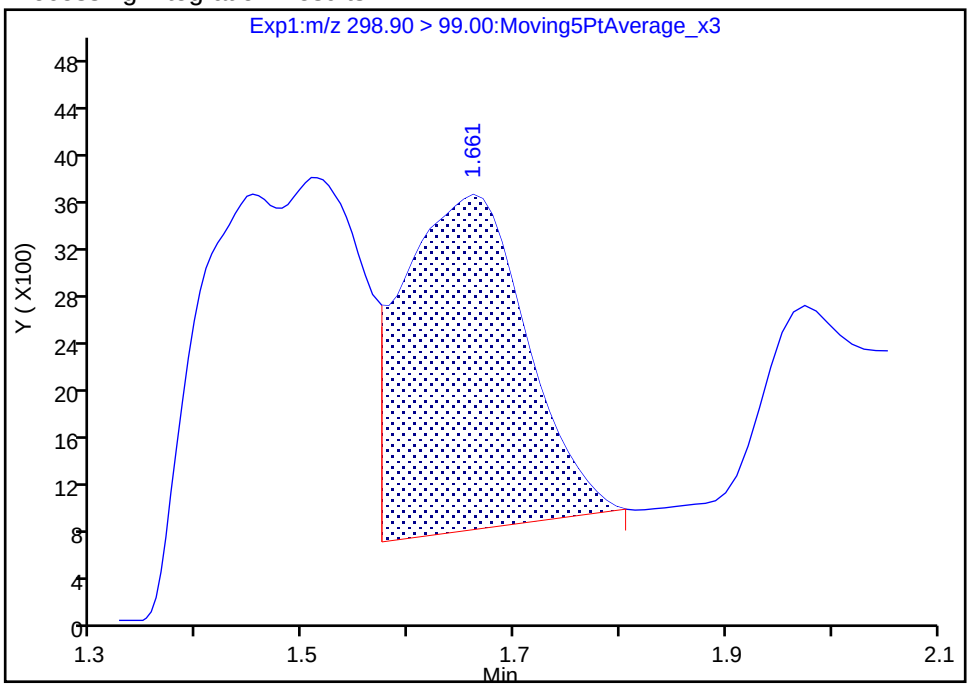
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_028.d				
Injection Date:	29-Jul-2018 02:50:39	Instrument ID:	A8_N		
Lims ID:	320-41149-A-34-A	Lab Sample ID:	320-41149-34		
Client ID:	GRE05-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	20	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

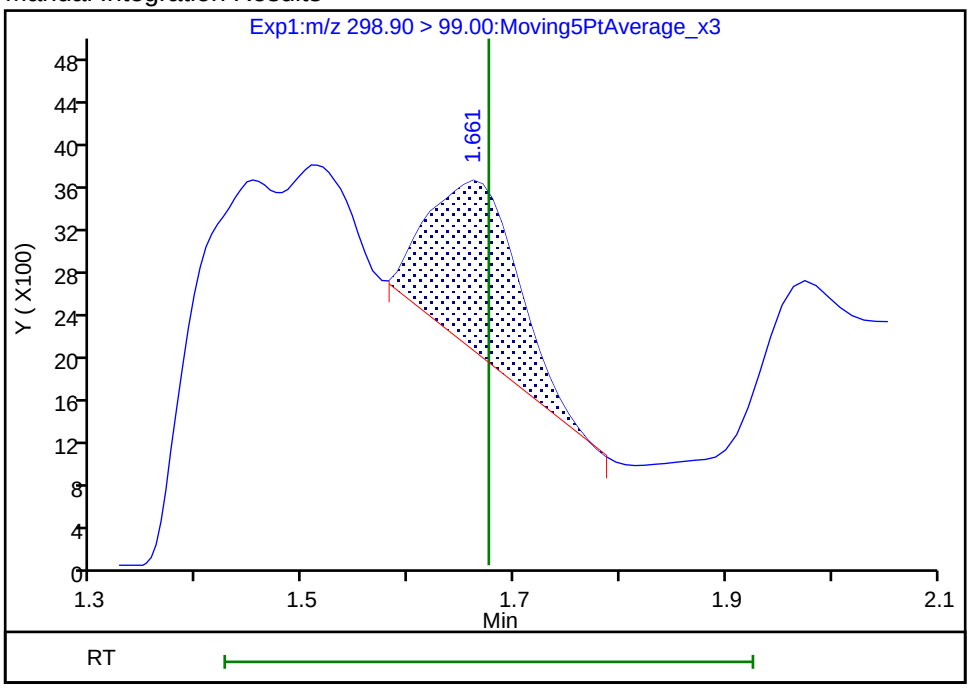
Processing Integration Results

RT: 1.66
Area: 22967
Amount: 0.011784
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 9314
Amount: 0.011784
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:52:28

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE05-SB1-01 DL | Lab Sample ID: 320-41149-34 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_018.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 09:10

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.00(g) | Date Analyzed: 07/31/2018 19:23

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 2.9 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.1*	*U M*	*3.1*	2.1	*0.80*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1.1*	*J D*	*3.1*	2.1	*1.0*
375-95-1	*Perfluorononanoic acid (PFNA)*	*1.4*	*J D*	*3.1*	2.1	*0.83*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*1.9*	*U*	*4.1*	1.9	*0.61*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*0.80*	*J D*	*3.1*	2.1	*0.64*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	46	D	10	5.2	2.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	67		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	85		50-150
STL00994	18O2 PFHxS	73		50-150
STL00991	13C4 PFOS	69		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_018.d
Lims ID: 320-41149-A-34-A
Client ID: GRE05-SB1-01
Sample Type: Client
Inject. Date: 31-Jul-2018 19:23:22 ALS Bottle#: 11 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-34-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:41:09 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:41:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.670	0.001	0.646	6701	0.1562		67.2	32.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.237	2.223	0.014	0.865	349320	0.2237		89.5	11924	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.225	2.229	-0.004	0.995	12938	0.008139			6.6	M
363.00 > 169.00	2.237	2.229	0.008	1.000	6765		1.91(1.13-3.40)		72.3	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.250	2.241	0.009	1.000	78355	0.0389			248	
399.00 > 99.00	2.250	2.241	0.009	1.000	22282		3.52(1.50-4.49)		32.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.250	2.248	0.002	0.870	409456	0.1726		73.0	11527	
* 62 13C2-PFOA										
415.00 > 370.00	2.587	2.578	0.009		415044	0.2500			18844	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.587	2.578	0.009	1.000	81698	0.0517			61.5	
413.00 > 169.00	2.587	2.578	0.009	1.000	42679		1.91(0.84-2.52)		233	
D 14 13C4 PFOA										
417.00 > 372.00	2.587	2.586	0.001	1.000	338534	0.2123		84.9	10968	
20 Perfluorononanoic acid										
463.00 > 419.00	2.951	2.946	0.005	1.000	85154	0.0660			124	
463.00 > 169.00	2.958	2.946	0.012	1.002	20480		4.16(1.90-5.69)		562	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.951	2.946	0.005	1.000	2963122	2.21			25596	
499.00 > 99.00	2.951	2.946	0.005	1.000	710865		4.17(2.31-6.93)		5287	
D 18 13C4 PFOS										
503.00 > 80.00	2.951	2.952	-0.001	1.141	280665	0.1647		68.9	4860	
D 19 13C5 PFNA										
468.00 > 423.00	2.951	2.952	-0.001	1.141	299115	0.2122		84.9	10227	

QC Flag Legend

Review Flags

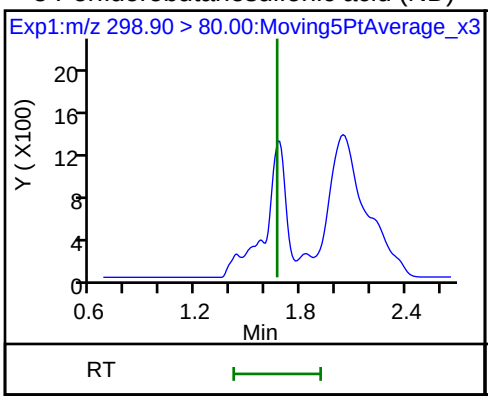
M - Manually Integrated

Report Date: 01-Aug-2018 12:41:09 Chrom Revision: 2.3 19-Jul-2018 15:14:50

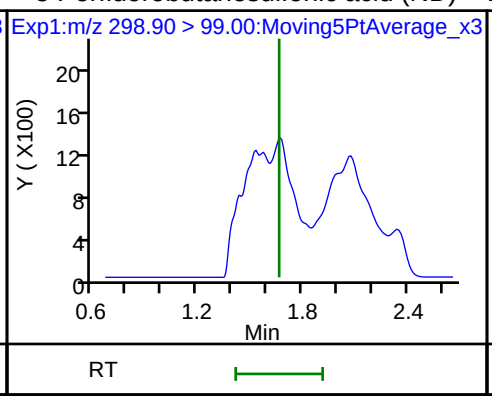
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_018.d				
Injection Date:	31-Jul-2018 19:23:22	Instrument ID:	A8_N		
Lims ID:	320-41149-A-34-A	Lab Sample ID:	320-41149-34		
Client ID:	GRE05-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

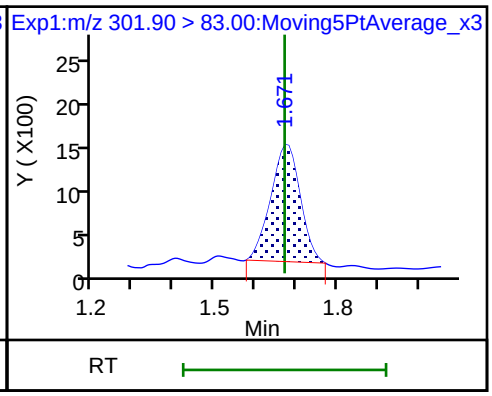
5 Perfluorobutanesulfonic acid (ND)



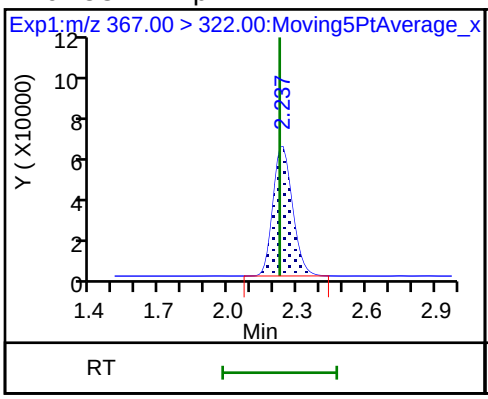
5 Perfluorobutanesulfonic acid (ND)



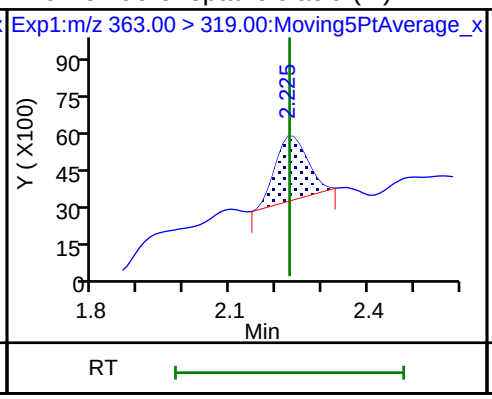
D 47 13C3-PFBS



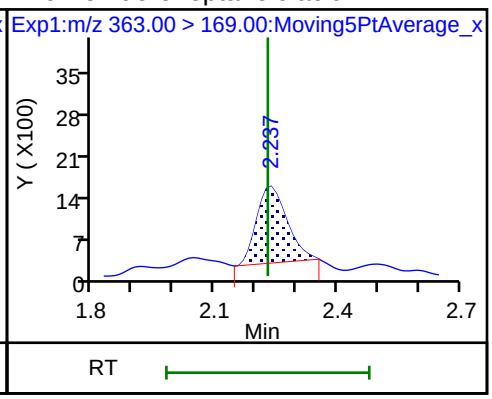
D 9 13C4-PFHpA



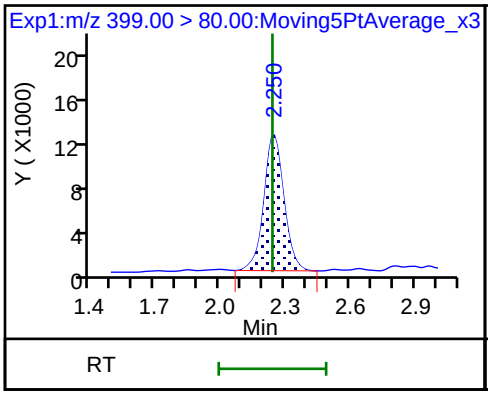
10 Perfluoroheptanoic acid (M)



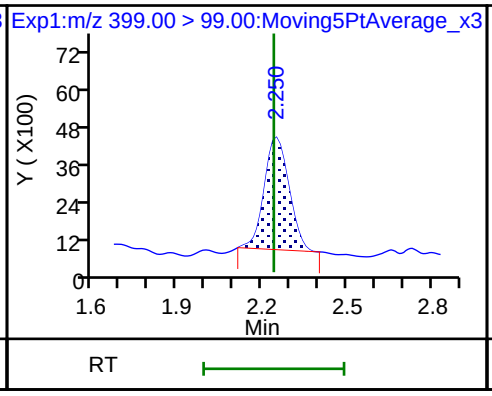
10 Perfluoroheptanoic acid



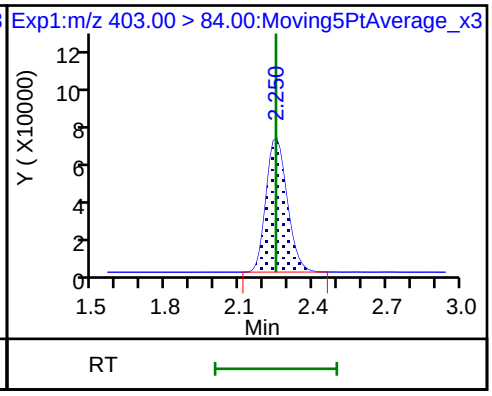
8 Perfluorohexanesulfonic acid



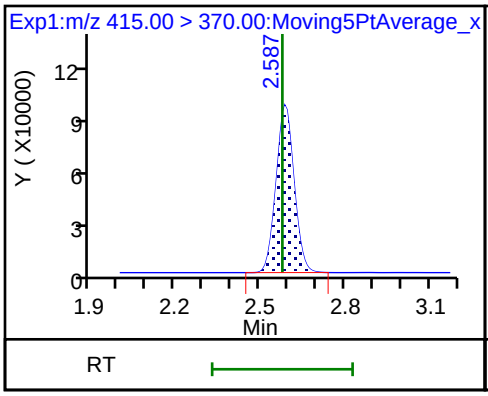
8 Perfluorohexanesulfonic acid



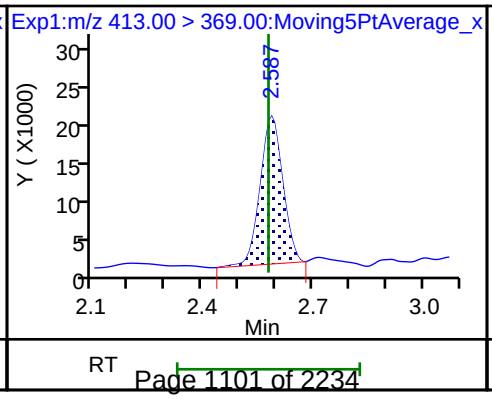
D 11 18O2 PFHxS



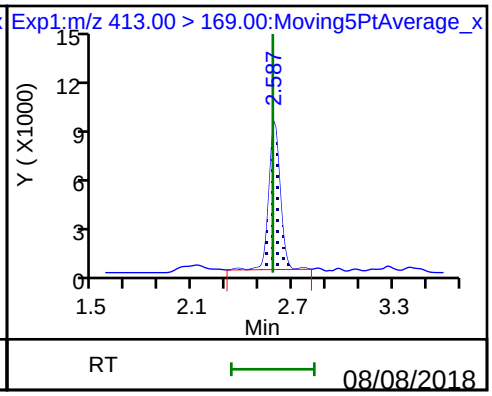
* 62 13C2-PFOA



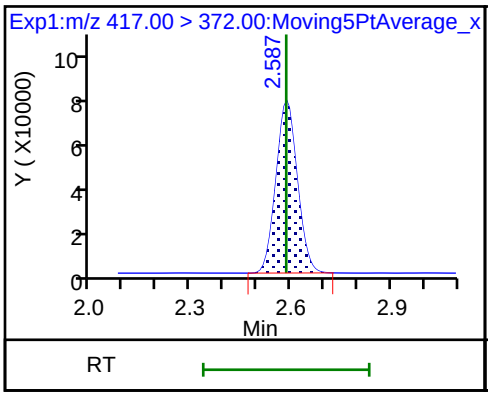
15 Perfluorooctanoic acid



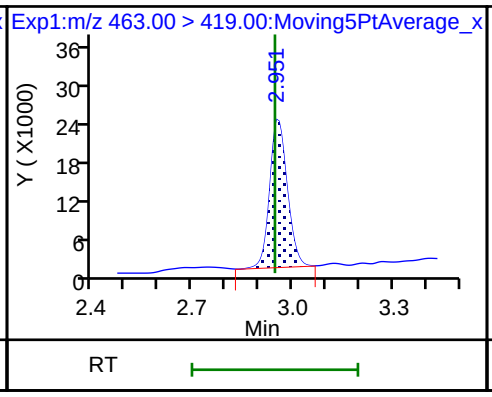
15 Perfluorooctanoic acid



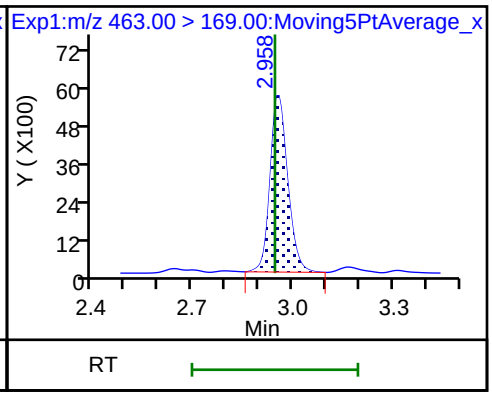
D 14 13C4 PFOA



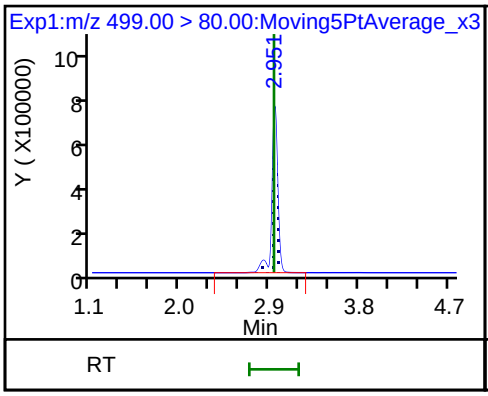
20 Perfluorononanoic acid



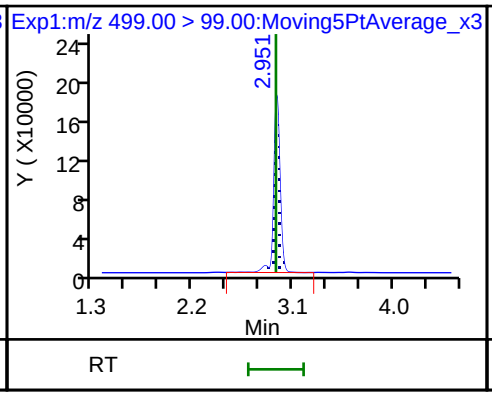
20 Perfluorononanoic acid



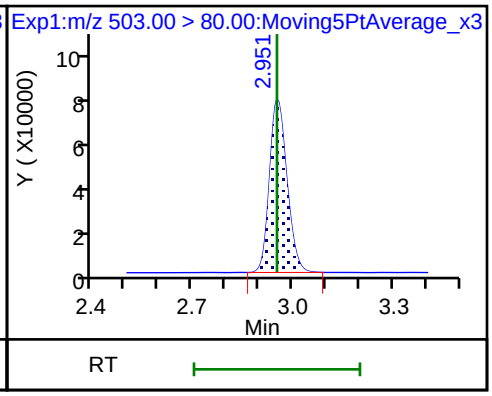
17 Perfluorooctane sulfonic acid



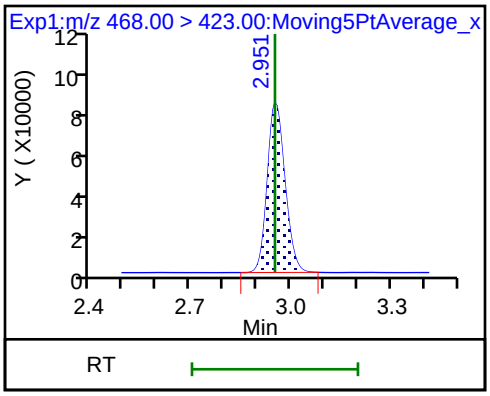
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

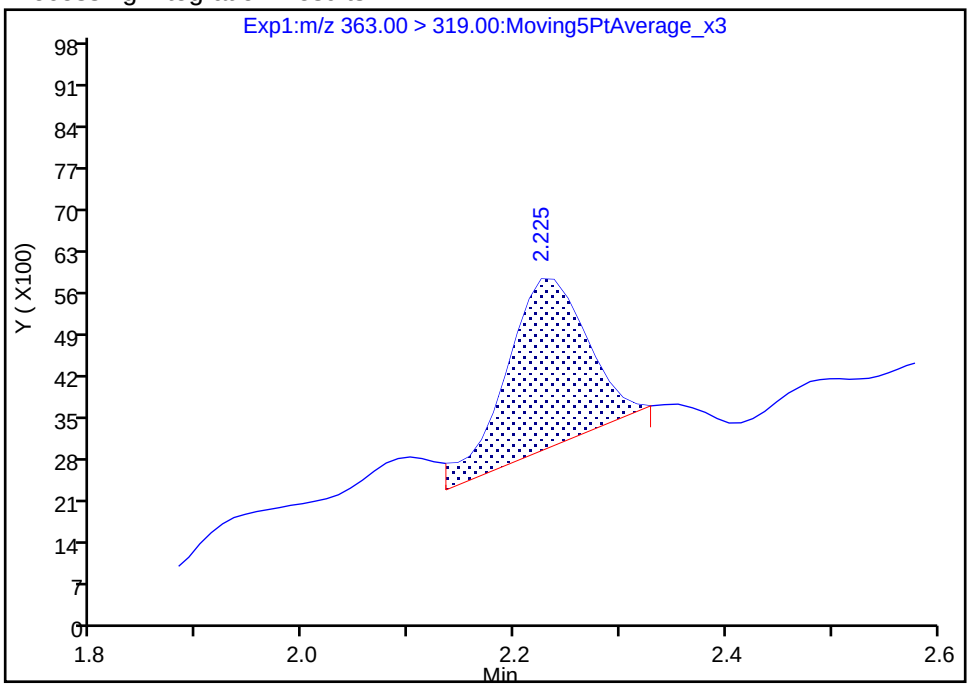
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_018.d				
Injection Date:	31-Jul-2018 19:23:22	Instrument ID:	A8_N		
Lims ID:	320-41149-A-34-A	Lab Sample ID:	320-41149-34		
Client ID:	GRE05-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

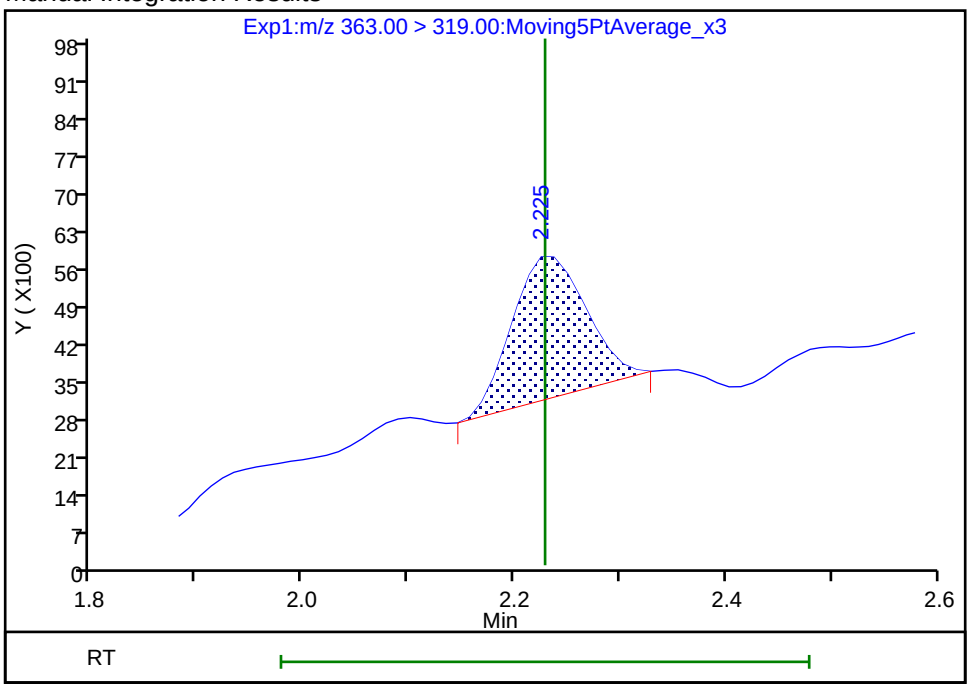
Processing Integration Results

RT: 2.23
Area: 15258
Amount: 0.009599
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 12938
Amount: 0.008139
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:41:00

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE05-SB2-01 | Lab Sample ID: 320-41149-35

Matrix: Solid | Lab File ID: 2018.07.28LLB_029.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 09:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.01(g) | Date Analyzed: 07/29/2018 02:58

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 3.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.22	J M	0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	0.87		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	3.4		0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U M	0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.93		0.31	0.21	0.064
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*59*	*E*	*1.0*	0.52	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	69		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	82		50-150
STL00995	13C5 PFNA	70		50-150
STL00994	18O2 PFHxS	70		50-150
STL00991	13C4 PFOS	69		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_029.d
Lims ID: 320-41149-A-35-A
Client ID: GRE05-SB2-01
Sample Type: Client
Inject. Date: 29-Jul-2018 02:58:28 ALS Bottle#: 21 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-35-
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:53:26 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:53:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.667	0.0	0.645	65980	1.61		69.2	175	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.676	1.676	0.0	1.005	34236	0.0152			46.7	
298.90 > 99.00	1.667	1.676	-0.009	1.000	10328		3.31(1.25-3.74)		9.9	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.228	0.002	0.864	3812755	2.02		80.8	80966	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.230	2.230	0.0	1.000	176707	0.1051			149	M
363.00 > 169.00	2.230	2.230	0.0	1.000	75450		2.34(1.13-3.40)		828	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.240	0.002	0.868	4043831	1.67		70.5	67908	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.242	0.0	1.000	897928	0.4501			1097	
399.00 > 99.00	2.242	2.242	0.0	1.000	284789		3.15(1.50-4.49)		588	
* 62 13C2-PFOA										
415.00 > 370.00	2.582	2.582	0.0		4827059	2.50			63739	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.582	2.582	0.0	1.000	772225	0.4179			625	
413.00 > 169.00	2.582	2.582	0.0	1.000	423564		1.82(0.84-2.52)		2081	
D 14 13C4 PFOA										
417.00 > 372.00	2.582	2.588	-0.006	1.000	3806757	2.06		82.4	57626	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.947	0.001	1.142	2763978	1.64		68.6	14229	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.947	0.001	1.142	2792325	1.75		70.1	43059	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.948	0.0	1.000	2078384	1.63			3342	
463.00 > 169.00	2.948	2.948	0.0	1.000	505756		4.11(1.90-5.69)		7717	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.948	2.948	0.0	1.000	36424019	28.5			88484	E
499.00 > 99.00	2.948	2.948	0.0	1.000	10091064		3.61(2.31-6.93)		68944	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

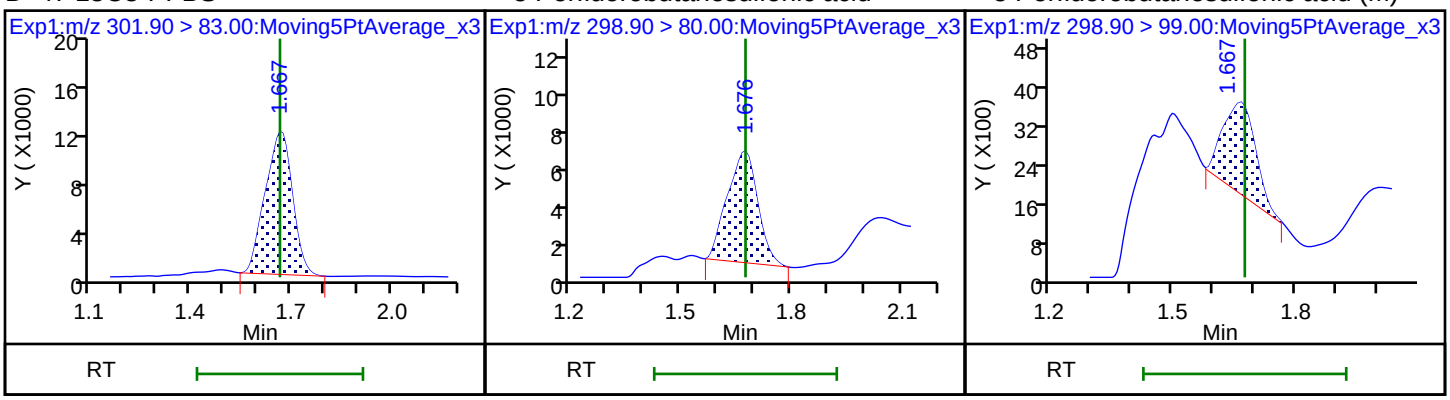
M - Manually Integrated

Report Date: 30-Jul-2018 15:53:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

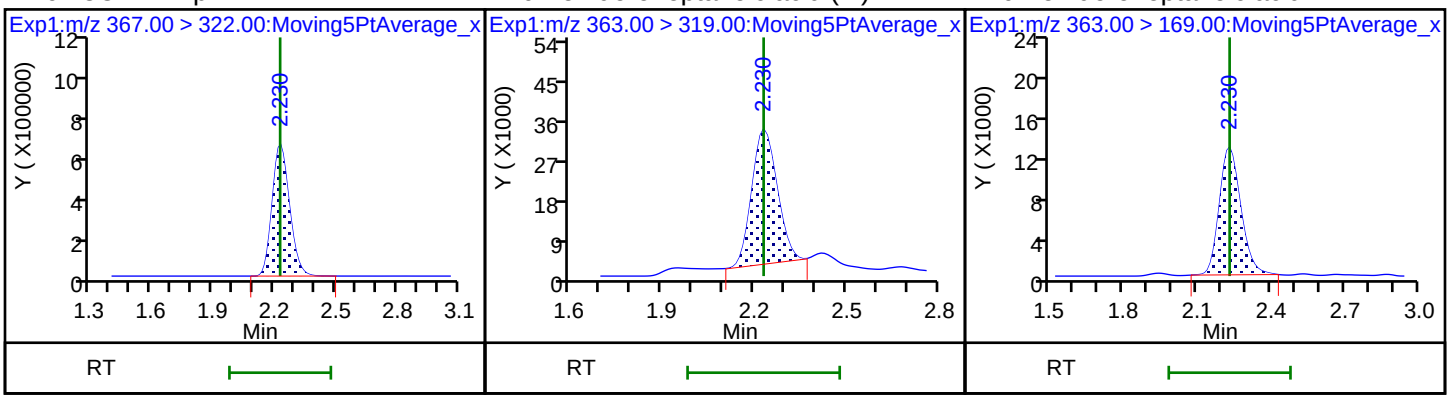
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_029.d				
Injection Date:	29-Jul-2018 02:58:28	Instrument ID:	A8_N		
Lims ID:	320-41149-A-35-A	Lab Sample ID:	320-41149-35		
Client ID:	GRE05-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

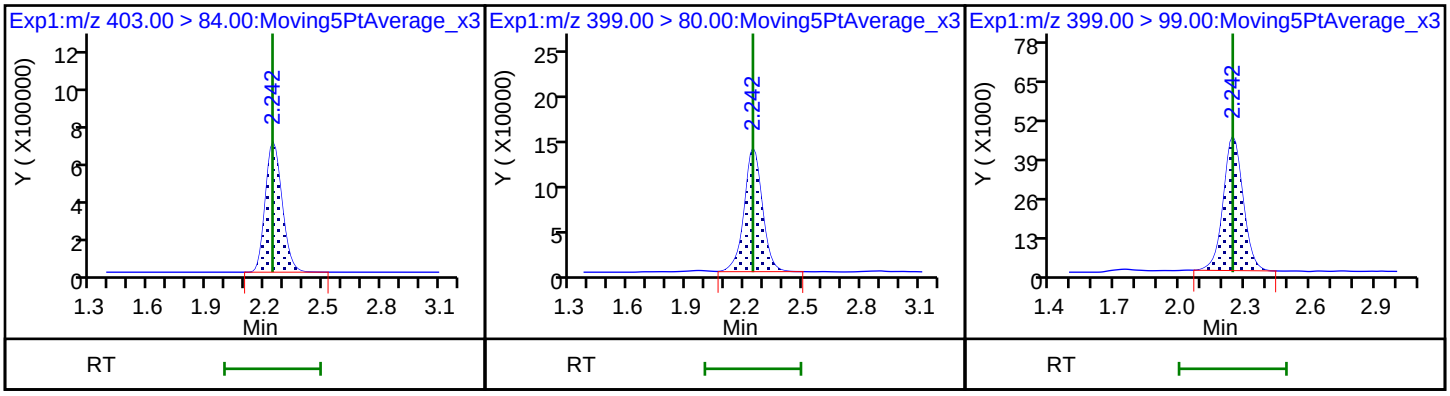
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid (M)



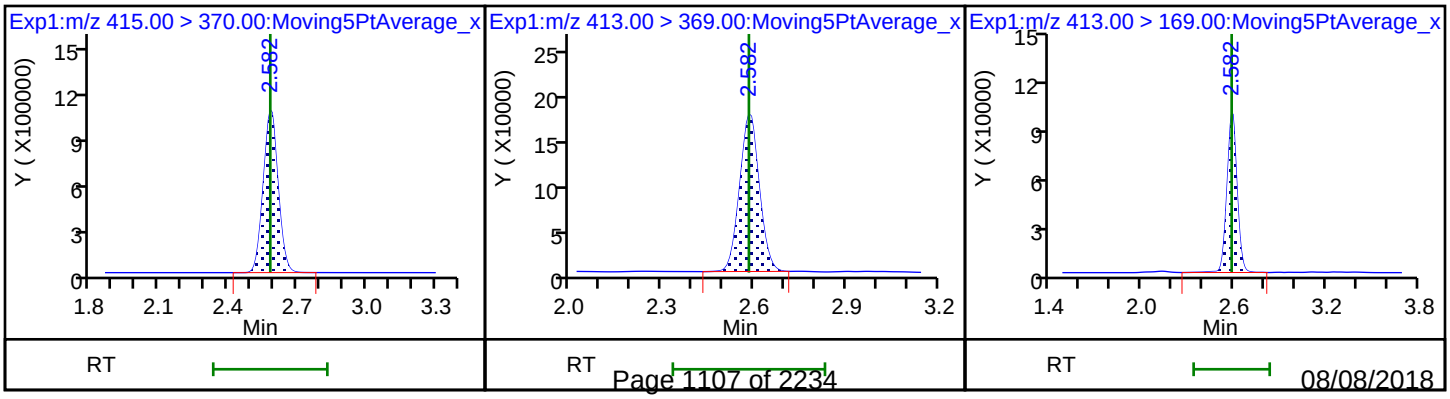
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid



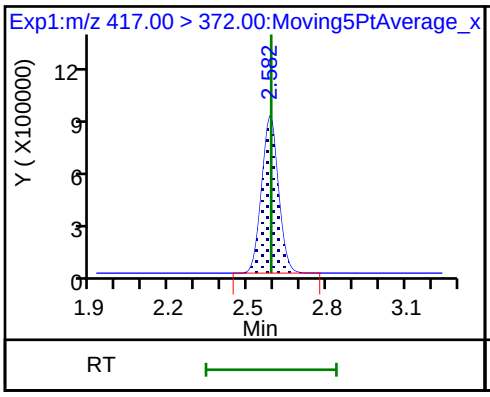
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



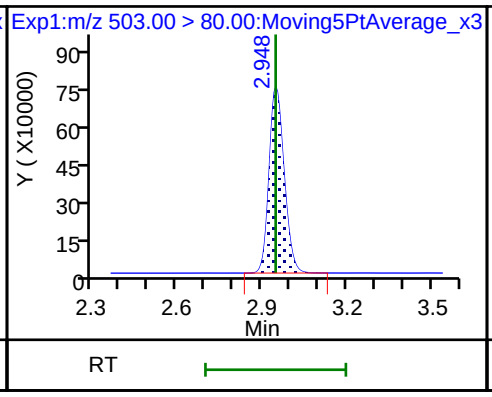
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



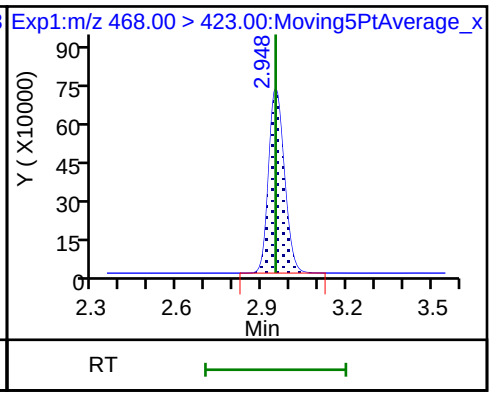
D 14 13C4 PFOA



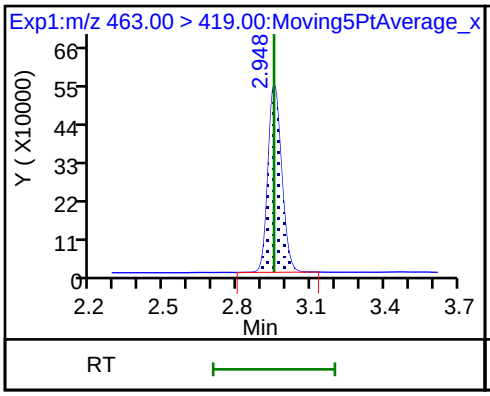
D 18 13C4 PFOS



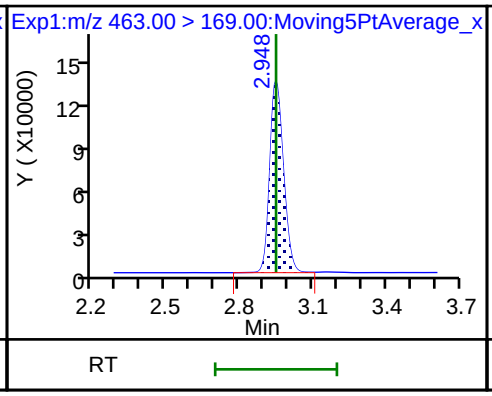
D 19 13C5 PFNA



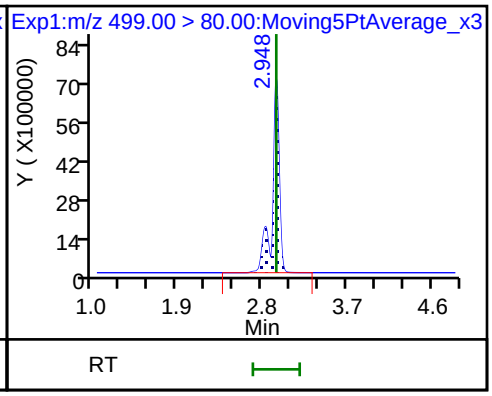
20 Perfluorononanoic acid



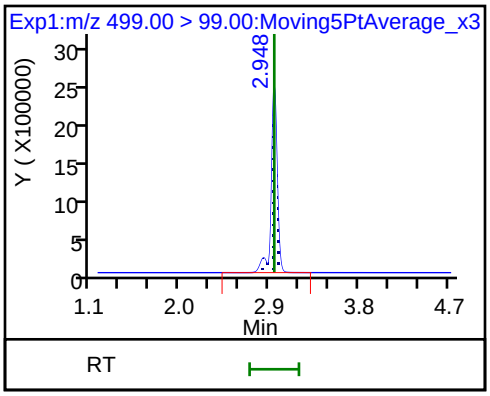
20 Perfluorononanoic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

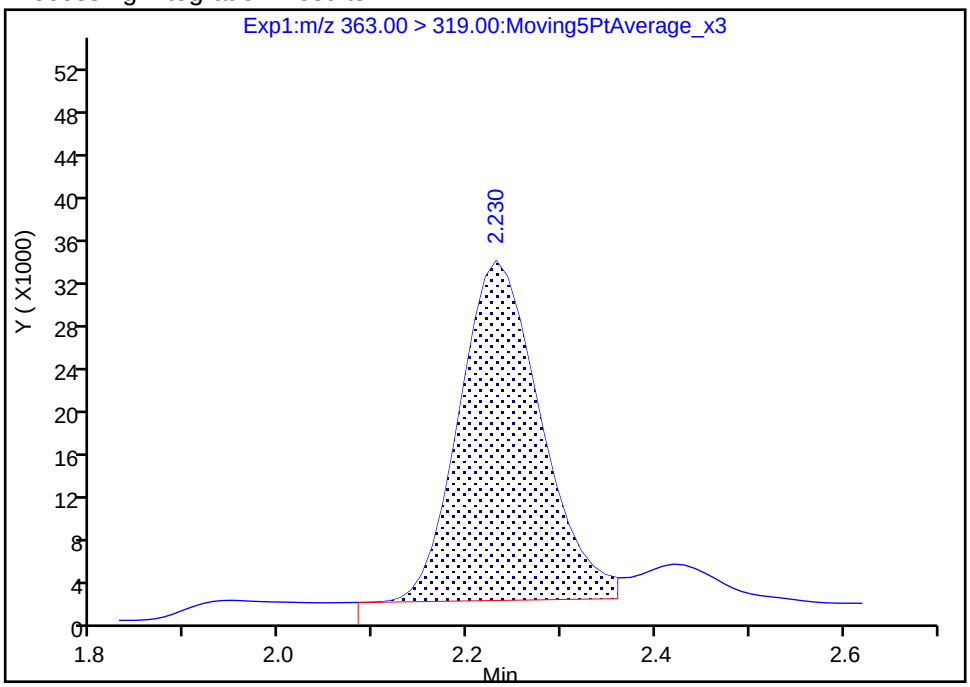
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_029.d				
Injection Date:	29-Jul-2018 02:58:28	Instrument ID:	A8_N		
Lims ID:	320-41149-A-35-A	Lab Sample ID:	320-41149-35		
Client ID:	GRE05-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

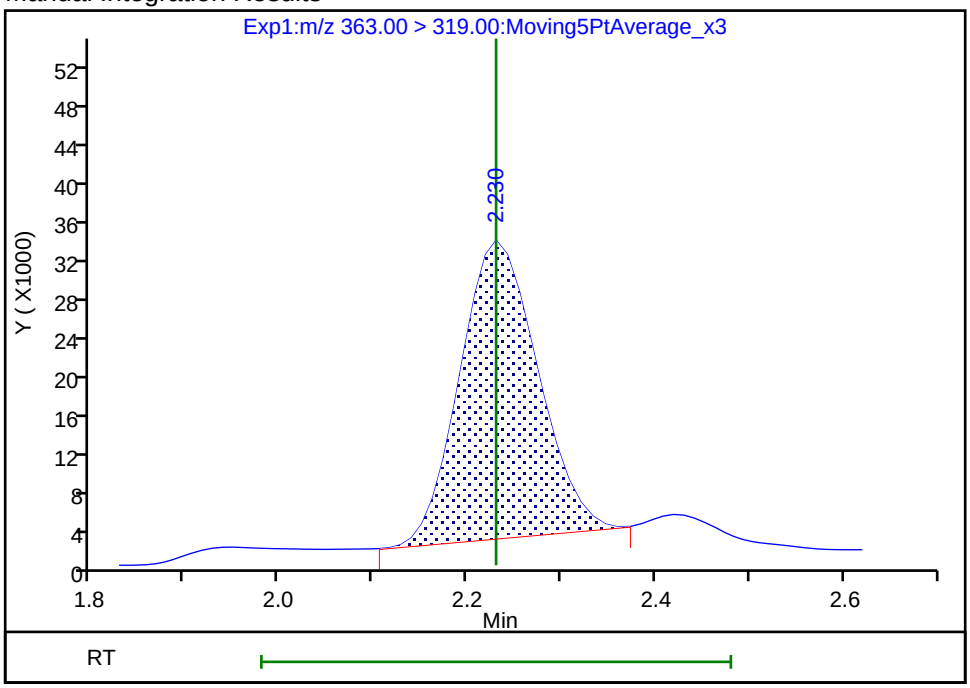
Processing Integration Results

RT: 2.23
Area: 189700
Amount: 0.112819
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 176707
Amount: 0.105091
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:53:06

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

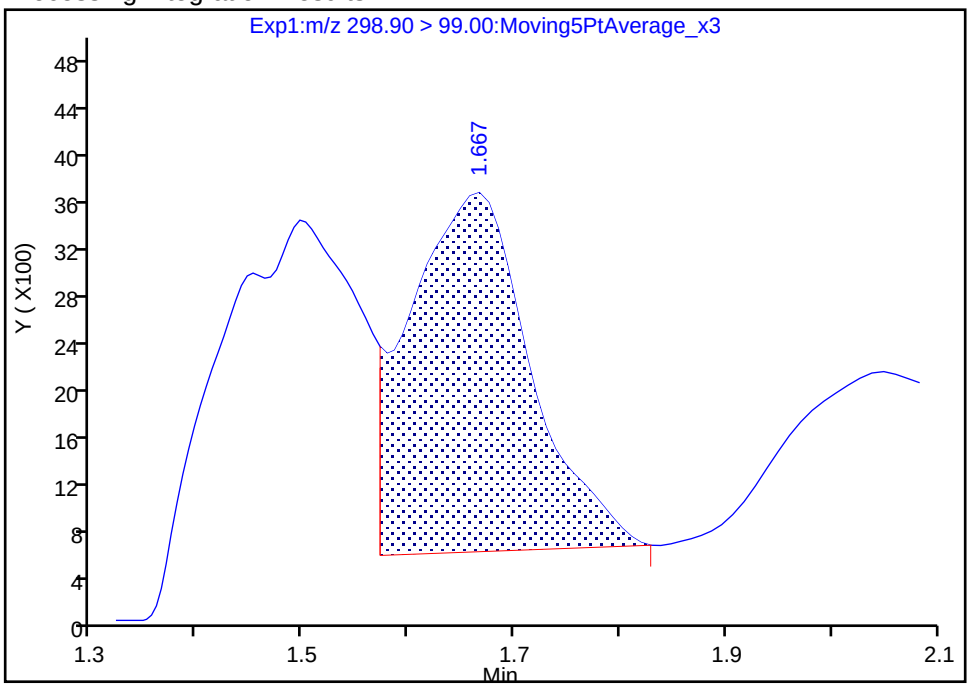
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_029.d				
Injection Date:	29-Jul-2018 02:58:28	Instrument ID:	A8_N		
Lims ID:	320-41149-A-35-A	Lab Sample ID:	320-41149-35		
Client ID:	GRE05-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

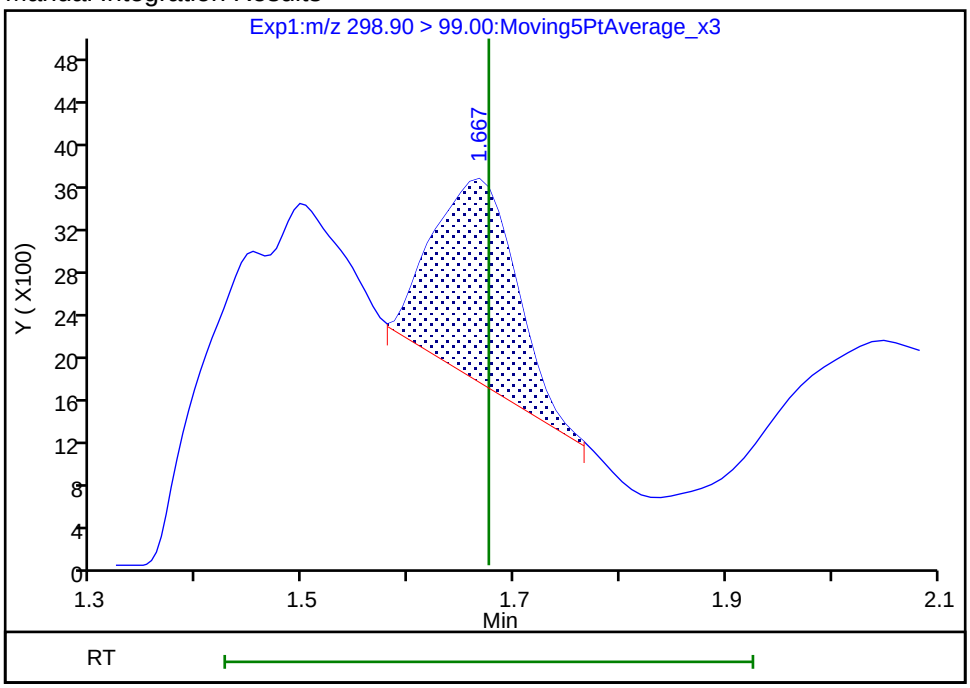
Processing Integration Results

RT: 1.67
Area: 24052
Amount: 0.015195
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 10328
Amount: 0.015195
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:52:55

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE05-SB2-01 DL | Lab Sample ID: 320-41149-35 DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 09:35

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.01(g) | Date Analyzed: 07/31/2018 19:31

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 3.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2.1*	*U M*	*3.1*	2.1	*0.81*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*2.1*	*U M*	*3.1*	2.1	*1.0*
375-95-1	*Perfluorononanoic acid (PFNA)*	*3.8*	*D*	*3.1*	2.1	*0.84*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*1.9*	*U*	*4.1*	1.9	*0.61*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*1.1*	*J D*	*3.1*	2.1	*0.64*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	67	D	10	5.2	2.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	59		50-150
STL01892	13C4-PFHpA	79		50-150
STL00990	13C4 PFOA	81		50-150
STL00995	13C5 PFNA	74		50-150
STL00994	18O2 PFHxS	61		50-150
STL00991	13C4 PFOS	61		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_019.d
Lims ID: 320-41149-A-35-A
Client ID: GRE05-SB2-01
Sample Type: Client
Inject. Date: 31-Jul-2018 19:31:10 ALS Bottle#: 12 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41149-a-35-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:41:42 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:41:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.674	1.670	0.004	0.646	6285	0.1375		59.2	28.9	
D 9 13C4-PFHpA										
367.00 > 322.00	2.232	2.223	0.009	0.861	328348	0.1974		79.0	11314	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.232	2.229	0.003	1.000	16901	0.0113			7.7	M
363.00 > 169.00	2.232	2.229	0.003	1.000	6100		2.77(1.13-3.40)		63.2	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.241	0.004	1.000	91559	0.0512			356	
399.00 > 99.00	2.245	2.241	0.004	1.000	25118		3.65(1.50-4.49)		34.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.245	2.248	-0.003	0.866	364162	0.1441		60.9	12266	
* 62 13C2-PFOA										
415.00 > 370.00	2.591	2.578	0.013		442078	0.2500			16673	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.591	2.578	0.013	1.000	72363	0.0448			54.8	M
413.00 > 169.00	2.591	2.578	0.013	1.000	42812		1.69(0.84-2.52)		209	
D 14 13C4 PFOA										
417.00 > 372.00	2.591	2.586	0.005	1.000	346097	0.2037		81.5	13206	
20 Perfluorononanoic acid										
463.00 > 419.00	2.955	2.946	0.009	1.000	218203	0.1822			343	
463.00 > 169.00	2.955	2.946	0.009	1.000	53451		4.08(1.90-5.69)		1315	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.955	2.946	0.009	1.000	4101742	3.25			23297	
499.00 > 99.00	2.955	2.946	0.009	1.000	999983		4.10(2.31-6.93)		6221	
D 18 13C4 PFOS										
503.00 > 80.00	2.955	2.952	0.003	1.141	264891	0.1460		61.1	4227	
D 19 13C5 PFNA										
468.00 > 423.00	2.955	2.952	0.003	1.141	277495	0.1848		73.9	10648	

QC Flag Legend

Review Flags

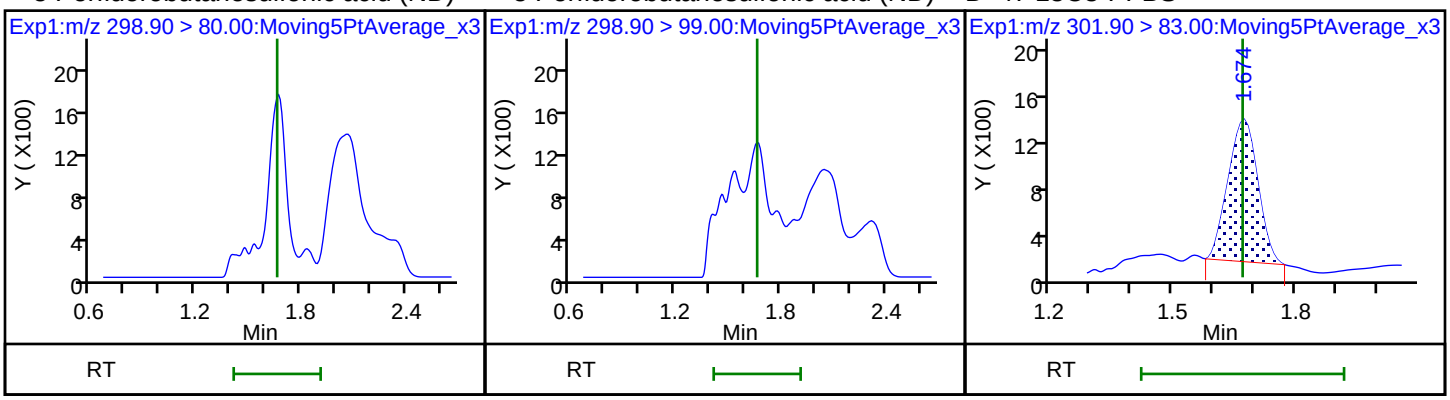
M - Manually Integrated

Report Date: 01-Aug-2018 12:41:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

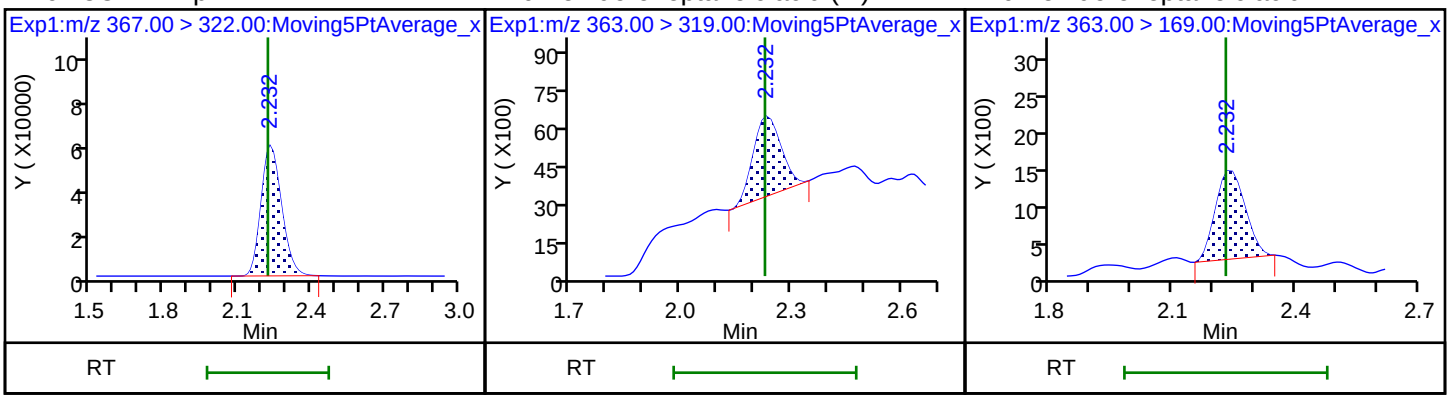
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_019.d				
Injection Date:	31-Jul-2018 19:31:10	Instrument ID:	A8_N		
Lims ID:	320-41149-A-35-A	Lab Sample ID:	320-41149-35		
Client ID:	GRE05-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

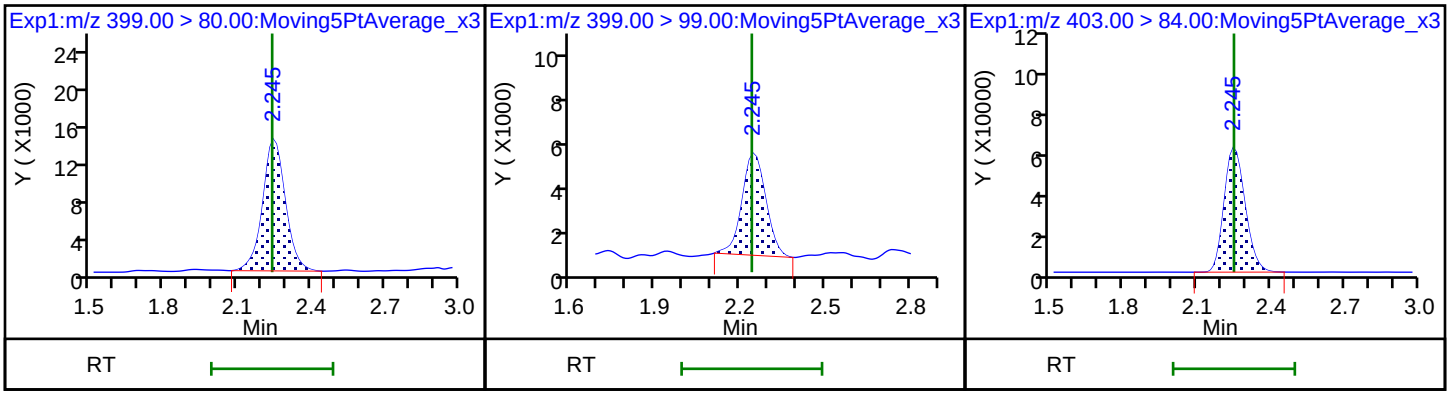
5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) D 47 13C3-PFBS



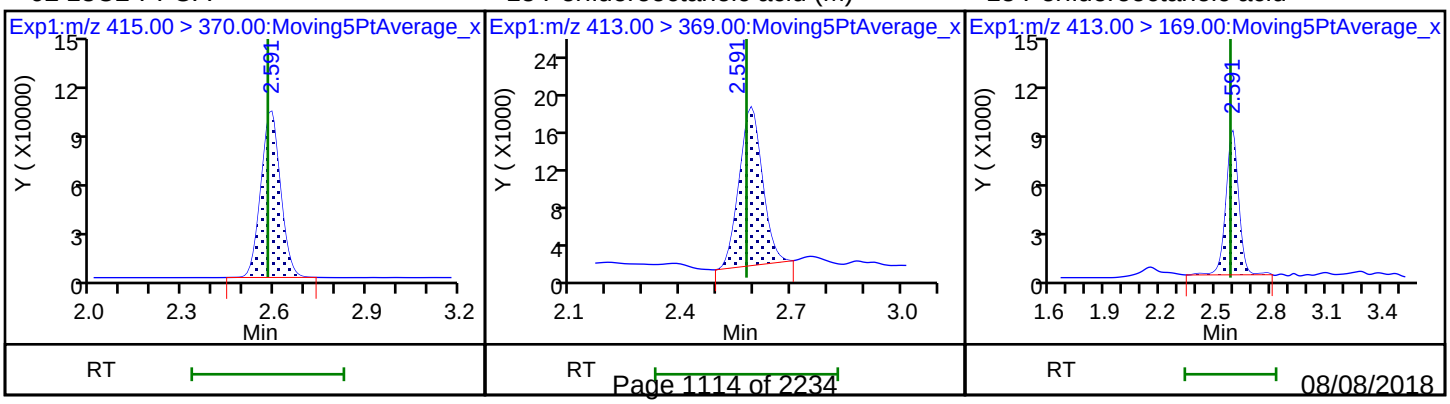
D 9 13C4-PFHpA 10 Perfluoroheptanoic acid (M) 10 Perfluoroheptanoic acid



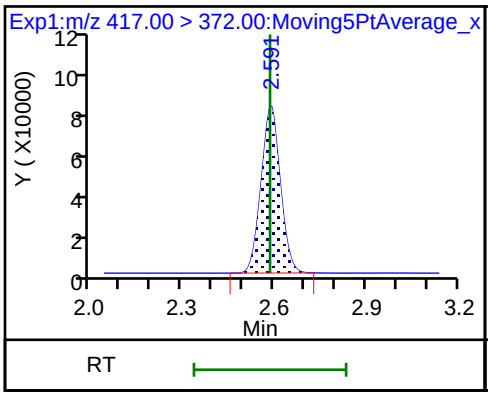
8 Perfluorohexanesulfonic acid 8 Perfluorohexanesulfonic acid D 11 18O2 PFHxS



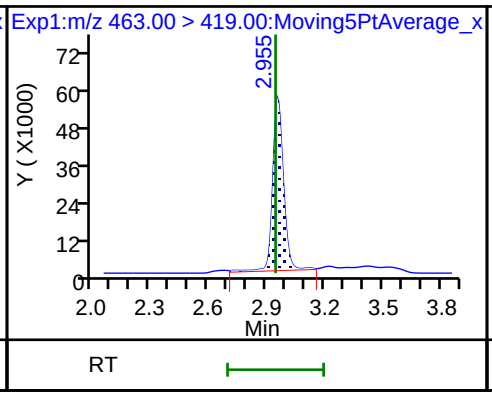
* 62 13C2-PFOA 15 Perfluorooctanoic acid (M) 15 Perfluorooctanoic acid



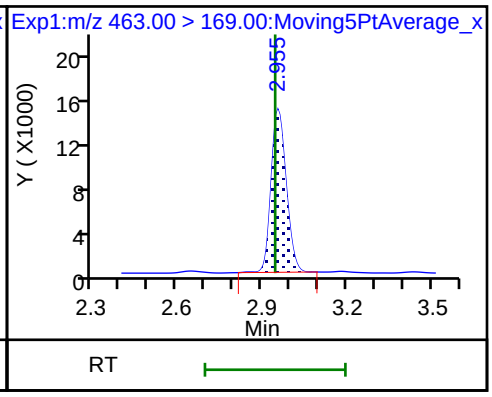
D 14 13C4 PFOA



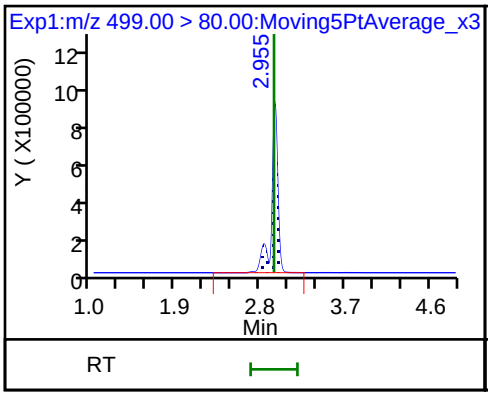
20 Perfluorononanoic acid



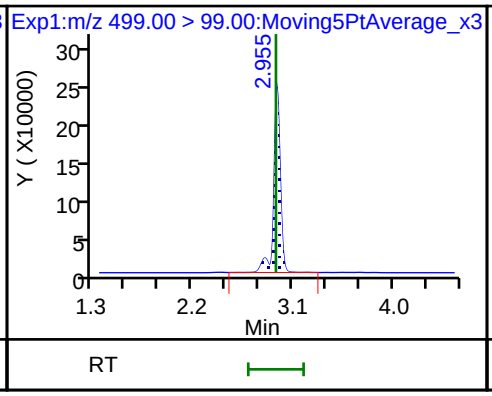
20 Perfluorononanoic acid



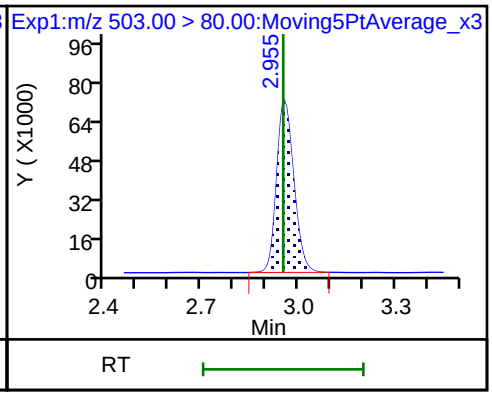
17 Perfluorooctane sulfonic acid



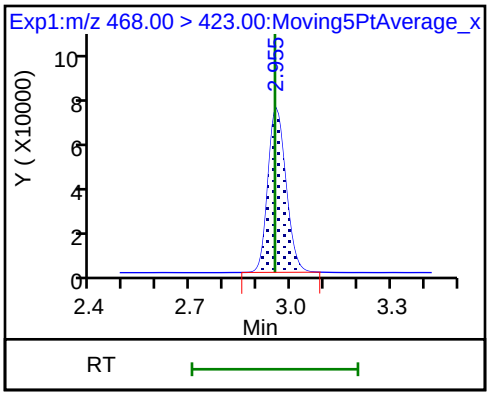
17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



D 19 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

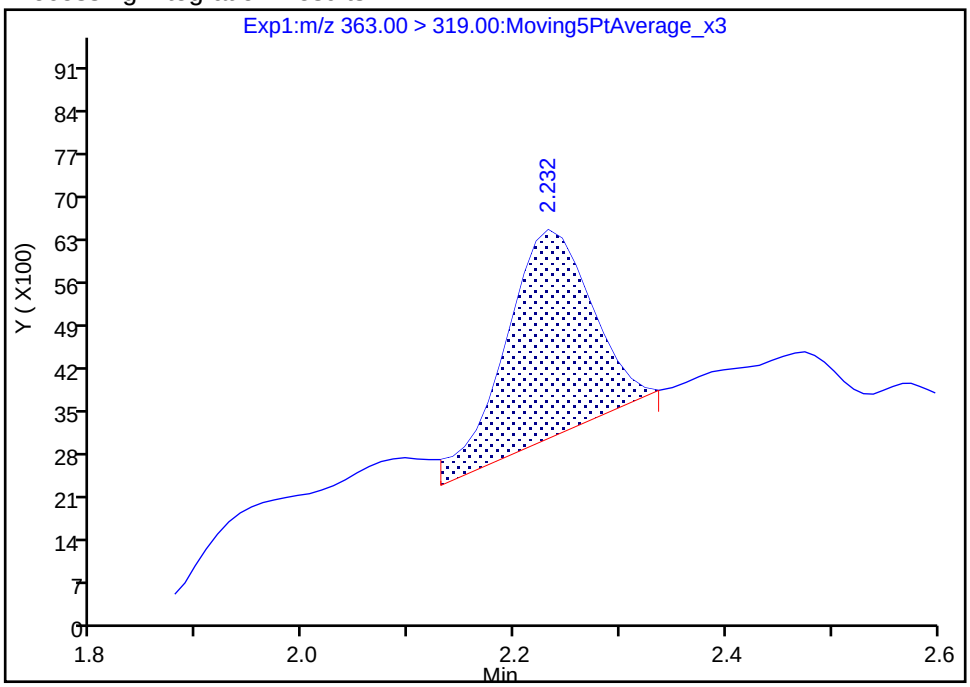
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_019.d				
Injection Date:	31-Jul-2018 19:31:10	Instrument ID:	A8_N		
Lims ID:	320-41149-A-35-A	Lab Sample ID:	320-41149-35		
Client ID:	GRE05-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

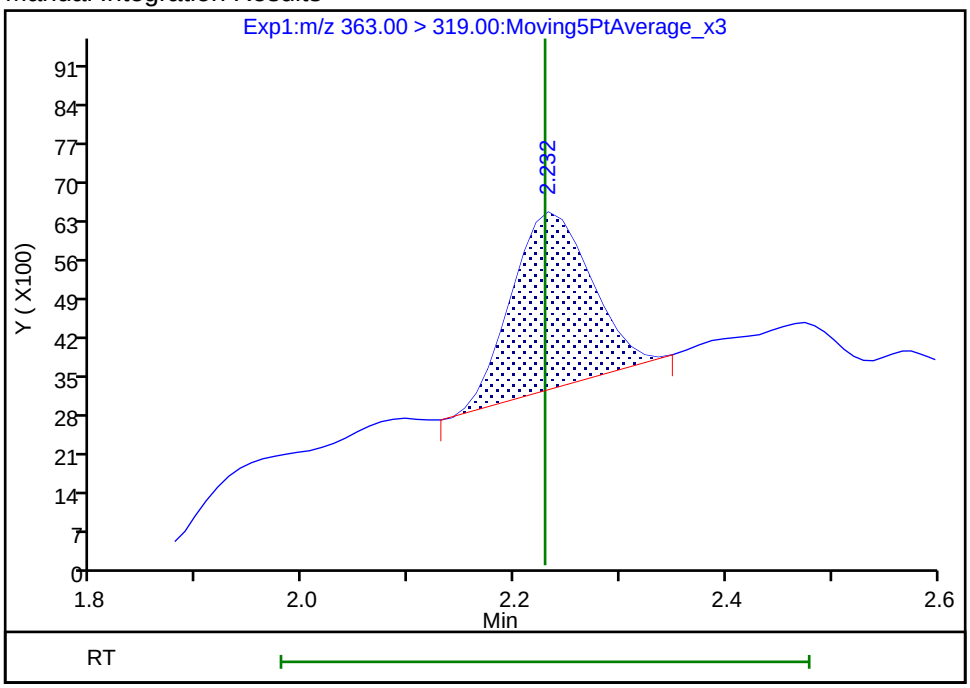
Processing Integration Results

RT: 2.23
Area: 19363
Amount: 0.012960
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 16901
Amount: 0.011312
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:41:28

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

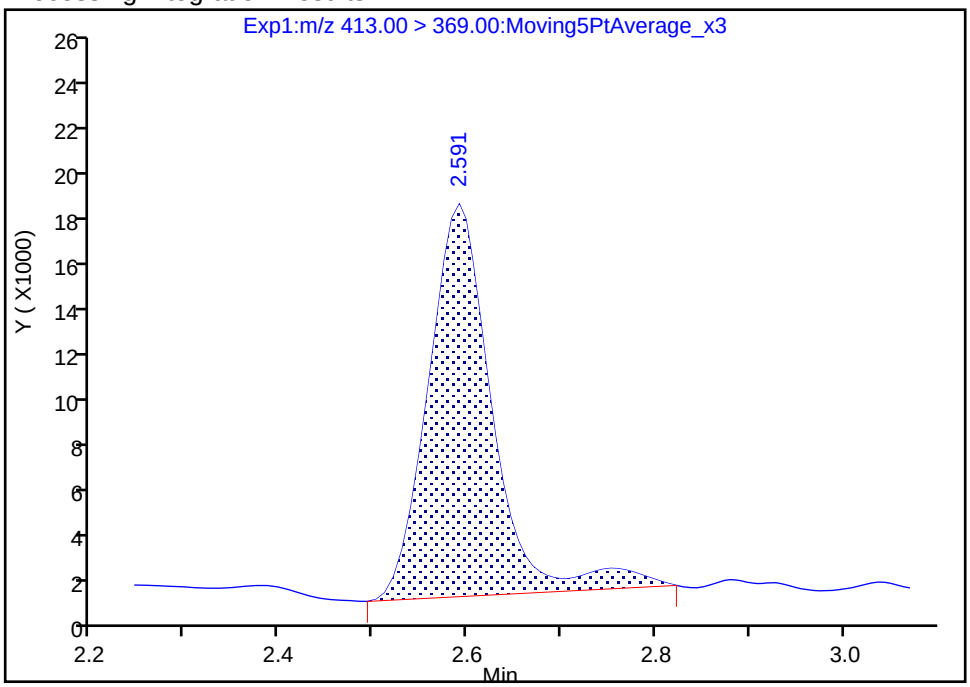
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_019.d				
Injection Date:	31-Jul-2018 19:31:10	Instrument ID:	A8_N		
Lims ID:	320-41149-A-35-A	Lab Sample ID:	320-41149-35		
Client ID:	GRE05-SB2-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

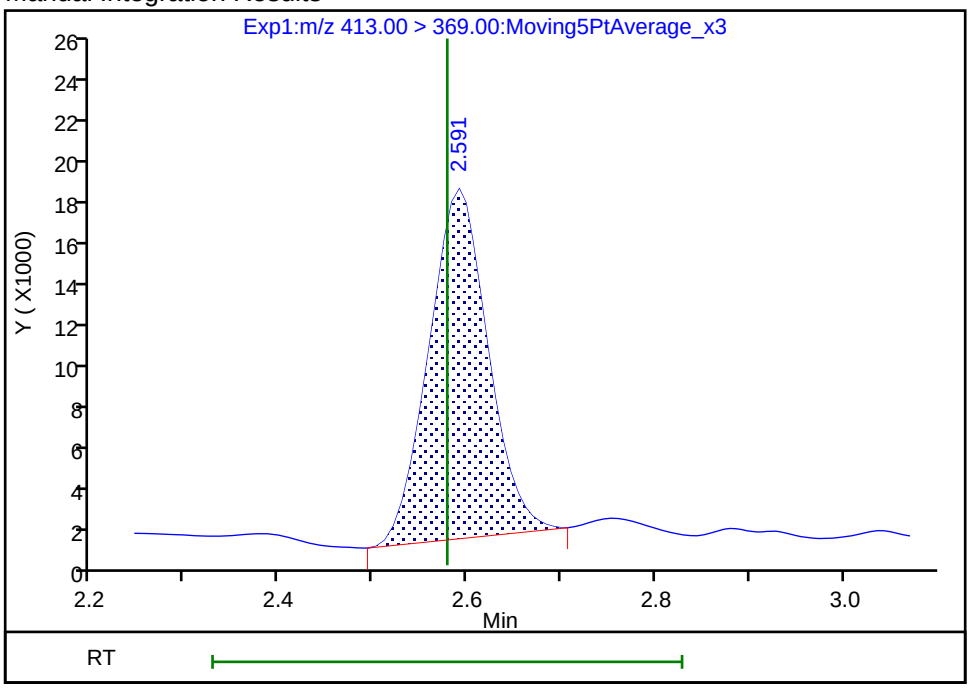
Processing Integration Results

RT: 2.59
Area: 79677
Amount: 0.049366
Amount Units: ng/ml



Manual Integration Results

RT: 2.59
Area: 72363
Amount: 0.044834
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:41:36

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235668/2	2018.07.23LLICAL_002.d
Level 2	IC 320-235668/3	2018.07.23LLICAL_003.d
Level 3	IC 320-235668/4	2018.07.23LLICAL_004.d
Level 4	IC 320-235668/5	2018.07.23LLICAL_005.d
Level 5	IC 320-235668/6	2018.07.23LLICAL_006.d
Level 6	IC 320-235668/7	2018.07.23LLICAL_007.d
Level 7	IC 320-235668/8	2018.07.23LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.0265 0.9920	0.9875 0.9901	0.9536	0.9563	0.9734	AveID		0.9828				2.5		20.0			
Perfluoropentanoic acid (PFPeA)	1.2079 1.1789	1.1940 1.1932	1.1912	1.2040	1.2093	AveID		1.1969				0.9		20.0			
Perfluorobutanesulfonic acid (PFBS)	83.431 77.020	81.651 72.890	80.321	79.939	80.500	AveID		79.393				4.4		20.0			
4:2 FTS	16.911 16.753	17.596 15.492	18.341	17.801	16.767	AveID		17.094				5.4		20.0			
Perfluorohexanoic acid (PFHxA)	1.1014 1.0539	1.0639 1.0384	1.0593	1.0478	1.0548	AveID		1.0599				1.9		20.0			
Perfluoropentanesulfonic acid	67.681 72.473	72.659 67.397	73.502	72.475	72.474	AveID		71.237				3.6		20.0			
Perfluoroheptanoic acid (PFHpA)	1.1475 1.1249	1.0523 1.0985	1.0603	1.1039	1.1303	AveID		1.1025				3.2		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.4765 1.0955	1.1791 1.1157	1.0860	1.1062	1.1077	AveID		1.1667				12.0		20.0			
6:2 FTS	1.7755 1.6421	1.7400 1.7400	1.6589	1.5412	1.7112	AveID		1.6870				4.7		20.0			
Perfluorooctanoic acid (PFOA)	1.3741 1.1910	1.2895 1.1394	1.0998	1.2051	1.1966	AveID		1.2136				7.6		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.3197 1.4411	1.3416 1.3785	1.3970	1.3701	1.4351	AveID		1.3833				3.3		20.0			
Perfluorononanoic acid (PFNA)	+++++ 1.0731	1.3946 1.0461	1.1326	1.0723	1.1318	AveID		1.1417				11.3		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.1335 1.1190	1.0783 1.1558	1.0889	1.0446	1.1147	AveID		1.1050				3.4		20.0			
8:2 FTS	1.3664 1.3555	1.2998 1.3634	1.3670	1.4096	1.3283	AveID		1.3557				2.5		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorononanesulfonic acid	0.6786 0.7824	0.7630 0.7859	0.7318	0.7395	0.7469	AveID		0.7469				4.9		20.0			
Perfluorodecanoic acid (PFDA)	1.1088 1.0114	0.8957 1.0872	1.0127	1.0350	1.0483	AveID		1.0284				6.7		20.0			
Perfluorooctane Sulfonamide (PFOSA)	0.9847 1.0176	1.0027 0.9411	0.9906	0.9943	1.0305	AveID		0.9945				2.9		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9097 0.9476	1.0940 1.0143	1.0304	0.9413	0.9614	AveID		0.9855				6.5		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6438 0.6747	0.6535 0.6825	0.6779	0.6334	0.6763	AveID		0.6631				2.9		20.0			
Perfluoroundecanoic acid (PFUnA)	+++++ 1.1692	1.5126 1.1605	1.2514	1.1602	1.1914	AveID		1.2409				11.1		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.1271 0.9178	0.8549 0.9575	0.9399	0.8420	0.8915	AveID		0.9329				10.2		20.0			
Perfluorododecanoic acid (PFDoA)	1.0991 1.0769	1.1579 1.0444	1.0985	1.0119	1.0849	AveID		1.0819				4.2		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.1585 0.9890	1.0710 1.0152	1.0201	1.0076	1.0911	AveID		1.0504				5.7		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.2505 0.2397	0.2677 0.2500	0.2342	0.2531	0.2598	AveID		0.2507				4.5		20.0			
13C4 PFBA	1.1051 1.2231	1.0960 1.2942	1.1063	1.1386	1.1513	Ave		1.1592				6.3		20.0			
13C5-PFPeA	0.7723 0.8312	0.7876 0.8762	0.8003	0.8050	0.7924	Ave		0.8093				4.3		20.0			
13C3-PFBS	0.0200 0.0228	0.0194 0.0244	0.0197	0.0210	0.0211	Ave		0.0212				8.5		20.0			
13C2 PFHxA	0.9136 0.9772	0.9227 1.0086	0.9254	0.9570	0.9384	Ave		0.9490				3.6		20.0			
13C4-PFHpA	0.9631 1.0016	0.9569 1.0210	0.9633	1.0079	0.9314	Ave		0.9779				3.3		20.0			
18O2 PFHxS	1.1688 1.3497	1.2292 1.4057	1.1928	1.2253	1.2213	Ave		1.2561				6.9		20.0			
M2-6:2FTS	0.2720 0.2756	0.2657 0.2599	0.2687	0.2943	0.2751	Ave		0.2731				4.0		20.0			
13C4 PFOA	0.9768 0.9582	0.9161 0.9783	0.9698	0.9475	0.9497	Ave		0.9566				2.3		20.0			
13C4 PFOS	0.8262 0.9163	0.8292 0.9665	0.8163	0.8943	0.8653	Ave		0.8734				6.3		20.0			
13C5 PFNA	0.7894 0.8514	0.8140 0.8560	0.8298	0.8437	0.7908	Ave		0.8250				3.4		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.3008 0.2688	0.2888 0.2595	0.3051	0.2955	0.2749	Ave		0.2848				6.1		20.0			
13C2 PFDA	0.6604 0.6734	0.6563 0.6259	0.6712	0.6856	0.6225	Ave		0.6565				3.7		20.0			
13C8 FOSA	1.2353 1.2893	1.2357 1.3210	1.2990	1.3106	1.2893	Ave		1.2829				2.7		20.0			
d3-NMeFOSAA	0.1972 0.2349	0.1976 0.2453	0.2108	0.2158	0.2168	Ave		0.2169				8.3		20.0			
d5-NEtFOSAA	0.2189 0.2306	0.2373 0.2288	0.2229	0.2368	0.2205	Ave		0.2280				3.3		20.0			
13C2 PFUnA	0.5264 0.5370	0.5270 0.5213	0.5324	0.5419	0.5151	Ave		0.5287				1.7		20.0			
13C2 PFDoA	0.4856 0.5391	0.4844 0.5407	0.4819	0.5022	0.4845	Ave		0.5026				5.2		20.0			
13C2-PFTeDA	0.4831 0.5125	0.4791 0.5489	0.4793	0.4756	0.4582	Ave		0.4910				6.1		20.0			
13C2-PFHxDA	0.7075 0.7629	0.7636 0.8003	0.7411	0.7454	0.6972	Ave		0.7454				4.7		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235668/2	2018.07.23LLICAL_002.d
Level 2	IC 320-235668/3	2018.07.23LLICAL_003.d
Level 3	IC 320-235668/4	2018.07.23LLICAL_004.d
Level 4	IC 320-235668/5	2018.07.23LLICAL_005.d
Level 5	IC 320-235668/6	2018.07.23LLICAL_006.d
Level 6	IC 320-235668/7	2018.07.23LLICAL_007.d
Level 7	IC 320-235668/8	2018.07.23LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	54662 9835771	100865 19339074	486511	1945262	4994634	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	44952 7944127	87632 15779261	439647	1731603	4270245	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	71164 12610058	130817 23700645	645045	2656453	6706119	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	15240 2898055	29786 5322216	155620	625017	1475833	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	48485 8348472	91488 15806374	452104	1791310	4411390	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	61256 12590452	123522 23253305	626336	2555539	6406319	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	53249 9133436	93835 16928139	471040	1987683	4691766	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	75675 10907663	122912 21540736	543653	2203602	5486367	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	22058 3478669	40852 6471554	194902	768241	1989042	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	64738 9261268	110203 16840284	492381	2041845	5069253	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	50018 10191534	98701 19142608	500662	2083941	5268243	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	+++++ 7406073	105791 13514816	433434	1616264	3988453	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	41880 7714043	77331 15645792	380417	1548724	3988913	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
8:2 FTS		AveID	18973 2829685	33518 5115198	184284	712803	1558921	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorononanesulfonic acid		AveID	25937 5579385	56605 11005221	264461	1134203	2765045	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorodecanoic acid (PFDA)		AveID	35287 5521565	54779 10269789	313494	1267791	2908266	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (PFOSA)		AveID	58617 10636117	115476 18761965	593444	2328173	5920977	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	8643 1804771	20149 3756042	100194	362883	928849	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	24709 4831368	48680 9597480	246002	975593	2513855	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	+++++ 5089468	74289 9129849	307287	1123256	2735087	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	11889 1715766	18908 3306623	96639	356256	875971	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	25717 4706732	52266 8523366	244107	907939	2342729	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	27107 4322525	48345 8285433	226682	904085	2356193	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	5830 995775	11951 2071202	51758	215092	530481	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5325082 4957611	5106874 4883197	5102046	5085441	5130909	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	3721474 3369200	3669835 3306163	3690862	3595441	3531229	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	89735 86122	84276 85519	84487	87401	87641	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4402181 3960776	4299501 3805574	4267996	4274151	4182069	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4640614 4059821	4458677 3852411	4442605	4501447	4150778	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5328016 5175462	5418231 5017633	5203959	5177221	5148729	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	1244953 1061423	1176358 931806	1177369	1248833	1164838	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	4706753 3884099	4268865 3691370	4472663	4231778	4232198	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3806094 3550779	3693870 3486265	3598957	3818414	3686425	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3803819 3450868	3792873 3229889	3826960	3768250	3524069	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1388549 1043782	1289313 937942	1348095	1264179	1173584	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C2 PFDA	13PF OA	Ave	3182411 2729607	3057920 2361487	3095634	3062260	2774374	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C8 FOSA	13PF OA	Ave	5952607 5225954	5758066 4984298	5990646	5853618	5745909	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	950145 952316	920862 925765	972395	963774	966156	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1054820 934717	1105917 863349	1028200	1057814	982550	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2536362 2176487	2455718 1966864	2455525	2420418	2295730	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2339777 2185359	2256995 2040247	2222244	2243127	2159403	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	2327660 2077317	2232553 2071078	2210453	2124401	2042126	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	3409061 3092486	3557979 3019605	3417814	3329175	3106916	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235668/2	2018.07.23LLICAL_002.d
Level 2	IC 320-235668/3	2018.07.23LLICAL_003.d
Level 3	IC 320-235668/4	2018.07.23LLICAL_004.d
Level 4	IC 320-235668/5	2018.07.23LLICAL_005.d
Level 5	IC 320-235668/6	2018.07.23LLICAL_006.d
Level 6	IC 320-235668/7	2018.07.23LLICAL_007.d
Level 7	IC 320-235668/8	2018.07.23LLICAL_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	4.4 0.7	0.5	-3.0	-2.7	-0.9	0.9	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	0.9 -0.3	-0.2	-0.5	0.6	1.0	-1.5	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	5.1 -8.2	2.8	1.2	0.7	1.4	-3.0	30 30	30	30	30	30	30
4:2 FTS	-1.1 -9.4	2.9	7.3	4.1	-1.9	-2.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	3.9 -2.0	0.4	-0.1	-1.1	-0.5	-0.6	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-5.0 -5.4	2.0	3.2	1.7	1.7	1.7	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	4.1 -0.4	-4.6	-3.8	0.1	2.5	2.0	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	26.6 -4.4	1.1	-6.9	-5.2	-5.1	-6.1	30 30	30	30	30	30	30
6:2 FTS	5.2 3.1	3.1	-1.7	-8.6	1.4	-2.7	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	13.2 -6.1	6.3	-9.4	-0.7	-1.4	-1.9	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-4.6 -0.3	-3.0	1.0	-1.0	3.7	4.2	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	+++++ -8.4	22.1	-0.8	-6.1	-0.9	-6.0	 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	2.6 4.6	-2.4	-1.5	-5.5	0.9	1.3	30 30	30	30	30	30	30
8:2 FTS	0.8 0.6	-4.1	0.8	4.0	-2.0	0.0	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-9.1 5.2	2.2	-2.0	-1.0	0.0	4.8	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorodecanoic acid (PFDA)	7.8 5.7	-12.9	-1.5	0.6	1.9	-1.7	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (PFOSA)	-1.0 -5.4	0.8	-0.4	0.0	3.6	2.3	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-7.7 2.9	11.0	4.6	-4.5	-2.4	-3.9	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-2.9 2.9	-1.5	2.2	-4.5	2.0	1.7	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	+++++ -6.5	21.9	0.8	-6.5	-4.0	-5.8	 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	20.8 2.6	-8.4	0.7	-9.8	-4.4	-1.6	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	1.6 -3.5	7.0	1.5	-6.5	0.3	-0.5	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	10.3 -3.3	2.0	-2.9	-4.1	3.9	-5.8	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	-0.1 -0.3	6.8	-6.6	1.0	3.6	-4.4	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 23-Jul-2018 16:11:19 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:14 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:45:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.402	1.398	0.004	0.542	5325082	2.38		95.3	109513	
2 Perfluorobutyric acid										
212.90 > 169.00	1.402	1.399	0.003	1.000	54662	0.0261		104	24.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.638	0.002	0.634	3721474	2.39		95.4	63670	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.640	1.639	0.001	1.000	44952	0.0252		101	19.8	M
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.670	0.005	0.647	89735	2.19		94.3	568	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.672	0.003	1.000	71164	0.0232		105	21.3	
298.90 > 99.00	1.675	1.672	0.003	1.000	28574		2.49(1.25-3.74)	105	19.0	
D 60 M2-4:2FTS										
329.00 > 81.00	1.885	1.877	0.008	0.728	645077	NC			7725	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.885	1.878	0.007	1.126	15240	0.0231		98.9	935	
D 7 13C2 PFHxA										
315.00 > 270.00	1.916	1.909	0.007	0.740	4402181	2.41		96.3	85678	
6 Perfluorohexanoic acid										RM
313.00 > 269.00	1.916	1.909	0.007	1.000	48485	0.0260		104	107	RM
313.00 > 119.00	1.916	1.909	0.007	1.000	2434		19.92(5.03-15.10)	104	41.2	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.938	1.931	0.007	1.157	61256	0.0223		95.0	1073	
349.00 > 99.00	1.938	1.931	0.007	1.157	21705		2.82(1.36-4.07)	95.0	272	
67 Perfluoro(2-propoxypropanoic) acid										M
329.10 > 285.00	2.014	2.006	0.008	1.000	7239	NC			27.0	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.007	0.007	0.778	233454	NC			8029	
D 9 13C4-PFHpA										
367.00 > 322.00	2.241	2.230	0.011	0.866	4640614	2.46		98.5	60207	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.241	2.230	0.011	1.000	53249	0.0260		104	66.8	
363.00 > 169.00	2.241	2.230	0.011	1.000	20753		2.57(1.13-3.40)	104	301	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.254	2.243	0.011	1.000	75675	0.0288		127	186	
399.00 > 99.00	2.254	2.243	0.011	1.000	23846		3.17(1.50-4.49)	127	78.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.254	2.246	0.008	0.871	5328016	2.20		93.1	52162	
65 ADONA										
377.00 > 251.00	2.280	2.272	0.008	0.772	124416	NC			1746	
377.00 > 85.00	2.280	2.272	0.008	0.772	80059		1.55(0.84-2.53)		450	
D 12 M2-6:2FTS										
429.00 > 81.00	2.565	2.559	0.005	0.991	1244953	2.37		99.6	16206	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.565	2.559	0.005	1.000	22058	0.0249		105	276	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.585	0.003	1.000	4706753	2.55		102	56843	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.585	0.003		4818596	2.50			57560	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.586	0.002	1.000	64738	0.0283		113	54.1	
413.00 > 169.00	2.588	2.586	0.002	1.000	34186		1.89(0.84-2.52)	113	173	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.596	2.591	0.005	0.879	50018	0.0227		95.4	883	
449.00 > 99.00	2.596	2.591	0.005	0.879	12848		3.89(1.94-5.82)	95.4	224	
D 18 13C4 PFOS										
503.00 > 80.00	2.954	2.949	0.005	1.141	3806094	2.26		94.6	37526	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.954	2.949	0.005	1.000	41880	0.0238		103	413	
499.00 > 99.00	2.954	2.949	0.005	1.000	12223		3.43(2.31-6.93)	103	127	
D 19 13C5 PFNA										
468.00 > 423.00	2.954	2.950	0.004	1.141	3803819	2.39		95.7	68318	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.960	2.950	0.010	1.002	67521	0.0389		155	151	M
463.00 > 169.00	2.960	2.950	0.010	1.002	14385		4.69(1.90-5.69)	155	310	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.161	0.003	1.071	67252	NC			1002	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.296	0.003	1.275	1388549	2.53		106	18857	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.307	3.297	0.010	1.002	18973	0.0241		101	924	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.307	3.299	0.008	1.120	25937	0.0218		90.9	913	
549.00 > 99.00	3.299	3.299	0.0	1.117	10655		2.43(1.33-3.97)	90.9	172	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.315	3.309	0.006	1.281	3182411	2.52		101	64706	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.315	3.309	0.006	1.000	35287	0.0270		108	121	
513.00 > 169.00	3.315	3.309	0.006	1.000	6252		5.64(2.36-7.09)	108	156	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.311	0.004	1.281	5952607	2.41		96.3	68773	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.314	0.001	1.000	58617	0.0248		99.0	1455	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.468	3.462	0.006	1.340	950145	2.27		90.9	34893	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.468	3.468	0.0	1.000	8643	0.0231		92.3	80.4	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.631	3.625	0.006	1.229	24709	0.0234		97.1	878	
599.00 > 99.00	3.631	3.625	0.006	1.229	8995		2.75(1.39-4.16)	97.1	213	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.641	3.635	0.006	1.406	1054820	2.40		96.0	3175	
D 30 13C2 PFUnA										
565.00 > 520.00	3.641	3.638	0.003	1.406	2536362	2.49		99.6	44916	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.641	3.638	0.003	1.000	44361	0.0352		141	131	
563.00 > 169.00	3.641	3.638	0.003	1.000	8518		5.21(2.12-6.36)	141	68.3	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.650	3.639	0.011	1.003	11889	0.0302		121	173	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.806	3.800	0.006	1.288	98527	NC			1570	
D 36 13C2 PFDoA										
615.00 > 570.00	3.941	3.934	0.007	1.523	2339777	2.42		96.6	24670	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.941	3.934	0.007	1.000	25717	0.0254		102	8.1	
613.00 > 169.00	3.931	3.934	-0.003	0.997	6884		3.74(2.13-6.40)	102	114	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.204	4.198	0.006	1.067	27107	0.0276		110	9.4	
663.00 > 169.00	4.204	4.198	0.006	1.067	8378		3.24(1.25-3.76)	110	120	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.433	-0.006	0.998	5830	0.0250		99.9	74.3	
713.00 > 219.00	4.427	4.433	-0.006	0.998	6134		0.95(0.71-2.13)	99.9	98.6	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.438	4.435	0.003	1.714	2327660	2.46		98.4	14703	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.843	4.840	0.003	1.871	3409061	2.37		94.9	10896	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.843	4.840	0.003	1.000	64391	NC			10.3	
813.00 > 169.00	4.843	4.840	0.003	1.000	10137		6.35(2.86-8.58)		118	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.182	5.184	-0.002	1.070	37760	NC			8.5	
913.00 > 169.00	5.189	5.184	0.005	1.072	5340		7.07(3.83-11.48)		85.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:19 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d

Injection Date: 23-Jul-2018 16:11:19 Instrument ID: A8_N

Lims ID: IC L1 Full

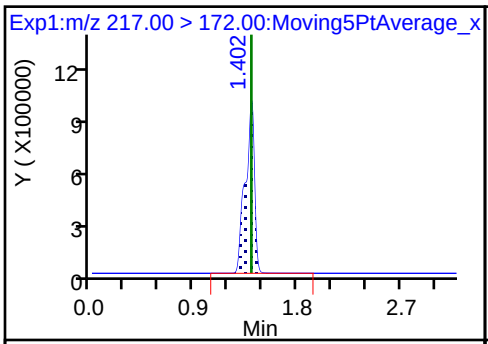
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

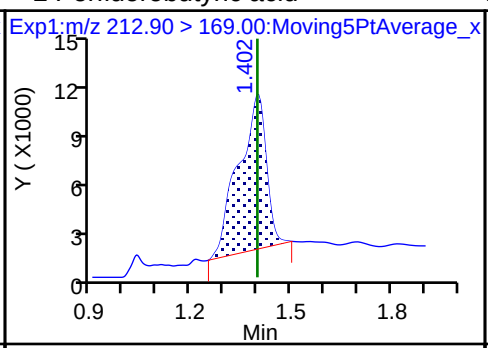
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

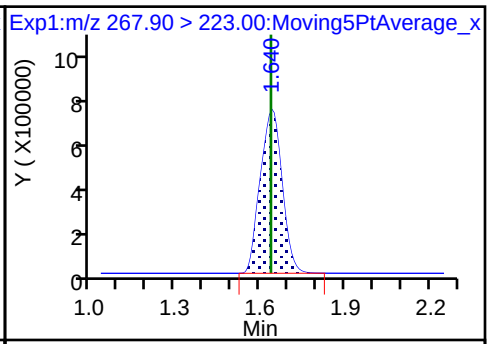
D 1 13C4 PFBA



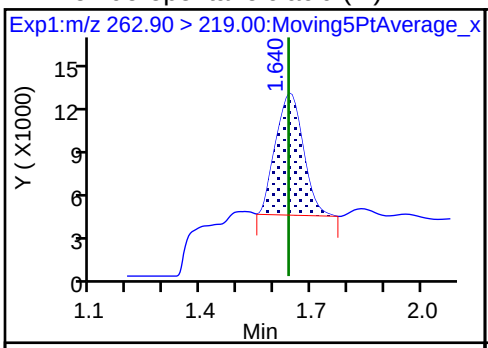
2 Perfluorobutyric acid



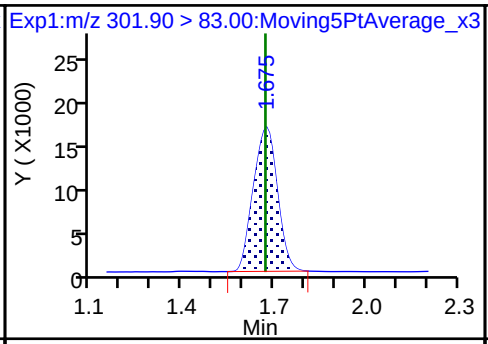
D 3 13C5-PFPeA



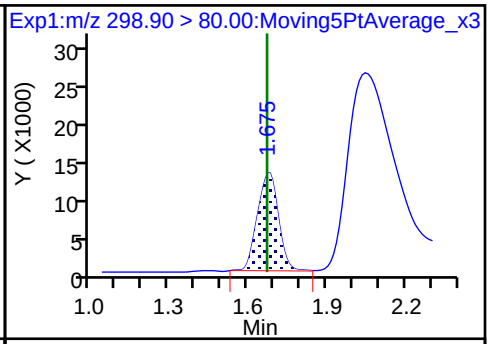
4 Perfluoropentanoic acid (M)



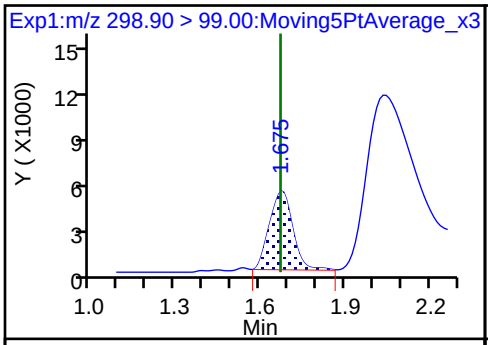
D 47 13C3-PFBS



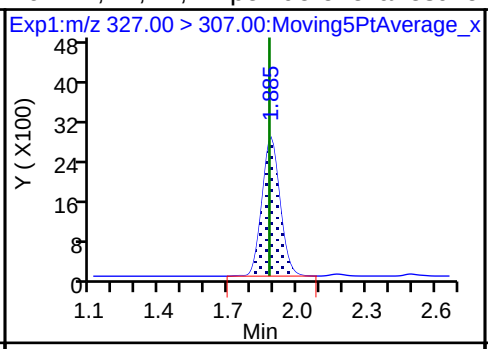
5 Perfluorobutanesulfonic acid



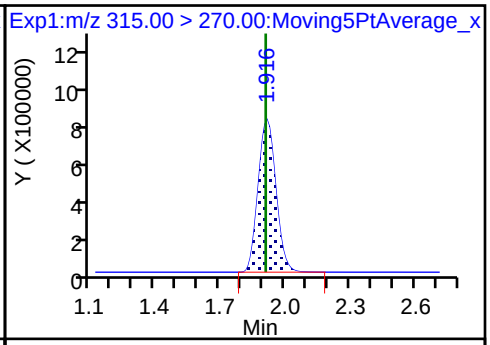
5 Perfluorobutanesulfonic acid



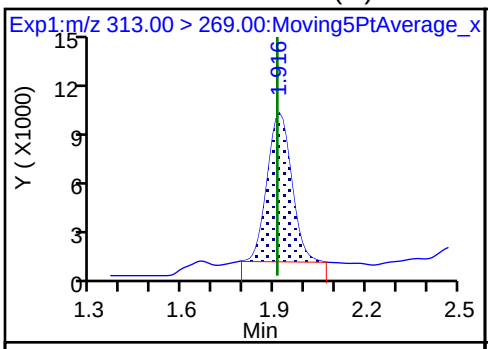
61 1H,1H,2H,2H-perfluorohexanesulfon



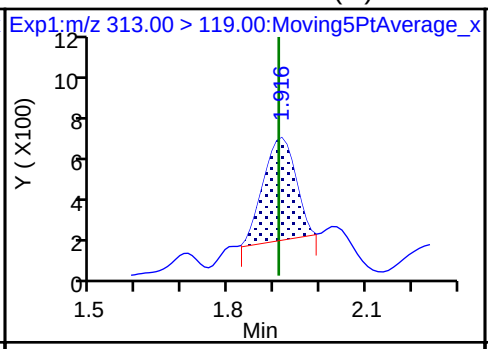
D 7 13C2 PFHxA



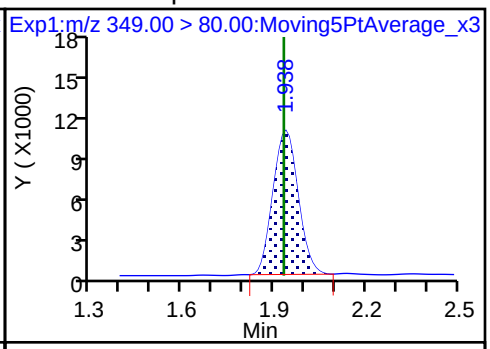
6 Perfluorohexanoic acid (M)



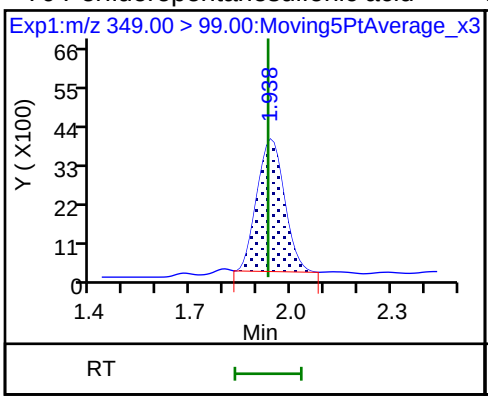
6 Perfluorohexanoic acid (M)



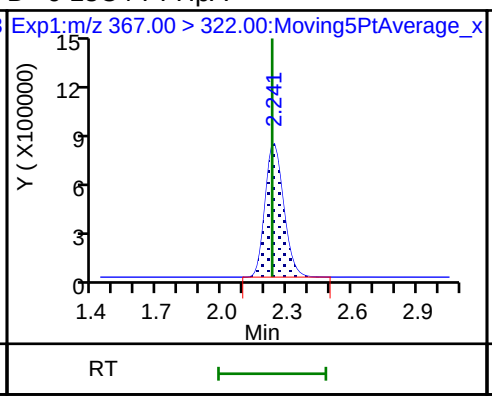
70 Perfluoropentanesulfonic acid



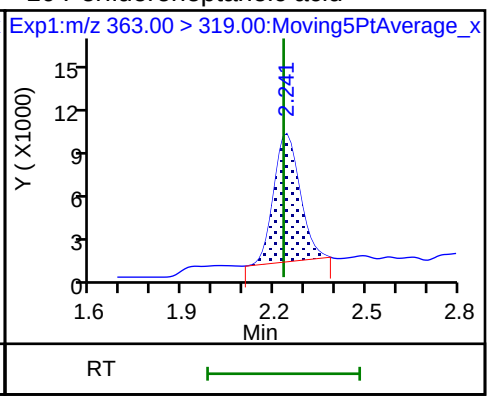
70 Perfluoropentanesulfonic acid



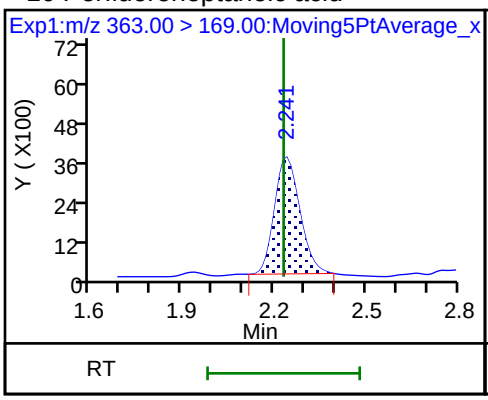
D 9 13C4-PFHpA



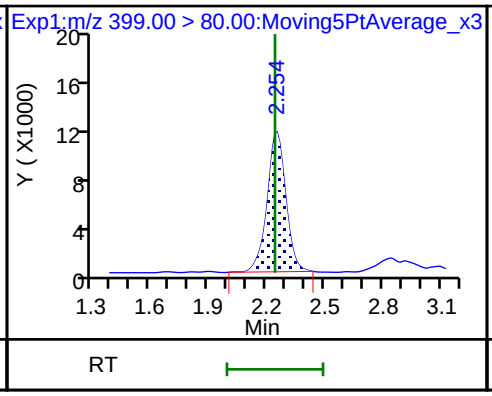
10 Perfluoroheptanoic acid



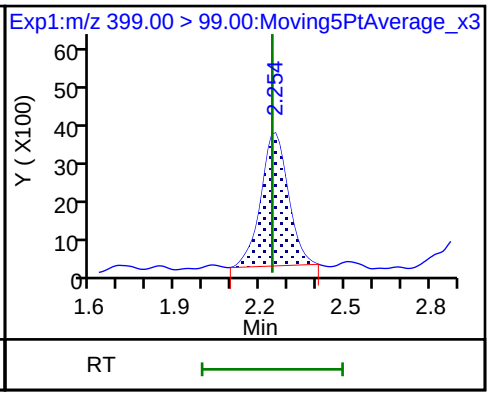
10 Perfluoroheptanoic acid



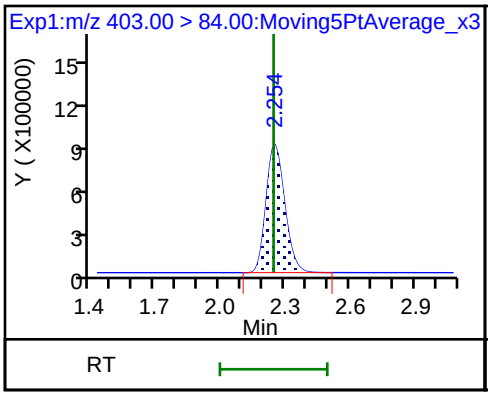
8 Perfluorohexanesulfonic acid



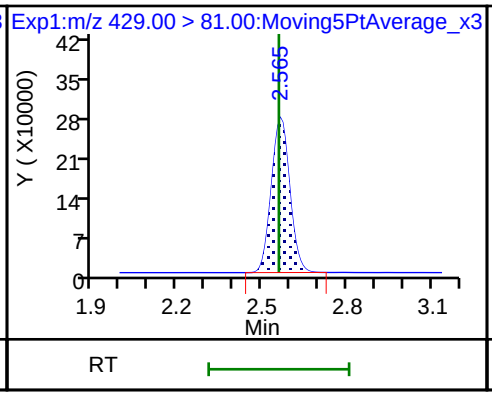
8 Perfluorohexanesulfonic acid



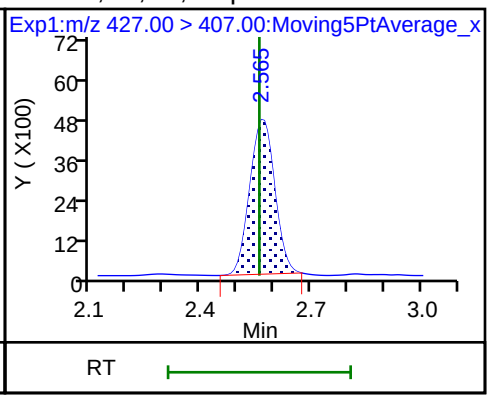
D 11 18O2 PFHxS



D 12 M2-6:2FTS



13 1H,1H,2H,2H-perfluorooctanesulfoni



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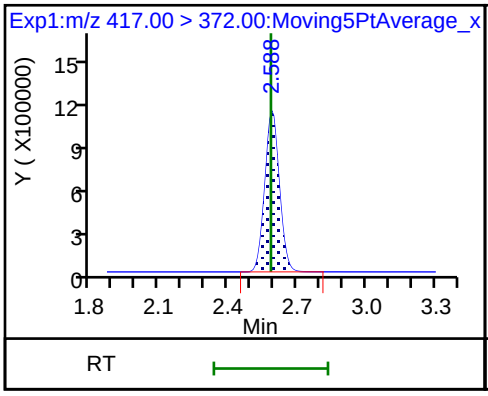
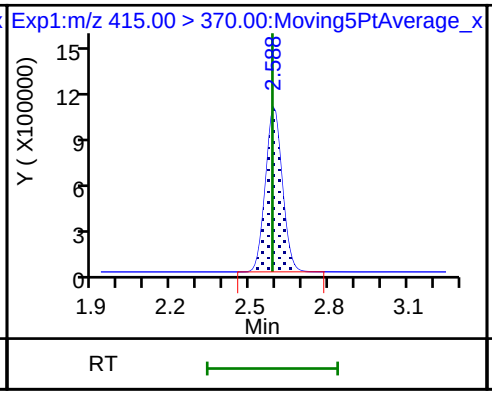
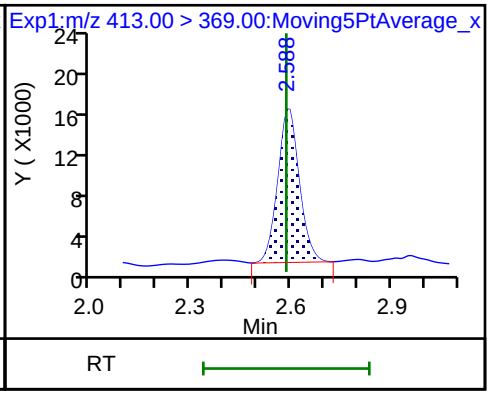


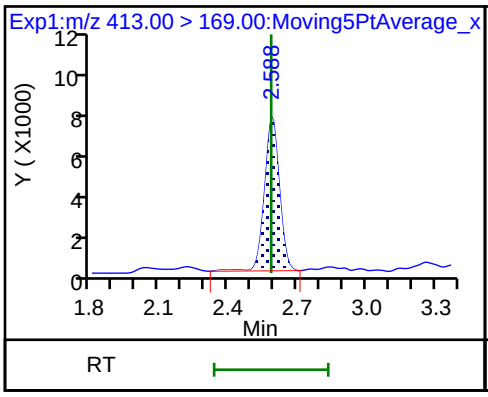
* 62 13C2-PFOA



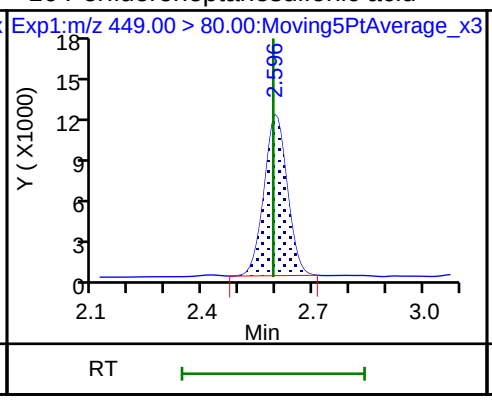
15 Perfluorooctanoic acid



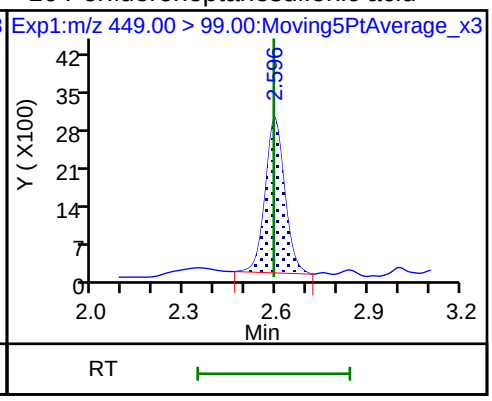
15 Perfluorooctanoic acid



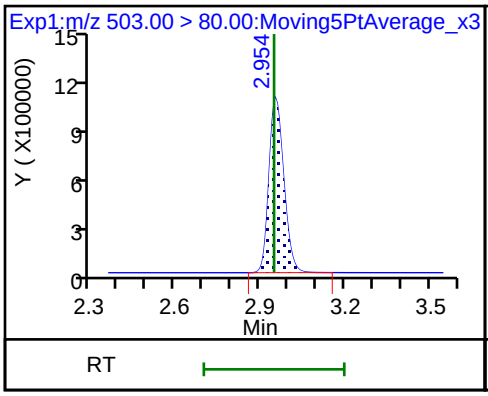
16 Perfluoroheptanesulfonic acid



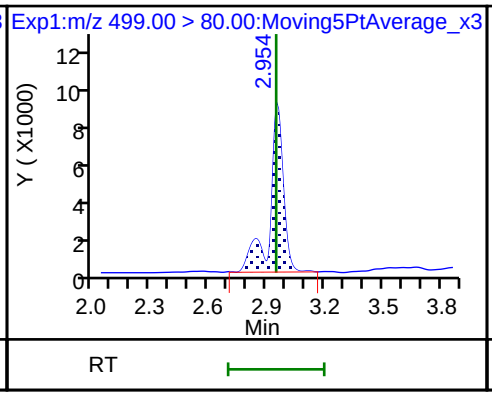
16 Perfluoroheptanesulfonic acid



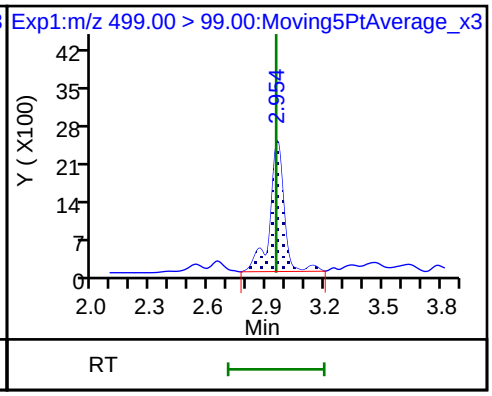
D 18 13C4 PFOS



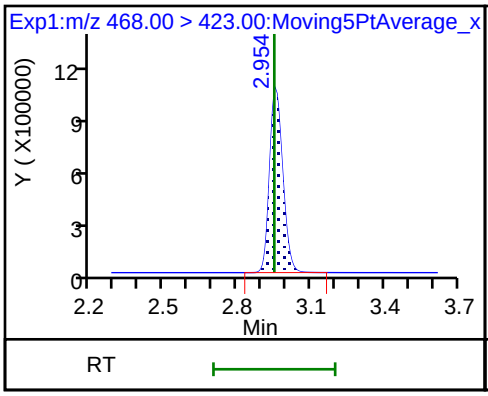
17 Perfluorooctane sulfonic acid



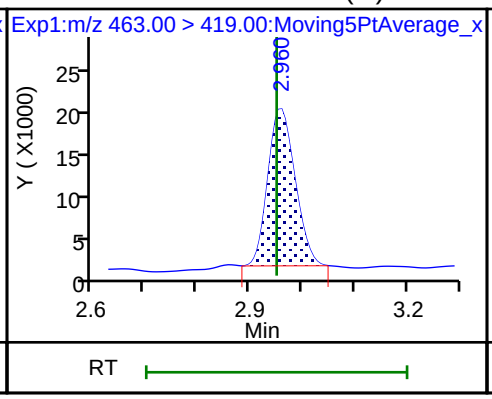
17 Perfluorooctane sulfonic acid



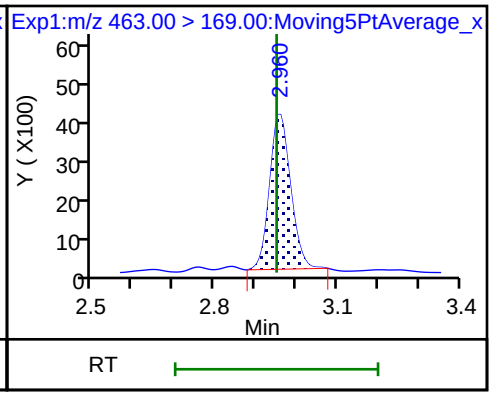
D 19 13C5 PFNA



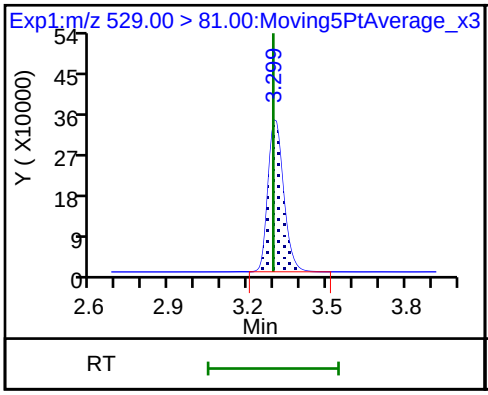
20 Perfluorononanoic acid (M)



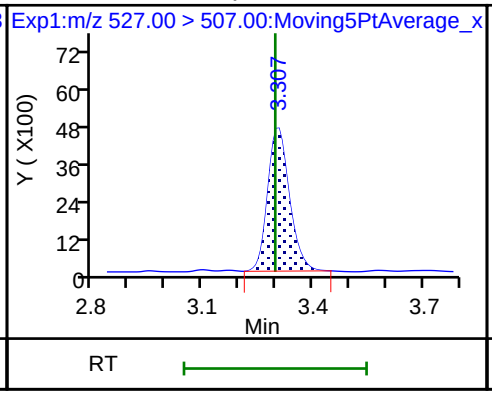
20 Perfluorononanoic acid



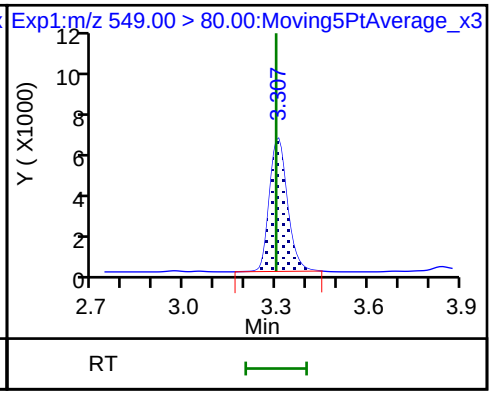
D 26 M2-8:2FTS



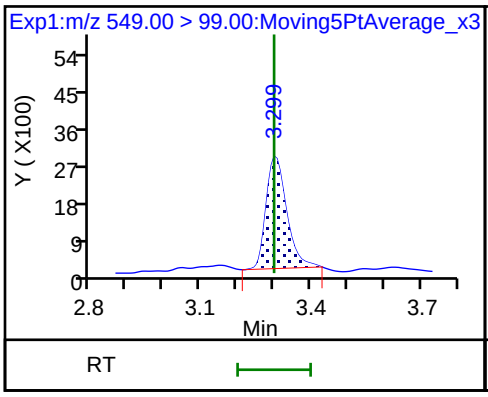
25 1H,1H,2H,2H-perfluorodecanesulfoni



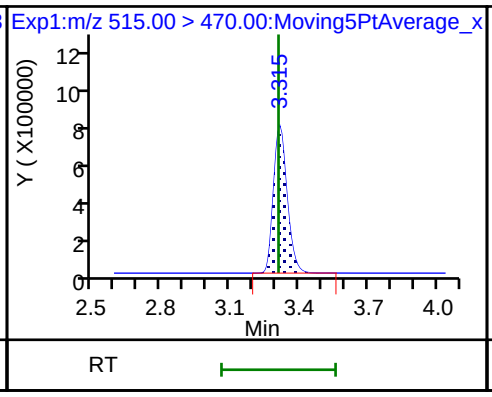
68 Perfluorononanesulfonic acid



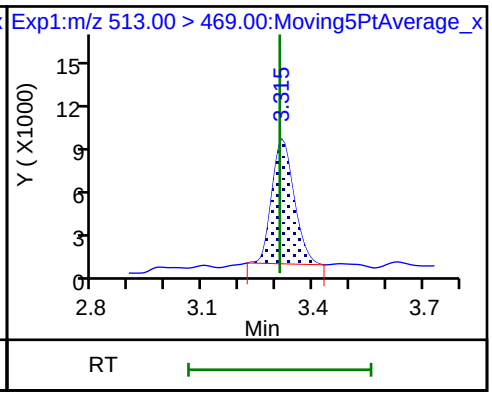
68 Perfluorononanesulfonic acid



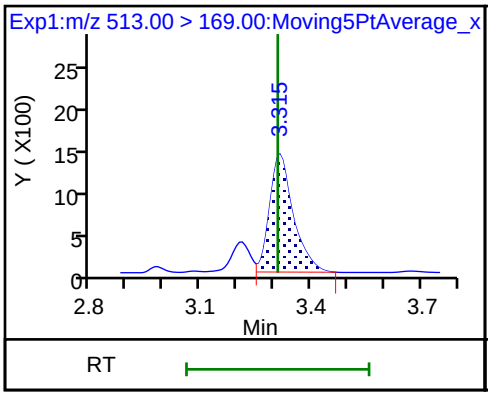
D 23 13C2 PFDA



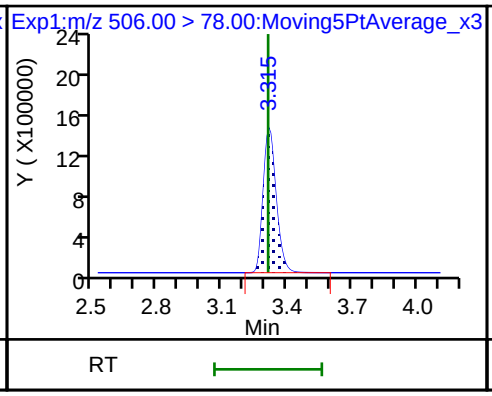
24 Perfluorodecanoic acid



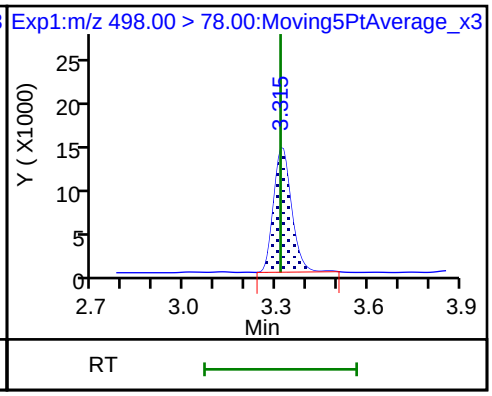
24 Perfluorodecanoic acid



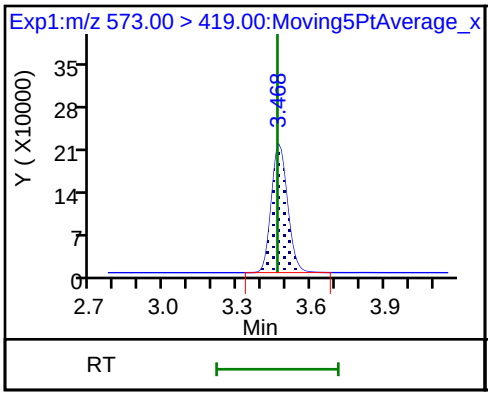
D 21 13C8 FOSA



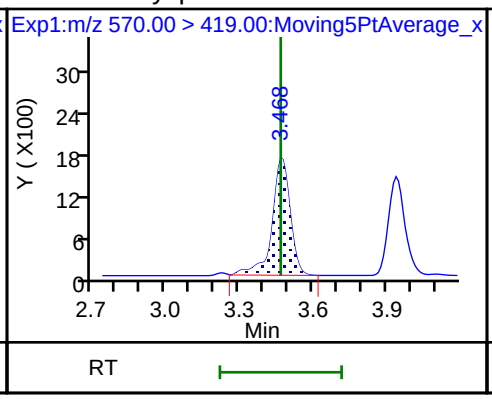
22 Perfluorooctane Sulfonamide



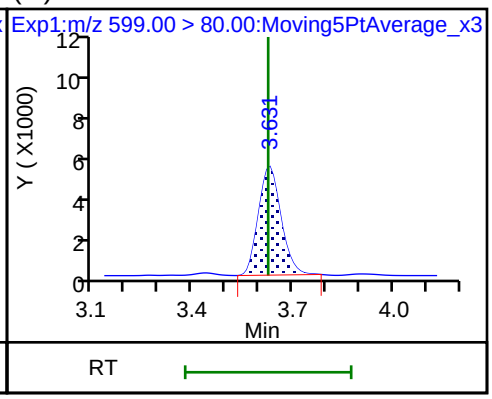
D 27 d3-NMeFOSAA



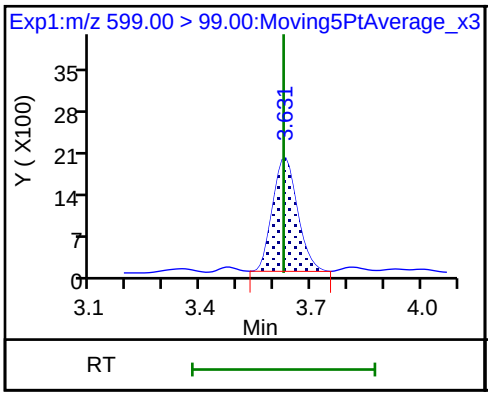
28 N-methyl perfluorooctane sulfonami (M)



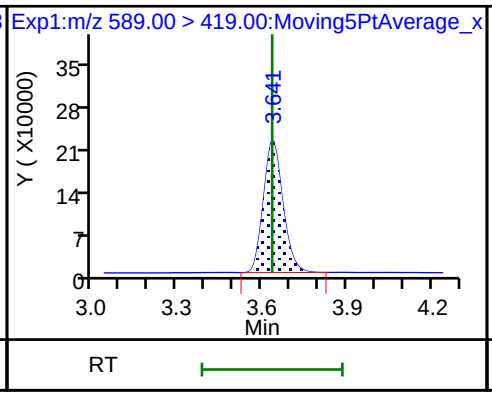
29 Perfluorodecane Sulfonic acid



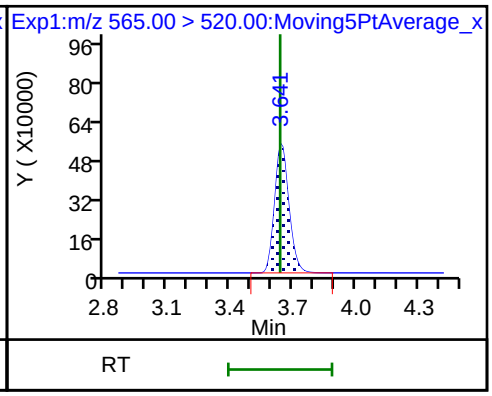
29 Perfluorodecane Sulfonic acid



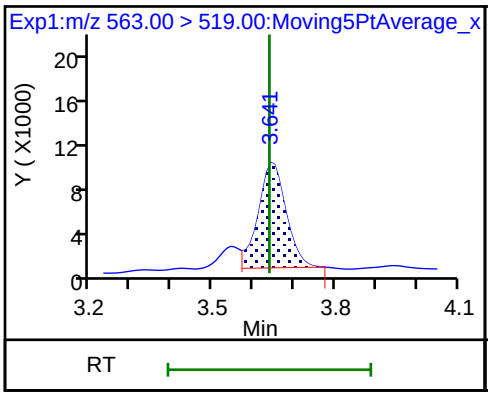
D 32 d5-NEtFOSAA



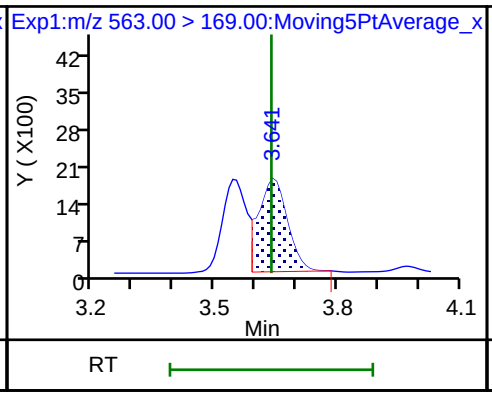
D 30 13C2 PFUnA



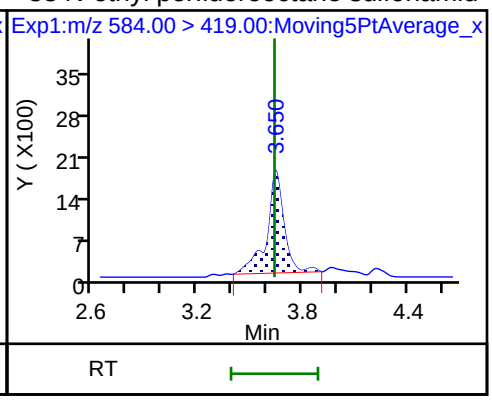
31 Perfluoroundecanoic acid



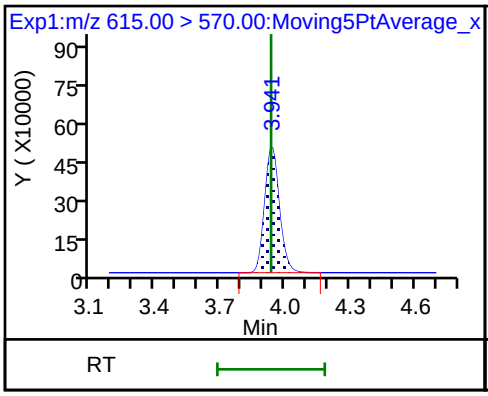
31 Perfluoroundecanoic acid



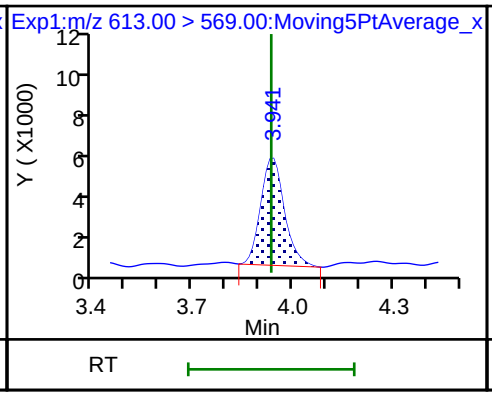
33 N-ethyl perfluorooctane sulfonamid



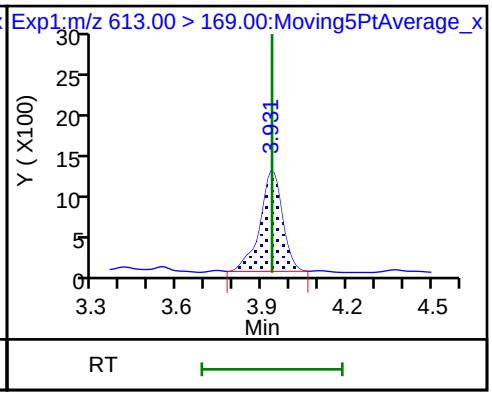
D 36 13C2 PFDoA



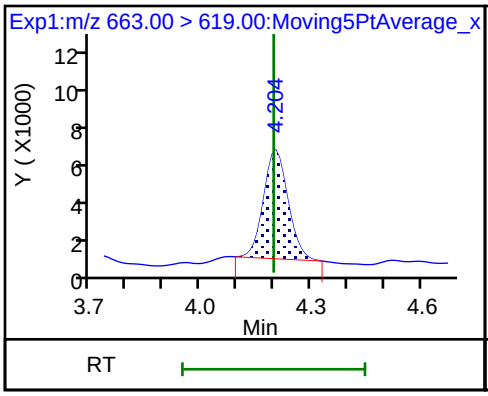
37 Perfluorododecanoic acid



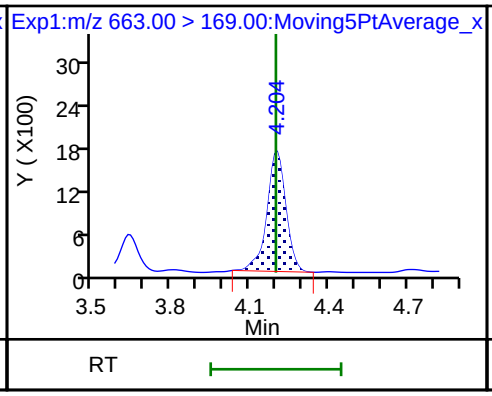
37 Perfluorododecanoic acid



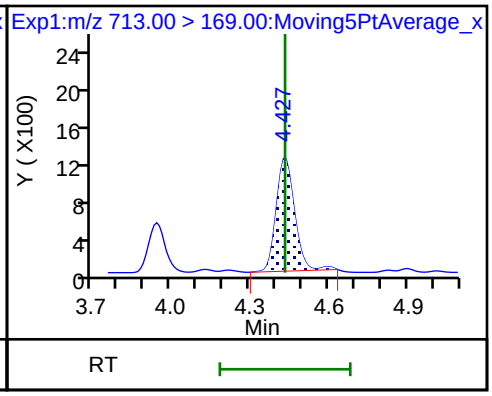
41 Perfluorotridecanoic acid



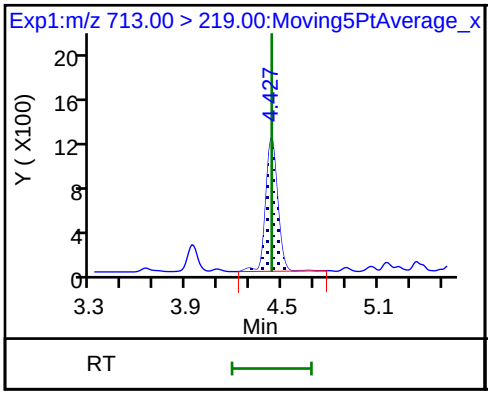
41 Perfluorotridecanoic acid



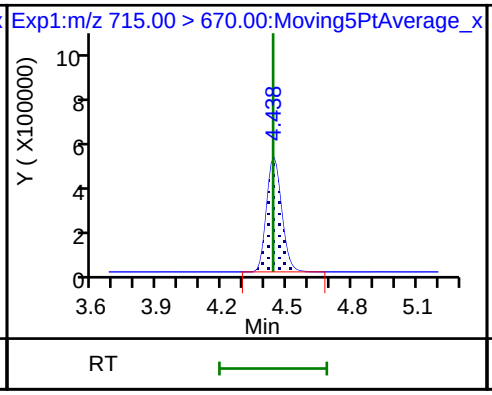
42 Perfluorotetradecanoic acid



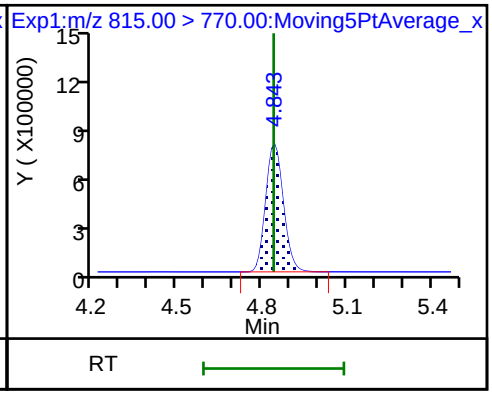
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

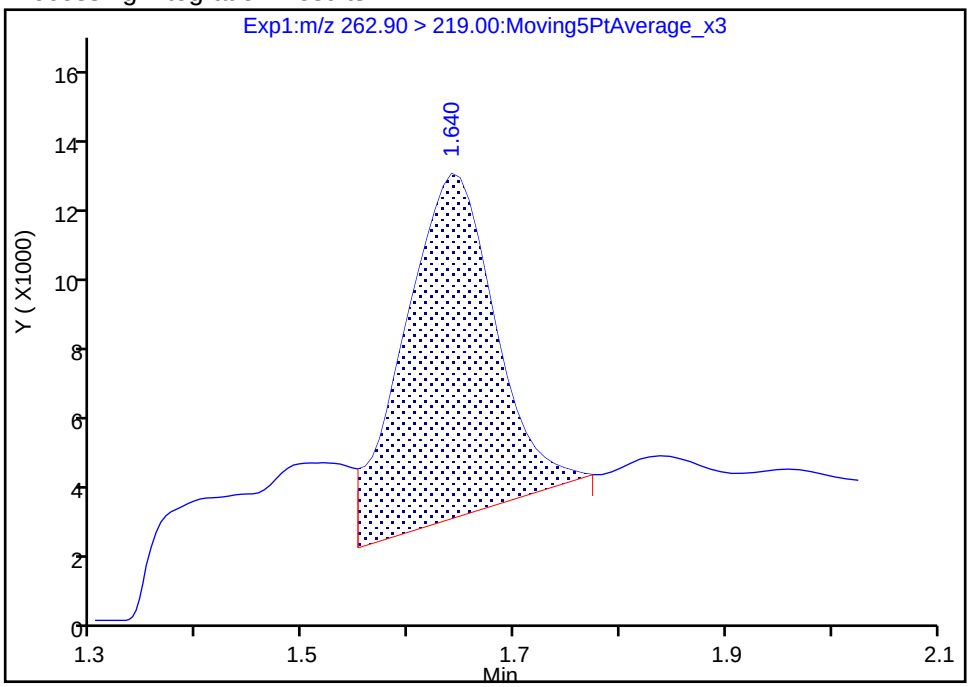
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

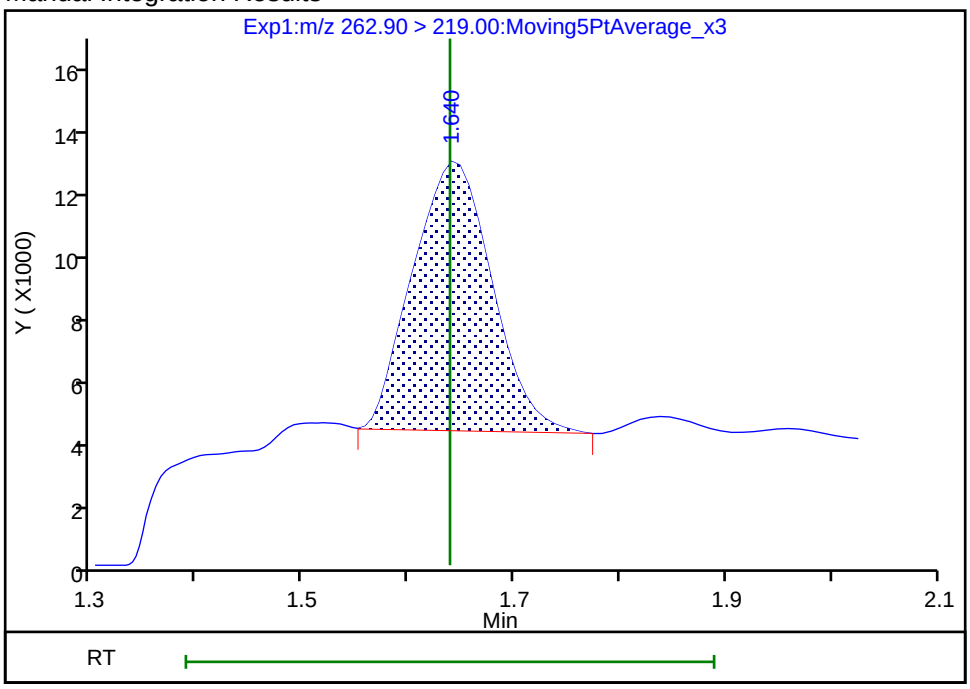
Processing Integration Results

RT: 1.64
Area: 60083
Amount: 0.029797
Amount Units: ng/ml



Manual Integration Results

RT: 1.64
Area: 44952
Amount: 0.025229
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:44:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

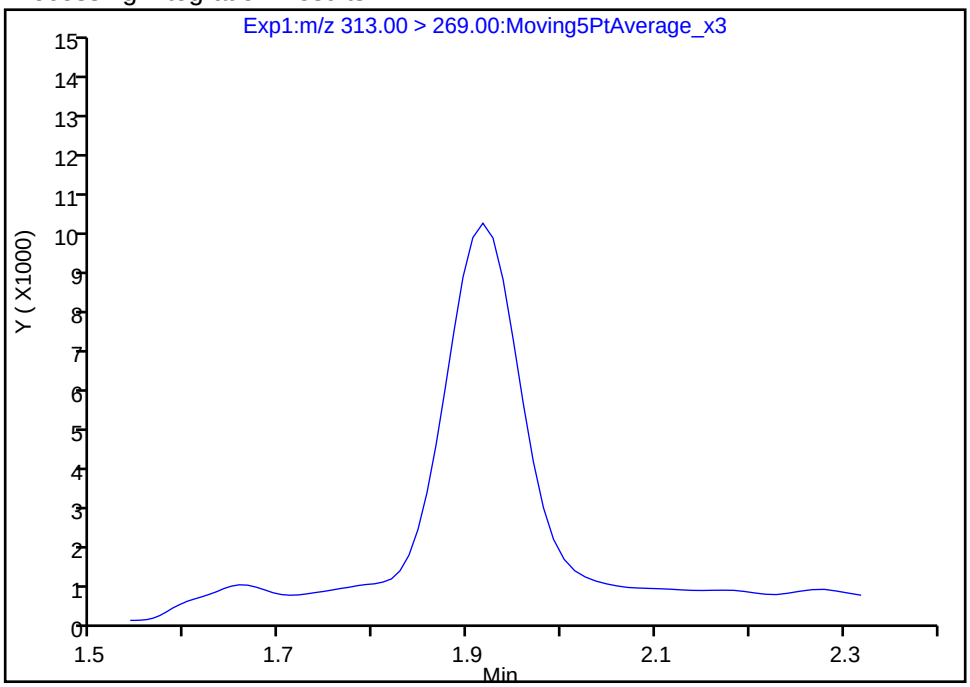
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

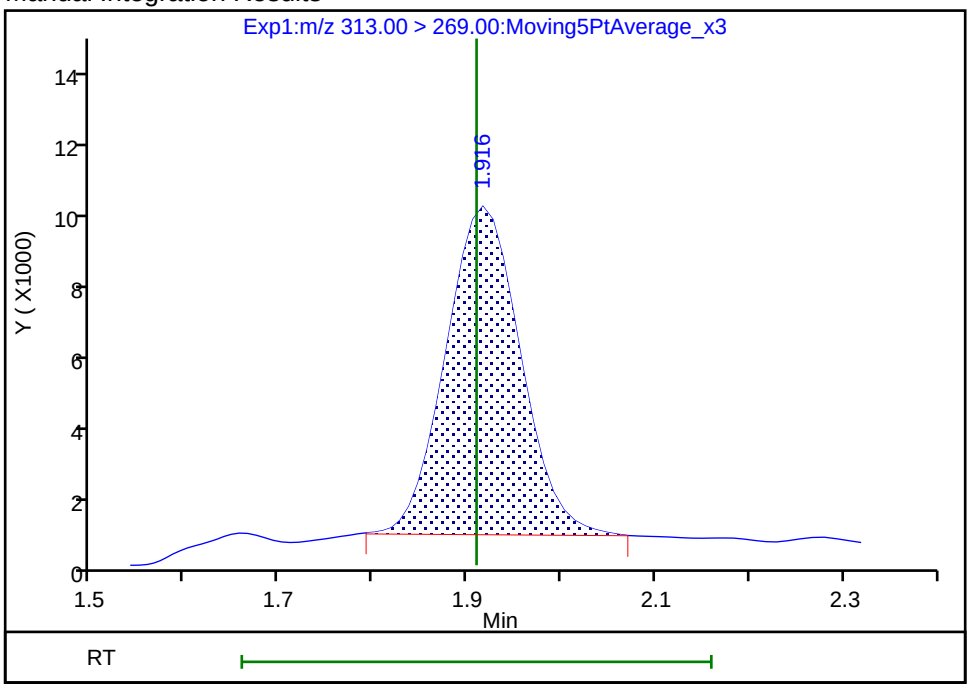
Processing Integration Results

Not Detected
Expected RT: 1.91



Manual Integration Results

RT: 1.92
Area: 48485
Amount: 0.025978
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:43:54
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

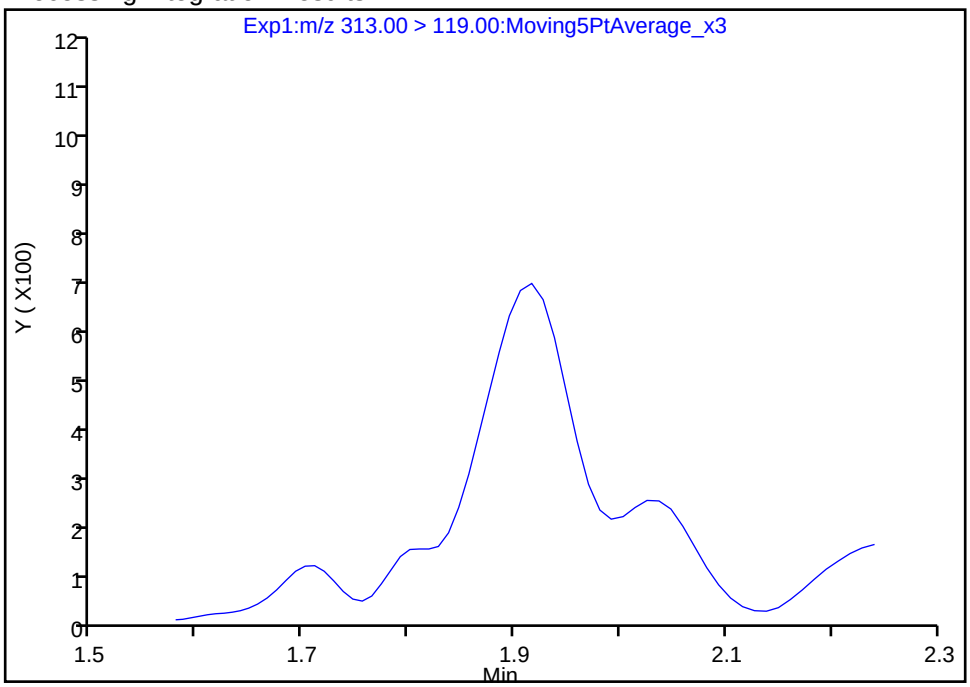
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

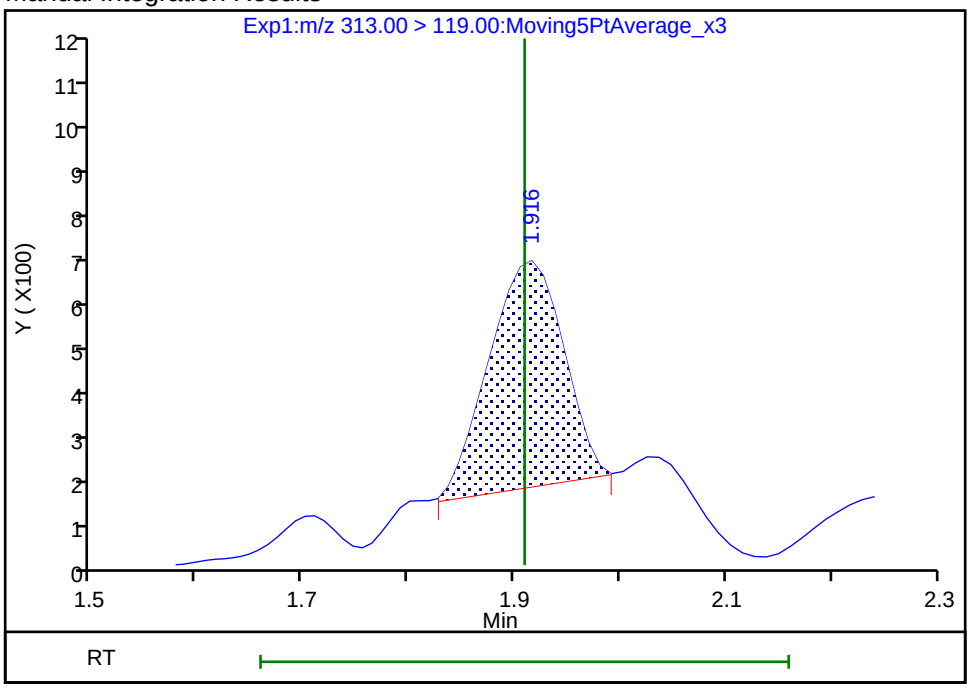
Processing Integration Results

Not Detected
Expected RT: 1.91



Manual Integration Results

RT: 1.92
Area: 2434
Amount: 0.025978
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:44:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

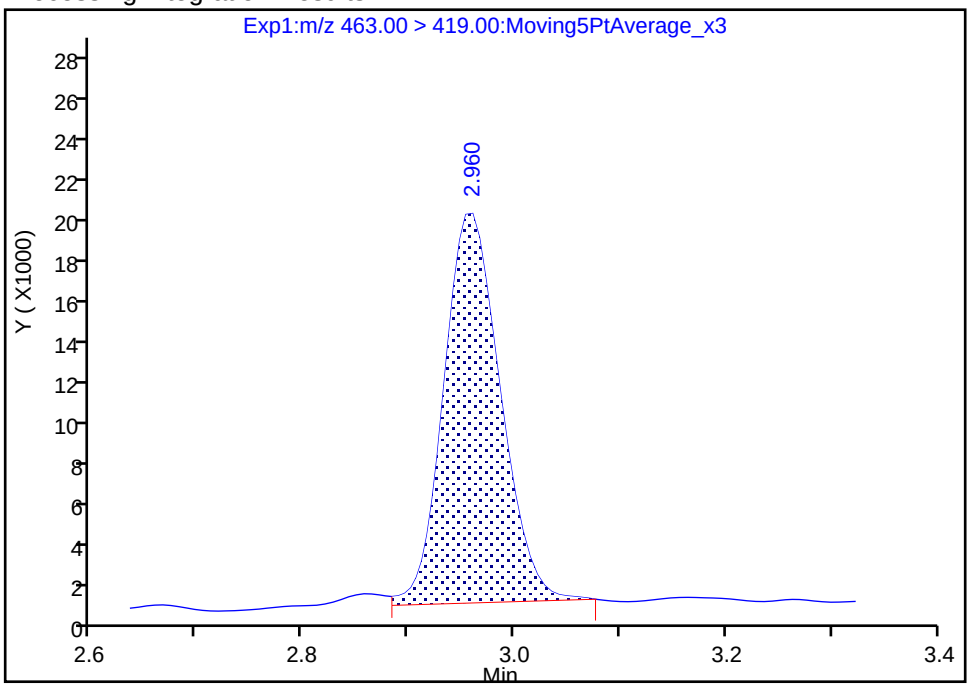
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

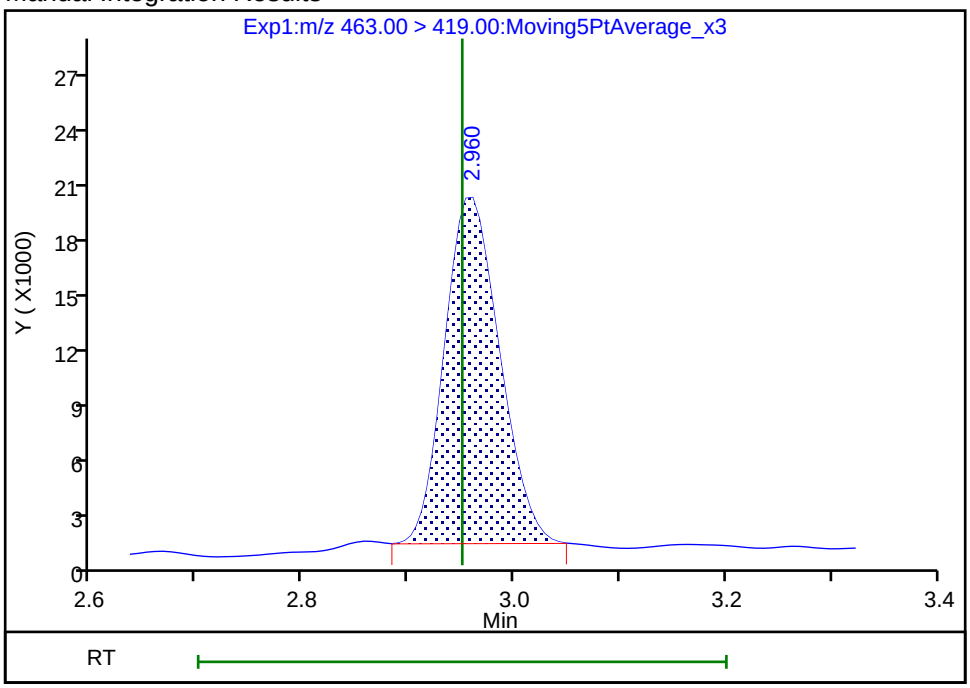
Processing Integration Results

RT: 2.96
Area: 70739
Amount: 0.037364
Amount Units: ng/ml



Manual Integration Results

RT: 2.96
Area: 67521
Amount: 0.038868
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 17:20:24

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

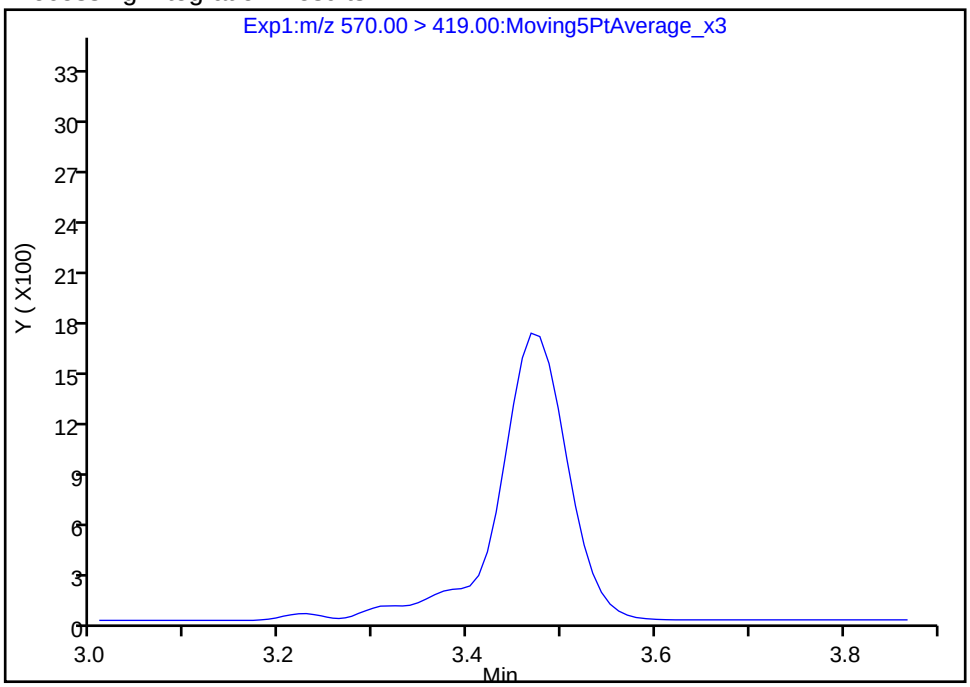
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

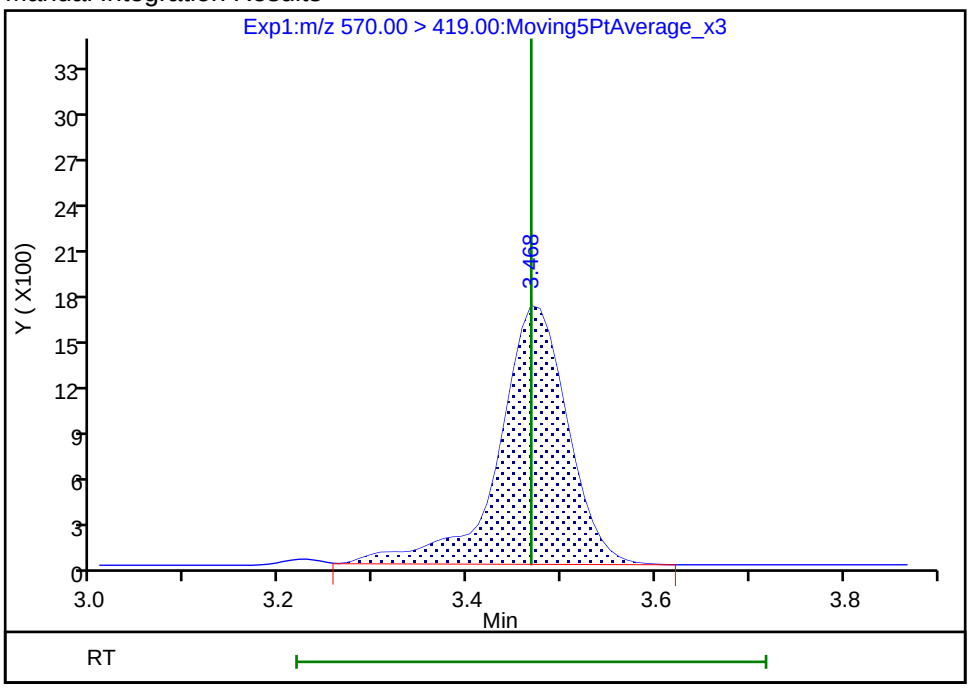
Not Detected
Expected RT: 3.47

Processing Integration Results



Manual Integration Results

RT: 3.47
Area: 8643
Amount: 0.023075
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:45:23
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 23-Jul-2018 16:19:08 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:23 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:49:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.392	1.398	-0.006	0.539	5106874	2.36		94.5	79559	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.004	100865	0.0502		100	48.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3669835	2.43		97.3	62735	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	87632	0.0499		99.8	39.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	84276	2.13		91.6	579	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	130817	0.0455		103	40.2	
298.90 > 99.00	1.667	1.672	-0.005	1.000	53793		2.43(1.25-3.74)	103	35.8	
D 60 M2-4:2FTS										
329.00 > 81.00	1.868	1.877	-0.009	0.724	617987	NC			6983	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.878	-0.001	1.126	29786	0.0481		103	1862	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.739	4299501	2.43		97.2	76346	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	91488	0.0502		100	210	
313.00 > 119.00	1.896	1.909	-0.013	0.995	8843		10.35(5.03-15.10)	100	177	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	123522	0.0478		102	1976	
349.00 > 99.00	1.928	1.931	-0.003	1.157	50778		2.43(1.36-4.07)	102	788	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.993	2.006	-0.013	0.994	19414	NC			70.7	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.777	227056	NC			9715	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.230	-0.011	0.860	4458677	2.45		97.9	68539	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.230	-0.011	1.000	93835	0.0477		95.4	114	
363.00 > 169.00	2.219	2.230	-0.011	1.000	42515		2.21(1.13-3.40)	95.4	436	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.231	2.243	-0.012	0.995	122912	0.0460		101	294	
399.00 > 99.00	2.231	2.243	-0.012	0.995	43227		2.84(1.50-4.49)	101	139	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.246	-0.003	0.869	5418231	2.31		97.9	56693	
65 ADONA										
377.00 > 251.00	2.269	2.272	-0.003	0.771	252213	NC			4681	
377.00 > 85.00	2.269	2.272	-0.003	0.771	149214		1.69(0.84-2.53)		873	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.559	-0.003	0.990	1176358	2.31		97.3	18317	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.559	-0.003	1.000	40852	0.0489		103	480	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.585	-0.004	1.000	4268865	2.39		95.8	63794	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.585	-0.004		4659586	2.50			47587	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.586	-0.005	1.000	110203	0.0532		106	97.6	
413.00 > 169.00	2.581	2.586	-0.005	1.000	63067		1.75(0.84-2.52)	106	370	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.591	-0.002	0.880	98701	0.0462		97.0	1316	
449.00 > 99.00	2.589	2.591	-0.002	0.880	26850		3.68(1.94-5.82)	97.0	666	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.949	-0.006	1.140	3693870	2.27		94.9	28519	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.943	2.949	-0.006	1.000	77331	0.0453		97.6	654	
499.00 > 99.00	2.948	2.949	-0.001	1.002	19792		3.91(2.31-6.93)	97.6	268	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.950	-0.002	1.142	3792873	2.47		98.7	73090	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.948	2.950	-0.002	1.000	105791	0.0611		122	254	M
463.00 > 169.00	2.948	2.950	-0.002	1.000	24590		4.30(1.90-5.69)	122	443	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.073	130612	NC			1504	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.296	-0.004	1.276	1289313	2.43		101	24297	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.297	-0.005	1.000	33518	0.0459		95.9	1595	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.299	-0.007	1.119	56605	0.0490		102	2035	
549.00 > 99.00	3.292	3.299	-0.007	1.119	21287		2.66(1.33-3.97)	102	342	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.282	3057920	2.50		100.0	46728	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	54779	0.0435		87.1	218	
513.00 > 169.00	3.308	3.309	-0.001	1.000	12406		4.42(2.36-7.09)	87.1	432	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.282	5758066	2.41		96.3	48814	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.314	-0.006	1.000	115476	0.0504		101	3111	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.459	3.462	-0.003	1.340	920862	2.28		91.1	18571	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.459	3.468	-0.009	1.000	20149	0.0555		111	282	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.625	-0.001	1.232	48680	0.0475		98.5	1129	
599.00 > 99.00	3.624	3.625	-0.001	1.232	16770		2.90(1.39-4.16)	98.5	588	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.634	3.635	-0.001	1.408	1105917	2.60		104	4062	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.408	2455718	2.49		99.7	43307	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	74289	0.0609		122	229	
563.00 > 169.00	3.634	3.638	-0.004	1.000	13147		5.65(2.12-6.36)	122	107	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.634	3.639	-0.005	1.000	18908	0.0458		91.6	310	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.799	3.800	-0.001	1.291	185856	NC			6412	
D 36 13C2 PFDoA										
615.00 > 570.00	3.924	3.934	-0.010	1.521	2256995	2.41		96.4	22431	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.924	3.934	-0.010	1.000	52266	0.0535		107	16.4	
613.00 > 169.00	3.924	3.934	-0.010	1.000	12156		4.30(2.13-6.40)	107	238	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.199	4.198	0.001	1.070	48345	0.0510		102	15.0	
663.00 > 169.00	4.189	4.198	-0.009	1.067	19530		2.48(1.25-3.76)	102	226	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.435	4.433	0.002	1.000	11951	0.0534		107	176	
713.00 > 219.00	4.424	4.433	-0.009	0.998	9870		1.21(0.71-2.13)	107	232	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.435	4.435	0.0	1.718	2232553	2.44		97.6	12087	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.840	4.840	0.0	1.876	3557979	2.56		102	11741	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.840	4.840	0.0	1.000	96987	NC			14.9	
813.00 > 169.00	4.840	4.840	0.0	1.000	16349		5.93(2.86-8.58)		217	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.188	5.184	0.004	1.072	73454	NC			16.4	
913.00 > 169.00	5.188	5.184	0.004	1.072	8823		8.33(3.83-11.48)		130	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_003.d

Injection Date: 23-Jul-2018 16:19:08 Instrument ID: A8_N

Lims ID: IC L2 Full

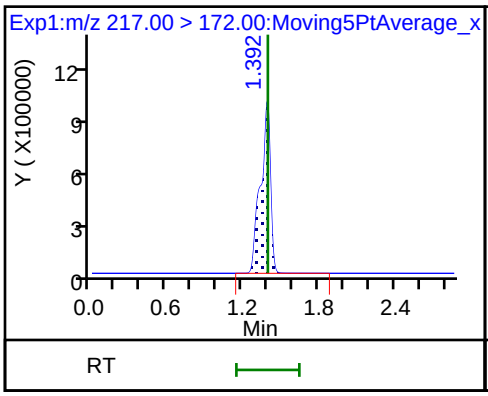
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

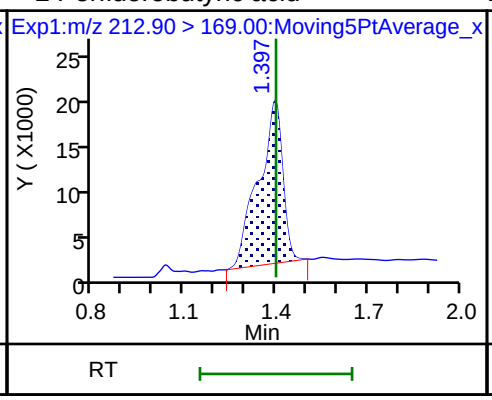
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

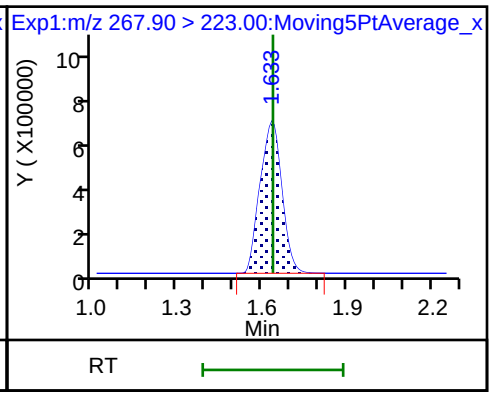
D 1 13C4 PFBA



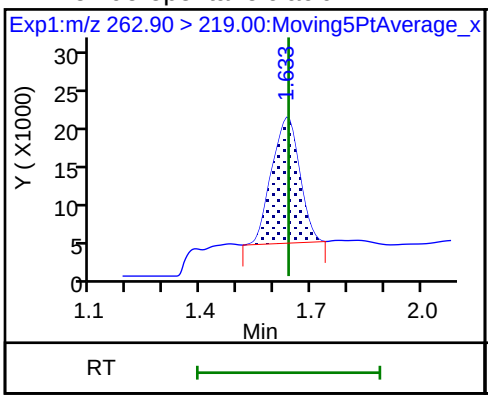
2 Perfluorobutyric acid



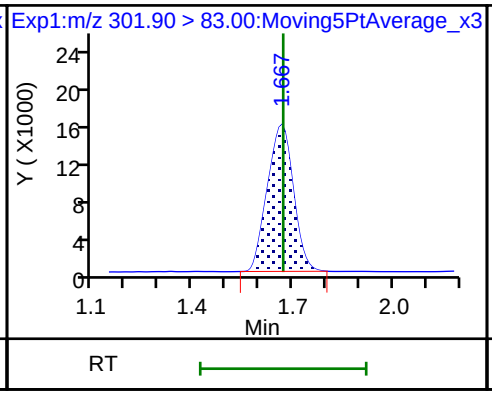
D 3 13C5-PFPeA



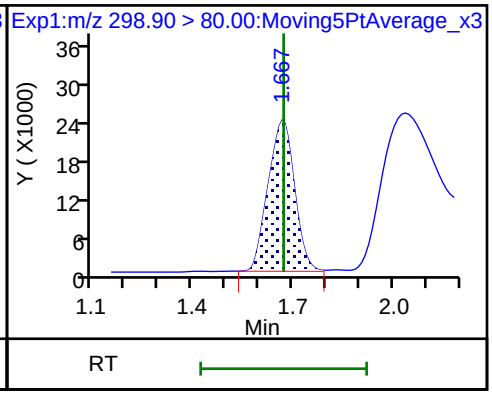
4 Perfluoropentanoic acid



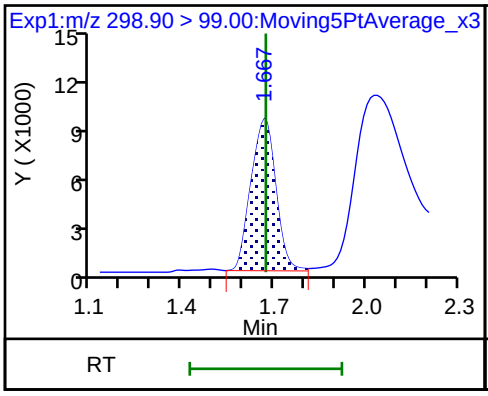
D 47 13C3-PFBS



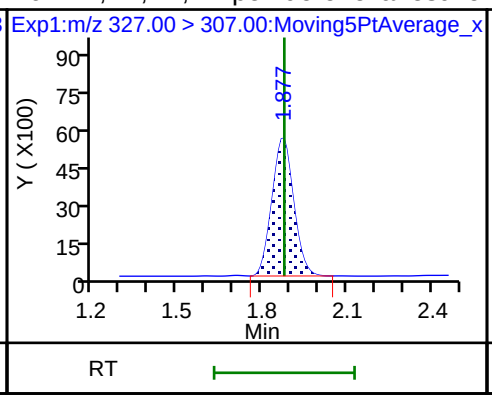
5 Perfluorobutanesulfonic acid



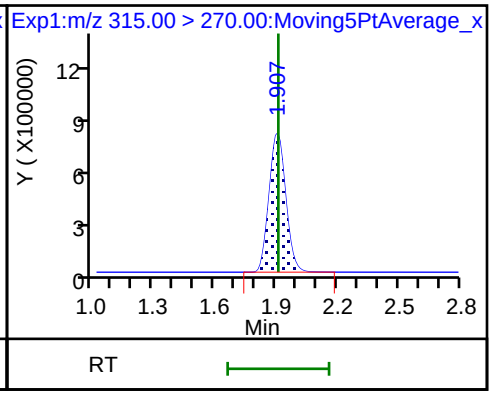
5 Perfluorobutanesulfonic acid



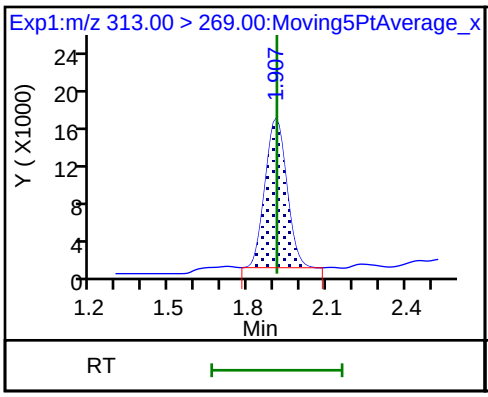
61 1H,1H,2H,2H-perfluorohexanesulfon



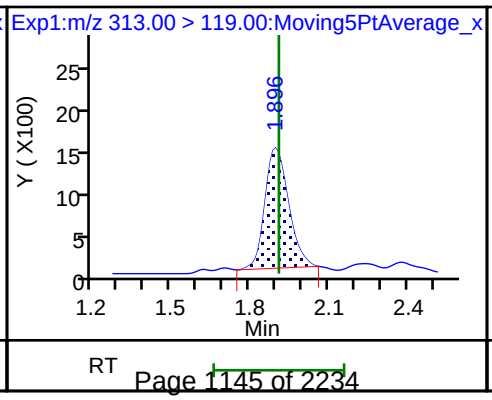
D 7 13C2 PFHxA



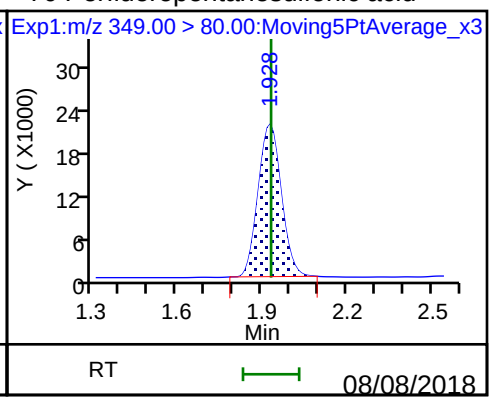
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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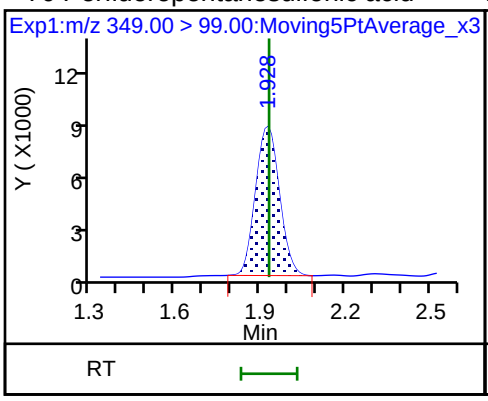
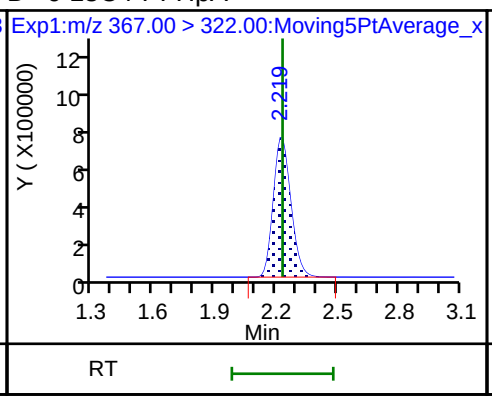
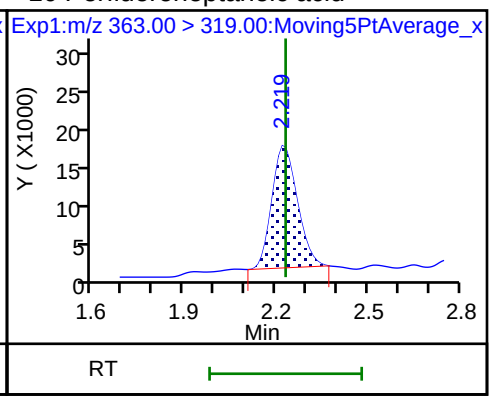


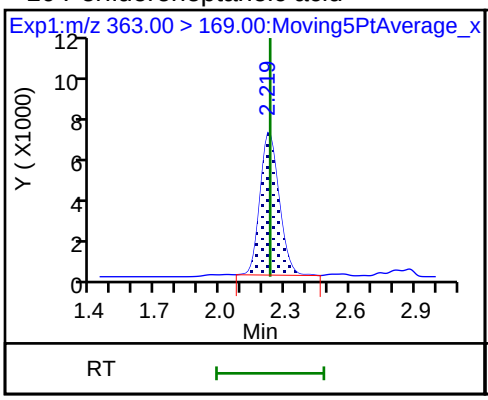
D 9 13C4-PFHpA



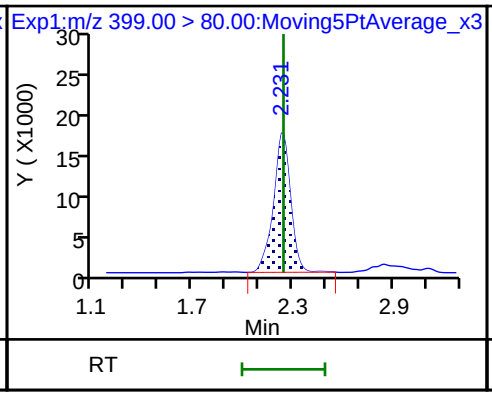
10 Perfluoroheptanoic acid



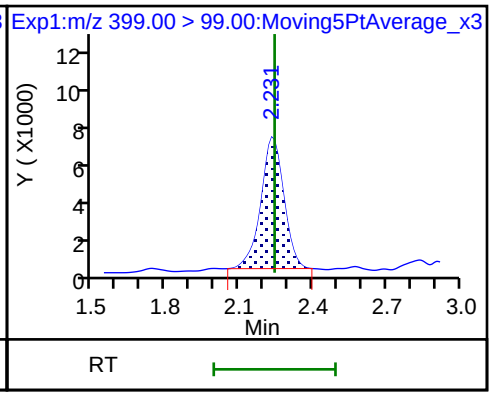
10 Perfluoroheptanoic acid



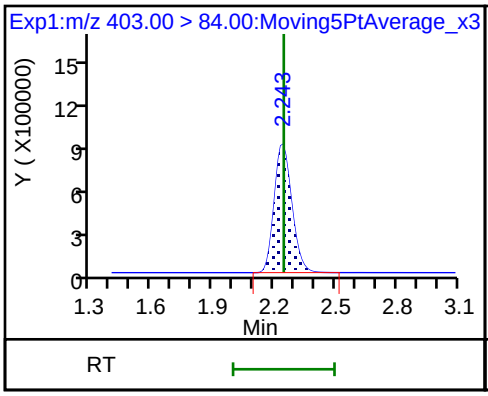
8 Perfluorohexanesulfonic acid



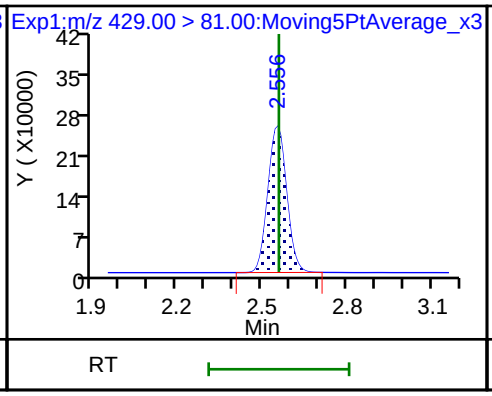
8 Perfluorohexanesulfonic acid



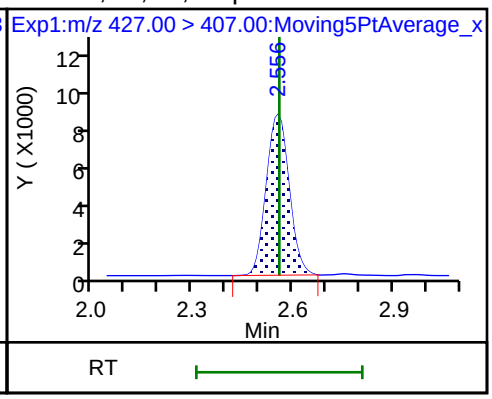
D 11 18O2 PFHxS



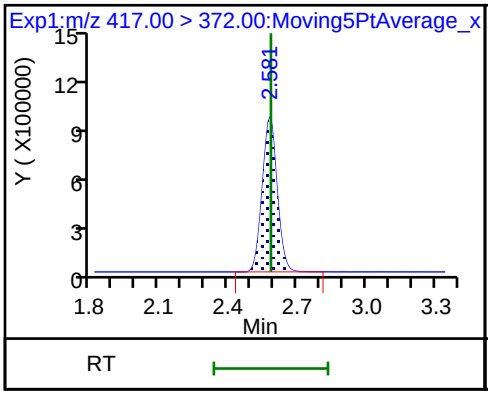
D 12 M2-6:2FTS



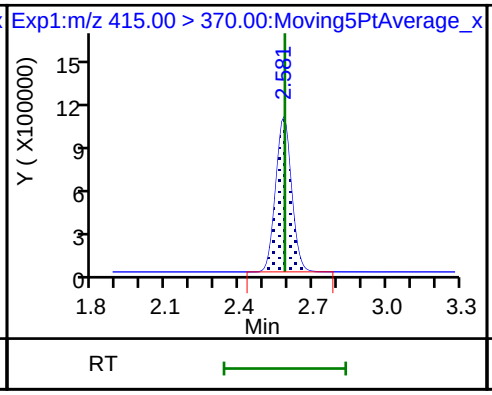
13 1H,1H,2H,2H-perfluorooctanesulfoni



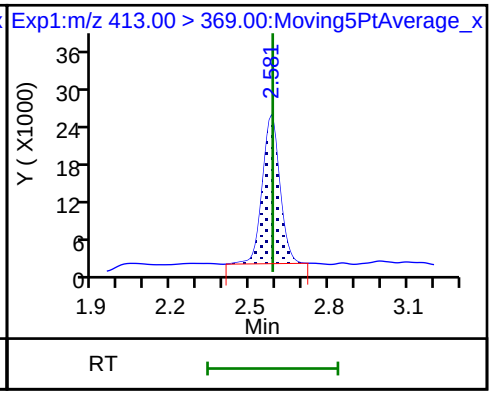
D 14 13C4 PFOA



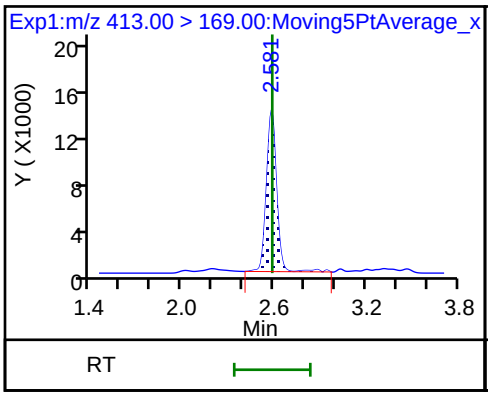
* 62 13C2-PFOA



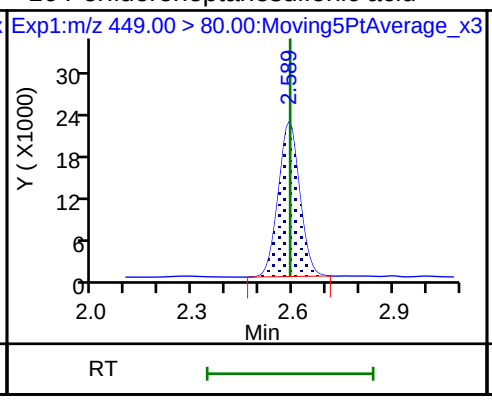
15 Perfluorooctanoic acid



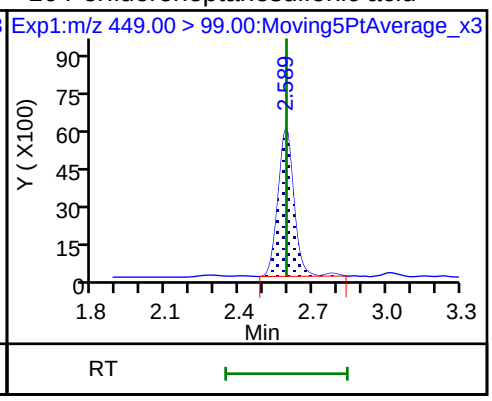
15 Perfluorooctanoic acid



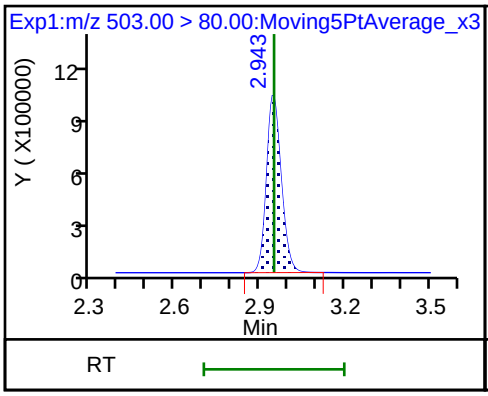
16 Perfluoroheptanesulfonic acid



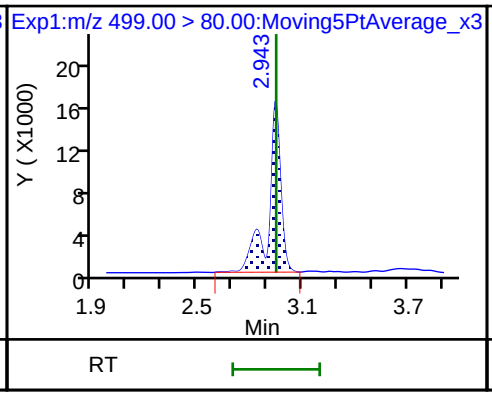
16 Perfluoroheptanesulfonic acid



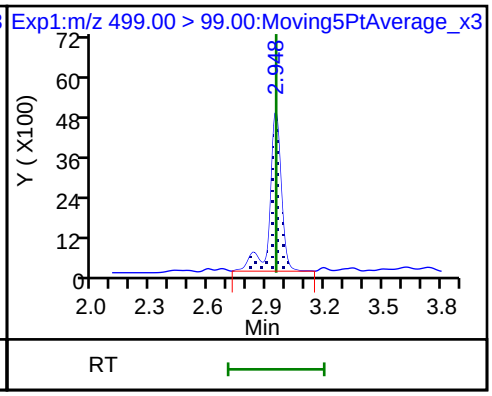
D 18 13C4 PFOS



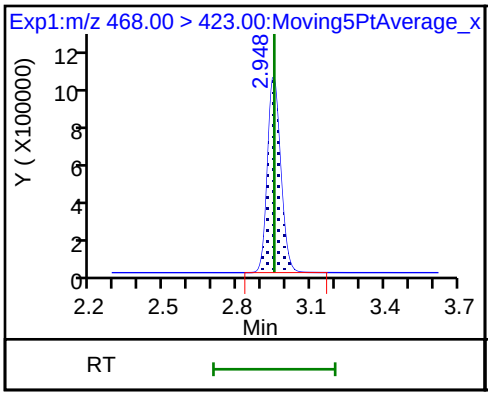
17 Perfluorooctane sulfonic acid



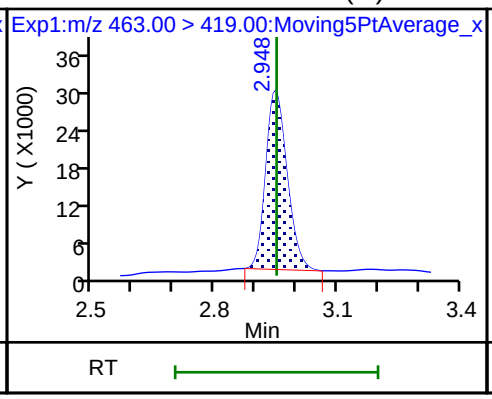
17 Perfluorooctane sulfonic acid



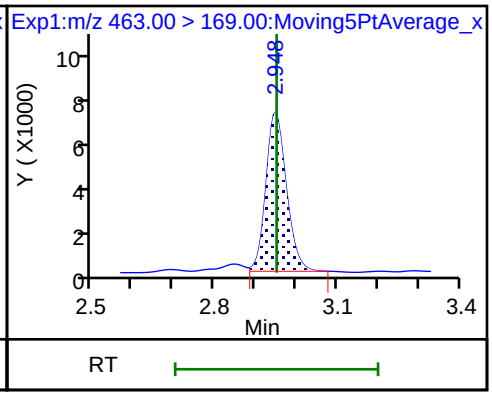
D 19 13C5 PFNA



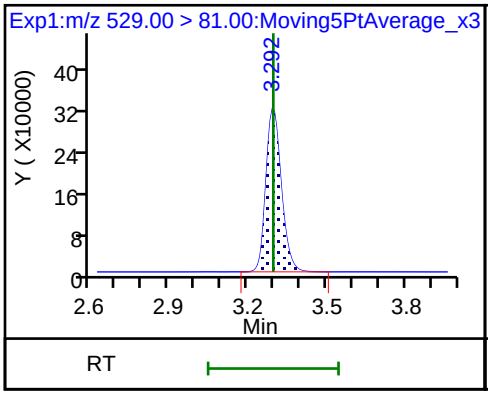
20 Perfluorononanoic acid (M)



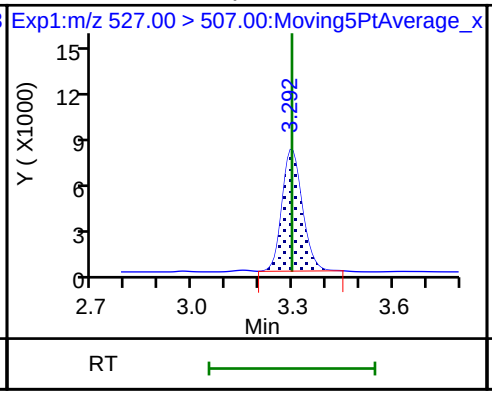
20 Perfluorononanoic acid



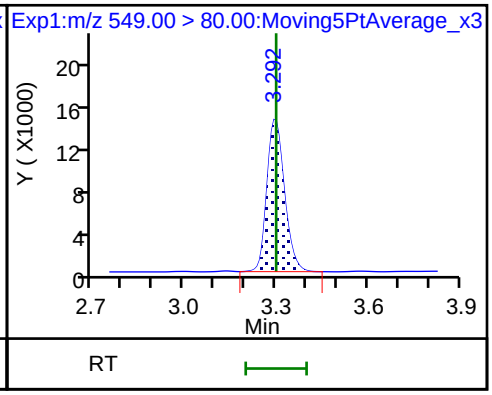
D 26 M2-8:2FTS



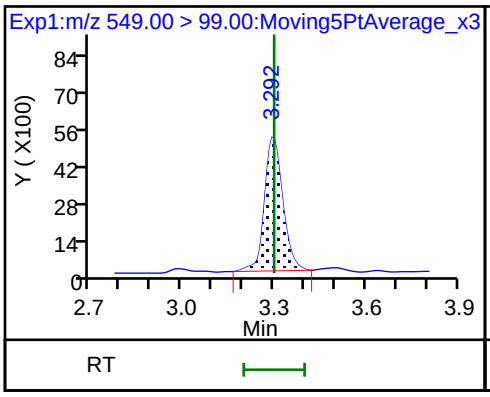
25 1H,1H,2H,2H-perfluorodecanesulfoni



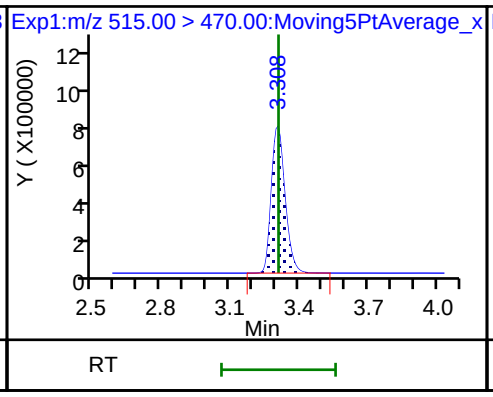
68 Perfluorononanesulfonic acid



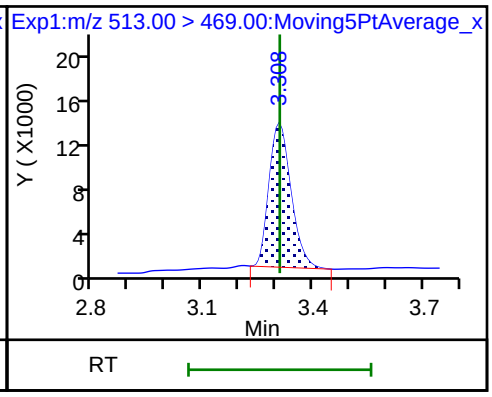
68 Perfluorononanesulfonic acid



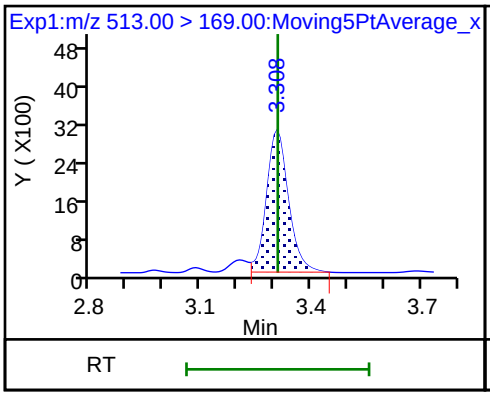
D 23 13C2 PFDA



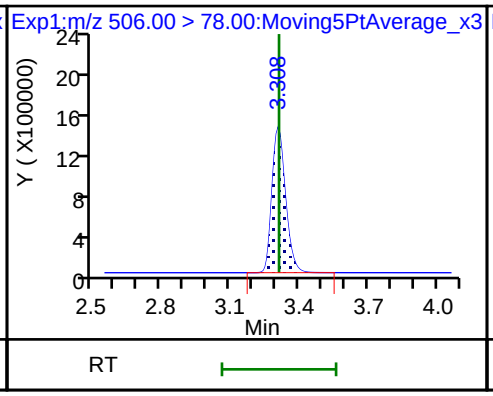
24 Perfluorodecanoic acid



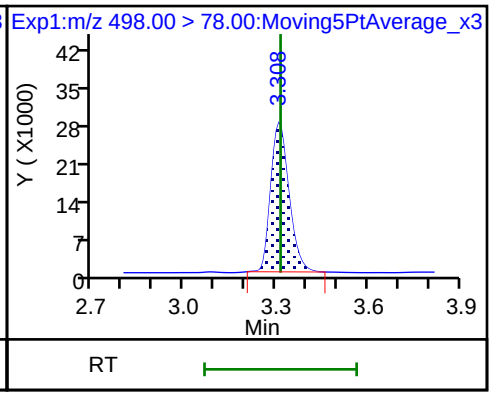
24 Perfluorodecanoic acid



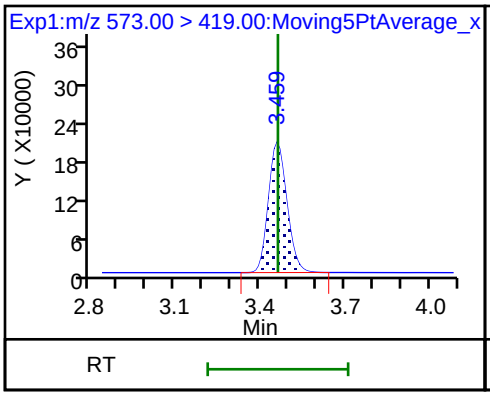
D 21 13C8 FOSA



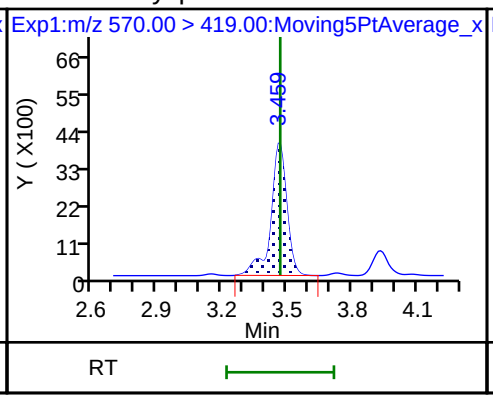
22 Perfluorooctane Sulfonamide



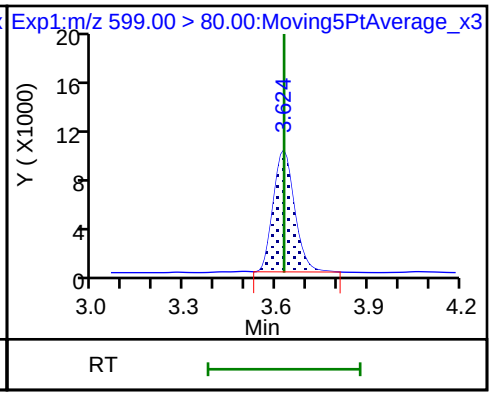
D 27 d3-NMeFOSAA



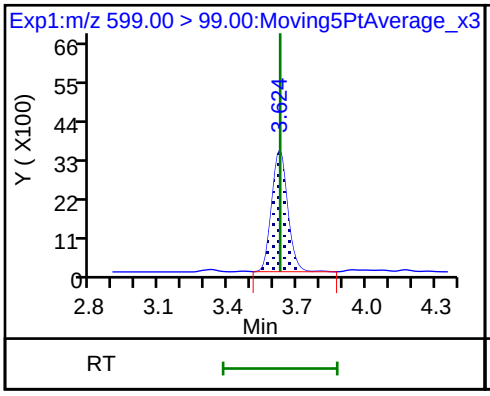
28 N-methyl perfluorooctane sulfonami



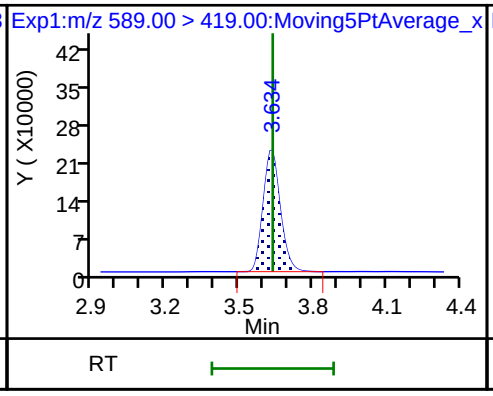
29 Perfluorodecane Sulfonic acid



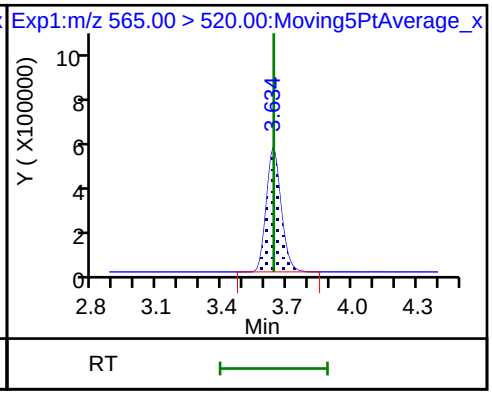
29 Perfluorodecane Sulfonic acid



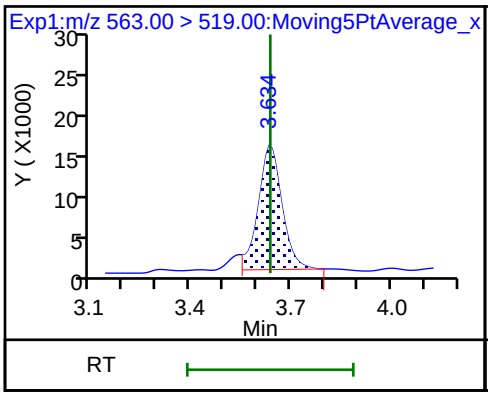
D 32 d5-NEtFOSAA



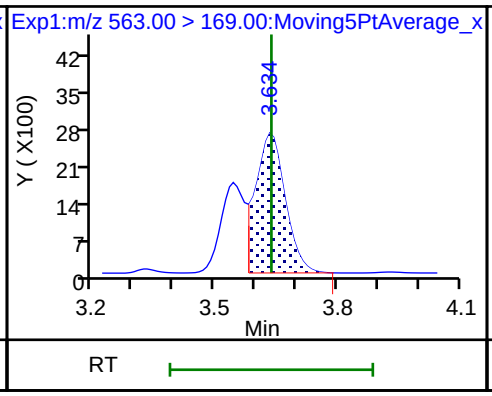
D 30 13C2 PFUnA



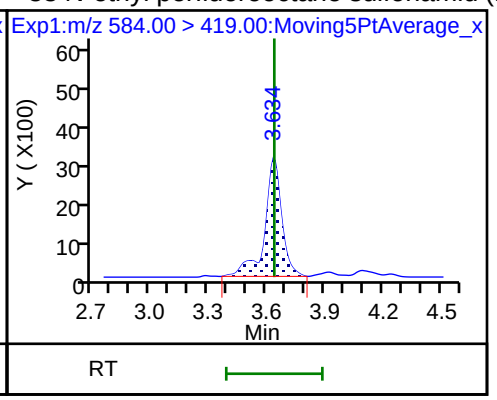
31 Perfluoroundecanoic acid



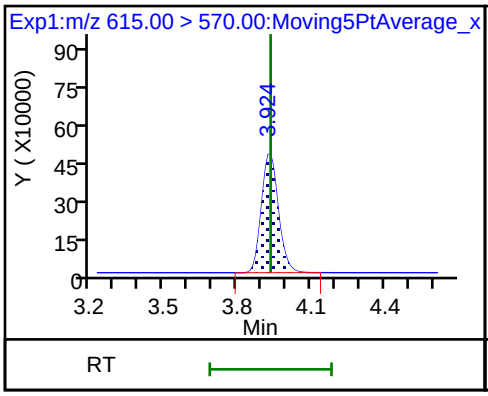
31 Perfluoroundecanoic acid



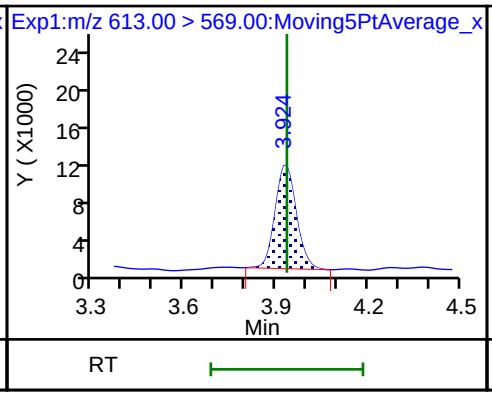
33 N-ethyl perfluorooctane sulfonamid (M)



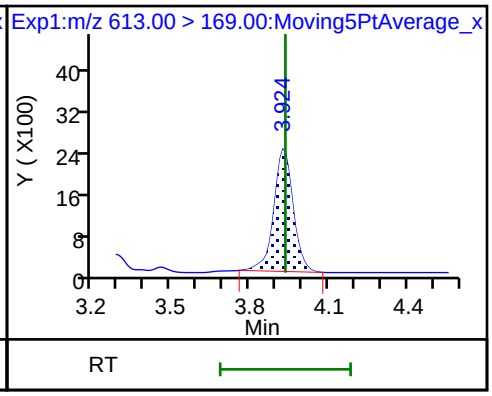
D 36 13C2 PFDoA



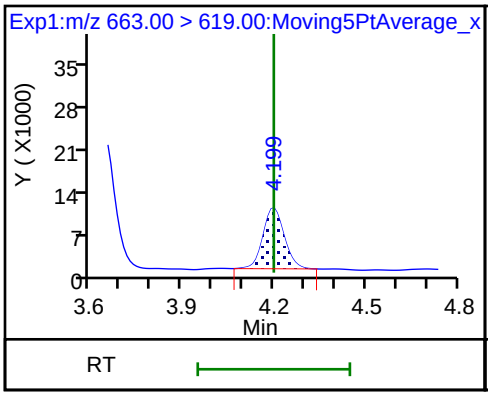
37 Perfluorododecanoic acid



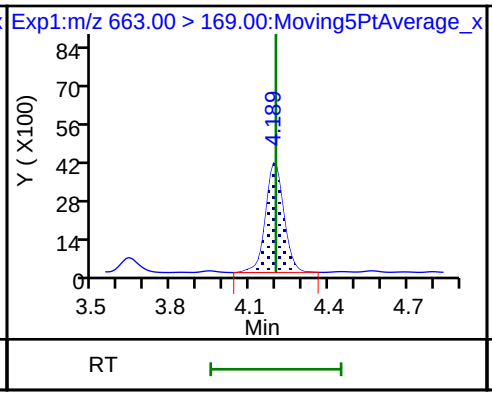
37 Perfluorododecanoic acid



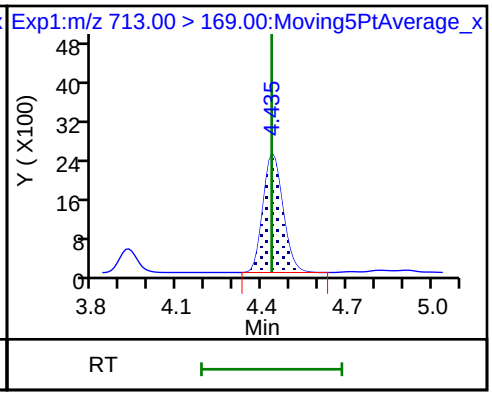
41 Perfluorotridecanoic acid



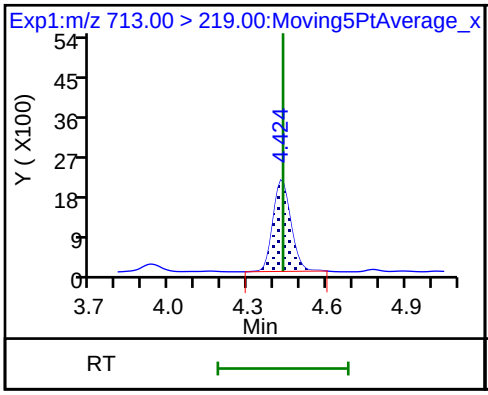
41 Perfluorotridecanoic acid



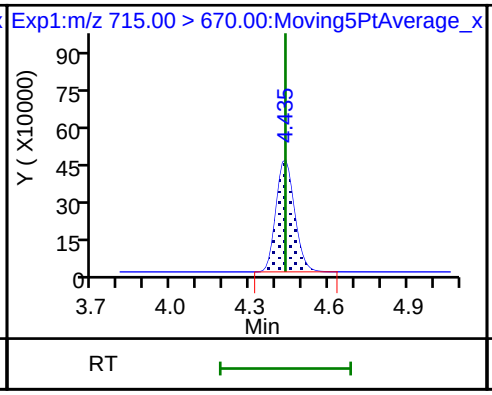
42 Perfluorotetradecanoic acid



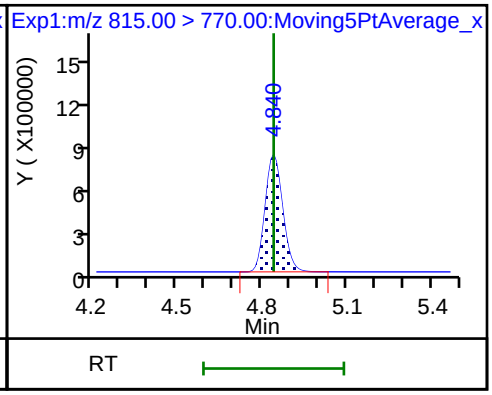
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

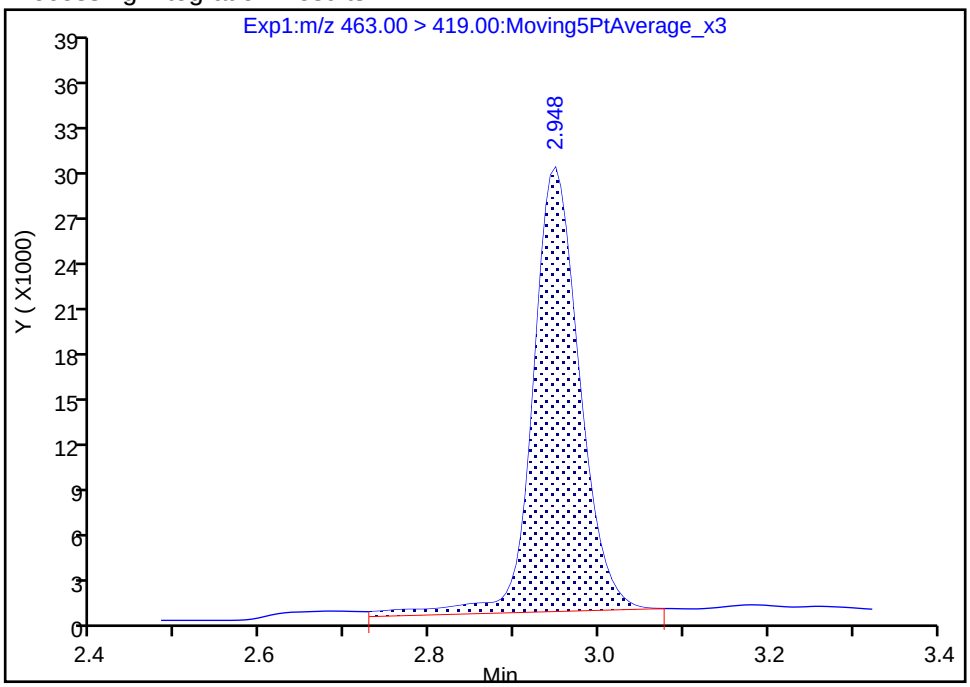
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_003.d				
Injection Date:	23-Jul-2018 16:19:08	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

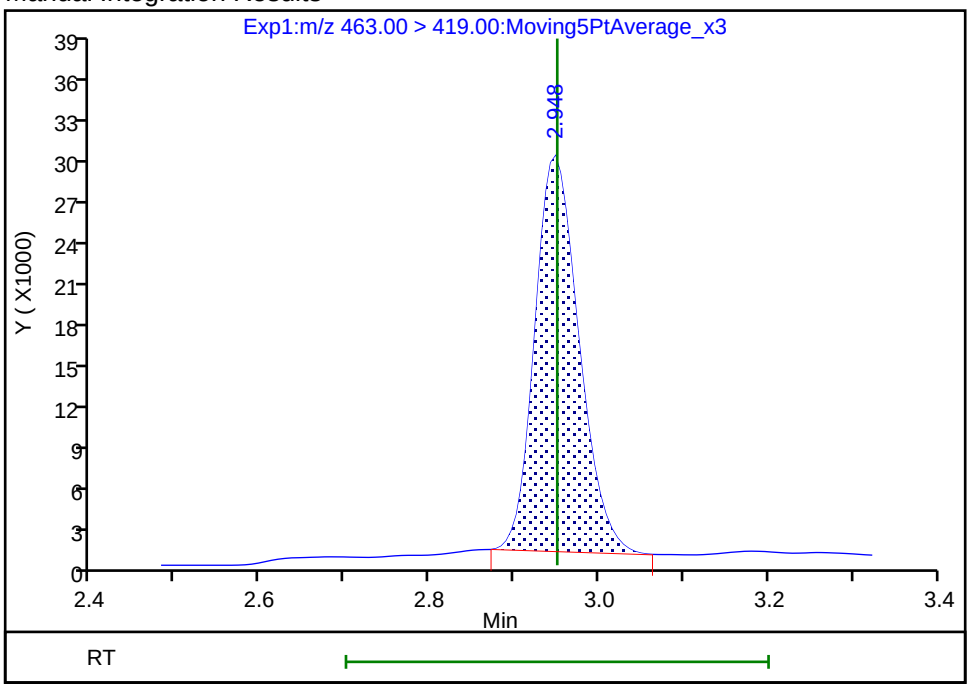
Processing Integration Results

RT: 2.95
Area: 113889
Amount: 0.050116
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 105791
Amount: 0.061074
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:48:28

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

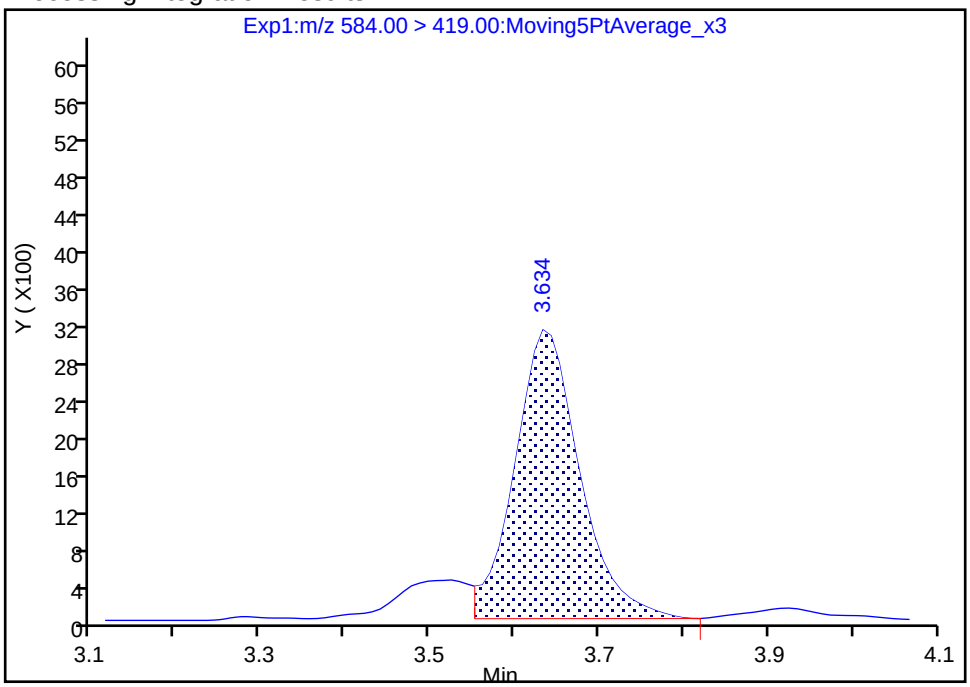
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_003.d				
Injection Date:	23-Jul-2018 16:19:08	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

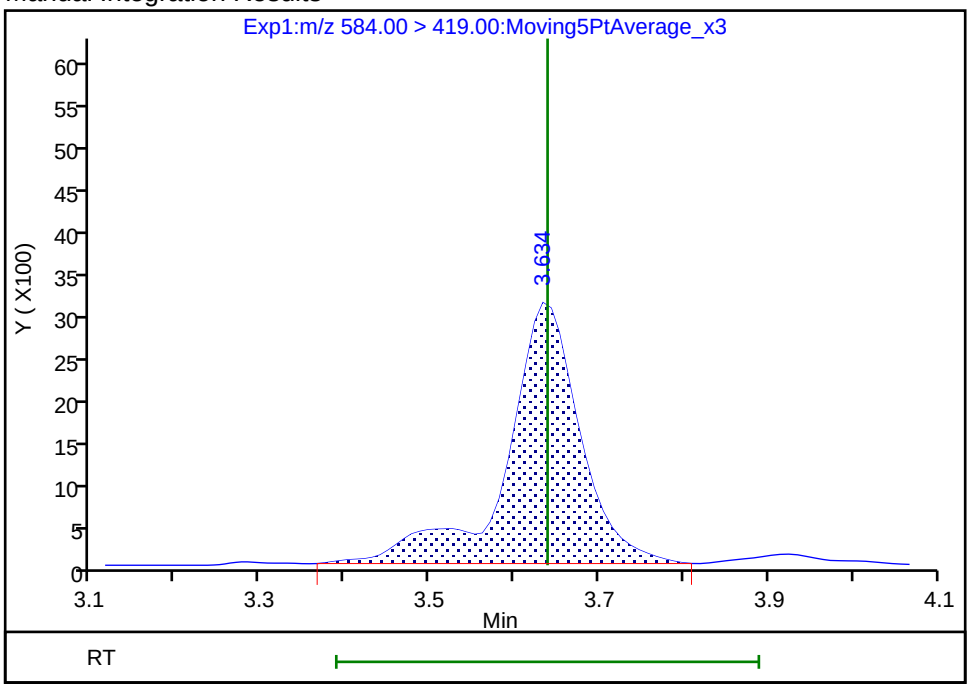
Processing Integration Results

RT: 3.63
Area: 16481
Amount: 0.039745
Amount Units: ng/ml



Manual Integration Results

RT: 3.63
Area: 18908
Amount: 0.045815
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:48:53

Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 23-Jul-2018 16:26:57 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:29 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:50:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.398	-0.002	0.541	5102046	2.39		95.4	63966	
2 Perfluorobutyric acid										
212.90 > 169.00	1.396	1.399	-0.003	1.000	486511	0.2426		97.0	251	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.638	0.002	0.636	3690862	2.47		98.9	62754	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.640	1.639	0.001	1.000	439647	0.2488		99.5	199	M
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.670	-0.005	0.645	84487	2.16		92.8	504	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.674	1.672	0.002	1.005	645045	0.2236		101	193	
298.90 > 99.00	1.674	1.672	0.002	1.005	262033		2.46(1.25-3.74)	101	179	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.877	-0.001	0.727	649507	NC			6462	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.878	-0.002	1.126	155620	0.2505		107	9331	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.909	-0.004	0.738	4267996	2.44		97.5	67497	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.909	-0.004	1.000	452104	0.2499		99.9	996	
313.00 > 119.00	1.905	1.909	-0.004	1.000	41188		10.98(5.03-15.10)	99.9	605	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.931	-0.004	1.157	626336	0.2420		103	9722	
349.00 > 99.00	1.927	1.931	-0.004	1.157	231252		2.71(1.36-4.07)	103	3337	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.002	2.006	-0.004	1.000	77470	NC			346	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.002	2.007	-0.005	0.776	241931	NC			10175	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.230	-0.002	0.864	4442605	2.46		98.5	68752	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.230	-0.002	1.000	471040	0.2404		96.2	675	
363.00 > 169.00	2.229	2.230	-0.002	1.000	188105		2.50(1.13-3.40)	96.2	2111	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.243	-0.003	1.000	543653	0.2118		93.1	1245	
399.00 > 99.00	2.240	2.243	-0.003	1.000	184590		2.95(1.50-4.49)	93.1	696	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.246	-0.006	0.868	5203959	2.25		95.0	57342	
65 ADONA										
377.00 > 251.00	2.267	2.272	-0.005	0.769	1248830	NC			20732	
377.00 > 85.00	2.267	2.272	-0.005	0.769	684874		1.82(0.84-2.53)		3872	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.559	-0.004	0.990	1177369	2.34		98.4	19673	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.559	-0.004	1.000	194902	0.2331		98.3	2037	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.585	-0.005	1.000	4472663	2.53		101	66159	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.585	-0.005		4611859	2.50			46778	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.586	0.002	1.003	492381	0.2268		90.6	466	
413.00 > 169.00	2.580	2.586	-0.006	1.000	256400		1.92(0.84-2.52)	90.6	1936	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.591	-0.003	0.878	500662	0.2404		101	6593	
449.00 > 99.00	2.588	2.591	-0.003	0.878	134113		3.73(1.94-5.82)	101	2466	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.949	-0.001	1.142	3598957	2.23		93.5	29961	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.949	-0.001	1.000	380417	0.2286		98.5	3341	
499.00 > 99.00	2.948	2.949	-0.001	1.000	87351		4.36(2.31-6.93)	98.5	1593	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.950	-0.002	1.142	3826960	2.51		101	65457	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.950	-0.002	1.000	433434	0.2480		99.2	1410	
463.00 > 169.00	2.948	2.950	-0.002	1.000	104763		4.14(1.90-5.69)	99.2	3129	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.161	0.003	1.073	643273	NC			6736	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.296	0.003	1.279	1348095	2.57		107	25461	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.297	0.002	1.000	184284	0.2415		101	6415	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.299	0.0	1.119	264461	0.2351		98.0	6695	
549.00 > 99.00	3.299	3.299	0.0	1.119	99972		2.65(1.33-3.97)	98.0	2109	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.309	-0.002	1.282	3095634	2.56		102	44382	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.309	-0.002	1.000	313494	0.2462		98.5	1204	
513.00 > 169.00	3.307	3.309	-0.002	1.000	56639		5.53(2.36-7.09)	98.5	1274	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.311	0.004	1.285	5990646	2.53		101	76449	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.314	0.001	1.000	593444	0.2490		99.6	9634	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.467	3.462	0.005	1.344	972395	2.43		97.2	26535	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.468	-0.001	1.000	100194	0.2614		105	925	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.625	-0.004	1.228	246002	0.2463		102	7445	
599.00 > 99.00	3.621	3.625	-0.004	1.228	82484		2.98(1.39-4.16)	102	1634	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.635	-0.004	1.407	1028200	2.44		97.8	3915	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.638	0.002	1.411	2455525	2.52		101	43525	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.640	3.638	0.002	1.000	307287	0.2521		101	1407	R
563.00 > 169.00	3.640	3.638	0.002	1.000	48217		6.37(2.12-6.36)	101	420	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.639	0.001	1.003	96639	0.2519		101	2322	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.800	-0.005	1.287	1000160	NC			18909	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.934	-0.003	1.523	2222244	2.40		95.9	19708	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.934	-0.003	1.000	244107	0.2538		102	82.0	
613.00 > 169.00	3.931	3.934	-0.003	1.000	59631		4.09(2.13-6.40)	102	1147	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.198	-0.005	1.067	226682	0.2428		97.1	74.6	
663.00 > 169.00	4.193	4.198	-0.005	1.067	71050		3.19(1.25-3.76)	97.1	1025	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.433	0.004	1.000	51758	0.2335		93.4	745	
713.00 > 219.00	4.427	4.433	-0.006	0.998	41061		1.26(0.71-2.13)	93.4	766	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.435	0.002	1.720	2210453	2.44		97.6	13344	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.840	0.002	1.877	3417814	2.49		99.4	12591	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.840	0.002	1.000	358215	NC			58.6	
813.00 > 169.00	4.842	4.840	0.002	1.000	59039		6.07(2.86-8.58)		656	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.182	5.184	-0.002	1.070	357314	NC			81.0	
913.00 > 169.00	5.182	5.184	-0.002	1.070	43056		8.30(3.83-11.48)		625	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL3_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_004.d

Injection Date: 23-Jul-2018 16:26:57 Instrument ID: A8_N

Lims ID: IC L3 Full

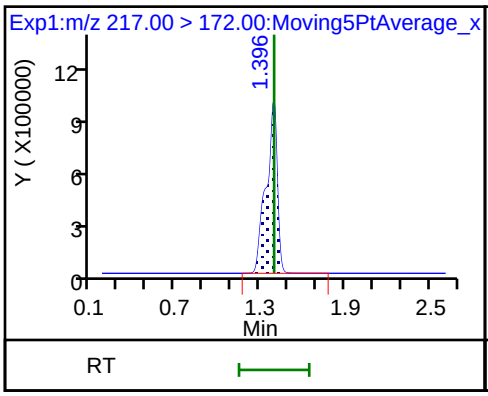
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4

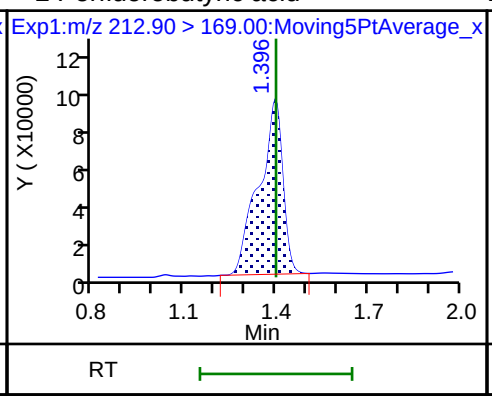
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

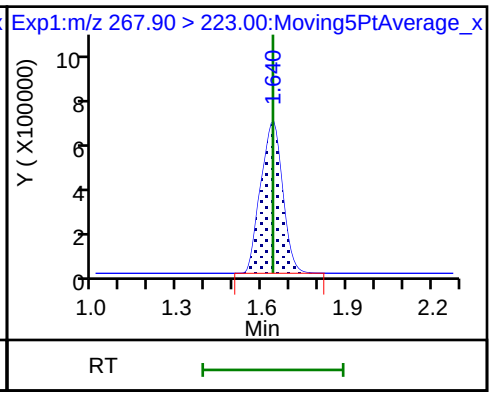
D 1 13C4 PFBA



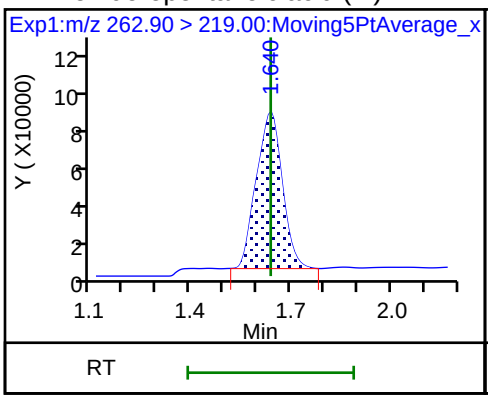
2 Perfluorobutyric acid



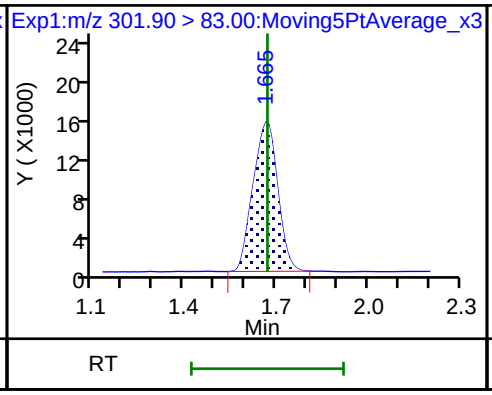
D 3 13C5-PFPeA



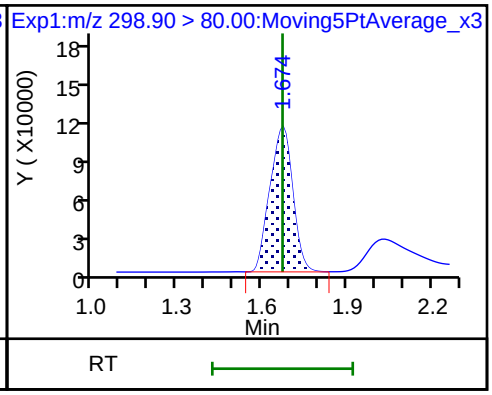
4 Perfluoropentanoic acid (M)



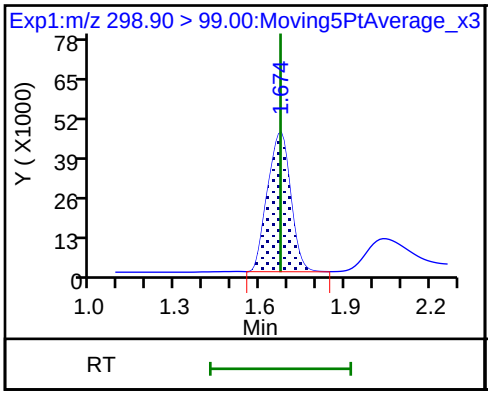
D 47 13C3-PFBS



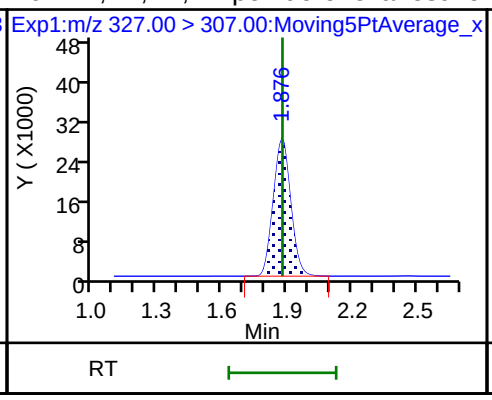
5 Perfluorobutanesulfonic acid



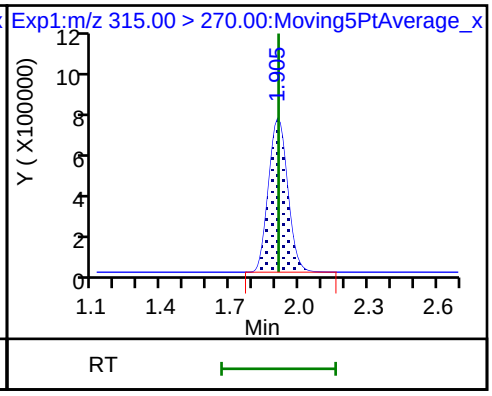
5 Perfluorobutanesulfonic acid



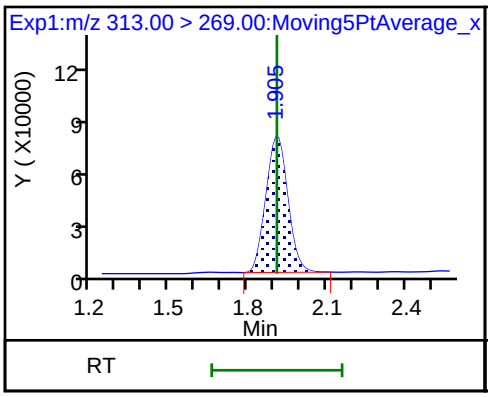
61 1H,1H,2H,2H-perfluorohexanesulfon



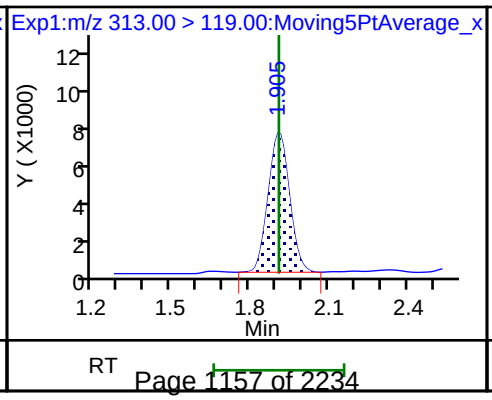
D 7 13C2 PFHxA



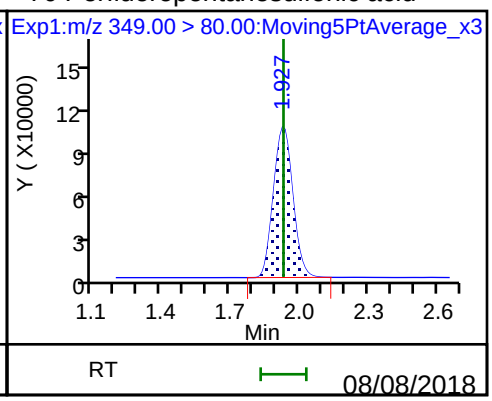
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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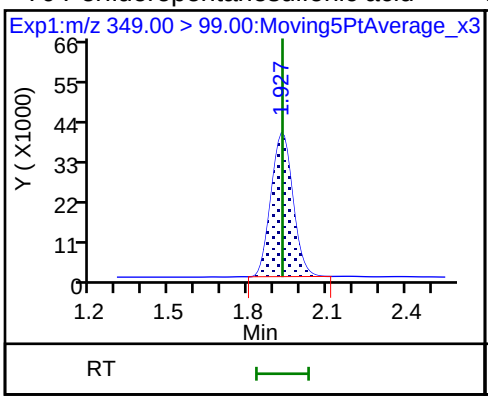
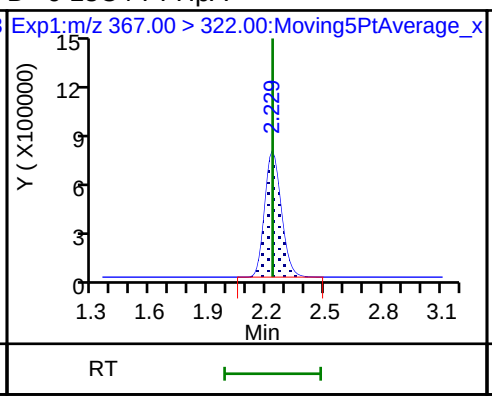
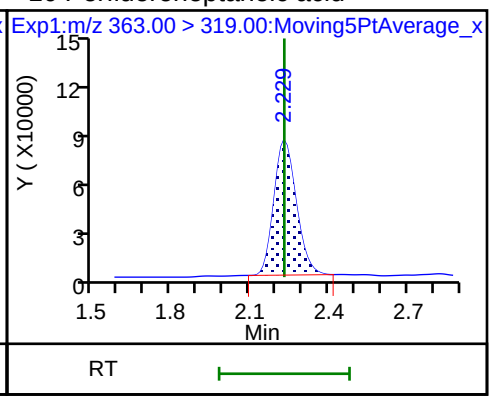


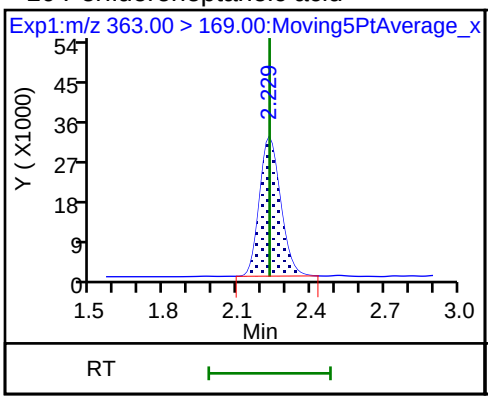
D 9 13C4-PFHpA



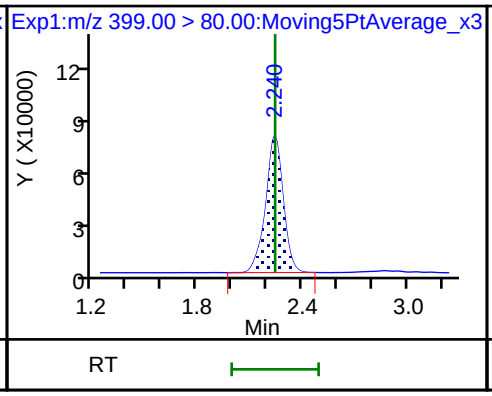
10 Perfluoroheptanoic acid



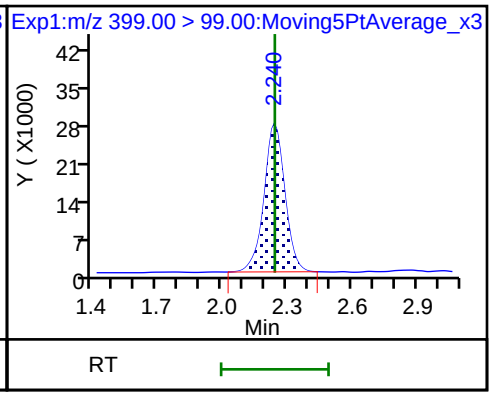
10 Perfluoroheptanoic acid



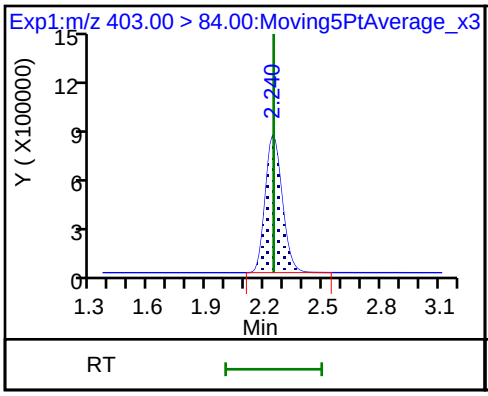
8 Perfluorohexanesulfonic acid



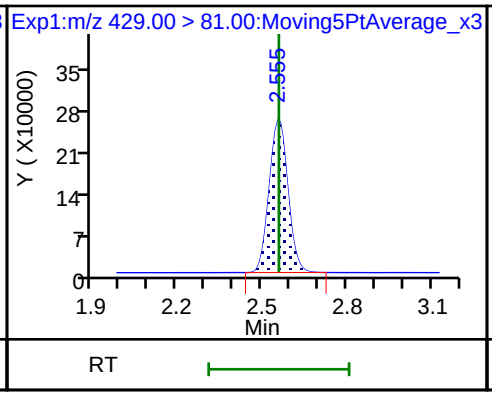
8 Perfluorohexanesulfonic acid



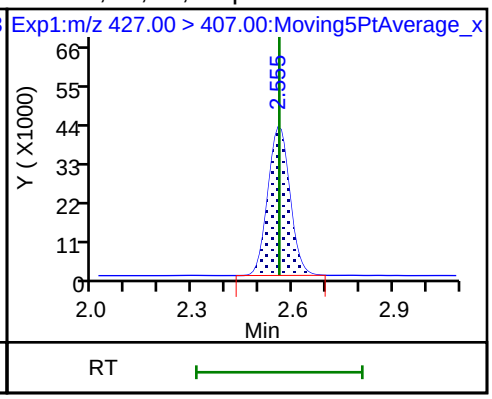
D 11 18O2 PFHxS



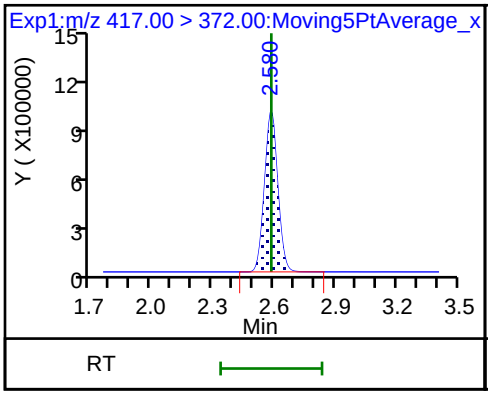
D 12 M2-6:2FTS



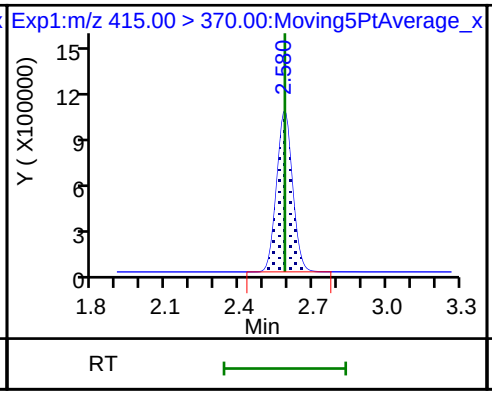
13 1H,1H,2H,2H-perfluorooctanesulfoni



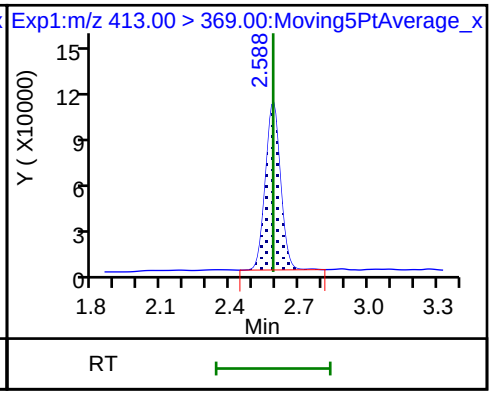
D 14 13C4 PFOA



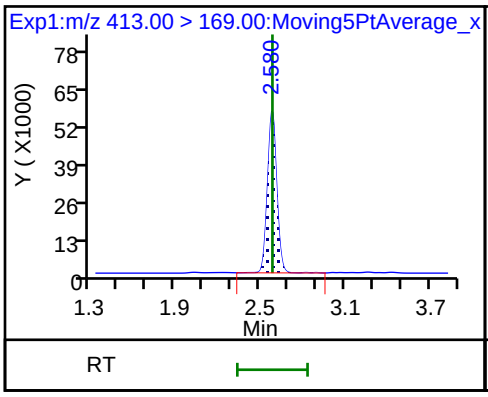
* 62 13C2-PFOA



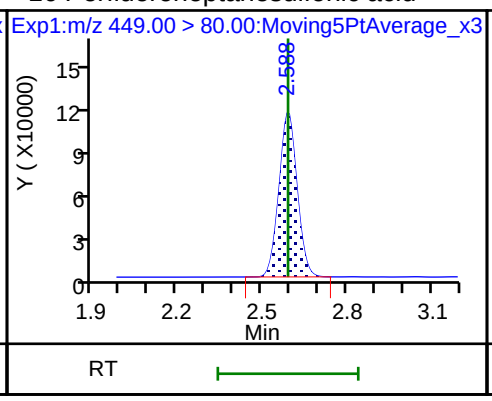
15 Perfluorooctanoic acid



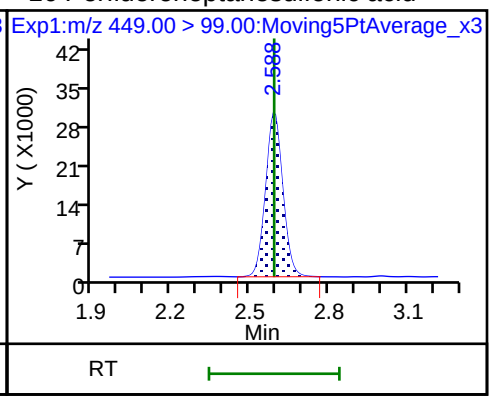
15 Perfluorooctanoic acid



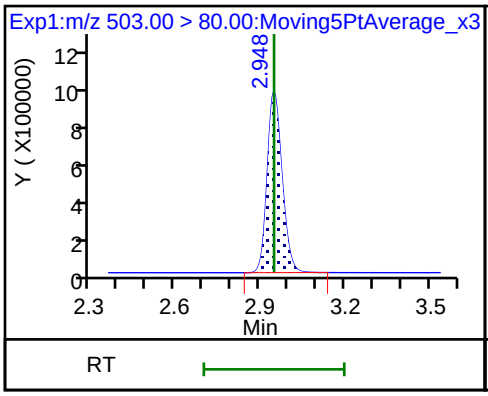
16 Perfluoroheptanesulfonic acid



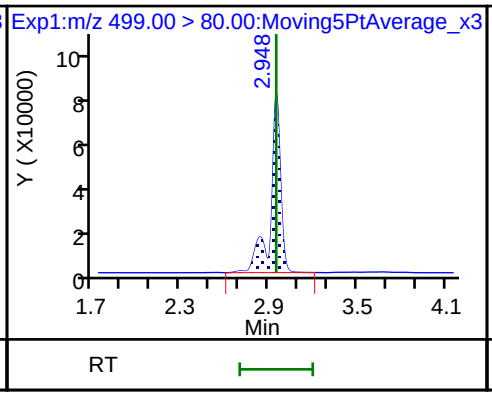
16 Perfluoroheptanesulfonic acid



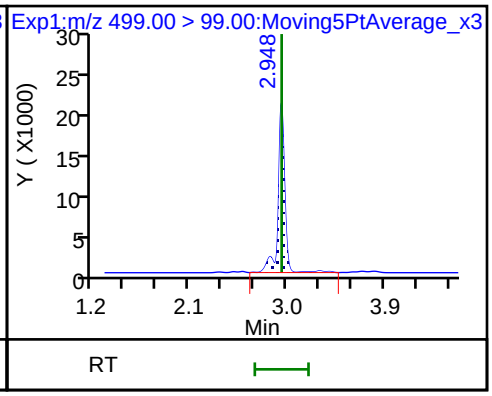
D 18 13C4 PFOS



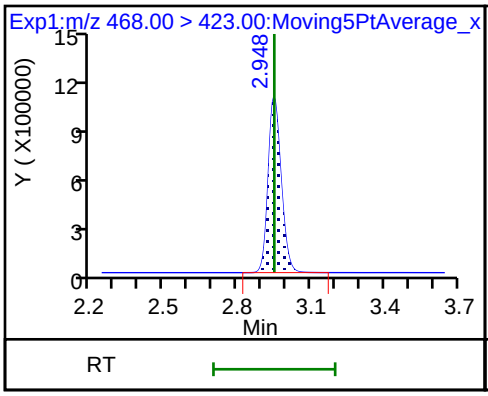
17 Perfluorooctane sulfonic acid



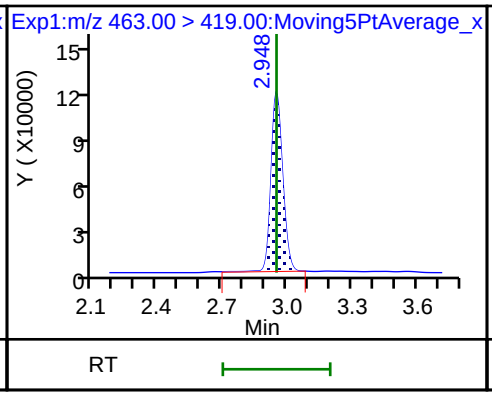
17 Perfluorooctane sulfonic acid



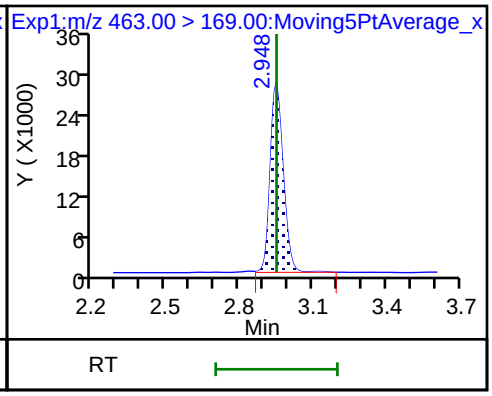
D 19 13C5 PFNA



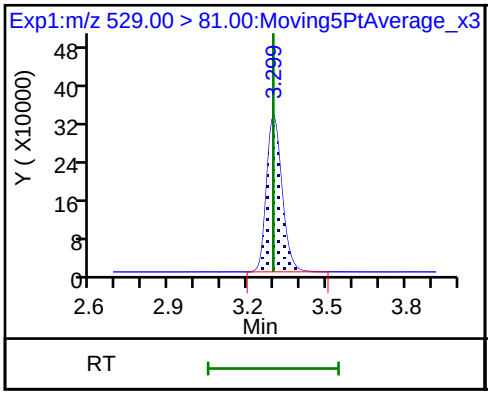
20 Perfluorononanoic acid



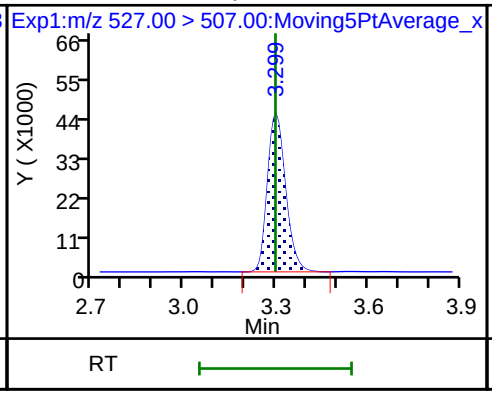
20 Perfluorononanoic acid



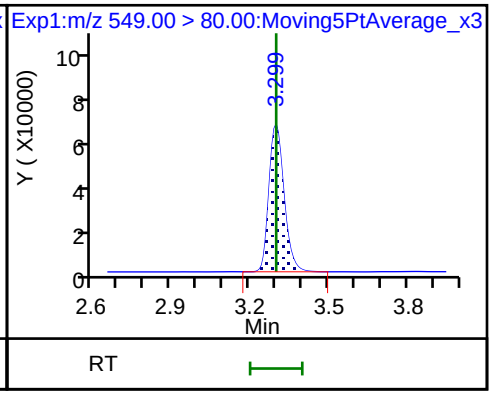
D 26 M2-8:2FTS



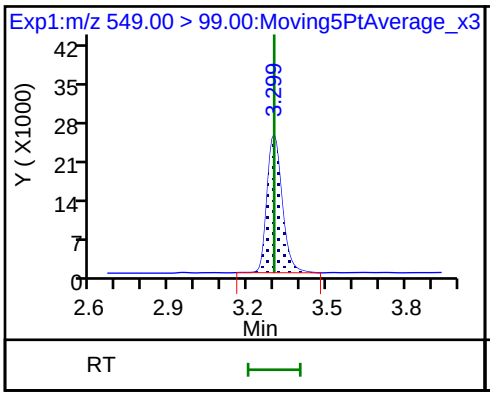
25 1H,1H,2H,2H-perfluorodecanesulfoni



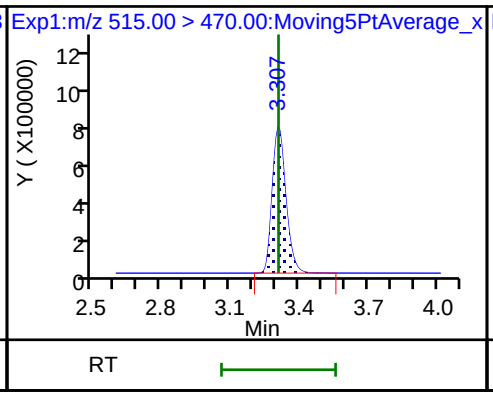
68 Perfluorononanesulfonic acid



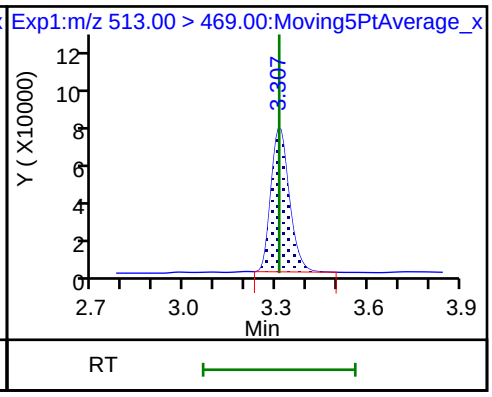
68 Perfluorononanesulfonic acid



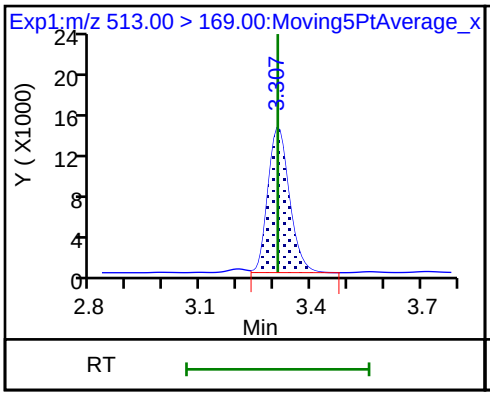
D 23 13C2 PFDA



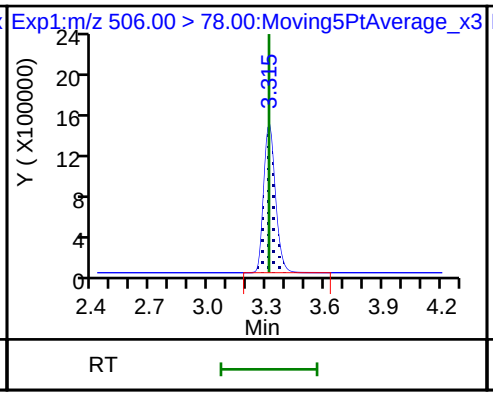
24 Perfluorodecanoic acid



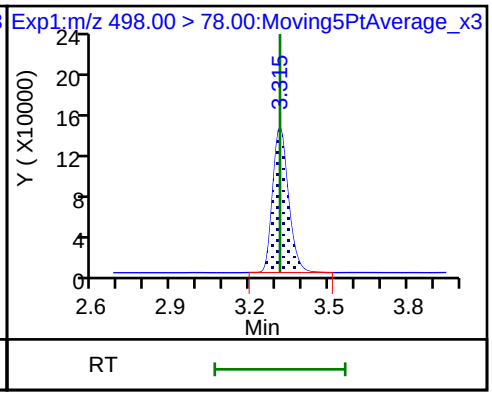
24 Perfluorodecanoic acid



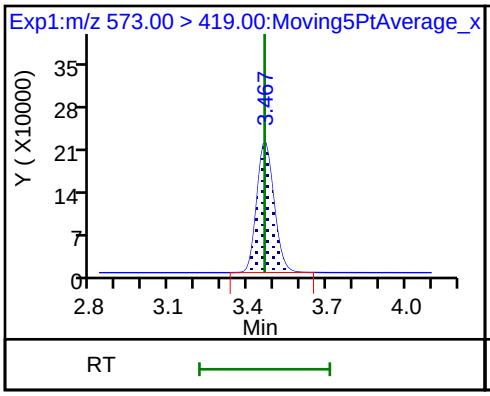
D 21 13C8 FOSA



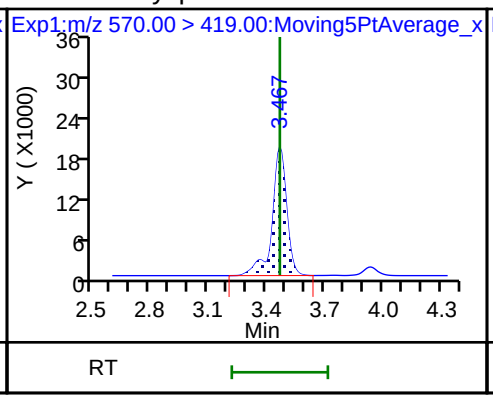
22 Perfluorooctane Sulfonamide



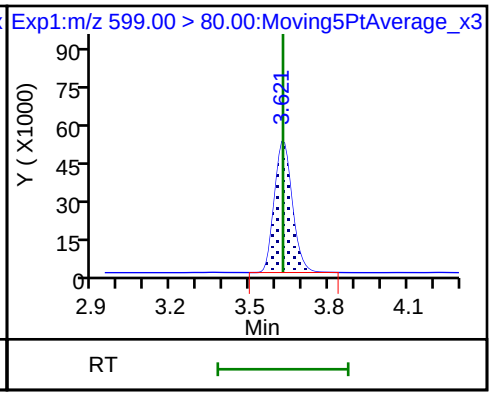
D 27 d3-NMeFOSAA



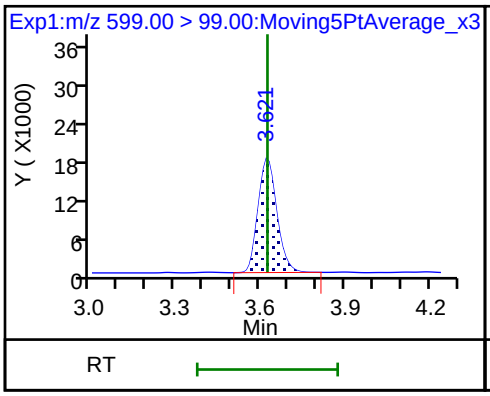
28 N-methyl perfluorooctane sulfonami



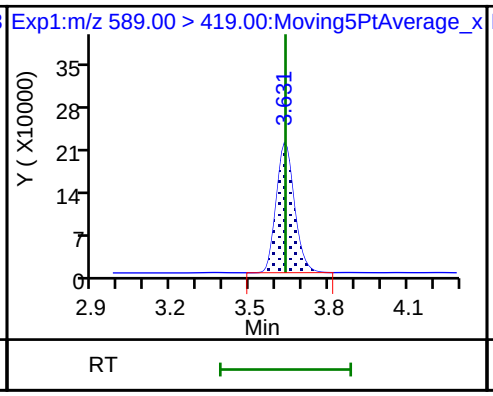
29 Perfluorodecane Sulfonic acid



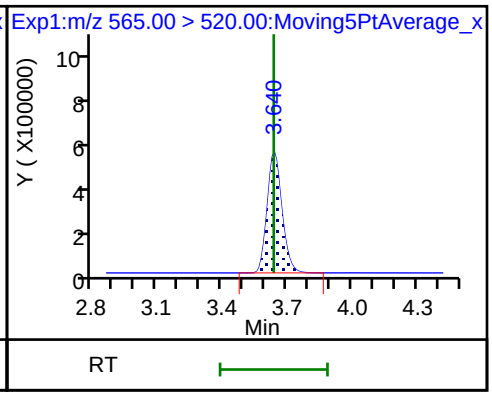
29 Perfluorodecane Sulfonic acid



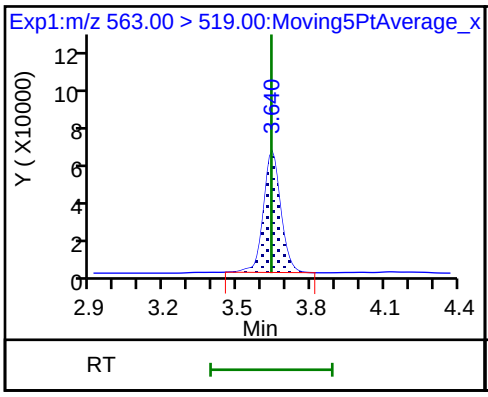
D 32 d5-NEtFOSAA



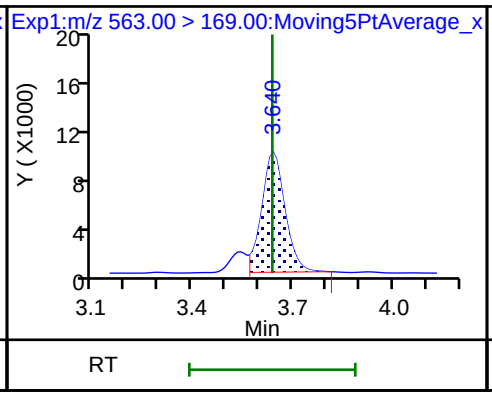
D 30 13C2 PFUnA



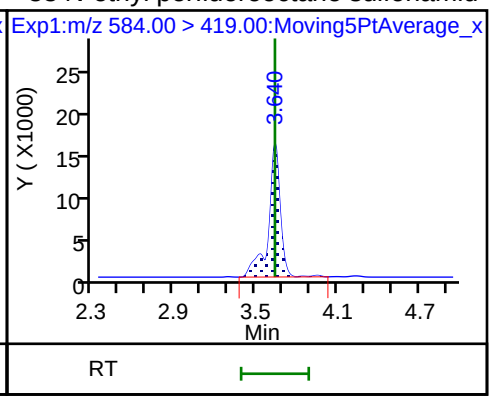
31 Perfluoroundecanoic acid



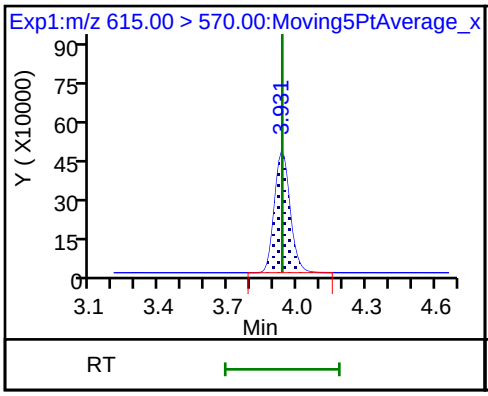
31 Perfluoroundecanoic acid



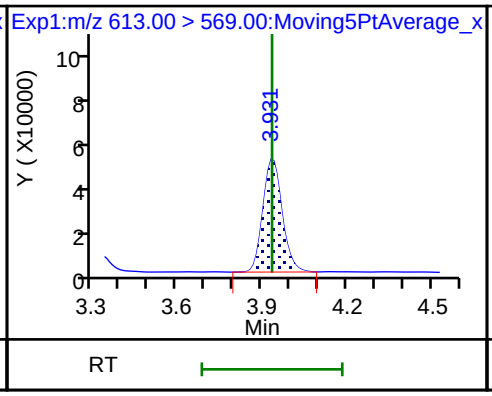
33 N-ethyl perfluorooctane sulfonamid



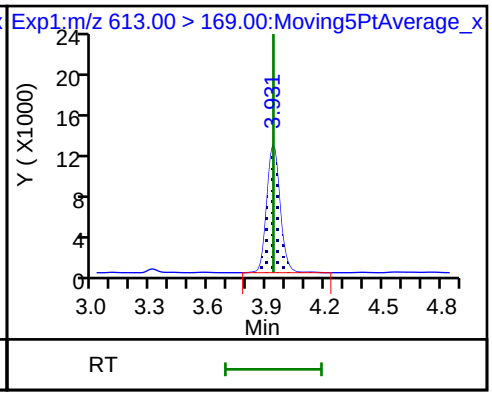
D 36 13C2 PFDoA



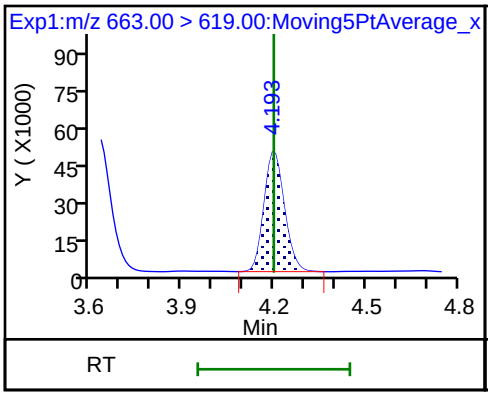
37 Perfluorododecanoic acid



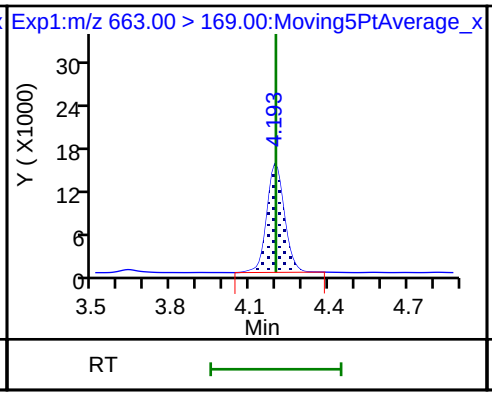
37 Perfluorododecanoic acid



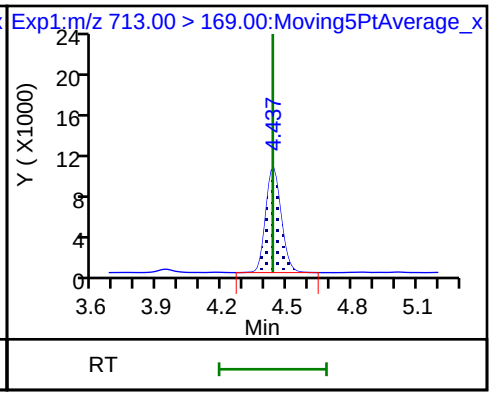
41 Perfluorotridecanoic acid



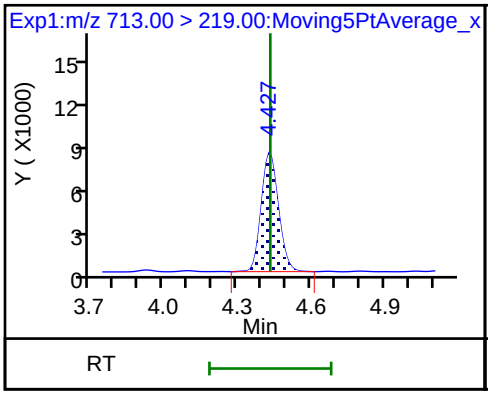
41 Perfluorotridecanoic acid



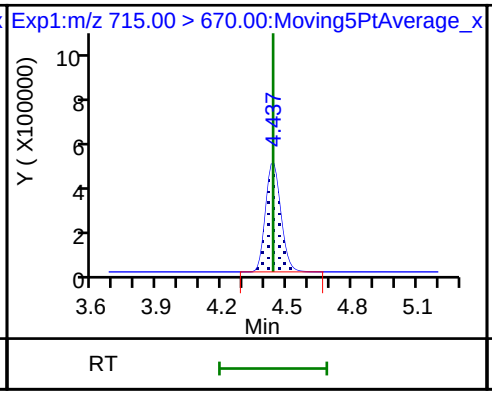
42 Perfluorotetradecanoic acid



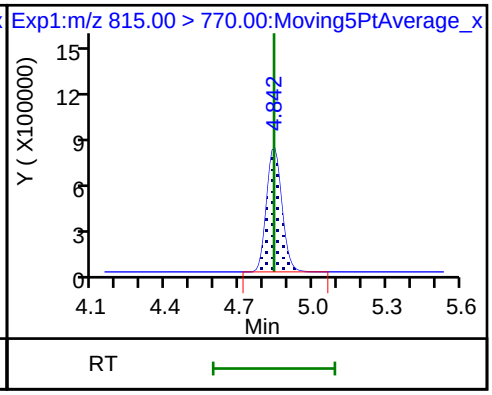
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

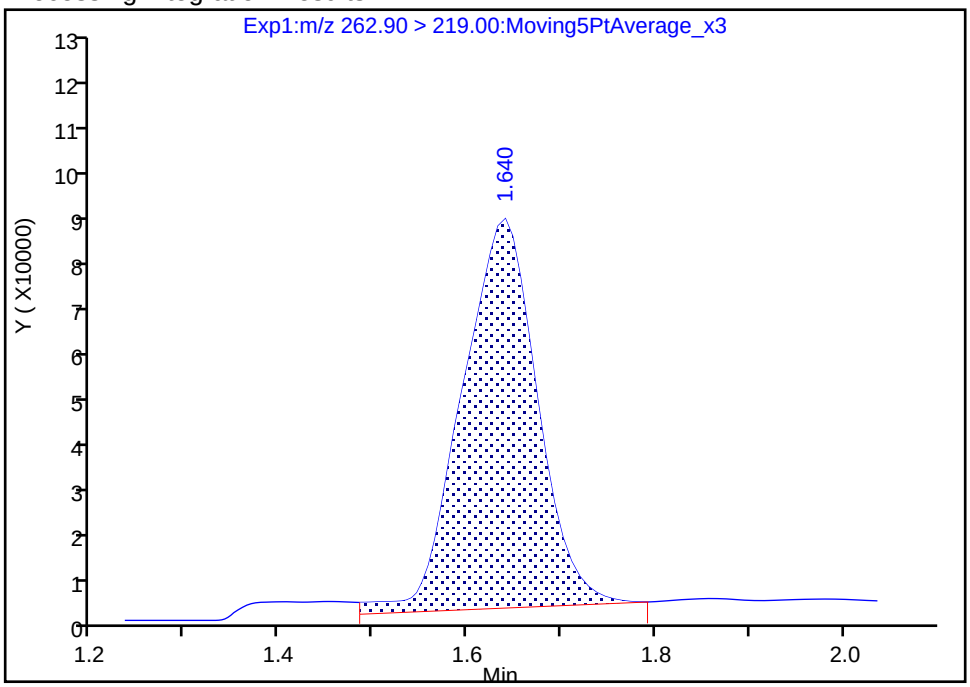
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_004.d				
Injection Date:	23-Jul-2018 16:26:57	Instrument ID:	A8_N		
Lims ID:	IC L3 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

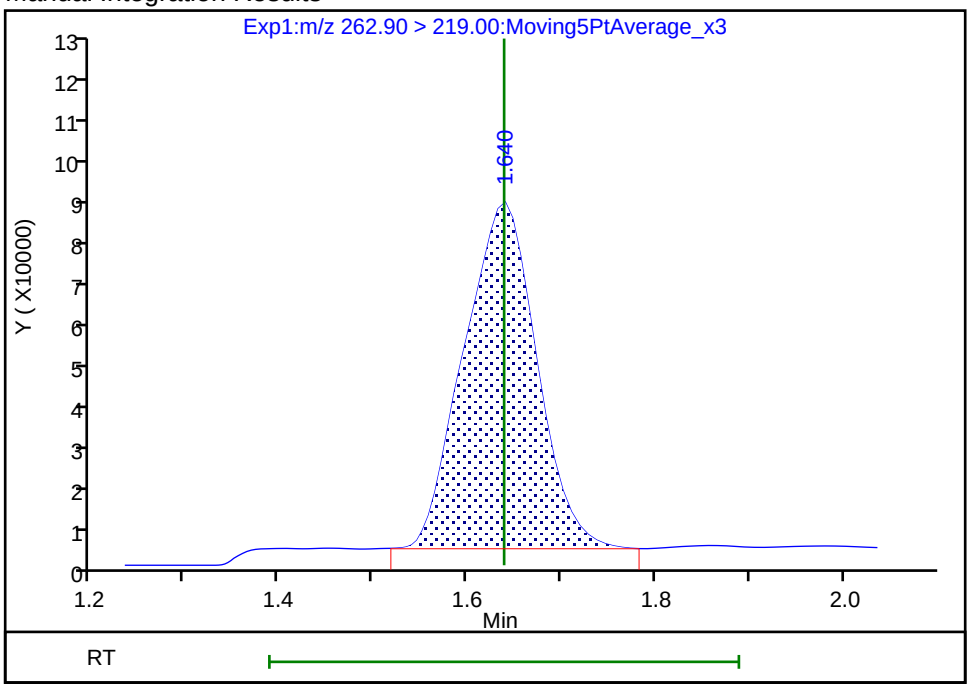
Processing Integration Results

RT: 1.64
Area: 463294
Amount: 0.257426
Amount Units: ng/ml



Manual Integration Results

RT: 1.64
Area: 439647
Amount: 0.248800
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:49:42

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 23-Jul-2018 16:34:44 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:05 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:39:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.540	5085441	2.46		98.2	68029	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	1945262	0.9731		97.3	983	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.638	0.003	0.634	3595441	2.49		99.5	67038	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.639	0.002	1.000	1731603	1.01		101	814	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.670	0.006	0.647	87401	2.30		99.1	637	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.672	0.004	1.000	2656453	0.8901		101	792	
298.90 > 99.00	1.676	1.672	0.004	1.000	1073612		2.47(1.25-3.74)	101	712	
D 60 M2-4:2FTS										
329.00 > 81.00	1.877	1.877	0.0	0.725	665117	NC			8579	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.878	-0.001	1.120	625017	0.9726		104	28310	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.736	4274151	2.52		101	106286	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	1791310	0.9885		98.9	4006	
313.00 > 119.00	1.907	1.909	-0.002	1.000	159080		11.26(5.03-15.10)	98.9	2771	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.929	1.931	-0.002	1.151	2555539	0.9543		102	33712	
349.00 > 99.00	1.929	1.931	-0.002	1.151	940495		2.72(1.36-4.07)	102	11586	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.005	2.006	-0.001	1.000	312243	NC			1472	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.774	232310	NC			8128	
D 9 13C4-PFHpA										
367.00 > 322.00	2.231	2.230	0.001	0.861	4501447	2.58		103	68803	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.231	2.230	0.001	1.000	1987683	1.00		100	2735	
363.00 > 169.00	2.231	2.230	0.001	1.000	744280		2.67(1.13-3.40)	100	6602	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.244	2.243	0.001	1.000	2203602	0.8628		94.8	4177	
399.00 > 99.00	2.244	2.243	0.001	1.000	730552		3.02(1.50-4.49)	94.8	2338	
D 11 18O2 PFHxS										
403.00 > 84.00	2.244	2.246	-0.002	0.866	5177221	2.31		97.5	56870	
65 ADONA										
377.00 > 251.00	2.270	2.272	-0.002	0.770	5267276	NC			51090	
377.00 > 85.00	2.270	2.272	-0.002	0.770	2972862		1.77(0.84-2.53)		14828	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.559	-0.002	0.987	1248833	2.56		108	19450	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.559	-0.002	1.000	768241	0.8661		91.4	6619	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.585	0.005	1.000	4231778	2.48		99.0	47085	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.585	0.005		4466345	2.50			45525	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.590	2.586	0.004	1.000	2041845	0.99		99.3	1598	
413.00 > 169.00	2.590	2.586	0.004	1.000	1027970		1.99(0.84-2.52)	99.3	5148	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.590	2.591	-0.001	0.878	2083941	0.9429		99.0	18462	
449.00 > 99.00	2.590	2.591	-0.001	0.878	547158		3.81(1.94-5.82)	99.0	8852	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.949	0.0	1.139	3818414	2.45		102	35440	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.949	2.949	0.0	1.000	1548724	0.8773		94.5	10880	
499.00 > 99.00	2.949	2.949	0.0	1.000	359665		4.31(2.31-6.93)	94.5	6596	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.950	-0.001	1.139	3768250	2.56		102	79540	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.950	-0.001	1.000	1616264	0.9392		93.9	4351	
463.00 > 169.00	2.949	2.950	-0.001	1.000	381603		4.24(1.90-5.69)	93.9	8572	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.165	3.161	0.004	1.073	2603350	NC			21207	
D 26 M2-8:2FTS										
529.00 > 81.00	3.300	3.296	0.004	1.274	1264179	2.48		104	17938	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.300	3.297	0.003	1.000	712803	1.00		104	21774	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.300	3.299	0.001	1.119	1134203	0.9505		99.0	28672	
549.00 > 99.00	3.300	3.299	0.001	1.119	436139		2.60(1.33-3.97)	99.0	6446	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.277	3062260	2.61		104	49773	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	1267791	1.01		101	5283	
513.00 > 169.00	3.308	3.309	-0.001	1.000	221574		5.72(2.36-7.09)	101	7706	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.277	5853618	2.55		102	70810	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.316	3.314	0.002	1.002	2328173	1.00		100.0	35092	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.462	-0.002	1.336	963774	2.49		99.5	30385	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.469	3.468	0.001	1.003	362883	0.9551		95.5	3626	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.625	3.625	0.0	1.229	975593	0.9208		95.5	20714	
599.00 > 99.00	3.625	3.625	0.0	1.229	344747		2.83(1.39-4.16)	95.5	6661	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.634	3.635	-0.001	1.403	1057814	2.60		104	4282	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.403	2420418	2.56		102	36289	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	1123256	0.9350		93.5	5099	
563.00 > 169.00	3.634	3.638	-0.004	1.000	203840		5.51(2.12-6.36)	93.5	6982	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.639	-0.005	1.000	356256	0.9025		90.2	8786	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.800	3.800	0.0	1.288	4070275	NC			53357	
D 36 13C2 PFDoA										
615.00 > 570.00	3.936	3.934	0.002	1.519	2243127	2.50		99.9	18184	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.936	3.934	0.002	1.000	907939	0.9353		93.5	254	
613.00 > 169.00	3.936	3.934	0.002	1.000	229611		3.95(2.13-6.40)	93.5	6005	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.200	4.198	0.002	1.067	904085	0.9593		95.9	294	
663.00 > 169.00	4.200	4.198	0.002	1.067	289645		3.12(1.25-3.76)	95.9	3462	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.436	4.433	0.003	1.000	215092	1.01		101	2755	
713.00 > 219.00	4.425	4.433	-0.008	0.998	152064		1.41(0.71-2.13)	101	3925	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.435	0.001	1.712	2124401	2.42		96.9	12187	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.841	4.840	0.001	1.869	3329175	2.50		100	11167	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.841	4.840	0.001	1.000	1217231	NC			189	
813.00 > 169.00	4.841	4.840	0.001	1.000	204580		5.95(2.86-8.58)		2497	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.184	-0.003	1.070	1302558	NC			282	
913.00 > 169.00	5.181	5.184	-0.003	1.070	156715		8.31(3.83-11.48)		2177	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_005.d

Injection Date: 23-Jul-2018 16:34:44 Instrument ID: A8_N

Lims ID: IC L4 Full

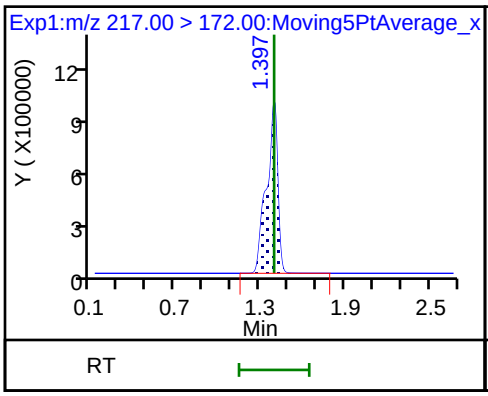
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 5

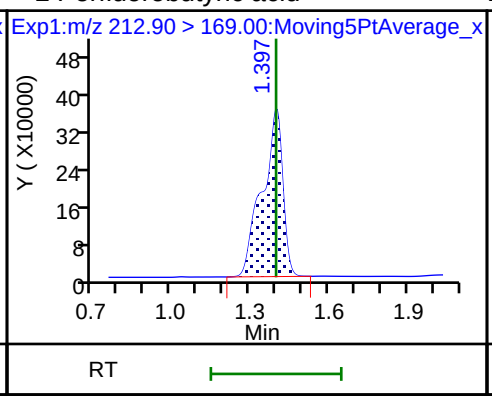
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

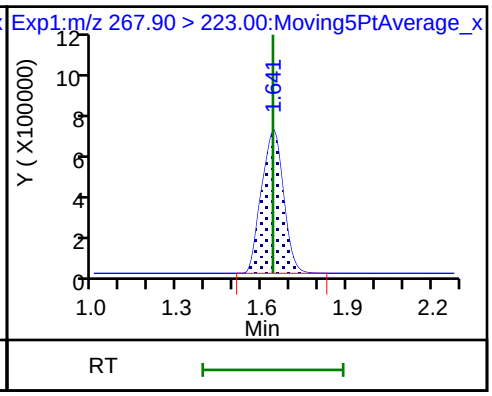
D 1 13C4 PFBA



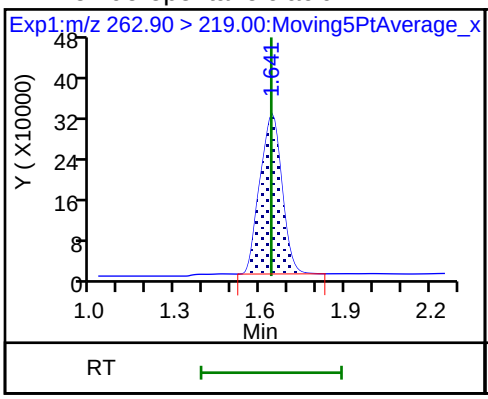
2 Perfluorobutyric acid



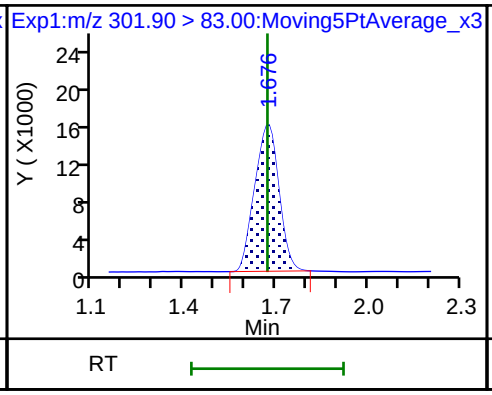
D 3 13C5-PFPeA



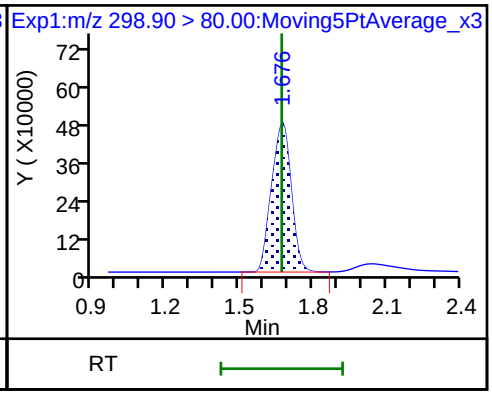
4 Perfluoropentanoic acid



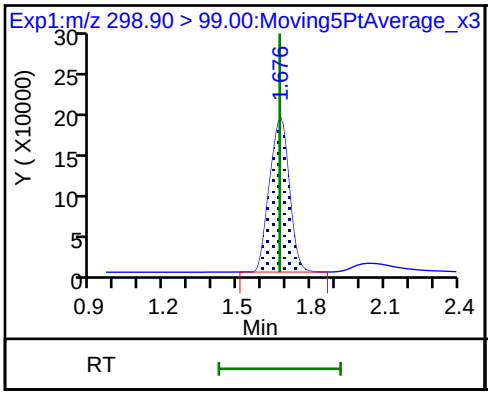
D 47 13C3-PFBS



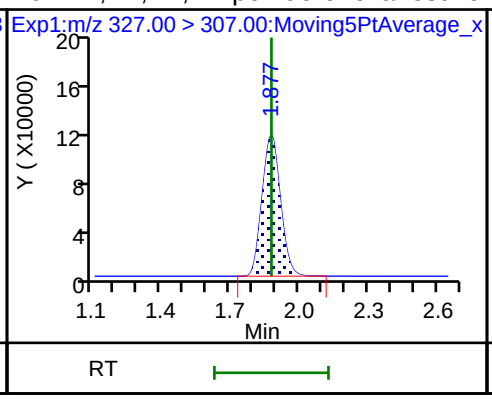
5 Perfluorobutanesulfonic acid



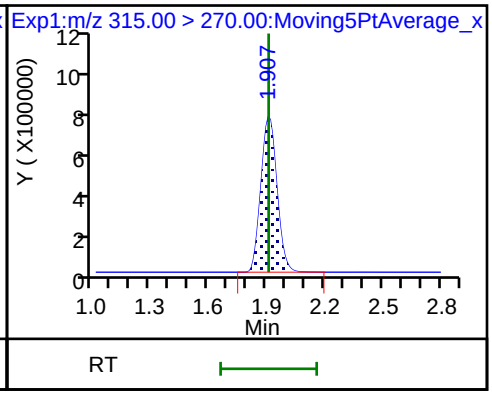
5 Perfluorobutanesulfonic acid



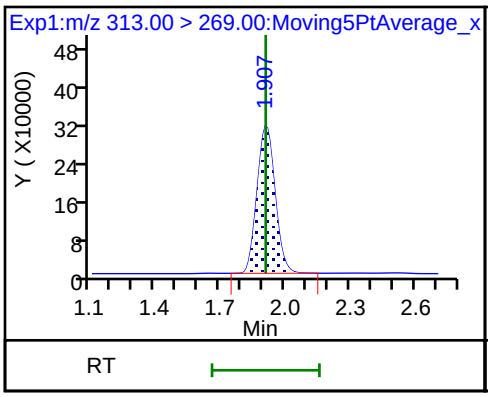
61 1H,1H,2H,2H-perfluorohexanesulfon



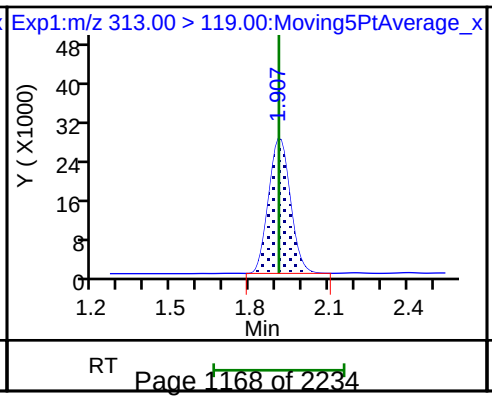
D 7 13C2 PFHxA



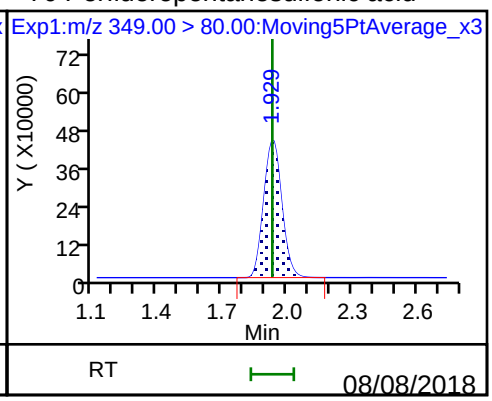
6 Perfluorohexanoic acid



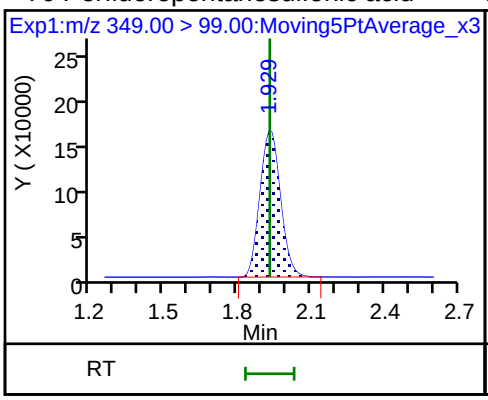
6 Perfluorohexanoic acid



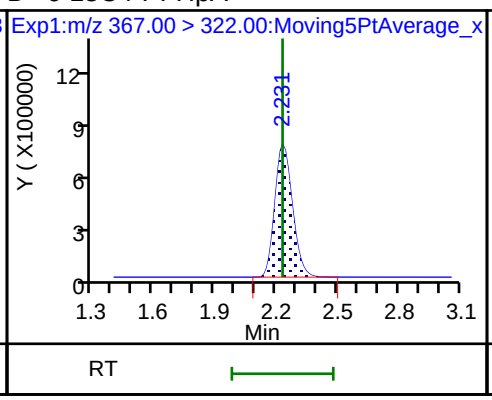
70 Perfluoropentanesulfonic acid



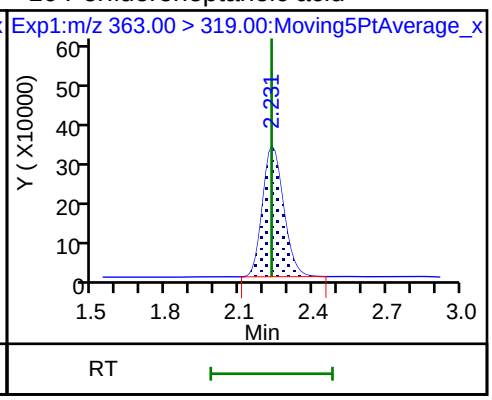
70 Perfluoropentanesulfonic acid



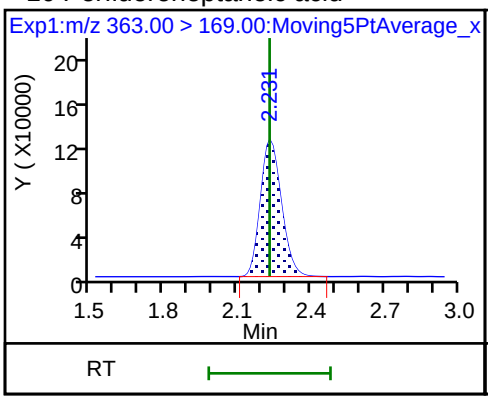
D 9 13C4-PFHpA



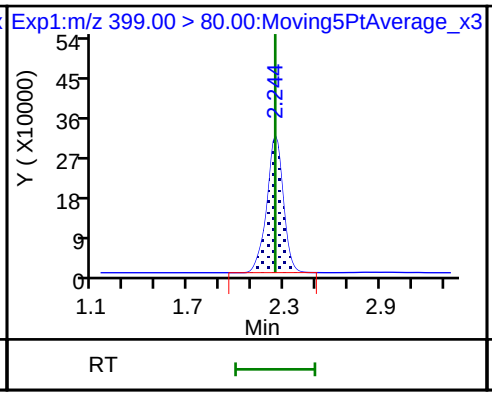
10 Perfluoroheptanoic acid



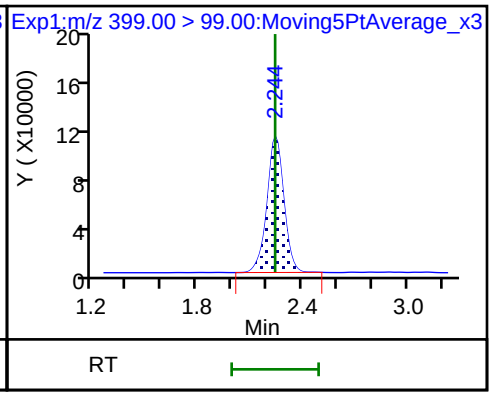
10 Perfluoroheptanoic acid



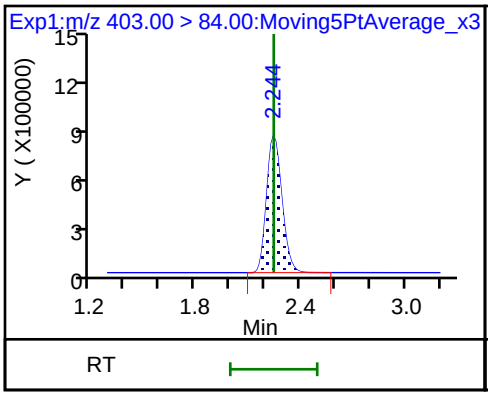
8 Perfluorohexanesulfonic acid



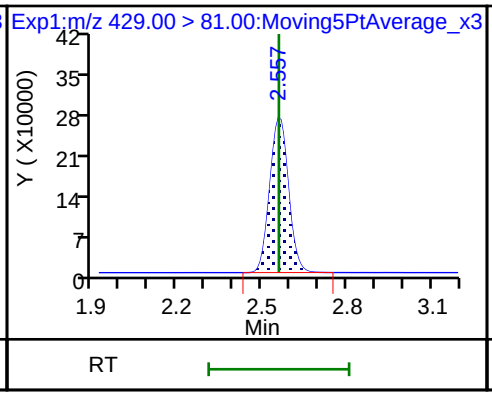
8 Perfluorohexanesulfonic acid



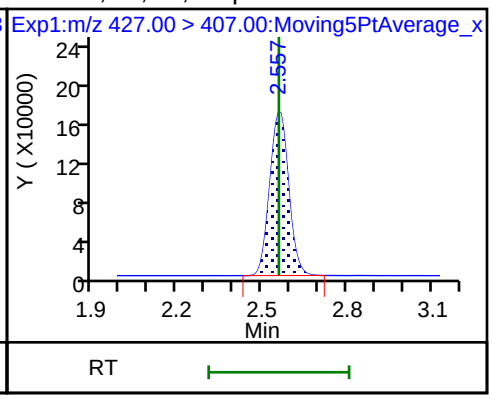
D 11 18O2 PFHxS



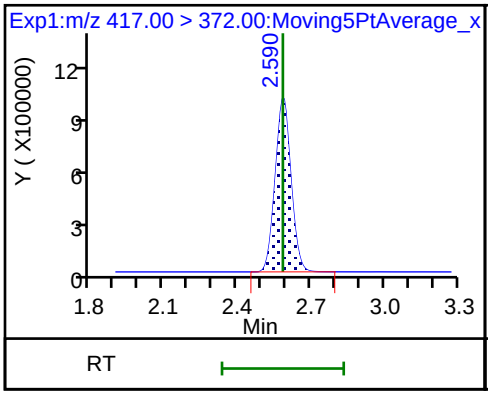
D 12 M2-6:2FTS



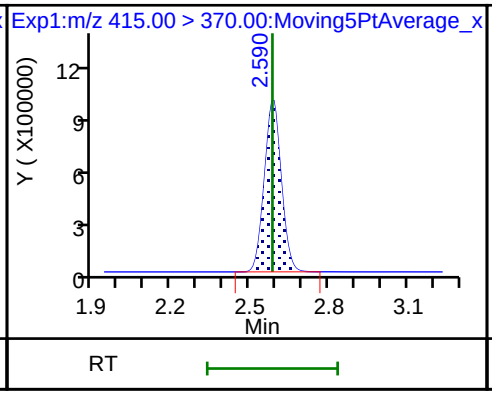
13 1H,1H,2H,2H-perfluorooctanesulfoni



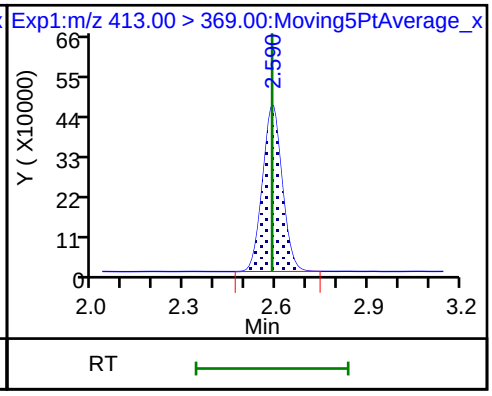
D 14 13C4 PFOA



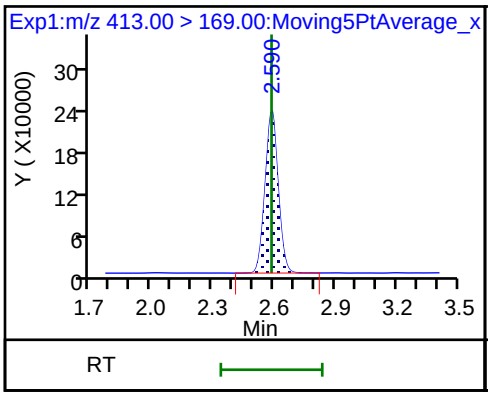
* 62 13C2-PFOA



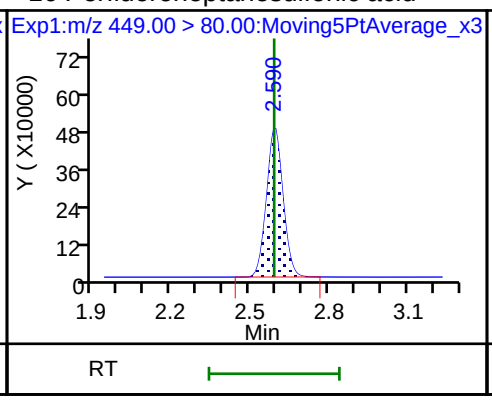
15 Perfluorooctanoic acid



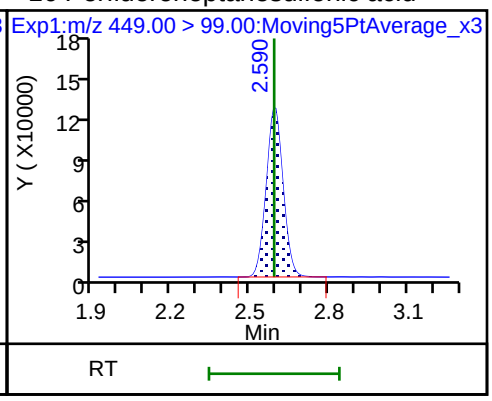
15 Perfluorooctanoic acid



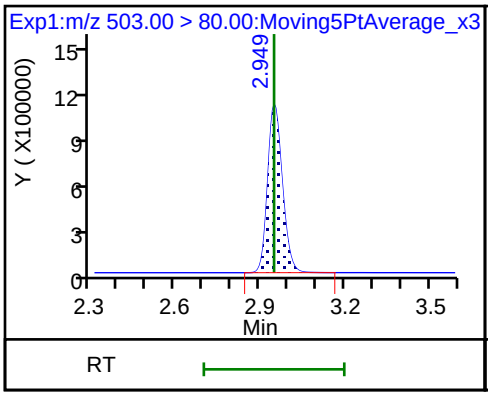
16 Perfluoroheptanesulfonic acid



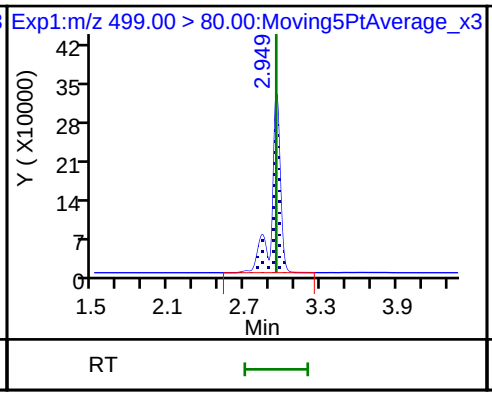
16 Perfluoroheptanesulfonic acid



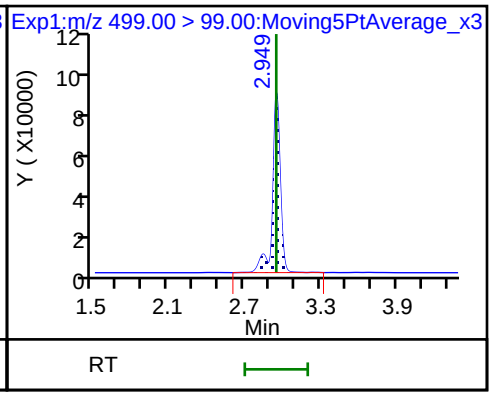
D 18 13C4 PFOS



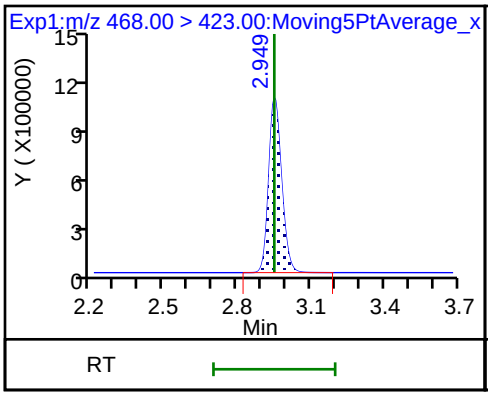
17 Perfluorooctane sulfonic acid



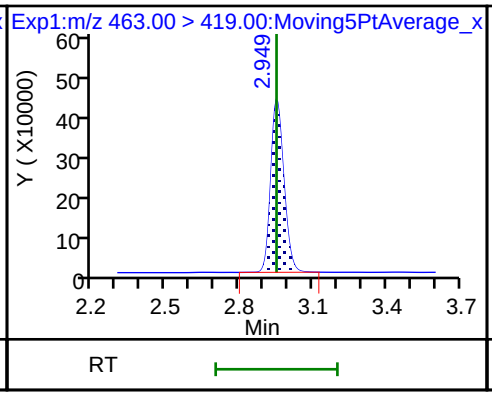
17 Perfluorooctane sulfonic acid



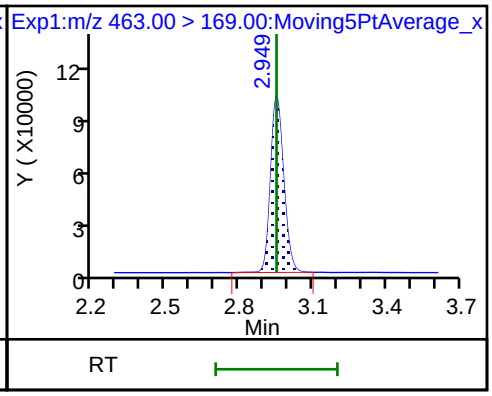
D 19 13C5 PFNA



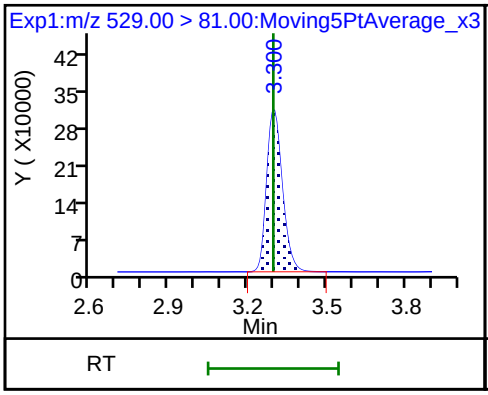
20 Perfluorononanoic acid



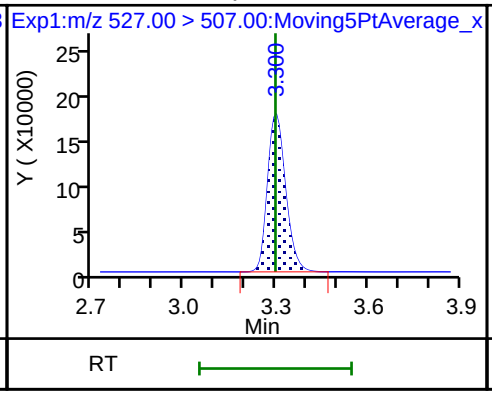
20 Perfluorononanoic acid



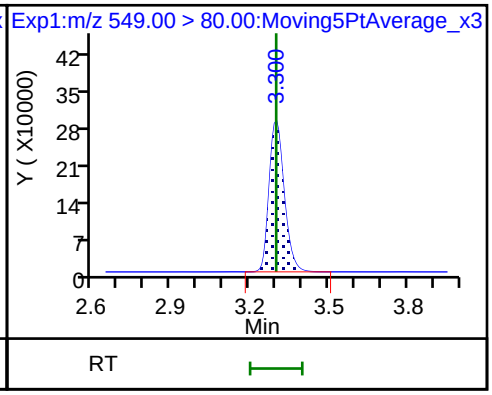
D 26 M2-8:2FTS



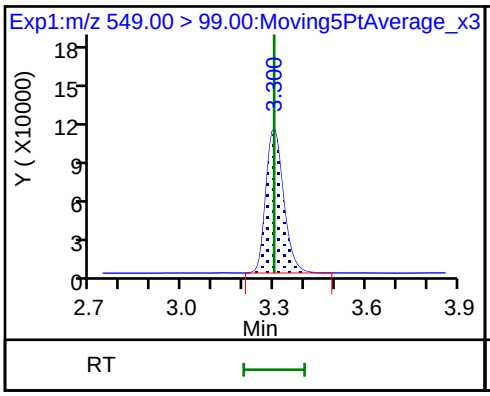
25 1H,1H,2H,2H-perfluorodecanesulfoni



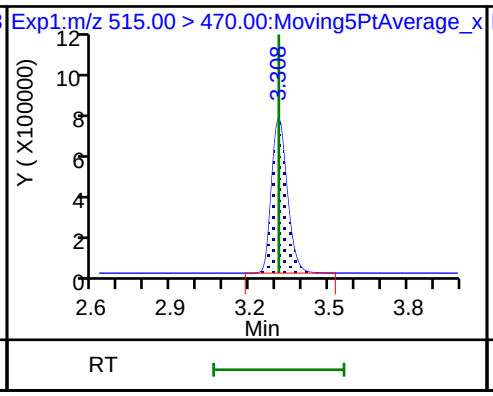
68 Perfluorononanesulfonic acid



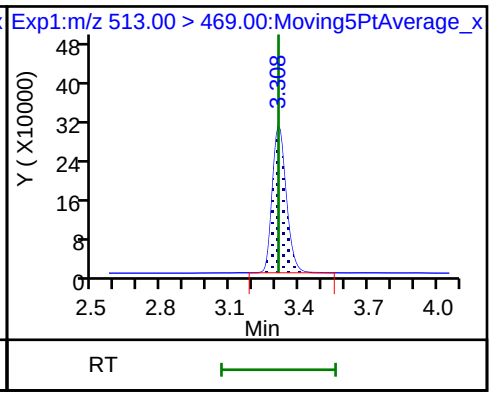
68 Perfluorononanesulfonic acid



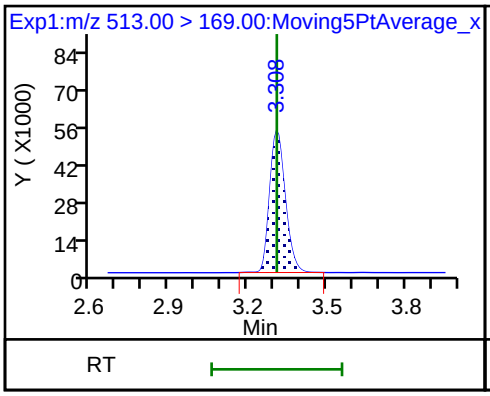
D 23 13C2 PFDA



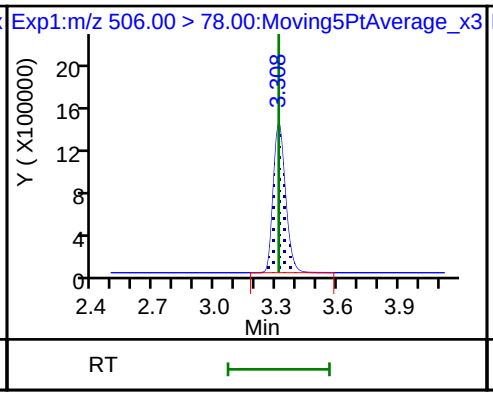
24 Perfluorodecanoic acid



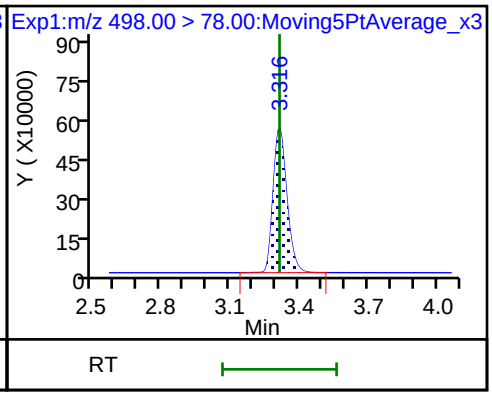
24 Perfluorodecanoic acid



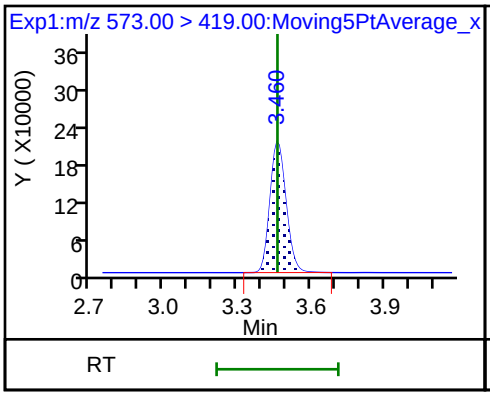
D 21 13C8 FOSA



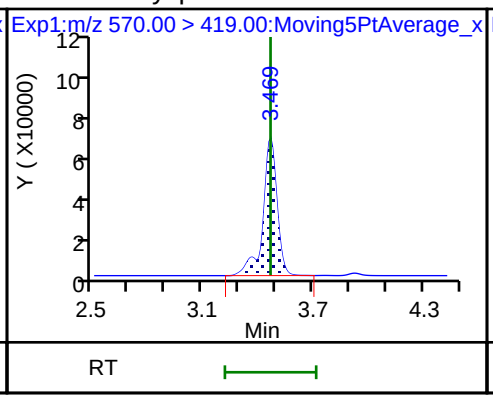
22 Perfluorooctane Sulfonamide



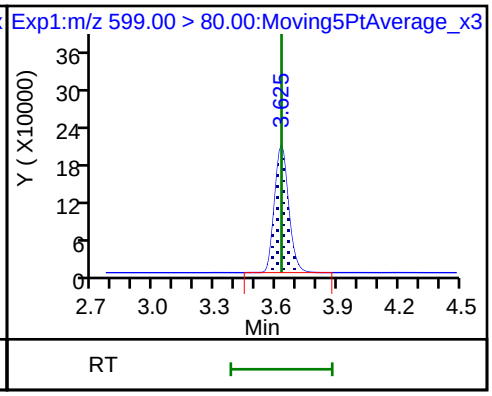
D 27 d3-NMeFOSAA



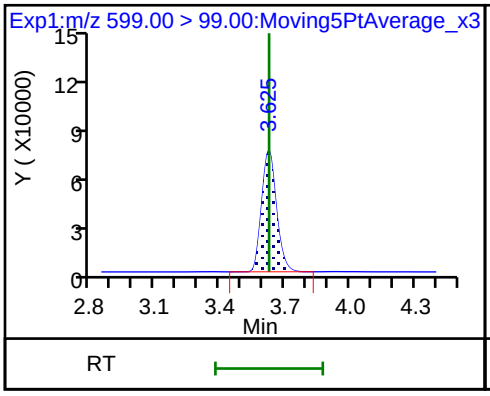
28 N-methyl perfluorooctane sulfonami



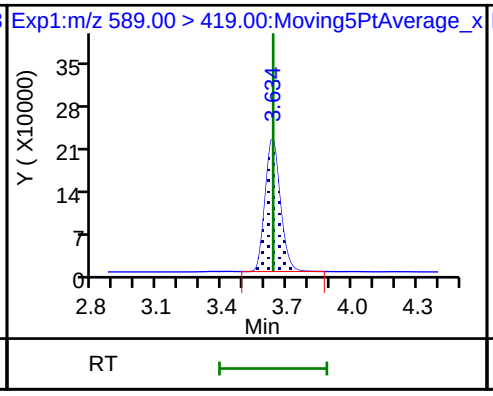
29 Perfluorodecane Sulfonic acid



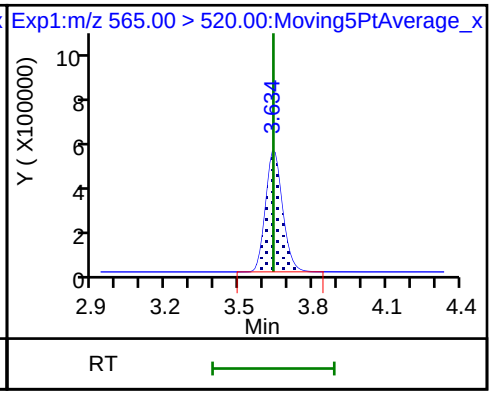
29 Perfluorodecane Sulfonic acid



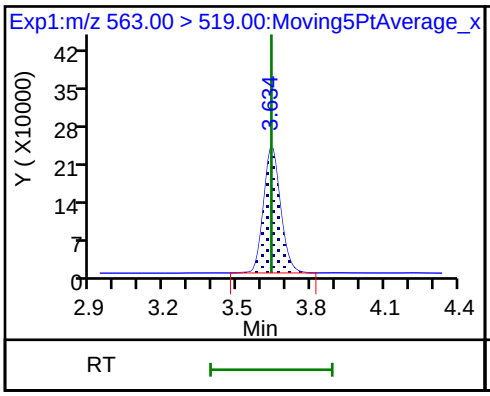
D 32 d5-NEtFOSAA



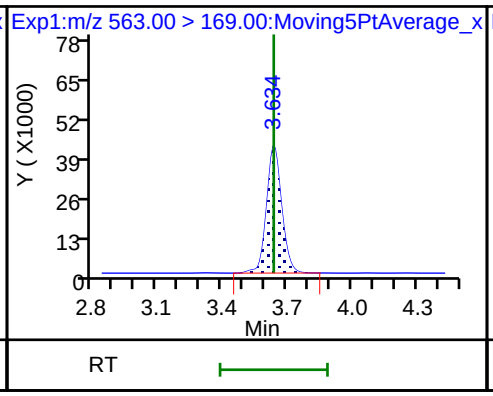
D 30 13C2 PFUnA



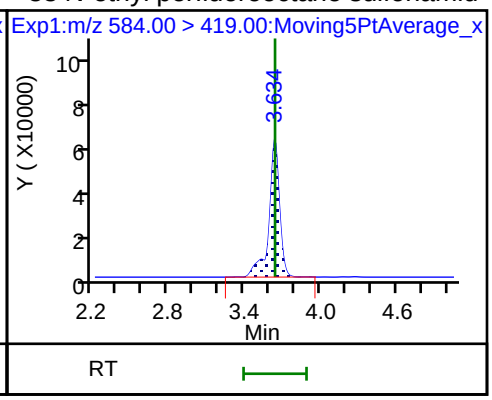
31 Perfluoroundecanoic acid



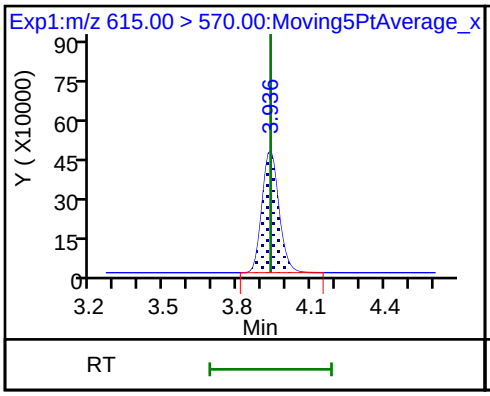
31 Perfluoroundecanoic acid



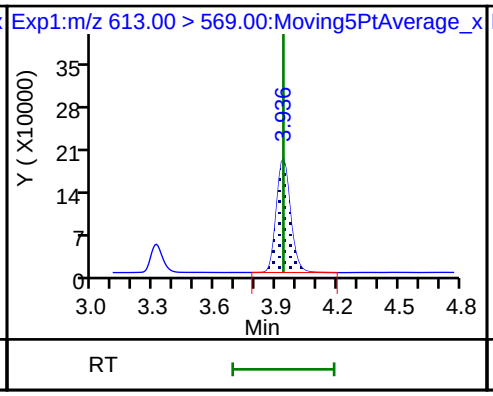
33 N-ethyl perfluorooctane sulfonamid



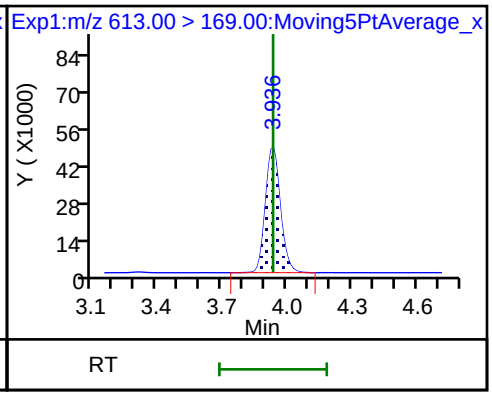
D 36 13C2 PFDoA



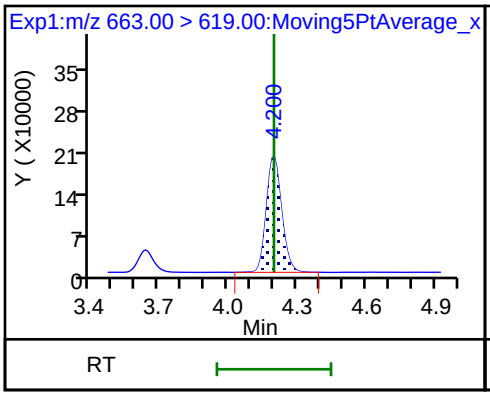
37 Perfluorododecanoic acid



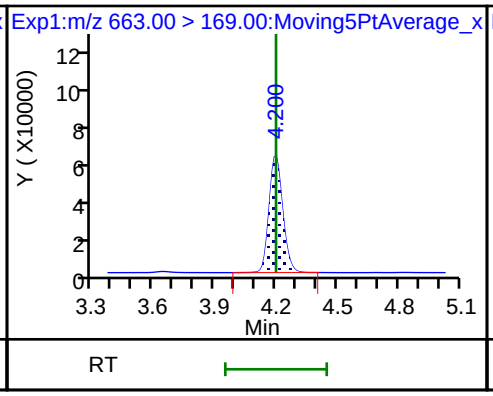
37 Perfluorododecanoic acid



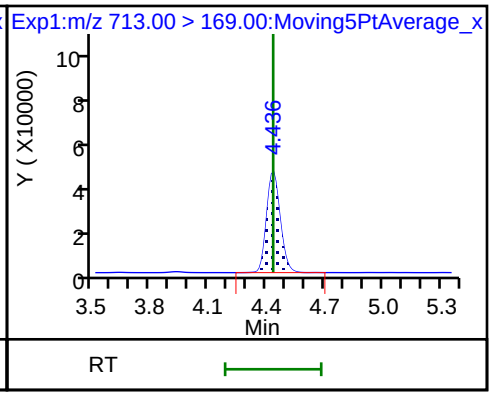
41 Perfluorotridecanoic acid



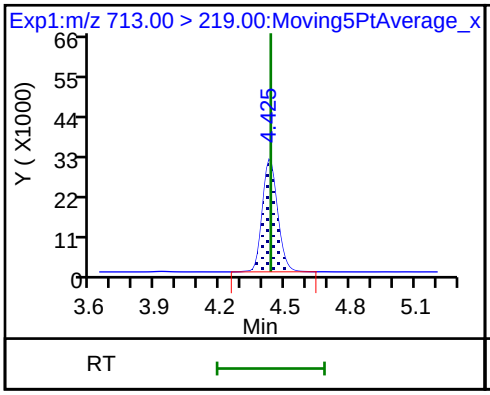
41 Perfluorotridecanoic acid



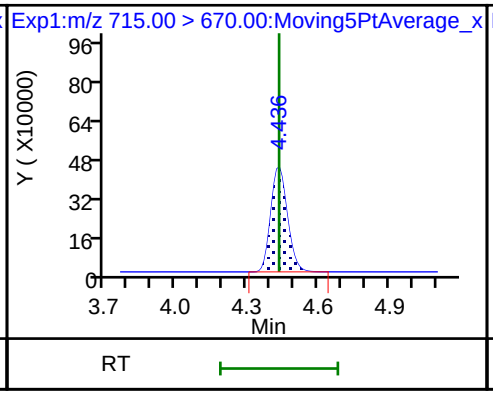
42 Perfluorotetradecanoic acid



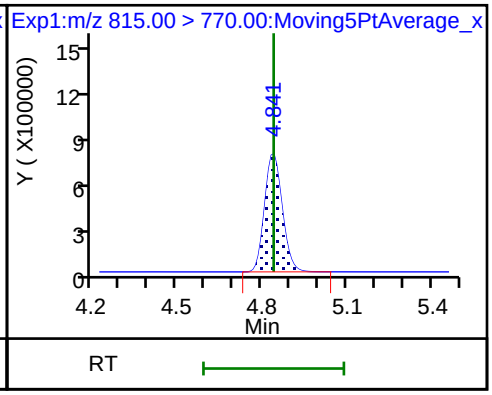
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 23-Jul-2018 16:42:32 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:36 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:55:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.403	1.398	0.005	0.542	5130909	2.48		99.3	74361	
2 Perfluorobutyric acid										
212.90 > 169.00	1.403	1.399	0.004	1.000	4994634	2.48		99.1	2425	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.638	0.003	0.634	3531229	2.45		97.9	55233	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.650	1.639	0.011	1.005	4270245	2.53		101	2374	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.670	0.006	0.647	87641	2.32		99.6	639	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.672	0.004	1.000	6706119	2.24		101	2009	
298.90 > 99.00	1.676	1.672	0.004	1.000	2695645		2.49(1.25-3.74)	101	1797	
D 60 M2-4:2FTS										
329.00 > 81.00	1.887	1.877	0.010	0.728	595819	NC			6688	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.887	1.878	0.009	1.126	1475833	2.29		98.1	65449	
D 7 13C2 PFHxA										
315.00 > 270.00	1.918	1.909	0.009	0.740	4182069	2.47		98.9	73706	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.918	1.909	0.009	1.000	4411390	2.49		99.5	10722	
313.00 > 119.00	1.918	1.909	0.009	1.000	387709		11.38(5.03-15.10)	99.5	6820	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.939	1.931	0.008	1.157	6406319	2.39		102	69733	
349.00 > 99.00	1.939	1.931	0.008	1.157	2336906		2.74(1.36-4.07)	102	29097	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.016	2.006	0.010	1.000	735954	NC			3477	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.016	2.007	0.009	0.778	240893	NC			7135	
D 9 13C4-PFHpA										
367.00 > 322.00	2.231	2.230	0.001	0.861	4150778	2.38		95.2	98495	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.231	2.230	0.001	1.000	4691766	2.56		103	5991	
363.00 > 169.00	2.231	2.230	0.001	1.000	1757045		2.67(1.13-3.40)	103	19497	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.244	2.243	0.001	0.994	5486367	2.16		94.9	9632	
399.00 > 99.00	2.244	2.243	0.001	0.994	1813604		3.03(1.50-4.49)	94.9	5265	
D 11 18O2 PFHxS										
403.00 > 84.00	2.257	2.246	0.011	0.871	5148729	2.30		97.2	42580	
65 ADONA										
377.00 > 251.00	2.283	2.272	0.011	0.774	12440903	NC			90044	
377.00 > 85.00	2.283	2.272	0.011	0.774	7322775		1.70(0.84-2.53)		30494	
D 12 M2-6:2FTS										
429.00 > 81.00	2.566	2.559	0.007	0.991	1164838	2.39		101	16202	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.566	2.559	0.007	1.000	1989042	2.40		101	19293	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.585	0.005	1.000	4232198	2.48		99.3	41947	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.585	0.005		4456546	2.50			67612	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.590	2.586	0.004	1.000	5069253	2.47		98.6	4915	
413.00 > 169.00	2.590	2.586	0.004	1.000	2618876		1.94(0.84-2.52)	98.6	12192	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.597	2.591	0.006	0.881	5268243	2.47		104	38243	
449.00 > 99.00	2.597	2.591	0.006	0.881	1347649		3.91(1.94-5.82)	104	14616	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.949	0.0	1.139	3686425	2.37		99.1	31954	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.949	2.949	0.0	1.000	3988913	2.34		101	30261	
499.00 > 99.00	2.949	2.949	0.0	1.000	901460		4.42(2.31-6.93)	101	14674	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.950	-0.001	1.139	3524069	2.40		95.8	55948	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.950	-0.001	1.000	3988453	2.48		99.1	9420	
463.00 > 169.00	2.949	2.950	-0.001	1.000	924470		4.31(1.90-5.69)	99.1	19208	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.158	3.161	-0.003	1.071	6588570	NC			79926	
D 26 M2-8:2FTS										
529.00 > 81.00	3.293	3.296	-0.003	1.271	1173584	2.31		96.5	18656	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.293	3.297	-0.004	1.000	1558921	2.35		98.0	37398	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.301	3.299	0.002	1.119	2765045	2.40		100	40764	
549.00 > 99.00	3.301	3.299	0.002	1.119	1072679		2.58(1.33-3.97)	100	12753	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.309	3.309	0.0	1.278	2774374	2.37		94.8	41656	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.309	3.309	0.0	1.000	2908266	2.55		102	13736	
513.00 > 169.00	3.309	3.309	0.0	1.000	517715		5.62(2.36-7.09)	102	25024	
D 21 13C8 FOSA										
506.00 > 78.00	3.309	3.311	-0.002	1.278	5745909	2.51		101	65966	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.317	3.314	0.003	1.002	5920977	2.59		104	40772	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.461	3.462	-0.001	1.336	966156	2.50		99.9	30308	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.470	3.468	0.002	1.003	928849	2.44		97.6	8936	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.626	3.625	0.001	1.229	2513855	2.46		102	48542	
599.00 > 99.00	3.626	3.625	0.001	1.229	835109		3.01(1.39-4.16)	102	19566	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.635	3.635	0.0	1.403	982550	2.42		96.7	3441	
D 30 13C2 PFUnA										
565.00 > 520.00	3.635	3.638	-0.003	1.403	2295730	2.44		97.4	48126	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.635	3.638	-0.003	1.000	2735087	2.40		96.0	11023	
563.00 > 169.00	3.635	3.638	-0.003	1.000	497203		5.50(2.12-6.36)	96.0	20766	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.635	3.639	-0.004	1.000	875971	2.39		95.6	29622	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.801	3.800	0.001	1.289	9902491	NC			70925	
D 36 13C2 PFDoA										
615.00 > 570.00	3.937	3.934	0.003	1.520	2159403	2.41		96.4	19647	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.937	3.934	0.003	1.000	2342729	2.51		100	793	
613.00 > 169.00	3.937	3.934	0.003	1.000	563987		4.15(2.13-6.40)	100	9813	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.200	4.198	0.002	1.067	2356193	2.60		104	748	
663.00 > 169.00	4.200	4.198	0.002	1.067	718905		3.28(1.25-3.76)	104	7361	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.436	4.433	0.003	1.000	530481	2.59		104	5161	
713.00 > 219.00	4.425	4.433	-0.008	0.998	372557		1.42(0.71-2.13)	104	6347	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.435	0.001	1.713	2042126	2.33		93.3	11368	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.840	0.002	1.869	3106916	2.34		93.5	11772	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.840	0.002	1.000	3049314	NC			494	
813.00 > 169.00	4.842	4.840	0.002	1.000	494179		6.17(2.86-8.58)		4991	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.188	5.184	0.004	1.072	3231497	NC			690	
913.00 > 169.00	5.181	5.184	-0.003	1.070	391309		8.26(3.83-11.48)		4228	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_006.d

Injection Date: 23-Jul-2018 16:42:32 Instrument ID: A8_N

Lims ID: IC L5 Full

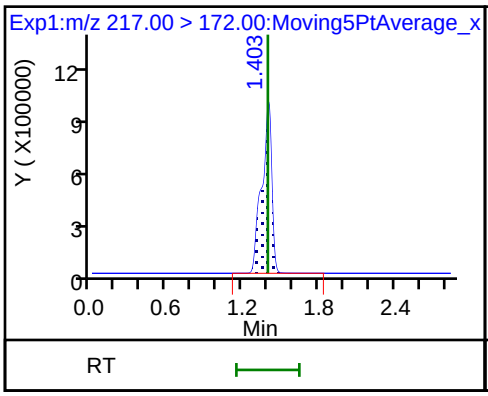
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 6

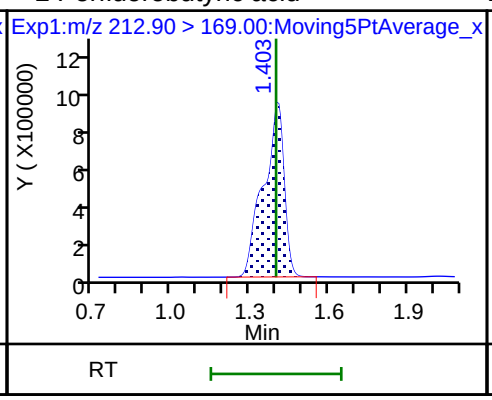
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

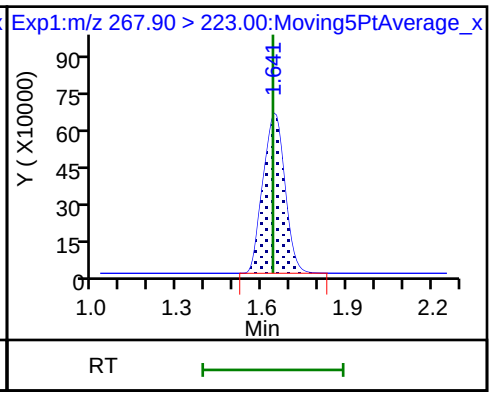
D 1 13C4 PFBA



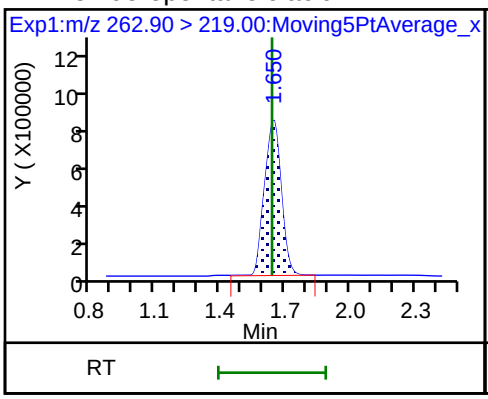
2 Perfluorobutyric acid



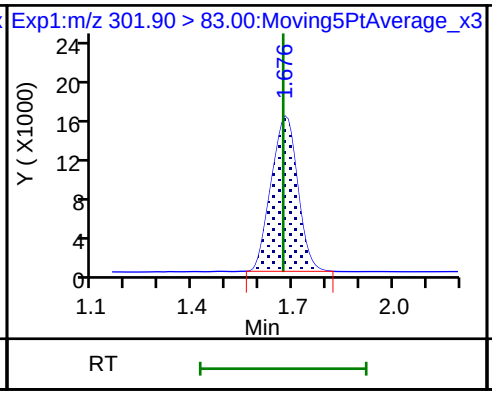
D 3 13C5-PFPeA



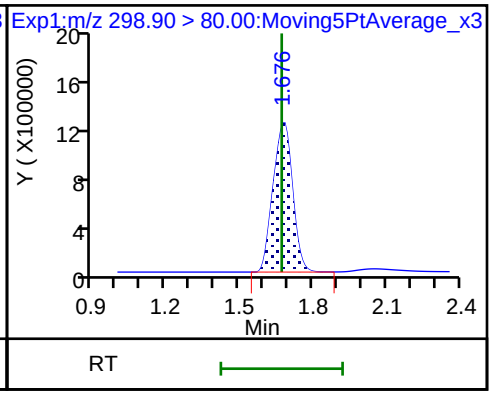
4 Perfluoropentanoic acid



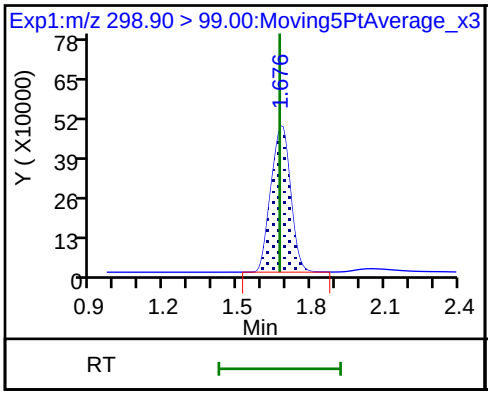
D 47 13C3-PFBS



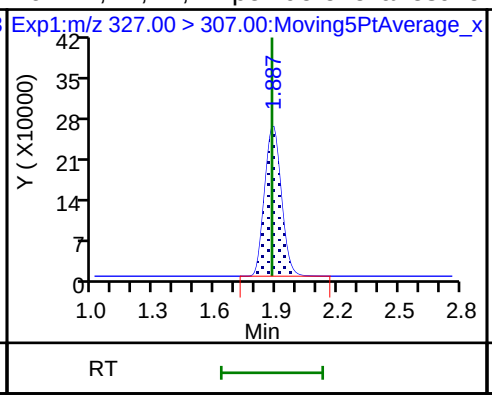
5 Perfluorobutanesulfonic acid



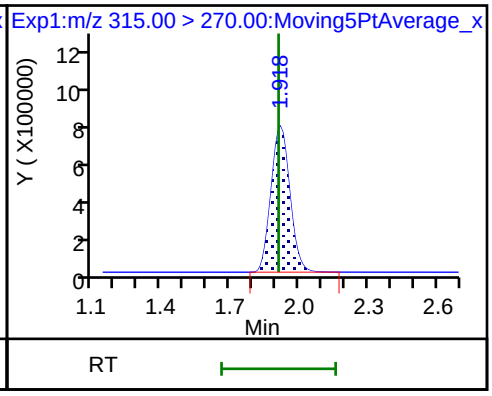
5 Perfluorobutanesulfonic acid



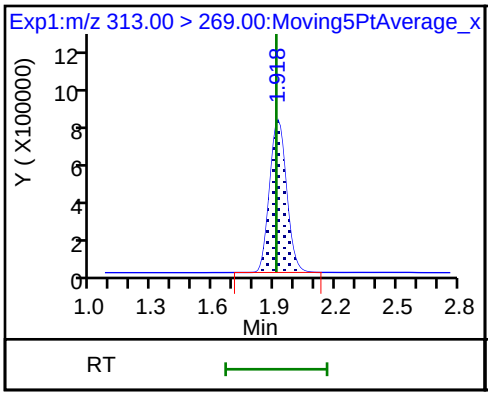
61 1H,1H,2H,2H-perfluorohexanesulfon



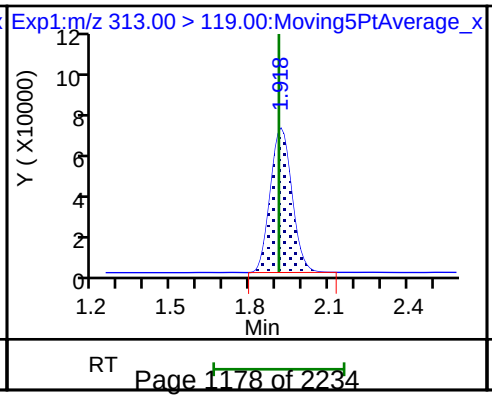
D 7 13C2 PFHxA



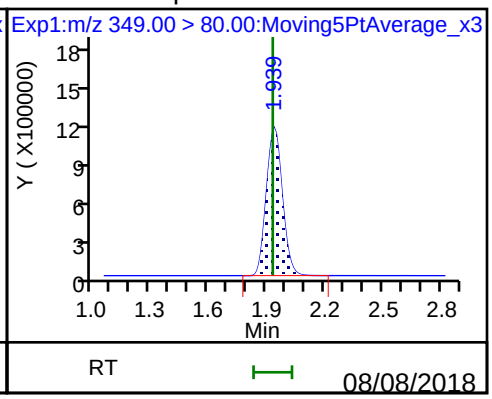
6 Perfluorohexanoic acid



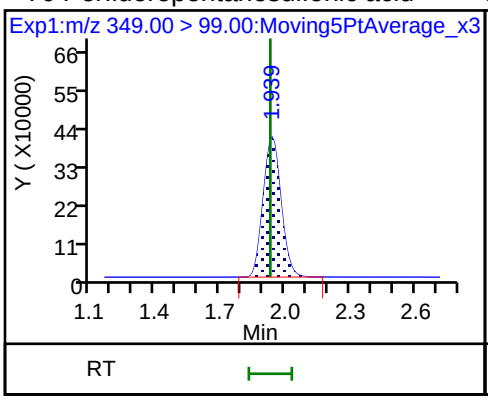
6 Perfluorohexanoic acid



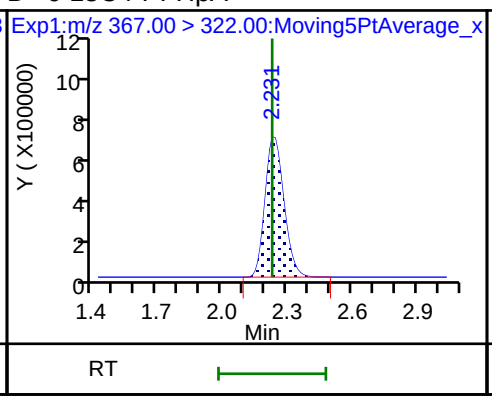
70 Perfluoropentanesulfonic acid



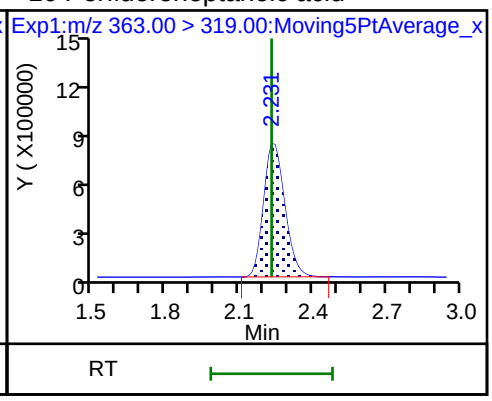
70 Perfluoropentanesulfonic acid



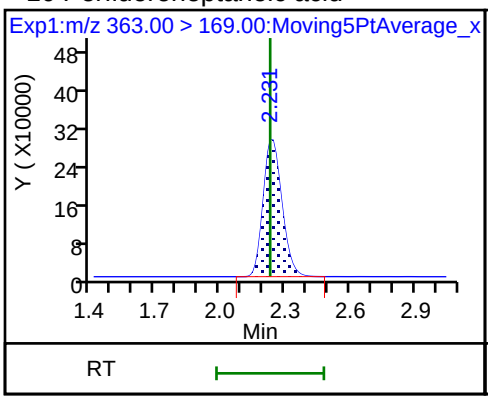
D 9 13C4-PFHpA



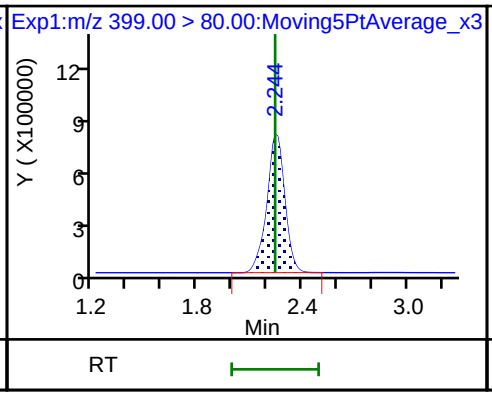
10 Perfluoroheptanoic acid



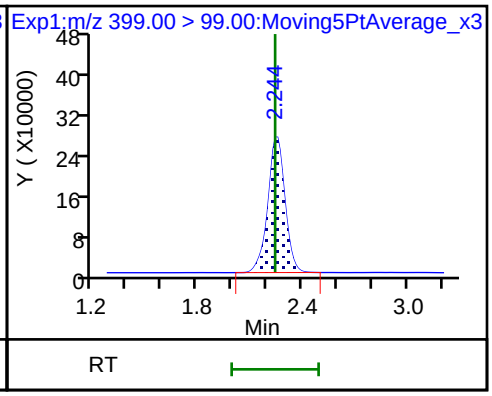
10 Perfluoroheptanoic acid



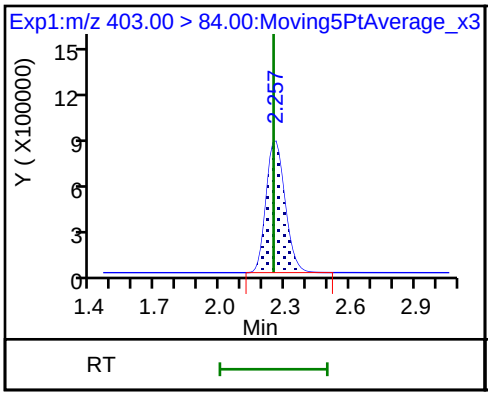
8 Perfluorohexanesulfonic acid



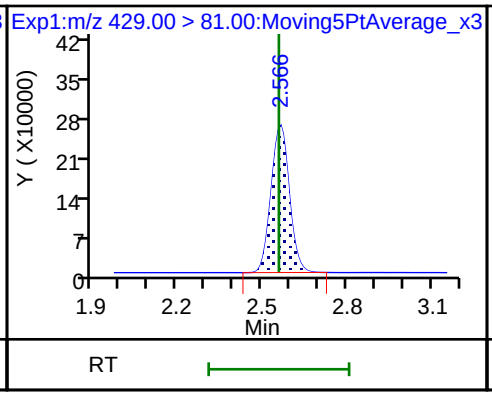
8 Perfluorohexanesulfonic acid



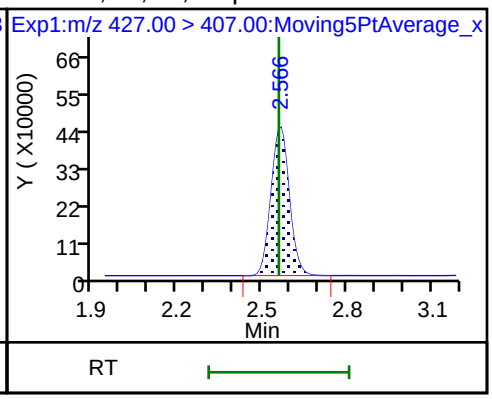
D 11 18O2 PFHxS



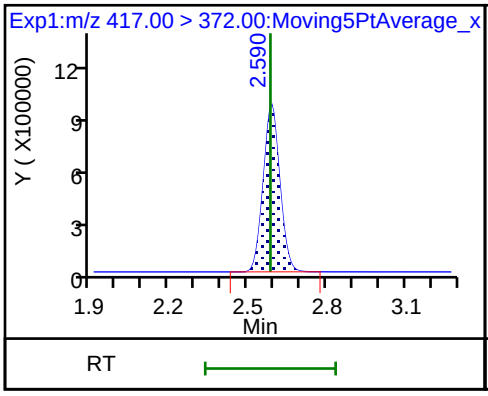
D 12 M2-6:2FTS



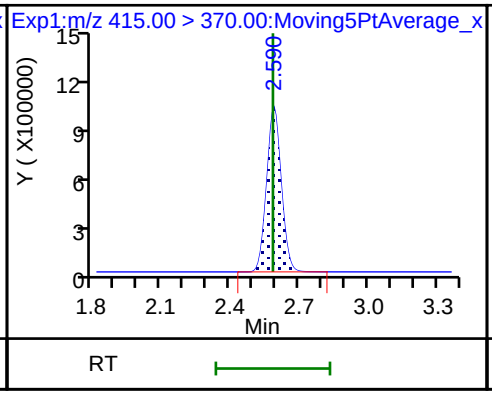
13 1H,1H,2H,2H-perfluorooctanesulfoni



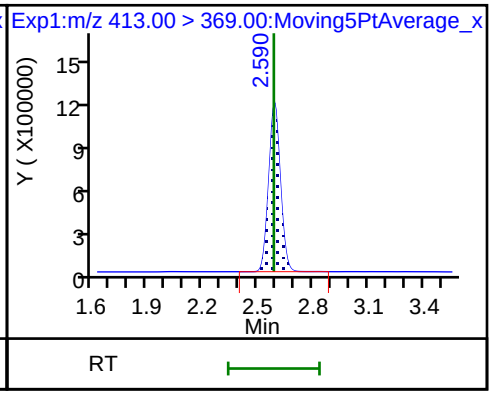
D 14 13C4 PFOA



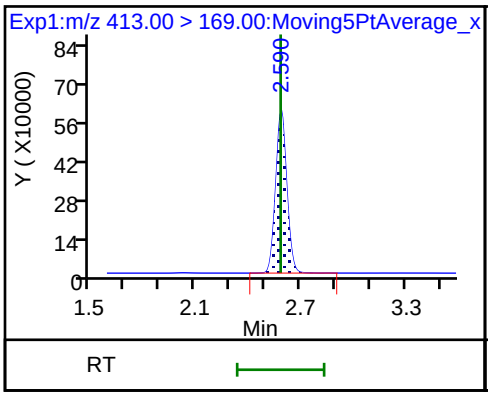
* 62 13C2-PFOA



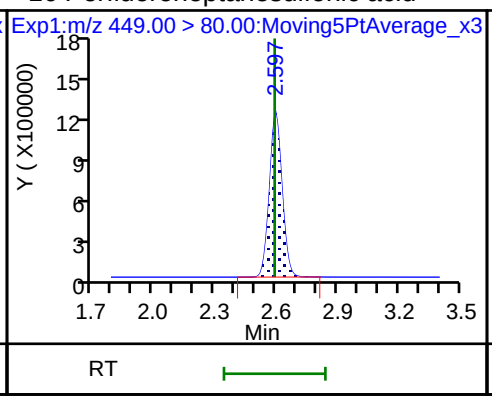
15 Perfluorooctanoic acid



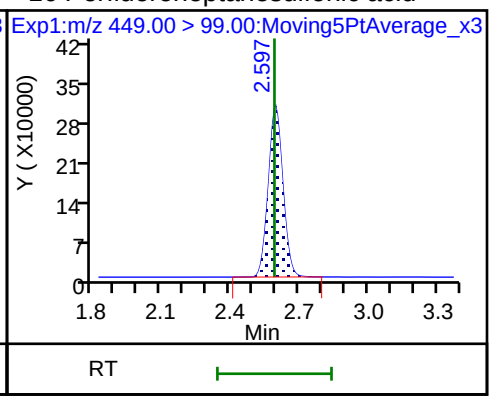
15 Perfluorooctanoic acid



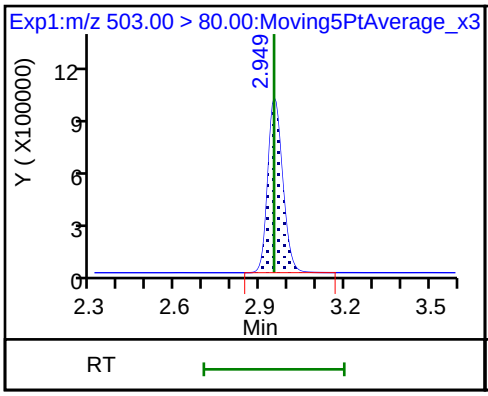
16 Perfluoroheptanesulfonic acid



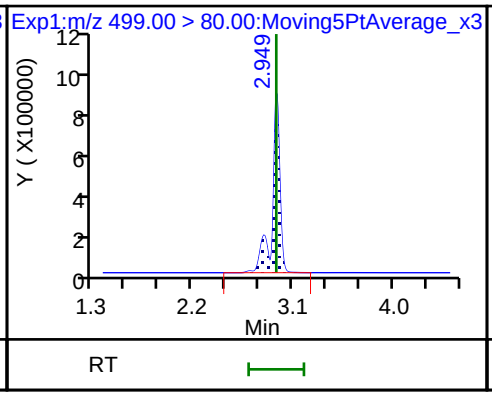
16 Perfluoroheptanesulfonic acid



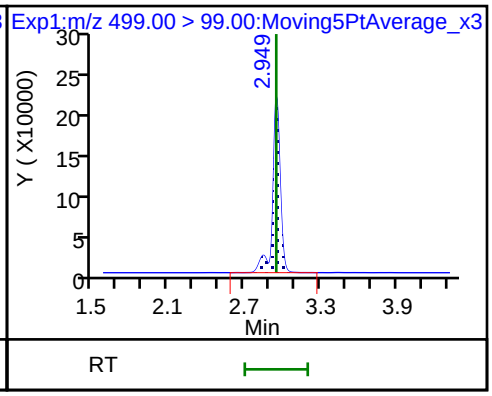
D 18 13C4 PFOS



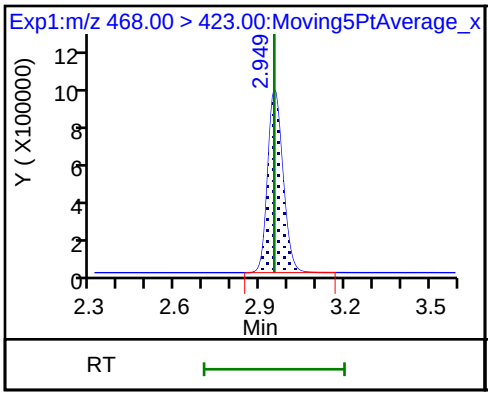
17 Perfluorooctane sulfonic acid



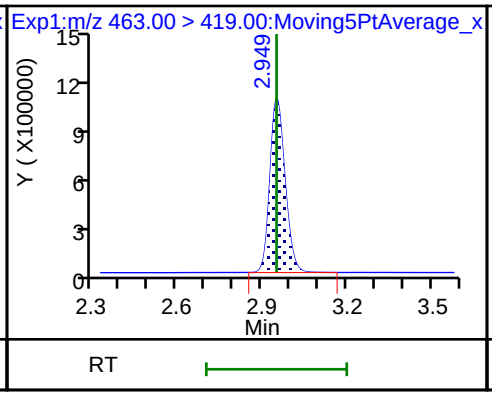
17 Perfluorooctane sulfonic acid



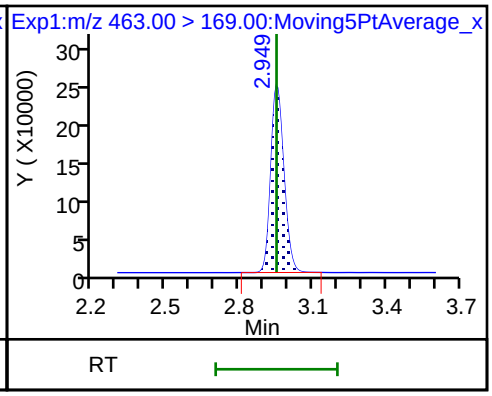
D 19 13C5 PFNA



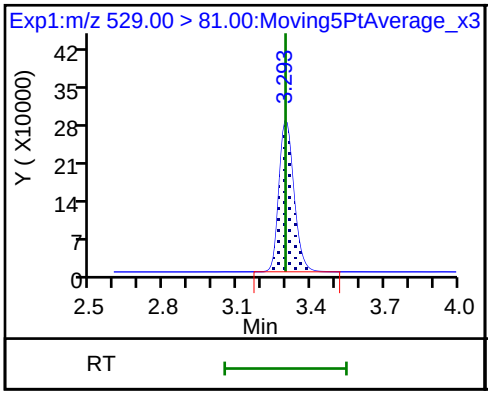
20 Perfluorononanoic acid



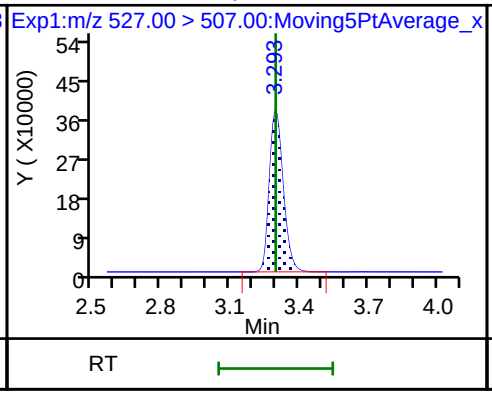
20 Perfluorononanoic acid



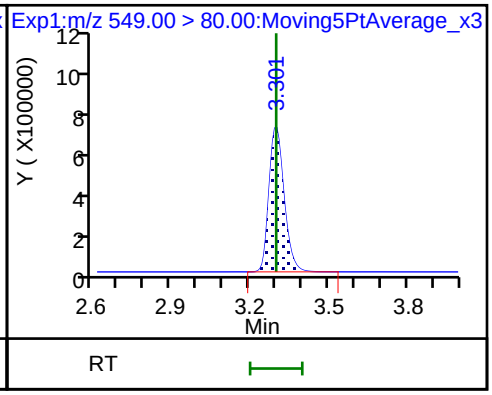
D 26 M2-8:2FTS



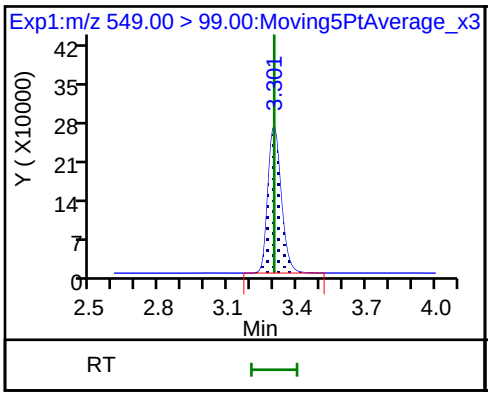
25 1H,1H,2H,2H-perfluorodecanesulfoni



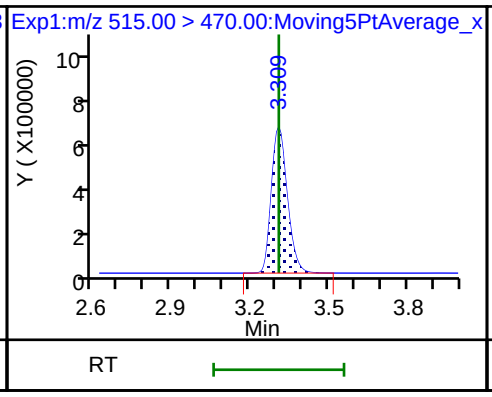
68 Perfluorononanesulfonic acid



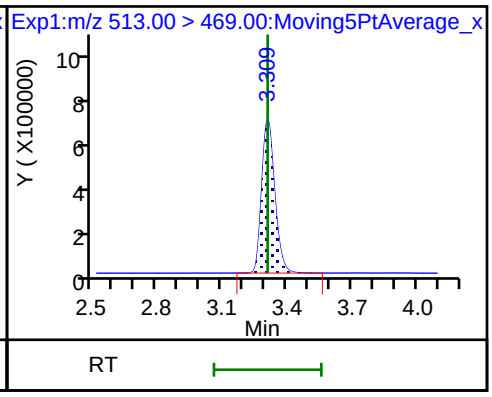
68 Perfluorononanesulfonic acid



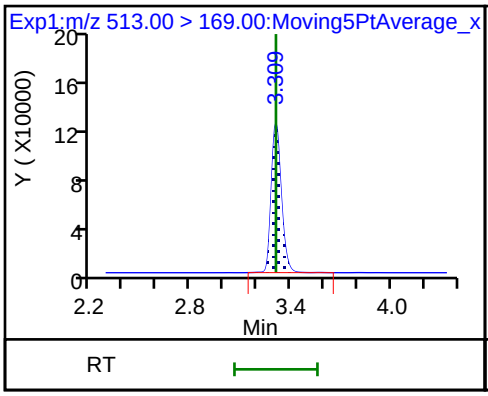
D 23 13C2 PFDA



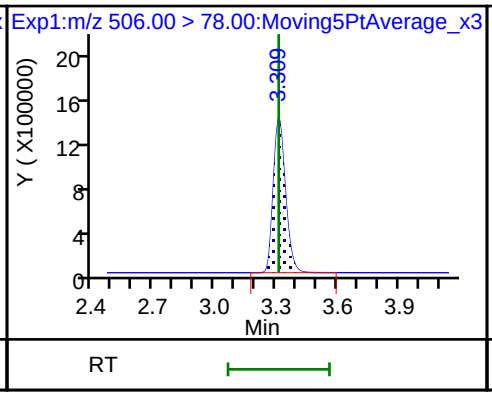
24 Perfluorodecanoic acid



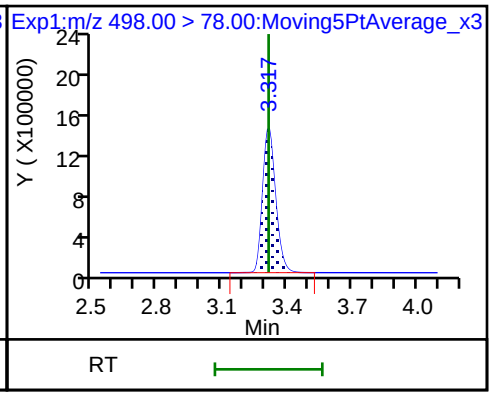
24 Perfluorodecanoic acid



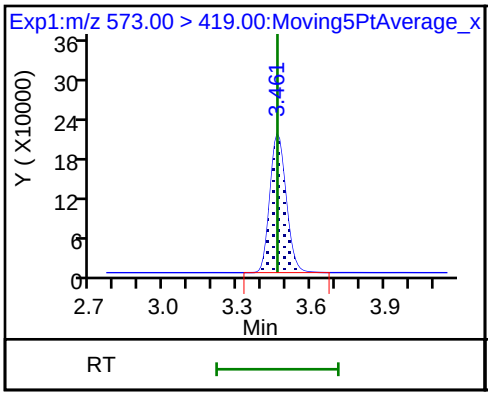
D 21 13C8 FOSA



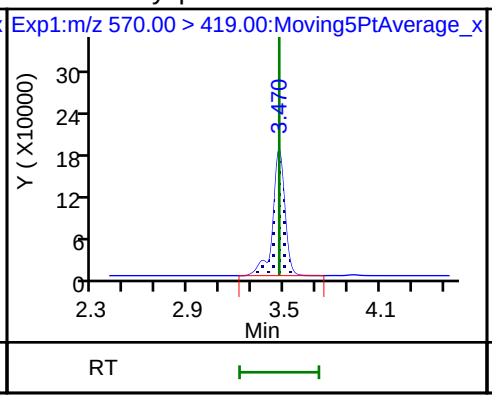
22 Perfluorooctane Sulfonamide



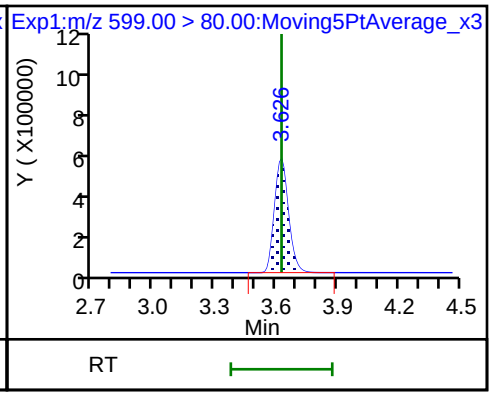
D 27 d3-NMeFOSAA



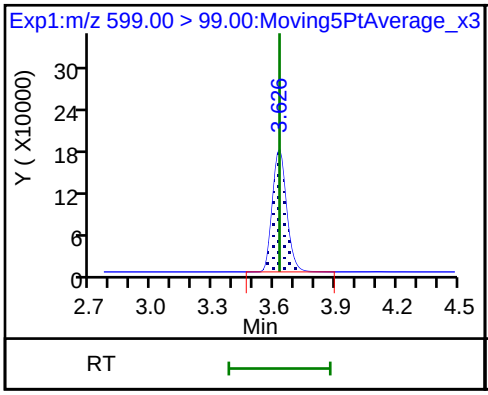
28 N-methyl perfluorooctane sulfonami



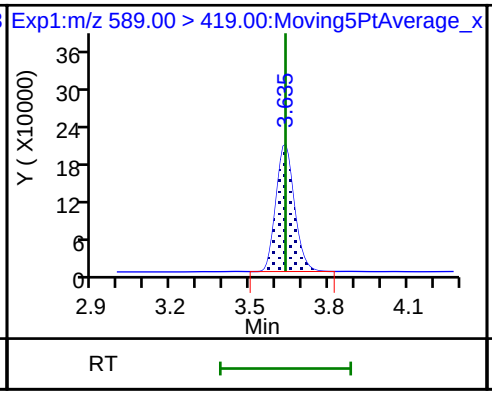
29 Perfluorodecane Sulfonic acid



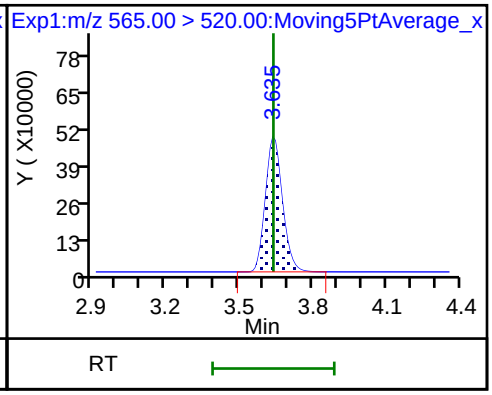
29 Perfluorodecane Sulfonic acid



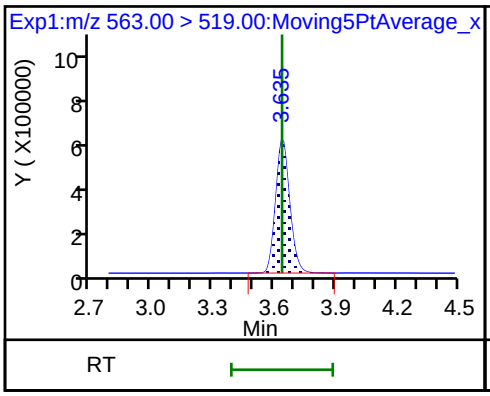
D 32 d5-NEtFOSAA



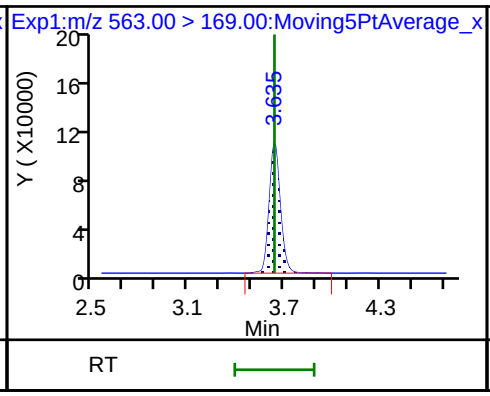
D 30 13C2 PFUnA



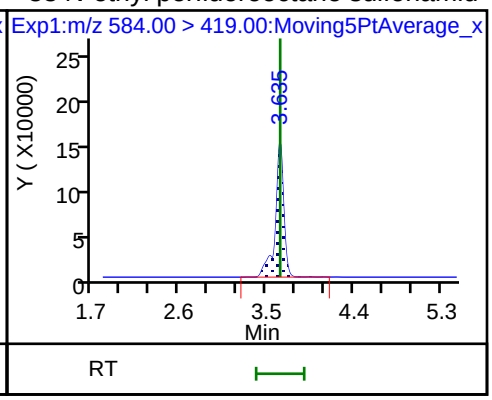
31 Perfluoroundecanoic acid



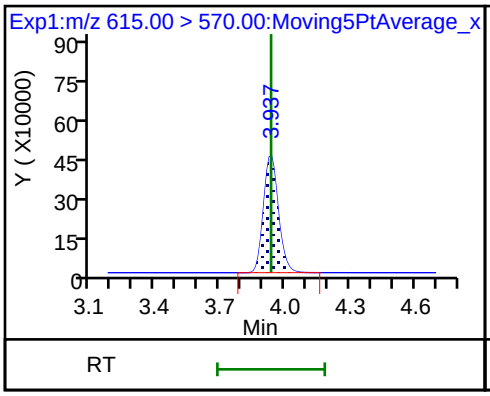
31 Perfluoroundecanoic acid



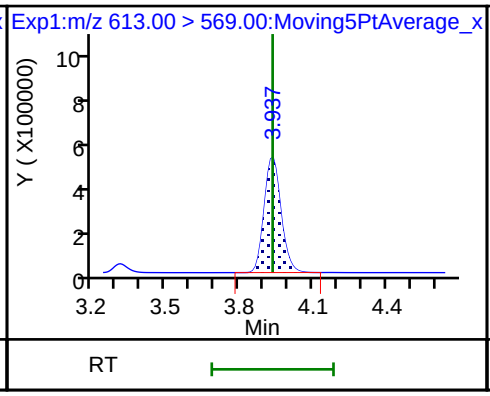
33 N-ethyl perfluorooctane sulfonamid



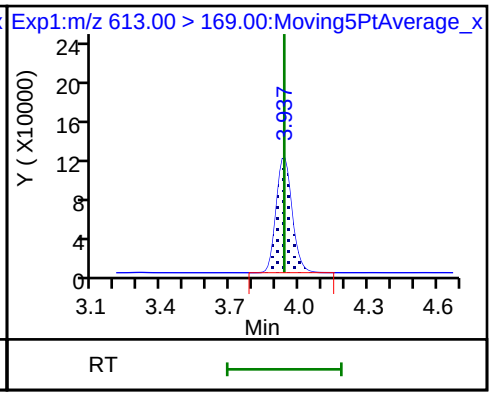
D 36 13C2 PFDoA



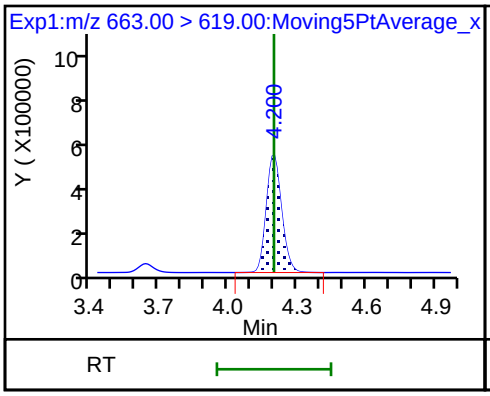
37 Perfluorododecanoic acid



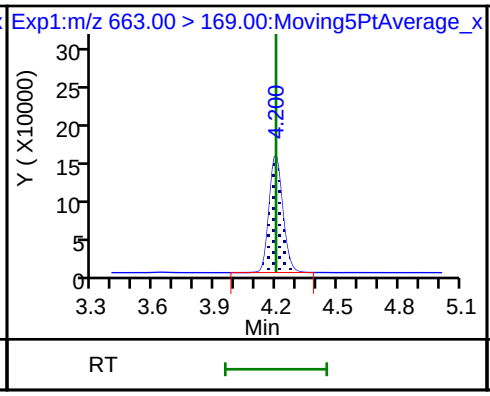
37 Perfluorododecanoic acid



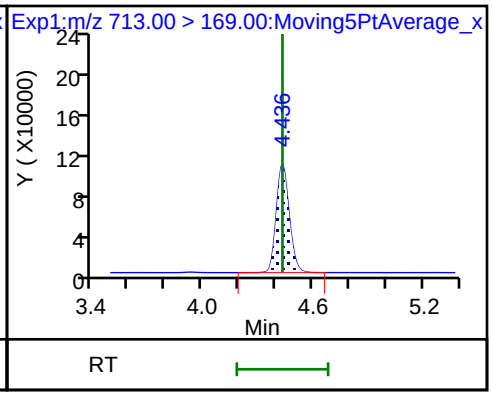
41 Perfluorotridecanoic acid



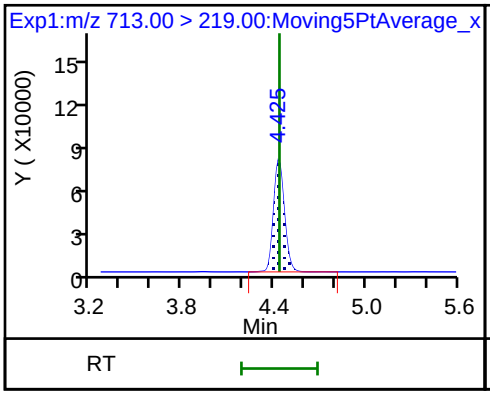
41 Perfluorotridecanoic acid



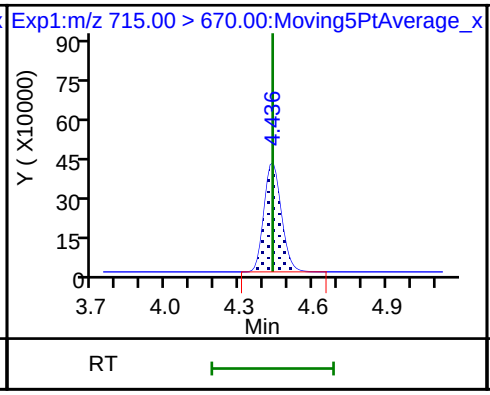
42 Perfluorotetradecanoic acid



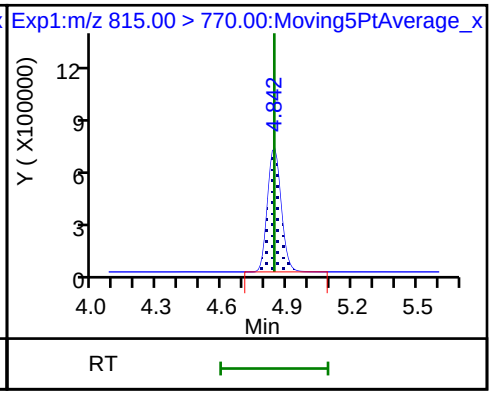
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 23-Jul-2018 16:50:19 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:41 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:09:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.541	4957611	2.64		106	76405	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	9835771	5.05		101	5225	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3369200	2.57		103	48068	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	7944127	4.92		98.5	4880	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	86122	2.50		108	607	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	12610058	4.29		97.0	3702	
298.90 > 99.00	1.667	1.672	-0.005	1.000	5300189		2.38(1.25-3.74)	97.0	3539	
D 60 M2-4:2FTS										
329.00 > 81.00	1.877	1.877	0.0	0.727	553766	NC			6060	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.878	-0.001	1.126	2898055	4.58		98.0	102101	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.739	3960776	2.57		103	76847	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	8348472	4.97		99.4	20245	
313.00 > 119.00	1.907	1.909	-0.002	1.000	750361		11.13(5.03-15.10)	99.4	11852	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	12590452	4.77		102	98455	
349.00 > 99.00	1.928	1.931	-0.003	1.157	4621188		2.72(1.36-4.07)	102	52740	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.005	2.006	-0.001	1.000	1519446	NC			8408	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.777	218817	NC			6237	
D 9 13C4-PFHpA										
367.00 > 322.00	2.231	2.230	0.001	0.864	4059821	2.56		102	62151	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.231	2.230	0.001	1.000	9133436	5.10		102	11941	
363.00 > 169.00	2.231	2.230	0.001	1.000	3500850		2.61(1.13-3.40)	102	28241	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	10907663	4.27		93.9	16395	
399.00 > 99.00	2.243	2.243	0.0	1.000	3633033		3.00(1.50-4.49)	93.9	10735	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.246	-0.003	0.869	5175462	2.54		107	50760	
65 ADONA										
377.00 > 251.00	2.269	2.272	-0.003	0.769	22372425	NC			131517	
377.00 > 85.00	2.269	2.272	-0.003	0.769	13665635		1.64(0.84-2.53)		51583	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.559	-0.003	0.990	1061423	2.40		101	17797	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.559	-0.003	1.000	3478669	4.61		97.3	25045	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.585	-0.004	1.000	3884099	2.50		100	65946	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.585	-0.004		4053358	2.50			35679	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.586	-0.005	1.000	9261268	4.91		98.1	7655	
413.00 > 169.00	2.581	2.586	-0.005	1.000	4822396		1.92(0.84-2.52)	98.1	20925	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.591	-0.002	0.878	10191534	4.96		104	61856	
449.00 > 99.00	2.589	2.591	-0.002	0.878	2685831		3.79(1.94-5.82)	104	26454	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.949	0.0	1.142	3550779	2.51		105	36252	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.949	2.949	0.0	1.000	7714043	4.70		101	35396	
499.00 > 99.00	2.949	2.949	0.0	1.000	1770065		4.36(2.31-6.93)	101	33206	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.950	-0.001	1.142	3450868	2.58		103	83580	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.950	-0.001	1.000	7406073	4.70		94.0	18582	
463.00 > 169.00	2.949	2.950	-0.001	1.000	1803538		4.11(1.90-5.69)	94.0	52899	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.070	12813896	NC			90944	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.296	-0.004	1.276	1043782	2.26		94.4	16607	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.297	-0.005	1.000	2829685	4.79		100.0	167430	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.299	-0.007	1.117	5579385	5.03		105	57924	
549.00 > 99.00	3.292	3.299	-0.007	1.117	2042554		2.73(1.33-3.97)	105	28097	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.282	2729607	2.56		103	50384	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	5521565	4.92		98.3	22336	
513.00 > 169.00	3.308	3.309	-0.001	1.000	960446		5.75(2.36-7.09)	98.3	38234	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.282	5225954	2.51		100	40495	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.314	-0.006	1.000	10636117	5.12		102	78258	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.462	-0.002	1.340	952316	2.71		108	19093	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.469	3.468	0.001	1.003	1804771	4.81		96.1	12856	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.625	-0.001	1.229	4831368	4.90		102	63953	
599.00 > 99.00	3.624	3.625	-0.001	1.229	1680170		2.88(1.39-4.16)	102	32260	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.634	3.635	-0.001	1.408	934717	2.53		101	3132	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.408	2176487	2.54		102	57027	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	5089468	4.71		94.2	20533	
563.00 > 169.00	3.634	3.638	-0.004	1.000	904751		5.63(2.12-6.36)	94.2	26960	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.639	-0.005	1.000	1715766	4.92		98.4	32422	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.799	3.800	-0.001	1.289	18579159	NC			116101	
D 36 13C2 PFDoA										
615.00 > 570.00	3.935	3.934	0.001	1.525	2185359	2.68		107	19987	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.935	3.934	0.001	1.000	4706732	4.98		99.5	1690	
613.00 > 169.00	3.935	3.934	0.001	1.000	1127628		4.17(2.13-6.40)	99.5	14695	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.198	-0.009	1.065	4322525	4.71		94.2	1444	
663.00 > 169.00	4.189	4.198	-0.009	1.065	1311471		3.30(1.25-3.76)	94.2	12817	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.433	-0.009	1.000	995775	4.78		95.6	9620	
713.00 > 219.00	4.424	4.433	-0.009	1.000	737039		1.35(0.71-2.13)	95.6	10063	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.435	-0.011	1.714	2077317	2.61		104	10634	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.831	4.840	-0.009	1.872	3092486	2.56		102	9832	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.831	4.840	-0.009	1.000	6124818	NC			930	
813.00 > 169.00	4.831	4.840	-0.009	1.000	989278		6.19(2.86-8.58)		8403	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.180	5.184	-0.004	1.072	6508688	NC			1305	
913.00 > 169.00	5.180	5.184	-0.004	1.072	768143		8.47(3.83-11.48)		6618	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00006 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_007.d

Injection Date: 23-Jul-2018 16:50:19 Instrument ID: A8_N

Lims ID: IC L6 Full

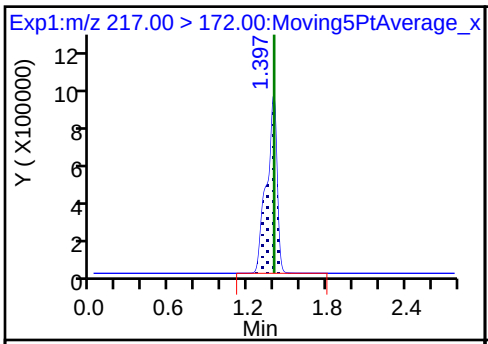
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 7

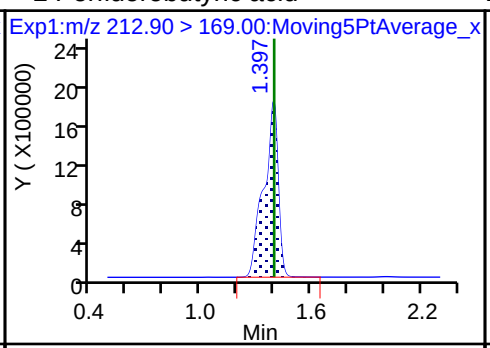
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

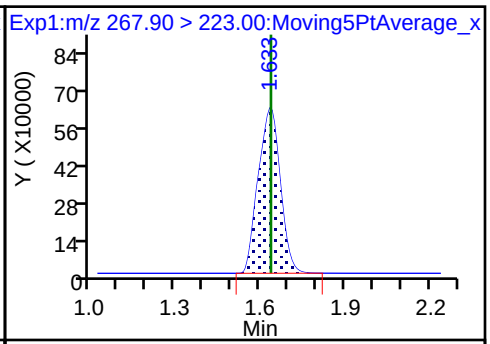
D 1 13C4 PFBA



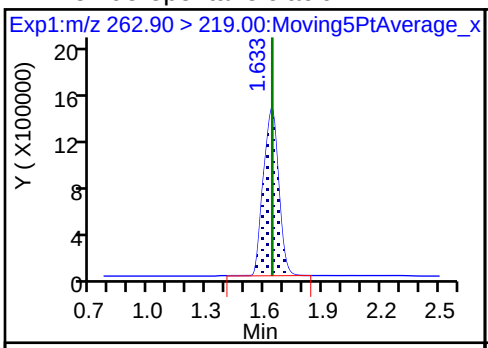
2 Perfluorobutyric acid



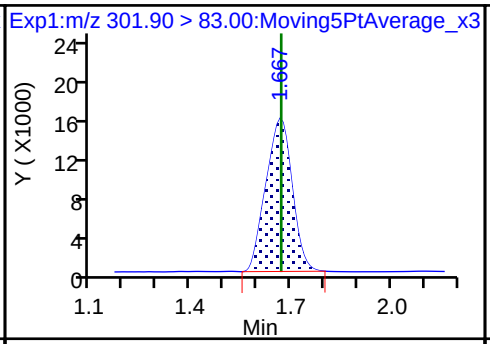
D 3 13C5-PFPeA



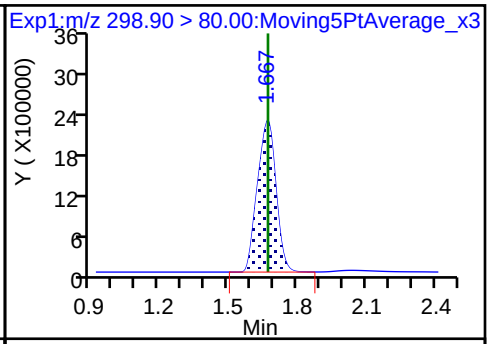
4 Perfluoropentanoic acid



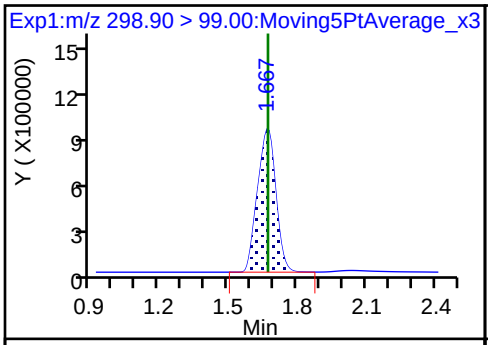
D 47 13C3-PFBS



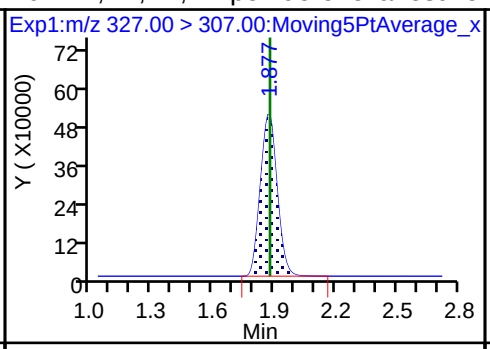
5 Perfluorobutanesulfonic acid



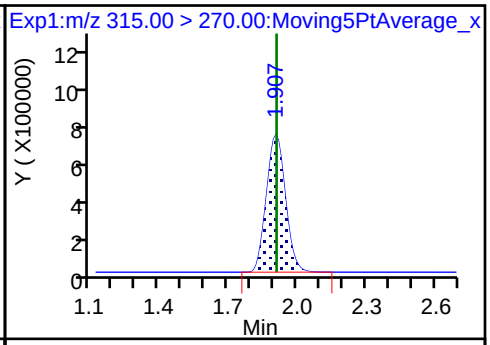
5 Perfluorobutanesulfonic acid



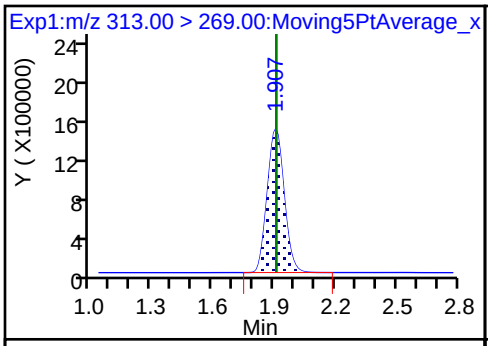
61 1H,1H,2H,2H-perfluorohexanesulfon



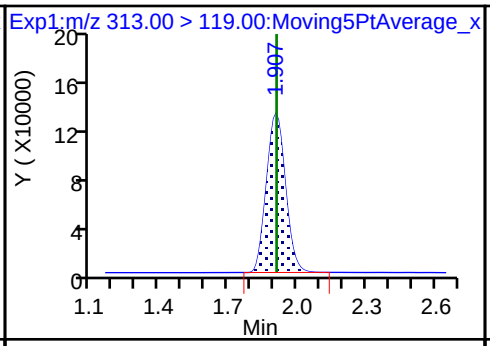
D 7 13C2 PFHxA



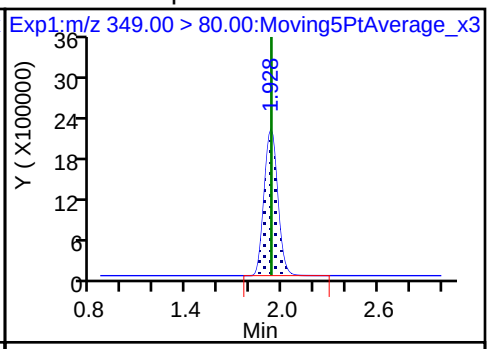
6 Perfluorohexanoic acid



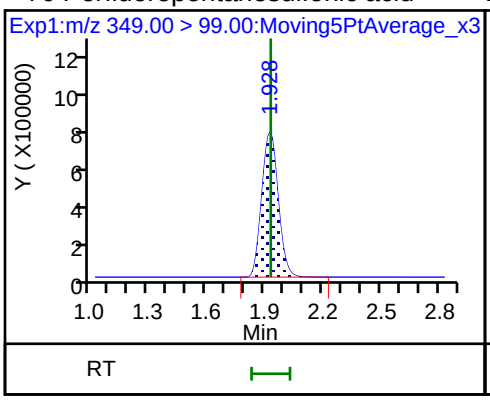
6 Perfluorohexanoic acid



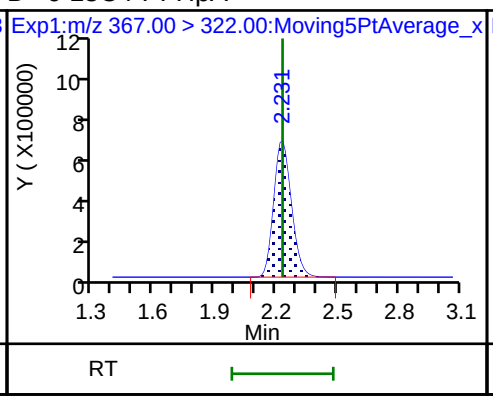
70 Perfluoropentanesulfonic acid



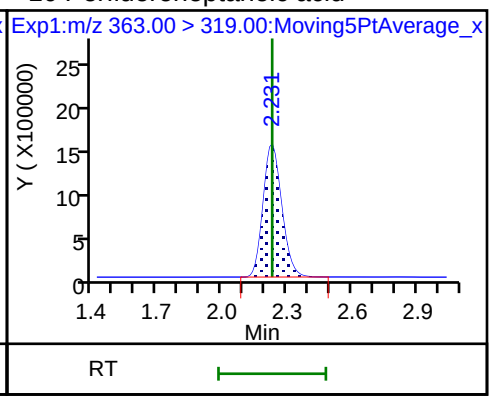
70 Perfluoropentanesulfonic acid



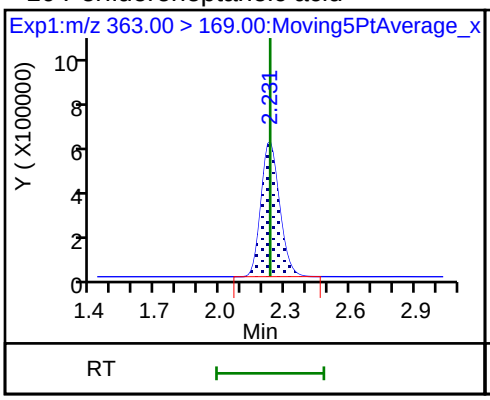
D 9 13C4-PFHpA



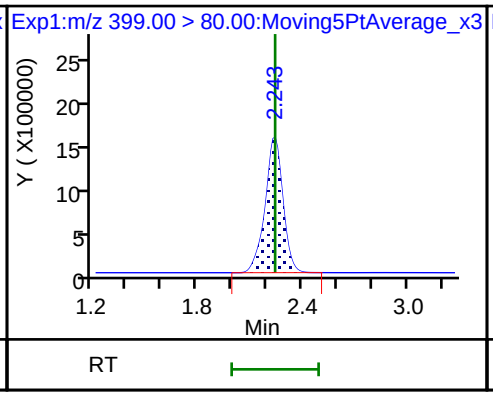
10 Perfluoroheptanoic acid



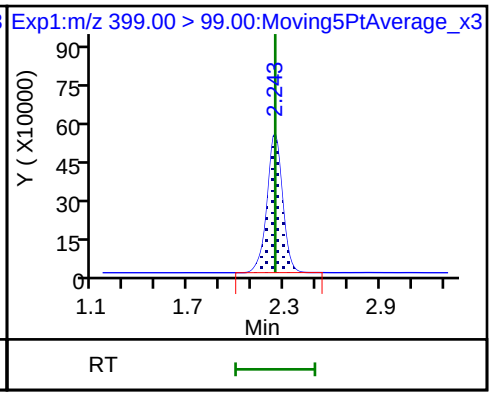
10 Perfluoroheptanoic acid



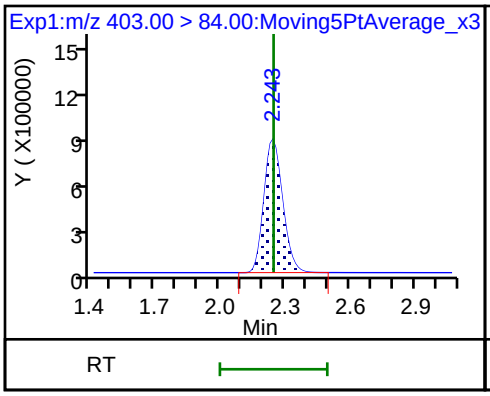
8 Perfluorohexanesulfonic acid



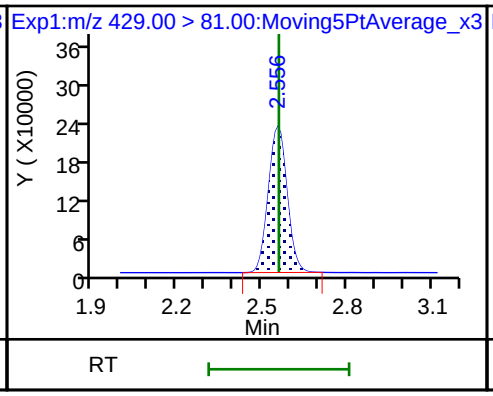
8 Perfluorohexanesulfonic acid



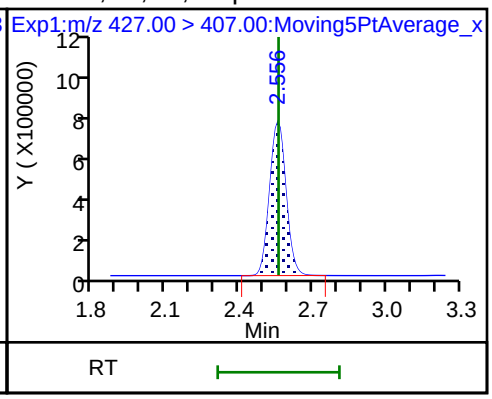
D 11 18O2 PFHxS



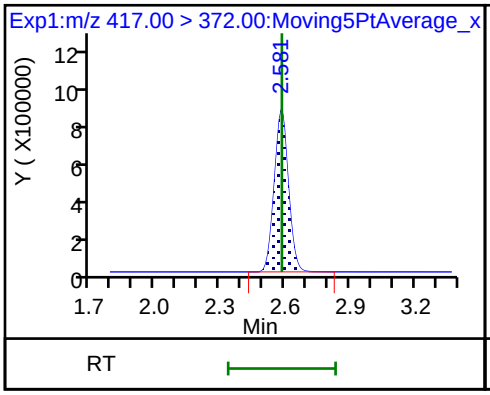
D 12 M2-6:2FTS



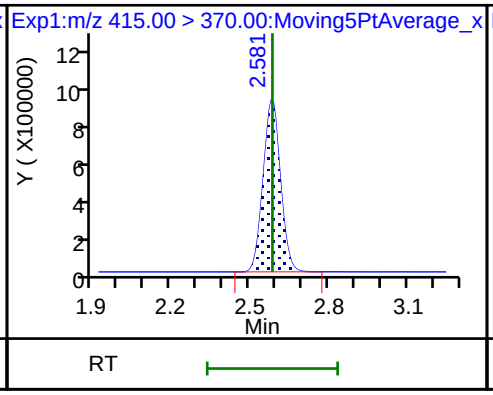
13 1H,1H,2H,2H-perfluorooctanesulfoni



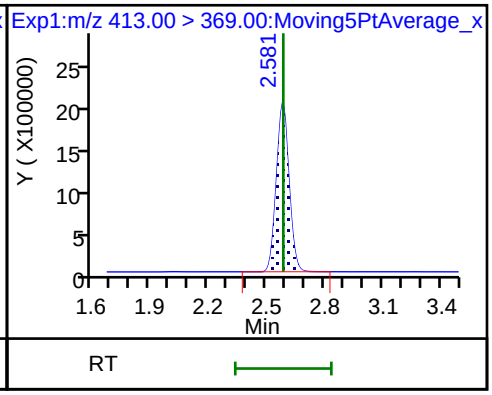
D 14 13C4 PFOA



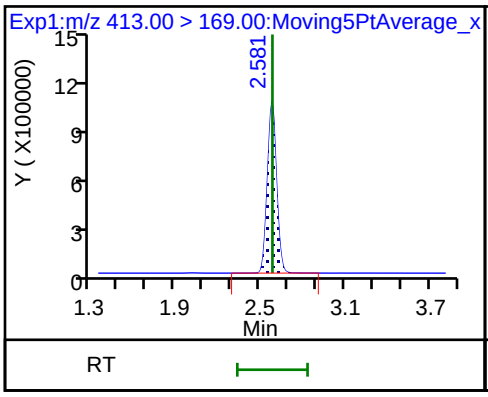
* 62 13C2-PFOA



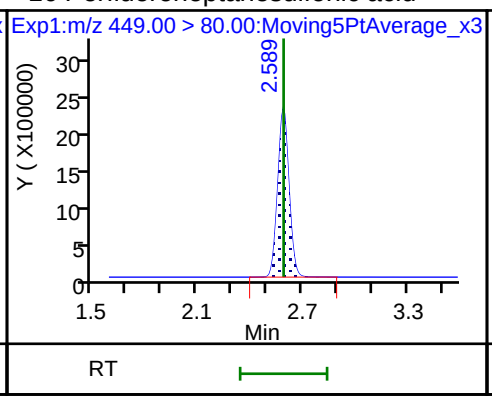
15 Perfluorooctanoic acid



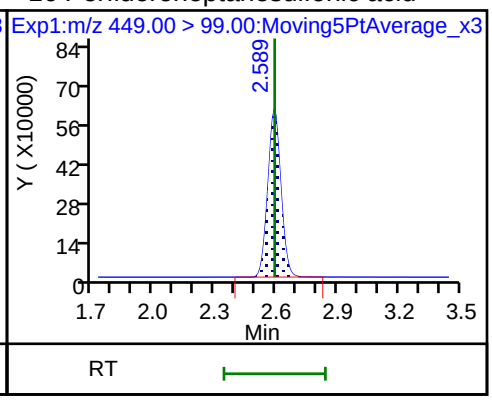
15 Perfluorooctanoic acid



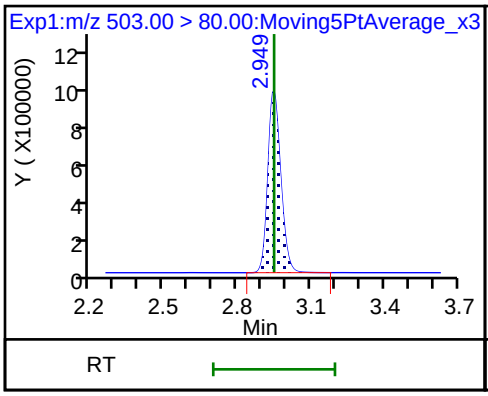
16 Perfluoroheptanesulfonic acid



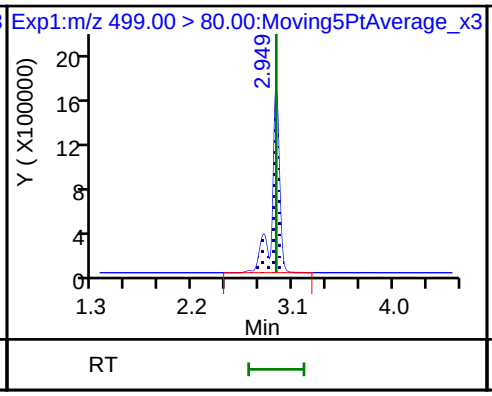
16 Perfluoroheptanesulfonic acid



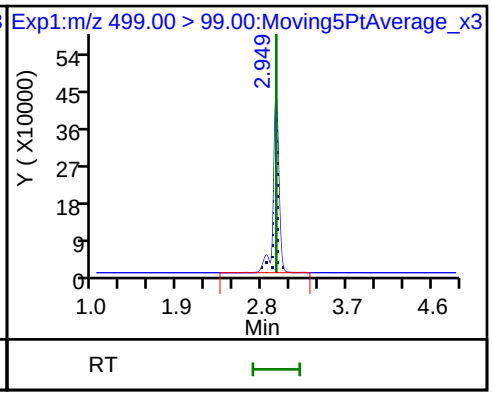
D 18 13C4 PFOS



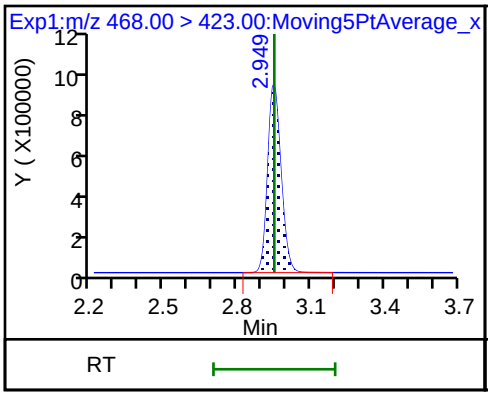
17 Perfluorooctane sulfonic acid



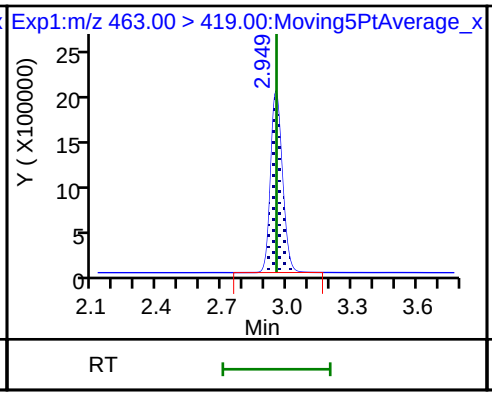
17 Perfluorooctane sulfonic acid



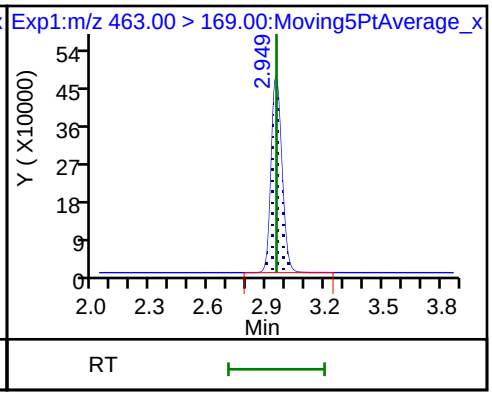
D 19 13C5 PFNA



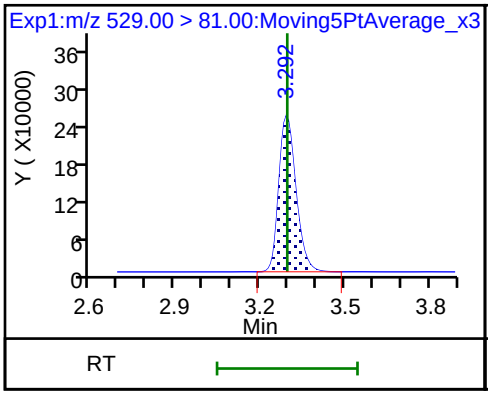
20 Perfluorononanoic acid



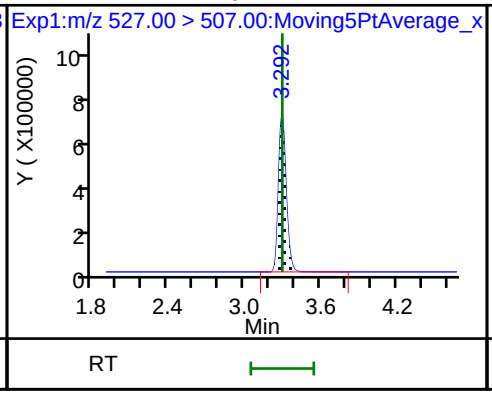
20 Perfluorononanoic acid



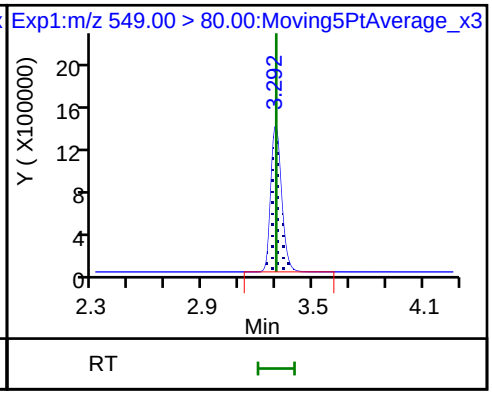
D 26 M2-8:2FTS



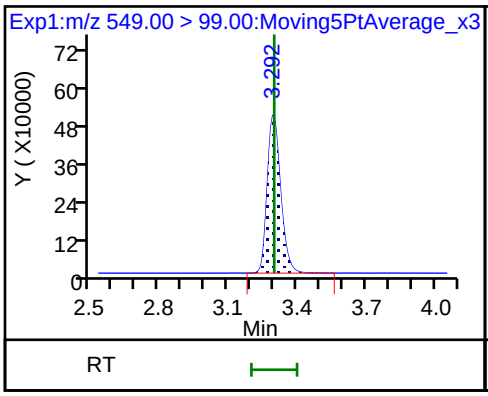
25 1H,1H,2H,2H-perfluorodecanesulfoni



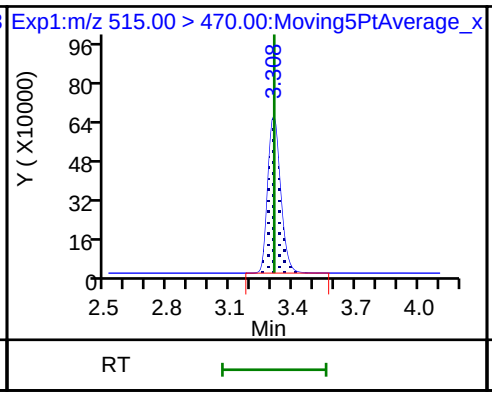
68 Perfluorononanesulfonic acid



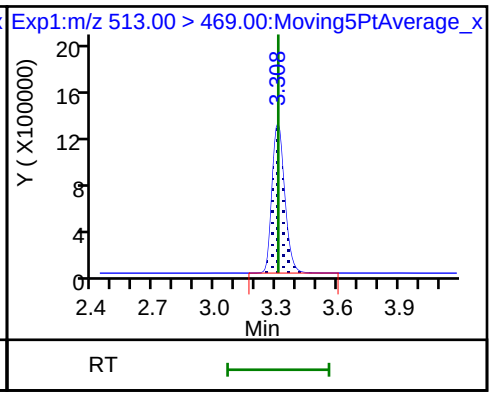
68 Perfluorononanesulfonic acid



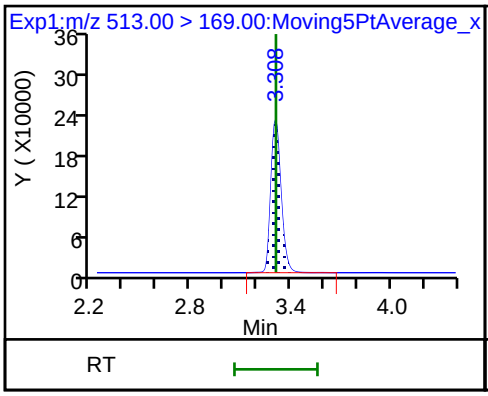
D 23 13C2 PFDA



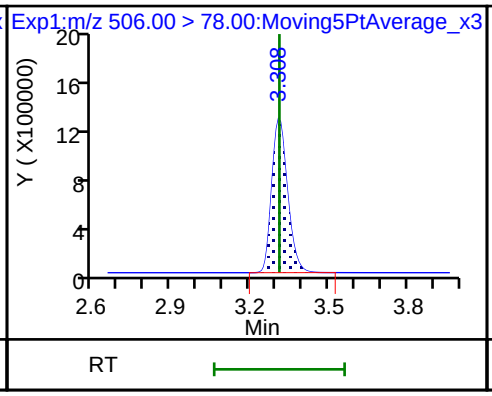
24 Perfluorodecanoic acid



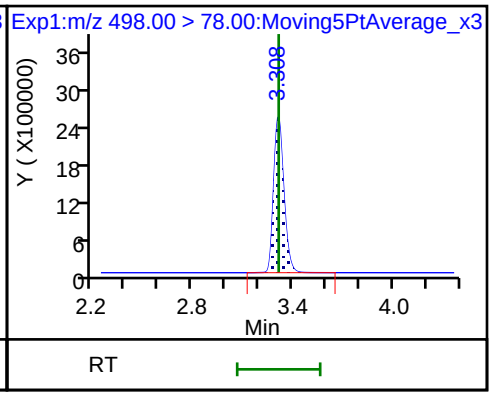
24 Perfluorodecanoic acid



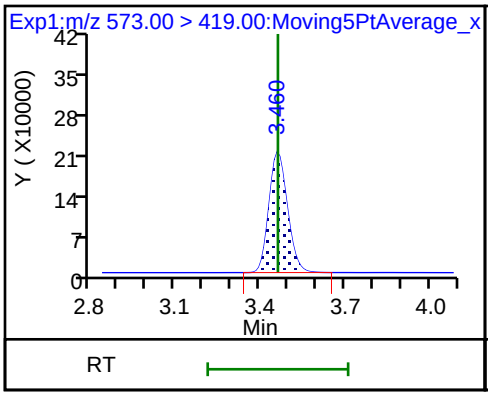
D 21 13C8 FOSA



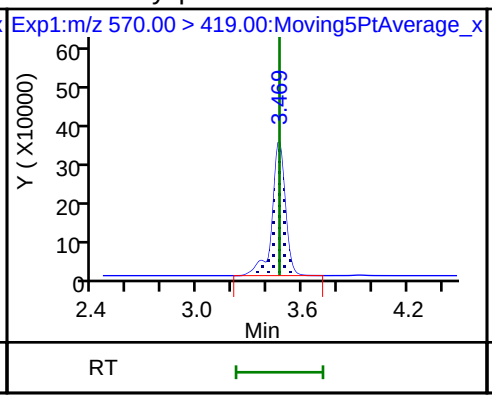
22 Perfluorooctane Sulfonamide



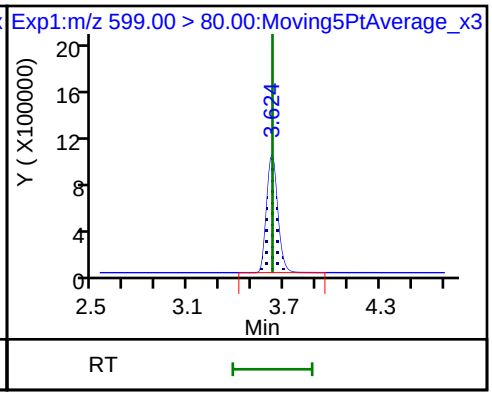
D 27 d3-NMeFOSAA



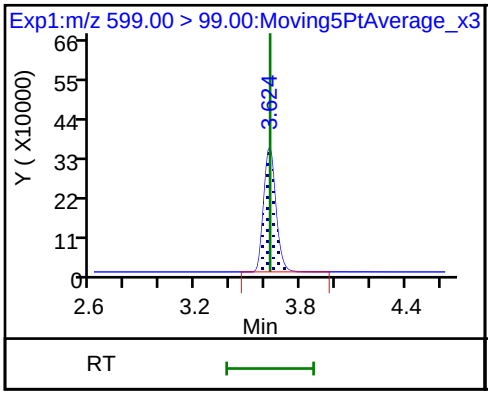
28 N-methyl perfluorooctane sulfonami



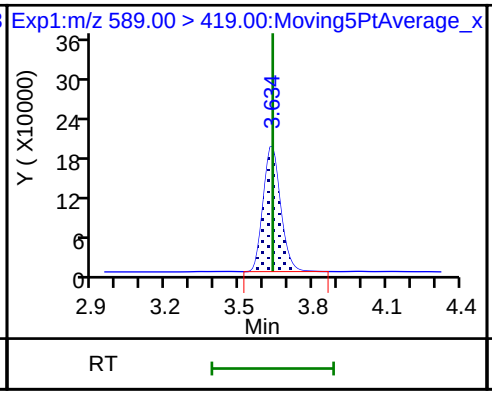
29 Perfluorodecane Sulfonic acid



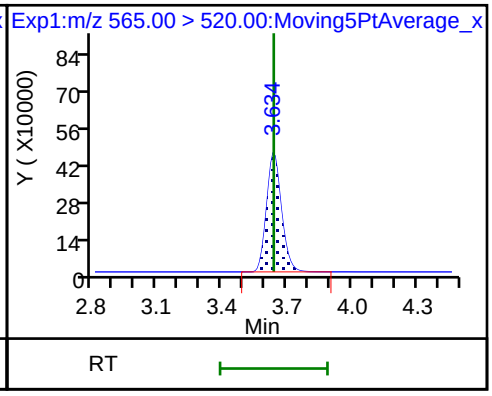
29 Perfluorodecane Sulfonic acid



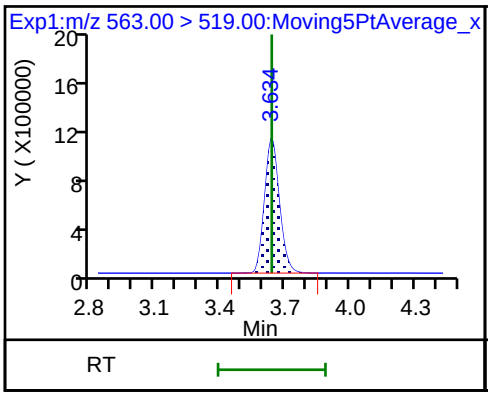
D 32 d5-NEtFOSAA



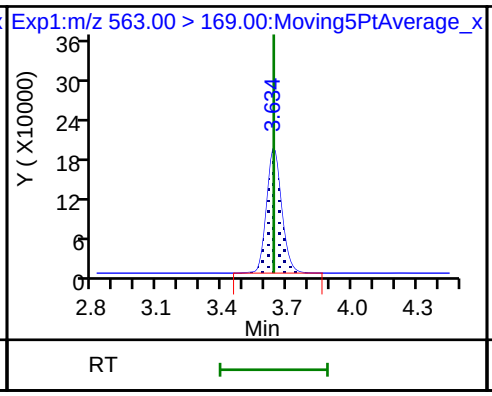
D 30 13C2 PFUnA



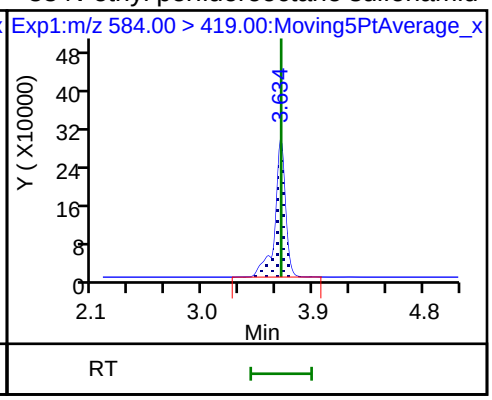
31 Perfluoroundecanoic acid



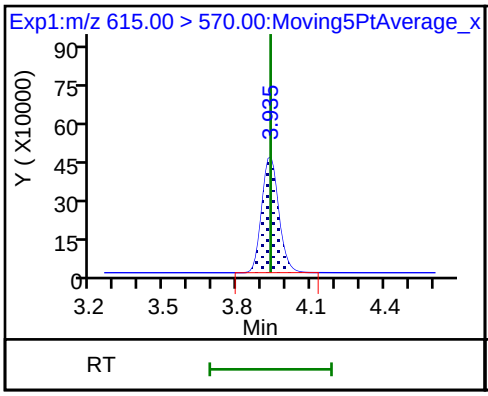
31 Perfluoroundecanoic acid



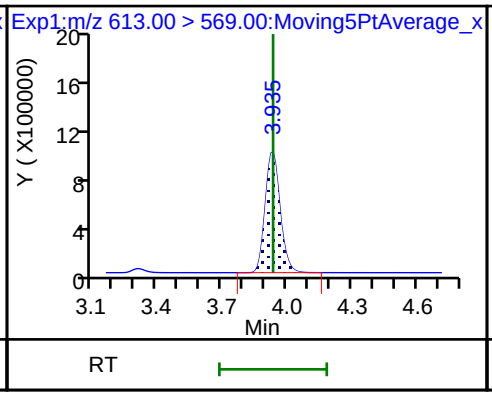
33 N-ethyl perfluorooctane sulfonamid



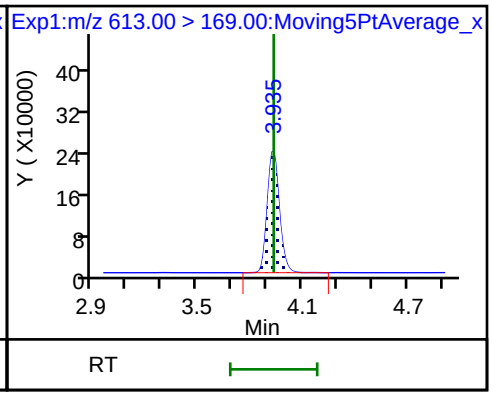
D 36 13C2 PFDoA



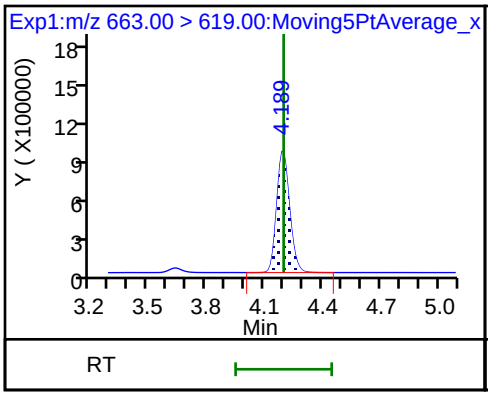
37 Perfluorododecanoic acid



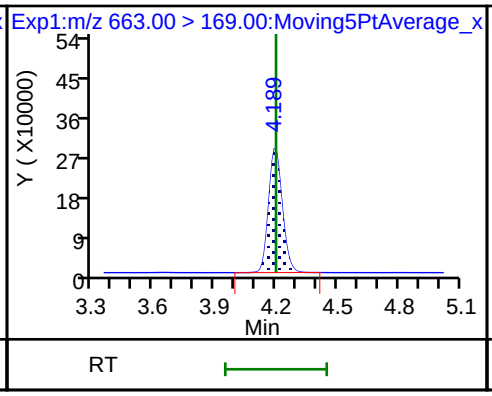
37 Perfluorododecanoic acid



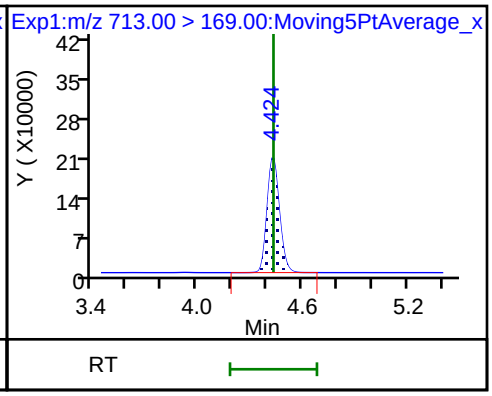
41 Perfluorotridecanoic acid



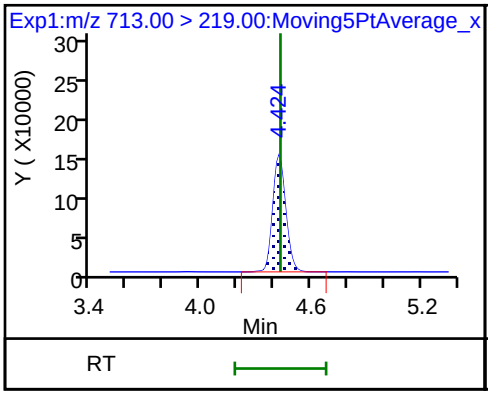
41 Perfluorotridecanoic acid



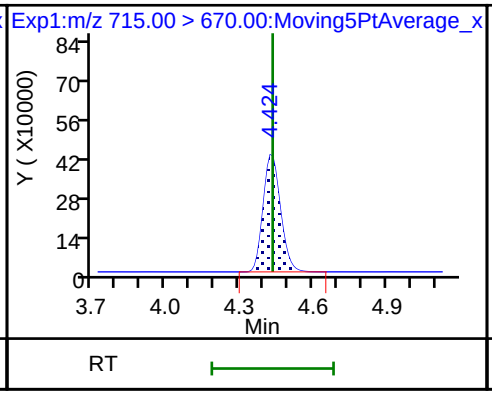
42 Perfluorotetradecanoic acid



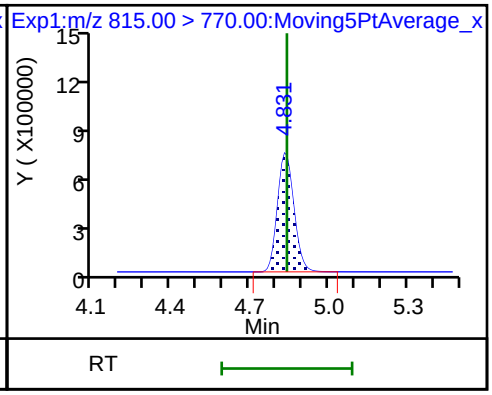
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 23-Jul-2018 16:58:07 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:48 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:10:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.541	4883197	2.79		112	74117	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	19339074	10.1		101	8639	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3306163	2.71		108	55915	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	15779261	9.97		99.7	7819	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	85519	2.67		115	606	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	23700645	8.12		91.8	6613	
298.90 > 99.00	1.667	1.672	-0.005	1.000	10527824		2.25(1.25-3.74)	91.8	6902	
D 60 M2-4:2FTS										
329.00 > 81.00	1.867	1.877	-0.010	0.723	543308	NC			6915	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.867	1.878	-0.011	1.120	5322216	8.46		90.6	135373	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.738	3805574	2.66		106	82676	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	15806374	9.80		98.0	39161	
313.00 > 119.00	1.907	1.909	-0.002	1.000	1445896		10.93(5.03-15.10)	98.0	25016	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	23253305	8.87		94.6	120505	
349.00 > 99.00	1.928	1.931	-0.003	1.157	9049105		2.57(1.36-4.07)	94.6	81619	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.004	2.006	-0.002	1.000	3047754	NC			14235	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.004	2.007	-0.003	0.776	216599	NC			7331	
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.230	0.0	0.864	3852411	2.61		104	64708	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	16928139	9.96		99.6	22205	
363.00 > 169.00	2.230	2.230	0.0	1.000	6609675		2.56(1.13-3.40)	99.6	40995	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.243	-0.001	1.000	21540736	8.70		95.6	27484	
399.00 > 99.00	2.242	2.243	-0.001	1.000	7460836		2.89(1.50-4.49)	95.6	19105	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.246	-0.004	0.868	5017633	2.65		112	59912	
65 ADONA										
377.00 > 251.00	2.268	2.272	-0.004	0.769	37856961	NC			120099	
377.00 > 85.00	2.268	2.272	-0.004	0.769	24058488		1.57(0.84-2.53)		98571	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.559	-0.002	0.990	931806	2.26		95.2	15530	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.559	-0.002	1.000	6471554	9.78		103	39315	
D 14 13C4 PFOA										
417.00 > 372.00	2.582	2.585	-0.003	1.000	3691370	2.56		102	62435	
* 62 13C2-PFOA										
415.00 > 370.00	2.582	2.585	-0.003		3773243	2.50			43682	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.582	2.586	-0.004	1.000	16840284	9.40		93.9	15773	
413.00 > 169.00	2.582	2.586	-0.004	1.000	8873683		1.90(0.84-2.52)	93.9	26145	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.590	2.591	-0.001	0.878	19142608	9.49		99.7	68445	
449.00 > 99.00	2.590	2.591	-0.001	0.878	5384787		3.55(1.94-5.82)	99.7	57339	
D 18 13C4 PFOS										
503.00 > 80.00	2.950	2.949	0.001	1.142	3486265	2.64		111	21820	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.950	2.949	0.001	1.000	15645792	9.71		105	34426	M
499.00 > 99.00	2.950	2.949	0.001	1.000	3521850		4.44(2.31-6.93)	105	46803	
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.950	0.0	1.142	3229889	2.59		104	53567	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.950	0.0	1.000	13514816	9.16		91.6	28592	
463.00 > 169.00	2.950	2.950	0.0	1.000	3446513		3.92(1.90-5.69)	91.6	50824	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.167	3.161	0.006	1.074	23659481	NC			133174	
D 26 M2-8:2FTS										
529.00 > 81.00	3.294	3.296	-0.002	1.276	937942	2.18		91.1	13574	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.294	3.297	-0.003	1.000	5115198	9.63		101	91326	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.302	3.299	0.003	1.119	11005221	10.1		105	87745	
549.00 > 99.00	3.302	3.299	0.003	1.119	3984151		2.76(1.33-3.97)	105	32796	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.310	3.309	0.001	1.282	2361487	2.38		95.3	42924	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.310	3.309	0.001	1.000	10269789	10.6		106	29870	
513.00 > 169.00	3.310	3.309	0.001	1.000	1743088		5.89(2.36-7.09)	106	40828	
D 21 13C8 FOSA										
506.00 > 78.00	3.318	3.311	0.007	1.285	4984298	2.57		103	53760	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.318	3.314	0.004	1.000	18761965	9.46		94.6	91120	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.462	3.462	0.0	1.341	925765	2.83		113	20240	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.471	3.468	0.003	1.003	3756042	10.3		103	29997	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.626	3.625	0.001	1.229	9597480	9.92		103	252971	
599.00 > 99.00	3.626	3.625	0.001	1.229	3379796		2.84(1.39-4.16)	103	64746	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.636	3.635	0.001	1.408	863349	2.51		100	3181	
D 30 13C2 PFUnA										
565.00 > 520.00	3.645	3.638	0.007	1.412	1966864	2.46		98.6	33851	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.645	3.638	0.007	1.000	9129849	9.35		93.5	42074	
563.00 > 169.00	3.645	3.638	0.007	1.000	1642596		5.56(2.12-6.36)	93.5	30551	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.645	3.639	0.006	1.003	3306623	10.3		103	23838	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.801	3.800	0.001	1.289	31515141	NC			102018	
D 36 13C2 PFDoA										
615.00 > 570.00	3.937	3.934	0.003	1.525	2040247	2.69		108	16383	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.937	3.934	0.003	1.000	8523366	9.65		96.5	3349	
613.00 > 169.00	3.937	3.934	0.003	1.000	2187217		3.90(2.13-6.40)	96.5	26960	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.201	4.198	0.003	1.067	8285433	9.67		96.7	3071	
663.00 > 169.00	4.201	4.198	0.003	1.067	2580205		3.21(1.25-3.76)	96.7	20537	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.436	4.433	0.003	1.000	2071202	9.97		99.7	21230	
713.00 > 219.00	4.426	4.433	-0.007	0.998	1466098		1.41(0.71-2.13)	99.7	15704	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.435	0.001	1.718	2071078	2.79		112	11010	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.840	0.002	1.875	3019605	2.68		107	11551	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.840	0.002	1.000	11414316	NC			1711	
813.00 > 169.00	4.842	4.840	0.002	1.000	1927769		5.92(2.86-8.58)		14501	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.188	5.184	0.004	1.072	11894774	NC			2277	
913.00 > 169.00	5.181	5.184	-0.003	1.070	1498604		7.94(3.83-11.48)		10703	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL7_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Injection Date: 23-Jul-2018 16:58:07 Instrument ID: A8_N

Lims ID: IC L7 Full

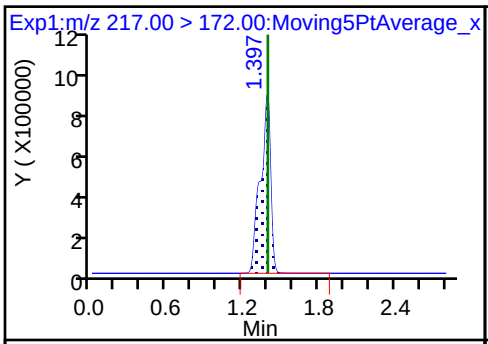
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

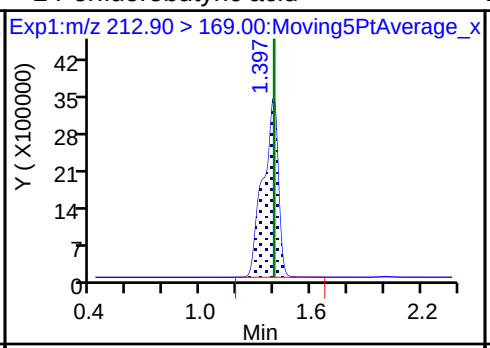
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



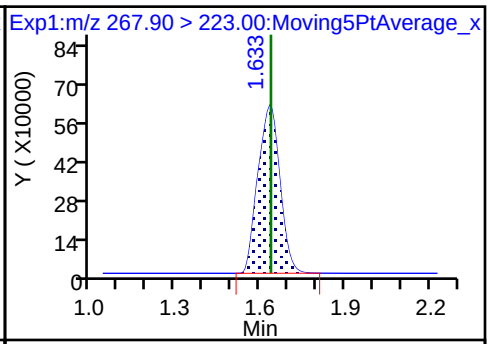
RT

2 Perfluorobutyric acid



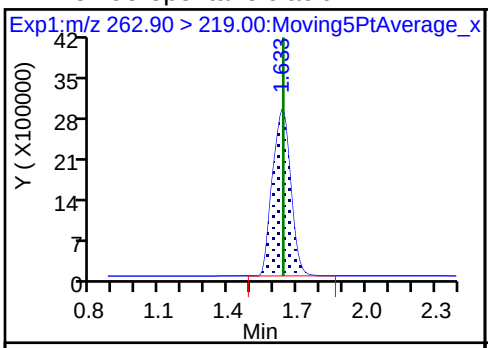
RT

D 3 13C5-PFPeA



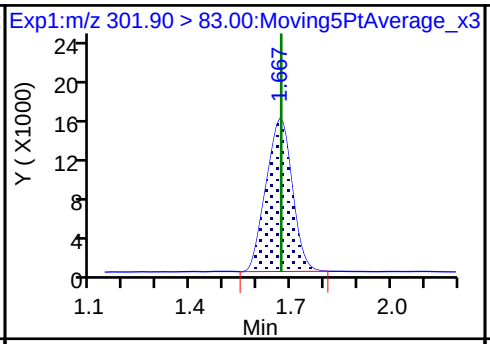
RT

4 Perfluoropentanoic acid



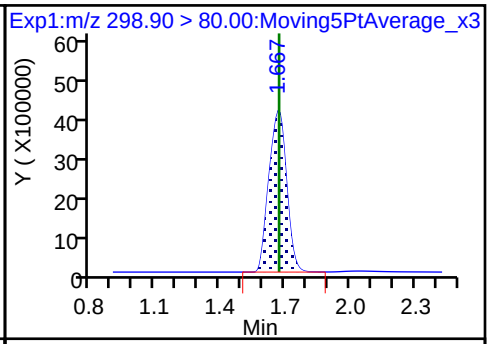
RT

D 47 13C3-PFBS



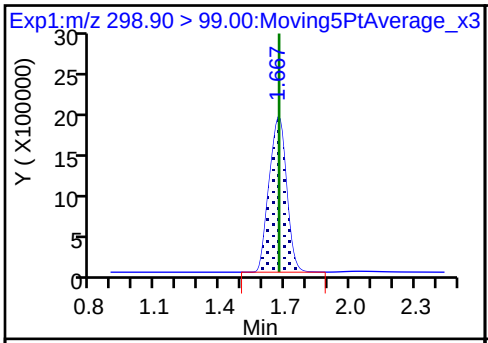
RT

5 Perfluorobutanesulfonic acid



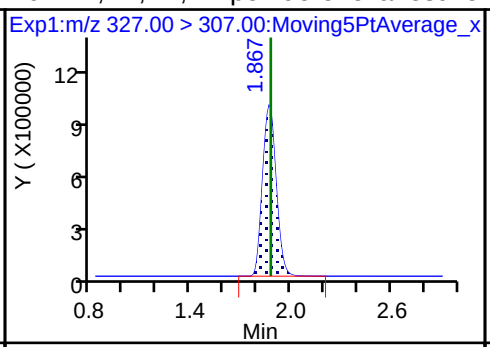
RT

5 Perfluorobutanesulfonic acid



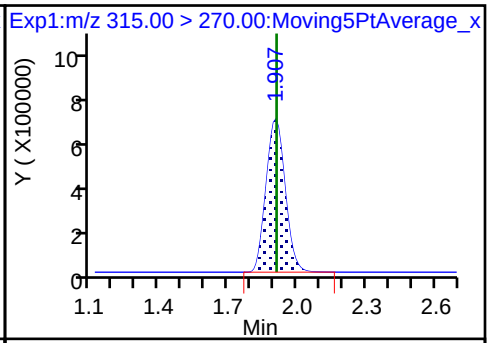
RT

61 1H,1H,2H,2H-perfluorohexanesulfon



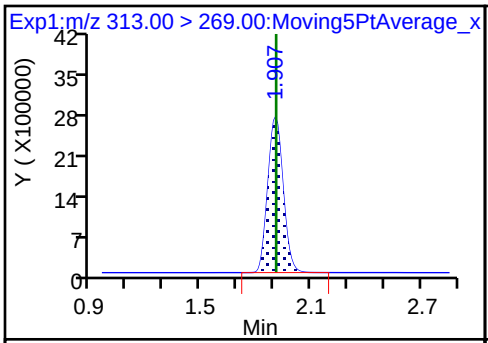
RT

D 7 13C2 PFHxA



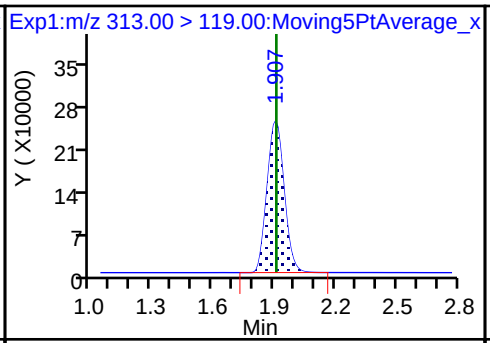
RT

6 Perfluorohexanoic acid



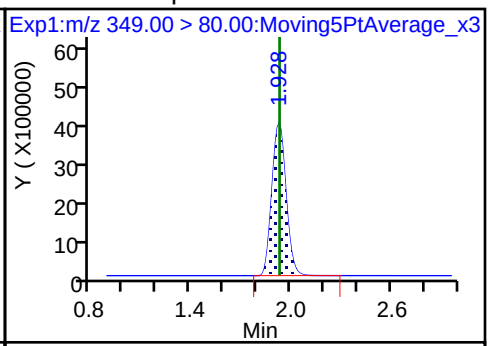
RT

6 Perfluorohexanoic acid



RT

70 Perfluoropentanesulfonic acid



RT

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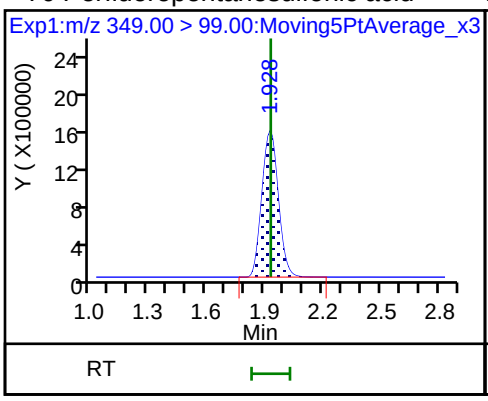
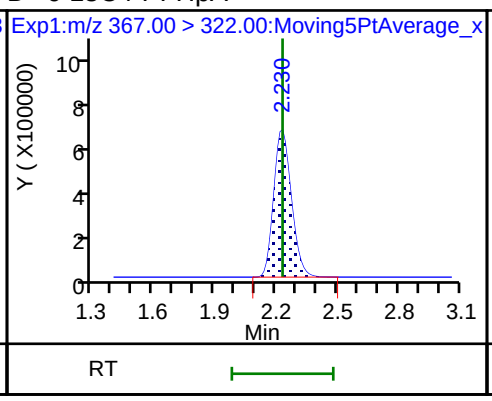
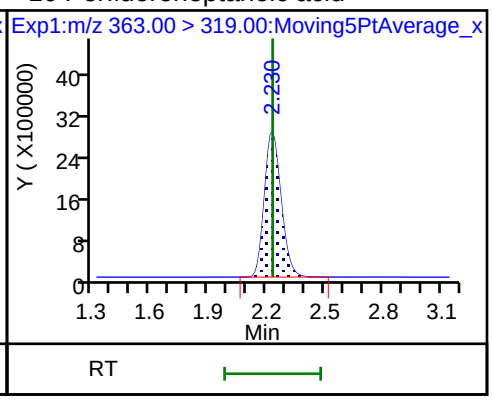


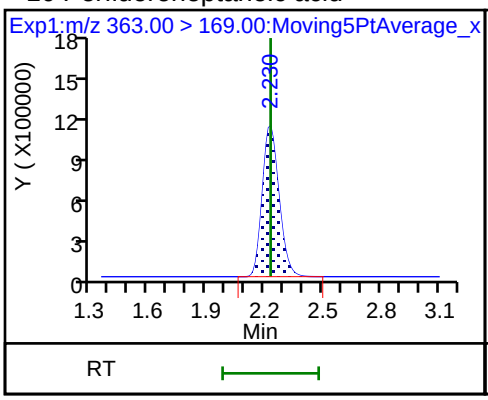
D 9 13C4-PFHpA



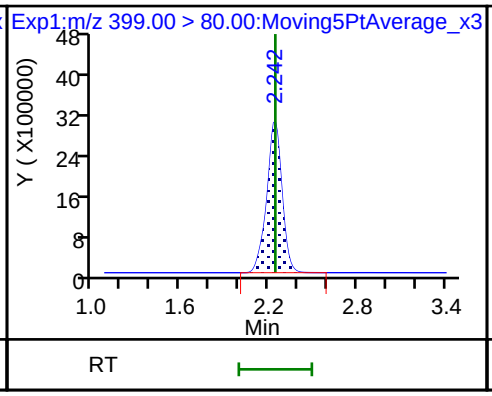
10 Perfluoroheptanoic acid



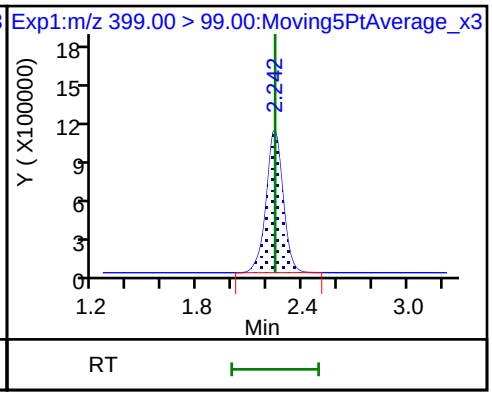
10 Perfluoroheptanoic acid



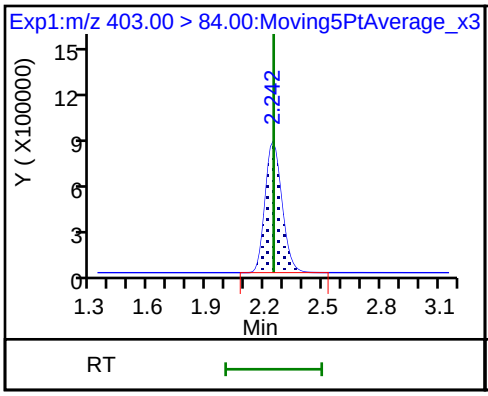
8 Perfluorohexanesulfonic acid



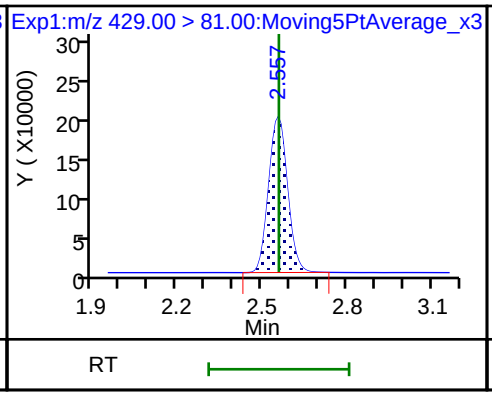
8 Perfluorohexanesulfonic acid



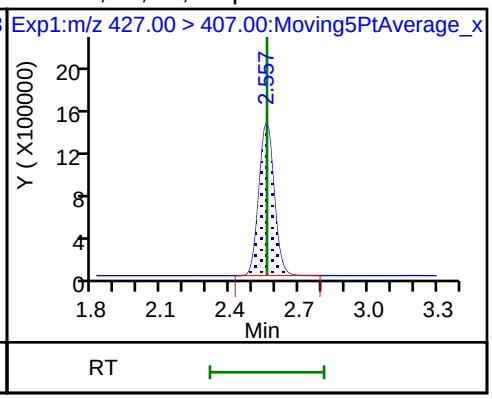
D 11 18O2 PFHxS



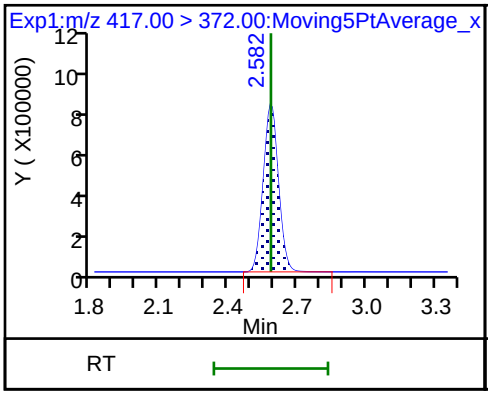
D 12 M2-6:2FTS



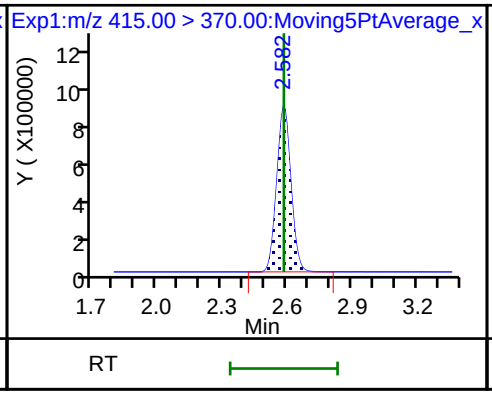
13 1H,1H,2H,2H-perfluorooctanesulfoni



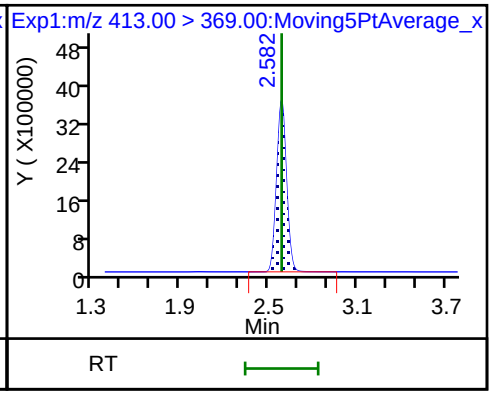
D 14 13C4 PFOA



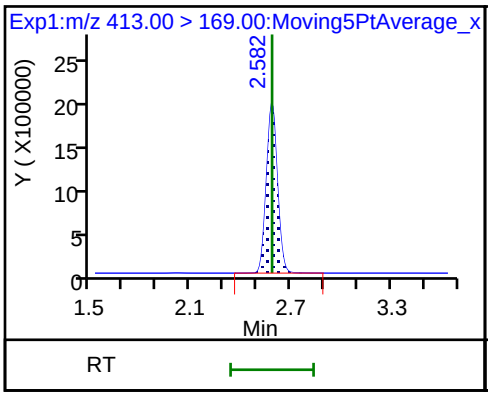
* 62 13C2-PFOA



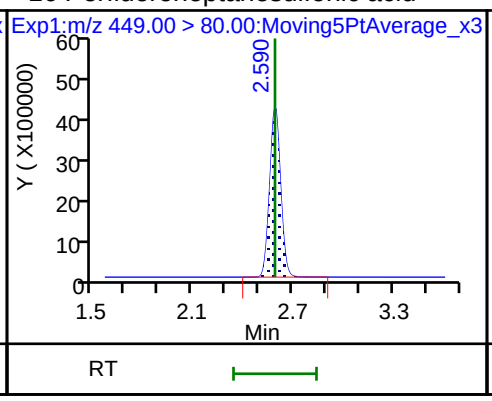
15 Perfluorooctanoic acid



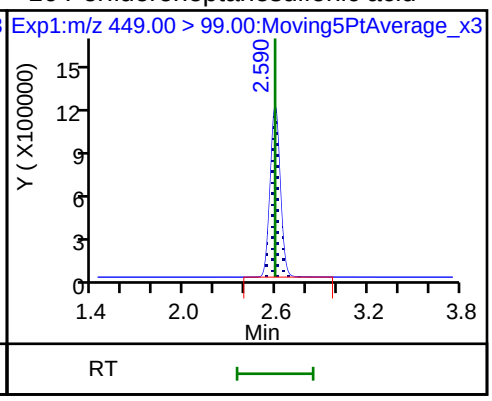
15 Perfluorooctanoic acid



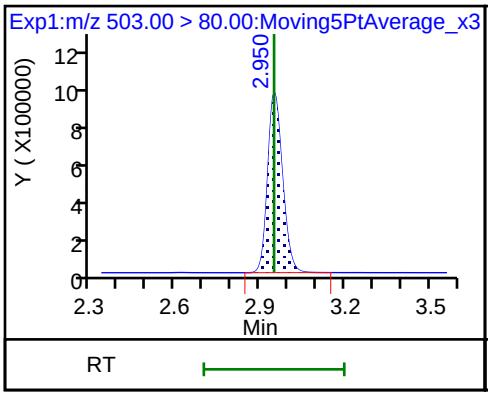
16 Perfluoroheptanesulfonic acid



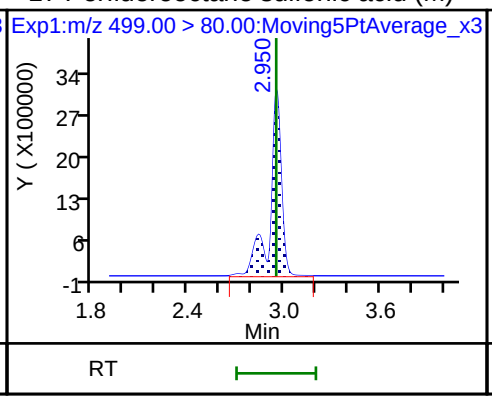
16 Perfluoroheptanesulfonic acid



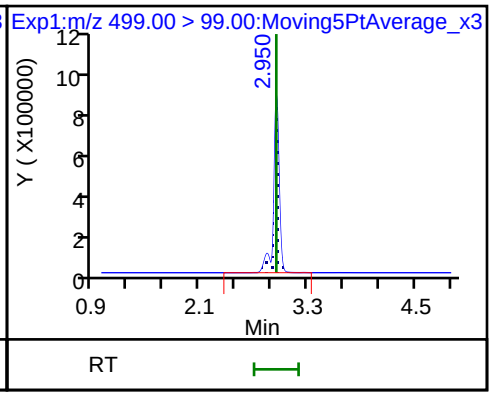
D 18 13C4 PFOS



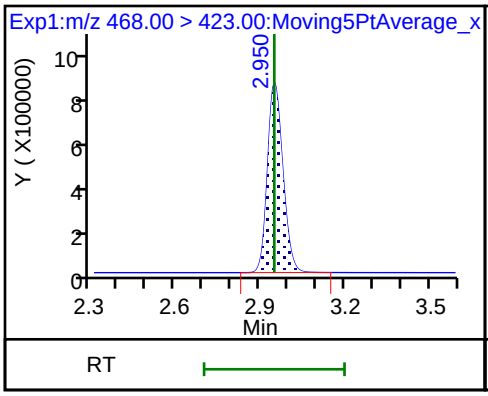
17 Perfluorooctane sulfonic acid (M)



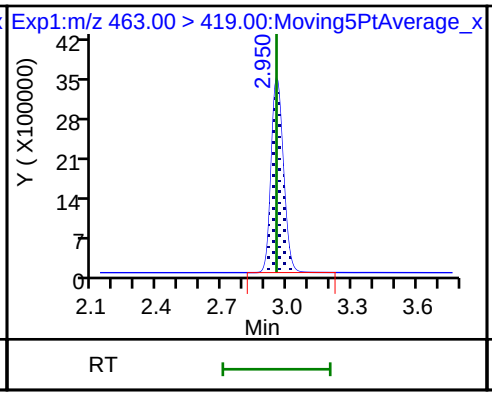
17 Perfluorooctane sulfonic acid



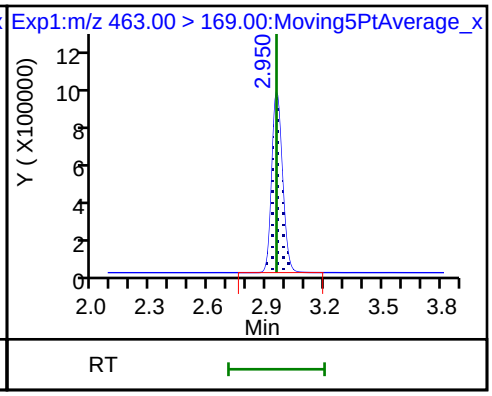
D 19 13C5 PFNA



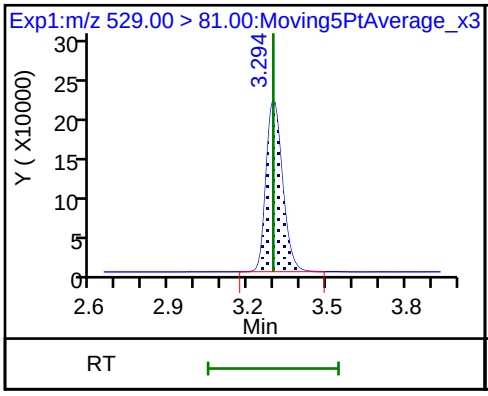
20 Perfluorononanoic acid



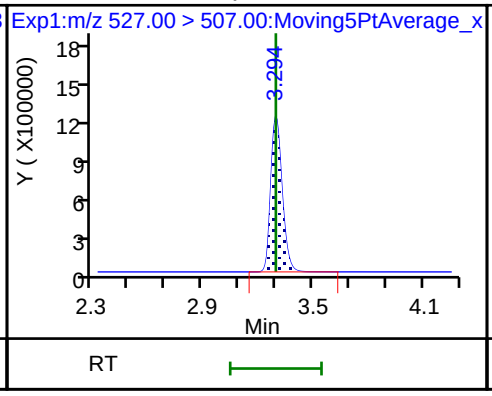
20 Perfluorononanoic acid



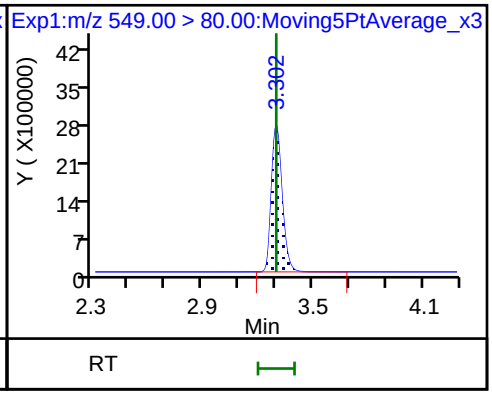
D 26 M2-8:2FTS



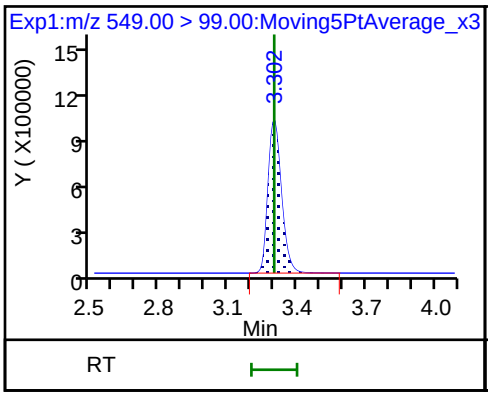
25 1H,1H,2H,2H-perfluorodecanesulfoni



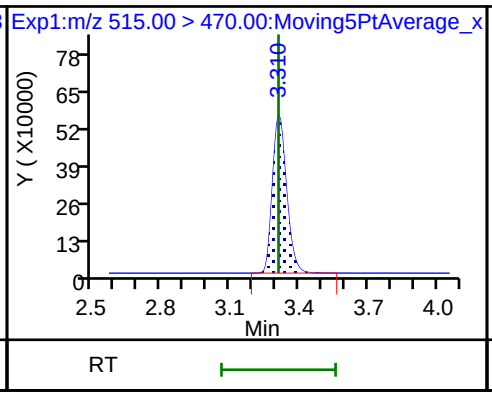
68 Perfluorononanesulfonic acid



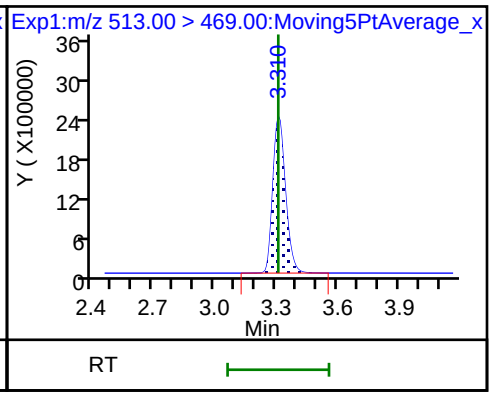
68 Perfluorononanesulfonic acid



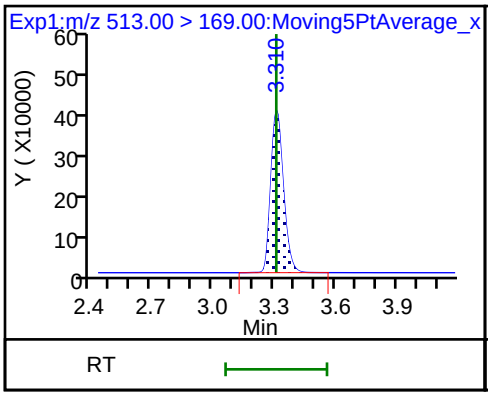
D 23 13C2 PFDA



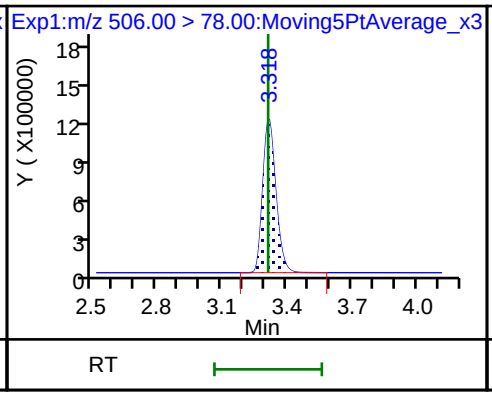
24 Perfluorodecanoic acid



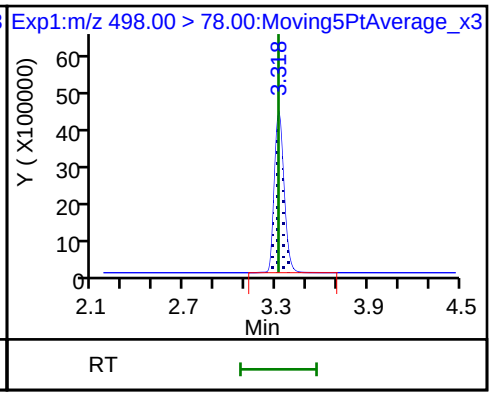
24 Perfluorodecanoic acid



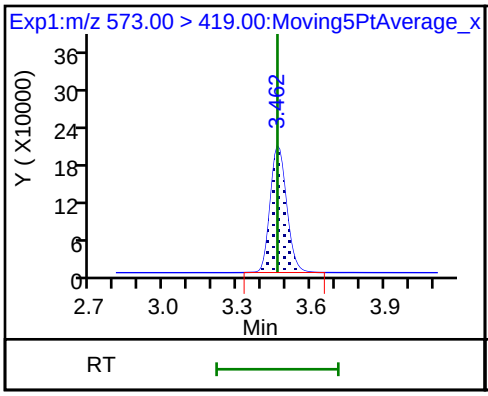
D 21 13C8 FOSA



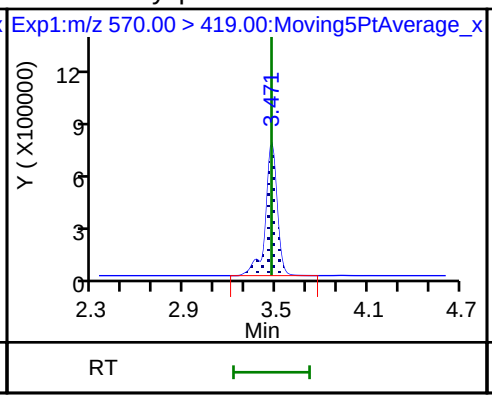
22 Perfluorooctane Sulfonamide



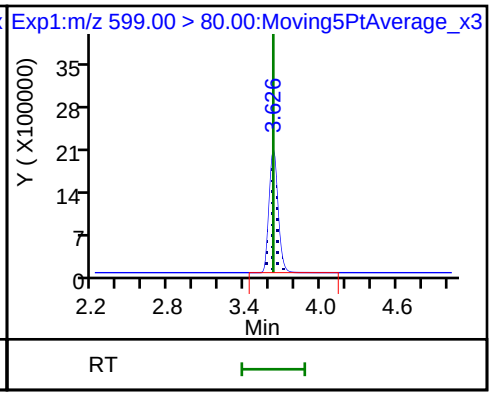
D 27 d3-NMeFOSAA



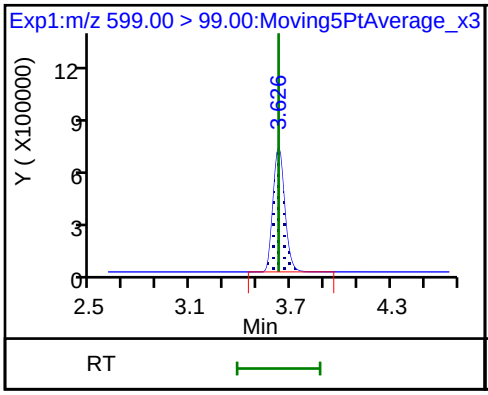
28 N-methyl perfluorooctane sulfonami



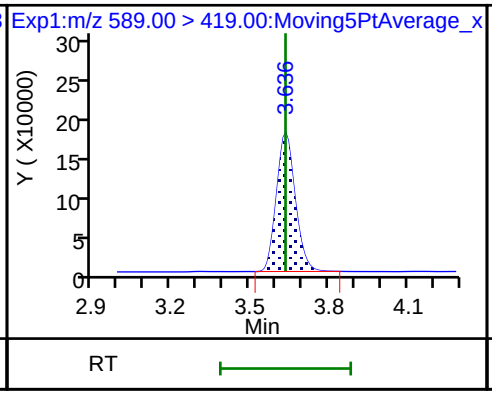
29 Perfluorodecane Sulfonic acid



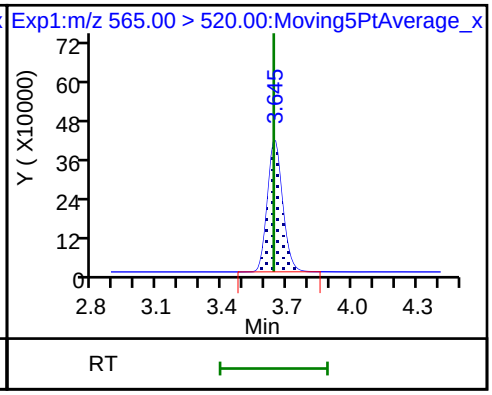
29 Perfluorodecane Sulfonic acid



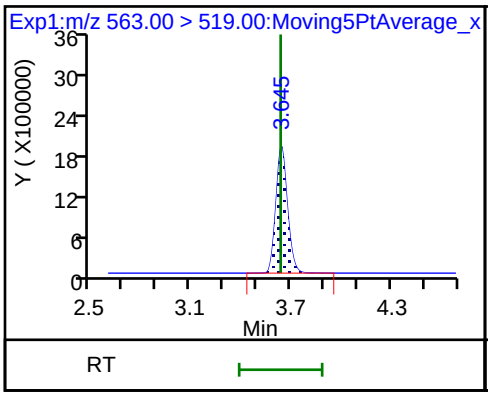
D 32 d5-NEtFOSAA



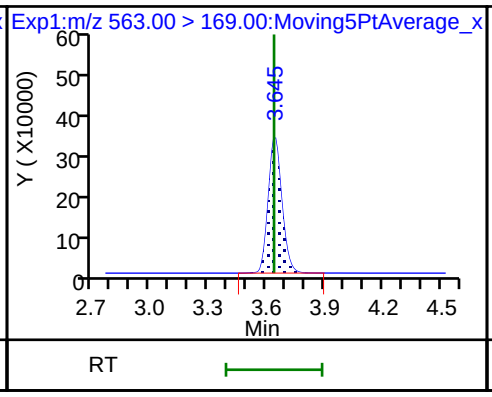
D 30 13C2 PFUnA



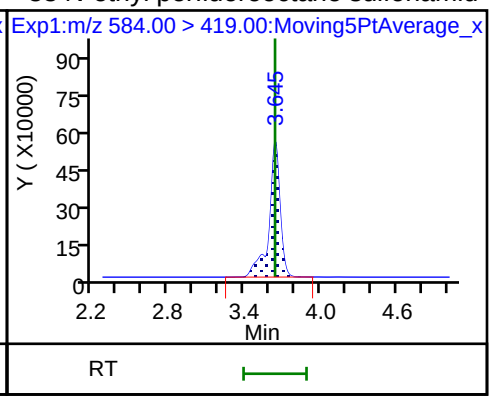
31 Perfluoroundecanoic acid



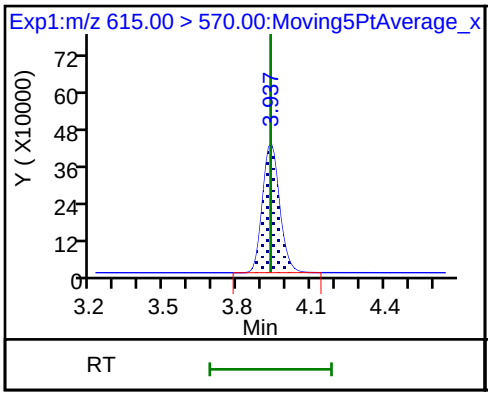
31 Perfluoroundecanoic acid



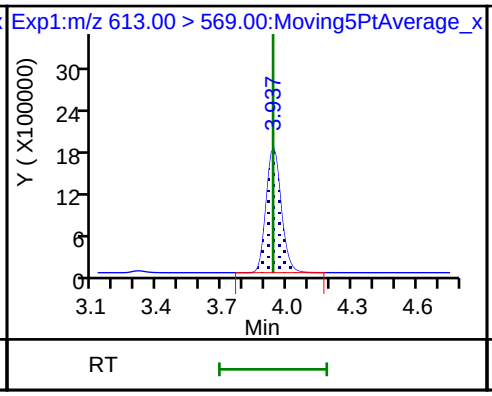
33 N-ethyl perfluorooctane sulfonamid



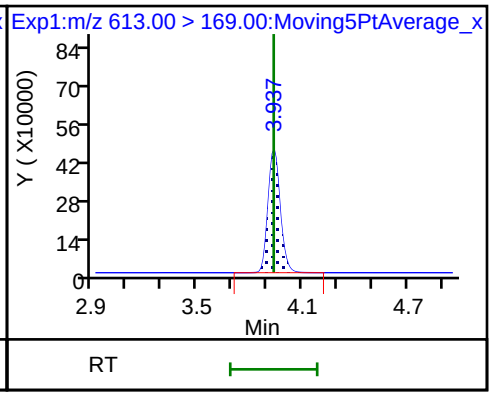
D 36 13C2 PFDoA



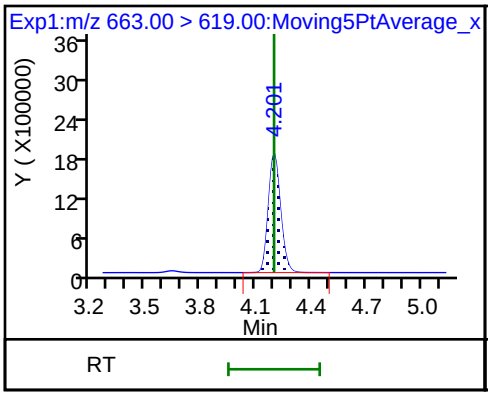
37 Perfluorododecanoic acid



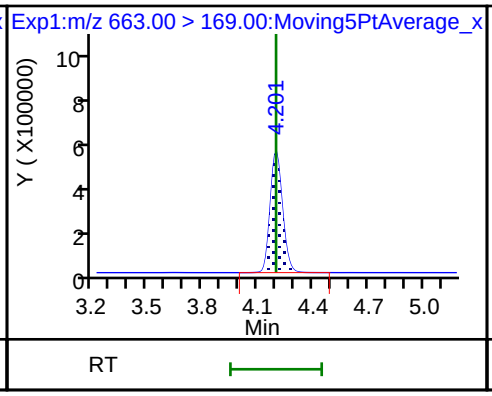
37 Perfluorododecanoic acid



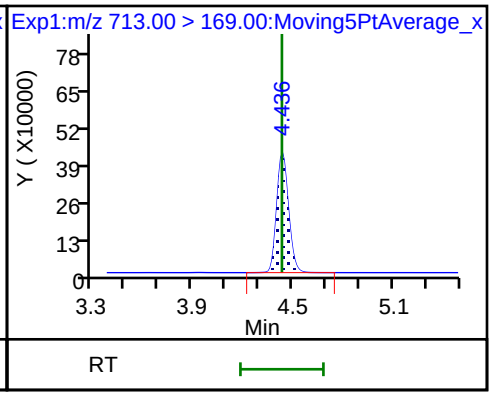
41 Perfluorotridecanoic acid



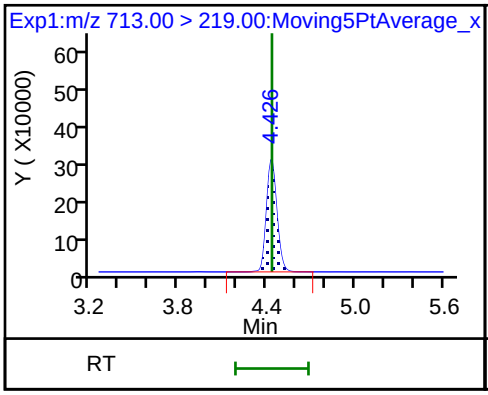
41 Perfluorotridecanoic acid



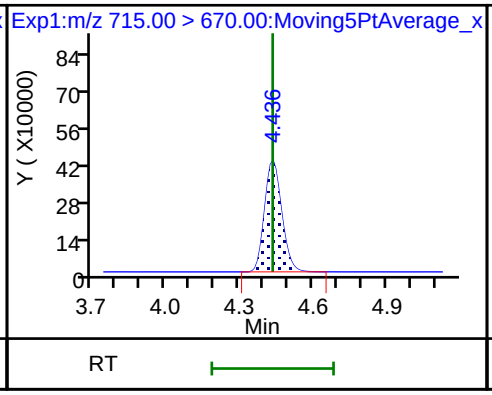
42 Perfluorotetradecanoic acid



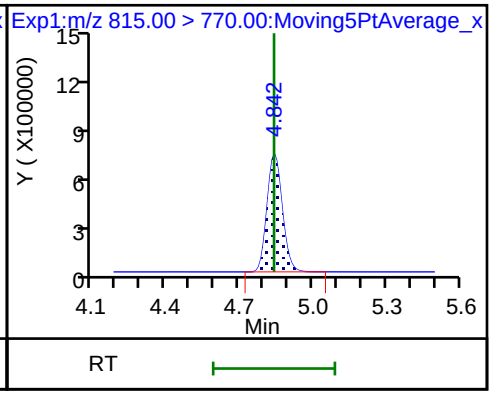
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

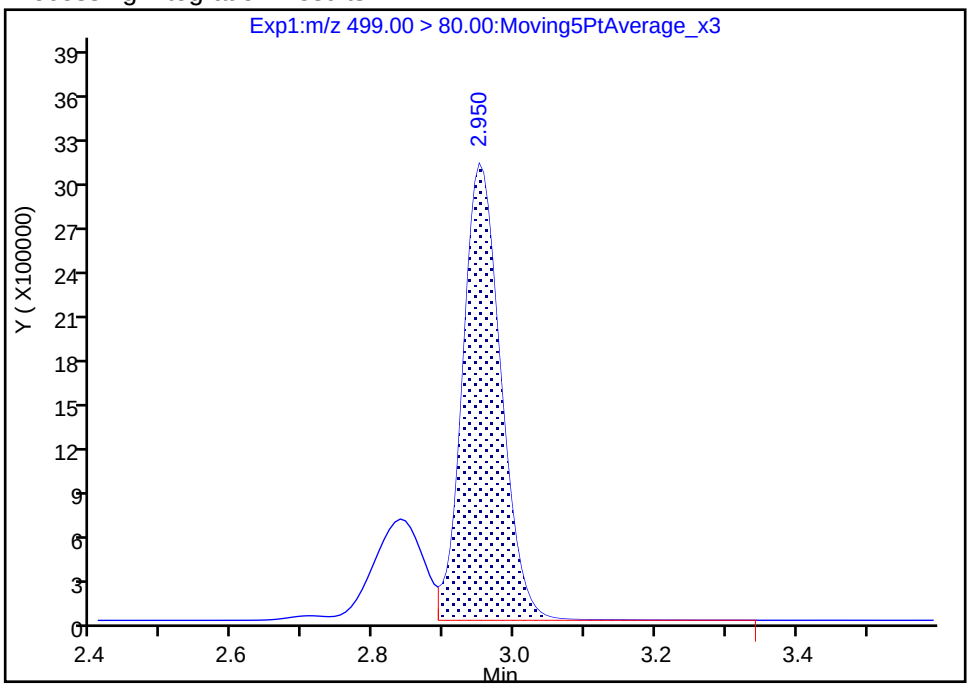
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d				
Injection Date:	23-Jul-2018 16:58:07	Instrument ID:	A8_N		
Lims ID:	IC L7 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	16	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

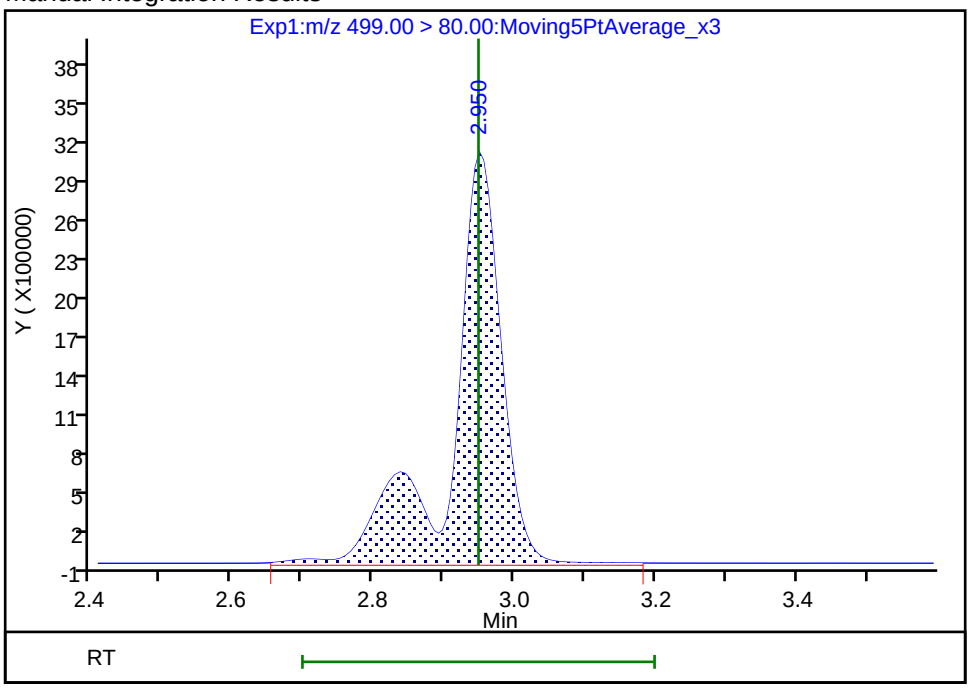
Processing Integration Results

RT: 2.95
Area: 11689609
Amount: 7.537173
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 15645792
Amount: 9.706854
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 17:10:20

Audit Action: Manually Integrated Audit Reason: Isomers

Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

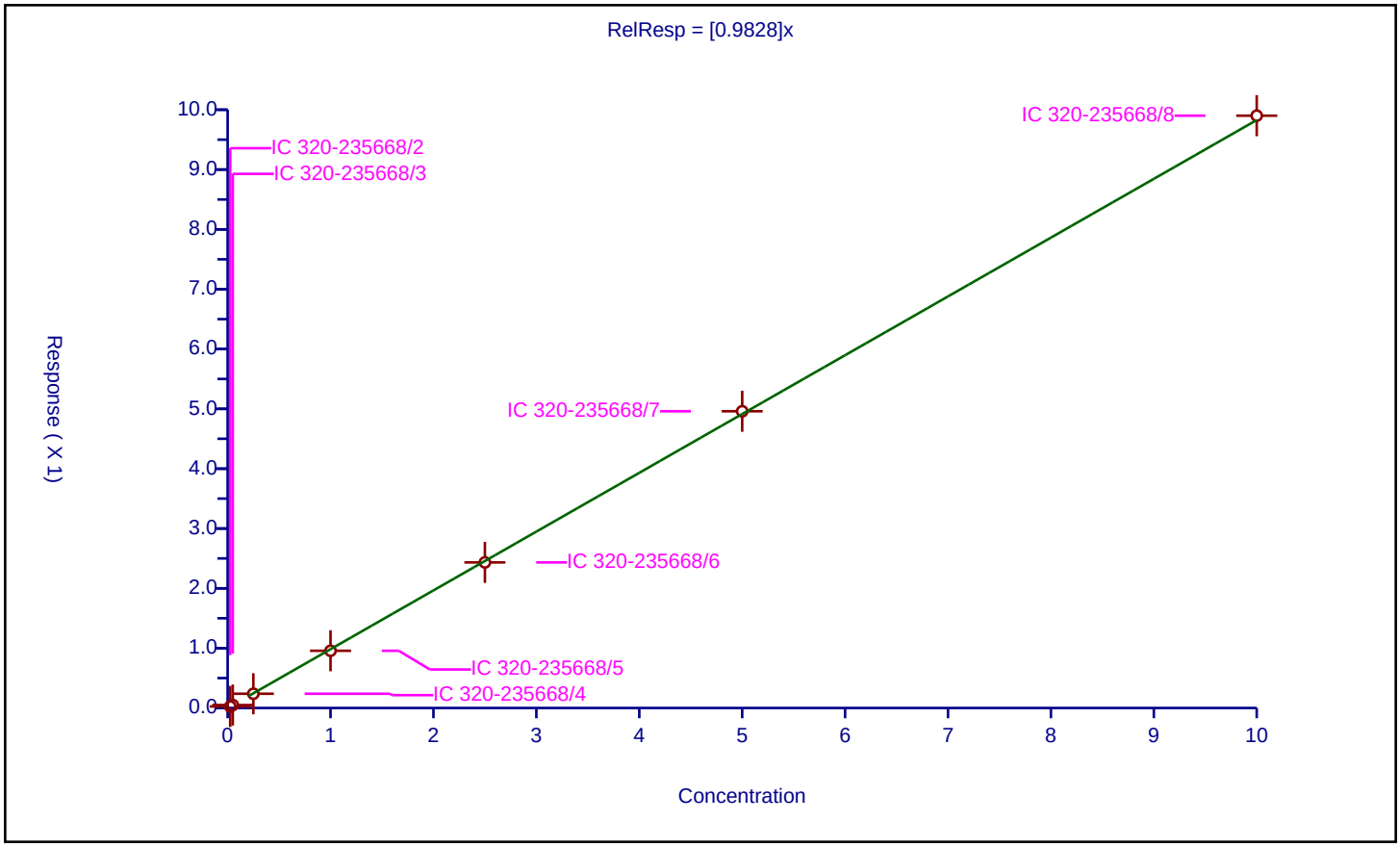
Curve Coefficients

Intercept:	0
Slope:	0.9828

Error Coefficients

Standard Error:	9130000
Relative Standard Error:	2.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.025663	2.5	5325082.0	1.026501	Y
2	IC 320-235668/3	0.05	0.049377	2.5	5106874.0	0.987541	Y
3	IC 320-235668/4	0.25	0.23839	2.5	5102046.0	0.953561	Y
4	IC 320-235668/5	1.0	0.95629	2.5	5085441.0	0.95629	Y
5	IC 320-235668/6	2.5	2.433601	2.5	5130909.0	0.97344	Y
6	IC 320-235668/7	5.0	4.959935	2.5	4957611.0	0.991987	Y
7	IC 320-235668/8	10.0	9.900826	2.5	4883197.0	0.990083	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

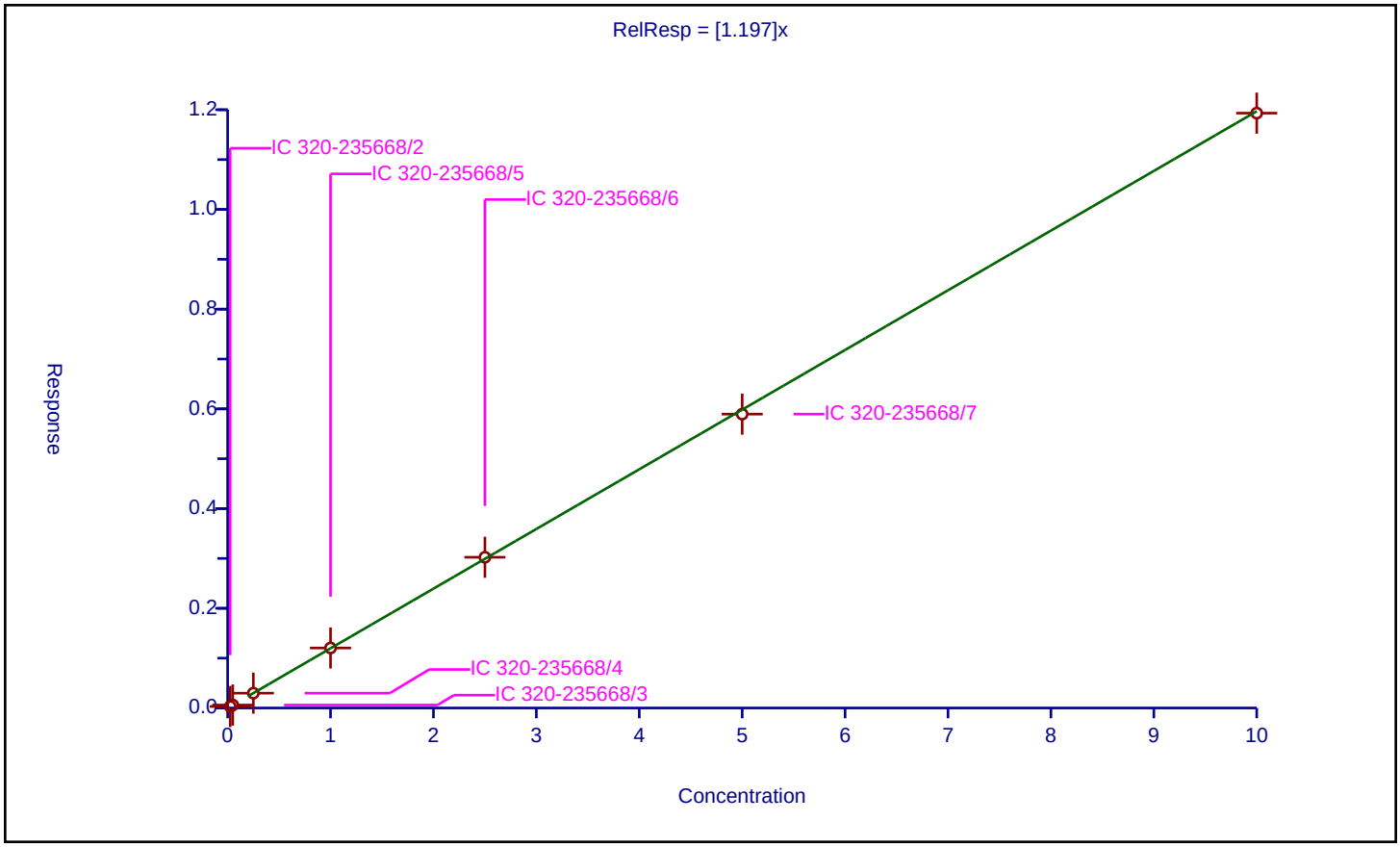
Curve Coefficients

Intercept:	0
Slope:	1.197

Error Coefficients

Standard Error:	7460000
Relative Standard Error:	0.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.030198	2.5	3721474.0	1.207908	Y
2	IC 320-235668/3	0.05	0.059698	2.5	3669835.0	1.19395	Y
3	IC 320-235668/4	0.25	0.297794	2.5	3690862.0	1.191177	Y
4	IC 320-235668/5	1.0	1.204027	2.5	3595441.0	1.204027	Y
5	IC 320-235668/6	2.5	3.0232	2.5	3531229.0	1.20928	Y
6	IC 320-235668/7	5.0	5.894669	2.5	3369200.0	1.178934	Y
7	IC 320-235668/8	10.0	11.931702	2.5	3306163.0	1.19317	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

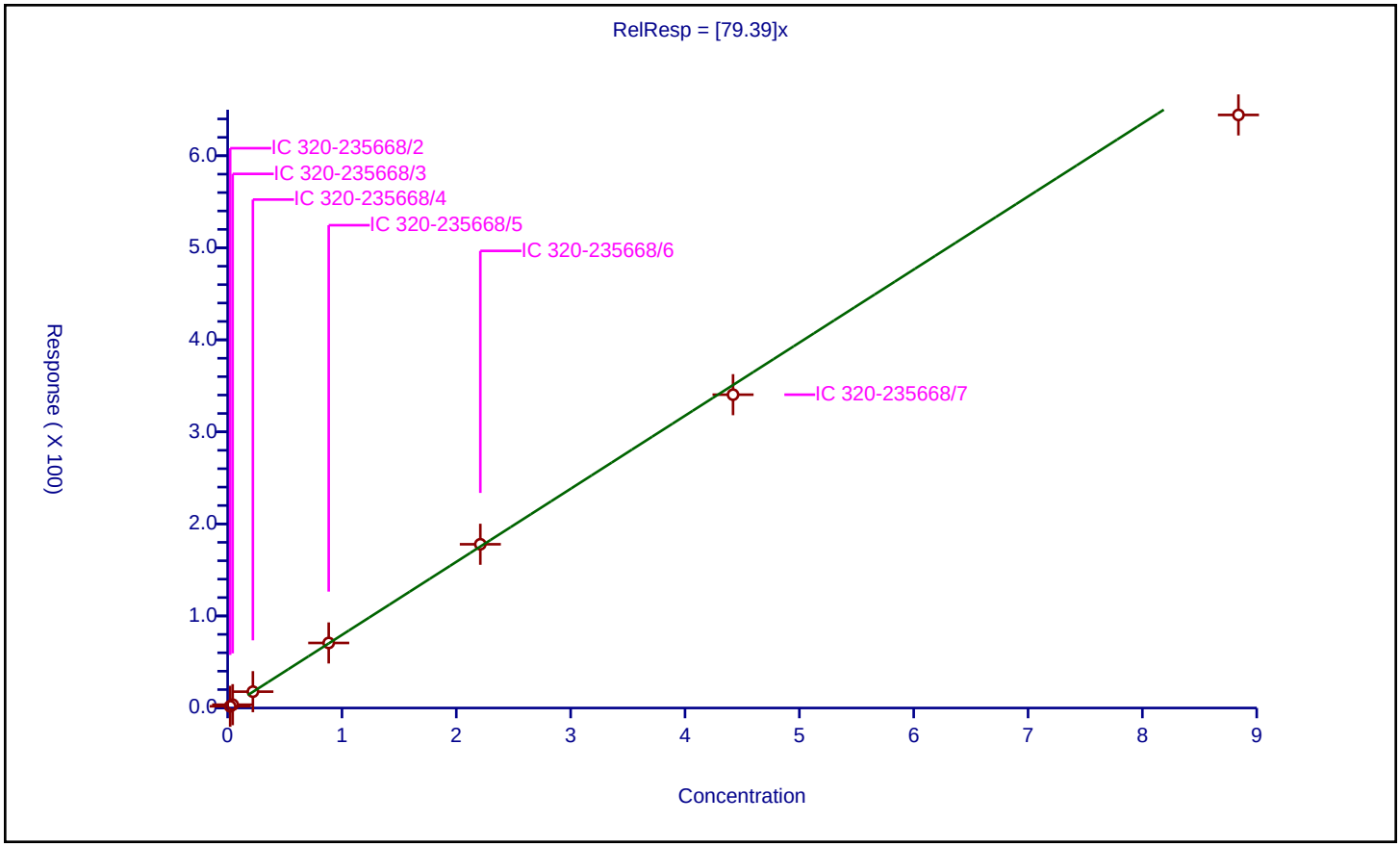
Curve Coefficients

Intercept:	0
Slope:	79.39

Error Coefficients

Standard Error:	11400000
Relative Standard Error:	4.4
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0221	1.843832	2.325	89735.0	83.43133	Y
2	IC 320-235668/3	0.0442	3.60897	2.325	84276.0	81.650897	Y
3	IC 320-235668/4	0.221	17.751011	2.325	84487.0	80.321315	Y
4	IC 320-235668/5	0.884	70.665704	2.325	87401.0	79.93858	Y
5	IC 320-235668/6	2.21	177.904482	2.325	87641.0	80.499765	Y
6	IC 320-235668/7	4.42	340.428518	2.325	86122.0	77.020027	Y
7	IC 320-235668/8	8.84	644.348035	2.325	85519.0	72.890049	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

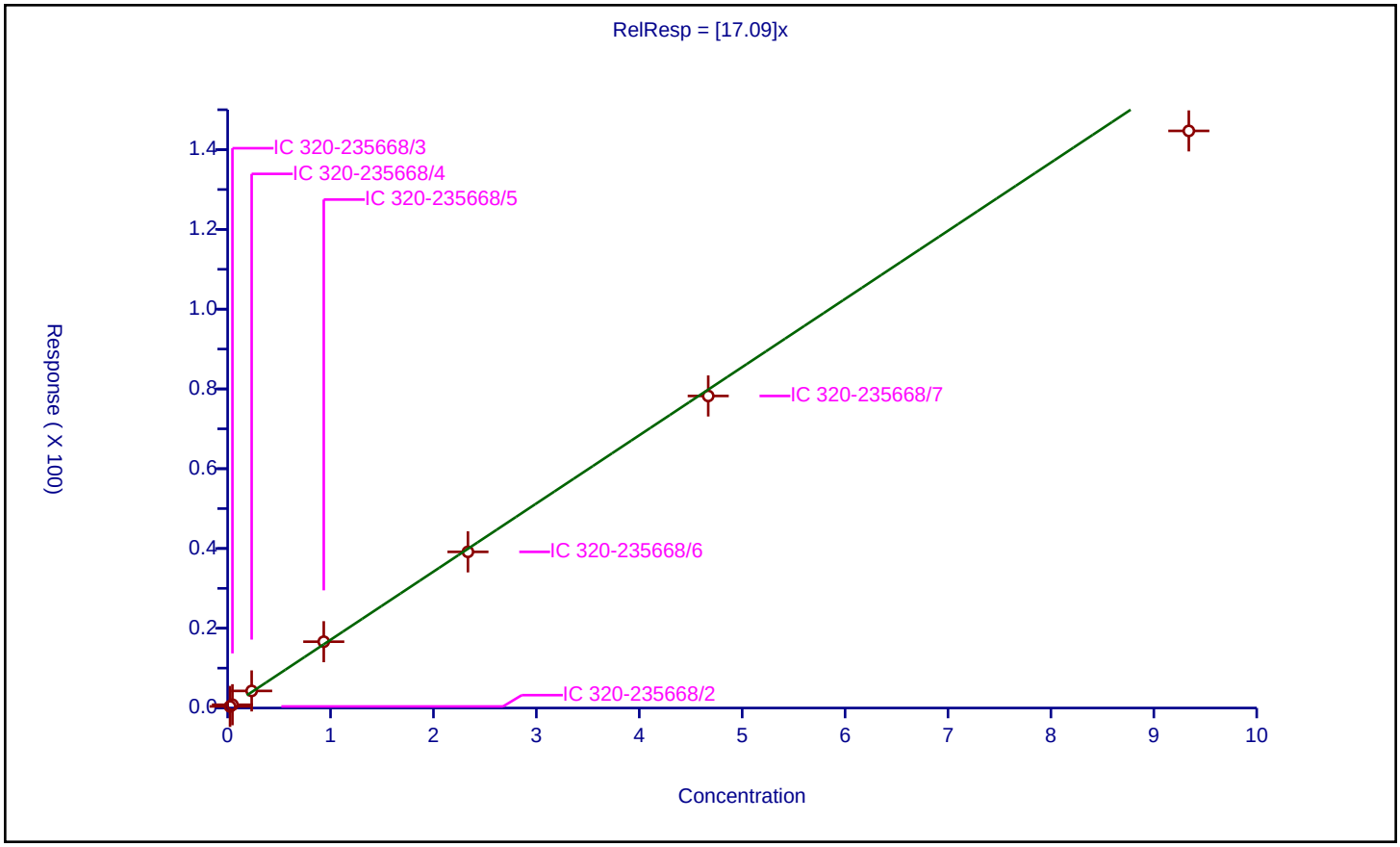
Curve Coefficients

Intercept:	0
Slope:	17.09

Error Coefficients

Standard Error:	2560000
Relative Standard Error:	5.4
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02335	0.394863	2.325	89735.0	16.910606	Y
2	IC 320-235668/3	0.0467	0.821734	2.325	84276.0	17.596016	Y
3	IC 320-235668/4	0.2335	4.282511	2.325	84487.0	18.340518	Y
4	IC 320-235668/5	0.934	16.626406	2.325	87401.0	17.801291	Y
5	IC 320-235668/6	2.335	39.151901	2.325	87641.0	16.767409	Y
6	IC 320-235668/7	4.67	78.237592	2.325	86122.0	16.753232	Y
7	IC 320-235668/8	9.34	144.694772	2.325	85519.0	15.491946	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

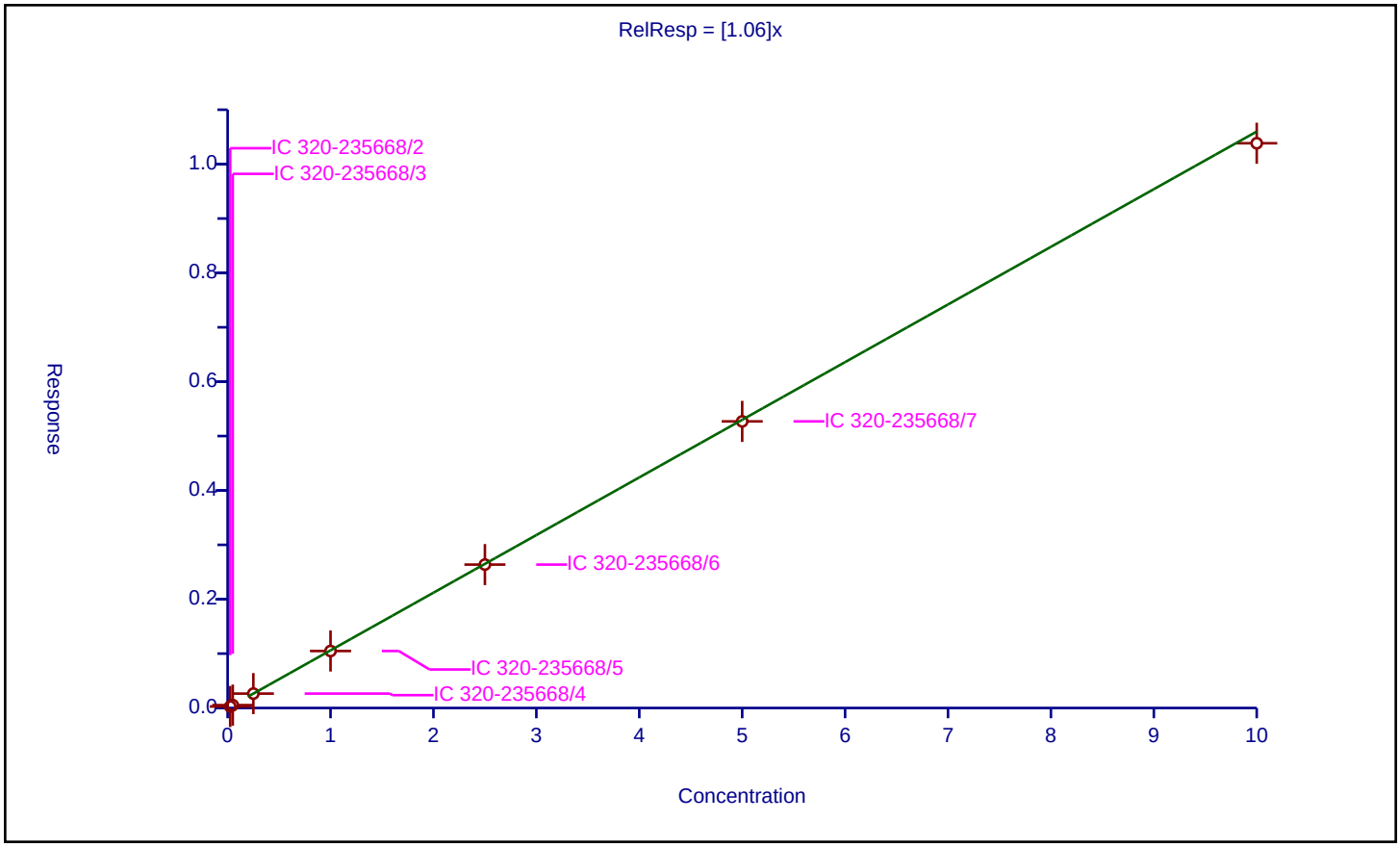
Curve Coefficients

Intercept:	0
Slope:	1.06

Error Coefficients

Standard Error:	7550000
Relative Standard Error:	1.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.027535	2.5	4402181.0	1.101386	Y
2	IC 320-235668/3	0.05	0.053197	2.5	4299501.0	1.063937	Y
3	IC 320-235668/4	0.25	0.264822	2.5	4267996.0	1.059289	Y
4	IC 320-235668/5	1.0	1.047758	2.5	4274151.0	1.047758	Y
5	IC 320-235668/6	2.5	2.637086	2.5	4182069.0	1.054834	Y
6	IC 320-235668/7	5.0	5.269467	2.5	3960776.0	1.053893	Y
7	IC 320-235668/8	10.0	10.383699	2.5	3805574.0	1.03837	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

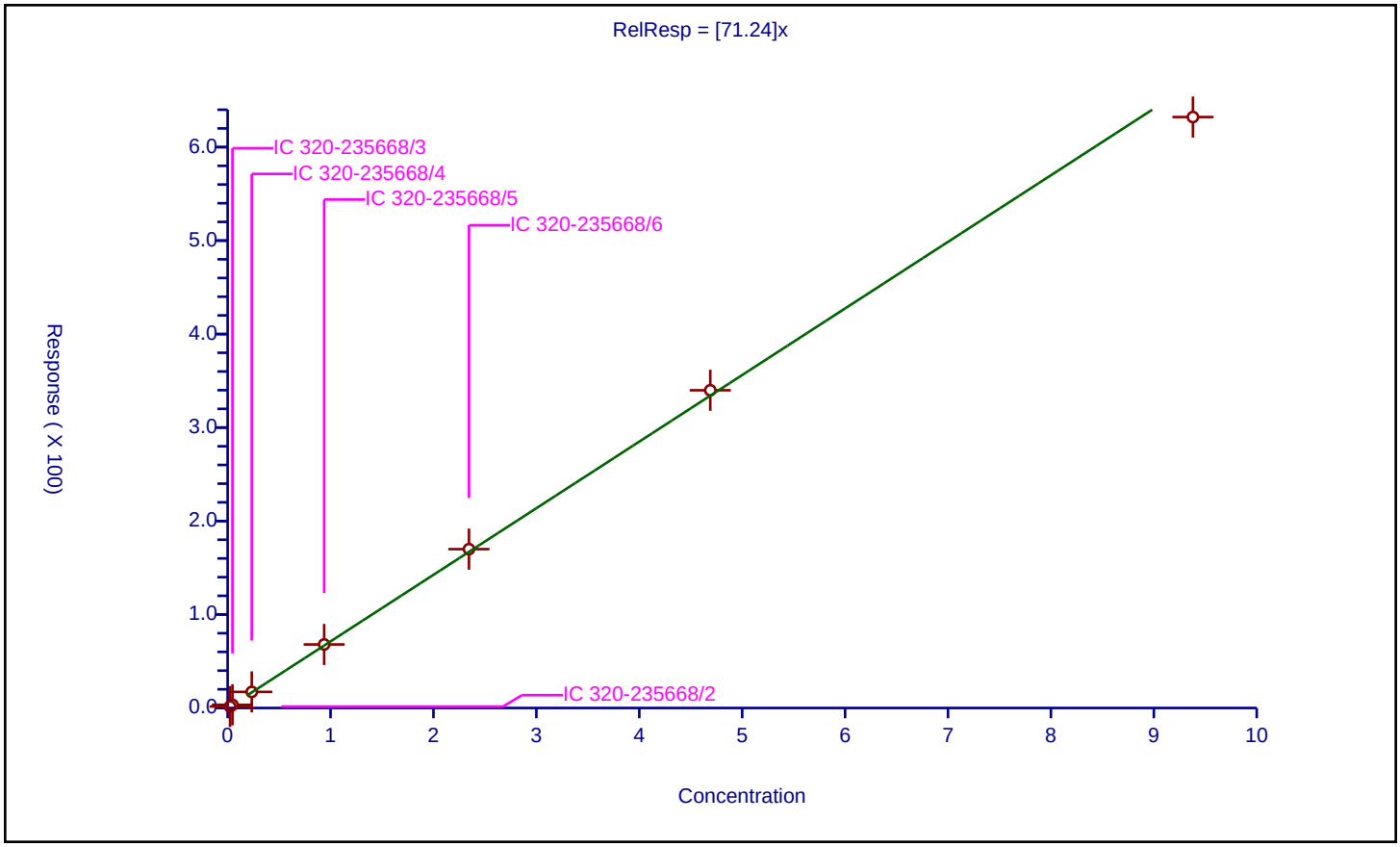
Curve Coefficients

Intercept:	0
Slope:	71.24

Error Coefficients

Standard Error:	11200000
Relative Standard Error:	3.6
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02345	1.58712	2.325	89735.0	67.681017	Y
2	IC 320-235668/3	0.0469	3.407716	2.325	84276.0	72.659184	Y
3	IC 320-235668/4	0.2345	17.236157	2.325	84487.0	73.501736	Y
4	IC 320-235668/5	0.938	67.981238	2.325	87401.0	72.474667	Y
5	IC 320-235668/6	2.345	169.951184	2.325	87641.0	72.473852	Y
6	IC 320-235668/7	4.69	339.899223	2.325	86122.0	72.473182	Y
7	IC 320-235668/8	9.38	632.186229	2.325	85519.0	67.397253	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

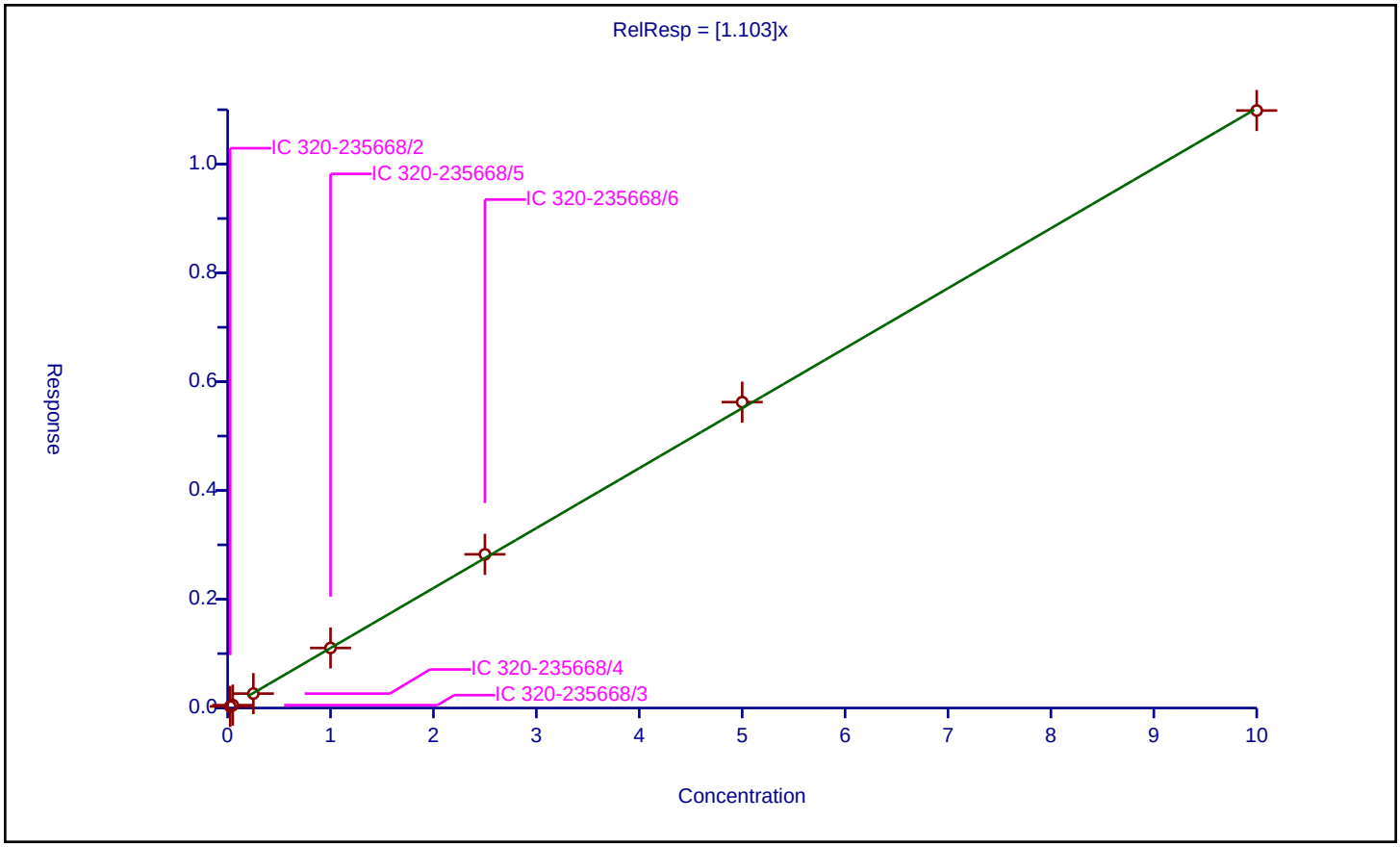
Curve Coefficients

Intercept:	0
Slope:	1.103

Error Coefficients

Standard Error:	8130000
Relative Standard Error:	3.2
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.028686	2.5	4640614.0	1.147456	Y
2	IC 320-235668/3	0.05	0.052614	2.5	4458677.0	1.052274	Y
3	IC 320-235668/4	0.25	0.26507	2.5	4442605.0	1.060279	Y
4	IC 320-235668/5	1.0	1.103913	2.5	4501447.0	1.103913	Y
5	IC 320-235668/6	2.5	2.825835	2.5	4150778.0	1.130334	Y
6	IC 320-235668/7	5.0	5.624285	2.5	4059821.0	1.124857	Y
7	IC 320-235668/8	10.0	10.985419	2.5	3852411.0	1.098542	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

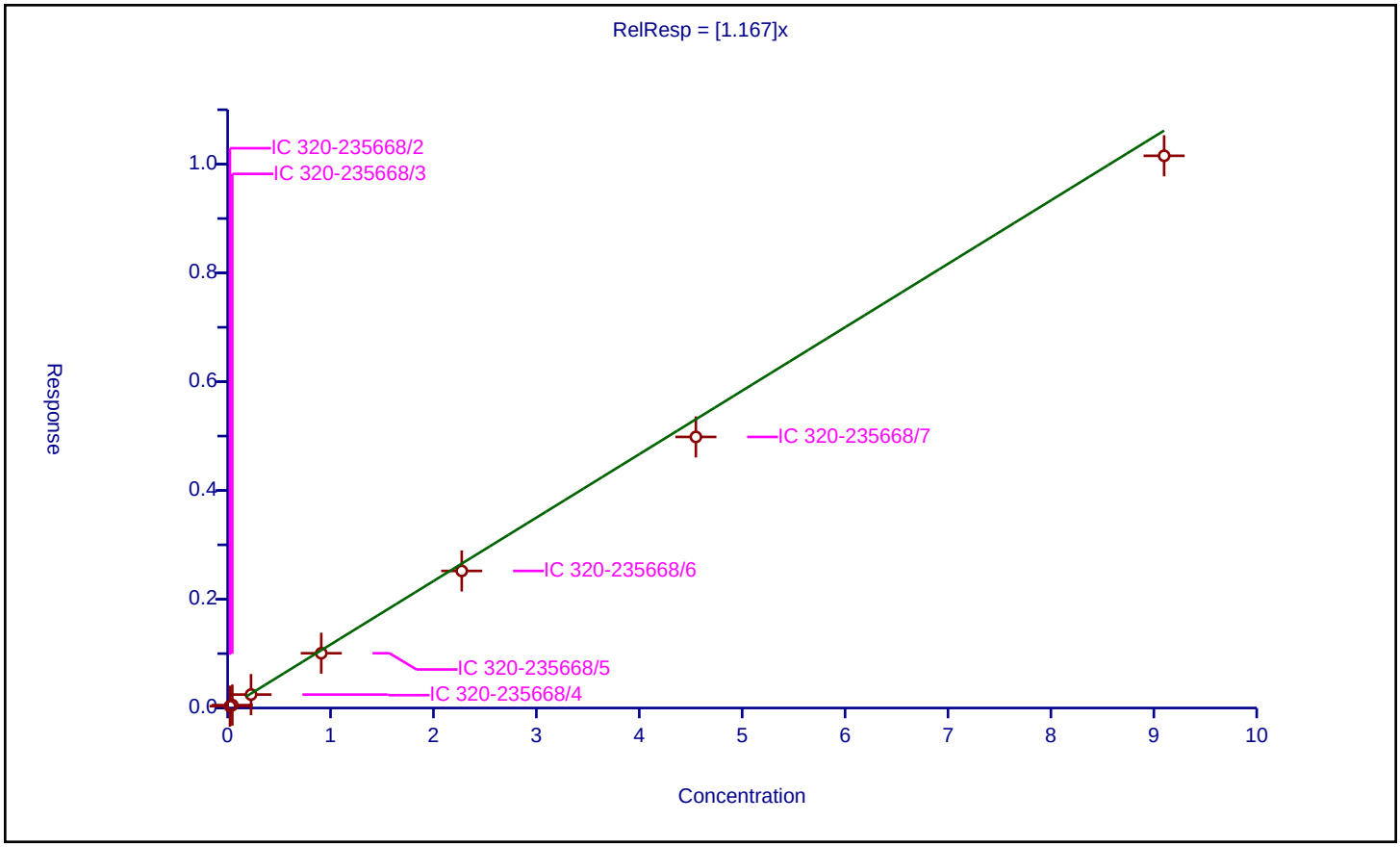
Curve Coefficients

Intercept:	0
Slope:	1.167

Error Coefficients

Standard Error:	10200000
Relative Standard Error:	12.0
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.980

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02275	0.033591	2.365	5328016.0	1.476511	Y
2	IC 320-235668/3	0.0455	0.05365	2.365	5418231.0	1.179116	Y
3	IC 320-235668/4	0.2275	0.247069	2.365	5203959.0	1.08602	Y
4	IC 320-235668/5	0.91	1.006625	2.365	5177221.0	1.106181	Y
5	IC 320-235668/6	2.275	2.52009	2.365	5148729.0	1.107732	Y
6	IC 320-235668/7	4.55	4.98441	2.365	5175462.0	1.095475	Y
7	IC 320-235668/8	9.1	10.152963	2.365	5017633.0	1.11571	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

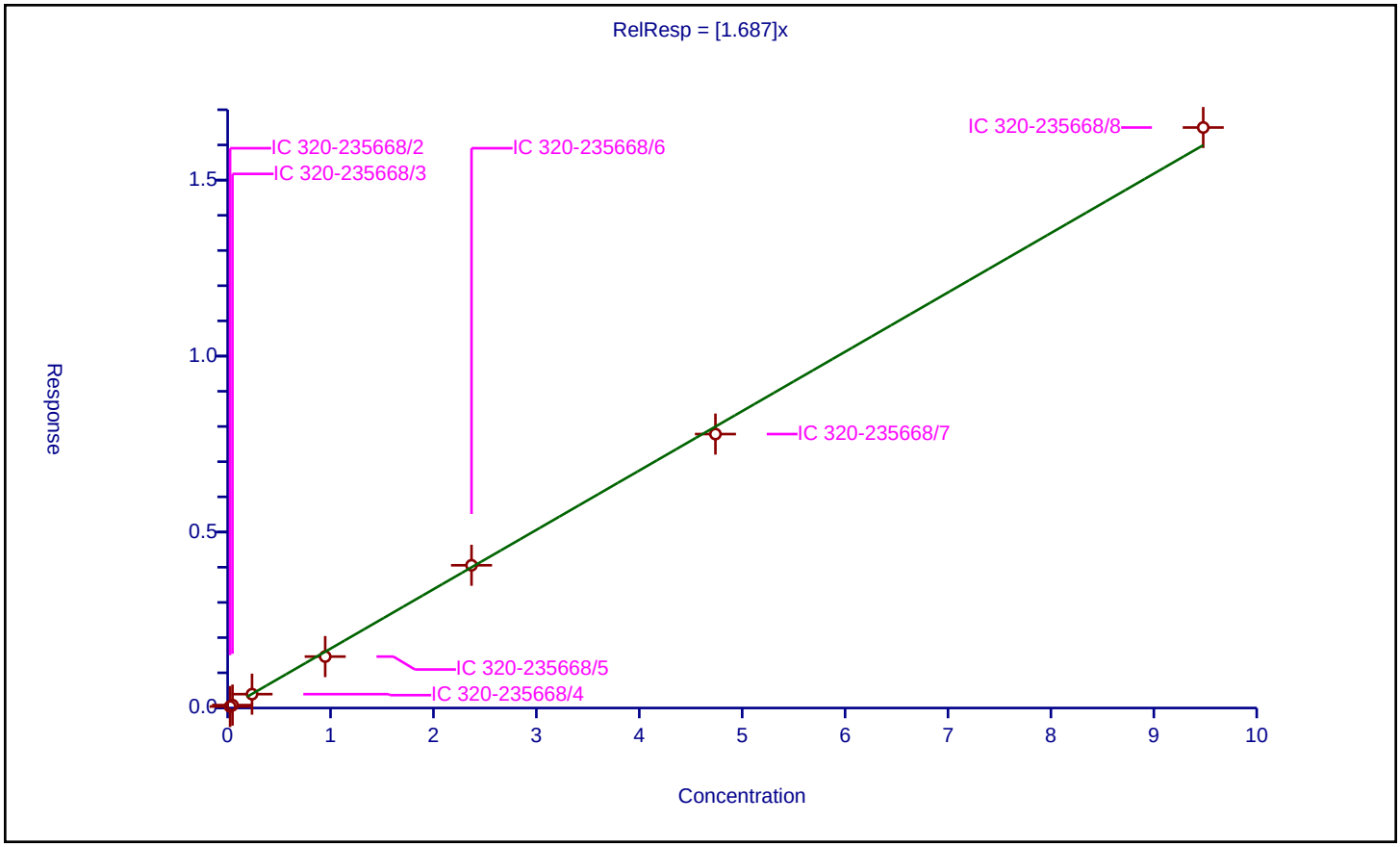
Curve Coefficients

Intercept:	0
Slope:	1.687

Error Coefficients

Standard Error:	3120000
Relative Standard Error:	4.7
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0237	0.04208	2.375	1244953.0	1.775532	Y
2	IC 320-235668/3	0.0474	0.082478	2.375	1176358.0	1.740039	Y
3	IC 320-235668/4	0.237	0.393158	2.375	1177369.0	1.658895	Y
4	IC 320-235668/5	0.948	1.461022	2.375	1248833.0	1.541162	Y
5	IC 320-235668/6	2.37	4.055478	2.375	1164838.0	1.711172	Y
6	IC 320-235668/7	4.74	7.783738	2.375	1061423.0	1.642139	Y
7	IC 320-235668/8	9.48	16.494786	2.375	931806.0	1.739956	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

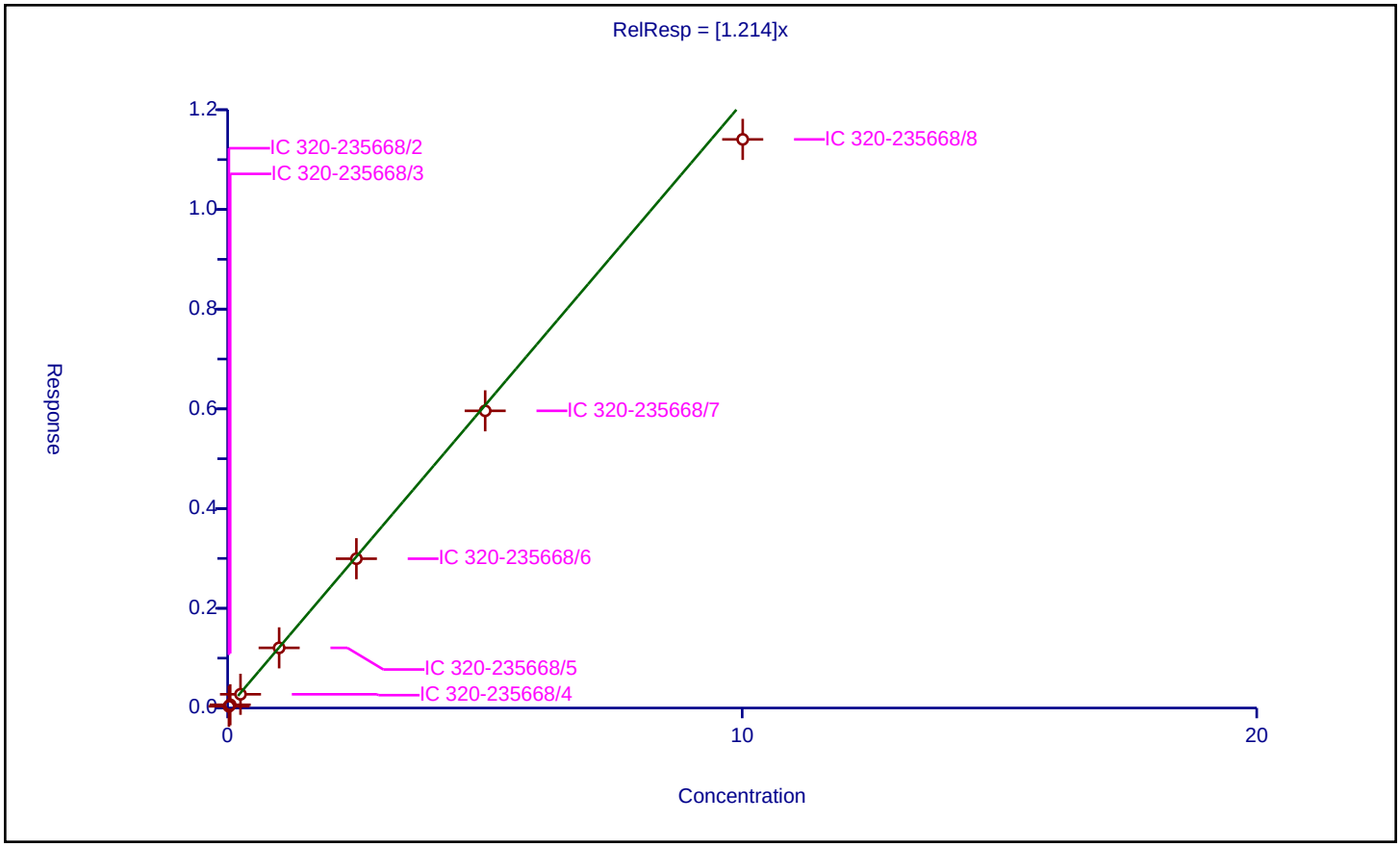
Curve Coefficients

Intercept:	0
Slope:	1.214

Error Coefficients

Standard Error:	8160000
Relative Standard Error:	7.6
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025025	0.034386	2.5	4706753.0	1.374054	Y
2	IC 320-235668/3	0.05005	0.064539	2.5	4268865.0	1.289487	Y
3	IC 320-235668/4	0.25025	0.275217	2.5	4472663.0	1.099768	Y
4	IC 320-235668/5	1.001	1.206257	2.5	4231778.0	1.205052	Y
5	IC 320-235668/6	2.5025	2.994456	2.5	4232198.0	1.196586	Y
6	IC 320-235668/7	5.005	5.961014	2.5	3884099.0	1.191012	Y
7	IC 320-235668/8	10.01	11.405172	2.5	3691370.0	1.139378	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

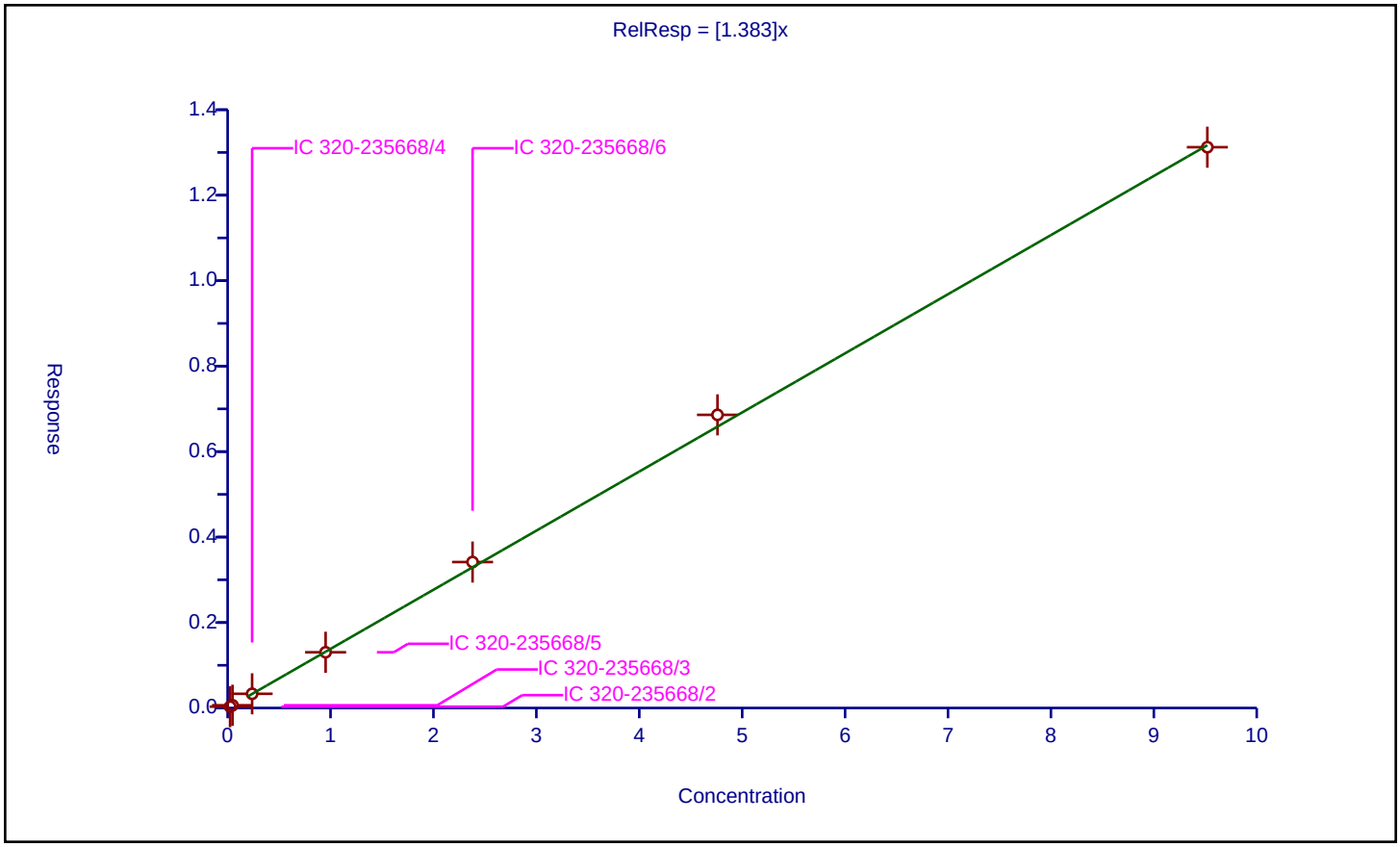
Curve Coefficients

Intercept:	0
Slope:	1.383

Error Coefficients

Standard Error:	9150000
Relative Standard Error:	3.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0238	0.031408	2.39	3806094.0	1.319677	Y
2	IC 320-235668/3	0.0476	0.063861	2.39	3693870.0	1.341624	Y
3	IC 320-235668/4	0.238	0.33248	2.39	3598957.0	1.396976	Y
4	IC 320-235668/5	0.952	1.304369	2.39	3818414.0	1.370135	Y
5	IC 320-235668/6	2.38	3.415532	2.39	3686425.0	1.435097	Y
6	IC 320-235668/7	4.76	6.859837	2.39	3550779.0	1.441142	Y
7	IC 320-235668/8	9.52	13.123166	2.39	3486265.0	1.378484	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

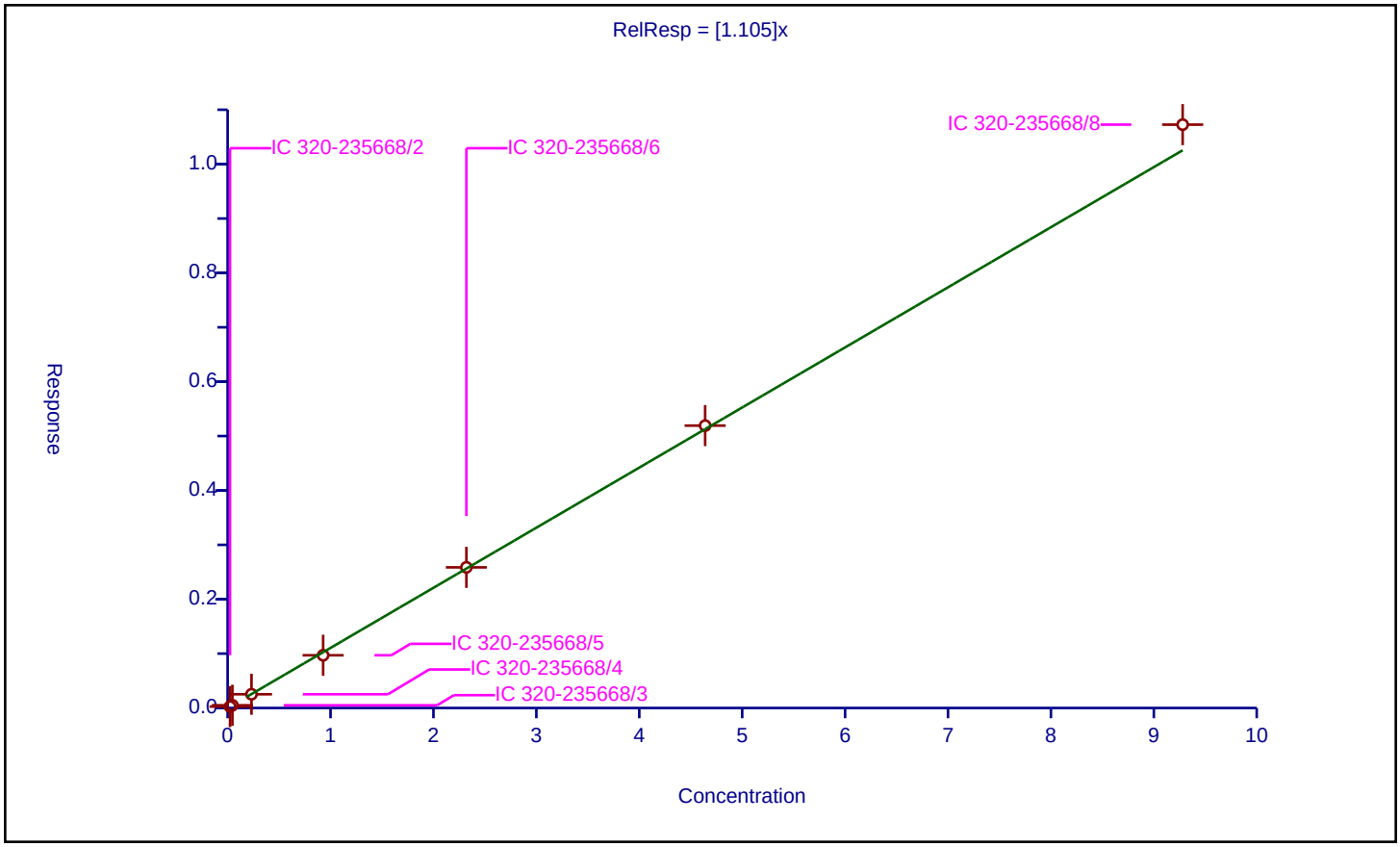
Curve Coefficients

Intercept:	0
Slope:	1.105

Error Coefficients

Standard Error:	7330000
Relative Standard Error:	3.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0232	0.026298	2.39	3806094.0	1.133541	Y
2	IC 320-235668/3	0.0464	0.050035	2.39	3693870.0	1.078331	Y
3	IC 320-235668/4	0.232	0.252628	2.39	3598957.0	1.088913	Y
4	IC 320-235668/5	0.928	0.969369	2.39	3818414.0	1.044578	Y
5	IC 320-235668/6	2.32	2.58611	2.39	3686425.0	1.114703	Y
6	IC 320-235668/7	4.64	5.192259	2.39	3550779.0	1.119021	Y
7	IC 320-235668/8	9.28	10.725932	2.39	3486265.0	1.155812	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

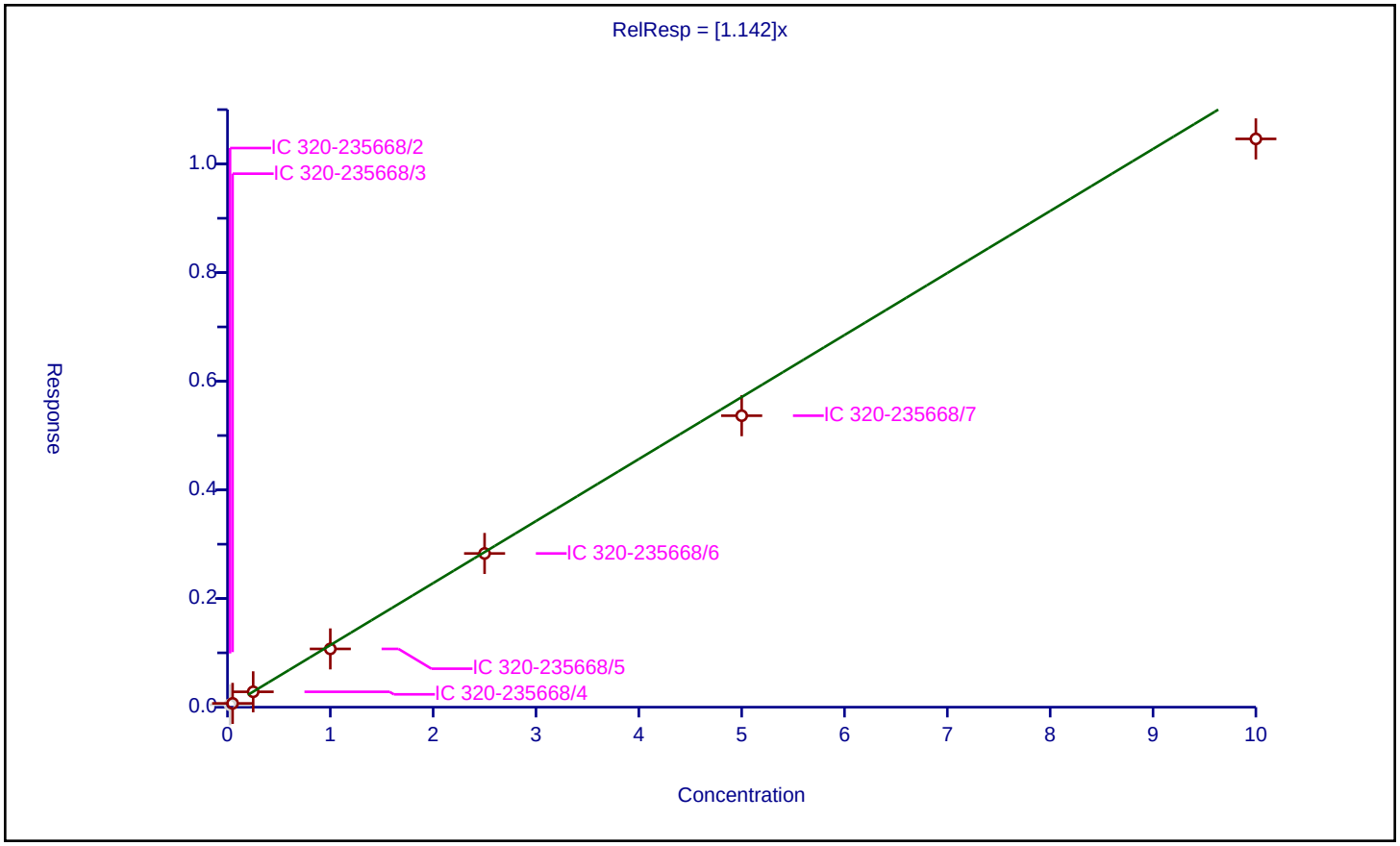
Curve Coefficients

Intercept:	0
Slope:	1.142

Error Coefficients

Standard Error:	7160000
Relative Standard Error:	11.3
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.044377	2.5	3803819.0	1.775084	N
2	IC 320-235668/3	0.05	0.06973	2.5	3792873.0	1.394602	Y
3	IC 320-235668/4	0.25	0.283145	2.5	3826960.0	1.13258	Y
4	IC 320-235668/5	1.0	1.072291	2.5	3768250.0	1.072291	Y
5	IC 320-235668/6	2.5	2.829437	2.5	3524069.0	1.131775	Y
6	IC 320-235668/7	5.0	5.36537	2.5	3450868.0	1.073074	Y
7	IC 320-235668/8	10.0	10.460743	2.5	3229889.0	1.046074	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

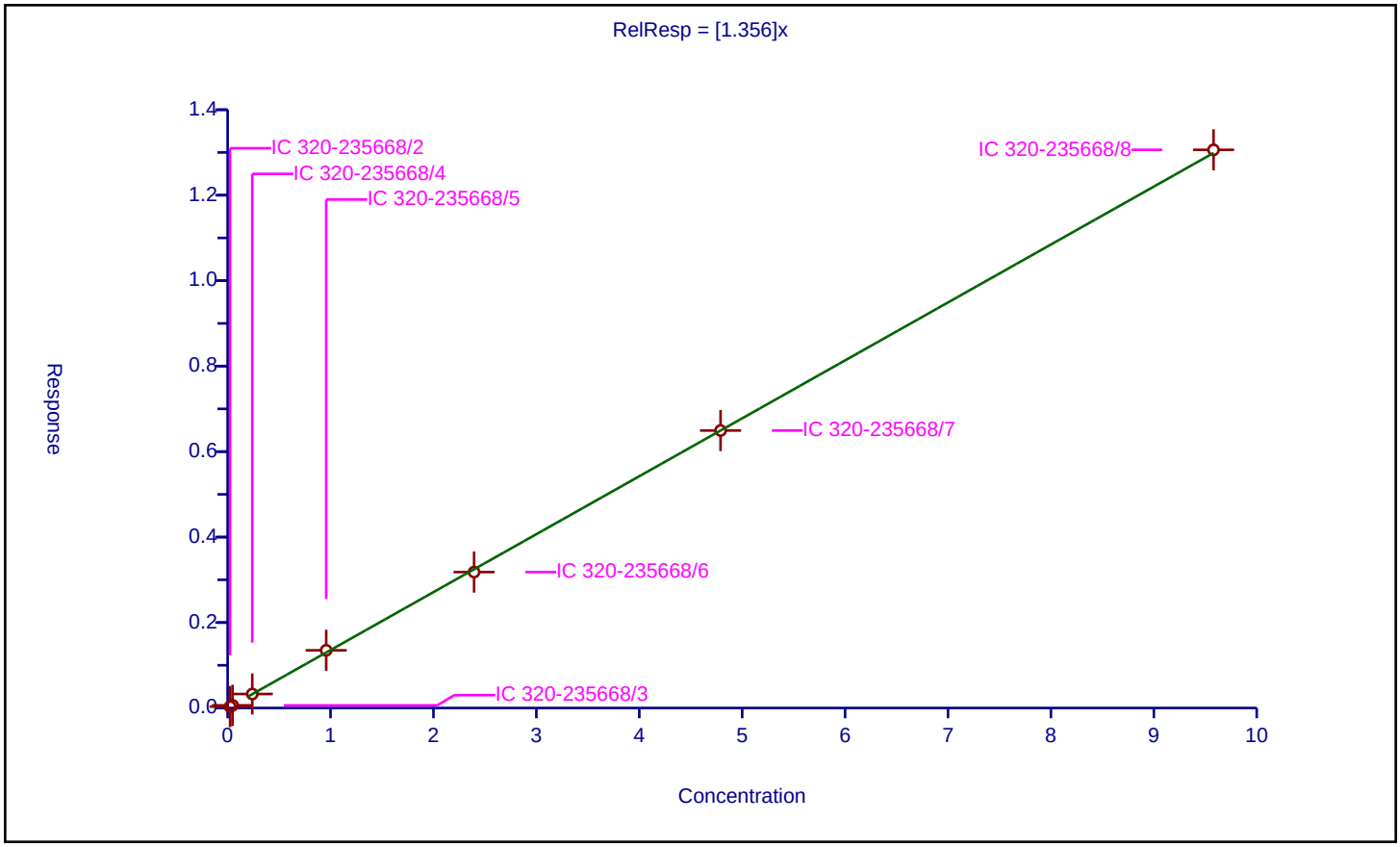
Curve Coefficients

Intercept:	0
Slope:	1.356

Error Coefficients

Standard Error:	2490000
Relative Standard Error:	2.5
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02395	0.032725	2.395	1388549.0	1.36639	Y
2	IC 320-235668/3	0.0479	0.062262	2.395	1289313.0	1.29984	Y
3	IC 320-235668/4	0.2395	0.327395	2.395	1348095.0	1.366996	Y
4	IC 320-235668/5	0.958	1.350413	2.395	1264179.0	1.409616	Y
5	IC 320-235668/6	2.395	3.181379	2.395	1173584.0	1.328342	Y
6	IC 320-235668/7	4.79	6.492827	2.395	1043782.0	1.355496	Y
7	IC 320-235668/8	9.58	13.061468	2.395	937942.0	1.36341	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

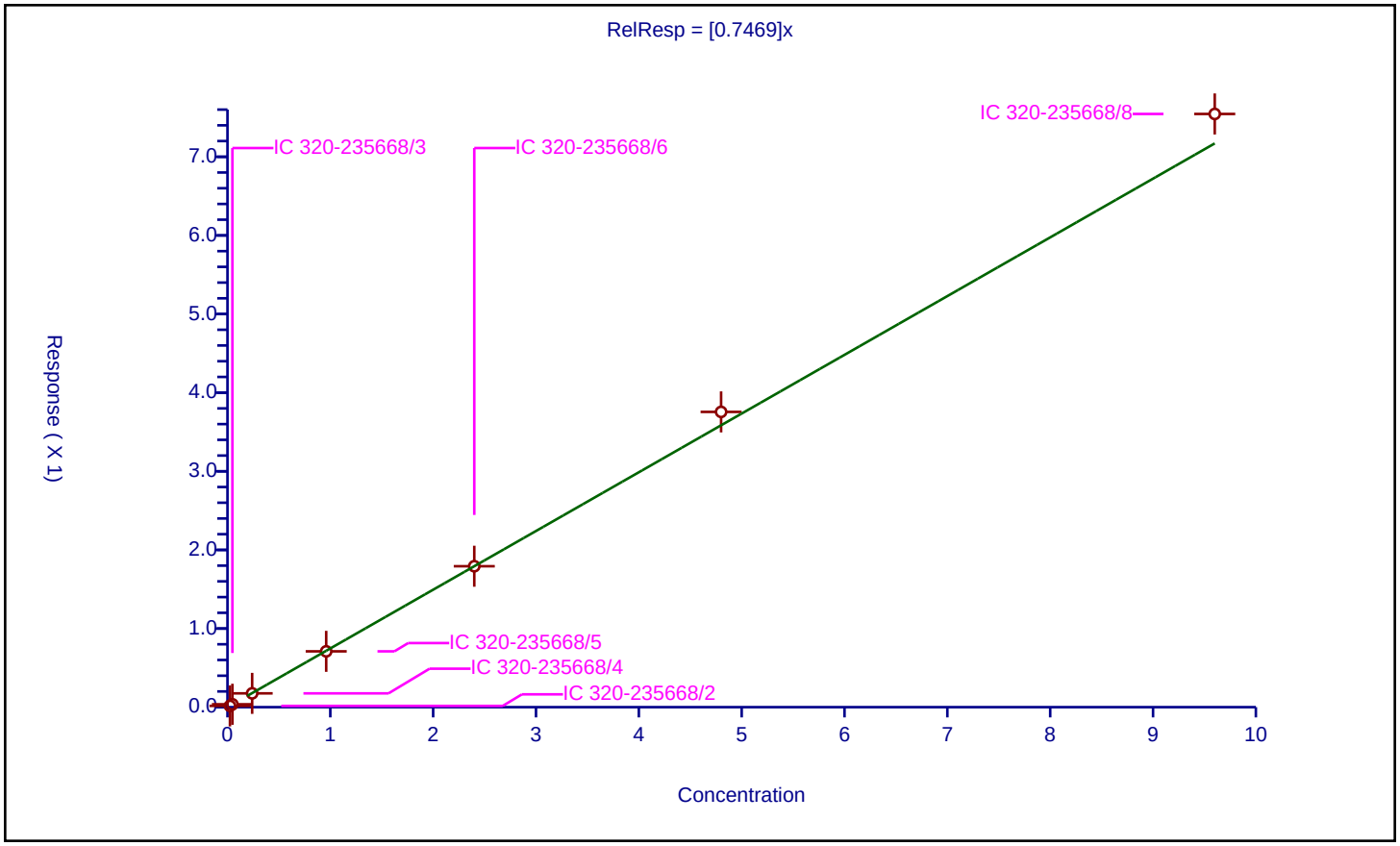
Curve Coefficients

Intercept:	0
Slope:	0.7469

Error Coefficients

Standard Error:	5180000
Relative Standard Error:	4.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.024	0.016287	2.39	3806094.0	0.67862	Y
2	IC 320-235668/3	0.048	0.036624	2.39	3693870.0	0.763009	Y
3	IC 320-235668/4	0.24	0.175624	2.39	3598957.0	0.731765	Y
4	IC 320-235668/5	0.96	0.709914	2.39	3818414.0	0.739494	Y
5	IC 320-235668/6	2.4	1.792647	2.39	3686425.0	0.746936	Y
6	IC 320-235668/7	4.8	3.755438	2.39	3550779.0	0.782383	Y
7	IC 320-235668/8	9.6	7.544601	2.39	3486265.0	0.785896	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

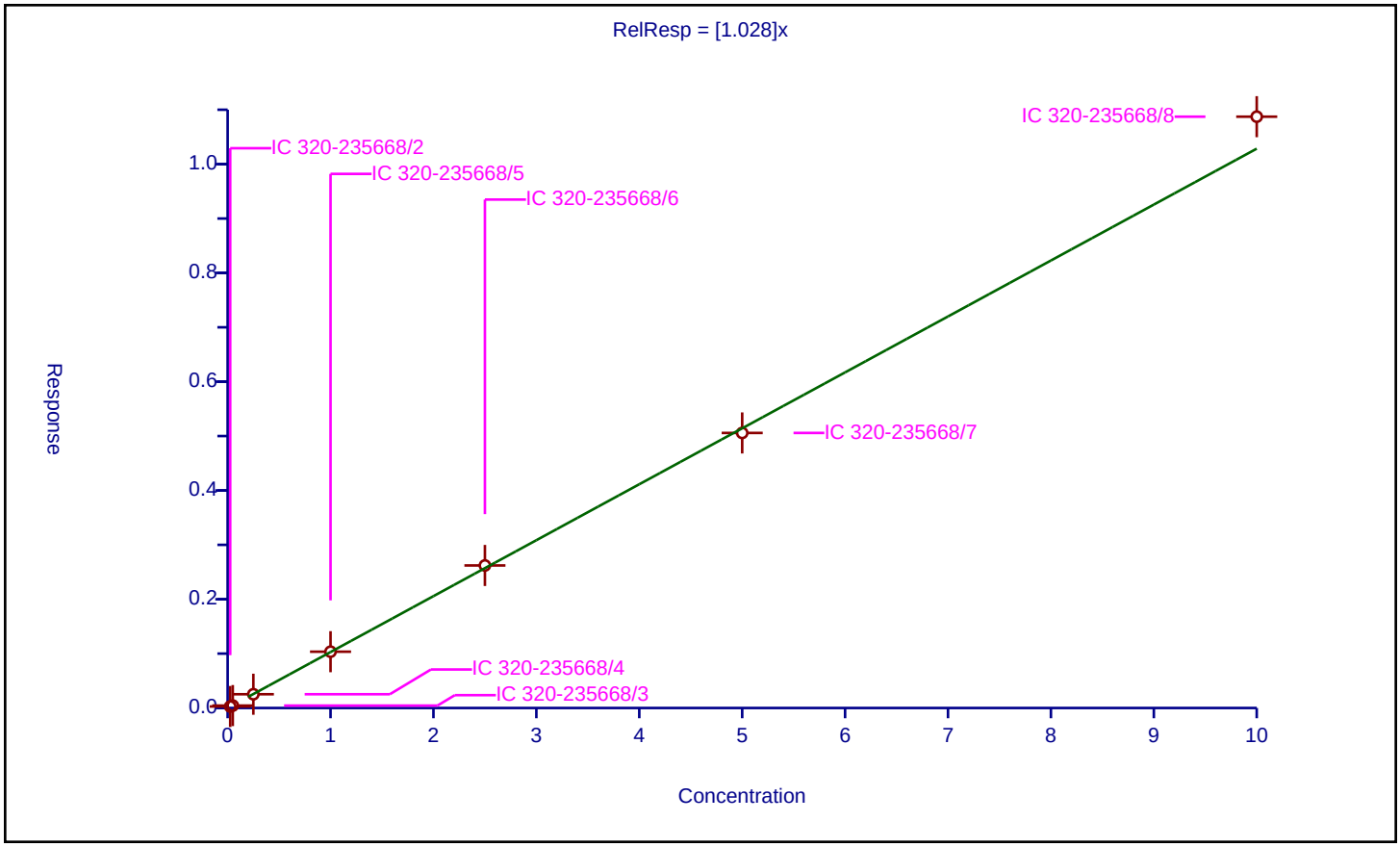
Curve Coefficients

Intercept:	0
Slope:	1.028

Error Coefficients

Standard Error:	4930000
Relative Standard Error:	6.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.02772	2.5	3182411.0	1.108813	Y
2	IC 320-235668/3	0.05	0.044785	2.5	3057920.0	0.895691	Y
3	IC 320-235668/4	0.25	0.253174	2.5	3095634.0	1.012697	Y
4	IC 320-235668/5	1.0	1.035013	2.5	3062260.0	1.035013	Y
5	IC 320-235668/6	2.5	2.620651	2.5	2774374.0	1.04826	Y
6	IC 320-235668/7	5.0	5.057106	2.5	2729607.0	1.011421	Y
7	IC 320-235668/8	10.0	10.872163	2.5	2361487.0	1.087216	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

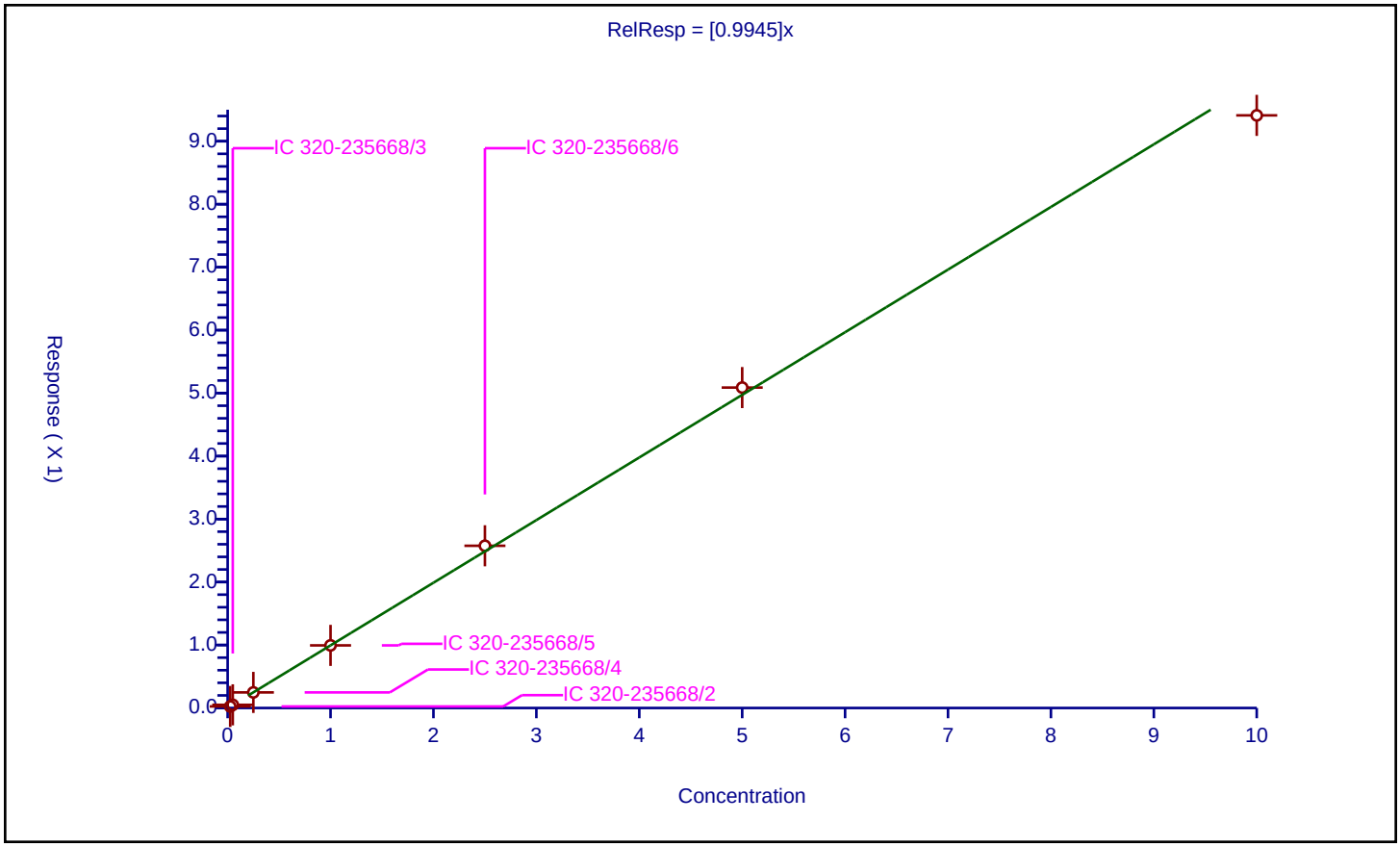
Curve Coefficients

Intercept:	0
Slope:	0.9945

Error Coefficients

Standard Error:	9180000
Relative Standard Error:	2.9
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.024618	2.5	5952607.0	0.984728	Y
2	IC 320-235668/3	0.05	0.050137	2.5	5758066.0	1.002733	Y
3	IC 320-235668/4	0.25	0.247654	2.5	5990646.0	0.990618	Y
4	IC 320-235668/5	1.0	0.994331	2.5	5853618.0	0.994331	Y
5	IC 320-235668/6	2.5	2.576171	2.5	5745909.0	1.030468	Y
6	IC 320-235668/7	5.0	5.088122	2.5	5225954.0	1.017624	Y
7	IC 320-235668/8	10.0	9.410535	2.5	4984298.0	0.941054	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

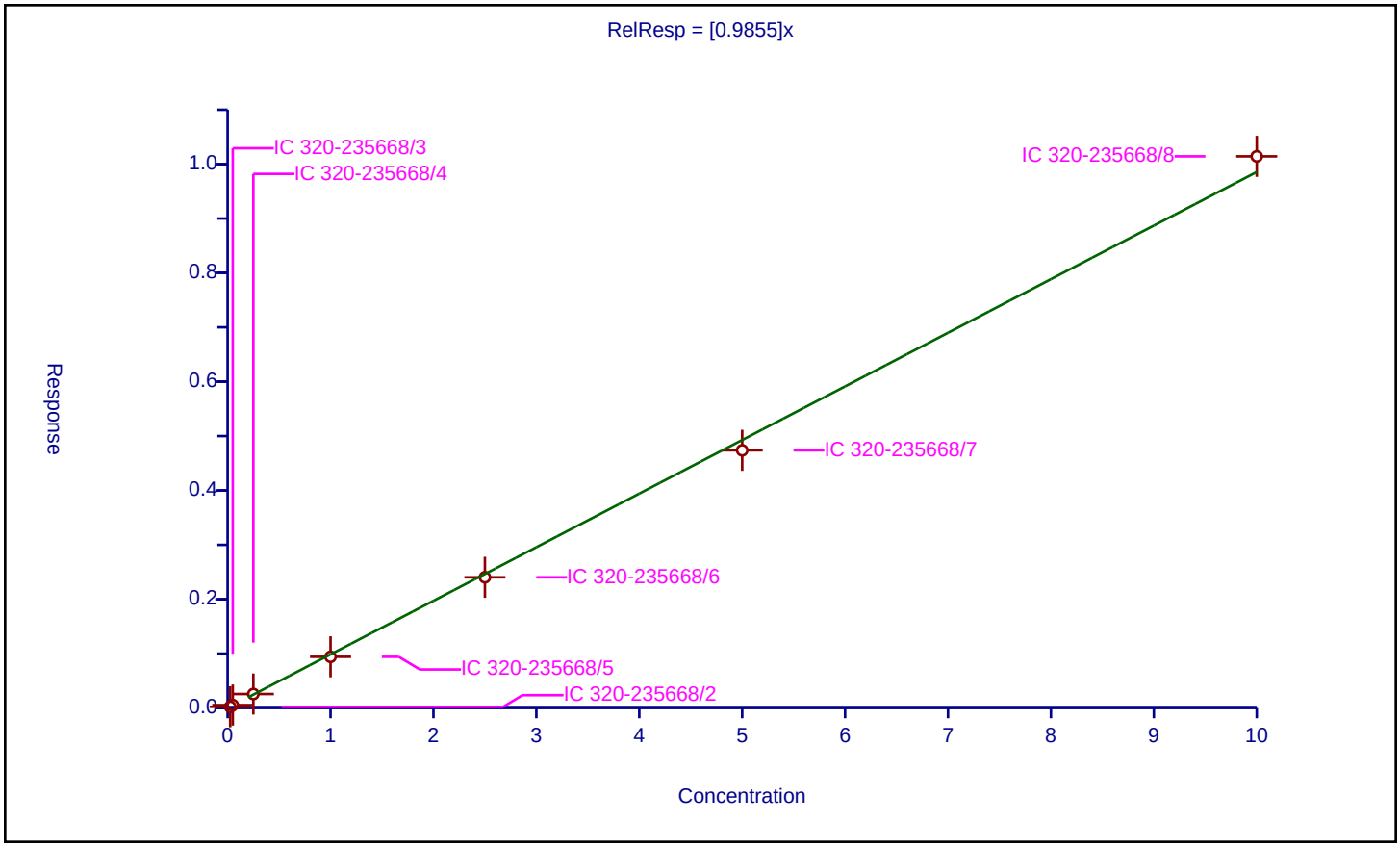
Curve Coefficients

Intercept:	0
Slope:	0.9855

Error Coefficients

Standard Error:	1750000
Relative Standard Error:	6.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.022741	2.5	950145.0	0.909651	Y
2	IC 320-235668/3	0.05	0.054701	2.5	920862.0	1.094029	Y
3	IC 320-235668/4	0.25	0.257596	2.5	972395.0	1.030384	Y
4	IC 320-235668/5	1.0	0.941307	2.5	963774.0	0.941307	Y
5	IC 320-235668/6	2.5	2.403465	2.5	966156.0	0.961386	Y
6	IC 320-235668/7	5.0	4.737847	2.5	952316.0	0.947569	Y
7	IC 320-235668/8	10.0	10.143076	2.5	925765.0	1.014308	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

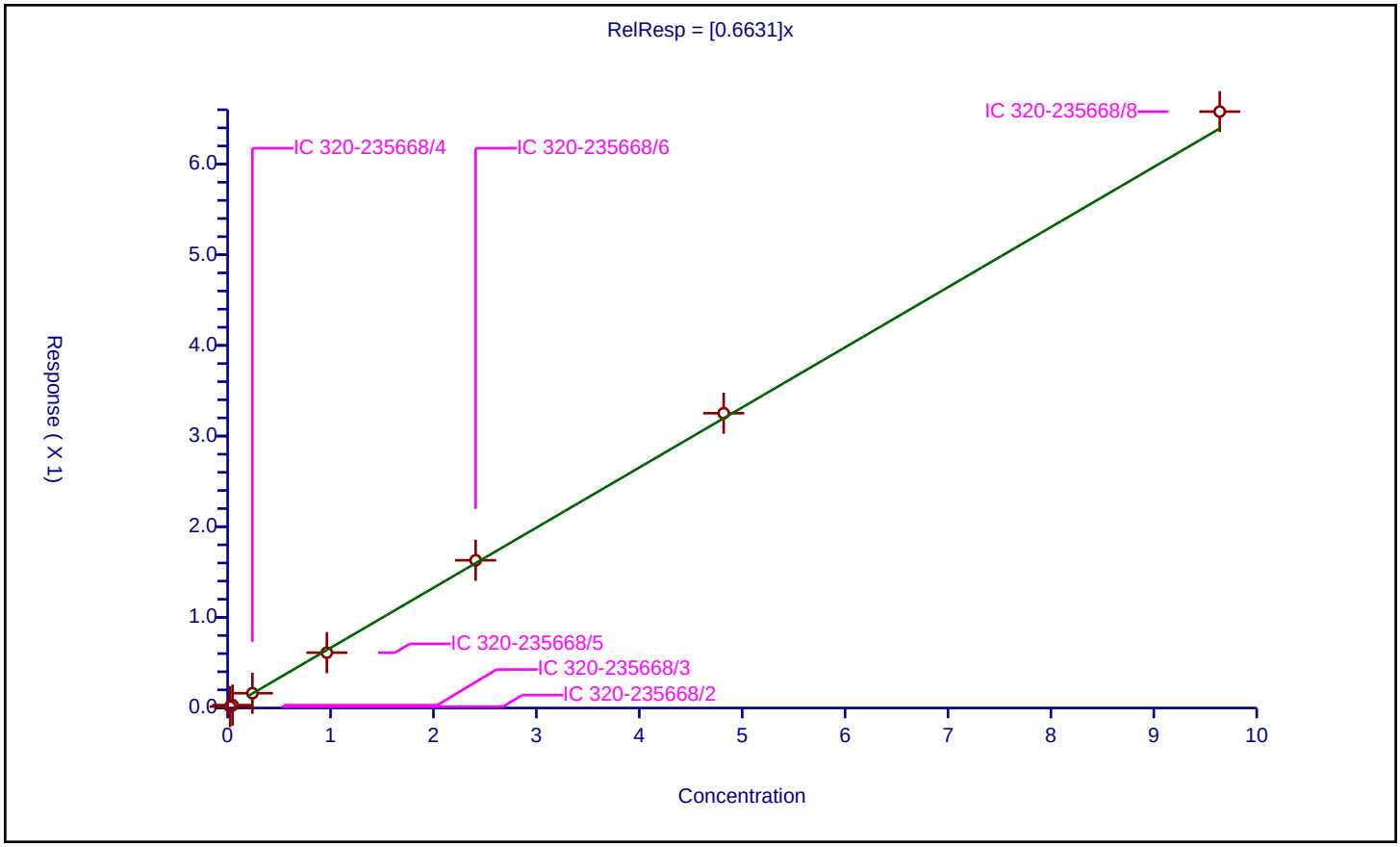
Curve Coefficients

Intercept:	0
Slope:	0.6631

Error Coefficients

Standard Error:	4520000
Relative Standard Error:	2.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0241	0.015516	2.39	3806094.0	0.643808	Y
2	IC 320-235668/3	0.0482	0.031497	2.39	3693870.0	0.653461	Y
3	IC 320-235668/4	0.241	0.163365	2.39	3598957.0	0.677864	Y
4	IC 320-235668/5	0.964	0.610638	2.39	3818414.0	0.633442	Y
5	IC 320-235668/6	2.41	1.629794	2.39	3686425.0	0.676263	Y
6	IC 320-235668/7	4.82	3.251954	2.39	3550779.0	0.674679	Y
7	IC 320-235668/8	9.64	6.579528	2.39	3486265.0	0.682524	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

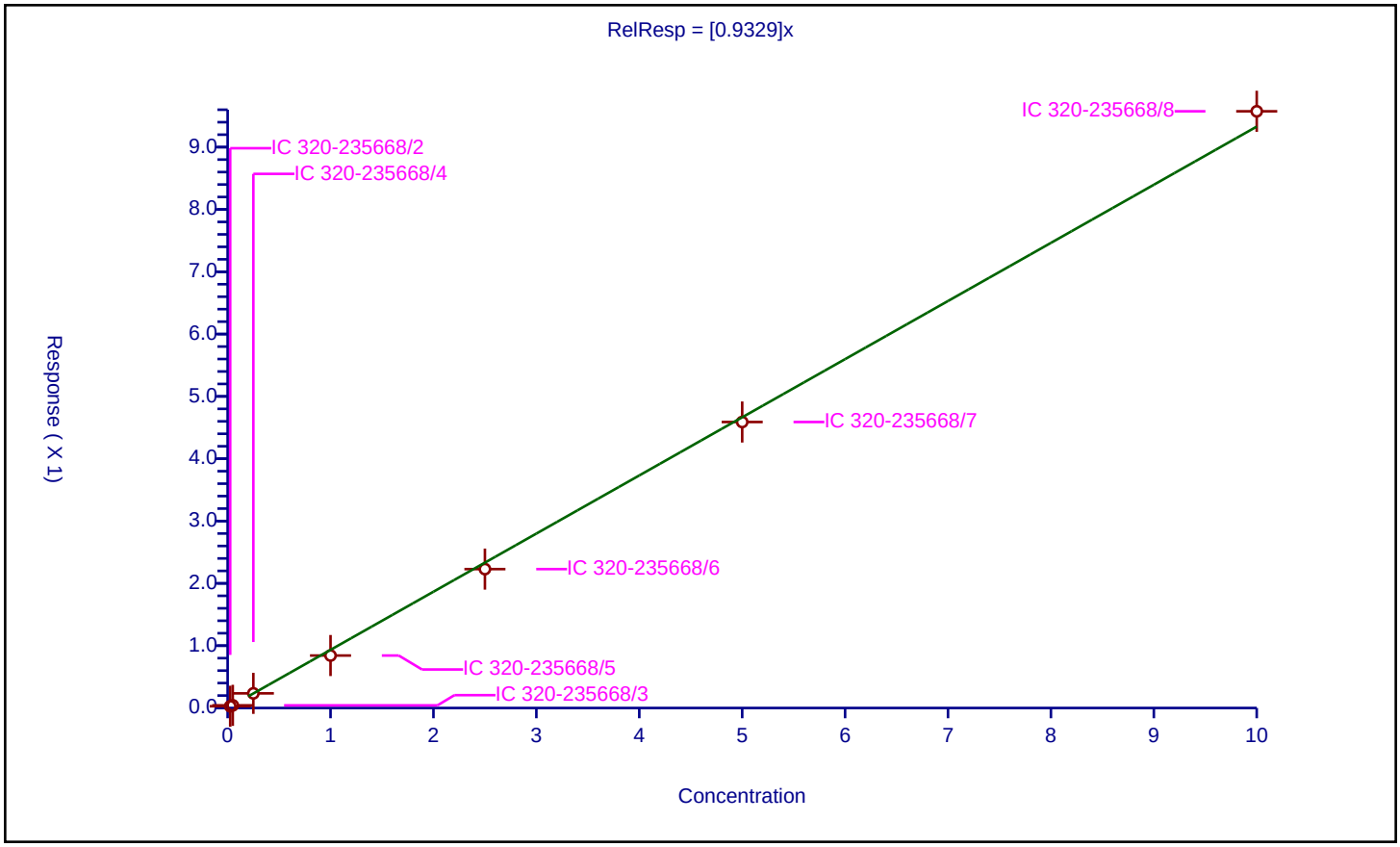
Curve Coefficients

Intercept:	0
Slope:	0.9329

Error Coefficients

Standard Error:	1570000
Relative Standard Error:	10.2
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.986

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.028178	2.5	1054820.0	1.127112	Y
2	IC 320-235668/3	0.05	0.042743	2.5	1105917.0	0.854856	Y
3	IC 320-235668/4	0.25	0.234971	2.5	1028200.0	0.939885	Y
4	IC 320-235668/5	1.0	0.841963	2.5	1057814.0	0.841963	Y
5	IC 320-235668/6	2.5	2.22882	2.5	982550.0	0.891528	Y
6	IC 320-235668/7	5.0	4.588999	2.5	934717.0	0.9178	Y
7	IC 320-235668/8	10.0	9.574989	2.5	863349.0	0.957499	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

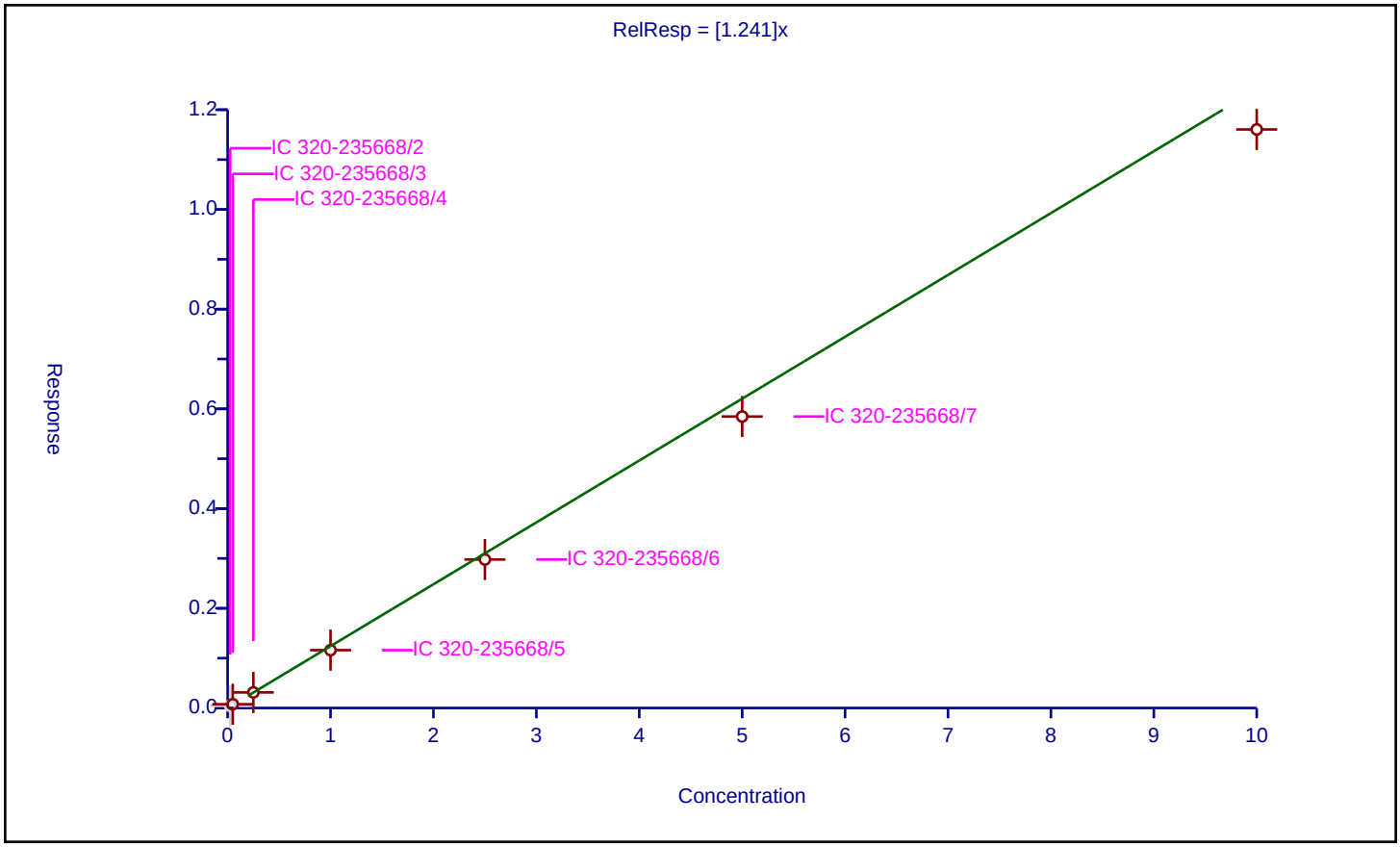
Curve Coefficients

Intercept:	0
Slope:	1.241

Error Coefficients

Standard Error:	4860000
Relative Standard Error:	11.1
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.043725	2.5	2536362.0	1.749001	N
2	IC 320-235668/3	0.05	0.075629	2.5	2455718.0	1.512572	Y
3	IC 320-235668/4	0.25	0.312853	2.5	2455525.0	1.251411	Y
4	IC 320-235668/5	1.0	1.160188	2.5	2420418.0	1.160188	Y
5	IC 320-235668/6	2.5	2.97845	2.5	2295730.0	1.19138	Y
6	IC 320-235668/7	5.0	5.845966	2.5	2176487.0	1.169193	Y
7	IC 320-235668/8	10.0	11.604576	2.5	1966864.0	1.160458	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

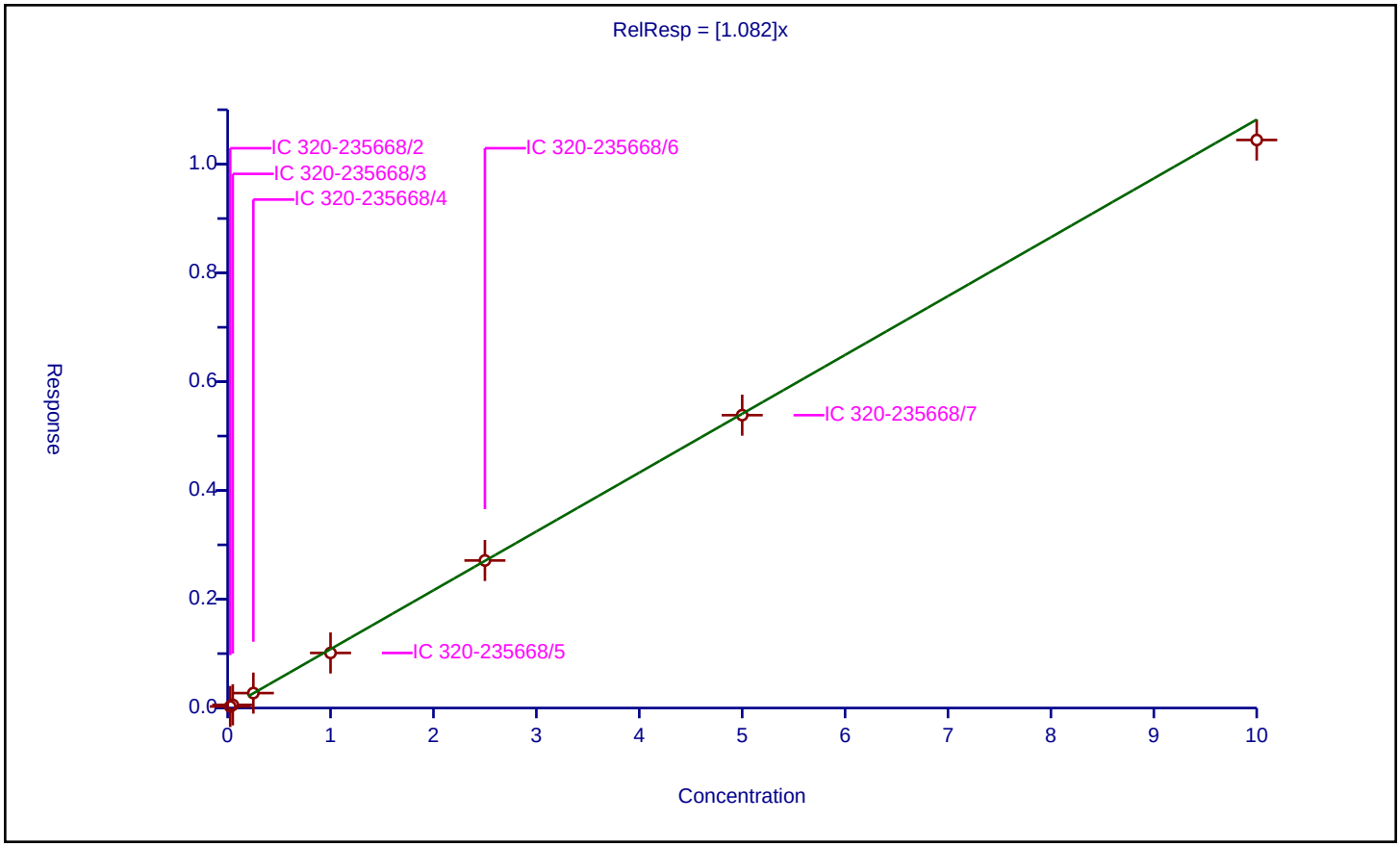
Curve Coefficients

Intercept:	0
Slope:	1.082

Error Coefficients

Standard Error:	4110000
Relative Standard Error:	4.2
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.027478	2.5	2339777.0	1.099122	Y
2	IC 320-235668/3	0.05	0.057893	2.5	2256995.0	1.157867	Y
3	IC 320-235668/4	0.25	0.274618	2.5	2222244.0	1.098471	Y
4	IC 320-235668/5	1.0	1.011912	2.5	2243127.0	1.011912	Y
5	IC 320-235668/6	2.5	2.712242	2.5	2159403.0	1.084897	Y
6	IC 320-235668/7	5.0	5.384392	2.5	2185359.0	1.076878	Y
7	IC 320-235668/8	10.0	10.444037	2.5	2040247.0	1.044404	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

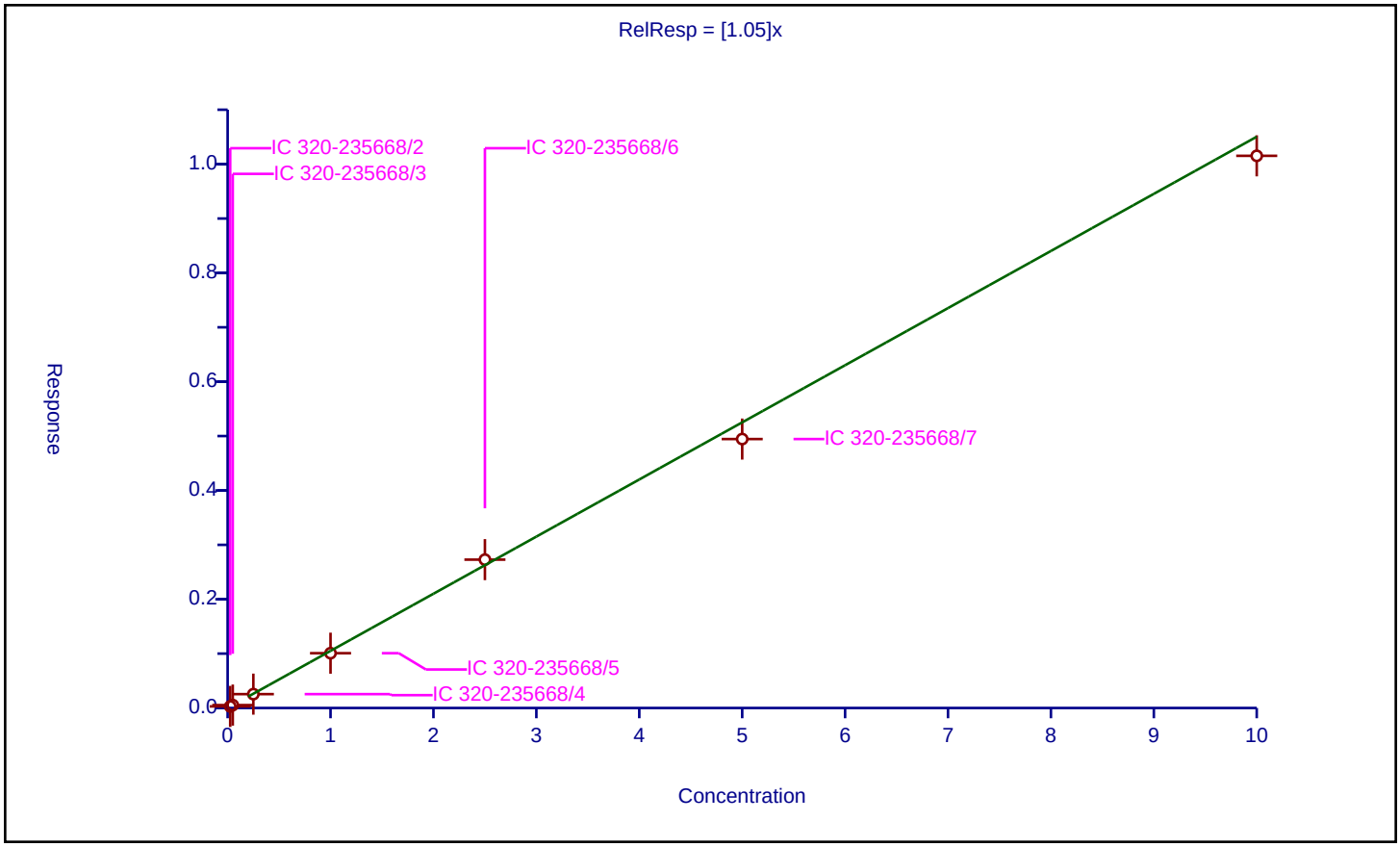
Curve Coefficients

Intercept:	0
Slope:	1.05

Error Coefficients

Standard Error:	3950000
Relative Standard Error:	5.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.028963	2.5	2339777.0	1.158529	Y
2	IC 320-235668/3	0.05	0.05355	2.5	2256995.0	1.071004	Y
3	IC 320-235668/4	0.25	0.255015	2.5	2222244.0	1.020059	Y
4	IC 320-235668/5	1.0	1.007617	2.5	2243127.0	1.007617	Y
5	IC 320-235668/6	2.5	2.727829	2.5	2159403.0	1.091132	Y
6	IC 320-235668/7	5.0	4.944868	2.5	2185359.0	0.988974	Y
7	IC 320-235668/8	10.0	10.152488	2.5	2040247.0	1.015249	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

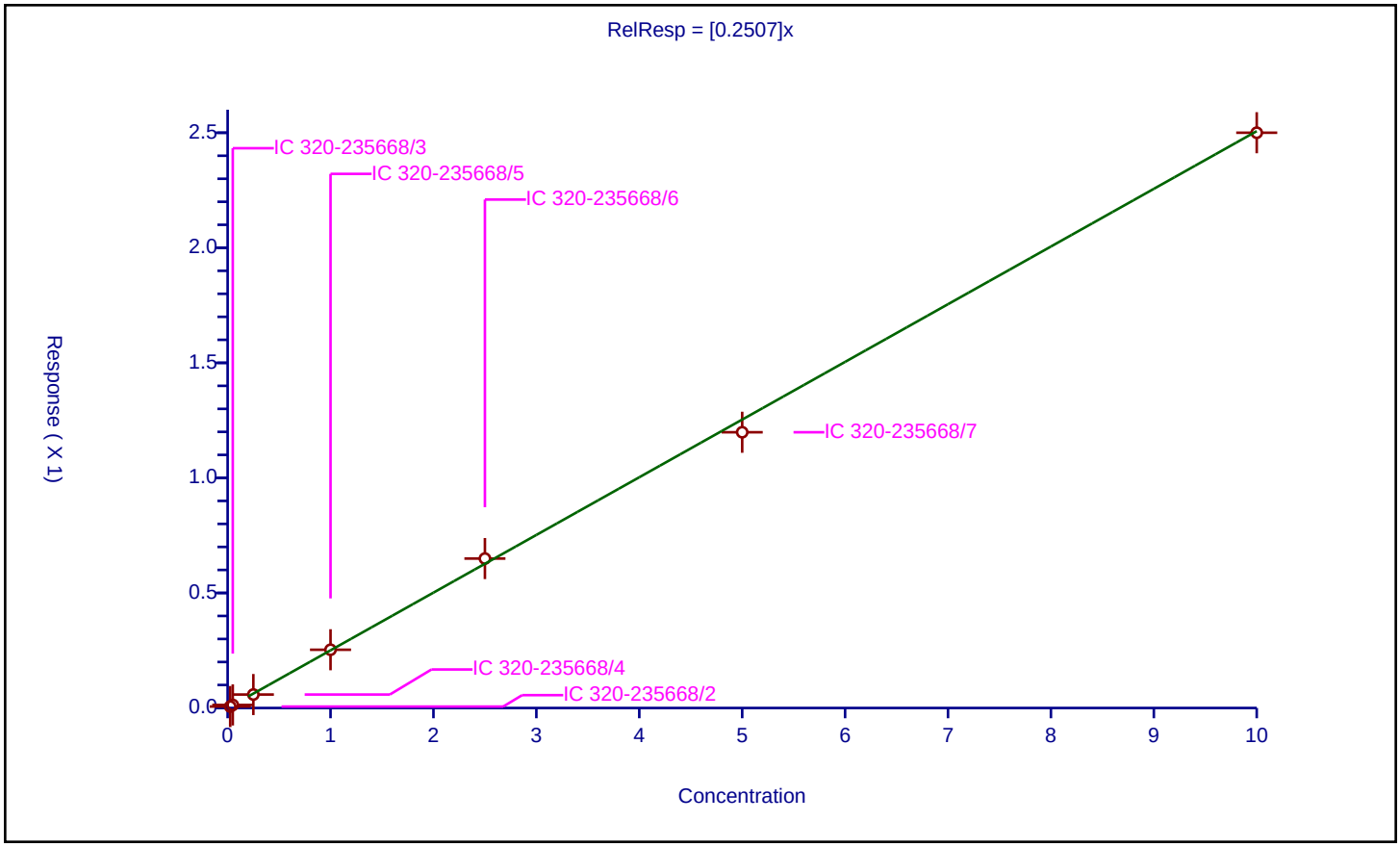
Curve Coefficients

Intercept:	0
Slope:	0.2507

Error Coefficients

Standard Error:	967000
Relative Standard Error:	4.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.006262	2.5	2327660.0	0.250466	Y
2	IC 320-235668/3	0.05	0.013383	2.5	2232553.0	0.267653	Y
3	IC 320-235668/4	0.25	0.058538	2.5	2210453.0	0.234151	Y
4	IC 320-235668/5	1.0	0.253121	2.5	2124401.0	0.253121	Y
5	IC 320-235668/6	2.5	0.649422	2.5	2042126.0	0.259769	Y
6	IC 320-235668/7	5.0	1.198391	2.5	2077317.0	0.239678	Y
7	IC 320-235668/8	10.0	2.50015	2.5	2071078.0	0.250015	Y



FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-236979/2	2018.07.30LLICA_002.d
Level 2	IC 320-236979/3	2018.07.30LLICA_003.d
Level 3	IC 320-236979/4	2018.07.30LLICA_004.d
Level 4	IC 320-236979/5	2018.07.30LLICA_005.d
Level 5	IC 320-236979/6	2018.07.30LLICA_006.d
Level 6	IC 320-236979/7	2018.07.30LLICA_007.d
Level 7	IC 320-236979/8	2018.07.30LLICA_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.2134 0.9974	1.0364 0.9959	0.9692	0.9721	0.9811	AveID		1.0237				8.5		20.0			
Perfluoropentanoic acid (PFPeA)	1.2965 1.2130	1.2088 1.1831	1.1824	1.1832	1.1997	AveID		1.2095				3.3		20.0			
Perfluorobutanesulfonic acid (PFBS)	77.523 78.070	77.701 71.517	80.248	77.660	79.827	AveID		77.507				3.7		20.0			
4:2 FTS	14.907 15.410	16.250 13.964	15.246	15.024	16.003	AveID		15.258				4.9		20.0			
Perfluorohexanoic acid (PFHxA)	1.2249 1.0513	1.0584 1.0213	1.0426	1.0049	1.0593	AveID		1.0661				6.8		20.0			
Perfluoropentanesulfonic acid	72.343 71.851	67.703 64.246	71.343	70.106	72.438	AveID		70.004				4.3		20.0			
Perfluoroheptanoic acid (PFHpA)	1.1024 1.1458	1.1607 1.1197	1.1010	1.1599	1.1737	AveID		1.1376				2.6		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3495 1.1413	1.2441 1.0966	1.0767	1.1189	1.1071	AveID		1.1620				8.5		20.0			
6:2 FTS	1.8766 1.6394	1.6380 1.6663	1.7061	1.6473	1.6190	AveID		1.6847				5.3		20.0			
Perfluorooctanoic acid (PFOA)	1.2799 1.1553	1.1198 1.1471	1.1445	1.1532	1.1613	AveID		1.1659				4.5		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2834 1.3831	1.3885 1.2582	1.3186	1.3125	1.3696	AveID		1.3306				3.8		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.1907 1.1508	1.1611 1.1306	1.1155	1.0950	1.1354	AveID		1.1398				2.7		20.0			
Perfluorononanoic acid (PFNA)	+++++ 1.1024	1.0874 1.0988	1.0260	1.0474	1.1112	AveID		1.0789				3.2		20.0			
Perfluorononanesulfonic acid	0.7998 0.8259	0.7440 0.7508	0.7759	0.7611	0.8226	AveID		0.7829				4.3		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
8:2 FTS	1.3080 1.2923	1.4412 1.3200	1.3258	1.2903	1.3186	AveID		1.3280				3.9		20.0			
Perfluorooctane Sulfonamide (PFOSA)	0.9868 0.9911	0.9334 0.9651	1.0067	1.0162	1.0309	AveID		0.9900				3.3		20.0			
Perfluorodecanoic acid (PFDA)	1.1693 1.0376	1.2023 1.0770	1.0414	1.0256	1.0578	AveID		1.0873				6.4		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9257 0.9803	1.1588 1.0641	1.0329	0.9776	1.0601	AveID		1.0285				7.4		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6281 0.7057	0.6936 0.6585	0.6497	0.6407	0.7077	AveID		0.6692				4.9		20.0			
Perfluoroundecanoic acid (PFUnA)	0.9959 0.8586	0.9779 0.9145	0.8174	0.8469	0.8671	AveID		0.8969				7.6		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.7856 0.9217	1.0232 0.9400	0.8898	0.9400	0.8908	AveID		0.9130				7.9		20.0			
Perfluorododecanoic acid (PFDoA)	+++++ 1.1070	1.0200 1.0896	1.1095	1.0753	1.0773	AveID		1.0798				3.0		20.0			
Perfluorotridecanoic Acid (PFTriA)	0.8961 0.9123	0.8795 0.9408	0.9205	0.9266	0.9426	AveID		0.9169				2.5		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.3212 0.2509	0.3011 0.2561	0.2491	0.2365	0.2510	AveID		0.2666				11.8		20.0			
13C4 PFBA	1.3292 1.3830	1.3463 1.4139	1.3398	1.3425	1.3222	Ave		1.3538				2.4		20.0			
13C5-PFPeA	0.8530 0.8835	0.8693 0.9158	0.8600	0.8699	0.8442	Ave		0.8708				2.7		20.0			
13C3-PFBS	0.0255 0.0260	0.0258 0.0287	0.0246	0.0254	0.0249	Ave		0.0258				5.2		20.0			
13C2 PFHxA	0.9632 0.9696	0.9914 1.0475	0.9842	1.0134	0.9492	Ave		0.9884				3.4		20.0			
13C4-PFHpA	0.9369 0.9413	0.9288 0.9765	0.9251	0.9440	0.9307	Ave		0.9405				1.8		20.0			
18O2 PFHxS	1.4268 1.4227	1.4317 1.5142	1.4321	1.3895	1.3865	Ave		1.4291				3.0		20.0			
M2-6:2FTS	0.2915 0.2934	0.2908 0.2963	0.2910	0.3004	0.2983	Ave		0.2945				1.3		20.0			
13C4 PFOA	0.9881 0.9518	0.9613 0.9589	0.9545	0.9644	0.9454	Ave		0.9607				1.4		20.0			
13C4 PFOS	1.0211 1.0214	1.0314 1.0902	1.0085	1.0308	0.9809	Ave		1.0263				3.2		20.0			
13C5 PFNA	0.8604 0.8287	0.8689 0.8400	0.8659	0.8569	0.8227	Ave		0.8491				2.2		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.3576 0.3310	0.3547 0.3070	0.3367	0.3587	0.3300	Ave		0.3394				5.6		20.0			
13C8 FOSA	1.4863 1.4718	1.4728 1.4280	1.4530	1.4809	1.4582	Ave		1.4644				1.4		20.0			
13C2 PFDA	0.7822 0.6812	0.7407 0.6528	0.7001	0.6831	0.6801	Ave		0.7029				6.3		20.0			
d3-NMeFOSAA	0.1636 0.1686	0.1515 0.1746	0.1524	0.1576	0.1444	Ave		0.1590				6.7		20.0			
d5-NEtFOSAA	0.1909 0.1674	0.1741 0.1749	0.1698	0.1721	0.1680	Ave		0.1739				4.6		20.0			
13C2 PFUnA	0.5672 0.5357	0.5555 0.5340	0.5306	0.5425	0.5560	Ave		0.5459				2.5		20.0			
13C2 PFDoA	0.5715 0.5537	0.5551 0.5706	0.5342	0.5567	0.5372	Ave		0.5541				2.6		20.0			
13C2-PFTeDA	0.5082 0.4918	0.4875 0.5182	0.5203	0.5236	0.4850	Ave		0.5049				3.3		20.0			
13C2-PFHxDA	0.9543 0.8237	0.9144 0.9115	0.8717	0.9100	0.8700	Ave		0.8936				4.7		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-236979/2	2018.07.30LLICA_002.d
Level 2	IC 320-236979/3	2018.07.30LLICA_003.d
Level 3	IC 320-236979/4	2018.07.30LLICA_004.d
Level 4	IC 320-236979/5	2018.07.30LLICA_005.d
Level 5	IC 320-236979/6	2018.07.30LLICA_006.d
Level 6	IC 320-236979/7	2018.07.30LLICA_007.d
Level 7	IC 320-236979/8	2018.07.30LLICA_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	55640 9595708	95976 18470638	478561	1851329	4625755	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	38154 7454191	72278 14214044	374727	1460063	3611446	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	60187 12485143	122045 23798155	644382	2472544	6254024	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	12228 2603715	26967 4909482	129345	505381	1324683	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	40704 7090465	72172 14034199	378153	1444727	3585562	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	59597 12192443	112838 22684764	607865	2368376	6021802	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	35633 7502071	74149 14342810	375371	1553374	3895067	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	60447 10278170	111488 19821606	517126	2007114	4980786	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	17893 3171748	31066 6139898	173438	665614	1632782	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	43675 7656726	74116 14443647	403026	1579409	3918848	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	43039 9355738	93773 17130665	466541	1827071	4560450	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorooctanesulfonic acid (PFOS)		AveID	38923 7587560	76439 15005307	384723	1485846	3685298	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanoic acid (PFNA)		AveID	+++++ 6354761	64988 12107210	327392	1273258	3260036	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorononanesulfonic acid		AveID	27048 5633140	50669 10307633	276844	1068357	2762305	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
8:2 FTS		AveID	15460 2850671	33682 5092438	157604	628972	1486419	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorooctane Sulfonamide (PFOSA)		AveID	50600 10146906	94565 18078409	539082	2134917	5360202	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanoic acid (PFDA)		AveID	31555 4916363	61256 9222412	268702	993850	2565522	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	5225 1150048	12074 2437502	58012	218553	545986	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	21330 4833890	47433 9078341	232785	903130	2386291	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	19488 3199541	37364 6405744	159838	651751	1719272	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	5174 1073047	12253 2156260	55691	229437	533712	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	+++++ 4263398	38943 8156318	218447	849134	2063713	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	17668 3513784	33580 7042097	181224	731755	1805713	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	5631 858287	10095 1740950	47759	175652	434071	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	4585466 4810186	4630140 4636797	4937606	4761246	4714773	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	2942808 3072715	2989728 3003467	3169314	3085012	3010228	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	81678 84122	82622 87520	84477	83737	82421	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	3323069 3372366	3409586 3435352	3627040	3594130	3384711	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	3232325 3273830	3194241 3202305	3409343	3347957	3318714	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4656503 4680902	4657860 4697586	4992768	4661982	4677090	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	955489 969384	950264 923131	1018721	1012278	1010664	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3408890 3310554	3305995 3144812	3517779	3420467	3371225	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3367548 3396258	3390963 3418135	3553019	3494855	3343827	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	2968355 2882269	2988238 2754672	3191026	3038962	2933744	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1181950 1102975	1168521 964489	1188736	1218683	1127285	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C8 FOSA	13PF OA	Ave	5127553 5118898	5065365 4683099	5354746	5252242	5199703	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C2 PFDA	13PF OA	Ave	2698620 2369147	2547441 2140731	2580166	2422600	2425320	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	564460 586561	520959 572690	561654	558924	515038	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	658589 582129	598786 573455	625902	610220	599108	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	1956846 1863275	1910475 1751167	1955397	1923975	1982699	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	1971714 1925682	1909051 1871344	1968835	1974249	1915610	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	1753145 1710393	1676468 1699348	1917316	1856897	1729327	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	3292125 2864881	3144815 2989284	3212348	3227345	3102234	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-236979/2	2018.07.30LLICA_002.d
Level 2	IC 320-236979/3	2018.07.30LLICA_003.d
Level 3	IC 320-236979/4	2018.07.30LLICA_004.d
Level 4	IC 320-236979/5	2018.07.30LLICA_005.d
Level 5	IC 320-236979/6	2018.07.30LLICA_006.d
Level 6	IC 320-236979/7	2018.07.30LLICA_007.d
Level 7	IC 320-236979/8	2018.07.30LLICA_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	18.5 -2.7	1.2	-5.3	-5.0	-4.2	-2.6	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	7.2 -2.2	-0.1	-2.2	-2.2	-0.8	0.3	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	0.0 -7.7	0.3	3.5	0.2	3.0	0.7	30 30	30	30	30	30	30
4:2 FTS	-2.3 -8.5	6.5	-0.1	-1.5	4.9	1.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	14.9 -4.2	-0.7	-2.2	-5.7	-0.6	-1.4	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	3.3 -8.2	-3.3	1.9	0.1	3.5	2.6	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	-3.1 -1.6	2.0	-3.2	2.0	3.2	0.7	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	16.1 -5.6	7.1	-7.3	-3.7	-4.7	-1.8	30 30	30	30	30	30	30
6:2 FTS	11.4 -1.1	-2.8	1.3	-2.2	-3.9	-2.7	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	9.8 -1.6	-4.0	-1.8	-1.1	-0.4	-0.9	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-3.5 -5.4	4.4	-0.9	-1.4	2.9	4.0	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	4.5 -0.8	1.9	-2.1	-3.9	-0.4	1.0	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	+++++ 1.8	0.8	-4.9	-2.9	3.0	2.2	 30	30	30	30	30	30
Perfluorononanesulfonic acid	2.2 -4.1	-5.0	-0.9	-2.8	5.1	5.5	30 30	30	30	30	30	30
8:2 FTS	-1.5 -0.6	8.5	-0.2	-2.8	-0.7	-2.7	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 236979

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/30/2018 15:14 Calibration End Date: 07/30/2018 16:00 Calibration ID: 40409

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorooctane Sulfonamide (PFOSA)	-0.3 -2.5	-5.7	1.7	2.6	4.1	0.1	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	7.5 -0.9	10.6	-4.2	-5.7	-2.7	-4.6	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-10.0 3.5	12.7	0.4	-5.0	3.1	-4.7	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-6.1 -1.6	3.7	-2.9	-4.3	5.8	5.5	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	11.0 2.0	9.0	-8.9	-5.6	-3.3	-4.3	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	-14.0 3.0	12.1	-2.5	3.0	-2.4	0.9	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	+++++ 0.9	-5.5	2.8	-0.4	-0.2	2.5	 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	-2.3 2.6	-4.1	0.4	1.1	2.8	-0.5	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	20.5 -3.9	13.0	-6.6	-11.3	-5.8	-5.9	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 30-Jul-2018 15:14:00 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:38:31 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:15:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.407	1.412	-0.005	0.536	4585466	2.45		98.2	66951	
2 Perfluorobutyric acid										
212.90 > 169.00	1.407	1.412	-0.005	1.000	55640	0.0296		119	10.2	
D 3 13C5-PFPeA										
267.90 > 223.00	1.656	1.658	-0.002	0.630	2942808	2.45		98.0	46727	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.656	1.659	-0.003	1.000	38154	0.0268		107	18.9	
D 47 13C3-PFBS										
301.90 > 83.00	1.683	1.693	-0.010	0.641	81678	2.29		98.5	355	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.693	1.697	-0.005	1.005	60187	0.0221		100	129	
298.90 > 99.00	1.693	1.697	-0.005	1.005	25315		2.38(1.25-3.74)	100	63.7	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.895	1.904	-0.009	1.125	12228	0.0228		97.7	523	
D 60 M2-4:2FTS										
329.00 > 81.00	1.905	1.905	0.0	0.725	512523	NC			4062	
D 7 13C2 PFHxA										
315.00 > 270.00	1.937	1.942	-0.005	0.737	3323069	2.44		97.5	74000	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.937	1.944	-0.007	1.000	40704	0.0287		115	69.4	
313.00 > 119.00	1.927	1.944	-0.017	0.994	5023		8.10(5.03-15.10)	115	38.9	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.959	1.965	-0.006	1.164	59597	0.0242		103	603	
349.00 > 99.00	1.959	1.965	-0.006	1.164	21518		2.77(1.36-4.07)	103	58.3	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.036	2.040	-0.004	0.775	206506	NC			9166	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.036	2.042	-0.006	1.000	7265	NC			37.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.267	0.0	0.863	3232325	2.49		99.6	48935	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.267	2.271	-0.004	1.000	35633	0.0242		96.9	10.9	M
363.00 > 169.00	2.267	2.271	-0.004	1.000	15513		2.30(1.13-3.40)	96.9	133	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.284	-0.004	1.000	60447	0.0264		116	170	
399.00 > 99.00	2.280	2.284	-0.004	1.000	22138		2.73(1.50-4.49)	116	30.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.288	-0.008	0.868	4656503	2.36		99.8	40695	
65 ADONA										
377.00 > 251.00	2.306	2.316	-0.010	0.770	87892	NC			860	
377.00 > 85.00	2.306	2.316	-0.010	0.770	48138		1.83(0.84-2.53)		223	
D 12 M2-6:2FTS										
429.00 > 81.00	2.596	2.603	-0.007	0.988	955489	2.35		99.0	8146	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.603	2.605	-0.002	1.003	17893	0.0264		111	311	
* 62 13C2-PFOA										
415.00 > 370.00	2.627	2.631	-0.004		3449913	2.50			56633	
D 14 13C4 PFOA										
417.00 > 372.00	2.627	2.631	-0.004	1.000	3408890	2.57		103	41561	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.619	2.631	-0.012	0.997	43675	0.0275		110	33.4	M
413.00 > 169.00	2.627	2.631	-0.004	1.000	23179		1.88(0.84-2.52)	110	94.6	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.636	2.640	-0.004	0.880	43039	0.0230		96.5	207	
449.00 > 99.00	2.636	2.640	-0.004	0.880	11488		3.75(1.94-5.82)	96.5	20.7	M
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.994	3.000	-0.006	1.000	38923	0.0242		104	29.2	M
499.00 > 99.00	2.994	3.000	-0.006	1.000	9912		3.93(2.31-6.93)	104	37.1	
D 18 13C4 PFOS										
503.00 > 80.00	2.994	3.000	-0.006	1.139	3367548	2.38		99.5	14548	
D 19 13C5 PFNA										
468.00 > 423.00	2.994	3.000	-0.006	1.139	2968355	2.53		101	77373	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.994	3.001	-0.007	1.000	19967	0.0156		62.3	2.4	M
463.00 > 169.00	2.994	3.001	-0.007	1.000	7133		2.80(1.90-5.69)	62.3	163	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.204	3.212	-0.008	1.070	61554	NC			215	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.338	3.347	-0.009	1.115	27048	0.0245		102	379	
549.00 > 99.00	3.347	3.347	0.0	1.118	11190		2.42(1.33-3.97)	102	92.0	
D 26 M2-8:2FTS										
529.00 > 81.00	3.347	3.350	-0.003	1.274	1181950	2.52		105	12373	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.347	3.350	-0.003	1.000	15460	0.0236		98.5	593	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.347	3.356	-0.009	1.274	5127553	2.54		101	53575	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.356	3.357	-0.001	1.003	50600	0.0249		99.7	1168	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.356	3.361	-0.005	1.000	31555	0.0269		108	53.2	
513.00 > 169.00	3.356	3.361	-0.005	1.000	6769		4.66(2.36-7.09)	108	71.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.356	3.361	-0.005	1.277	2698620	2.78		111	68744	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.505	3.515	-0.010	1.334	564460	2.57		103	20102	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.515	3.519	-0.004	1.003	5225	0.0225		90.0	64.1	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.669	3.674	-0.005	1.226	21330	0.0226		93.9	171	
599.00 > 99.00	3.669	3.674	-0.005	1.226	6824		3.13(1.39-4.16)	93.9	94.1	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.679	3.683	-0.004	1.400	658589	2.74		110	9836	
D 30 13C2 PFUnA										
565.00 > 520.00	3.679	3.687	-0.008	1.400	1956846	2.60		104	81507	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.679	3.687	-0.008	1.000	19488	0.0278		111	86.5	
563.00 > 169.00	3.679	3.687	-0.008	1.000	5140		3.79(2.12-6.36)	111	135	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.679	3.689	-0.010	1.000	5174	0.0215		86.0	94.0	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.847	3.848	-0.001	1.285	87397	NC			2571	
D 36 13C2 PFDoA										
615.00 > 570.00	3.979	3.983	-0.004	1.514	1971714	2.58		103	27928	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.989	3.987	0.002	1.003	28026	0.0329		132	5.4	
613.00 > 169.00	3.979	3.987	-0.008	1.000	6223		4.50(2.13-6.40)	132	87.3	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.243	4.245	-0.002	1.067	17668	0.0244		97.7	14.6	
663.00 > 169.00	4.243	4.245	-0.002	1.067	6326		2.79(1.25-3.76)	97.7	80.1	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.481	4.481	0.0	1.705	1753145	2.52		101	9894	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.481	4.483	-0.002	1.000	5631	0.0301		120	64.9	
713.00 > 219.00	4.470	4.483	-0.013	0.998	3609		1.56(0.71-2.13)	120	55.8	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.888	-0.001	1.000	55185	NC			12.8	
813.00 > 169.00	4.879	4.888	-0.009	0.998	9866		5.59(2.86-8.58)		67.8	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.888	-0.001	1.860	3292125	2.67		107	10352	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.226	5.229	-0.003	1.069	29741	NC			12.3	
913.00 > 169.00	5.226	5.229	-0.003	1.069	3862		7.70(3.83-11.48)		21.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:38:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d

Injection Date: 30-Jul-2018 15:14:00 Instrument ID: A8_N

Lims ID: IC L1 Full

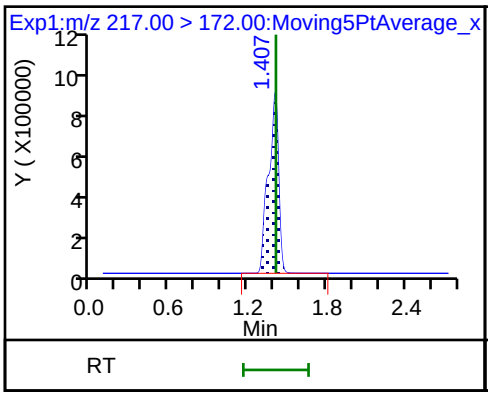
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 10 Worklist Smp#: 2

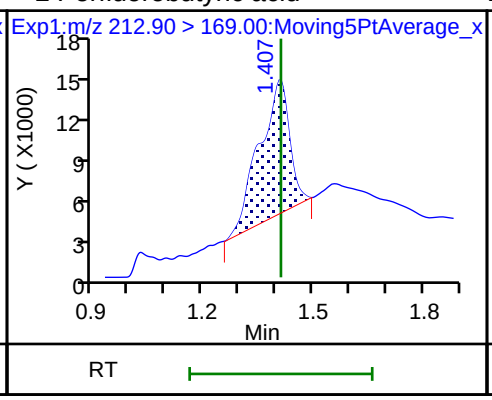
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

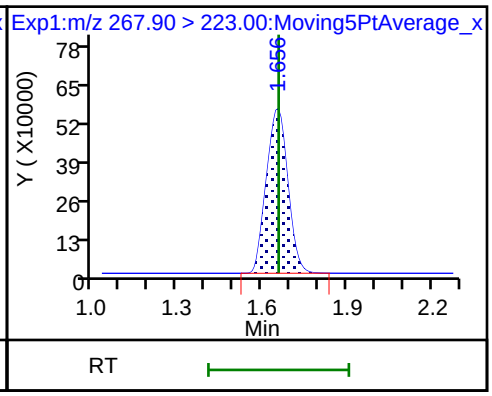
D 1 13C4 PFBA



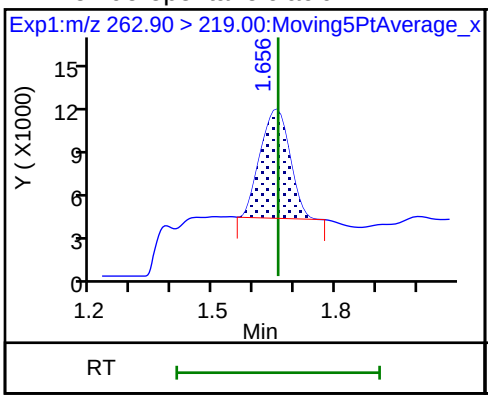
2 Perfluorobutyric acid



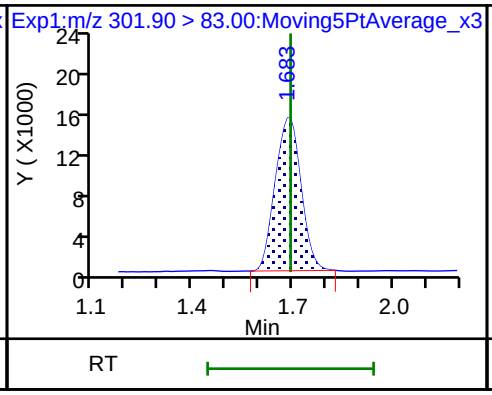
D 3 13C5-PFPeA



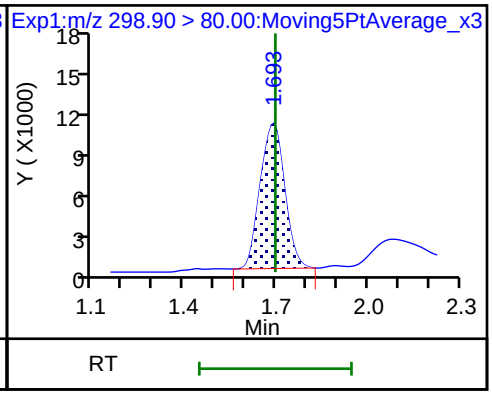
4 Perfluoropentanoic acid



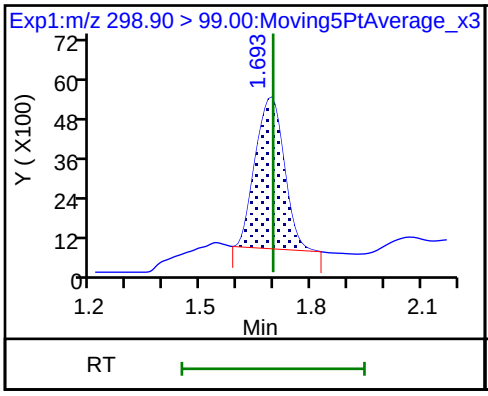
D 47 13C3-PFBS



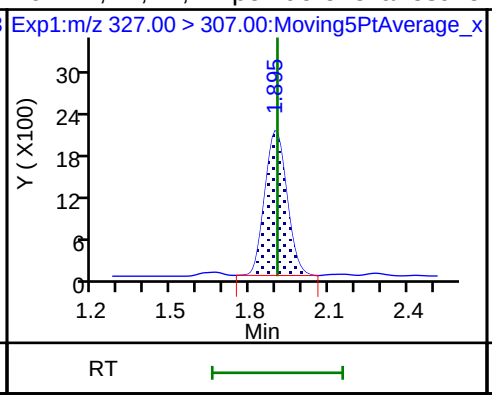
5 Perfluorobutanesulfonic acid



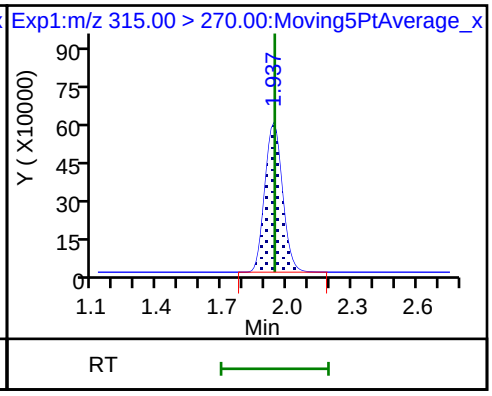
5 Perfluorobutanesulfonic acid



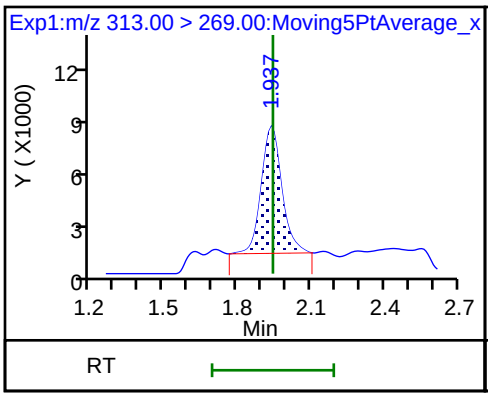
61 1H,1H,2H,2H-perfluorohexanesulfon



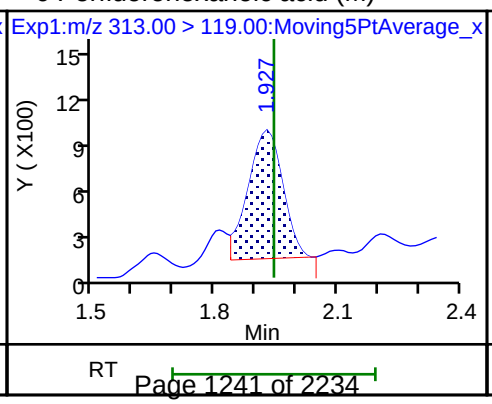
D 7 13C2 PFHxA



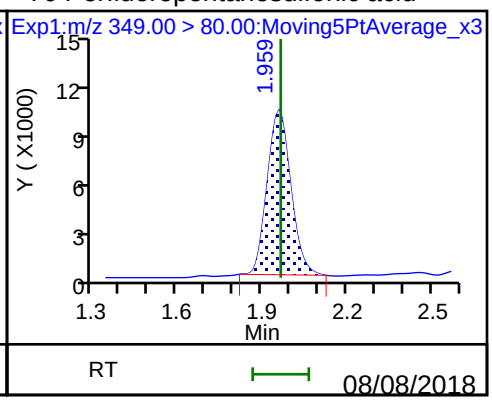
6 Perfluorohexanoic acid



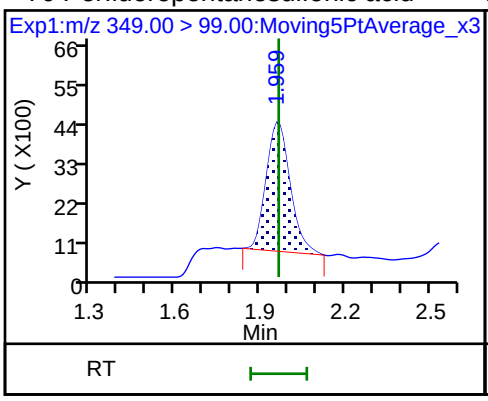
6 Perfluorohexanoic acid (M)



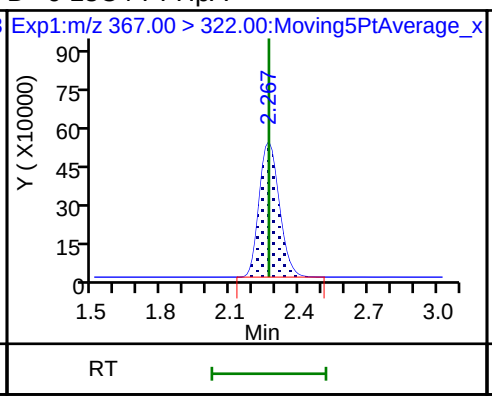
70 Perfluoropentanesulfonic acid



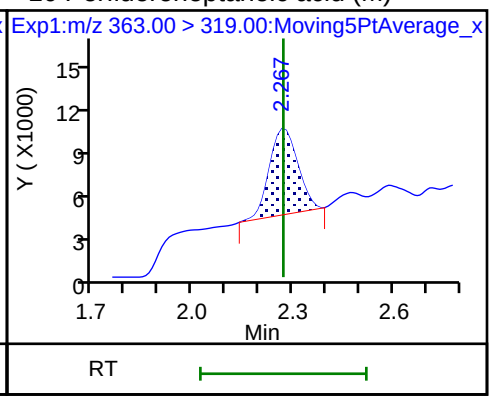
70 Perfluoropentanesulfonic acid



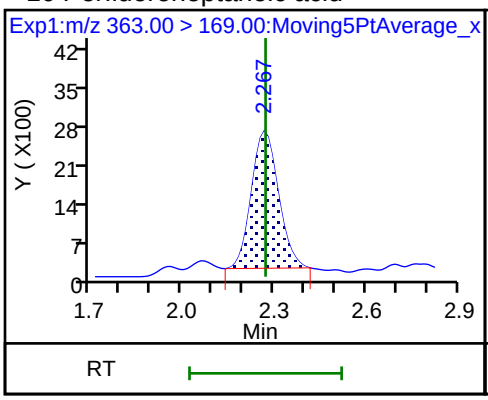
D 9 13C4-PFHpA



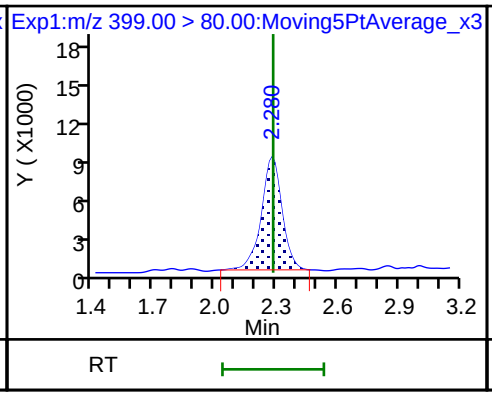
10 Perfluoroheptanoic acid (M)



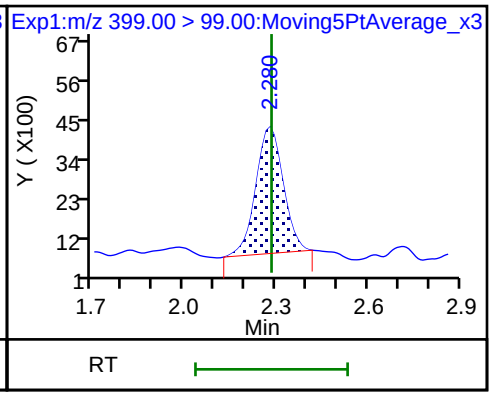
10 Perfluoroheptanoic acid



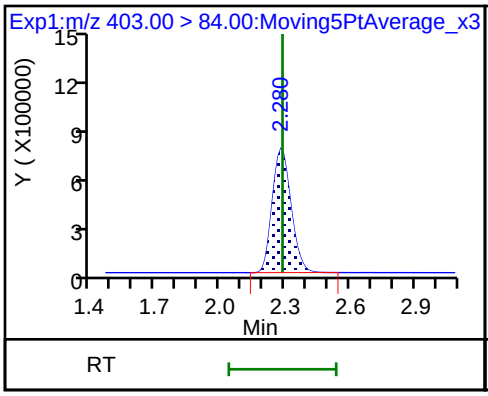
8 Perfluorohexanesulfonic acid



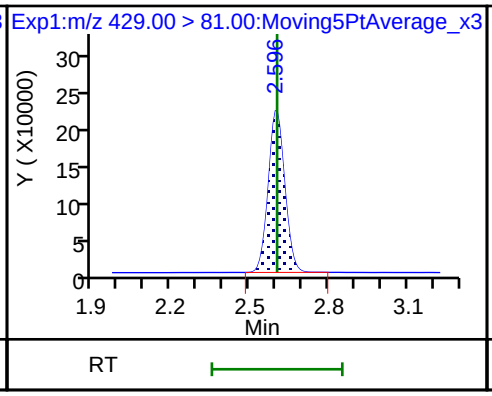
8 Perfluorohexanesulfonic acid



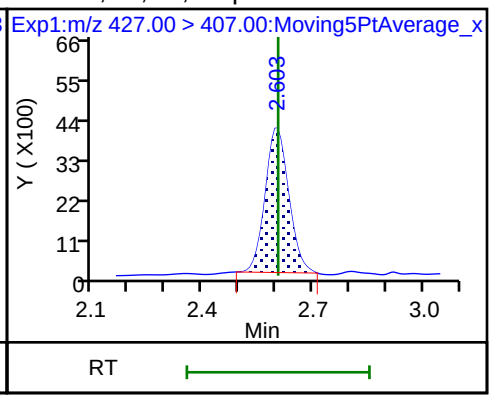
D 11 18O2 PFHxS



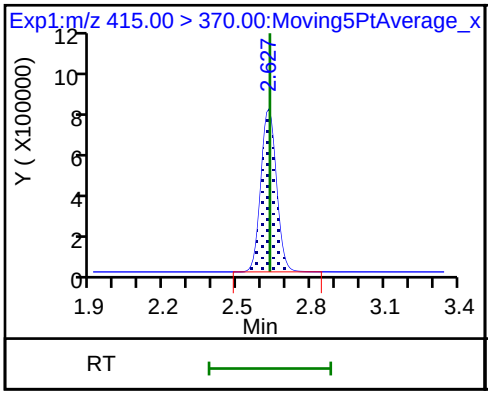
D 12 M2-6:2FTS



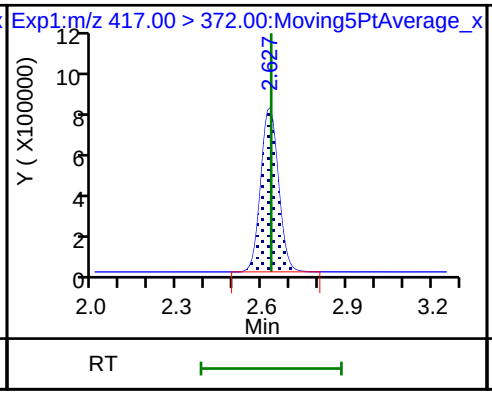
13 1H,1H,2H,2H-perfluorooctanesulfoni



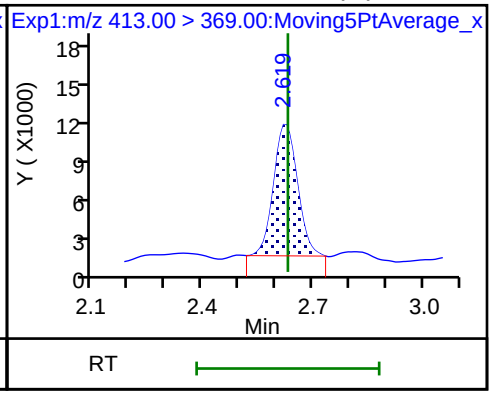
* 62 13C2-PFOA



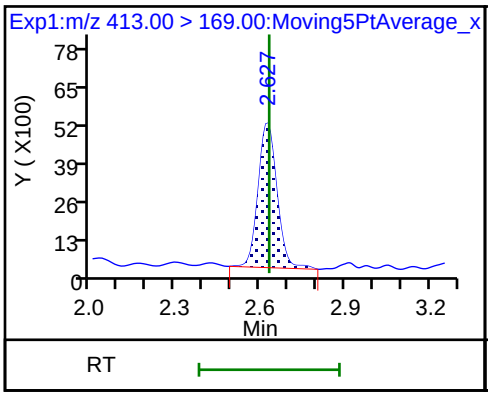
D 14 13C4 PFOA



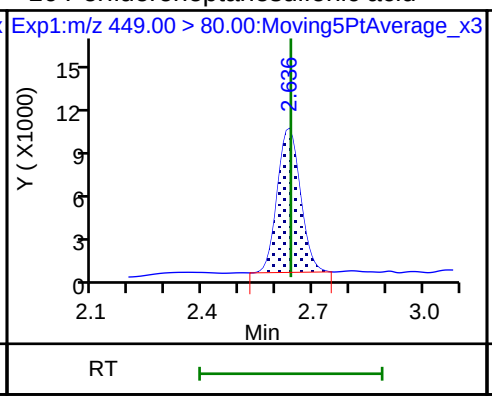
15 Perfluorooctanoic acid (M)



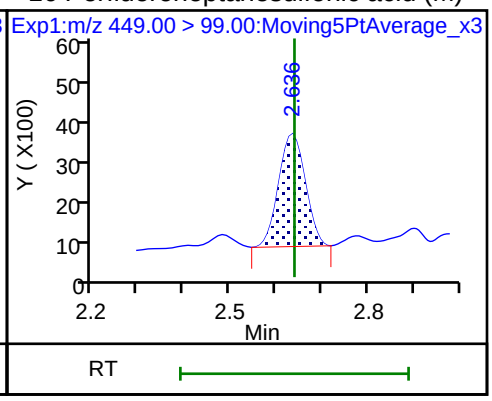
15 Perfluorooctanoic acid



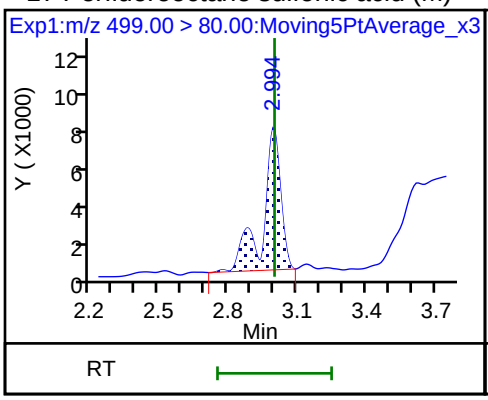
16 Perfluoroheptanesulfonic acid



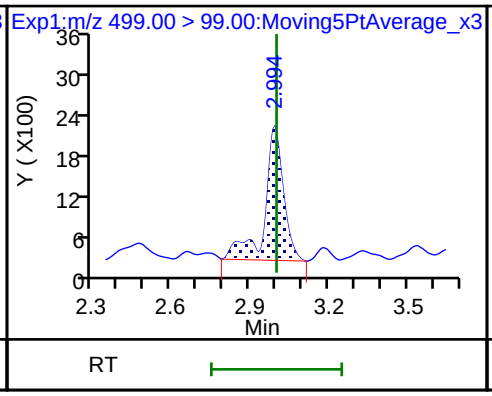
16 Perfluoroheptanesulfonic acid (M)



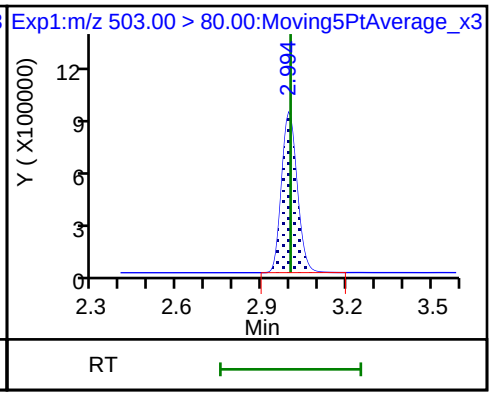
17 Perfluorooctane sulfonic acid (M)



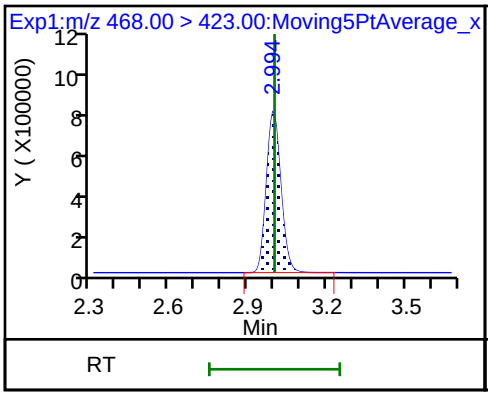
17 Perfluorooctane sulfonic acid



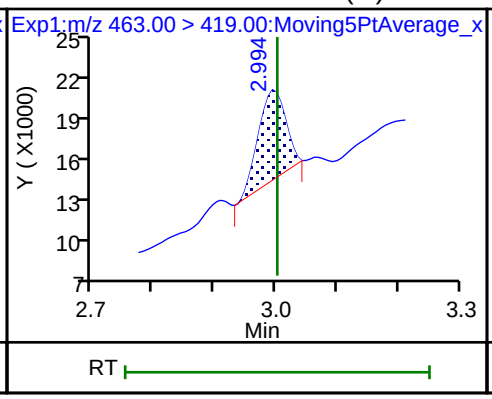
D 18 13C4 PFOS



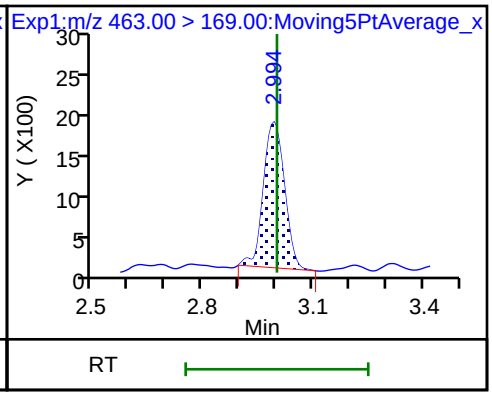
D 19 13C5 PFNA



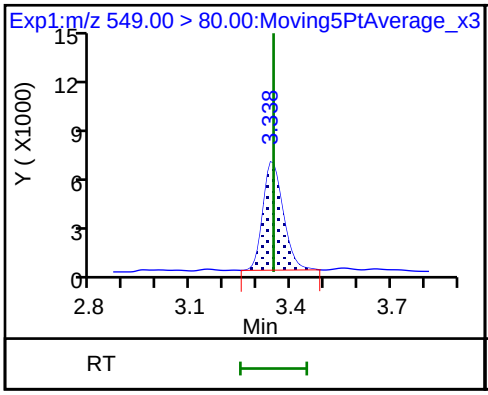
20 Perfluorononanoic acid (M)



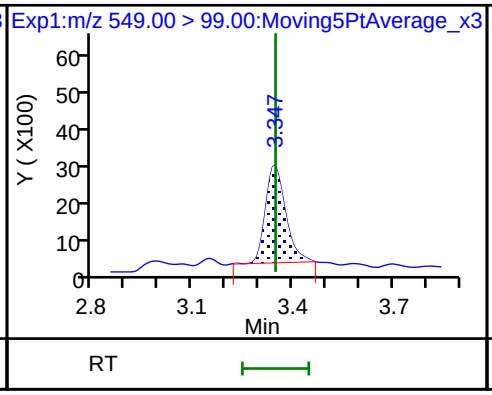
20 Perfluorononanoic acid



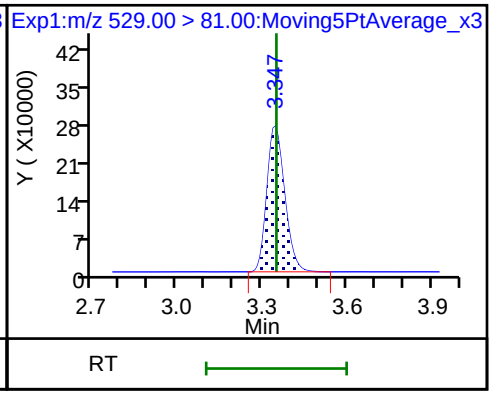
68 Perfluorononanesulfonic acid



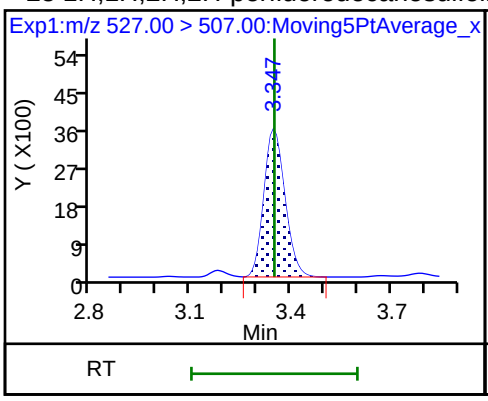
68 Perfluorononanesulfonic acid



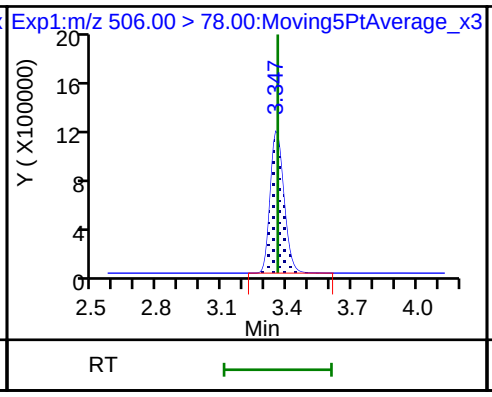
D 26 M2-8:2FTS



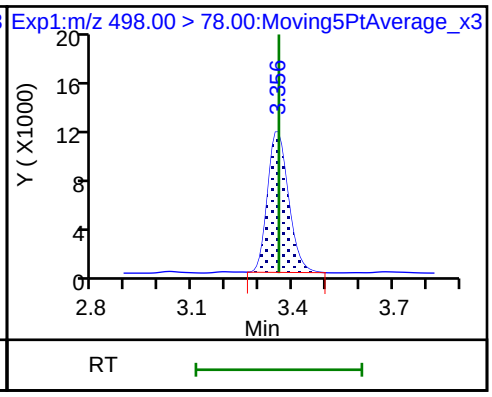
25 1H,1H,2H,2H-perfluorodecanesulfon



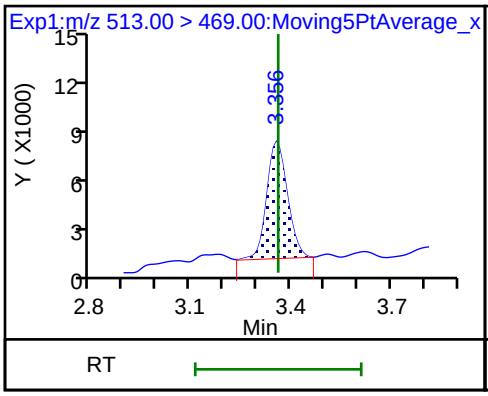
D 21 13C8 FOSA



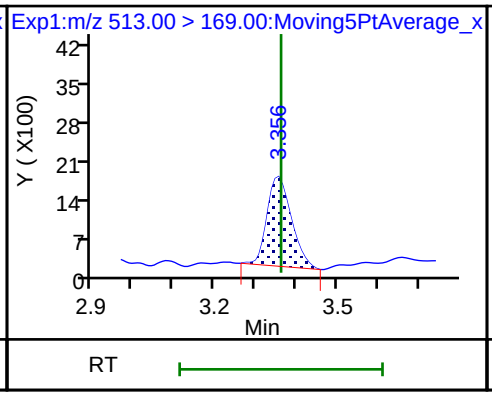
22 Perfluorooctane Sulfonamide



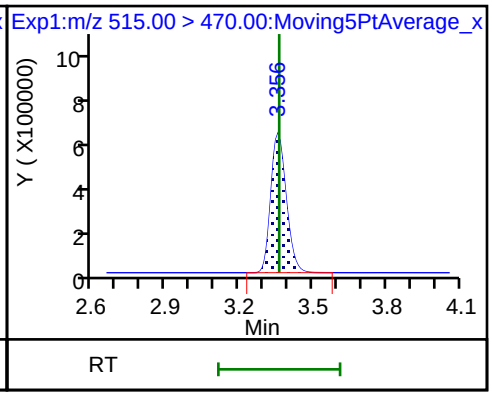
24 Perfluorodecanoic acid



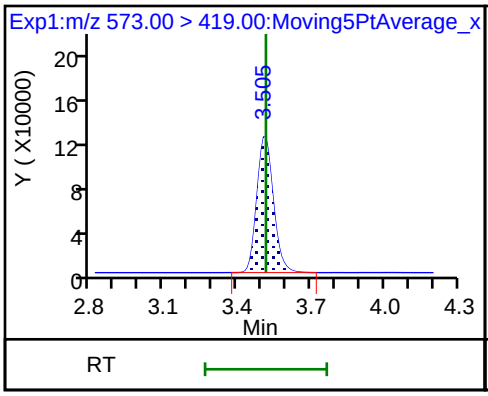
24 Perfluorodecanoic acid



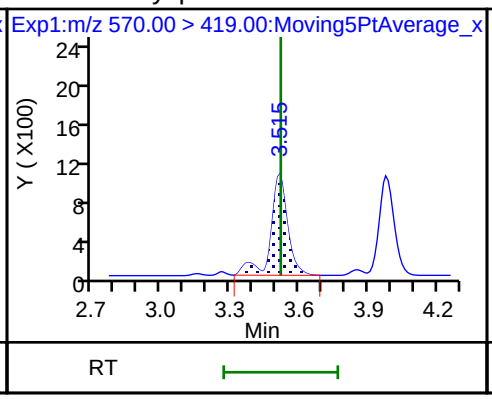
D 23 13C2 PFDA



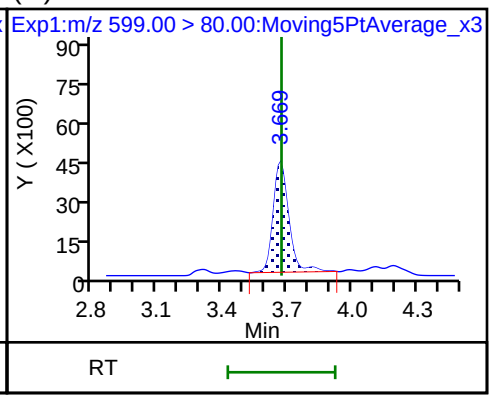
D 27 d3-NMeFOSAA



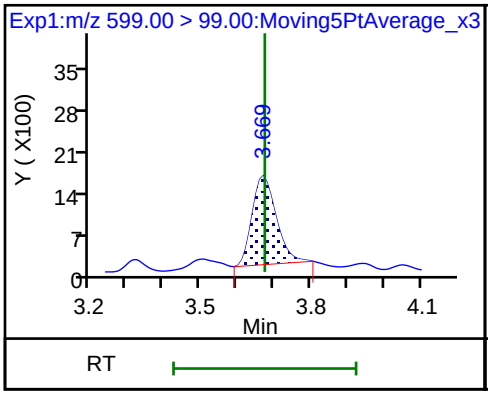
28 N-methyl perfluorooctane sulfonami (M)



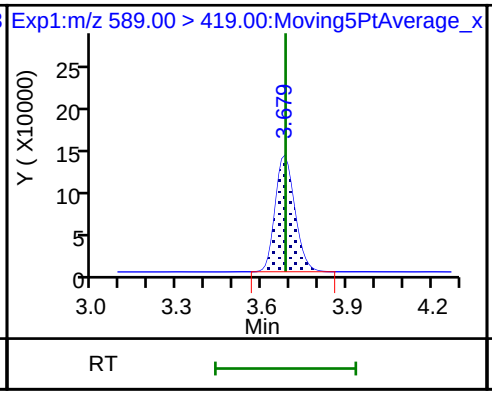
29 Perfluorodecane Sulfonic acid



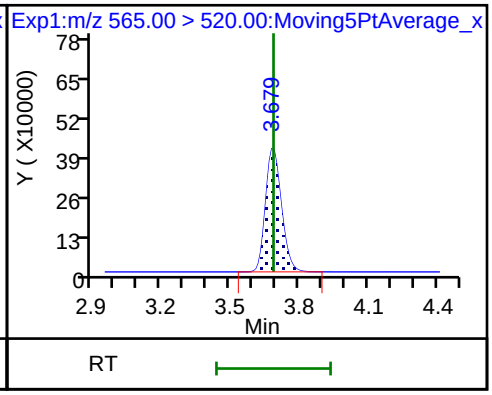
29 Perfluorodecane Sulfonic acid



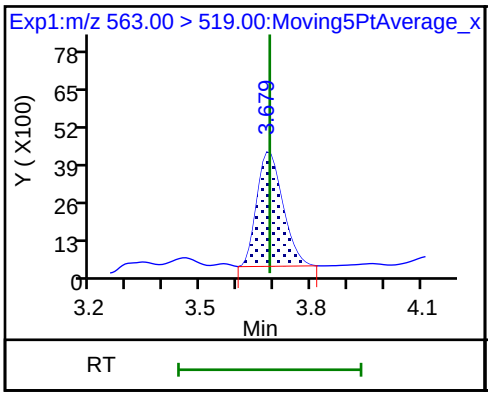
D 32 d5-NEtFOSAA



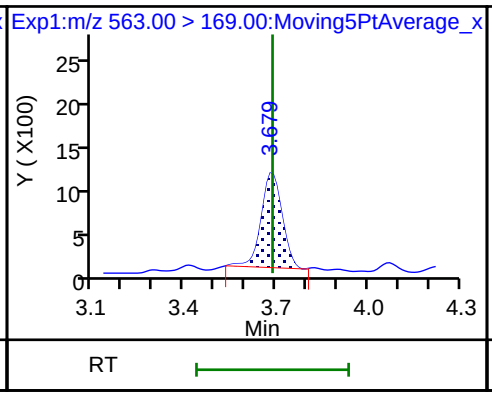
D 30 13C2 PFUnA



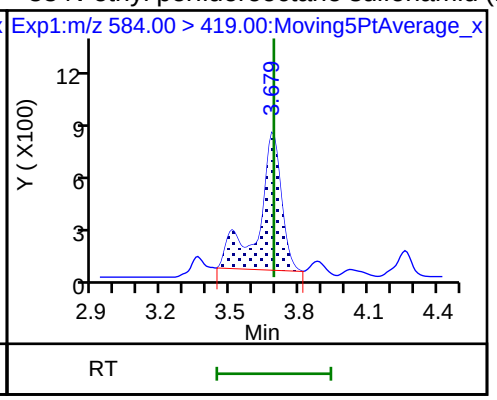
31 Perfluoroundecanoic acid



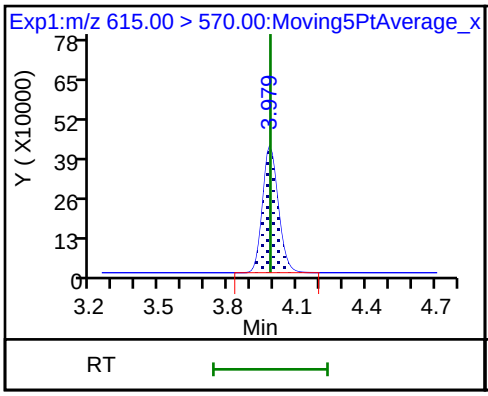
31 Perfluoroundecanoic acid



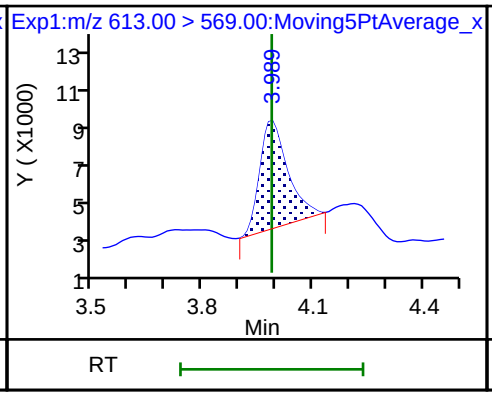
33 N-ethyl perfluorooctane sulfonamid (M)



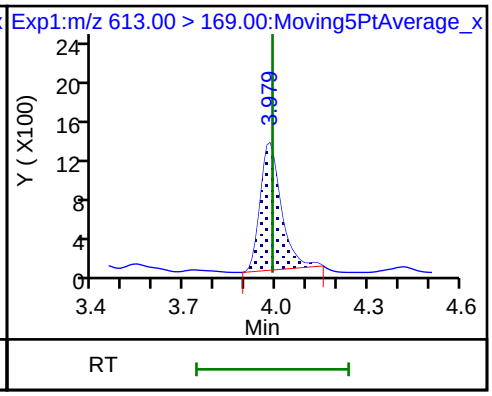
D 36 13C2 PFDoA



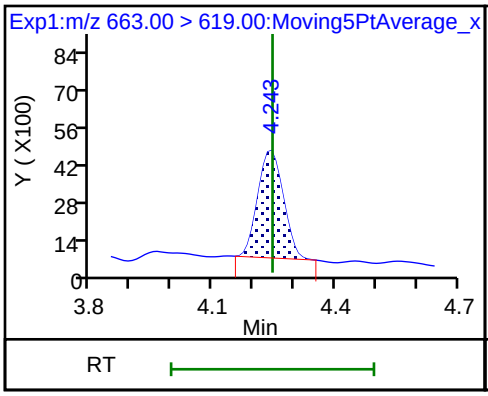
37 Perfluorododecanoic acid



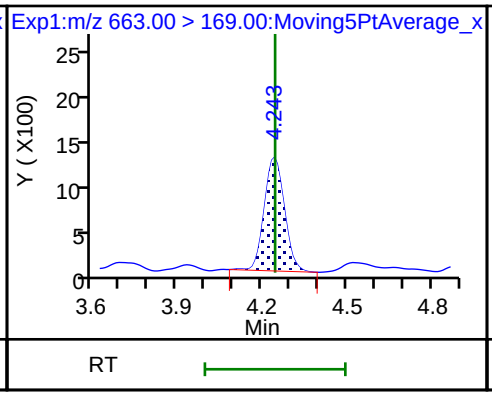
37 Perfluorododecanoic acid



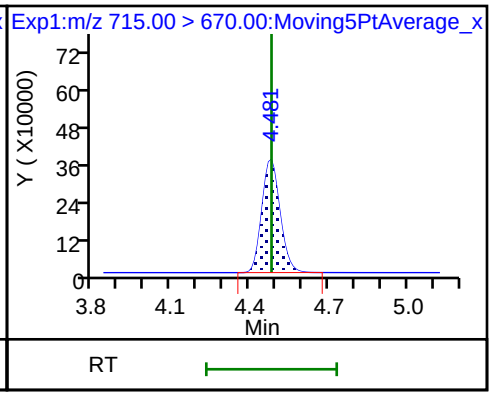
41 Perfluorotridecanoic acid



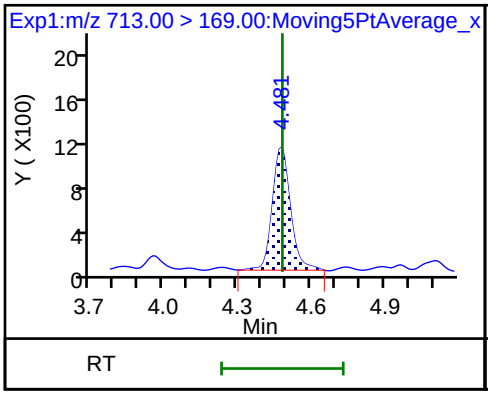
41 Perfluorotridecanoic acid



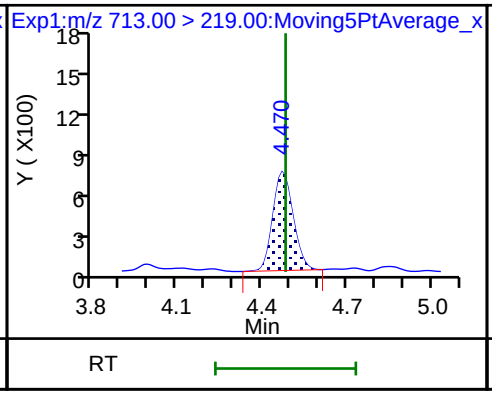
D 43 13C2-PFTeDA



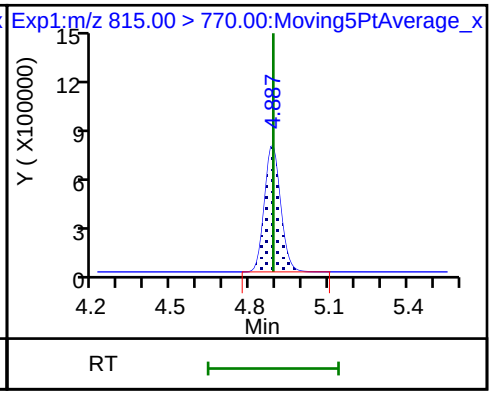
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

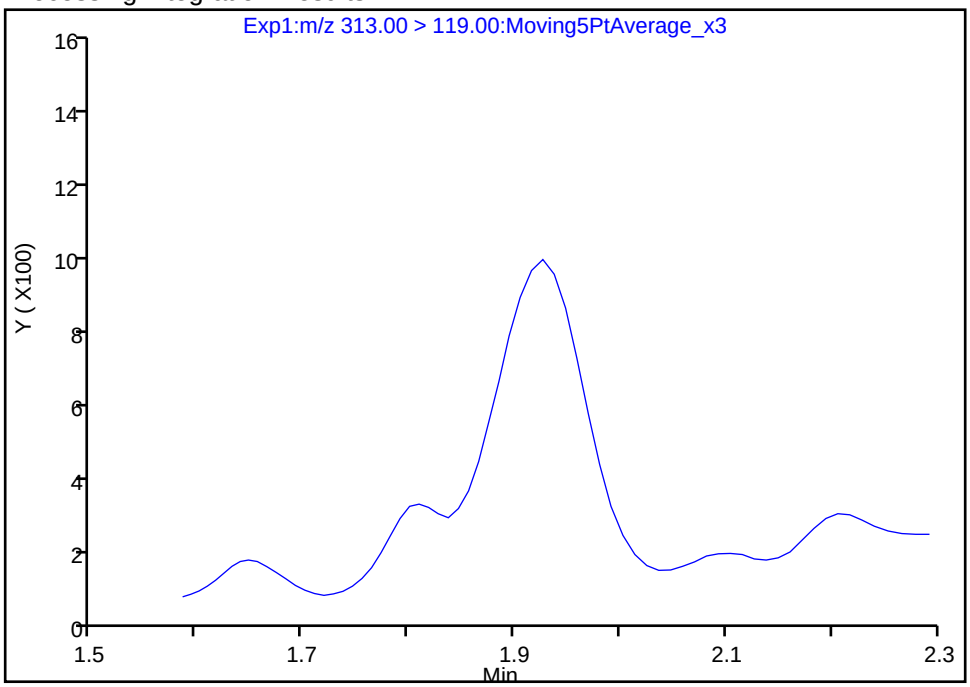
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

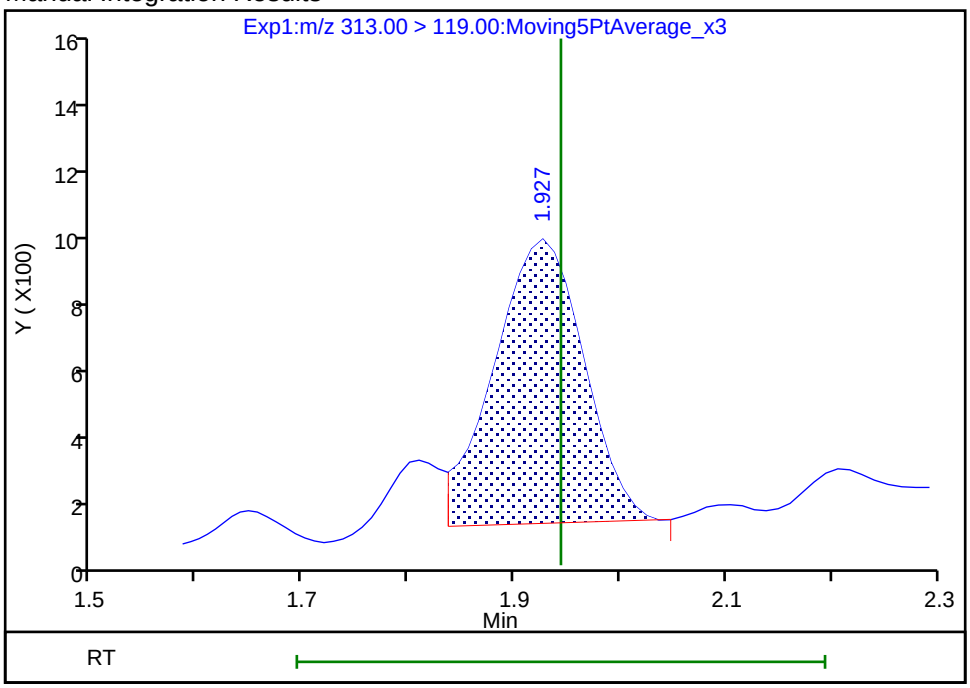
Not Detected
Expected RT: 1.94

Processing Integration Results



Manual Integration Results

RT: 1.93
Area: 5023
Amount: 0.028724
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:13:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

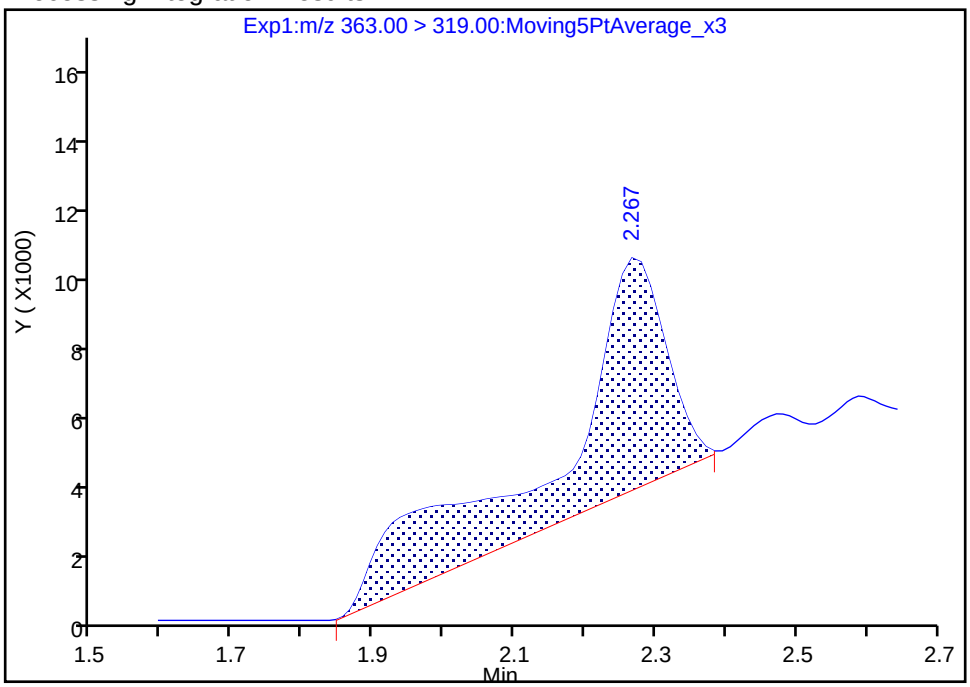
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

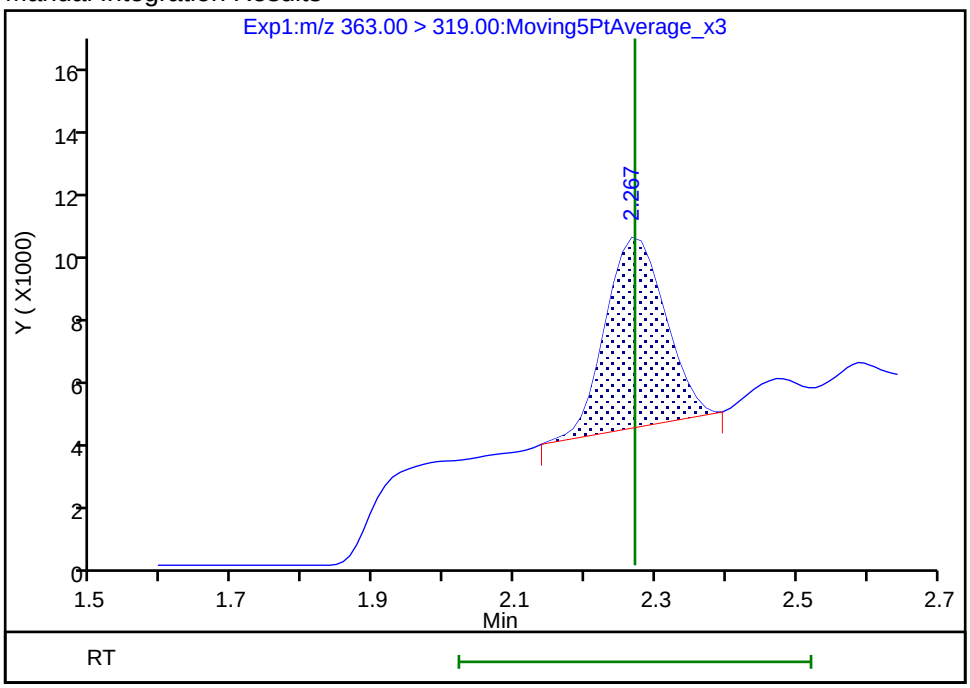
Processing Integration Results

RT: 2.27
Area: 71530
Amount: 0.041308
Amount Units: ng/ml



Manual Integration Results

RT: 2.27
Area: 35633
Amount: 0.024226
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:14:00

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

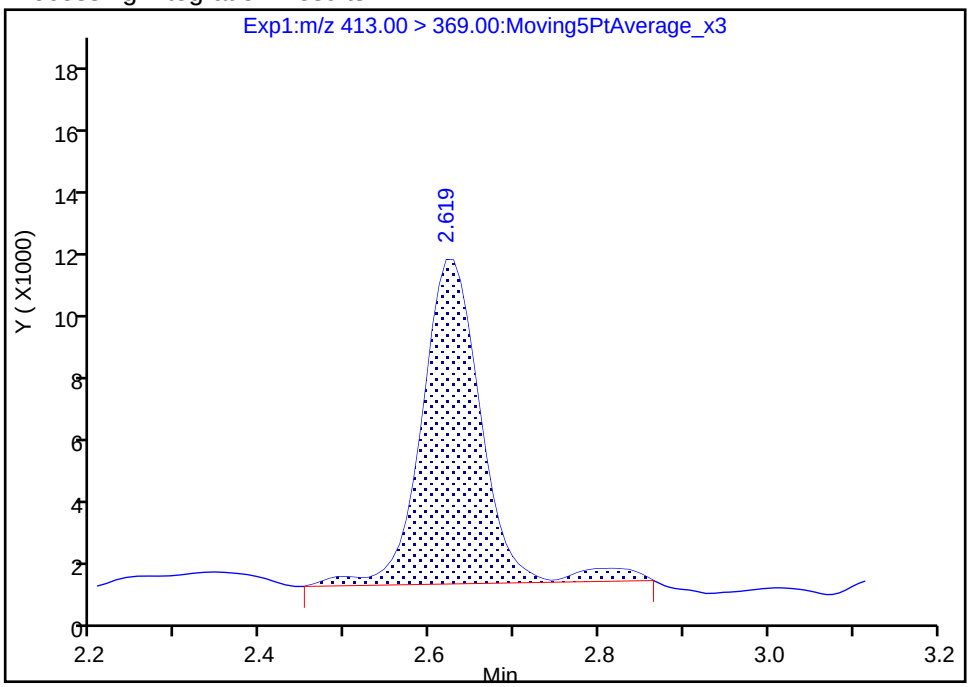
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

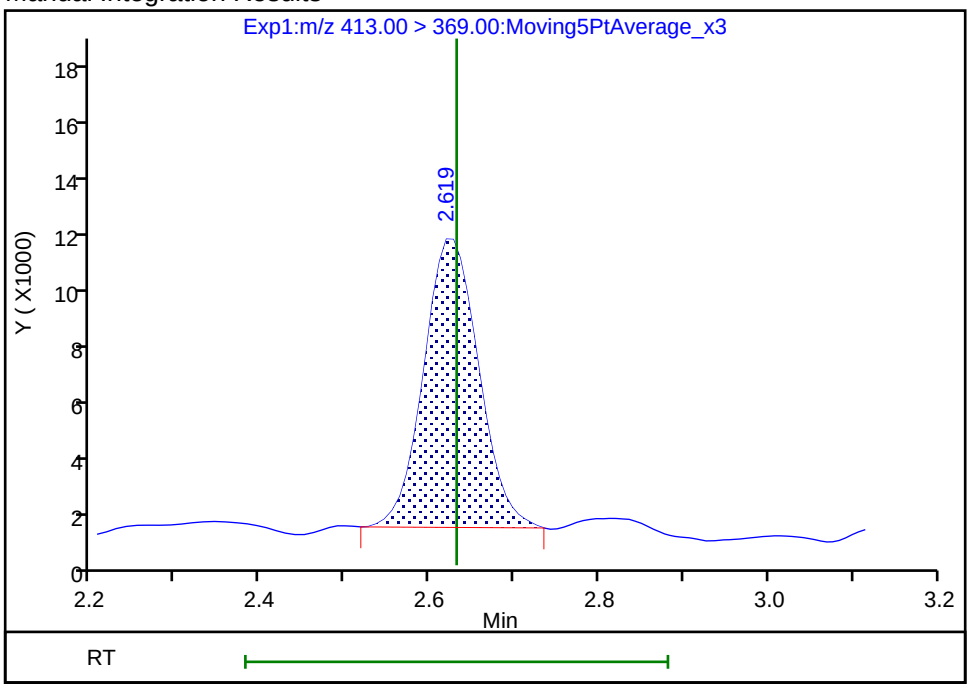
Processing Integration Results

RT: 2.62
Area: 48517
Amount: 0.029997
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 43675
Amount: 0.027473
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:14:08

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

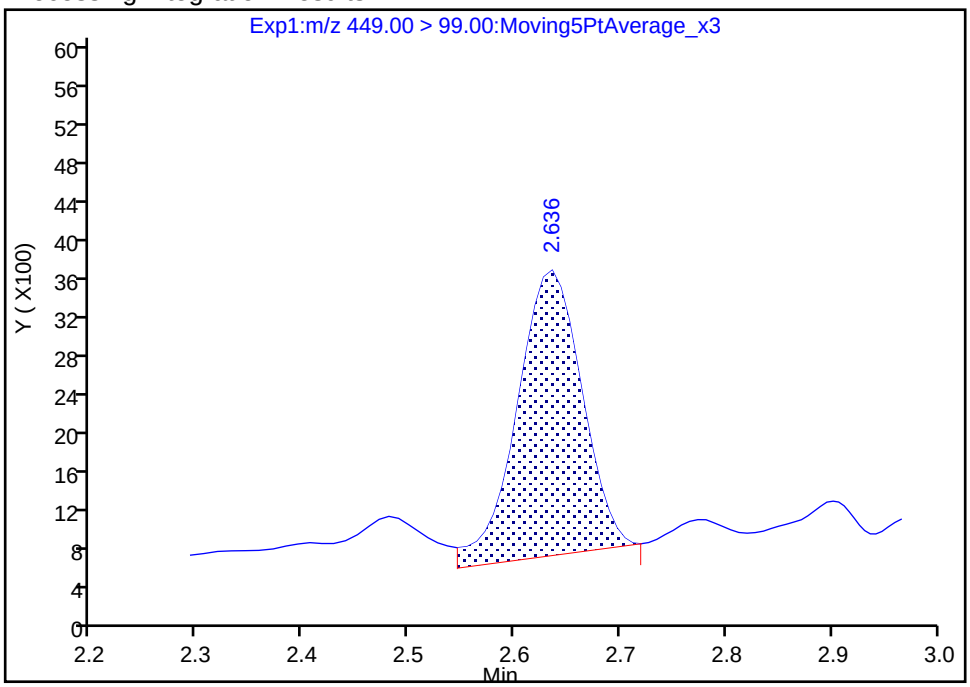
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

Signal: 2

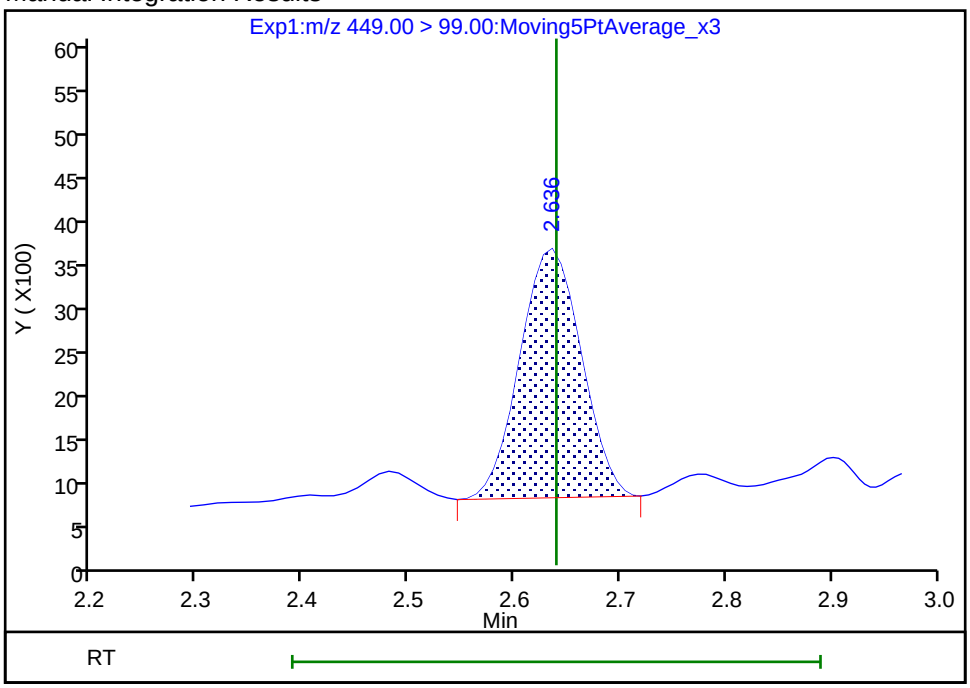
Processing Integration Results

RT: 2.64
Area: 12587
Amount: 0.022957
Amount Units: ng/ml



Manual Integration Results

RT: 2.64
Area: 11488
Amount: 0.022957
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:14:18

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

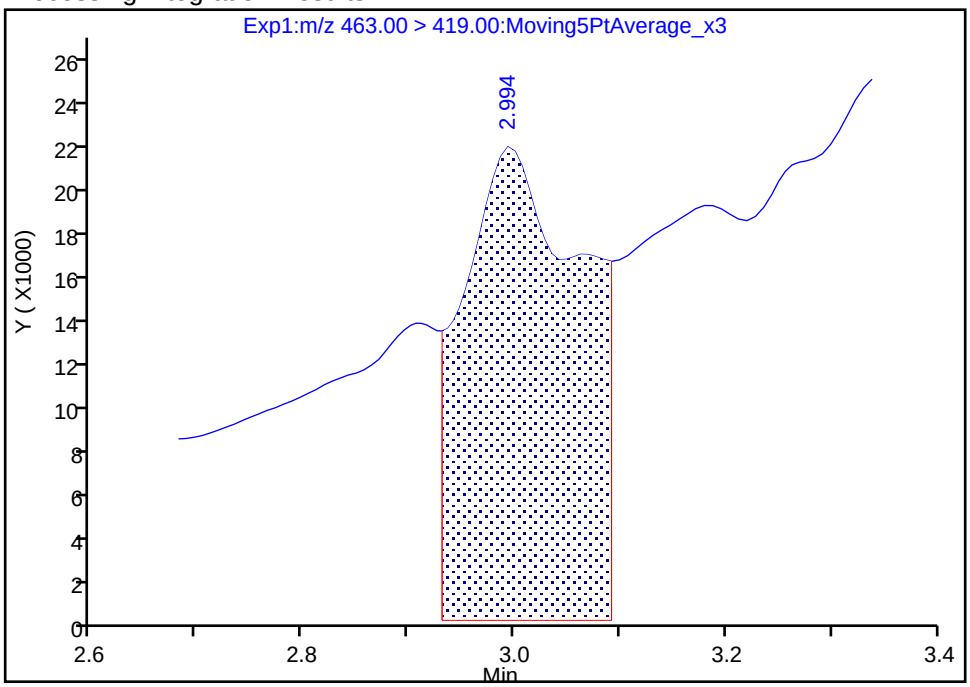
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

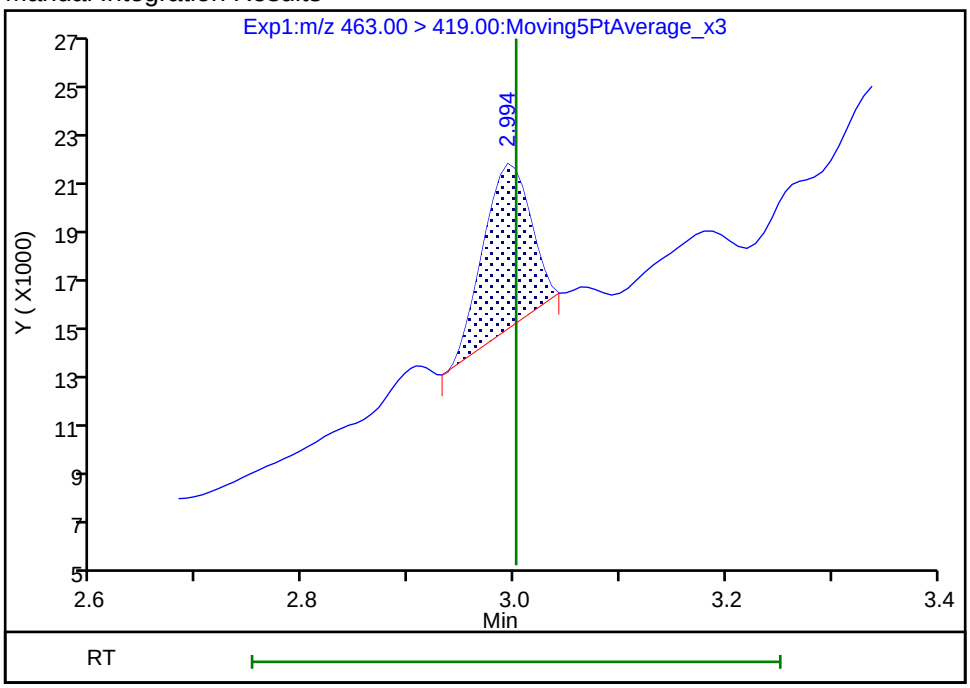
Processing Integration Results

RT: 2.99
Area: 165012
Amount: 0.012083
Amount Units: ng/ml



Manual Integration Results

RT: 2.99
Area: 19967
Amount: 0.015587
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:14:33

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

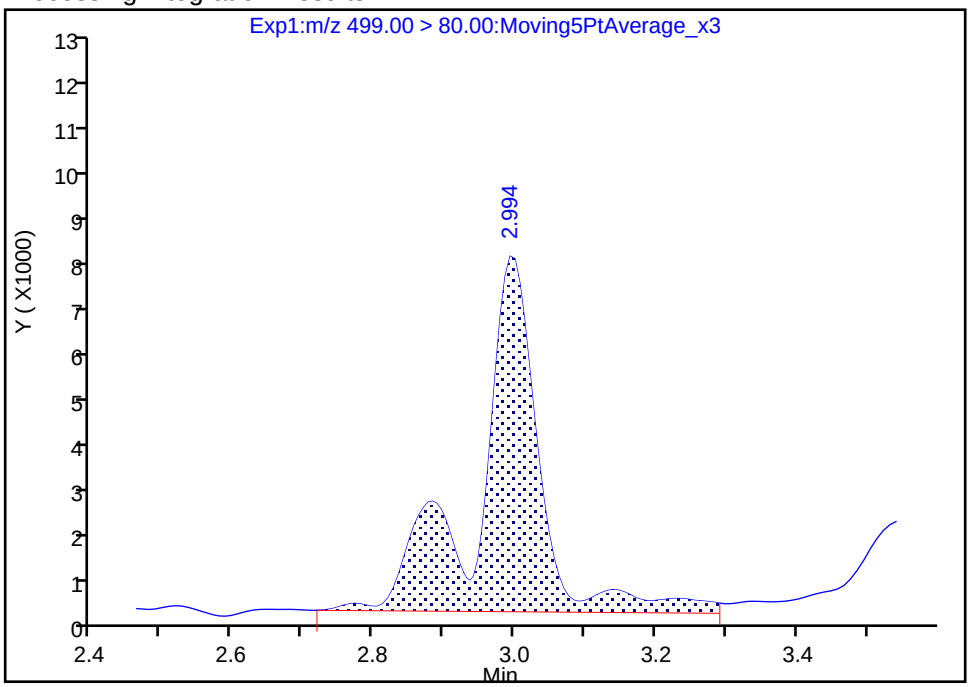
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

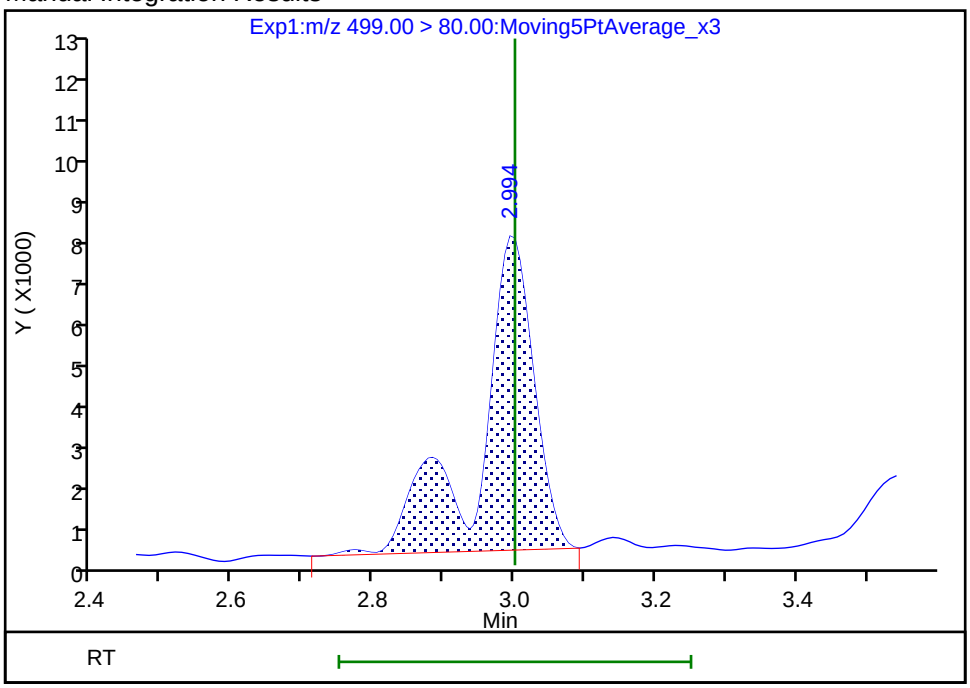
Processing Integration Results

RT: 2.99
Area: 45176
Amount: 0.029985
Amount Units: ng/ml



Manual Integration Results

RT: 2.99
Area: 38923
Amount: 0.024235
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:14:25

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

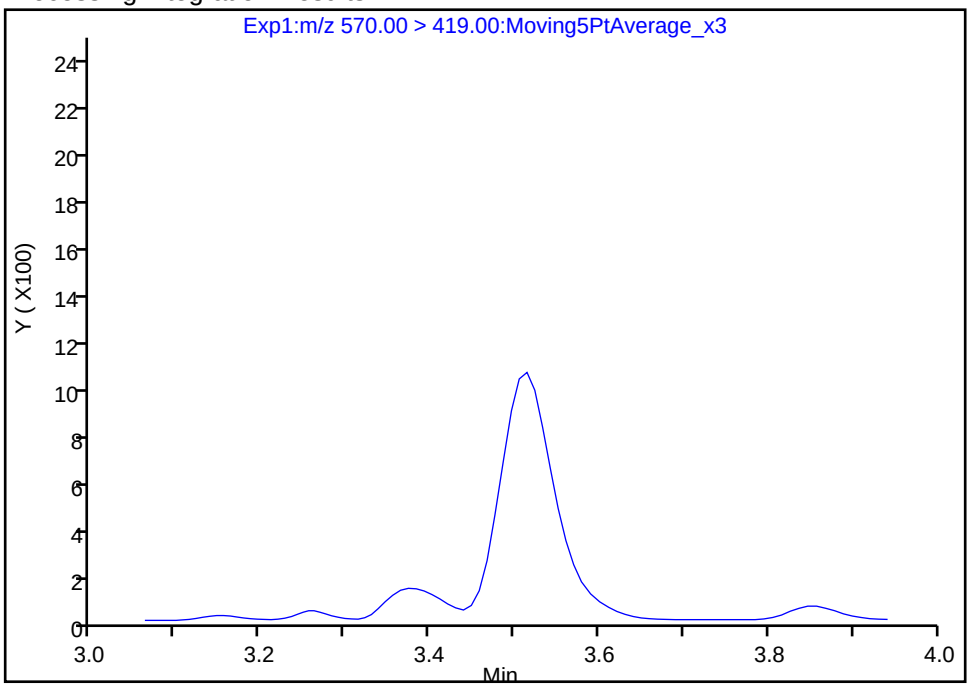
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

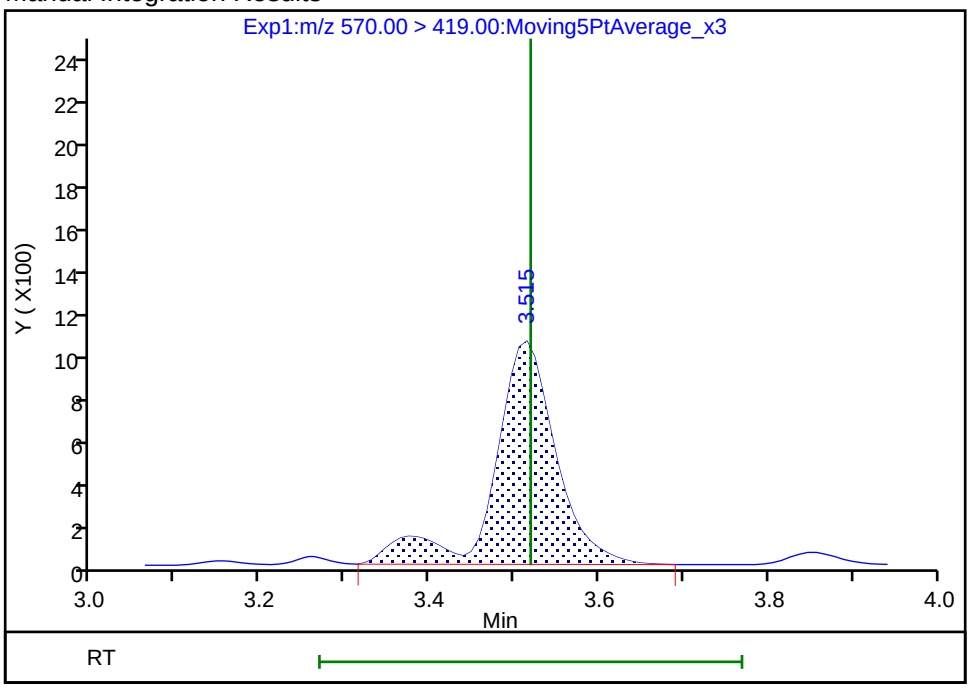
Not Detected
Expected RT: 3.52

Processing Integration Results



Manual Integration Results

RT: 3.51
Area: 5225
Amount: 0.022501
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:14:51
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

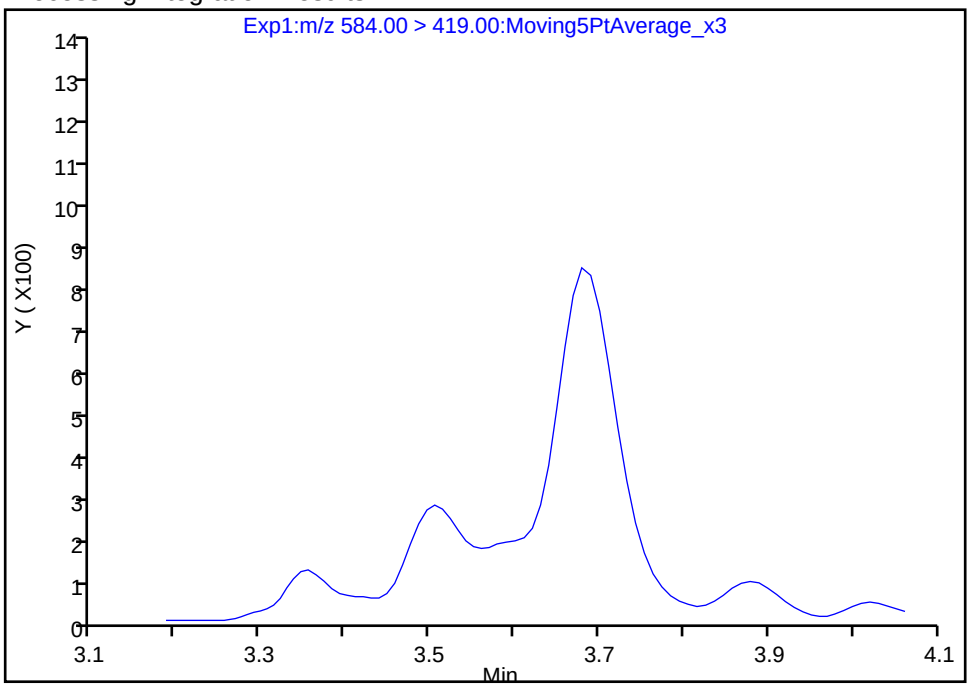
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_002.d				
Injection Date:	30-Jul-2018 15:14:00	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

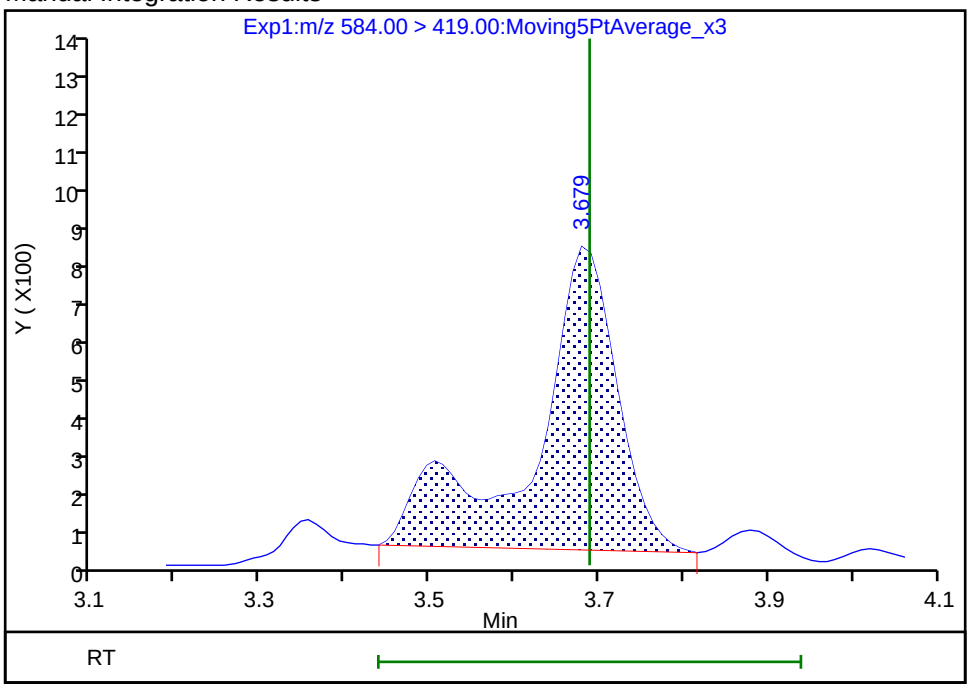
Processing Integration Results

Not Detected
Expected RT: 3.69



Manual Integration Results

RT: 3.68
Area: 5174
Amount: 0.021512
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:14:58
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 30-Jul-2018 15:21:49 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:38:39 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:16:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.414	1.412	0.002	0.536	4630140	2.49		99.4	80029	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.412	0.002	1.000	95976	0.0506		101	18.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.658	0.0	0.629	2989728	2.50		99.8	43049	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.667	1.659	0.008	1.005	72278	0.0500		99.9	32.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.693	0.001	0.642	82622	2.32		100.0	351	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.703	1.697	0.006	1.005	122045	0.0443		100	299	
298.90 > 99.00	1.703	1.697	0.006	1.005	50461		2.42(1.25-3.74)	100	124	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.907	1.904	0.003	1.126	26967	0.0497		107	1185	
D 60 M2-4:2FTS										
329.00 > 81.00	1.907	1.905	0.002	0.723	515751	NC			4061	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.942	-0.003	0.735	3409586	2.51		100	66105	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.950	1.944	0.006	1.006	72172	0.0496		99.3	131	
313.00 > 119.00	1.950	1.944	0.006	1.006	7816		9.23(5.03-15.10)	99.3	75.5	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.971	1.965	0.006	1.164	112838	0.0454		96.7	1163	
349.00 > 99.00	1.971	1.965	0.006	1.164	41159		2.74(1.36-4.07)	96.7	115	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.050	2.040	0.010	0.777	222831	NC			6476	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.038	2.042	-0.004	0.994	15205	NC			75.1	
D 9 13C4-PFHpA										
367.00 > 322.00	2.268	2.267	0.001	0.860	3194241	2.47		98.8	43621	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.268	2.271	-0.003	1.000	74149	0.0510		102	22.8	M
363.00 > 169.00	2.268	2.271	-0.003	1.000	25015		2.96(1.13-3.40)	102	204	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.295	2.284	0.011	1.000	111488	0.0487		107	270	
399.00 > 99.00	2.295	2.284	0.011	1.000	36463		3.06(1.50-4.49)	107	43.6	
D 11 18O2 PFHxS										
403.00 > 84.00	2.295	2.288	0.007	0.870	4657860	2.37		100	38000	
65 ADONA										
377.00 > 251.00	2.321	2.316	0.005	0.773	186852	NC			1741	
377.00 > 85.00	2.321	2.316	0.005	0.773	113982		1.64(0.84-2.53)		471	
D 12 M2-6:2FTS										
429.00 > 81.00	2.604	2.603	0.001	0.988	950264	2.35		98.7	8744	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.612	2.605	0.007	1.003	31066	0.0461		97.2	475	
* 62 13C2-PFOA										
415.00 > 370.00	2.636	2.631	0.005		3439183	2.50			61110	
D 14 13C4 PFOA										
417.00 > 372.00	2.636	2.631	0.005	1.000	3305995	2.50		100	55001	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.636	2.631	0.005	1.000	74116	0.0481		96.0	52.4	
413.00 > 169.00	2.636	2.631	0.005	1.000	41363		1.79(0.84-2.52)	96.0	164	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.645	2.640	0.005	0.881	93773	0.0497		104	509	
449.00 > 99.00	2.645	2.640	0.005	0.881	23896		3.92(1.94-5.82)	104	44.9	M
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.001	3.000	0.001	1.000	76439	0.0473		102	80.2	M
499.00 > 99.00	3.008	3.000	0.008	1.002	17065		4.48(2.31-6.93)	102	68.7	
D 18 13C4 PFOS										
503.00 > 80.00	3.001	3.000	0.001	1.138	3390963	2.40		100	16128	
D 19 13C5 PFNA										
468.00 > 423.00	3.001	3.000	0.001	1.138	2988238	2.56		102	64473	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.008	3.001	0.007	1.002	64988	0.0504		101	8.4	M
463.00 > 169.00	3.001	3.001	0.0	1.000	14734		4.41(1.90-5.69)	101	401	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.213	3.212	0.001	1.070	120518	NC			578	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.349	3.347	0.002	1.116	50669	0.0456		95.0	711	
549.00 > 99.00	3.349	3.347	0.002	1.116	22082		2.29(1.33-3.97)	95.0	154	
D 26 M2-8:2FTS										
529.00 > 81.00	3.349	3.350	-0.001	1.270	1168521	2.50		105	11438	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.349	3.350	-0.001	1.000	33682	0.0520		109	2654	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.357	3.356	0.001	1.273	5065365	2.51		101	72066	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.357	0.0	1.000	94565	0.0471		94.3	1976	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.367	3.361	0.006	1.000	61256	0.0553		111	96.8	
513.00 > 169.00	3.357	3.361	-0.004	0.997	13262		4.62(2.36-7.09)	111	163	
D 23 13C2 PFDA										
515.00 > 470.00	3.367	3.361	0.006	1.277	2547441	2.63		105	71000	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.516	3.515	0.001	1.334	520959	2.38		95.3	11387	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.525	3.519	0.006	1.003	12074	0.0563		113	218	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.673	3.674	-0.001	1.224	47433	0.0500		104	519	
599.00 > 99.00	3.673	3.674	-0.001	1.224	17180		2.76(1.39-4.16)	104	213	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.684	3.683	0.001	1.397	598786	2.50		100	8754	
D 30 13C2 PFUnA										
565.00 > 520.00	3.694	3.687	0.007	1.401	1910475	2.54		102	56669	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.694	3.687	0.007	1.000	37364	0.0545		109	154	
563.00 > 169.00	3.694	3.687	0.007	1.000	7959		4.69(2.12-6.36)	109	184	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.694	3.689	0.005	1.003	12253	0.0560		112	279	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.851	3.848	0.003	1.283	181415	NC			5348	
D 36 13C2 PFDoA										
615.00 > 570.00	3.985	3.983	0.002	1.511	1909051	2.50		100	22099	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.985	3.987	-0.002	1.000	38943	0.0472		94.5	9.6	
613.00 > 169.00	3.985	3.987	-0.002	1.000	12960		3.00(2.13-6.40)	94.5	159	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.249	4.245	0.004	1.066	33580	0.0480		95.9	24.4	
663.00 > 169.00	4.249	4.245	0.004	1.066	10821		3.10(1.25-3.76)	95.9	119	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.489	4.481	0.008	1.703	1676468	2.41		96.5	8771	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.489	4.483	0.006	1.000	10095	0.0565		113	112	
713.00 > 219.00	4.489	4.483	0.006	1.000	6992		1.44(0.71-2.13)	113	115	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.895	4.888	0.007	1.000	83674	NC			18.7	
813.00 > 169.00	4.895	4.888	0.007	1.000	14470		5.78(2.86-8.58)		110	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.895	4.888	0.007	1.856	3144815	2.56		102	9087	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.232	5.229	0.003	1.069	61870	NC			24.3	
913.00 > 169.00	5.232	5.229	0.003	1.069	7262		8.52(3.83-11.48)		46.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:38:42 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_003.d

Injection Date: 30-Jul-2018 15:21:49 Instrument ID: A8_N

Lims ID: IC L2 Full

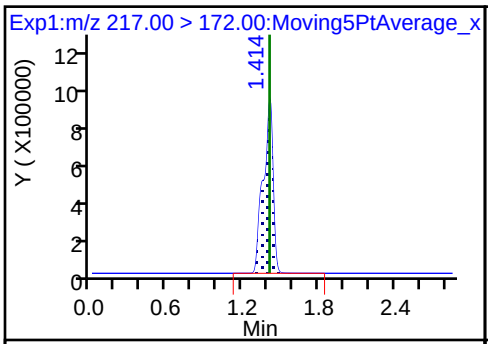
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 11 Worklist Smp#: 3

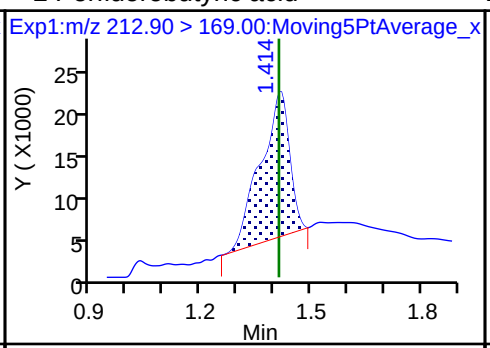
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

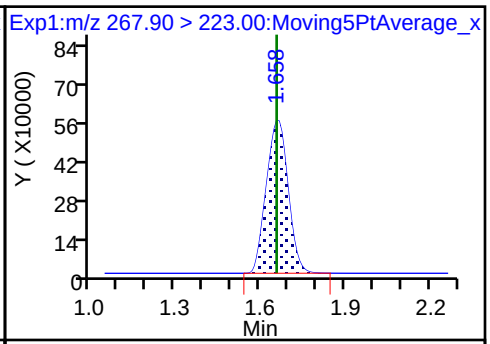
D 1 13C4 PFBA



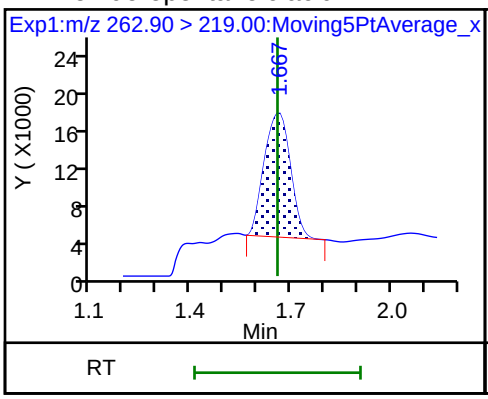
2 Perfluorobutyric acid



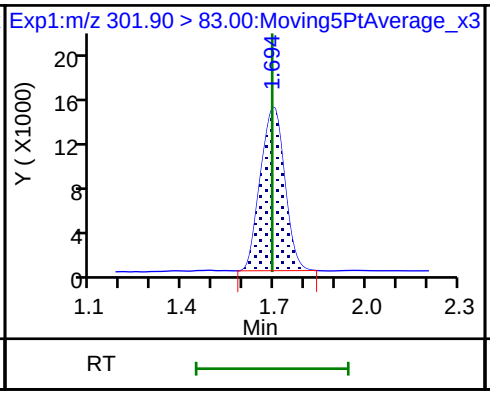
D 3 13C5-PFPeA



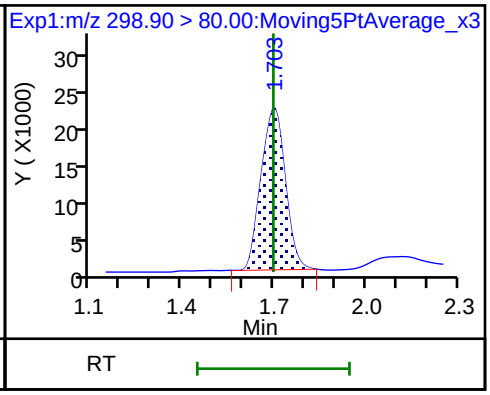
4 Perfluoropentanoic acid



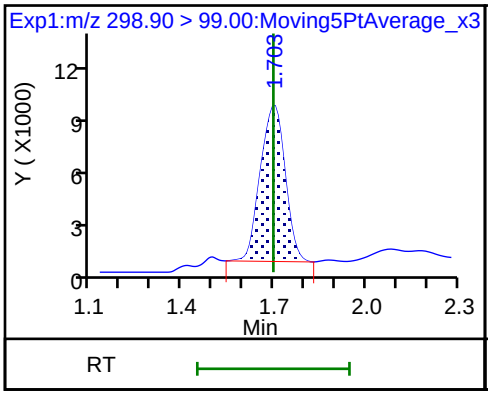
D 47 13C3-PFBS



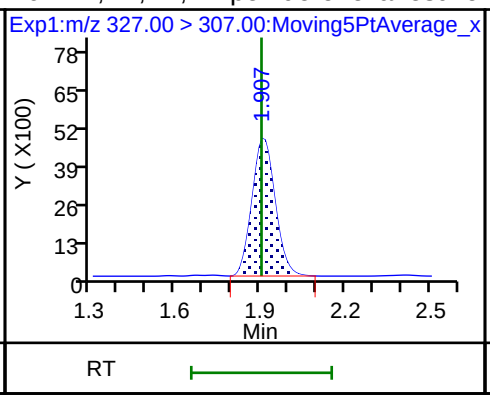
5 Perfluorobutanesulfonic acid



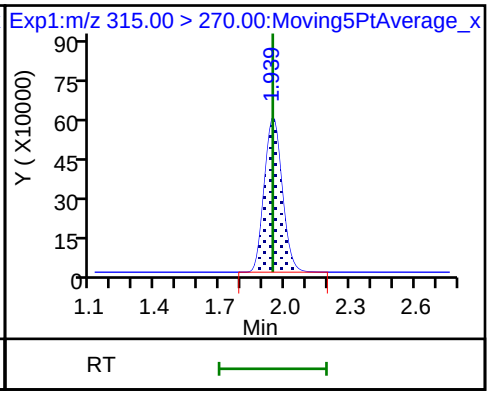
5 Perfluorobutanesulfonic acid



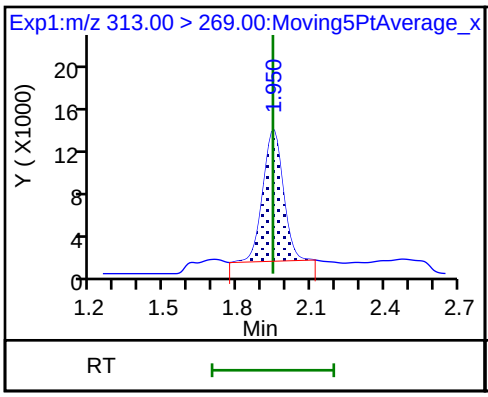
61 1H,1H,2H,2H-perfluorohexanesulfon



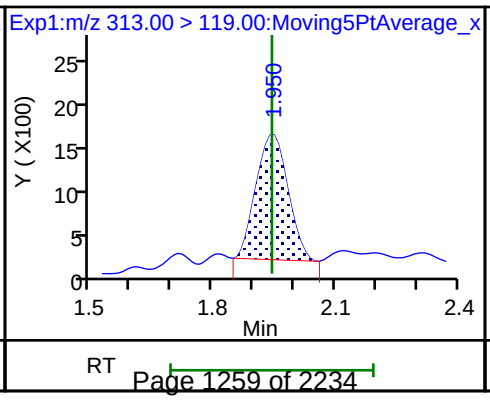
D 7 13C2 PFHxA



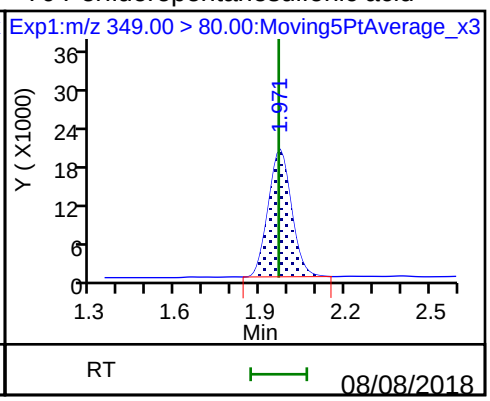
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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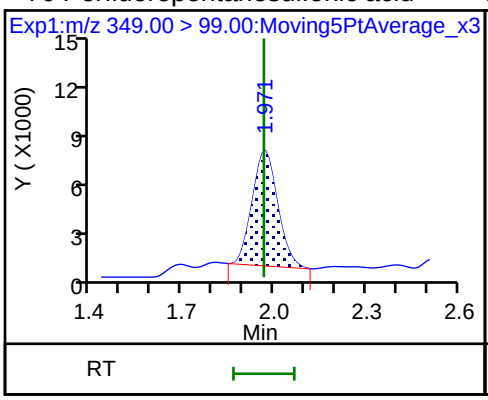
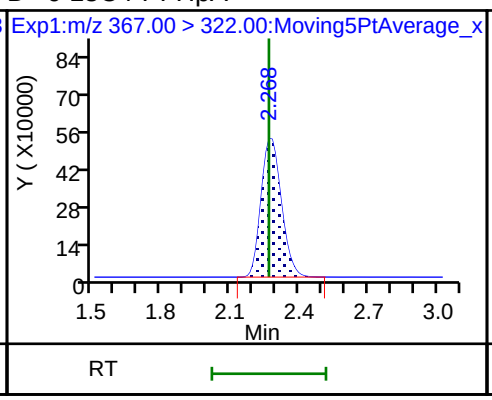
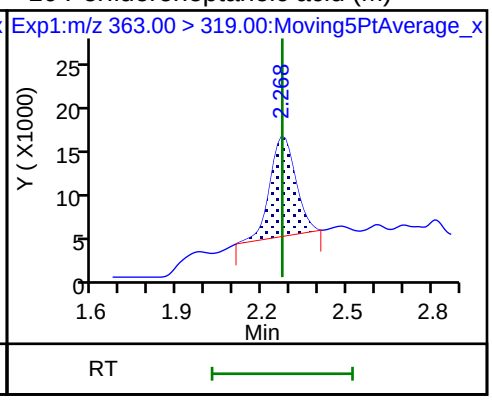


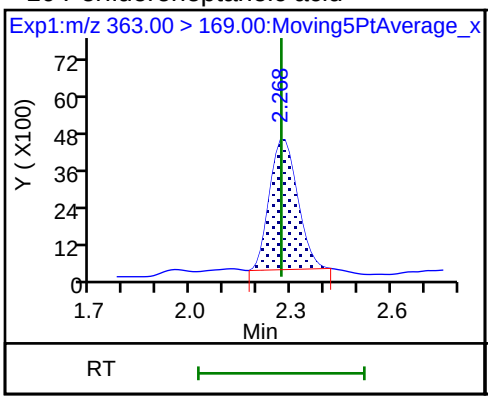
D 9 13C4-PFHpA



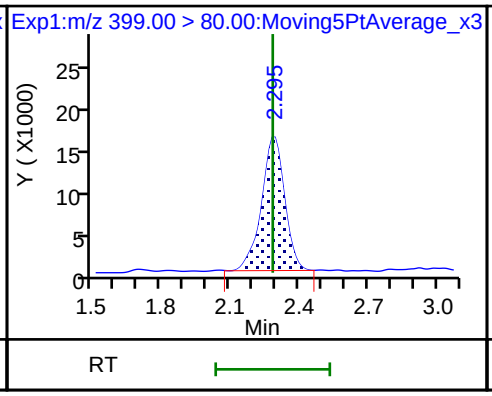
10 Perfluoroheptanoic acid (M)



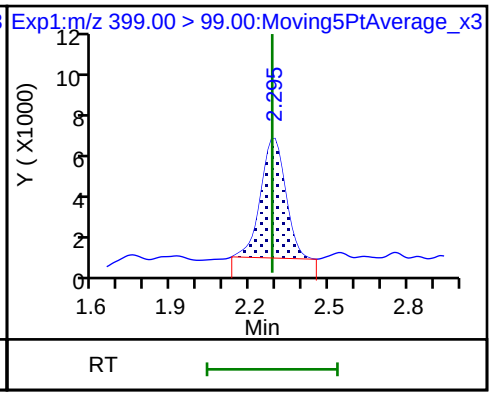
10 Perfluoroheptanoic acid



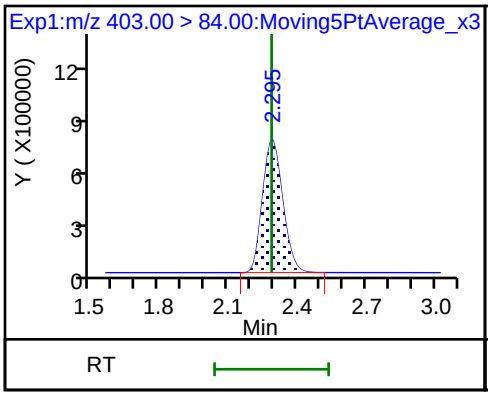
8 Perfluorohexanesulfonic acid



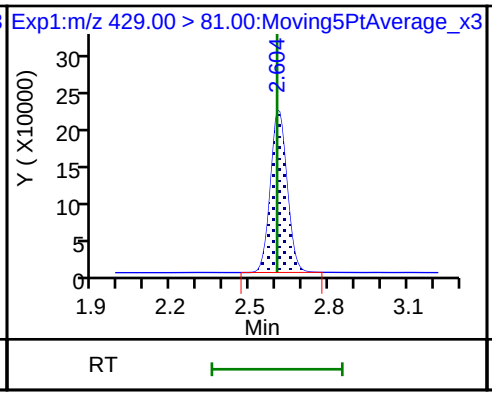
8 Perfluorohexanesulfonic acid



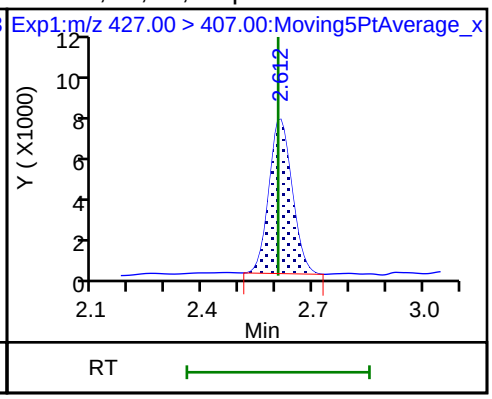
D 11 18O2 PFHxS



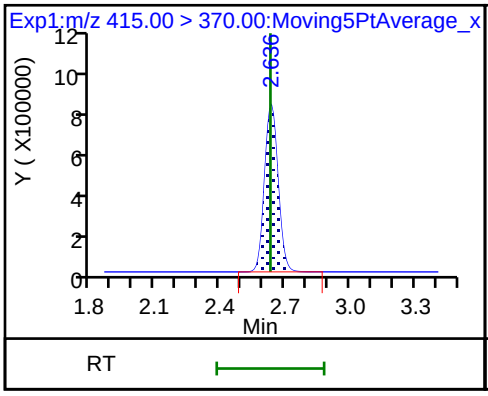
D 12 M2-6:2FTS



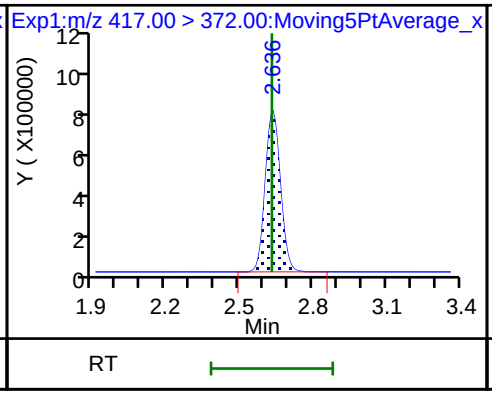
13 1H,1H,2H,2H-perfluorooctanesulfoni



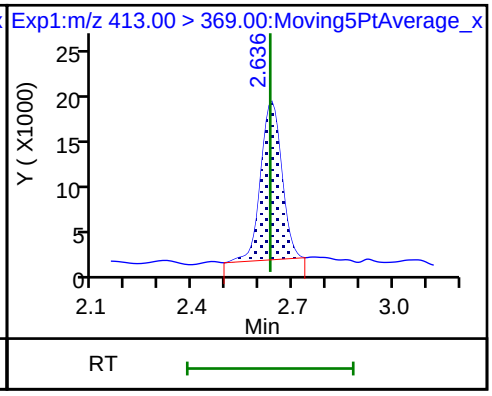
* 62 13C2-PFOA



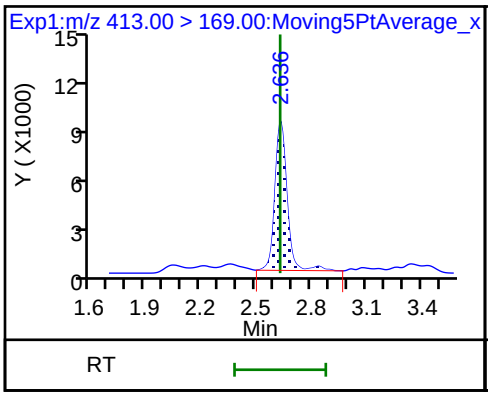
D 14 13C4 PFOA



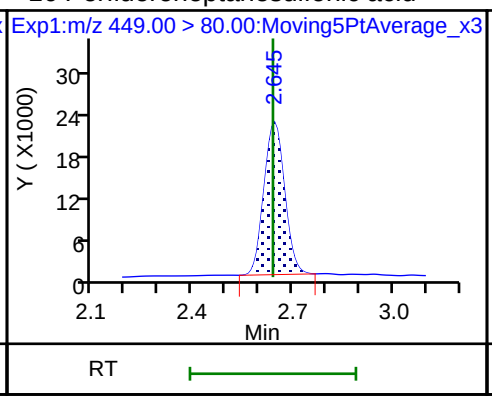
15 Perfluorooctanoic acid



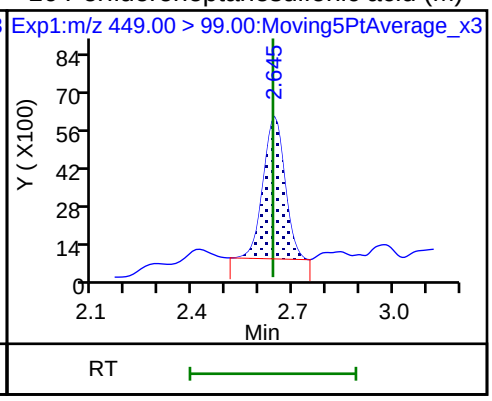
15 Perfluorooctanoic acid



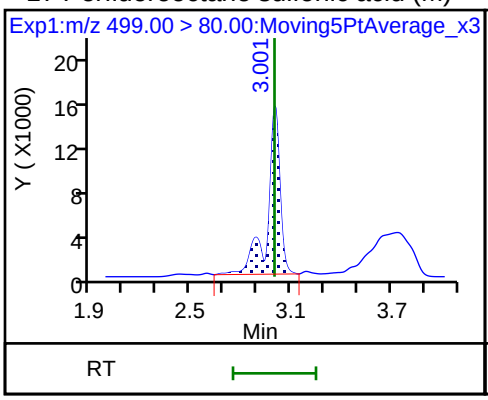
16 Perfluoroheptanesulfonic acid



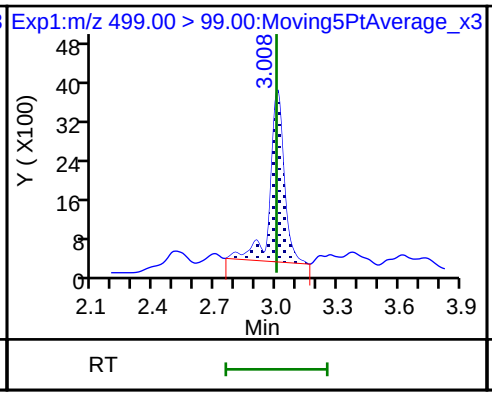
16 Perfluoroheptanesulfonic acid (M)



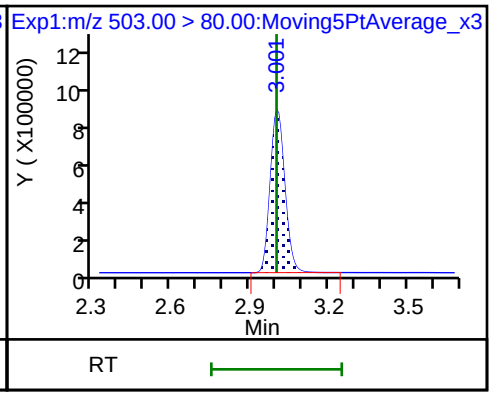
17 Perfluorooctane sulfonic acid (M)



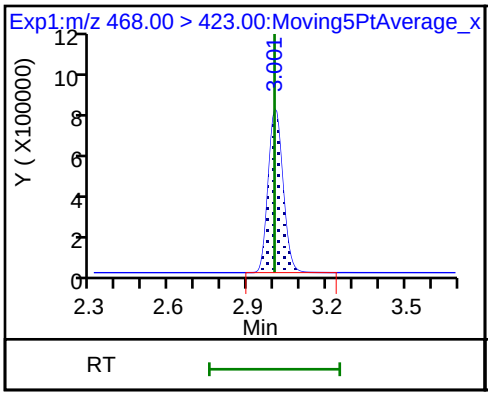
17 Perfluorooctane sulfonic acid



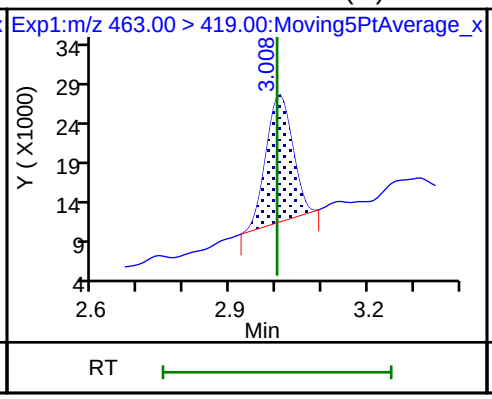
D 18 13C4 PFOS



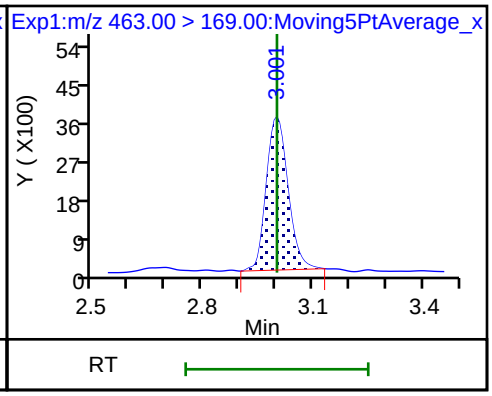
D 19 13C5 PFNA



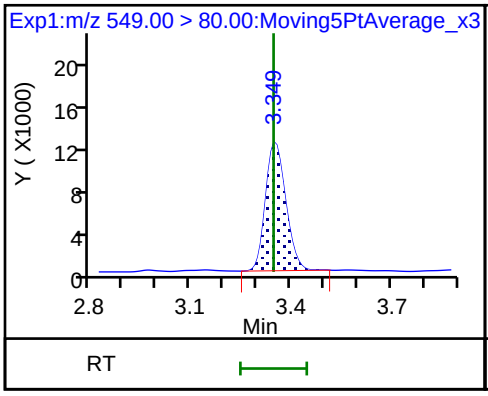
20 Perfluorononanoic acid (M)



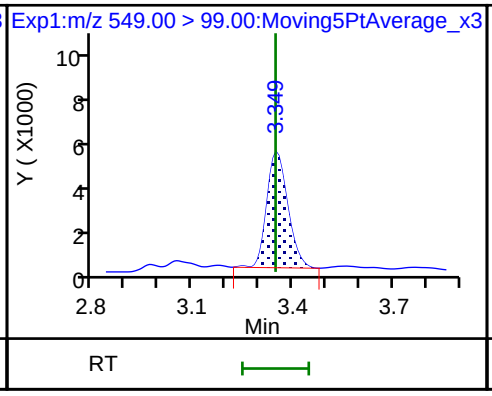
20 Perfluorononanoic acid



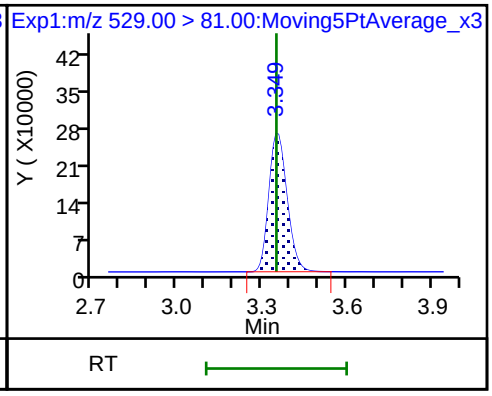
68 Perfluorononanesulfonic acid



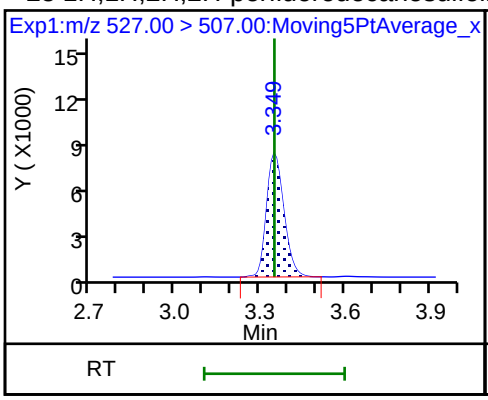
68 Perfluorononanesulfonic acid



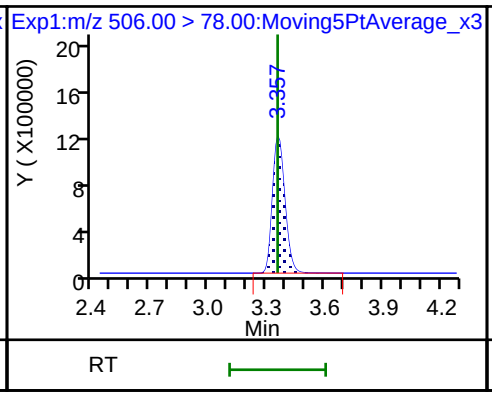
D 26 M2-8:2FTS



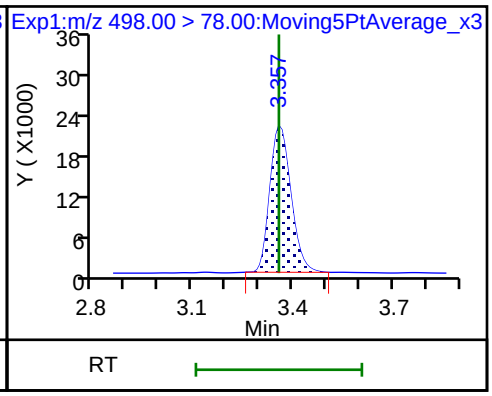
25 1H,1H,2H,2H-perfluorodecanesulfon



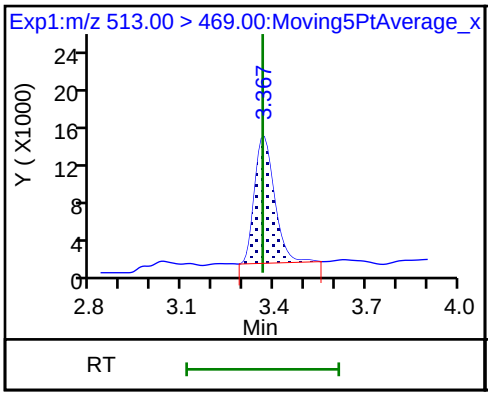
D 21 13C8 FOSA



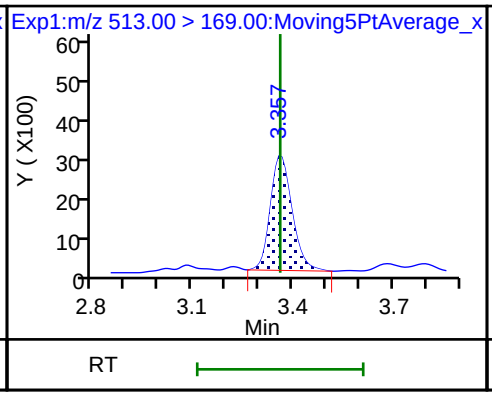
22 Perfluorooctane Sulfonamide



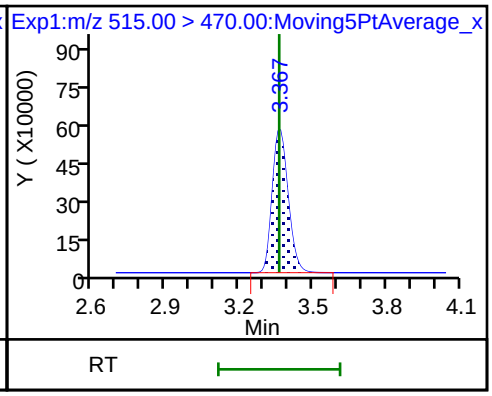
24 Perfluorodecanoic acid



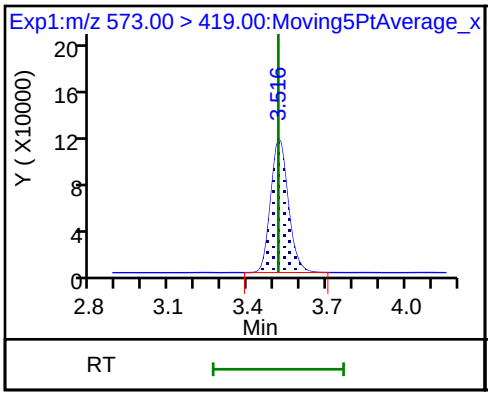
24 Perfluorodecanoic acid



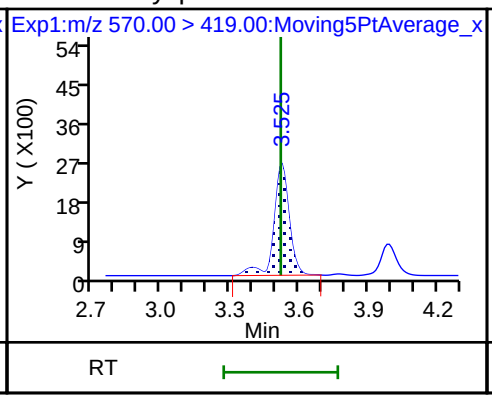
D 23 13C2 PFDA



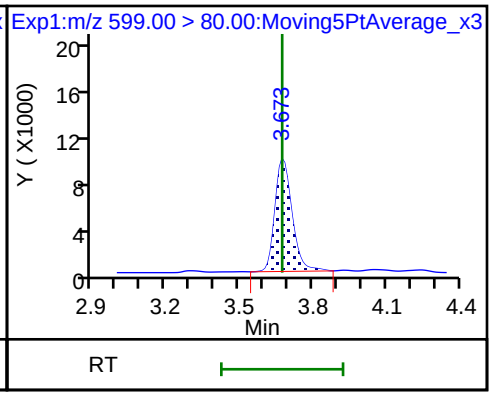
D 27 d3-NMeFOSAA



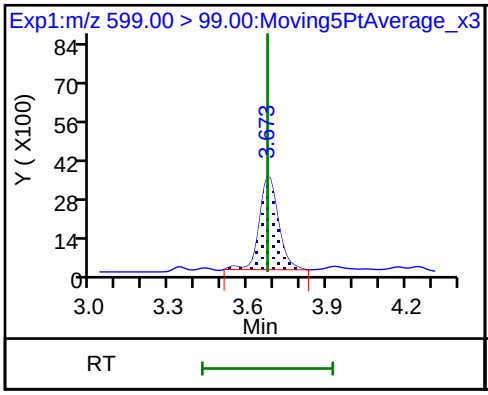
28 N-methyl perfluorooctane sulfonami



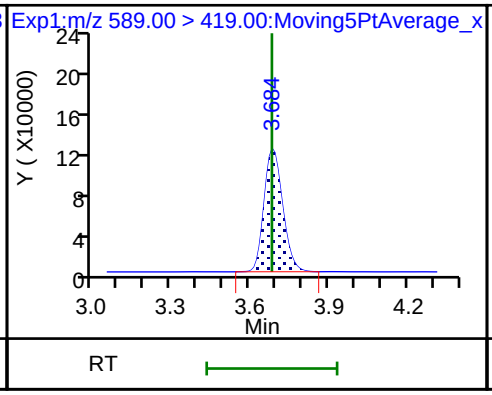
29 Perfluorodecane Sulfonic acid



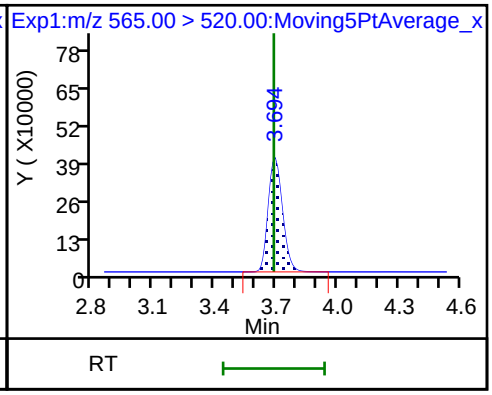
29 Perfluorodecane Sulfonic acid



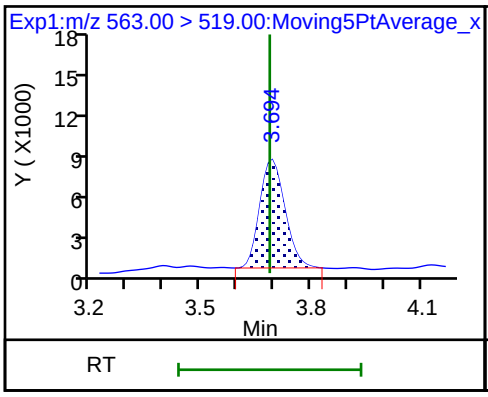
D 32 d5-NEtFOSAA



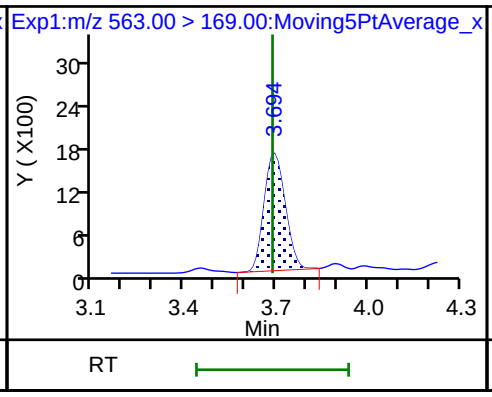
D 30 13C2 PFUnA



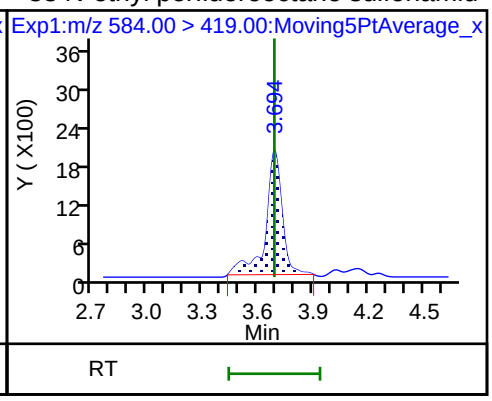
31 Perfluoroundecanoic acid



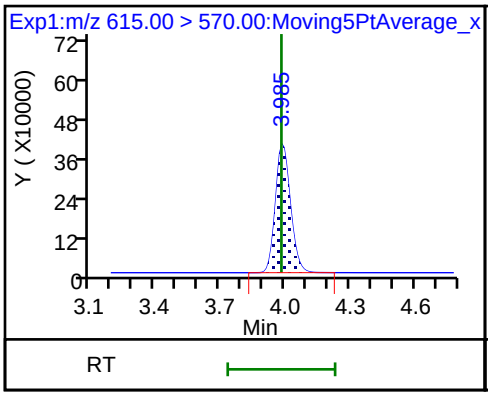
31 Perfluoroundecanoic acid



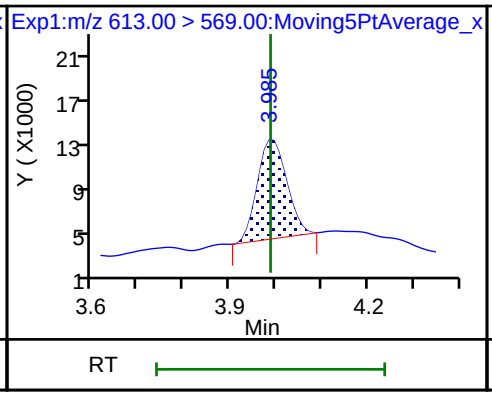
33 N-ethyl perfluorooctane sulfonamid



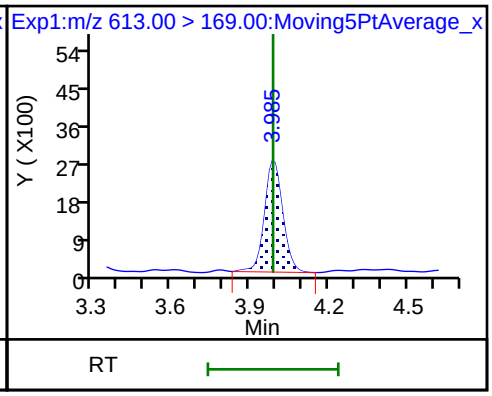
D 36 13C2 PFDoA



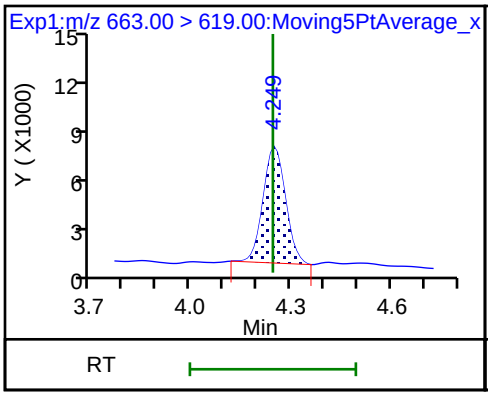
37 Perfluorododecanoic acid



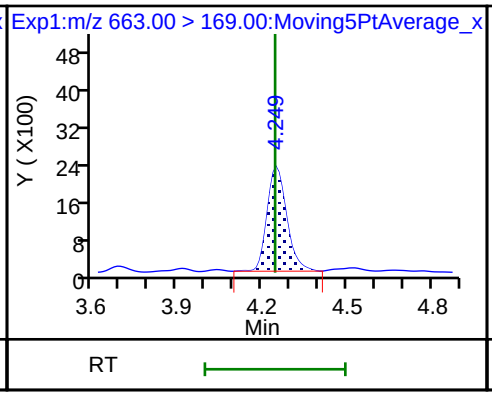
37 Perfluorododecanoic acid



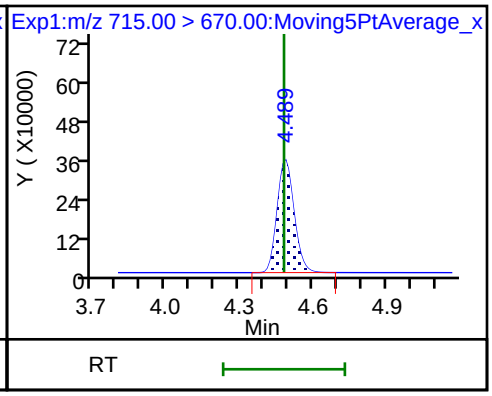
41 Perfluorotridecanoic acid



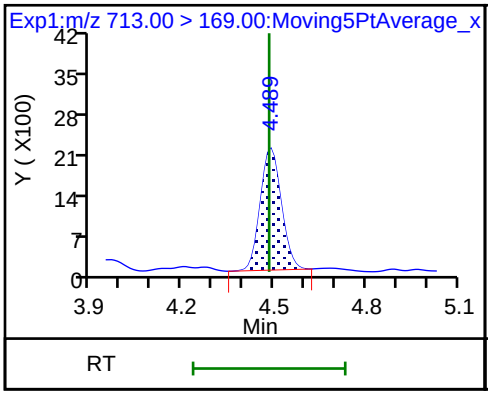
41 Perfluorotridecanoic acid



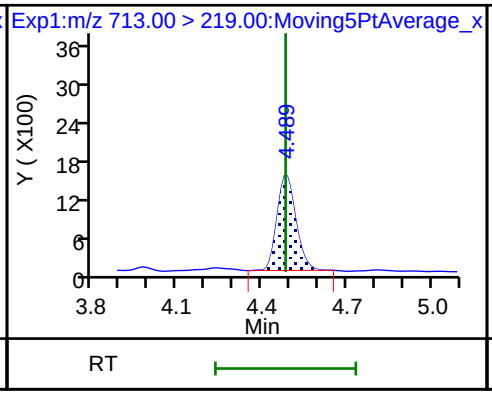
D 43 13C2-PFTeDA



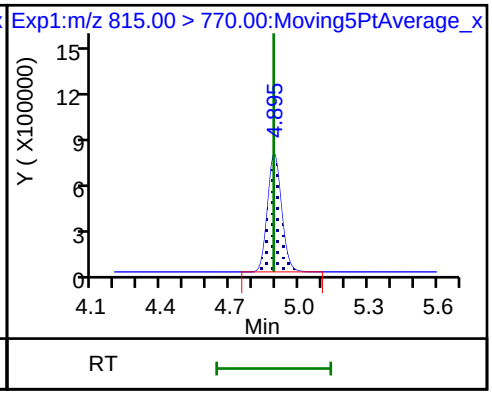
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

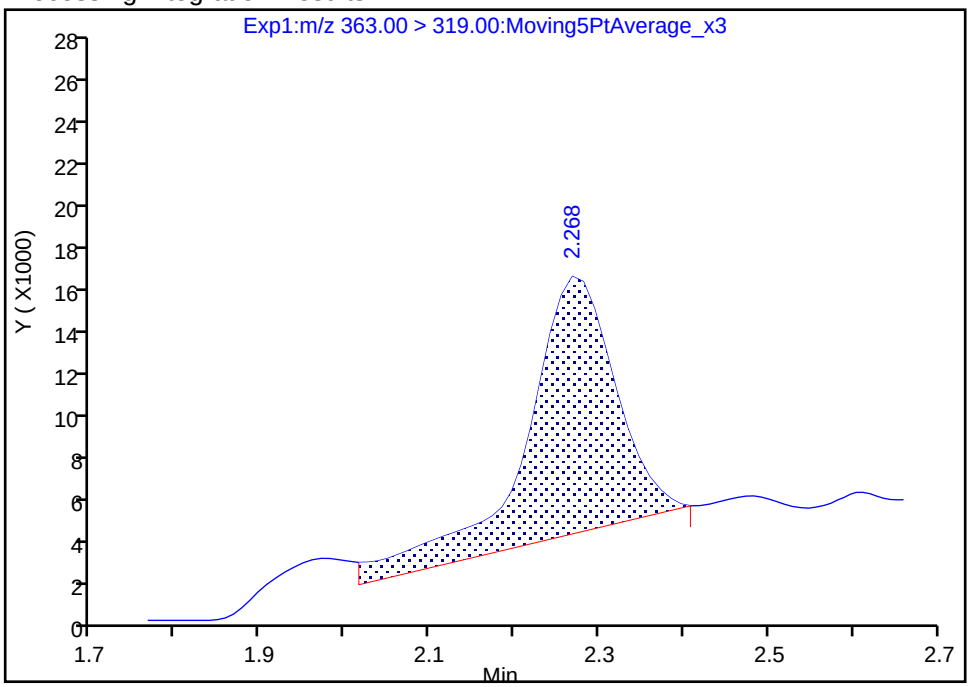
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_003.d				
Injection Date:	30-Jul-2018 15:21:49	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

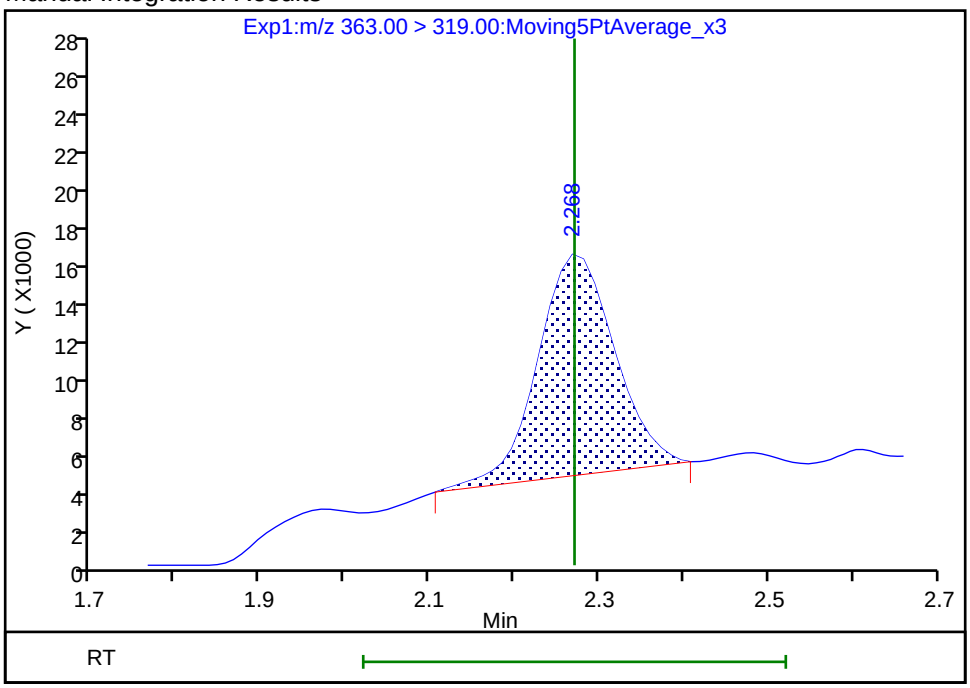
Processing Integration Results

RT: 2.27
Area: 91685
Amount: 0.060779
Amount Units: ng/ml



Manual Integration Results

RT: 2.27
Area: 74149
Amount: 0.051014
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:15:22

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

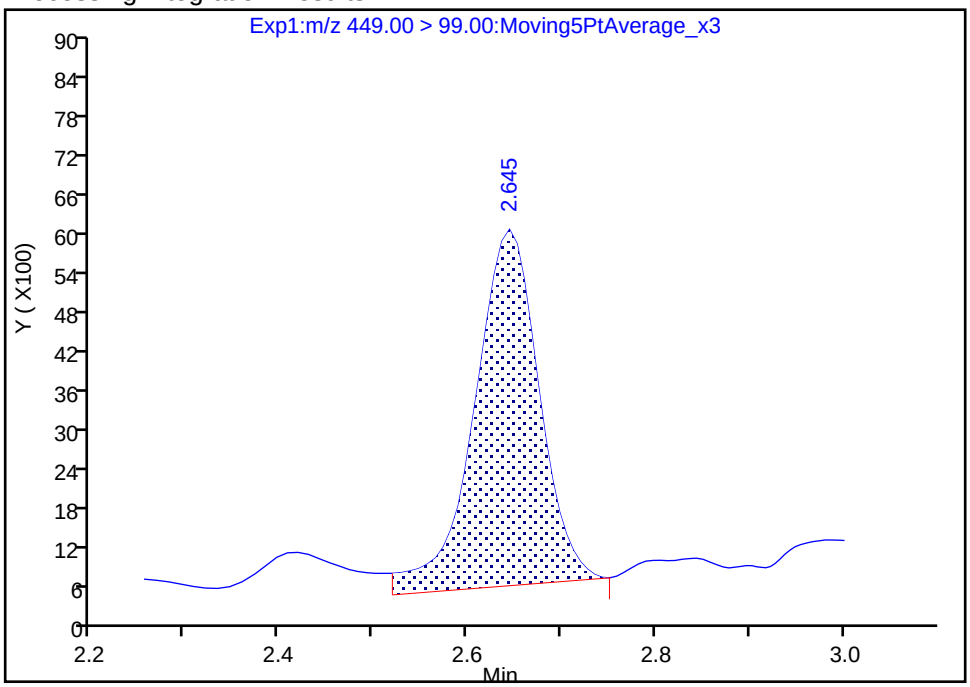
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_003.d				
Injection Date:	30-Jul-2018 15:21:49	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

Signal: 2

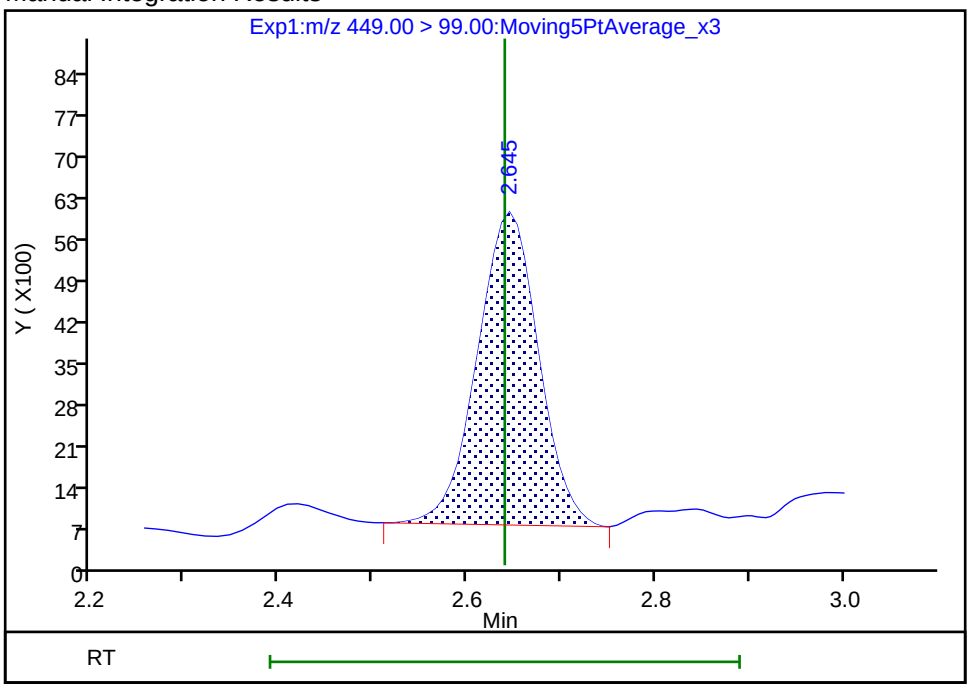
Processing Integration Results

RT: 2.64
Area: 26166
Amount: 0.049673
Amount Units: ng/ml



Manual Integration Results

RT: 2.64
Area: 23896
Amount: 0.049673
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:15:30

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

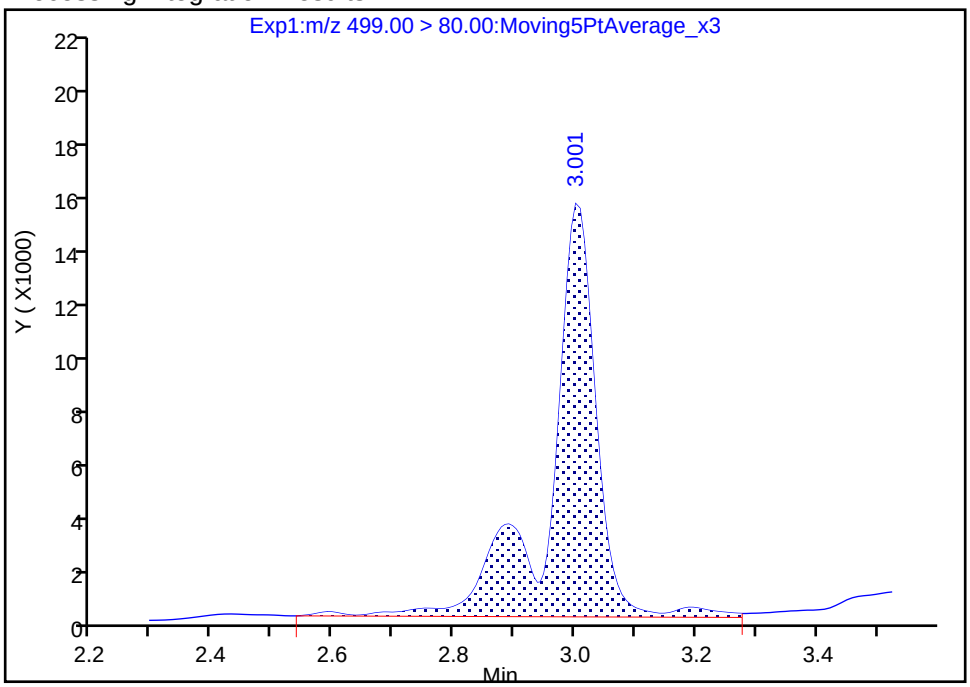
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_003.d				
Injection Date:	30-Jul-2018 15:21:49	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

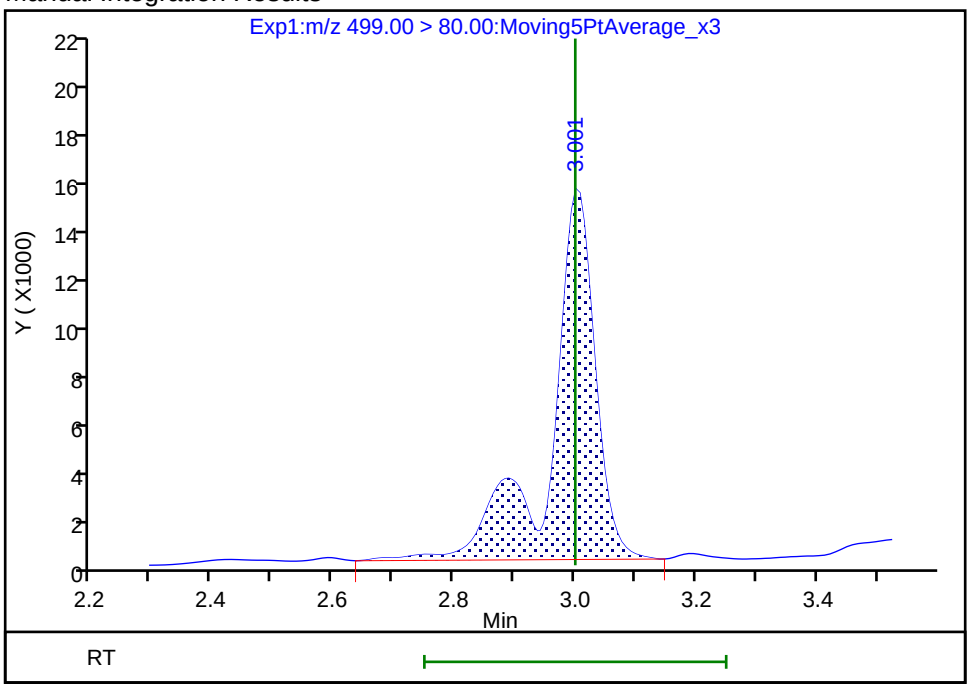
Processing Integration Results

RT: 3.00
Area: 81136
Amount: 0.054884
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 76439
Amount: 0.047265
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:15:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

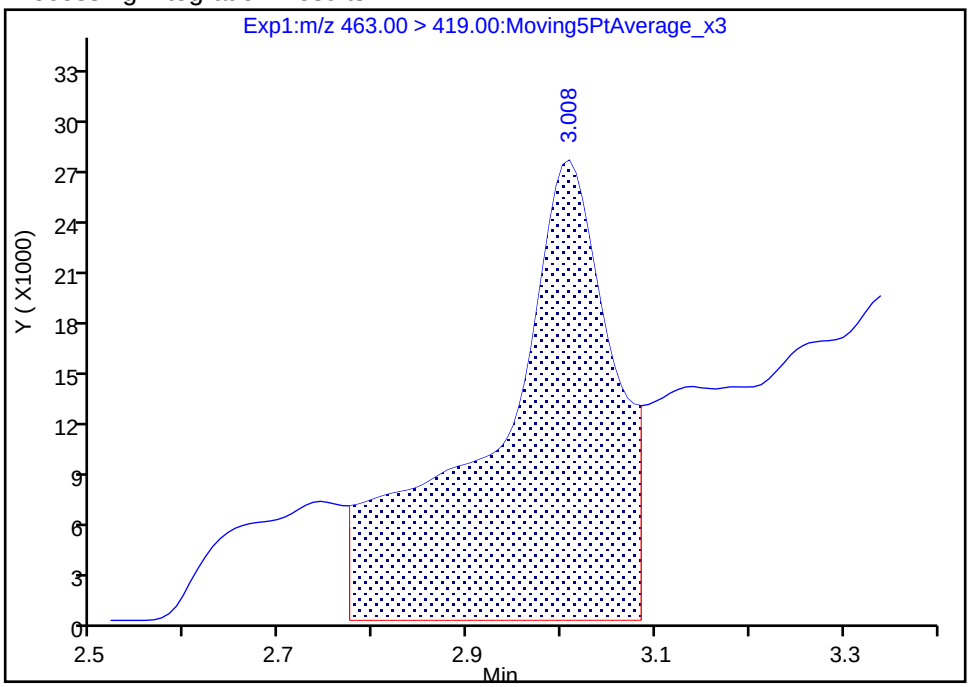
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_003.d				
Injection Date:	30-Jul-2018 15:21:49	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

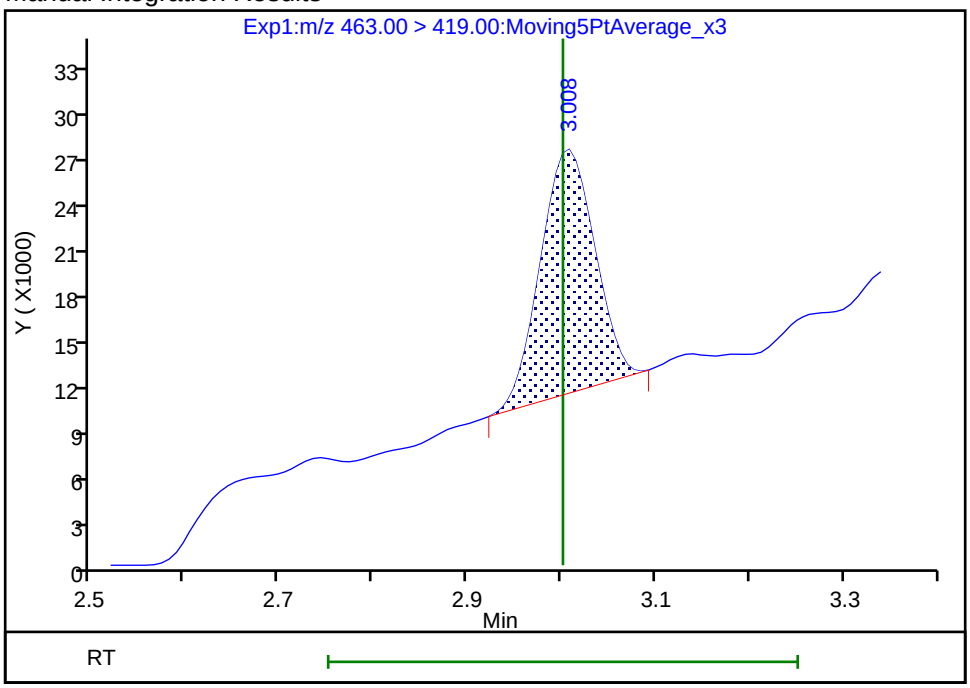
Processing Integration Results

RT: 3.01
Area: 248410
Amount: 0.131950
Amount Units: ng/ml



Manual Integration Results

RT: 3.01
Area: 64988
Amount: 0.050395
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:15:41

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 30-Jul-2018 15:29:37 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:38:46 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:13:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.413	1.412	0.001	0.536	4937606	2.47		99.0	92316	
2 Perfluorobutyric acid										
212.90 > 169.00	1.413	1.412	0.001	1.000	478561	0.2367		94.7	92.8	
D 3 13C5-PFPeA										
267.90 > 223.00	1.657	1.658	-0.001	0.629	3169314	2.47		98.8	42608	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.657	1.659	-0.002	1.000	374727	0.2444		97.8	175	M
D 47 13C3-PFBS										
301.90 > 83.00	1.693	1.693	0.0	0.642	84477	2.22		95.4	330	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.702	1.697	0.005	1.005	644382	0.2288		104	1825	
298.90 > 99.00	1.702	1.697	0.005	1.005	257124		2.51(1.25-3.74)	104	772	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.905	1.904	0.001	1.126	129345	0.2333		99.9	5896	
D 60 M2-4:2FTS										
329.00 > 81.00	1.905	1.905	0.0	0.723	538730	NC			4421	
D 7 13C2 PFHxA										
315.00 > 270.00	1.948	1.942	0.006	0.739	3627040	2.49		99.6	64474	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.948	1.944	0.004	1.000	378153	0.2445		97.8	626	
313.00 > 119.00	1.948	1.944	0.004	1.000	37587		10.06(5.03-15.10)	97.8	358	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.970	1.965	0.005	1.164	607865	0.2390		102	6980	
349.00 > 99.00	1.970	1.965	0.005	1.164	220990		2.75(1.36-4.07)	102	745	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.036	2.040	-0.004	0.773	207184	NC			5955	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.048	2.042	0.006	1.006	69466	NC			333	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.267	0.0	0.860	3409343	2.46		98.4	51135	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.267	2.271	-0.004	1.000	375371	0.2420		96.8	127	M
363.00 > 169.00	2.280	2.271	0.009	1.006	155301		2.42(1.13-3.40)	96.8	1069	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.284	-0.004	0.994	517126	0.2108		92.7	1386	
399.00 > 99.00	2.293	2.284	0.009	1.000	181681		2.85(1.50-4.49)	92.7	221	
D 11 18O2 PFHxS										
403.00 > 84.00	2.293	2.288	0.005	0.870	4992768	2.37		100	39377	
65 ADONA										
377.00 > 251.00	2.319	2.316	0.003	0.773	990481	NC			9745	
377.00 > 85.00	2.319	2.316	0.003	0.773	580149		1.71(0.84-2.53)		2373	
D 12 M2-6:2FTS										
429.00 > 81.00	2.603	2.603	0.0	0.988	1018721	2.35		98.8	10622	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.603	2.605	-0.002	1.000	173438	0.2400		101	2471	
* 62 13C2-PFOA										
415.00 > 370.00	2.636	2.631	0.005		3685282	2.50			44795	
D 14 13C4 PFOA										
417.00 > 372.00	2.636	2.631	0.005	1.000	3517779	2.48		99.4	45267	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.636	2.631	0.005	1.000	403026	0.2457		98.2	316	
413.00 > 169.00	2.636	2.631	0.005	1.000	216213		1.86(0.84-2.52)	98.2	874	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.644	2.640	0.004	0.881	466541	0.2359		99.1	2796	
449.00 > 99.00	2.644	2.640	0.004	0.881	128923		3.62(1.94-5.82)	99.1	314	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.001	3.000	0.001	1.000	384723	0.2270		97.9	435	M
499.00 > 99.00	3.001	3.000	0.001	1.000	91518		4.20(2.31-6.93)	97.9	360	
D 18 13C4 PFOS										
503.00 > 80.00	3.001	3.000	0.001	1.138	3553019	2.35		98.3	19777	
D 19 13C5 PFNA										
468.00 > 423.00	3.001	3.000	0.001	1.138	3191026	2.55		102	75088	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.001	3.001	0.0	1.000	327392	0.2377		95.1	56.6	M
463.00 > 169.00	3.001	3.001	0.0	1.000	81941		4.00(1.90-5.69)	95.1	2144	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.212	3.212	0.0	1.070	631163	NC			3612	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.347	3.347	0.0	1.115	276844	0.2379		99.1	3756	
549.00 > 99.00	3.347	3.347	0.0	1.115	101999		2.71(1.33-3.97)	99.1	849	
D 26 M2-8:2FTS										
529.00 > 81.00	3.356	3.350	0.006	1.273	1188736	2.38		99.2	12113	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.356	3.350	0.006	1.000	157604	0.2391		99.8	11817	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.356	3.356	0.0	1.273	5354746	2.48		99.2	52846	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.356	3.357	-0.001	1.000	539082	0.2542		102	10104	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.365	3.361	0.004	1.000	268702	0.2395		95.8	408	
513.00 > 169.00	3.365	3.361	0.004	1.000	49248		5.46(2.36-7.09)	95.8	482	
D 23 13C2 PFDA										
515.00 > 470.00	3.365	3.361	0.004	1.277	2580166	2.49		99.6	58072	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.515	3.515	0.0	1.334	561654	2.40		95.9	17596	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.524	3.519	0.005	1.003	58012	0.2511		100	837	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.679	3.674	0.005	1.226	232785	0.2340		97.1	3057	
599.00 > 99.00	3.679	3.674	0.005	1.226	84569		2.75(1.39-4.16)	97.1	1174	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.679	3.683	-0.004	1.396	625902	2.44		97.7	10641	
D 30 13C2 PFUnA										
565.00 > 520.00	3.690	3.687	0.003	1.400	1955397	2.43		97.2	40575	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.690	3.687	0.003	1.000	159838	0.2278		91.1	580	
563.00 > 169.00	3.690	3.687	0.003	1.000	35215		4.54(2.12-6.36)	91.1	679	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.690	3.689	0.001	1.003	55691	0.2436		97.5	1074	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.847	3.848	-0.001	1.282	892680	NC			20562	
D 36 13C2 PFDoA										
615.00 > 570.00	3.989	3.983	0.006	1.514	1968835	2.41		96.4	27483	
37 Perfluorododecanoic acid										M
613.00 > 569.00	3.989	3.987	0.002	1.000	218447	0.2569		103	53.2	M
613.00 > 169.00	3.979	3.987	-0.008	0.997	50037		4.37(2.13-6.40)	103	704	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.243	4.245	-0.002	1.064	181224	0.2510		100	121	
663.00 > 169.00	4.253	4.245	0.008	1.066	52575		3.45(1.25-3.76)	100	547	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.481	4.481	0.0	1.700	1917316	2.58		103	11192	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.481	4.483	-0.002	1.000	47759	0.2336		93.4	539	
713.00 > 219.00	4.481	4.483	-0.002	1.000	37112		1.29(0.71-2.13)	93.4	646	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.888	-0.001	1.000	336132	NC			71.6	
813.00 > 169.00	4.887	4.888	-0.001	1.000	51515		6.52(2.86-8.58)		405	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.888	-0.001	1.854	3212348	2.44		97.5	8342	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.233	5.229	0.004	1.071	309642	NC			111	
913.00 > 169.00	5.226	5.229	-0.003	1.069	38702		8.00(3.83-11.48)		294	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL3_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:38:49 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_004.d

Injection Date: 30-Jul-2018 15:29:37 Instrument ID: A8_N

Lims ID: IC L3 Full

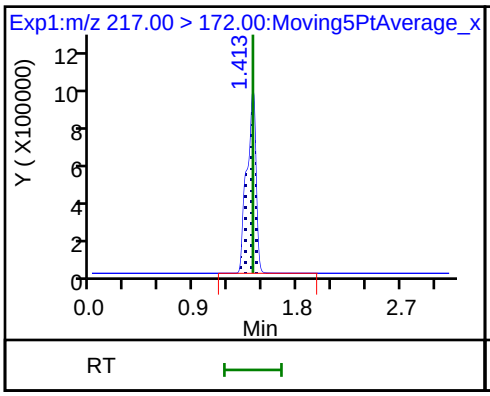
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 12 Worklist Smp#: 4

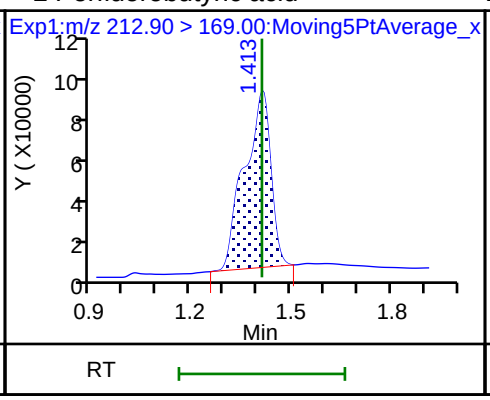
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

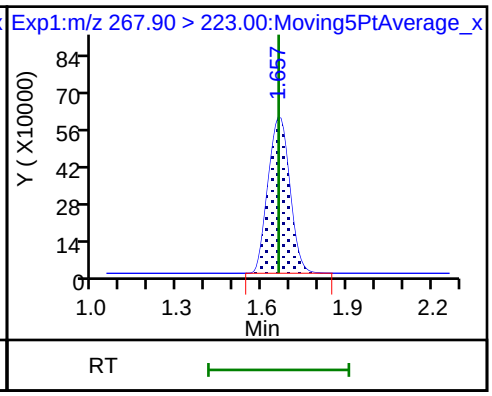
D 1 13C4 PFBA



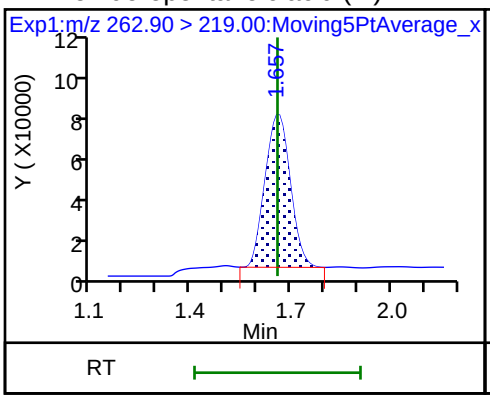
2 Perfluorobutyric acid



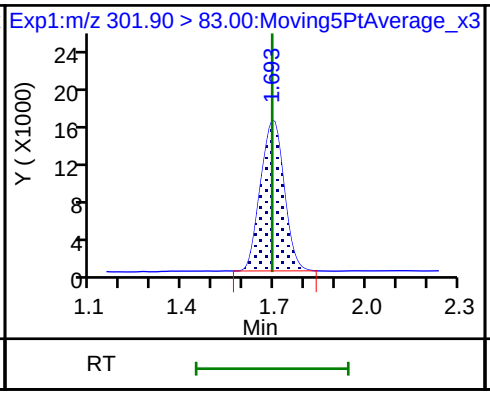
D 3 13C5-PFPeA



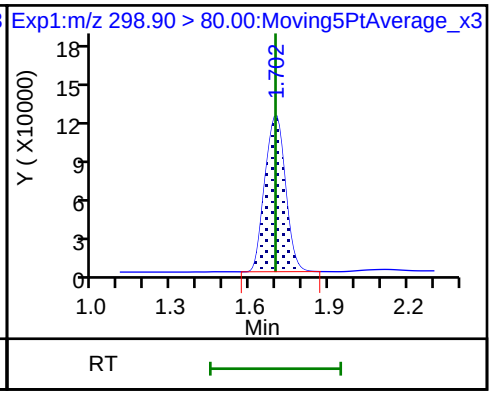
4 Perfluoropentanoic acid (M)



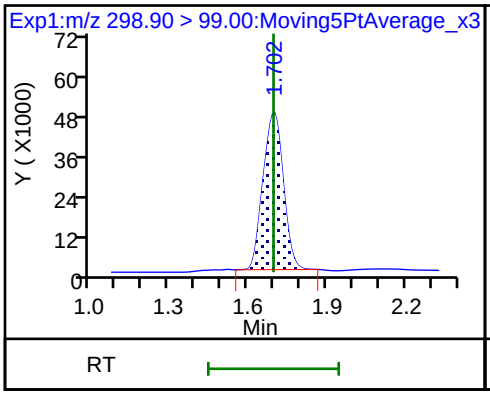
D 47 13C3-PFBS



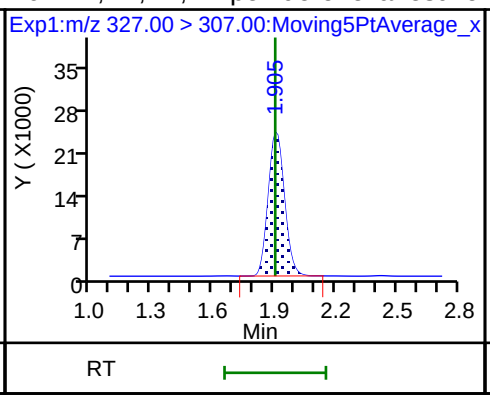
5 Perfluorobutanesulfonic acid



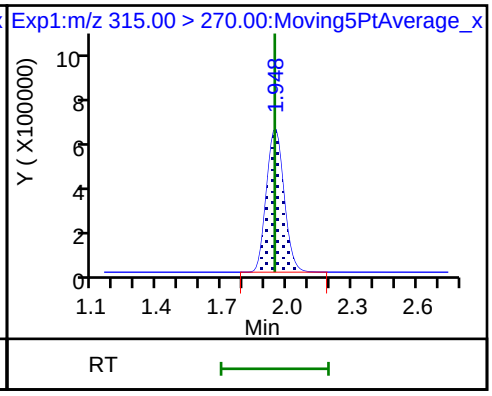
5 Perfluorobutanesulfonic acid



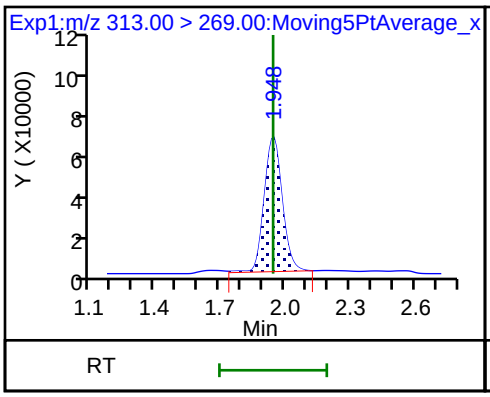
61 1H,1H,2H,2H-perfluorohexanesulfon



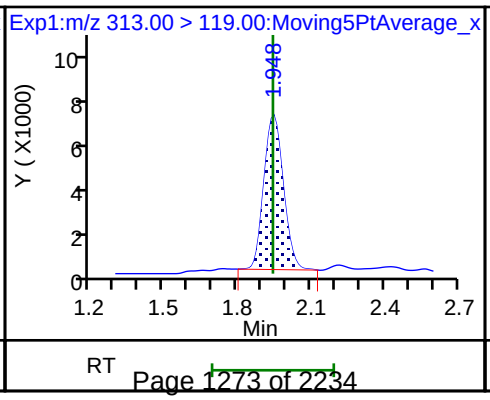
D 7 13C2 PFHxA



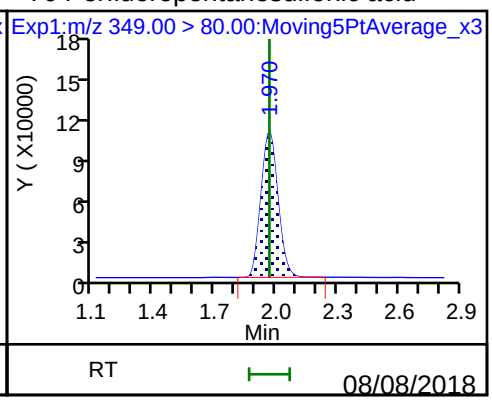
6 Perfluorohexanoic acid



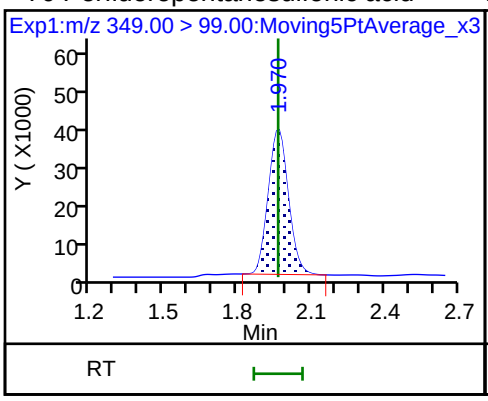
6 Perfluorohexanoic acid



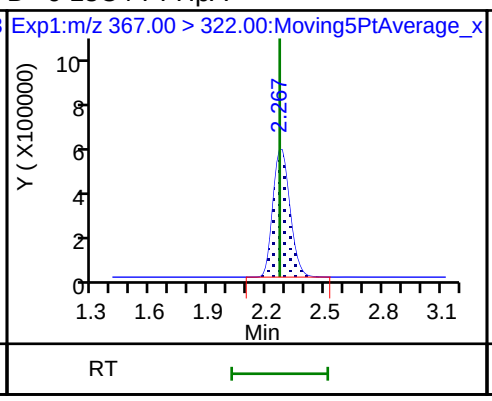
70 Perfluoropentanesulfonic acid



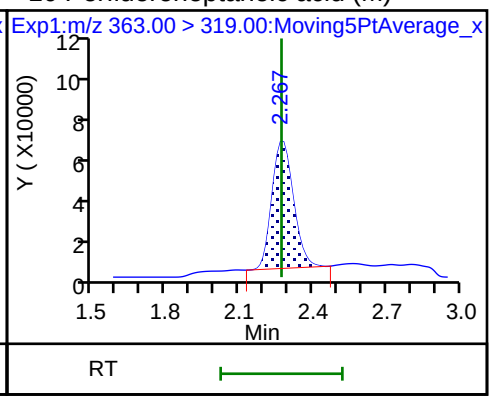
70 Perfluoropentanesulfonic acid



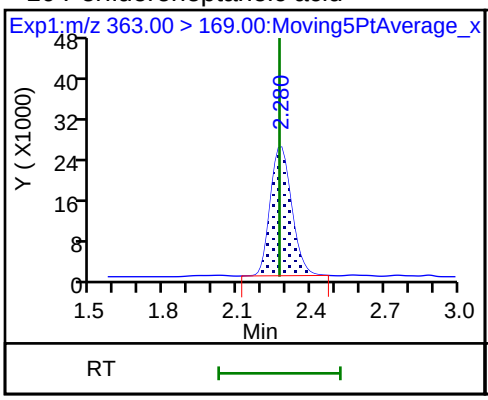
D 9 13C4-PFHpA



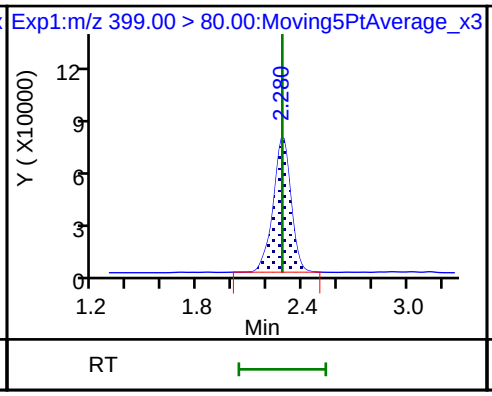
10 Perfluoroheptanoic acid (M)



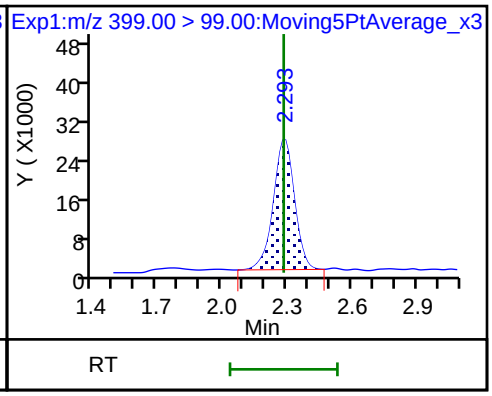
10 Perfluoroheptanoic acid



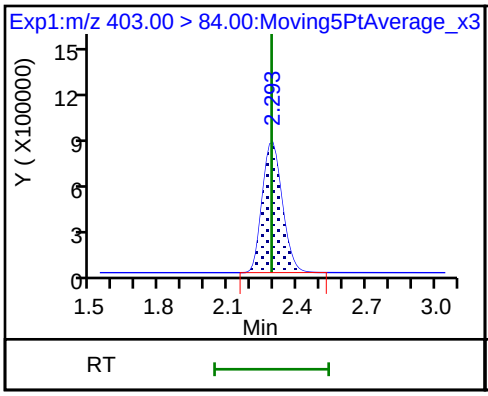
8 Perfluorohexanesulfonic acid



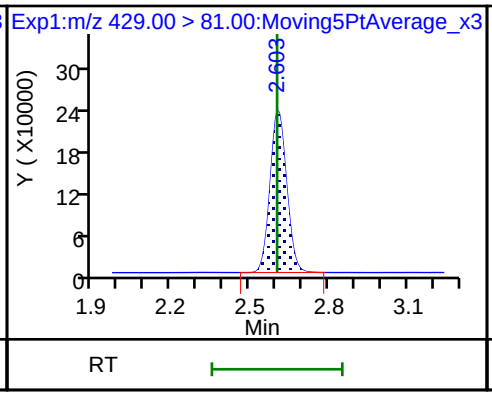
8 Perfluorohexanesulfonic acid



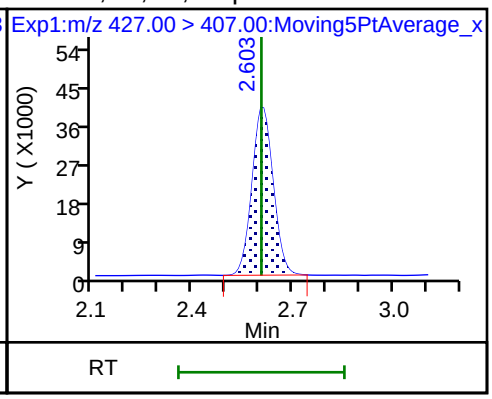
D 11 18O2 PFHxS



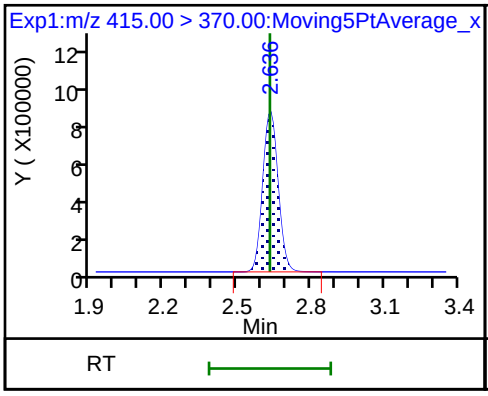
D 12 M2-6:2FTS



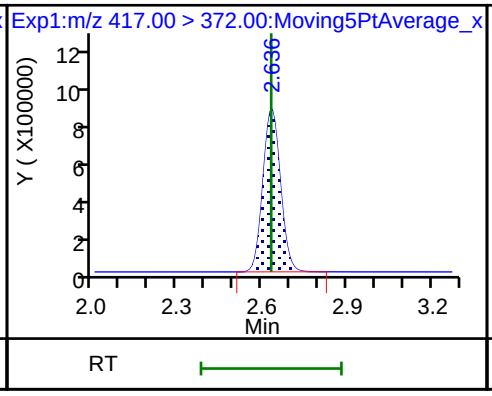
13 1H,1H,2H,2H-perfluorooctanesulfoni



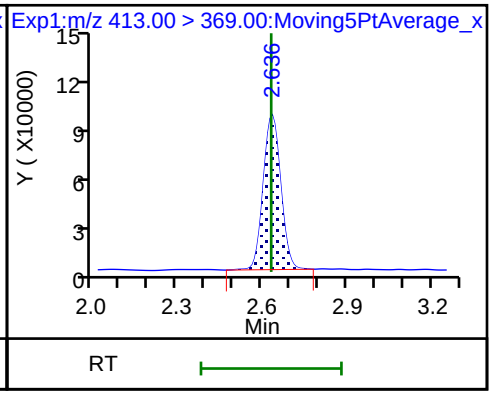
* 62 13C2-PFOA



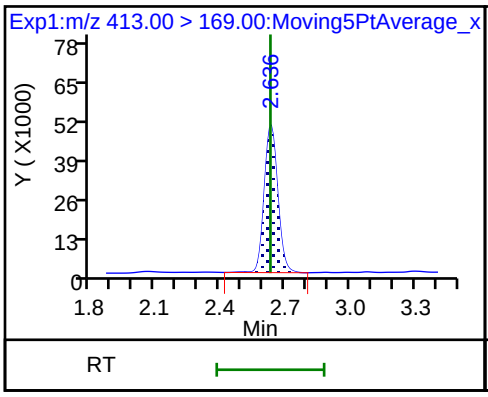
D 14 13C4 PFOA



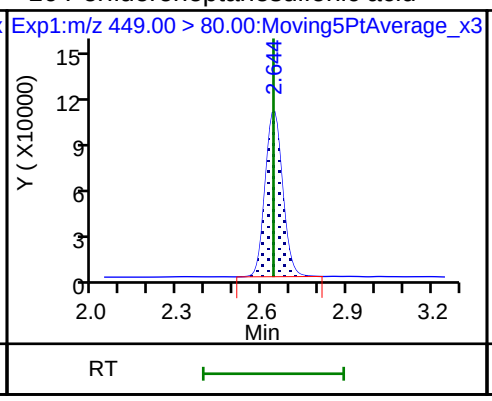
15 Perfluorooctanoic acid



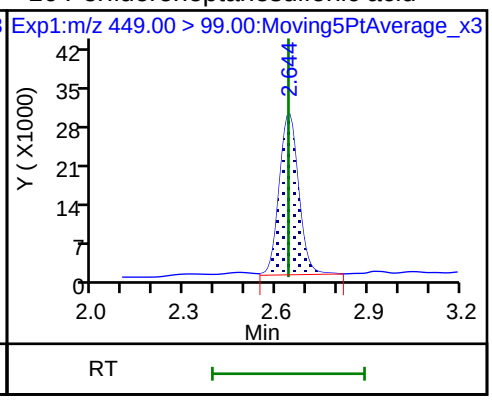
15 Perfluorooctanoic acid



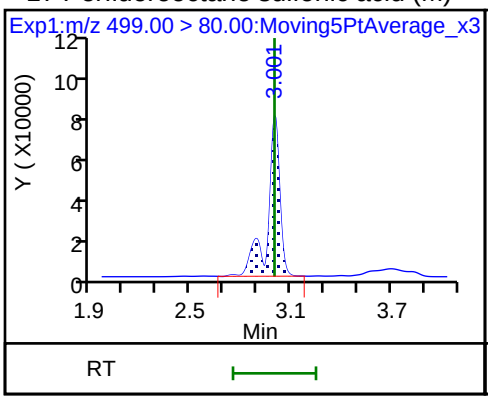
16 Perfluoroheptanesulfonic acid



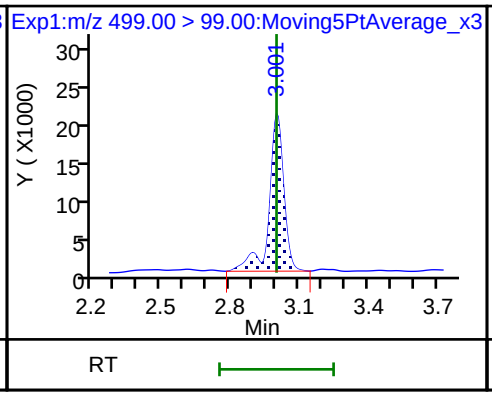
16 Perfluoroheptanesulfonic acid



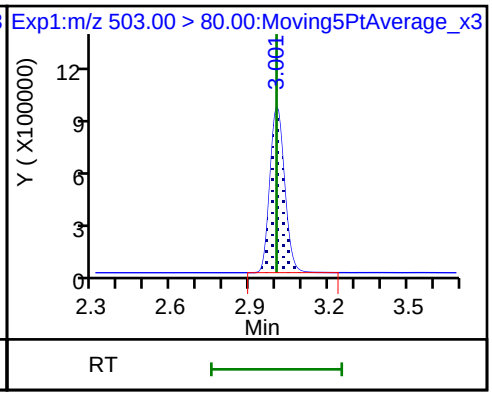
17 Perfluorooctane sulfonic acid (M)



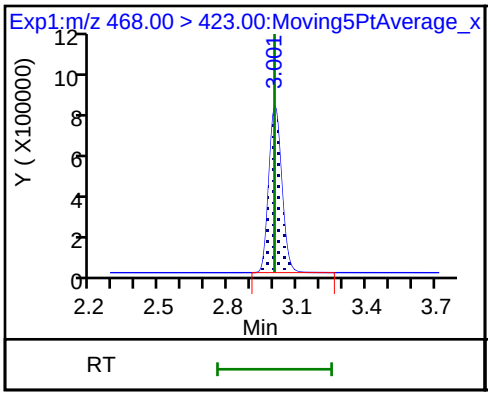
17 Perfluorooctane sulfonic acid



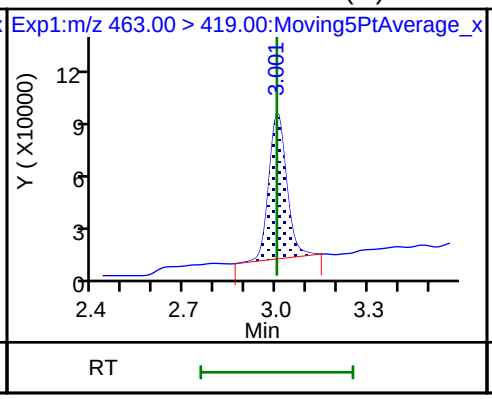
D 18 13C4 PFOS



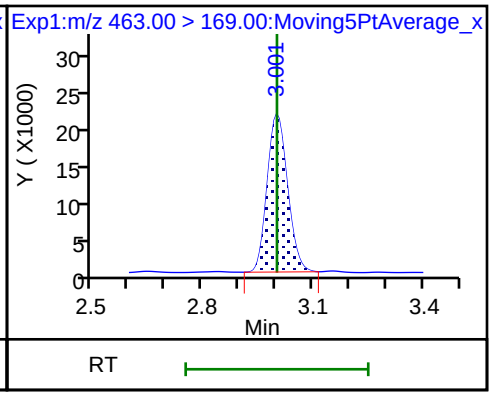
D 19 13C5 PFNA



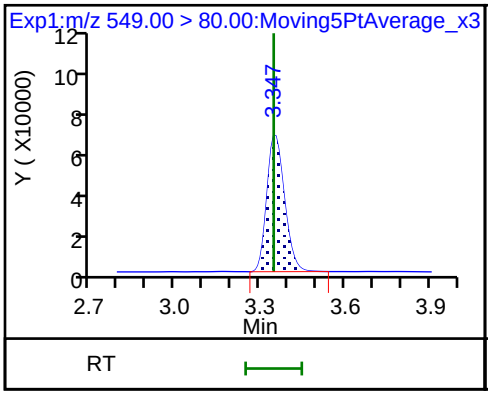
20 Perfluorononanoic acid (M)



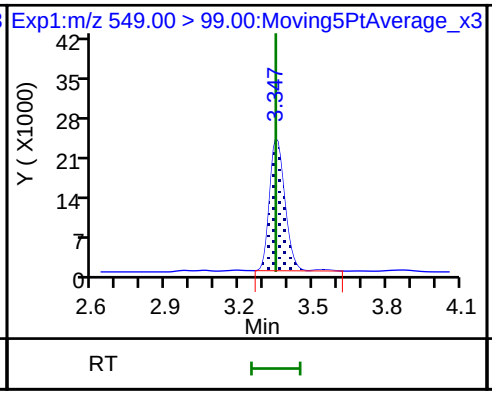
20 Perfluorononanoic acid



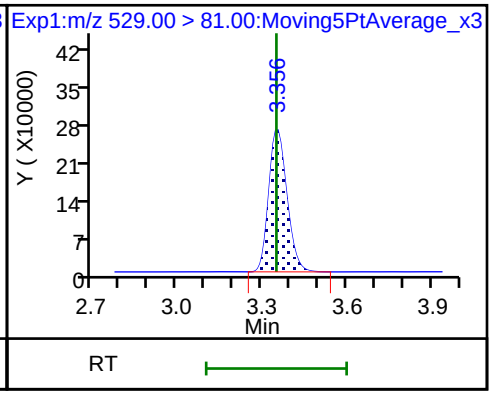
68 Perfluorononanesulfonic acid



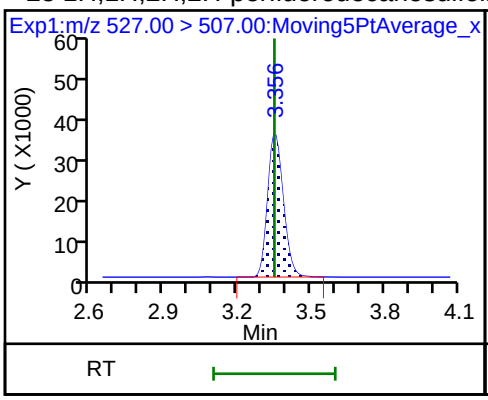
68 Perfluorononanesulfonic acid



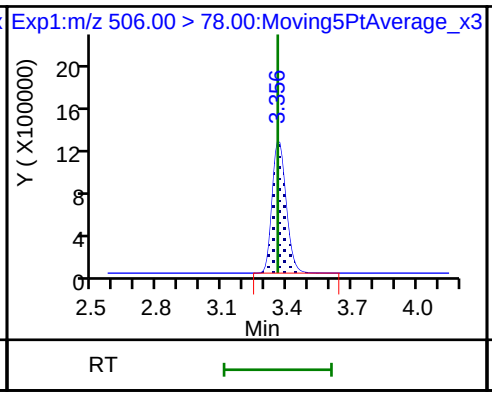
D 26 M2-8:2FTS



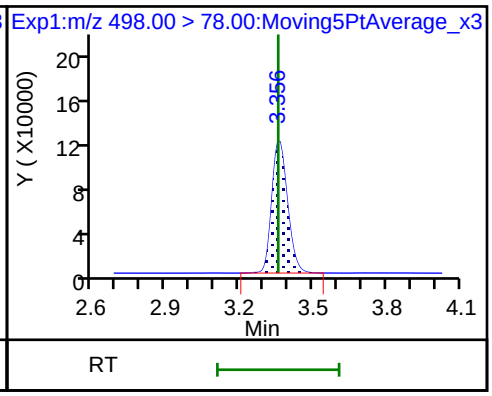
25 1H,1H,2H,2H-perfluorodecanesulfon



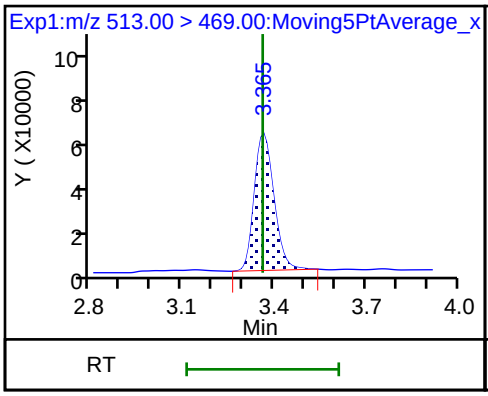
D 21 13C8 FOSA



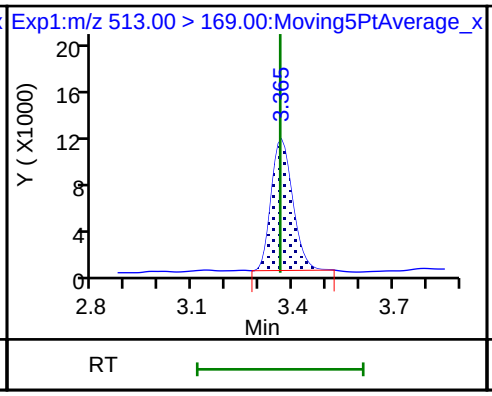
22 Perfluorooctane Sulfonamide



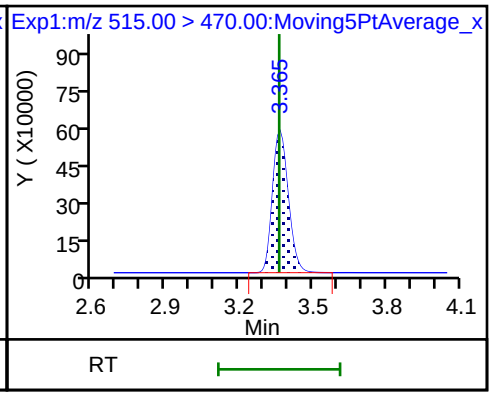
24 Perfluorodecanoic acid



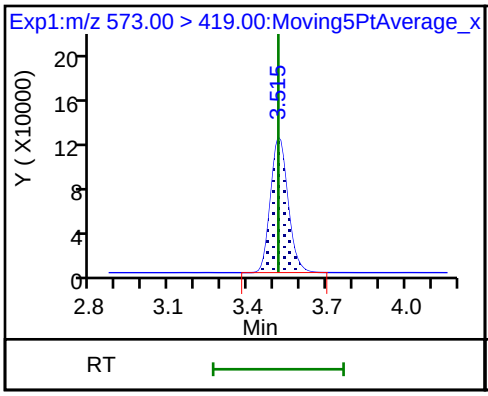
24 Perfluorodecanoic acid



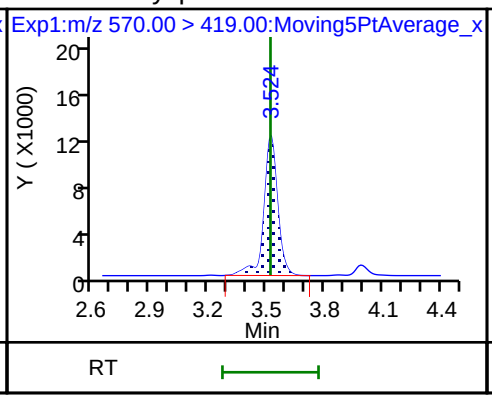
D 23 13C2 PFDA



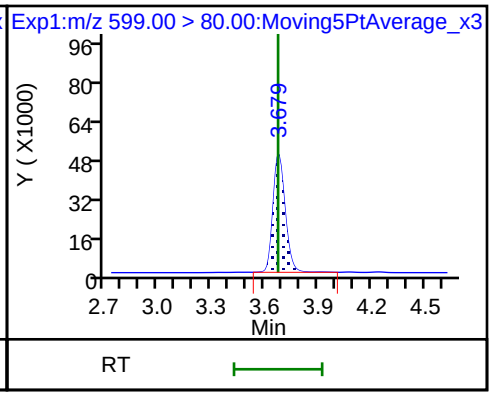
D 27 d3-NMeFOSAA



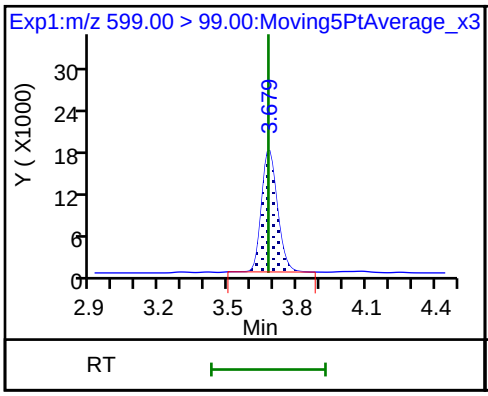
28 N-methyl perfluorooctane sulfonami



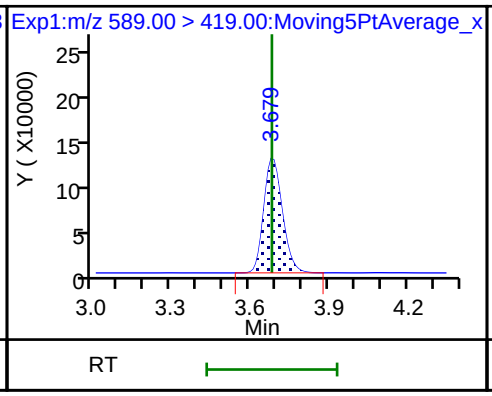
29 Perfluorodecane Sulfonic acid



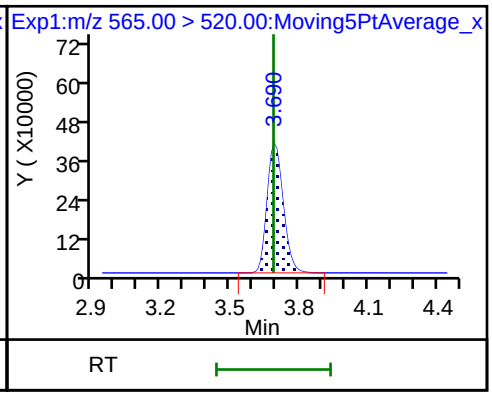
29 Perfluorodecane Sulfonic acid



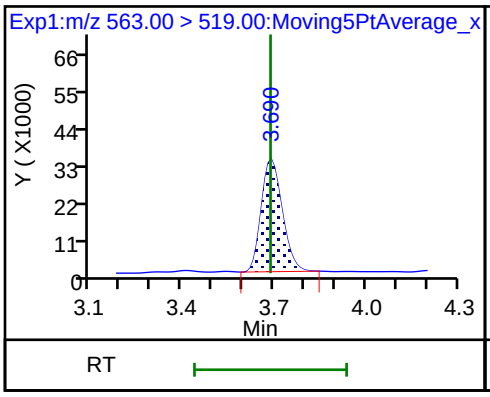
D 32 d5-NEtFOSAA



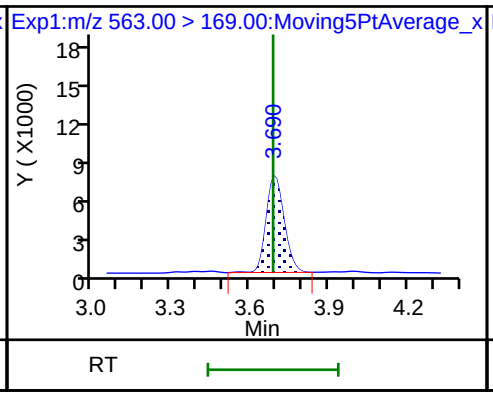
D 30 13C2 PFUnA



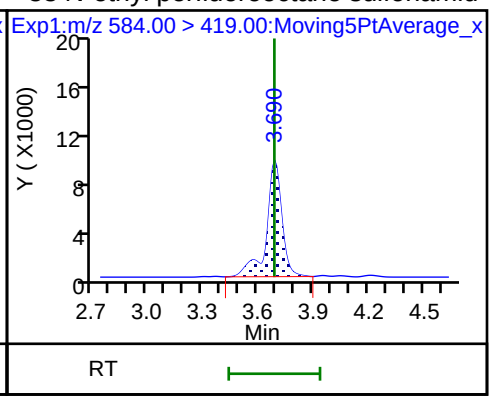
31 Perfluoroundecanoic acid



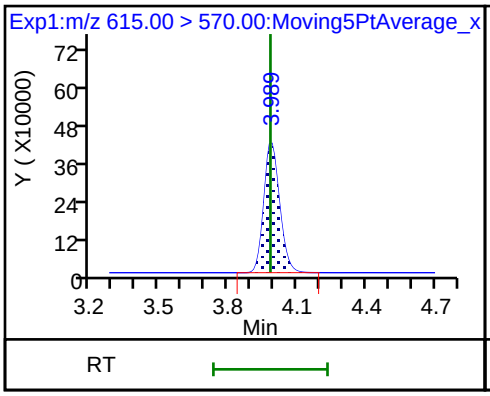
31 Perfluoroundecanoic acid



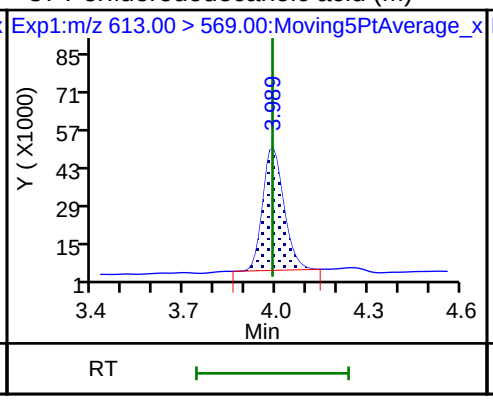
33 N-ethyl perfluorooctane sulfonamid



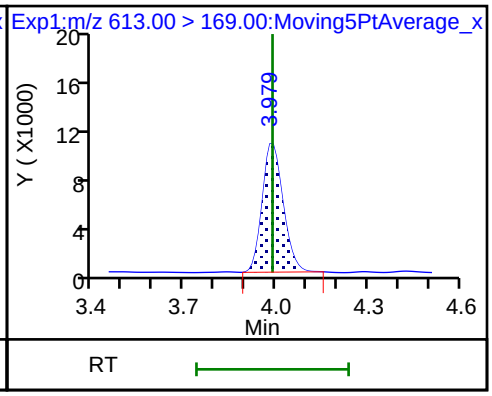
D 36 13C2 PFDoA



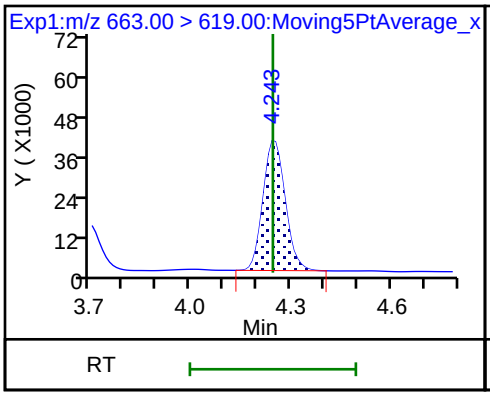
37 Perfluorododecanoic acid (M)



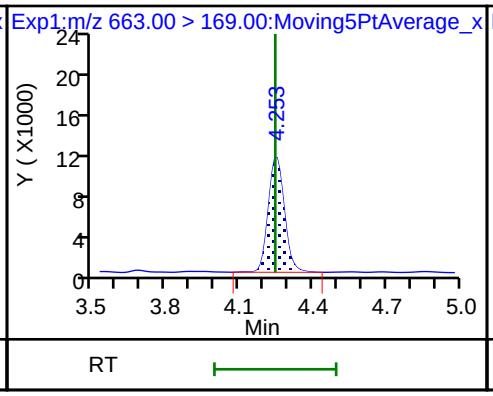
37 Perfluorododecanoic acid



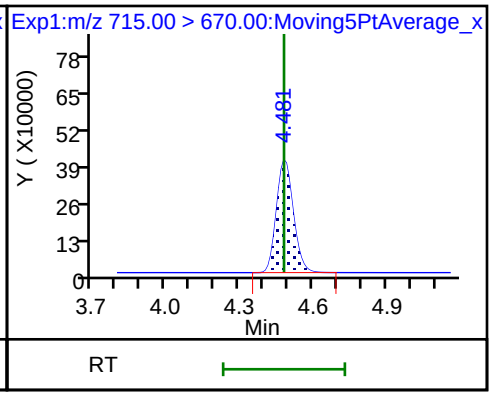
41 Perfluorotridecanoic acid



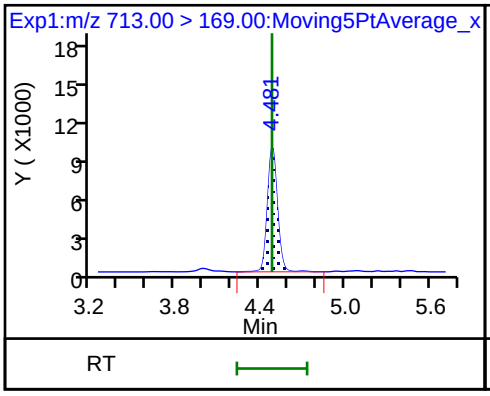
41 Perfluorotridecanoic acid



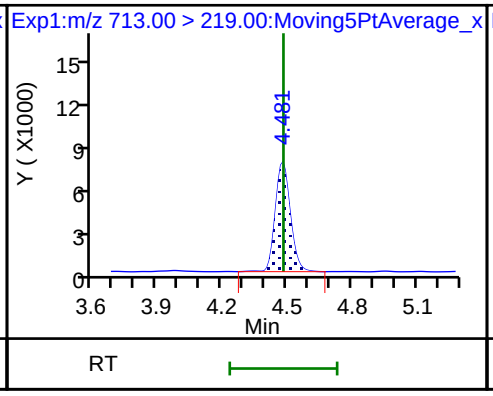
D 43 13C2-PFTeDA



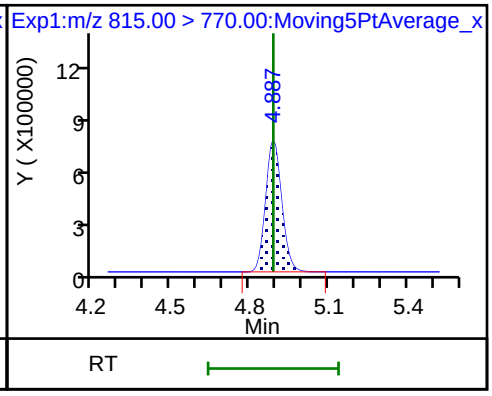
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

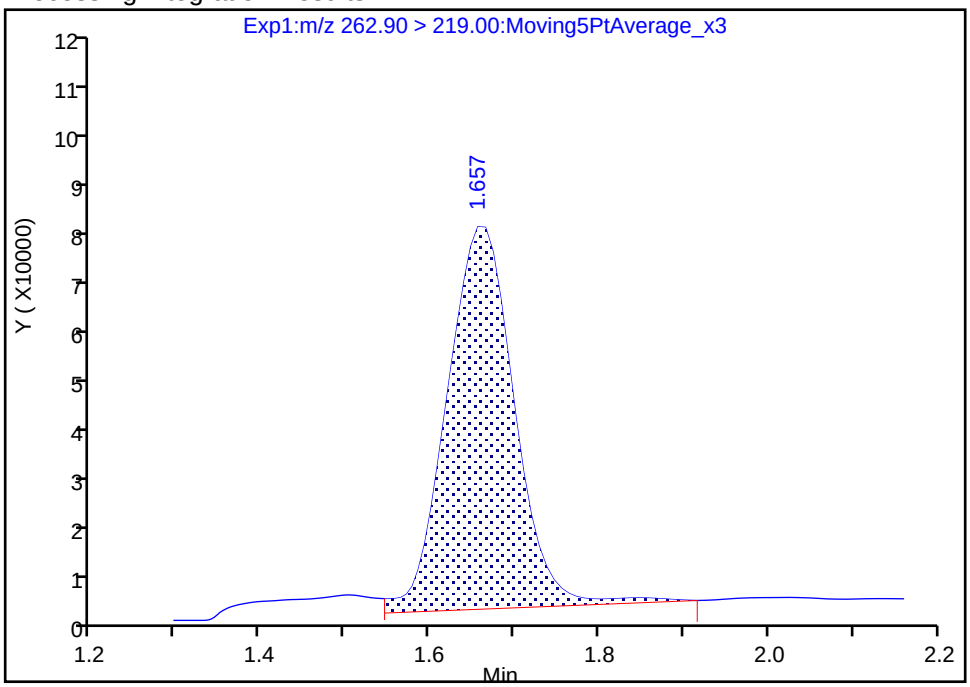
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_004.d				
Injection Date:	30-Jul-2018 15:29:37	Instrument ID:	A8_N		
Lims ID:	IC L3 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

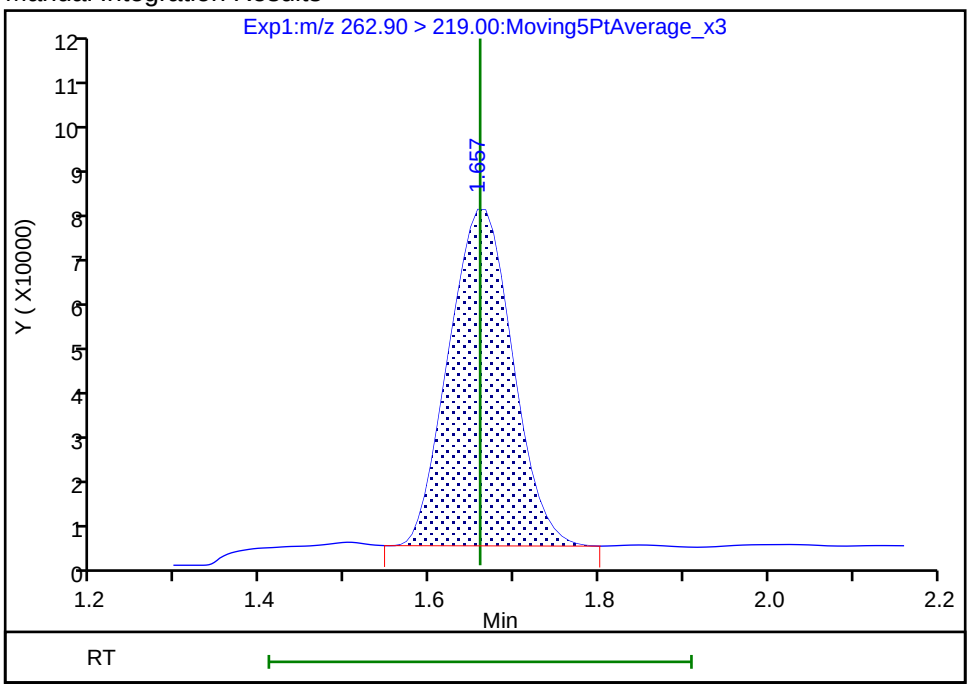
Processing Integration Results

RT: 1.66
Area: 408032
Amount: 0.261436
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 374727
Amount: 0.244385
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:16:20

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

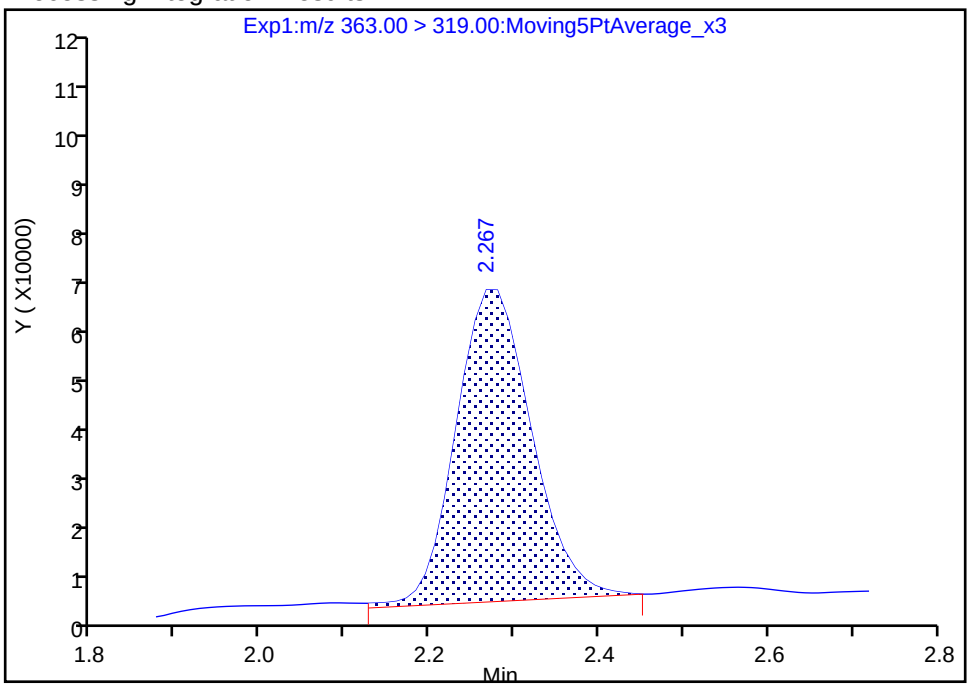
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_004.d				
Injection Date:	30-Jul-2018 15:29:37	Instrument ID:	A8_N		
Lims ID:	IC L3 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

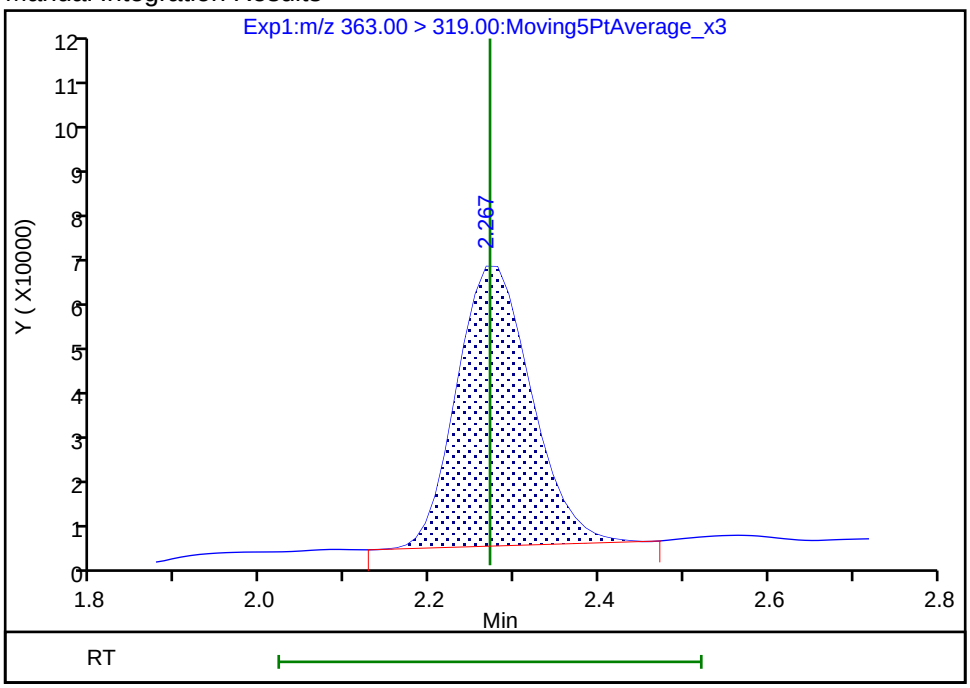
Processing Integration Results

RT: 2.27
Area: 384531
Amount: 0.247030
Amount Units: ng/ml



Manual Integration Results

RT: 2.27
Area: 375371
Amount: 0.241959
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:16:28

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

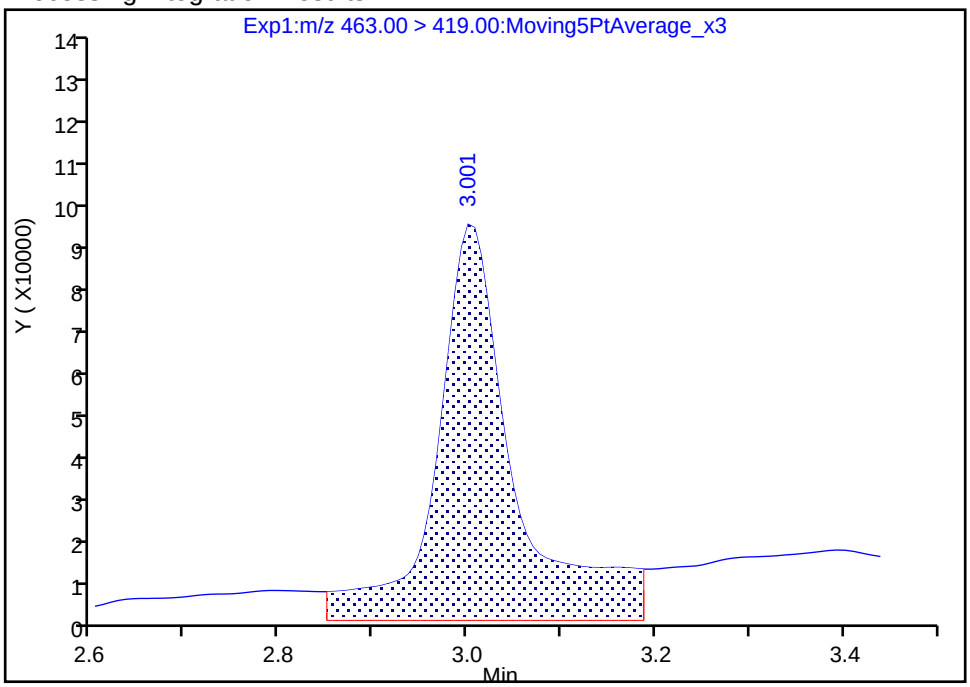
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_004.d				
Injection Date:	30-Jul-2018 15:29:37	Instrument ID:	A8_N		
Lims ID:	IC L3 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

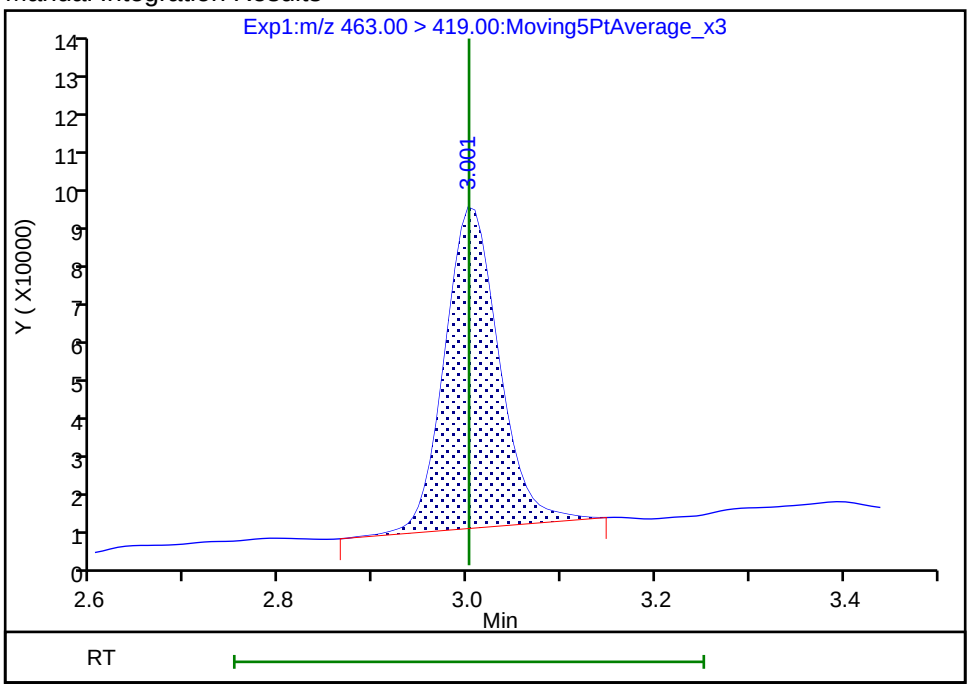
Processing Integration Results

RT: 3.00
Area: 522177
Amount: 0.359940
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 327392
Amount: 0.237744
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:16:43

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

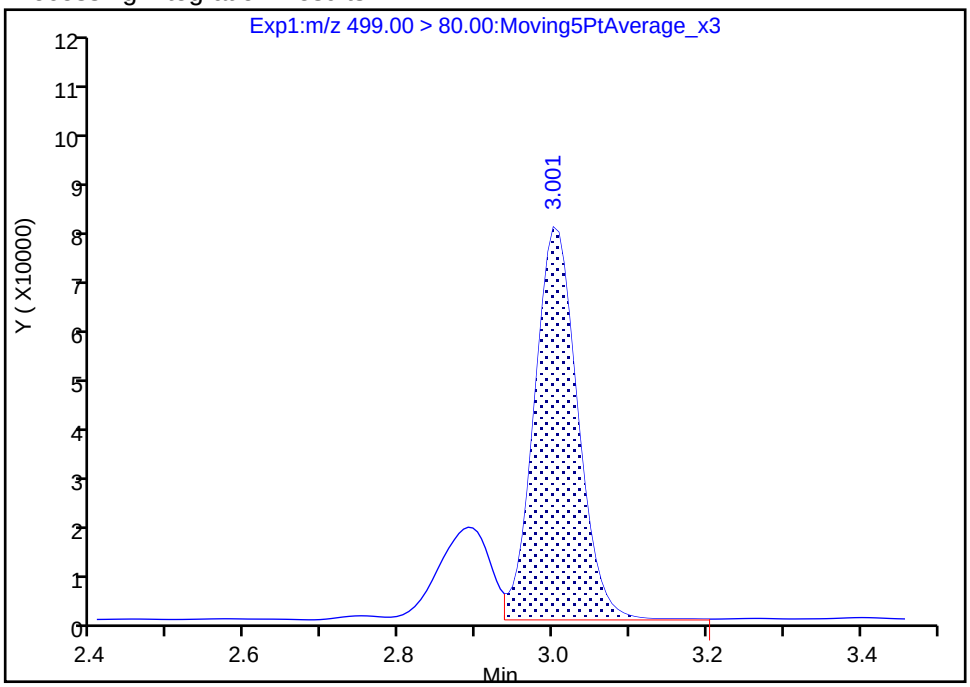
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_004.d				
Injection Date:	30-Jul-2018 15:29:37	Instrument ID:	A8_N		
Lims ID:	IC L3 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

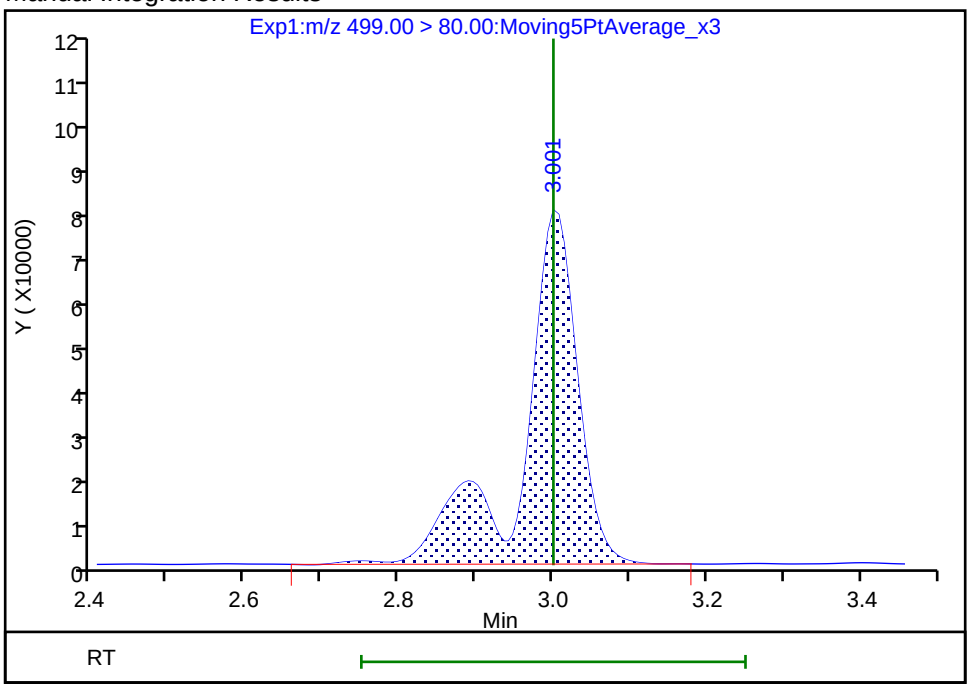
Processing Integration Results

RT: 3.00
Area: 301783
Amount: 0.196754
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 384723
Amount: 0.227039
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:16:37

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

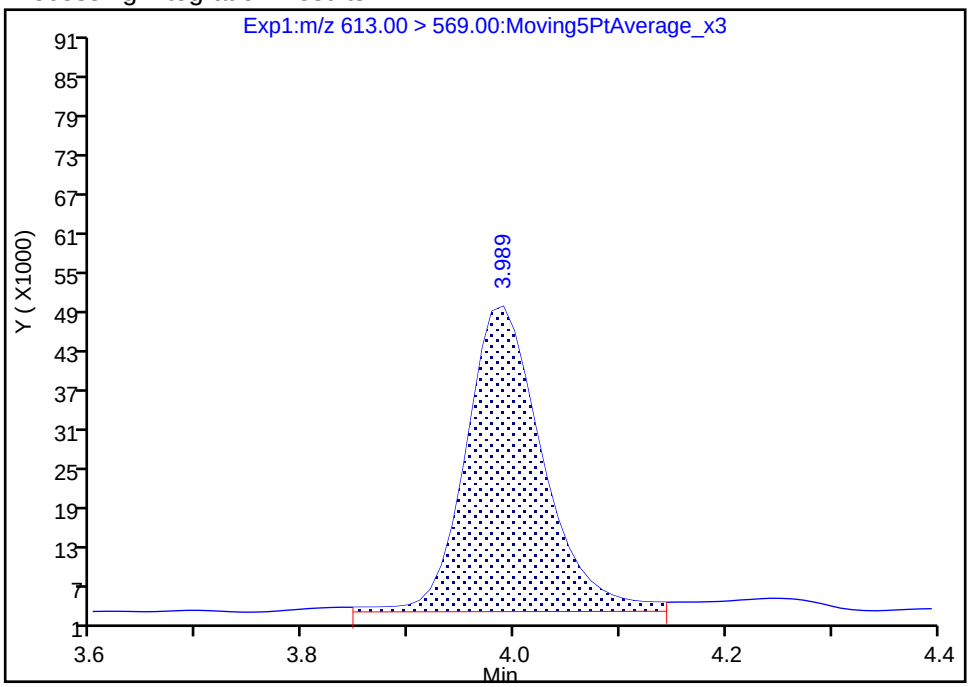
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_004.d				
Injection Date:	30-Jul-2018 15:29:37	Instrument ID:	A8_N		
Lims ID:	IC L3 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

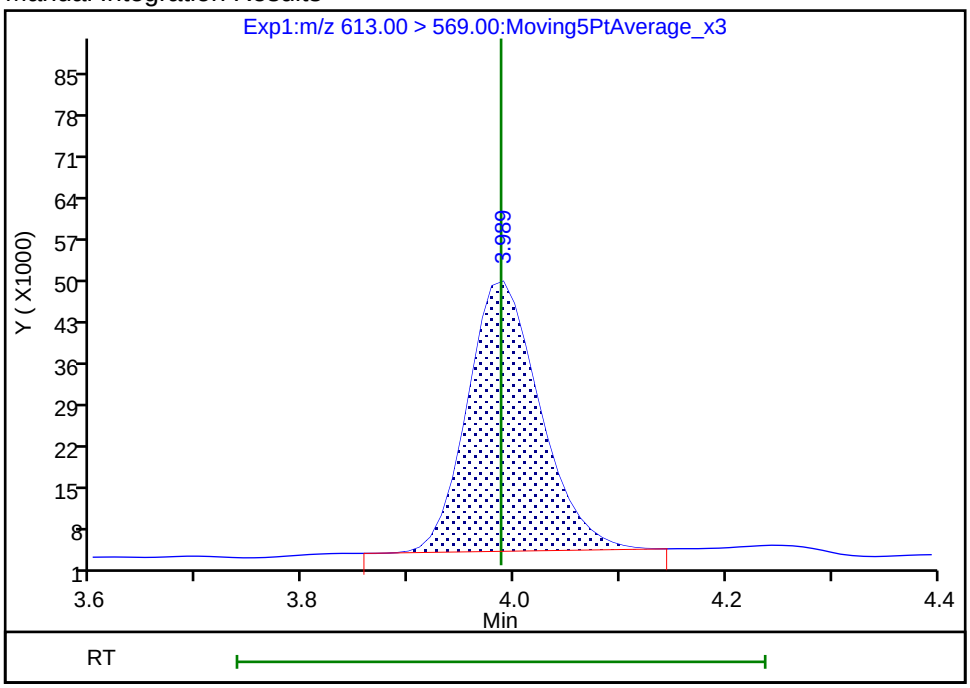
Processing Integration Results

RT: 3.99
Area: 236965
Amount: 0.263476
Amount Units: ng/ml



Manual Integration Results

RT: 3.99
Area: 218447
Amount: 0.256887
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:16:54

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 30-Jul-2018 15:37:25 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:38:53 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:17:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.414	1.412	0.002	0.538	4761246	2.48		99.2	54870	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.412	0.002	1.000	1851329	0.9496		95.0	367	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.658	0.0	0.631	3085012	2.50		99.9	47731	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.658	1.659	-0.001	1.000	1460063	0.9782		97.8	827	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.693	0.001	0.644	83737	2.28		98.2	309	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.697	-0.003	1.000	2472544	0.8858		100	7197	
298.90 > 99.00	1.694	1.697	-0.003	1.000	1026975		2.41(1.25-3.74)	100	2869	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.907	1.904	0.003	1.126	505381	0.9197		98.5	18078	
D 60 M2-4:2FTS										
329.00 > 81.00	1.907	1.905	0.002	0.725	532069	NC			4145	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.942	-0.003	0.738	3594130	2.56		103	78479	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.944	-0.005	1.000	1444727	0.9426		94.3	2673	
313.00 > 119.00	1.939	1.944	-0.005	1.000	126765		11.40(5.03-15.10)	94.3	1788	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.961	1.965	-0.004	1.157	2368376	0.9394		100	19322	
349.00 > 99.00	1.961	1.965	-0.004	1.157	892884		2.65(1.36-4.07)	100	3916	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.039	2.040	-0.001	0.775	205961	NC			4921	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.039	2.042	-0.003	1.000	251430	NC			1107	
D 9 13C4-PFHpA										
367.00 > 322.00	2.269	2.267	0.002	0.863	3347957	2.51		100	50422	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.269	2.271	-0.002	1.000	1553374	1.02		102	523	
363.00 > 169.00	2.269	2.271	-0.002	1.000	582257		2.67(1.13-3.40)	102	4847	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.282	2.284	-0.002	1.000	2007114	0.8762		96.3	4748	
399.00 > 99.00	2.282	2.284	-0.002	1.000	670324		2.99(1.50-4.49)	96.3	800	
D 11 18O2 PFHxS										
403.00 > 84.00	2.282	2.288	-0.006	0.868	4661982	2.30		97.2	33267	
65 ADONA										
377.00 > 251.00	2.321	2.316	0.005	0.773	3967454	NC			32911	
377.00 > 85.00	2.321	2.316	0.005	0.773	2279033		1.74(0.84-2.53)		7862	
D 12 M2-6:2FTS										
429.00 > 81.00	2.605	2.603	0.002	0.991	1012278	2.42		102	9213	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.605	2.605	0.0	1.000	665614	0.9270		97.8	11001	
* 62 13C2-PFOA										
415.00 > 370.00	2.629	2.631	-0.002		3546579	2.50			45236	
D 14 13C4 PFOA										
417.00 > 372.00	2.629	2.631	-0.002	1.000	3420467	2.51		100	46079	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.629	2.631	-0.002	1.000	1579409	0.99		98.9	1384	
413.00 > 169.00	2.629	2.631	-0.002	1.000	833102		1.90(0.84-2.52)	98.9	3146	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.637	2.640	-0.003	0.878	1827071	0.9391		98.6	9690	
449.00 > 99.00	2.637	2.640	-0.003	0.878	494672		3.69(1.94-5.82)	98.6	1522	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.002	3.000	0.002	1.000	1485846	0.8914		96.1	1835	
499.00 > 99.00	3.002	3.000	0.002	1.000	352644		4.21(2.31-6.93)	96.1	2043	
D 18 13C4 PFOS										
503.00 > 80.00	3.002	3.000	0.002	1.142	3494855	2.40		100	18281	
D 19 13C5 PFNA										
468.00 > 423.00	3.002	3.000	0.002	1.142	3038962	2.52		101	60092	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.002	3.001	0.001	1.000	1273258	0.9709		97.1	281	M
463.00 > 169.00	3.002	3.001	0.001	1.000	306651		4.15(1.90-5.69)	97.1	7872	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.214	3.212	0.002	1.071	2443972	NC			13994	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.350	3.347	0.003	1.116	1068357	0.9332		97.2	15468	
549.00 > 99.00	3.350	3.347	0.003	1.116	420841		2.54(1.33-3.97)	97.2	3179	
D 26 M2-8:2FTS										
529.00 > 81.00	3.350	3.350	0.0	1.274	1218683	2.53		106	12616	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.350	3.350	0.0	1.000	628972	0.9308		97.2	20270	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.359	3.356	0.003	1.278	5252242	2.53		101	52101	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.359	3.357	0.002	1.000	2134917	1.03		103	18606	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.359	3.361	-0.002	1.000	993850	0.9433		94.3	1571	
513.00 > 169.00	3.359	3.361	-0.002	1.000	174914		5.68(2.36-7.09)	94.3	2105	
D 23 13C2 PFDA										
515.00 > 470.00	3.359	3.361	-0.002	1.278	2422600	2.43		97.2	67298	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.518	3.515	0.003	1.338	558924	2.48		99.1	20339	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.518	3.519	-0.001	1.000	218553	0.9505		95.0	2196	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.675	3.674	0.001	1.224	903130	0.9230		95.7	9082	
599.00 > 99.00	3.675	3.674	0.001	1.224	299343		3.02(1.39-4.16)	95.7	4205	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.685	3.683	0.002	1.402	610220	2.47		99.0	8310	
D 30 13C2 PFUnA										
565.00 > 520.00	3.685	3.687	-0.002	1.402	1923975	2.48		99.4	43787	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.685	3.687	-0.002	1.000	651751	0.9442		94.4	2570	
563.00 > 169.00	3.696	3.687	0.009	1.003	151715		4.30(2.12-6.36)	94.4	6167	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.696	3.689	0.007	1.003	229437	1.03		103	6573	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.853	3.848	0.005	1.283	3763614	NC			64942	
D 36 13C2 PFDoA										
615.00 > 570.00	3.986	3.983	0.003	1.516	1974249	2.51		100	24367	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.986	3.987	-0.001	1.000	849134	1.00		99.6	215	
613.00 > 169.00	3.986	3.987	-0.001	1.000	205572		4.13(2.13-6.40)	99.6	3934	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.250	4.245	0.005	1.066	731755	1.01		101	420	
663.00 > 169.00	4.250	4.245	0.005	1.066	215035		3.40(1.25-3.76)	101	2209	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.479	4.481	-0.002	1.704	1856897	2.59		104	10423	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.490	4.483	0.007	1.002	175652	0.8872		88.7	2568	
713.00 > 219.00	4.479	4.483	-0.004	1.000	128928		1.36(0.71-2.13)	88.7	1913	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.888	-0.001	1.000	1263980	NC			270	
813.00 > 169.00	4.887	4.888	-0.001	1.000	196216		6.44(2.86-8.58)		1548	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.888	-0.001	1.859	3227345	2.55		102	7878	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.232	5.229	0.003	1.071	1284007	NC			419	
913.00 > 169.00	5.225	5.229	-0.004	1.069	153300		8.38(3.83-11.48)		1124	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:38:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_005.d

Injection Date: 30-Jul-2018 15:37:25 Instrument ID: A8_N

Lims ID: IC L4 Full

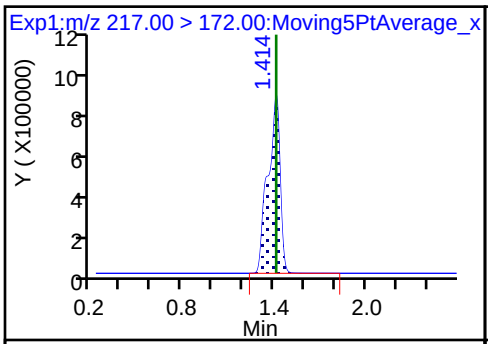
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

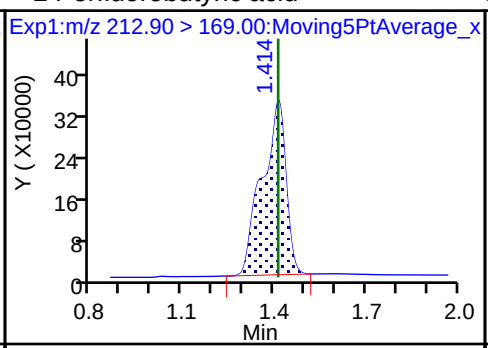
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



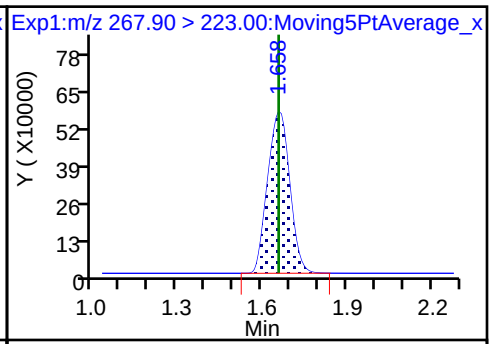
RT

2 Perfluorobutyric acid



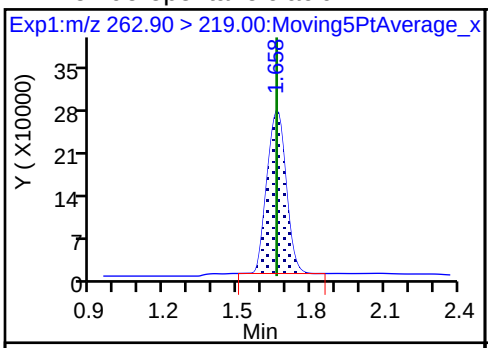
RT

D 3 13C5-PFPeA



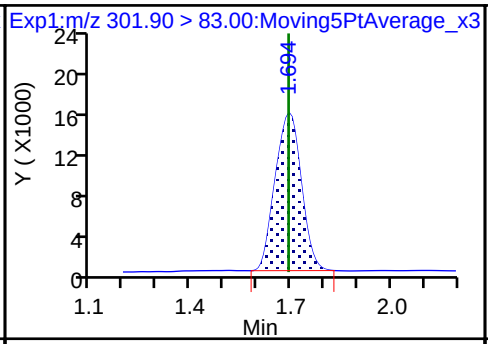
RT

4 Perfluoropentanoic acid



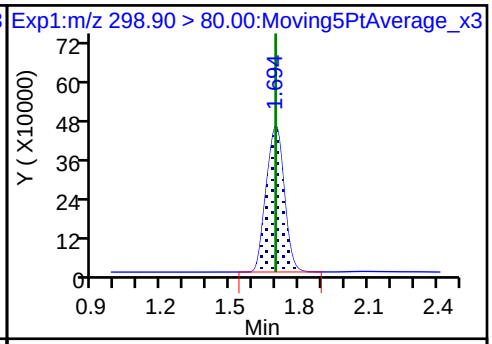
RT

D 47 13C3-PFBS



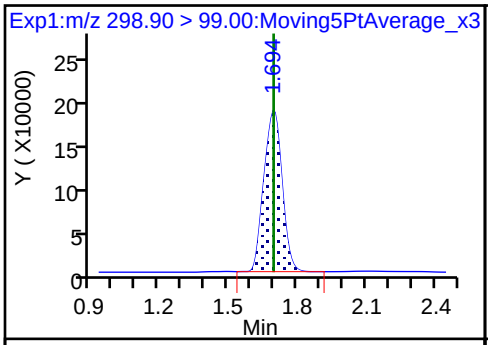
RT

5 Perfluorobutanesulfonic acid



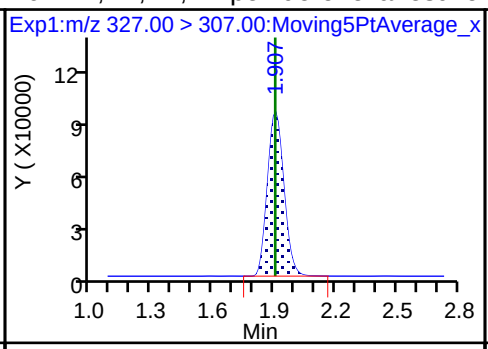
RT

5 Perfluorobutanesulfonic acid



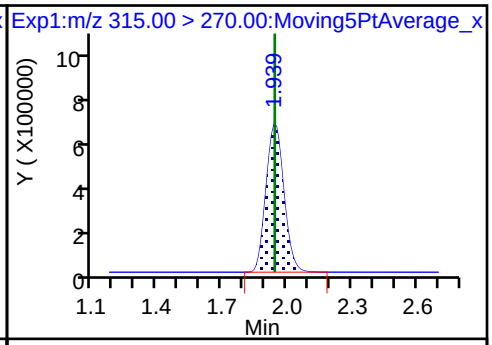
RT

61 1H,1H,2H,2H-perfluorohexanesulfon



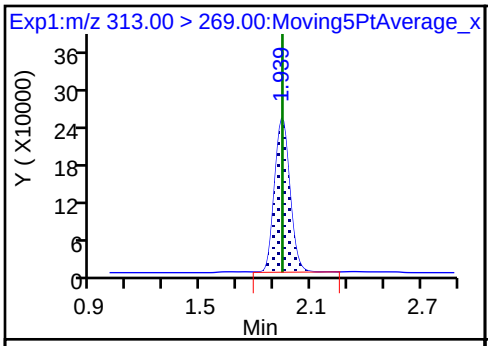
RT

D 7 13C2 PFHxA



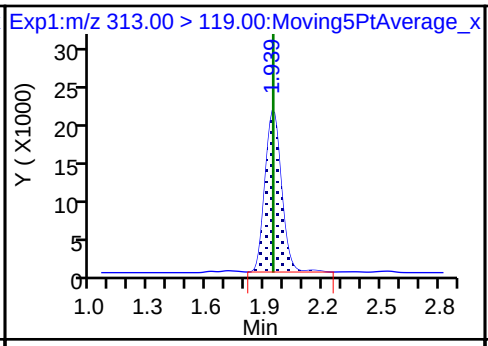
RT

6 Perfluorohexanoic acid



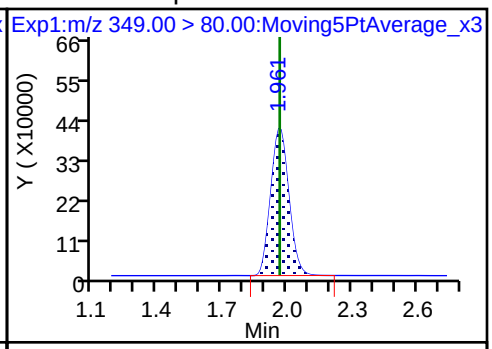
RT

6 Perfluorohexanoic acid



RT

70 Perfluoropentanesulfonic acid



RT

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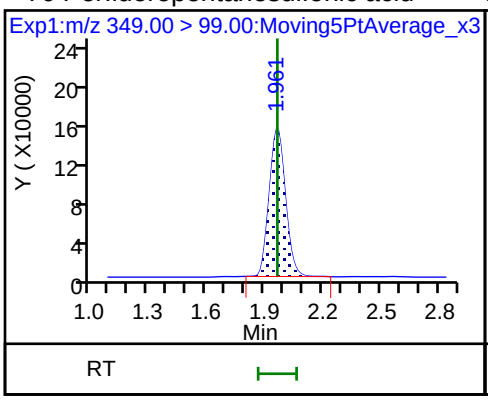
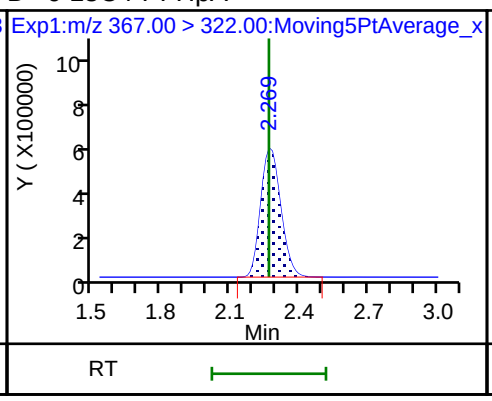
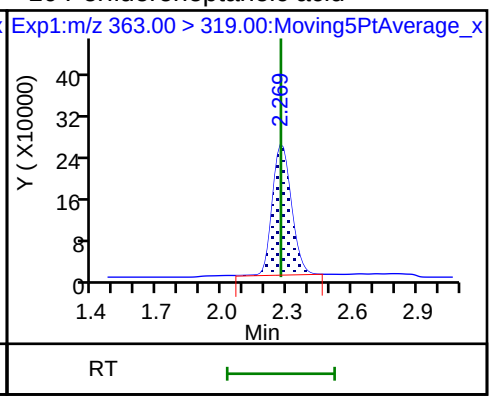


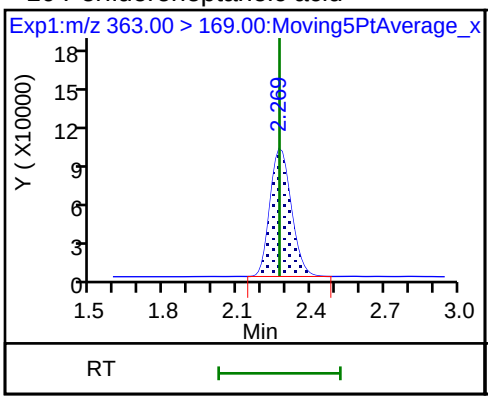
D 9 13C4-PFHpA



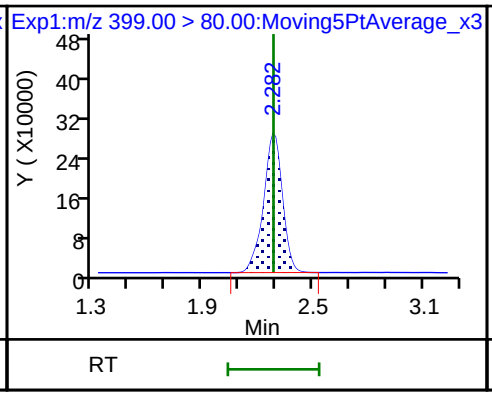
10 Perfluoroheptanoic acid



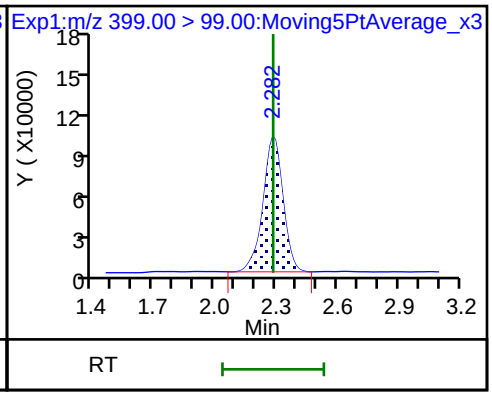
10 Perfluoroheptanoic acid



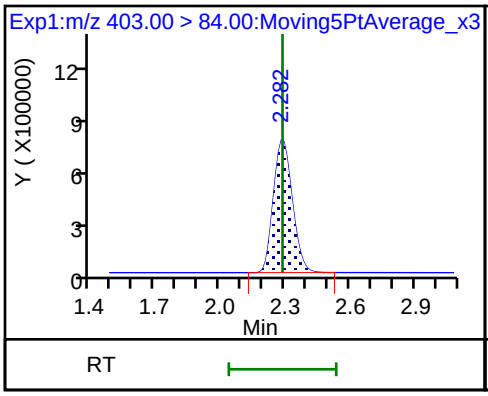
8 Perfluorohexanesulfonic acid



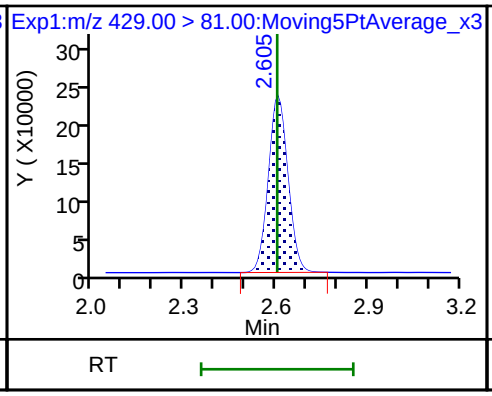
8 Perfluorohexanesulfonic acid



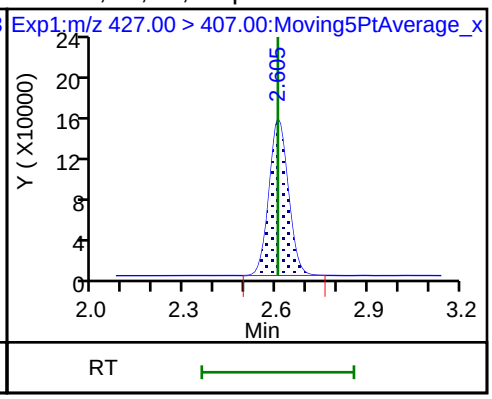
D 11 18O2 PFHxS



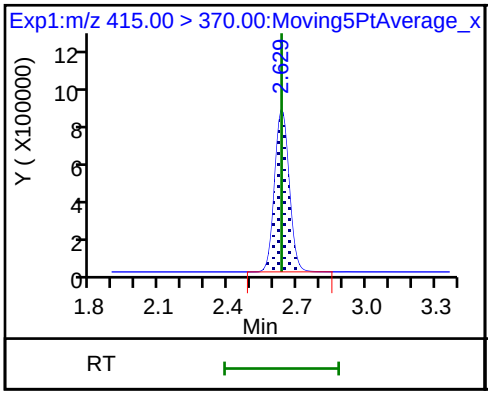
D 12 M2-6:2FTS



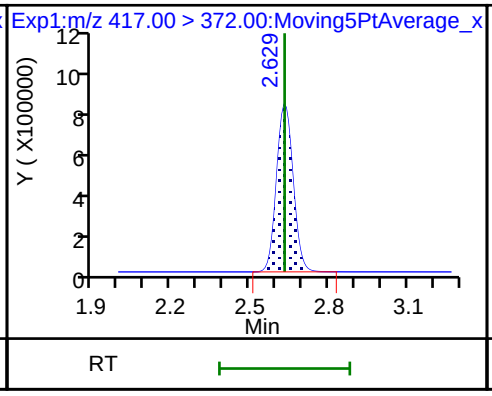
13 1H,1H,2H,2H-perfluorooctanesulfoni



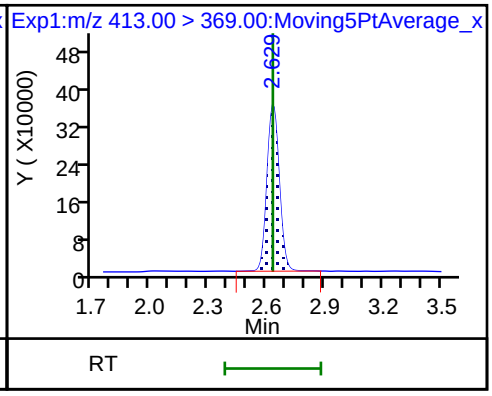
* 62 13C2-PFOA



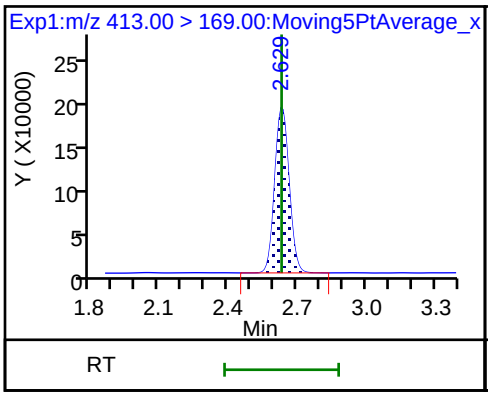
D 14 13C4 PFOA



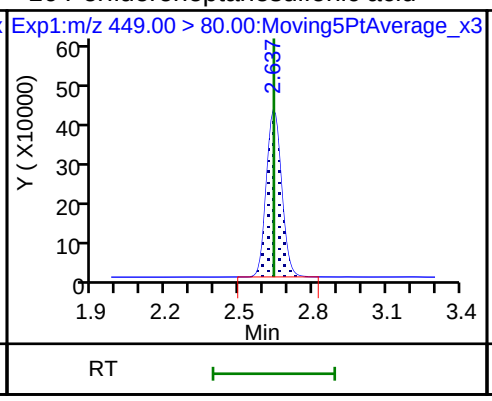
15 Perfluorooctanoic acid



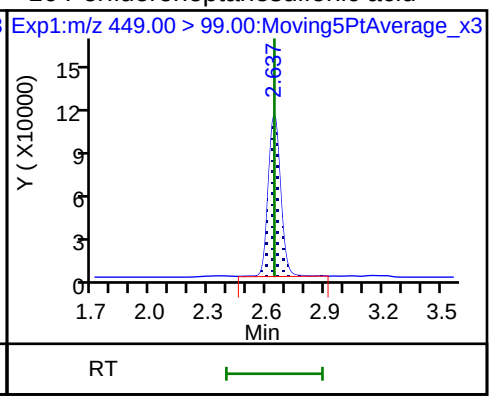
15 Perfluorooctanoic acid



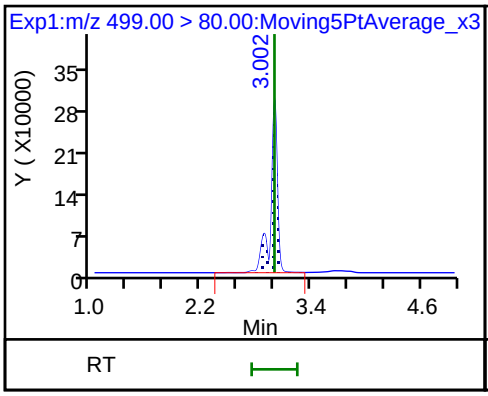
16 Perfluoroheptanesulfonic acid



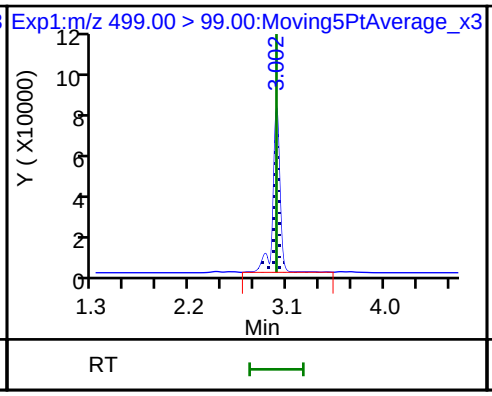
16 Perfluoroheptanesulfonic acid



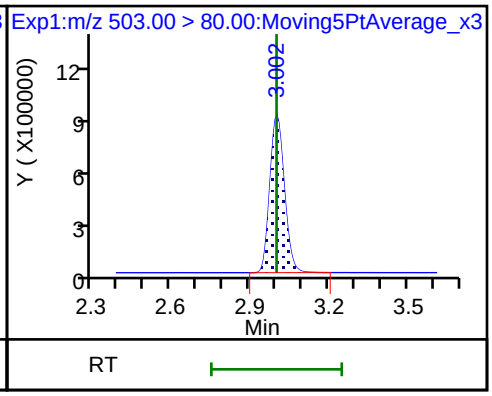
17 Perfluorooctane sulfonic acid



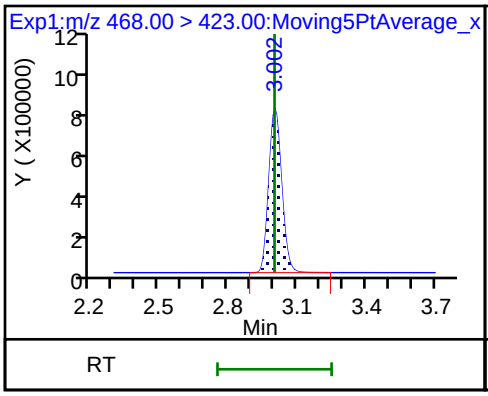
17 Perfluorooctane sulfonic acid



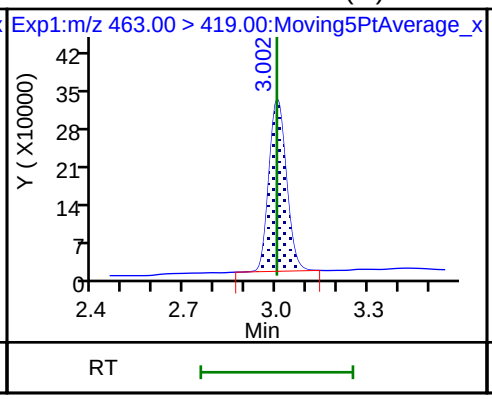
D 18 13C4 PFOS



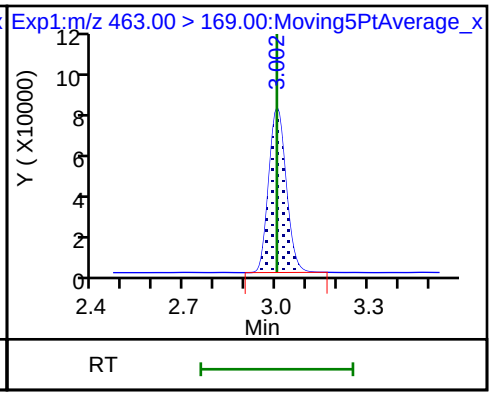
D 19 13C5 PFNA



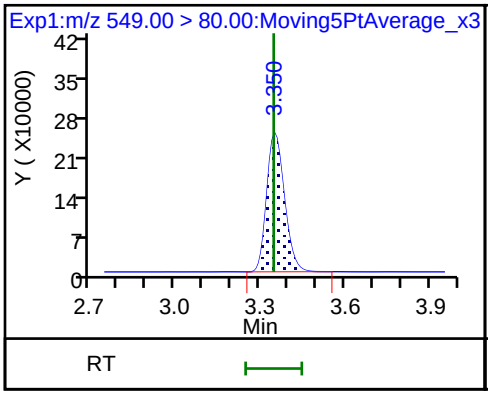
20 Perfluorononanoic acid (M)



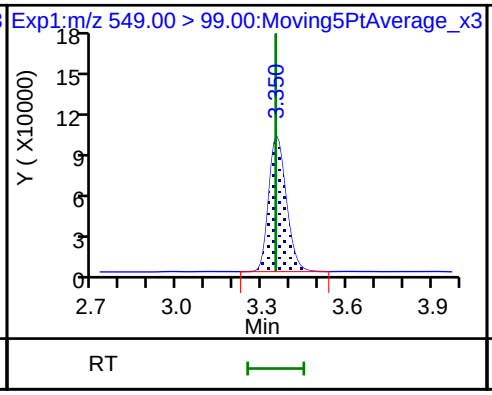
20 Perfluorononanoic acid



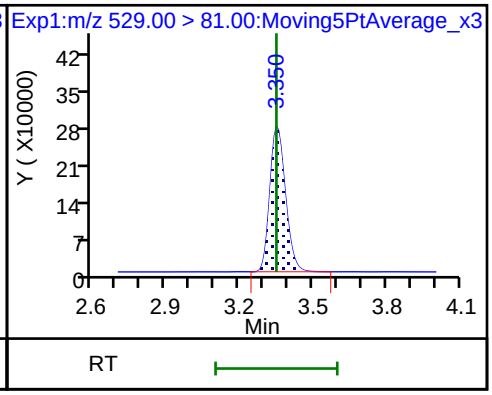
68 Perfluorononanesulfonic acid



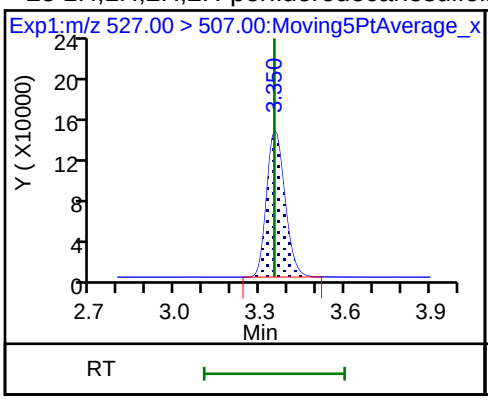
68 Perfluorononanesulfonic acid



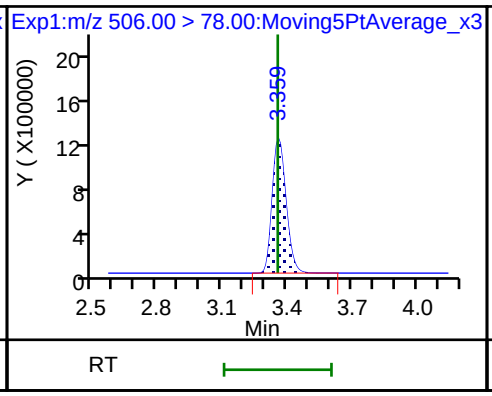
D 26 M2-8:2FTS



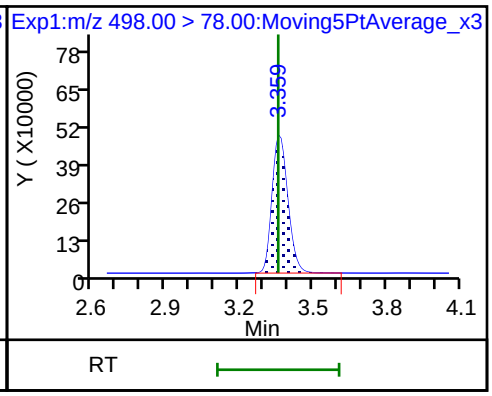
25 1H,1H,2H,2H-perfluorodecanesulfon



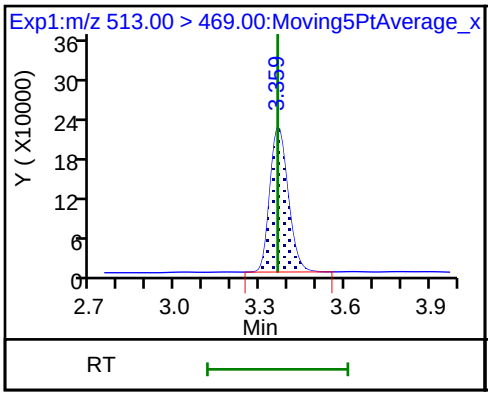
D 21 13C8 FOSA



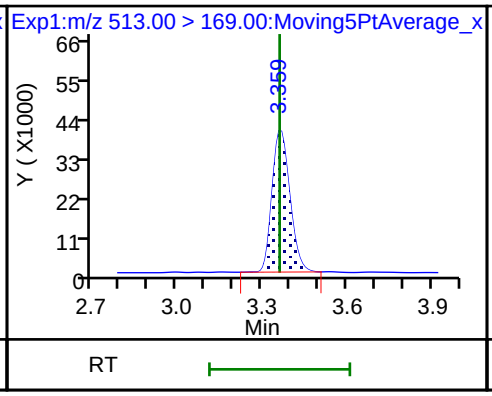
22 Perfluorooctane Sulfonamide



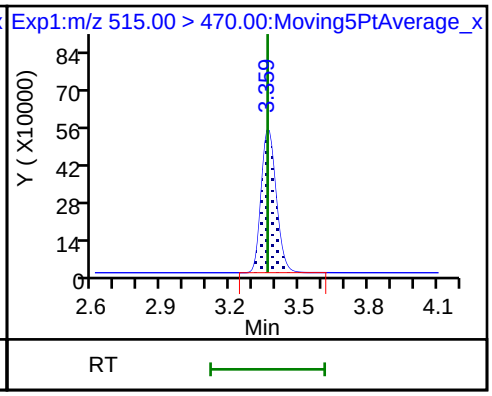
24 Perfluorodecanoic acid



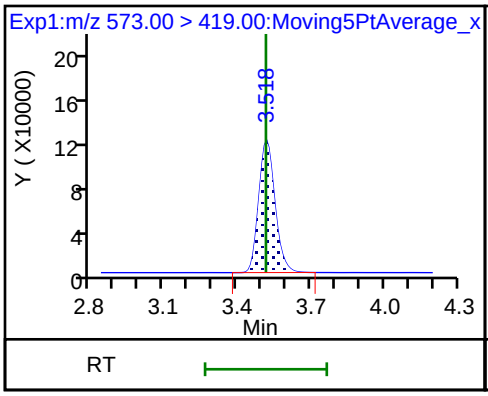
24 Perfluorodecanoic acid



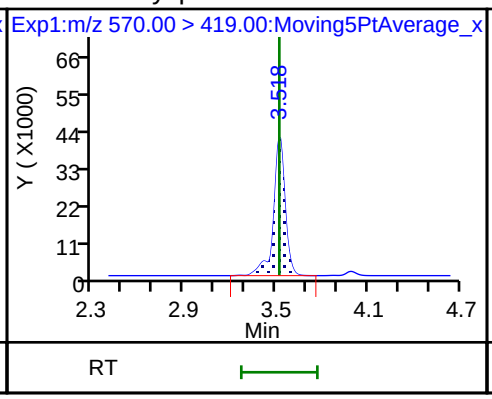
D 23 13C2 PFDA



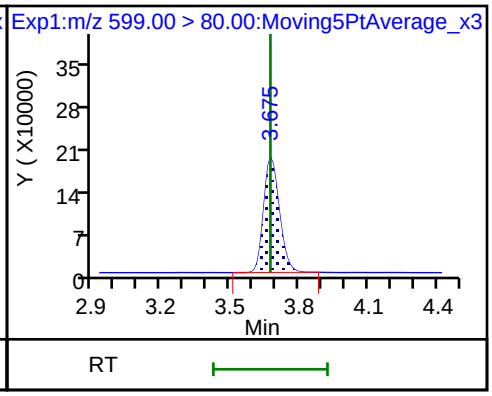
D 27 d3-NMeFOSAA



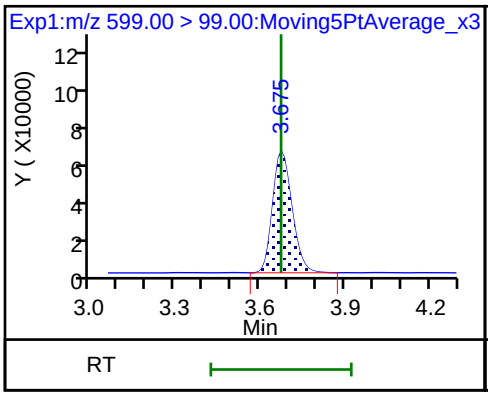
28 N-methyl perfluorooctane sulfonami



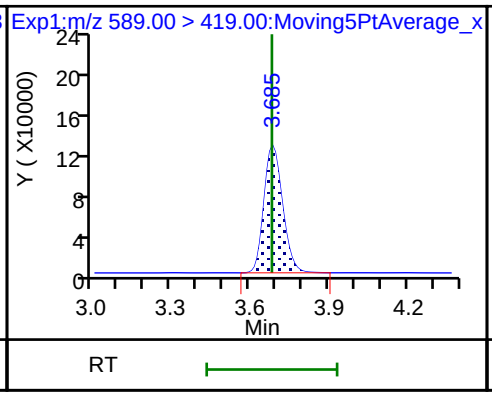
29 Perfluorodecane Sulfonic acid



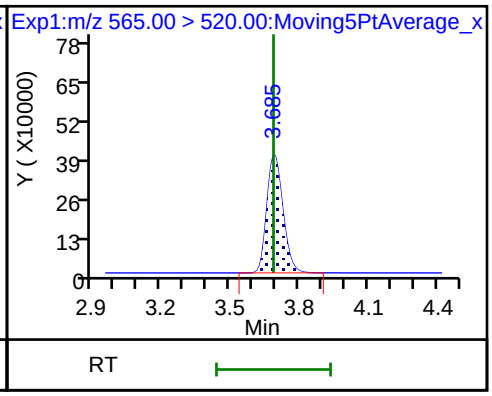
29 Perfluorodecane Sulfonic acid



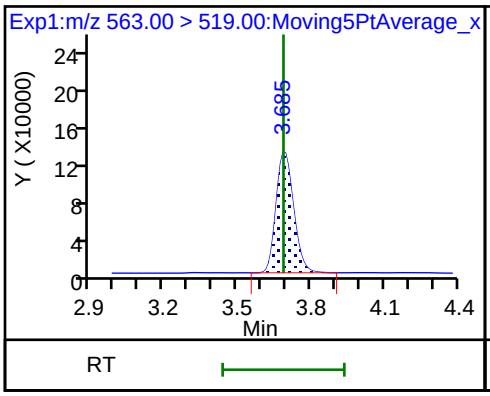
D 32 d5-NEtFOSAA



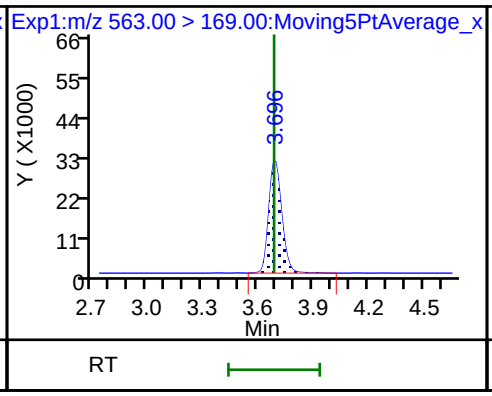
D 30 13C2 PFUnA



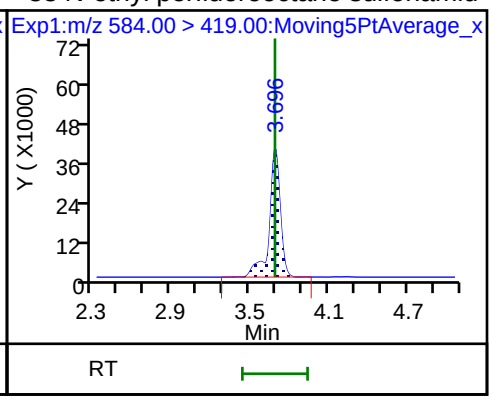
31 Perfluoroundecanoic acid



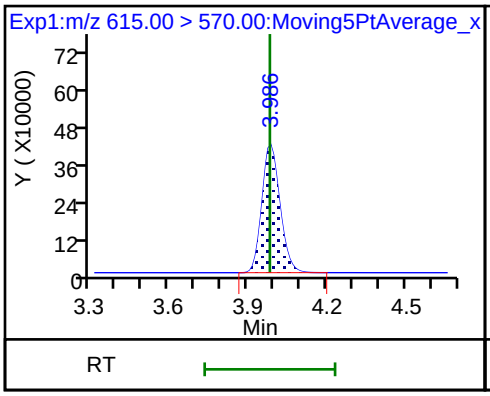
31 Perfluoroundecanoic acid



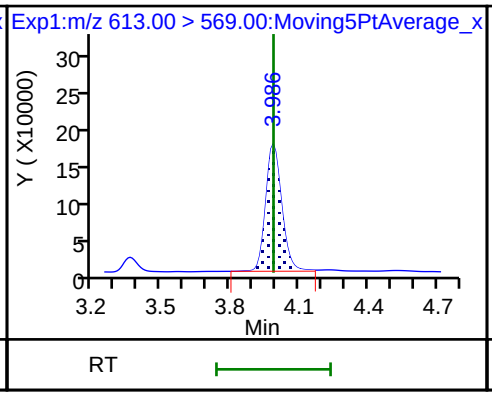
33 N-ethyl perfluorooctane sulfonamid



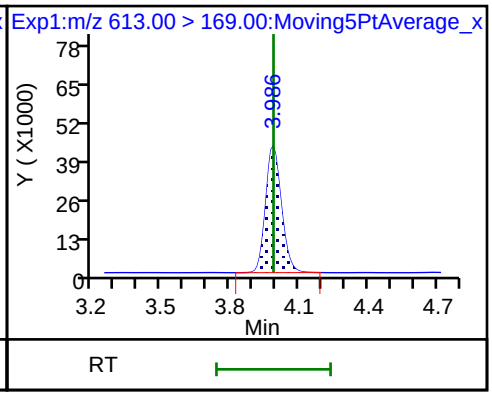
D 36 13C2 PFDoA



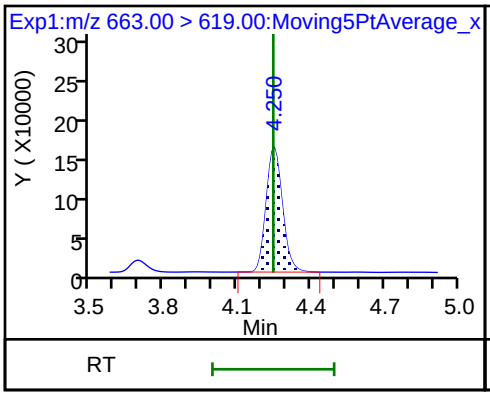
37 Perfluorododecanoic acid



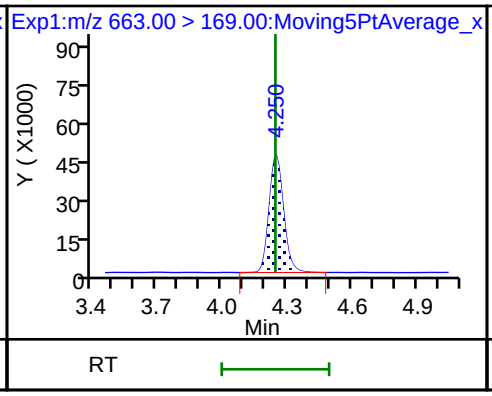
37 Perfluorododecanoic acid



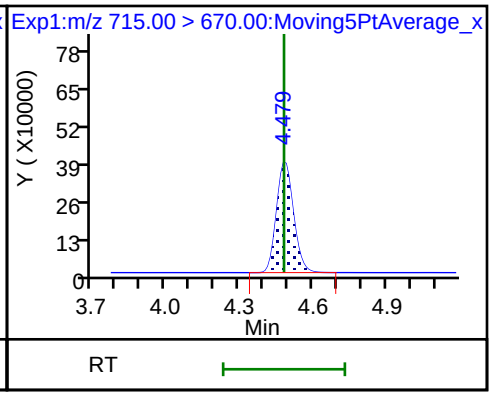
41 Perfluorotridecanoic acid



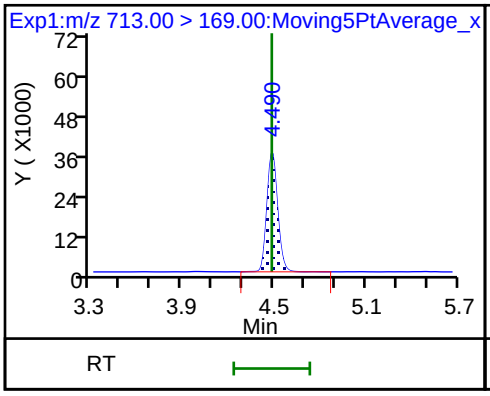
41 Perfluorotridecanoic acid



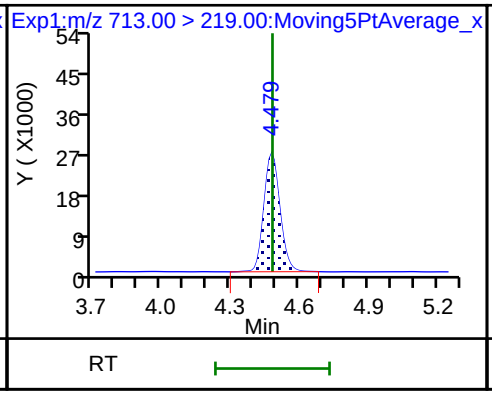
D 43 13C2-PFTeDA



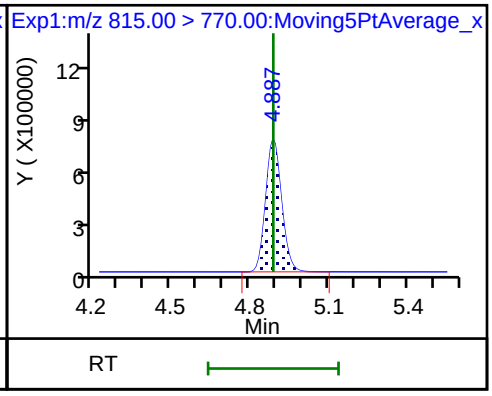
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

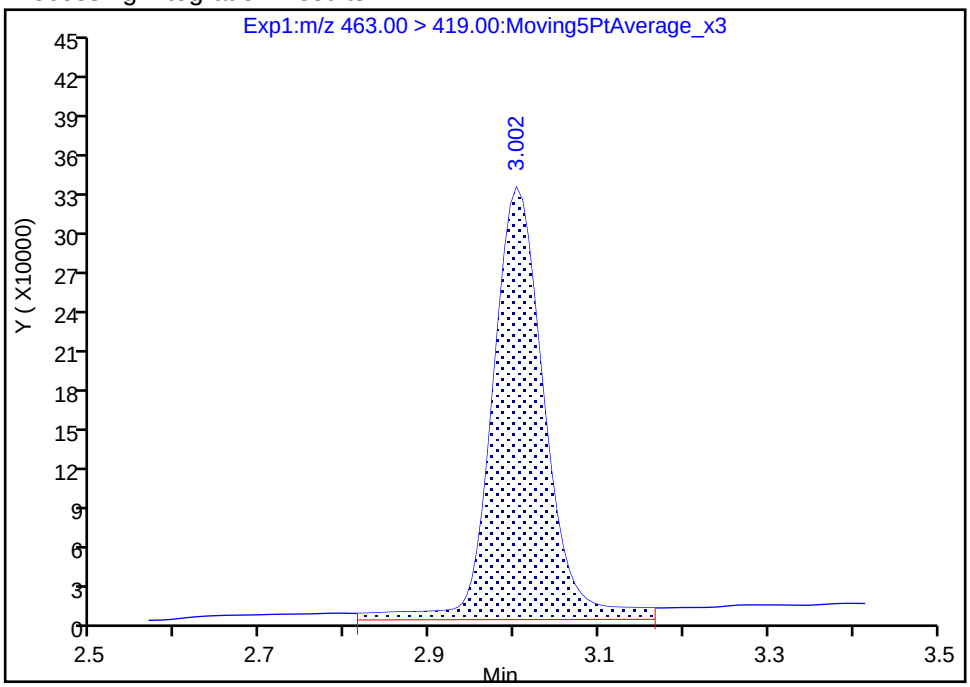
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_005.d				
Injection Date:	30-Jul-2018 15:37:25	Instrument ID:	A8_N		
Lims ID:	IC L4 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

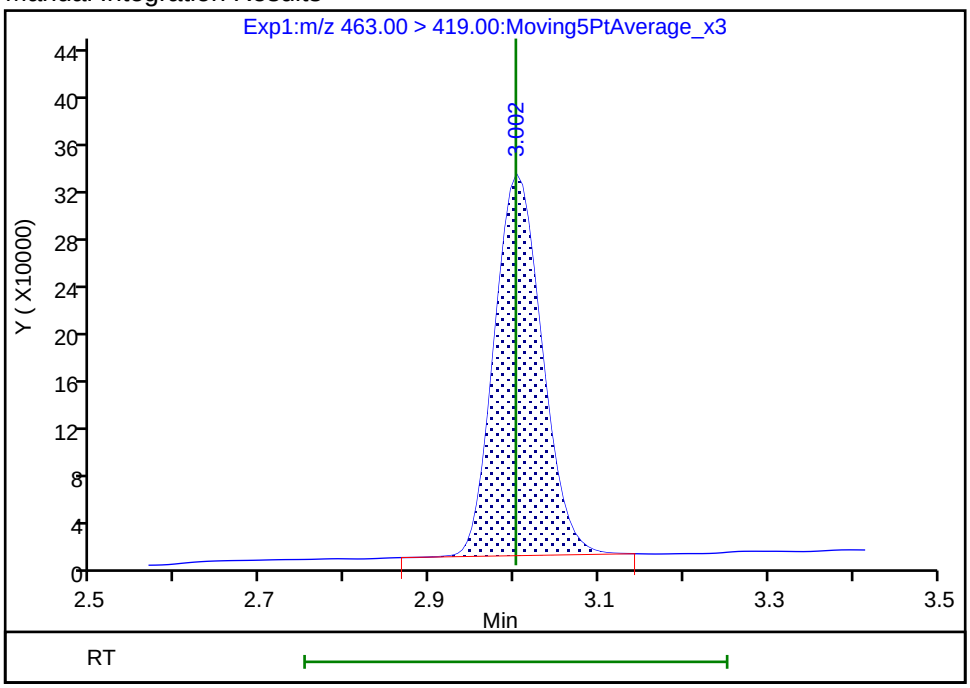
Processing Integration Results

RT: 3.00
Area: 1428750
Amount: 1.120063
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 1273258
Amount: 0.970873
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:17:36

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 30-Jul-2018 15:45:12 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:39:00 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:18:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.411	1.412	-0.001	0.537	4714773	2.44		97.7	87832	
2 Perfluorobutyric acid										
212.90 > 169.00	1.411	1.412	-0.001	1.000	4625755	2.40		95.8	962	
D 3 13C5-PFPeA										
267.90 > 223.00	1.663	1.658	0.005	0.633	3010228	2.42		96.9	51110	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.663	1.659	0.004	1.000	3611446	2.48		99.2	1862	
D 47 13C3-PFBS										
301.90 > 83.00	1.699	1.693	0.006	0.647	82421	2.24		96.2	365	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.699	1.697	0.002	1.000	6254024	2.28		103	19225	
298.90 > 99.00	1.699	1.697	0.002	1.000	2506105		2.50(1.25-3.74)	103	7037	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.902	1.904	-0.002	1.120	1324683	2.45		105	47058	
D 60 M2-4:2FTS										
329.00 > 81.00	1.902	1.905	-0.003	0.724	527911	NC			4297	
D 7 13C2 PFHxA										
315.00 > 270.00	1.945	1.942	0.003	0.741	3384711	2.40		96.0	65865	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.945	1.944	0.001	1.000	3585562	2.48		99.4	6218	
313.00 > 119.00	1.945	1.944	0.001	1.000	319739		11.21(5.03-15.10)	99.4	3111	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.967	1.965	0.002	1.158	6021802	2.43		103	55027	
349.00 > 99.00	1.967	1.965	0.002	1.158	2185747		2.76(1.36-4.07)	103	8740	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.045	2.040	0.005	0.779	219883	NC			7419	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.045	2.042	0.003	1.000	662628	NC			3505	
D 9 13C4-PFHpA										
367.00 > 322.00	2.264	2.267	-0.003	0.862	3318714	2.47		99.0	54729	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.277	2.271	0.006	1.006	3895067	2.58		103	1421	
363.00 > 169.00	2.264	2.271	-0.007	1.000	1436855		2.71(1.13-3.40)	103	9397	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.290	2.284	0.006	1.000	4980786	2.17		95.3	11655	
399.00 > 99.00	2.290	2.284	0.006	1.000	1699376		2.93(1.50-4.49)	95.3	2162	
D 11 18O2 PFHxS										
403.00 > 84.00	2.290	2.288	0.002	0.872	4677090	2.29		97.0	47951	
65 ADONA										
377.00 > 251.00	2.316	2.316	0.0	0.772	9776100	NC			70691	
377.00 > 85.00	2.316	2.316	0.0	0.772	5679547		1.72(0.84-2.53)		19270	
D 12 M2-6:2FTS										
429.00 > 81.00	2.602	2.603	-0.001	0.991	1010664	2.41		101	9345	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.602	2.605	-0.003	1.000	1632782	2.28		96.1	20659	
* 62 13C2-PFOA										
415.00 > 370.00	2.627	2.631	-0.004		3565898	2.50			37414	
D 14 13C4 PFOA										
417.00 > 372.00	2.627	2.631	-0.004	1.000	3371225	2.46		98.4	51910	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.635	2.631	0.004	1.003	3918848	2.49		99.6	3126	
413.00 > 169.00	2.627	2.631	-0.004	1.000	1991045		1.97(0.84-2.52)	99.6	9031	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.635	2.640	-0.005	0.878	4560450	2.45		103	20733	
449.00 > 99.00	2.635	2.640	-0.005	0.878	1203068		3.79(1.94-5.82)	103	3092	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.000	3.000	0.0	1.000	3685298	2.31		99.6	4873	M
499.00 > 99.00	3.000	3.000	0.0	1.000	838100		4.40(2.31-6.93)	99.6	6134	
D 18 13C4 PFOS										
503.00 > 80.00	3.000	3.000	0.0	1.142	3343827	2.28		95.6	17565	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	3.000	0.0	1.142	2933744	2.42		96.9	44136	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.000	3.001	-0.001	1.000	3260036	2.57		103	784	M
463.00 > 169.00	3.000	3.001	-0.001	1.000	789987		4.13(1.90-5.69)	103	22574	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.211	3.212	-0.001	1.070	6139630	NC			36063	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.347	3.347	0.0	1.115	2762305	2.52		105	33835	
549.00 > 99.00	3.347	3.347	0.0	1.115	1027274		2.69(1.33-3.97)	105	5325	
D 26 M2-8:2FTS										
529.00 > 81.00	3.347	3.350	-0.003	1.274	1127285	2.33		97.2	14083	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.347	3.350	-0.003	1.000	1486419	2.38		99.3	55810	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.355	3.356	-0.001	1.277	5199703	2.49		99.6	41996	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.355	3.357	-0.002	1.000	5360202	2.60		104	37746	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.365	3.361	0.004	1.000	2565522	2.43		97.3	4439	
513.00 > 169.00	3.365	3.361	0.004	1.000	412404		6.22(2.36-7.09)	97.3	6137	
D 23 13C2 PFDA										
515.00 > 470.00	3.365	3.361	0.004	1.281	2425320	2.42		96.8	31936	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.514	3.515	-0.001	1.338	515038	2.27		90.9	14166	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.514	3.519	-0.005	1.000	545986	2.58		103	6818	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.669	3.674	-0.005	1.223	2386291	2.55		106	37977	
599.00 > 99.00	3.669	3.674	-0.005	1.223	806738		2.96(1.39-4.16)	106	6939	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.679	3.683	-0.004	1.401	599108	2.42		96.6	7148	
D 30 13C2 PFUnA										
565.00 > 520.00	3.690	3.687	0.003	1.405	1982699	2.55		102	50277	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.690	3.687	0.003	1.000	1719272	2.42		96.7	7709	
563.00 > 169.00	3.690	3.687	0.003	1.000	385739		4.46(2.12-6.36)	96.7	8639	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.690	3.689	0.001	1.003	533712	2.44		97.6	10939	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.852	3.848	0.004	1.284	9392464	NC			91938	
D 36 13C2 PFDoA										
615.00 > 570.00	3.986	3.983	0.003	1.518	1915610	2.42		96.9	30619	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.986	3.987	-0.001	1.000	2063713	2.49		99.8	545	
613.00 > 169.00	3.986	3.987	-0.001	1.000	517508		3.99(2.13-6.40)	99.8	7260	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.240	4.245	-0.005	1.064	1805713	2.57		103	899	
663.00 > 169.00	4.240	4.245	-0.005	1.064	538216		3.35(1.25-3.76)	103	5512	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.479	4.481	-0.002	1.705	1729327	2.40		96.0	10572	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.479	4.483	-0.004	1.000	434071	2.35		94.2	4708	
713.00 > 219.00	4.469	4.483	-0.014	0.998	311902		1.39(0.71-2.13)	94.2	5297	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.888	-0.001	1.000	3108351	NC			636	
813.00 > 169.00	4.887	4.888	-0.001	1.000	477608		6.51(2.86-8.58)		3779	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.888	-0.001	1.861	3102234	2.43		97.4	7696	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.225	5.229	-0.004	1.069	3189855	NC			1008	
913.00 > 169.00	5.225	5.229	-0.004	1.069	372222		8.57(3.83-11.48)		2643	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:39:03 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_006.d

Injection Date: 30-Jul-2018 15:45:12 Instrument ID: A8_N

Lims ID: IC L5 Full

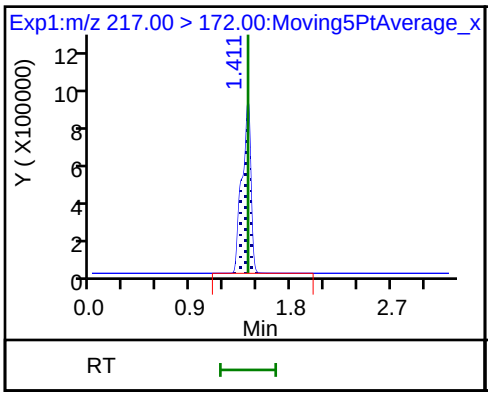
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 6

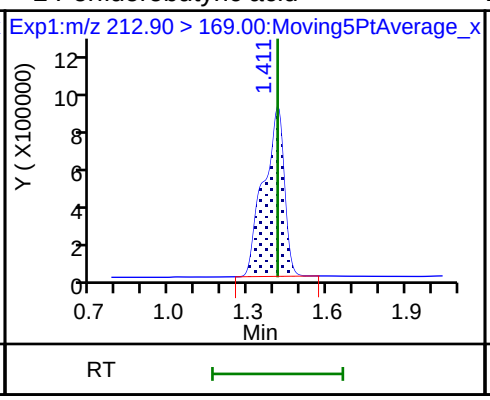
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

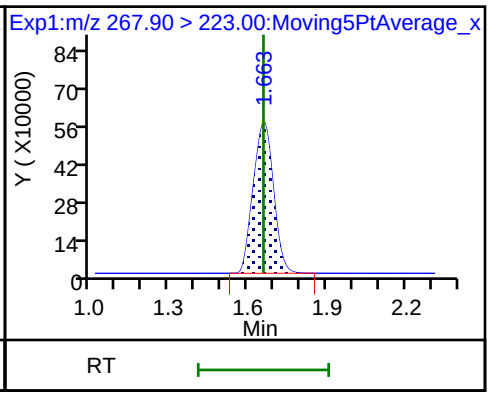
D 1 13C4 PFBA



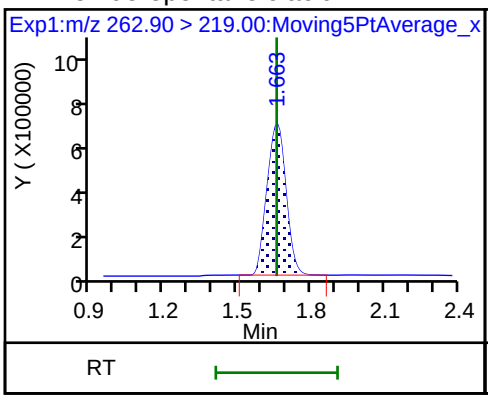
2 Perfluorobutyric acid



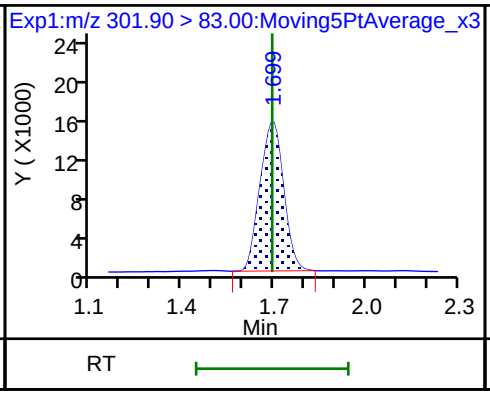
D 3 13C5-PFPeA



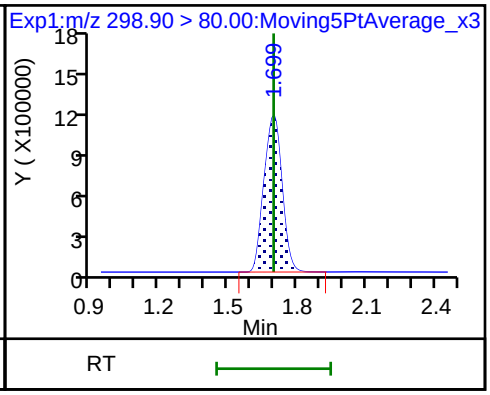
4 Perfluoropentanoic acid



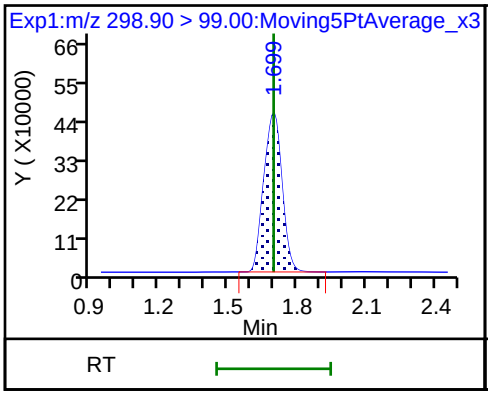
D 47 13C3-PFBS



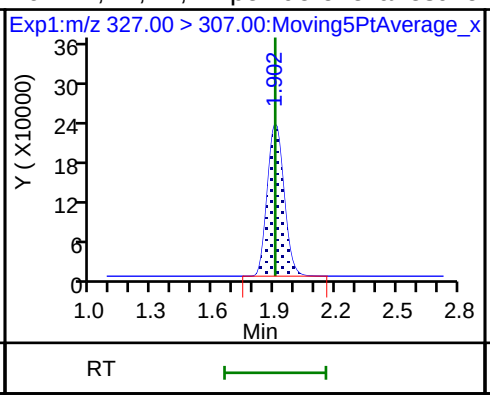
5 Perfluorobutanesulfonic acid



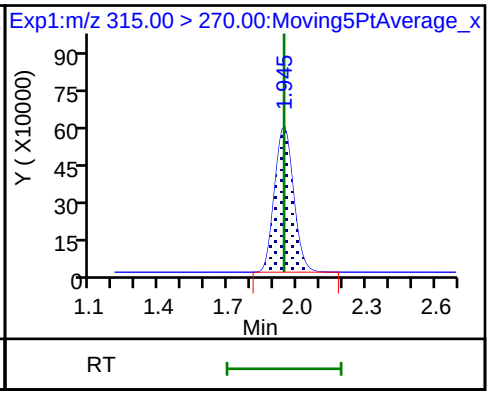
5 Perfluorobutanesulfonic acid



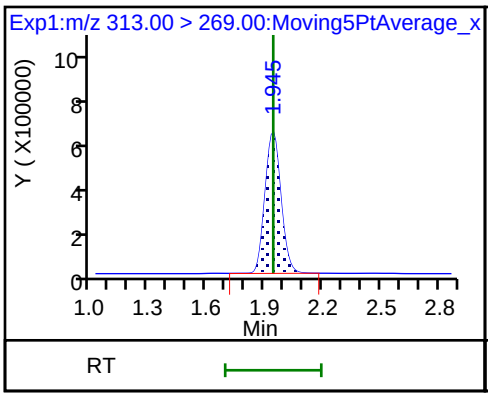
61 1H,1H,2H,2H-perfluorohexanesulfon



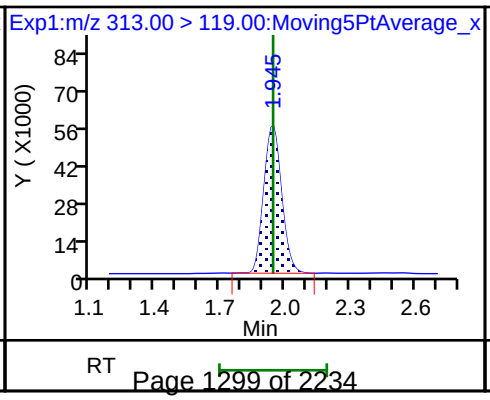
D 7 13C2 PFHxA



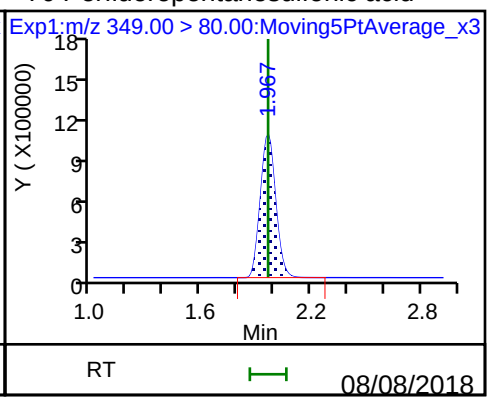
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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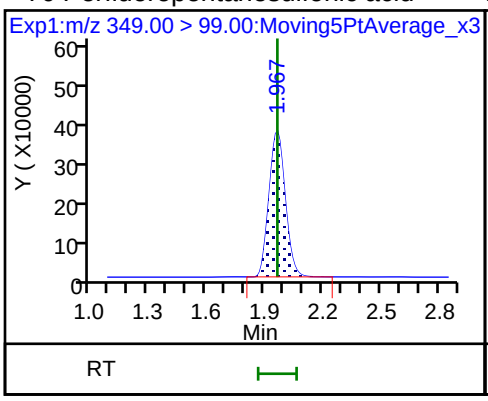
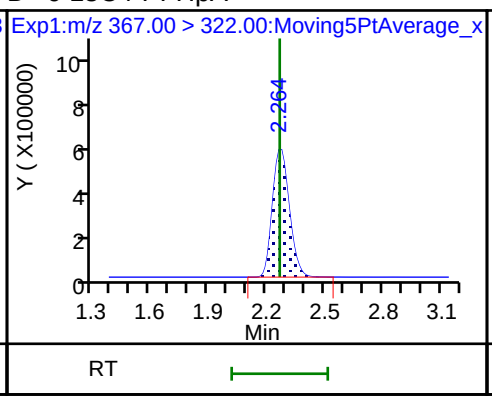


D 9 13C4-PFHpA



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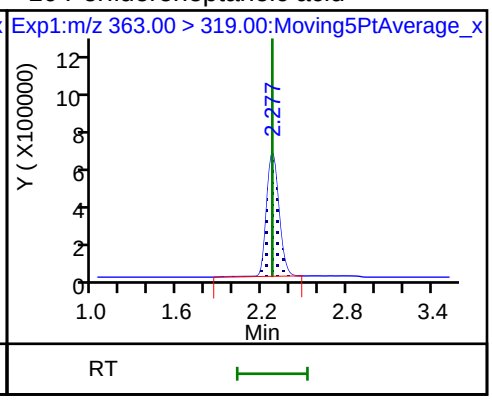

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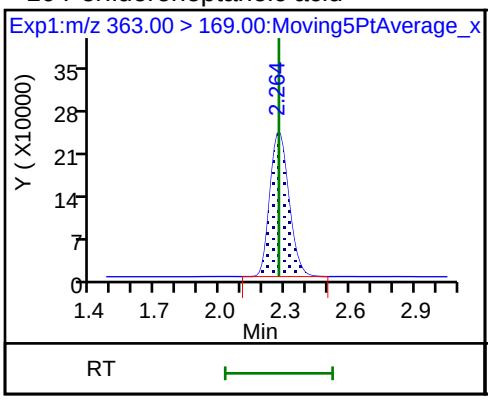
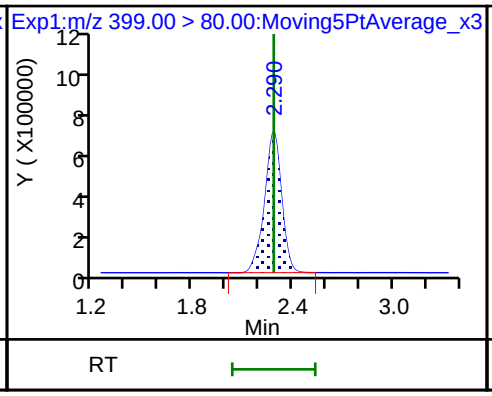
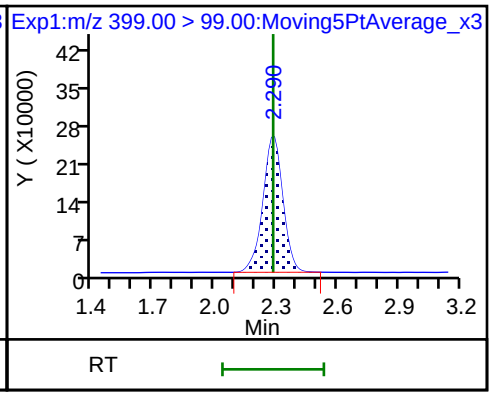


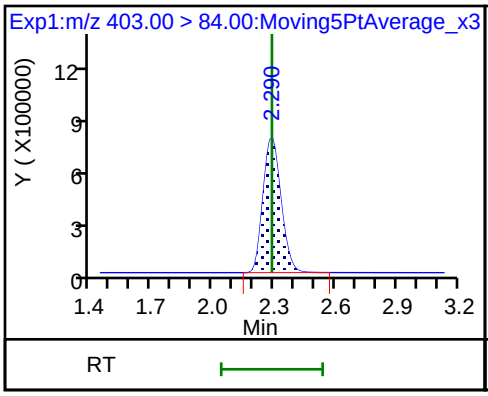
8 Perfluorohexanesulfonic acid



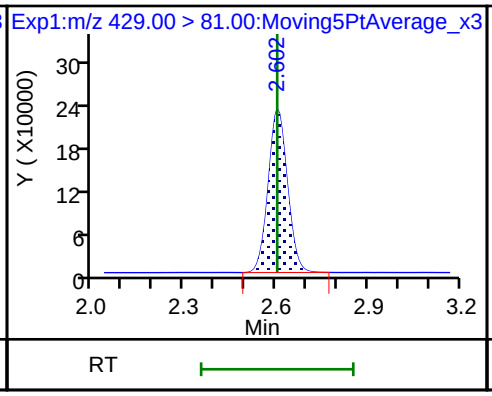
8 Perfluorohexanesulfonic acid



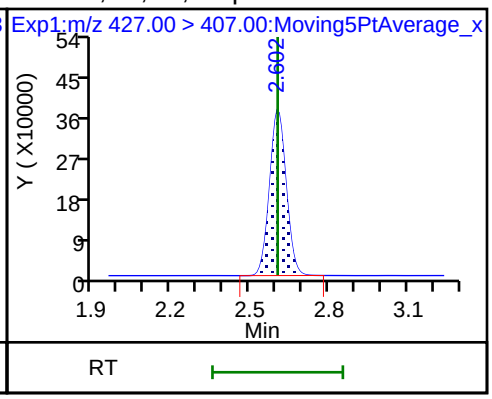
D 11 18O2 PFHxS



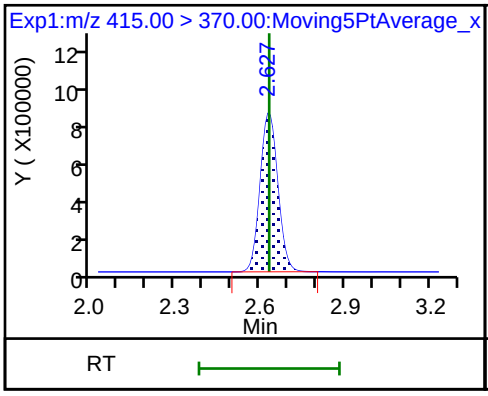
D 12 M2-6:2FTS



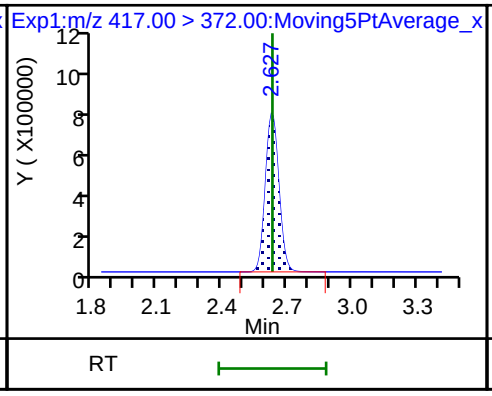
13 1H,1H,2H,2H-perfluorooctanesulfoni



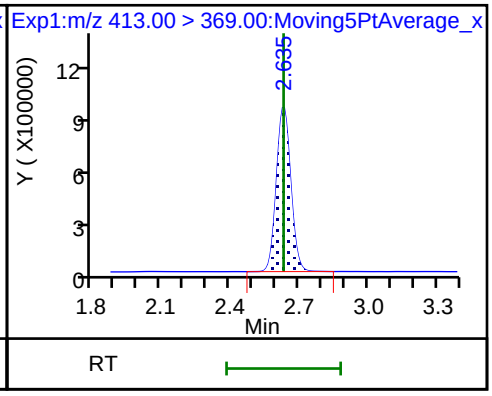
* 62 13C2-PFOA



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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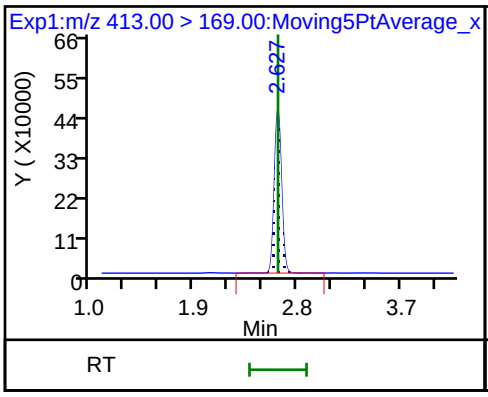
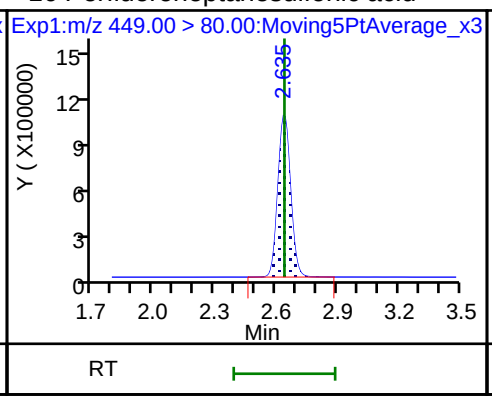
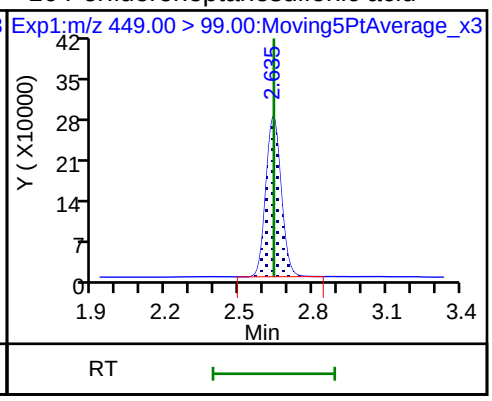


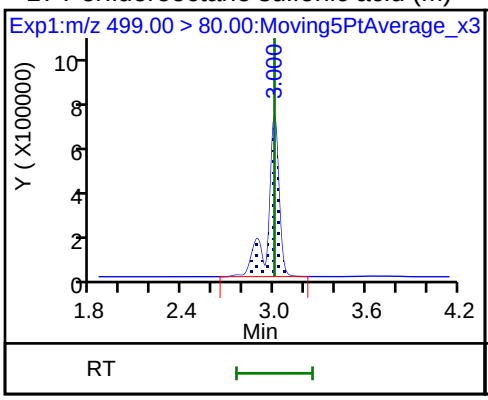
16 Perfluoroheptanesulfonic acid



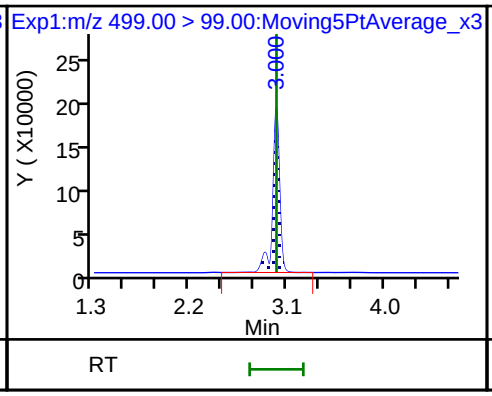
16 Perfluoroheptanesulfonic acid



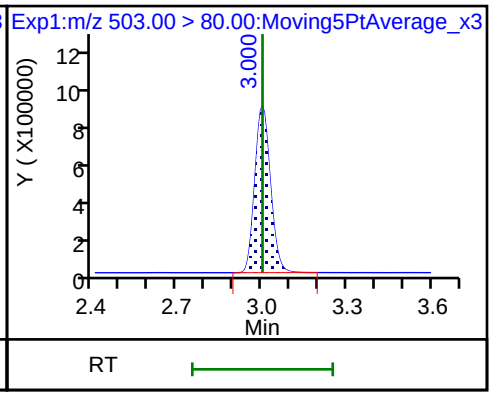
17 Perfluorooctane sulfonic acid (M)



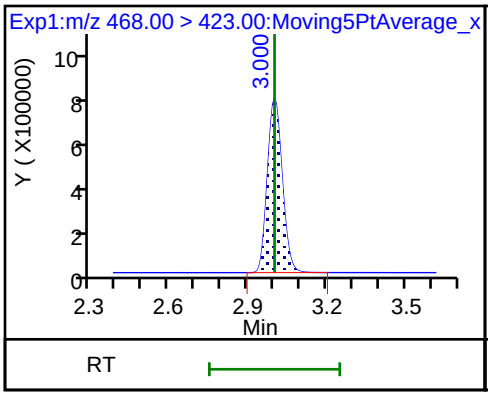
17 Perfluorooctane sulfonic acid



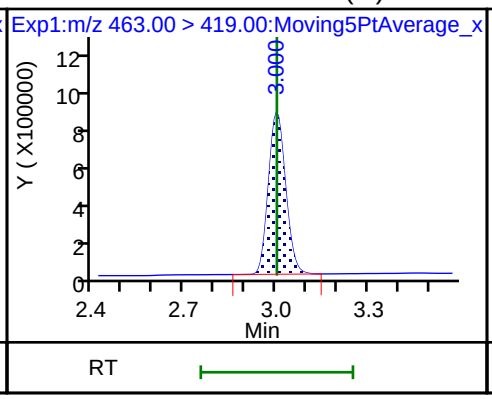
D 18 13C4 PFOS



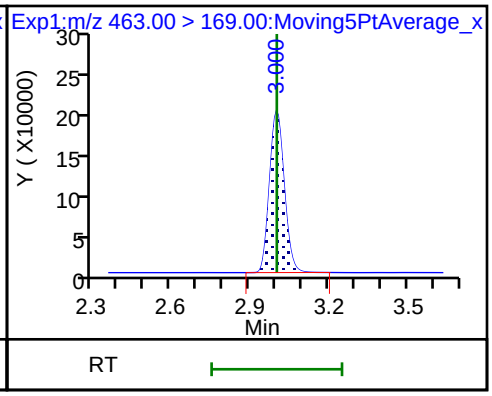
D 19 13C5 PFNA



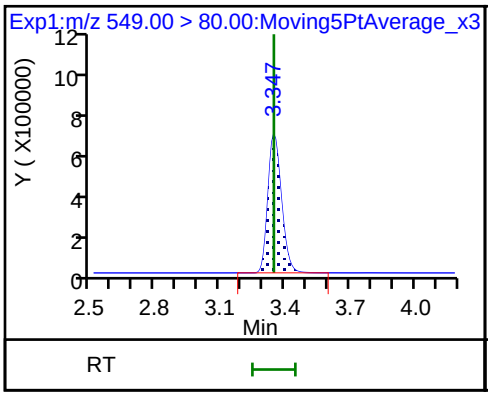
20 Perfluorononanoic acid (M)



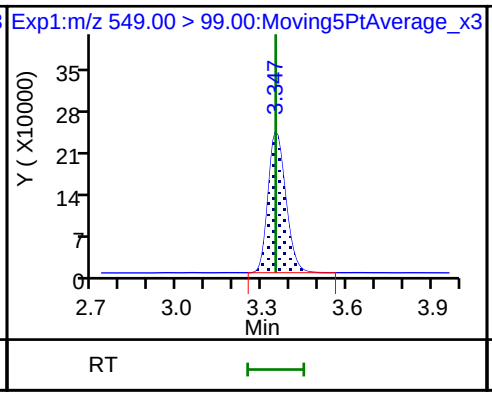
20 Perfluorononanoic acid



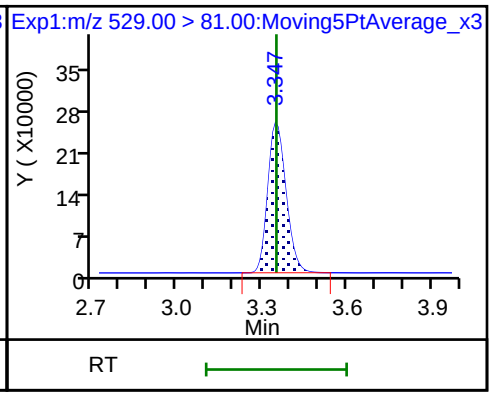
68 Perfluorononanesulfonic acid



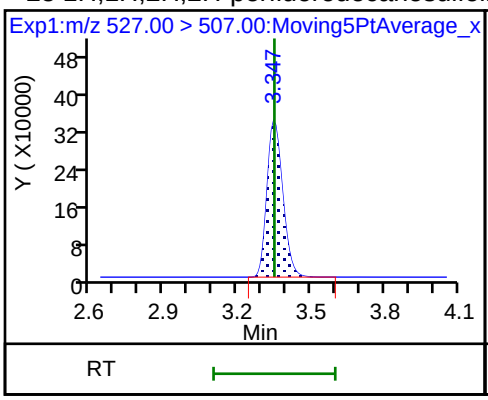
68 Perfluorononanesulfonic acid



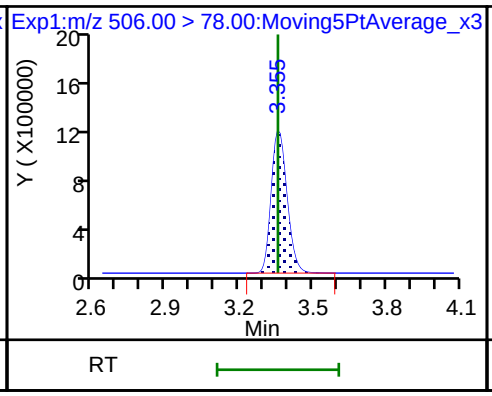
D 26 M2-8:2FTS



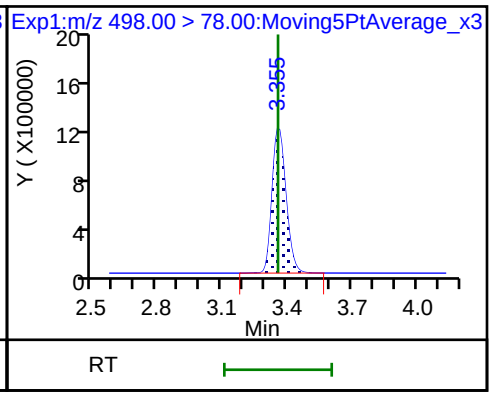
25 1H,1H,2H,2H-perfluorodecanesulfon



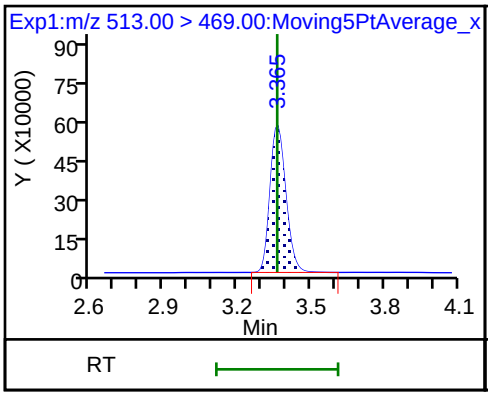
D 21 13C8 FOSA



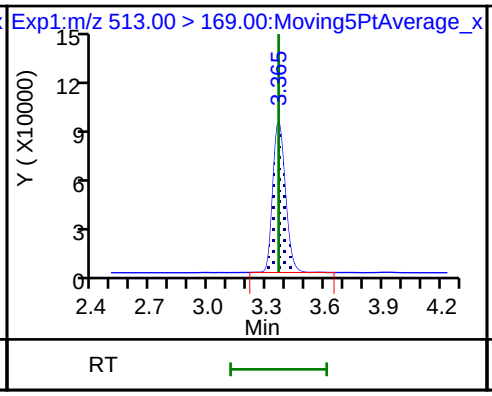
22 Perfluorooctane Sulfonamide



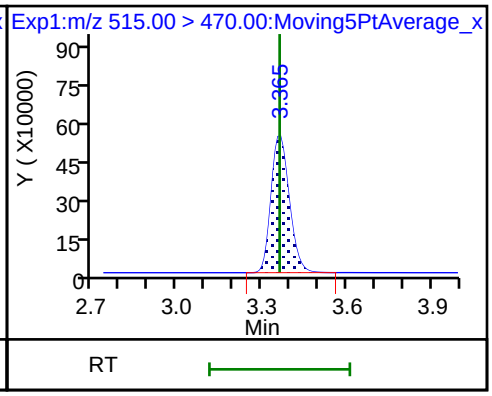
24 Perfluorodecanoic acid



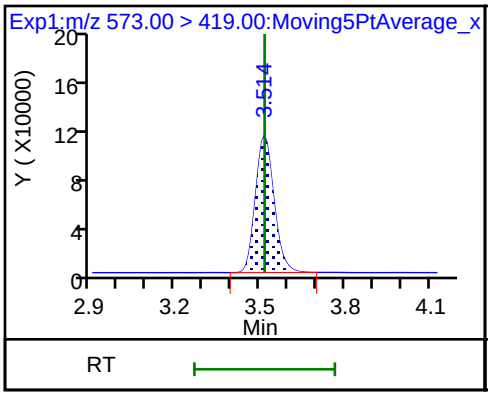
24 Perfluorodecanoic acid



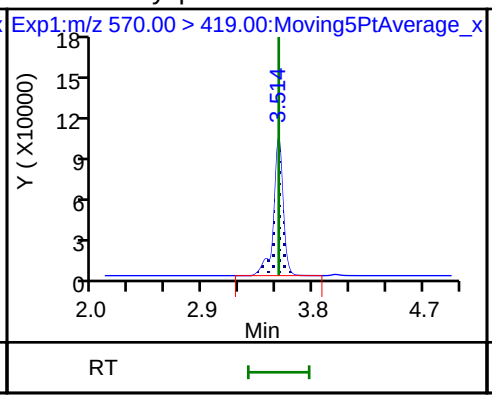
D 23 13C2 PFDA



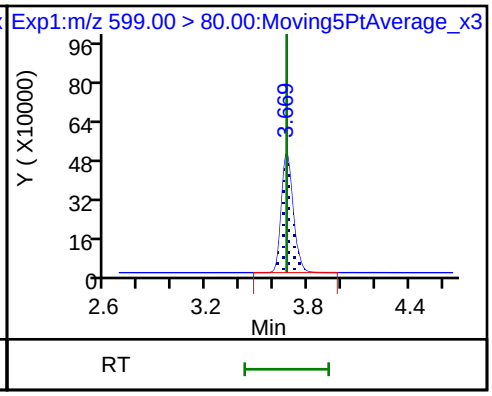
D 27 d3-NMeFOSAA



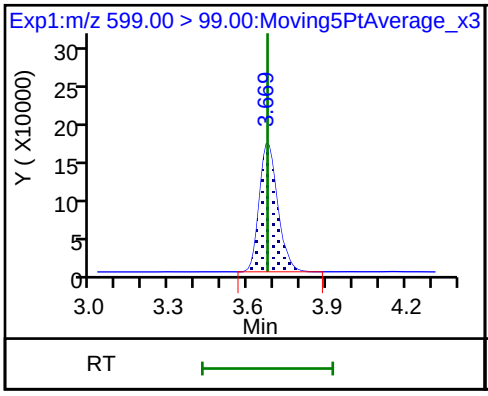
28 N-methyl perfluorooctane sulfonami



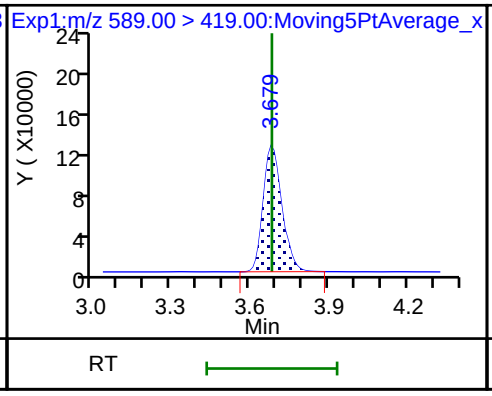
29 Perfluorodecane Sulfonic acid



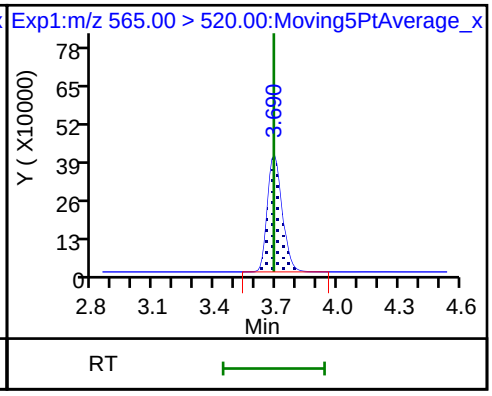
29 Perfluorodecane Sulfonic acid



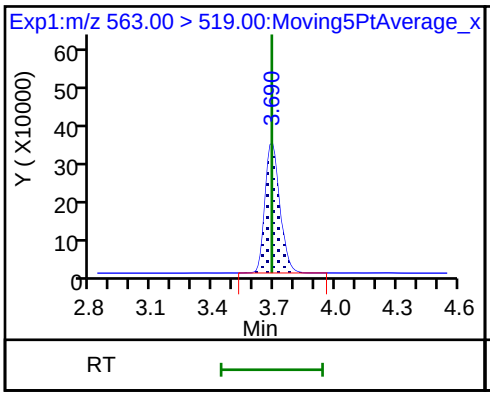
D 32 d5-NEtFOSAA



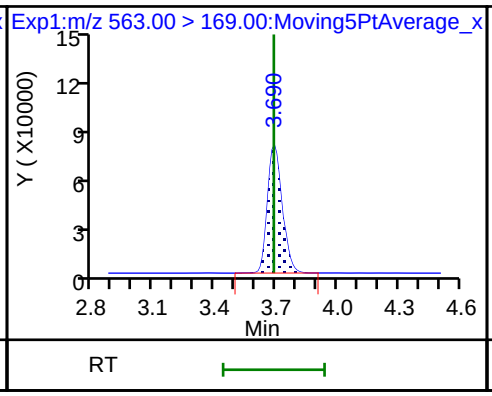
D 30 13C2 PFUnA



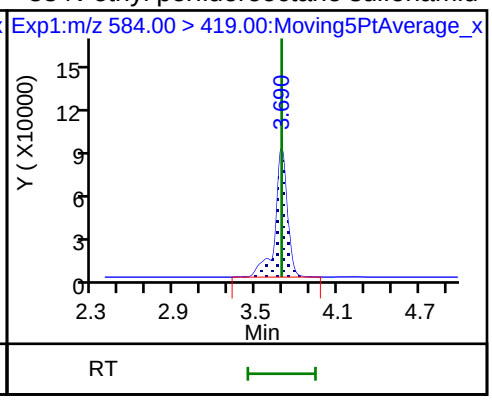
31 Perfluoroundecanoic acid



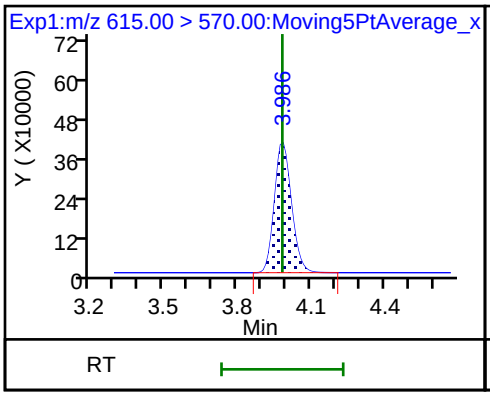
31 Perfluoroundecanoic acid



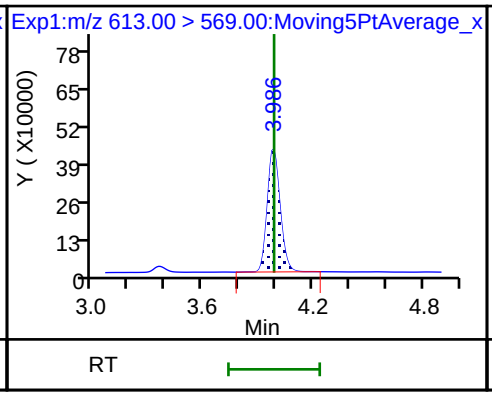
33 N-ethyl perfluorooctane sulfonamid



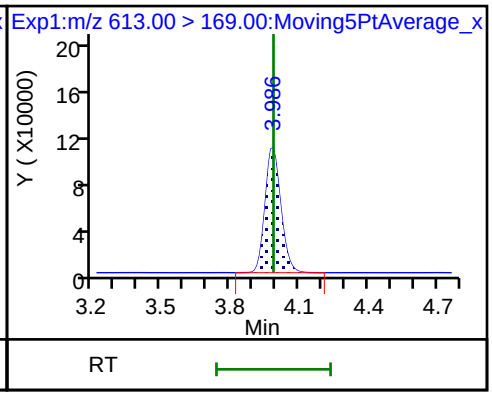
D 36 13C2 PFDoA



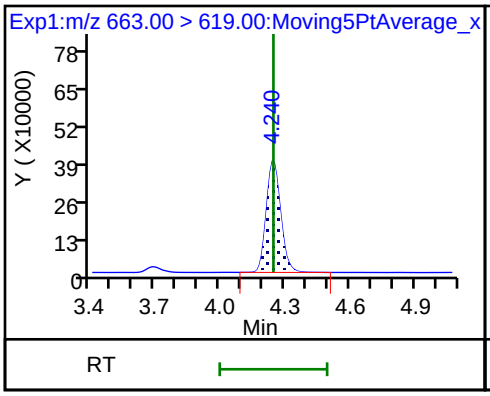
37 Perfluorododecanoic acid



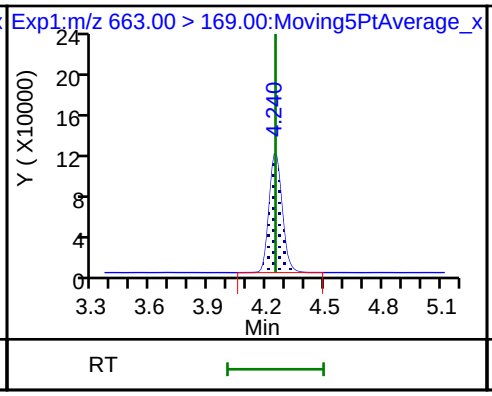
37 Perfluorododecanoic acid



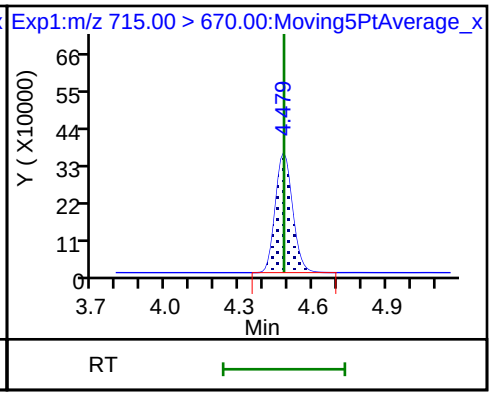
41 Perfluorotridecanoic acid



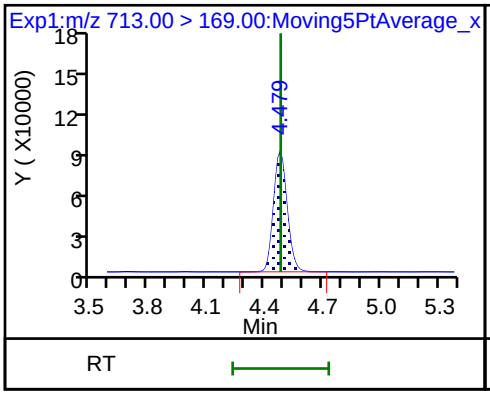
41 Perfluorotridecanoic acid



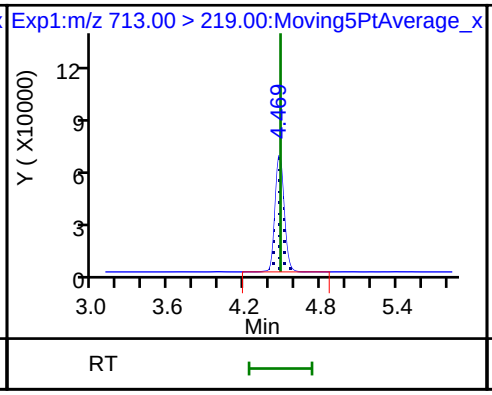
D 43 13C2-PFTeDA



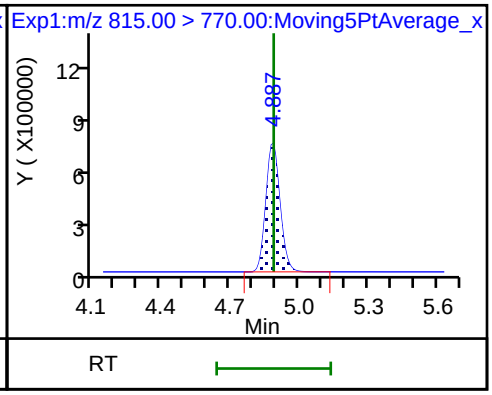
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

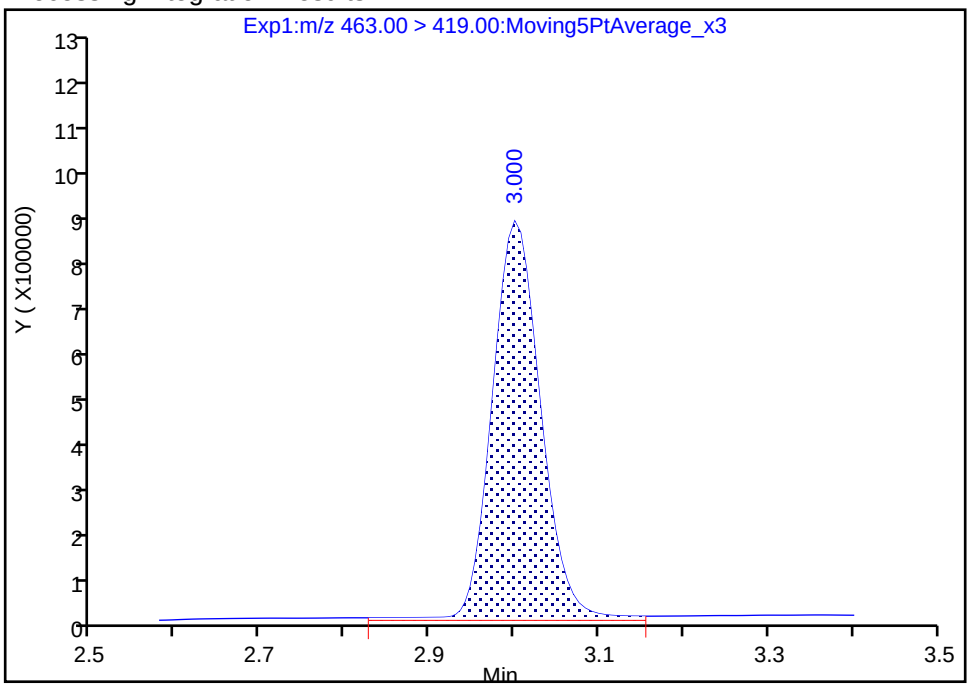
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_006.d				
Injection Date:	30-Jul-2018 15:45:12	Instrument ID:	A8_N		
Lims ID:	IC L5 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

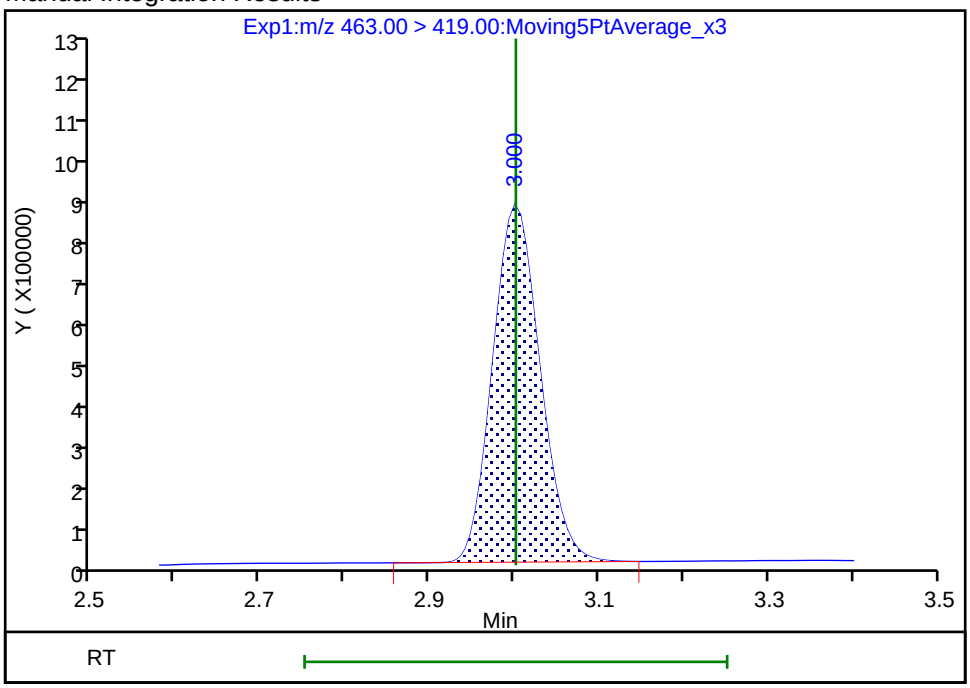
Processing Integration Results

RT: 3.00
Area: 3400567
Amount: 2.810411
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 3260036
Amount: 2.574965
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:18:10

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

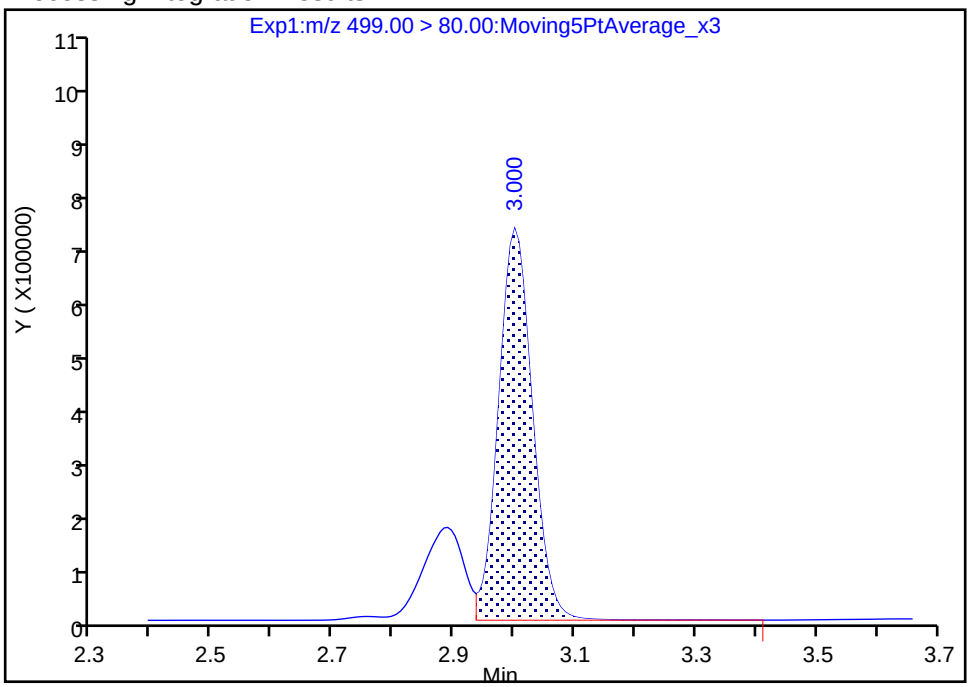
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_006.d				
Injection Date:	30-Jul-2018 15:45:12	Instrument ID:	A8_N		
Lims ID:	IC L5 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	14	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

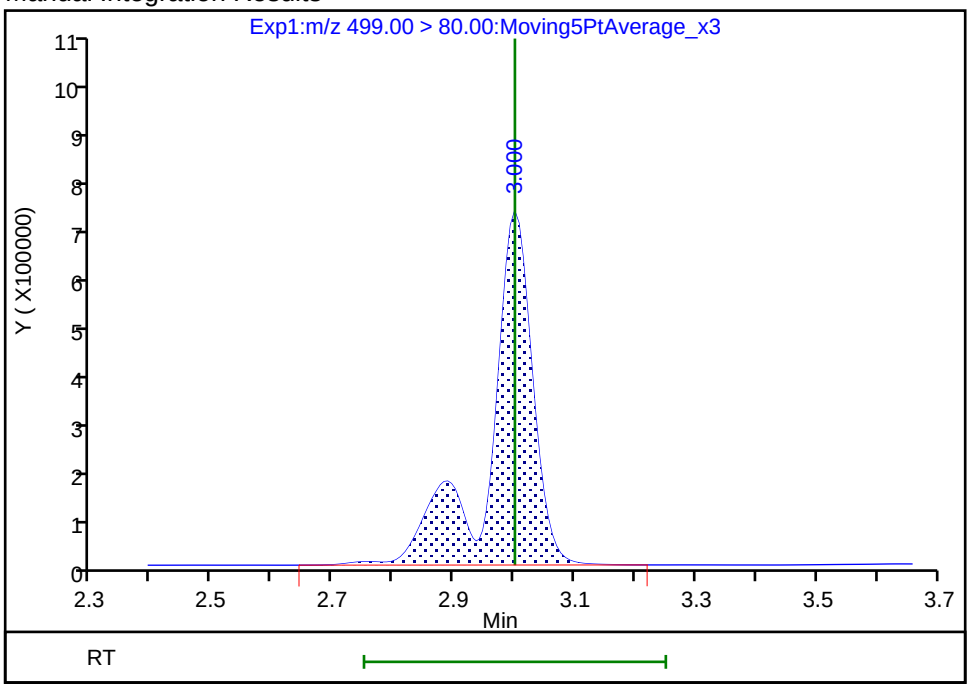
Processing Integration Results

RT: 3.00
Area: 2851634
Amount: 1.911836
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 3685298
Amount: 2.310889
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:18:04

Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 30-Jul-2018 15:53:00 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:39:07 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:18:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.414	1.412	0.002	0.538	4810186	2.55		102	88339	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.412	0.002	1.000	9595708	4.87		97.4	1968	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.658	0.0	0.631	3072715	2.54		101	48670	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.658	1.659	-0.001	1.000	7454191	5.01		100	3618	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.693	0.001	0.644	84122	2.34		101	1122	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.697	-0.003	1.000	12485143	4.45		101	33032	
298.90 > 99.00	1.694	1.697	-0.003	1.000	5245364		2.38(1.25-3.74)	101	13094	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.906	1.904	0.002	1.126	2603715	4.72		101	78907	
D 60 M2-4:2FTS										
329.00 > 81.00	1.906	1.905	0.001	0.725	532947	NC			4627	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.942	-0.003	0.738	3372366	2.45		98.1	74565	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.944	-0.005	1.000	7090465	4.93		98.6	11252	
313.00 > 119.00	1.939	1.944	-0.005	1.000	651966		10.88(5.03-15.10)	98.6	8197	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.960	1.965	-0.005	1.157	12192443	4.81		103	92118	
349.00 > 99.00	1.960	1.965	-0.005	1.157	4599488		2.65(1.36-4.07)	103	14883	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.038	2.040	-0.002	0.775	238749	NC			8689	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.038	2.042	-0.004	1.000	1419537	NC			7159	
D 9 13C4-PFHpA										
367.00 > 322.00	2.268	2.267	0.001	0.863	3273830	2.50		100	68244	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.268	2.271	-0.003	1.000	7502071	5.04		101	2690	
363.00 > 169.00	2.268	2.271	-0.003	1.000	2885151		2.60(1.13-3.40)	101	24038	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.284	-0.003	1.000	10278170	4.47		98.2	20727	
399.00 > 99.00	2.281	2.284	-0.003	1.000	3417367		3.01(1.50-4.49)	98.2	4161	
D 11 18O2 PFHxS										
403.00 > 84.00	2.281	2.288	-0.007	0.868	4680902	2.35		99.6	40926	
65 ADONA										
377.00 > 251.00	2.308	2.316	-0.008	0.769	18885508	NC			88419	
377.00 > 85.00	2.308	2.316	-0.008	0.769	11263811		1.68(0.84-2.53)		36394	
D 12 M2-6:2FTS										
429.00 > 81.00	2.604	2.603	0.001	0.991	969384	2.37		99.6	9312	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.604	2.605	-0.001	1.000	3171748	4.61		97.3	32231	
* 62 13C2-PFOA										
415.00 > 370.00	2.628	2.631	-0.003		3478035	2.50			42440	
D 14 13C4 PFOA										
417.00 > 372.00	2.628	2.631	-0.003	1.000	3310554	2.48		99.1	38424	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.628	2.631	-0.003	1.000	7656726	4.96		99.1	6245	
413.00 > 169.00	2.628	2.631	-0.003	1.000	3879513		1.97(0.84-2.52)	99.1	11660	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.636	2.640	-0.004	0.878	9355738	4.95		104	37943	
449.00 > 99.00	2.636	2.640	-0.004	0.878	2541237		3.68(1.94-5.82)	104	10888	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.003	3.000	0.003	1.000	7587560	4.68		101	9375	M
499.00 > 99.00	3.003	3.000	0.003	1.000	1713940		4.43(2.31-6.93)	101	11691	
D 18 13C4 PFOS										
503.00 > 80.00	3.003	3.000	0.003	1.142	3396258	2.38		99.5	15371	
D 19 13C5 PFNA										
468.00 > 423.00	3.003	3.000	0.003	1.142	2882269	2.44		97.6	61271	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.003	3.001	0.002	1.000	6354761	5.11		102	1838	M
463.00 > 169.00	3.003	3.001	0.002	1.000	1559974		4.07(1.90-5.69)	102	40368	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.215	3.212	0.003	1.071	12283708	NC			55654	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.350	3.347	0.003	1.116	5633140	5.06		105	45172	
549.00 > 99.00	3.350	3.347	0.003	1.116	2037971		2.76(1.33-3.97)	105	18888	
D 26 M2-8:2FTS										
529.00 > 81.00	3.350	3.350	0.0	1.275	1102975	2.34		97.5	10699	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.350	3.350	0.0	1.000	2850671	4.66		97.3	58075	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.359	3.356	0.003	1.278	5118898	2.51		101	40092	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.359	3.357	0.002	1.000	10146906	5.01		100	65335	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.359	3.361	-0.002	1.000	4916363	4.77		95.4	7595	
513.00 > 169.00	3.359	3.361	-0.002	1.000	833330		5.90(2.36-7.09)	95.4	14241	
D 23 13C2 PFDA										
515.00 > 470.00	3.359	3.361	-0.002	1.278	2369147	2.42		96.9	66840	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.518	3.515	0.003	1.339	586561	2.65		106	18074	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.518	3.519	-0.001	1.000	1150048	4.77		95.3	10048	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.675	3.674	0.001	1.224	4833890	5.08		105	56549	
599.00 > 99.00	3.675	3.674	0.001	1.224	1541984		3.13(1.39-4.16)	105	13504	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.685	3.683	0.002	1.402	582129	2.41		96.3	7889	
D 30 13C2 PFUnA										
565.00 > 520.00	3.685	3.687	-0.002	1.402	1863275	2.45		98.1	42798	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.685	3.687	-0.002	1.000	3199541	4.79		95.7	11329	
563.00 > 169.00	3.685	3.687	-0.002	1.000	714842		4.48(2.12-6.36)	95.7	16296	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.685	3.689	-0.004	1.000	1073047	5.05		101	36619	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.843	3.848	-0.005	1.280	17240478	NC			97837	
D 36 13C2 PFDoA										
615.00 > 570.00	3.976	3.983	-0.007	1.513	1925682	2.50		99.9	28840	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.987	3.987	0.0	1.003	4263398	5.13		103	1210	
613.00 > 169.00	3.987	3.987	0.0	1.003	989300		4.31(2.13-6.40)	103	13772	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.251	4.245	0.006	1.069	3513784	4.98		99.5	1782	
663.00 > 169.00	4.241	4.245	-0.004	1.067	1038299		3.38(1.25-3.76)	99.5	9344	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.479	4.481	-0.002	1.704	1710393	2.43		97.4	9373	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.479	4.483	-0.004	1.000	858287	4.71		94.1	8873	
713.00 > 219.00	4.479	4.483	-0.004	1.000	627604		1.37(0.71-2.13)	94.1	8000	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.888	-0.001	1.000	5682321	NC			1128	
813.00 > 169.00	4.887	4.888	-0.001	1.000	888201		6.40(2.86-8.58)		6425	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.888	-0.001	1.859	2864881	2.30		92.2	6299	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.227	5.229	-0.002	1.070	6067718	NC			1865	
913.00 > 169.00	5.227	5.229	-0.002	1.070	706717		8.59(3.83-11.48)		4463	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL6_00006 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:39:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_007.d

Injection Date: 30-Jul-2018 15:53:00 Instrument ID: A8_N

Lims ID: IC L6 Full

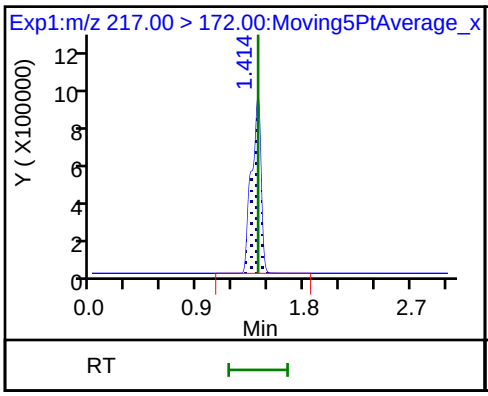
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 15 Worklist Smp#: 7

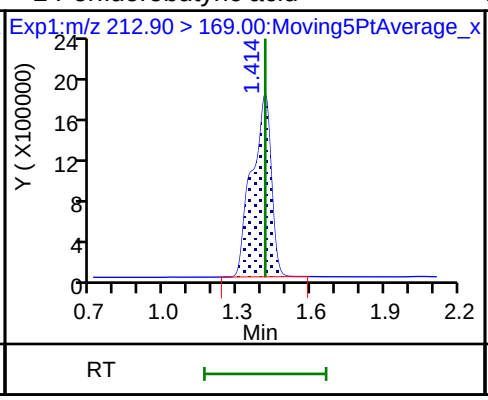
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

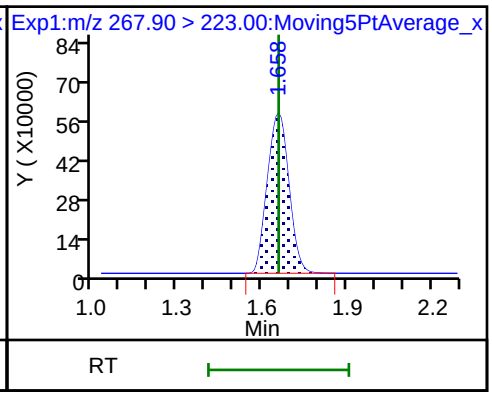
D 1 13C4 PFBA



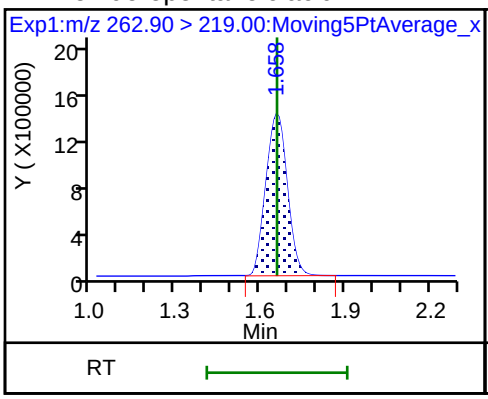
2 Perfluorobutyric acid



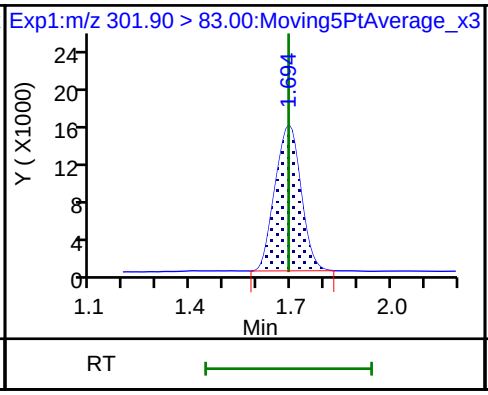
D 3 13C5-PFPeA



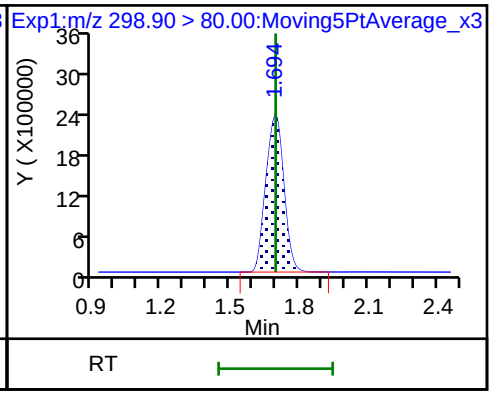
4 Perfluoropentanoic acid



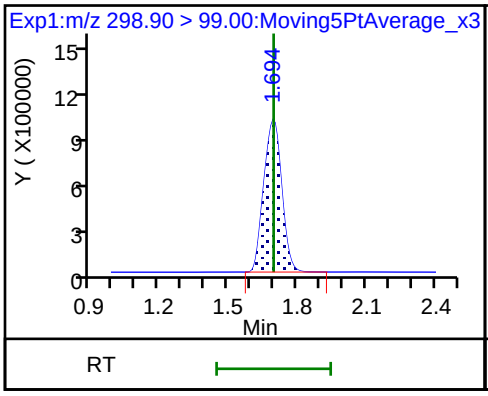
D 47 13C3-PFBS



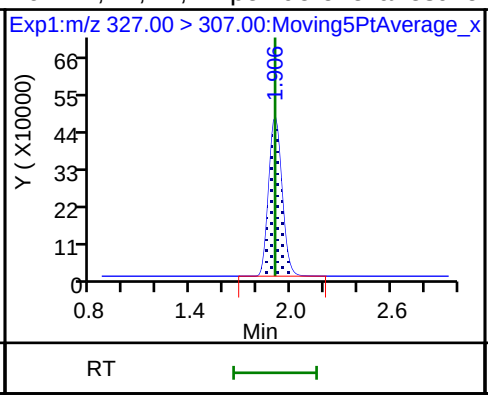
5 Perfluorobutanesulfonic acid



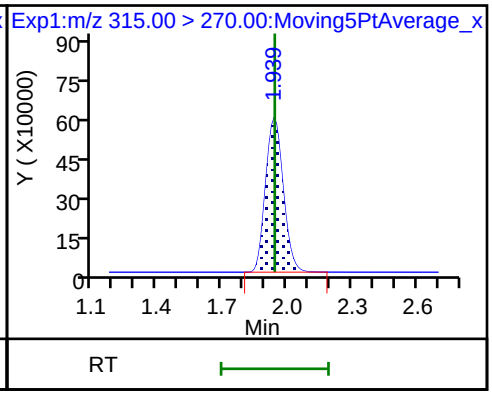
5 Perfluorobutanesulfonic acid



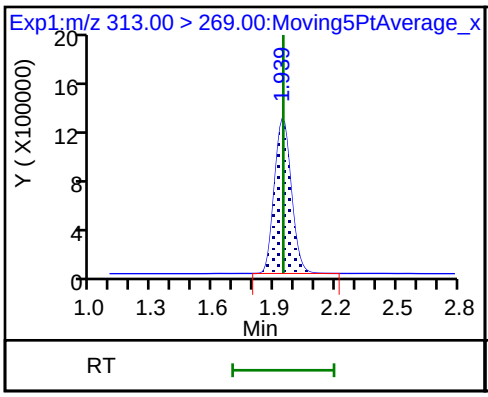
61 1H,1H,2H,2H-perfluorohexanesulfon



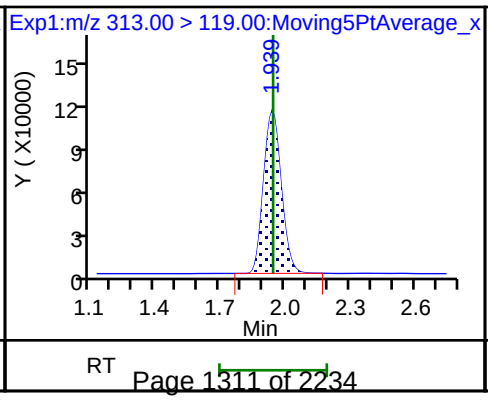
D 7 13C2 PFHxA



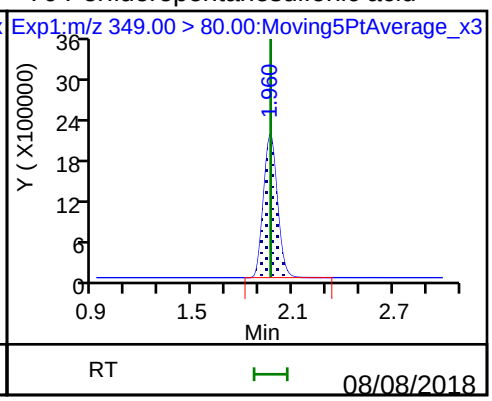
6 Perfluorohexanoic acid



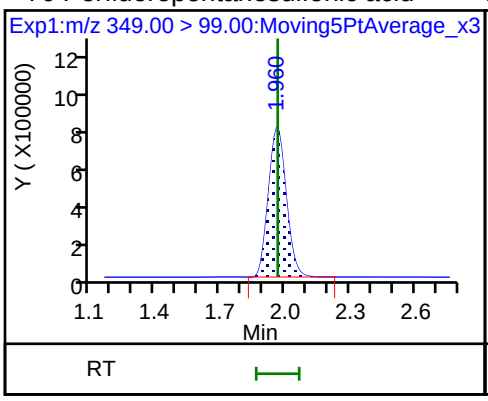
6 Perfluorohexanoic acid



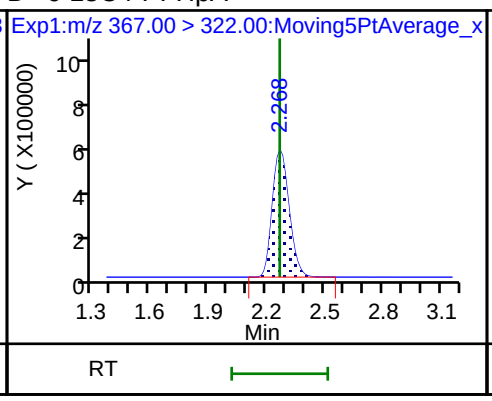
70 Perfluoropentanesulfonic acid



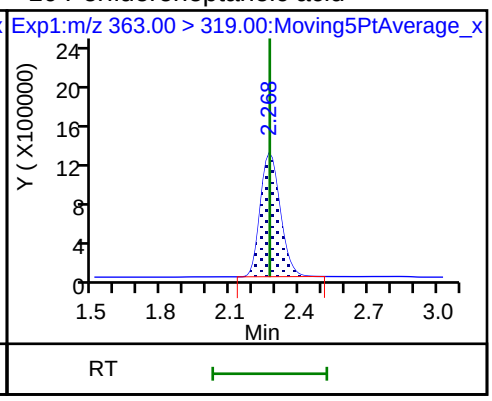
70 Perfluoropentanesulfonic acid



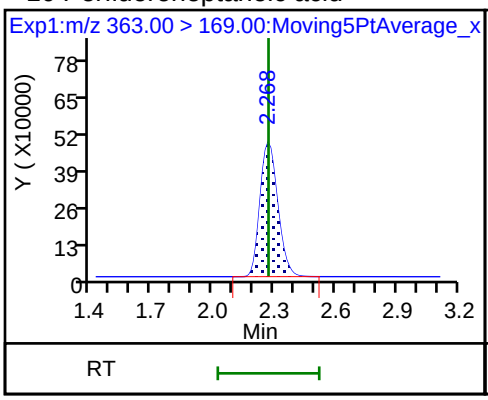
D 9 13C4-PFHpA



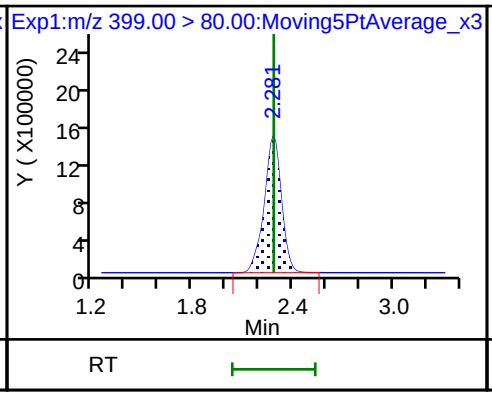
10 Perfluoroheptanoic acid



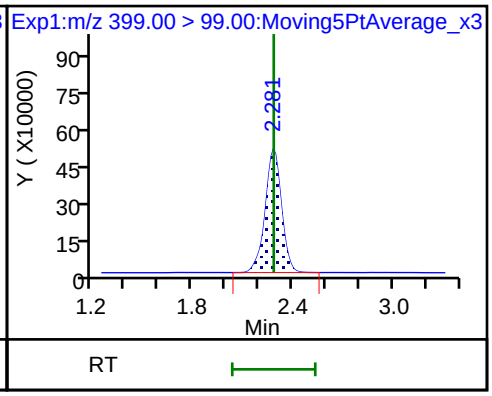
10 Perfluoroheptanoic acid



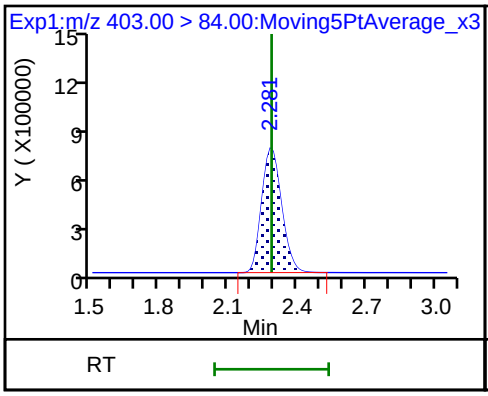
8 Perfluorohexanesulfonic acid



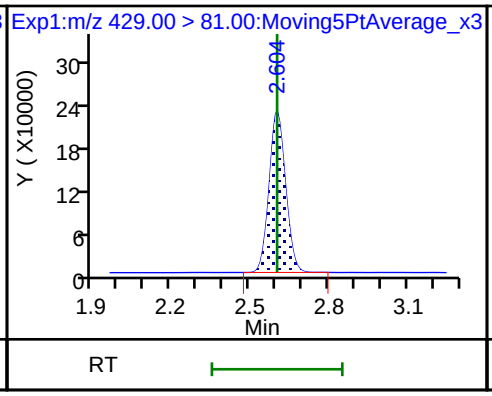
8 Perfluorohexanesulfonic acid



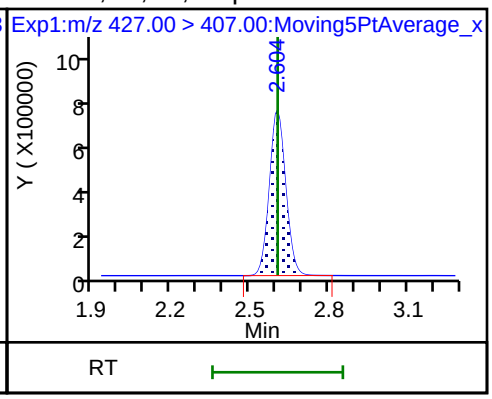
D 11 18O2 PFHxS



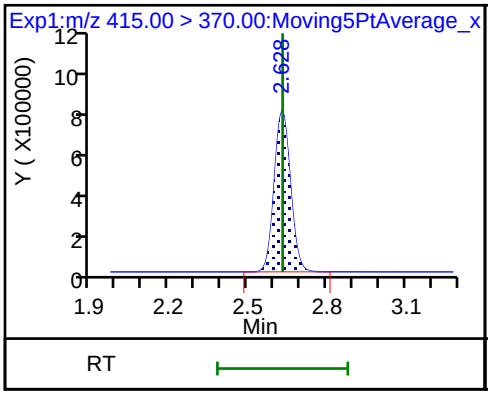
D 12 M2-6:2FTS



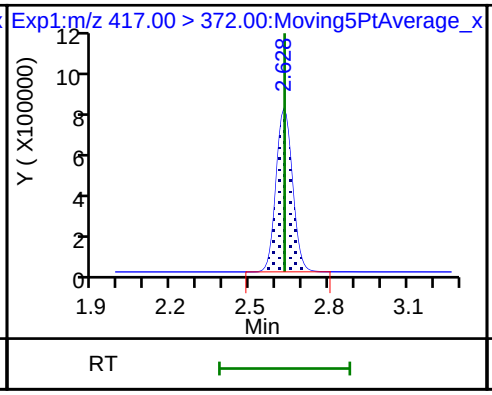
13 1H,1H,2H,2H-perfluorooctanesulfoni



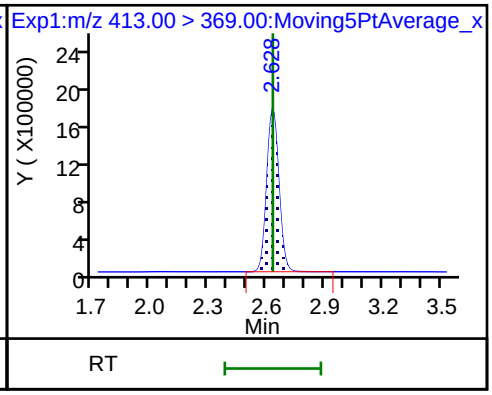
* 62 13C2-PFOA



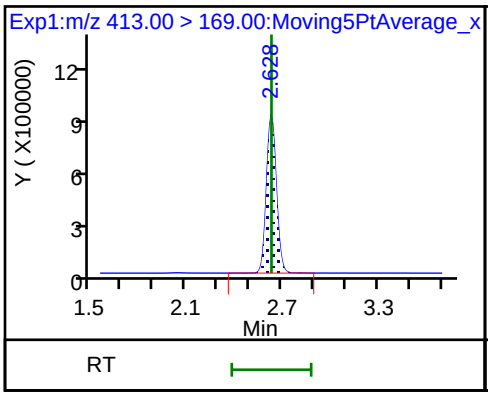
D 14 13C4 PFOA



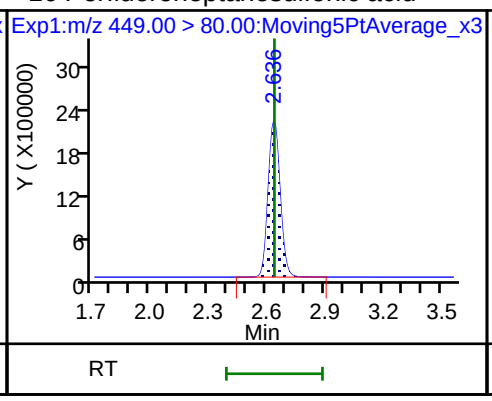
15 Perfluorooctanoic acid



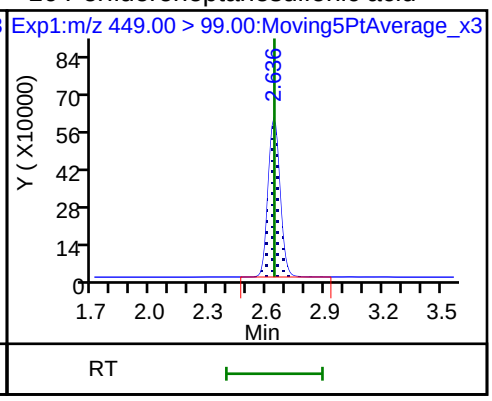
15 Perfluorooctanoic acid



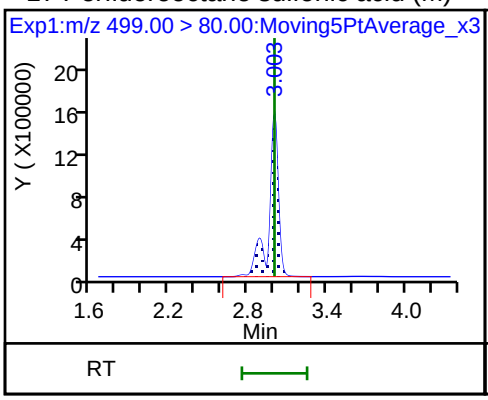
16 Perfluoroheptanesulfonic acid



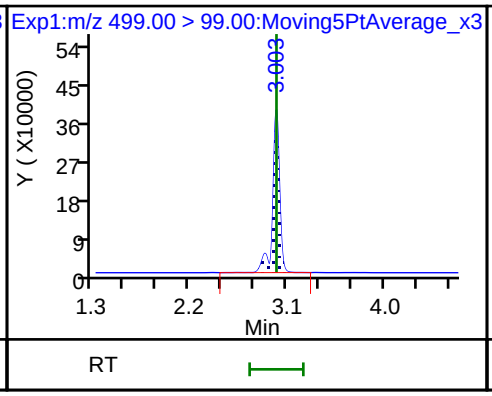
16 Perfluoroheptanesulfonic acid



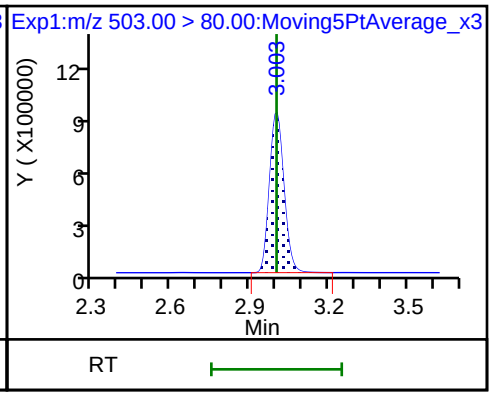
17 Perfluorooctane sulfonic acid (M)



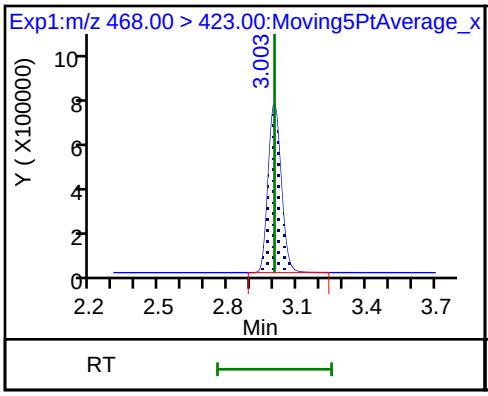
17 Perfluorooctane sulfonic acid



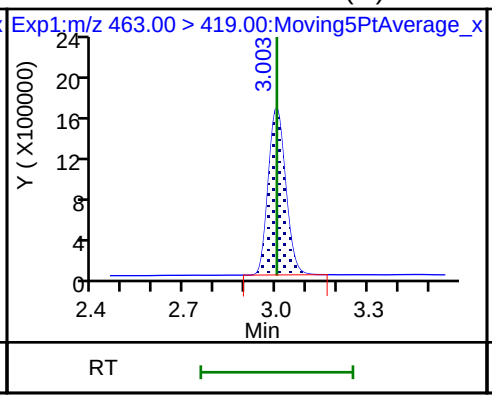
D 18 13C4 PFOS



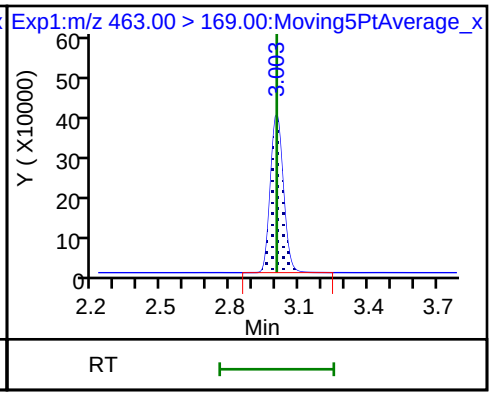
D 19 13C5 PFNA



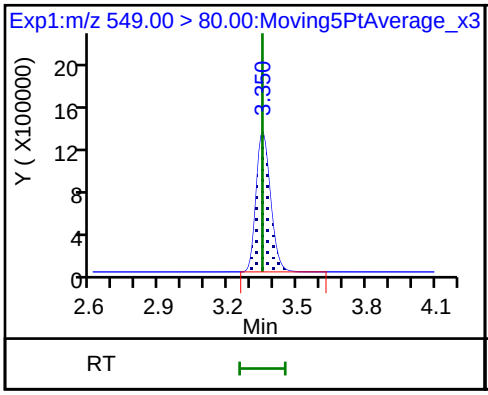
20 Perfluorononanoic acid (M)



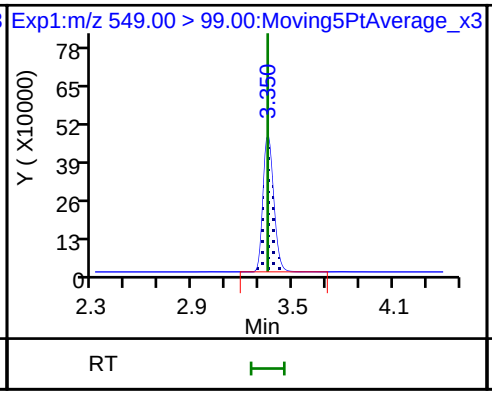
20 Perfluorononanoic acid



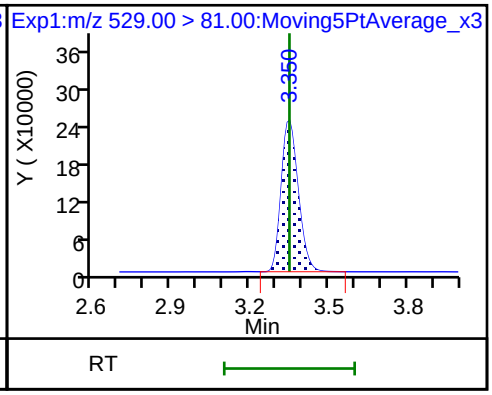
68 Perfluorononanesulfonic acid



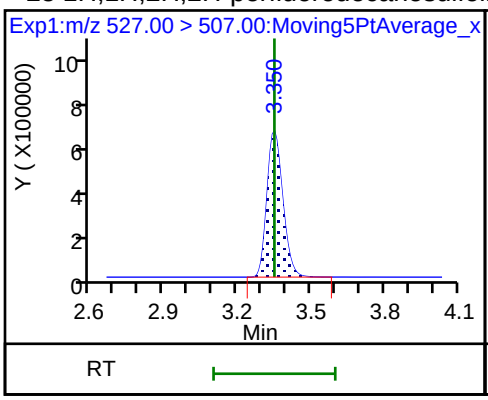
68 Perfluorononanesulfonic acid



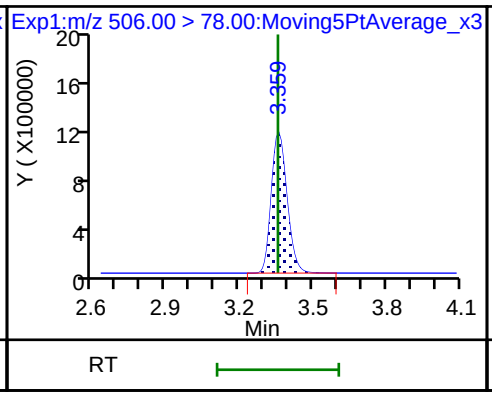
D 26 M2-8:2FTS



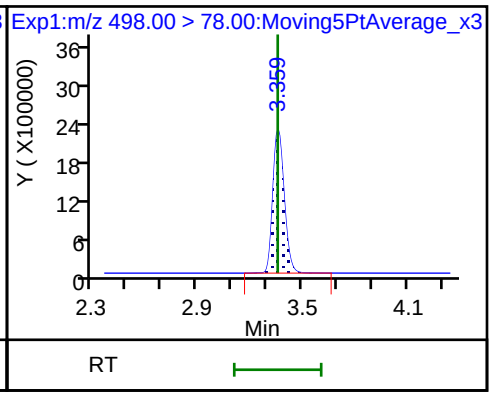
25 1H,1H,2H,2H-perfluorodecanesulfon



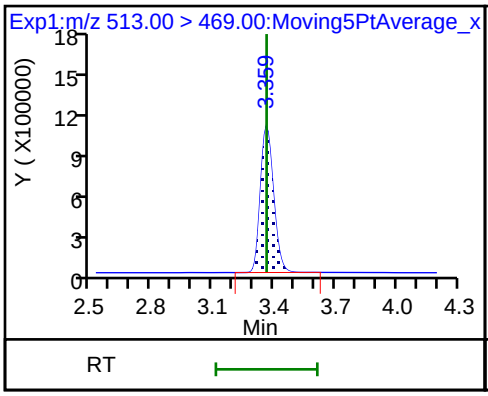
D 21 13C8 FOSA



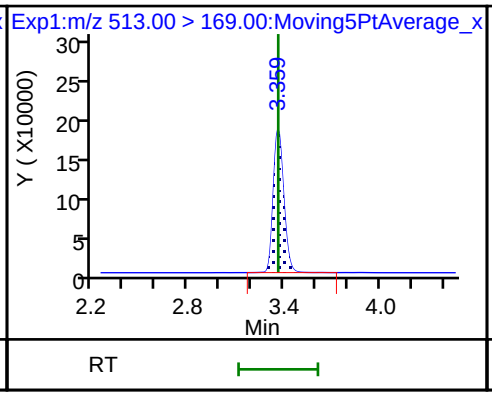
22 Perfluorooctane Sulfonamide



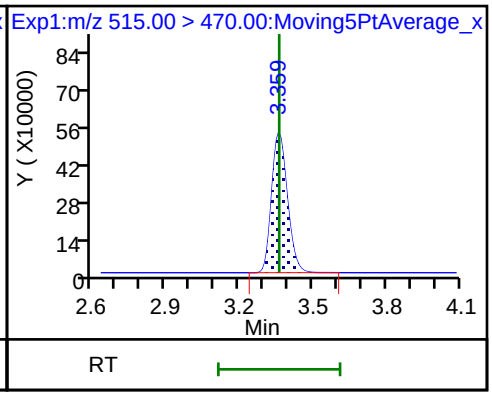
24 Perfluorodecanoic acid



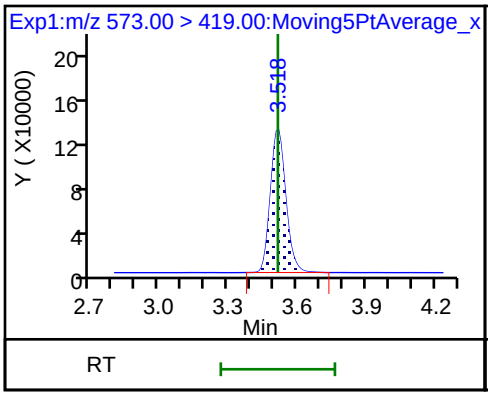
24 Perfluorodecanoic acid



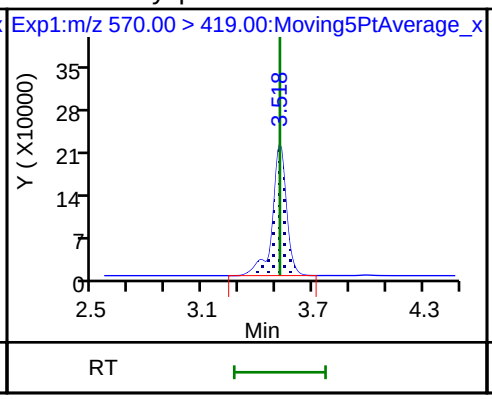
D 23 13C2 PFDA



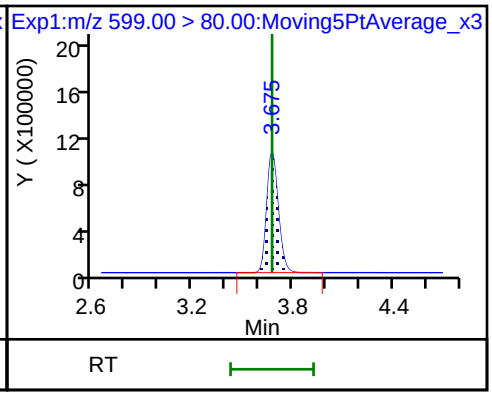
D 27 d3-NMeFOSAA



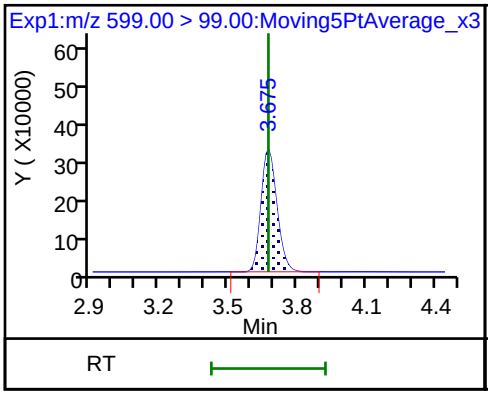
28 N-methyl perfluorooctane sulfonami



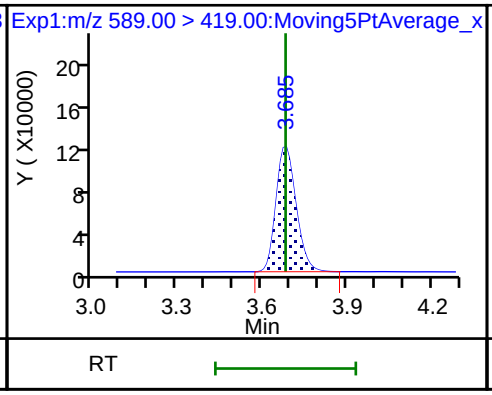
29 Perfluorodecane Sulfonic acid



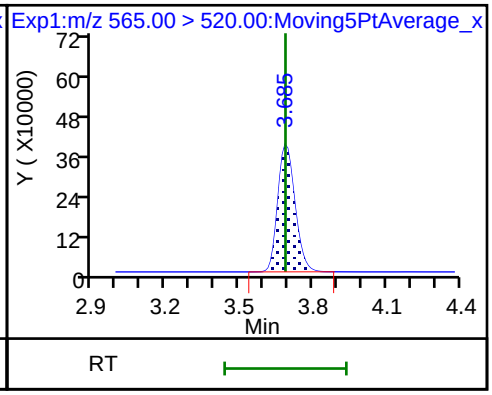
29 Perfluorodecane Sulfonic acid



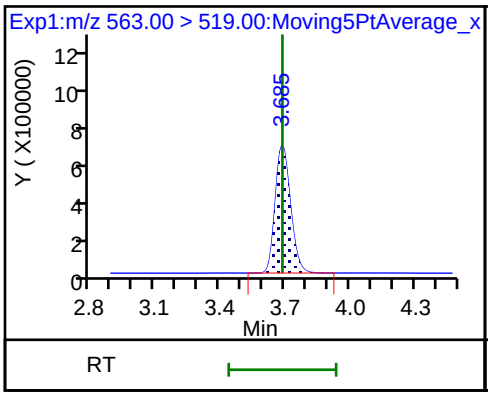
D 32 d5-NEtFOSAA



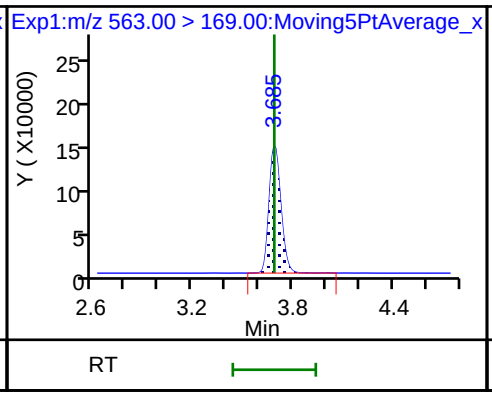
D 30 13C2 PFUnA



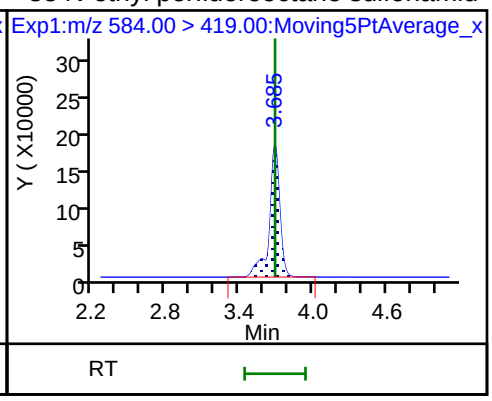
31 Perfluoroundecanoic acid



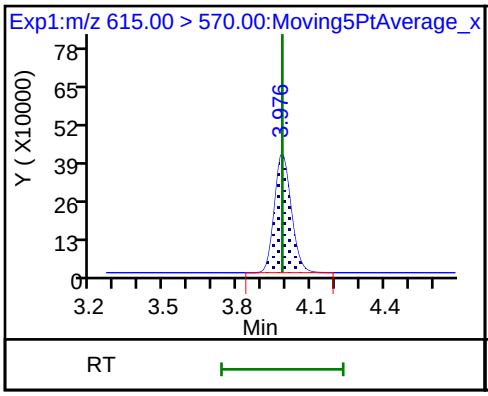
31 Perfluoroundecanoic acid



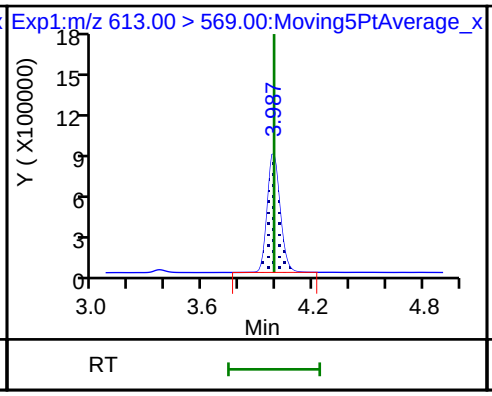
33 N-ethyl perfluorooctane sulfonamid



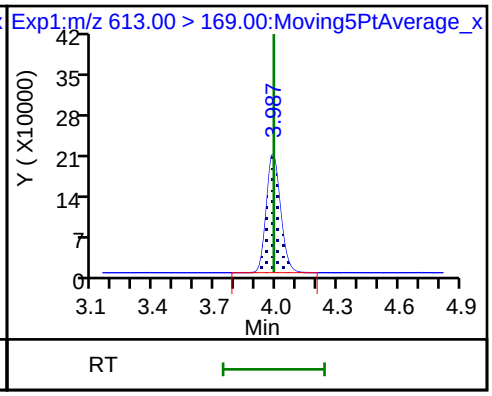
D 36 13C2 PFDoA



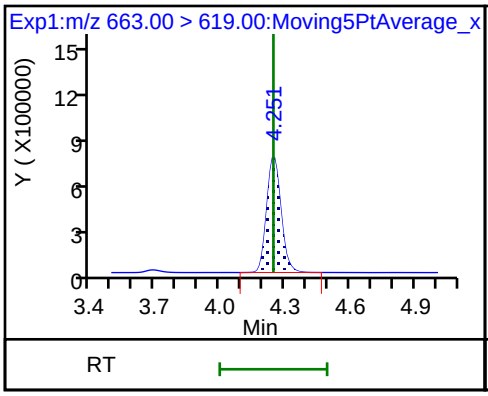
37 Perfluorododecanoic acid



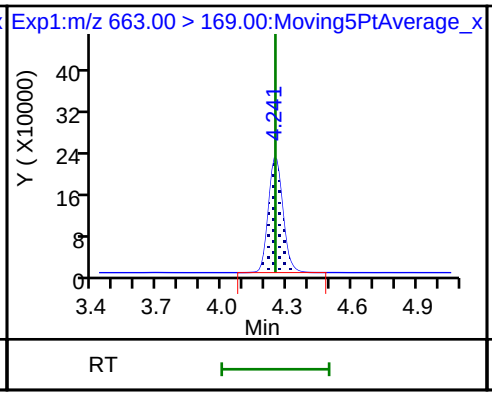
37 Perfluorododecanoic acid



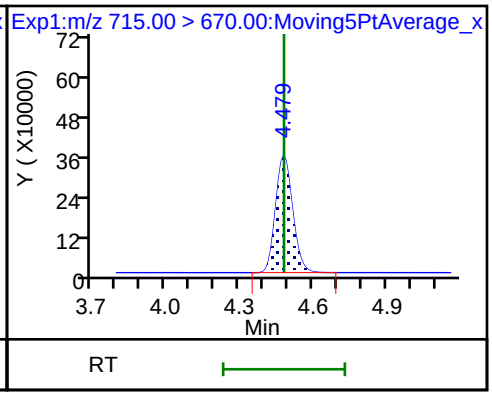
41 Perfluorotridecanoic acid



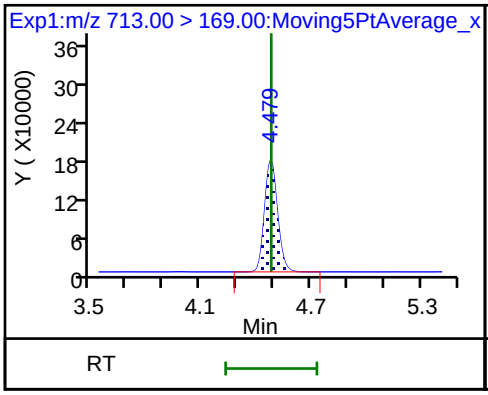
41 Perfluorotridecanoic acid



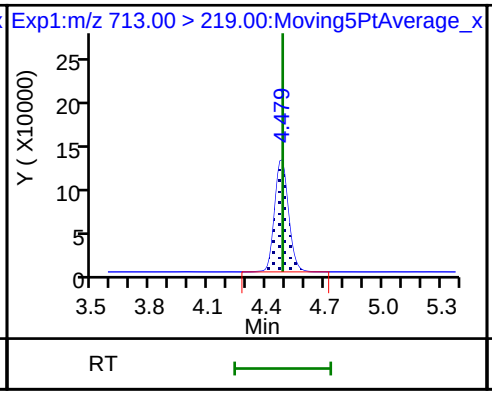
D 43 13C2-PFTeDA



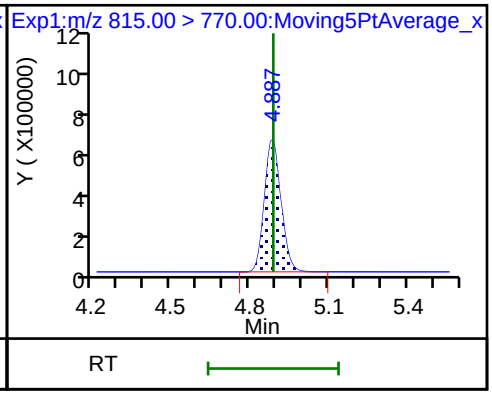
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

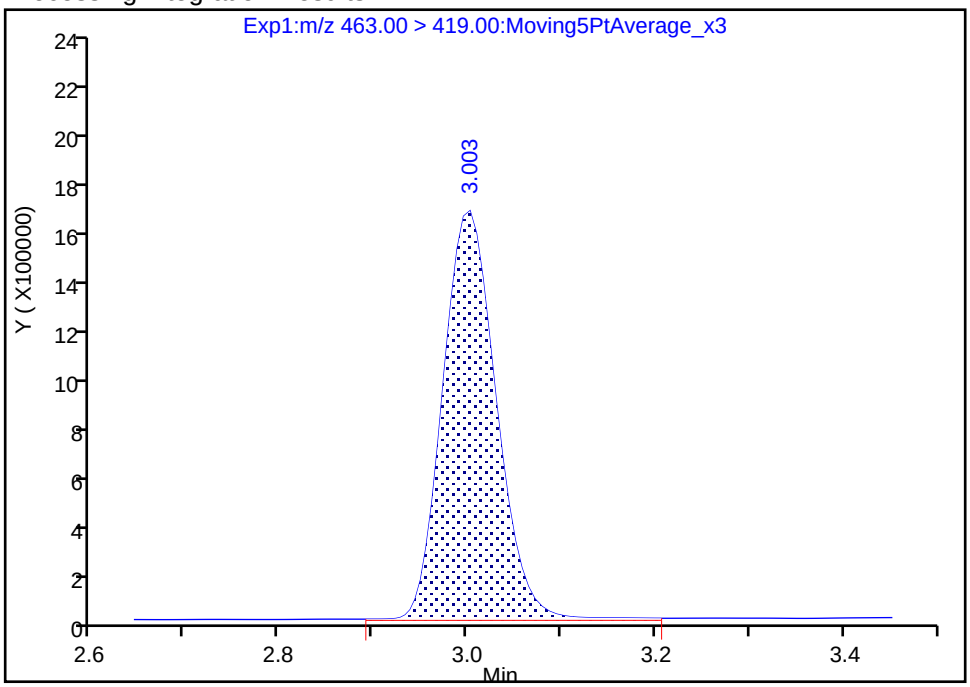
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_007.d				
Injection Date:	30-Jul-2018 15:53:00	Instrument ID:	A8_N		
Lims ID:	IC L6 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

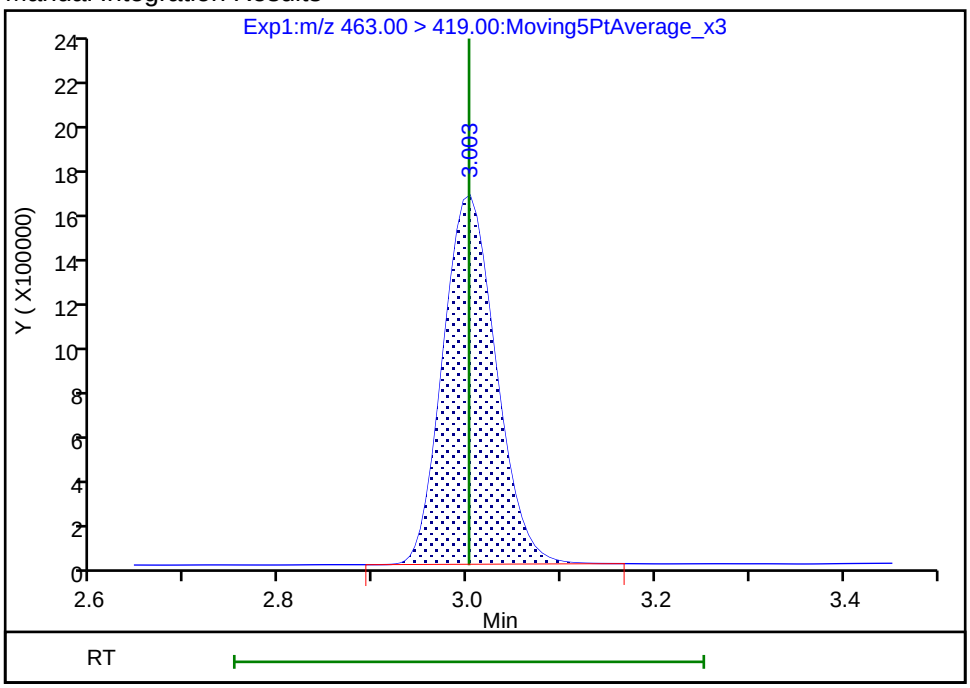
Processing Integration Results

RT: 3.00
Area: 6492506
Amount: 5.498072
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 6354761
Amount: 5.108999
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:18:46

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

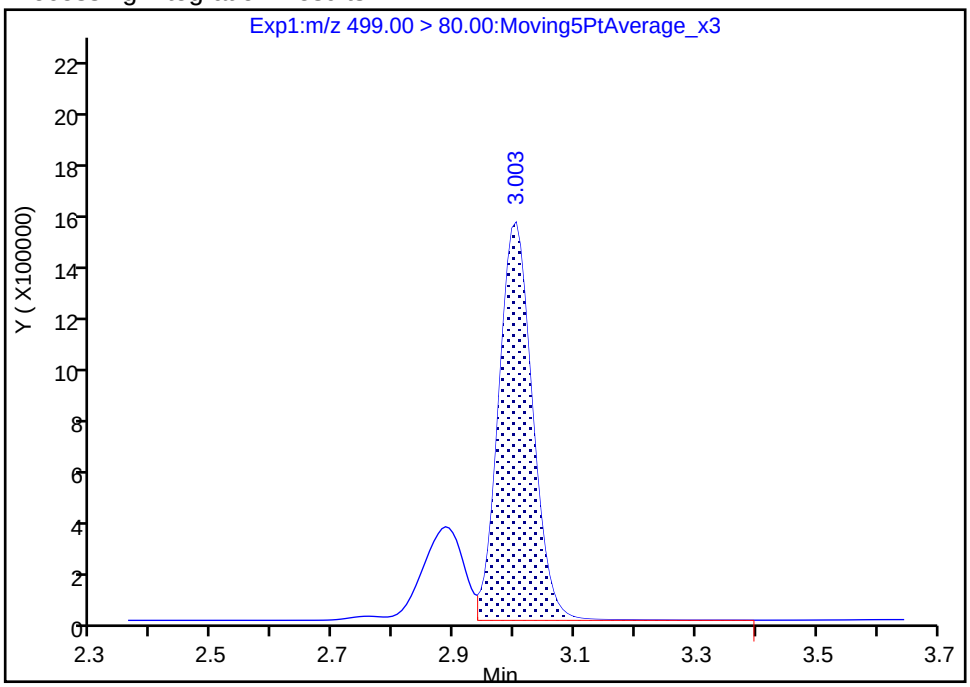
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_007.d				
Injection Date:	30-Jul-2018 15:53:00	Instrument ID:	A8_N		
Lims ID:	IC L6 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	15	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

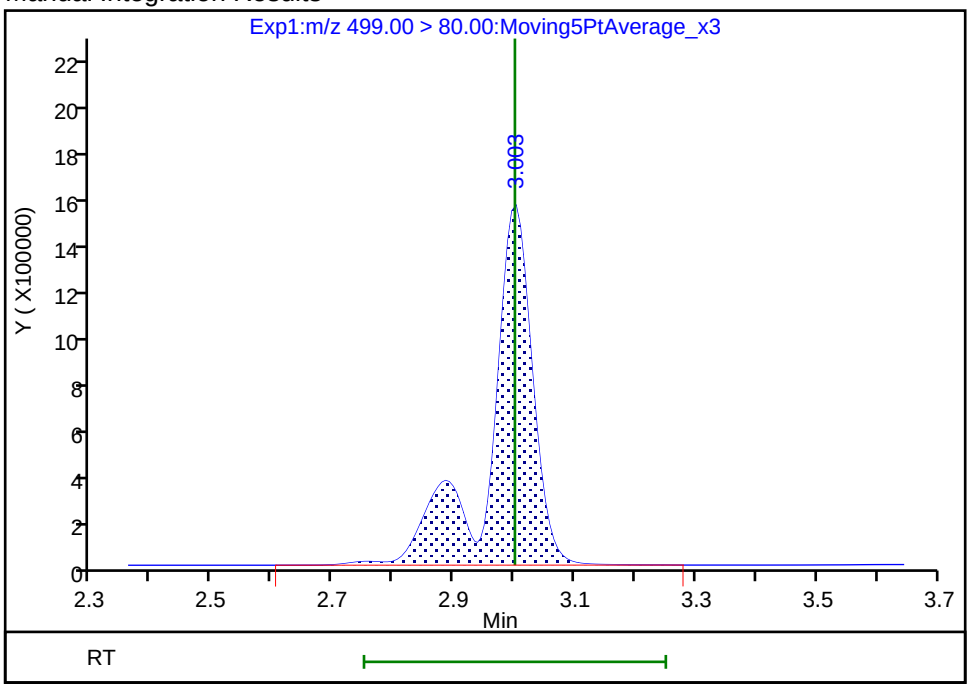
Processing Integration Results

RT: 3.00
Area: 5877036
Amount: 3.750274
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 7587560
Amount: 4.684375
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:18:39

Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 30-Jul-2018 16:00:49 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:39:14 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:19:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.408	1.412	-0.004	0.534	4636797	2.61		104	56166	
2 Perfluorobutyric acid										
212.90 > 169.00	1.413	1.412	0.001	1.004	18470638	9.73		97.3	3610	
D 3 13C5-PFPeA										
267.90 > 223.00	1.657	1.658	-0.001	0.628	3003467	2.63		105	39917	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.657	1.659	-0.002	1.000	14214044	9.78		97.8	7674	
D 47 13C3-PFBS										
301.90 > 83.00	1.693	1.693	0.0	0.642	87520	2.58		111	394	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.693	1.697	-0.004	1.000	23798155	8.16		92.3	61572	
298.90 > 99.00	1.693	1.697	-0.004	1.000	10412421		2.29(1.25-3.74)	92.3	29859	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.906	1.904	0.002	1.126	4909482	8.55		91.5	148622	
D 60 M2-4:2FTS										
329.00 > 81.00	1.906	1.905	0.001	0.723	460246	NC			4142	
D 7 13C2 PFHxA										
315.00 > 270.00	1.949	1.942	0.007	0.739	3435352	2.65		106	99863	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.949	1.944	0.005	1.000	14034199	9.58		95.8	24770	
313.00 > 119.00	1.949	1.944	0.005	1.000	1287818		10.90(5.03-15.10)	95.8	13109	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.970	1.965	0.005	1.164	22684764	8.61		91.8	228204	
349.00 > 99.00	1.970	1.965	0.005	1.164	9146717		2.48(1.36-4.07)	91.8	32355	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.037	2.040	-0.003	0.773	225480	NC			7907	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.049	2.042	0.007	1.006	3036291	NC			15603	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.267	0.0	0.860	3202305	2.60		104	44131	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.281	2.271	0.010	1.006	14342810	9.84		98.4	5241	
363.00 > 169.00	2.281	2.271	0.010	1.006	5517362		2.60(1.13-3.40)	98.4	32528	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.284	-0.003	0.994	19821606	8.59		94.4	29281	
399.00 > 99.00	2.294	2.284	0.010	1.000	6907186		2.87(1.50-4.49)	94.4	9090	
D 11 18O2 PFHxS										
403.00 > 84.00	2.294	2.288	0.006	0.870	4697586	2.51		106	40776	
65 ADONA										
377.00 > 251.00	2.320	2.316	0.004	0.772	32524833	NC			121573	
377.00 > 85.00	2.320	2.316	0.004	0.772	21325763		1.53(0.84-2.53)		56970	
D 12 M2-6:2FTS										
429.00 > 81.00	2.604	2.603	0.001	0.988	923131	2.39		101	9192	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.604	2.605	-0.001	1.000	6139898	9.38		98.9	53952	
* 62 13C2-PFOA										
415.00 > 370.00	2.636	2.631	0.005		3279500	2.50			37307	
D 14 13C4 PFOA										
417.00 > 372.00	2.636	2.631	0.005	1.000	3144812	2.50		99.8	42428	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.636	2.631	0.005	1.000	14443647	9.85		98.4	11773	
413.00 > 169.00	2.636	2.631	0.005	1.000	7649861		1.89(0.84-2.52)	98.4	20991	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.645	2.640	0.004	0.881	17130665	9.00		94.6	52512	
449.00 > 99.00	2.645	2.640	0.004	0.881	5198443		3.30(1.94-5.82)	94.6	25714	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.003	3.000	0.003	1.000	15005307	9.20		99.2	18451	
499.00 > 99.00	3.003	3.000	0.003	1.000	3413446		4.40(2.31-6.93)	99.2	14283	
D 18 13C4 PFOS										
503.00 > 80.00	3.003	3.000	0.003	1.139	3418135	2.54		106	14550	
D 19 13C5 PFNA										
468.00 > 423.00	3.003	3.000	0.003	1.139	2754672	2.47		98.9	58273	
20 Perfluorononanoic acid										
463.00 > 419.00	3.003	3.001	0.002	1.000	12107210	10.2		102	4353	
463.00 > 169.00	3.003	3.001	0.002	1.000	2949214		4.11(1.90-5.69)	102	46759	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.215	3.212	0.003	1.071	22110085	NC			73495	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.351	3.347	0.004	1.116	10307633	9.21		95.9	51286	
549.00 > 99.00	3.351	3.347	0.004	1.116	3874607		2.66(1.33-3.97)	95.9	26003	
D 26 M2-8:2FTS										
529.00 > 81.00	3.351	3.350	0.001	1.271	964489	2.17		90.5	10073	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.351	3.350	0.001	1.000	5092438	9.52		99.4	139448	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.360	3.356	0.004	1.275	4683099	2.44		97.5	45729	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.360	3.357	0.003	1.000	18078409	9.75		97.5	83998	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.360	3.361	-0.001	1.000	9222412	9.91		99.1	12608	
513.00 > 169.00	3.360	3.361	-0.001	1.000	1596198		5.78(2.36-7.09)	99.1	23584	
D 23 13C2 PFDA										
515.00 > 470.00	3.360	3.361	-0.001	1.275	2140731	2.32		92.9	52631	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.519	3.515	0.004	1.335	572690	2.75		110	15662	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.519	3.519	0.0	1.000	2437502	10.3		103	15175	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.676	3.674	0.002	1.224	9078341	9.49		98.4	90274	
599.00 > 99.00	3.676	3.674	0.002	1.224	3153470		2.88(1.39-4.16)	98.4	34788	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.686	3.683	0.003	1.398	573455	2.51		101	6833	
D 30 13C2 PFUnA										
565.00 > 520.00	3.686	3.687	-0.001	1.398	1751167	2.45		97.8	32521	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.686	3.687	-0.001	1.000	6405744	10.2		102	25956	
563.00 > 169.00	3.686	3.687	-0.001	1.000	1450427		4.42(2.12-6.36)	102	49282	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.686	3.689	-0.003	1.000	2156260	10.3		103	35960	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.844	3.848	-0.004	1.280	30233548	NC			758991	
D 36 13C2 PFDoA										
615.00 > 570.00	3.977	3.983	-0.006	1.509	1871344	2.57		103	32206	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.988	3.987	0.001	1.003	8156318	10.1		101	2618	
613.00 > 169.00	3.988	3.987	0.001	1.003	2013861		4.05(2.13-6.40)	101	19068	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.242	4.245	-0.003	1.067	7042097	10.3		103	3670	
663.00 > 169.00	4.242	4.245	-0.003	1.067	2114822		3.33(1.25-3.76)	103	14390	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.480	4.481	-0.001	1.699	1699348	2.57		103	10397	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.480	4.483	-0.003	1.000	1740950	9.61		96.1	13379	
713.00 > 219.00	4.470	4.483	-0.013	0.998	1259716		1.38(0.71-2.13)	96.1	12910	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.888	-0.001	1.000	11183869	NC			2069	
813.00 > 169.00	4.887	4.888	-0.001	1.000	1876393		5.96(2.86-8.58)		11945	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.888	-0.001	1.854	2989284	2.55		102	6320	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.225	5.229	-0.004	1.069	11994213	NC			3175	
913.00 > 169.00	5.225	5.229	-0.004	1.069	1448517		8.28(3.83-11.48)		8320	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:39:17 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Injection Date: 30-Jul-2018 16:00:49 Instrument ID: A8_N

Lims ID: IC L7 Full

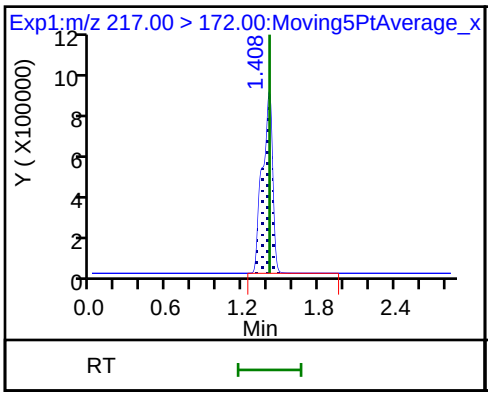
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 16 Worklist Smp#: 8

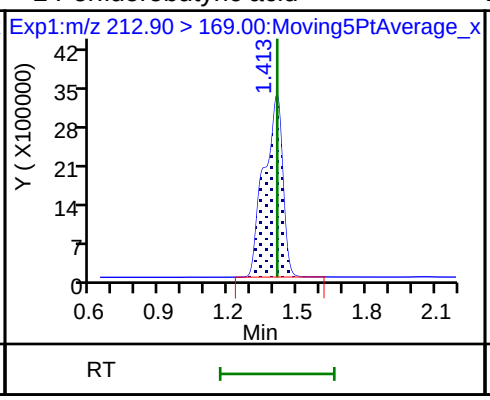
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

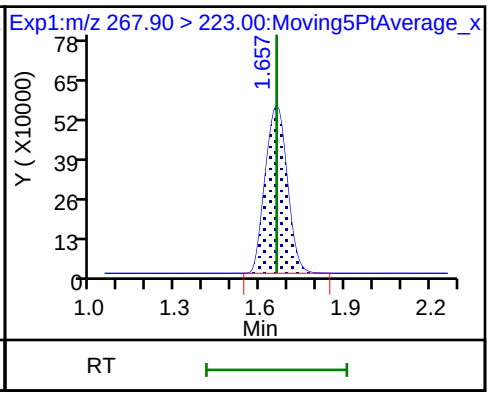
D 1 13C4 PFBA



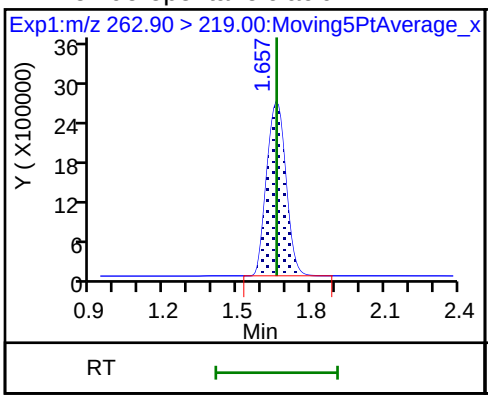
2 Perfluorobutyric acid



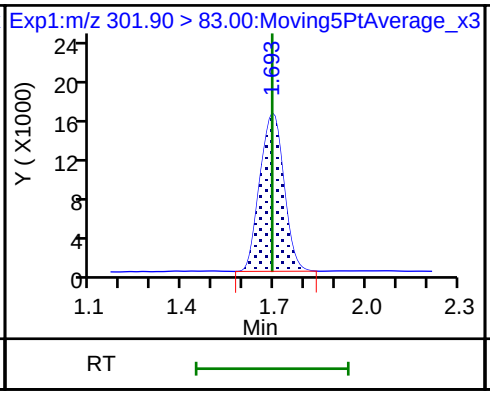
D 3 13C5-PFPeA



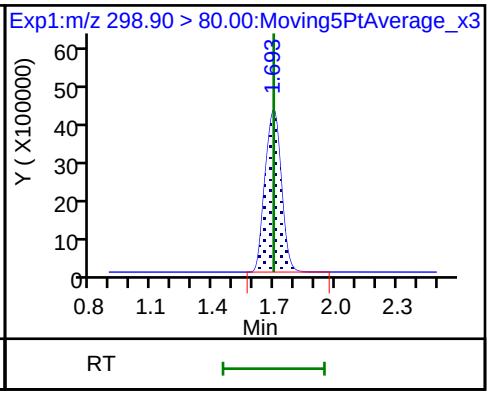
4 Perfluoropentanoic acid



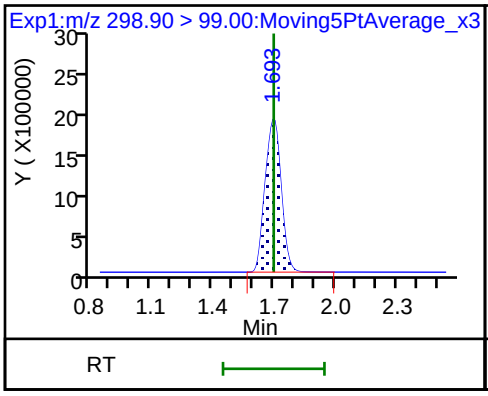
D 47 13C3-PFBS



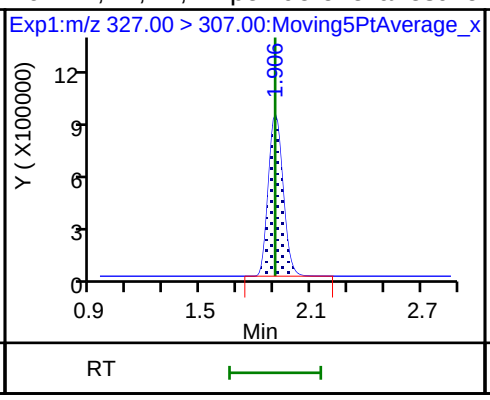
5 Perfluorobutanesulfonic acid



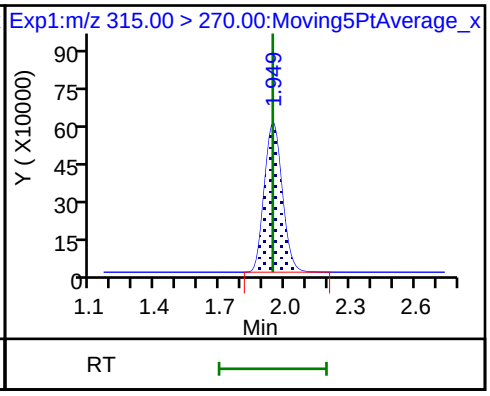
5 Perfluorobutanesulfonic acid



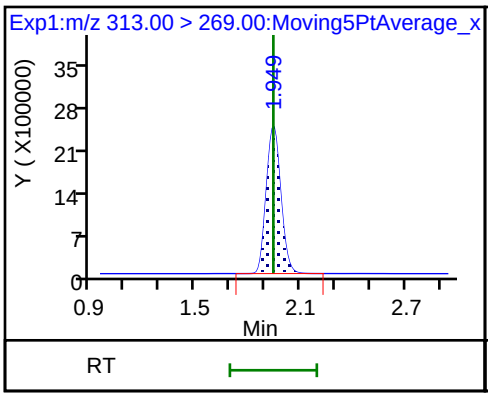
61 1H,1H,2H,2H-perfluorohexanesulfon



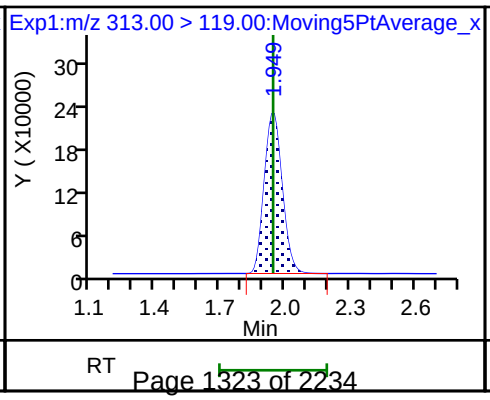
D 7 13C2 PFHxA



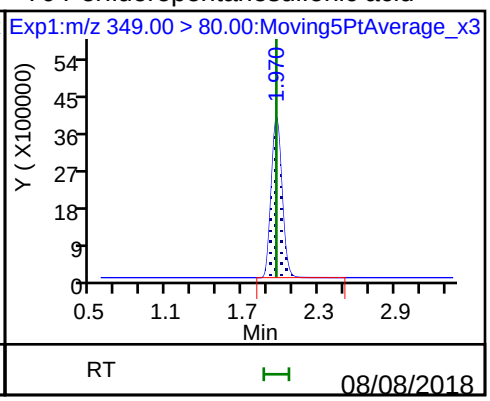
6 Perfluorohexanoic acid



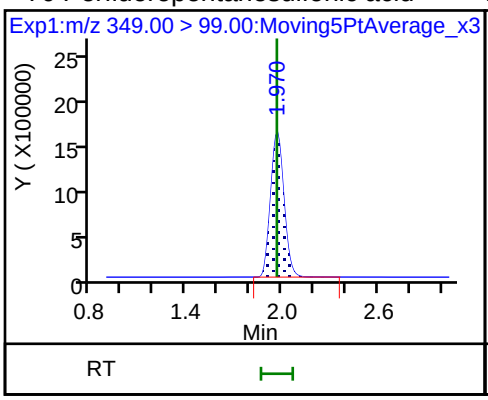
6 Perfluorohexanoic acid



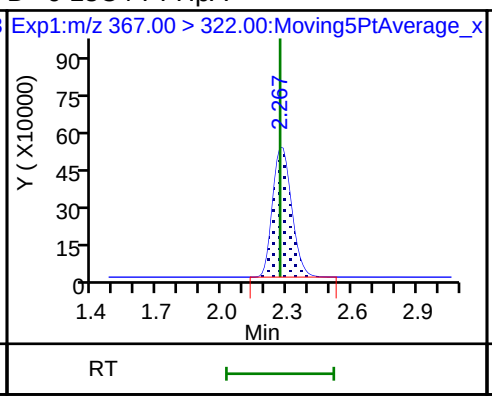
70 Perfluoropentanesulfonic acid



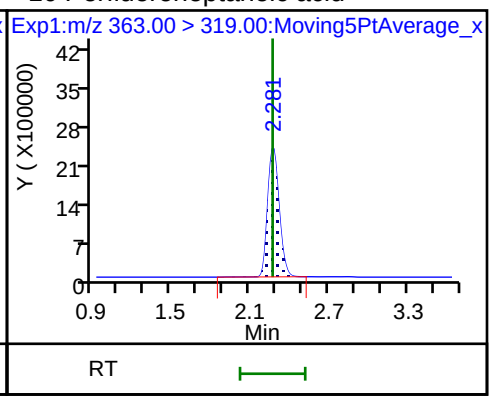
70 Perfluoropentanesulfonic acid



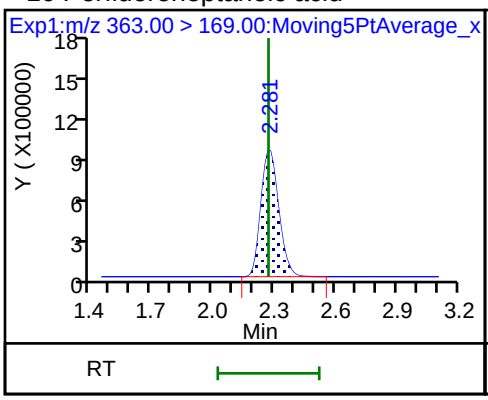
D 9 13C4-PFHpA



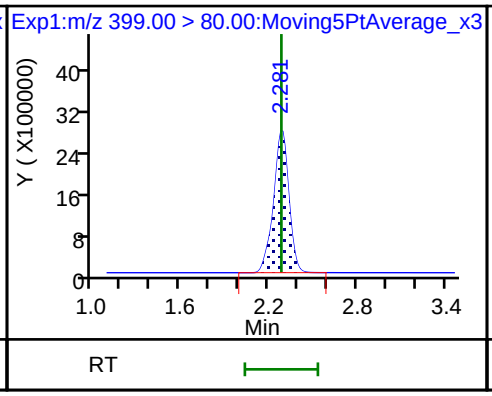
10 Perfluoroheptanoic acid



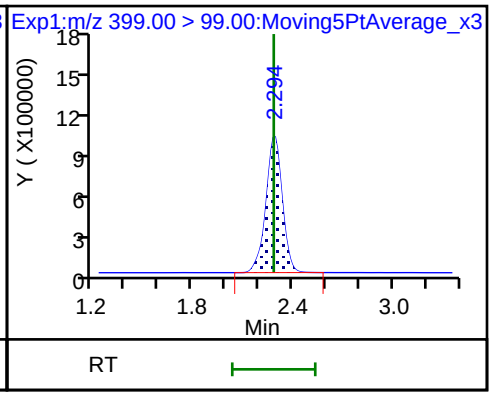
10 Perfluoroheptanoic acid



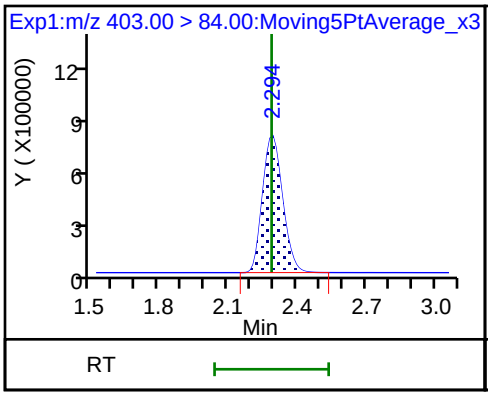
8 Perfluorohexanesulfonic acid



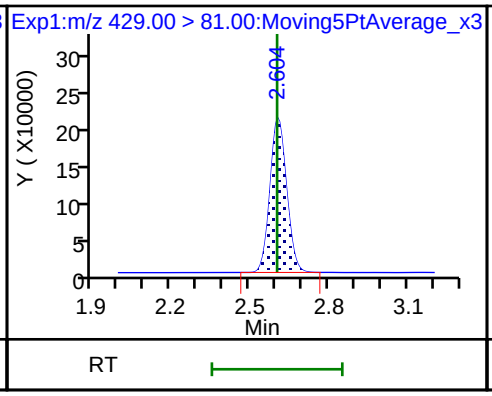
8 Perfluorohexanesulfonic acid



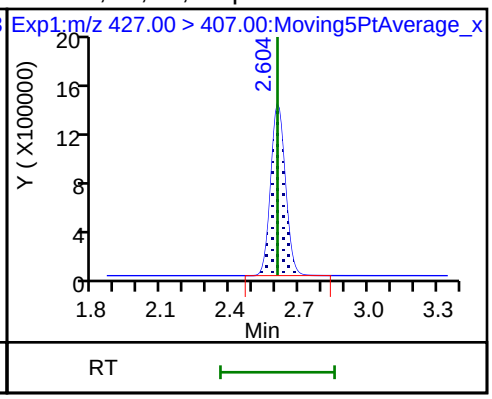
D 11 18O2 PFHxS



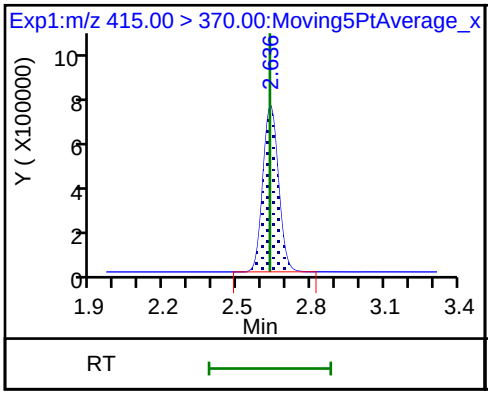
D 12 M2-6:2FTS



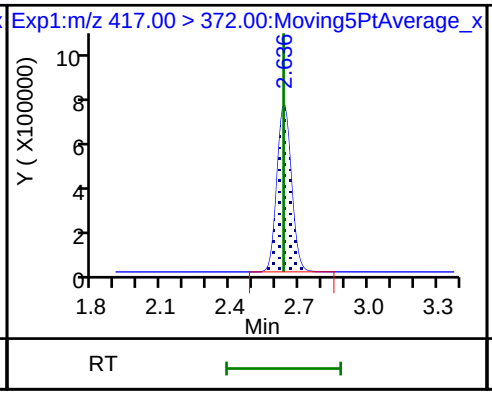
13 1H,1H,2H,2H-perfluorooctanesulfoni



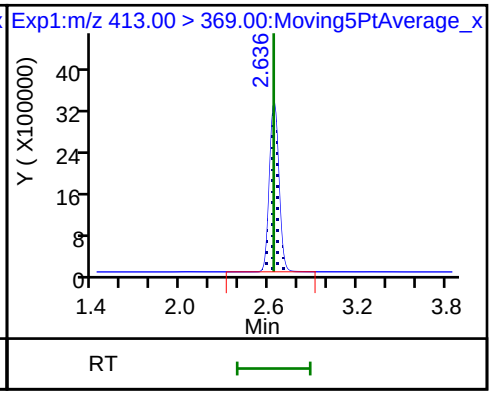
* 62 13C2-PFOA



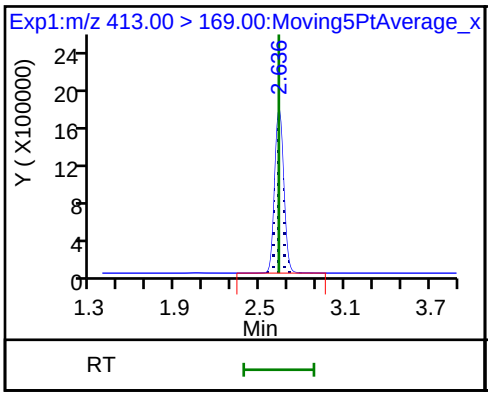
D 14 13C4 PFOA



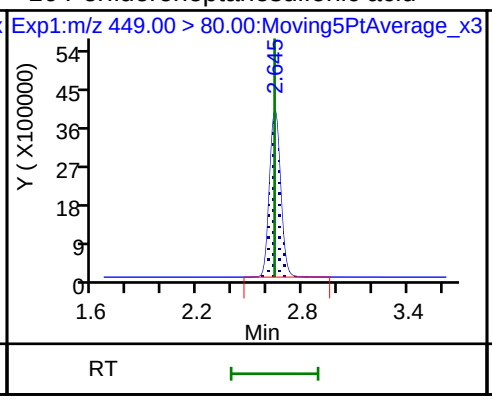
15 Perfluorooctanoic acid



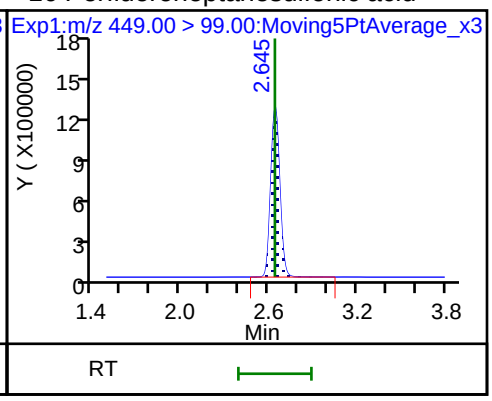
15 Perfluorooctanoic acid



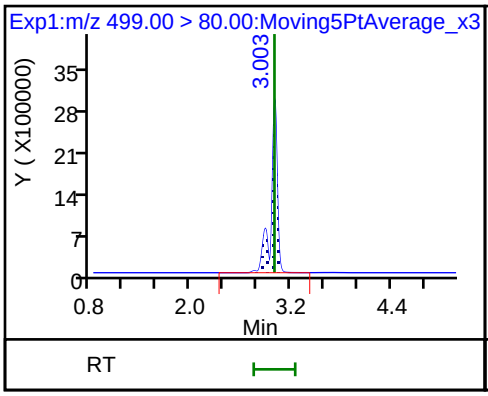
16 Perfluoroheptanesulfonic acid



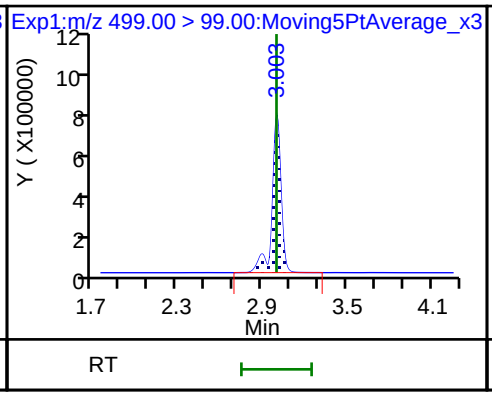
16 Perfluoroheptanesulfonic acid



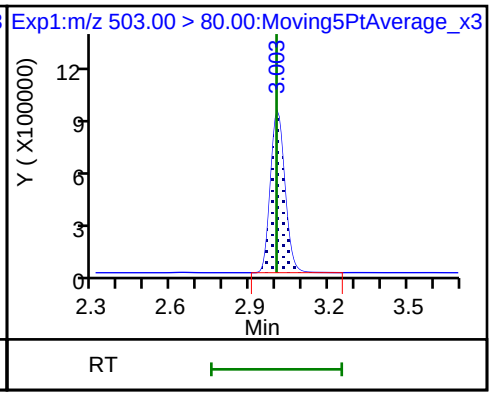
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



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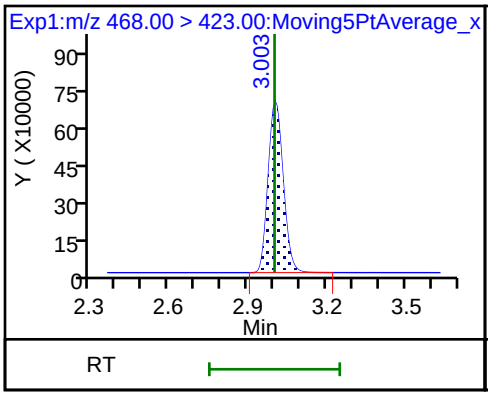
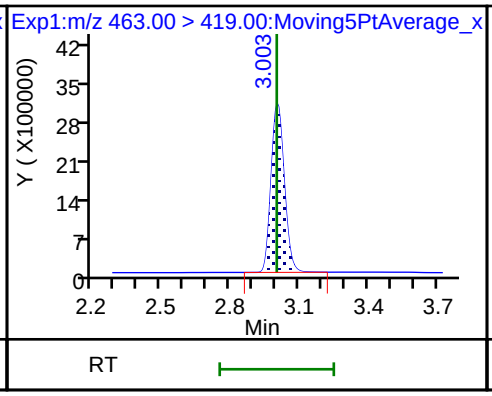
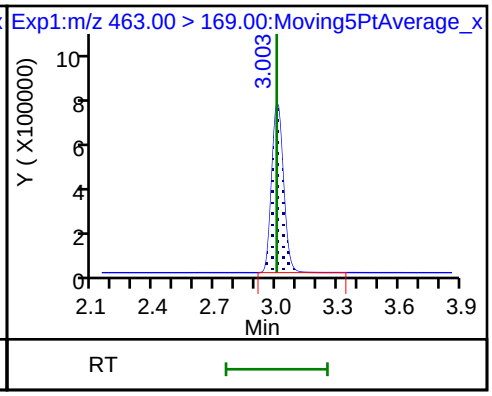


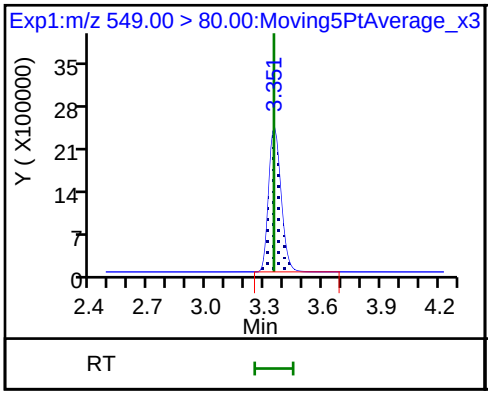
20 Perfluorononanoic acid



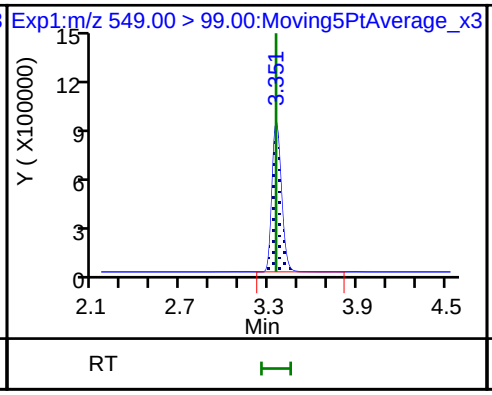
20 Perfluorononanoic acid



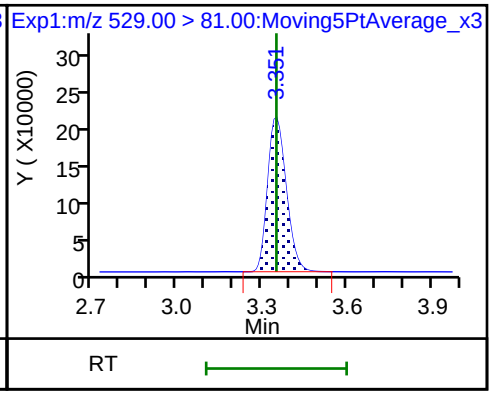
68 Perfluorononanesulfonic acid



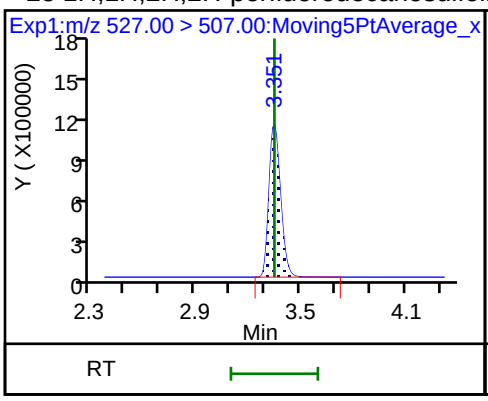
68 Perfluorononanesulfonic acid



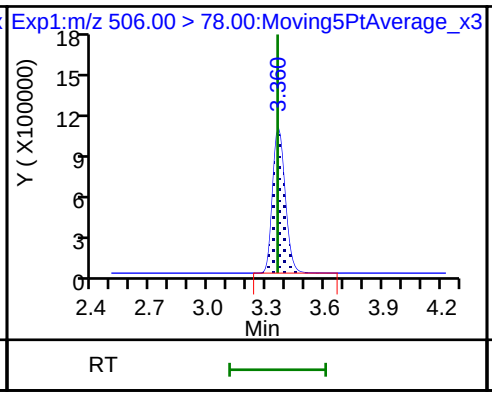
D 26 M2-8:2FTS



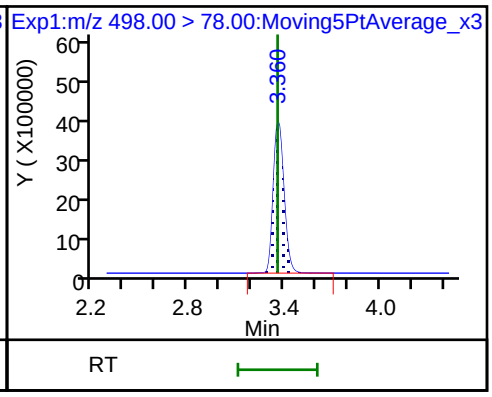
25 1H,1H,2H,2H-perfluorodecanesulfon



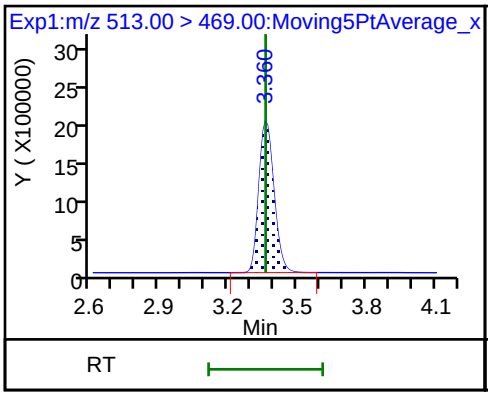
D 21 13C8 FOSA



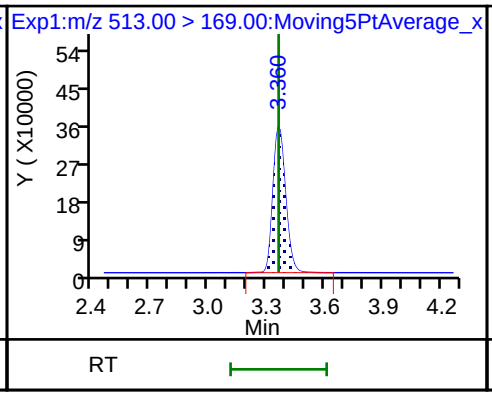
22 Perfluorooctane Sulfonamide



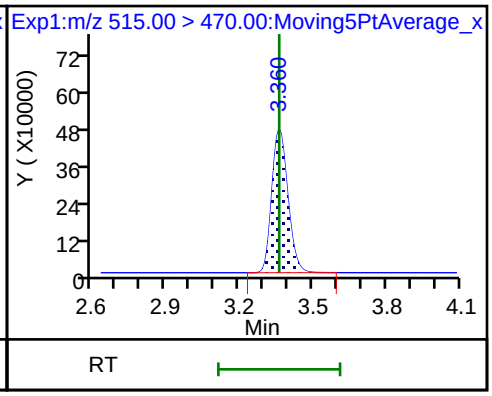
24 Perfluorodecanoic acid



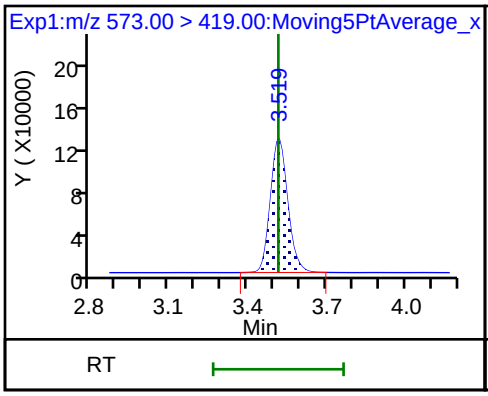
24 Perfluorodecanoic acid



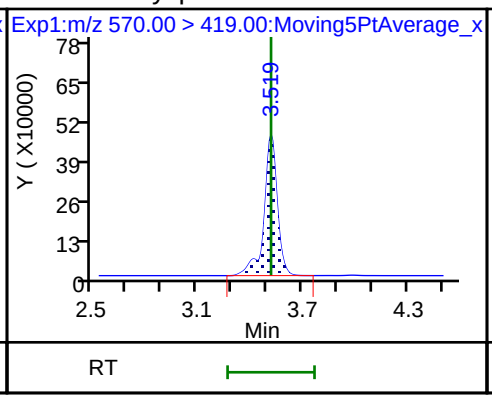
D 23 13C2 PFDA



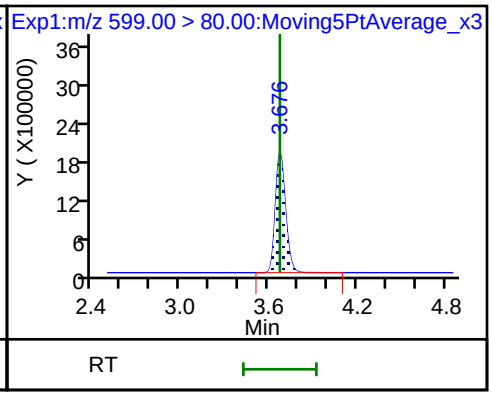
D 27 d3-NMeFOSAA



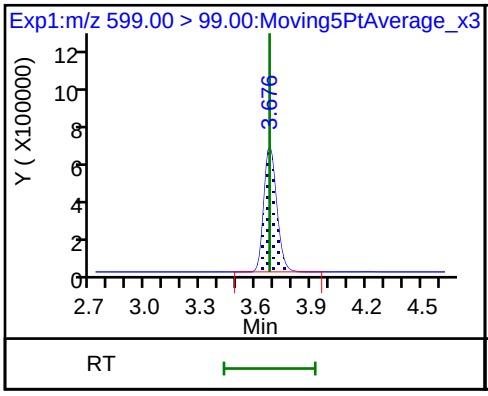
28 N-methyl perfluorooctane sulfonami



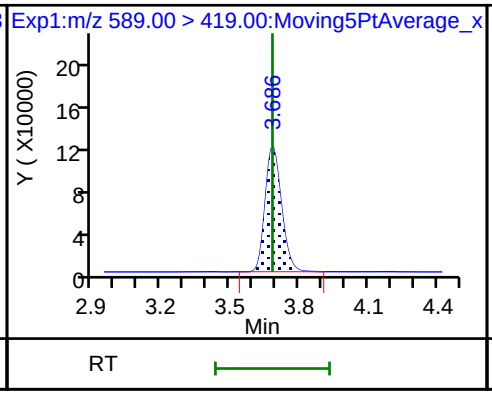
29 Perfluorodecane Sulfonic acid



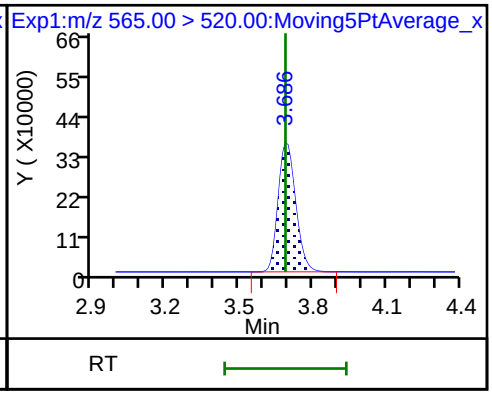
29 Perfluorodecane Sulfonic acid



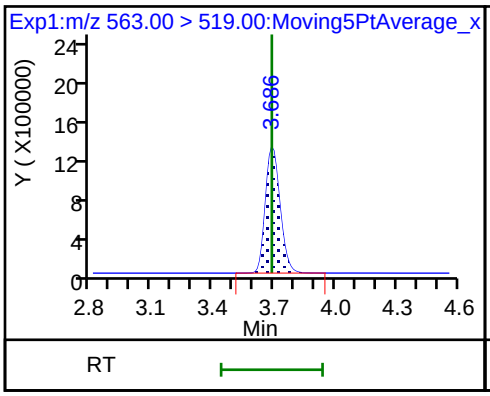
D 32 d5-NEtFOSAA



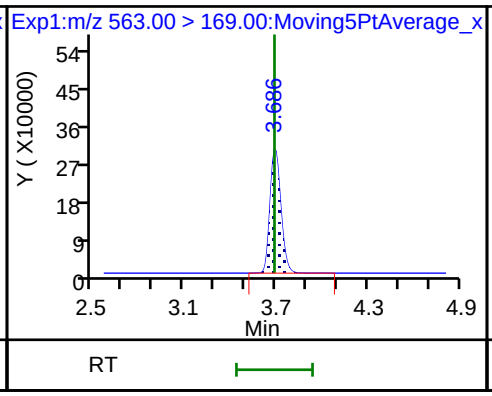
D 30 13C2 PFUnA



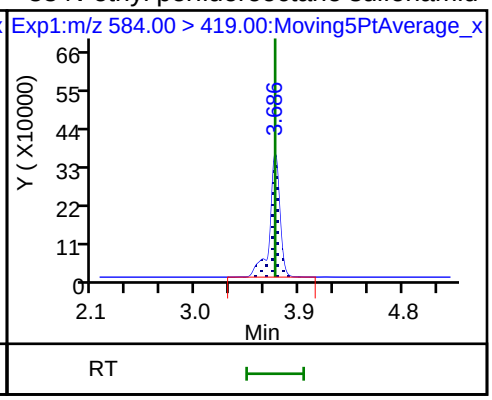
31 Perfluoroundecanoic acid



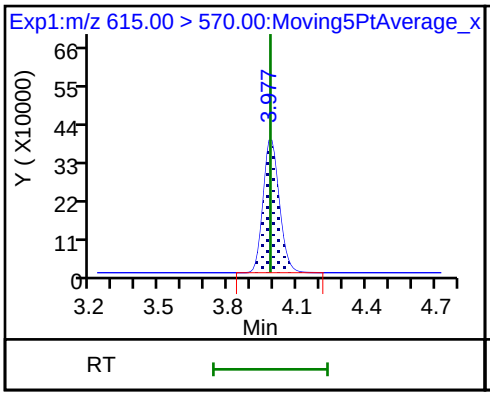
31 Perfluoroundecanoic acid



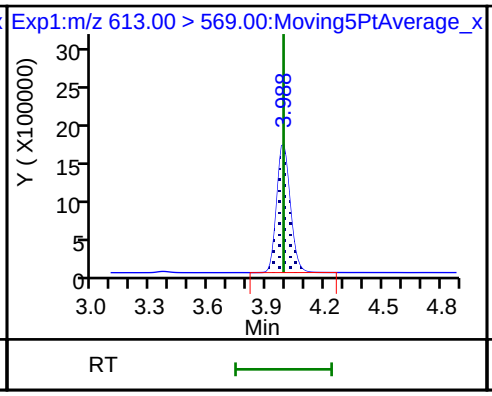
33 N-ethyl perfluorooctane sulfonamid



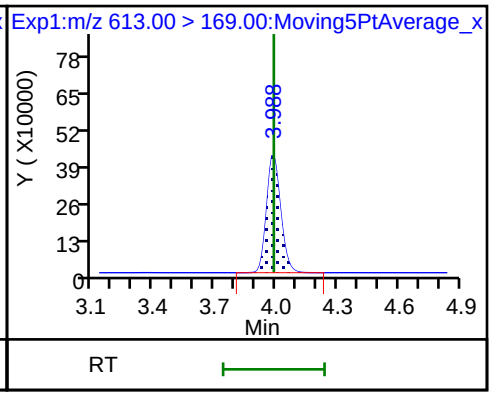
D 36 13C2 PFDoA



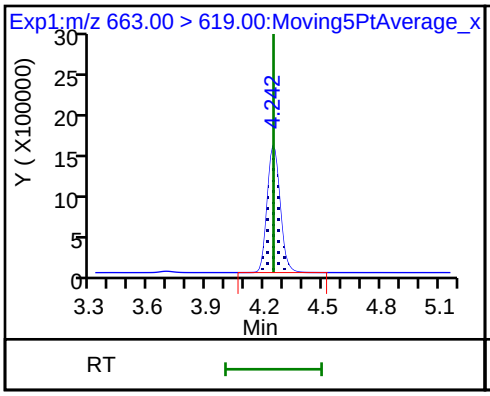
37 Perfluorododecanoic acid



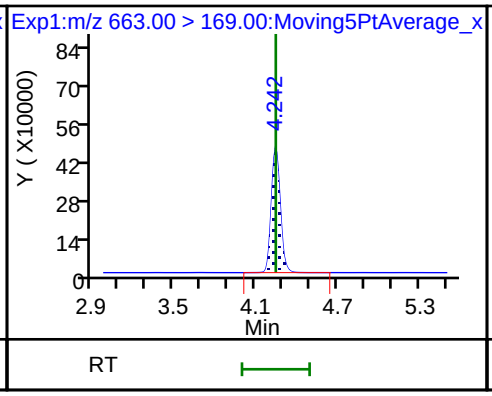
37 Perfluorododecanoic acid



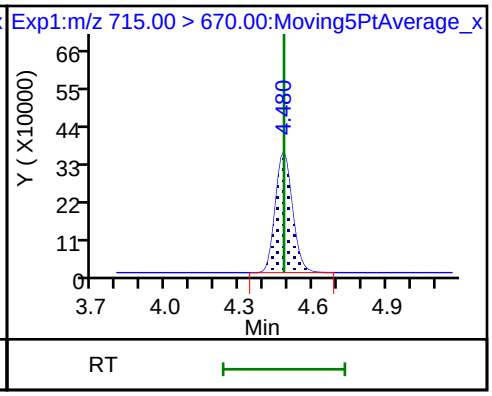
41 Perfluorotridecanoic acid



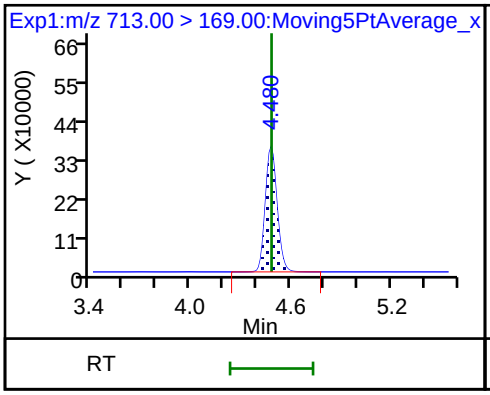
41 Perfluorotridecanoic acid



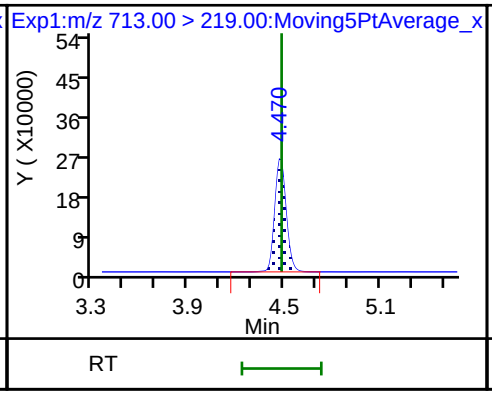
D 43 13C2-PFTeDA



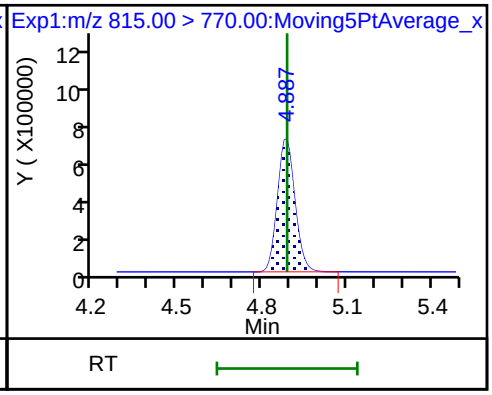
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

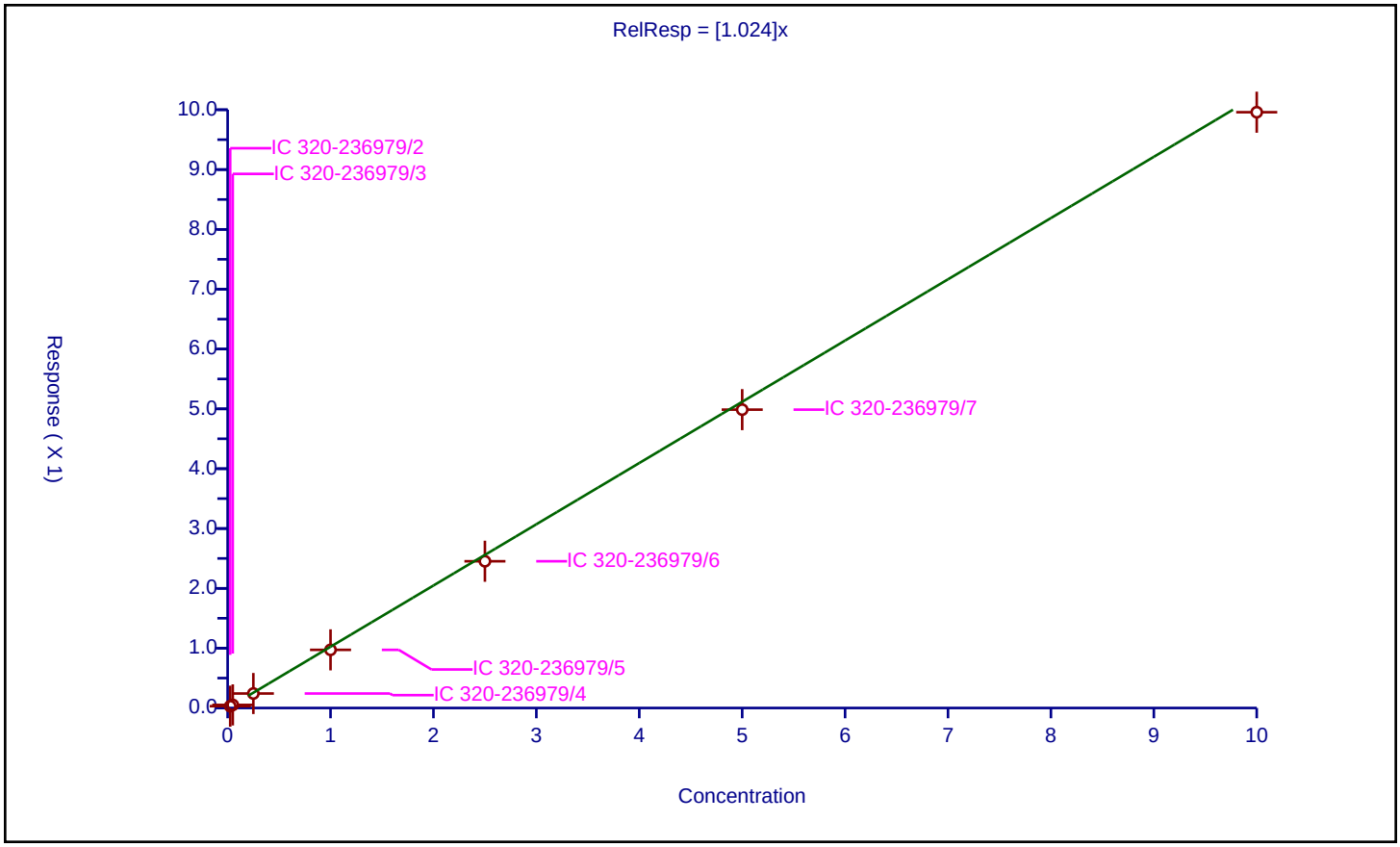
Curve Coefficients

Intercept:	0
Slope:	1.024

Error Coefficients

Standard Error:	8740000
Relative Standard Error:	8.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.030335	2.5	4585466.0	1.213399	Y
2	IC 320-236979/3	0.05	0.051821	2.5	4630140.0	1.036427	Y
3	IC 320-236979/4	0.25	0.242304	2.5	4937606.0	0.969217	Y
4	IC 320-236979/5	1.0	0.972082	2.5	4761246.0	0.972082	Y
5	IC 320-236979/6	2.5	2.452798	2.5	4714773.0	0.981119	Y
6	IC 320-236979/7	5.0	4.987181	2.5	4810186.0	0.997436	Y
7	IC 320-236979/8	10.0	9.958727	2.5	4636797.0	0.995873	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

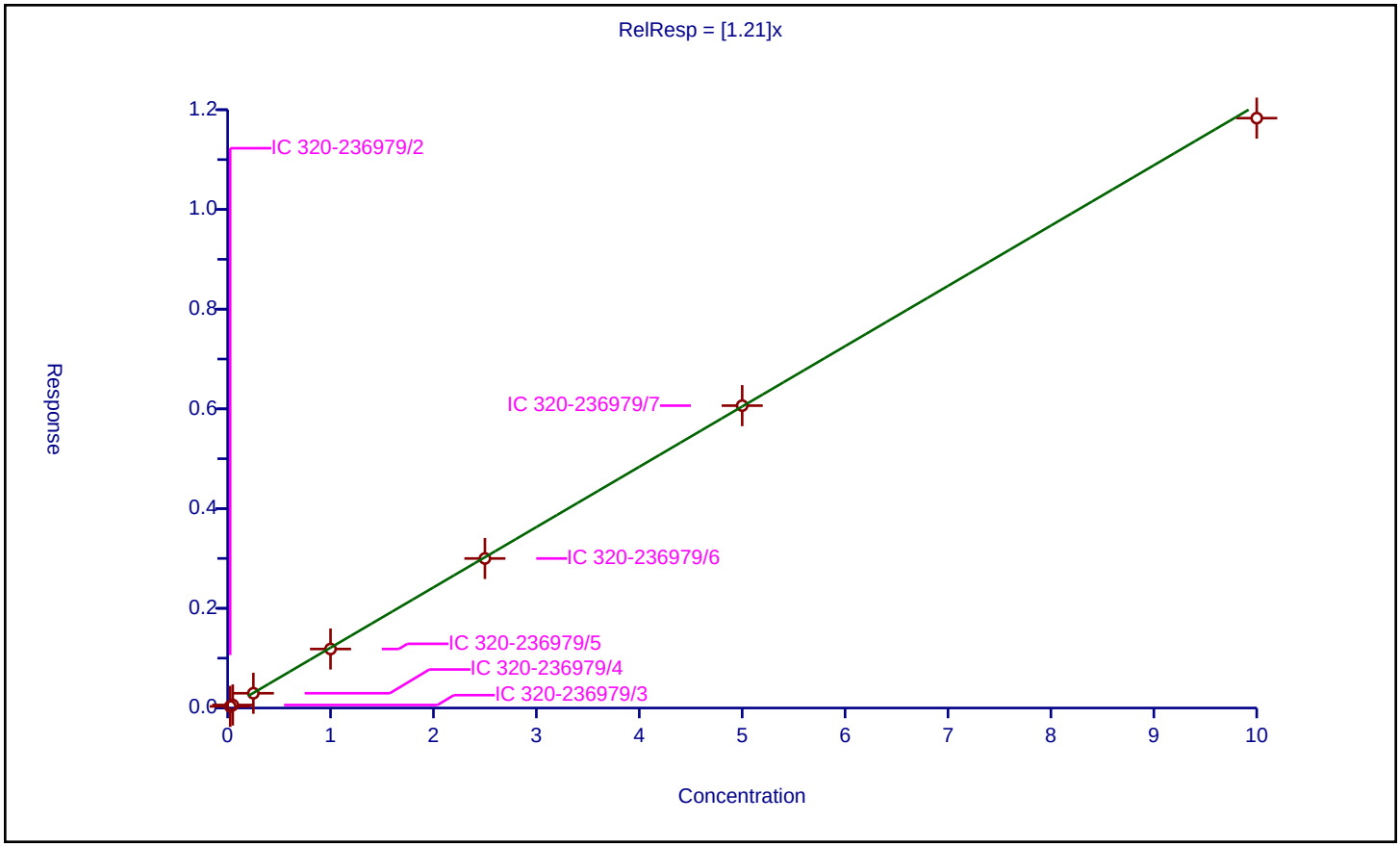
Curve Coefficients

Intercept:	0
Slope:	1.21

Error Coefficients

Standard Error:	6740000
Relative Standard Error:	3.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.032413	2.5	2942808.0	1.296517	Y
2	IC 320-236979/3	0.05	0.060439	2.5	2989728.0	1.208772	Y
3	IC 320-236979/4	0.25	0.29559	2.5	3169314.0	1.18236	Y
4	IC 320-236979/5	1.0	1.183191	2.5	3085012.0	1.183191	Y
5	IC 320-236979/6	2.5	2.999313	2.5	3010228.0	1.199725	Y
6	IC 320-236979/7	5.0	6.064825	2.5	3072715.0	1.212965	Y
7	IC 320-236979/8	10.0	11.831364	2.5	3003467.0	1.183136	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

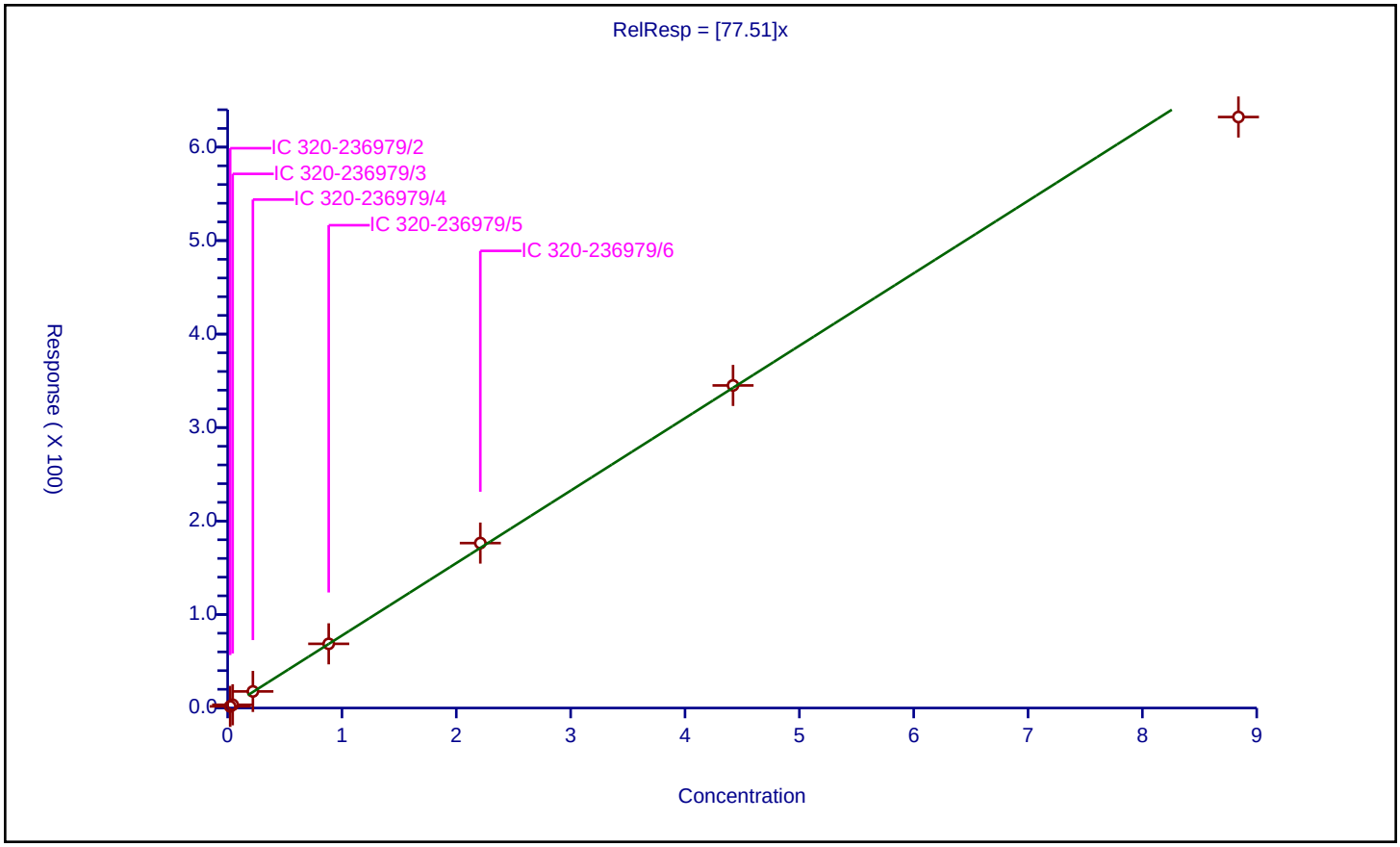
Curve Coefficients

Intercept:	0
Slope:	77.51

Error Coefficients

Standard Error:	11300000
Relative Standard Error:	3.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.0221	1.713249	2.325	81678.0	77.522592	Y
2	IC 320-236979/3	0.0442	3.434371	2.325	82622.0	77.700708	Y
3	IC 320-236979/4	0.221	17.734865	2.325	84477.0	80.248256	Y
4	IC 320-236979/5	0.884	68.65143	2.325	83737.0	77.659989	Y
5	IC 320-236979/6	2.21	176.418702	2.325	82421.0	79.827467	Y
6	IC 320-236979/7	4.42	345.06975	2.325	84122.0	78.070079	Y
7	IC 320-236979/8	8.84	632.206471	2.325	87520.0	71.516569	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

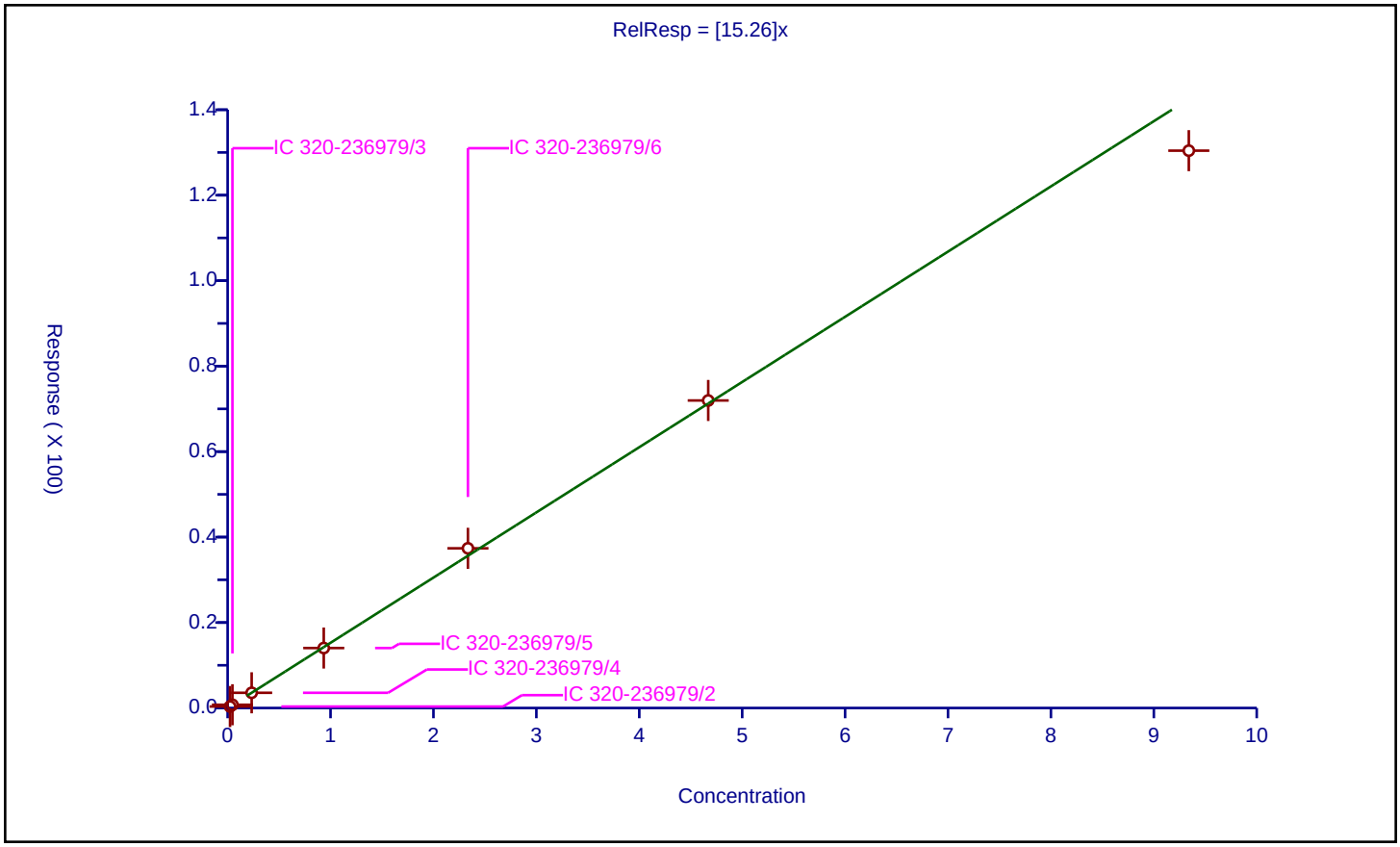
Curve Coefficients

Intercept:	0
Slope:	15.26

Error Coefficients

Standard Error:	2340000
Relative Standard Error:	4.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.02335	0.348075	2.325	81678.0	14.906868	Y
2	IC 320-236979/3	0.0467	0.758857	2.325	82622.0	16.249612	Y
3	IC 320-236979/4	0.2335	3.55987	2.325	84477.0	15.245695	Y
4	IC 320-236979/5	0.934	14.032158	2.325	83737.0	15.023724	Y
5	IC 320-236979/6	2.335	37.367758	2.325	82421.0	16.003322	Y
6	IC 320-236979/7	4.67	71.962595	2.325	84122.0	15.409549	Y
7	IC 320-236979/8	9.34	130.42214	2.325	87520.0	13.963827	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

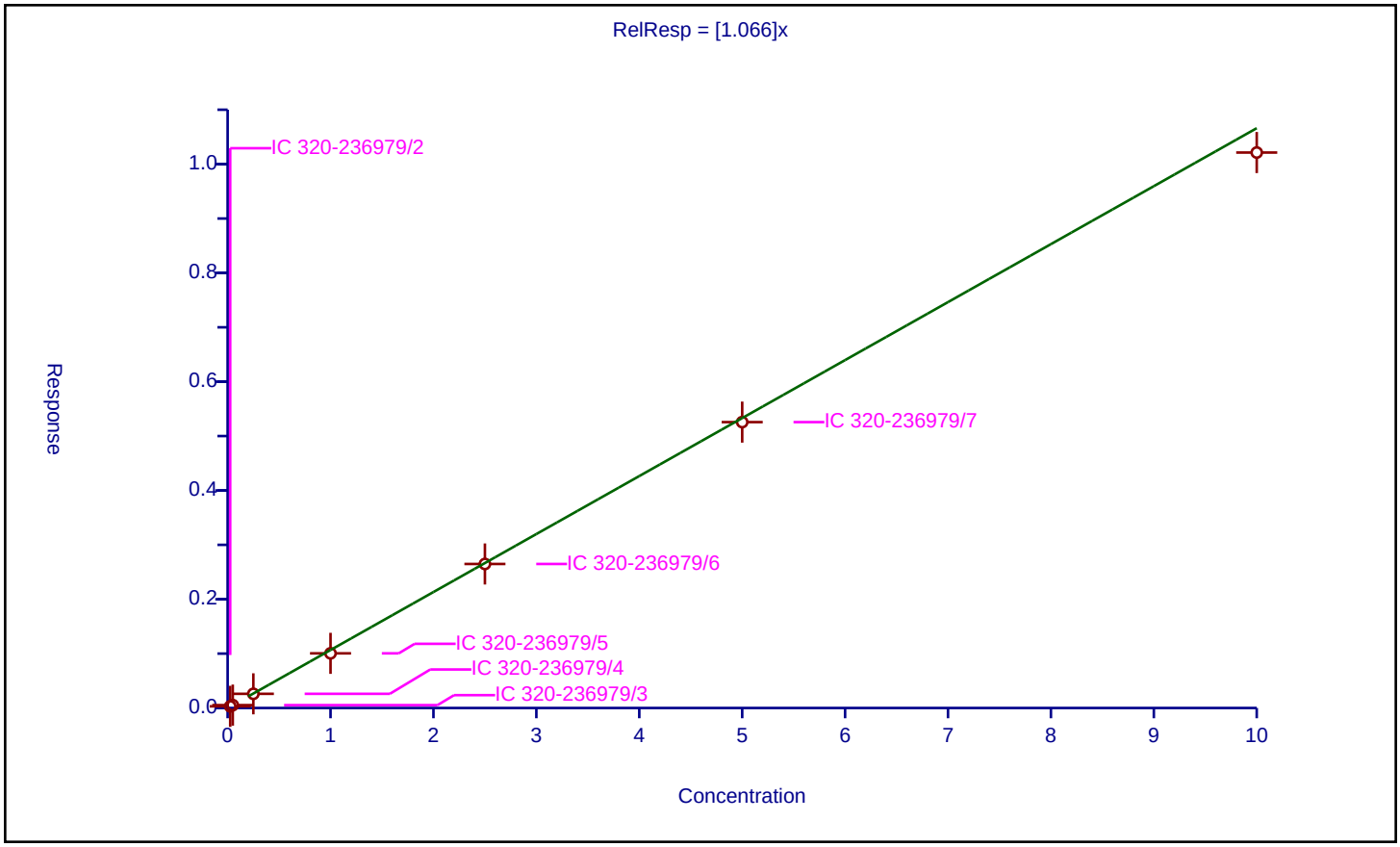
Curve Coefficients

Intercept:	0
Slope:	1.066

Error Coefficients

Standard Error:	6610000
Relative Standard Error:	6.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.030622	2.5	3323069.0	1.224892	Y
2	IC 320-236979/3	0.05	0.052918	2.5	3409586.0	1.058369	Y
3	IC 320-236979/4	0.25	0.260648	2.5	3627040.0	1.042594	Y
4	IC 320-236979/5	1.0	1.004921	2.5	3594130.0	1.004921	Y
5	IC 320-236979/6	2.5	2.648352	2.5	3384711.0	1.059341	Y
6	IC 320-236979/7	5.0	5.256299	2.5	3372366.0	1.05126	Y
7	IC 320-236979/8	10.0	10.213072	2.5	3435352.0	1.021307	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

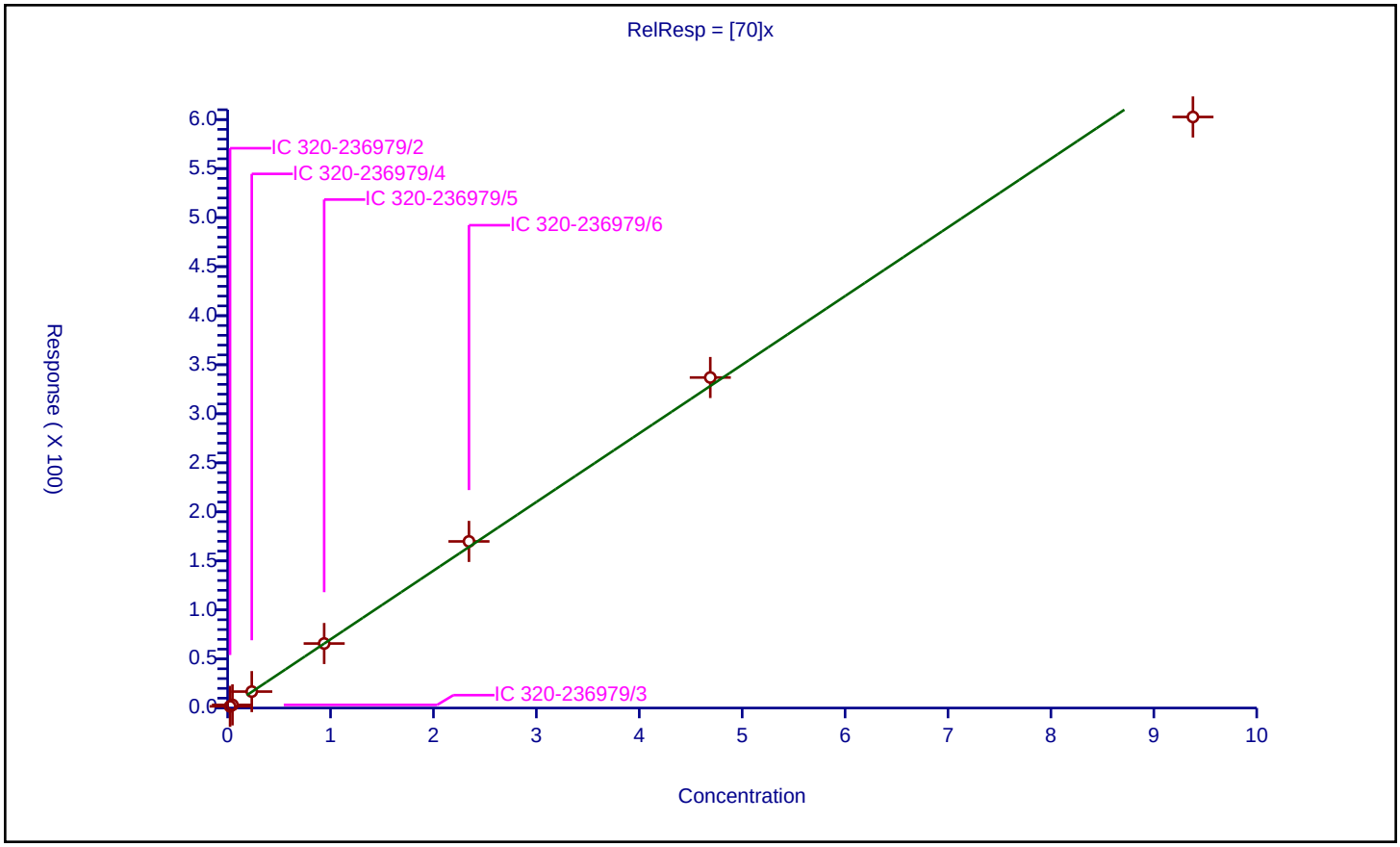
Curve Coefficients

Intercept:	0
Slope:	70

Error Coefficients

Standard Error:	10800000
Relative Standard Error:	4.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.02345	1.696455	2.325	81678.0	72.343483	Y
2	IC 320-236979/3	0.0469	3.175284	2.325	82622.0	67.703293	Y
3	IC 320-236979/4	0.2345	16.729833	2.325	84477.0	71.342573	Y
4	IC 320-236979/5	0.938	65.759153	2.325	83737.0	70.105707	Y
5	IC 320-236979/6	2.345	169.867991	2.325	82421.0	72.438376	Y
6	IC 320-236979/7	4.69	336.979981	2.325	84122.0	71.850742	Y
7	IC 320-236979/8	9.38	602.628843	2.325	87520.0	64.246145	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

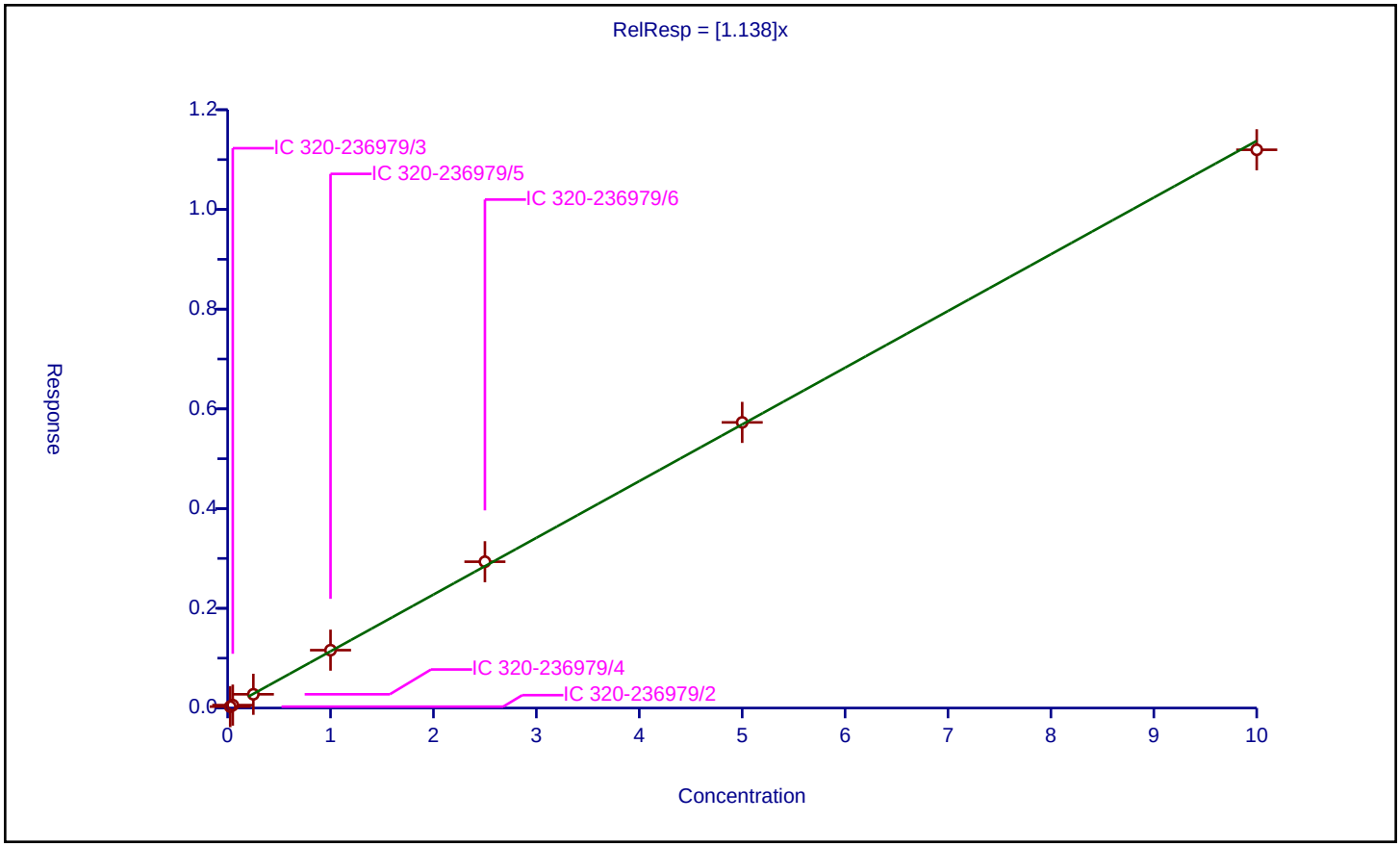
Curve Coefficients

Intercept:	0
Slope:	1.138

Error Coefficients

Standard Error:	6830000
Relative Standard Error:	2.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.02756	2.5	3232325.0	1.102395	Y
2	IC 320-236979/3	0.05	0.058033	2.5	3194241.0	1.160667	Y
3	IC 320-236979/4	0.25	0.275252	2.5	3409343.0	1.101007	Y
4	IC 320-236979/5	1.0	1.159942	2.5	3347957.0	1.159942	Y
5	IC 320-236979/6	2.5	2.934169	2.5	3318714.0	1.173668	Y
6	IC 320-236979/7	5.0	5.728818	2.5	3273830.0	1.145764	Y
7	IC 320-236979/8	10.0	11.197255	2.5	3202305.0	1.119725	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

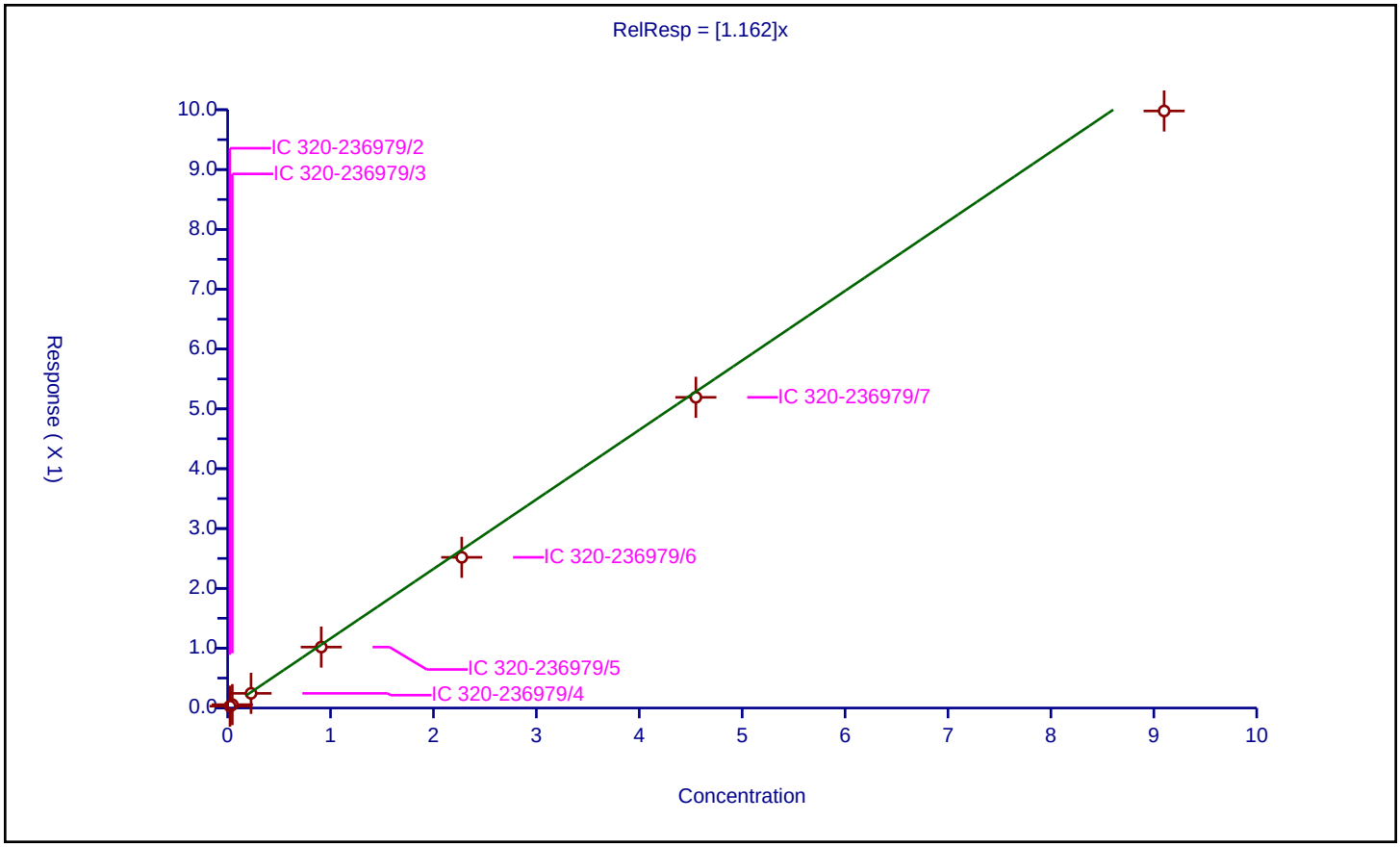
Curve Coefficients

Intercept:	0
Slope:	1.162

Error Coefficients

Standard Error:	9380000
Relative Standard Error:	8.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.02275	0.030701	2.365	4656503.0	1.349474	Y
2	IC 320-236979/3	0.0455	0.056607	2.365	4657860.0	1.244118	Y
3	IC 320-236979/4	0.2275	0.244955	2.365	4992768.0	1.076725	Y
4	IC 320-236979/5	0.91	1.018199	2.365	4661982.0	1.1189	Y
5	IC 320-236979/6	2.275	2.518566	2.365	4677090.0	1.107062	Y
6	IC 320-236979/7	4.55	5.192989	2.365	4680902.0	1.141316	Y
7	IC 320-236979/8	9.1	9.979189	2.365	4697586.0	1.096614	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

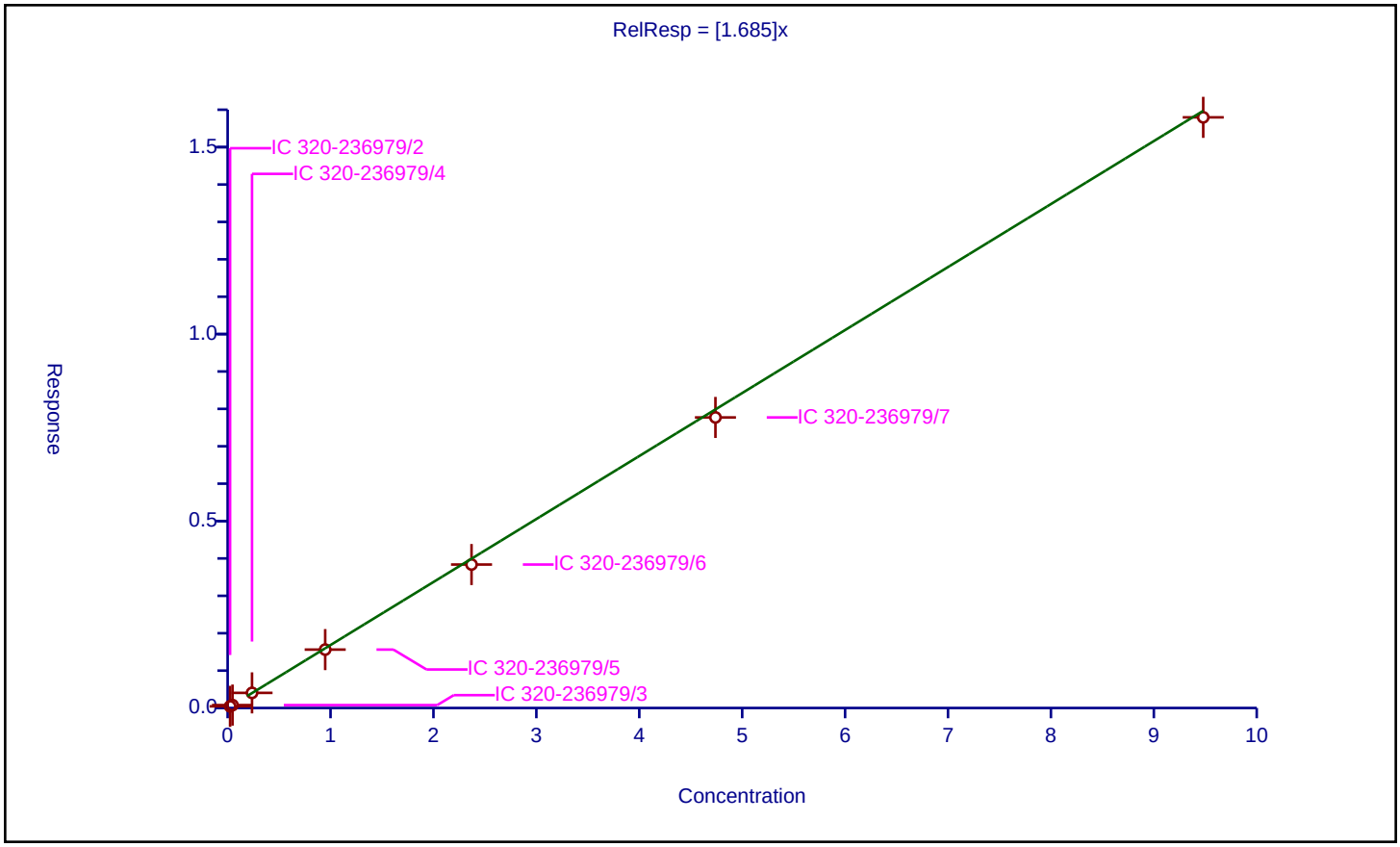
Curve Coefficients

Intercept:	0
Slope:	1.685

Error Coefficients

Standard Error:	2910000
Relative Standard Error:	5.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.0237	0.044476	2.375	955489.0	1.876604	Y
2	IC 320-236979/3	0.0474	0.077643	2.375	950264.0	1.638047	Y
3	IC 320-236979/4	0.237	0.404345	2.375	1018721.0	1.706099	Y
4	IC 320-236979/5	0.948	1.561659	2.375	1012278.0	1.64732	Y
5	IC 320-236979/6	2.37	3.83694	2.375	1010664.0	1.618962	Y
6	IC 320-236979/7	4.74	7.770813	2.375	969384.0	1.639412	Y
7	IC 320-236979/8	9.48	15.79652	2.375	923131.0	1.6663	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

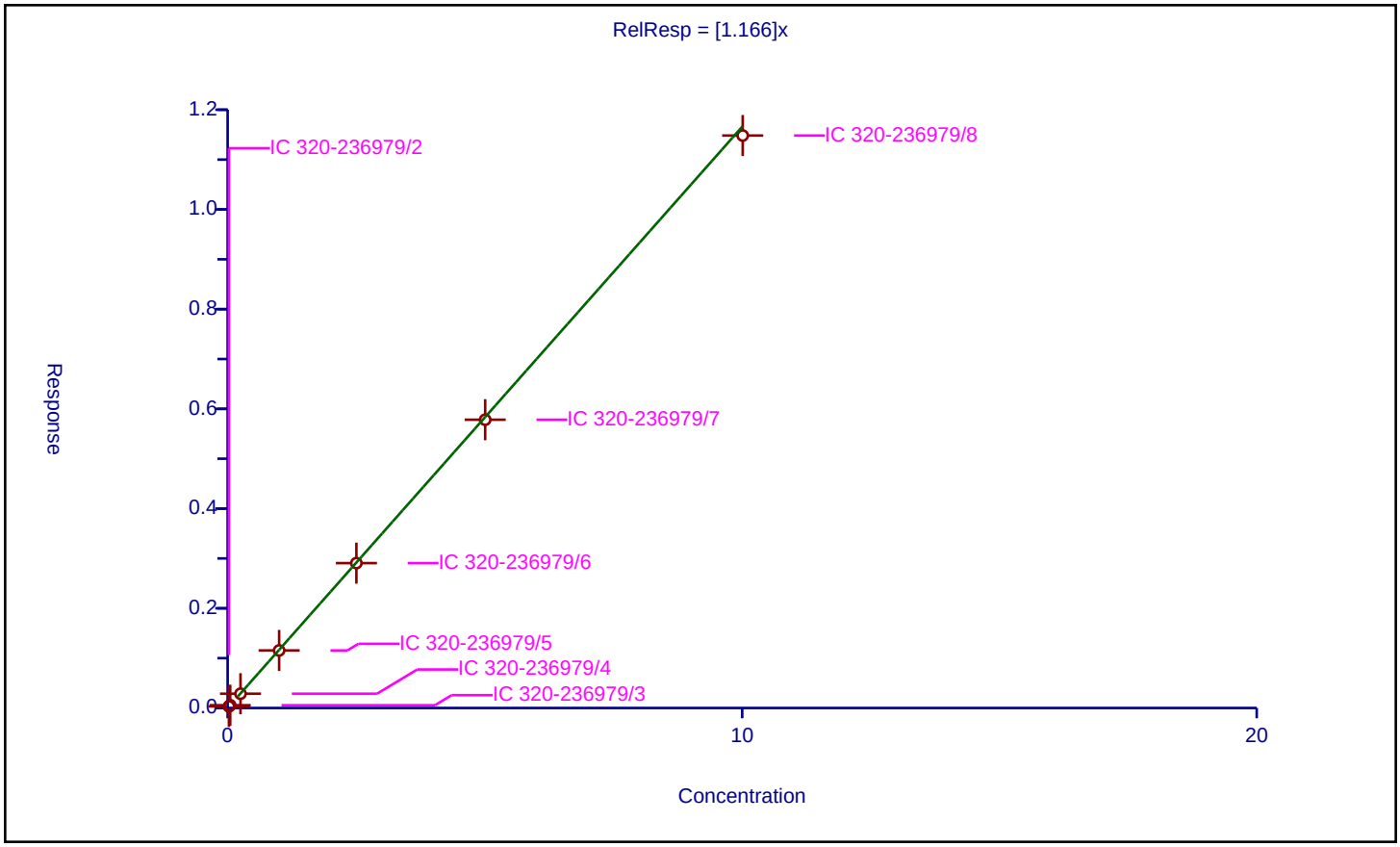
Curve Coefficients

Intercept:	0
Slope:	1.166

Error Coefficients

Standard Error:	6900000
Relative Standard Error:	4.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025025	0.03203	2.5	3408890.0	1.279929	Y
2	IC 320-236979/3	0.05005	0.056047	2.5	3305995.0	1.119814	Y
3	IC 320-236979/4	0.25025	0.286421	2.5	3517779.0	1.144539	Y
4	IC 320-236979/5	1.001	1.154381	2.5	3420467.0	1.153228	Y
5	IC 320-236979/6	2.5025	2.906101	2.5	3371225.0	1.161279	Y
6	IC 320-236979/7	5.005	5.782058	2.5	3310554.0	1.155256	Y
7	IC 320-236979/8	10.01	11.482123	2.5	3144812.0	1.147065	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

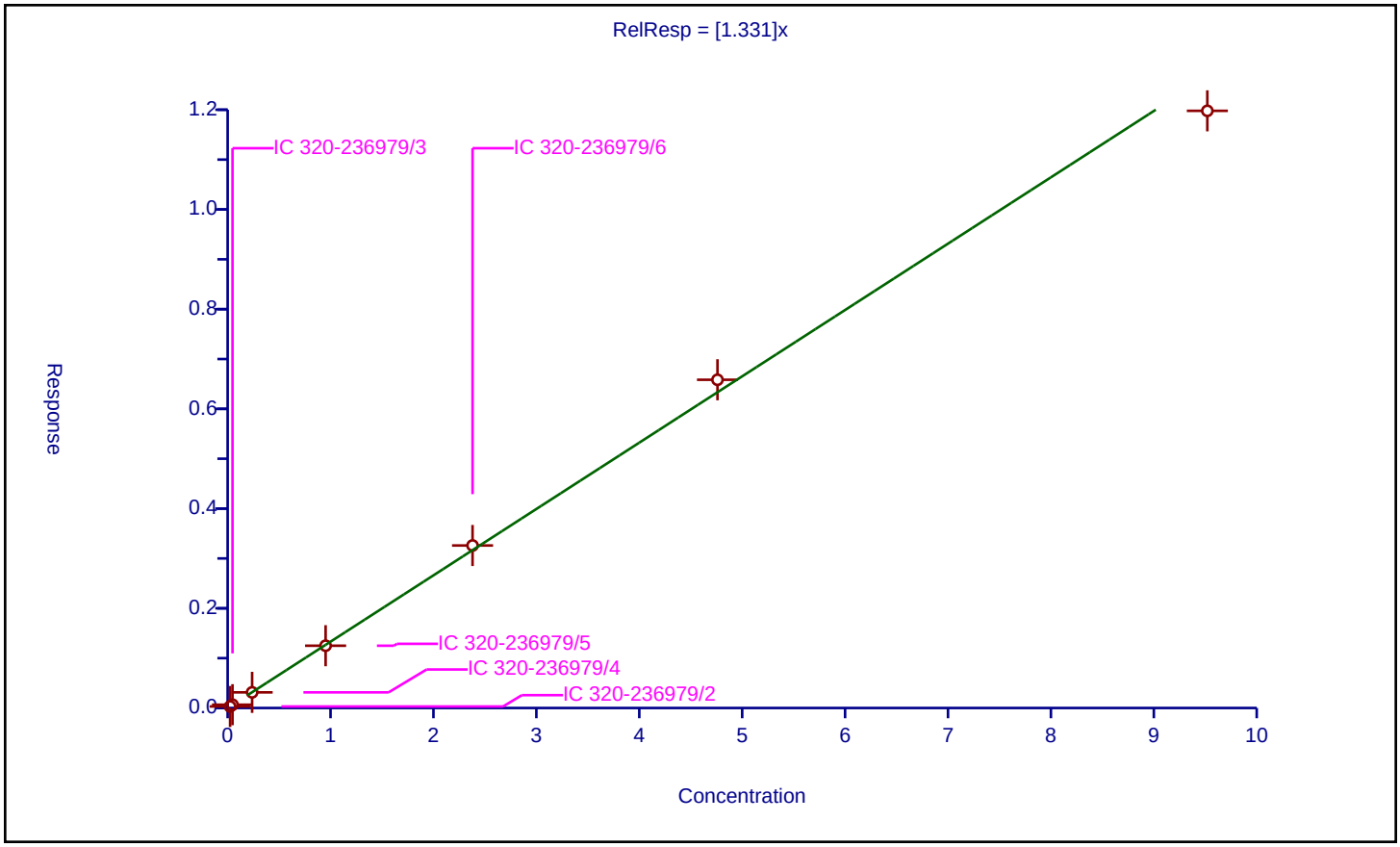
Curve Coefficients

Intercept:	0
Slope:	1.331

Error Coefficients

Standard Error:	8220000
Relative Standard Error:	3.8
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.0238	0.030545	2.39	3367548.0	1.283422	Y
2	IC 320-236979/3	0.0476	0.066093	2.39	3390963.0	1.388499	Y
3	IC 320-236979/4	0.238	0.313827	2.39	3553019.0	1.3186	Y
4	IC 320-236979/5	0.952	1.249465	2.39	3494855.0	1.312463	Y
5	IC 320-236979/6	2.38	3.259581	2.39	3343827.0	1.369572	Y
6	IC 320-236979/7	4.76	6.58378	2.39	3396258.0	1.383147	Y
7	IC 320-236979/8	9.52	11.977961	2.39	3418135.0	1.258189	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

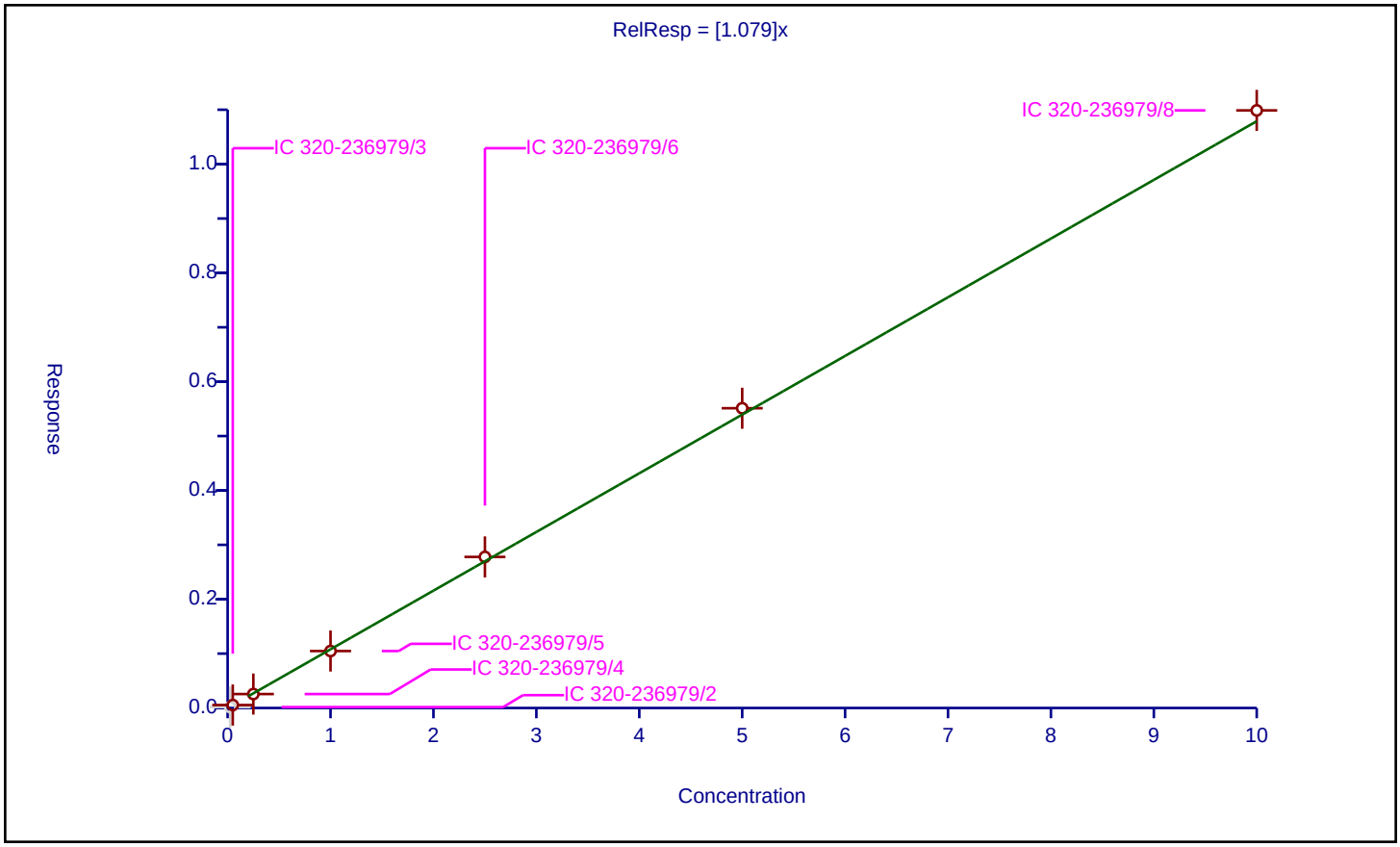
Curve Coefficients

Intercept:	0
Slope:	1.079

Error Coefficients

Standard Error:	6310000
Relative Standard Error:	3.2
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.016817	2.5	2968355.0	0.672662	N
2	IC 320-236979/3	0.05	0.05437	2.5	2988238.0	1.087397	Y
3	IC 320-236979/4	0.25	0.256494	2.5	3191026.0	1.025977	Y
4	IC 320-236979/5	1.0	1.047445	2.5	3038962.0	1.047445	Y
5	IC 320-236979/6	2.5	2.778051	2.5	2933744.0	1.11122	Y
6	IC 320-236979/7	5.0	5.511943	2.5	2882269.0	1.102389	Y
7	IC 320-236979/8	10.0	10.987887	2.5	2754672.0	1.098789	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

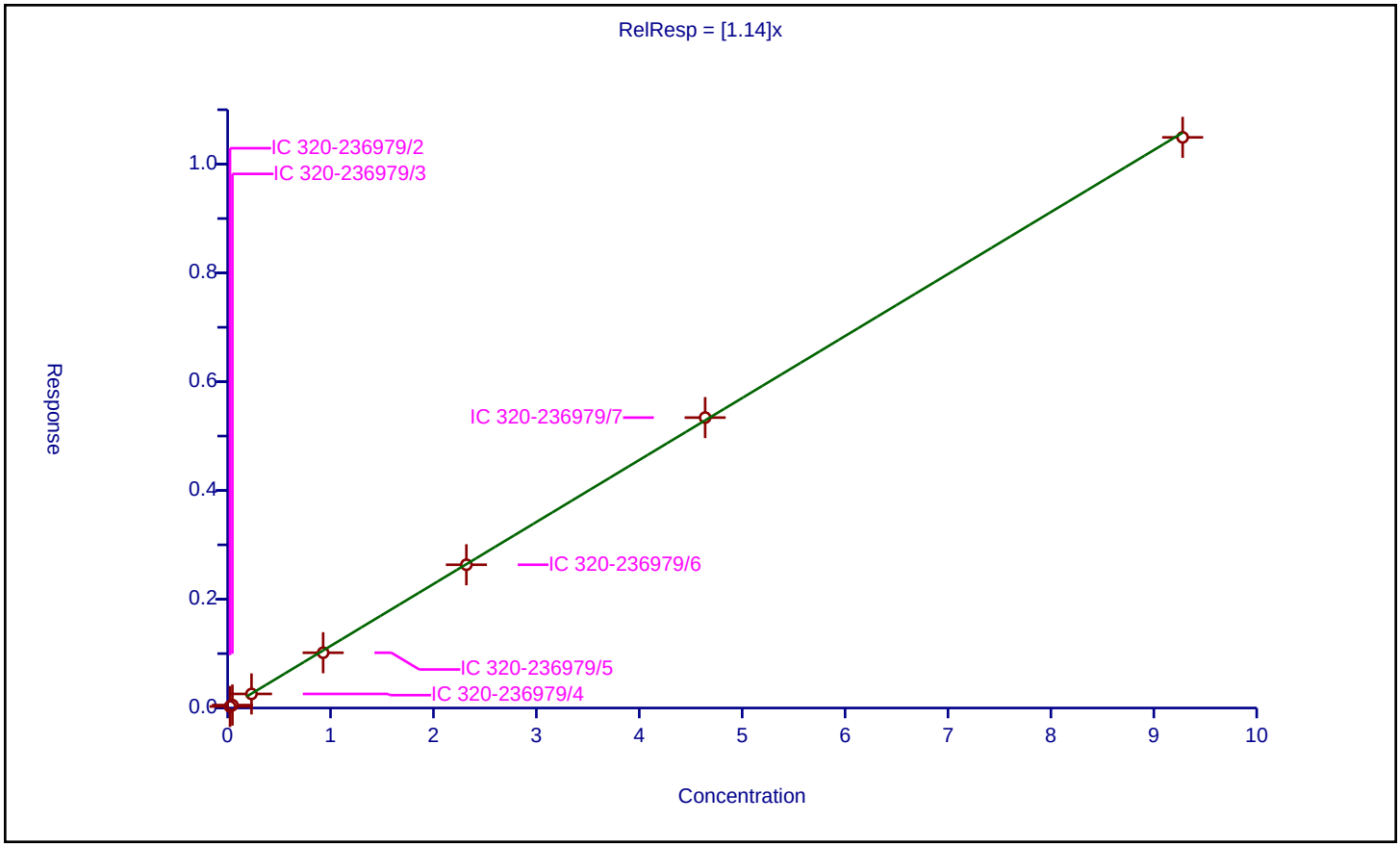
Curve Coefficients

Intercept:	0
Slope:	1.14

Error Coefficients

Standard Error:	7060000
Relative Standard Error:	2.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.0232	0.027624	2.39	3367548.0	1.1907	Y
2	IC 320-236979/3	0.0464	0.053875	2.39	3390963.0	1.161106	Y
3	IC 320-236979/4	0.232	0.258791	2.39	3553019.0	1.115477	Y
4	IC 320-236979/5	0.928	1.016114	2.39	3494855.0	1.094951	Y
5	IC 320-236979/6	2.32	2.634066	2.39	3343827.0	1.135373	Y
6	IC 320-236979/7	4.64	5.339485	2.39	3396258.0	1.150751	Y
7	IC 320-236979/8	9.28	10.491886	2.39	3418135.0	1.130591	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

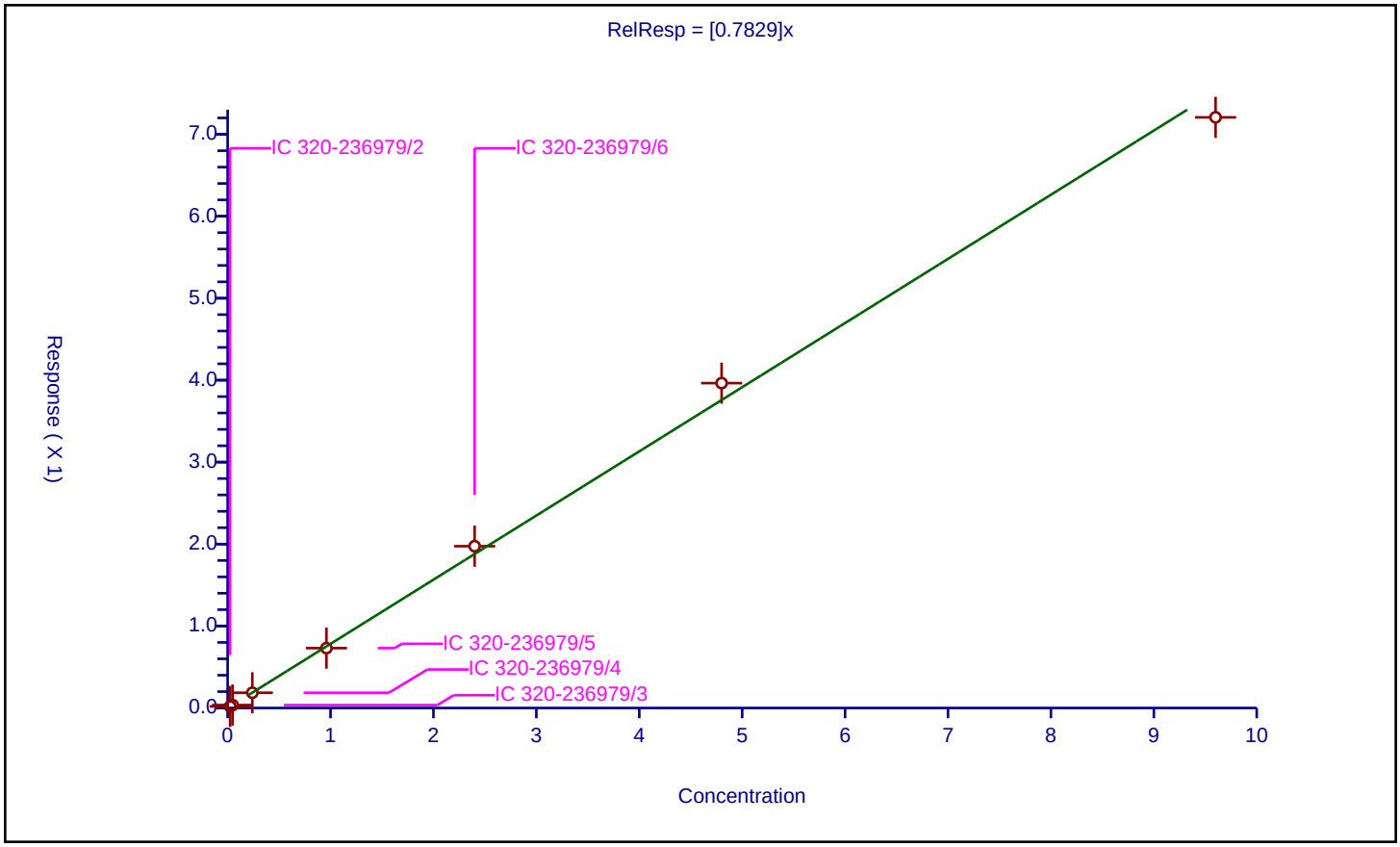
Curve Coefficients

Intercept:	0
Slope:	0.7829

Error Coefficients

Standard Error:	4950000
Relative Standard Error:	4.3
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.024	0.019196	2.39	3367548.0	0.799849	Y
2	IC 320-236979/3	0.048	0.035712	2.39	3390963.0	0.744005	Y
3	IC 320-236979/4	0.24	0.186224	2.39	3553019.0	0.775933	Y
4	IC 320-236979/5	0.96	0.730609	2.39	3494855.0	0.761051	Y
5	IC 320-236979/6	2.4	1.974357	2.39	3343827.0	0.822649	Y
6	IC 320-236979/7	4.8	3.964129	2.39	3396258.0	0.82586	Y
7	IC 320-236979/8	9.6	7.207218	2.39	3418135.0	0.750752	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

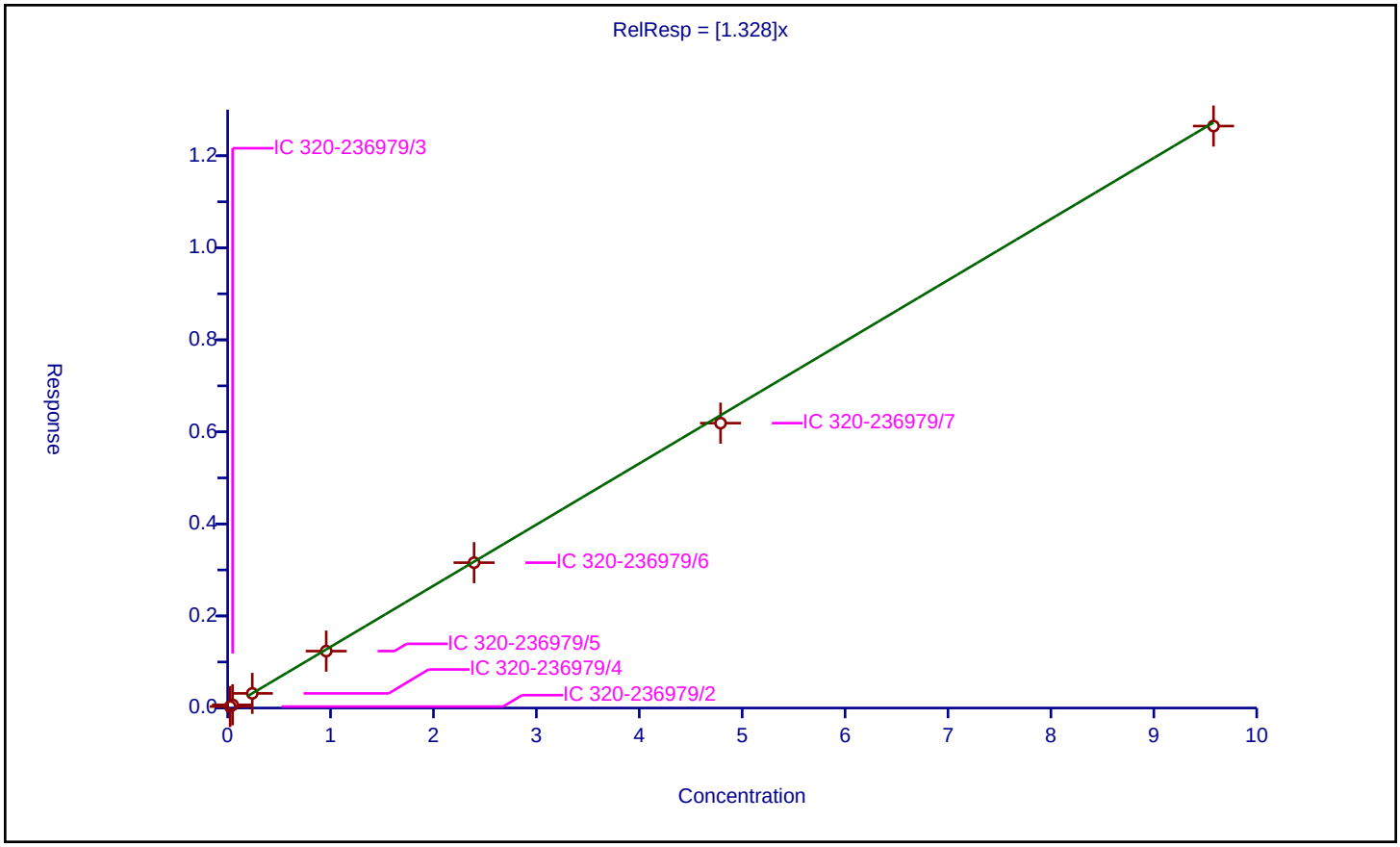
Curve Coefficients

Intercept:	0
Slope:	1.328

Error Coefficients

Standard Error:	2470000
Relative Standard Error:	3.9
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.02395	0.031327	2.395	1181950.0	1.308008	Y
2	IC 320-236979/3	0.0479	0.069035	2.395	1168521.0	1.441224	Y
3	IC 320-236979/4	0.2395	0.317532	2.395	1188736.0	1.325812	Y
4	IC 320-236979/5	0.958	1.236079	2.395	1218683.0	1.29027	Y
5	IC 320-236979/6	2.395	3.158007	2.395	1127285.0	1.318583	Y
6	IC 320-236979/7	4.79	6.189947	2.395	1102975.0	1.292265	Y
7	IC 320-236979/8	9.58	12.645441	2.395	964489.0	1.319983	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

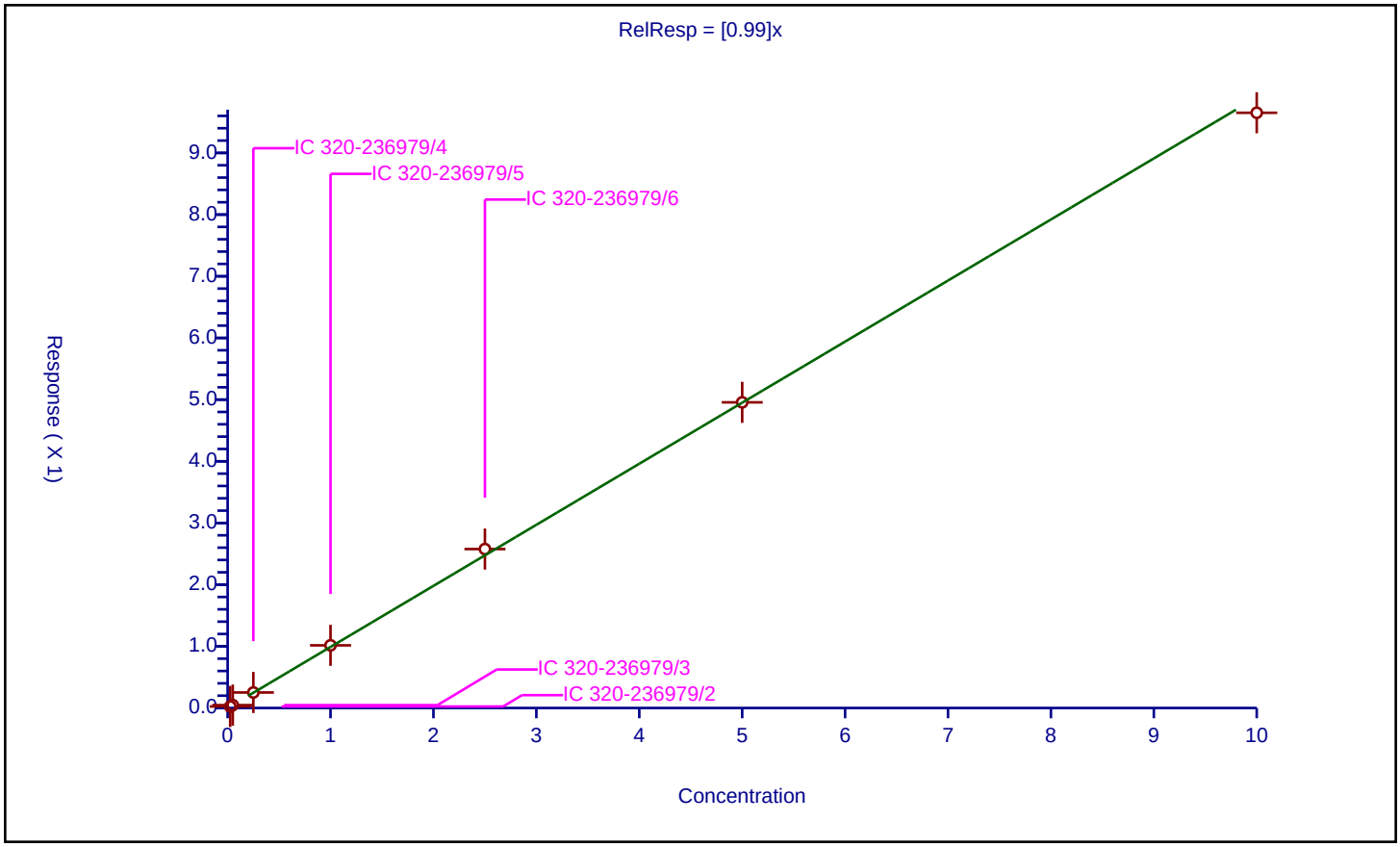
Curve Coefficients

Intercept:	0
Slope:	0.99

Error Coefficients

Standard Error:	8790000
Relative Standard Error:	3.3
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.024671	2.5	5127553.0	0.986825	Y
2	IC 320-236979/3	0.05	0.046672	2.5	5065365.0	0.933447	Y
3	IC 320-236979/4	0.25	0.251684	2.5	5354746.0	1.006737	Y
4	IC 320-236979/5	1.0	1.016193	2.5	5252242.0	1.016193	Y
5	IC 320-236979/6	2.5	2.577167	2.5	5199703.0	1.030867	Y
6	IC 320-236979/7	5.0	4.955611	2.5	5118898.0	0.991122	Y
7	IC 320-236979/8	10.0	9.650879	2.5	4683099.0	0.965088	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

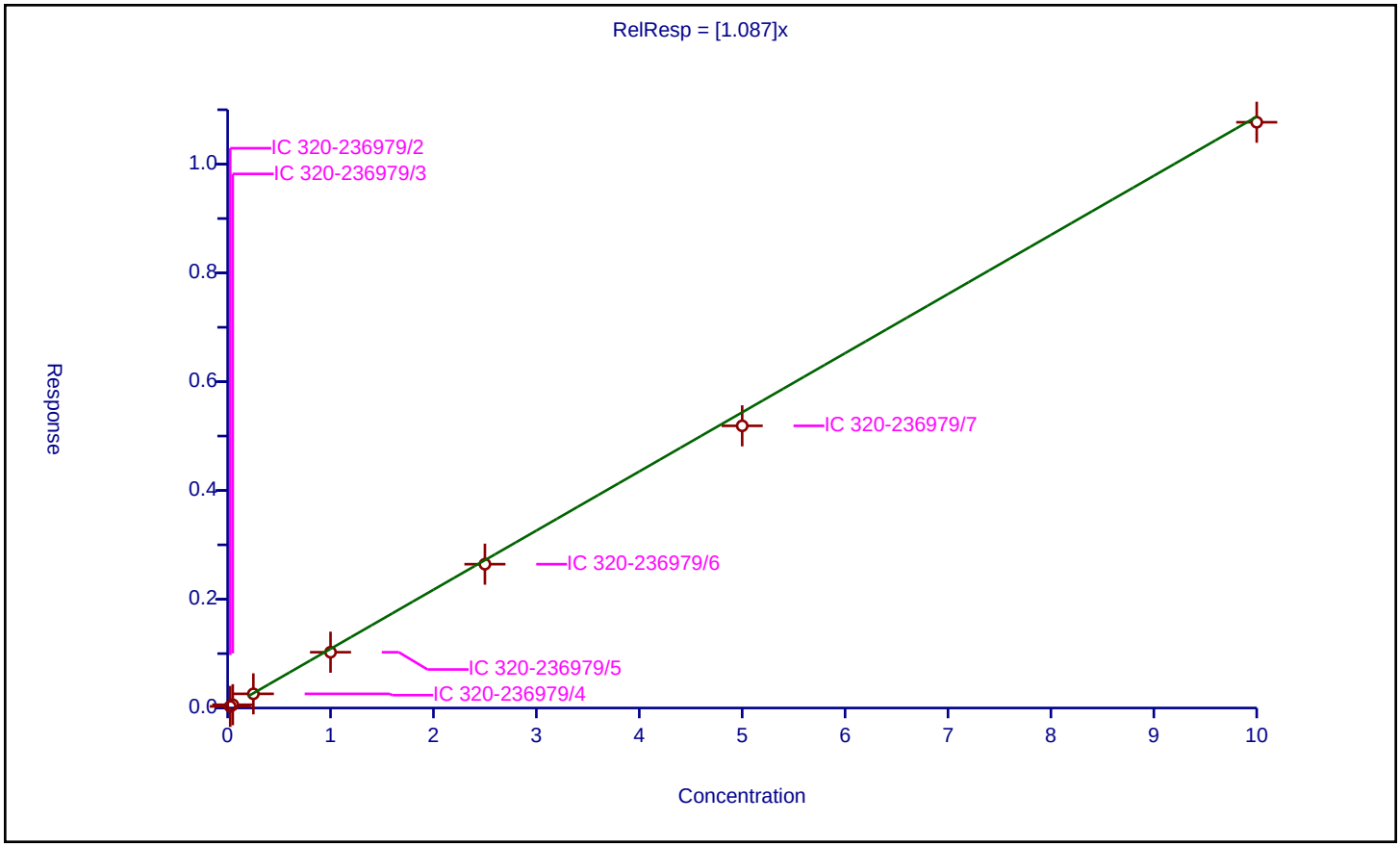
Curve Coefficients

Intercept:	0
Slope:	1.087

Error Coefficients

Standard Error:	4410000
Relative Standard Error:	6.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.029233	2.5	2698620.0	1.169301	Y
2	IC 320-236979/3	0.05	0.060115	2.5	2547441.0	1.202305	Y
3	IC 320-236979/4	0.25	0.260353	2.5	2580166.0	1.041414	Y
4	IC 320-236979/5	1.0	1.025603	2.5	2422600.0	1.025603	Y
5	IC 320-236979/6	2.5	2.644519	2.5	2425320.0	1.057808	Y
6	IC 320-236979/7	5.0	5.187904	2.5	2369147.0	1.037581	Y
7	IC 320-236979/8	10.0	10.770167	2.5	2140731.0	1.077017	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

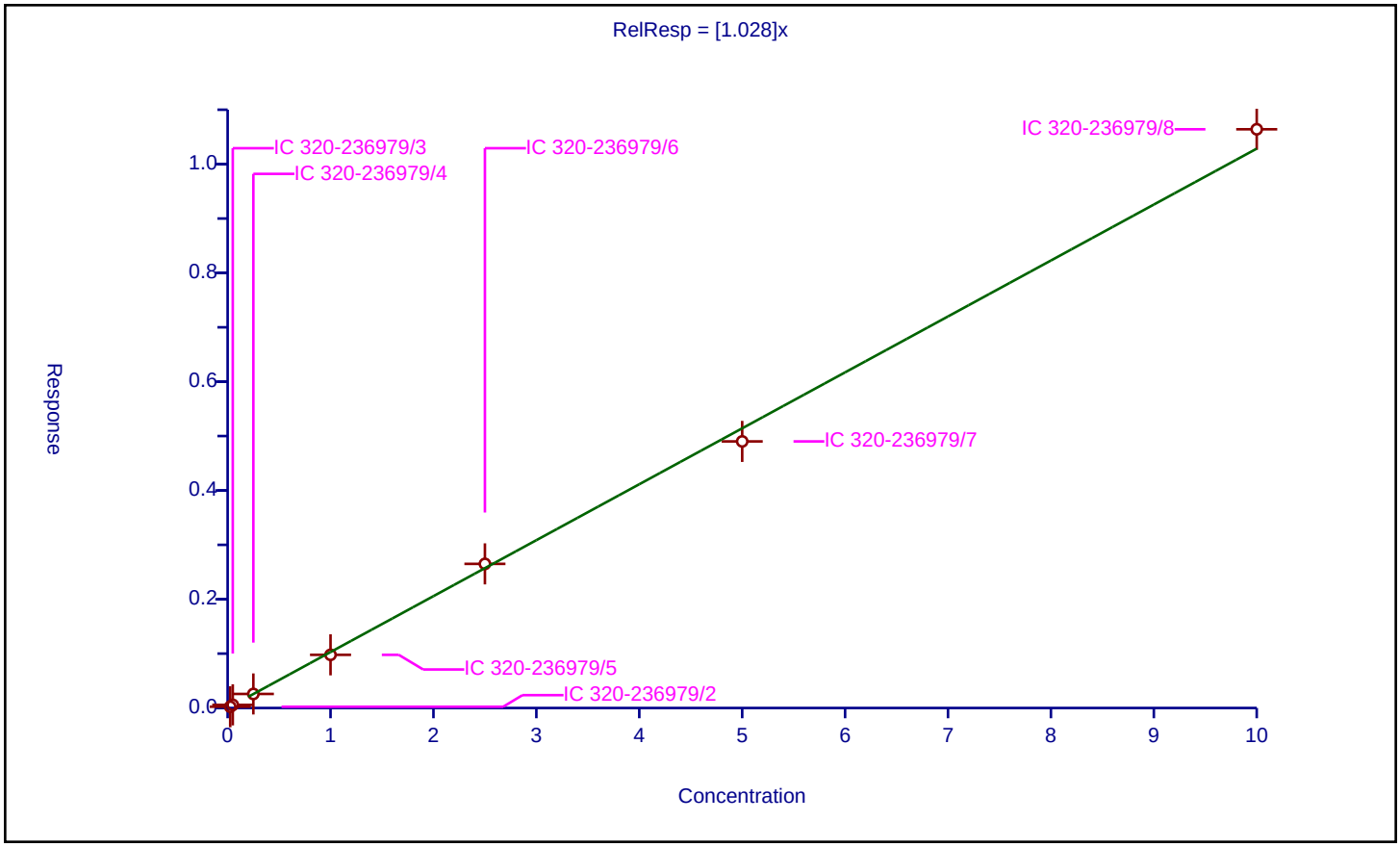
Curve Coefficients

Intercept:	0
Slope:	1.028

Error Coefficients

Standard Error:	1130000
Relative Standard Error:	7.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.023142	2.5	564460.0	0.925663	Y
2	IC 320-236979/3	0.05	0.057941	2.5	520959.0	1.158824	Y
3	IC 320-236979/4	0.25	0.258219	2.5	561654.0	1.032878	Y
4	IC 320-236979/5	1.0	0.977561	2.5	558924.0	0.977561	Y
5	IC 320-236979/6	2.5	2.650222	2.5	515038.0	1.060089	Y
6	IC 320-236979/7	5.0	4.901656	2.5	586561.0	0.980331	Y
7	IC 320-236979/8	10.0	10.640582	2.5	572690.0	1.064058	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

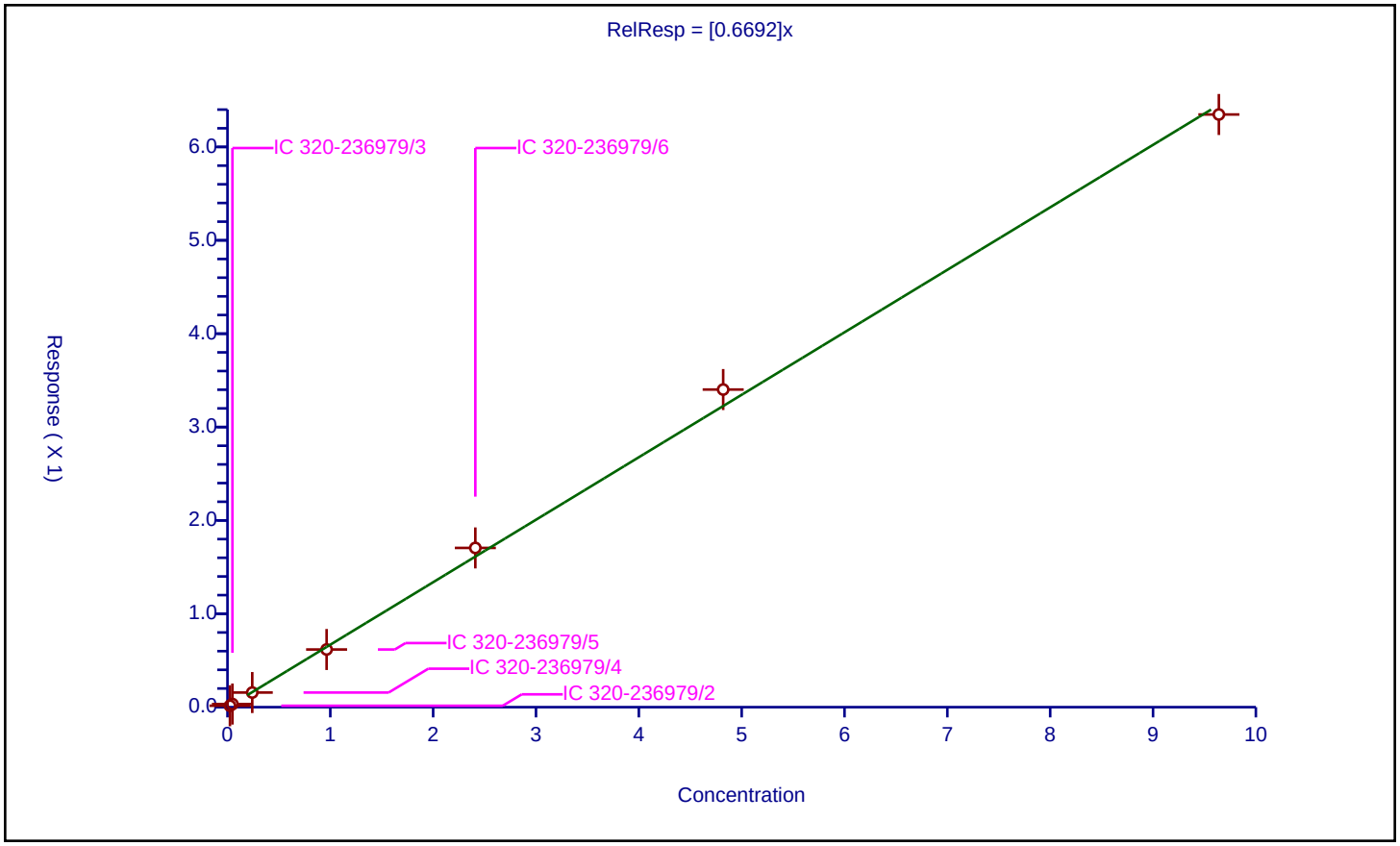
Curve Coefficients

Intercept:	0
Slope:	0.6692

Error Coefficients

Standard Error:	4330000
Relative Standard Error:	4.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.0241	0.015138	2.39	3367548.0	0.628142	Y
2	IC 320-236979/3	0.0482	0.033431	2.39	3390963.0	0.693599	Y
3	IC 320-236979/4	0.241	0.156587	2.39	3553019.0	0.649738	Y
4	IC 320-236979/5	0.964	0.617617	2.39	3494855.0	0.640681	Y
5	IC 320-236979/6	2.41	1.705601	2.39	3343827.0	0.707718	Y
6	IC 320-236979/7	4.82	3.401684	2.39	3396258.0	0.705744	Y
7	IC 320-236979/8	9.64	6.347682	2.39	3418135.0	0.658473	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

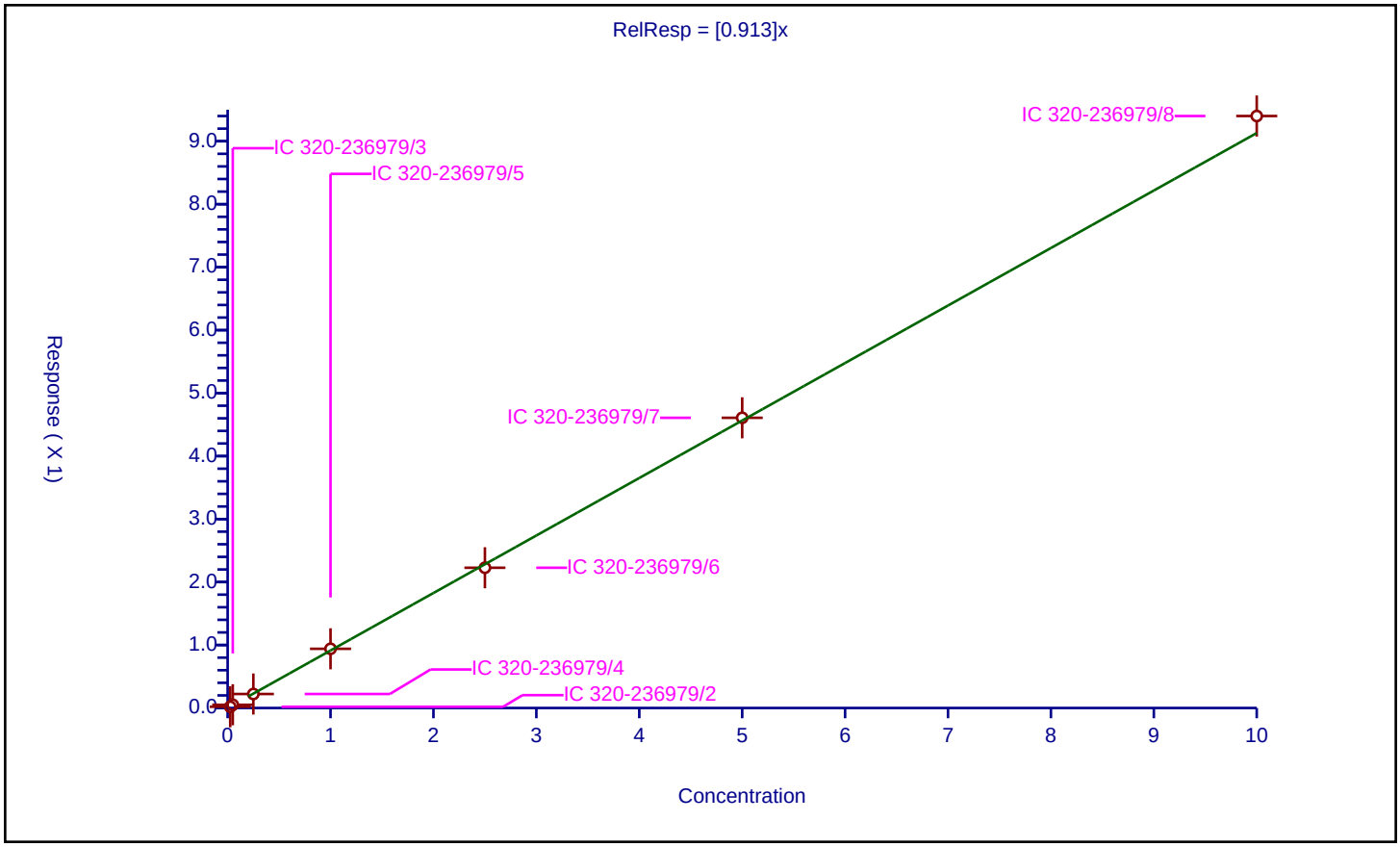
Curve Coefficients

Intercept:	0
Slope:	0.913

Error Coefficients

Standard Error:	1010000
Relative Standard Error:	7.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.01964	2.5	658589.0	0.785619	Y
2	IC 320-236979/3	0.05	0.051158	2.5	598786.0	1.023154	Y
3	IC 320-236979/4	0.25	0.222443	2.5	625902.0	0.889772	Y
4	IC 320-236979/5	1.0	0.939977	2.5	610220.0	0.939977	Y
5	IC 320-236979/6	2.5	2.227111	2.5	599108.0	0.890844	Y
6	IC 320-236979/7	5.0	4.608287	2.5	582129.0	0.921657	Y
7	IC 320-236979/8	10.0	9.400302	2.5	573455.0	0.94003	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

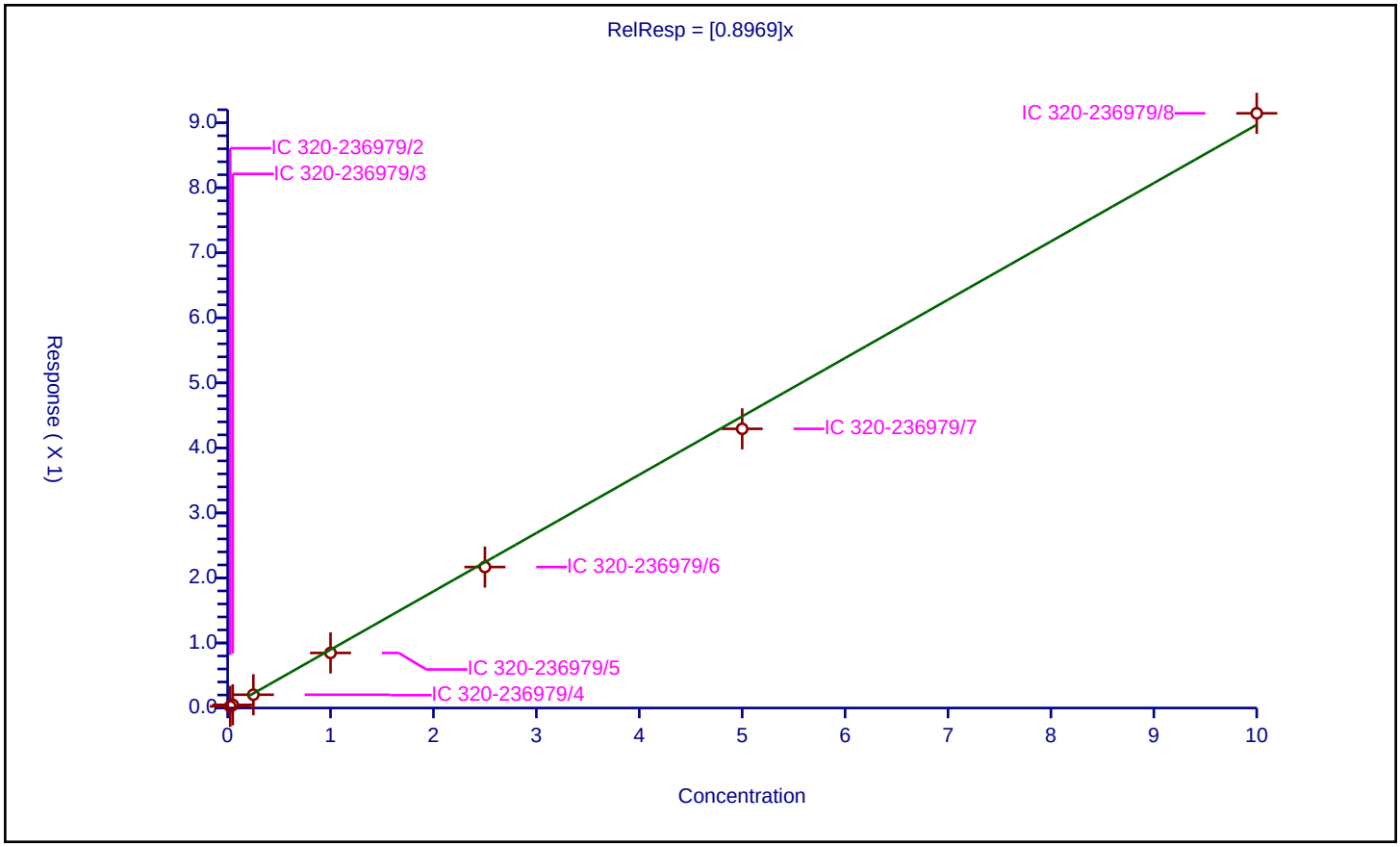
Curve Coefficients

Intercept:	0
Slope:	0.8969

Error Coefficients

Standard Error:	3020000
Relative Standard Error:	7.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.024897	2.5	1956846.0	0.995888	Y
2	IC 320-236979/3	0.05	0.048894	2.5	1910475.0	0.977872	Y
3	IC 320-236979/4	0.25	0.204355	2.5	1955397.0	0.81742	Y
4	IC 320-236979/5	1.0	0.846881	2.5	1923975.0	0.846881	Y
5	IC 320-236979/6	2.5	2.167843	2.5	1982699.0	0.867137	Y
6	IC 320-236979/7	5.0	4.2929	2.5	1863275.0	0.85858	Y
7	IC 320-236979/8	10.0	9.144964	2.5	1751167.0	0.914496	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

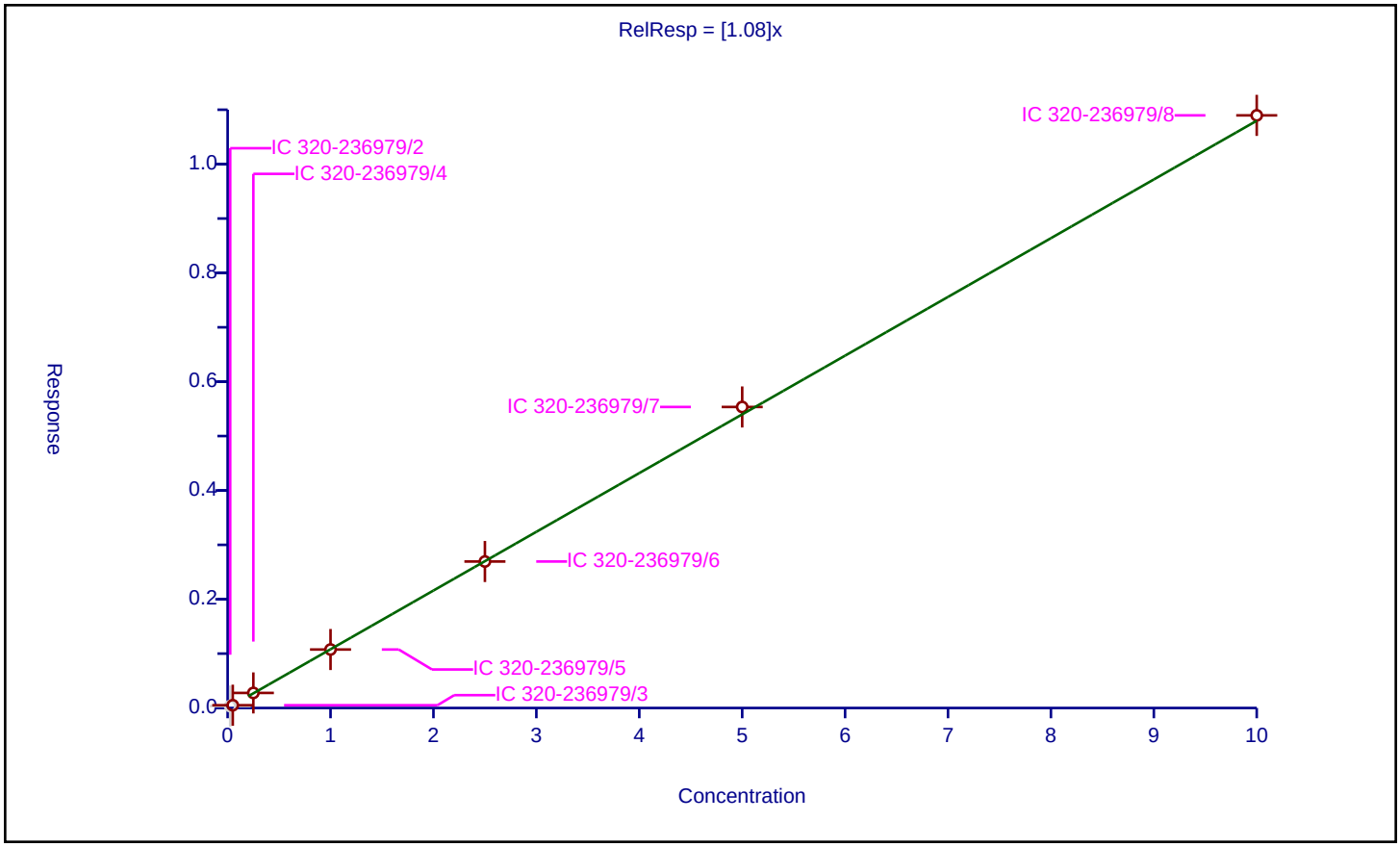
Curve Coefficients

Intercept:	0
Slope:	1.08

Error Coefficients

Standard Error:	4240000
Relative Standard Error:	3.0
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.035535	2.5	1971714.0	1.421403	N
2	IC 320-236979/3	0.05	0.050998	2.5	1909051.0	1.019957	Y
3	IC 320-236979/4	0.25	0.277381	2.5	1968835.0	1.109524	Y
4	IC 320-236979/5	1.0	1.075262	2.5	1974249.0	1.075262	Y
5	IC 320-236979/6	2.5	2.693284	2.5	1915610.0	1.077314	Y
6	IC 320-236979/7	5.0	5.53492	2.5	1925682.0	1.106984	Y
7	IC 320-236979/8	10.0	10.896337	2.5	1871344.0	1.089634	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

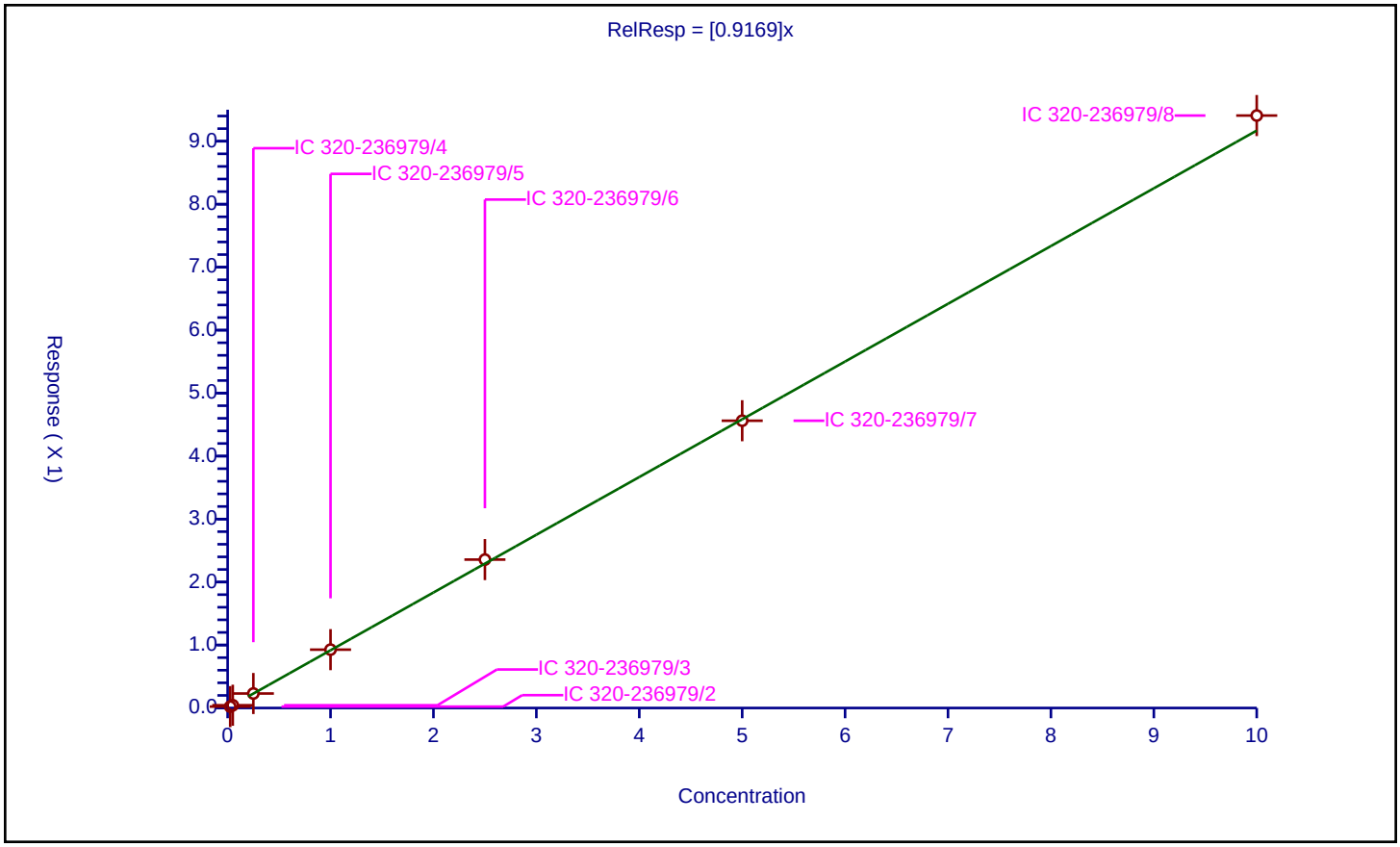
Curve Coefficients

Intercept:	0
Slope:	0.9169

Error Coefficients

Standard Error:	3310000
Relative Standard Error:	2.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.022402	2.5	1971714.0	0.896073	Y
2	IC 320-236979/3	0.05	0.043975	2.5	1909051.0	0.879495	Y
3	IC 320-236979/4	0.25	0.230116	2.5	1968835.0	0.920463	Y
4	IC 320-236979/5	1.0	0.926625	2.5	1974249.0	0.926625	Y
5	IC 320-236979/6	2.5	2.356577	2.5	1915610.0	0.942631	Y
6	IC 320-236979/7	5.0	4.56174	2.5	1925682.0	0.912348	Y
7	IC 320-236979/8	10.0	9.407807	2.5	1871344.0	0.940781	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

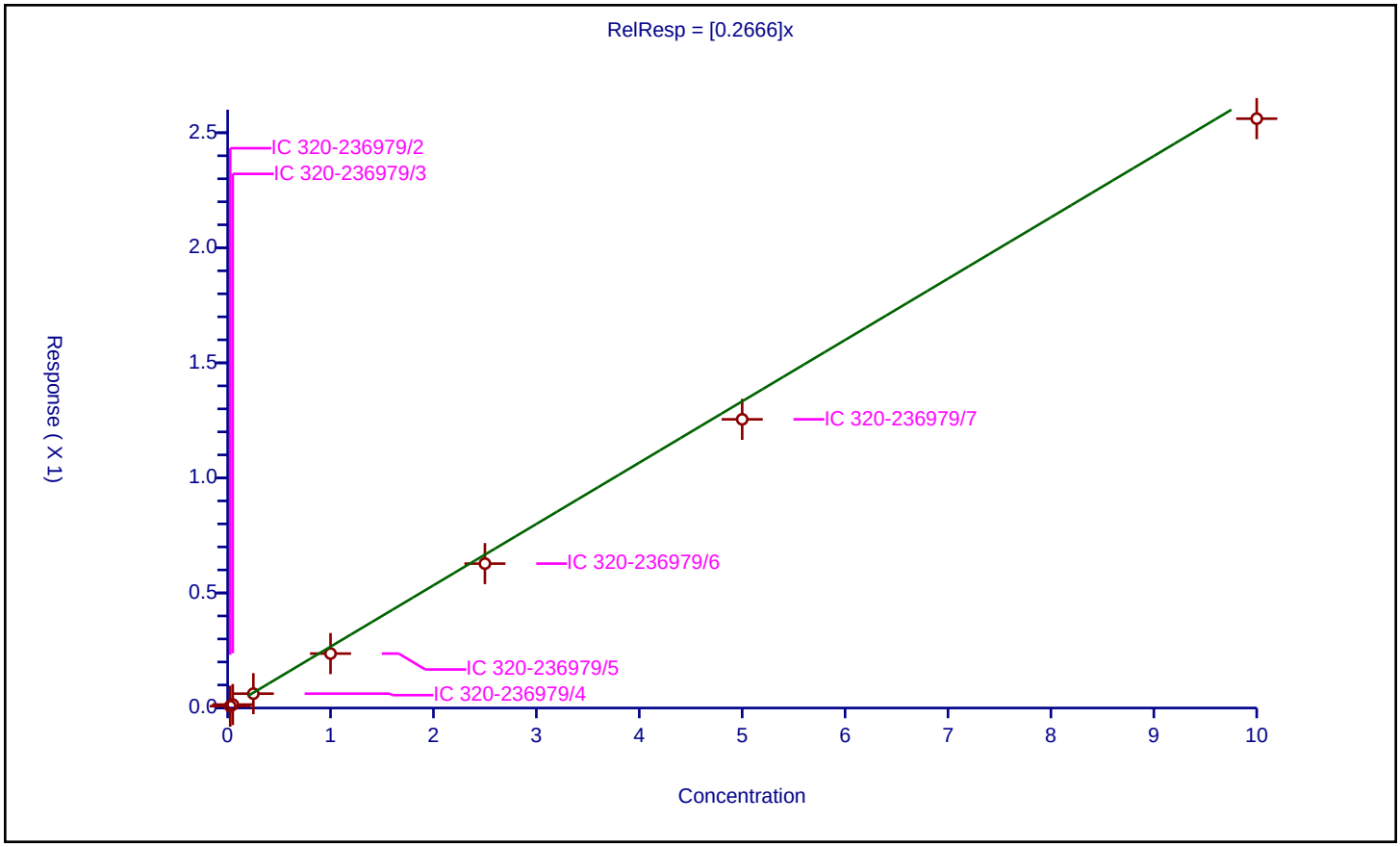
Curve Coefficients

Intercept:	0
Slope:	0.2666

Error Coefficients

Standard Error:	815000
Relative Standard Error:	11.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.980

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-236979/2	0.025	0.00803	2.5	1753145.0	0.321194	Y
2	IC 320-236979/3	0.05	0.015054	2.5	1676468.0	0.301079	Y
3	IC 320-236979/4	0.25	0.062273	2.5	1917316.0	0.249093	Y
4	IC 320-236979/5	1.0	0.236486	2.5	1856897.0	0.236486	Y
5	IC 320-236979/6	2.5	0.627514	2.5	1729327.0	0.251006	Y
6	IC 320-236979/7	5.0	1.254517	2.5	1710393.0	0.250903	Y
7	IC 320-236979/8	10.0	2.561203	2.5	1699348.0	0.25612	Y



FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237402/2	2018.08.01LLICAL_002.d
Level 2	IC 320-237402/3	2018.08.01LLICAL_003.d
Level 3	IC 320-237402/4	2018.08.01LLICAL_004.d
Level 4	IC 320-237402/5	2018.08.01LLICAL_005.d
Level 5	IC 320-237402/6	2018.08.01LLICAL_006.d
Level 6	IC 320-237402/7	2018.08.01LLICAL_007.d
Level 7	IC 320-237402/8	2018.08.01LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.0341 0.9972	0.9799 0.9834	0.9577	0.9623	0.9835	AveID		0.9855				2.6		20.0			
Perfluoropentanoic acid (PFPeA)	1.2135 1.1977	1.2772 1.1997	1.1732	1.1396	1.1803	AveID		1.1973				3.6		20.0			
Perfluorobutanesulfonic acid (PFBS)	77.861 76.922	76.347 73.670	75.500	78.075	78.162	AveID		76.648				2.1		20.0			
4:2 FTS	17.009 16.910	17.314 16.211	17.766	18.555	16.706	AveID		17.210				4.4		20.0			
Perfluorohexanoic acid (PFHxA)	1.0349 1.0545	1.1276 1.0819	1.0073	1.0407	1.0350	AveID		1.0546				3.7		20.0			
Perfluoropentanesulfonic acid	66.118 68.869	66.515 66.804	66.603	69.820	68.852	AveID		67.654				2.2		20.0			
Perfluoroheptanoic acid (PFHpA)	1.2256 1.1650	1.1159 1.1495	1.1723	1.1813	1.1078	AveID		1.1596				3.5		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3789 1.1090	1.2306 1.0783	1.0904	1.0665	1.1383	AveID		1.1560				9.7		20.0			
6:2 FTS	1.6086 1.6432	1.6820 1.7048	1.6109	1.7076	1.6188	AveID		1.6537				2.6		20.0			
Perfluorooctanoic acid (PFOA)	1.1936 1.1841	1.1205 1.1606	1.1342	1.1315	1.1689	AveID		1.1562				2.4		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.4367 1.4256	1.4491 1.3190	1.2931	1.3270	1.4260	AveID		1.3824				4.8		20.0			
Perfluorononanoic acid (PFNA)	1.0260 1.1092	1.1173 1.1233	1.0184	1.0806	1.0842	AveID		1.0799				3.9		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.2316 1.1195	1.1413 1.1217	1.0371	1.0748	1.1325	AveID		1.1226				5.4		20.0			
8:2 FTS	1.3856 1.3517	1.4103 1.3057	1.3830	1.3210	1.3008	AveID		1.3511				3.2		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorononanesulfonic acid	0.6692 0.7668	0.7515 0.7224	0.6529	0.7198	0.7484	AveID		0.7187				6.0		20.0			
Perfluorodecanoic acid (PFDA)	1.1200 1.0213	1.0789 1.0702	1.0909	1.0386	1.0518	AveID		1.0674				3.1		20.0			
Perfluorooctane Sulfonamide (PFOSA)	0.9853 0.9975	0.9675 0.9764	0.9700	1.0090	1.0037	AveID		0.9871				1.7		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.0296 0.9833	1.1040 1.0283	0.9606	1.0149	0.9958	AveID		1.0166				4.5		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6182 0.6700	0.6918 0.6365	0.6465	0.6174	0.6724	AveID		0.6504				4.4		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9092 0.9063	0.7809 0.9307	0.9039	0.9216	0.8860	AveID		0.8912				5.7		20.0			
Perfluoroundecanoic acid (PFUnA)	1.5332 1.1610	1.2751 1.1866	1.1085	1.1713	1.1901	AveID		1.2323				11.5		20.0			
Perfluorododecanoic acid (PFDoA)	1.1314 1.0953	1.0778 1.0496	1.0444	1.0390	1.1416	AveID		1.0827				3.9		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.0526 1.0082	0.8009 0.9105	0.9230	0.9030	0.9986	AveID		0.9424				8.9		20.0			
Perfluorotetradecanoic acid (PFTeA)	+++++ 0.2617	0.2978 0.2668	0.2613	0.2576	0.2710	AveID		0.2694				5.5		20.0			
13C4 PFBA	1.3860 1.5038	1.4125 1.5694	1.3776	1.4016	1.4257	Ave		1.4395				4.9		20.0			
13C5-PFPeA	0.9305 0.9725	0.9291 0.9956	0.9358	0.9353	0.9377	Ave		0.9481				2.7		20.0			
13C3-PFBS	0.0253 0.0289	0.0266 0.0304	0.0261	0.0260	0.0276	Ave		0.0273				6.7		20.0			
13C2 PFHxA	1.0134 1.0568	0.9986 1.0567	0.9968	1.0136	1.0448	Ave		1.0258				2.6		20.0			
13C4-PFHpA	0.9934 1.0191	0.9760 1.0169	0.9730	0.9740	1.0074	Ave		0.9943				2.1		20.0			
18O2 PFHxS	1.4304 1.5738	1.4538 1.6700	1.4140	1.4586	1.4573	Ave		1.4940				6.2		20.0			
M2-6:2FTS	0.2961 0.2939	0.2996 0.2881	0.2885	0.2821	0.2907	Ave		0.2913				2.0		20.0			
13C4 PFOA	0.9546 0.9624	0.9775 0.9545	0.9507	0.9545	0.9655	Ave		0.9600				1.0		20.0			
13C4 PFOS	0.9886 1.0700	0.9821 1.1500	1.0111	1.0083	1.0143	Ave		1.0320				5.7		20.0			
13C5 PFNA	0.8370 0.8467	0.8476 0.8370	0.8256	0.8317	0.8297	Ave		0.8365				1.0		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.2896 0.2827	0.2927 0.2716	0.2809	0.2878	0.2823	Ave		0.2839				2.4		20.0			
13C2 PFDA	0.6339 0.6420	0.6249 0.6255	0.6020	0.6324	0.6188	Ave		0.6256				2.0		20.0			
13C8 FOSA	1.4347 1.5785	1.4590 1.6106	1.4918	1.4859	1.5520	Ave		1.5161				4.3		20.0			
d3-NMeFOSAA	0.1450 0.1640	0.1468 0.1633	0.1486	0.1434	0.1515	Ave		0.1518				5.6		20.0			
d5-NEtFOSAA	0.1576 0.1621	0.1676 0.1655	0.1629	0.1634	0.1602	Ave		0.1627				2.0		20.0			
13C2 PFUnA	0.4758 0.4899	0.4889 0.5032	0.4795	0.4765	0.4588	Ave		0.4818				2.9		20.0			
13C2 PFDoA	0.3873 0.4184	0.4188 0.4727	0.3980	0.4174	0.4079	Ave		0.4172				6.5		20.0			
13C2-PFTeDA	0.3367 0.3657	0.3424 0.3736	0.3450	0.3395	0.3487	Ave		0.3502				4.0		20.0			
13C2-PFHxDA	0.5978 0.6133	0.5840 0.6631	0.5991	0.5347	0.6310	Ave		0.6033				6.6		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237402/2	2018.08.01LLICAL_002.d
Level 2	IC 320-237402/3	2018.08.01LLICAL_003.d
Level 3	IC 320-237402/4	2018.08.01LLICAL_004.d
Level 4	IC 320-237402/5	2018.08.01LLICAL_005.d
Level 5	IC 320-237402/6	2018.08.01LLICAL_006.d
Level 6	IC 320-237402/7	2018.08.01LLICAL_007.d
Level 7	IC 320-237402/8	2018.08.01LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	49584 9171174	100773 17657065	462891	1847519	4662124	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	39061 7124053	86389 13665143	385176	1460012	3679899	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	60262 12002466	130464 22654929	611203	2456709	6345476	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	13909 2787781	31260 5267139	151962	616866	1432956	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	36283 6816050	81976 13079443	352293	1444908	3595187	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	54299 11402360	120606 21798270	572115	2331146	5931128	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	42120 7260990	79296 13373710	400178	1576104	3710400	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	62092 9713740	118530 18747407	492246	1939177	5019141	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	15623 2799930	34779 5327073	154602	625589	1483178	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	39458 6976550	79819 12686108	378678	1480871	3755999	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	46773 8881601	98640 16519531	436716	1744730	4578297	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	29706 5744475	68954 10755568	295007	1231102	2990574	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	39085 6798798	75727 13695202	341410	1377557	3544232	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
8:2 FTS		AveID	13298 2239081	28792 3886014	130586	498832	1169399	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorononanesulfonic acid		AveID	21970 4817452	51583 9124121	222331	954403	2423026	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorodecanoic acid (PFDA)		AveID	24561 4009985	49086 7657634	230406	899636	2163881	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (PFOSA)		AveID	48904 9630397	102774 17992319	507693	2053736	5178982	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	5163 986536	11798 1921554	50086	199395	501591	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	20381 4226499	47682 8073020	221097	822043	2185833	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	4957 898298	9530 1761697	51670	206227	471804	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	25237 3479056	45391 6830755	186462	764538	1815476	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	15157 2802983	32864 5676012	145817	594065	1548416	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	14102 2580030	24421 4923814	128866	516294	1354496	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	+++++ 585419	7424 1140306	31626	119786	314195	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	4794702 4598618	5141928 4488667	4833356	4799715	4740211	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	3218796 2974004	3382043 2847672	3283004	3202919	3117638	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	81424 82077	89887 80880	85167	82758	85408	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	3505828 3231846	3635013 3022362	3497268	3471025	3473699	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	3436629 3116337	3553062 2908549	3413685	3335466	3349409	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4681014 4552896	5006593 4518625	4692968	4725288	4583643	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	973239 853793	1036033 782824	961732	917820	918152	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3302357 2942955	3558329 2730006	3335341	3268736	3210040	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3269307 3128101	3417703 3144316	3391354	3300872	3224053	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	2895444 2589352	3085644 2393820	2896674	2848081	2758407	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	959713 828227	1020788 744064	944227	944062	899004	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C2 PFDA	13PF OA	Ave	2192940 1963135	2274867 1788913	2112120	2165508	2057230	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C8 FOSA	13PF OA	Ave	4963170 4827094	5311185 4606616	5234016	5088363	5160037	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	501437 501663	534311 467155	521422	491188	503700	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	545218 495602	610182 473237	571651	559410	532526	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	1645990 1498263	1779877 1439097	1682161	1631762	1525487	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	1339683 1279511	1524607 1351987	1396187	1429399	1356329	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	1164683 1118375	1246501 1068686	1210263	1162431	1159368	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	2067843 1875506	2126007 1896531	2101845	1831086	2097837	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237402/2	2018.08.01LLICAL_002.d
Level 2	IC 320-237402/3	2018.08.01LLICAL_003.d
Level 3	IC 320-237402/4	2018.08.01LLICAL_004.d
Level 4	IC 320-237402/5	2018.08.01LLICAL_005.d
Level 5	IC 320-237402/6	2018.08.01LLICAL_006.d
Level 6	IC 320-237402/7	2018.08.01LLICAL_007.d
Level 7	IC 320-237402/8	2018.08.01LLICAL_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	4.9 -0.2	-0.6	-2.8	-2.3	-0.2	1.2	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	1.4 0.2	6.7	-2.0	-4.8	-1.4	0.0	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	1.6 -3.9	-0.4	-1.5	1.9	2.0	0.4	30 30	30	30	30	30	30
4:2 FTS	-1.2 -5.8	0.6	3.2	7.8	-2.9	-1.7	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-1.9 2.6	6.9	-4.5	-1.3	-1.9	0.0	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-2.3 -1.3	-1.7	-1.6	3.2	1.8	1.8	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	5.7 -0.9	-3.8	1.1	1.9	-4.5	0.5	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	19.3 -6.7	6.5	-5.7	-7.7	-1.5	-4.1	30 30	30	30	30	30	30
6:2 FTS	-2.7 3.1	1.7	-2.6	3.3	-2.1	-0.6	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	3.2 0.4	-3.1	-1.9	-2.1	1.1	2.4	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	3.9 -4.6	4.8	-6.5	-4.0	3.2	3.1	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-5.0 4.0	3.5	-5.7	0.1	0.4	2.7	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	9.7 -0.1	1.7	-7.6	-4.3	0.9	-0.3	30 30	30	30	30	30	30
8:2 FTS	2.6 -3.4	4.4	2.4	-2.2	-3.7	0.0	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-6.9 0.5	4.6	-9.2	0.2	4.1	6.7	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorodecanoic acid (PFDA)	4.9 0.3	1.1	2.2	-2.7	-1.5	-4.3	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (PFOSA)	-0.2 -1.1	-2.0	-1.7	2.2	1.7	1.1	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.3 1.1	8.6	-5.5	-0.2	-2.0	-3.3	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-4.9 -2.1	6.4	-0.6	-5.1	3.4	3.0	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2.0 4.4	-12.4	1.4	3.4	-0.6	1.7	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	24.4 -3.7	3.5	-10.0	-4.9	-3.4	-5.8	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	4.5 -3.1	-0.5	-3.5	-4.0	5.4	1.2	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	11.7 -3.4	-15.0	-2.1	-4.2	6.0	7.0	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	+++++ -1.0	10.6	-3.0	-4.4	0.6	-2.8	 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 01-Aug-2018 12:59:04 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:33 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:28:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.395	0.001	0.541	4794702	2.41		96.3	64287	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.395	1.396	-0.001	1.000	49584	0.0262		105	11.2	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.636	0.001	0.635	3218796	2.45		98.1	51402	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.636	0.001	1.000	39061	0.0253		101	14.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.672	1.669	0.003	0.648	81424	2.16		92.8	391	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.672	1.671	0.001	1.000	60262	0.0224		102	287	
298.90 > 99.00	1.681	1.671	0.010	1.005	25278		2.38(1.25-3.74)	102	110	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.872	0.001	0.726	628423	NC			7484	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.873	1.872	0.001	1.120	13909	0.0231		98.8	820	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.903	-0.001	0.738	3505828	2.47		98.8	68035	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.902	1.903	-0.001	1.000	36283	0.0245		98.1	51.6	M
313.00 > 119.00	1.902	1.903	-0.001	1.000	3247		11.17(5.03-15.10)	98.1	20.3	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.935	1.928	0.007	1.157	54299	0.0229		97.7	1145	
349.00 > 99.00	1.924	1.928	-0.004	1.151	19898		2.73(1.36-4.07)	97.7	101	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.000	2.000	0.0	0.775	159667	NC			4614	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.011	2.002	0.009	1.006	7432	NC			23.6	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.225	0.001	0.863	3436629	2.50		99.9	63835	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.226	2.226	0.0	1.000	42120	0.0264		106	16.7	M
363.00 > 169.00	2.226	2.226	0.0	1.000	18218		2.31(1.13-3.40)	106	143	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.238	2.237	0.001	1.000	62092	0.0271		119	363	
399.00 > 99.00	2.238	2.237	0.001	1.000	21302		2.91(1.50-4.49)	119	33.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.238	2.238	0.0	0.868	4681014	2.26		95.7	45481	
65 ADONA										
377.00 > 251.00	2.277	2.270	0.007	0.773	92157	NC			803	
377.00 > 85.00	2.277	2.270	0.007	0.773	58106		1.59(0.84-2.53)		198	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	15623	0.0231		97.3	375	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.556	-0.002	0.990	973239	2.41		102	11040	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.580	-0.001	1.000	3302357	2.49		99.4	40075	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.579	2.581	-0.002	1.000	39458	0.0258		103	21.0	
413.00 > 169.00	2.579	2.581	-0.002	1.000	25449		1.55(0.84-2.52)	103	130	M
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.581	-0.002		3459352	2.50			50770	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	46773	0.0247		104	734	
449.00 > 99.00	2.587	2.587	0.0	0.878	12280		3.81(1.94-5.82)	104	118	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.946	0.0	1.142	3269307	2.29		95.8	33518	
D 19 13C5 PFNA										
468.00 > 423.00	2.952	2.948	0.004	1.144	2895444	2.50		100	58511	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.952	2.949	0.003	1.000	29706	0.0238		95.0	45.7	M
463.00 > 169.00	2.952	2.949	0.003	1.000	7031		4.23(1.90-5.69)	95.0	266	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.952	2.949	0.003	1.002	39085	0.0255		110	318	
499.00 > 99.00	2.952	2.949	0.003	1.002	8733		4.48(2.31-6.93)	110	42.9	M
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.162	3.158	0.004	1.073	60566	NC			868	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.292	0.003	1.000	13298	0.0246		103	1113	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.292	0.003	1.278	959713	2.44		102	16553	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.295	0.0	1.119	21970	0.0223		93.1	920	
549.00 > 99.00	3.295	3.295	0.0	1.119	9963		2.21(1.33-3.97)	93.1	56.3	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.311	3.306	0.005	1.284	2192940	2.53		101	75042	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.311	3.308	0.003	1.000	24561	0.0262		105	33.2	
513.00 > 169.00	3.303	3.308	-0.005	0.998	4748		5.17(2.36-7.09)	105	64.5	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.312	-0.001	1.284	4963170	2.37		94.6	48844	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.313	-0.002	1.000	48904	0.0250		99.8	1474	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.464	3.459	0.005	1.343	501437	2.39		95.5	11078	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.473	3.465	0.008	1.003	5163	0.0253		101	63.6	M
29 Perfluorodecane Sulfonic acid										M
599.00 > 80.00	3.628	3.620	0.008	1.232	20381	0.0229		95.1	533	
599.00 > 99.00	3.618	3.620	-0.002	1.228	6067		3.36(1.39-4.16)	95.1	52.2	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.627	0.001	1.407	545218	2.42		96.8	4334	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.647	3.633	0.014	1.005	4957	0.0255		102	116	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.638	3.634	0.004	1.410	1645990	2.47		98.8	31735	
31 Perfluoroundecanoic acid										RM
563.00 > 519.00	3.638	3.634	0.004	1.000	25237	0.0311		124	51.2	R
563.00 > 169.00	3.647	3.634	0.013	1.003	3299		7.65(2.12-6.36)	124	108	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.793	3.792	0.001	1.287	73728	NC			1970	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.925	0.003	1.523	1339683	2.32		92.8	19954	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.927	0.001	1.000	15157	0.0261		104	4.4	
613.00 > 169.00	3.928	3.927	0.001	1.000	4103		3.69(2.13-6.40)	104	70.2	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.193	4.188	0.005	1.067	14102	0.0279		112	4.5	R
663.00 > 169.00	4.193	4.188	0.005	1.067	3483		4.05(1.25-3.76)	112	29.0	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.423	0.003	1.000	4297	0.0342		137	56.7	
713.00 > 219.00	4.426	4.423	0.003	1.000	2855		1.51(0.71-2.13)	137	37.3	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.423	0.003	1.716	1164683	2.40		96.1	5463	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.826	0.007	1.874	2067843	2.48		99.1	3018	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.827	0.006	1.000	41372	NC			2.5	
813.00 > 169.00	4.833	4.827	0.006	1.000	6431		6.43(2.86-8.58)		67.5	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.166	0.007	1.070	21294	NC			6.9	
913.00 > 169.00	5.173	5.166	0.007	1.070	3017		7.06(3.83-11.48)		29.4	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d

Injection Date: 01-Aug-2018 12:59:04 Instrument ID: A8_N

Lims ID: IC L1 Full

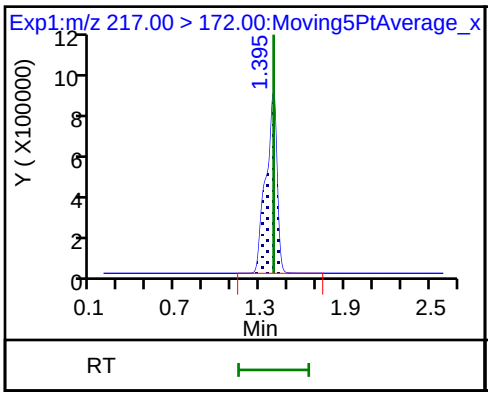
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 10 Worklist Smp#: 2

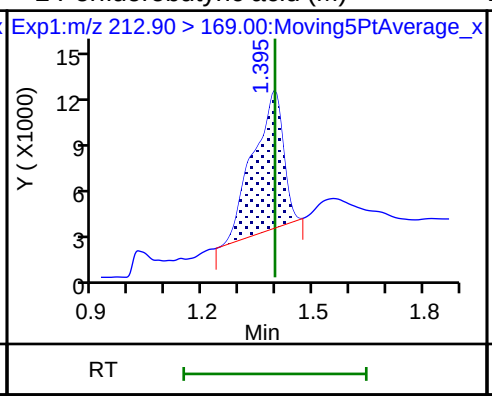
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

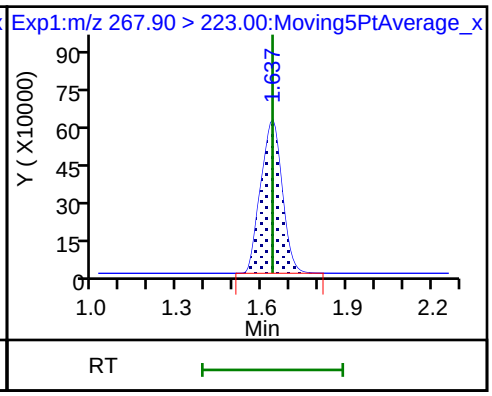
D 1 13C4 PFBA



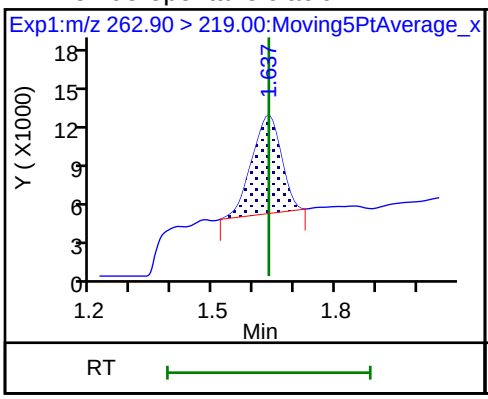
2 Perfluorobutyric acid (M)



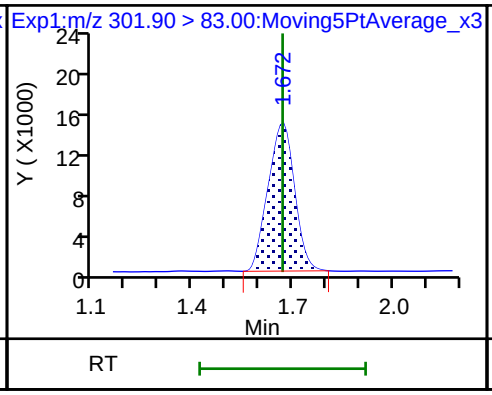
D 3 13C5-PFPeA



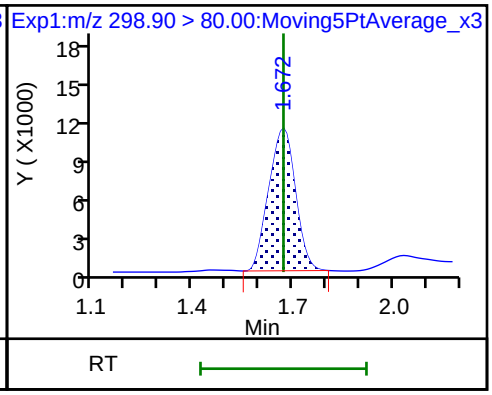
4 Perfluoropentanoic acid



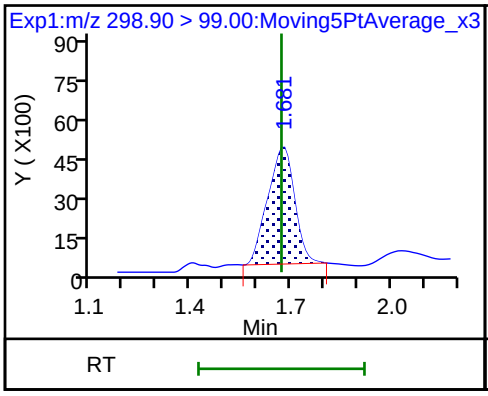
D 47 13C3-PFBS



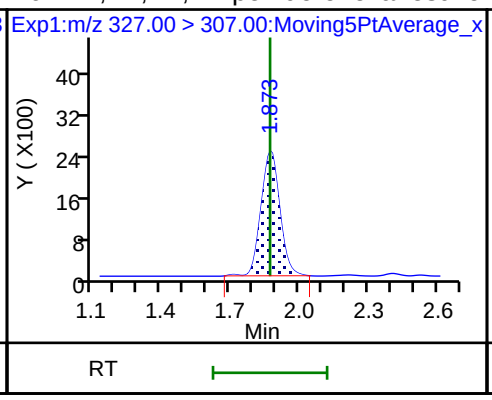
5 Perfluorobutanesulfonic acid



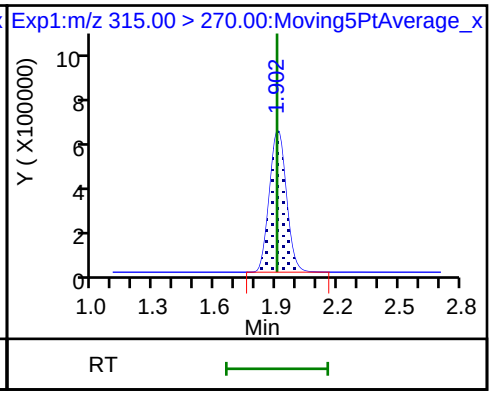
5 Perfluorobutanesulfonic acid



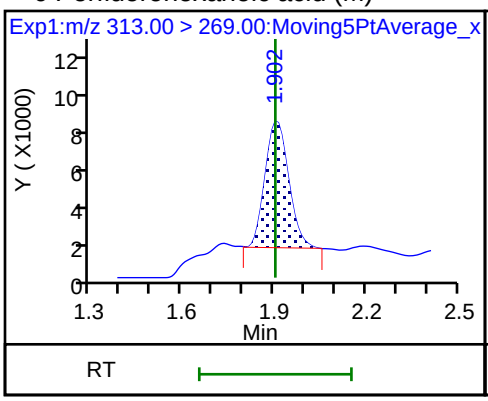
61 1H,1H,2H,2H-perfluorohexanesulfon



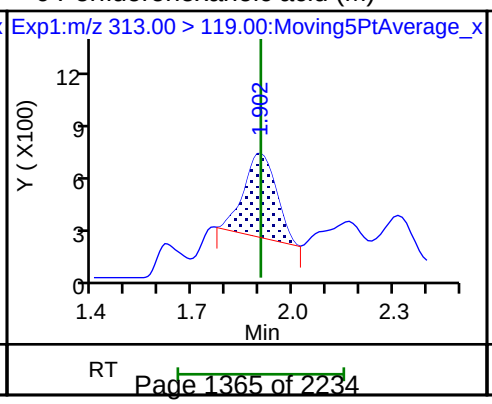
D 7 13C2 PFHxA



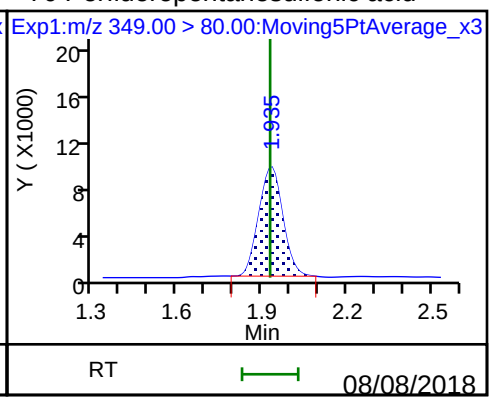
6 Perfluorohexanoic acid (M)



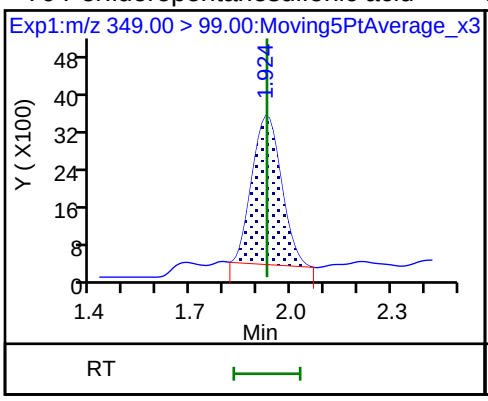
6 Perfluorohexanoic acid (M)



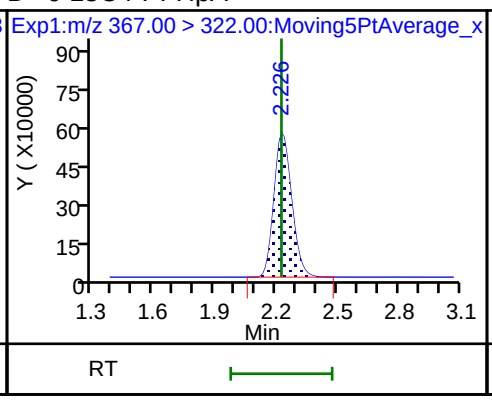
70 Perfluoropentanesulfonic acid



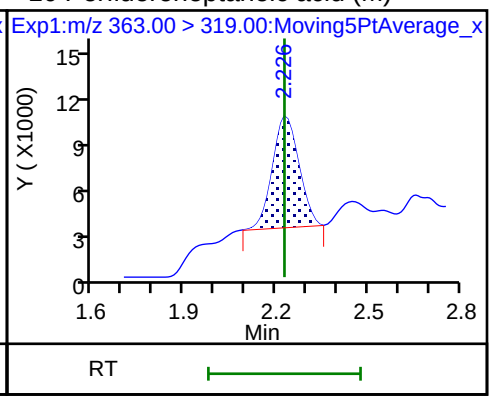
70 Perfluoropentanesulfonic acid



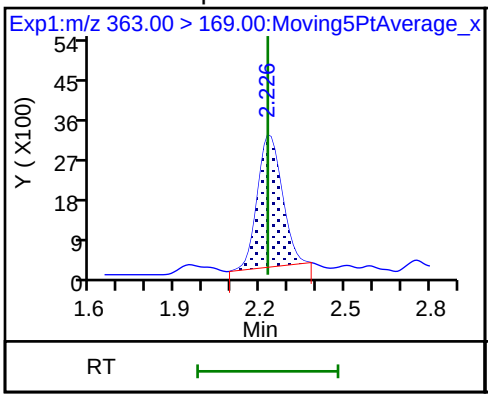
D 9 13C4-PFHpA



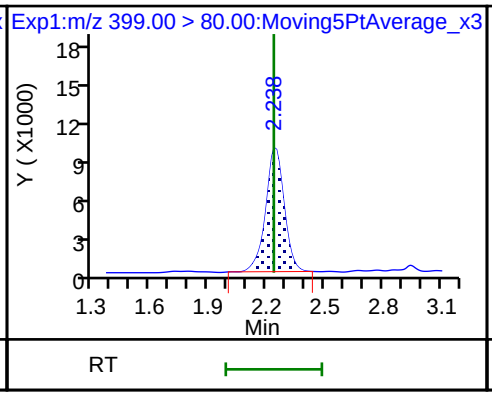
10 Perfluoroheptanoic acid (M)



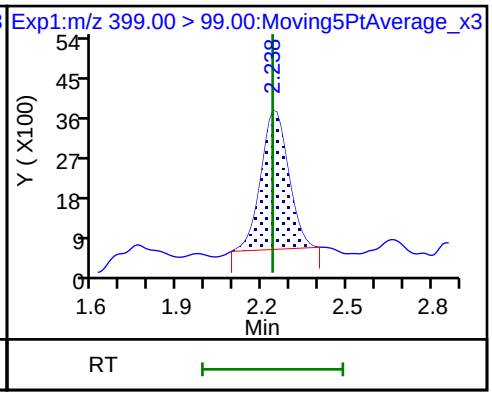
10 Perfluoroheptanoic acid



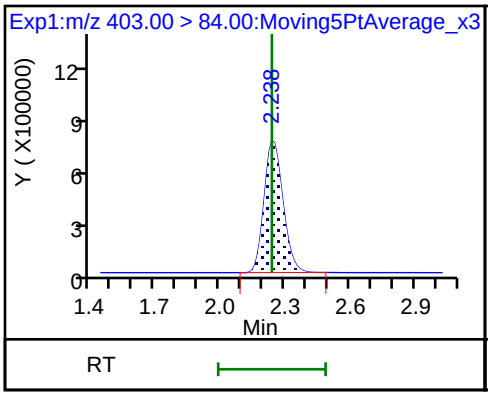
8 Perfluorohexanesulfonic acid



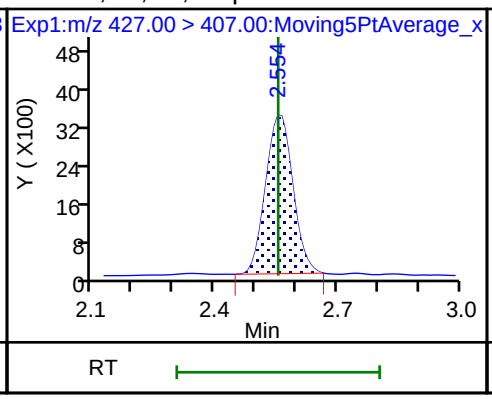
8 Perfluorohexanesulfonic acid



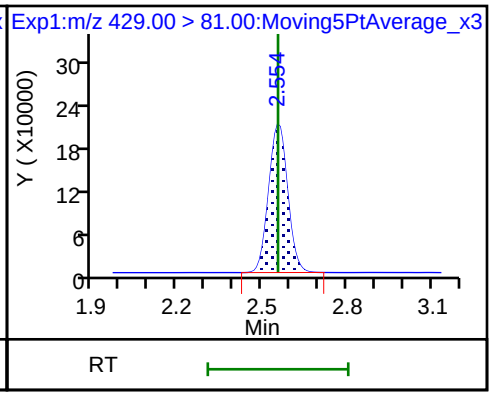
D 11 18O2 PFHxS



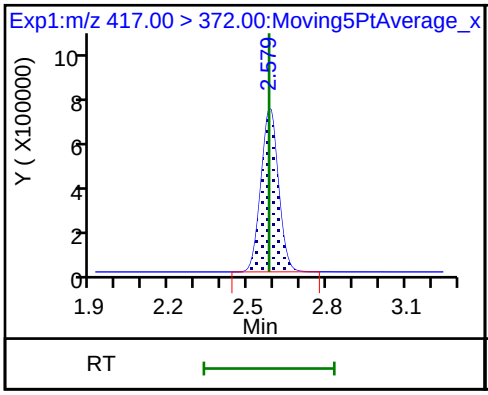
13 1H,1H,2H,2H-perfluorooctanesulfon



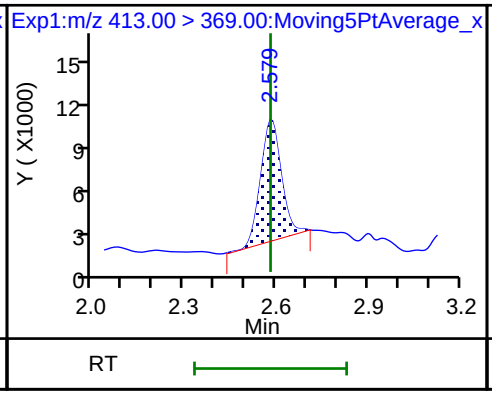
D 12 M2-6:2FTS



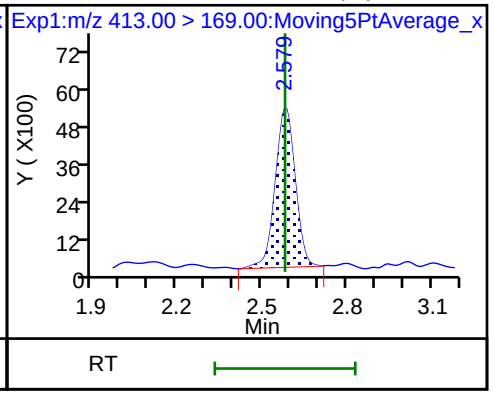
D 14 13C4 PFOA



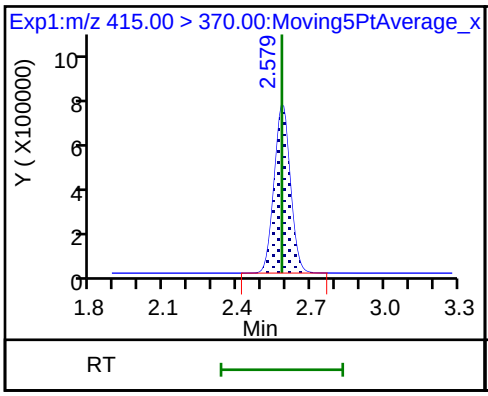
15 Perfluorooctanoic acid



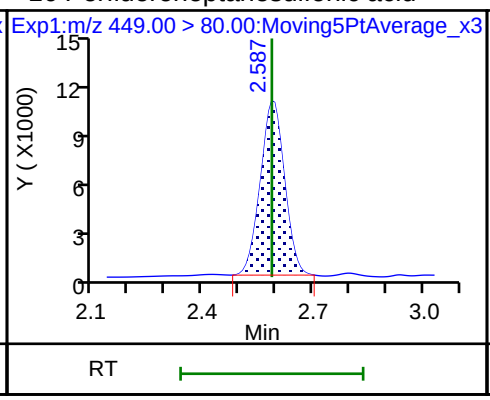
15 Perfluorooctanoic acid (M)



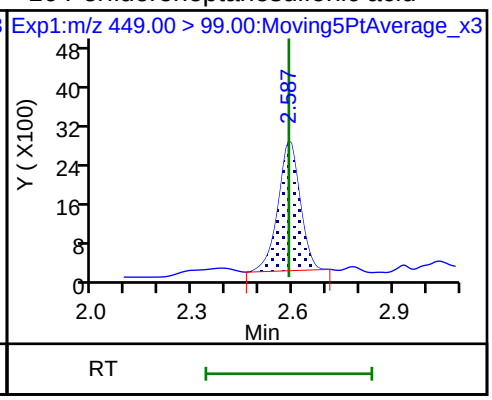
* 62 13C2-PFOA



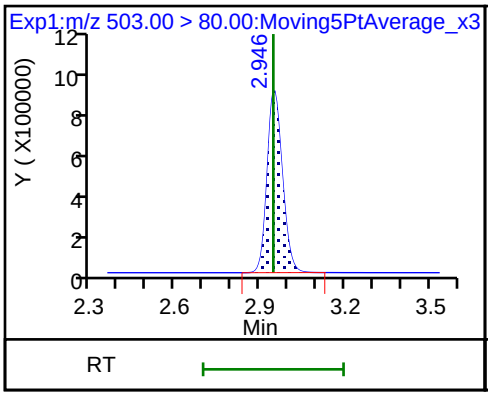
16 Perfluoroheptanesulfonic acid



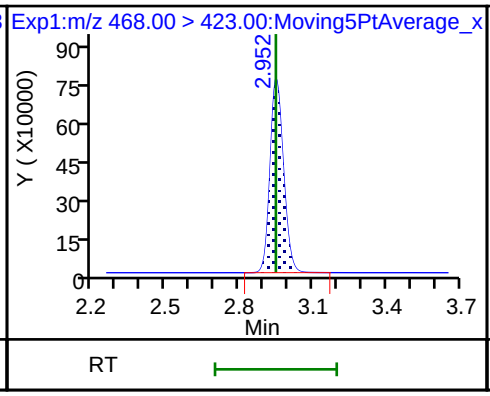
16 Perfluoroheptanesulfonic acid



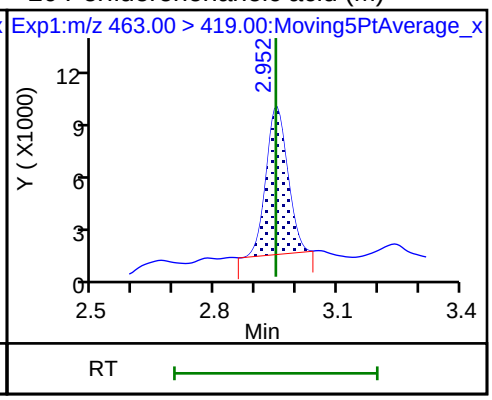
D 18 13C4 PFOS



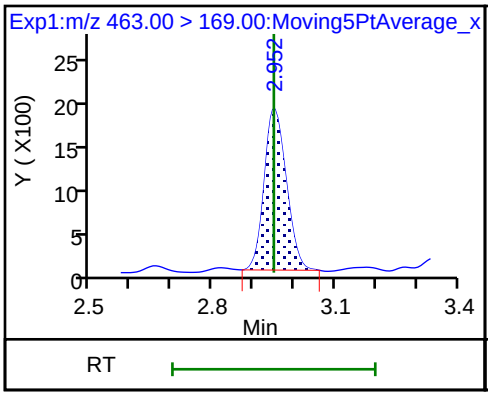
D 19 13C5 PFNA



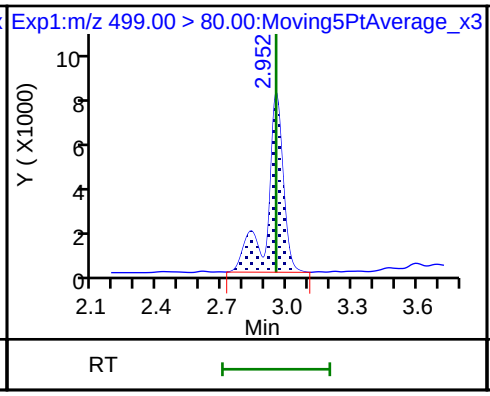
20 Perfluorononanoic acid (M)



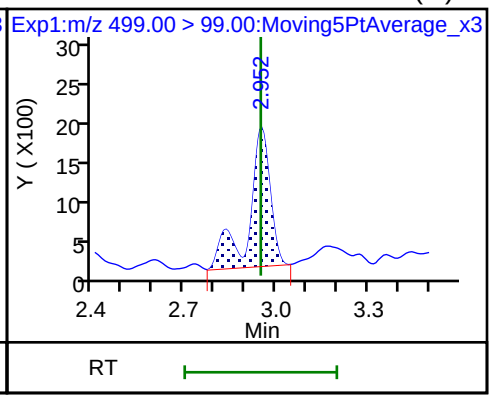
20 Perfluorononanoic acid



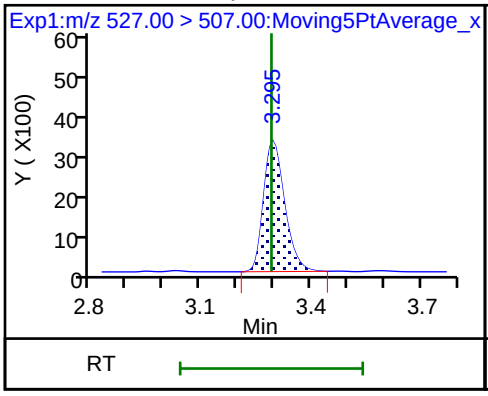
17 Perfluorooctane sulfonic acid



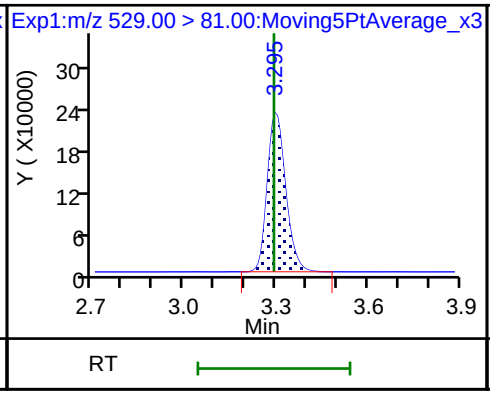
17 Perfluorooctane sulfonic acid (M)



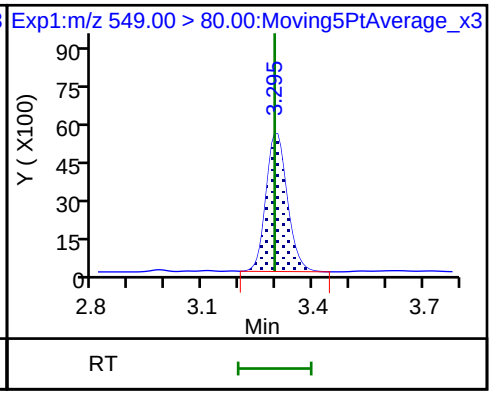
25 1H,1H,2H,2H-perfluorodecanesulfon



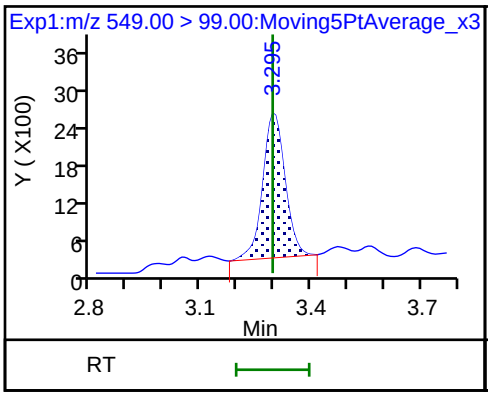
D 26 M2-8:2FTS



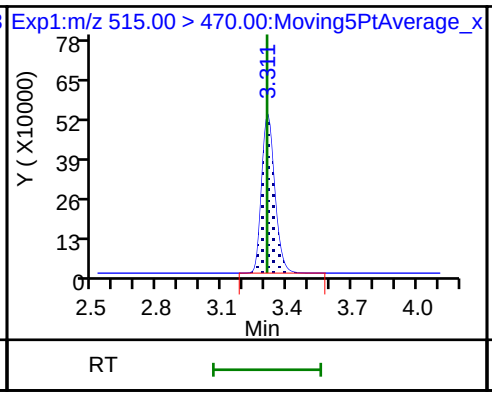
68 Perfluorononanesulfonic acid



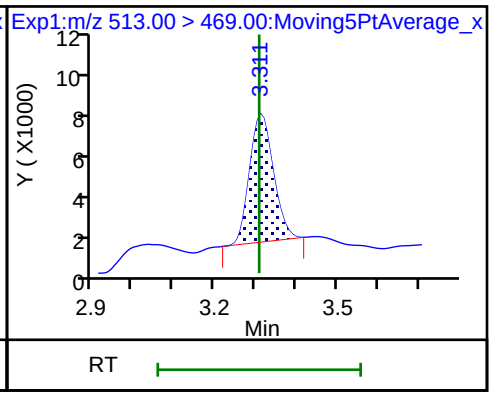
68 Perfluorononanesulfonic acid



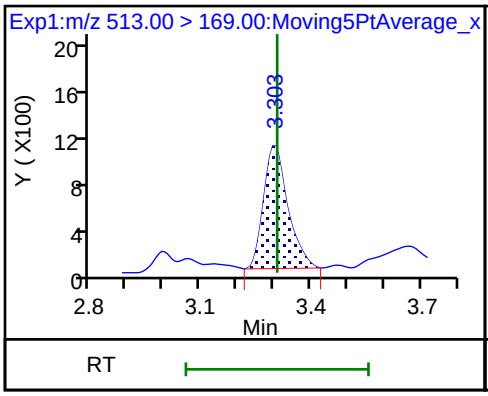
D 23 13C2 PFDA



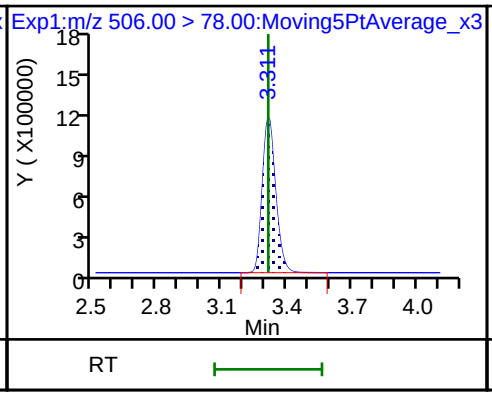
24 Perfluorodecanoic acid



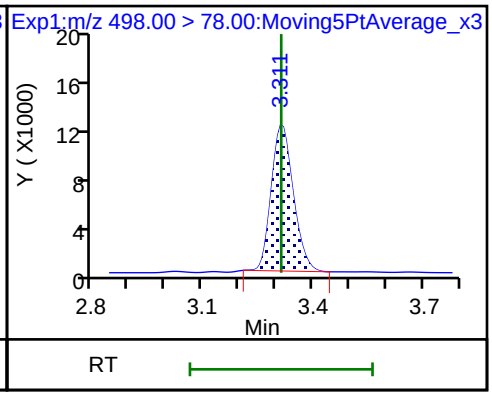
24 Perfluorodecanoic acid



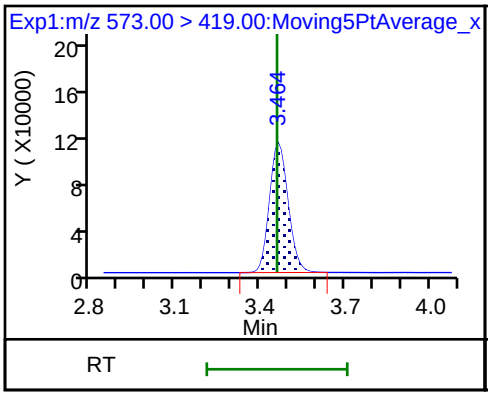
D 21 13C8 FOSA



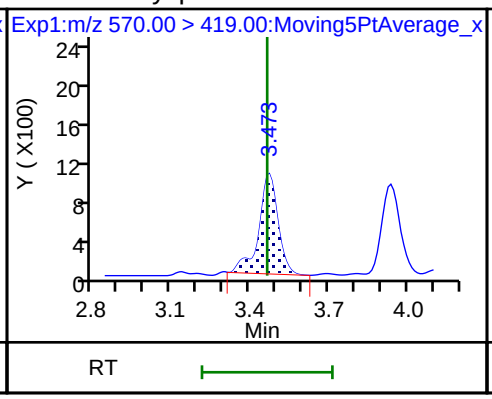
22 Perfluorooctane Sulfonamide



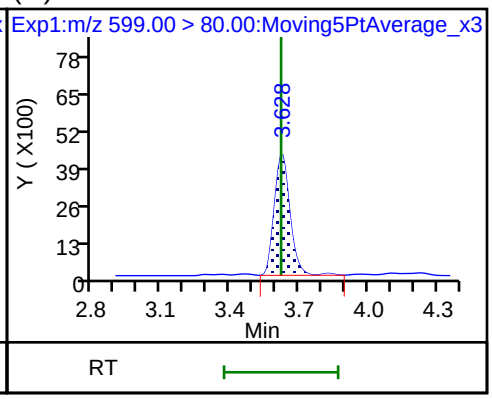
D 27 d3-NMeFOSAA



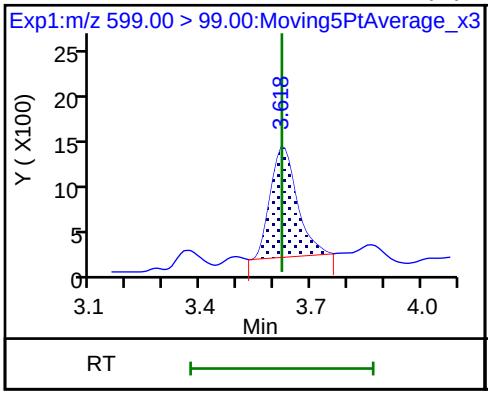
28 N-methyl perfluorooctane sulfonami (M)



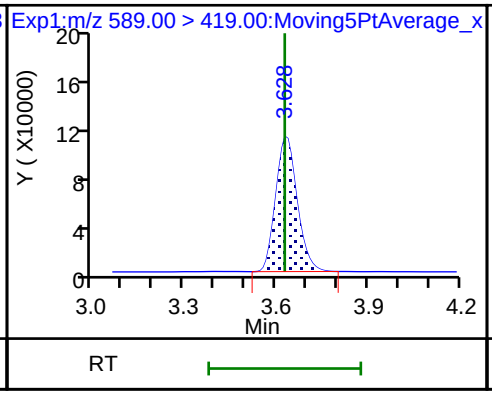
29 Perfluorodecane Sulfonic acid



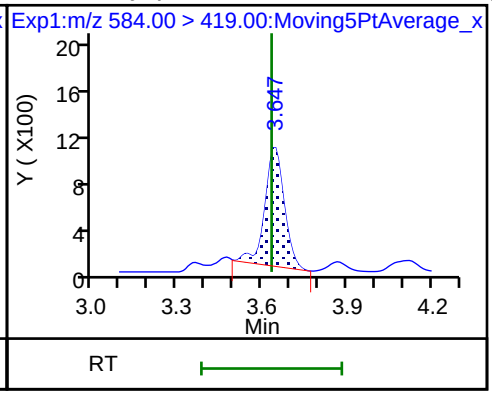
29 Perfluorodecane Sulfonic acid (M)



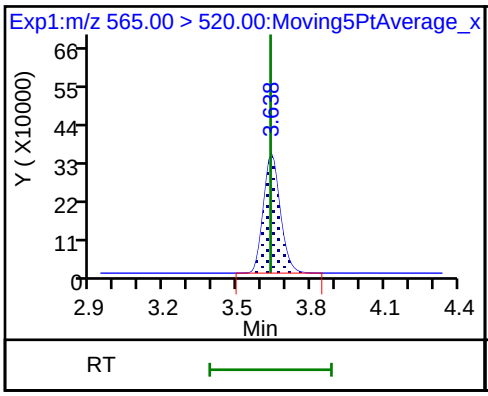
D 32 d5-NEtFOSAA



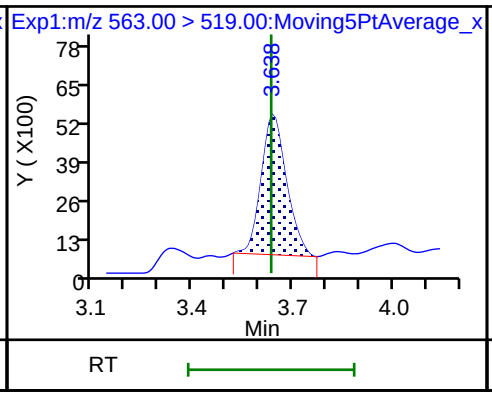
33 N-ethyl perfluorooctane sulfonamid (M)



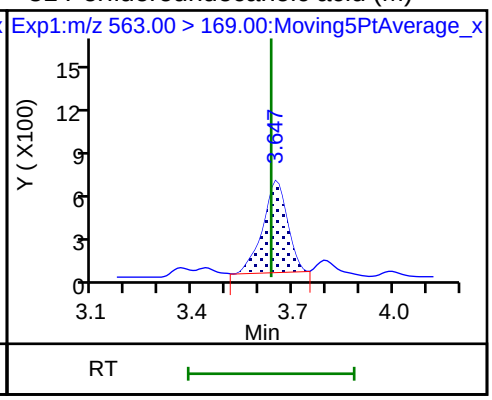
D 30 13C2 PFUnA



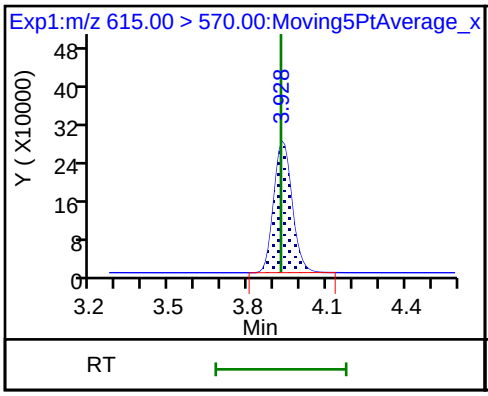
31 Perfluoroundecanoic acid



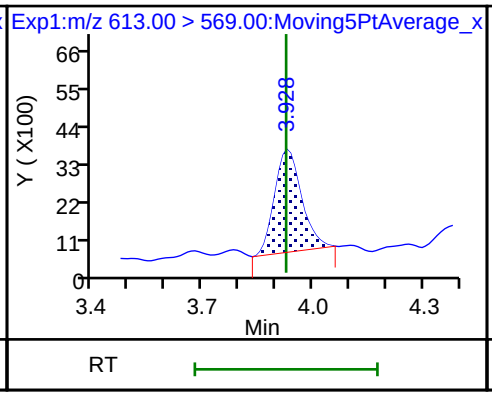
31 Perfluoroundecanoic acid (M)



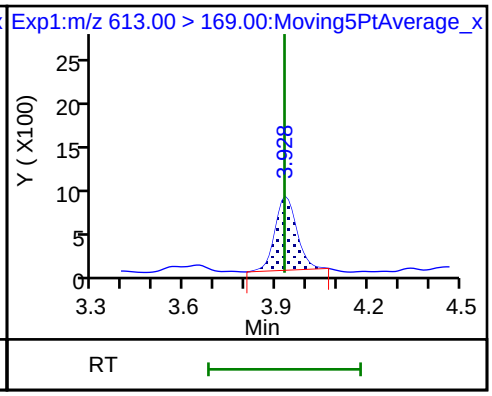
D 36 13C2 PFDoA



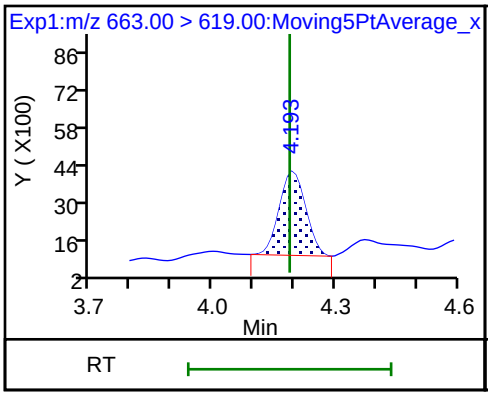
37 Perfluorododecanoic acid



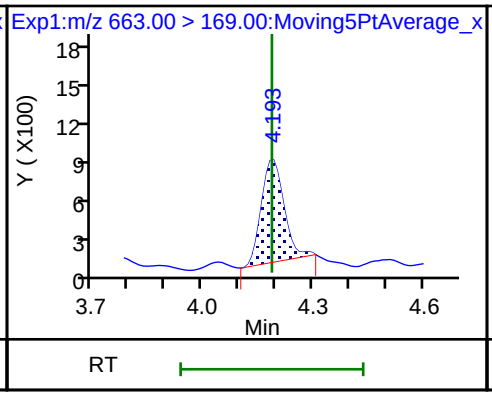
37 Perfluorododecanoic acid



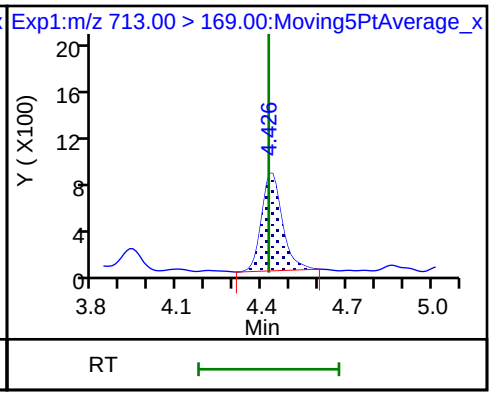
41 Perfluorotridecanoic acid



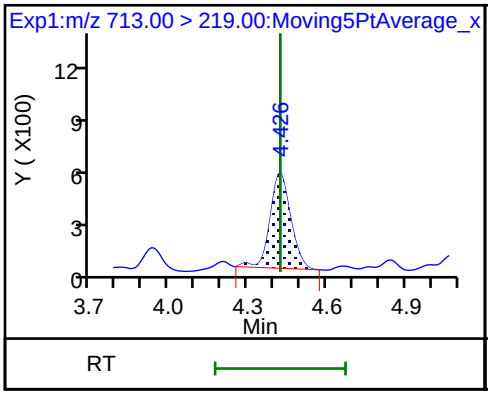
41 Perfluorotridecanoic acid



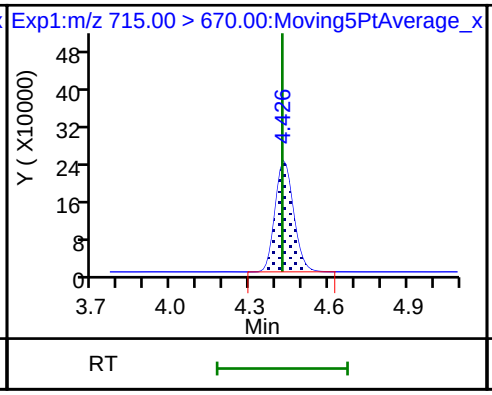
42 Perfluorotetradecanoic acid



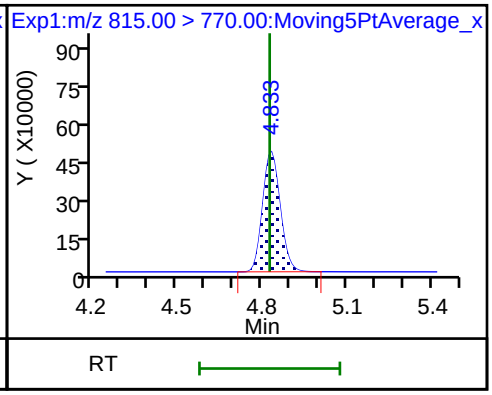
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

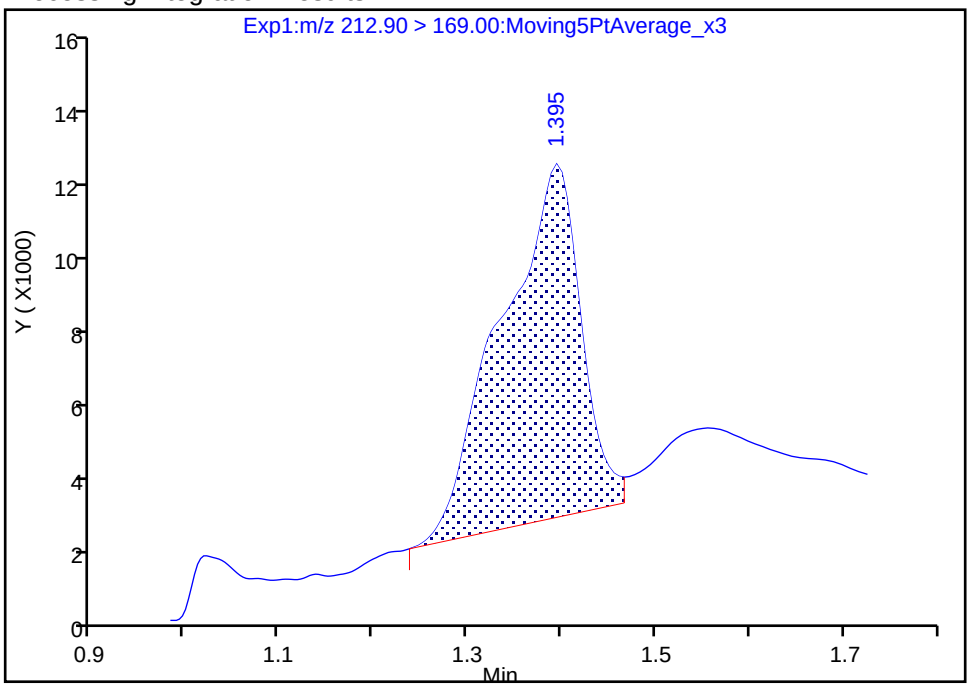
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

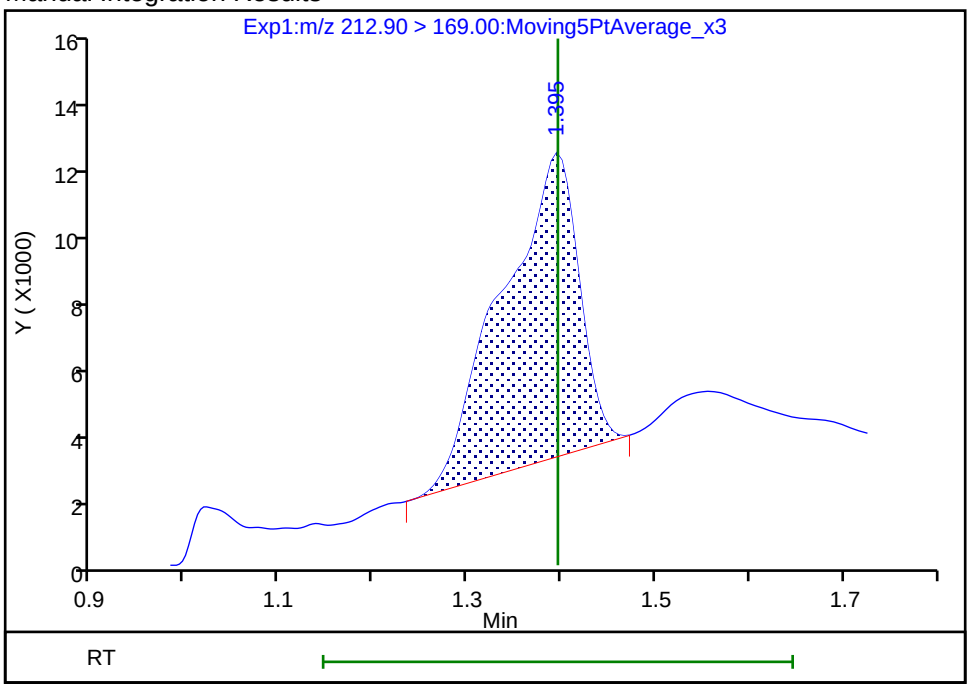
Processing Integration Results

RT: 1.39
Area: 53947
Amount: 0.028172
Amount Units: ng/ml



Manual Integration Results

RT: 1.39
Area: 49584
Amount: 0.026235
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:23:50

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

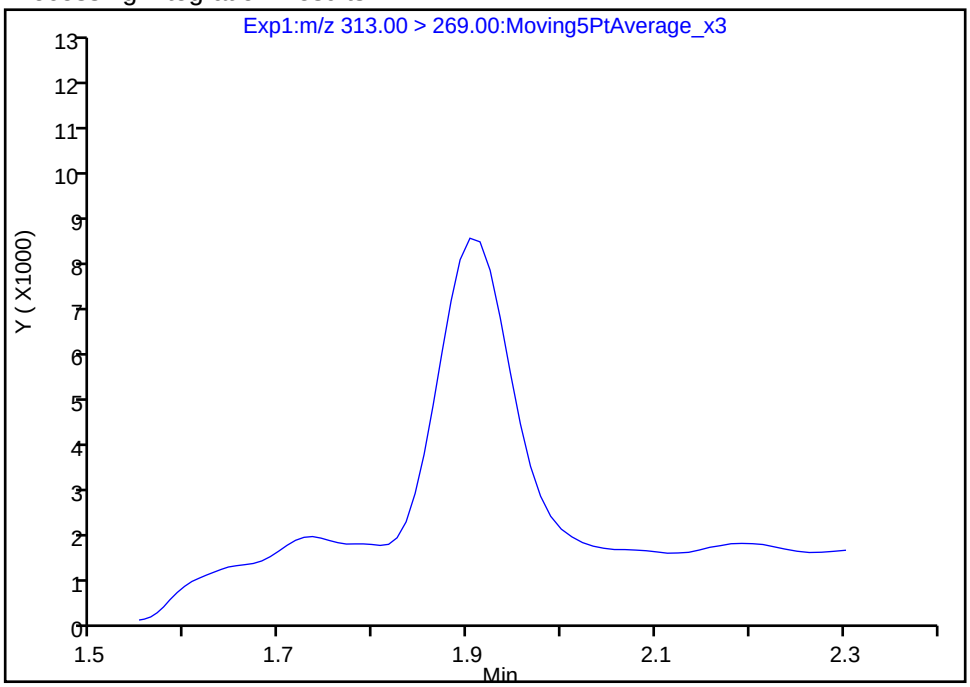
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

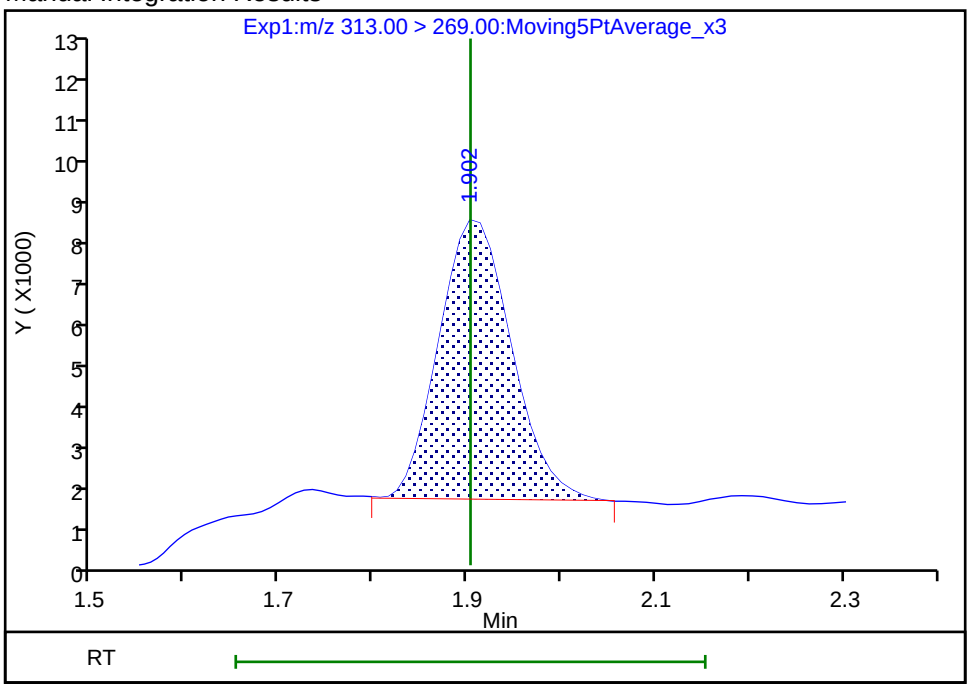
Not Detected
Expected RT: 1.90

Processing Integration Results



Manual Integration Results

RT: 1.90
Area: 36283
Amount: 0.024535
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:03
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

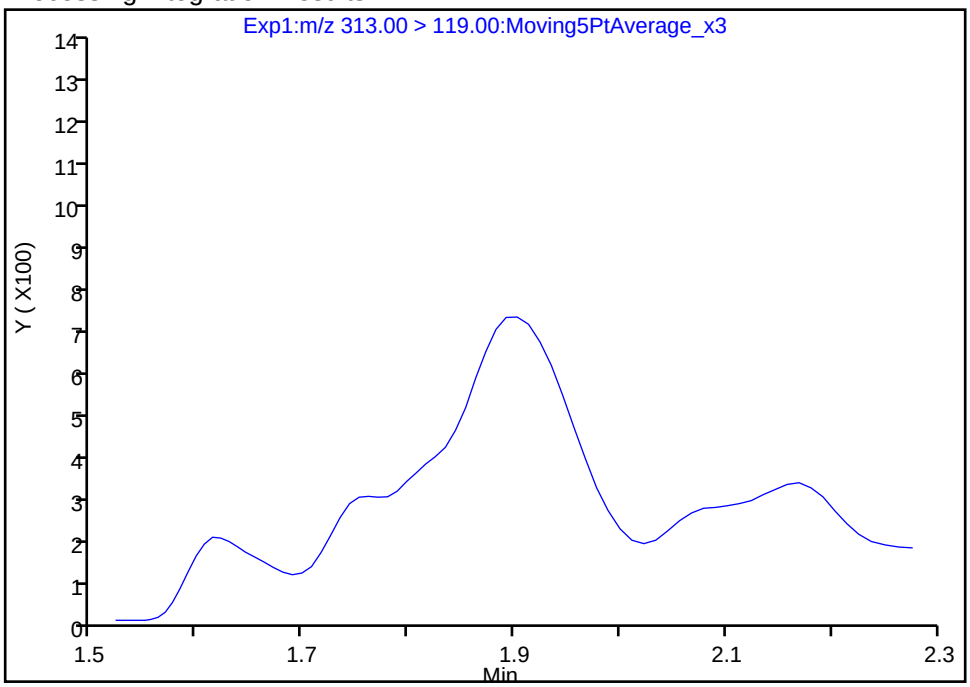
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

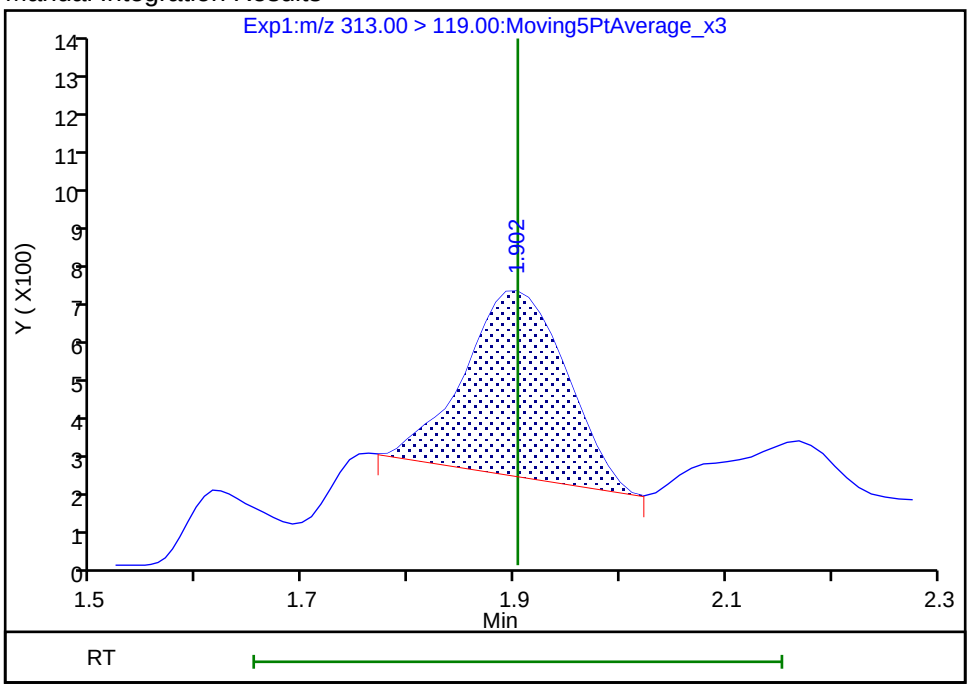
Processing Integration Results

Not Detected
Expected RT: 1.90



Manual Integration Results

RT: 1.90
Area: 3247
Amount: 0.024535
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:09
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

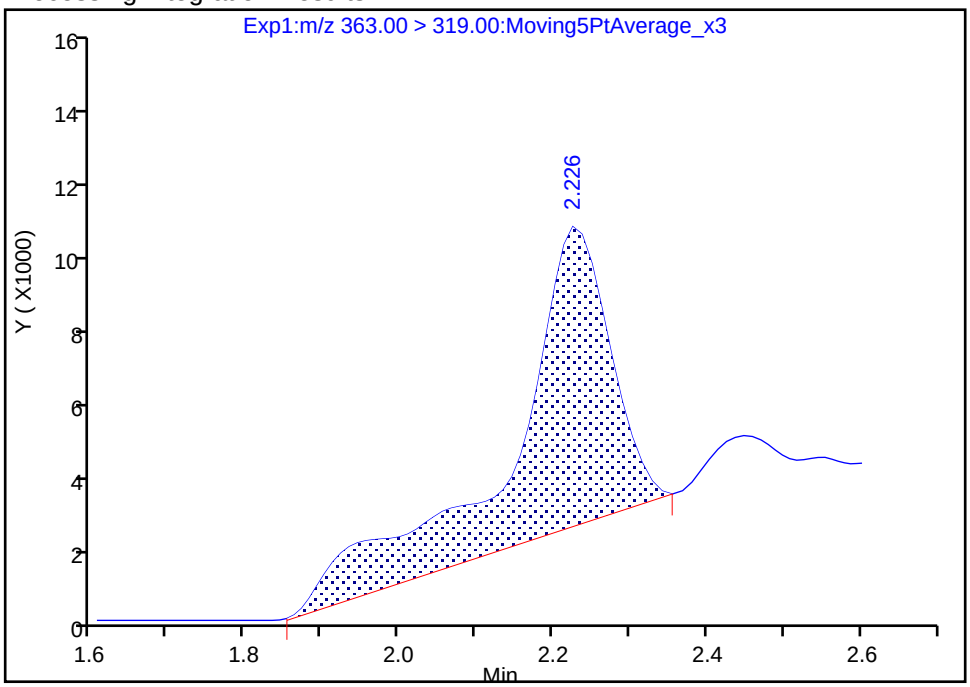
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

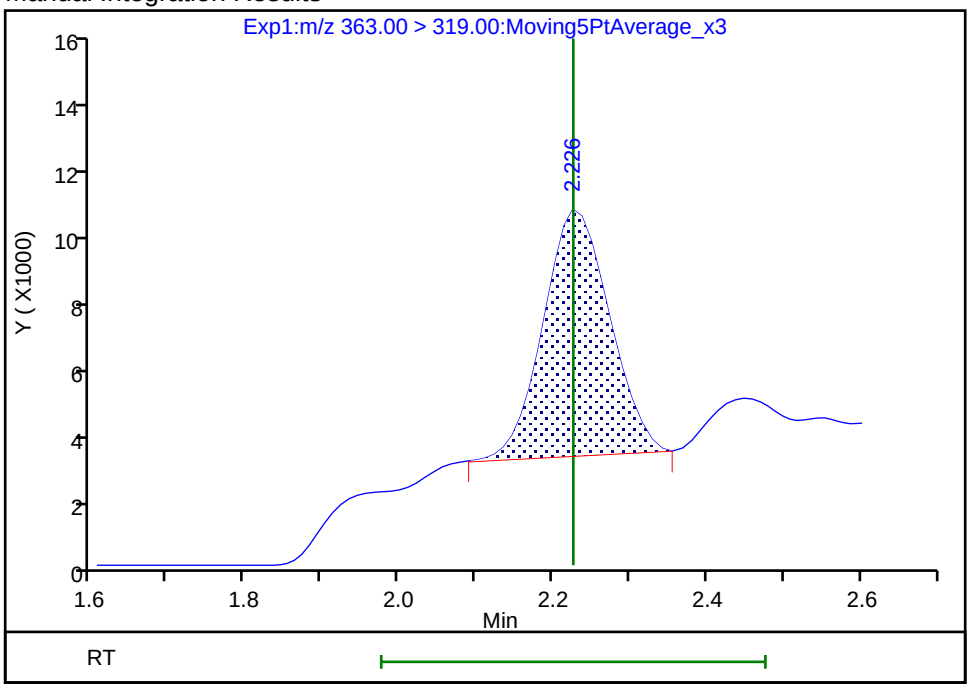
Processing Integration Results

RT: 2.23
Area: 69199
Amount: 0.039009
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 42120
Amount: 0.026423
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:21

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

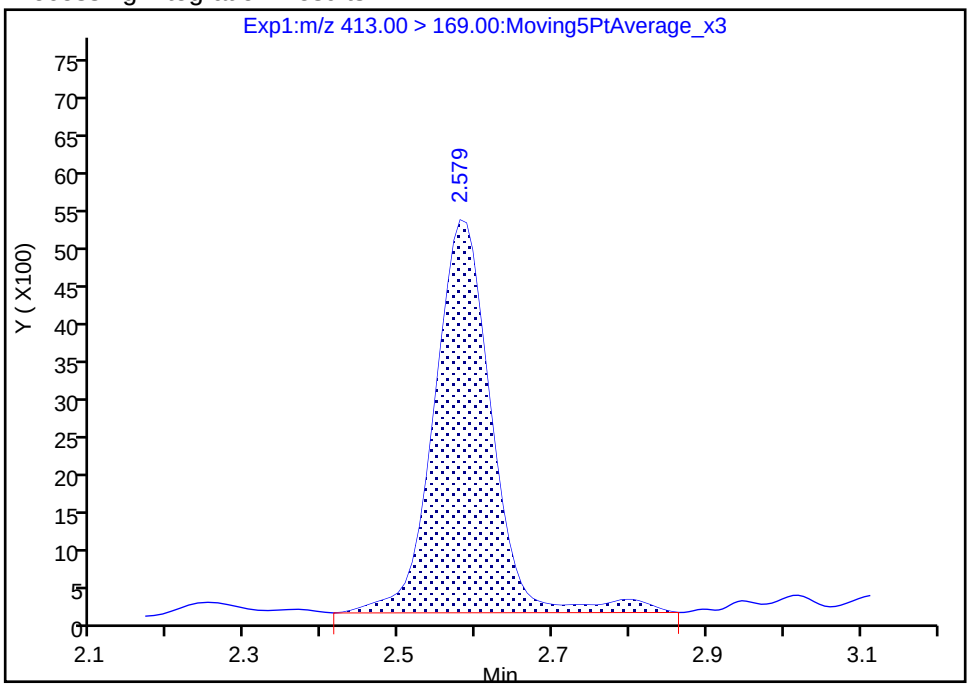
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

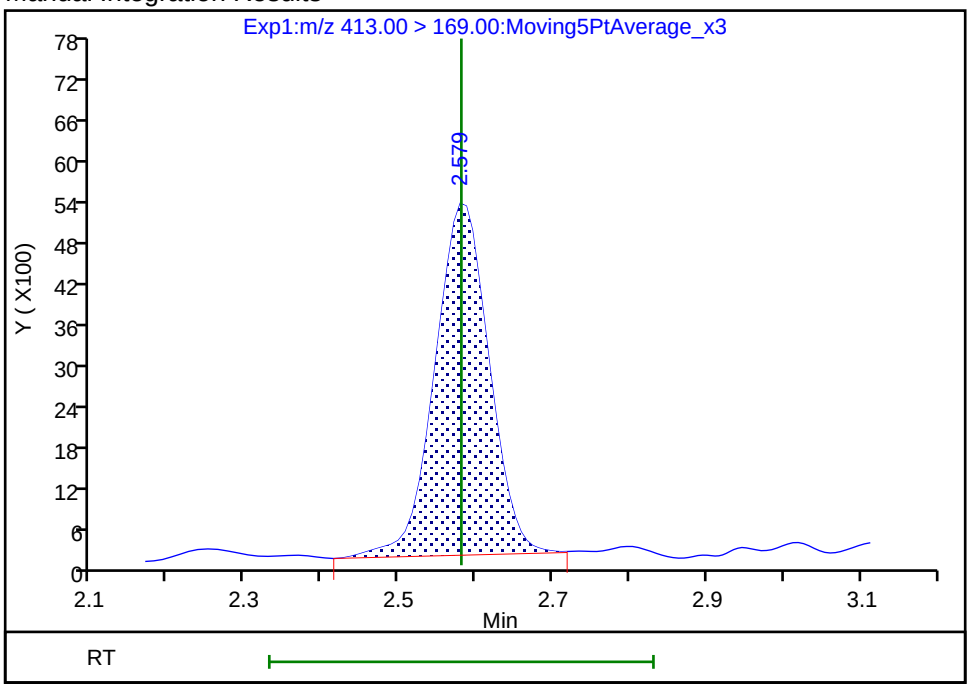
Processing Integration Results

RT: 2.58
Area: 27152
Amount: 0.025387
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 25449
Amount: 0.025836
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:23:41

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

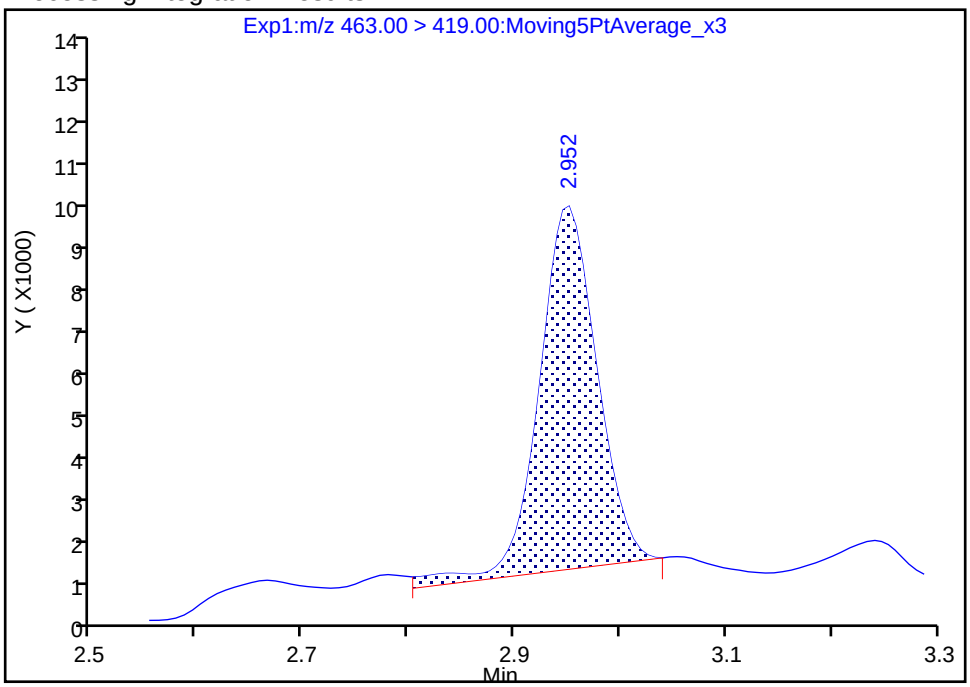
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

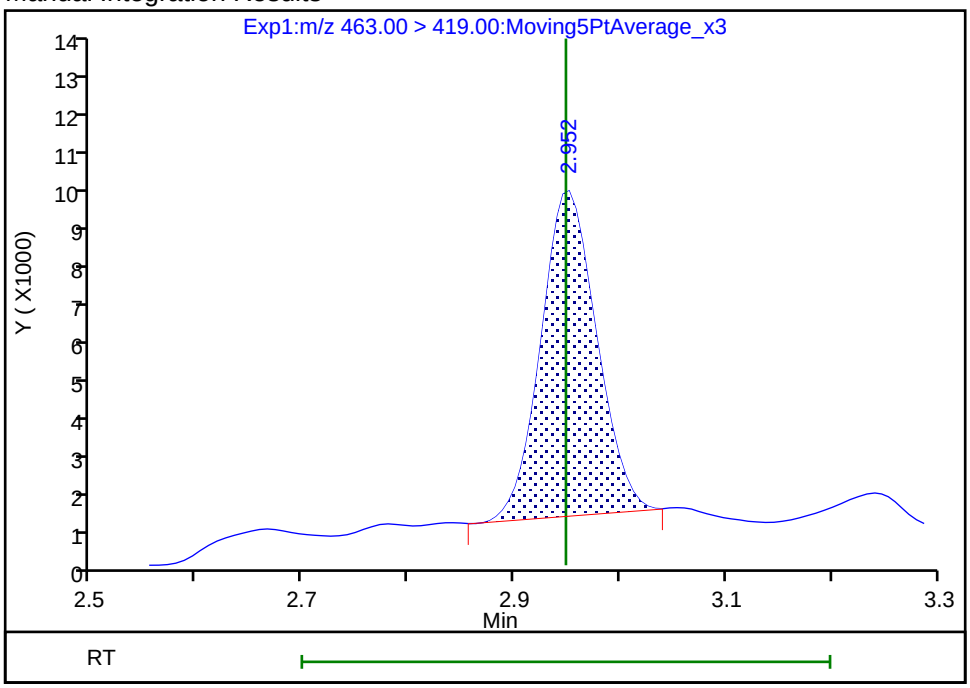
Processing Integration Results

RT: 2.95
Area: 31262
Amount: 0.024820
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 29706
Amount: 0.023752
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:25:05

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

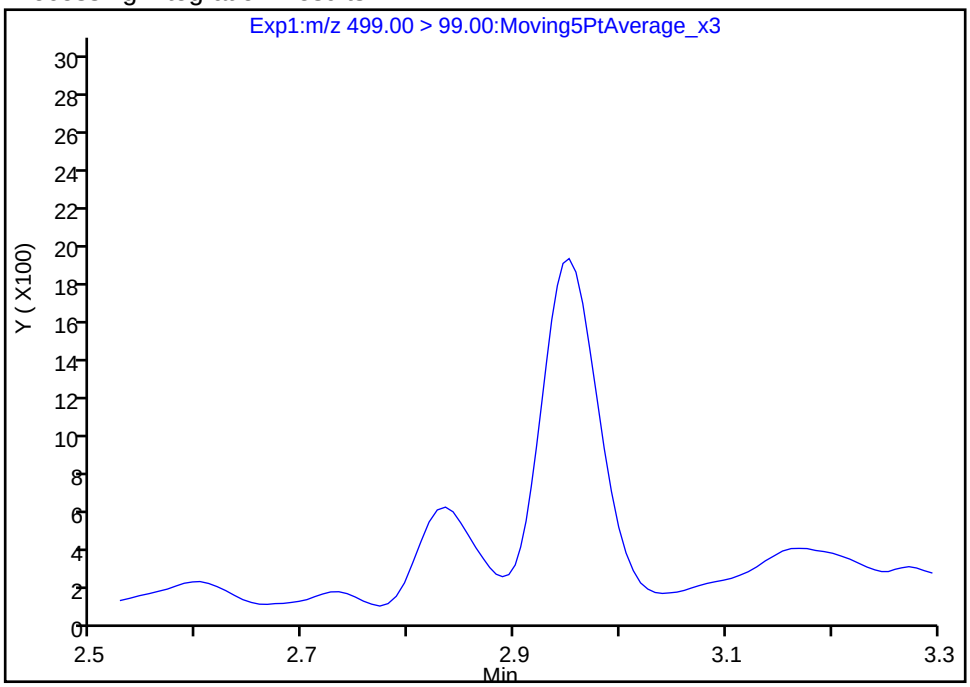
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

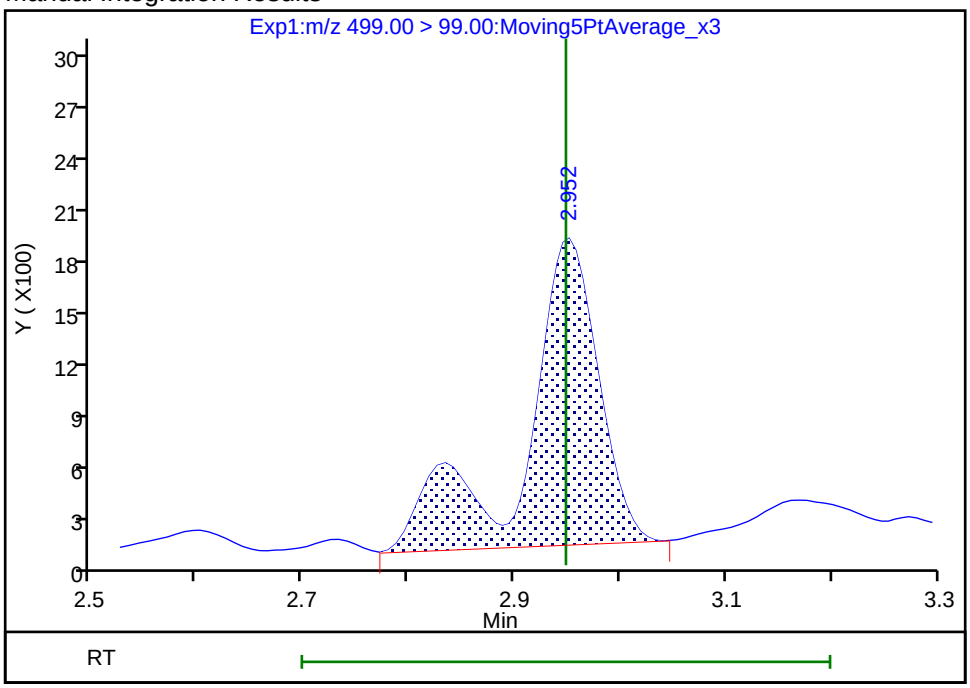
Processing Integration Results

RT: 2.95
Area: 0
Amount: 0.026262
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 8733
Amount: 0.025451
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:45

Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

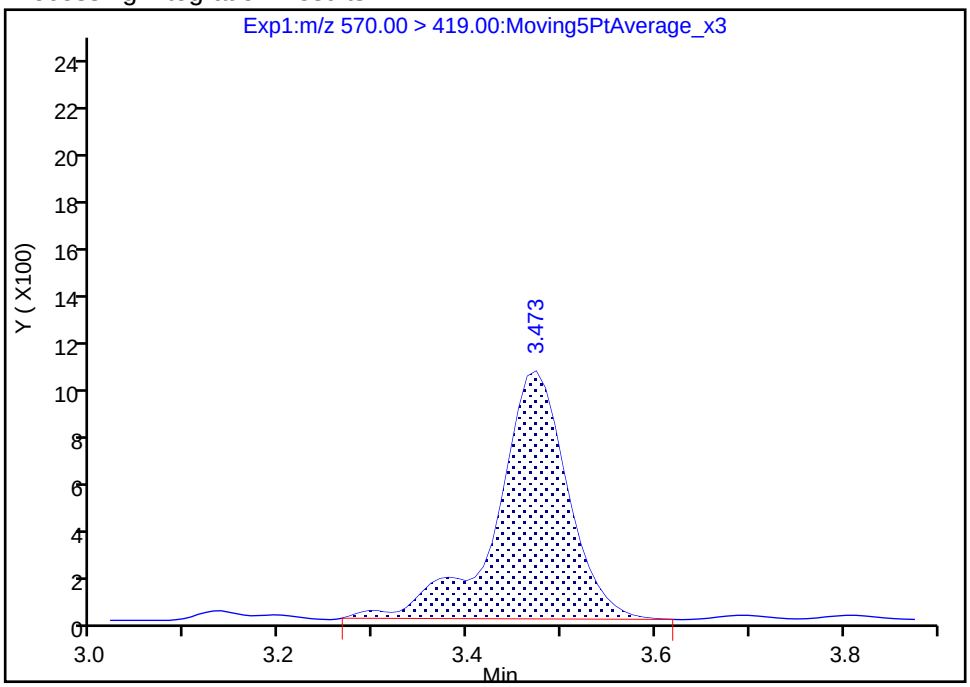
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

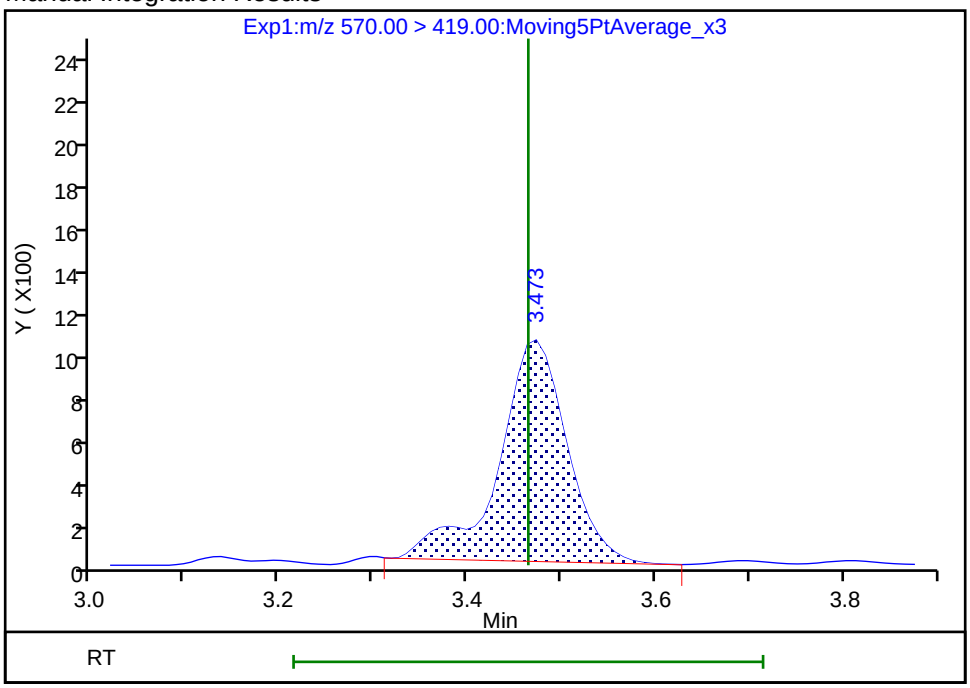
Processing Integration Results

RT: 3.47
Area: 5437
Amount: 0.026807
Amount Units: ng/ml



Manual Integration Results

RT: 3.47
Area: 5163
Amount: 0.025320
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:25:26

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

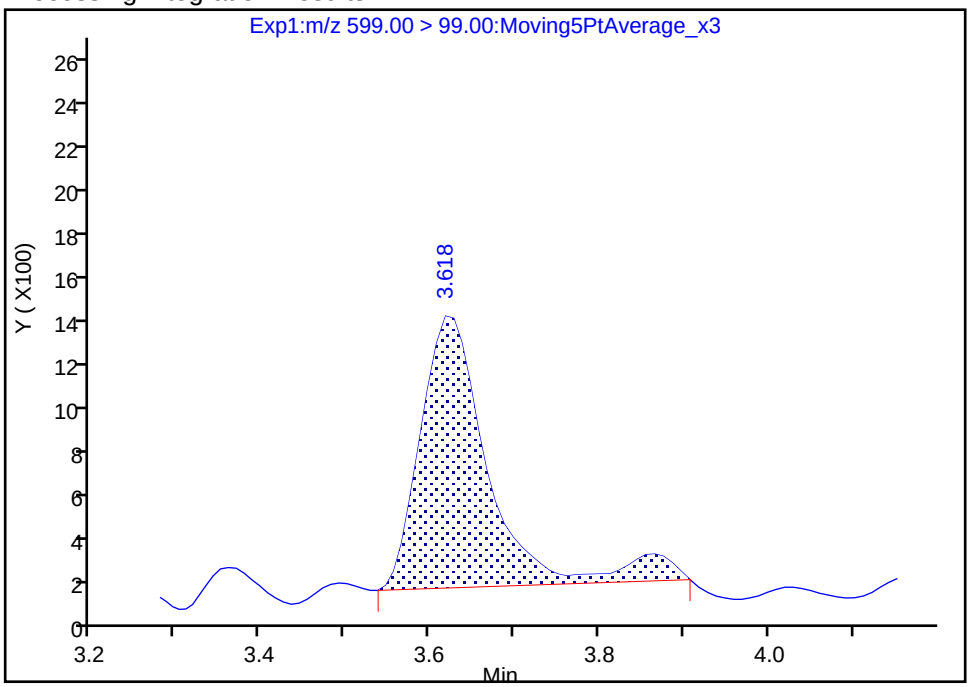
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

29 Perfluorodecane Sulfonic acid, CAS: 335-77-3

Signal: 2

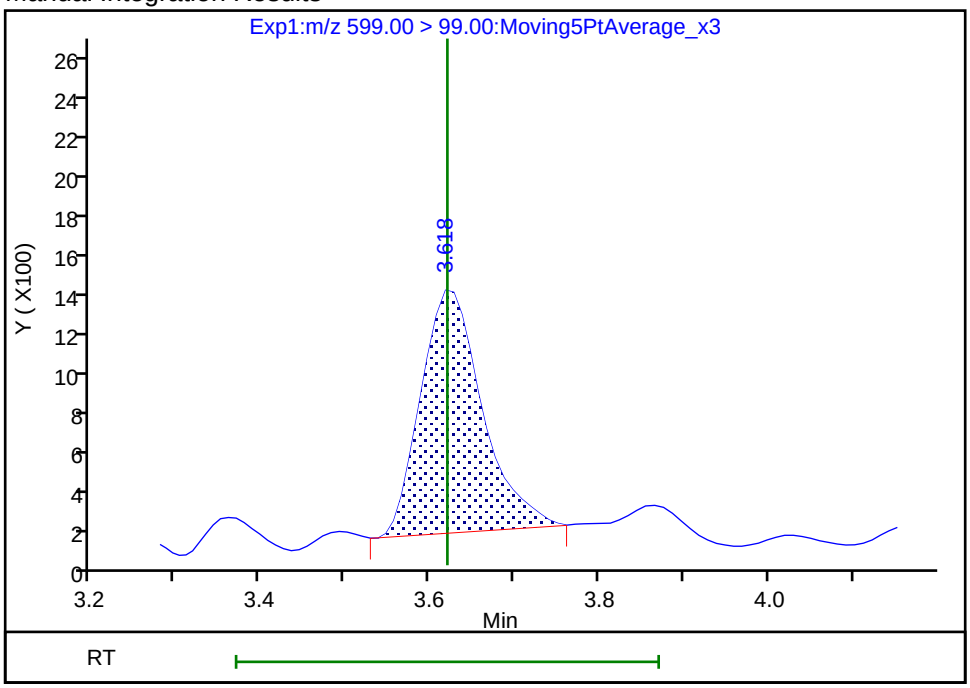
Processing Integration Results

RT: 3.62
Area: 6867
Amount: 0.022908
Amount Units: ng/ml



Manual Integration Results

RT: 3.62
Area: 6067
Amount: 0.022908
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:26:44

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

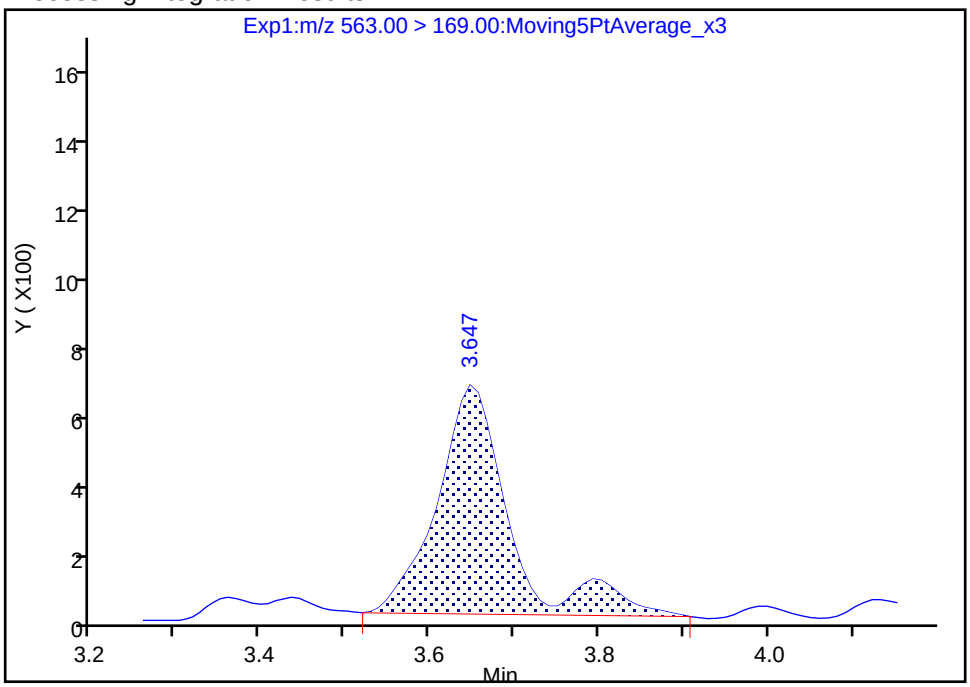
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

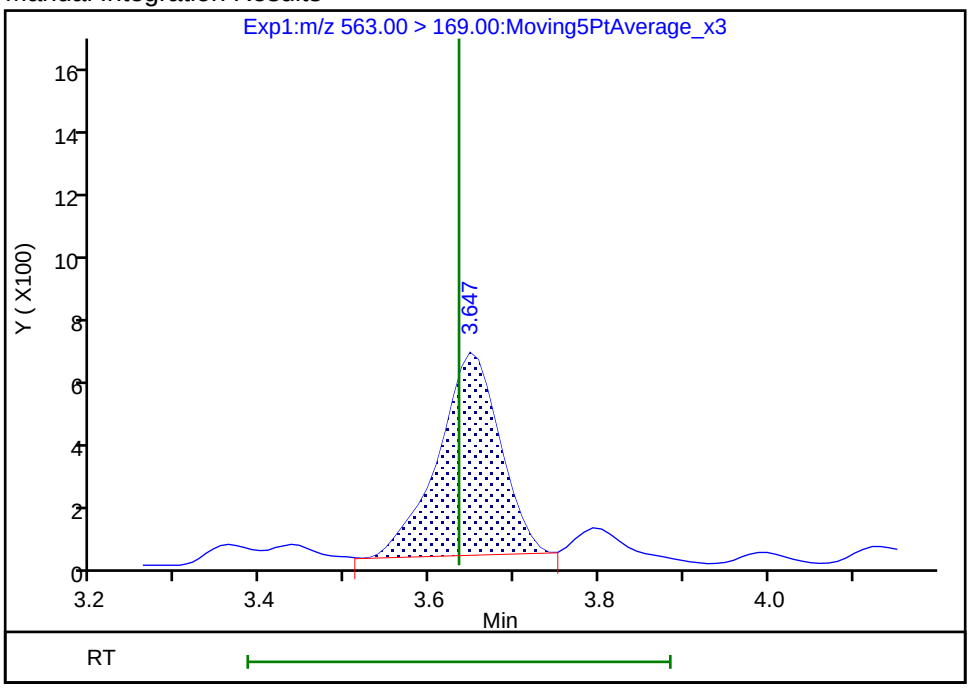
Processing Integration Results

RT: 3.65
Area: 3919
Amount: 0.031106
Amount Units: ng/ml



Manual Integration Results

RT: 3.65
Area: 3299
Amount: 0.031106
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:27:05

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

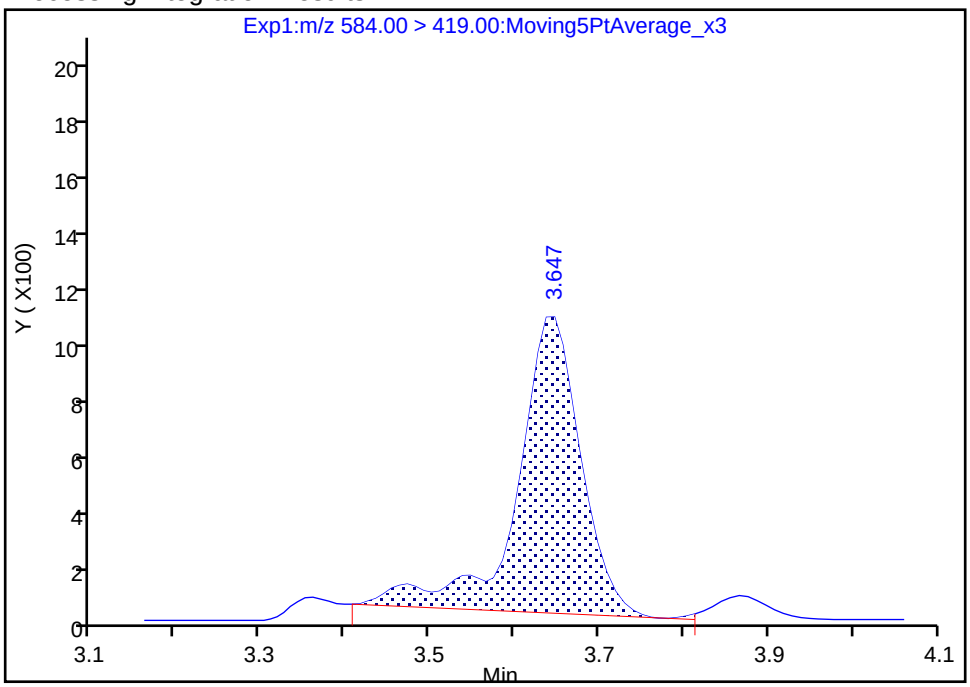
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

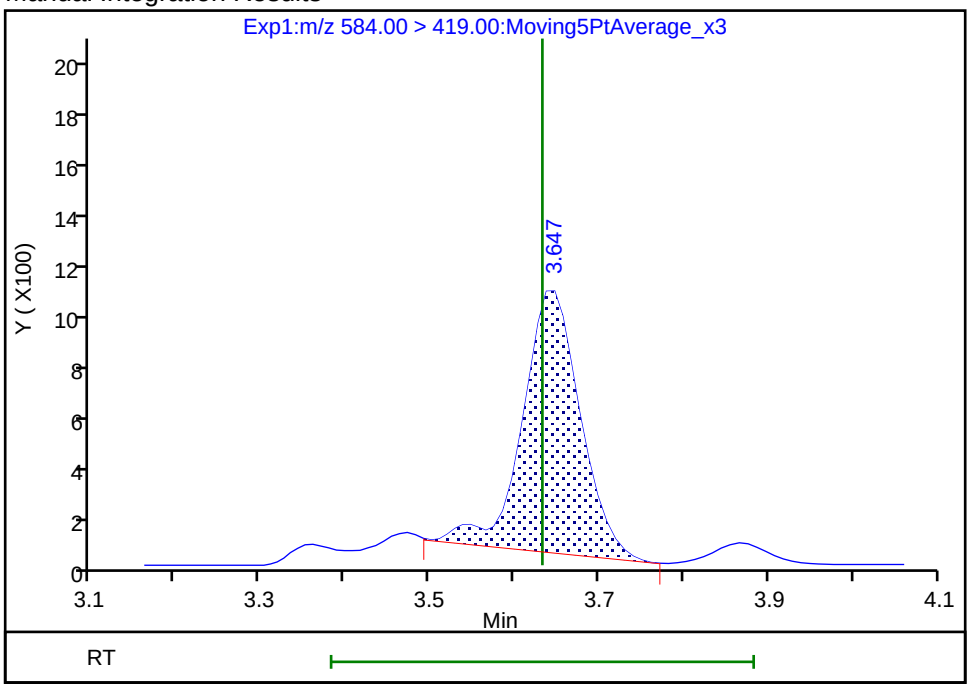
Processing Integration Results

RT: 3.65
Area: 5628
Amount: 0.028396
Amount Units: ng/ml



Manual Integration Results

RT: 3.65
Area: 4957
Amount: 0.025504
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:26:54

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 01-Aug-2018 13:06:53 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:39 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:31:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.395	0.002	0.540	5141928	2.45		98.1	74945	
2 Perfluorobutyric acid										
212.90 > 169.00	1.402	1.396	0.006	1.004	100773	0.0497		99.4	23.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.636	0.004	0.634	3382043	2.45		98.0	54096	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.636	0.004	1.000	86389	0.0533		107	31.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.669	0.006	0.647	89887	2.26		97.4	348	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.671	0.004	1.000	130464	0.0440		99.6	734	
298.90 > 99.00	1.675	1.671	0.004	1.000	56499		2.31(1.25-3.74)	99.6	234	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.872	0.004	0.725	632383	NC			6856	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.872	0.004	1.120	31260	0.0470		101	1851	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.903	0.002	0.736	3635013	2.43		97.3	79582	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.905	1.903	0.002	1.000	81976	0.0535		107	123	M
313.00 > 119.00	1.916	1.903	0.013	1.006	8717		9.40(5.03-15.10)	107	61.8	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.151	120606	0.0461		98.3	1899	
349.00 > 99.00	1.927	1.928	-0.001	1.151	46184		2.61(1.36-4.07)	98.3	266	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.000	0.014	0.778	179442	NC			4453	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	0.994	10701	NC			36.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.225	0.004	0.861	3553062	2.45		98.2	66788	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.226	0.003	1.000	79296	0.0481		96.2	32.7	M
363.00 > 169.00	2.229	2.226	0.003	1.000	37217		2.13(1.13-3.40)	96.2	328	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.237	0.003	1.000	118530	0.0484		106	688	
399.00 > 99.00	2.240	2.237	0.003	1.000	41157		2.88(1.50-4.49)	106	67.6	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.238	0.002	0.866	5006593	2.30		97.3	55144	
65 ADONA										
377.00 > 251.00	2.280	2.270	0.010	0.773	194813	NC			1691	
377.00 > 85.00	2.280	2.270	0.010	0.773	113714		1.71(0.84-2.53)		456	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.564	2.554	0.010	1.000	34779	0.0482		102	936	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.556	0.008	0.991	1036033	2.44		103	15008	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.580	0.0	0.997	3558329	2.55		102	52579	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.588	2.581	0.007	1.003	79819	0.0485		96.9	40.0	M
413.00 > 169.00	2.588	2.581	0.007	1.003	46881		1.70(0.84-2.52)	96.9	302	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.581	0.007		3640262	2.50			47450	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.587	0.001	0.878	98640	0.0499		105	1833	
449.00 > 99.00	2.588	2.587	0.001	0.878	26853		3.67(1.94-5.82)	105	226	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.946	0.002	1.139	3417703	2.27		95.2	45596	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.948	0.0	1.139	3085644	2.53		101	63218	
20 Perfluorononanoic acid										
463.00 > 419.00	2.953	2.949	0.004	1.002	68954	0.0517		103	105	
463.00 > 169.00	2.948	2.949	-0.001	1.000	16456		4.19(1.90-5.69)	103	876	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.953	2.949	0.004	1.002	75727	0.0472		102	600	
499.00 > 99.00	2.953	2.949	0.004	1.002	17304		4.38(2.31-6.93)	102	99.6	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.158	0.006	1.073	119615	NC			1581	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.292	0.007	1.000	28792	0.0500		104	1757	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.292	0.007	1.275	1020788	2.47		103	19201	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.295	0.004	1.119	51583	0.0502		105	1797	
549.00 > 99.00	3.299	3.295	0.004	1.119	19964		2.58(1.33-3.97)	105	132	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.306	0.001	1.278	2274867	2.50		99.9	36263	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.315	3.308	0.007	1.002	49086	0.0505		101	62.1	
513.00 > 169.00	3.307	3.308	-0.001	1.000	9842		4.99(2.36-7.09)	101	159	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.312	0.003	1.281	5311185	2.41		96.2	47157	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.313	0.002	1.000	102774	0.0490		98.0	1888	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.467	3.459	0.008	1.340	534311	2.42		96.7	11634	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.467	3.465	0.002	1.000	11798	0.0543		109	127	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.620	0.001	1.228	47682	0.0513		106	1719	
599.00 > 99.00	3.621	3.620	0.001	1.228	15861		3.01(1.39-4.16)	106	145	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.630	3.627	0.003	1.403	610182	2.57		103	9078	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.630	3.633	-0.003	1.000	9530	0.0438		87.6	216	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.634	0.006	1.406	1779877	2.54		101	31430	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.640	3.634	0.006	1.000	45391	0.0517		103	94.2	
563.00 > 169.00	3.640	3.634	0.006	1.000	9346		4.86(2.12-6.36)	103	385	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.792	0.003	1.287	168004	NC			5028	
D 36 13C2 PFDoA										
615.00 > 570.00	3.930	3.925	0.005	1.519	1524607	2.51		100	17103	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.930	3.927	0.003	1.000	32864	0.0498		99.5	9.8	
613.00 > 169.00	3.930	3.927	0.003	1.000	8696		3.78(2.13-6.40)	99.5	180	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.188	0.005	1.067	24421	0.0425		85.0	7.3	
663.00 > 169.00	4.193	4.188	0.005	1.067	7586		3.22(1.25-3.76)	85.0	76.7	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.423	0.003	1.000	7424	0.0553		111	107	
713.00 > 219.00	4.416	4.423	-0.007	0.998	4052		1.83(0.71-2.13)	111	64.9	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.423	0.003	1.710	1246501	2.44		97.8	5991	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.826	0.007	1.868	2126007	2.42		96.8	3087	
45 Perfluorohexadecanoic acid										M
813.00 > 769.00	4.833	4.827	0.006	1.000	56565	NC			3.7	M
813.00 > 169.00	4.833	4.827	0.006	1.000	9667		5.85(2.86-8.58)		103	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.167	5.166	0.001	1.069	44038	NC			13.9	
913.00 > 169.00	5.167	5.166	0.001	1.069	5315		8.29(3.83-11.48)		50.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:41 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d

Injection Date: 01-Aug-2018 13:06:53 Instrument ID: A8_N

Lims ID: IC L2 Full

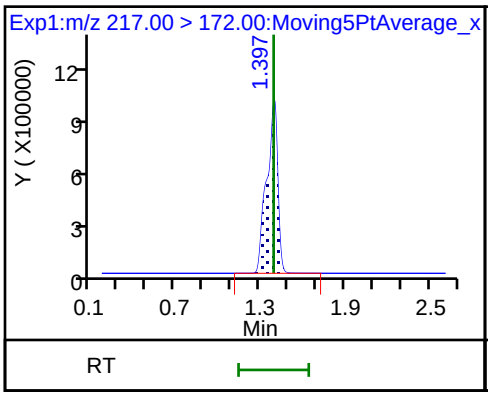
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 11 Worklist Smp#: 3

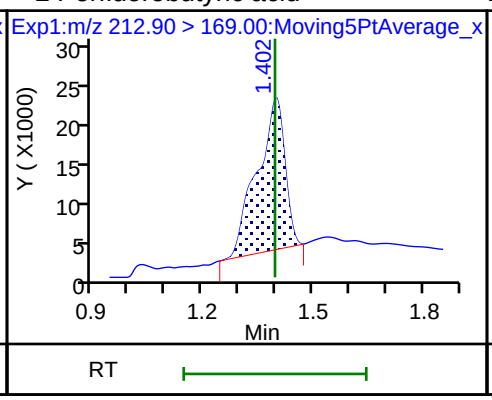
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

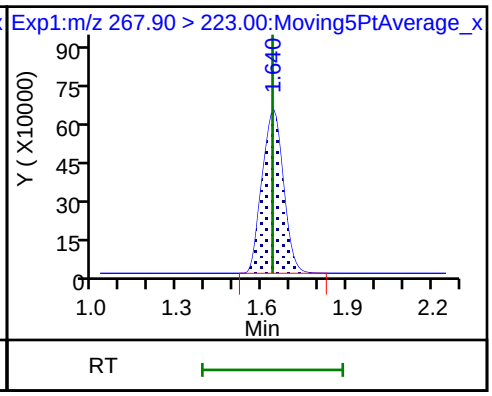
D 1 13C4 PFBA



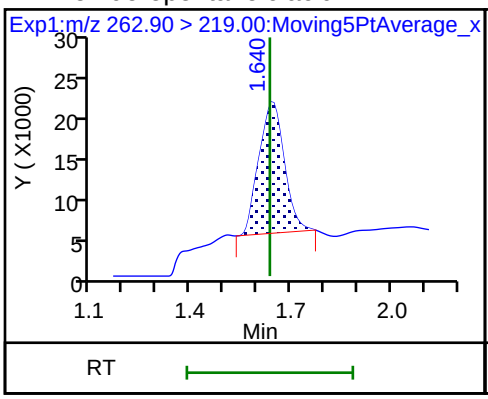
2 Perfluorobutyric acid



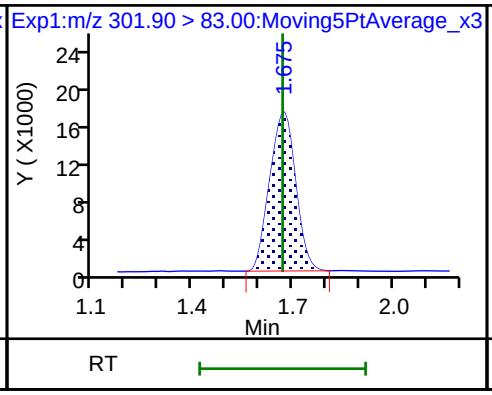
D 3 13C5-PFPeA



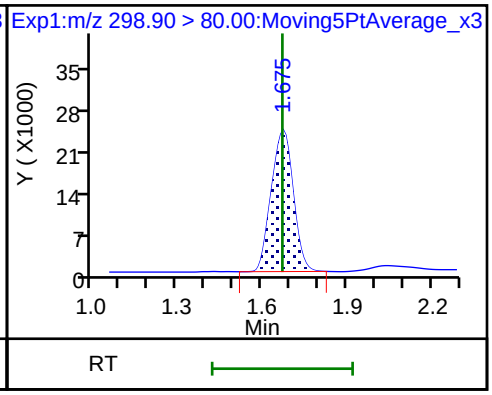
4 Perfluoropentanoic acid



D 47 13C3-PFBS



5 Perfluorobutanesulfonic acid



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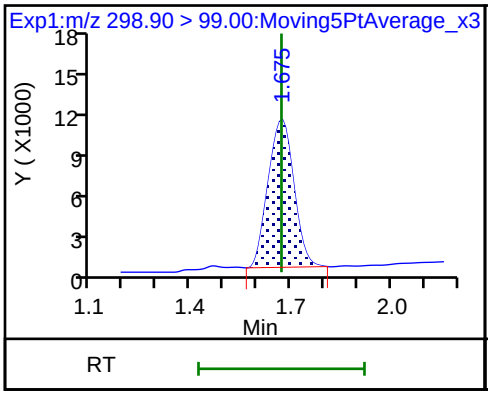
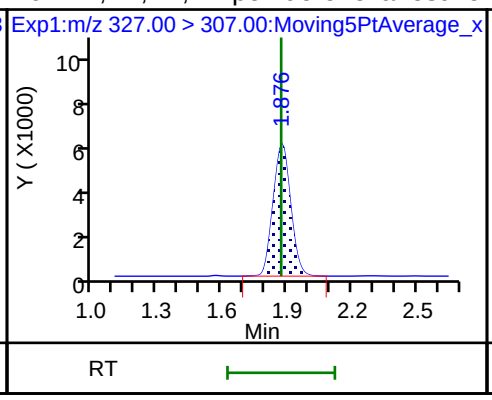
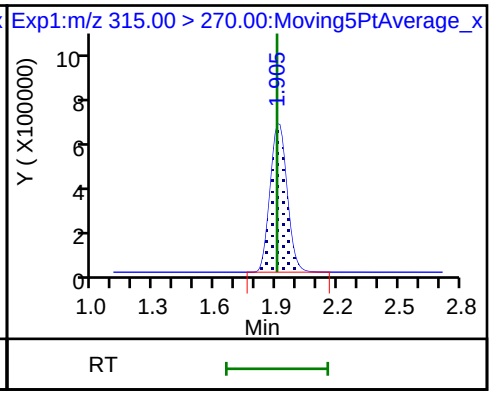


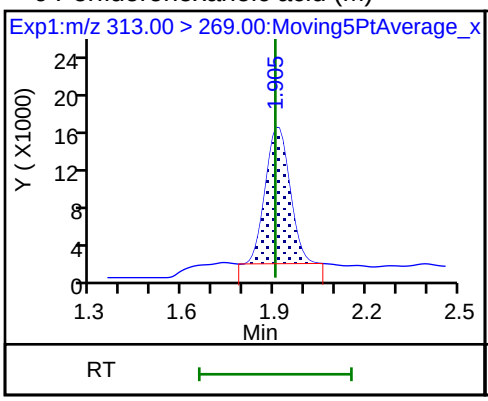
61 1H,1H,2H,2H-perfluorohexanesulfon



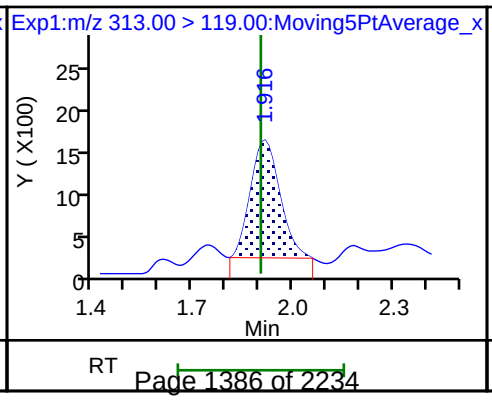
D 7 13C2 PFHxA



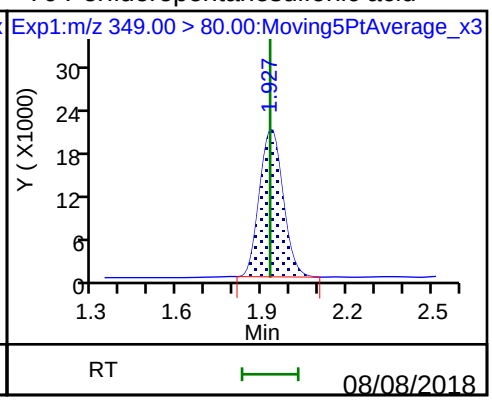
6 Perfluorohexanoic acid (M)



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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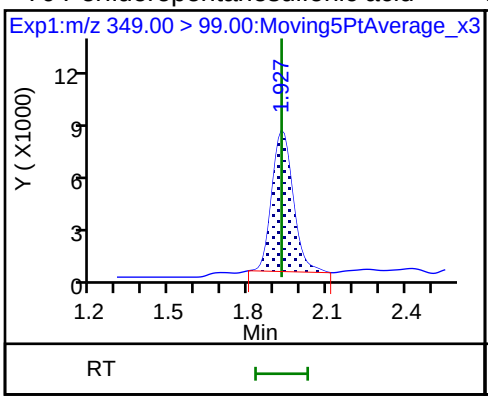
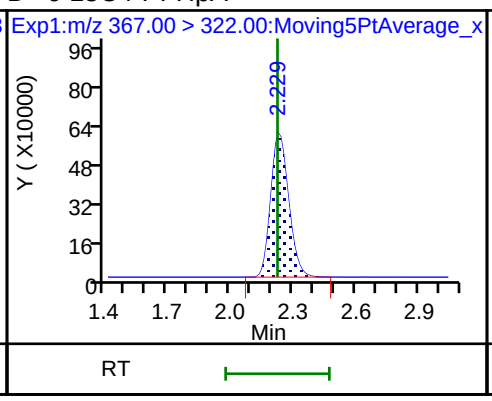
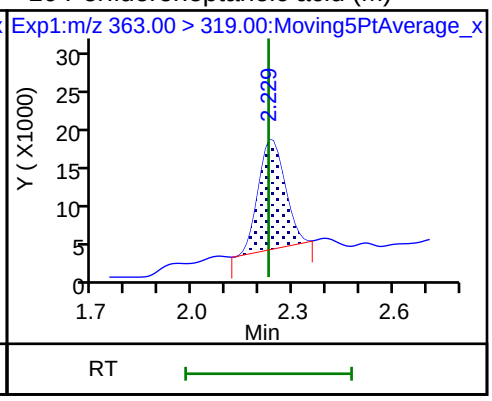


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid (M)



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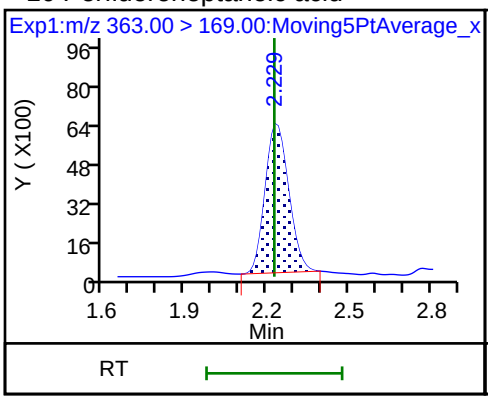
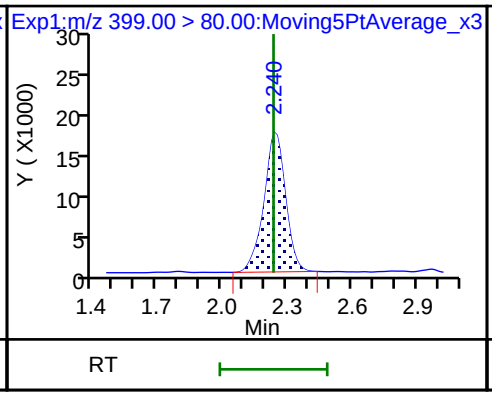


8 Perfluorohexanesulfonic acid



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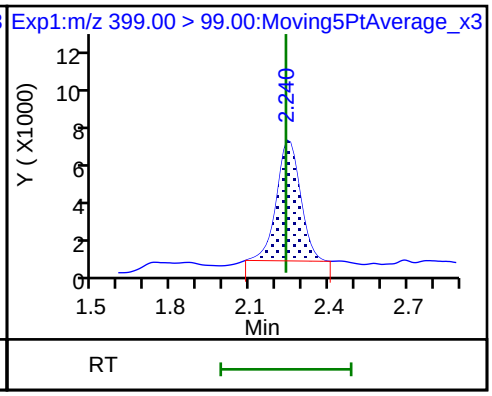
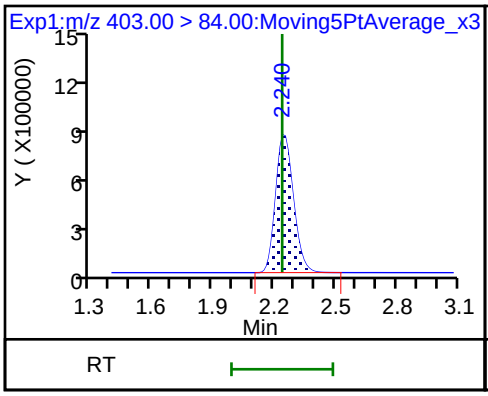
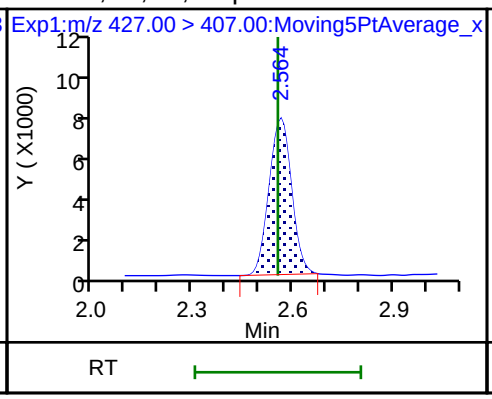


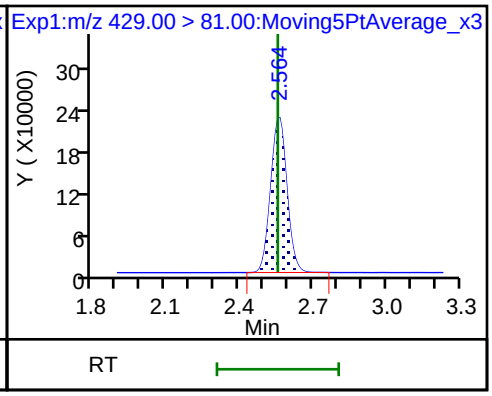
D 11 18O2 PFHxS



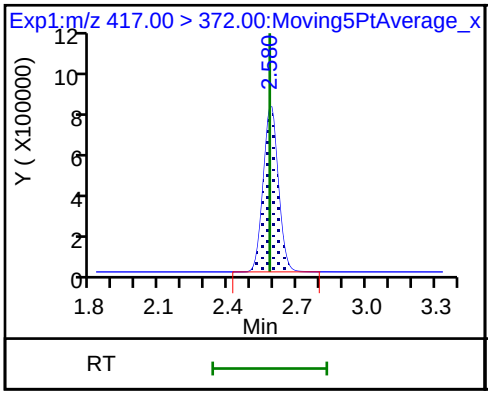
13 1H,1H,2H,2H-perfluorooctanesulfon



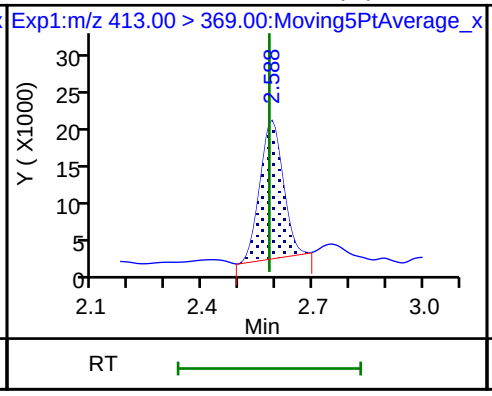
D 12 M2-6:2FTS



D 14 13C4 PFOA



15 Perfluorooctanoic acid (M)



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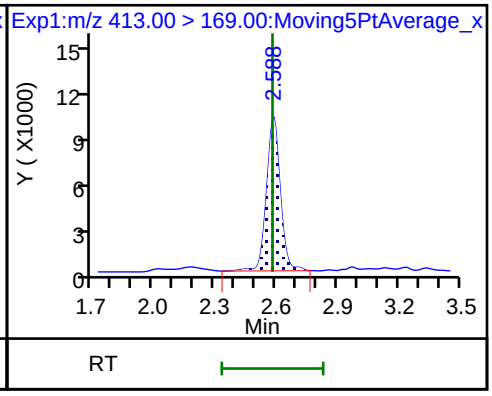
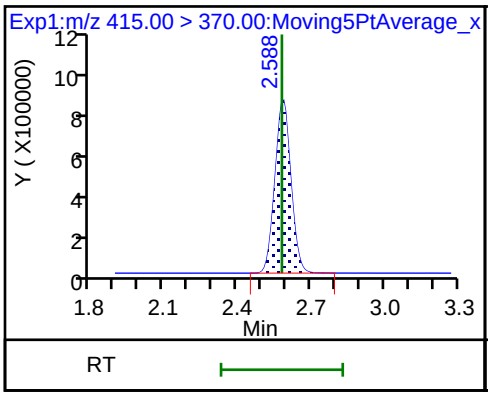
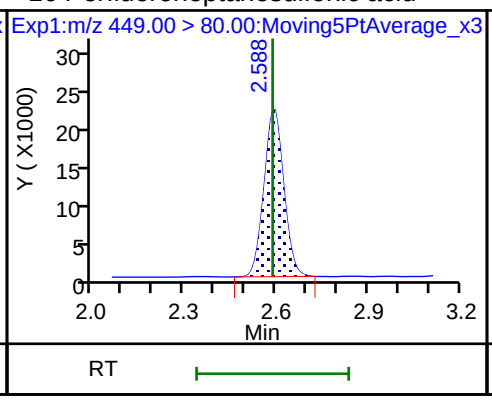


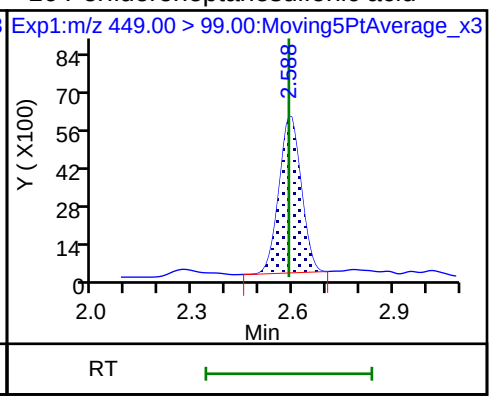
* 62 13C2-PFOA



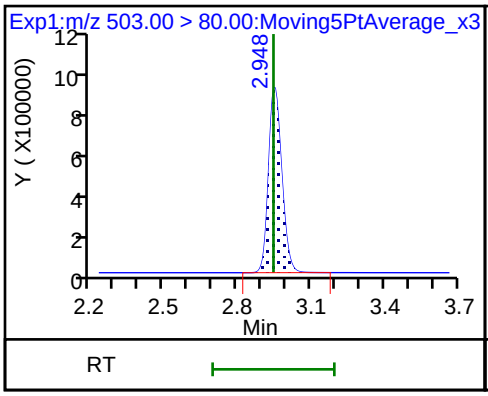
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS



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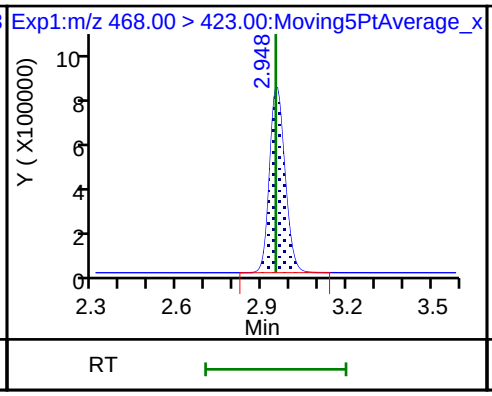
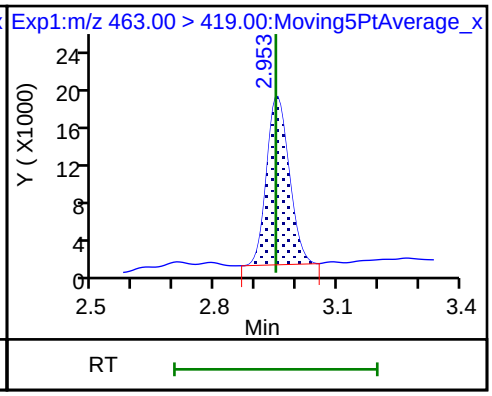


20 Perfluorononanoic acid



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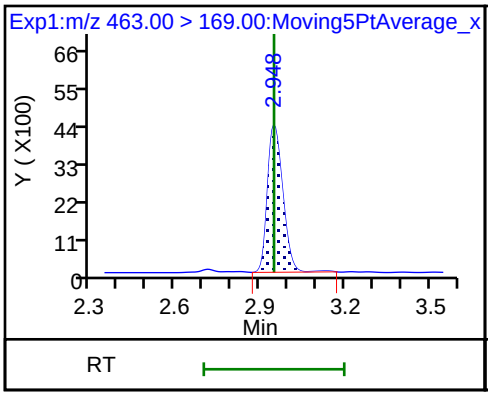
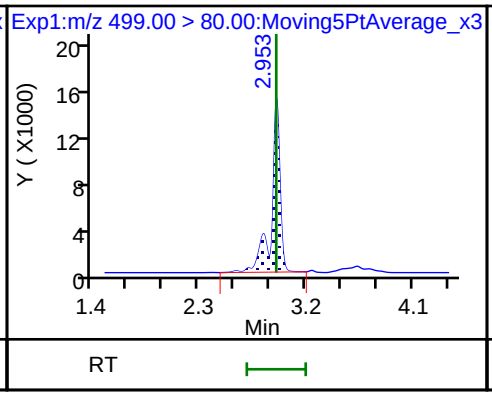


17 Perfluorooctane sulfonic acid



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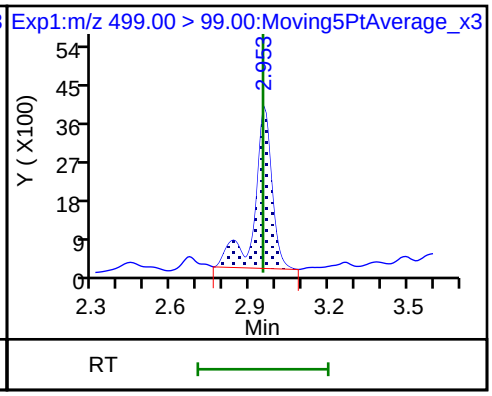
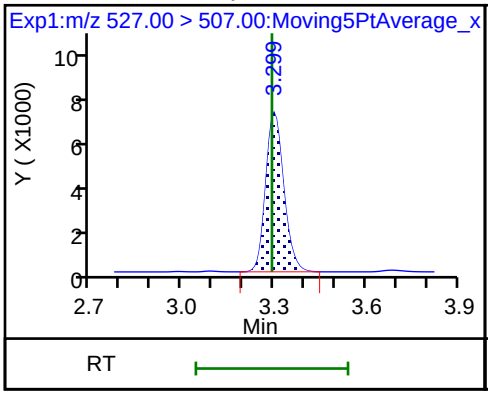
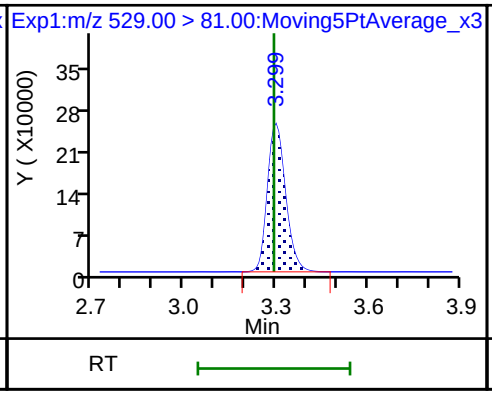


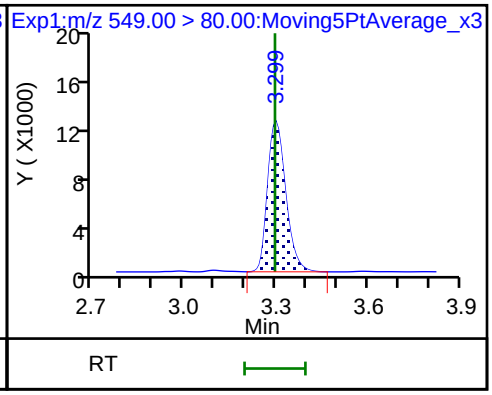
25 1H,1H,2H,2H-perfluorodecanesulfon



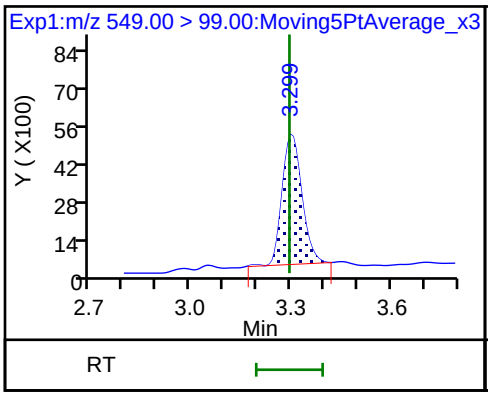
D 26 M2-8:2FTS



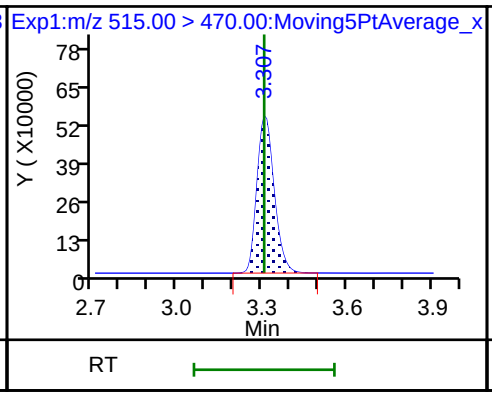
68 Perfluorononanesulfonic acid



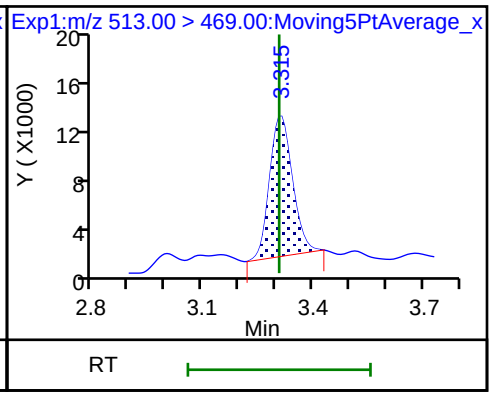
68 Perfluorononanesulfonic acid



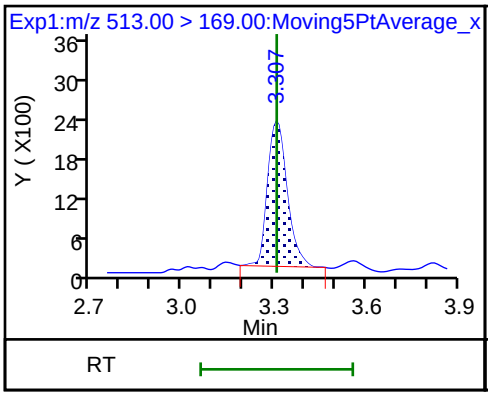
D 23 13C2 PFDA



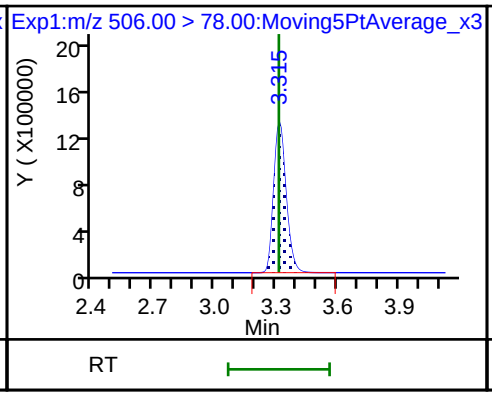
24 Perfluorodecanoic acid



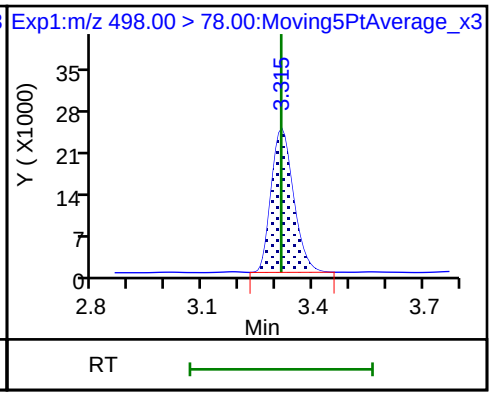
24 Perfluorodecanoic acid



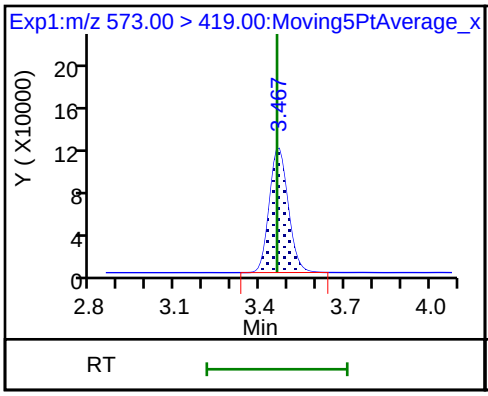
D 21 13C8 FOSA



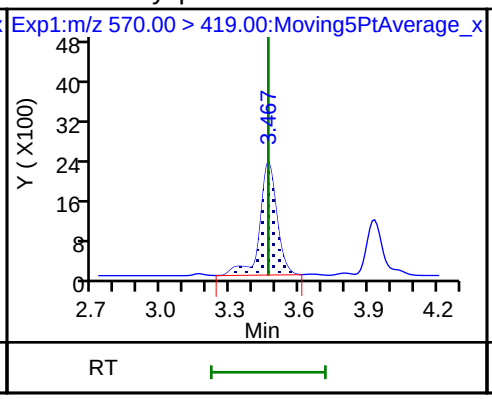
22 Perfluorooctane Sulfonamide



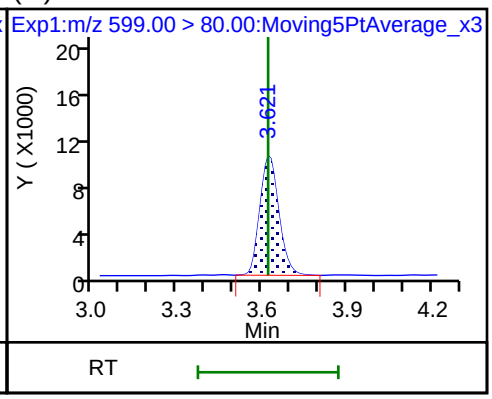
D 27 d3-NMeFOSAA



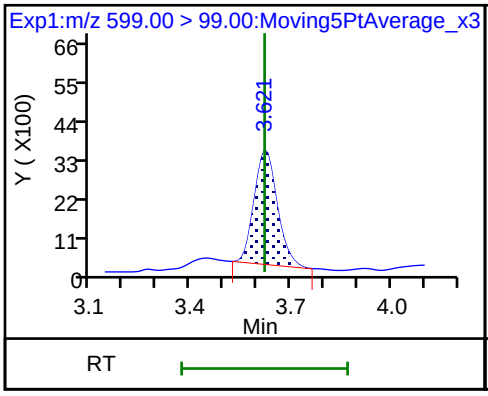
28 N-methyl perfluorooctane sulfonami (M)



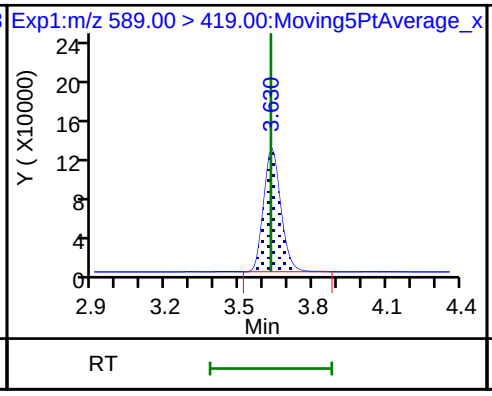
29 Perfluorodecane Sulfonic acid



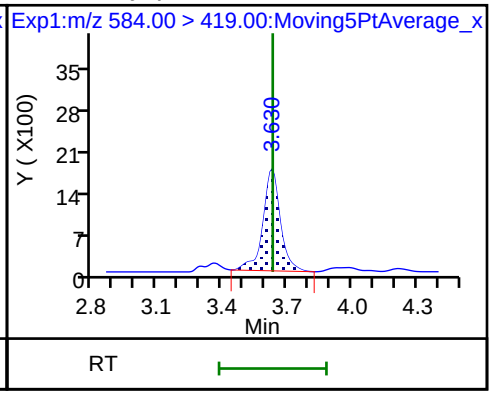
29 Perfluorodecane Sulfonic acid



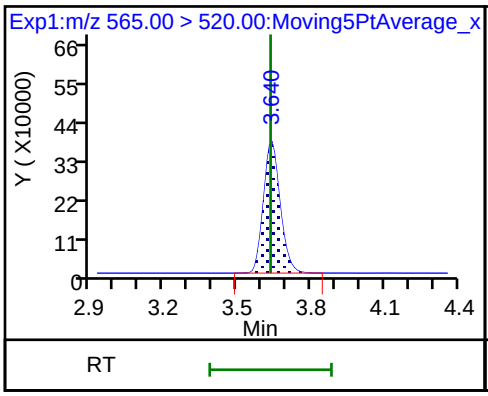
D 32 d5-NEtFOSAA



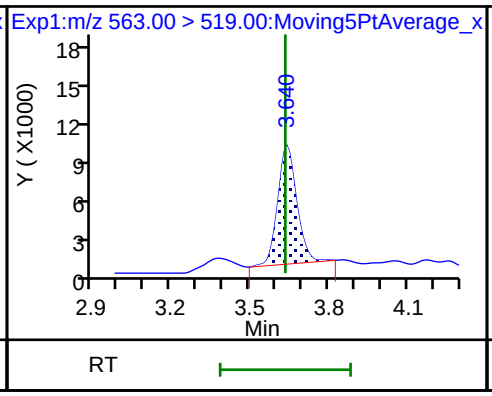
33 N-ethyl perfluorooctane sulfonamid



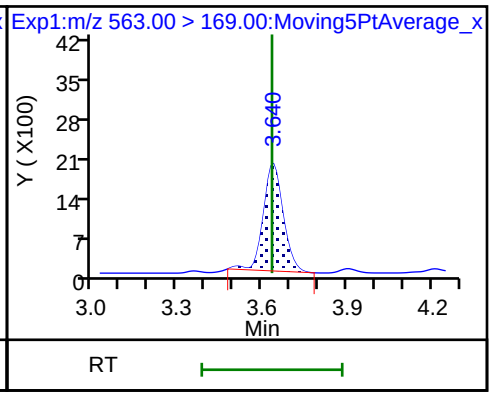
D 30 13C2 PFUnA



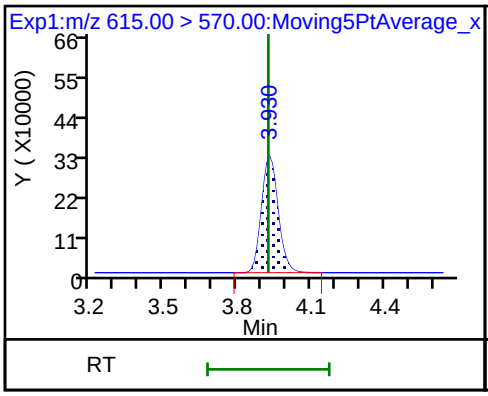
31 Perfluoroundecanoic acid



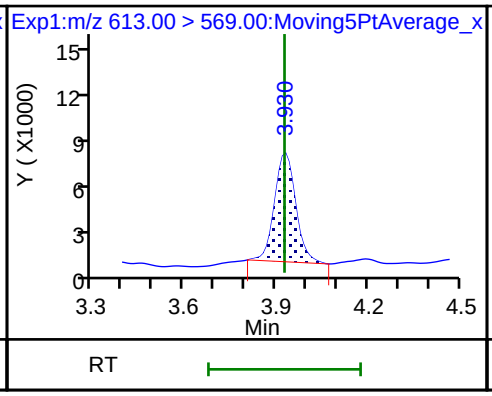
31 Perfluoroundecanoic acid



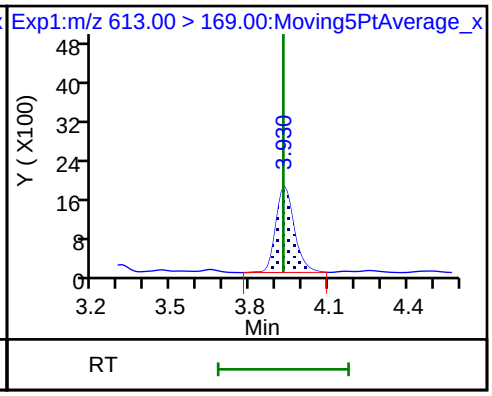
D 36 13C2 PFDoA



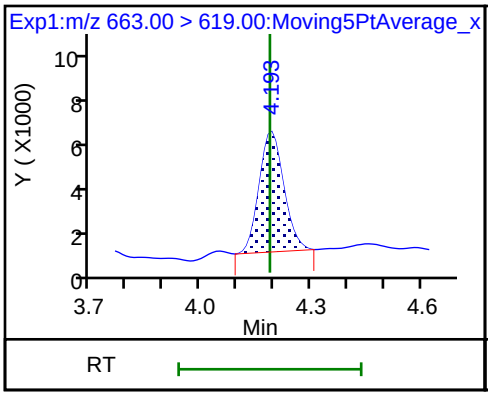
37 Perfluorododecanoic acid



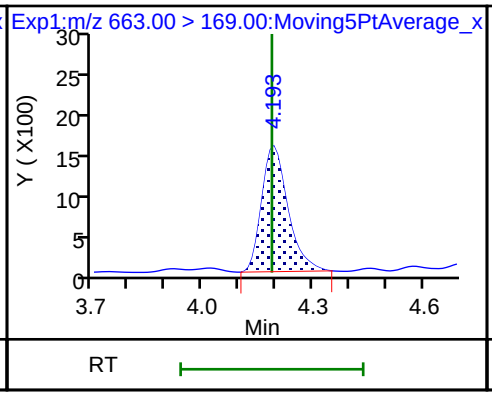
37 Perfluorododecanoic acid



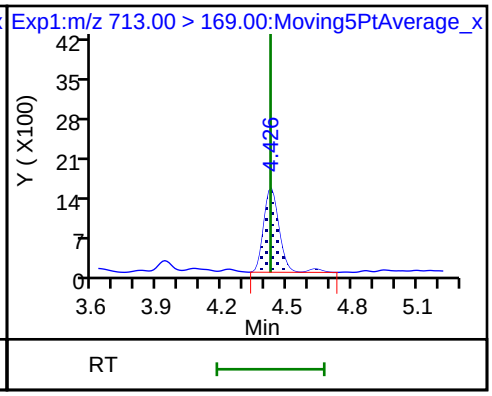
41 Perfluorotridecanoic acid



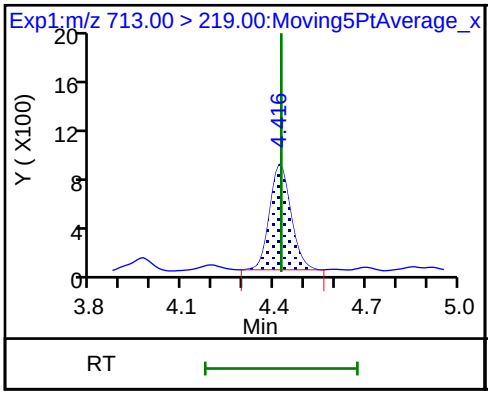
41 Perfluorotridecanoic acid



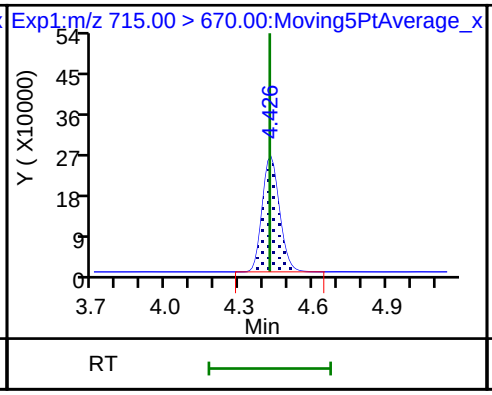
42 Perfluorotetradecanoic acid



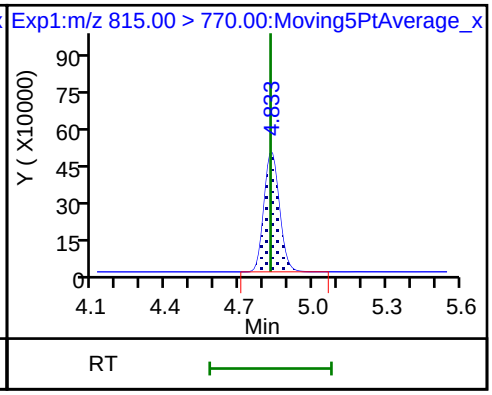
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

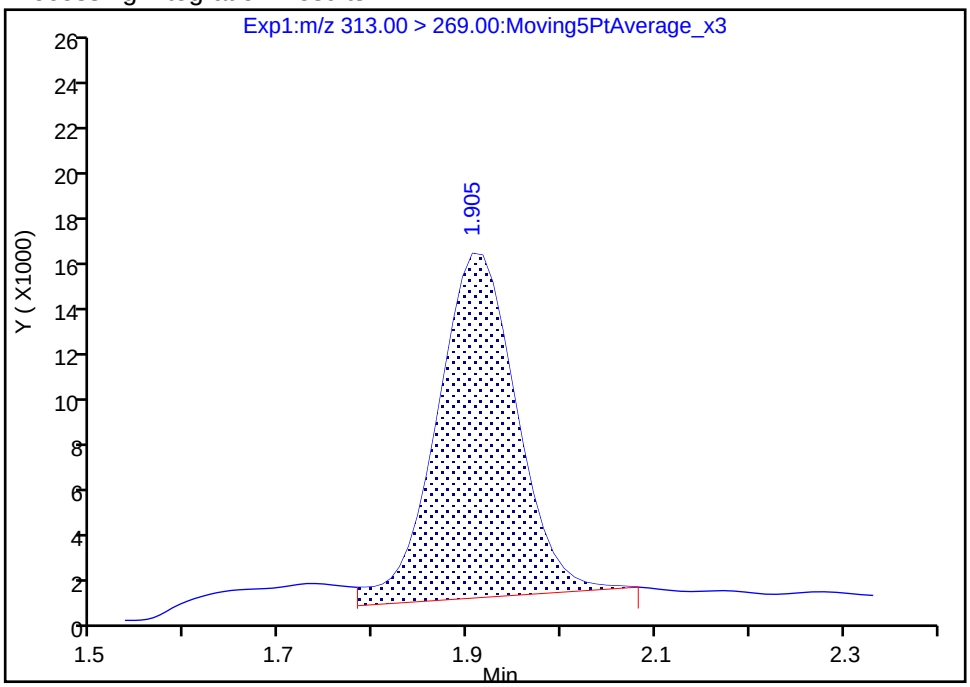
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

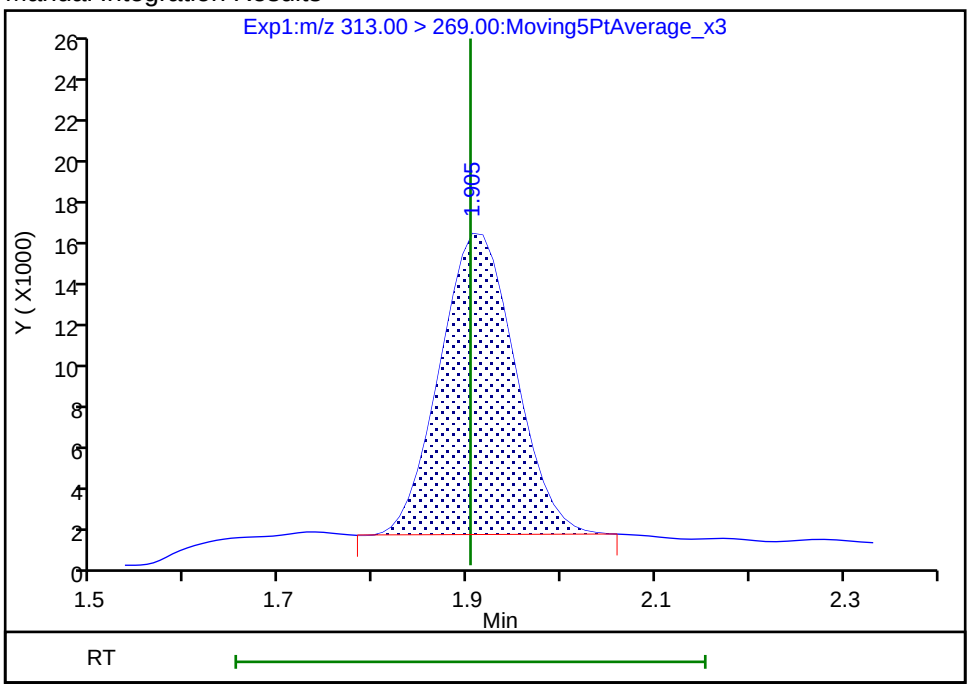
Processing Integration Results

RT: 1.91
Area: 89995
Amount: 0.057828
Amount Units: ng/ml



Manual Integration Results

RT: 1.91
Area: 81976
Amount: 0.053462
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:29:08

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

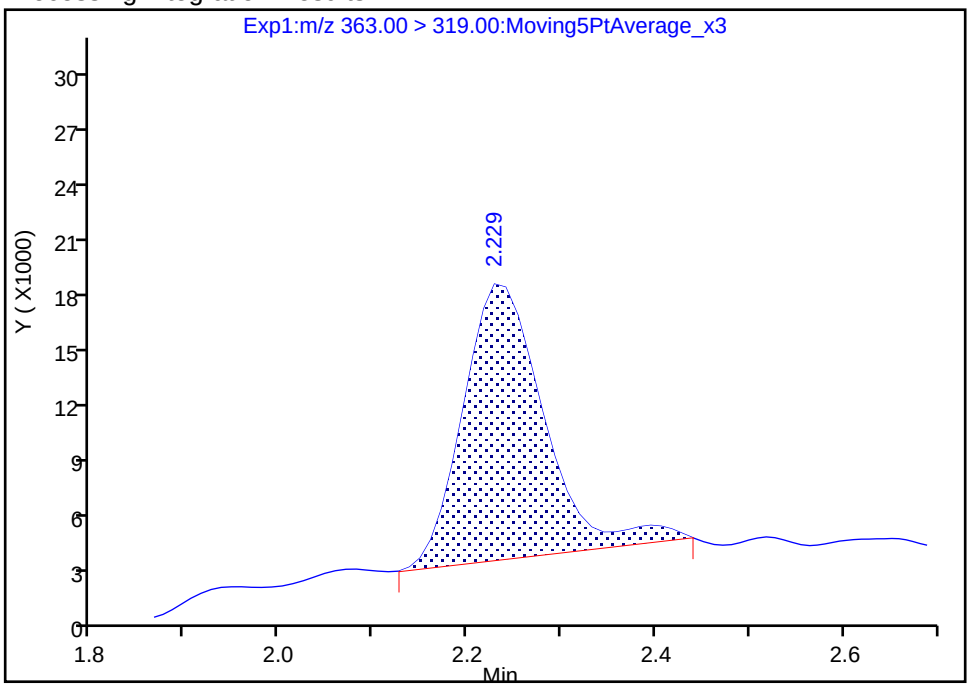
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

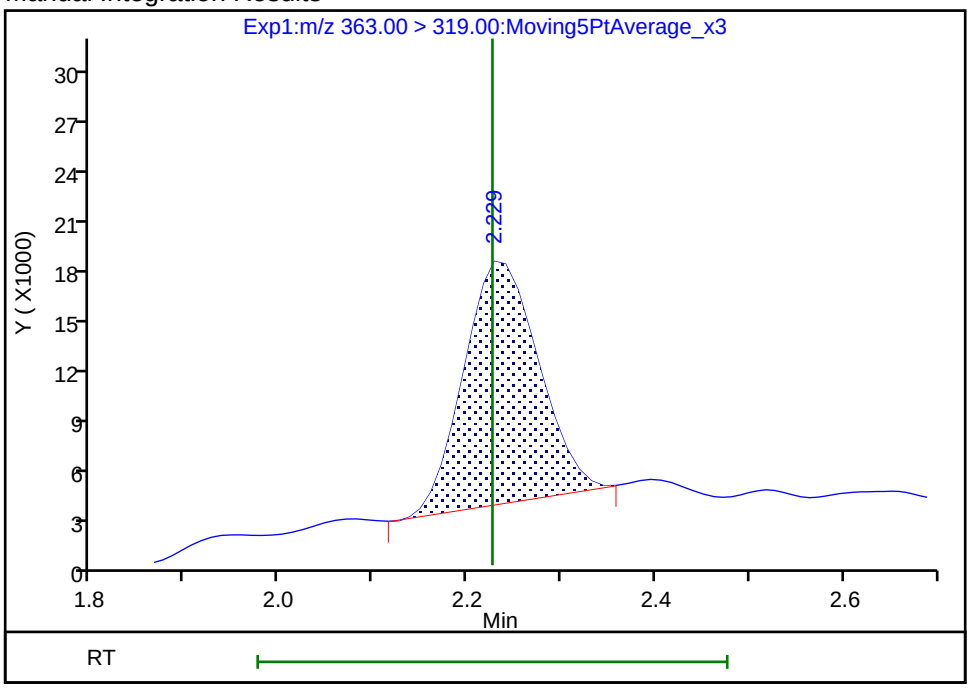
Processing Integration Results

RT: 2.23
Area: 88379
Amount: 0.052794
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 79296
Amount: 0.048114
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:29:25

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

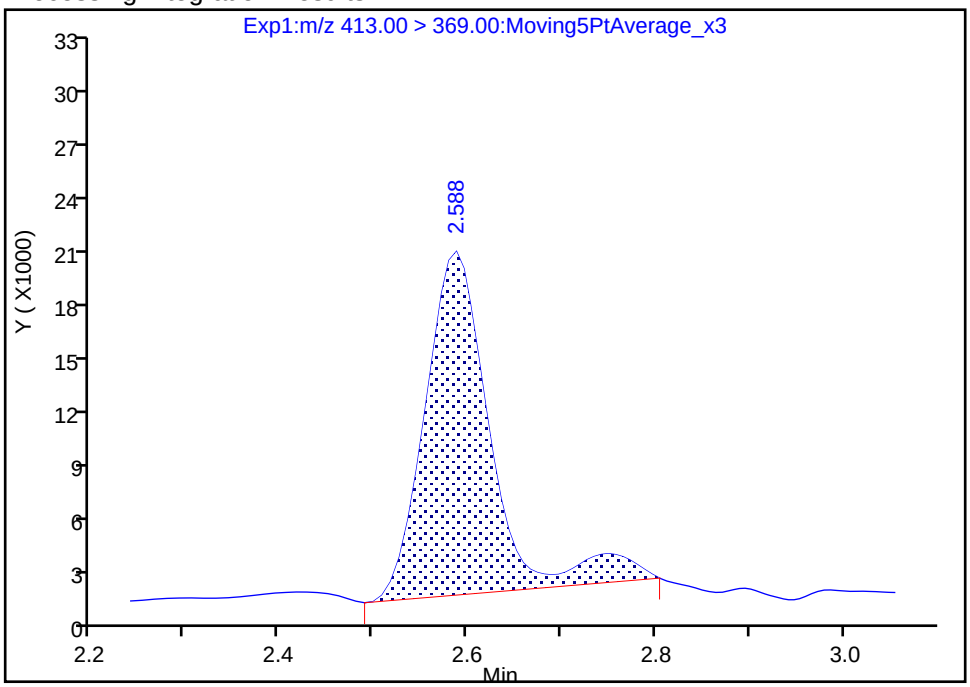
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

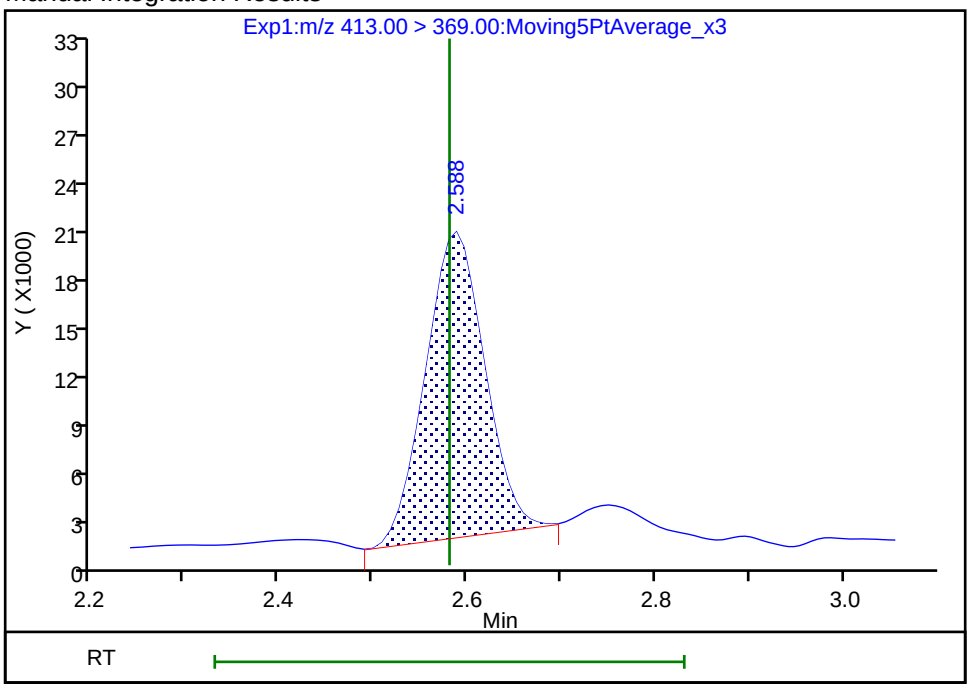
Processing Integration Results

RT: 2.59
Area: 90013
Amount: 0.053747
Amount Units: ng/ml



Manual Integration Results

RT: 2.59
Area: 79819
Amount: 0.048503
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:28:37

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

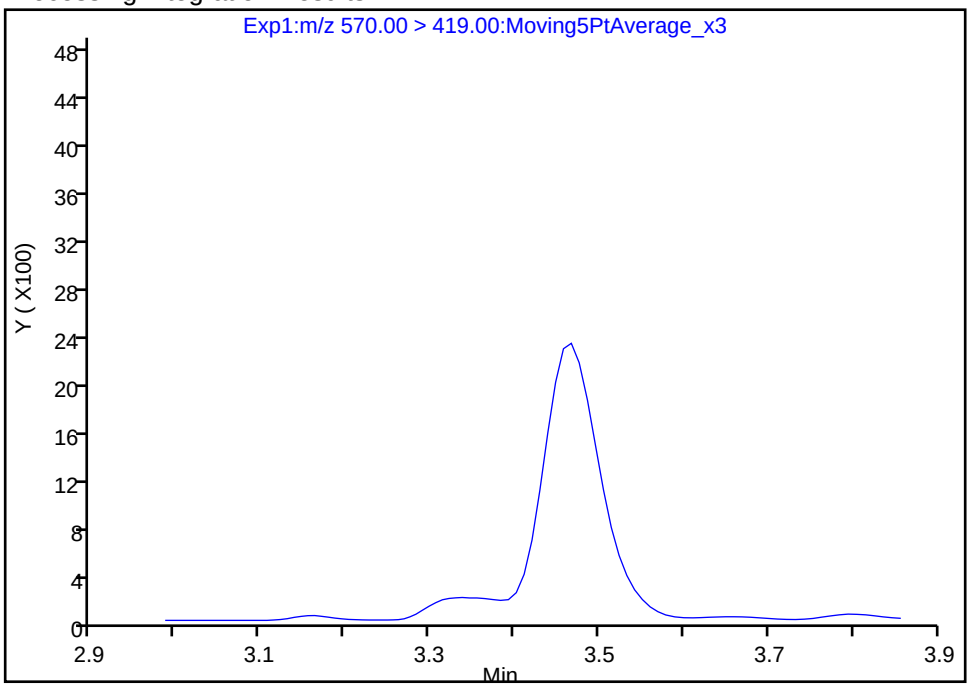
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

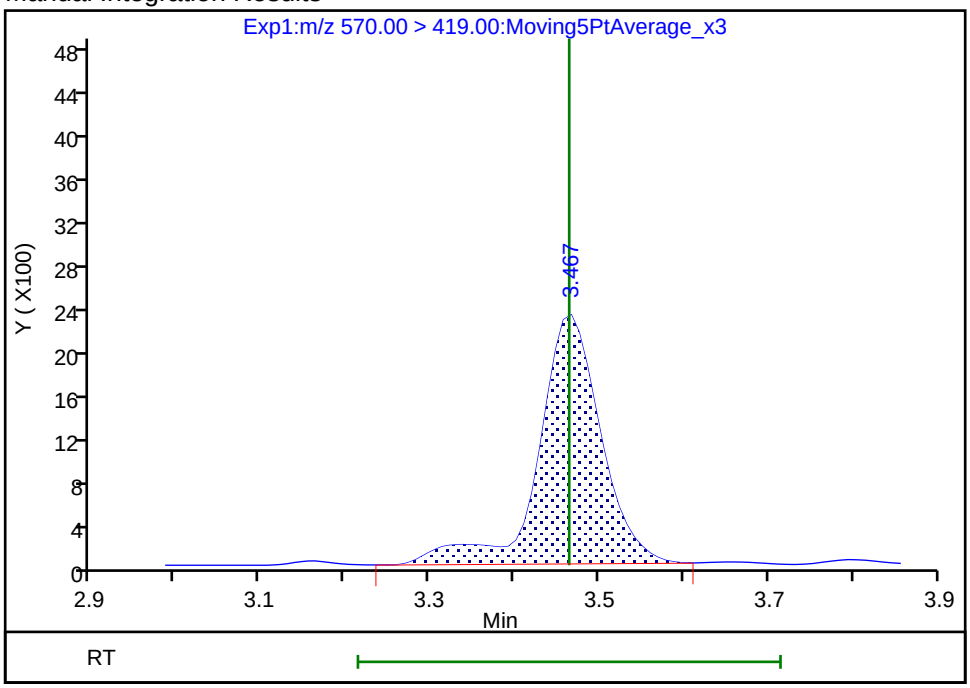
Not Detected
Expected RT: 3.46

Processing Integration Results



Manual Integration Results

RT: 3.47
Area: 11798
Amount: 0.054298
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:29:42
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 01-Aug-2018 13:14:43 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:43 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:32:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.395	0.003	0.540	4833356	2.39		95.7	89658	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.396	0.001	1.000	462891	0.2430		97.2	104	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.636	0.004	0.635	3283004	2.47		98.7	56857	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.636	0.004	1.000	385176	0.2450		98.0	143	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.645	85167	2.23		95.7	327	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.671	0.004	1.005	611203	0.2177		98.5	3163	
298.90 > 99.00	1.675	1.671	0.004	1.005	265854		2.30(1.25-3.74)	98.5	1104	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.872	0.004	0.726	612244	NC			5766	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.872	0.004	1.126	151962	0.2410		103	9089	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.903	0.002	0.737	3497268	2.43		97.2	101113	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.903	0.002	1.000	352293	0.2388		95.5	530	
313.00 > 119.00	1.905	1.903	0.002	1.000	35057		10.05(5.03-15.10)	95.5	338	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	572115	0.2309		98.4	10772	
349.00 > 99.00	1.927	1.928	-0.001	1.157	211889		2.70(1.36-4.07)	98.4	1247	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.000	0.003	0.775	165918	NC			5657	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	1.000	69749	NC			261	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.225	0.004	0.862	3413685	2.45		97.9	57432	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.226	0.003	1.000	400178	0.2527		101	165	
363.00 > 169.00	2.229	2.226	0.003	1.000	144272		2.77(1.13-3.40)	101	1607	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.237	0.004	1.000	492246	0.2146		94.3	2563	
399.00 > 99.00	2.241	2.237	0.004	1.000	176898		2.78(1.50-4.49)	94.3	290	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.867	4692968	2.24		94.6	40809	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.768	912723	NC			6763	
377.00 > 85.00	2.267	2.270	-0.003	0.768	516047		1.77(0.84-2.53)		1961	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.560	2.554	0.006	1.000	154602	0.2309		97.4	4116	
D 12 M2-6:2FTS										
429.00 > 81.00	2.560	2.556	0.004	0.991	961732	2.35		99.1	13733	
D 14 13C4 PFOA										
417.00 > 372.00	2.584	2.580	0.004	1.000	3335341	2.48		99.0	46480	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.584	2.581	0.003	1.000	378678	0.2455		98.1	236	
413.00 > 169.00	2.584	2.581	0.003	1.000	188937		2.00(0.84-2.52)	98.1	1155	
* 62 13C2-PFOA										
415.00 > 370.00	2.584	2.581	0.003		3508409	2.50			48346	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.592	2.587	0.005	0.879	436716	0.2226		93.5	7361	
449.00 > 99.00	2.592	2.587	0.005	0.879	122110		3.58(1.94-5.82)	93.5	1406	
D 18 13C4 PFOS										
503.00 > 80.00	2.951	2.946	0.005	1.142	3391354	2.34		98.0	33814	
D 19 13C5 PFNA										
468.00 > 423.00	2.951	2.948	0.003	1.142	2896674	2.47		98.7	59571	
20 Perfluorononanoic acid										
463.00 > 419.00	2.951	2.949	0.002	1.000	295007	0.2358		94.3	549	
463.00 > 169.00	2.951	2.949	0.002	1.000	74494		3.96(1.90-5.69)	94.3	1695	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.951	2.949	0.002	1.000	341410	0.2143		92.4	3442	
499.00 > 99.00	2.951	2.949	0.002	1.000	82300		4.15(2.31-6.93)	92.4	432	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.159	3.158	0.001	1.071	569724	NC			7887	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.292	0.003	1.000	130586	0.2451		102	7867	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.292	0.003	1.275	944227	2.37		98.9	14150	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.302	3.295	0.007	1.119	222331	0.2180		90.8	9052	
549.00 > 99.00	3.295	3.295	0.0	1.117	100259		2.22(1.33-3.97)	90.8	845	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.310	3.306	0.004	1.281	2112120	2.41		96.2	46081	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.310	3.308	0.002	1.000	230406	0.2555		102	324	
513.00 > 169.00	3.310	3.308	0.002	1.000	36327		6.34(2.36-7.09)	102	583	
D 21 13C8 FOSA										
506.00 > 78.00	3.318	3.312	0.006	1.284	5234016	2.46		98.4	65059	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.318	3.313	0.005	1.000	507693	0.2457		98.3	9280	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.463	3.459	0.004	1.340	521422	2.45		97.9	10409	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.465	-0.002	1.000	50086	0.2362		94.5	1029	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.618	3.620	-0.002	1.226	221097	0.2396		99.4	5766	
599.00 > 99.00	3.618	3.620	-0.002	1.226	66539		3.32(1.39-4.16)	99.4	626	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.627	0.0	1.404	571651	2.50		100	5691	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.637	3.633	0.004	1.003	51670	0.2536		101	1206	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.634	0.003	1.407	1682161	2.49		99.5	32258	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.637	3.634	0.003	1.000	186462	0.2249		90.0	400	
563.00 > 169.00	3.637	3.634	0.003	1.000	38148		4.89(2.12-6.36)	90.0	1315	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.285	804413	NC			13958	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.925	0.003	1.520	1396187	2.38		95.4	17277	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.927	0.001	1.000	145817	0.2411		96.5	45.4	
613.00 > 169.00	3.928	3.927	0.001	1.000	37372		3.90(2.13-6.40)	96.5	608	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.188	0.004	1.067	128866	0.2448		97.9	41.7	
663.00 > 169.00	4.192	4.188	0.004	1.067	39055		3.30(1.25-3.76)	97.9	312	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.425	4.423	0.002	1.000	31626	0.2425		97.0	380	
713.00 > 219.00	4.415	4.423	-0.008	0.998	22264		1.42(0.71-2.13)	97.0	338	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.423	0.002	1.713	1210263	2.46		98.5	5695	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.826	-0.003	1.866	2101845	2.48		99.3	2996	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.832	4.827	0.005	1.002	213563	NC			13.7	
813.00 > 169.00	4.832	4.827	0.005	1.002	37996		5.62(2.86-8.58)		459	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.165	5.166	-0.001	1.071	215624	NC			69.1	
913.00 > 169.00	5.165	5.166	-0.001	1.071	26376		8.18(3.83-11.48)		263	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_004.d

Injection Date: 01-Aug-2018 13:14:43 Instrument ID: A8_N

Lims ID: IC L3 Full

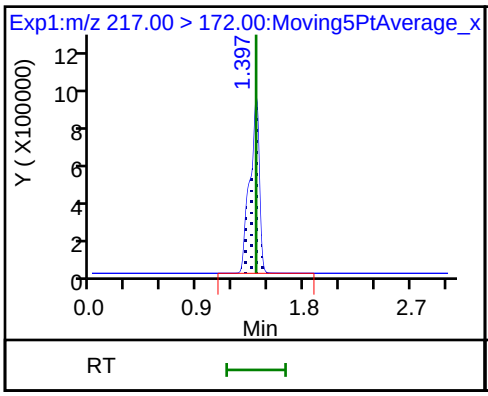
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 12 Worklist Smp#: 4

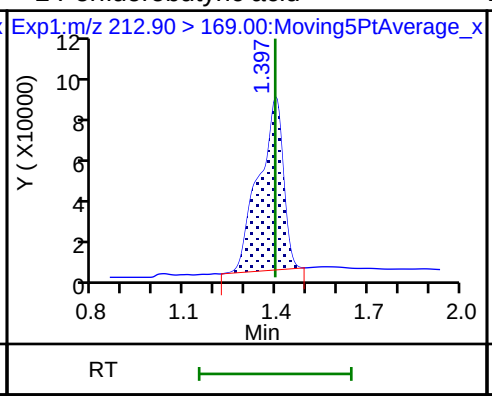
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

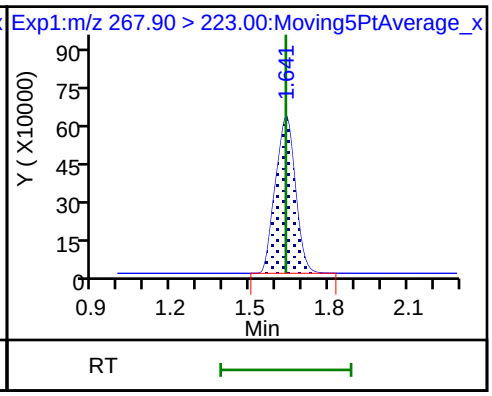
D 1 13C4 PFBA



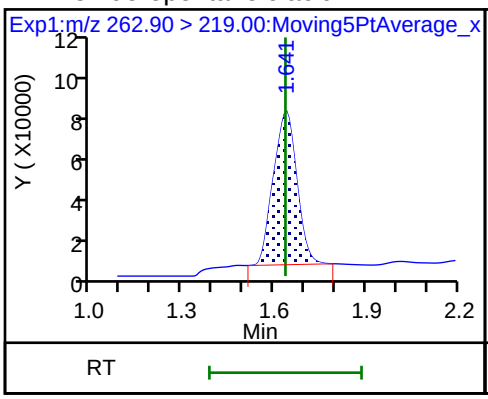
2 Perfluorobutyric acid



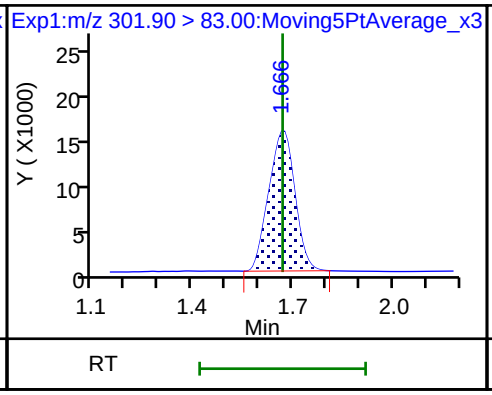
D 3 13C5-PFPeA



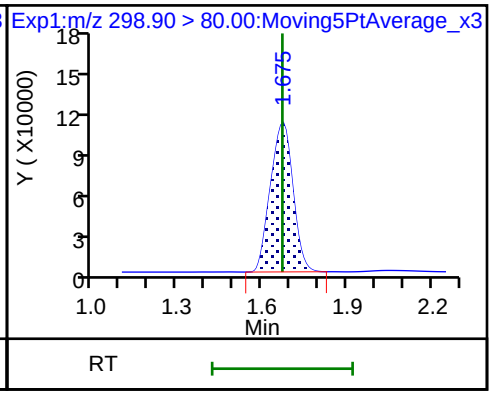
4 Perfluoropentanoic acid



D 47 13C3-PFBS



5 Perfluorobutanesulfonic acid



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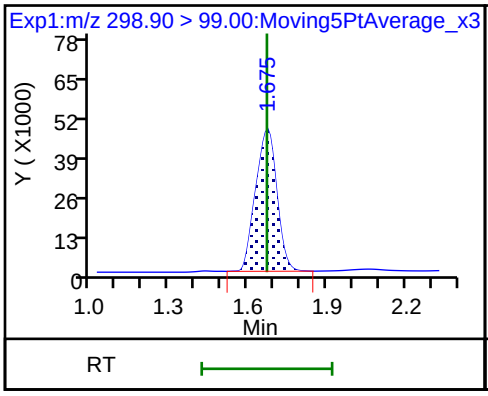
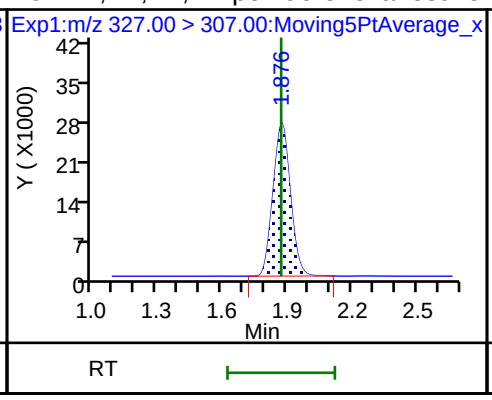
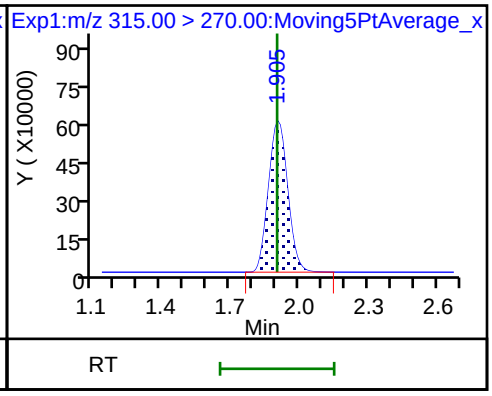


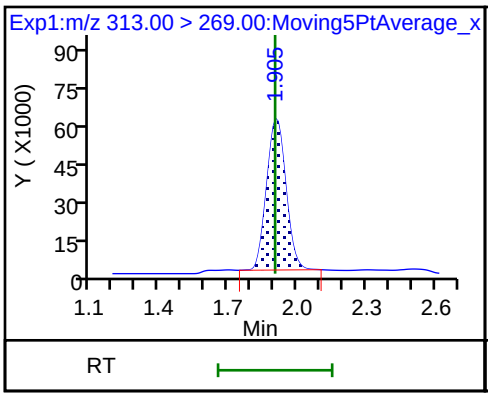
61 1H,1H,2H,2H-perfluorohexanesulfon



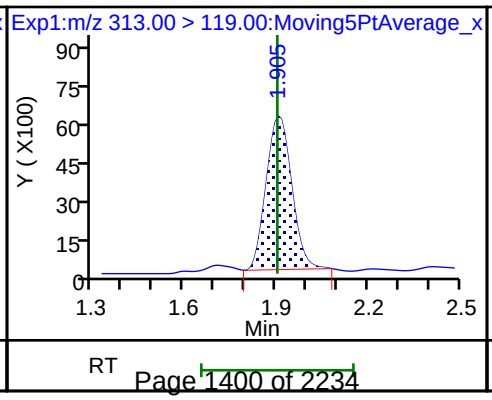
D 7 13C2 PFHxA



6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



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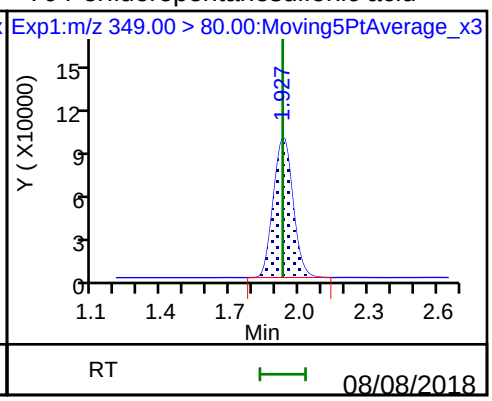

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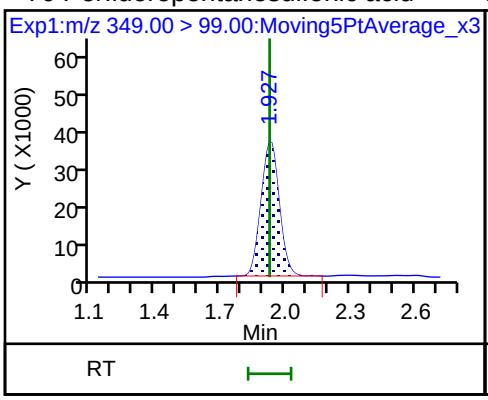
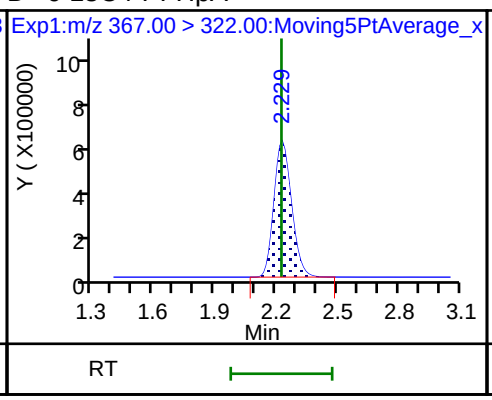


D 9 13C4-PFHpA



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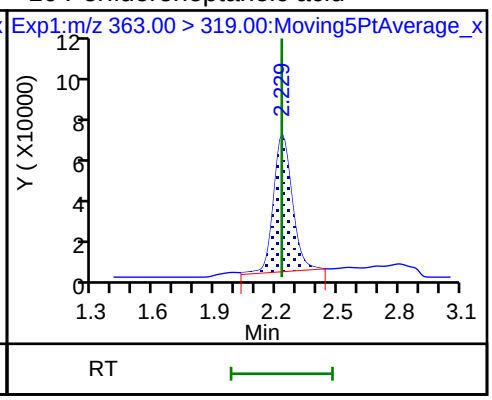

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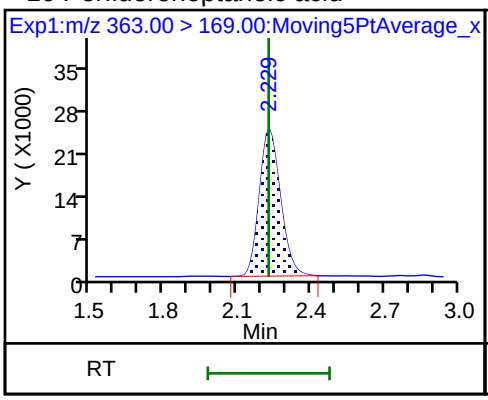

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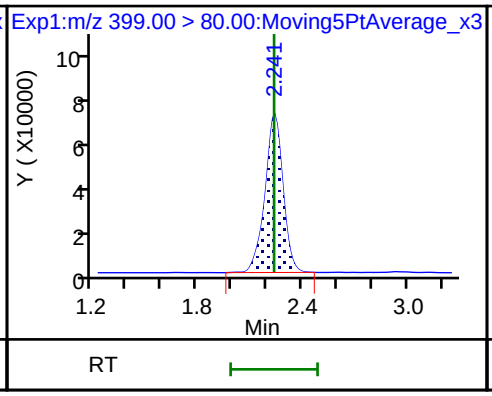

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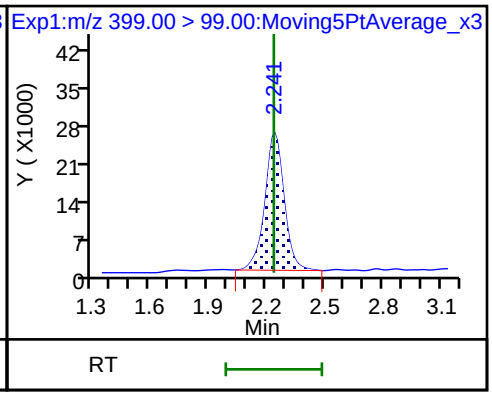
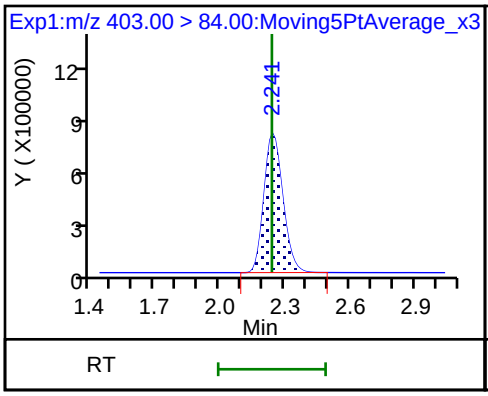
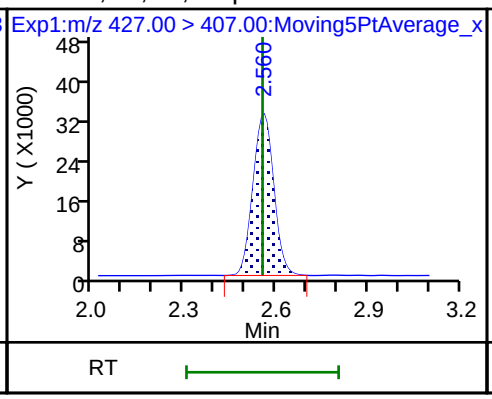


D 11 18O2 PFHxS



13 1H,1H,2H,2H-perfluorooctanesulfon



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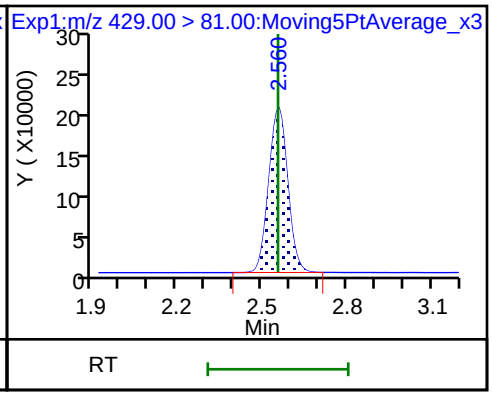
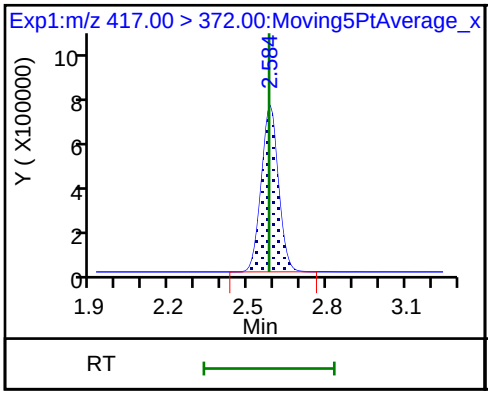
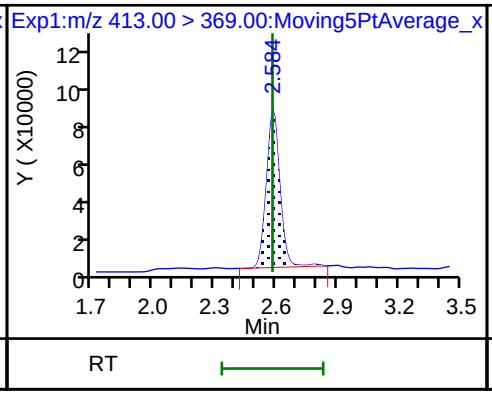


D 14 13C4 PFOA



15 Perfluorooctanoic acid



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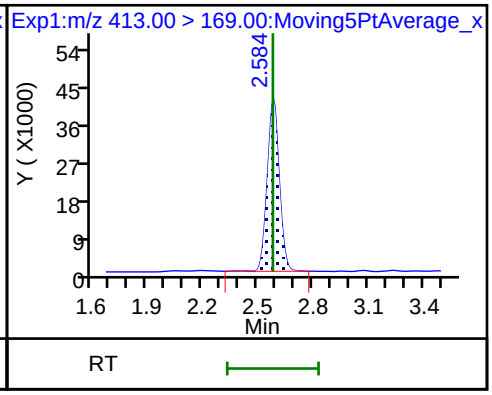
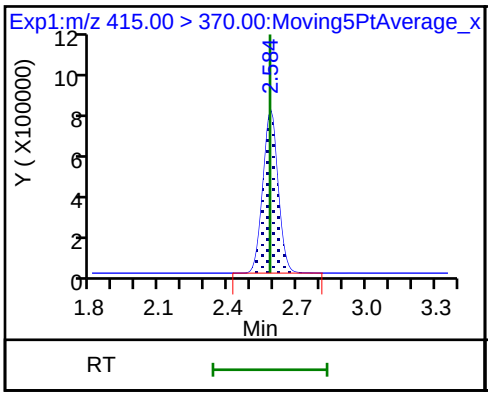
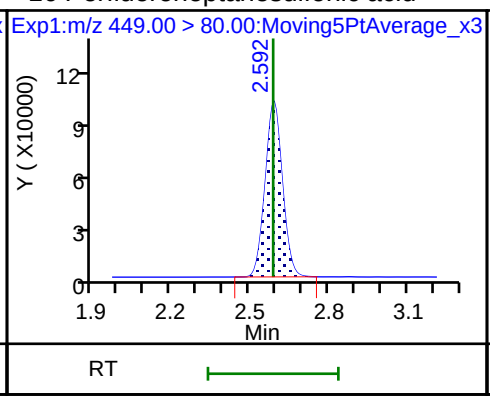


* 62 13C2-PFOA



16 Perfluoroheptanesulfonic acid



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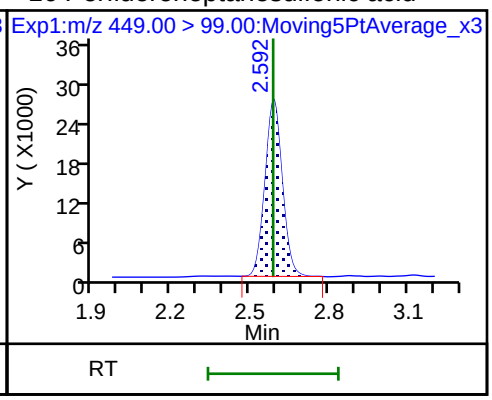
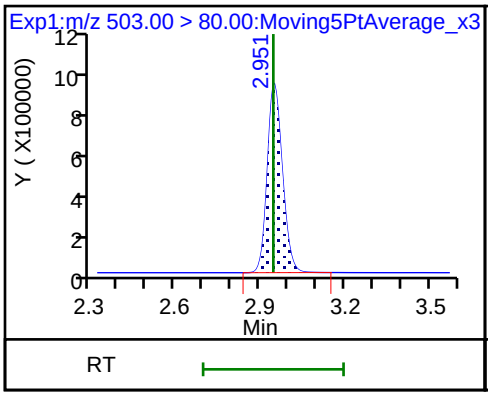


D 18 13C4 PFOS



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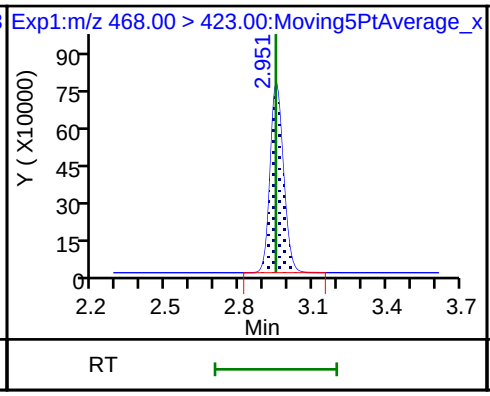
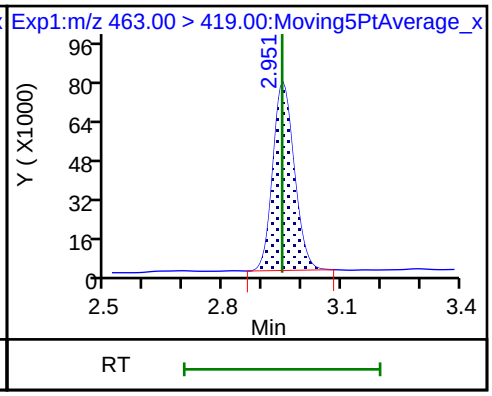


20 Perfluorononanoic acid



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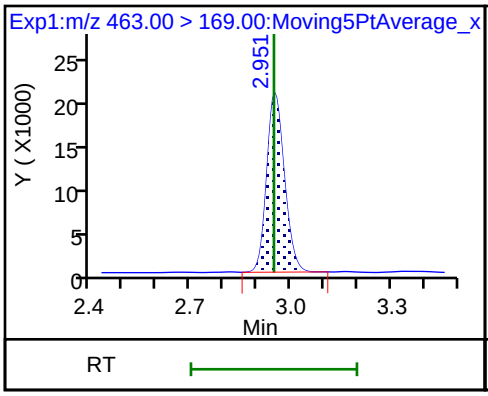
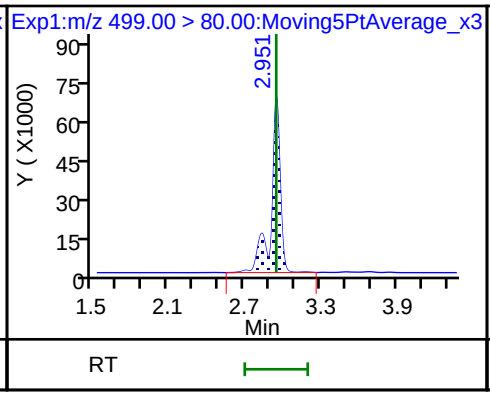


17 Perfluorooctane sulfonic acid



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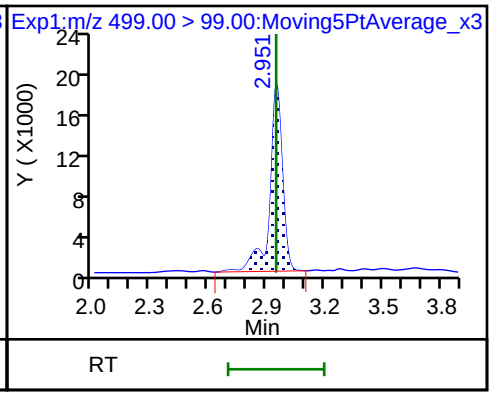
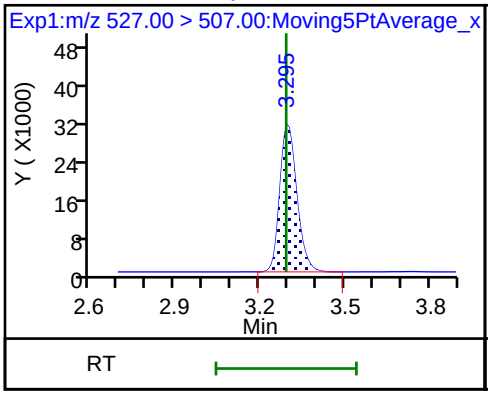
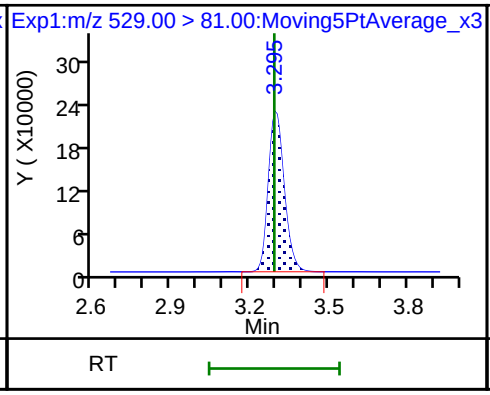


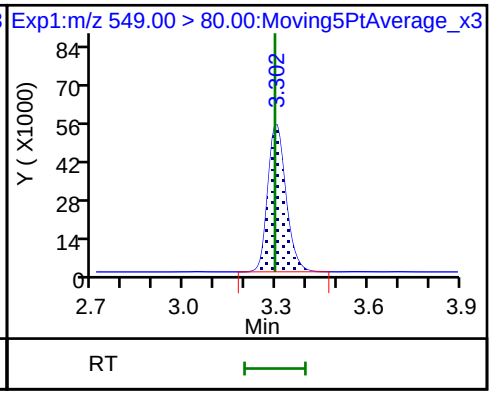
25 1H,1H,2H,2H-perfluorodecanesulfon



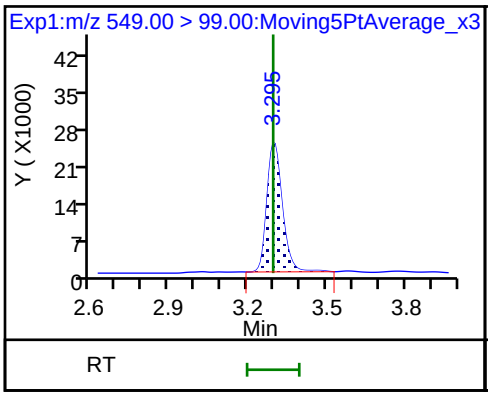
D 26 M2-8:2FTS



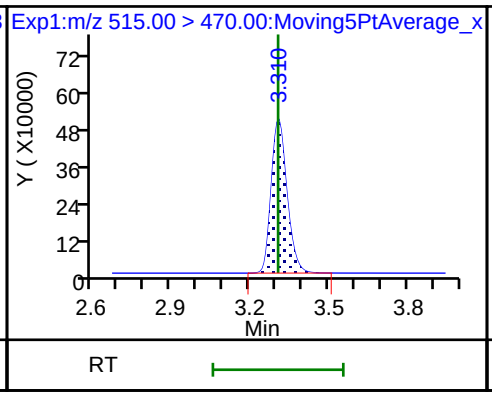
68 Perfluorononanesulfonic acid



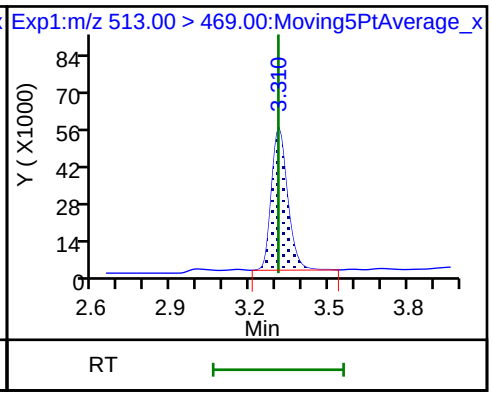
68 Perfluorononanesulfonic acid



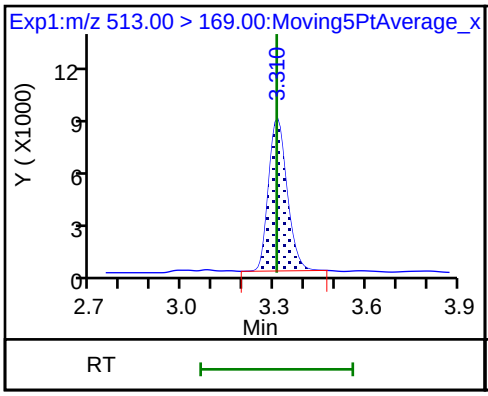
D 23 13C2 PFDA



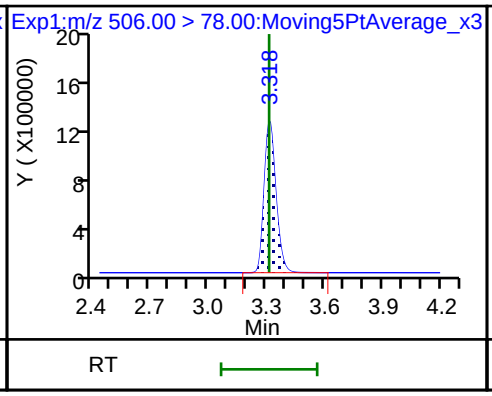
24 Perfluorodecanoic acid



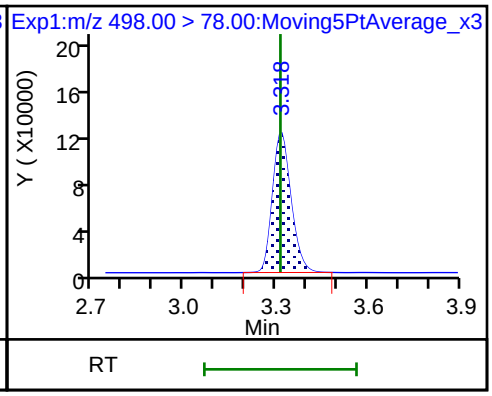
24 Perfluorodecanoic acid



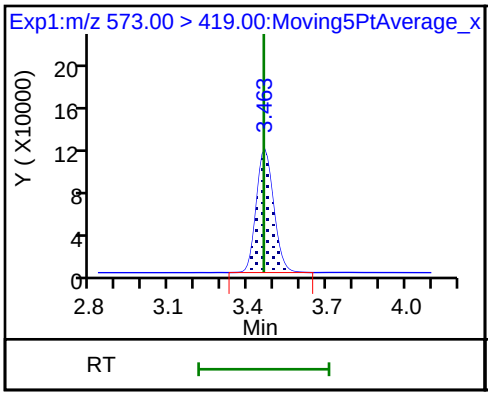
D 21 13C8 FOSA



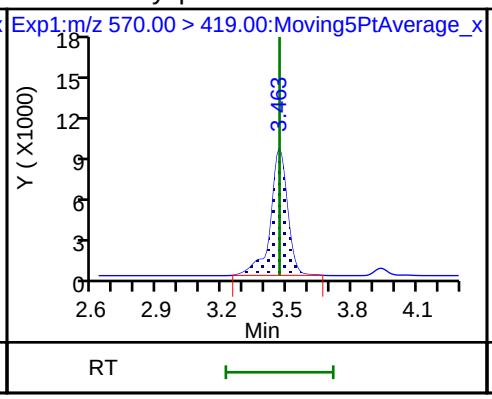
22 Perfluorooctane Sulfonamide



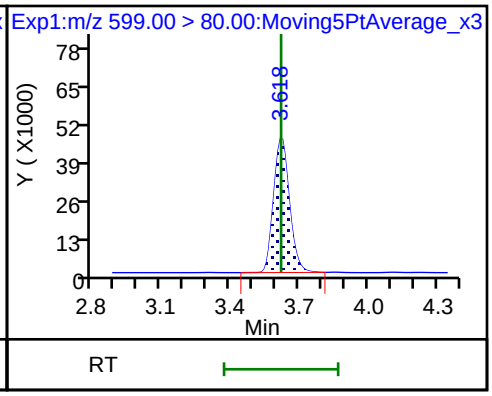
D 27 d3-NMeFOSAA



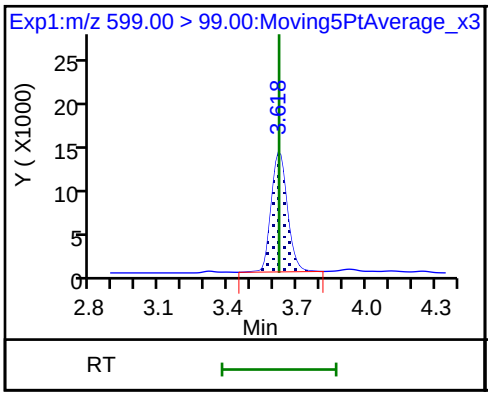
28 N-methyl perfluorooctane sulfonami



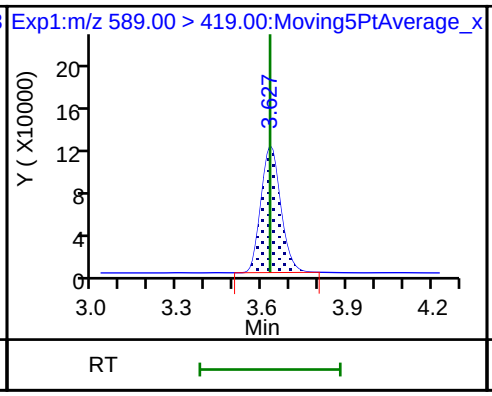
29 Perfluorodecane Sulfonic acid



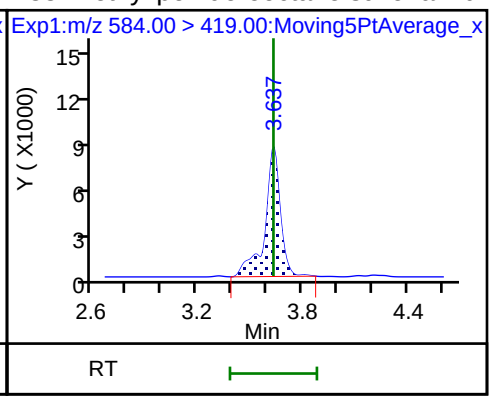
29 Perfluorodecane Sulfonic acid



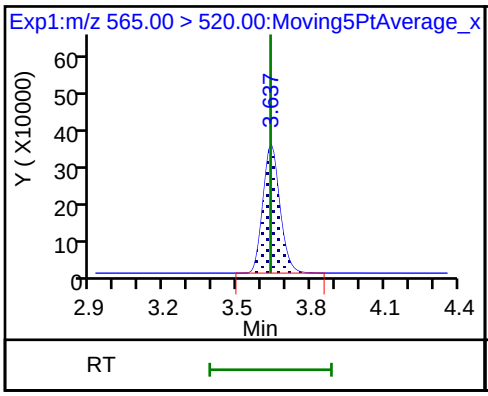
D 32 d5-NEtFOSAA



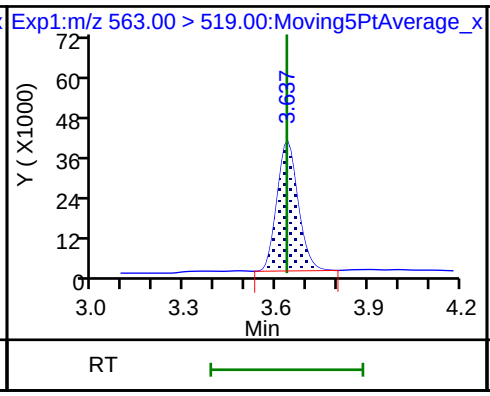
33 N-ethyl perfluorooctane sulfonamid



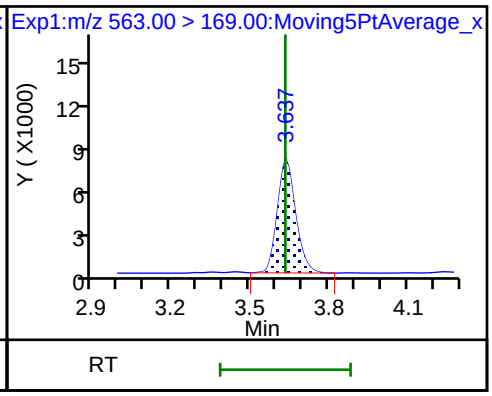
D 30 13C2 PFUnA



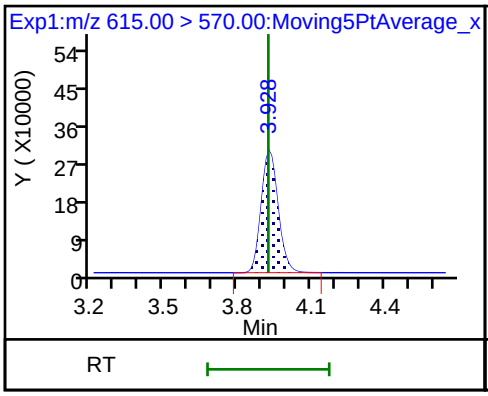
31 Perfluoroundecanoic acid



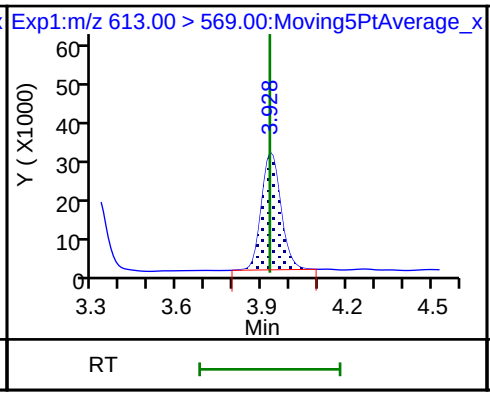
31 Perfluoroundecanoic acid



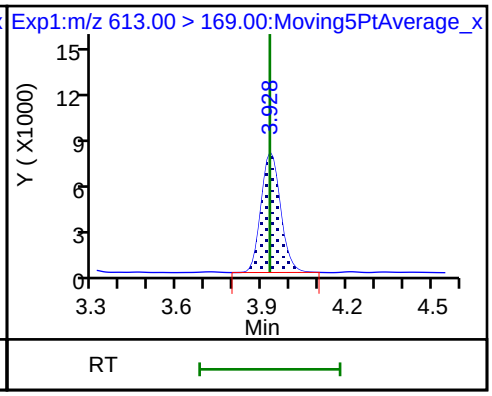
D 36 13C2 PFDoA



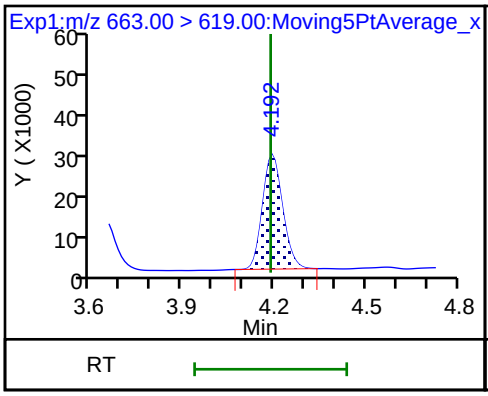
37 Perfluorododecanoic acid



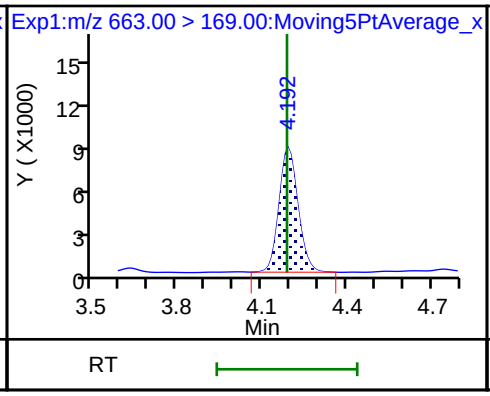
37 Perfluorododecanoic acid



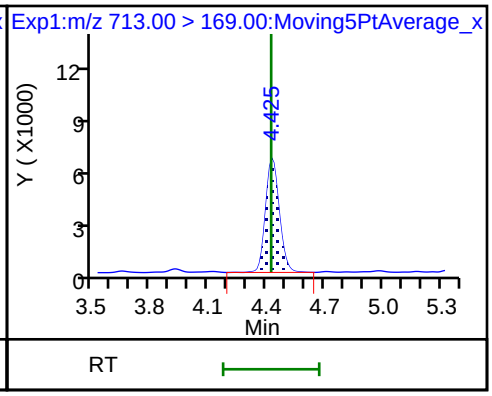
41 Perfluorotridecanoic acid



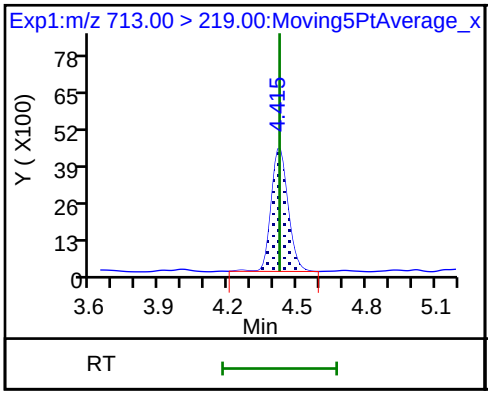
41 Perfluorotridecanoic acid



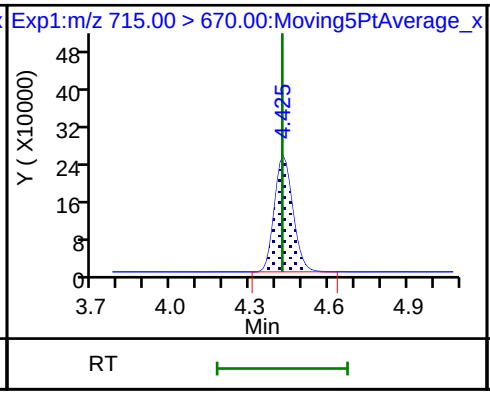
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



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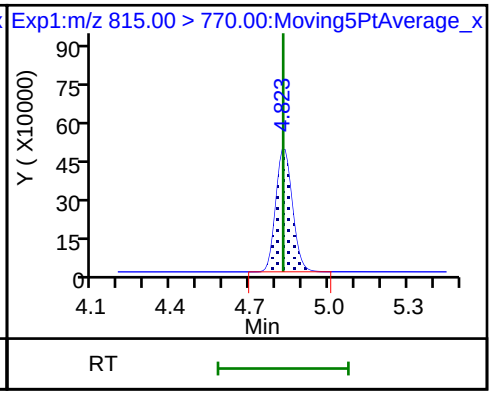


TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 01-Aug-2018 13:22:33 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:47 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:33:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.003	0.539	4799715	2.43		97.4	74573	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.396	-0.005	1.000	1847519	0.9765		97.7	458	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.633	3202919	2.47		98.7	50580	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	1460012	0.9518		95.2	576	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.645	82758	2.22		95.3	322	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.671	-0.005	1.000	2456709	0.9005		102	11704	
298.90 > 99.00	1.666	1.671	-0.005	1.000	1020887		2.41(1.25-3.74)	102	4237	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.872	-0.006	0.723	609520	NC			7261	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.872	-0.006	1.120	616866	1.01		108	27741	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.903	0.002	0.738	3471025	2.47		98.8	74585	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.903	0.002	1.000	1444908	0.9868		98.7	2675	
313.00 > 119.00	1.905	1.903	0.002	1.000	130079		11.11(5.03-15.10)	98.7	1229	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	2331146	0.9680		103	28507	
349.00 > 99.00	1.927	1.928	-0.001	1.157	858927		2.71(1.36-4.07)	103	3854	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.992	2.000	-0.008	0.772	146564	NC			4135	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	1.006	252051	NC			970	
D 9 13C4-PFHpA										
367.00 > 322.00	2.218	2.225	-0.007	0.859	3335466	2.45		98.0	92739	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.226	0.003	1.005	1576104	1.02		102	710	
363.00 > 169.00	2.218	2.226	-0.008	1.000	581246		2.71(1.13-3.40)	102	4223	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.237	-0.008	0.995	1939177	0.8396		92.3	8693	
399.00 > 99.00	2.229	2.237	-0.008	0.995	684304		2.83(1.50-4.49)	92.3	1083	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.868	4725288	2.31		97.6	51826	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.771	3740044	NC			26879	
377.00 > 85.00	2.267	2.270	-0.003	0.771	2140747		1.75(0.84-2.53)		8829	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.547	2.554	-0.007	0.996	625589	0.9789		103	10144	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.556	0.0	0.990	917820	2.30		96.9	11454	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.580	0.001	1.000	3268736	2.49		99.4	58647	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.581	0.0	1.000	1480871	0.9796		97.9	834	
413.00 > 169.00	2.581	2.581	0.0	1.000	778244		1.90(0.84-2.52)	97.9	4099	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.581	0.0		3424441	2.50			49930	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.587	0.002	0.880	1744730	0.9139		96.0	21103	
449.00 > 99.00	2.589	2.587	0.002	0.880	476758		3.66(1.94-5.82)	96.0	5417	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.946	-0.003	1.140	3300872	2.33		97.7	52168	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.948	0.001	1.142	2848081	2.49		99.4	53985	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.949	0.0	1.000	1231102	1.00		100	2303	
463.00 > 169.00	2.949	2.949	0.0	1.000	308292		3.99(1.90-5.69)	100	10022	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.949	2.949	0.0	1.002	1377557	0.8885		95.7	9043	M
499.00 > 99.00	2.943	2.949	-0.006	1.000	324464		4.25(2.31-6.93)	95.7	1831	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.158	-0.002	1.073	2289912	NC			22851	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.292	0.0	1.000	498832	0.9366		97.8	30068	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.292	0.0	1.275	944062	2.43		101	16371	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.295	-0.003	1.119	954403	0.9615		100	23863	
549.00 > 99.00	3.292	3.295	-0.003	1.119	369759		2.58(1.33-3.97)	100	2430	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.306	0.002	1.282	2165508	2.53		101	52188	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.308	0.0	1.000	899636	0.9730		97.3	1260	
513.00 > 169.00	3.308	3.308	0.0	1.000	160313		5.61(2.36-7.09)	97.3	2251	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.312	-0.004	1.282	5088363	2.45		98.0	41666	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.313	0.002	1.002	2053736	1.02		102	25672	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.459	0.001	1.340	491188	2.36		94.5	21413	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.465	-0.005	1.000	199395	1.00		99.8	2768	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.620	0.004	1.232	822043	0.9151		94.9	24438	
599.00 > 99.00	3.614	3.620	-0.006	1.228	292040		2.81(1.39-4.16)	94.9	2192	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.627	-0.003	1.404	559410	2.51		100	6051	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.633	0.001	1.003	206227	1.03		103	3971	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.634	0.0	1.408	1631762	2.47		98.9	42516	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.634	0.0	1.000	764538	0.9505		95.1	1912	
563.00 > 169.00	3.634	3.634	0.0	1.000	135245		5.65(2.12-6.36)	95.1	4704	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.789	3.792	-0.003	1.287	3369008	NC			63395	
D 36 13C2 PFDoA										
615.00 > 570.00	3.924	3.925	-0.001	1.520	1429399	2.50		100	18712	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.924	3.927	-0.003	1.000	594065	0.9596		96.0	186	
613.00 > 169.00	3.924	3.927	-0.003	1.000	139893		4.25(2.13-6.40)	96.0	1975	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.188	0.001	1.067	516294	0.9582		95.8	170	
663.00 > 169.00	4.189	4.188	0.001	1.067	156240		3.30(1.25-3.76)	95.8	1002	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.423	0.001	1.000	119786	0.9564		95.6	1904	
713.00 > 219.00	4.424	4.423	0.001	1.000	84842		1.41(0.71-2.13)	95.6	1434	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.423	0.001	1.714	1162431	2.42		96.9	6005	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.822	4.826	-0.004	1.868	1831086	2.22		88.6	2796	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.822	4.827	-0.005	1.000	733744	NC			46.2	
813.00 > 169.00	4.822	4.827	-0.005	1.000	117618		6.24(2.86-8.58)		1277	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.164	5.166	-0.002	1.071	751756	NC			248	
913.00 > 169.00	5.164	5.166	-0.002	1.071	91329		8.23(3.83-11.48)		984	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:49 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_005.d

Injection Date: 01-Aug-2018 13:22:33 Instrument ID: A8_N

Lims ID: IC L4 Full

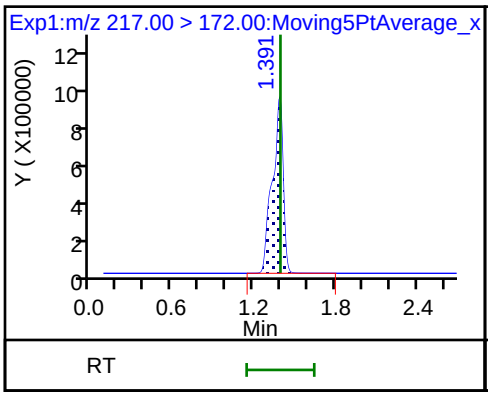
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 5

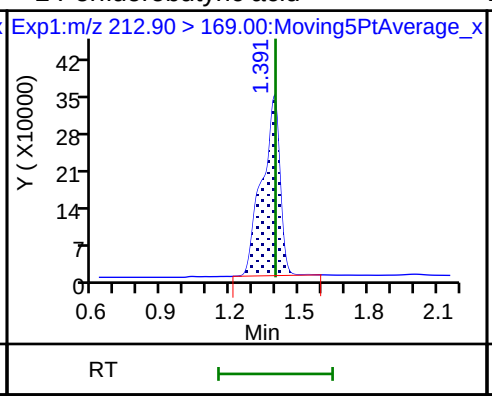
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

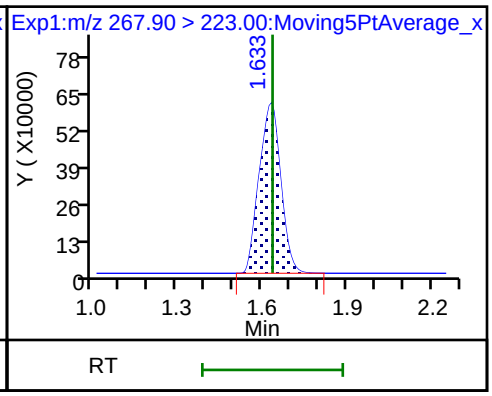
D 1 13C4 PFBA



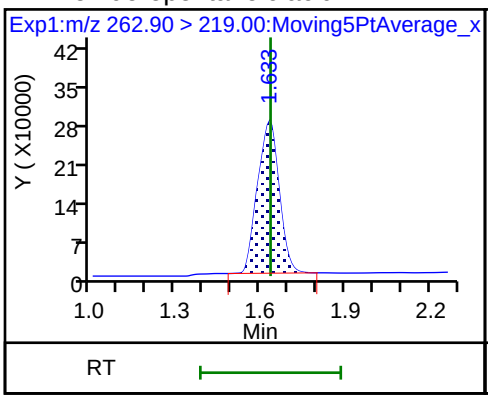
2 Perfluorobutyric acid



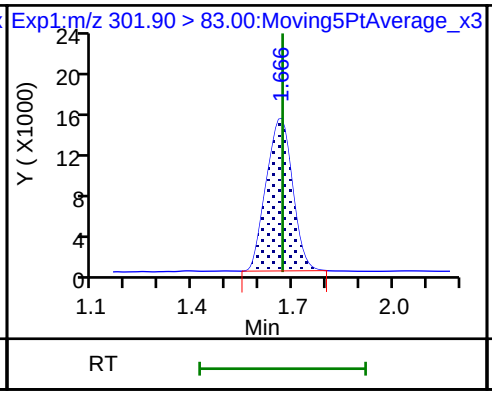
D 3 13C5-PFPeA



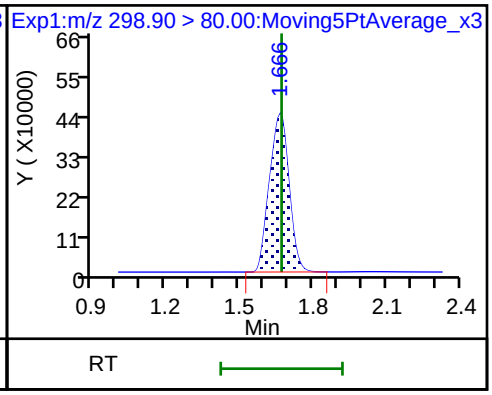
4 Perfluoropentanoic acid



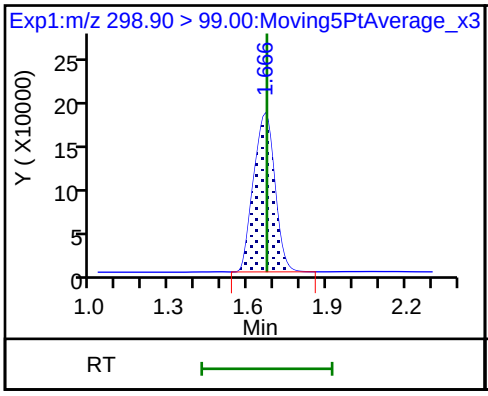
D 47 13C3-PFBS



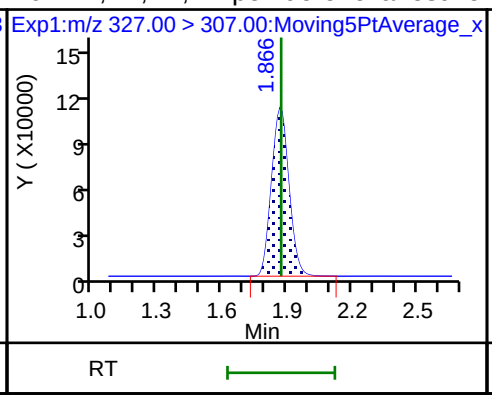
5 Perfluorobutanesulfonic acid



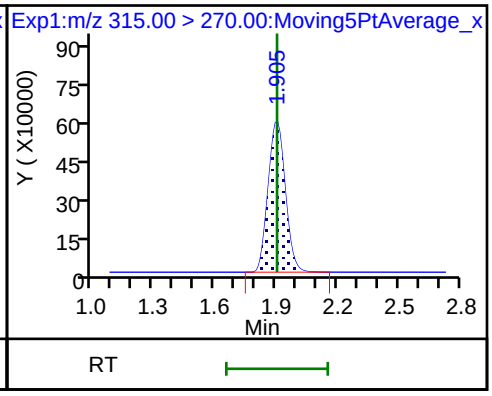
5 Perfluorobutanesulfonic acid



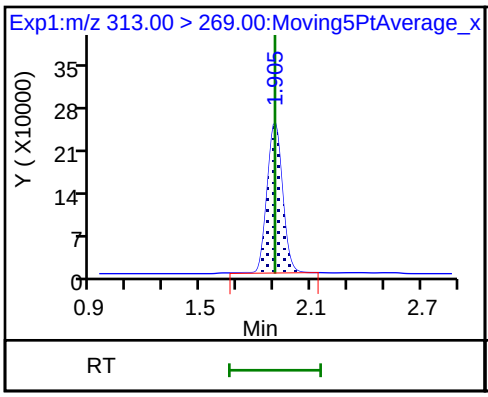
61 1H,1H,2H,2H-perfluorohexanesulfon



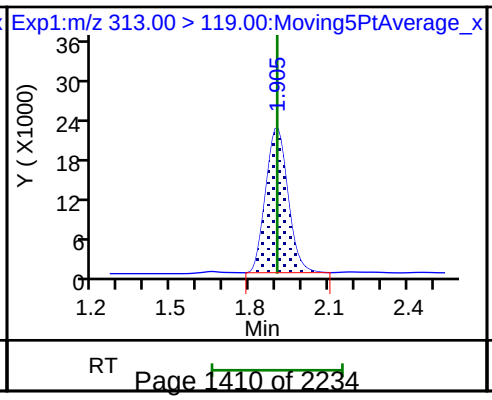
D 7 13C2 PFHxA



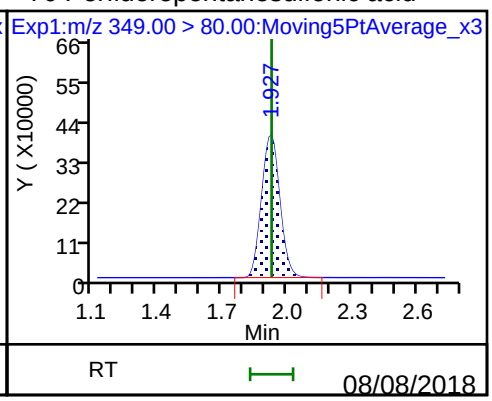
6 Perfluorohexanoic acid



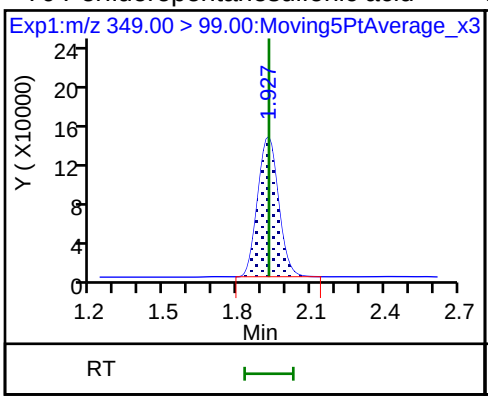
6 Perfluorohexanoic acid



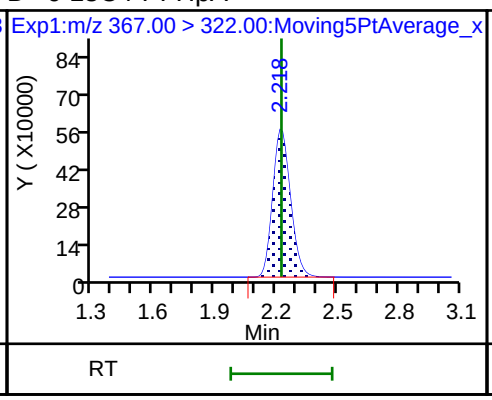
70 Perfluoropentanesulfonic acid



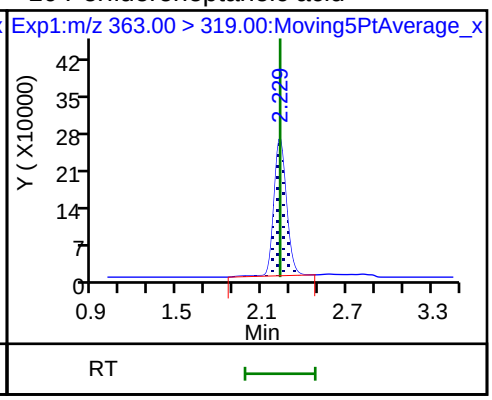
70 Perfluoropentanesulfonic acid



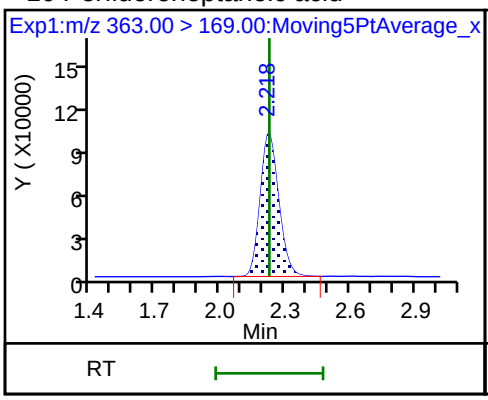
D 9 13C4-PFHpA



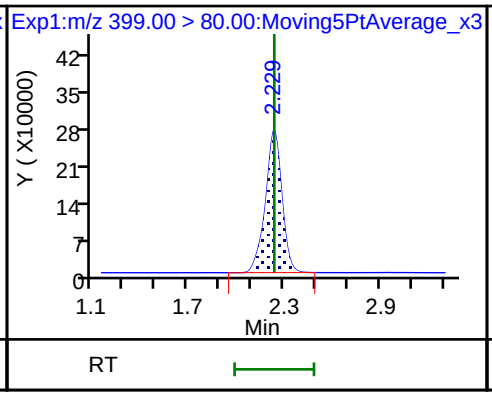
10 Perfluoroheptanoic acid



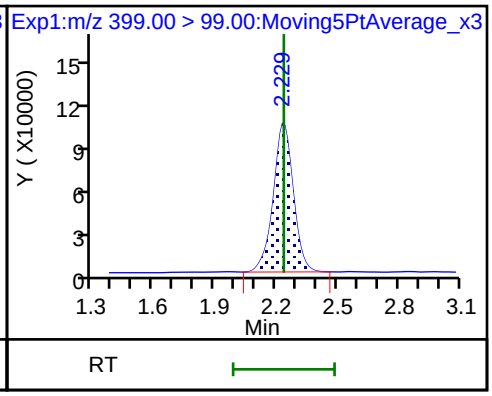
10 Perfluoroheptanoic acid



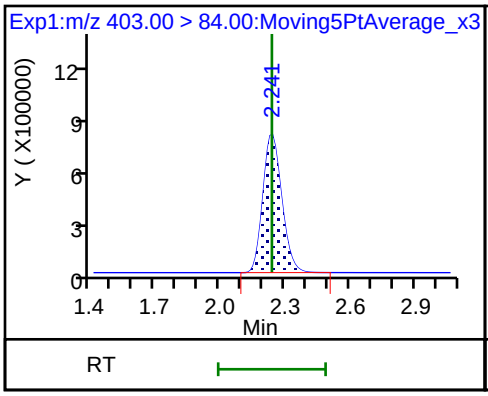
8 Perfluorohexanesulfonic acid



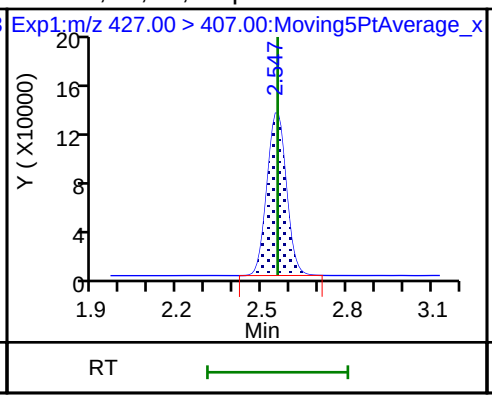
8 Perfluorohexanesulfonic acid



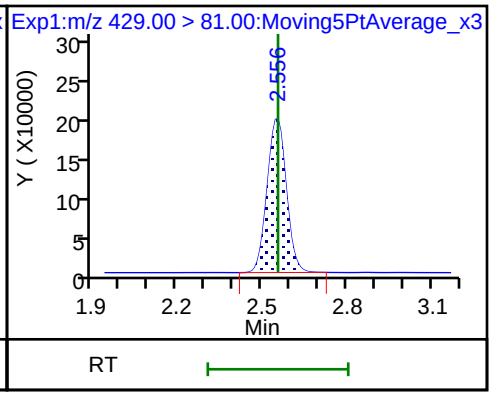
D 11 18O2 PFHxS



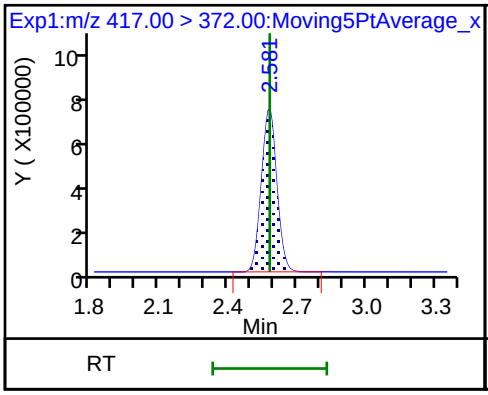
13 1H,1H,2H,2H-perfluorooctanesulfon



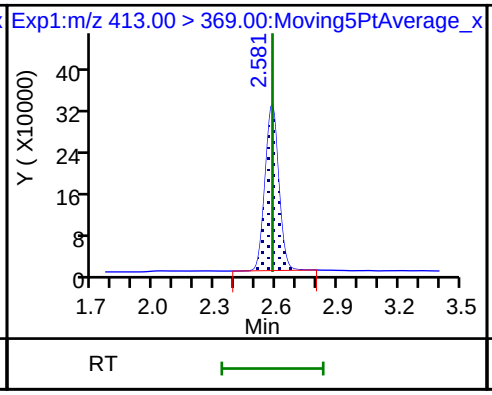
D 12 M2-6:2FTS



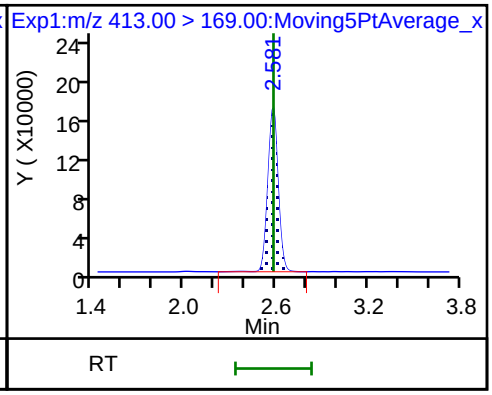
D 14 13C4 PFOA



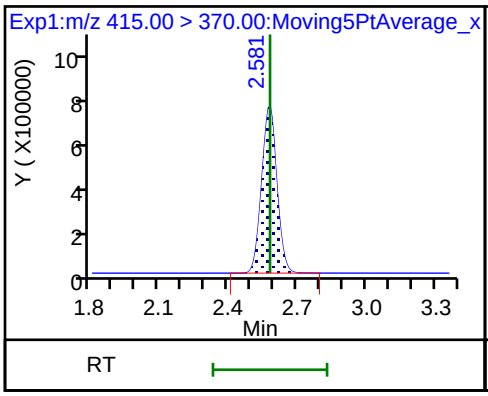
15 Perfluorooctanoic acid



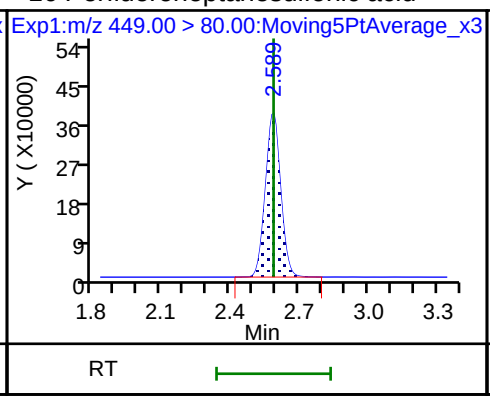
15 Perfluorooctanoic acid



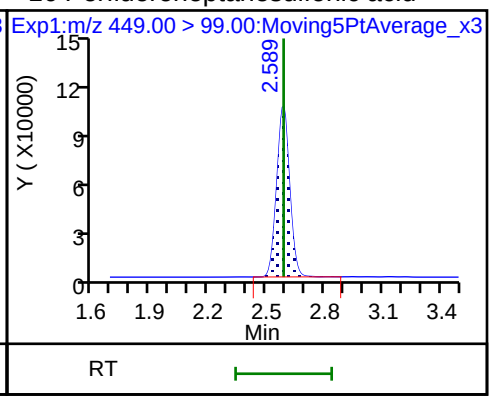
* 62 13C2-PFOA



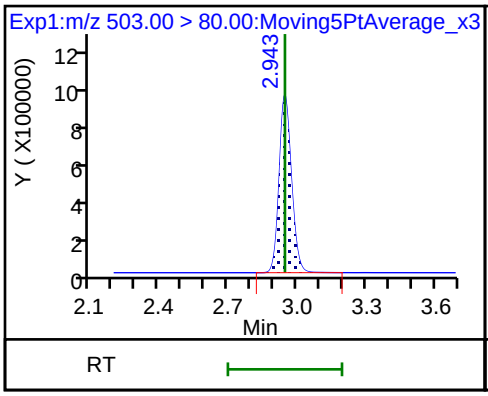
16 Perfluoroheptanesulfonic acid



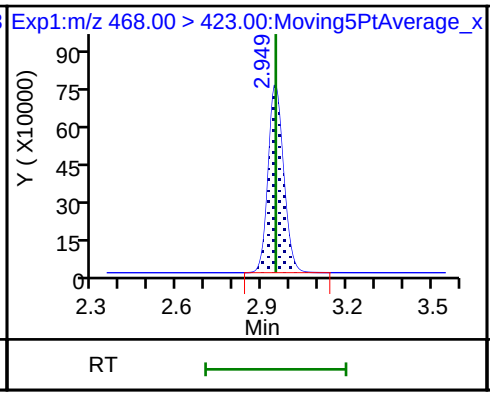
16 Perfluoroheptanesulfonic acid



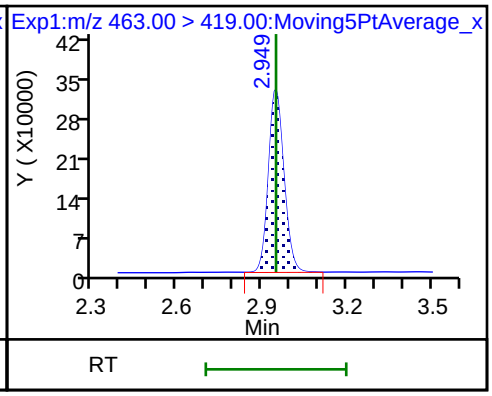
D 18 13C4 PFOS



D 19 13C5 PFNA



20 Perfluorononanoic acid



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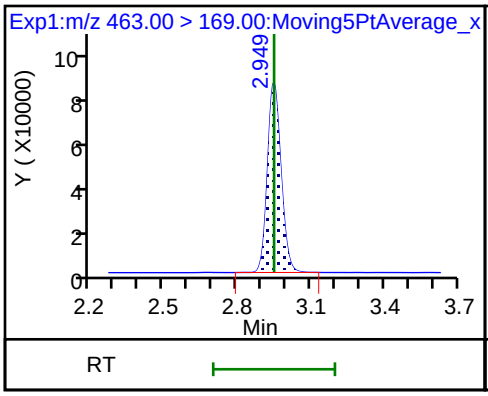
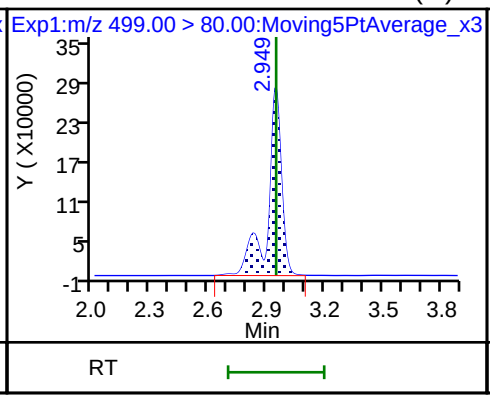
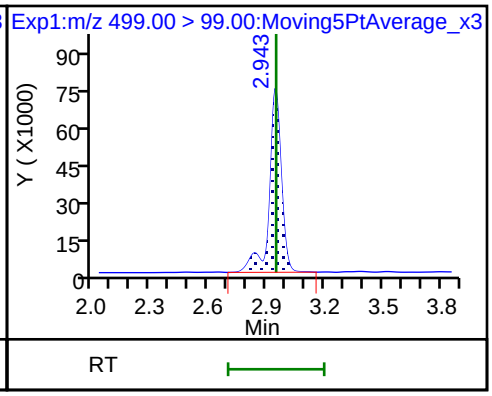


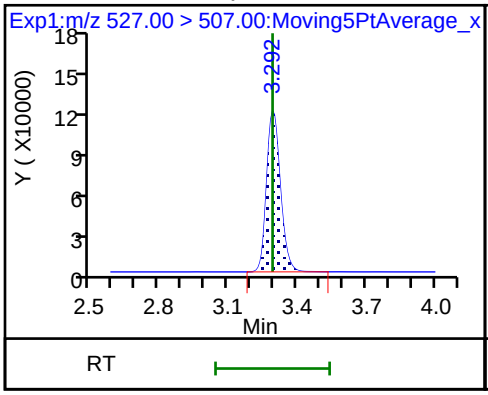
17 Perfluorooctane sulfonic acid (M)



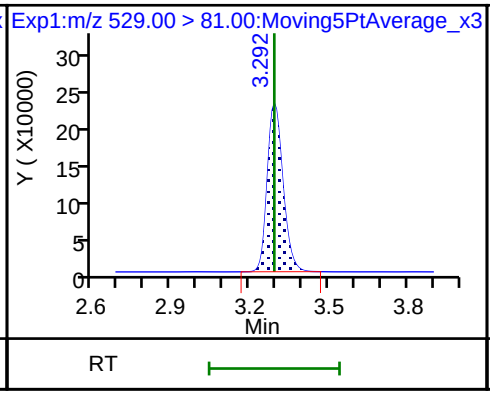
17 Perfluorooctane sulfonic acid



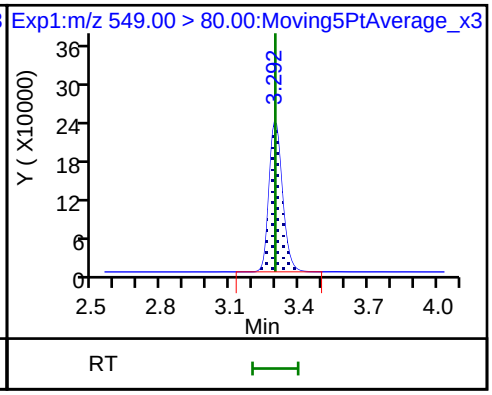
25 1H,1H,2H,2H-perfluorodecanesulfon



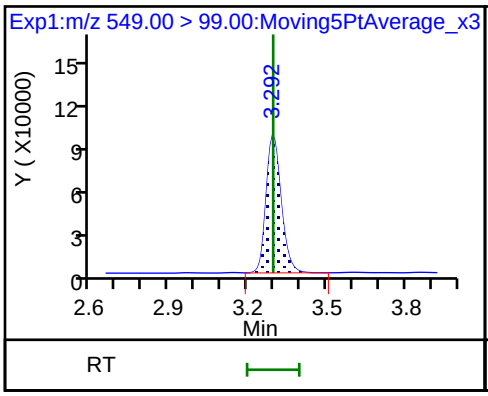
D 26 M2-8:2FTS



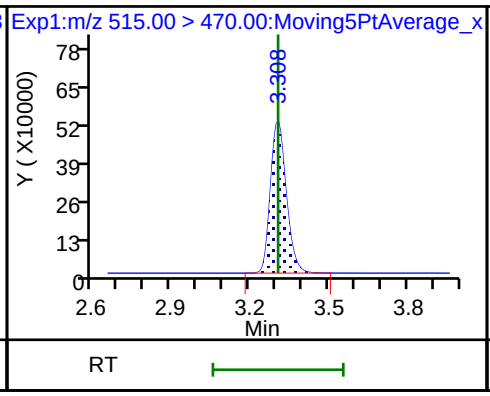
68 Perfluorononanesulfonic acid



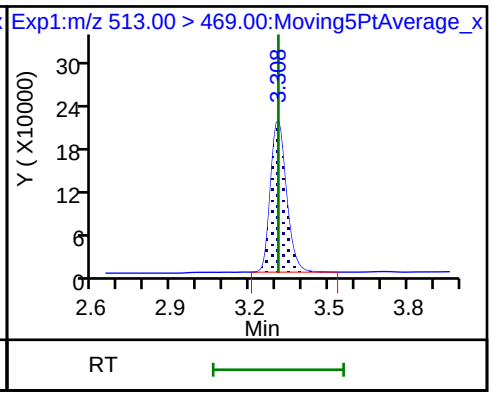
68 Perfluorononanesulfonic acid



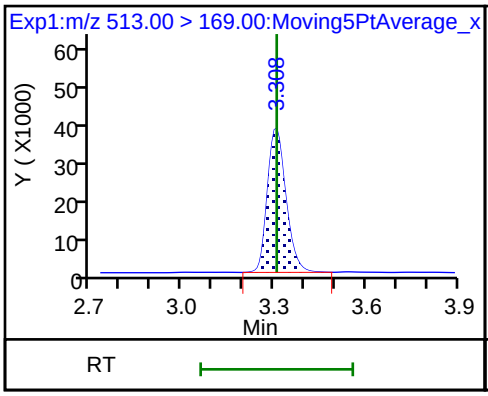
D 23 13C2 PFDA



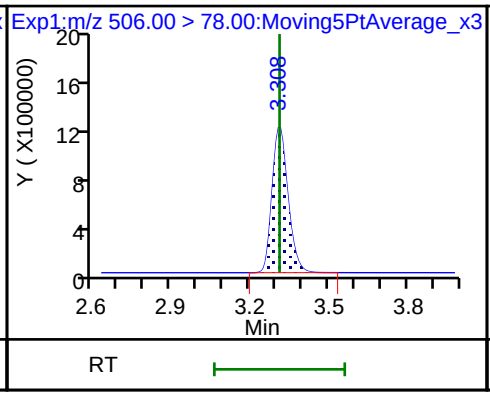
24 Perfluorodecanoic acid



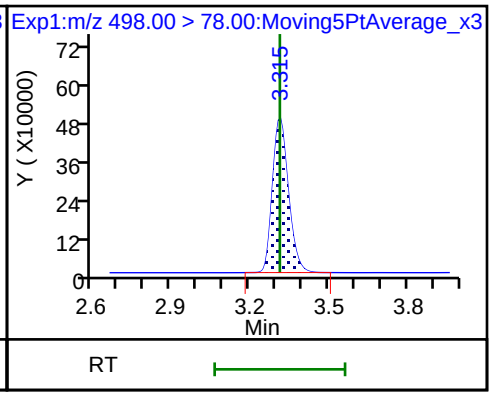
24 Perfluorodecanoic acid



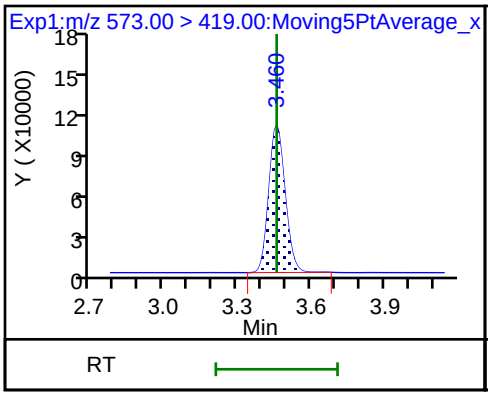
D 21 13C8 FOSA



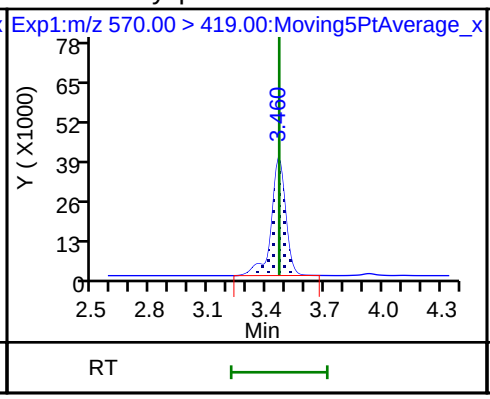
22 Perfluorooctane Sulfonamide



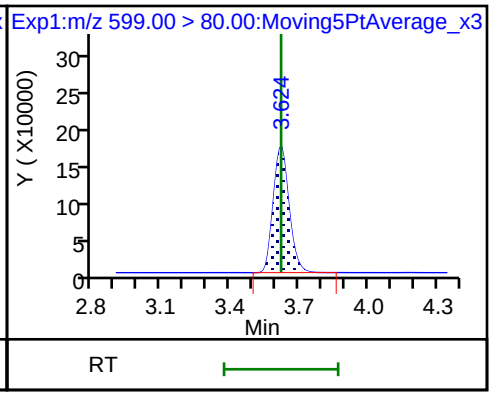
D 27 d3-NMeFOSAA



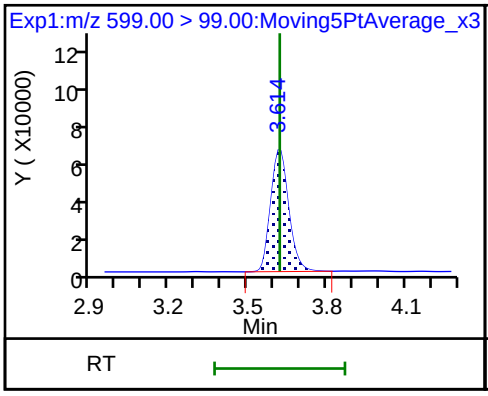
28 N-methyl perfluorooctane sulfonami



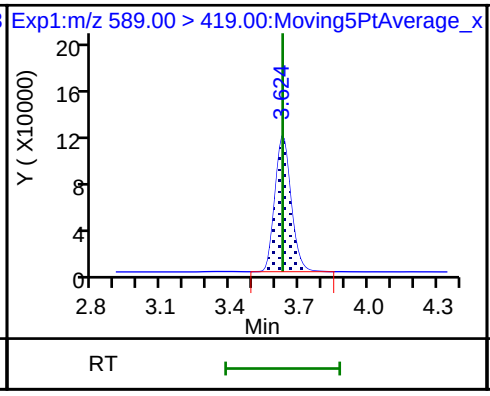
29 Perfluorodecane Sulfonic acid



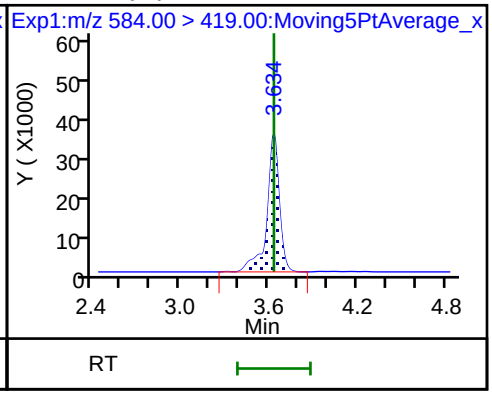
29 Perfluorodecane Sulfonic acid



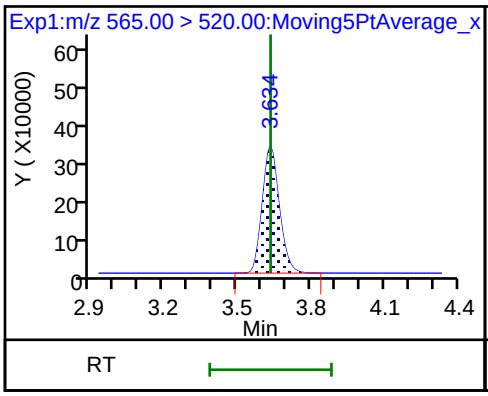
D 32 d5-NEtFOSAA



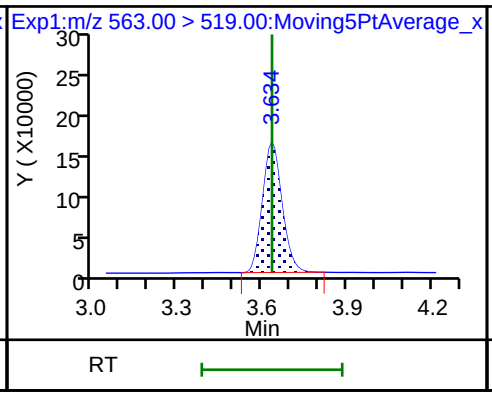
33 N-ethyl perfluorooctane sulfonamid



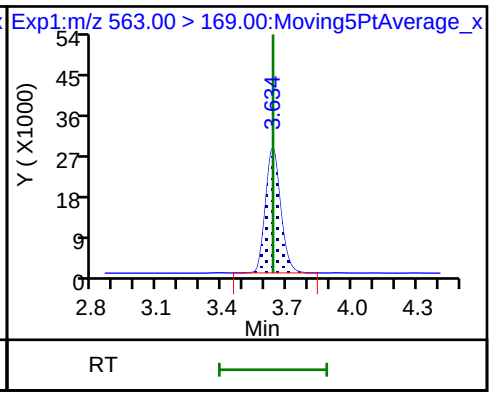
D 30 13C2 PFUnA



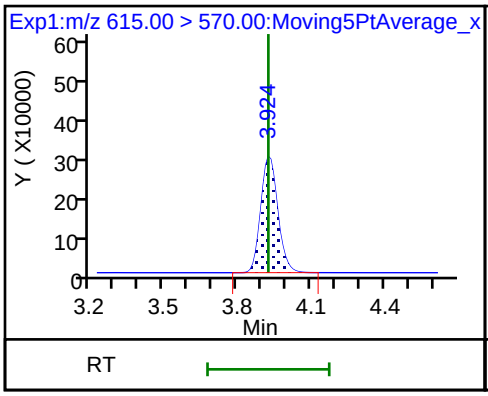
31 Perfluoroundecanoic acid



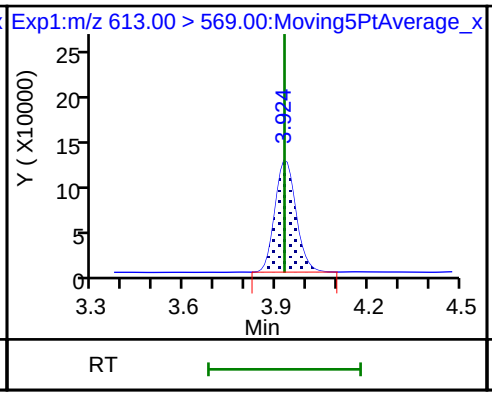
31 Perfluoroundecanoic acid



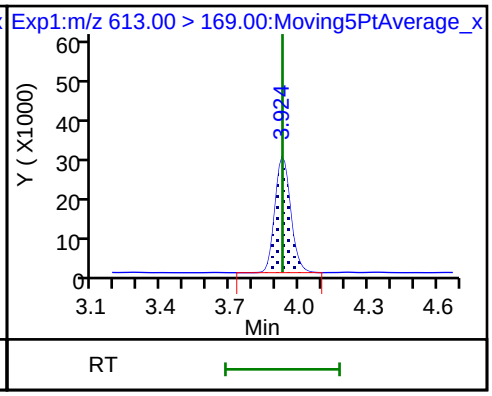
D 36 13C2 PFDoA



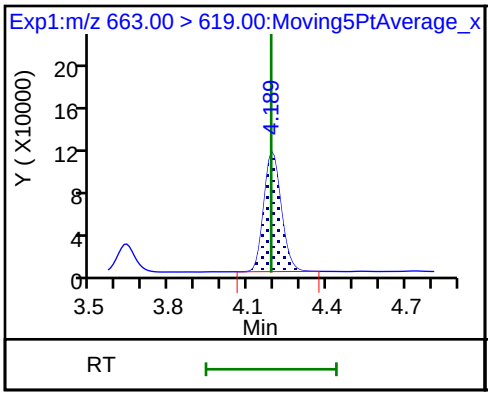
37 Perfluorododecanoic acid



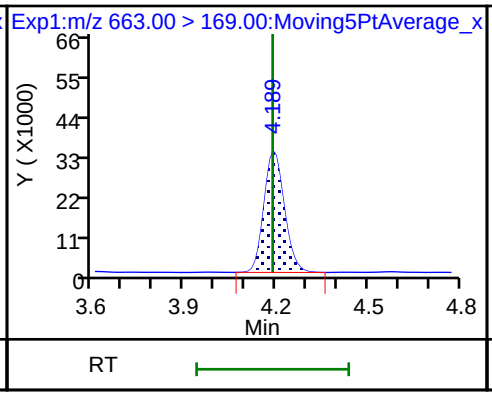
37 Perfluorododecanoic acid



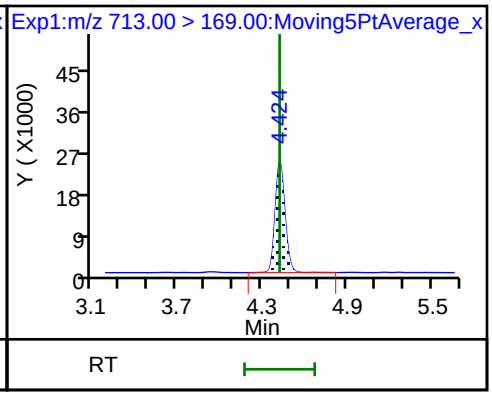
41 Perfluorotridecanoic acid



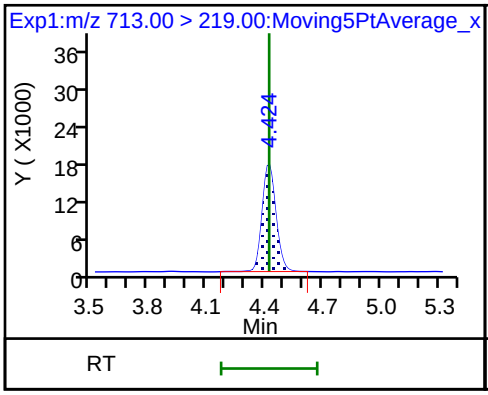
41 Perfluorotridecanoic acid



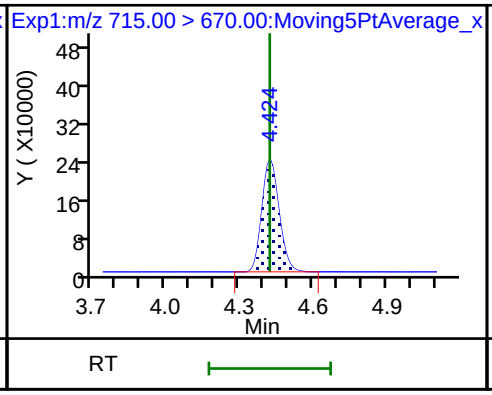
42 Perfluorotetradecanoic acid



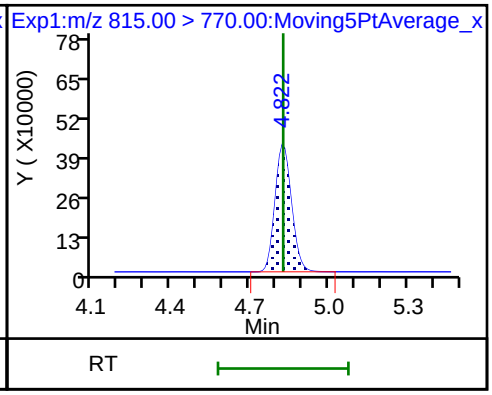
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

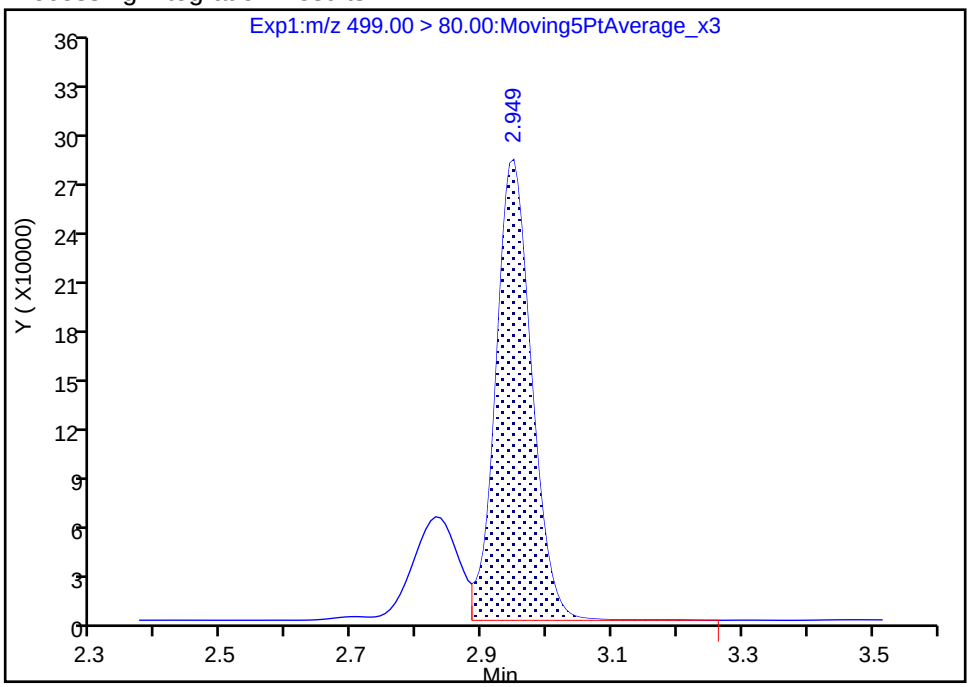
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_005.d				
Injection Date:	01-Aug-2018 13:22:33	Instrument ID:	A8_N		
Lims ID:	IC L4 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

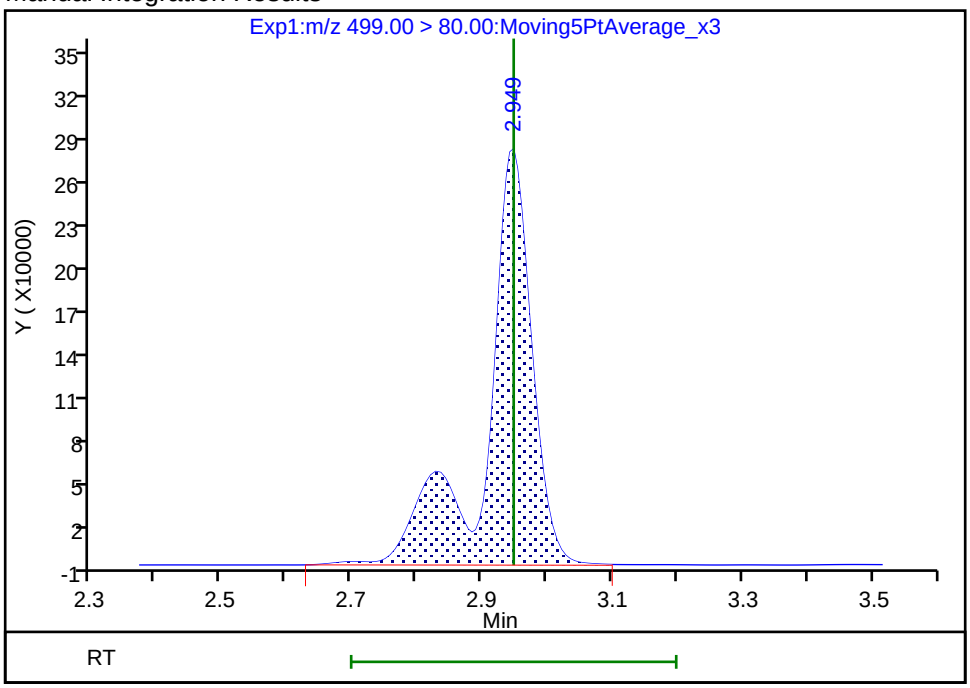
Processing Integration Results

RT: 2.95
Area: 1066714
Amount: 0.709888
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 1377557
Amount: 0.888458
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:33:07

Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 01-Aug-2018 13:30:23 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:50 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:34:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.394	1.395	0.0	0.541	4740211	2.48		99.0	79259	
2 Perfluorobutyric acid										
212.90 > 169.00	1.400	1.396	0.004	1.004	4662124	2.50		99.8	1176	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.636	0.001	0.635	3117638	2.47		98.9	49305	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.636	0.001	1.000	3679899	2.46		98.6	1471	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.669	0.002	0.648	85408	2.36		101	403	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.000	6345476	2.25		102	29623	
298.90 > 99.00	1.671	1.671	0.0	1.000	2536780		2.50(1.25-3.74)	102	10495	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.872	0.0	0.726	603368	NC			6037	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.872	0.0	1.120	1432956	2.27		97.1	64785	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.903	-0.001	0.738	3473699	2.55		102	76225	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.903	-0.001	1.000	3595187	2.45		98.1	5255	
313.00 > 119.00	1.902	1.903	-0.001	1.000	338806		10.61(5.03-15.10)	98.1	2550	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.923	1.928	-0.005	1.151	5931128	2.39		102	59589	
349.00 > 99.00	1.923	1.928	-0.005	1.151	2210145		2.68(1.36-4.07)	102	10516	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.000	-0.001	0.775	148535	NC			4245	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	2.002	-0.003	1.000	622158	NC			2808	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.225	0.0	0.863	3349409	2.53		101	56764	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.226	-0.001	1.000	3710400	2.39		95.5	1604	
363.00 > 169.00	2.225	2.226	-0.001	1.000	1418167		2.62(1.13-3.40)	95.5	12553	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	5019141	2.24		98.5	18548	
399.00 > 99.00	2.237	2.237	0.0	1.000	1661270		3.02(1.50-4.49)	98.5	2637	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.238	-0.001	0.867	4583643	2.31		97.5	40055	
65 ADONA										
377.00 > 251.00	2.263	2.270	-0.007	0.768	9407416	NC			67386	
377.00 > 85.00	2.263	2.270	-0.007	0.768	5469113		1.72(0.84-2.53)		21080	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	1483178	2.32		97.9	29041	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.556	-0.002	0.990	918152	2.37		99.8	13169	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.580	-0.001	1.000	3210040	2.51		101	37275	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.581	-0.002	1.000	3755999	2.53		101	2236	
413.00 > 169.00	2.579	2.581	-0.002	1.000	1895218		1.98(0.84-2.52)	101	9580	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.581	-0.002		3324756	2.50			48783	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	4578297	2.46		103	35137	
449.00 > 99.00	2.587	2.587	0.0	0.878	1227668		3.73(1.94-5.82)	103	13514	
D 18 13C4 PFOS										
503.00 > 80.00	2.945	2.946	-0.001	1.142	3224053	2.35		98.3	33751	
D 19 13C5 PFNA										
468.00 > 423.00	2.945	2.948	-0.003	1.142	2758407	2.48		99.2	52925	
20 Perfluorononanoic acid										
463.00 > 419.00	2.945	2.949	-0.004	1.000	2990574	2.51		100	5749	
463.00 > 169.00	2.945	2.949	-0.004	1.000	730894		4.09(1.90-5.69)	100	24495	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.945	2.949	-0.004	1.000	3544232	2.34		101	21346	
499.00 > 99.00	2.945	2.949	-0.004	1.000	827927		4.28(2.31-6.93)	101	4643	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.153	3.158	-0.005	1.070	5759920	NC			40362	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.287	3.292	-0.005	1.000	1169399	2.31		96.3	40497	
D 26 M2-8:2FTS										
529.00 > 81.00	3.287	3.292	-0.005	1.275	899004	2.38		99.4	12948	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.294	3.295	-0.001	1.119	2423026	2.50		104	43353	
549.00 > 99.00	3.287	3.295	-0.008	1.116	908376		2.67(1.33-3.97)	104	5660	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.302	3.306	-0.004	1.281	2057230	2.47		98.9	55312	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.302	3.308	-0.006	1.000	2163881	2.46		98.5	3036	
513.00 > 169.00	3.302	3.308	-0.006	1.000	394458		5.49(2.36-7.09)	98.5	6847	
D 21 13C8 FOSA										
506.00 > 78.00	3.310	3.312	-0.002	1.284	5160037	2.56		102	35436	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.310	3.313	-0.003	1.000	5178982	2.54		102	47592	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.453	3.459	-0.006	1.339	503700	2.49		99.8	13758	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.465	-0.002	1.003	501591	2.45		98.0	5074	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.617	3.620	-0.003	1.228	2185833	2.49		103	51377	
599.00 > 99.00	3.617	3.620	-0.003	1.228	696558		3.14(1.39-4.16)	103	7270	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.627	0.0	1.407	532526	2.46		98.4	3898	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.627	3.633	-0.006	1.000	471804	2.49		99.4	13060	
D 30 13C2 PFUnA										
565.00 > 520.00	3.627	3.634	-0.007	1.407	1525487	2.38		95.2	44993	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.627	3.634	-0.007	1.000	1815476	2.41		96.6	4055	
563.00 > 169.00	3.627	3.634	-0.007	1.000	313726		5.79(2.12-6.36)	96.6	13018	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.287	8214135	NC			94573	
D 36 13C2 PFDoA										
615.00 > 570.00	3.927	3.925	0.002	1.523	1356329	2.44		97.8	13416	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.927	3.927	0.0	1.000	1548416	2.64		105	525	
613.00 > 169.00	3.927	3.927	0.0	1.000	358786		4.32(2.13-6.40)	105	6196	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.182	4.188	-0.006	1.065	1354496	2.65		106	484	
663.00 > 169.00	4.182	4.188	-0.006	1.065	411754		3.29(1.25-3.76)	106	3297	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.415	4.423	-0.008	1.000	314195	2.52		101	3555	
713.00 > 219.00	4.415	4.423	-0.008	1.000	226756		1.39(0.71-2.13)	101	2914	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.423	-0.008	1.712	1159368	2.49		99.6	5921	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.826	-0.003	1.870	2097837	2.61		105	3110	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.827	-0.004	1.000	2002321	NC			133	
813.00 > 169.00	4.823	4.827	-0.004	1.000	339061		5.91(2.86-8.58)		3586	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.165	5.166	-0.001	1.071	2186416	NC			704	
913.00 > 169.00	5.157	5.166	-0.009	1.069	268198		8.15(3.83-11.48)		2448	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_006.d

Injection Date: 01-Aug-2018 13:30:23 Instrument ID: A8_N

Lims ID: IC L5 Full

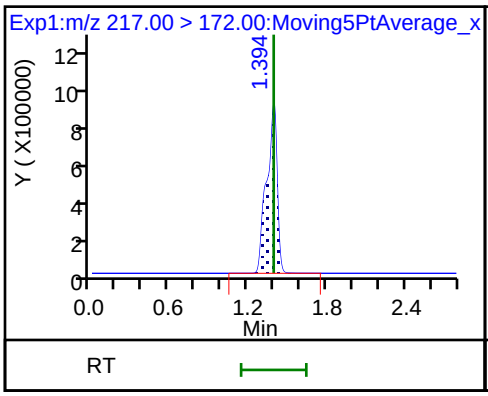
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 6

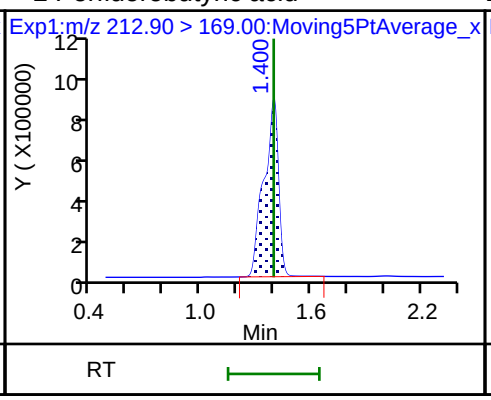
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

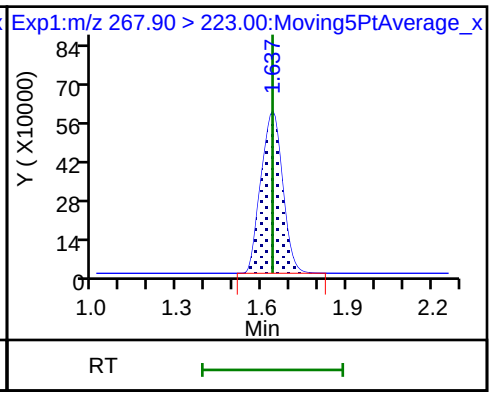
D 1 13C4 PFBA



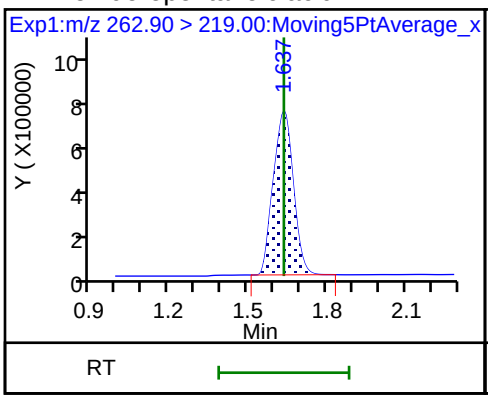
2 Perfluorobutyric acid



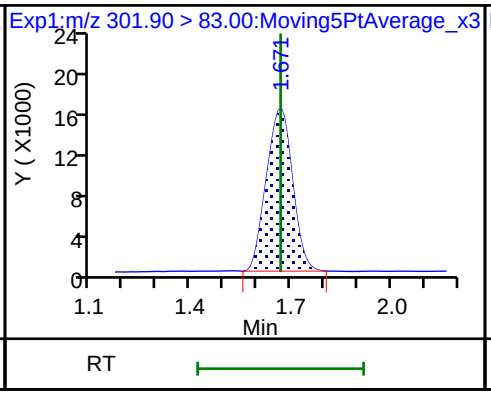
D 3 13C5-PFPeA



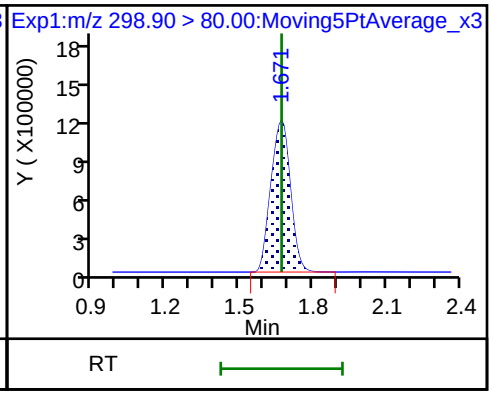
4 Perfluoropentanoic acid



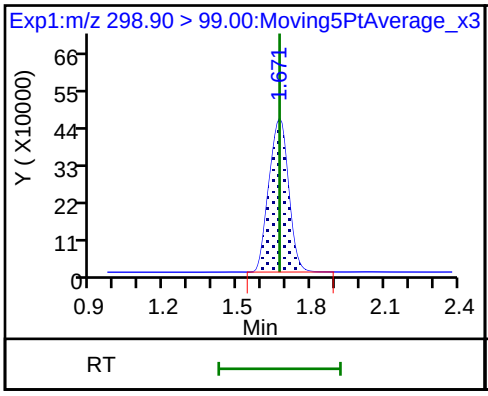
D 47 13C3-PFBS



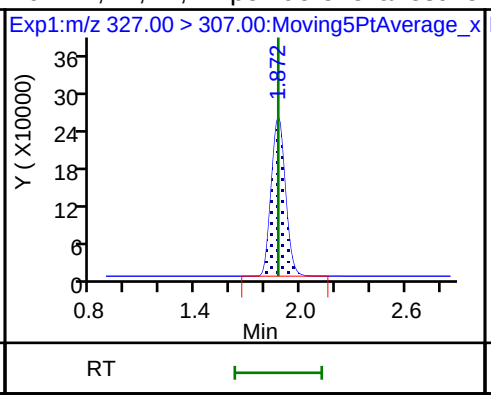
5 Perfluorobutanesulfonic acid



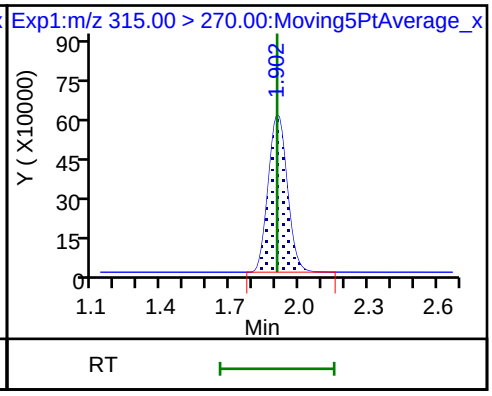
5 Perfluorobutanesulfonic acid



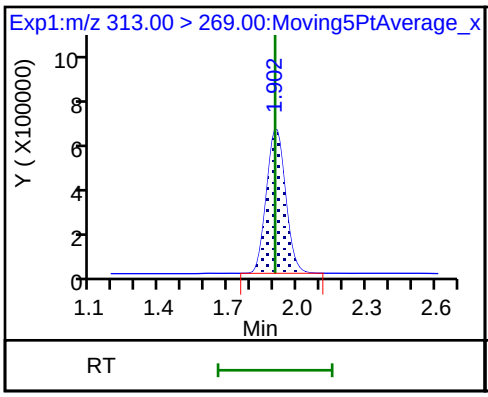
61 1H,1H,2H,2H-perfluorohexanesulfon



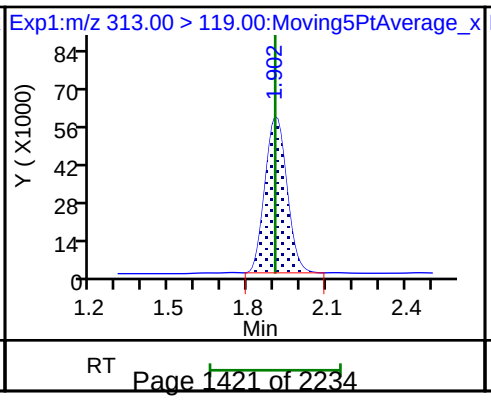
D 7 13C2 PFHxA



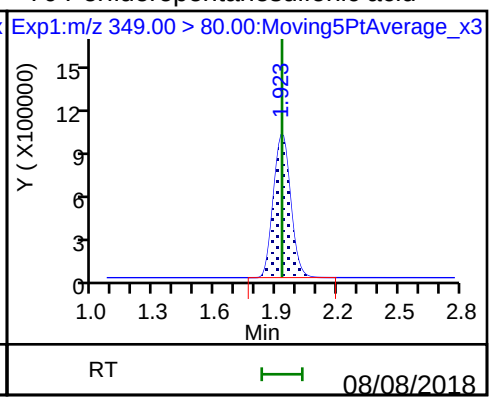
6 Perfluorohexanoic acid



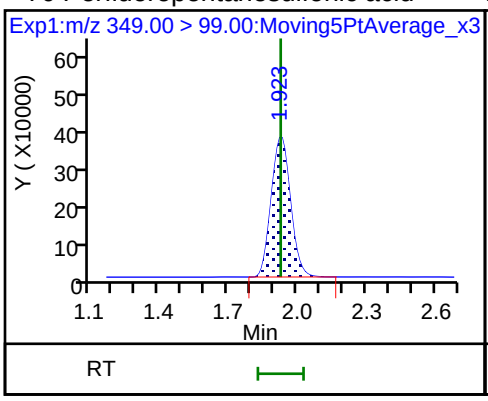
6 Perfluorohexanoic acid



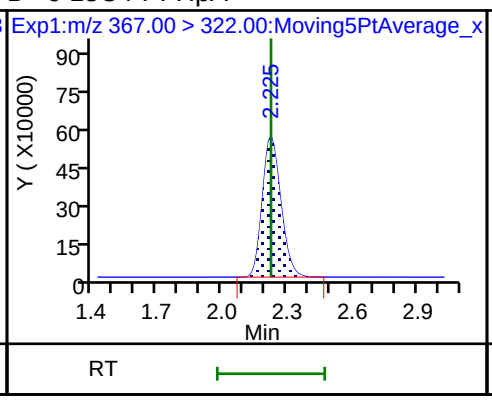
70 Perfluoropentanesulfonic acid



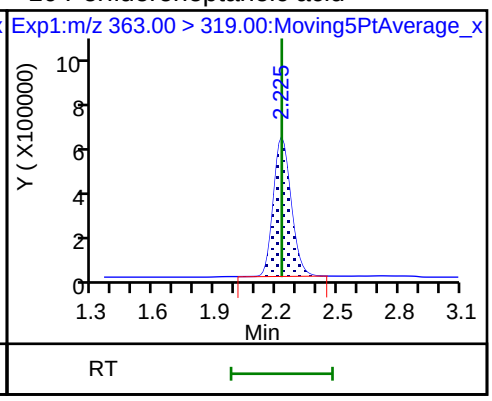
70 Perfluoropentanesulfonic acid



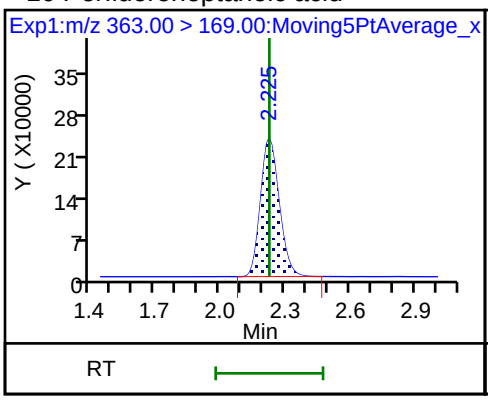
D 9 13C4-PFHpA



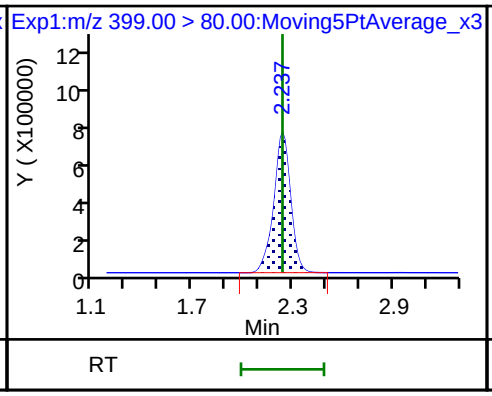
10 Perfluoroheptanoic acid



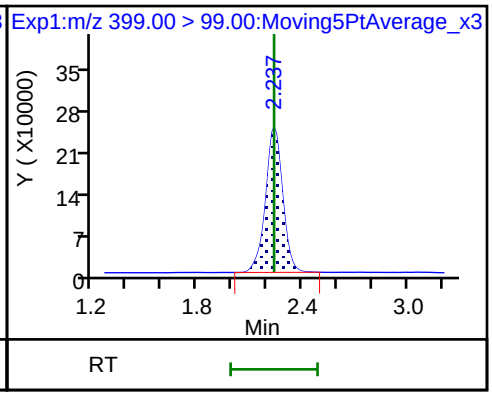
10 Perfluoroheptanoic acid



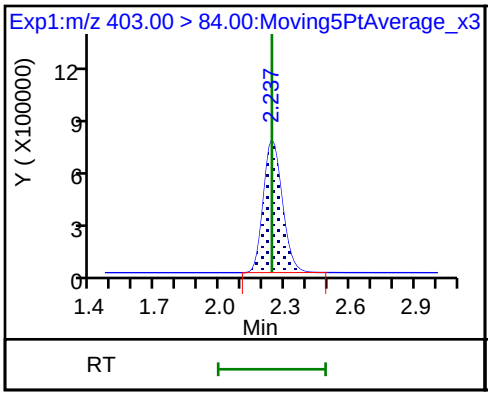
8 Perfluorohexanesulfonic acid



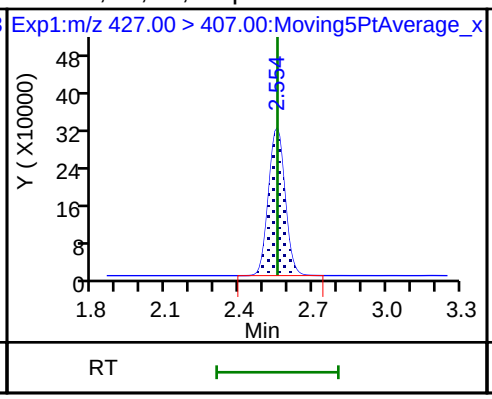
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS



13 1H,1H,2H,2H-perfluorooctanesulfon



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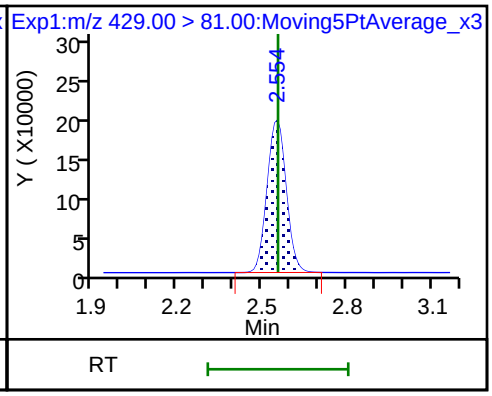
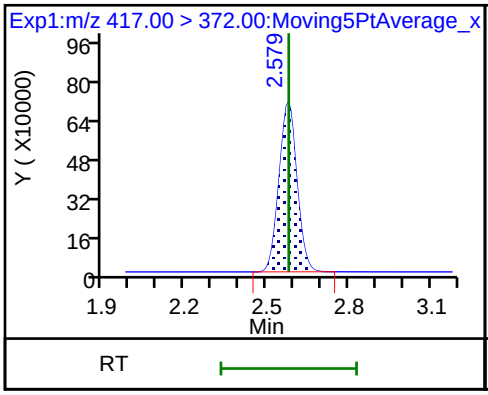
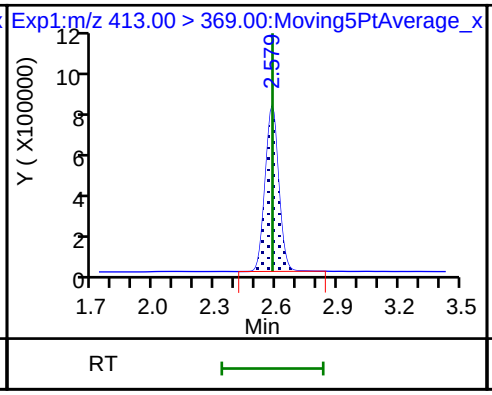


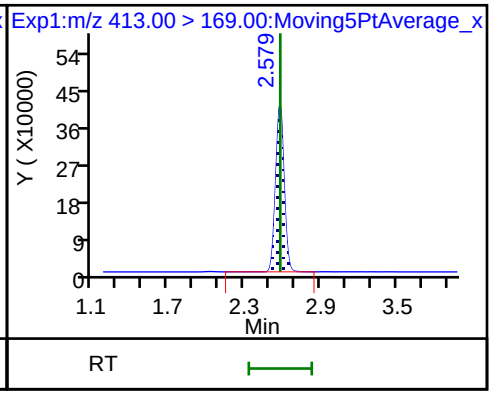
D 14 13C4 PFOA



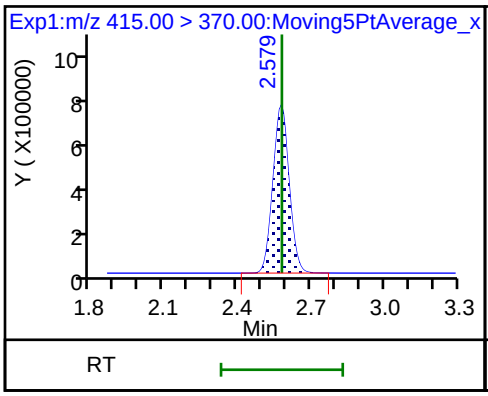
15 Perfluorooctanoic acid



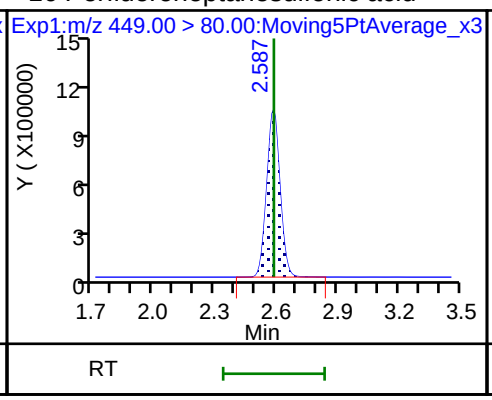
15 Perfluorooctanoic acid



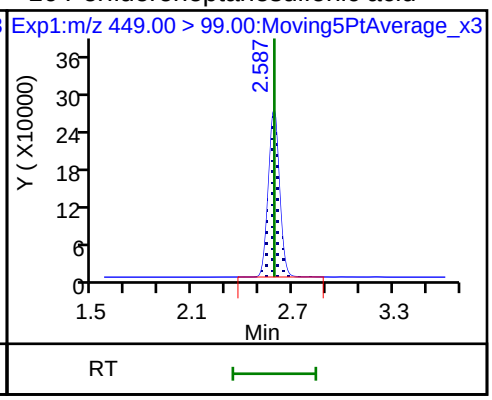
* 62 13C2-PFOA



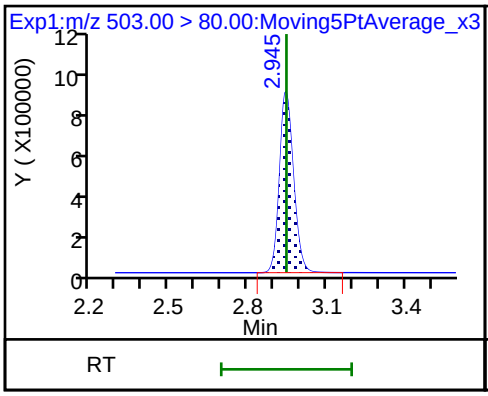
16 Perfluoroheptanesulfonic acid



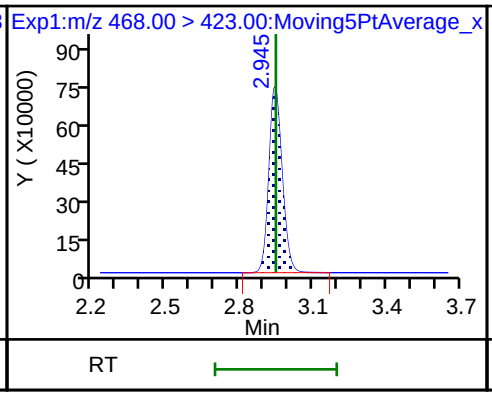
16 Perfluoroheptanesulfonic acid



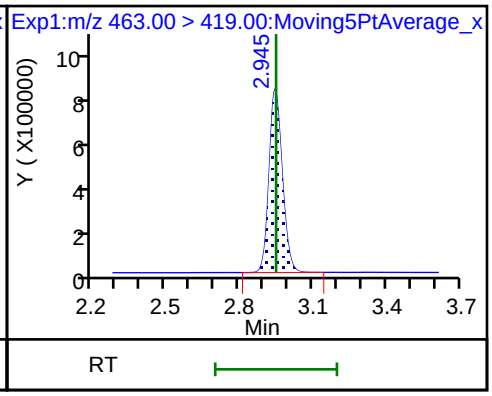
D 18 13C4 PFOS



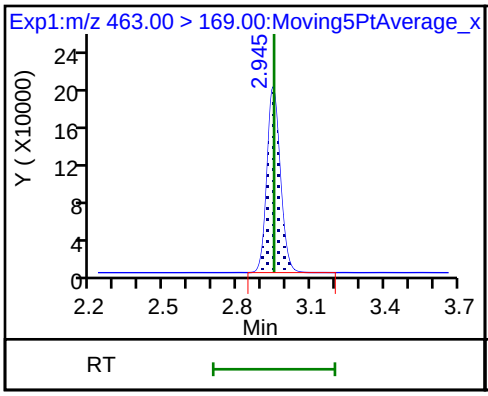
D 19 13C5 PFNA



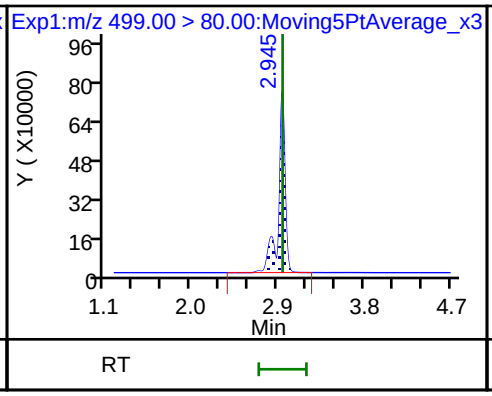
20 Perfluorononanoic acid



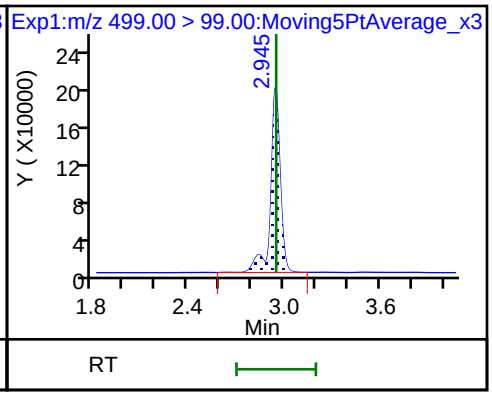
20 Perfluorononanoic acid



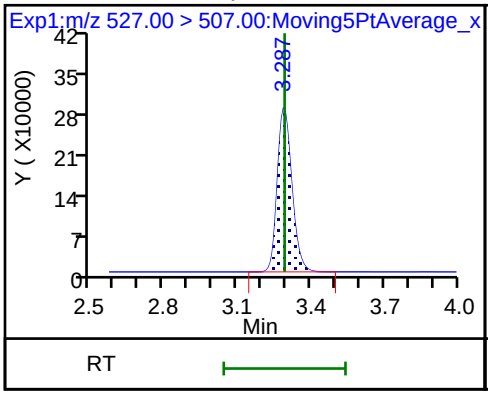
17 Perfluorooctane sulfonic acid



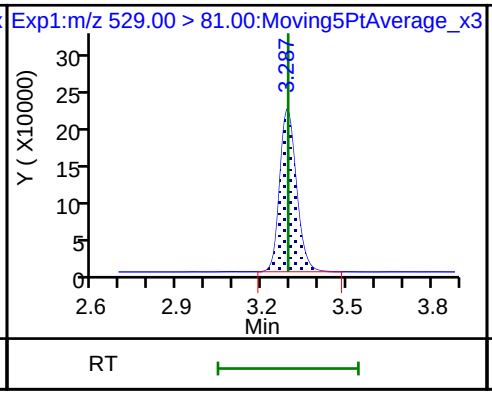
17 Perfluorooctane sulfonic acid



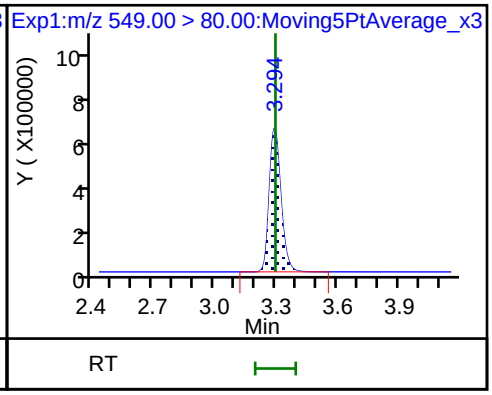
25 1H,1H,2H,2H-perfluorodecanesulfon



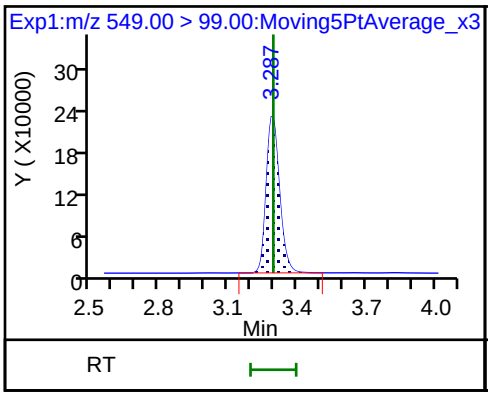
D 26 M2-8:2FTS



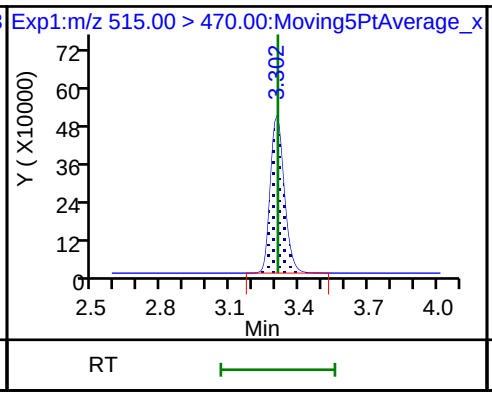
68 Perfluorononanesulfonic acid



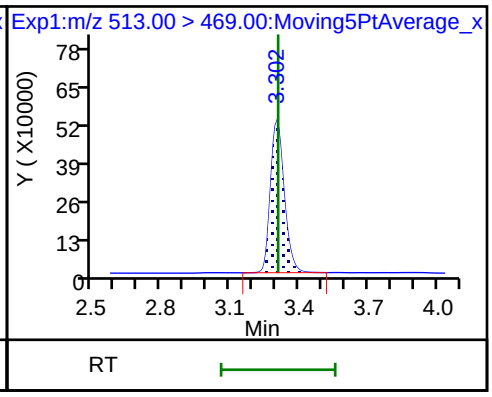
68 Perfluorononanesulfonic acid



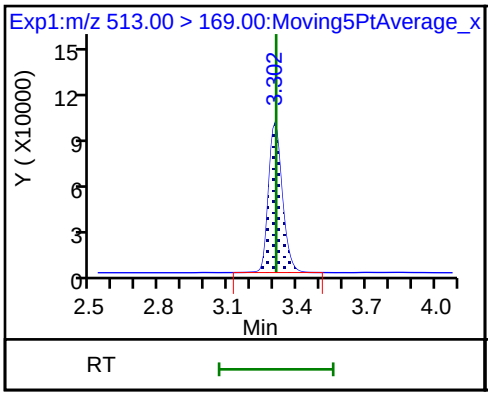
D 23 13C2 PFDA



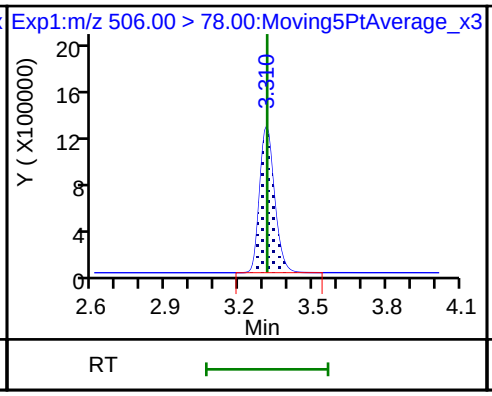
24 Perfluorodecanoic acid



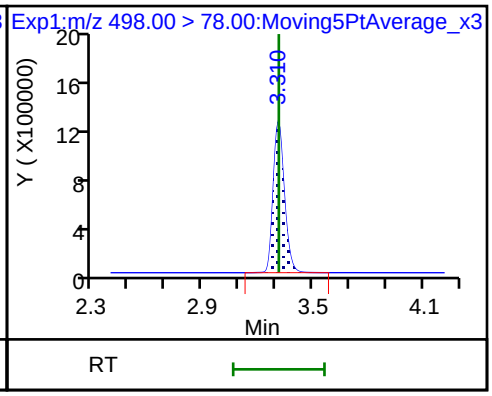
24 Perfluorodecanoic acid



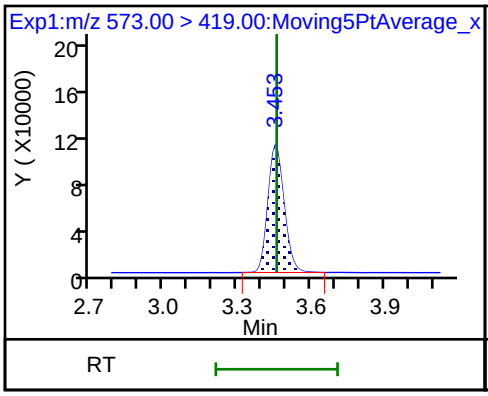
D 21 13C8 FOSA



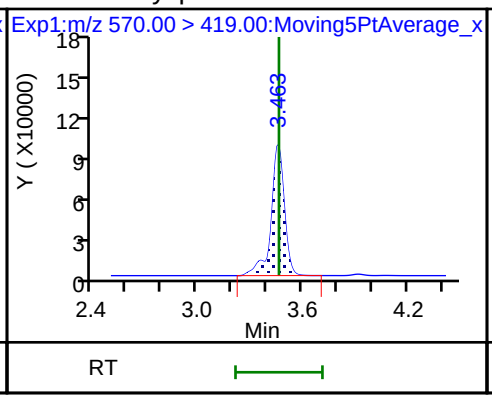
22 Perfluorooctane Sulfonamide



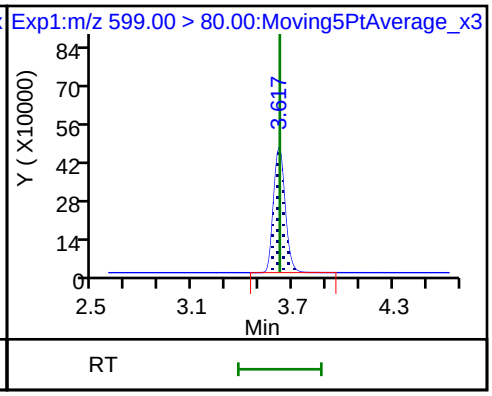
D 27 d3-NMeFOSAA



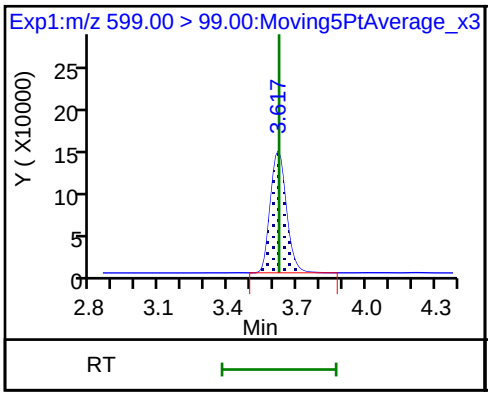
28 N-methyl perfluorooctane sulfonami



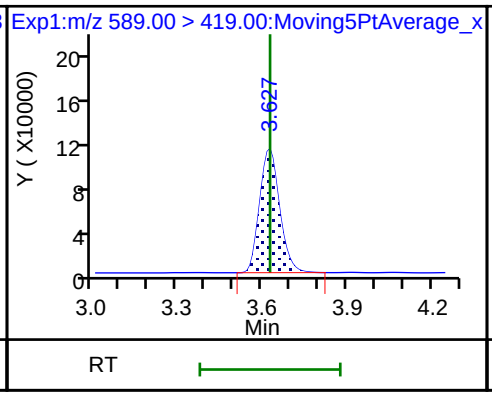
29 Perfluorodecane Sulfonic acid



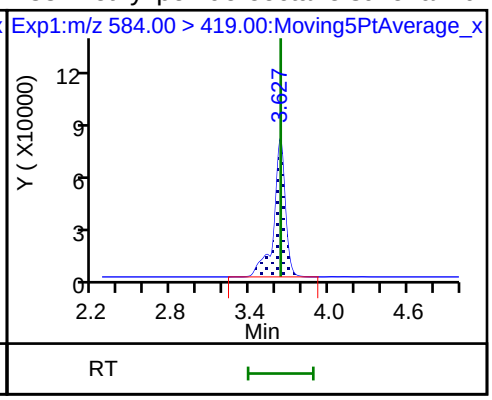
29 Perfluorodecane Sulfonic acid



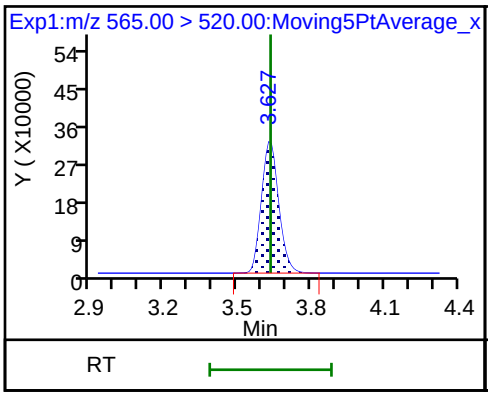
D 32 d5-NEtFOSAA



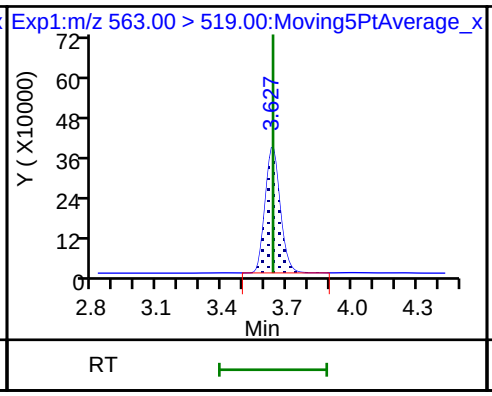
33 N-ethyl perfluorooctane sulfonamid



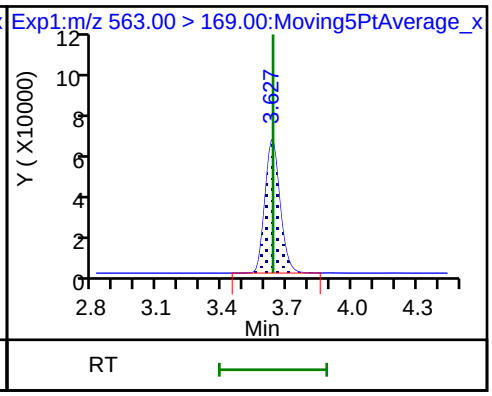
D 30 13C2 PFUnA



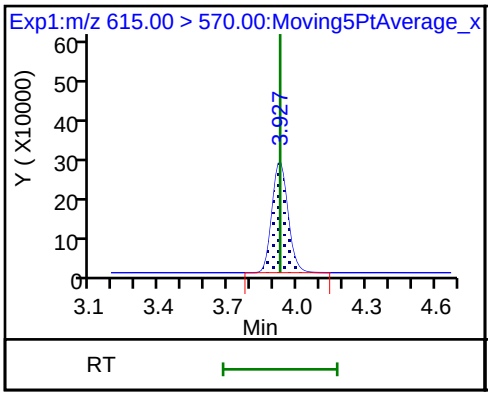
31 Perfluoroundecanoic acid



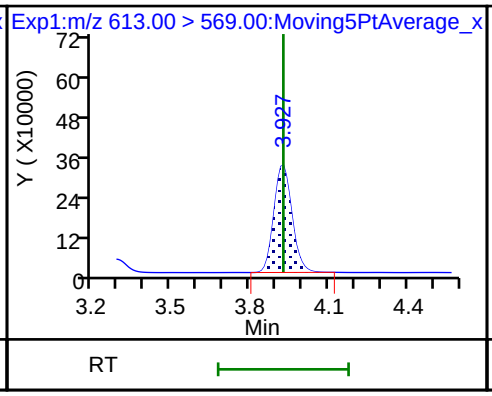
31 Perfluoroundecanoic acid



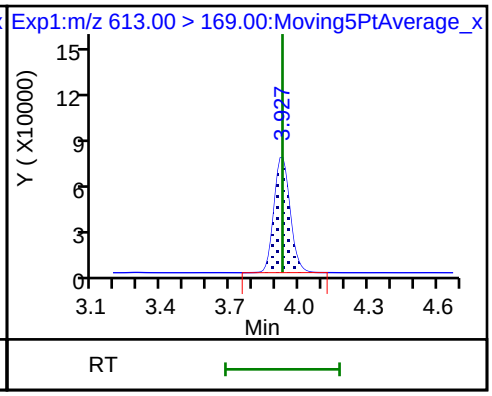
D 36 13C2 PFDoA



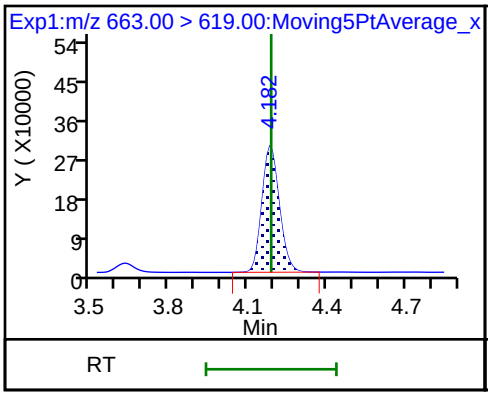
37 Perfluorododecanoic acid



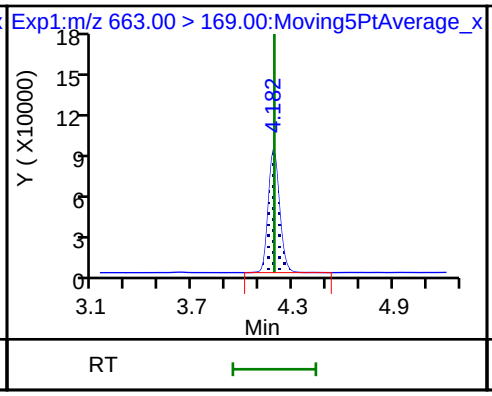
37 Perfluorododecanoic acid



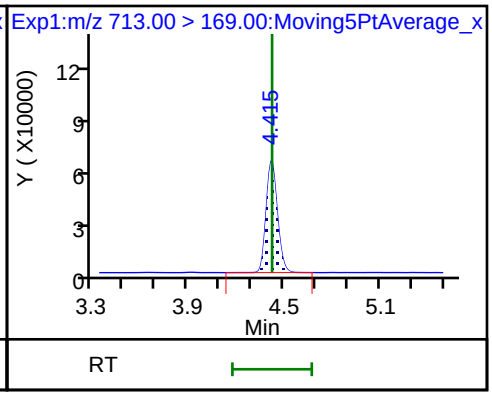
41 Perfluorotridecanoic acid



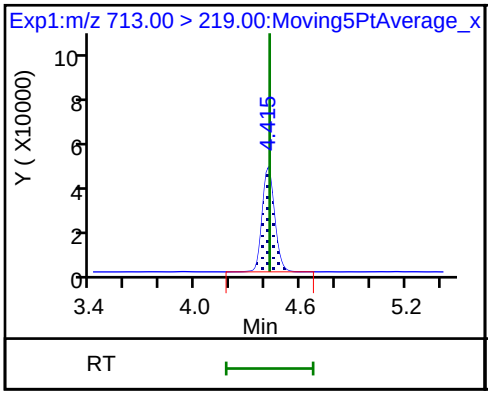
41 Perfluorotridecanoic acid



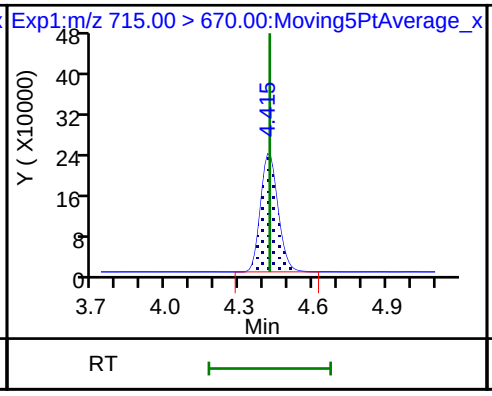
42 Perfluorotetradecanoic acid



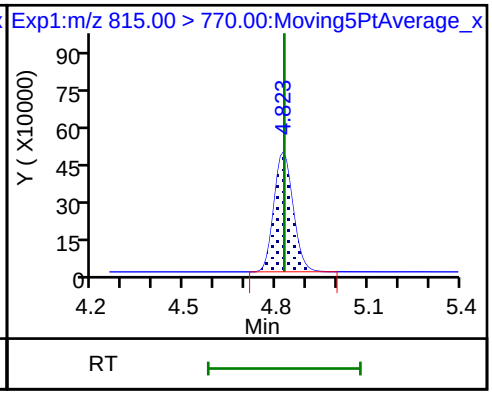
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 01-Aug-2018 13:38:11 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:29 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:59:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.395	0.003	0.541	4598618	2.61		104	69966	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.396	0.001	1.000	9171174	5.06		101	2117	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	7124053	5.00		100	3043	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.633	2974004	2.56		103	42918	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.646	82077	2.46		106	326	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.671	0.004	1.005	12002466	4.44		100	49723	
298.90 > 99.00	1.666	1.671	-0.005	1.000	5088225		2.36(1.25-3.74)	100	22853	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.872	0.004	1.126	2787781	4.59		98.3	122401	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.872	0.004	0.727	567443	NC			6287	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.906	1.903	0.003	1.000	6816050	5.00		100	10692	
313.00 > 119.00	1.906	1.903	0.003	1.000	607403		11.22(5.03-15.10)	100	6084	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.903	0.003	0.738	3231846	2.58		103	69974	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	11402360	4.77		102	91517	
349.00 > 99.00	1.927	1.928	-0.001	1.157	4322819		2.64(1.36-4.07)	102	21604	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.000	0.003	0.776	153939	NC			4397	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	1.000	1171510	NC			4626	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.225	0.004	0.864	3116337	2.56		102	57492	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.226	0.003	1.000	7260990	5.02		100	3272	
363.00 > 169.00	2.229	2.226	0.003	1.000	2743085		2.65(1.13-3.40)	100	22895	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.237	0.004	1.000	9713740	4.36		95.9	29626	
399.00 > 99.00	2.241	2.237	0.004	1.000	3229342		3.01(1.50-4.49)	95.9	4983	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.868	4552896	2.49		105	41500	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.769	17310053	NC			97371	
377.00 > 85.00	2.267	2.270	-0.003	0.769	10635588		1.63(0.84-2.53)		37926	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.554	0.001	1.000	2799930	4.71		99.4	29558	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.556	-0.001	0.990	853793	2.40		101	10018	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.580	0.0	1.000	2942955	2.51		100	37513	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.581	-0.001		3058012	2.50			46964	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.581	-0.001	1.000	6976550	5.13		102	5295	
413.00 > 169.00	2.580	2.581	-0.001	1.000	3689319		1.89(0.84-2.52)	102	12958	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.587	0.001	0.878	8881601	4.91		103	41144	
449.00 > 99.00	2.588	2.587	0.001	0.878	2392742		3.71(1.94-5.82)	103	21710	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.946	0.002	1.142	3128101	2.48		104	34966	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.948	0.0	1.142	2589352	2.53		101	48232	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.949	-0.001	1.000	6798798	4.63		99.7	37617	
499.00 > 99.00	2.948	2.949	-0.001	1.000	1556808		4.37(2.31-6.93)	99.7	8559	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.949	-0.001	1.000	5744475	5.14		103	11587	
463.00 > 169.00	2.948	2.949	-0.001	1.000	1399812		4.10(1.90-5.69)	103	26388	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.158	-0.002	1.070	11077192	NC			84001	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.292	-0.001	1.275	828227	2.38		99.6	14255	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.291	3.292	-0.001	1.000	2239081	4.79		100	67668	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.291	3.295	-0.004	1.116	4817452	5.12		107	47993	
549.00 > 99.00	3.291	3.295	-0.004	1.116	1750190		2.75(1.33-3.97)	107	10655	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.306	0.001	1.282	1963135	2.57		103	42394	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.308	-0.001	1.000	4009985	4.78		95.7	4974	
513.00 > 169.00	3.307	3.308	-0.001	1.000	708571		5.66(2.36-7.09)	95.7	8379	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.312	0.003	1.285	4827094	2.60		104	47868	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.313	0.002	1.000	9630397	5.05		101	44465	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.459	-0.001	1.340	501663	2.70		108	13710	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.465	0.002	1.003	986536	4.84		96.7	11800	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.620	0.001	1.228	4226499	4.96		103	128198	
599.00 > 99.00	3.621	3.620	0.001	1.228	1369923		3.09(1.39-4.16)	103	18062	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.627	0.004	1.407	495602	2.49		99.6	4442	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.631	3.633	-0.002	1.000	898298	5.08		102	17316	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.631	3.634	-0.003	1.000	3479056	4.71		94.2	7241	
563.00 > 169.00	3.631	3.634	-0.003	1.000	615392		5.65(2.12-6.36)	94.2	25449	
D 30 13C2 PFUnA										
565.00 > 520.00	3.631	3.634	-0.003	1.407	1498263	2.54		102	35012	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.792	0.003	1.287	15311015	NC			98644	
D 36 13C2 PFDoA										
615.00 > 570.00	3.920	3.925	-0.005	1.519	1279511	2.51		100	16773	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.927	0.004	1.003	2802983	5.06		101	1051	
613.00 > 169.00	3.920	3.927	-0.007	1.000	716512		3.91(2.13-6.40)	101	12519	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.184	4.188	-0.004	1.067	2580030	5.35		107	886	
663.00 > 169.00	4.184	4.188	-0.004	1.067	776811		3.32(1.25-3.76)	107	6166	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.423	0.004	1.716	1118375	2.61		104	5580	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.423	0.004	1.000	585419	4.86		97.2	5924	
713.00 > 219.00	4.416	4.423	-0.007	0.998	418173		1.40(0.71-2.13)	97.2	5362	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.826	-0.002	1.869	1875506	2.54		102	2831	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.824	4.827	-0.003	1.000	3739164	NC			237	
813.00 > 169.00	4.824	4.827	-0.003	1.000	606682		6.16(2.86-8.58)		4826	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.166	5.166	0.0	1.071	3935966	NC			1173	
913.00 > 169.00	5.158	5.166	-0.008	1.069	487622		8.07(3.83-11.48)		4062	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00006 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:31 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_007.d

Injection Date: 01-Aug-2018 13:38:11 Instrument ID: A8_N

Lims ID: IC L6 Full

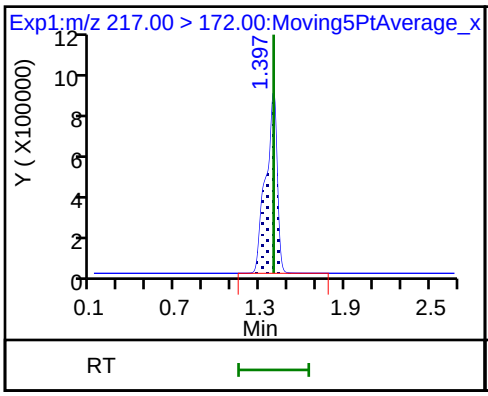
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 15 Worklist Smp#: 7

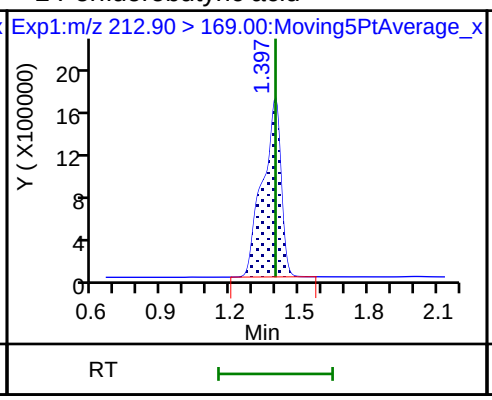
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

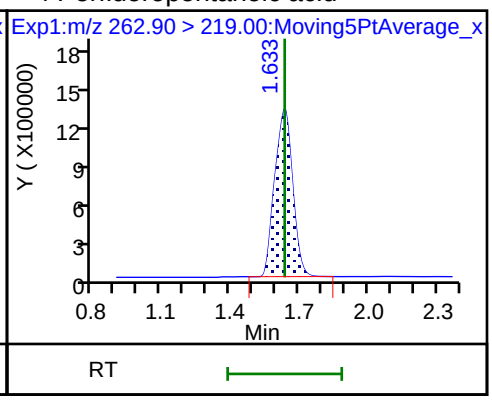
D 1 13C4 PFBA



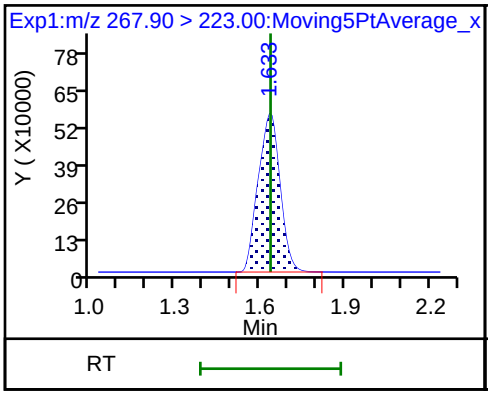
2 Perfluorobutyric acid



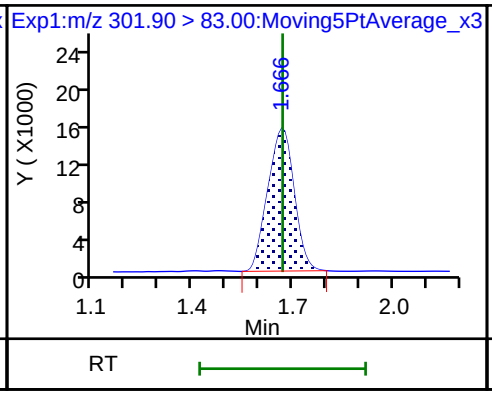
4 Perfluoropentanoic acid



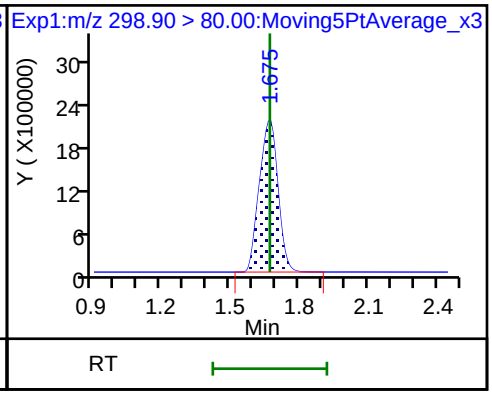
D 3 13C5-PFPeA



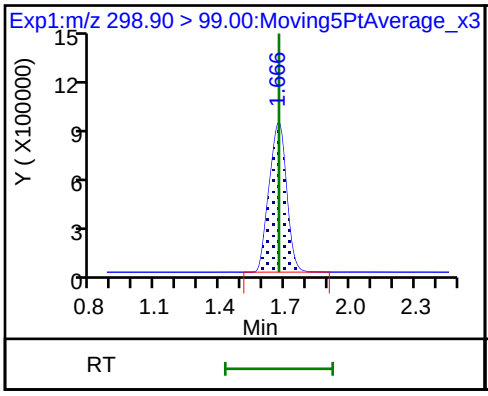
D 47 13C3-PFBS



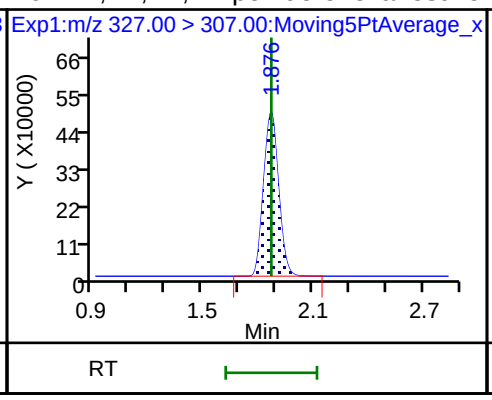
5 Perfluorobutanesulfonic acid



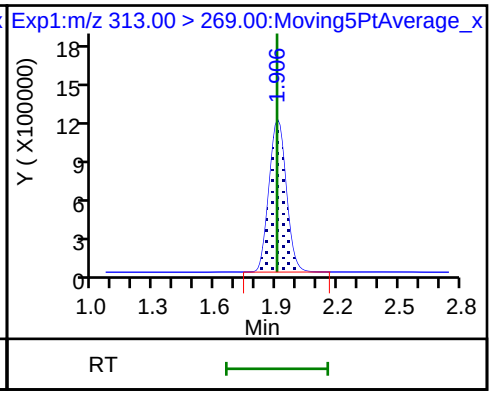
5 Perfluorobutanesulfonic acid



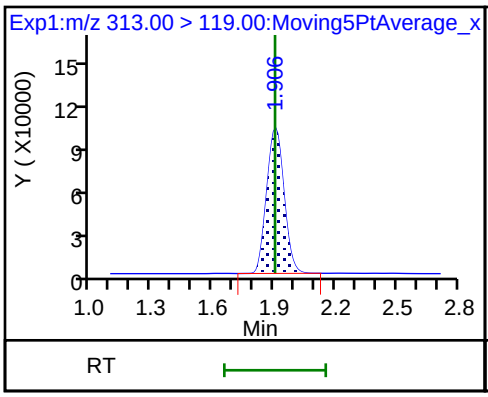
61 1H,1H,2H,2H-perfluorohexanesulfoni



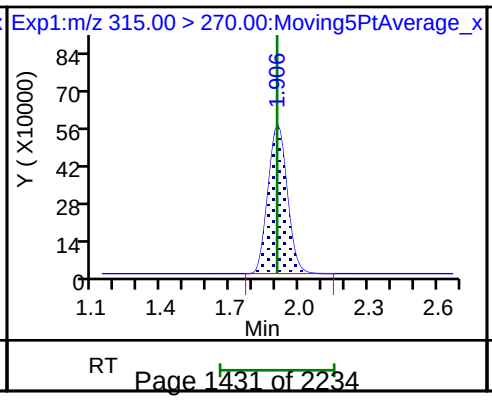
6 Perfluorohexanoic acid



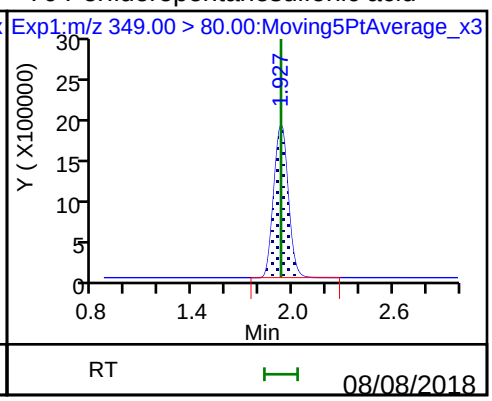
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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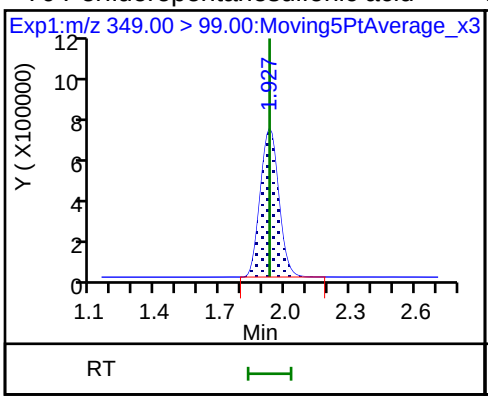
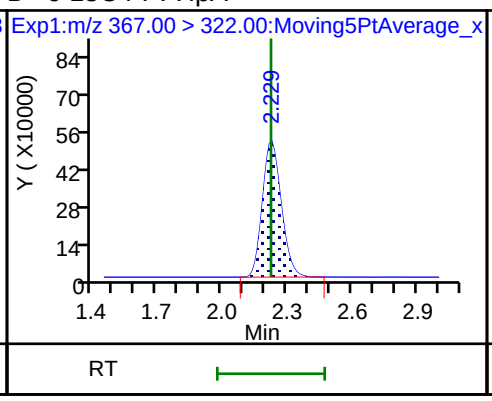
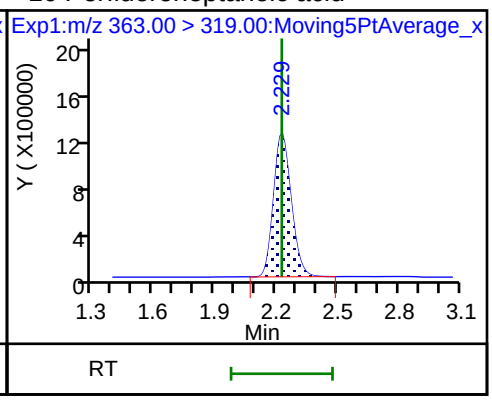


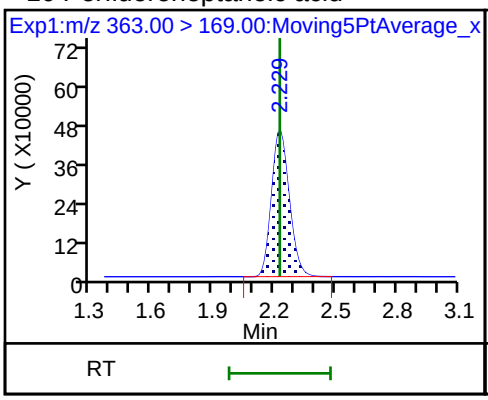
D 9 13C4-PFHpA



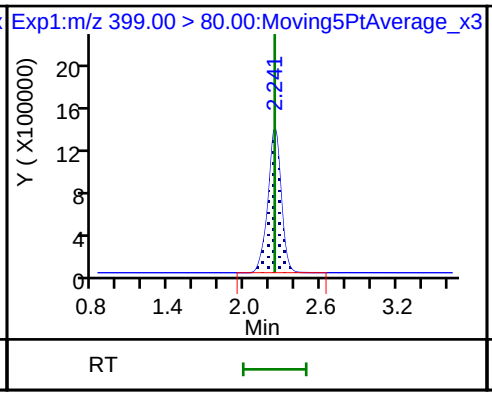
10 Perfluoroheptanoic acid



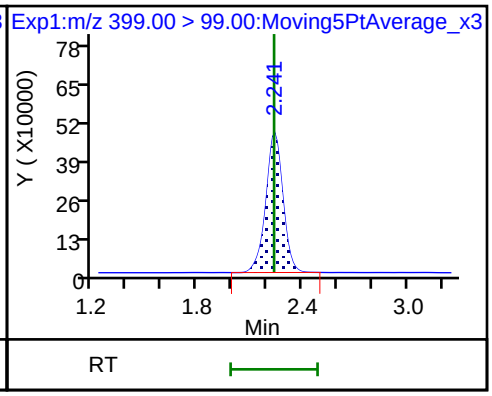
10 Perfluoroheptanoic acid



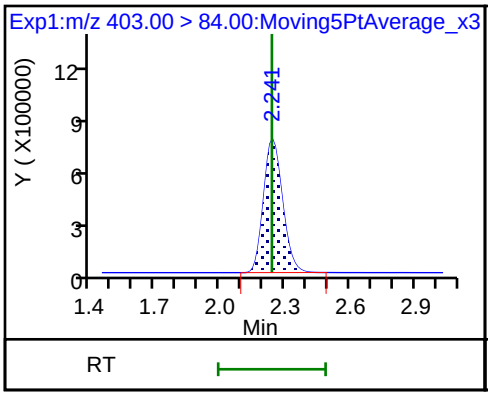
8 Perfluorohexanesulfonic acid



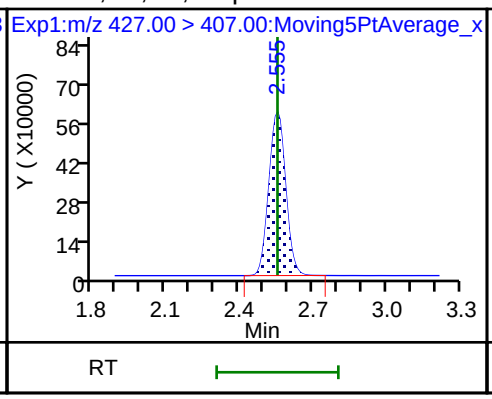
8 Perfluorohexanesulfonic acid



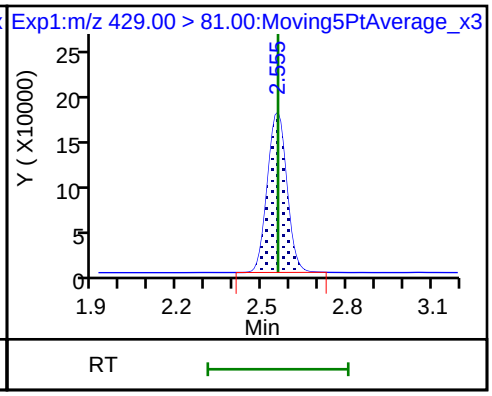
D 11 18O2 PFHxS



13 1H,1H,2H,2H-perfluorooctanesulfon



D 12 M2-6:2FTS



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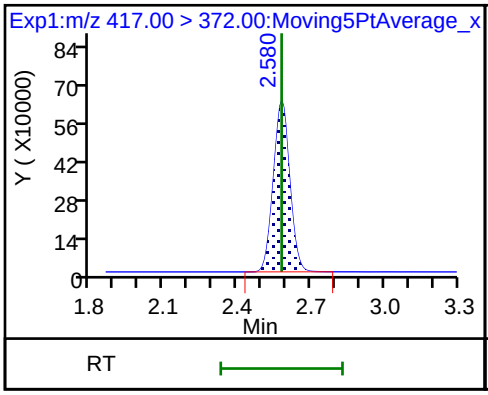
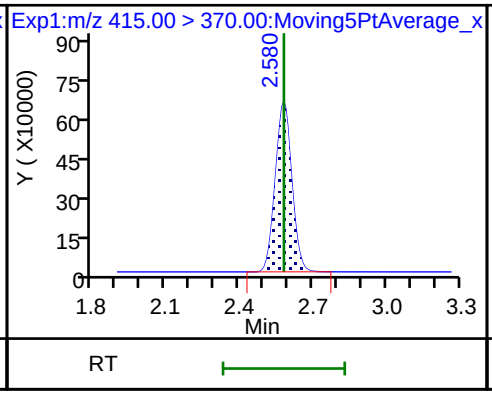
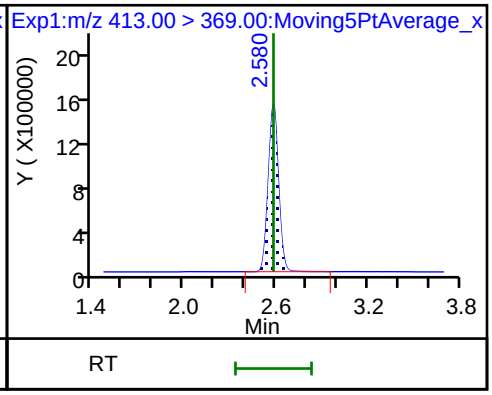


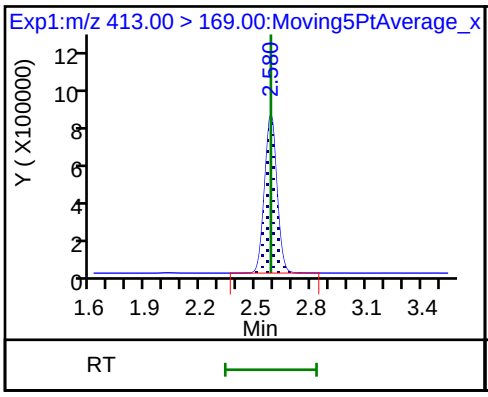
* 62 13C2-PFOA



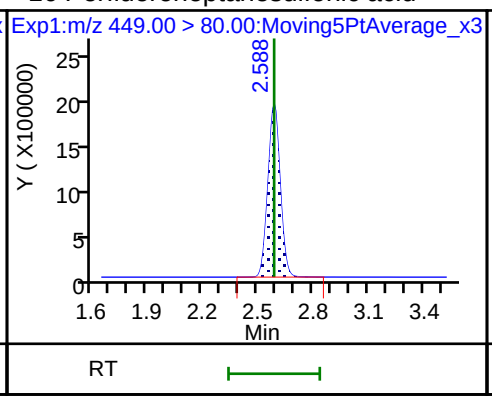
15 Perfluorooctanoic acid



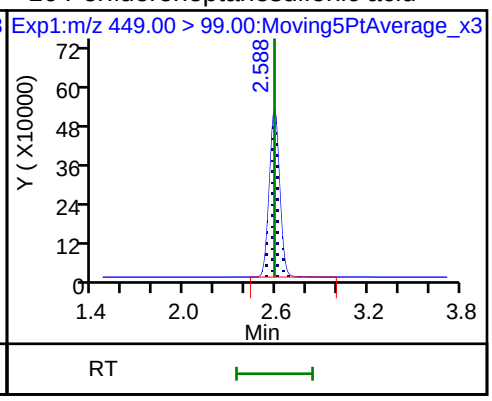
15 Perfluorooctanoic acid



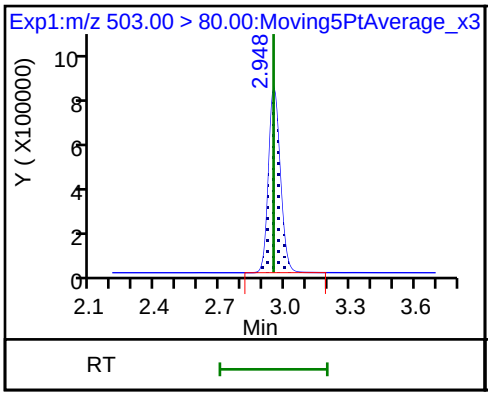
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS



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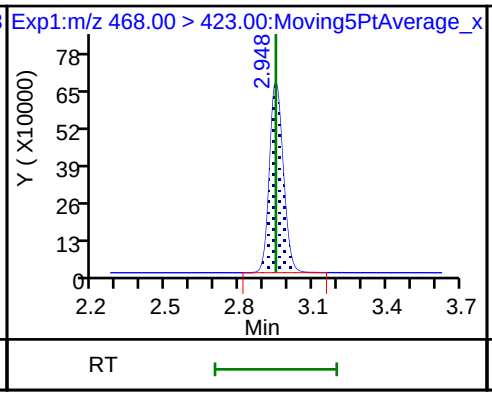
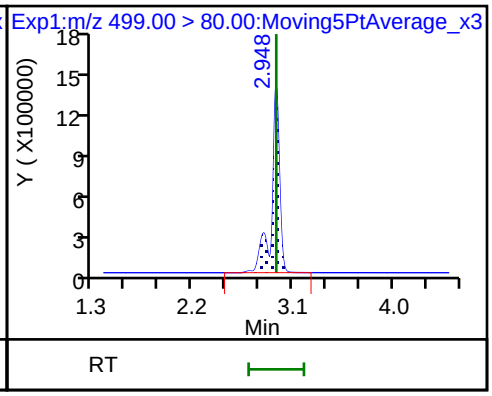
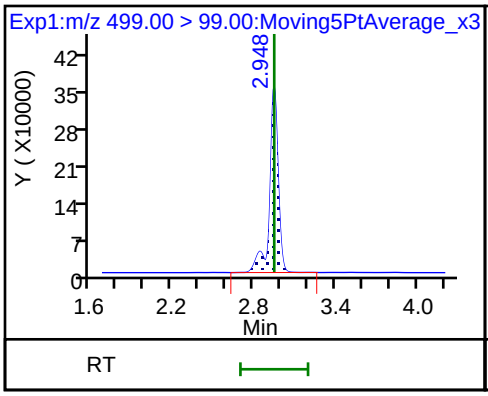


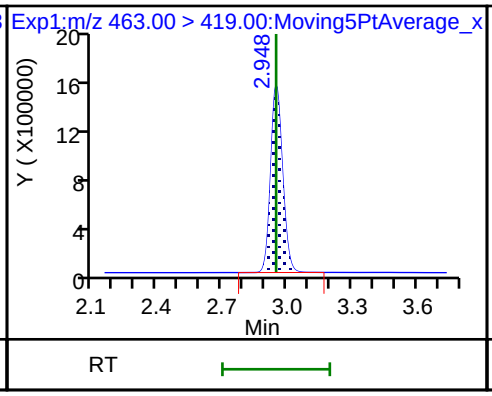
17 Perfluorooctane sulfonic acid



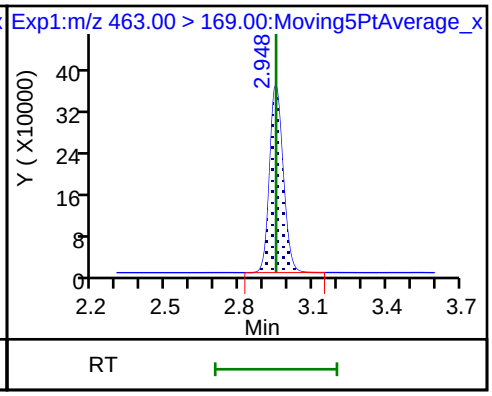
17 Perfluorooctane sulfonic acid



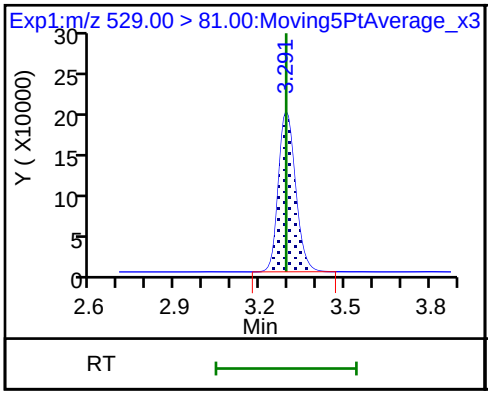
20 Perfluorononanoic acid



20 Perfluorononanoic acid



D 26 M2-8:2FTS



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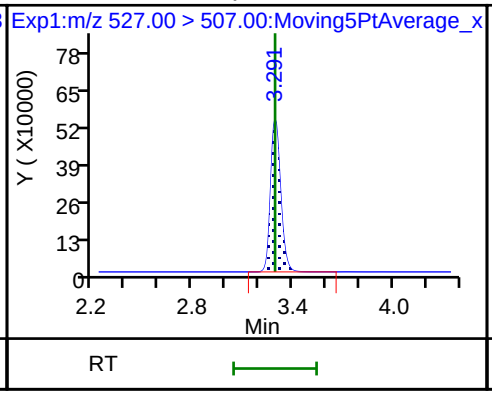
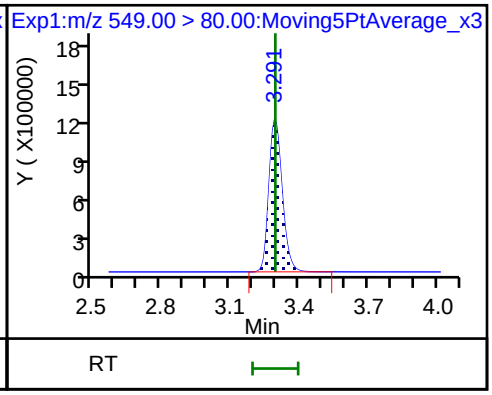
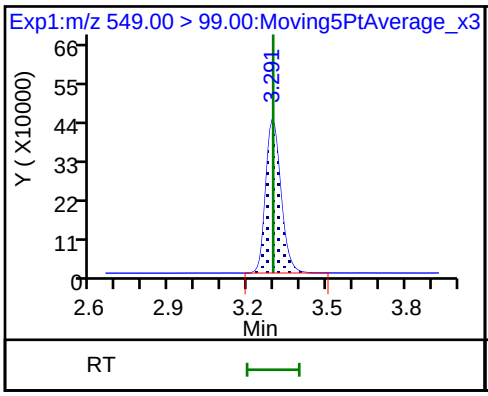


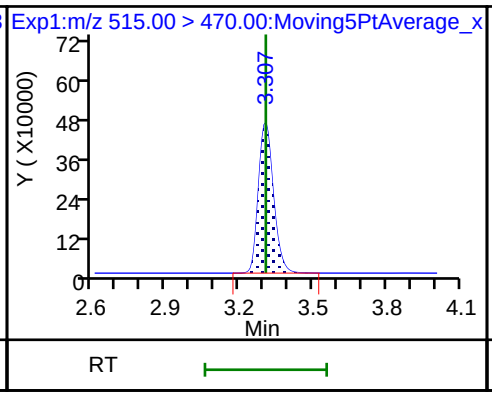
68 Perfluorononanesulfonic acid



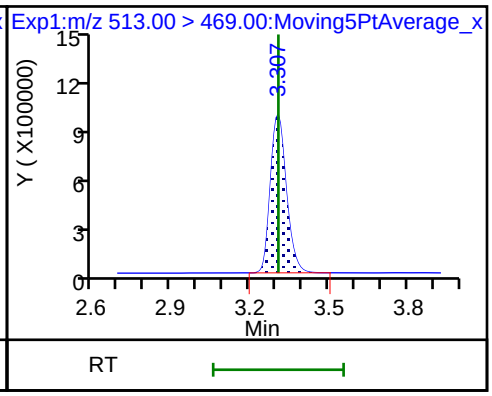
68 Perfluorononanesulfonic acid



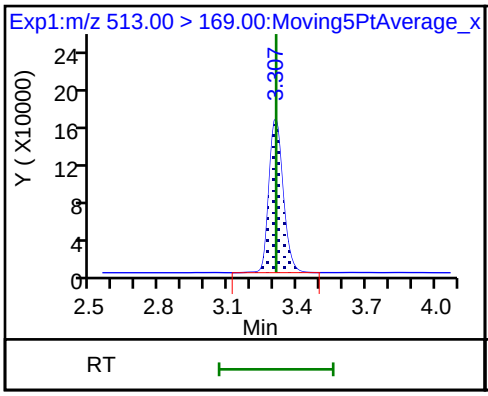
D 23 13C2 PFDA



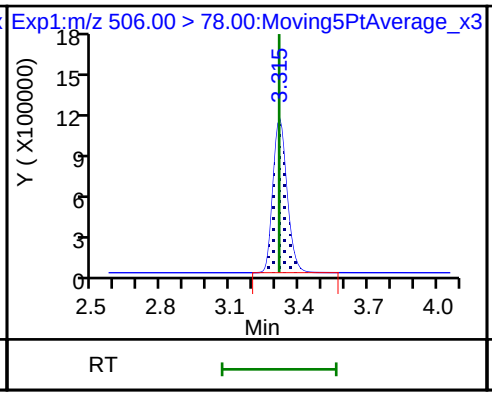
24 Perfluorodecanoic acid



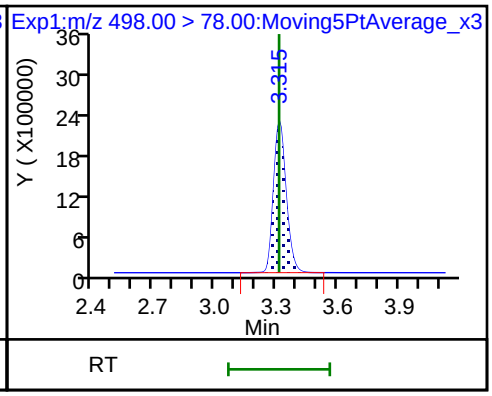
24 Perfluorodecanoic acid



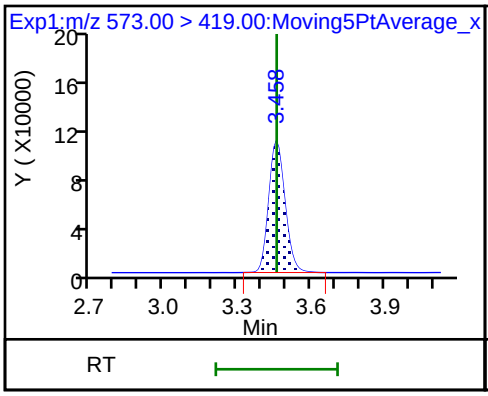
D 21 13C8 FOSA



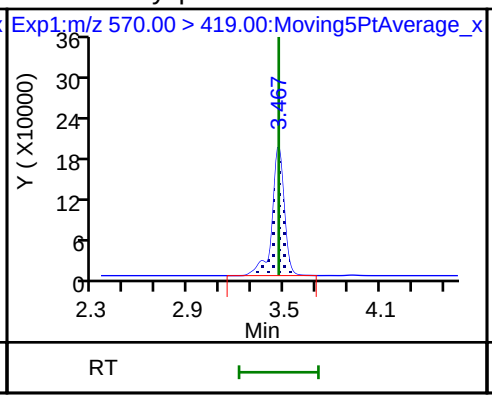
22 Perfluorooctane Sulfonamide



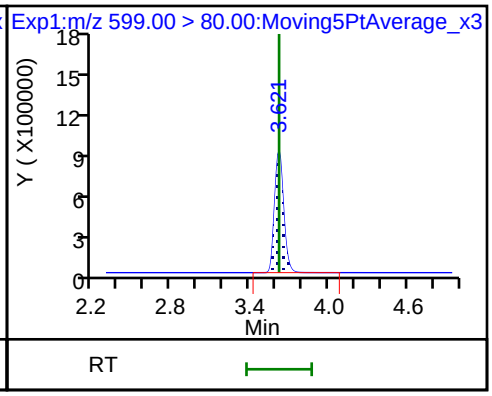
D 27 d3-NMeFOSAA



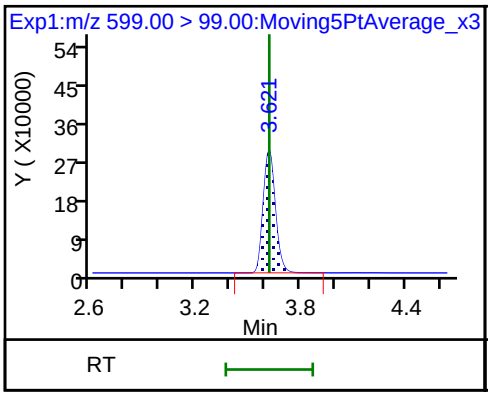
28 N-methyl perfluorooctane sulfonami



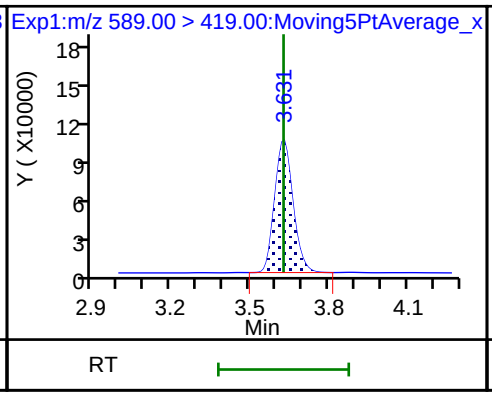
29 Perfluorodecane Sulfonic acid



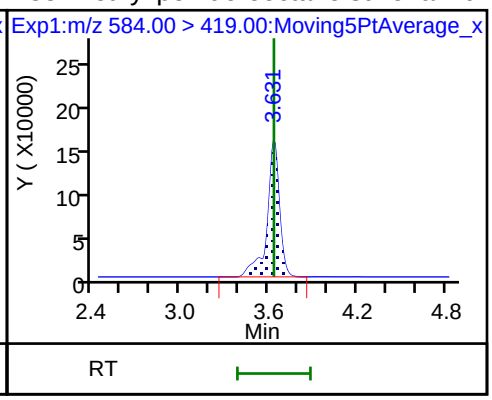
29 Perfluorodecane Sulfonic acid



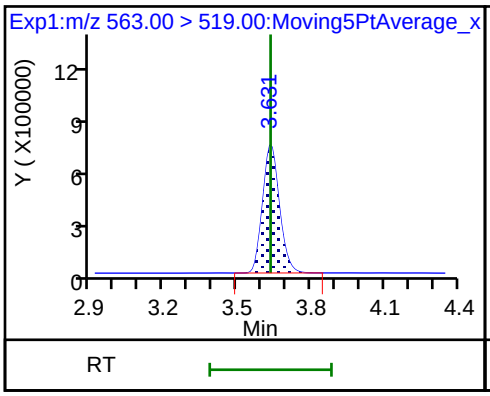
D 32 d5-NEtFOSAA



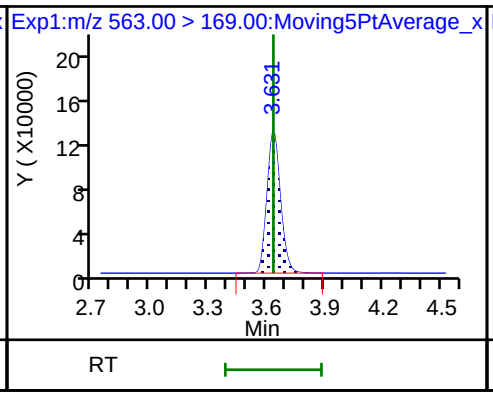
33 N-ethyl perfluorooctane sulfonamid



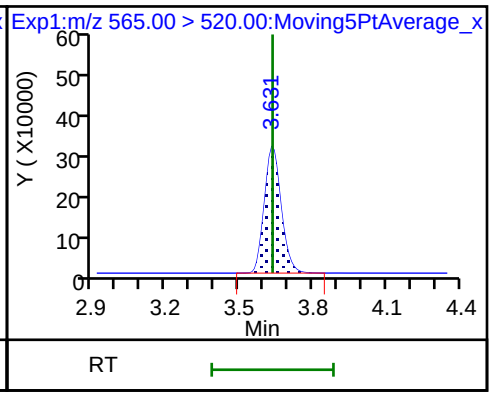
31 Perfluoroundecanoic acid



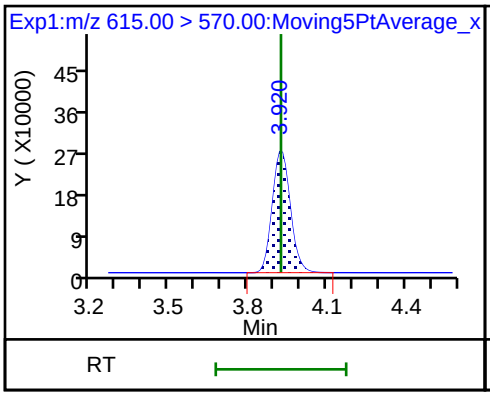
31 Perfluoroundecanoic acid



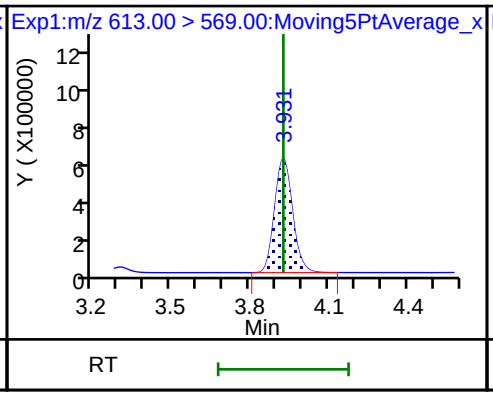
D 30 13C2 PFUnA



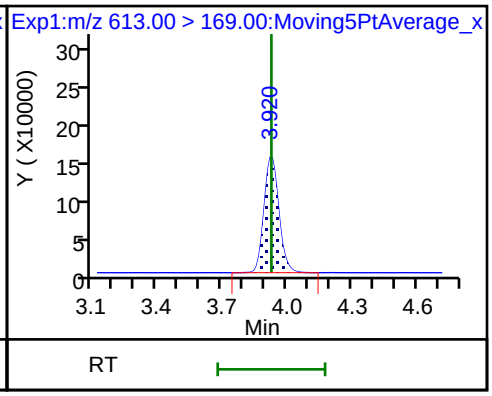
D 36 13C2 PFDoA



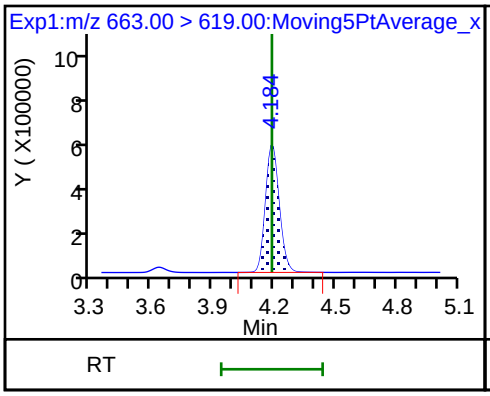
37 Perfluorododecanoic acid



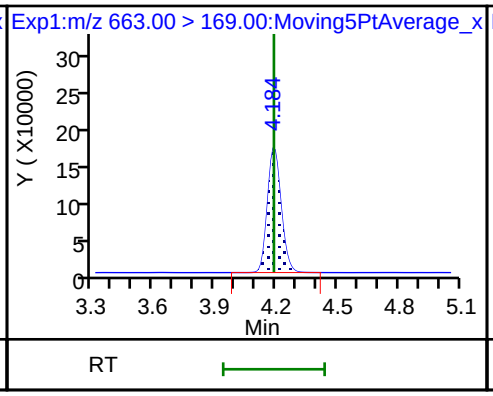
37 Perfluorododecanoic acid



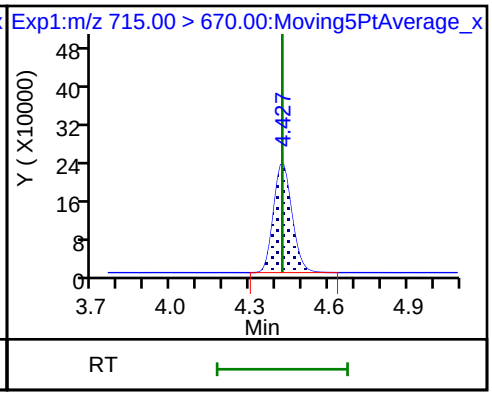
41 Perfluorotridecanoic acid



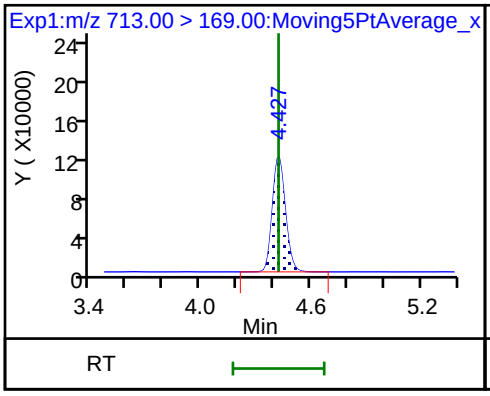
41 Perfluorotridecanoic acid



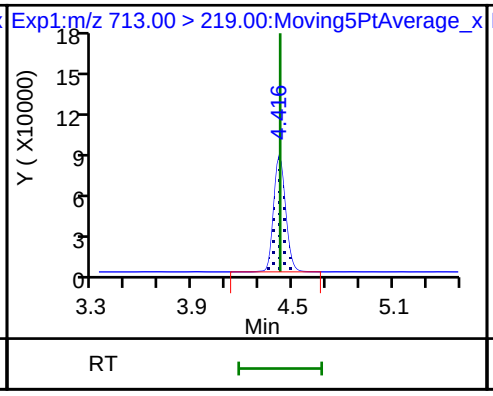
D 43 13C2-PFTeDA



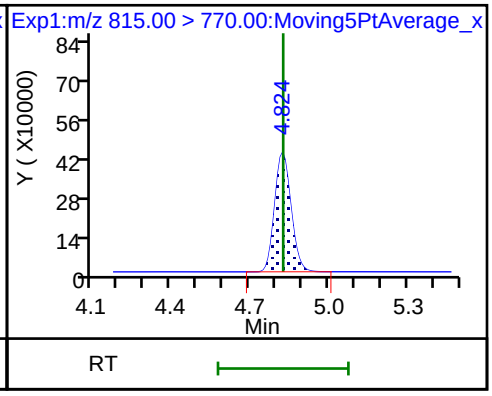
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 01-Aug-2018 13:46:01 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:54 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:35:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.003	0.541	4488667	2.73		109	73989	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.396	-0.005	1.000	17657065	9.98		99.8	4339	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.635	2847672	2.63		105	44006	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	13665143	10.0		100	5702	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.647	80880	2.59		112	321	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.671	-0.005	1.000	22654929	8.50		96.1	77149	
298.90 > 99.00	1.666	1.671	-0.005	1.000	10018644		2.26(1.25-3.74)	96.1	64080	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.872	-0.006	0.725	526933	NC			5548	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.872	-0.006	1.120	5267139	8.80		94.2	185327	
D 7 13C2 PFHxA										
315.00 > 270.00	1.895	1.903	-0.008	0.737	3022362	2.58		103	64725	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.895	1.903	-0.008	1.000	13079443	10.3		103	23297	
313.00 > 119.00	1.895	1.903	-0.008	1.000	1166130		11.22(5.03-15.10)	103	13276	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	21798270	9.26		98.7	139676	
349.00 > 99.00	1.927	1.928	-0.001	1.157	8606195		2.53(1.36-4.07)	98.7	42784	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.992	2.000	-0.008	0.774	159356	NC			3961	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.992	2.002	-0.010	1.000	2476711	NC			10791	
D 9 13C4-PFHpA										
367.00 > 322.00	2.218	2.225	-0.007	0.862	2908549	2.56		102	60437	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.218	2.226	-0.008	1.000	13373710	9.91		99.1	5700	
363.00 > 169.00	2.218	2.226	-0.008	1.000	5233691		2.56(1.13-3.40)	99.1	41791	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.237	-0.008	1.000	18747407	8.49		93.3	37401	
399.00 > 99.00	2.229	2.237	-0.008	1.000	6489057		2.89(1.50-4.49)	93.3	8896	
D 11 18O2 PFHxS										
403.00 > 84.00	2.229	2.238	-0.009	0.866	4518625	2.64		112	52710	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.771	30025263	NC			138977	
377.00 > 85.00	2.267	2.270	-0.003	0.771	18863315		1.59(0.84-2.53)		55929	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.547	2.554	-0.007	1.000	5327073	9.77		103	41841	
D 12 M2-6:2FTS										
429.00 > 81.00	2.547	2.556	-0.009	0.990	782824	2.35		98.9	10988	
D 14 13C4 PFOA										
417.00 > 372.00	2.573	2.580	-0.007	1.000	2730006	2.49		99.4	48269	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.573	2.581	-0.008	1.000	12686108	10.0		100	9244	
413.00 > 169.00	2.573	2.581	-0.008	1.000	7050018		1.80(0.84-2.52)	100	18721	
* 62 13C2-PFOA										
415.00 > 370.00	2.573	2.581	-0.008		2860140	2.50			30580	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.587	-0.006	0.877	16519531	9.08		95.4	40839	
449.00 > 99.00	2.581	2.587	-0.006	0.877	4738121		3.49(1.94-5.82)	95.4	36870	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.946	-0.003	1.144	3144316	2.66		111	42087	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.948	-0.005	1.144	2393820	2.50		100	51513	
20 Perfluorononanoic acid										
463.00 > 419.00	2.943	2.949	-0.006	1.000	10755568	10.4		104	21010	
463.00 > 169.00	2.943	2.949	-0.006	1.000	2576235		4.17(1.90-5.69)	104	41900	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.943	2.949	-0.006	1.000	13695202	9.27		99.9	54151	
499.00 > 99.00	2.943	2.949	-0.006	1.000	3178976		4.31(2.31-6.93)	99.9	18790	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.158	-0.002	1.073	20317968	NC			84817	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.284	3.292	-0.008	1.000	3886014	9.26		96.6	84560	
D 26 M2-8:2FTS										
529.00 > 81.00	3.284	3.292	-0.008	1.276	744064	2.29		95.6	12722	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.295	-0.003	1.119	9124121	9.65		101	51248	
549.00 > 99.00	3.292	3.295	-0.003	1.119	3638243		2.51(1.33-3.97)	101	19247	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.300	3.306	-0.006	1.282	1788913	2.50		100.0	32934	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.300	3.308	-0.008	1.000	7657634	10.0		100	9199	
513.00 > 169.00	3.300	3.308	-0.008	1.000	1309103		5.85(2.36-7.09)	100	14855	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.312	-0.004	1.285	4606616	2.66		106	37706	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.313	-0.005	1.000	17992319	9.89		98.9	109874	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.450	3.459	-0.009	1.341	467155	2.69		108	14408	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.465	-0.005	1.003	1921554	10.1		101	14086	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.614	3.620	-0.006	1.228	8073020	9.43		97.9	120699	
599.00 > 99.00	3.614	3.620	-0.006	1.228	2617387		3.08(1.39-4.16)	97.9	42044	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.627	-0.003	1.408	473237	2.54		102	5165	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.624	3.633	-0.009	1.000	1761697	10.4		104	24833	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.634	0.0	1.412	1439097	2.61		104	42272	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.634	0.0	1.000	6830755	9.63		96.3	15533	
563.00 > 169.00	3.624	3.634	-0.010	0.997	1198536		5.70(2.12-6.36)	96.3	24762	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.288	27013913	NC			65696	
D 36 13C2 PFDoA										
615.00 > 570.00	3.917	3.925	-0.008	1.522	1351987	2.83		113	20224	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.917	3.927	-0.010	1.000	5676012	9.69		96.9	2244	
613.00 > 169.00	3.917	3.927	-0.010	1.000	1385417		4.10(2.13-6.40)	96.9	19252	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.182	4.188	-0.006	1.068	4923814	9.66		96.6	1723	
663.00 > 169.00	4.182	4.188	-0.006	1.068	1575534		3.13(1.25-3.76)	96.6	13165	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.415	4.423	-0.008	1.000	1140306	9.90		99.0	9729	
713.00 > 219.00	4.415	4.423	-0.008	1.000	831907		1.37(0.71-2.13)	99.0	9444	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.423	-0.008	1.716	1068686	2.67		107	5212	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.826	-0.002	1.875	1896531	2.75		110	2774	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.824	4.827	-0.003	1.000	7317162	NC			476	
813.00 > 169.00	4.824	4.827	-0.003	1.000	1186172		6.17(2.86-8.58)		7540	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.158	5.166	-0.008	1.069	7502047	NC			2210	
913.00 > 169.00	5.158	5.166	-0.008	1.069	918043		8.17(3.83-11.48)		6030	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Injection Date: 01-Aug-2018 13:46:01 Instrument ID: A8_N

Lims ID: IC L7 Full

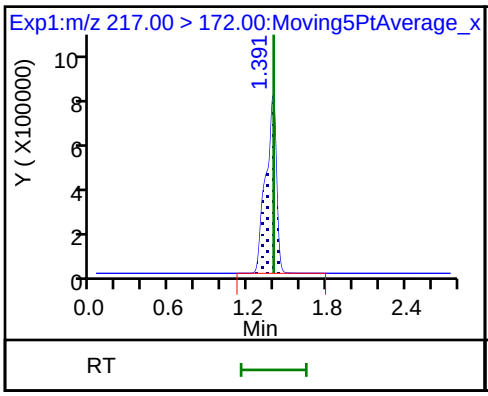
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 16 Worklist Smp#: 8

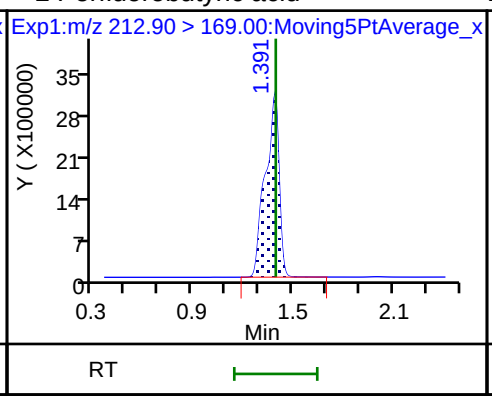
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

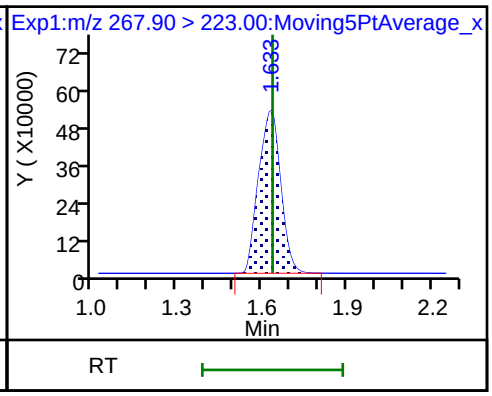
D 1 13C4 PFBA



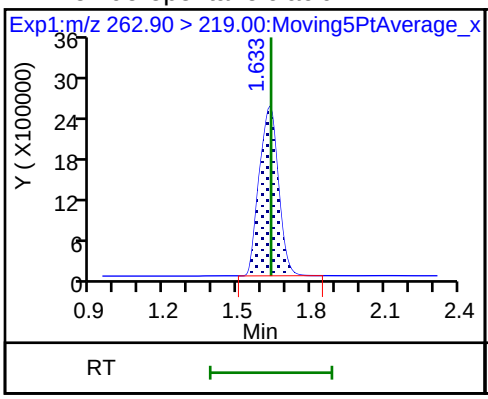
2 Perfluorobutyric acid



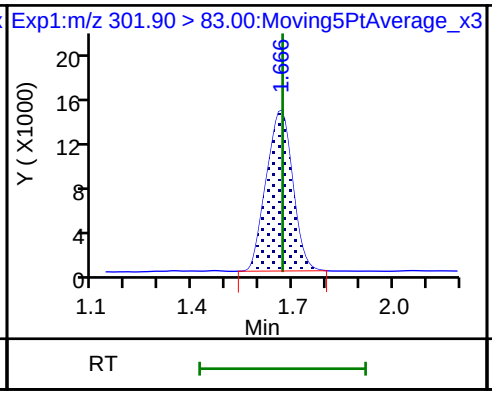
D 3 13C5-PFPeA



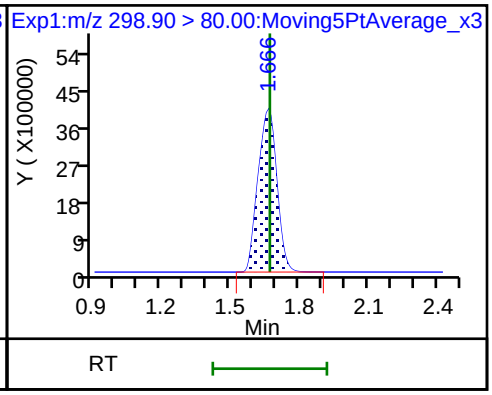
4 Perfluoropentanoic acid



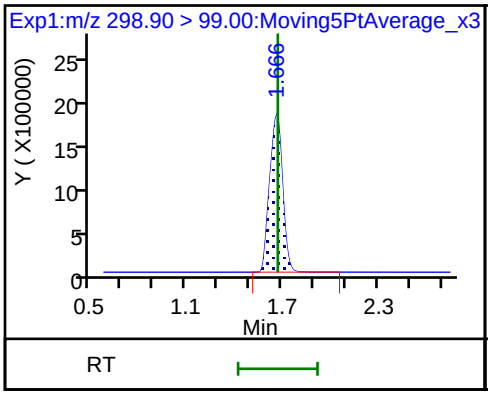
D 47 13C3-PFBS



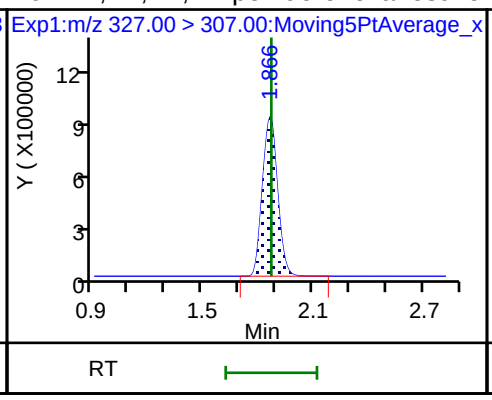
5 Perfluorobutanesulfonic acid



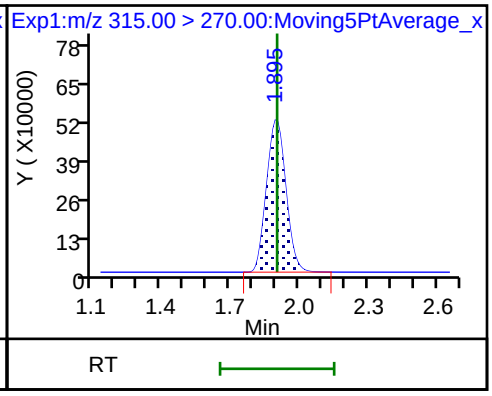
5 Perfluorobutanesulfonic acid



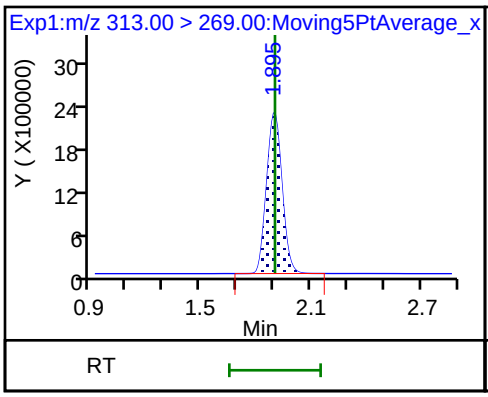
61 1H,1H,2H,2H-perfluorohexanesulfon



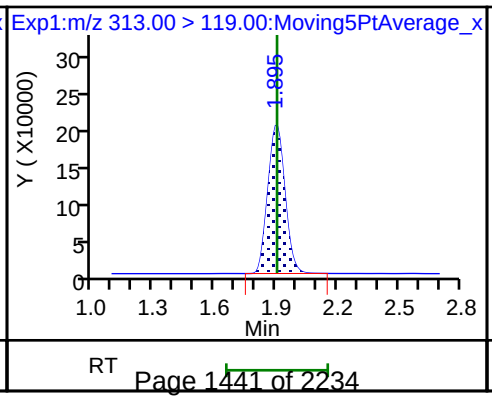
D 7 13C2 PFHxA



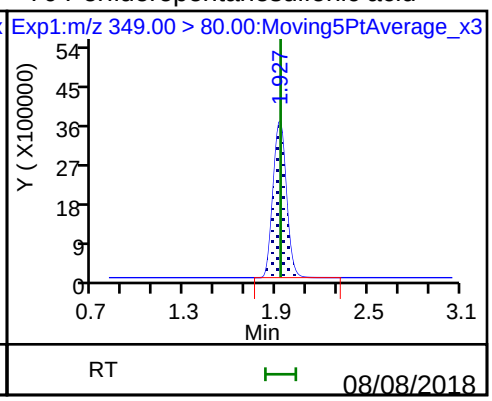
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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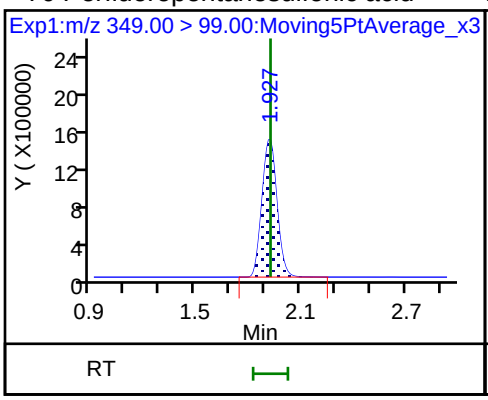
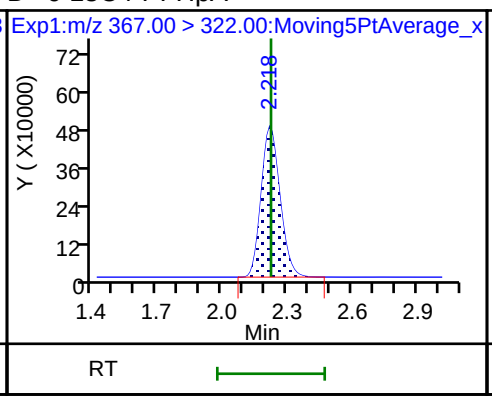
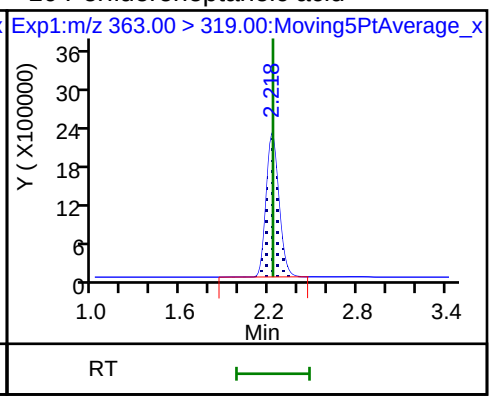


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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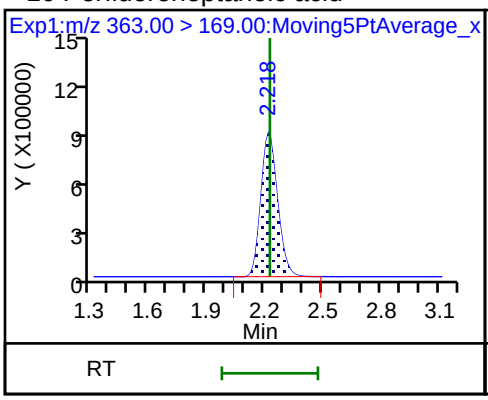
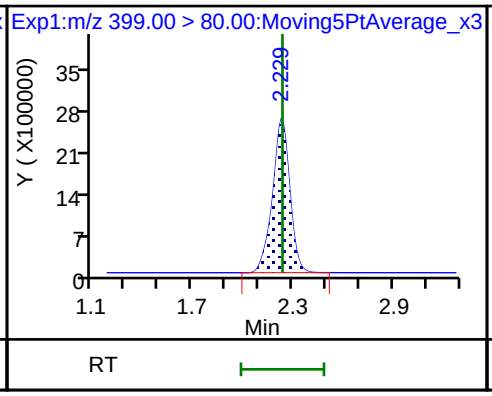
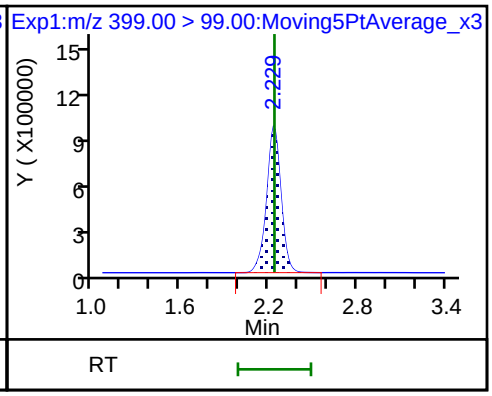


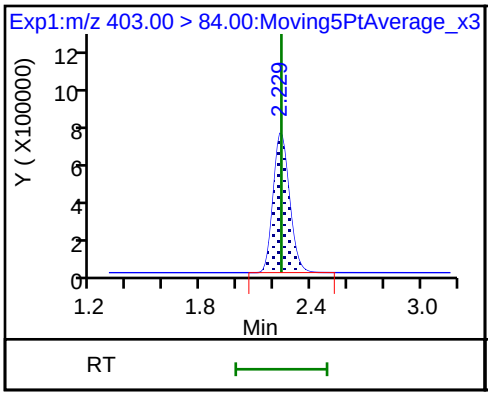
8 Perfluorohexanesulfonic acid



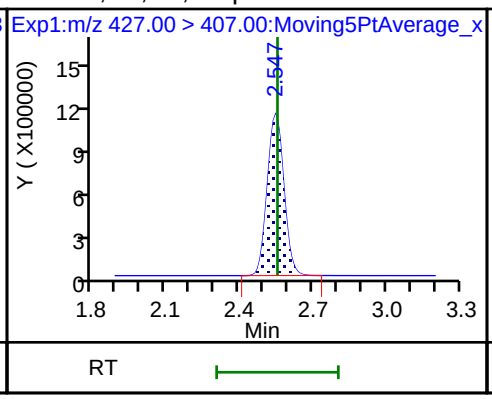
8 Perfluorohexanesulfonic acid



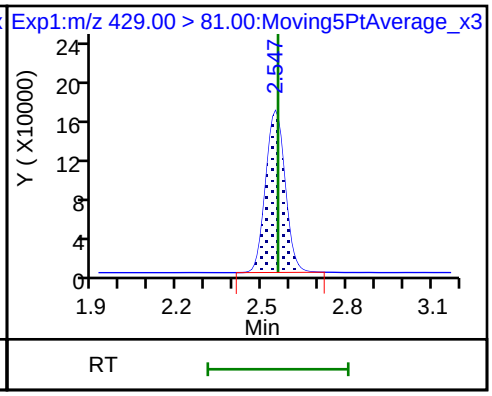
D 11 18O2 PFHxS



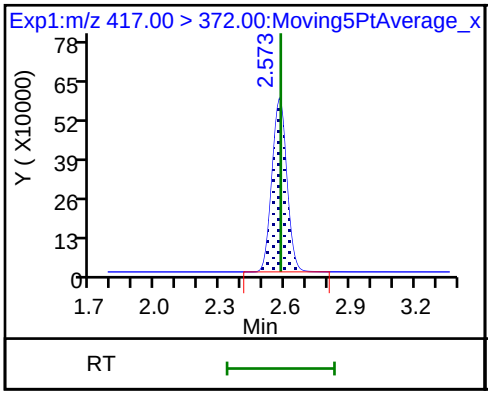
13 1H,1H,2H,2H-perfluorooctanesulfon



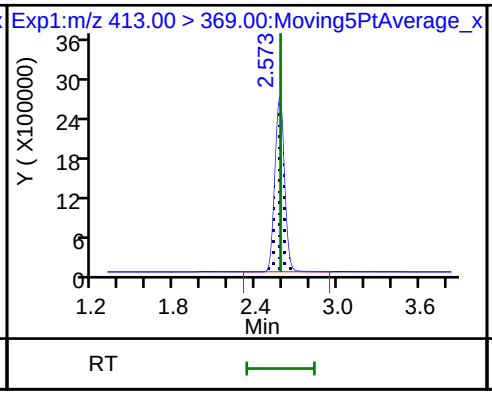
D 12 M2-6:2FTS



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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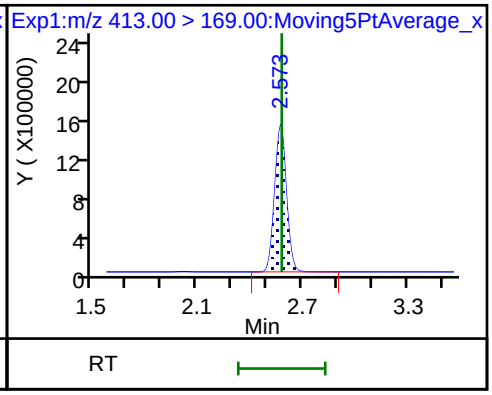
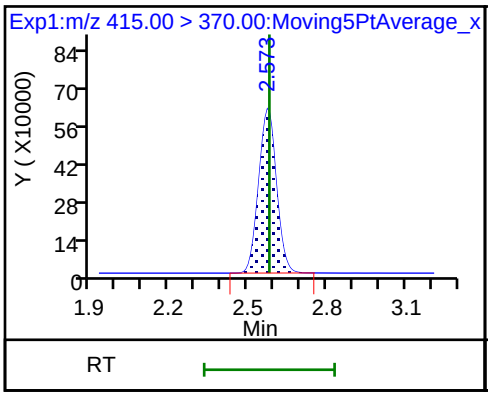
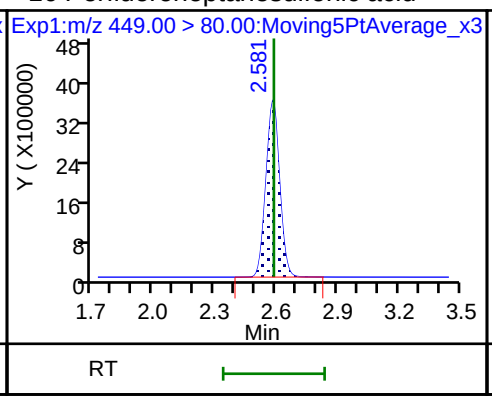


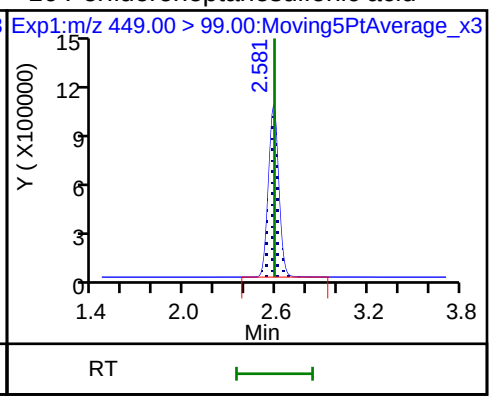
* 62 13C2-PFOA



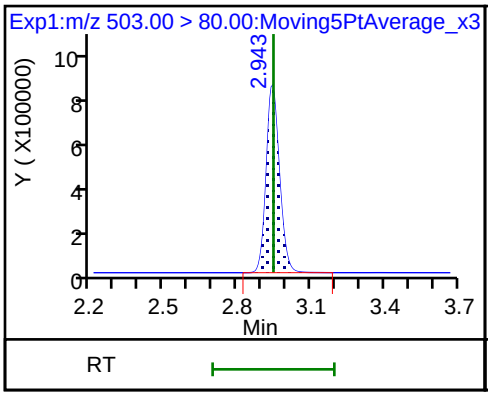
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS



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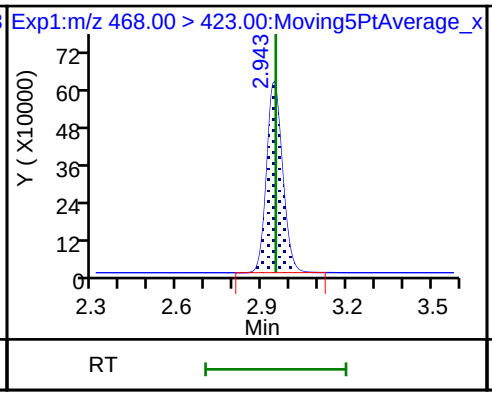
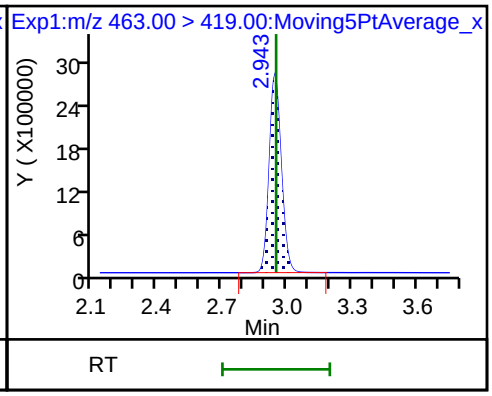


20 Perfluorononanoic acid



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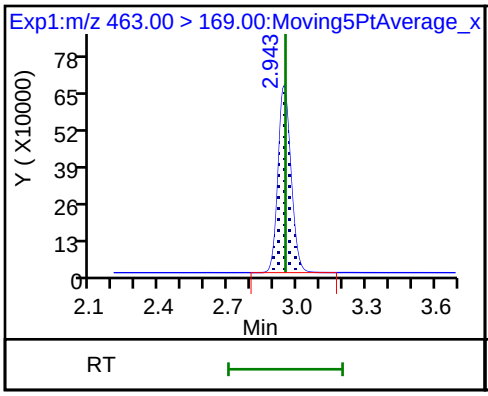
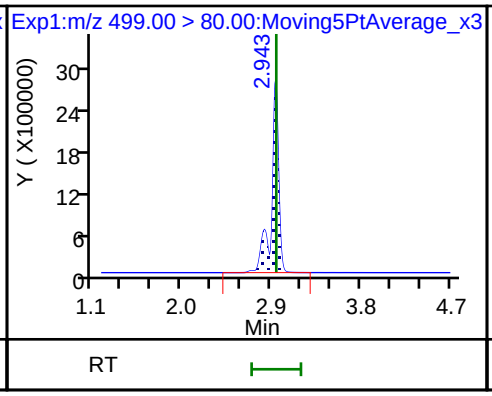
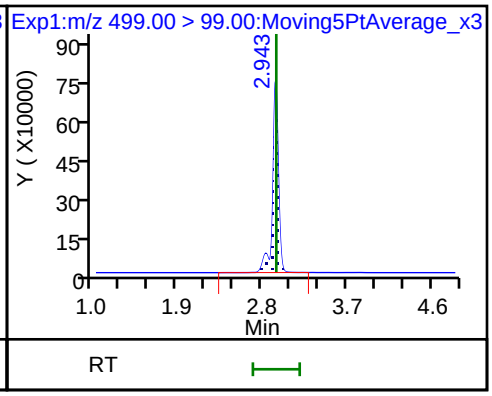


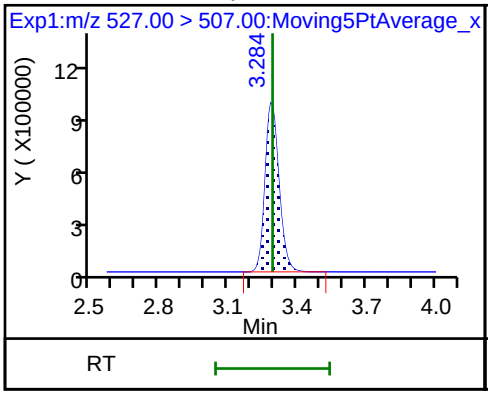
17 Perfluorooctane sulfonic acid



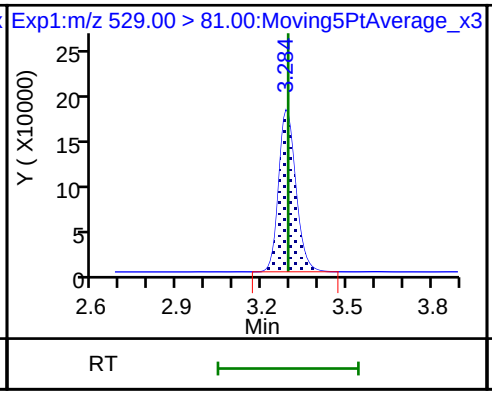
17 Perfluorooctane sulfonic acid



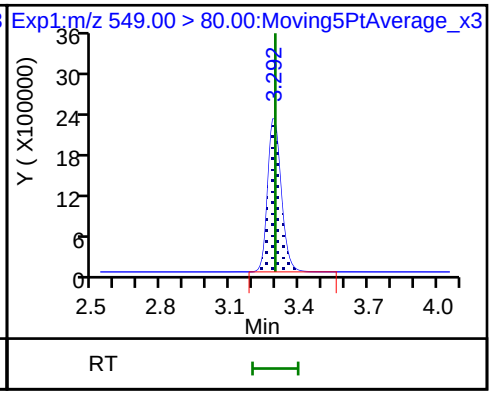
25 1H,1H,2H,2H-perfluorodecanesulfon



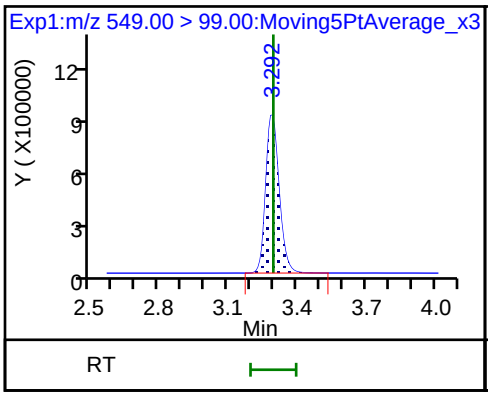
D 26 M2-8:2FTS



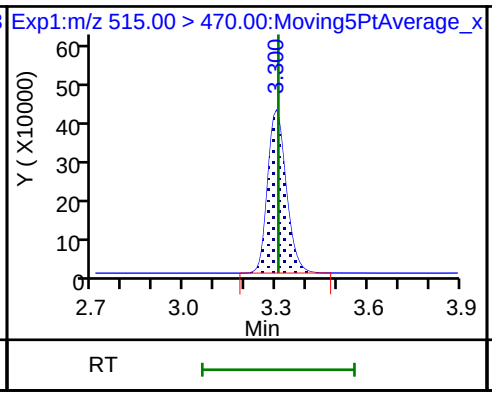
68 Perfluorononanesulfonic acid



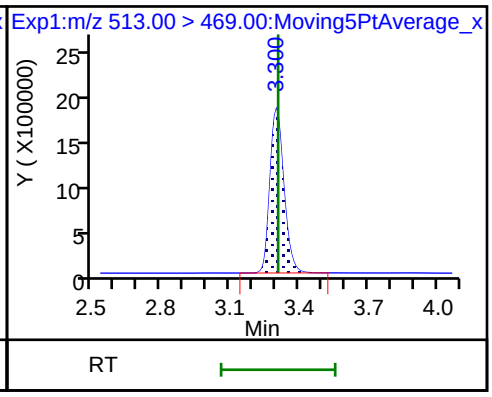
68 Perfluorononanesulfonic acid



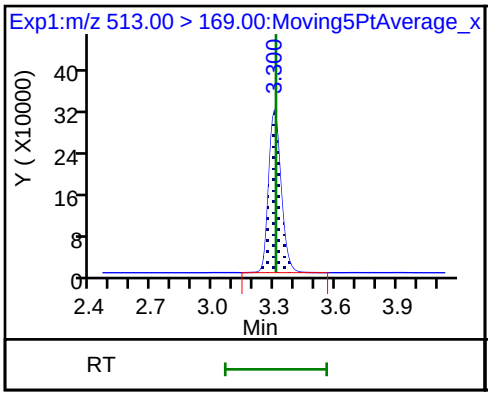
D 23 13C2 PFDA



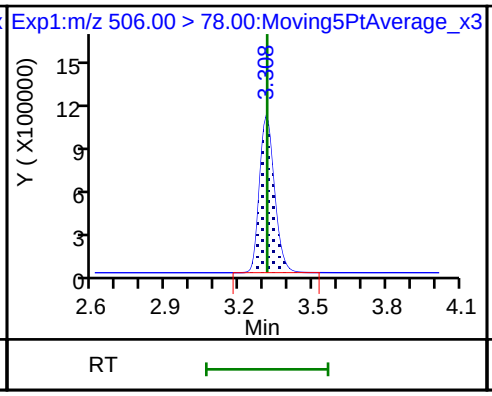
24 Perfluorodecanoic acid



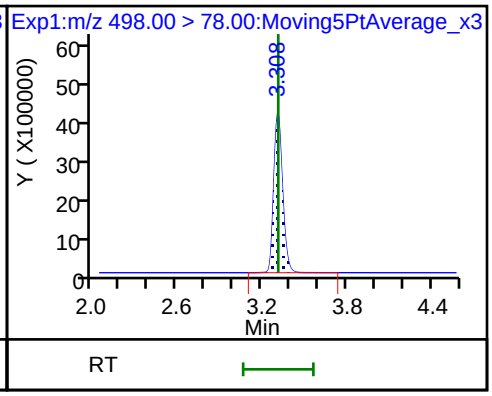
24 Perfluorodecanoic acid



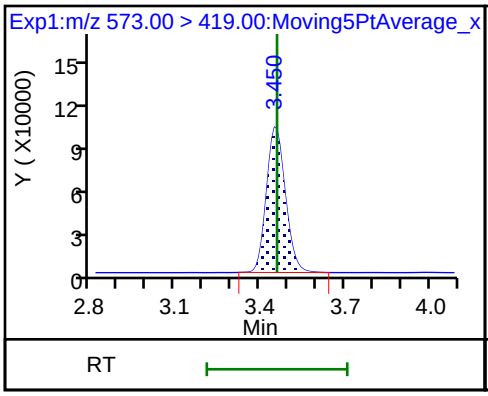
D 21 13C8 FOSA



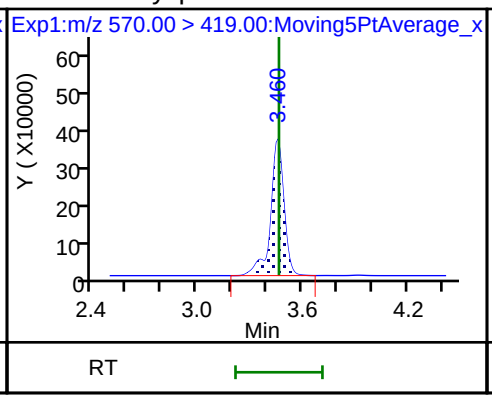
22 Perfluorooctane Sulfonamide



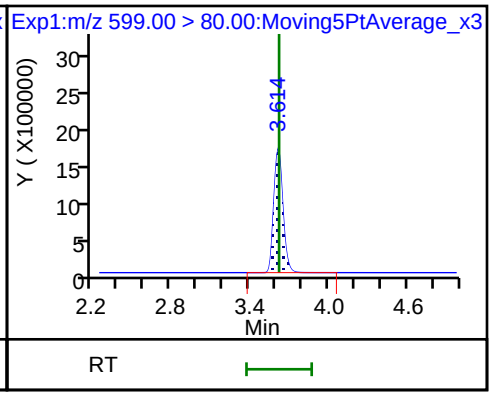
D 27 d3-NMeFOSAA



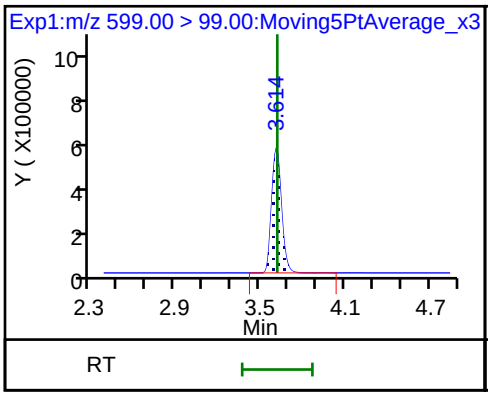
28 N-methyl perfluorooctane sulfonami



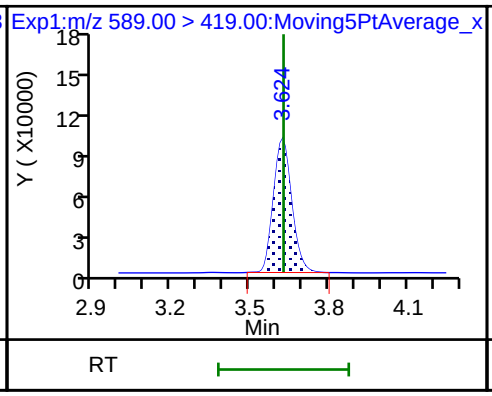
29 Perfluorodecane Sulfonic acid



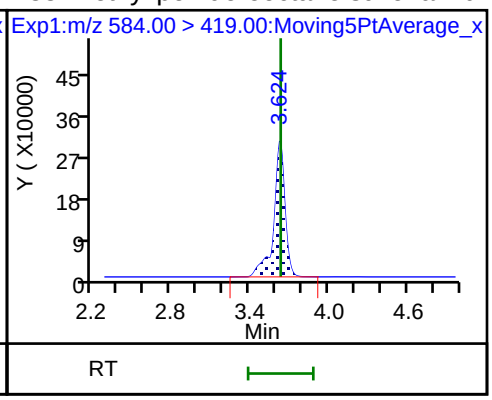
29 Perfluorodecane Sulfonic acid



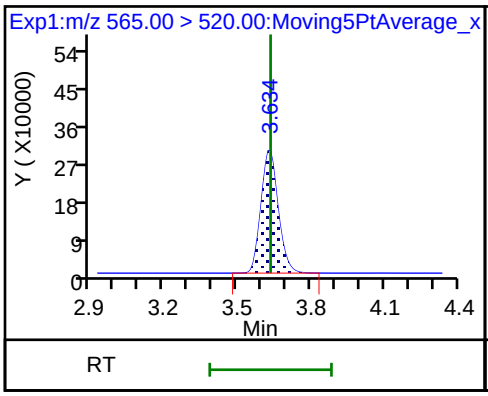
D 32 d5-NEtFOSAA



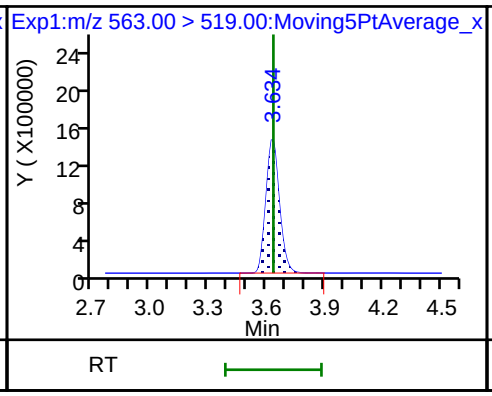
33 N-ethyl perfluorooctane sulfonamid



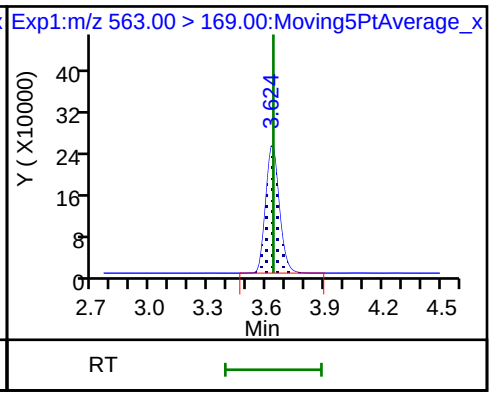
D 30 13C2 PFUnA



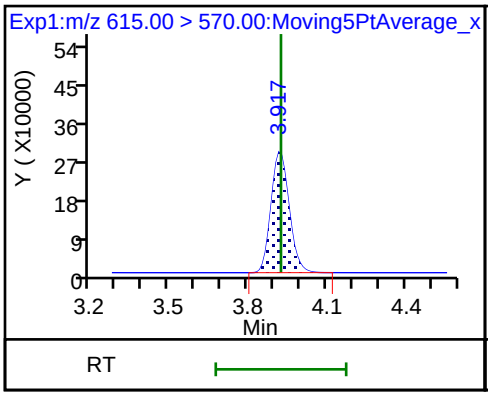
31 Perfluoroundecanoic acid



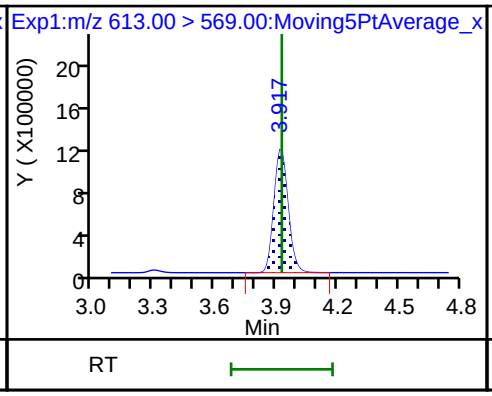
31 Perfluoroundecanoic acid



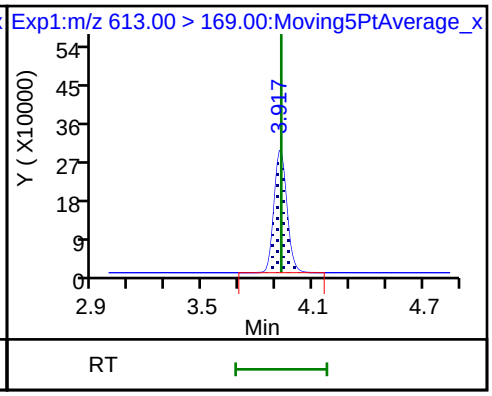
D 36 13C2 PFDoA



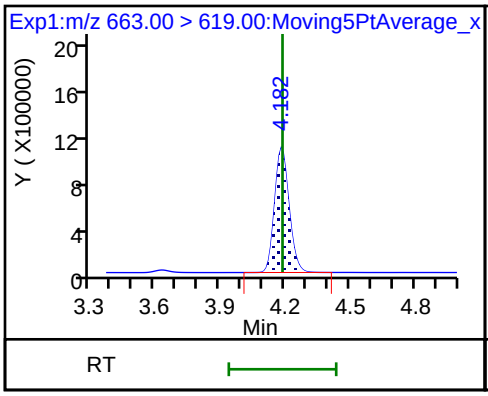
37 Perfluorododecanoic acid



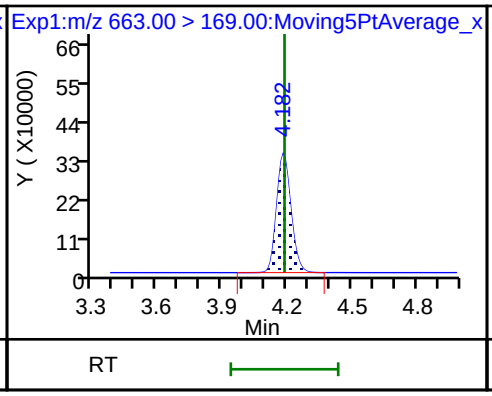
37 Perfluorododecanoic acid



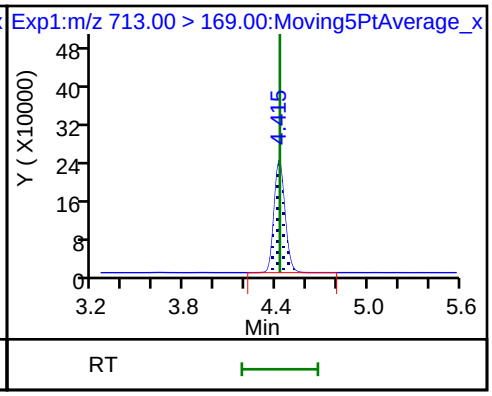
41 Perfluorotridecanoic acid



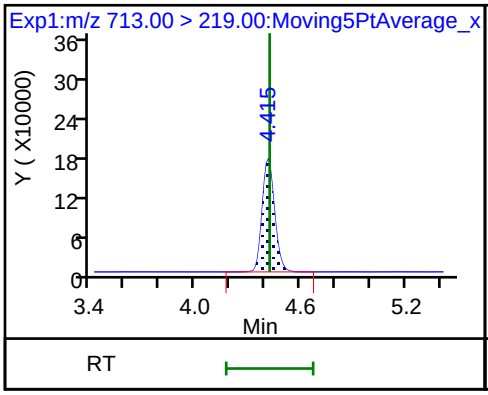
41 Perfluorotridecanoic acid



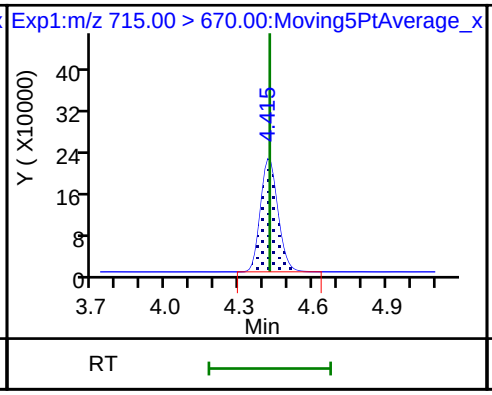
42 Perfluorotetradecanoic acid



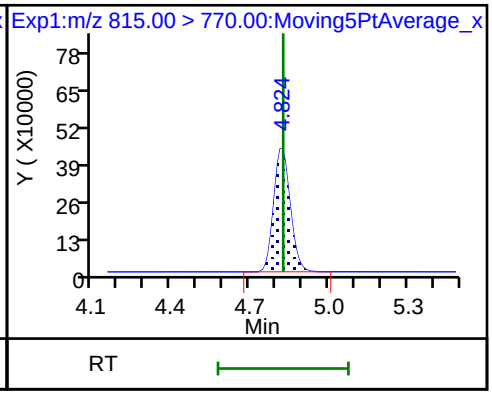
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

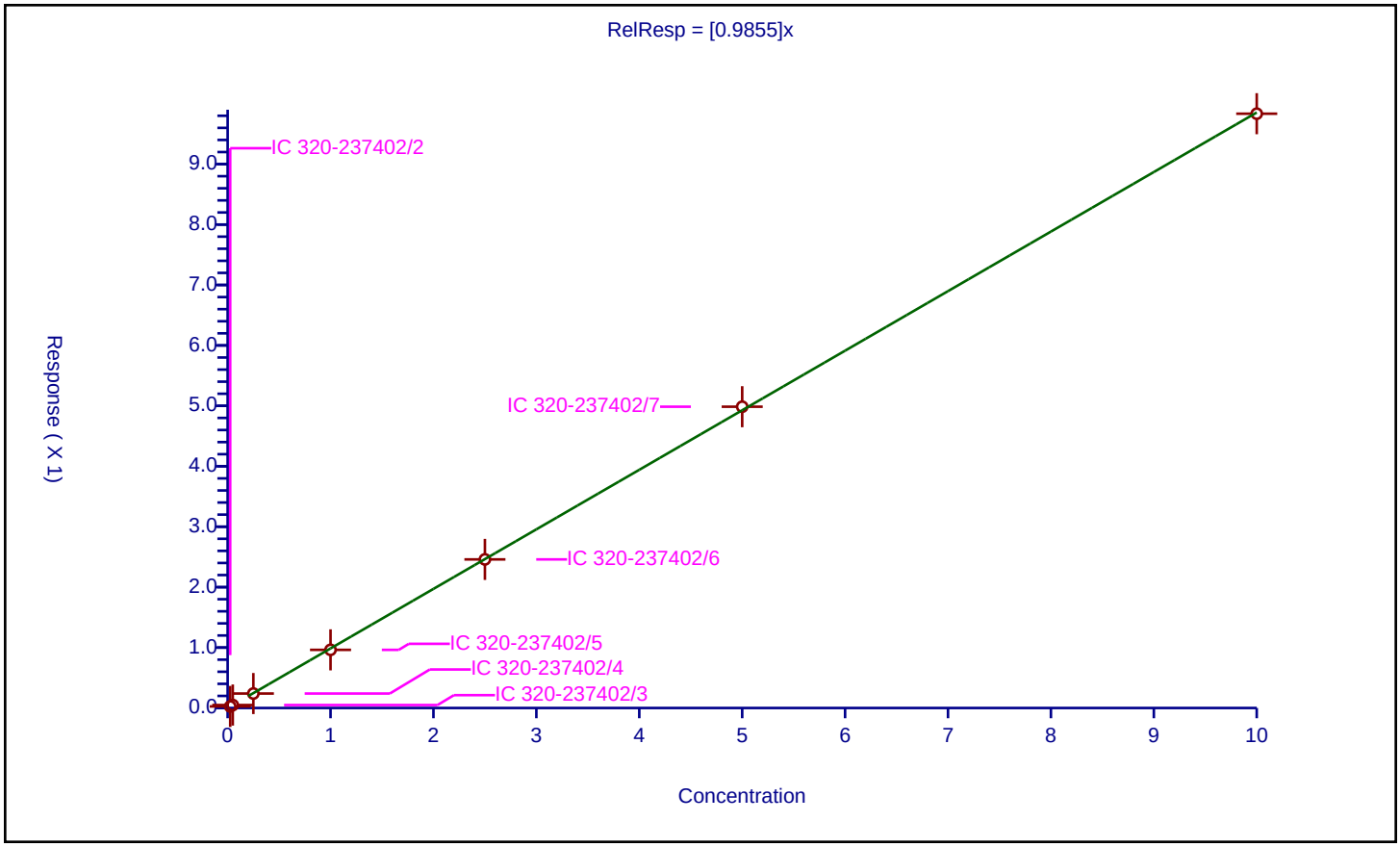
Curve Coefficients

Intercept:	0
Slope:	0.9855

Error Coefficients

Standard Error:	8380000
Relative Standard Error:	2.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025854	2.5	4794702.0	1.034141	Y
2	IC 320-237402/3	0.05	0.048996	2.5	5141928.0	0.979915	Y
3	IC 320-237402/4	0.25	0.239425	2.5	4833356.0	0.957701	Y
4	IC 320-237402/5	1.0	0.962307	2.5	4799715.0	0.962307	Y
5	IC 320-237402/6	2.5	2.458817	2.5	4740211.0	0.983527	Y
6	IC 320-237402/7	5.0	4.985832	2.5	4598618.0	0.997166	Y
7	IC 320-237402/8	10.0	9.834248	2.5	4488667.0	0.983425	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

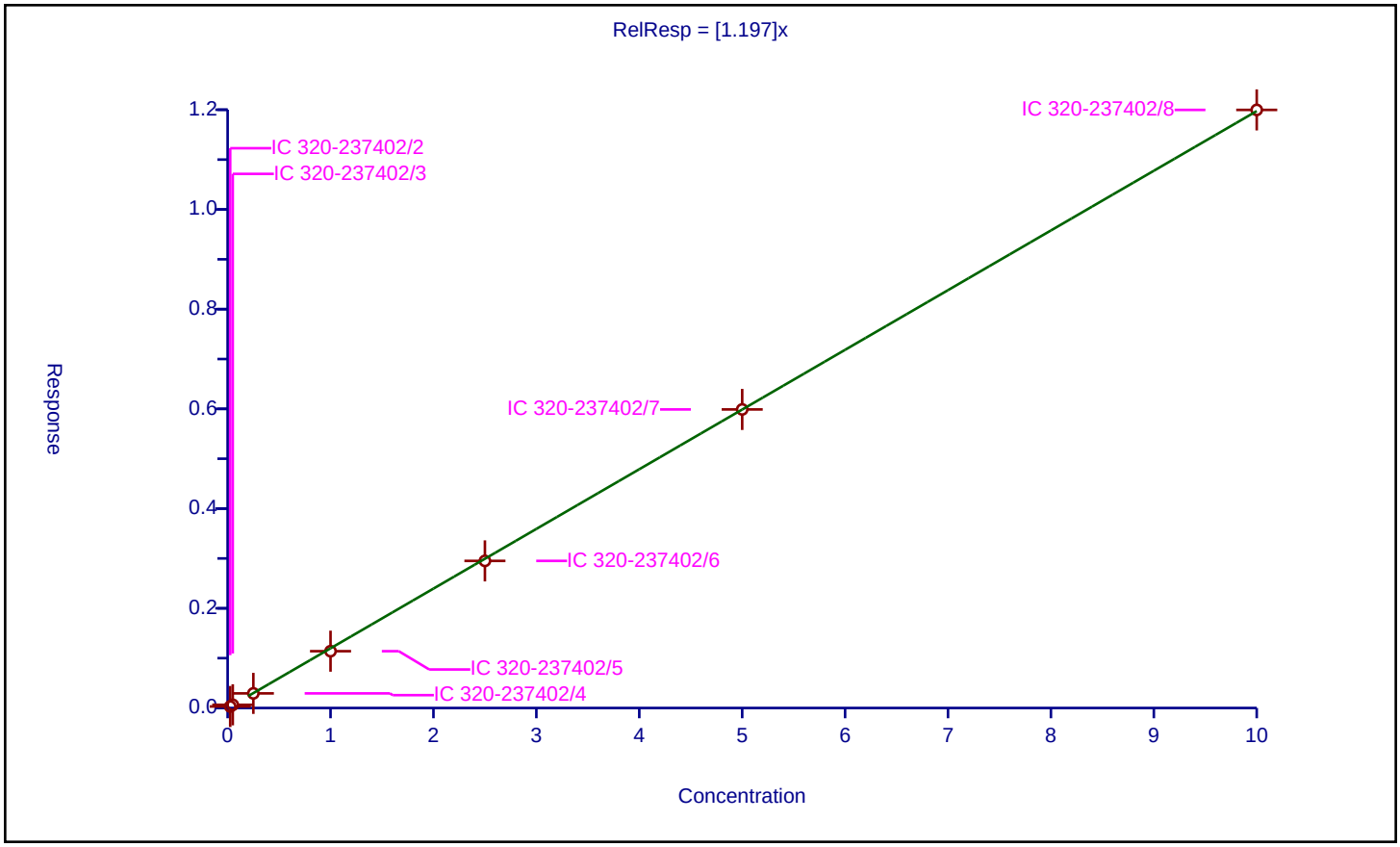
Curve Coefficients

Intercept:	0
Slope:	1.197

Error Coefficients

Standard Error:	6500000
Relative Standard Error:	3.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.030338	2.5	3218796.0	1.213528	Y
2	IC 320-237402/3	0.05	0.063859	2.5	3382043.0	1.277172	Y
3	IC 320-237402/4	0.25	0.293311	2.5	3283004.0	1.173243	Y
4	IC 320-237402/5	1.0	1.139595	2.5	3202919.0	1.139595	Y
5	IC 320-237402/6	2.5	2.950871	2.5	3117638.0	1.180348	Y
6	IC 320-237402/7	5.0	5.988604	2.5	2974004.0	1.197721	Y
7	IC 320-237402/8	10.0	11.996767	2.5	2847672.0	1.199677	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

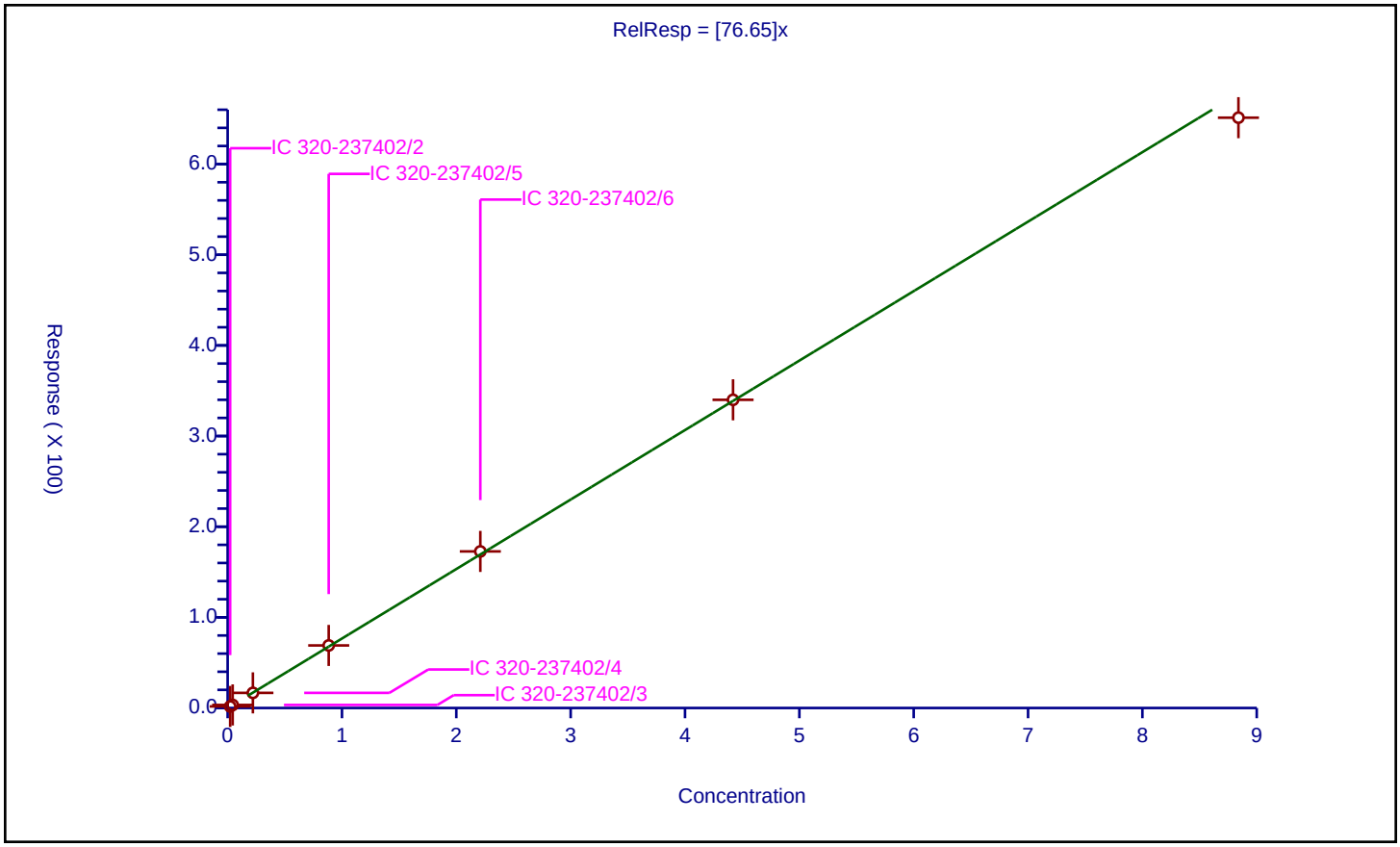
Curve Coefficients

Intercept:	0
Slope:	76.65

Error Coefficients

Standard Error:	10800000
Relative Standard Error:	2.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0221	1.720735	2.325	81424.0	77.861325	Y
2	IC 320-237402/3	0.0442	3.374557	2.325	89887.0	76.347442	Y
3	IC 320-237402/4	0.221	16.685418	2.325	85167.0	75.499628	Y
4	IC 320-237402/5	0.884	69.018686	2.325	82758.0	78.075437	Y
5	IC 320-237402/6	2.21	172.738288	2.325	85408.0	78.162121	Y
6	IC 320-237402/7	4.42	339.994559	2.325	82077.0	76.921846	Y
7	IC 320-237402/8	8.84	651.245177	2.325	80880.0	73.670269	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

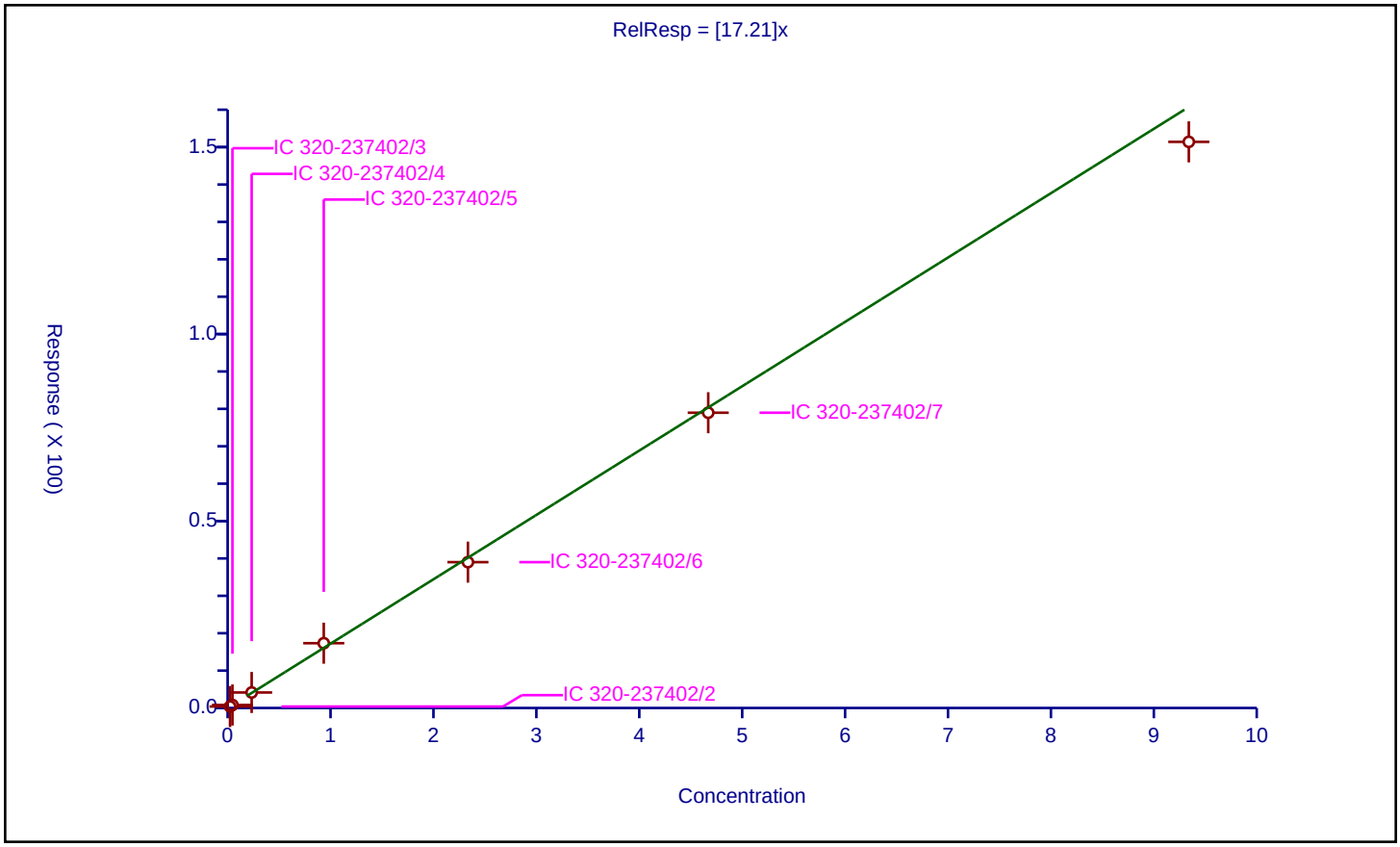
Curve Coefficients

Intercept:	0
Slope:	17.21

Error Coefficients

Standard Error:	2520000
Relative Standard Error:	4.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02335	0.397161	2.325	81424.0	17.00903	Y
2	IC 320-237402/3	0.0467	0.808565	2.325	89887.0	17.31403	Y
3	IC 320-237402/4	0.2335	4.148457	2.325	85167.0	17.766412	Y
4	IC 320-237402/5	0.934	17.330209	2.325	82758.0	18.554828	Y
5	IC 320-237402/6	2.335	39.008321	2.325	85408.0	16.705919	Y
6	IC 320-237402/7	4.67	78.969636	2.325	82077.0	16.909986	Y
7	IC 320-237402/8	9.34	151.410709	2.325	80880.0	16.210997	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

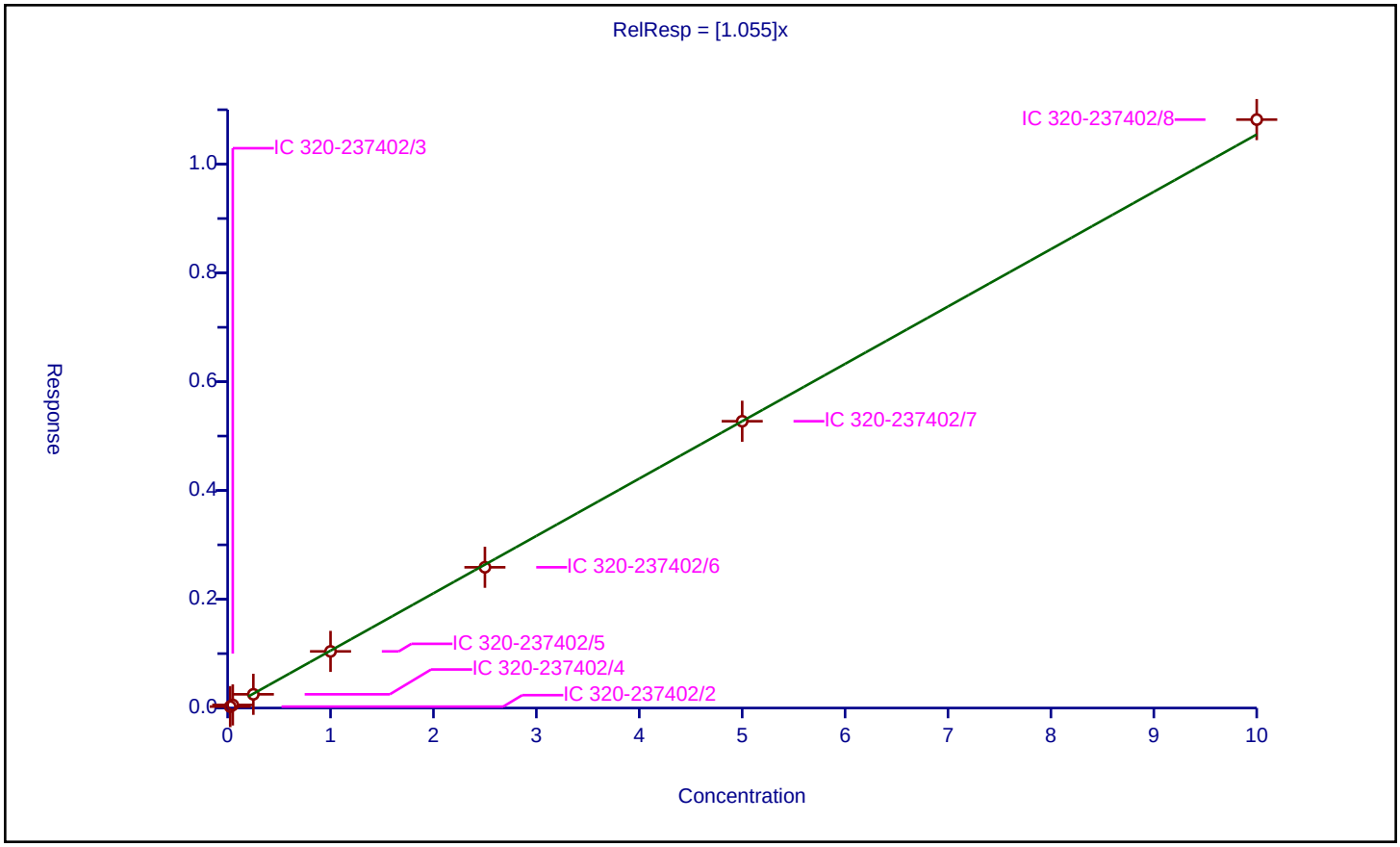
Curve Coefficients

Intercept:	0
Slope:	1.055

Error Coefficients

Standard Error:	6230000
Relative Standard Error:	3.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025873	2.5	3505828.0	1.034934	Y
2	IC 320-237402/3	0.05	0.056379	2.5	3635013.0	1.127589	Y
3	IC 320-237402/4	0.25	0.251834	2.5	3497268.0	1.007338	Y
4	IC 320-237402/5	1.0	1.040693	2.5	3471025.0	1.040693	Y
5	IC 320-237402/6	2.5	2.587434	2.5	3473699.0	1.034974	Y
6	IC 320-237402/7	5.0	5.272567	2.5	3231846.0	1.054513	Y
7	IC 320-237402/8	10.0	10.818892	2.5	3022362.0	1.081889	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

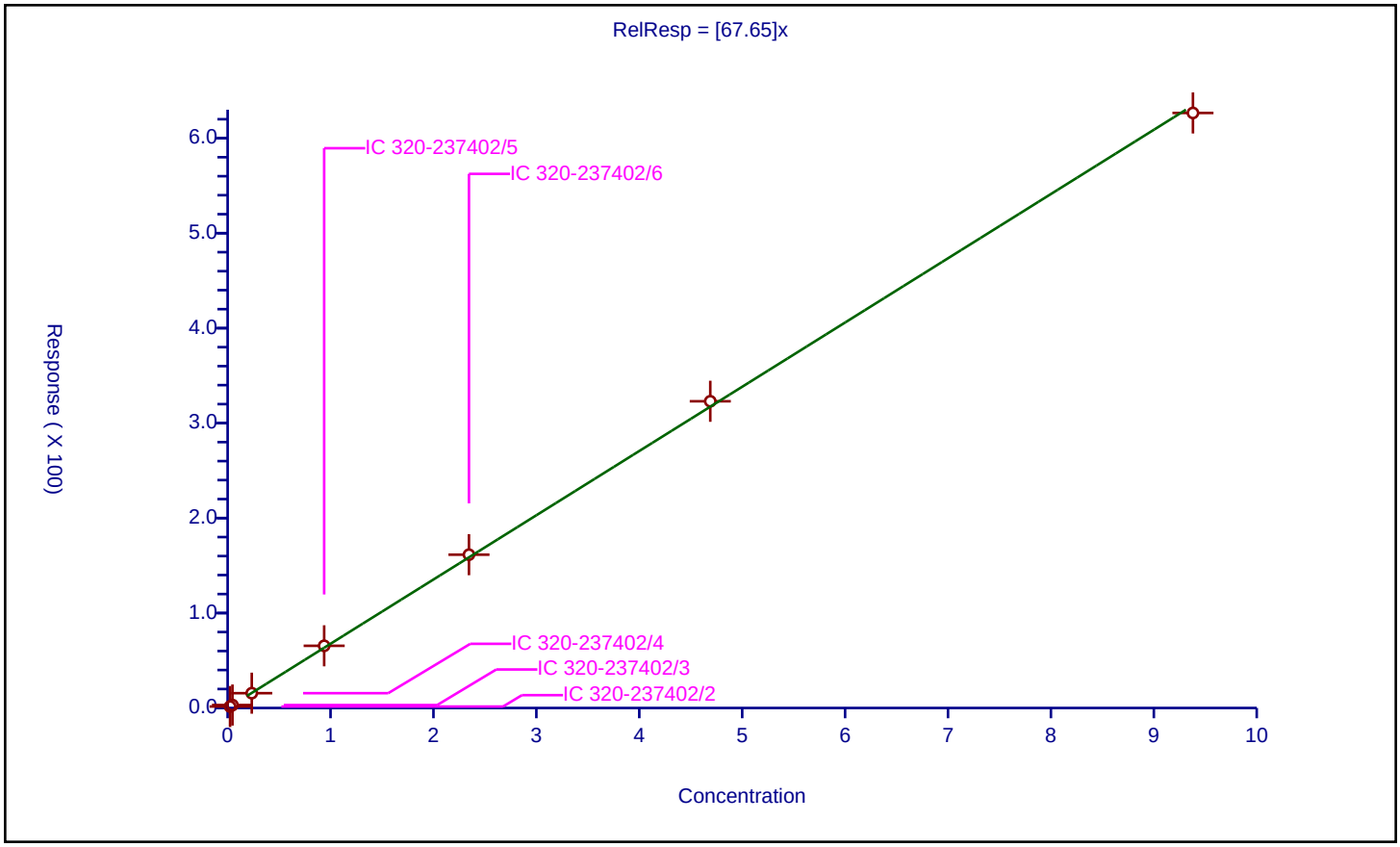
Curve Coefficients

Intercept:	0
Slope:	67.65

Error Coefficients

Standard Error:	10400000
Relative Standard Error:	2.2
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02345	1.550466	2.325	81424.0	66.11797	Y
2	IC 320-237402/3	0.0469	3.119572	2.325	89887.0	66.51539	Y
3	IC 320-237402/4	0.2345	15.618342	2.325	85167.0	66.60274	Y
4	IC 320-237402/5	0.938	65.491124	2.325	82758.0	69.819962	Y
5	IC 320-237402/6	2.345	161.458793	2.325	85408.0	68.852364	Y
6	IC 320-237402/7	4.69	322.995321	2.325	82077.0	68.868938	Y
7	IC 320-237402/8	9.38	626.619408	2.325	80880.0	66.803775	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

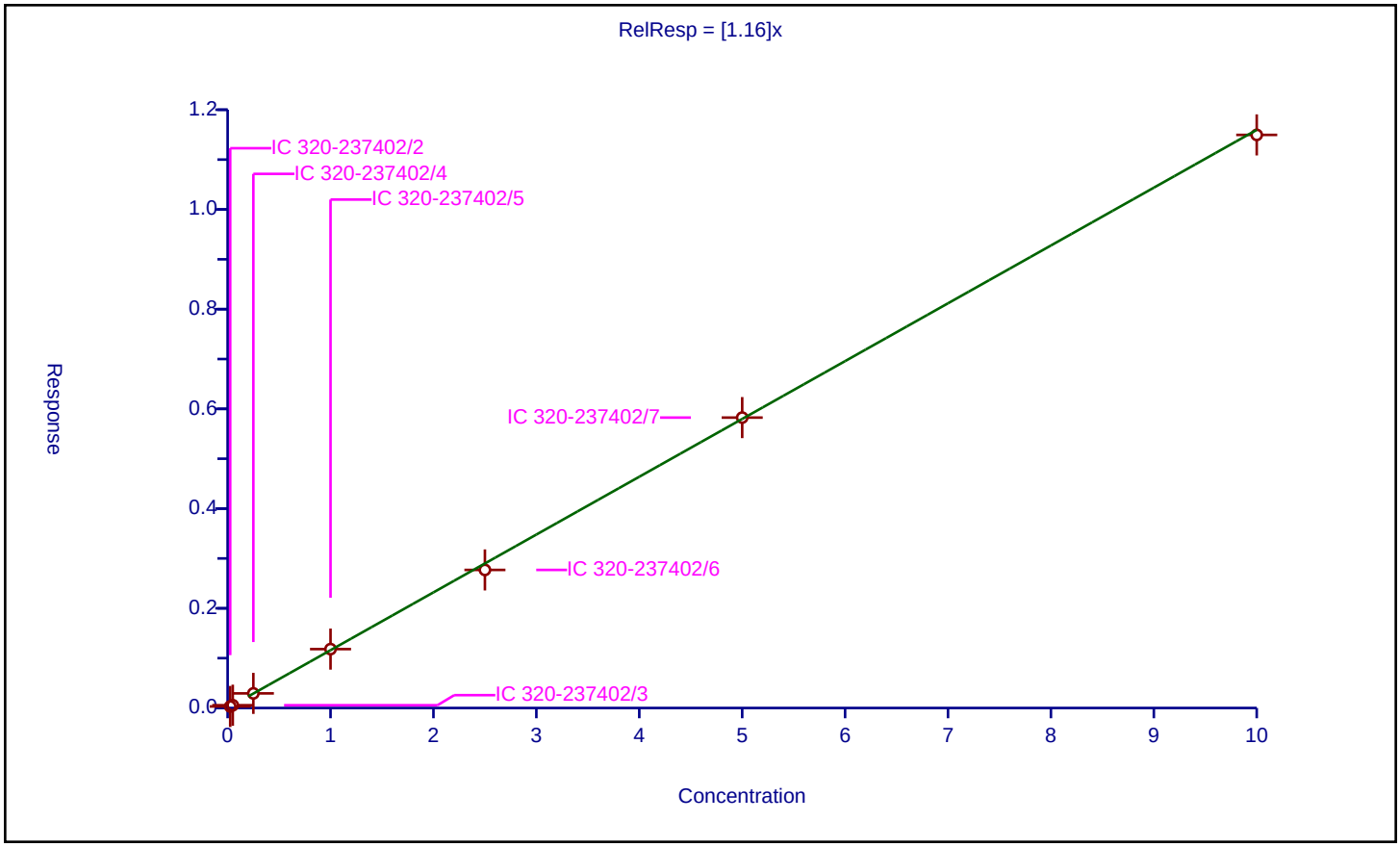
Curve Coefficients

Intercept:	0
Slope:	1.16

Error Coefficients

Standard Error:	6430000
Relative Standard Error:	3.5
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.03064	2.5	3436629.0	1.22562	Y
2	IC 320-237402/3	0.05	0.055794	2.5	3553062.0	1.115883	Y
3	IC 320-237402/4	0.25	0.293069	2.5	3413685.0	1.172276	Y
4	IC 320-237402/5	1.0	1.181322	2.5	3335466.0	1.181322	Y
5	IC 320-237402/6	2.5	2.769444	2.5	3349409.0	1.107778	Y
6	IC 320-237402/7	5.0	5.82494	2.5	3116337.0	1.164988	Y
7	IC 320-237402/8	10.0	11.495173	2.5	2908549.0	1.149517	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

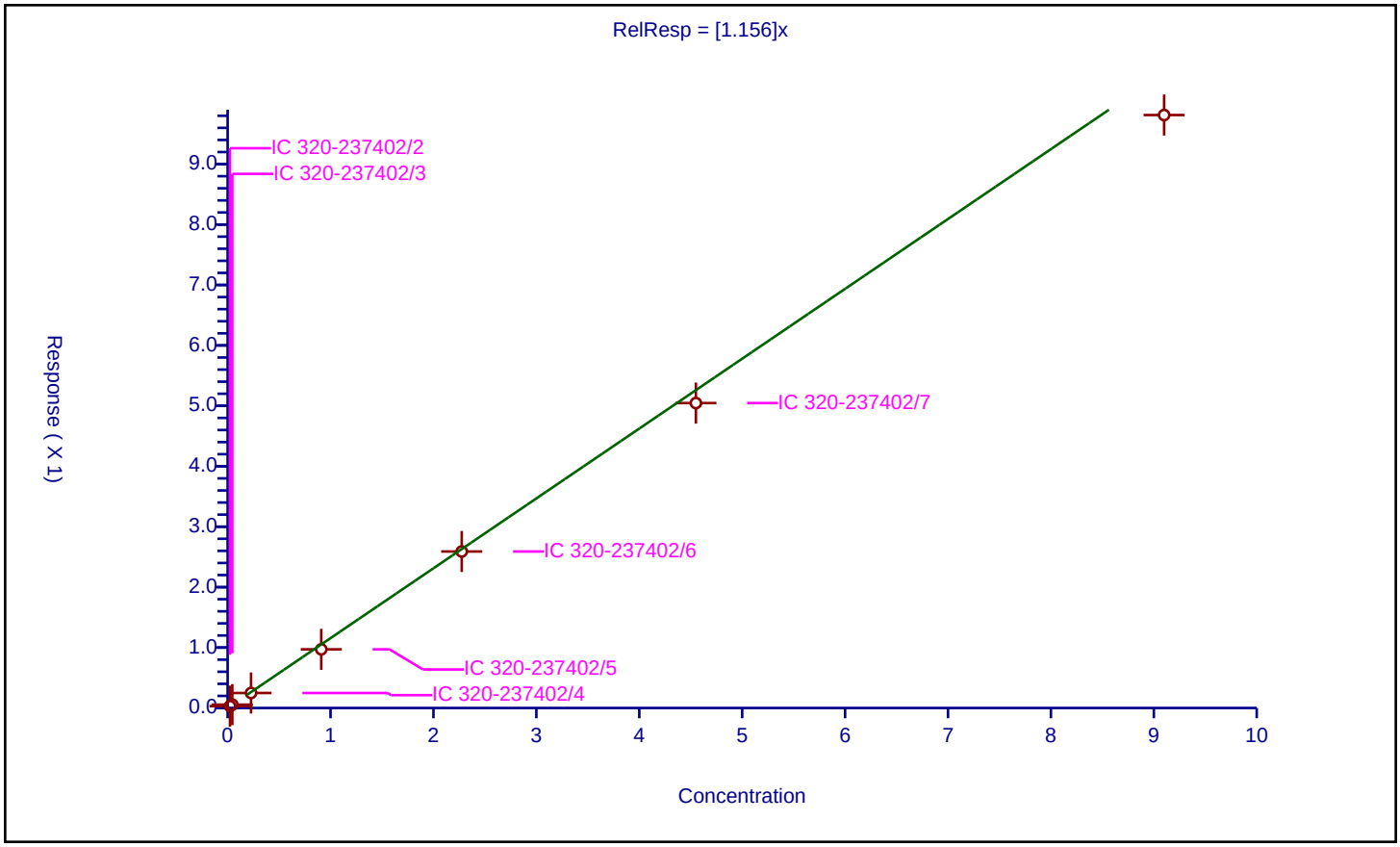
Curve Coefficients

Intercept:	0
Slope:	1.156

Error Coefficients

Standard Error:	8900000
Relative Standard Error:	9.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02275	0.031371	2.365	4681014.0	1.37894	Y
2	IC 320-237402/3	0.0455	0.055991	2.365	5006593.0	1.230568	Y
3	IC 320-237402/4	0.2275	0.248065	2.365	4692968.0	1.090396	Y
4	IC 320-237402/5	0.91	0.970555	2.365	4725288.0	1.066544	Y
5	IC 320-237402/6	2.275	2.589702	2.365	4583643.0	1.13833	Y
6	IC 320-237402/7	4.55	5.045798	2.365	4552896.0	1.108967	Y
7	IC 320-237402/8	9.1	9.812192	2.365	4518625.0	1.078263	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

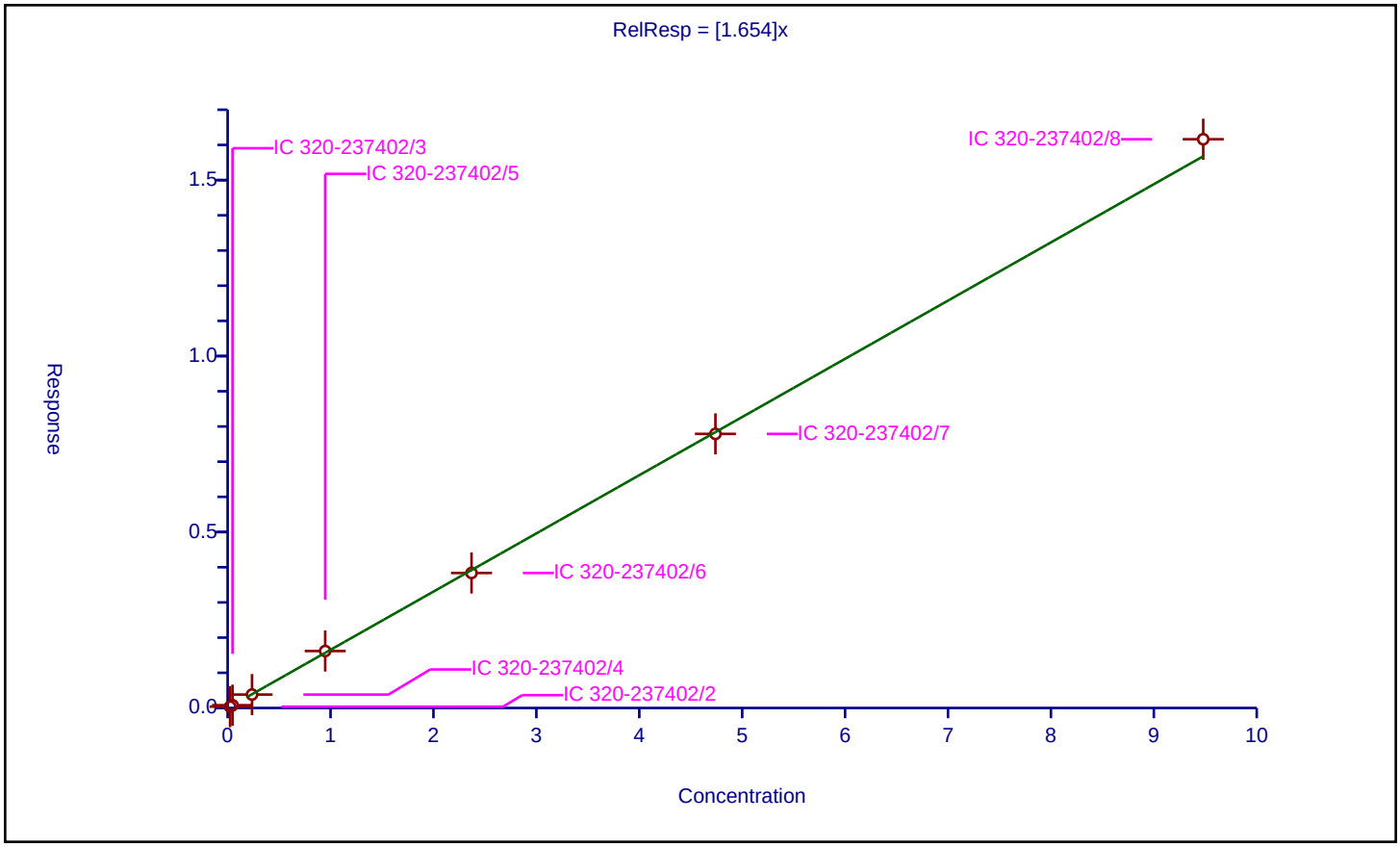
Curve Coefficients

Intercept:	0
Slope:	1.654

Error Coefficients

Standard Error:	2540000
Relative Standard Error:	2.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0237	0.038125	2.375	973239.0	1.608645	Y
2	IC 320-237402/3	0.0474	0.079727	2.375	1036033.0	1.682011	Y
3	IC 320-237402/4	0.237	0.38179	2.375	961732.0	1.610929	Y
4	IC 320-237402/5	0.948	1.618807	2.375	917820.0	1.707603	Y
5	IC 320-237402/6	2.37	3.836563	2.375	918152.0	1.618803	Y
6	IC 320-237402/7	4.74	7.788578	2.375	853793.0	1.64316	Y
7	IC 320-237402/8	9.48	16.161741	2.375	782824.0	1.704825	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

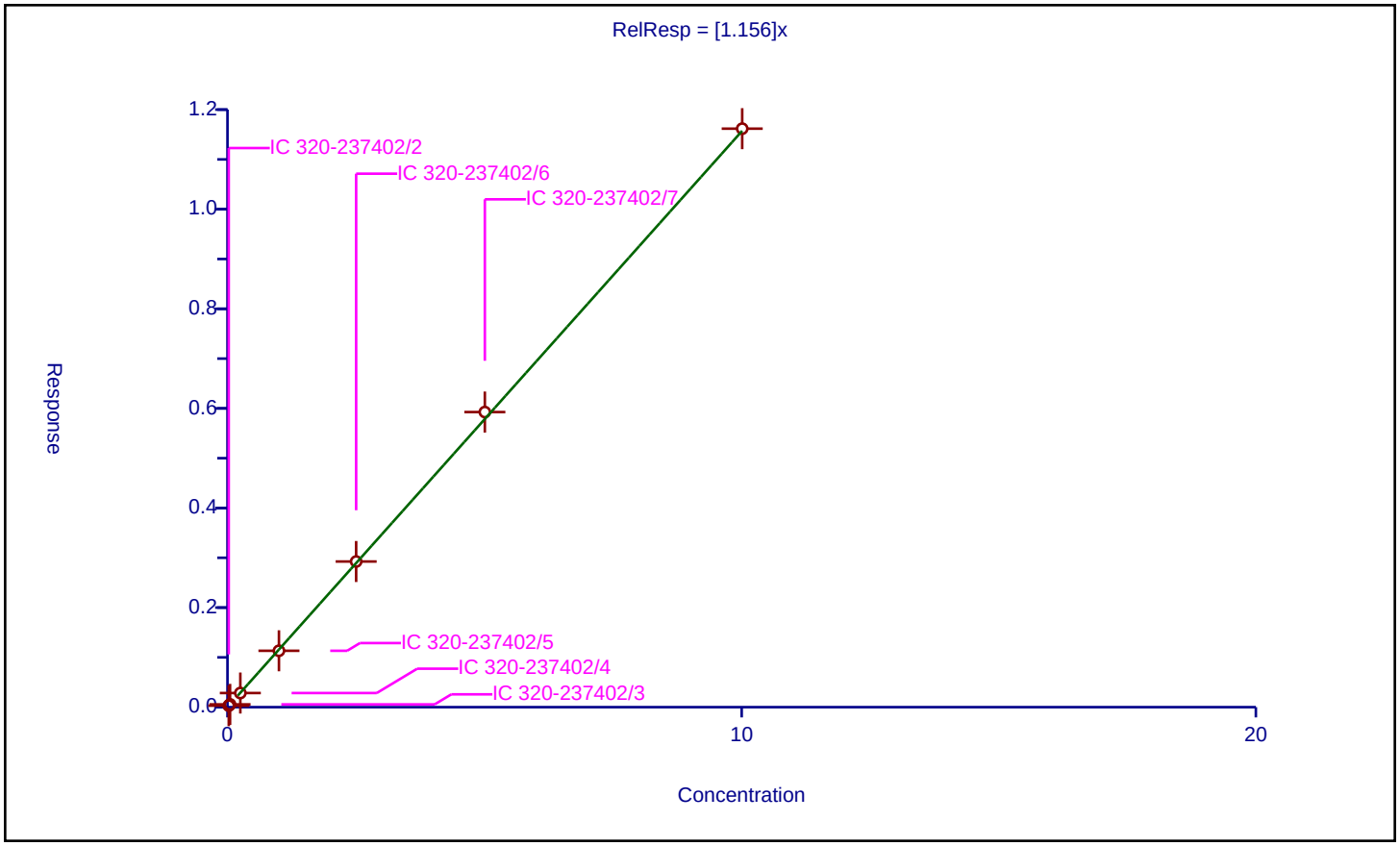
Curve Coefficients

Intercept:	0
Slope:	1.156

Error Coefficients

Standard Error:	6140000
Relative Standard Error:	2.4
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025025	0.029871	2.5	3302357.0	1.19365	Y
2	IC 320-237402/3	0.05005	0.056079	2.5	3558329.0	1.120459	Y
3	IC 320-237402/4	0.25025	0.283838	2.5	3335341.0	1.134216	Y
4	IC 320-237402/5	1.001	1.132602	2.5	3268736.0	1.131471	Y
5	IC 320-237402/6	2.5025	2.925196	2.5	3210040.0	1.16891	Y
6	IC 320-237402/7	5.005	5.926484	2.5	2942955.0	1.184113	Y
7	IC 320-237402/8	10.01	11.617289	2.5	2730006.0	1.160568	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

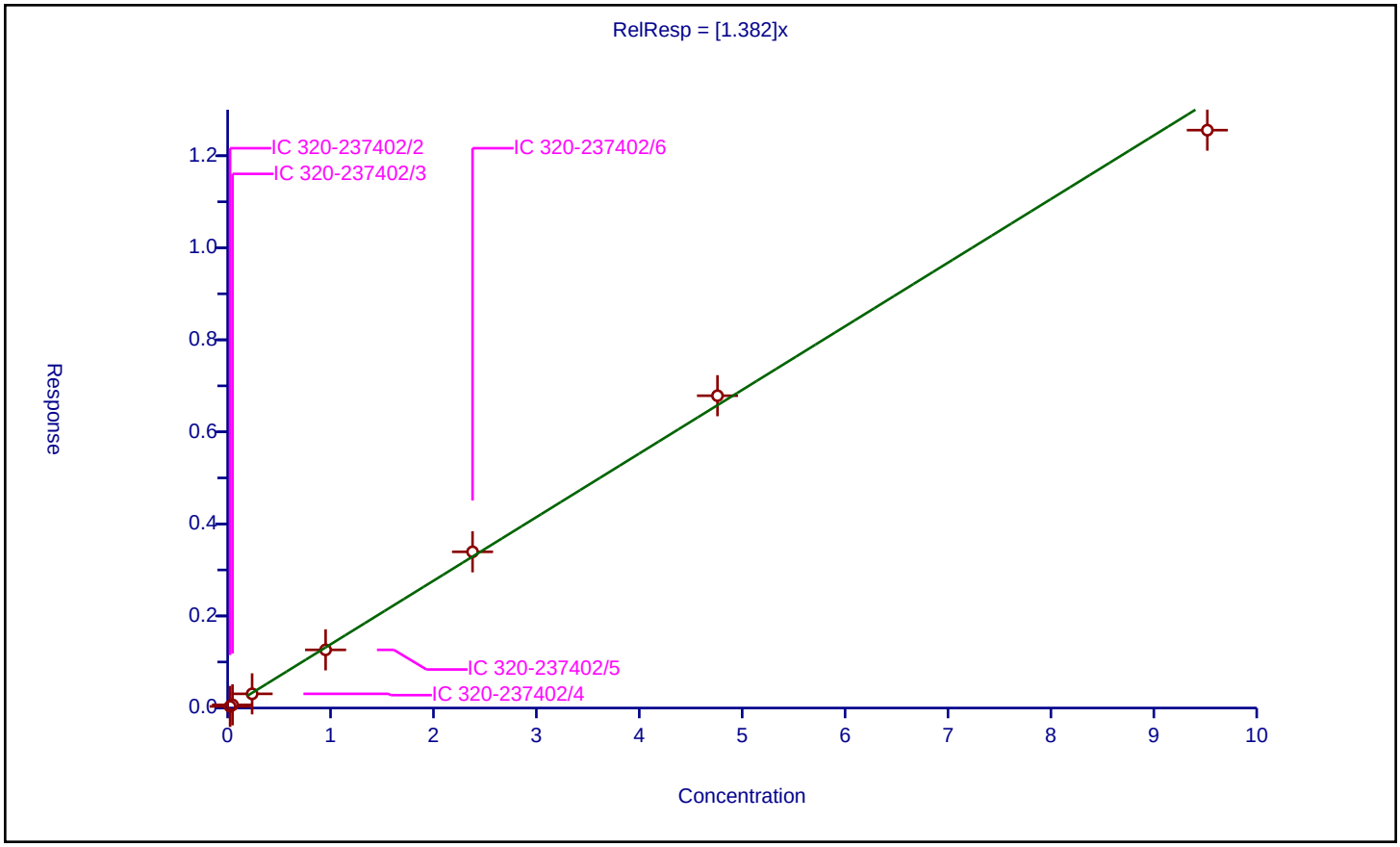
Curve Coefficients

Intercept:	0
Slope:	1.382

Error Coefficients

Standard Error:	7920000
Relative Standard Error:	4.8
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0238	0.034193	2.39	3269307.0	1.436681	Y
2	IC 320-237402/3	0.0476	0.068979	2.39	3417703.0	1.449138	Y
3	IC 320-237402/4	0.238	0.307768	2.39	3391354.0	1.293144	Y
4	IC 320-237402/5	0.952	1.263274	2.39	3300872.0	1.326968	Y
5	IC 320-237402/6	2.38	3.393905	2.39	3224053.0	1.426011	Y
6	IC 320-237402/7	4.76	6.785915	2.39	3128101.0	1.425612	Y
7	IC 320-237402/8	9.52	12.556524	2.39	3144316.0	1.318963	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

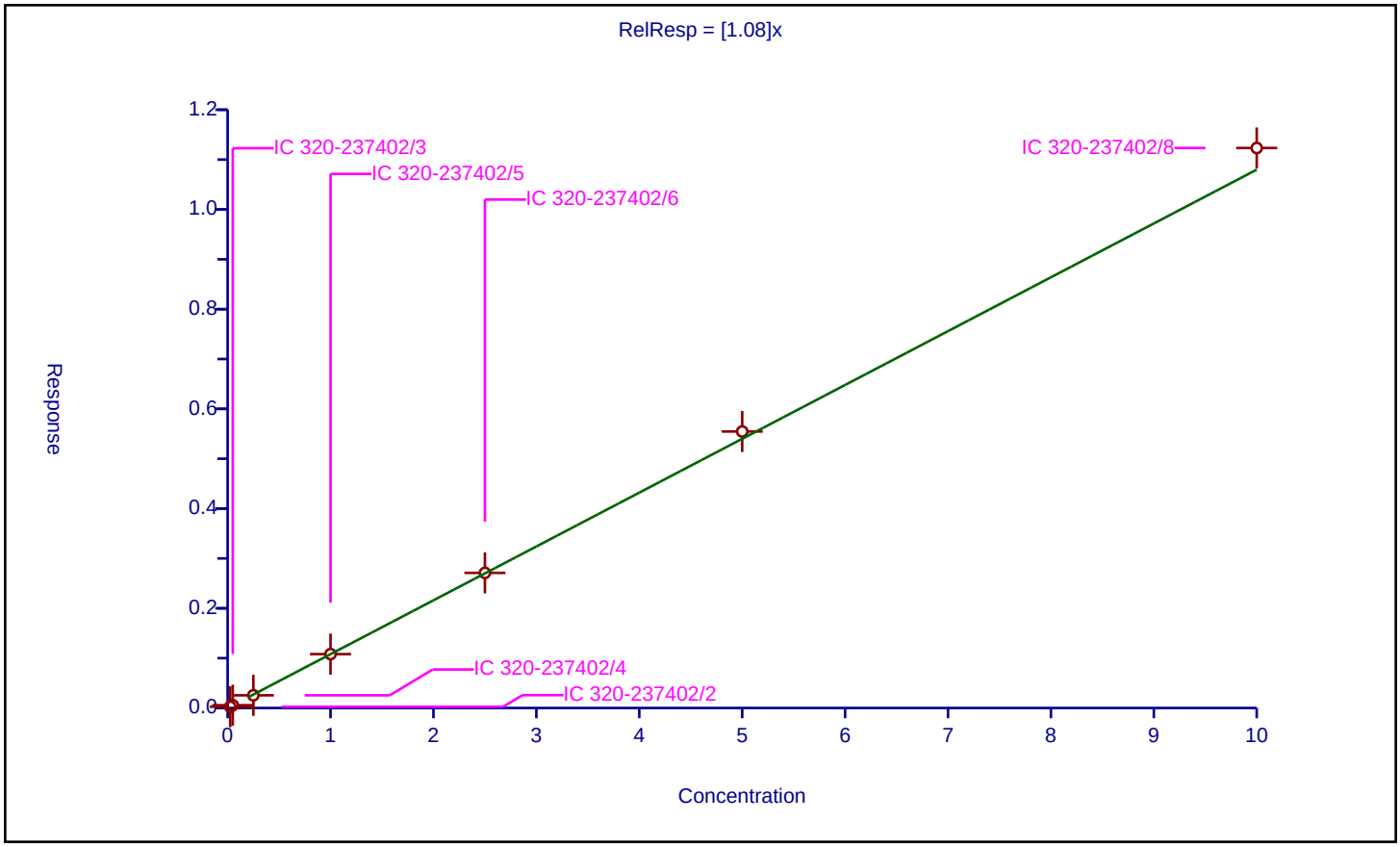
Curve Coefficients

Intercept:	0
Slope:	1.08

Error Coefficients

Standard Error:	5150000
Relative Standard Error:	3.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025649	2.5	2895444.0	1.025957	Y
2	IC 320-237402/3	0.05	0.055867	2.5	3085644.0	1.117336	Y
3	IC 320-237402/4	0.25	0.254608	2.5	2896674.0	1.018434	Y
4	IC 320-237402/5	1.0	1.080642	2.5	2848081.0	1.080642	Y
5	IC 320-237402/6	2.5	2.710418	2.5	2758407.0	1.084167	Y
6	IC 320-237402/7	5.0	5.546248	2.5	2589352.0	1.10925	Y
7	IC 320-237402/8	10.0	11.232641	2.5	2393820.0	1.123264	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

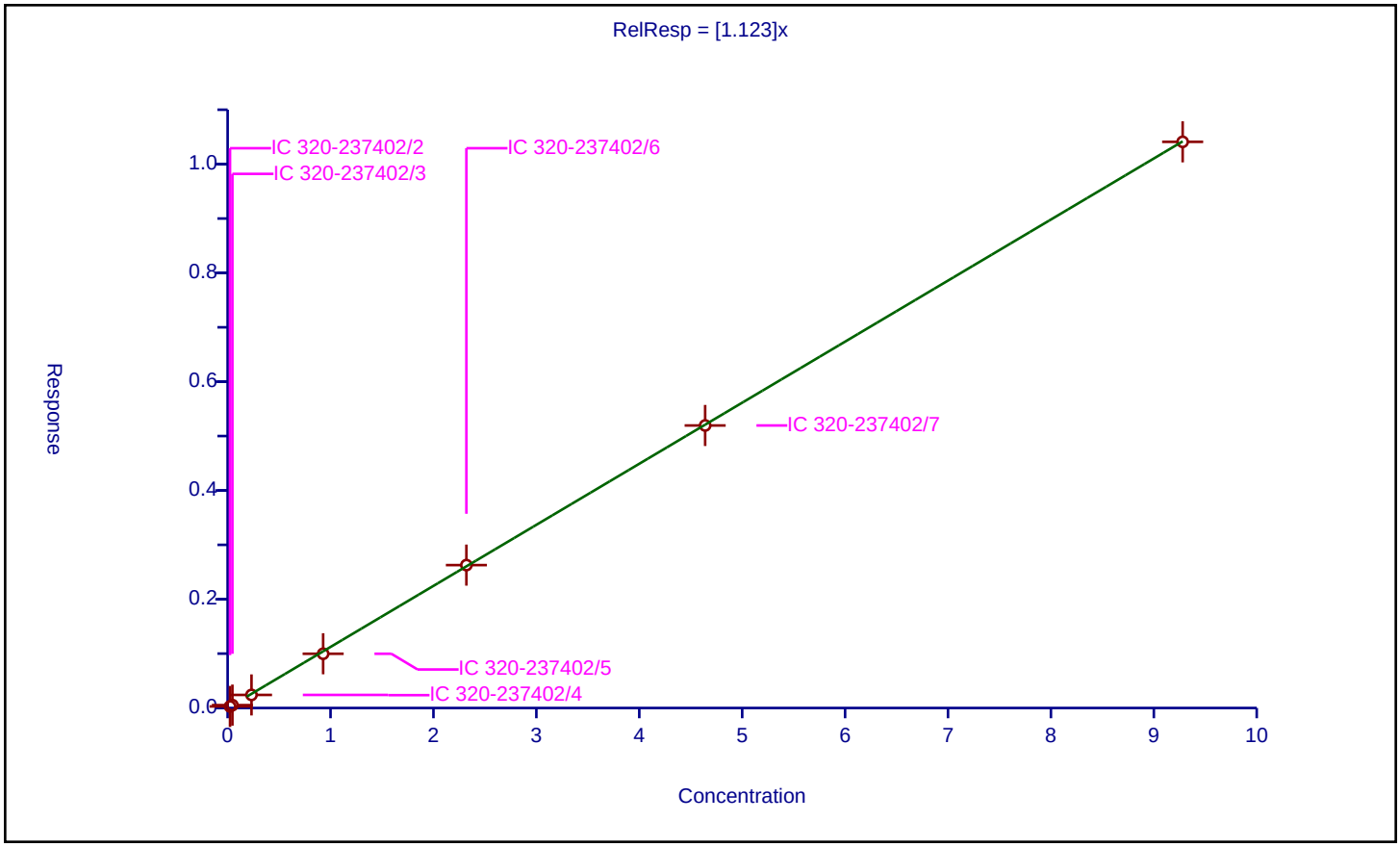
Curve Coefficients

Intercept:	0
Slope:	1.123

Error Coefficients

Standard Error:	6430000
Relative Standard Error:	5.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0232	0.028573	2.39	3269307.0	1.231585	Y
2	IC 320-237402/3	0.0464	0.052956	2.39	3417703.0	1.141291	Y
3	IC 320-237402/4	0.232	0.240603	2.39	3391354.0	1.037082	Y
4	IC 320-237402/5	0.928	0.997422	2.39	3300872.0	1.074808	Y
5	IC 320-237402/6	2.32	2.62735	2.39	3224053.0	1.132478	Y
6	IC 320-237402/7	4.64	5.194566	2.39	3128101.0	1.119519	Y
7	IC 320-237402/8	9.28	10.409747	2.39	3144316.0	1.12174	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

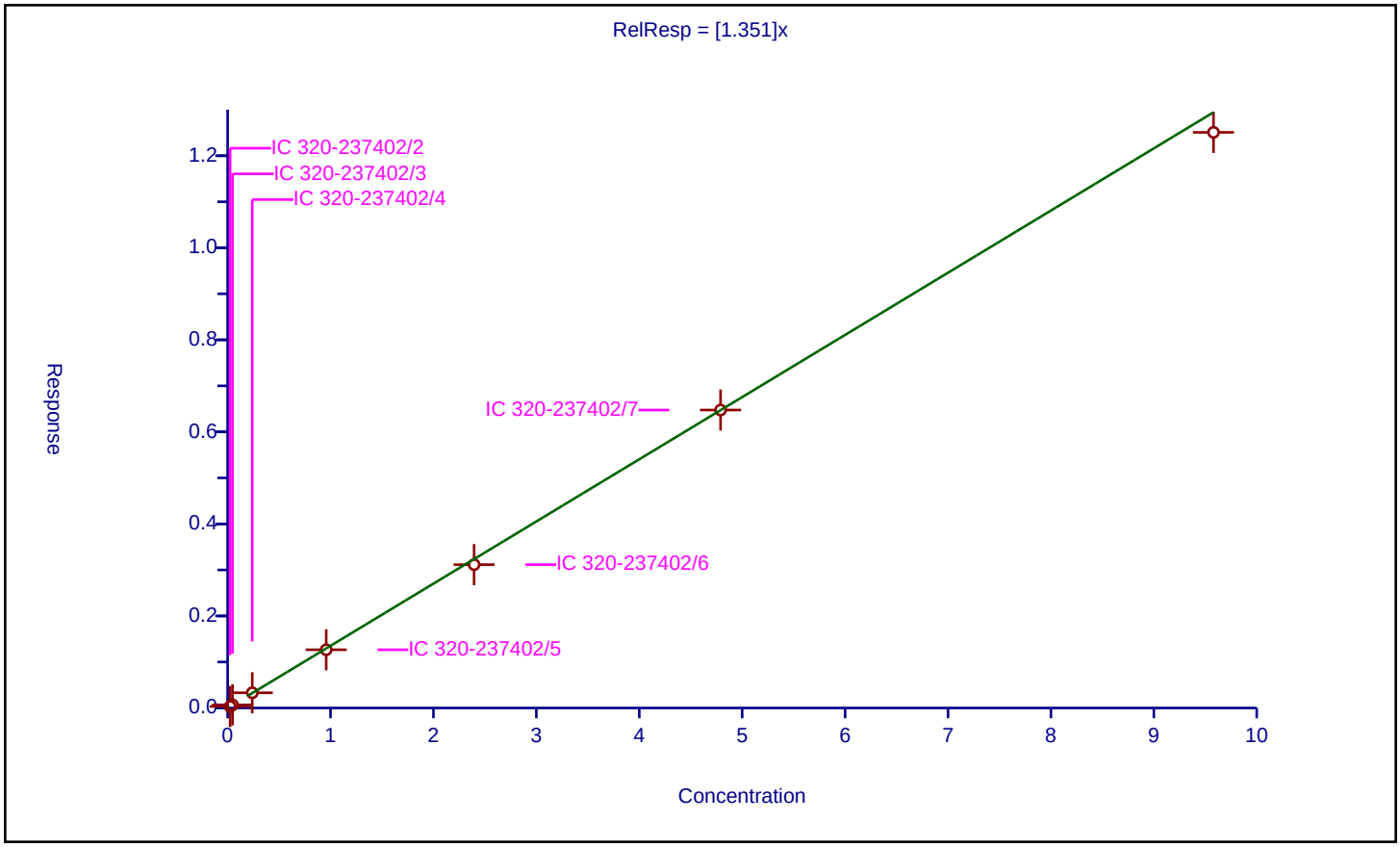
Curve Coefficients

Intercept:	0
Slope:	1.351

Error Coefficients

Standard Error:	1900000
Relative Standard Error:	3.2
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02395	0.033186	2.395	959713.0	1.385623	Y
2	IC 320-237402/3	0.0479	0.067553	2.395	1020788.0	1.410283	Y
3	IC 320-237402/4	0.2395	0.331227	2.395	944227.0	1.382994	Y
4	IC 320-237402/5	0.958	1.265492	2.395	944062.0	1.320973	Y
5	IC 320-237402/6	2.395	3.115348	2.395	899004.0	1.300772	Y
6	IC 320-237402/7	4.79	6.474794	2.395	828227.0	1.351731	Y
7	IC 320-237402/8	9.58	12.508337	2.395	744064.0	1.305672	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

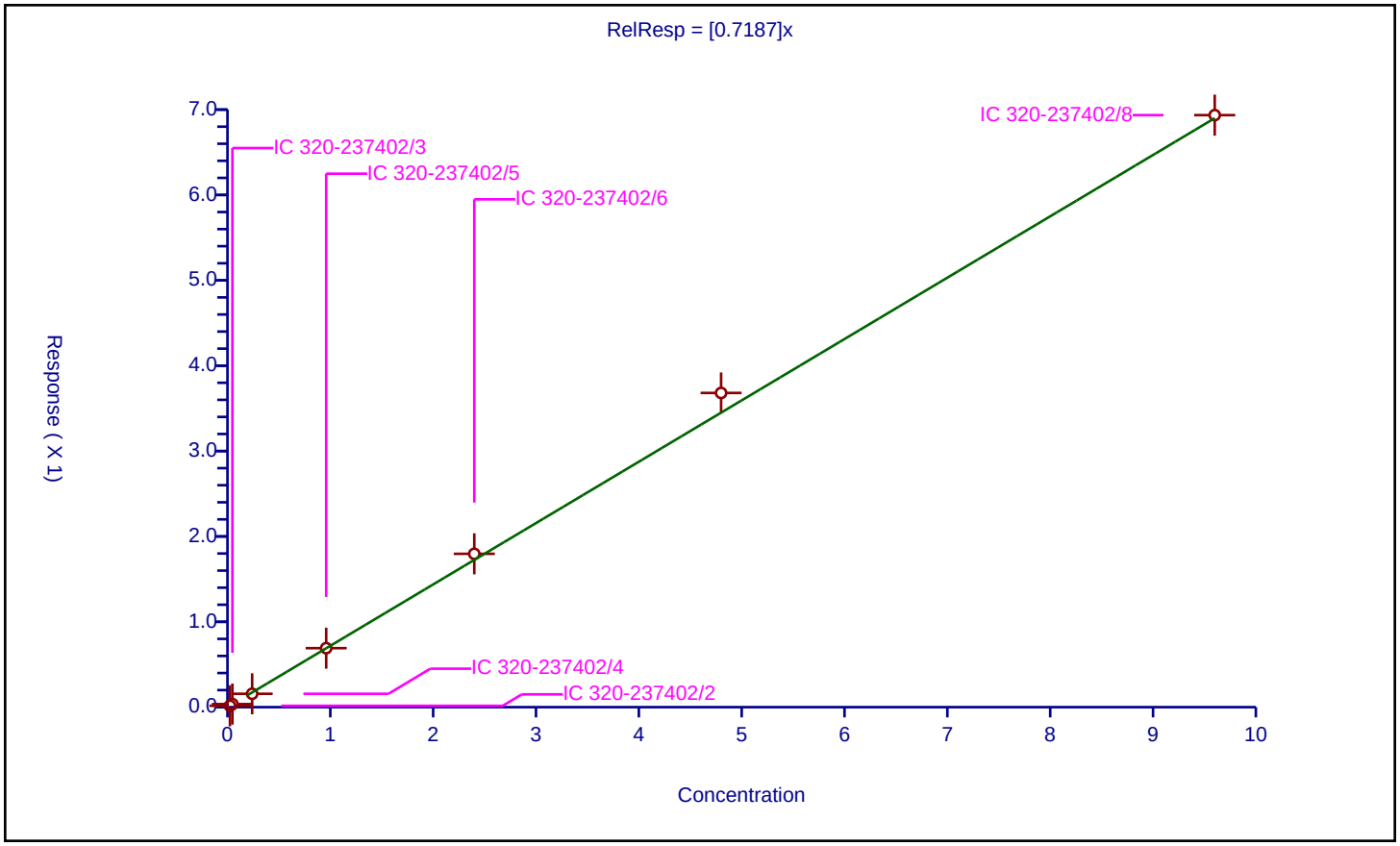
Curve Coefficients

Intercept:	0
Slope:	0.7187

Error Coefficients

Standard Error:	4350000
Relative Standard Error:	6.0
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.024	0.016061	2.39	3269307.0	0.669208	Y
2	IC 320-237402/3	0.048	0.036072	2.39	3417703.0	0.7515	Y
3	IC 320-237402/4	0.24	0.156684	2.39	3391354.0	0.65285	Y
4	IC 320-237402/5	0.96	0.691037	2.39	3300872.0	0.71983	Y
5	IC 320-237402/6	2.4	1.796196	2.39	3224053.0	0.748415	Y
6	IC 320-237402/7	4.8	3.680735	2.39	3128101.0	0.76682	Y
7	IC 320-237402/8	9.6	6.93526	2.39	3144316.0	0.722423	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

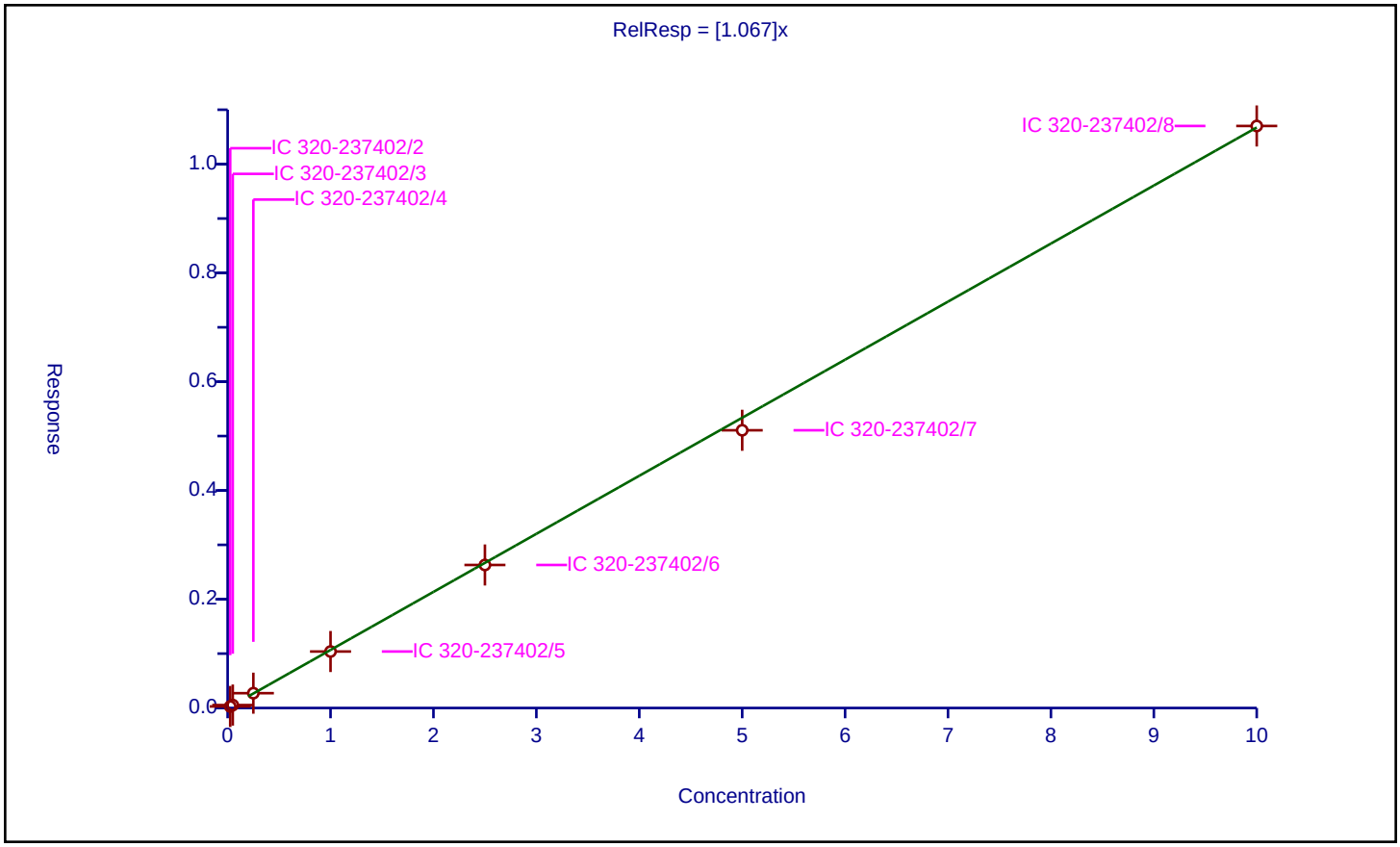
Curve Coefficients

Intercept:	0
Slope:	1.067

Error Coefficients

Standard Error:	3660000
Relative Standard Error:	3.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.028	2.5	2192940.0	1.120003	Y
2	IC 320-237402/3	0.05	0.053944	2.5	2274867.0	1.078876	Y
3	IC 320-237402/4	0.25	0.272719	2.5	2112120.0	1.090876	Y
4	IC 320-237402/5	1.0	1.038597	2.5	2165508.0	1.038597	Y
5	IC 320-237402/6	2.5	2.629605	2.5	2057230.0	1.051842	Y
6	IC 320-237402/7	5.0	5.106609	2.5	1963135.0	1.021322	Y
7	IC 320-237402/8	10.0	10.701518	2.5	1788913.0	1.070152	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

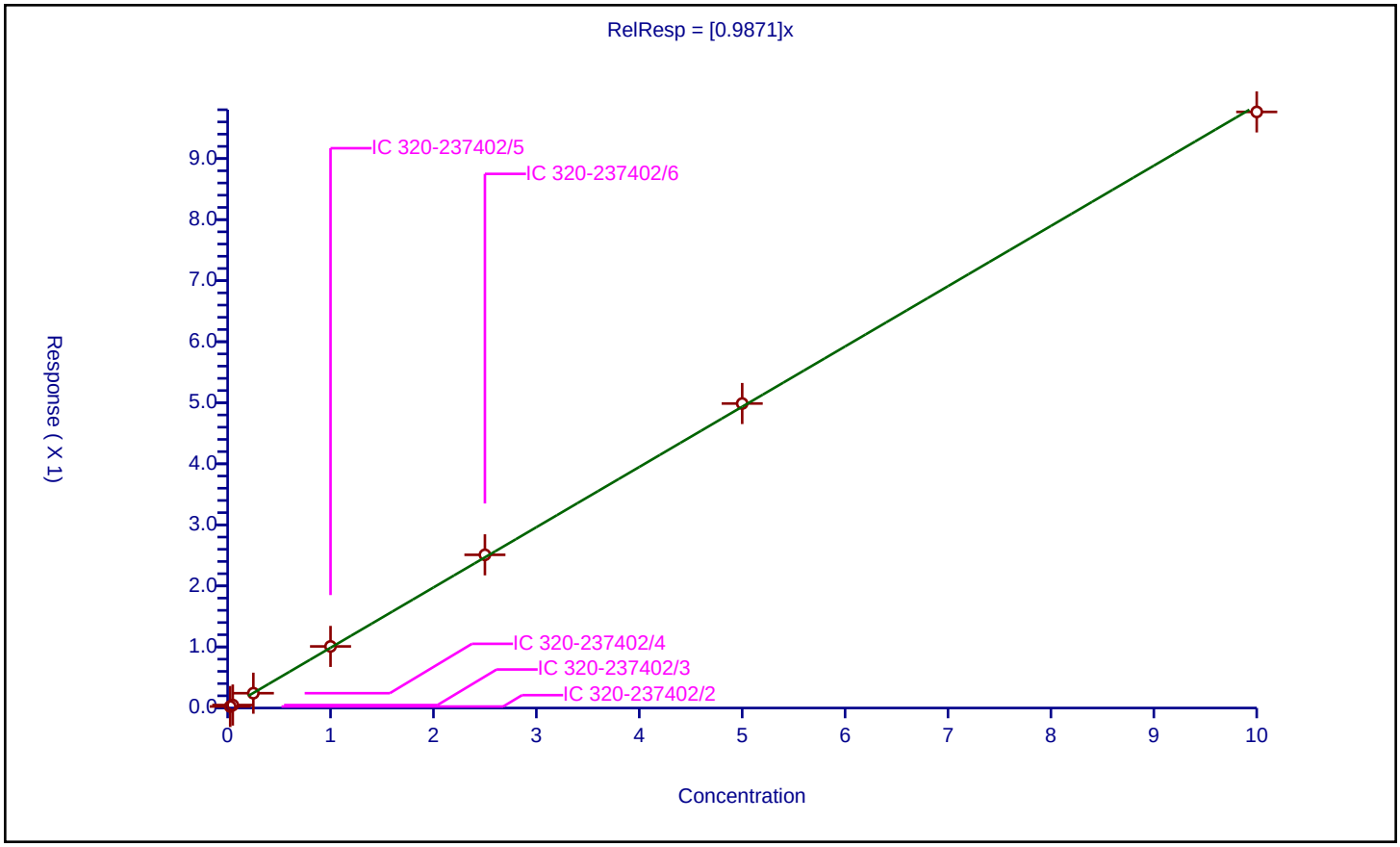
Curve Coefficients

Intercept:	0
Slope:	0.9871

Error Coefficients

Standard Error:	8640000
Relative Standard Error:	1.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.024633	2.5	4963170.0	0.985338	Y
2	IC 320-237402/3	0.05	0.048376	2.5	5311185.0	0.967524	Y
3	IC 320-237402/4	0.25	0.242497	2.5	5234016.0	0.969987	Y
4	IC 320-237402/5	1.0	1.009036	2.5	5088363.0	1.009036	Y
5	IC 320-237402/6	2.5	2.509179	2.5	5160037.0	1.003671	Y
6	IC 320-237402/7	5.0	4.987678	2.5	4827094.0	0.997536	Y
7	IC 320-237402/8	10.0	9.76439	2.5	4606616.0	0.976439	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

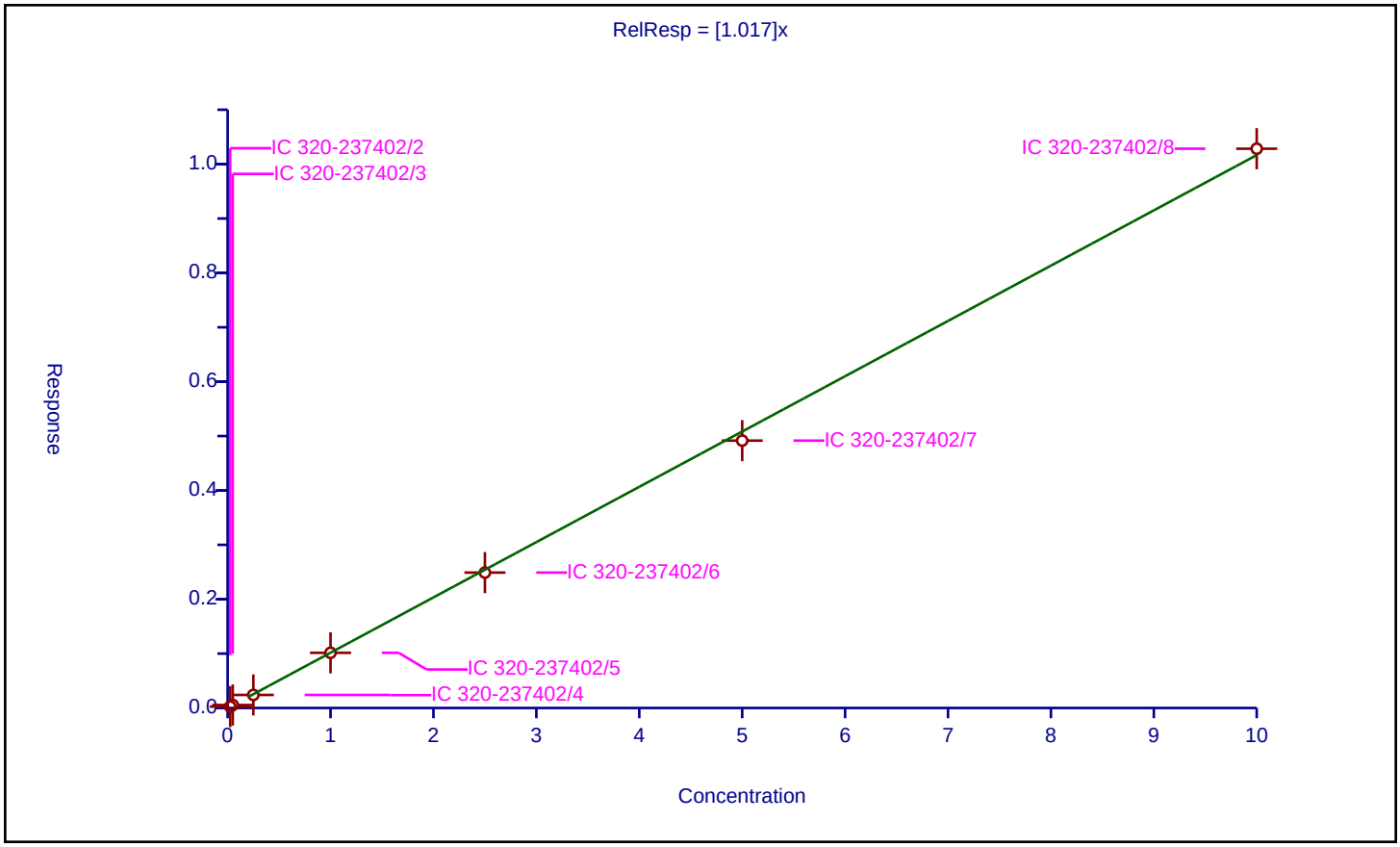
Curve Coefficients

Intercept:	0
Slope:	1.017

Error Coefficients

Standard Error:	909000
Relative Standard Error:	4.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025741	2.5	501437.0	1.029641	Y
2	IC 320-237402/3	0.05	0.055202	2.5	534311.0	1.104039	Y
3	IC 320-237402/4	0.25	0.240141	2.5	521422.0	0.960566	Y
4	IC 320-237402/5	1.0	1.014861	2.5	491188.0	1.014861	Y
5	IC 320-237402/6	2.5	2.489532	2.5	503700.0	0.995813	Y
6	IC 320-237402/7	5.0	4.916328	2.5	501663.0	0.983266	Y
7	IC 320-237402/8	10.0	10.283279	2.5	467155.0	1.028328	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

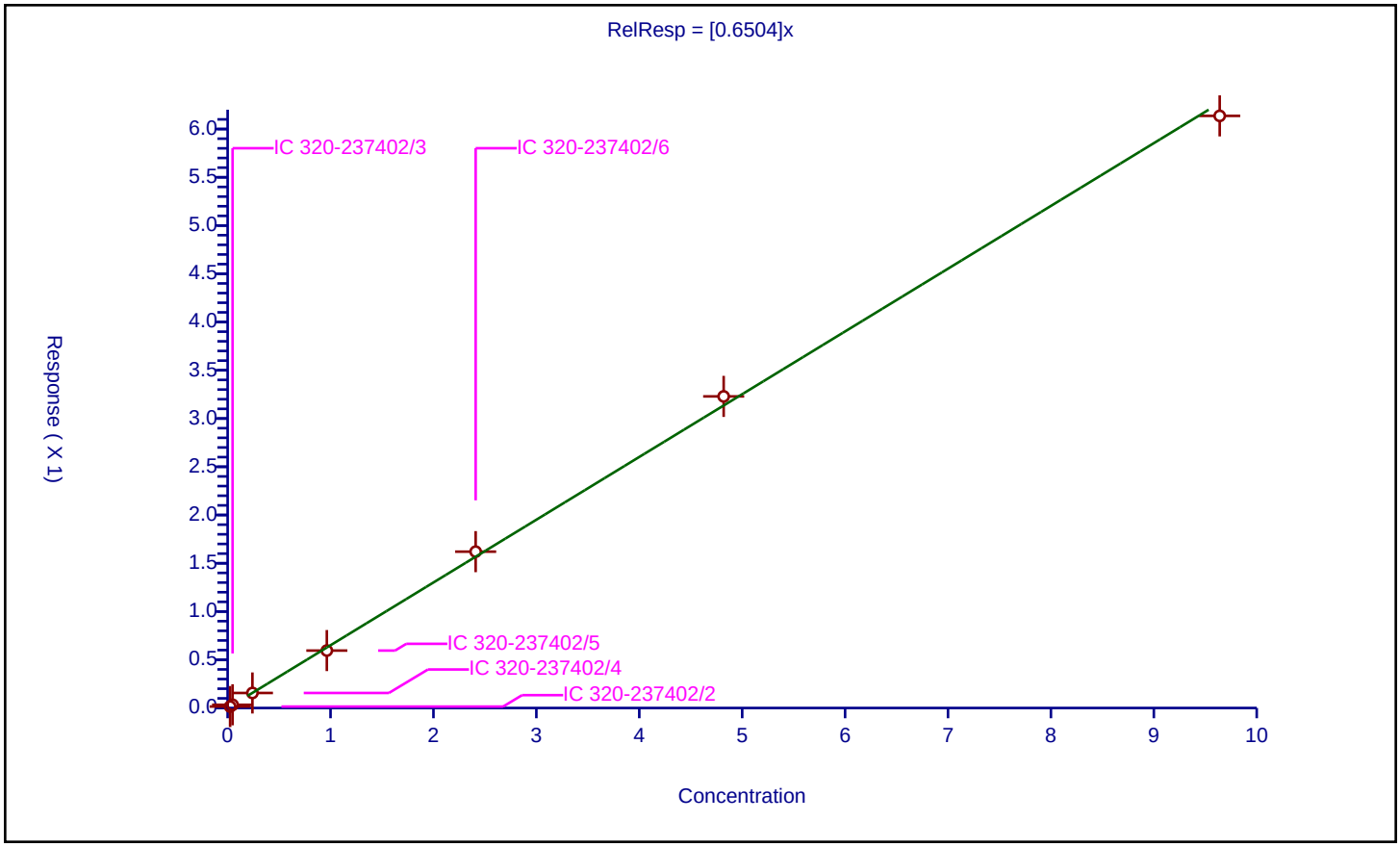
Curve Coefficients

Intercept:	0
Slope:	0.6504

Error Coefficients

Standard Error:	3840000
Relative Standard Error:	4.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0241	0.014899	2.39	3269307.0	0.618231	Y
2	IC 320-237402/3	0.0482	0.033344	2.39	3417703.0	0.691785	Y
3	IC 320-237402/4	0.241	0.155814	2.39	3391354.0	0.646533	Y
4	IC 320-237402/5	0.964	0.595201	2.39	3300872.0	0.617429	Y
5	IC 320-237402/6	2.41	1.620364	2.39	3224053.0	0.67235	Y
6	IC 320-237402/7	4.82	3.229222	2.39	3128101.0	0.669963	Y
7	IC 320-237402/8	9.64	6.136316	2.39	3144316.0	0.636547	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

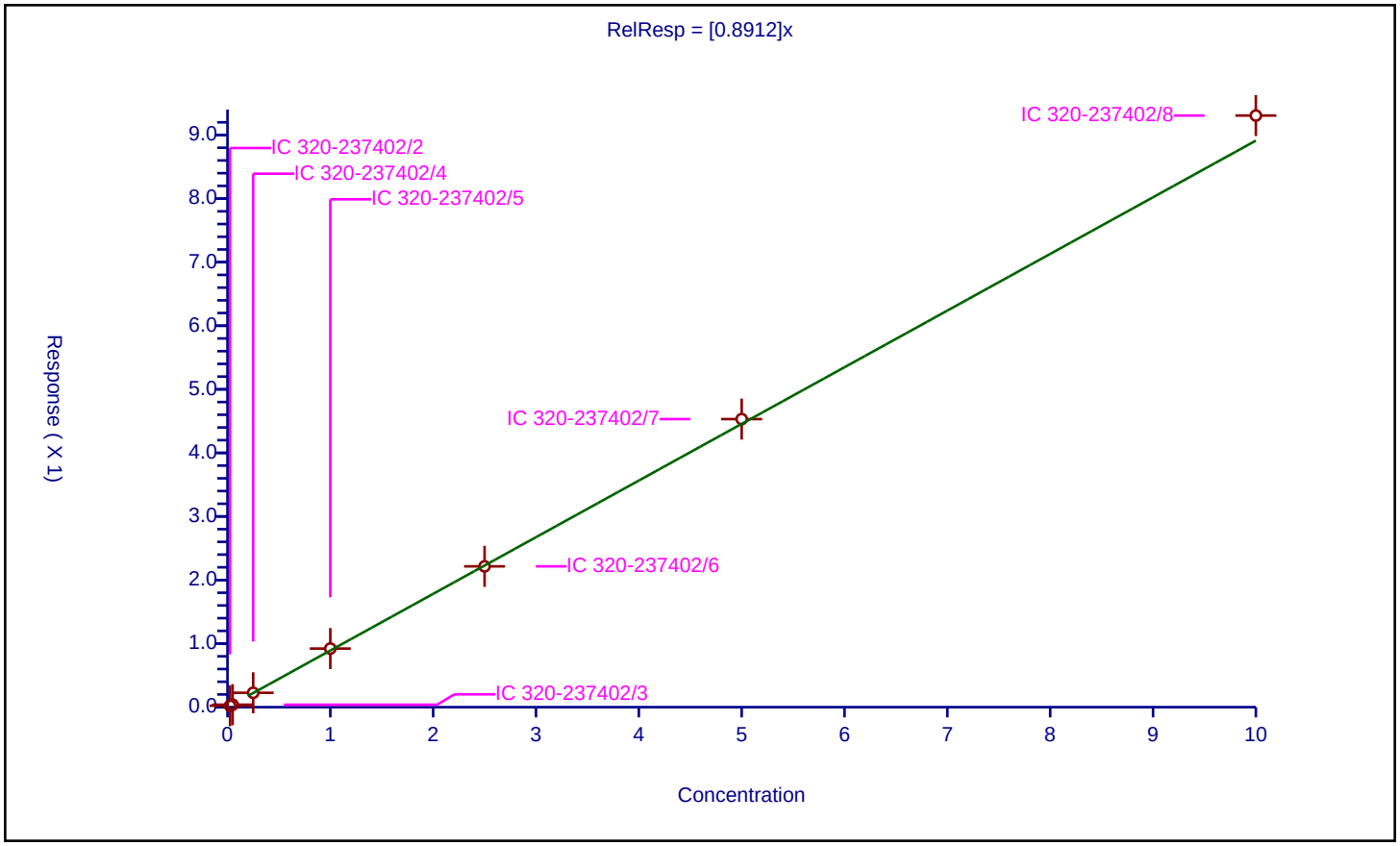
Curve Coefficients

Intercept:	0
Slope:	0.8912

Error Coefficients

Standard Error:	835000
Relative Standard Error:	5.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.022729	2.5	545218.0	0.909178	Y
2	IC 320-237402/3	0.05	0.039046	2.5	610182.0	0.780915	Y
3	IC 320-237402/4	0.25	0.225968	2.5	571651.0	0.903873	Y
4	IC 320-237402/5	1.0	0.921627	2.5	559410.0	0.921627	Y
5	IC 320-237402/6	2.5	2.214934	2.5	532526.0	0.885974	Y
6	IC 320-237402/7	5.0	4.531348	2.5	495602.0	0.90627	Y
7	IC 320-237402/8	10.0	9.306632	2.5	473237.0	0.930663	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

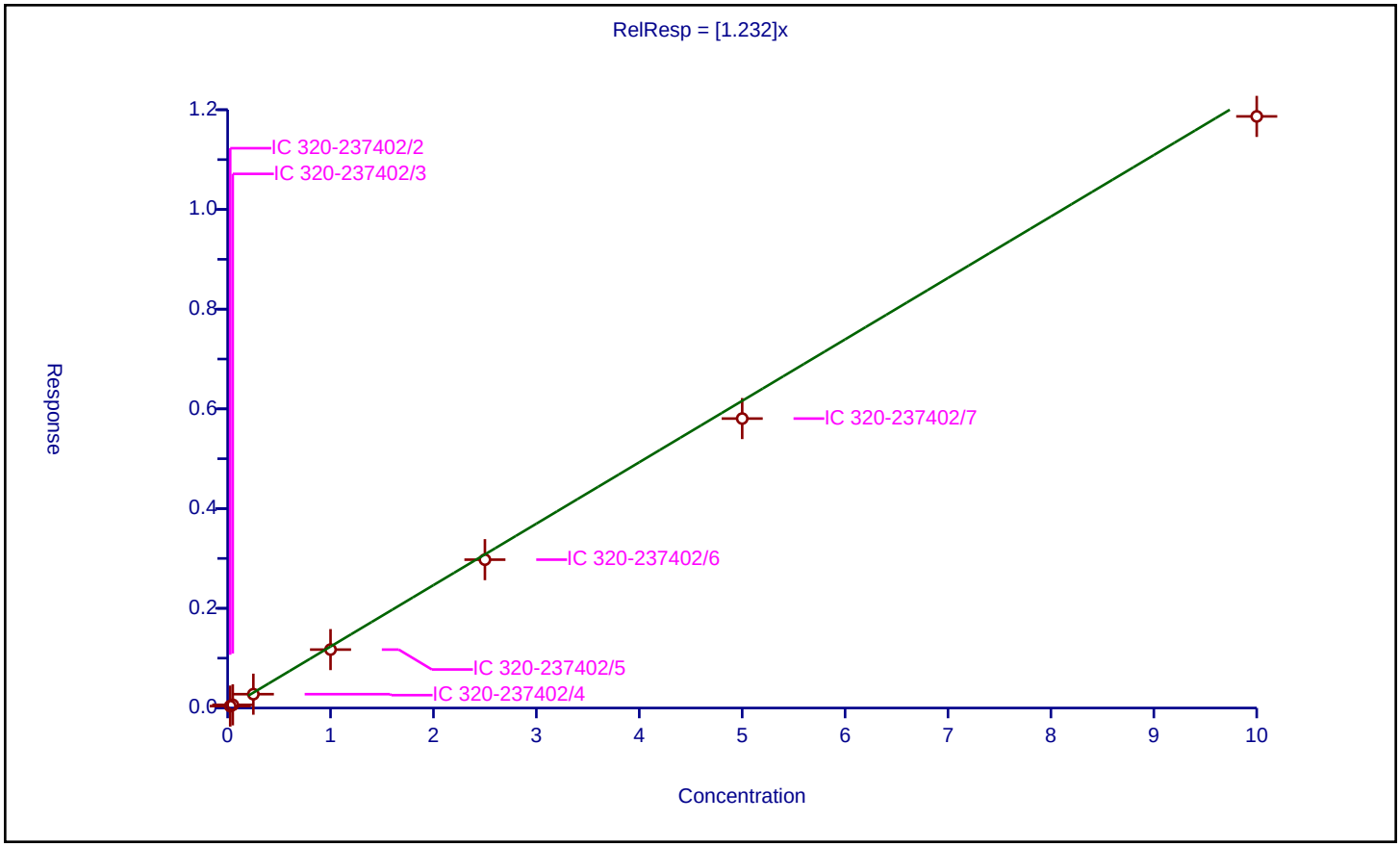
Curve Coefficients

Intercept:	0
Slope:	1.232

Error Coefficients

Standard Error:	3230000
Relative Standard Error:	11.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.981

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.038331	2.5	1645990.0	1.533241	Y
2	IC 320-237402/3	0.05	0.063756	2.5	1779877.0	1.275116	Y
3	IC 320-237402/4	0.25	0.277117	2.5	1682161.0	1.108467	Y
4	IC 320-237402/5	1.0	1.171338	2.5	1631762.0	1.171338	Y
5	IC 320-237402/6	2.5	2.97524	2.5	1525487.0	1.190096	Y
6	IC 320-237402/7	5.0	5.805149	2.5	1498263.0	1.16103	Y
7	IC 320-237402/8	10.0	11.866391	2.5	1439097.0	1.186639	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

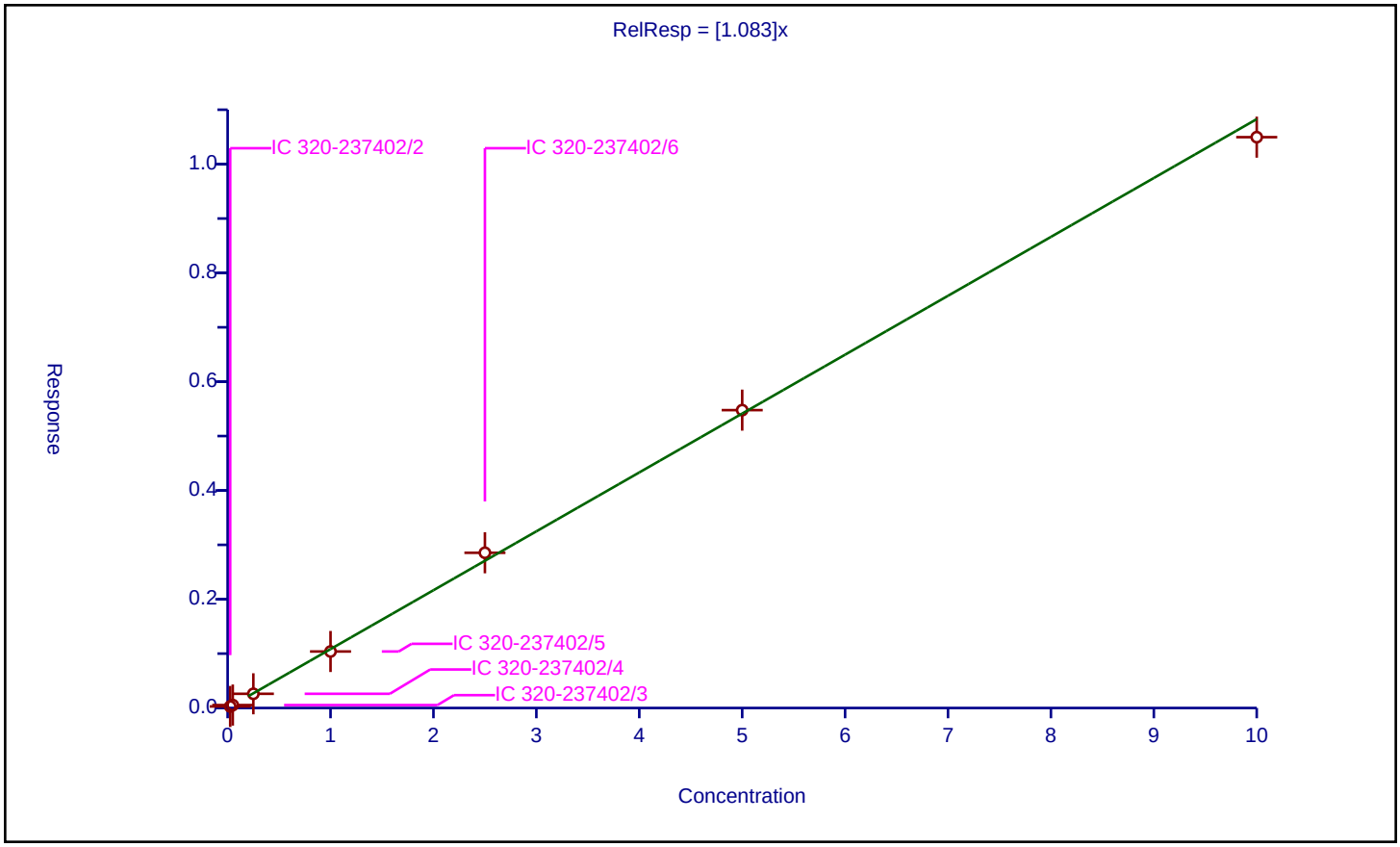
Curve Coefficients

Intercept:	0
Slope:	1.083

Error Coefficients

Standard Error:	2670000
Relative Standard Error:	3.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.028285	2.5	1339683.0	1.131387	Y
2	IC 320-237402/3	0.05	0.053889	2.5	1524607.0	1.077786	Y
3	IC 320-237402/4	0.25	0.261099	2.5	1396187.0	1.044394	Y
4	IC 320-237402/5	1.0	1.039012	2.5	1429399.0	1.039012	Y
5	IC 320-237402/6	2.5	2.854057	2.5	1356329.0	1.141623	Y
6	IC 320-237402/7	5.0	5.476668	2.5	1279511.0	1.095334	Y
7	IC 320-237402/8	10.0	10.495685	2.5	1351987.0	1.049569	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

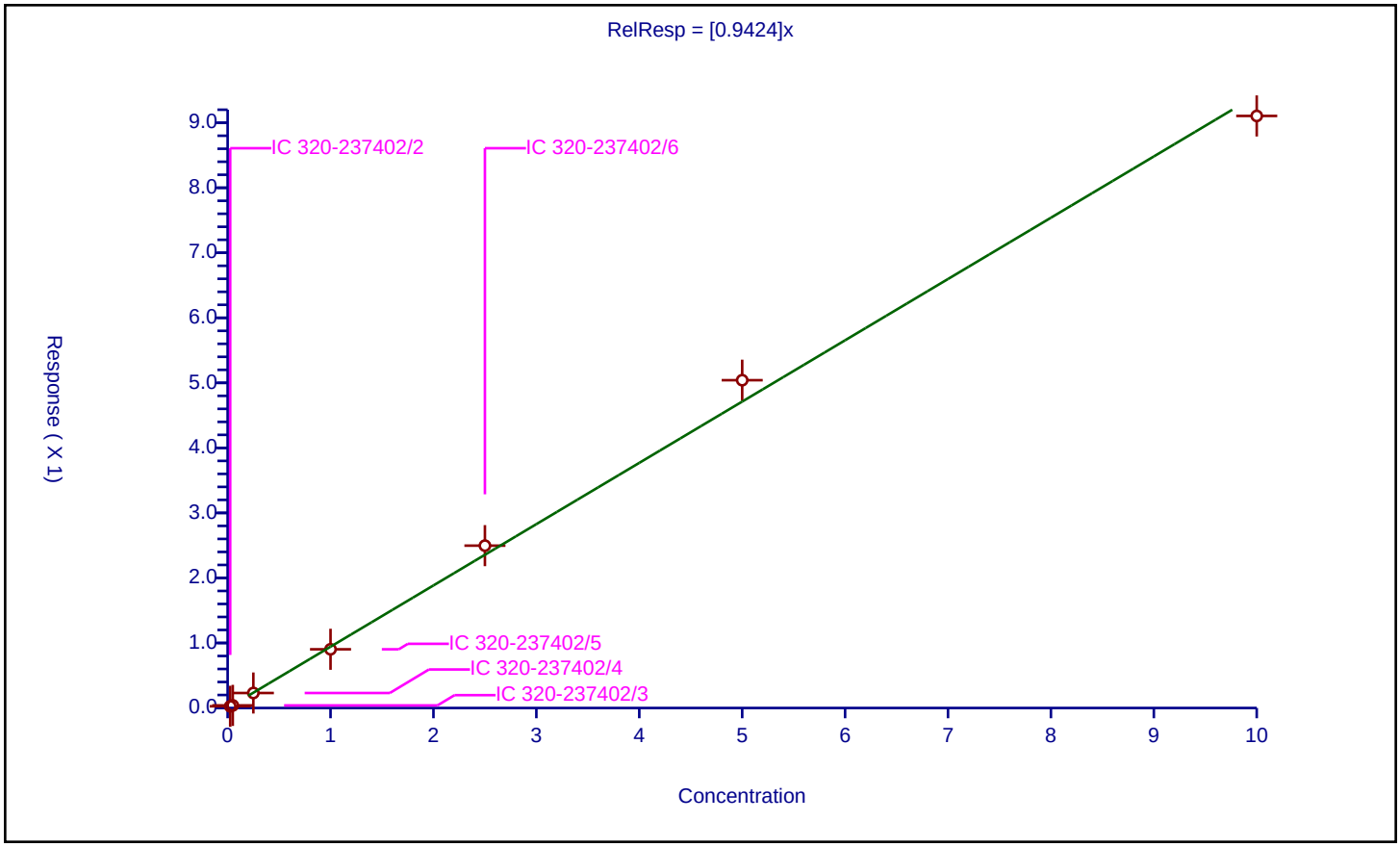
Curve Coefficients

Intercept:	0
Slope:	0.9424

Error Coefficients

Standard Error:	2350000
Relative Standard Error:	8.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.026316	2.5	1339683.0	1.052637	Y
2	IC 320-237402/3	0.05	0.040045	2.5	1524607.0	0.800895	Y
3	IC 320-237402/4	0.25	0.230746	2.5	1396187.0	0.922985	Y
4	IC 320-237402/5	1.0	0.902991	2.5	1429399.0	0.902991	Y
5	IC 320-237402/6	2.5	2.496621	2.5	1356329.0	0.998649	Y
6	IC 320-237402/7	5.0	5.041047	2.5	1279511.0	1.008209	Y
7	IC 320-237402/8	10.0	9.104773	2.5	1351987.0	0.910477	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

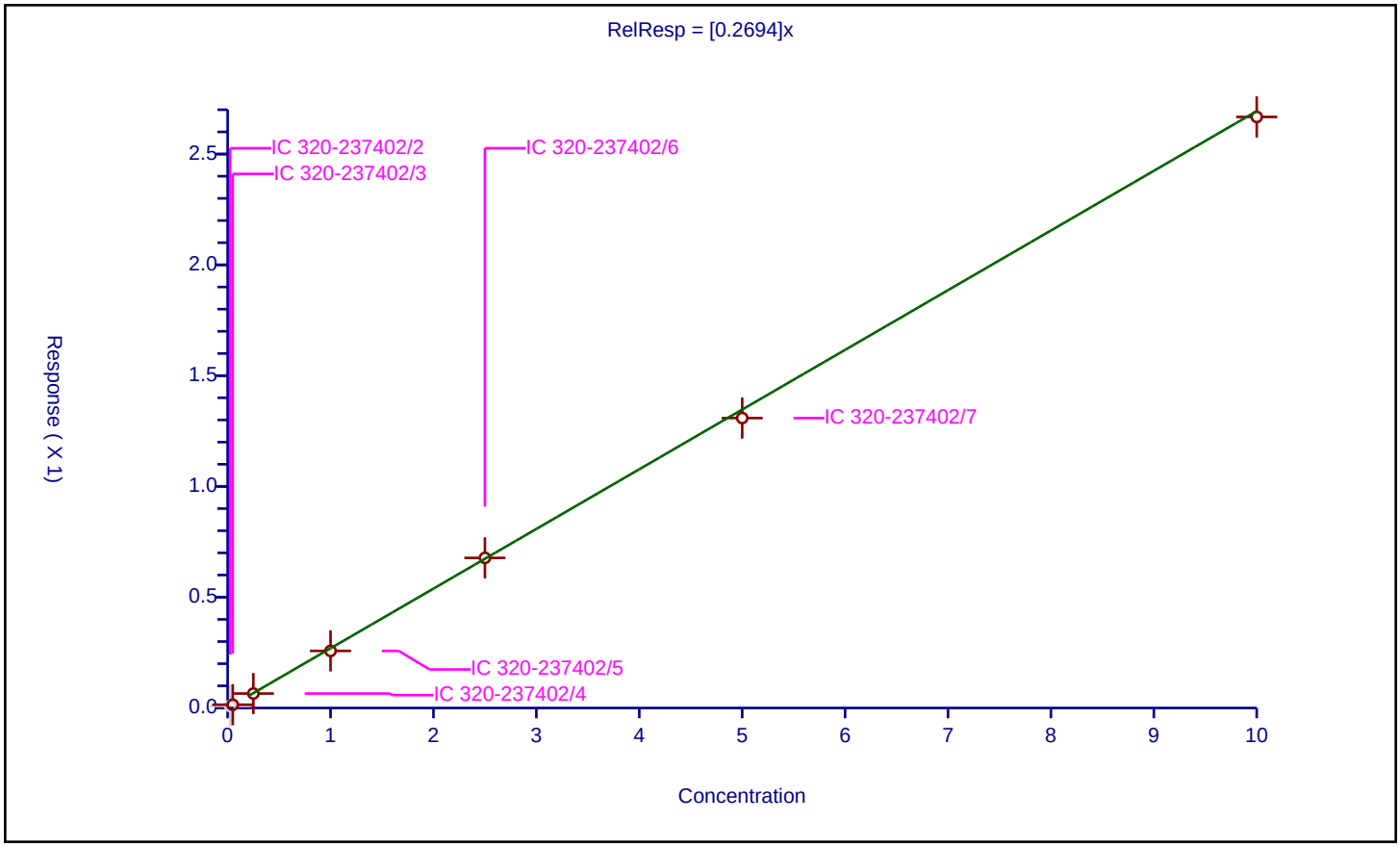
Curve Coefficients

Intercept:	0
Slope:	0.2694

Error Coefficients

Standard Error:	593000
Relative Standard Error:	5.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.009224	2.5	1164683.0	0.368942	N
2	IC 320-237402/3	0.05	0.01489	2.5	1246501.0	0.297794	Y
3	IC 320-237402/4	0.25	0.065329	2.5	1210263.0	0.261315	Y
4	IC 320-237402/5	1.0	0.25762	2.5	1162431.0	0.25762	Y
5	IC 320-237402/6	2.5	0.677514	2.5	1159368.0	0.271005	Y
6	IC 320-237402/7	5.0	1.308638	2.5	1118375.0	0.261728	Y
7	IC 320-237402/8	10.0	2.667542	2.5	1068686.0	0.266754	Y



FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235323/2	2018.07.20LLA_004.d
Level 2	IC 320-235323/3	2018.07.20LLA_005.d
Level 3	IC 320-235323/4	2018.07.20LLA_006.d
Level 4	IC 320-235323/5	2018.07.20LLA_007.d
Level 5	IC 320-235323/6	2018.07.20LLA_008.d
Level 6	IC 320-235323/7	2018.07.20LLA_009.d
Level 7	IC 320-235323/8	2018.07.20LLA_010.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.9494 0.9541	0.9663 0.8743	0.9721	0.9857	1.0068	AveID		0.9584				4.4		20.0			
Perfluoropentanoic acid (PFPeA)	1.2524 1.0067	1.1412 0.9020	1.1122	1.0750	1.1085	AveID		1.0854				10.1		20.0			
Perfluorobutanesulfonic acid (PFBS)	108.52 103.56	114.72 95.580	115.58	114.22	113.56	AveID		109.39				6.8		20.0			
4:2 FTS	21.005 21.278	22.562 20.307	21.537	21.723	21.863	AveID		21.468				3.3		20.0			
Perfluorohexanoic acid (PFHxA)	1.0636 0.9038	1.0190 0.8050	0.9823	0.9129	0.9378	AveID		0.9463				9.0		20.0			
Perfluoropentanesulfonic acid	45.690 53.756	52.306 49.761	54.551	52.471	56.878	AveID		52.202				6.9		20.0			
Perfluoroheptanoic acid (PFHpA)	1.1849 1.0080	1.1249 0.8730	1.1668	1.2245	1.1119	AveID		1.0992				11.0		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6811 1.3024	1.3648 1.2322	1.2393	1.2113	1.2944	AveID		1.3322				12.2		20.0			
6:2 FTS	1.9831 2.1432	2.2880 2.1430	2.1175	2.2145	2.3840	AveID		2.1819				5.9		20.0			
Perfluorooctanoic acid (PFOA)	1.3979 1.0411	1.2433 0.8864	1.2175	1.1582	1.1189	AveID		1.1519				14.0		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.0589 1.0630	1.1013 1.0055	1.0752	1.0599	1.0998	AveID		1.0662				3.0		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.2269 1.1350	1.1296 1.0738	1.0919	1.1036	1.1194	AveID		1.1258				4.4		20.0			
Perfluorononanoic acid (PFNA)	1.1410 0.9408	1.1809 0.8886	1.0997	1.1539	1.0922	AveID		1.0710				10.5		20.0			
Perfluorooctane Sulfonamide (PFOSA)	3.1672 2.9415	3.2177 2.5275	3.1142	3.2534	3.2057	AveID		3.0610				8.4		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorononanesulfonic acid	0.4196 0.4050	0.3776 0.3698	0.3913	0.3774	0.4048	AveID		0.3922				4.7		20.0			
8:2 FTS	15.101 14.208	16.235 14.237	19.826	16.078	15.573	AveID		15.894				12.0		20.0			
Perfluorodecanoic acid (PFDA)	1.1749 1.0836	1.2446 0.9110	1.2910	1.2826	1.2276	AveID		1.1736				11.6		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.0434 1.0453	1.0606 0.9080	1.0425	1.0227	1.1230	AveID		1.0351				6.2		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.9404 0.9255	0.9132 0.8236	0.9683	0.9511	1.0180	AveID		0.9343				6.4		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9898 0.9688	0.9593 1.0523	1.0126	1.0181	1.0227	AveID		1.0034				3.3		20.0			
Perfluoroundecanoic acid (PFUnA)	1.1554 0.8914	1.0322 0.7687	0.9691	1.0106	0.9684	AveID		0.9708				12.4		20.0			
Perfluorododecanoic acid (PFDoA)	1.2507 0.9452	1.1814 0.8165	1.1208	1.1290	1.1104	AveID		1.0791				13.7		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.0032 0.8773	1.1532 0.8085	1.1294	1.0125	1.0205	AveID		1.0006				12.4		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.1856 0.1694	0.1781 0.1840	0.1613	0.1621	0.1649	AveID		0.1722				6.0		20.0			
13C4 PFBA	0.9563 1.0192	0.9417 1.0284	0.9612	0.9687	0.9411	Ave		0.9738				3.7		20.0			
13C5-PFPeA	0.8769 0.9391	0.8823 0.9387	0.8628	0.9097	0.8600	Ave		0.8956				3.8		20.0			
13C3-PFBS	0.0111 0.0119	0.0108 0.0119	0.0110	0.0115	0.0110	Ave		0.0113				4.1		20.0			
13C2 PFHxA	0.9029 0.9782	0.9165 0.9942	0.9009	0.9639	0.9223	Ave		0.9398				4.1		20.0			
13C4-PFHpA	1.1038 1.1562	1.0753 1.1241	1.0627	1.0525	1.0493	Ave		1.0891				3.7		20.0			
18O2 PFHxS	0.6728 0.6765	0.6539 0.6604	0.6595	0.6835	0.6334	Ave		0.6628				2.5		20.0			
M2-6:2FTS	0.0958 0.1070	0.1013 0.1025	0.1064	0.1047	0.0953	Ave		0.1018				4.7		20.0			
13C4 PFOA	0.9569 1.0034	0.9948 0.9835	0.9598	0.9925	0.9639	Ave		0.9793				1.9		20.0			
13C4 PFOS	0.7049 0.7279	0.7189 0.7178	0.6919	0.7237	0.6864	Ave		0.7102				2.3		20.0			
13C5 PFNA	0.9122 0.9744	0.9186 0.8955	0.9344	0.9101	0.8944	Ave		0.9199				3.0		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
13C8 FOSA	0.4086 0.4042	0.3995 0.4052	0.4020	0.4025	0.3857	Ave		0.4011				1.8		20.0			
M2-8:2FTS	0.0149 0.0151	0.0137 0.0135	0.0127	0.0139	0.0135	Ave		0.0139				6.2		20.0			
13C2 PFDA	0.9806 0.9728	0.9376 0.9228	0.9585	0.9750	0.9410	Ave		0.9555				2.3		20.0			
d3-NMeFOSAA	0.4287 0.4827	0.4488 0.4772	0.4198	0.4726	0.4181	Ave		0.4497				6.2		20.0			
d5-NEtFOSAA	0.3806 0.3632	0.3989 0.3188	0.3644	0.3529	0.3427	Ave		0.3602				7.2		20.0			
13C2 PFUnA	0.8877 0.8405	0.8636 0.8434	0.9449	0.8966	0.8311	Ave		0.8725				4.6		20.0			
13C2 PFDoA	0.9138 0.9647	0.9384 0.9190	0.9526	0.9625	0.9061	Ave		0.9367				2.6		20.0			
13C2-PFTeDA	0.8294 0.8405	0.7978 0.8182	0.7786	0.8001	0.8093	Ave		0.8106				2.6		20.0			
13C2-PFHxDA	0.8665 0.8465	0.8244 0.8430	0.7975	0.8656	0.7966	Ave		0.8343				3.5		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235323/2	2018.07.20LLA_004.d
Level 2	IC 320-235323/3	2018.07.20LLA_005.d
Level 3	IC 320-235323/4	2018.07.20LLA_006.d
Level 4	IC 320-235323/5	2018.07.20LLA_007.d
Level 5	IC 320-235323/6	2018.07.20LLA_008.d
Level 6	IC 320-235323/7	2018.07.20LLA_009.d
Level 7	IC 320-235323/8	2018.07.20LLA_010.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	82337 16382616	167911 29864504	851429	3406000	8683460	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	99603 15927568	185793 28122892	874387	3488097	8737065	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	96295 18352327	201330 33353238	1023420	4144415	10135605	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	19694 3983885	41834 7487042	201492	832795	2061744	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	87093 14895958	172337 26582148	806387	3138680	7926274	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	43021 10107955	97400 18425148	512547	2020216	5386654	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	118610 19635530	223218 32597003	1129898	4596898	10692038	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	93350 13507927	149865 24596113	677726	2687244	6836644	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	16326 3661214	40529 6919612	194634	784162	1973546	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	121436 17615969	228448 28986920	1065875	4104432	9893943	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	64444 12410251	139091 22822135	645339	2604672	6586083	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorooctanesulfonic acid (PFOS)		AveID	72788 12917138	139069 23758907	638860	2643716	6534759	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanoic acid (PFNA)		AveID	94397 15444297	200154 26432339	936306	3745852	8952125	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (PFOSA)		AveID	117368 20031798	237227 34015766	1140674	4670503	11331304	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorononanesulfonic acid		AveID	25753 4768397	48095 8463231	236810	935214	2444697	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
8:2 FTS		AveID	19565 3473887	39413 6095376	219032	762590	1852213	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	104490 17758765	215343 27925293	1127618	4460655	10586026	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	40570 8500506	87825 14391958	398731	1724005	4302560	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	57954 10941518	116789 18928781	588475	2366775	6173042	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	34167 5927916	70619 11143574	336209	1281556	3212075	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	93020 12622798	164485 21533911	834432	3231982	7375185	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	103648 15361417	204578 24922329	972821	3875943	9220790	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	83136 14257729	199692 24678882	980288	3476223	8474129	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	13963 2398350	26222 4999700	114454	462550	1223124	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	8672946 8585448	8688476 8540015	8758871	8638287	8624856	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	7953022 7911006	8140376 7794784	7861863	8111747	7881612	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	93356 93215	92312 91779	93156	95433	93897	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	8188862 8240591	8456056 8255766	8209316	8595361	8451911	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	10010342 9739676	9921303 9334661	9683804	9385285	9615791	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5772546 5391005	5707383 5187747	5684732	5765649	5490801	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	824992 855949	887572 808920	921104	887129	829585	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	8678172 8452129	9178155 8167184	8746058	8850671	8833584	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	6111656 5861926	6341311 5698361	6027169	6169394	6013683	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	8273114 8207906	8474952 7436534	8514394	8115774	8196177	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	3705712 3405074	3686257 3364547	3662779	3588945	3534703	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	129564 122253	121380 107033	110479	118578	118941	2.40 2.40	2.40 2.40	2.40	2.40	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C2 PFDA	13PF OA	Ave	8893234 8194592	8650981 7663476	8734319	8694492	8623593	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	3888200 4066191	4140403 3962467	3824936	4214233	3831445	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	3451888 3059291	3680693 2647477	3320282	3146939	3140930	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	8050897 7080168	7967477 7003448	8610405	7995274	7616119	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	8286918 8126284	8658513 7631148	8680037	8582866	8304185	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	7521612 7080232	7360849 6794396	7095002	7135088	7416295	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	7858720 7130990	7605993 7000546	7267155	7718471	7300156	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235323/2	2018.07.20LLA_004.d
Level 2	IC 320-235323/3	2018.07.20LLA_005.d
Level 3	IC 320-235323/4	2018.07.20LLA_006.d
Level 4	IC 320-235323/5	2018.07.20LLA_007.d
Level 5	IC 320-235323/6	2018.07.20LLA_008.d
Level 6	IC 320-235323/7	2018.07.20LLA_009.d
Level 7	IC 320-235323/8	2018.07.20LLA_010.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	-0.9 -8.8	0.8	1.4	2.9	5.1	-0.4	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	15.4 -16.9	5.1	2.5	-1.0	2.1	-7.3	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	-0.8 -12.6	4.9	5.7	4.4	3.8	-5.3	30 30	30	30	30	30	30
4:2 FTS	-2.2 -5.4	5.1	0.3	1.2	1.8	-0.9	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	12.4 -14.9	7.7	3.8	-3.5	-0.9	-4.5	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-12.5 -4.7	0.2	4.5	0.5	9.0	3.0	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	7.8 -20.6	2.3	6.2	11.4	1.2	-8.3	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	26.2 -7.5	2.4	-7.0	-9.1	-2.8	-2.2	30 30	30	30	30	30	30
6:2 FTS	-9.1 -1.8	4.9	-3.0	1.5	9.3	-1.8	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	21.4 -23.0	7.9	5.7	0.5	-2.9	-9.6	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-0.7 -5.7	3.3	0.8	-0.6	3.1	-0.3	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	9.0 -4.6	0.3	-3.0	-2.0	-0.6	0.8	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	6.5 -17.0	10.3	2.7	7.7	2.0	-12.2	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (PFOSA)	3.5 -17.4	5.1	1.7	6.3	4.7	-3.9	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	7.0 -5.7	-3.7	-0.2	-3.8	3.2	3.3	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1 Analy Batch No.: 235323

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/20/2018 19:32 Calibration End Date: 07/20/2018 20:17 Calibration ID: 40228

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
8:2 FTS	-5.0 -10.4	2.1	24.7	1.2	-2.0	-10.6	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	0.1 -22.4	6.0	10.0	9.3	4.6	-7.7	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.8 -12.3	2.5	0.7	-1.2	8.5	1.0	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	0.7 -11.9	-2.3	3.6	1.8	9.0	-0.9	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	-1.4 4.9	-4.4	0.9	1.5	1.9	-3.4	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	19.0 -20.8	6.3	-0.2	4.1	-0.3	-8.2	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	15.9 -24.3	9.5	3.9	4.6	2.9	-12.4	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	0.3 -19.2	15.2	12.9	1.2	2.0	-12.3	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	7.8 6.8	3.4	-6.3	-5.9	-4.2	-1.6	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 20-Jul-2018 19:32:31 ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: L1
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:25:04 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 09:50:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.515	0.002	0.539	8672946	2.46		98.2	22012	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.516	0.001	1.000	82337	0.0248		99.1	11.7	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.789	0.003	1.000	99603	0.0288		115	45.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.789	0.003	0.637	7953022	2.45		97.9	23882	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.827	-0.001	0.649	93356	2.28		97.9	1283	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.834	1.831	0.003	1.005	96295	0.0219		99.2	70.7	
298.90 > 99.00	1.834	1.831	0.003	1.005	35241		2.73(1.35-4.05)	99.2	112	
D 60 M2-4:2FTS										
329.00 > 81.00	2.056	2.051	0.005	0.731	776474	NC			1930	
61 1H,1H,2H,2H-perfluorohexanesulfoni										M
327.00 > 307.00	2.056	2.051	0.005	1.126	19694	0.0228		97.8	338	M
D 7 13C2 PFHxA										
315.00 > 270.00	2.088	2.085	0.003	0.742	8188862	2.40		96.1	31928	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.088	2.086	0.002	1.000	87093	0.0281		112	54.0	
313.00 > 119.00	2.088	2.086	0.002	1.000	7735		11.26(6.96-20.87)	112	59.0	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.108	2.112	-0.004	1.155	43021	0.0205		87.5	133	
349.00 > 99.00	2.108	2.112	-0.004	1.155	21156		2.03(1.15-3.45)	87.5	140	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.192	2.189	0.003	0.779	817542	NC			6056	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.192	2.189	0.003	1.000	15708	NC			9.2	
D 9 13C4-PFHpA										
367.00 > 322.00	2.436	2.431	0.005	0.866	10010342	2.53		101	39769	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.436	2.433	0.003	1.000	118610	0.0269		108	46.1	
363.00 > 169.00	2.436	2.433	0.003	1.000	23435		5.06(2.17-6.52)	108	135	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.446	0.003	1.000	93350	0.0287		126	159	
399.00 > 99.00	2.449	2.446	0.003	1.000	20434		4.57(1.90-5.70)	126	109	
D 11 18O2 PFHxS										
403.00 > 84.00	2.449	2.447	0.002	0.871	5772546	2.40		102	36981	
65 ADONA										M
377.00 > 251.00	2.475	2.477	-0.002	0.775	189589	NC			727	
377.00 > 85.00	2.475	2.477	-0.002	0.775	69559		2.73(1.05-3.16)		36.4	M
D 12 M2-6:2FTS										
429.00 > 81.00	2.781	2.779	0.002	0.989	824992	2.23		94.0	2616	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.781	2.779	0.002	1.000	16326	0.0215		90.9	259	
D 14 13C4 PFOA										
417.00 > 372.00	2.813	2.804	0.009	1.000	8678172	2.44		97.7	57210	
* 62 13C2-PFOA										
415.00 > 370.00	2.813	2.804	0.009		9069103	2.50			31506	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.813	2.806	0.007	1.000	121436	0.0304		121	22.5	
413.00 > 169.00	2.813	2.806	0.007	1.000	40517		3.00(1.36-4.08)	121	139	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.813	2.813	0.0	0.881	64444	0.0236		99.3	104	
449.00 > 99.00	2.813	2.813	0.0	0.881	16757		3.85(1.84-5.53)	99.3	238	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.192	3.184	0.008	1.000	72788	0.0253		109	103	
499.00 > 99.00	3.192	3.184	0.008	1.000	15392		4.73(2.04-6.12)	109	109	M
20 Perfluorononanoic acid										M
463.00 > 419.00	3.192	3.189	0.003	1.000	94397	0.0266		107	28.4	
463.00 > 169.00	3.192	3.189	0.003	1.000	18787		5.02(2.68-8.03)	107	42.3	M
D 19 13C5 PFNA										
468.00 > 423.00	3.192	3.189	0.003	1.135	8273114	2.48		99.2	21764	
D 18 13C4 PFOS										
503.00 > 80.00	3.192	3.189	0.003	1.135	6111656	2.37		99.3	8316	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.405	3.398	0.007	1.067	80995	NC			309	
D 21 13C8 FOSA										
506.00 > 78.00	3.519	3.519	-0.001	1.251	3705712	2.55		102	11968	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.519	3.519	-0.001	1.000	117368	0.0259		103	402	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.534	3.534	0.0	1.107	25753	0.0257		107	69.7	
549.00 > 99.00	3.534	3.534	0.0	1.107	9685		2.66(1.42-4.26)	107	62.9	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.548	3.538	0.010	1.000	19565	0.0228		95.0	74.7	
D 26 M2-8:2FTS										
529.00 > 81.00	3.548	3.540	0.008	1.261	129564	2.57		107	2012	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.261	8893234	2.57		103	40518	
24 Perfluorodecanoic acid										M
513.00 > 469.00	3.548	3.548	0.0	1.000	104490	0.0250		100	27.4	
513.00 > 169.00	3.548	3.548	0.0	1.000	6555		15.94(7.12-21.35)	100	22.3	M
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.701	3.698	0.003	1.316	3888200	2.38		95.3	8841	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.701	3.702	-0.001	1.000	40570	0.0252		101	33.2	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.858	3.856	0.002	1.209	57954	0.0243		101	105	
599.00 > 99.00	3.858	3.856	0.002	1.209	11905		4.87(2.14-6.43)	101	179	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.872	3.866	0.006	1.377	3451888	2.64		106	6997	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.870	0.002	1.377	8050897	2.54		102	25932	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.872	3.870	0.002	1.000	34167	0.0247		98.6	110	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.000	93020	0.0298		119	31.6	
563.00 > 169.00	3.872	3.872	0.0	1.000	10963		8.48(5.24-15.72)	119	46.7	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.261	102162	NC			478	
D 36 13C2 PFDoA										
615.00 > 570.00	4.172	4.162	0.010	1.483	8286918	2.44		97.5	28235	
37 Perfluorododecanoic acid										M
613.00 > 569.00	4.172	4.162	0.010	1.000	103648	0.0290		116	28.5	
613.00 > 169.00	4.172	4.162	0.010	1.000	8740		11.86(4.68-14.05)	116	36.0	M
41 Perfluorotridecanoic acid										M
663.00 > 619.00	4.430	4.426	0.004	1.062	83136	0.0251		100	28.6	
663.00 > 169.00	4.430	4.426	0.004	1.062	14036		5.92(3.09-9.27)	100	47.4	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006	1.660	7521612	2.56		102	19497	
42 Perfluorotetradecanoic acid										M
713.00 > 169.00	4.670	4.664	0.006	1.000	13963	0.0270		108	64.3	M
713.00 > 219.00	4.670	4.664	0.006	1.000	9388		1.49(0.70-2.09)	108	50.1	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.090	5.081	0.009	1.810	7858720	2.60		104	7552	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.090	5.083	0.007	1.000	150967	NC			26.8	
813.00 > 169.00	5.090	5.083	0.007	1.000	24696		6.11(2.77-8.32)		72.7	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.070	63849	NC			14.4	
913.00 > 169.00	5.445	5.443	0.002	1.070	12667		5.04(2.55-7.64)		79.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:25:07 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d

Injection Date: 20-Jul-2018 19:32:31 Instrument ID: A9

Lims ID: IC L1 Full

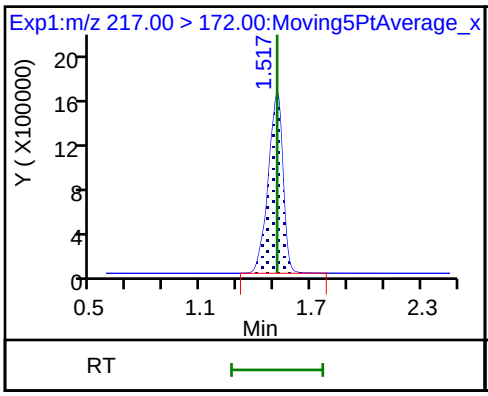
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 1 Worklist Smp#: 2

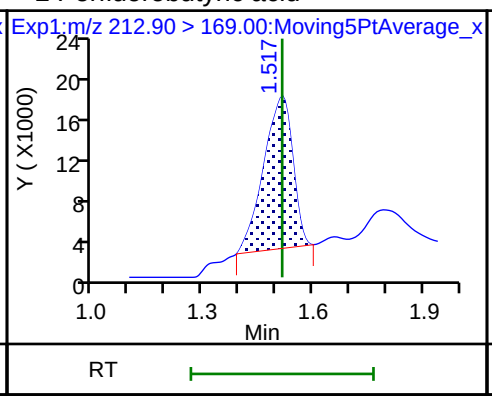
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

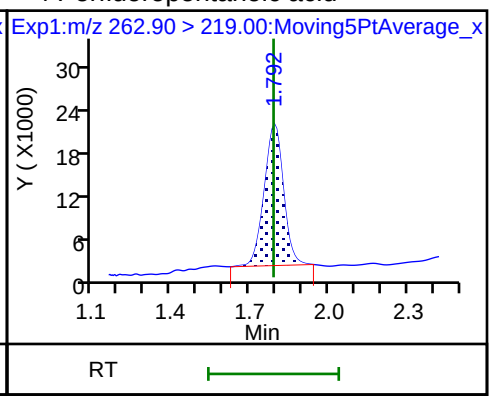
D 1 13C4 PFBA



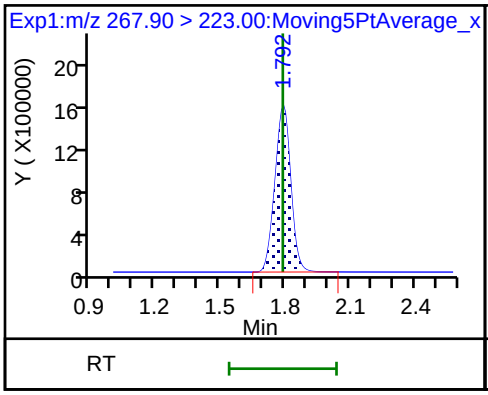
2 Perfluorobutyric acid



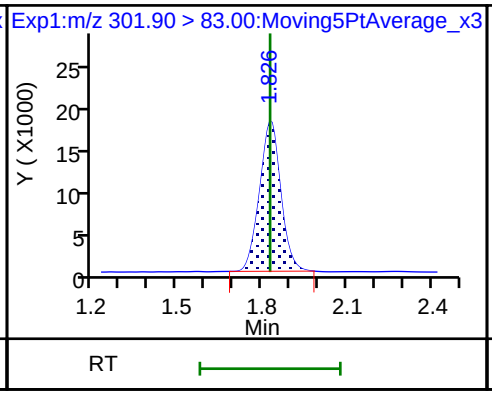
4 Perfluoropentanoic acid



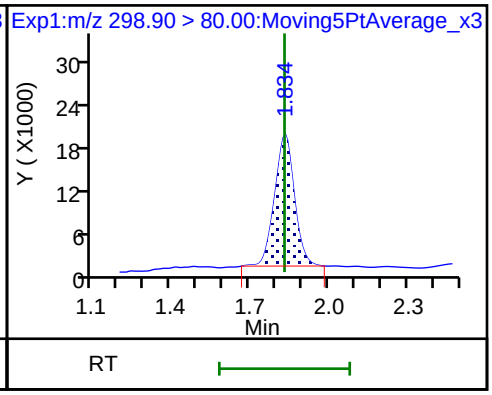
D 3 13C5-PFPeA



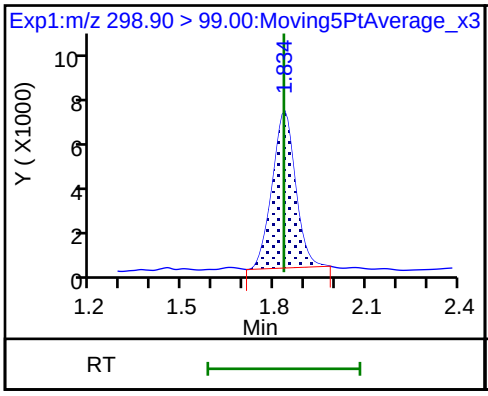
D 47 13C3-PFBS



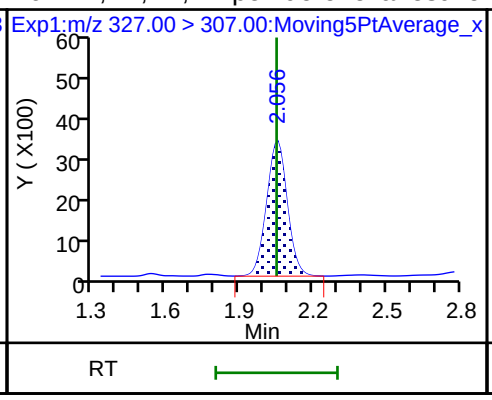
5 Perfluorobutanesulfonic acid



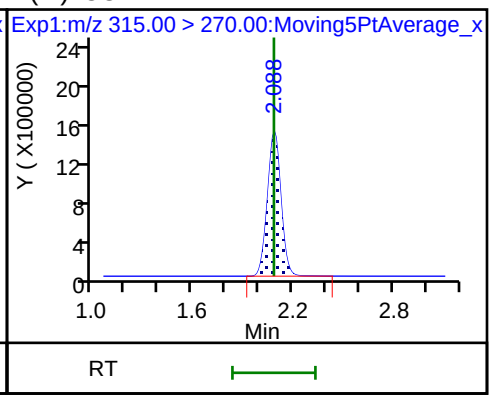
5 Perfluorobutanesulfonic acid



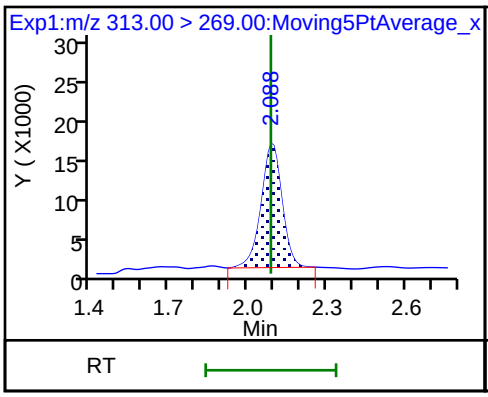
61 1H,1H,2H,2H-perfluorohexanesulfon



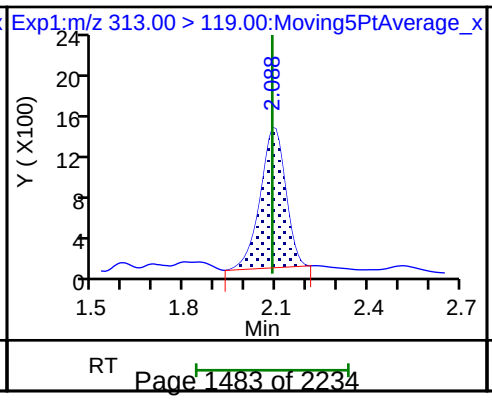
D (M)13C2 PFHxA



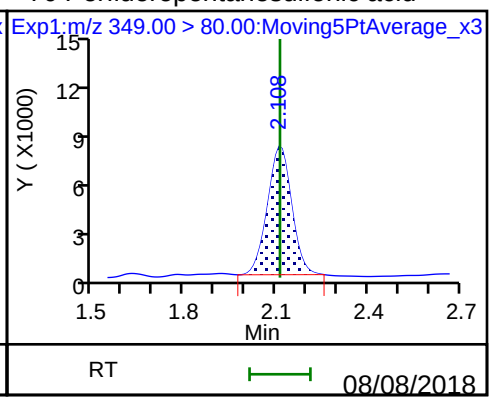
6 Perfluorohexanoic acid



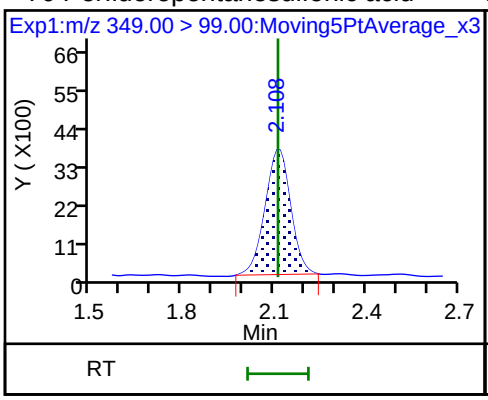
6 Perfluorohexanoic acid



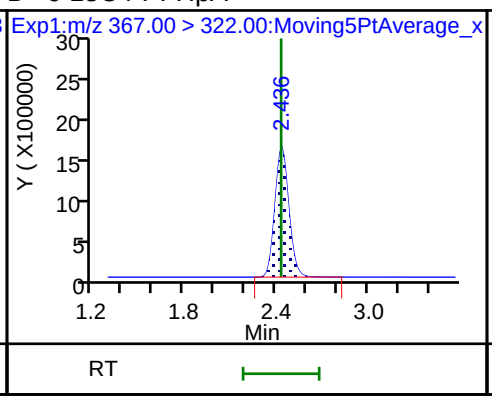
70 Perfluoropentanesulfonic acid



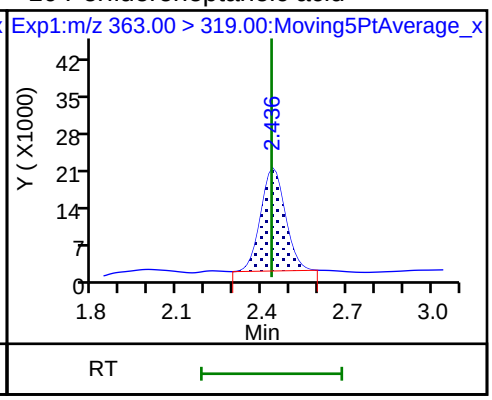
70 Perfluoropentanesulfonic acid



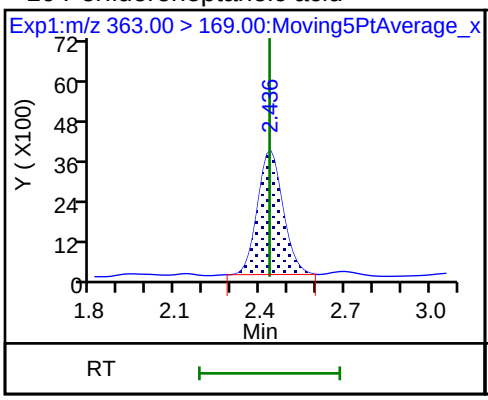
D 9 13C4-PFHpA



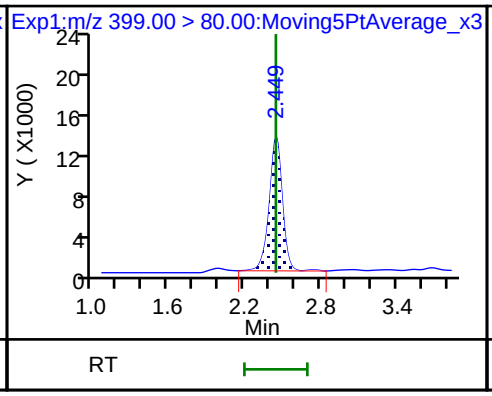
10 Perfluoroheptanoic acid



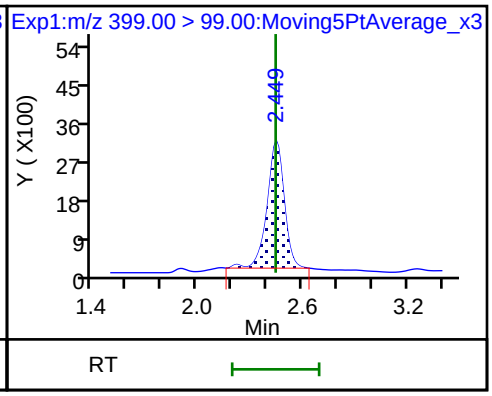
10 Perfluoroheptanoic acid



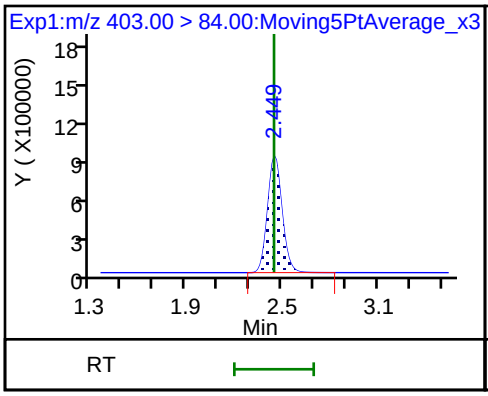
8 Perfluorohexanesulfonic acid



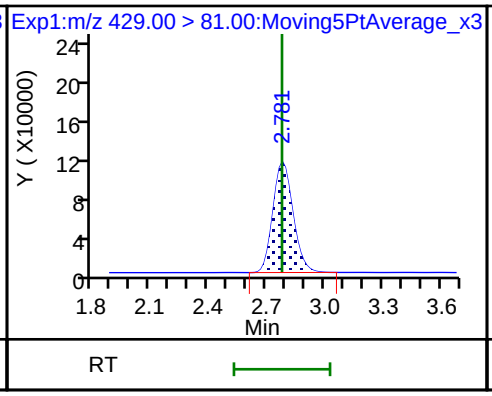
8 Perfluorohexanesulfonic acid



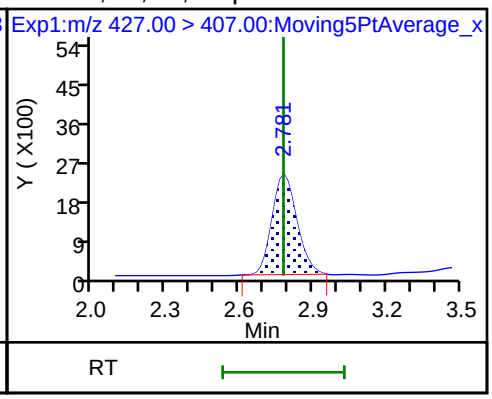
D 11 18O2 PFHxS



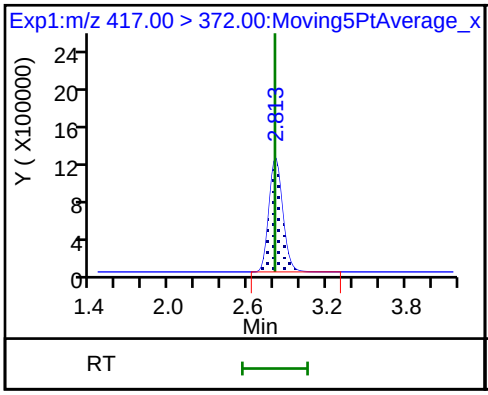
D 12 M2-6:2FTS



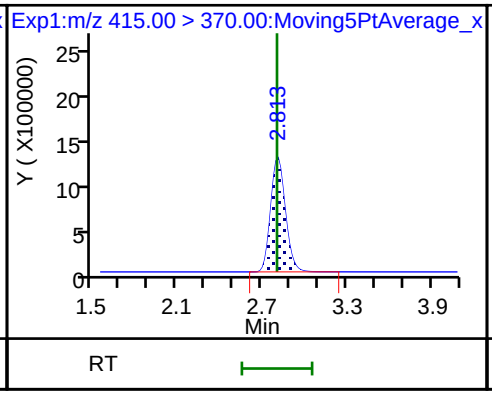
13 1H,1H,2H,2H-perfluorooctanesulfoni



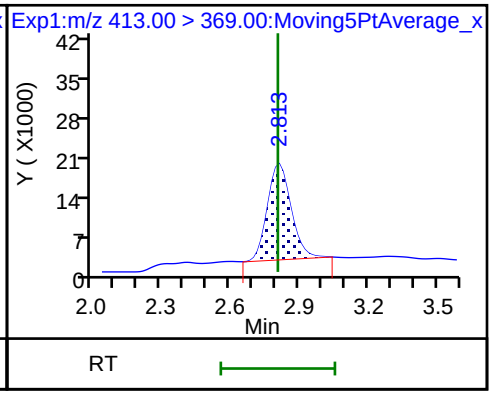
D 14 13C4 PFOA



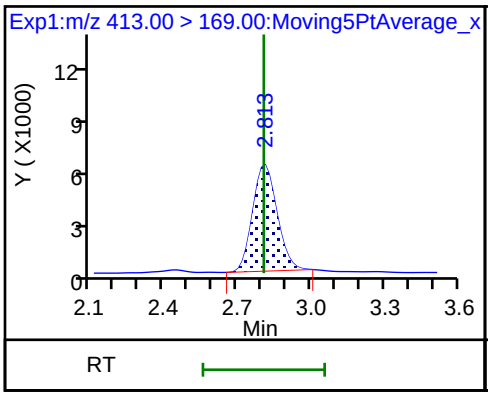
* 62 13C2-PFOA



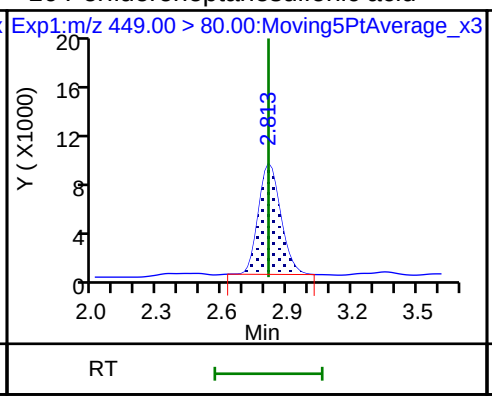
15 Perfluorooctanoic acid



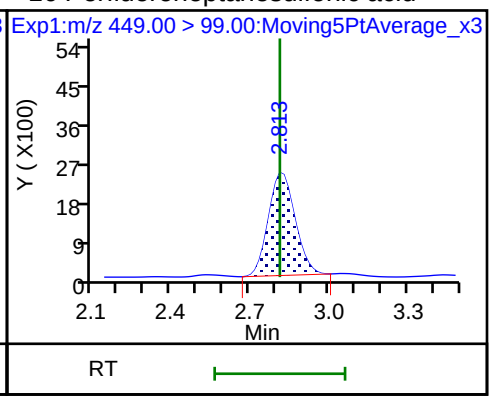
15 Perfluorooctanoic acid



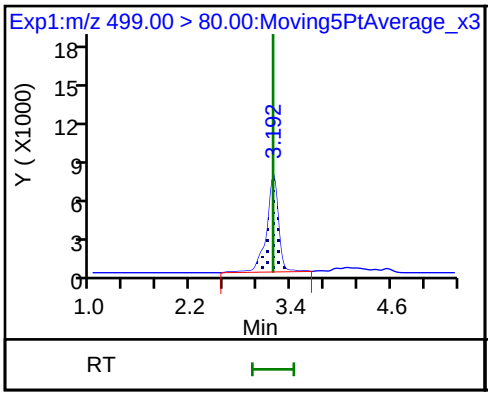
16 Perfluoroheptanesulfonic acid



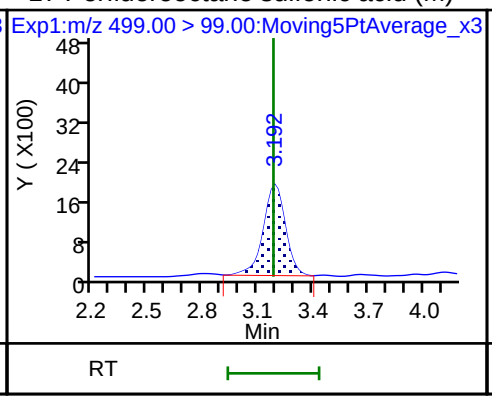
16 Perfluoroheptanesulfonic acid



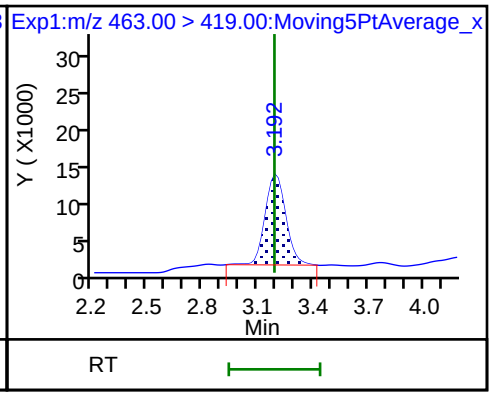
17 Perfluorooctane sulfonic acid



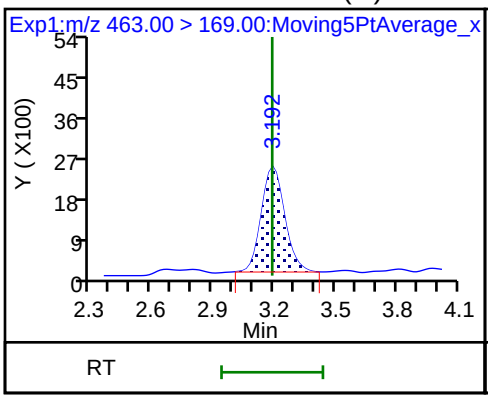
17 Perfluorooctane sulfonic acid (M)



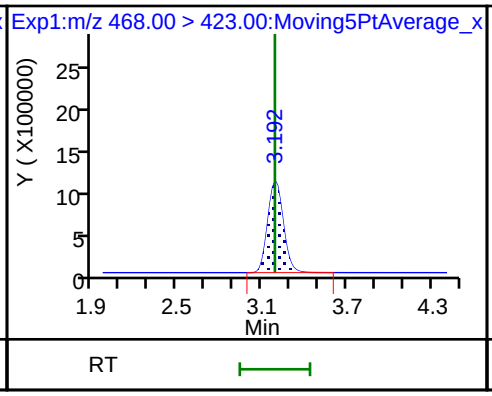
20 Perfluorononanoic acid



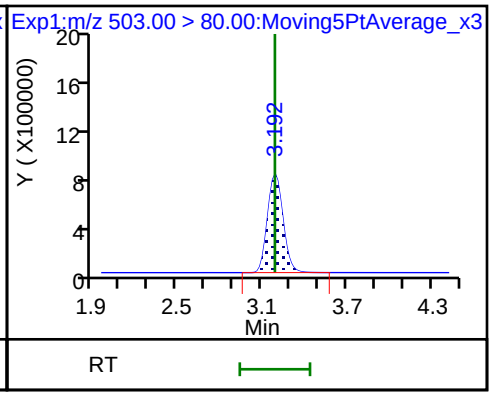
20 Perfluorononanoic acid (M)



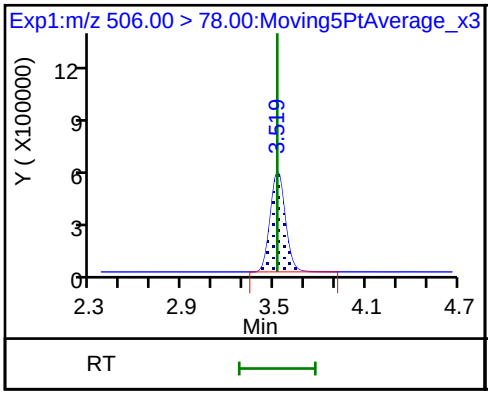
D 19 13C5 PFNA



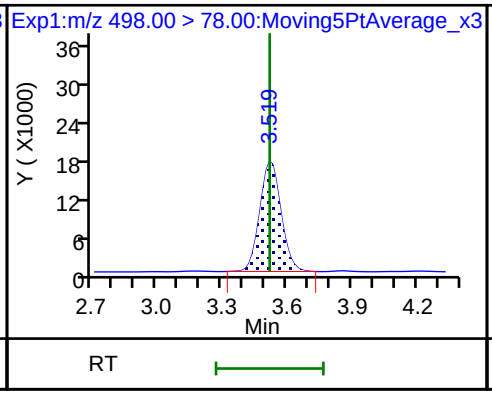
D 18 13C4 PFOS



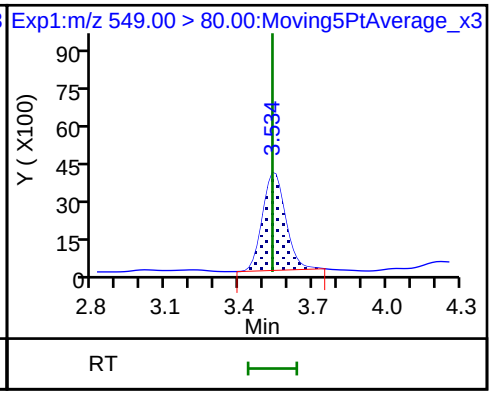
D 21 13C8 FOSA



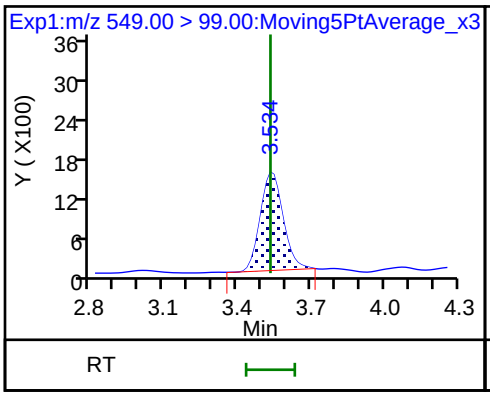
22 Perfluorooctane Sulfonamide



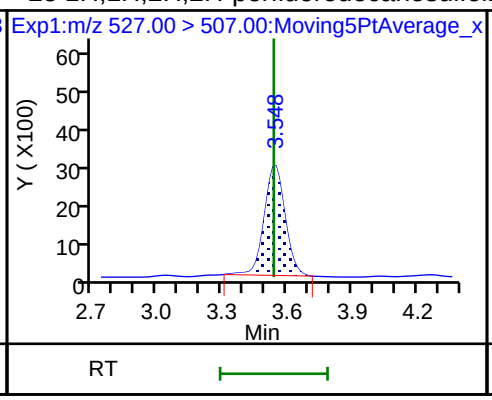
68 Perfluorononanesulfonic acid



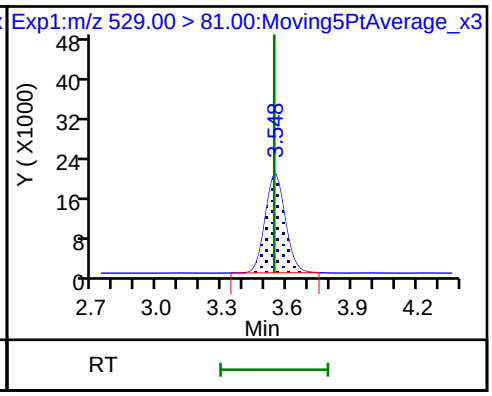
68 Perfluorononanesulfonic acid



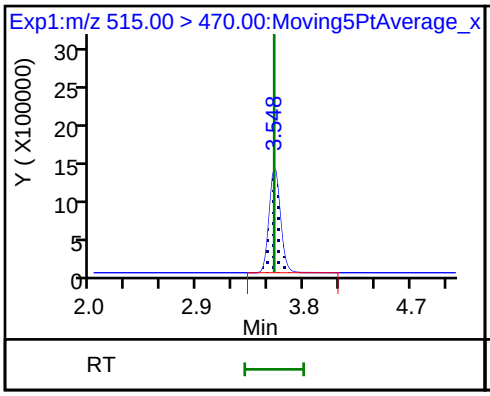
25 1H,1H,2H,2H-perfluorodecanesulfon



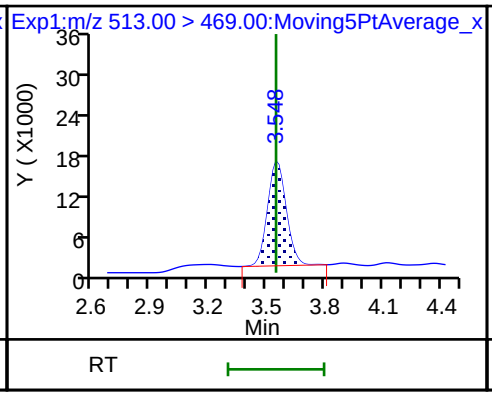
D 26 M2-8:2FTS



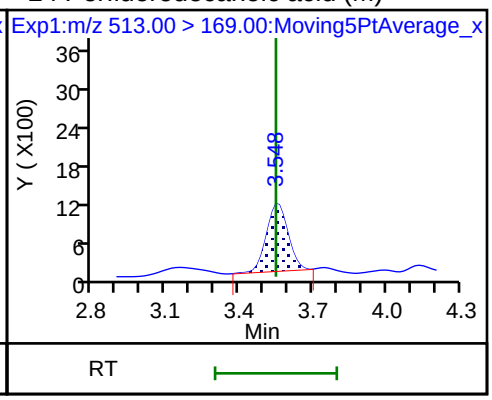
D 23 13C2 PFDA



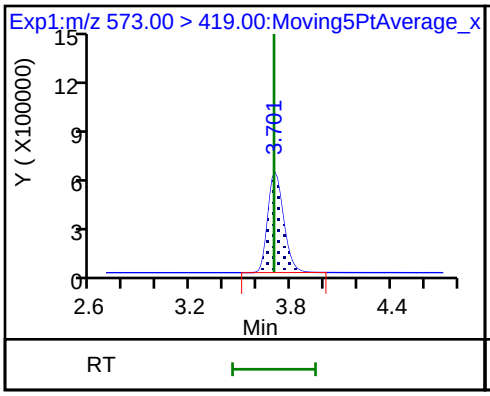
24 Perfluorodecanoic acid



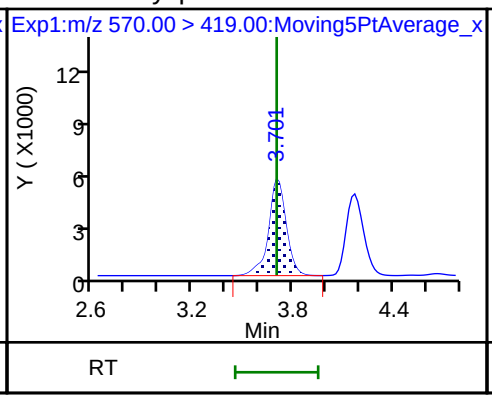
24 Perfluorodecanoic acid (M)



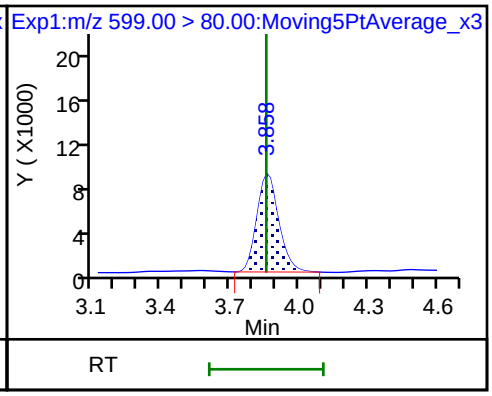
D 27 d3-NMeFOSAA



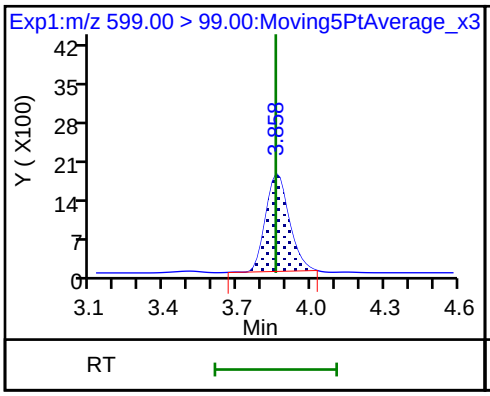
28 N-methyl perfluorooctane sulfonami



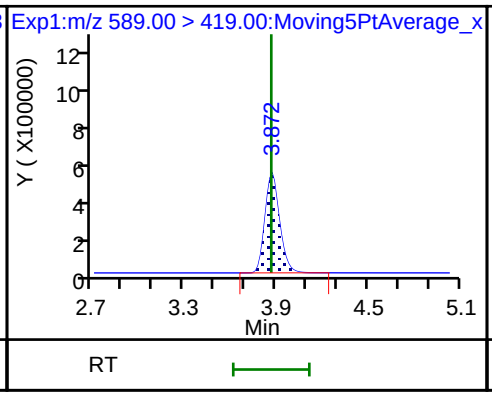
29 Perfluorodecane Sulfonic acid



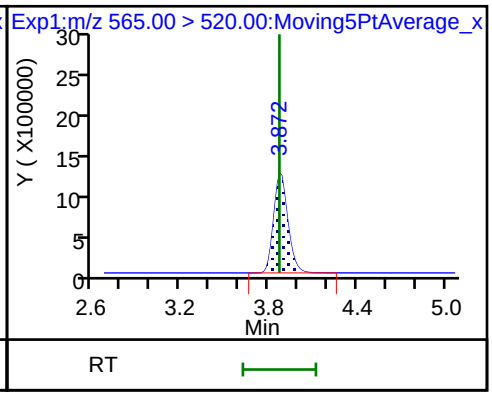
29 Perfluorodecane Sulfonic acid



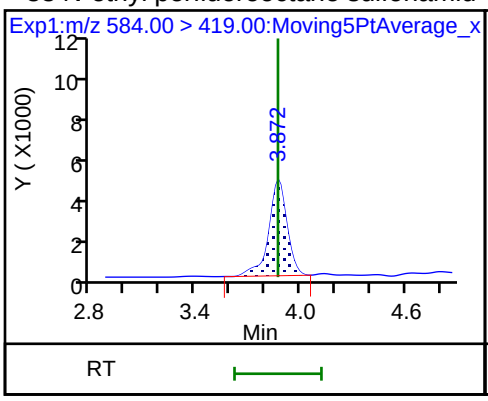
D 32 d5-NEtFOSAA



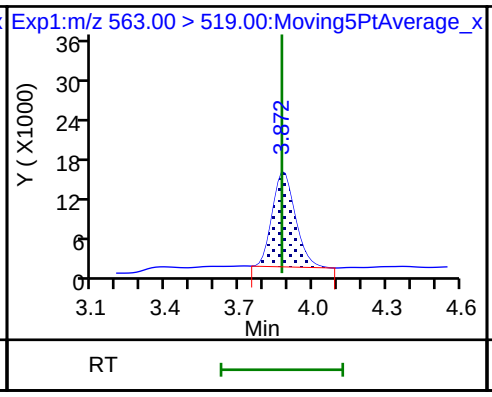
D 30 13C2 PFUnA



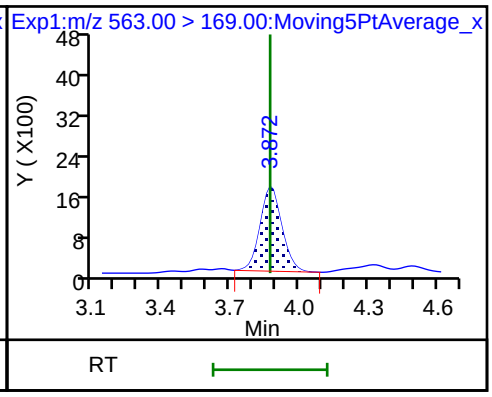
33 N-ethyl perfluorooctane sulfonamid



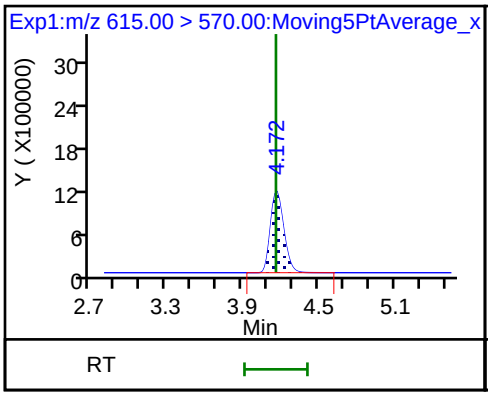
31 Perfluoroundecanoic acid



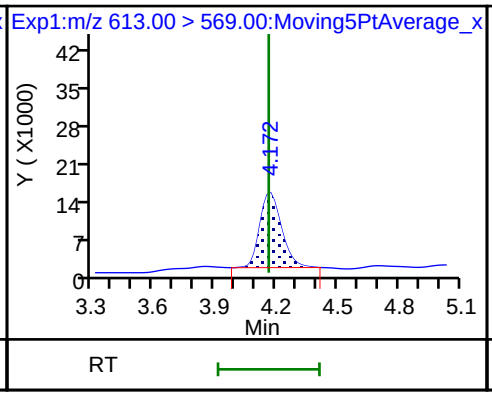
31 Perfluoroundecanoic acid



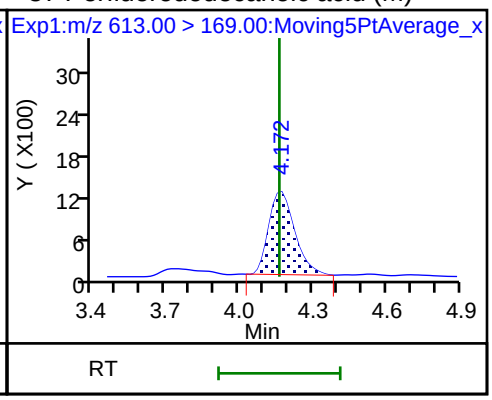
D 36 13C2 PFDoA



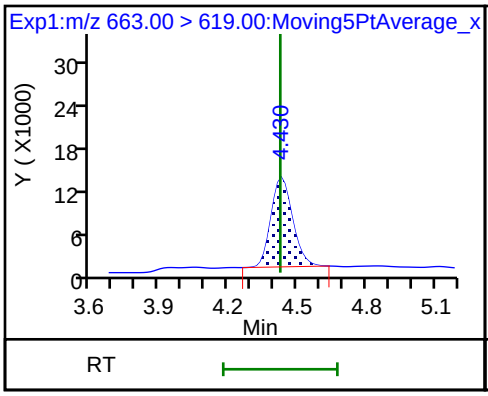
37 Perfluorododecanoic acid



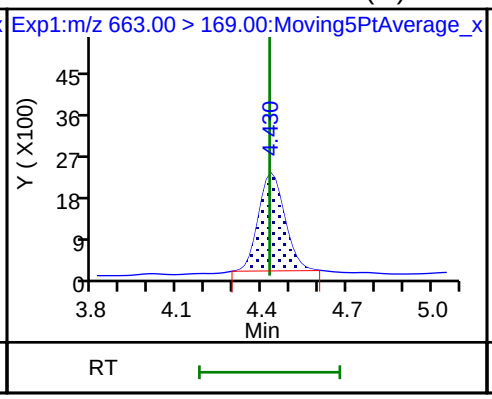
37 Perfluorododecanoic acid (M)



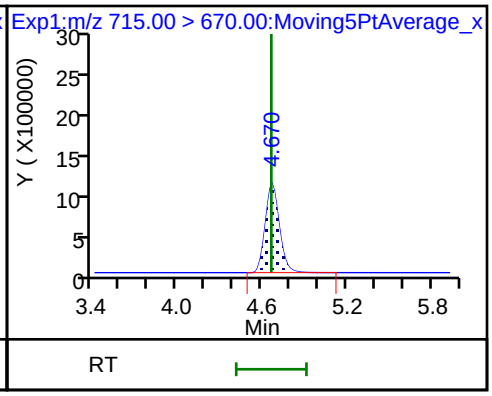
41 Perfluorotridecanoic acid



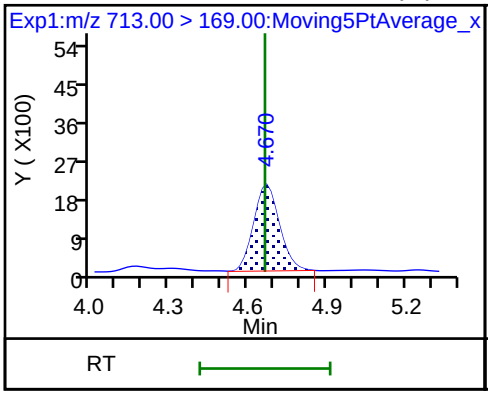
41 Perfluorotridecanoic acid (M)



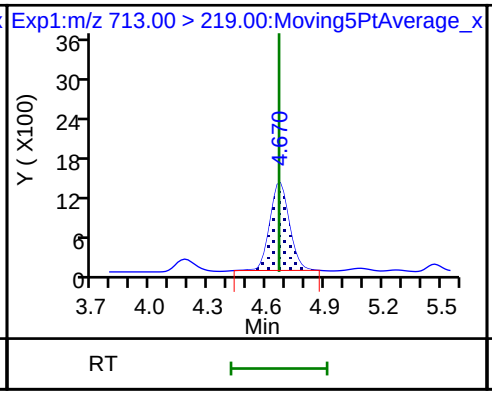
D 43 13C2-PFTeDA



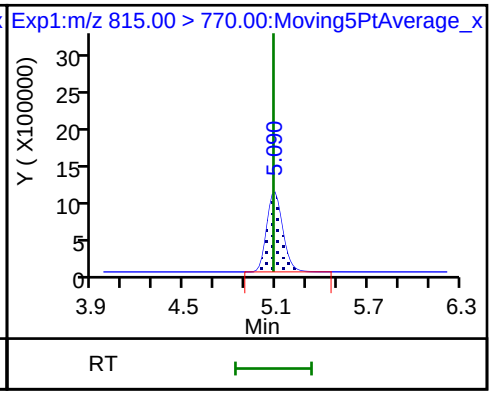
42 Perfluorotetradecanoic acid (M)



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

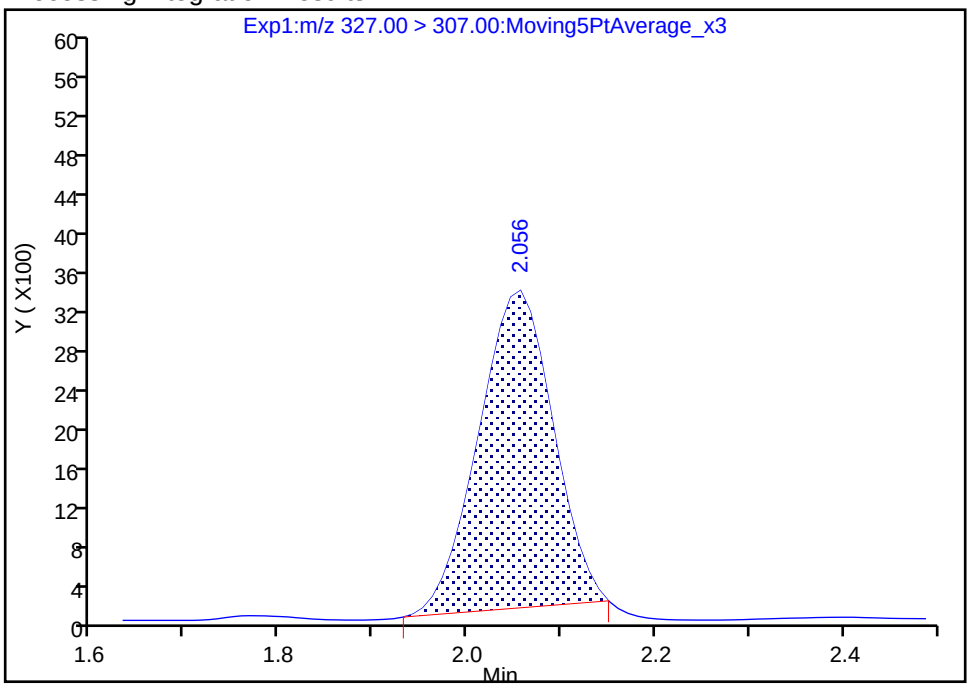
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d				
Injection Date:	20-Jul-2018 19:32:31	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

61 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:, CAS: 757124-72-4

Signal: 1

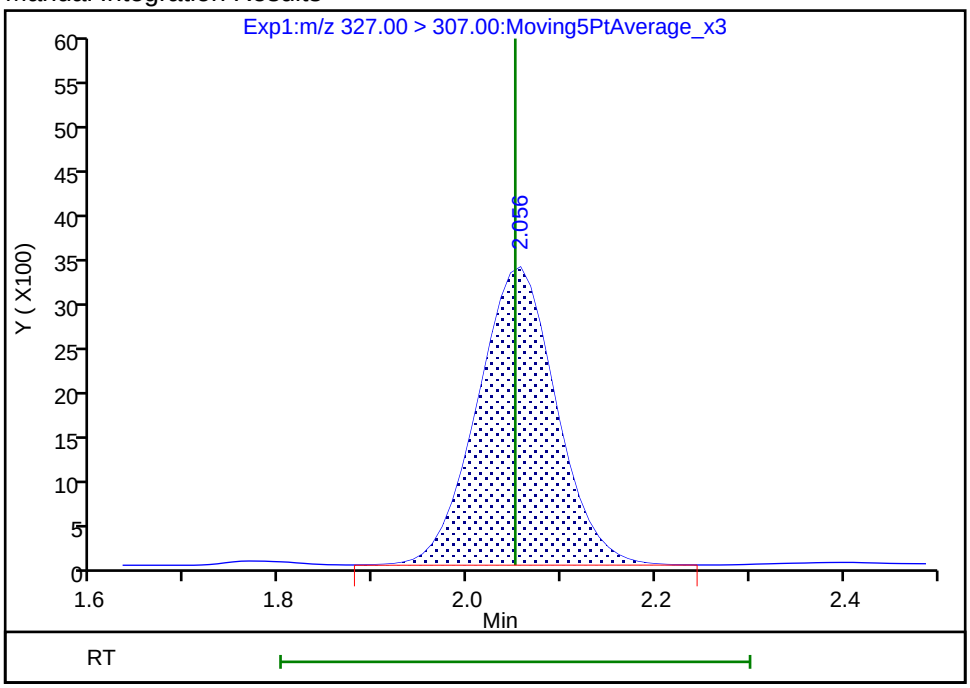
Processing Integration Results

RT: 2.06
Area: 17904
Amount: 0.021038
Amount Units: ng/ml



Manual Integration Results

RT: 2.06
Area: 19694
Amount: 0.022847
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:52:13

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

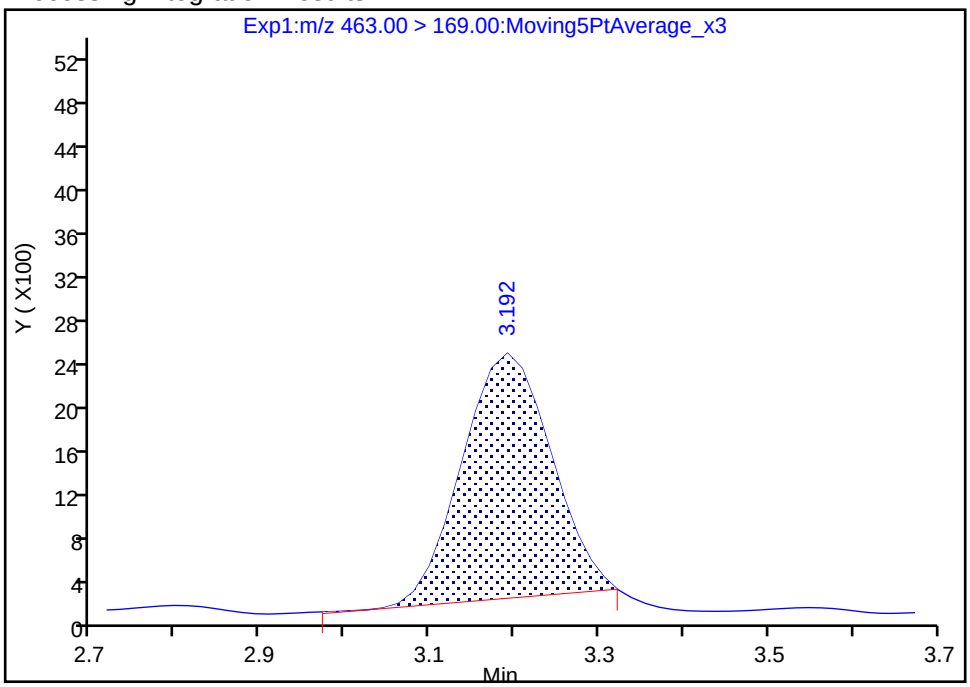
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d				
Injection Date:	20-Jul-2018 19:32:31	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

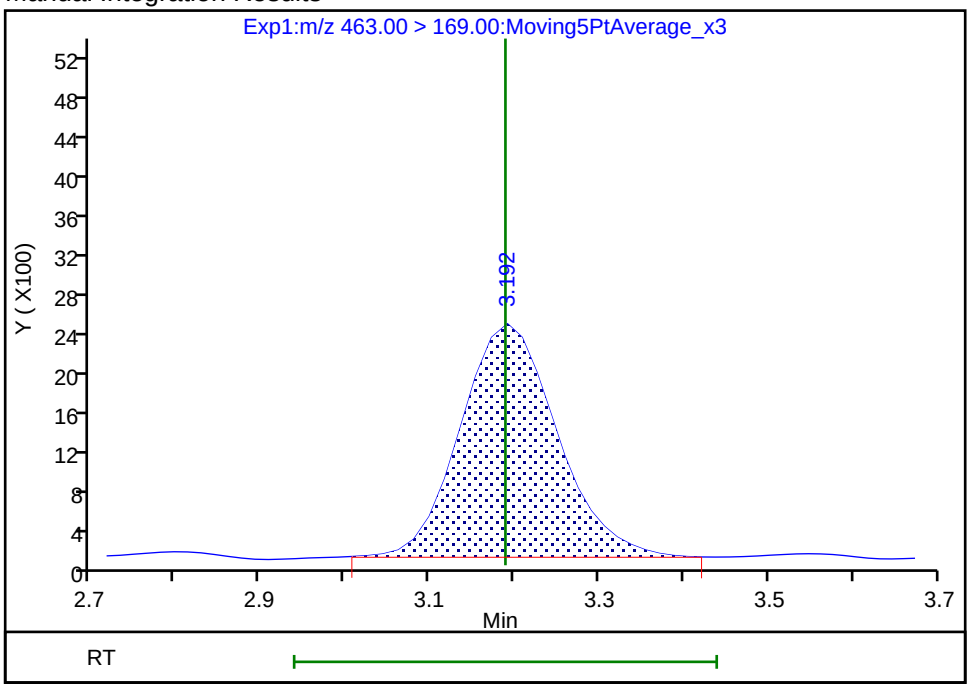
Processing Integration Results

RT: 3.19
Area: 16472
Amount: 0.026634
Amount Units: ng/ml



Manual Integration Results

RT: 3.19
Area: 18787
Amount: 0.026634
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:52:44

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

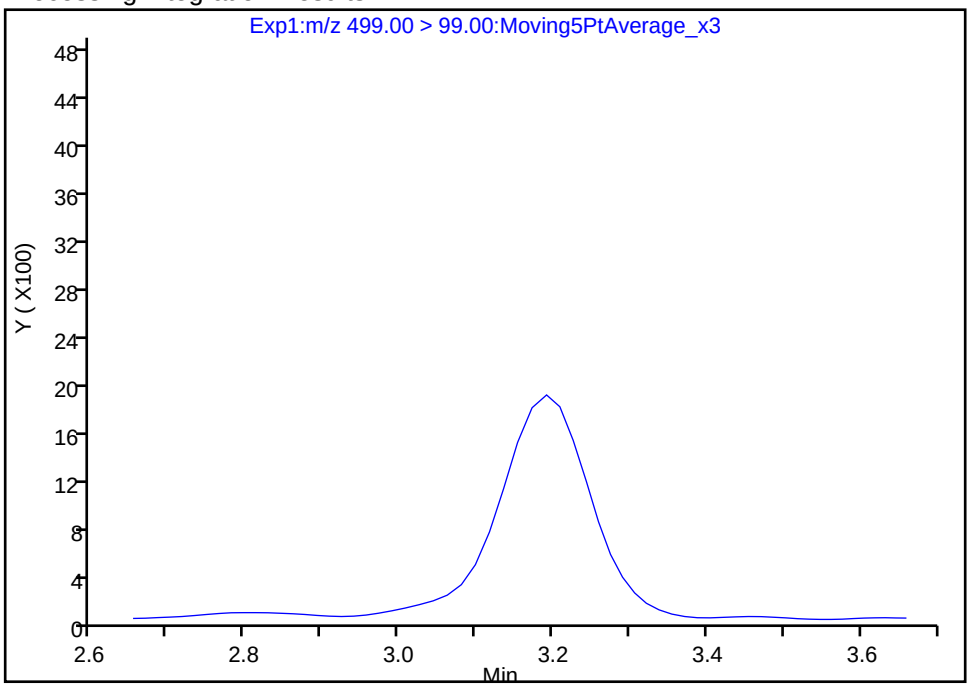
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d				
Injection Date:	20-Jul-2018 19:32:31	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

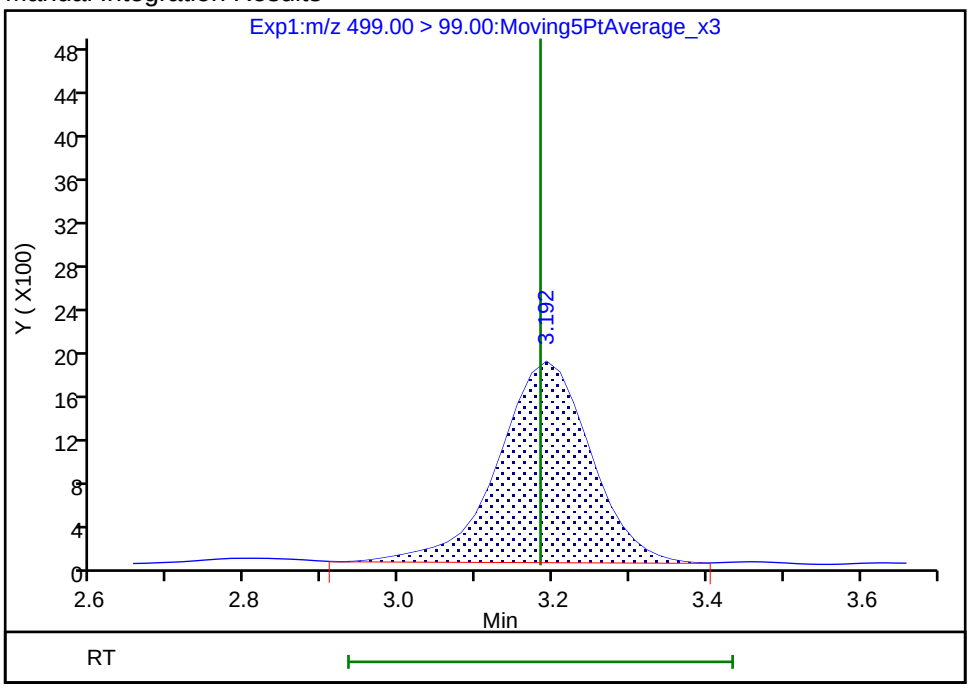
Processing Integration Results

RT: 3.26
Area: 0
Amount: 0.025284
Amount Units: ng/ml



Manual Integration Results

RT: 3.19
Area: 15392
Amount: 0.025284
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:50:54

Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

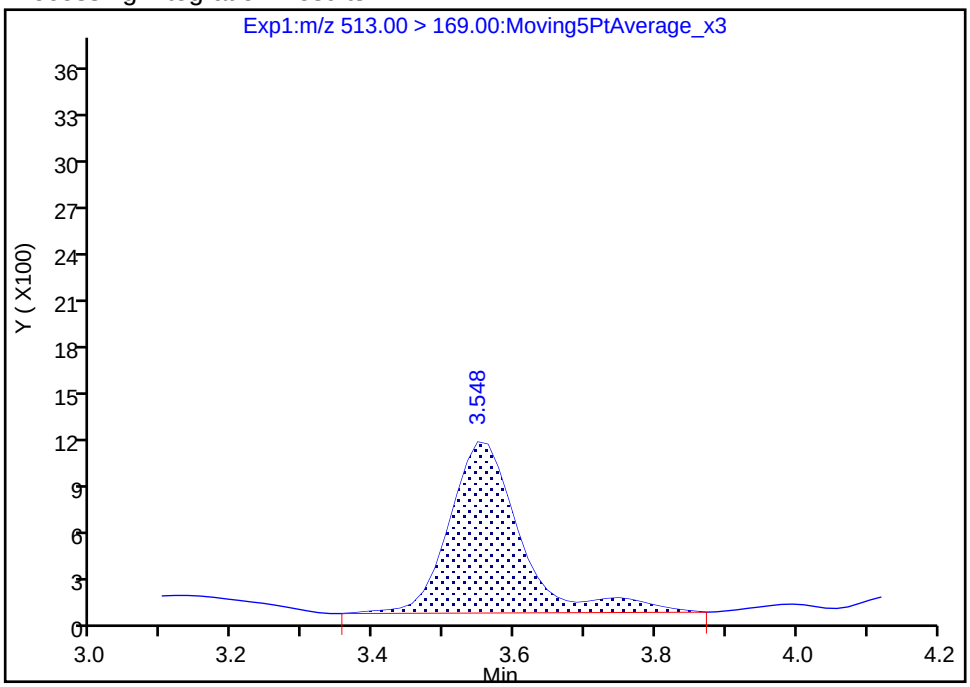
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d				
Injection Date:	20-Jul-2018 19:32:31	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 2

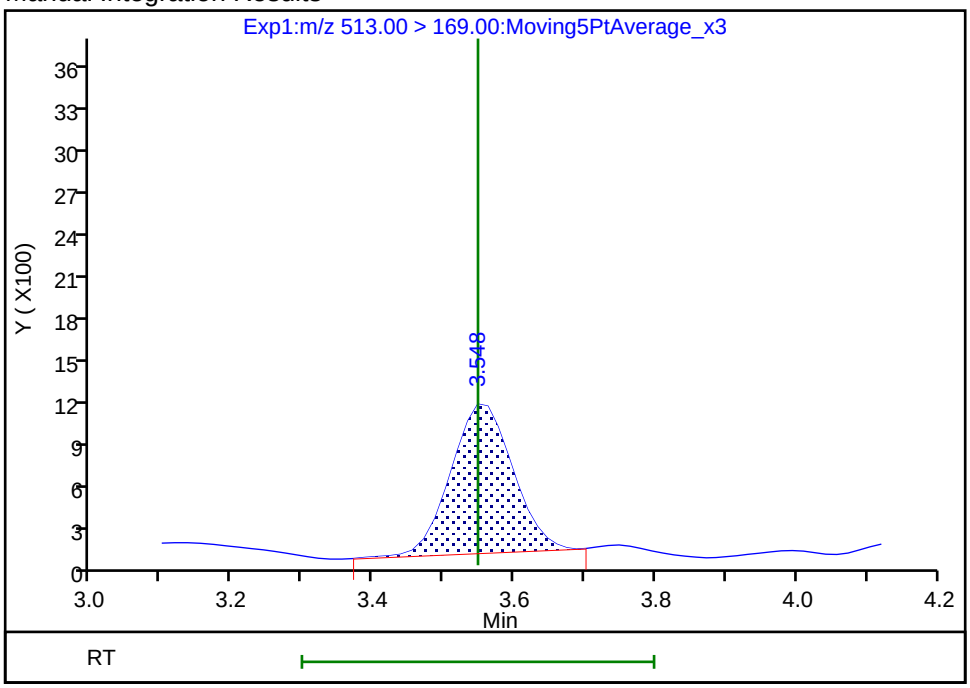
Processing Integration Results

RT: 3.55
Area: 7749
Amount: 0.025028
Amount Units: ng/ml



Manual Integration Results

RT: 3.55
Area: 6555
Amount: 0.025028
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:52:56

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

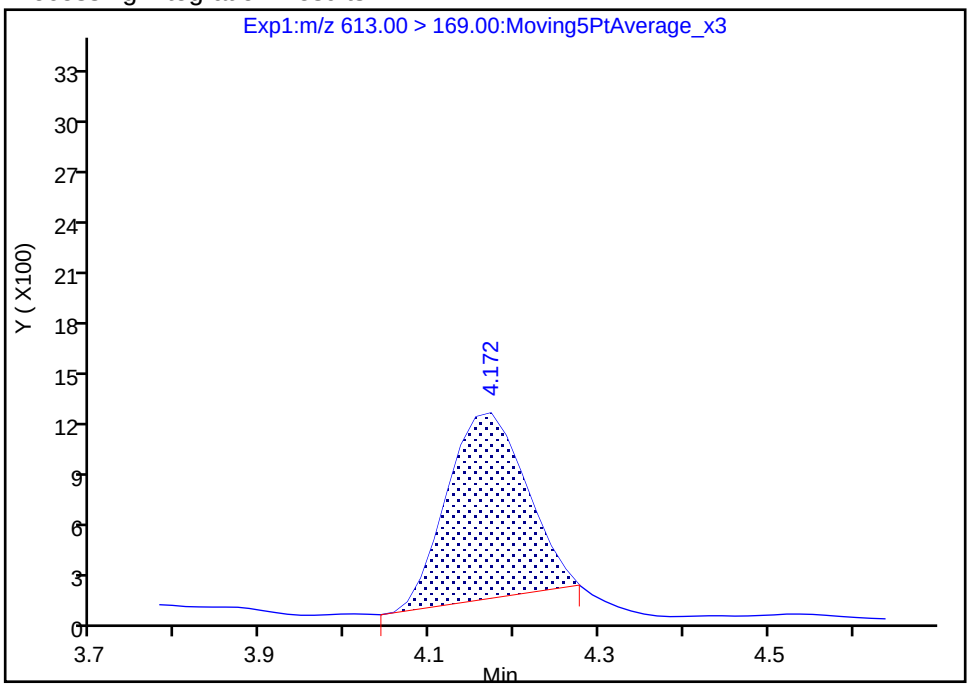
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d				
Injection Date:	20-Jul-2018 19:32:31	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 2

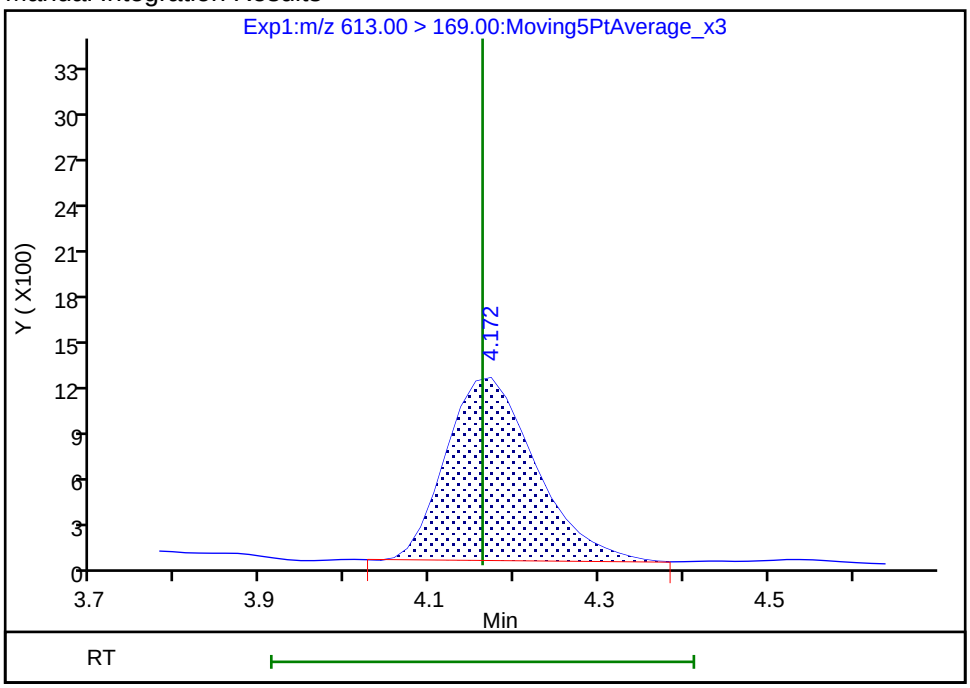
Processing Integration Results

RT: 4.17
Area: 7112
Amount: 0.028976
Amount Units: ng/ml



Manual Integration Results

RT: 4.17
Area: 8740
Amount: 0.028976
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:53:17

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

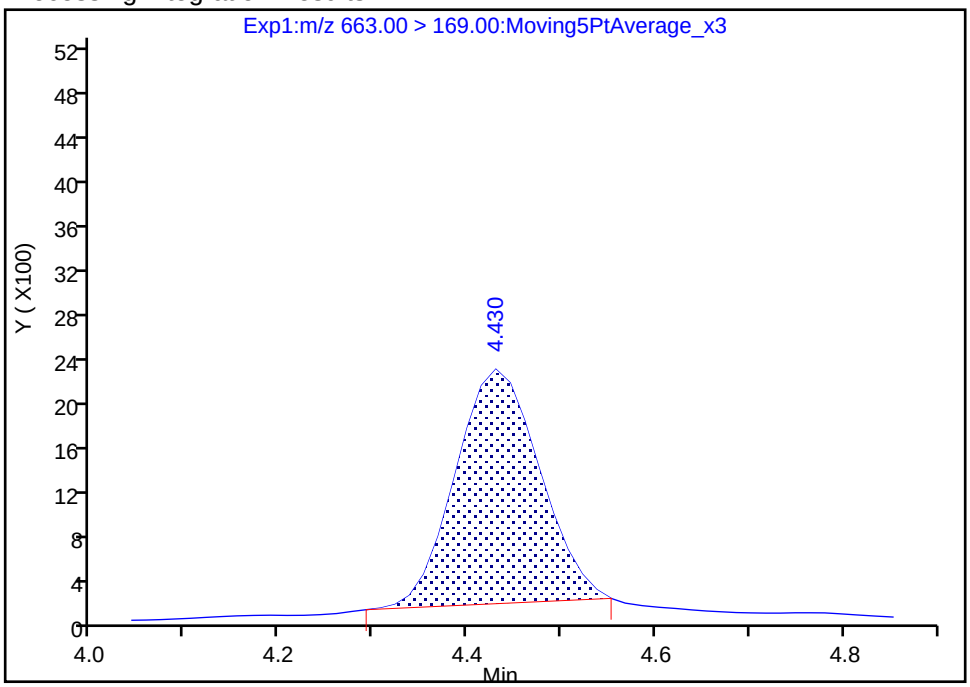
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d				
Injection Date:	20-Jul-2018 19:32:31	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

41 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 2

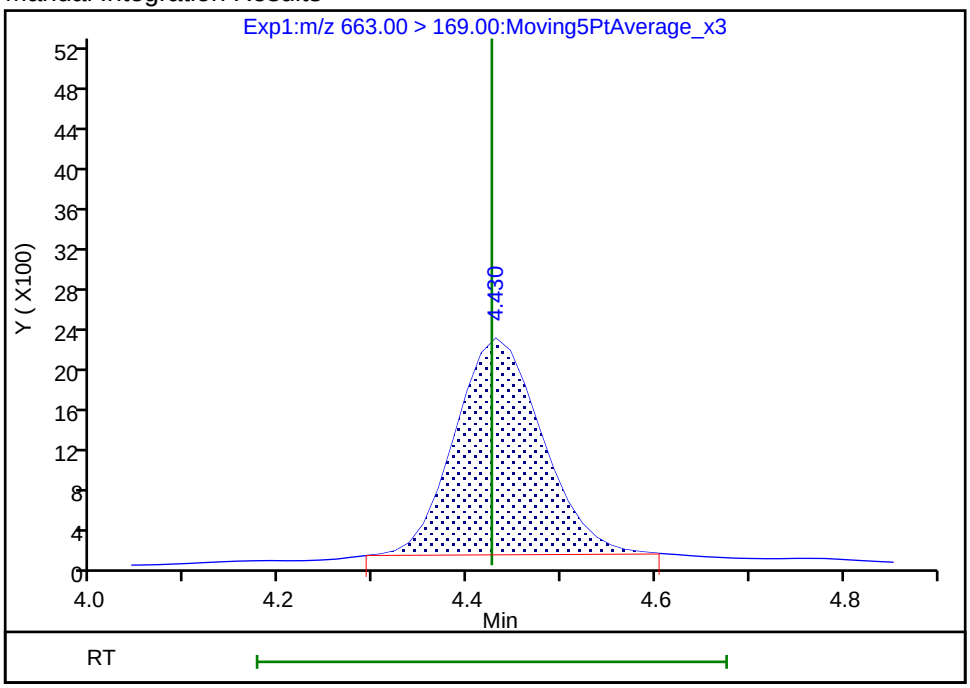
Processing Integration Results

RT: 4.43
Area: 13231
Amount: 0.025064
Amount Units: ng/ml



Manual Integration Results

RT: 4.43
Area: 14036
Amount: 0.025064
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:53:30

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

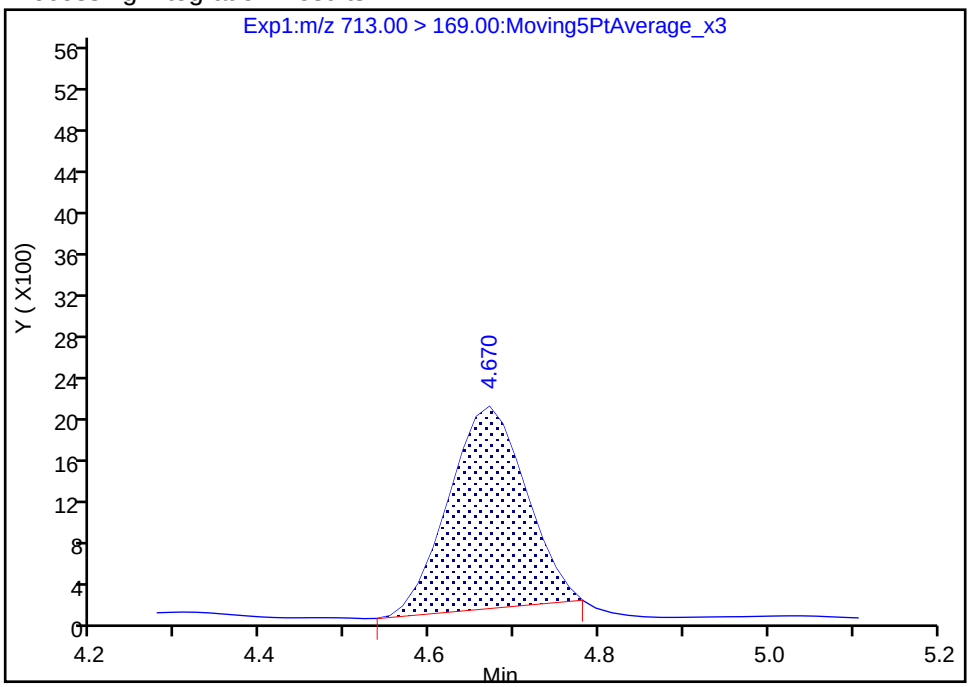
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_004.d				
Injection Date:	20-Jul-2018 19:32:31	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	1	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

42 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 1

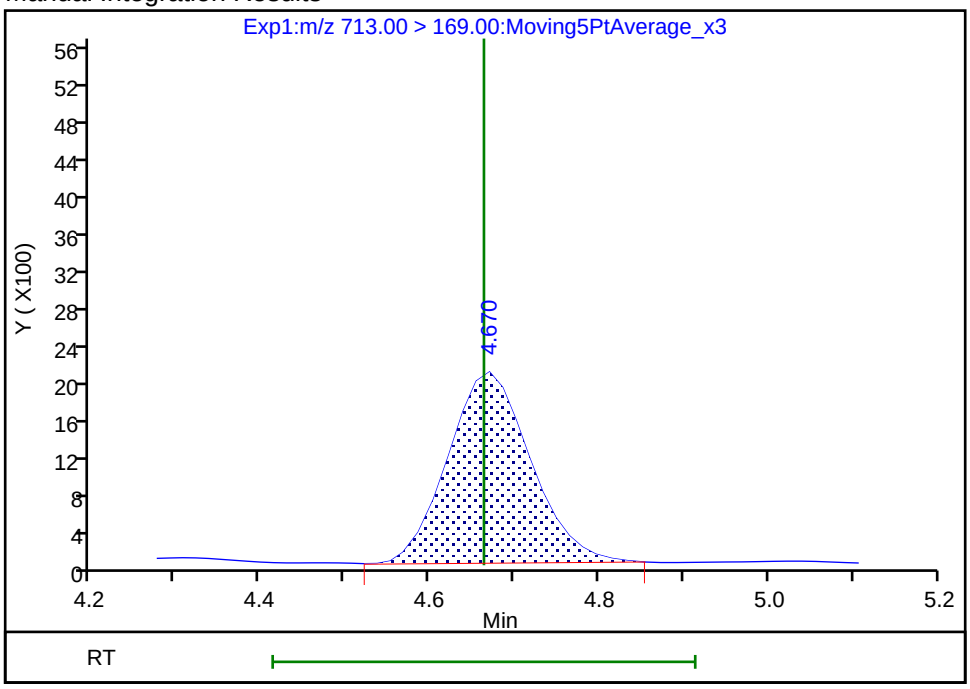
Processing Integration Results

RT: 4.67
Area: 12472
Amount: 0.024476
Amount Units: ng/ml



Manual Integration Results

RT: 4.67
Area: 13963
Amount: 0.026951
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:53:42

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_005.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 20-Jul-2018 19:40:05 ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: L2
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:25:08 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 09:56:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.511	1.515	-0.004	0.540	8688476	2.42		96.7	19408	
2 Perfluorobutyric acid										
212.90 > 169.00	1.518	1.516	0.002	1.004	167911	0.0504		101	24.7	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.785	1.789	-0.004	1.000	185793	0.0526		105	81.2	
D 3 13C5-PFPeA										
267.90 > 223.00	1.785	1.789	-0.004	0.638	8140376	2.46		98.5	25730	
D 47 13C3-PFBS										
301.90 > 83.00	1.827	1.827	0.0	0.653	92312	2.21		95.2	1620	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.827	1.831	-0.004	1.000	201330	0.0464		105	144	
298.90 > 99.00	1.827	1.831	-0.004	1.000	70786		2.84(1.35-4.05)	105	213	
D 60 M2-4:2FTS										
329.00 > 81.00	2.047	2.051	-0.004	0.732	726185	NC			1763	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.047	2.051	-0.004	1.120	41834	0.0491		105	625	
D 7 13C2 PFHxA										
315.00 > 270.00	2.078	2.085	-0.007	0.743	8456056	2.44		97.5	45359	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.088	2.086	0.002	1.005	172337	0.0538		108	112	
313.00 > 119.00	2.088	2.086	0.002	1.005	12067		14.28(6.96-20.87)	108	71.7	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.109	2.112	-0.003	1.155	97400	0.0470		100	323	
349.00 > 99.00	2.109	2.112	-0.003	1.155	42672		2.28(1.15-3.45)	100	308	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.182	2.189	-0.007	0.780	788810	NC			6737	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.192	2.189	0.003	1.005	36200	NC			21.2	
D 9 13C4-PFHpA										
367.00 > 322.00	2.424	2.431	-0.007	0.866	9921303	2.47		98.7	67920	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.437	2.433	0.004	1.005	223218	0.0512		102	81.3	
363.00 > 169.00	2.424	2.433	-0.009	1.000	47906		4.66(2.17-6.52)	102	265	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.450	2.446	0.004	1.000	149865	0.0466		102	247	
399.00 > 99.00	2.450	2.446	0.004	1.000	45210		3.31(1.90-5.70)	102	236	
D 11 18O2 PFHxS										
403.00 > 84.00	2.450	2.447	0.003	0.876	5707383	2.33		98.7	29390	
65 ADONA										
377.00 > 251.00	2.475	2.477	-0.002	0.775	390525	NC			1773	
377.00 > 85.00	2.475	2.477	-0.002	0.775	152667		2.56(1.05-3.16)		80.5	
D 12 M2-6:2FTS										
429.00 > 81.00	2.782	2.779	0.003	0.994	887572	2.36		99.4	3436	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.782	2.779	0.003	1.000	40529	0.0497		105	710	
D 14 13C4 PFOA										
417.00 > 372.00	2.798	2.804	-0.006	1.000	9178155	2.54		102	45523	
* 62 13C2-PFOA										
415.00 > 370.00	2.798	2.804	-0.006		9226413	2.50			36424	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.798	2.806	-0.008	1.000	228448	0.0540		108	39.2	
413.00 > 169.00	2.798	2.806	-0.008	1.000	81998		2.79(1.36-4.08)	108	305	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.814	2.813	0.001	0.881	139091	0.0492		103	234	
449.00 > 99.00	2.814	2.813	0.001	0.881	33095		4.20(1.84-5.53)	103	510	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.173	3.184	-0.011	0.994	139069	0.0466		100	260	
499.00 > 99.00	3.192	3.184	0.008	1.000	34324		4.05(2.04-6.12)	100	238	
20 Perfluorononanoic acid										
463.00 > 419.00	3.192	3.189	0.003	1.000	200154	0.0551		110	62.3	
463.00 > 169.00	3.192	3.189	0.003	1.000	31524		6.35(2.68-8.03)	110	71.3	
D 19 13C5 PFNA										
468.00 > 423.00	3.192	3.189	0.003	1.141	8474952	2.50		99.9	39428	
D 18 13C4 PFOS										
503.00 > 80.00	3.192	3.189	0.003	1.141	6341311	2.42		101	9240	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.388	3.398	-0.010	1.062	167100	NC			488	
D 21 13C8 FOSA										
506.00 > 78.00	3.519	3.519	0.0	1.258	3686257	2.49		99.6	12925	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.519	3.519	0.0	1.000	237227	0.0526		105	837	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.534	3.534	0.0	1.107	48095	0.0462		96.3	137	
549.00 > 99.00	3.534	3.534	0.0	1.107	18511		2.60(1.42-4.26)	96.3	102	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.534	3.538	-0.004	1.000	39413	0.0489		102	176	
D 26 M2-8:2FTS										
529.00 > 81.00	3.534	3.540	-0.006	1.263	121380	2.37		98.8	1452	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.268	8650981	2.45		98.1	30919	
24 Perfluorodecanoic acid										M
513.00 > 469.00	3.548	3.548	0.0	1.000	215343	0.0530		106	58.7	
513.00 > 169.00	3.548	3.548	0.0	1.000	14309		15.05(7.12-21.35)	106	50.8	M
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.702	3.698	0.004	1.323	4140403	2.49		99.8	11579	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.702	3.702	0.0	1.000	87825	0.0512		102	63.2	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.858	3.856	0.002	1.209	116789	0.0471		97.7	194	
599.00 > 99.00	3.858	3.856	0.002	1.209	27489		4.25(2.14-6.43)	97.7	278	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.858	3.866	-0.008	1.379	3680693	2.77		111	5267	
D 30 13C2 PFUnA										
565.00 > 520.00	3.873	3.870	0.003	1.384	7967477	2.47		99.0	30167	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.873	3.870	0.003	1.004	70619	0.0478		95.6	289	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.873	3.872	0.001	1.000	164485	0.0532		106	51.6	
563.00 > 169.00	3.873	3.872	0.001	1.000	19940		8.25(5.24-15.72)	106	89.7	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.261	201737	NC			966	
D 36 13C2 PFDoA										
615.00 > 570.00	4.155	4.162	-0.007	1.485	8658513	2.50		100	31171	
37 Perfluorododecanoic acid										M
613.00 > 569.00	4.155	4.162	-0.007	1.000	204578	0.0547		109	62.1	
613.00 > 169.00	4.155	4.162	-0.007	1.000	15961		12.82(4.68-14.05)	109	49.2	M
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.431	4.426	0.005	1.066	199692	0.0576		115	73.8	
663.00 > 169.00	4.415	4.426	-0.011	1.063	28334		7.05(3.09-9.27)	115	99.4	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.655	4.664	-0.009	1.664	7360849	2.46		98.4	20954	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.655	4.664	-0.009	1.000	26222	0.0517		103	99.5	
713.00 > 219.00	4.655	4.664	-0.009	1.000	18064		1.45(0.70-2.09)	103	114	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.074	5.081	-0.007	1.814	7605993	2.47		98.8	9750	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.074	5.083	-0.009	1.000	233219	NC			41.2	
813.00 > 169.00	5.074	5.083	-0.009	1.000	35327		6.60(2.77-8.32)		96.7	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.073	125185	NC			27.9	
913.00 > 169.00	5.445	5.443	0.002	1.073	22789		5.49(2.55-7.64)		151	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:25:11 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_005.d

Injection Date: 20-Jul-2018 19:40:05 Instrument ID: A9

Lims ID: IC L2 Full

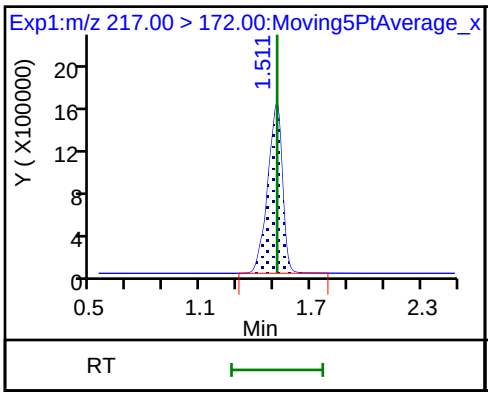
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 2 Worklist Smp#: 3

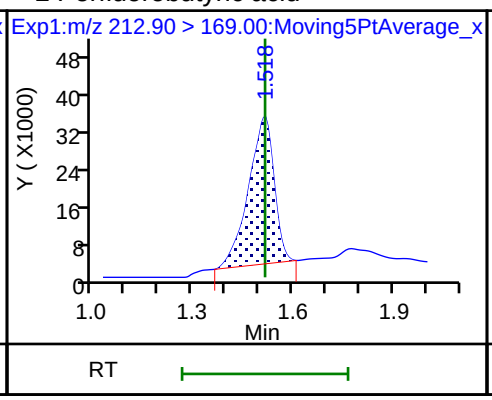
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

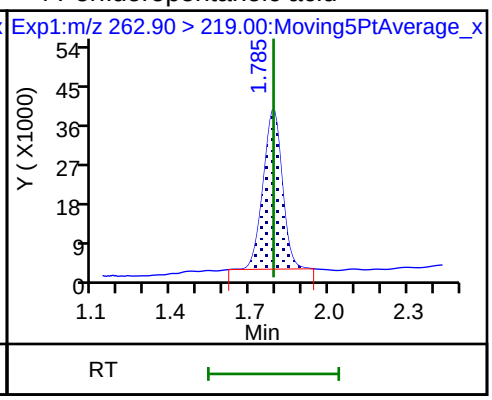
D 1 13C4 PFBA



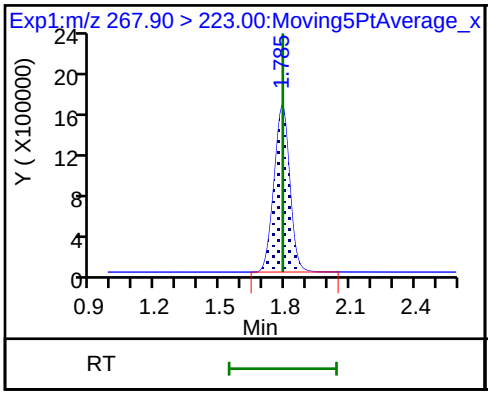
2 Perfluorobutyric acid



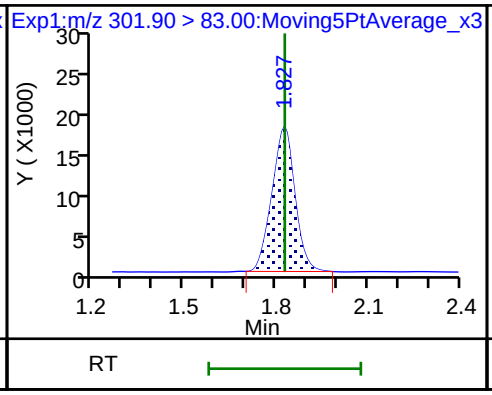
4 Perfluoropentanoic acid



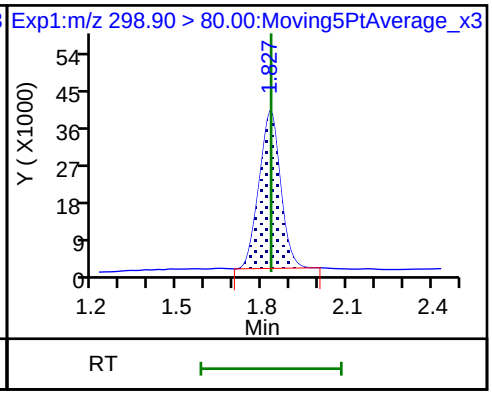
D 3 13C5-PFPeA



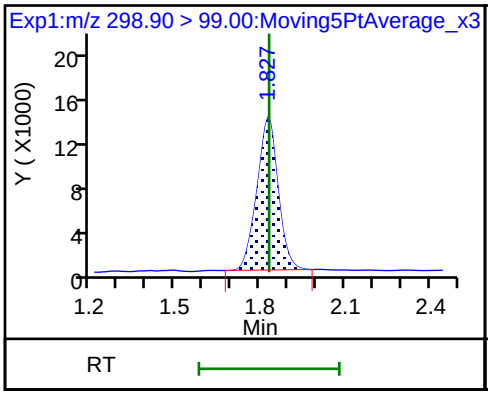
D 47 13C3-PFBS



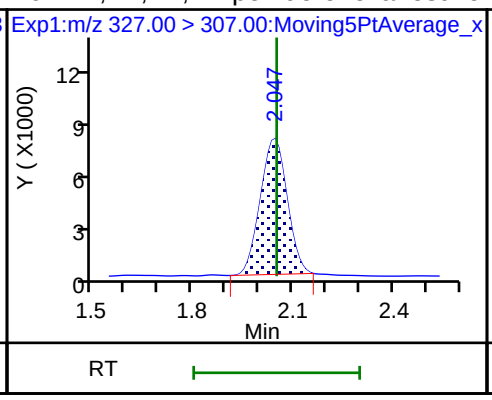
5 Perfluorobutanesulfonic acid



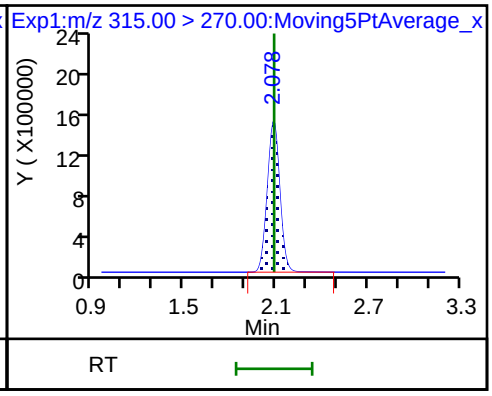
5 Perfluorobutanesulfonic acid



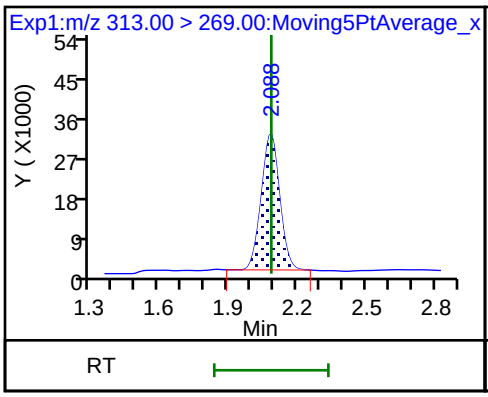
61 1H,1H,2H,2H-perfluorohexanesulfon



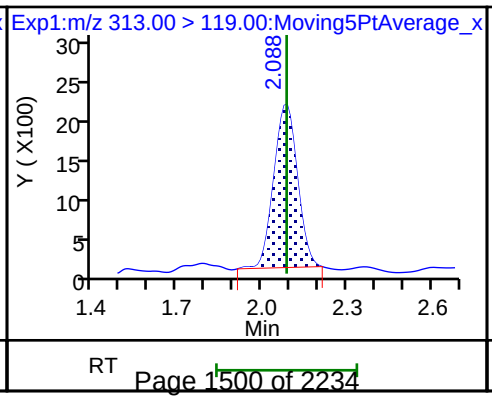
D 7 13C2 PFHxA



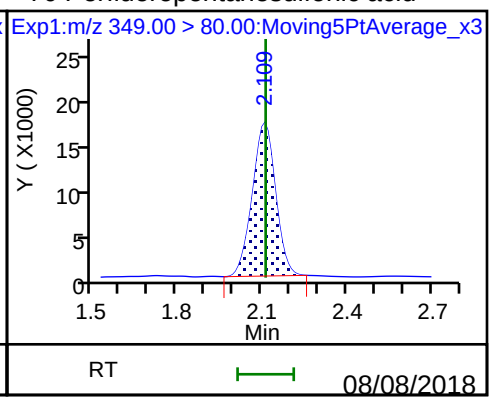
6 Perfluorohexanoic acid



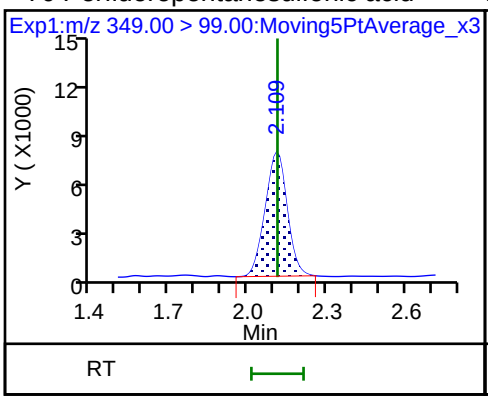
6 Perfluorohexanoic acid



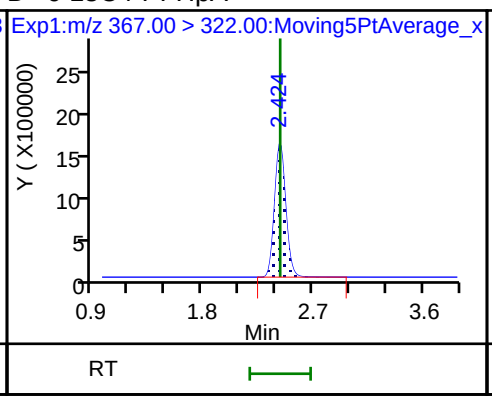
70 Perfluoropentanesulfonic acid



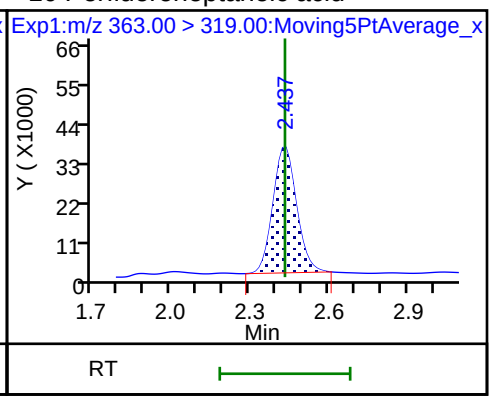
70 Perfluoropentanesulfonic acid



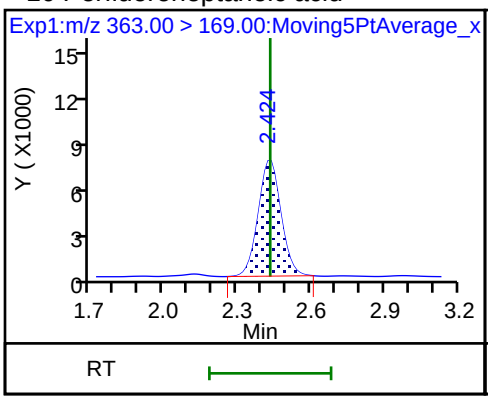
D 9 13C4-PFHpA



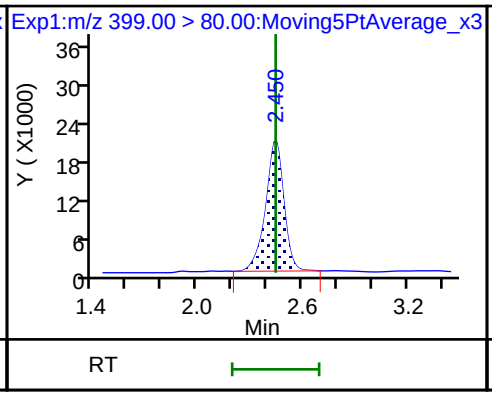
10 Perfluoroheptanoic acid



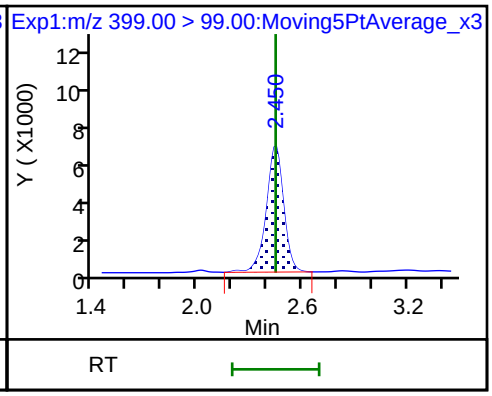
10 Perfluoroheptanoic acid



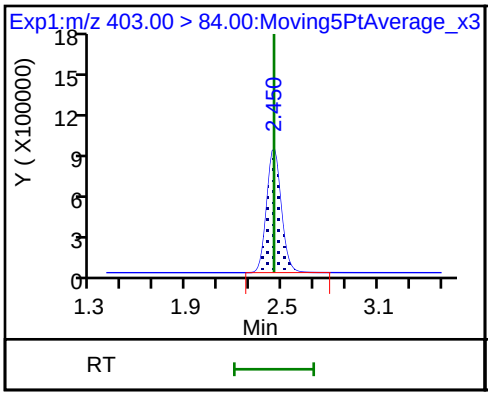
8 Perfluorohexanesulfonic acid



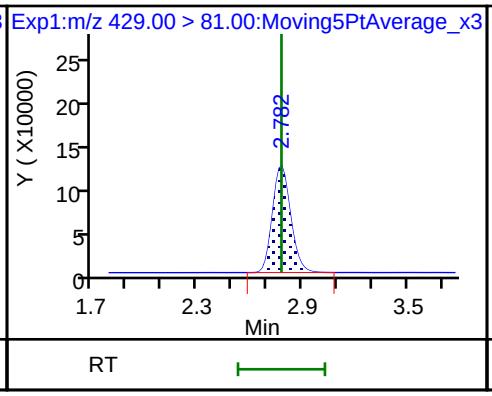
8 Perfluorohexanesulfonic acid



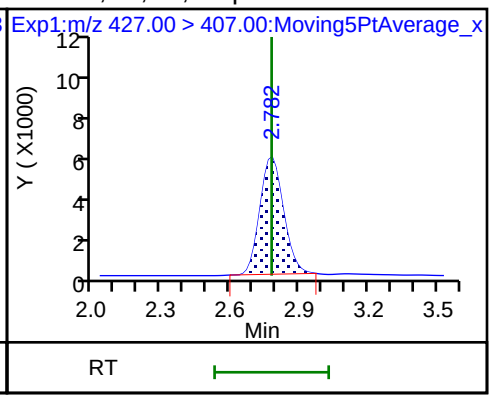
D 11 18O2 PFHxS



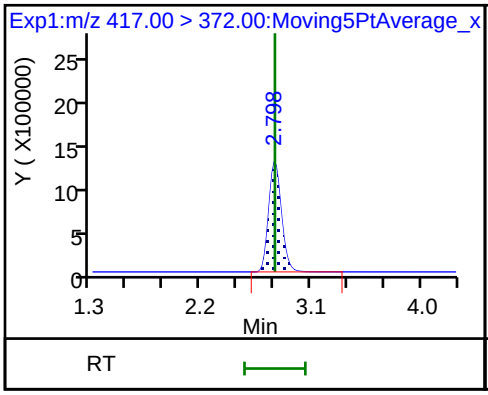
D 12 M2-6:2FTS



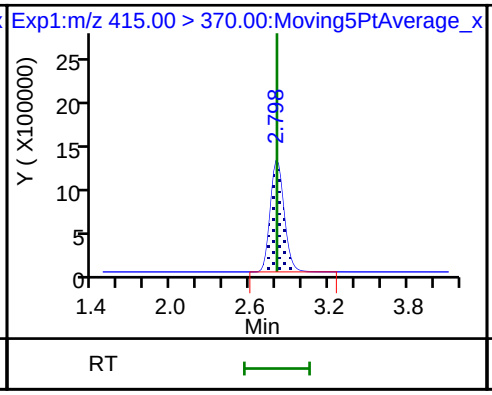
13 1H,1H,2H,2H-perfluorooctanesulfoni



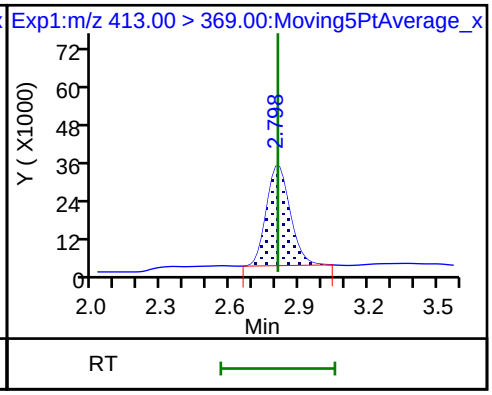
D 14 13C4 PFOA



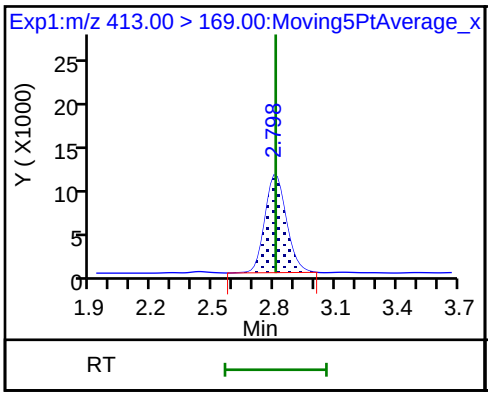
* 62 13C2-PFOA



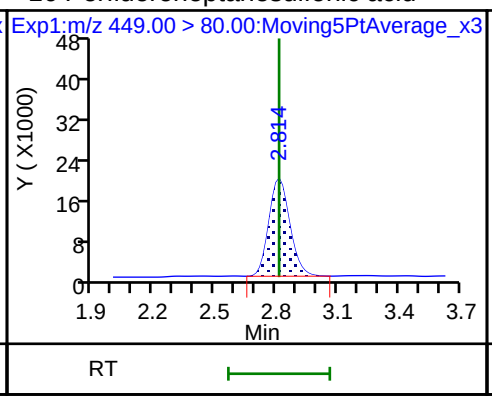
15 Perfluorooctanoic acid



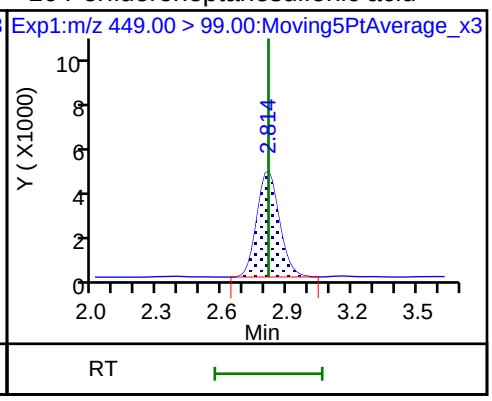
15 Perfluorooctanoic acid



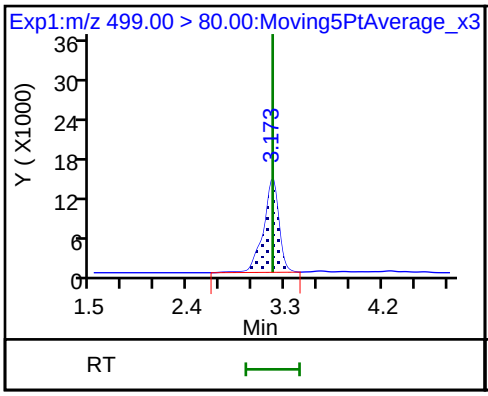
16 Perfluoroheptanesulfonic acid



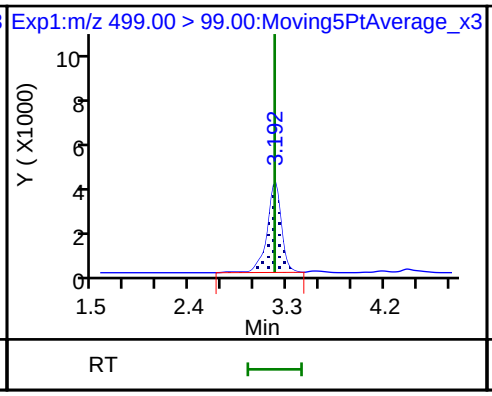
16 Perfluoroheptanesulfonic acid



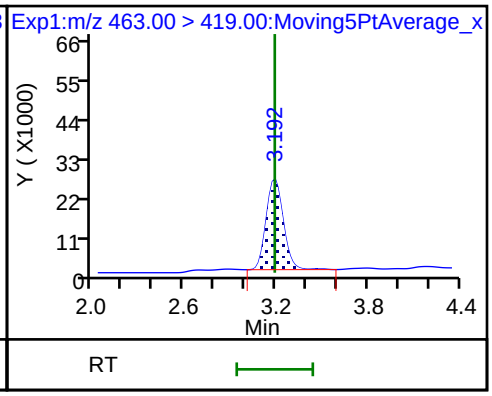
17 Perfluorooctane sulfonic acid



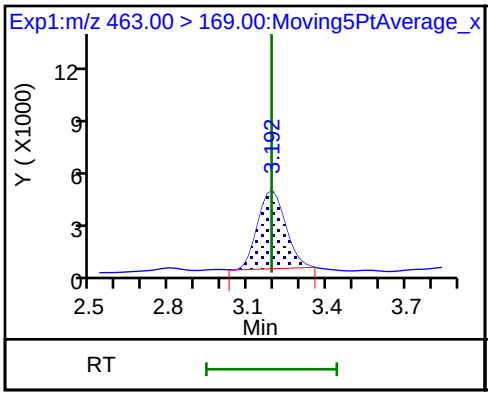
17 Perfluorooctane sulfonic acid



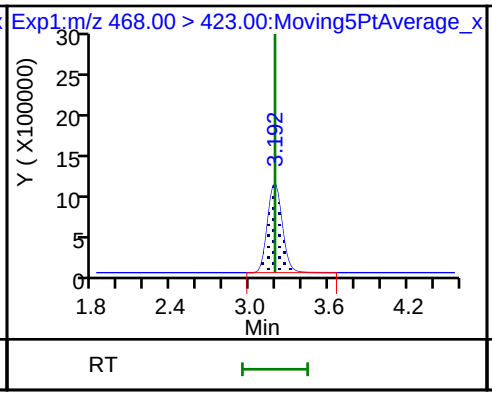
20 Perfluorononanoic acid



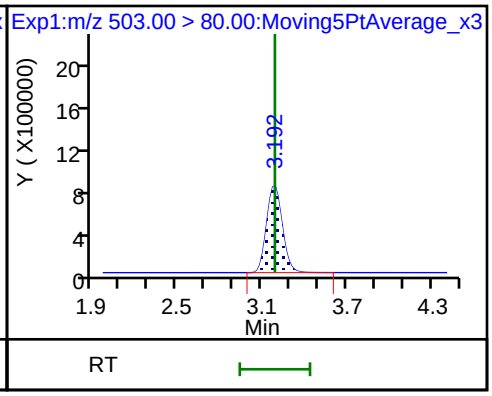
20 Perfluorononanoic acid



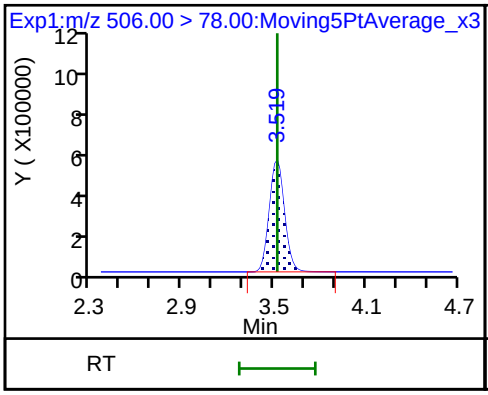
D 19 13C5 PFNA



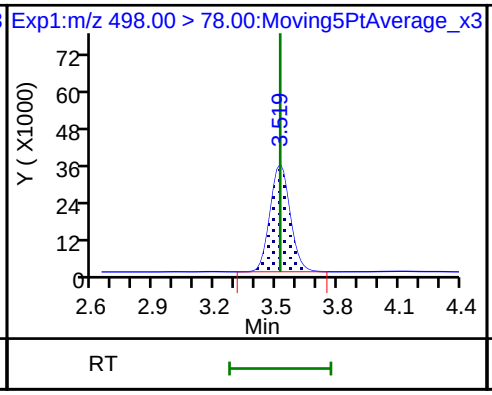
D 18 13C4 PFOS



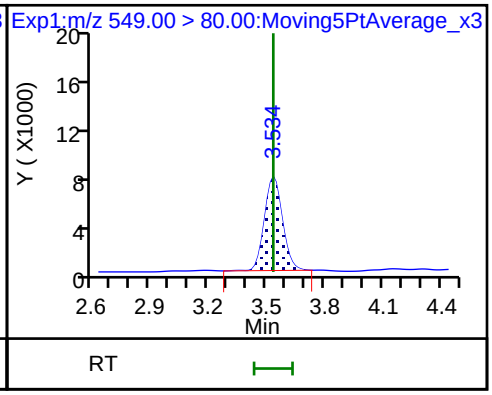
D 21 13C8 FOSA



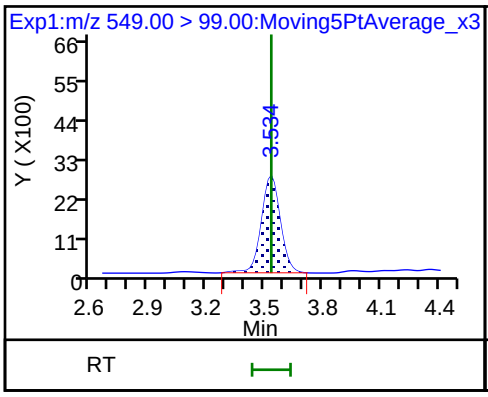
22 Perfluorooctane Sulfonamide



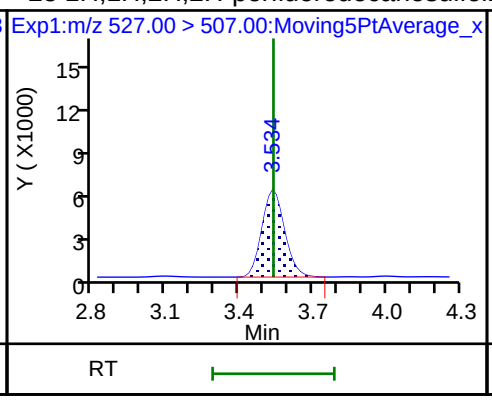
68 Perfluorononanesulfonic acid



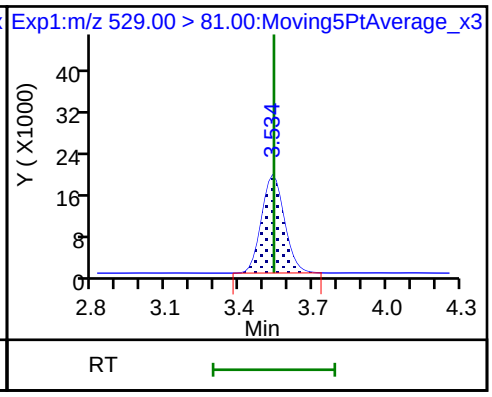
68 Perfluorononanesulfonic acid



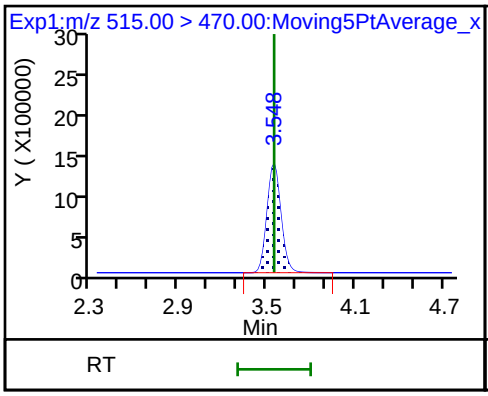
25 1H,1H,2H,2H-perfluorodecanesulfon



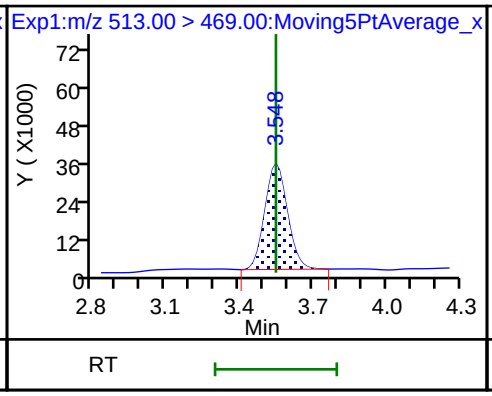
D 26 M2-8:2FTS



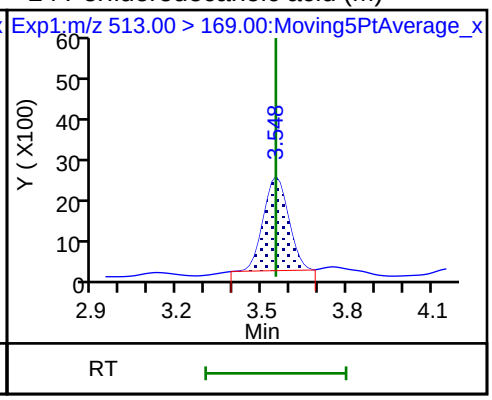
D 23 13C2 PFDA



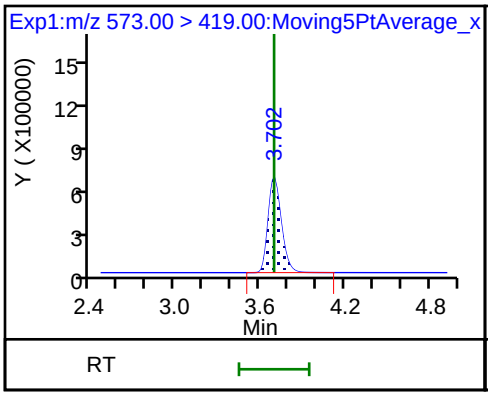
24 Perfluorodecanoic acid



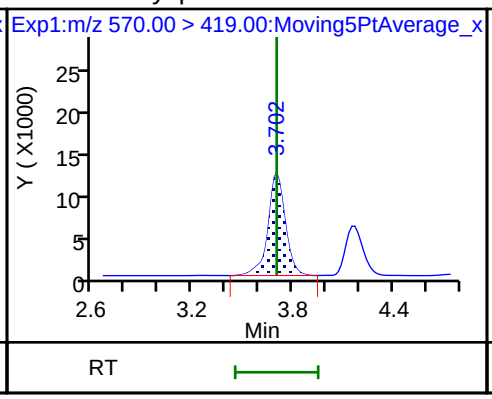
24 Perfluorodecanoic acid (M)



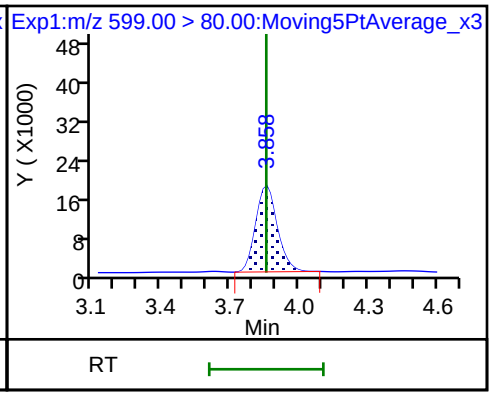
D 27 d3-NMeFOSAA



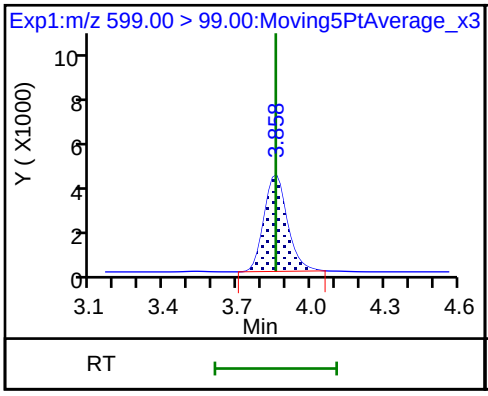
28 N-methyl perfluorooctane sulfonami



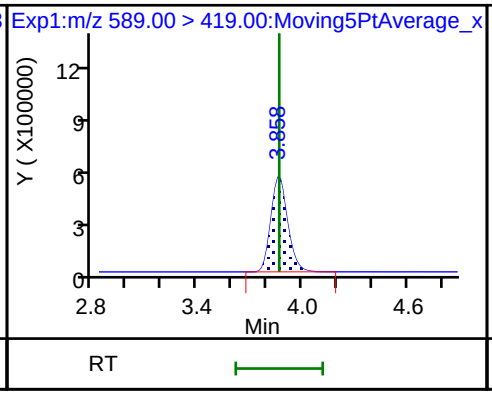
29 Perfluorodecane Sulfonic acid



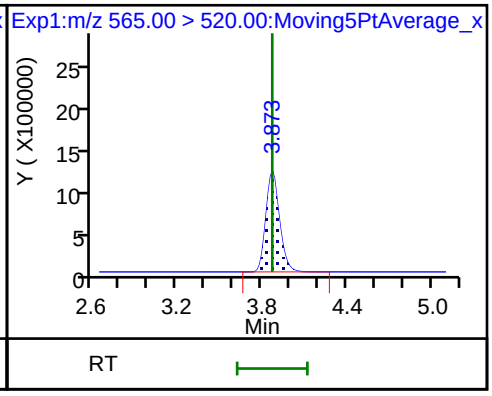
29 Perfluorodecane Sulfonic acid



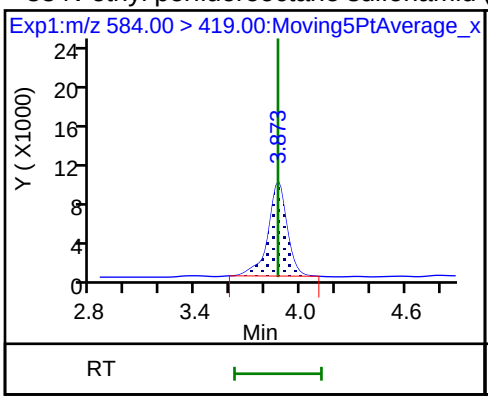
D 32 d5-NEtFOSAA



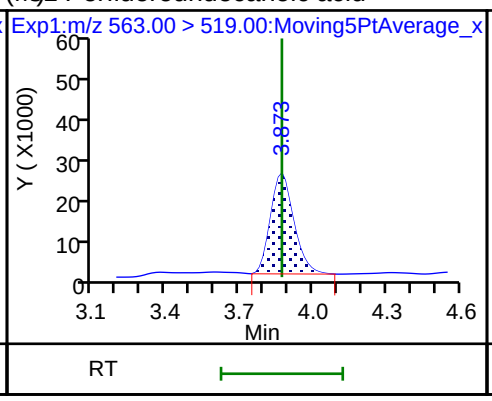
D 30 13C2 PFUnA



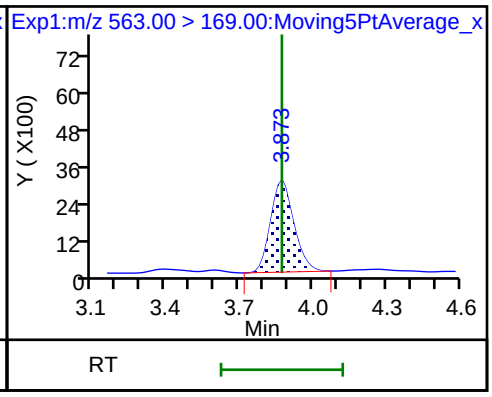
33 N-ethyl perfluorooctane sulfonamid (M)



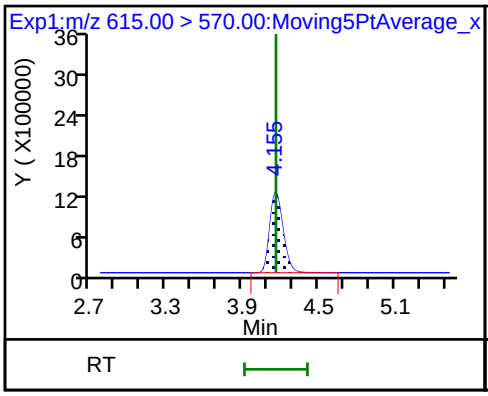
31 Perfluoroundecanoic acid



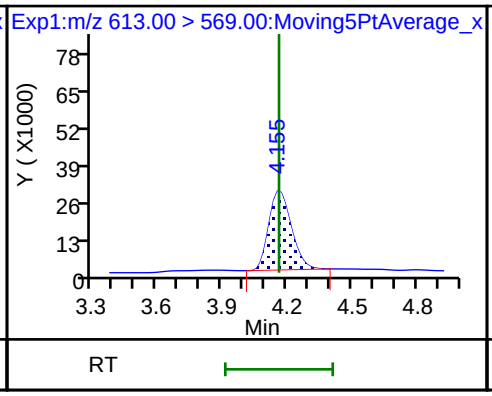
31 Perfluoroundecanoic acid



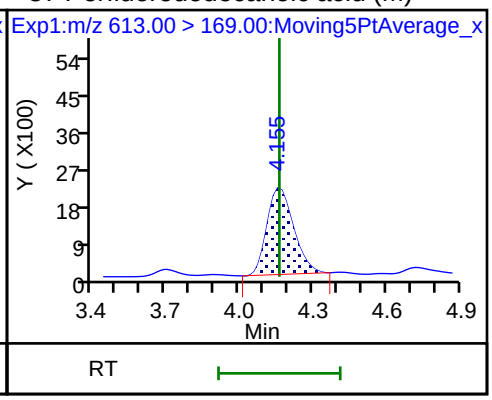
D 36 13C2 PFDoA



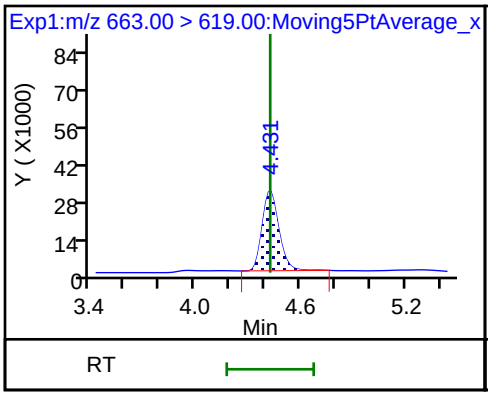
37 Perfluorododecanoic acid



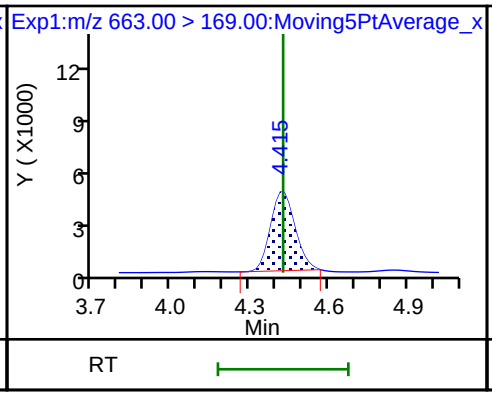
37 Perfluorododecanoic acid (M)



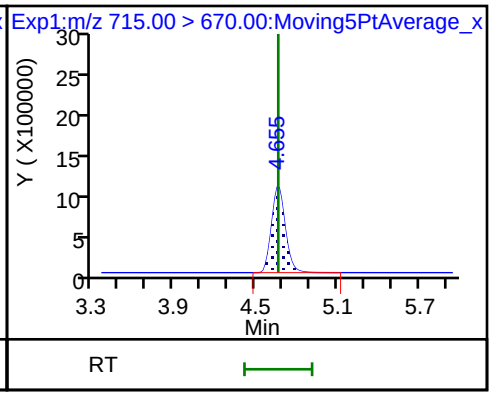
41 Perfluorotridecanoic acid



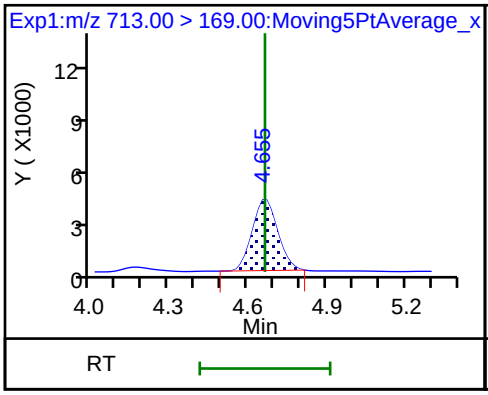
41 Perfluorotridecanoic acid



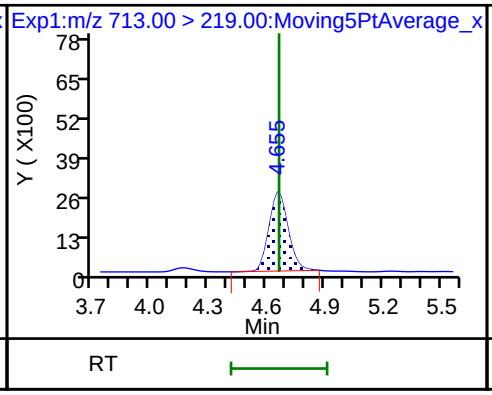
D 43 13C2-PFTeDA



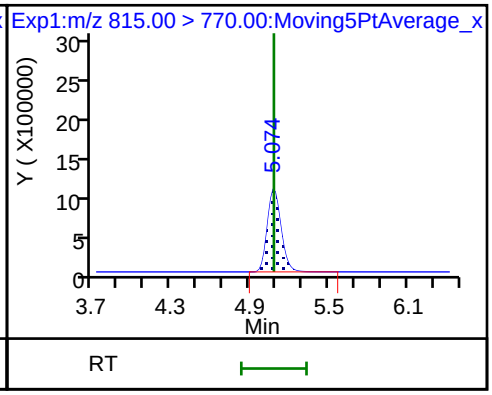
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

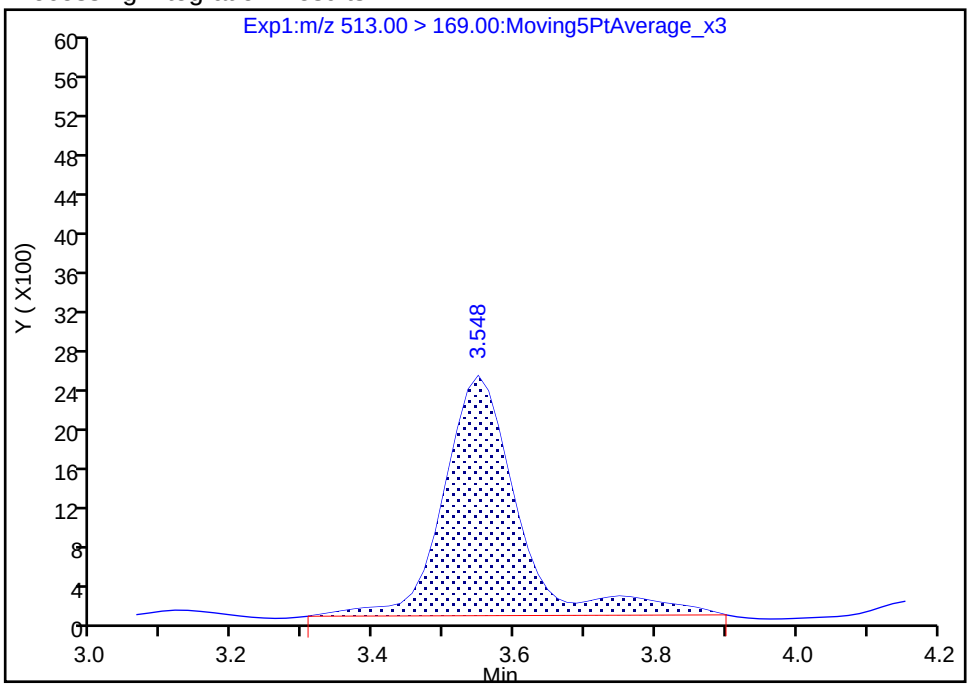
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_005.d				
Injection Date:	20-Jul-2018 19:40:05	Instrument ID:	A9		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	2	Worklist Smp#:	3
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 2

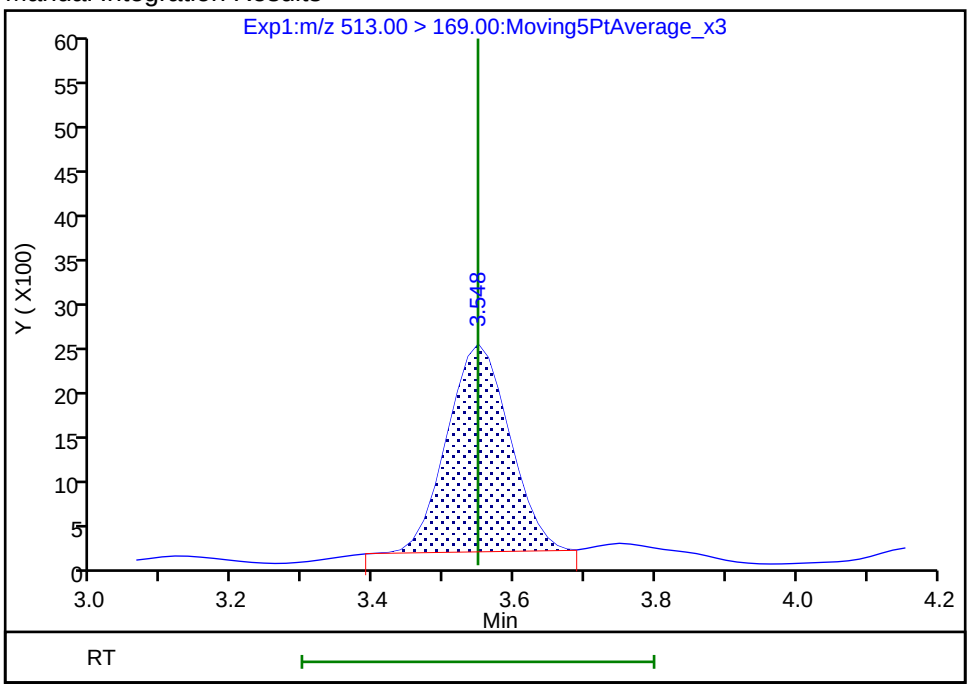
Processing Integration Results

RT: 3.55
Area: 17940
Amount: 0.053025
Amount Units: ng/ml



Manual Integration Results

RT: 3.55
Area: 14309
Amount: 0.053025
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:55:04

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

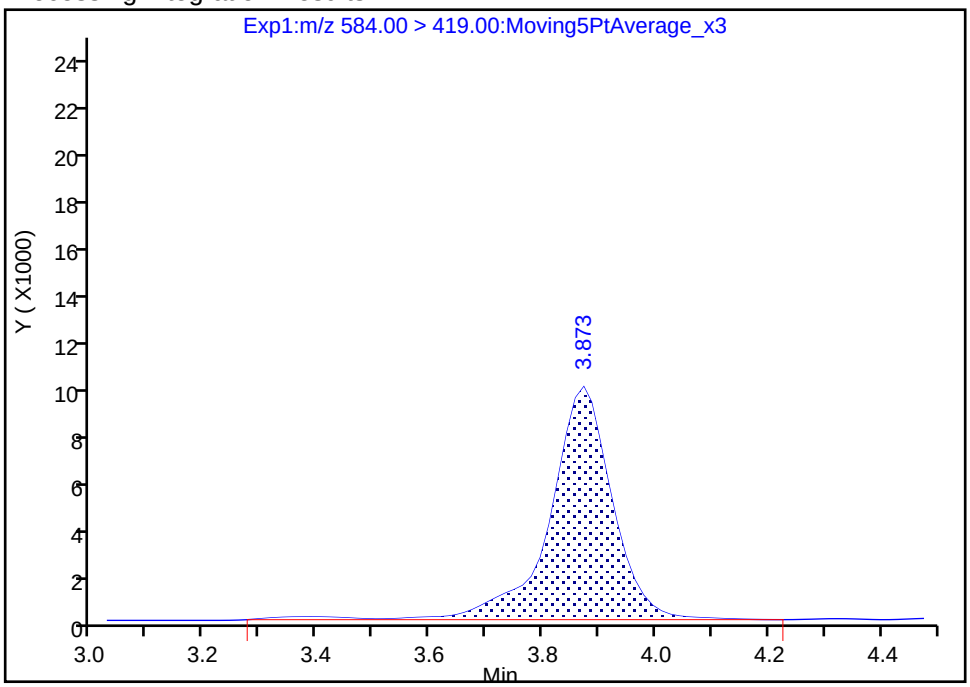
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_005.d				
Injection Date:	20-Jul-2018 19:40:05	Instrument ID:	A9		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	2	Worklist Smp#:	3
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

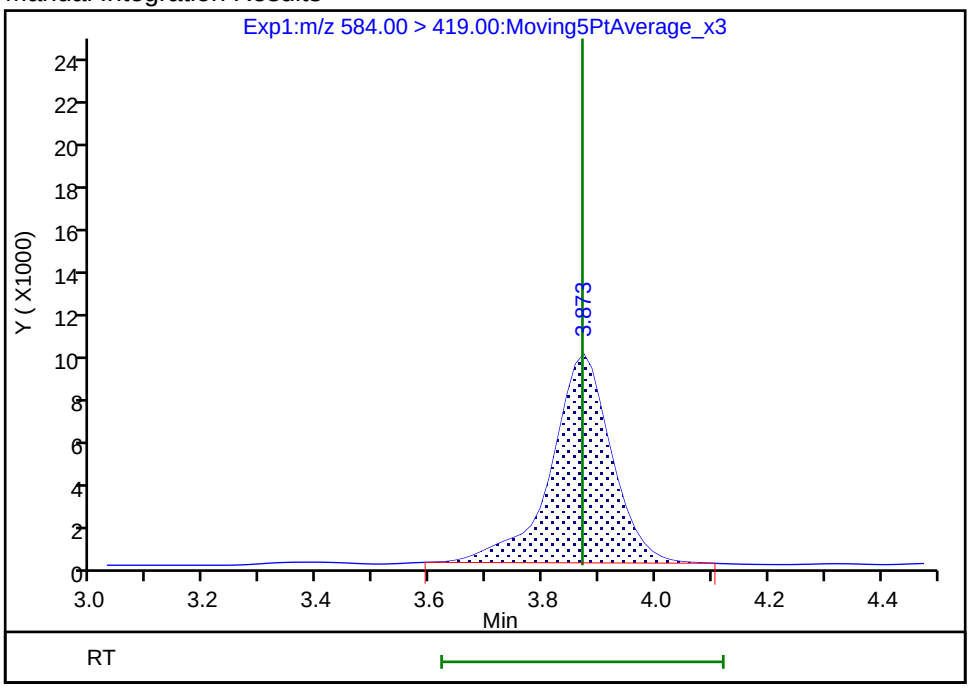
Processing Integration Results

RT: 3.87
Area: 74617
Amount: 0.050124
Amount Units: ng/ml



Manual Integration Results

RT: 3.87
Area: 70619
Amount: 0.047805
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:55:20
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

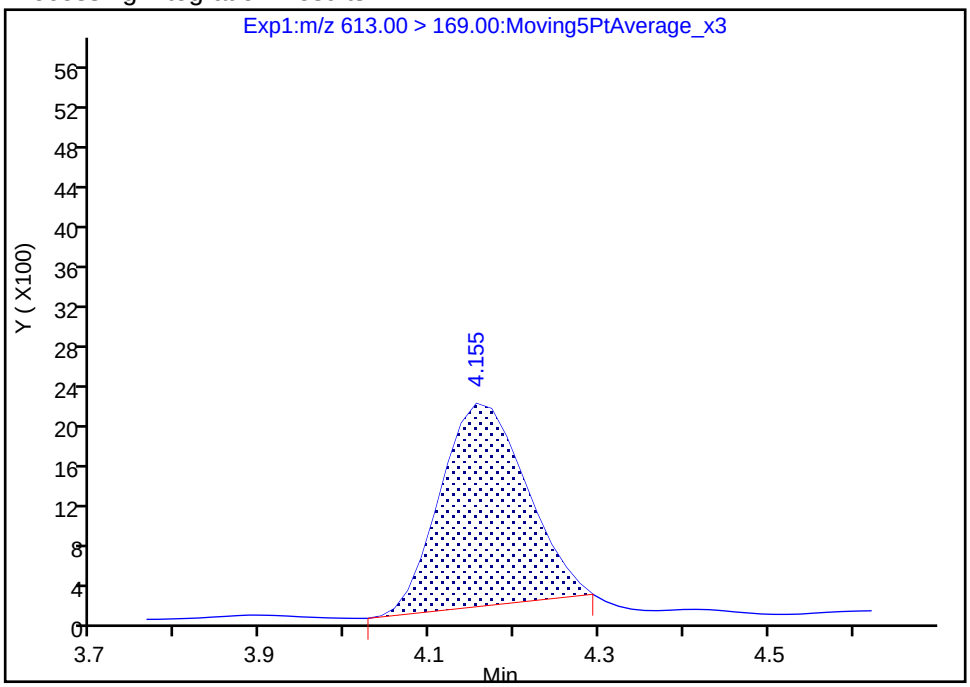
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_005.d				
Injection Date:	20-Jul-2018 19:40:05	Instrument ID:	A9		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	2	Worklist Smp#:	3
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 2

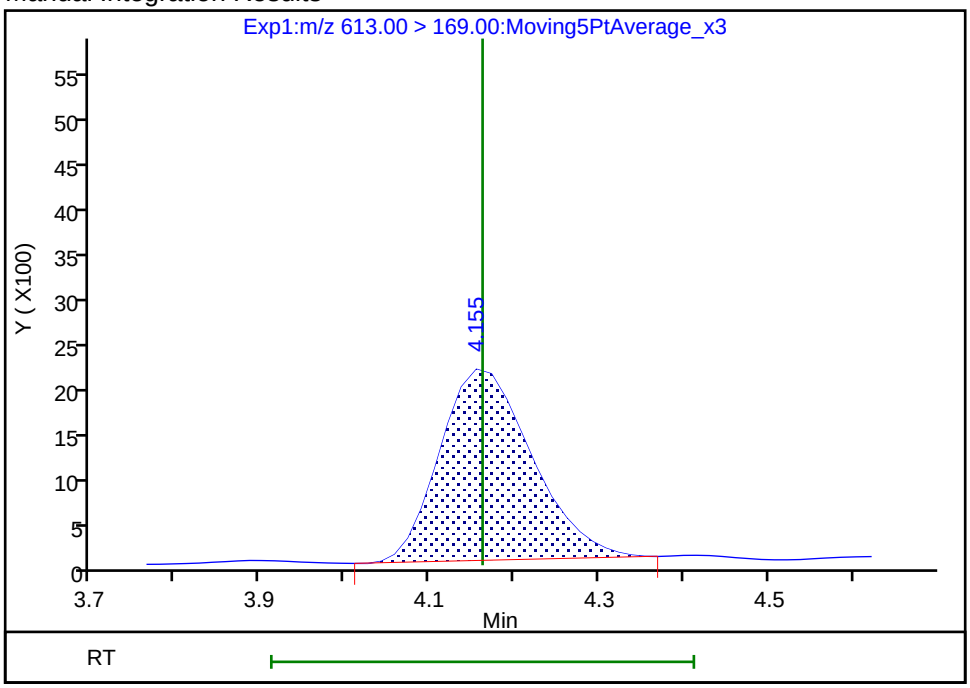
Processing Integration Results

RT: 4.15
Area: 14338
Amount: 0.054737
Amount Units: ng/ml



Manual Integration Results

RT: 4.15
Area: 15961
Amount: 0.054737
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 09:55:32

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_006.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 20-Jul-2018 19:47:37 ALS Bottle#: 3 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: L3
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:25:13 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 09:56:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.518	1.515	0.003	0.539	8758871	2.47		98.7	18481	
2 Perfluorobutyric acid										
212.90 > 169.00	1.518	1.516	0.002	1.000	851429	0.2536		101	125	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.793	1.789	0.004	1.000	874387	0.2562		102	386	
D 3 13C5-PFPeA										
267.90 > 223.00	1.793	1.789	0.004	0.637	7861863	2.41		96.3	25151	
D 47 13C3-PFBS										
301.90 > 83.00	1.835	1.827	0.008	0.652	93156	2.26		97.2	1126	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.835	1.831	0.004	1.000	1023420	0.2335		106	860	
298.90 > 99.00	1.835	1.831	0.004	1.000	363310		2.82(1.35-4.05)	106	1152	
D 60 M2-4:2FTS										
329.00 > 81.00	2.057	2.051	0.006	0.731	754638	NC			2506	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.057	2.051	0.006	1.121	201492	0.2343		100	2814	
D 7 13C2 PFHxA										
315.00 > 270.00	2.088	2.085	0.003	0.742	8209316	2.40		95.9	63242	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.088	2.086	0.002	1.000	806387	0.2595		104	482	
313.00 > 119.00	2.088	2.086	0.002	1.000	57793		13.95(6.96-20.87)	104	341	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.119	2.112	0.007	1.155	512547	0.2451		105	1605	
349.00 > 99.00	2.109	2.112	-0.003	1.149	217290		2.36(1.15-3.45)	105	1392	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.192	2.189	0.003	0.779	877885	NC			5921	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.192	2.189	0.003	1.000	172753	NC			101	
D 9 13C4-PFHpA										
367.00 > 322.00	2.436	2.431	0.005	0.866	9683804	2.44		97.6	42486	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.436	2.433	0.003	1.000	1129898	0.2654		106	391	
363.00 > 169.00	2.436	2.433	0.003	1.000	232342		4.86(2.17-6.52)	106	1159	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.446	0.003	1.000	677726	0.2116		93.0	1015	
399.00 > 99.00	2.449	2.446	0.003	1.000	182767		3.71(1.90-5.70)	93.0	1017	
D 11 18O2 PFHxS										
403.00 > 84.00	2.449	2.447	0.002	0.871	5684732	2.35		99.5	25174	
65 ADONA										
377.00 > 251.00	2.488	2.477	0.011	0.780	1889707	NC			6326	
377.00 > 85.00	2.488	2.477	0.011	0.780	764874		2.47(1.05-3.16)		420	
D 12 M2-6:2FTS										
429.00 > 81.00	2.781	2.779	0.002	0.989	921104	2.48		104	2824	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.781	2.779	0.002	1.000	194634	0.2300		97.0	3414	
D 14 13C4 PFOA										
417.00 > 372.00	2.813	2.804	0.009	1.000	8746058	2.45		98.0	32770	
* 62 13C2-PFOA										
415.00 > 370.00	2.813	2.804	0.009		9112355	2.50			46852	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.813	2.806	0.007	1.000	1065875	0.2645		106	194	
413.00 > 169.00	2.813	2.806	0.007	1.000	383623		2.78(1.36-4.08)	106	1150	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.813	2.813	0.0	0.881	645339	0.2400		101	992	
449.00 > 99.00	2.813	2.813	0.0	0.881	160217		4.03(1.84-5.53)	101	2015	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.192	3.184	0.008	1.000	638860	0.2250		97.0	970	
499.00 > 99.00	3.192	3.184	0.008	1.000	155499		4.11(2.04-6.12)	97.0	1154	
20 Perfluorononanoic acid										
463.00 > 419.00	3.192	3.189	0.003	1.000	936306	0.2567		103	276	
463.00 > 169.00	3.192	3.189	0.003	1.000	161377		5.80(2.68-8.03)	103	434	
D 19 13C5 PFNA										
468.00 > 423.00	3.192	3.189	0.003	1.135	8514394	2.54		102	25499	
D 18 13C4 PFOS										
503.00 > 80.00	3.192	3.189	0.003	1.135	6027169	2.33		97.4	7983	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.405	3.398	0.007	1.067	830593	NC			2616	
D 21 13C8 FOSA										
506.00 > 78.00	3.519	3.519	0.0	1.251	3662779	2.51		100	9562	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.519	3.519	0.0	1.000	1140674	0.2543		102	3178	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.534	3.534	0.0	1.107	236810	0.2394		99.8	755	
549.00 > 99.00	3.534	3.534	0.0	1.107	85235		2.78(1.42-4.26)	99.8	649	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.548	3.538	0.010	1.000	219032	0.2987		125	1049	
D 26 M2-8:2FTS										
529.00 > 81.00	3.548	3.540	0.008	1.261	110479	2.18		91.0	1308	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.261	8734319	2.51		100	43465	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.548	3.548	0.0	1.000	1127618	0.2750		110	313	
513.00 > 169.00	3.548	3.548	0.0	1.000	76303		14.78(7.12-21.35)	110	298	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.702	3.698	0.004	1.316	3824936	2.33		93.3	10316	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.702	3.702	0.0	1.000	398731	0.2518		101	287	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.858	3.856	0.002	1.209	588475	0.2498		104	1037	
599.00 > 99.00	3.858	3.856	0.002	1.209	134986		4.36(2.14-6.43)	104	1292	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.872	3.866	0.006	1.377	3320282	2.53		101	6168	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.870	0.002	1.377	8610405	2.71		108	22896	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.872	3.870	0.002	1.000	336209	0.2523		101	1251	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.000	834432	0.2496		99.8	285	
563.00 > 169.00	3.872	3.872	0.0	1.000	75162		11.10(5.24-15.72)	99.8	453	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.261	993726	NC			3398	
D 36 13C2 PFDoA										
615.00 > 570.00	4.172	4.162	0.010	1.483	8680037	2.54		102	31288	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.172	4.162	0.010	1.000	972821	0.2596		104	270	
613.00 > 169.00	4.172	4.162	0.010	1.000	100564		9.67(4.68-14.05)	104	305	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.430	4.426	0.004	1.062	980288	0.2822		113	376	
663.00 > 169.00	4.430	4.426	0.004	1.062	137395		7.13(3.09-9.27)	113	430	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006	1.660	7095002	2.40		96.1	21436	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.670	4.664	0.006	1.000	114454	0.2342		93.7	359	
713.00 > 219.00	4.670	4.664	0.006	1.000	79588		1.44(0.70-2.09)	93.7	360	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.090	5.081	0.009	1.809	7267155	2.39		95.6	9313	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.090	5.083	0.007	1.000	798562	NC			141	
813.00 > 169.00	5.090	5.083	0.007	1.000	133105		6.00(2.77-8.32)		418	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.070	540163	NC			115	
913.00 > 169.00	5.445	5.443	0.002	1.070	94966		5.69(2.55-7.64)		613	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00005 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:25:15 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_006.d

Injection Date: 20-Jul-2018 19:47:37 Instrument ID: A9

Lims ID: IC L3 Full

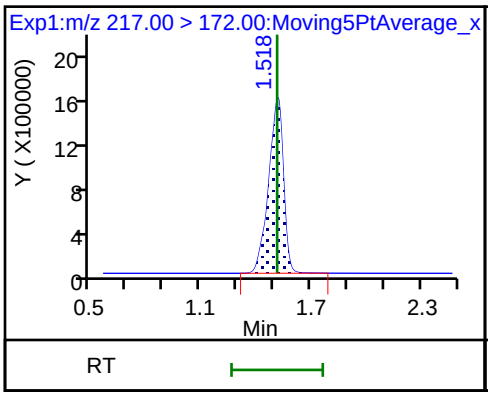
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 3 Worklist Smp#: 4

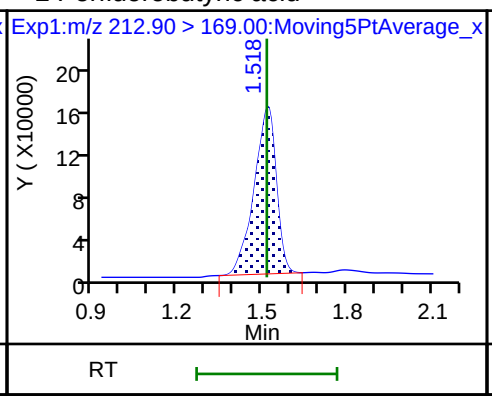
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

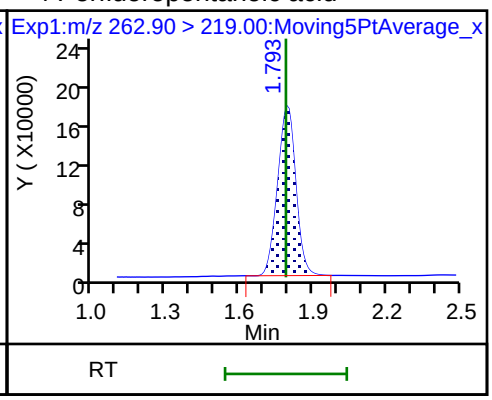
D 1 13C4 PFBA



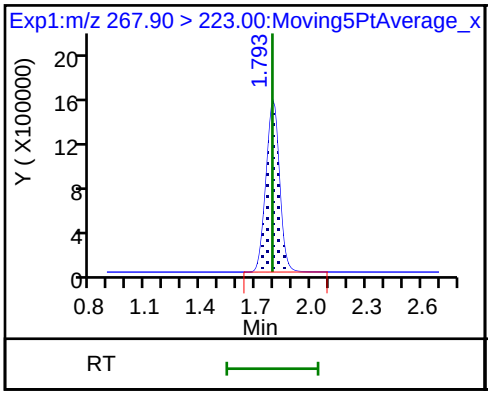
2 Perfluorobutyric acid



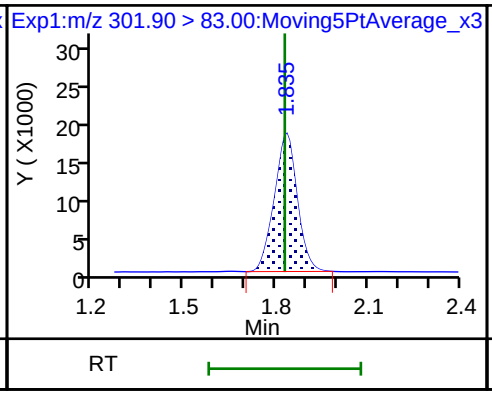
4 Perfluoropentanoic acid



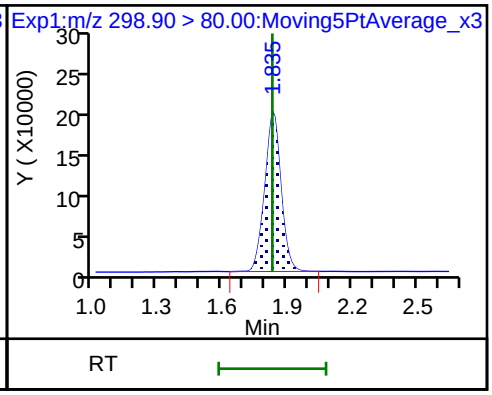
D 3 13C5-PFPeA



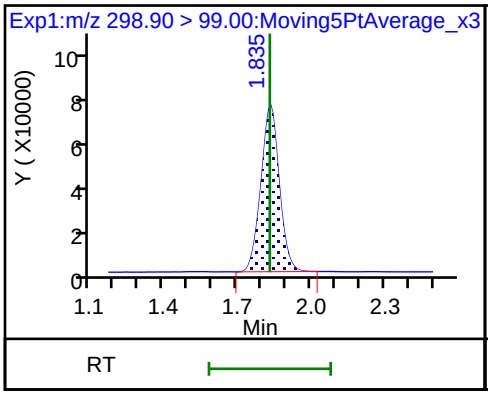
D 47 13C3-PFBS



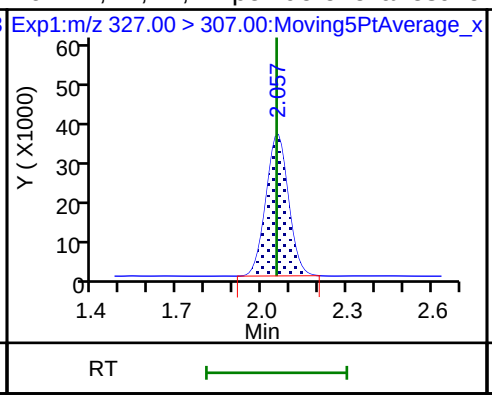
5 Perfluorobutanesulfonic acid



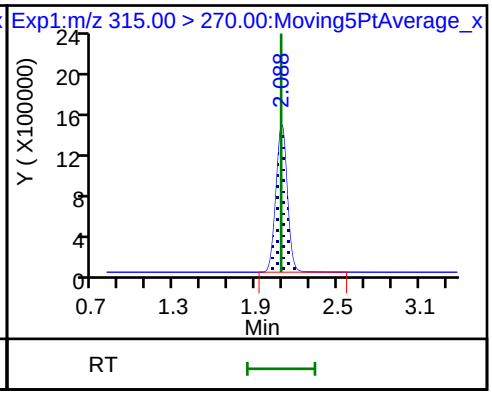
5 Perfluorobutanesulfonic acid



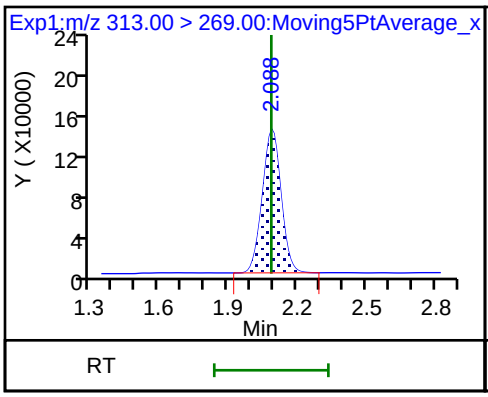
61 1H,1H,2H,2H-perfluorohexanesulfon



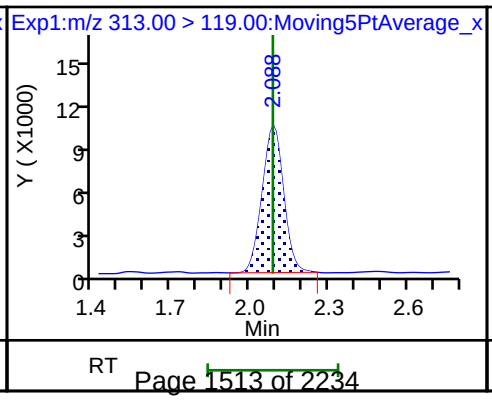
D 7 13C2 PFHxA



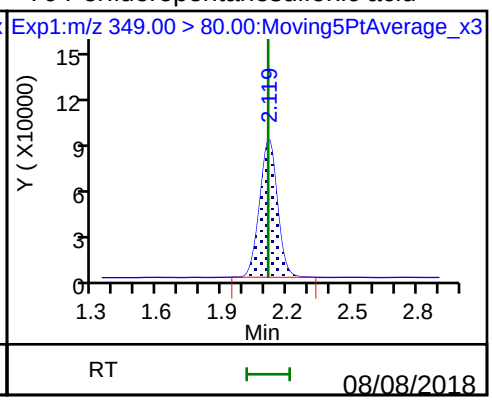
6 Perfluorohexanoic acid



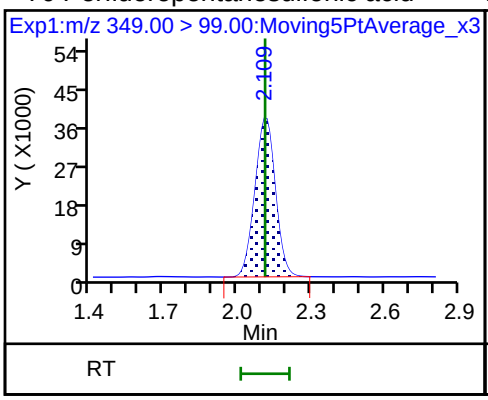
6 Perfluorohexanoic acid



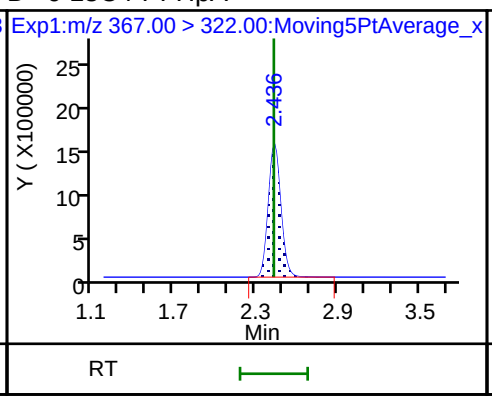
70 Perfluoropentanesulfonic acid



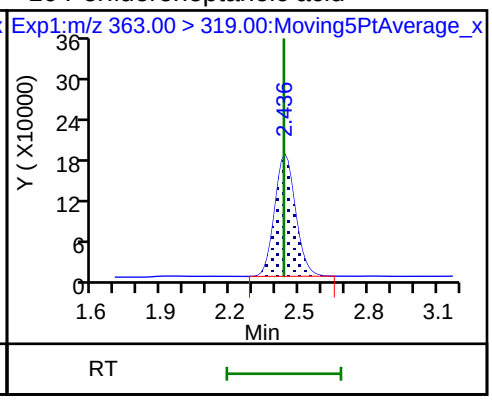
70 Perfluoropentanesulfonic acid



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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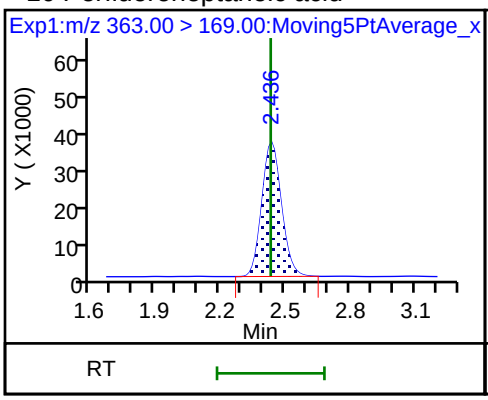
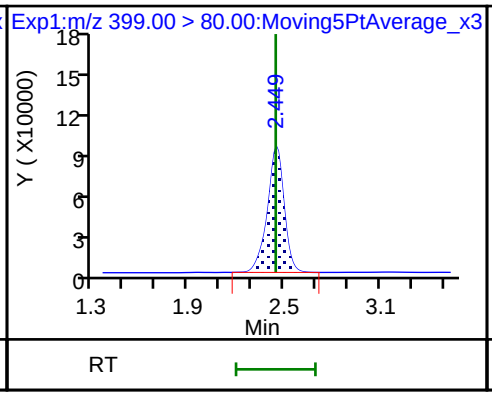
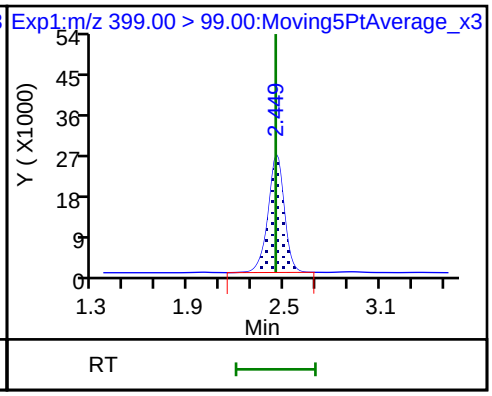


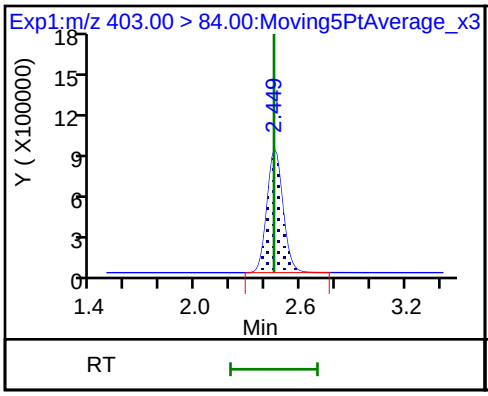
8 Perfluorohexanesulfonic acid



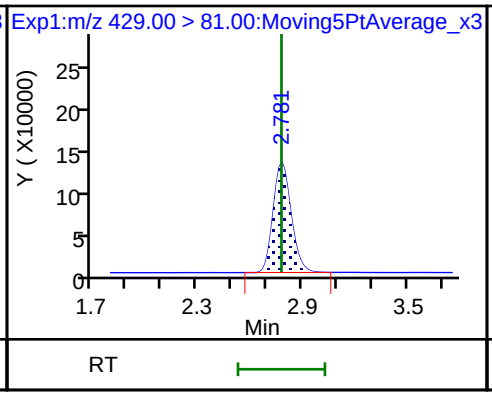
8 Perfluorohexanesulfonic acid



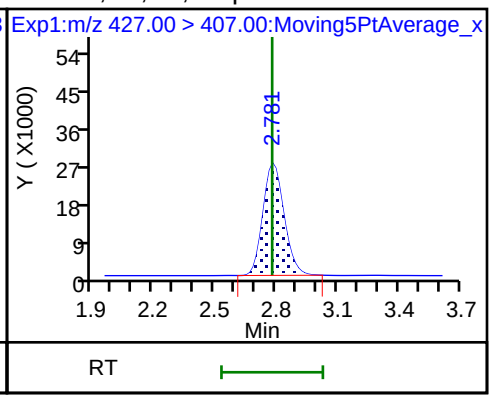
D 11 18O2 PFHxS



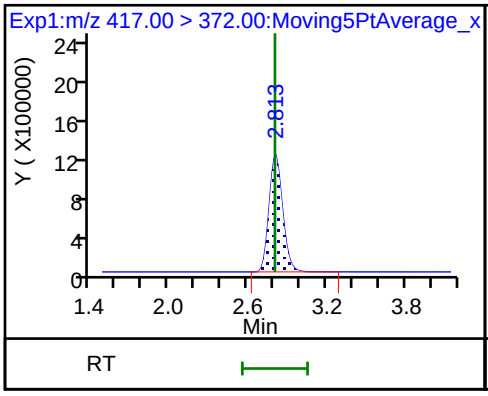
D 12 M2-6:2FTS



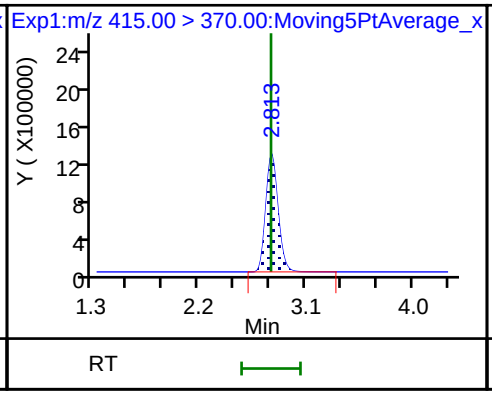
13 1H,1H,2H,2H-perfluorooctanesulfoni



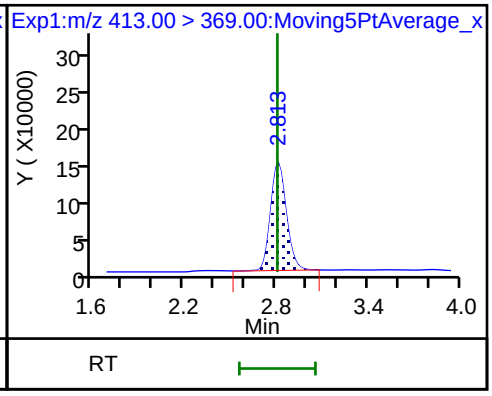
D 14 13C4 PFOA



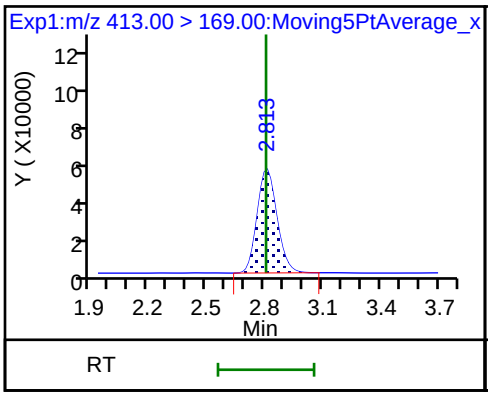
* 62 13C2-PFOA



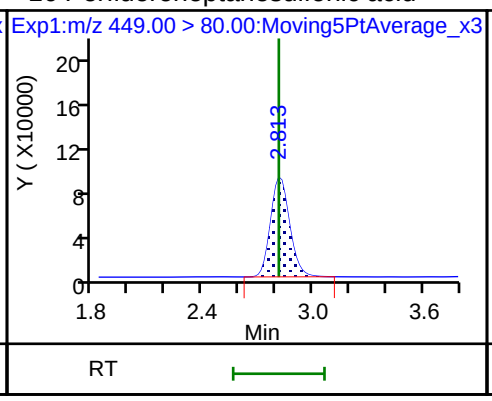
15 Perfluorooctanoic acid



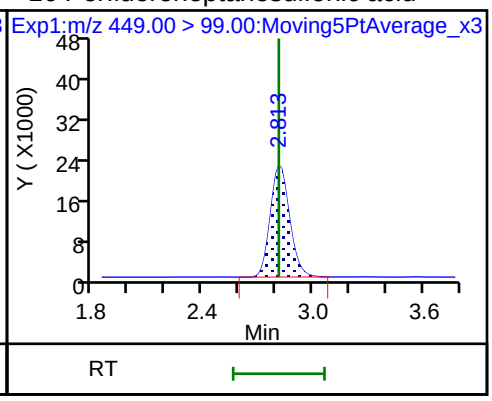
15 Perfluorooctanoic acid



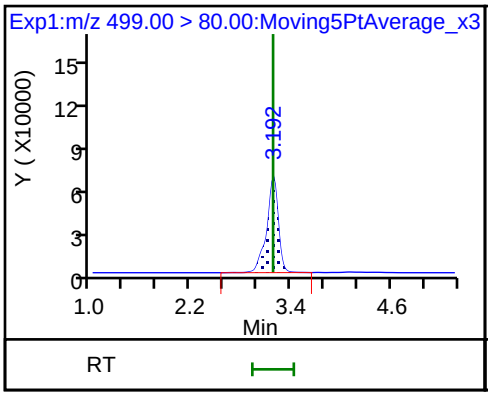
16 Perfluoroheptanesulfonic acid



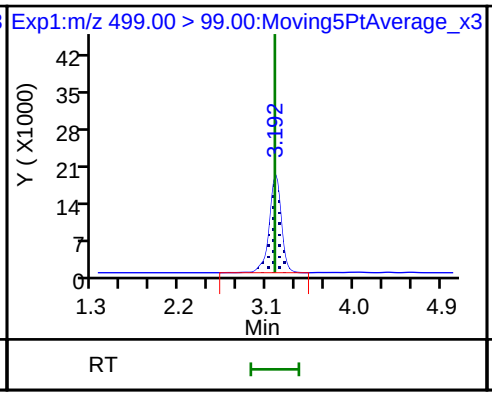
16 Perfluoroheptanesulfonic acid



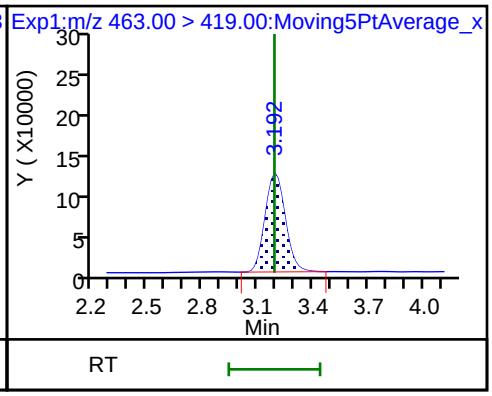
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



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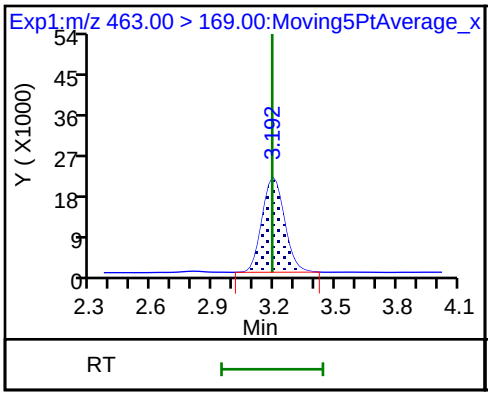
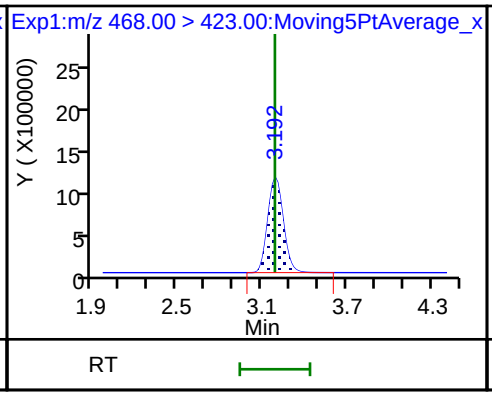
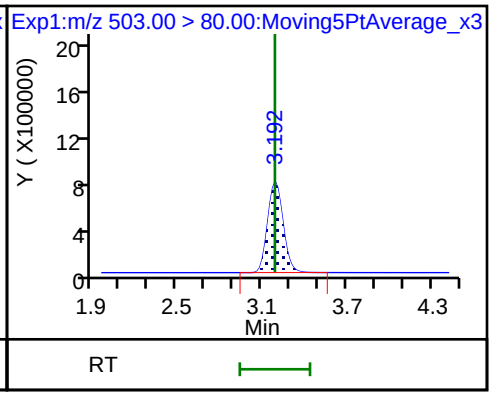


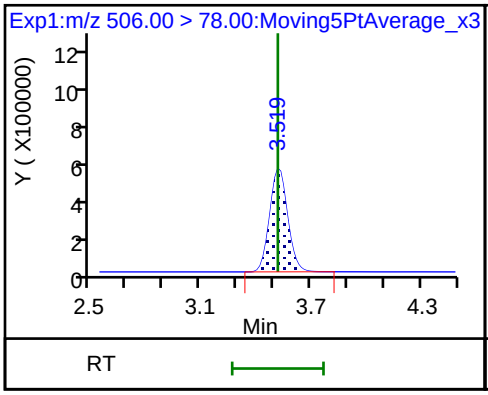
D 19 13C5 PFNA



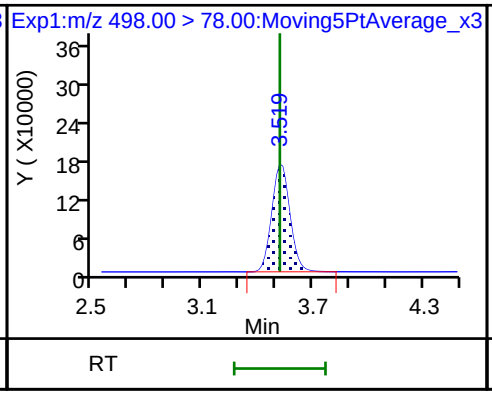
D 18 13C4 PFOS



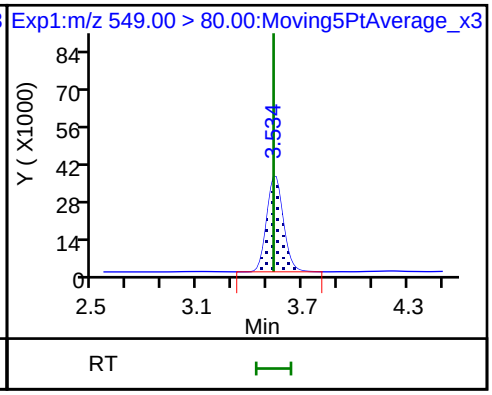
D 21 13C8 FOSA



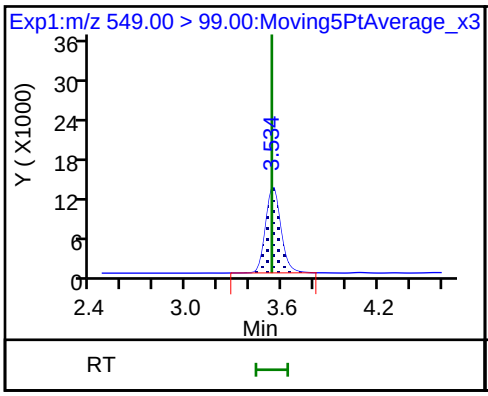
22 Perfluorooctane Sulfonamide



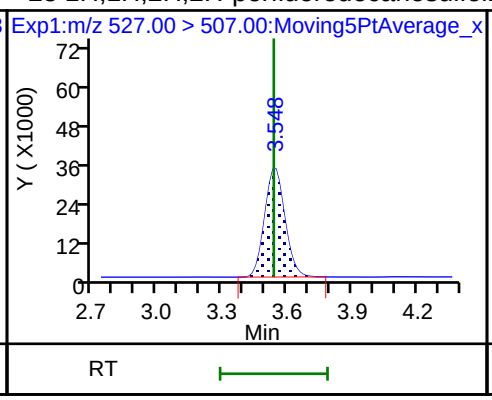
68 Perfluorononanesulfonic acid



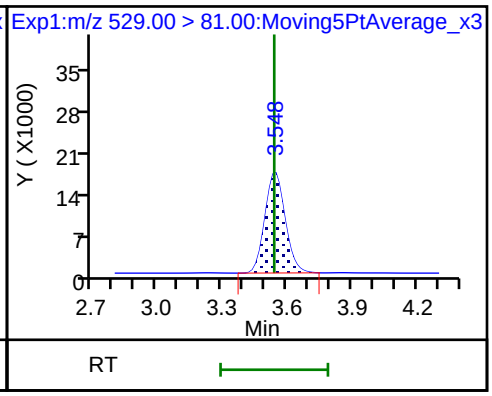
68 Perfluorononanesulfonic acid



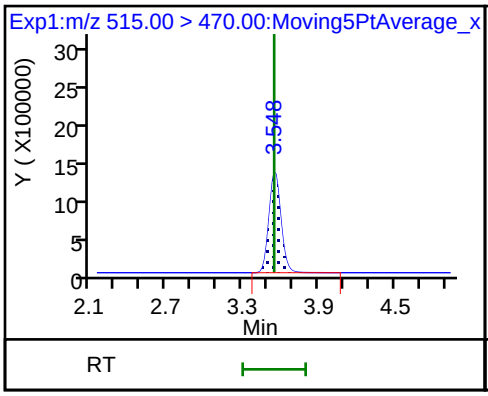
25 1H,1H,2H,2H-perfluorodecanesulfon



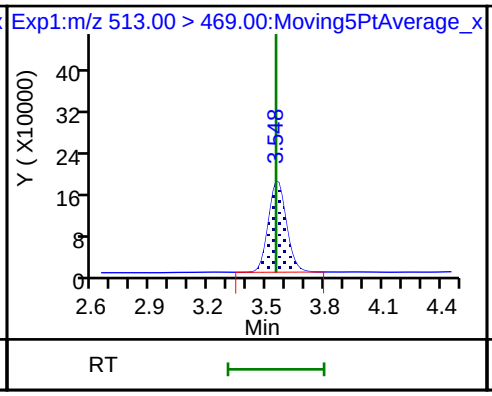
D 26 M2-8:2FTS



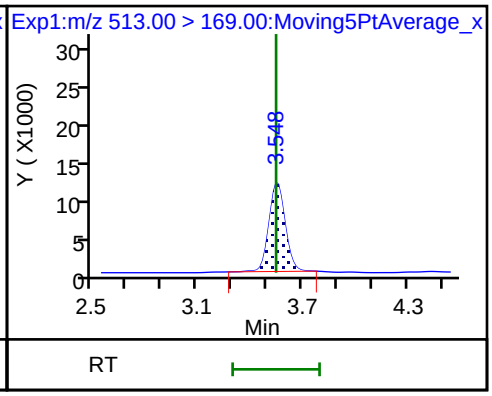
D 23 13C2 PFDA



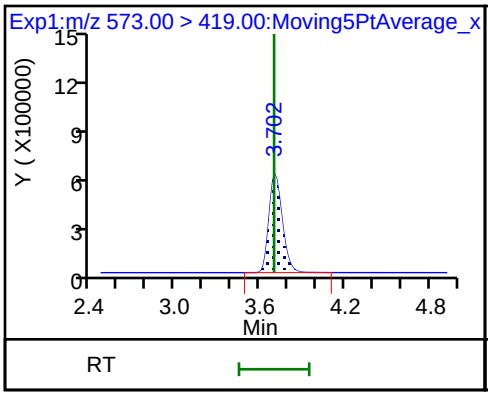
24 Perfluorodecanoic acid



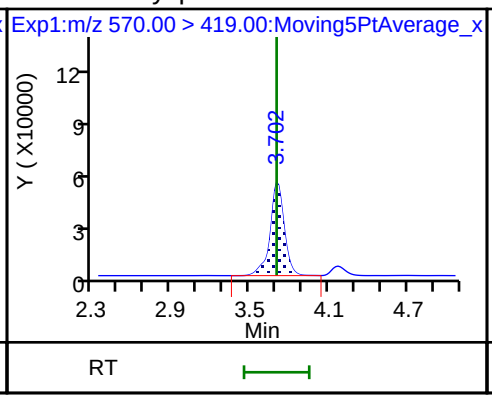
24 Perfluorodecanoic acid



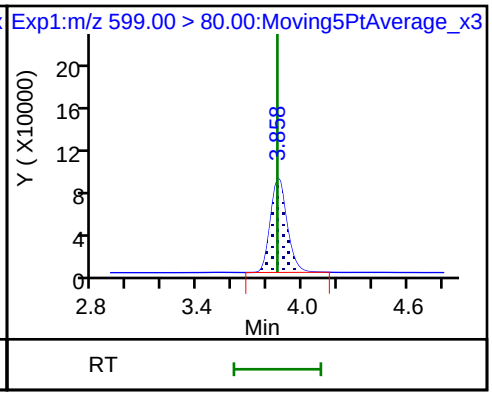
D 27 d3-NMeFOSAA



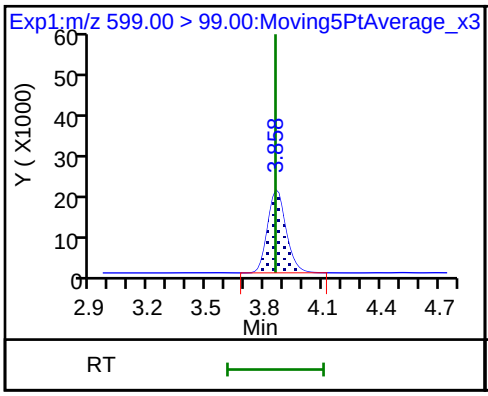
28 N-methyl perfluorooctane sulfonami



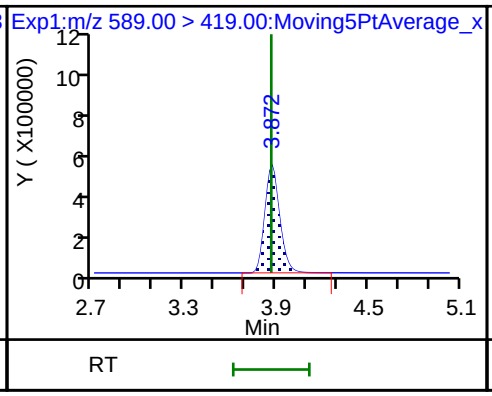
29 Perfluorodecane Sulfonic acid



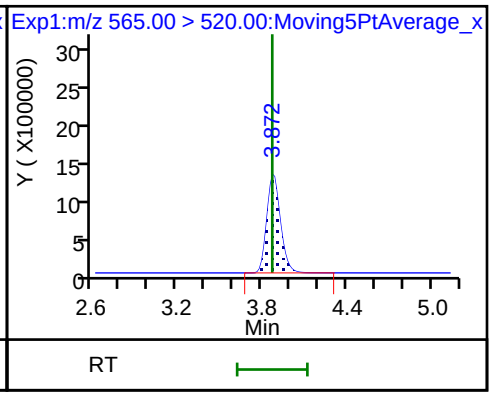
29 Perfluorodecane Sulfonic acid



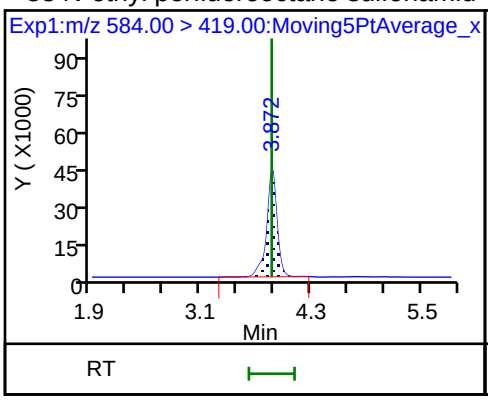
D 32 d5-NEtFOSAA



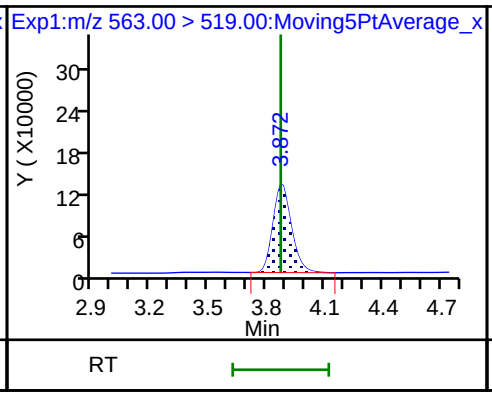
D 30 13C2 PFUnA



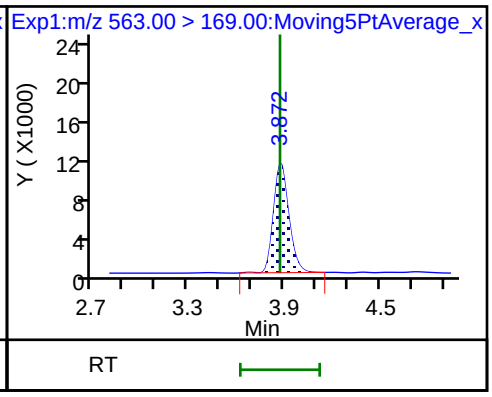
33 N-ethyl perfluorooctane sulfonamid



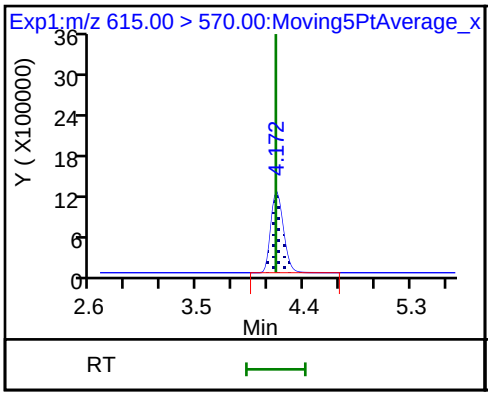
31 Perfluoroundecanoic acid



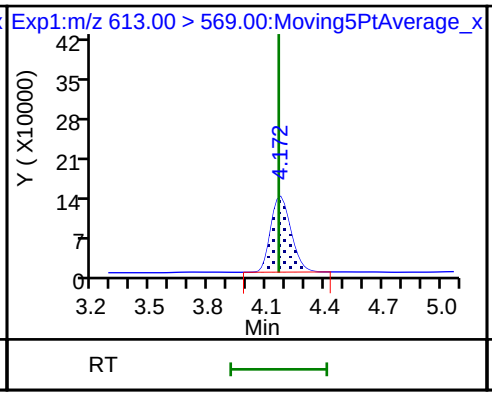
31 Perfluoroundecanoic acid



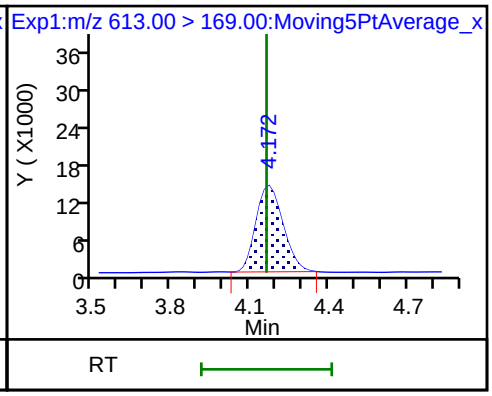
D 36 13C2 PFDoA



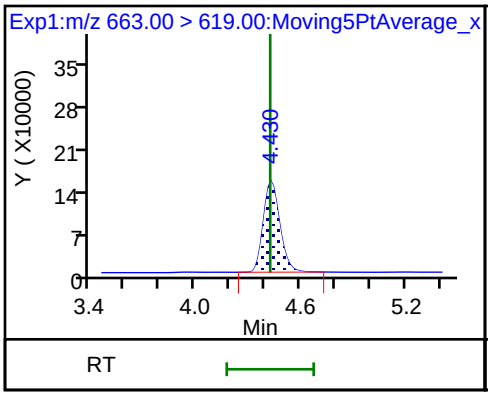
37 Perfluorododecanoic acid



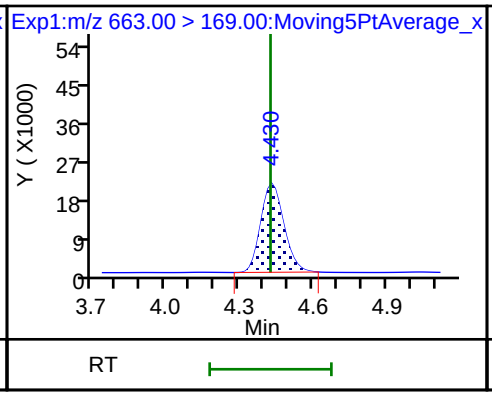
37 Perfluorododecanoic acid



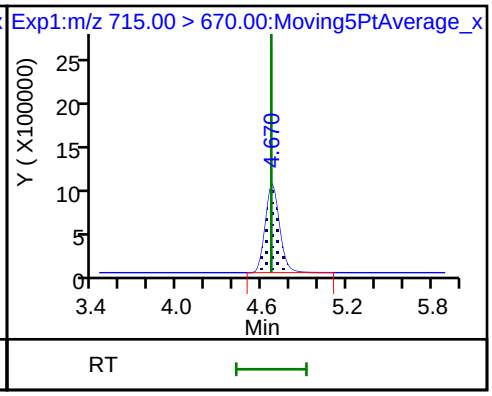
41 Perfluorotridecanoic acid



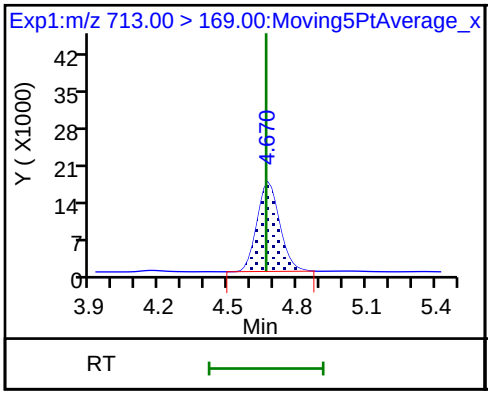
41 Perfluorotridecanoic acid



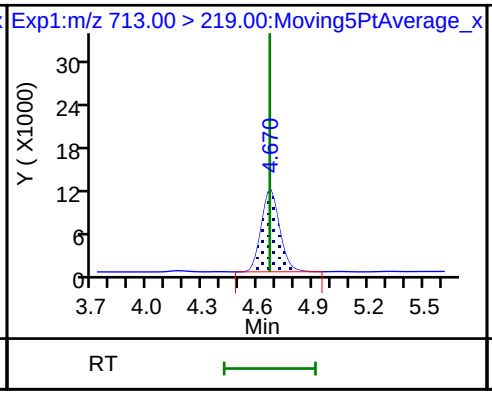
D 43 13C2-PFTeDA



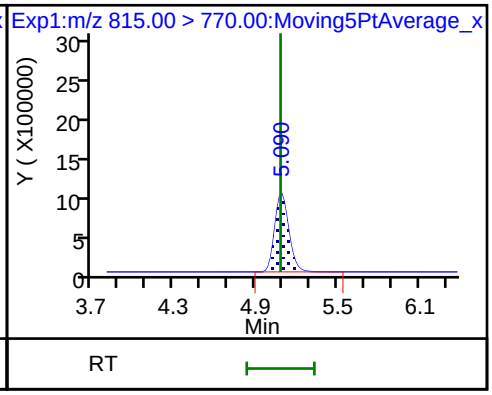
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

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Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 20-Jul-2018 19:55:09 ALS Bottle#: 4 Worklist Smp#: 5
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: L4
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:25:17 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 09:57:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.511	1.515	-0.004	0.540	8638287	2.49		99.5	13771	
2 Perfluorobutyric acid										
212.90 > 169.00	1.511	1.516	-0.005	1.000	3406000	1.03		103	515	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.784	1.789	-0.005	1.000	3488097	0.99		99.0	1567	
D 3 13C5-PFPeA										
267.90 > 223.00	1.784	1.789	-0.005	0.638	8111747	2.54		102	23024	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.827	-0.001	0.653	95433	2.37		102	1459	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.826	1.831	-0.005	1.000	4144415	0.9230		104	3211	
298.90 > 99.00	1.826	1.831	-0.005	1.000	1396240		2.97(1.35-4.05)	104	4270	
D 60 M2-4:2FTS										
329.00 > 81.00	2.047	2.051	-0.004	0.732	725795	NC			1864	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.047	2.051	-0.004	1.120	832795	0.9451		101	7966	
D 7 13C2 PFHxA										
315.00 > 270.00	2.088	2.085	0.003	0.746	8595361	2.56		103	34015	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.088	2.086	0.002	1.000	3138680	0.9647		96.5	1875	
313.00 > 119.00	2.078	2.086	-0.008	0.995	236071		13.30(6.96-20.87)	96.5	1262	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.109	2.112	-0.003	1.155	2020216	0.9428		101	6067	
349.00 > 99.00	2.109	2.112	-0.003	1.155	852974		2.37(1.15-3.45)	101	5189	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.192	2.189	0.003	0.784	768384	NC			5467	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.182	2.189	-0.007	0.995	678879	NC			378	
D 9 13C4-PFHpA										
367.00 > 322.00	2.424	2.431	-0.007	0.866	9385285	2.42		96.6	33731	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.424	2.433	-0.009	1.000	4596898	1.11		111	1637	
363.00 > 169.00	2.424	2.433	-0.009	1.000	1001946		4.59(2.17-6.52)	111	7297	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.437	2.446	-0.009	0.995	2687244	0.8274		90.9	4379	
399.00 > 99.00	2.437	2.446	-0.009	0.995	710858		3.78(1.90-5.70)	90.9	3770	
D 11 18O2 PFHxS										
403.00 > 84.00	2.450	2.447	0.003	0.876	5765649	2.44		103	43575	
65 ADONA										
377.00 > 251.00	2.476	2.477	-0.001	0.775	7315413	NC			29251	
377.00 > 85.00	2.476	2.477	-0.001	0.775	3052051		2.40(1.05-3.16)		1607	
D 12 M2-6:2FTS										
429.00 > 81.00	2.782	2.779	0.003	0.994	887129	2.44		103	4115	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.782	2.779	0.003	1.000	784162	0.9622		101	9991	
D 14 13C4 PFOA										
417.00 > 372.00	2.798	2.804	-0.006	1.000	8850671	2.53		101	27347	
* 62 13C2-PFOA										
415.00 > 370.00	2.798	2.804	-0.006		8917220	2.50			53837	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.798	2.806	-0.008	1.000	4104432	1.01		101	703	
413.00 > 169.00	2.798	2.806	-0.008	1.000	1499473		2.74(1.36-4.08)	101	4458	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.814	2.813	0.001	0.881	2604672	0.9464		99.4	3739	
449.00 > 99.00	2.814	2.813	0.001	0.881	643938		4.04(1.84-5.53)	99.4	4479	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.173	3.184	-0.011	0.994	2643716	0.9097		98.0	4195	
499.00 > 99.00	3.173	3.184	-0.011	0.994	629132		4.20(2.04-6.12)	98.0	5207	
20 Perfluorononanoic acid										
463.00 > 419.00	3.192	3.189	0.003	1.000	3745852	1.08		108	1065	
463.00 > 169.00	3.192	3.189	0.003	1.000	662001		5.66(2.68-8.03)	108	2049	
D 19 13C5 PFNA										
468.00 > 423.00	3.192	3.189	0.003	1.141	8115774	2.47		98.9	19849	
D 18 13C4 PFOS										
503.00 > 80.00	3.192	3.189	0.003	1.141	6169394	2.44		102	7267	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.389	3.398	-0.009	1.061	3214772	NC			8845	
D 21 13C8 FOSA										
506.00 > 78.00	3.519	3.519	0.0	1.258	3588945	2.51		100	13853	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.519	3.519	0.0	1.000	4670503	1.06		106	6984	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.534	3.534	0.0	1.107	935214	0.9237		96.2	2360	
549.00 > 99.00	3.534	3.534	0.0	1.107	292434		3.20(1.42-4.26)	96.2	1663	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.534	3.538	-0.004	1.000	762590	0.9691		101	3341	
D 26 M2-8:2FTS										
529.00 > 81.00	3.534	3.540	-0.006	1.263	118578	2.39		99.8	1518	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.268	8694492	2.55		102	58147	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.548	3.548	0.0	1.000	4460655	1.09		109	1357	
513.00 > 169.00	3.548	3.548	0.0	1.000	272139		16.39(7.12-21.35)	109	1107	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.688	3.698	-0.010	1.318	4214233	2.63		105	9227	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.702	3.702	0.0	1.004	1724005	0.9881		98.8	1068	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.858	3.856	0.002	1.209	2366775	0.9814		102	3529	
599.00 > 99.00	3.858	3.856	0.002	1.209	502610		4.71(2.14-6.43)	102	3472	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.858	3.866	-0.008	1.379	3146939	2.45		98.0	6276	
D 30 13C2 PFUnA										
565.00 > 520.00	3.873	3.870	0.003	1.384	7995274	2.57		103	19876	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.873	3.870	0.003	1.004	1281556	1.01		101	2962	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.873	3.872	0.001	1.000	3231982	1.04		104	1045	
563.00 > 169.00	3.873	3.872	0.001	1.000	282391		11.45(5.24-15.72)	104	1790	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.027	4.026	0.001	1.261	4004388	NC			14131	
D 36 13C2 PFDoA										
615.00 > 570.00	4.155	4.162	-0.007	1.485	8582866	2.57		103	17126	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.155	4.162	-0.007	1.000	3875943	1.05		105	1077	
613.00 > 169.00	4.155	4.162	-0.007	1.000	376386		10.30(4.68-14.05)	105	1233	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.415	4.426	-0.011	1.063	3476223	1.01		101	1343	
663.00 > 169.00	4.415	4.426	-0.011	1.063	526599		6.60(3.09-9.27)	101	1390	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.655	4.664	-0.009	1.664	7135088	2.47		98.7	20391	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.655	4.664	-0.009	1.000	462550	0.9412		94.1	1234	
713.00 > 219.00	4.655	4.664	-0.009	1.000	353497		1.31(0.70-2.09)	94.1	1497	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.074	5.081	-0.007	1.814	7718471	2.59		104	10662	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.074	5.083	-0.009	1.000	3302984	NC			527	
813.00 > 169.00	5.074	5.083	-0.009	1.000	557229		5.93(2.77-8.32)		1324	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.073	2501662	NC			462	
913.00 > 169.00	5.431	5.443	-0.012	1.070	440034		5.69(2.55-7.64)		1600	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:25:18 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_007.d

Injection Date: 20-Jul-2018 19:55:09 Instrument ID: A9

Lims ID: IC L4 Full

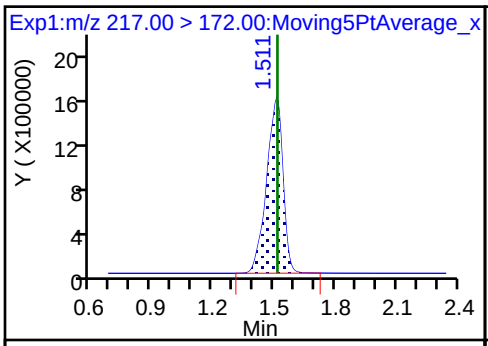
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 4 Worklist Smp#: 5

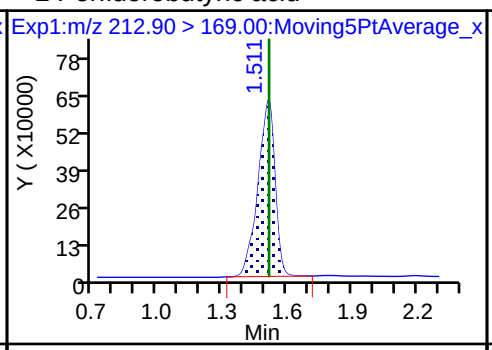
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

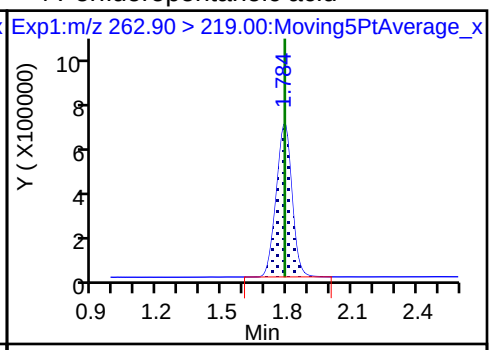
D 1 13C4 PFBA



2 Perfluorobutyric acid



4 Perfluoropentanoic acid



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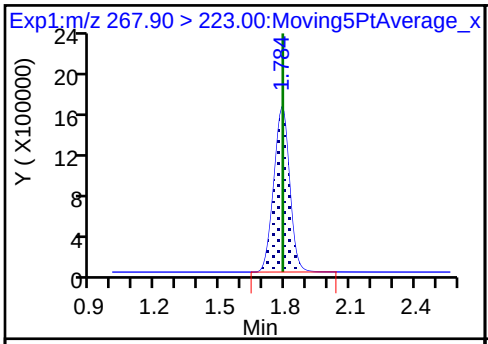
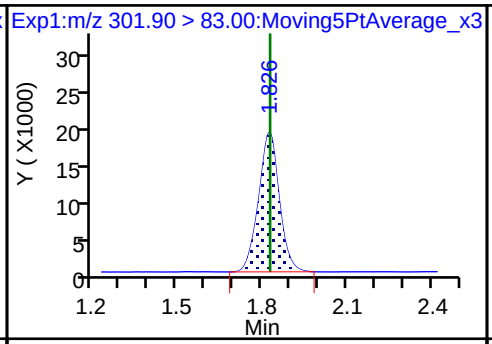
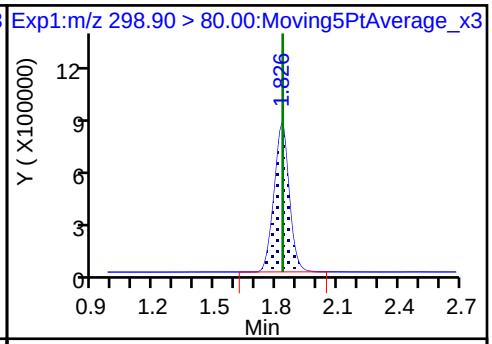


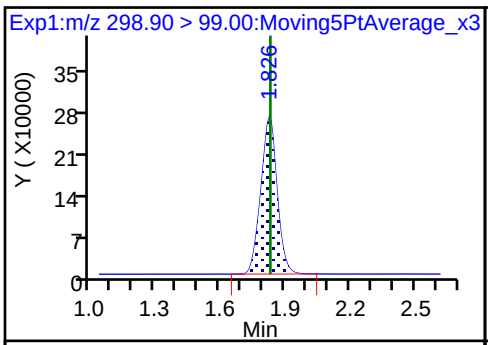
D 47 13C3-PFBS



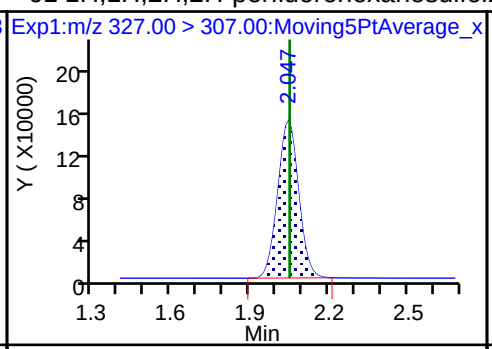
5 Perfluorobutanesulfonic acid



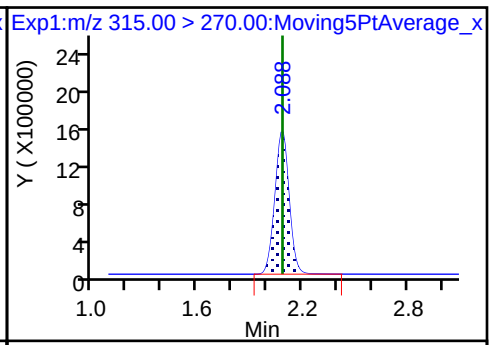
5 Perfluorobutanesulfonic acid



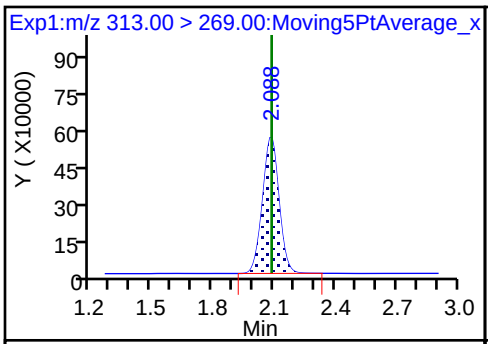
61 1H,1H,2H,2H-perfluorohexanesulfon



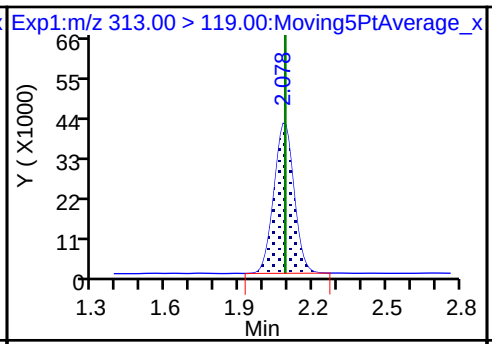
D 7 13C2 PFHxA



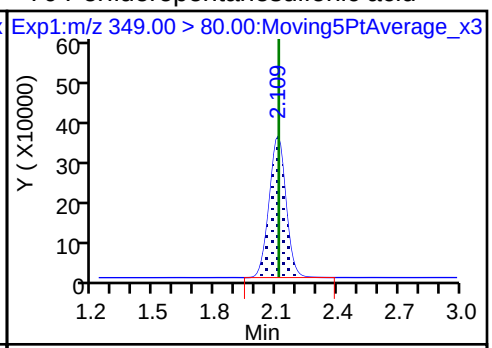
6 Perfluorohexanoic acid



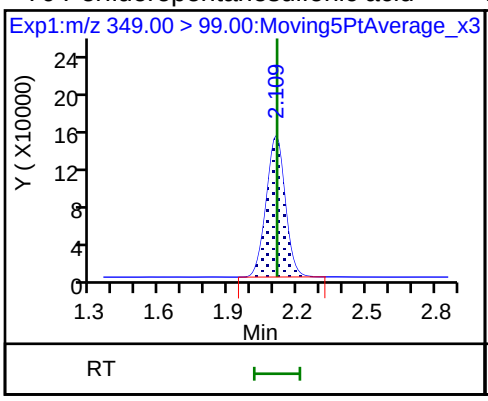
6 Perfluorohexanoic acid



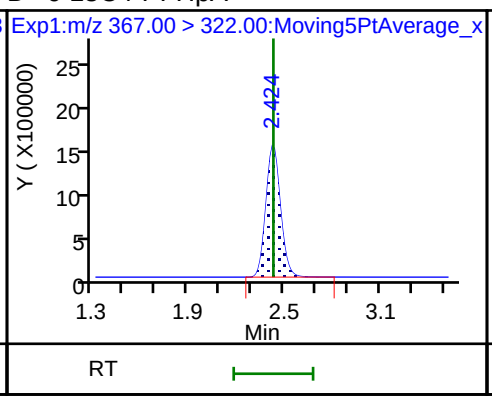
70 Perfluoropentanesulfonic acid



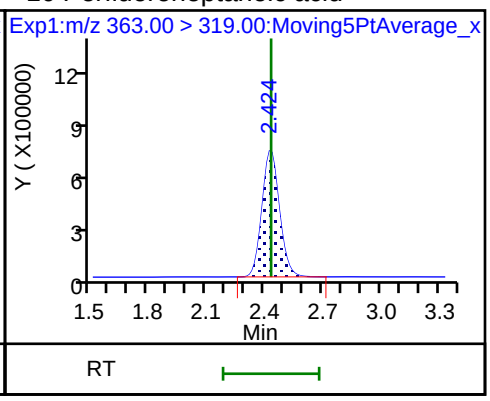
70 Perfluoropentanesulfonic acid



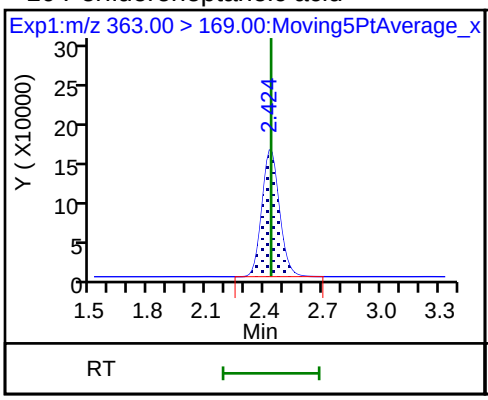
D 9 13C4-PFHpA



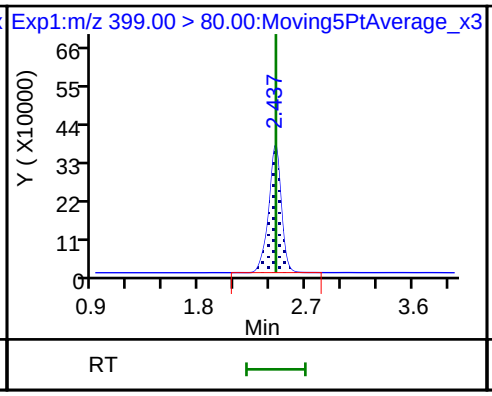
10 Perfluoroheptanoic acid



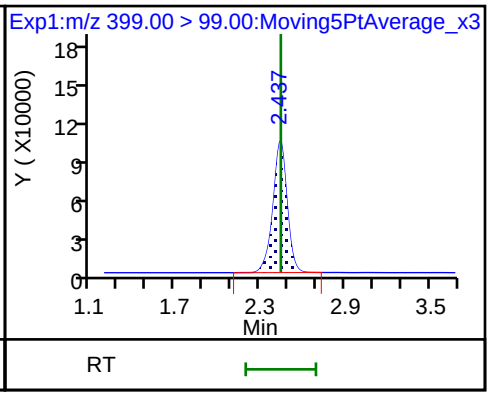
10 Perfluoroheptanoic acid



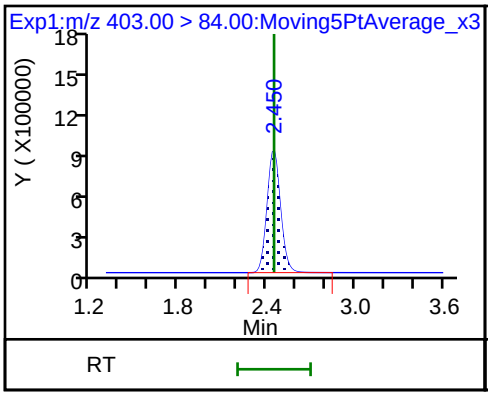
8 Perfluorohexanesulfonic acid



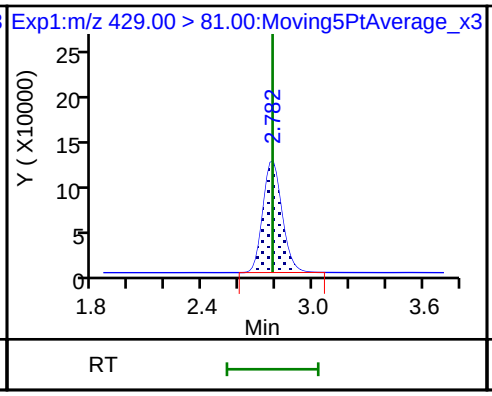
8 Perfluorohexanesulfonic acid



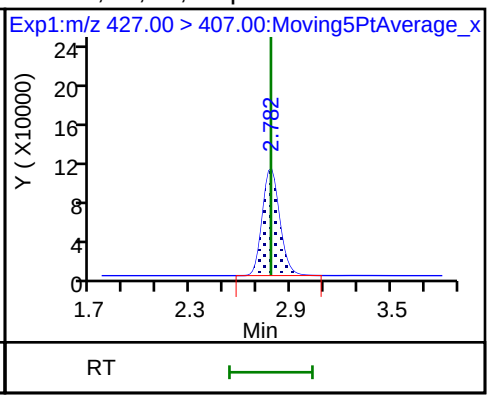
D 11 18O2 PFHxS



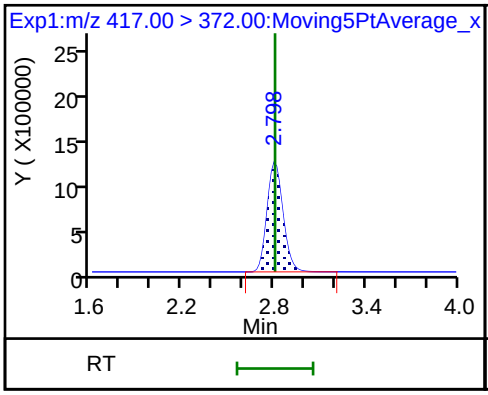
D 12 M2-6:2FTS



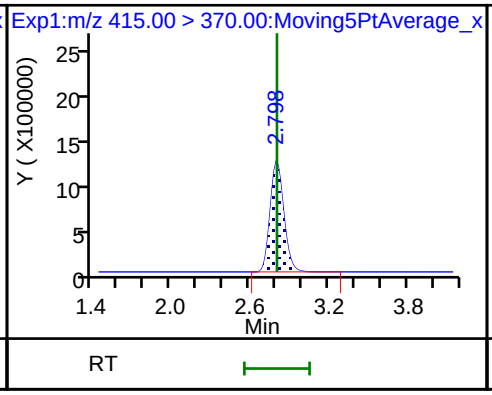
13 1H,1H,2H,2H-perfluorooctanesulfoni



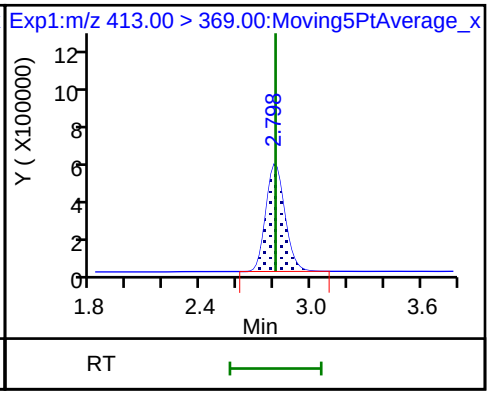
D 14 13C4 PFOA



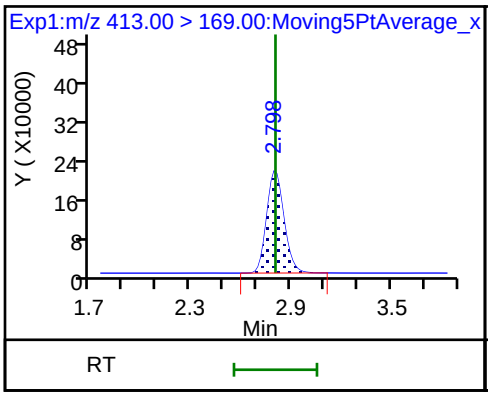
* 62 13C2-PFOA



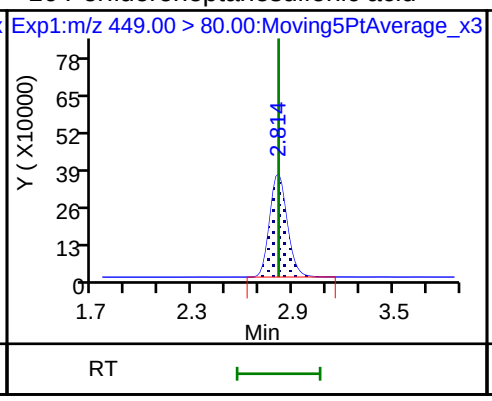
15 Perfluorooctanoic acid



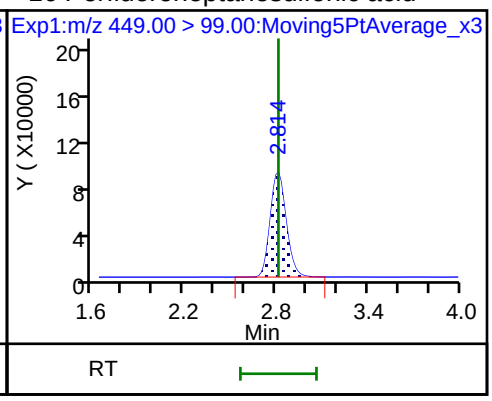
15 Perfluorooctanoic acid



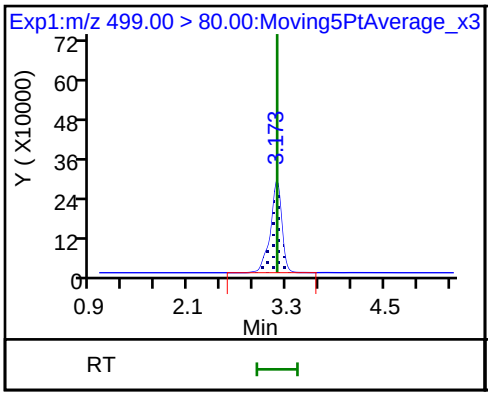
16 Perfluoroheptanesulfonic acid



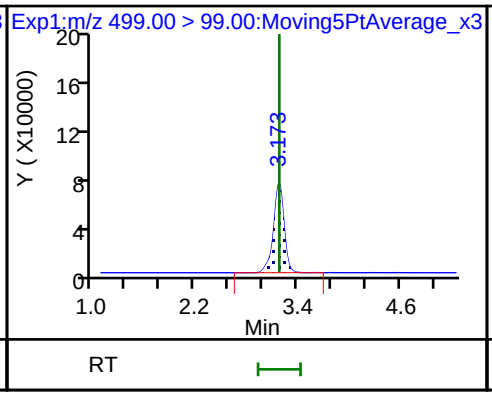
16 Perfluoroheptanesulfonic acid



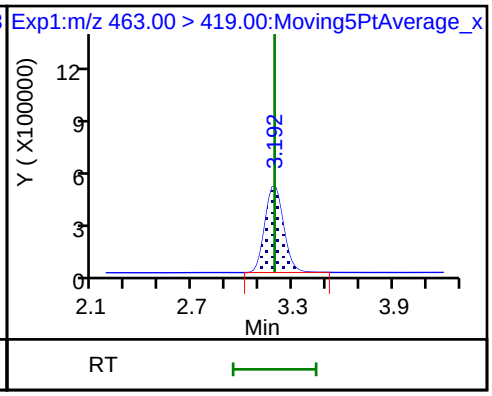
17 Perfluorooctane sulfonic acid



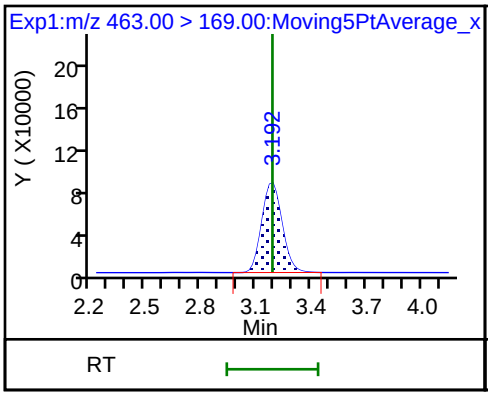
17 Perfluorooctane sulfonic acid



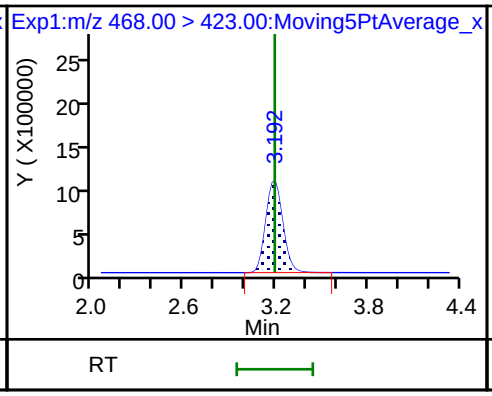
20 Perfluorononanoic acid



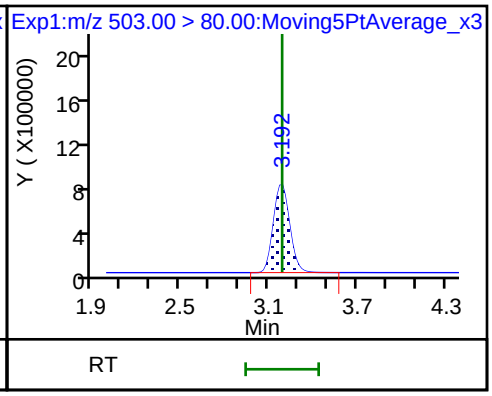
20 Perfluorononanoic acid



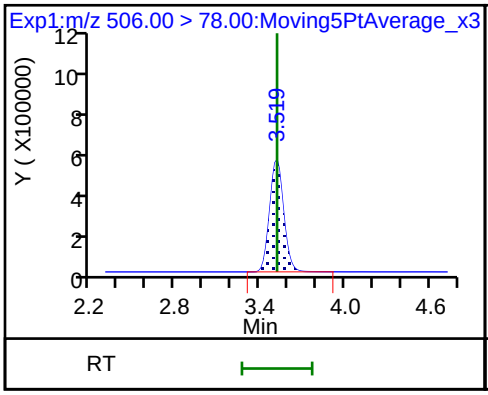
D 19 13C5 PFNA



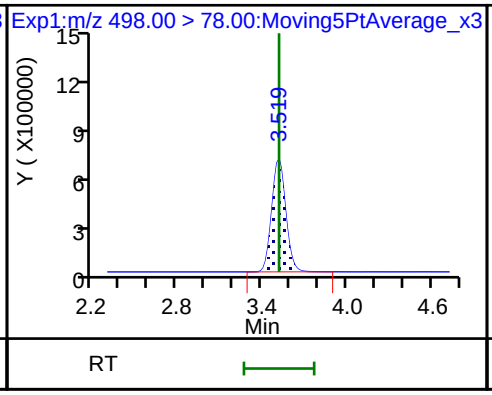
D 18 13C4 PFOS



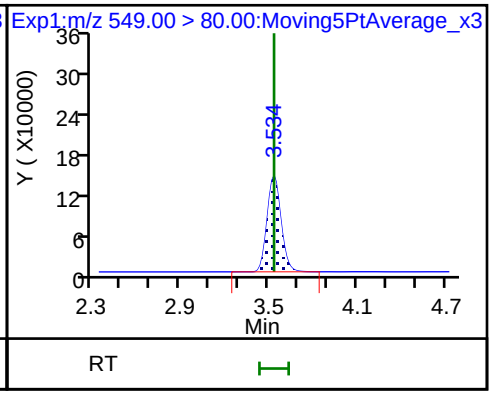
D 21 13C8 FOSA



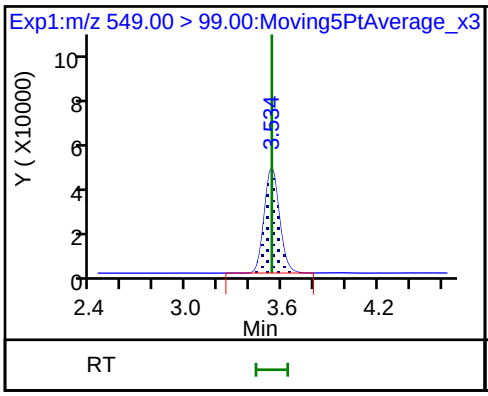
22 Perfluorooctane Sulfonamide



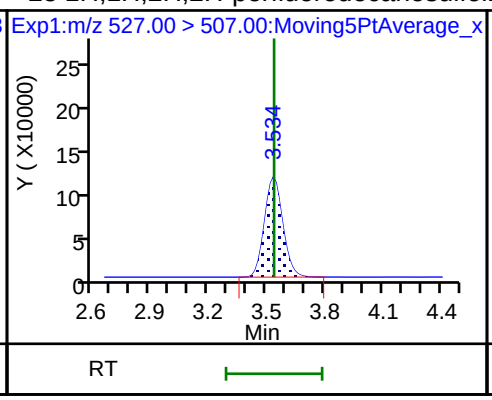
68 Perfluorononanesulfonic acid



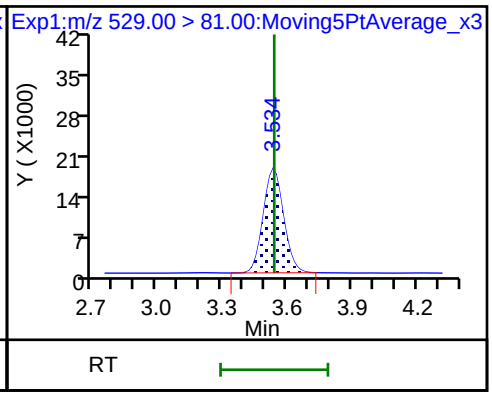
68 Perfluorononanesulfonic acid



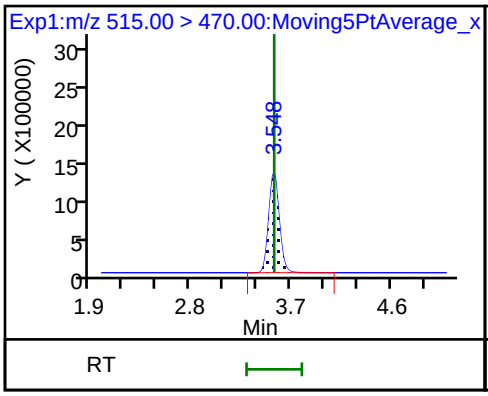
25 1H,1H,2H,2H-perfluorodecanesulfon



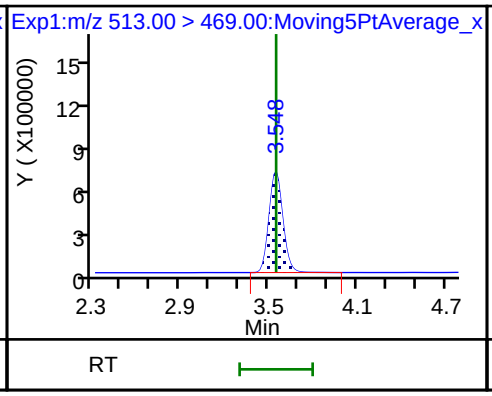
D 26 M2-8:2FTS



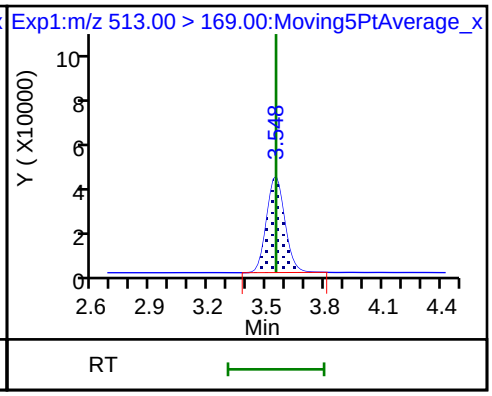
D 23 13C2 PFDA



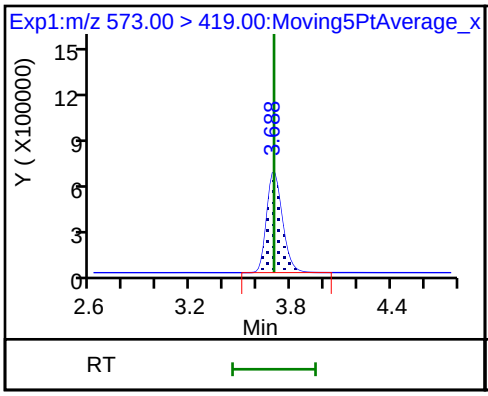
24 Perfluorodecanoic acid



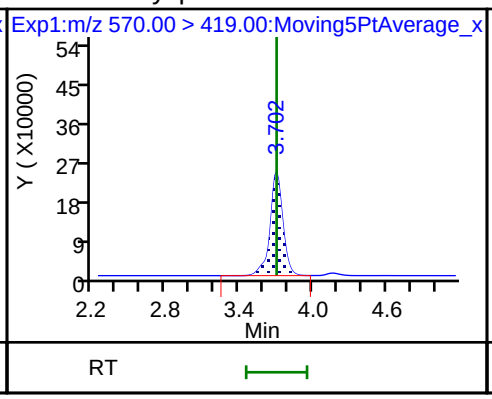
24 Perfluorodecanoic acid



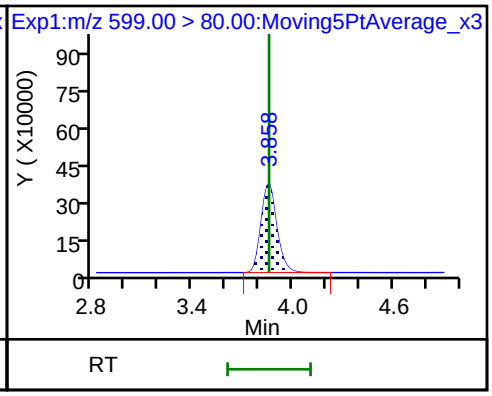
D 27 d3-NMeFOSAA



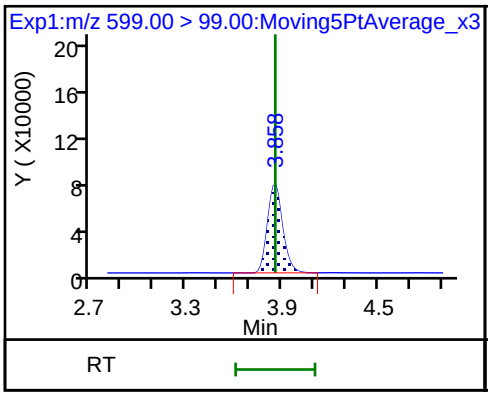
28 N-methyl perfluorooctane sulfonami



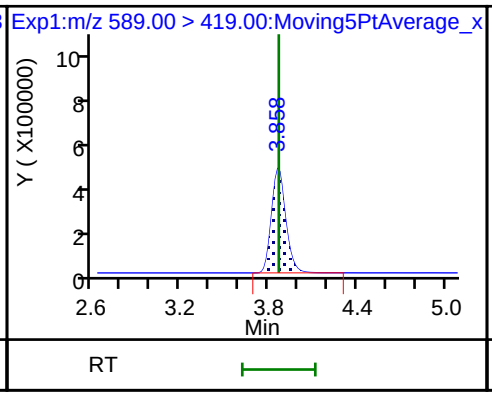
29 Perfluorodecane Sulfonic acid



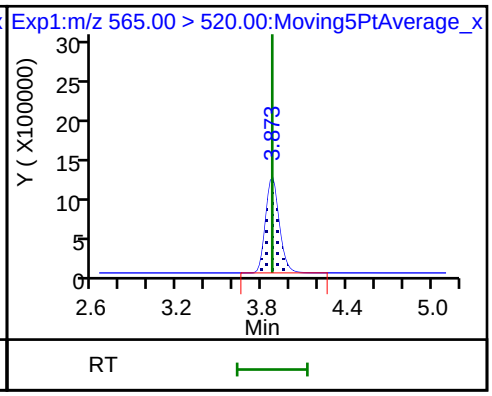
29 Perfluorodecane Sulfonic acid



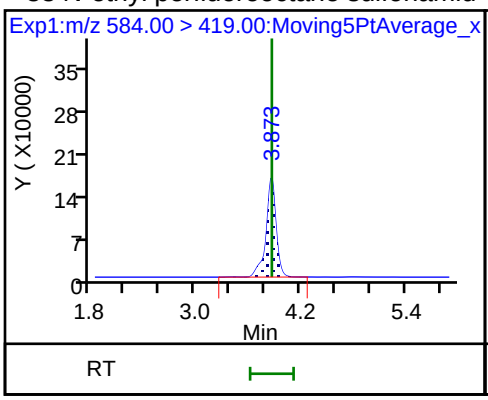
D 32 d5-NEtFOSAA



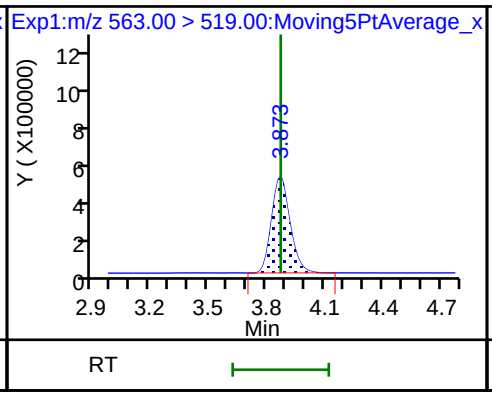
D 30 13C2 PFUnA



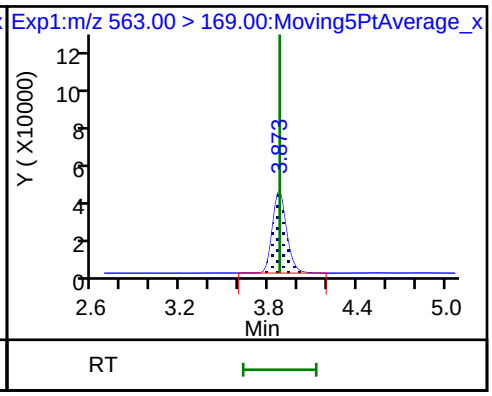
33 N-ethyl perfluorooctane sulfonamid



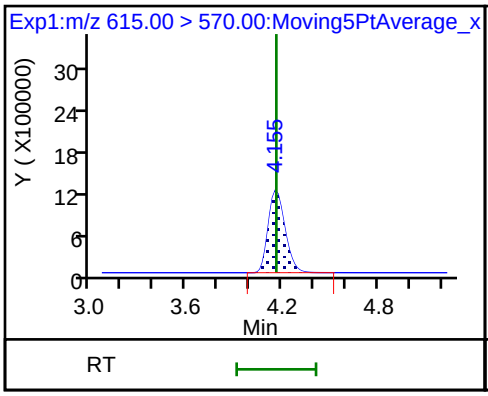
31 Perfluoroundecanoic acid



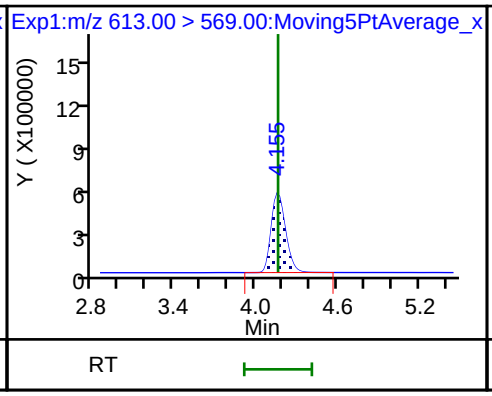
31 Perfluoroundecanoic acid



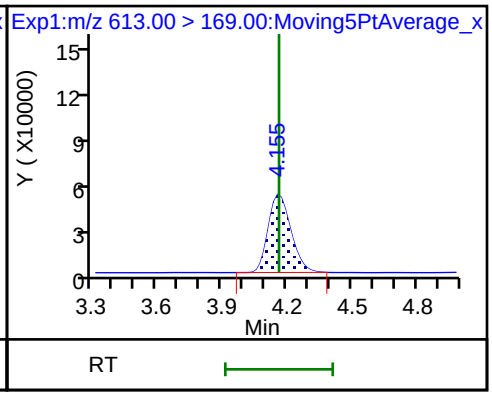
D 36 13C2 PFDoA



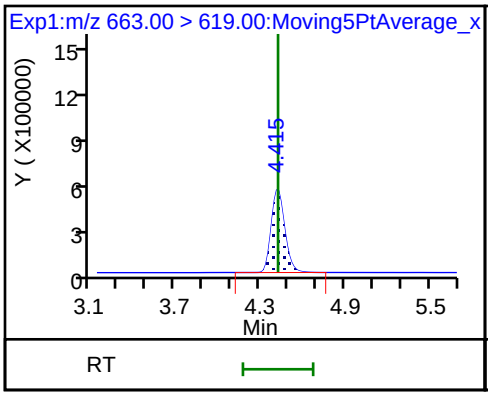
37 Perfluorododecanoic acid



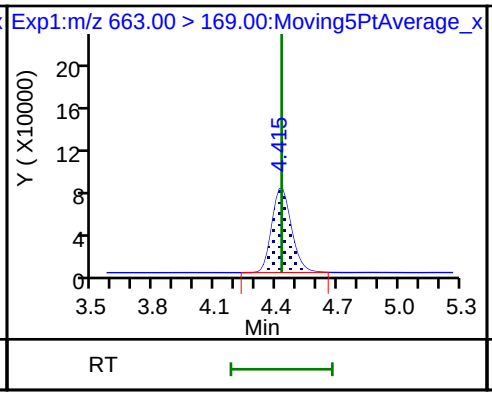
37 Perfluorododecanoic acid



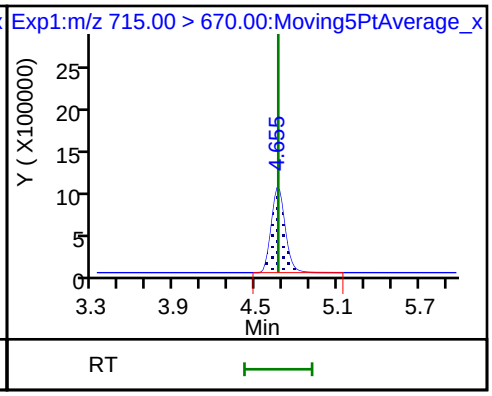
41 Perfluorotridecanoic acid



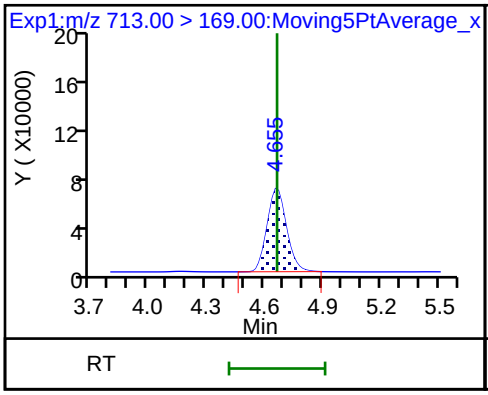
41 Perfluorotridecanoic acid



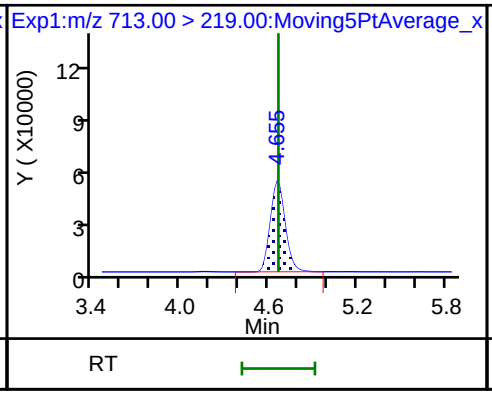
D 43 13C2-PFTeDA



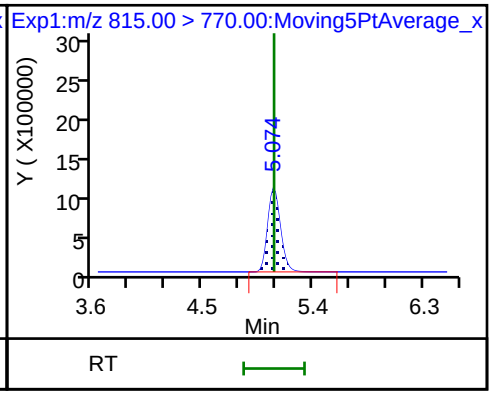
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_008.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 20-Jul-2018 20:02:43 ALS Bottle#: 5 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: L5
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:25:20 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 09:58:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.515	0.002	0.543	8624856	2.42		96.6	13012	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.516	0.001	1.000	8683460	2.63		105	1440	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.789	0.003	1.000	8737065	2.55		102	3901	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.789	0.003	0.641	7881612	2.40		96.0	20829	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.827	-0.001	0.653	93897	2.27		97.5	1217	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.834	1.831	0.003	1.005	10135605	2.29		104	6704	
298.90 > 99.00	1.834	1.831	0.003	1.005	3614093		2.80(1.35-4.05)	104	9311	
D 60 M2-4:2FTS										
329.00 > 81.00	2.046	2.051	-0.005	0.732	711807	NC			1754	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.051	-0.005	1.120	2061744	2.38		102	16982	
D 7 13C2 PFHxA										
315.00 > 270.00	2.088	2.085	0.003	0.746	8451911	2.45		98.1	50066	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.088	2.086	0.002	1.000	7926274	2.48		99.1	4474	
313.00 > 119.00	2.088	2.086	0.002	1.000	571458		13.87(6.96-20.87)	99.1	2767	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.108	2.112	-0.004	1.155	5386654	2.56		109	12087	
349.00 > 99.00	2.108	2.112	-0.004	1.155	2308042		2.33(1.15-3.45)	109	10049	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.192	2.189	0.003	0.784	911459	NC			6456	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.192	2.189	0.003	1.000	1725800	NC			909	
D 9 13C4-PFHpA										
367.00 > 322.00	2.436	2.431	0.005	0.871	9615791	2.41		96.3	36024	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.436	2.433	0.003	1.000	10692038	2.53		101	3502	
363.00 > 169.00	2.436	2.433	0.003	1.000	2488856		4.30(2.17-6.52)	101	11369	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.446	0.003	1.000	6836644	2.21		97.2	10140	
399.00 > 99.00	2.449	2.446	0.003	1.000	1771019		3.86(1.90-5.70)	97.2	7374	
D 11 18O2 PFHxS										
403.00 > 84.00	2.449	2.447	0.002	0.876	5490801	2.26		95.6	62398	
65 ADONA										
377.00 > 251.00	2.475	2.477	-0.002	0.775	16926841	NC			64610	
377.00 > 85.00	2.475	2.477	-0.002	0.775	7893784		2.14(1.05-3.16)		4414	
D 12 M2-6:2FTS										
429.00 > 81.00	2.781	2.779	0.002	0.994	829585	2.22		93.6	3612	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.781	2.779	0.002	1.000	1973546	2.59		109	16127	
D 14 13C4 PFOA										
417.00 > 372.00	2.797	2.804	-0.007	1.000	8833584	2.46		98.4	48716	
* 62 13C2-PFOA										
415.00 > 370.00	2.797	2.804	-0.007		9164254	2.50			34133	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.813	2.806	0.007	1.006	9893943	2.43		97.1	1662	
413.00 > 169.00	2.797	2.806	-0.009	1.000	3764817		2.63(1.36-4.08)	97.1	7550	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.813	2.813	0.0	0.881	6586083	2.45		103	9015	
449.00 > 99.00	2.813	2.813	0.0	0.881	1654784		3.98(1.84-5.53)	103	14500	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.192	3.184	0.008	1.000	6534759	2.31		99.4	12138	
499.00 > 99.00	3.192	3.184	0.008	1.000	1641419		3.98(2.04-6.12)	99.4	8343	
20 Perfluorononanoic acid										
463.00 > 419.00	3.192	3.189	0.003	1.000	8952125	2.55		102	2553	
463.00 > 169.00	3.192	3.189	0.003	1.000	1763836		5.08(2.68-8.03)	102	3574	
D 19 13C5 PFNA										
468.00 > 423.00	3.192	3.189	0.003	1.141	8196177	2.43		97.2	26775	
D 18 13C4 PFOS										
503.00 > 80.00	3.192	3.189	0.003	1.141	6013683	2.31		96.6	8769	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.404	3.398	0.006	1.067	7680486	NC			11447	
D 21 13C8 FOSA										
506.00 > 78.00	3.518	3.519	-0.001	1.258	3534703	2.40		96.2	11166	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.518	3.519	-0.001	1.000	11331304	2.62		105	9292	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.533	3.534	-0.001	1.107	2444697	2.48		103	6715	
549.00 > 99.00	3.533	3.534	-0.001	1.107	788463		3.10(1.42-4.26)	103	3943	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.533	3.538	-0.005	1.000	1852213	2.35		98.0	6332	
D 26 M2-8:2FTS										
529.00 > 81.00	3.533	3.540	-0.007	1.263	118941	2.33		97.4	1405	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.268	8623593	2.46		98.5	18221	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.548	3.548	0.0	1.000	10586026	2.61		105	3091	
513.00 > 169.00	3.548	3.548	0.0	1.000	700112		15.12(7.12-21.35)	105	3088	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.701	3.698	0.003	1.323	3831445	2.32		93.0	6738	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.701	3.702	-0.001	1.000	4302560	2.71		108	18456	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.858	3.856	0.002	1.209	6173042	2.63		109	8946	
599.00 > 99.00	3.858	3.856	0.002	1.209	1285338		4.80(2.14-6.43)	109	7887	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.872	3.866	0.006	1.384	3140930	2.38		95.1	5670	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.870	0.002	1.384	7616119	2.38		95.2	22671	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.872	3.870	0.002	1.000	3212075	2.55		102	7539	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.000	7375185	2.49		99.7	2294	
563.00 > 169.00	3.872	3.872	0.0	1.000	732683		10.07(5.24-15.72)	99.7	3496	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.261	9062942	NC			24766	
D 36 13C2 PFDoA										
615.00 > 570.00	4.154	4.162	-0.008	1.485	8304185	2.42		96.7	15478	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.154	4.162	-0.008	1.000	9220790	2.57		103	2835	
613.00 > 169.00	4.154	4.162	-0.008	1.000	1015600		9.08(4.68-14.05)	103	2495	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.430	4.426	0.004	1.066	8474129	2.55		102	2757	
663.00 > 169.00	4.430	4.426	0.004	1.066	1433263		5.91(3.09-9.27)	102	3703	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006	1.670	7416295	2.50		99.8	16196	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.670	4.664	0.006	1.000	1223124	2.39		95.8	2980	
713.00 > 219.00	4.654	4.664	-0.010	0.997	851570		1.44(0.70-2.09)	95.8	2645	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.073	5.081	-0.008	1.814	7300156	2.39		95.5	9244	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.090	5.083	0.007	1.003	7297603	NC			1102	
813.00 > 169.00	5.073	5.083	-0.010	1.000	1358857		5.37(2.77-8.32)		2115	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.073	6164791	NC			968	
913.00 > 169.00	5.445	5.443	0.002	1.073	1138213		5.42(2.55-7.64)		2903	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:25:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_008.d

Injection Date: 20-Jul-2018 20:02:43 Instrument ID: A9

Lims ID: IC L5 Full

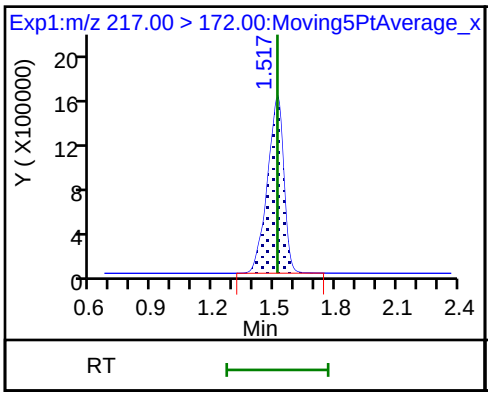
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 6

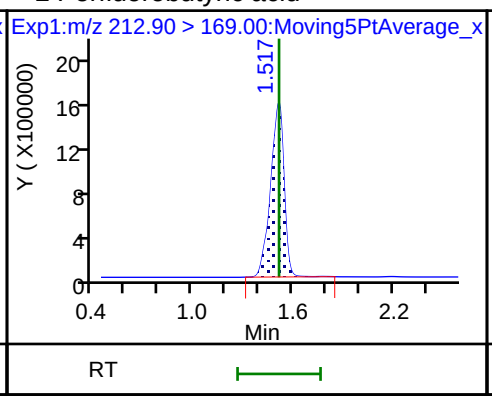
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

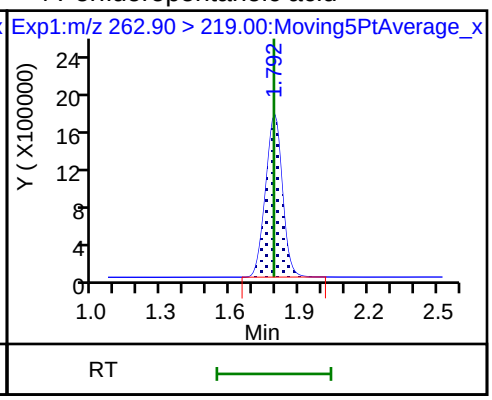
D 1 13C4 PFBA



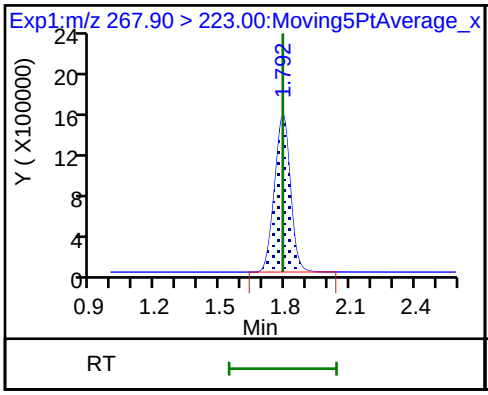
2 Perfluorobutyric acid



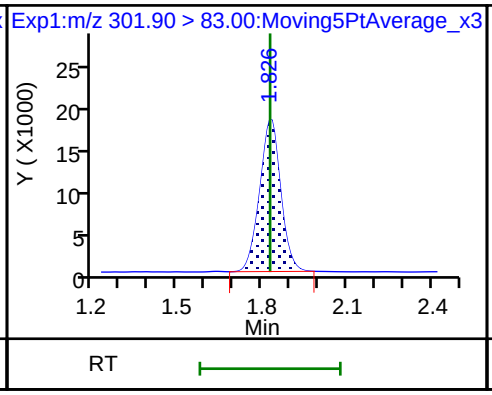
4 Perfluoropentanoic acid



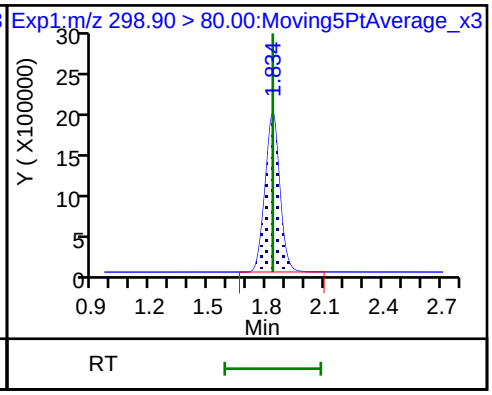
D 3 13C5-PFPeA



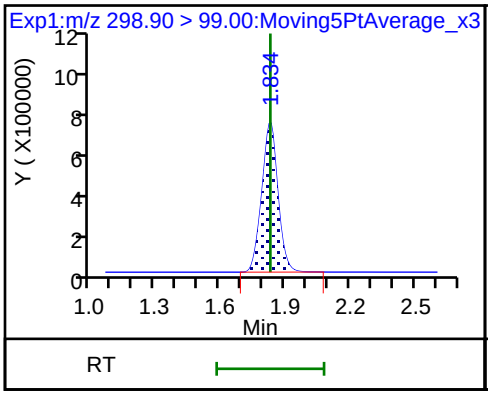
D 47 13C3-PFBS



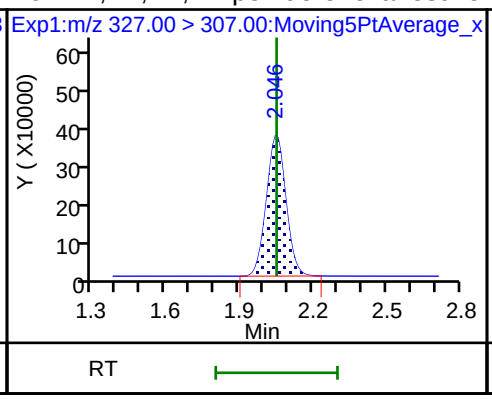
5 Perfluorobutanesulfonic acid



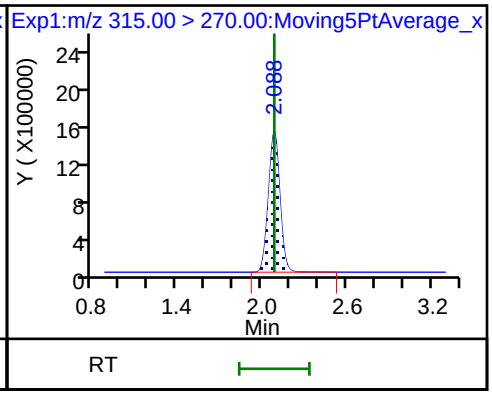
5 Perfluorobutanesulfonic acid



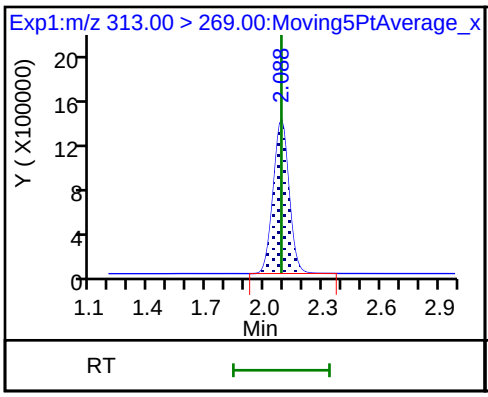
61 1H,1H,2H,2H-perfluorohexanesulfon



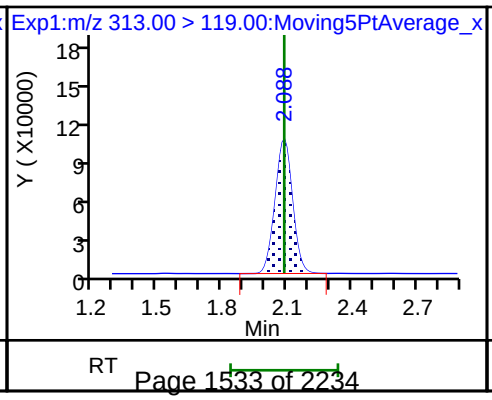
D 7 13C2 PFHxA



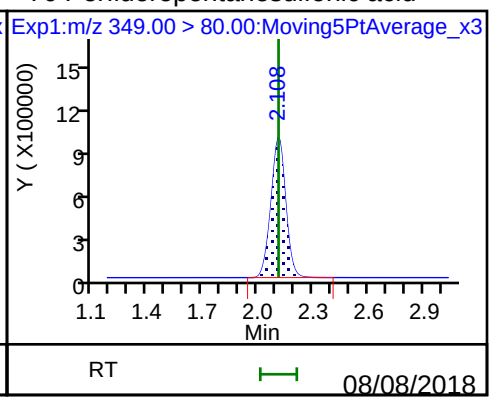
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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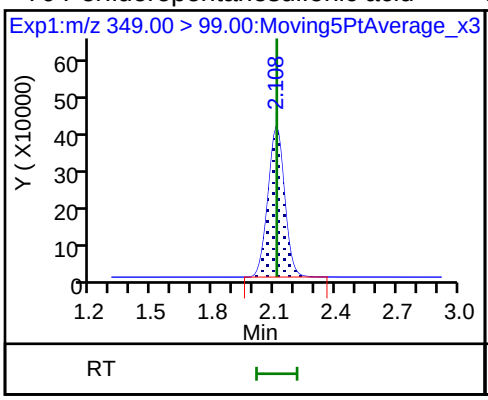
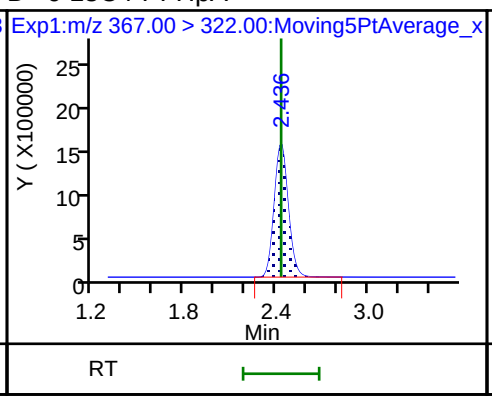
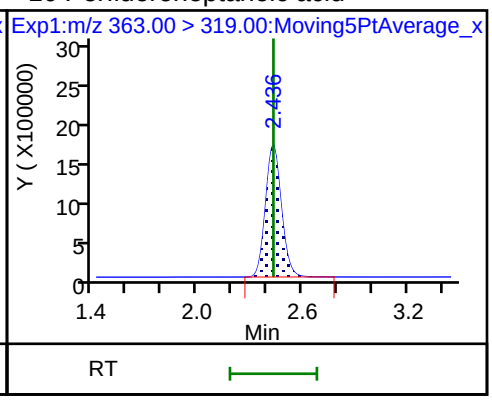


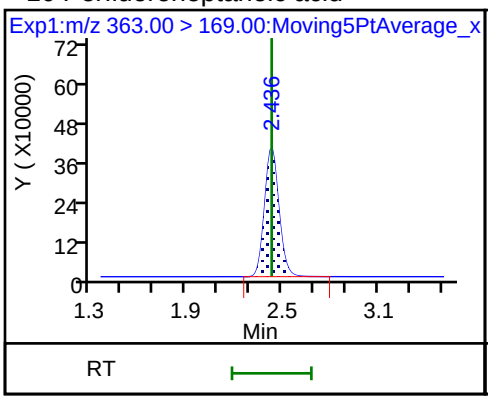
D 9 13C4-PFHpA



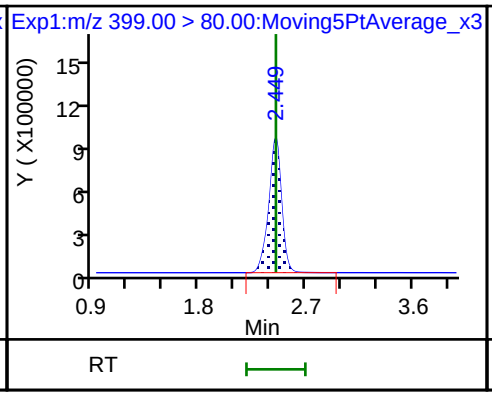
10 Perfluoroheptanoic acid



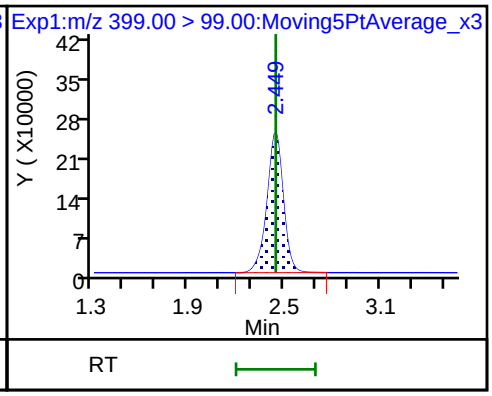
10 Perfluoroheptanoic acid



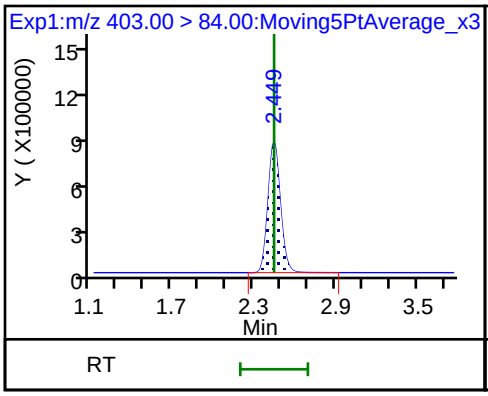
8 Perfluorohexanesulfonic acid



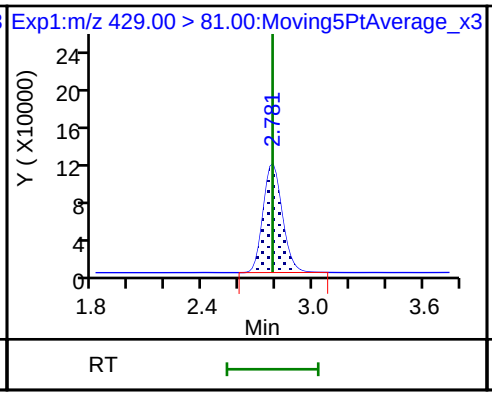
8 Perfluorohexanesulfonic acid



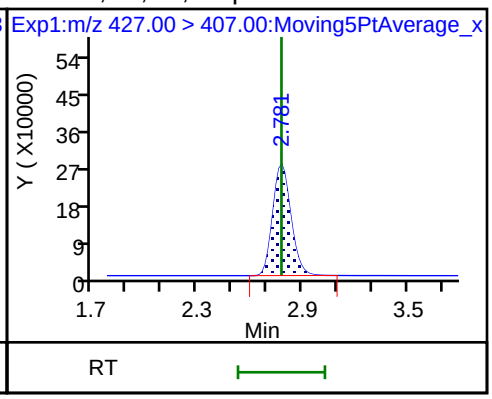
D 11 18O2 PFHxS



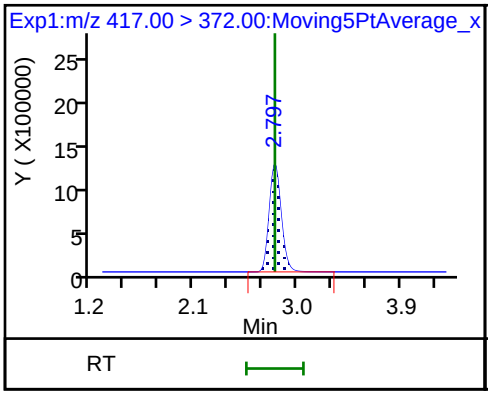
D 12 M2-6:2FTS



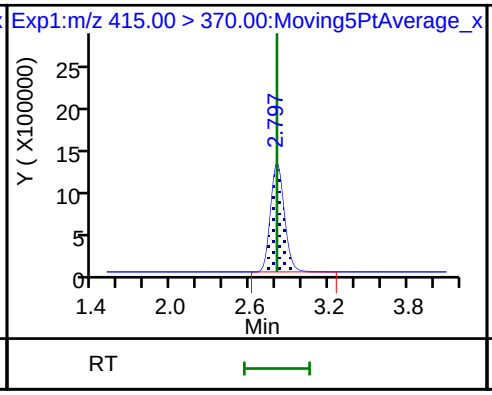
13 1H,1H,2H,2H-perfluorooctanesulfoni



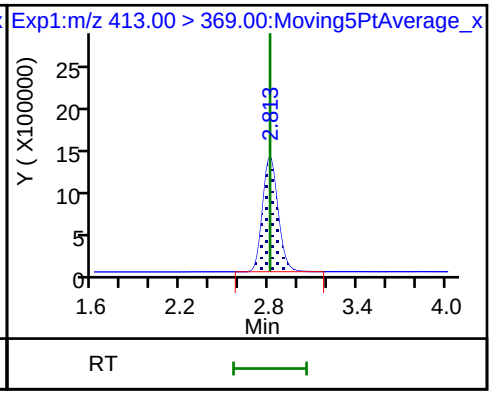
D 14 13C4 PFOA



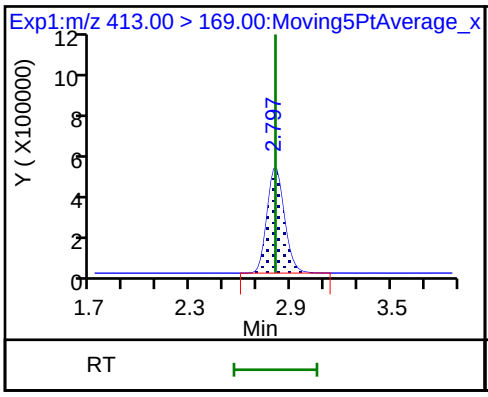
* 62 13C2-PFOA



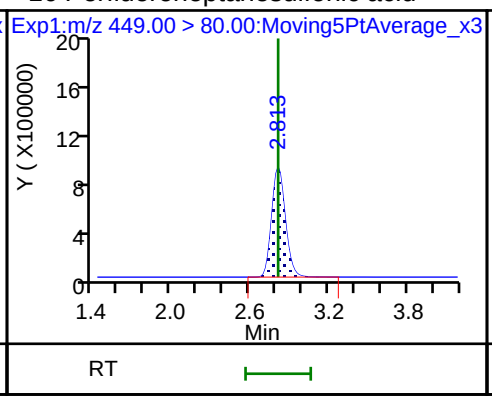
15 Perfluorooctanoic acid



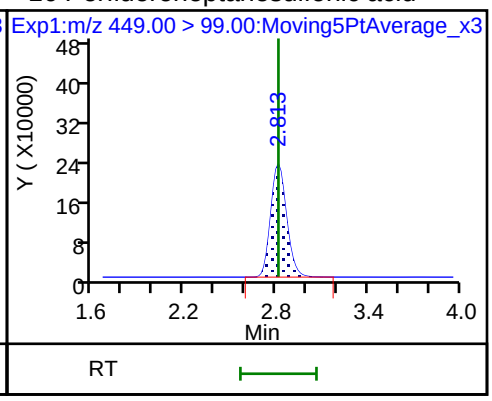
15 Perfluorooctanoic acid



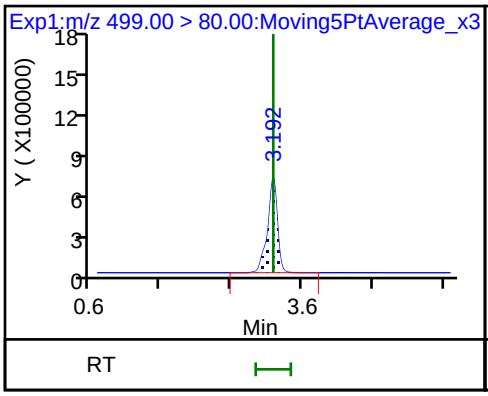
16 Perfluoroheptanesulfonic acid



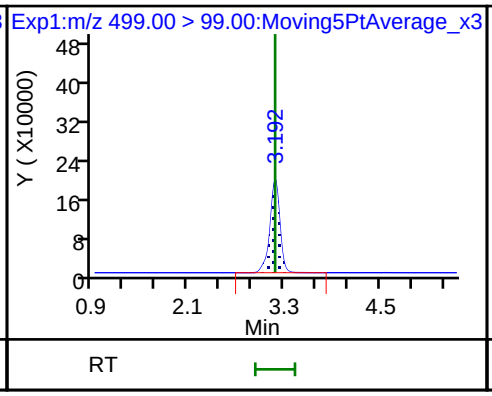
16 Perfluoroheptanesulfonic acid



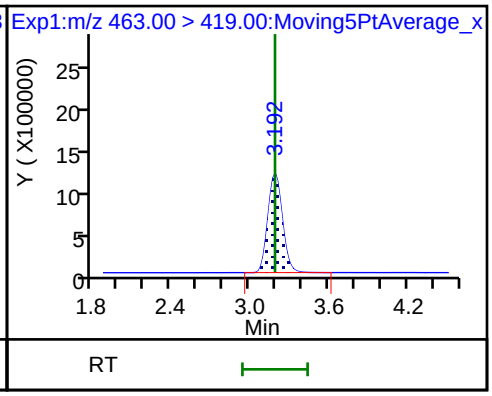
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



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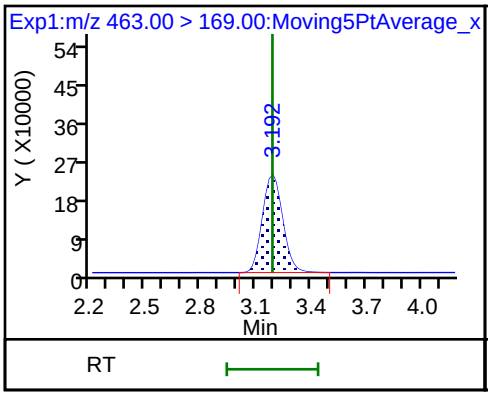
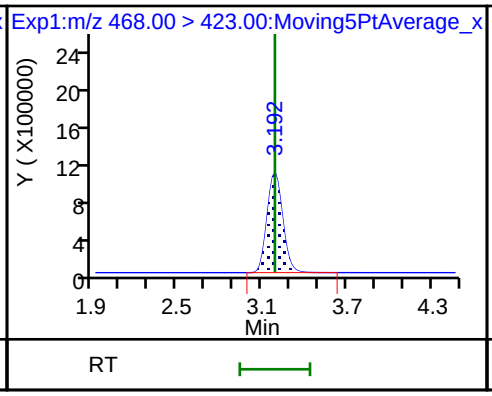
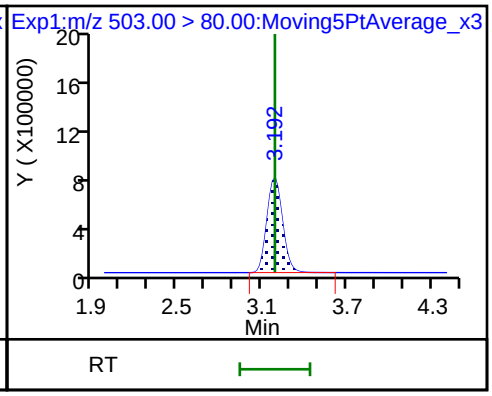


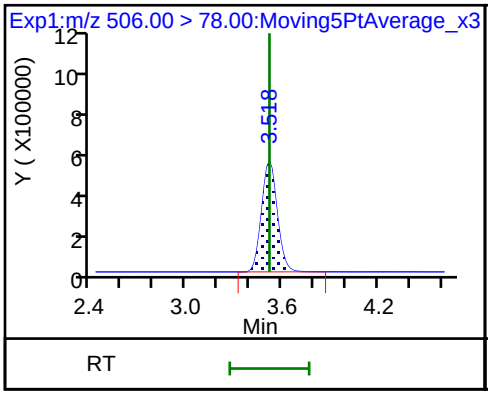
D 19 13C5 PFNA



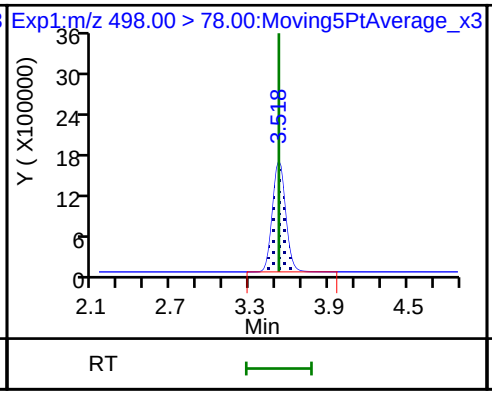
D 18 13C4 PFOS



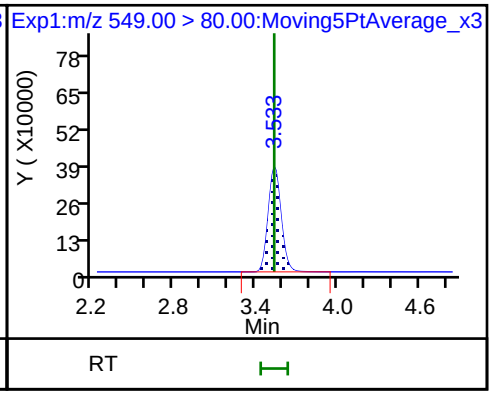
D 21 13C8 FOSA



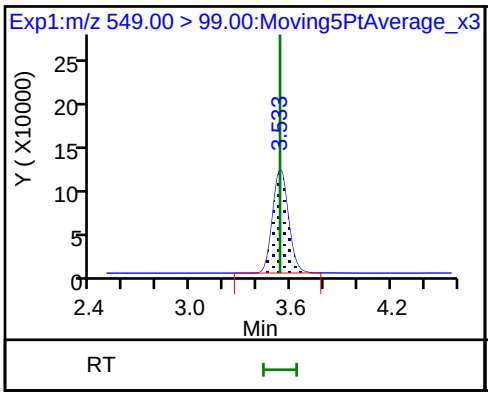
22 Perfluorooctane Sulfonamide



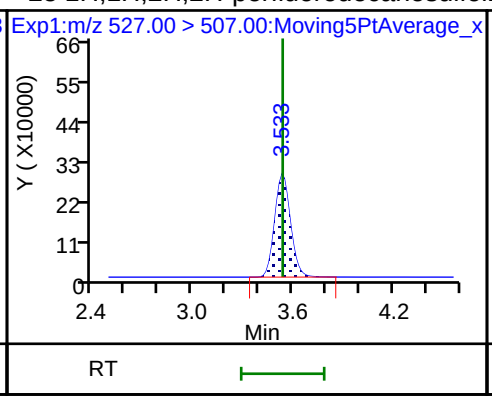
68 Perfluorononanesulfonic acid



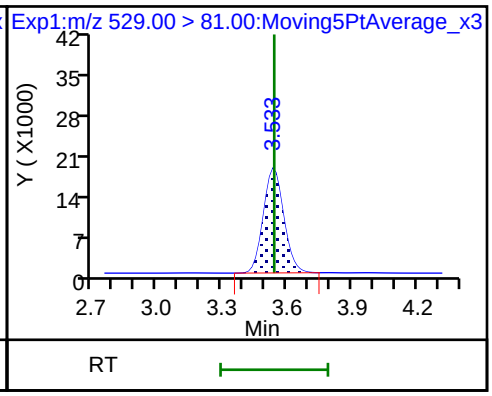
68 Perfluorononanesulfonic acid



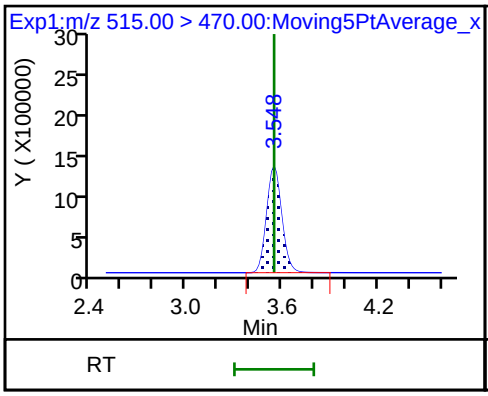
25 1H,1H,2H,2H-perfluorodecanesulfon



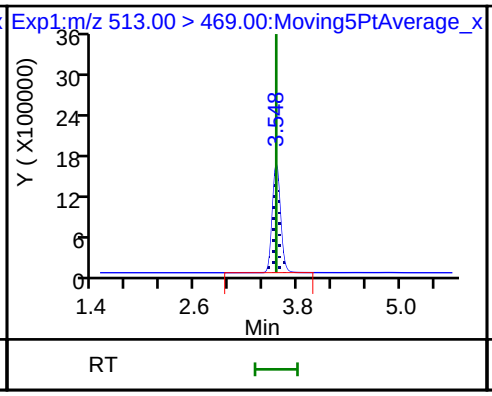
D 26 M2-8:2FTS



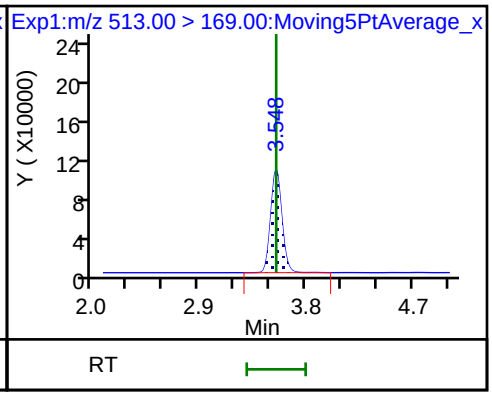
D 23 13C2 PFDA



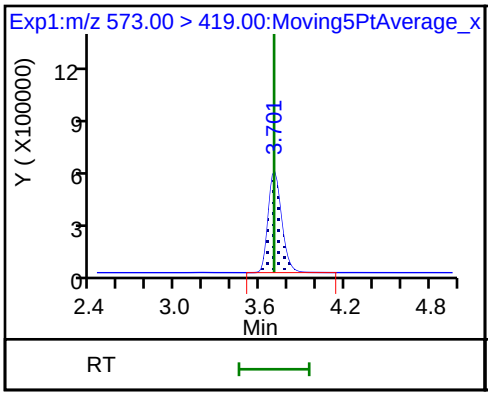
24 Perfluorodecanoic acid



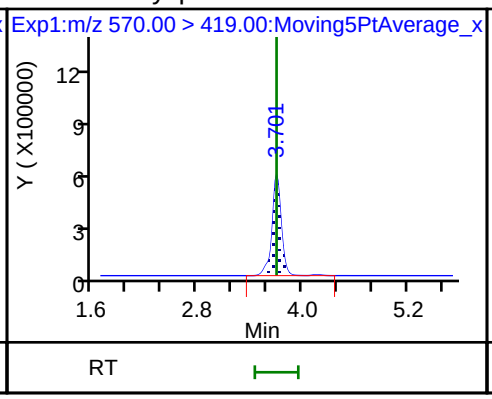
24 Perfluorodecanoic acid



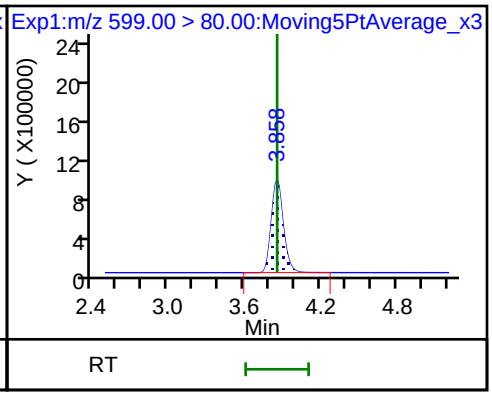
D 27 d3-NMeFOSAA



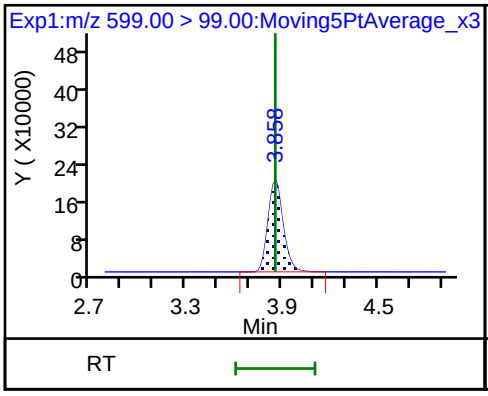
28 N-methyl perfluorooctane sulfonami



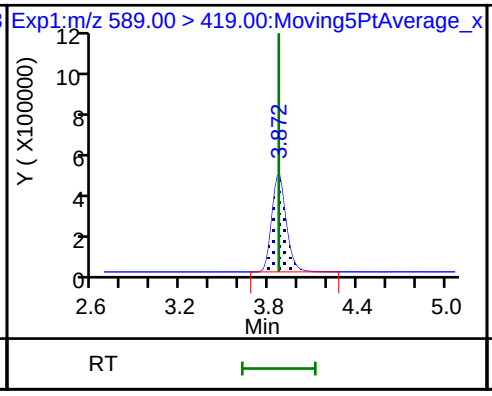
29 Perfluorodecane Sulfonic acid



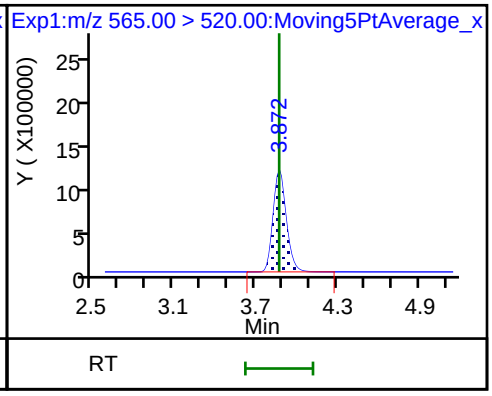
29 Perfluorodecane Sulfonic acid



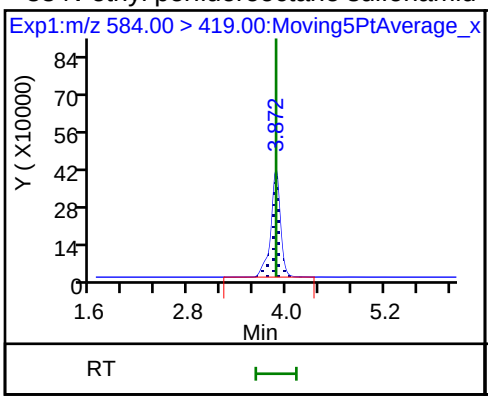
D 32 d5-NEtFOSAA



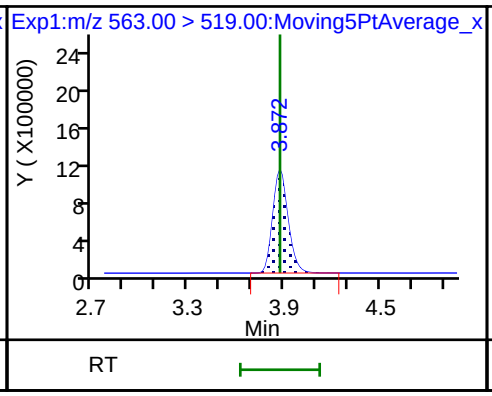
D 30 13C2 PFUnA



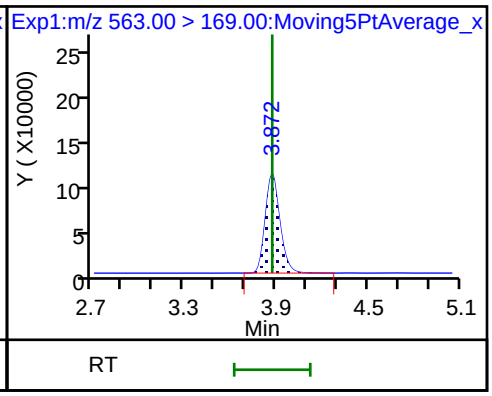
33 N-ethyl perfluorooctane sulfonamid



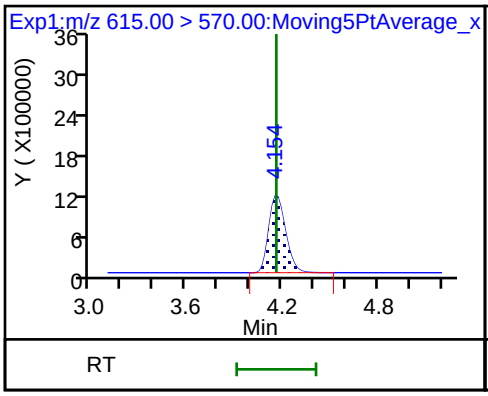
31 Perfluoroundecanoic acid



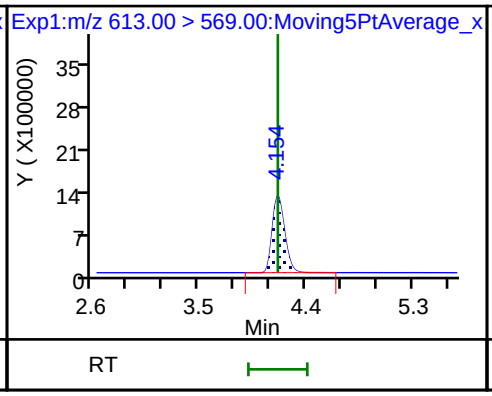
31 Perfluoroundecanoic acid



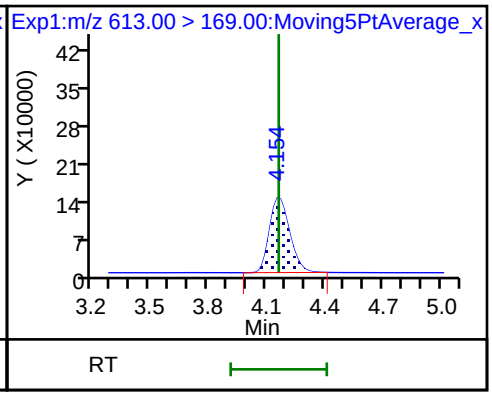
D 36 13C2 PFDoA



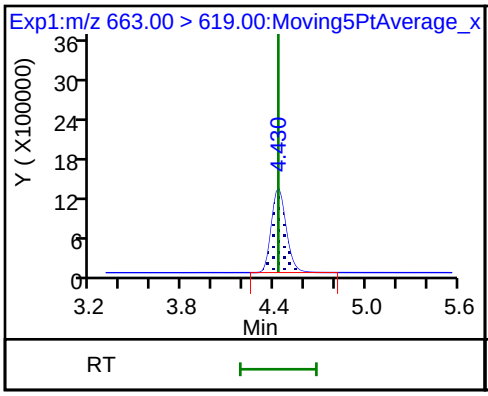
37 Perfluorododecanoic acid



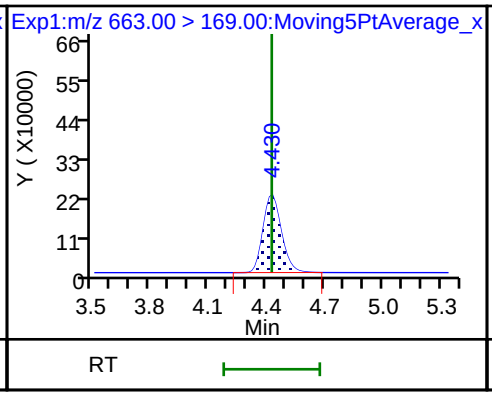
37 Perfluorododecanoic acid



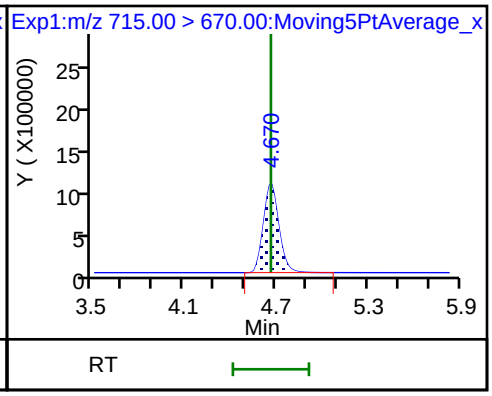
41 Perfluorotridecanoic acid



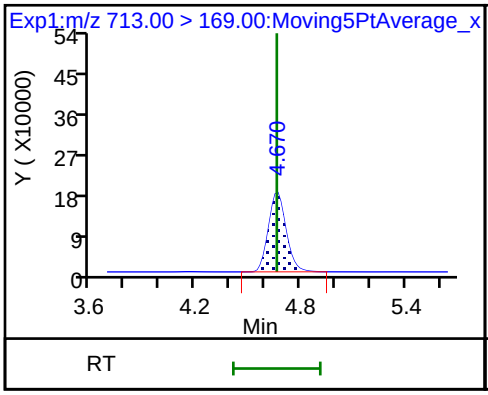
41 Perfluorotridecanoic acid



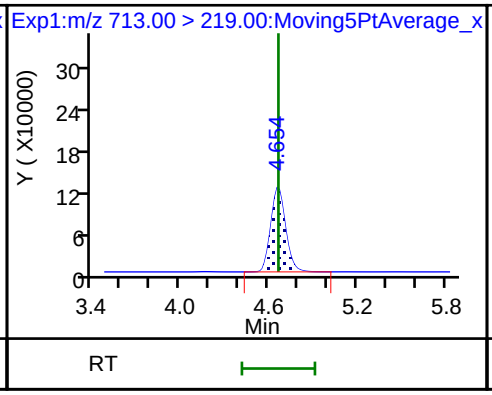
D 43 13C2-PFTeDA



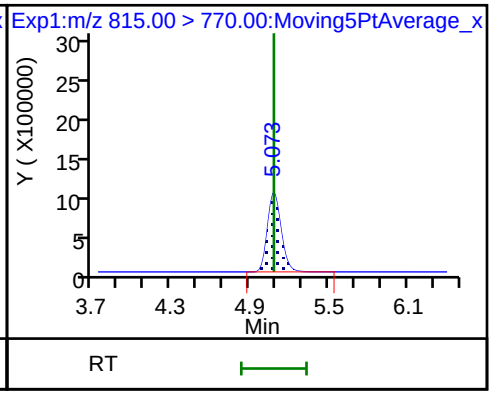
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_009.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 20-Jul-2018 20:10:16 ALS Bottle#: 6 Worklist Smp#: 7
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: L6
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:25:24 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 09:59:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.511	1.515	-0.004	0.540	8585448	2.62		105	12381	
2 Perfluorobutyric acid										
212.90 > 169.00	1.511	1.516	-0.005	1.000	16382616	4.98		99.6	2671	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.784	1.789	-0.005	1.000	15927568	4.64		92.7	7135	
D 3 13C5-PFPeA										
267.90 > 223.00	1.784	1.789	-0.005	0.638	7911006	2.62		105	22808	
D 47 13C3-PFBS										
301.90 > 83.00	1.818	1.827	-0.009	0.650	93215	2.45		105	1649	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.826	1.831	-0.005	1.005	18352327	4.18		94.7	11423	
298.90 > 99.00	1.826	1.831	-0.005	1.005	7063554		2.60(1.35-4.05)	94.7	17555	
D 60 M2-4:2FTS										
329.00 > 81.00	2.046	2.051	-0.005	0.732	693304	NC			1740	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.051	-0.005	1.126	3983885	4.63		99.1	18424	
D 7 13C2 PFHxA										
315.00 > 270.00	2.078	2.085	-0.007	0.743	8240591	2.60		104	40930	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.078	2.086	-0.008	1.000	14895958	4.78		95.5	8721	
313.00 > 119.00	2.078	2.086	-0.008	1.000	1120061		13.30(6.96-20.87)	95.5	4409	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.109	2.112	-0.003	1.160	10107955	4.83		103	20346	
349.00 > 99.00	2.109	2.112	-0.003	1.160	4404039		2.30(1.15-3.45)	103	21060	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.182	2.189	-0.007	0.780	893698	NC			6524	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.182	2.189	-0.007	1.000	3368341	NC			1842	
D 9 13C4-PFHpA										
367.00 > 322.00	2.424	2.431	-0.007	0.866	9739676	2.65		106	38591	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.424	2.433	-0.009	1.000	19635530	4.59		91.7	5758	
363.00 > 169.00	2.424	2.433	-0.009	1.000	4917943		3.99(2.17-6.52)	91.7	15420	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.436	2.446	-0.010	1.000	13507927	4.45		97.8	21434	
399.00 > 99.00	2.436	2.446	-0.010	1.000	3568035		3.79(1.90-5.70)	97.8	13053	
D 11 18O2 PFHxS										
403.00 > 84.00	2.436	2.447	-0.011	0.871	5391005	2.41		102	40577	
65 ADONA										
377.00 > 251.00	2.475	2.477	-0.002	0.780	29913236	NC			105302	
377.00 > 85.00	2.475	2.477	-0.002	0.780	14376216		2.08(1.05-3.16)		8120	
D 12 M2-6:2FTS										
429.00 > 81.00	2.765	2.779	-0.014	0.989	855949	2.49		105	3847	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.765	2.779	-0.014	1.000	3661214	4.66		98.2	33622	
D 14 13C4 PFOA										
417.00 > 372.00	2.797	2.804	-0.007	1.000	8452129	2.56		102	31782	
* 62 13C2-PFOA										
415.00 > 370.00	2.797	2.804	-0.007		8423906	2.50			35361	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.797	2.806	-0.009	1.000	17615969	4.52		90.4	2994	
413.00 > 169.00	2.797	2.806	-0.009	1.000	7348569		2.40(1.36-4.08)	90.4	13293	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.813	2.813	0.0	0.887	12410251	4.75		99.7	19704	
449.00 > 99.00	2.813	2.813	0.0	0.887	3314182		3.74(1.84-5.53)	99.7	18410	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.173	3.184	-0.011	1.000	12917138	4.68		101	19321	
499.00 > 99.00	3.173	3.184	-0.011	1.000	3209615		4.02(2.04-6.12)	101	21853	
20 Perfluorononanoic acid										
463.00 > 419.00	3.173	3.189	-0.016	1.000	15444297	4.39		87.8	4100	
463.00 > 169.00	3.173	3.189	-0.016	1.000	3261029		4.74(2.68-8.03)	87.8	5994	
D 19 13C5 PFNA										
468.00 > 423.00	3.173	3.189	-0.016	1.134	8207906	2.65		106	25030	
D 18 13C4 PFOS										
503.00 > 80.00	3.173	3.189	-0.016	1.134	5861926	2.45		102	6550	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.388	3.398	-0.010	1.068	14278556	NC			35668	
D 21 13C8 FOSA										
506.00 > 78.00	3.519	3.519	0.0	1.258	3405074	2.52		101	13632	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.519	3.519	0.0	1.000	20031798	4.80		96.1	14409	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.534	3.534	0.0	1.114	4768397	4.96		103	12727	
549.00 > 99.00	3.534	3.534	0.0	1.114	1536252		3.10(1.42-4.26)	103	5434	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.534	3.538	-0.004	1.000	3473887	4.28		89.4	9790	
D 26 M2-8:2FTS										
529.00 > 81.00	3.534	3.540	-0.006	1.263	122253	2.61		109	1243	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.268	8194592	2.55		102	28933	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.548	3.548	0.0	1.000	17758765	4.62		92.3	4843	
513.00 > 169.00	3.548	3.548	0.0	1.000	1284067		13.83(7.12-21.35)	92.3	4224	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.688	3.698	-0.010	1.318	4066191	2.68		107	5577	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.702	3.702	0.0	1.004	8500506	5.05		101	30472	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.842	3.856	-0.014	1.211	10941518	4.77		99.1	12356	
599.00 > 99.00	3.842	3.856	-0.014	1.211	2579708		4.24(2.14-6.43)	99.1	12570	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.858	3.866	-0.008	1.379	3059291	2.52		101	5794	
D 30 13C2 PFUnA										
565.00 > 520.00	3.858	3.870	-0.012	1.379	7080168	2.41		96.3	22896	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.858	3.870	-0.012	1.000	5927916	4.83		96.6	7477	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.004	12622798	4.59		91.8	4079	
563.00 > 169.00	3.872	3.872	0.0	1.004	1257717		10.04(5.24-15.72)	91.8	7537	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.269	17231770	NC			53417	
D 36 13C2 PFDoA										
615.00 > 570.00	4.154	4.162	-0.008	1.485	8126284	2.57		103	28683	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.154	4.162	-0.008	1.000	15361417	4.38		87.6	4457	
613.00 > 169.00	4.154	4.162	-0.008	1.000	1909707		8.04(4.68-14.05)	87.6	4617	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.415	4.426	-0.011	1.063	14257729	4.38		87.7	4470	
663.00 > 169.00	4.415	4.426	-0.011	1.063	2850513		5.00(3.09-9.27)	87.7	6021	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.655	4.664	-0.009	1.664	7080232	2.59		104	21609	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.655	4.664	-0.009	1.000	2398350	4.92		98.4	4617	
713.00 > 219.00	4.655	4.664	-0.009	1.000	1706996		1.41(0.70-2.09)	98.4	5453	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.073	5.081	-0.008	1.814	7130990	2.54		101	10668	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.073	5.083	-0.010	1.000	13504510	NC			1927	
813.00 > 169.00	5.073	5.083	-0.010	1.000	2614911		5.16(2.77-8.32)		3398	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.431	5.443	-0.012	1.070	10952133	NC			1630	
913.00 > 169.00	5.431	5.443	-0.012	1.070	2151202		5.09(2.55-7.64)		4379	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00006 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:25:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_009.d

Injection Date: 20-Jul-2018 20:10:16 Instrument ID: A9

Lims ID: IC L6 Full

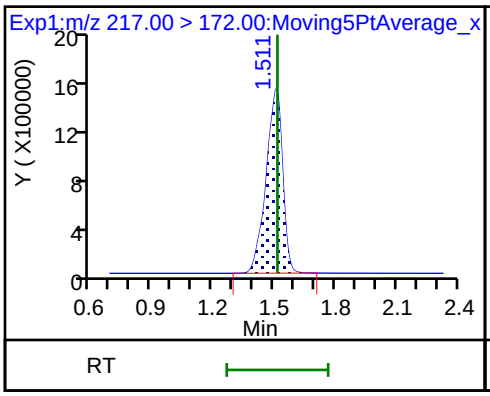
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 6 Worklist Smp#: 7

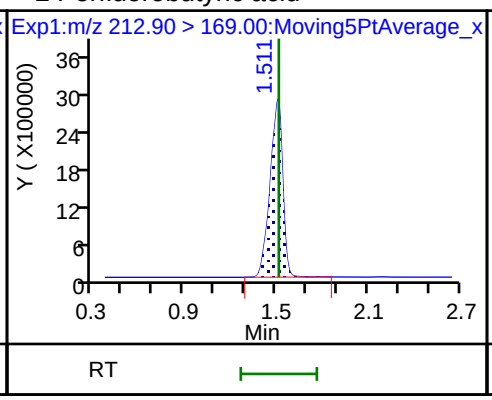
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

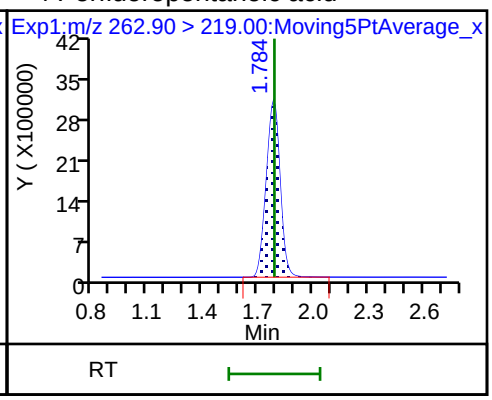
D 1 13C4 PFBA



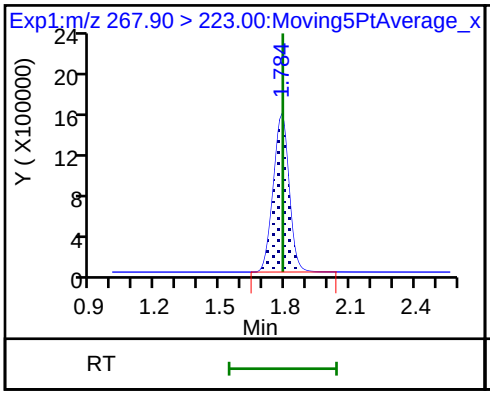
2 Perfluorobutyric acid



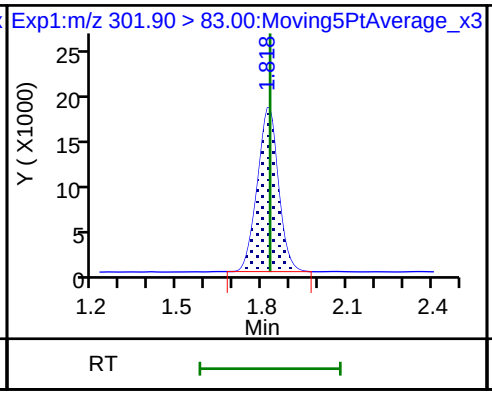
4 Perfluoropentanoic acid



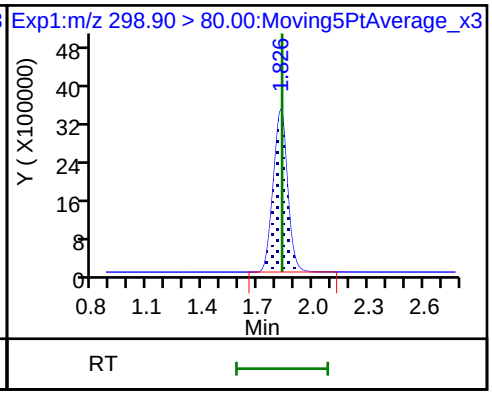
D 3 13C5-PFPeA



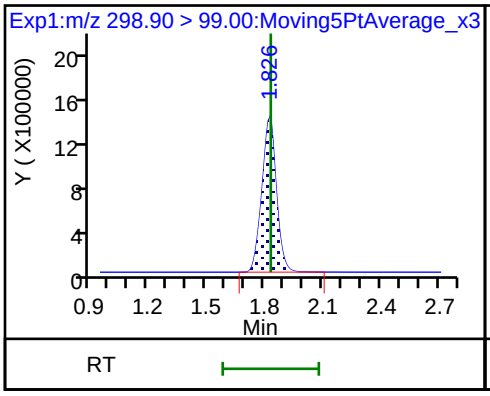
D 47 13C3-PFBS



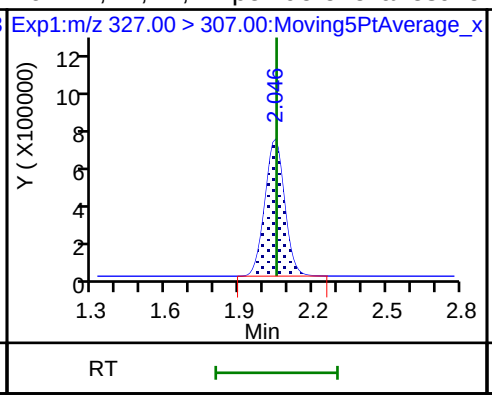
5 Perfluorobutanesulfonic acid



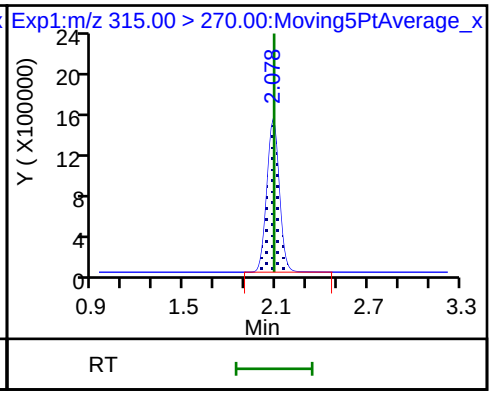
5 Perfluorobutanesulfonic acid



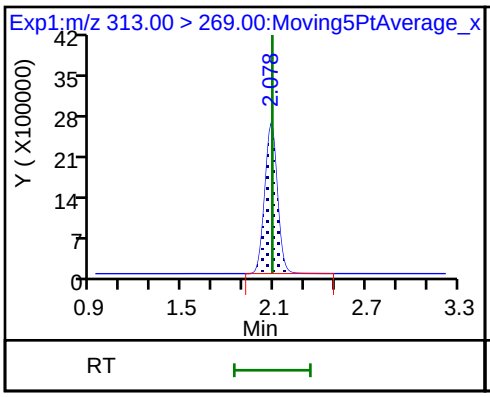
61 1H,1H,2H,2H-perfluorohexanesulfon



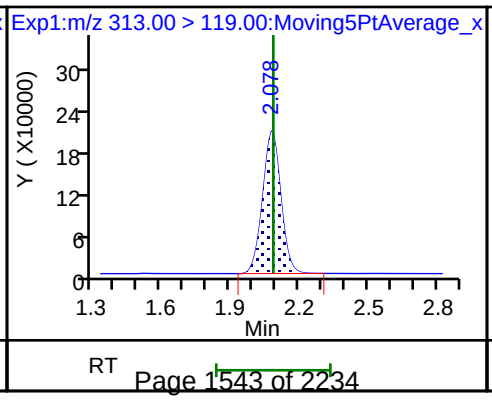
D 7 13C2 PFHxA



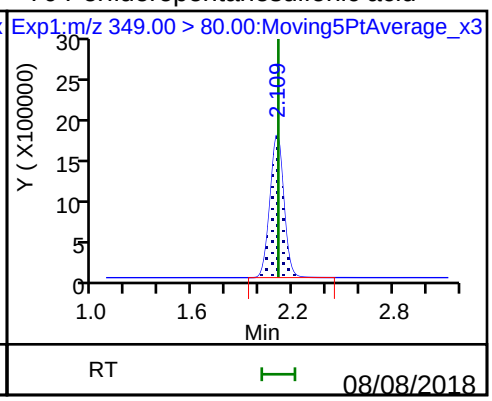
6 Perfluorohexanoic acid



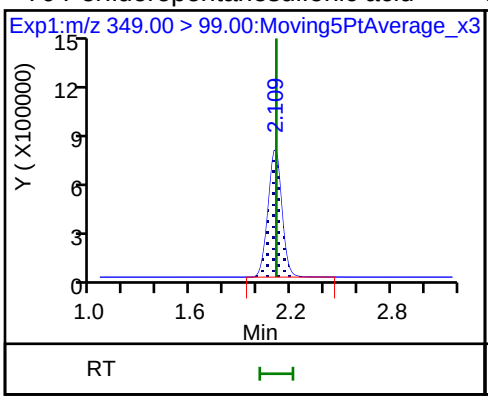
6 Perfluorohexanoic acid



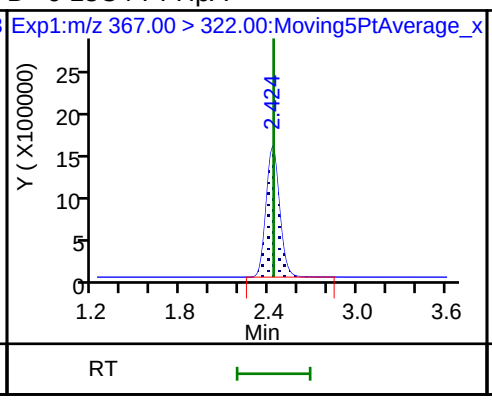
70 Perfluoropentanesulfonic acid



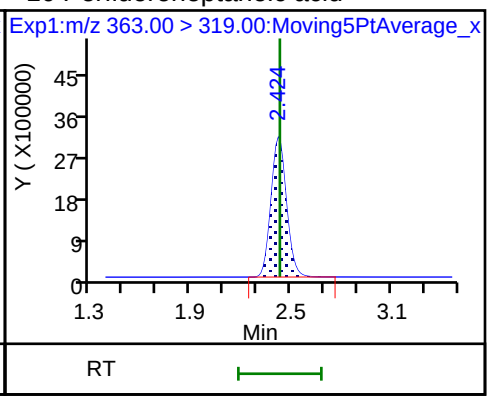
70 Perfluoropentanesulfonic acid



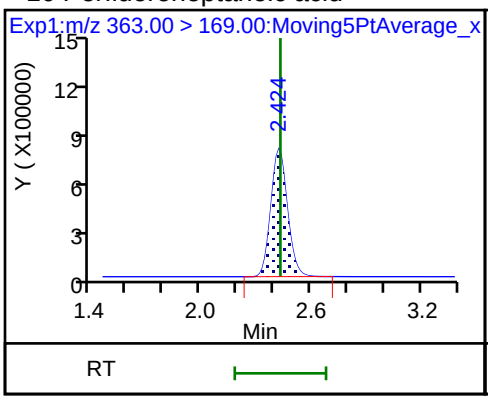
D 9 13C4-PFHpA



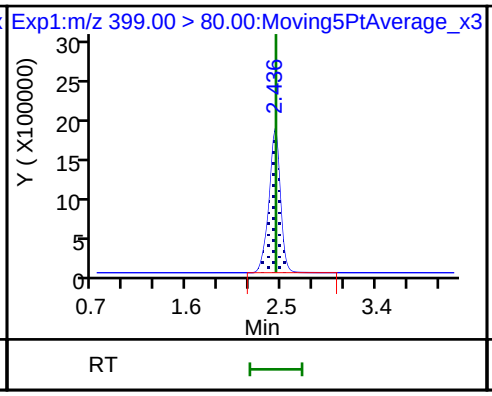
10 Perfluoroheptanoic acid



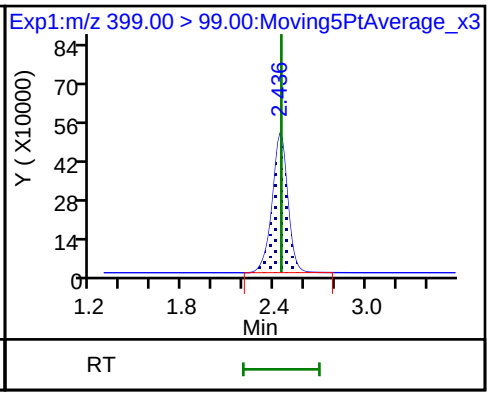
10 Perfluoroheptanoic acid



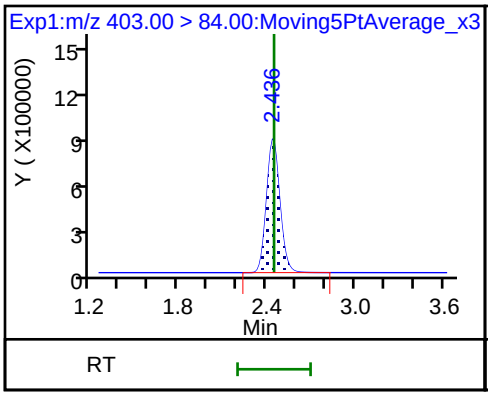
8 Perfluorohexanesulfonic acid



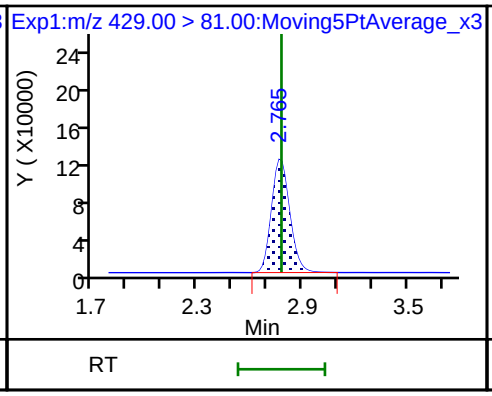
8 Perfluorohexanesulfonic acid



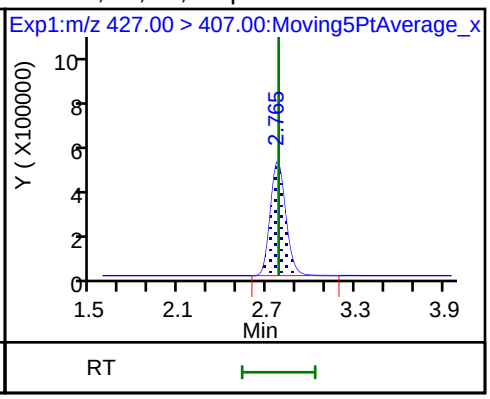
D 11 18O2 PFHxS



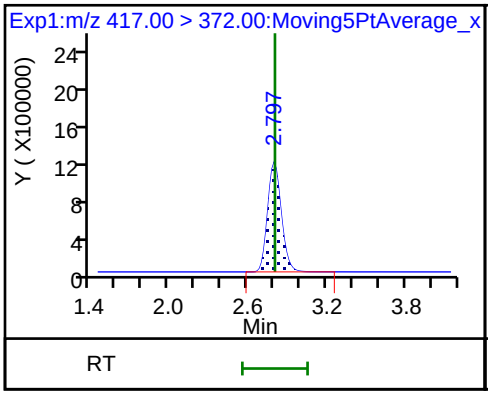
D 12 M2-6:2FTS



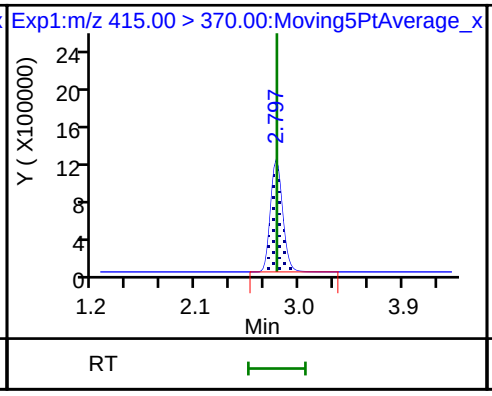
13 1H,1H,2H,2H-perfluorooctanesulfoni



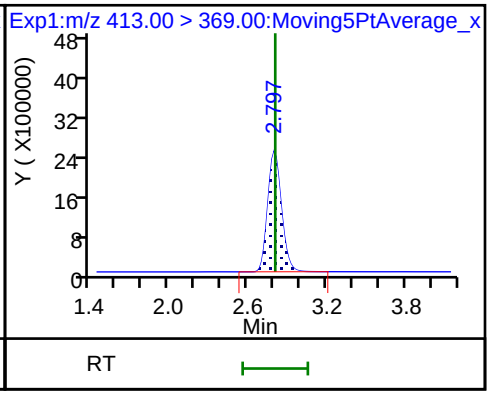
D 14 13C4 PFOA



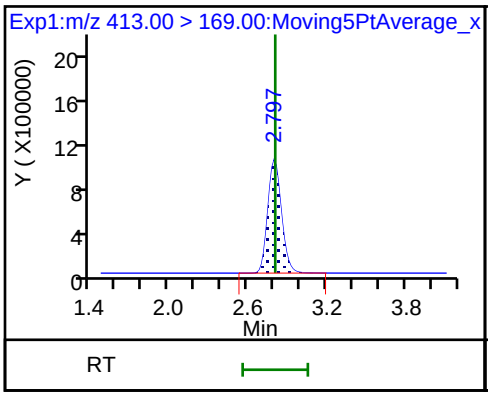
* 62 13C2-PFOA



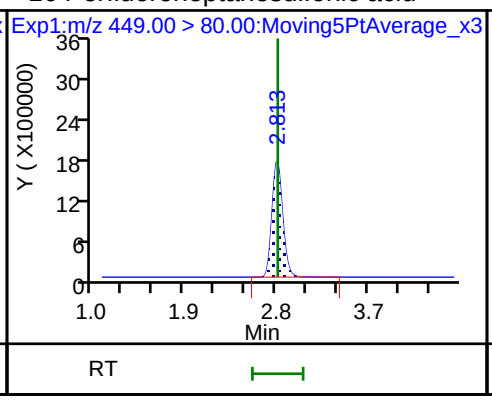
15 Perfluorooctanoic acid



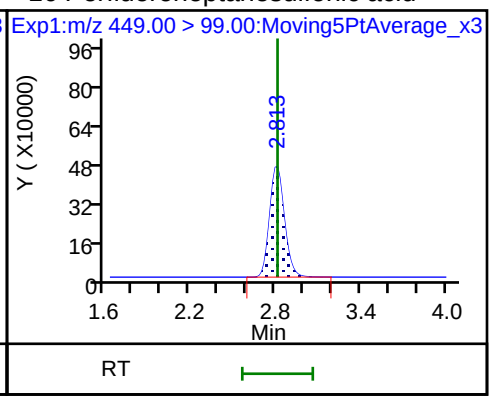
15 Perfluorooctanoic acid



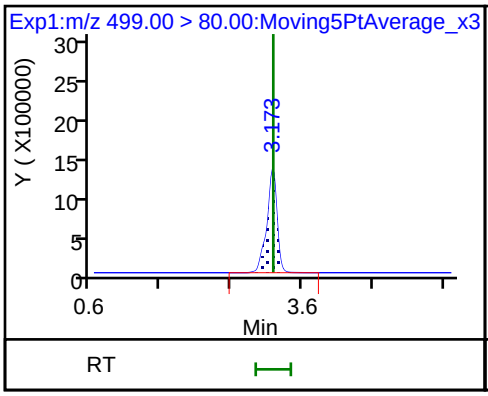
16 Perfluoroheptanesulfonic acid



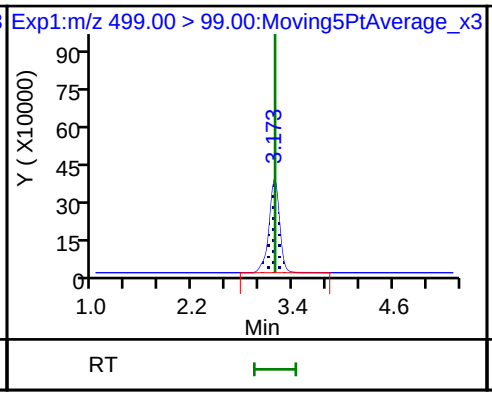
16 Perfluoroheptanesulfonic acid



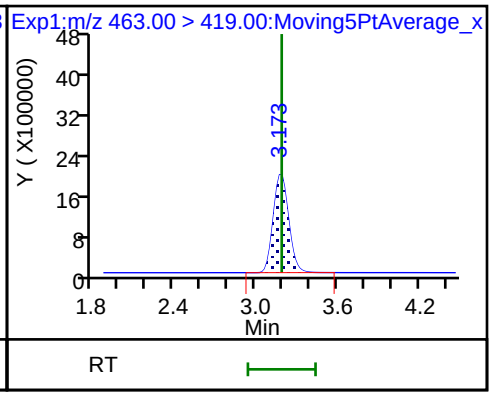
17 Perfluorooctane sulfonic acid



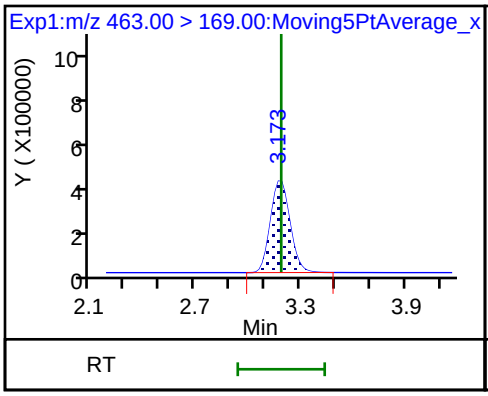
17 Perfluorooctane sulfonic acid



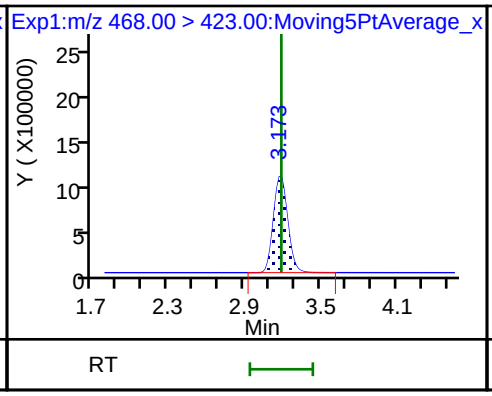
20 Perfluorononanoic acid



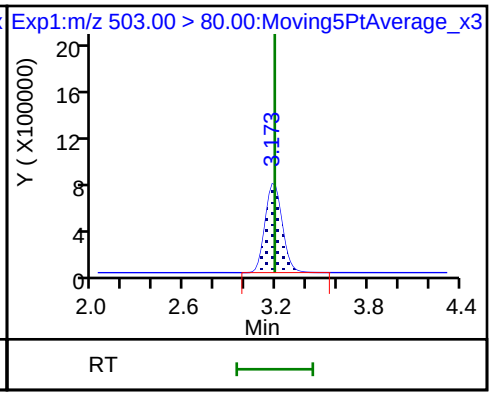
20 Perfluorononanoic acid



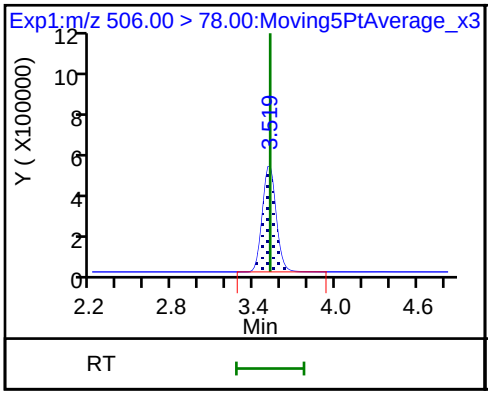
D 19 13C5 PFNA



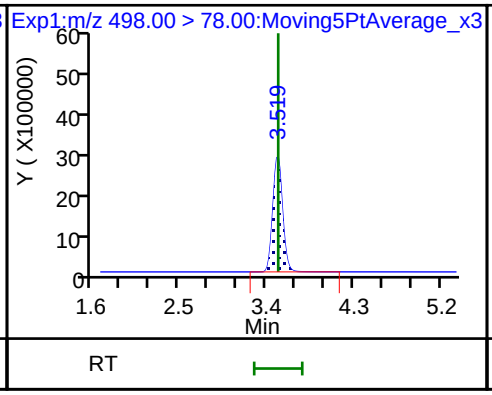
D 18 13C4 PFOS



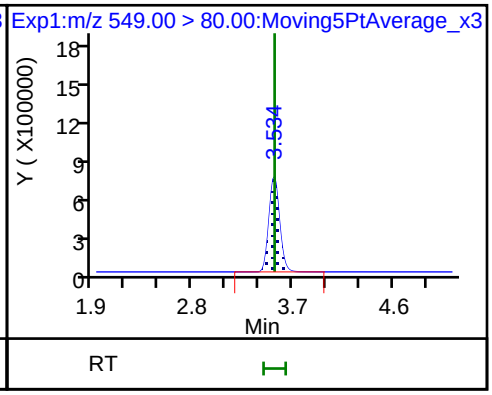
D 21 13C8 FOSA



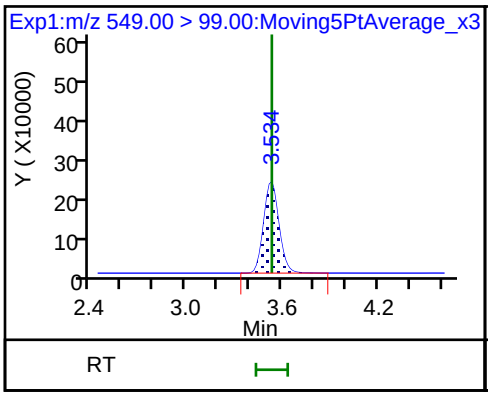
22 Perfluorooctane Sulfonamide



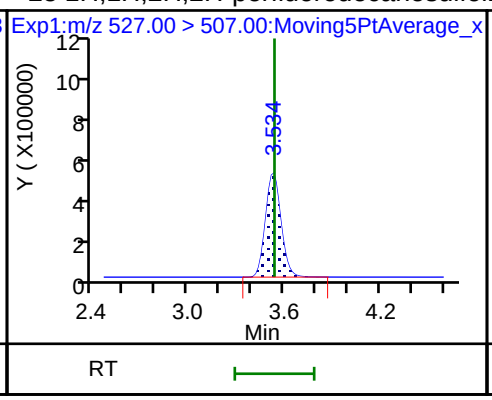
68 Perfluorononanesulfonic acid



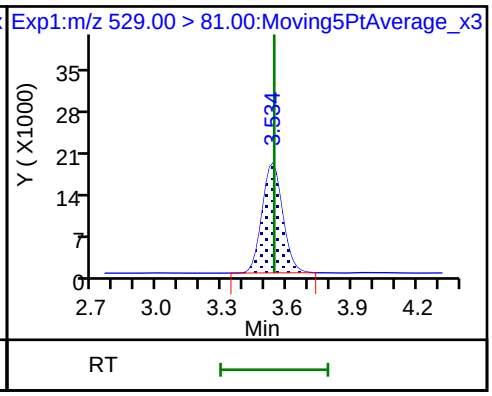
68 Perfluorononanesulfonic acid



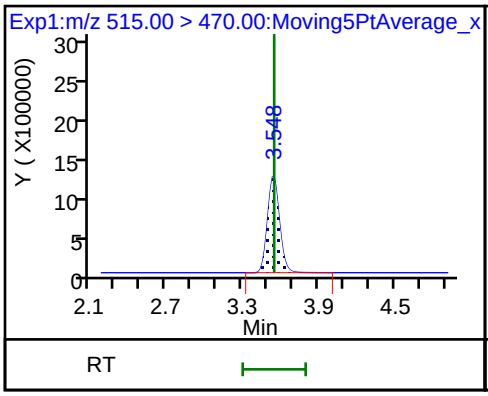
25 1H,1H,2H,2H-perfluorodecanesulfon



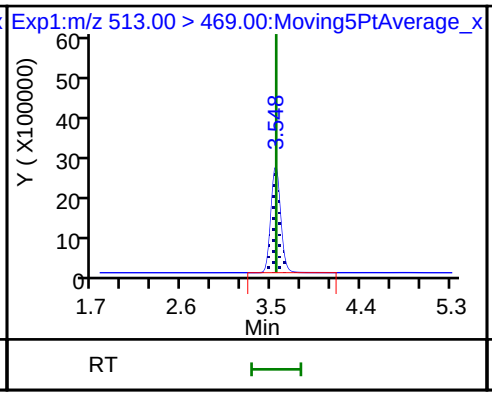
D 26 M2-8:2FTS



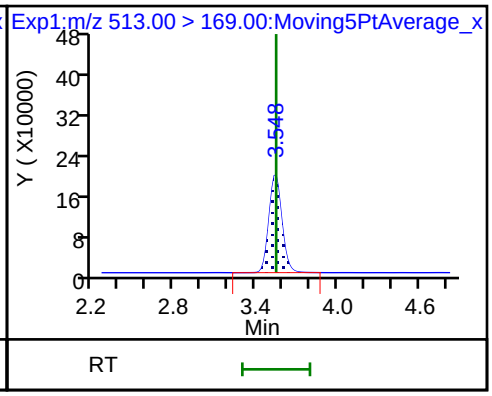
D 23 13C2 PFDA



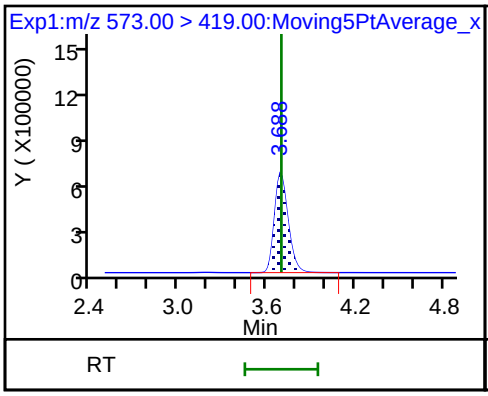
24 Perfluorodecanoic acid



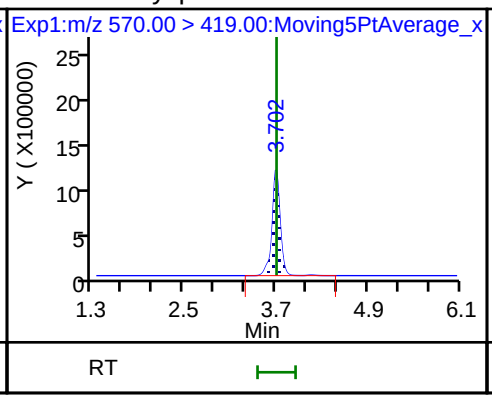
24 Perfluorodecanoic acid



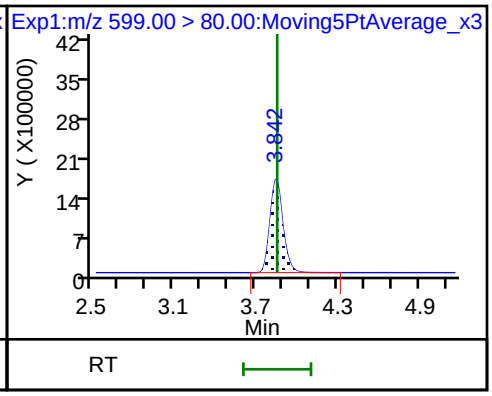
D 27 d3-NMeFOSAA



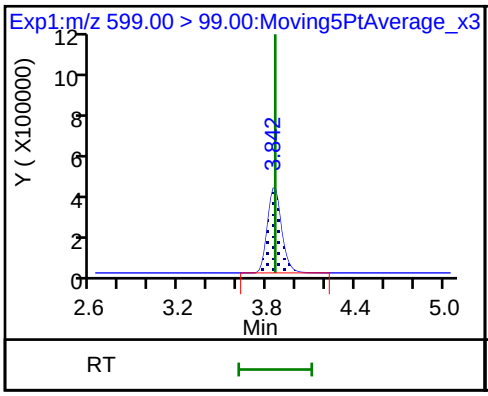
28 N-methyl perfluorooctane sulfonami



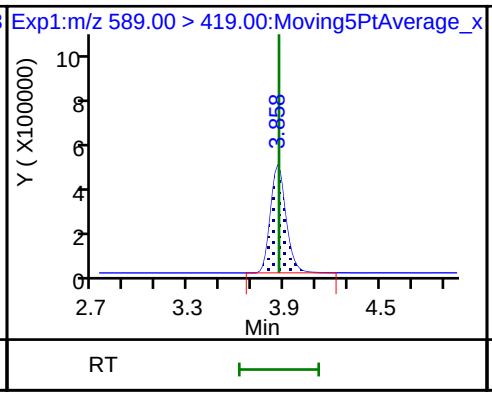
29 Perfluorodecane Sulfonic acid



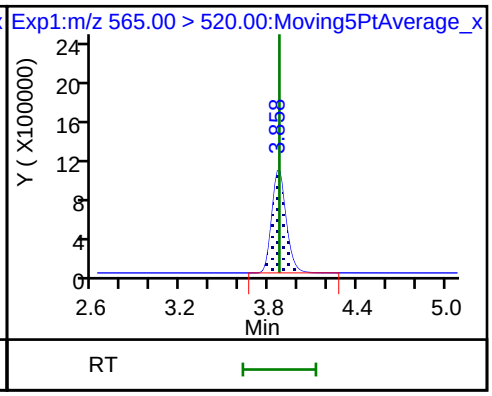
29 Perfluorodecane Sulfonic acid



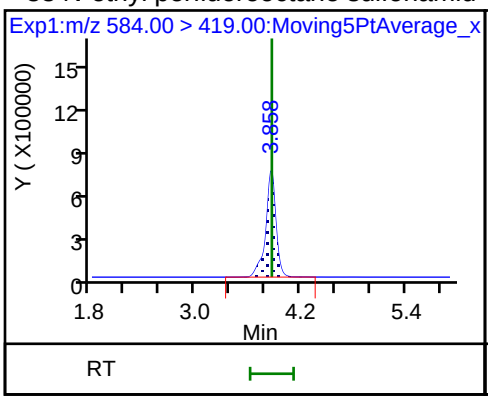
D 32 d5-NEtFOSAA



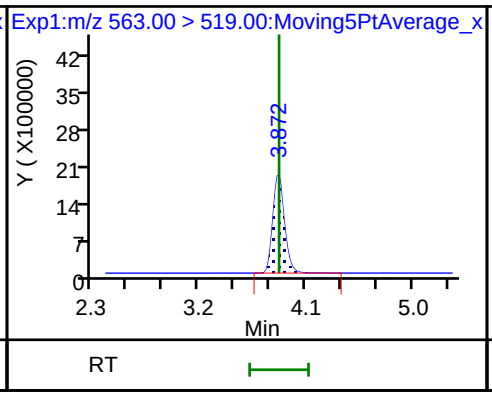
D 30 13C2 PFUnA



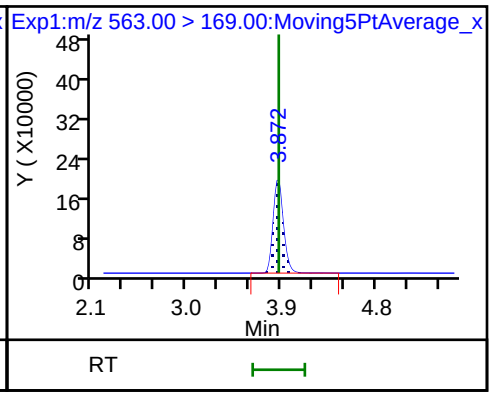
33 N-ethyl perfluorooctane sulfonamid



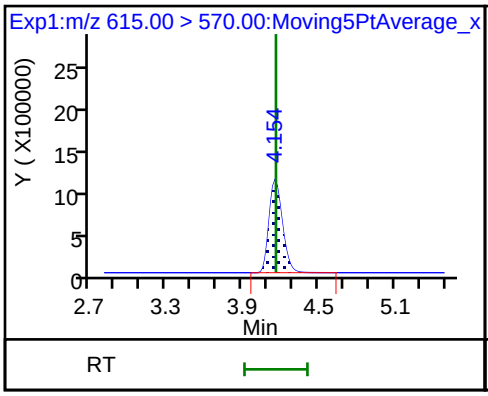
31 Perfluoroundecanoic acid



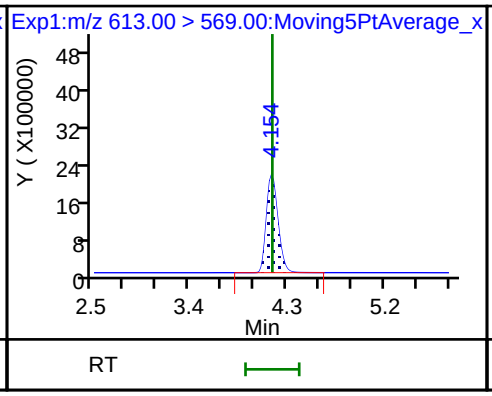
31 Perfluoroundecanoic acid



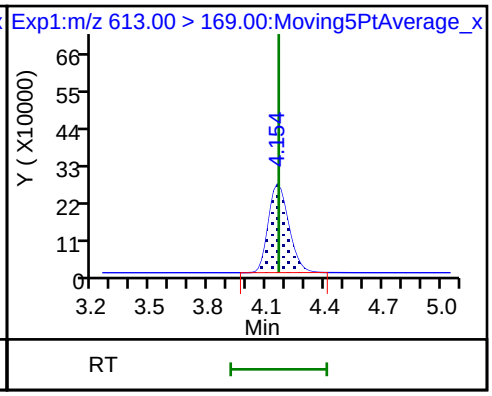
D 36 13C2 PFDoA



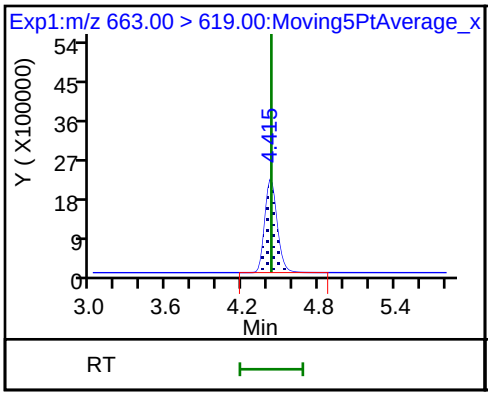
37 Perfluorododecanoic acid



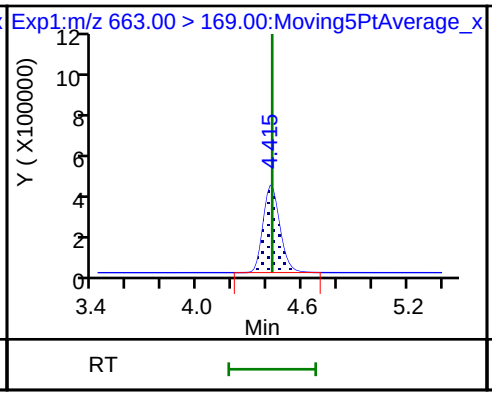
37 Perfluorododecanoic acid



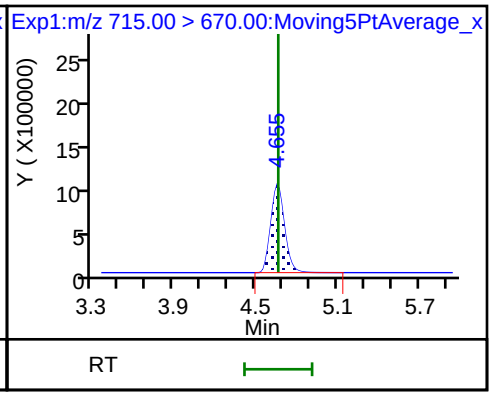
41 Perfluorotridecanoic acid



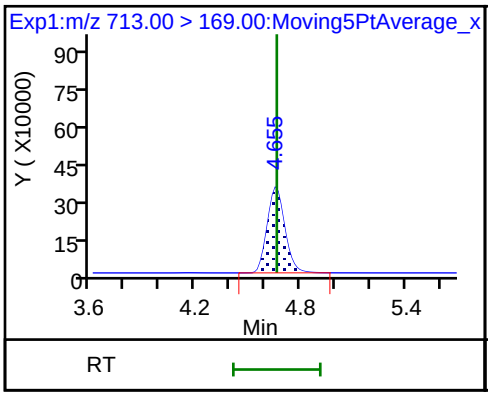
41 Perfluorotridecanoic acid



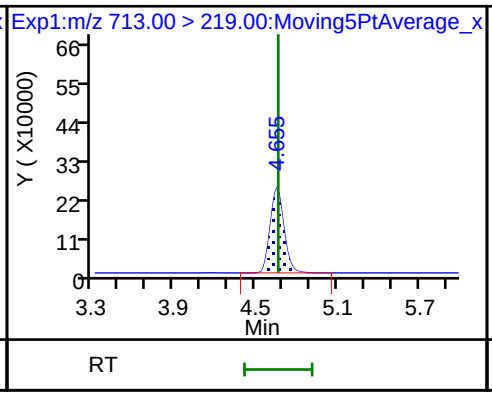
D 43 13C2-PFTeDA



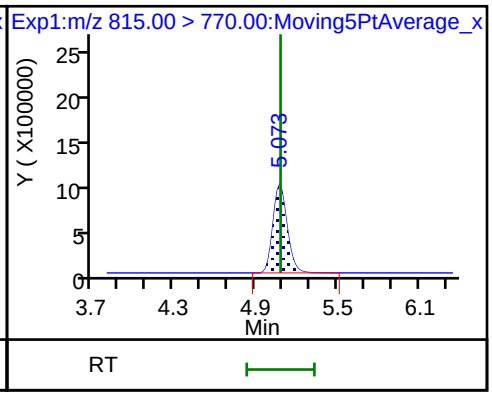
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 20-Jul-2018 20:17:49 ALS Bottle#: 7 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: L7
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:25:28 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 10:00:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.518	1.515	0.003	0.539	8540015	2.64		106	14834	
2 Perfluorobutyric acid										
212.90 > 169.00	1.518	1.516	0.002	1.000	29864504	9.12		91.2	4669	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.789	0.003	1.000	28122892	8.31		83.1	12024	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.789	0.003	0.637	7794784	2.62		105	21787	
D 47 13C3-PFBS										
301.90 > 83.00	1.835	1.827	0.007	0.652	91779	2.44		105	1530	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.835	1.831	0.003	1.000	33353238	7.72		87.4	17584	
298.90 > 99.00	1.835	1.831	0.003	1.000	13711119		2.43(1.35-4.05)	87.4	24003	
D 60 M2-4:2FTS										
329.00 > 81.00	2.056	2.051	0.005	0.731	728580	NC			1719	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.056	2.051	0.005	1.121	7487042	8.83		94.6	25785	
D 7 13C2 PFHxA										
315.00 > 270.00	2.088	2.085	0.003	0.742	8255766	2.64		106	32480	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.088	2.086	0.002	1.000	26582148	8.51		85.1	16456	
313.00 > 119.00	2.088	2.086	0.002	1.000	2268674		11.72(6.96-20.87)	85.1	6762	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.119	2.112	0.007	1.155	18425148	8.94		95.3	30731	
349.00 > 99.00	2.108	2.112	-0.004	1.149	8810271		2.09(1.15-3.45)	95.3	30674	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.192	2.189	0.003	0.779	845723	NC			5882	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.192	2.189	0.003	1.000	6909593	NC			3793	
D 9 13C4-PFHpA										
367.00 > 322.00	2.436	2.431	0.005	0.866	9334661	2.58		103	21727	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.436	2.433	0.003	1.000	32597003	7.94		79.4	8879	
363.00 > 169.00	2.436	2.433	0.003	1.000	9509708		3.43(2.17-6.52)	79.4	25590	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.446	0.003	1.000	24596113	8.42		92.5	33053	
399.00 > 99.00	2.449	2.446	0.003	1.000	7204612		3.41(1.90-5.70)	92.5	19986	
D 11 18O2 PFHxS										
403.00 > 84.00	2.449	2.447	0.002	0.871	5187747	2.36		99.6	22227	
65 ADONA										
377.00 > 251.00	2.475	2.477	-0.002	0.775	48736791	NC			80042	
377.00 > 85.00	2.475	2.477	-0.002	0.775	25883423		1.88(1.05-3.16)		15705	
D 12 M2-6:2FTS										
429.00 > 81.00	2.781	2.779	0.002	0.989	808920	2.39		101	2974	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.781	2.779	0.002	1.000	6919612	9.31		98.2	35688	
D 14 13C4 PFOA										
417.00 > 372.00	2.813	2.804	0.009	1.000	8167184	2.51		100	25060	
* 62 13C2-PFOA										
415.00 > 370.00	2.813	2.804	0.009		8304170	2.50			23984	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.813	2.806	0.007	1.000	28986920	7.70		77.0	4599	
413.00 > 169.00	2.813	2.806	0.007	1.000	12473103		2.32(1.36-4.08)	77.0	16930	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.813	2.813	0.0	0.881	22822135	8.98		94.3	27587	
449.00 > 99.00	2.813	2.813	0.0	0.881	6547505		3.49(1.84-5.53)	94.3	18981	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.192	3.184	0.008	1.000	23758907	8.85		95.4	21049	
499.00 > 99.00	3.192	3.184	0.008	1.000	6252184		3.80(2.04-6.12)	95.4	23621	
20 Perfluorononanoic acid										
463.00 > 419.00	3.192	3.189	0.003	1.000	26432339	8.30		83.0	5718	
463.00 > 169.00	3.192	3.189	0.003	1.000	6366918		4.15(2.68-8.03)	83.0	8816	
D 19 13C5 PFNA										
468.00 > 423.00	3.192	3.189	0.003	1.135	7436534	2.43		97.3	16243	
D 18 13C4 PFOS										
503.00 > 80.00	3.192	3.189	0.003	1.135	5698361	2.42		101	6949	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.404	3.398	0.006	1.067	24335011	NC			24771	
D 21 13C8 FOSA										
506.00 > 78.00	3.518	3.519	-0.001	1.251	3364547	2.53		101	17212	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.518	3.519	-0.001	1.000	34015766	8.26		82.6	15256	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.533	3.534	-0.001	1.107	8463231	9.05		94.3	13578	
549.00 > 99.00	3.533	3.534	-0.001	1.107	3075688		2.75(1.42-4.26)	94.3	14615	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.533	3.538	-0.005	0.996	6095376	8.58		89.6	11010	
D 26 M2-8:2FTS										
529.00 > 81.00	3.548	3.540	0.008	1.261	107033	2.32		96.8	1163	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.261	7663476	2.41		96.6	17091	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.548	3.548	0.0	1.000	27925293	7.76		77.6	8204	
513.00 > 169.00	3.548	3.548	0.0	1.000	2574321		10.85(7.12-21.35)	77.6	7627	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.701	3.698	0.003	1.316	3962467	2.65		106	4057	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.701	3.702	-0.001	1.000	14391958	8.77		87.7	34225	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.858	3.856	0.002	1.209	18928781	8.50		88.1	16754	
599.00 > 99.00	3.858	3.856	0.002	1.209	4872234		3.89(2.14-6.43)	88.1	14575	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.872	3.866	0.006	1.377	2647477	2.21		88.5	4350	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.870	0.002	1.377	7003448	2.42		96.7	26378	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.872	3.870	0.002	1.000	11143574	10.5		105	12092	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.000	21533911	7.92		79.2	6585	
563.00 > 169.00	3.872	3.872	0.0	1.000	2443009		8.81(5.24-15.72)	79.2	12654	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.261	27078363	NC			90815	
D 36 13C2 PFDoA										
615.00 > 570.00	4.172	4.162	0.010	1.483	7631148	2.45		98.1	21971	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.172	4.162	0.010	1.000	24922329	7.57		75.7	7098	
613.00 > 169.00	4.172	4.162	0.010	1.000	3761598		6.63(4.68-14.05)	75.7	7431	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.430	4.426	0.004	1.062	24678882	8.08		80.8	7968	
663.00 > 169.00	4.430	4.426	0.004	1.062	5119667		4.82(3.09-9.27)	80.8	8348	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006	1.660	6794396	2.52		101	16895	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.670	4.664	0.006	1.000	4999700	10.7		107	6308	
713.00 > 219.00	4.670	4.664	0.006	1.000	3336820		1.50(0.70-2.09)	107	6800	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.090	5.081	0.009	1.810	7000546	2.53		101	8611	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.090	5.083	0.007	1.000	22145735	NC			2996	
813.00 > 169.00	5.090	5.083	0.007	1.000	5012883		4.42(2.77-8.32)		4019	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.070	19344501	NC			2533	
913.00 > 169.00	5.445	5.443	0.002	1.070	4363109		4.43(2.55-7.64)		5288	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00005 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:25:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Injection Date: 20-Jul-2018 20:17:49 Instrument ID: A9

Lims ID: IC L7 Full

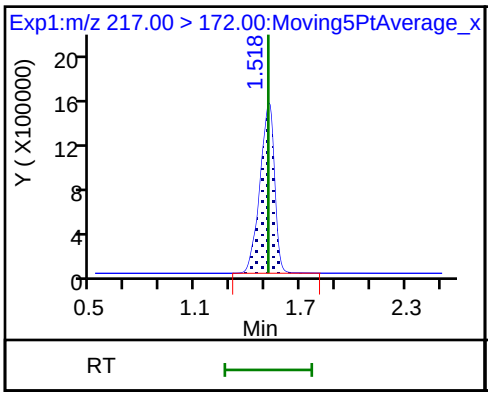
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 7 Worklist Smp#: 8

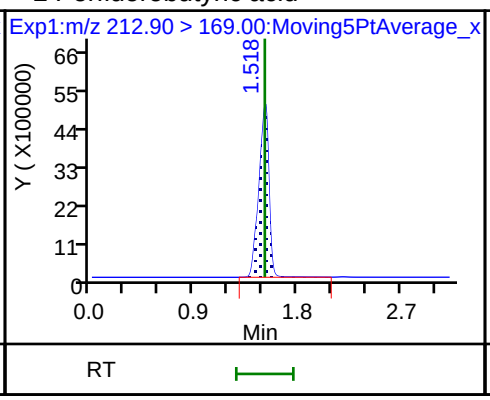
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

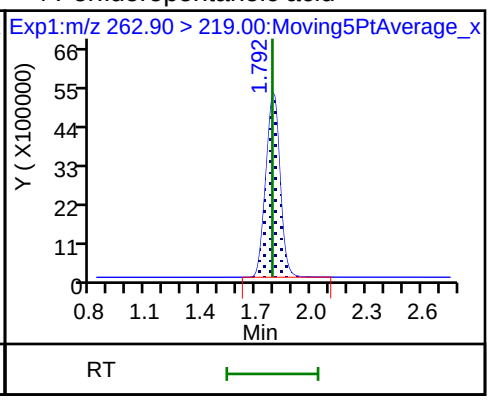
D 1 13C4 PFBA



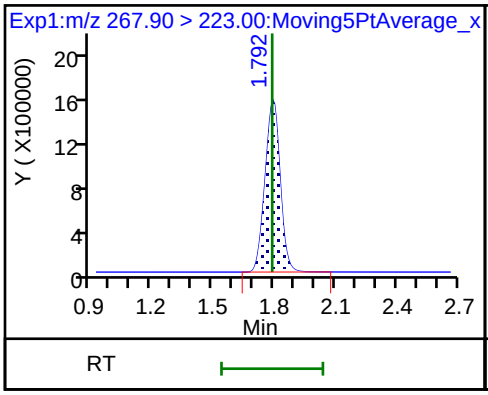
2 Perfluorobutyric acid



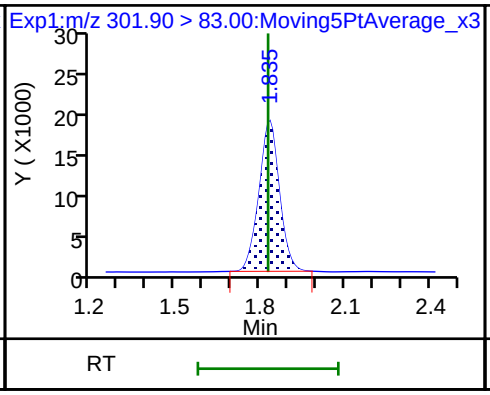
4 Perfluoropentanoic acid



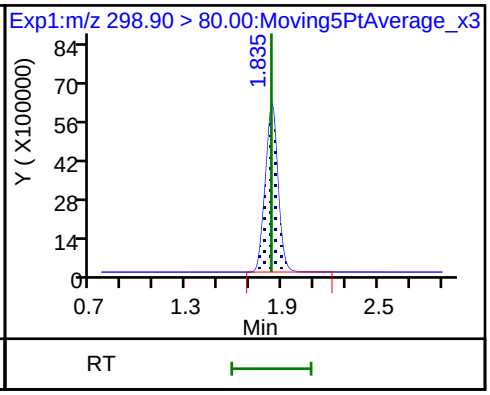
D 3 13C5-PFPeA



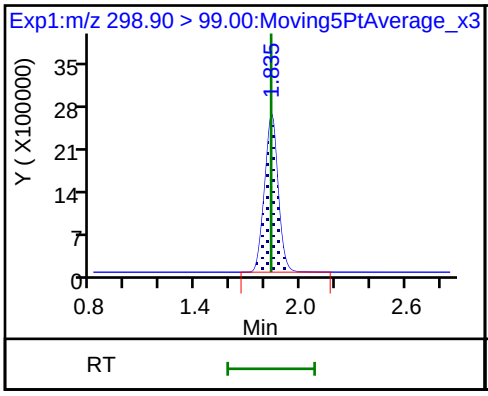
D 47 13C3-PFBS



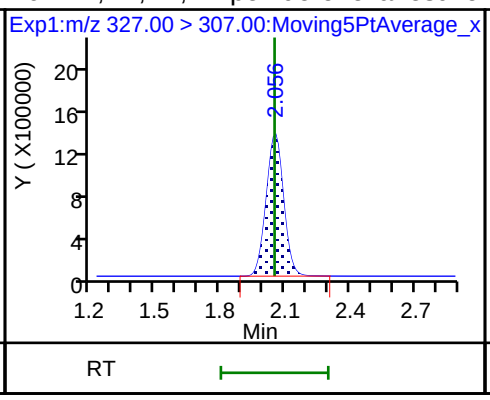
5 Perfluorobutanesulfonic acid



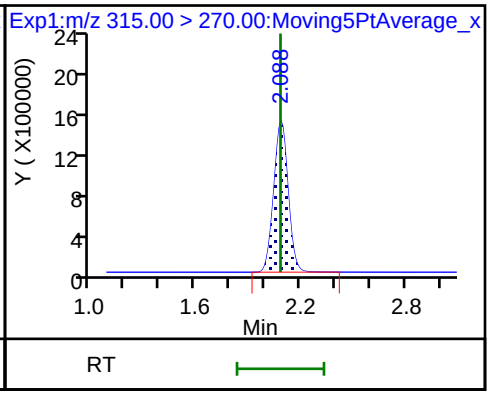
5 Perfluorobutanesulfonic acid



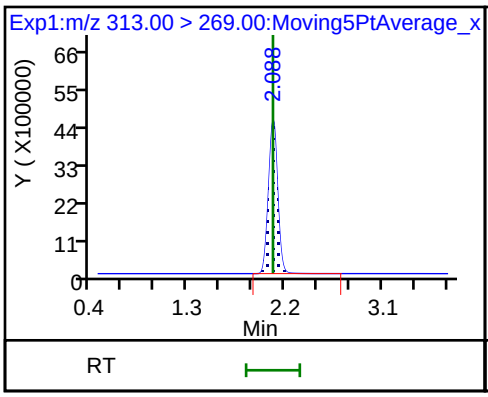
61 1H,1H,2H,2H-perfluorohexanesulfon



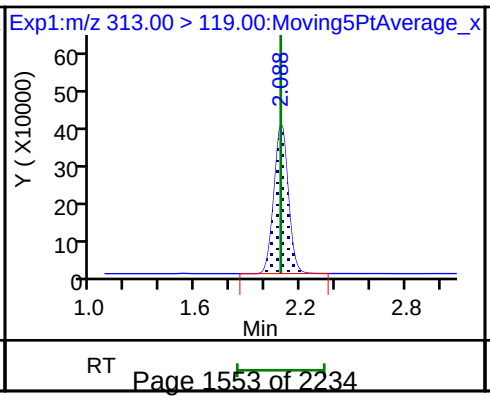
D 7 13C2 PFHxA



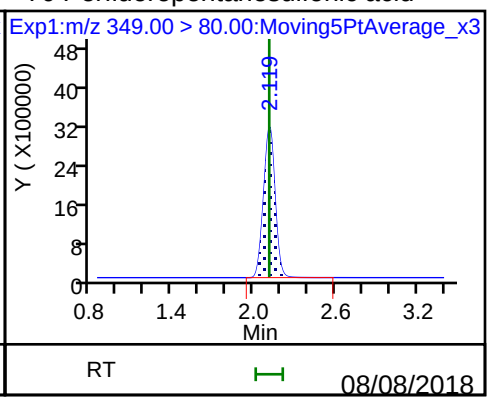
6 Perfluorohexanoic acid



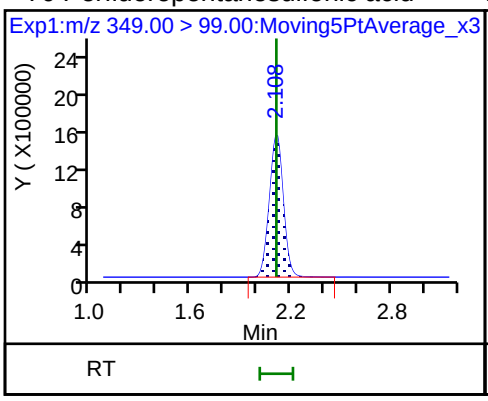
6 Perfluorohexanoic acid



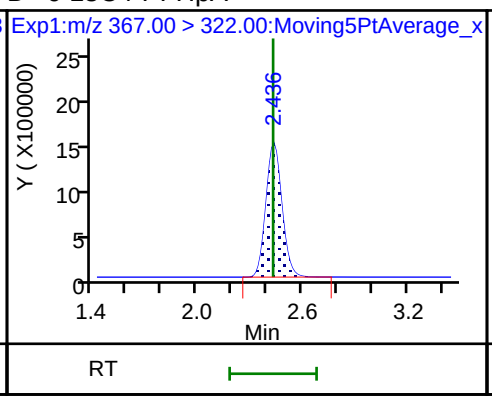
70 Perfluoropentanesulfonic acid



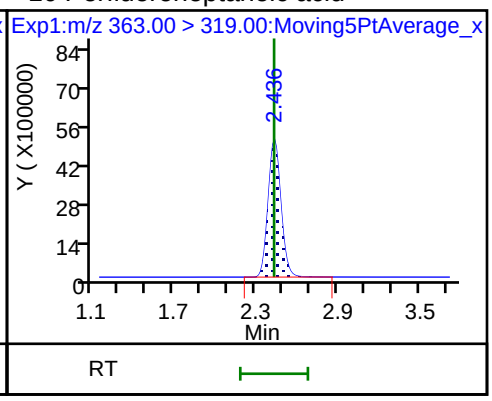
70 Perfluoropentanesulfonic acid



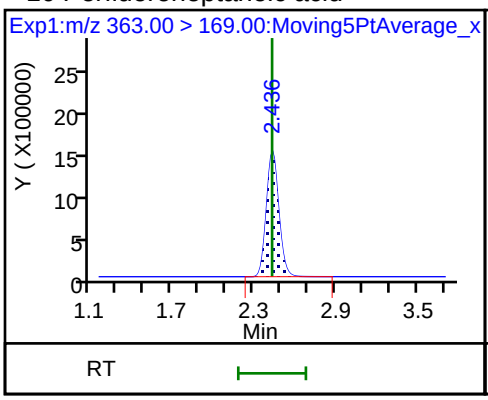
D 9 13C4-PFHpA



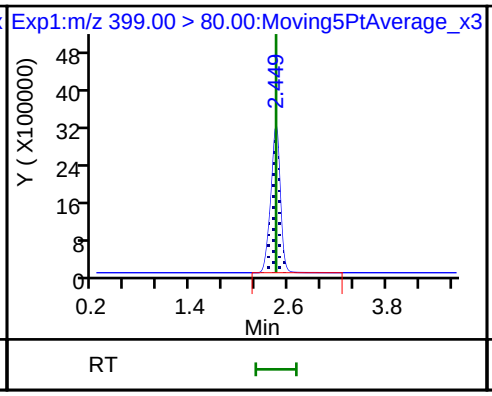
10 Perfluoroheptanoic acid



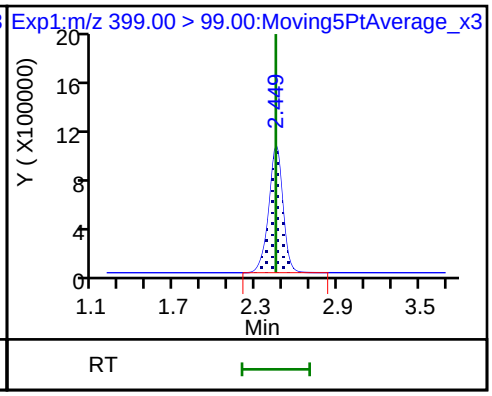
10 Perfluoroheptanoic acid



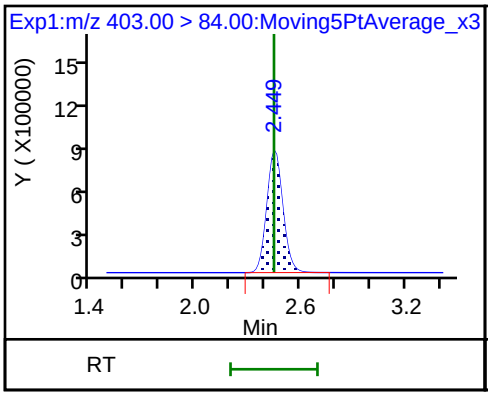
8 Perfluorohexanesulfonic acid



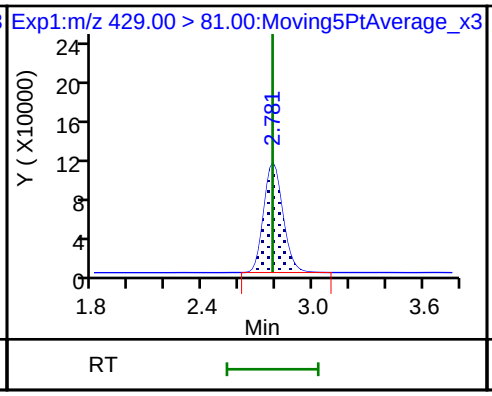
8 Perfluorohexanesulfonic acid



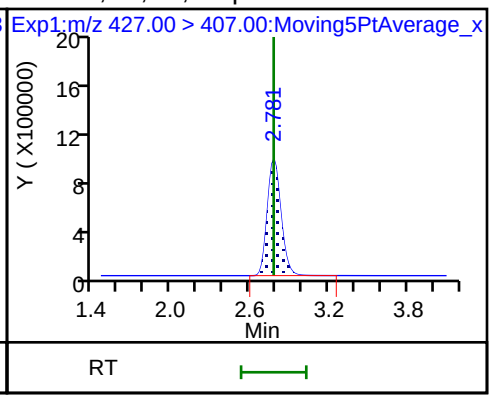
D 11 18O2 PFHxS



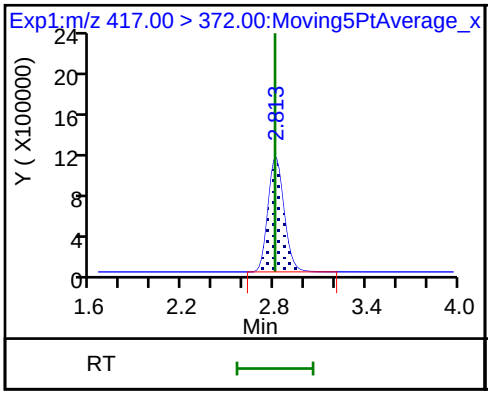
D 12 M2-6:2FTS



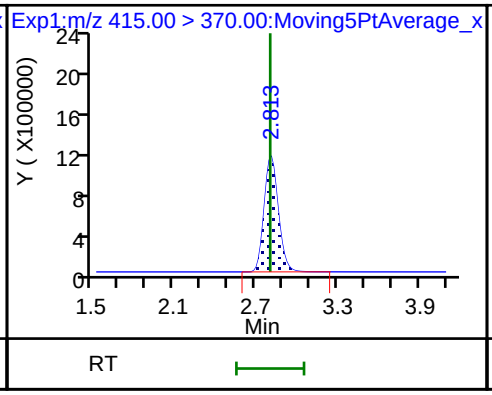
13 1H,1H,2H,2H-perfluorooctanesulfoni



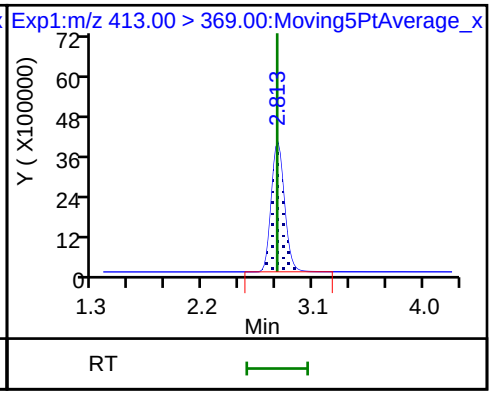
D 14 13C4 PFOA



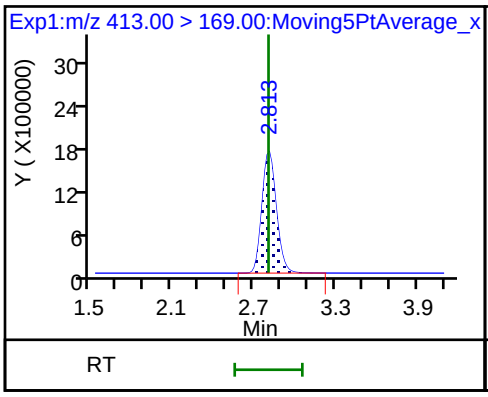
* 62 13C2-PFOA



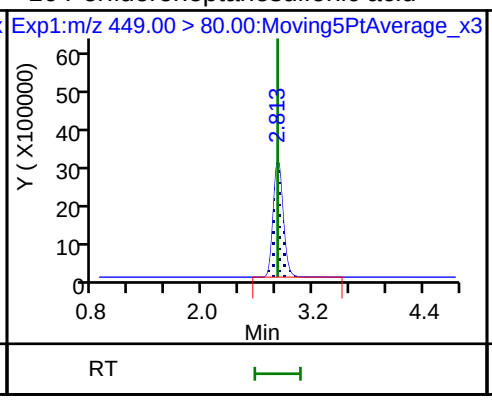
15 Perfluorooctanoic acid



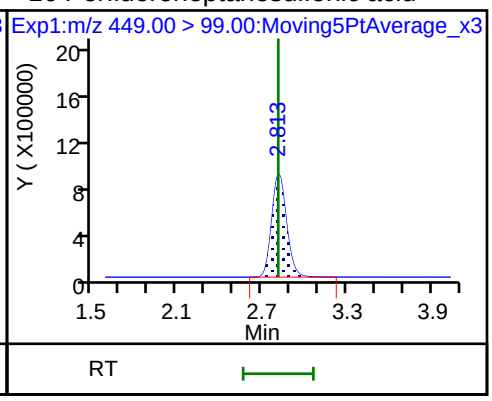
15 Perfluorooctanoic acid



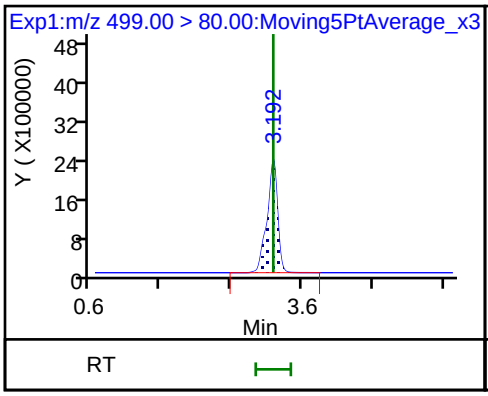
16 Perfluoroheptanesulfonic acid



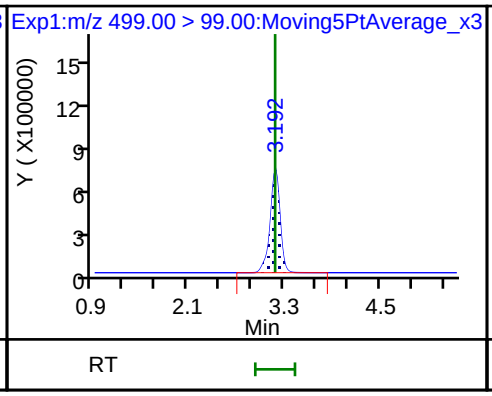
16 Perfluoroheptanesulfonic acid



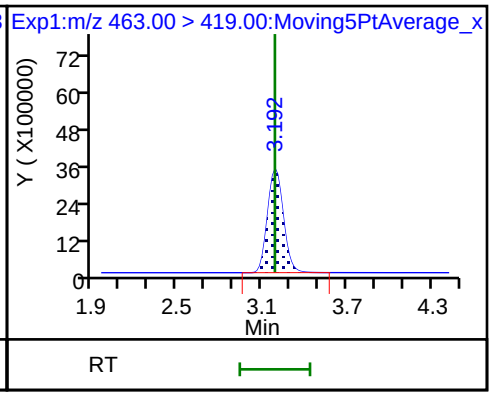
17 Perfluorooctane sulfonic acid



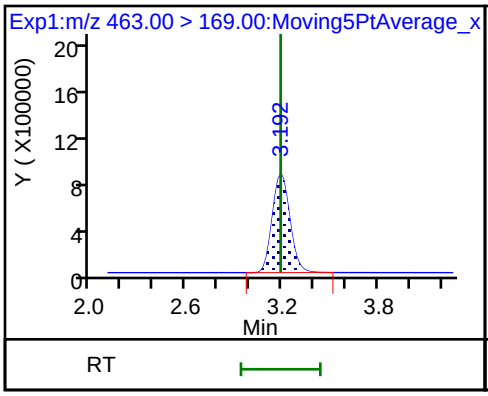
17 Perfluorooctane sulfonic acid



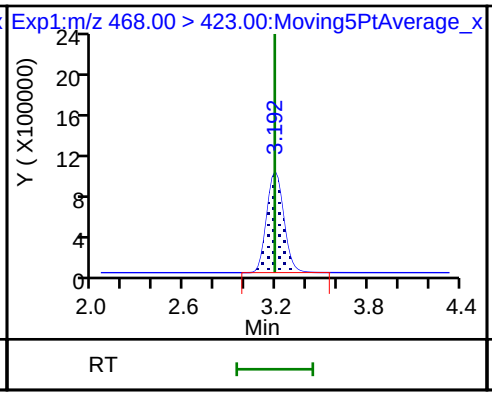
20 Perfluorononanoic acid



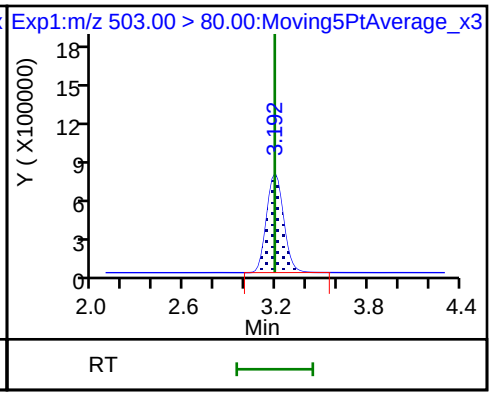
20 Perfluorononanoic acid



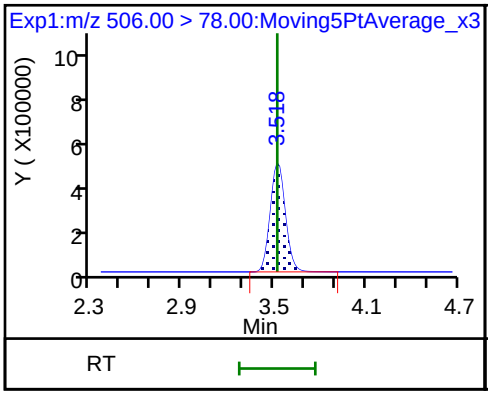
D 19 13C5 PFNA



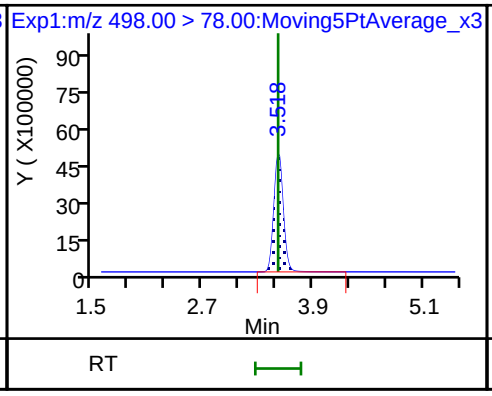
D 18 13C4 PFOS



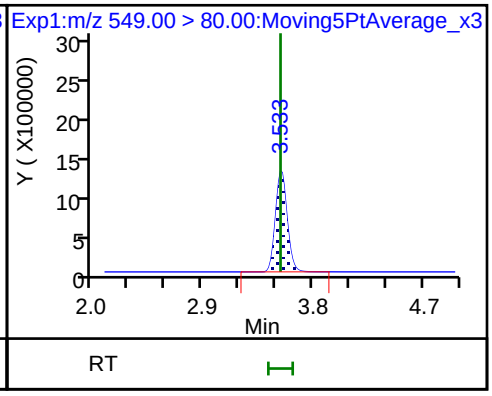
D 21 13C8 FOSA



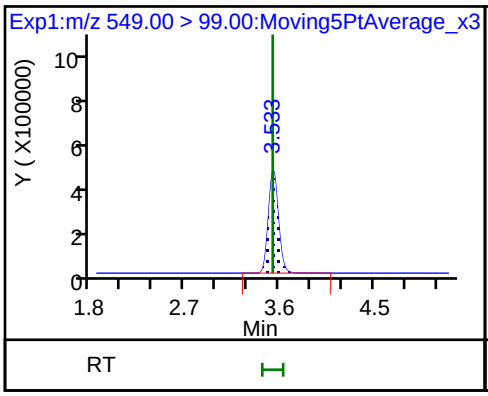
22 Perfluorooctane Sulfonamide



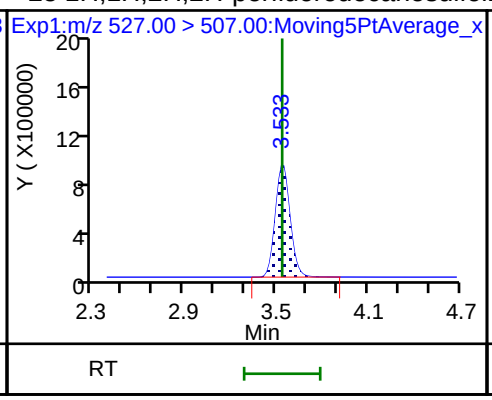
68 Perfluorononanesulfonic acid



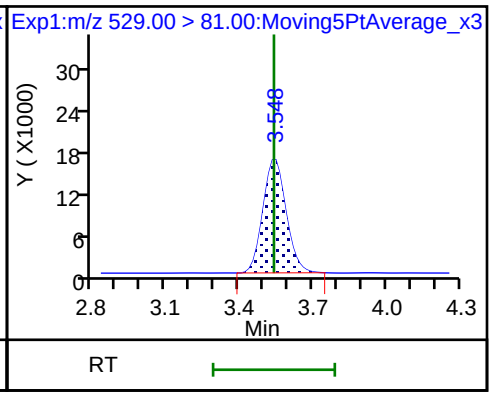
68 Perfluorononanesulfonic acid



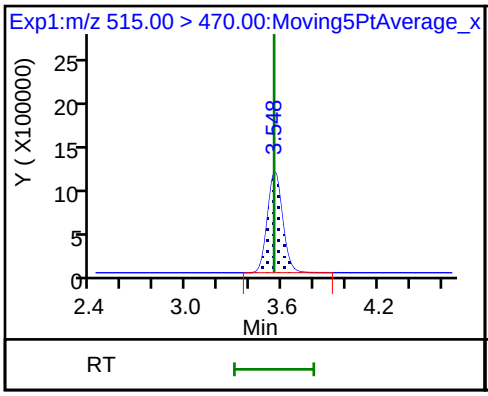
25 1H,1H,2H,2H-perfluorodecanesulfon



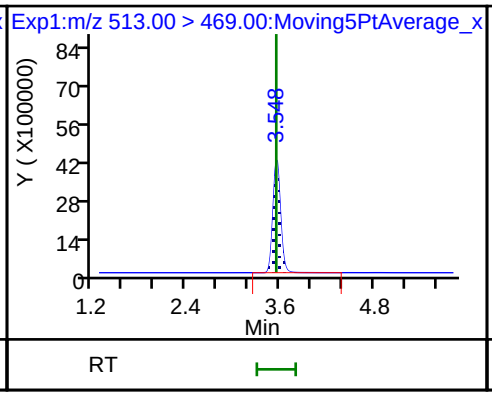
D 26 M2-8:2FTS



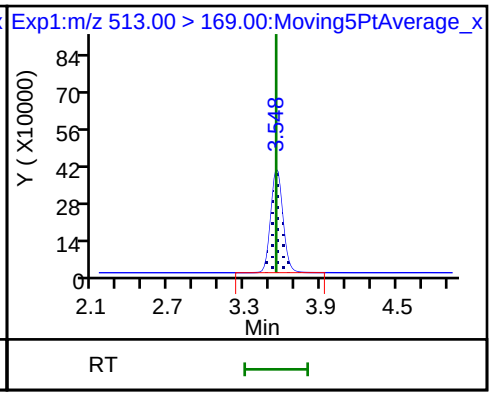
D 23 13C2 PFDA



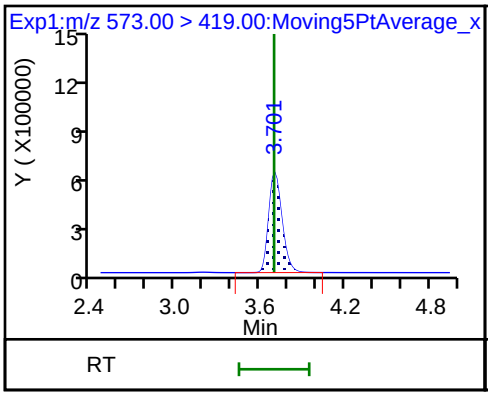
24 Perfluorodecanoic acid



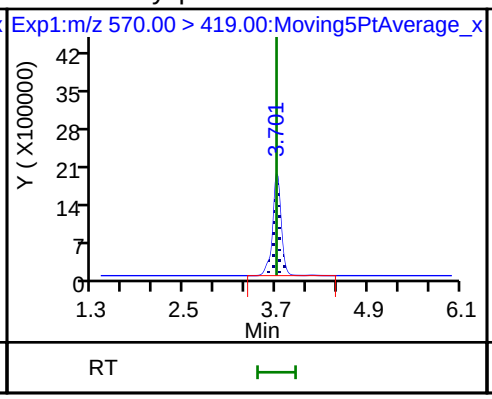
24 Perfluorodecanoic acid



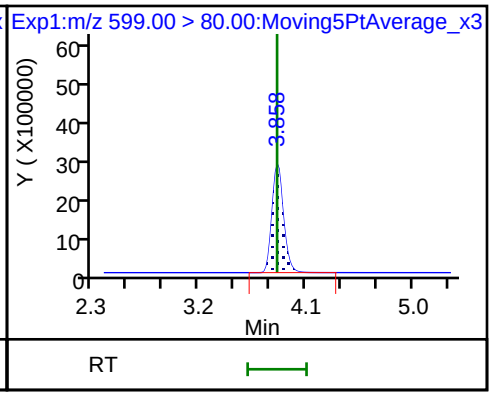
D 27 d3-NMeFOSAA



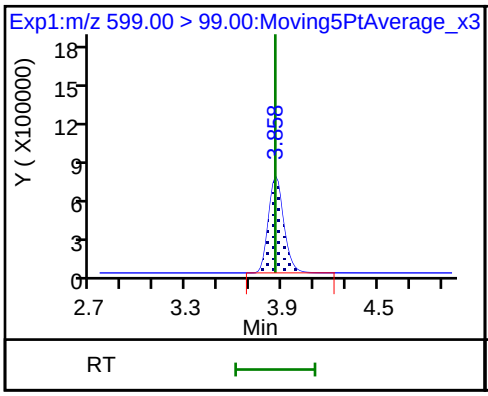
28 N-methyl perfluorooctane sulfonami



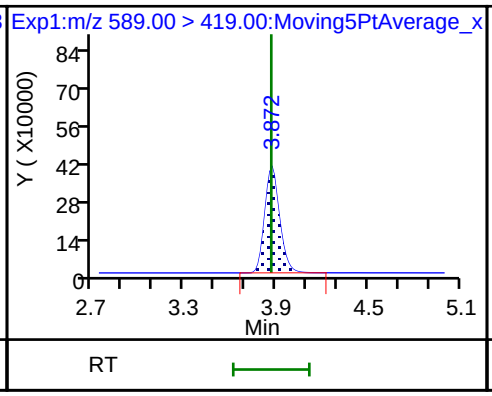
29 Perfluorodecane Sulfonic acid



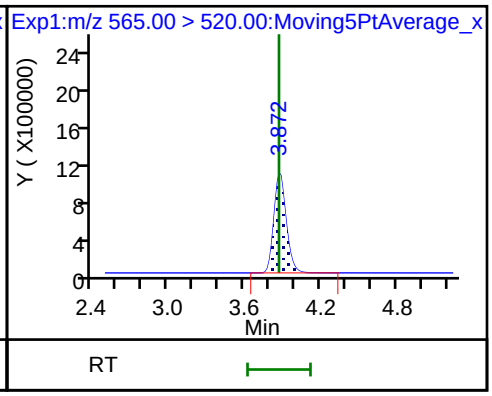
29 Perfluorodecane Sulfonic acid



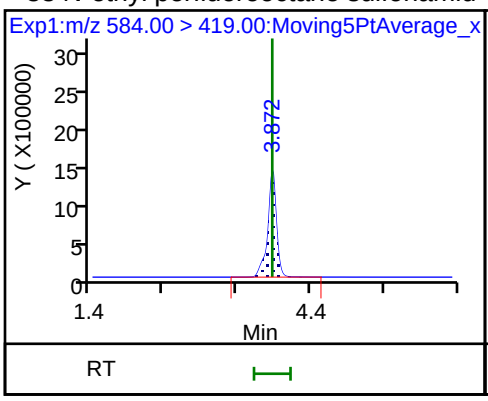
D 32 d5-NEtFOSAA



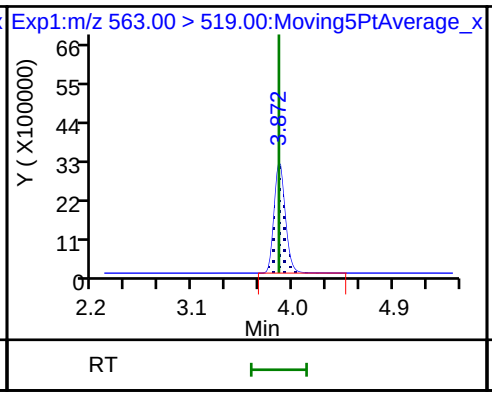
D 30 13C2 PFUnA



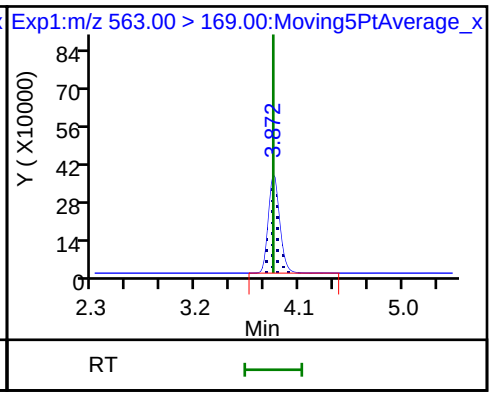
33 N-ethyl perfluorooctane sulfonamid



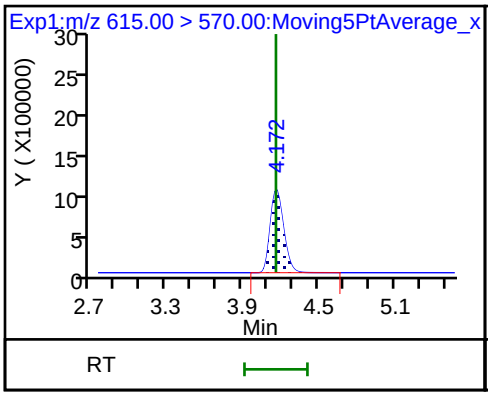
31 Perfluoroundecanoic acid



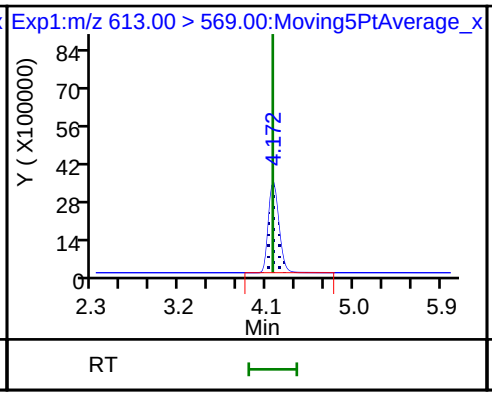
31 Perfluoroundecanoic acid



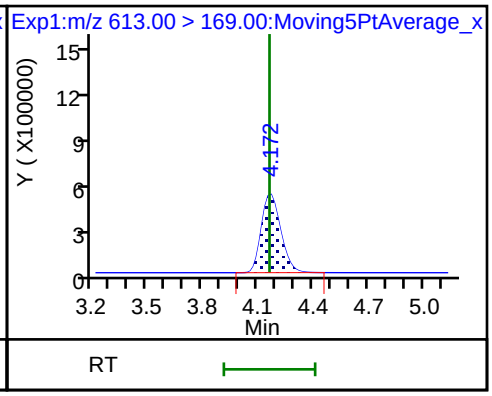
D 36 13C2 PFDoA



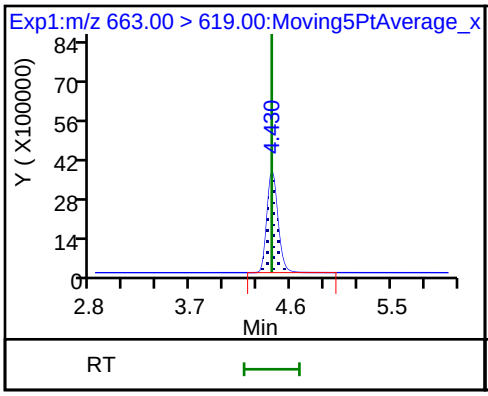
37 Perfluorododecanoic acid



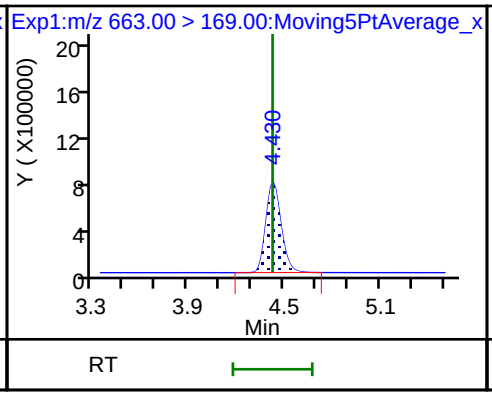
37 Perfluorododecanoic acid



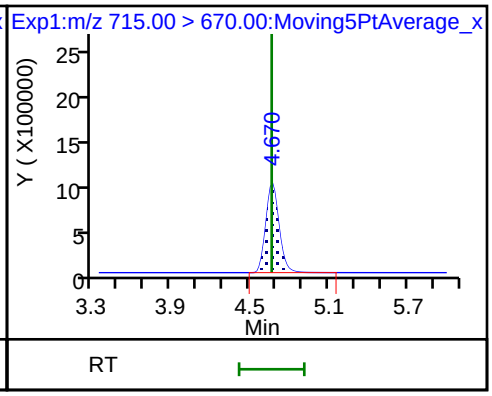
41 Perfluorotridecanoic acid



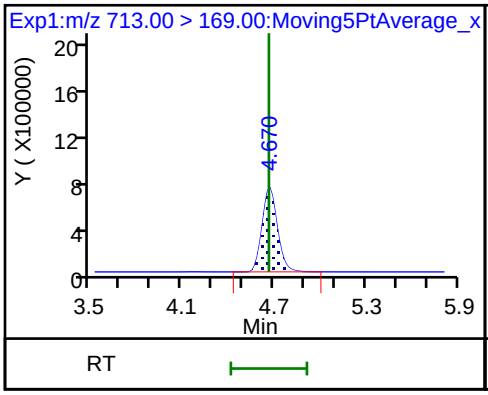
41 Perfluorotridecanoic acid



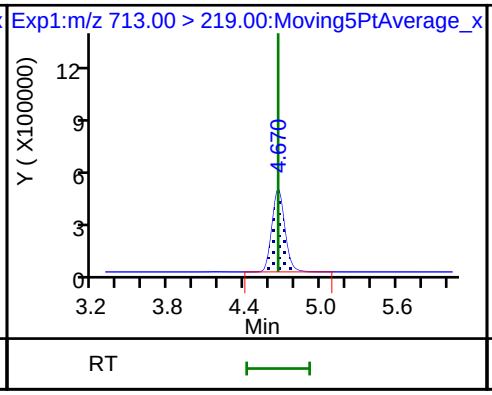
D 43 13C2-PFTeDA



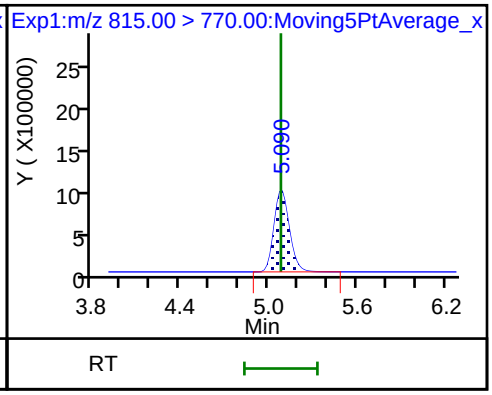
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

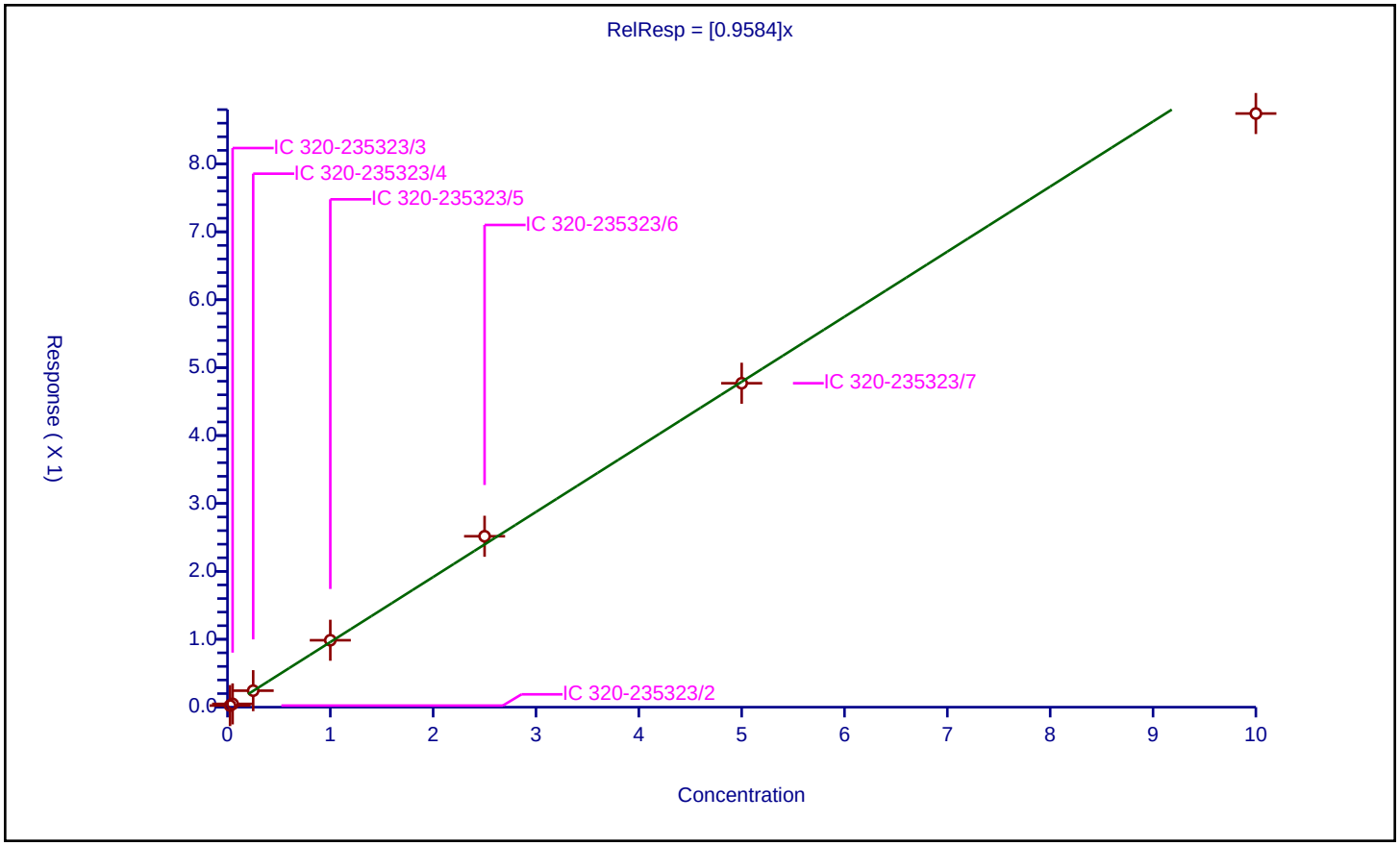
Curve Coefficients

Intercept:	0
Slope:	0.9584

Error Coefficients

Standard Error:	14400000
Relative Standard Error:	4.4
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.023734	2.5	8672946.0	0.949354	Y
2	IC 320-235323/3	0.05	0.048314	2.5	8688476.0	0.966286	Y
3	IC 320-235323/4	0.25	0.243019	2.5	8758871.0	0.972076	Y
4	IC 320-235323/5	1.0	0.985728	2.5	8638287.0	0.985728	Y
5	IC 320-235323/6	2.5	2.516987	2.5	8624856.0	1.006795	Y
6	IC 320-235323/7	5.0	4.77046	2.5	8585448.0	0.954092	Y
7	IC 320-235323/8	10.0	8.742521	2.5	8540015.0	0.874252	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

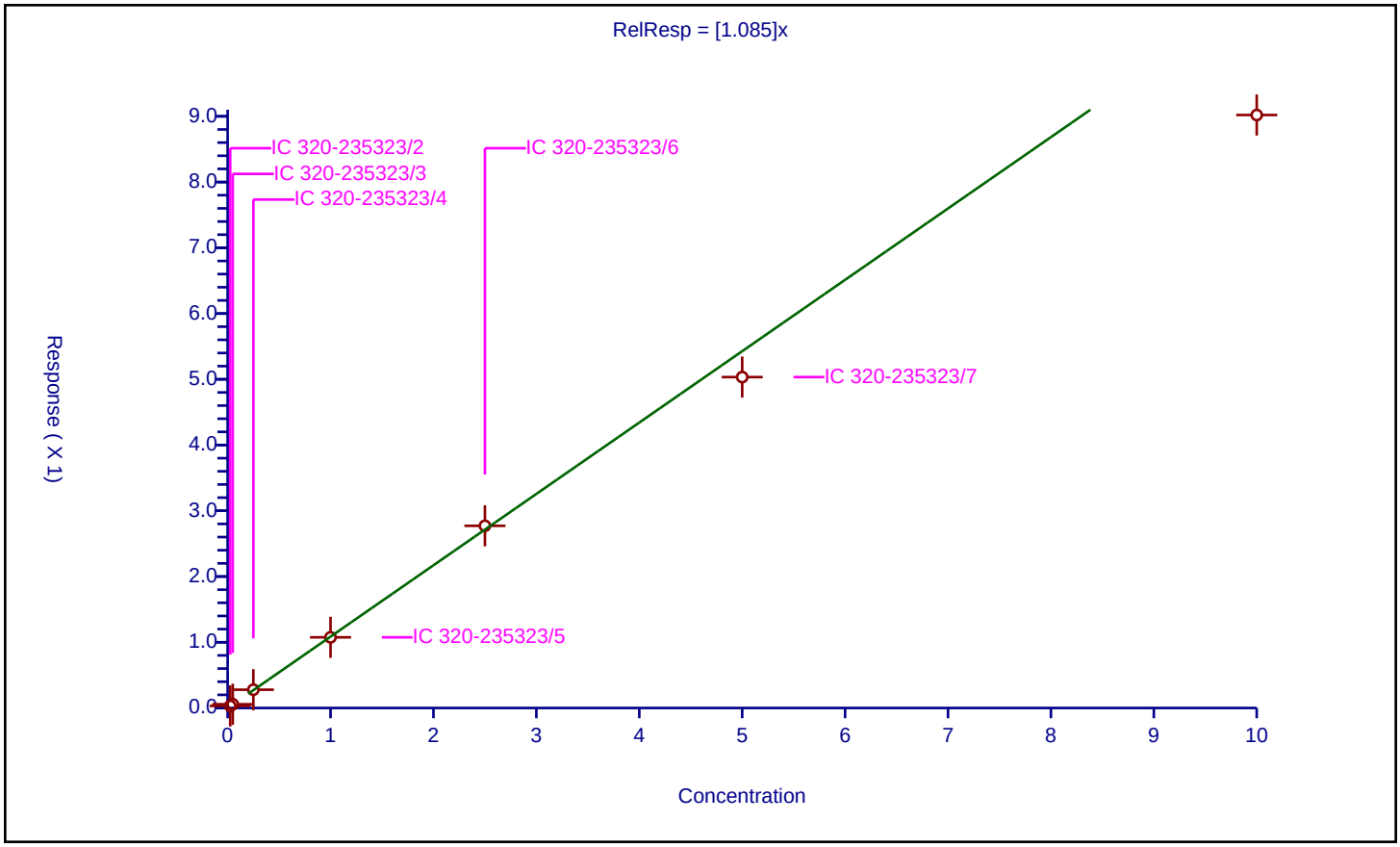
Curve Coefficients

Intercept:	0
Slope:	1.085

Error Coefficients

Standard Error:	13700000
Relative Standard Error:	10.1
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.986

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.03131	2.5	7953022.0	1.252392	Y
2	IC 320-235323/3	0.05	0.057059	2.5	8140376.0	1.141182	Y
3	IC 320-235323/4	0.25	0.278047	2.5	7861863.0	1.112188	Y
4	IC 320-235323/5	1.0	1.075014	2.5	8111747.0	1.075014	Y
5	IC 320-235323/6	2.5	2.771345	2.5	7881612.0	1.108538	Y
6	IC 320-235323/7	5.0	5.033357	2.5	7911006.0	1.006671	Y
7	IC 320-235323/8	10.0	9.019779	2.5	7794784.0	0.901978	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

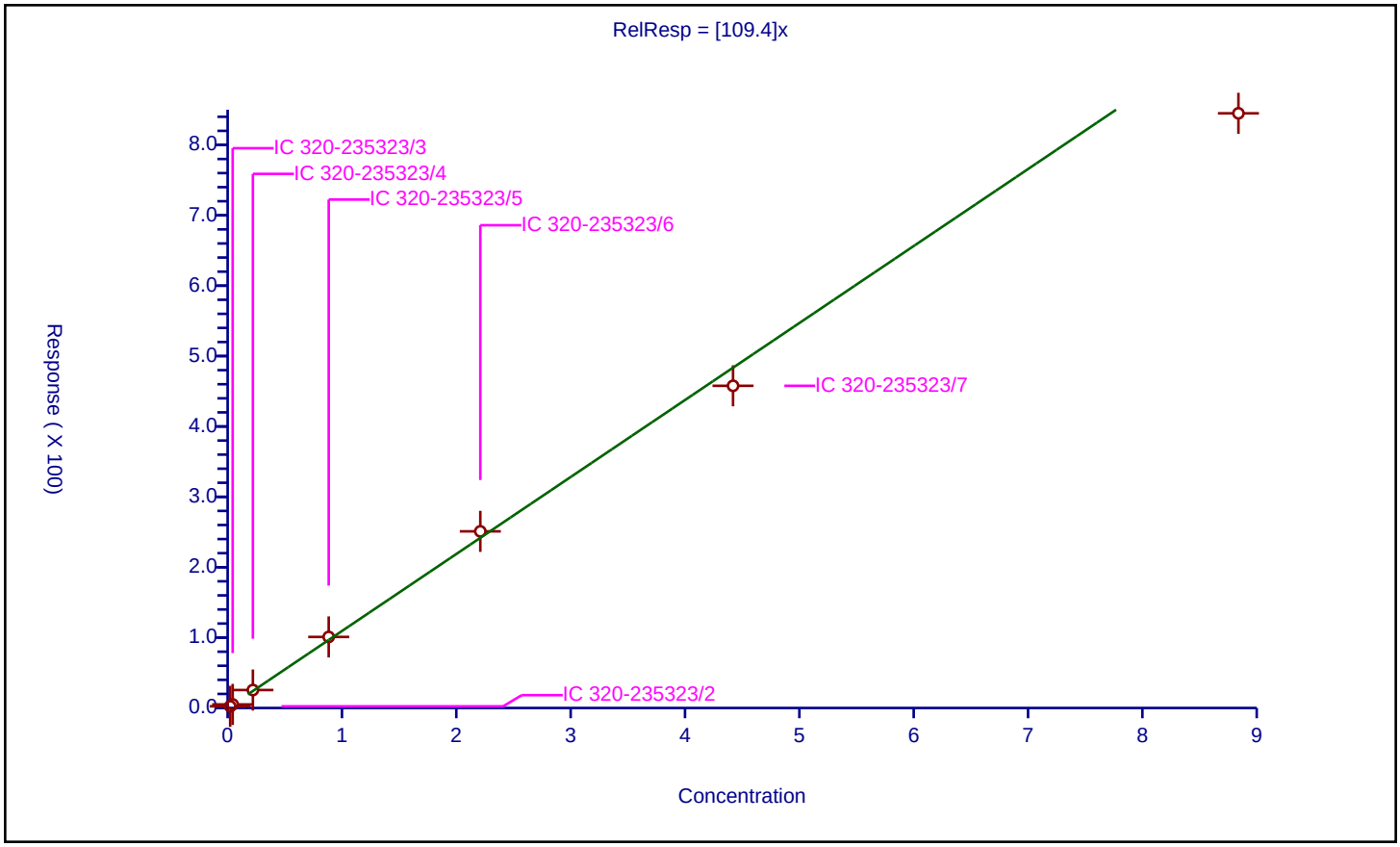
Curve Coefficients

Intercept:	0
Slope:	109.4

Error Coefficients

Standard Error:	16200000
Relative Standard Error:	6.8
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.0221	2.398195	2.325	93356.0	108.515602	Y
2	IC 320-235323/3	0.0442	5.070763	2.325	92312.0	114.723139	Y
3	IC 320-235323/4	0.221	25.542654	2.325	93156.0	115.577621	Y
4	IC 320-235323/5	0.884	100.968898	2.325	95433.0	114.218211	Y
5	IC 320-235323/6	2.21	250.969484	2.325	93897.0	113.560852	Y
6	IC 320-235323/7	4.42	457.749936	2.325	93215.0	103.563334	Y
7	IC 320-235323/8	8.84	844.923984	2.325	91779.0	95.579636	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

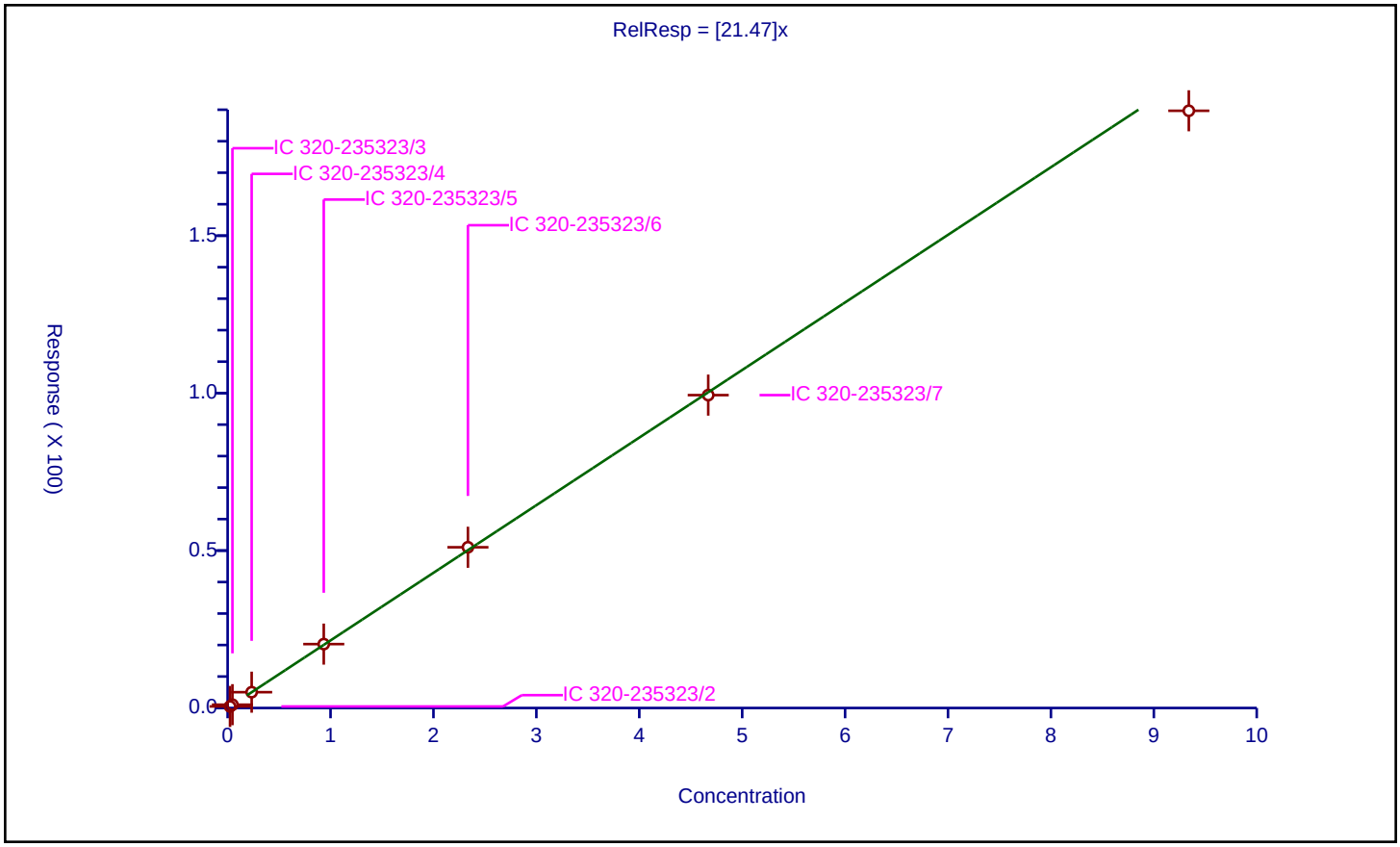
Curve Coefficients

Intercept:	0
Slope:	21.47

Error Coefficients

Standard Error:	3580000
Relative Standard Error:	3.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.02335	0.490472	2.325	93356.0	21.005246	Y
2	IC 320-235323/3	0.0467	1.053645	2.325	92312.0	22.561985	Y
3	IC 320-235323/4	0.2335	5.028864	2.325	93156.0	21.536893	Y
4	IC 320-235323/5	0.934	20.289086	2.325	95433.0	21.72279	Y
5	IC 320-235323/6	2.335	51.051203	2.325	93897.0	21.86347	Y
6	IC 320-235323/7	4.67	99.367405	2.325	93215.0	21.277817	Y
7	IC 320-235323/8	9.34	189.666183	2.325	91779.0	20.306872	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

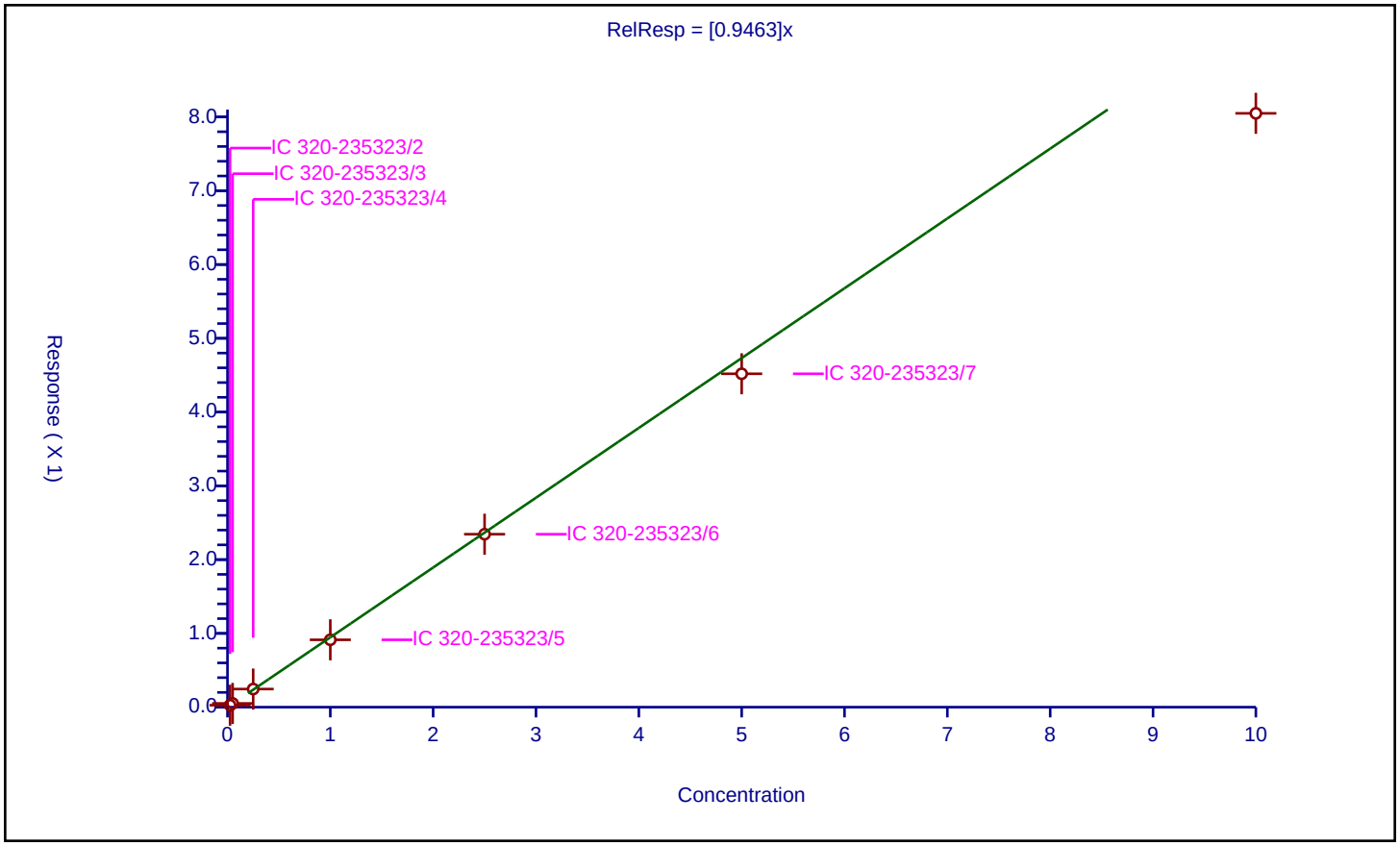
Curve Coefficients

Intercept:	0
Slope:	0.9463

Error Coefficients

Standard Error:	12900000
Relative Standard Error:	9.0
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.989

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.026589	2.5	8188862.0	1.063554	Y
2	IC 320-235323/3	0.05	0.050951	2.5	8456056.0	1.019015	Y
3	IC 320-235323/4	0.25	0.245571	2.5	8209316.0	0.982283	Y
4	IC 320-235323/5	1.0	0.912899	2.5	8595361.0	0.912899	Y
5	IC 320-235323/6	2.5	2.344521	2.5	8451911.0	0.937809	Y
6	IC 320-235323/7	5.0	4.519081	2.5	8240591.0	0.903816	Y
7	IC 320-235323/8	10.0	8.04957	2.5	8255766.0	0.804957	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

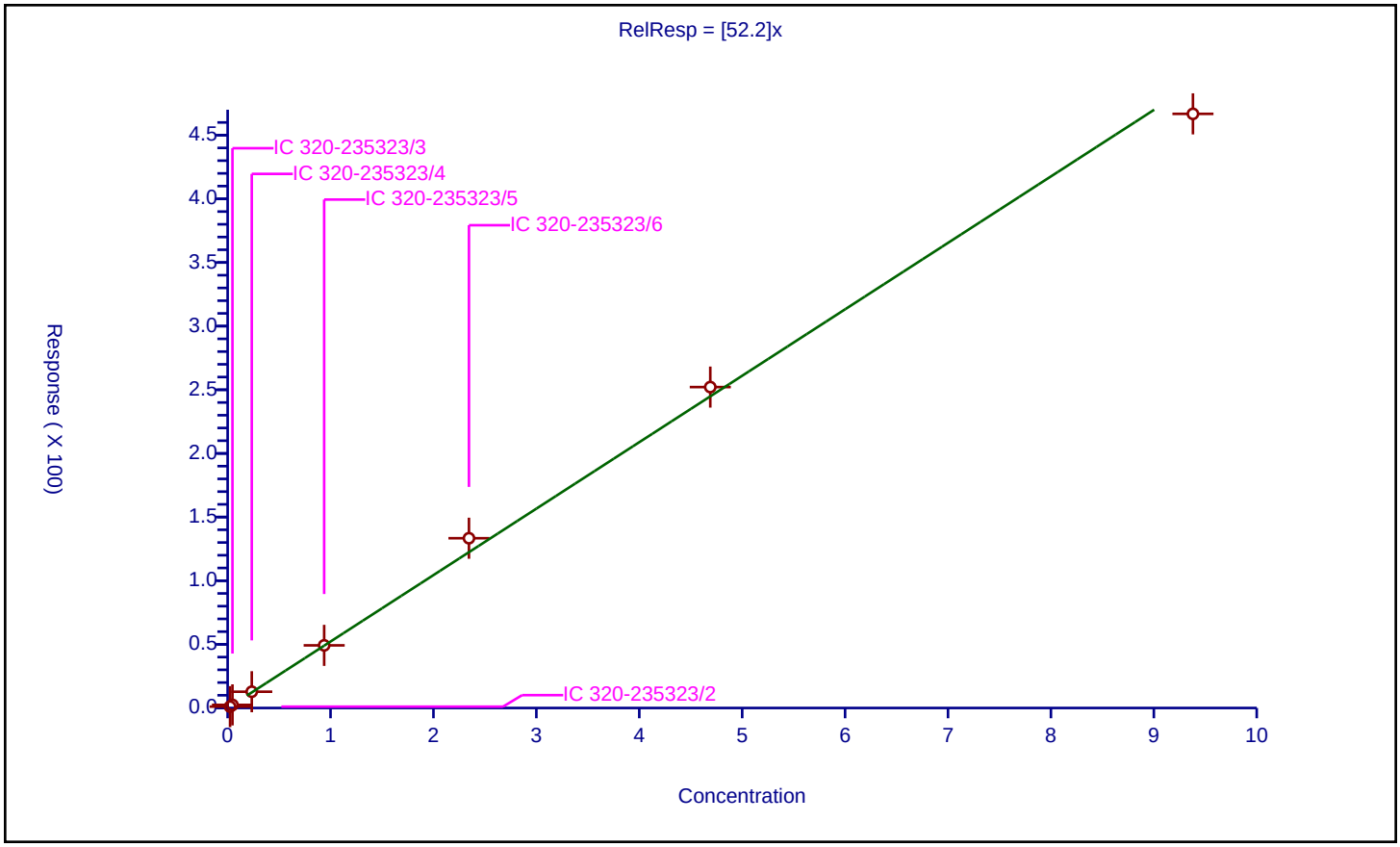
Curve Coefficients

Intercept:	0
Slope:	52.2

Error Coefficients

Standard Error:	8900000
Relative Standard Error:	6.9
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.02345	1.071424	2.325	93356.0	45.689707	Y
2	IC 320-235323/3	0.0469	2.453148	2.325	92312.0	52.305928	Y
3	IC 320-235323/4	0.2345	12.792217	2.325	93156.0	54.551032	Y
4	IC 320-235323/5	0.938	49.217799	2.325	95433.0	52.471001	Y
5	IC 320-235323/6	2.345	133.37988	2.325	93897.0	56.878413	Y
6	IC 320-235323/7	4.69	252.116026	2.325	93215.0	53.756082	Y
7	IC 320-235323/8	9.38	466.756765	2.325	91779.0	49.760849	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

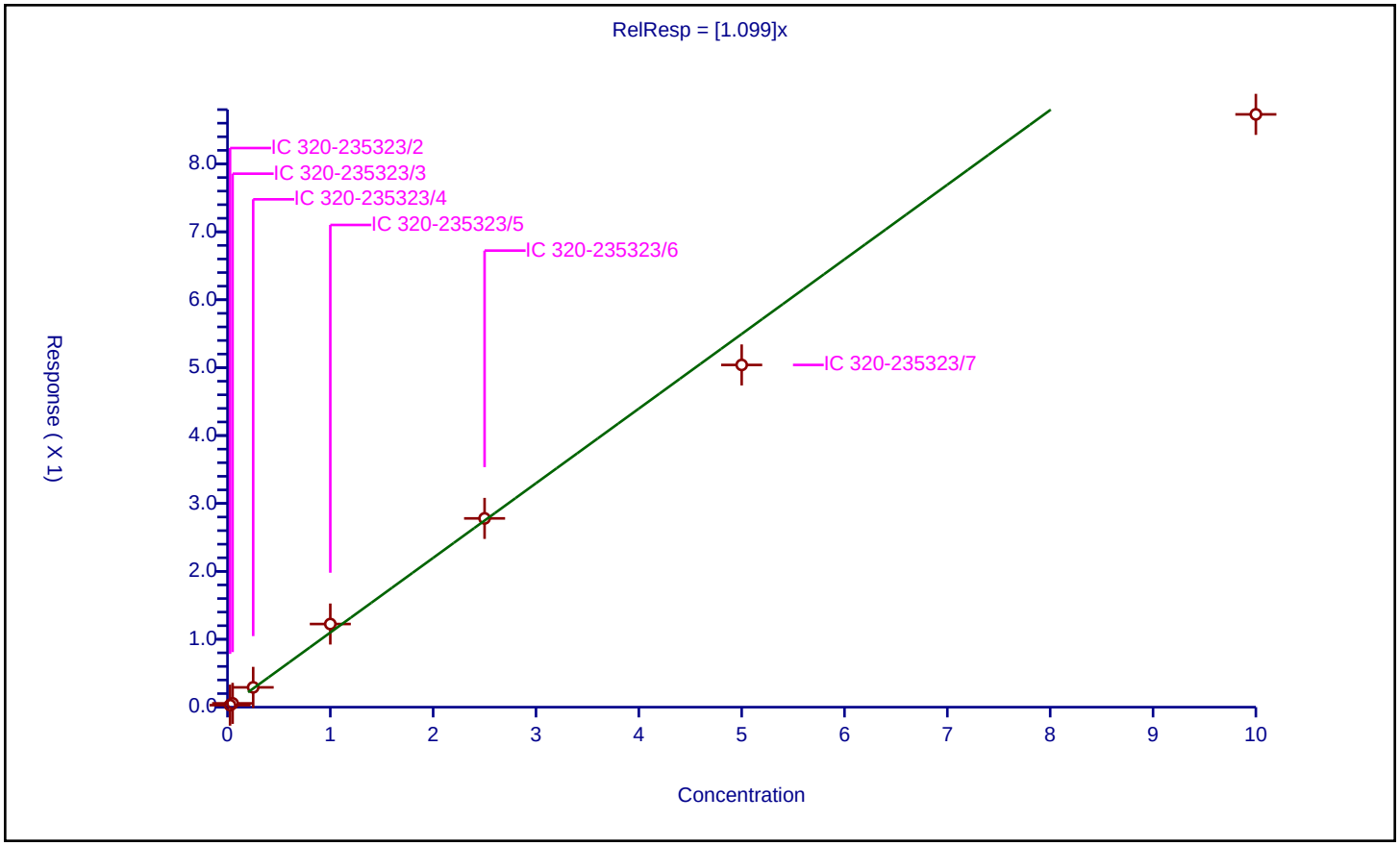
Curve Coefficients

Intercept:	0
Slope:	1.099

Error Coefficients

Standard Error:	16300000
Relative Standard Error:	11.0
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.029622	2.5	10010342.0	1.184875	Y
2	IC 320-235323/3	0.05	0.056247	2.5	9921303.0	1.124943	Y
3	IC 320-235323/4	0.25	0.291698	2.5	9683804.0	1.166791	Y
4	IC 320-235323/5	1.0	1.224496	2.5	9385285.0	1.224496	Y
5	IC 320-235323/6	2.5	2.779812	2.5	9615791.0	1.111925	Y
6	IC 320-235323/7	5.0	5.040088	2.5	9739676.0	1.008018	Y
7	IC 320-235323/8	10.0	8.730098	2.5	9334661.0	0.87301	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

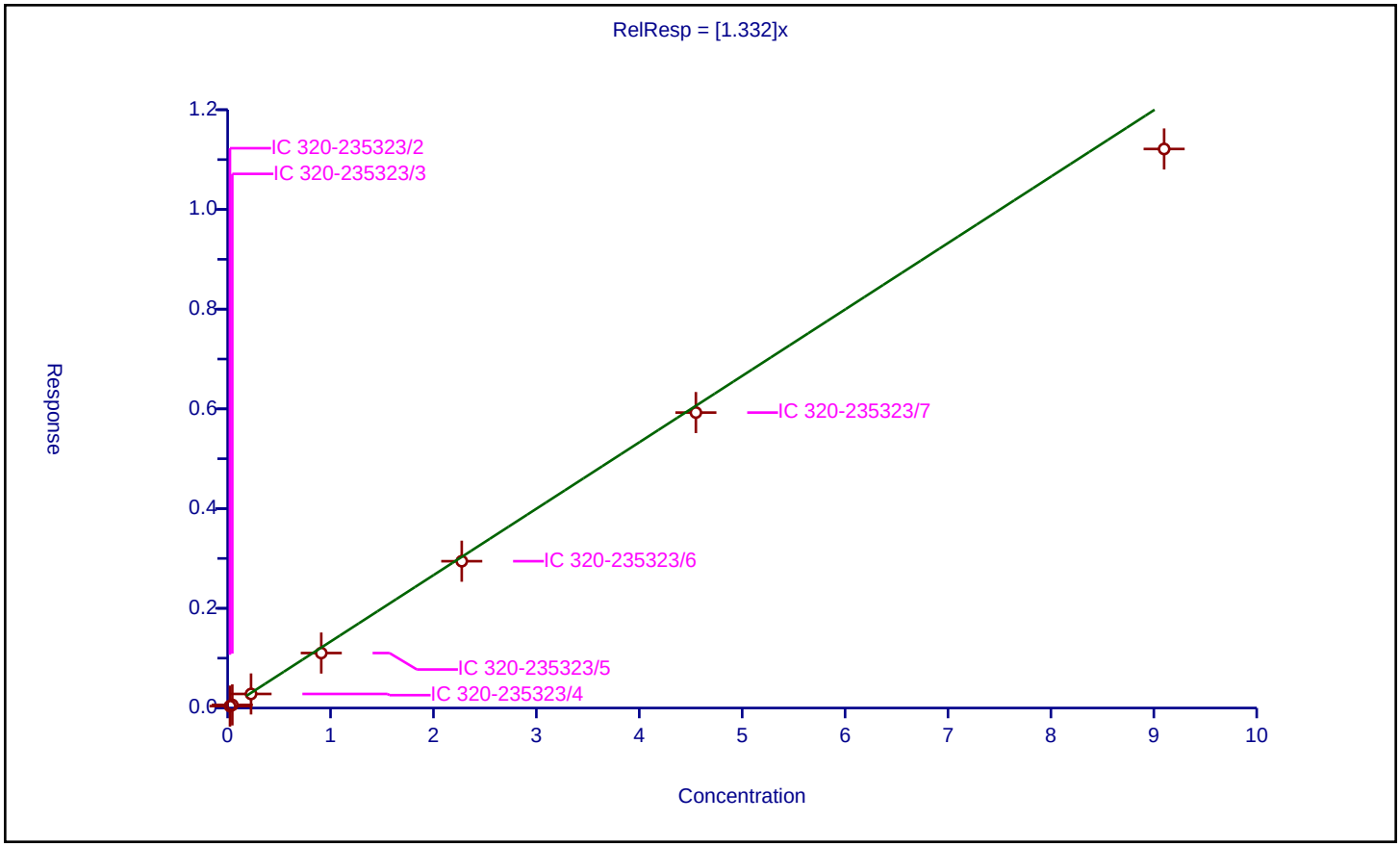
Curve Coefficients

Intercept:	0
Slope:	1.332

Error Coefficients

Standard Error:	11800000
Relative Standard Error:	12.2
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.979

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.02275	0.038245	2.365	5772546.0	1.681112	Y
2	IC 320-235323/3	0.0455	0.0621	2.365	5707383.0	1.364844	Y
3	IC 320-235323/4	0.2275	0.281952	2.365	5684732.0	1.23935	Y
4	IC 320-235323/5	0.91	1.102275	2.365	5765649.0	1.211291	Y
5	IC 320-235323/6	2.275	2.944682	2.365	5490801.0	1.294366	Y
6	IC 320-235323/7	4.55	5.925843	2.365	5391005.0	1.302383	Y
7	IC 320-235323/8	9.1	11.212923	2.365	5187747.0	1.232189	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

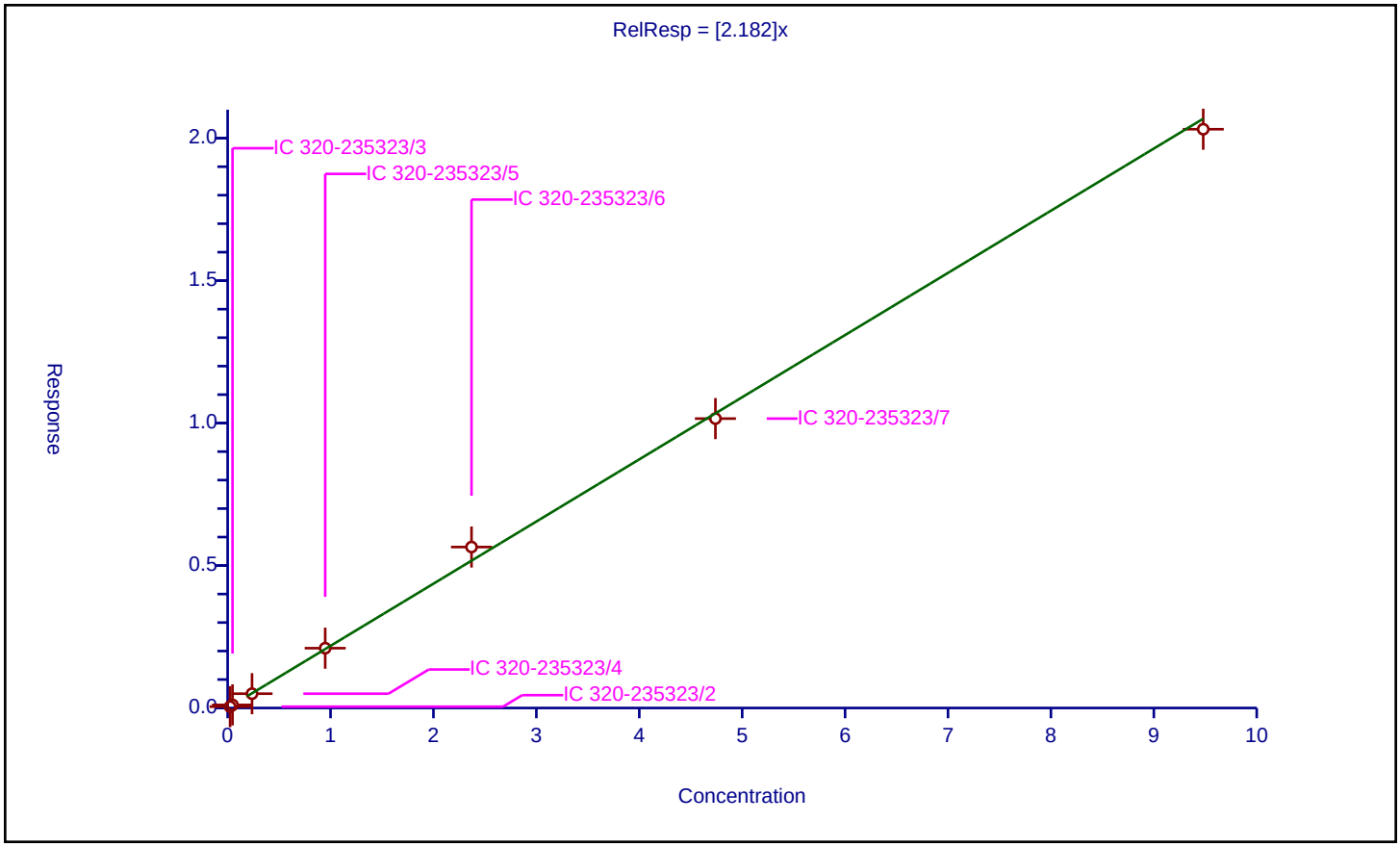
Curve Coefficients

Intercept:	0
Slope:	2.182

Error Coefficients

Standard Error:	3310000
Relative Standard Error:	5.9
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.0237	0.047	2.375	824992.0	1.983103	Y
2	IC 320-235323/3	0.0474	0.108449	2.375	887572.0	2.287955	Y
3	IC 320-235323/4	0.237	0.50185	2.375	921104.0	2.117509	Y
4	IC 320-235323/5	0.948	2.099339	2.375	887129.0	2.214493	Y
5	IC 320-235323/6	2.37	5.65002	2.375	829585.0	2.383975	Y
6	IC 320-235323/7	4.74	10.158763	2.375	855949.0	2.143199	Y
7	IC 320-235323/8	9.48	20.316074	2.375	808920.0	2.143046	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

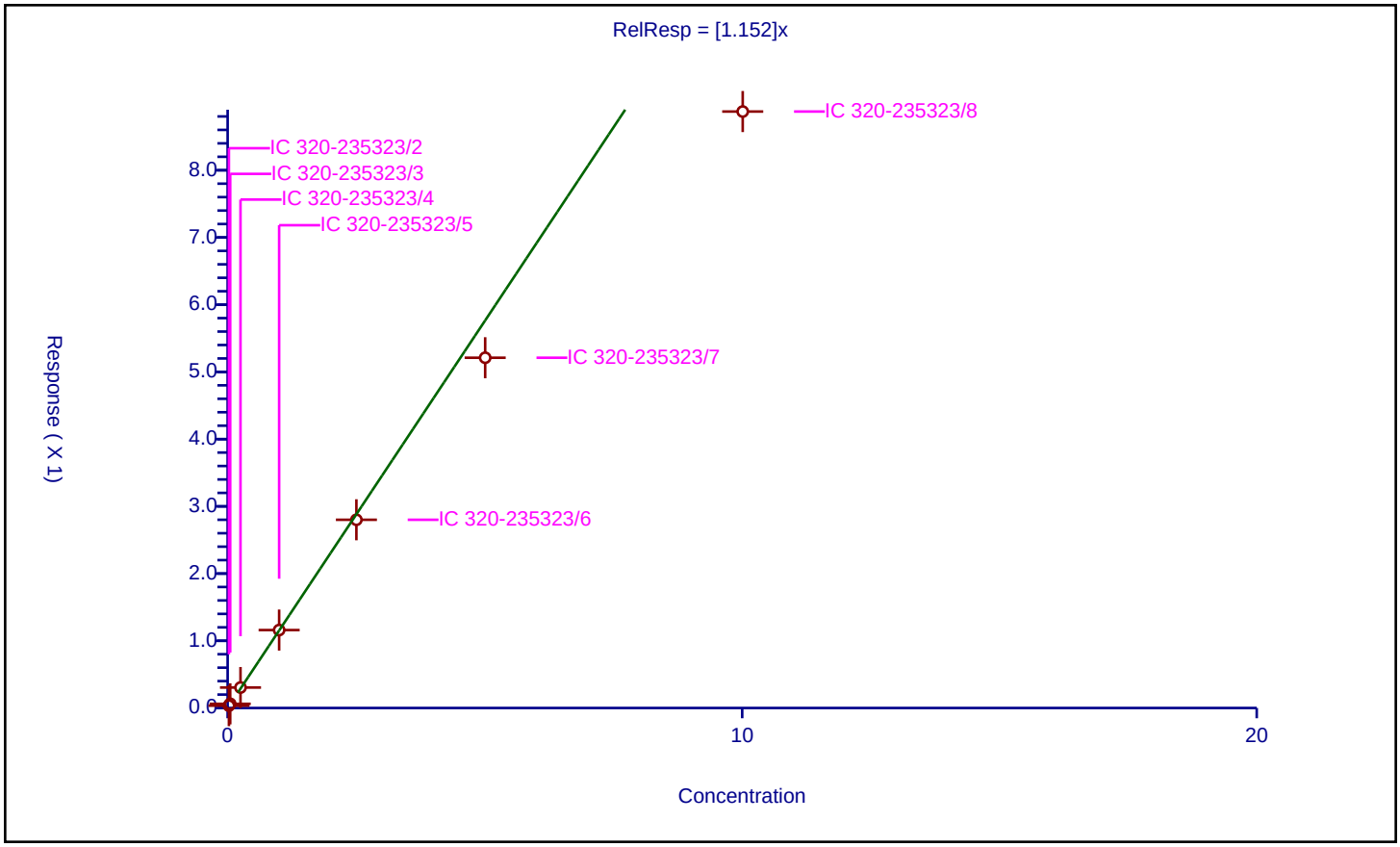
Curve Coefficients

Intercept:	0
Slope:	1.152

Error Coefficients

Standard Error:	14500000
Relative Standard Error:	14.0
Correlation Coefficient:	0.986
Coefficient of Determination (Adjusted):	0.972

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025025	0.034983	2.5	8678172.0	1.397929	Y
2	IC 320-235323/3	0.05005	0.062226	2.5	9178155.0	1.243277	Y
3	IC 320-235323/4	0.25025	0.304673	2.5	8746058.0	1.217474	Y
4	IC 320-235323/5	1.001	1.159356	2.5	8850671.0	1.158198	Y
5	IC 320-235323/6	2.5025	2.800093	2.5	8833584.0	1.118918	Y
6	IC 320-235323/7	5.005	5.210512	2.5	8452129.0	1.041061	Y
7	IC 320-235323/8	10.01	8.872985	2.5	8167184.0	0.886412	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

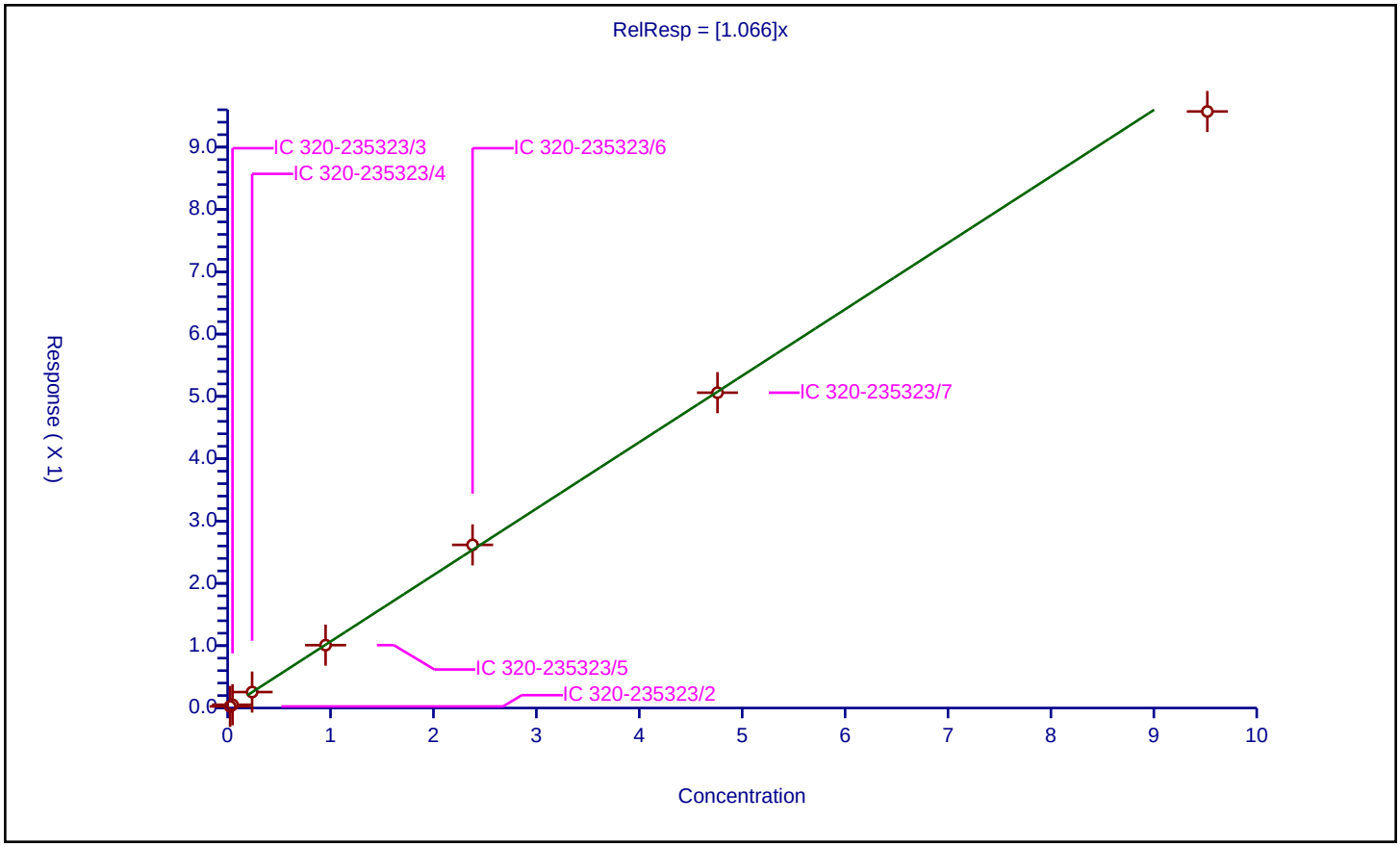
Curve Coefficients

Intercept:	0
Slope:	1.066

Error Coefficients

Standard Error:	11000000
Relative Standard Error:	3.0
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.0238	0.025201	2.39	6111656.0	1.058875	Y
2	IC 320-235323/3	0.0476	0.052423	2.39	6341311.0	1.101313	Y
3	IC 320-235323/4	0.238	0.255901	2.39	6027169.0	1.075215	Y
4	IC 320-235323/5	0.952	1.00904	2.39	6169394.0	1.059916	Y
5	IC 320-235323/6	2.38	2.617487	2.39	6013683.0	1.099785	Y
6	IC 320-235323/7	4.76	5.059856	2.39	5861926.0	1.062995	Y
7	IC 320-235323/8	9.52	9.572034	2.39	5698361.0	1.005466	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

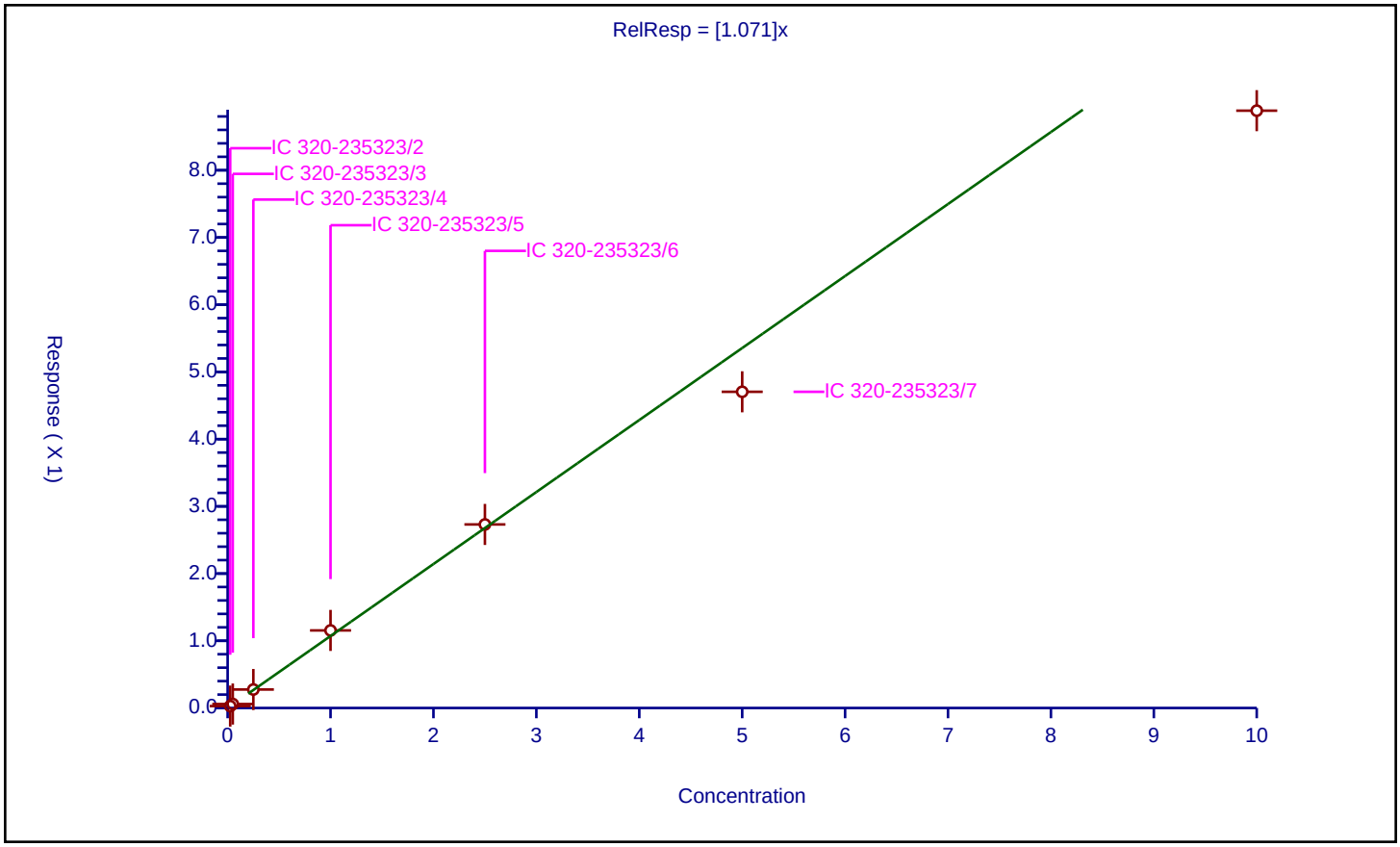
Curve Coefficients

Intercept:	0
Slope:	1.071

Error Coefficients

Standard Error:	13100000
Relative Standard Error:	10.5
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.986

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.028525	2.5	8273114.0	1.141009	Y
2	IC 320-235323/3	0.05	0.059043	2.5	8474952.0	1.180856	Y
3	IC 320-235323/4	0.25	0.274919	2.5	8514394.0	1.099674	Y
4	IC 320-235323/5	1.0	1.15388	2.5	8115774.0	1.15388	Y
5	IC 320-235323/6	2.5	2.730579	2.5	8196177.0	1.092232	Y
6	IC 320-235323/7	5.0	4.704092	2.5	8207906.0	0.940818	Y
7	IC 320-235323/8	10.0	8.885974	2.5	7436534.0	0.888597	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

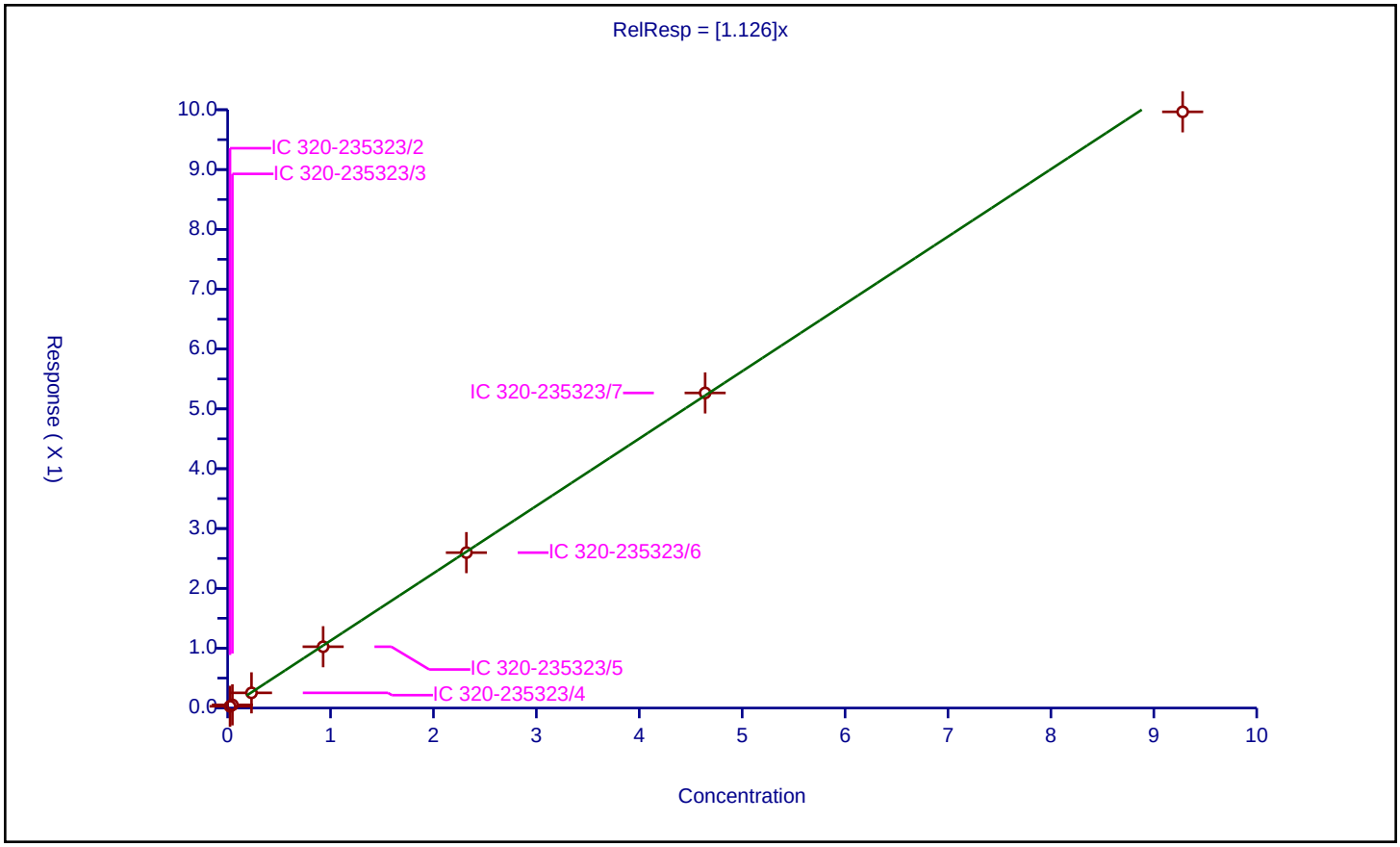
Curve Coefficients

Intercept:	0
Slope:	1.126

Error Coefficients

Standard Error:	11400000
Relative Standard Error:	4.4
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.0232	0.028464	2.39	6111656.0	1.226905	Y
2	IC 320-235323/3	0.0464	0.052414	2.39	6341311.0	1.129617	Y
3	IC 320-235323/4	0.232	0.253332	2.39	6027169.0	1.091949	Y
4	IC 320-235323/5	0.928	1.024166	2.39	6169394.0	1.103627	Y
5	IC 320-235323/6	2.32	2.59709	2.39	6013683.0	1.119435	Y
6	IC 320-235323/7	4.64	5.266522	2.39	5861926.0	1.135026	Y
7	IC 320-235323/8	9.28	9.964933	2.39	5698361.0	1.073807	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

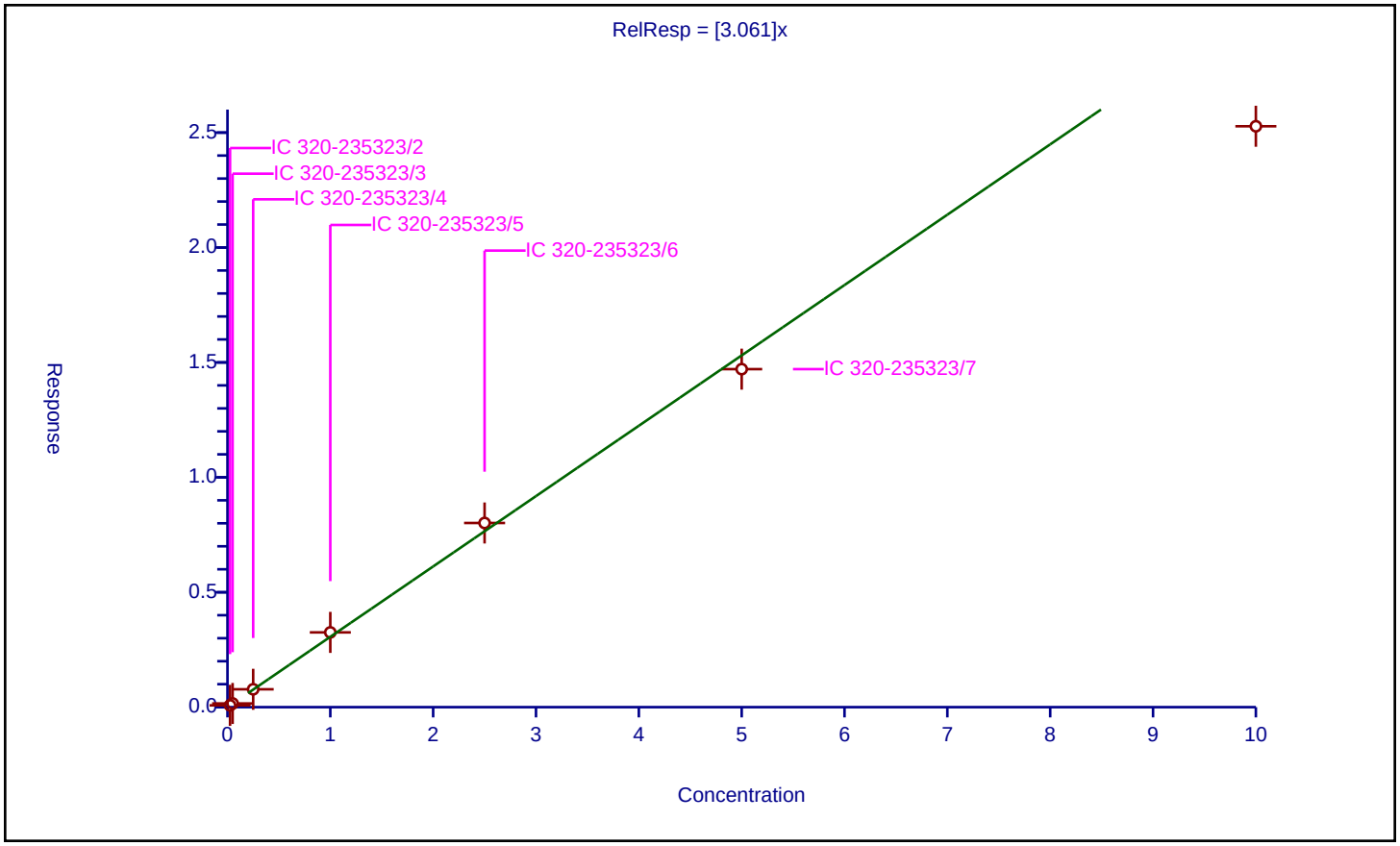
Curve Coefficients

Intercept:	0
Slope:	3.061

Error Coefficients

Standard Error:	16900000
Relative Standard Error:	8.4
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.07918	2.5	3705712.0	3.167219	Y
2	IC 320-235323/3	0.05	0.160886	2.5	3686257.0	3.217722	Y
3	IC 320-235323/4	0.25	0.778558	2.5	3662779.0	3.114231	Y
4	IC 320-235323/5	1.0	3.253395	2.5	3588945.0	3.253395	Y
5	IC 320-235323/6	2.5	8.014325	2.5	3534703.0	3.20573	Y
6	IC 320-235323/7	5.0	14.707315	2.5	3405074.0	2.941463	Y
7	IC 320-235323/8	10.0	25.275146	2.5	3364547.0	2.527515	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

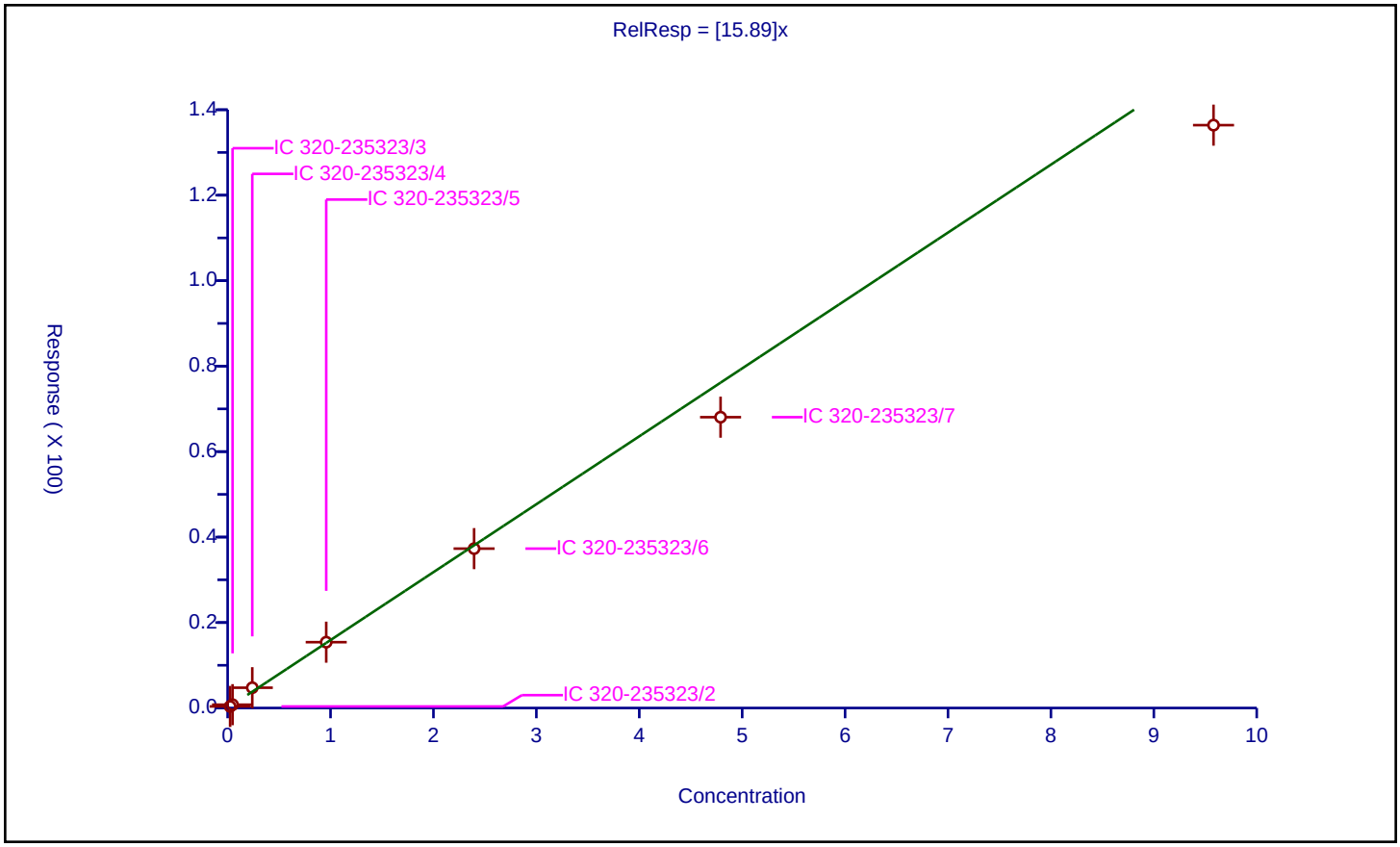
Curve Coefficients

Intercept:	0
Slope:	15.89

Error Coefficients

Standard Error:	2980000
Relative Standard Error:	12.0
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.983

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.02395	0.36166	2.395	129564.0	15.100645	Y
2	IC 320-235323/3	0.0479	0.777675	2.395	121380.0	16.235377	Y
3	IC 320-235323/4	0.2395	4.748248	2.395	110479.0	19.825668	Y
4	IC 320-235323/5	0.958	15.402546	2.395	118578.0	16.077814	Y
5	IC 320-235323/6	2.395	37.296224	2.395	118941.0	15.572536	Y
6	IC 320-235323/7	4.79	68.055257	2.395	122253.0	14.207778	Y
7	IC 320-235323/8	9.58	136.391819	2.395	107033.0	14.237142	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

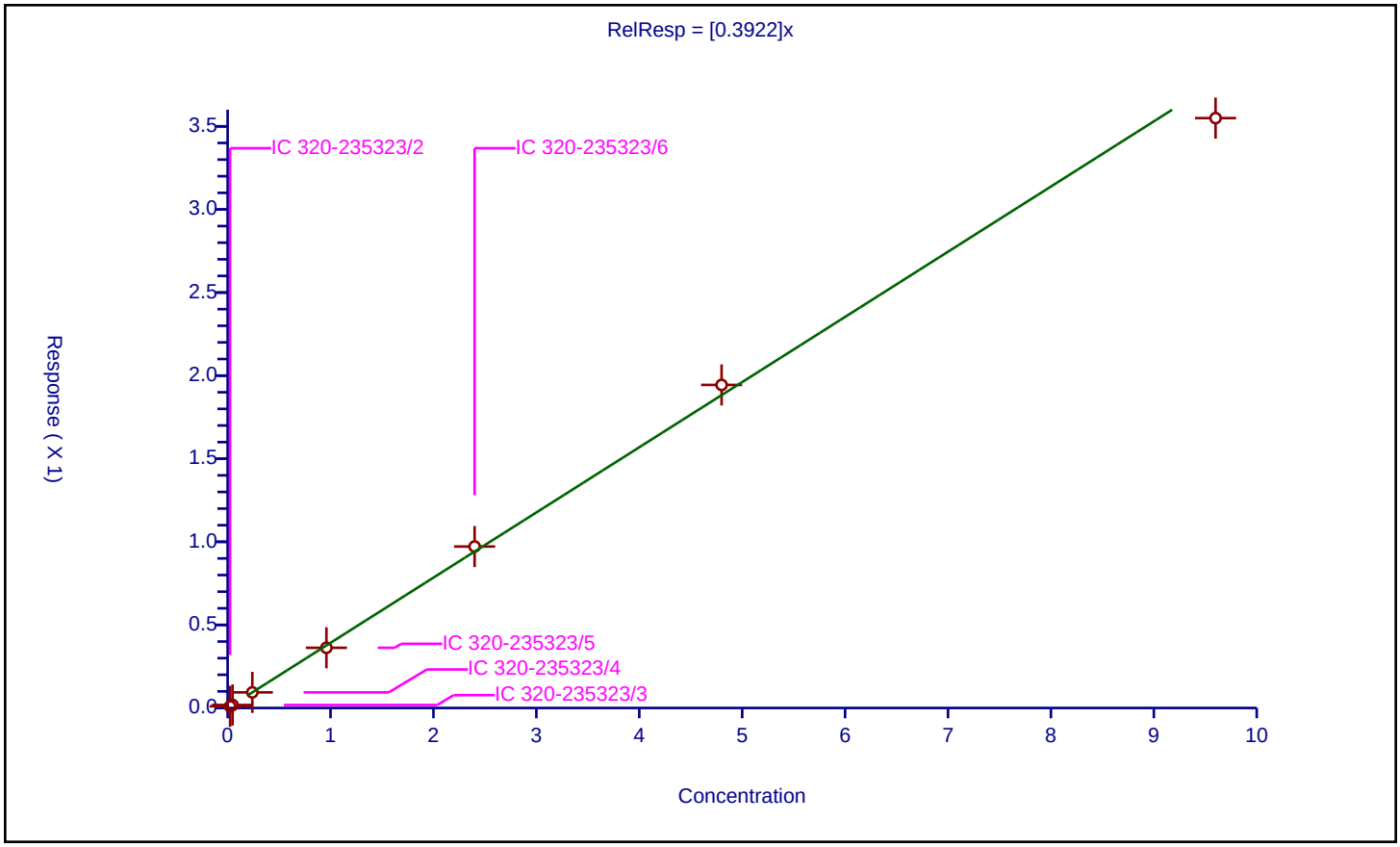
Curve Coefficients

Intercept:	0
Slope:	0.3922

Error Coefficients

Standard Error:	4110000
Relative Standard Error:	4.7
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.024	0.010071	2.39	6111656.0	0.419619	Y
2	IC 320-235323/3	0.048	0.018127	2.39	6341311.0	0.37764	Y
3	IC 320-235323/4	0.24	0.093904	2.39	6027169.0	0.391267	Y
4	IC 320-235323/5	0.96	0.362298	2.39	6169394.0	0.377394	Y
5	IC 320-235323/6	2.4	0.971589	2.39	6013683.0	0.404829	Y
6	IC 320-235323/7	4.8	1.944151	2.39	5861926.0	0.405031	Y
7	IC 320-235323/8	9.6	3.549639	2.39	5698361.0	0.369754	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

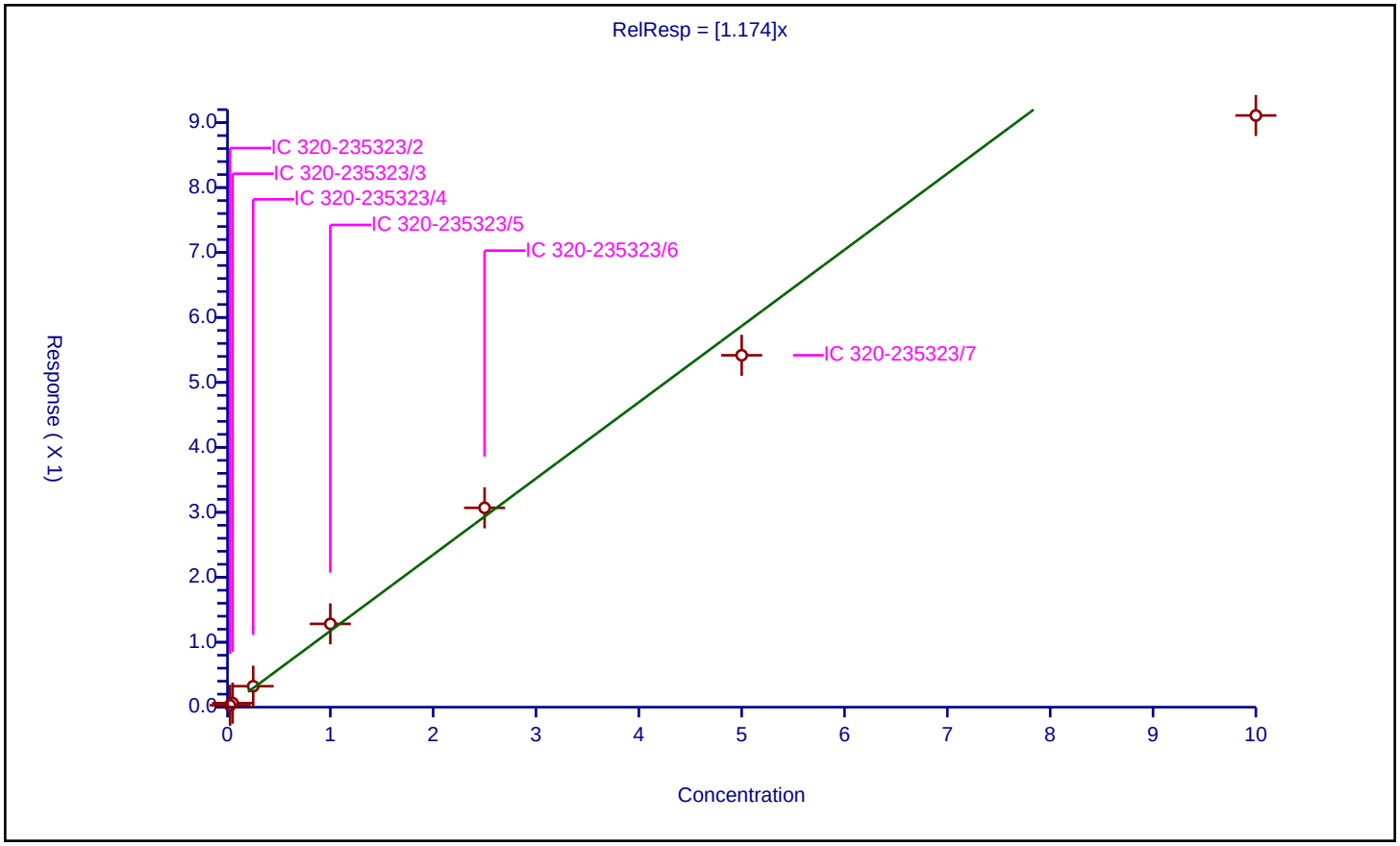
Curve Coefficients

Intercept:	0
Slope:	1.174

Error Coefficients

Standard Error:	14300000
Relative Standard Error:	11.6
Correlation Coefficient:	0.975
Coefficient of Determination (Adjusted):	0.983

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.029373	2.5	8893234.0	1.174938	Y
2	IC 320-235323/3	0.05	0.062231	2.5	8650981.0	1.244616	Y
3	IC 320-235323/4	0.25	0.322755	2.5	8734319.0	1.29102	Y
4	IC 320-235323/5	1.0	1.282609	2.5	8694492.0	1.282609	Y
5	IC 320-235323/6	2.5	3.068914	2.5	8623593.0	1.227566	Y
6	IC 320-235323/7	5.0	5.417831	2.5	8194592.0	1.083566	Y
7	IC 320-235323/8	10.0	9.109865	2.5	7663476.0	0.910987	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

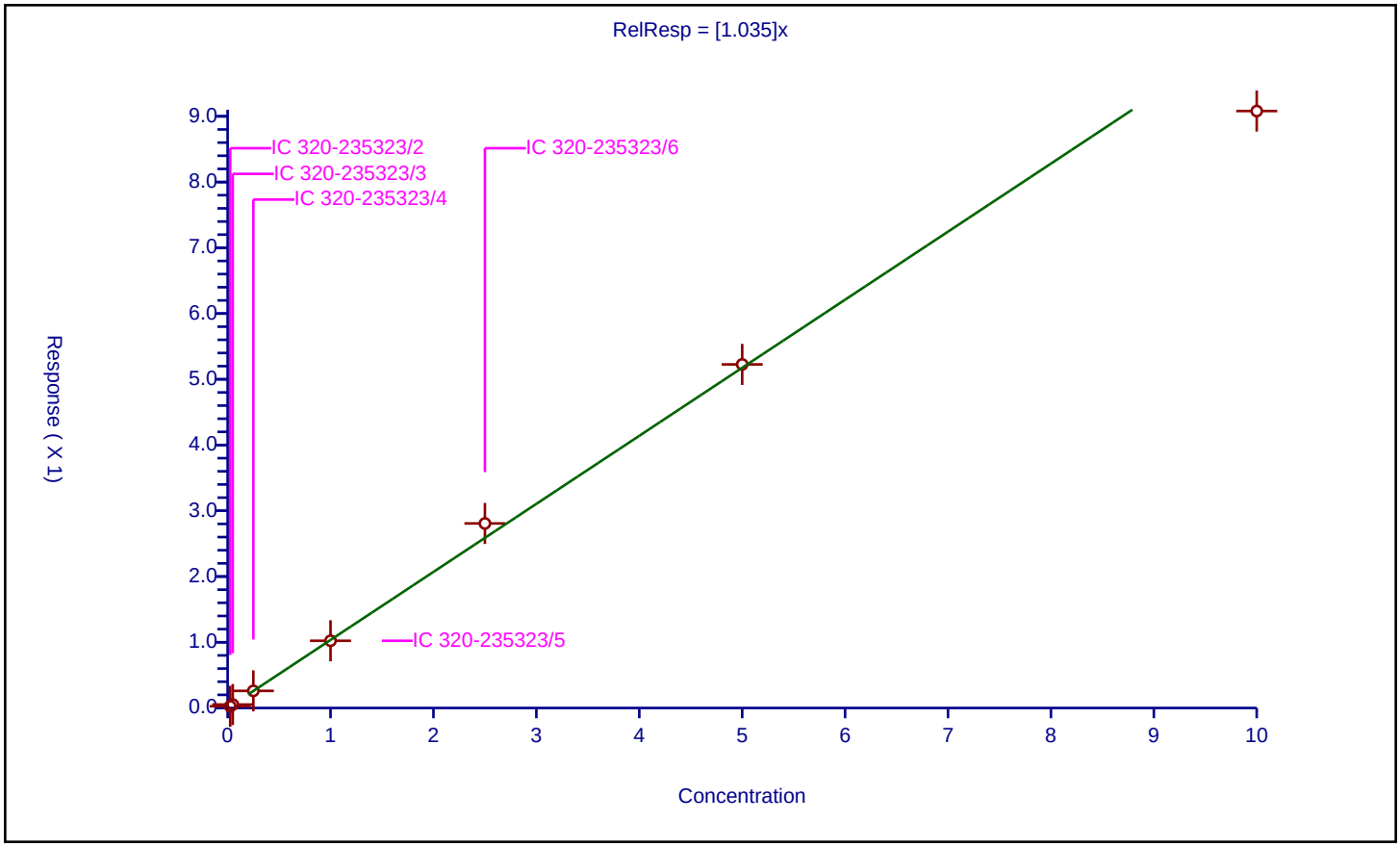
Curve Coefficients

Intercept:	0
Slope:	1.035

Error Coefficients

Standard Error:	7080000
Relative Standard Error:	6.2
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.026085	2.5	3888200.0	1.043413	Y
2	IC 320-235323/3	0.05	0.053029	2.5	4140403.0	1.060585	Y
3	IC 320-235323/4	0.25	0.260613	2.5	3824936.0	1.042451	Y
4	IC 320-235323/5	1.0	1.022728	2.5	4214233.0	1.022728	Y
5	IC 320-235323/6	2.5	2.8074	2.5	3831445.0	1.12296	Y
6	IC 320-235323/7	5.0	5.226332	2.5	4066191.0	1.045266	Y
7	IC 320-235323/8	10.0	9.080175	2.5	3962467.0	0.908018	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

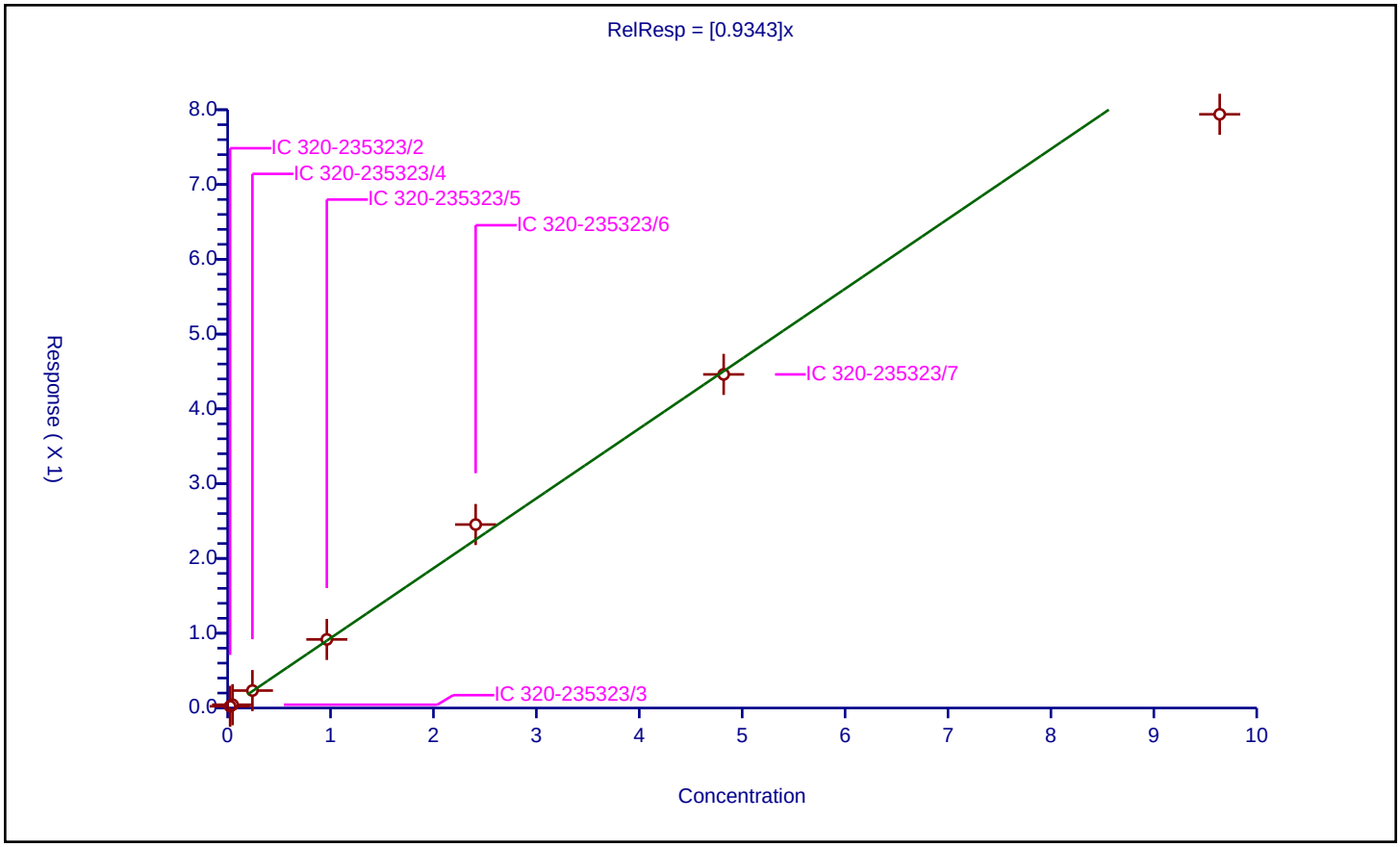
Curve Coefficients

Intercept:	0
Slope:	0.9343

Error Coefficients

Standard Error:	9330000
Relative Standard Error:	6.4
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.0241	0.022663	2.39	6111656.0	0.940384	Y
2	IC 320-235323/3	0.0482	0.044017	2.39	6341311.0	0.913216	Y
3	IC 320-235323/4	0.241	0.233353	2.39	6027169.0	0.968268	Y
4	IC 320-235323/5	0.964	0.91688	2.39	6169394.0	0.95112	Y
5	IC 320-235323/6	2.41	2.453334	2.39	6013683.0	1.017981	Y
6	IC 320-235323/7	4.82	4.46103	2.39	5861926.0	0.925525	Y
7	IC 320-235323/8	9.64	7.939088	2.39	5698361.0	0.823557	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

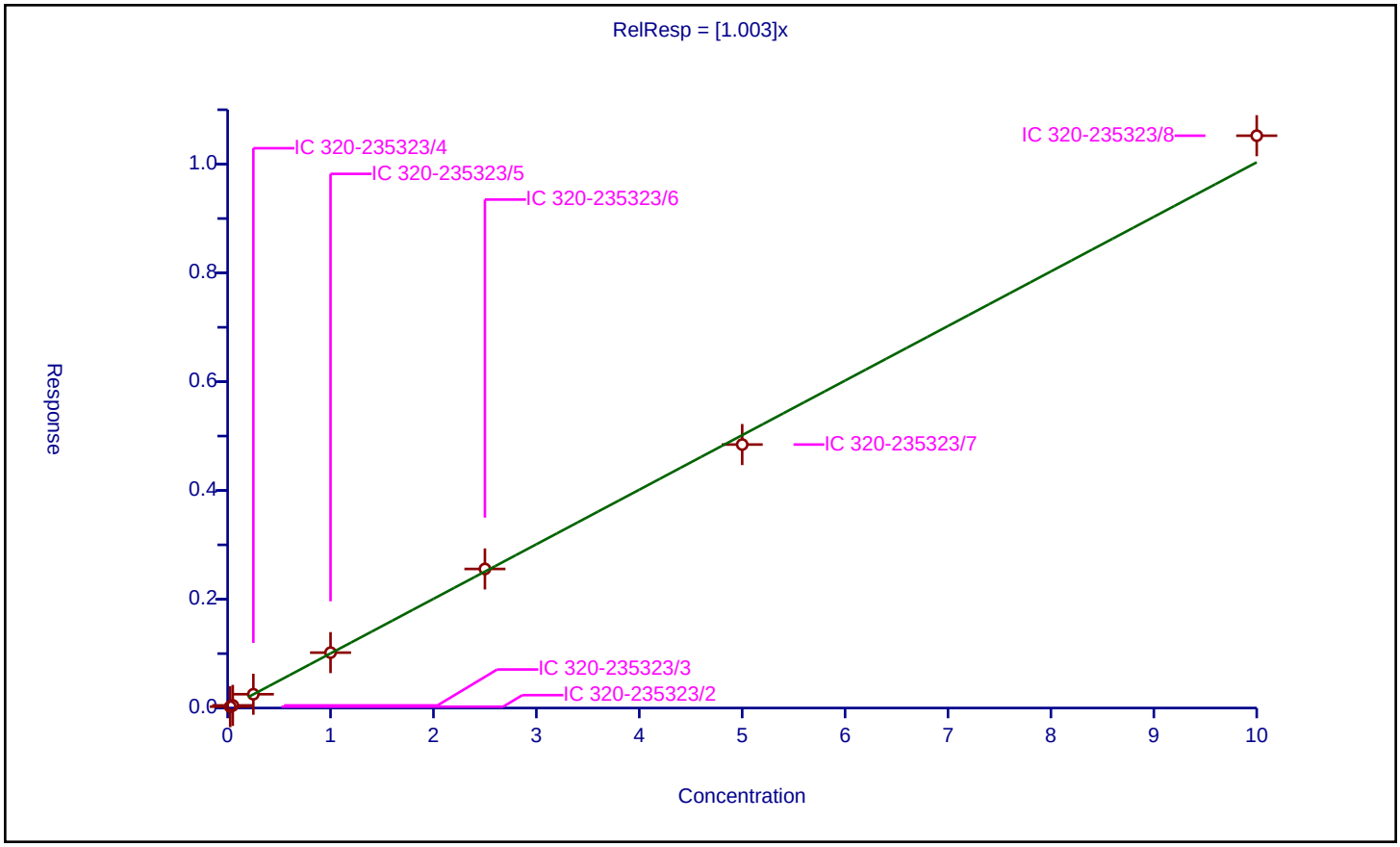
Curve Coefficients

Intercept:	0
Slope:	1.003

Error Coefficients

Standard Error:	5340000
Relative Standard Error:	3.3
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.024745	2.5	3451888.0	0.989806	Y
2	IC 320-235323/3	0.05	0.047966	2.5	3680693.0	0.959317	Y
3	IC 320-235323/4	0.25	0.253148	2.5	3320282.0	1.012592	Y
4	IC 320-235323/5	1.0	1.018097	2.5	3146939.0	1.018097	Y
5	IC 320-235323/6	2.5	2.556627	2.5	3140930.0	1.022651	Y
6	IC 320-235323/7	5.0	4.844191	2.5	3059291.0	0.968838	Y
7	IC 320-235323/8	10.0	10.522824	2.5	2647477.0	1.052282	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

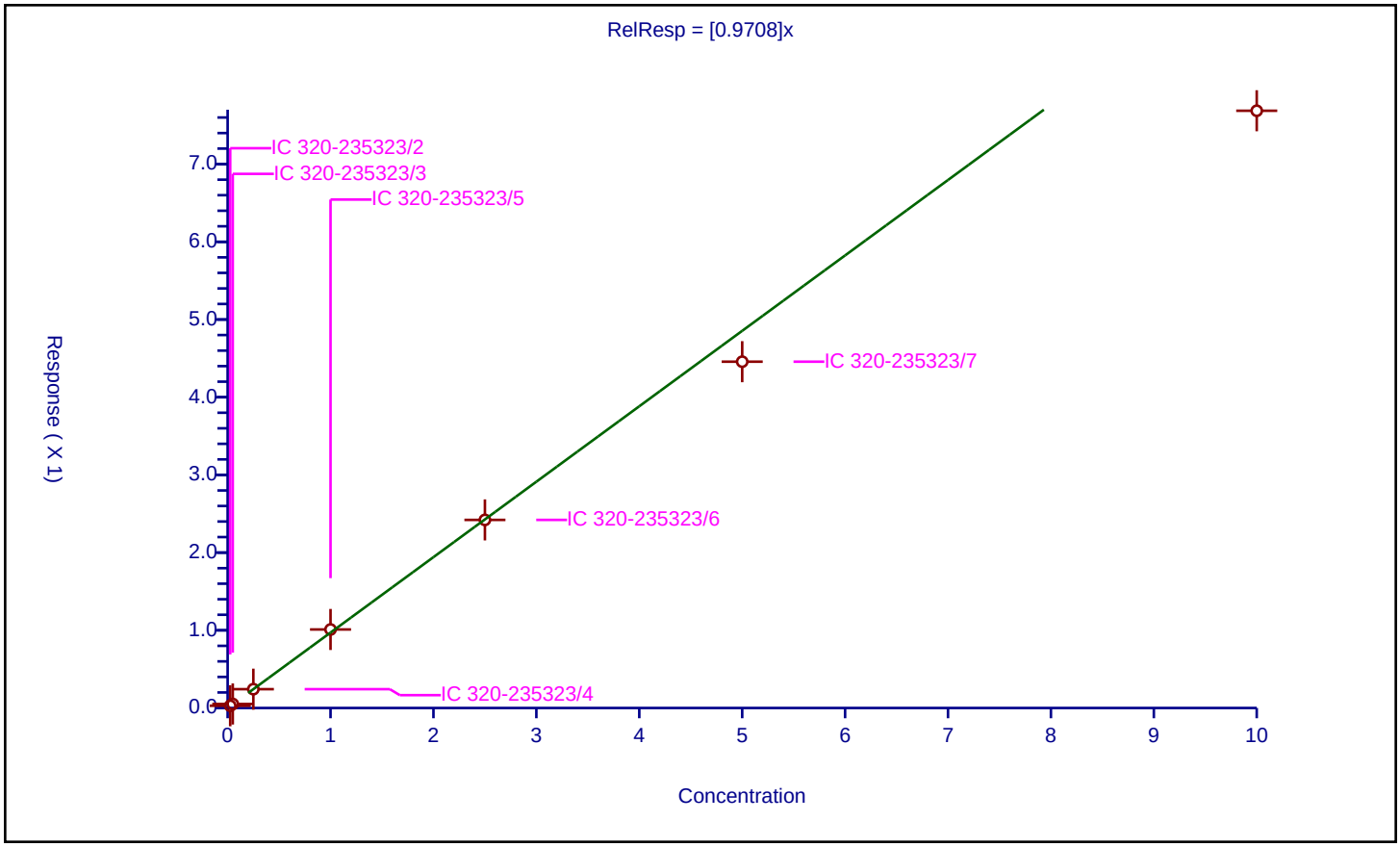
Curve Coefficients

Intercept:	0
Slope:	0.9708

Error Coefficients

Standard Error:	10700000
Relative Standard Error:	12.4
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.979

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.028885	2.5	8050897.0	1.155399	Y
2	IC 320-235323/3	0.05	0.051611	2.5	7967477.0	1.032228	Y
3	IC 320-235323/4	0.25	0.242274	2.5	8610405.0	0.969097	Y
4	IC 320-235323/5	1.0	1.010591	2.5	7995274.0	1.010591	Y
5	IC 320-235323/6	2.5	2.420913	2.5	7616119.0	0.968365	Y
6	IC 320-235323/7	5.0	4.457097	2.5	7080168.0	0.891419	Y
7	IC 320-235323/8	10.0	7.686896	2.5	7003448.0	0.76869	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

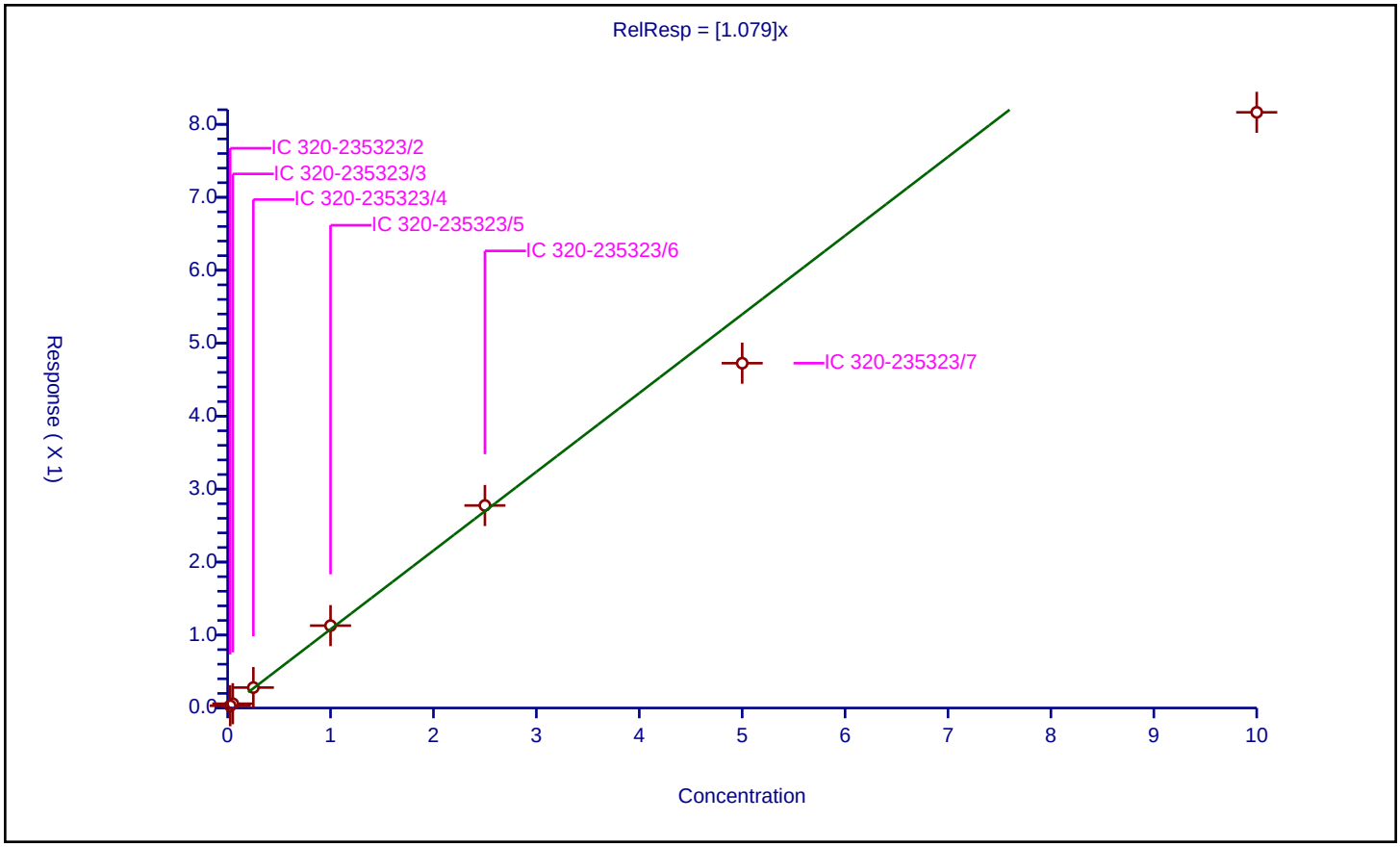
Curve Coefficients

Intercept:	0
Slope:	1.079

Error Coefficients

Standard Error:	12600000
Relative Standard Error:	13.7
Correlation Coefficient:	0.980
Coefficient of Determination (Adjusted):	0.974

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.031269	2.5	8286918.0	1.250742	Y
2	IC 320-235323/3	0.05	0.059068	2.5	8658513.0	1.181369	Y
3	IC 320-235323/4	0.25	0.280189	2.5	8680037.0	1.120757	Y
4	IC 320-235323/5	1.0	1.128977	2.5	8582866.0	1.128977	Y
5	IC 320-235323/6	2.5	2.775947	2.5	8304185.0	1.110379	Y
6	IC 320-235323/7	5.0	4.725843	2.5	8126284.0	0.945169	Y
7	IC 320-235323/8	10.0	8.164672	2.5	7631148.0	0.816467	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

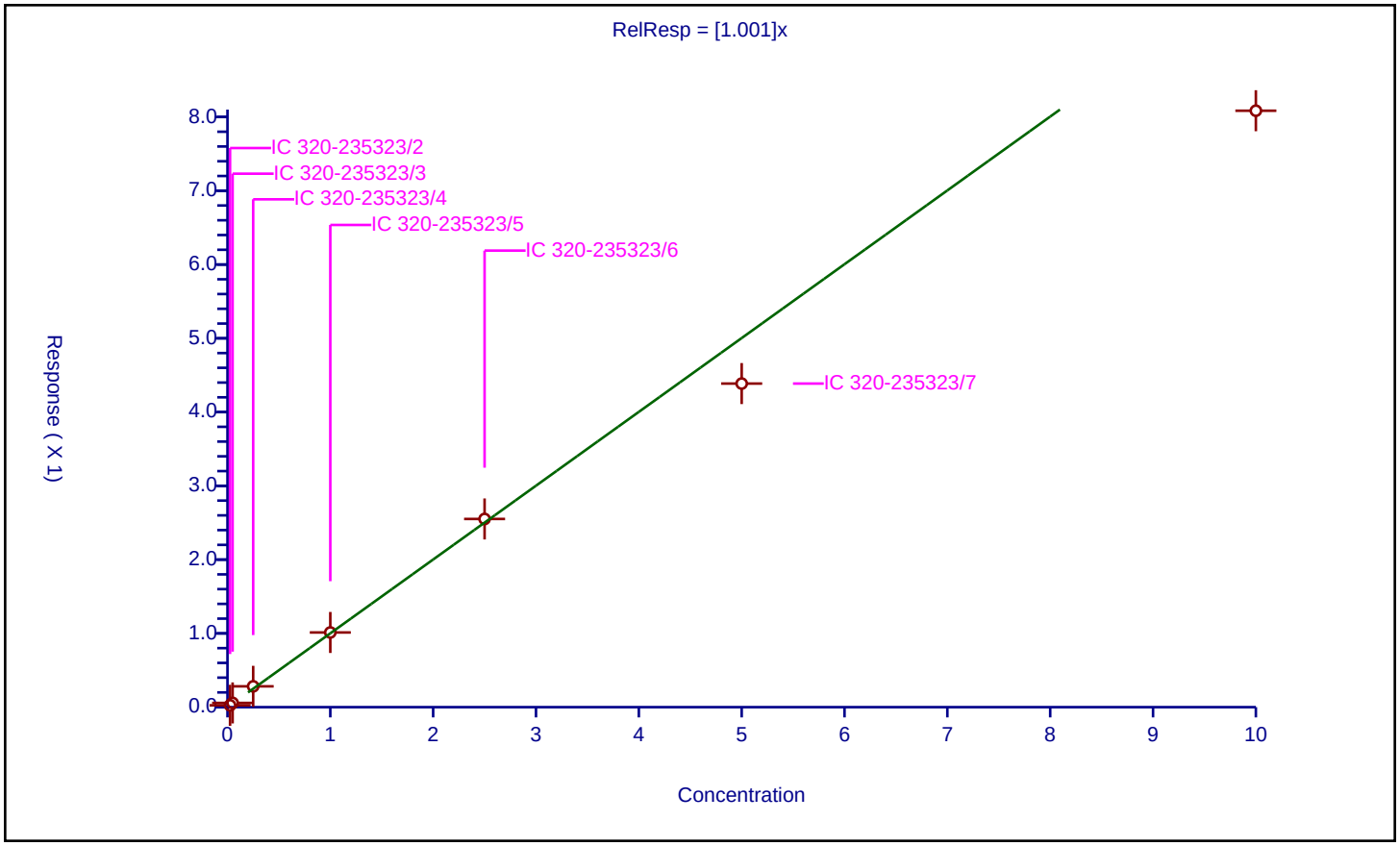
Curve Coefficients

Intercept:	0
Slope:	1.001

Error Coefficients

Standard Error:	12200000
Relative Standard Error:	12.4
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.980

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.02508	2.5	8286918.0	1.00322	Y
2	IC 320-235323/3	0.05	0.057658	2.5	8658513.0	1.153154	Y
3	IC 320-235323/4	0.25	0.28234	2.5	8680037.0	1.129359	Y
4	IC 320-235323/5	1.0	1.012547	2.5	8582866.0	1.012547	Y
5	IC 320-235323/6	2.5	2.551162	2.5	8304185.0	1.020465	Y
6	IC 320-235323/7	5.0	4.3863	2.5	8126284.0	0.87726	Y
7	IC 320-235323/8	10.0	8.084918	2.5	7631148.0	0.808492	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

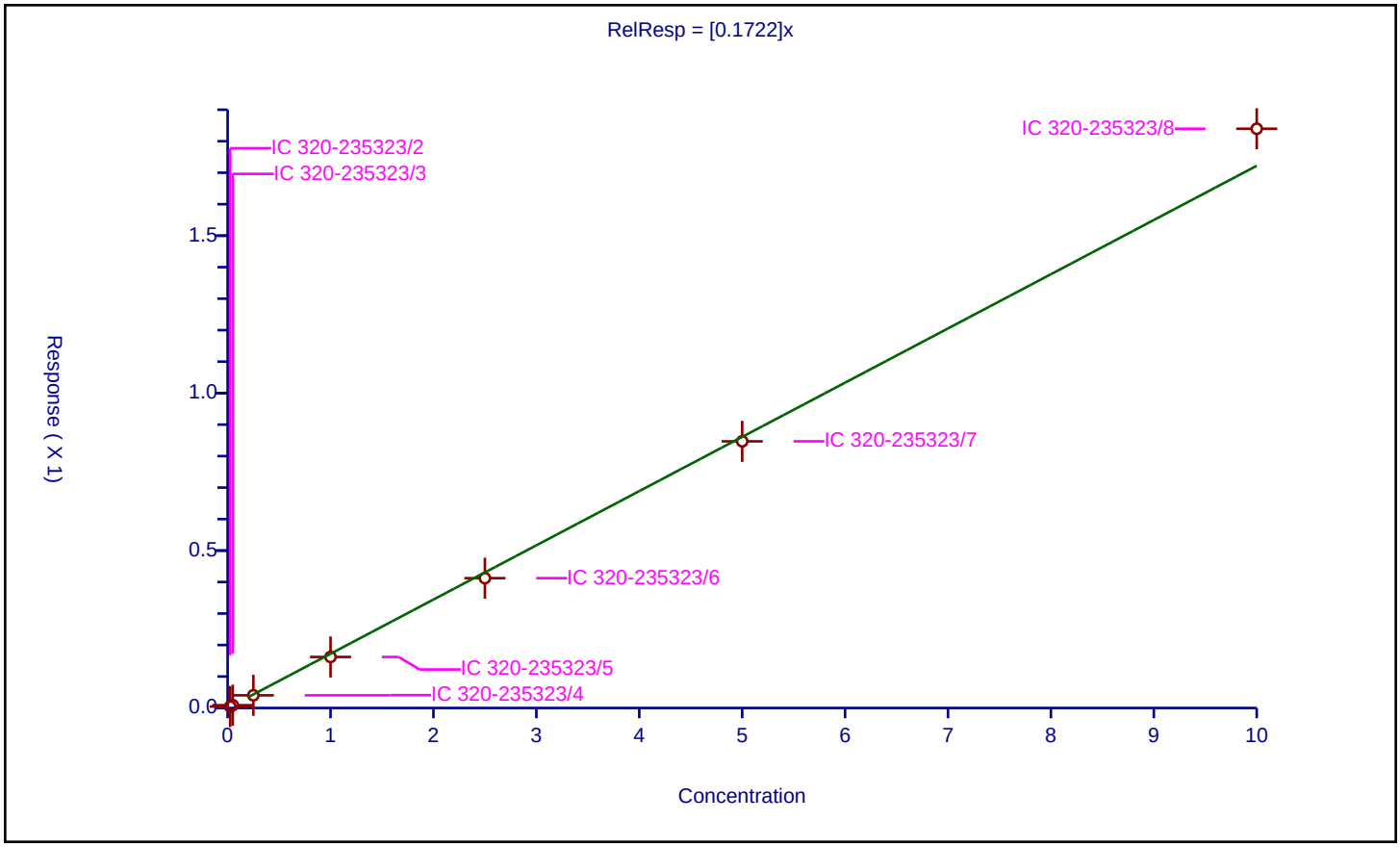
Curve Coefficients

Intercept:	0
Slope:	0.1722

Error Coefficients

Standard Error:	2330000
Relative Standard Error:	6.0
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235323/2	0.025	0.004641	2.5	7521612.0	0.185638	Y
2	IC 320-235323/3	0.05	0.008906	2.5	7360849.0	0.178118	Y
3	IC 320-235323/4	0.25	0.040329	2.5	7095002.0	0.161316	Y
4	IC 320-235323/5	1.0	0.162069	2.5	7135088.0	0.162069	Y
5	IC 320-235323/6	2.5	0.41231	2.5	7416295.0	0.164924	Y
6	IC 320-235323/7	5.0	0.846847	2.5	7080232.0	0.169369	Y
7	IC 320-235323/8	10.0	1.839641	2.5	6794396.0	0.183964	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-235668/10 Calibration Date: 07/23/2018 17:13

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.23LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9357		2.38	2.50	-4.8	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.163		2.43	2.50	-2.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	82.20		2.29	2.21	3.5	30.0
4:2 FTS	AveID	17.09	17.09		2.33	2.34	-0.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.004		2.37	2.50	-5.2	30.0
Perfluoropentanesulfonic acid	AveID	71.24	75.65		2.49	2.35	6.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.062		2.41	2.50	-3.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.094		2.13	2.28	-6.2	30.0
6:2 FTS	AveID	1.687	1.669		2.34	2.37	-1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.151		2.37	2.50	-5.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.340		2.31	2.38	-3.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.042		2.28	2.50	-8.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.060		2.22	2.32	-4.1	30.0
8:2 FTS	AveID	1.356	1.257		2.22	2.40	-7.3	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7493		2.41	2.40	0.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	0.9694		2.36	2.50	-5.7	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.023		2.57	2.50	2.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.036		2.63	2.50	5.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6454		2.35	2.41	-2.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8995		2.41	2.50	-3.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.173		2.36	2.50	-5.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.040		2.40	2.50	-3.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	0.9501		2.26	2.50	-9.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2467		2.46	2.50	-1.6	30.0
13C4 PFBA	Ave	1.159	1.165		2.51	2.50	0.5	30.0
13C5-PFPeA	Ave	0.8093	0.7939		2.45	2.50	-1.9	30.0
13C3-PFBS	Ave	0.0212	0.0201		2.20	2.33	-5.3	30.0
13C2 PFHxA	Ave	0.9490	0.9447		2.49	2.50	-0.5	30.0
13C4-PFHpA	Ave	0.9779	0.9729		2.49	2.50	-0.5	30.0
18O2 PFHxS	Ave	1.256	1.257		2.37	2.37	0.0	30.0
M2-6:2FTS	Ave	0.2731	0.2686		2.34	2.38	-1.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-235668/10 Calibration Date: 07/23/2018 17:13

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.23LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9474		2.48	2.50	-1.0	30.0
13C4 PFOS	Ave	0.8734	0.8764		2.40	2.39	0.3	30.0
13C5 PFNA	Ave	0.8250	0.8143		2.47	2.50	-1.3	30.0
M2-8:2FTS	Ave	0.2848	0.2964		2.49	2.40	4.1	30.0
13C2 PFDA	Ave	0.6565	0.6741		2.57	2.50	2.7	30.0
13C8 FOSA	Ave	1.283	1.241		2.42	2.50	-3.2	30.0
d3-NMeFOSAA	Ave	0.2169	0.2203		2.54	2.50	1.6	30.0
d5-NEtFOSAA	Ave	0.2280	0.2394		2.63	2.50	5.0	30.0
13C2 PFUnA	Ave	0.5287	0.5192		2.46	2.50	-1.8	30.0
13C2 PFDoA	Ave	0.5026	0.5036		2.50	2.50	0.2	30.0
13C2-PFTeDA	Ave	0.4910	0.4703		2.39	2.50	-4.2	30.0
13C2-PFHxDA	Ave	0.7454	0.7291		2.45	2.50	-2.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 23-Jul-2018 17:13:43 ALS Bottle#: 17 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:42:02 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:30:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.541	5310235	2.51		100	80667	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	4969012	2.38			2613	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3618535	2.45		98.1	60889	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	4206698	2.43			2290	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	85192	2.20		94.7	638	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	6656174	2.29			1903	
298.90 > 99.00	1.667	1.672	-0.005	1.000	2724951		2.44(1.25-3.74)		1751	
D 60 M2-4:2FTS										
329.00 > 81.00	1.868	1.877	-0.009	0.724	639924	NC			6615	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.868	1.878	-0.010	1.120	1462273	2.33			64593	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.739	4305938	2.49		99.5	67449	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	4325035	2.37			10794	
313.00 > 119.00	1.907	1.909	-0.002	1.000	402182		10.75(5.03-15.10)		8711	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	6500053	2.49			74329	
349.00 > 99.00	1.928	1.931	-0.003	1.157	2349760		2.77(1.36-4.07)		28528	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.005	2.006	-0.001	1.000	672980	NC			2733	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.777	250648	NC			8516	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.230	-0.011	0.860	4434685	2.49		99.5	92162	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.230	-0.011	1.000	4710583	2.41			6336	
363.00 > 169.00	2.219	2.230	-0.011	1.000	1802407		2.61(1.13-3.40)		16742	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	5706415	2.13			9758	
399.00 > 99.00	2.243	2.243	0.0	1.000	1785556		3.20(1.50-4.49)		4831	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.246	-0.003	0.869	5421355	2.37		100	59735	
65 ADONA										
377.00 > 251.00	2.269	2.272	-0.003	0.771	11918471	NC			93843	
377.00 > 85.00	2.269	2.272	-0.003	0.771	6946675		1.72(0.84-2.53)		34847	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.559	-0.003	0.990	1163099	2.34		98.4	19368	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.559	-0.003	1.000	1936819	2.34			16012	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.585	-0.004	1.000	4318338	2.48		99.0	59731	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.585	-0.004		4558188	2.50			50491	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.586	-0.005	1.000	4976092	2.37			4944	
413.00 > 169.00	2.581	2.586	-0.005	1.000	2555267		1.95(0.84-2.52)		11988	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.591	-0.002	0.880	5096681	2.31			39227	
449.00 > 99.00	2.589	2.591	-0.002	0.880	1370999		3.72(1.94-5.82)		21993	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.949	-0.006	1.140	3818968	2.40		100	35882	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.949	-0.001	1.002	3928441	2.22			25831	
499.00 > 99.00	2.948	2.949	-0.001	1.002	901039		4.36(2.31-6.93)		10821	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.950	-0.007	1.140	3711737	2.47		98.7	61465	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.950	-0.002	1.002	3866317	2.28			9545	
463.00 > 169.00	2.948	2.950	-0.002	1.002	949818		4.07(1.90-5.69)		21333	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.073	6190387	NC			41409	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.296	-0.004	1.276	1294487	2.49		104	26283	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.297	-0.005	1.000	1626949	2.22			79155	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.299	-0.007	1.119	2873640	2.41			45215	
549.00 > 99.00	3.292	3.299	-0.007	1.119	1081670		2.66(1.33-3.97)		18094	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.282	3072706	2.57		103	53545	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	2978682	2.36			12182	
513.00 > 169.00	3.308	3.309	-0.001	1.000	520808		5.72(2.36-7.09)		20886	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.282	5658602	2.42		96.8	68731	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.314	-0.006	1.000	5786785	2.57			35912	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.462	-0.002	1.340	1004225	2.54		102	24450	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.468	-0.008	1.000	1039903	2.63			8383	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.625	-0.001	1.232	2485244	2.35			52207	
599.00 > 99.00	3.624	3.625	-0.001	1.232	858834		2.89(1.39-4.16)		16441	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.635	-0.011	1.404	1091378	2.63		105	3536	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.408	2366775	2.46		98.2	45109	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	2775891	2.36			15113	
563.00 > 169.00	3.634	3.638	-0.004	1.000	465993		5.96(2.12-6.36)		16104	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.639	-0.005	1.003	981670	2.41			17029	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.789	3.800	-0.011	1.287	9575256	NC			58331	
D 36 13C2 PFDoA										
615.00 > 570.00	3.925	3.934	-0.009	1.521	2295591	2.50		100	24113	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.925	3.934	-0.009	1.000	2388363	2.40			782	
613.00 > 169.00	3.925	3.934	-0.009	1.000	584421		4.09(2.13-6.40)		9427	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.198	-0.009	1.067	2181083	2.26			704	
663.00 > 169.00	4.189	4.198	-0.009	1.067	683553		3.19(1.25-3.76)		9170	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.433	-0.009	1.000	528837	2.46			6682	
713.00 > 219.00	4.424	4.433	-0.009	1.000	383227		1.38(0.71-2.13)		5629	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.435	-0.011	1.714	2143869	2.39		95.8	11513	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.841	4.840	0.001	1.876	3323460	2.45		97.8	10477	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.841	4.840	0.001	1.000	3079685	NC			478	
813.00 > 169.00	4.841	4.840	0.001	1.000	500120		6.16(2.86-8.58)		5013	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.184	-0.003	1.070	3299974	NC			683	
913.00 > 169.00	5.181	5.184	-0.003	1.070	411500		8.02(3.83-11.48)		3986	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00012 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:42:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_010.d

Injection Date: 23-Jul-2018 17:13:43 Instrument ID: A8_N

Lims ID: ICV Full

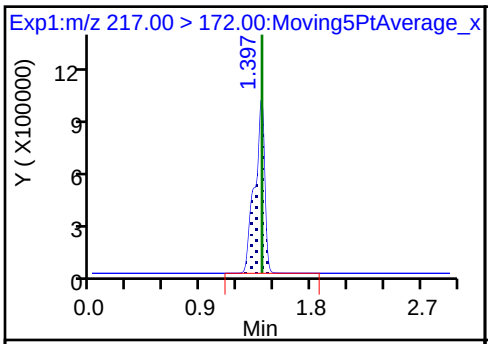
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 17 Worklist Smp#: 10

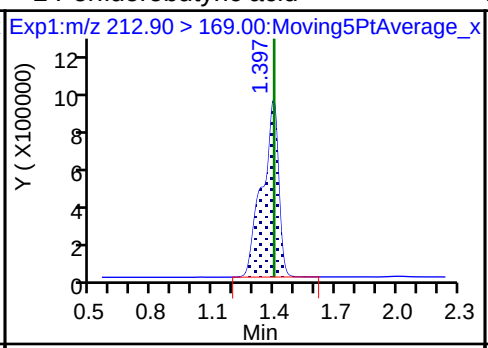
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

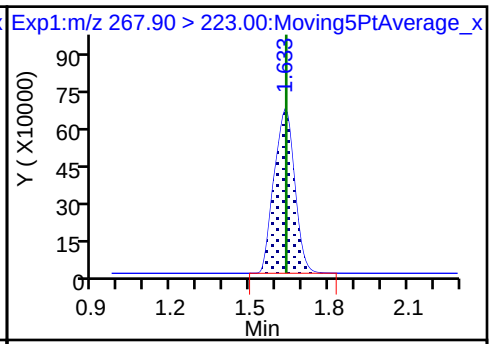
D 1 13C4 PFBA



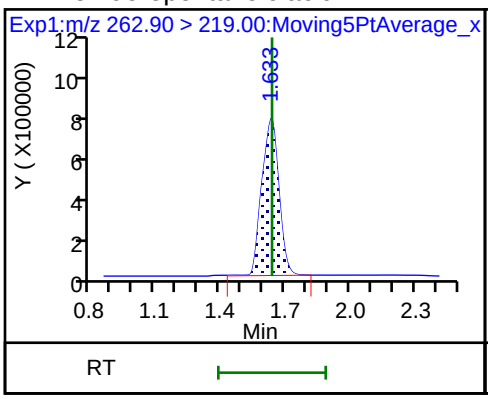
2 Perfluorobutyric acid



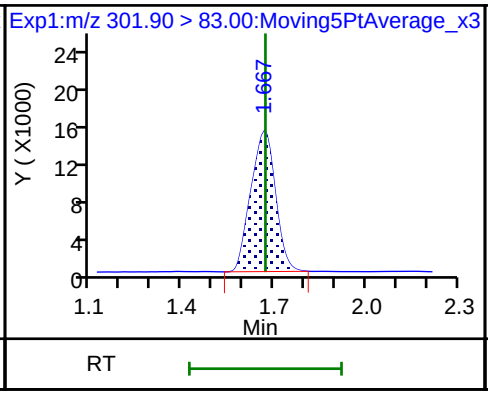
D 3 13C5-PFPeA



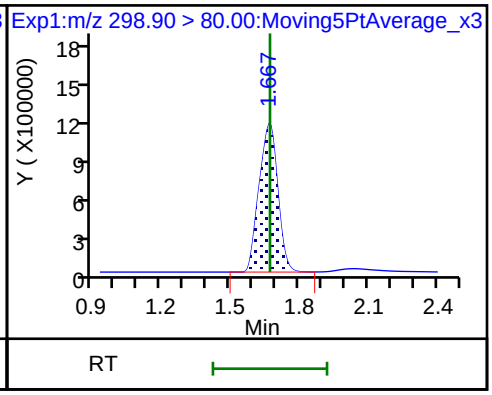
4 Perfluoropentanoic acid



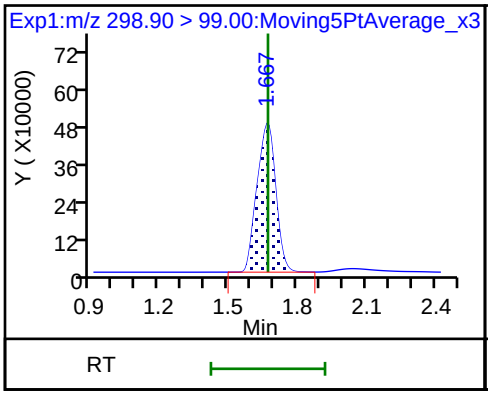
D 47 13C3-PFBS



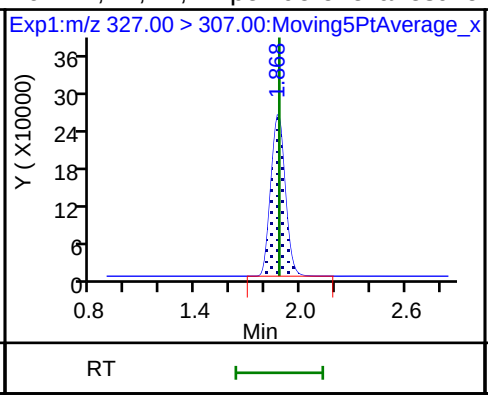
5 Perfluorobutanesulfonic acid



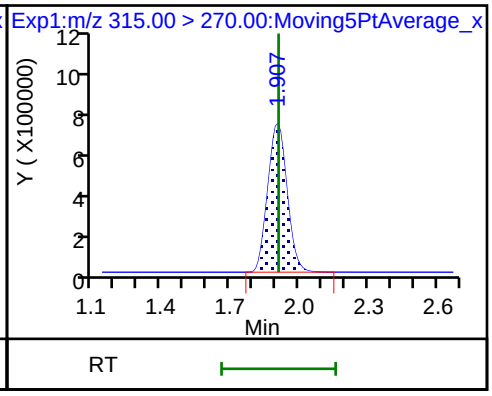
5 Perfluorobutanesulfonic acid



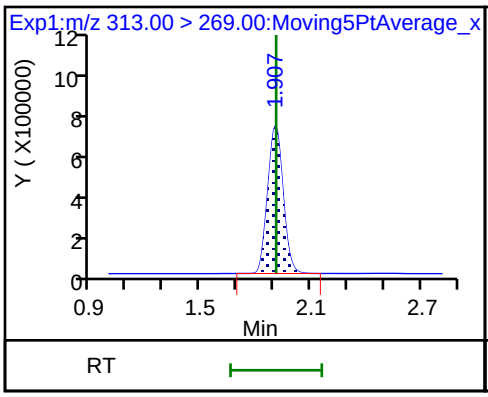
61 1H,1H,2H,2H-perfluorohexanesulfon



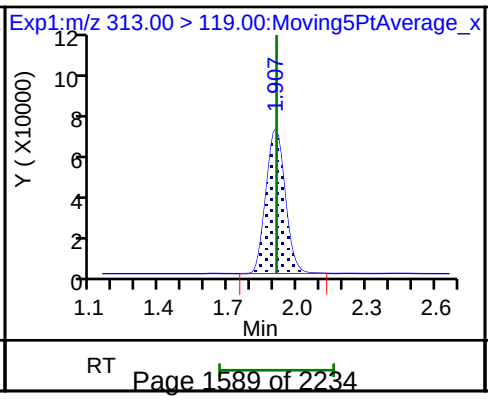
D 7 13C2 PFHxA



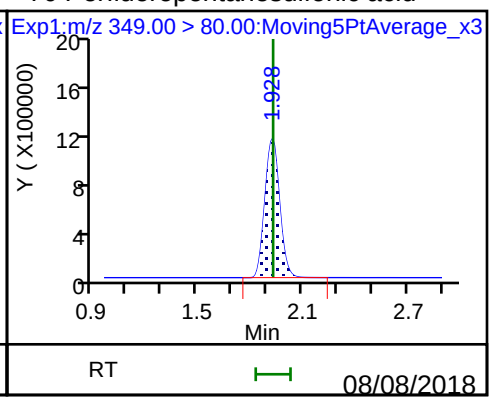
6 Perfluorohexanoic acid



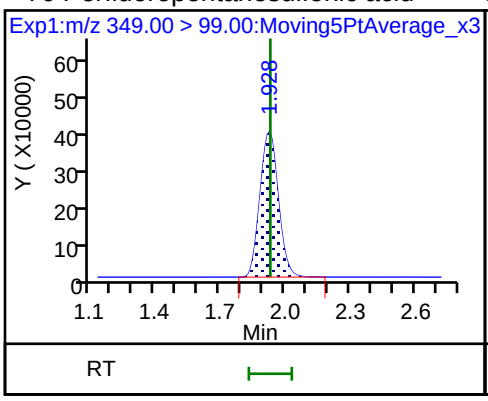
6 Perfluorohexanoic acid



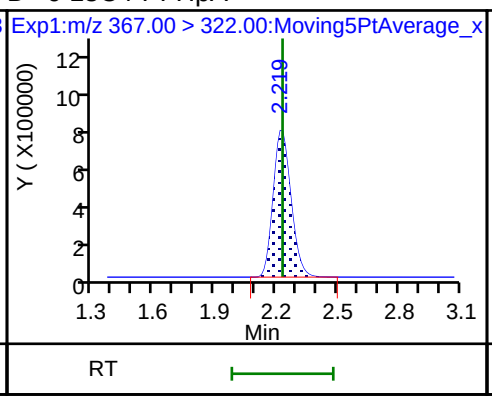
70 Perfluoropentanesulfonic acid



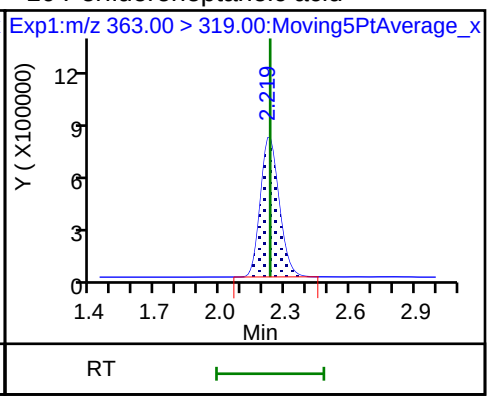
70 Perfluoropentanesulfonic acid



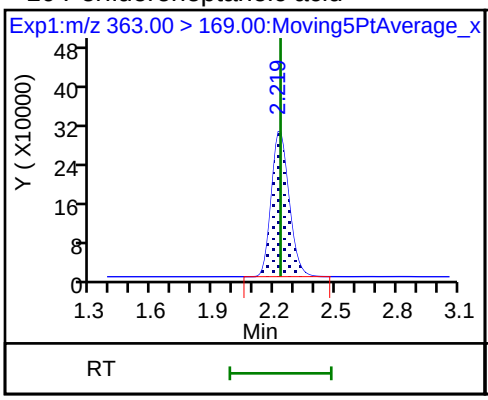
D 9 13C4-PFHpA



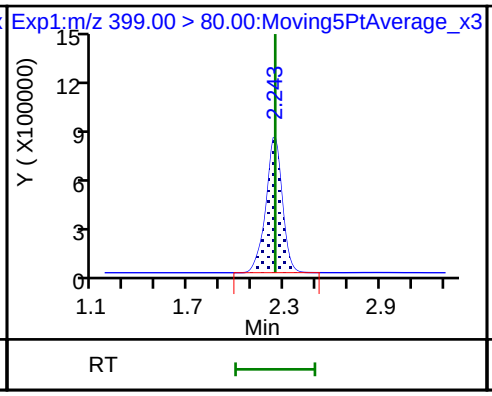
10 Perfluoroheptanoic acid



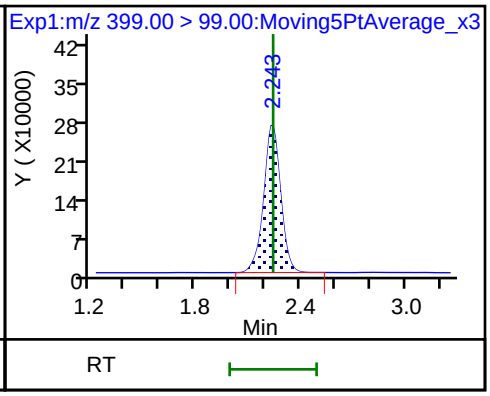
10 Perfluoroheptanoic acid



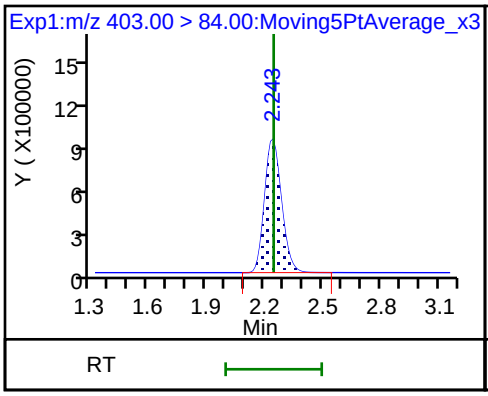
8 Perfluorohexanesulfonic acid



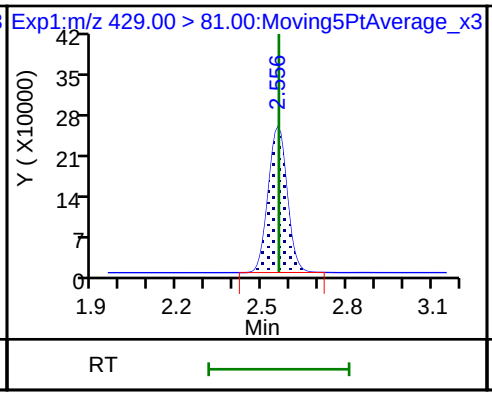
8 Perfluorohexanesulfonic acid



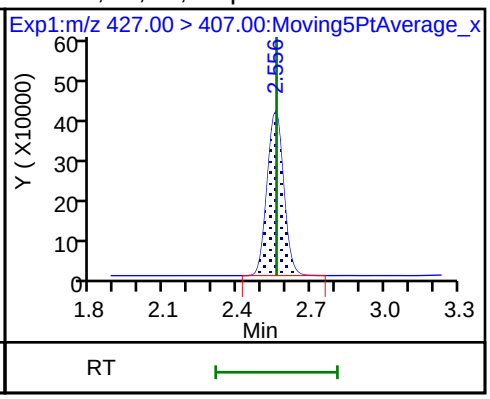
D 11 18O2 PFHxS



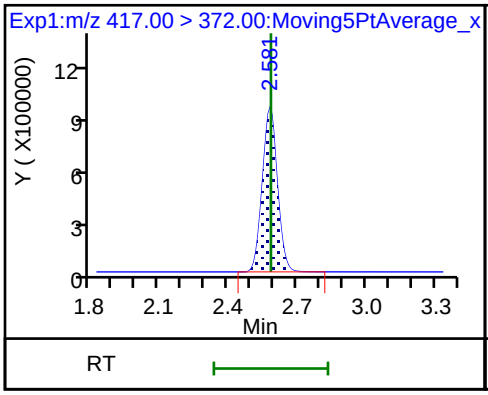
D 12 M2-6:2FTS



13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA



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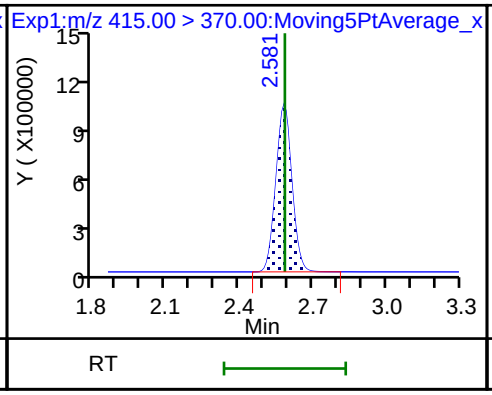
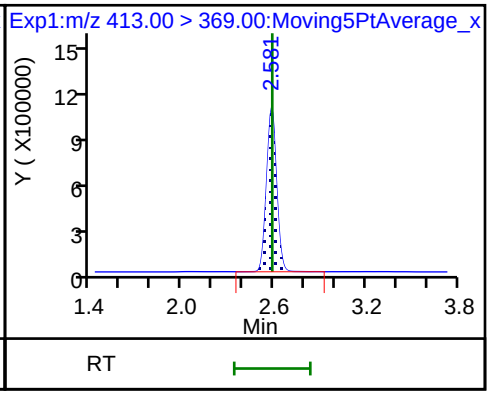
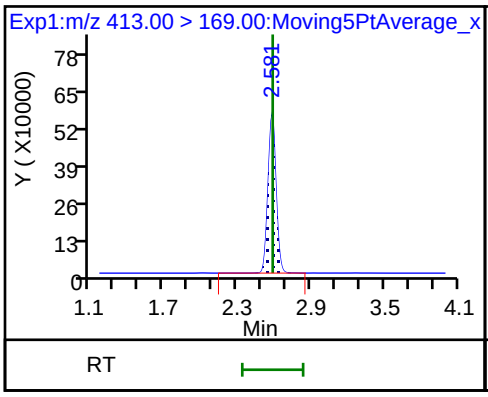


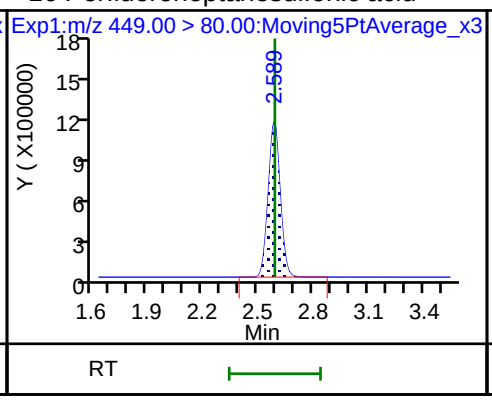
15 Perfluorooctanoic acid



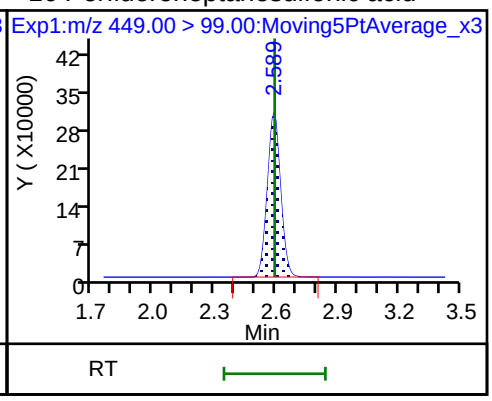
15 Perfluorooctanoic acid



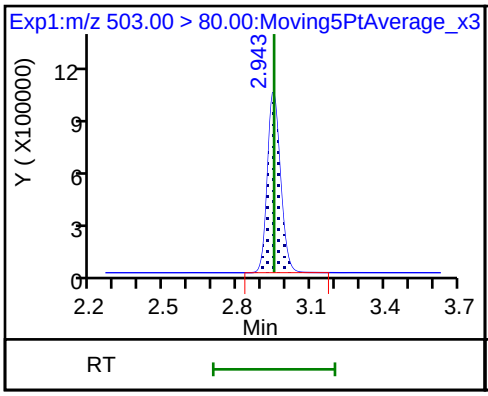
16 Perfluoroheptanesulfonic acid



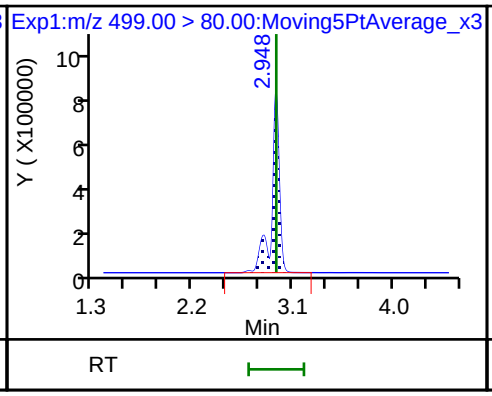
16 Perfluoroheptanesulfonic acid



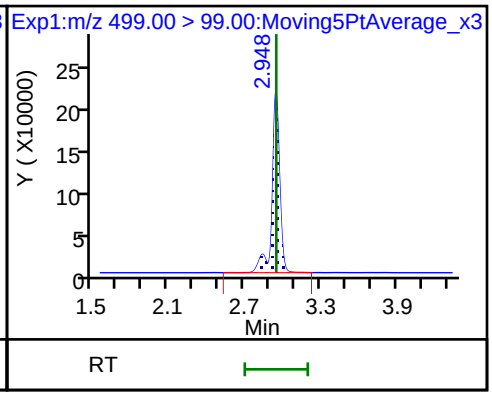
D 18 13C4 PFOS



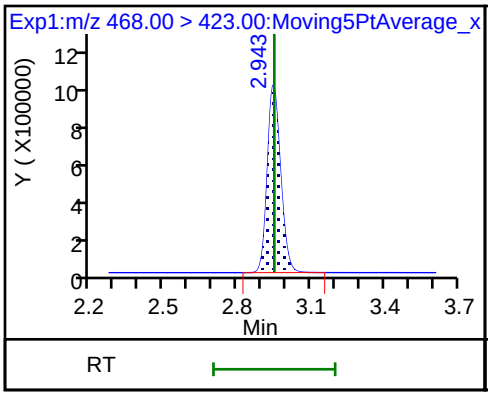
17 Perfluorooctane sulfonic acid



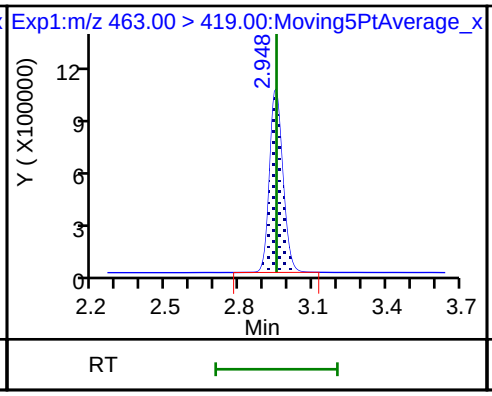
17 Perfluorooctane sulfonic acid



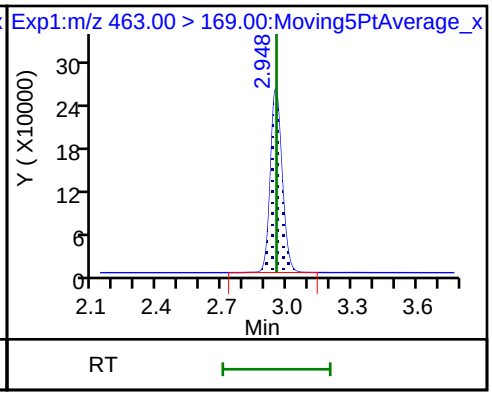
D 19 13C5 PFNA



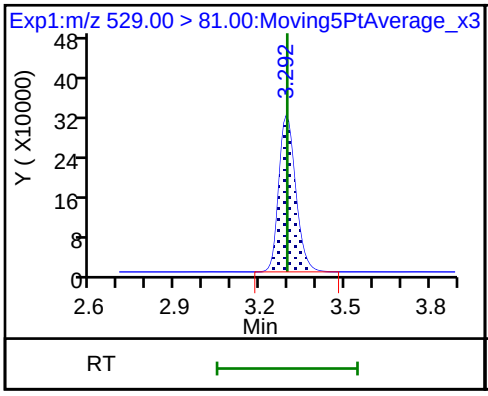
20 Perfluorononanoic acid



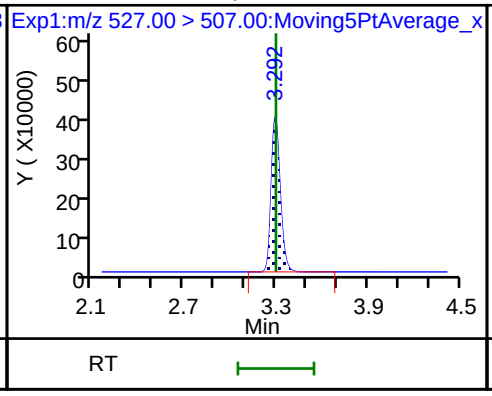
20 Perfluorononanoic acid



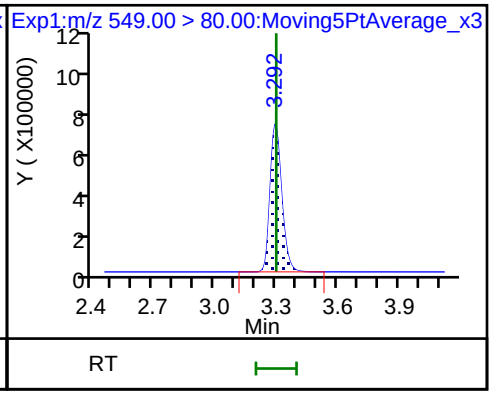
D 26 M2-8:2FTS



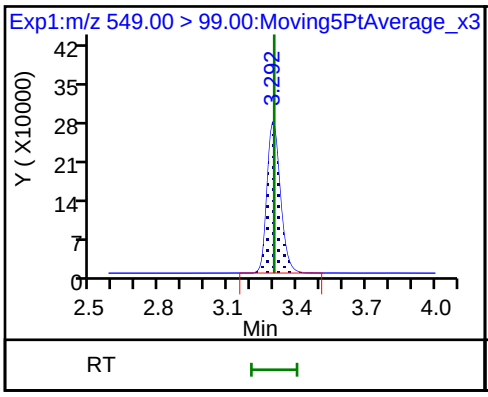
25 1H,1H,2H,2H-perfluorodecanesulfoni



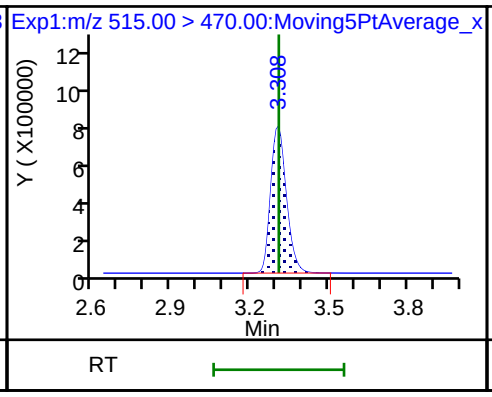
68 Perfluorononanesulfonic acid



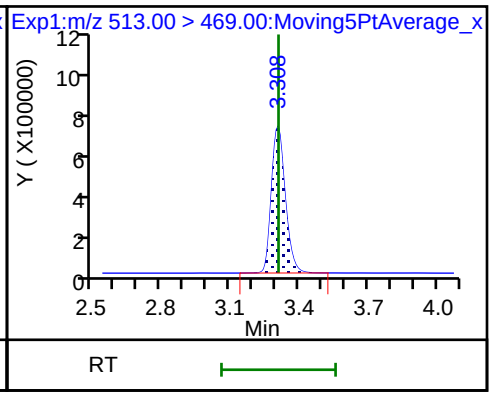
68 Perfluorononanesulfonic acid



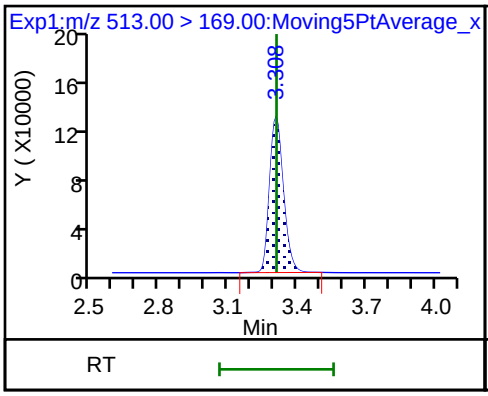
D 23 13C2 PFDA



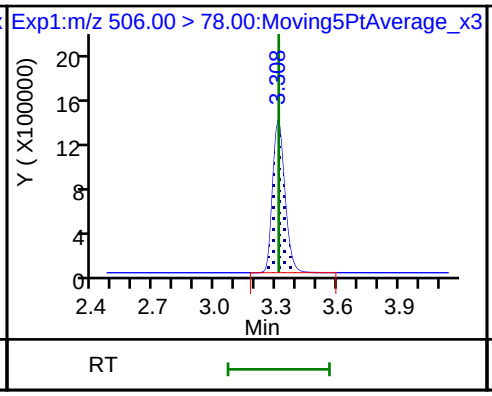
24 Perfluorodecanoic acid



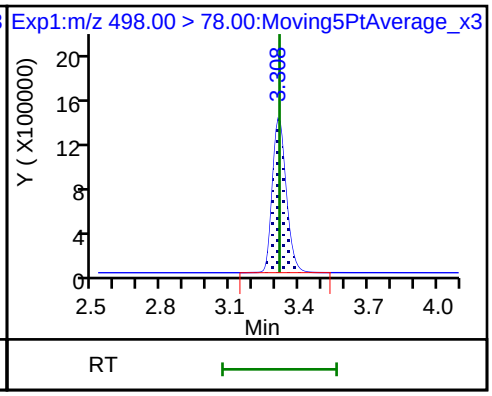
24 Perfluorodecanoic acid



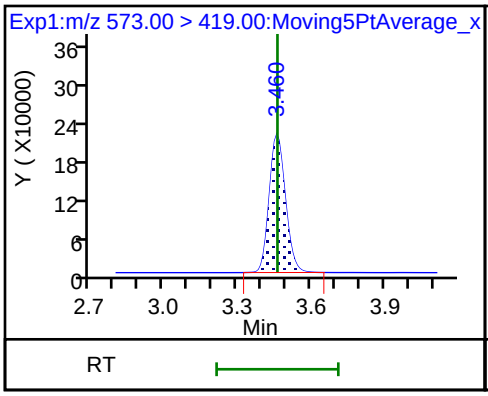
D 21 13C8 FOSA



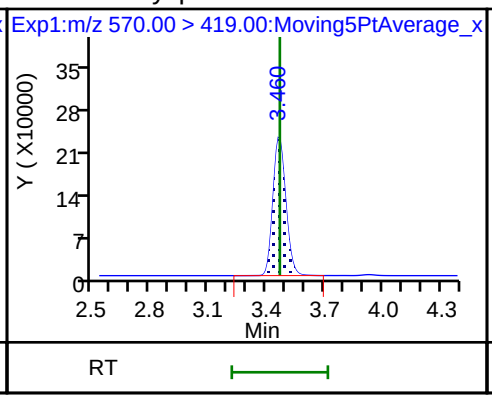
22 Perfluorooctane Sulfonamide



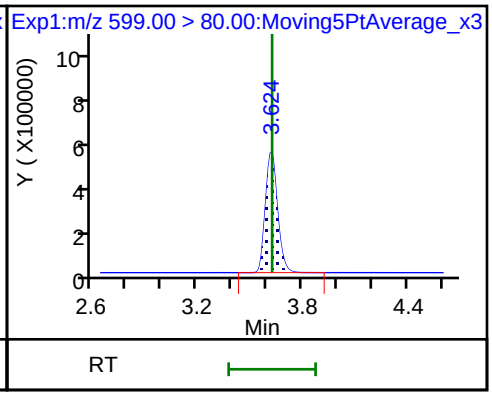
D 27 d3-NMeFOSAA



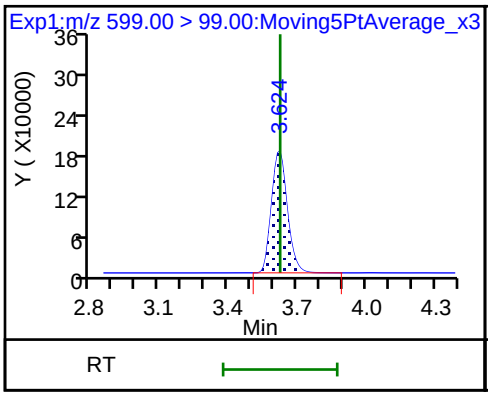
28 N-methyl perfluorooctane sulfonami



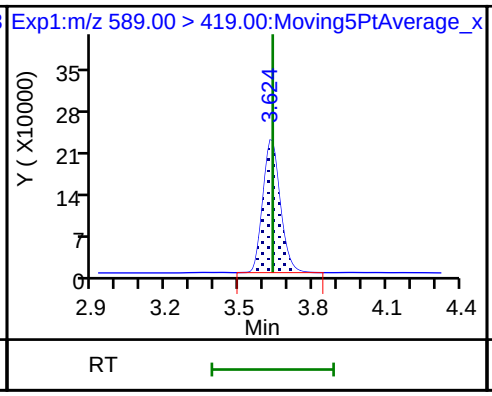
29 Perfluorodecane Sulfonic acid



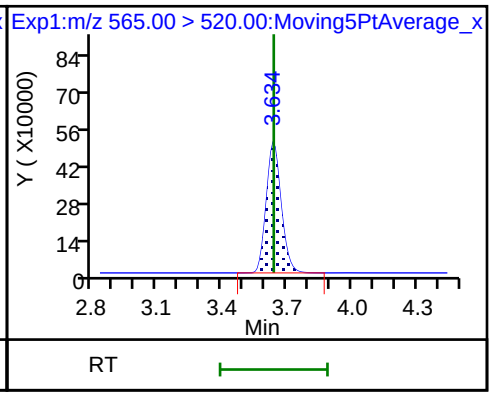
29 Perfluorodecane Sulfonic acid



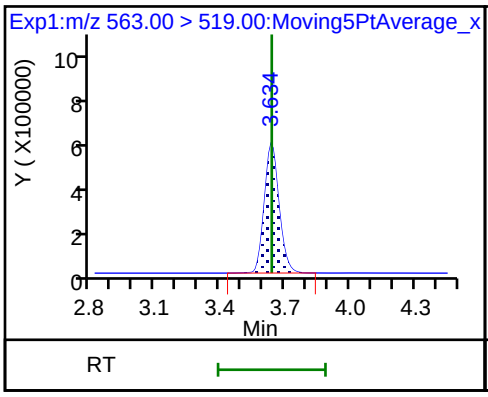
D 32 d5-NEtFOSAA



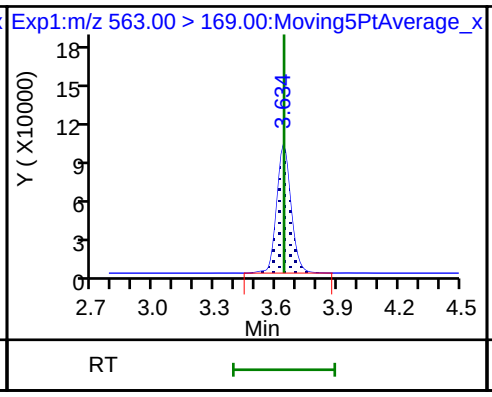
D 30 13C2 PFUnA



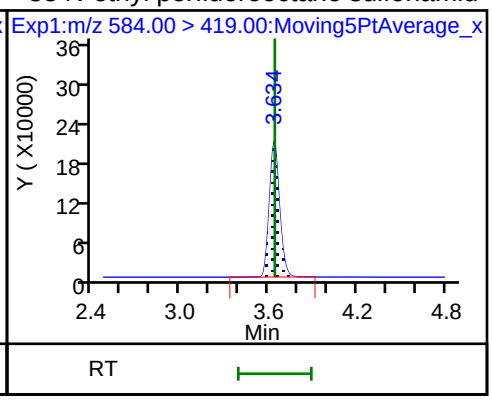
31 Perfluoroundecanoic acid



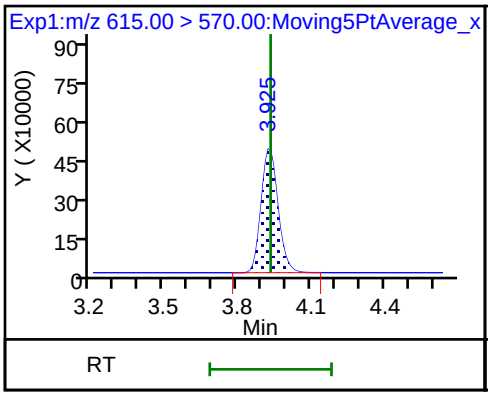
31 Perfluoroundecanoic acid



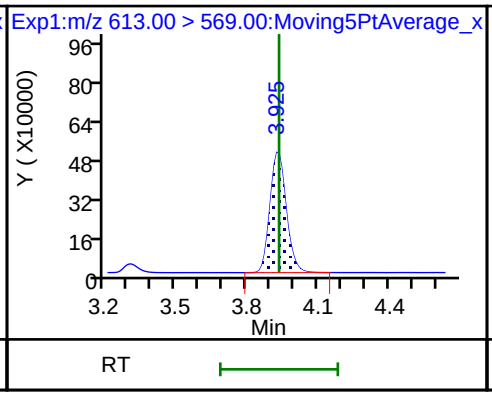
33 N-ethyl perfluorooctane sulfonamid



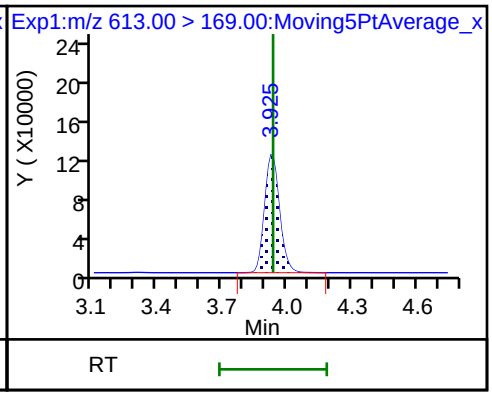
D 36 13C2 PFDoA



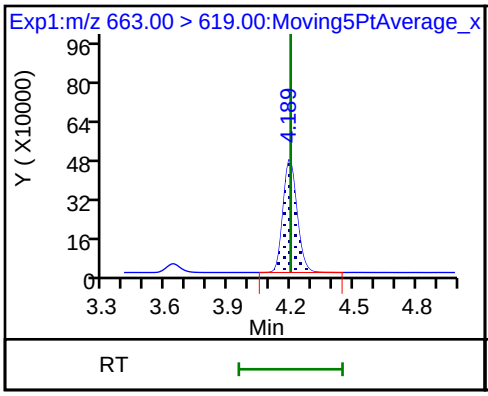
37 Perfluorododecanoic acid



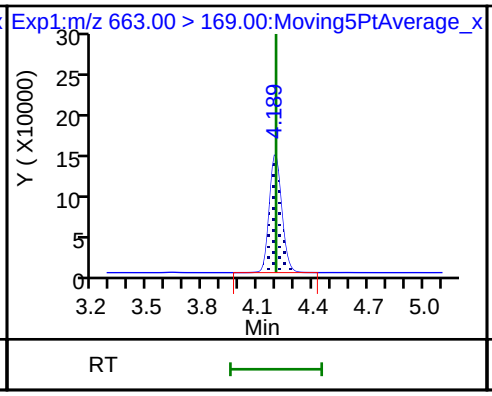
37 Perfluorododecanoic acid



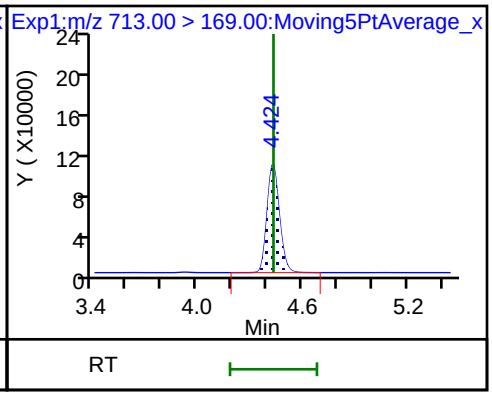
41 Perfluorotridecanoic acid



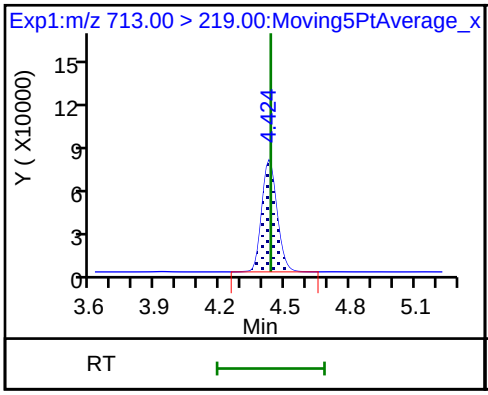
41 Perfluorotridecanoic acid



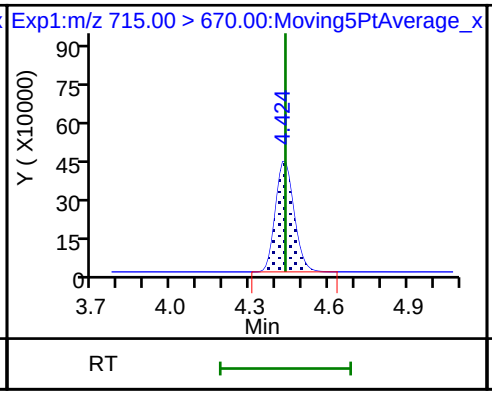
42 Perfluorotetradecanoic acid



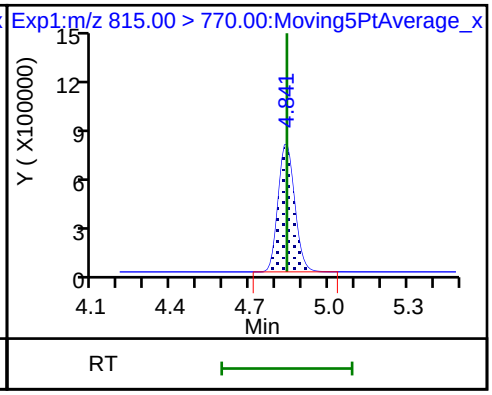
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-236773/2 Calibration Date: 07/28/2018 19:55

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLAA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9878		0.0503	0.0500	0.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.239		0.0518	0.0500	3.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	80.59		0.0449	0.0442	1.5	30.0
4:2 FTS	AveID	17.09	12.82		0.400	0.0467	-25.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.044		0.0492	0.0500	-1.5	30.0
Perfluoropentanesulfonic acid	AveID	71.24	69.26		0.0456	0.0469	-2.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.149		0.0521	0.0500	4.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.144		0.0446	0.0455	-2.0	30.0
6:2 FTS	AveID	1.687	1.753		0.400	0.0474	3.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.296		0.0534	0.0501	6.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.232		0.0424	0.0476	-11.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.108		0.0485	0.0500	-2.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.180		0.0495	0.0464	6.8	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7412		0.0476	0.0480	-0.8	30.0
8:2 FTS	AveID	1.356	1.349		0.400	0.0479	-0.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.045		0.0508	0.0500	1.6	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	0.9518		0.0479	0.0500	-4.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.996		0.400	0.0500	1.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6742		0.0490	0.0482	1.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8701		0.400	0.0500	-6.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.270		0.0512	0.0500	2.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.149		0.0531	0.0500	6.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.119		0.0533	0.0500	6.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2868		0.0572	0.0500	14.4	30.0
13C4 PFBA	Ave	1.159	1.213		2.62	2.50	4.7	30.0
13C5-PFPeA	Ave	0.8093	0.8726		2.70	2.50	7.8	30.0
13C3-PFBS	Ave	0.0212	0.0222		2.43	2.33	4.6	30.0
13C2 PFHxA	Ave	0.9490	0.9518		2.51	2.50	0.3	30.0
13C4-PFHpA	Ave	0.9779	0.9514		2.43	2.50	-2.7	30.0
18O2 PFHxS	Ave	1.256	1.284		2.42	2.37	2.2	30.0
M2-6:2FTS	Ave	0.2731	0.1947		1.69	2.38	-28.7	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-236773/2 Calibration Date: 07/28/2018 19:55

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLAA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9446		2.47	2.50	-1.3	30.0
13C4 PFOS	Ave	0.8734	0.9129		2.50	2.39	4.5	30.0
13C5 PFNA	Ave	0.8250	0.8430		2.55	2.50	2.2	30.0
M2-8:2FTS	Ave	0.2848	0.2873		2.42	2.40	0.9	30.0
13C2 PFDA	Ave	0.6565	0.7091		2.70	2.50	8.0	30.0
13C8 FOSA	Ave	1.283	1.347		2.62	2.50	5.0	30.0
d3-NMeFOSAA	Ave	0.2169	0.2366		2.73	2.50	9.1	30.0
13C2 PFUnA	Ave	0.5287	0.5929		2.80	2.50	12.1	30.0
d5-NEtFOSAA	Ave	0.2280	0.2554		2.80	2.50	12.0	30.0
13C2 PFDoA	Ave	0.5026	0.5293		2.63	2.50	5.3	30.0
13C2-PFTeDA	Ave	0.4910	0.5326		2.71	2.50	8.5	30.0
13C2-PFHxDA	Ave	0.7454	0.8082		2.71	2.50	8.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 28-Jul-2018 19:55:31 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:04:27 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:04:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.391	1.394	-0.003	1.000	99723	0.0503		101	36.5	M
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.396	-0.005	0.539	5047723	2.62		105	94088	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.632	0.001	0.633	3630138	2.70		108	48794	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.641	1.637	0.004	1.005	89979	0.0518		104	35.4	M
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.665	0.001	0.646	85930	2.43		105	739	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.671	-0.005	1.000	131654	0.0449		102	390	
298.90 > 99.00	1.666	1.671	-0.005	1.000	54085		2.43(1.25-3.74)		243	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.866	0.010	0.727	428727	NC			5526	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.872	0.004	1.126	22128	0.0350		75.0	1344	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.902	0.003	1.000	82670	0.0492		98.5	251	
313.00 > 119.00	1.905	1.902	0.003	1.000	8362		9.89(5.03-15.10)		198	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.905	0.0	0.738	3959502	2.51		100	87118	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.924	0.003	1.157	120053	0.0456		97.2	3474	
349.00 > 99.00	1.927	1.924	0.003	1.157	45435		2.64(1.36-4.07)		361	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.991	1.999	-0.008	0.994	20258	NC			86.1	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.002	0.001	0.776	326094	NC			11056	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.225	0.004	1.000	90928	0.0521		104	191	
363.00 > 169.00	2.218	2.225	-0.007	0.995	39087		2.33(1.13-3.40)		473	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.864	3957982	2.43		97.3	66789	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.237	0.004	1.000	111213	0.0446		98.0	1343	
399.00 > 99.00	2.241	2.237	0.004	1.000	42992		2.59(1.50-4.49)		126	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.868	5054247	2.42		102	56265	
65 ADONA										
377.00 > 251.00	2.267	2.263	0.004	0.769	236139	NC			4356	
377.00 > 85.00	2.267	2.263	0.004	0.769	133519		1.77(0.84-2.53)		529	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.554	0.001	1.000	26929	0.0493		104	313	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.564	-0.009	0.990	769612	1.69		71.3	11024	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.579	0.001		4160224	2.50			44117	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.579	0.001	1.000	101939	0.0534		107	105	
413.00 > 169.00	2.580	2.579	0.001	1.000	52111		1.96(0.84-2.52)		279	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.587	0.001	0.878	89057	0.0424		89.0	2263	
449.00 > 99.00	2.588	2.587	0.001	0.878	24814		3.59(1.94-5.82)		251	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3929697	2.47		98.7	48357	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.945	0.003	1.000	83177	0.0495		107	1442	
499.00 > 99.00	2.948	2.945	0.003	1.000	22239		3.74(2.31-6.93)		136	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.945	0.003	1.000	77747	0.0485		97.1	256	
463.00 > 169.00	2.948	2.945	0.003	1.000	19731		3.94(1.90-5.69)		628	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.948	0.0	1.142	3506970	2.55		102	62723	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.948	0.0	1.142	3630930	2.50		105	30064	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.070	124689	NC			1431	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.295	0.004	1.002	30894	0.0477		99.5	994	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.291	3.295	-0.004	1.116	54048	0.0476		99.2	3432	
549.00 > 99.00	3.291	3.295	-0.004	1.116	23064		2.34(1.33-3.97)		264	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.299	-0.008	1.276	1144957	2.42		101	18670	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.302	0.005	1.000	61676	0.0508		102	414	
513.00 > 169.00	3.307	3.302	0.005	1.000	11749		5.25(2.36-7.09)		467	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.307	0.0	1.282	2949843	2.70		108	45305	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.310	0.005	1.000	106666	0.0479		95.7	3148	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.314	0.001	1.285	5603440	2.62		105	32954	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.458	3.463	-0.005	1.000	19597	0.0505		101	232	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.467	-0.009	1.340	984241	2.73		109	26718	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.618	0.003	1.228	49368	0.0490		102	2606	
599.00 > 99.00	3.621	3.618	0.003	1.228	15534		3.18(1.39-4.16)		234	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.630	3.627	0.003	1.000	62634	0.0512		102	311	
563.00 > 169.00	3.640	3.627	0.013	1.003	12231		5.12(2.12-6.36)		444	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.630	3.627	0.003	1.000	18491	0.0466		93.3	276	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.630	3.630	0.0	1.407	1062604	2.80		112	3334	
D 30 13C2 PFUnA										
565.00 > 520.00	3.630	3.640	-0.010	1.407	2466560	2.80		112	39987	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.792	0.003	1.287	192846	NC			6730	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.928	0.003	1.000	50586	0.0531		106	14.5	
613.00 > 169.00	3.931	3.928	0.003	1.000	13464		3.76(2.13-6.40)		259	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.930	0.001	1.523	2201853	2.63		105	21181	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.192	0.001	1.067	49278	0.0533		107	16.5	
663.00 > 169.00	4.193	4.192	0.001	1.067	16335		3.02(1.25-3.76)		193	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.425	0.001	1.000	12712	0.0572		114	217	
713.00 > 219.00	4.416	4.425	-0.009	0.998	8295		1.53(0.71-2.13)		170	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.437	-0.011	1.715	2215861	2.71		108	18361	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.832	0.001	1.000	92545	NC			14.7	
813.00 > 169.00	4.833	4.832	0.001	1.000	17051		5.43(2.86-8.58)		203	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.833	0.0	1.873	3362137	2.71		108	12832	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.173	0.0	1.070	73878	NC			13.2	
913.00 > 169.00	5.166	5.173	-0.007	1.069	9302		7.94(3.83-11.48)		168	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 15:04:31 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_005.d

Injection Date: 28-Jul-2018 19:55:31 Instrument ID: A8_N

Lims ID: CCVL

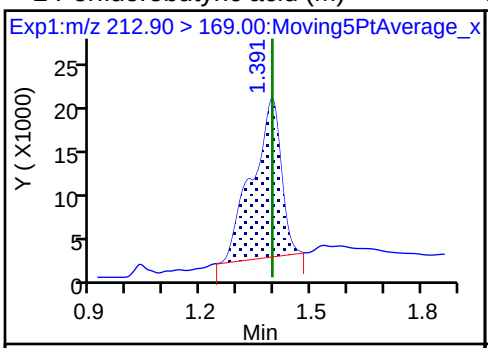
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2

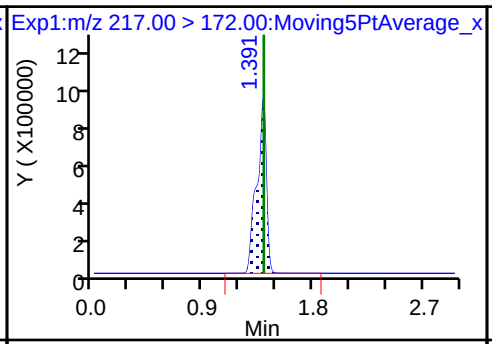
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

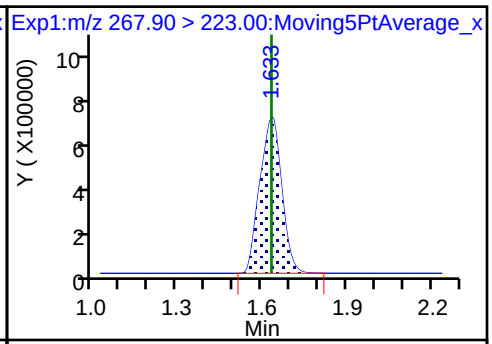
2 Perfluorobutyric acid (M)



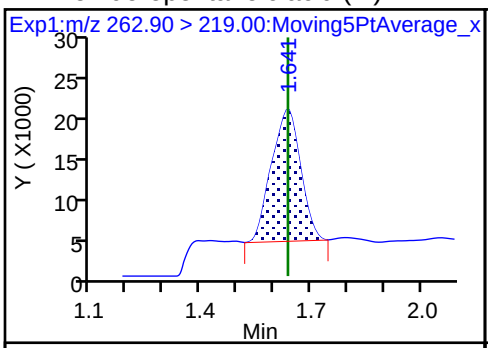
D 1 13C4 PFBA



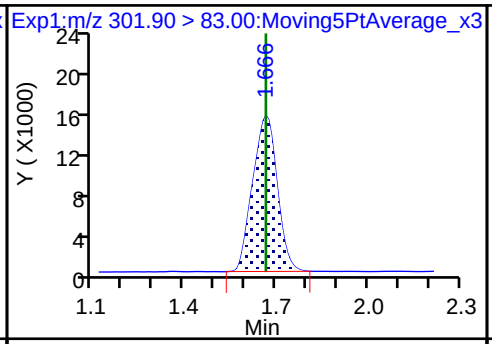
D 3 13C5-PFPeA



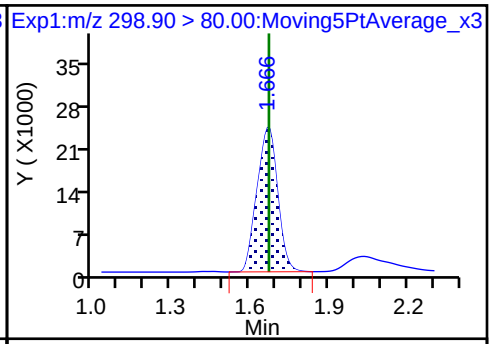
4 Perfluoropentanoic acid (M)



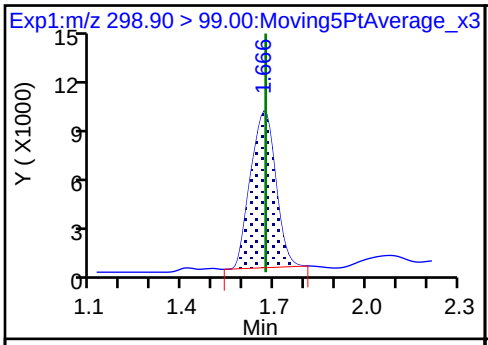
D 47 13C3-PFBS



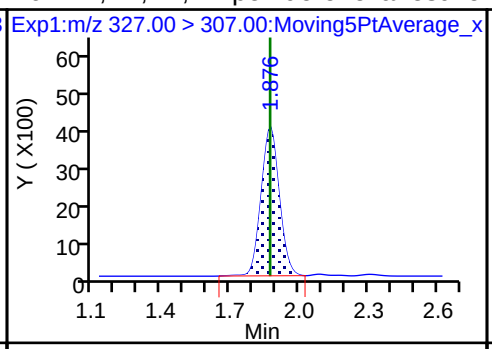
5 Perfluorobutanesulfonic acid



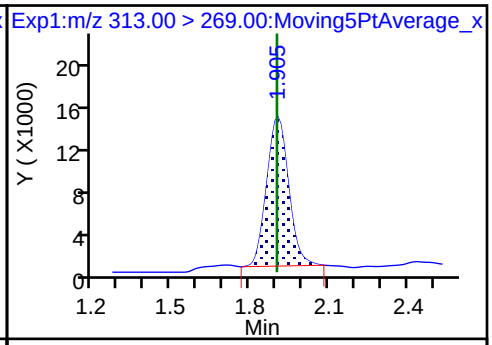
5 Perfluorobutanesulfonic acid



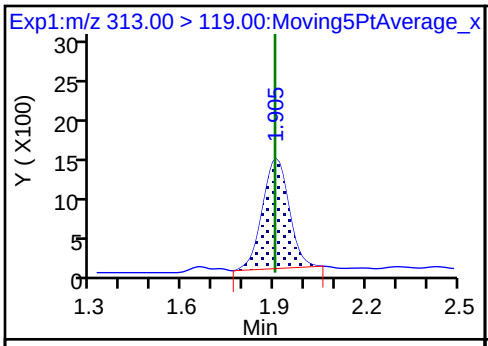
61 1H,1H,2H,2H-perfluorohexanesulfoni



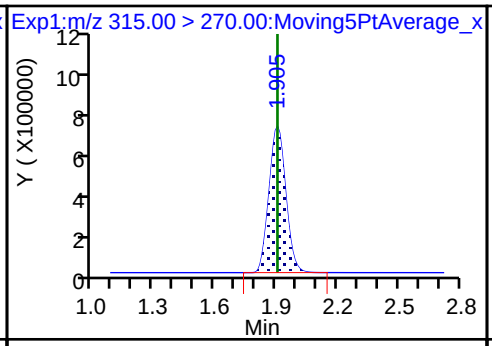
6 Perfluorohexanoic acid



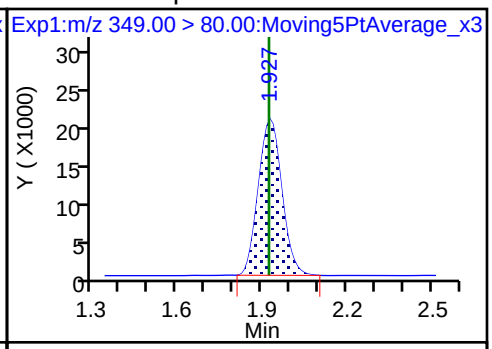
6 Perfluorohexanoic acid



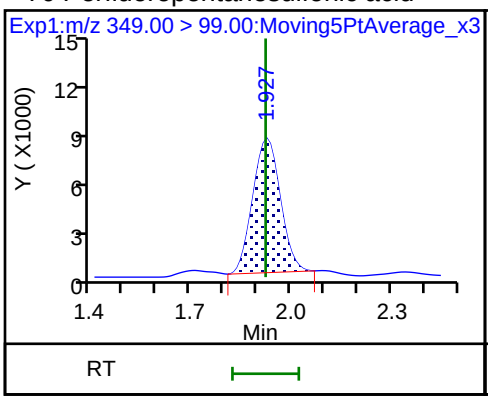
D 7 13C2 PFHxA



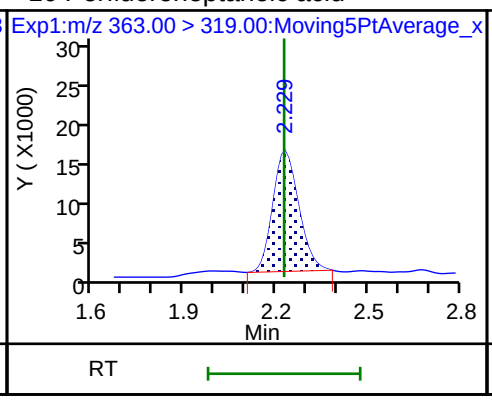
70 Perfluoropentanesulfonic acid



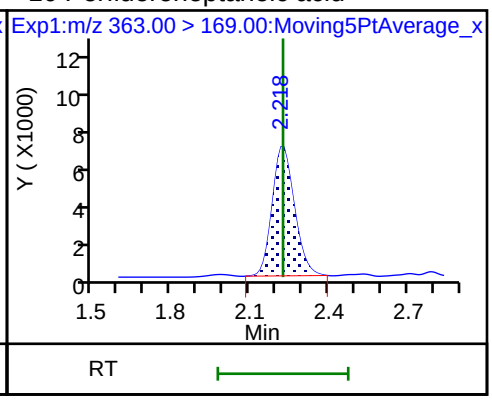
70 Perfluoropentanesulfonic acid



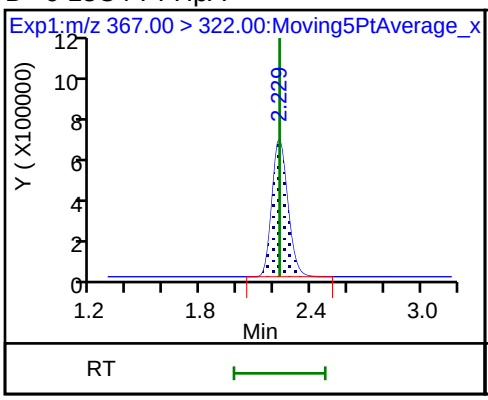
10 Perfluoroheptanoic acid



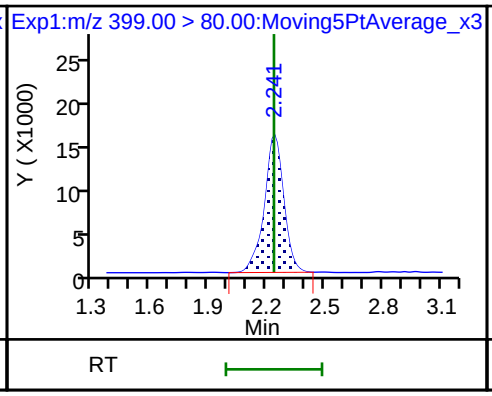
10 Perfluoroheptanoic acid



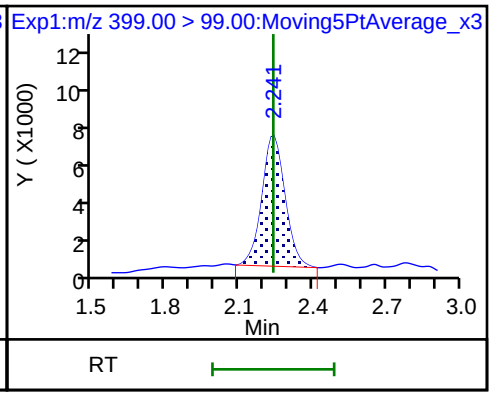
D 9 13C4-PFHpA



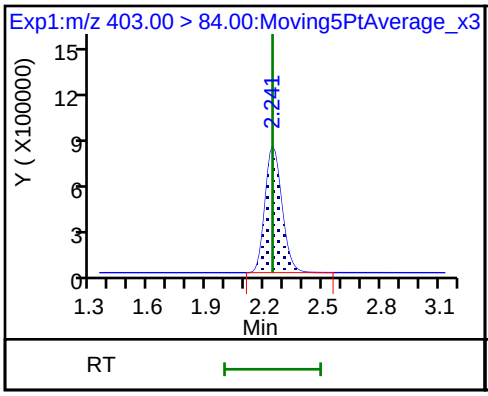
8 Perfluorohexanesulfonic acid



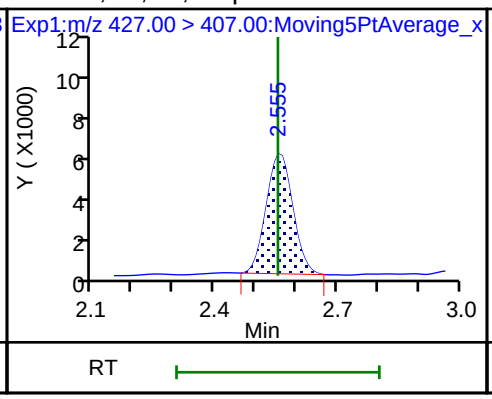
8 Perfluorohexanesulfonic acid



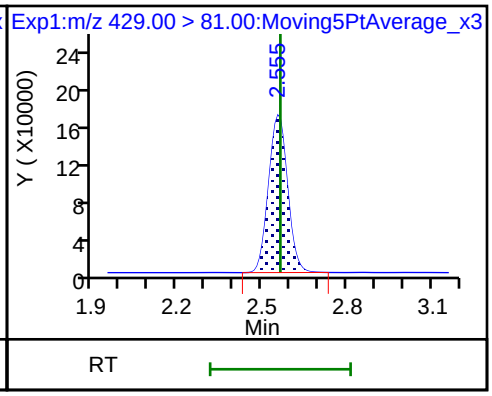
D 11 18O2 PFHxS



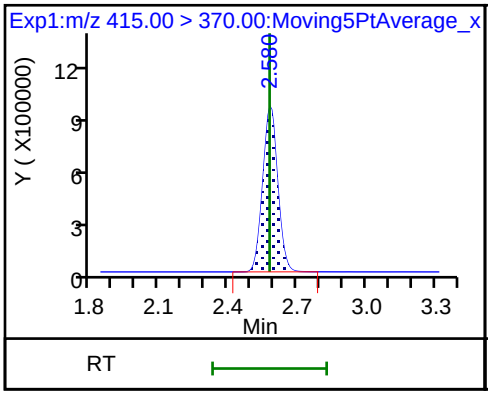
13 1H,1H,2H,2H-perfluorooctanesulfon



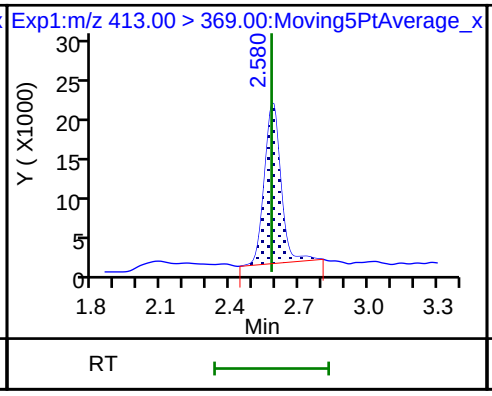
D 12 M2-6:2FTS



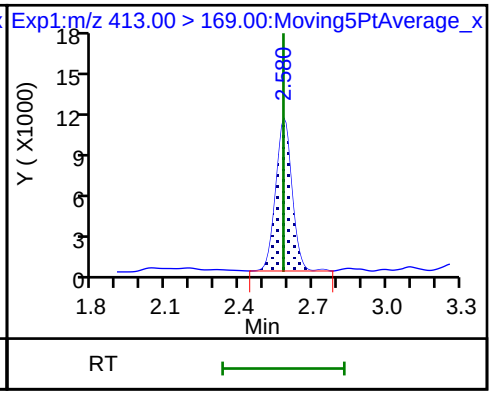
* 62 13C2-PFOA



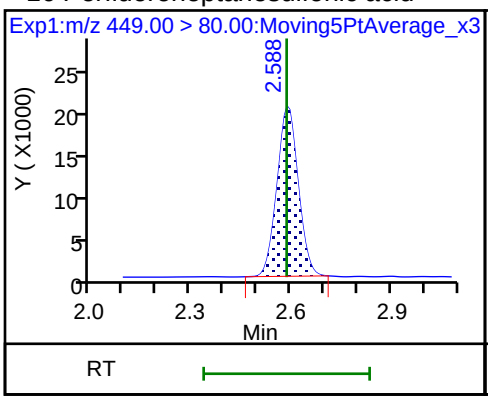
15 Perfluorooctanoic acid



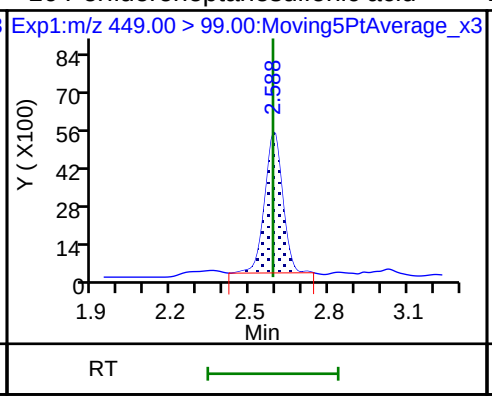
15 Perfluorooctanoic acid



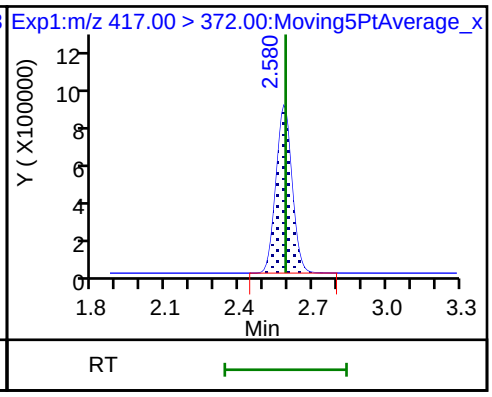
16 Perfluoroheptanesulfonic acid



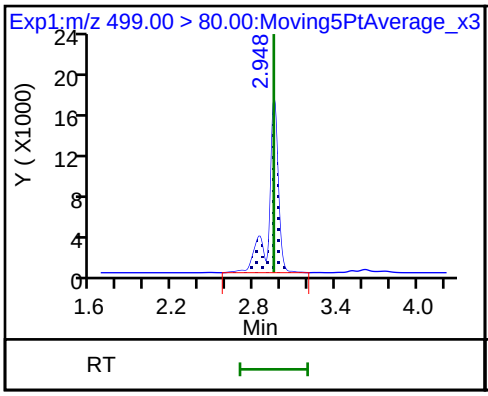
16 Perfluoroheptanesulfonic acid



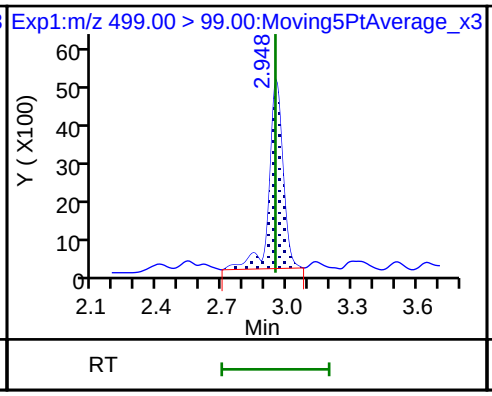
D 14 13C4 PFOA



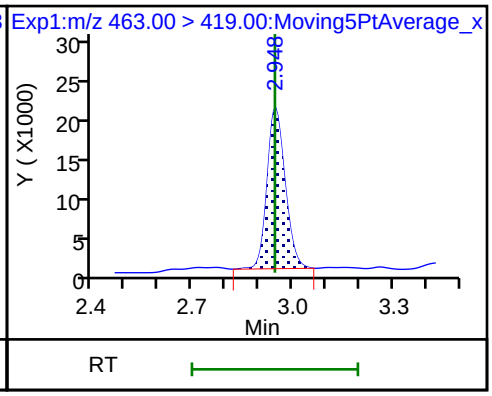
17 Perfluorooctane sulfonic acid



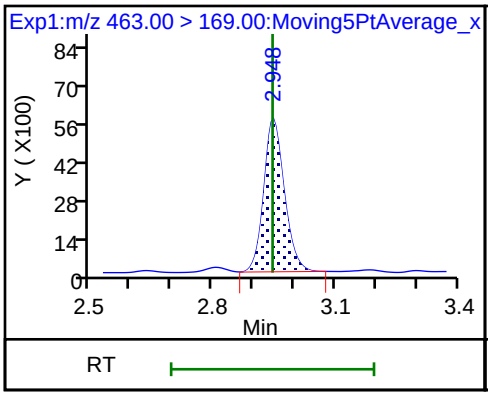
17 Perfluorooctane sulfonic acid



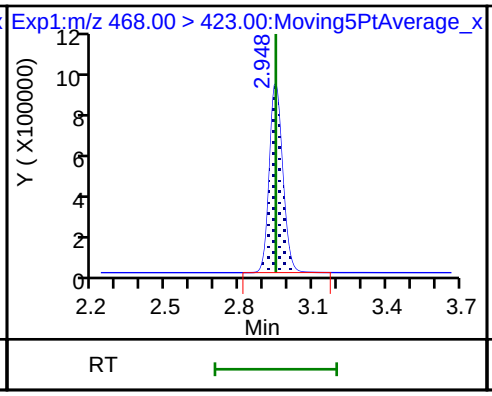
20 Perfluorononanoic acid



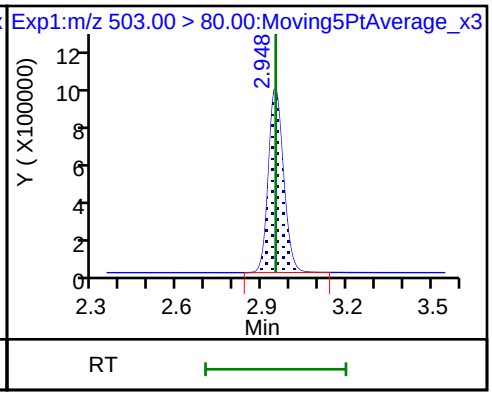
20 Perfluorononanoic acid



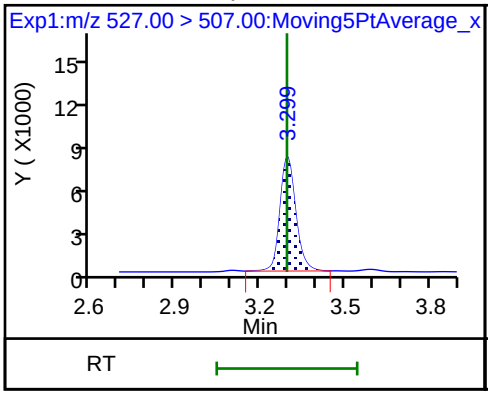
D 19 13C5 PFNA



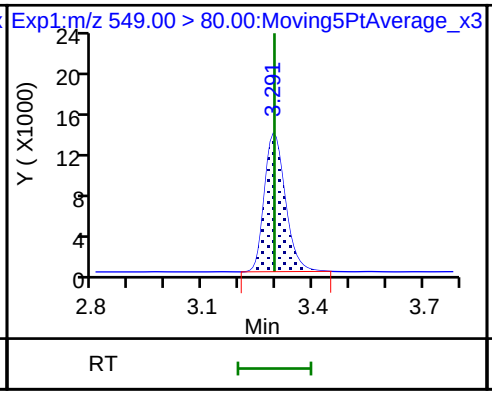
D 18 13C4 PFOS



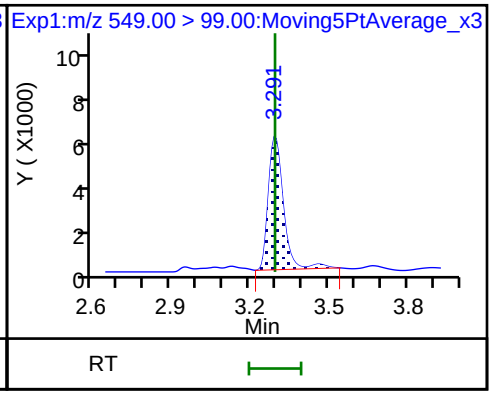
25 1H,1H,2H,2H-perfluorodecanesulfoni



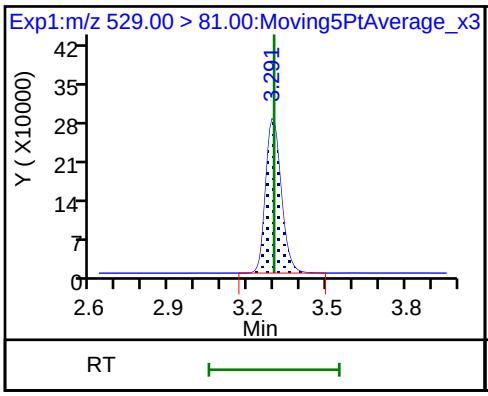
68 Perfluorononanesulfonic acid



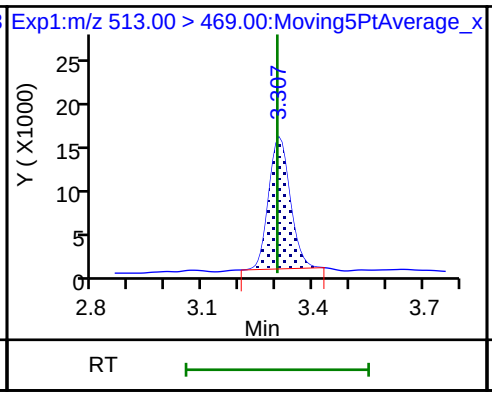
68 Perfluorononanesulfonic acid



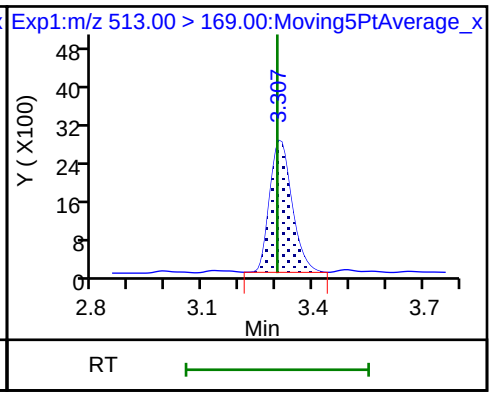
D 26 M2-8:2FTS



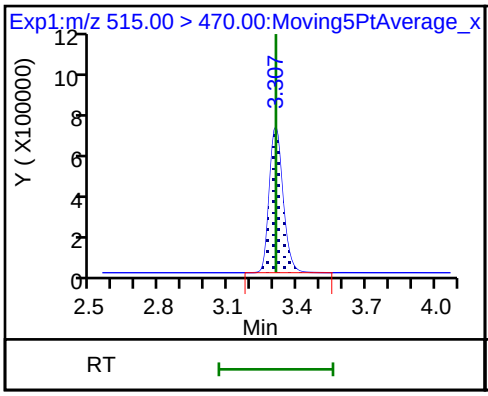
24 Perfluorodecanoic acid



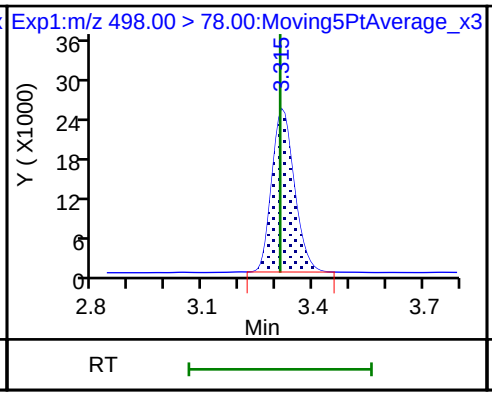
24 Perfluorodecanoic acid



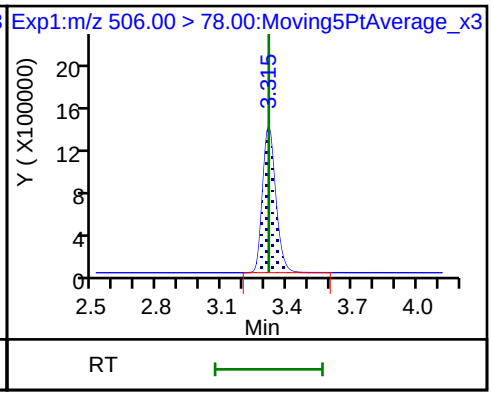
D 23 13C2 PFDA



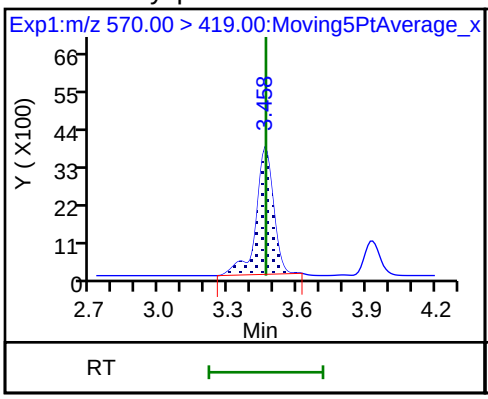
22 Perfluorooctane Sulfonamide



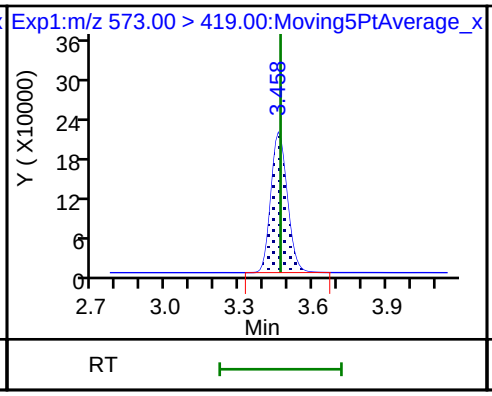
D 21 13C8 FOSA



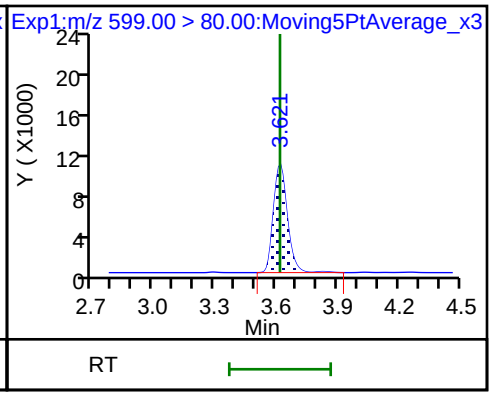
28 N-methyl perfluorooctane sulfonami



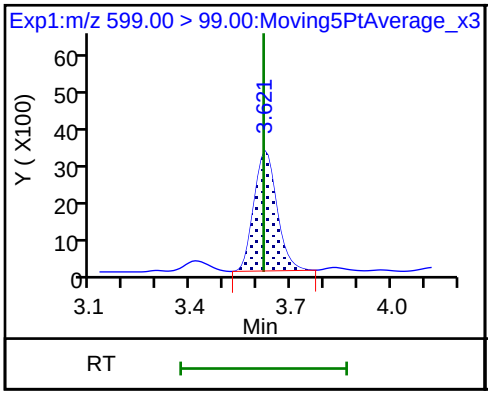
D 27 d3-NMeFOSAA



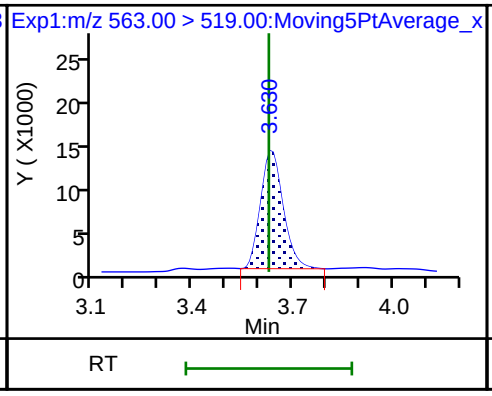
29 Perfluorodecane Sulfonic acid



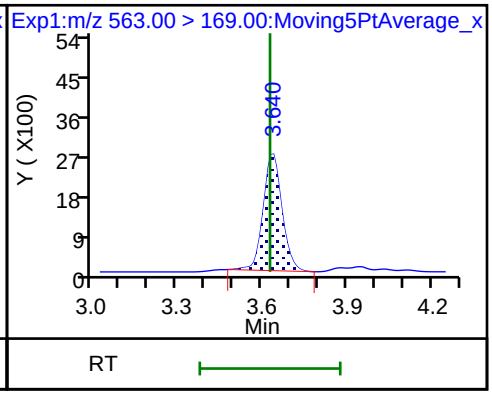
29 Perfluorodecane Sulfonic acid



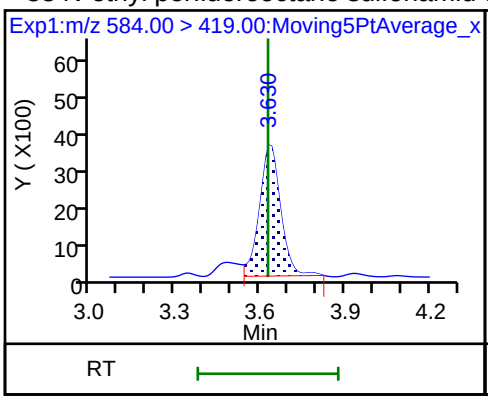
31 Perfluoroundecanoic acid



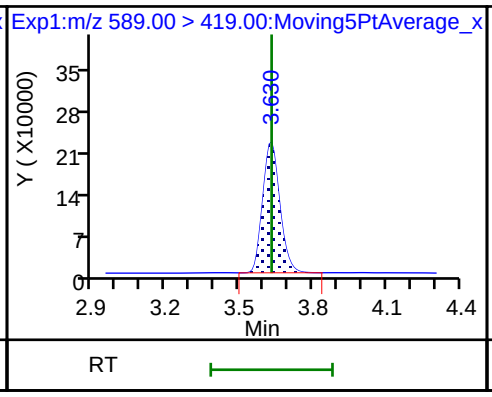
31 Perfluoroundecanoic acid



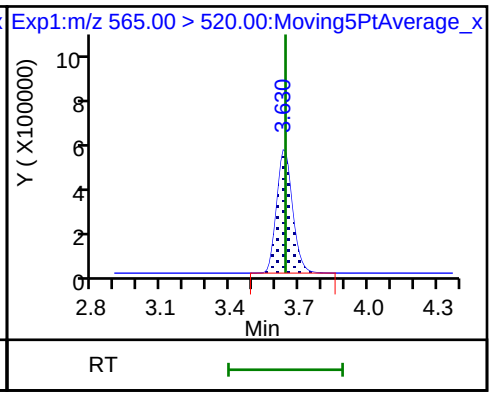
33 N-ethyl perfluorooctane sulfonamid



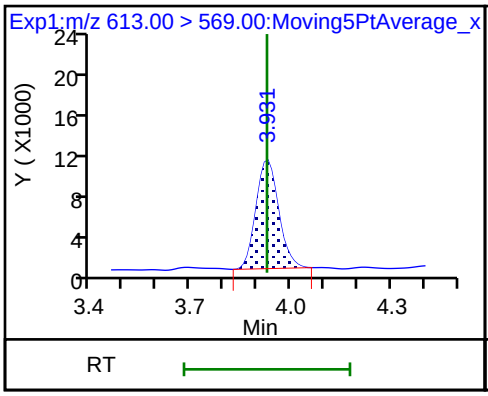
D 32 d5-NEtFOSAA



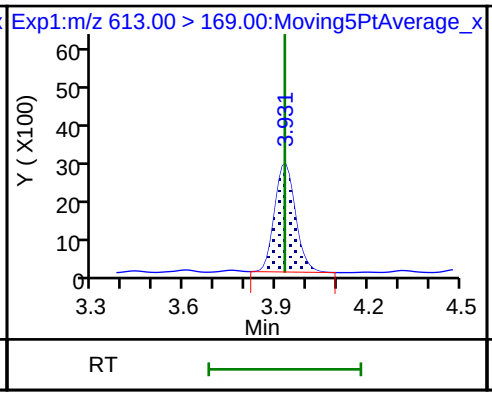
D 30 13C2 PFUnA



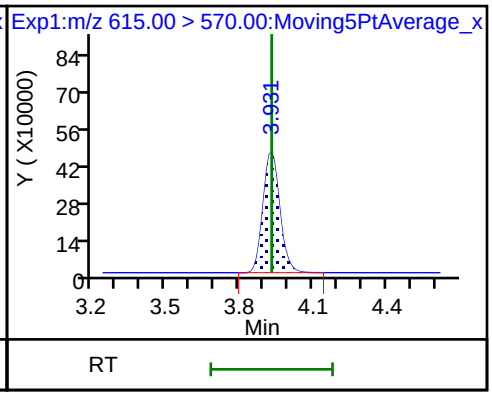
37 Perfluorododecanoic acid



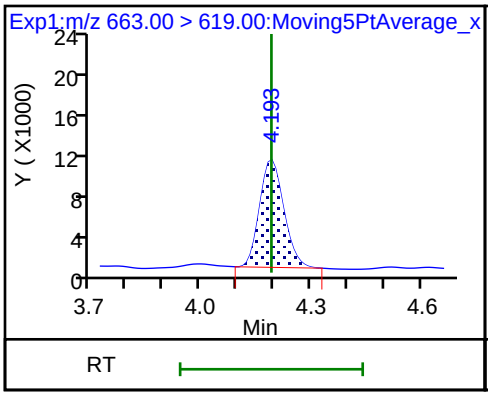
37 Perfluorododecanoic acid



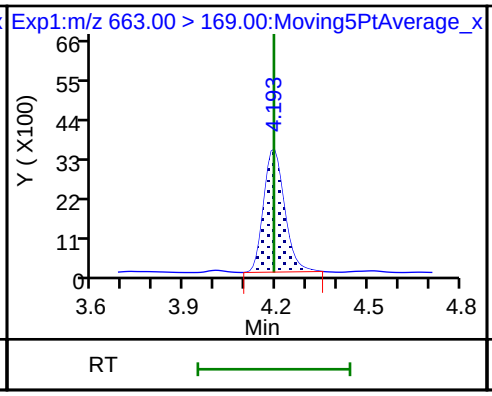
D 36 13C2 PFDoA



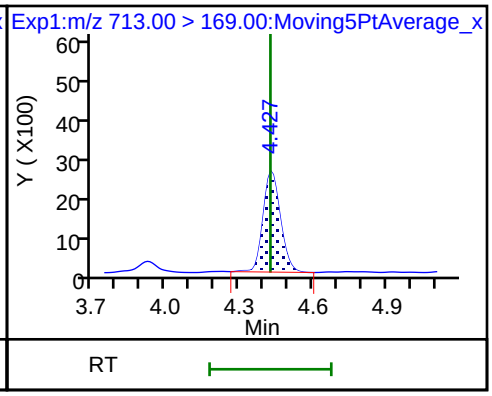
41 Perfluorotridecanoic acid



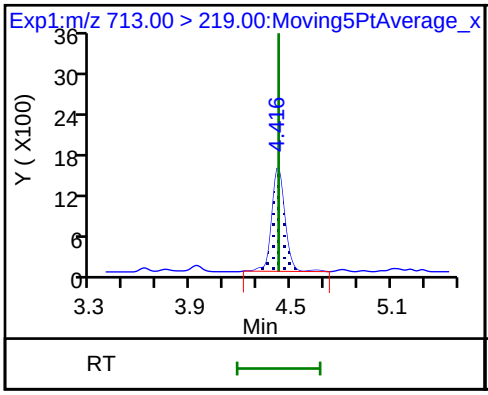
41 Perfluorotridecanoic acid



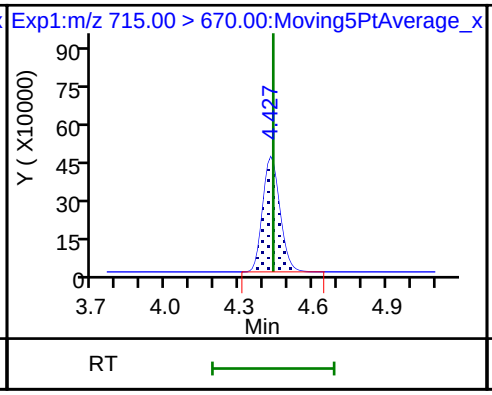
42 Perfluorotetradecanoic acid



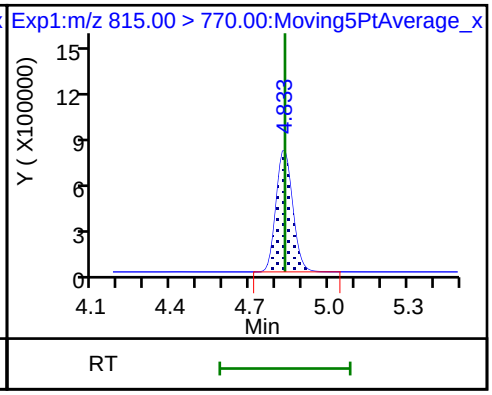
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

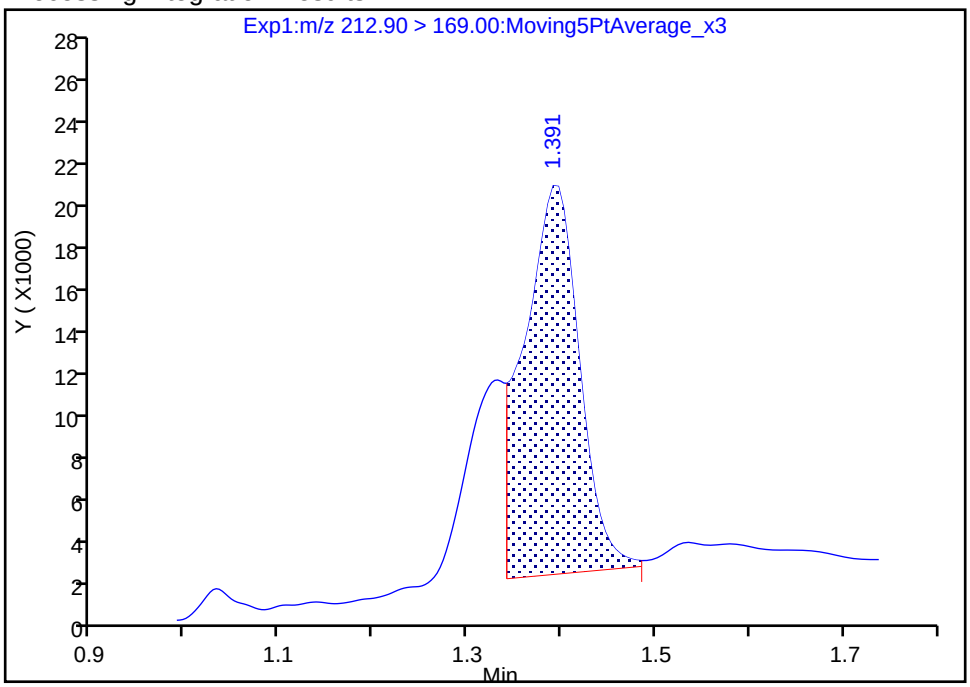
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_005.d				
Injection Date:	28-Jul-2018 19:55:31	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

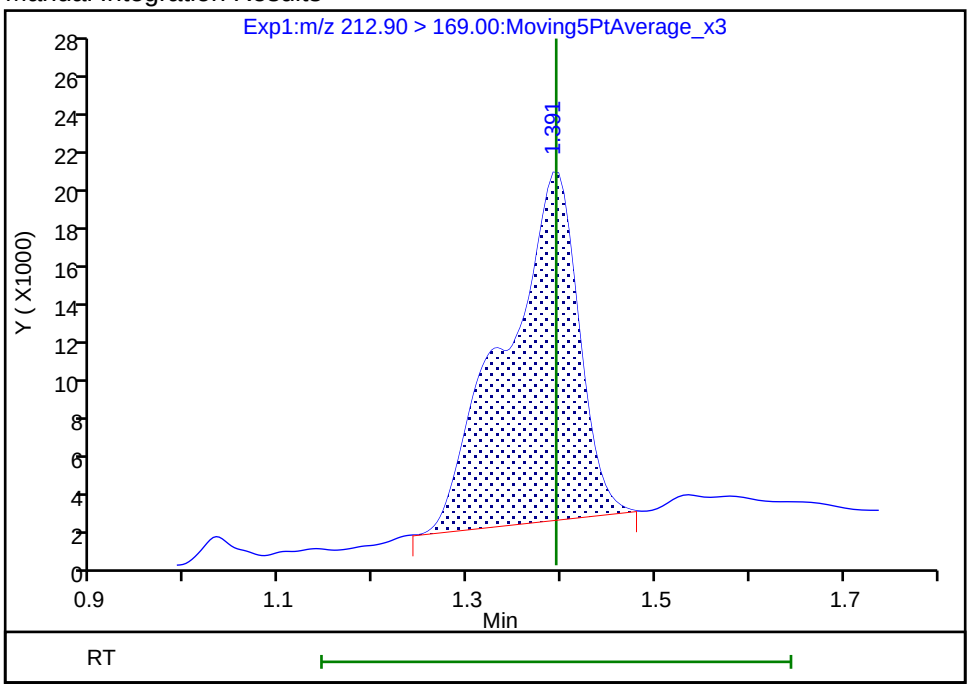
Processing Integration Results

RT: 1.39
Area: 74647
Amount: 0.037619
Amount Units: ng/ml



Manual Integration Results

RT: 1.39
Area: 99723
Amount: 0.050256
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 14:41:59

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

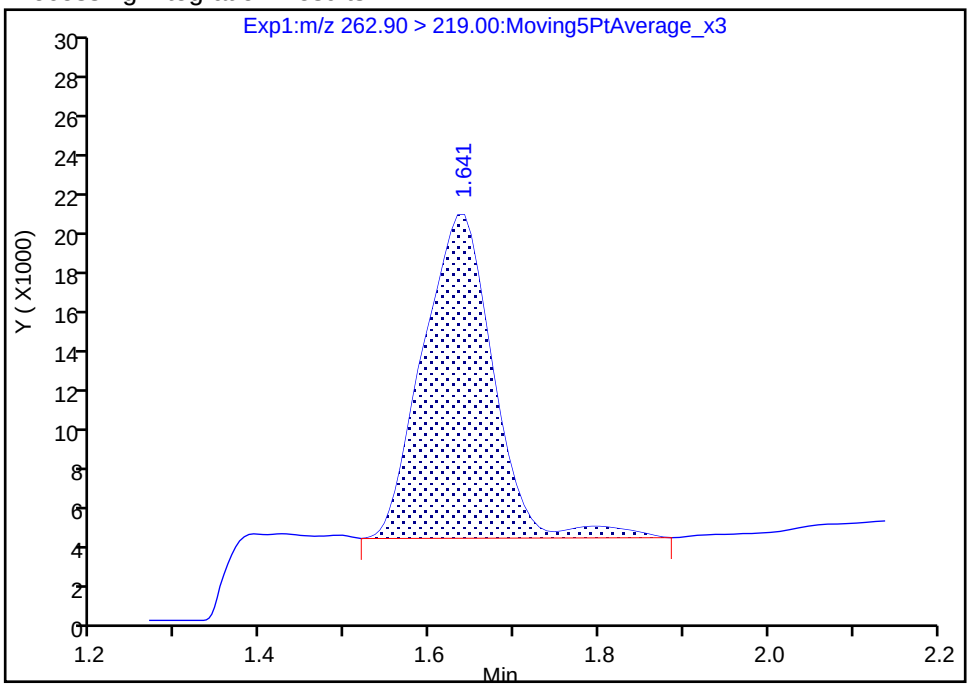
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_005.d				
Injection Date:	28-Jul-2018 19:55:31	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

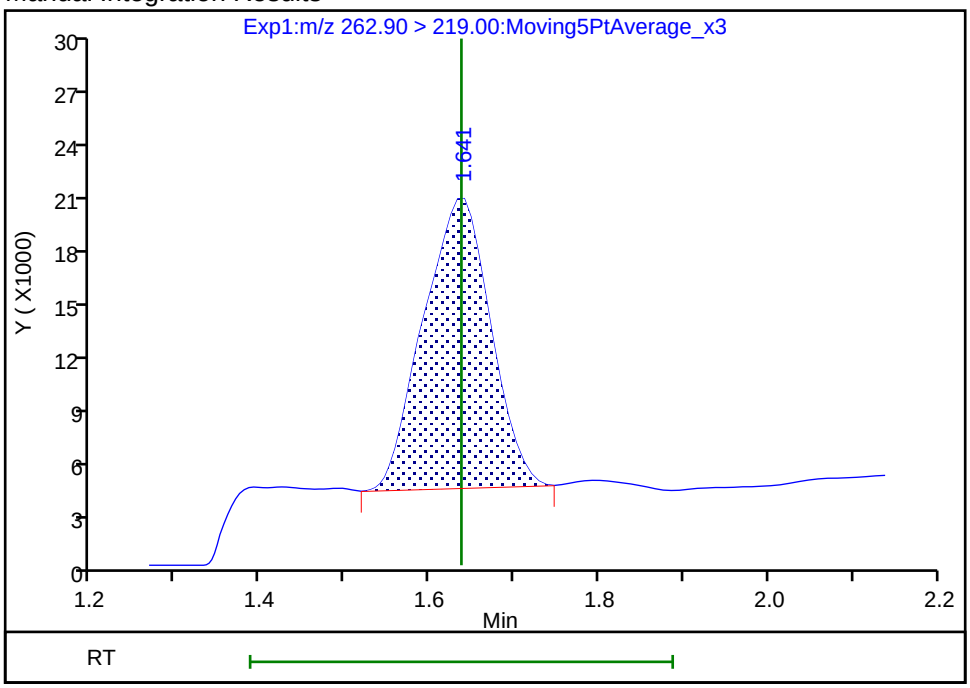
Processing Integration Results

RT: 1.64
Area: 94914
Amount: 0.054611
Amount Units: ng/ml



Manual Integration Results

RT: 1.64
Area: 89979
Amount: 0.051772
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 14:42:07

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236773/3 Calibration Date: 07/28/2018 20:03

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLAA_040.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9734		0.990	1.00	-1.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.211		1.01	1.00	1.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	76.56		0.852	0.884	-3.6	30.0
4:2 FTS	AveID	17.09	11.69		0.639	0.934	-31.6*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.008		0.951	1.00	-4.9	30.0
Perfluoropentanesulfonic acid	AveID	71.24	67.34		0.887	0.938	-5.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.129		1.02	1.00	2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.066		0.831	0.910	-8.6	30.0
6:2 FTS	AveID	1.687	1.708		0.960	0.948	1.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.146		0.945	1.00	-5.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.348		0.928	0.952	-2.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.055		0.924	1.00	-7.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.082		0.909	0.928	-2.1	30.0
8:2 FTS	AveID	1.356	1.301		0.919	0.958	-4.0	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7969		1.02	0.960	6.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.035		1.01	1.00	0.7	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	0.998		1.00	1.00	0.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.9632		0.977	1.00	-2.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6945		1.01	0.964	4.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.9218		0.988	1.00	-1.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.204		0.970	1.00	-3.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.027		0.949	1.00	-5.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.012		0.963	1.00	-3.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2530		1.01	1.00	0.9	30.0
13C4 PFBA	Ave	1.159	1.228		2.65	2.50	5.9	30.0
13C5-PFPeA	Ave	0.8093	0.8559		2.64	2.50	5.8	30.0
13C3-PFBS	Ave	0.0212	0.0232		2.54	2.33	9.1	30.0
13C2 PFHxA	Ave	0.9490	0.9836		2.59	2.50	3.6	30.0
13C4-PFHpA	Ave	0.9779	0.9649		2.47	2.50	-1.3	30.0
18O2 PFHxS	Ave	1.256	1.282		2.41	2.37	2.0	30.0
M2-6:2FTS	Ave	0.2731	0.1924		1.67	2.38	-29.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236773/3 Calibration Date: 07/28/2018 20:03

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLAA_040.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9678		2.53	2.50	1.2	30.0
13C4 PFOS	Ave	0.8734	0.8957		2.45	2.39	2.6	30.0
13C5 PFNA	Ave	0.8250	0.8628		2.61	2.50	4.6	30.0
M2-8:2FTS	Ave	0.2848	0.2877		2.42	2.40	1.0	30.0
13C2 PFDA	Ave	0.6565	0.7190		2.74	2.50	9.5	30.0
13C8 FOSA	Ave	1.283	1.355		2.64	2.50	5.6	30.0
d3-NMeFOSAA	Ave	0.2169	0.2579		2.97	2.50	18.9	30.0
13C2 PFUnA	Ave	0.5287	0.5868		2.77	2.50	11.0	30.0
d5-NEtFOSAA	Ave	0.2280	0.2647		2.90	2.50	16.1	30.0
13C2 PFDoA	Ave	0.5026	0.5685		2.83	2.50	13.1	30.0
13C2-PFTeDA	Ave	0.4910	0.5385		2.74	2.50	9.7	30.0
13C2-PFHxDA	Ave	0.7454	0.7652		2.57	2.50	2.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_040.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 28-Jul-2018 20:03:18 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 14:43:35 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 14:43:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.394	1.394	0.0	1.004	1844145	0.99		99.0	786	
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.396	-0.007	0.539	4736445	2.65		106	80601	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.632	-0.003	0.632	3301817	2.64		106	50587	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.637	0.0	1.005	1598968	1.01		101	710	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.665	-0.003	0.645	83087	2.54		109	551	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.005	2418632	0.8525		96.4	7216	
298.90 > 99.00	1.671	1.671	0.0	1.005	1000562		2.42(1.25-3.74)		3845	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.866	0.006	0.726	392700	NC			6246	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.872	0.0	1.126	390075	0.6385		68.4	22903	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.902	0.0	1.000	1530265	0.9512		95.1	4309	
313.00 > 119.00	1.902	1.902	0.0	1.000	142718		10.72(5.03-15.10)		3078	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.905	-0.003	0.738	3794582	2.59		104	92839	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.157	2257429	0.8867		94.5	37954	
349.00 > 99.00	1.924	1.924	0.0	1.157	856383		2.64(1.36-4.07)		8015	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	1.999	0.0	1.000	312682	NC			1293	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.002	-0.003	0.775	318513	NC			10705	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.225	0.0	1.000	1680527	1.02		102	3542	
363.00 > 169.00	2.225	2.225	0.0	1.000	647381		2.60(1.13-3.40)		6376	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.228	-0.003	0.863	3722328	2.47		98.7	44452	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	1918837	0.8315		91.4	11178	
399.00 > 99.00	2.237	2.237	0.0	1.000	628041		3.06(1.50-4.49)		1804	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.240	-0.003	0.868	4678154	2.41		102	42270	
65 ADONA										
377.00 > 251.00	2.263	2.263	0.0	0.768	4472026	NC			52206	
377.00 > 85.00	2.263	2.263	0.0	0.768	2608657		1.71(0.84-2.53)		11832	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	480683	0.9597		101	5950	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.564	-0.010	0.990	705107	1.67		70.5	11607	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		3857843	2.50			44276	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	1712625	0.9449		94.4	2418	
413.00 > 169.00	2.579	2.579	0.0	1.000	903531		1.90(0.84-2.52)		4774	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	1773472	0.9275		97.4	28074	
449.00 > 99.00	2.587	2.587	0.0	0.878	486861		3.64(1.94-5.82)		3974	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3733628	2.53		101	50961	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.945	2.945	0.0	1.000	1387905	0.9087		97.9	20430	
499.00 > 99.00	2.945	2.945	0.0	1.000	322672		4.30(2.31-6.93)		2068	
20 Perfluorononanoic acid										
463.00 > 419.00	2.945	2.945	0.0	1.000	1404992	0.9242		92.4	4524	
463.00 > 169.00	2.945	2.945	0.0	1.000	333170		4.22(1.90-5.69)		12481	
D 19 13C5 PFNA										
468.00 > 423.00	2.945	2.948	-0.003	1.142	3328664	2.61		105	59160	
D 18 13C4 PFOS										
503.00 > 80.00	2.945	2.948	-0.003	1.142	3303527	2.45		103	42720	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.161	3.161	0.0	1.073	2395814	NC			16543	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.295	0.0	1.000	553318	0.9193		96.0	15118	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.295	0.0	1.119	1057404	1.02		107	29384	
549.00 > 99.00	3.295	3.295	0.0	1.119	389412		2.72(1.33-3.97)		4057	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.299	-0.004	1.278	1063332	2.42		101	21655	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.302	3.302	0.0	1.000	1148570	1.01		101	7288	
513.00 > 169.00	3.302	3.302	0.0	1.000	195872		5.86(2.36-7.09)		5848	
D 23 13C2 PFDA										
515.00 > 470.00	3.302	3.307	-0.005	1.281	2773829	2.74		110	37260	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.310	3.310	0.0	1.000	2086857	1.00		100	35487	
D 21 13C8 FOSA										
506.00 > 78.00	3.310	3.314	-0.004	1.284	5228112	2.64		106	36463	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.463	0.0	1.000	383338	0.9774		97.7	4352	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.463	3.467	-0.004	1.343	994934	2.97		119	53725	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.618	3.618	0.0	1.228	925443	1.01		105	28103	
599.00 > 99.00	3.618	3.618	0.0	1.228	304532		3.04(1.39-4.16)		7135	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.627	3.627	0.0	1.000	1090419	0.9705		97.0	5518	
563.00 > 169.00	3.637	3.627	0.010	1.003	174073		6.26(2.12-6.36)		8955	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.627	3.627	0.0	1.000	376479	0.9881		98.8	8168	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.630	-0.003	1.407	1021016	2.90		116	3207	
D 30 13C2 PFUnA										
565.00 > 520.00	3.627	3.640	-0.013	1.407	2263713	2.77		111	33781	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.287	3614765	NC			83524	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.928	0.0	1.000	900655	0.9489		94.9	282	
613.00 > 169.00	3.928	3.928	0.0	1.000	216625		4.16(2.13-6.40)		4482	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.930	-0.002	1.523	2193118	2.83		113	28746	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.192	0.0	1.067	887484	0.9632		96.3	273	
663.00 > 169.00	4.192	4.192	0.0	1.067	264933		3.35(1.25-3.76)		3386	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.425	4.425	0.0	1.000	210255	1.01		101	2851	
713.00 > 219.00	4.415	4.425	-0.010	0.998	148715		1.41(0.71-2.13)		2502	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.437	-0.012	1.716	2077358	2.74		110	13823	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.832	4.832	0.0	1.000	1180596	NC			212	
813.00 > 169.00	4.832	4.832	0.0	1.000	189235		6.24(2.86-8.58)		2178	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.832	4.833	-0.001	1.874	2951853	2.57		103	11755	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.173	0.0	1.070	1278437	NC			256	
913.00 > 169.00	5.173	5.173	0.0	1.070	159658		8.01(3.83-11.48)		2437	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 14:43:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_040.d

Injection Date: 28-Jul-2018 20:03:18 Instrument ID: A8_N

Lims ID: CCV L4

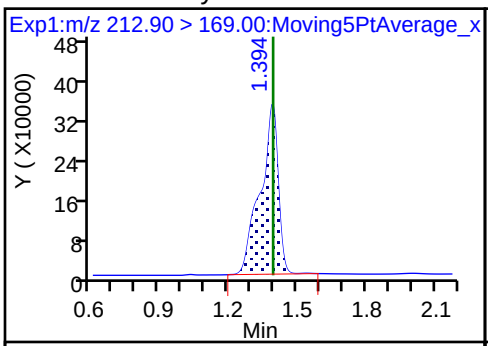
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid



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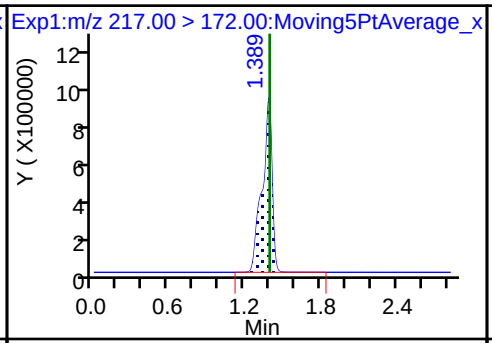
D 1 13C4 PFBA



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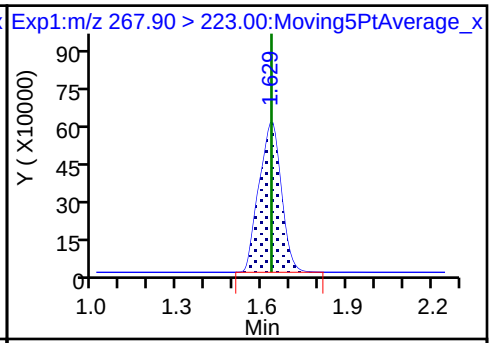
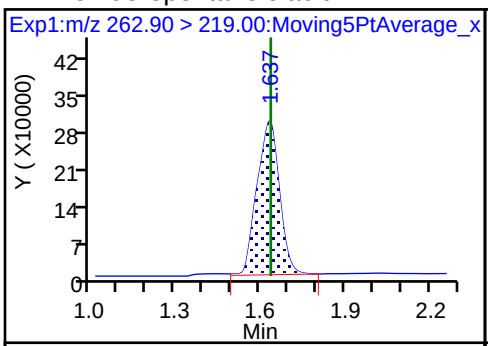
D 3 13C5-PFPeA



RT

4 Perfluoropentanoic acid



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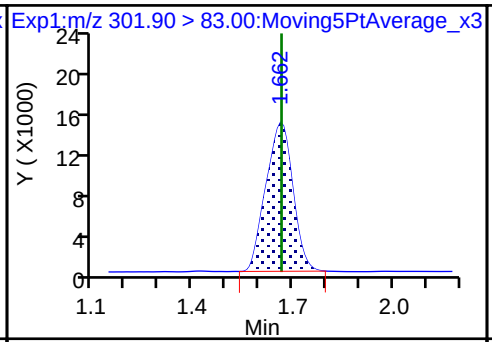
D 47 13C3-PFBS



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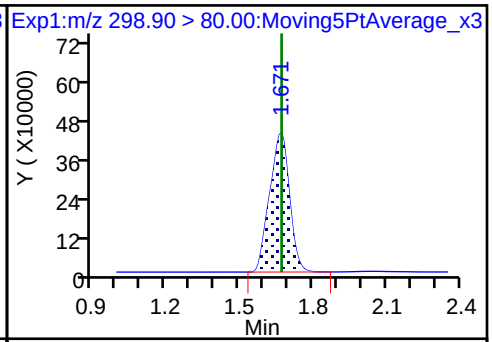
5 Perfluorobutanesulfonic acid



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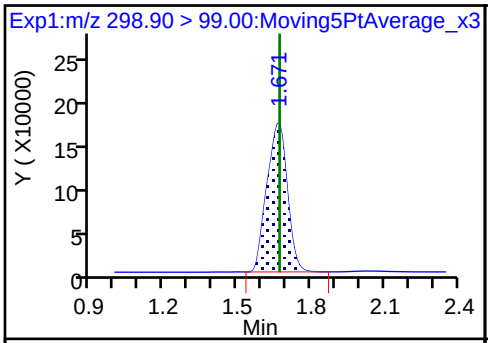
5 Perfluorobutanesulfonic acid



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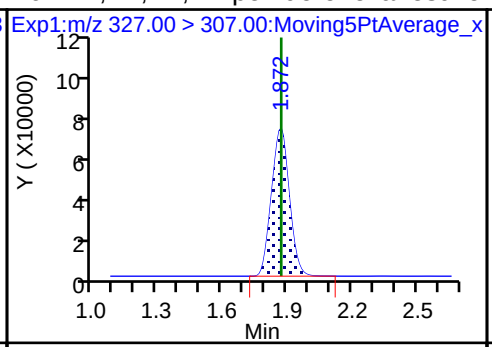
61 1H,1H,2H,2H-perfluorohexanesulfoni



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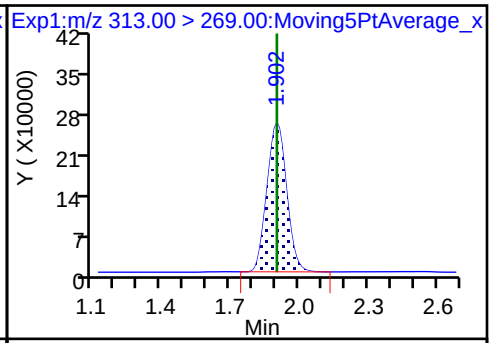
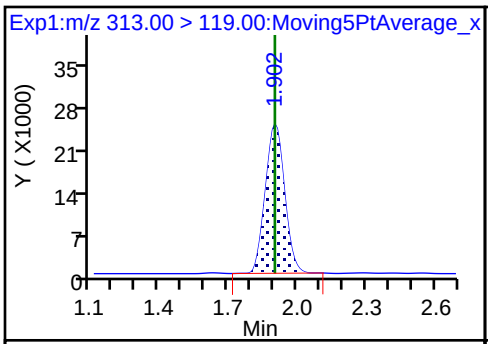
6 Perfluorohexanoic acid



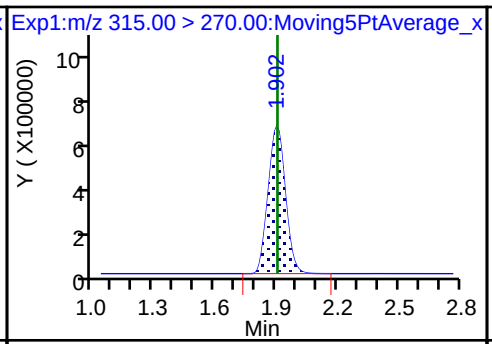
RT

6 Perfluorohexanoic acid



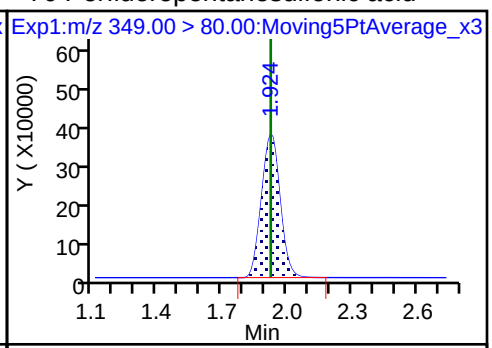
RT

D 7 13C2 PFHxA



RT

70 Perfluoropentanesulfonic acid



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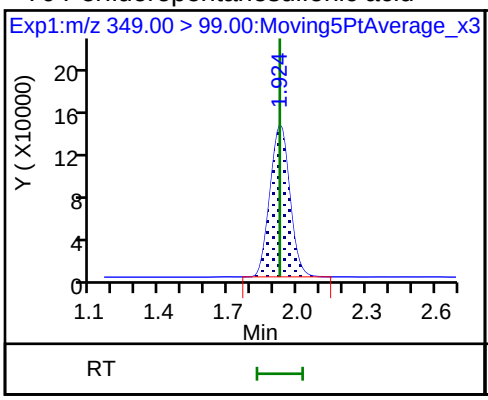
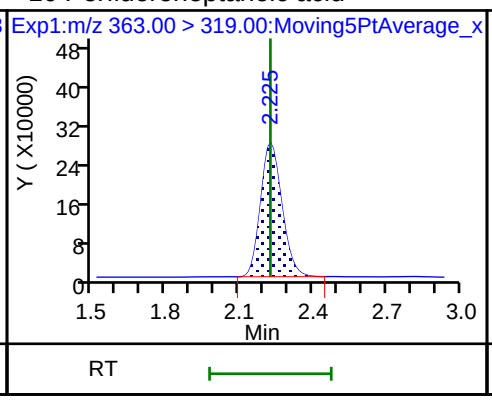
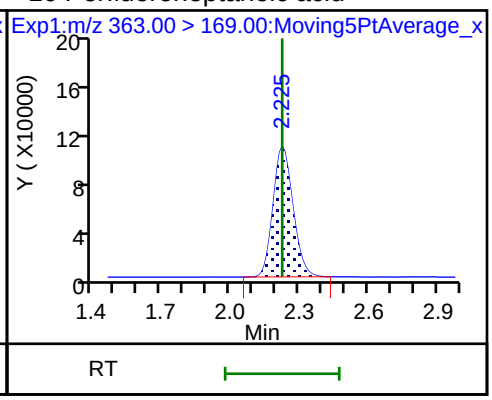
70 Perfluoropentanesulfonic acid



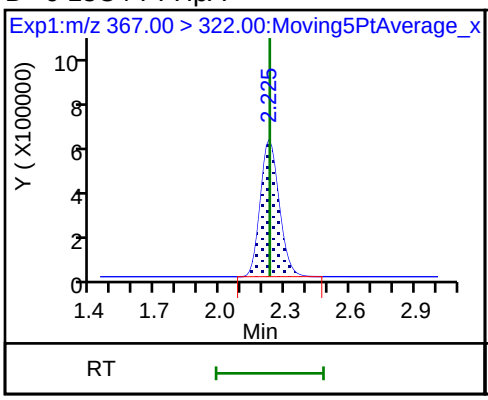
10 Perfluoroheptanoic acid



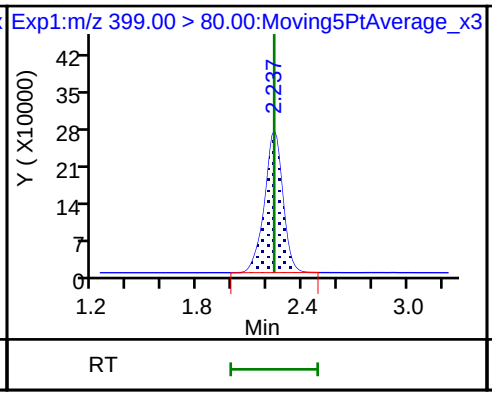
10 Perfluoroheptanoic acid



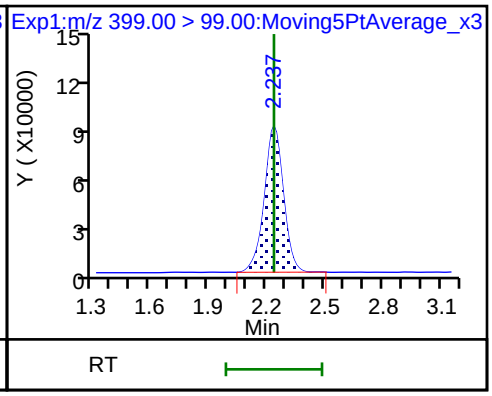
D 9 13C4-PFHpA



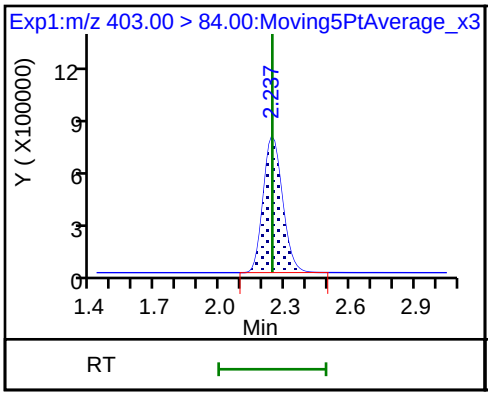
8 Perfluorohexanesulfonic acid



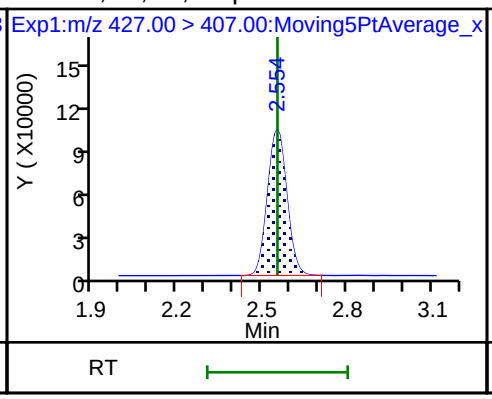
8 Perfluorohexanesulfonic acid



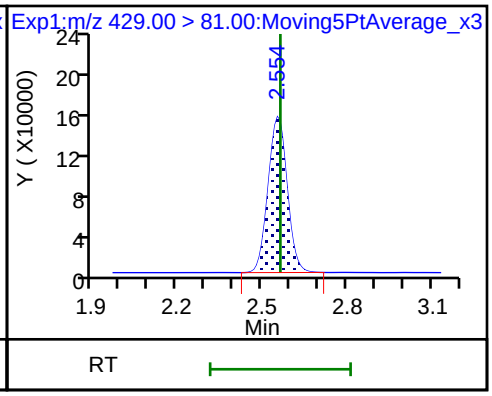
D 11 18O2 PFHxS



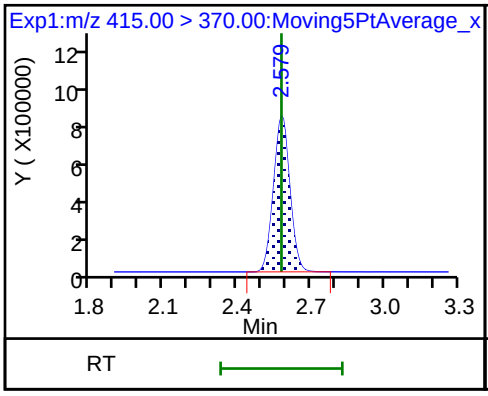
13 1H,1H,2H,2H-perfluorooctanesulfon



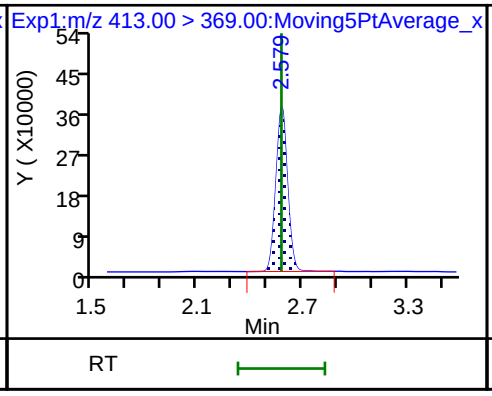
D 12 M2-6:2FTS



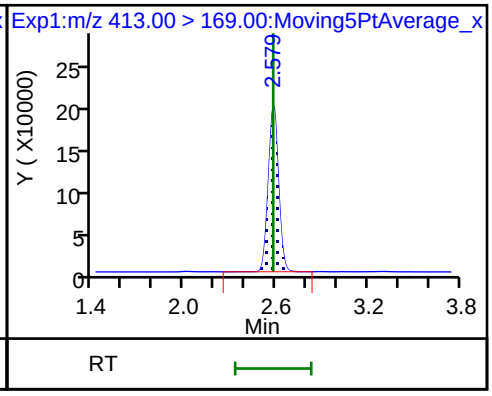
* 62 13C2-PFOA



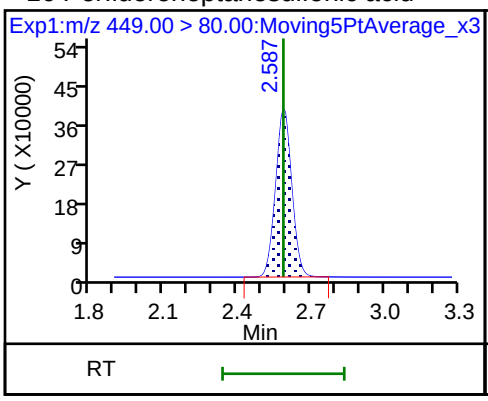
15 Perfluorooctanoic acid



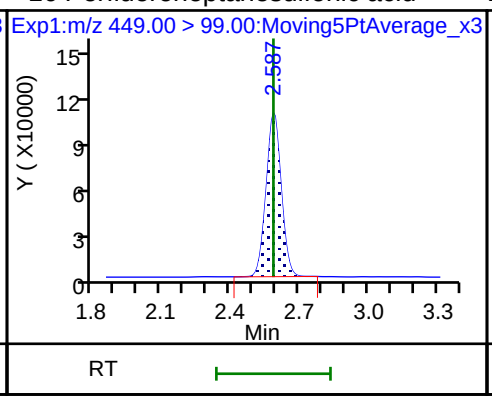
15 Perfluorooctanoic acid



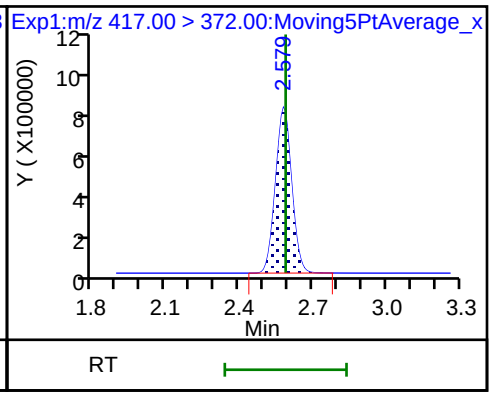
16 Perfluoroheptanesulfonic acid



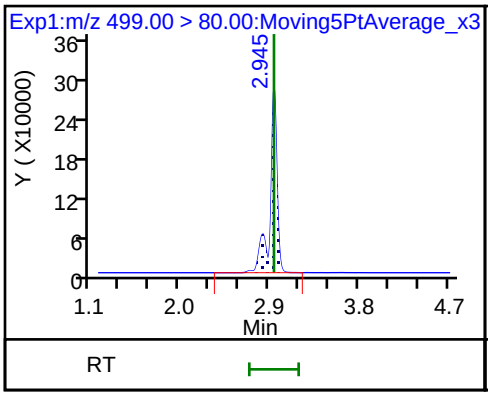
16 Perfluoroheptanesulfonic acid



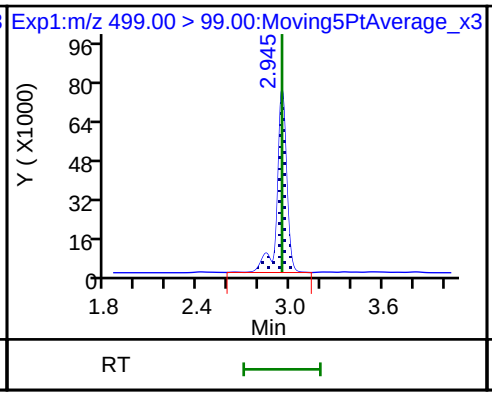
D 14 13C4 PFOA



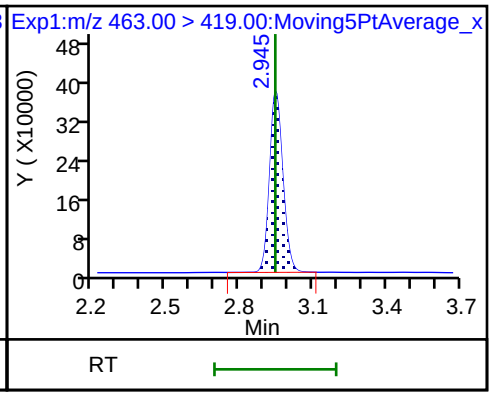
17 Perfluorooctane sulfonic acid



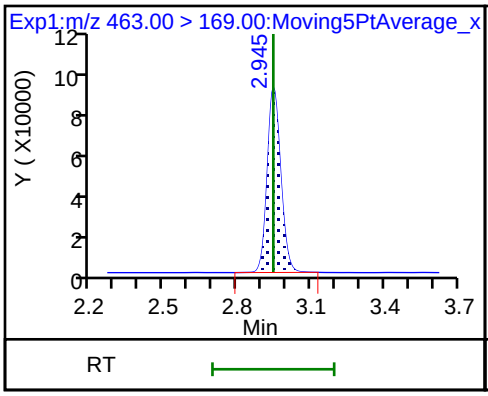
17 Perfluorooctane sulfonic acid



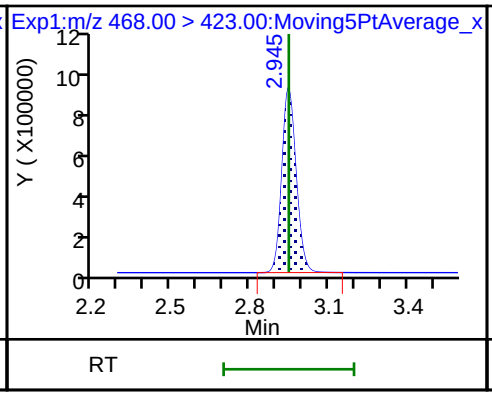
20 Perfluorononanoic acid



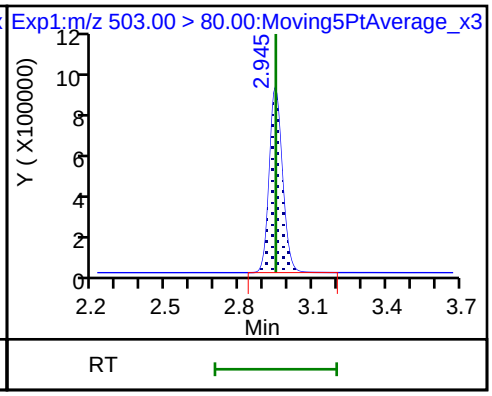
20 Perfluorononanoic acid



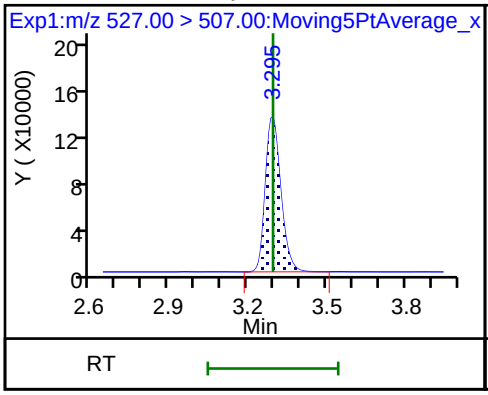
D 19 13C5 PFNA



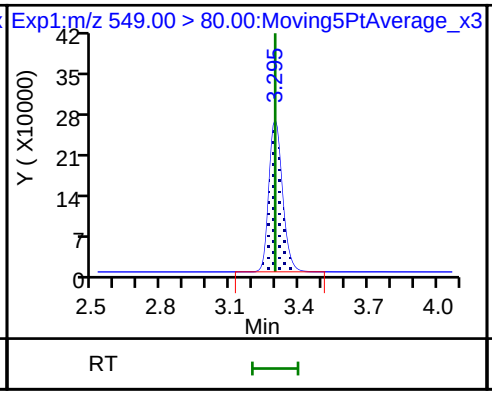
D 18 13C4 PFOS



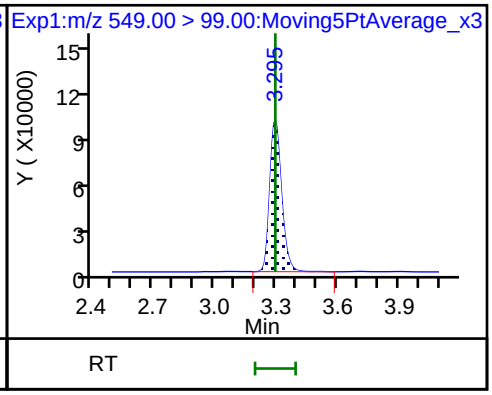
25 1H,1H,2H,2H-perfluorodecanesulfoni



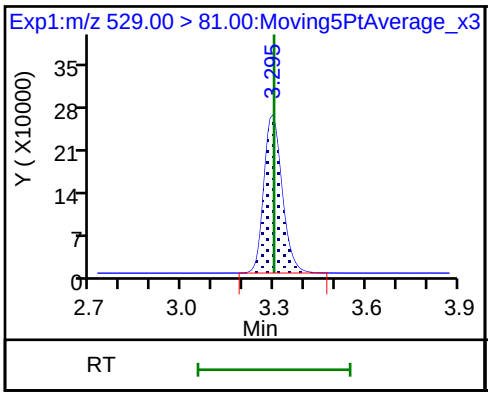
68 Perfluorononanesulfonic acid



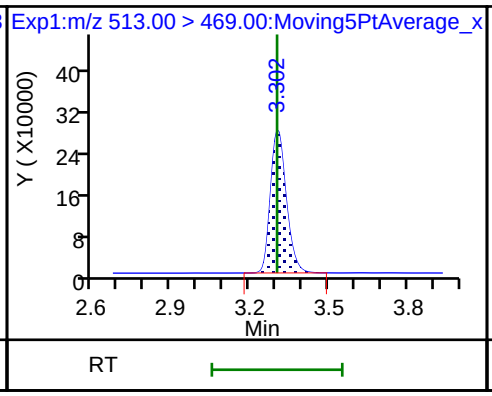
68 Perfluorononanesulfonic acid



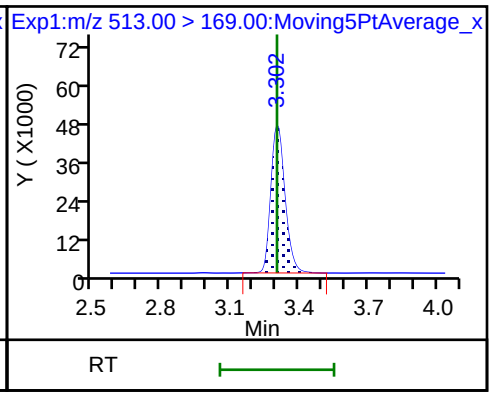
D 26 M2-8:2FTS



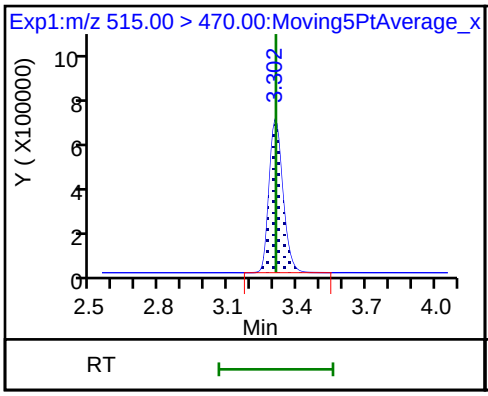
24 Perfluorodecanoic acid



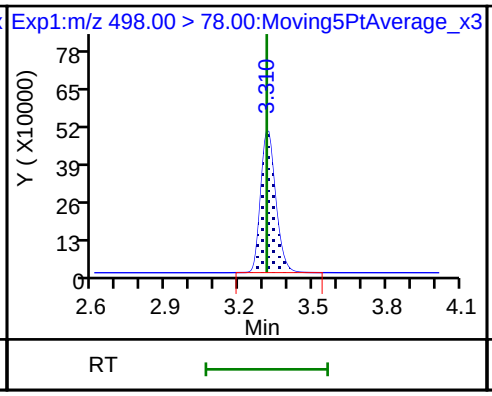
24 Perfluorodecanoic acid



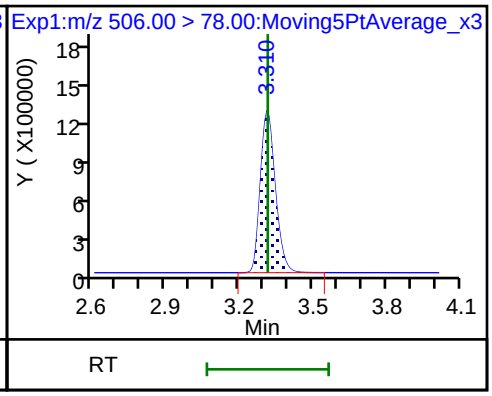
D 23 13C2 PFDA



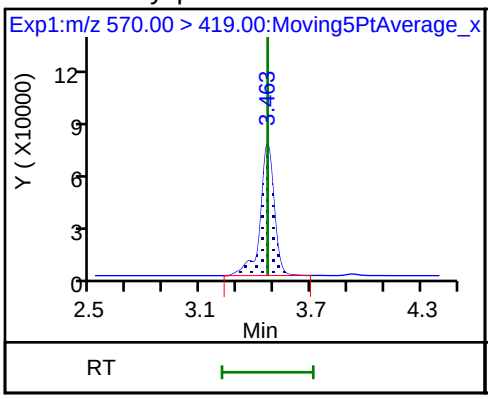
22 Perfluorooctane Sulfonamide



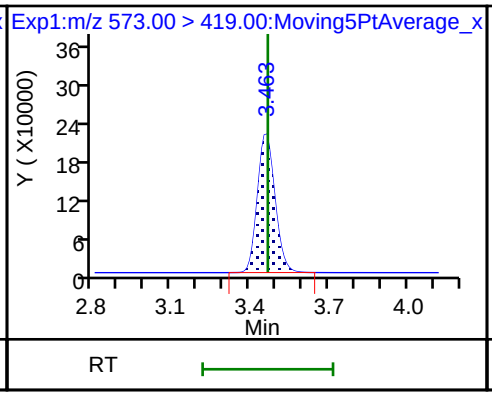
D 21 13C8 FOSA



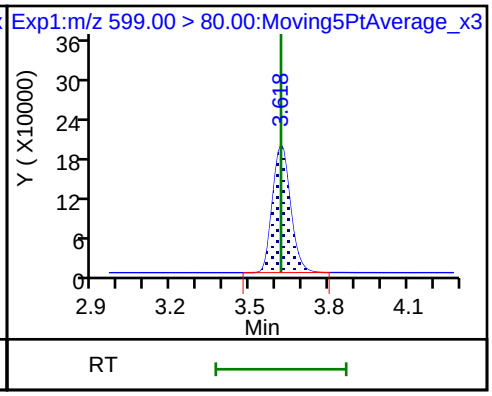
28 N-methyl perfluorooctane sulfonami



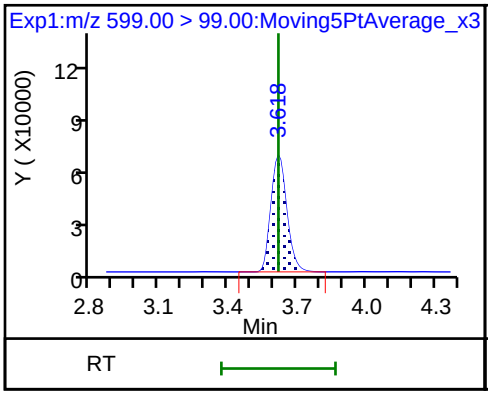
D 27 d3-NMeFOSAA



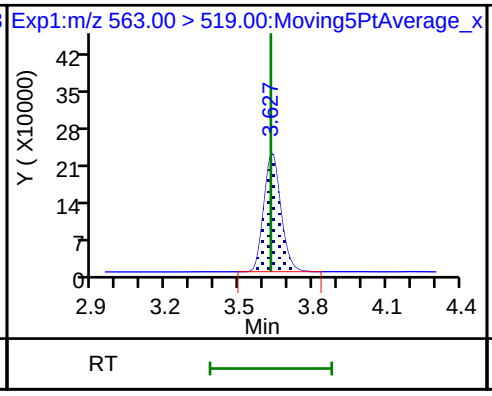
29 Perfluorodecane Sulfonic acid



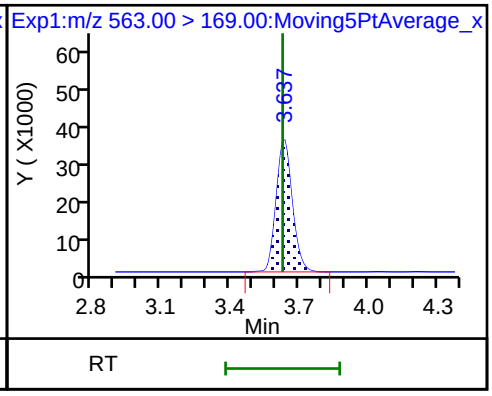
29 Perfluorodecane Sulfonic acid



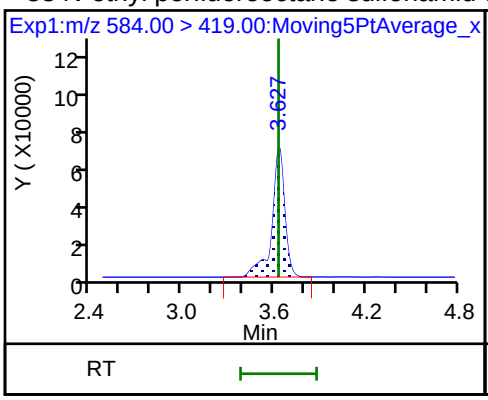
31 Perfluoroundecanoic acid



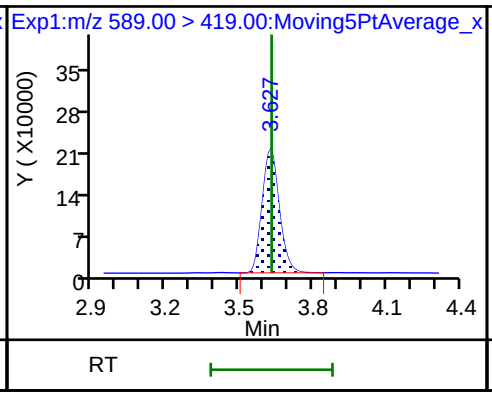
31 Perfluoroundecanoic acid



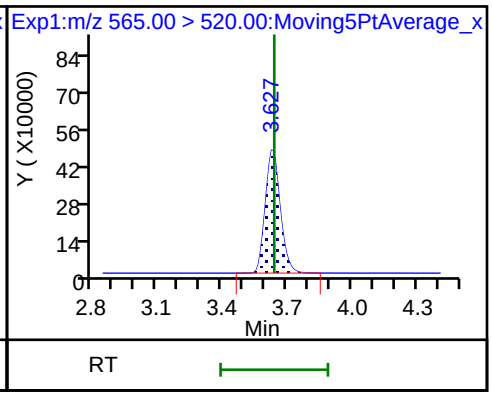
33 N-ethyl perfluorooctane sulfonamid



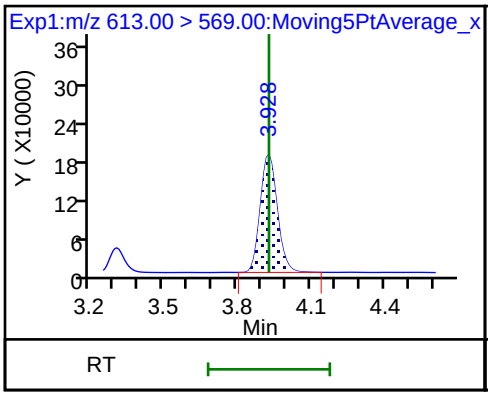
D 32 d5-NEtFOSAA



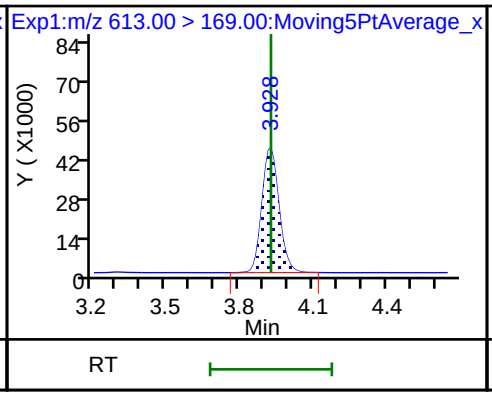
D 30 13C2 PFUnA



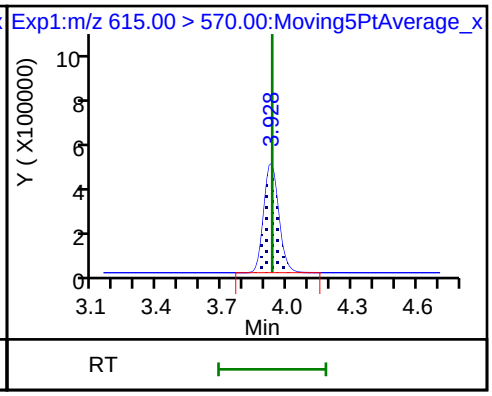
37 Perfluorododecanoic acid



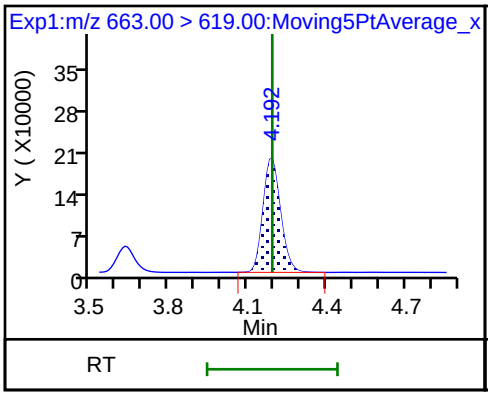
37 Perfluorododecanoic acid



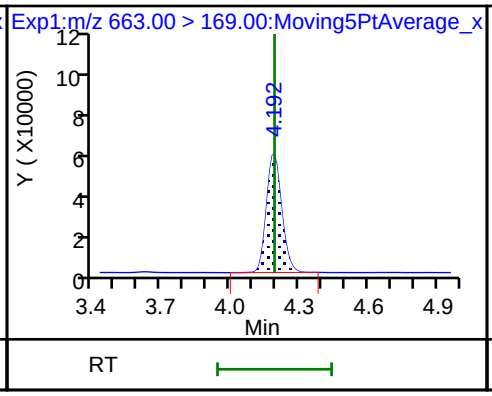
D 36 13C2 PFDoA



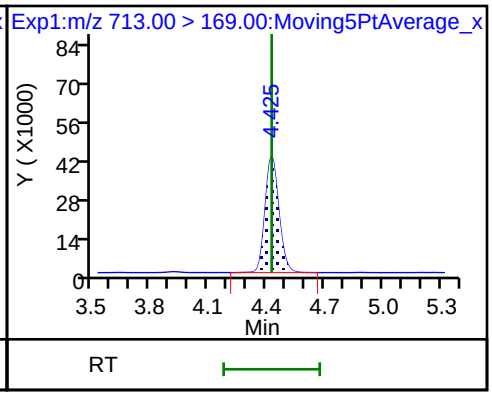
41 Perfluorotridecanoic acid



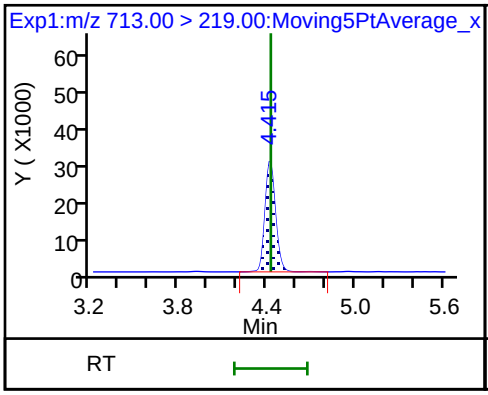
41 Perfluorotridecanoic acid



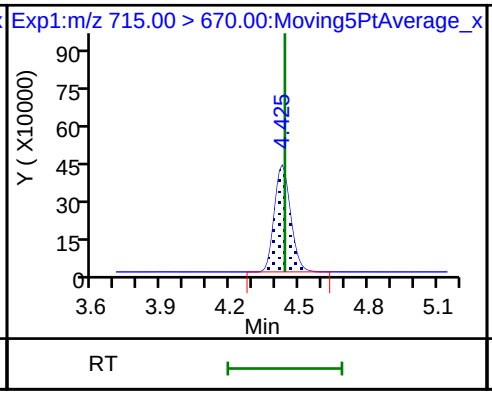
42 Perfluorotetradecanoic acid



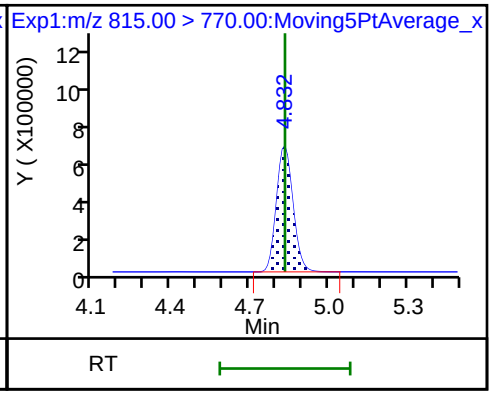
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236778/1 Calibration Date: 07/29/2018 01:00

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9825		2.50	2.50	-0.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.211		2.53	2.50	1.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	79.00		2.20	2.21	-0.5	30.0
4:2 FTS	AveID	17.09	11.58		1.58	2.34	-32.3*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.078		2.54	2.50	1.7	30.0
Perfluoropentanesulfonic acid	AveID	71.24	70.25		2.31	2.35	-1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.168		2.65	2.50	5.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.048		2.04	2.28	-10.2	30.0
6:2 FTS	AveID	1.687	1.726		2.42	2.37	2.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.392		2.39	2.38	0.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.182		2.44	2.50	-2.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.071		2.34	2.50	-6.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.107		2.32	2.32	0.2	30.0
8:2 FTS	AveID	1.356	1.231		2.18	2.40	-9.2	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.8254		2.65	2.40	10.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.049		2.55	2.50	2.0	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.034		2.60	2.50	4.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.017		2.58	2.50	3.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.7131		2.59	2.41	7.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8722		2.34	2.50	-6.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.144		2.31	2.50	-7.8	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.023		2.36	2.50	-5.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	0.999		2.38	2.50	-4.9	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2515		2.51	2.50	0.3	30.0
13C4 PFBA	Ave	1.159	1.287		2.78	2.50	11.0	30.0
13C5-PFPeA	Ave	0.8093	0.8933		2.76	2.50	10.4	30.0
13C3-PFBS	Ave	0.0212	0.0237		2.59	2.33	11.5	30.0
13C2 PFHxA	Ave	0.9490	0.9717		2.56	2.50	2.4	30.0
13C4-PFHpA	Ave	0.9779	0.9776		2.50	2.50	-0.0	30.0
18O2 PFHxS	Ave	1.256	1.367		2.57	2.37	8.9	30.0
M2-6:2FTS	Ave	0.2731	0.1830		1.59	2.38	-33.0*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236778/1 Calibration Date: 07/29/2018 01:00

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9601		2.51	2.50	0.4	30.0
13C4 PFOS	Ave	0.8734	0.9239		2.53	2.39	5.8	30.0
13C5 PFNA	Ave	0.8250	0.8804		2.67	2.50	6.7	30.0
M2-8:2FTS	Ave	0.2848	0.2855		2.40	2.40	0.2	30.0
13C2 PFDA	Ave	0.6565	0.7295		2.78	2.50	11.1	30.0
13C8 FOSA	Ave	1.283	1.375		2.68	2.50	7.2	30.0
d3-NMeFOSAA	Ave	0.2169	0.2679		3.09	2.50	23.5	30.0
d5-NEtFOSAA	Ave	0.2280	0.2912		3.19	2.50	27.7	30.0
13C2 PFUnA	Ave	0.5287	0.6056		2.86	2.50	14.5	30.0
13C2 PFDoA	Ave	0.5026	0.5828		2.90	2.50	15.9	30.0
13C2-PFTeDA	Ave	0.4910	0.5560		2.83	2.50	13.2	30.0
13C2-PFHxDA	Ave	0.7454	0.7884		2.64	2.50	5.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_014.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 29-Jul-2018 01:00:51 ALS Bottle#: 31 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:22:26 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:22:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.396	0.001	1.004	4715801	2.50		100.0	2316	
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.397	-0.006	0.539	4799644	2.78		111	76041	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.633	0.0	0.633	3331707	2.76		110	62675	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.640	0.001	1.005	4035118	2.53		101	2208	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.667	-0.001	0.646	82124	2.59		112	587	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.675	0.001	1.005	6167021	2.20		99.5	15202	
298.90 > 99.00	1.675	1.675	0.001	1.005	2467637		2.50(1.25-3.74)		11406	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.875	0.001	0.727	392276	NC			5410	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.876	-0.010	1.120	955007	1.58		67.7	42607	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.905	0.001	0.738	3624403	2.56		102	79783	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.906	1.905	0.001	1.000	3908055	2.54		102	12620	
313.00 > 119.00	1.906	1.905	0.001	1.000	345707		11.30(5.03-15.10)		6702	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.927	0.0	1.157	5818580	2.31		98.6	99960	
349.00 > 99.00	1.927	1.927	0.0	1.157	2158633		2.70(1.36-4.07)		16778	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.002	0.001	0.776	327126	NC			9482	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.003	0.0	1.000	766669	NC			3642	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.864	3646284	2.50		100.0	68127	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.229	0.0	1.000	4257611	2.65		106	11269	
363.00 > 169.00	2.229	2.229	0.0	1.000	1646290		2.59(1.13-3.40)		18638	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.868	4825015	2.57		109	47090	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.241	0.0	1.000	4862990	2.04		89.8	22588	
399.00 > 99.00	2.241	2.241	0.0	1.000	1655811		2.94(1.50-4.49)		5480	
65 ADONA										
377.00 > 251.00	2.267	2.267	0.0	0.769	11201331	NC			103022	
377.00 > 85.00	2.267	2.267	0.0	0.769	6684655		1.68(0.84-2.53)		30770	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.555	0.0	1.000	1116828	2.42		102	12099	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.564	-0.009	0.990	648429	1.59		67.0	11541	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.580	0.0		3729840	2.50			35257	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3580991	2.51		100	43556	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.588	0.0	1.003	4237999	2.44		97.4	4900	
413.00 > 169.00	2.580	2.588	-0.008	1.000	2289433		1.85(0.84-2.52)		10459	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.588	0.0	0.878	4565882	2.39		101	44308	
449.00 > 99.00	2.588	2.588	0.0	0.878	1227685		3.72(1.94-5.82)		10067	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.947	0.001	1.142	3294309	2.53		106	33100	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.947	0.001	1.142	3283680	2.67		107	38343	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.948	0.0	1.000	3516192	2.34		93.8	11644	
463.00 > 169.00	2.948	2.948	0.0	1.000	825996		4.26(1.90-5.69)		24114	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.948	0.0	1.000	3539808	2.32		100	33123	
499.00 > 99.00	2.948	2.948	0.0	1.000	804891		4.40(2.31-6.93)		6913	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.164	0.0	1.073	5927585	NC			35658	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.291	0.008	1.000	1255891	2.18		90.8	50929	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.298	0.001	1.279	1019956	2.40		100	14549	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.299	0.0	1.119	2730339	2.65		111	49047	
549.00 > 99.00	3.299	3.299	0.0	1.119	975011		2.80(1.33-3.97)		8931	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.307	0.0	1.000	2853040	2.55		102	15580	
513.00 > 169.00	3.307	3.307	0.0	1.000	496149		5.75(2.36-7.09)		13116	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.314	-0.007	1.282	2721012	2.78		111	43881	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.314	0.001	1.285	5129504	2.68		107	36235	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.314	0.001	1.000	5305863	2.60		104	52557	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.467	3.466	0.001	1.344	999342	3.09		124	21856	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.467	0.0	1.000	1016136	2.58		103	9398	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.621	0.0	1.228	2368783	2.59		108	84015	
599.00 > 99.00	3.621	3.621	0.0	1.228	784094		3.02(1.39-4.16)		12807	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.629	0.002	1.407	1086225	3.19		128	3894	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.639	0.001	1.411	2258595	2.86		115	34185	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.640	3.640	0.0	1.000	2584204	2.31		92.2	11880	
563.00 > 169.00	3.640	3.640	0.0	1.000	454435		5.69(2.12-6.36)		12004	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.640	0.0	1.003	947374	2.34		93.5	20081	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.795	0.0	1.287	8898176	NC			70950	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.930	0.001	1.523	2173744	2.90		116	20932	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.930	0.001	1.000	2223354	2.36		94.5	656	
613.00 > 169.00	3.931	3.930	0.001	1.000	529046		4.20(2.13-6.40)		8578	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.193	0.0	1.067	2172449	2.38		95.1	676	
663.00 > 169.00	4.193	4.193	0.0	1.067	669620		3.24(1.25-3.76)		11203	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.426	0.001	1.000	521493	2.51		100	7564	
713.00 > 219.00	4.427	4.426	0.001	1.000	374525		1.39(0.71-2.13)		5508	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.437	-0.010	1.716	2073638	2.83		113	13672	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	2826133	NC			488	
813.00 > 169.00	4.833	4.833	0.0	1.000	469125		6.02(2.86-8.58)		4326	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.873	2940490	2.64		106	11691	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.182	5.173	0.009	1.072	3179385	NC			659	
913.00 > 169.00	5.182	5.173	0.009	1.072	376290		8.45(3.83-11.48)		2966	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 15:22:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_014.d

Injection Date: 29-Jul-2018 01:00:51 Instrument ID: A8_N

Lims ID: CCV L5

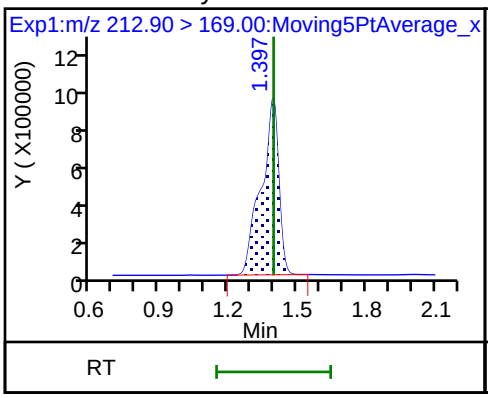
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 31 Worklist Smp#: 1

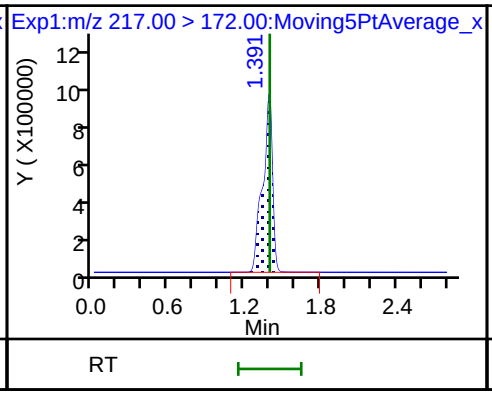
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

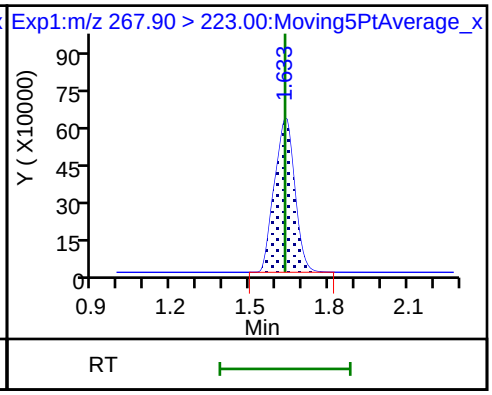
2 Perfluorobutyric acid



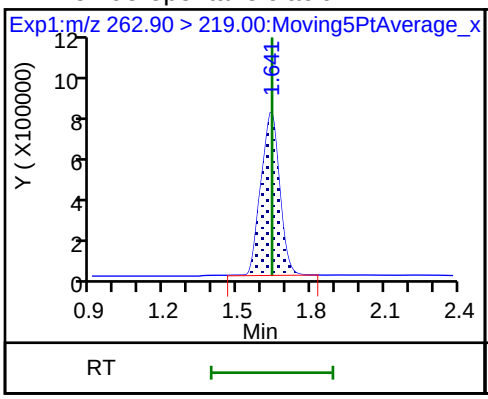
D 1 13C4 PFBA



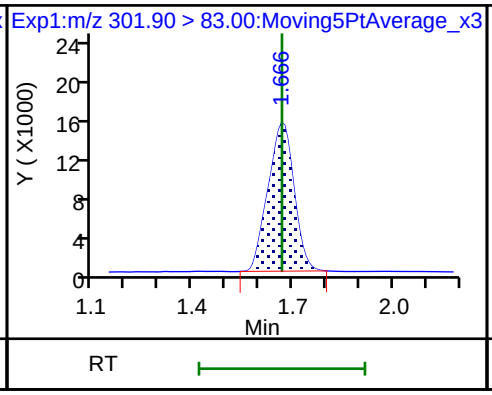
D 3 13C5-PFPeA



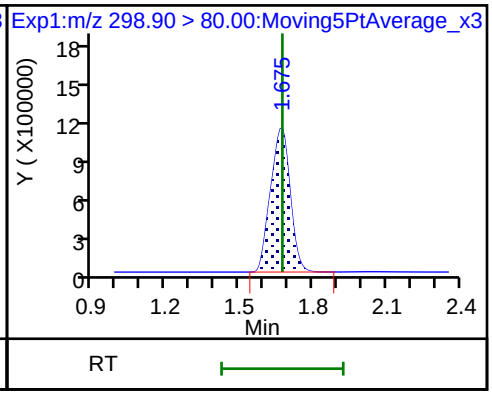
4 Perfluoropentanoic acid



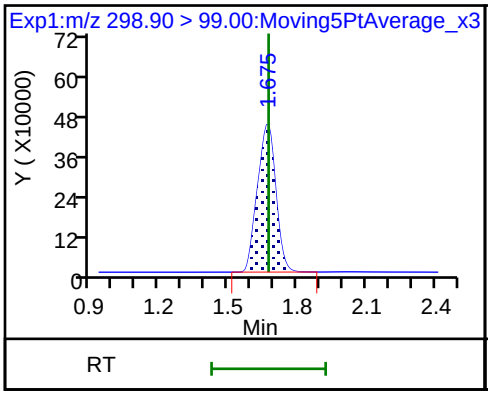
D 47 13C3-PFBS



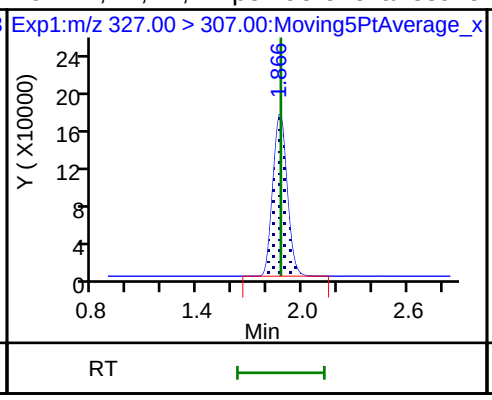
5 Perfluorobutanesulfonic acid



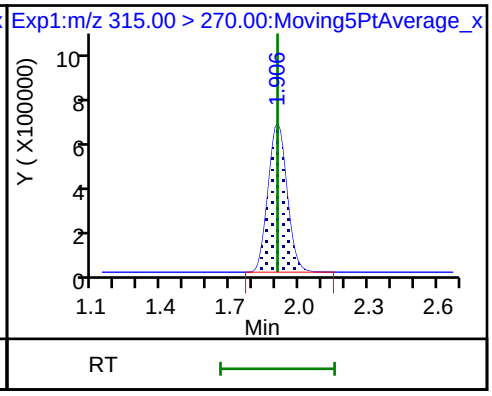
5 Perfluorobutanesulfonic acid



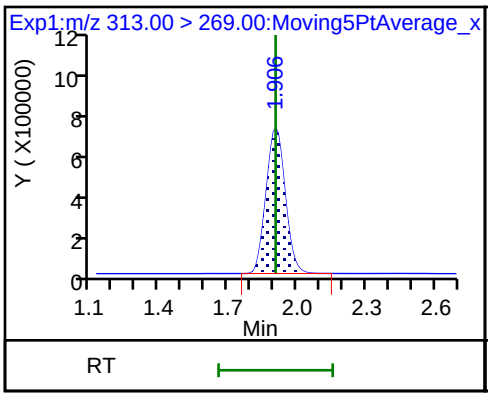
61 1H,1H,2H,2H-perfluorohexanesulfon



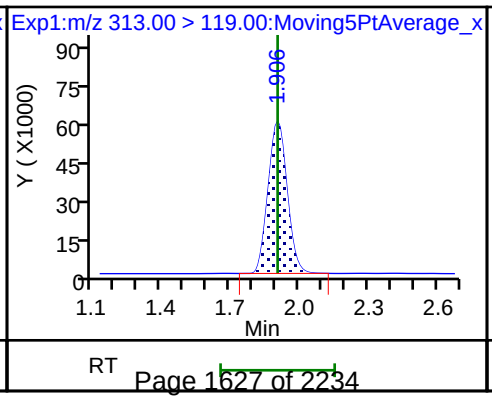
D 7 13C2 PFHxA



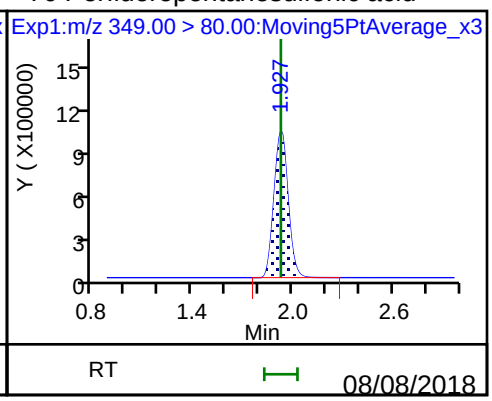
6 Perfluorohexanoic acid



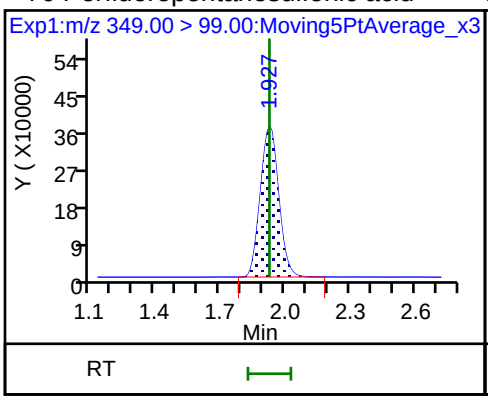
6 Perfluorohexanoic acid



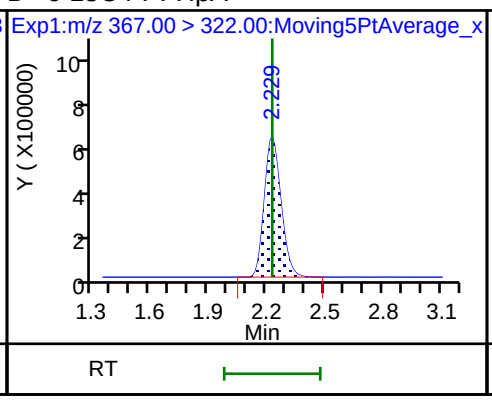
70 Perfluoropentanesulfonic acid



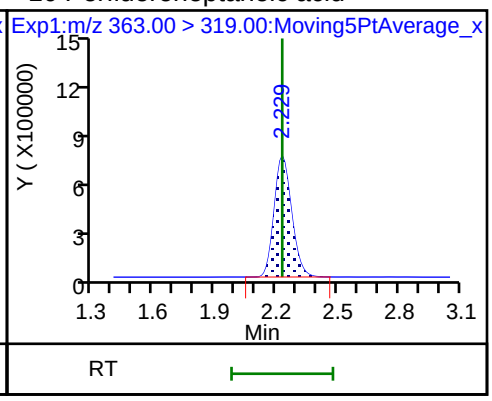
70 Perfluoropentanesulfonic acid



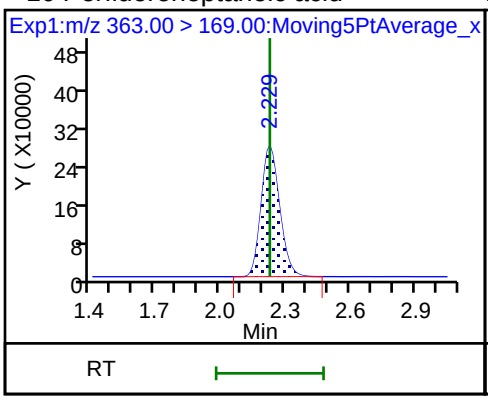
D 9 13C4-PFHpA



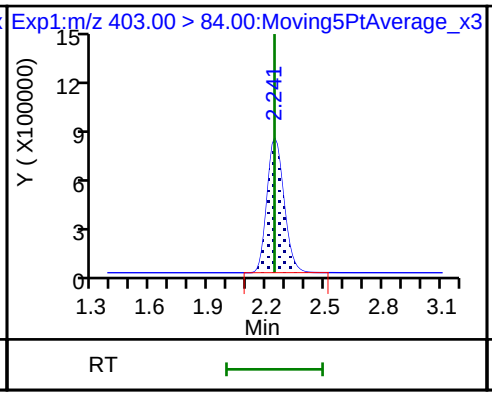
10 Perfluoroheptanoic acid



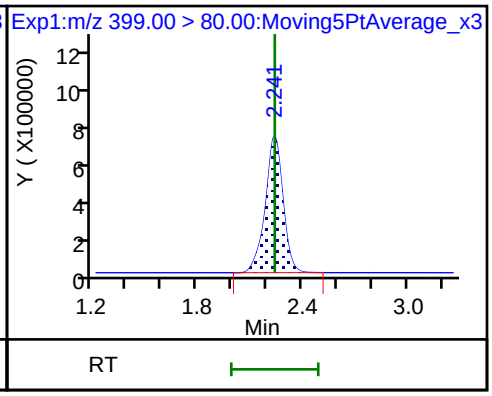
10 Perfluoroheptanoic acid



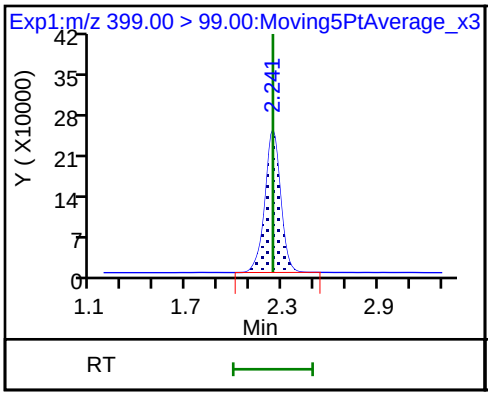
D 11 18O2 PFHxS



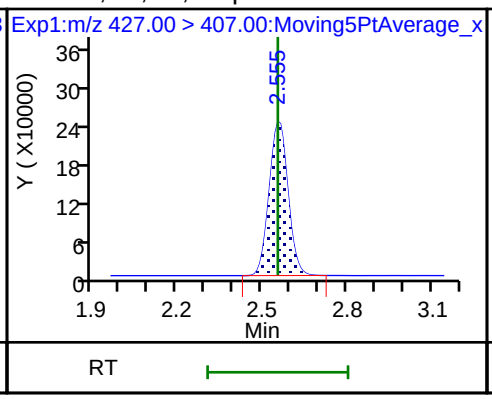
8 Perfluorohexanesulfonic acid



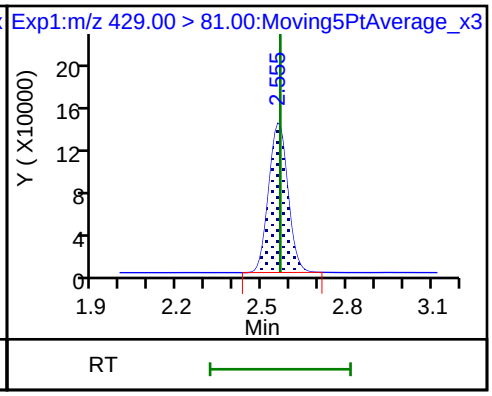
8 Perfluorohexanesulfonic acid



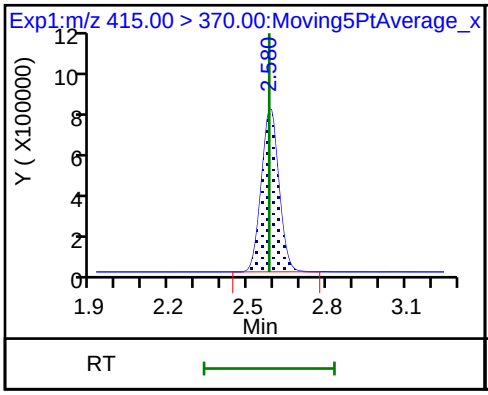
13 1H,1H,2H,2H-perfluorooctanesulfon



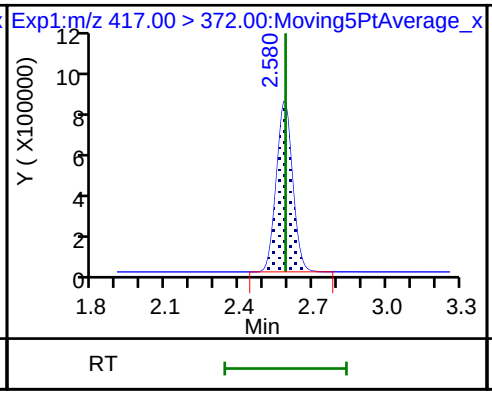
D 12 M2-6:2FTS



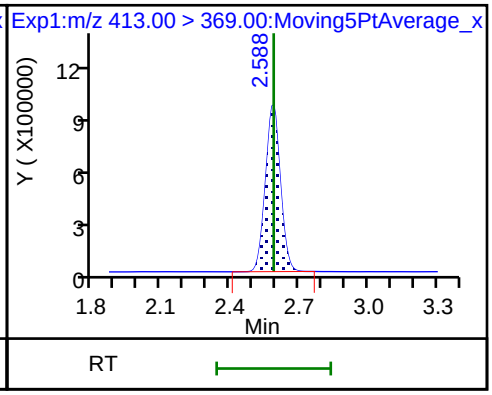
* 62 13C2-PFOA



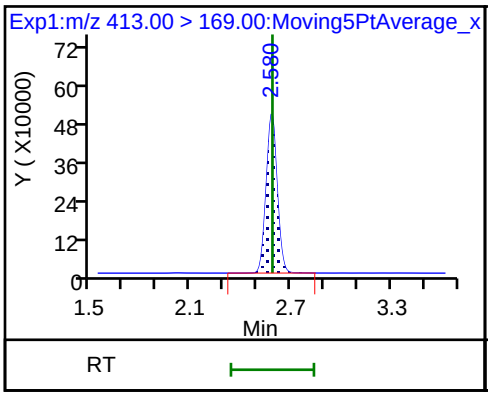
D 14 13C4 PFOA



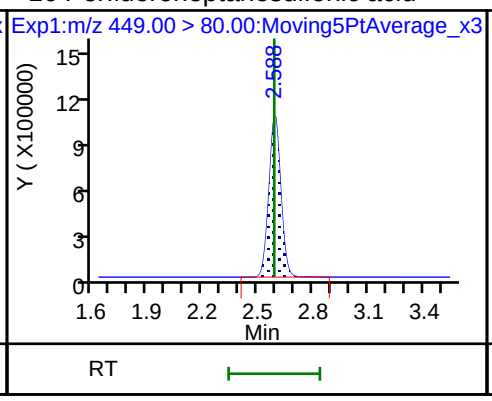
15 Perfluorooctanoic acid



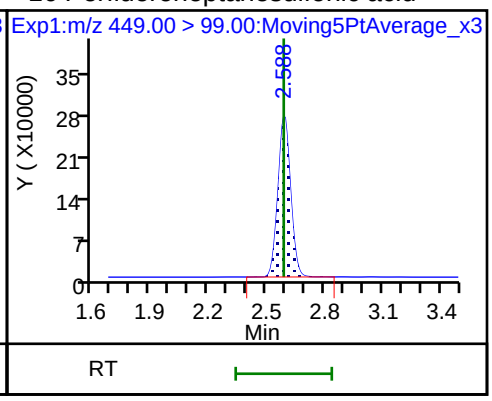
15 Perfluorooctanoic acid



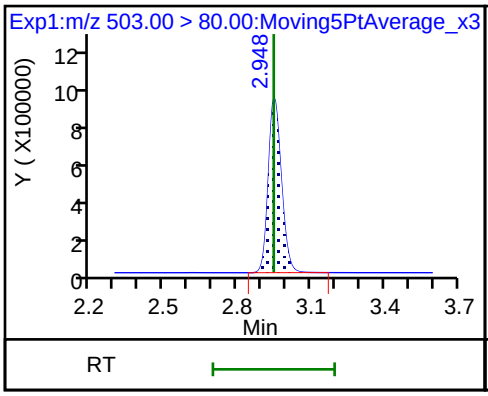
16 Perfluoroheptanesulfonic acid



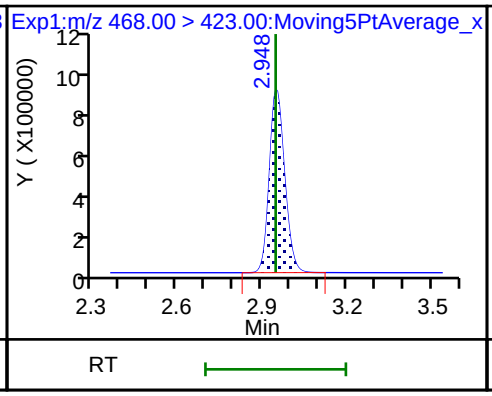
16 Perfluoroheptanesulfonic acid



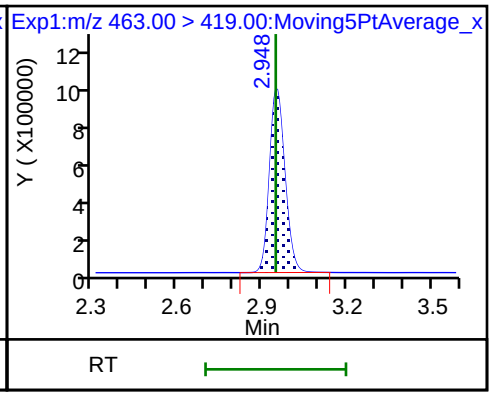
D 18 13C4 PFOS



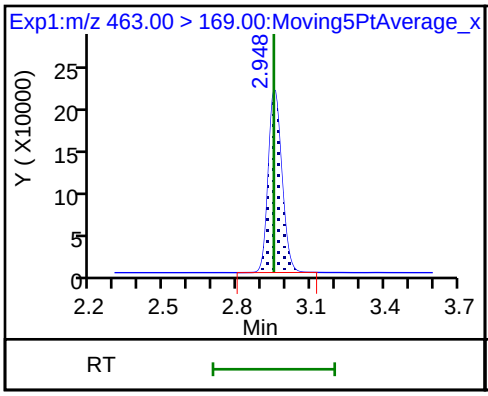
D 19 13C5 PFNA



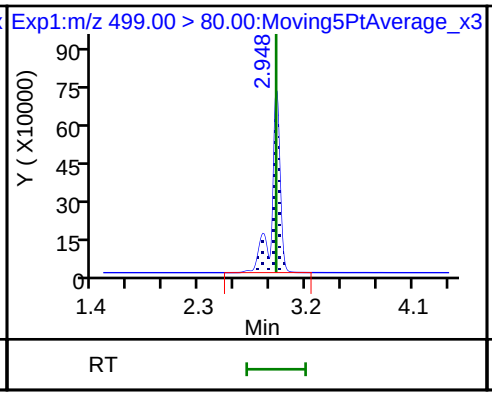
20 Perfluorononanoic acid



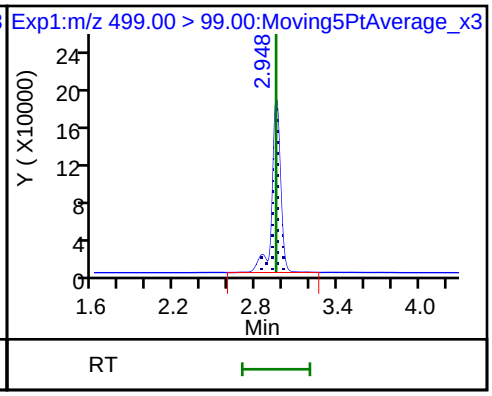
20 Perfluorononanoic acid



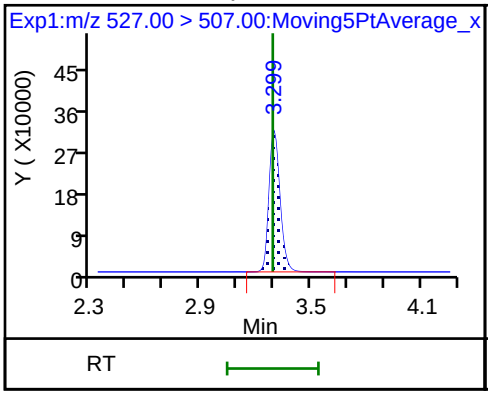
17 Perfluorooctane sulfonic acid



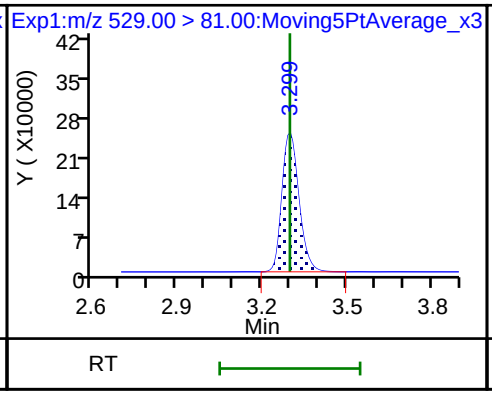
17 Perfluorooctane sulfonic acid



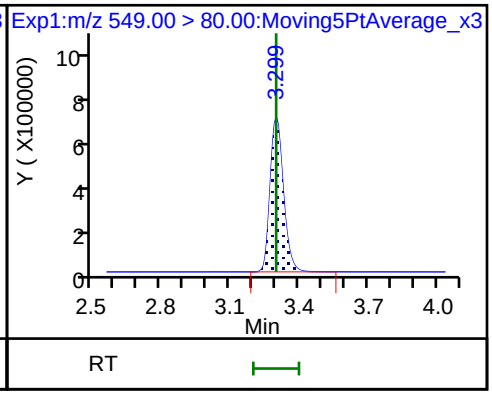
25 1H,1H,2H,2H-perfluorodecanesulfon



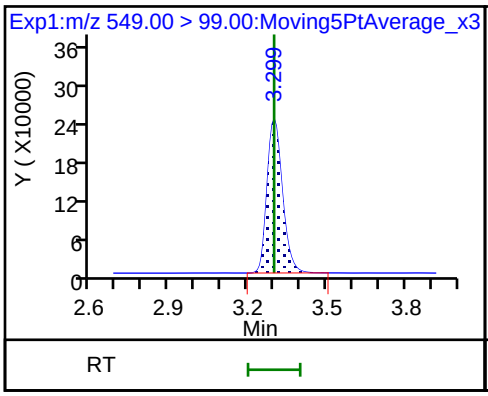
D 26 M2-8:2FTS



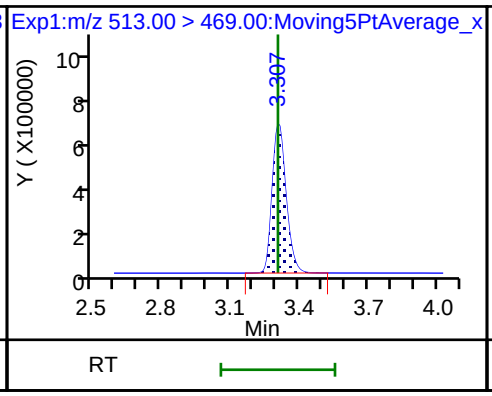
68 Perfluorononanesulfonic acid



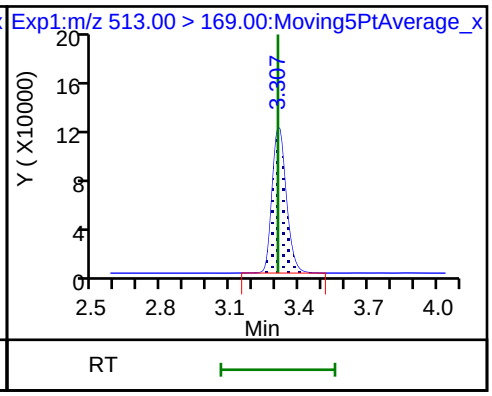
68 Perfluorononanesulfonic acid



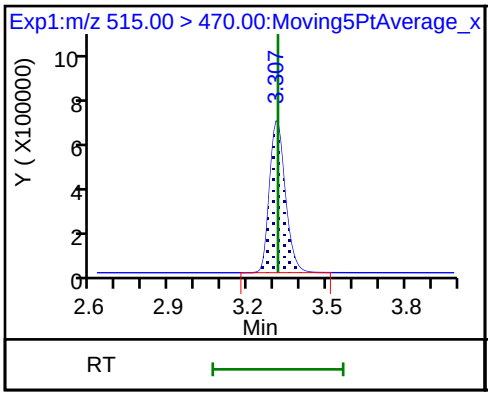
24 Perfluorodecanoic acid



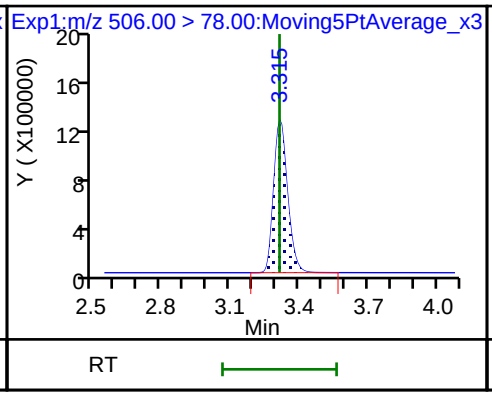
24 Perfluorodecanoic acid



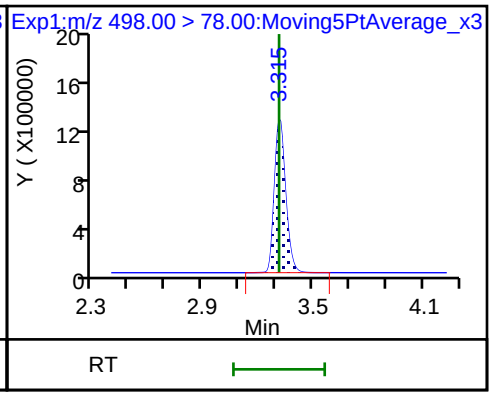
D 23 13C2 PFDA



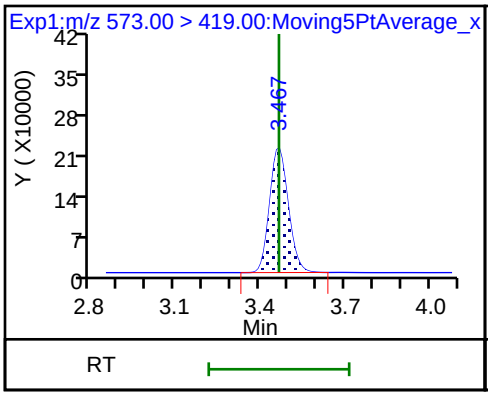
D 21 13C8 FOSA



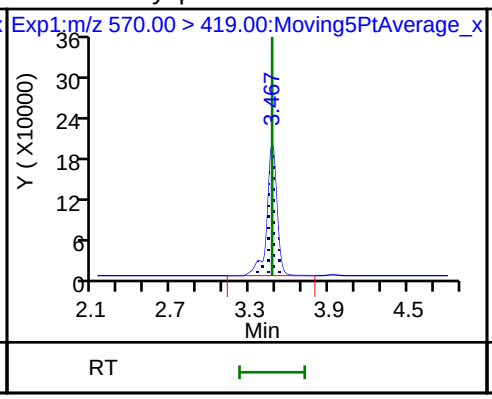
22 Perfluorooctane Sulfonamide



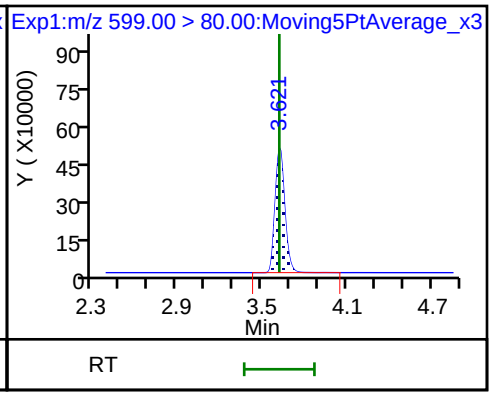
D 27 d3-NMeFOSAA



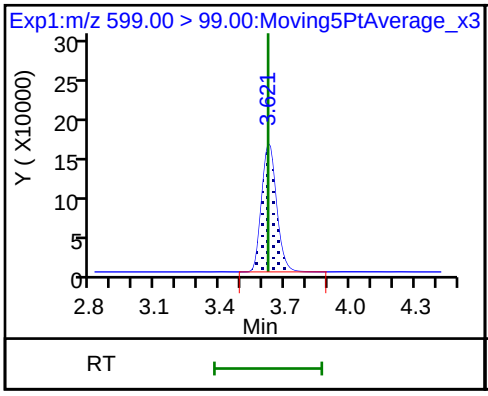
28 N-methyl perfluorooctane sulfonami



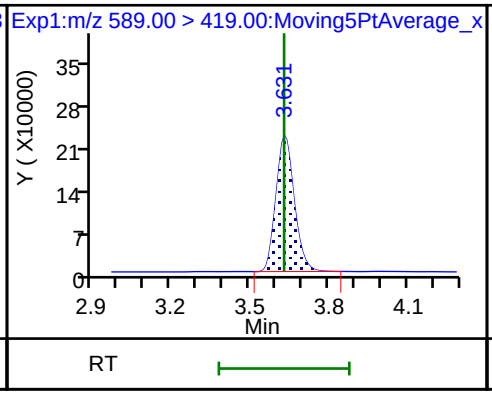
29 Perfluorodecane Sulfonic acid



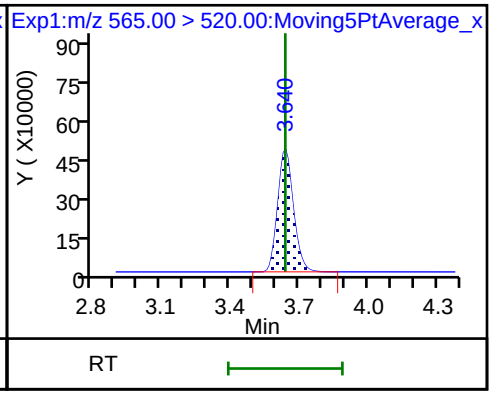
29 Perfluorodecane Sulfonic acid



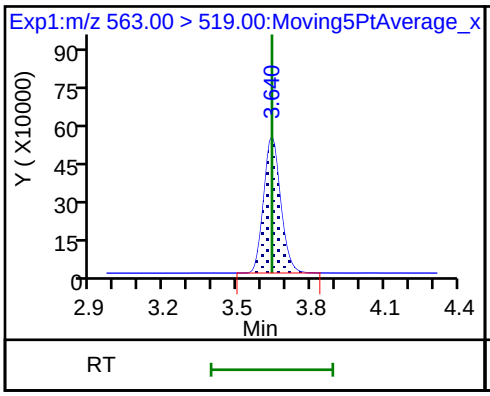
D 32 d5-NEtFOSAA



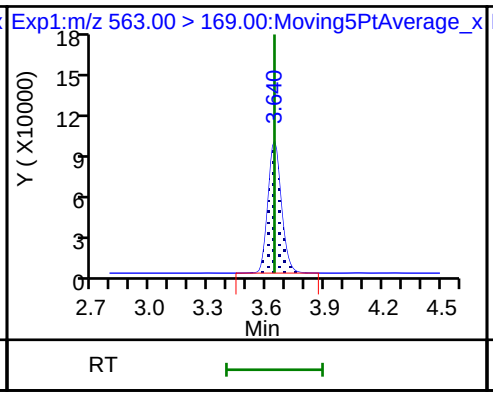
D 30 13C2 PFUnA



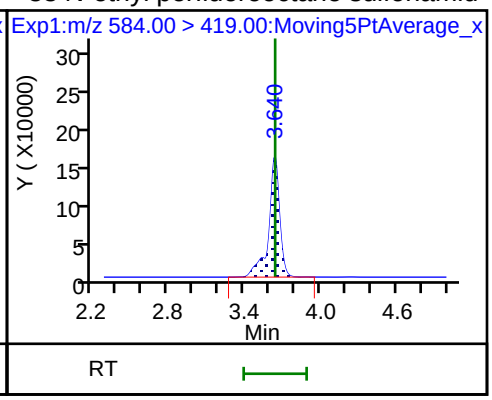
31 Perfluoroundecanoic acid



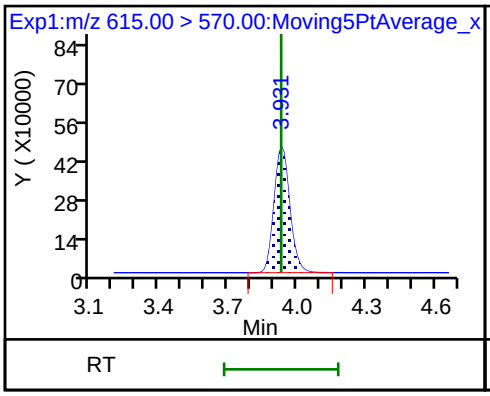
31 Perfluoroundecanoic acid



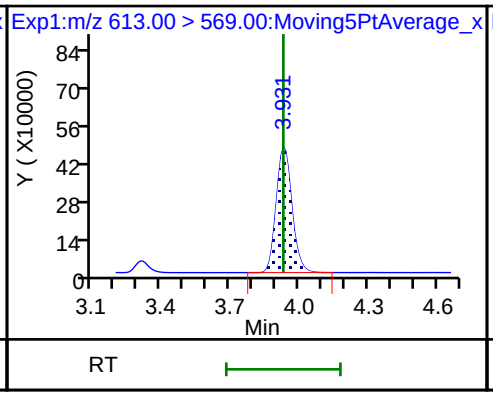
33 N-ethyl perfluorooctane sulfonamid



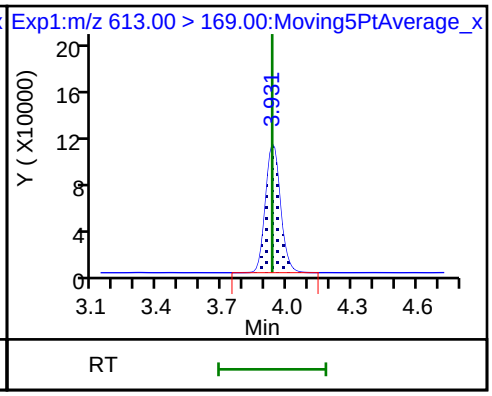
D 36 13C2 PFDoA



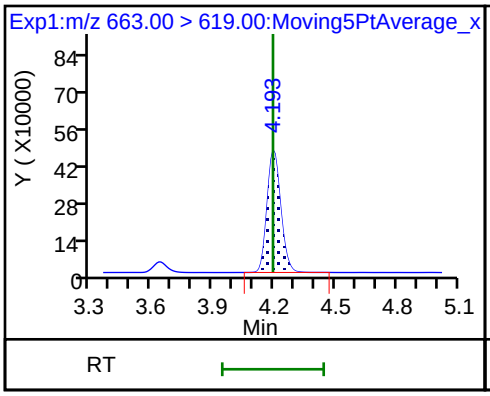
37 Perfluorododecanoic acid



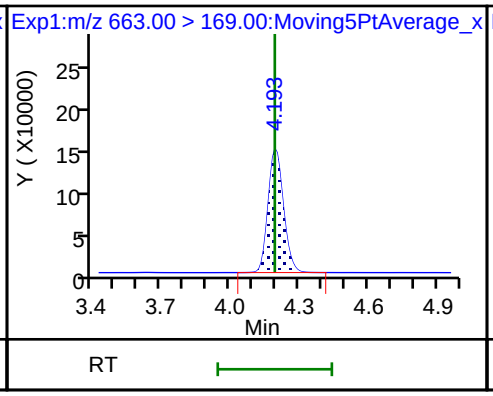
37 Perfluorododecanoic acid



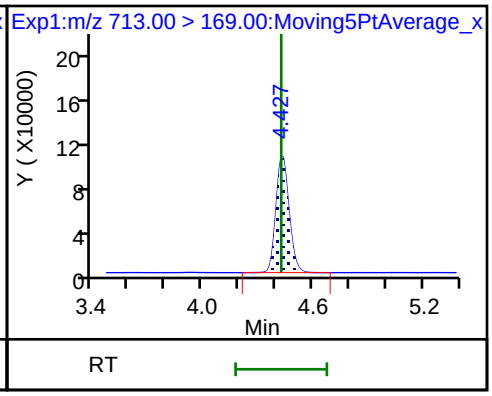
41 Perfluorotridecanoic acid



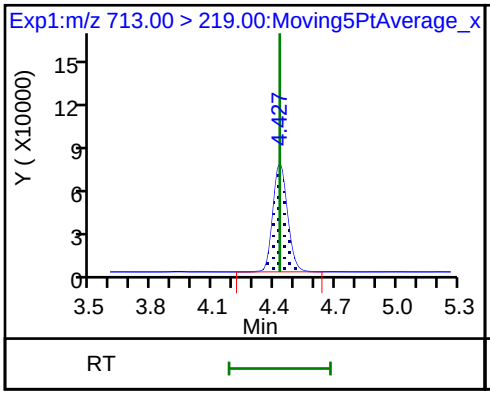
41 Perfluorotridecanoic acid



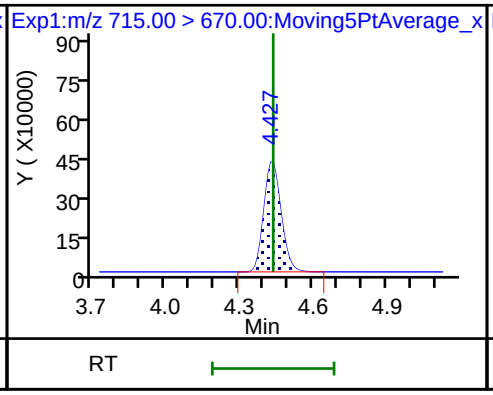
42 Perfluorotetradecanoic acid



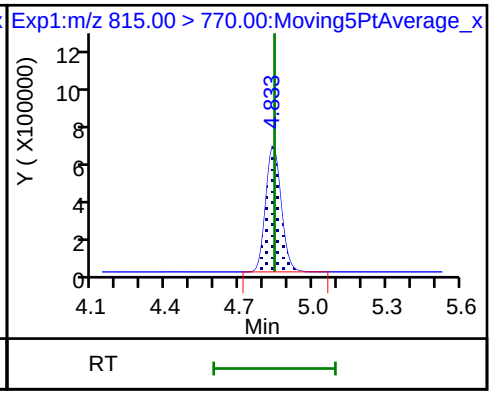
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236778/12 Calibration Date: 07/29/2018 02:27

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9697		0.987	1.00	-1.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.212		1.01	1.00	1.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	77.04		0.858	0.884	-3.0	30.0
4:2 FTS	AveID	17.09	11.98		0.655	0.934	-29.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.032		0.974	1.00	-2.6	30.0
Perfluoropentanesulfonic acid	AveID	71.24	69.50		0.915	0.938	-2.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.086		0.985	1.00	-1.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.068		0.833	0.910	-8.4	30.0
6:2 FTS	AveID	1.687	1.613		0.906	0.948	-4.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.331		0.916	0.952	-3.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.153		0.951	1.00	-5.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.068		0.935	1.00	-6.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.149		0.965	0.928	4.0	30.0
8:2 FTS	AveID	1.356	1.367		0.966	0.958	0.8	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7624		0.980	0.960	2.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.068		1.04	1.00	3.8	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.002		1.01	1.00	0.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.9720		0.986	1.00	-1.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6602		0.960	0.964	-0.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8729		0.936	1.00	-6.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.196		0.964	1.00	-3.6	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.030		0.952	1.00	-4.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.028		0.978	1.00	-2.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2390		0.953	1.00	-4.7	30.0
13C4 PFBA	Ave	1.159	1.283		2.77	2.50	10.6	30.0
13C5-PFPeA	Ave	0.8093	0.8949		2.76	2.50	10.6	30.0
13C3-PFBS	Ave	0.0212	0.0229		2.50	2.33	7.7	30.0
13C2 PFHxA	Ave	0.9490	0.9792		2.58	2.50	3.2	30.0
13C4-PFHpA	Ave	0.9779	0.9943		2.54	2.50	1.7	30.0
18O2 PFHxS	Ave	1.256	1.292		2.43	2.37	2.9	30.0
M2-6:2FTS	Ave	0.2731	0.1959		1.70	2.38	-28.3	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236778/12 Calibration Date: 07/29/2018 02:27

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9656		2.52	2.50	0.9	30.0
13C4 PFOS	Ave	0.8734	0.9328		2.55	2.39	6.8	30.0
13C5 PFNA	Ave	0.8250	0.8808		2.67	2.50	6.8	30.0
M2-8:2FTS	Ave	0.2848	0.3012		2.53	2.40	5.8	30.0
13C2 PFDA	Ave	0.6565	0.7368		2.81	2.50	12.2	30.0
13C8 FOSA	Ave	1.283	1.372		2.67	2.50	7.0	30.0
d3-NMeFOSAA	Ave	0.2169	0.2695		3.11	2.50	24.2	30.0
d5-NEtFOSAA	Ave	0.2280	0.2883		3.16	2.50	26.4	30.0
13C2 PFUnA	Ave	0.5287	0.6241		2.95	2.50	18.0	30.0
13C2 PFDoA	Ave	0.5026	0.5837		2.90	2.50	16.1	30.0
13C2-PFTeDA	Ave	0.4910	0.5458		2.78	2.50	11.2	30.0
13C2-PFHxDA	Ave	0.7454	0.6705		2.25	2.50	-10.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_025.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 29-Jul-2018 02:27:12 ALS Bottle#: 30 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:23:03 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:23:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.396	1.396	0.0	1.000	1864675	0.9867		98.7	899	
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.397	-0.001	0.541	4807131	2.77		111	77274	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.633	0.007	0.636	3354299	2.76		111	62735	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.640	0.0	1.000	1626036	1.01		101	829	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.667	-0.001	0.646	79713	2.50		108	632	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.675	0.0	1.005	2334832	0.8578		97.0	7308	
298.90 > 99.00	1.675	1.675	0.0	1.005	994706		2.35(1.25-3.74)		4983	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.875	0.001	0.727	381508	NC			4562	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.876	0.0	1.126	383741	0.6548		70.1	14111	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.905	0.0	0.738	3670286	2.58		103	80044	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.905	0.0	1.000	1515141	0.9737		97.4	5675	
313.00 > 119.00	1.905	1.905	0.0	1.000	135349		11.19(5.03-15.10)		3372	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.927	0.0	1.157	2235210	0.9152		97.6	31673	
349.00 > 99.00	1.927	1.927	0.0	1.157	819365		2.73(1.36-4.07)		8119	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.002	0.001	0.776	304180	NC			8972	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.003	0.0	1.000	298281	NC			1463	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.864	3727015	2.54		102	57092	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.229	0.0	1.000	1619426	0.9853		98.5	3787	
363.00 > 169.00	2.229	2.229	0.0	1.000	603530		2.68(1.13-3.40)		7298	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.868	4581743	2.43		103	58203	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.241	0.0	1.000	1883376	0.8333		91.6	14045	
399.00 > 99.00	2.241	2.241	0.0	1.000	637964		2.95(1.50-4.49)		2070	
65 ADONA										
377.00 > 251.00	2.267	2.267	0.0	0.769	4329152	NC			54547	
377.00 > 85.00	2.267	2.267	0.0	0.769	2562834		1.69(0.84-2.53)		11976	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.555	0.0	1.000	449065	0.9062		95.6	7505	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.564	-0.009	0.990	697642	1.70		71.7	10069	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.580	0.0		3748252	2.50			42932	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	3619466	2.52		101	56534	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.588	0.0	1.003	1671337	0.9512		95.0	1832	
413.00 > 169.00	2.580	2.588	-0.008	1.000	886034		1.89(0.84-2.52)		6077	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.588	0.0	0.878	1772572	0.9162		96.2	21834	
449.00 > 99.00	2.588	2.588	0.0	0.878	481323		3.68(1.94-5.82)		5318	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.947	0.001	1.142	3342551	2.55		107	30383	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.947	0.001	1.142	3301307	2.67		107	52597	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.948	0.0	1.000	1410347	0.9354		93.5	3412	
463.00 > 169.00	2.948	2.948	0.0	1.000	340680		4.14(1.90-5.69)		10017	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.948	0.0	1.000	1490827	0.9647		104	6694	
499.00 > 99.00	2.948	2.948	0.0	1.000	346836		4.30(2.31-6.93)		2923	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.164	0.0	1.073	2314008	NC			19767	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.291	3.291	0.0	1.000	591446	0.9661		101	15898	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.298	-0.007	1.276	1081513	2.53		106	14545	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.299	0.0	1.119	1023552	0.9799		102	9406	
549.00 > 99.00	3.299	3.299	0.0	1.119	385590		2.65(1.33-3.97)		4772	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.307	0.0	1.000	1179350	1.04		104	6951	
513.00 > 169.00	3.307	3.307	0.0	1.000	199490		5.91(2.36-7.09)		6866	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.314	-0.007	1.282	2761619	2.81		112	41717	
D 21 13C8 FOSA										
506.00 > 78.00	3.314	3.314	0.0	1.285	5143739	2.67		107	37349	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.314	3.314	0.0	1.000	2061637	1.01		101	11717	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.466	-0.008	1.340	1010264	3.11		124	27306	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.467	0.0	1.003	392786	0.9863		98.6	3615	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.621	0.0	1.228	890039	0.9597		99.5	7826	
599.00 > 99.00	3.621	3.621	0.0	1.228	304277		2.93(1.39-4.16)		7119	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.630	3.629	0.001	1.407	1080479	3.16		126	3832	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.639	0.001	1.411	2339317	2.95		118	48855	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.640	3.640	0.0	1.000	1119478	0.9641		96.4	3758	
563.00 > 169.00	3.640	3.640	0.0	1.000	191490		5.85(2.12-6.36)		8134	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.640	0.0	1.003	377239	0.9356		93.6	9223	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.795	0.0	1.287	3659825	NC			54509	
D 36 13C2 PFDoA										
615.00 > 570.00	3.930	3.930	0.0	1.523	2187878	2.90		116	19331	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.930	3.930	0.0	1.000	901527	0.9521		95.2	281	
613.00 > 169.00	3.930	3.930	0.0	1.000	215659		4.18(2.13-6.40)		4109	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.193	0.0	1.067	899418	0.9784		97.8	267	
663.00 > 169.00	4.193	4.193	0.0	1.067	258607		3.48(1.25-3.76)		3504	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.426	0.0	1.000	195566	0.9534		95.3	2653	
713.00 > 219.00	4.426	4.426	0.0	1.000	145624		1.34(0.71-2.13)		2954	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.437	-0.011	1.716	2045620	2.78		111	11410	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	987613	NC			185	
813.00 > 169.00	4.833	4.833	0.0	1.000	169830		5.82(2.86-8.58)		1304	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.873	2513096	2.25		89.9	5949	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.173	0.0	1.070	1098462	NC			323	
913.00 > 169.00	5.173	5.173	0.0	1.070	135242		8.12(3.83-11.48)		898	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 15:23:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_025.d

Injection Date: 29-Jul-2018 02:27:12 Instrument ID: A8_N

Lims ID: CCV L4

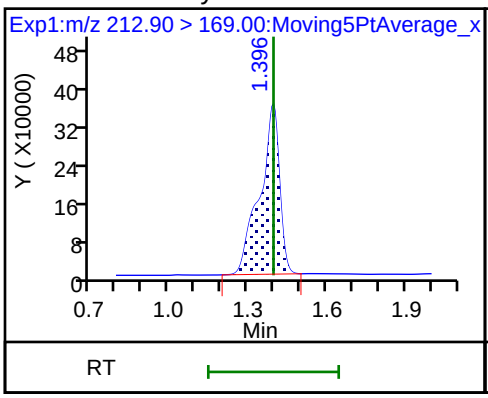
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 30 Worklist Smp#: 12

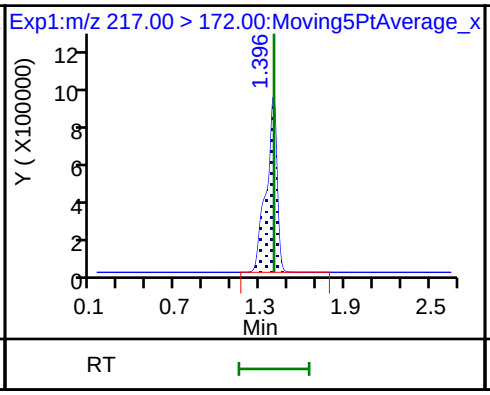
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

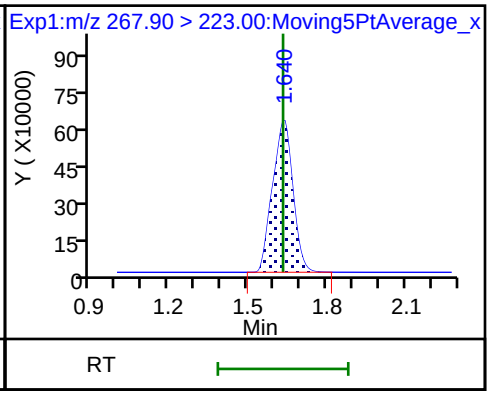
2 Perfluorobutyric acid



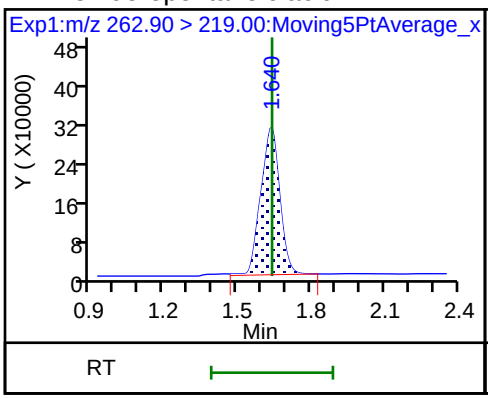
D 1 13C4 PFBA



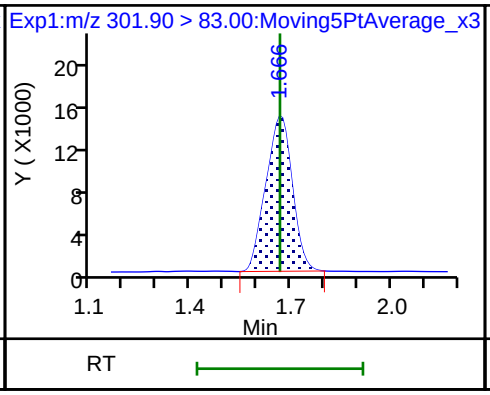
D 3 13C5-PFPeA



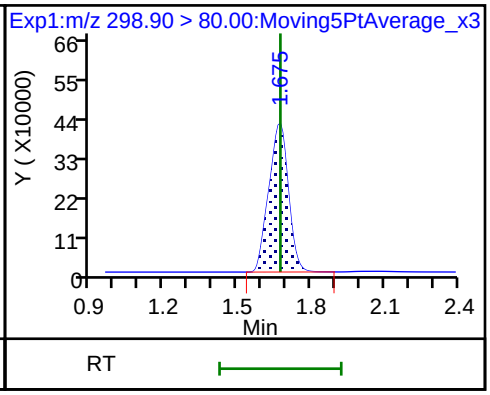
4 Perfluoropentanoic acid



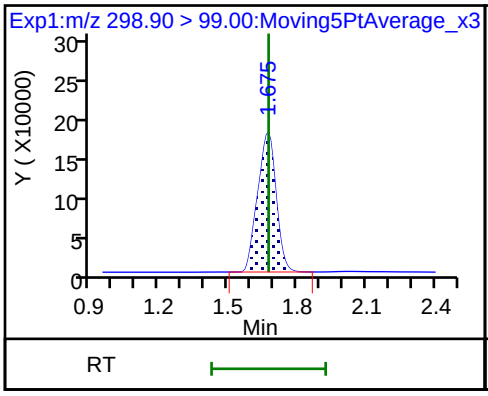
D 47 13C3-PFBS



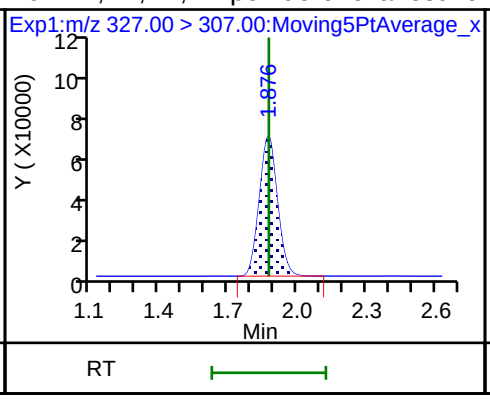
5 Perfluorobutanesulfonic acid



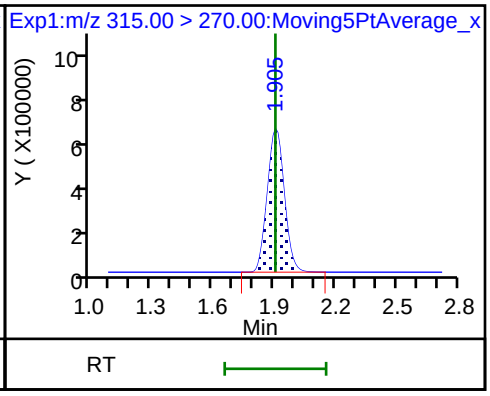
5 Perfluorobutanesulfonic acid



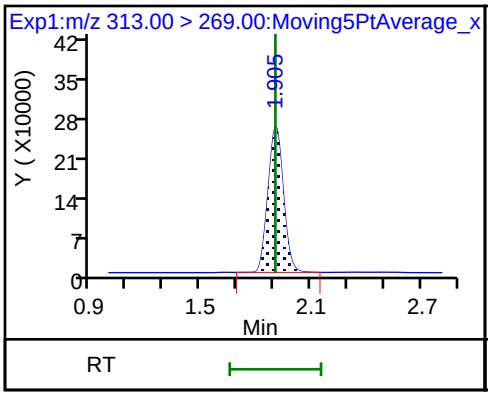
61 1H,1H,2H,2H-perfluorohexanesulfon



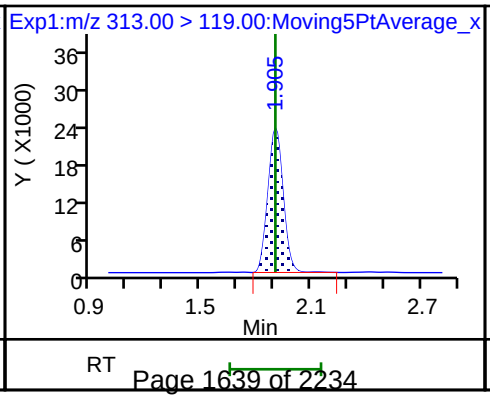
D 7 13C2 PFHxA



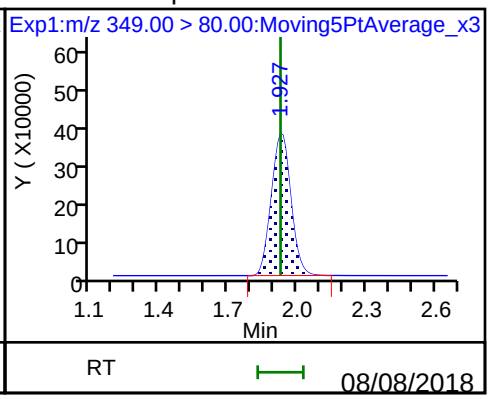
6 Perfluorohexanoic acid



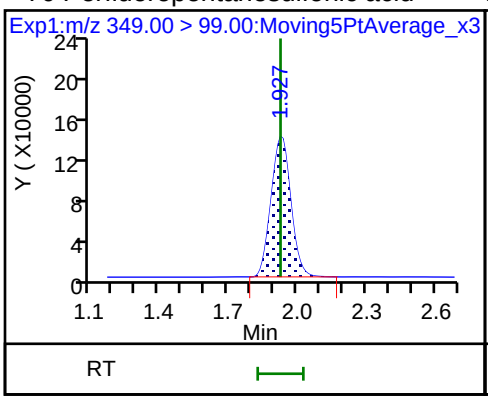
6 Perfluorohexanoic acid



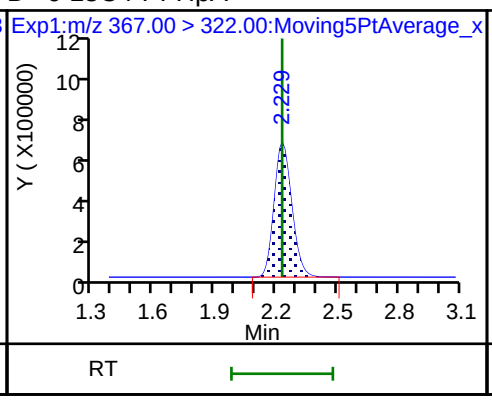
70 Perfluoropentanesulfonic acid



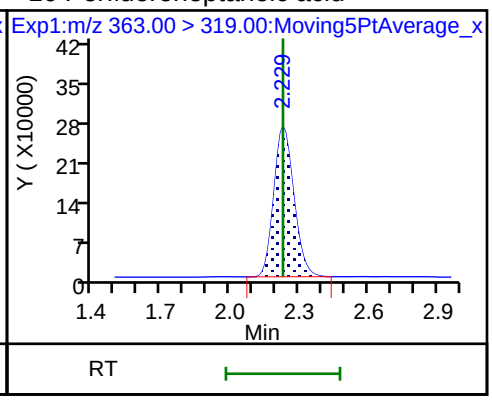
70 Perfluoropentanesulfonic acid



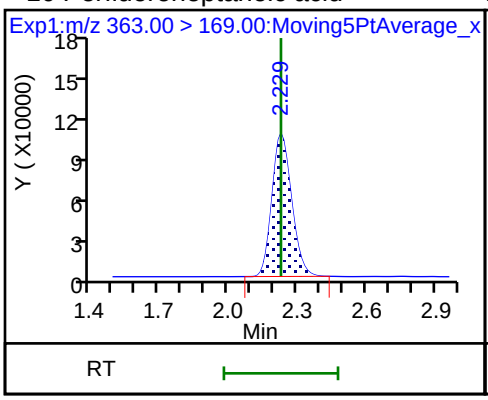
D 9 13C4-PFHpA



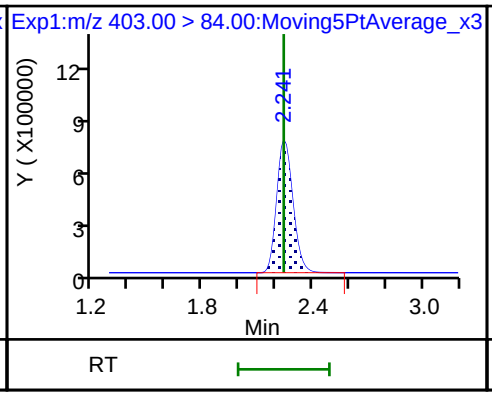
10 Perfluoroheptanoic acid



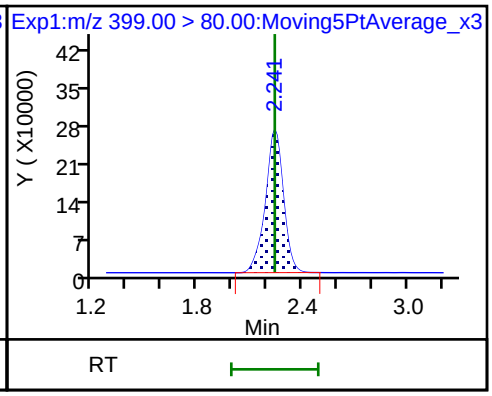
10 Perfluoroheptanoic acid



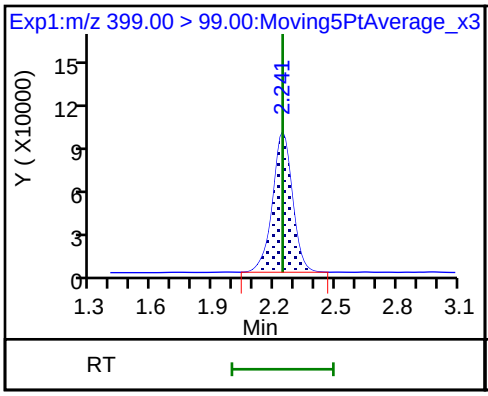
D 11 18O2 PFHxS



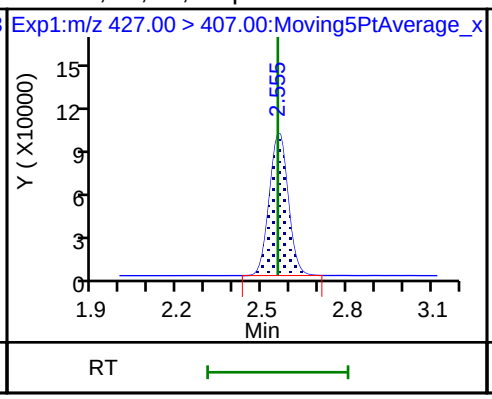
8 Perfluorohexanesulfonic acid



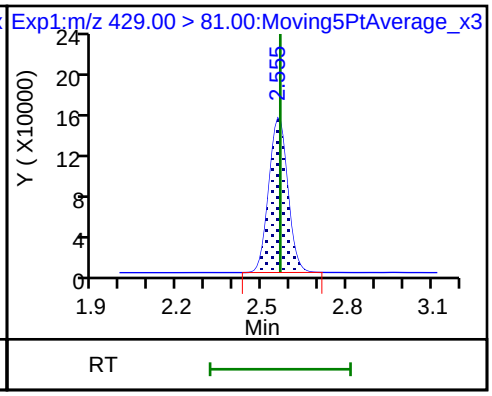
8 Perfluorohexanesulfonic acid



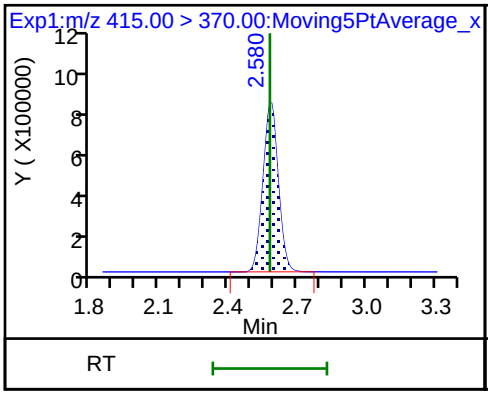
13 1H,1H,2H,2H-perfluorooctanesulfon



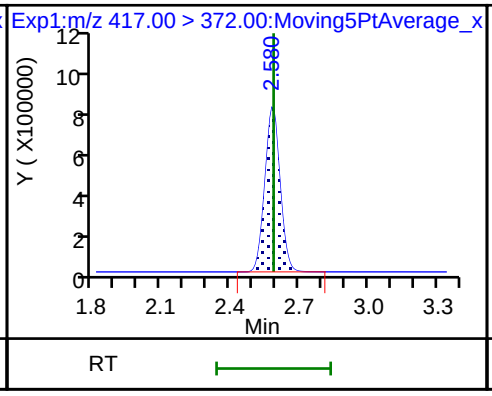
D 12 M2-6:2FTS



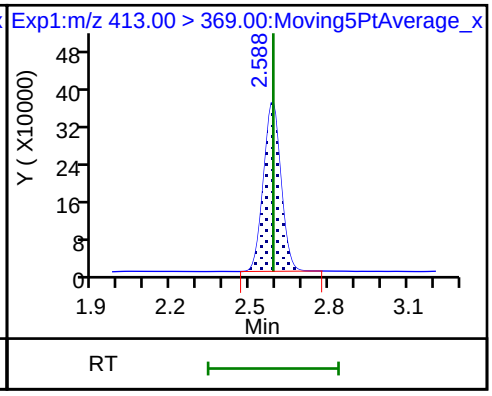
* 62 13C2-PFOA



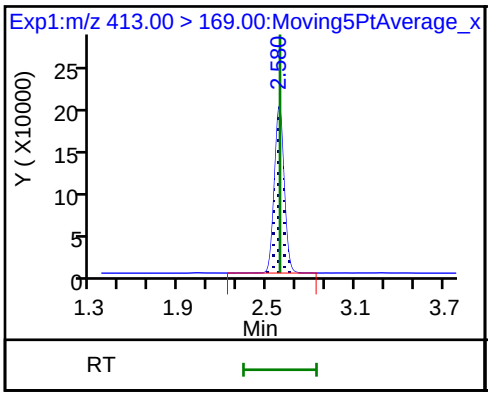
D 14 13C4 PFOA



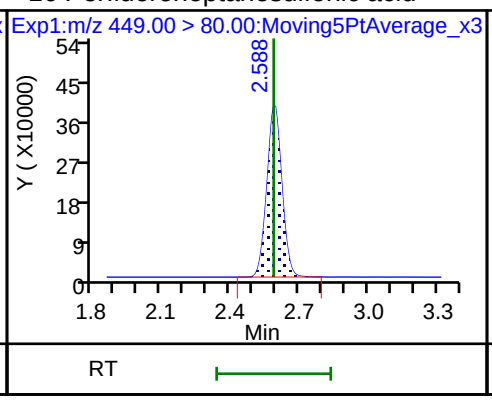
15 Perfluorooctanoic acid



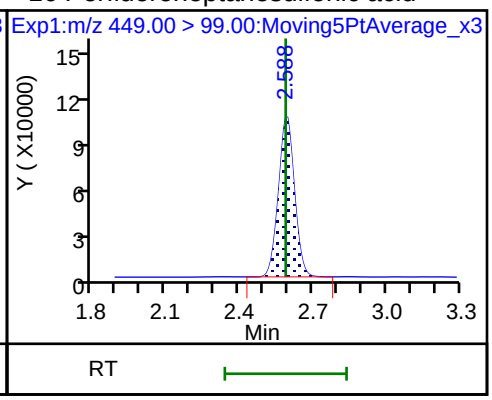
15 Perfluorooctanoic acid



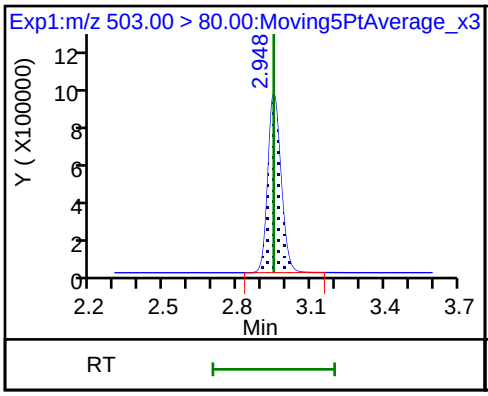
16 Perfluoroheptanesulfonic acid



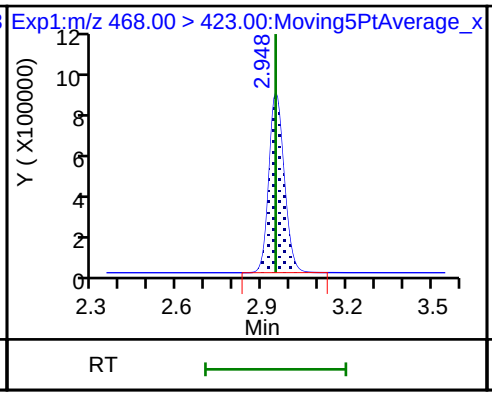
16 Perfluoroheptanesulfonic acid



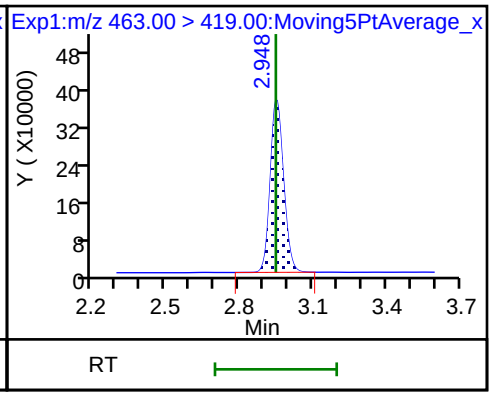
D 18 13C4 PFOS



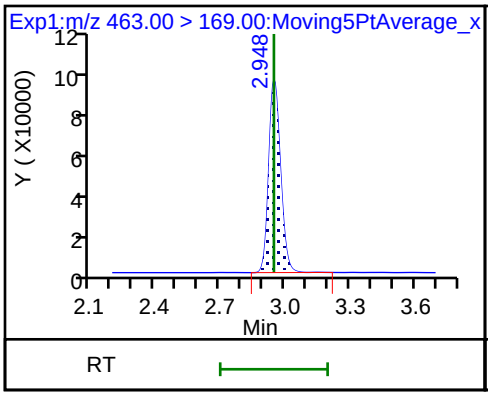
D 19 13C5 PFNA



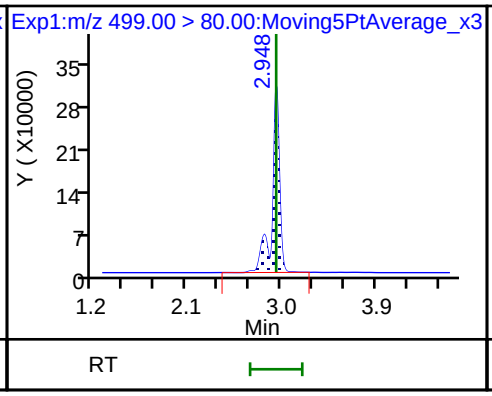
20 Perfluorononanoic acid



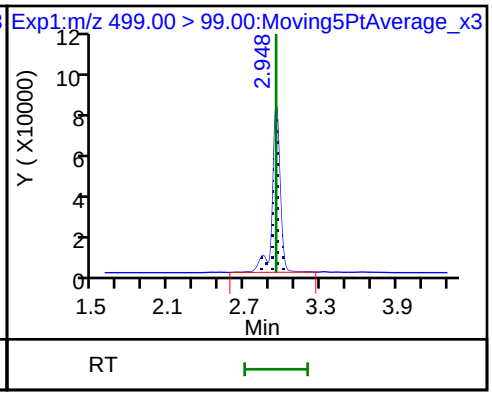
20 Perfluorononanoic acid



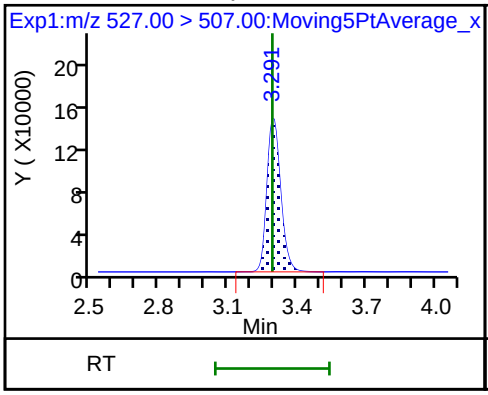
17 Perfluorooctane sulfonic acid



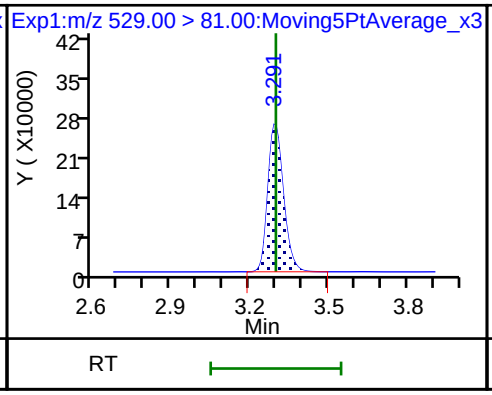
17 Perfluorooctane sulfonic acid



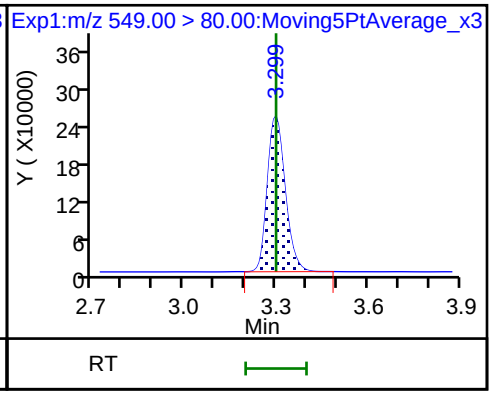
25 1H,1H,2H,2H-perfluorodecanesulfon



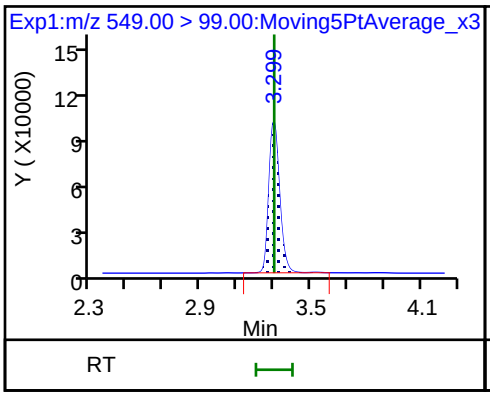
D 26 M2-8:2FTS



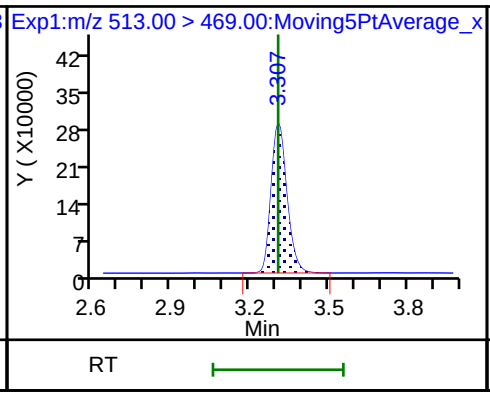
68 Perfluorononanesulfonic acid



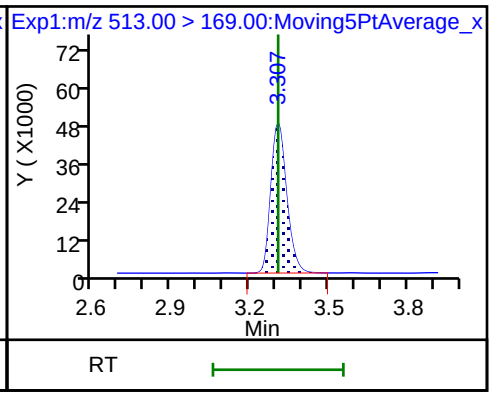
68 Perfluorononanesulfonic acid



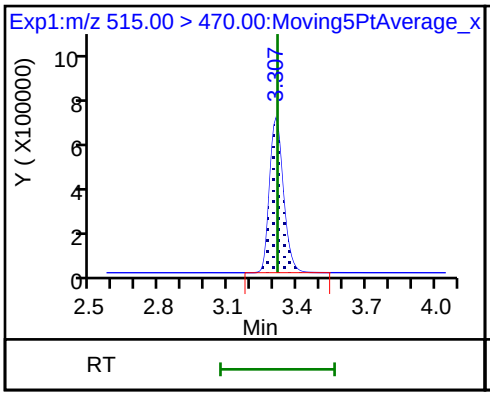
24 Perfluorodecanoic acid



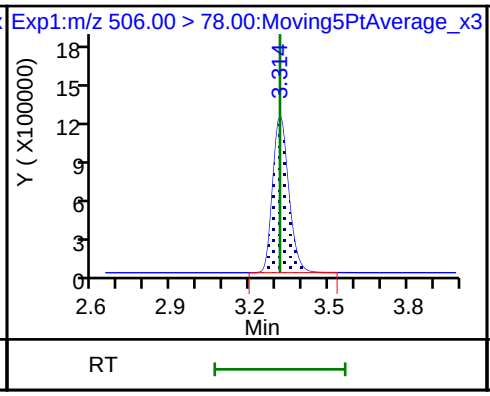
24 Perfluorodecanoic acid



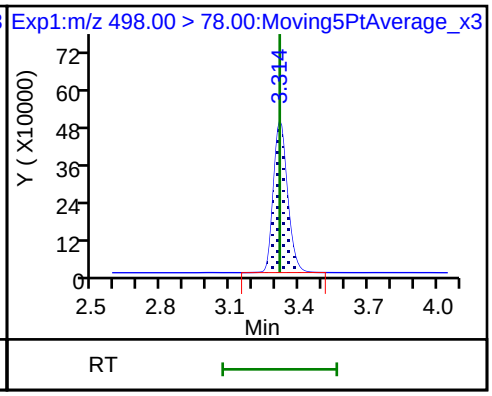
D 23 13C2 PFDA



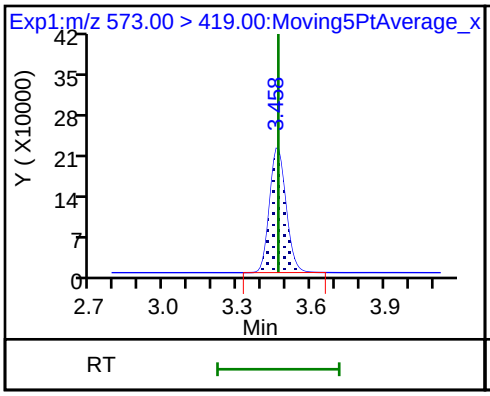
D 21 13C8 FOSA



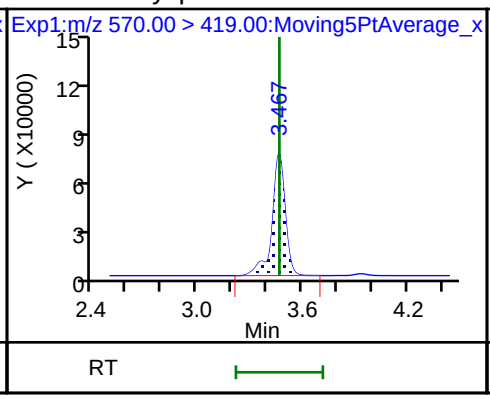
22 Perfluorooctane Sulfonamide



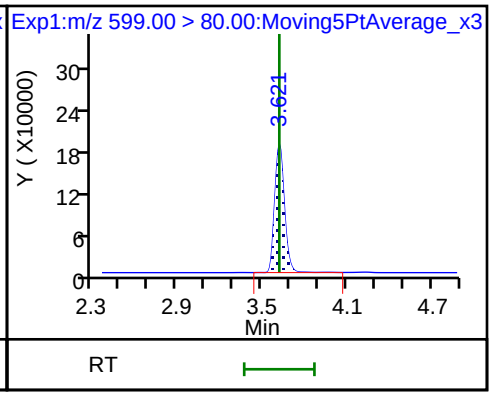
D 27 d3-NMeFOSAA



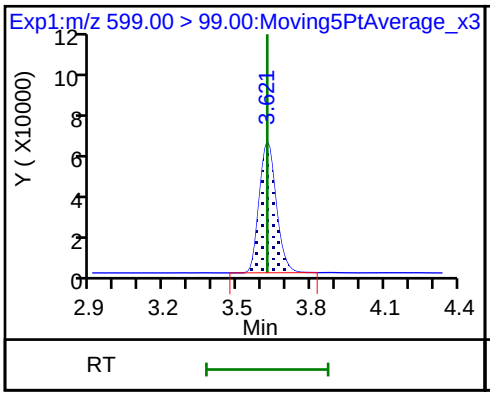
28 N-methyl perfluorooctane sulfonami



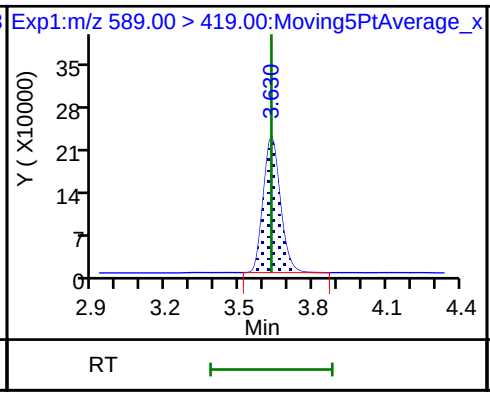
29 Perfluorodecane Sulfonic acid



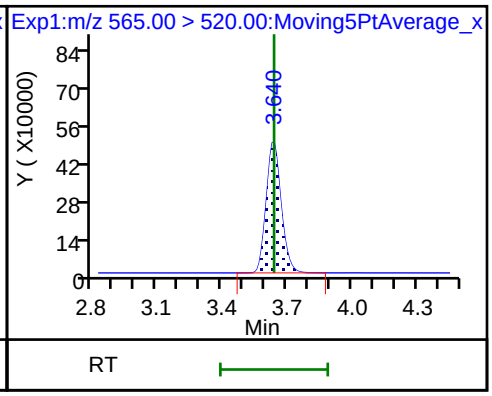
29 Perfluorodecane Sulfonic acid



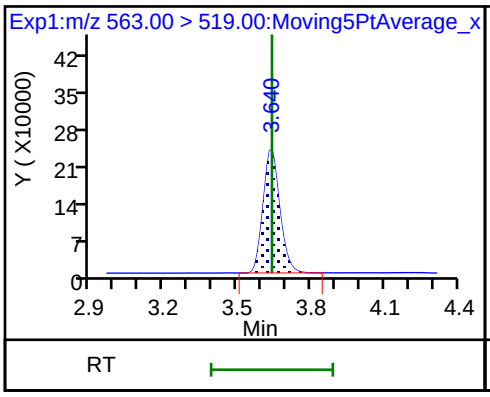
D 32 d5-NEtFOSAA



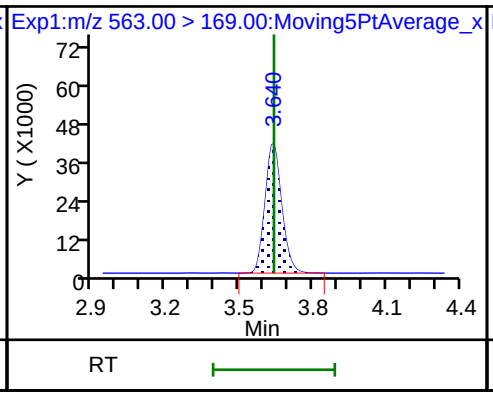
D 30 13C2 PFUnA



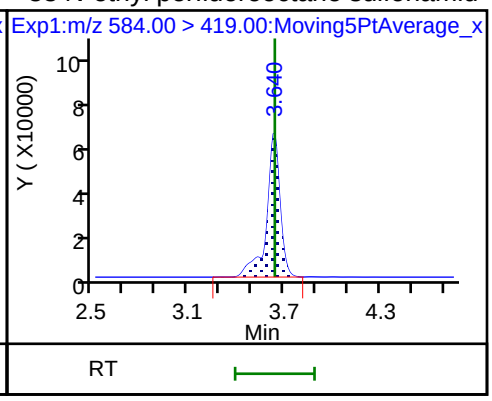
31 Perfluoroundecanoic acid



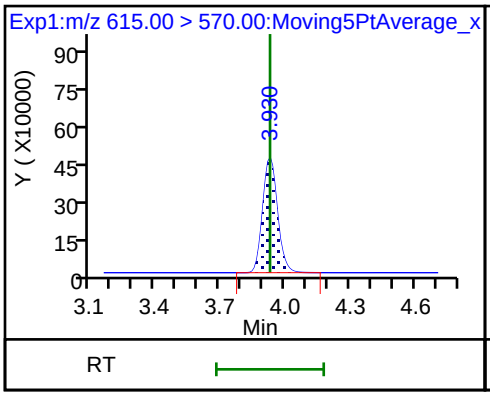
31 Perfluoroundecanoic acid



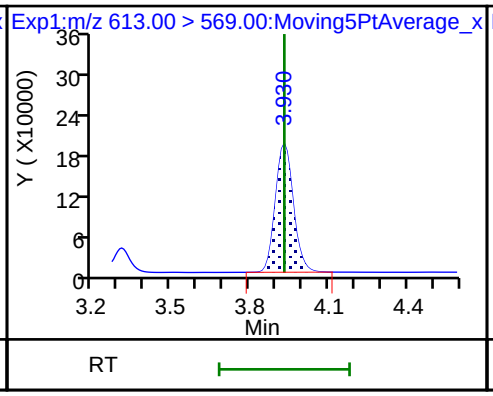
33 N-ethyl perfluorooctane sulfonamid



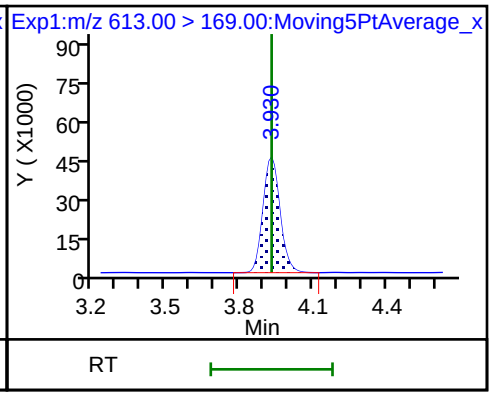
D 36 13C2 PFDoA



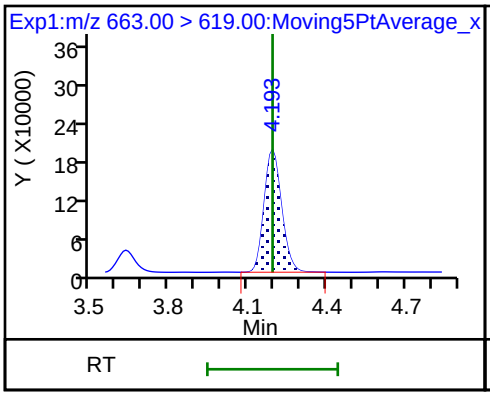
37 Perfluorododecanoic acid



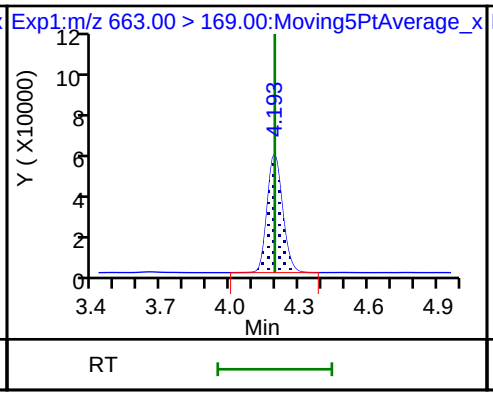
37 Perfluorododecanoic acid



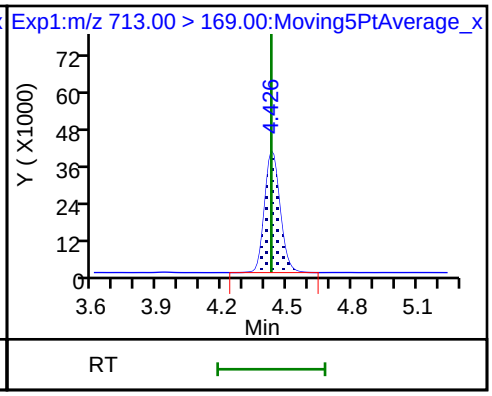
41 Perfluorotridecanoic acid



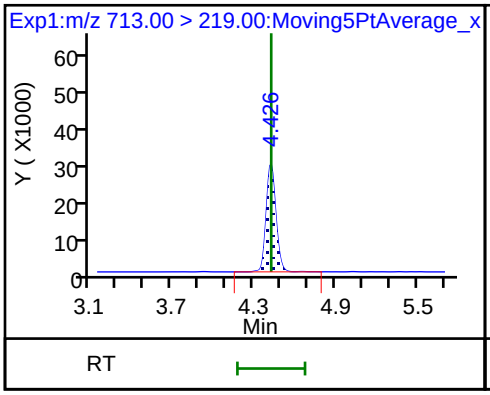
41 Perfluorotridecanoic acid



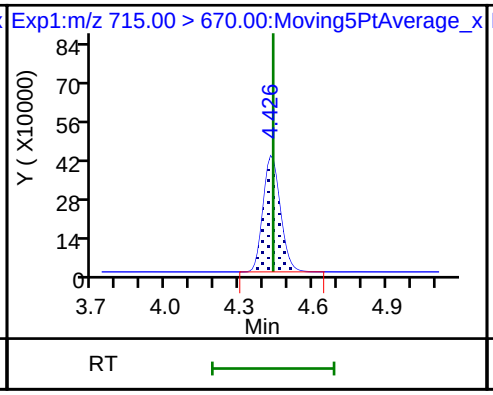
42 Perfluorotetradecanoic acid



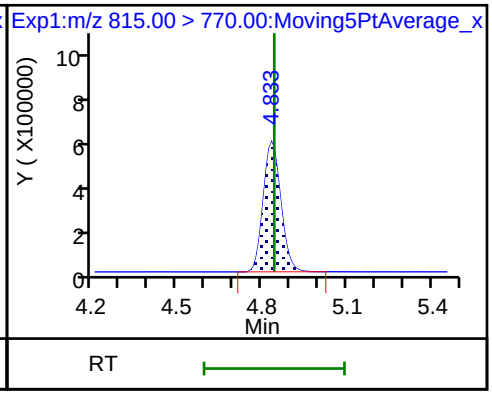
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236778/23 Calibration Date: 07/29/2018 03:53

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_036.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9934		2.53	2.50	1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.202		2.51	2.50	0.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	79.44		2.21	2.21	0.0	30.0
4:2 FTS	AveID	17.09	11.23		1.53	2.34	-34.3*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.051		2.48	2.50	-0.8	30.0
Perfluoropentanesulfonic acid	AveID	71.24	69.94		2.30	2.35	-1.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.082		2.45	2.50	-1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.107		2.16	2.28	-5.1	30.0
6:2 FTS	AveID	1.687	1.505		2.11	2.37	-10.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.196		2.47	2.50	-1.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.412		2.43	2.38	2.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.064		2.33	2.50	-6.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.107		2.32	2.32	0.2	30.0
8:2 FTS	AveID	1.356	1.330		2.35	2.40	-1.9	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7707		2.48	2.40	3.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.064		2.59	2.50	3.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.037		2.61	2.50	4.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.070		2.71	2.50	8.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6903		2.51	2.41	4.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.9155		2.45	2.50	-1.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.211		2.44	2.50	-2.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.077		2.49	2.50	-0.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.066		2.54	2.50	1.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2592		2.58	2.50	3.4	30.0
13C4 PFBA	Ave	1.159	1.239		2.67	2.50	6.8	30.0
13C5-PFPeA	Ave	0.8093	0.8612		2.66	2.50	6.4	30.0
13C3-PFBS	Ave	0.0212	0.0225		2.47	2.33	6.1	30.0
13C2 PFHxA	Ave	0.9490	0.9203		2.42	2.50	-3.0	30.0
13C4-PFHpA	Ave	0.9779	0.9674		2.47	2.50	-1.1	30.0
18O2 PFHxS	Ave	1.256	1.253		2.36	2.37	-0.3	30.0
M2-6:2FTS	Ave	0.2731	0.1898		1.65	2.38	-30.5*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236778/23 Calibration Date: 07/29/2018 03:53

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_036.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9302		2.43	2.50	-2.8	30.0
13C4 PFOS	Ave	0.8734	0.8961		2.45	2.39	2.6	30.0
13C5 PFNA	Ave	0.8250	0.8409		2.55	2.50	1.9	30.0
M2-8:2FTS	Ave	0.2848	0.2883		2.42	2.40	1.2	30.0
13C2 PFDA	Ave	0.6565	0.7100		2.70	2.50	8.2	30.0
13C8 FOSA	Ave	1.283	1.331		2.59	2.50	3.8	30.0
d3-NMeFOSAA	Ave	0.2169	0.2596		2.99	2.50	19.7	30.0
d5-NEtFOSAA	Ave	0.2280	0.2745		3.01	2.50	20.4	30.0
13C2 PFUnA	Ave	0.5287	0.5718		2.70	2.50	8.1	30.0
13C2 PFDoA	Ave	0.5026	0.5624		2.80	2.50	11.9	30.0
13C2-PFTeDA	Ave	0.4910	0.5336		2.72	2.50	8.7	30.0
13C2-PFHxDA	Ave	0.7454	0.7759		2.60	2.50	4.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_036.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 29-Jul-2018 03:53:19 ALS Bottle#: 31 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:36:01 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:36:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.403	1.396	0.007	1.004	4906125	2.53		101	2426	
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.397	0.0	0.540	4938899	2.67		107	71635	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.633	0.008	0.635	3434088	2.66		106	54343	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.640	0.001	1.000	4126193	2.51		100	1976	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.667	0.009	0.648	83500	2.47		106	683	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.675	0.002	1.000	6304944	2.21		100	18092	
298.90 > 99.00	1.676	1.675	0.002	1.000	2549391		2.47(1.25-3.74)		11134	
D 60 M2-4:2FTS										
329.00 > 81.00	1.877	1.875	0.002	0.726	359336	NC			5772	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.876	0.001	1.120	941575	1.53		65.7	41393	
D 7 13C2 PFHxA										
315.00 > 270.00	1.913	1.905	0.008	0.740	3670066	2.42		97.0	70428	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.913	1.905	0.008	1.000	3857486	2.48		99.2	12467	
313.00 > 119.00	1.913	1.905	0.008	1.000	348201		11.08(5.03-15.10)		9956	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.935	1.927	0.008	1.154	5890343	2.30		98.2	60329	
349.00 > 99.00	1.935	1.927	0.008	1.154	2173414		2.71(1.36-4.07)		15638	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.011	2.002	0.009	0.778	305512	NC			8778	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.011	2.003	0.008	1.000	801577	NC			4662	
D 9 13C4-PFHpA										
367.00 > 322.00	2.238	2.228	0.010	0.866	3857554	2.47		98.9	54016	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.238	2.229	0.009	1.000	4174988	2.45		98.2	10242	
363.00 > 169.00	2.238	2.229	0.009	1.000	1615378		2.58(1.13-3.40)		21029	
D 11 18O2 PFHxS										
403.00 > 84.00	2.251	2.240	0.011	0.871	4725009	2.36		99.7	49340	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.251	2.241	0.010	1.000	5031843	2.16		94.9	23226	
399.00 > 99.00	2.251	2.241	0.010	1.000	1696455		2.97(1.50-4.49)		5646	
65 ADONA										
377.00 > 251.00	2.277	2.267	0.010	0.771	10908862	NC			106739	
377.00 > 85.00	2.277	2.267	0.010	0.771	6643193		1.64(0.84-2.53)		27701	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.562	2.555	0.007	1.000	1080133	2.11		89.2	14780	
D 12 M2-6:2FTS										
429.00 > 81.00	2.562	2.564	-0.002	0.991	719184	1.65		69.5	13307	
* 62 13C2-PFOA										
415.00 > 370.00	2.586	2.580	0.006		3987714	2.50			59832	
D 14 13C4 PFOA										
417.00 > 372.00	2.586	2.588	-0.002	1.000	3709478	2.43		97.2	30017	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.586	2.588	-0.002	1.000	4440696	2.47		98.5	5522	
413.00 > 169.00	2.586	2.588	-0.002	1.000	2287486		1.94(0.84-2.52)		12617	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.594	2.588	0.006	0.879	4802686	2.43		102	40732	
449.00 > 99.00	2.594	2.588	0.006	0.879	1279633		3.75(1.94-5.82)		13825	
D 18 13C4 PFOS										
503.00 > 80.00	2.952	2.947	0.005	1.142	3416250	2.45		103	29152	
D 19 13C5 PFNA										
468.00 > 423.00	2.952	2.947	0.005	1.142	3353101	2.55		102	49764	
20 Perfluorononanoic acid										
463.00 > 419.00	2.952	2.948	0.004	1.000	3567451	2.33		93.2	9524	
463.00 > 169.00	2.952	2.948	0.004	1.000	859264		4.15(1.90-5.69)		17817	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.952	2.948	0.004	1.000	3670354	2.32		100	27303	
499.00 > 99.00	2.952	2.948	0.004	1.000	839121		4.37(2.31-6.93)		8425	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.162	3.164	-0.002	1.071	6276706	NC			31197	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.291	0.004	1.000	1464275	2.35		98.1	35646	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.298	-0.003	1.275	1101215	2.42		101	22332	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.299	-0.004	1.116	2644003	2.48		103	31259	
549.00 > 99.00	3.295	3.299	-0.004	1.116	1049475		2.52(1.33-3.97)		11303	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.311	3.307	0.004	1.000	3013438	2.59		103	17556	
513.00 > 169.00	3.311	3.307	0.004	1.000	527141		5.72(2.36-7.09)		14057	
D 23 13C2 PFDA										
515.00 > 470.00	3.311	3.314	-0.003	1.281	2831286	2.70		108	42192	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.314	0.005	1.284	5309560	2.59		104	48604	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.314	0.005	1.000	5507051	2.61		104	40014	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.464	3.466	-0.002	1.340	1035095	2.99		120	28333	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.464	3.467	-0.003	1.000	1107455	2.71		109	9186	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.628	3.621	0.007	1.229	2377887	2.51		104	35432	
599.00 > 99.00	3.628	3.621	0.007	1.229	808151		2.94(1.39-4.16)		12066	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.629	-0.001	1.403	1094538	3.01		120	4030	
D 30 13C2 PFUnA										
565.00 > 520.00	3.638	3.639	-0.001	1.407	2280028	2.70		108	68422	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.638	3.640	-0.002	1.000	2761626	2.44		97.6	10799	
563.00 > 169.00	3.638	3.640	-0.002	1.000	473893		5.83(2.12-6.36)		24906	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.638	3.640	-0.002	1.003	1002091	2.45		98.1	28564	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.793	3.795	-0.002	1.285	9370934	NC			84534	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.930	-0.002	1.519	2242588	2.80		112	20479	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.930	-0.002	1.000	2414270	2.49		99.5	706	
613.00 > 169.00	3.928	3.930	-0.002	1.000	633507		3.81(2.13-6.40)		11087	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.193	0.0	1.067	2390747	2.54		101	698	
663.00 > 169.00	4.193	4.193	0.0	1.067	729773		3.28(1.25-3.76)		11368	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.426	0.0	1.000	551491	2.58		103	7029	
713.00 > 219.00	4.426	4.426	0.0	1.000	387204		1.42(0.71-2.13)		6085	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.437	-0.011	1.712	2127755	2.72		109	12479	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	2990043	NC			510	
813.00 > 169.00	4.833	4.833	0.0	1.000	476383		6.28(2.86-8.58)		3569	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.869	3093960	2.60		104	7487	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.173	0.008	1.072	2865831	NC			651	
913.00 > 169.00	5.181	5.173	0.008	1.072	344557		8.32(3.83-11.48)		1883	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 15:36:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_036.d

Injection Date: 29-Jul-2018 03:53:19 Instrument ID: A8_N

Lims ID: CCV L5

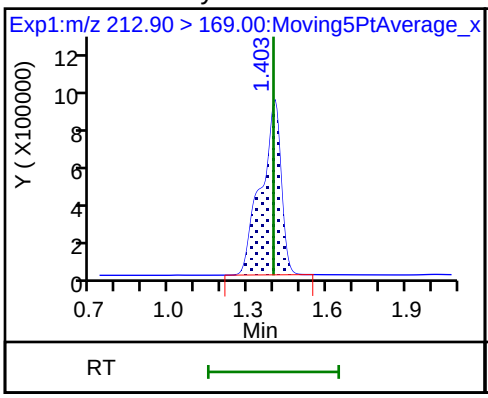
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 31 Worklist Smp#: 23

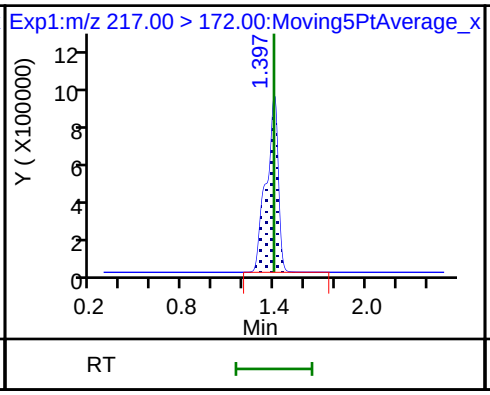
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

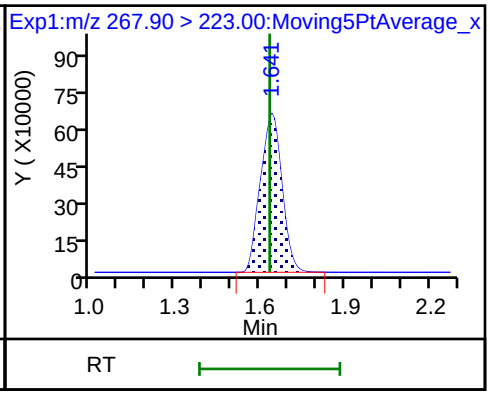
2 Perfluorobutyric acid



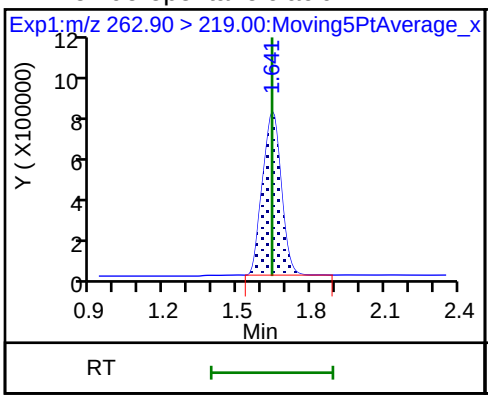
D 1 13C4 PFBA



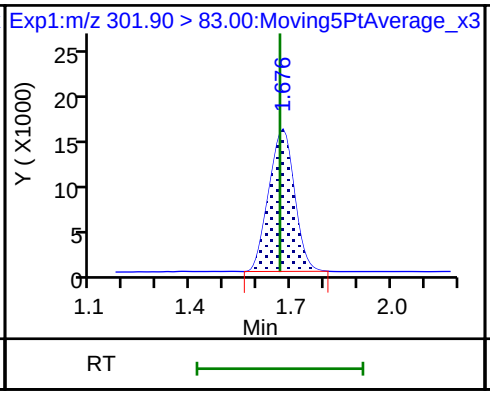
D 3 13C5-PFPeA



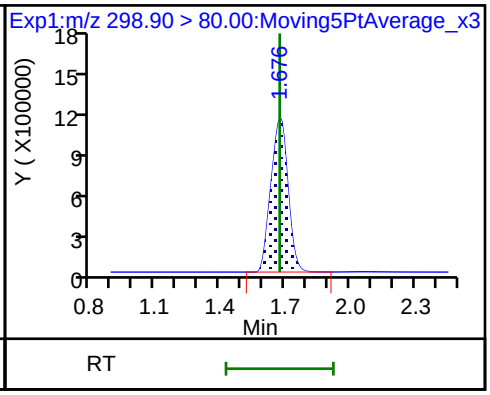
4 Perfluoropentanoic acid



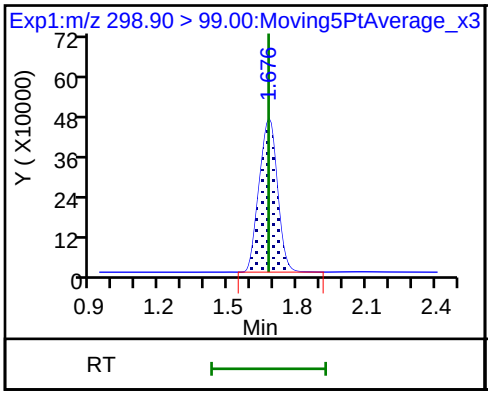
D 47 13C3-PFBS



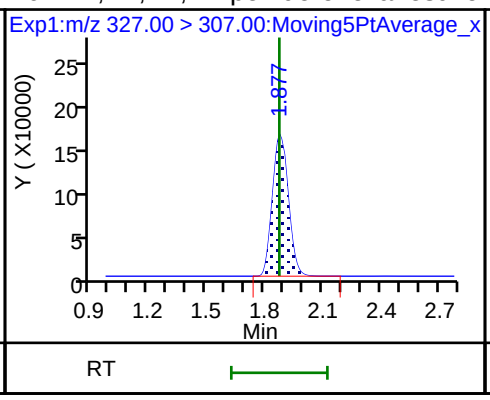
5 Perfluorobutanesulfonic acid



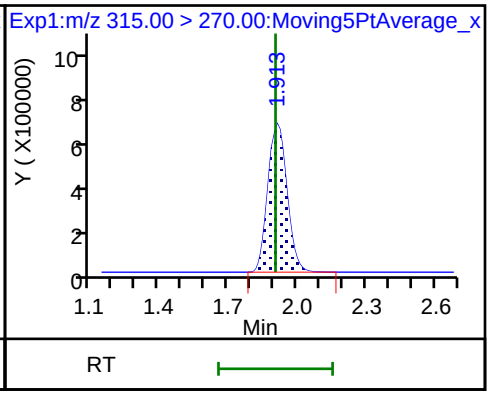
5 Perfluorobutanesulfonic acid



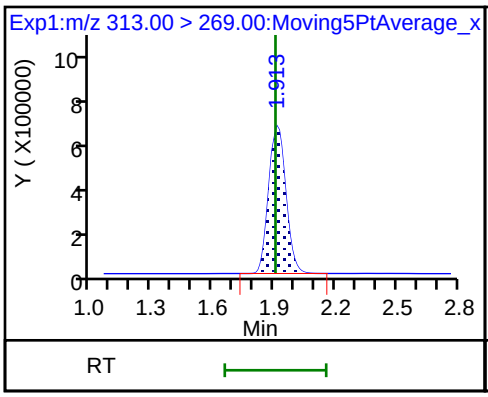
61 1H,1H,2H,2H-perfluorohexanesulfon



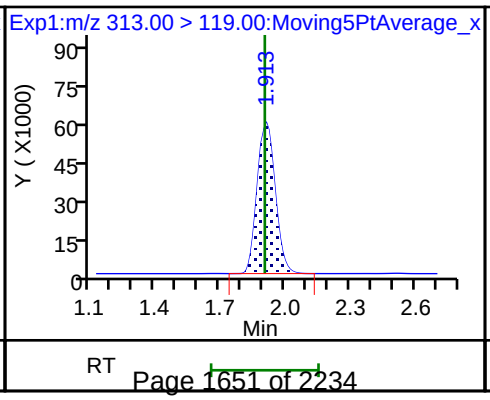
D 7 13C2 PFHxA



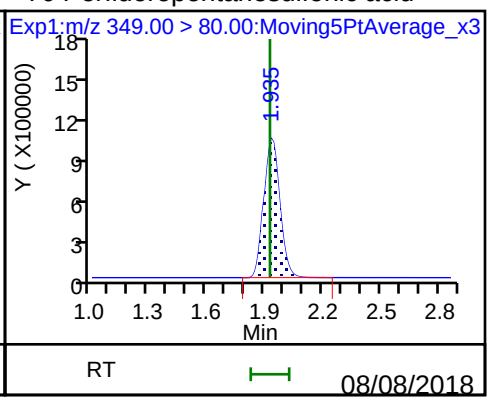
6 Perfluorohexanoic acid



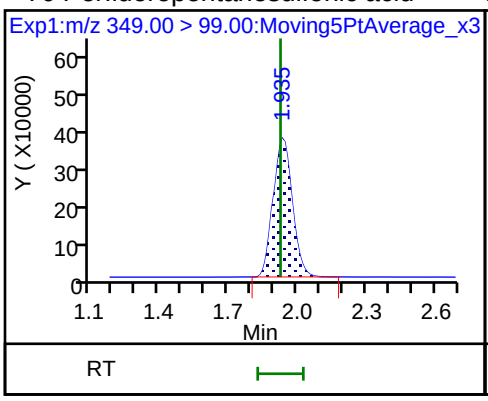
6 Perfluorohexanoic acid



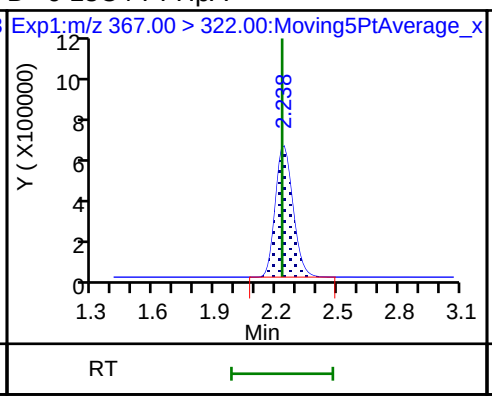
70 Perfluoropentanesulfonic acid



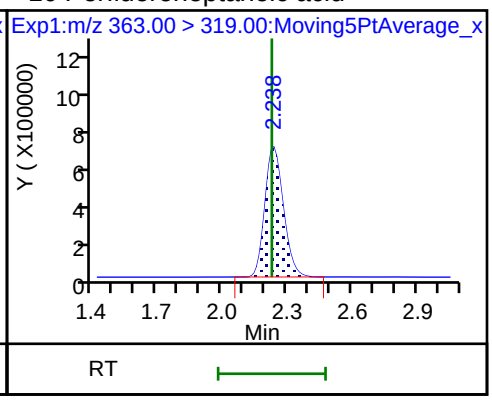
70 Perfluoropentanesulfonic acid



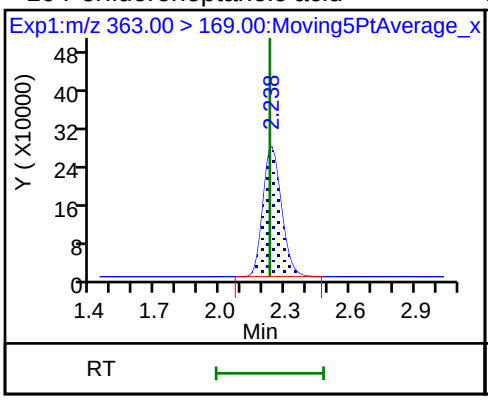
D 9 13C4-PFHpA



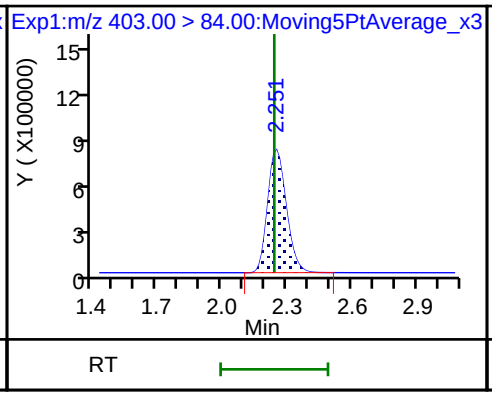
10 Perfluoroheptanoic acid



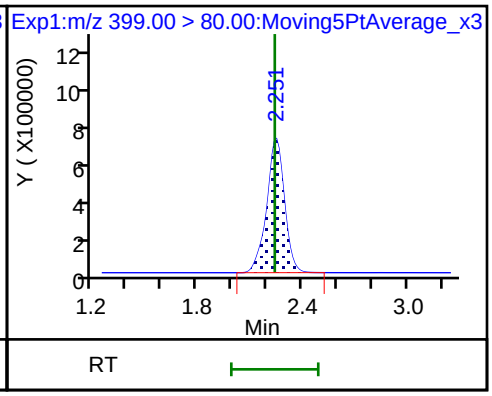
10 Perfluoroheptanoic acid



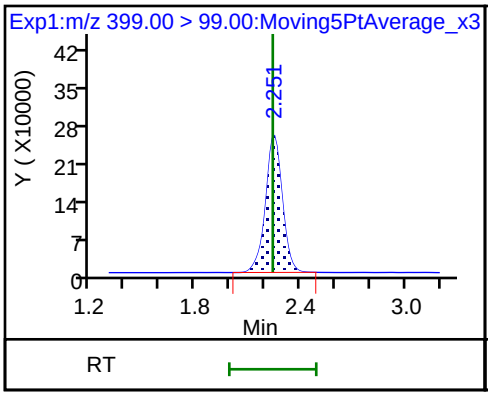
D 11 18O2 PFHxS



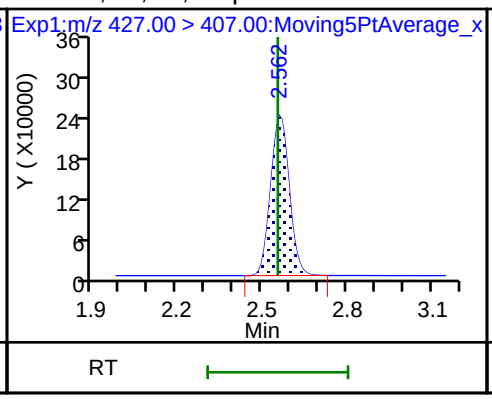
8 Perfluorohexanesulfonic acid



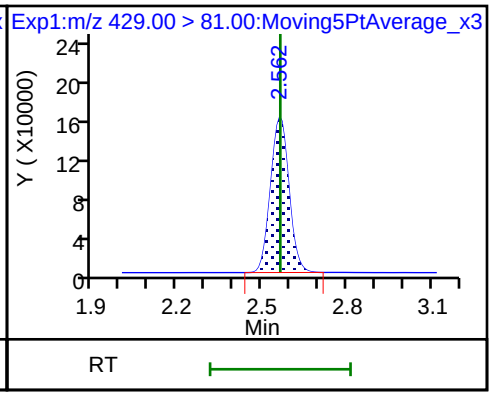
8 Perfluorohexanesulfonic acid



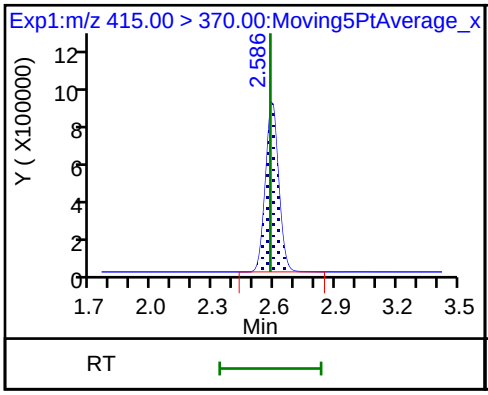
13 1H,1H,2H,2H-perfluorooctanesulfon



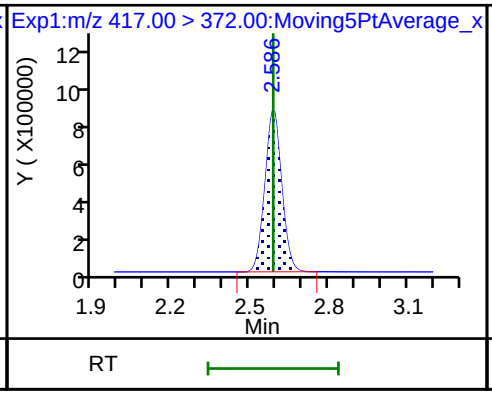
D 12 M2-6:2FTS



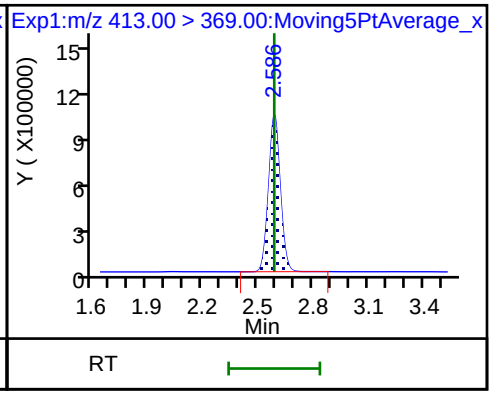
* 62 13C2-PFOA



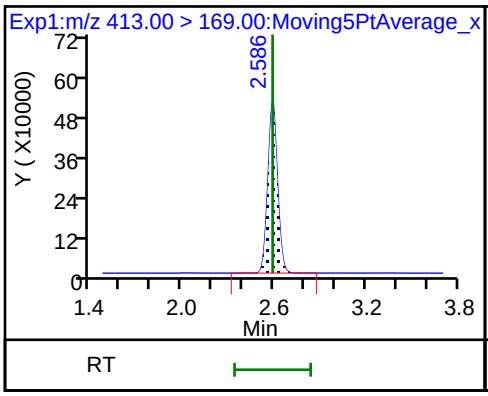
D 14 13C4 PFOA



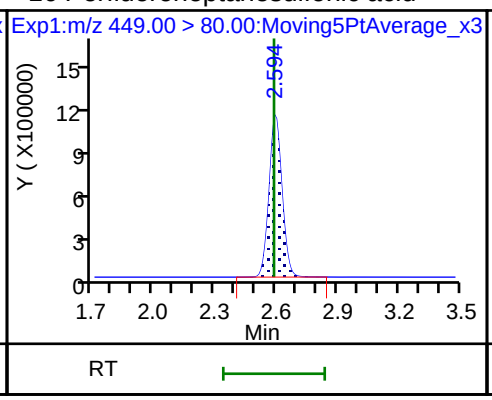
15 Perfluorooctanoic acid



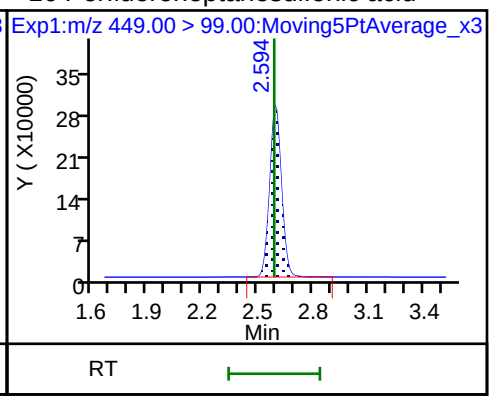
15 Perfluorooctanoic acid



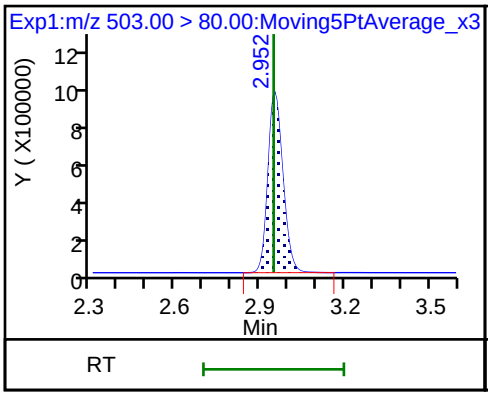
16 Perfluoroheptanesulfonic acid



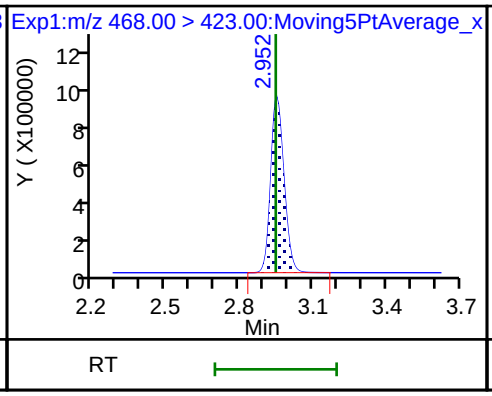
16 Perfluoroheptanesulfonic acid



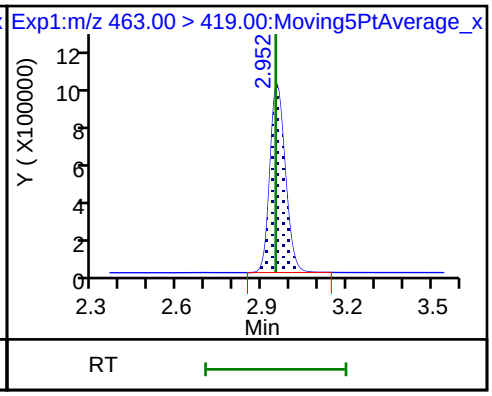
D 18 13C4 PFOS



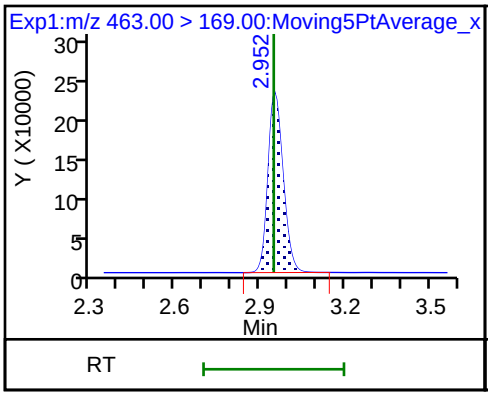
D 19 13C5 PFNA



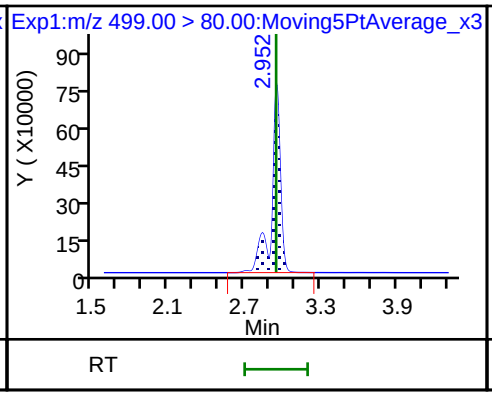
20 Perfluorononanoic acid



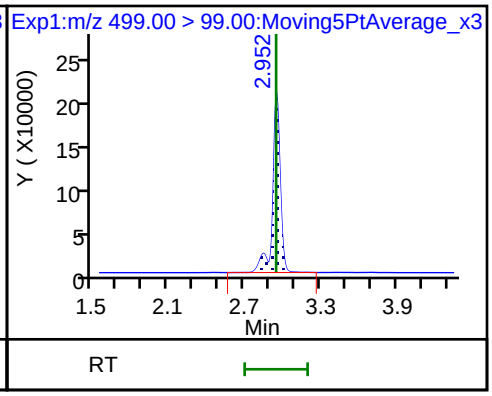
20 Perfluorononanoic acid



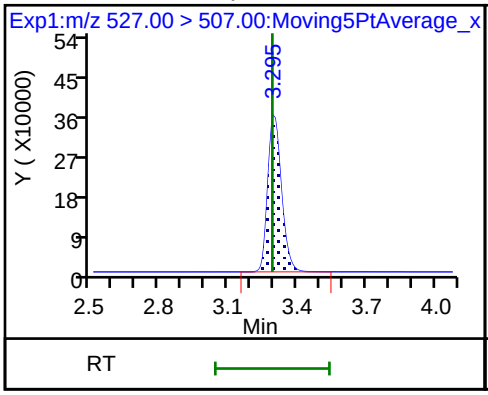
17 Perfluorooctane sulfonic acid



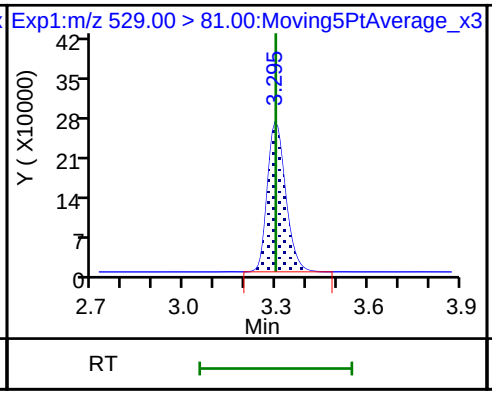
17 Perfluorooctane sulfonic acid



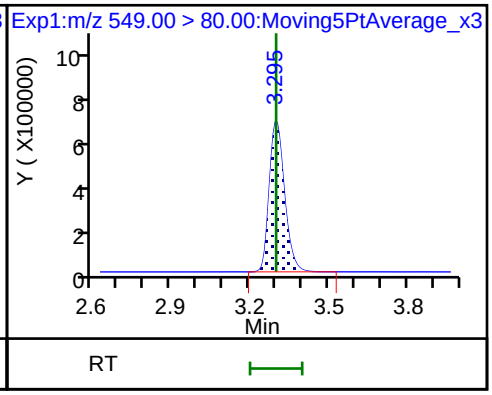
25 1H,1H,2H,2H-perfluorodecanesulfon



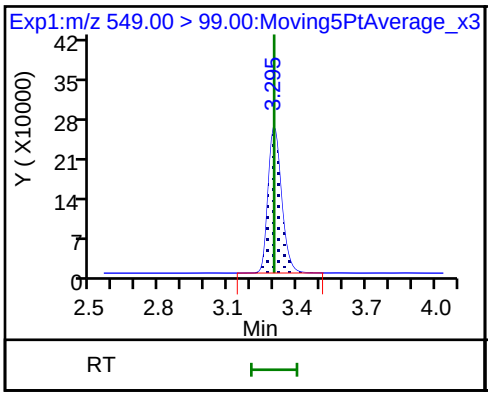
D 26 M2-8:2FTS



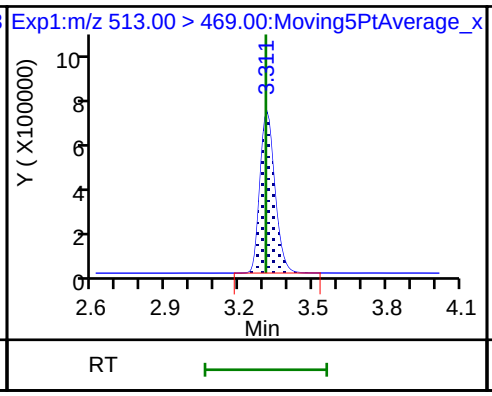
68 Perfluorononanesulfonic acid



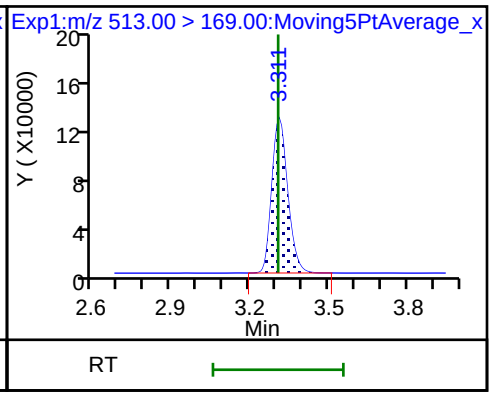
68 Perfluorononanesulfonic acid



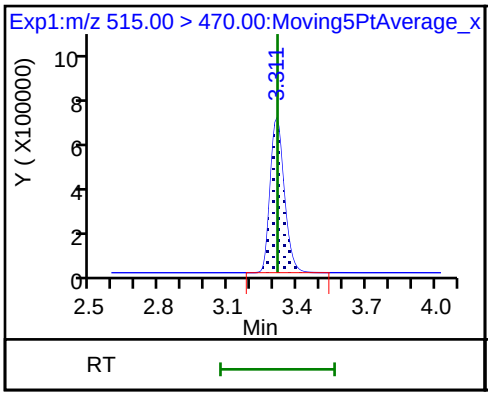
24 Perfluorodecanoic acid



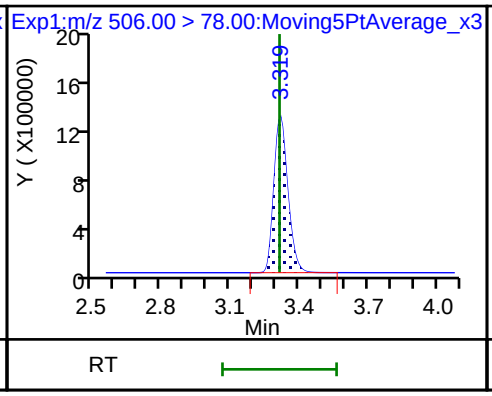
24 Perfluorodecanoic acid



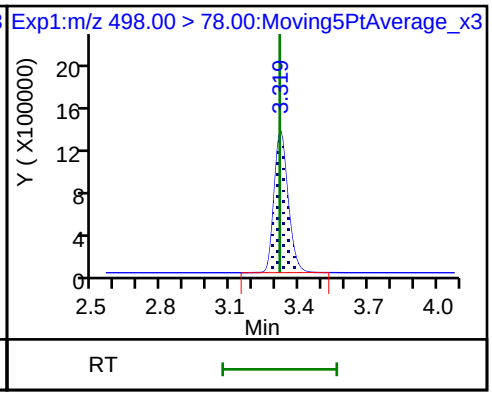
D 23 13C2 PFDA



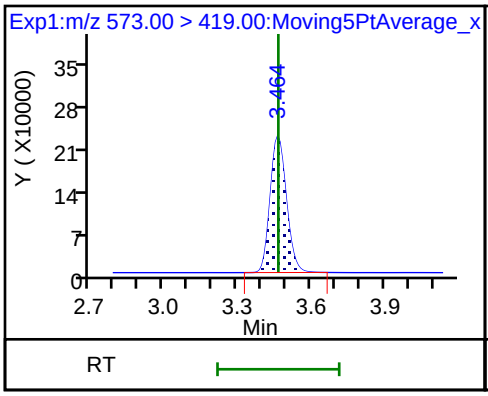
D 21 13C8 FOSA



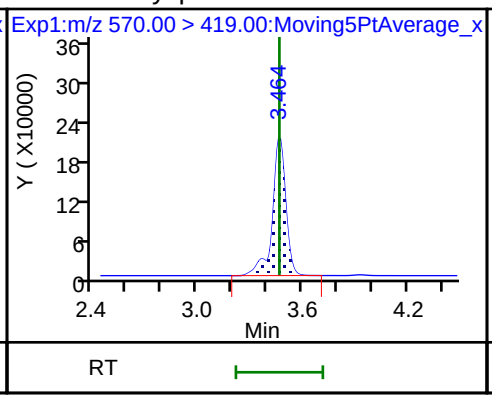
22 Perfluorooctane Sulfonamide



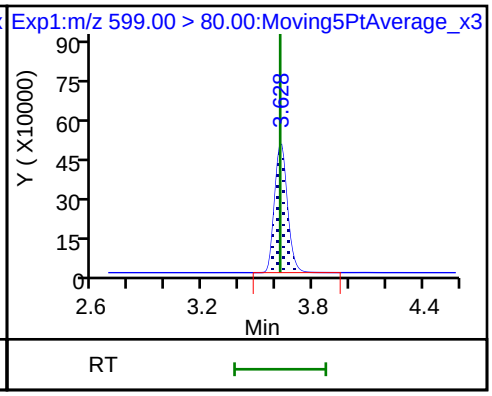
D 27 d3-NMeFOSAA



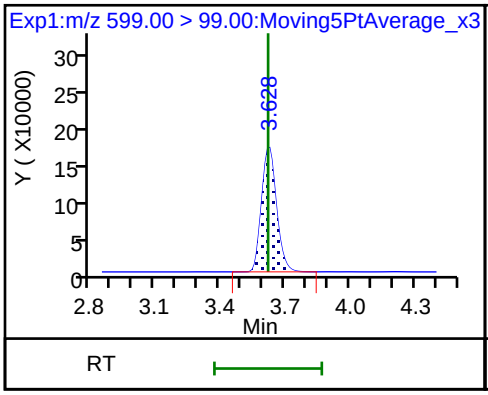
28 N-methyl perfluorooctane sulfonami



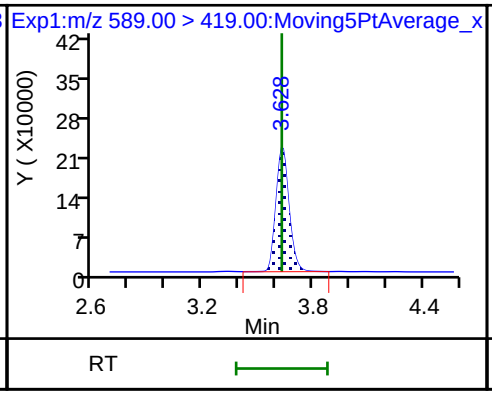
29 Perfluorodecane Sulfonic acid



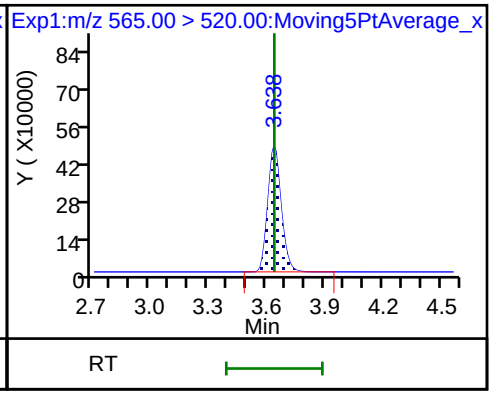
29 Perfluorodecane Sulfonic acid



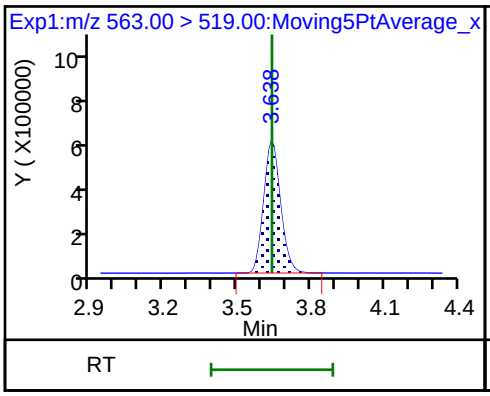
D 32 d5-NEtFOSAA



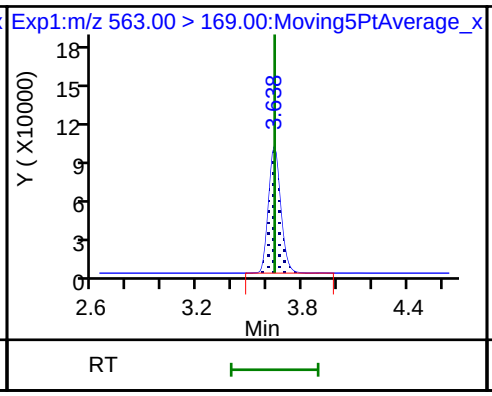
D 30 13C2 PFUnA



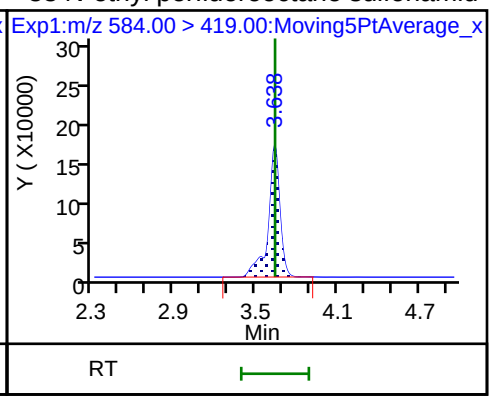
31 Perfluoroundecanoic acid



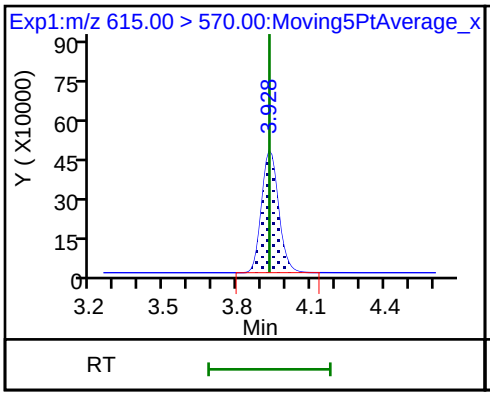
31 Perfluoroundecanoic acid



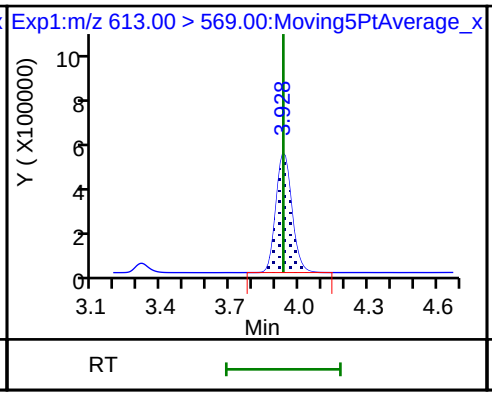
33 N-ethyl perfluorooctane sulfonamid



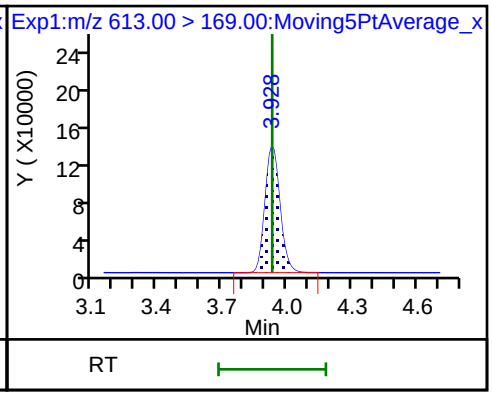
D 36 13C2 PFDoA



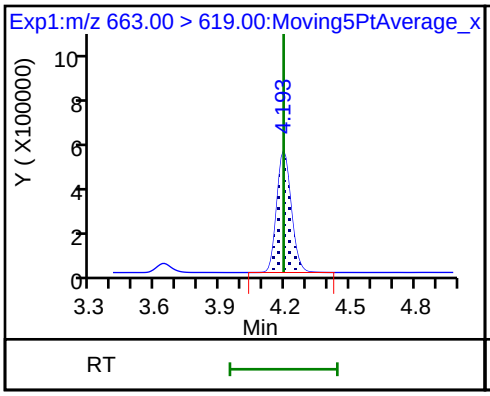
37 Perfluorododecanoic acid



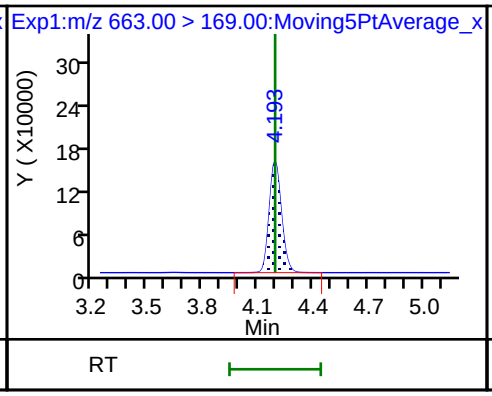
37 Perfluorododecanoic acid



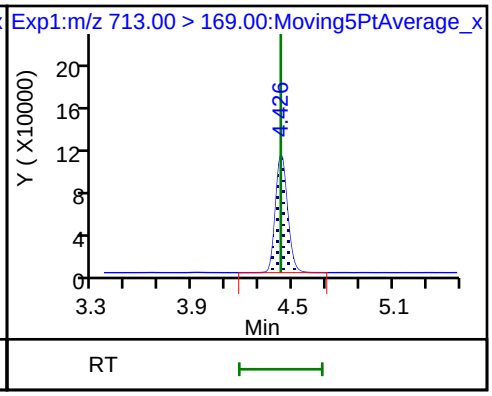
41 Perfluorotridecanoic acid



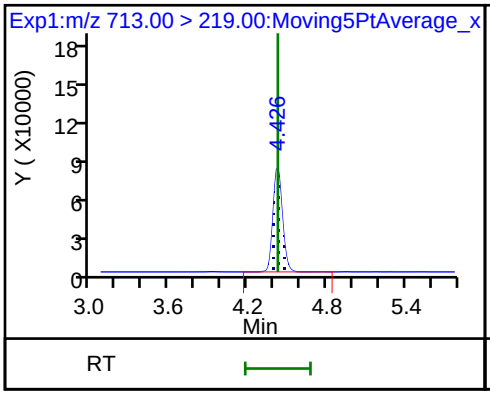
41 Perfluorotridecanoic acid



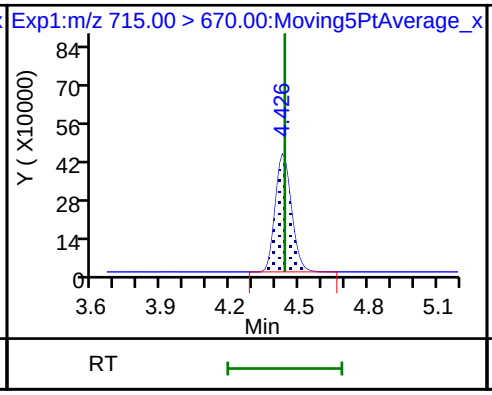
42 Perfluorotetradecanoic acid



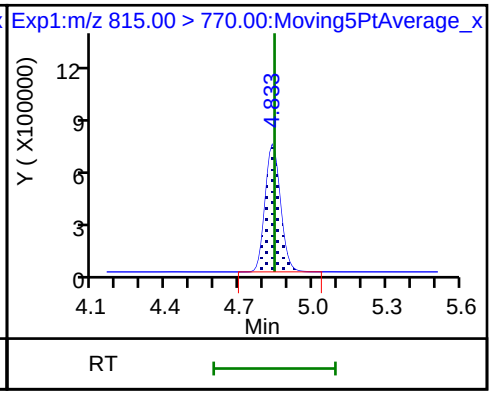
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-236836/2 Calibration Date: 07/30/2018 03:21

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	1.002		0.0510	0.0500	2.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.228		0.0513	0.0500	2.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	81.29		0.0453	0.0442	2.4	30.0
4:2 FTS	AveID	17.09	11.66		0.400	0.0467	-31.8*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.148		0.0541	0.0500	8.3	30.0
Perfluoropentanesulfonic acid	AveID	71.24	67.37		0.0444	0.0469	-5.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.340		0.0608	0.0500	21.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.176		0.0459	0.0455	0.8	30.0
6:2 FTS	AveID	1.687	1.656		0.400	0.0474	-1.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.268		0.0523	0.0501	4.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.276		0.0439	0.0476	-7.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.066		0.0467	0.0500	-6.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.135		0.0476	0.0464	2.7	30.0
8:2 FTS	AveID	1.356	1.359		0.400	0.0479	0.2	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.8198		0.0527	0.0480	9.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	0.9780		0.0475	0.0500	-4.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	0.9455		0.0475	0.0500	-4.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.9834		0.400	0.0500	-0.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6857		0.0498	0.0482	3.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.7229		0.400	0.0500	-22.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.078		0.0434	0.0500	-13.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.198		0.0554	0.0500	10.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.065		0.0507	0.0500	1.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2627		0.0524	0.0500	4.8	30.0
13C4 PFBA	Ave	1.159	1.254		2.70	2.50	8.2	30.0
13C5-PFPeA	Ave	0.8093	0.8729		2.70	2.50	7.9	30.0
13C3-PFBS	Ave	0.0212	0.0229		2.51	2.33	7.8	30.0
13C2 PFHxA	Ave	0.9490	0.9513		2.51	2.50	0.2	30.0
13C4-PFHpA	Ave	0.9779	0.9794		2.50	2.50	0.2	30.0
18O2 PFHxS	Ave	1.256	1.317		2.48	2.37	4.8	30.0
M2-6:2FTS	Ave	0.2731	0.1889		1.64	2.38	-30.8*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-236836/2 Calibration Date: 07/30/2018 03:21

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9667		2.53	2.50	1.1	30.0
13C4 PFOS	Ave	0.8734	0.9424		2.58	2.39	7.9	30.0
13C5 PFNA	Ave	0.8250	0.8953		2.71	2.50	8.5	30.0
M2-8:2FTS	Ave	0.2848	0.2924		2.46	2.40	2.7	30.0
13C2 PFDA	Ave	0.6565	0.7575		2.88	2.50	15.4	30.0
13C8 FOSA	Ave	1.283	1.444		2.81	2.50	12.6	30.0
d3-NMeFOSAA	Ave	0.2169	0.2698		3.11	2.50	24.4	30.0
13C2 PFUnA	Ave	0.5287	0.6604		3.12	2.50	24.9	30.0
d5-NEtFOSAA	Ave	0.2280	0.2984		3.27	2.50	30.9*	30.0
13C2 PFDoA	Ave	0.5026	0.5572		2.77	2.50	10.9	30.0
13C2-PFTeDA	Ave	0.4910	0.5461		2.78	2.50	11.2	30.0
13C2-PFHxDA	Ave	0.7454	0.8589		2.88	2.50	15.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 30-Jul-2018 03:21:09 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 11:55:35 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jul-2018 11:53:30

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.389	1.389	0.0	1.000	91015	0.0510		102	44.2	
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.396	-0.007	0.540	4540090	2.70		108	87704	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.630	1.629	0.001	1.000	77646	0.0513		103	34.9	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.630	1.640	-0.010	0.634	3160990	2.70		108	66293	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.663	1.662	0.0	1.000	119088	0.0453		102	357	
298.90 > 99.00	1.663	1.662	0.0	1.000	51729		2.30(1.25-3.74)		259	
D 47 13C3-PFBS										
301.90 > 83.00	1.663	1.674	-0.012	0.647	77057	2.51		108	666	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.863	1.863	0.0	1.121	18047	0.0319		68.2	1043	
D 60 M2-4:2FTS										
329.00 > 81.00	1.863	1.875	-0.012	0.725	370166	NC			6013	
6 Perfluorohexanoic acid										RM
313.00 > 269.00	1.902	1.902	0.0	1.006	79073	0.0541		108	332	RM
313.00 > 119.00	1.892	1.902	-0.010	1.000	4707		16.80(5.03-15.10)		123	M
D 7 13C2 PFHxA										
315.00 > 270.00	1.892	1.916	-0.024	0.736	3444846	2.51		100	65826	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.157	104714	0.0444		94.6	2950	
349.00 > 99.00	1.913	1.924	-0.011	1.151	38732		2.70(1.36-4.07)		319	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.988	1.999	-0.011	1.000	16392	NC			92.1	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.988	2.014	-0.026	0.773	307150	NC			10535	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.214	2.214	0.0	1.000	95067	0.0608		122	226	
363.00 > 169.00	2.214	2.214	0.0	1.000	37576		2.53(1.13-3.40)		595	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.226	2.225	0.001	1.000	102033	0.0459		101	1060	
399.00 > 99.00	2.226	2.225	0.001	1.000	39892		2.56(1.50-4.49)		136	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.240	-0.026	0.861	3546579	2.50		100	60175	
D 11 18O2 PFHxS										
403.00 > 84.00	2.226	2.253	-0.027	0.866	4510032	2.48		105	35285	
65 ADONA										
377.00 > 251.00	2.264	2.263	0.001	0.771	205827	NC			4269	
377.00 > 85.00	2.264	2.263	0.001	0.771	125538		1.64(0.84-2.53)		615	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.545	2.545	0.0	1.000	21471	0.0465		98.1	341	
D 12 M2-6:2FTS										
429.00 > 81.00	2.545	2.564	-0.019	0.990	649753	1.64		69.2	10813	
* 62 13C2-PFOA										
415.00 > 370.00	2.571	2.571	0.0		3621327	2.50			49416	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.571	2.571	0.0	1.000	88862	0.0523		104	106	
413.00 > 169.00	2.571	2.571	0.0	1.000	46651		1.90(0.84-2.52)		380	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.579	2.579	0.0	0.879	82907	0.0439		92.2	2273	
449.00 > 99.00	2.579	2.579	0.0	0.879	23279		3.56(1.94-5.82)		239	
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.588	-0.017	1.000	3500703	2.53		101	36924	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.935	2.935	0.0	1.000	71863	0.0476		103	1510	
499.00 > 99.00	2.930	2.935	-0.005	0.998	16734		4.29(2.31-6.93)		151	M
20 Perfluorononanoic acid										
463.00 > 419.00	2.935	2.935	0.0	1.000	69121	0.0467		93.4	221	
463.00 > 169.00	2.935	2.935	0.0	1.000	18116		3.82(1.90-5.69)		711	
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.953	-0.018	1.142	3242299	2.71		109	56025	
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.953	-0.018	1.142	3262662	2.58		108	32207	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.145	3.145	0.0	1.071	113084	NC			1219	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.280	3.280	0.0	1.000	27565	0.0480		100	776	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.280	3.287	-0.007	1.117	53720	0.0527		110	2795	
549.00 > 99.00	3.280	3.287	-0.007	1.117	19796		2.71(1.33-3.97)		180	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.295	3.295	0.0	1.002	53653	0.0475		95.1	354	
513.00 > 169.00	3.295	3.295	0.0	1.002	10380		5.17(2.36-7.09)		369	
D 26 M2-8:2FTS										
529.00 > 81.00	3.280	3.299	-0.019	1.276	1014513	2.46		103	19454	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.311	0.0	1.000	98892	0.0475		95.1	3988	
D 23 13C2 PFDA										
515.00 > 470.00	3.287	3.314	-0.027	1.278	2743126	2.88		115	56449	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.322	-0.011	1.288	5229554	2.81		113	46572	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.454	0.0	1.003	19216	0.0499		99.8	272	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.445	3.467	-0.022	1.340	977070	3.11		124	35482	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.607	3.607	0.0	1.229	45119	0.0498		103	1050	
599.00 > 99.00	3.607	3.607	0.0	1.229	17214		2.62(1.39-4.16)		355	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.628	3.628	0.0	1.003	51555	0.0434		86.9	295	
563.00 > 169.00	3.628	3.628	0.0	1.003	8419		6.12(2.12-6.36)		368	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.618	3.628	-0.010	1.000	15621	0.0387		77.5	531	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.618	3.640	-0.022	1.407	1080514	3.27		131	3574	
D 30 13C2 PFUnA										
565.00 > 520.00	3.618	3.640	-0.022	1.407	2391430	3.12		125	45808	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.782	3.782	0.0	1.288	166751	NC			8527	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.918	3.918	0.0	1.000	48352	0.0554		111	16.2	
613.00 > 169.00	3.918	3.918	0.0	1.000	10795		4.48(2.13-6.40)		252	
D 36 13C2 PFDoA										
615.00 > 570.00	3.918	3.930	-0.012	1.524	2017762	2.77		111	21002	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.172	4.182	-0.010	1.065	42971	0.0507		101	15.9	
663.00 > 169.00	4.172	4.182	-0.010	1.065	12824		3.35(1.25-3.76)		214	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.415	4.415	0.0	1.000	10389	0.0524		105	184	
713.00 > 219.00	4.404	4.415	-0.011	0.998	7582		1.37(0.71-2.13)		214	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.437	-0.022	1.717	1977646	2.78		111	15637	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.814	4.823	-0.009	1.000	82453	NC			14.7	
813.00 > 169.00	4.814	4.823	-0.009	1.000	14211		5.80(2.86-8.58)		192	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.814	4.842	-0.028	1.872	3110447	2.88		115	13804	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.158	5.165	-0.007	1.071	65533	NC			13.0	
913.00 > 169.00	5.158	5.165	-0.007	1.071	7765		8.44(3.83-11.48)		144	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 11:55:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_004.d

Injection Date: 30-Jul-2018 03:21:09 Instrument ID: A8_N

Lims ID: CCVL

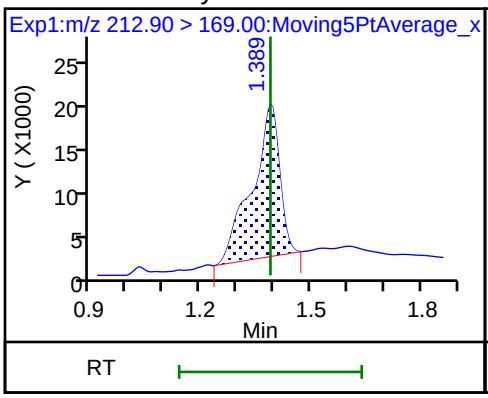
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2

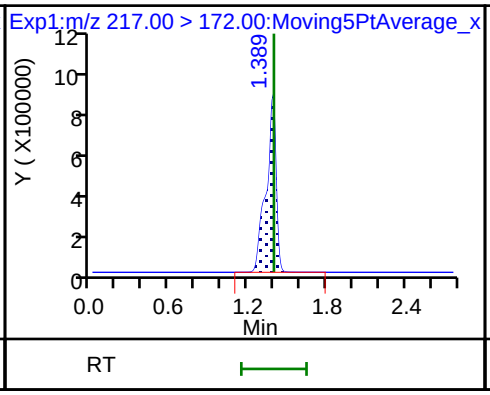
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

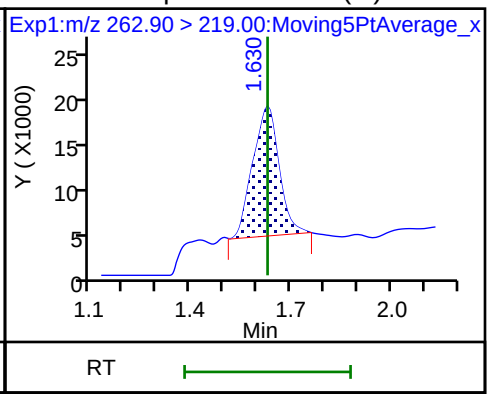
2 Perfluorobutyric acid



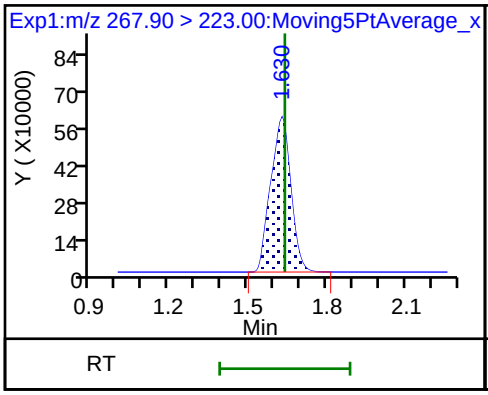
D 1 13C4 PFBA



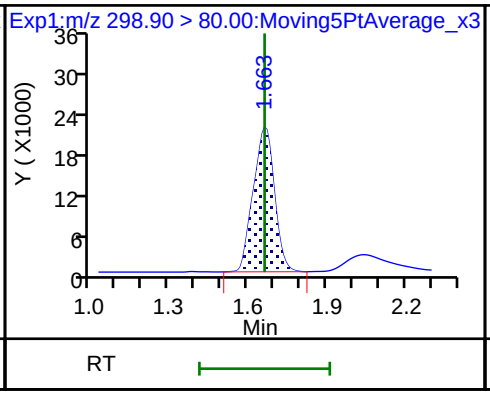
4 Perfluoropentanoic acid (M)



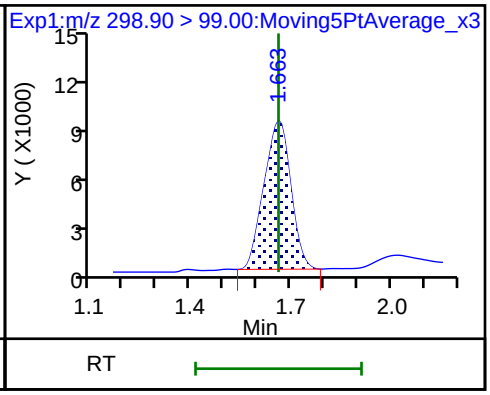
D 3 13C5-PFPeA



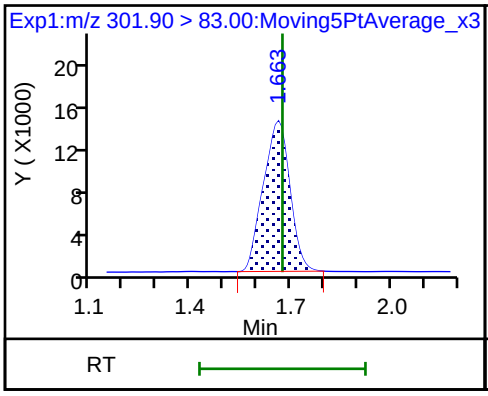
5 Perfluorobutanesulfonic acid



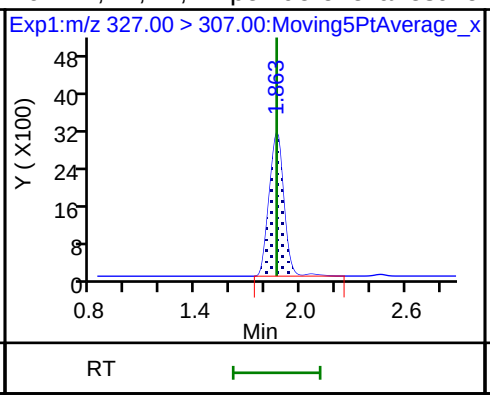
5 Perfluorobutanesulfonic acid



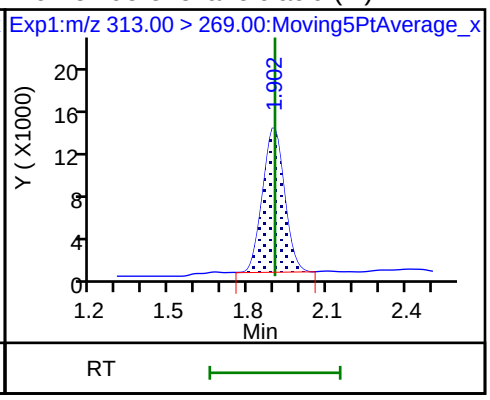
D 47 13C3-PFBS



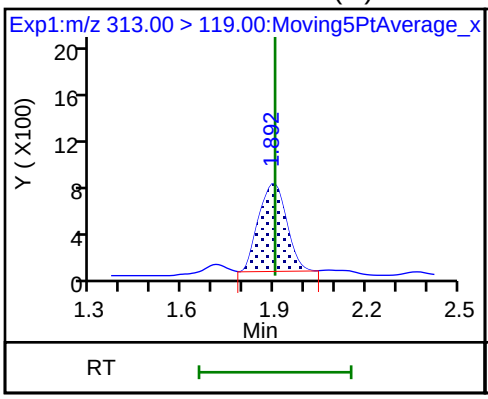
61 1H,1H,2H,2H-perfluorohexanesulfoni



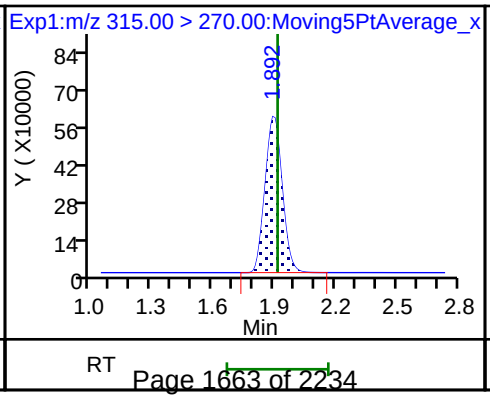
6 Perfluorohexanoic acid (M)



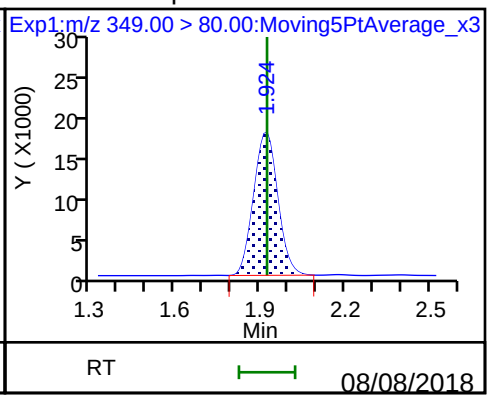
6 Perfluorohexanoic acid (M)



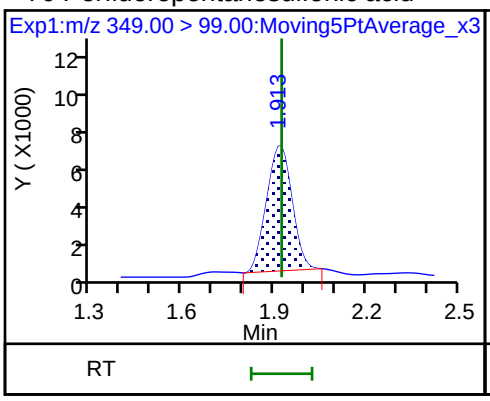
D 7 13C2 PFHxA



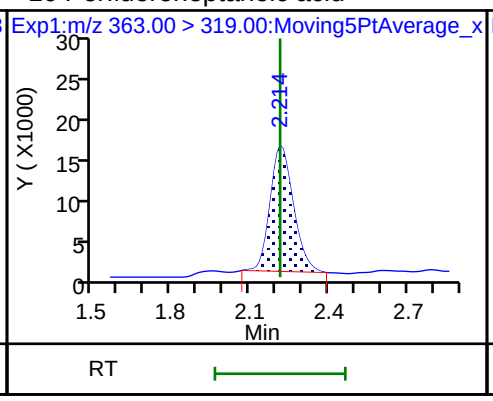
70 Perfluoropentanesulfonic acid



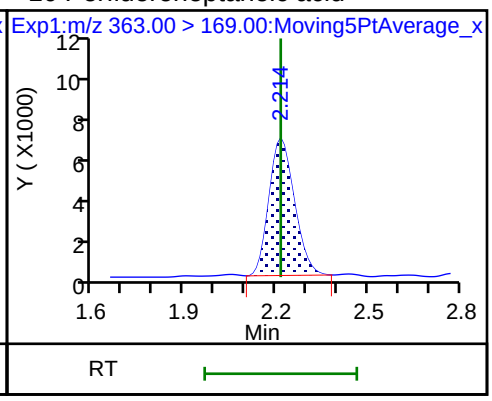
70 Perfluoropentanesulfonic acid



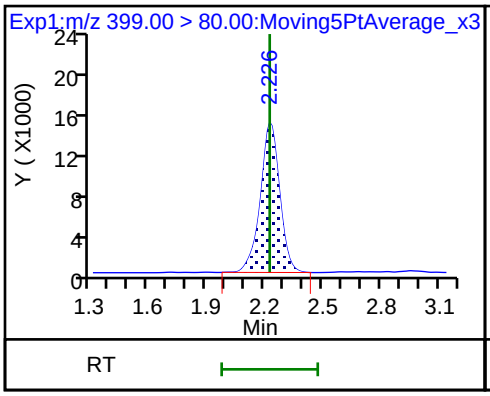
10 Perfluoroheptanoic acid



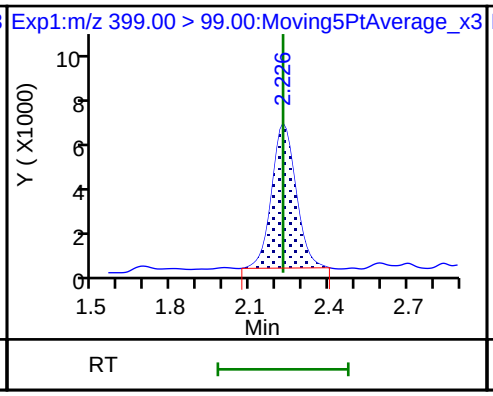
10 Perfluoroheptanoic acid



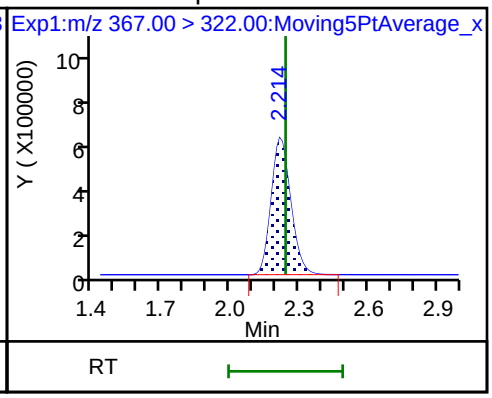
8 Perfluorohexanesulfonic acid



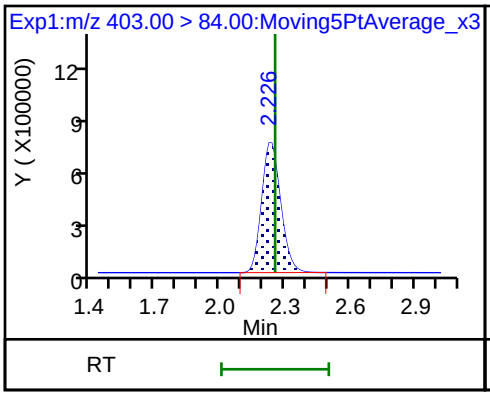
8 Perfluorohexanesulfonic acid



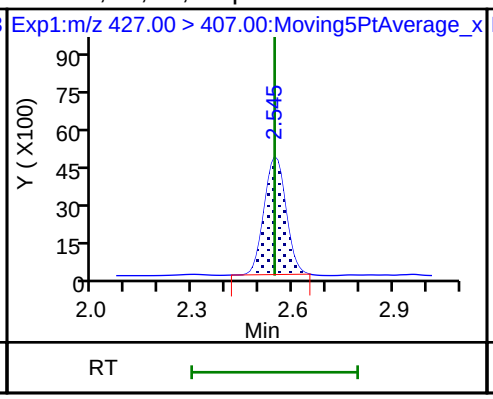
D 9 13C4-PFHpA



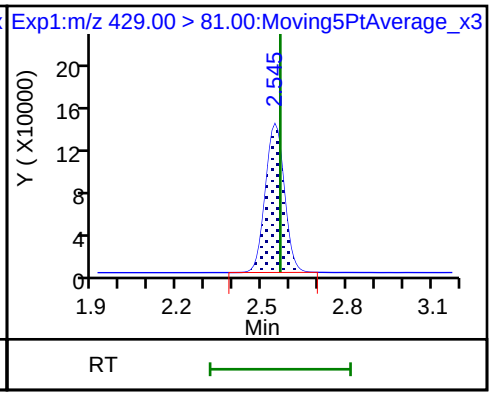
D 11 18O2 PFHxS



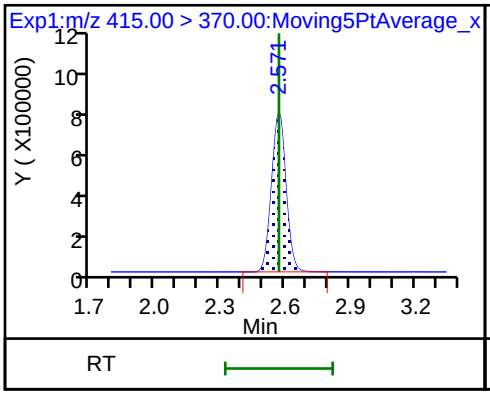
13 1H,1H,2H,2H-perfluorooctanesulfon



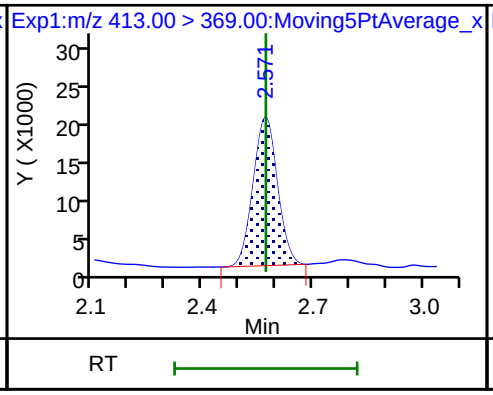
D 12 M2-6:2FTS



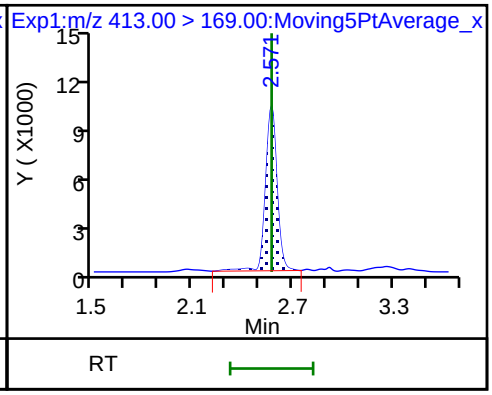
* 62 13C2-PFOA



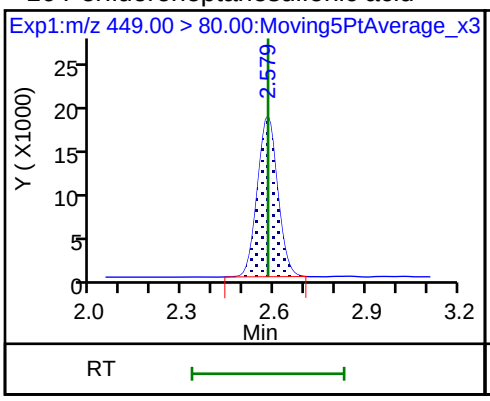
15 Perfluorooctanoic acid



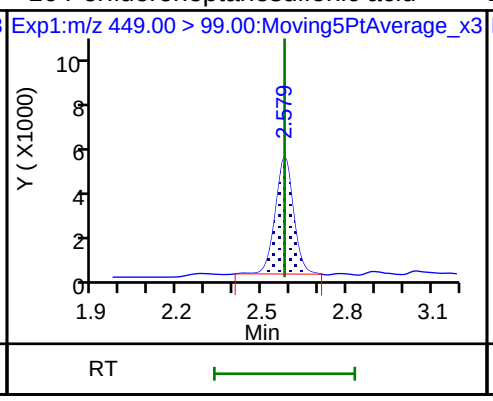
15 Perfluorooctanoic acid



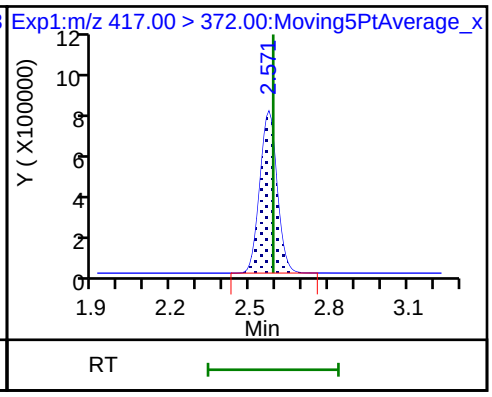
16 Perfluoroheptanesulfonic acid



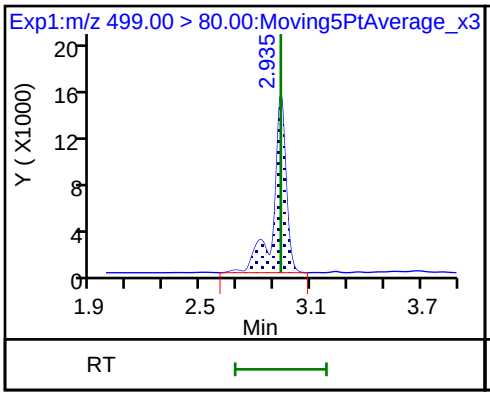
16 Perfluoroheptanesulfonic acid



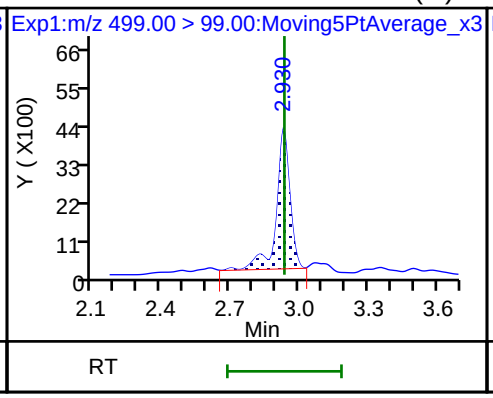
D 14 13C4 PFOA



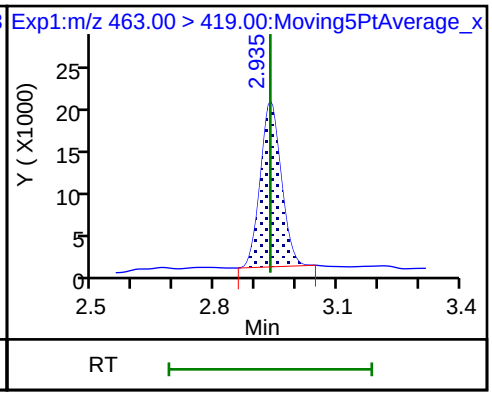
17 Perfluorooctane sulfonic acid



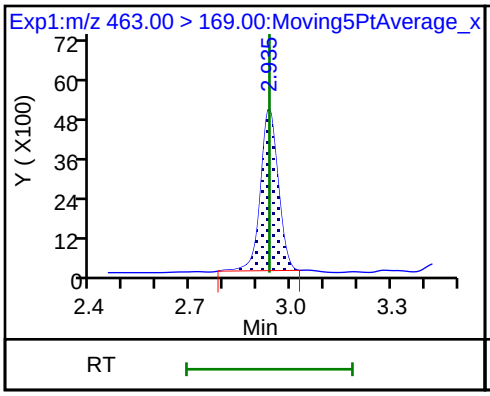
17 Perfluorooctane sulfonic acid (M)



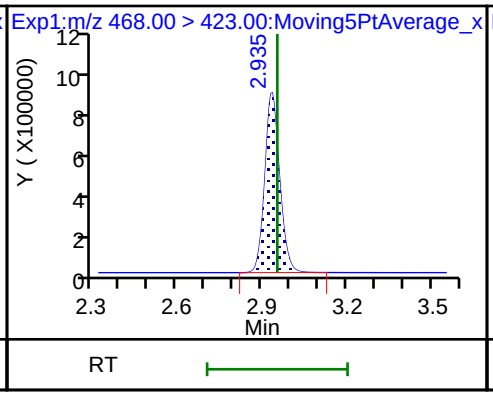
20 Perfluorononanoic acid



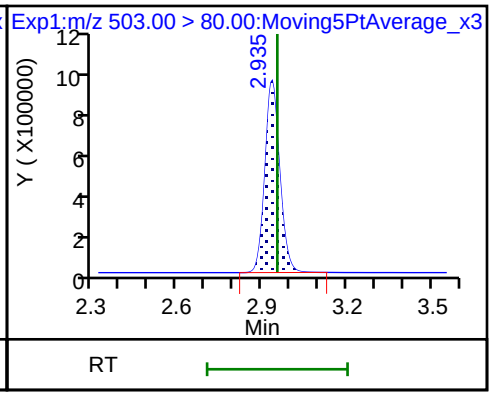
20 Perfluorononanoic acid



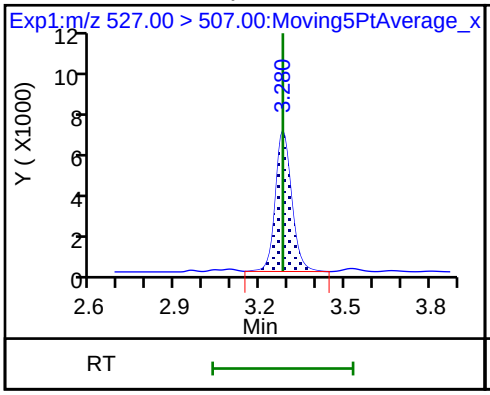
D 19 13C5 PFNA



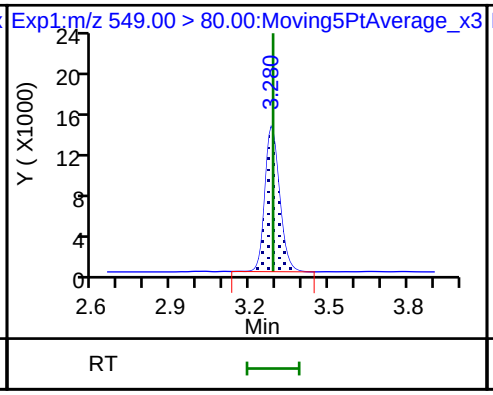
D 18 13C4 PFOS



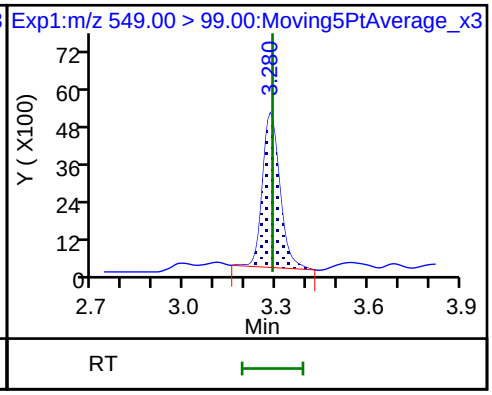
25 1H,1H,2H,2H-perfluorodecanesulfoni



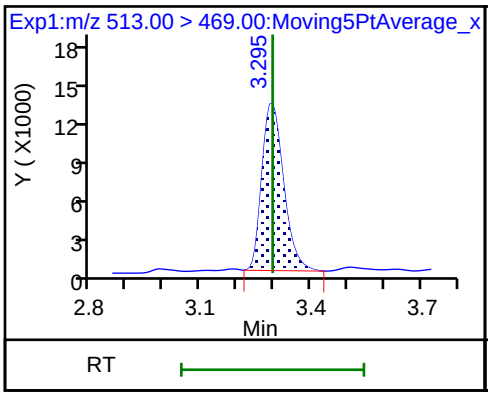
68 Perfluorononanesulfonic acid



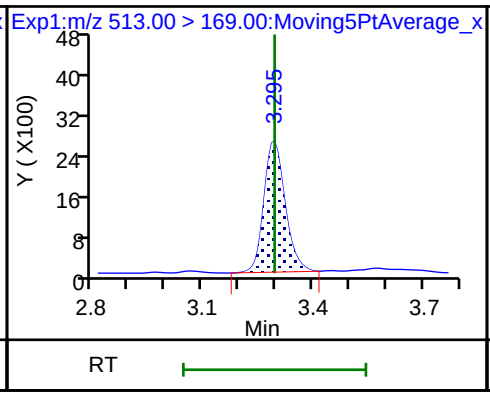
68 Perfluorononanesulfonic acid



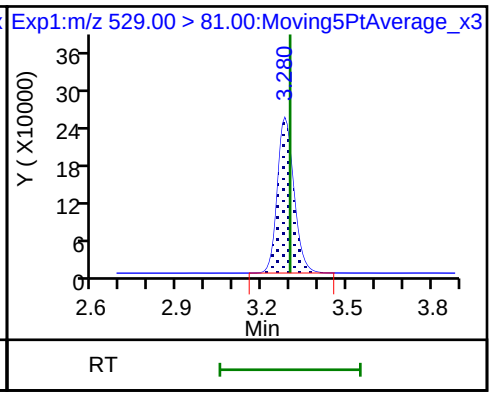
24 Perfluorodecanoic acid



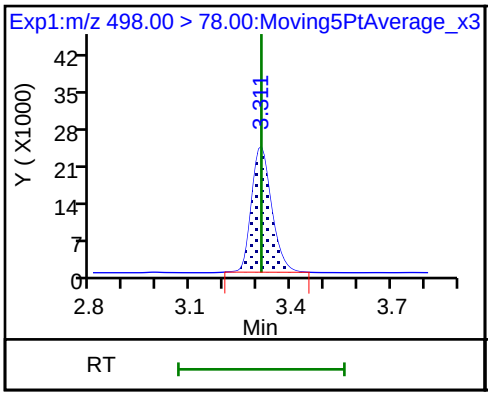
24 Perfluorodecanoic acid



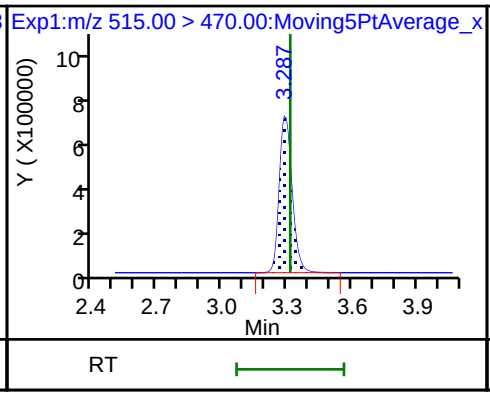
D 26 M2-8:2FTS



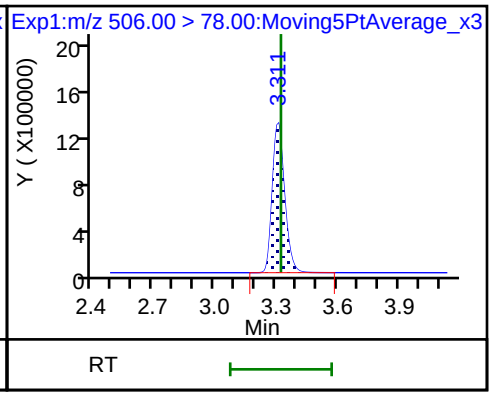
22 Perfluorooctane Sulfonamide



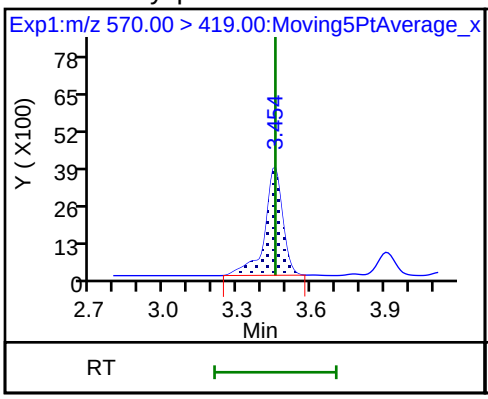
D 23 13C2 PFDA



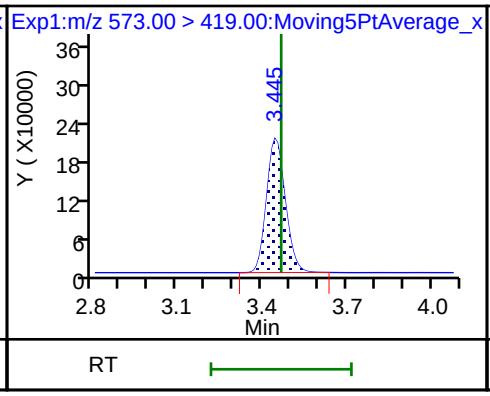
D 21 13C8 FOSA



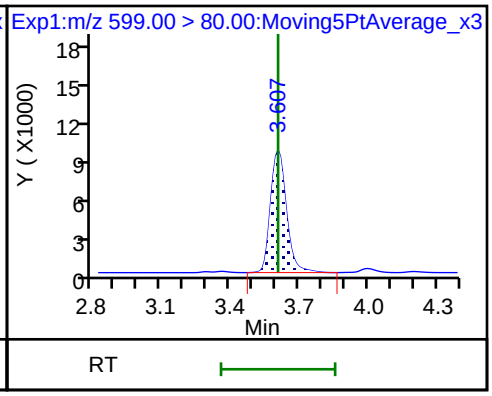
28 N-methyl perfluorooctane sulfonami



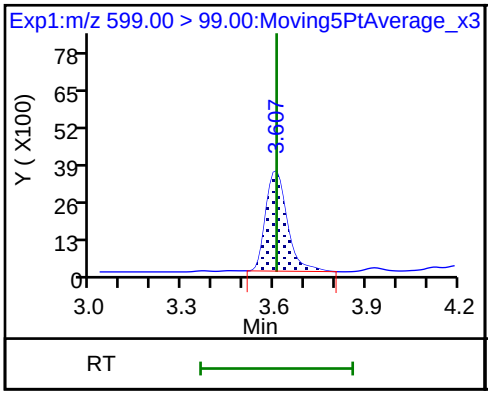
D 27 d3-NMeFOSAA



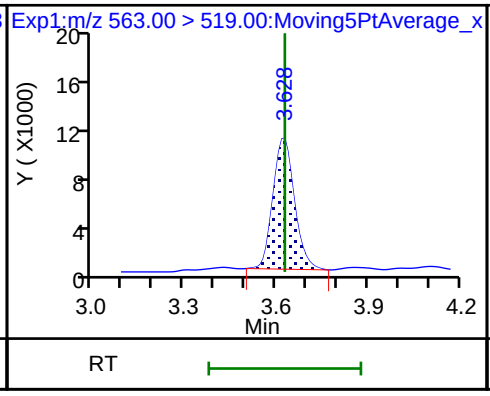
29 Perfluorodecane Sulfonic acid



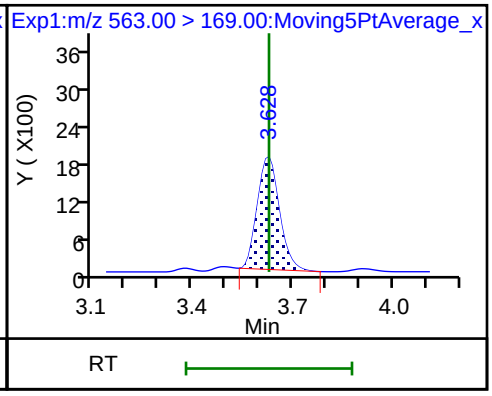
29 Perfluorodecane Sulfonic acid



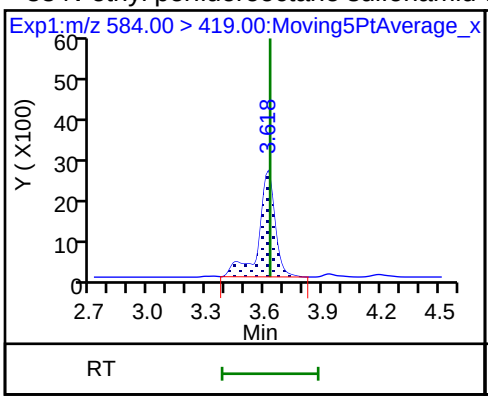
31 Perfluoroundecanoic acid



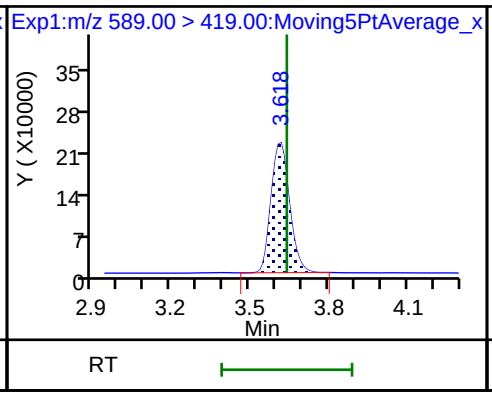
31 Perfluoroundecanoic acid



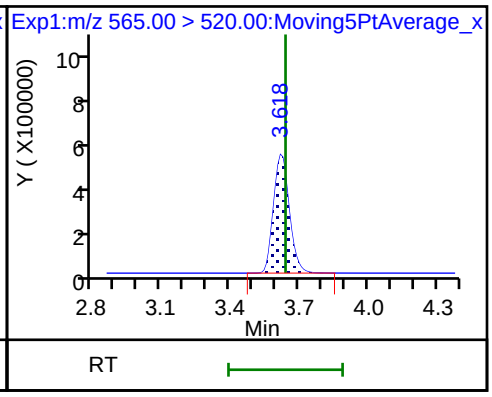
33 N-ethyl perfluorooctane sulfonamid



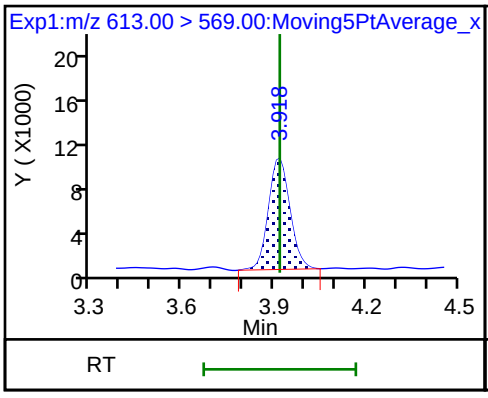
D 32 d5-NEtFOSAA



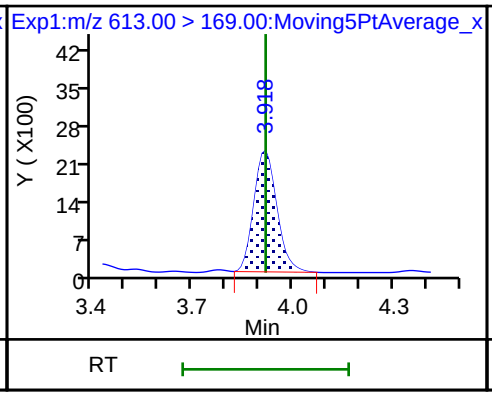
D 30 13C2 PFUnA



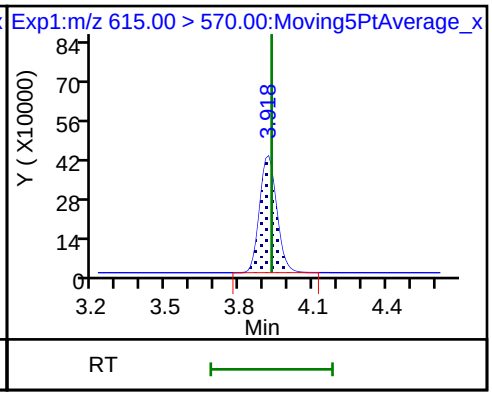
37 Perfluorododecanoic acid



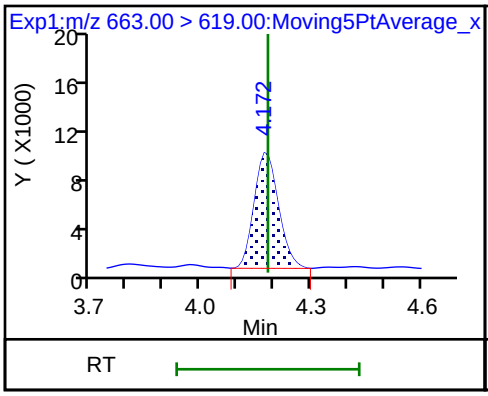
37 Perfluorododecanoic acid



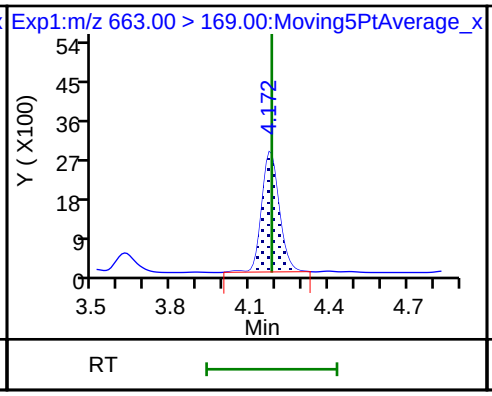
D 36 13C2 PFDoA



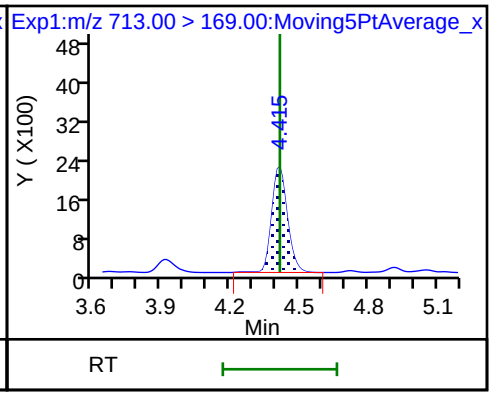
41 Perfluorotridecanoic acid



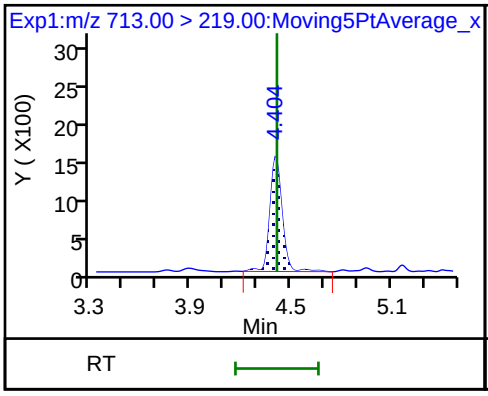
41 Perfluorotridecanoic acid



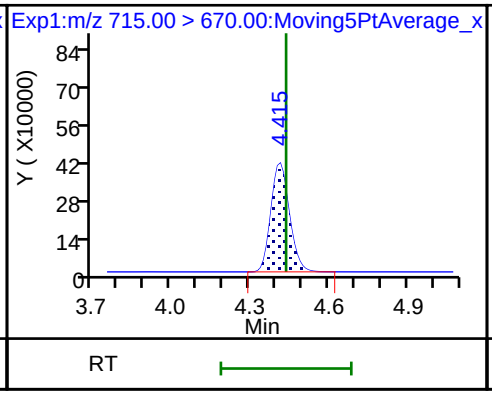
42 Perfluorotetradecanoic acid



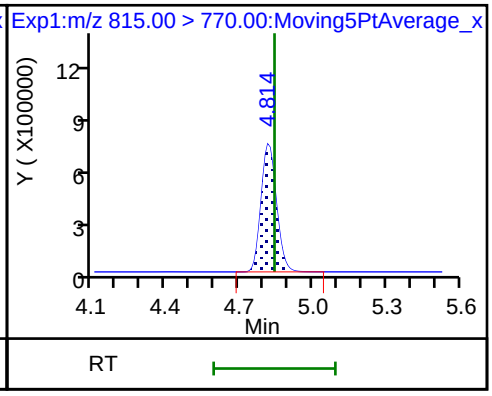
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

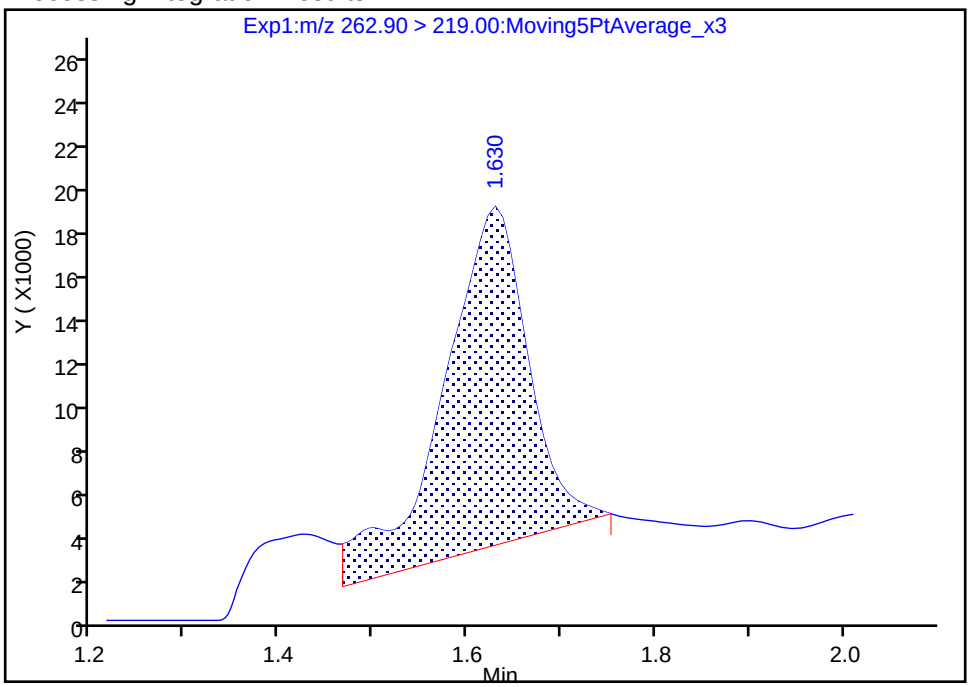
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_004.d				
Injection Date:	30-Jul-2018 03:21:09	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

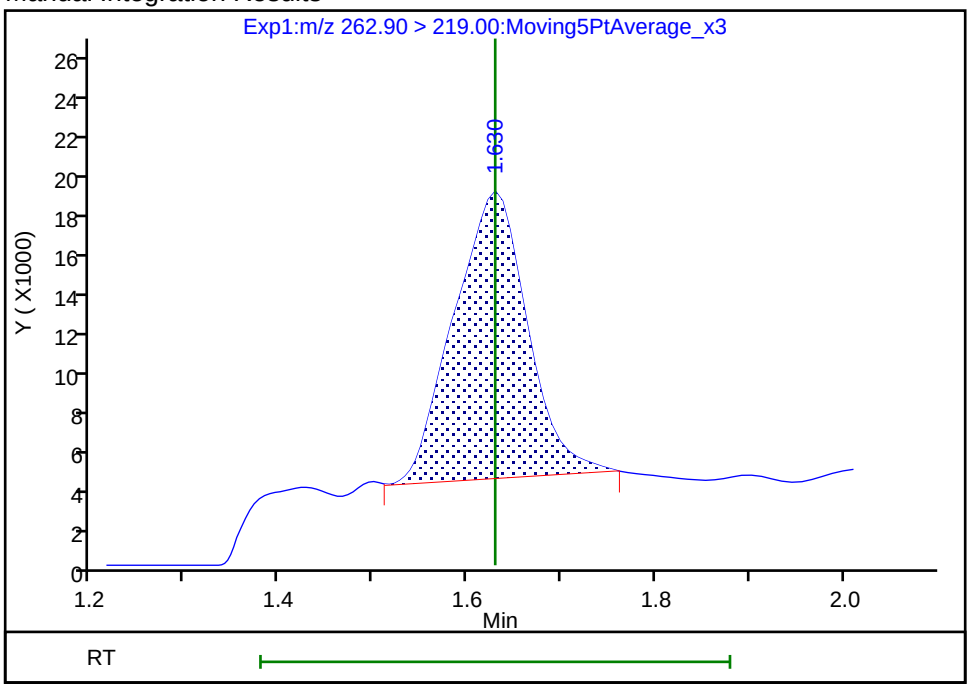
Processing Integration Results

RT: 1.63
Area: 96560
Amount: 0.063804
Amount Units: ng/ml



Manual Integration Results

RT: 1.63
Area: 77646
Amount: 0.051306
Amount Units: ng/ml



Reviewer: roycea, 30-Jul-2018 11:52:30

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

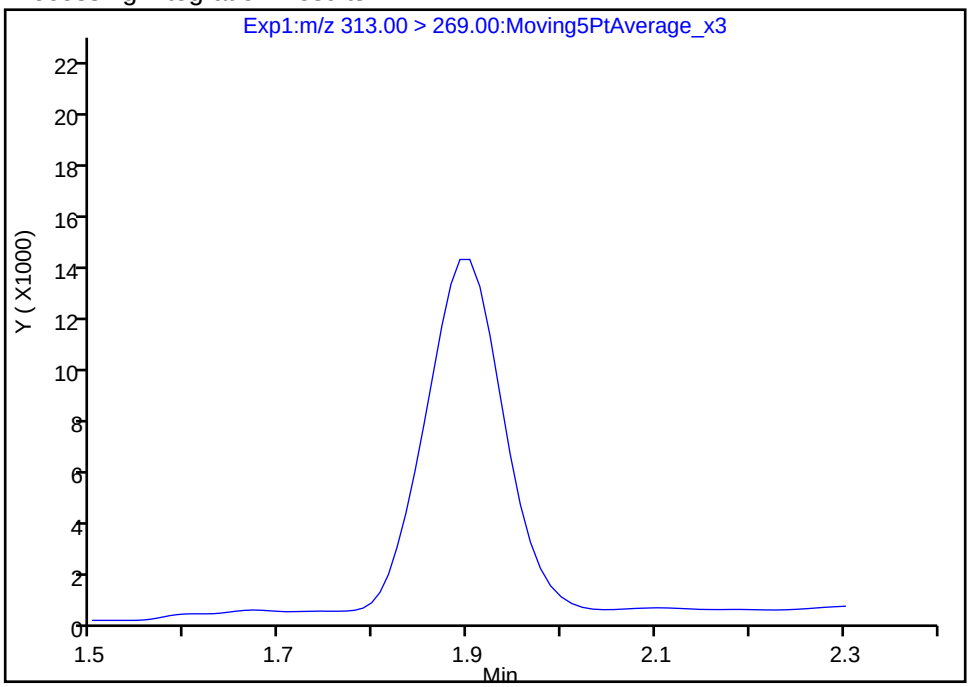
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_004.d				
Injection Date:	30-Jul-2018 03:21:09	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

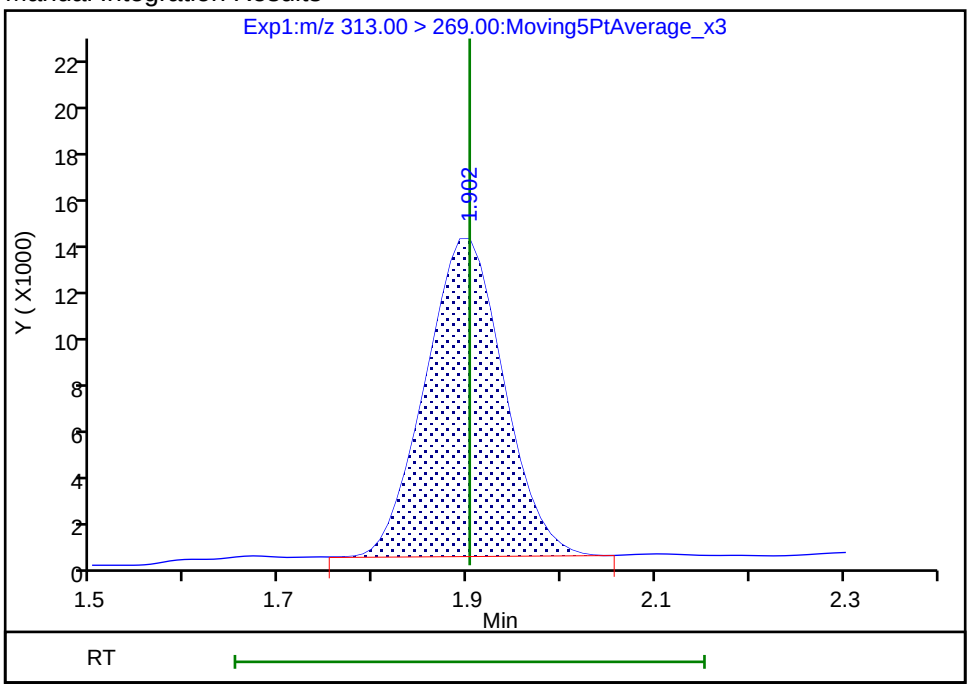
Not Detected
Expected RT: 1.90

Processing Integration Results



Manual Integration Results

RT: 1.90
Area: 79073
Amount: 0.054141
Amount Units: ng/ml



Reviewer: roycea, 30-Jul-2018 11:52:40
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_004.d				
Injection Date:	30-Jul-2018 03:21:09	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

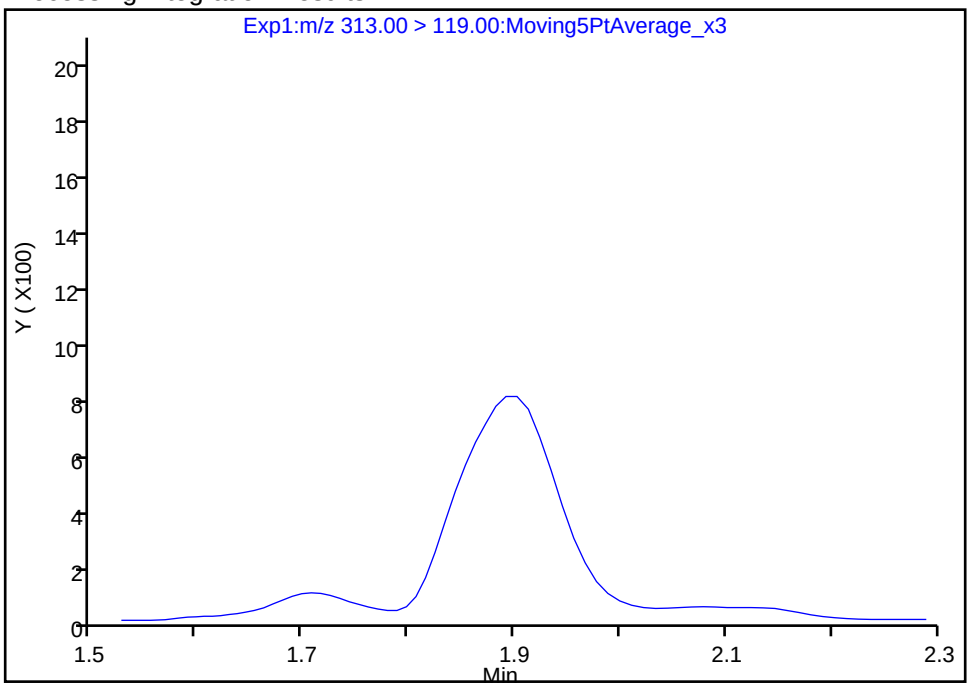
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

Processing Integration Results

Not Detected

Expected RT: 1.90



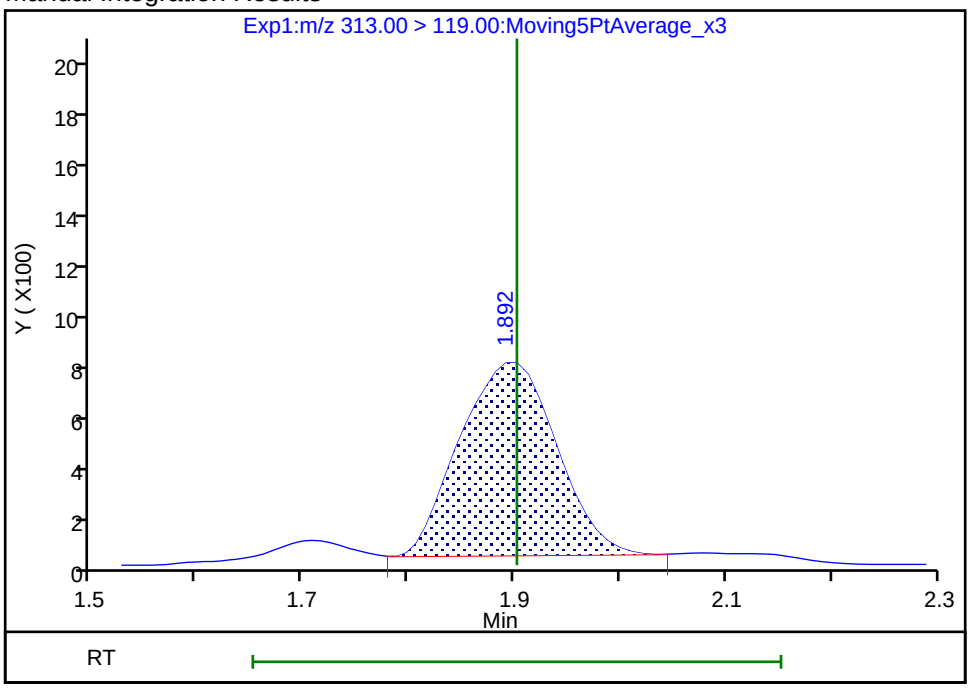
Manual Integration Results

RT: 1.89

Area: 4707

Amount: 0.054141

Amount Units: ng/ml



Reviewer: roycea, 30-Jul-2018 11:52:49

Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

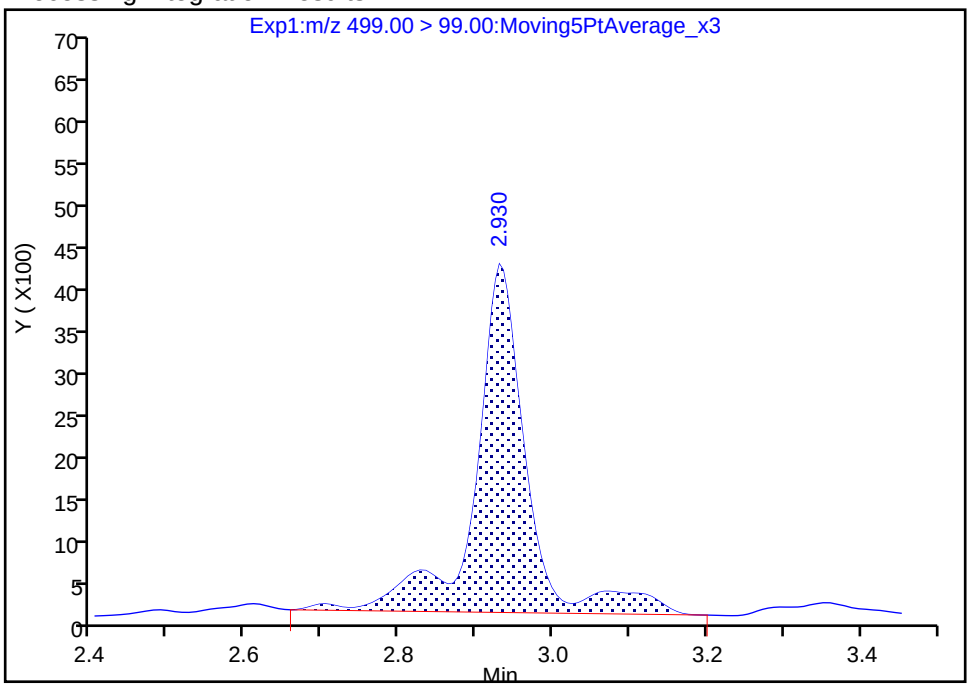
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_004.d				
Injection Date:	30-Jul-2018 03:21:09	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

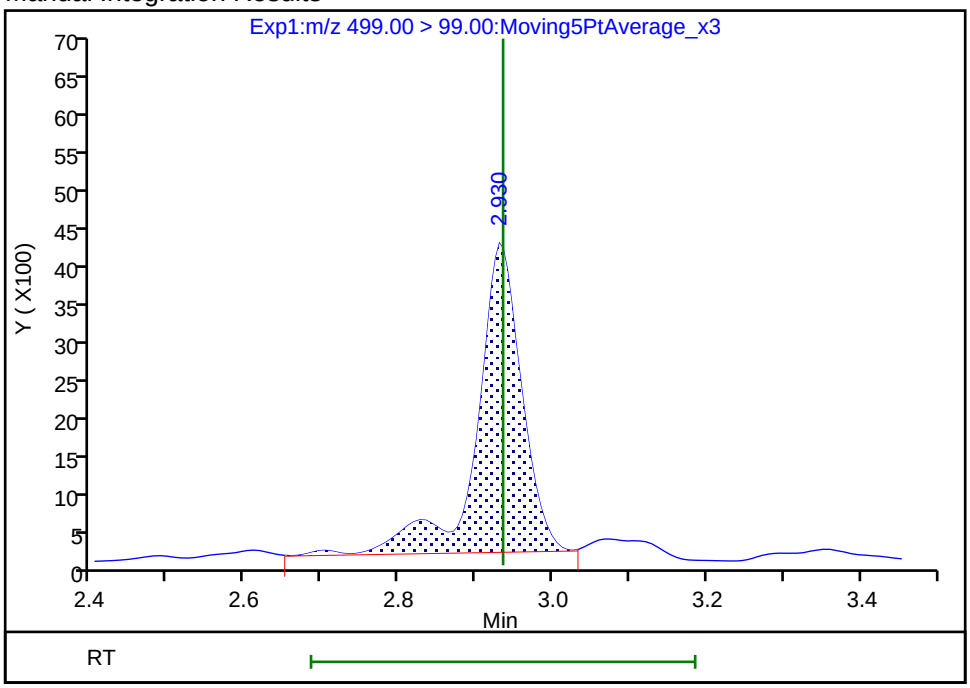
Processing Integration Results

RT: 2.93
Area: 19452
Amount: 0.047640
Amount Units: ng/ml



Manual Integration Results

RT: 2.93
Area: 16734
Amount: 0.047640
Amount Units: ng/ml



Reviewer: roycea, 30-Jul-2018 11:52:19

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/3 Calibration Date: 07/30/2018 03:28

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9679		0.985	1.00	-1.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.201		1.00	1.00	0.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	76.80		0.855	0.884	-3.3	30.0
4:2 FTS	AveID	17.09	10.82		0.591	0.934	-36.7*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.025		0.967	1.00	-3.3	30.0
Perfluoropentanesulfonic acid	AveID	71.24	70.43		0.927	0.938	-1.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.136		1.03	1.00	3.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.081		0.843	0.910	-7.3	30.0
6:2 FTS	AveID	1.687	1.585		0.891	0.948	-6.0	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.147		0.946	1.00	-5.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.320		0.908	0.952	-4.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.063		0.931	1.00	-6.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.089		0.914	0.928	-1.5	30.0
8:2 FTS	AveID	1.356	1.314		0.929	0.958	-3.1	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7668		0.986	0.960	2.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.055		1.03	1.00	2.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.001		1.01	1.00	0.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.9812		0.996	1.00	-0.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6818		0.991	0.964	2.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8345		0.895	1.00	-10.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.151		0.927	1.00	-7.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.082		1.00	1.00	-0.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.005		0.956	1.00	-4.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2592		1.03	1.00	3.4	30.0
13C4 PFBA	Ave	1.159	1.324		2.86	2.50	14.2	30.0
13C5-PFPeA	Ave	0.8093	0.9237		2.85	2.50	14.1	30.0
13C3-PFBS	Ave	0.0212	0.0248		2.72	2.33	16.9	30.0
13C2 PFHxA	Ave	0.9490	1.027		2.71	2.50	8.2	30.0
13C4-PFHpA	Ave	0.9779	1.033		2.64	2.50	5.7	30.0
18O2 PFHxS	Ave	1.256	1.422		2.68	2.37	13.2	30.0
M2-6:2FTS	Ave	0.2731	0.1928		1.68	2.38	-29.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/3 Calibration Date: 07/30/2018 03:28

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	1.016		2.66	2.50	6.2	30.0
13C4 PFOS	Ave	0.8734	0.9949		2.72	2.39	13.9	30.0
13C5 PFNA	Ave	0.8250	0.9392		2.85	2.50	13.8	30.0
M2-8:2FTS	Ave	0.2848	0.3128		2.63	2.40	9.8	30.0
13C2 PFDA	Ave	0.6565	0.7938		3.02	2.50	20.9	30.0
13C8 FOSA	Ave	1.283	1.487		2.90	2.50	15.9	30.0
d3-NMeFOSAA	Ave	0.2169	0.2969		3.42	2.50	36.8*	30.0
d5-NEtFOSAA	Ave	0.2280	0.3293		3.61	2.50	44.4*	30.0
13C2 PFUnA	Ave	0.5287	0.6409		3.03	2.50	21.2	30.0
13C2 PFDoA	Ave	0.5026	0.5932		2.95	2.50	18.0	30.0
13C2-PFTeDA	Ave	0.4910	0.5812		2.96	2.50	18.4	30.0
13C2-PFHxDA	Ave	0.7454	0.8695		2.92	2.50	16.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_005.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 30-Jul-2018 03:28:58 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 11:55:40 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jul-2018 11:54:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.389	1.389	0.0	1.000	1910053	0.9849		98.5	898	M
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.396	-0.007	0.540	4933421	2.86		114	91813	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.629	1.629	0.0	1.000	1652954	1.00		100	876	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.640	-0.011	0.634	3441865	2.85		114	65147	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.662	1.662	0.0	1.000	2510195	0.8551		96.7	7099	
298.90 > 99.00	1.662	1.662	0.0	1.000	1025729		2.45(1.25-3.74)		5152	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.674	-0.012	0.647	85962	2.72		117	754	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.863	1.863	0.0	1.121	373533	0.5910		63.3	16977	
D 60 M2-4:2FTS										
329.00 > 81.00	1.863	1.875	-0.012	0.725	393682	NC			4836	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.902	0.0	1.000	1568629	0.9670		96.7	6889	
313.00 > 119.00	1.902	1.902	0.0	1.000	150491		10.42(5.03-15.10)		4438	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.740	3826178	2.71		108	75007	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.157	2442528	0.9274		98.9	32818	
349.00 > 99.00	1.924	1.924	0.0	1.157	889527		2.75(1.36-4.07)		10310	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	1.999	0.0	1.006	313022	NC			1801	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.988	2.014	-0.026	0.773	358202	NC			12674	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.214	2.214	0.0	1.000	1750548	1.03		103	4255	
363.00 > 169.00	2.214	2.214	0.0	1.000	691083		2.53(1.13-3.40)		8393	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.225	2.225	0.0	0.995	2085965	0.8433		92.7	13597	
399.00 > 99.00	2.225	2.225	0.0	0.995	717181		2.91(1.50-4.49)		2516	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.240	-0.026	0.861	3850902	2.64		106	59716	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.870	5014198	2.68		113	44139	
65 ADONA										
377.00 > 251.00	2.263	2.263	0.0	0.771	4604029	NC			64945	
377.00 > 85.00	2.263	2.263	0.0	0.771	2676136		1.72(0.84-2.53)		13647	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.545	2.545	0.0	1.000	431750	0.8907		94.0	6717	
D 12 M2-6:2FTS										
429.00 > 81.00	2.545	2.564	-0.019	0.990	682385	1.68		70.6	11315	
* 62 13C2-PFOA										
415.00 > 370.00	2.571	2.571	0.0		3726307	2.50			46039	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.571	2.571	0.0	1.000	1739964	0.9464		94.5	2734	
413.00 > 169.00	2.571	2.571	0.0	1.000	898677		1.94(0.84-2.52)		6843	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.579	2.579	0.0	0.879	1863288	0.9083		95.4	24766	
449.00 > 99.00	2.579	2.579	0.0	0.879	493684		3.77(1.94-5.82)		4304	
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.588	-0.017	1.000	3787066	2.66		106	53230	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.935	2.935	0.0	1.000	1498215	0.9143		98.5	20363	
499.00 > 99.00	2.935	2.935	0.0	1.000	353468		4.24(2.31-6.93)		3627	
20 Perfluorononanoic acid										
463.00 > 419.00	2.935	2.935	0.0	1.000	1488647	0.9314		93.1	5506	
463.00 > 169.00	2.935	2.935	0.0	1.000	351434		4.24(1.90-5.69)		12203	
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.953	-0.018	1.142	3499722	2.85		114	60852	
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.953	-0.018	1.142	3544294	2.72		114	36040	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.145	3.145	0.0	1.072	2491733	NC			18100	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.280	3.280	0.0	1.000	586877	0.9286		96.9	14625	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.287	3.287	0.0	1.120	1091676	0.9856		103	27822	
549.00 > 99.00	3.287	3.287	0.0	1.120	436188		2.50(1.33-3.97)		3348	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.295	3.295	0.0	1.000	1247827	1.03		103	9329	
513.00 > 169.00	3.295	3.295	0.0	1.000	205689		6.07(2.36-7.09)		5556	
D 26 M2-8:2FTS										
529.00 > 81.00	3.280	3.299	-0.019	1.276	1116471	2.63		110	23135	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.311	0.0	1.000	2219474	1.01		101	28348	
D 23 13C2 PFDA										
515.00 > 470.00	3.295	3.314	-0.019	1.282	2958102	3.02		121	48826	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.322	-0.011	1.288	5542504	2.90		116	40567	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.454	0.0	1.000	434153	1.00		99.6	4698	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.467	-0.013	1.343	1106185	3.42		137	40068	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.607	3.607	0.0	1.229	974690	0.99		103	40829	
599.00 > 99.00	3.607	3.607	0.0	1.229	308901		3.16(1.39-4.16)		5877	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.628	3.628	0.0	1.000	1099171	0.9273		92.7	5140	
563.00 > 169.00	3.628	3.628	0.0	1.000	204692		5.37(2.12-6.36)		6127	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.628	3.628	0.0	1.003	409587	0.8945		89.5	11512	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.618	3.640	-0.022	1.407	1226978	3.61		144	4161	
D 30 13C2 PFUnA										
565.00 > 520.00	3.628	3.640	-0.012	1.411	2388212	3.03		121	45484	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.782	3.782	0.0	1.289	3793767	NC			41758	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.918	3.918	0.0	1.000	956561	1.00		100.0	288	
613.00 > 169.00	3.918	3.918	0.0	1.000	231374		4.13(2.13-6.40)		4413	
D 36 13C2 PFDoA										
615.00 > 570.00	3.918	3.930	-0.012	1.524	2210558	2.95		118	17864	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.182	4.182	0.0	1.068	888250	0.9564		95.6	268	
663.00 > 169.00	4.182	4.182	0.0	1.068	274558		3.24(1.25-3.76)		4530	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.415	4.415	0.0	1.000	224519	1.03		103	3858	
713.00 > 219.00	4.415	4.415	0.0	1.000	153485		1.46(0.71-2.13)		2847	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.437	-0.022	1.717	2165893	2.96		118	17877	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.823	0.0	1.000	1241691	NC			197	
813.00 > 169.00	4.823	4.823	0.0	1.000	221082		5.62(2.86-8.58)		2984	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.842	-0.019	1.876	3239928	2.92		117	12849	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.165	5.165	0.0	1.071	1353445	NC			224	
913.00 > 169.00	5.165	5.165	0.0	1.071	171119		7.91(3.83-11.48)		2441	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 11:55:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_005.d

Injection Date: 30-Jul-2018 03:28:58 Instrument ID: A8_N

Lims ID: CCV L4

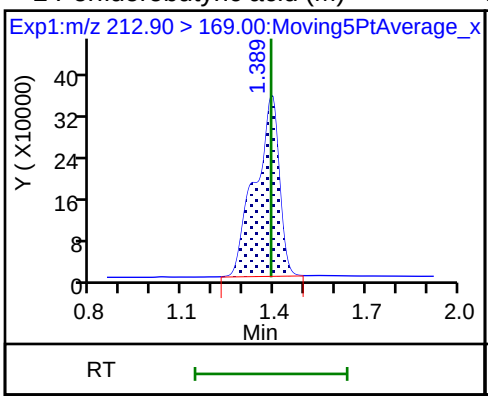
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 3

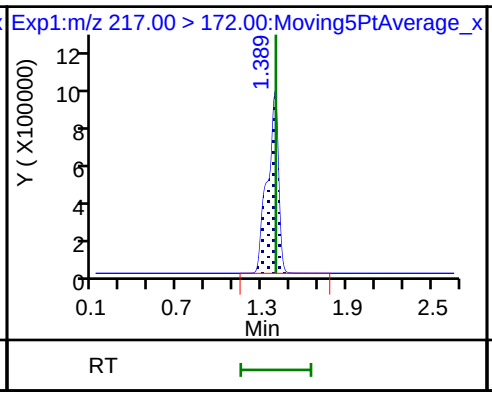
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

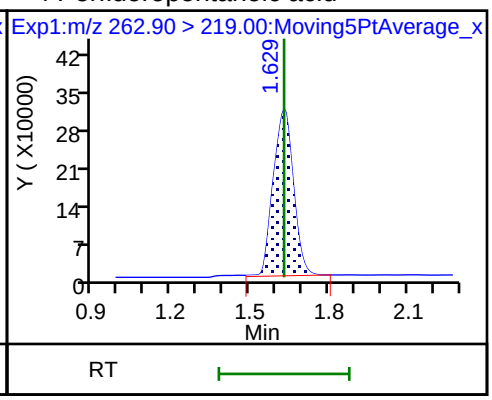
2 Perfluorobutyric acid (M)



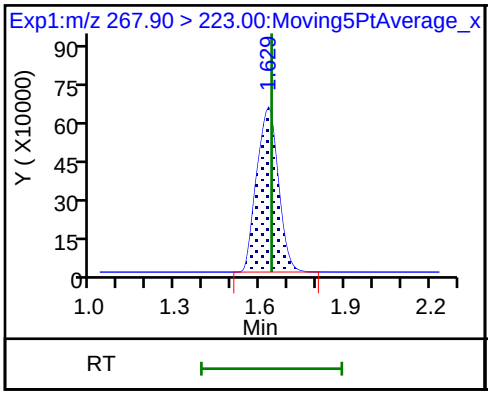
D 1 13C4 PFBA



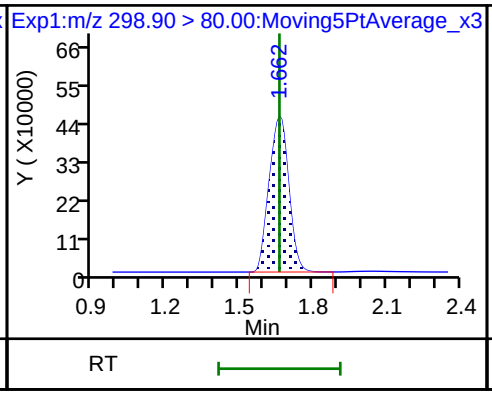
4 Perfluoropentanoic acid



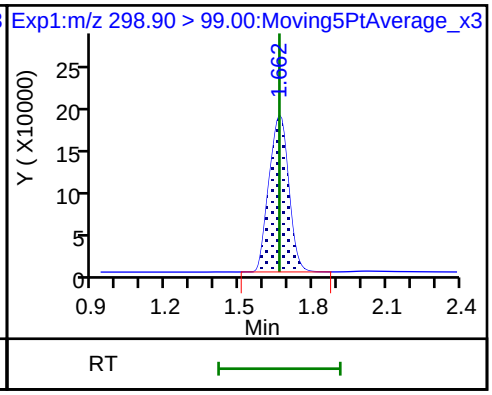
D 3 13C5-PFPeA



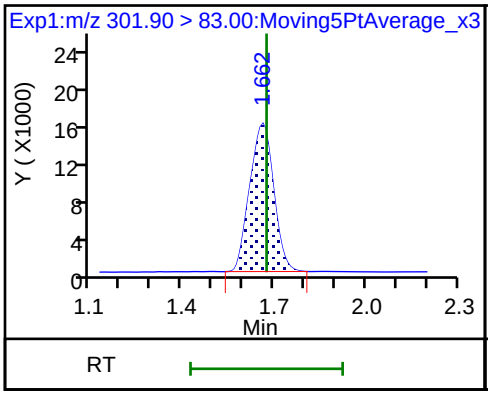
5 Perfluorobutanesulfonic acid



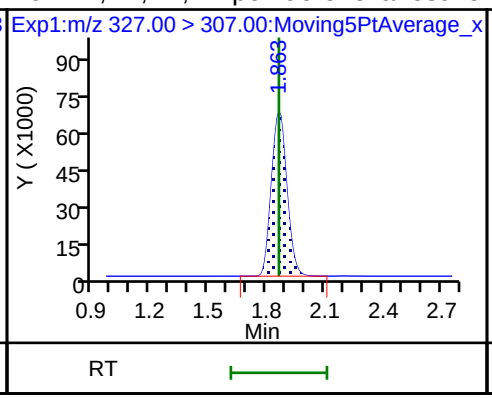
5 Perfluorobutanesulfonic acid



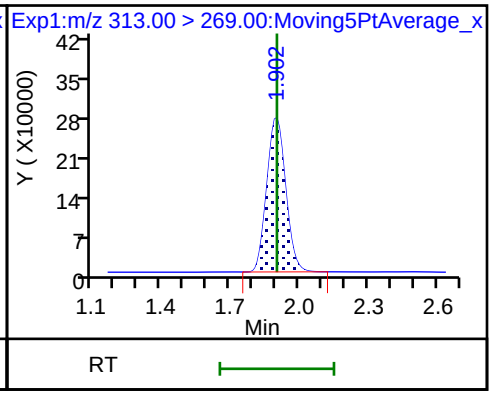
D 47 13C3-PFBS



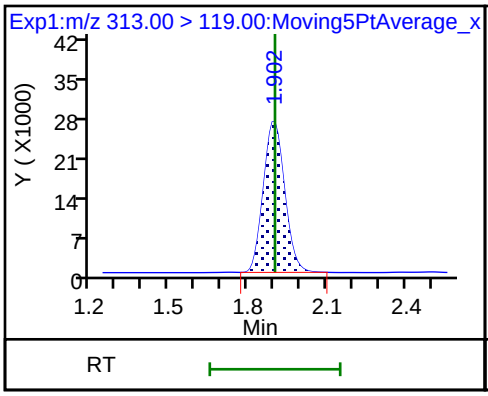
61 1H,1H,2H,2H-perfluorohexanesulfoni



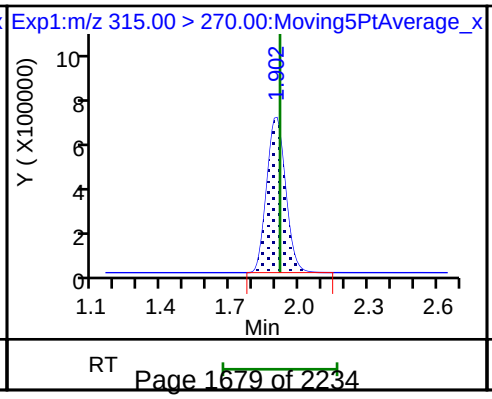
6 Perfluorohexanoic acid



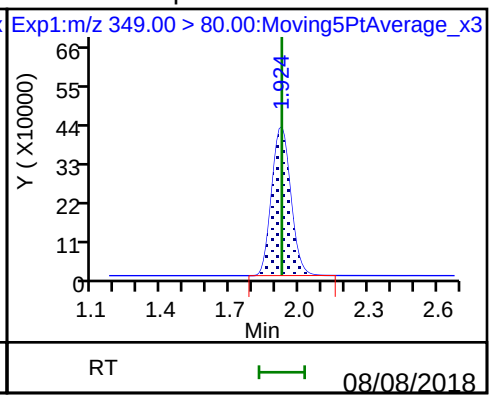
6 Perfluorohexanoic acid



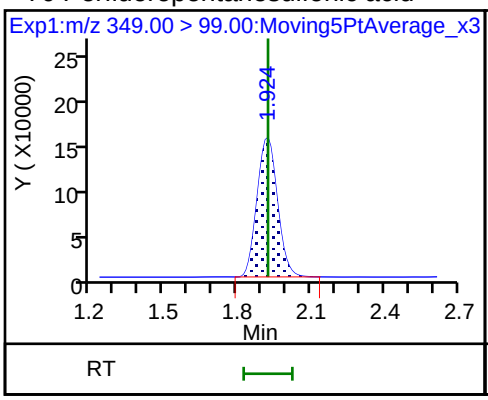
D 7 13C2 PFHxA



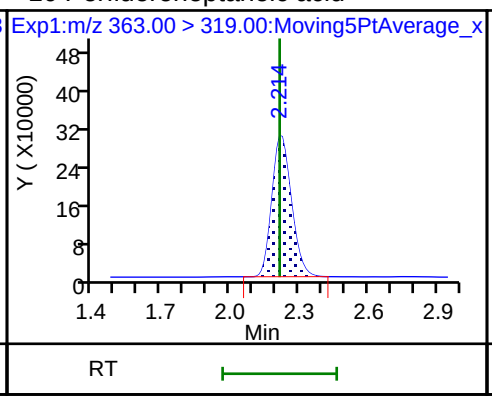
70 Perfluoropentanesulfonic acid



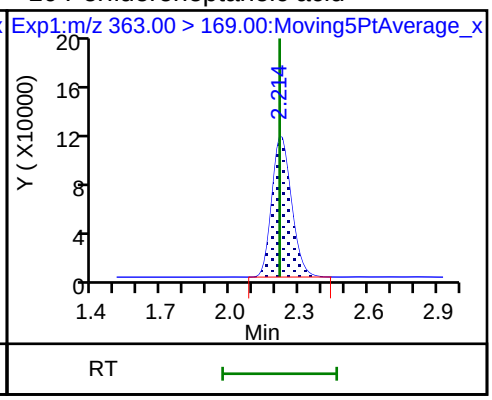
70 Perfluoropentanesulfonic acid



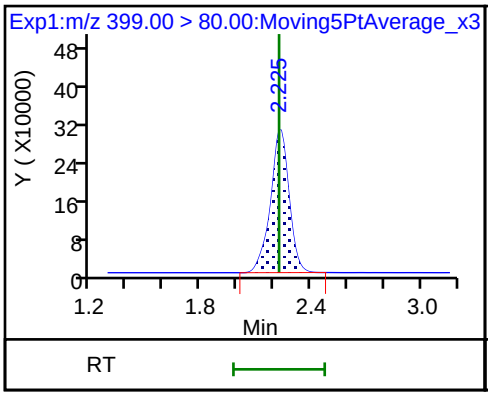
10 Perfluoroheptanoic acid



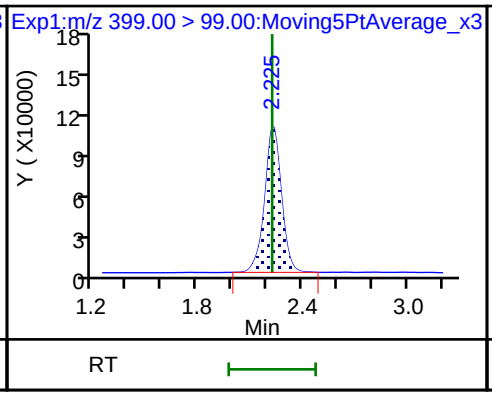
10 Perfluoroheptanoic acid



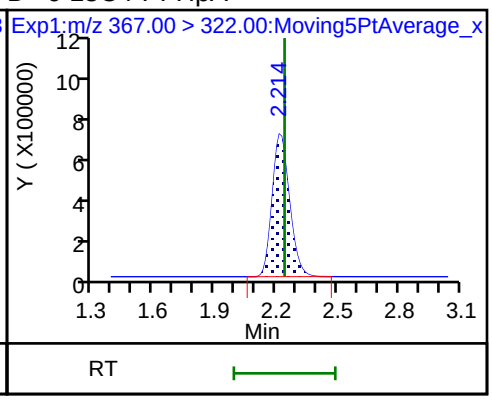
8 Perfluorohexanesulfonic acid



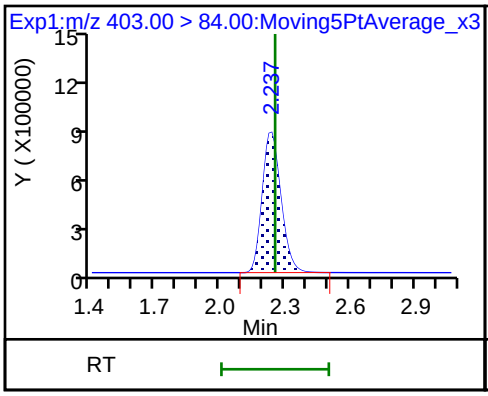
8 Perfluorohexanesulfonic acid



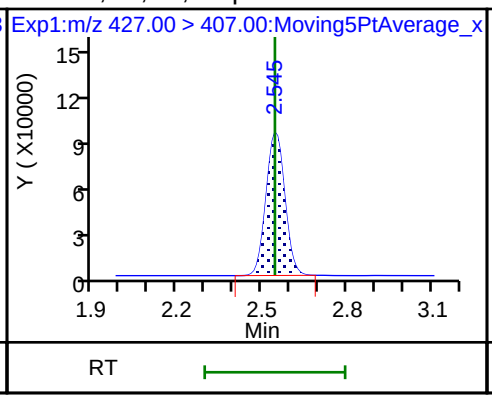
D 9 13C4-PFHpA



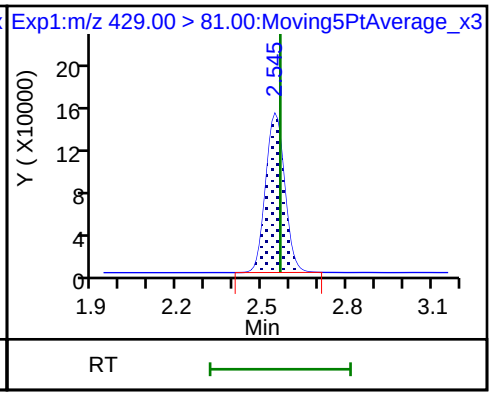
D 11 18O2 PFHxS



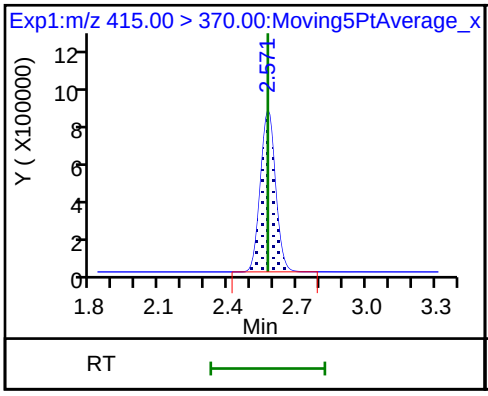
13 1H,1H,2H,2H-perfluorooctanesulfon



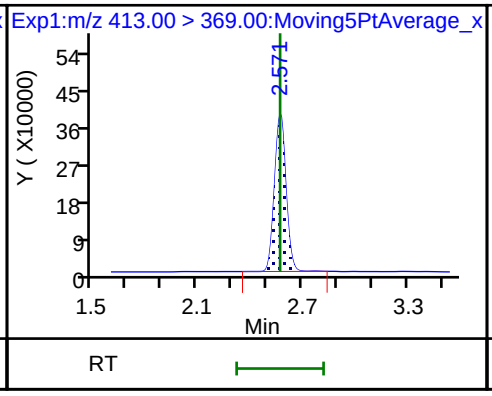
D 12 M2-6:2FTS



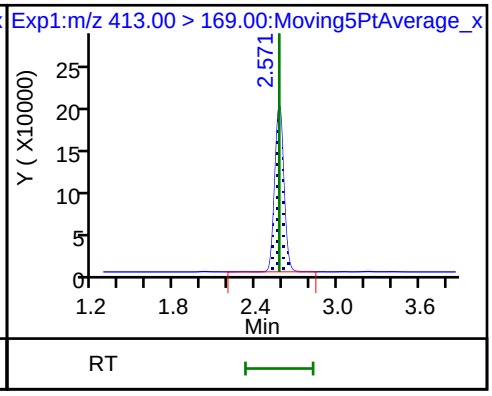
* 62 13C2-PFOA



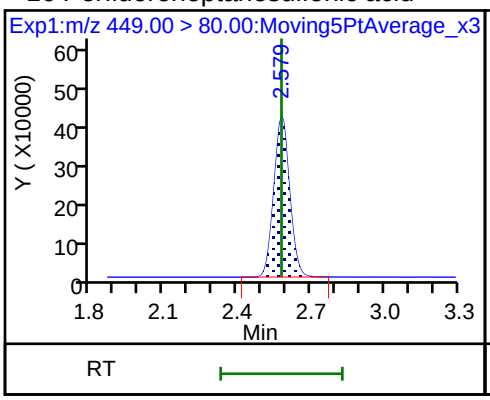
15 Perfluorooctanoic acid



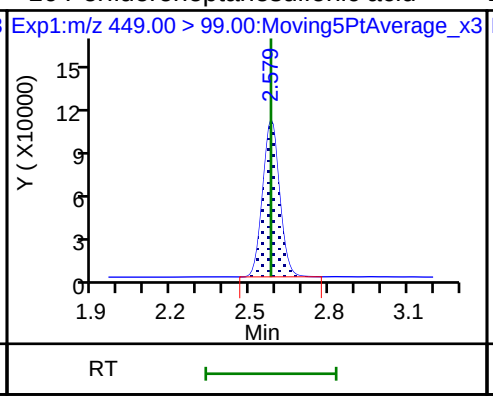
15 Perfluorooctanoic acid



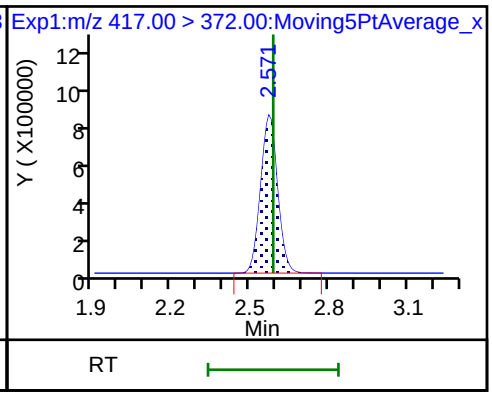
16 Perfluoroheptanesulfonic acid



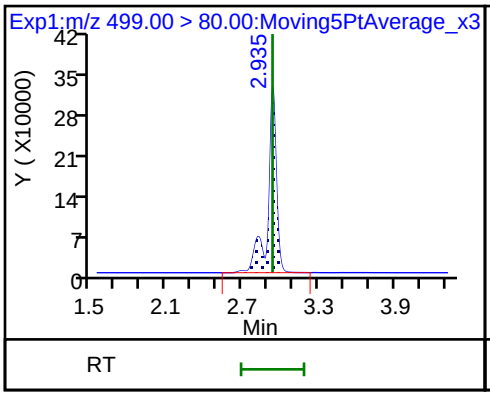
16 Perfluoroheptanesulfonic acid



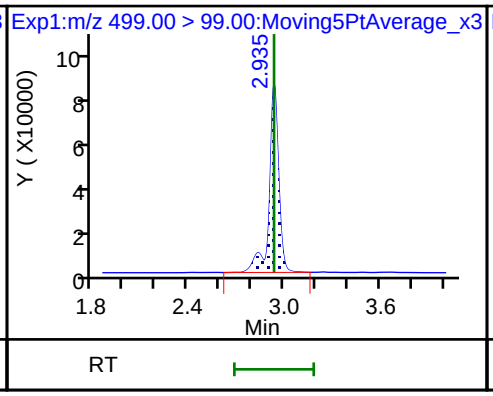
D 14 13C4 PFOA



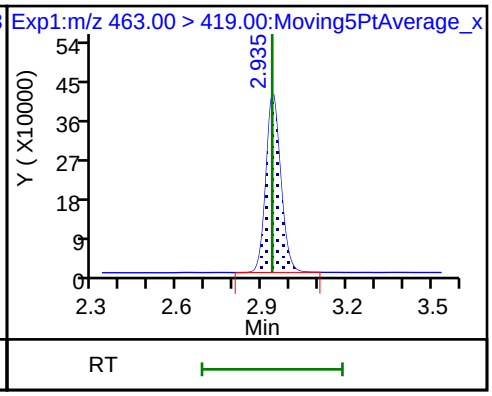
17 Perfluorooctane sulfonic acid



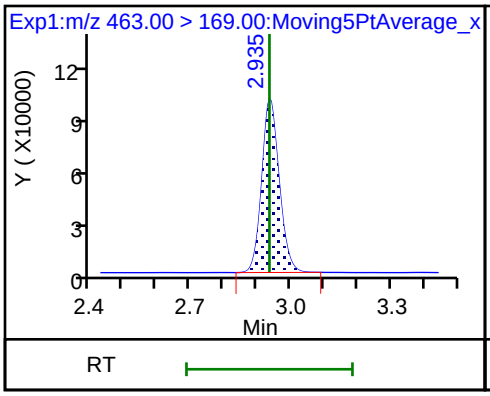
17 Perfluorooctane sulfonic acid



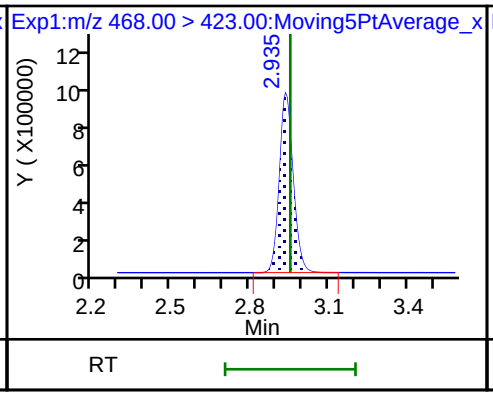
20 Perfluorononanoic acid



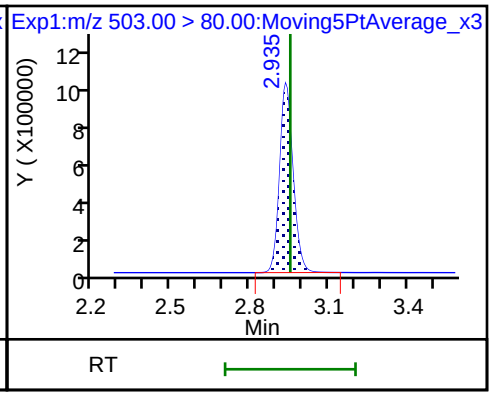
20 Perfluorononanoic acid



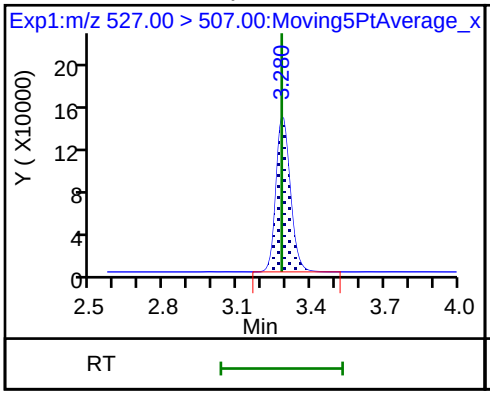
D 19 13C5 PFNA



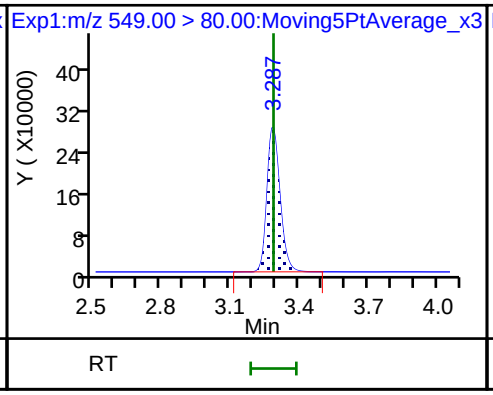
D 18 13C4 PFOS



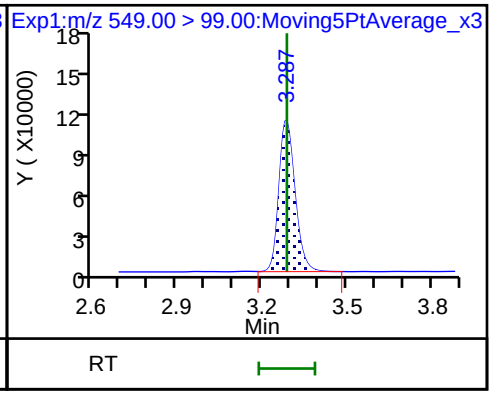
25 1H,1H,2H,2H-perfluorodecanesulfoni



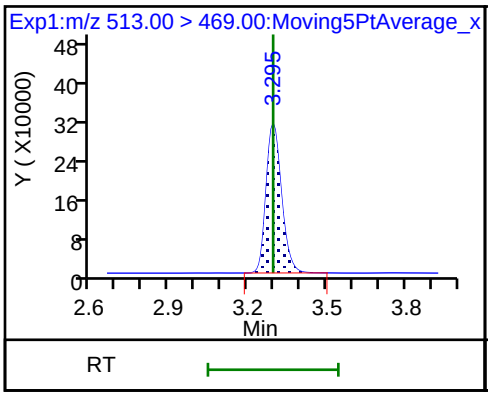
68 Perfluorononanesulfonic acid



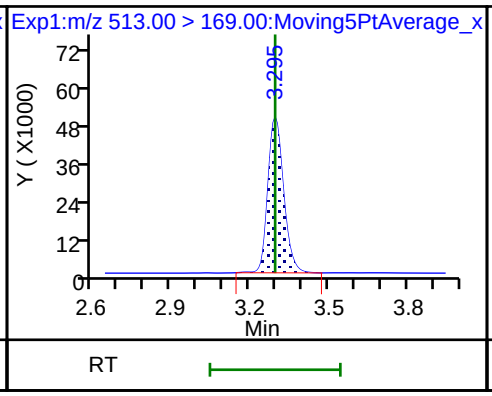
68 Perfluorononanesulfonic acid



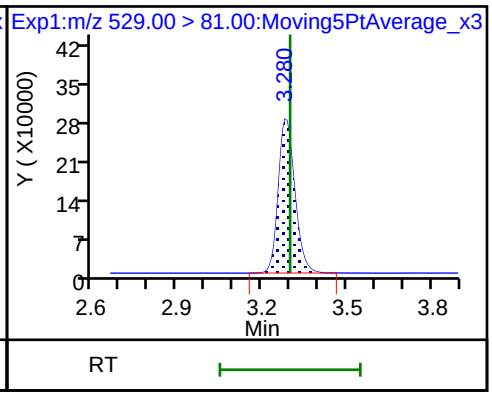
24 Perfluorodecanoic acid



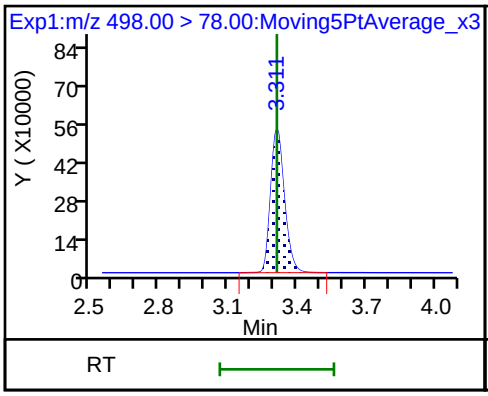
24 Perfluorodecanoic acid



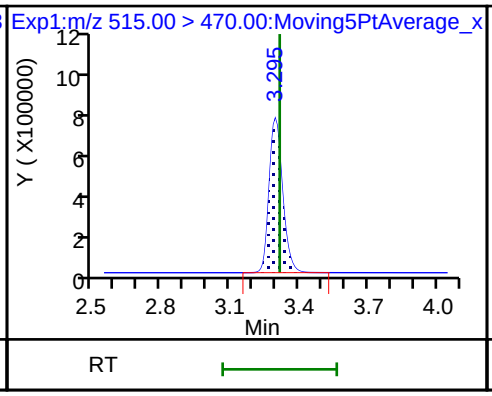
D 26 M2-8:2FTS



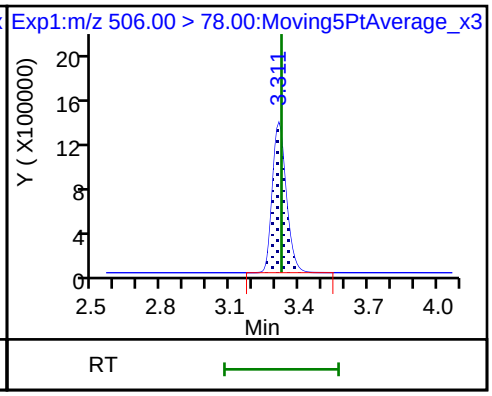
22 Perfluorooctane Sulfonamide



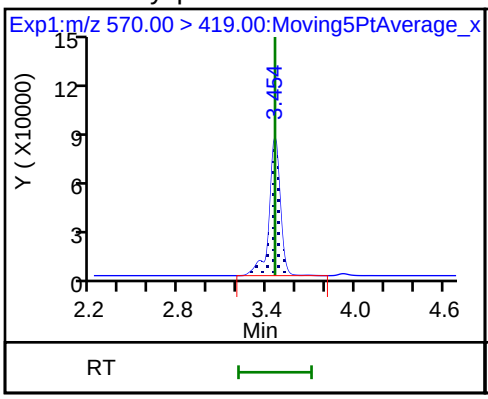
D 23 13C2 PFDA



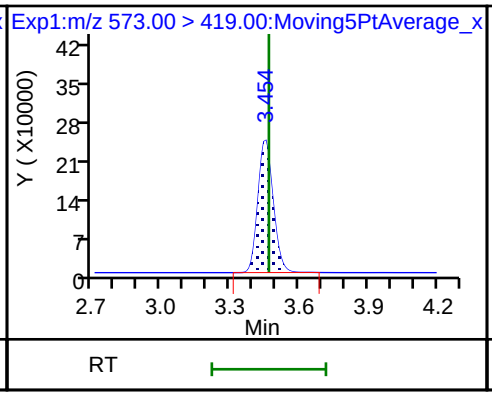
D 21 13C8 FOSA



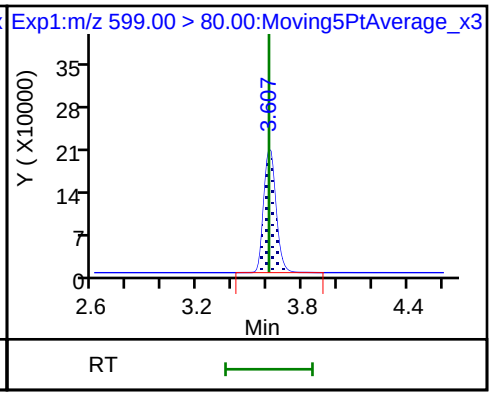
28 N-methyl perfluorooctane sulfonami



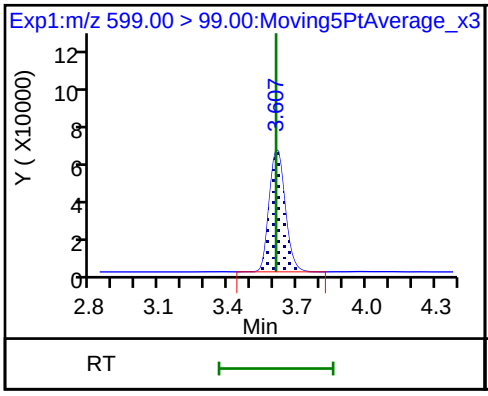
D 27 d3-NMeFOSAA



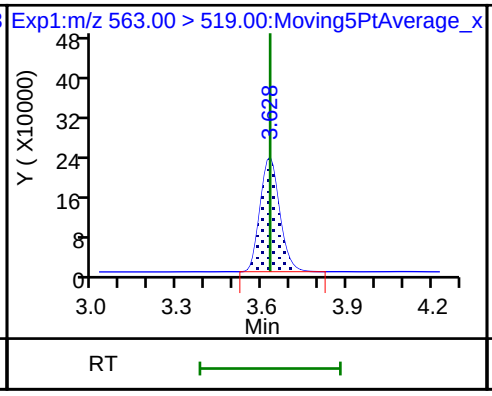
29 Perfluorodecane Sulfonic acid



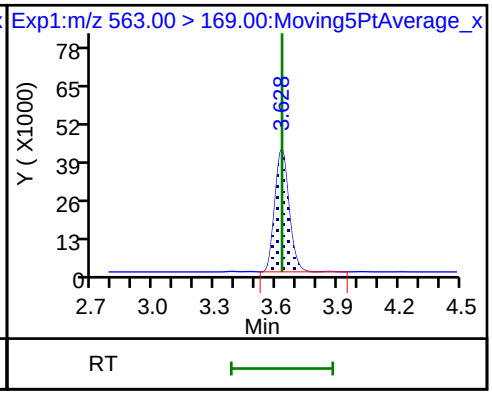
29 Perfluorodecane Sulfonic acid



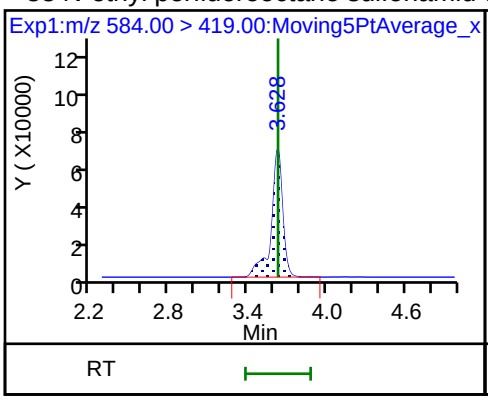
31 Perfluoroundecanoic acid



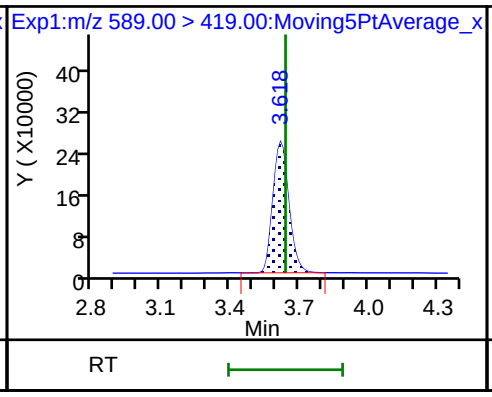
31 Perfluoroundecanoic acid



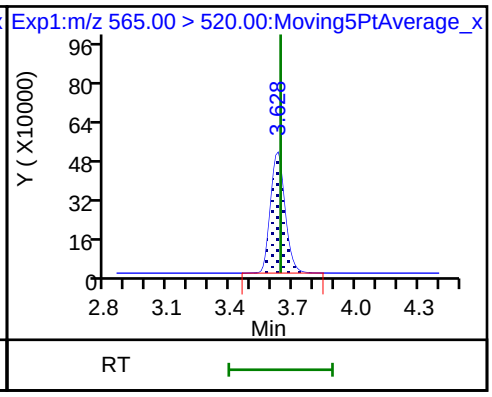
33 N-ethyl perfluorooctane sulfonamid



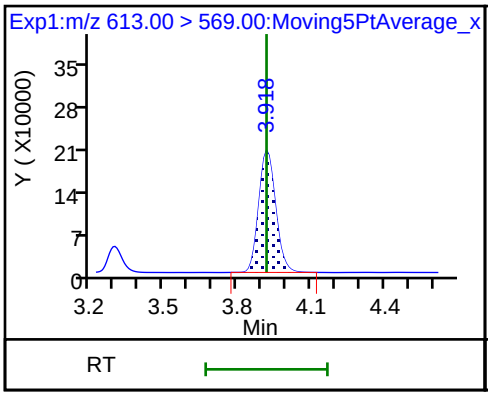
D 32 d5-NEtFOSAA



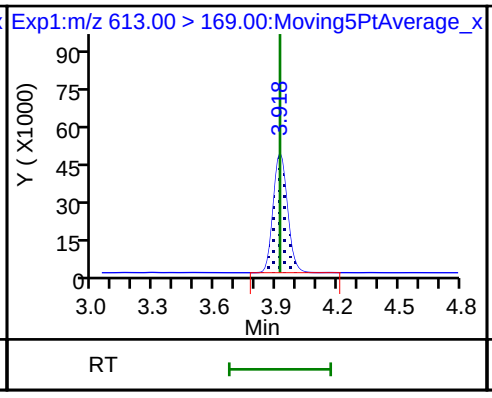
D 30 13C2 PFUnA



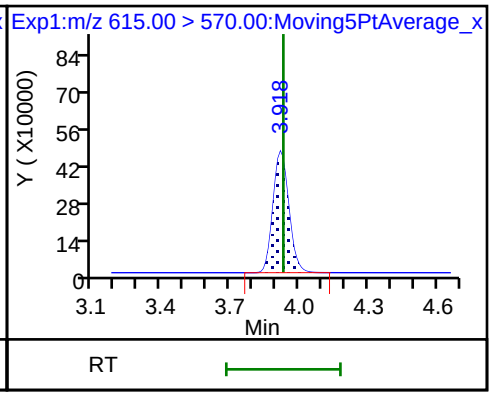
37 Perfluorododecanoic acid



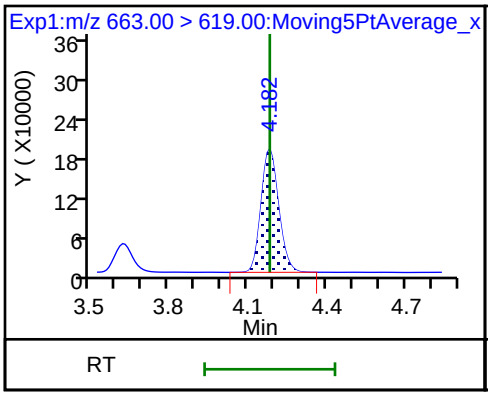
37 Perfluorododecanoic acid



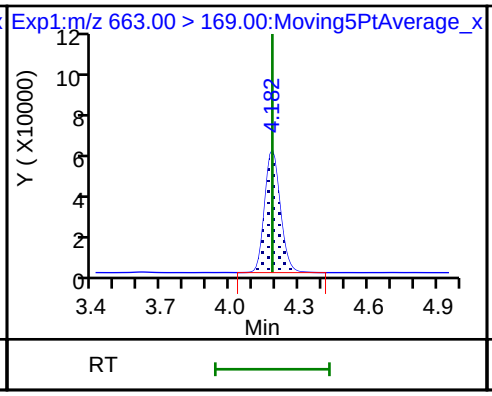
D 36 13C2 PFDoA



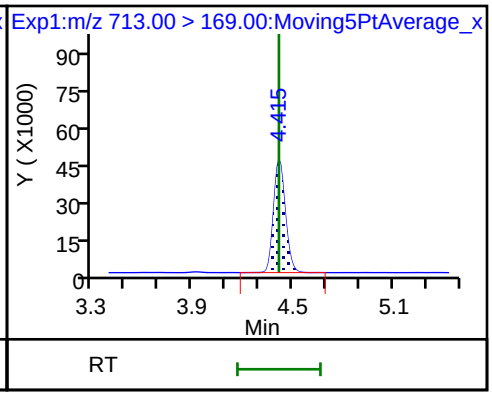
41 Perfluorotridecanoic acid



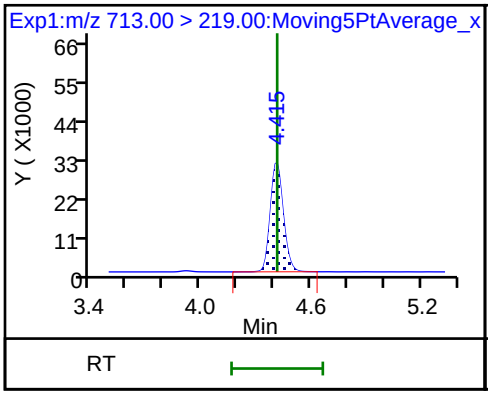
41 Perfluorotridecanoic acid



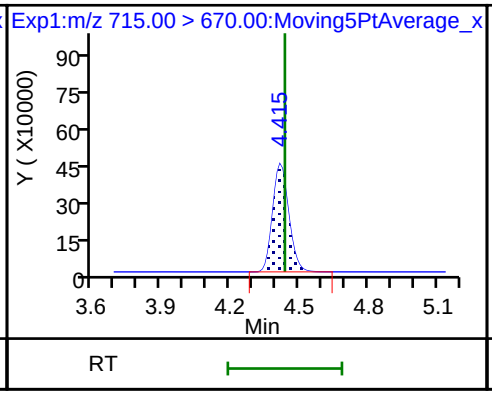
42 Perfluorotetradecanoic acid



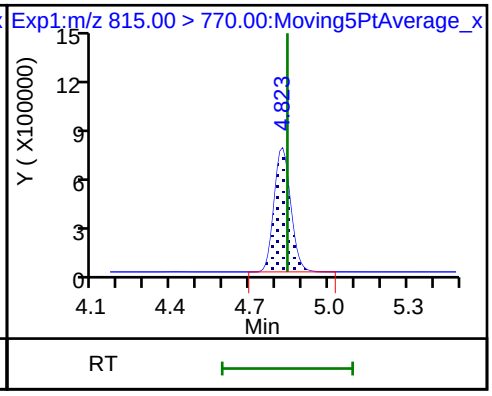
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

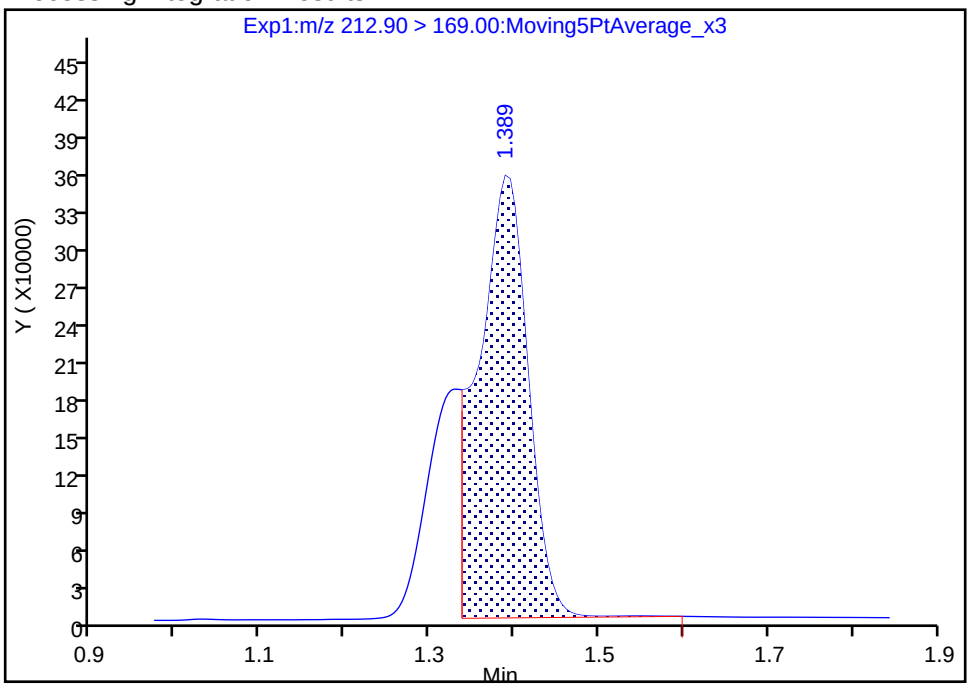
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_005.d				
Injection Date:	30-Jul-2018 03:28:58	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

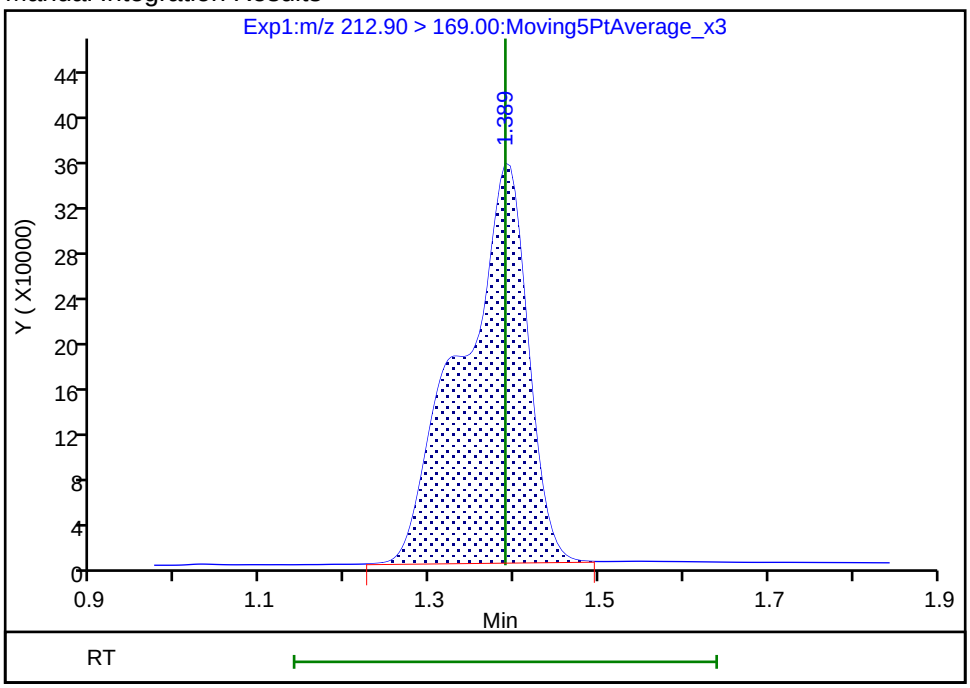
Processing Integration Results

RT: 1.39
Area: 1408338
Amount: 0.726183
Amount Units: ng/ml



Manual Integration Results

RT: 1.39
Area: 1910053
Amount: 0.984883
Amount Units: ng/ml



Reviewer: roycea, 30-Jul-2018 11:53:58

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/14 Calibration Date: 07/30/2018 04:54

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9786		2.49	2.50	-0.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.236		2.58	2.50	3.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	79.30		2.21	2.21	-0.1	30.0
4:2 FTS	AveID	17.09	11.30		1.54	2.34	-33.9*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.000		2.36	2.50	-5.6	30.0
Perfluoropentanesulfonic acid	AveID	71.24	70.62		2.32	2.35	-0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.135		2.57	2.50	2.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.135		2.21	2.28	-2.7	30.0
6:2 FTS	AveID	1.687	1.564		2.20	2.37	-7.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.193		2.46	2.50	-1.7	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.385		2.38	2.38	0.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.111		2.43	2.50	-2.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.113		2.34	2.32	0.7	30.0
8:2 FTS	AveID	1.356	1.318		2.33	2.40	-2.8	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.8070		2.59	2.40	8.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.074		2.61	2.50	4.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.002		2.52	2.50	0.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.036		2.63	2.50	5.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6957		2.53	2.41	4.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8190		2.19	2.50	-12.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.144		2.31	2.50	-7.8	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.088		2.51	2.50	0.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.037		2.47	2.50	-1.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2454		2.45	2.50	-2.1	30.0
13C4 PFBA	Ave	1.159	1.289		2.78	2.50	11.2	30.0
13C5-PFPeA	Ave	0.8093	0.8756		2.70	2.50	8.2	30.0
13C3-PFBS	Ave	0.0212	0.0232		2.54	2.33	9.3	30.0
13C2 PFHxA	Ave	0.9490	0.998		2.63	2.50	5.2	30.0
13C4-PFHpA	Ave	0.9779	0.9515		2.43	2.50	-2.7	30.0
18O2 PFHxS	Ave	1.256	1.314		2.47	2.37	4.6	30.0
M2-6:2FTS	Ave	0.2731	0.1810		1.57	2.38	-33.7*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/14 Calibration Date: 07/30/2018 04:54

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9443		2.47	2.50	-1.3	30.0
13C4 PFOS	Ave	0.8734	0.9375		2.57	2.39	7.3	30.0
13C5 PFNA	Ave	0.8250	0.8504		2.58	2.50	3.1	30.0
M2-8:2FTS	Ave	0.2848	0.2882		2.42	2.40	1.2	30.0
13C2 PFDA	Ave	0.6565	0.7421		2.83	2.50	13.0	30.0
13C8 FOSA	Ave	1.283	1.410		2.75	2.50	9.9	30.0
d3-NMeFOSAA	Ave	0.2169	0.2741		3.16	2.50	26.3	30.0
d5-NEtFOSAA	Ave	0.2280	0.3081		3.38	2.50	35.2*	30.0
13C2 PFUnA	Ave	0.5287	0.6260		2.96	2.50	18.4	30.0
13C2 PFDoA	Ave	0.5026	0.5929		2.95	2.50	18.0	30.0
13C2-PFTeDA	Ave	0.4910	0.5789		2.95	2.50	17.9	30.0
13C2-PFHxDA	Ave	0.7454	0.8320		2.79	2.50	11.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_016.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 30-Jul-2018 04:54:58 ALS Bottle#: 14 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:57:51 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:57:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.400	1.400	0.0	1.004	4844532	2.49		99.6	2358	
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.396	-0.001	0.541	4950309	2.78		111	76542	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.637	0.0	1.000	4156305	2.58		103	3652	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.640	-0.003	0.635	3362675	2.70		108	71067	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.000	6244994	2.21		99.9	18886	
298.90 > 99.00	1.671	1.671	0.0	1.000	2534458		2.46(1.25-3.74)		12255	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.674	-0.003	0.648	82849	2.54		109	633	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.873	1.873	0.0	1.120	940500	1.54		66.1	43032	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.875	-0.002	0.726	363103	NC			4417	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.902	0.0	1.000	3834803	2.36		94.4	16803	
313.00 > 119.00	1.902	1.902	0.0	1.000	349956		10.96(5.03-15.10)		8794	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.738	3833760	2.63		105	75638	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.934	1.934	0.0	1.157	5901120	2.32		99.1	84993	
349.00 > 99.00	1.934	1.934	0.0	1.157	2160945		2.73(1.36-4.07)		19718	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	1.999	0.0	1.000	773087	NC			5568	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.014	-0.015	0.775	313773	NC			10737	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.225	0.0	1.000	4147062	2.57		103	10498	
363.00 > 169.00	2.225	2.225	0.0	1.000	1548746		2.68(1.13-3.40)		18738	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	5211540	2.21		97.3	24256	
399.00 > 99.00	2.237	2.237	0.0	1.000	1678266		3.11(1.50-4.49)		5493	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3654184	2.43		97.3	77529	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4772190	2.47		105	39743	
65 ADONA										
377.00 > 251.00	2.277	2.277	0.0	0.773	11051688	NC			97001	
377.00 > 85.00	2.277	2.277	0.0	0.773	6856238		1.61(0.84-2.53)		27930	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	1030777	2.20		92.7	13916	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.564	-0.010	0.990	660422	1.57		66.3	16184	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		3840557	2.50			45032	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	4329435	2.46		98.3	5681	
413.00 > 169.00	2.579	2.579	0.0	1.000	2270069		1.91(0.84-2.52)		12653	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	4748448	2.38		100	38170	
449.00 > 99.00	2.587	2.587	0.0	0.878	1260679		3.77(1.94-5.82)		10602	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3626568	2.47		98.7	45049	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.946	2.946	0.0	1.000	3717600	2.34		101	32687	
499.00 > 99.00	2.946	2.946	0.0	1.000	872948		4.26(2.31-6.93)		11159	
20 Perfluorononanoic acid										
463.00 > 419.00	2.946	2.946	0.0	1.000	3628498	2.43		97.3	8664	
463.00 > 169.00	2.946	2.946	0.0	1.000	867175		4.18(1.90-5.69)		23359	
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.953	-0.007	1.142	3265917	2.58		103	44846	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.953	-0.007	1.142	3442013	2.57		107	25834	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.162	3.162	0.0	1.073	6099363	NC			35286	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.295	0.0	1.000	1398026	2.33		97.2	37328	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.295	0.0	1.119	2789419	2.59		108	32108	
549.00 > 99.00	3.295	3.295	0.0	1.119	1014832		2.75(1.33-3.97)		9751	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.311	3.311	0.0	1.000	3060463	2.61		104	18922	
513.00 > 169.00	3.311	3.311	0.0	1.000	549115		5.57(2.36-7.09)		13254	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.299	-0.004	1.278	1060461	2.42		101	18586	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.319	0.0	1.000	5426475	2.52		101	62003	
D 23 13C2 PFDA										
515.00 > 470.00	3.311	3.314	-0.003	1.284	2850079	2.83		113	37692	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.322	-0.003	1.287	5414884	2.75		110	41751	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.464	3.464	0.0	1.000	1090596	2.63		105	9996	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.464	3.467	-0.003	1.343	1052569	3.16		126	38374	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.618	3.618	0.0	1.228	2414466	2.53		105	9199	
599.00 > 99.00	3.618	3.618	0.0	1.228	828556		2.91(1.39-4.16)		19320	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.638	3.638	0.0	1.000	2750766	2.31		92.2	9816	
563.00 > 169.00	3.638	3.638	0.0	1.000	492736		5.58(2.12-6.36)		17207	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.638	3.638	0.0	1.003	969219	2.19		87.8	23502	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.640	-0.012	1.407	1183405	3.38		135	4105	
D 30 13C2 PFUnA										
565.00 > 520.00	3.638	3.640	-0.002	1.410	2404033	2.96		118	45623	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.793	3.793	0.0	1.287	9462727	NC			89410	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.928	0.0	1.000	2477599	2.51		101	751	
613.00 > 169.00	3.928	3.928	0.0	1.000	571864		4.33(2.13-6.40)		9202	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.930	-0.002	1.523	2276942	2.95		118	22815	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.193	0.0	1.067	2360595	2.47		98.7	688	
663.00 > 169.00	4.193	4.193	0.0	1.067	716277		3.30(1.25-3.76)		10320	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.426	0.0	1.000	545650	2.45		97.9	6990	
713.00 > 219.00	4.426	4.426	0.0	1.000	393358		1.39(0.71-2.13)		5018	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.437	-0.011	1.716	2223322	2.95		118	10620	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	3113506	NC			607	
813.00 > 169.00	4.833	4.833	0.0	1.000	497627		6.26(2.86-8.58)		3461	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.874	3195406	2.79		112	8972	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.181	0.0	1.072	3628820	NC			1060	
913.00 > 169.00	5.181	5.181	0.0	1.072	433807		8.37(3.83-11.48)		3045	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 31-Jul-2018 09:57:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_016.d

Injection Date: 30-Jul-2018 04:54:58 Instrument ID: A8_N

Lims ID: CCV L5

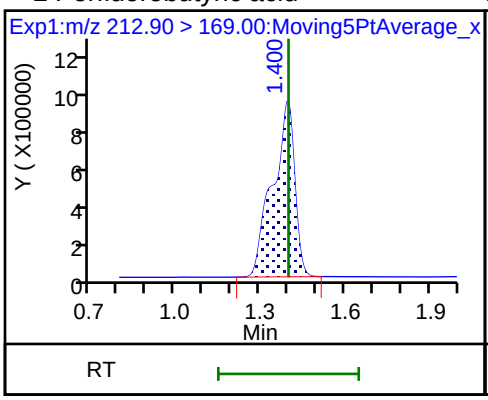
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 14

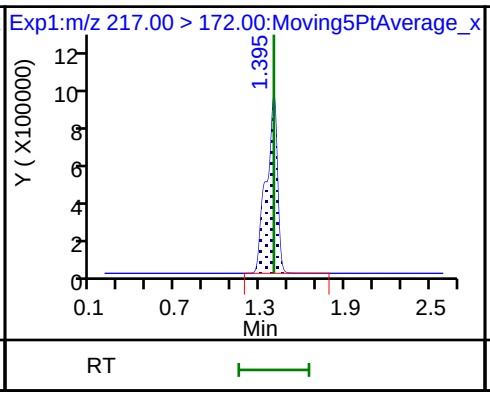
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

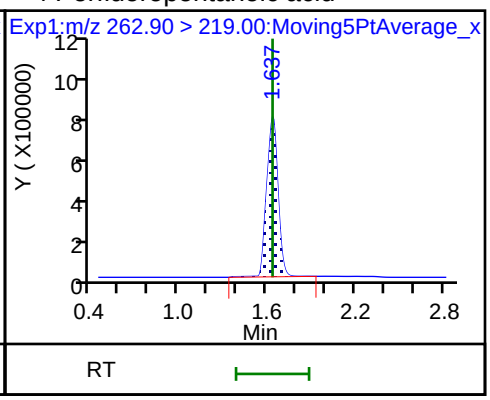
2 Perfluorobutyric acid



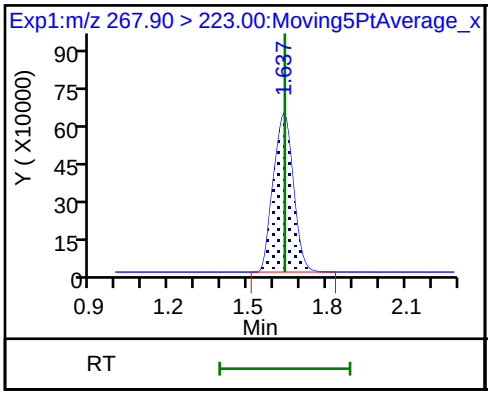
D 1 13C4 PFBA



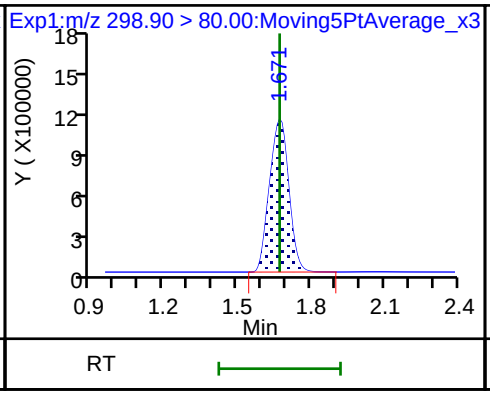
4 Perfluoropentanoic acid



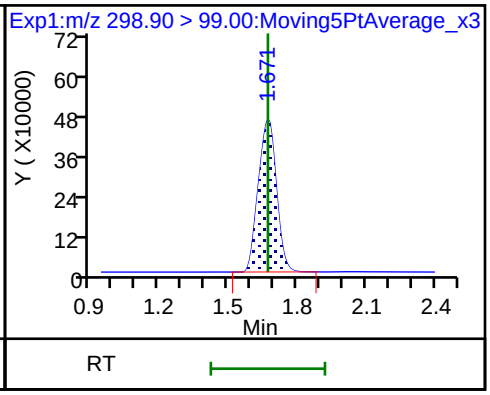
D 3 13C5-PFPeA



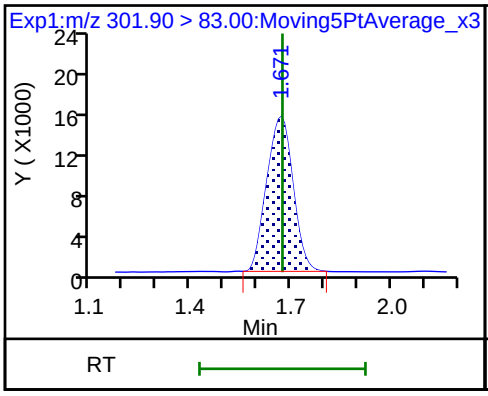
5 Perfluorobutanesulfonic acid



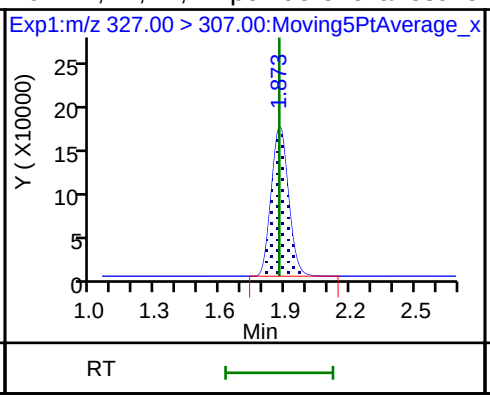
5 Perfluorobutanesulfonic acid



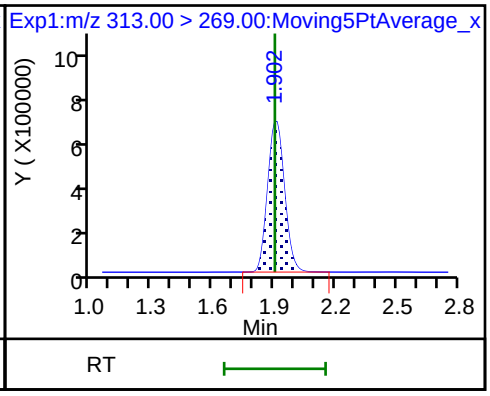
D 47 13C3-PFBS



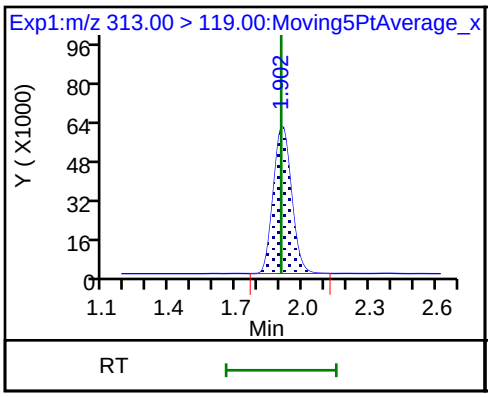
61 1H,1H,2H,2H-perfluorohexanesulfoni



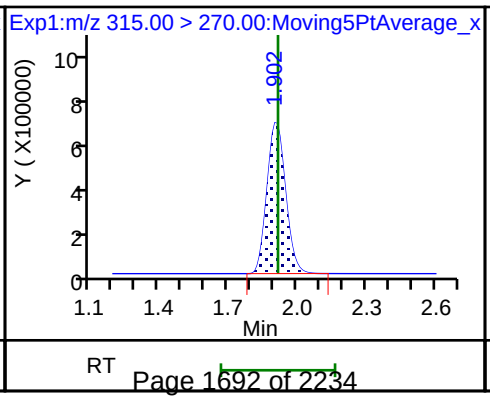
6 Perfluorohexanoic acid



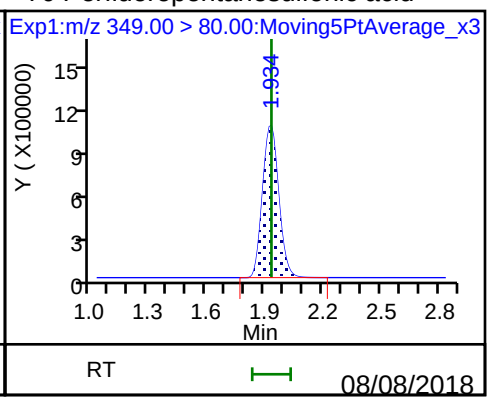
6 Perfluorohexanoic acid



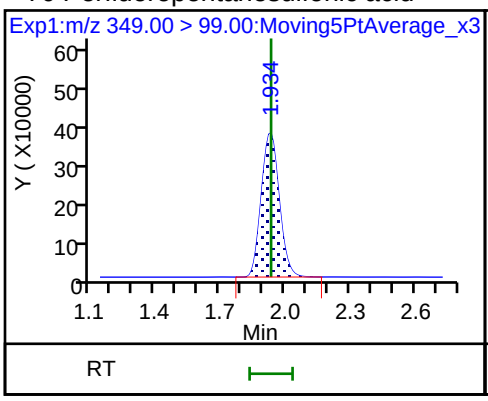
D 7 13C2 PFHxA



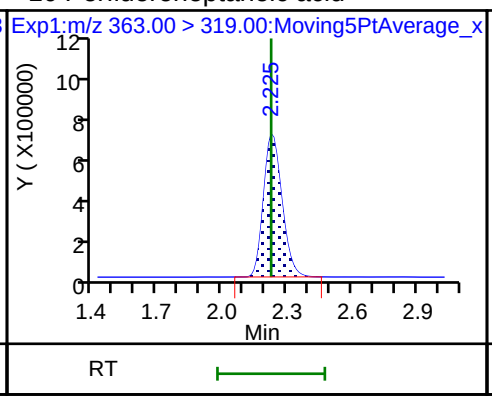
70 Perfluoropentanesulfonic acid



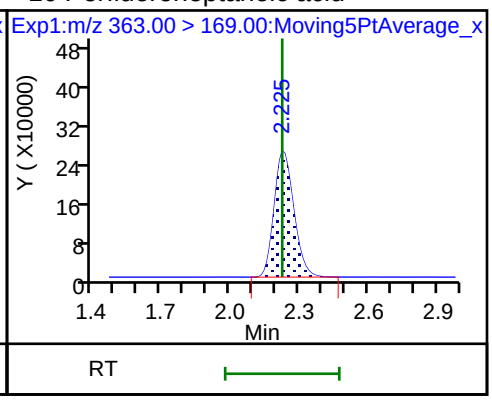
70 Perfluoropentanesulfonic acid



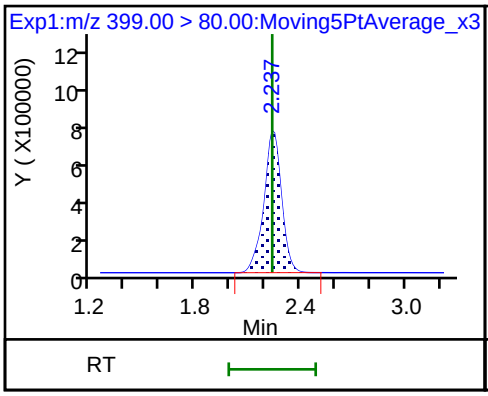
10 Perfluoroheptanoic acid



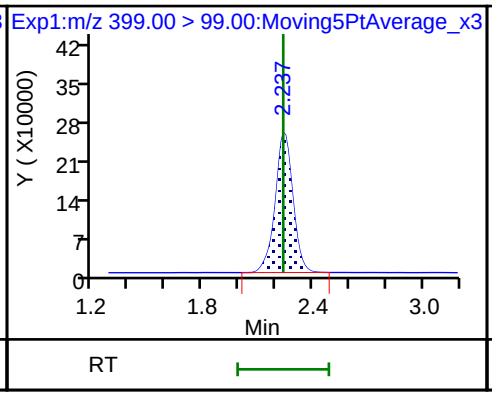
10 Perfluoroheptanoic acid



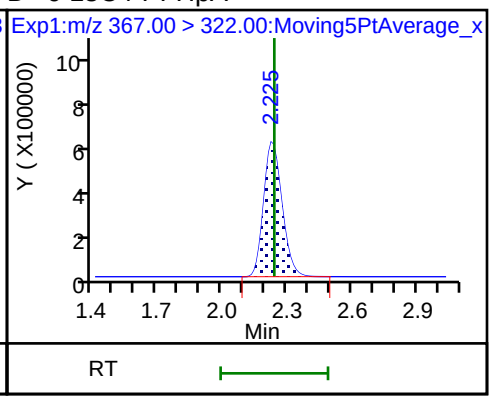
8 Perfluorohexanesulfonic acid



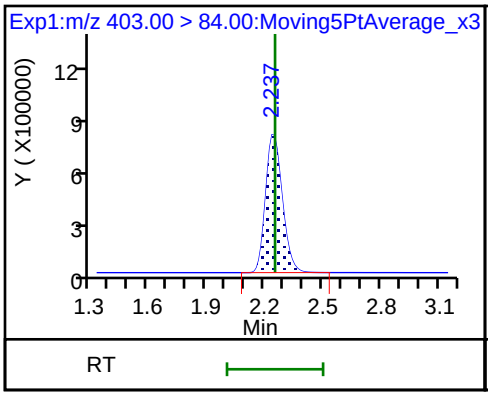
8 Perfluorohexanesulfonic acid



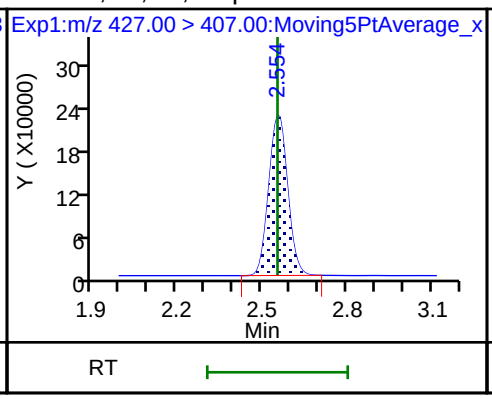
D 9 13C4-PFHpA



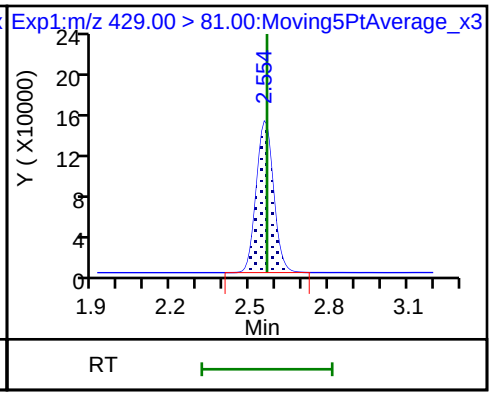
D 11 18O2 PFHxS



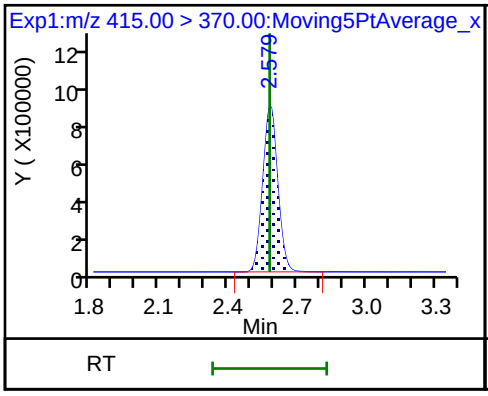
13 1H,1H,2H,2H-perfluorooctanesulfon



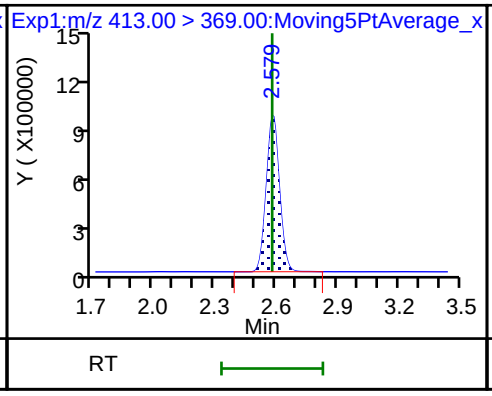
D 12 M2-6:2FTS



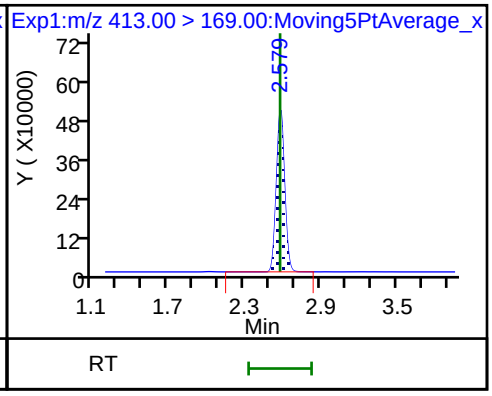
* 62 13C2-PFOA



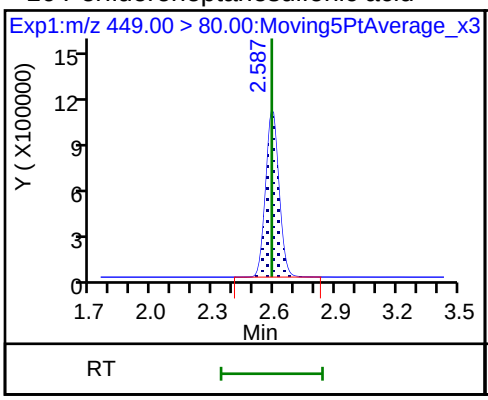
15 Perfluorooctanoic acid



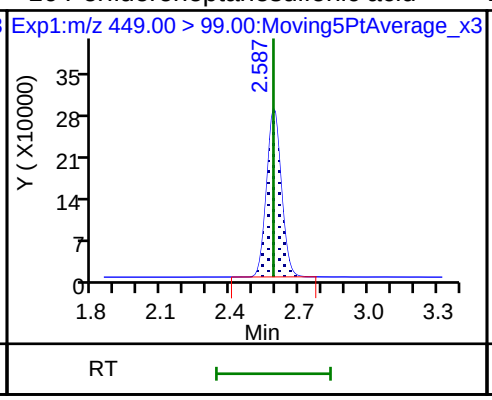
15 Perfluorooctanoic acid



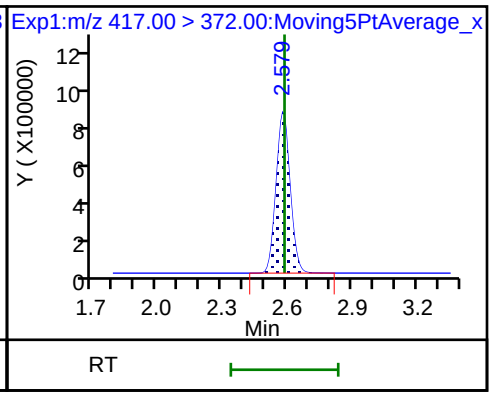
16 Perfluoroheptanesulfonic acid



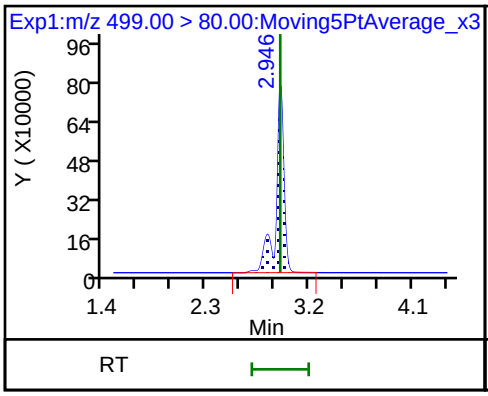
16 Perfluoroheptanesulfonic acid



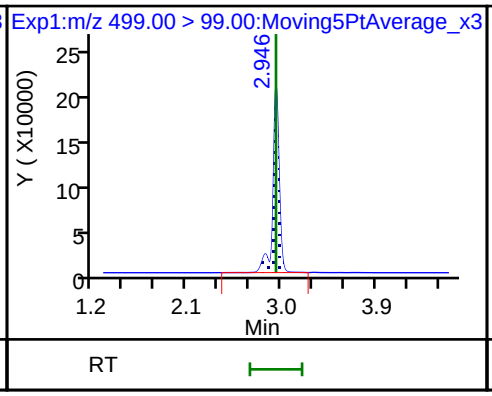
D 14 13C4 PFOA



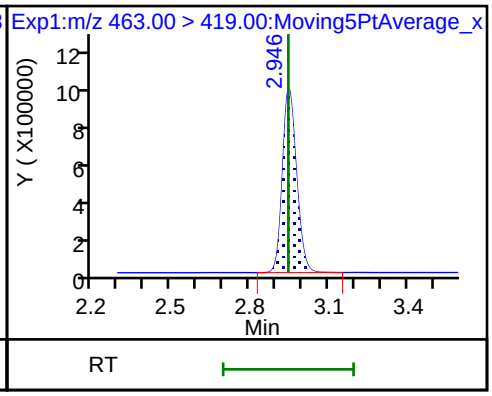
17 Perfluorooctane sulfonic acid



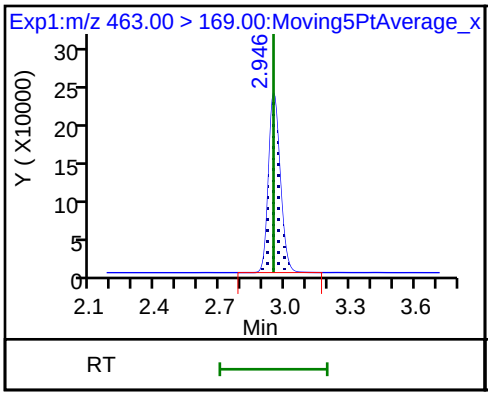
17 Perfluorooctane sulfonic acid



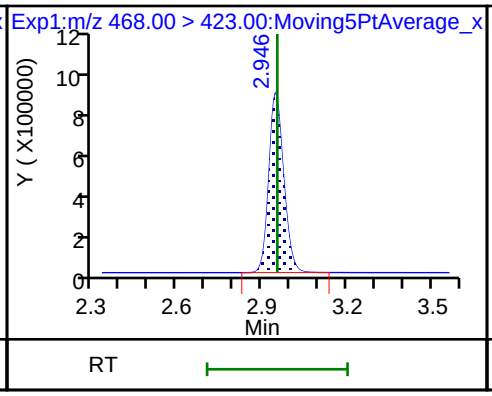
20 Perfluorononanoic acid



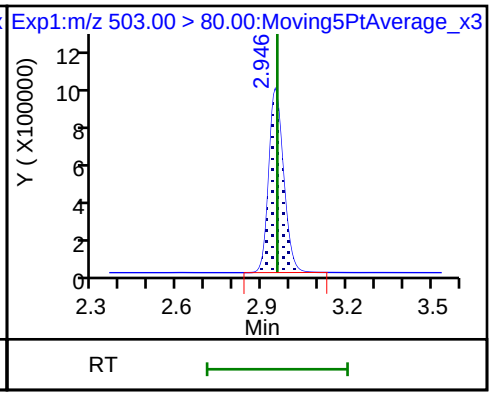
20 Perfluorononanoic acid



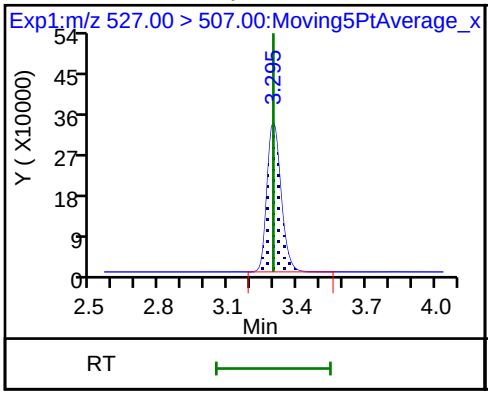
D 19 13C5 PFNA



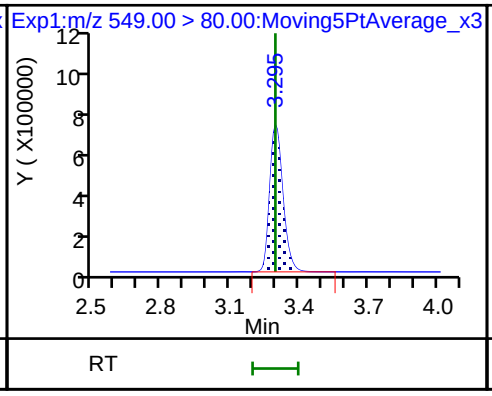
D 18 13C4 PFOS



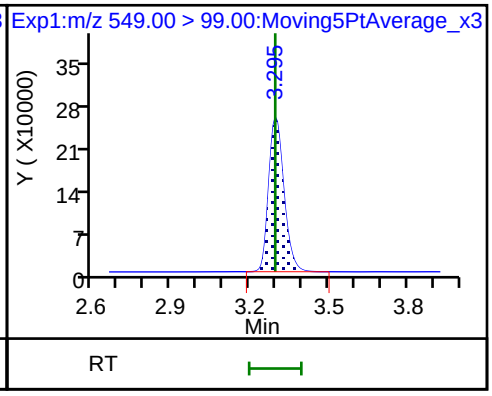
25 1H,1H,2H,2H-perfluorodecanesulfoni



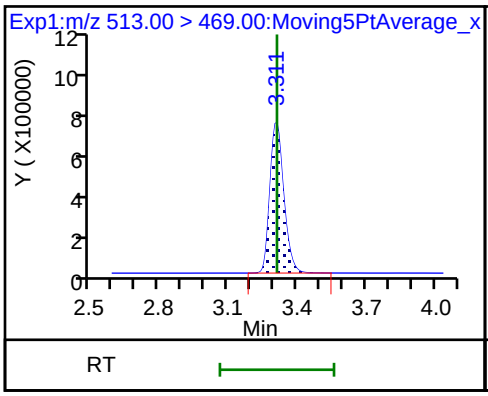
68 Perfluorononanesulfonic acid



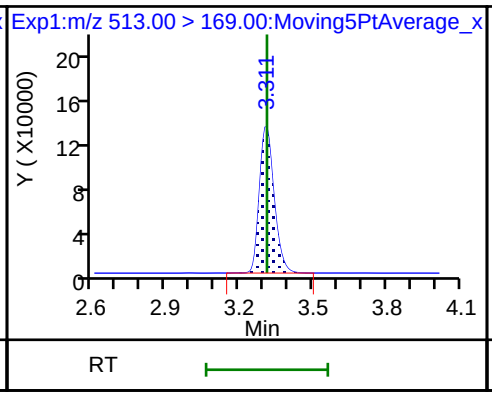
68 Perfluorononanesulfonic acid



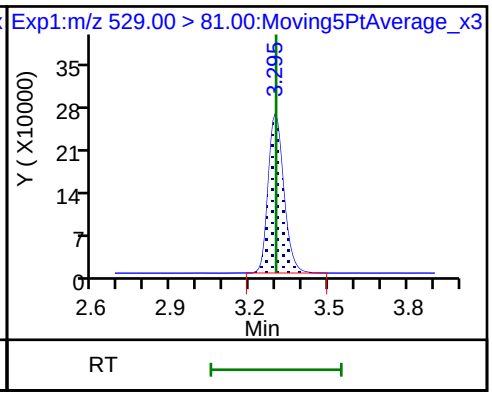
24 Perfluorodecanoic acid



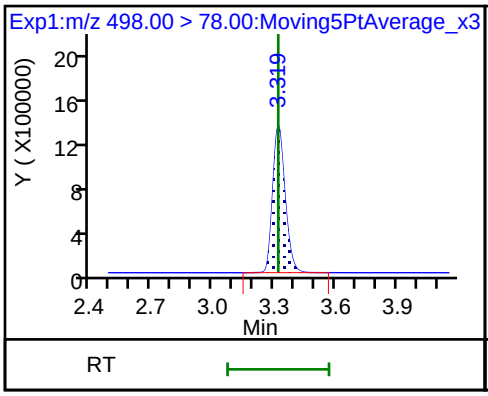
24 Perfluorodecanoic acid



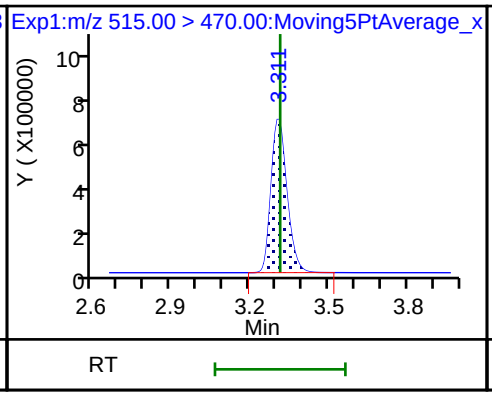
D 26 M2-8:2FTS



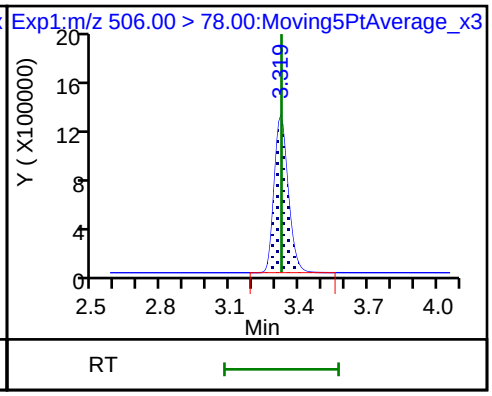
22 Perfluorooctane Sulfonamide



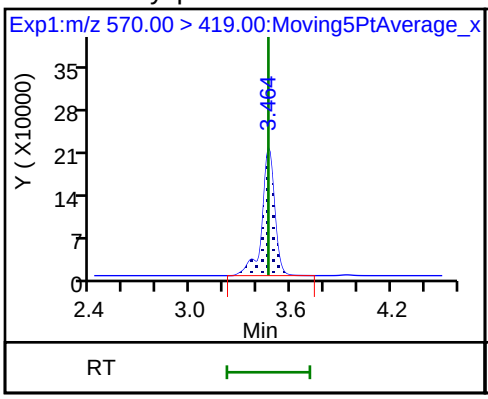
D 23 13C2 PFDA



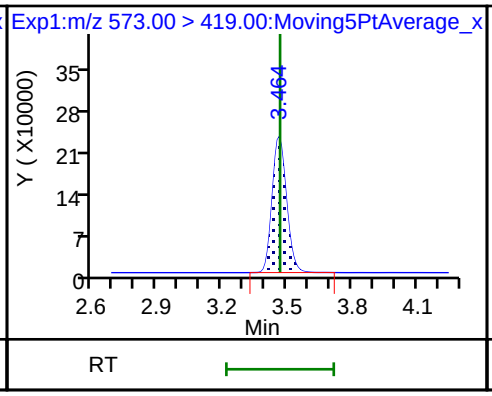
D 21 13C8 FOSA



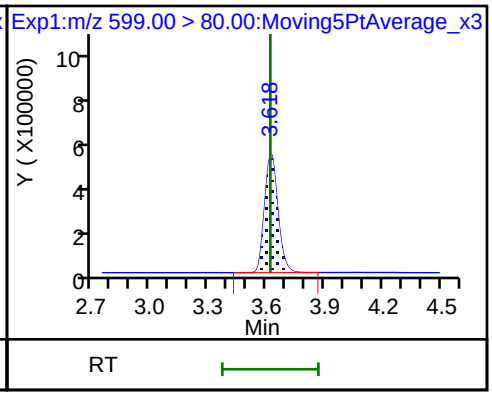
28 N-methyl perfluorooctane sulfonami



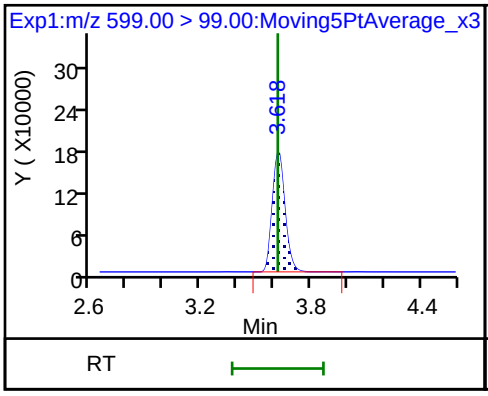
D 27 d3-NMeFOSAA



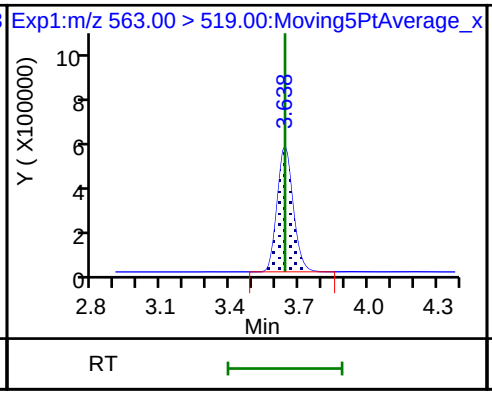
29 Perfluorodecane Sulfonic acid



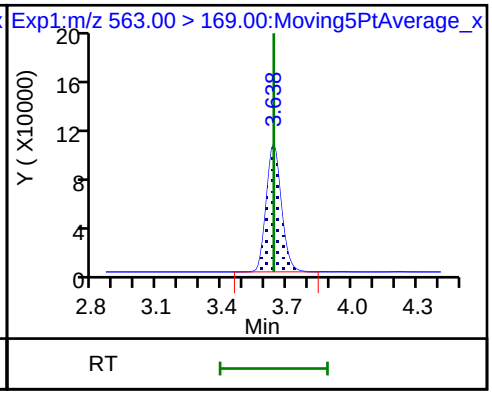
29 Perfluorodecane Sulfonic acid



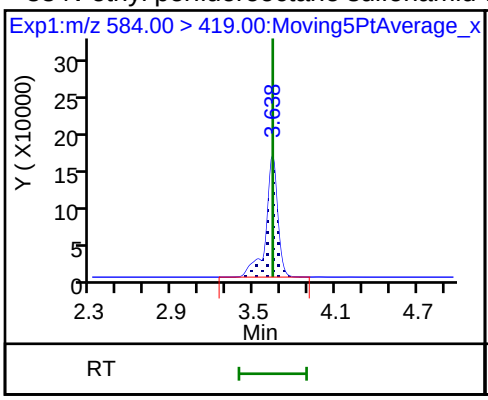
31 Perfluoroundecanoic acid



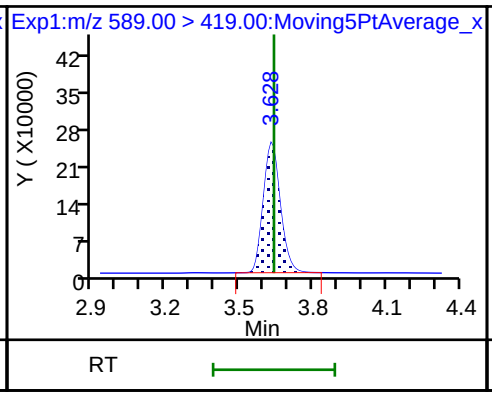
31 Perfluoroundecanoic acid



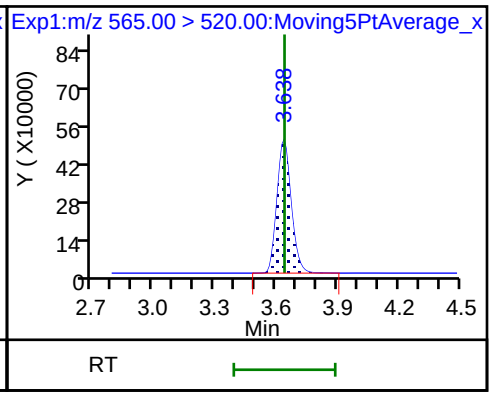
33 N-ethyl perfluorooctane sulfonamid



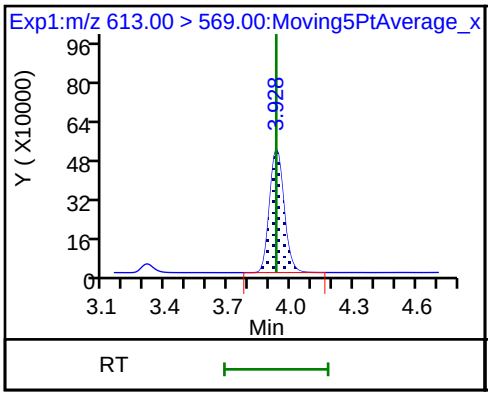
D 32 d5-NEtFOSAA



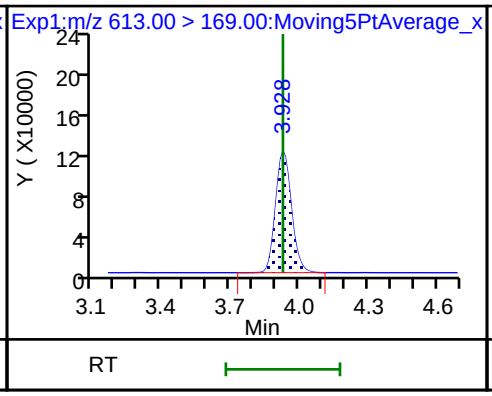
D 30 13C2 PFUnA



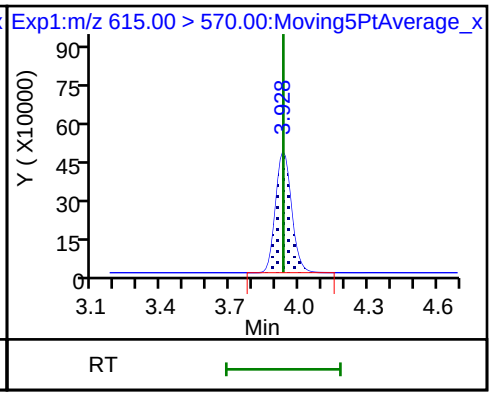
37 Perfluorododecanoic acid



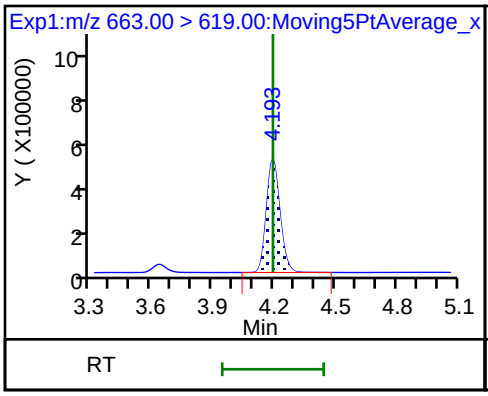
37 Perfluorododecanoic acid



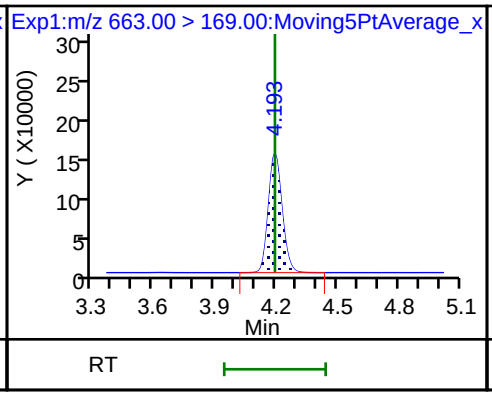
D 36 13C2 PFDoA



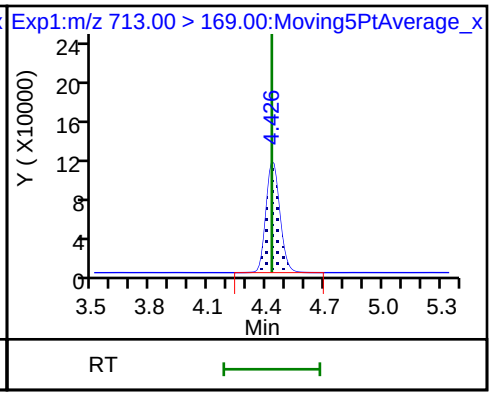
41 Perfluorotridecanoic acid



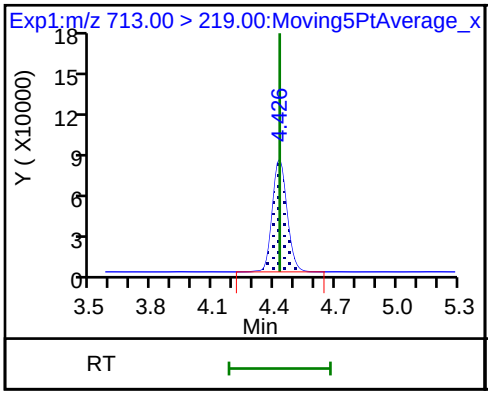
41 Perfluorotridecanoic acid



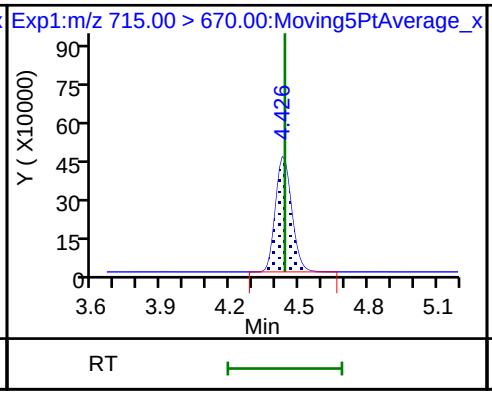
42 Perfluorotetradecanoic acid



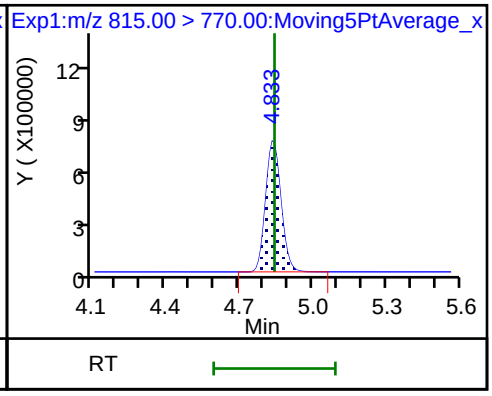
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/25 Calibration Date: 07/30/2018 06:21

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9620		0.979	1.00	-2.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.184		0.989	1.00	-1.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	74.76		0.832	0.884	-5.8	30.0
4:2 FTS	AveID	17.09	10.72		0.586	0.934	-37.3*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.008		0.951	1.00	-4.9	30.0
Perfluoropentanesulfonic acid	AveID	71.24	67.55		0.889	0.938	-5.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.139		1.03	1.00	3.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.064		0.830	0.910	-8.8	30.0
6:2 FTS	AveID	1.687	1.691		0.950	0.948	0.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.179		0.972	1.00	-2.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.273		0.876	0.952	-7.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.089		0.953	1.00	-4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.060		0.891	0.928	-4.0	30.0
8:2 FTS	AveID	1.356	1.288		0.910	0.958	-5.0	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7449		0.957	0.960	-0.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.005		0.977	1.00	-2.3	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.025		1.03	1.00	3.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.027		1.04	1.00	4.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6633		0.964	0.964	0.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8270		0.886	1.00	-11.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.091		0.879	1.00	-12.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.102		1.02	1.00	1.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.031		0.982	1.00	-1.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2641		1.05	1.00	5.4	30.0
13C4 PFBA	Ave	1.159	1.322		2.85	2.50	14.1	30.0
13C5-PFPeA	Ave	0.8093	0.9137		2.82	2.50	12.9	30.0
13C3-PFBS	Ave	0.0212	0.0243		2.66	2.33	14.4	30.0
13C2 PFHxA	Ave	0.9490	1.009		2.66	2.50	6.3	30.0
13C4-PFHpA	Ave	0.9779	0.9950		2.54	2.50	1.8	30.0
18O2 PFHxS	Ave	1.256	1.374		2.59	2.37	9.4	30.0
M2-6:2FTS	Ave	0.2731	0.1825		1.59	2.38	-33.2*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/25 Calibration Date: 07/30/2018 06:21

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9673		2.53	2.50	1.1	30.0
13C4 PFOS	Ave	0.8734	0.9862		2.70	2.39	12.9	30.0
13C5 PFNA	Ave	0.8250	0.9115		2.76	2.50	10.5	30.0
M2-8:2FTS	Ave	0.2848	0.3023		2.54	2.40	6.2	30.0
13C2 PFDA	Ave	0.6565	0.7681		2.93	2.50	17.0	30.0
13C8 FOSA	Ave	1.283	1.414		2.76	2.50	10.3	30.0
d3-NMeFOSAA	Ave	0.2169	0.2796		3.22	2.50	28.9	30.0
d5-NEtFOSAA	Ave	0.2280	0.3292		3.61	2.50	44.4*	30.0
13C2 PFUnA	Ave	0.5287	0.6707		3.17	2.50	26.8	30.0
13C2 PFDoA	Ave	0.5026	0.5861		2.92	2.50	16.6	30.0
13C2-PFTeDA	Ave	0.4910	0.5953		3.03	2.50	21.3	30.0
13C2-PFHxDA	Ave	0.7454	0.9450		3.17	2.50	26.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_027.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 30-Jul-2018 06:21:22 ALS Bottle#: 13 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:04:51 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:04:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.396	0.0	0.541	4553055	2.85		114	78543	
2 Perfluorobutyric acid										
212.90 > 169.00	1.396	1.396	0.0	1.000	1752006	0.9789		97.9	899	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.640	0.0	1.005	1490135	0.9894		98.9	694	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.640	-0.007	0.633	3145836	2.82		113	53263	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.666	0.0	1.000	2210856	0.8324		94.2	6467	
298.90 > 99.00	1.666	1.666	0.0	1.000	925005		2.39(1.25-3.74)		4388	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.674	-0.008	0.645	77777	2.66		114	672	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.876	0.0	1.126	334958	0.5857		62.7	14920	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.875	-0.009	0.723	352750	NC			3929	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.906	1.906	0.0	1.000	1400057	0.9509		95.1	6632	
313.00 > 119.00	1.906	1.906	0.0	1.000	127844		10.95(5.03-15.10)		3094	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.916	-0.010	0.738	3472681	2.66		106	85876	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.927	0.0	1.157	2119604	0.8894		94.8	32423	
349.00 > 99.00	1.927	1.927	0.0	1.157	802959		2.64(1.36-4.07)		8062	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.003	0.0	1.006	276455	NC			1835	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.992	2.014	-0.022	0.772	296272	NC			9501	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.229	0.0	1.000	1560484	1.03		103	3487	
363.00 > 169.00	2.229	2.229	0.0	1.000	585286		2.67(1.13-3.40)		8143	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.241	0.0	1.000	1831689	0.8296		91.2	12837	
399.00 > 99.00	2.241	2.241	0.0	1.000	633590		2.89(1.50-4.49)		2144	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.240	-0.011	0.864	3425796	2.54		102	63301	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.253	-0.012	0.868	4475537	2.59		109	40712	
65 ADONA										
377.00 > 251.00	2.267	2.267	0.0	0.771	4118091	NC			42566	
377.00 > 85.00	2.267	2.267	0.0	0.771	2431951		1.69(0.84-2.53)		12562	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.556	0.0	1.000	402917	0.9504		100	9489	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.564	-0.008	0.990	596844	1.59		66.8	9735	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.581	0.0		3443034	2.50			35781	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.581	0.0	1.000	1572076	0.9724		97.1	1907	
413.00 > 169.00	2.581	2.581	0.0	1.000	817796		1.92(0.84-2.52)		6132	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.589	0.0	0.880	1646574	0.8764		92.1	17138	
449.00 > 99.00	2.589	2.589	0.0	0.880	441226		3.73(1.94-5.82)		6360	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.588	-0.007	1.000	3330271	2.53		101	40010	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.943	2.943	0.0	1.000	1336500	0.8905		96.0	21083	
499.00 > 99.00	2.943	2.943	0.0	1.000	321280		4.16(2.31-6.93)		3166	
20 Perfluorononanoic acid										
463.00 > 419.00	2.943	2.943	0.0	1.000	1366636	0.9535		95.3	2521	
463.00 > 169.00	2.943	2.943	0.0	1.000	326108		4.19(1.90-5.69)		7854	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.953	-0.010	1.140	3138408	2.76		110	59728	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.953	-0.010	1.140	3246128	2.70		113	30203	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.156	0.0	1.073	2268678	NC			21727	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.292	0.0	1.000	513948	0.9105		95.0	12338	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.292	0.0	1.119	971258	0.9575		99.7	20241	
549.00 > 99.00	3.292	3.292	0.0	1.119	373170		2.60(1.33-3.97)		4003	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.299	-0.007	1.275	997232	2.54		106	18579	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.308	0.0	1.000	1062947	0.9770		97.7	5952	
513.00 > 169.00	3.308	3.308	0.0	1.000	195066		5.45(2.36-7.09)		9277	
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.314	-0.006	1.282	2644628	2.93		117	35422	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.315	0.0	1.000	1996285	1.03		103	27867	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.322	-0.007	1.285	4869975	2.76		110	48366	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.459	3.459	0.0	1.000	395368	1.04		104	3948	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.459	3.467	-0.008	1.340	962694	3.22		129	35290	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.624	0.0	1.231	868438	0.9642		100	30285	
599.00 > 99.00	3.624	3.624	0.0	1.231	303684		2.86(1.39-4.16)		7948	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.633	3.633	0.0	1.000	1008041	0.8795		87.9	4941	
563.00 > 169.00	3.633	3.633	0.0	1.000	175326		5.75(2.12-6.36)		9183	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.633	3.633	0.0	1.003	374894	0.8864		88.6	8144	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.640	-0.016	1.404	1133354	3.61		144	3764	
D 30 13C2 PFUnA										
565.00 > 520.00	3.633	3.640	-0.007	1.408	2309220	3.17		127	48568	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.799	3.799	0.0	1.291	3498318	NC			72363	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.924	3.924	0.0	1.000	889349	1.02		102	296	
613.00 > 169.00	3.924	3.924	0.0	1.000	219780		4.05(2.13-6.40)		4178	
D 36 13C2 PFDoA										
615.00 > 570.00	3.924	3.930	-0.006	1.520	2018110	2.92		117	15091	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.189	0.0	1.067	832355	0.9817		98.2	265	
663.00 > 169.00	4.189	4.189	0.0	1.067	252486		3.30(1.25-3.76)		3218	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.424	0.0	1.000	216546	1.05		105	3160	
713.00 > 219.00	4.424	4.424	0.0	1.000	139512		1.55(0.71-2.13)		2203	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.437	-0.013	1.714	2049781	3.03		121	15460	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.840	4.840	0.0	1.002	1232794	NC			222	
813.00 > 169.00	4.831	4.840	-0.009	1.000	200856		6.14(2.86-8.58)		1709	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.831	4.842	-0.011	1.872	3253729	3.17		127	9874	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.180	5.180	0.0	1.072	1312330	NC			341	
913.00 > 169.00	5.180	5.180	0.0	1.072	166269		7.89(3.83-11.48)		1679	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 31-Jul-2018 10:04:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_027.d

Injection Date: 30-Jul-2018 06:21:22 Instrument ID: A8_N

Lims ID: CCV L4

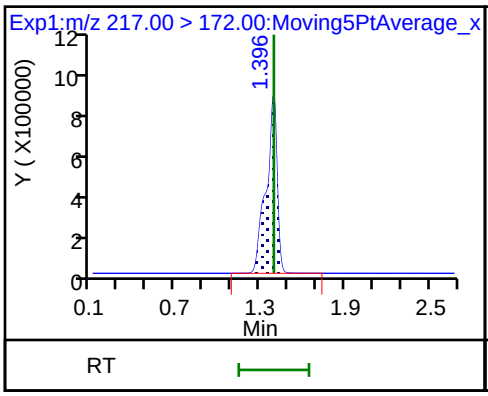
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 25

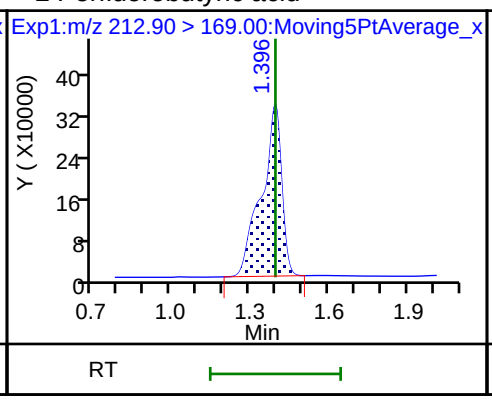
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

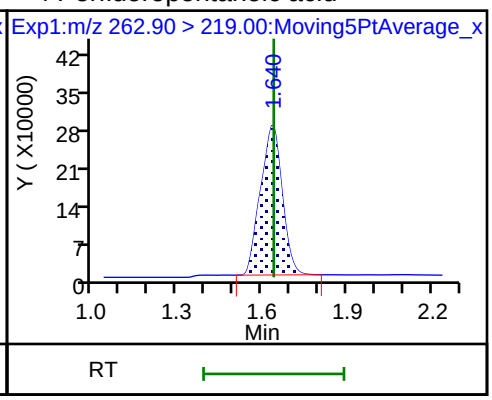
D 1 13C4 PFBA



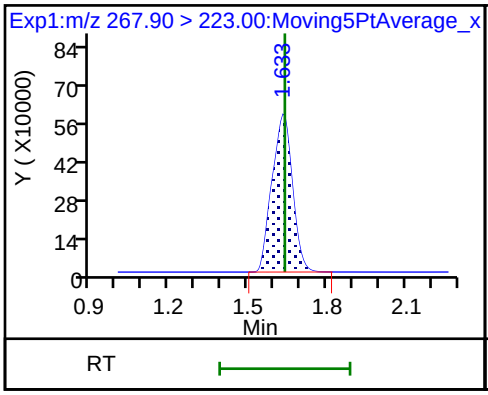
2 Perfluorobutyric acid



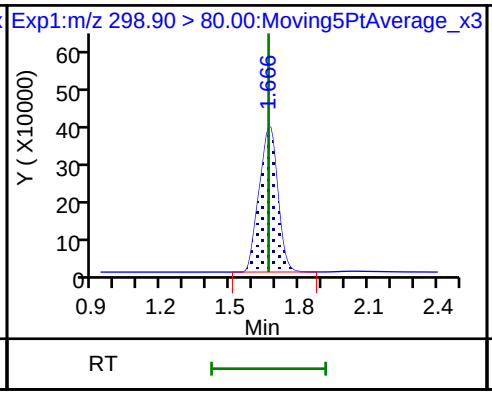
4 Perfluoropentanoic acid



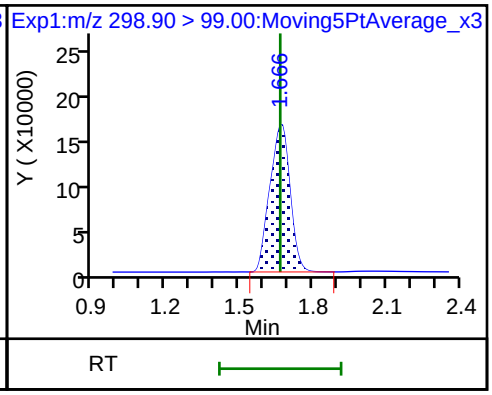
D 3 13C5-PFPeA



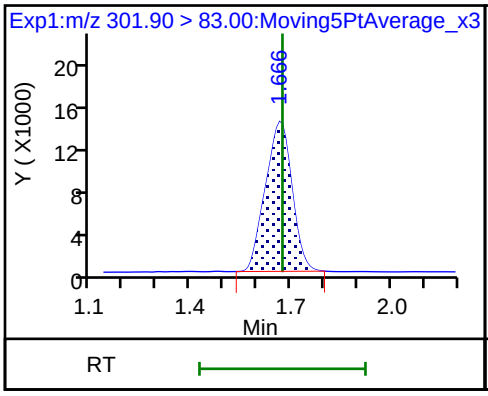
5 Perfluorobutanesulfonic acid



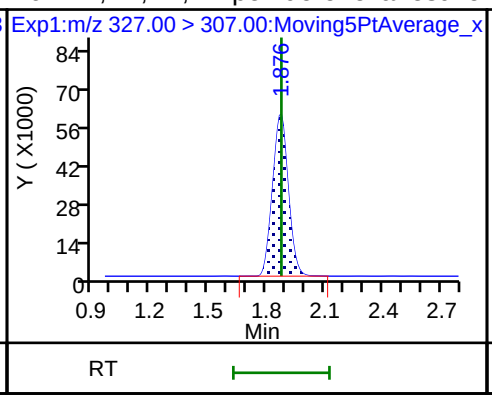
5 Perfluorobutanesulfonic acid



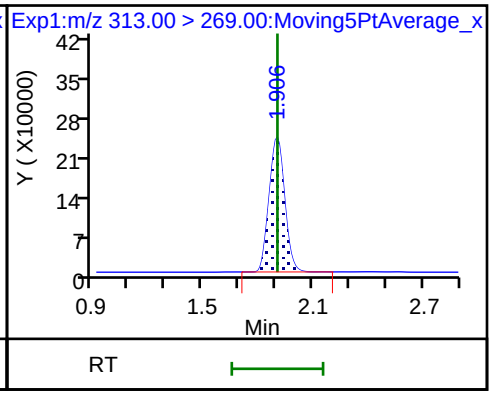
D 47 13C3-PFBS



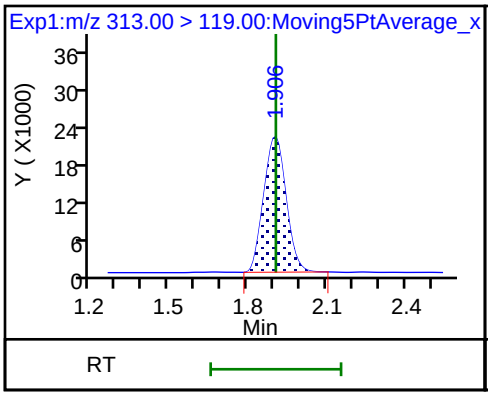
61 1H,1H,2H,2H-perfluorohexanesulfoni



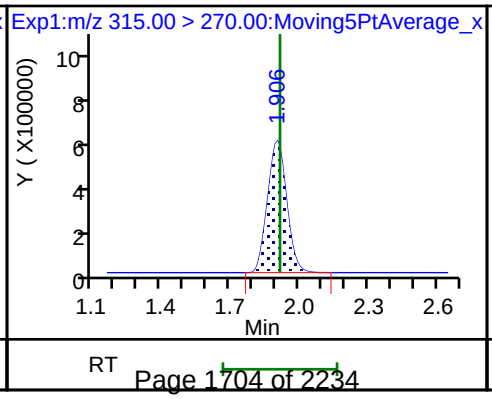
6 Perfluorohexanoic acid



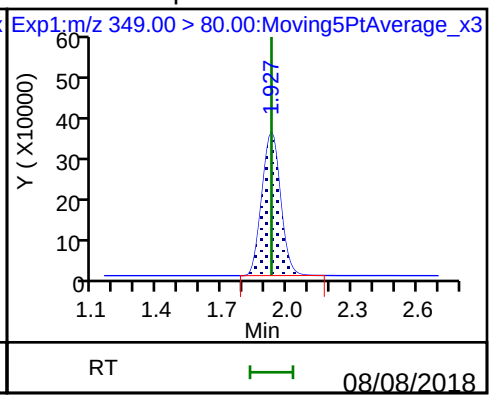
6 Perfluorohexanoic acid



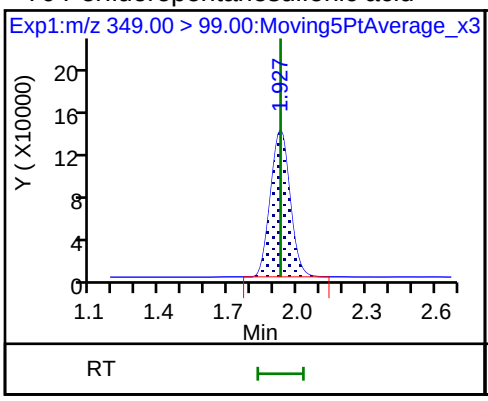
D 7 13C2 PFHxA



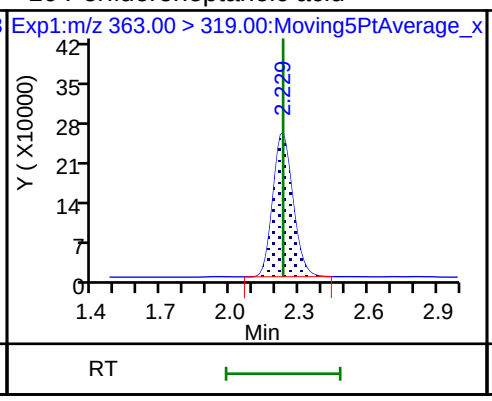
70 Perfluoropentanesulfonic acid



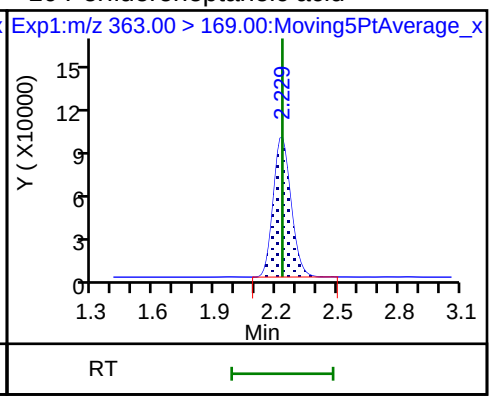
70 Perfluoropentanesulfonic acid



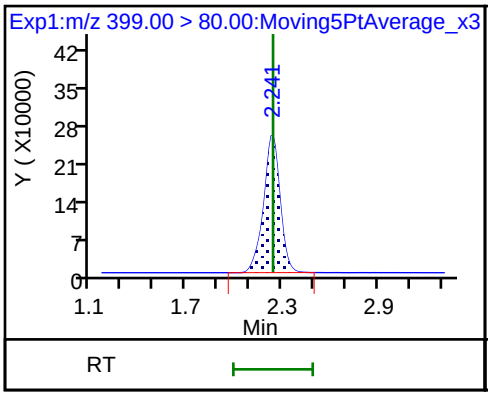
10 Perfluoroheptanoic acid



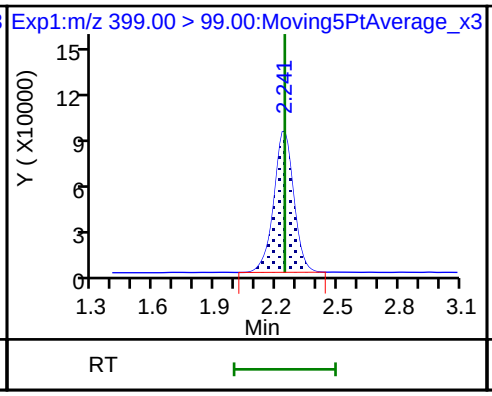
10 Perfluoroheptanoic acid



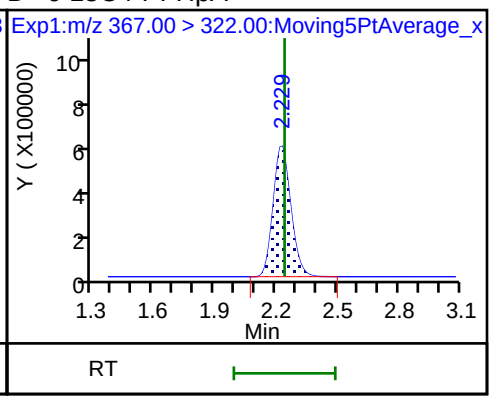
8 Perfluorohexanesulfonic acid



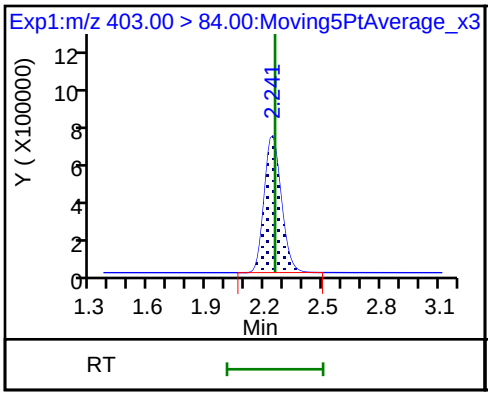
8 Perfluorohexanesulfonic acid



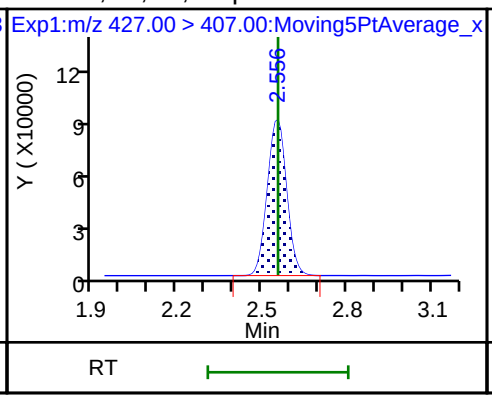
D 9 13C4-PFHpA



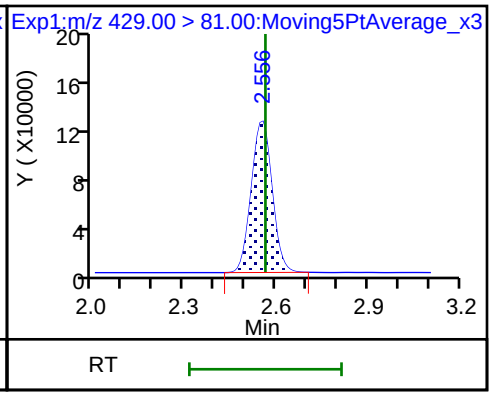
D 11 18O2 PFHxS



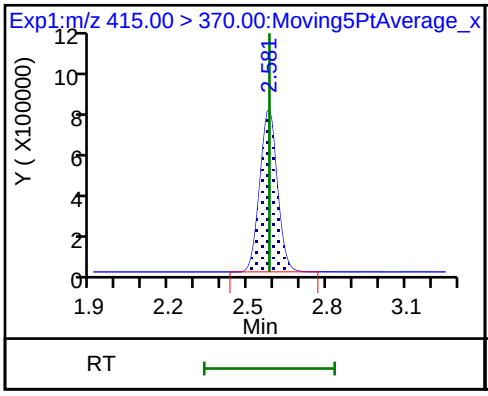
13 1H,1H,2H,2H-perfluorooctanesulfon



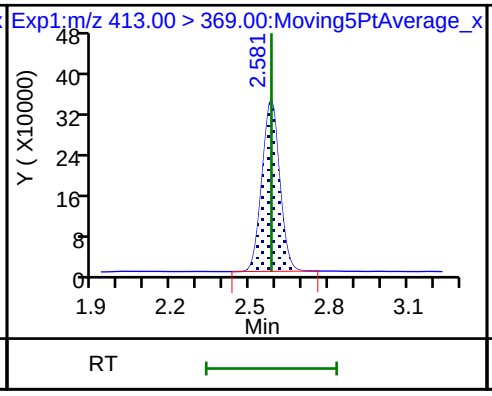
D 12 M2-6:2FTS



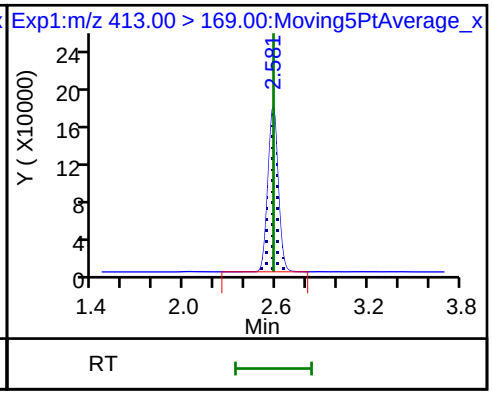
* 62 13C2-PFOA



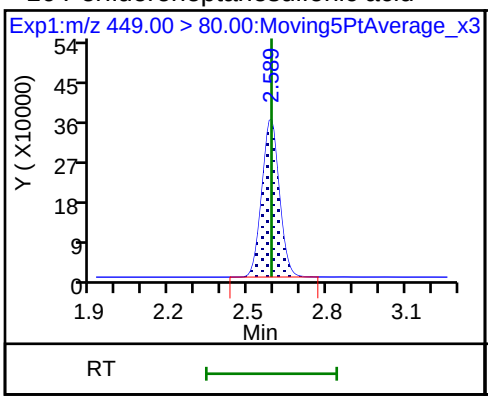
15 Perfluorooctanoic acid



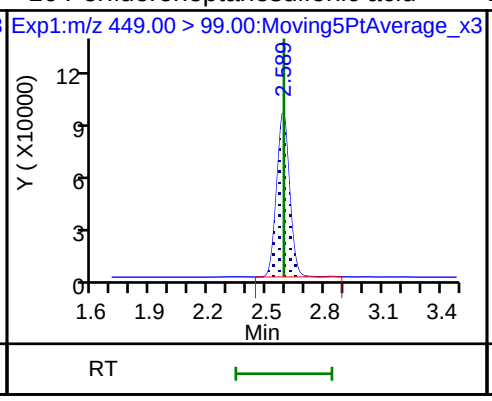
15 Perfluorooctanoic acid



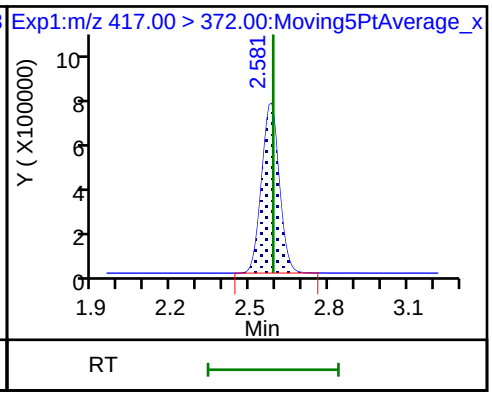
16 Perfluoroheptanesulfonic acid



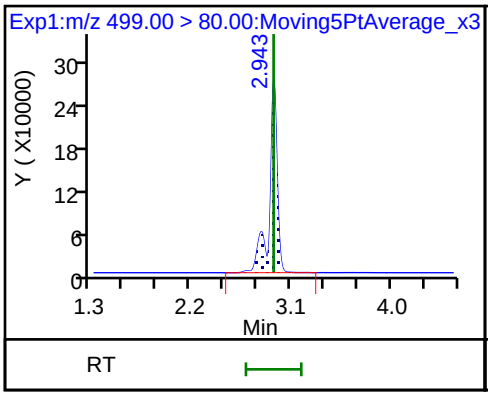
16 Perfluoroheptanesulfonic acid



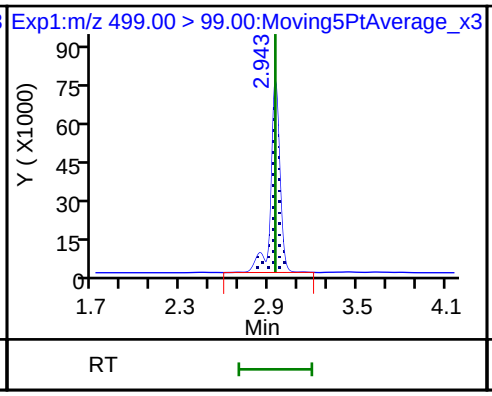
D 14 13C4 PFOA



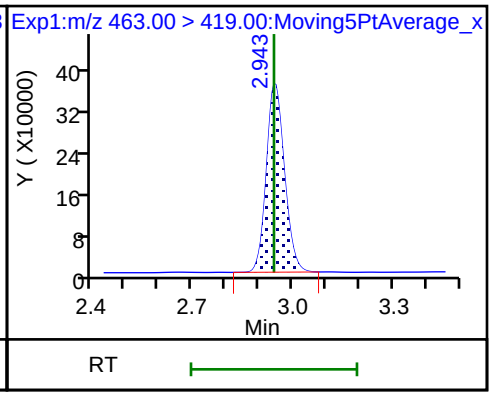
17 Perfluorooctane sulfonic acid



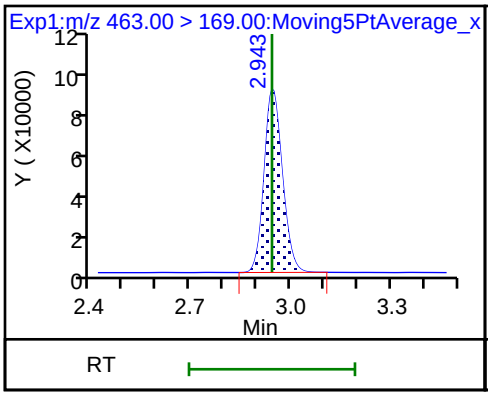
17 Perfluorooctane sulfonic acid



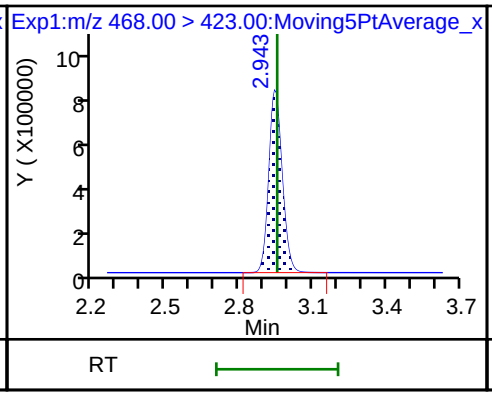
20 Perfluorononanoic acid



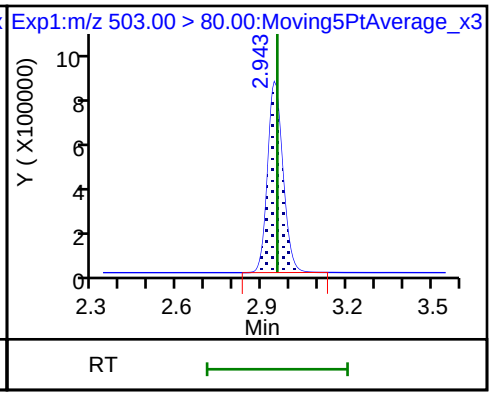
20 Perfluorononanoic acid



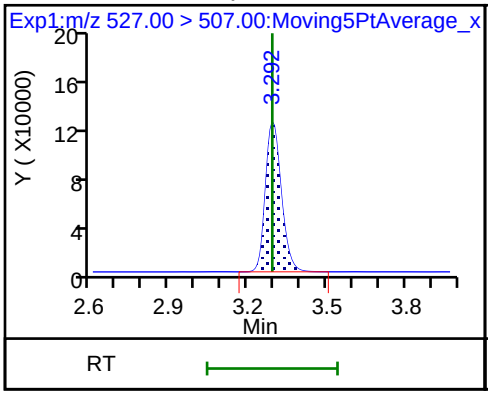
D 19 13C5 PFNA



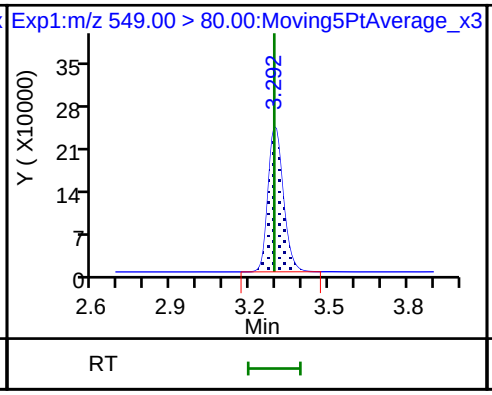
D 18 13C4 PFOS



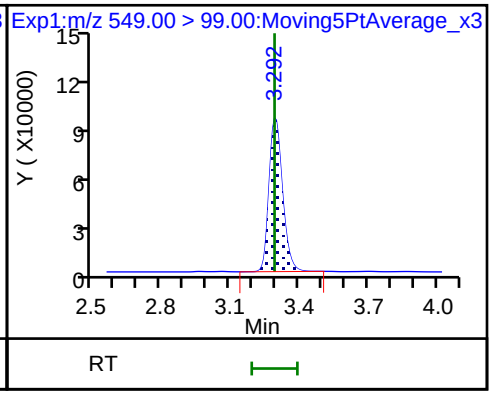
25 1H,1H,2H,2H-perfluorodecanesulfoni



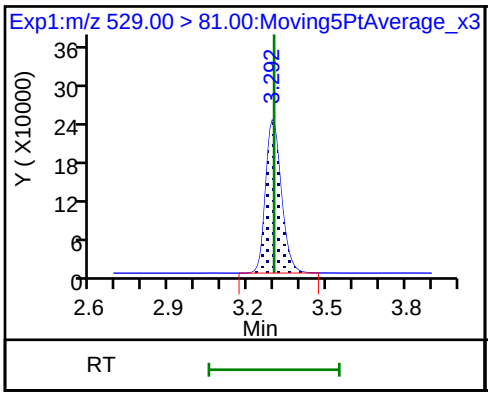
68 Perfluorononanesulfonic acid



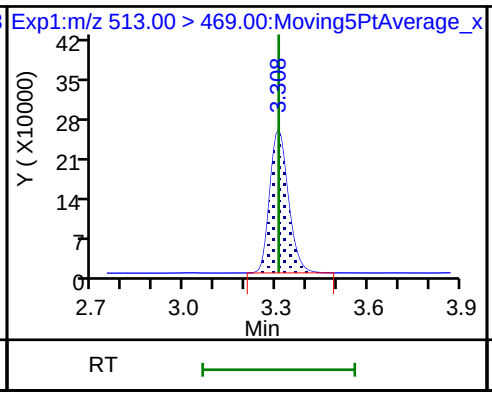
68 Perfluorononanesulfonic acid



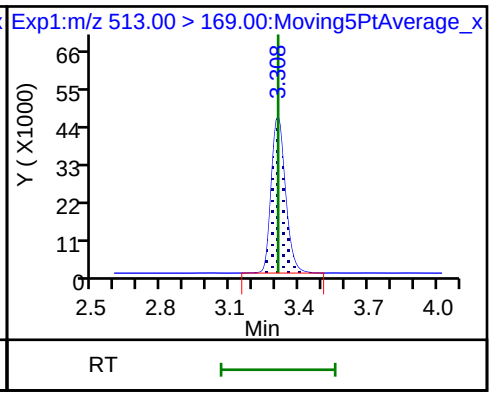
D 26 M2-8:2FTS



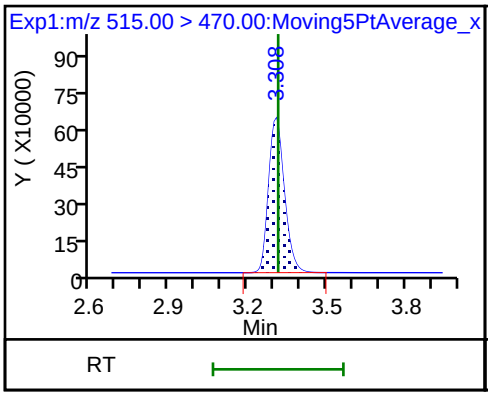
24 Perfluorodecanoic acid



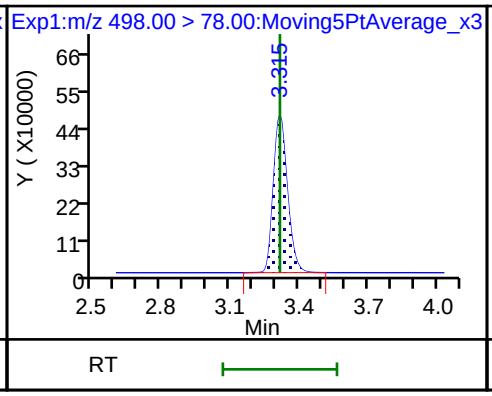
24 Perfluorodecanoic acid



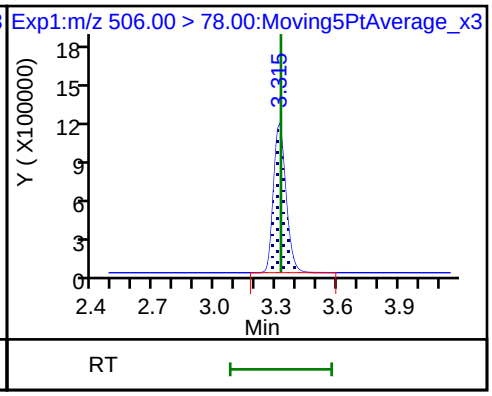
D 23 13C2 PFDA



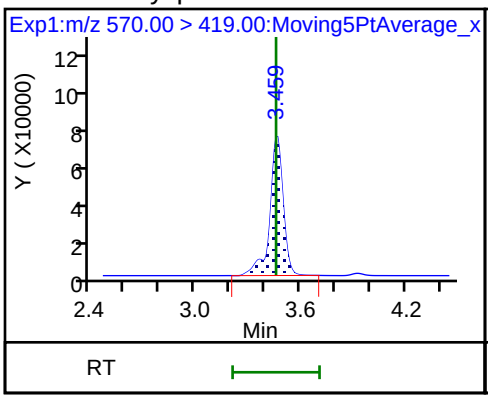
22 Perfluorooctane Sulfonamide



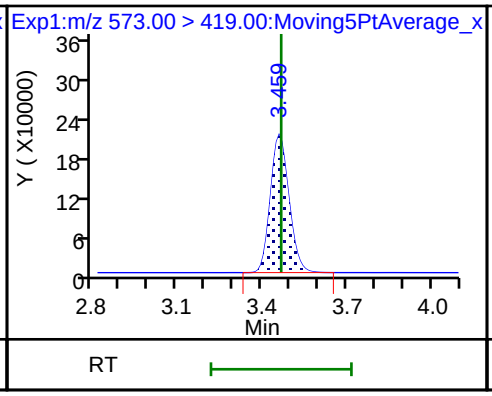
D 21 13C8 FOSA



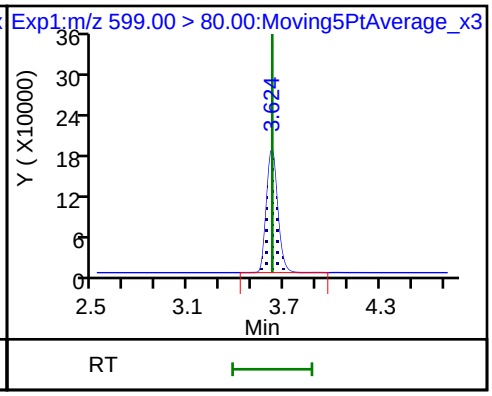
28 N-methyl perfluorooctane sulfonami



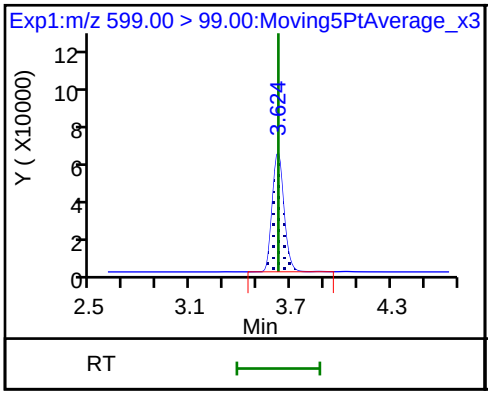
D 27 d3-NMeFOSAA



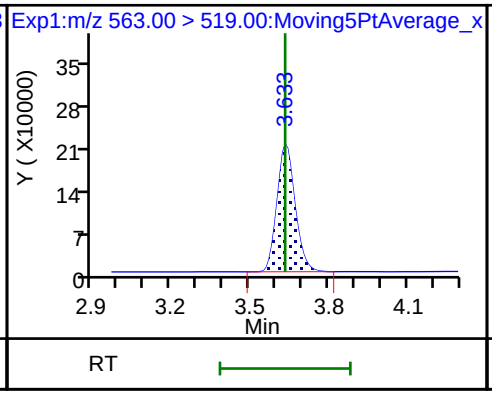
29 Perfluorodecane Sulfonic acid



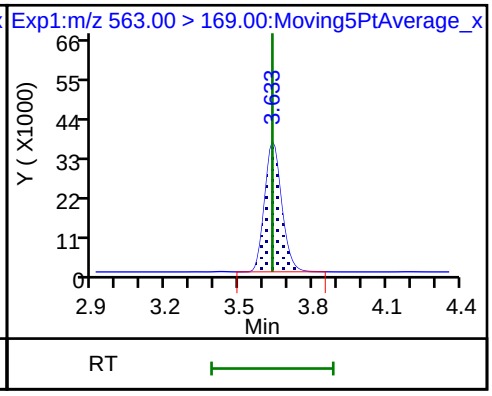
29 Perfluorodecane Sulfonic acid



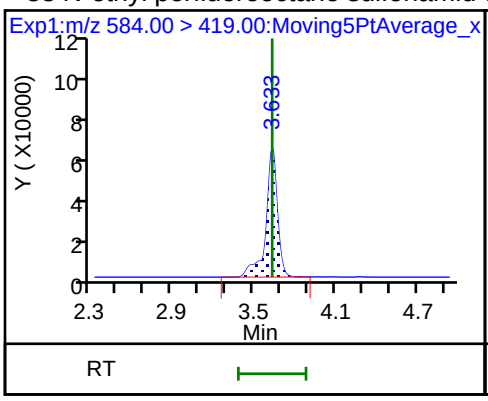
31 Perfluoroundecanoic acid



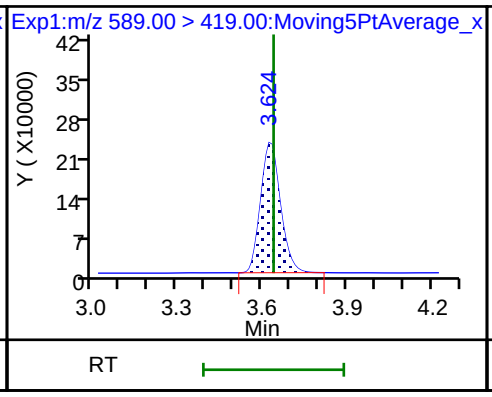
31 Perfluoroundecanoic acid



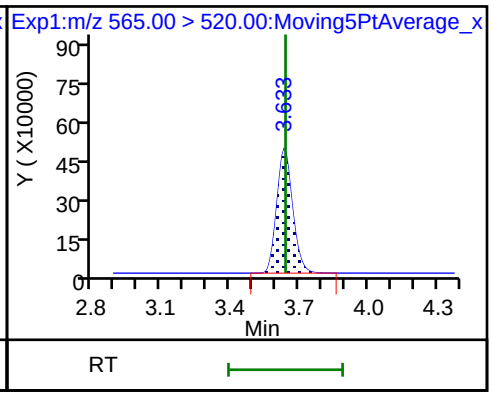
33 N-ethyl perfluorooctane sulfonamid



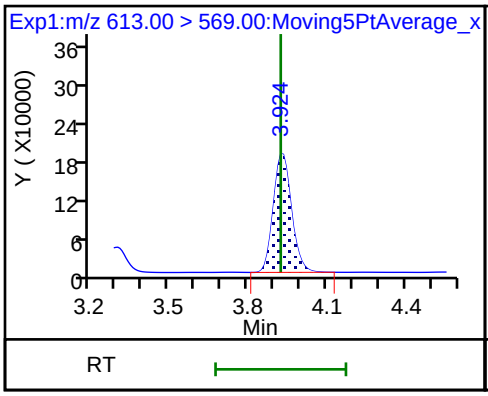
D 32 d5-NEtFOSAA



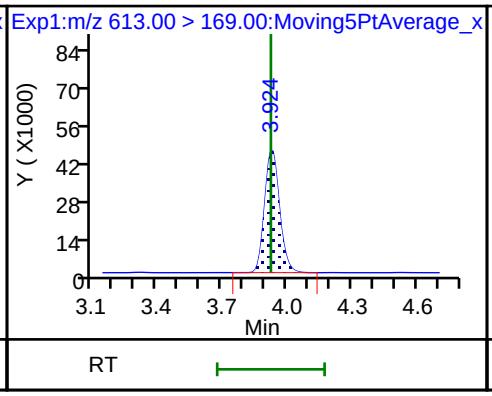
D 30 13C2 PFUnA



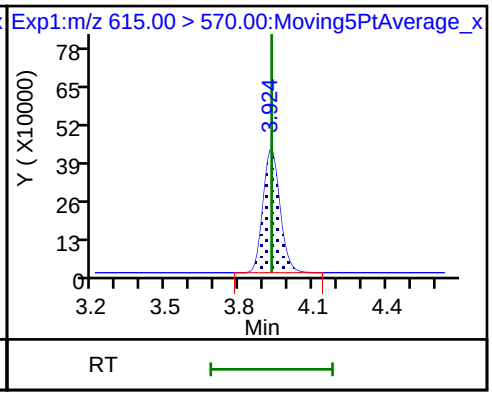
37 Perfluorododecanoic acid



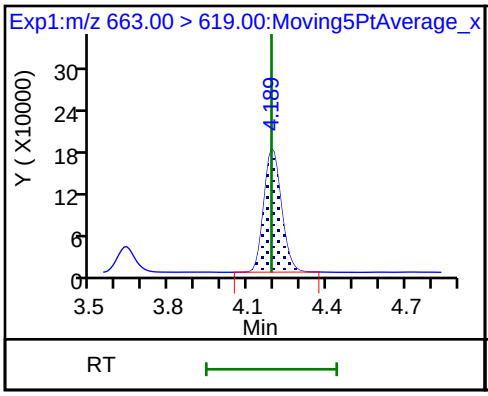
37 Perfluorododecanoic acid



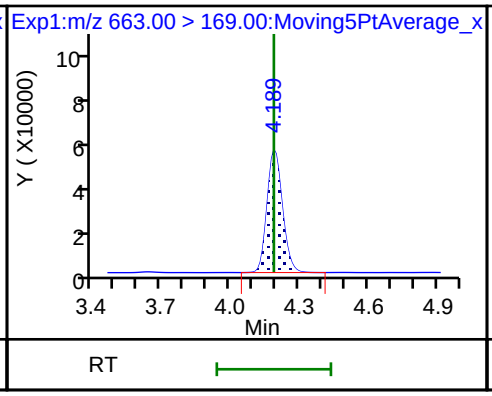
D 36 13C2 PFDoA



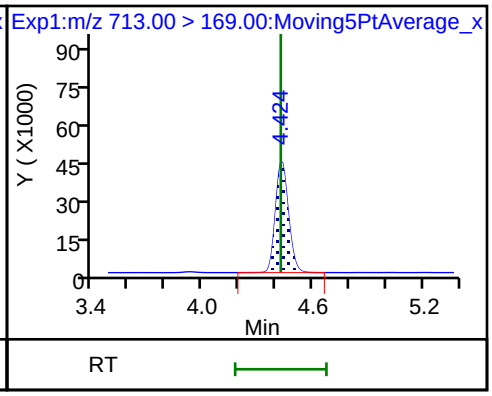
41 Perfluorotridecanoic acid



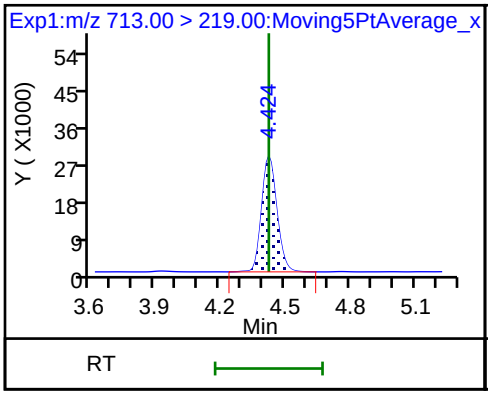
41 Perfluorotridecanoic acid



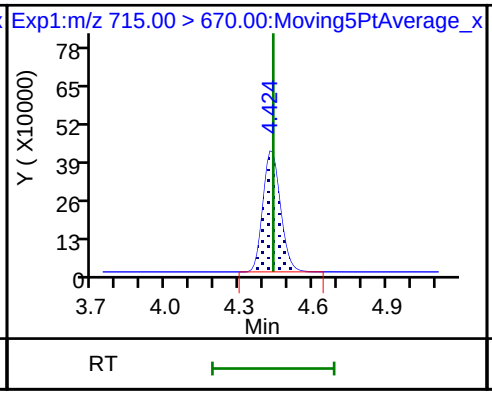
42 Perfluorotetradecanoic acid



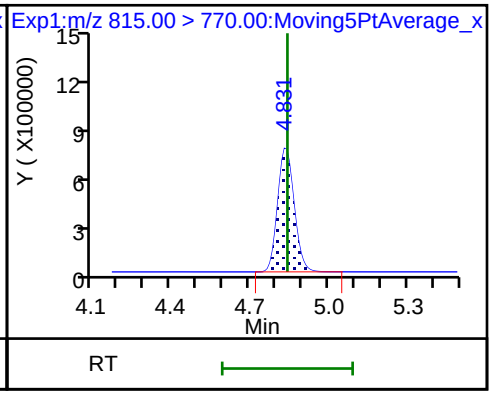
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/30 Calibration Date: 07/30/2018 07:00

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_032.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9926		2.53	2.50	1.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.230		2.57	2.50	2.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	80.30		2.24	2.21	1.1	30.0
4:2 FTS	AveID	17.09	11.19		1.53	2.34	-34.6*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.077		2.54	2.50	1.6	30.0
Perfluoropentanesulfonic acid	AveID	71.24	72.34		2.38	2.35	1.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.169		2.65	2.50	6.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.087		2.12	2.28	-6.9	30.0
6:2 FTS	AveID	1.687	1.649		2.32	2.37	-2.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.166		2.40	2.50	-4.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.383		2.38	2.38	-0.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.097		2.40	2.50	-3.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.087		2.28	2.32	-1.6	30.0
8:2 FTS	AveID	1.356	1.370		2.42	2.40	1.1	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7522		2.42	2.40	0.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.051		2.55	2.50	2.2	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.011		2.54	2.50	1.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.041		2.64	2.50	5.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6991		2.54	2.41	5.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.9296		2.49	2.50	-0.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.166		2.35	2.50	-6.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.103		2.55	2.50	1.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.074		2.56	2.50	2.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2497		2.49	2.50	-0.4	30.0
13C4 PFBA	Ave	1.159	1.282		2.77	2.50	10.6	30.0
13C5-PFPeA	Ave	0.8093	0.8612		2.66	2.50	6.4	30.0
13C3-PFBS	Ave	0.0212	0.0226		2.48	2.33	6.6	30.0
13C2 PFHxA	Ave	0.9490	0.9402		2.48	2.50	-0.9	30.0
13C4-PFHpA	Ave	0.9779	0.9189		2.35	2.50	-6.0	30.0
18O2 PFHxS	Ave	1.256	1.332		2.51	2.37	6.1	30.0
M2-6:2FTS	Ave	0.2731	0.1742		1.51	2.38	-36.2*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236836/30 Calibration Date: 07/30/2018 07:00

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.30LLA_032.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9367		2.45	2.50	-2.1	30.0
13C4 PFOS	Ave	0.8734	0.9435		2.58	2.39	8.0	30.0
13C5 PFNA	Ave	0.8250	0.8582		2.60	2.50	4.0	30.0
M2-8:2FTS	Ave	0.2848	0.2693		2.26	2.40	-5.4	30.0
13C2 PFDA	Ave	0.6565	0.7310		2.78	2.50	11.4	30.0
13C8 FOSA	Ave	1.283	1.377		2.68	2.50	7.3	30.0
d3-NMeFOSAA	Ave	0.2169	0.2696		3.11	2.50	24.3	30.0
13C2 PFUnA	Ave	0.5287	0.6258		2.96	2.50	18.4	30.0
d5-NEtFOSAA	Ave	0.2280	0.2723		2.99	2.50	19.5	30.0
13C2 PFDoA	Ave	0.5026	0.5692		2.83	2.50	13.3	30.0
13C2-PFTeDA	Ave	0.4910	0.5835		2.97	2.50	18.9	30.0
13C2-PFHxDA	Ave	0.7454	0.8981		3.01	2.50	20.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_032.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 30-Jul-2018 07:00:29 ALS Bottle#: 14 Worklist Smp#: 30
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 10:07:35 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 10:07:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.396	-0.001	0.541	4886294	2.77		111	65725	
2 Perfluorobutyric acid										
212.90 > 169.00	1.395	1.395	0.0	1.000	4850199	2.53		101	2821	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.640	-0.003	0.635	3281551	2.66		106	56795	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.637	0.0	1.000	4034818	2.57		103	2024	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.672	1.672	0.0	1.000	6117952	2.24		101	17481	
298.90 > 99.00	1.672	1.672	0.0	1.000	2479792		2.47(1.25-3.74)		10730	
D 47 13C3-PFBS										
301.90 > 83.00	1.672	1.674	-0.002	0.648	80150	2.48		107	637	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.875	-0.002	0.726	365565	NC			4132	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.873	1.873	0.0	1.120	900580	1.53		65.4	41577	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.902	0.0	1.000	3857206	2.54		102	14152	
313.00 > 119.00	1.902	1.902	0.0	1.000	338120		11.41(5.03-15.10)		8478	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.738	3582240	2.48		99.1	90023	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.151	5848198	2.38		102	67507	
349.00 > 99.00	1.924	1.924	0.0	1.151	2174303		2.69(1.36-4.07)		24994	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.000	2.000	0.0	1.000	785286	NC			5219	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.000	2.014	-0.014	0.775	307120	NC			9238	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.226	2.226	0.0	1.000	4091640	2.65		106	8940	
363.00 > 169.00	2.226	2.226	0.0	1.000	1603113		2.55(1.13-3.40)		24888	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.240	-0.014	0.863	3501341	2.35		94.0	74177	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.238	2.238	0.0	1.000	5019828	2.12		93.1	26788	
399.00 > 99.00	2.238	2.238	0.0	1.000	1706123		2.94(1.50-4.49)		6279	
D 11 18O2 PFHxS										
403.00 > 84.00	2.238	2.253	-0.015	0.868	4802065	2.51		106	61511	
65 ADONA										
377.00 > 251.00	2.277	2.277	0.0	0.773	10741450	NC			73950	
377.00 > 85.00	2.277	2.277	0.0	0.773	6445823		1.67(0.84-2.53)		27407	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	1037444	2.32		97.8	18862	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.564	-0.010	0.990	630444	1.51		63.8	10526	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		3810250	2.50			42513	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	4164114	2.40		96.0	5042	
413.00 > 169.00	2.579	2.579	0.0	1.000	2151281		1.94(0.84-2.52)		11276	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3569133	2.45		97.9	42076	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	4732070	2.38		100.0	41450	
449.00 > 99.00	2.587	2.587	0.0	0.878	1232724		3.84(1.94-5.82)		13904	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.946	2.946	0.0	1.000	3627026	2.28		98.4	31976	
499.00 > 99.00	2.946	2.946	0.0	1.000	846437		4.29(2.31-6.93)		7786	
20 Perfluorononanoic acid										
463.00 > 419.00	2.946	2.946	0.0	1.000	3586519	2.40		96.1	11039	
463.00 > 169.00	2.946	2.946	0.0	1.000	819384		4.38(1.90-5.69)		27387	
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.953	-0.007	1.142	3270114	2.60		104	52609	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.953	-0.007	1.142	3436651	2.58		108	33875	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.162	3.162	0.0	1.073	6114816	NC			35545	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.295	0.0	1.000	1346862	2.42		101	36551	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.295	0.0	1.119	2596002	2.42		101	35921	
549.00 > 99.00	3.295	3.295	0.0	1.119	1018936		2.55(1.33-3.97)		11602	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.299	-0.004	1.278	982956	2.26		94.6	18327	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.311	3.311	0.0	1.000	2927522	2.55		102	22550	
513.00 > 169.00	3.311	3.311	0.0	1.000	487244		6.01(2.36-7.09)		14402	
D 23 13C2 PFDA										
515.00 > 470.00	3.311	3.314	-0.003	1.284	2785352	2.78		111	47741	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.319	0.0	1.000	5303929	2.54		102	46999	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.322	-0.003	1.287	5246454	2.68		107	54402	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.464	3.464	0.0	1.000	1069354	2.64		106	12218	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.464	3.467	-0.003	1.343	1027045	3.11		124	16053	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.628	3.628	0.0	1.232	2422639	2.54		105	46269	
599.00 > 99.00	3.628	3.628	0.0	1.232	805818		3.01(1.39-4.16)		11209	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.638	3.638	0.0	1.000	2780108	2.35		94.0	12997	
563.00 > 169.00	3.638	3.638	0.0	1.000	473949		5.87(2.12-6.36)		19840	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.638	3.638	0.0	1.000	964632	2.49		99.6	26879	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.638	3.640	-0.002	1.410	1037675	2.99		119	3926	
D 30 13C2 PFUnA										
565.00 > 520.00	3.638	3.640	-0.002	1.410	2384314	2.96		118	55994	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.803	3.803	0.0	1.291	9547626	NC			85535	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.939	3.939	0.0	1.003	2392350	2.55		102	777	
613.00 > 169.00	3.928	3.939	-0.011	1.000	576630		4.15(2.13-6.40)		11977	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.930	-0.002	1.523	2168949	2.83		113	18053	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.192	0.0	1.067	2329915	2.56		102	780	
663.00 > 169.00	4.192	4.192	0.0	1.067	705858		3.30(1.25-3.76)		11624	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.437	0.0	1.000	555259	2.49		99.6	8061	
713.00 > 219.00	4.426	4.437	-0.011	0.998	416635		1.33(0.71-2.13)		6589	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.437	0.0	1.720	2223368	2.97		119	16153	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.842	0.0	1.000	3429336	NC			638	
813.00 > 169.00	4.842	4.842	0.0	1.000	547228		6.27(2.86-8.58)		4518	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.842	0.0	1.877	3421922	3.01		120	10611	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.189	5.189	0.0	1.072	3527844	NC			847	
913.00 > 169.00	5.189	5.189	0.0	1.072	421291		8.37(3.83-11.48)		4083	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 31-Jul-2018 10:07:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_032.d

Injection Date: 30-Jul-2018 07:00:29 Instrument ID: A8_N

Lims ID: CCV L5

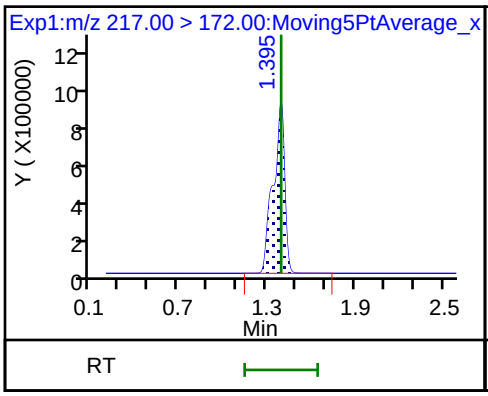
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 30

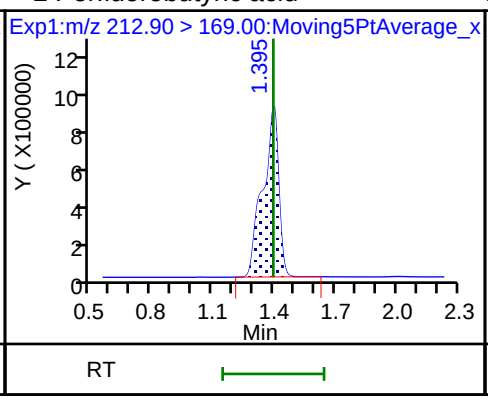
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

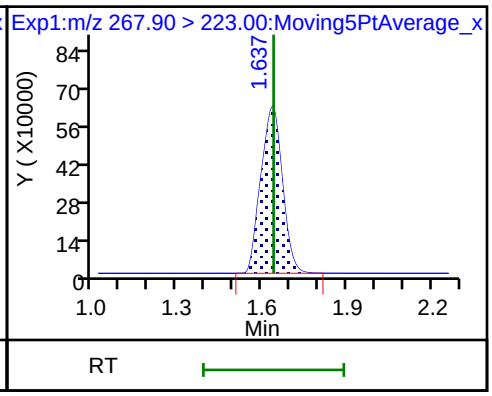
D 1 13C4 PFBA



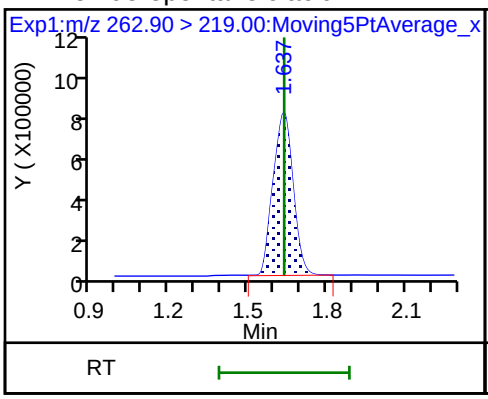
2 Perfluorobutyric acid



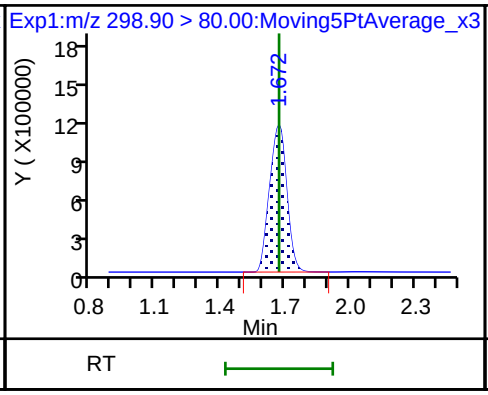
D 3 13C5-PFPeA



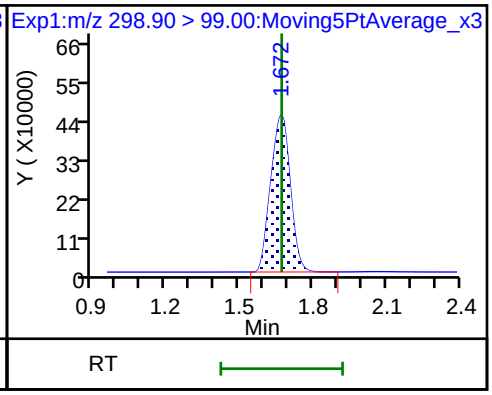
4 Perfluoropentanoic acid



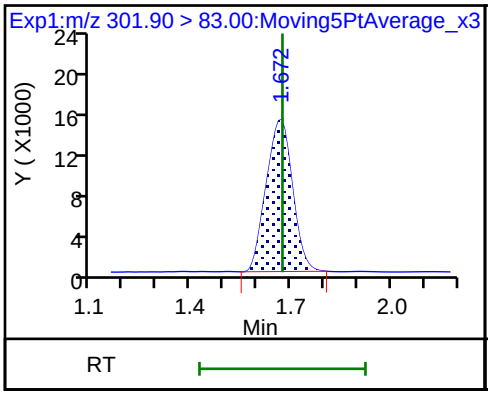
5 Perfluorobutanesulfonic acid



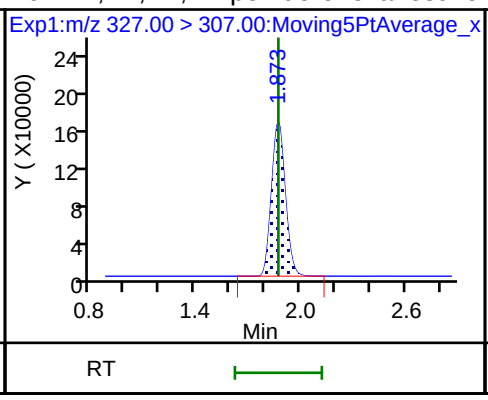
5 Perfluorobutanesulfonic acid



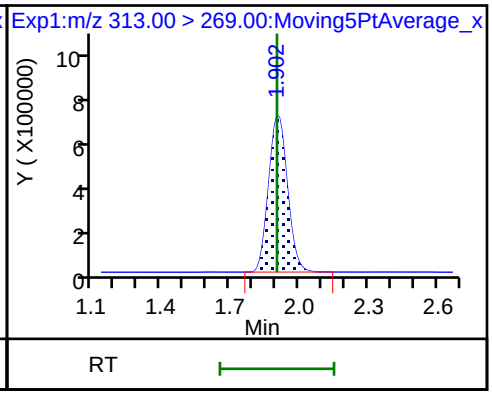
D 47 13C3-PFBS



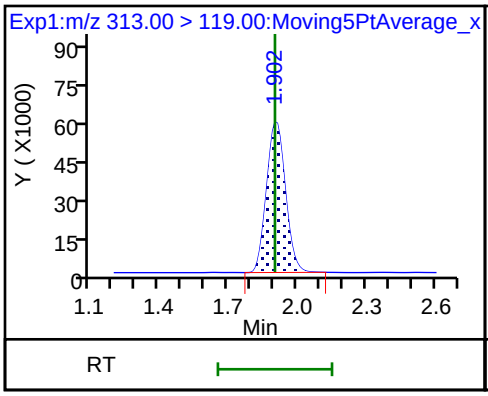
61 1H,1H,2H,2H-perfluorohexanesulfoni



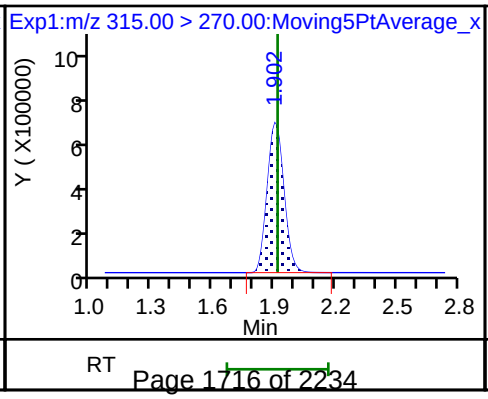
6 Perfluorohexanoic acid



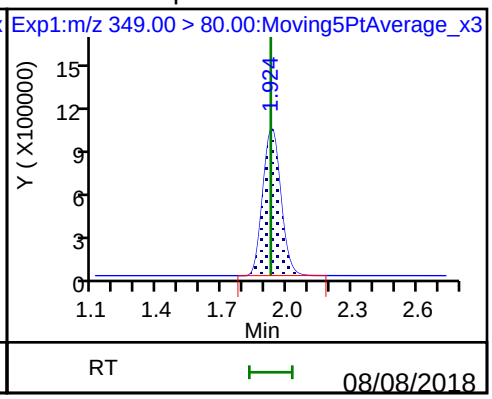
6 Perfluorohexanoic acid



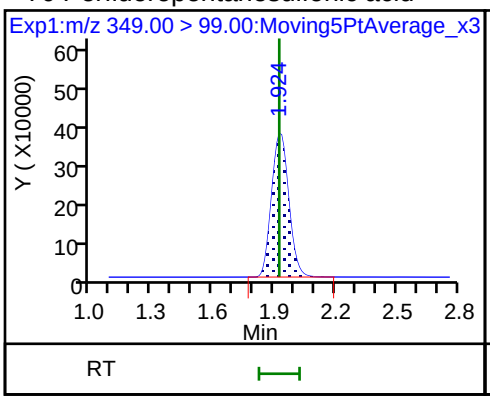
D 7 13C2 PFHxA



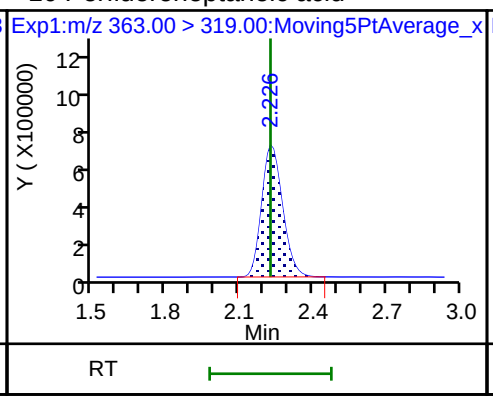
70 Perfluoropentanesulfonic acid



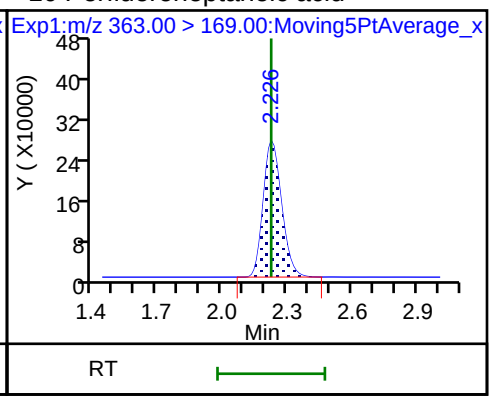
70 Perfluoropentanesulfonic acid



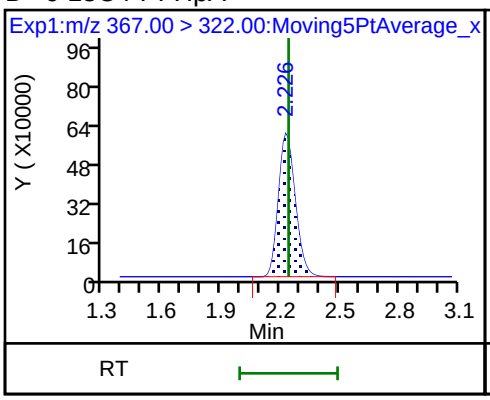
10 Perfluoroheptanoic acid



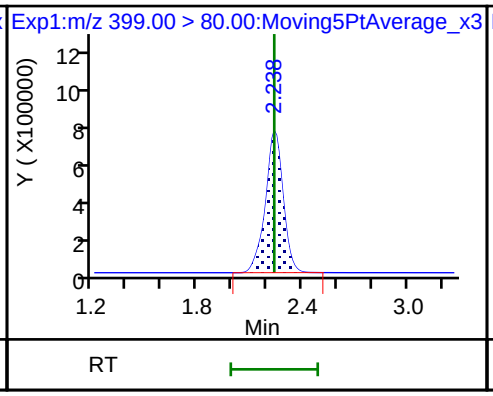
10 Perfluoroheptanoic acid



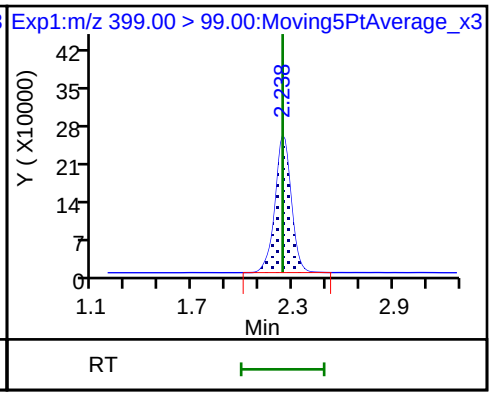
D 9 13C4-PFHpA



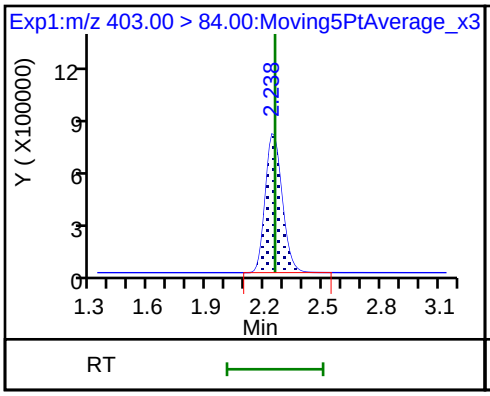
8 Perfluorohexanesulfonic acid



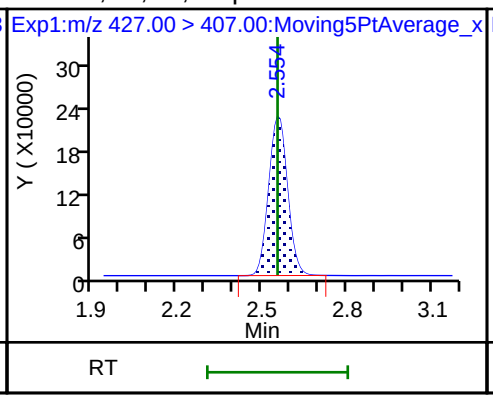
8 Perfluorohexanesulfonic acid



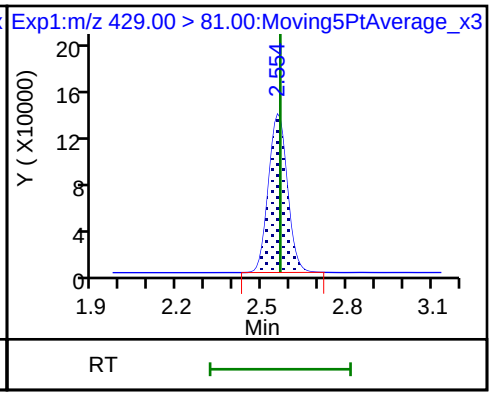
D 11 18O2 PFHxS



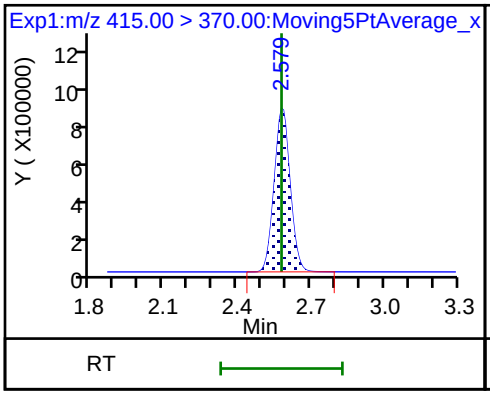
13 1H,1H,2H,2H-perfluorooctanesulfon



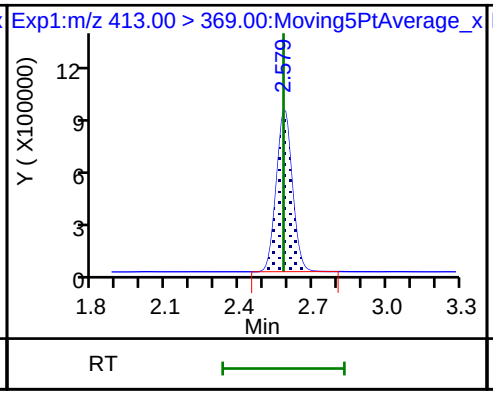
D 12 M2-6:2FTS



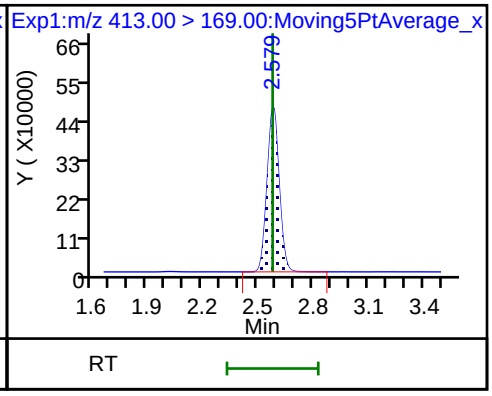
* 62 13C2-PFOA



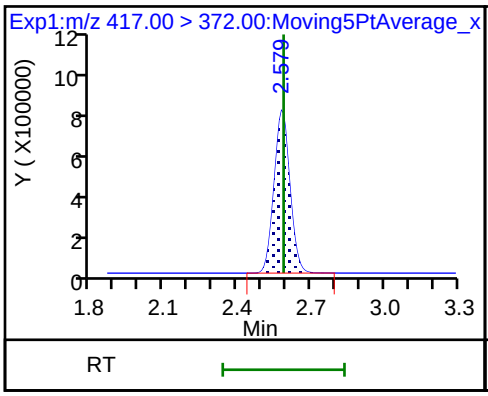
15 Perfluorooctanoic acid



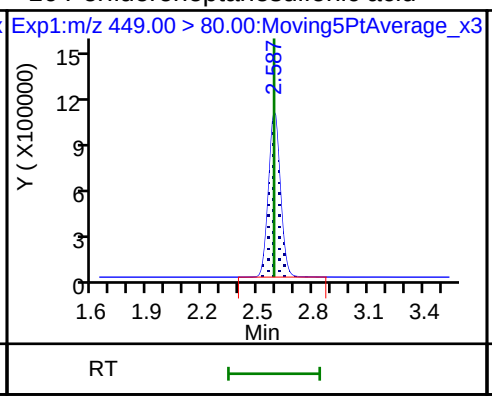
15 Perfluorooctanoic acid



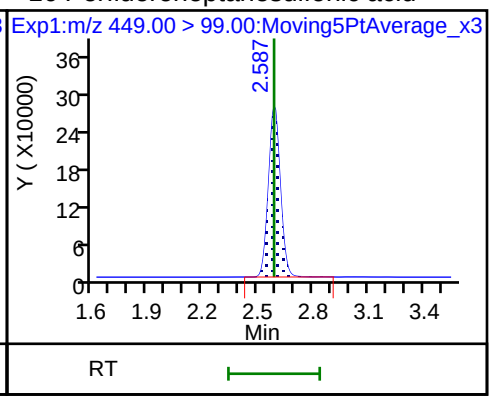
D 14 13C4 PFOA



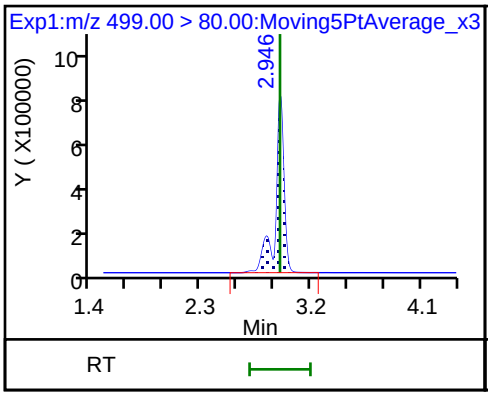
16 Perfluoroheptanesulfonic acid



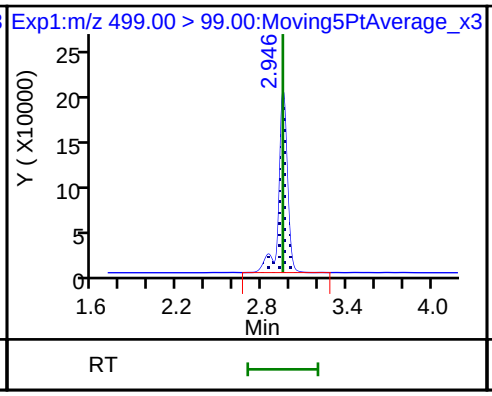
16 Perfluoroheptanesulfonic acid



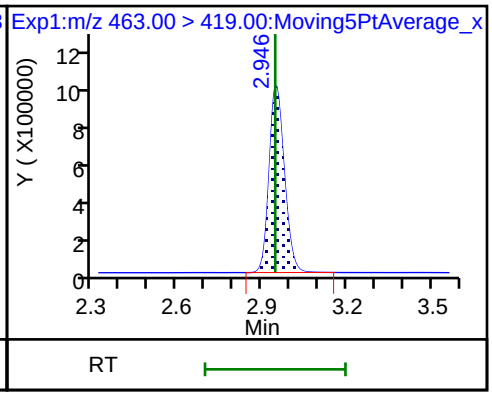
17 Perfluorooctane sulfonic acid



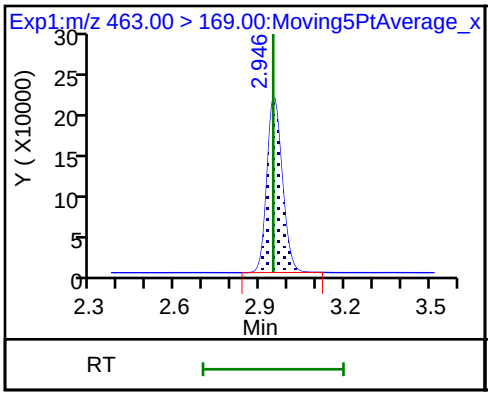
17 Perfluorooctane sulfonic acid



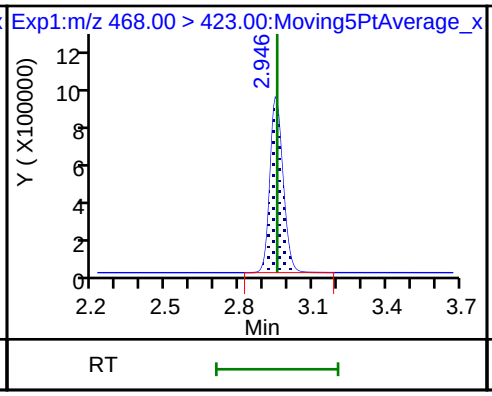
20 Perfluorononanoic acid



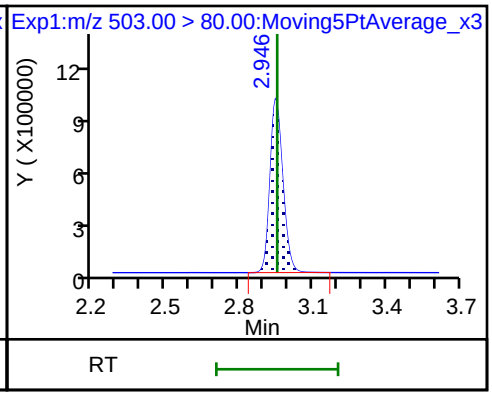
20 Perfluorononanoic acid



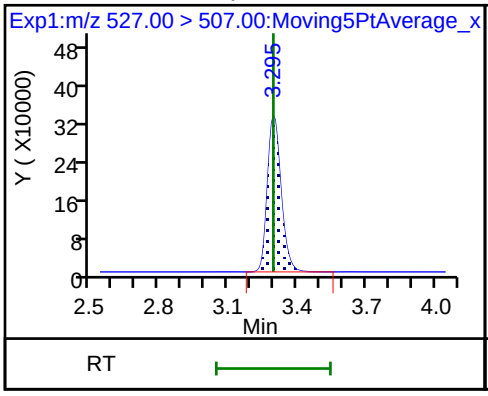
D 19 13C5 PFNA



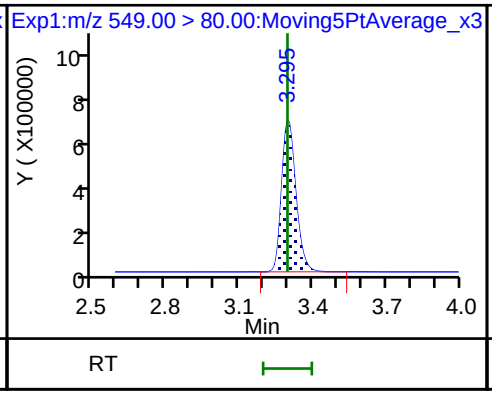
D 18 13C4 PFOS



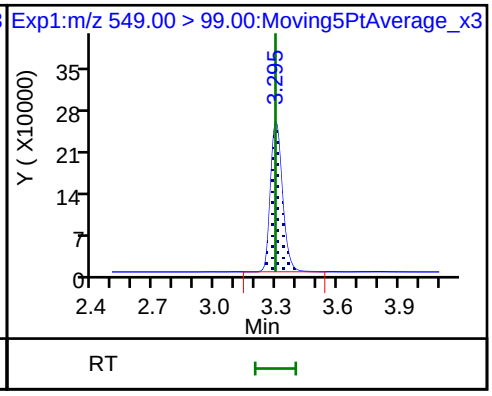
25 1H,1H,2H,2H-perfluorodecanesulfoni



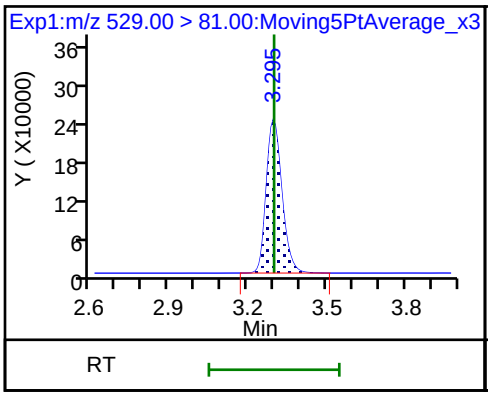
68 Perfluorononanesulfonic acid



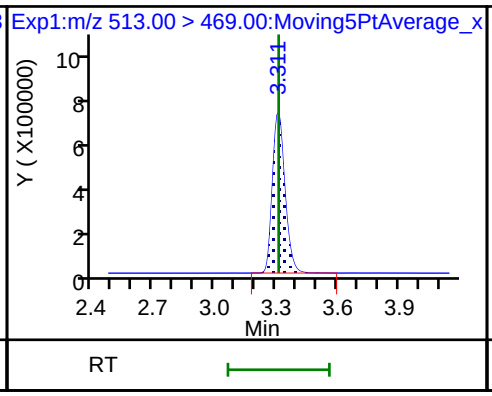
68 Perfluorononanesulfonic acid



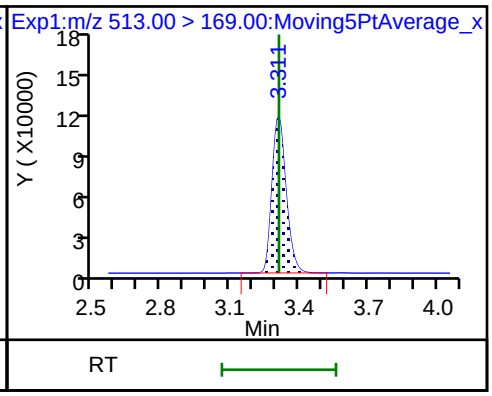
D 26 M2-8:2FTS



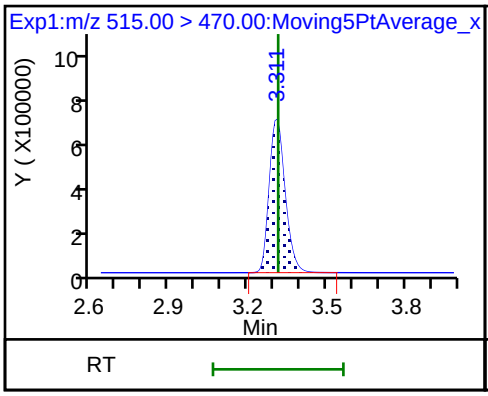
24 Perfluorodecanoic acid



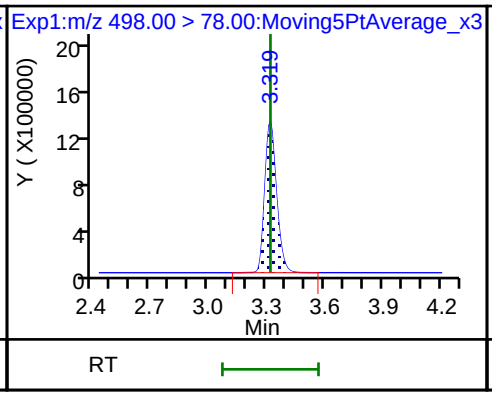
24 Perfluorodecanoic acid



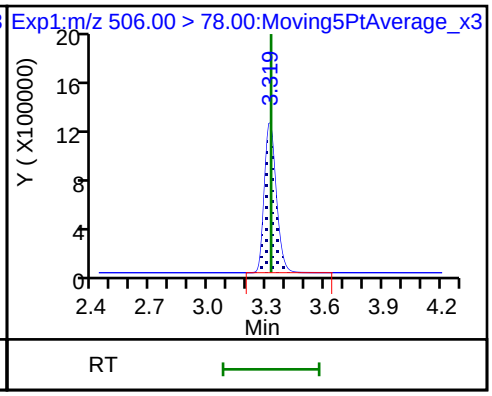
D 23 13C2 PFDA



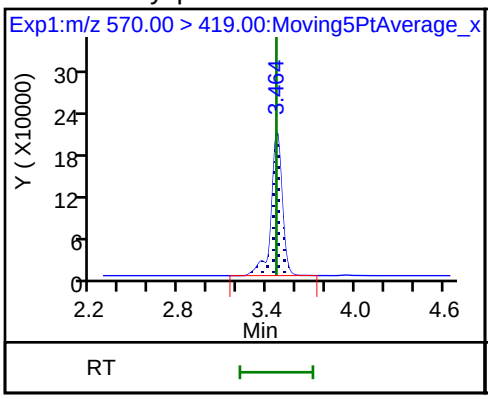
22 Perfluorooctane Sulfonamide



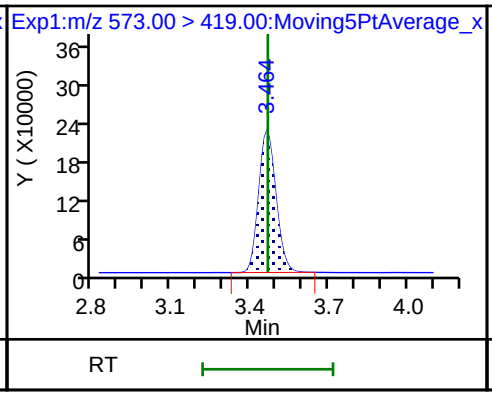
D 21 13C8 FOSA



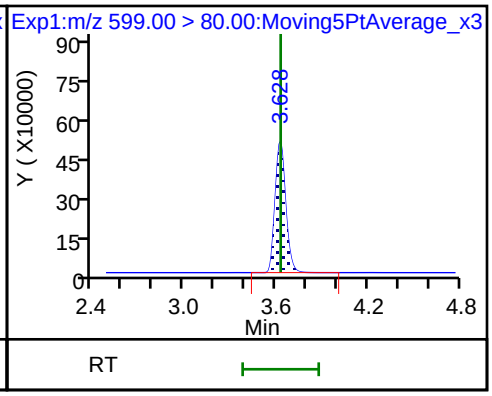
28 N-methyl perfluorooctane sulfonami



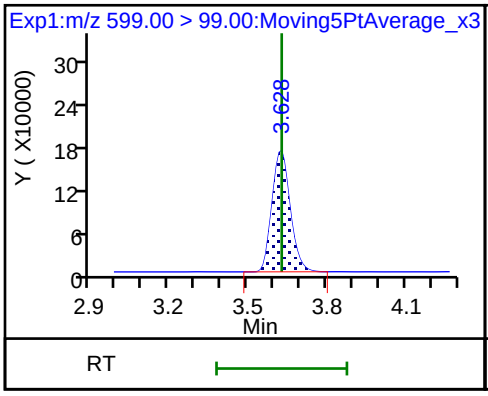
D 27 d3-NMeFOSAA



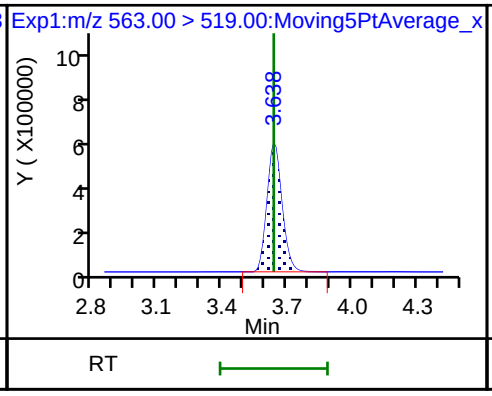
29 Perfluorodecane Sulfonic acid



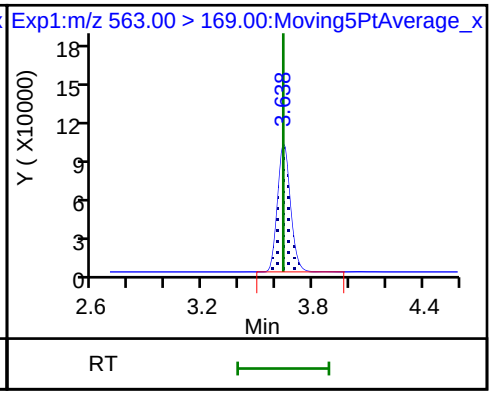
29 Perfluorodecane Sulfonic acid



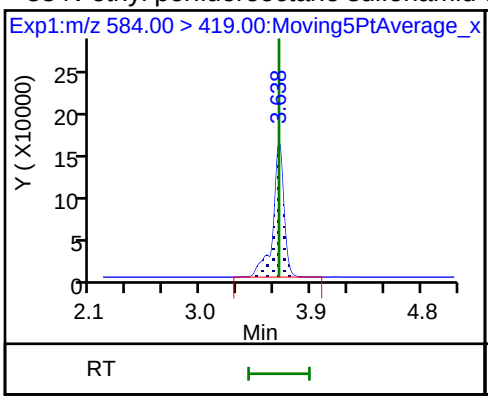
31 Perfluoroundecanoic acid



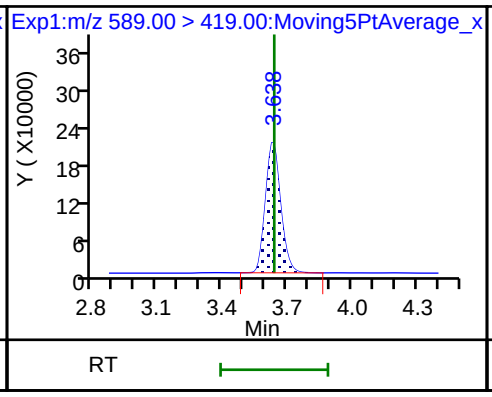
31 Perfluoroundecanoic acid



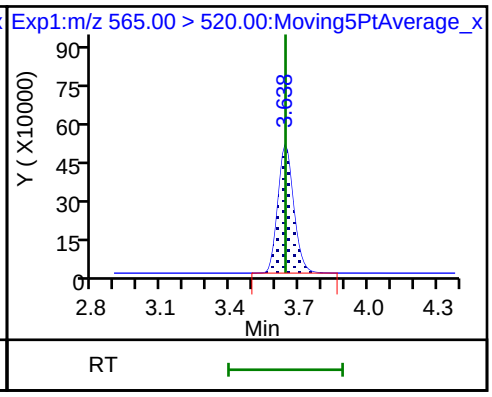
33 N-ethyl perfluorooctane sulfonamid



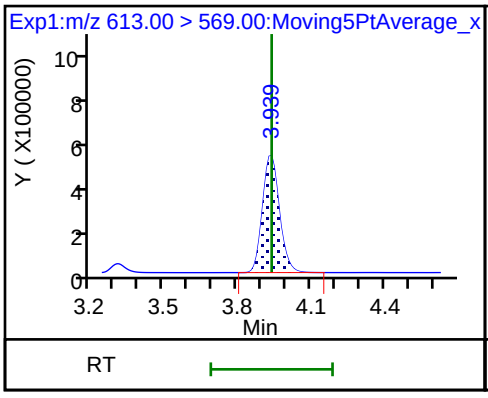
D 32 d5-NEtFOSAA



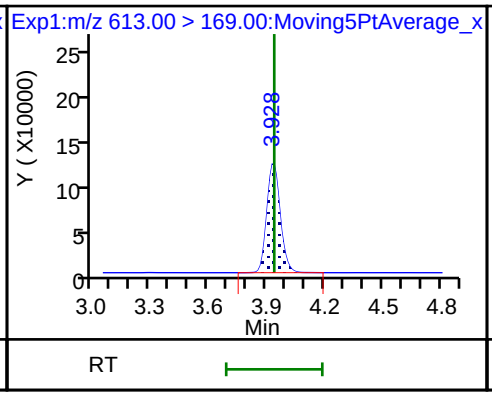
D 30 13C2 PFUnA



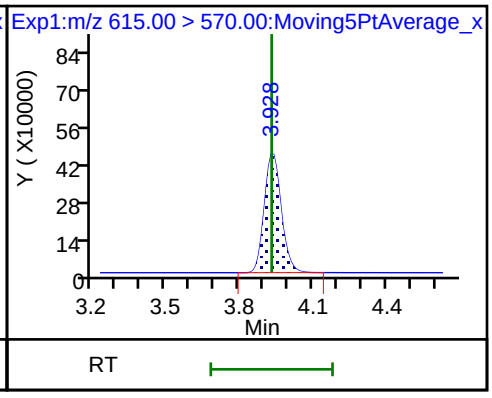
37 Perfluorododecanoic acid



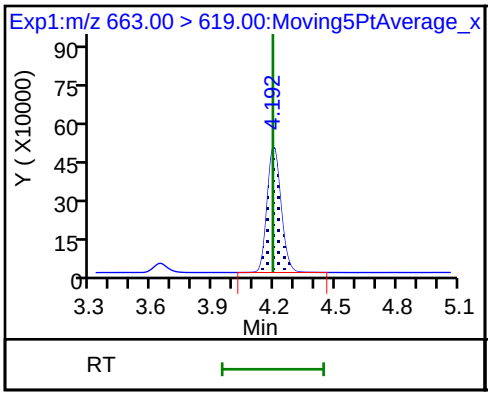
37 Perfluorododecanoic acid



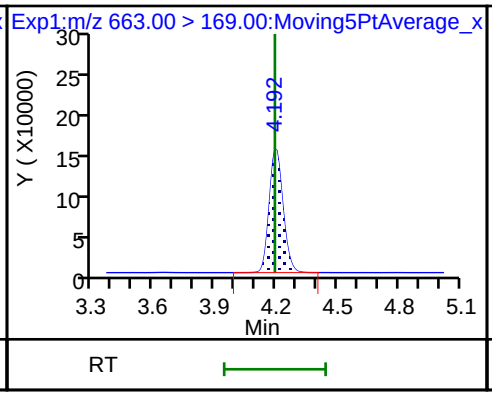
D 36 13C2 PFDoA



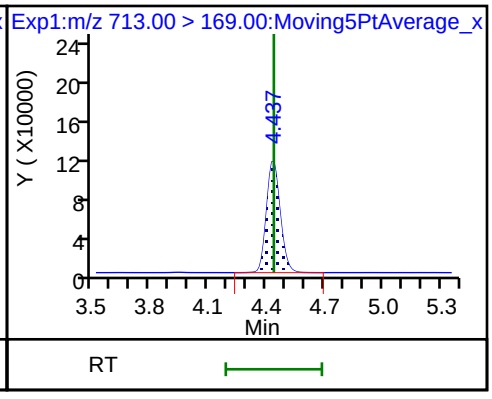
41 Perfluorotridecanoic acid



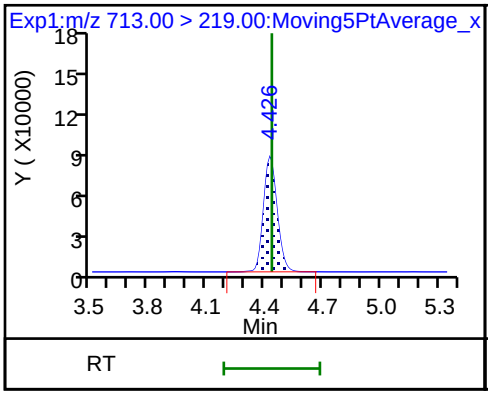
41 Perfluorotridecanoic acid



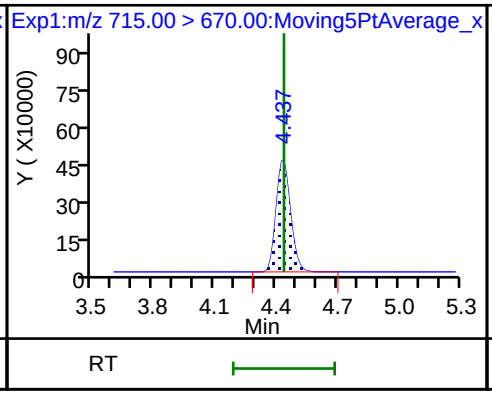
42 Perfluorotetradecanoic acid



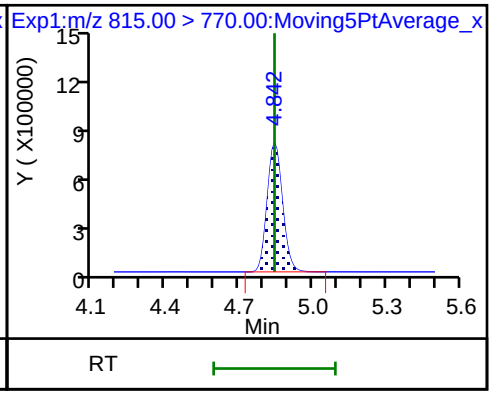
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-236979/10 Calibration Date: 07/30/2018 16:16

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.30LLICA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.024	0.9512		2.32	2.50	-7.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.210	1.140		2.36	2.50	-5.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.51	81.89		2.34	2.21	5.7	30.0
4:2 FTS	AveID	15.26	16.71		2.56	2.34	9.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.066	1.004		2.35	2.50	-5.8	30.0
Perfluoropentanesulfonic acid	AveID	70.00	74.57		2.50	2.35	6.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.138	1.046		2.30	2.50	-8.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.162	1.049		2.05	2.28	-9.7	30.0
6:2 FTS	AveID	1.685	1.615		2.27	2.37	-4.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.166	1.178		2.53	2.50	1.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.331	1.363		2.44	2.38	2.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.079	1.046		2.42	2.50	-3.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.140	1.125		2.29	2.32	-1.3	30.0
8:2 FTS	AveID	1.328	1.311		2.36	2.40	-1.3	30.0
Perfluorononanesulfonic acid	AveID	0.7829	0.7721		2.37	2.40	-1.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.087	1.021		2.35	2.50	-6.1	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9900	0.9847		2.49	2.50	-0.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.028	1.017		2.47	2.50	-1.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6692	0.6714		2.42	2.41	0.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9130	0.9492		2.60	2.50	4.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8969	0.7408		2.06	2.50	-17.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.080	1.045		2.42	2.50	-3.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9169	0.9488		2.59	2.50	3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2666	0.2396		2.25	2.50	-10.1	30.0
13C4 PFBA	Ave	1.354	1.340		2.48	2.50	-1.0	30.0
13C5-PFPeA	Ave	0.8708	0.8328		2.39	2.50	-4.4	30.0
13C3-PFBS	Ave	0.0258	0.0235		2.11	2.33	-9.2	30.0
13C2 PFHxA	Ave	0.9884	0.9884		2.50	2.50	0.0	30.0
13C4-PFHpA	Ave	0.9405	0.9728		2.59	2.50	3.4	30.0
18O2 PFHxS	Ave	1.429	1.402		2.32	2.37	-1.9	30.0
M2-6:2FTS	Ave	0.2945	0.2812		2.27	2.38	-4.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-236979/10 Calibration Date: 07/30/2018 16:16

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.30LLICA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9607	0.9340		2.43	2.50	-2.8	30.0
13C4 PFOS	Ave	1.026	0.9844		2.29	2.39	-4.1	30.0
13C5 PFNA	Ave	0.8491	0.8667		2.55	2.50	2.1	30.0
M2-8:2FTS	Ave	0.3394	0.3238		2.28	2.40	-4.6	30.0
13C8 FOSA	Ave	1.464	1.422		2.43	2.50	-2.9	30.0
13C2 PFDA	Ave	0.7029	0.6806		2.42	2.50	-3.2	30.0
d3-NMeFOSAA	Ave	0.1590	0.1722		2.71	2.50	8.3	30.0
13C2 PFUnA	Ave	0.5459	0.5322		2.44	2.50	-2.5	30.0
d5-NEtFOSAA	Ave	0.1739	0.1699		2.44	2.50	-2.3	30.0
13C2 PFDoA	Ave	0.5541	0.5162		2.33	2.50	-6.8	30.0
13C2-PFTeDA	Ave	0.5049	0.5487		2.72	2.50	8.7	30.0
13C2-PFHxDA	Ave	0.8936	0.9213		2.58	2.50	3.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 30-Jul-2018 16:16:22 ALS Bottle#: 17 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:41:11 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:40:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.419	1.412	0.007	0.535	4935884	2.48		99.0	51490	
2 Perfluorobutyric acid										
212.90 > 169.00	1.425	1.412	0.013	1.004	4695191	2.32			1079	
D 3 13C5-PFPeA										
267.90 > 223.00	1.675	1.658	0.017	0.631	3066806	2.39		95.6	37680	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.675	1.659	0.016	1.000	3495793	2.36			1586	
D 47 13C3-PFBS										
301.90 > 83.00	1.711	1.693	0.018	0.645	80313	2.11		90.8	344	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.711	1.697	0.014	1.000	6251559	2.34			21340	
298.90 > 99.00	1.711	1.697	0.014	1.000	2587151		2.42(1.25-3.74)		8457	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.927	1.904	0.023	1.126	1347738	2.56			59422	
D 60 M2-4:2FTS										
329.00 > 81.00	1.927	1.905	0.022	0.726	562778	NC			4343	
D 7 13C2 PFHxA										
315.00 > 270.00	1.959	1.942	0.017	0.739	3639832	2.50		100	90872	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.959	1.944	0.015	1.000	3654874	2.35			7062	
313.00 > 119.00	1.959	1.944	0.015	1.000	346953		10.53(5.03-15.10)		4036	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.981	1.965	0.016	1.158	6040292	2.50			54685	
349.00 > 99.00	1.981	1.965	0.016	1.158	2163596		2.79(1.36-4.07)		6881	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.060	2.040	0.020	0.777	201247	NC			5759	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.060	2.042	0.018	1.000	626345	NC			3106	
D 9 13C4-PFHpA										
367.00 > 322.00	2.294	2.267	0.027	0.865	3582460	2.59		103	42259	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.294	2.271	0.023	1.000	3746809	2.30			1274	
363.00 > 169.00	2.294	2.271	0.023	1.000	1406469		2.66(1.13-3.40)		10520	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.307	2.284	0.023	1.000	4928846	2.05			12006	
399.00 > 99.00	2.307	2.284	0.023	1.000	1716772		2.87(1.50-4.49)		2190	
D 11 18O2 PFHxS										
403.00 > 84.00	2.307	2.288	0.019	0.870	4884706	2.32		98.1	44713	
65 ADONA										
377.00 > 251.00	2.333	2.316	0.017	0.771	9640238	NC			61827	
377.00 > 85.00	2.333	2.316	0.017	0.771	5534339		1.74(0.84-2.53)		18848	
D 12 M2-6:2FTS										
429.00 > 81.00	2.629	2.603	0.026	0.991	983777	2.27		95.5	10326	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.629	2.605	0.024	1.000	1585385	2.27			19222	
* 62 13C2-PFOA										
415.00 > 370.00	2.653	2.631	0.022		3682587	2.50			45087	
D 14 13C4 PFOA										
417.00 > 372.00	2.653	2.631	0.022	1.000	3439434	2.43		97.2	33531	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.653	2.631	0.022	1.000	4057238	2.53			2766	
413.00 > 169.00	2.653	2.631	0.022	1.000	2041781		1.99(0.84-2.52)		7633	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.660	2.640	0.020	0.879	4703291	2.44			21397	
449.00 > 99.00	2.660	2.640	0.020	0.879	1232312		3.82(1.94-5.82)		4978	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.025	3.000	0.025	1.000	3786187	2.29			6128	
499.00 > 99.00	3.025	3.000	0.025	1.000	833032		4.55(2.31-6.93)		3369	
D 18 13C4 PFOS										
503.00 > 80.00	3.025	3.000	0.025	1.140	3465753	2.29		95.9	19014	
D 19 13C5 PFNA										
468.00 > 423.00	3.025	3.000	0.025	1.140	3191811	2.55		102	47785	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.025	3.001	0.024	1.000	3337437	2.42			1154	M
463.00 > 169.00	3.025	3.001	0.024	1.000	812423		4.11(1.90-5.69)		15838	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.240	3.212	0.028	1.071	6411007	NC			31603	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.370	3.347	0.023	1.114	2687132	2.37			28739	
549.00 > 99.00	3.370	3.347	0.023	1.114	1025137		2.62(1.33-3.97)		5748	
D 26 M2-8:2FTS										
529.00 > 81.00	3.370	3.350	0.020	1.270	1142169	2.28		95.4	10877	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.370	3.350	0.020	1.000	1497293	2.36			81388	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.379	3.356	0.023	1.274	5236788	2.43		97.1	60679	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.388	3.357	0.031	1.003	5156504	2.49			30597	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.388	3.361	0.027	1.000	2559829	2.35			3934	
513.00 > 169.00	3.388	3.361	0.027	1.000	450146		5.69(2.36-7.09)		4717	
D 23 13C2 PFDA										
515.00 > 470.00	3.388	3.361	0.027	1.277	2506214	2.42		96.8	42533	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.538	3.515	0.023	1.334	634140	2.71		108	19800	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.547	3.519	0.028	1.003	645210	2.47			6586	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.697	3.674	0.023	1.222	2346371	2.42			30547	
599.00 > 99.00	3.697	3.674	0.023	1.222	796578		2.95(1.39-4.16)		7496	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.708	3.683	0.025	1.398	625671	2.44		97.7	8435	
D 30 13C2 PFUnA										
565.00 > 520.00	3.708	3.687	0.021	1.398	1959778	2.44		97.5	49891	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.708	3.687	0.021	1.000	1451831	2.06			6285	
563.00 > 169.00	3.708	3.687	0.021	1.000	394606		3.68(2.12-6.36)		10081	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.708	3.689	0.019	1.000	593859	2.60			39817	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.866	3.848	0.018	1.278	8829345	NC			76140	
D 36 13C2 PFDoA										
615.00 > 570.00	3.999	3.983	0.016	1.507	1900922	2.33		93.2	28321	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.999	3.987	0.012	1.000	1987295	2.42			568	
613.00 > 169.00	3.999	3.987	0.012	1.000	452711		4.39(2.13-6.40)		6711	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.262	4.245	0.017	1.066	1803579	2.59			858	
663.00 > 169.00	4.262	4.245	0.017	1.066	529428		3.41(1.25-3.76)		3740	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.501	4.481	0.020	1.697	2020768	2.72		109	11745	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.501	4.483	0.018	1.000	484198	2.25			8381	
713.00 > 219.00	4.491	4.483	0.008	0.998	328380		1.47(0.71-2.13)		4518	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.905	4.888	0.017	1.000	3244800	NC			702	
813.00 > 169.00	4.905	4.888	0.017	1.000	510597		6.35(2.86-8.58)		4321	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.905	4.888	0.017	1.849	3392845	2.58		103	6661	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.240	5.229	0.011	1.068	3322393	NC			903	
913.00 > 169.00	5.240	5.229	0.011	1.068	376229		8.83(3.83-11.48)		2938	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFCIC_FULL_00012 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:41:14 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_010.d

Injection Date: 30-Jul-2018 16:16:22 Instrument ID: A8_N

Lims ID: ICV Full

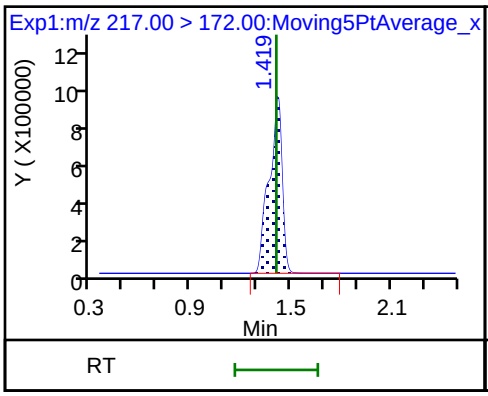
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 17 Worklist Smp#: 10

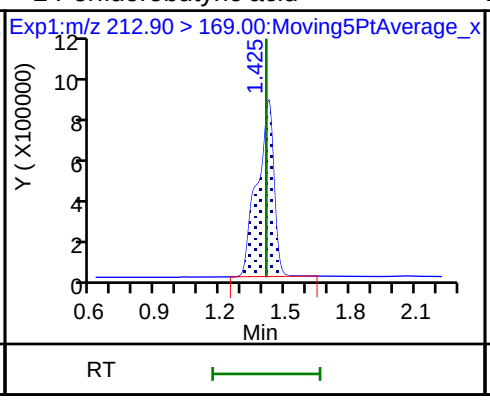
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

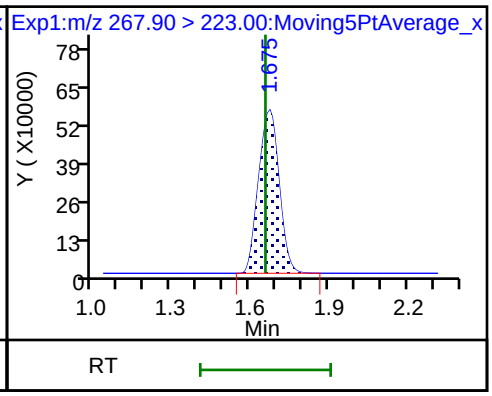
D 1 13C4 PFBA



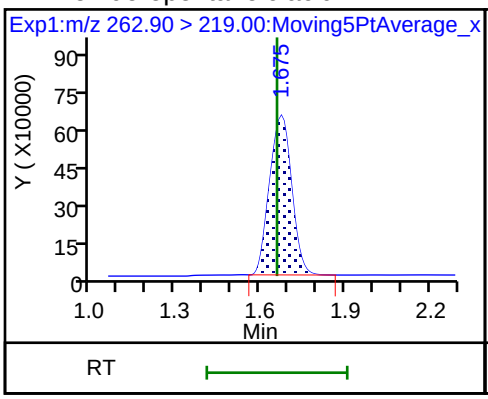
2 Perfluorobutyric acid



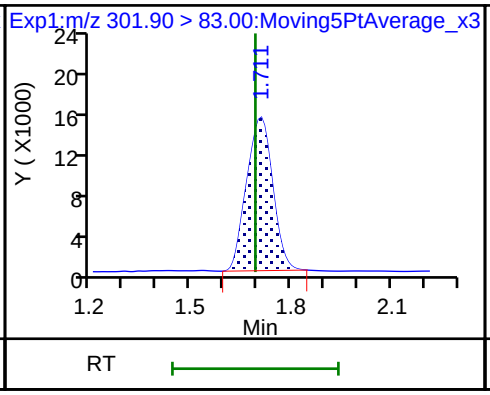
D 3 13C5-PFPeA



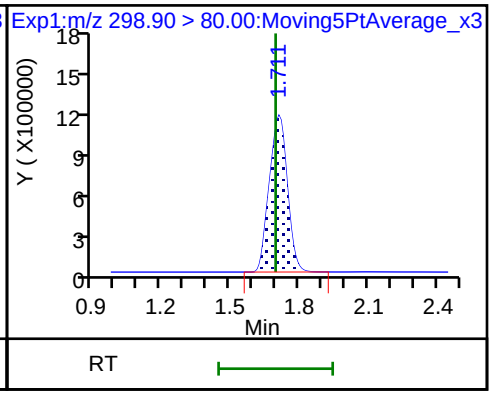
4 Perfluoropentanoic acid



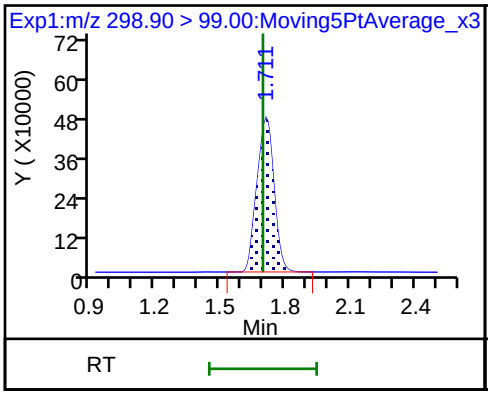
D 47 13C3-PFBS



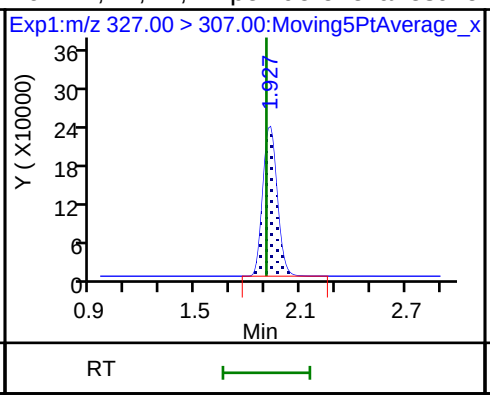
5 Perfluorobutanesulfonic acid



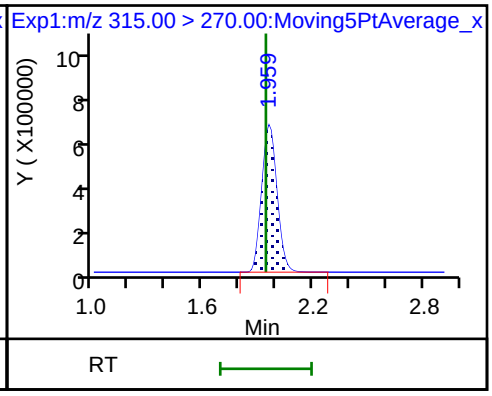
5 Perfluorobutanesulfonic acid



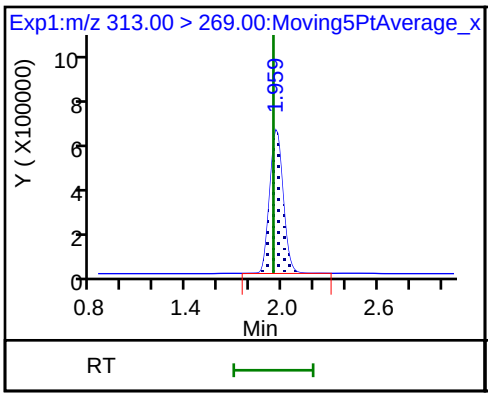
61 1H,1H,2H,2H-perfluorohexanesulfon



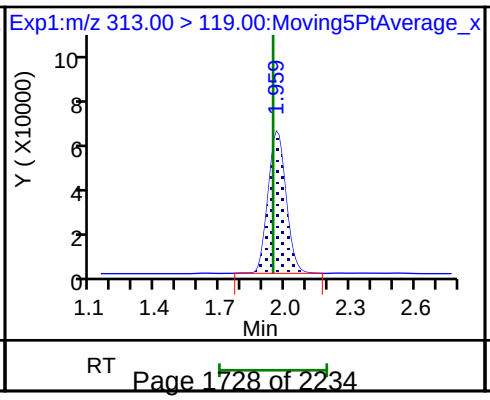
D 7 13C2 PFHxA



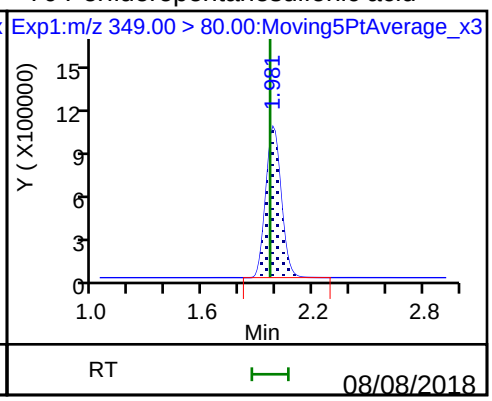
6 Perfluorohexanoic acid



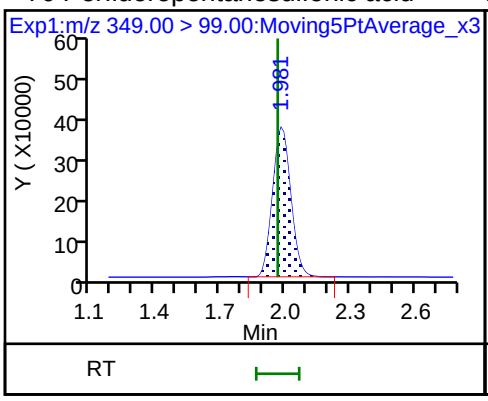
6 Perfluorohexanoic acid



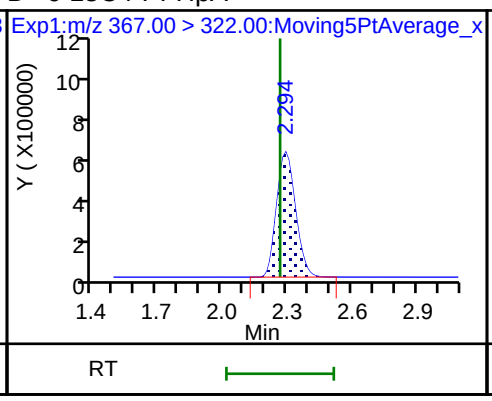
70 Perfluoropentanesulfonic acid



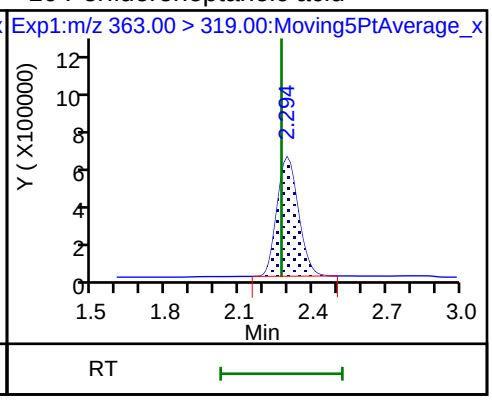
70 Perfluoropentanesulfonic acid



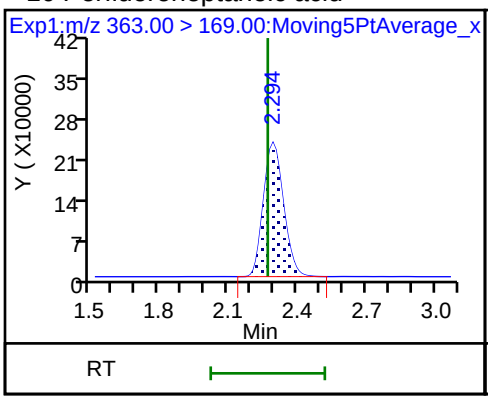
D 9 13C4-PFHpA



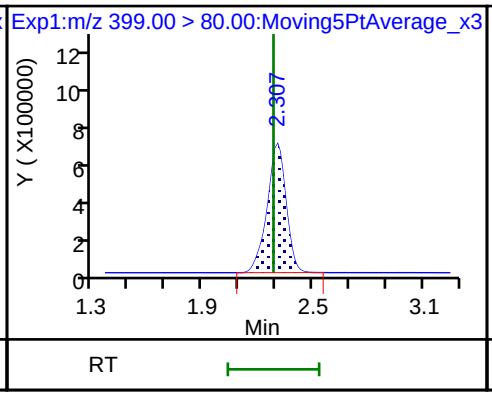
10 Perfluoroheptanoic acid



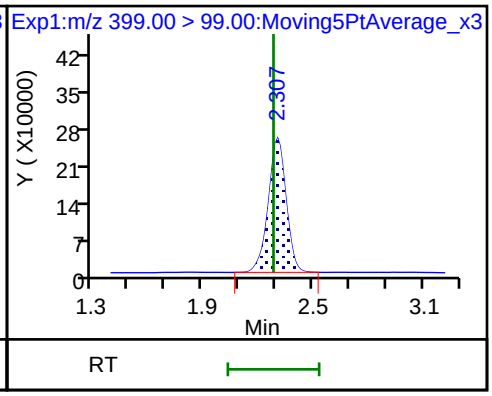
10 Perfluoroheptanoic acid



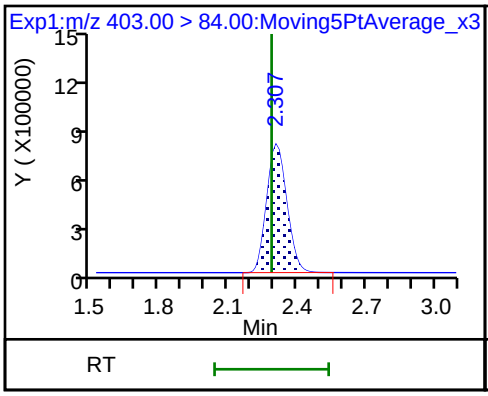
8 Perfluorohexanesulfonic acid



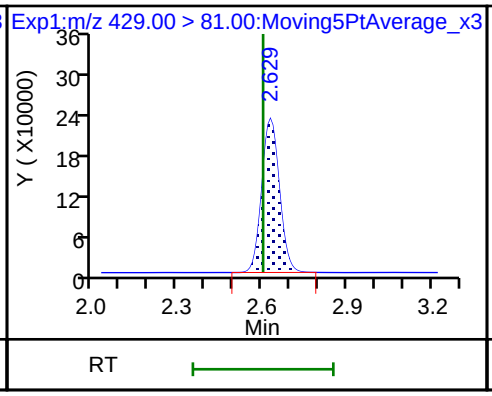
8 Perfluorohexanesulfonic acid



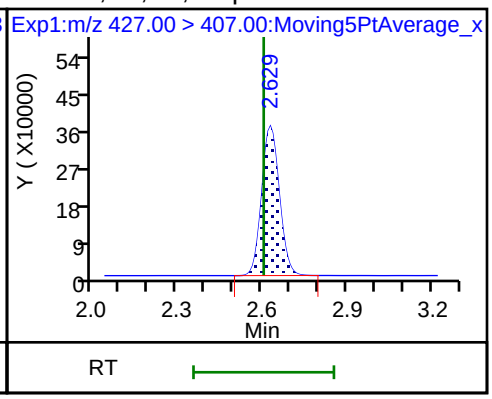
D 11 18O2 PFHxS



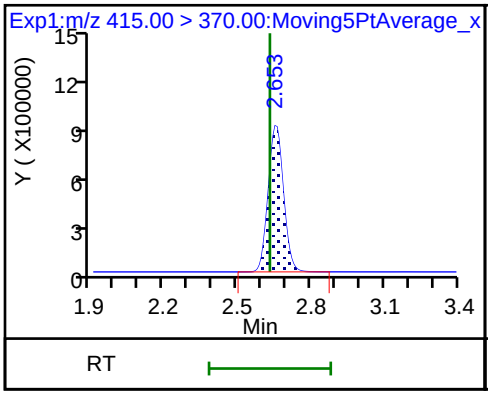
D 12 M2-6:2FTS



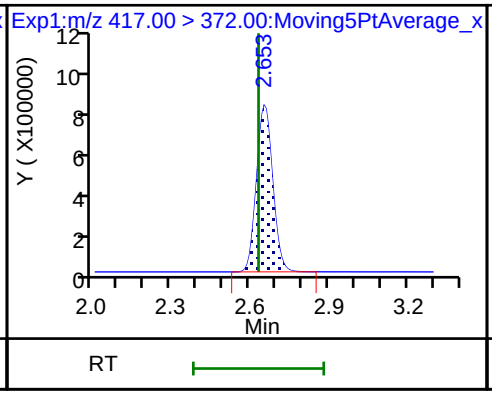
13 1H,1H,2H,2H-perfluorooctanesulfoni



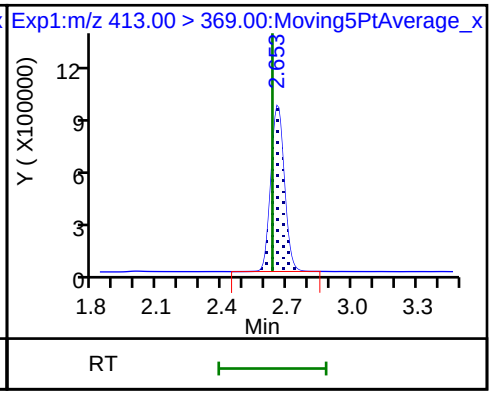
* 62 13C2-PFOA



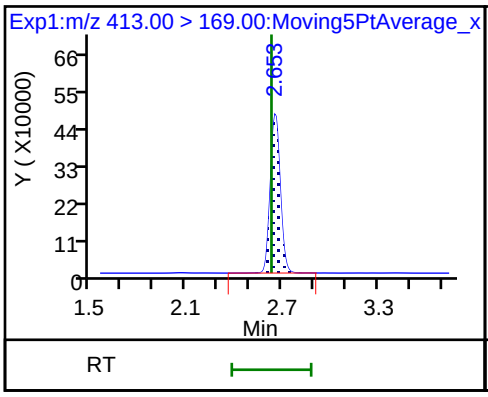
D 14 13C4 PFOA



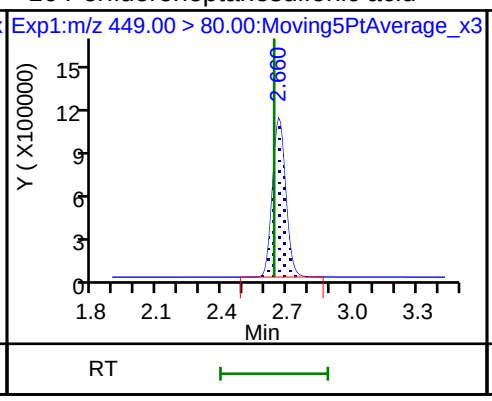
15 Perfluorooctanoic acid



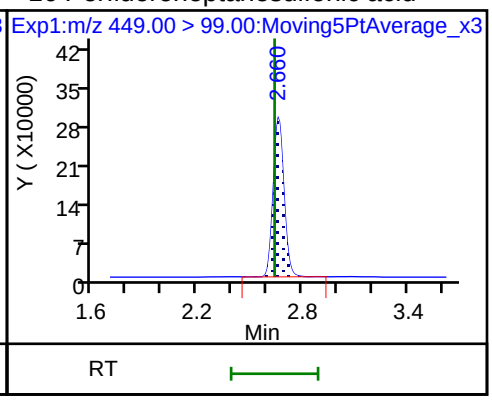
15 Perfluorooctanoic acid



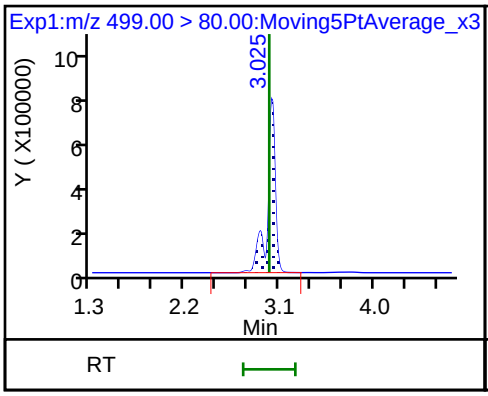
16 Perfluoroheptanesulfonic acid



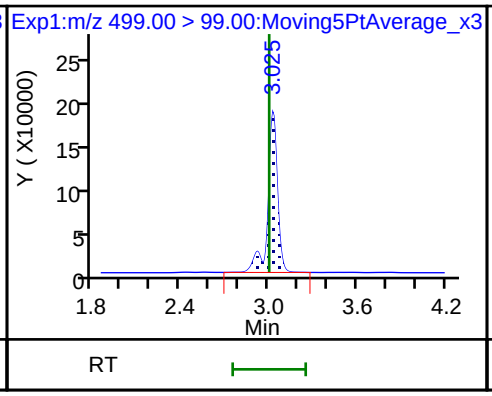
16 Perfluoroheptanesulfonic acid



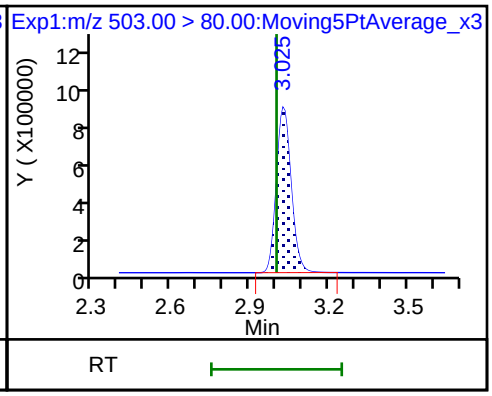
17 Perfluorooctane sulfonic acid



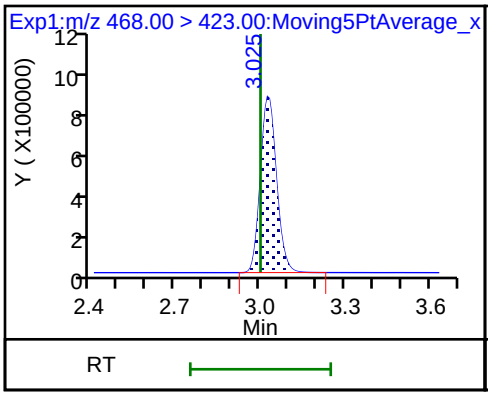
17 Perfluorooctane sulfonic acid



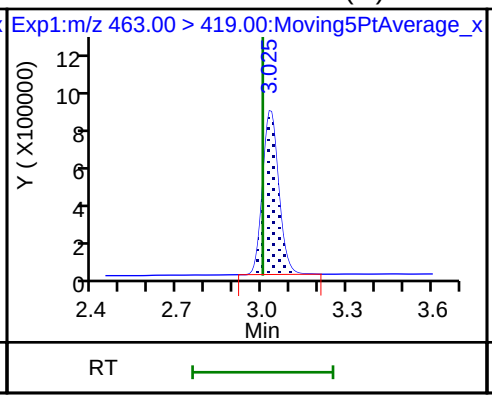
D 18 13C4 PFOS



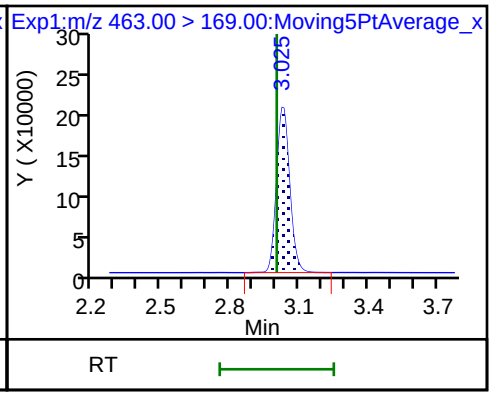
D 19 13C5 PFNA



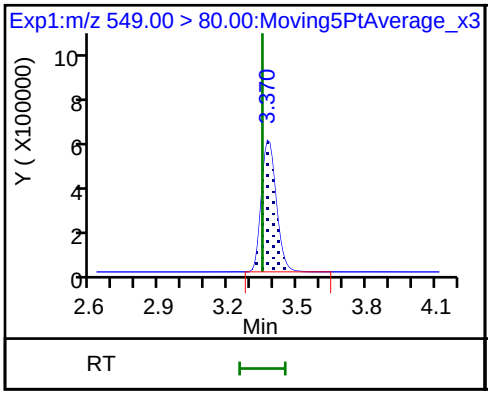
20 Perfluorononanoic acid (M)



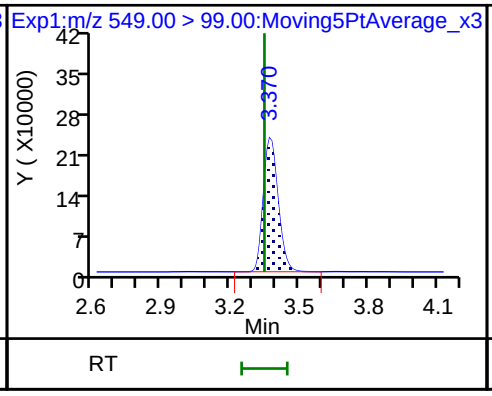
20 Perfluorononanoic acid



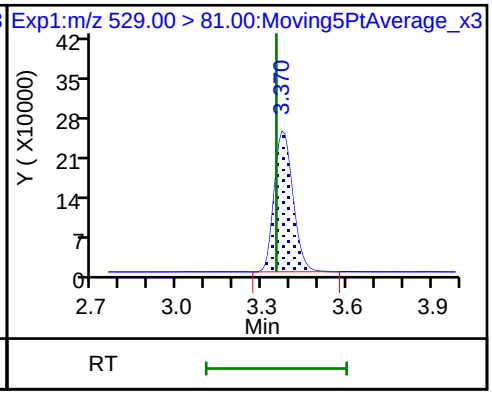
68 Perfluorononanesulfonic acid



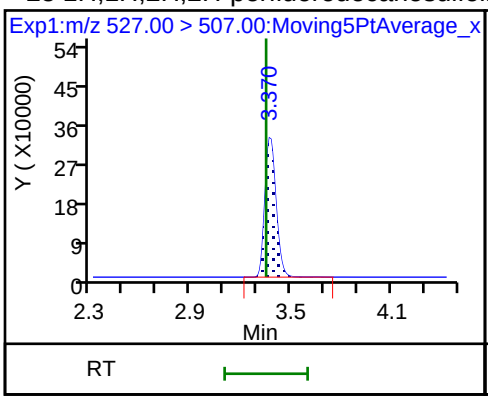
68 Perfluorononanesulfonic acid



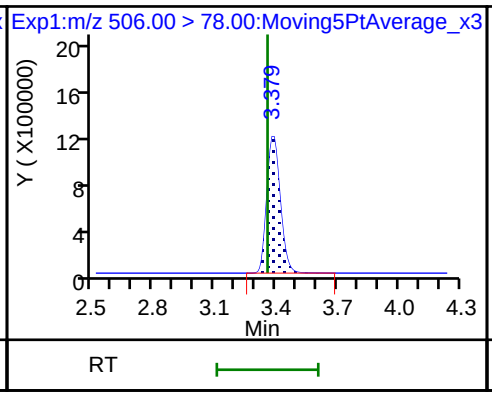
D 26 M2-8:2FTS



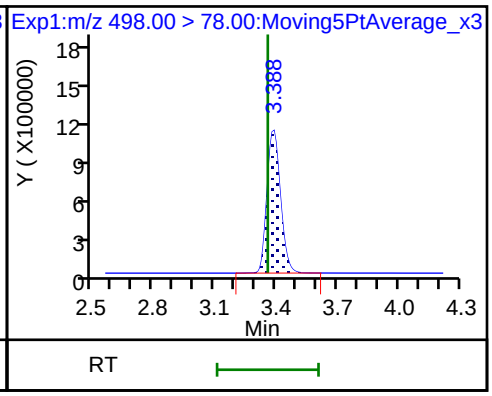
25 1H,1H,2H,2H-perfluorodecanesulfon



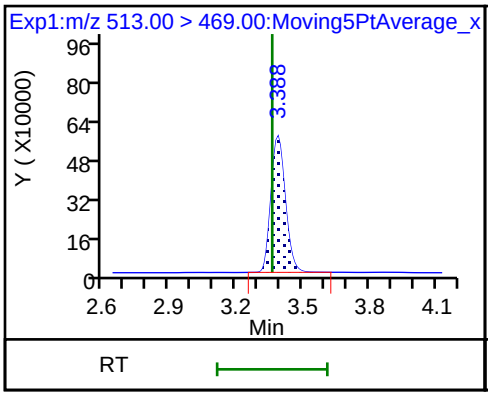
D 21 13C8 FOSA



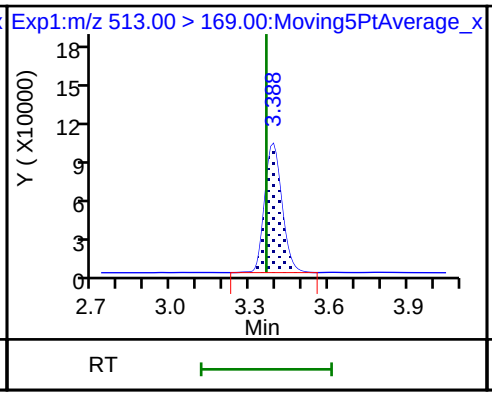
22 Perfluorooctane Sulfonamide



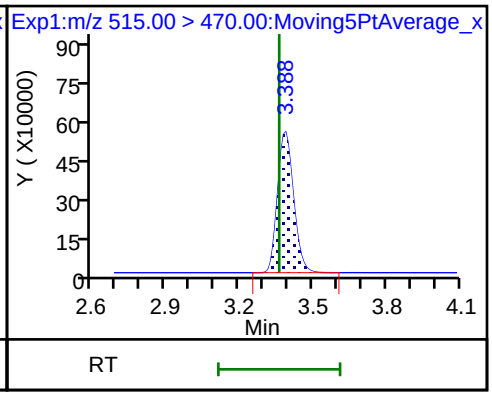
24 Perfluorodecanoic acid



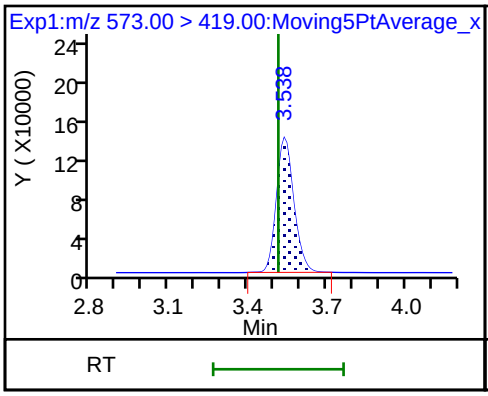
24 Perfluorodecanoic acid



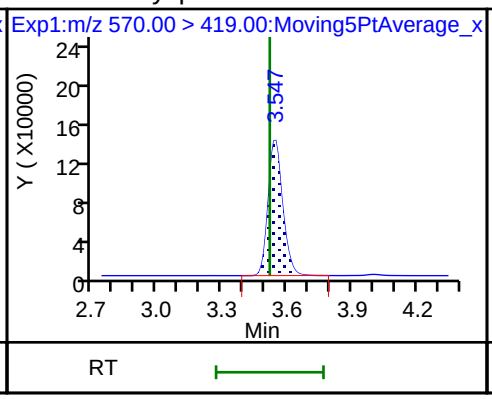
D 23 13C2 PFDA



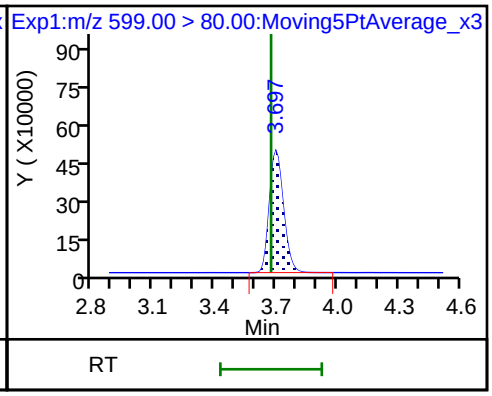
D 27 d3-NMeFOSAA



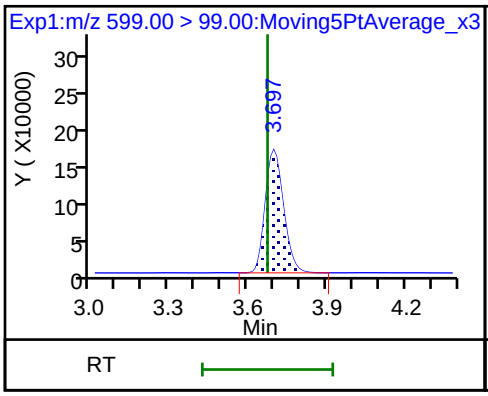
28 N-methyl perfluorooctane sulfonami



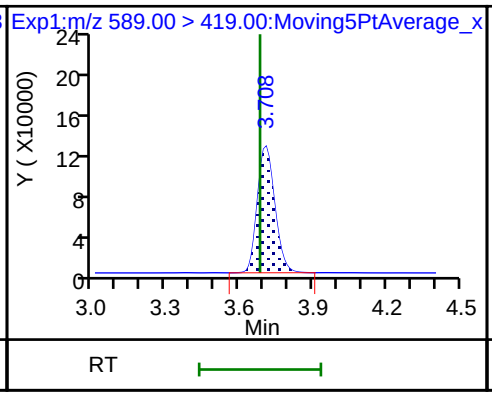
29 Perfluorodecane Sulfonic acid



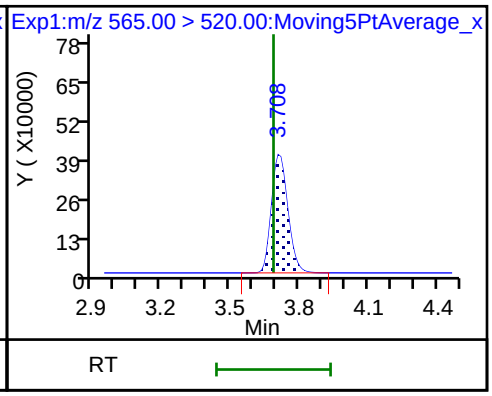
29 Perfluorodecane Sulfonic acid



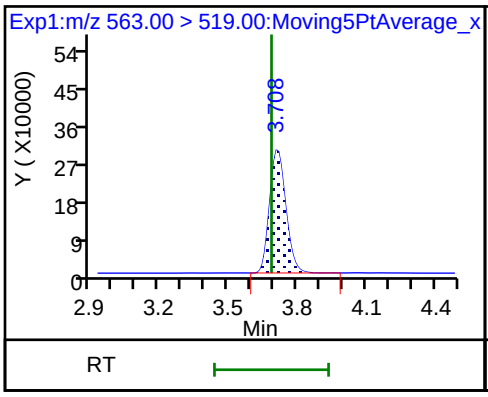
D 32 d5-NEtFOSAA



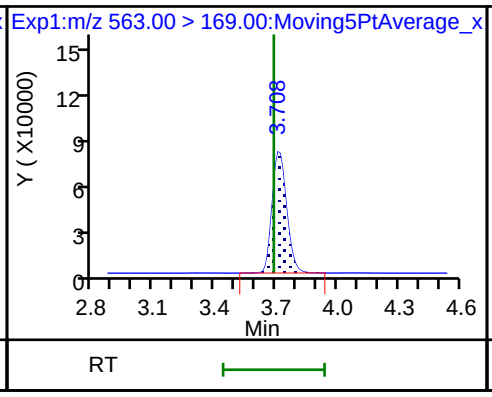
D 30 13C2 PFUnA



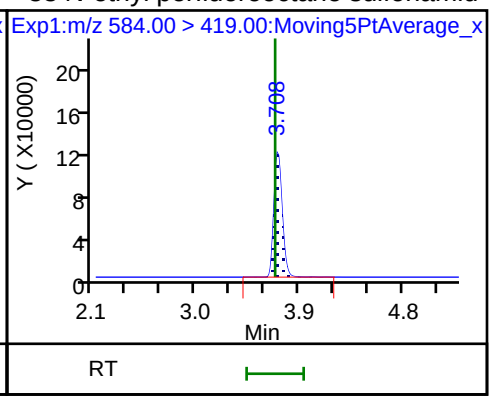
31 Perfluoroundecanoic acid



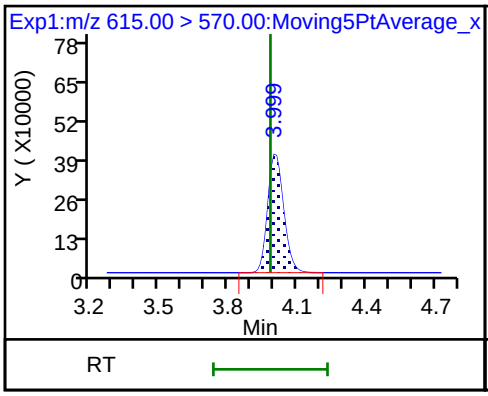
31 Perfluoroundecanoic acid



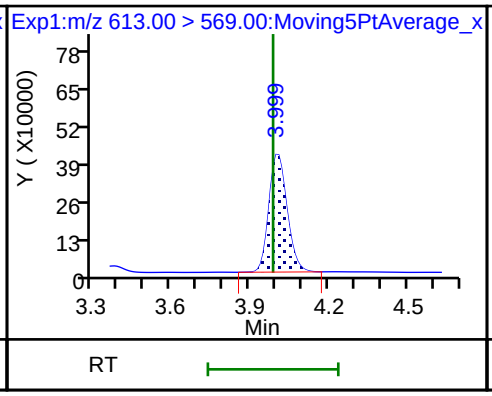
33 N-ethyl perfluorooctane sulfonamid



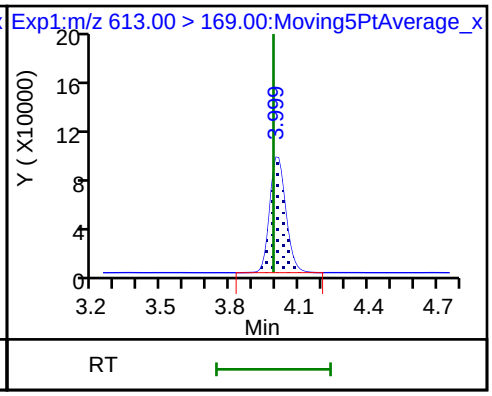
D 36 13C2 PFDoA



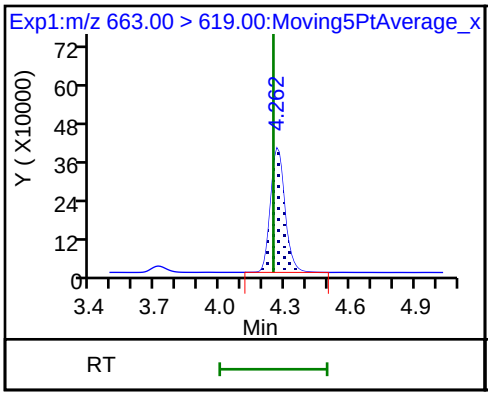
37 Perfluorododecanoic acid



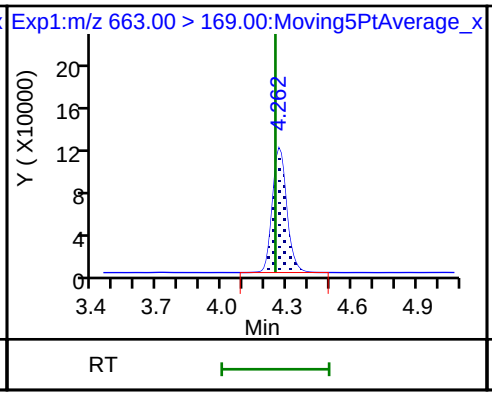
37 Perfluorododecanoic acid



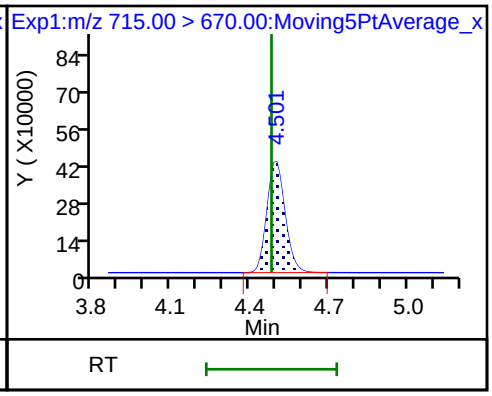
41 Perfluorotridecanoic acid



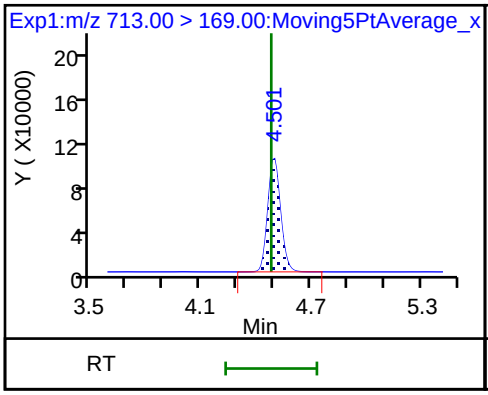
41 Perfluorotridecanoic acid



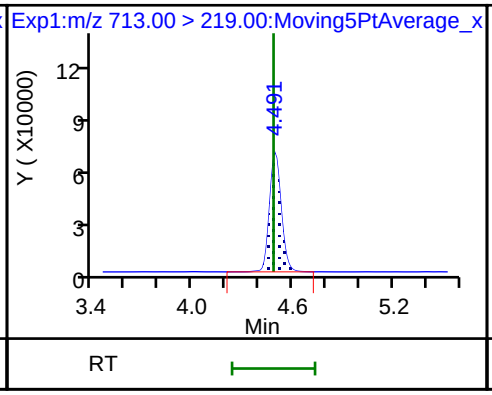
D 43 13C2-PFTeDA



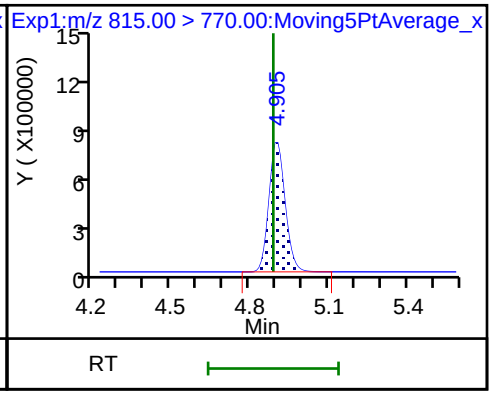
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

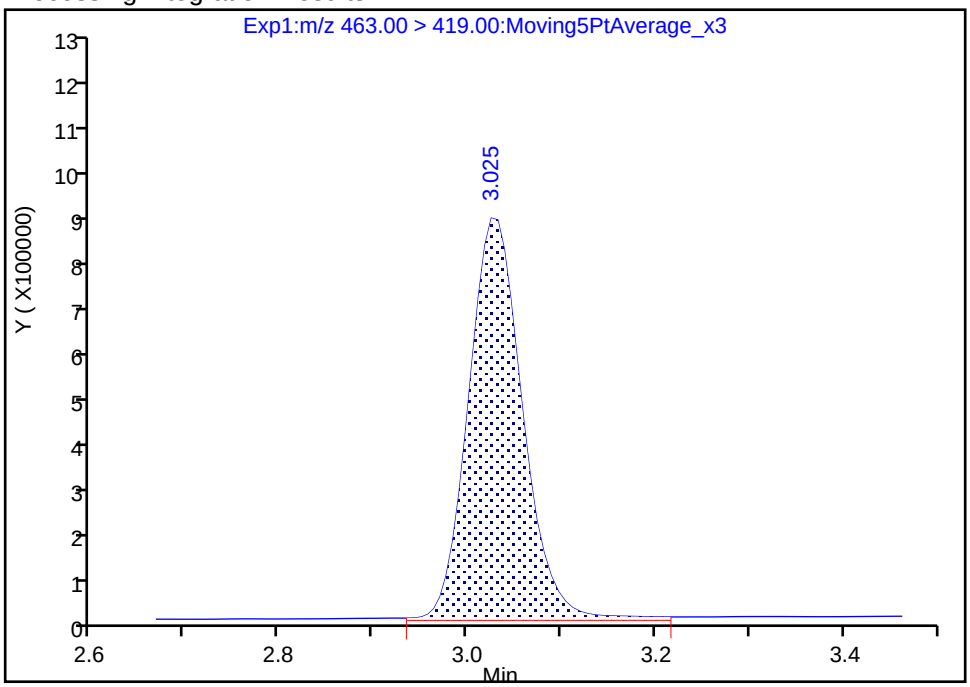
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_010.d				
Injection Date:	30-Jul-2018 16:16:22	Instrument ID:	A8_N		
Lims ID:	ICV Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	17	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

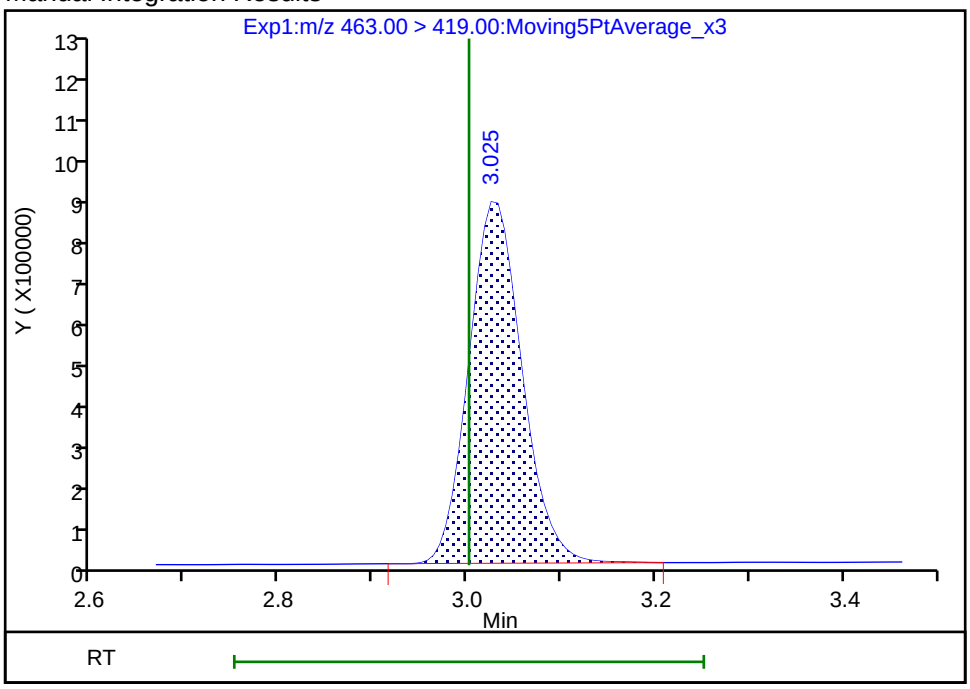
Processing Integration Results

RT: 3.03
Area: 3440694
Amount: 2.497929
Amount Units: ng/ml



Manual Integration Results

RT: 3.03
Area: 3337437
Amount: 2.422964
Amount Units: ng/ml



Reviewer: westendorfc, 30-Jul-2018 16:40:52

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-237043/2 Calibration Date: 07/31/2018 15:44

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.024	1.008		0.0493	0.0500	-1.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.210	1.332		0.0551	0.0500	10.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.51	79.76		0.0455	0.0442	2.9	30.0
4:2 FTS	AveID	15.26	16.68		0.400	0.0467	9.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.066	1.134		0.0532	0.0500	6.3	30.0
Perfluoropentanesulfonic acid	AveID	70.00	66.17		0.0443	0.0469	-5.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.138	1.153		0.0507	0.0500	1.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.162	1.295		0.0507	0.0455	11.4	30.0
6:2 FTS	AveID	1.685	1.714		0.400	0.0474	1.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.331	1.310		0.0469	0.0476	-1.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.166	1.237		0.0531	0.0501	6.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.079	1.173		0.0544	0.0500	8.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.140	1.033		0.0421	0.0464	-9.3	30.0
8:2 FTS	AveID	1.328	1.171		0.400	0.0479	-11.8	30.0
Perfluorononanesulfonic acid	AveID	0.7829	0.7187		0.0441	0.0480	-8.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.087	1.067		0.0490	0.0500	-1.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9900	0.9884		0.0499	0.0500	-0.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.028	1.052		0.400	0.0500	2.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6692	0.6307		0.0454	0.0482	-5.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9130	0.9191		0.0503	0.0500	0.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8969	1.310		0.0730	0.0500	46.0*	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.080	1.062		0.0492	0.0500	-1.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9169	0.9632		0.0525	0.0500	5.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2666	0.2594		0.0487	0.0500	-2.7	30.0
13C4 PFBA	Ave	1.354	1.244		2.30	2.50	-8.1	30.0
13C5-PFPeA	Ave	0.8708	0.8203		2.36	2.50	-5.8	30.0
13C3-PFBS	Ave	0.0258	0.0235		2.11	2.33	-9.1	30.0
13C2 PFHxA	Ave	0.9884	0.9159		2.32	2.50	-7.3	30.0
13C4-PFHpA	Ave	0.9405	0.9472		2.52	2.50	0.7	30.0
18O2 PFHxS	Ave	1.429	1.316		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2945	0.2598		2.09	2.38	-11.8	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-237043/2 Calibration Date: 07/31/2018 15:44

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9607	0.9191		2.39	2.50	-4.3	30.0
13C4 PFOS	Ave	1.026	0.9153		2.13	2.39	-10.8	30.0
13C5 PFNA	Ave	0.8491	0.7756		2.28	2.50	-8.7	30.0
M2-8:2FTS	Ave	0.3394	0.2726		1.92	2.40	-19.7	30.0
13C2 PFDA	Ave	0.7029	0.6405		2.28	2.50	-8.9	30.0
13C8 FOSA	Ave	1.464	1.367		2.33	2.50	-6.6	30.0
d3-NMeFOSAA	Ave	0.1590	0.1447		2.27	2.50	-9.0	30.0
d5-NEtFOSAA	Ave	0.1739	0.1666		2.40	2.50	-4.2	30.0
13C2 PFUnA	Ave	0.5459	0.4920		2.25	2.50	-9.9	30.0
13C2 PFDoA	Ave	0.5541	0.4345		1.96	2.50	-21.6	30.0
13C2-PFTeDA	Ave	0.5049	0.3754		1.86	2.50	-25.7	30.0
13C2-PFHxDA	Ave	0.8936	0.5431		1.52	2.50	-39.2*	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 31-Jul-2018 15:44:25 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 09:04:20 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 09:04:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.402	1.397	0.005	1.000	89693	0.0493		98.5	17.0	M
D 1 13C4 PFBA										
217.00 > 172.00	1.402	1.402	0.0	0.542	4447066	2.30		91.9	76685	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.648	1.640	0.008	1.000	78148	0.0551		110	31.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.648	1.640	0.008	0.637	2933545	2.36		94.2	61549	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.684	1.675	0.009	1.005	118388	0.0455		103	540	
298.90 > 99.00	1.684	1.675	0.009	1.005	48136		2.46(1.25-3.74)		137	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.675	-0.001	0.647	78079	2.11		90.9	332	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.885	1.876	0.009	1.126	26165	0.0511		109	1142	
D 60 M2-4:2FTS										
329.00 > 81.00	1.885	1.885	0.0	0.728	519712	NC			4215	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.916	1.916	0.0	1.000	74268	0.0532		106	110	
313.00 > 119.00	1.916	1.916	0.0	1.000	7628		9.74(5.03-15.10)		83.5	
D 7 13C2 PFHxA										
315.00 > 270.00	1.916	1.916	0.0	0.740	3275359	2.32		92.7	62990	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.937	1.938	-0.001	1.157	104216	0.0443		94.5	1776	
349.00 > 99.00	1.937	1.938	-0.001	1.157	41763		2.50(1.36-4.07)		179	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.014	2.003	0.011	1.000	14540	NC			59.8	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.014	0.0	0.778	232823	NC			6507	
D 9 13C4-PFHpA										
367.00 > 322.00	2.240	2.229	0.011	0.866	3387233	2.52		101	43394	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.240	2.229	0.011	1.000	78129	0.0507		101	31.6	M
363.00 > 169.00	2.229	2.229	-0.001	0.995	28166		2.77(1.13-3.40)		226	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.253	2.241	0.012	1.000	110892	0.0507		111	570	
399.00 > 99.00	2.253	2.241	0.012	1.000	40396		2.75(1.50-4.49)		53.3	
D 11 18O2 PFHxS										
403.00 > 84.00	2.253	2.254	-0.001	0.871	4452214	2.18		92.1	42642	
65 ADONA										
377.00 > 251.00	2.280	2.280	0.0	0.770	188648	NC			1843	
377.00 > 85.00	2.280	2.280	0.0	0.770	114029		1.65(0.84-2.53)		398	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.564	0.0	0.991	882589	2.09		88.2	10655	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.572	2.564	0.008	1.003	30199	0.0482		102	388	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	1.000	3286665	2.39		95.7	60285	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.596	2.588	0.008	1.003	81418	0.0531		106	64.3	
413.00 > 169.00	2.588	2.588	0.0	1.000	38111		2.14(0.84-2.52)		166	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.588	0.0		3576137	2.50			44399	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.596	2.596	0.0	0.877	81623	0.0469		98.4	1125	
449.00 > 99.00	2.596	2.596	0.0	0.877	25758		3.17(1.94-5.82)		116	
20 Perfluorononanoic acid										
463.00 > 419.00	2.960	2.948	0.012	1.000	65088	0.0544		109	89.4	
463.00 > 169.00	2.953	2.948	0.005	0.998	15662		4.16(1.90-5.69)		472	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.960	2.948	0.012	1.000	62783	0.0421		90.7	478	
499.00 > 99.00	2.960	2.948	0.012	1.000	18047		3.48(2.31-6.93)		67.2	M
D 18 13C4 PFOS										
503.00 > 80.00	2.960	2.953	0.007	1.144	3129302	2.13		89.2	37460	
D 19 13C5 PFNA										
468.00 > 423.00	2.960	2.960	0.0	1.144	2773547	2.28		91.3	51158	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.171	3.164	0.007	1.071	112961	NC			1681	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.307	3.299	0.008	1.000	21875	0.0423		88.2	1259	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.307	3.299	0.008	1.117	45169	0.0441		91.8	1556	
549.00 > 99.00	3.307	3.299	0.008	1.117	18320		2.47(1.33-3.97)		113	
D 26 M2-8:2FTS										
529.00 > 81.00	3.307	3.307	0.0	1.278	933725	1.92		80.3	14135	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.315	3.307	0.007	0.998	48855	0.0490		98.1	90.1	
513.00 > 169.00	3.315	3.307	0.007	0.998	11108		4.40(2.36-7.09)		138	
D 23 13C2 PFDA										
515.00 > 470.00	3.322	3.315	0.007	1.284	2290322	2.28		91.1	53926	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.322	3.315	0.007	1.000	96653	0.0499		99.8	3740	
D 21 13C8 FOSA										
506.00 > 78.00	3.322	3.322	0.0	1.284	4889222	2.33		93.4	36118	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.467	3.467	0.0	0.997	10882	0.0511		102	136	M
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.476	3.476	0.0	1.343	517272	2.27		91.0	18414	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.630	3.621	0.009	1.226	39802	0.0454		94.2	1419	
599.00 > 99.00	3.630	3.621	0.009	1.226	16065		2.48(1.39-4.16)		172	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.650	3.640	0.010	1.000	46078	0.0730		146	127	
563.00 > 169.00	3.650	3.640	0.010	1.000	9285		4.96(2.12-6.36)		202	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.640	0.0	1.000	10952	0.0503		101	252	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.640	3.640	0.0	1.406	595834	2.40		95.8	5710	
D 30 13C2 PFUnA										
565.00 > 520.00	3.650	3.650	0.0	1.410	1759366	2.25		90.1	92821	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.805	3.795	0.010	1.286	165061	NC			3170	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.941	3.931	0.010	1.000	33006	0.0492		98.4	11.4	
613.00 > 169.00	3.941	3.931	0.010	1.000	7599		4.34(2.13-6.40)		121	
D 36 13C2 PFDoA										
615.00 > 570.00	3.941	3.941	0.0	1.523	1553767	1.96		78.4	22056	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.203	4.193	0.010	1.066	29931	0.0525		105	10.0	
663.00 > 169.00	4.193	4.193	0.0	1.064	8364		3.58(1.25-3.76)		68.6	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.427	0.010	1.000	6965	0.0487		97.3	86.9	
713.00 > 219.00	4.437	4.427	0.010	1.000	5119		1.36(0.71-2.13)		89.9	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.437	0.0	1.714	1342410	1.86		74.3	7116	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.833	0.009	1.000	59709	NC			5.4	
813.00 > 169.00	4.842	4.833	0.009	1.000	8242		7.24(2.86-8.58)		90.7	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.842	0.0	1.871	1942072	1.52		60.8	3122	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.189	5.182	0.007	1.072	41446	NC			12.2	
913.00 > 169.00	5.182	5.182	0.0	1.070	5413		7.66(3.83-11.48)		63.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 09:04:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_005.d

Injection Date: 31-Jul-2018 15:44:25 Instrument ID: A8_N

Lims ID: CCVL

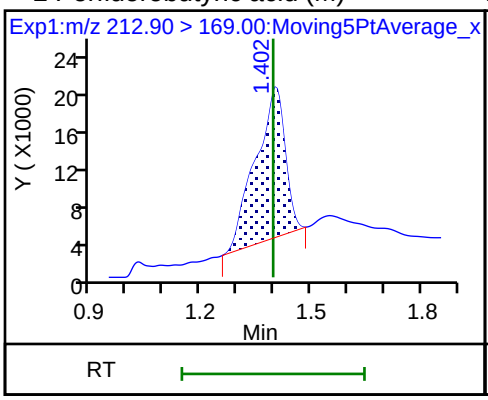
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2

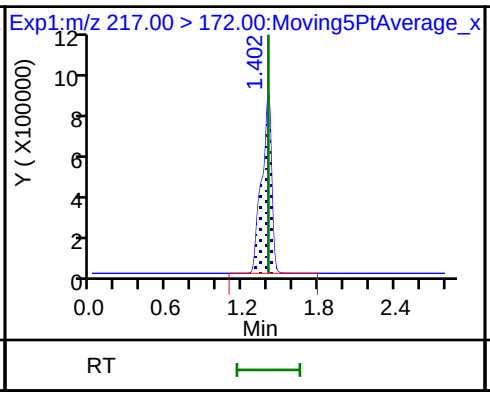
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

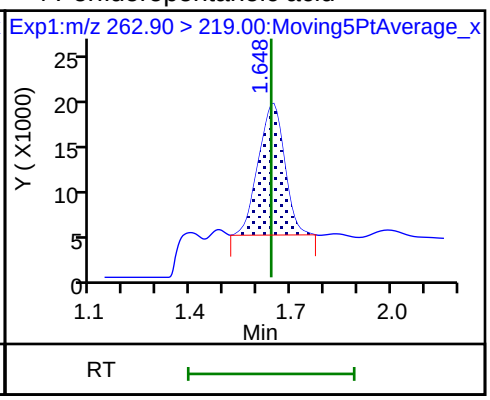
2 Perfluorobutyric acid (M)



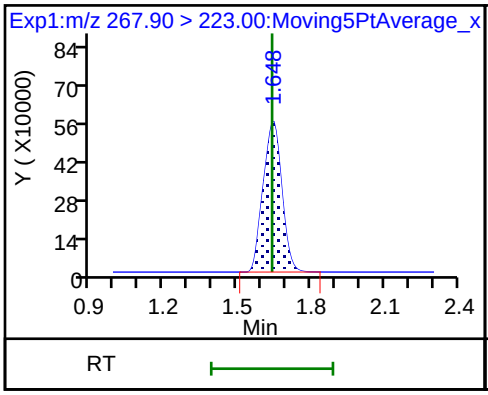
D 1 13C4 PFBA



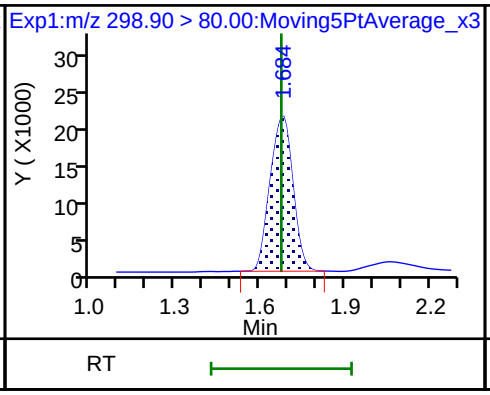
4 Perfluoropentanoic acid



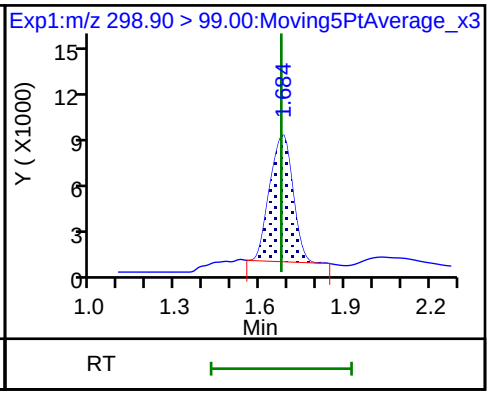
D 3 13C5-PFPeA



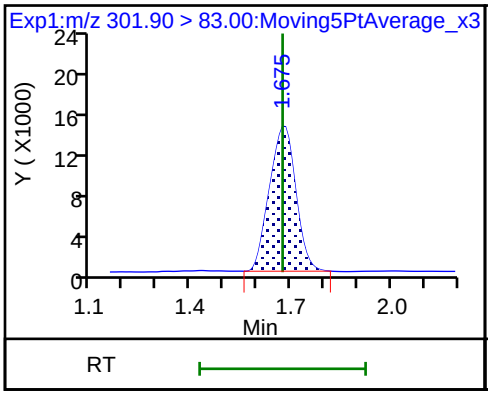
5 Perfluorobutanesulfonic acid



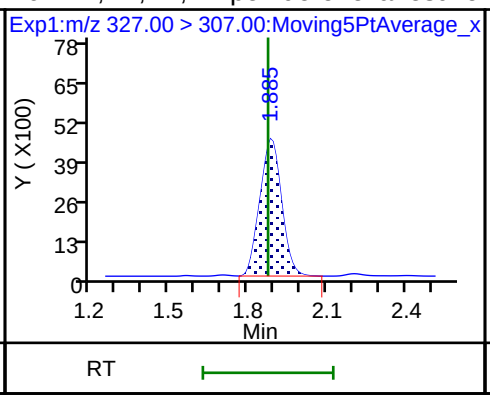
5 Perfluorobutanesulfonic acid



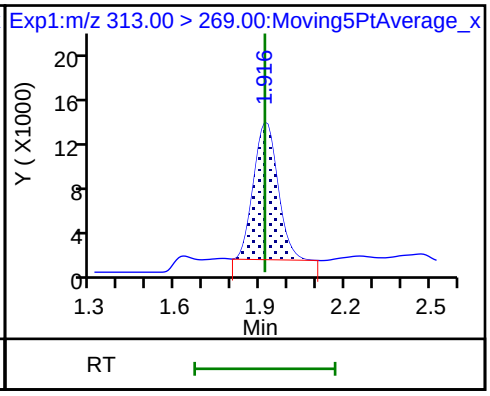
D 47 13C3-PFBS



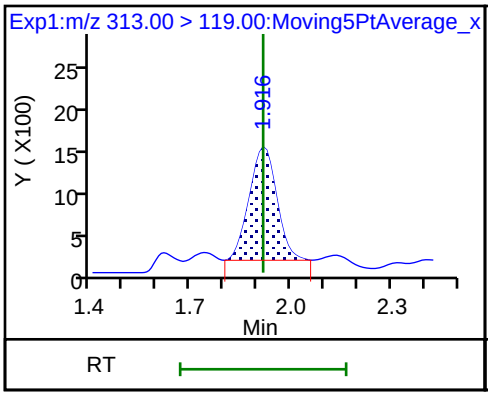
61 1H,1H,2H,2H-perfluorohexanesulfoni



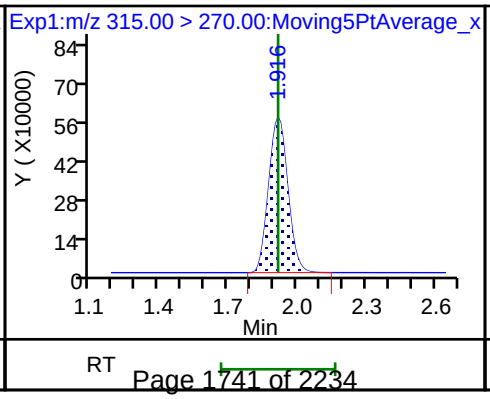
6 Perfluorohexanoic acid



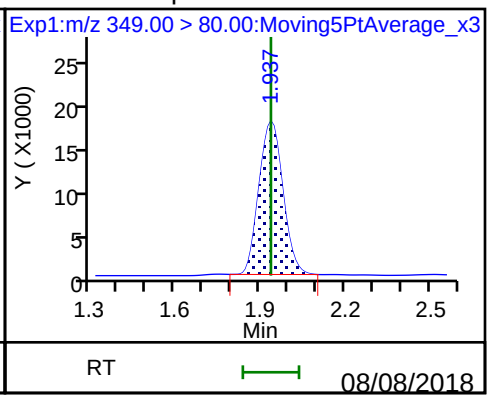
6 Perfluorohexanoic acid



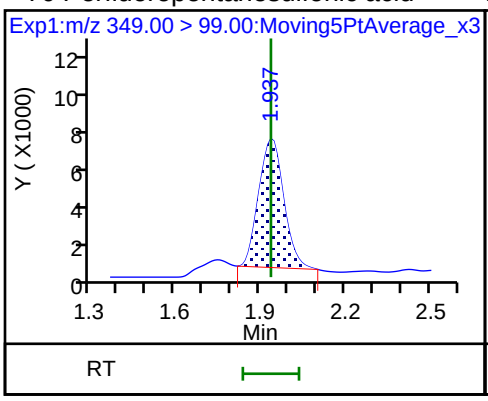
D 7 13C2 PFHxA



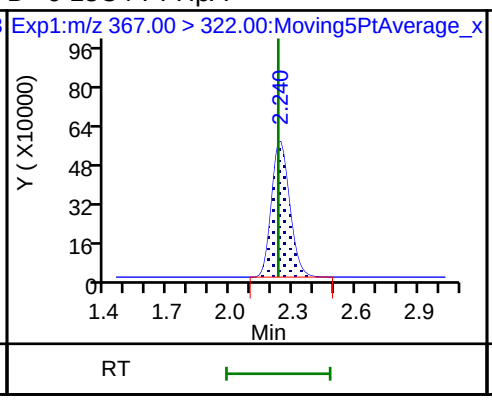
70 Perfluoropentanesulfonic acid



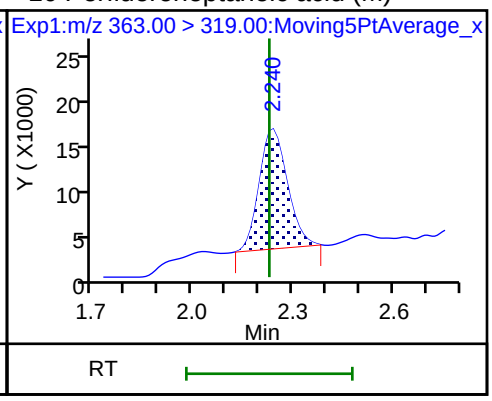
70 Perfluoropentanesulfonic acid



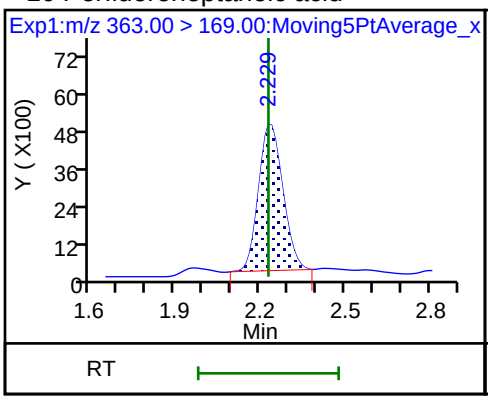
D 9 13C4-PFHpA



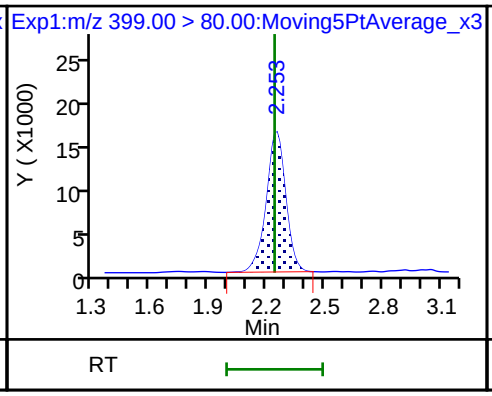
10 Perfluoroheptanoic acid (M)



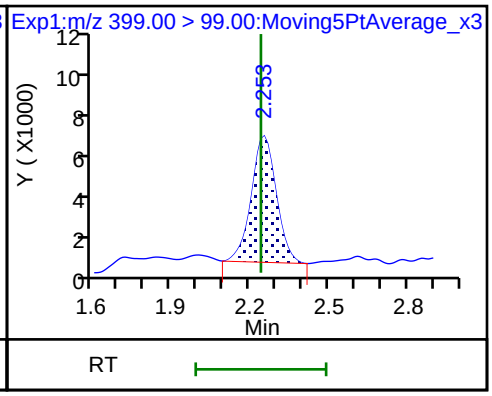
10 Perfluoroheptanoic acid



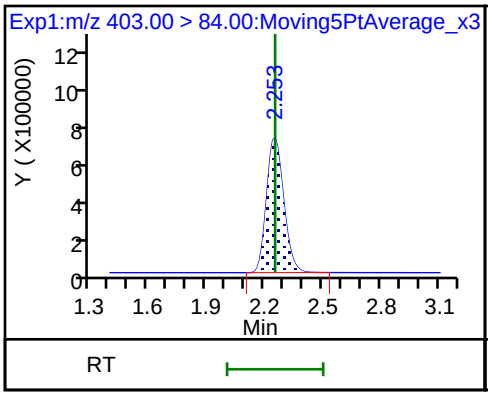
8 Perfluorohexanesulfonic acid



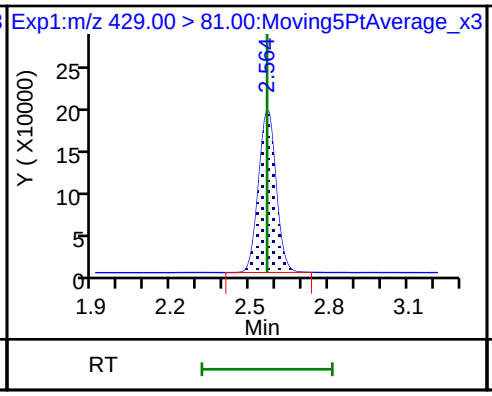
8 Perfluorohexanesulfonic acid



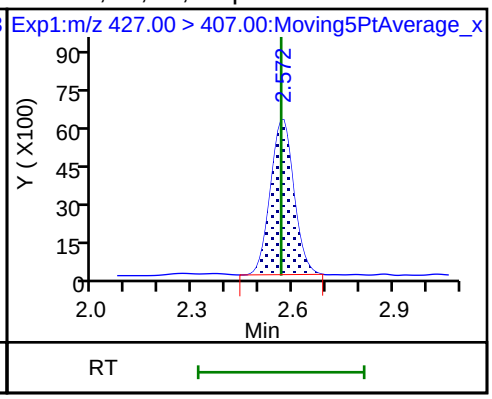
D 11 18O2 PFHxS



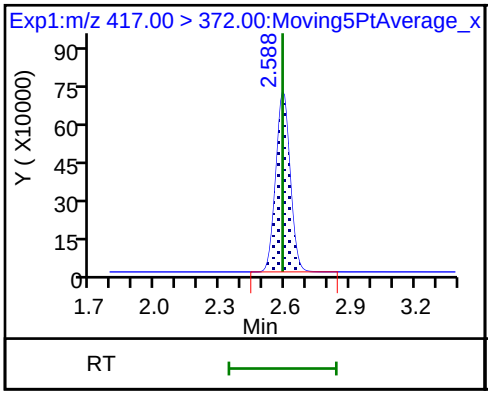
D 12 M2-6:2FTS



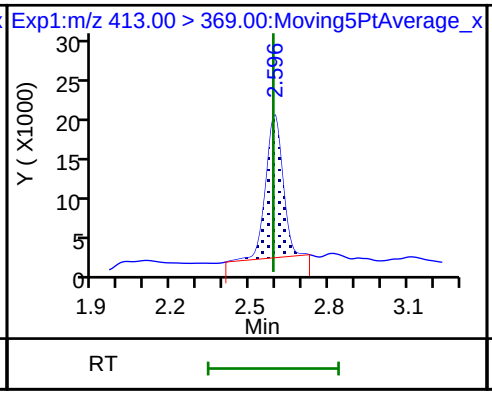
13 1H,1H,2H,2H-perfluorooctanesulfoni



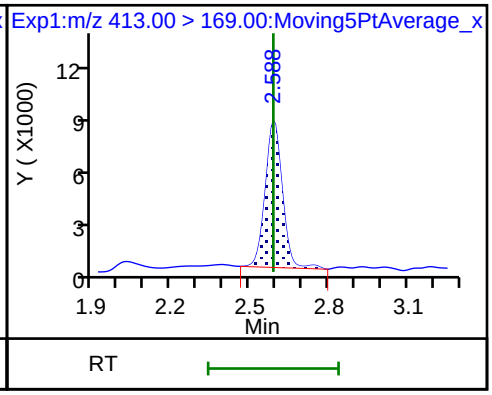
D 14 13C4 PFOA



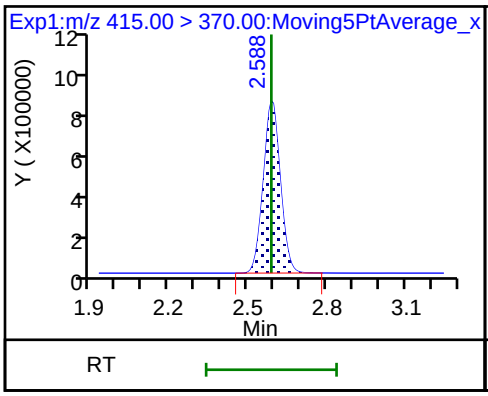
15 Perfluorooctanoic acid



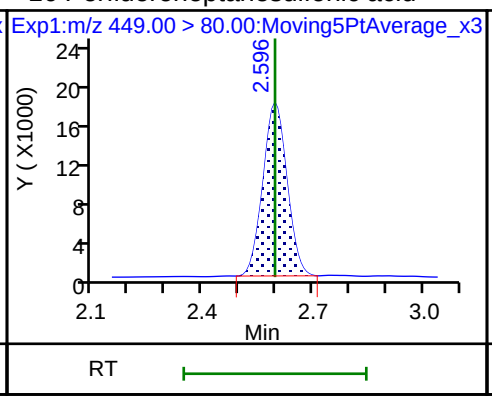
15 Perfluorooctanoic acid



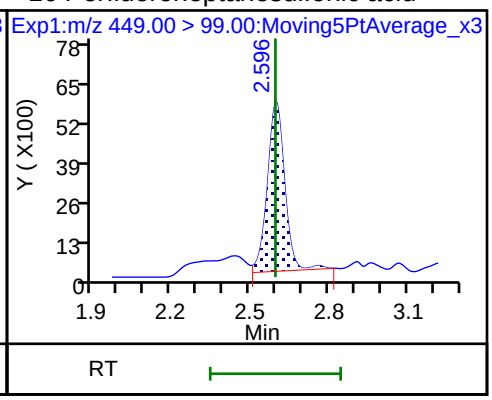
* 62 13C2-PFOA



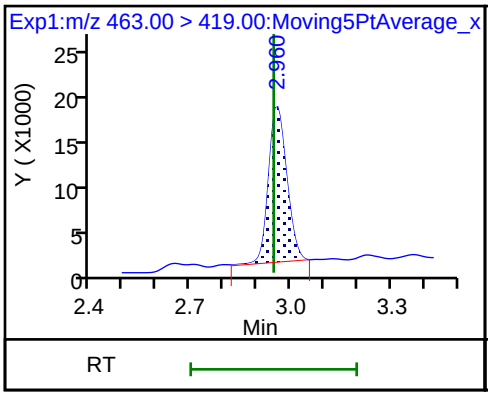
16 Perfluoroheptanesulfonic acid



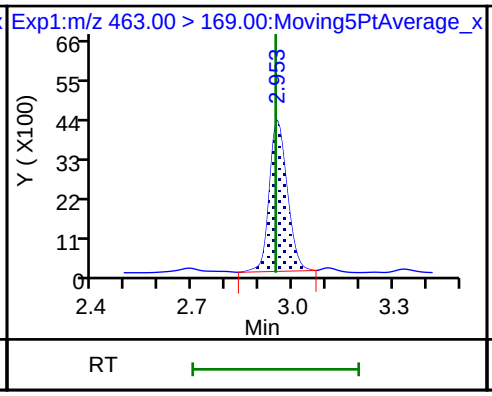
16 Perfluoroheptanesulfonic acid



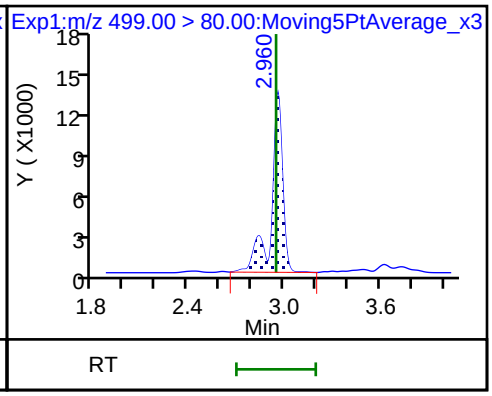
20 Perfluorononanoic acid



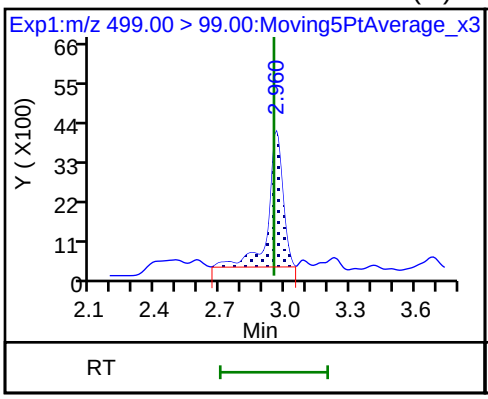
20 Perfluorononanoic acid



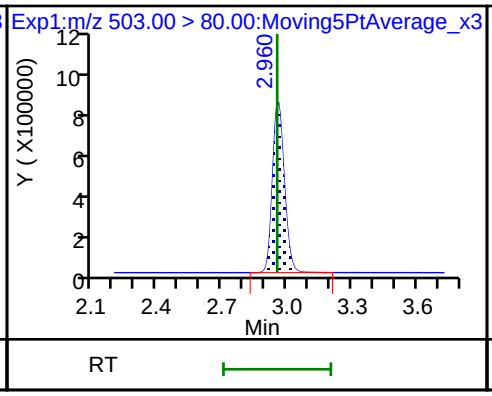
17 Perfluorooctane sulfonic acid



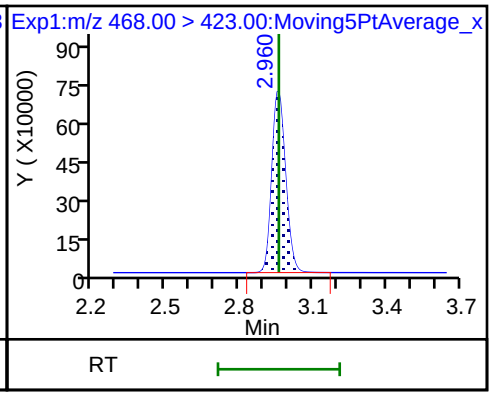
17 Perfluorooctane sulfonic acid (M)



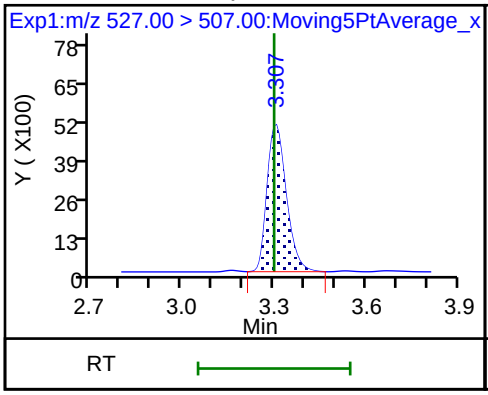
D 18 13C4 PFOS



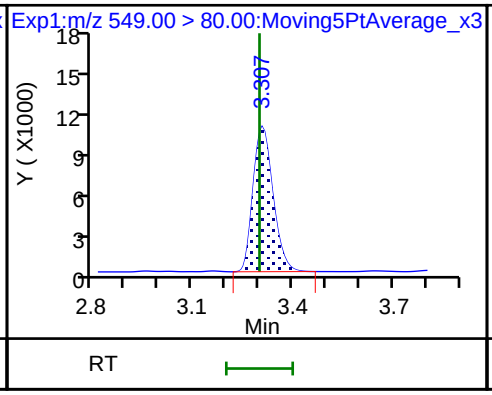
D 19 13C5 PFNA



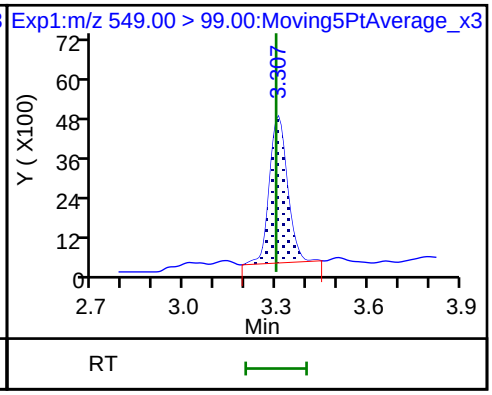
25 1H,1H,2H,2H-perfluorodecanesulfoni



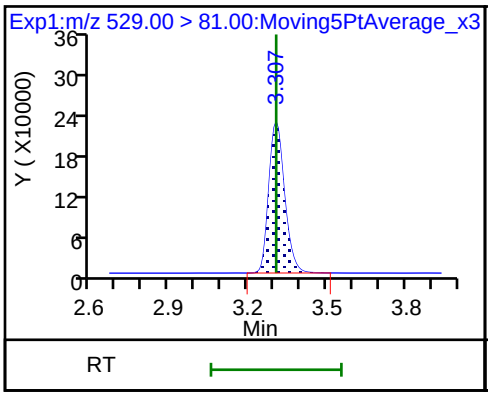
68 Perfluorononanesulfonic acid



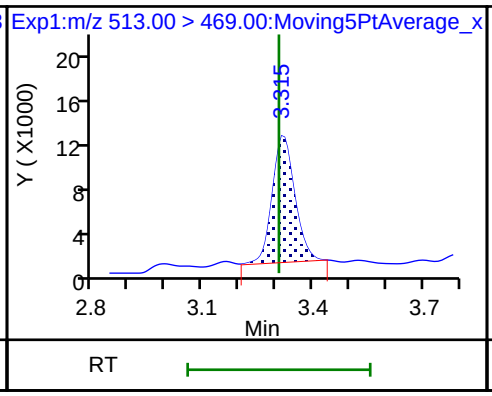
68 Perfluorononanesulfonic acid



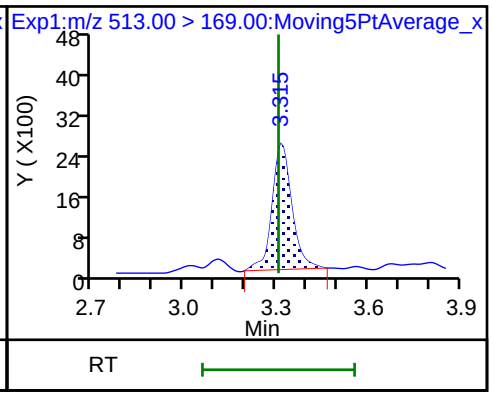
D 26 M2-8:2FTS



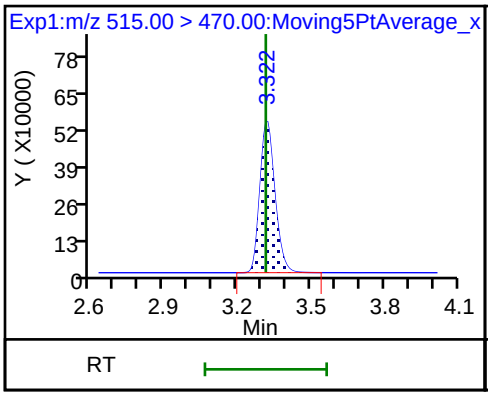
24 Perfluorodecanoic acid



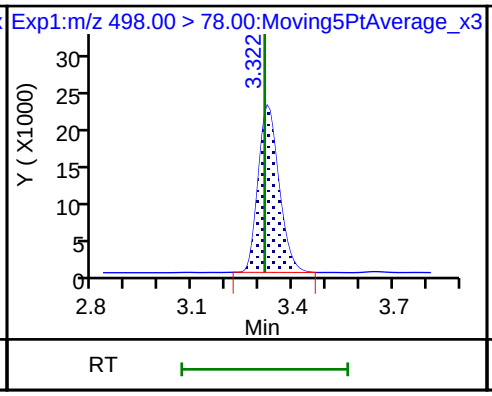
24 Perfluorodecanoic acid



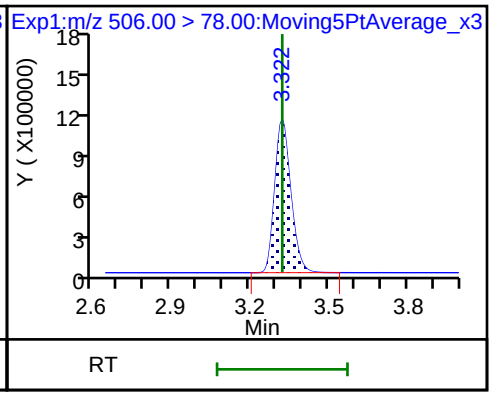
D 23 13C2 PFDA



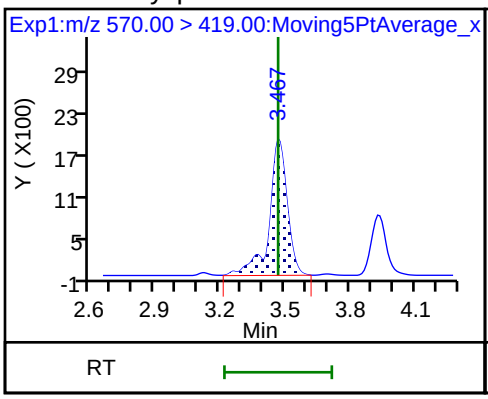
22 Perfluorooctane Sulfonamide



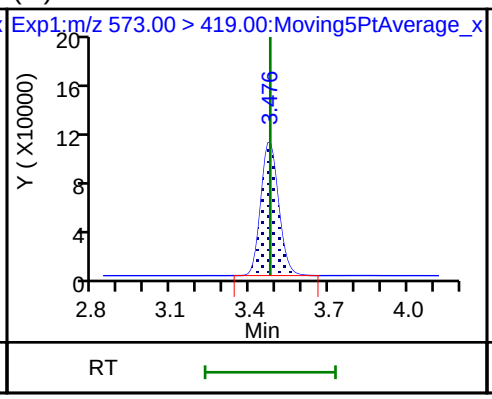
D 21 13C8 FOSA



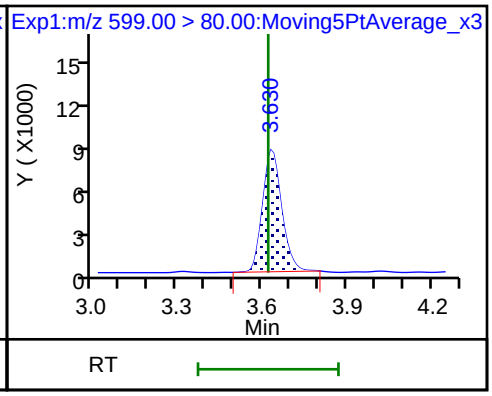
28 N-methyl perfluorooctane sulfonamid



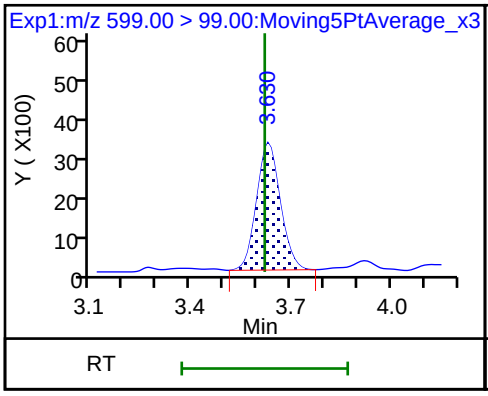
D 27 d3-NMeFOSAA



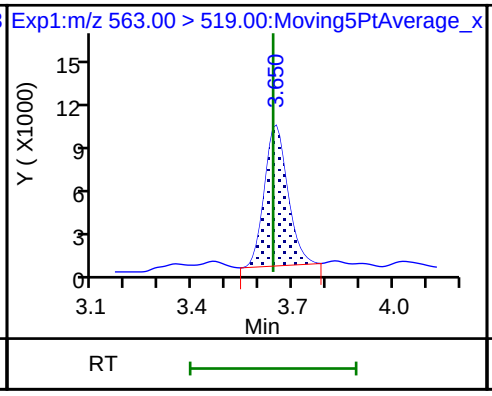
29 Perfluorodecane Sulfonic acid



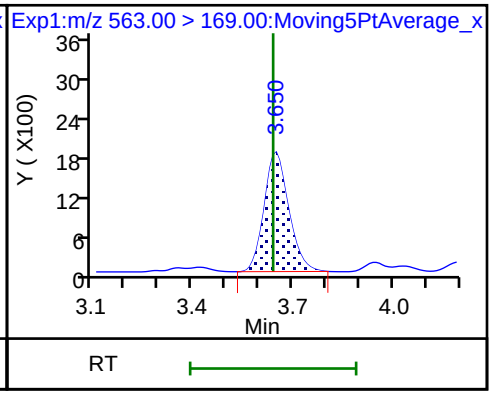
29 Perfluorodecane Sulfonic acid



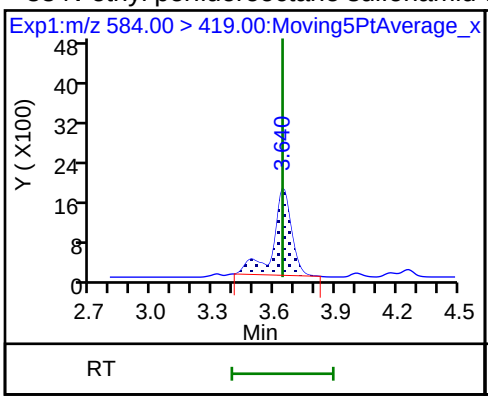
31 Perfluoroundecanoic acid



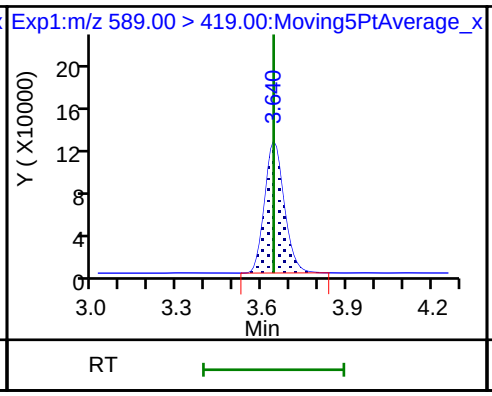
31 Perfluoroundecanoic acid



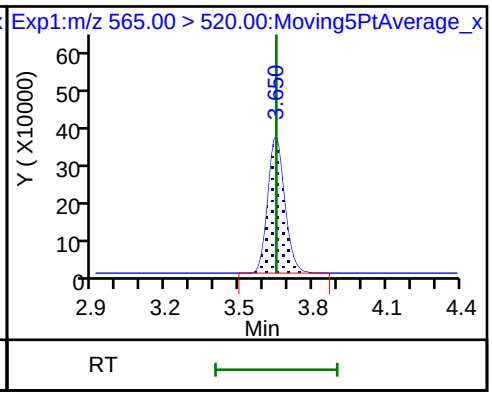
33 N-ethyl perfluorooctane sulfonamid



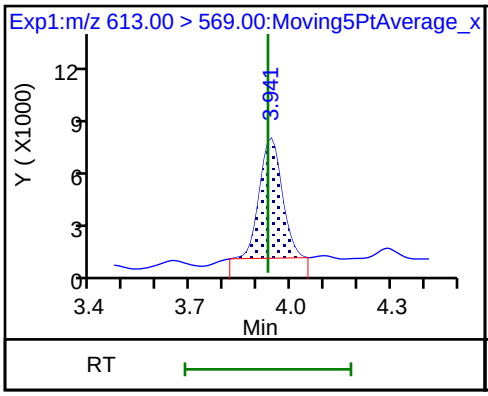
D 32 d5-NEtFOSAA



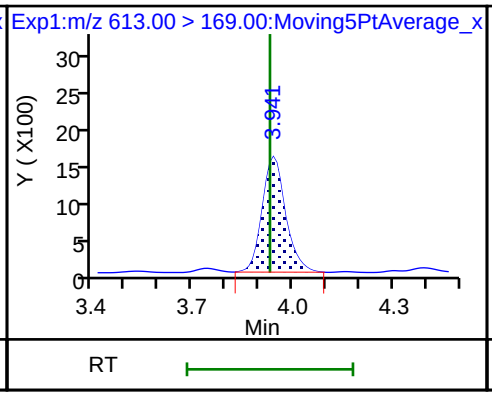
D 30 13C2 PFUnA



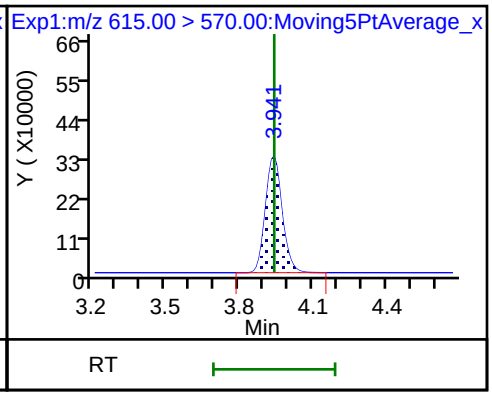
37 Perfluorododecanoic acid



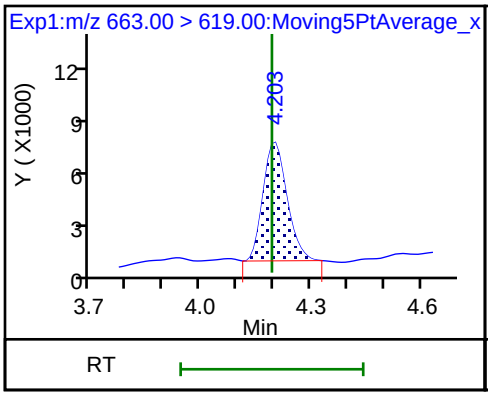
37 Perfluorododecanoic acid



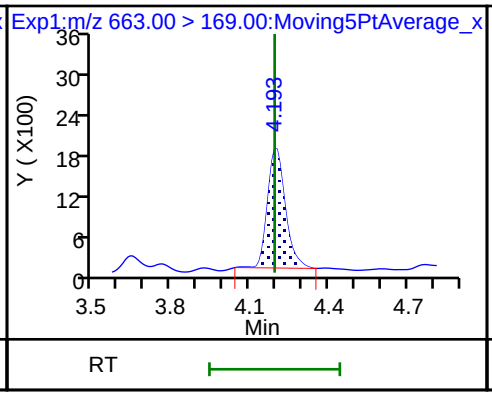
D 36 13C2 PFDoA



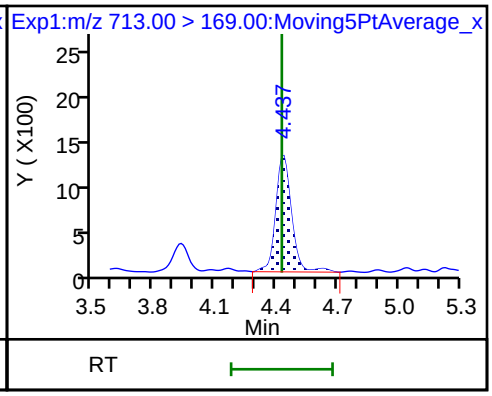
41 Perfluorotridecanoic acid



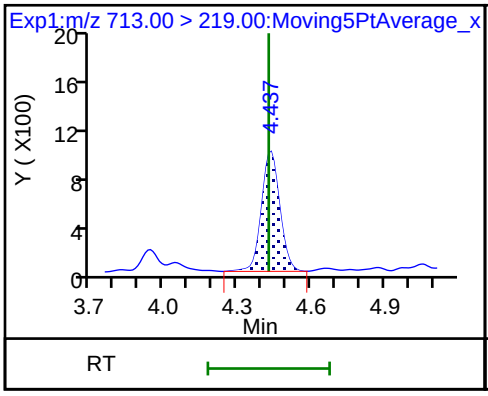
41 Perfluorotridecanoic acid



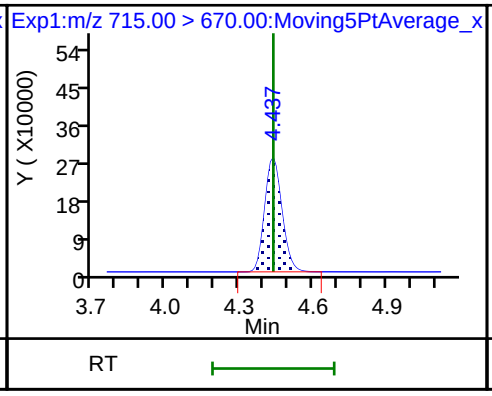
42 Perfluorotetradecanoic acid



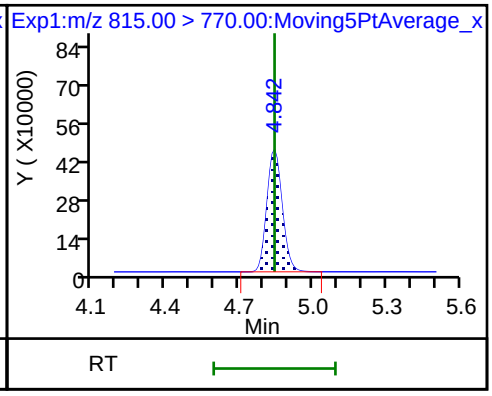
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

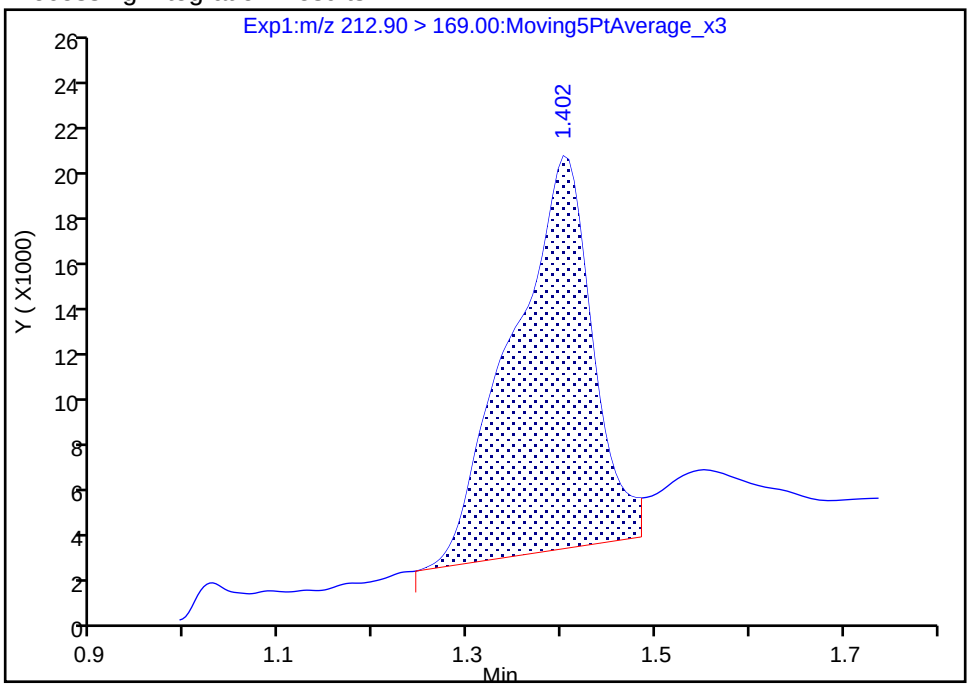
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_005.d				
Injection Date:	31-Jul-2018 15:44:25	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

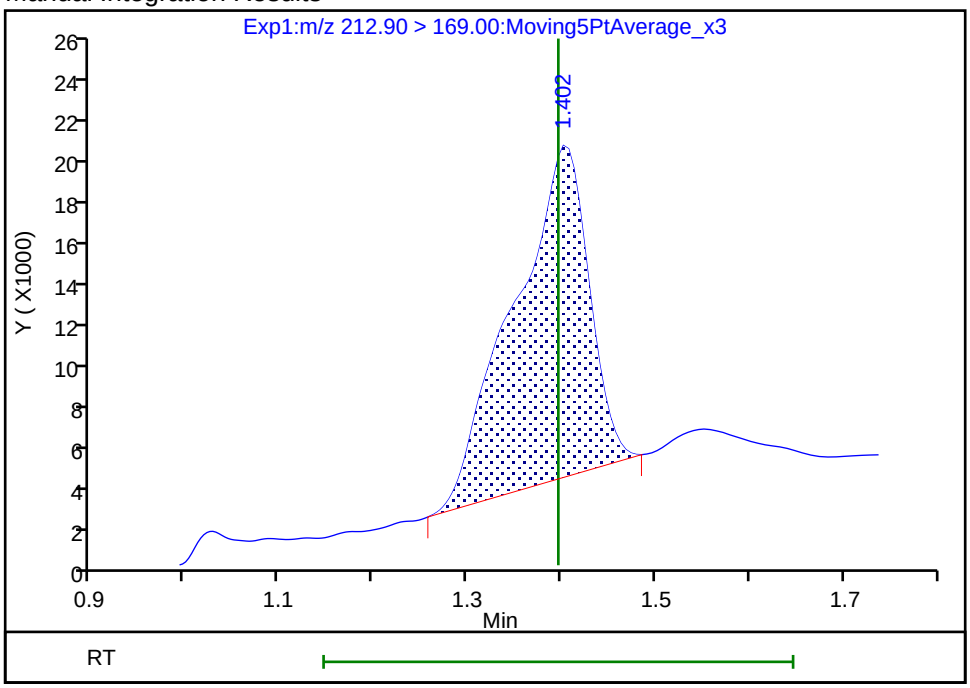
Processing Integration Results

RT: 1.40
Area: 101970
Amount: 0.056000
Amount Units: ng/ml



Manual Integration Results

RT: 1.40
Area: 89693
Amount: 0.049258
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 09:03:38

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

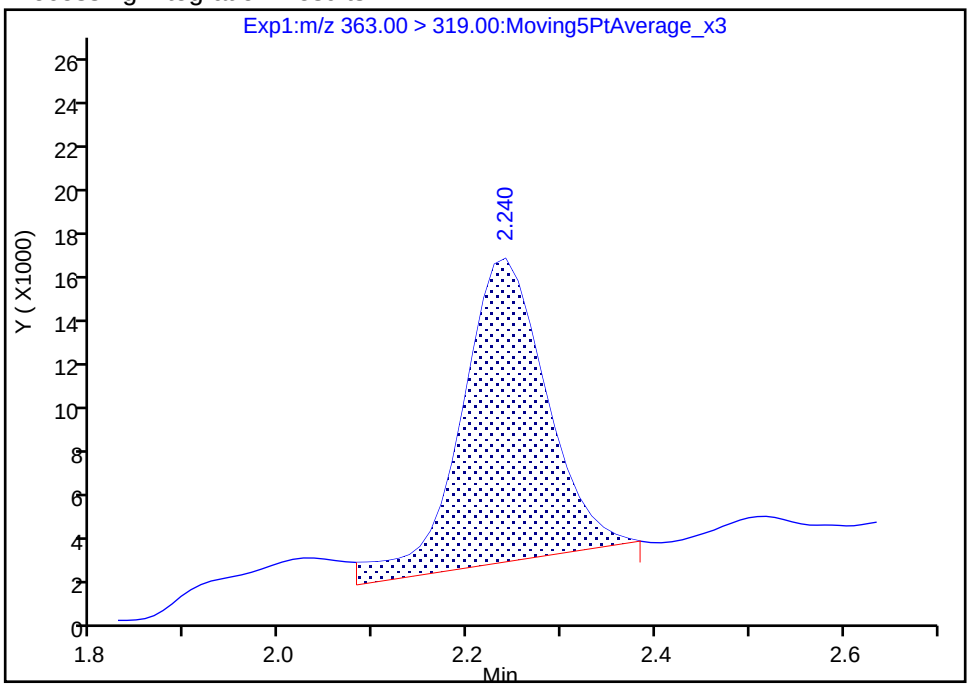
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_005.d				
Injection Date:	31-Jul-2018 15:44:25	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

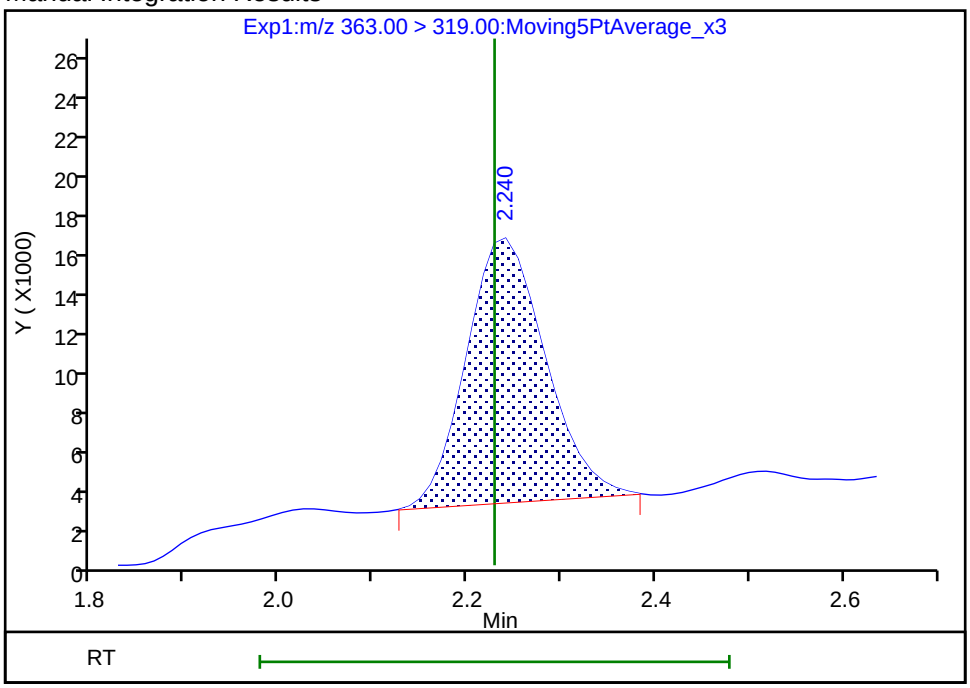
Processing Integration Results

RT: 2.24
Area: 87096
Amount: 0.056507
Amount Units: ng/ml



Manual Integration Results

RT: 2.24
Area: 78129
Amount: 0.050690
Amount Units: ng/ml



Reviewer: barnettj, 31-Jul-2018 16:13:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

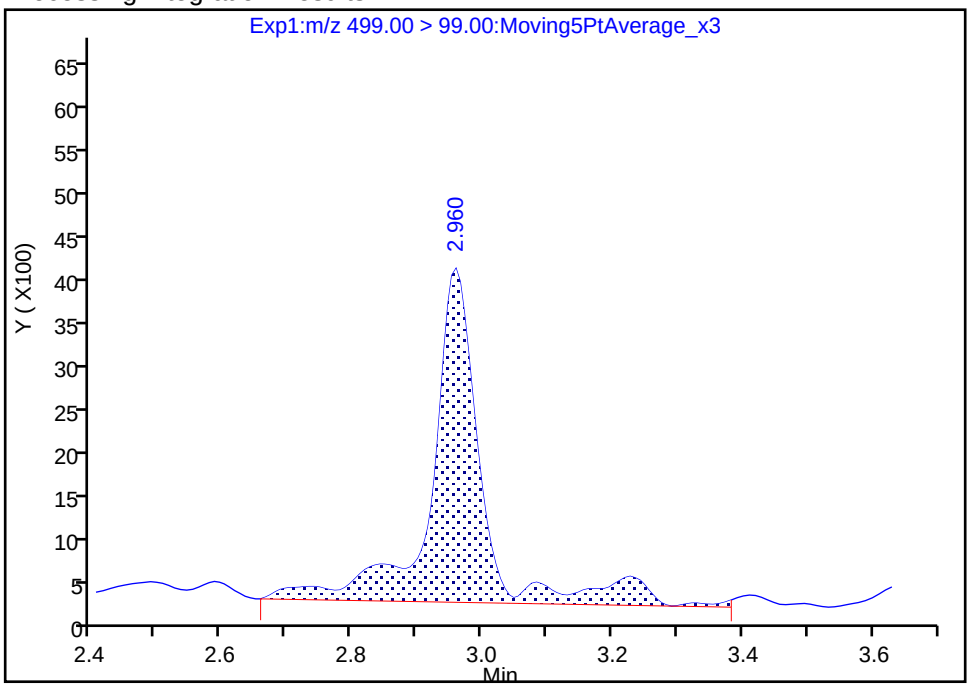
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_005.d				
Injection Date:	31-Jul-2018 15:44:25	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

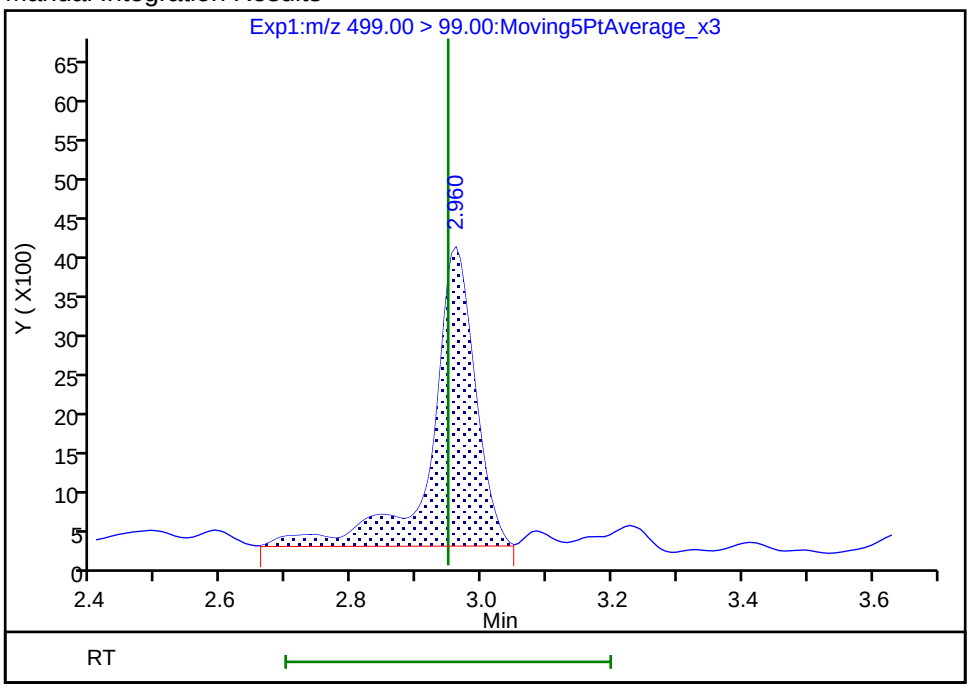
Processing Integration Results

RT: 2.96
Area: 21297
Amount: 0.042067
Amount Units: ng/ml



Manual Integration Results

RT: 2.96
Area: 18047
Amount: 0.042067
Amount Units: ng/ml



Reviewer: barnettj, 31-Jul-2018 16:14:04

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

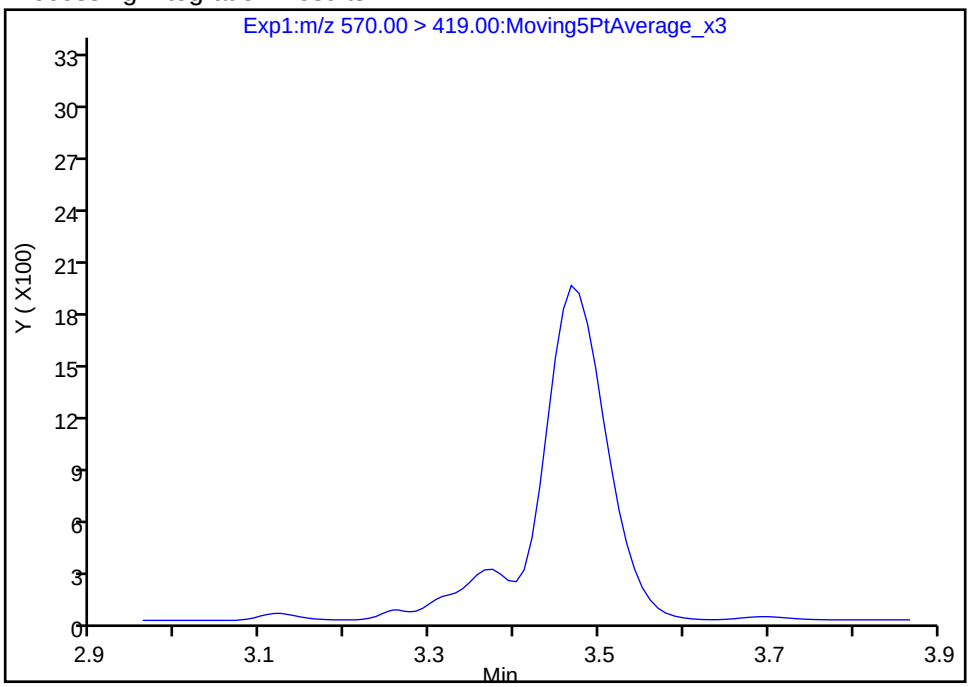
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_005.d				
Injection Date:	31-Jul-2018 15:44:25	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

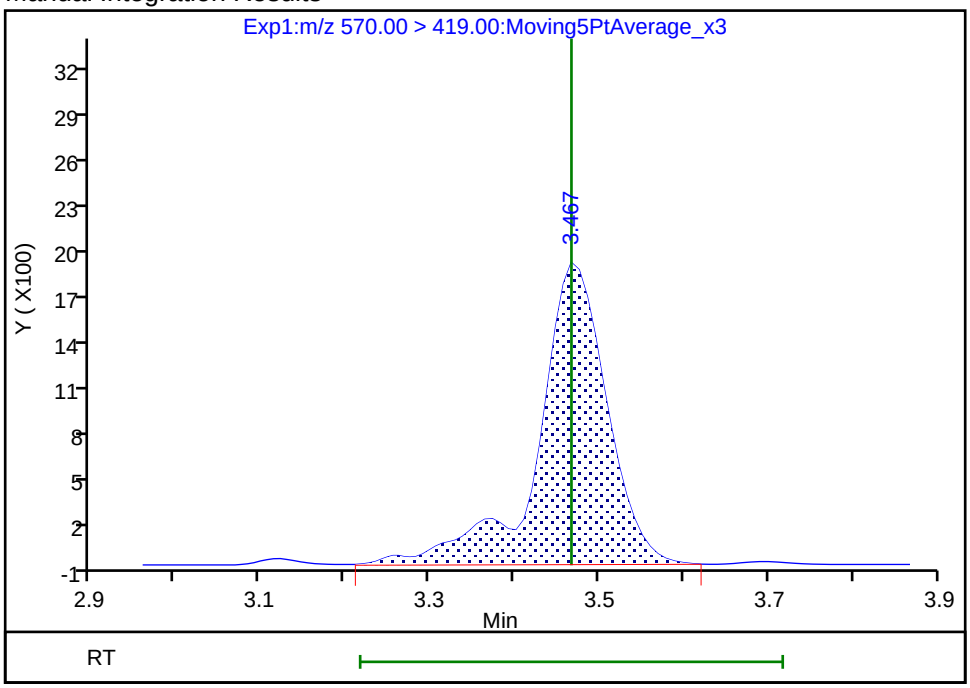
Not Detected
Expected RT: 3.47

Processing Integration Results



Manual Integration Results

RT:	3.47
Area:	10882
Amount:	0.051137
Amount Units:	ng/ml



Reviewer: barnettj, 31-Jul-2018 16:14:31
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237043/3 Calibration Date: 07/31/2018 15:52

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.30LLBB_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.024	0.9619		0.940	1.00	-6.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.210	1.133		0.937	1.00	-6.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.51	81.01		0.924	0.884	4.5	30.0
4:2 FTS	AveID	15.26	16.65		1.02	0.934	9.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.066	1.040		0.976	1.00	-2.4	30.0
Perfluoropentanesulfonic acid	AveID	70.00	70.10		0.939	0.938	0.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.138	1.144		1.01	1.00	0.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.162	1.071		0.839	0.910	-7.8	30.0
6:2 FTS	AveID	1.685	1.687		0.949	0.948	0.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.166	1.177		1.01	1.00	0.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.331	1.397		0.999	0.952	5.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.079	1.070		0.992	1.00	-0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.140	1.096		0.893	0.928	-3.8	30.0
8:2 FTS	AveID	1.328	1.320		0.952	0.958	-0.6	30.0
Perfluorononanesulfonic acid	AveID	0.7829	0.7565		0.928	0.960	-3.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.087	1.048		0.964	1.00	-3.6	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9900	1.030		1.04	1.00	4.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.028	0.9876		0.960	1.00	-4.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6692	0.6246		0.900	0.964	-6.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9130	0.8427		0.923	1.00	-7.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8969	1.148		1.28	1.00	28.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.080	1.136		1.05	1.00	5.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9169	0.8995		0.981	1.00	-1.9	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2666	0.2561		0.961	1.00	-3.9	30.0
13C4 PFBA	Ave	1.354	1.328		2.45	2.50	-1.9	30.0
13C5-PFPeA	Ave	0.8708	0.9056		2.60	2.50	4.0	30.0
13C3-PFBS	Ave	0.0258	0.0247		2.22	2.33	-4.5	30.0
13C2 PFHxA	Ave	0.9884	0.9756		2.47	2.50	-1.3	30.0
13C4-PFHpA	Ave	0.9405	0.9817		2.61	2.50	4.4	30.0
18O2 PFHxS	Ave	1.429	1.408		2.33	2.37	-1.5	30.0
M2-6:2FTS	Ave	0.2945	0.2794		2.25	2.38	-5.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237043/3 Calibration Date: 07/31/2018 15:52

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.30LLBB_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9607	0.9749		2.54	2.50	1.5	30.0
13C4 PFOS	Ave	1.026	0.9568		2.23	2.39	-6.8	30.0
13C5 PFNA	Ave	0.8491	0.8508		2.50	2.50	0.2	30.0
M2-8:2FTS	Ave	0.3394	0.2817		1.99	2.40	-17.0	30.0
13C2 PFDA	Ave	0.7029	0.6722		2.39	2.50	-4.4	30.0
13C8 FOSA	Ave	1.464	1.451		2.48	2.50	-0.9	30.0
d3-NMeFOSAA	Ave	0.1590	0.1575		2.48	2.50	-0.9	30.0
d5-NEtFOSAA	Ave	0.1739	0.1748		2.51	2.50	0.5	30.0
13C2 PFUnA	Ave	0.5459	0.5368		2.46	2.50	-1.7	30.0
13C2 PFDoA	Ave	0.5541	0.4599		2.07	2.50	-17.0	30.0
13C2-PFTeDA	Ave	0.5049	0.4019		1.99	2.50	-20.4	30.0
13C2-PFHxDA	Ave	0.8936	0.5536		1.55	2.50	-38.1*	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.30LLBB_064.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 31-Jul-2018 15:52:17 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 09:05:14 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 09:05:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.397	0.0	1.000	1498265	0.9396		94.0	328	
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.402	-0.005	0.540	3894137	2.45		98.1	69759	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.640	1.640	0.0	1.000	1203777	0.9369		93.7	476	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.640	0.0	0.634	2655738	2.60		104	45432	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.675	0.0	1.000	2072238	0.9239		105	8874	
298.90 > 99.00	1.675	1.675	0.0	1.000	847097		2.45(1.25-3.74)		2648	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.675	0.0	0.647	67280	2.22		95.5	267	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.876	0.0	1.120	449909	1.02		109	19503	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.885	-0.009	0.725	460409	NC			4248	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.916	1.916	0.0	1.006	1190340	0.9756		97.6	2008	
313.00 > 119.00	1.916	1.916	0.0	1.006	111249		10.70(5.03-15.10)		1907	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.916	-0.011	0.736	2861200	2.47		98.7	52968	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.938	1.938	0.0	1.157	1902721	0.9393		100	22300	
349.00 > 99.00	1.927	1.938	-0.011	1.151	741553		2.57(1.36-4.07)		3551	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.003	0.0	1.000	247010	NC			1321	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.014	-0.011	0.774	219093	NC			6225	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.229	0.0	0.861	2879052	2.61		104	46894	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.229	0.0	1.000	1317638	1.01		101	574	
363.00 > 169.00	2.229	2.229	0.0	1.000	523135		2.52(1.13-3.40)		4082	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.241	0.0	1.000	1609300	0.8387		92.2	8472	
399.00 > 99.00	2.241	2.241	0.0	1.000	547488		2.94(1.50-4.49)		718	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.254	-0.013	0.866	3904977	2.33		98.5	31126	
65 ADONA										
377.00 > 251.00	2.280	2.280	0.0	0.773	3186812	NC			26782	
377.00 > 85.00	2.280	2.280	0.0	0.773	1950127		1.63(0.84-2.53)		7049	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.564	-0.009	0.987	778384	2.25		94.9	8998	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.564	2.564	0.0	1.004	524110	0.9492		100	6069	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	1.000	2859108	2.54		101	50881	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.588	0.0	1.000	1347341	1.01		101	1043	
413.00 > 169.00	2.588	2.588	0.0	1.000	667263		2.02(0.84-2.52)		3088	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.588	0.0		2932741	2.50			33114	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.596	2.596	0.0	0.881	1492239	1.00		105	12819	
449.00 > 99.00	2.588	2.596	-0.008	0.878	399869		3.73(1.94-5.82)		1775	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.948	0.0	1.000	1067727	0.99		99.2	1567	
463.00 > 169.00	2.948	2.948	0.0	1.000	255153		4.18(1.90-5.69)		5441	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.948	0.0	1.000	1141856	0.8925		96.2	12618	
499.00 > 99.00	2.948	2.948	0.0	1.000	270589		4.22(2.31-6.93)		1394	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.953	-0.005	1.139	2682540	2.23		93.2	31579	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.960	-0.012	1.139	2495053	2.50		100	43092	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.164	0.0	1.073	1914989	NC			18104	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.299	0.0	1.000	417771	0.9519		99.4	16724	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.299	0.0	1.119	815157	0.9277		96.6	16517	
549.00 > 99.00	3.299	3.299	0.0	1.119	301348		2.71(1.33-3.97)		2021	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.307	-0.008	1.275	791460	1.99		83.0	14585	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.307	0.0	1.000	826140	0.9636		96.4	1327	
513.00 > 169.00	3.307	3.307	0.0	1.000	141081		5.86(2.36-7.09)		2327	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.315	-0.008	1.278	1971279	2.39		95.6	51653	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.315	0.0	1.000	1754149	1.04		104	25771	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.322	-0.007	1.281	4255704	2.48		99.1	35654	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.467	0.0	1.000	182488	0.9602		96.0	2889	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.467	3.476	-0.009	1.340	461969	2.48		99.1	14326	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.621	0.0	1.228	675773	0.8998		93.3	20139	
599.00 > 99.00	3.621	3.621	0.0	1.228	227322		2.97(1.39-4.16)		2968	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.640	3.640	0.0	1.000	722879	1.28		128	2503	
563.00 > 169.00	3.640	3.640	0.0	1.000	131626		5.49(2.12-6.36)		3476	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.640	0.0	1.003	172801	0.9230		92.3	2997	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.630	3.640	-0.010	1.403	512626	2.51		101	5022	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.650	-0.010	1.406	1574173	2.46		98.3	33342	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.795	0.0	1.287	2812075	NC			30469	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.931	0.0	1.000	612982	1.05		105	212	
613.00 > 169.00	3.931	3.931	0.0	1.000	137570		4.46(2.13-6.40)		2207	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.941	-0.010	1.519	1348685	2.07		83.0	18923	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.193	0.0	1.067	485245	0.9810		98.1	169	
663.00 > 169.00	4.193	4.193	0.0	1.067	147064		3.30(1.25-3.76)		1028	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.427	0.0	1.000	120760	0.9609		96.1	1527	
713.00 > 219.00	4.427	4.427	0.0	1.000	89758		1.35(0.71-2.13)		1319	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.437	-0.010	1.710	1178683	1.99		79.6	6733	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	654964	NC			61.6	
813.00 > 169.00	4.833	4.833	0.0	1.000	102054		6.42(2.86-8.58)		1174	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.867	1623556	1.55		61.9	2751	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.182	5.182	0.0	1.072	687972	NC			208	
913.00 > 169.00	5.182	5.182	0.0	1.072	82810		8.31(3.83-11.48)		938	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 09:05:17 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.30LLBB_064.d

Injection Date: 31-Jul-2018 15:52:17 Instrument ID: A8_N

Lims ID: CCV L4

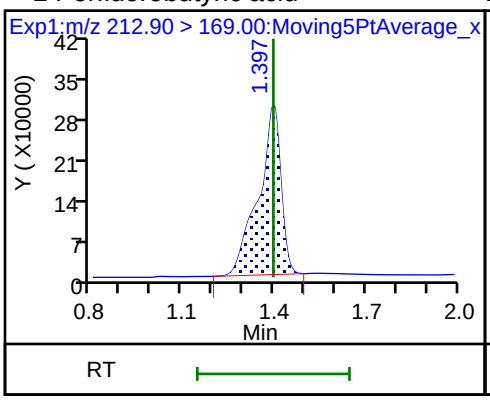
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 3

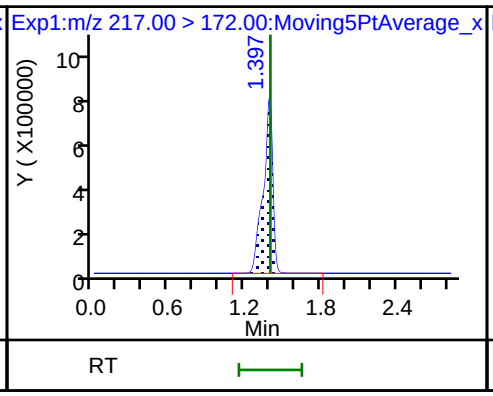
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

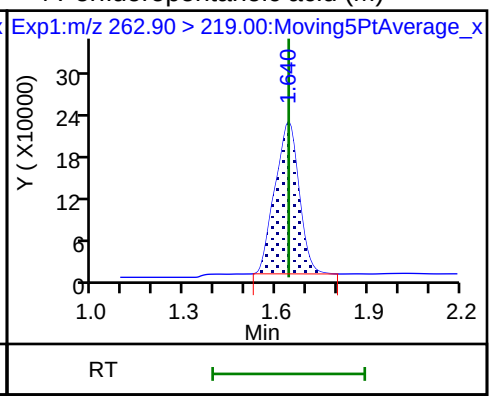
2 Perfluorobutyric acid



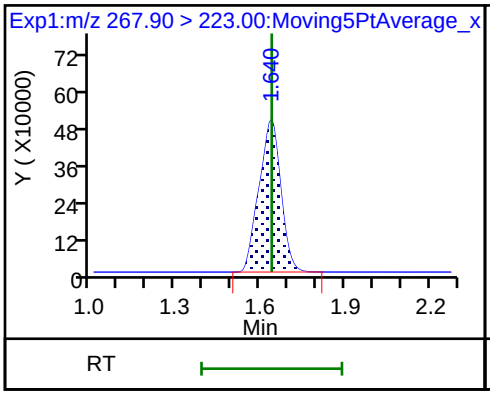
D 1 13C4 PFBA



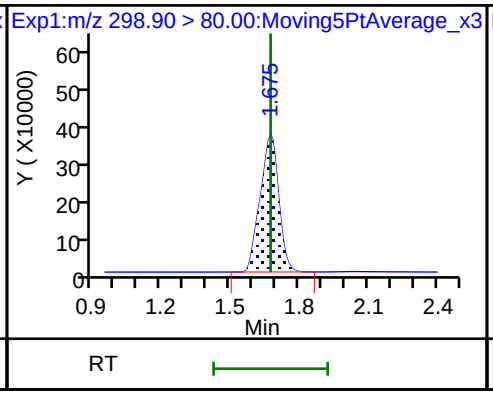
4 Perfluoropentanoic acid (M)



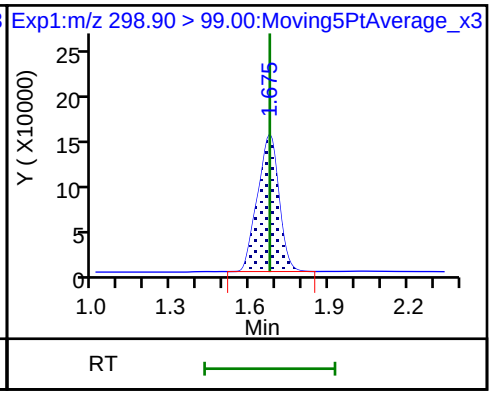
D 3 13C5-PFPeA



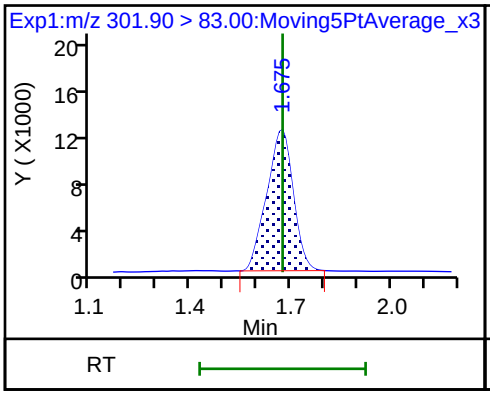
5 Perfluorobutanesulfonic acid



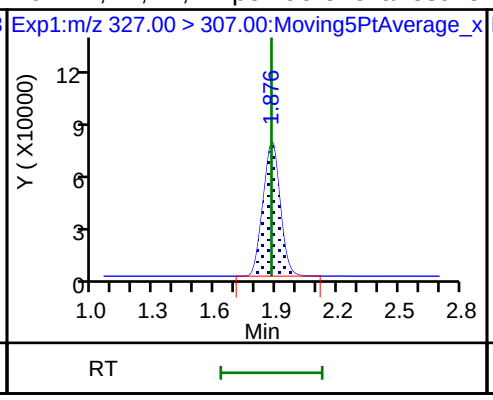
5 Perfluorobutanesulfonic acid



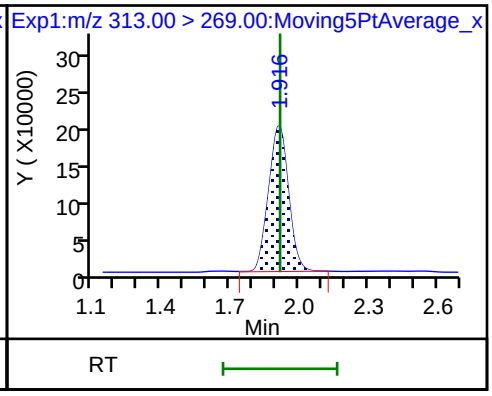
D 47 13C3-PFBS



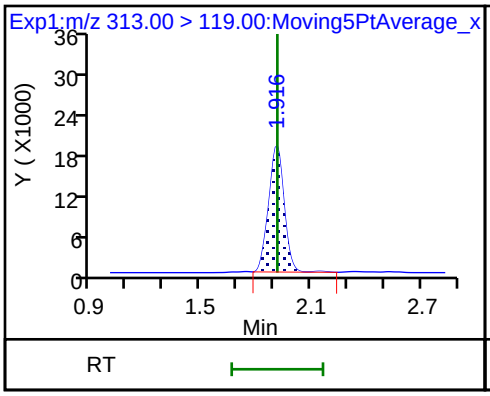
61 1H,1H,2H,2H-perfluorohexanesulfoni



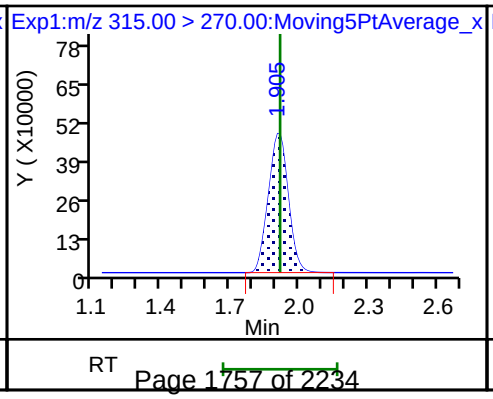
6 Perfluorohexanoic acid



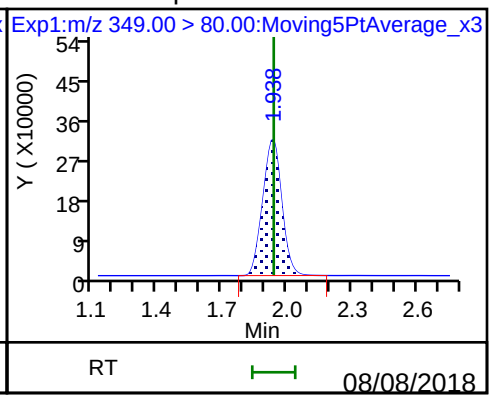
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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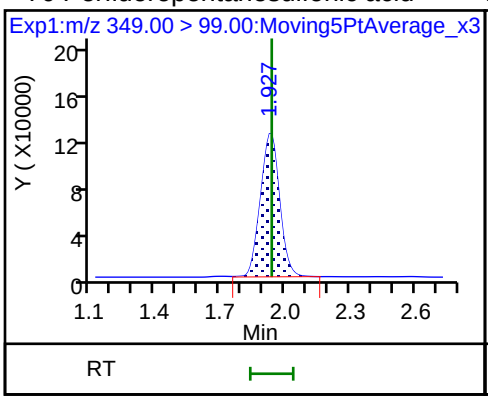
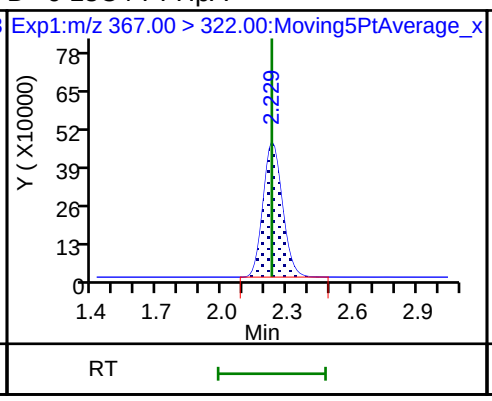
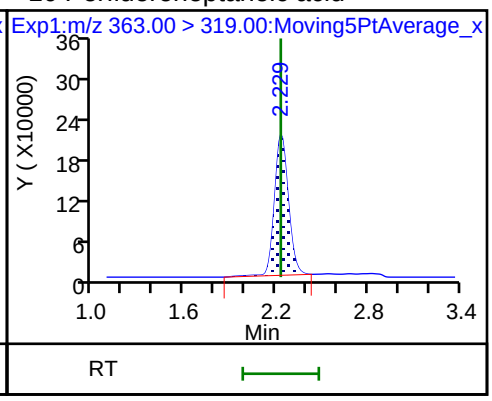


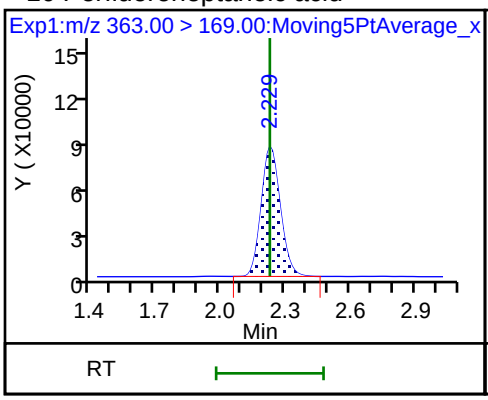
D 9 13C4-PFHpA



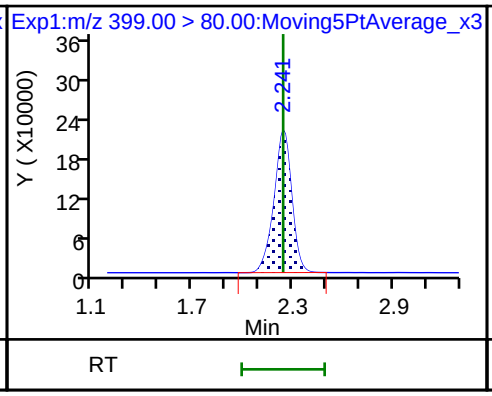
10 Perfluoroheptanoic acid



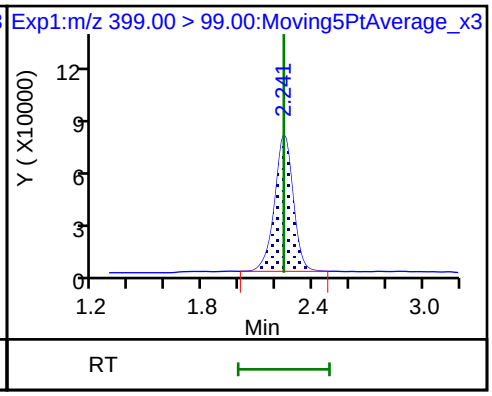
10 Perfluoroheptanoic acid



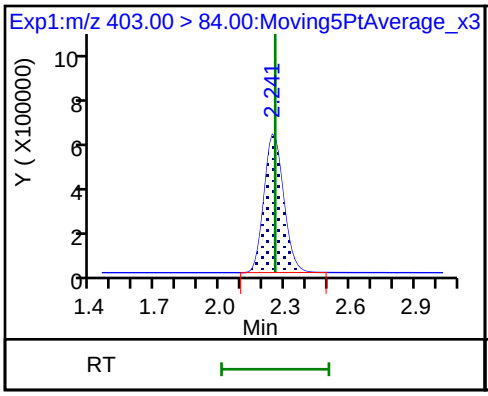
8 Perfluorohexanesulfonic acid



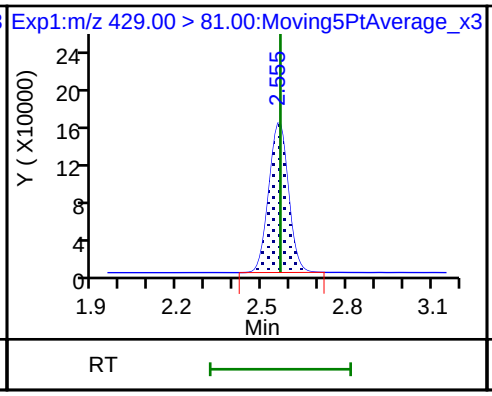
8 Perfluorohexanesulfonic acid



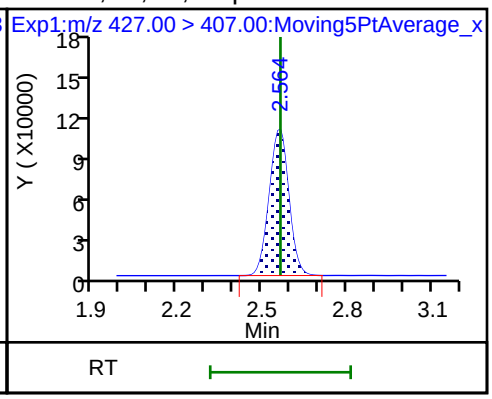
D 11 18O2 PFHxS



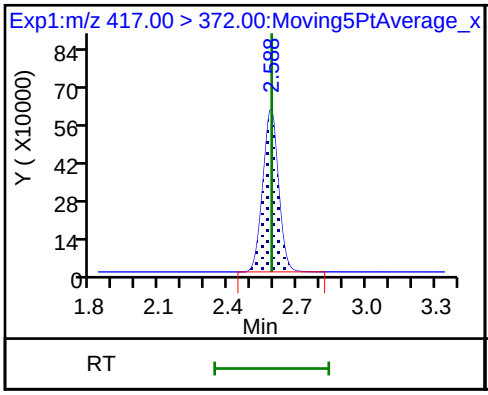
D 12 M2-6:2FTS



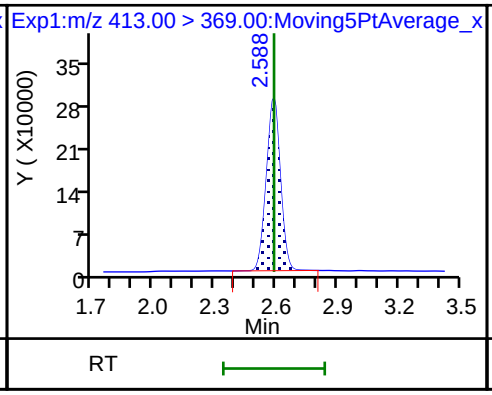
13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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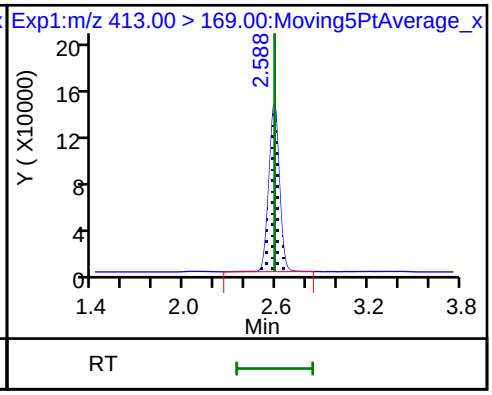
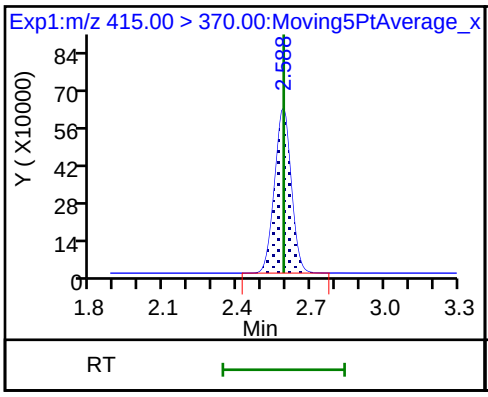
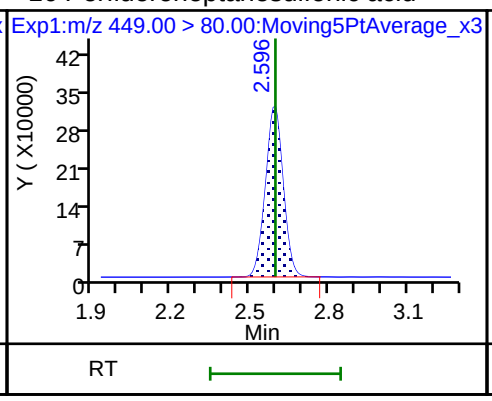


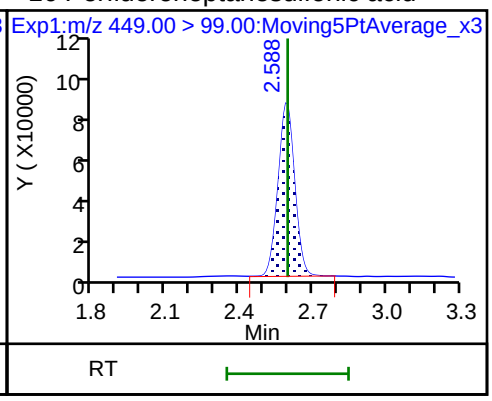
* 62 13C2-PFOA



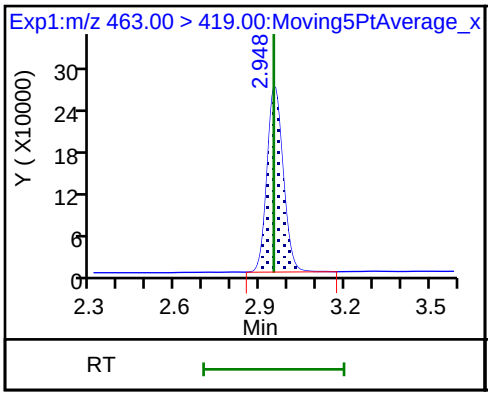
16 Perfluoroheptanesulfonic acid



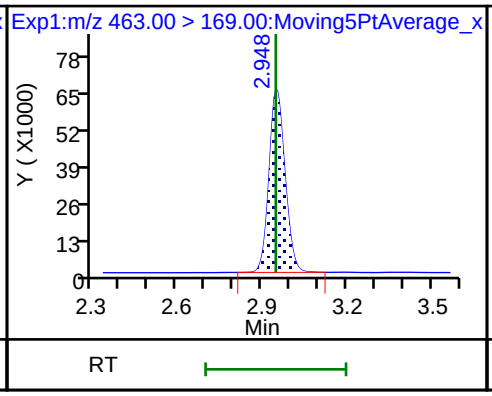
16 Perfluoroheptanesulfonic acid



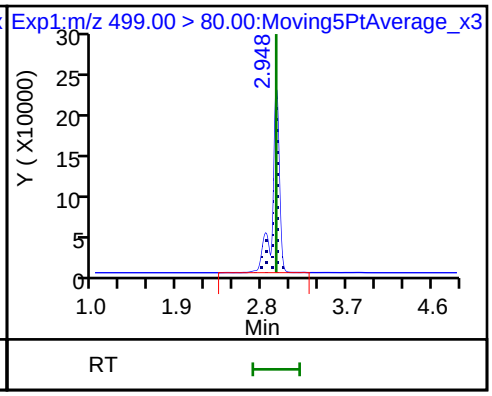
20 Perfluorononanoic acid



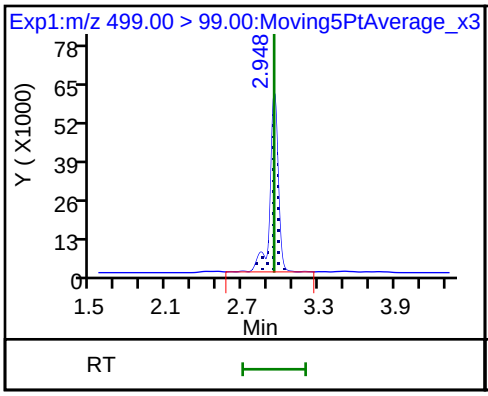
20 Perfluorononanoic acid



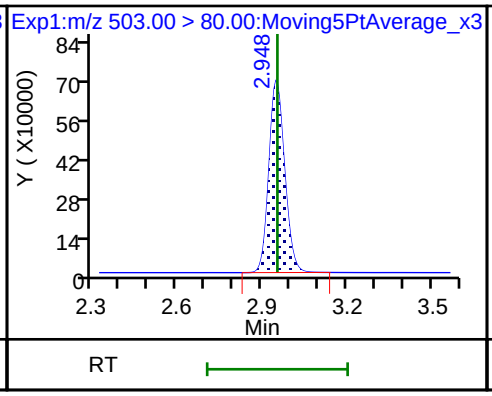
17 Perfluorooctane sulfonic acid



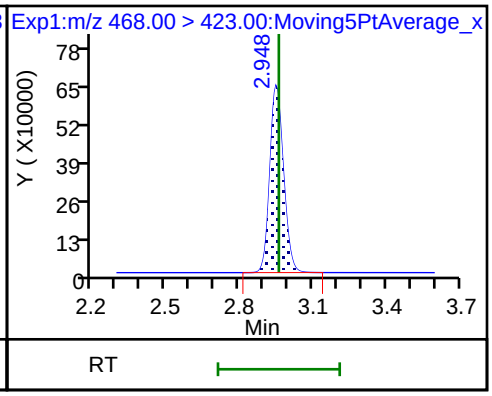
17 Perfluorooctane sulfonic acid



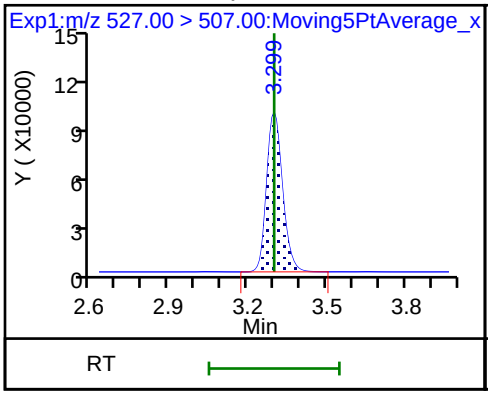
D 18 13C4 PFOS



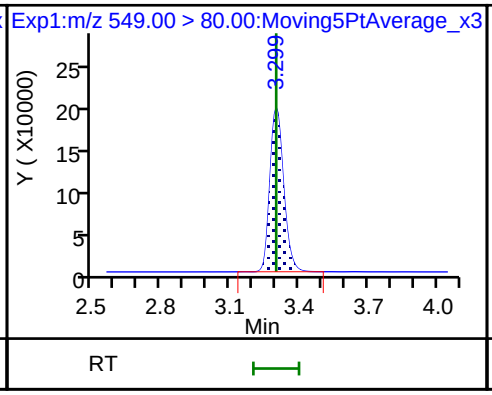
D 19 13C5 PFNA



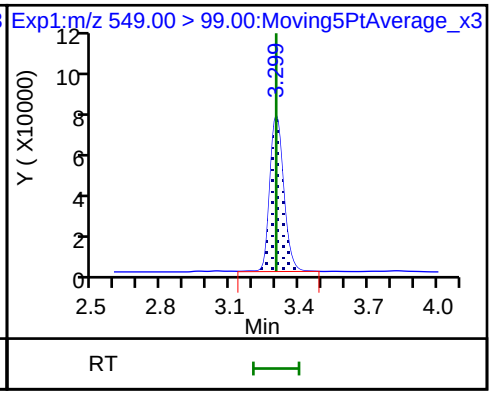
25 1H,1H,2H,2H-perfluorodecanesulfoni



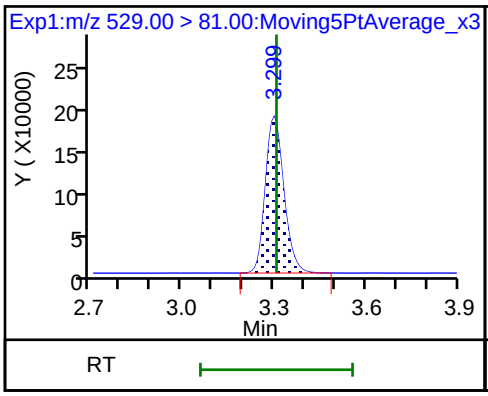
68 Perfluorononanesulfonic acid



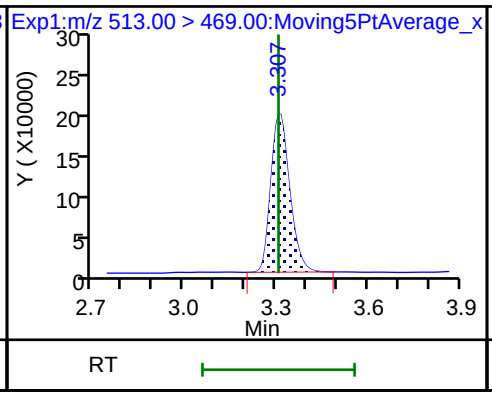
68 Perfluorononanesulfonic acid



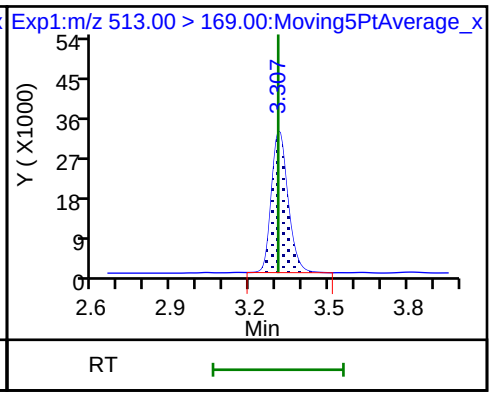
D 26 M2-8:2FTS



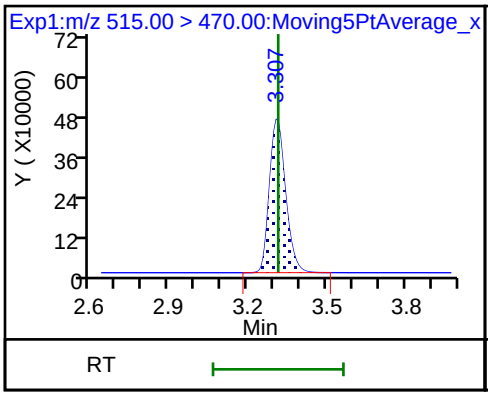
24 Perfluorodecanoic acid



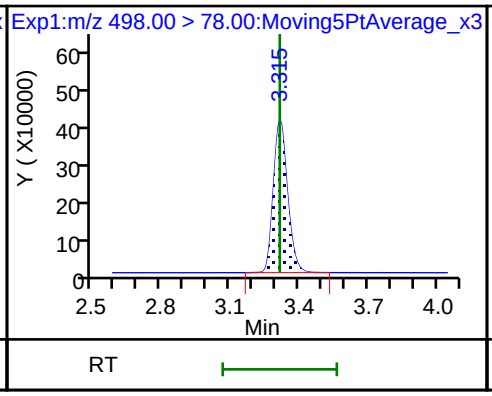
24 Perfluorodecanoic acid



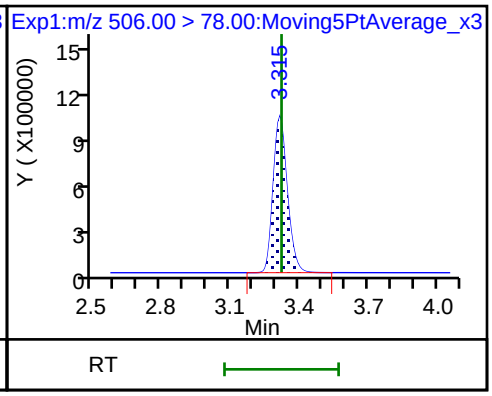
D 23 13C2 PFDA



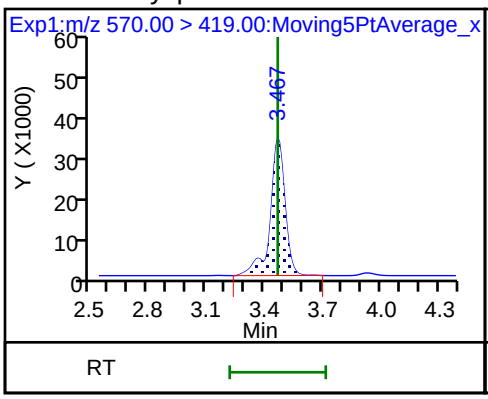
22 Perfluorooctane Sulfonamide



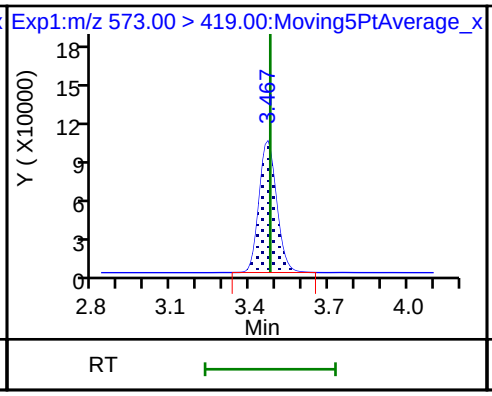
D 21 13C8 FOSA



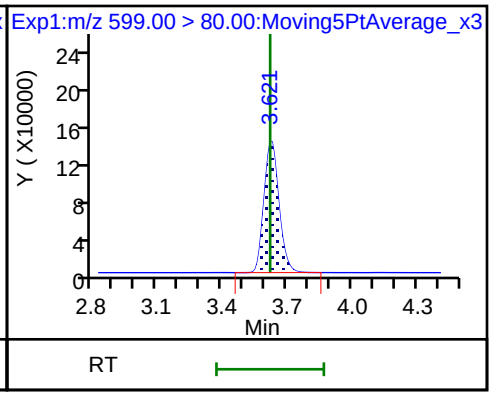
28 N-methyl perfluorooctane sulfonami



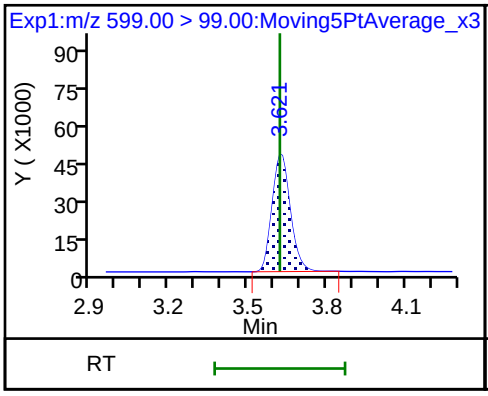
D 27 d3-NMeFOSAA



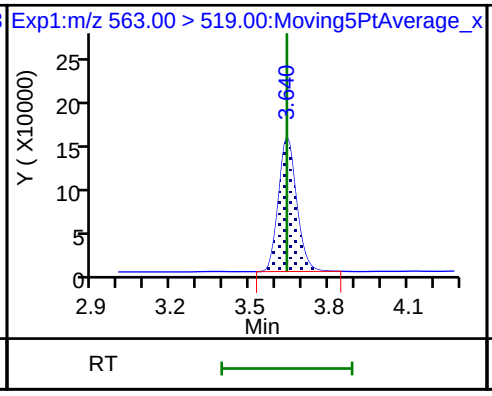
29 Perfluorodecane Sulfonic acid



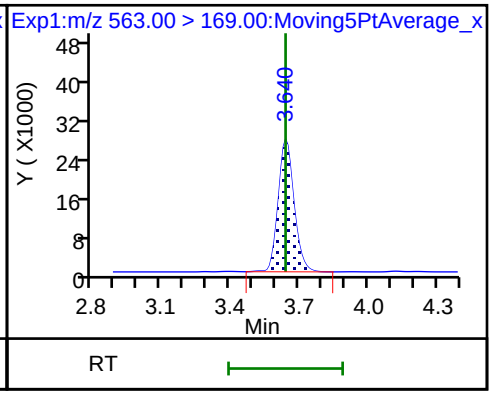
29 Perfluorodecane Sulfonic acid



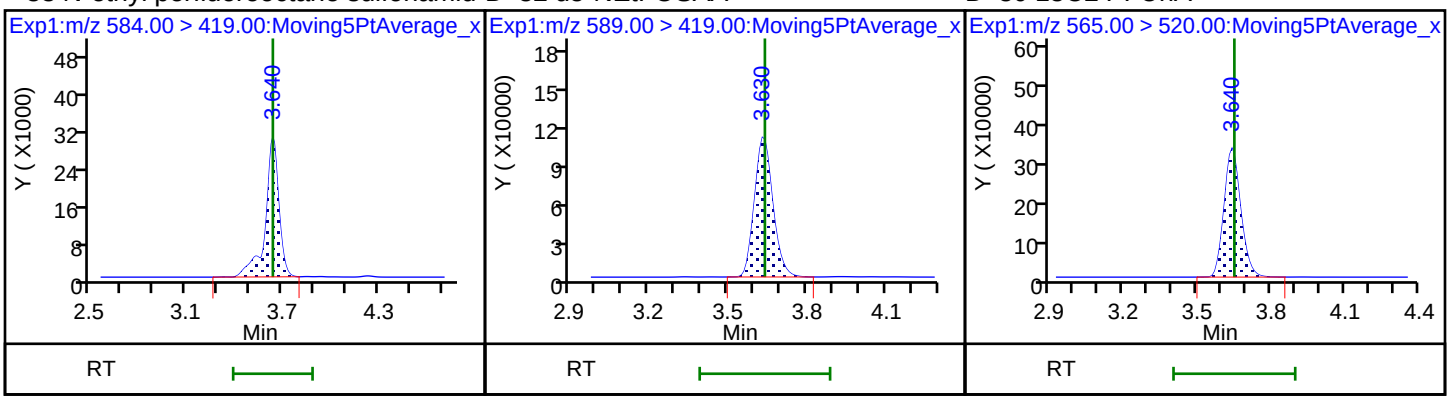
31 Perfluoroundecanoic acid



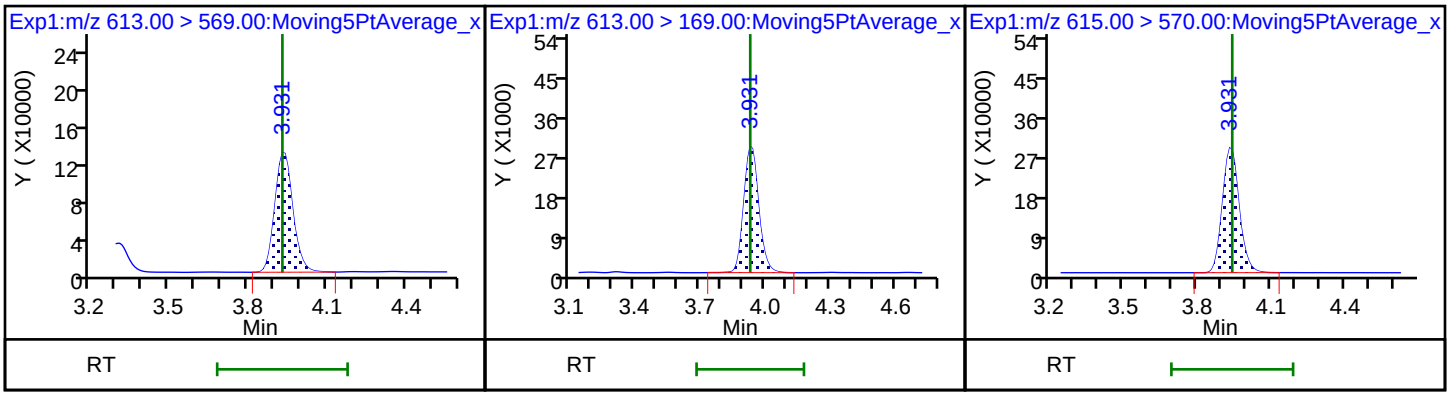
31 Perfluoroundecanoic acid



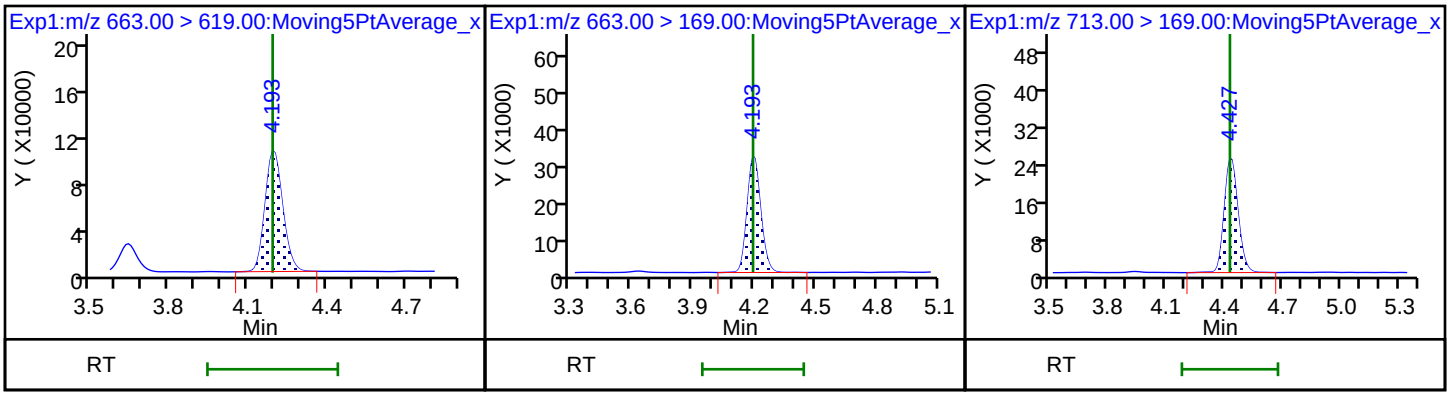
33 N-ethyl perfluorooctane sulfonamid D 32 d5-NEtFOSAA D 30 13C2 PFUnA



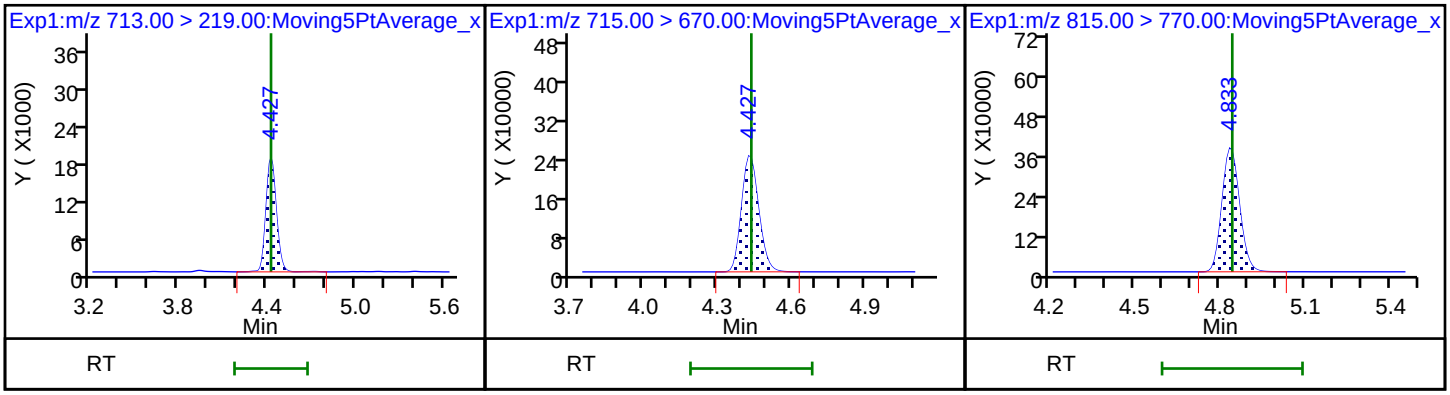
37 Perfluorododecanoic acid 37 Perfluorododecanoic acid D 36 13C2 PFDoA



41 Perfluorotridecanoic acid 41 Perfluorotridecanoic acid 42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid D 43 13C2-PFTeDA D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

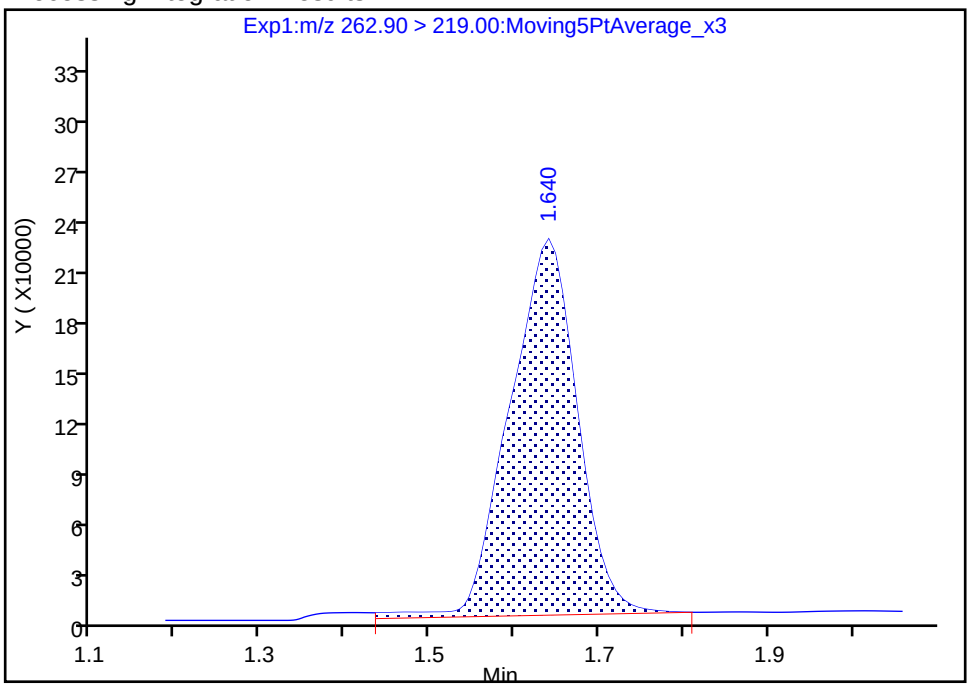
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.30LLBB_064.d				
Injection Date:	31-Jul-2018 15:52:17	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

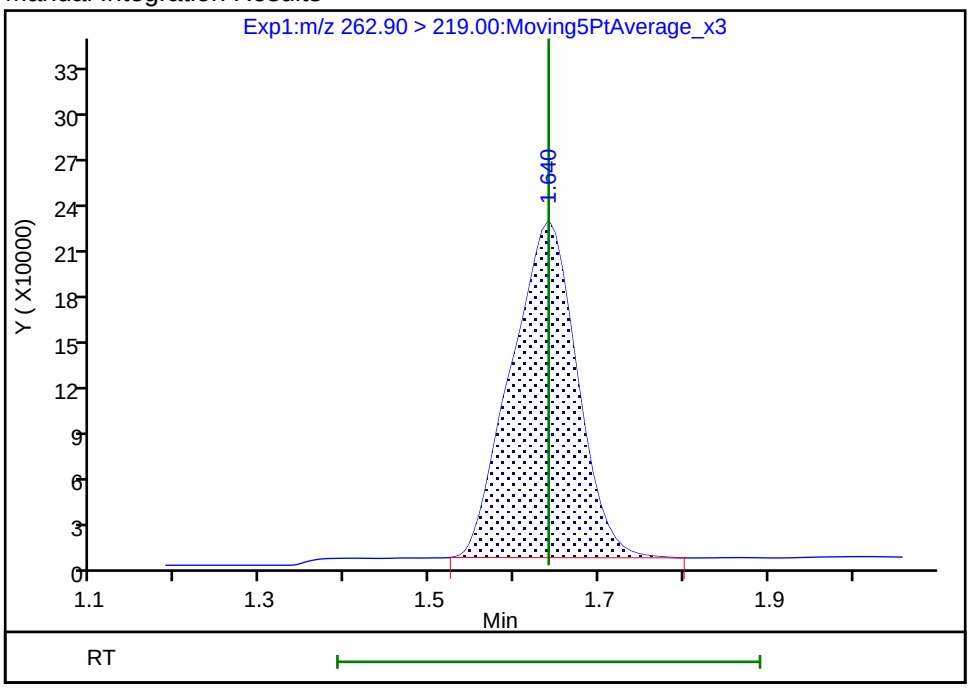
Processing Integration Results

RT: 1.64
Area: 1248912
Amount: 0.972013
Amount Units: ng/ml



Manual Integration Results

RT: 1.64
Area: 1203777
Amount: 0.936885
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 09:05:03

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237052/1 Calibration Date: 07/31/2018 17:49

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.024	0.9673		0.945	1.00	-5.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.210	1.218		1.01	1.00	0.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.51	78.35		0.894	0.884	1.1	30.0
4:2 FTS	AveID	15.26	15.96		0.977	0.934	4.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.066	1.011		0.949	1.00	-5.1	30.0
Perfluoropentanesulfonic acid	AveID	70.00	70.52		0.945	0.938	0.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.138	1.131		0.994	1.00	-0.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.162	1.040		0.814	0.910	-10.5	30.0
6:2 FTS	AveID	1.685	1.606		0.904	0.948	-4.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.166	1.127		0.968	1.00	-3.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.331	1.345		0.962	0.952	1.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.079	1.085		1.01	1.00	0.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.140	1.062		0.865	0.928	-6.8	30.0
8:2 FTS	AveID	1.328	1.274		0.919	0.958	-4.1	30.0
Perfluorononanesulfonic acid	AveID	0.7829	0.7559		0.927	0.960	-3.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.087	0.996		0.916	1.00	-8.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9900	1.034		1.04	1.00	4.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.028	0.9905		0.963	1.00	-3.7	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6692	0.6453		0.930	0.964	-3.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9130	0.8232		0.902	1.00	-9.8	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8969	1.153		1.28	1.00	28.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.080	1.067		0.988	1.00	-1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9169	0.8764		0.956	1.00	-4.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2666	0.2507		0.941	1.00	-5.9	30.0
13C4 PFBA	Ave	1.354	1.340		2.47	2.50	-1.1	30.0
13C5-PFPeA	Ave	0.8708	0.8709		2.50	2.50	0.0	30.0
13C3-PFBS	Ave	0.0258	0.0247		2.22	2.33	-4.4	30.0
13C2 PFHxA	Ave	0.9884	0.9872		2.50	2.50	-0.1	30.0
13C4-PFHpA	Ave	0.9405	0.9654		2.57	2.50	2.6	30.0
18O2 PFHxS	Ave	1.429	1.454		2.41	2.37	1.8	30.0
M2-6:2FTS	Ave	0.2945	0.2577		2.08	2.38	-12.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237052/1 Calibration Date: 07/31/2018 17:49

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9607	0.9795		2.55	2.50	2.0	30.0
13C4 PFOS	Ave	1.026	0.9638		2.24	2.39	-6.1	30.0
13C5 PFNA	Ave	0.8491	0.8073		2.38	2.50	-4.9	30.0
M2-8:2FTS	Ave	0.3394	0.2826		1.99	2.40	-16.7	30.0
13C2 PFDA	Ave	0.7029	0.6607		2.35	2.50	-6.0	30.0
13C8 FOSA	Ave	1.464	1.429		2.44	2.50	-2.4	30.0
d3-NMeFOSAA	Ave	0.1590	0.1606		2.53	2.50	1.0	30.0
13C2 PFUnA	Ave	0.5459	0.5100		2.34	2.50	-6.6	30.0
d5-NEtFOSAA	Ave	0.1739	0.1868		2.69	2.50	7.4	30.0
13C2 PFDoA	Ave	0.5541	0.4688		2.11	2.50	-15.4	30.0
13C2-PFTeDA	Ave	0.5049	0.4018		1.99	2.50	-20.4	30.0
13C2-PFHxDA	Ave	0.8936	0.5779		1.62	2.50	-35.3*	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 31-Jul-2018 17:49:38 ALS Bottle#: 28 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:23:35 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:23:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.391	0.0	1.000	1792435	0.9449		94.5	324	
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.394	-0.003	0.540	4632643	2.47		98.9	79279	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.633	0.0	1.000	1467301	1.01		101	570	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.633	3011936	2.50		100	48345	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.666	0.0	1.000	2367097	0.8936		101	9972	
298.90 > 99.00	1.666	1.666	0.0	1.000	991016		2.39(1.25-3.74)		2884	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.670	-0.004	0.646	79460	2.22		95.6	307	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.866	0.0	1.120	509400	0.9769		105	23035	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.871	-0.005	0.724	518101	NC			4474	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.906	1.906	0.0	1.000	1381139	0.9487		94.9	2027	
313.00 > 119.00	1.906	1.906	0.0	1.000	125429		11.01(5.03-15.10)		1467	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.911	-0.005	0.739	3414029	2.50		99.9	66652	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.927	0.0	1.157	2260562	0.9449		101	32810	
349.00 > 99.00	1.927	1.927	0.0	1.157	843231		2.68(1.36-4.07)		2945	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	1.997	0.006	0.777	253405	NC			7358	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.003	0.0	1.000	276695	NC			1072	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.223	0.006	0.864	3338442	2.57		103	55977	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.229	0.0	1.000	1510265	0.99		99.4	675	
363.00 > 169.00	2.229	2.229	0.0	1.000	585400		2.58(1.13-3.40)		5460	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.241	0.0	1.000	1903520	0.8144		89.5	8709	
399.00 > 99.00	2.241	2.241	0.0	1.000	664404		2.87(1.50-4.49)		851	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.248	-0.007	0.869	4757202	2.41		102	52808	
65 ADONA										
377.00 > 251.00	2.267	2.267	0.0	0.770	3831795	NC			31976	
377.00 > 85.00	2.267	2.267	0.0	0.770	2139172		1.79(0.84-2.53)		6372	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.553	2.553	0.0	1.000	542884	0.9039		95.3	6699	
D 12 M2-6:2FTS										
429.00 > 81.00	2.553	2.562	-0.009	0.990	846732	2.08		87.5	8104	
* 62 13C2-PFOA										
415.00 > 370.00	2.578	2.578	0.0		3458240	2.50			44102	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.578	2.578	0.0	1.000	1528827	0.9678		96.7	1240	
413.00 > 169.00	2.578	2.578	0.0	1.000	788042		1.94(0.84-2.52)		2787	
D 14 13C4 PFOA										
417.00 > 372.00	2.578	2.586	-0.008	1.000	3387206	2.55		102	49007	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.586	2.586	0.0	0.878	1707177	0.9624		101	13454	
449.00 > 99.00	2.586	2.586	0.0	0.878	476555		3.58(1.94-5.82)		3012	
20 Perfluorononanoic acid										
463.00 > 419.00	2.946	2.946	0.0	1.000	1211437	1.01		101	1534	
463.00 > 169.00	2.946	2.946	0.0	1.000	294974		4.11(1.90-5.69)		7270	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.946	2.946	0.0	1.000	1313972	0.8647		93.2	10779	
499.00 > 99.00	2.946	2.946	0.0	1.000	301231		4.36(2.31-6.93)		1842	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.952	-0.006	1.142	3186252	2.24		93.9	36354	
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.952	-0.006	1.142	2791708	2.38		95.1	46546	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.161	3.161	0.0	1.073	2266980	NC			21155	
D 26 M2-8:2FTS										
529.00 > 81.00	3.296	3.296	0.0	1.278	936320	1.99		83.3	14924	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.296	3.296	0.0	1.000	477046	0.9188		95.9	28519	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.296	3.296	0.0	1.119	967366	0.9269		96.5	26402	
549.00 > 99.00	3.296	3.296	0.0	1.119	372003		2.60(1.33-3.97)		2524	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.311	3.311	0.0	1.284	2284704	2.35		94.0	45461	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.311	3.311	0.0	1.000	909909	0.9157		91.6	1470	
513.00 > 169.00	3.311	3.311	0.0	1.000	166539		5.46(2.36-7.09)		2330	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.319	-0.008	1.284	4941722	2.44		97.6	48536	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.319	0.0	1.002	2043437	1.04		104	25399	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.464	3.464	0.0	1.343	555450	2.53		101	13467	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.464	3.464	0.0	1.000	220074	0.9631		96.3	2309	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.638	3.628	0.010	1.411	646016	2.69		107	5563	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.628	3.628	0.0	1.232	829249	0.9296		96.4	17441	
599.00 > 99.00	3.628	3.628	0.0	1.232	276717		3.00(1.39-4.16)		3843	
D 30 13C2 PFUnA										
565.00 > 520.00	3.638	3.638	0.0	1.411	1763603	2.34		93.4	52992	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.638	3.638	0.0	1.000	212726	0.9017		90.2	4731	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.638	3.638	0.0	1.000	813019	1.28		128	2724	
563.00 > 169.00	3.638	3.638	0.0	1.000	140211		5.80(2.12-6.36)		2952	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.803	3.803	0.0	1.291	3351914	NC			46245	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.928	0.0	1.000	691595	0.9877		98.8	226	
613.00 > 169.00	3.928	3.928	0.0	1.000	163396		4.23(2.13-6.40)		1876	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.928	0.0	1.524	1621166	2.11		84.6	19946	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.193	0.0	1.067	568314	0.9558		95.6	175	
663.00 > 169.00	4.193	4.193	0.0	1.067	189324		3.00(1.25-3.76)		1323	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.426	0.0	1.717	1389358	1.99		79.6	7950	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.426	0.0	1.000	139345	0.9407		94.1	1794	
713.00 > 219.00	4.426	4.426	0.0	1.000	99580		1.40(0.71-2.13)		1543	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.833	0.0	1.875	1998439	1.62		64.7	3444	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	773462	NC			68.6	
813.00 > 169.00	4.833	4.833	0.0	1.000	123738		6.25(2.86-8.58)		1193	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.174	5.174	0.0	1.070	828354	NC			235	
913.00 > 169.00	5.174	5.174	0.0	1.070	99735		8.31(3.83-11.48)		1079	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 12:23:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_006.d

Injection Date: 31-Jul-2018 17:49:38 Instrument ID: A8_N

Lims ID: CCV L4

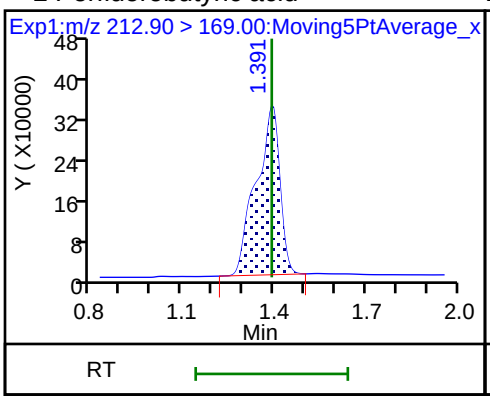
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 1

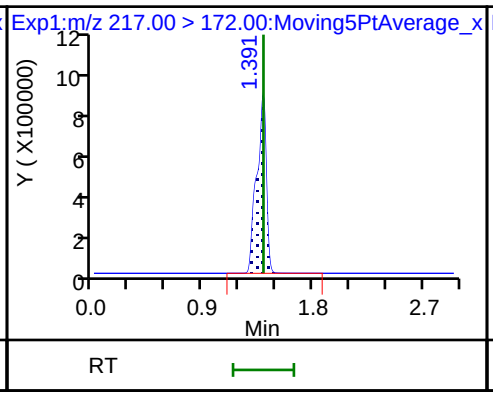
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

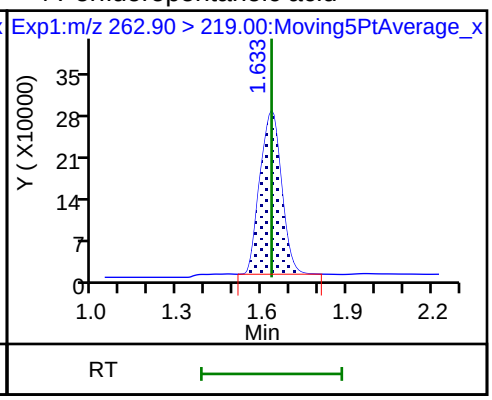
2 Perfluorobutyric acid



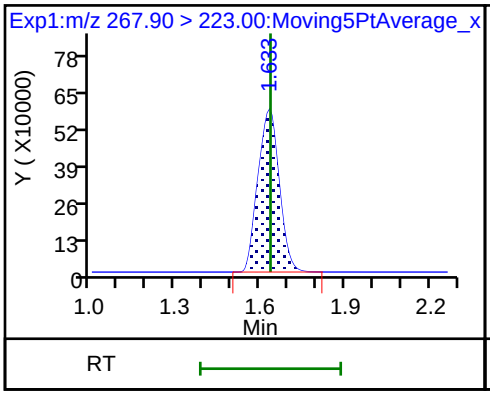
D 1 13C4 PFBA



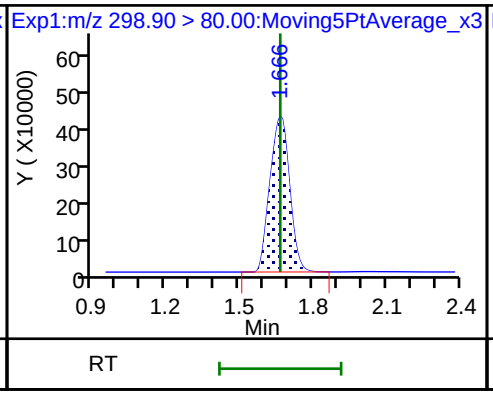
4 Perfluoropentanoic acid



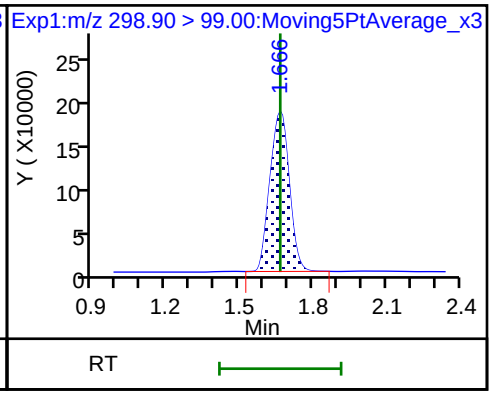
D 3 13C5-PFPeA



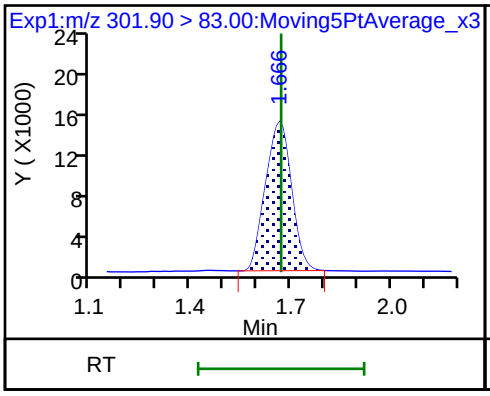
5 Perfluorobutanesulfonic acid



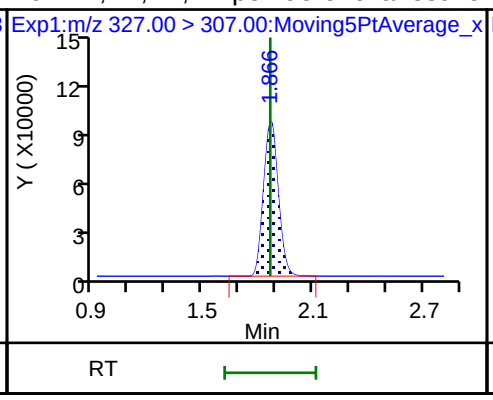
5 Perfluorobutanesulfonic acid



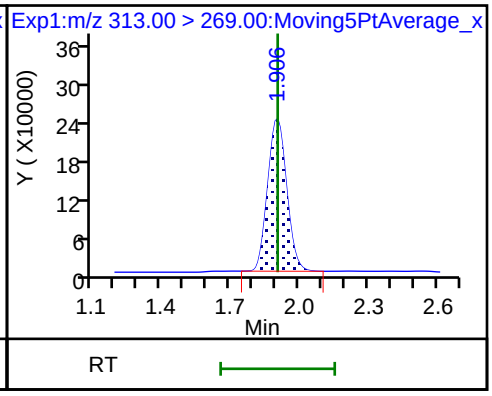
D 47 13C3-PFBS



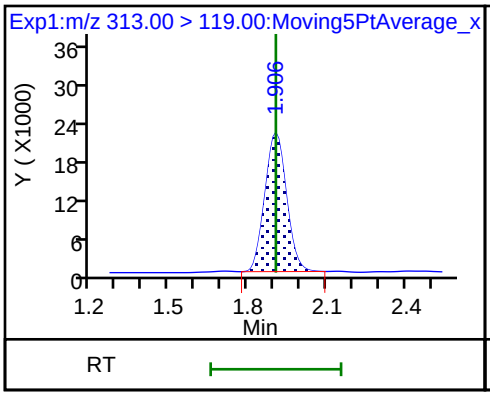
61 1H,1H,2H,2H-perfluorohexanesulfoni



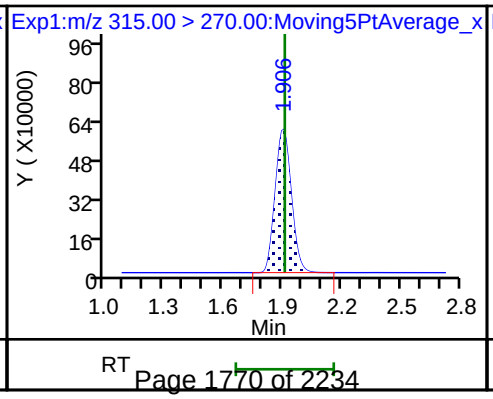
6 Perfluorohexanoic acid



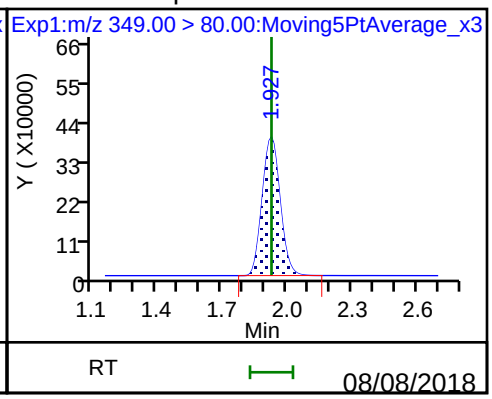
6 Perfluorohexanoic acid



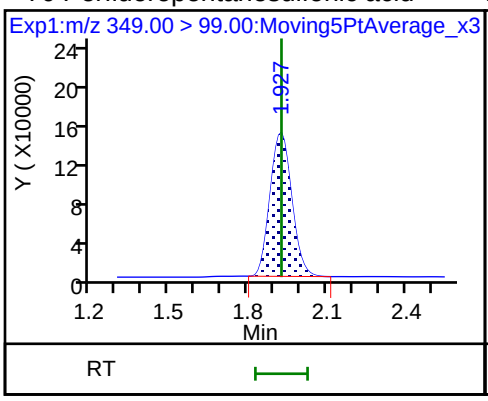
D 7 13C2 PFHxA



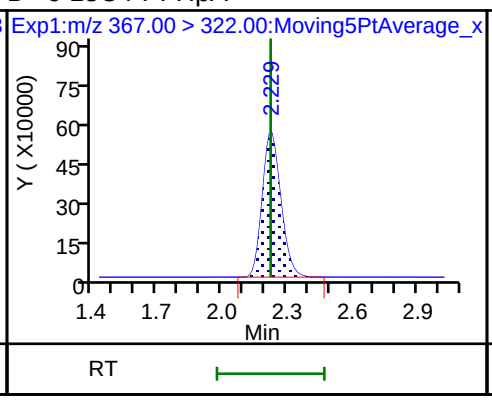
70 Perfluoropentanesulfonic acid



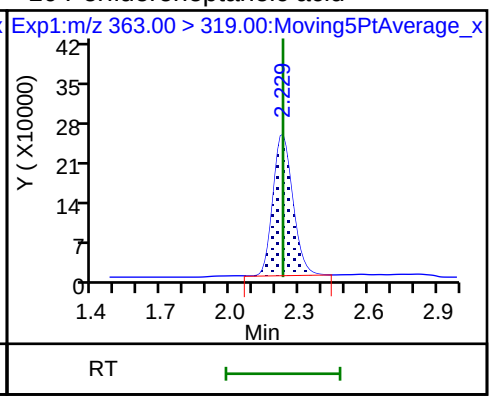
70 Perfluoropentanesulfonic acid



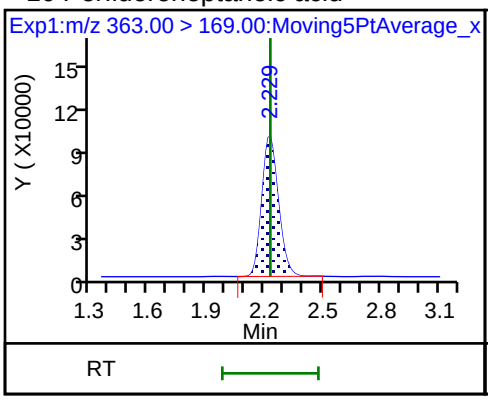
D 9 13C4-PFHpA



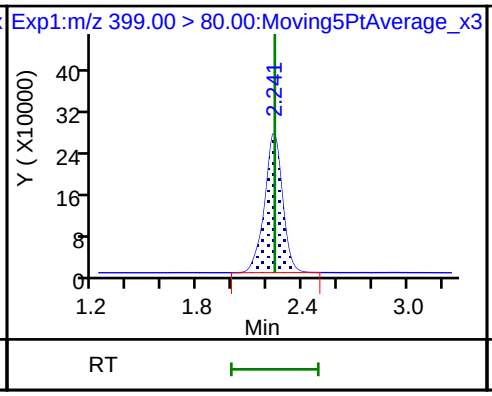
10 Perfluoroheptanoic acid



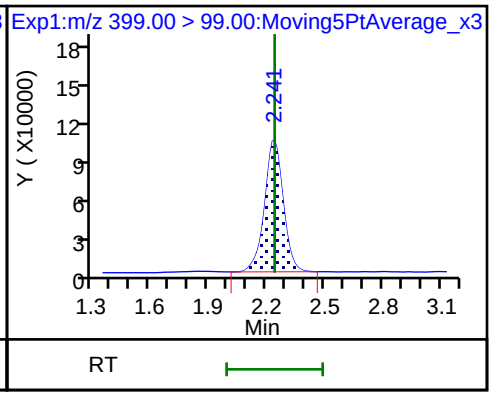
10 Perfluoroheptanoic acid



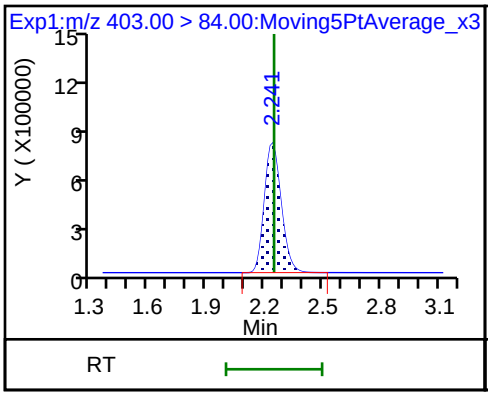
8 Perfluorohexanesulfonic acid



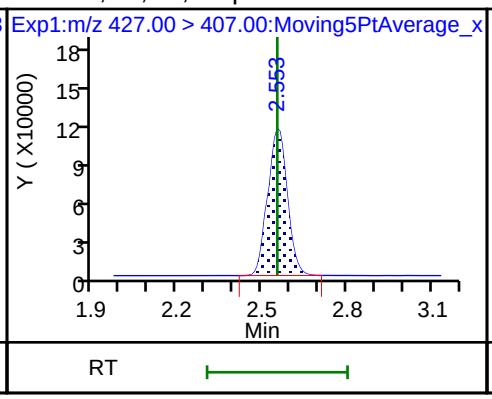
8 Perfluorohexanesulfonic acid



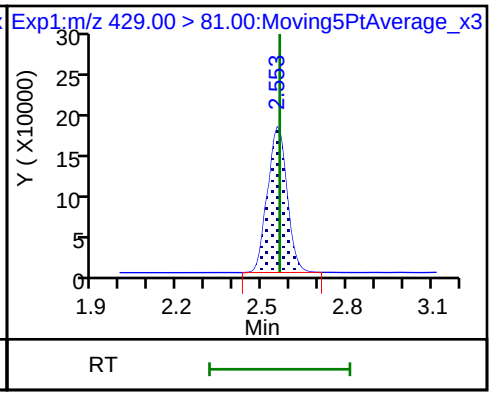
D 11 18O2 PFHxS



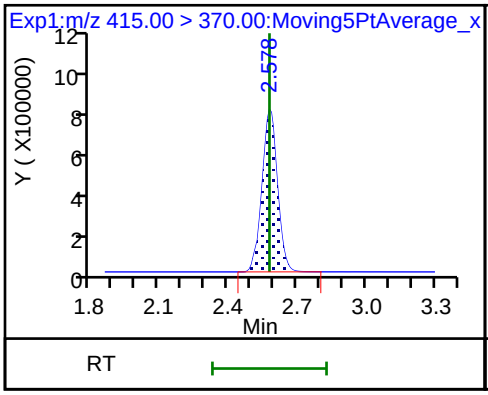
13 1H,1H,2H,2H-perfluorooctanesulfon



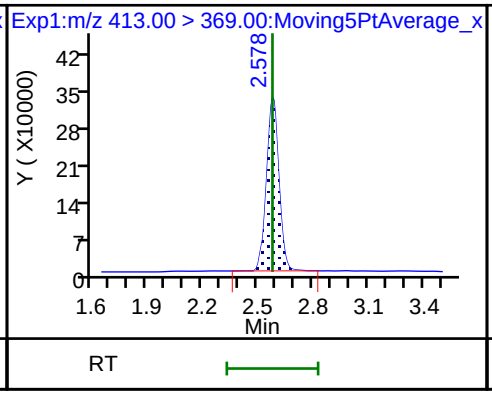
D 12 M2-6:2FTS



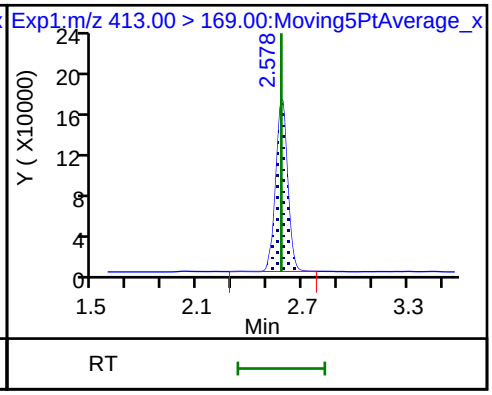
* 62 13C2-PFOA



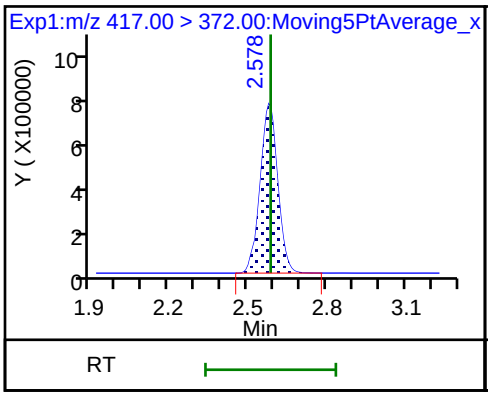
15 Perfluorooctanoic acid



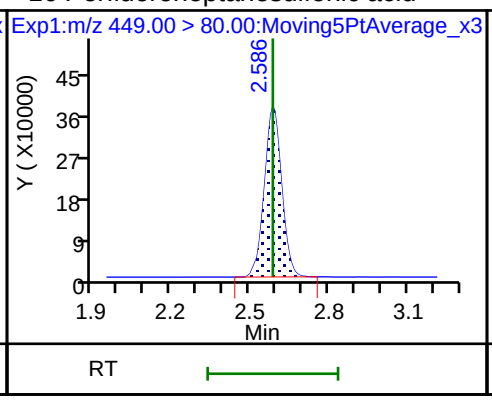
15 Perfluorooctanoic acid



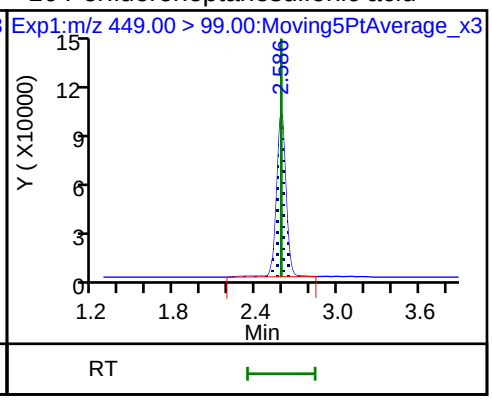
D 14 13C4 PFOA



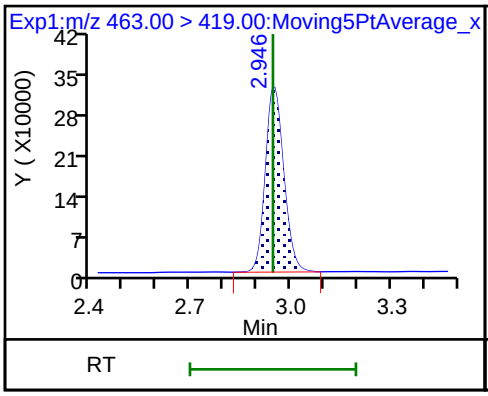
16 Perfluoroheptanesulfonic acid



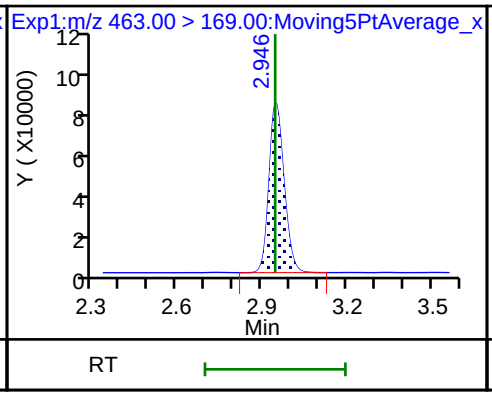
16 Perfluoroheptanesulfonic acid



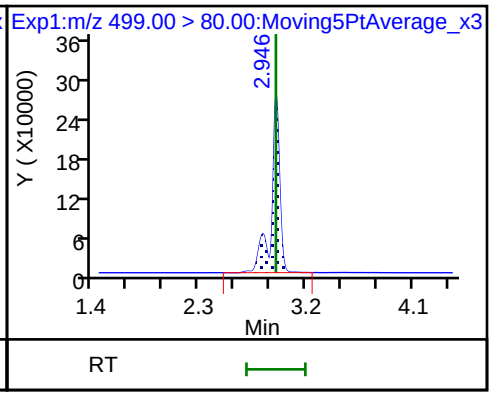
20 Perfluorononanoic acid



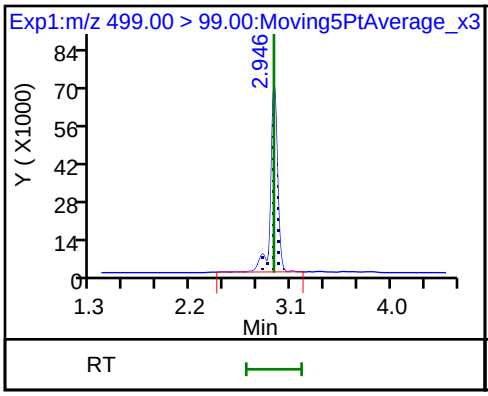
20 Perfluorononanoic acid



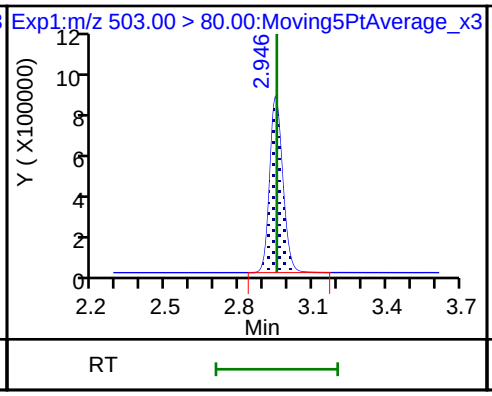
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



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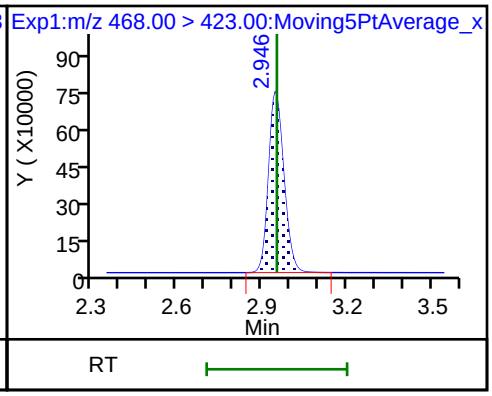
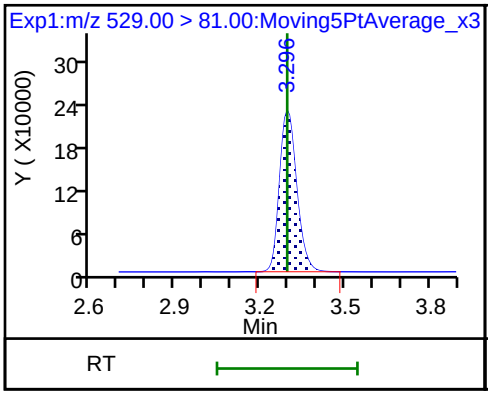
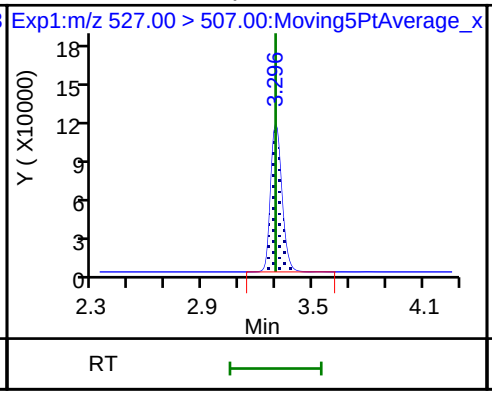


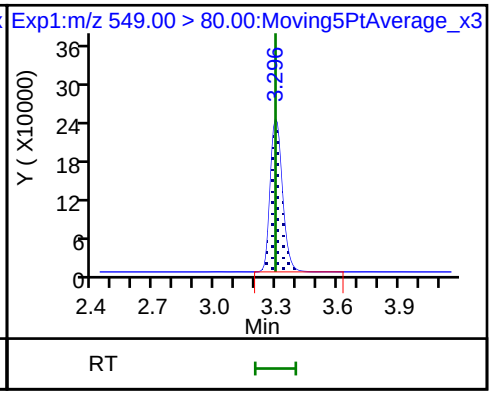
D 26 M2-8:2FTS



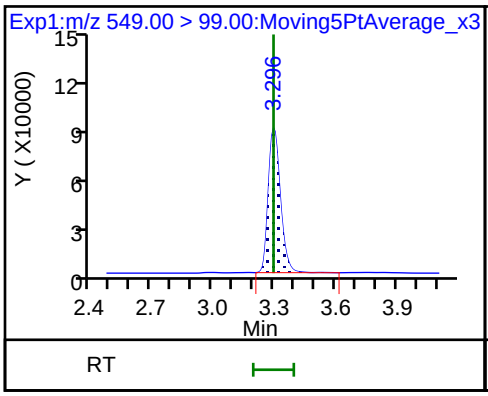
25 1H,1H,2H,2H-perfluorodecanesulfoni



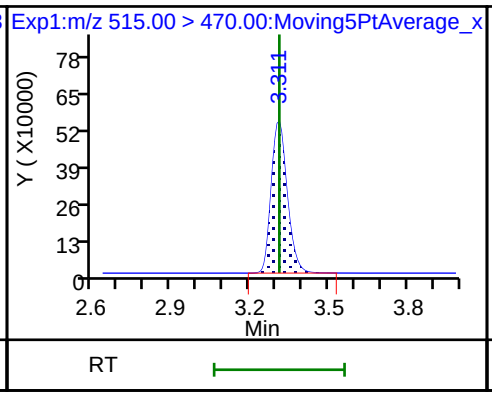
68 Perfluorononanesulfonic acid



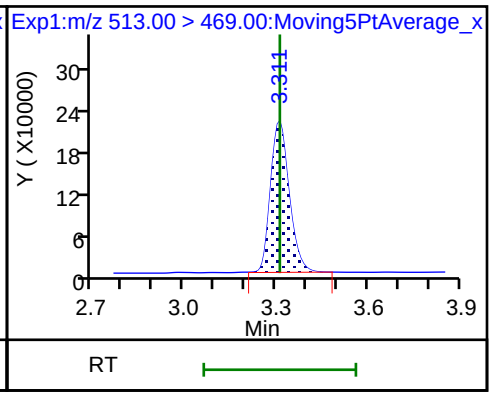
68 Perfluorononanesulfonic acid



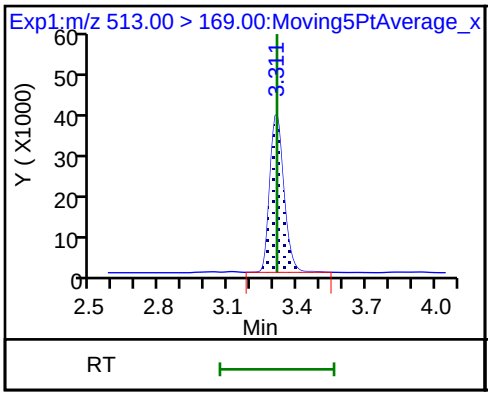
D 23 13C2 PFDA



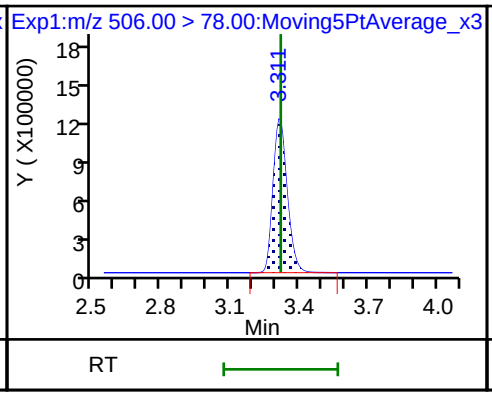
24 Perfluorodecanoic acid



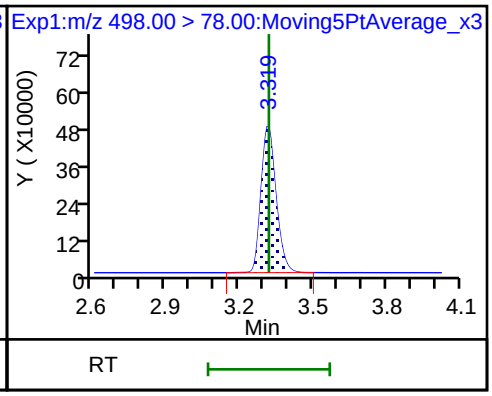
24 Perfluorodecanoic acid



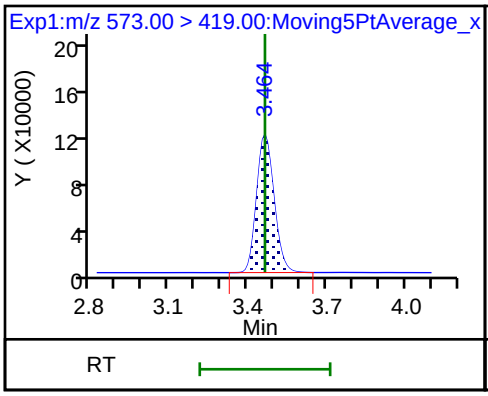
D 21 13C8 FOSA



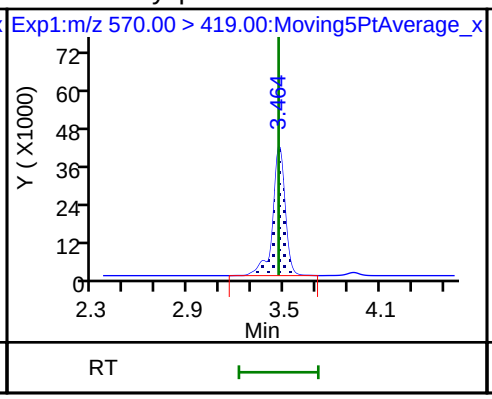
22 Perfluorooctane Sulfonamide



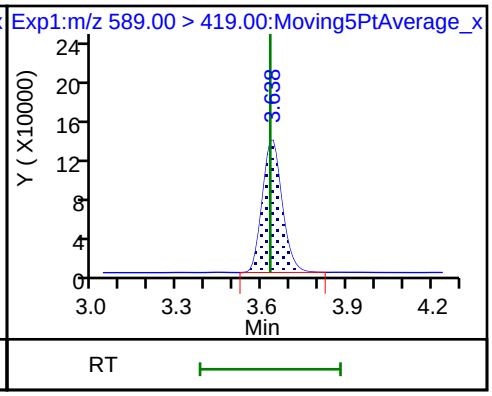
D 27 d3-NMeFOSAA



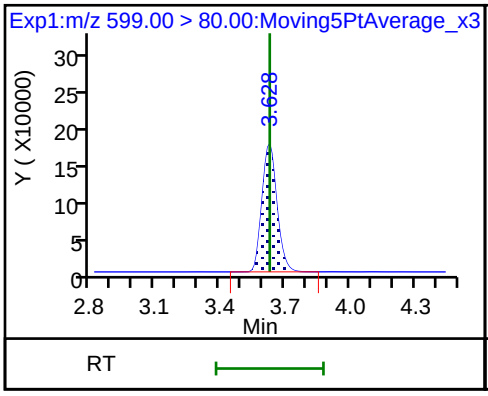
28 N-methyl perfluorooctane sulfonami



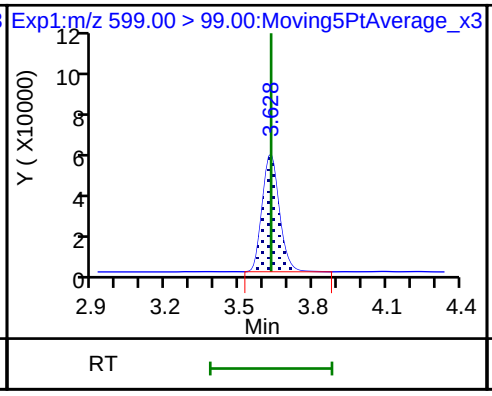
D 32 d5-NEtFOSAA



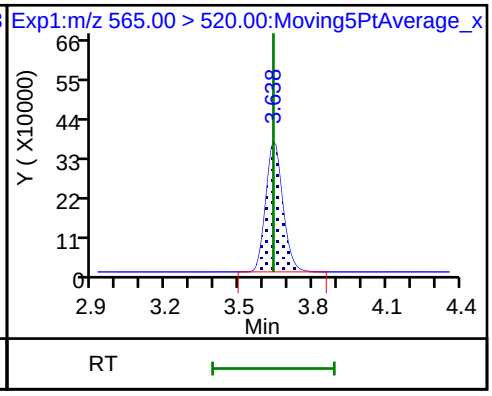
29 Perfluorodecane Sulfonic acid



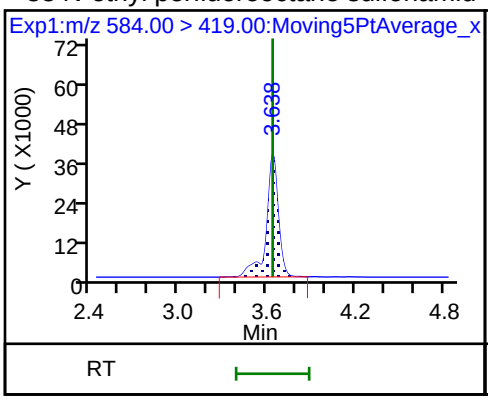
29 Perfluorodecane Sulfonic acid



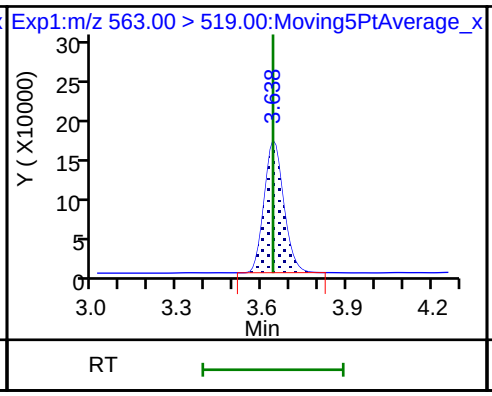
D 30 13C2 PFUnA



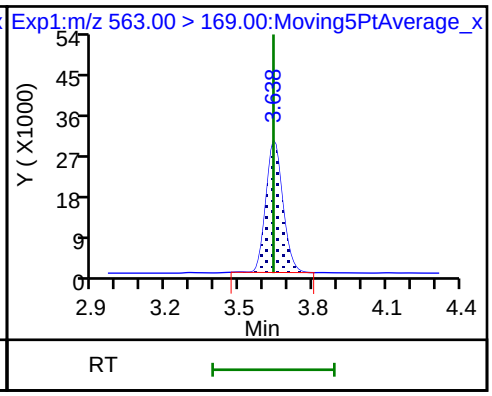
33 N-ethyl perfluorooctane sulfonamid



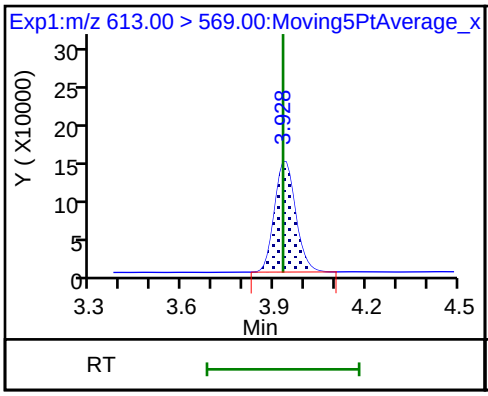
31 Perfluoroundecanoic acid



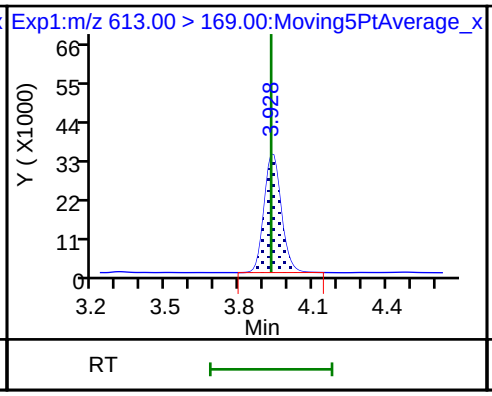
31 Perfluoroundecanoic acid



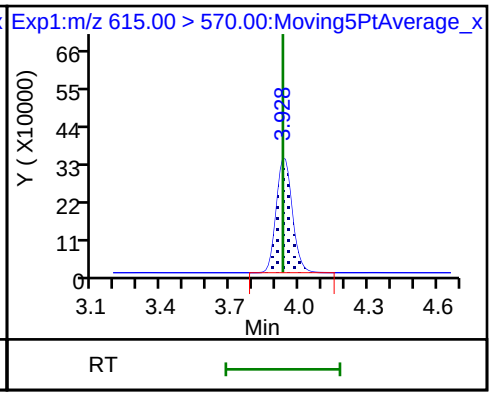
37 Perfluorododecanoic acid



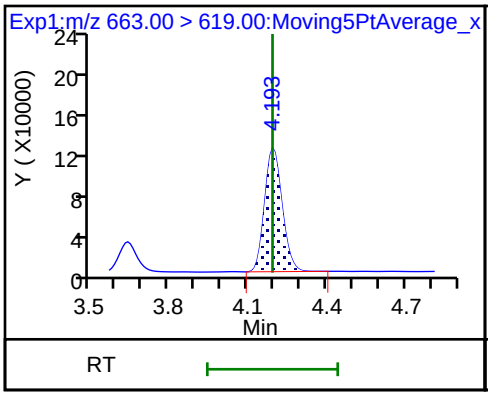
37 Perfluorododecanoic acid



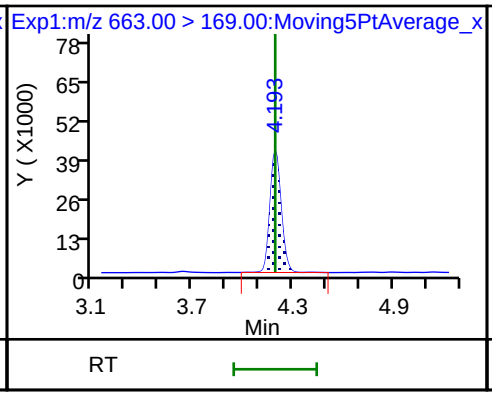
D 36 13C2 PFDoA



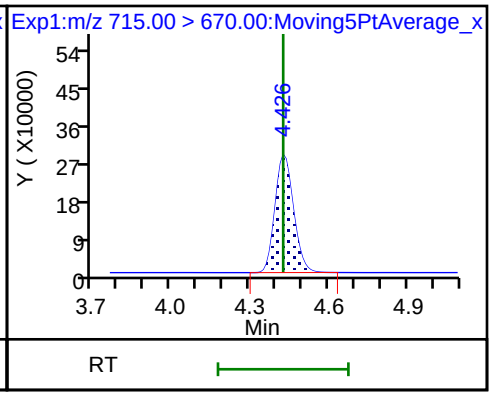
41 Perfluorotridecanoic acid



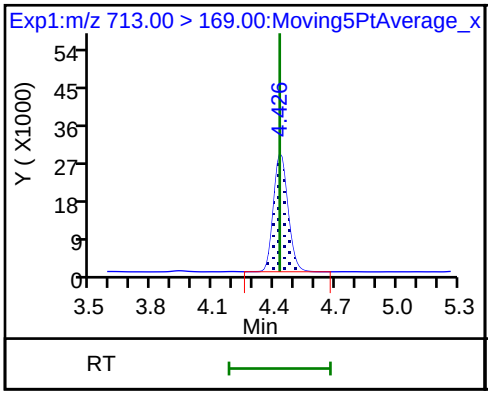
41 Perfluorotridecanoic acid



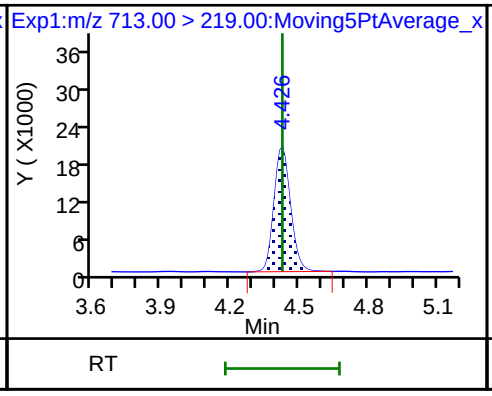
D 43 13C2-PFTeDA



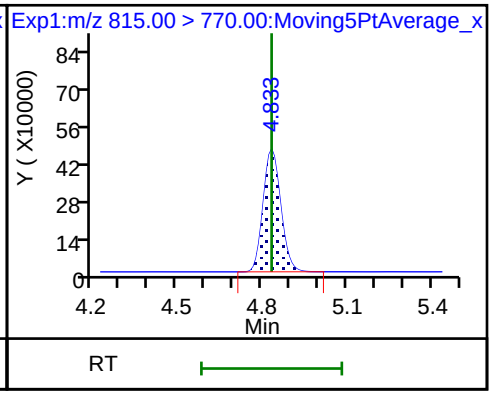
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237052/12 Calibration Date: 07/31/2018 19:15

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.024	0.9932		2.43	2.50	-3.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.210	1.184		2.45	2.50	-2.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.51	78.75		2.25	2.21	1.6	30.0
4:2 FTS	AveID	15.26	17.28		2.64	2.34	13.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.066	1.032		2.42	2.50	-3.2	30.0
Perfluoropentanesulfonic acid	AveID	70.00	71.44		2.39	2.35	2.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.138	1.160		2.55	2.50	1.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.162	1.116		2.18	2.28	-4.0	30.0
6:2 FTS	AveID	1.685	1.719		2.42	2.37	2.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.331	1.364		2.44	2.38	2.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.166	1.189		2.55	2.50	2.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.079	1.100		2.55	2.50	1.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.140	1.122		2.28	2.32	-1.5	30.0
8:2 FTS	AveID	1.328	1.347		2.43	2.40	1.4	30.0
Perfluorononanesulfonic acid	AveID	0.7829	0.7329		2.25	2.40	-6.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.087	1.108		2.55	2.50	1.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9900	1.038		2.62	2.50	4.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.028	0.9807		2.38	2.50	-4.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6692	0.6483		2.33	2.41	-3.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9130	0.9140		2.50	2.50	0.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8969	1.142		3.18	2.50	27.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.080	1.098		2.54	2.50	1.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9169	0.9329		2.54	2.50	1.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2666	0.2622		2.46	2.50	-1.6	30.0
13C4 PFBA	Ave	1.354	1.381		2.55	2.50	2.0	30.0
13C5-PFPeA	Ave	0.8708	0.8893		2.55	2.50	2.1	30.0
13C3-PFBS	Ave	0.0258	0.0258		2.32	2.33	-0.4	30.0
13C2 PFHxA	Ave	0.9884	0.9916		2.51	2.50	0.3	30.0
13C4-PFHpA	Ave	0.9405	0.9789		2.60	2.50	4.1	30.0
18O2 PFHxS	Ave	1.429	1.447		2.39	2.37	1.2	30.0
M2-6:2FTS	Ave	0.2945	0.2683		2.16	2.38	-8.9	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237052/12 Calibration Date: 07/31/2018 19:15

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9607	0.9579		2.49	2.50	-0.3	30.0
13C4 PFOS	Ave	1.026	1.008		2.35	2.39	-1.8	30.0
13C5 PFNA	Ave	0.8491	0.8535		2.51	2.50	0.5	30.0
M2-8:2FTS	Ave	0.3394	0.2895		2.04	2.40	-14.7	30.0
13C2 PFDA	Ave	0.7029	0.6523		2.32	2.50	-7.2	30.0
13C8 FOSA	Ave	1.464	1.447		2.47	2.50	-1.2	30.0
d3-NMeFOSAA	Ave	0.1590	0.1724		2.71	2.50	8.4	30.0
d5-NEtFOSAA	Ave	0.1739	0.1741		2.50	2.50	0.2	30.0
13C2 PFUnA	Ave	0.5459	0.5361		2.45	2.50	-1.8	30.0
13C2 PFDoA	Ave	0.5541	0.4750		2.14	2.50	-14.3	30.0
13C2-PFTeDA	Ave	0.5049	0.3907		1.93	2.50	-22.6	30.0
13C2-PFHxDA	Ave	0.8936	0.5887		1.65	2.50	-34.1*	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_017.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 31-Jul-2018 19:15:33 ALS Bottle#: 29 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:40:37 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:40:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.391	0.0	1.000	4697810	2.43		97.0	1696	
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.394	-0.003	0.541	4729877	2.55		102	74353	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.633	0.0	1.000	3606252	2.45		97.9	1938	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.635	3045807	2.55		102	53731	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.666	0.0	1.000	6138770	2.25		102	26778	
298.90 > 99.00	1.666	1.666	0.0	1.000	2564631		2.39(1.25-3.74)		8985	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.670	-0.004	0.647	82014	2.32		99.6	1391	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.866	0.0	1.120	1423178	2.64		113	52110	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.871	-0.005	0.725	528951	NC			8051	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.906	1.906	0.0	1.000	3504644	2.42		96.8	10329	
313.00 > 119.00	1.906	1.906	0.0	1.000	306821		11.42(5.03-15.10)		4518	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.911	-0.005	0.741	3396226	2.51		100	75168	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.927	0.0	1.157	5909339	2.39		102	54500	
349.00 > 99.00	1.927	1.927	0.0	1.157	2093529		2.82(1.36-4.07)		10757	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.004	1.997	0.007	0.779	244171	NC			8439	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.004	2.003	0.001	1.000	709873	NC			4711	
D 9 13C4-PFHpA										
367.00 > 322.00	2.218	2.223	-0.005	0.862	3352754	2.60		104	47379	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.218	2.229	-0.011	1.000	3888183	2.55		102	2183	
363.00 > 169.00	2.218	2.229	-0.011	1.000	1430090		2.72(1.13-3.40)		15062	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.241	-0.011	0.995	5032250	2.18		96.0	17228	
399.00 > 99.00	2.241	2.241	0.0	1.000	1667593		3.02(1.50-4.49)		2530	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.248	-0.007	0.871	4687745	2.39		101	43567	
65 ADONA										
377.00 > 251.00	2.268	2.267	0.001	0.772	9527542	NC			63844	
377.00 > 85.00	2.268	2.267	0.001	0.772	5781272		1.65(0.84-2.53)		18382	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.547	2.553	-0.006	1.000	1497575	2.42		102	14034	
D 12 M2-6:2FTS										
429.00 > 81.00	2.547	2.562	-0.015	0.990	872806	2.16		91.1	12545	
* 62 13C2-PFOA										
415.00 > 370.00	2.573	2.578	-0.005		3424997	2.50			47173	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.578	0.003	1.003	3905017	2.55		102	3130	
413.00 > 169.00	2.573	2.578	-0.005	1.000	2029802		1.92(0.84-2.52)		8588	
D 14 13C4 PFOA										
417.00 > 372.00	2.573	2.586	-0.013	1.000	3280621	2.49		99.7	51562	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.586	-0.005	0.879	4481153	2.44		102	33406	
449.00 > 99.00	2.581	2.586	-0.005	0.879	1234877		3.63(1.94-5.82)		6158	
20 Perfluorononanoic acid										
463.00 > 419.00	2.938	2.946	-0.008	1.000	3214597	2.55		102	3945	
463.00 > 169.00	2.938	2.946	-0.008	1.000	773313		4.16(1.90-5.69)		21118	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.938	2.946	-0.008	1.000	3595553	2.28		98.5	25735	
499.00 > 99.00	2.938	2.946	-0.008	1.000	820792		4.38(2.31-6.93)		5634	
D 18 13C4 PFOS										
503.00 > 80.00	2.938	2.952	-0.014	1.142	3300044	2.35		98.2	30628	
D 19 13C5 PFNA										
468.00 > 423.00	2.938	2.952	-0.014	1.142	2923229	2.51		101	56863	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.075	5804425	NC			47887	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.296	-0.004	1.279	949929	2.04		85.3	12103	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.284	3.296	-0.012	0.998	1279816	2.43		101	78026	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.296	-0.004	1.121	2428645	2.25		93.6	43493	
549.00 > 99.00	3.292	3.296	-0.004	1.121	903772		2.69(1.33-3.97)		5336	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.300	3.311	-0.011	1.282	2234020	2.32		92.8	48828	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.300	3.311	-0.011	1.000	2475738	2.55		102	4263	
513.00 > 169.00	3.300	3.311	-0.011	1.000	411881		6.01(2.36-7.09)		9882	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.319	-0.011	1.285	4956460	2.47		98.8	66093	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.319	-0.011	1.000	5143053	2.62		105	41183	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.464	-0.004	1.345	590474	2.71		108	21736	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.464	-0.004	1.000	579090	2.38		95.4	8666	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.628	-0.004	1.408	596444	2.50		100	5821	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.614	3.628	-0.014	1.230	2157161	2.33		96.9	41350	
599.00 > 99.00	3.614	3.628	-0.014	1.230	745600		2.89(1.39-4.16)		9321	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.412	1835988	2.45		98.2	54659	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.638	-0.004	1.003	545143	2.50		100	11644	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	2096398	3.18		127	6217	
563.00 > 169.00	3.634	3.638	-0.004	1.000	379390		5.53(2.12-6.36)		9810	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.789	3.803	-0.014	1.290	8541808	NC			94068	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.924	3.928	-0.004	1.000	1786205	2.54		102	544	
613.00 > 169.00	3.924	3.928	-0.004	1.000	430658		4.15(2.13-6.40)		6432	
D 36 13C2 PFDoA										
615.00 > 570.00	3.924	3.928	-0.004	1.525	1626741	2.14		85.7	21314	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.193	-0.004	1.067	1517626	2.54		102	465	
663.00 > 169.00	4.189	4.193	-0.004	1.067	467674		3.25(1.25-3.76)		3708	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.426	-0.002	1.719	1338080	1.93		77.4	7457	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.426	-0.002	1.000	350864	2.46		98.4	4799	
713.00 > 219.00	4.413	4.426	-0.013	0.998	258874		1.36(0.71-2.13)		4804	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.822	4.833	-0.011	1.874	2016217	1.65		65.9	3187	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.822	4.833	-0.011	1.000	1932573	NC			166	
813.00 > 169.00	4.822	4.833	-0.011	1.000	316517		6.11(2.86-8.58)		2694	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.172	5.174	-0.002	1.073	2227350	NC			616	
913.00 > 169.00	5.164	5.174	-0.010	1.071	267888		8.31(3.83-11.48)		2749	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 12:40:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_017.d

Injection Date: 31-Jul-2018 19:15:33 Instrument ID: A8_N

Lims ID: CCV L5

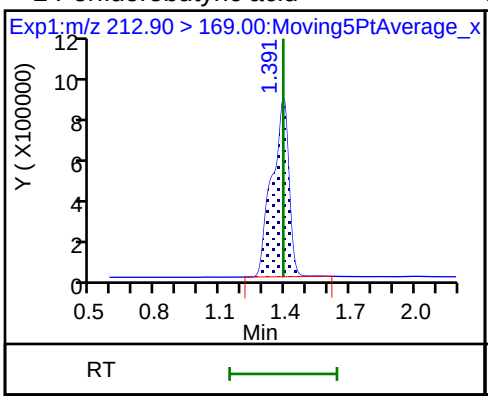
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 29 Worklist Smp#: 12

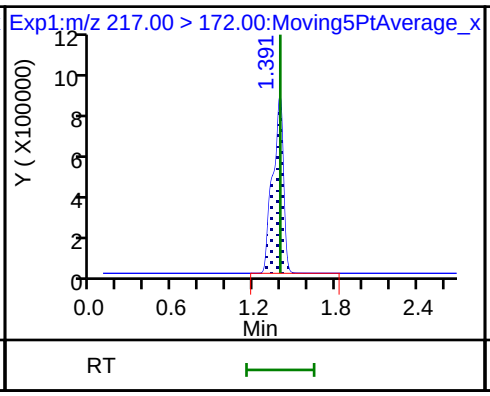
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

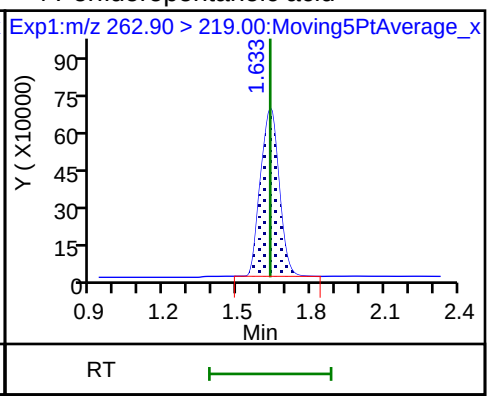
2 Perfluorobutyric acid



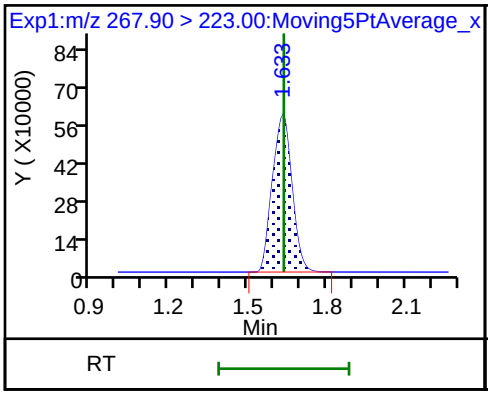
D 1 13C4 PFBA



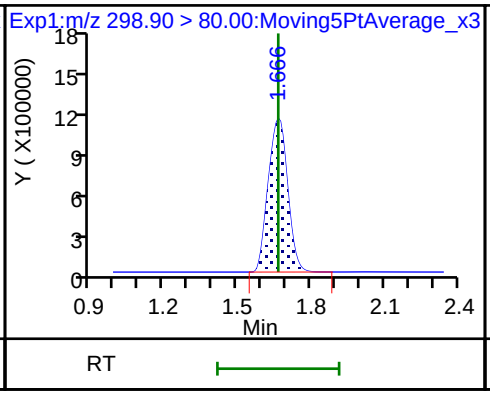
4 Perfluoropentanoic acid



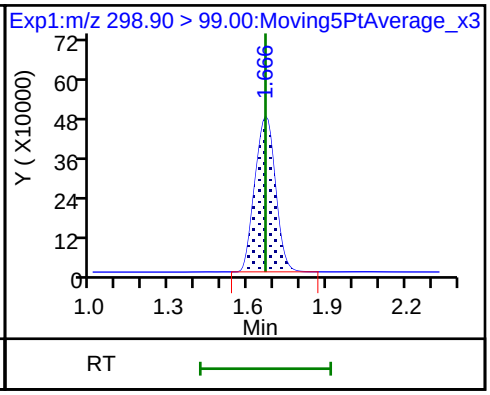
D 3 13C5-PFPeA



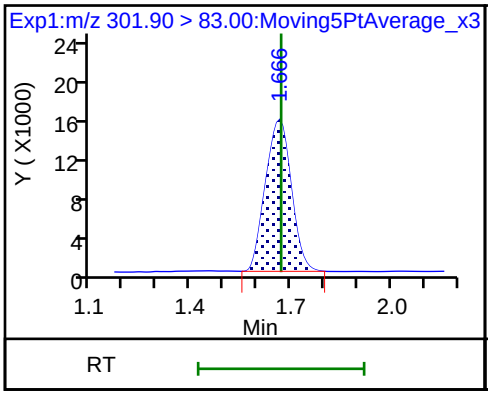
5 Perfluorobutanesulfonic acid



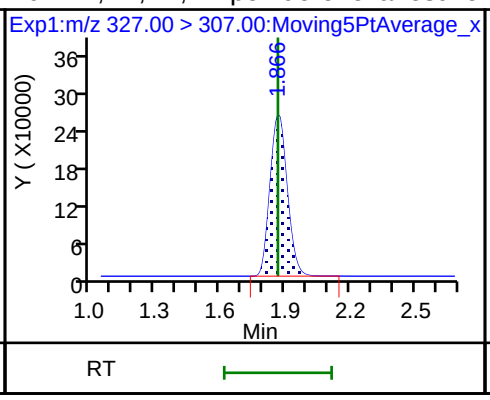
5 Perfluorobutanesulfonic acid



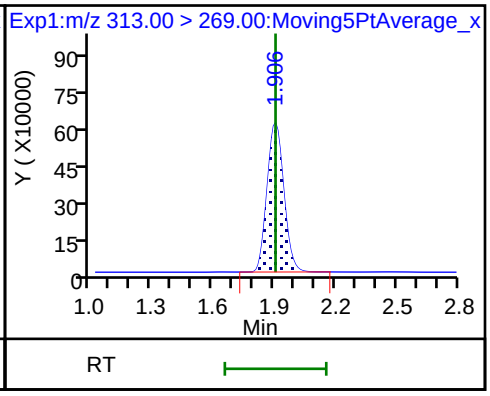
D 47 13C3-PFBS



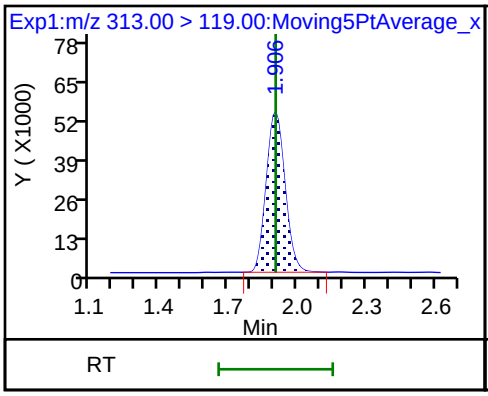
61 1H,1H,2H,2H-perfluorohexanesulfoni



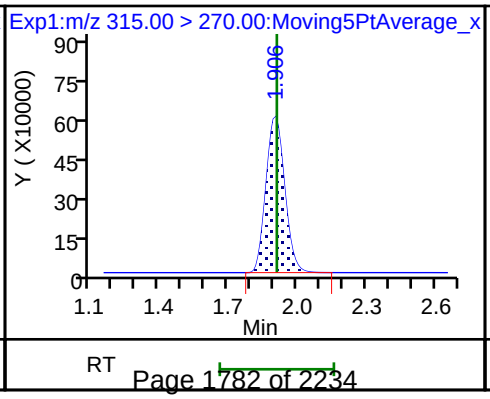
6 Perfluorohexanoic acid



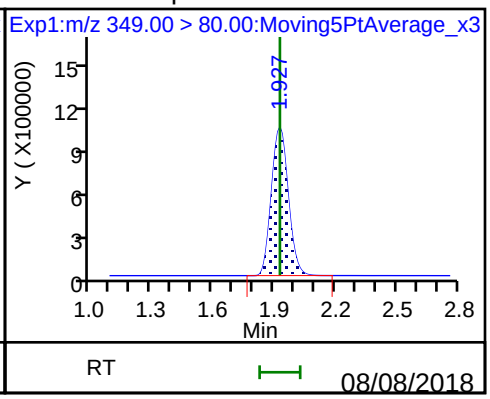
6 Perfluorohexanoic acid



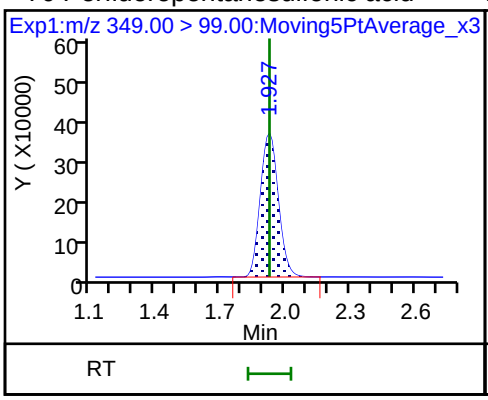
D 7 13C2 PFHxA



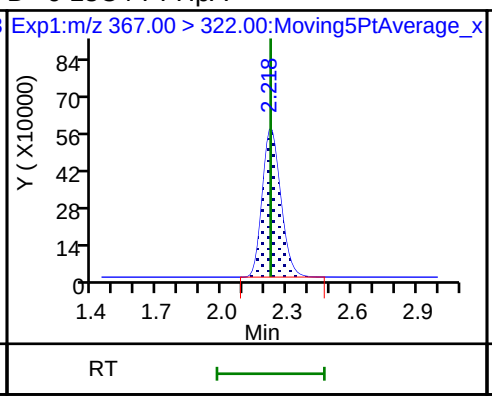
70 Perfluoropentanesulfonic acid



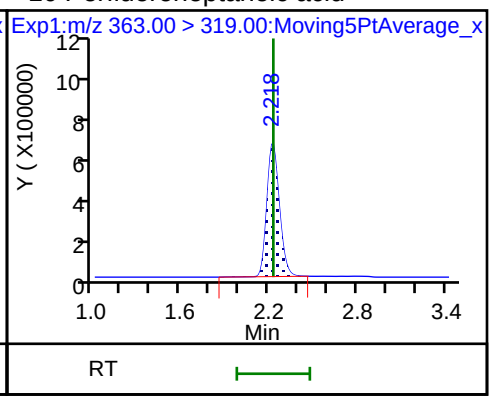
70 Perfluoropentanesulfonic acid



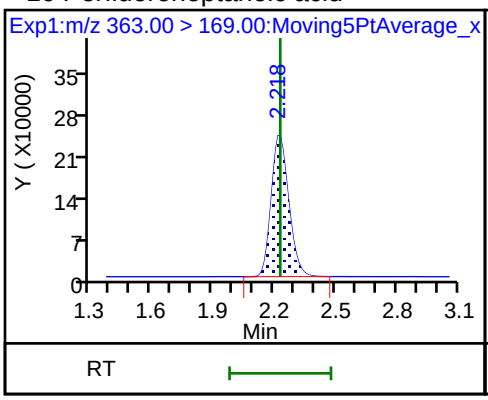
D 9 13C4-PFHpA



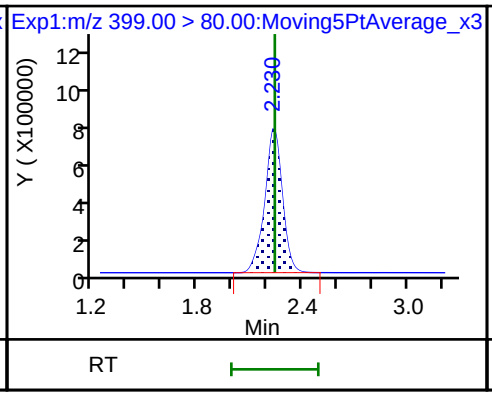
10 Perfluoroheptanoic acid



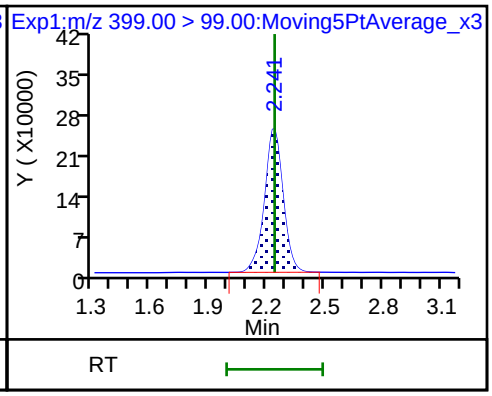
10 Perfluoroheptanoic acid



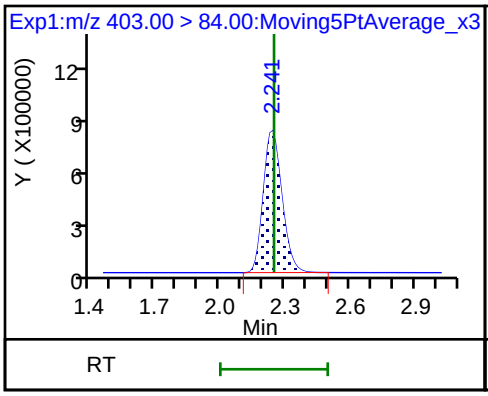
8 Perfluorohexanesulfonic acid



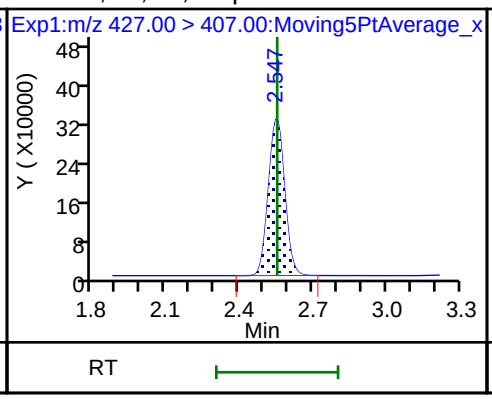
8 Perfluorohexanesulfonic acid



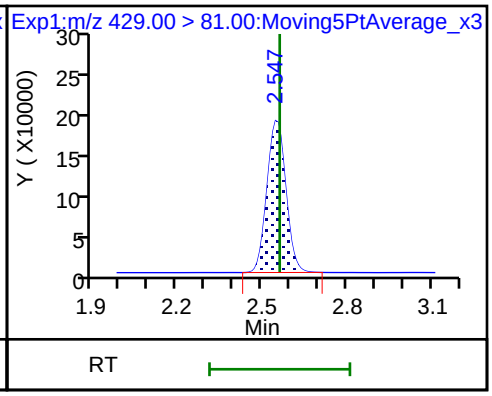
D 11 18O2 PFHxS



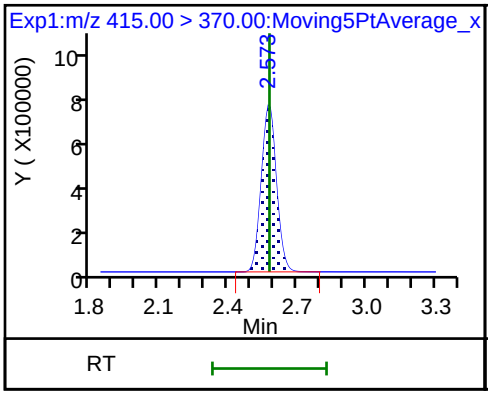
13 1H,1H,2H,2H-perfluorooctanesulfon



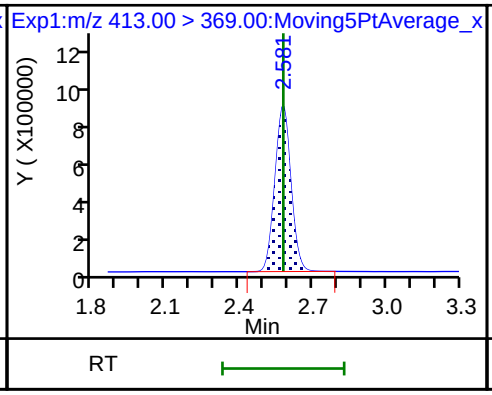
D 12 M2-6:2FTS



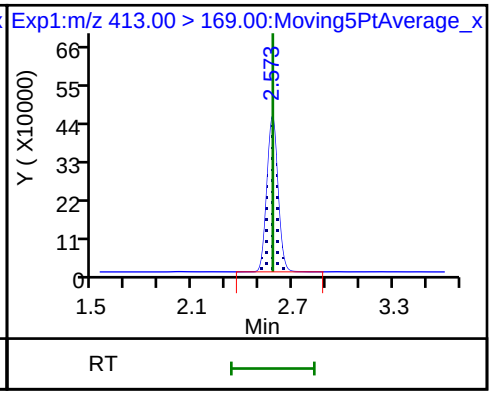
* 62 13C2-PFOA



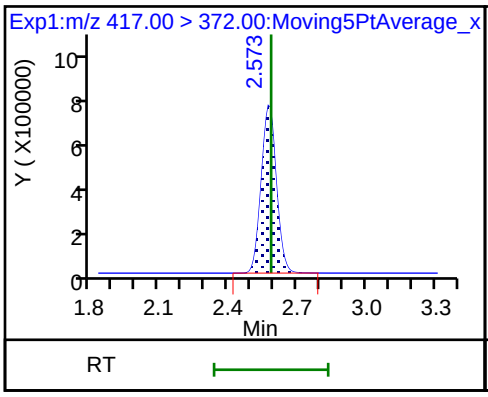
15 Perfluorooctanoic acid



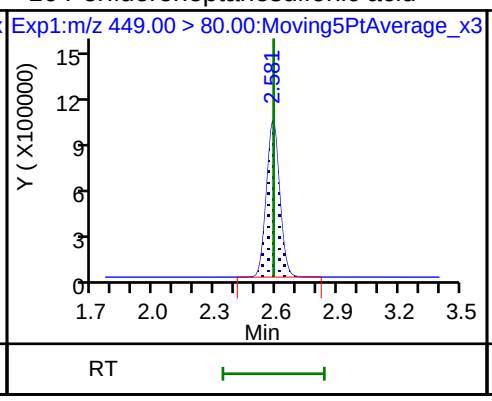
15 Perfluorooctanoic acid



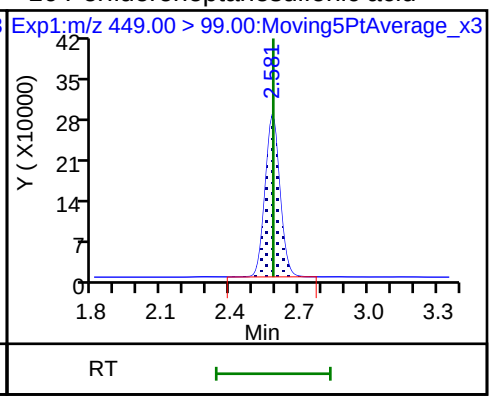
D 14 13C4 PFOA



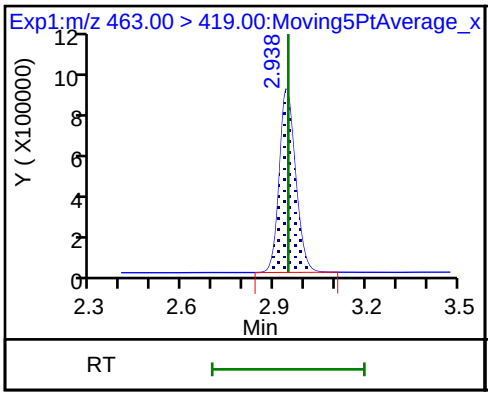
16 Perfluoroheptanesulfonic acid



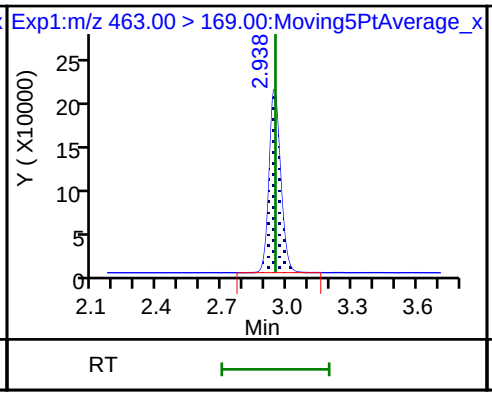
16 Perfluoroheptanesulfonic acid



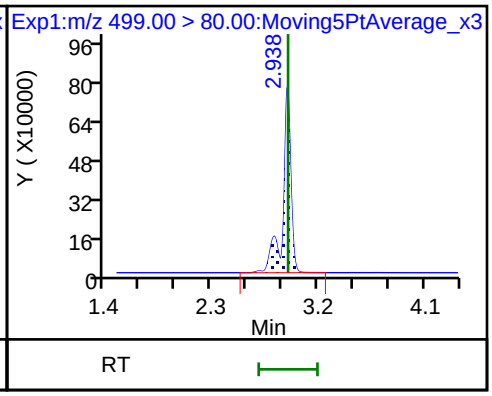
20 Perfluorononanoic acid



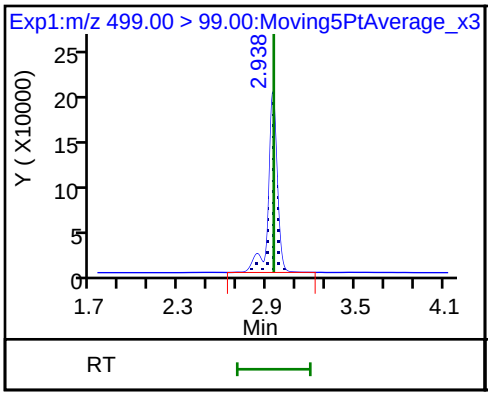
20 Perfluorononanoic acid



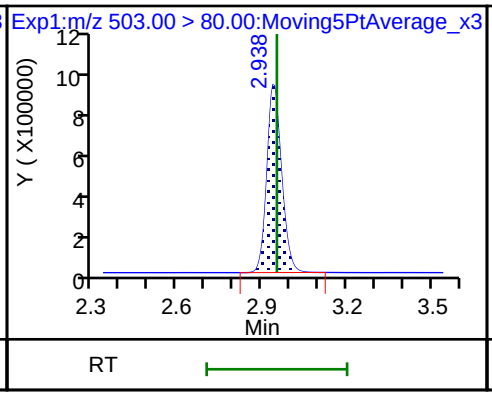
17 Perfluorooctane sulfonic acid



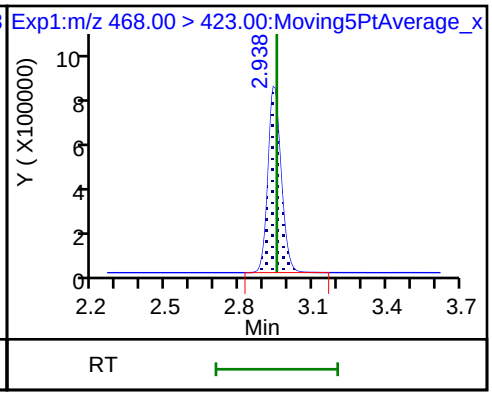
17 Perfluorooctane sulfonic acid



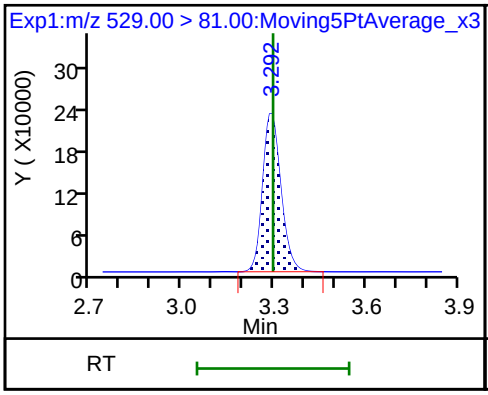
D 18 13C4 PFOS



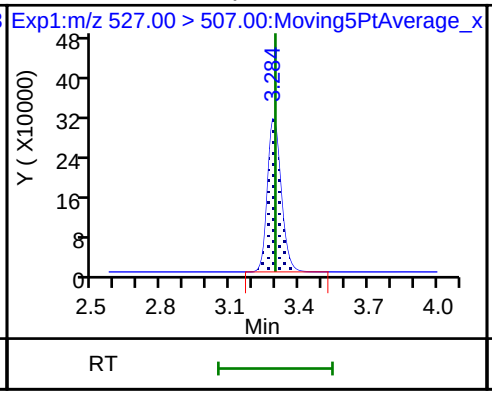
D 19 13C5 PFNA



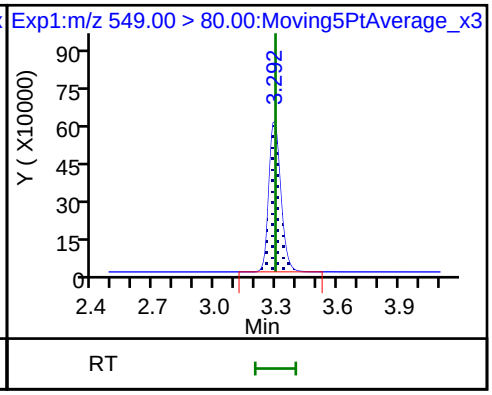
D 26 M2-8:2FTS



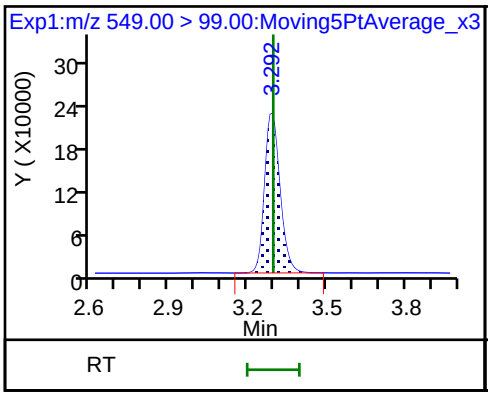
25 1H,1H,2H,2H-perfluorodecanesulfoni



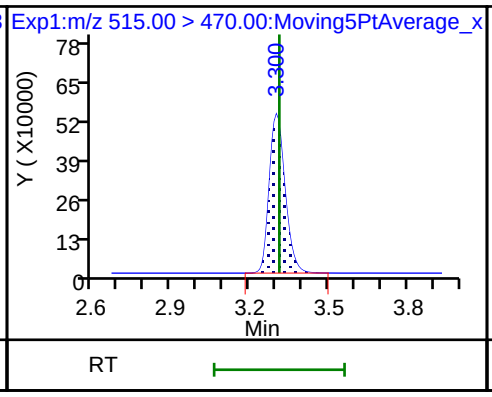
68 Perfluorononanesulfonic acid



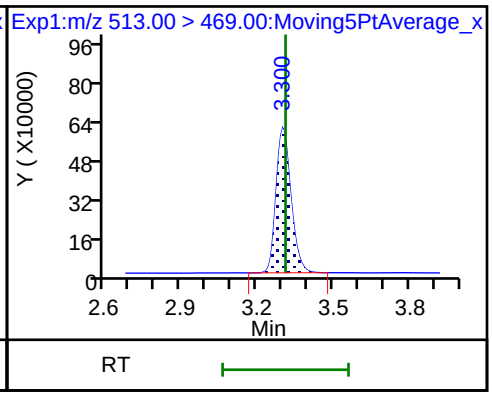
68 Perfluorononanesulfonic acid



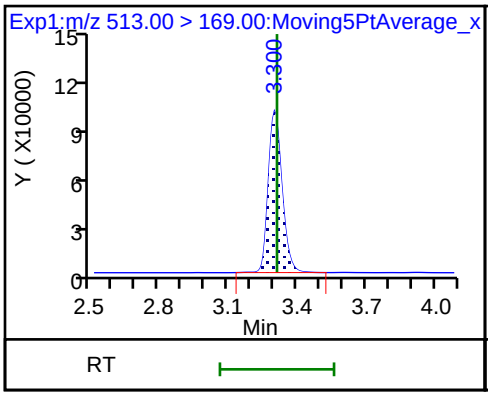
D 23 13C2 PFDA



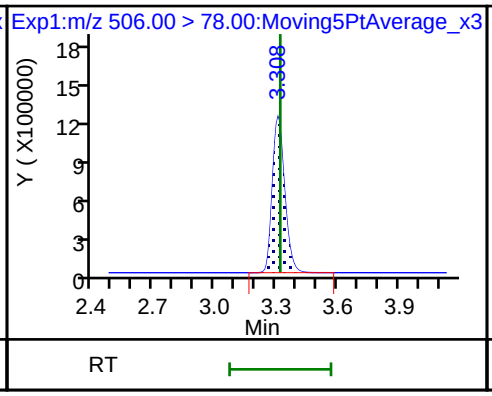
24 Perfluorodecanoic acid



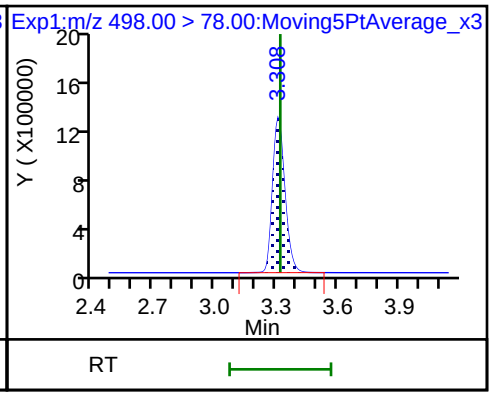
24 Perfluorodecanoic acid



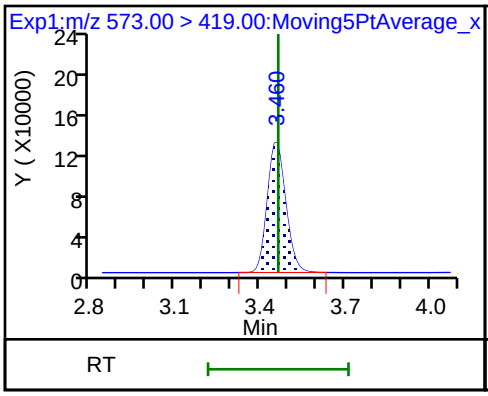
D 21 13C8 FOSA



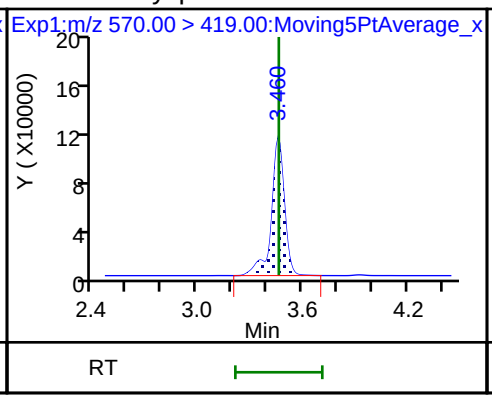
22 Perfluorooctane Sulfonamide



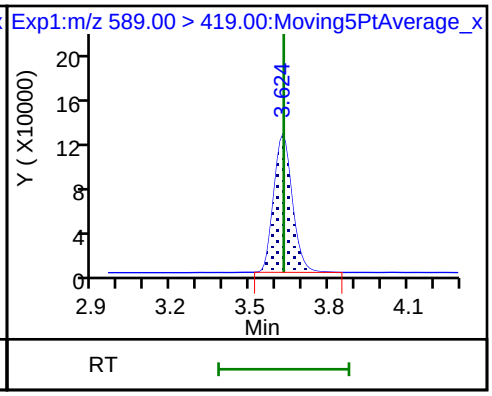
D 27 d3-NMeFOSAA



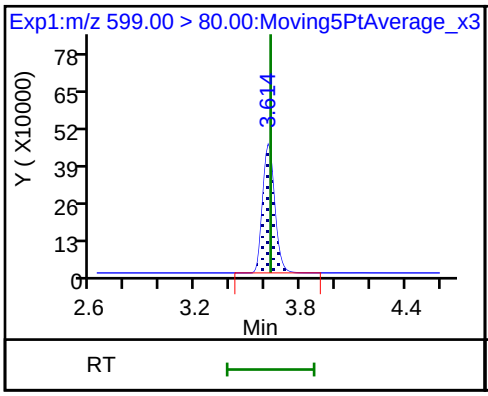
28 N-methyl perfluorooctane sulfonami



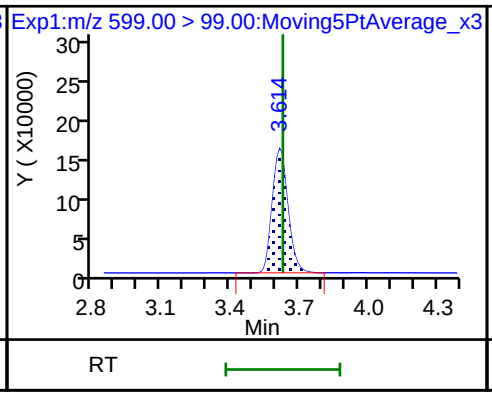
D 32 d5-NEtFOSAA



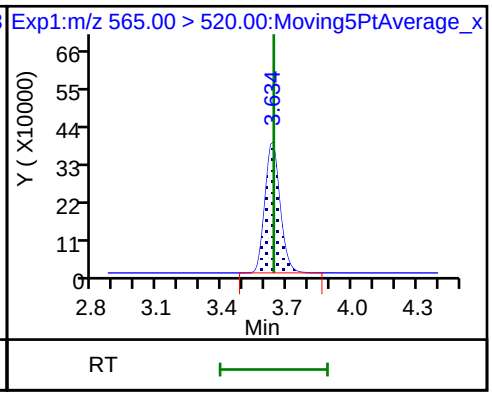
29 Perfluorodecane Sulfonic acid



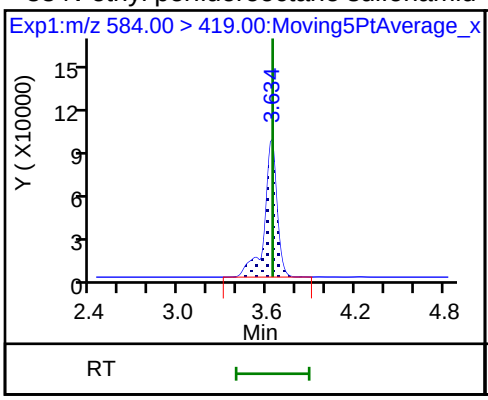
29 Perfluorodecane Sulfonic acid



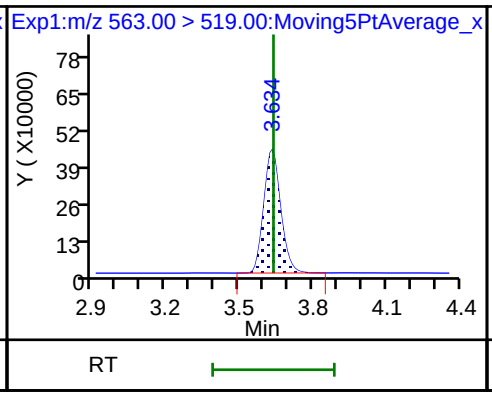
D 30 13C2 PFUnA



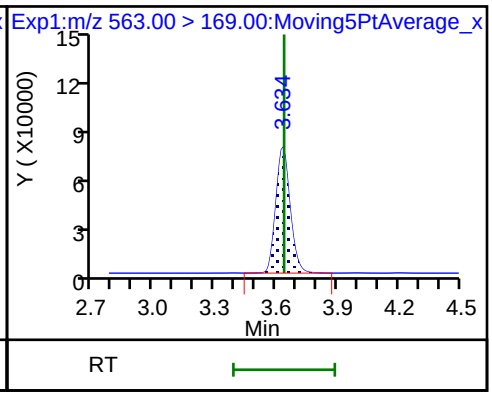
33 N-ethyl perfluorooctane sulfonamid



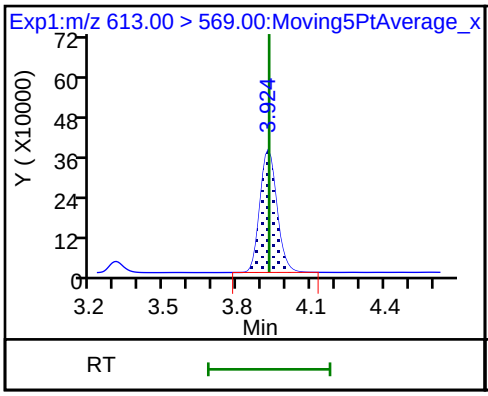
31 Perfluoroundecanoic acid



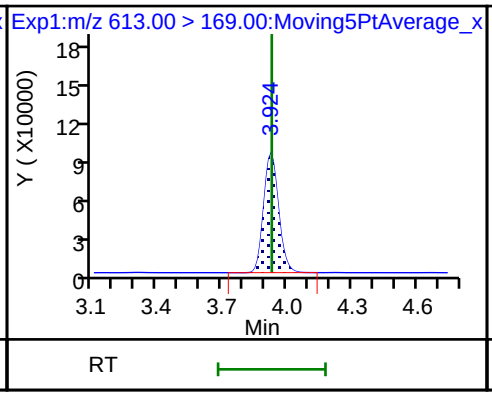
31 Perfluoroundecanoic acid



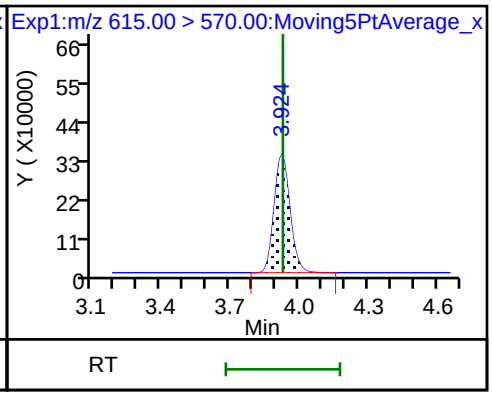
37 Perfluorododecanoic acid



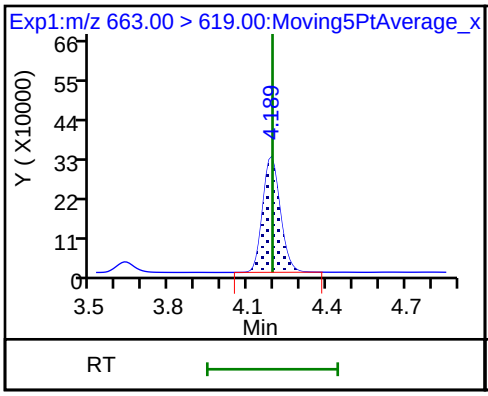
37 Perfluorododecanoic acid



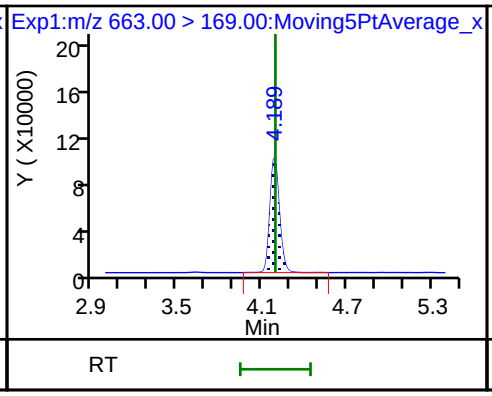
D 36 13C2 PFDoA



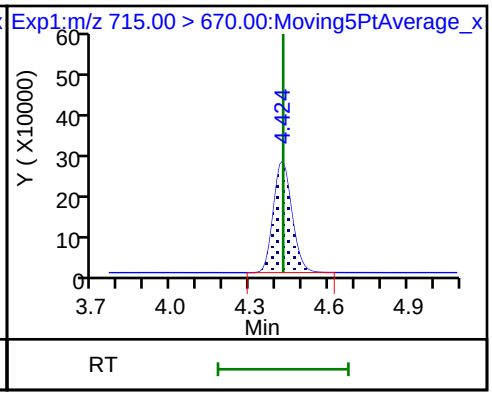
41 Perfluorotridecanoic acid



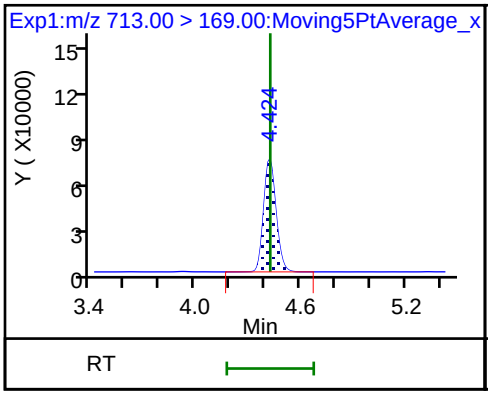
41 Perfluorotridecanoic acid



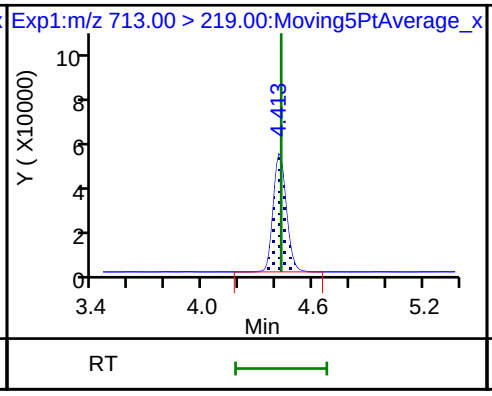
D 43 13C2-PFTeDA



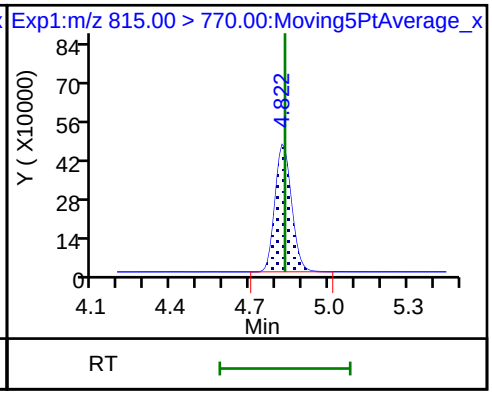
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237052/22 Calibration Date: 07/31/2018 20:33

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.024	0.9788		0.956	1.00	-4.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.210	1.167		0.965	1.00	-3.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.51	77.39		0.883	0.884	-0.2	30.0
4:2 FTS	AveID	15.26	16.51		1.01	0.934	8.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.066	0.997		0.935	1.00	-6.5	30.0
Perfluoropentanesulfonic acid	AveID	70.00	68.64		0.920	0.938	-2.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.138	1.106		0.973	1.00	-2.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.162	1.092		0.855	0.910	-6.1	30.0
6:2 FTS	AveID	1.685	1.602		0.901	0.948	-4.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.166	1.213		1.04	1.00	4.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.331	1.401		1.00	0.952	5.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.079	1.045		0.969	1.00	-3.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.140	1.129		0.919	0.928	-1.0	30.0
8:2 FTS	AveID	1.328	1.255		0.905	0.958	-5.5	30.0
Perfluorononanesulfonic acid	AveID	0.7829	0.7577		0.929	0.960	-3.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.087	1.015		0.933	1.00	-6.7	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9900	1.003		1.01	1.00	1.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.028	1.024		0.995	1.00	-0.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6692	0.6426		0.926	0.964	-4.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9130	0.8276		0.906	1.00	-9.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8969	1.200		1.34	1.00	33.8*	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.080	1.079		0.999	1.00	-0.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9169	0.9089		0.991	1.00	-0.9	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2666	0.2615		0.981	1.00	-1.9	30.0
13C4 PFBA	Ave	1.354	1.333		2.46	2.50	-1.5	30.0
13C5-PFPeA	Ave	0.8708	0.9022		2.59	2.50	3.6	30.0
13C3-PFBS	Ave	0.0258	0.0250		2.25	2.33	-3.4	30.0
13C2 PFHxA	Ave	0.9884	1.015		2.57	2.50	2.7	30.0
13C4-PFHpA	Ave	0.9405	1.000		2.66	2.50	6.3	30.0
18O2 PFHxS	Ave	1.429	1.414		2.34	2.37	-1.1	30.0
M2-6:2FTS	Ave	0.2945	0.2819		2.27	2.38	-4.3	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237052/22 Calibration Date: 07/31/2018 20:33

Instrument ID: A8_N Calib Start Date: 07/30/2018 15:14

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/30/2018 16:00

Lab File ID: 2018.07.31LLA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9607	0.9457		2.46	2.50	-1.6	30.0
13C4 PFOS	Ave	1.026	0.9561		2.23	2.39	-6.8	30.0
13C5 PFNA	Ave	0.8491	0.8493		2.50	2.50	0.0	30.0
M2-8:2FTS	Ave	0.3394	0.2901		2.05	2.40	-14.5	30.0
13C2 PFDA	Ave	0.7029	0.6791		2.42	2.50	-3.4	30.0
13C8 FOSA	Ave	1.464	1.444		2.47	2.50	-1.4	30.0
d3-NMeFOSAA	Ave	0.1590	0.1550		2.44	2.50	-2.5	30.0
d5-NEtFOSAA	Ave	0.1739	0.1753		2.52	2.50	0.8	30.0
13C2 PFUnA	Ave	0.5459	0.4998		2.29	2.50	-8.4	30.0
13C2 PFDoA	Ave	0.5541	0.4679		2.11	2.50	-15.6	30.0
13C2-PFTeDA	Ave	0.5049	0.4088		2.02	2.50	-19.0	30.0
13C2-PFHxDA	Ave	0.8936	0.5796		1.62	2.50	-35.1*	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_027.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 31-Jul-2018 20:33:52 ALS Bottle#: 28 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:46:17 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:46:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.395	1.395	0.0	1.000	1706486	0.9562		95.6	686	
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.394	0.001	0.541	4358608	2.46		98.5	69419	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.637	0.0	1.000	1376496	0.9646		96.5	688	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.636	0.001	0.635	2949408	2.59		104	56273	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.000	2232482	0.8826		99.8	11549	
298.90 > 99.00	1.671	1.671	0.0	1.000	928343		2.40(1.25-3.74)		3303	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.670	0.001	0.648	75875	2.25		96.6	367	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.872	0.0	1.120	503314	1.01		108	22656	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.871	0.001	0.726	505721	NC			5341	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.902	0.0	1.000	1323132	0.9350		93.5	3559	
313.00 > 119.00	1.902	1.902	0.0	1.000	124041		10.67(5.03-15.10)		2424	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.911	-0.009	0.738	3318443	2.57		103	81737	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.151	2101063	0.9197		98.0	32186	
349.00 > 99.00	1.924	1.924	0.0	1.151	812010		2.59(1.36-4.07)		4391	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	1.997	0.002	0.775	248753	NC			10425	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	1.999	0.0	1.000	275317	NC			1410	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.223	0.002	0.863	3268116	2.66		106	60833	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.225	0.0	1.000	1446282	0.9725		97.3	741	
363.00 > 169.00	2.225	2.225	0.0	1.000	547778		2.64(1.13-3.40)		6117	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	1836658	0.8548		93.9	8176	
399.00 > 99.00	2.237	2.237	0.0	1.000	630571		2.91(1.50-4.49)		993	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.248	-0.011	0.868	4372995	2.34		98.9	45145	
65 ADONA										
377.00 > 251.00	2.263	2.263	0.0	0.768	3588661	NC			25378	
377.00 > 85.00	2.263	2.263	0.0	0.768	2081480		1.72(0.84-2.53)		8745	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	559846	0.9014		95.1	7410	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.562	-0.008	0.990	875537	2.27		95.7	14475	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.579	0.0		3269152	2.50			65101	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	1501291	1.04		104	1333	
413.00 > 169.00	2.579	2.579	0.0	1.000	745045		2.02(0.84-2.52)		3875	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.586	-0.007	1.000	3091487	2.46		98.4	42364	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	1667550	1.00		105	17675	
449.00 > 99.00	2.587	2.587	0.0	0.878	448243		3.72(1.94-5.82)		2333	
20 Perfluorononanoic acid										
463.00 > 419.00	2.946	2.946	0.0	1.000	1161116	0.9690		96.9	1732	
463.00 > 169.00	2.946	2.946	0.0	1.000	286906		4.05(1.90-5.69)		8633	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.946	2.946	0.0	1.000	1309592	0.9189		99.0	11215	
499.00 > 99.00	2.946	2.946	0.0	1.000	304310		4.30(2.31-6.93)		1562	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.952	-0.006	1.142	2988246	2.23		93.2	45047	
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.952	-0.006	1.142	2776559	2.50		100	61077	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.153	3.153	0.0	1.070	2153082	NC			19024	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.296	-0.001	1.278	908557	2.05		85.5	10518	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.295	0.0	1.000	456080	0.9053		94.5	18364	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.295	0.0	1.119	909413	0.9291		96.8	22840	
549.00 > 99.00	3.295	3.295	0.0	1.119	348292		2.61(1.33-3.97)		2058	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.303	3.311	-0.008	1.281	2220209	2.42		96.6	53809	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.303	3.303	0.0	1.000	901385	0.9335		93.3	1611	
513.00 > 169.00	3.303	3.303	0.0	1.000	164165		5.49(2.36-7.09)		3063	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.319	-0.008	1.284	4721082	2.47		98.6	40238	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.311	0.0	1.000	1893327	1.01		101	19485	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.464	-0.010	1.339	506741	2.44		97.5	13718	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.463	0.0	1.003	207459	1.00		99.5	3264	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.628	-0.001	1.407	573172	2.52		101	6606	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.618	3.618	0.0	1.228	774479	0.9257		96.0	8188	
599.00 > 99.00	3.618	3.618	0.0	1.228	259106		2.99(1.39-4.16)		3653	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.638	-0.001	1.410	1634043	2.29		91.6	56569	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.637	3.637	0.0	1.003	189750	0.9065		90.6	4525	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.637	3.637	0.0	1.000	784228	1.34		134	2643	
563.00 > 169.00	3.637	3.637	0.0	1.000	132449		5.92(2.12-6.36)		5472	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.287	3107104	NC			65045	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.928	0.0	1.000	659892	1.00		99.9	209	
613.00 > 169.00	3.928	3.928	0.0	1.000	163444		4.04(2.13-6.40)		3079	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.928	0.0	1.523	1529516	2.11		84.4	17796	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.192	0.0	1.067	556077	0.99		99.1	178	
663.00 > 169.00	4.192	4.192	0.0	1.067	173433		3.21(1.25-3.76)		1560	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.426	0.0	1.716	1336439	2.02		81.0	6295	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.426	0.0	1.000	139773	0.9809		98.1	2055	
713.00 > 219.00	4.426	4.426	0.0	1.000	90793		1.54(0.71-2.13)		1545	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.833	0.0	1.874	1894759	1.62		64.9	2818	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	742781	NC			65.7	
813.00 > 169.00	4.833	4.833	0.0	1.000	117107		6.34(2.86-8.58)		1293	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.173	0.0	1.070	843524	NC			257	
913.00 > 169.00	5.173	5.173	0.0	1.070	104950		8.04(3.83-11.48)		1046	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 12:46:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_027.d

Injection Date: 31-Jul-2018 20:33:52 Instrument ID: A8_N

Lims ID: CCV L4

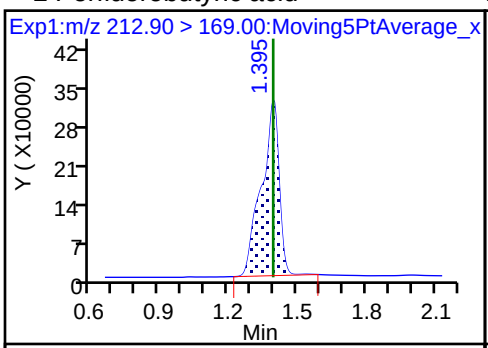
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 22

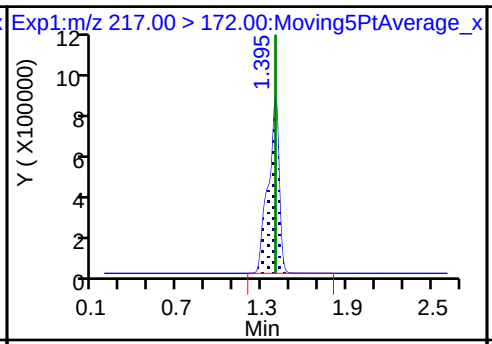
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

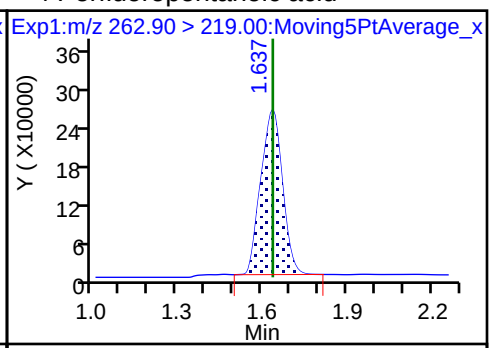
2 Perfluorobutyric acid



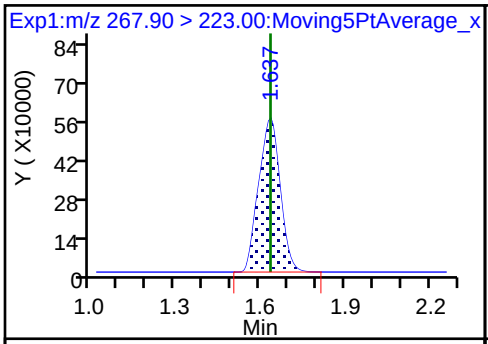
D 1 13C4 PFBA



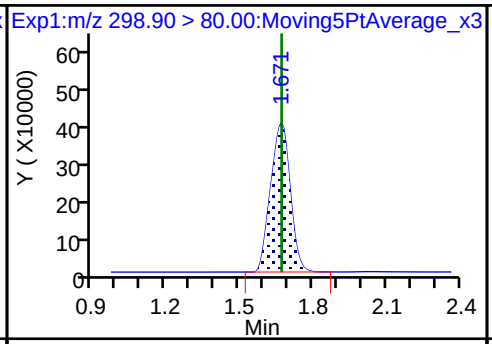
4 Perfluoropentanoic acid



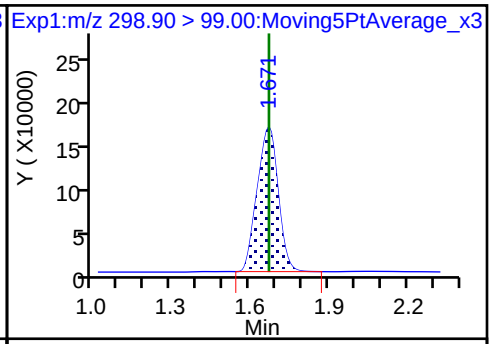
D 3 13C5-PFPeA



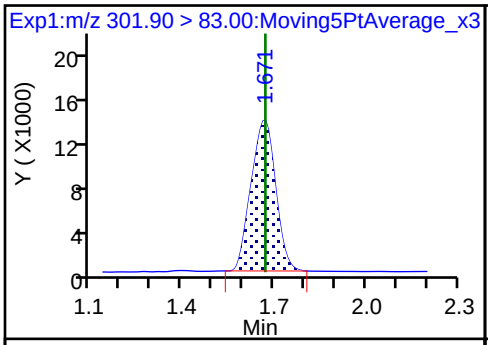
5 Perfluorobutanesulfonic acid



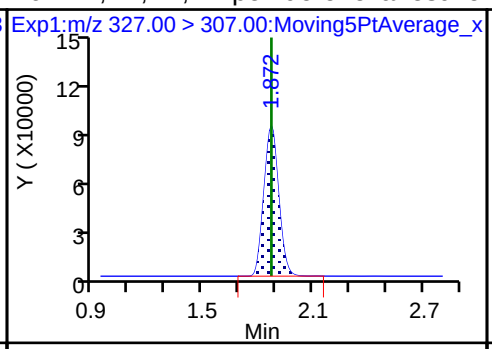
5 Perfluorobutanesulfonic acid



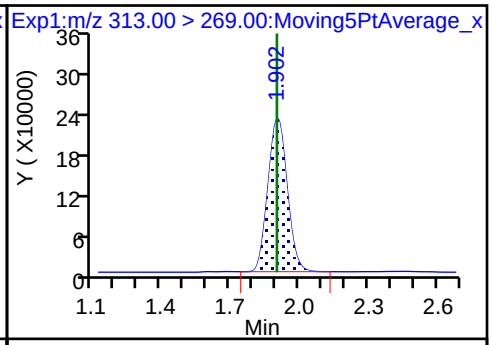
D 47 13C3-PFBS



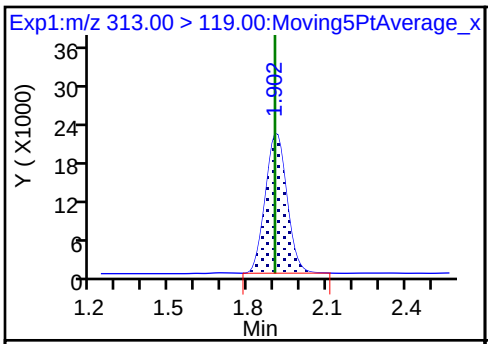
61 1H,1H,2H,2H-perfluorohexanesulfoni



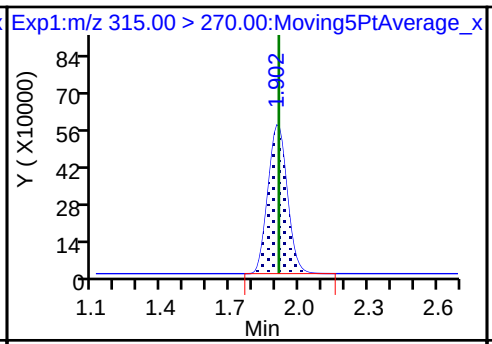
6 Perfluorohexanoic acid



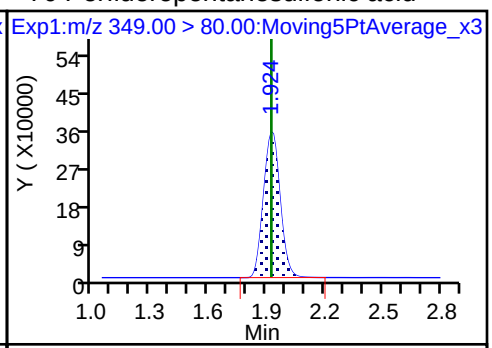
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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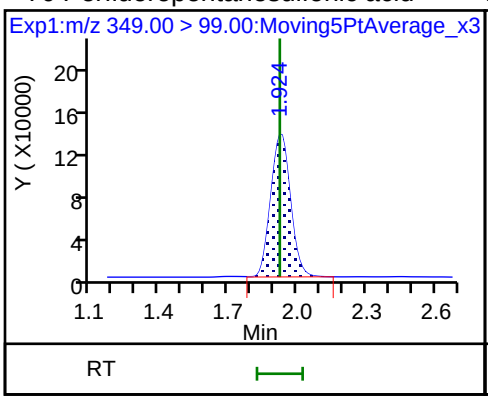
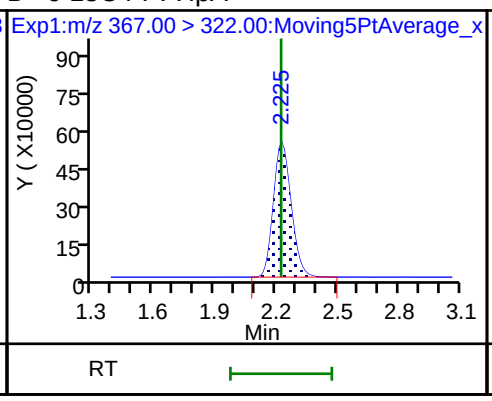
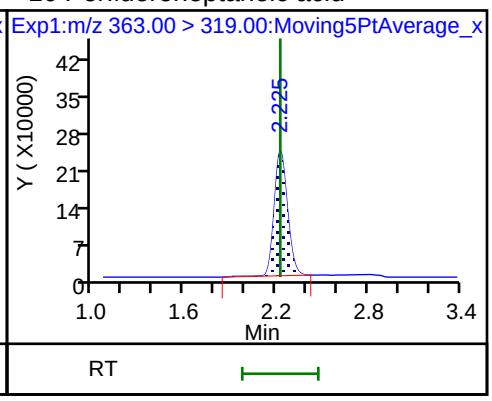


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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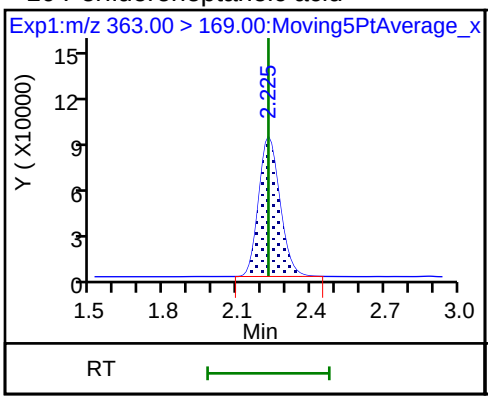
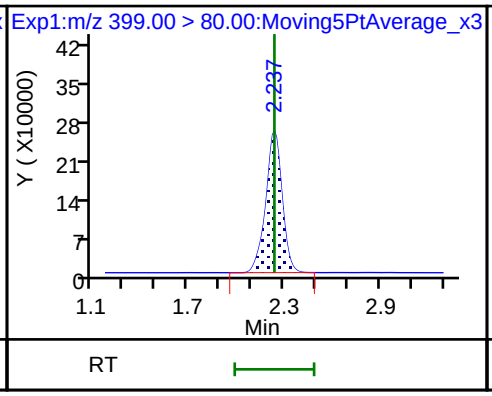


8 Perfluorohexanesulfonic acid



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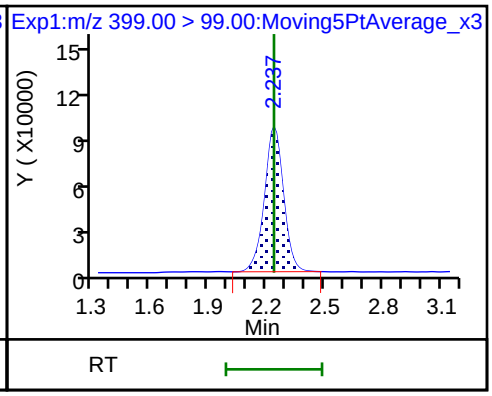
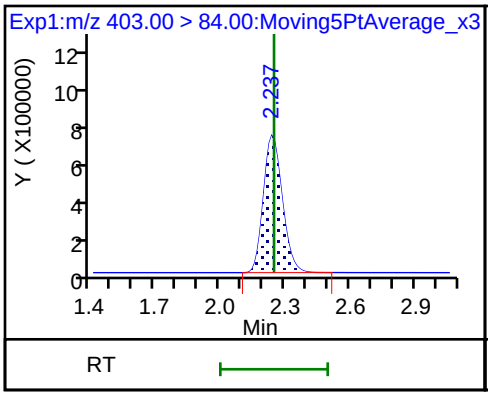
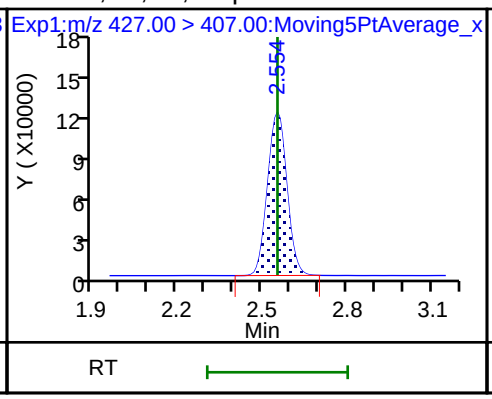


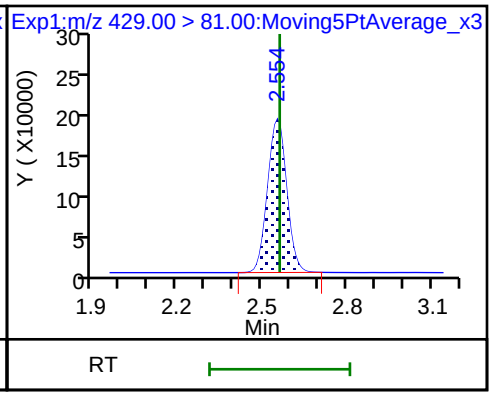
D 11 18O2 PFHxS



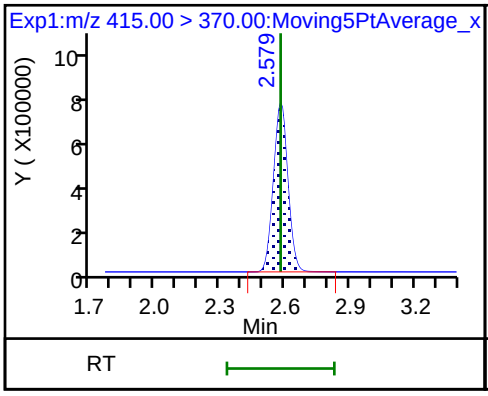
13 1H,1H,2H,2H-perfluorooctanesulfon



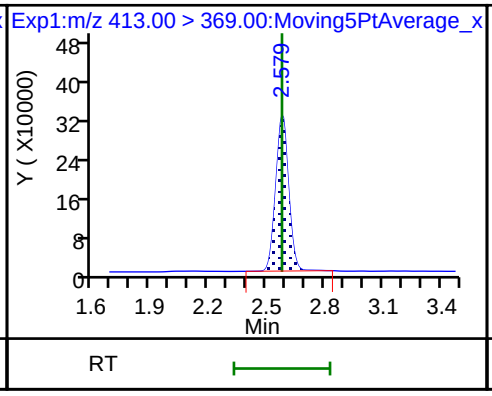
D 12 M2-6:2FTS



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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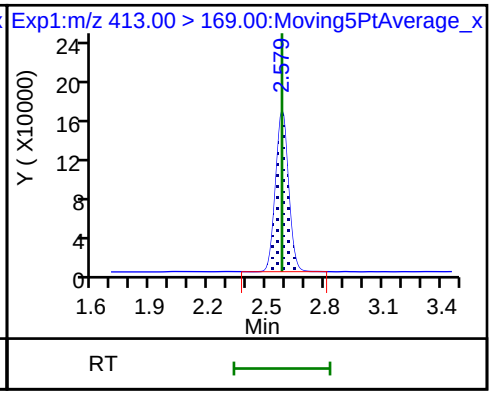
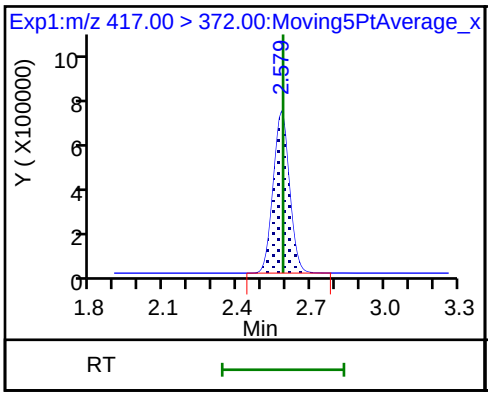
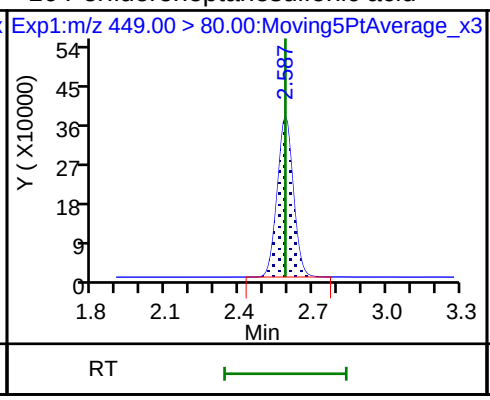


D 14 13C4 PFOA



16 Perfluoroheptanesulfonic acid



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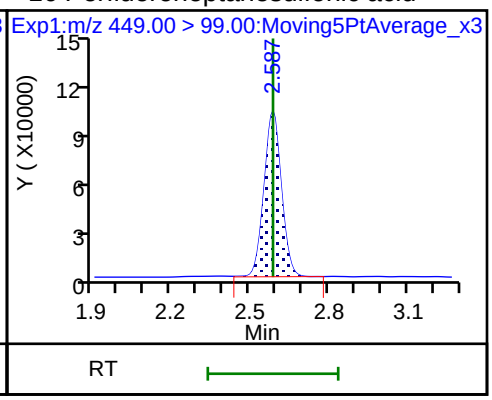
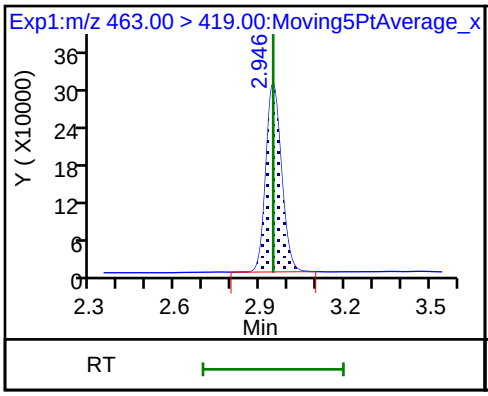


20 Perfluorononanoic acid



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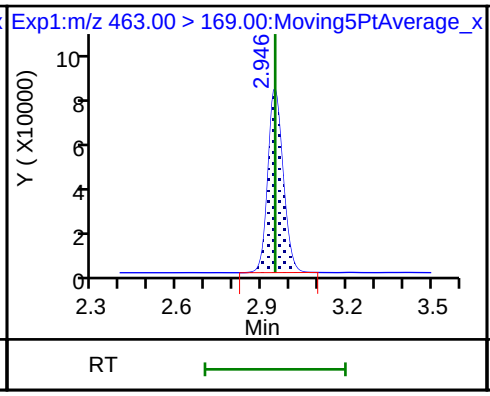
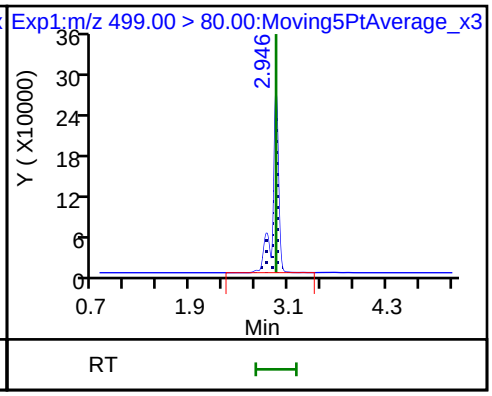


17 Perfluorooctane sulfonic acid



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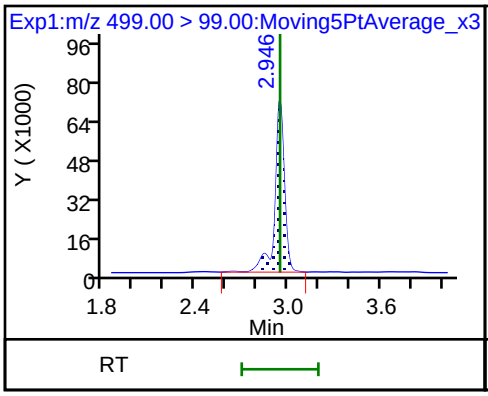
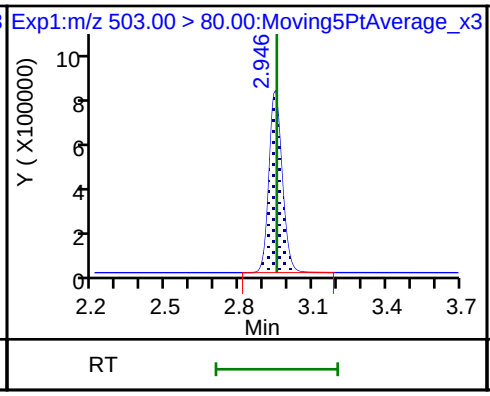
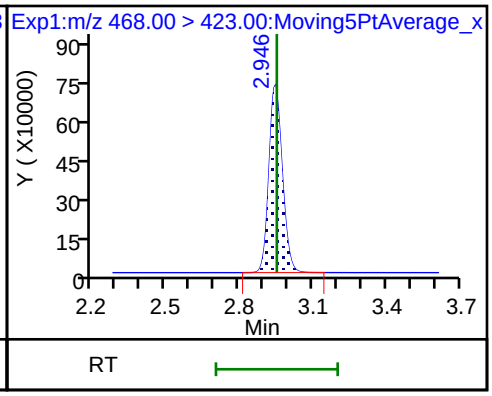


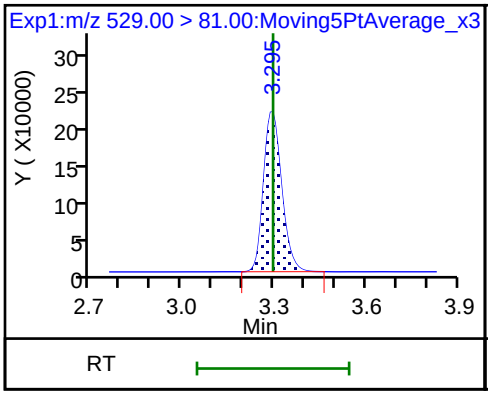
D 18 13C4 PFOS



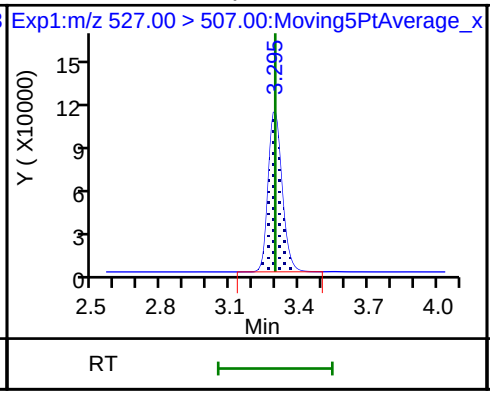
D 19 13C5 PFNA



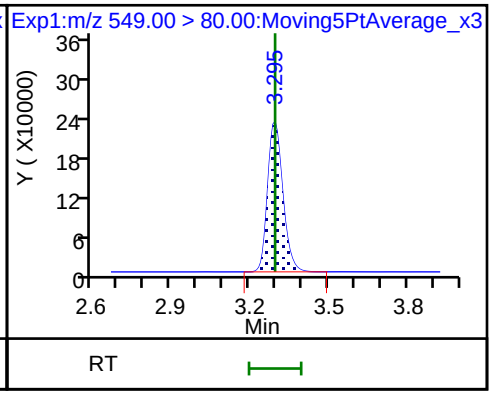
D 26 M2-8:2FTS



25 1H,1H,2H,2H-perfluorodecanesulfoni



68 Perfluorononanesulfonic acid



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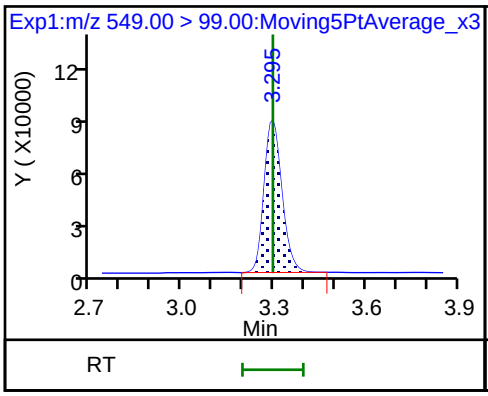
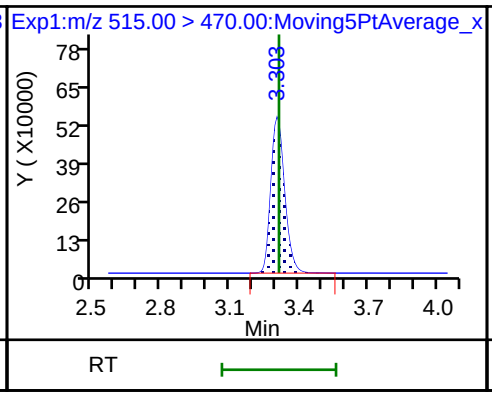
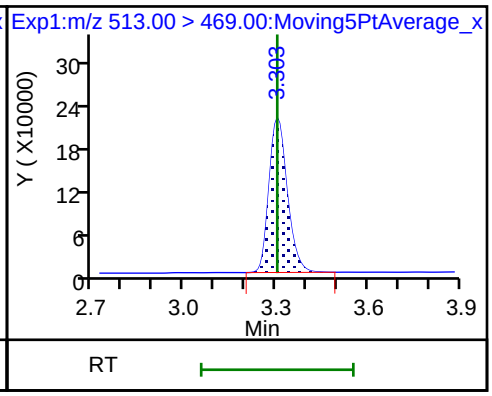
68 Perfluorononanesulfonic acid



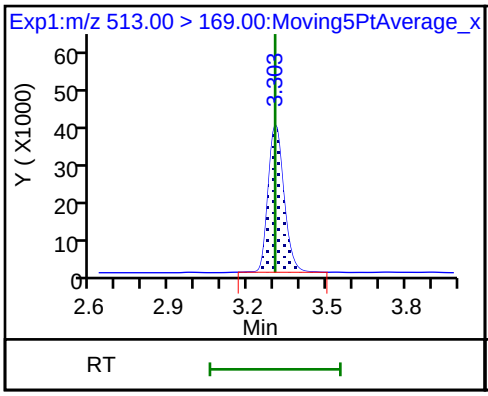
D 23 13C2 PFDA



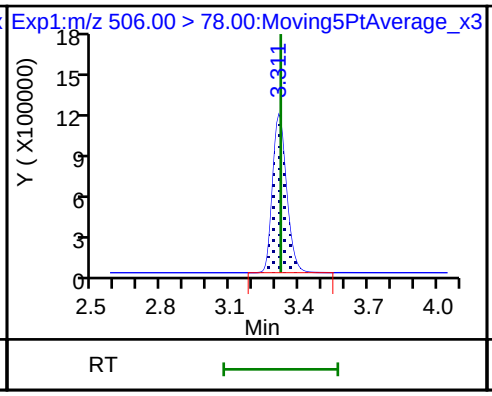
24 Perfluorodecanoic acid



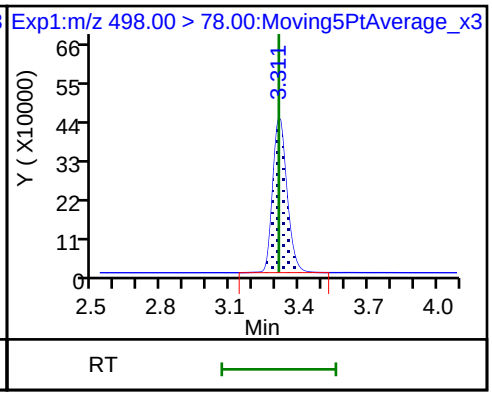
24 Perfluorodecanoic acid



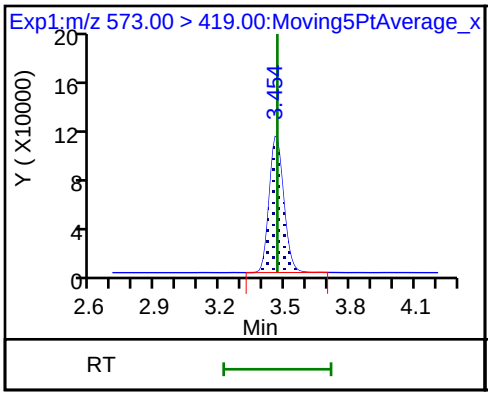
D 21 13C8 FOSA



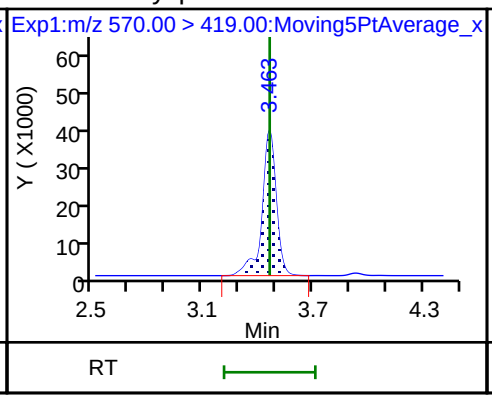
22 Perfluorooctane Sulfonamide



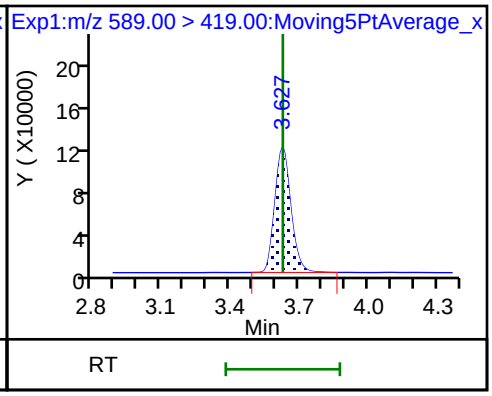
D 27 d3-NMeFOSAA



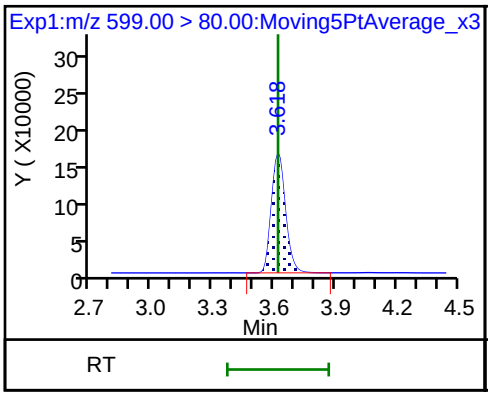
28 N-methyl perfluorooctane sulfonami



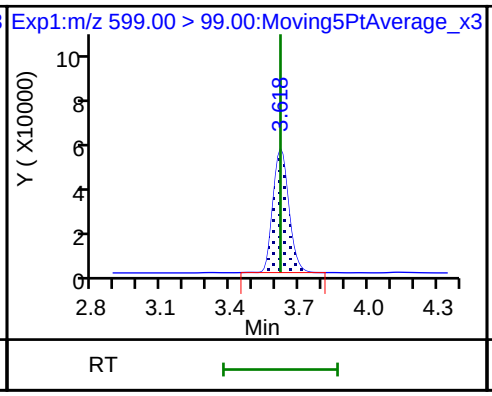
D 32 d5-NEtFOSAA



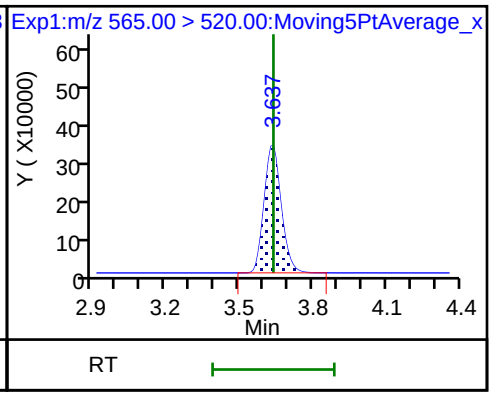
29 Perfluorodecane Sulfonic acid



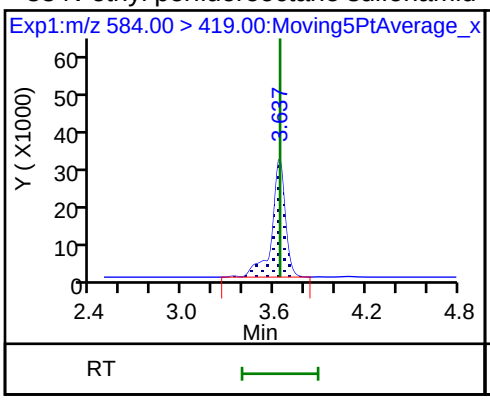
29 Perfluorodecane Sulfonic acid



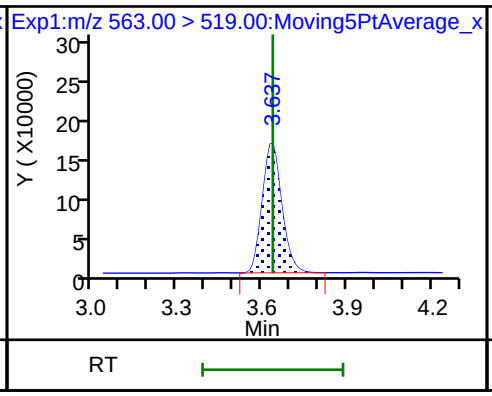
D 30 13C2 PFUnA



33 N-ethyl perfluorooctane sulfonamid



31 Perfluoroundecanoic acid



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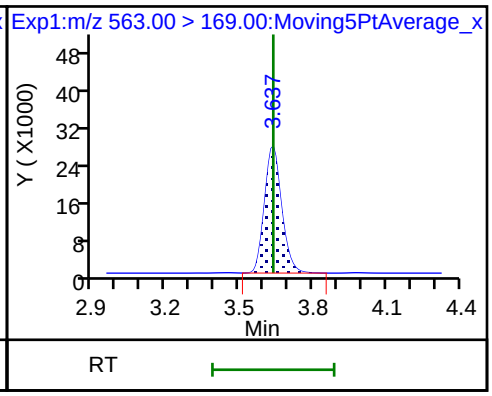
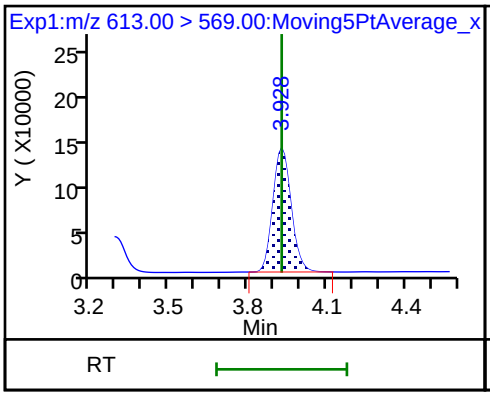
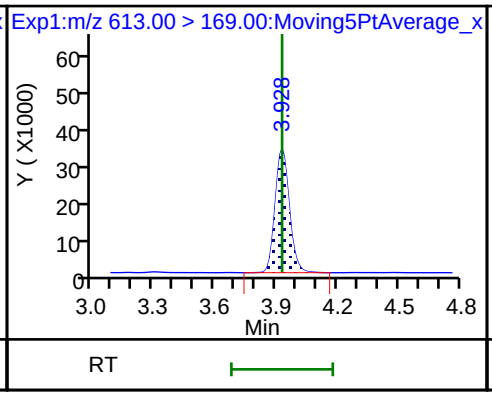


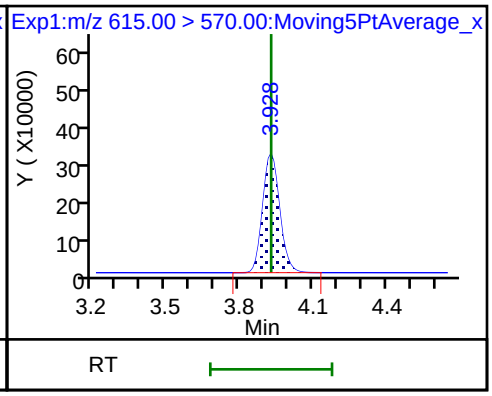
37 Perfluorododecanoic acid



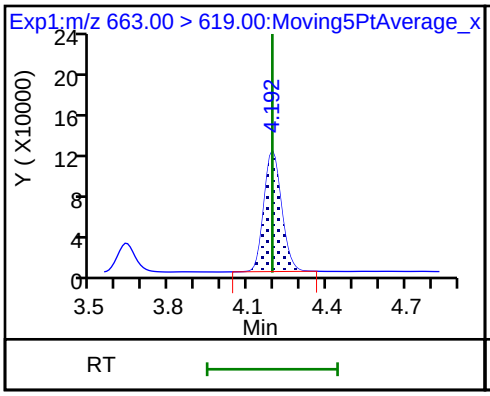
37 Perfluorododecanoic acid



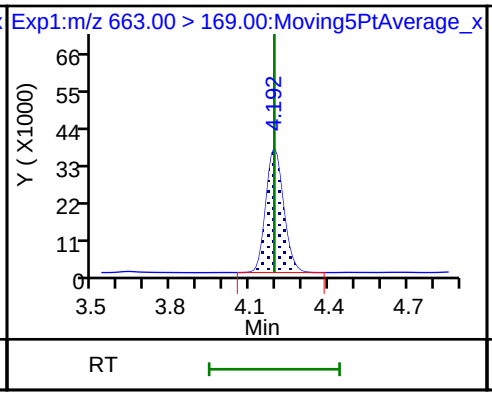
D 36 13C2 PFDoA



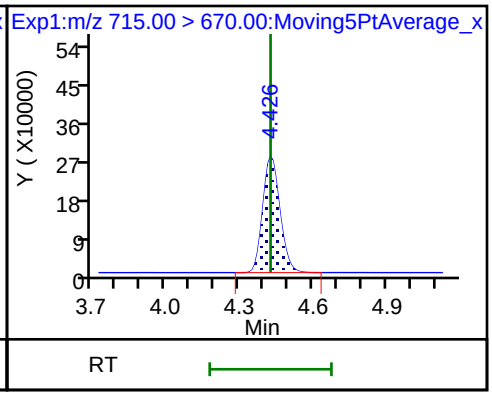
41 Perfluorotridecanoic acid



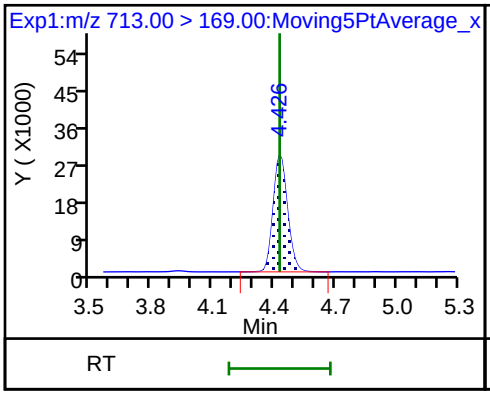
41 Perfluorotridecanoic acid



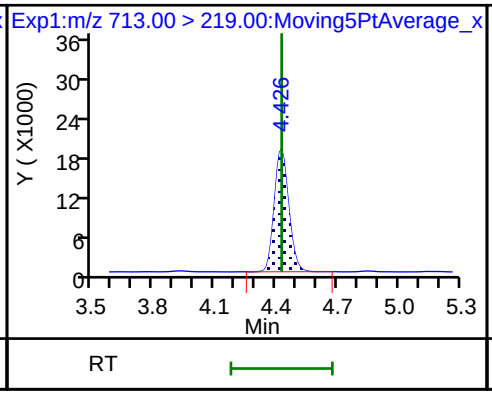
D 43 13C2-PFTeDA



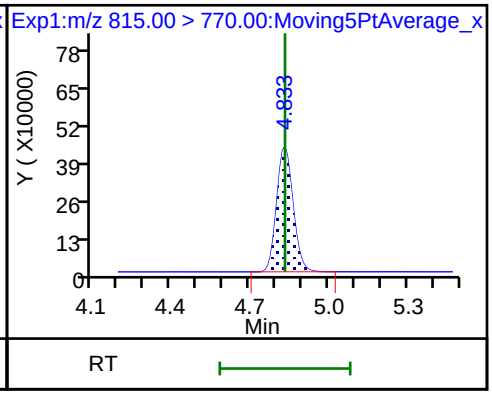
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-237402/10 Calibration Date: 08/01/2018 14:01

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.996		2.53	2.50	1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.141		2.38	2.50	-4.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	78.28		2.26	2.21	2.1	30.0
4:2 FTS	AveID	17.21	18.09		2.45	2.34	5.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.073		2.54	2.50	1.7	30.0
Perfluoropentanesulfonic acid	AveID	67.65	71.70		2.49	2.35	6.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.180		2.54	2.50	1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.098		2.16	2.28	-5.0	30.0
6:2 FTS	AveID	1.654	1.634		2.34	2.37	-1.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.173		2.54	2.50	1.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.361		2.34	2.38	-1.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.076		2.49	2.50	-0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.120		2.32	2.32	-0.2	30.0
8:2 FTS	AveID	1.351	1.284		2.28	2.40	-4.9	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7689		2.57	2.40	7.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.063		2.49	2.50	-0.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.010		2.56	2.50	2.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	0.9942		2.44	2.50	-2.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6058		2.24	2.41	-6.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.9063		2.54	2.50	1.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.219		2.47	2.50	-1.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.124		2.59	2.50	3.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9558		2.54	2.50	1.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2709		2.51	2.50	0.6	30.0
13C4 PFBA	Ave	1.440	1.501		2.61	2.50	4.3	30.0
13C5-PFPeA	Ave	0.9481	0.999		2.63	2.50	5.4	30.0
13C3-PFBS	Ave	0.0273	0.0284		2.42	2.33	4.2	30.0
13C2 PFHxA	Ave	1.026	1.058		2.58	2.50	3.2	30.0
13C4-PFHpA	Ave	0.9943	1.027		2.58	2.50	3.3	30.0
18O2 PFHxS	Ave	1.494	1.570		2.49	2.37	5.1	30.0
M2-6:2FTS	Ave	0.2913	0.3055		2.49	2.38	4.9	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-237402/10 Calibration Date: 08/01/2018 14:01

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9713		2.53	2.50	1.2	30.0
13C4 PFOS	Ave	1.032	1.079		2.50	2.39	4.6	30.0
13C5 PFNA	Ave	0.8365	0.8635		2.58	2.50	3.2	30.0
M2-8:2FTS	Ave	0.2839	0.2881		2.43	2.40	1.5	30.0
13C2 PFDA	Ave	0.6256	0.6373		2.55	2.50	1.9	30.0
13C8 FOSA	Ave	1.516	1.575		2.60	2.50	3.9	30.0
d3-NMeFOSAA	Ave	0.1518	0.1582		2.61	2.50	4.2	30.0
13C2 PFUnA	Ave	0.4818	0.4684		2.43	2.50	-2.8	30.0
d5-NEtFOSAA	Ave	0.1627	0.1659		2.55	2.50	2.0	30.0
13C2 PFDoA	Ave	0.4172	0.4308		2.58	2.50	3.3	30.0
13C2-PFTeDA	Ave	0.3502	0.3637		2.60	2.50	3.8	30.0
13C2-PFHxDA	Ave	0.6033	0.6229		2.58	2.50	3.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 01-Aug-2018 14:01:42 ALS Bottle#: 17 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:58:55 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:39:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.003	0.541	5158997	2.61		104	85495	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.396	-0.005	1.000	5138118	2.53			1232	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	3919947	2.38			1698	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.635	3434840	2.63		105	55728	
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.669	-0.012	0.644	90781	2.42		104	426	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.671	-0.005	1.005	6754766	2.26			41131	
298.90 > 99.00	1.666	1.671	-0.005	1.005	2808886		2.40(1.25-3.74)		13438	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.872	-0.006	1.126	1649631	2.45			61313	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.872	-0.006	0.725	670160	NC			7799	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.895	1.903	-0.008	1.000	3902411	2.54			7245	
313.00 > 119.00	1.895	1.903	-0.008	1.000	347547		11.23(5.03-15.10)		4820	
D 7 13C2 PFHxA										
315.00 > 270.00	1.895	1.903	-0.008	0.737	3637776	2.58		103	72472	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.163	6564767	2.49			72476	
349.00 > 99.00	1.916	1.928	-0.012	1.157	2371753		2.77(1.36-4.07)		12317	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.000	0.003	0.779	169507	NC			4270	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.991	2.002	-0.011	0.994	634603	NC			2525	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.225	-0.008	0.862	3531170	2.58		103	61136	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.217	2.226	-0.009	1.000	4167871	2.54			1936	
363.00 > 169.00	2.217	2.226	-0.009	1.000	1563964		2.66(1.13-3.40)		15045	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.237	-0.008	1.000	5395477	2.16			20268	
399.00 > 99.00	2.229	2.237	-0.008	1.000	1851466		2.91(1.50-4.49)		2832	
D 11 18O2 PFHxS										
403.00 > 84.00	2.229	2.238	-0.009	0.866	5106773	2.49		105	57818	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.772	9836221	NC			61243	
377.00 > 85.00	2.267	2.270	-0.003	0.772	5856972		1.68(0.84-2.53)		25221	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.546	2.554	-0.008	1.000	1627073	2.34			23474	
D 12 M2-6:2FTS										
429.00 > 81.00	2.546	2.556	-0.010	0.990	997741	2.49		105	14512	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.580	-0.008	1.000	3338986	2.53		101	48960	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.581	-0.009		3437702	2.50			58528	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.581	-0.009	1.000	3920928	2.54			2215	
413.00 > 169.00	2.572	2.581	-0.009	1.000	2042358		1.92(0.84-2.52)		8644	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.580	2.587	-0.007	0.879	4806506	2.34			33495	
449.00 > 99.00	2.580	2.587	-0.007	0.879	1302594		3.69(1.94-5.82)		13848	
D 18 13C4 PFOS										
503.00 > 80.00	2.937	2.946	-0.009	1.142	3546365	2.50		105	38150	
D 19 13C5 PFNA										
468.00 > 423.00	2.937	2.948	-0.011	1.142	2968342	2.58		103	47853	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.937	2.949	-0.012	1.000	3856513	2.32			36179	
499.00 > 99.00	2.937	2.949	-0.012	1.000	885014		4.36(2.31-6.93)		8338	
20 Perfluorononanoic acid										
463.00 > 419.00	2.937	2.949	-0.012	1.000	3194149	2.49			7264	
463.00 > 169.00	2.937	2.949	-0.012	1.000	778384		4.10(1.90-5.69)		21558	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.148	3.158	-0.010	1.072	6018978	NC			38345	
D 26 M2-8:2FTS										
529.00 > 81.00	3.283	3.292	-0.009	1.276	948689	2.43		101	16643	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.283	3.292	-0.009	1.000	1218401	2.28			43042	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.283	3.295	-0.012	1.118	2738195	2.57			47146	
549.00 > 99.00	3.283	3.295	-0.012	1.118	986495		2.78(1.33-3.97)		6451	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.291	3.306	-0.015	1.279	2190677	2.55		102	41149	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.291	3.308	-0.017	1.000	2329283	2.49			3298	
513.00 > 169.00	3.291	3.308	-0.017	1.000	408402		5.70(2.36-7.09)		8194	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.312	-0.005	1.286	5414039	2.60		104	48450	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.307	3.313	-0.006	1.000	5468758	2.56			38250	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.449	3.459	-0.010	1.341	543823	2.61		104	12011	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.458	3.465	-0.007	1.003	540665	2.44			5417	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.611	3.620	-0.009	1.230	2166453	2.24			41917	
599.00 > 99.00	3.611	3.620	-0.009	1.230	731739		2.96(1.39-4.16)		7029	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.621	3.627	-0.006	1.408	570452	2.55		102	5372	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.621	3.633	-0.012	1.000	516993	2.54			14918	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.621	3.634	-0.013	1.000	1962447	2.47			4374	
563.00 > 169.00	3.621	3.634	-0.013	1.000	347507		5.65(2.12-6.36)		10450	
D 30 13C2 PFUnA										
565.00 > 520.00	3.621	3.634	-0.013	1.408	1610245	2.43		97.2	42028	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.785	3.792	-0.007	1.289	9090381	NC			82214	
D 36 13C2 PFDoA										
615.00 > 570.00	3.920	3.925	-0.005	1.524	1481030	2.58		103	18241	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.920	3.927	-0.007	1.000	1664007	2.59			514	
613.00 > 169.00	3.920	3.927	-0.007	1.000	388004		4.29(2.13-6.40)		8144	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.174	4.188	-0.014	1.065	1415575	2.54			433	
663.00 > 169.00	4.174	4.188	-0.014	1.065	436616		3.24(1.25-3.76)		3223	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.416	4.423	-0.007	1.717	1250322	2.60		104	5684	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.416	4.423	-0.007	1.000	338703	2.51			4600	
713.00 > 219.00	4.405	4.423	-0.018	0.998	238055		1.42(0.71-2.13)		3041	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.815	4.826	-0.011	1.872	2141386	2.58		103	3112	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.815	4.827	-0.012	1.000	1974016	NC			123	
813.00 > 169.00	4.815	4.827	-0.012	1.000	324992		6.07(2.86-8.58)		3024	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.150	5.166	-0.016	1.070	1860264	NC			569	
913.00 > 169.00	5.150	5.166	-0.016	1.070	229133		8.12(3.83-11.48)		2098	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00012 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:58:57 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_010.d

Injection Date: 01-Aug-2018 14:01:42 Instrument ID: A8_N

Lims ID: ICV Full

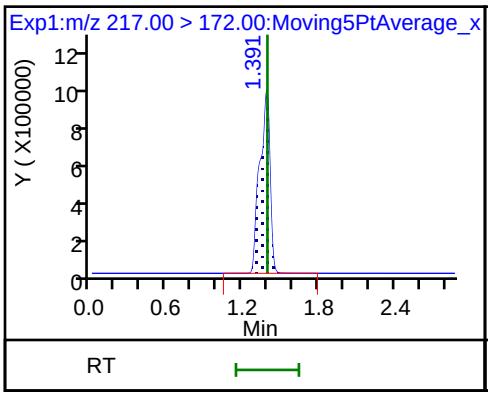
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 17 Worklist Smp#: 10

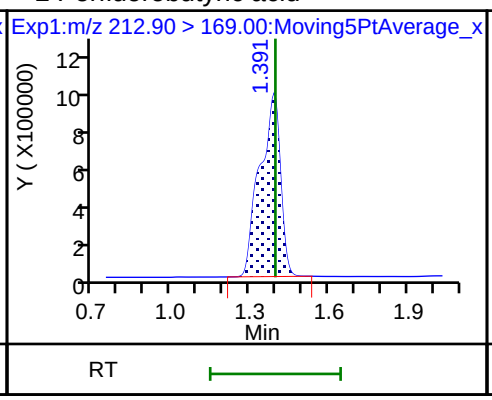
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

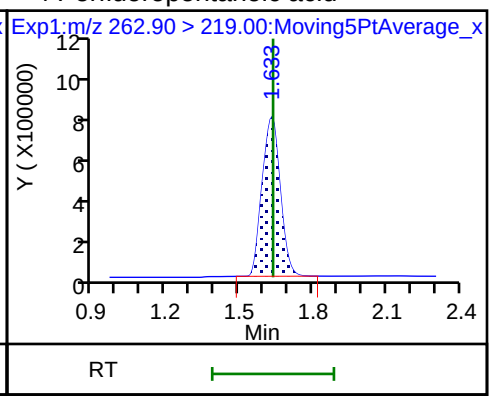
D 1 13C4 PFBA



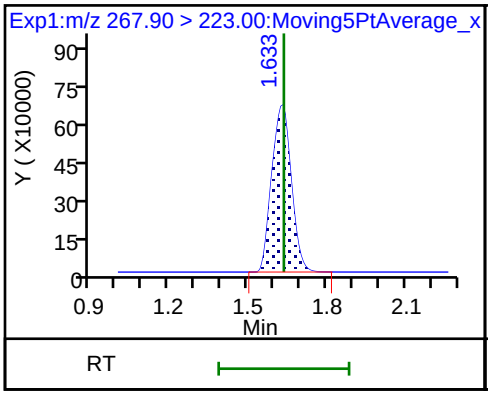
2 Perfluorobutyric acid



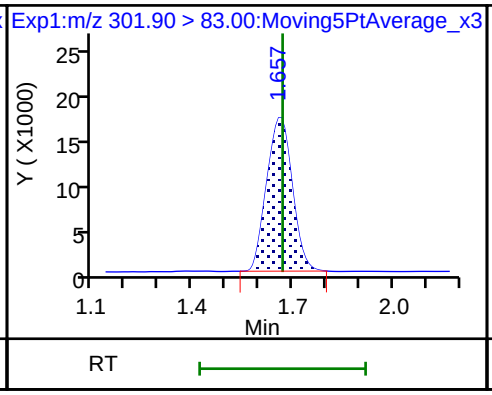
4 Perfluoropentanoic acid



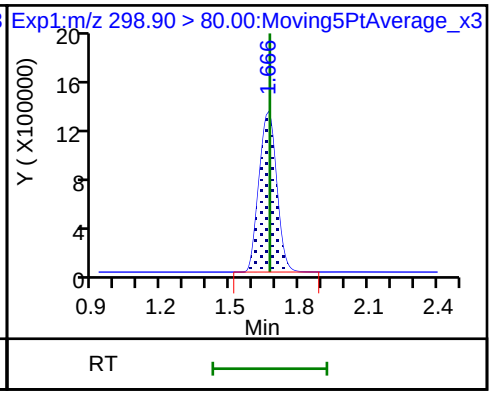
D 3 13C5-PFPeA



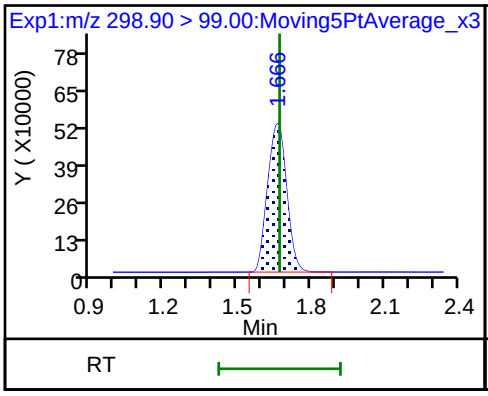
D 47 13C3-PFBS



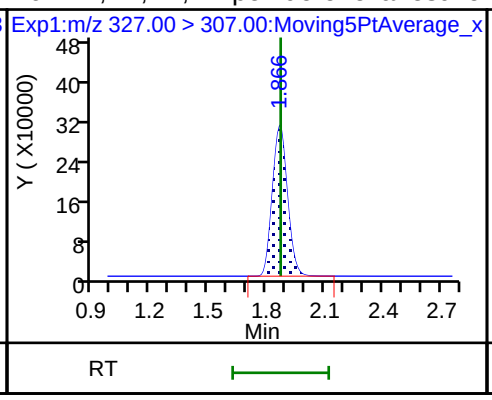
5 Perfluorobutanesulfonic acid



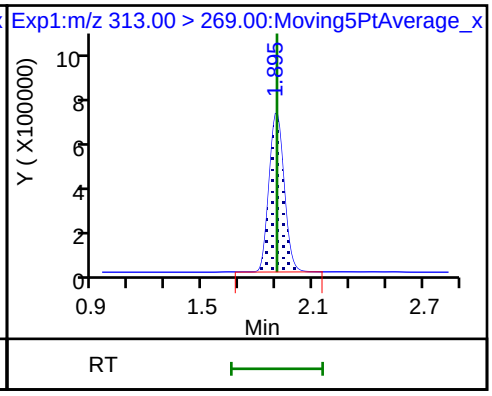
5 Perfluorobutanesulfonic acid



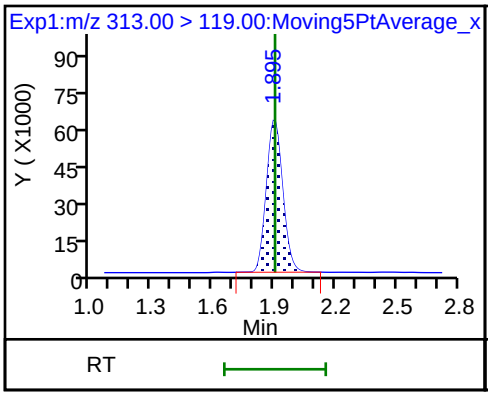
61 1H,1H,2H,2H-perfluorohexanesulfoni



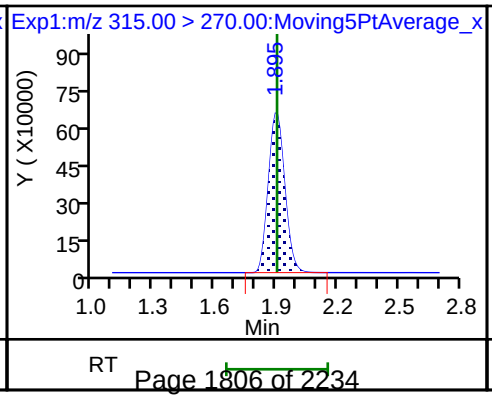
6 Perfluorohexanoic acid



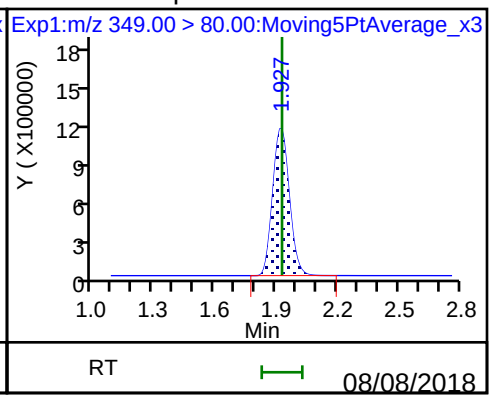
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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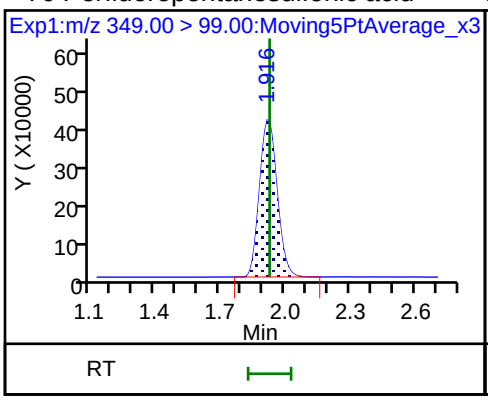
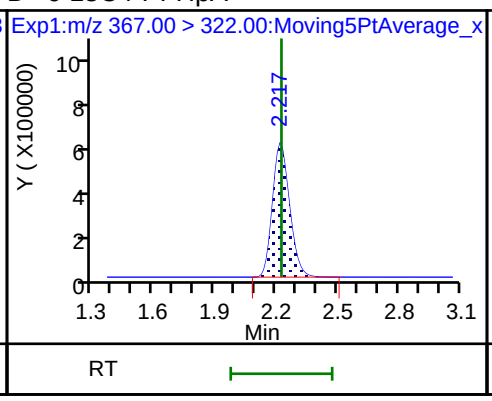
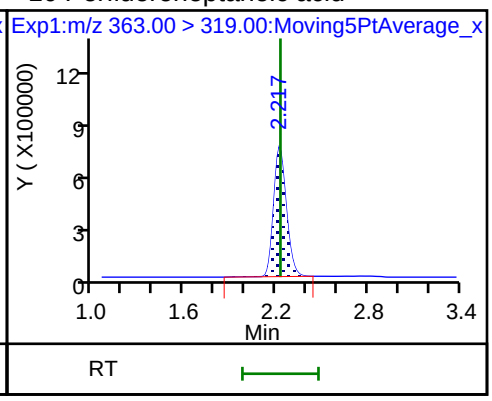


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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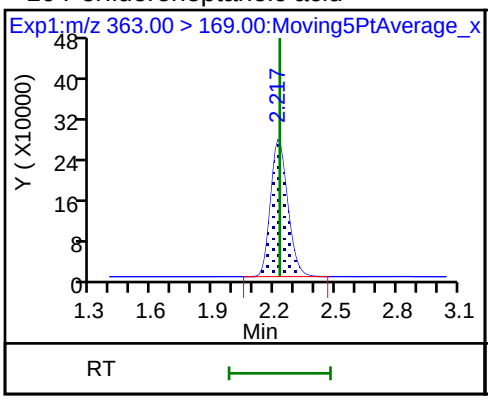
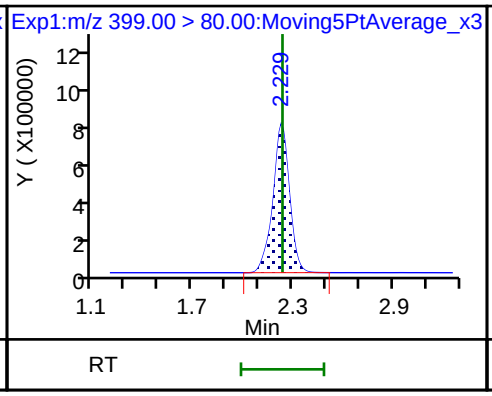
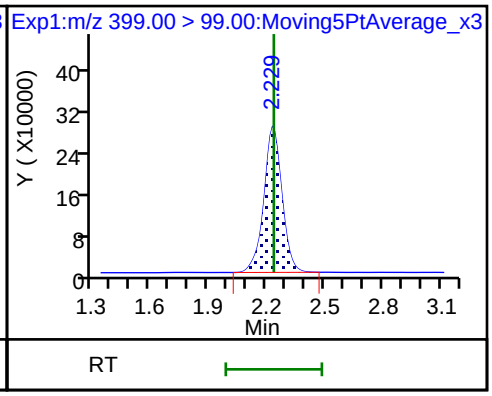


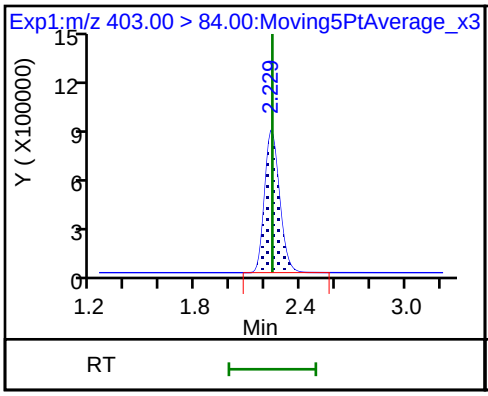
8 Perfluorohexanesulfonic acid



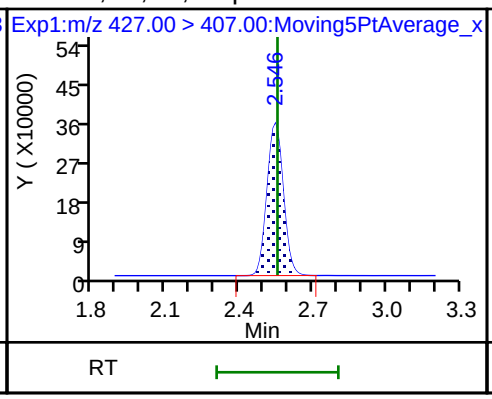
8 Perfluorohexanesulfonic acid



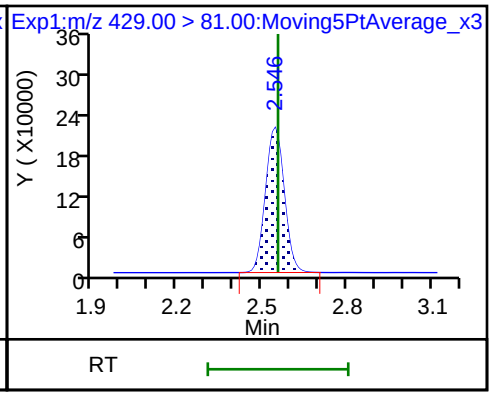
D 11 18O2 PFHxS



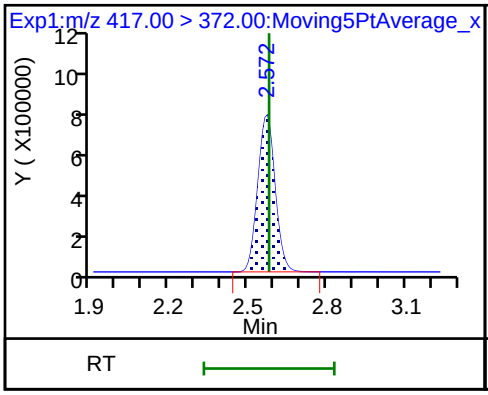
13 1H,1H,2H,2H-perfluorooctanesulfon



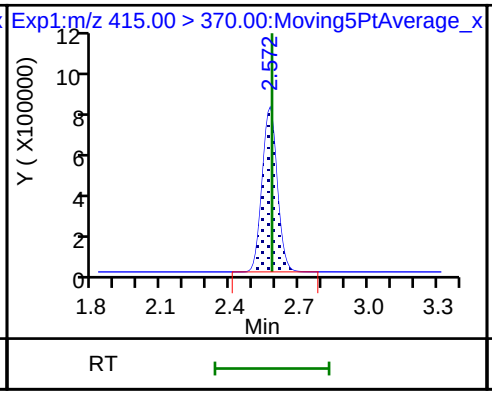
D 12 M2-6:2FTS



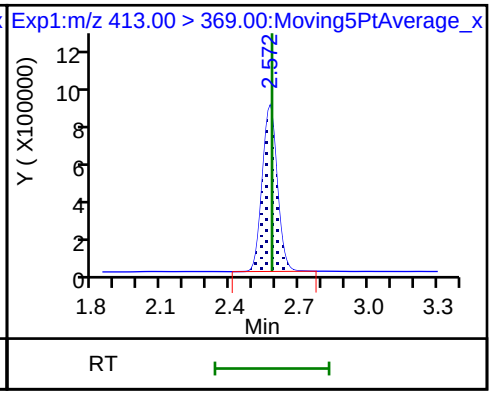
D 14 13C4 PFOA



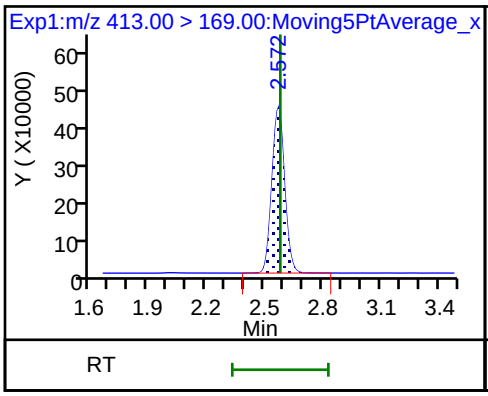
* 62 13C2-PFOA



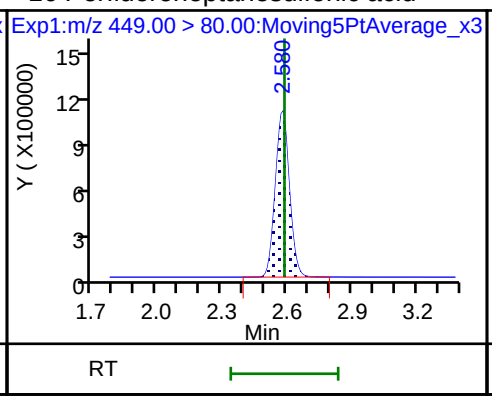
15 Perfluorooctanoic acid



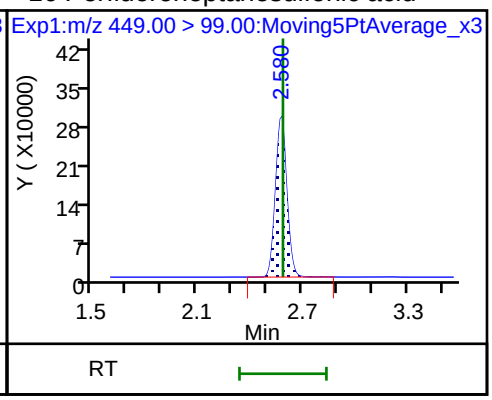
15 Perfluorooctanoic acid



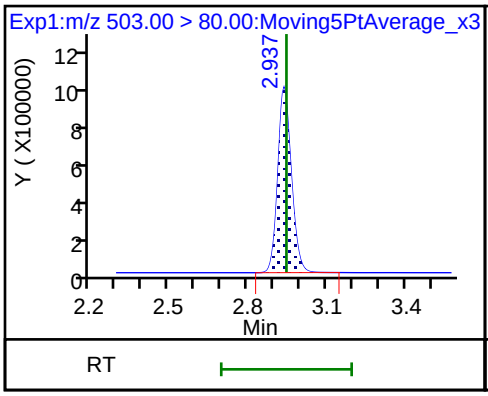
16 Perfluoroheptanesulfonic acid



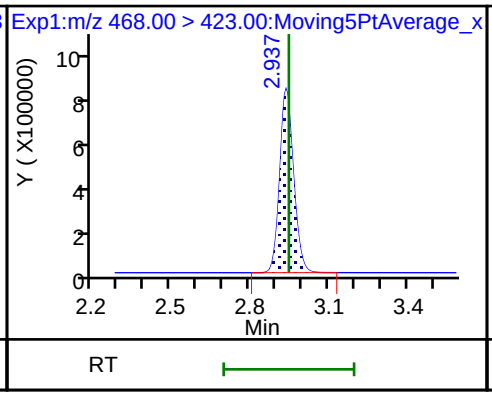
16 Perfluoroheptanesulfonic acid



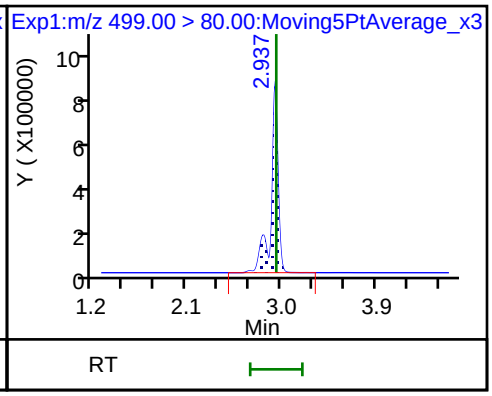
D 18 13C4 PFOS



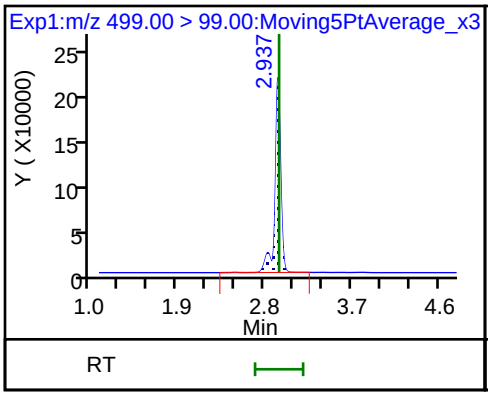
D 19 13C5 PFNA



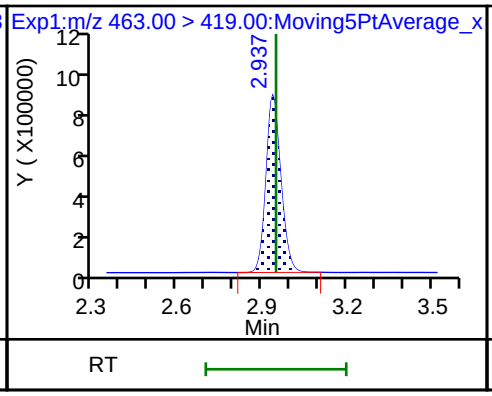
17 Perfluorooctane sulfonic acid



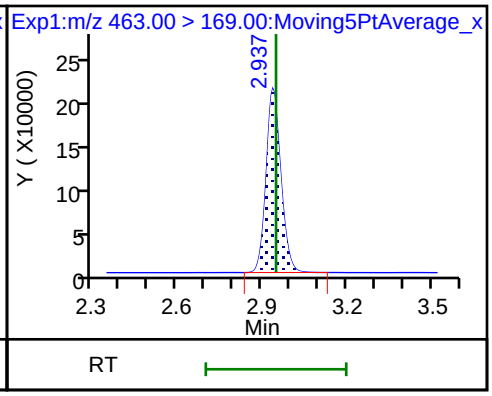
17 Perfluorooctane sulfonic acid



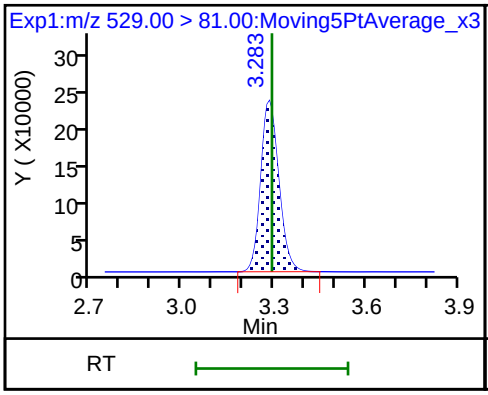
20 Perfluorononanoic acid



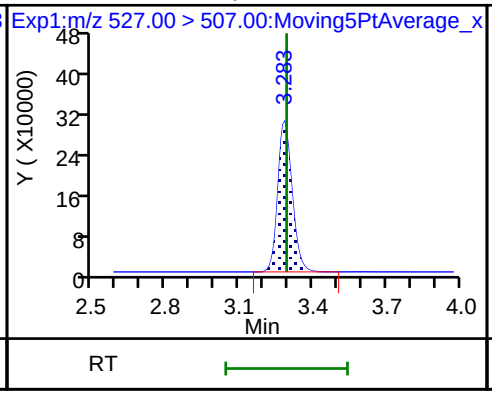
20 Perfluorononanoic acid



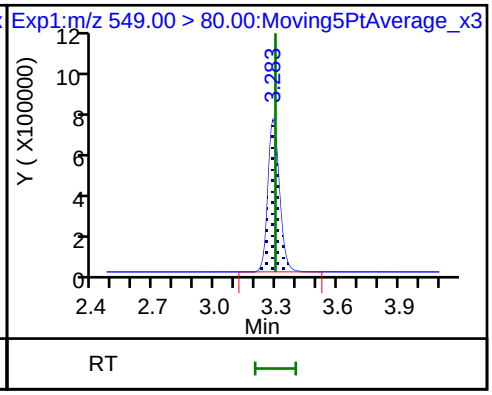
D 26 M2-8:2FTS



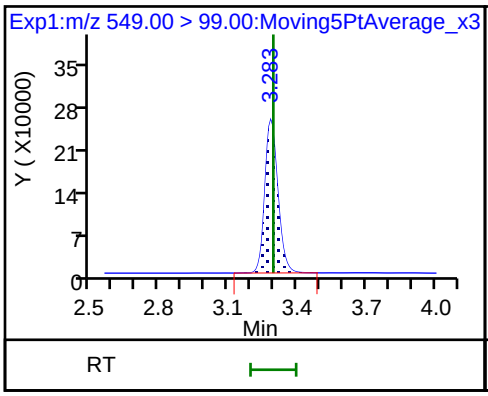
25 1H,1H,2H,2H-perfluorodecanesulfoni



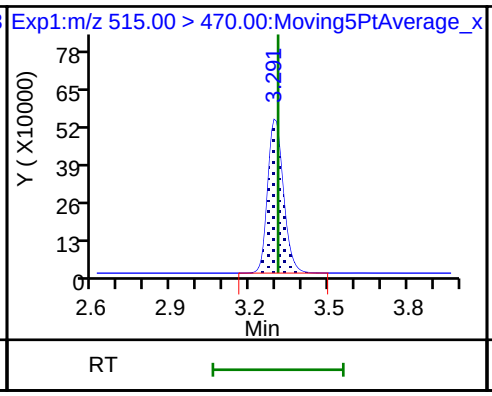
68 Perfluorononanesulfonic acid



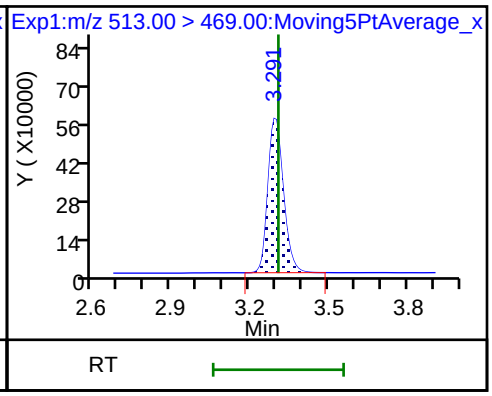
68 Perfluorononanesulfonic acid



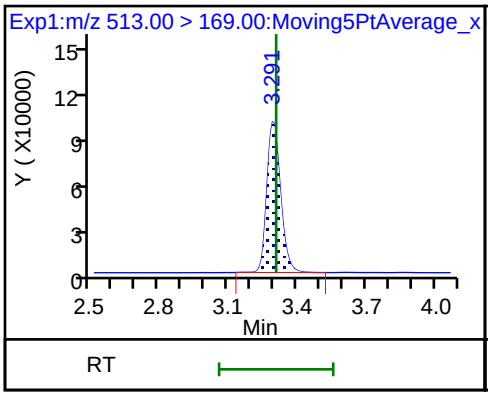
D 23 13C2 PFDA



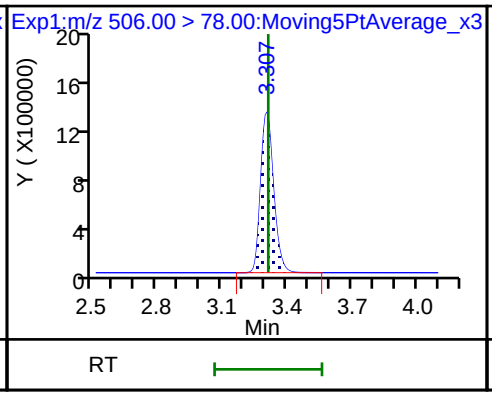
24 Perfluorodecanoic acid



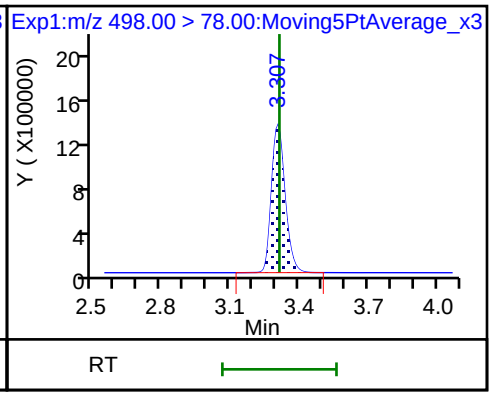
24 Perfluorodecanoic acid



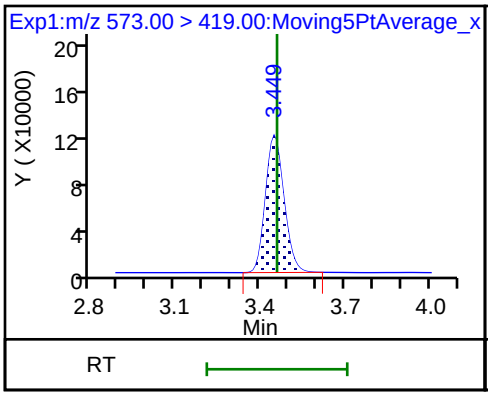
D 21 13C8 FOSA



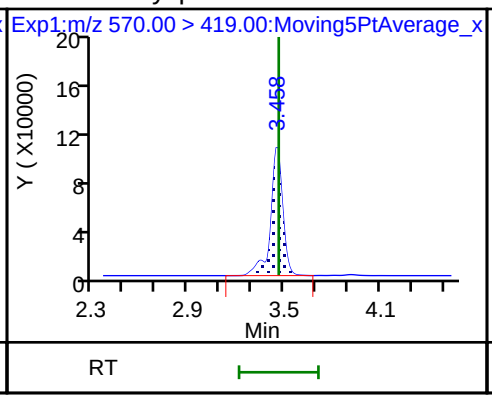
22 Perfluorooctane Sulfonamide



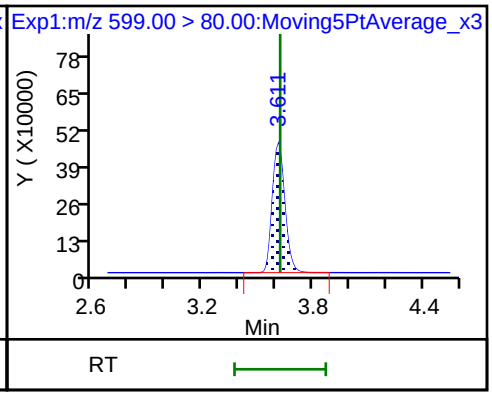
D 27 d3-NMeFOSAA



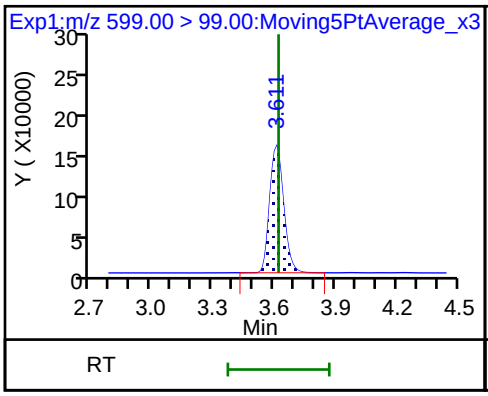
28 N-methyl perfluorooctane sulfonami



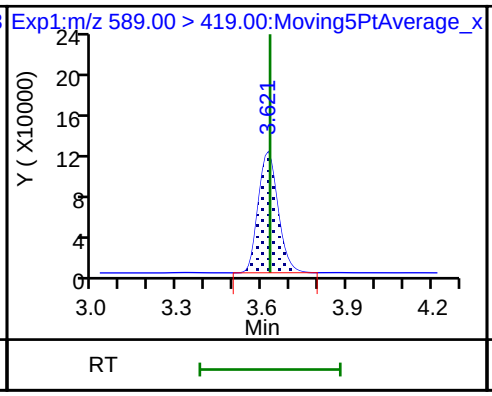
29 Perfluorodecane Sulfonic acid



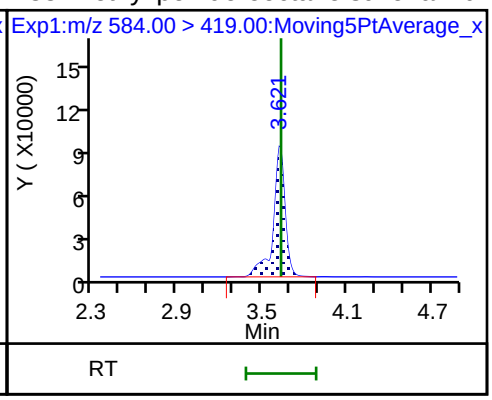
29 Perfluorodecane Sulfonic acid



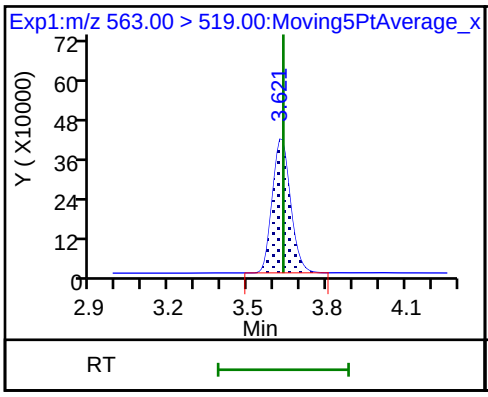
D 32 d5-NEtFOSAA



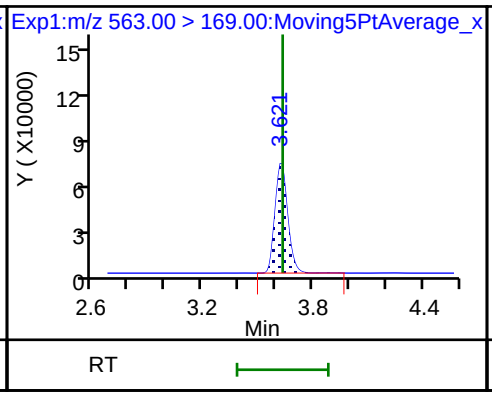
33 N-ethyl perfluorooctane sulfonamid



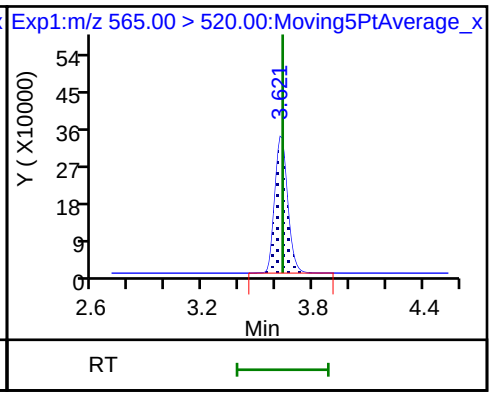
31 Perfluoroundecanoic acid



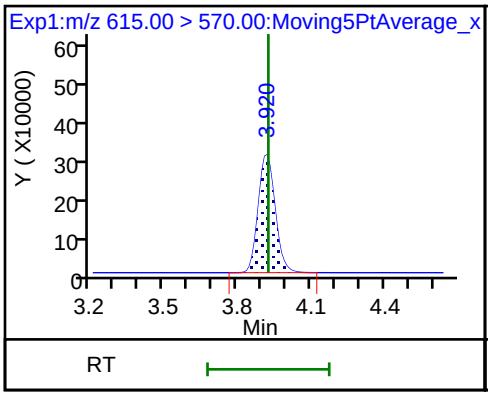
31 Perfluoroundecanoic acid



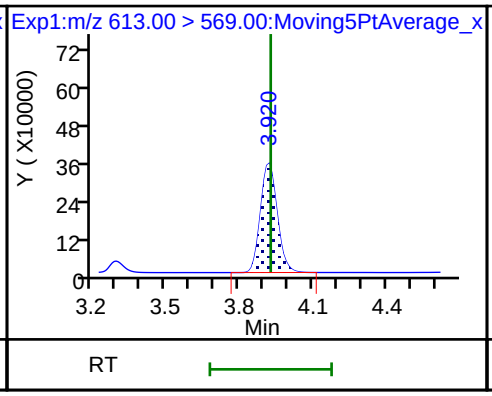
D 30 13C2 PFUnA



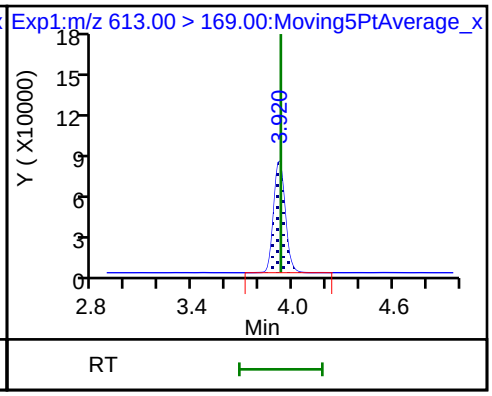
D 36 13C2 PFDoA



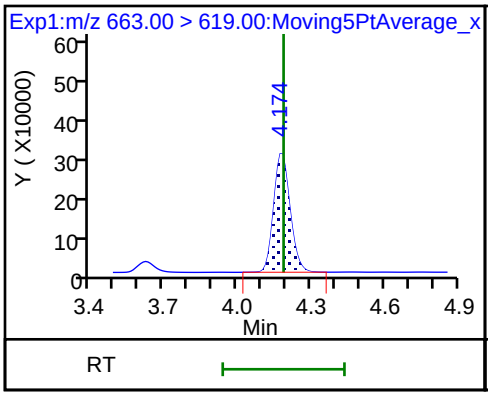
37 Perfluorododecanoic acid



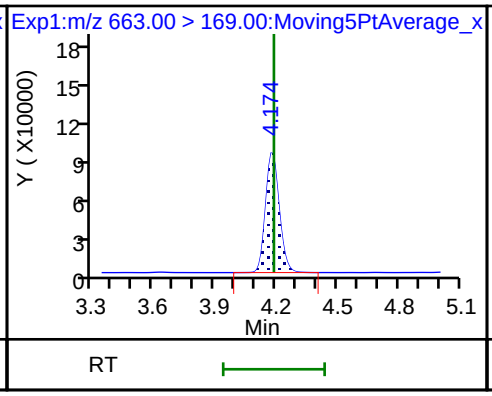
37 Perfluorododecanoic acid



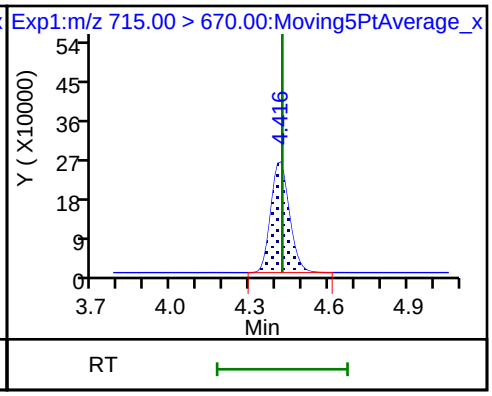
41 Perfluorotridecanoic acid



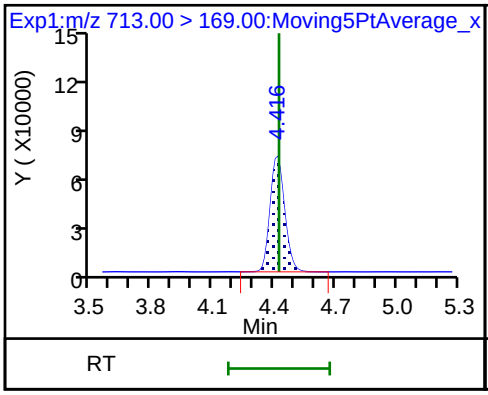
41 Perfluorotridecanoic acid



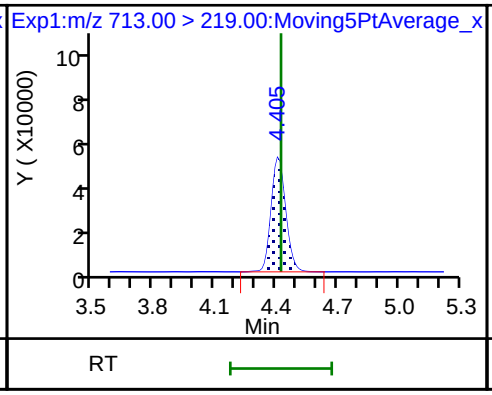
D 43 13C2-PFTeDA



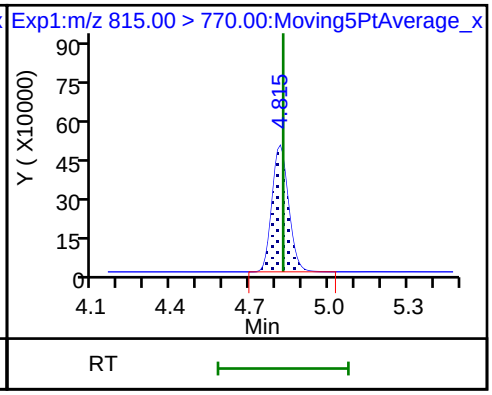
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237446/1 Calibration Date: 08/01/2018 15:04

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLB_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.997		2.53	2.50	1.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.188		2.48	2.50	-0.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	79.07		2.28	2.21	3.2	30.0
4:2 FTS	AveID	17.21	18.04		2.45	2.34	4.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.043		2.47	2.50	-1.1	30.0
Perfluoropentanesulfonic acid	AveID	67.65	69.56		2.41	2.35	2.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.105		2.38	2.50	-4.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.094		2.15	2.28	-5.4	30.0
6:2 FTS	AveID	1.654	1.643		2.35	2.37	-0.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.143		2.47	2.50	-1.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.377		2.37	2.38	-0.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.098		2.54	2.50	1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.101		2.28	2.32	-1.9	30.0
8:2 FTS	AveID	1.351	1.334		2.36	2.40	-1.3	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7641		2.55	2.40	6.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.036		2.43	2.50	-2.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.074		2.72	2.50	8.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.027		2.53	2.50	1.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6255		2.32	2.41	-3.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.9002		2.53	2.50	1.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.202		2.44	2.50	-2.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.132		2.61	2.50	4.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9946		2.64	2.50	5.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2616		2.43	2.50	-2.9	30.0
13C4 PFBA	Ave	1.440	1.453		2.52	2.50	0.9	30.0
13C5-PFPeA	Ave	0.9481	0.9631		2.54	2.50	1.6	30.0
13C3-PFBS	Ave	0.0273	0.0277		2.36	2.33	1.5	30.0
13C2 PFHxA	Ave	1.026	1.057		2.58	2.50	3.0	30.0
13C4-PFHpA	Ave	0.9943	1.025		2.58	2.50	3.1	30.0
18O2 PFHxS	Ave	1.494	1.519		2.40	2.37	1.7	30.0
M2-6:2FTS	Ave	0.2913	0.3008		2.45	2.38	3.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237446/1 Calibration Date: 08/01/2018 15:04

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLB_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9900		2.58	2.50	3.1	30.0
13C4 PFOS	Ave	1.032	1.035		2.40	2.39	0.3	30.0
13C5 PFNA	Ave	0.8365	0.8437		2.52	2.50	0.9	30.0
M2-8:2FTS	Ave	0.2839	0.2850		2.40	2.40	0.4	30.0
13C2 PFDA	Ave	0.6256	0.6682		2.67	2.50	6.8	30.0
13C8 FOSA	Ave	1.516	1.494		2.46	2.50	-1.5	30.0
d3-NMeFOSAA	Ave	0.1518	0.1560		2.57	2.50	2.8	30.0
d5-NEtFOSAA	Ave	0.1627	0.1562		2.40	2.50	-4.0	30.0
13C2 PFUnA	Ave	0.4818	0.4692		2.43	2.50	-2.6	30.0
13C2 PFDoA	Ave	0.4172	0.4209		2.52	2.50	0.9	30.0
13C2-PFTeDA	Ave	0.3502	0.3593		2.57	2.50	2.6	30.0
13C2-PFHxDA	Ave	0.6033	0.5531		2.29	2.50	-8.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_012.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 01-Aug-2018 15:04:13 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 11:51:24 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 11:51:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.392	1.389	0.003	1.000	4276701	2.53		101	1022	
D 1 13C4 PFBA										
217.00 > 172.00	1.392	1.395	-0.002	0.541	4290348	2.52		101	81055	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.629	0.004	1.000	3377175	2.48		99.2	1380	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.634	2843662	2.54		102	44063	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.662	0.005	1.000	5713069	2.28		103	32030	
298.90 > 99.00	1.667	1.662	0.005	1.000	2310062		2.47(1.25-3.74)		11823	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.669	-0.002	0.648	76017	2.36		102	307	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.867	1.863	0.004	1.120	1376959	2.45		105	48597	
D 60 M2-4:2FTS										
329.00 > 81.00	1.867	1.872	-0.005	0.725	541521	NC			6878	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.896	1.902	-0.006	1.000	3253851	2.47		98.9	6268	
313.00 > 119.00	1.896	1.902	-0.006	1.000	296115		10.99(5.03-15.10)		3877	
D 7 13C2 PFHxA										
315.00 > 270.00	1.896	1.903	-0.007	0.737	3121116	2.58		103	59533	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.917	1.924	-0.007	1.150	5333319	2.41		103	38615	
349.00 > 99.00	1.917	1.924	-0.007	1.150	1934248		2.76(1.36-4.07)		9758	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.993	1.988	0.005	1.000	589917	NC			2534	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.993	2.000	-0.007	0.774	166462	NC			4060	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.214	0.005	1.000	3343911	2.38		95.3	1365	
363.00 > 169.00	2.219	2.214	0.005	1.000	1340050		2.50(1.13-3.40)		12336	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.225	-0.006	0.862	3025777	2.58		103	55895	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.225	0.005	1.000	4464659	2.15		94.6	16596	
399.00 > 99.00	2.230	2.225	0.005	1.000	1531379		2.92(1.50-4.49)		2321	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.238	-0.008	0.867	4242211	2.40		102	49241	
65 ADONA										
377.00 > 251.00	2.268	2.263	0.005	0.772	8506675	NC			62710	
377.00 > 85.00	2.268	2.263	0.005	0.772	4903618		1.73(0.84-2.53)		17639	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.547	2.545	0.002	1.000	1383150	2.35		99.4	24192	
D 12 M2-6:2FTS										
429.00 > 81.00	2.547	2.556	-0.009	0.990	843615	2.45		103	10388	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.571	0.003	1.000	3343897	2.47		98.8	2097	
413.00 > 169.00	2.574	2.571	0.003	1.000	1710894		1.95(0.84-2.52)		8638	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.582	2.571	0.011	0.879	4006878	2.37		99.6	29095	
449.00 > 99.00	2.582	2.571	0.011	0.879	1097018		3.65(1.94-5.82)		10803	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.571	0.003		2952556	2.50			34935	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.580	-0.006	1.000	2923100	2.58		103	44835	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.935	0.004	1.000	3122341	2.28		98.1	25148	
499.00 > 99.00	2.939	2.935	0.004	1.000	732566		4.26(2.31-6.93)		4131	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.935	0.004	1.000	2736036	2.54		102	6843	
463.00 > 169.00	2.939	2.935	0.004	1.000	645113		4.24(1.90-5.69)		15362	
D 18 13C4 PFOS										
503.00 > 80.00	2.939	2.946	-0.007	1.142	2921384	2.40		100	33883	
D 19 13C5 PFNA										
468.00 > 423.00	2.939	2.948	-0.009	1.142	2491093	2.52		101	43503	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.150	3.145	0.005	1.072	5358832	NC			39911	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.286	3.280	0.006	1.000	1075070	2.36		98.7	36806	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.286	3.280	0.006	1.118	2241439	2.55		106	56389	
549.00 > 99.00	3.286	3.280	0.006	1.118	860861		2.60(1.33-3.97)		4930	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.294	3.287	0.007	1.000	2043833	2.43		97.1	2658	
513.00 > 169.00	3.294	3.287	0.007	1.000	355830		5.74(2.36-7.09)		4255	
D 26 M2-8:2FTS										
529.00 > 81.00	3.286	3.292	-0.006	1.277	806072	2.40		100	21778	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.309	3.303	0.006	1.000	4738693	2.72		109	56358	
D 23 13C2 PFDA										
515.00 > 470.00	3.294	3.306	-0.012	1.280	1972919	2.67		107	39772	
D 21 13C8 FOSA										
506.00 > 78.00	3.309	3.312	-0.003	1.286	4410412	2.46		98.5	31727	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.452	3.444	0.008	1.000	473320	2.53		101	6551	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.452	3.459	-0.007	1.341	460711	2.57		103	14479	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.616	3.607	0.009	1.231	1842460	2.32		96.2	31866	
599.00 > 99.00	3.616	3.607	0.009	1.231	605024		3.05(1.39-4.16)		8341	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.626	3.618	0.008	1.003	415194	2.53		101	7022	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.626	3.618	0.008	1.000	1665495	2.44		97.6	3868	
563.00 > 169.00	3.626	3.618	0.008	1.000	299124		5.57(2.12-6.36)		10468	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.616	3.627	-0.011	1.405	461231	2.40		96.0	5517	
D 30 13C2 PFUnA										
565.00 > 520.00	3.626	3.634	-0.008	1.409	1385188	2.43		97.4	32330	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.780	3.771	0.009	1.286	7542667	NC			81606	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.916	3.907	0.009	1.000	1407202	2.61		105	516	
613.00 > 169.00	3.916	3.907	0.009	1.000	327139		4.30(2.13-6.40)		6847	
D 36 13C2 PFDoA										
615.00 > 570.00	3.916	3.925	-0.009	1.521	1242845	2.52		101	15333	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.180	4.172	0.008	1.068	1236158	2.64		106	450	
663.00 > 169.00	4.180	4.172	0.008	1.068	380627		3.25(1.25-3.76)		3742	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.414	4.404	0.010	1.000	277501	2.43		97.1	3808	
713.00 > 219.00	4.404	4.404	0.0	0.998	199581		1.39(0.71-2.13)		2380	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.414	4.423	-0.009	1.715	1060961	2.57		103	4666	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.813	4.813	0.0	1.000	1626671	NC			104	
813.00 > 169.00	4.813	4.813	0.0	1.000	263939		6.16(2.86-8.58)		2641	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.813	4.826	-0.013	1.870	1632926	2.29		91.7	2596	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.150	5.149	0.001	1.070	1997655	NC			683	
913.00 > 169.00	5.150	5.149	0.001	1.070	241196		8.28(3.83-11.48)		2318	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 02-Aug-2018 11:51:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_012.d

Injection Date: 01-Aug-2018 15:04:13 Instrument ID: A8_N

Lims ID: CCV L5

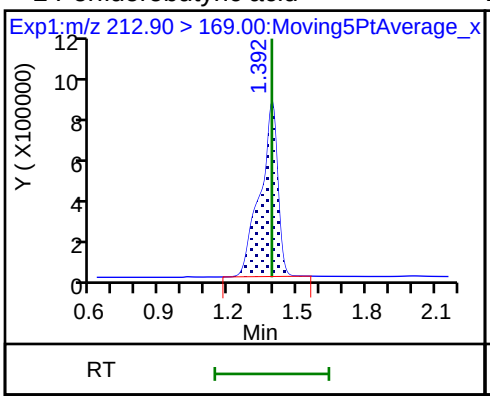
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 1

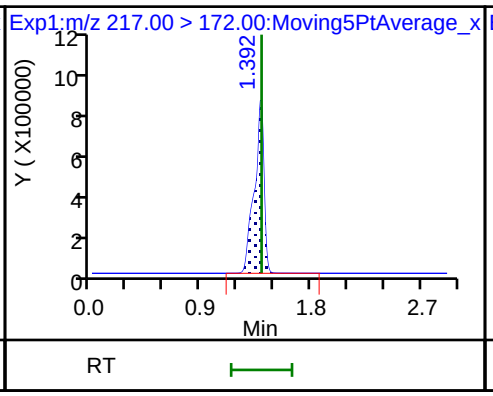
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

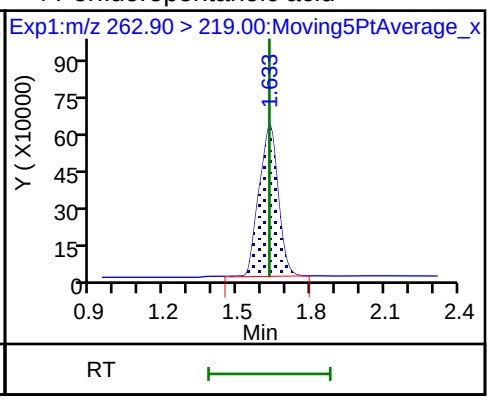
2 Perfluorobutyric acid



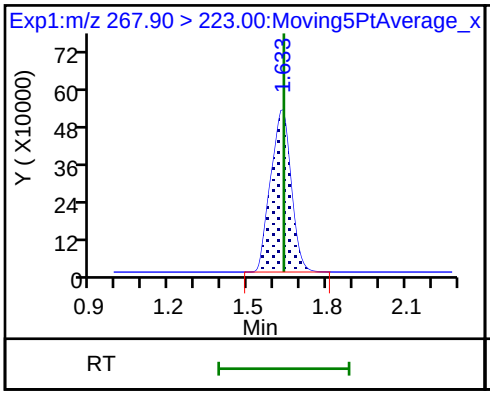
D 1 13C4 PFBA



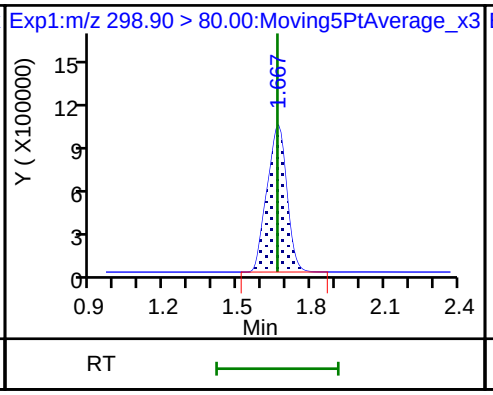
4 Perfluoropentanoic acid



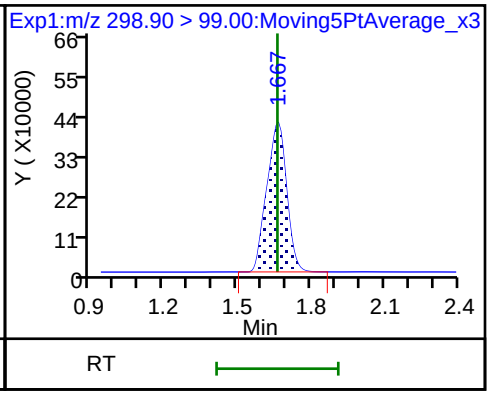
D 3 13C5-PFPeA



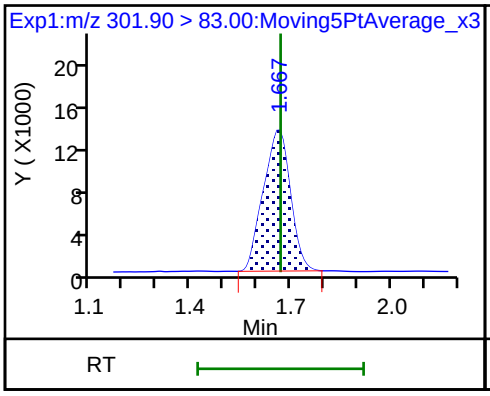
5 Perfluorobutanesulfonic acid



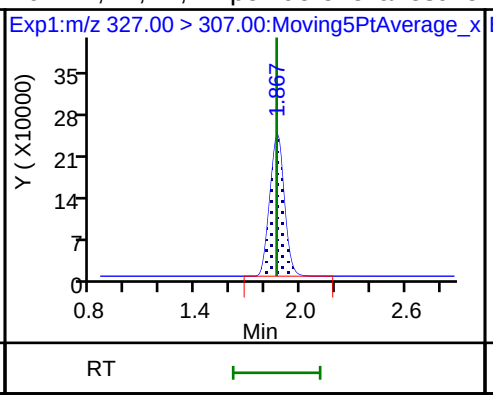
5 Perfluorobutanesulfonic acid



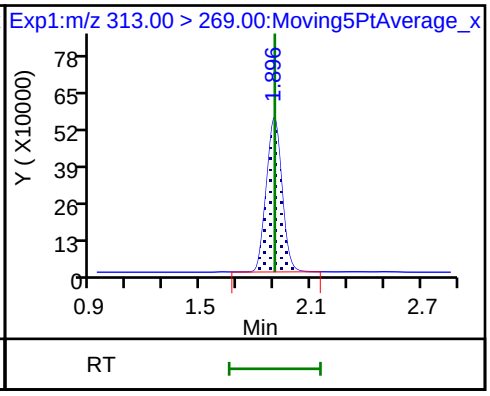
D 47 13C3-PFBS



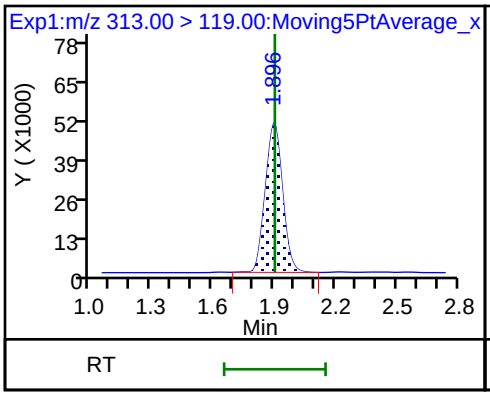
61 1H,1H,2H,2H-perfluorohexanesulfoni



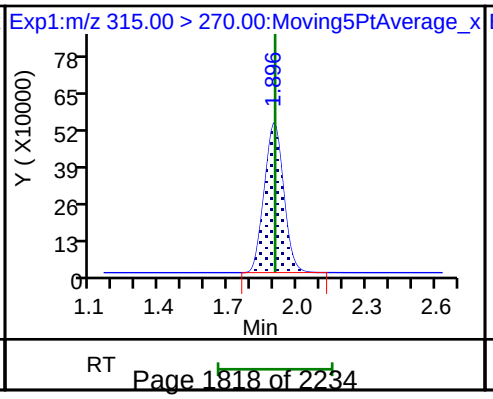
6 Perfluorohexanoic acid



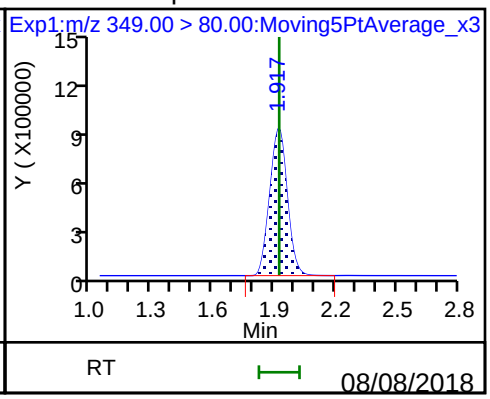
6 Perfluorohexanoic acid



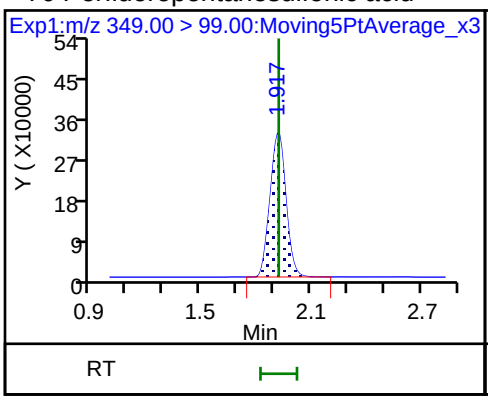
D 7 13C2 PFHxA



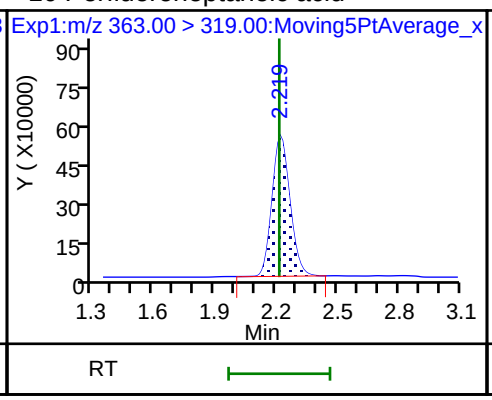
70 Perfluoropentanesulfonic acid



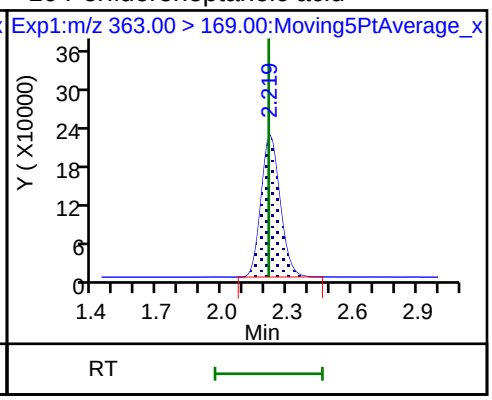
70 Perfluoropentanesulfonic acid



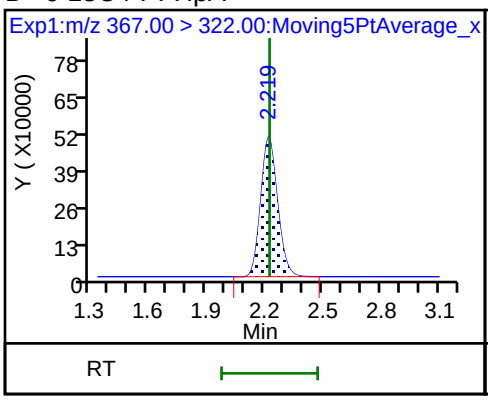
10 Perfluoroheptanoic acid



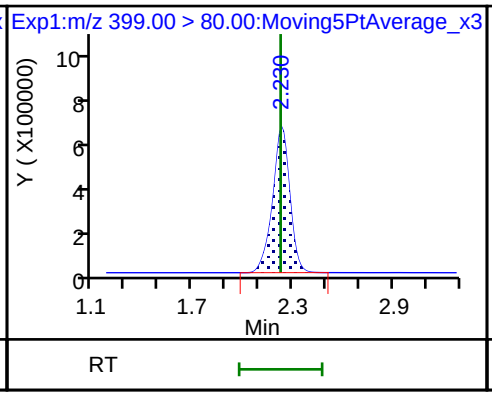
10 Perfluoroheptanoic acid



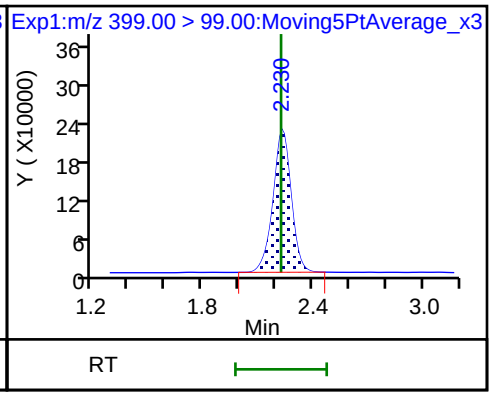
D 9 13C4-PFHpA



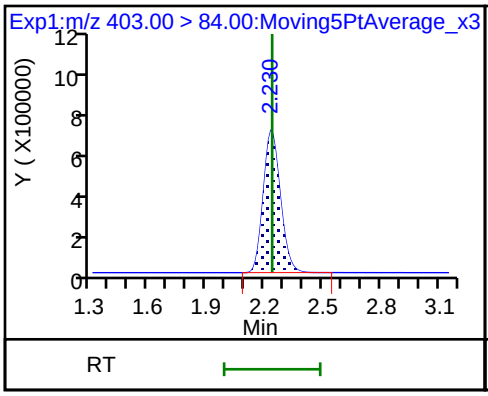
8 Perfluorohexanesulfonic acid



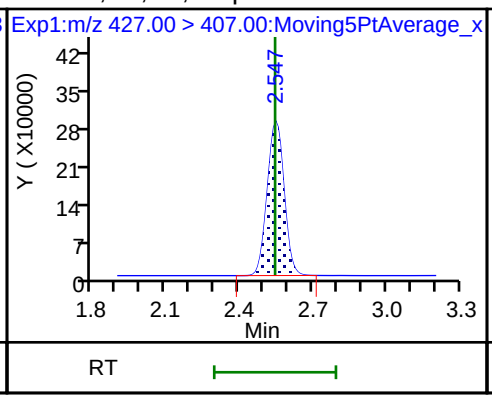
8 Perfluorohexanesulfonic acid



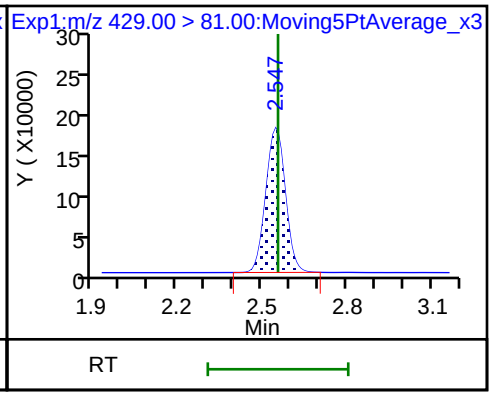
D 11 18O2 PFHxS



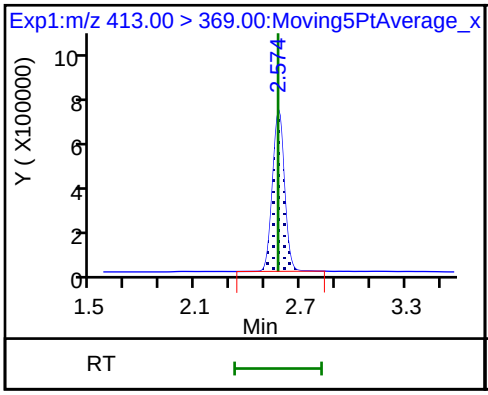
13 1H,1H,2H,2H-perfluorooctanesulfon



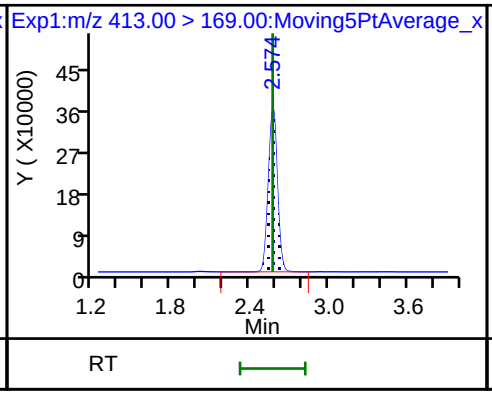
D 12 M2-6:2FTS



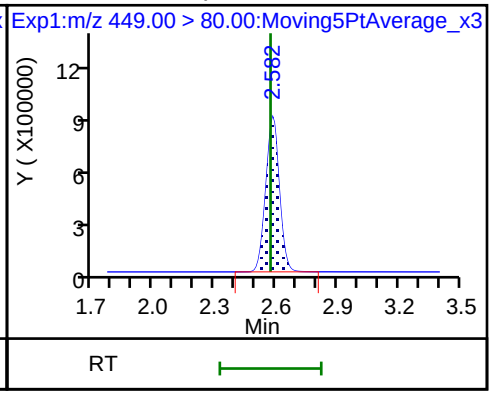
15 Perfluorooctanoic acid



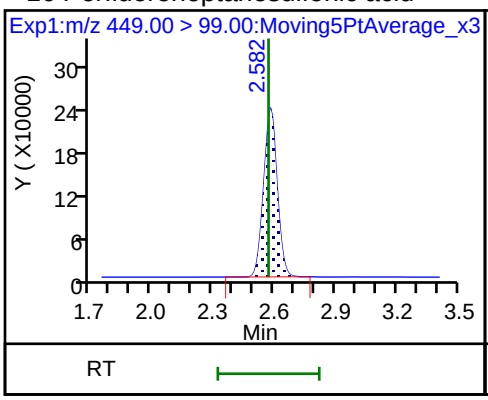
15 Perfluorooctanoic acid



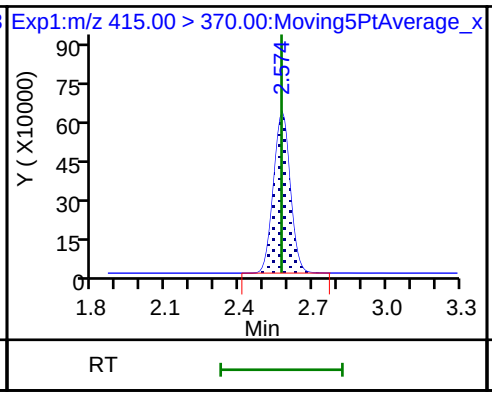
16 Perfluoroheptanesulfonic acid



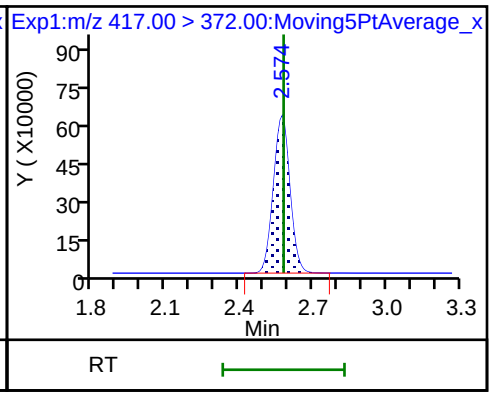
16 Perfluoroheptanesulfonic acid



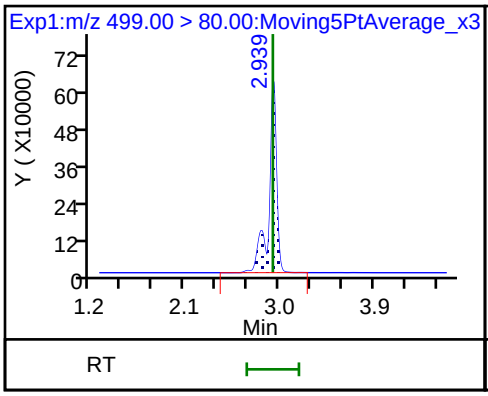
* 62 13C2-PFOA



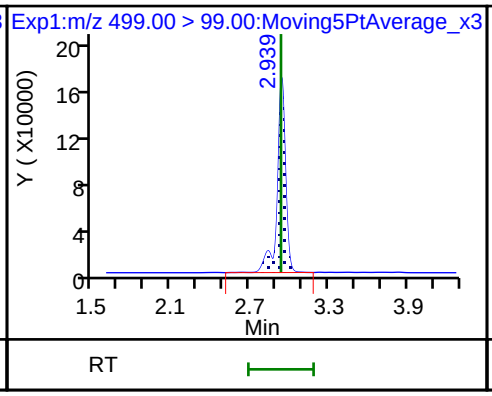
D 14 13C4 PFOA



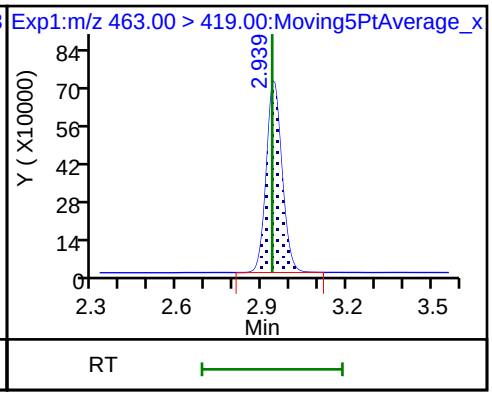
17 Perfluorooctane sulfonic acid



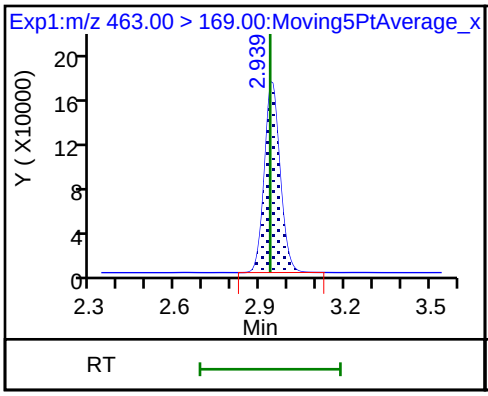
17 Perfluorooctane sulfonic acid



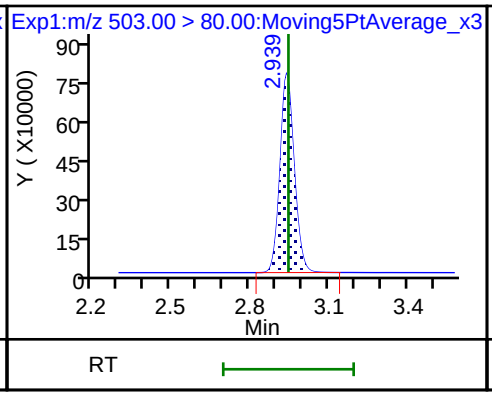
20 Perfluorononanoic acid



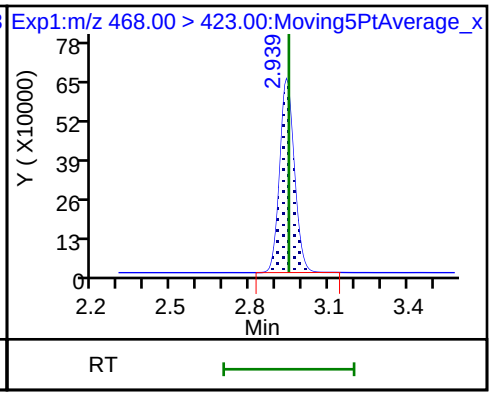
20 Perfluorononanoic acid



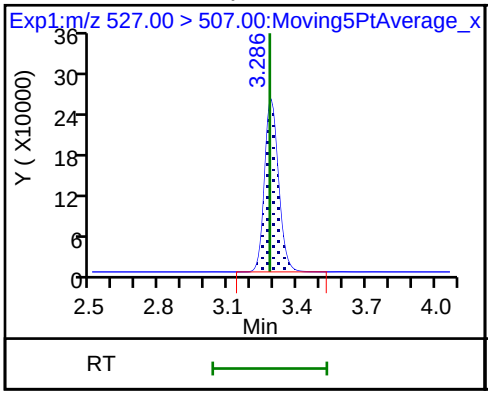
D 18 13C4 PFOS



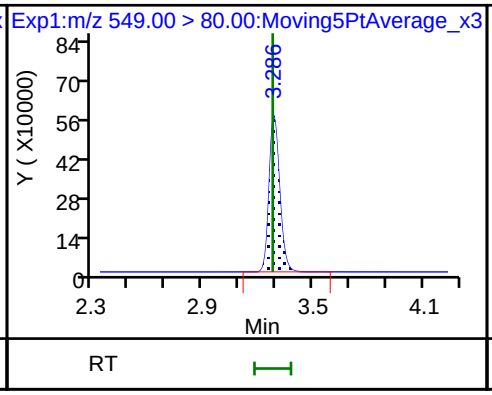
D 19 13C5 PFNA



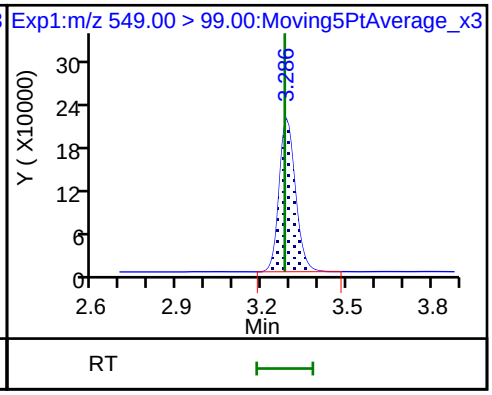
25 1H,1H,2H,2H-perfluorodecanesulfoni



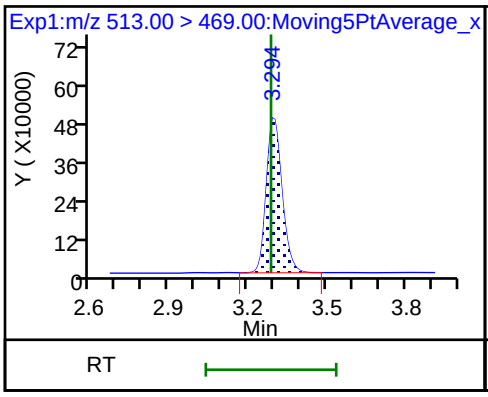
68 Perfluorononanesulfonic acid



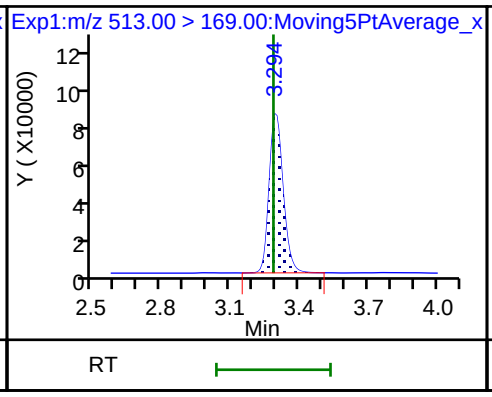
68 Perfluorononanesulfonic acid



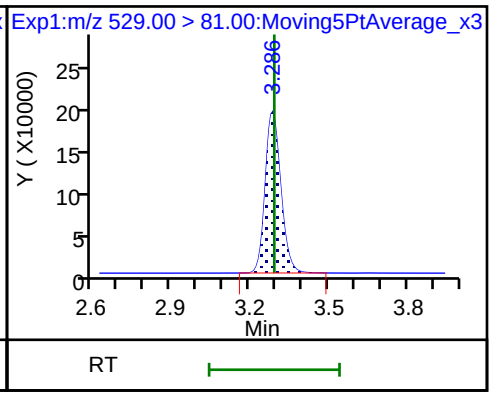
24 Perfluorodecanoic acid



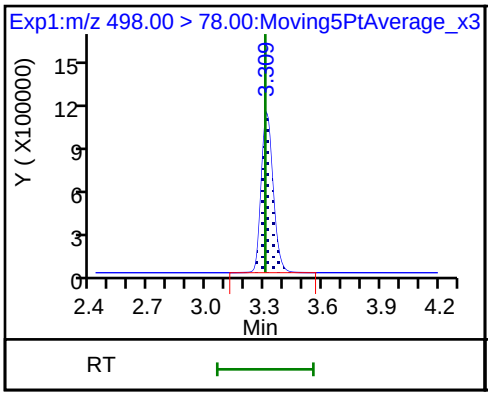
24 Perfluorodecanoic acid



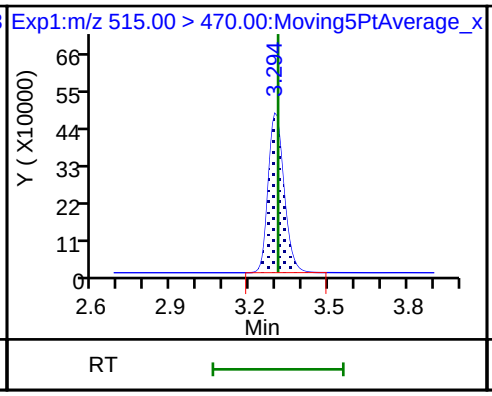
D 26 M2-8:2FTS



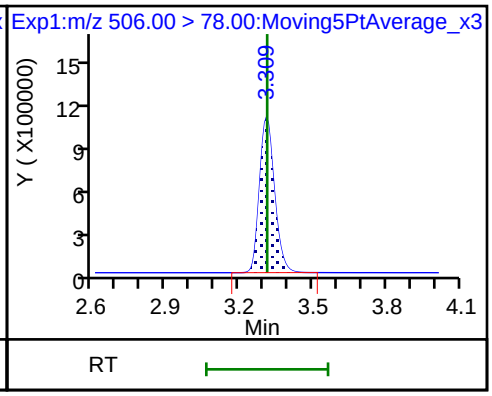
22 Perfluorooctane Sulfonamide



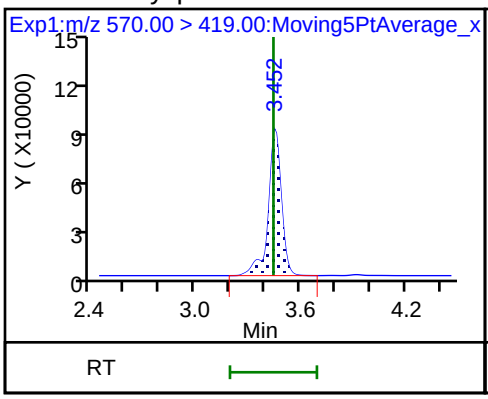
D 23 13C2 PFDA



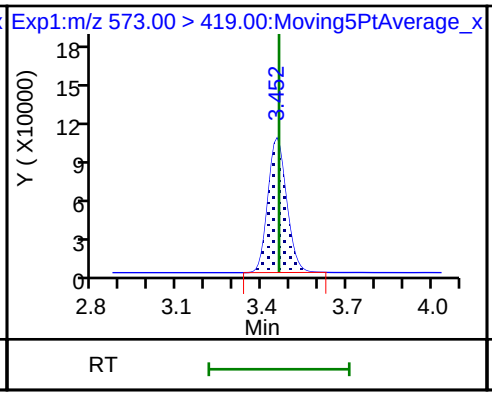
D 21 13C8 FOSA



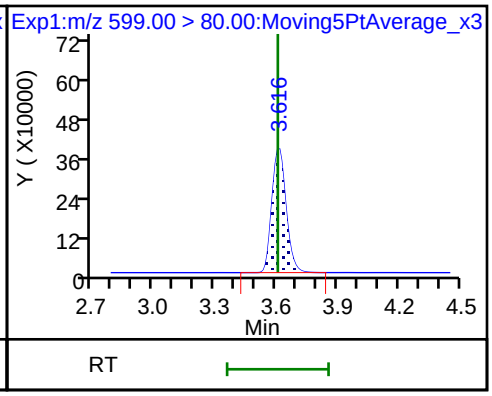
28 N-methyl perfluorooctane sulfonami



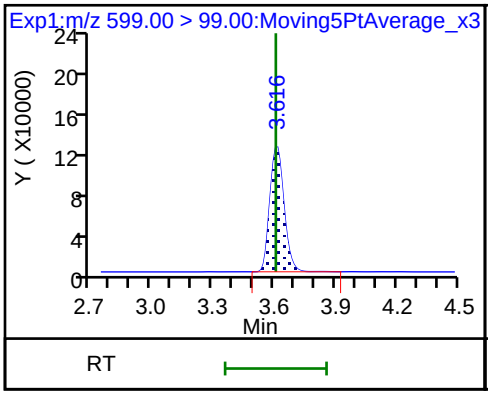
D 27 d3-NMeFOSAA



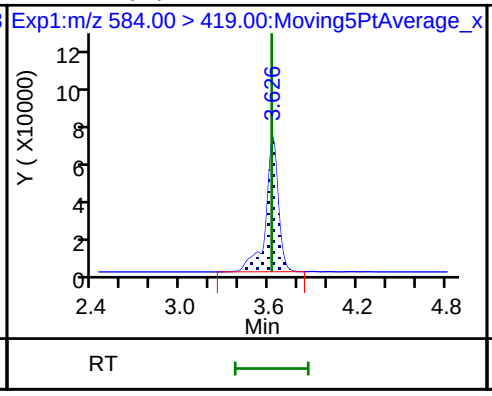
29 Perfluorodecane Sulfonic acid



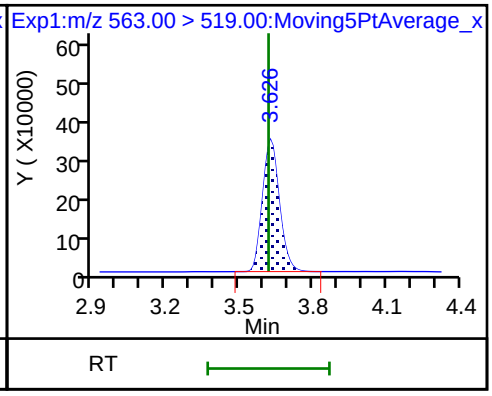
29 Perfluorodecane Sulfonic acid



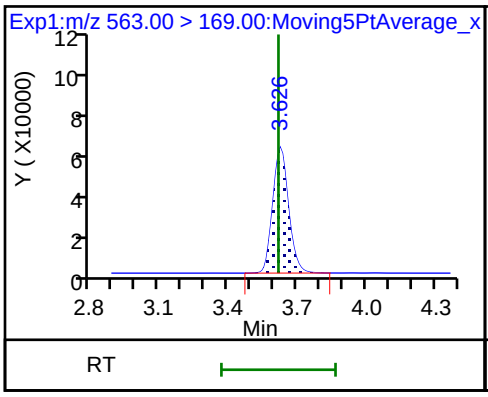
33 N-ethyl perfluorooctane sulfonamid



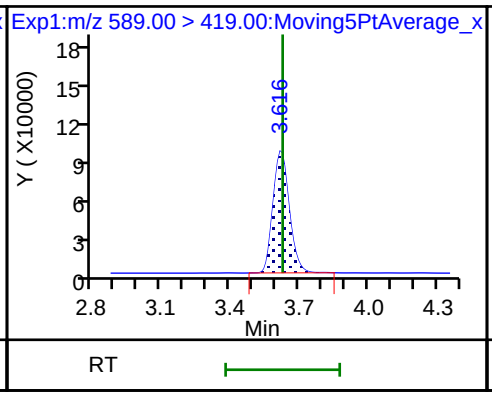
31 Perfluoroundecanoic acid



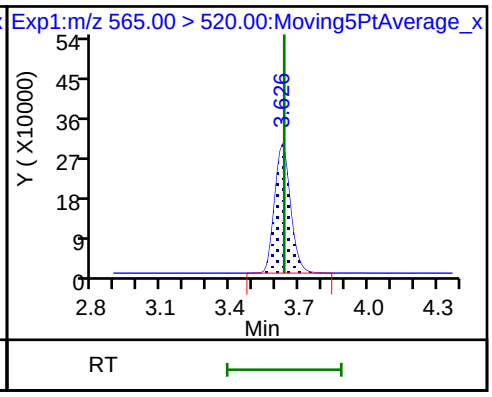
31 Perfluoroundecanoic acid



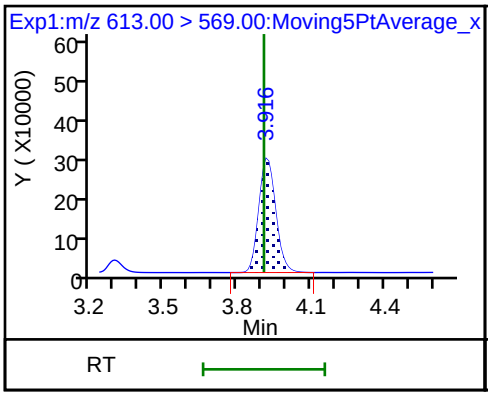
D 32 d5-NEtFOSAA



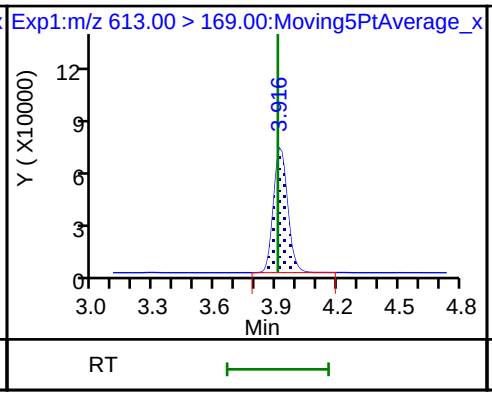
D 30 13C2 PFUnA



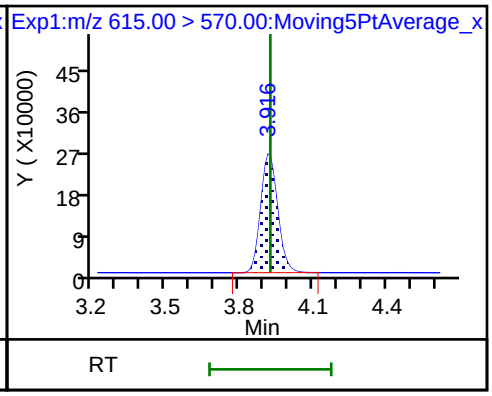
37 Perfluorododecanoic acid



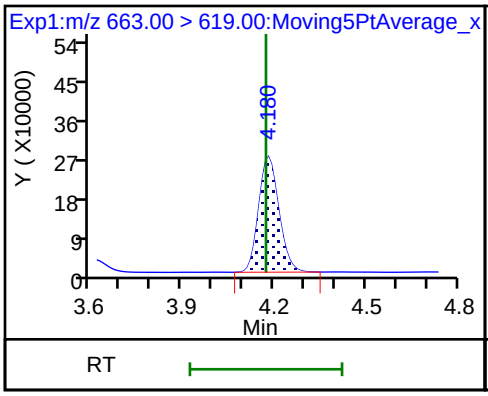
37 Perfluorododecanoic acid



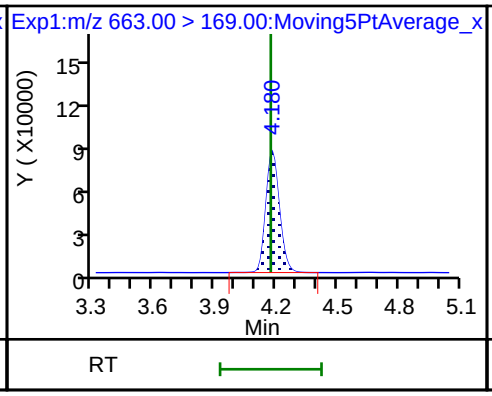
D 36 13C2 PFDoA



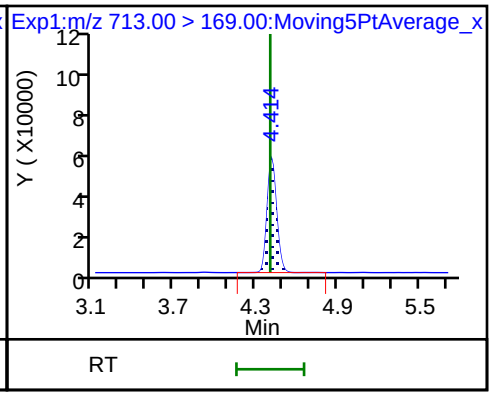
41 Perfluorotridecanoic acid



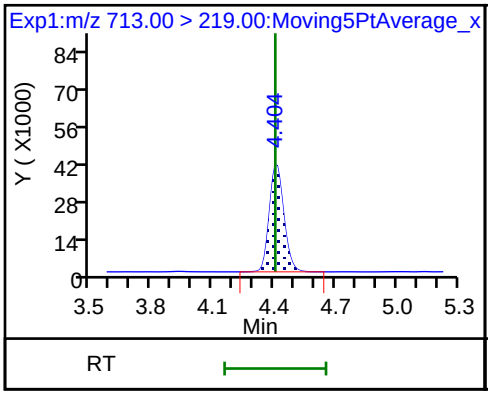
41 Perfluorotridecanoic acid



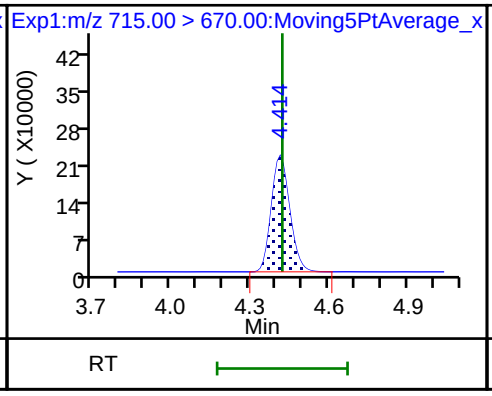
42 Perfluorotetradecanoic acid



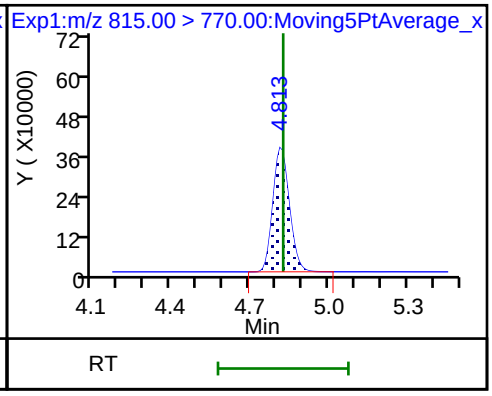
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237446/7 Calibration Date: 08/01/2018 15:51

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLB_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9719		0.986	1.00	-1.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.172		0.979	1.00	-2.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	81.69		0.942	0.884	6.6	30.0
4:2 FTS	AveID	17.21	18.30		0.993	0.934	6.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.054		1.00	1.00	-0.0	30.0
Perfluoropentanesulfonic acid	AveID	67.65	70.32		0.975	0.938	3.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.077		0.928	1.00	-7.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.070		0.843	0.910	-7.4	30.0
6:2 FTS	AveID	1.654	1.606		0.921	0.948	-2.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.359		0.936	0.952	-1.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.110		0.961	1.00	-4.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.096		1.02	1.00	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.094		0.904	0.928	-2.5	30.0
8:2 FTS	AveID	1.351	1.368		0.970	0.958	1.3	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7312		0.977	0.960	1.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.062		0.995	1.00	-0.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.029		1.04	1.00	4.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.021		1.00	1.00	0.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6193		0.918	0.964	-4.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.9123		1.02	1.00	2.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.158		0.940	1.00	-6.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.092		1.01	1.00	0.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9176		0.974	1.00	-2.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2571		0.954	1.00	-4.6	30.0
13C4 PFBA	Ave	1.440	1.424		2.47	2.50	-1.1	30.0
13C5-PFPeA	Ave	0.9481	0.9544		2.52	2.50	0.7	30.0
13C3-PFBS	Ave	0.0273	0.0261		2.23	2.33	-4.3	30.0
13C2 PFHxA	Ave	1.026	1.018		2.48	2.50	-0.8	30.0
13C4-PFHpA	Ave	0.9943	1.015		2.55	2.50	2.1	30.0
18O2 PFHxS	Ave	1.494	1.480		2.34	2.37	-1.0	30.0
M2-6:2FTS	Ave	0.2913	0.2975		2.43	2.38	2.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237446/7 Calibration Date: 08/01/2018 15:51

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLB_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9652		2.51	2.50	0.5	30.0
13C4 PFOS	Ave	1.032	0.9844		2.28	2.39	-4.6	30.0
13C5 PFNA	Ave	0.8365	0.8316		2.49	2.50	-0.6	30.0
M2-8:2FTS	Ave	0.2839	0.2857		2.41	2.40	0.6	30.0
13C2 PFDA	Ave	0.6256	0.6351		2.54	2.50	1.5	30.0
13C8 FOSA	Ave	1.516	1.493		2.46	2.50	-1.5	30.0
d3-NMeFOSAA	Ave	0.1518	0.1479		2.44	2.50	-2.6	30.0
d5-NEtFOSAA	Ave	0.1627	0.1536		2.36	2.50	-5.6	30.0
13C2 PFUnA	Ave	0.4818	0.4646		2.41	2.50	-3.6	30.0
13C2 PFDoA	Ave	0.4172	0.4304		2.58	2.50	3.2	30.0
13C2-PFTeDA	Ave	0.3502	0.3448		2.46	2.50	-1.6	30.0
13C2-PFHxDA	Ave	0.6033	0.4924		2.04	2.50	-18.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_023.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 01-Aug-2018 15:51:03 ALS Bottle#: 13 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:25:58 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:25:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.389	1.389	0.0	1.000	1801862	0.9862		98.6	421	
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.395	-0.005	0.540	4635099	2.47		98.9	71898	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.629	1.629	0.0	1.000	1456212	0.9787		97.9	555	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.636	-0.007	0.634	3106836	2.52		101	53064	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.662	1.662	0.0	1.000	2454169	0.9422		107	17810	
298.90 > 99.00	1.662	1.662	0.0	1.000	1008091		2.43(1.25-3.74)		4240	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.669	-0.007	0.647	79013	2.23		95.7	290	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.863	1.863	0.0	1.121	580732	0.99		106	25765	
D 60 M2-4:2FTS										
329.00 > 81.00	1.863	1.872	-0.009	0.725	590360	NC			5837	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.902	0.0	1.006	1397218	1.00		100.0	3208	
313.00 > 119.00	1.892	1.902	-0.010	1.000	126068		11.08(5.03-15.10)		1283	
D 7 13C2 PFHxA										
315.00 > 270.00	1.892	1.903	-0.011	0.736	3313850	2.48		99.2	81538	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.157	2241625	0.9750		104	34539	
349.00 > 99.00	1.924	1.924	0.0	1.157	825682		2.71(1.36-4.07)		4362	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.988	1.988	0.0	1.000	249599	NC			907	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.988	2.000	-0.012	0.773	153958	NC			3744	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.214	2.214	0.0	1.000	1423081	0.9284		92.8	546	
363.00 > 169.00	2.214	2.214	0.0	1.000	582198		2.44(1.13-3.40)		5406	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.225	-0.011	0.861	3304608	2.55		102	55684	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.225	2.225	0.0	1.000	1876751	0.8426		92.6	8299	
399.00 > 99.00	2.225	2.225	0.0	1.000	640638		2.93(1.50-4.49)		992	
D 11 18O2 PFHxS										
403.00 > 84.00	2.225	2.238	-0.013	0.866	4556755	2.34		99.0	50122	
65 ADONA										
377.00 > 251.00	2.263	2.263	0.0	0.771	3556333	NC			25386	
377.00 > 85.00	2.263	2.263	0.0	0.771	2088076		1.70(0.84-2.53)		8372	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.545	2.545	0.0	1.000	589910	0.9208		97.1	9617	
D 12 M2-6:2FTS										
429.00 > 81.00	2.545	2.556	-0.011	0.990	920028	2.43		102	9671	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.571	2.571	0.0	1.000	1396034	0.9607		96.0	832	
413.00 > 169.00	2.571	2.571	0.0	1.000	721970		1.93(0.84-2.52)		4278	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.571	2.571	0.0	0.876	1658845	0.9362		98.3	17836	
449.00 > 99.00	2.571	2.571	0.0	0.876	457540		3.63(1.94-5.82)		4128	
* 62 13C2-PFOA										
415.00 > 370.00	2.571	2.571	0.0		3255357	2.50			41218	
D 14 13C4 PFOA										
417.00 > 372.00	2.571	2.580	-0.009	1.000	3141921	2.51		101	52170	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.935	2.935	0.0	1.000	1301532	0.9045		97.5	16061	M
499.00 > 99.00	2.935	2.935	0.0	1.000	302169		4.31(2.31-6.93)		1760	
20 Perfluorononanoic acid										
463.00 > 419.00	2.935	2.935	0.0	1.000	1186902	1.02		102	3818	
463.00 > 169.00	2.935	2.935	0.0	1.000	275880		4.30(1.90-5.69)		9236	
D 18 13C4 PFOS										
503.00 > 80.00	2.935	2.946	-0.011	1.142	3063439	2.28		95.4	42322	
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.948	-0.013	1.142	2707022	2.49		99.4	42735	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.145	3.145	0.0	1.071	2155509	NC			21639	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.280	3.280	0.0	1.000	487647	0.9703		101	24512	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.280	3.280	0.0	1.117	899707	0.9766		102	22980	
549.00 > 99.00	3.280	3.280	0.0	1.117	350689		2.57(1.33-3.97)		2321	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.287	3.287	0.0	1.000	878005	0.99		99.5	1108	
513.00 > 169.00	3.287	3.287	0.0	1.000	154712		5.68(2.36-7.09)		3472	
D 26 M2-8:2FTS										
529.00 > 81.00	3.280	3.292	-0.012	1.276	890854	2.41		101	13774	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.303	3.303	0.0	1.000	2000385	1.04		104	25329	
D 23 13C2 PFDA										
515.00 > 470.00	3.287	3.306	-0.019	1.278	2067537	2.54		102	46545	
D 21 13C8 FOSA										
506.00 > 78.00	3.303	3.312	-0.009	1.285	4860838	2.46		98.5	49091	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.444	3.444	0.0	1.000	196583	1.00		100	3196	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.444	3.459	-0.015	1.340	481391	2.44		97.4	13067	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.607	3.607	0.0	1.229	765159	0.9178		95.2	20157	
599.00 > 99.00	3.607	3.607	0.0	1.229	253245		3.02(1.39-4.16)		1909	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.618	3.618	0.0	1.003	182453	1.02		102	3939	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.618	3.618	0.0	1.000	700635	0.9398		94.0	1353	
563.00 > 169.00	3.618	3.618	0.0	1.000	122564		5.72(2.12-6.36)		6440	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.607	3.627	-0.020	1.403	499976	2.36		94.4	6814	
D 30 13C2 PFUnA										
565.00 > 520.00	3.618	3.634	-0.016	1.407	1512453	2.41		96.4	35208	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.771	3.771	0.0	1.285	3205400	NC			41446	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.907	3.907	0.0	1.000	612195	1.01		101	212	
613.00 > 169.00	3.907	3.907	0.0	1.000	138644		4.42(2.13-6.40)		2061	
D 36 13C2 PFDoA										
615.00 > 570.00	3.907	3.925	-0.018	1.520	1400997	2.58		103	15475	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.172	4.172	0.0	1.068	514247	0.9737		97.4	183	
663.00 > 169.00	4.172	4.172	0.0	1.068	153528		3.35(1.25-3.76)		1033	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.404	4.404	0.0	1.000	115411	0.9544		95.4	1315	
713.00 > 219.00	4.404	4.404	0.0	1.000	80728		1.43(0.71-2.13)		1183	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.404	4.423	-0.019	1.713	1122292	2.46		98.4	5251	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.813	4.813	0.0	1.002	637858	NC			42.0	
813.00 > 169.00	4.813	4.813	0.0	1.002	103367		6.17(2.86-8.58)		1066	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.803	4.826	-0.023	1.868	1603034	2.04		81.6	2471	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.149	5.149	0.0	1.072	728449	NC			261	
913.00 > 169.00	5.141	5.149	-0.008	1.070	92918		7.84(3.83-11.48)		769	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 02-Aug-2018 13:26:01 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_023.d

Injection Date: 01-Aug-2018 15:51:03 Instrument ID: A8_N

Lims ID: CCV L4

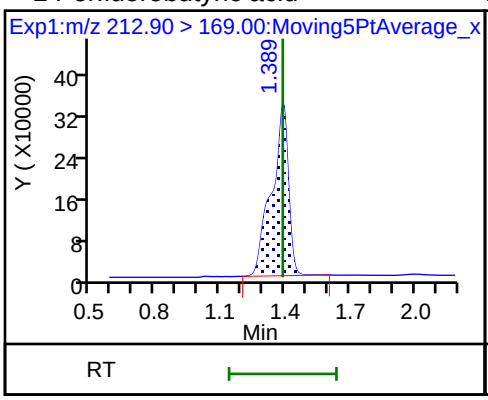
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 7

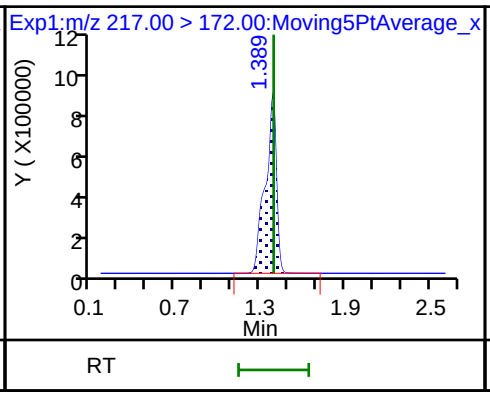
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

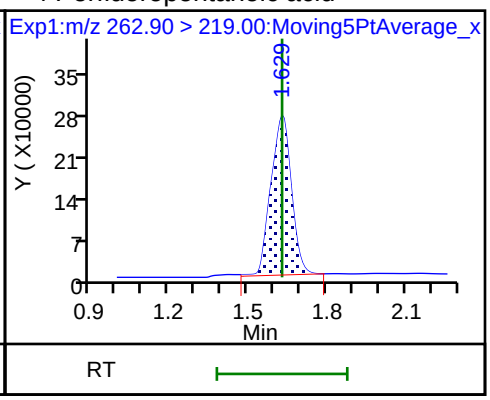
2 Perfluorobutyric acid



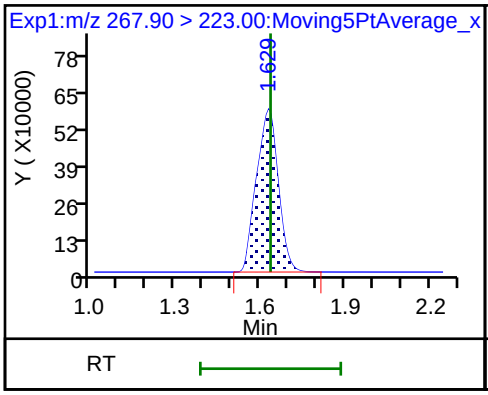
D 1 13C4 PFBA



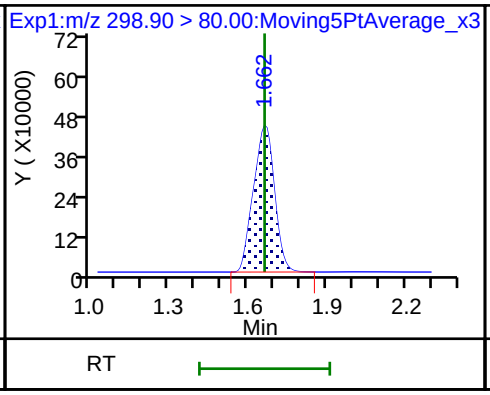
4 Perfluoropentanoic acid



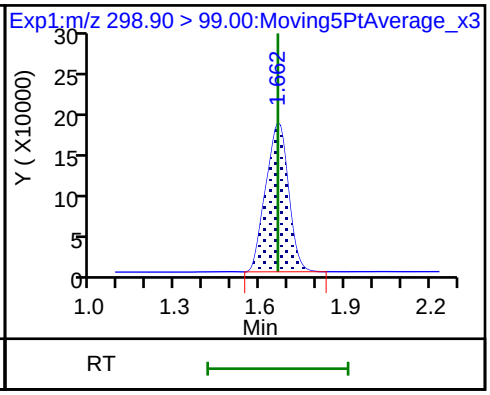
D 3 13C5-PFPeA



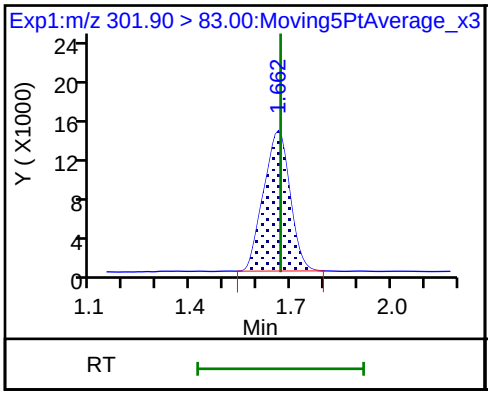
5 Perfluorobutanesulfonic acid



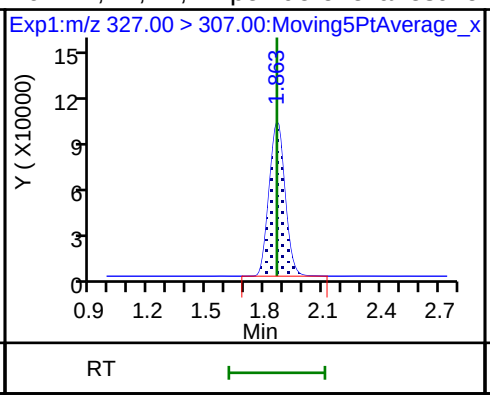
5 Perfluorobutanesulfonic acid



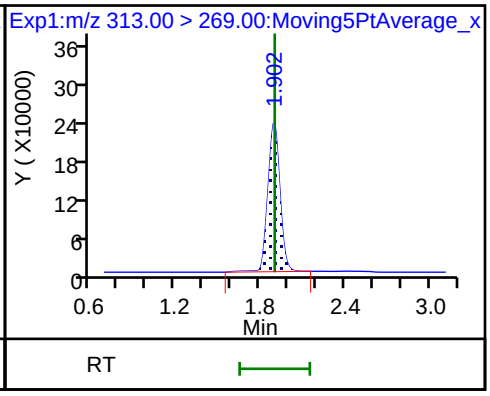
D 47 13C3-PFBS



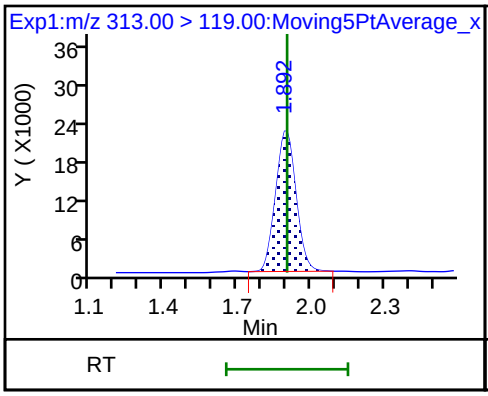
61 1H,1H,2H,2H-perfluorohexanesulfoni



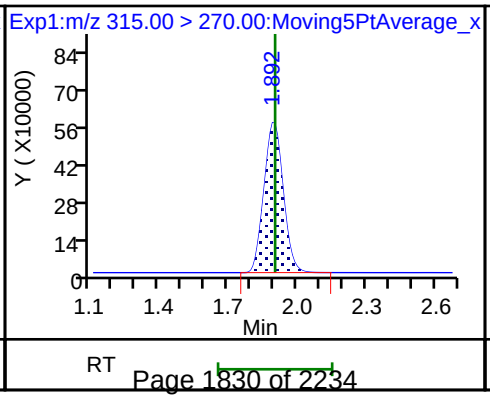
6 Perfluorohexanoic acid



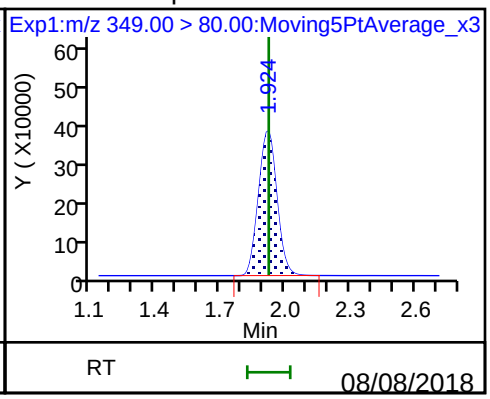
6 Perfluorohexanoic acid



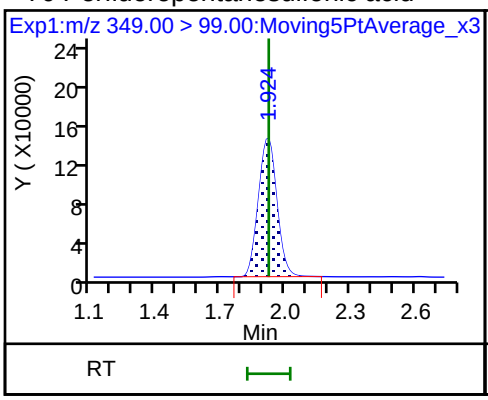
D 7 13C2 PFHxA



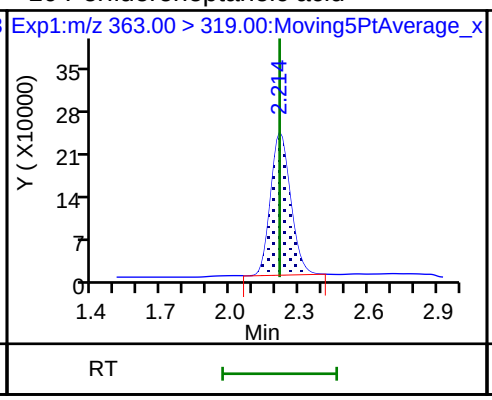
70 Perfluoropentanesulfonic acid



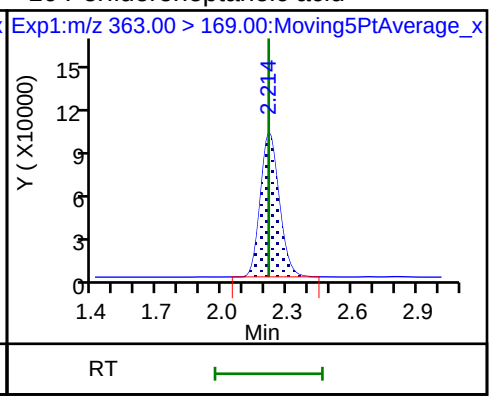
70 Perfluoropentanesulfonic acid



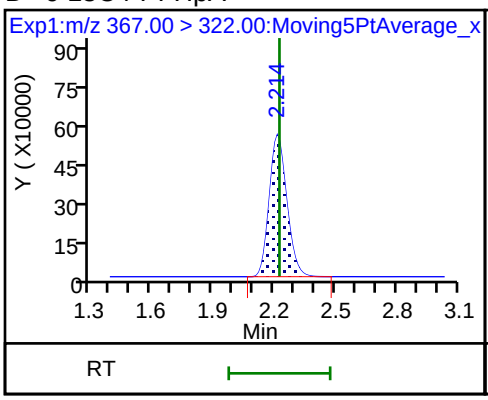
10 Perfluoroheptanoic acid



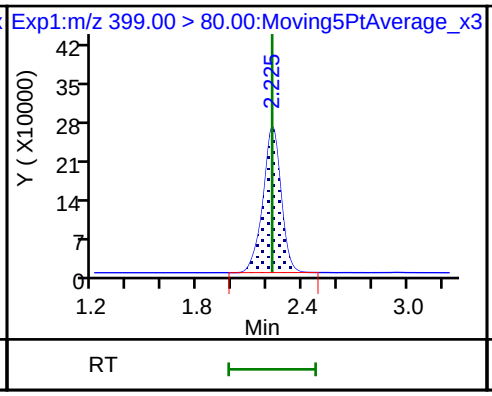
10 Perfluoroheptanoic acid



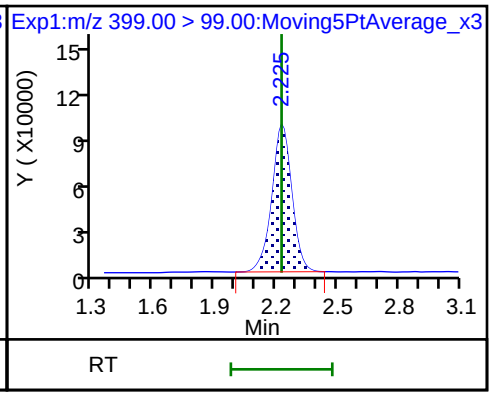
D 9 13C4-PFHpA



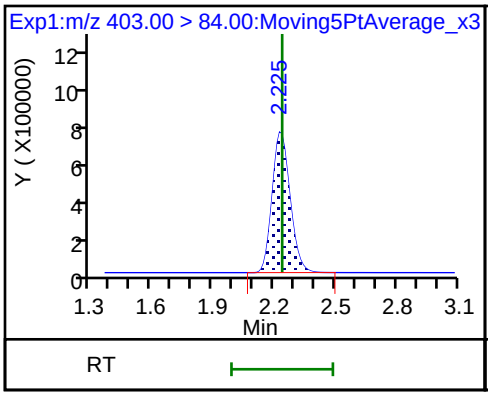
8 Perfluorohexanesulfonic acid



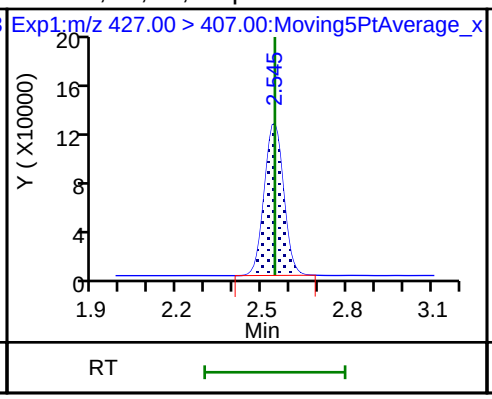
8 Perfluorohexanesulfonic acid



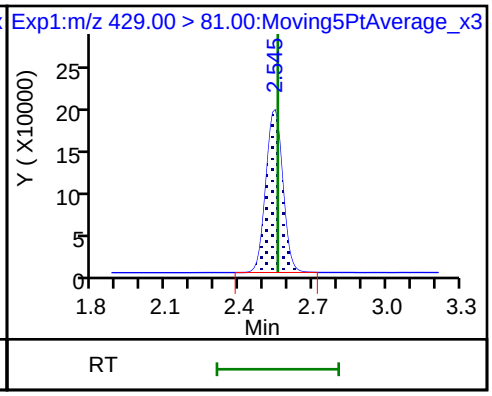
D 11 18O2 PFHxS



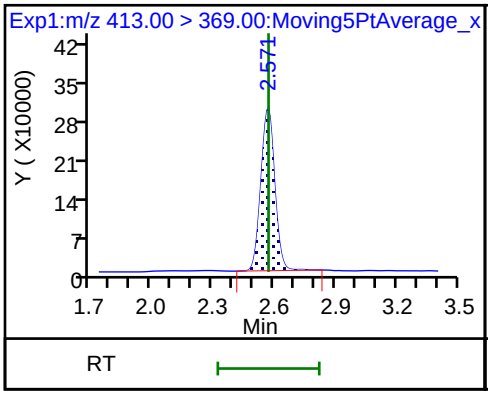
13 1H,1H,2H,2H-perfluorooctanesulfon



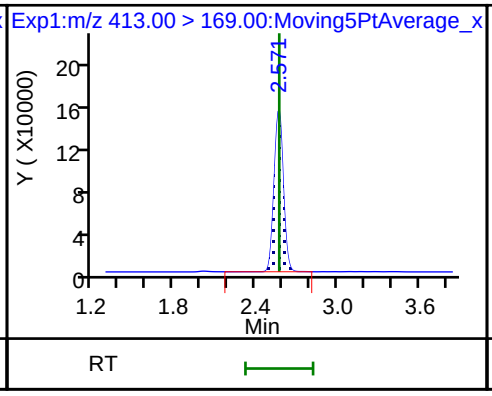
D 12 M2-6:2FTS



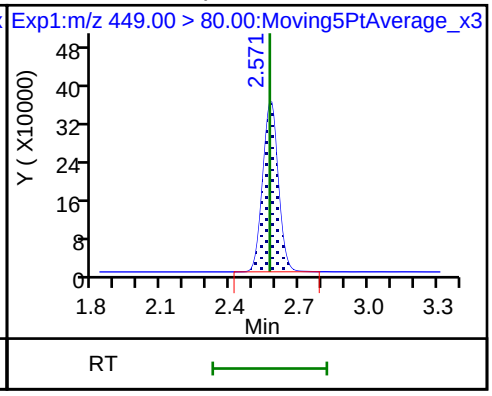
15 Perfluorooctanoic acid



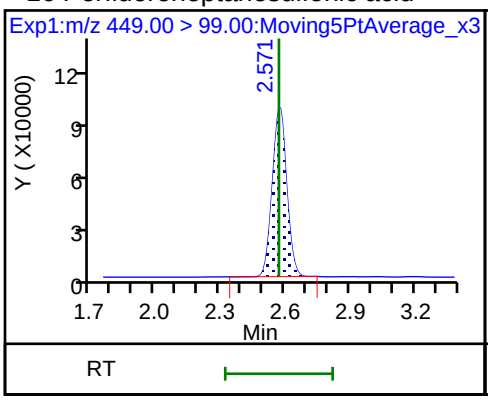
15 Perfluorooctanoic acid



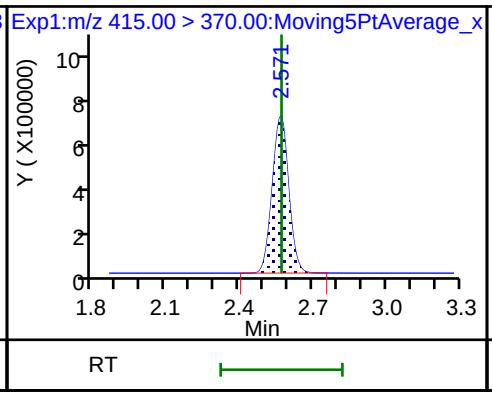
16 Perfluoroheptanesulfonic acid



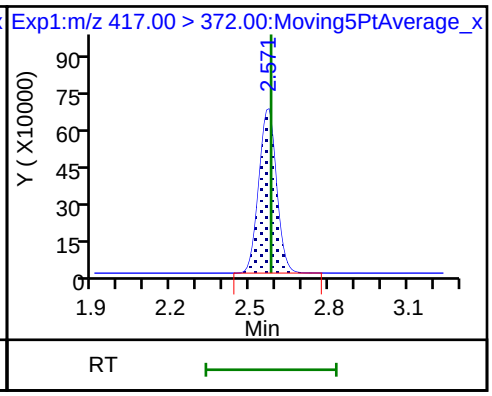
16 Perfluoroheptanesulfonic acid



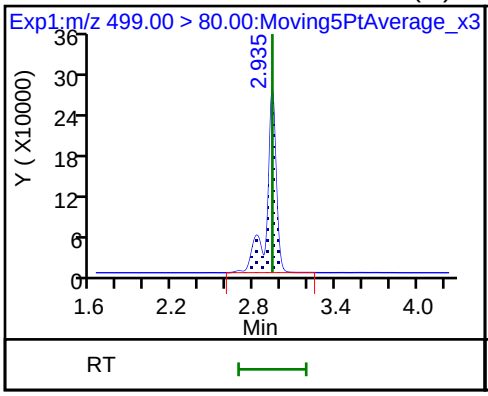
* 62 13C2-PFOA



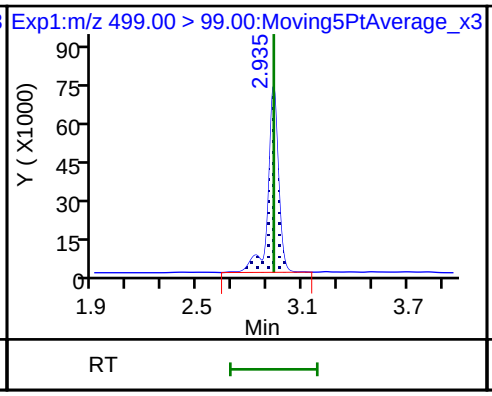
D 14 13C4 PFOA



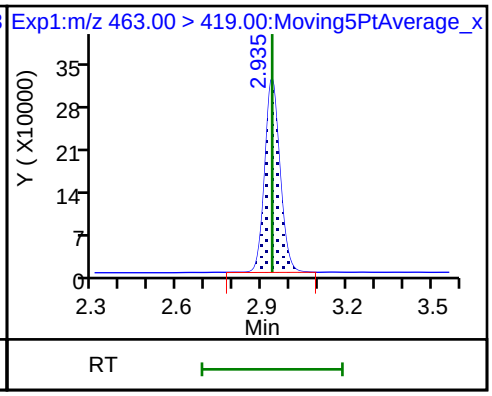
17 Perfluorooctane sulfonic acid (M)



17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



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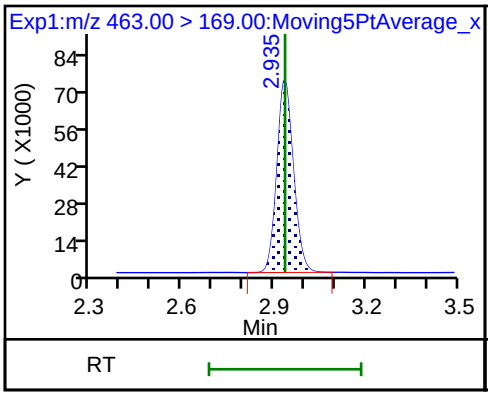
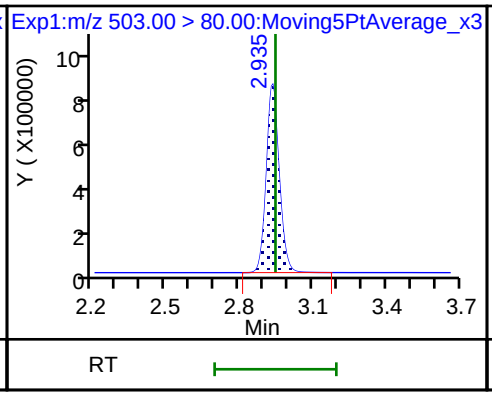
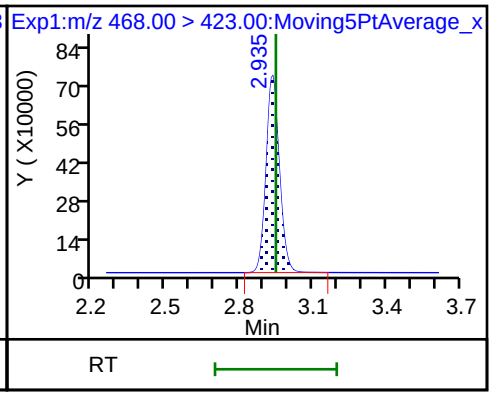


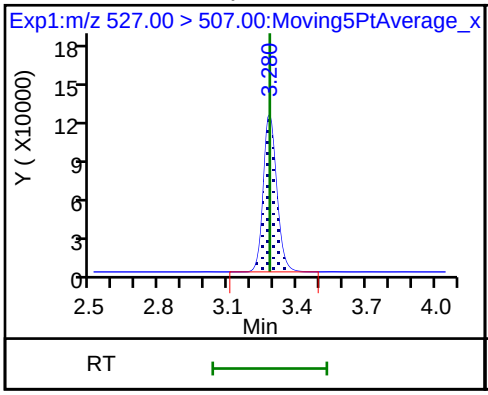
D 18 13C4 PFOS



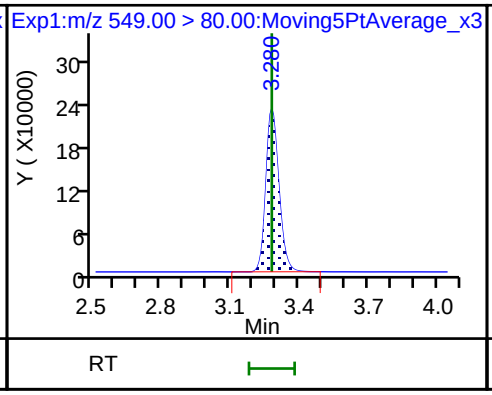
D 19 13C5 PFNA



25 1H,1H,2H,2H-perfluorodecanesulfoni



68 Perfluorononanesulfonic acid



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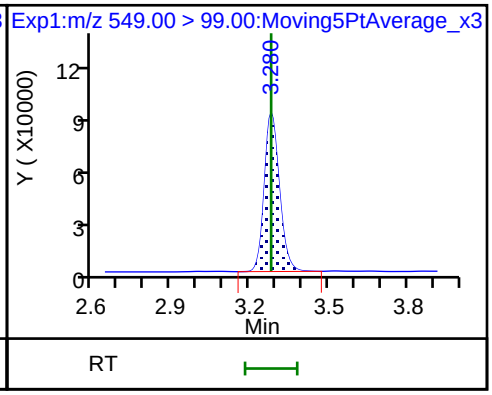
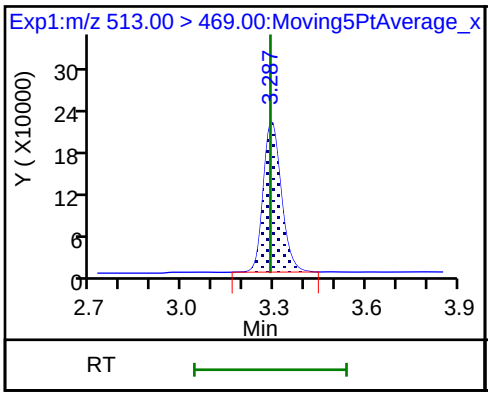
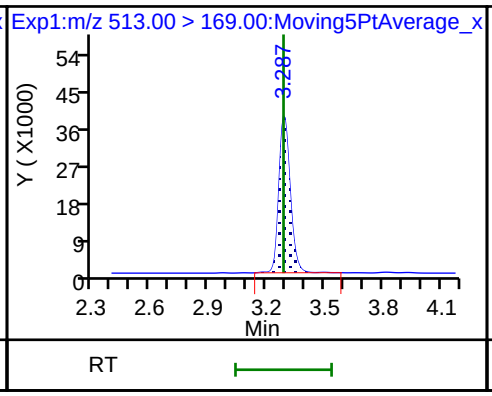


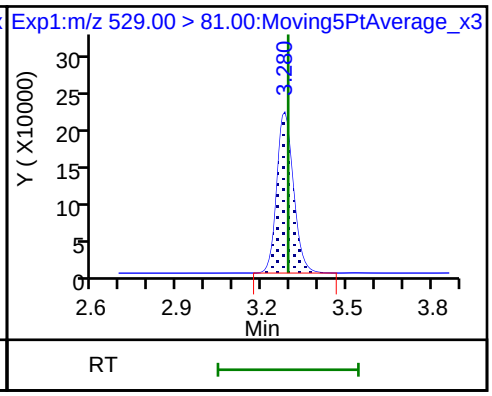
24 Perfluorodecanoic acid



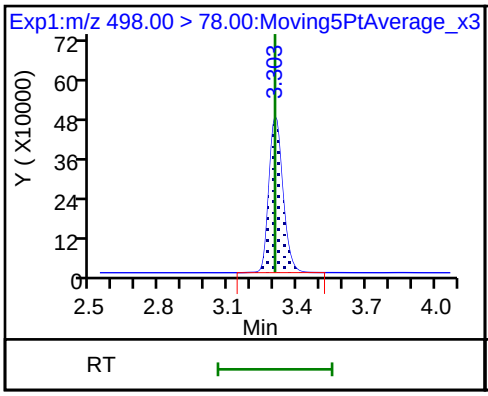
24 Perfluorodecanoic acid



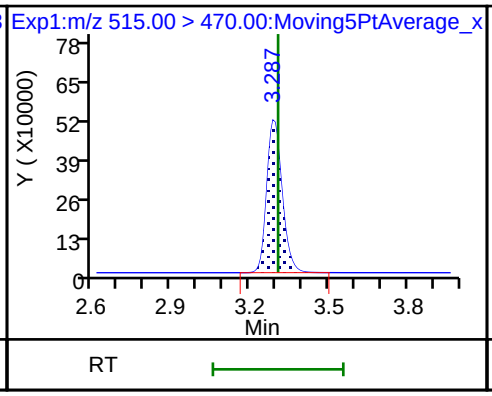
D 26 M2-8:2FTS



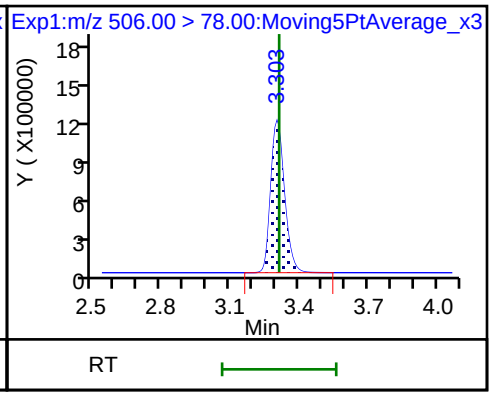
22 Perfluorooctane Sulfonamide



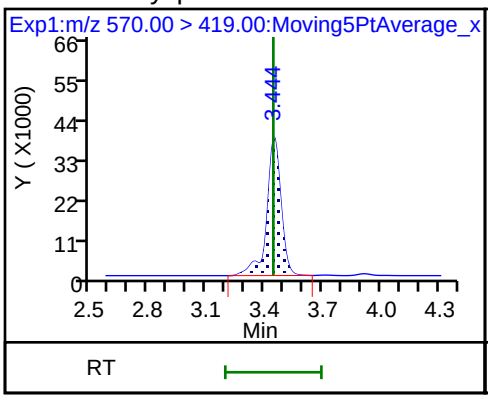
D 23 13C2 PFDA



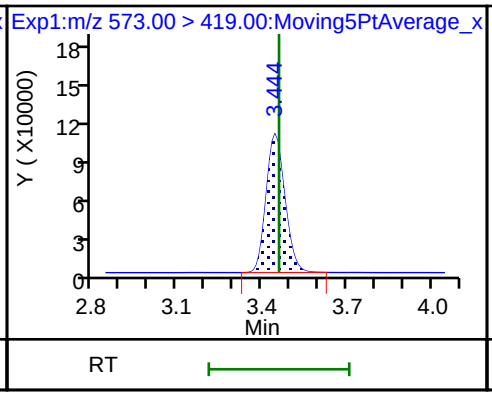
D 21 13C8 FOSA



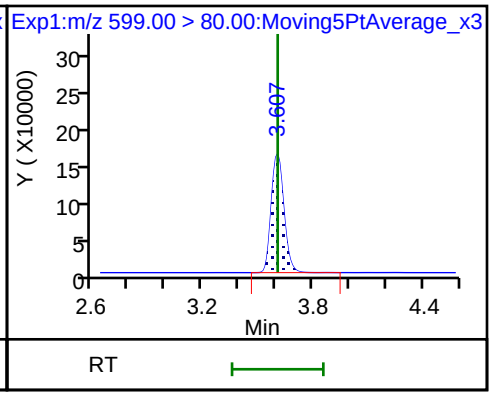
28 N-methyl perfluorooctane sulfonami



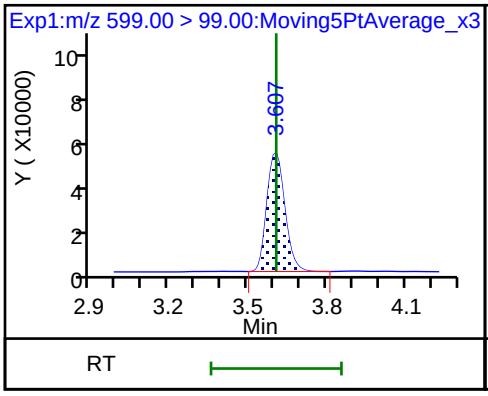
D 27 d3-NMeFOSAA



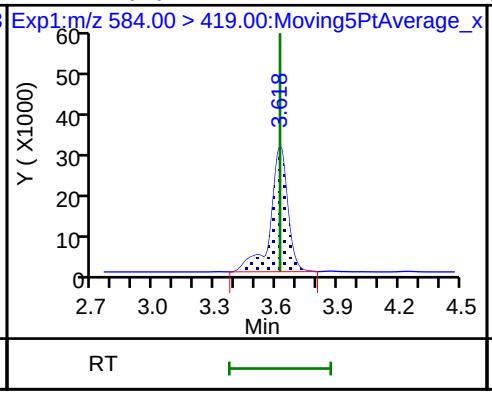
29 Perfluorodecane Sulfonic acid



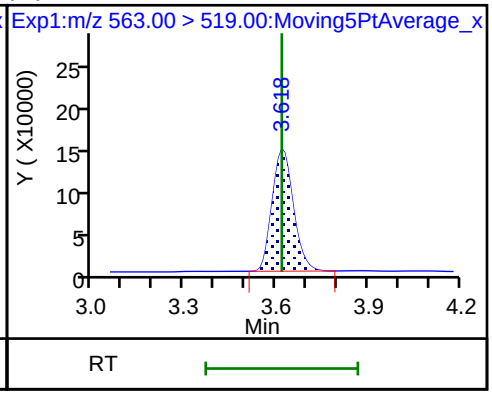
29 Perfluorodecane Sulfonic acid



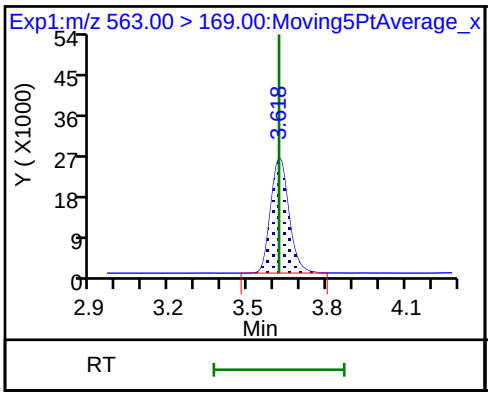
33 N-ethyl perfluorooctane sulfonamid (M



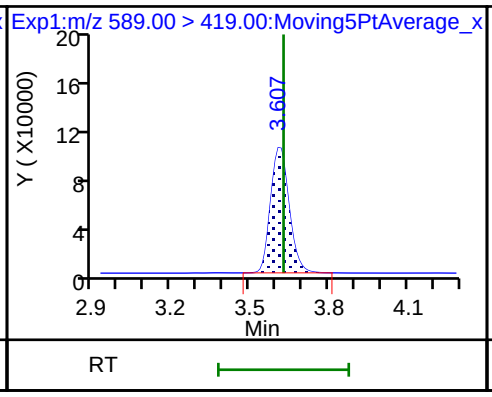
31 Perfluoroundecanoic acid



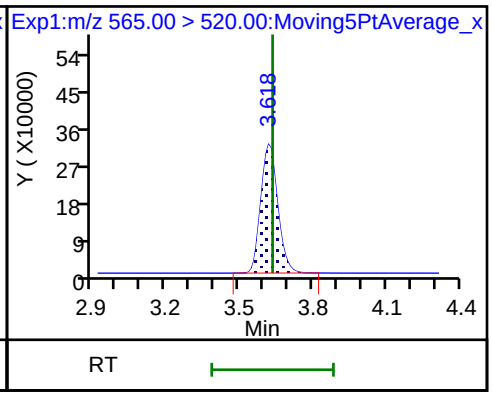
31 Perfluoroundecanoic acid



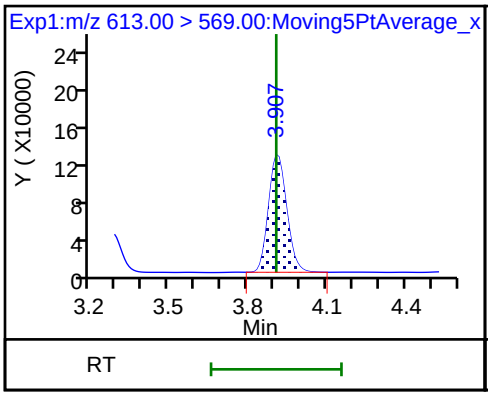
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA



37 Perfluorododecanoic acid



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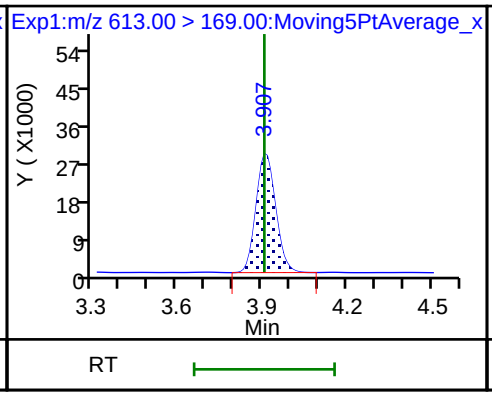
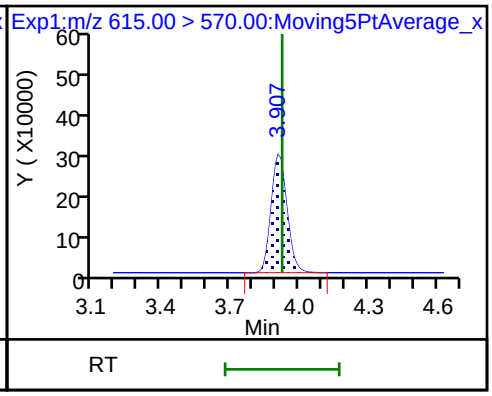
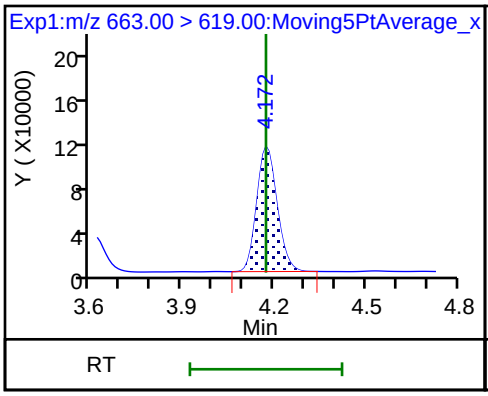


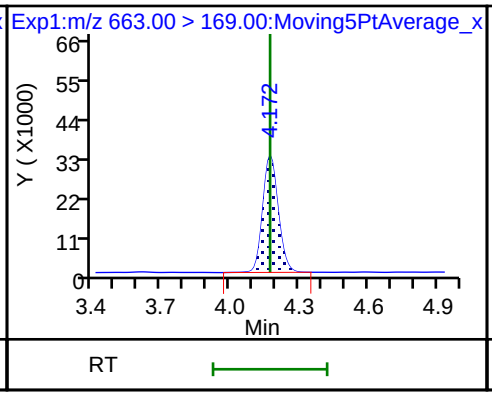
D 36 13C2 PFDoA



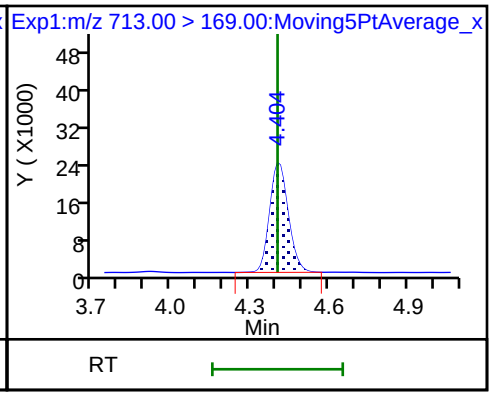
41 Perfluorotridecanoic acid



41 Perfluorotridecanoic acid



42 Perfluorotetradecanoic acid



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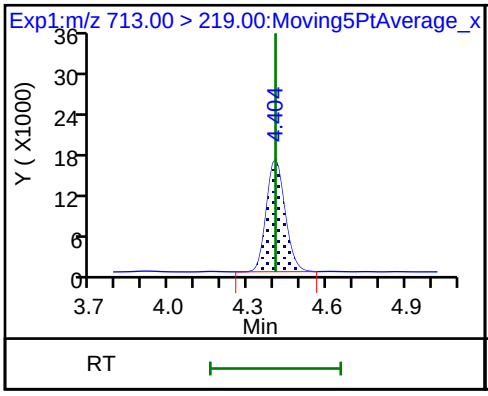
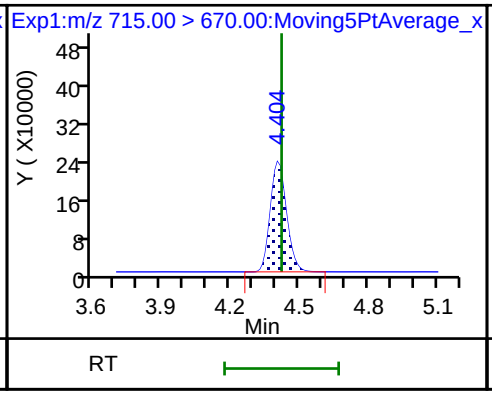
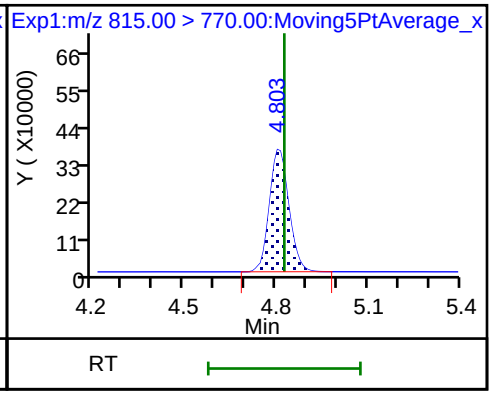


D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

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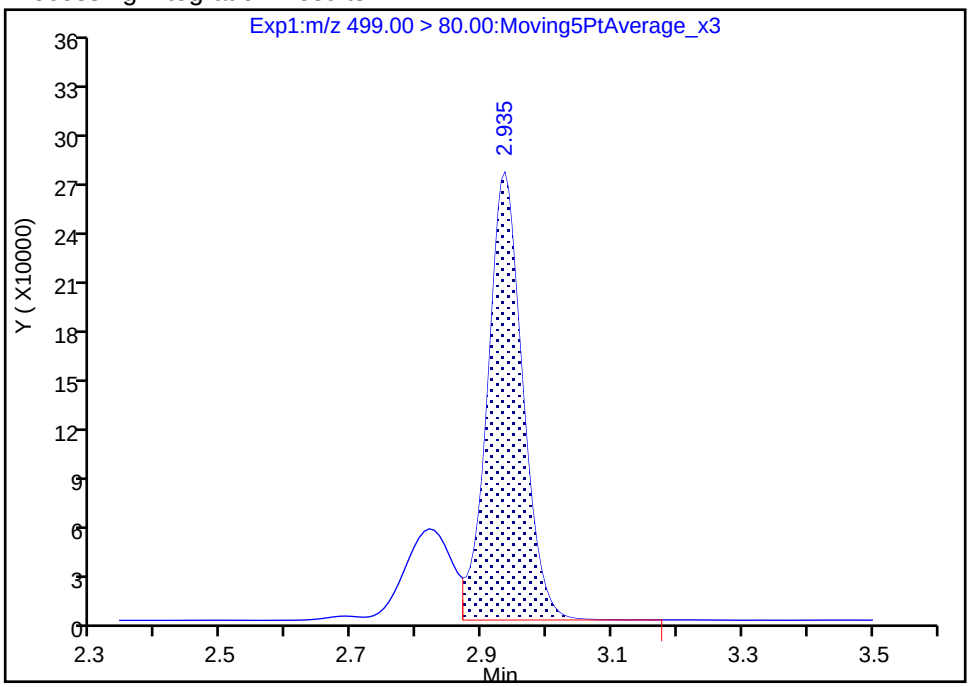
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

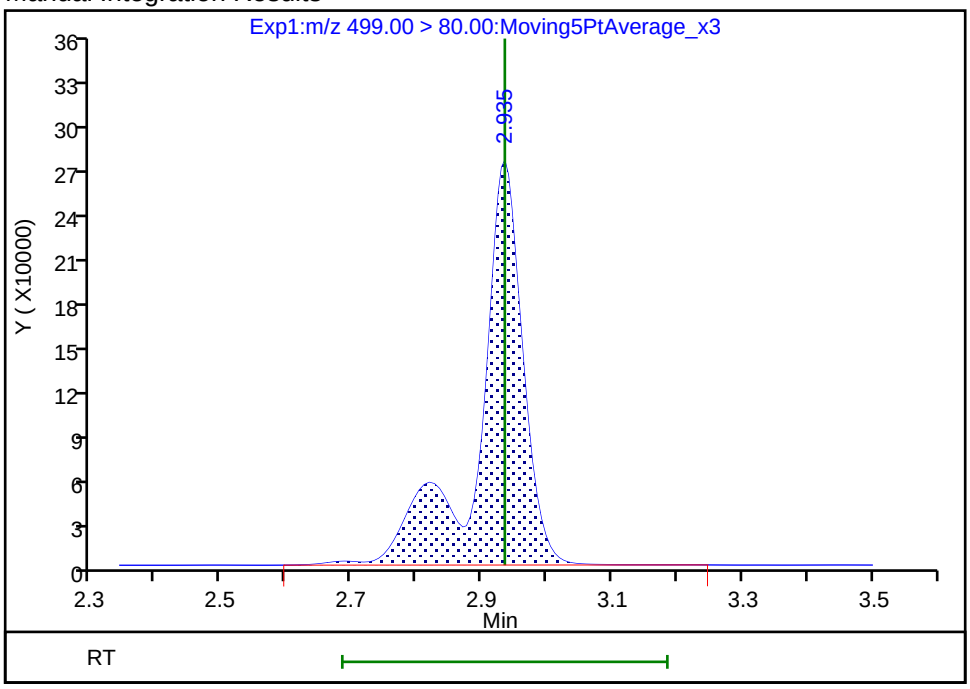
Processing Integration Results

RT: 2.93
Area: 1014353
Amount: 0.704914
Amount Units: ng/ml



Manual Integration Results

RT: 2.93
Area: 1301532
Amount: 0.904486
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:25:41

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

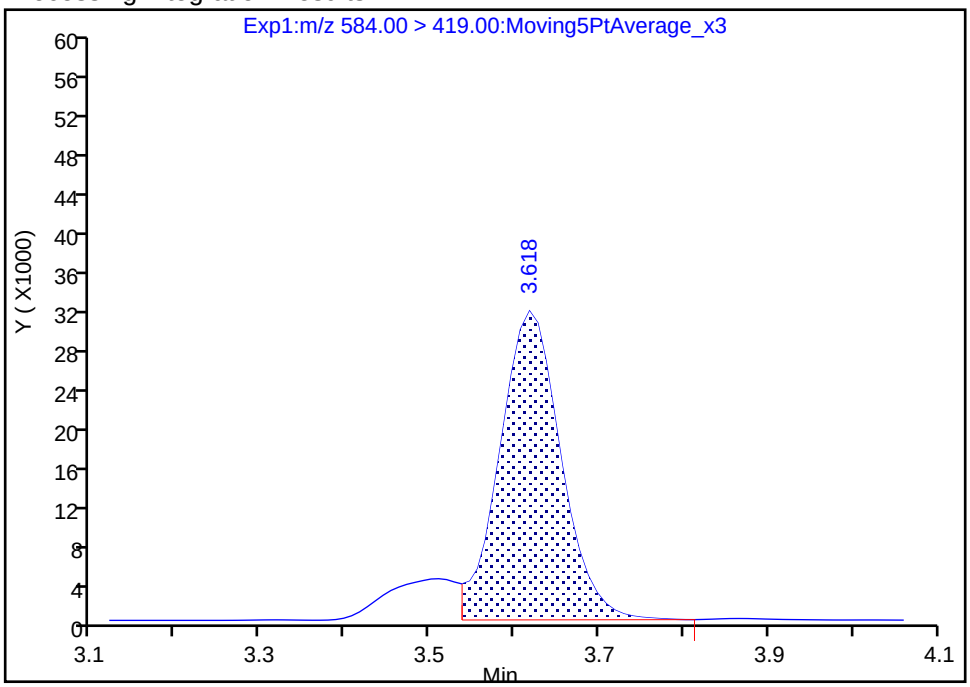
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLB_023.d				
Injection Date:	01-Aug-2018 15:51:03	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

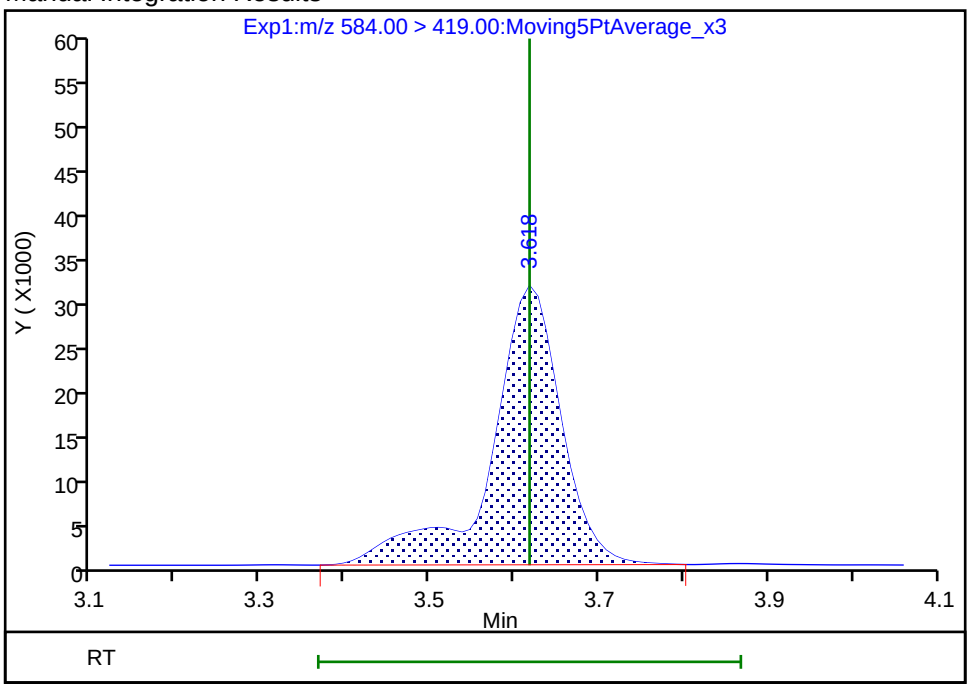
Processing Integration Results

RT: 3.62
Area: 158076
Amount: 0.886900
Amount Units: ng/ml



Manual Integration Results

RT: 3.62
Area: 182453
Amount: 1.023670
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:25:52

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237446/16 Calibration Date: 08/01/2018 17:01

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLBB_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9750		0.989	1.00	-1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.202		1.00	1.00	0.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	77.81		0.897	0.884	1.5	30.0
4:2 FTS	AveID	17.21	17.77		0.964	0.934	3.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.008		0.956	1.00	-4.4	30.0
Perfluoropentanesulfonic acid	AveID	67.65	70.22		0.974	0.938	3.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.104		0.952	1.00	-4.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.064		0.838	0.910	-7.9	30.0
6:2 FTS	AveID	1.654	1.690		0.969	0.948	2.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.138		0.985	1.00	-1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.363		0.939	0.952	-1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.060		0.982	1.00	-1.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.086		0.898	0.928	-3.3	30.0
8:2 FTS	AveID	1.351	1.372		0.973	0.958	1.5	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7150		0.955	0.960	-0.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	0.9935		0.931	1.00	-6.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.001		1.01	1.00	1.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.056		1.04	1.00	3.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6316		0.936	0.964	-2.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8501		0.954	1.00	-4.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.226		0.995	1.00	-0.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.054		0.973	1.00	-2.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9380		0.995	1.00	-0.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2575		0.956	1.00	-4.4	30.0
13C4 PFBA	Ave	1.440	1.417		2.46	2.50	-1.5	30.0
13C5-PFPeA	Ave	0.9481	0.9407		2.48	2.50	-0.8	30.0
13C3-PFBS	Ave	0.0273	0.0262		2.23	2.33	-4.0	30.0
13C2 PFHxA	Ave	1.026	1.031		2.51	2.50	0.5	30.0
13C4-PFHpA	Ave	0.9943	1.025		2.58	2.50	3.1	30.0
18O2 PFHxS	Ave	1.494	1.464		2.32	2.37	-2.0	30.0
M2-6:2FTS	Ave	0.2913	0.2894		2.36	2.38	-0.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-237446/16 Calibration Date: 08/01/2018 17:01

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLBB_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9535		2.48	2.50	-0.7	30.0
13C4 PFOS	Ave	1.032	0.9837		2.28	2.39	-4.7	30.0
13C5 PFNA	Ave	0.8365	0.8370		2.50	2.50	0.0	30.0
M2-8:2FTS	Ave	0.2839	0.2807		2.37	2.40	-1.2	30.0
13C2 PFDA	Ave	0.6256	0.6446		2.58	2.50	3.0	30.0
13C8 FOSA	Ave	1.516	1.500		2.47	2.50	-1.1	30.0
d3-NMeFOSAA	Ave	0.1518	0.1408		2.32	2.50	-7.2	30.0
d5-NEtFOSAA	Ave	0.1627	0.1561		2.40	2.50	-4.1	30.0
13C2 PFUnA	Ave	0.4818	0.4540		2.36	2.50	-5.8	30.0
13C2 PFDoA	Ave	0.4172	0.4128		2.47	2.50	-1.1	30.0
13C2-PFTeDA	Ave	0.3502	0.3289		2.35	2.50	-6.1	30.0
13C2-PFHxDA	Ave	0.6033	0.4365		1.81	2.50	-27.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_023.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 01-Aug-2018 17:01:18 ALS Bottle#: 13 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 02-Aug-2018 13:29:37 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: mongkols Date: 02-Aug-2018 13:29:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.391	0.0	1.000	1828691	0.9893		98.9	592	
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.003	0.541	4689181	2.46		98.5	126388	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.632	1.632	0.0	1.000	1496462	1.00		100	581	
D 3 13C5-PFPeA										
267.90 > 223.00	1.632	1.636	-0.004	0.635	3111783	2.48		99.2	53037	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.665	1.665	0.0	1.000	2382792	0.8974		102	18638	
298.90 > 99.00	1.665	1.665	0.0	1.000	978326		2.44(1.25-3.74)		5861	
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.669	-0.004	0.647	80541	2.23		96.0	369	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.866	0.0	1.120	574854	0.9642		103	25494	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.872	-0.006	0.725	615507	NC			8351	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.895	1.895	0.0	1.000	1374952	0.9561		95.6	2453	
313.00 > 119.00	1.895	1.895	0.0	1.000	117236		11.73(5.03-15.10)		1364	
D 7 13C2 PFHxA										
315.00 > 270.00	1.895	1.903	-0.008	0.737	3409227	2.51		100	74180	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.916	1.916	0.0	1.151	2281780	0.9736		104	35073	
349.00 > 99.00	1.916	1.916	0.0	1.151	825614		2.76(1.36-4.07)		4976	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.991	1.991	0.0	1.000	243380	NC			1011	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.991	2.000	-0.009	0.774	154822	NC			4318	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.217	2.217	0.0	1.000	1498256	0.9523		95.2	621	
363.00 > 169.00	2.217	2.217	0.0	1.000	588965		2.54(1.13-3.40)		5819	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.225	-0.008	0.862	3391849	2.58		103	63493	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.229	0.0	1.000	1876647	0.8379		92.1	8316	
399.00 > 99.00	2.229	2.229	0.0	1.000	634831		2.96(1.50-4.49)		1038	
D 11 18O2 PFHxS										
403.00 > 84.00	2.229	2.238	-0.009	0.866	4582053	2.32		98.0	50269	
65 ADONA										
377.00 > 251.00	2.267	2.267	0.0	0.772	3499119	NC			40689	
377.00 > 85.00	2.267	2.267	0.0	0.772	2101373		1.67(0.84-2.53)		7456	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.546	2.546	0.0	1.000	613636	0.9689		102	11765	
D 12 M2-6:2FTS										
429.00 > 81.00	2.546	2.556	-0.010	0.990	909556	2.36		99.4	11882	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.572	0.0	1.000	1436850	0.9850		98.4	840	
413.00 > 169.00	2.572	2.572	0.0	1.000	747594		1.92(0.84-2.52)		3756	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.580	2.580	0.0	0.879	1688836	0.9386		98.6	22829	
449.00 > 99.00	2.580	2.580	0.0	0.879	451702		3.74(1.94-5.82)		7033	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.572	0.0		3308081	2.50			44628	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.580	-0.008	1.000	3154223	2.48		99.3	52681	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.937	2.937	0.0	1.000	1311870	0.8977		96.7	12433	M
499.00 > 99.00	2.937	2.937	0.0	1.000	295141		4.44(2.31-6.93)		1792	
20 Perfluorononanoic acid										
463.00 > 419.00	2.937	2.937	0.0	1.000	1174450	0.9820		98.2	3593	
463.00 > 169.00	2.937	2.937	0.0	1.000	284750		4.12(1.90-5.69)		9639	
D 18 13C4 PFOS										
503.00 > 80.00	2.937	2.946	-0.009	1.142	3111047	2.28		95.3	33752	
D 19 13C5 PFNA										
468.00 > 423.00	2.937	2.948	-0.011	1.142	2768698	2.50		100	52969	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.148	3.148	0.0	1.072	2203458	NC			21233	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.284	3.284	0.0	1.000	488031	0.9726		102	29733	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.284	3.284	0.0	1.118	893424	0.9550		99.5	22335	
549.00 > 99.00	3.284	3.284	0.0	1.118	358296		2.49(1.33-3.97)		2719	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.299	0.0	1.002	847395	0.9307		93.1	1111	
513.00 > 169.00	3.292	3.299	-0.007	1.000	158206		5.36(2.36-7.09)		1987	
D 26 M2-8:2FTS										
529.00 > 81.00	3.284	3.292	-0.008	1.276	889420	2.37		98.8	14585	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.307	3.307	0.0	1.000	1986187	1.01		101	26118	
D 23 13C2 PFDA										
515.00 > 470.00	3.292	3.306	-0.014	1.280	2132426	2.58		103	51610	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.312	-0.005	1.286	4961382	2.47		98.9	49260	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.450	3.450	0.0	1.000	196748	1.04		104	3365	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.450	3.459	-0.009	1.341	465801	2.32		92.8	17043	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.614	3.614	0.0	1.231	792558	0.9361		97.1	27599	
599.00 > 99.00	3.614	3.614	0.0	1.231	255843		3.10(1.39-4.16)		2236	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.624	3.624	0.0	1.003	175620	0.9539		95.4	4258	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.624	3.624	0.0	1.000	736639	1.00		99.5	1848	
563.00 > 169.00	3.624	3.624	0.0	1.000	128578		5.73(2.12-6.36)		5271	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.614	3.627	-0.013	1.405	516468	2.40		95.9	6222	
D 30 13C2 PFUnA										
565.00 > 520.00	3.624	3.634	-0.010	1.409	1501917	2.36		94.2	35047	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.778	3.778	0.0	1.286	3343638	NC			53525	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	575615	0.9733		97.3	182	
613.00 > 169.00	3.913	3.913	0.0	1.000	142096		4.05(2.13-6.40)		3289	
D 36 13C2 PFDoA										
615.00 > 570.00	3.913	3.925	-0.012	1.521	1365479	2.47		98.9	16889	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.178	4.178	0.0	1.068	512352	1.00		99.5	168	
663.00 > 169.00	4.178	4.178	0.0	1.068	163003		3.14(1.25-3.76)		1440	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.412	4.412	0.0	1.000	112075	0.9560		95.6	2107	
713.00 > 219.00	4.412	4.412	0.0	1.000	79614		1.41(0.71-2.13)		1350	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.412	4.423	-0.011	1.715	1088084	2.35		93.9	4888	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.812	4.812	0.0	1.000	560477	NC			32.9	
813.00 > 169.00	4.812	4.812	0.0	1.000	96308		5.82(2.86-8.58)		1113	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.812	4.826	-0.014	1.870	1443916	1.81		72.4	2179	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.148	5.148	0.0	1.070	680886	NC			227	
913.00 > 169.00	5.148	5.148	0.0	1.070	83732		8.13(3.83-11.48)		831	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 02-Aug-2018 13:29:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_023.d

Injection Date: 01-Aug-2018 17:01:18 Instrument ID: A8_N

Lims ID: CCV L4

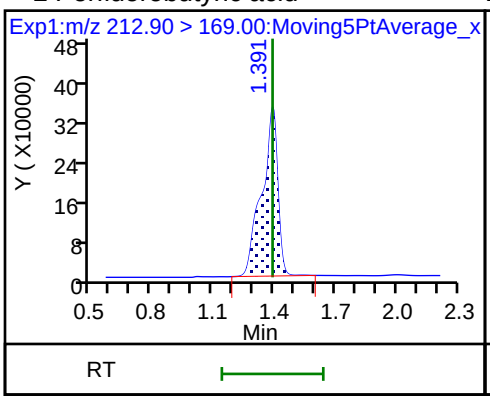
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 16

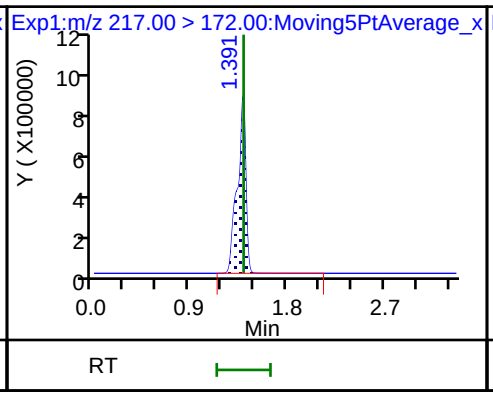
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

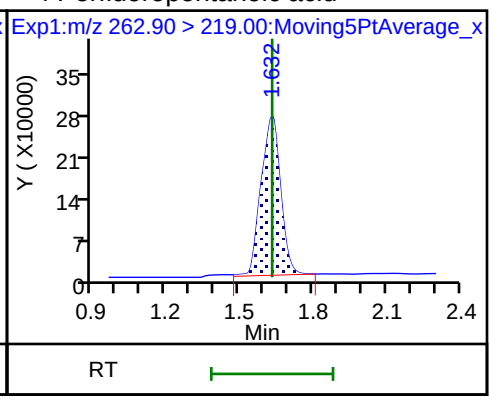
2 Perfluorobutyric acid



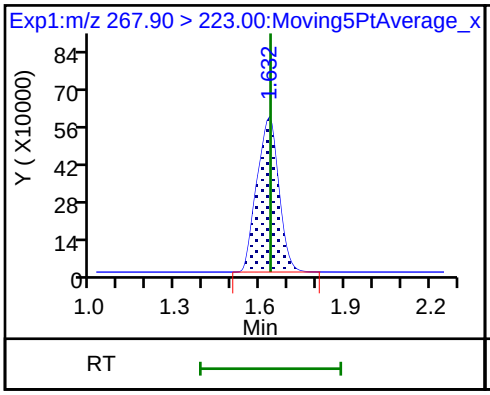
D 1 13C4 PFBA



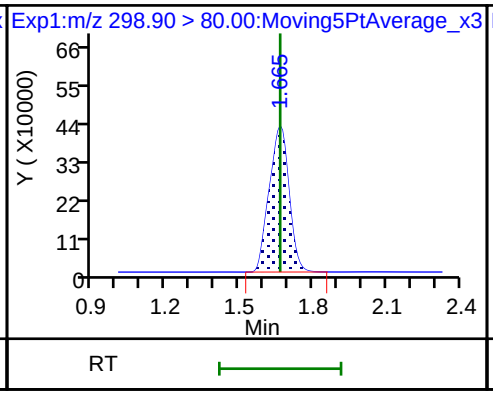
4 Perfluoropentanoic acid



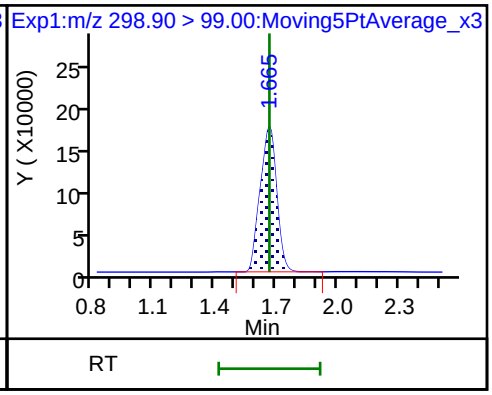
D 3 13C5-PFPeA



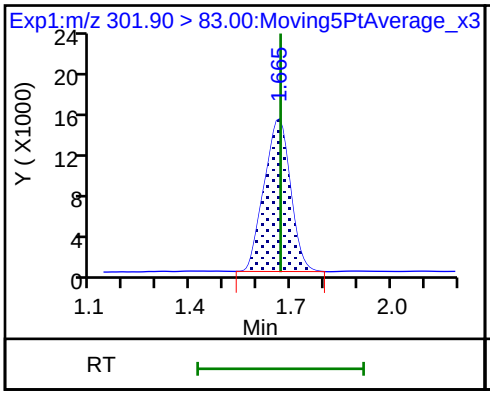
5 Perfluorobutanesulfonic acid



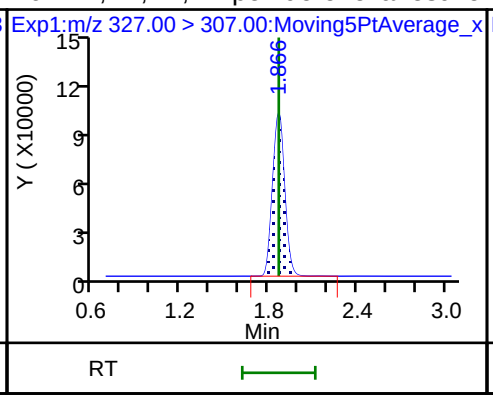
5 Perfluorobutanesulfonic acid



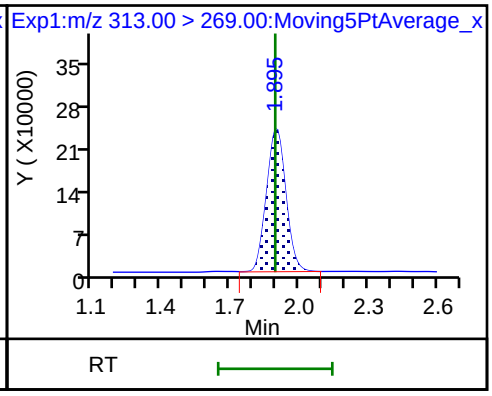
D 47 13C3-PFBS



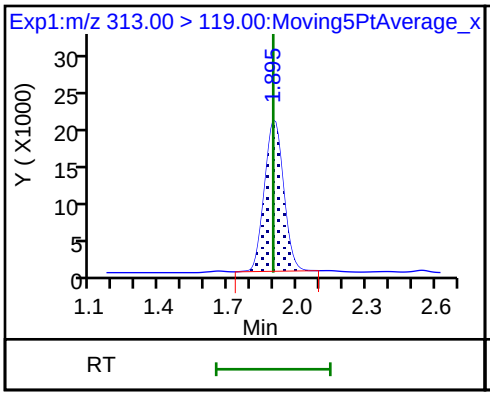
61 1H,1H,2H,2H-perfluorohexanesulfoni



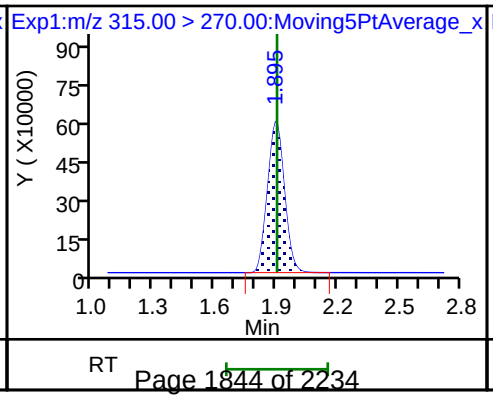
6 Perfluorohexanoic acid



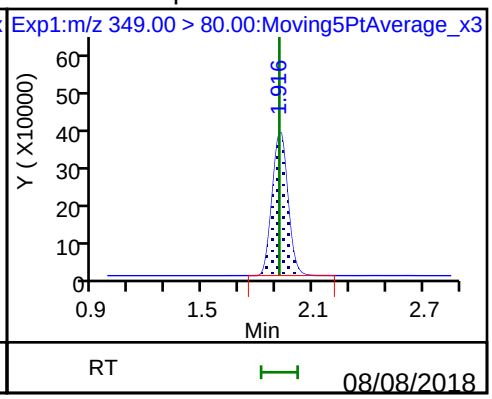
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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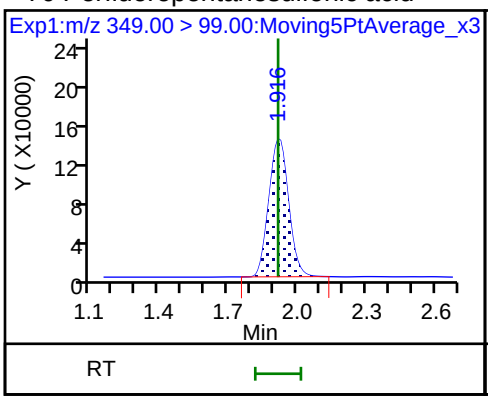
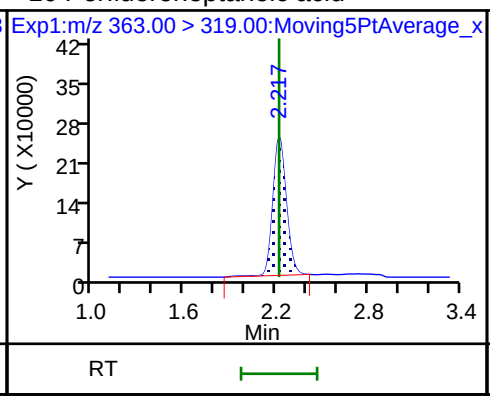
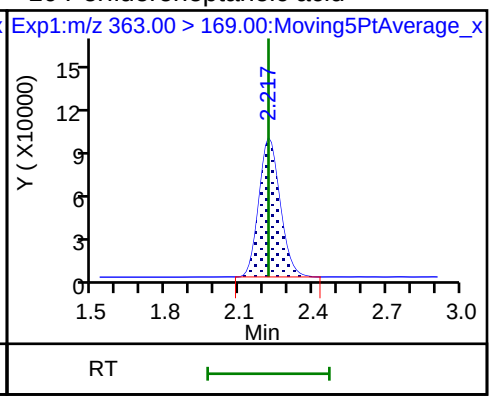


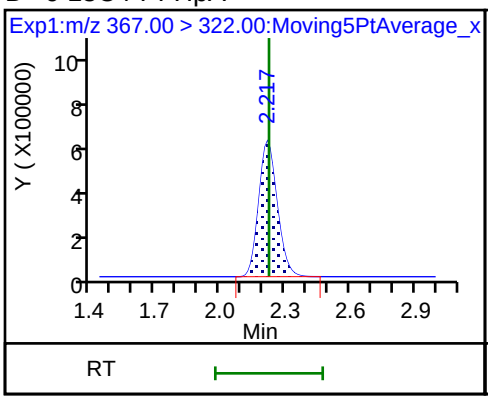
10 Perfluoroheptanoic acid



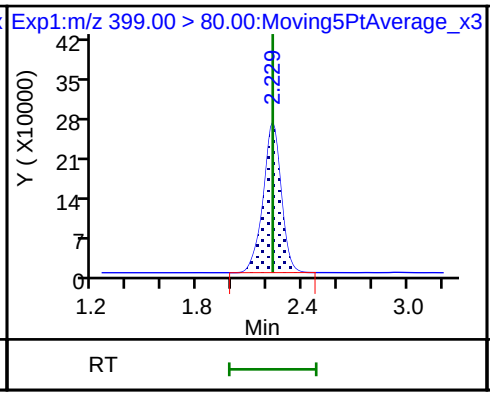
10 Perfluoroheptanoic acid



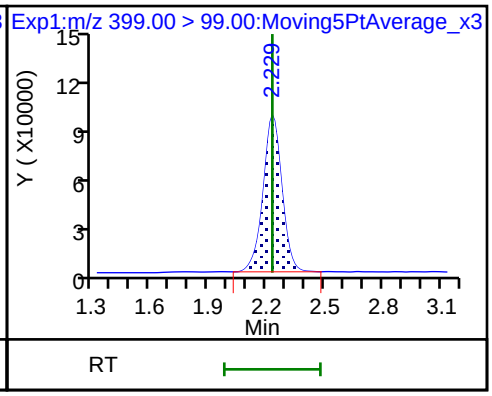
D 9 13C4-PFHpA



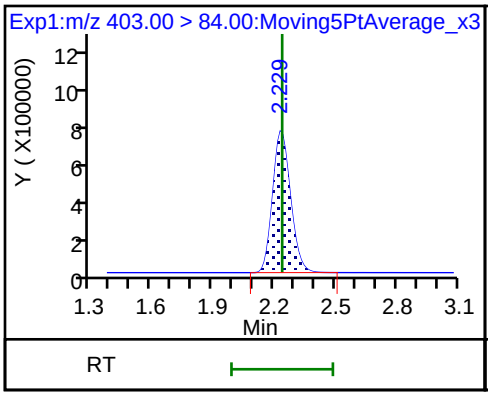
8 Perfluorohexanesulfonic acid



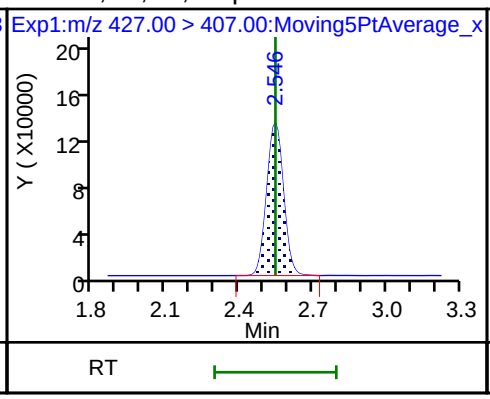
8 Perfluorohexanesulfonic acid



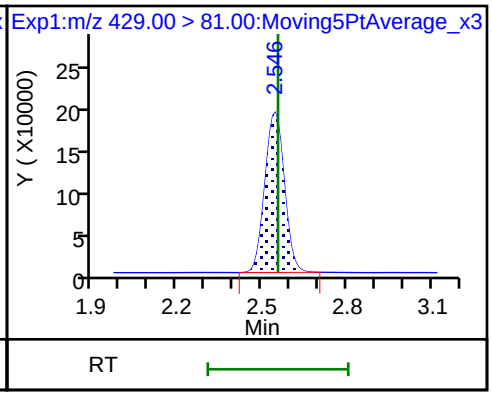
D 11 18O2 PFHxS



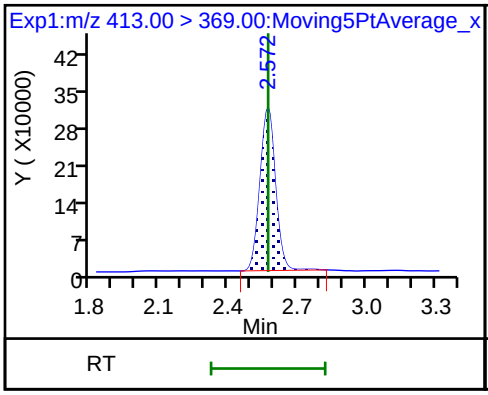
13 1H,1H,2H,2H-perfluorooctanesulfon



D 12 M2-6:2FTS



15 Perfluorooctanoic acid



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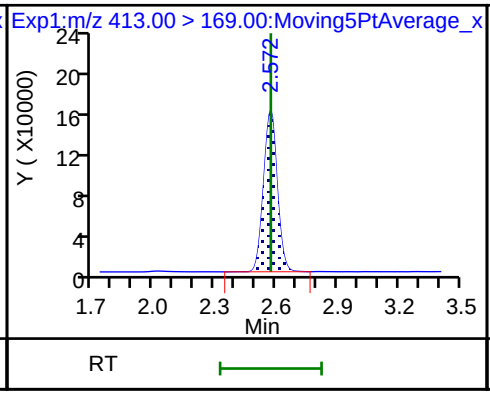
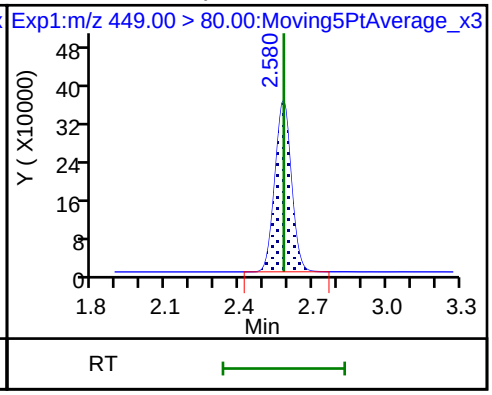
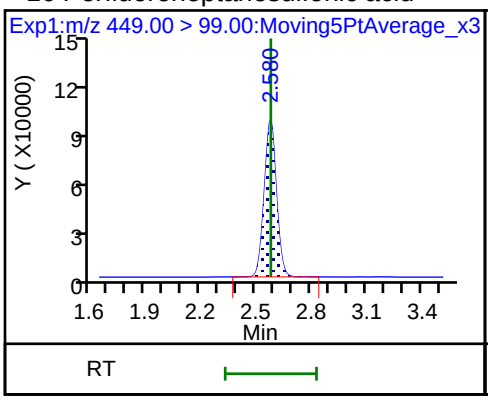


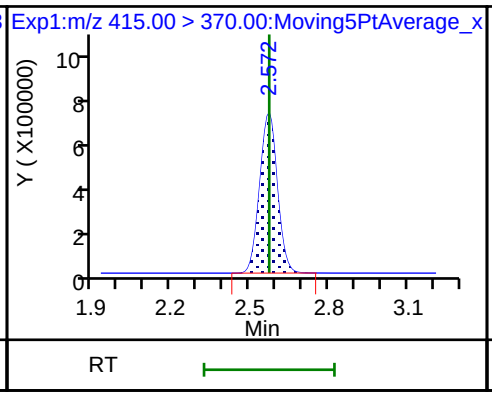
16 Perfluoroheptanesulfonic acid



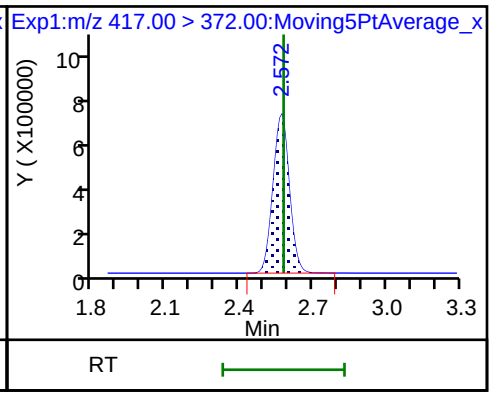
16 Perfluoroheptanesulfonic acid



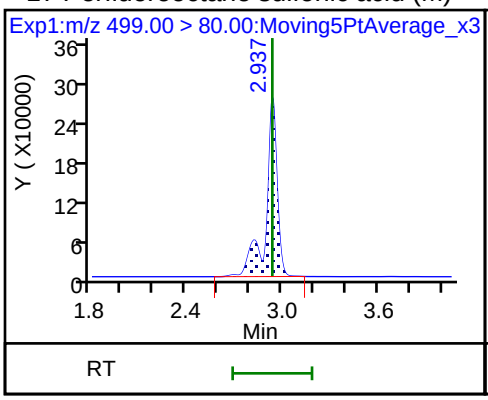
* 62 13C2-PFOA



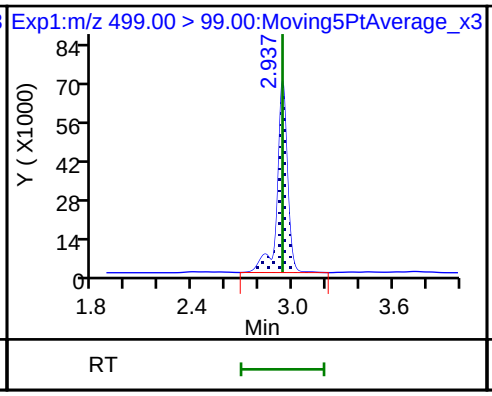
D 14 13C4 PFOA



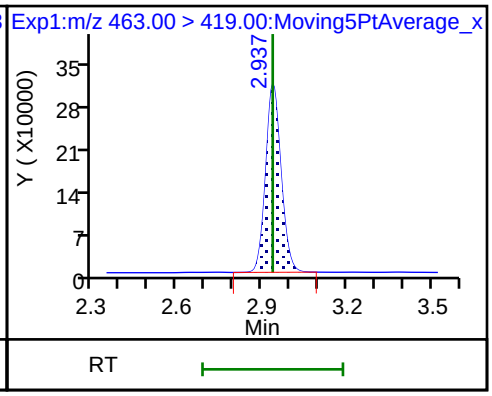
17 Perfluorooctane sulfonic acid (M)



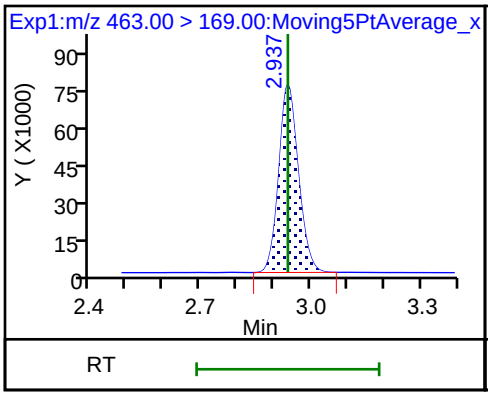
17 Perfluorooctane sulfonic acid



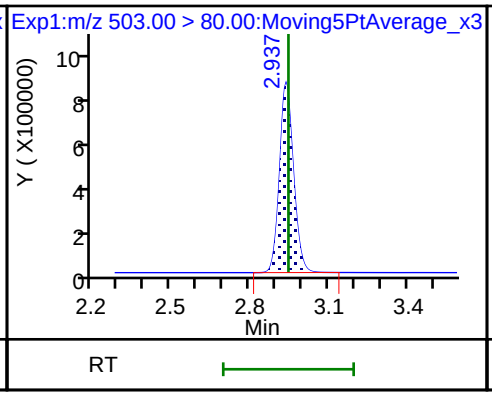
20 Perfluorononanoic acid



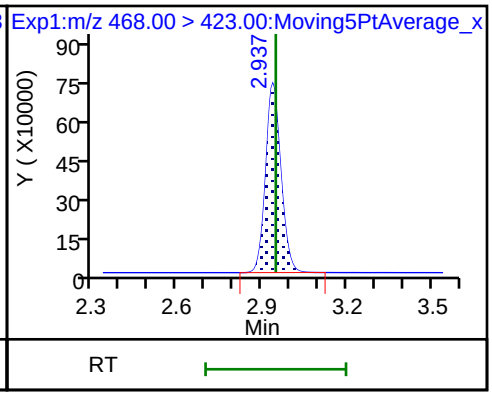
20 Perfluorononanoic acid



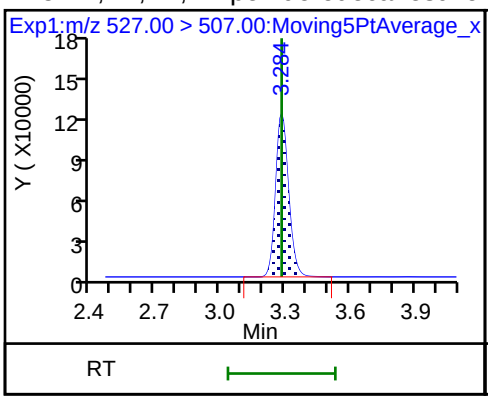
D 18 13C4 PFOS



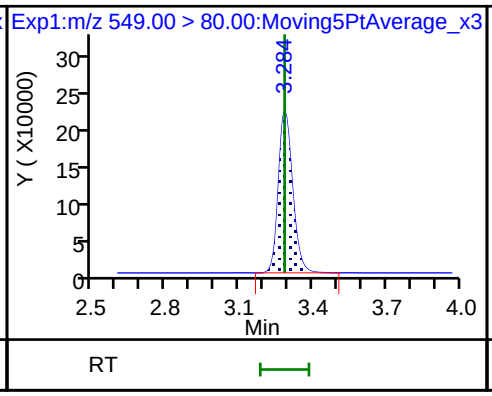
D 19 13C5 PFNA



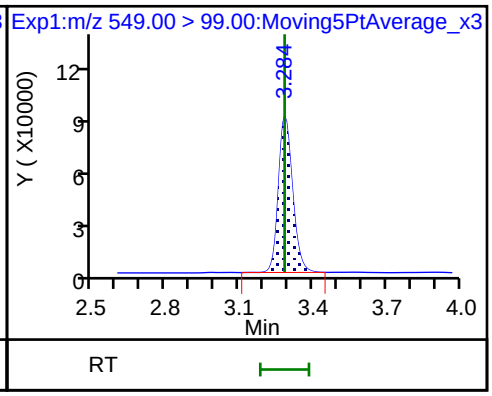
25 1H,1H,2H,2H-perfluorodecanesulfoni



68 Perfluorononanesulfonic acid



68 Perfluorononanesulfonic acid



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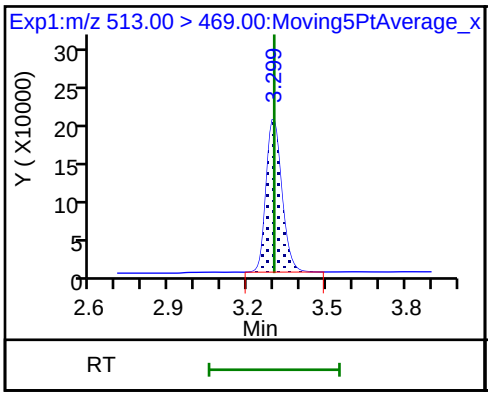
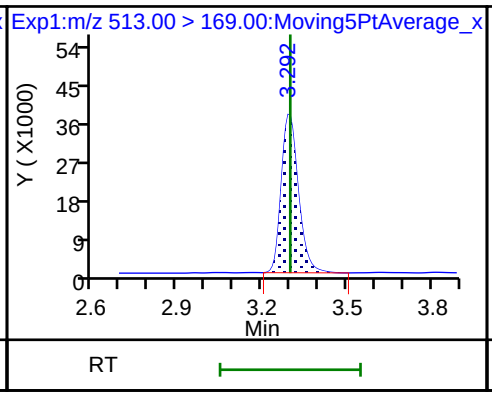
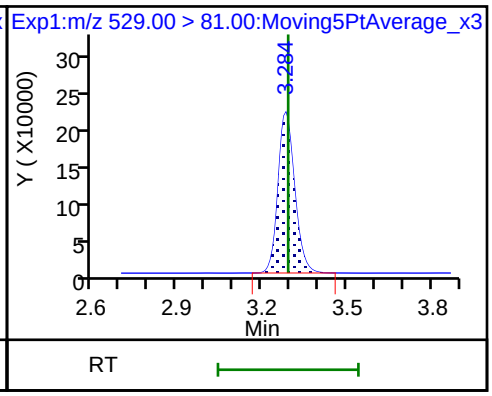
24 Perfluorodecanoic acid



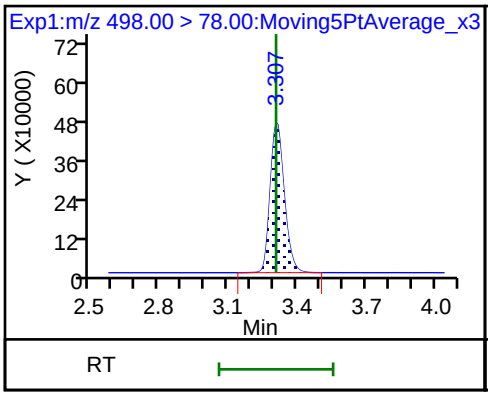
24 Perfluorodecanoic acid



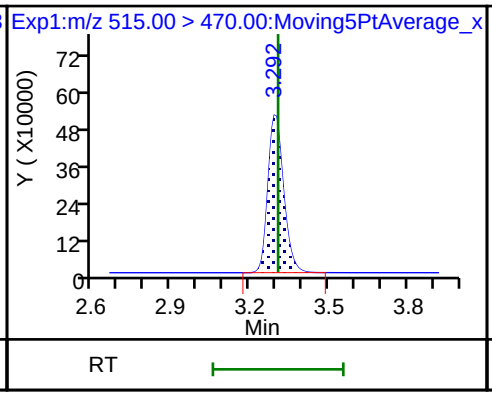
D 26 M2-8:2FTS



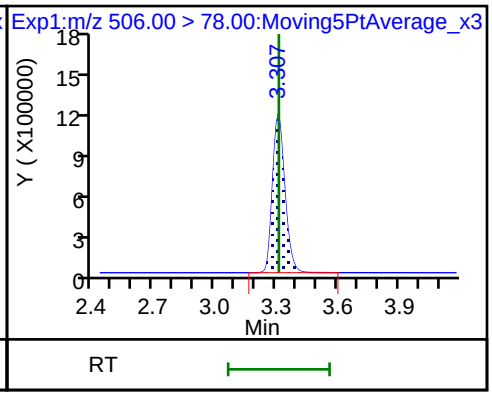
22 Perfluorooctane Sulfonamide



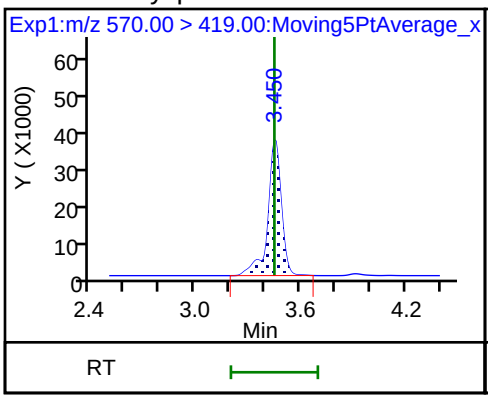
D 23 13C2 PFDA



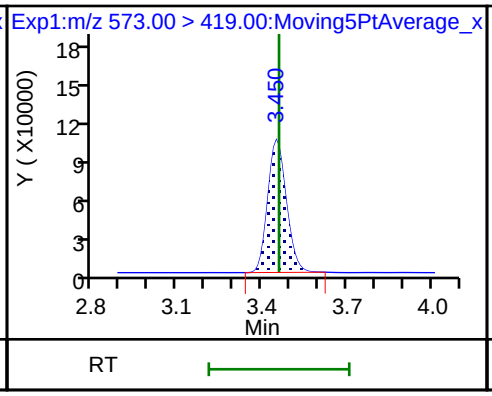
D 21 13C8 FOSA



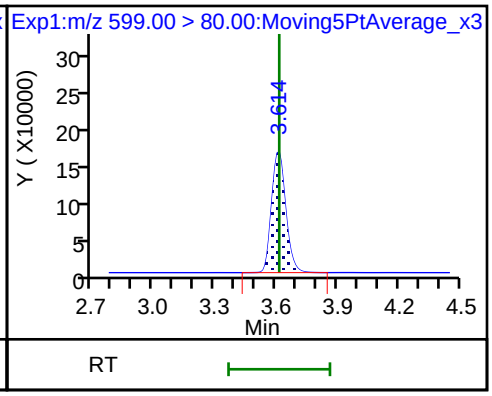
28 N-methyl perfluorooctane sulfonami



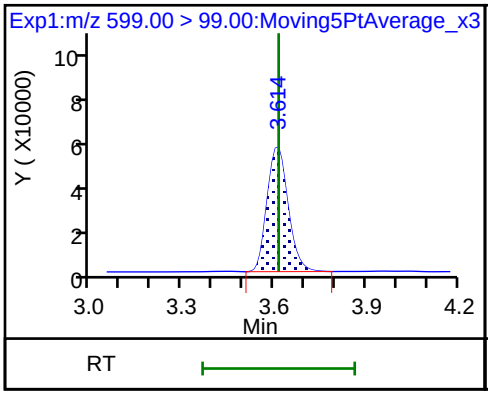
D 27 d3-NMeFOSAA



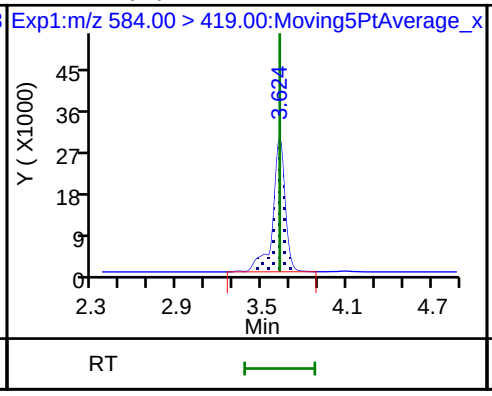
29 Perfluorodecane Sulfonic acid



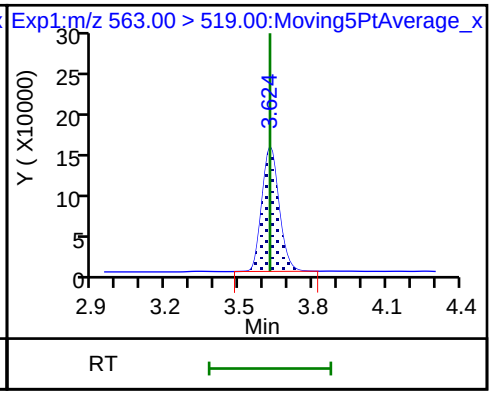
29 Perfluorodecane Sulfonic acid



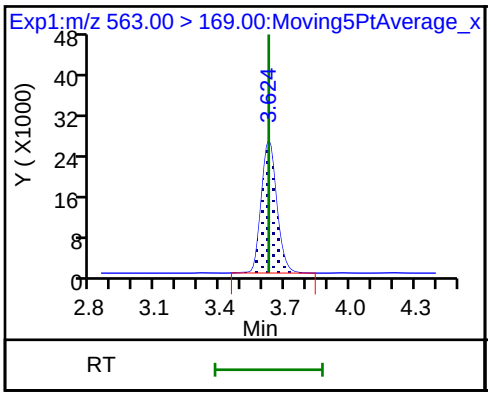
33 N-ethyl perfluorooctane sulfonamid



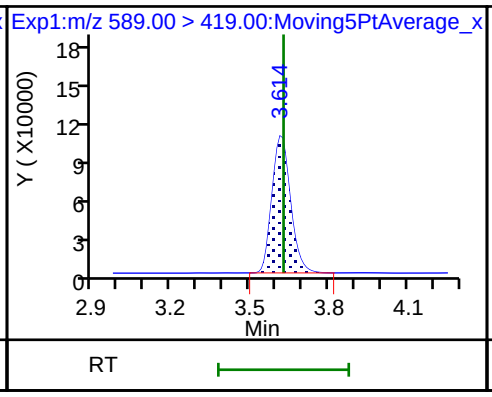
31 Perfluoroundecanoic acid



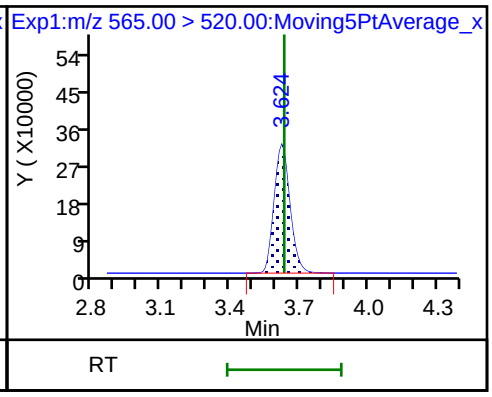
31 Perfluoroundecanoic acid



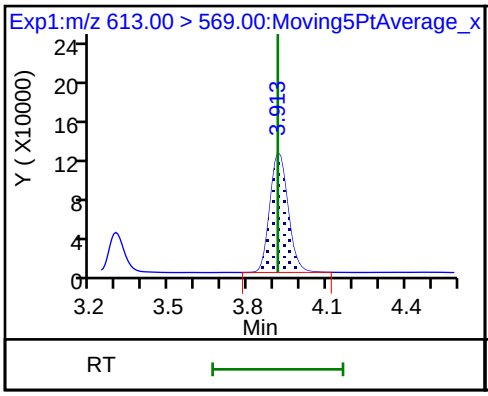
D 32 d5-NEtFOSAA



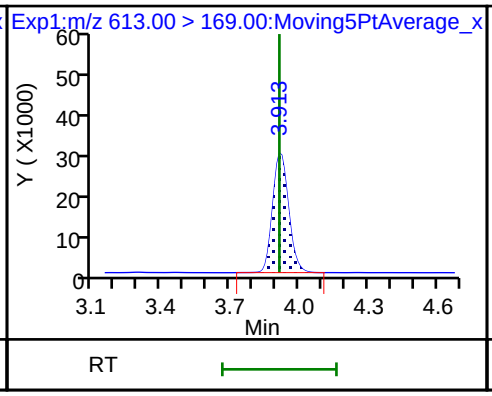
D 30 13C2 PFUnA



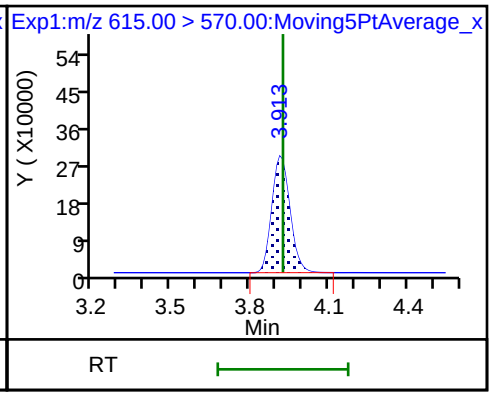
37 Perfluorododecanoic acid



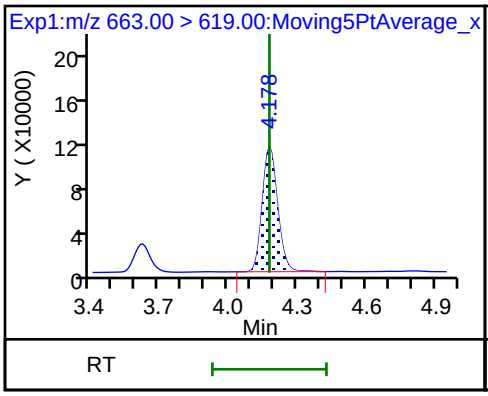
37 Perfluorododecanoic acid



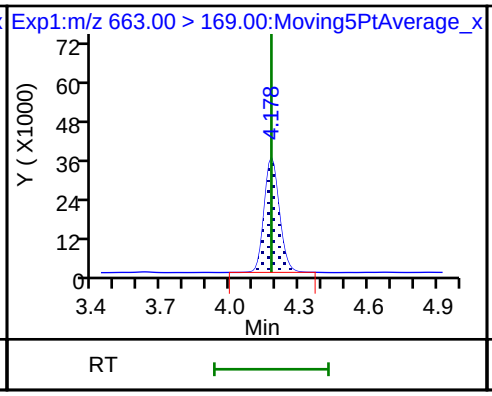
D 36 13C2 PFDoA



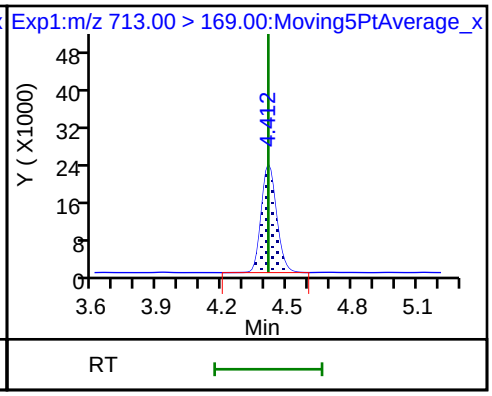
41 Perfluorotridecanoic acid



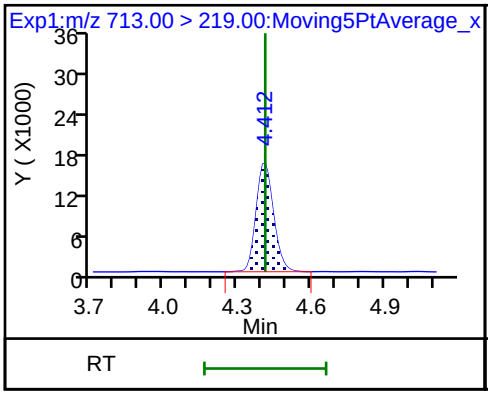
41 Perfluorotridecanoic acid



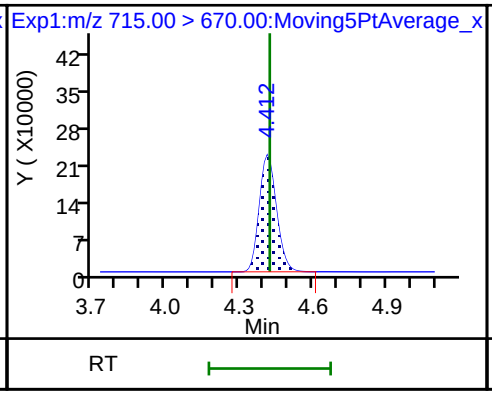
42 Perfluorotetradecanoic acid



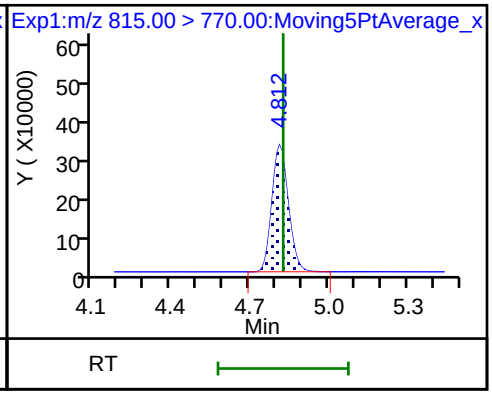
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

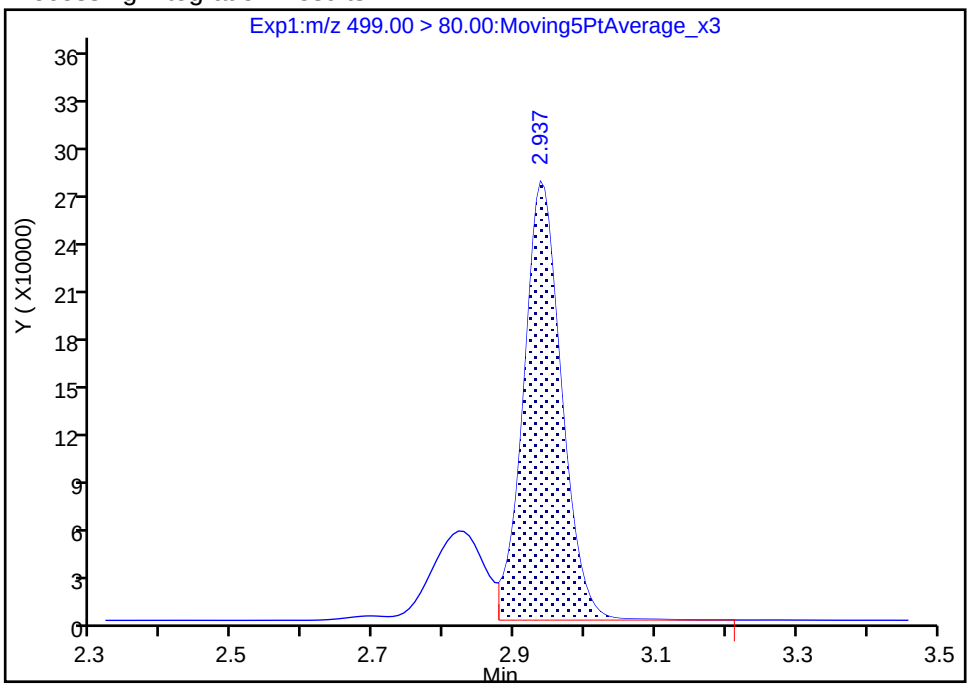
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61999.b\2018.08.01LLBB_023.d				
Injection Date:	01-Aug-2018 17:01:18	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

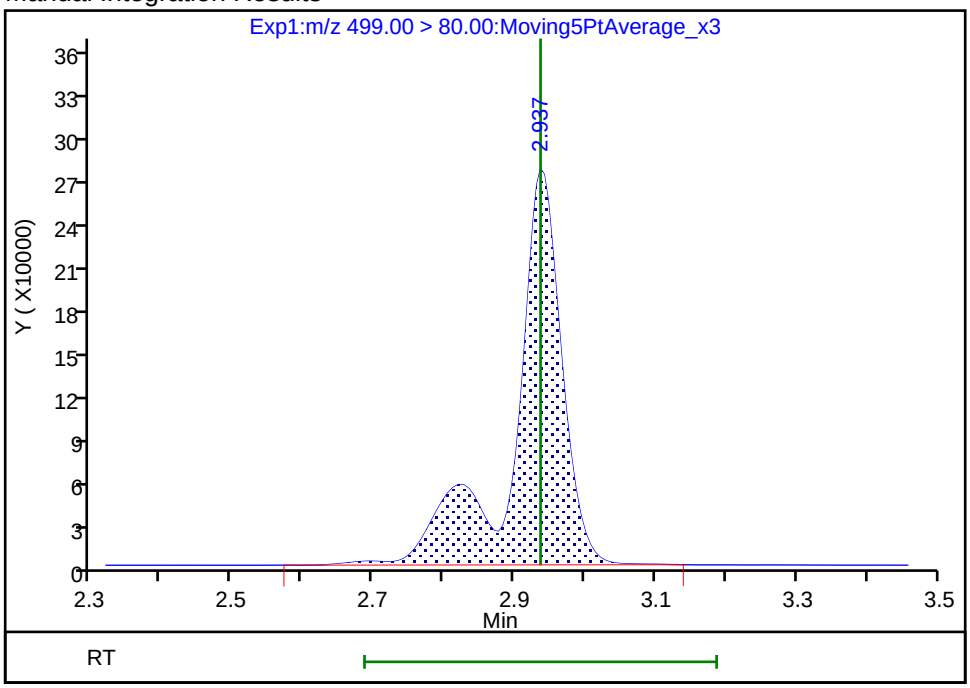
Processing Integration Results

RT: 2.94
Area: 1019377
Amount: 0.697565
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 1311870
Amount: 0.897719
Amount Units: ng/ml



Reviewer: mongkols, 02-Aug-2018 13:29:28

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-235323/10 Calibration Date: 07/20/2018 20:32

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.20LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	0.9527		2.49	2.50	-0.6	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.034		2.38	2.50	-4.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	112.1		2.27	2.21	2.5	30.0
4:2 FTS	AveID	21.47	22.86		2.49	2.34	6.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	0.9233		2.44	2.50	-2.4	30.0
Perfluoropentanesulfonic acid	AveID	52.20	54.18		2.43	2.35	3.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.092		2.48	2.50	-0.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.229		2.10	2.28	-7.7	30.0
6:2 FTS	AveID	2.182	2.280		2.48	2.37	4.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.133		2.46	2.50	-1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.101		2.46	2.38	3.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	0.9722		2.27	2.50	-9.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.157		2.38	2.32	2.8	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.320		2.71	2.50	8.5	30.0
8:2 FTS	AveID	15.89	14.38		2.17	2.40	-9.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.140		2.43	2.50	-2.9	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.3821		2.34	2.40	-2.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.081		2.61	2.50	4.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	1.039		2.68	2.41	11.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	1.089		2.71	2.50	8.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	0.8612		2.22	2.50	-11.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.129		2.61	2.50	4.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	1.005		2.51	2.50	0.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1577		2.29	2.50	-8.4	30.0
13C4 PFBA	Ave	0.9738	0.9266		2.38	2.50	-4.8	30.0
13C5-PFPeA	Ave	0.8956	0.8521		2.38	2.50	-4.9	30.0
13C3-PFBS	Ave	0.0113	0.0108		2.23	2.33	-4.1	30.0
13C2 PFHxA	Ave	0.9398	0.9062		2.41	2.50	-3.6	30.0
13C4-PFHpA	Ave	1.089	1.059		2.43	2.50	-2.8	30.0
18O2 PFHxS	Ave	0.6628	0.6131		2.19	2.37	-7.5	30.0
M2-6:2FTS	Ave	0.1018	0.0992		2.31	2.38	-2.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: ICV 320-235323/10 Calibration Date: 07/20/2018 20:32

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.20LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.9457		2.41	2.50	-3.4	30.0
13C4 PFOS	Ave	0.7102	0.6768		2.28	2.39	-4.7	30.0
13C5 PFNA	Ave	0.9199	0.9575		2.60	2.50	4.1	30.0
13C8 FOSA	Ave	0.4011	0.3630		2.26	2.50	-9.5	30.0
13C2 PFDA	Ave	0.9555	0.9785		2.56	2.50	2.4	30.0
M2-8:2FTS	Ave	0.0139	0.0141		2.43	2.40	1.5	30.0
d3-NMeFOSAA	Ave	0.4497	0.4356		2.42	2.50	-3.1	30.0
13C2 PFUnA	Ave	0.8725	0.9272		2.66	2.50	6.3	30.0
d5-NEtFOSAA	Ave	0.3602	0.3675		2.55	2.50	2.0	30.0
13C2 PFDoA	Ave	0.9367	0.9161		2.45	2.50	-2.2	30.0
13C2-PFTeDA	Ave	0.8106	0.8183		2.52	2.50	1.0	30.0
13C2-PFHxDA	Ave	0.8343	0.7990		2.39	2.50	-4.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_012.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 20-Jul-2018 20:32:53 ALS Bottle#: 9 Worklist Smp#: 10
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9
Sublist:

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:24:34 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 10:03:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.524	1.515	0.009	0.542	4618106	2.38		95.2	16540	
2 Perfluorobutyric acid										
212.90 > 169.00	1.524	1.516	0.008	1.000	4399739	2.49			1090	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.789	0.021	1.000	4393010	2.38			2765	
D 3 13C5-PFPeA										
267.90 > 223.00	1.810	1.789	0.021	0.643	4246617	2.38		95.1	18253	
D 47 13C3-PFBS										
301.90 > 83.00	1.843	1.827	0.016	0.655	50261	2.23		95.9	890	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.843	1.831	0.012	1.000	5356601	2.27			5186	
298.90 > 99.00	1.843	1.831	0.012	1.000	1931341		2.77(1.35-4.05)		6700	
D 60 M2-4:2FTS										
329.00 > 81.00	2.067	2.051	0.016	0.735	423176	NC			1324	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.067	2.051	0.016	1.121	1153808	2.49			13913	
D 7 13C2 PFHxA										
315.00 > 270.00	2.098	2.085	0.013	0.746	4516351	2.41		96.4	32355	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.098	2.086	0.012	1.000	4169760	2.44			3007	
313.00 > 119.00	2.098	2.086	0.012	1.000	288936		14.43(6.96-20.87)		1594	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.130	2.112	0.018	1.155	2746384	2.43			9732	
349.00 > 99.00	2.130	2.112	0.018	1.155	1176463		2.33(1.15-3.45)		8148	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.202	2.189	0.013	0.783	343915	NC			3223	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.202	2.189	0.013	1.000	765485	NC			500	
D 9 13C4-PFHpA										
367.00 > 322.00	2.449	2.431	0.018	0.871	5277175	2.43		97.2	34367	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.449	2.433	0.016	1.000	5762918	2.48			2127	
363.00 > 169.00	2.449	2.433	0.016	1.000	1291844		4.46(2.17-6.52)		7134	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.462	2.446	0.016	1.000	3417422	2.10			5706	
399.00 > 99.00	2.462	2.446	0.016	1.000	883588		3.87(1.90-5.70)		4516	
D 11 18O2 PFHxS										
403.00 > 84.00	2.462	2.447	0.015	0.875	2890422	2.19		92.5	42632	
65 ADONA										
377.00 > 251.00	2.488	2.477	0.011	0.780	8808692	NC			24529	
377.00 > 85.00	2.488	2.477	0.011	0.780	3932529		2.24(1.05-3.16)		2596	
D 12 M2-6:2FTS										
429.00 > 81.00	2.797	2.779	0.018	0.994	469514	2.31		97.4	1855	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.797	2.779	0.018	1.000	1068012	2.48			15657	
D 14 13C4 PFOA										
417.00 > 372.00	2.813	2.804	0.009	1.000	4713297	2.41		96.6	23798	
* 62 13C2-PFOA										
415.00 > 370.00	2.813	2.804	0.009		4983916	2.50			20864	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.813	2.806	0.007	1.000	5346174	2.46			934	
413.00 > 169.00	2.813	2.806	0.007	1.000	1961708		2.73(1.36-4.08)		5226	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.829	2.813	0.016	0.886	3536880	2.46			5153	
449.00 > 99.00	2.829	2.813	0.016	0.886	848103		4.17(1.84-5.53)		5937	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.192	3.184	0.008	1.000	3622041	2.38			6859	
499.00 > 99.00	3.192	3.184	0.008	1.000	810771		4.47(2.04-6.12)		5441	
20 Perfluorononanoic acid										
463.00 > 419.00	3.192	3.189	0.003	1.000	4639649	2.27			1389	
463.00 > 169.00	3.192	3.189	0.003	1.000	910156		5.10(2.68-8.03)		2077	
D 19 13C5 PFNA										
468.00 > 423.00	3.192	3.189	0.003	1.135	4772282	2.60		104	22952	
D 18 13C4 PFOS										
503.00 > 80.00	3.192	3.189	0.003	1.135	3224711	2.28		95.3	4244	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.405	3.398	0.007	1.067	3860679	NC			10885	
D 21 13C8 FOSA										
506.00 > 78.00	3.534	3.519	0.015	1.256	1808908	2.26		90.5	7237	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.534	3.519	0.015	1.000	6006109	2.71			7303	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.548	3.534	0.014	1.112	1237367	2.34			4138	
549.00 > 99.00	3.548	3.534	0.014	1.112	438832		2.82(1.42-4.26)		2157	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.548	3.538	0.010	1.000	968424	2.17			3028	
D 26 M2-8:2FTS										
529.00 > 81.00	3.548	3.540	0.008	1.261	67368	2.43		101	961	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.261	4876778	2.56		102	22505	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.548	3.548	0.0	1.000	5559837	2.43			1456	
513.00 > 169.00	3.548	3.548	0.0	1.000	380655		14.61(7.12-21.35)		1362	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.702	3.698	0.004	1.316	2171175	2.42		96.9	5774	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.717	3.702	0.015	1.004	2346512	2.61			11013	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.858	3.856	0.002	1.209	3377734	2.68			5506	
599.00 > 99.00	3.858	3.856	0.002	1.209	694680		4.86(2.14-6.43)		3575	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.872	3.866	0.006	1.377	1831565	2.55		102	4108	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.870	0.002	1.377	4621064	2.66		106	23531	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.872	3.870	0.002	1.000	1994753	2.71			3726	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.000	3979735	2.22			1321	
563.00 > 169.00	3.872	3.872	0.0	1.000	362366		10.98(5.24-15.72)		2131	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.261	5252340	NC			20452	
D 36 13C2 PFDoA										
615.00 > 570.00	4.172	4.162	0.010	1.483	4565831	2.45		97.8	16421	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.172	4.162	0.010	1.000	5152680	2.61			1649	
613.00 > 169.00	4.172	4.162	0.010	1.000	512151		10.06(4.68-14.05)		1463	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.430	4.426	0.004	1.062	4590759	2.51			1735	
663.00 > 169.00	4.430	4.426	0.004	1.062	683319		6.72(3.09-9.27)		1975	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006	1.660	4078266	2.52		101	14067	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.670	4.664	0.006	1.000	643180	2.29			2340	
713.00 > 219.00	4.655	4.664	-0.009	0.997	481840		1.33(0.70-2.09)		1720	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.073	5.081	-0.008	1.803	3982198	2.39		95.8	5637	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.090	5.083	0.007	1.003	4030913	NC			939	
813.00 > 169.00	5.073	5.083	-0.010	1.000	682059		5.91(2.77-8.32)		1461	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.073	3196198	NC			826	
913.00 > 169.00	5.445	5.443	0.002	1.073	582875		5.48(2.55-7.64)		1897	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00012 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:24:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_012.d

Injection Date: 20-Jul-2018 20:32:53 Instrument ID: A9

Lims ID: ICV Full

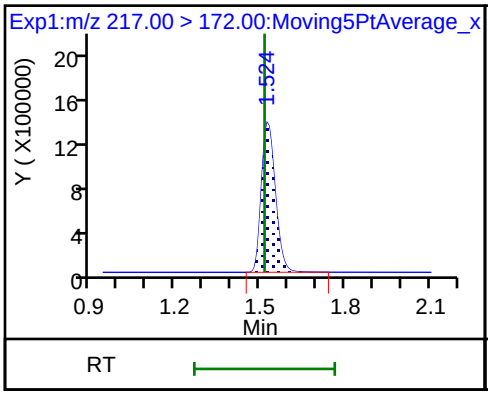
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 9 Worklist Smp#: 10

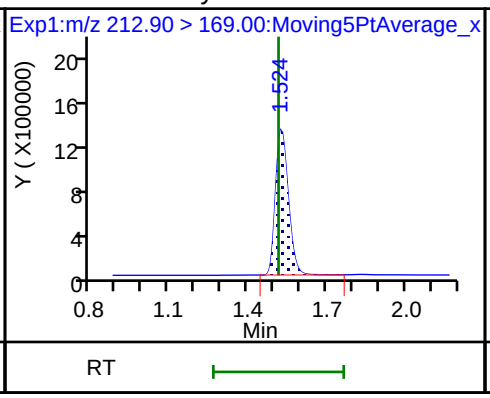
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

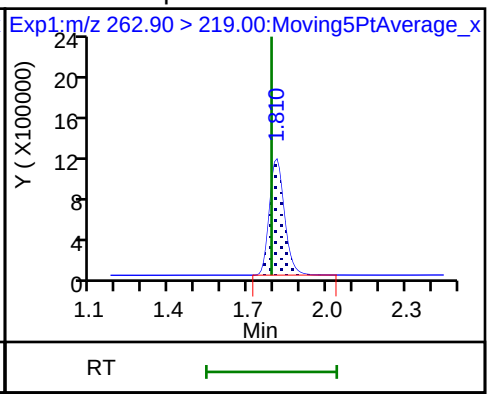
D 1 13C4 PFBA



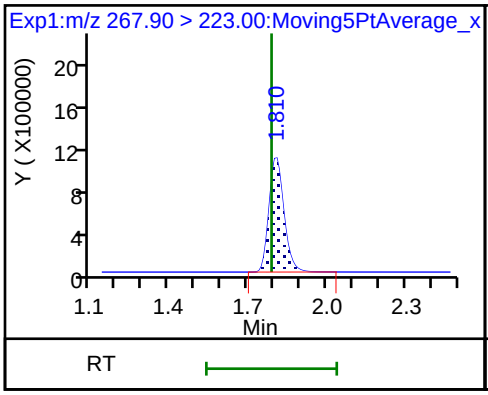
2 Perfluorobutyric acid



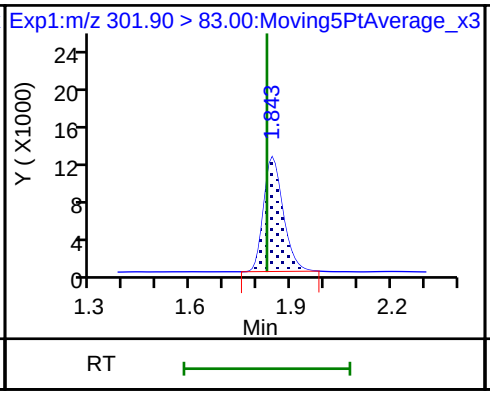
4 Perfluoropentanoic acid



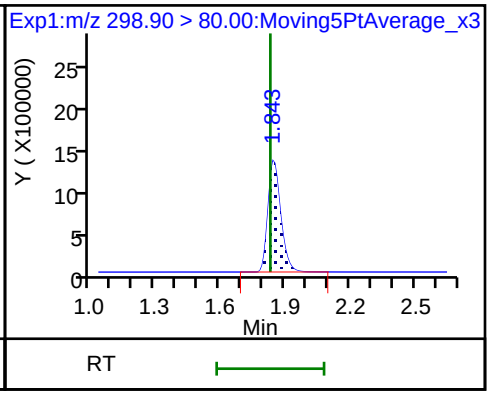
D 3 13C5-PFPeA



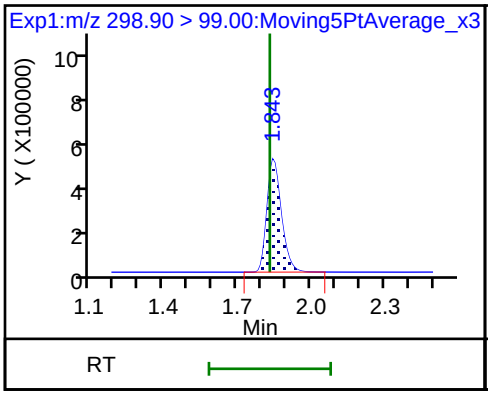
D 47 13C3-PFBS



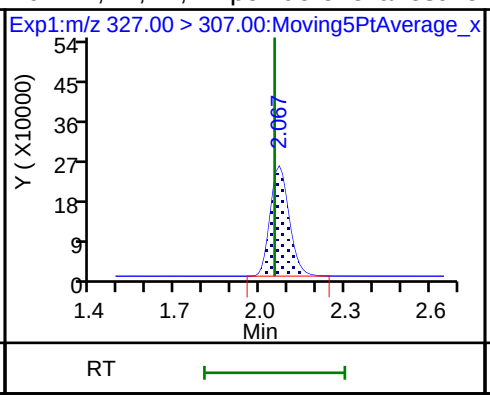
5 Perfluorobutanesulfonic acid



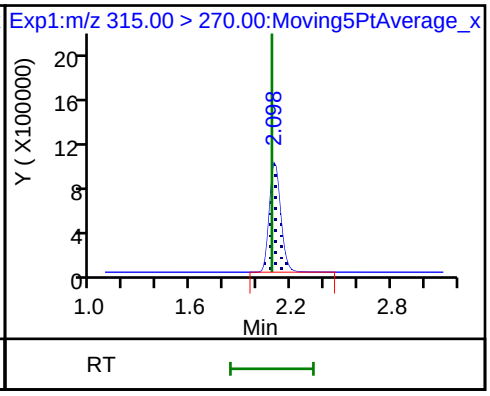
5 Perfluorobutanesulfonic acid



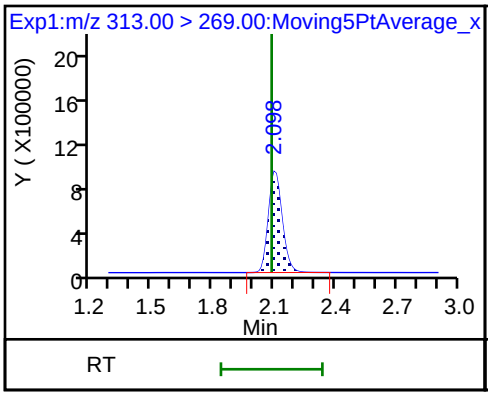
61 1H,1H,2H,2H-perfluorohexanesulfon



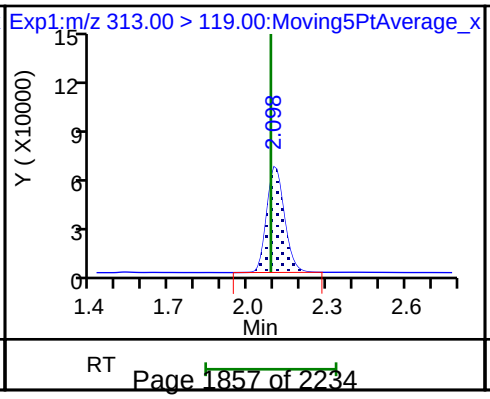
D 7 13C2 PFHxA



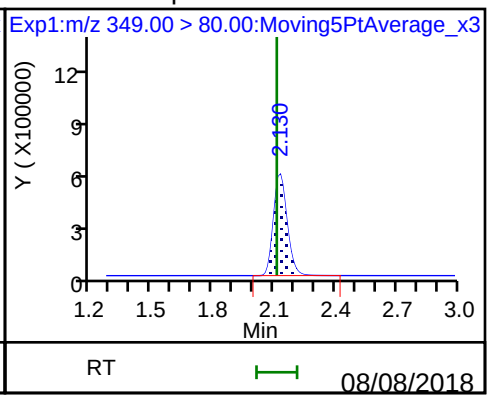
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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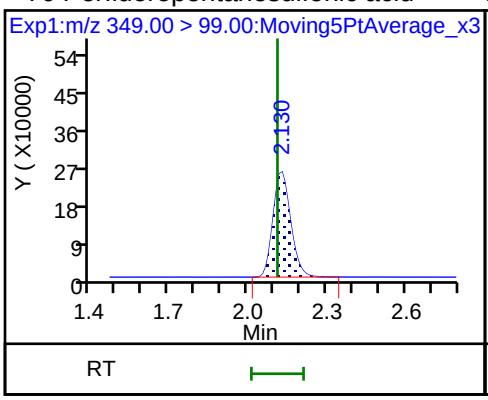
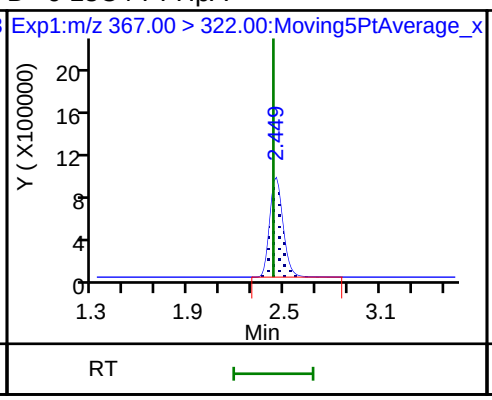
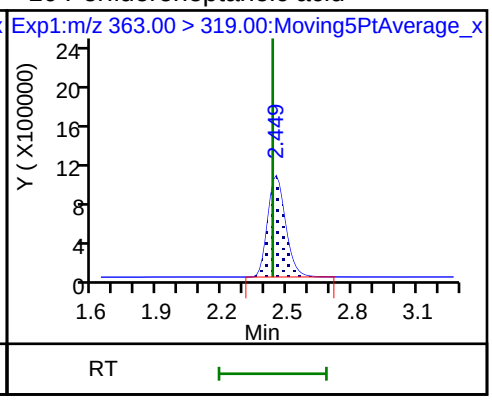


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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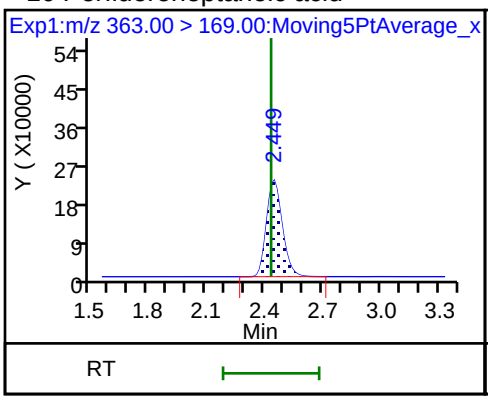
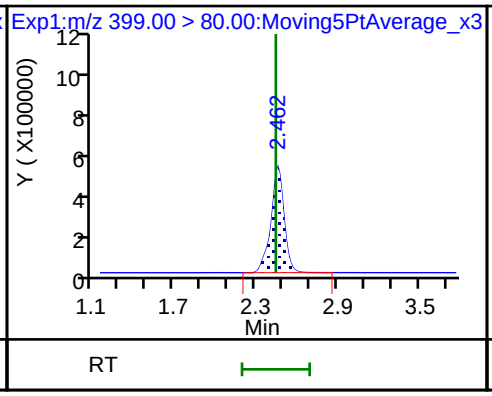


8 Perfluorohexanesulfonic acid



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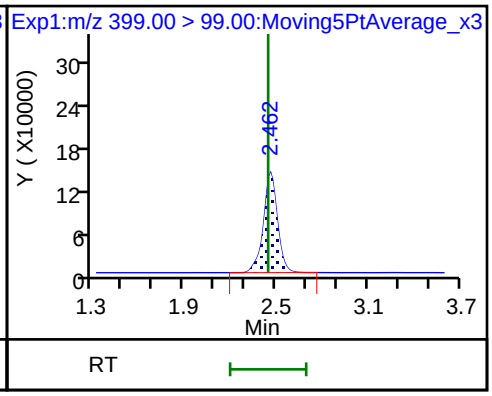
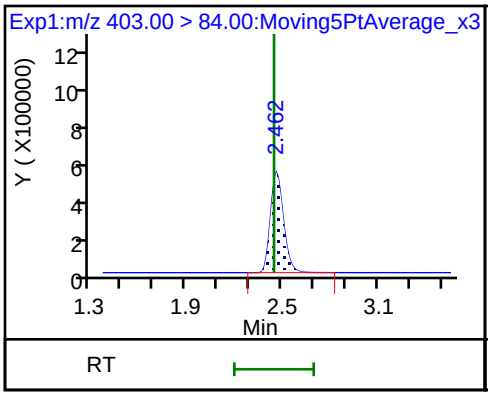
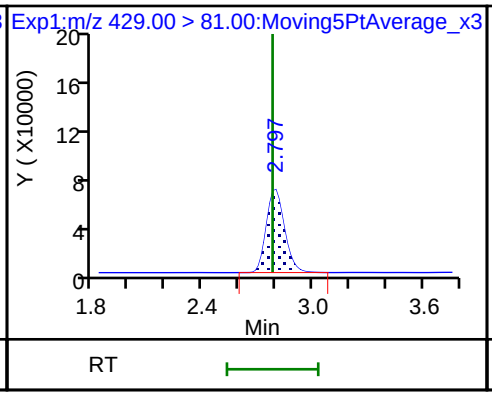


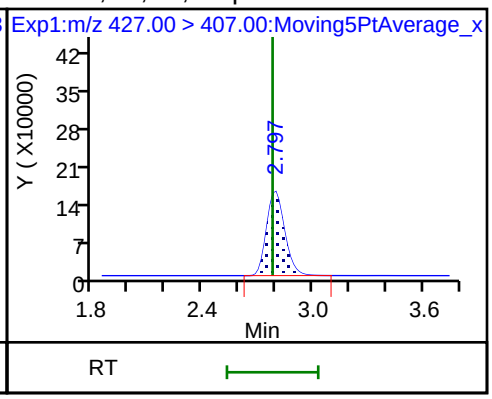
D 11 18O2 PFHxS



D 12 M2-6:2FTS



13 1H,1H,2H,2H-perfluorooctanesulfoni



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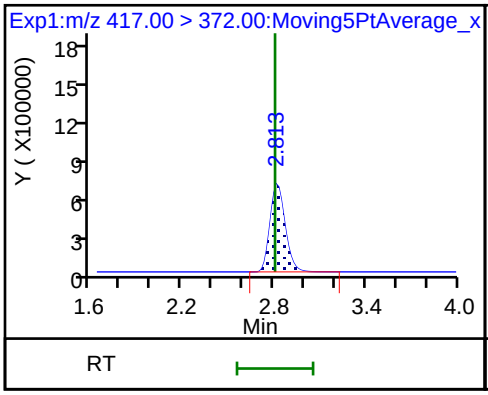
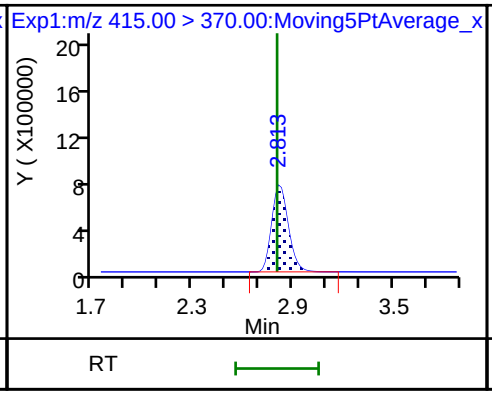
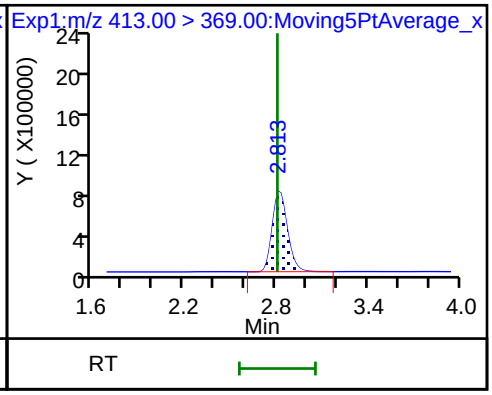


* 62 13C2-PFOA



15 Perfluorooctanoic acid



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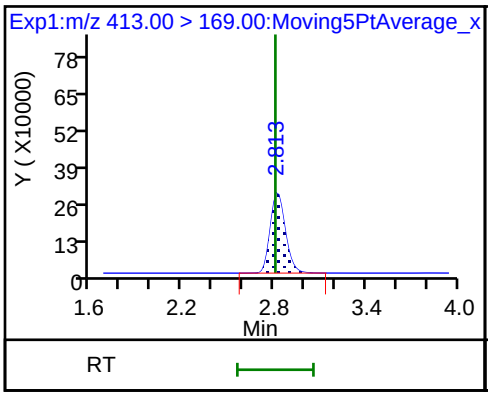
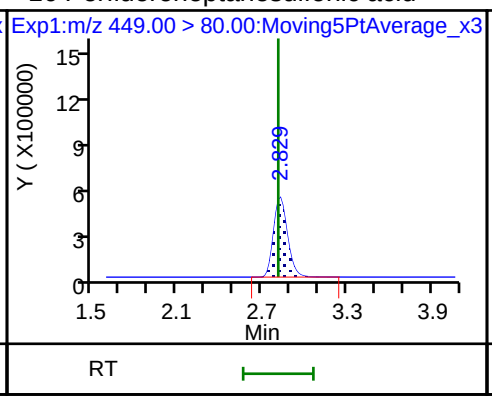


16 Perfluoroheptanesulfonic acid



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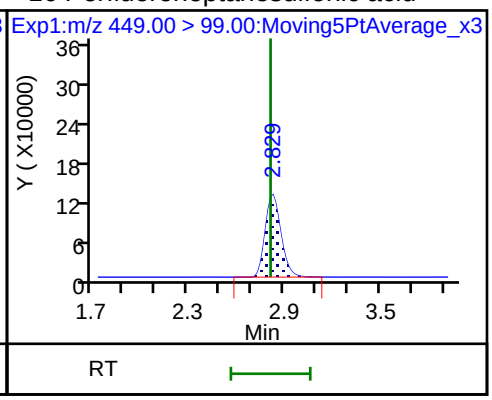
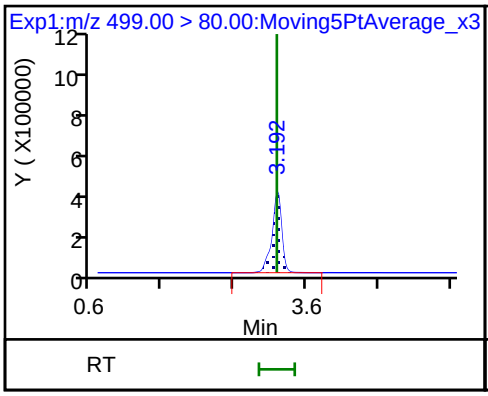


17 Perfluorooctane sulfonic acid



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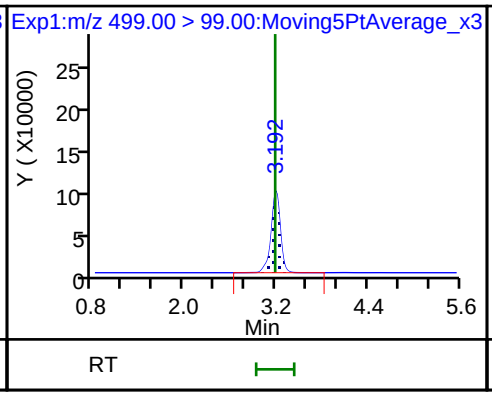
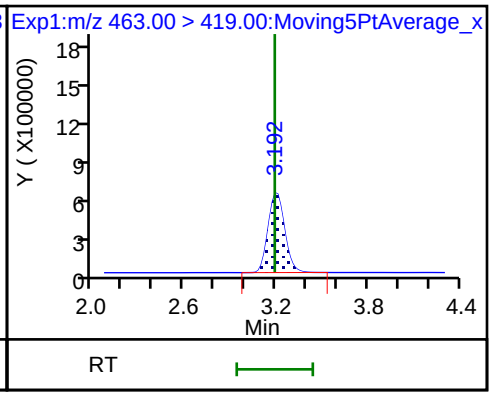


20 Perfluorononanoic acid



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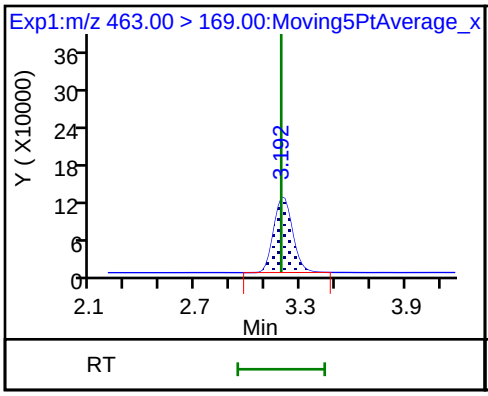
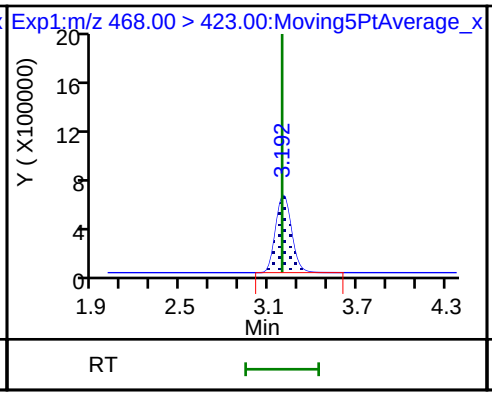


D 19 13C5 PFNA



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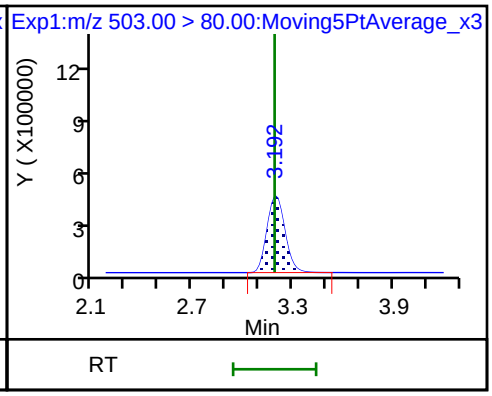
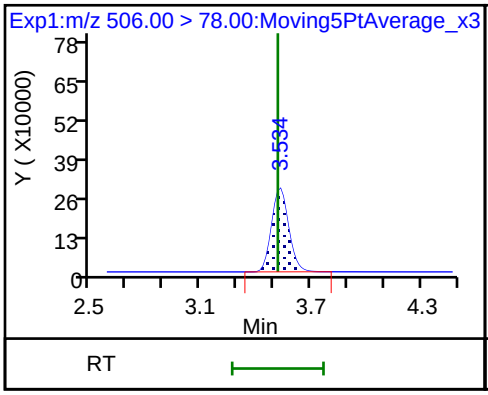
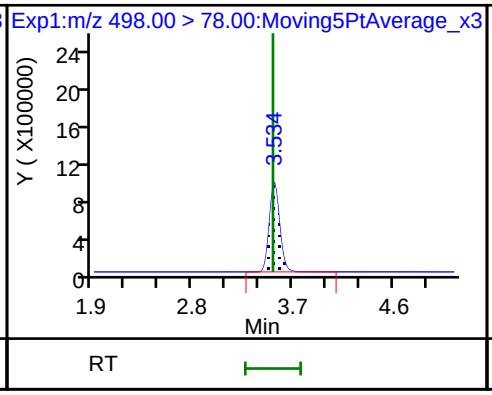


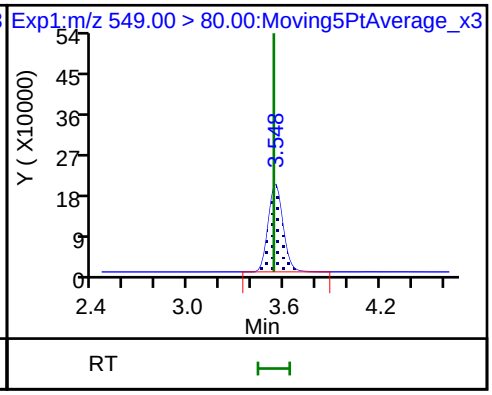
D 21 13C8 FOSA



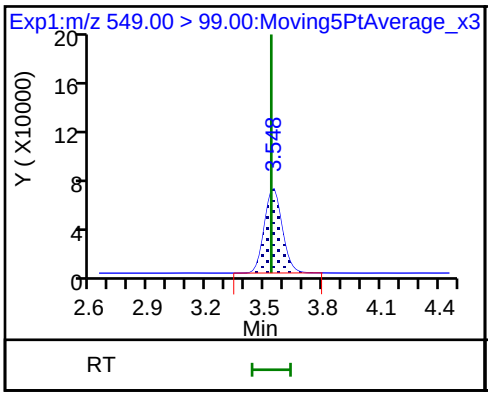
22 Perfluorooctane Sulfonamide



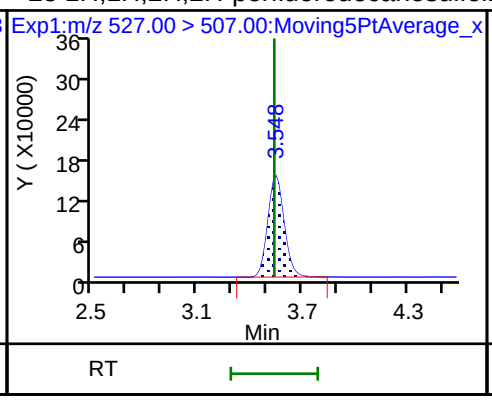
68 Perfluorononanesulfonic acid



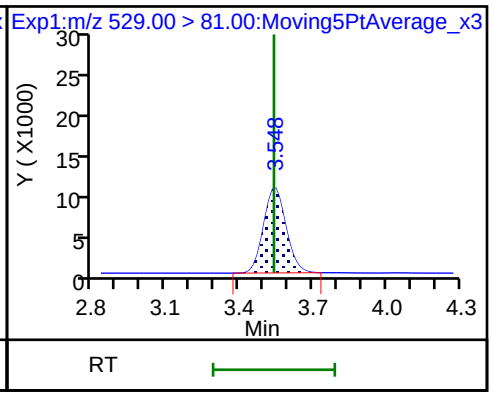
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfon



D 26 M2-8:2FTS



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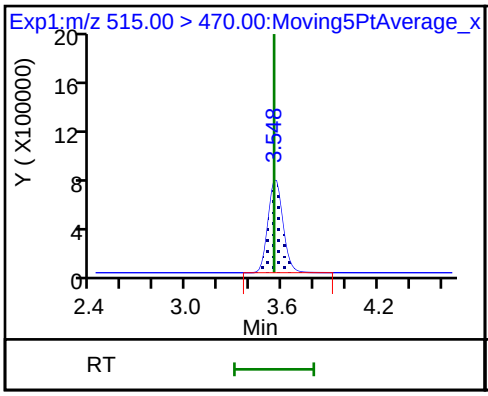
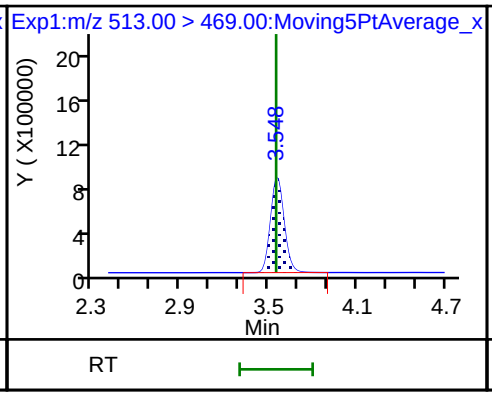
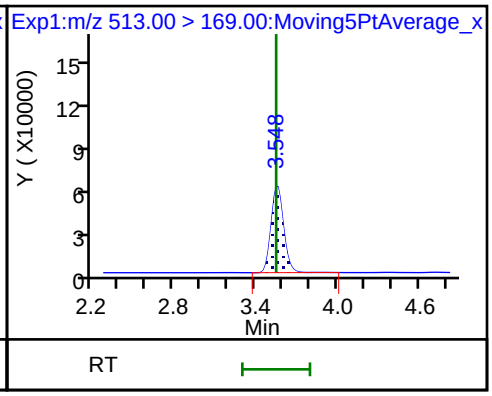


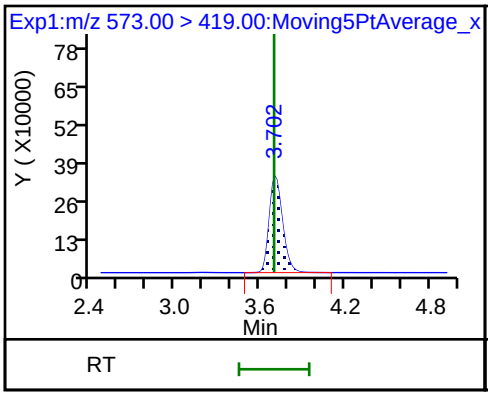
24 Perfluorodecanoic acid



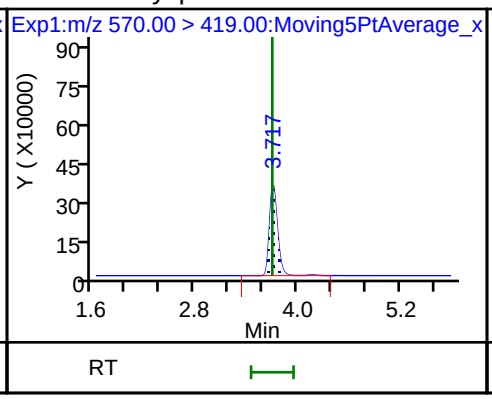
24 Perfluorodecanoic acid



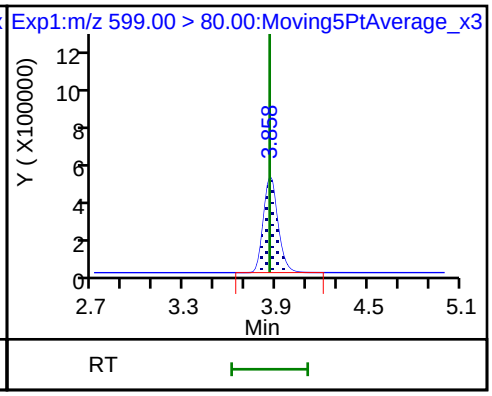
D 27 d3-NMeFOSAA



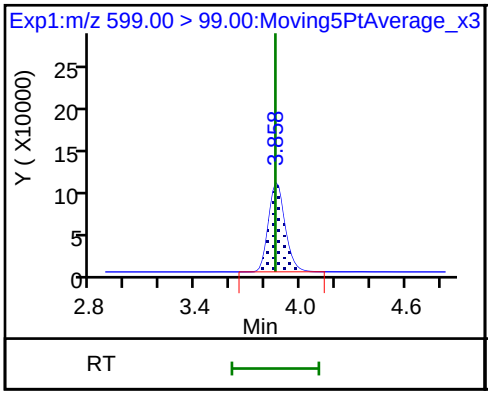
28 N-methyl perfluorooctane sulfonami



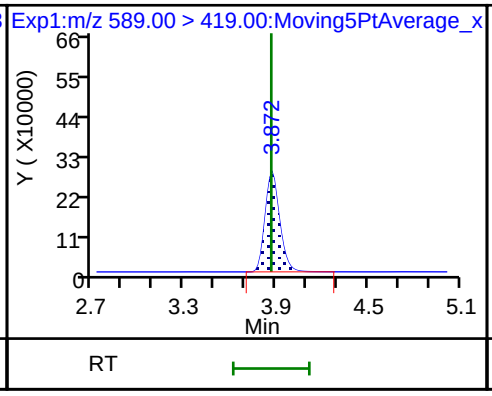
29 Perfluorodecane Sulfonic acid



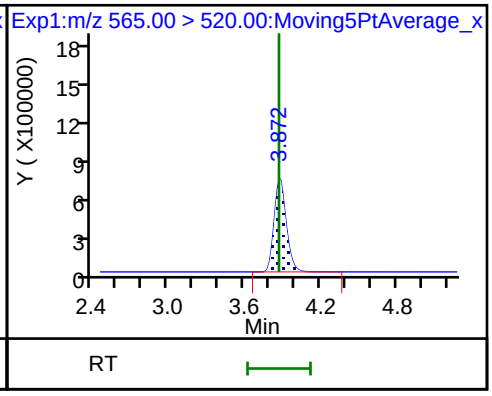
29 Perfluorodecane Sulfonic acid



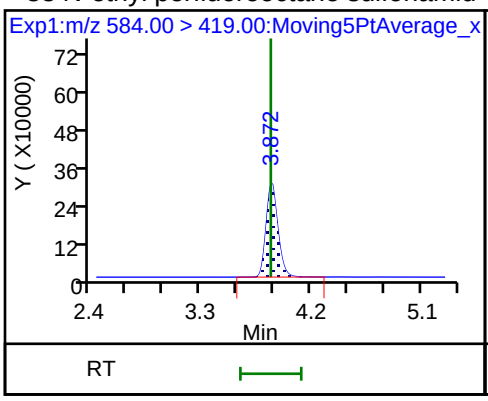
D 32 d5-NEtFOSAA



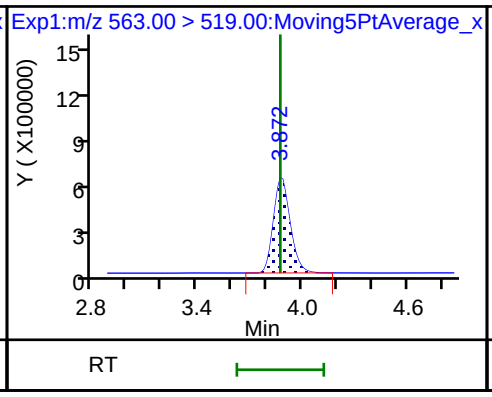
D 30 13C2 PFUnA



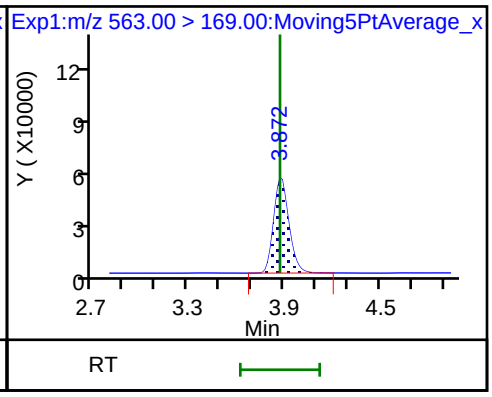
33 N-ethyl perfluorooctane sulfonamid



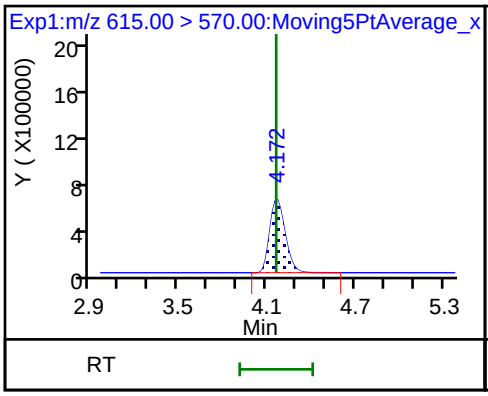
31 Perfluoroundecanoic acid



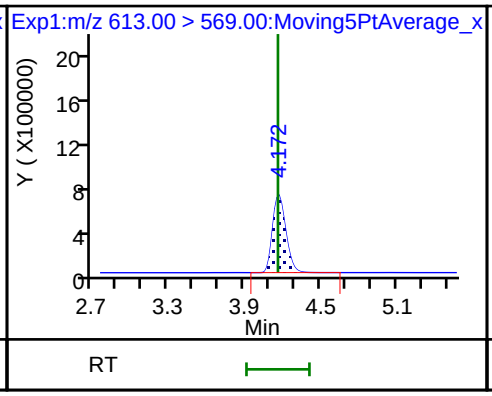
31 Perfluoroundecanoic acid



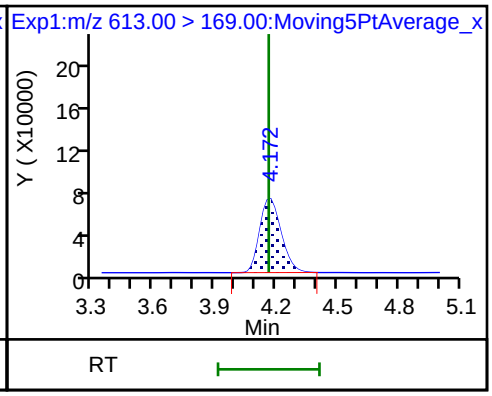
D 36 13C2 PFDoA



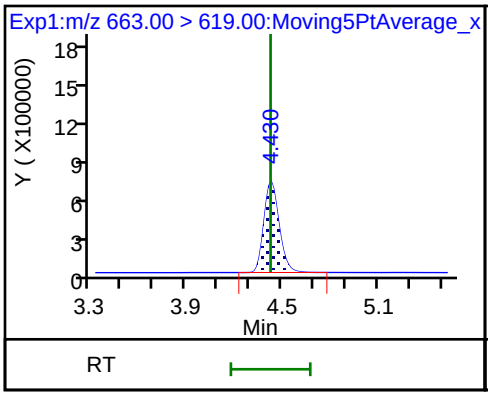
37 Perfluorododecanoic acid



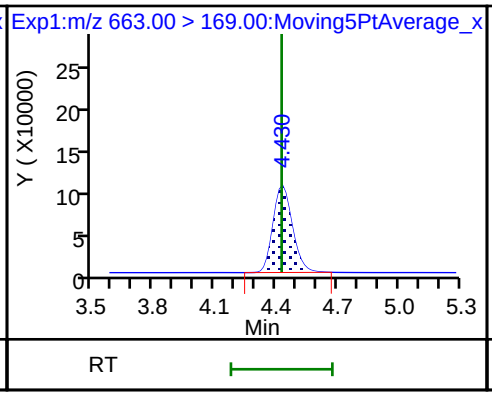
37 Perfluorododecanoic acid



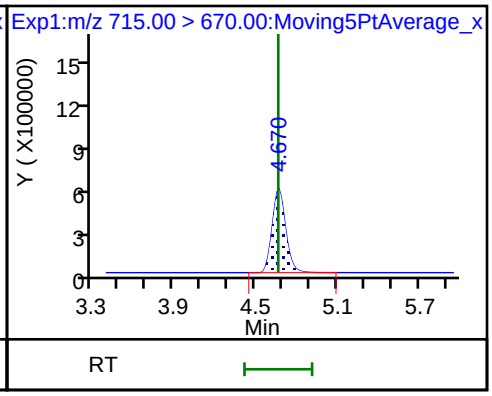
41 Perfluorotridecanoic acid



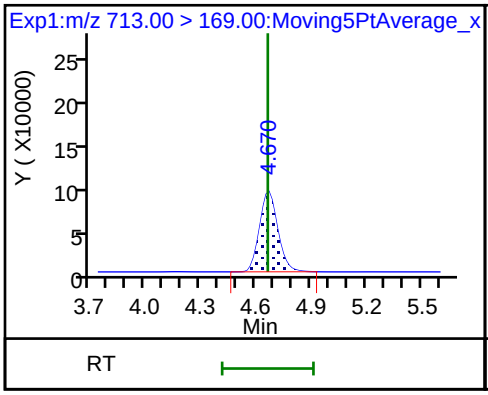
41 Perfluorotridecanoic acid



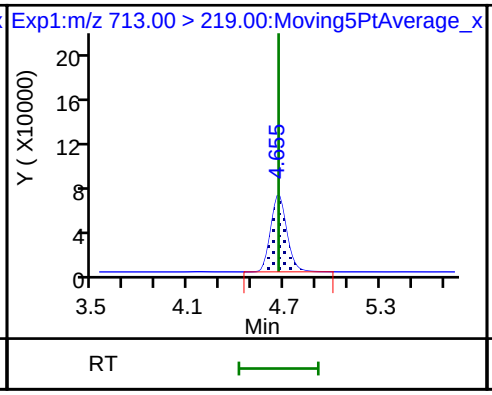
D 43 13C2-PFTeDA



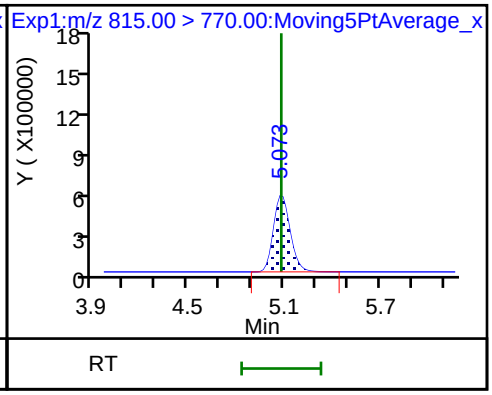
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-235506/2 Calibration Date: 07/22/2018 06:14

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	0.9385		0.0490	0.0500	-2.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.133		0.0522	0.0500	4.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	110.3		0.0446	0.0442	0.8	30.0
4:2 FTS	AveID	21.47	18.07		0.400	0.0467	-15.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	1.003		0.0530	0.0500	6.0	30.0
Perfluoropentanesulfonic acid	AveID	52.20	49.79		0.0447	0.0469	-4.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.292		0.0588	0.0500	17.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.367		0.0467	0.0455	2.6	30.0
6:2 FTS	AveID	2.182	2.112		0.400	0.0474	-3.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.050		0.0469	0.0476	-1.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.245		0.0541	0.0501	8.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.136		0.0530	0.0500	6.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.095		0.0451	0.0464	-2.7	30.0
8:2 FTS	AveID	15.89	14.68		0.400	0.0479	-7.6	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.3500		0.0428	0.0480	-10.8	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.236		0.0529	0.0500	5.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.252		0.0533	0.0500	6.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.044		0.400	0.0500	0.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	0.9254		0.0477	0.0482	-1.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	1.106		0.0551	0.0500	10.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	1.058		0.0545	0.0500	9.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.147		0.0531	0.0500	6.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	0.9714		0.0485	0.0500	-2.9	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1759		0.0511	0.0500	2.1	30.0
13C4 PFBA	Ave	0.9738	0.9150		2.35	2.50	-6.0	30.0
13C5-PFPeA	Ave	0.8956	0.8446		2.36	2.50	-5.7	30.0
13C3-PFBS	Ave	0.0113	0.0113		2.33	2.33	0.0	30.0
13C2 PFHxA	Ave	0.9398	0.8387		2.23	2.50	-10.8	30.0
13C4-PFHpA	Ave	1.089	1.025		2.35	2.50	-5.9	30.0
18O2 PFHxS	Ave	0.6628	0.6515		2.32	2.37	-1.7	30.0
M2-6:2FTS	Ave	0.1018	0.1049		2.45	2.38	3.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-235506/2 Calibration Date: 07/22/2018 06:14

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.9948		2.54	2.50	1.6	30.0
13C4 PFOS	Ave	0.7102	0.7008		2.36	2.39	-1.3	30.0
13C5 PFNA	Ave	0.9199	0.8585		2.33	2.50	-6.7	30.0
13C8 FOSA	Ave	0.4011	0.4015		2.50	2.50	0.1	30.0
M2-8:2FTS	Ave	0.0139	0.0141		2.44	2.40	1.7	30.0
13C2 PFDA	Ave	0.9555	0.9173		2.40	2.50	-4.0	30.0
d3-NMeFOSAA	Ave	0.4497	0.4173		2.32	2.50	-7.2	30.0
d5-NEtFOSAA	Ave	0.3602	0.3582		2.49	2.50	-0.6	30.0
13C2 PFUnA	Ave	0.8725	0.8141		2.33	2.50	-6.7	30.0
13C2 PFDoA	Ave	0.9367	0.9823		2.62	2.50	4.9	30.0
13C2-PFTeDA	Ave	0.8106	0.7767		2.40	2.50	-4.2	30.0
13C2-PFHxDA	Ave	0.8343	0.8148		2.44	2.50	-2.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 22-Jul-2018 06:14:33 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 08:30:10 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 08:30:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.511	1.511	0.0	0.540	9489045	2.35		94.0	10771	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.517	0.0	1.004	178103	0.0490		97.9	23.8	
D 3 13C5-PFPeA										
267.90 > 223.00	1.784	1.784	0.0	0.638	8758649	2.36		94.3	12785	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.784	1.792	-0.008	1.000	198464	0.0522		104	70.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.826	0.0	0.653	109086	2.33		100	1094	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.826	1.834	-0.008	1.000	228679	0.0446		101	168	
298.90 > 99.00	1.826	1.834	-0.008	1.000	81624		2.80(1.35-4.05)		189	
D 60 M2-4:2FTS										
329.00 > 81.00	2.046	2.046	0.0	0.732	900714	NC			1243	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.046	0.0	1.120	39584	0.0393		84.2	878	
D 7 13C2 PFHxA										
315.00 > 270.00	2.077	2.077	0.0	0.743	8697557	2.23		89.2	16735	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.077	2.087	-0.010	1.000	174493	0.0530		106	89.5	
313.00 > 119.00	2.077	2.087	-0.010	1.000	15452		11.29(6.96-20.87)		80.1	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.098	2.108	-0.010	1.149	109562	0.0447		95.4	337	
349.00 > 99.00	2.098	2.108	-0.010	1.149	49338		2.22(1.15-3.45)		325	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.181	2.181	0.0	0.780	819636	NC			3863	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.181	2.191	-0.010	1.000	35768	NC			19.0	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.423	0.0	0.867	10627960	2.35		94.1	28080	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.423	2.423	0.0	1.000	274567	0.0588		118	78.0	
363.00 > 169.00	2.423	2.423	0.0	1.000	52216		5.26(2.17-6.52)		211	
D 11 18O2 PFHxS										
403.00 > 84.00	2.435	2.436	-0.001	0.871	6391891	2.32		98.3	45808	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.435	2.436	-0.001	1.000	168043	0.0467		103	326	
399.00 > 99.00	2.435	2.436	-0.001	1.000	43173		3.89(1.90-5.70)		220	
65 ADONA										
377.00 > 251.00	2.474	2.474	0.0	0.780	401669	NC			1191	
377.00 > 85.00	2.461	2.474	-0.013	0.776	171974		2.34(1.05-3.16)		116	
D 12 M2-6:2FTS										
429.00 > 81.00	2.764	2.764	0.0	0.989	1033731	2.45		103	3372	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.764	2.780	-0.016	1.000	43567	0.0459		96.8	869	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.796	0.0	1.000	10316262	2.54		102	21801	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10370723	2.50			18537	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.796	2.796	0.0	1.000	257118	0.0541		108	34.1	M
413.00 > 169.00	2.796	2.796	0.0	1.000	88697		2.90(1.36-4.08)		262	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.796	2.812	-0.016	0.882	145241	0.0469		98.4	293	
449.00 > 99.00	2.796	2.812	-0.016	0.882	40671		3.57(1.84-5.53)		380	
D 18 13C4 PFOS										
503.00 > 80.00	3.171	3.171	0.0	1.134	6947813	2.36		98.7	9976	
D 19 13C5 PFNA										
468.00 > 423.00	3.171	3.171	0.0	1.134	8902798	2.33		93.3	17467	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.171	0.0	1.000	147694	0.0451		97.3	276	
499.00 > 99.00	3.171	3.171	0.0	1.000	37728		3.91(2.04-6.12)		349	
20 Perfluorononanoic acid										
463.00 > 419.00	3.171	3.190	-0.019	1.000	202226	0.0530		106	54.1	
463.00 > 169.00	3.171	3.190	-0.019	1.000	33746		5.99(2.68-8.03)		96.0	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.386	3.386	0.0	1.068	172294	NC			544	
D 21 13C8 FOSA										
506.00 > 78.00	3.516	3.516	0.0	1.258	4163879	2.50		100	11877	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.516	3.517	-0.001	1.000	269486	0.0529		106	941	
D 26 M2-8:2FTS										
529.00 > 81.00	3.516	3.531	-0.015	1.258	140500	2.44		102	1645	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.516	3.532	-0.016	1.109	48843	0.0428		89.2	151	
549.00 > 99.00	3.516	3.532	-0.016	1.109	16930		2.88(1.42-4.26)		88.0	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.516	3.532	-0.016	1.000	41258	0.0442		92.4	172	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.531	3.532	-0.001	1.000	238265	0.0533		107	62.4	
513.00 > 169.00	3.531	3.532	-0.001	1.000	17507		13.61(7.12-21.35)		78.9	
D 23 13C2 PFDA										
515.00 > 470.00	3.531	3.546	-0.015	1.263	9513530	2.40		96.0	23498	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.685	3.685	0.0	1.318	4328152	2.32		92.8	11375	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.685	3.686	-0.001	1.000	90369	0.0504		101	58.0	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.840	3.840	0.0	1.211	129662	0.0477		99.0	207	
599.00 > 99.00	3.840	3.840	0.0	1.211	29786		4.35(2.14-6.43)		230	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.840	3.855	-0.015	1.373	3715060	2.49		99.4	6911	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.855	3.855	0.0	1.004	82166	0.0551		110	222	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.855	3.855	0.0	1.000	178715	0.0545		109	50.3	
563.00 > 169.00	3.855	3.855	0.0	1.000	18342		9.74(5.24-15.72)		112	
D 30 13C2 PFUnA										
565.00 > 520.00	3.855	3.870	-0.015	1.379	8443079	2.33		93.3	25431	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.008	4.024	-0.016	1.264	242727	NC			862	
D 36 13C2 PFDoA										
615.00 > 570.00	4.134	4.152	-0.018	1.479	10187593	2.62		105	22935	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.134	4.152	-0.018	1.000	233725	0.0531		106	58.0	
613.00 > 169.00	4.134	4.152	-0.018	1.000	25347		9.22(4.68-14.05)		125	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.397	4.412	-0.015	1.064	197919	0.0485		97.1	60.4	
663.00 > 169.00	4.397	4.412	-0.015	1.064	30974		6.39(3.09-9.27)		108	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.636	4.652	-0.016	1.658	8054686	2.40		95.8	16959	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.636	4.652	-0.016	1.000	28333	0.0511		102	121	
713.00 > 219.00	4.636	4.652	-0.016	1.000	19743		1.44(0.70-2.09)		71.8	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.053	5.070	-0.017	1.808	8450111	2.44		97.7	9938	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.053	5.070	-0.017	1.000	262186	NC			39.9	
813.00 > 169.00	5.053	5.070	-0.017	1.000	41985		6.24(2.77-8.32)		99.5	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.428	-0.015	1.071	130238	NC			27.9	
913.00 > 169.00	5.413	5.428	-0.015	1.071	25486		5.11(2.55-7.64)		151	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 25-Jul-2018 08:30:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_005.d

Injection Date: 22-Jul-2018 06:14:33 Instrument ID: A9

Lims ID: CCVL

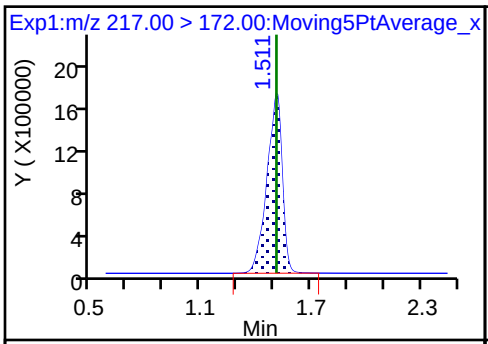
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2

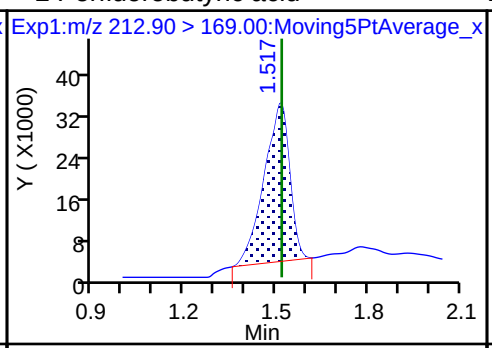
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

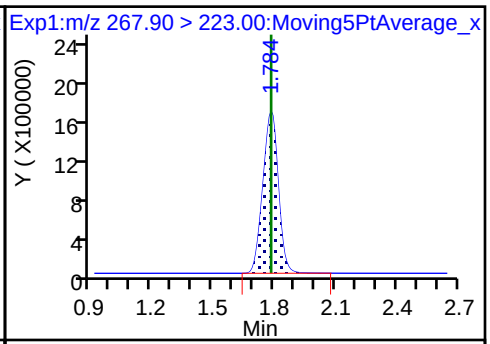
D 1 13C4 PFBA



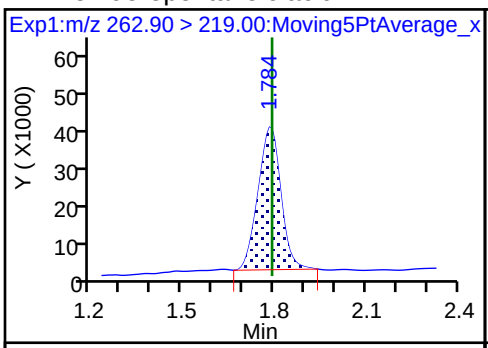
2 Perfluorobutyric acid



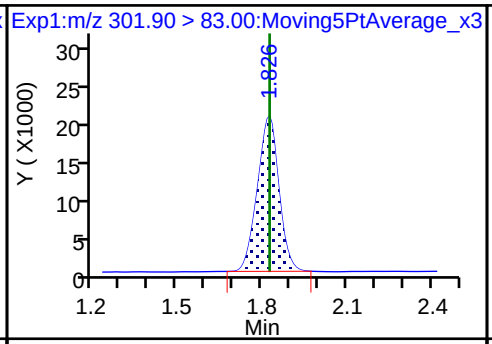
D 3 13C5-PFPeA



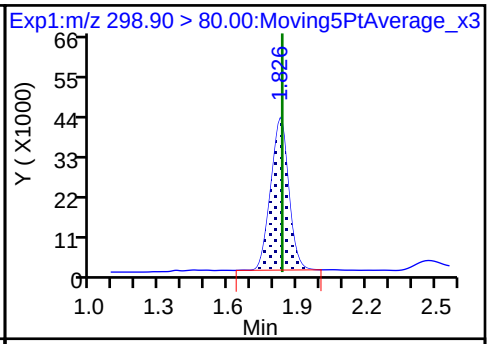
4 Perfluoropentanoic acid



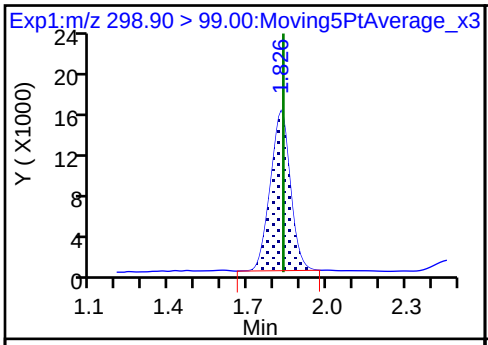
D 47 13C3-PFBS



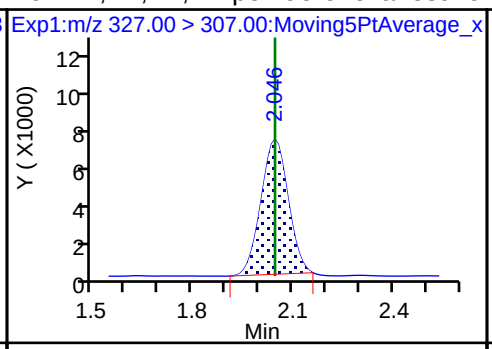
5 Perfluorobutanesulfonic acid



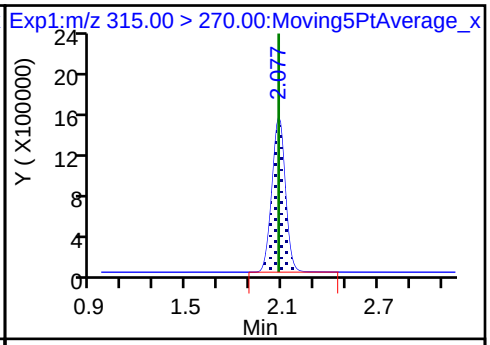
5 Perfluorobutanesulfonic acid



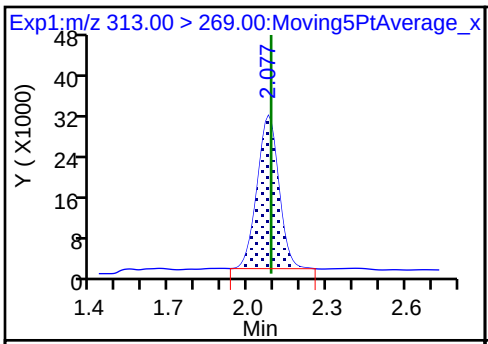
61 1H,1H,2H,2H-perfluorohexanesulfon



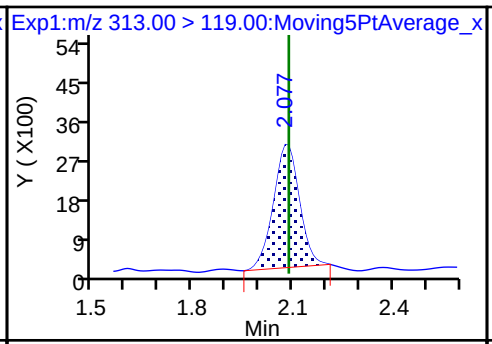
D 7 13C2 PFHxA



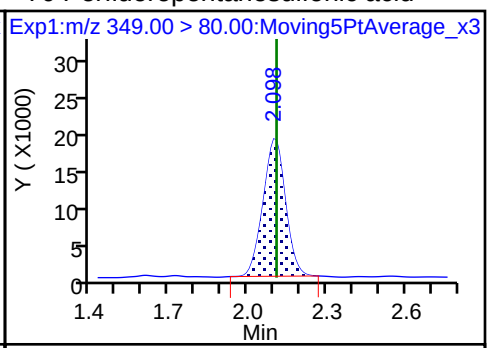
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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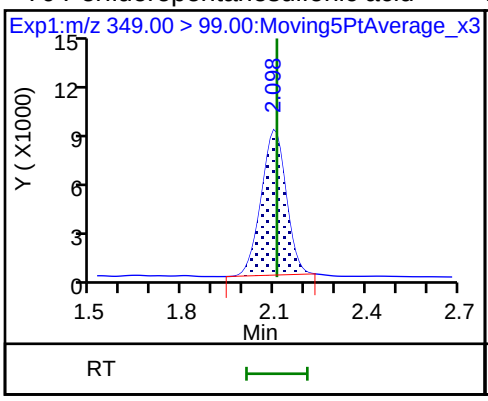
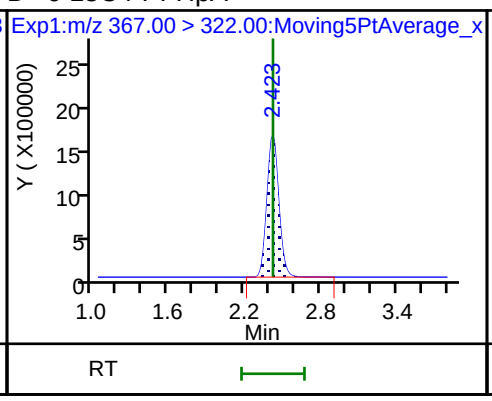
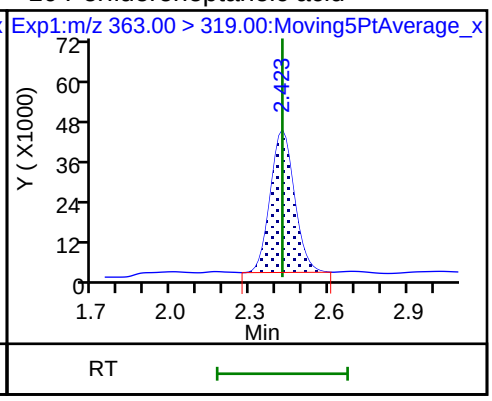


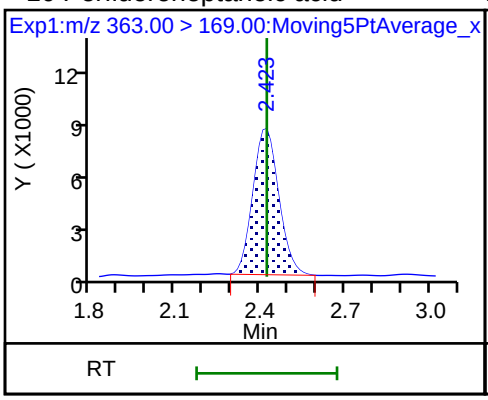
D 9 13C4-PFHpA



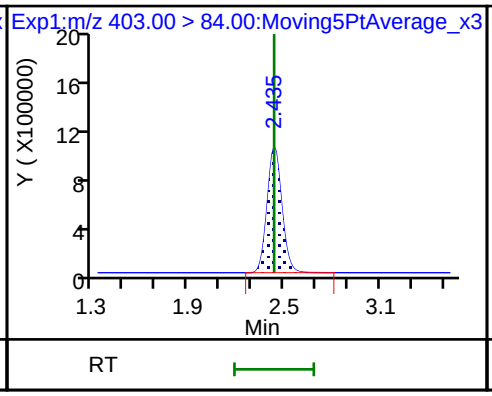
10 Perfluoroheptanoic acid



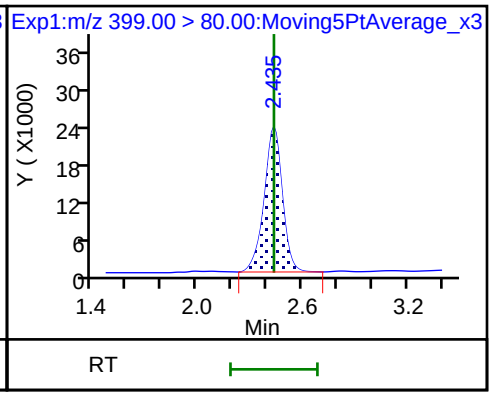
10 Perfluoroheptanoic acid



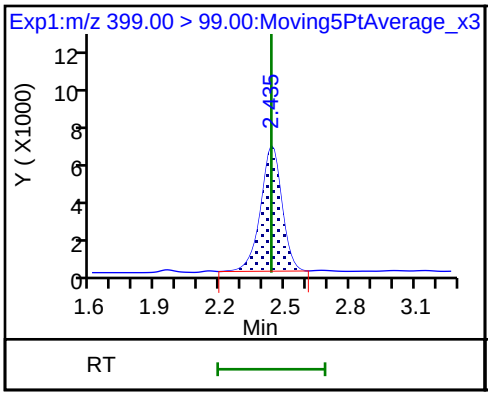
D 11 18O2 PFHxS



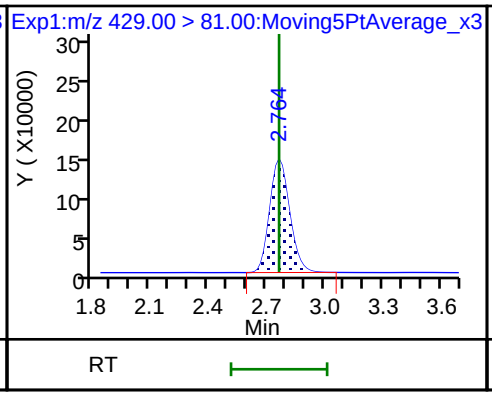
8 Perfluorohexanesulfonic acid



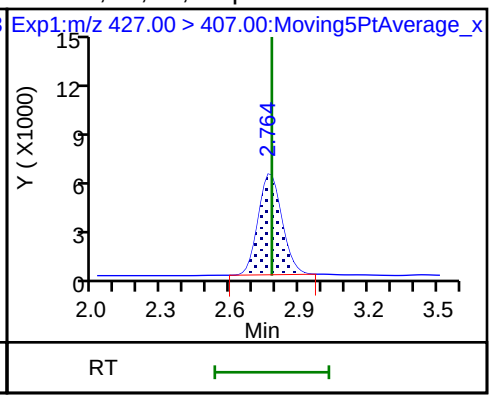
8 Perfluorohexanesulfonic acid



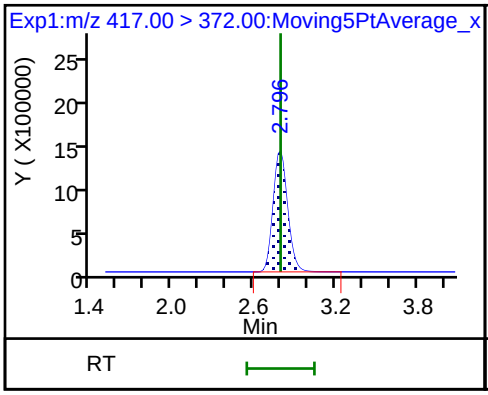
D 12 M2-6:2FTS



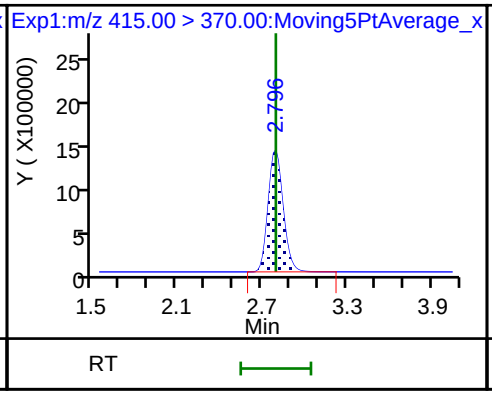
13 1H,1H,2H,2H-perfluorooctanesulfoni



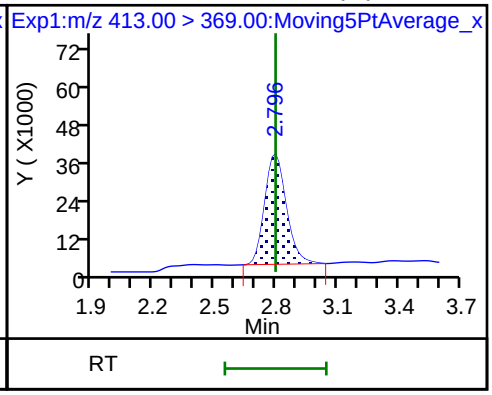
D 14 13C4 PFOA



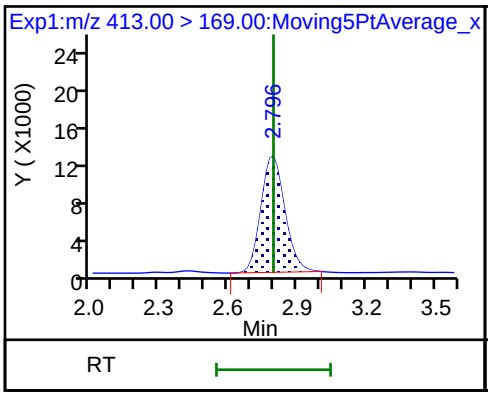
* 62 13C2-PFOA



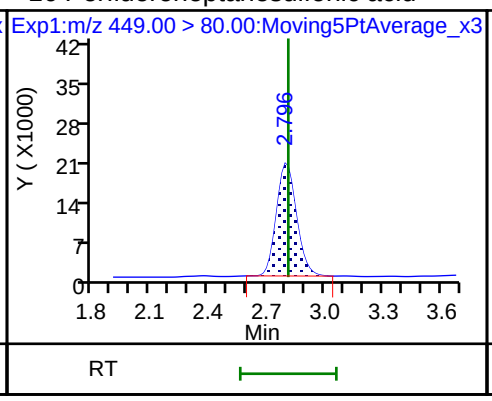
15 Perfluorooctanoic acid (M)



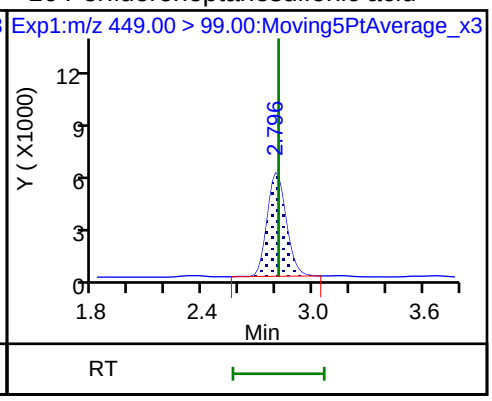
15 Perfluorooctanoic acid



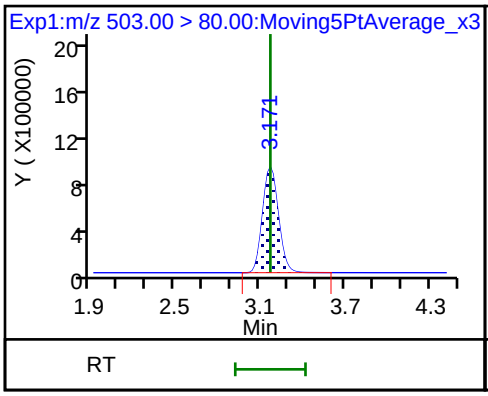
16 Perfluoroheptanesulfonic acid



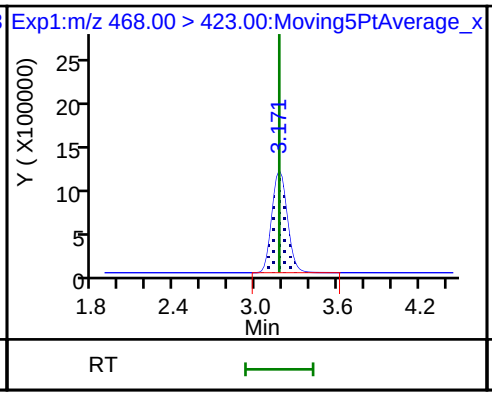
16 Perfluoroheptanesulfonic acid



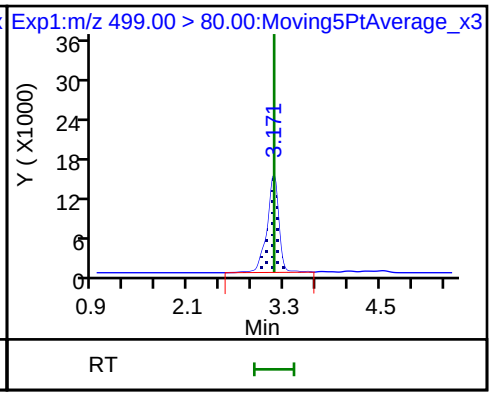
D 18 13C4 PFOS



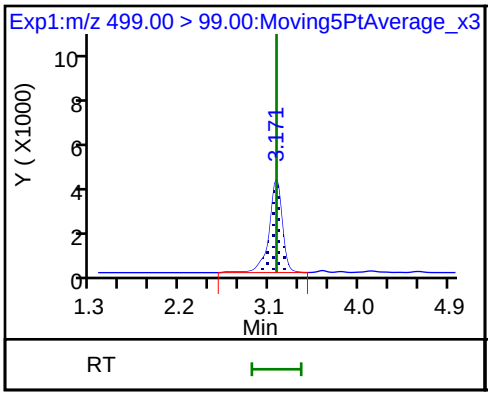
D 19 13C5 PFNA



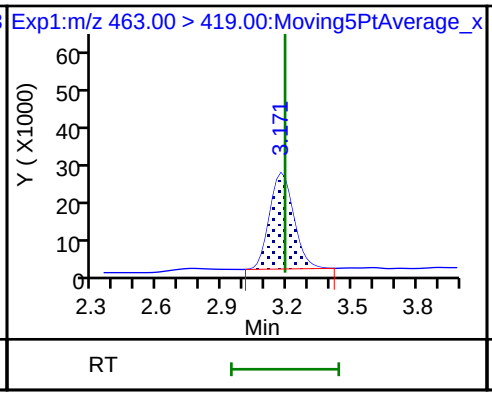
17 Perfluorooctane sulfonic acid



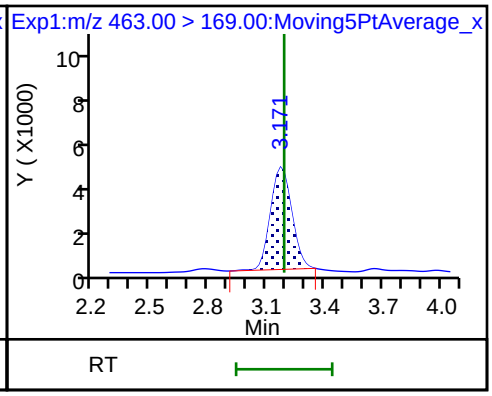
17 Perfluorooctane sulfonic acid



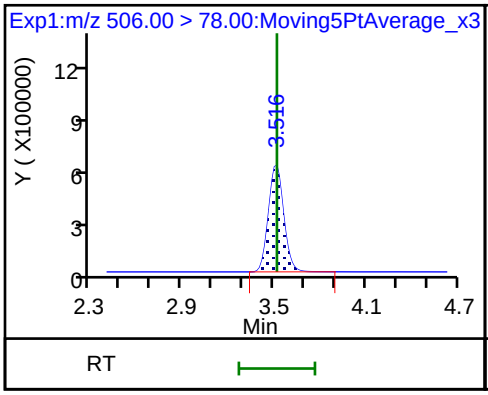
20 Perfluorononanoic acid



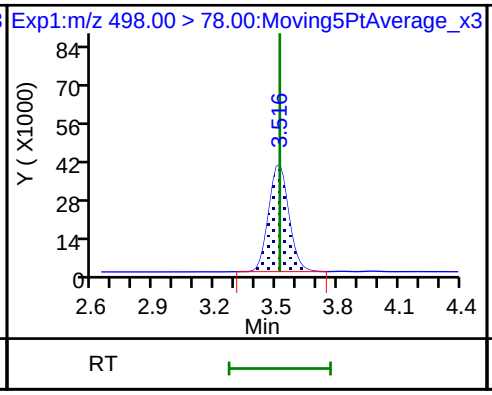
20 Perfluorononanoic acid



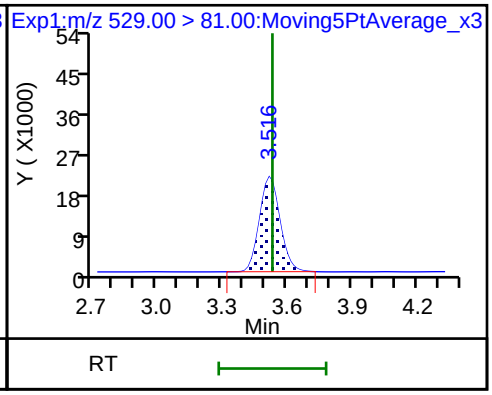
D 21 13C8 FOSA



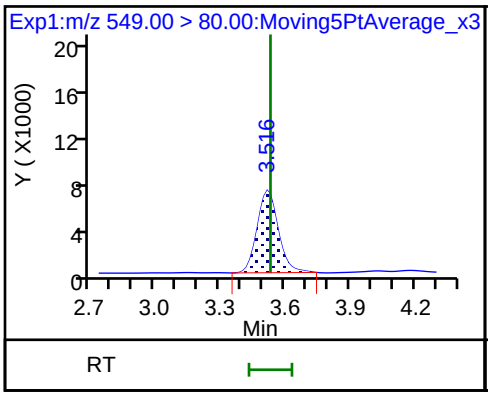
22 Perfluorooctane Sulfonamide



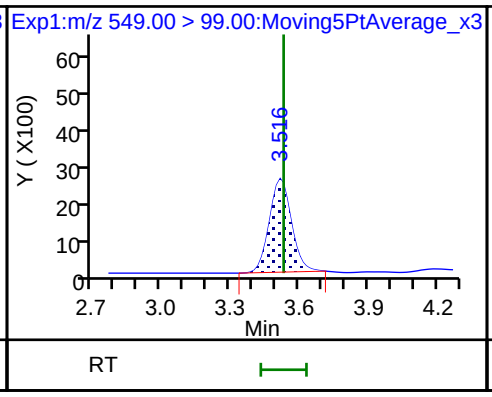
D 26 M2-8:2FTS



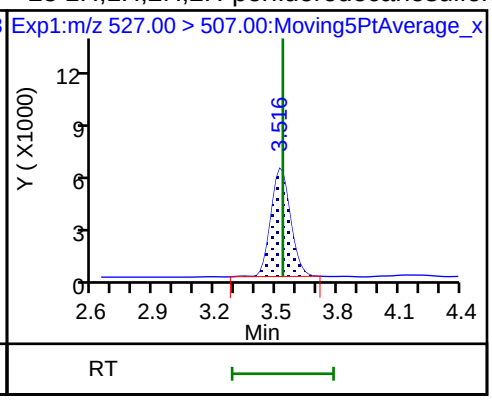
68 Perfluorononanesulfonic acid



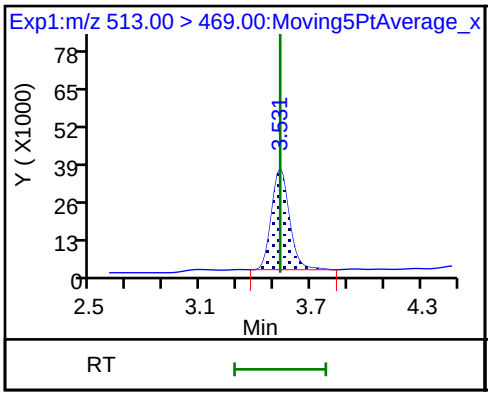
68 Perfluorononanesulfonic acid



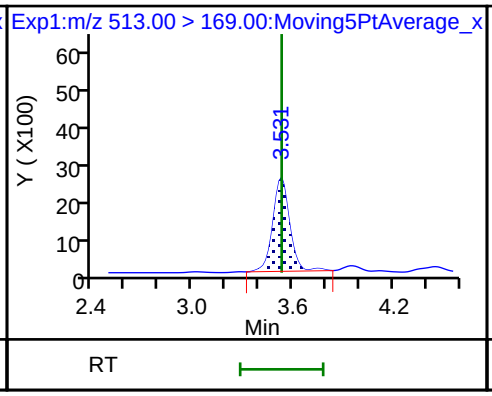
25 1H,1H,2H,2H-perfluorodecanesulfoni



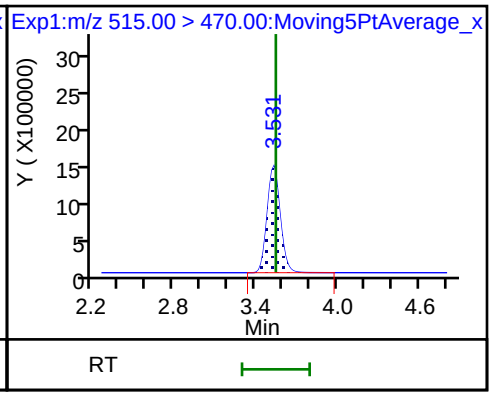
24 Perfluorodecanoic acid



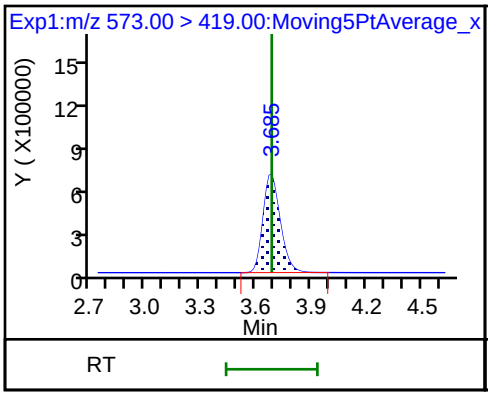
24 Perfluorodecanoic acid



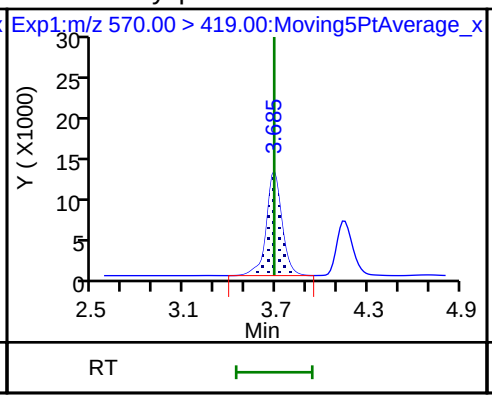
D 23 13C2 PFDA



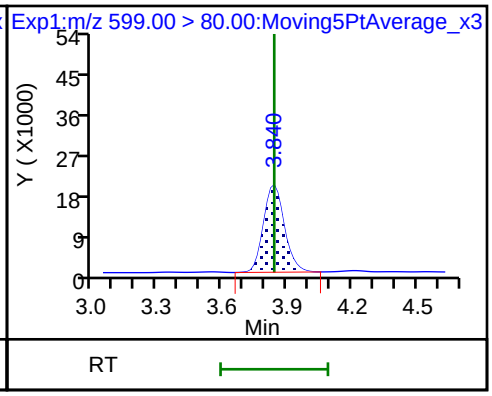
D 27 d3-NMeFOSAA



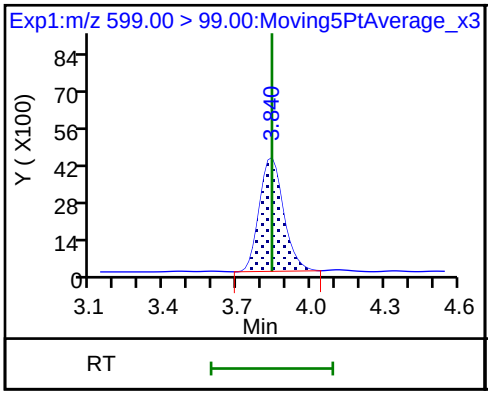
28 N-methyl perfluorooctane sulfonami



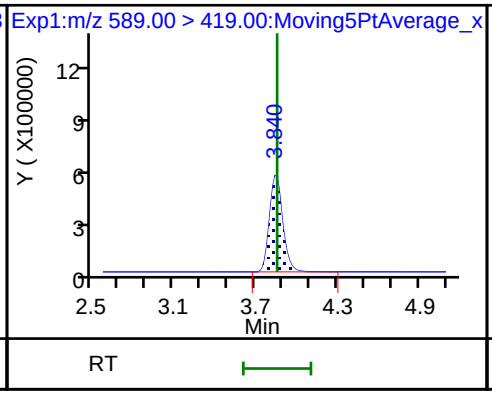
29 Perfluorodecane Sulfonic acid



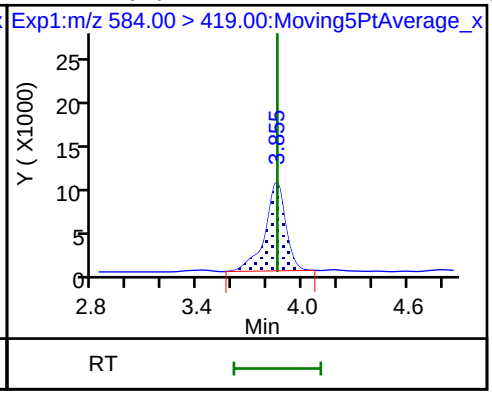
29 Perfluorodecane Sulfonic acid



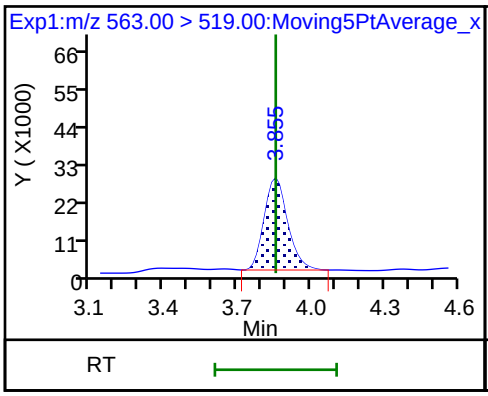
D 32 d5-NEtFOSAA



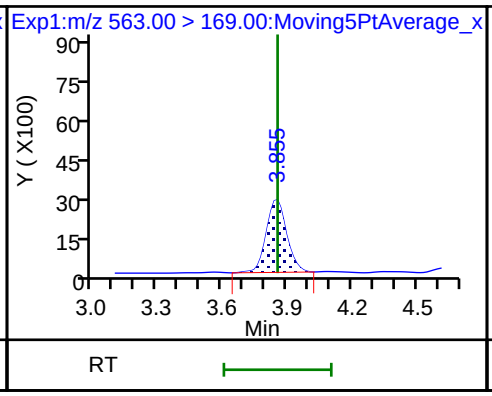
33 N-ethyl perfluorooctane sulfonamid (M)



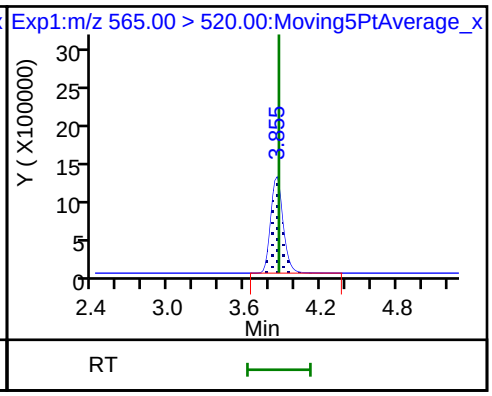
31 Perfluoroundecanoic acid



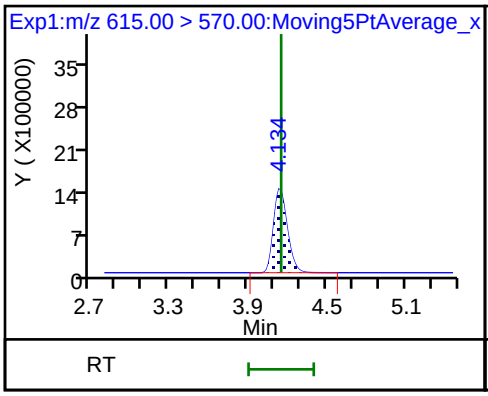
31 Perfluoroundecanoic acid



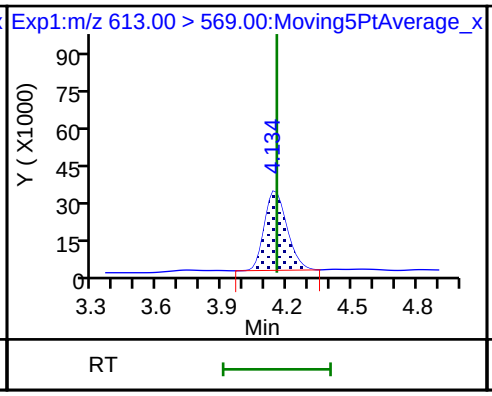
D 30 13C2 PFUnA



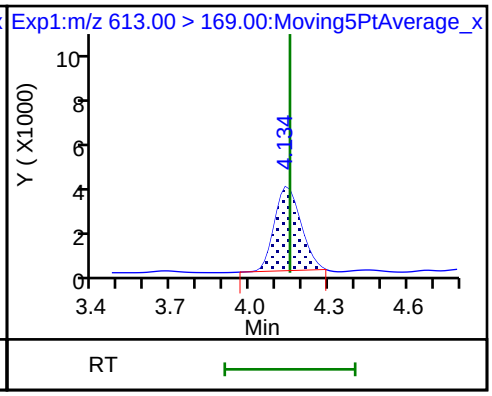
D 36 13C2 PFDoA



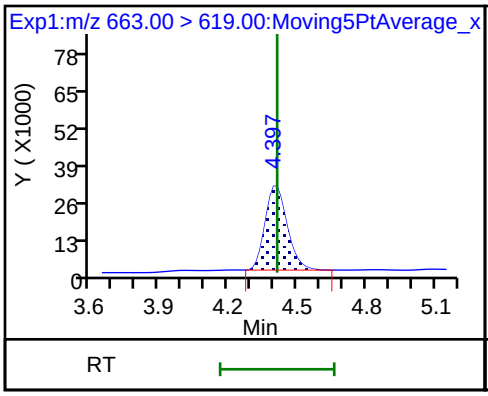
37 Perfluorododecanoic acid



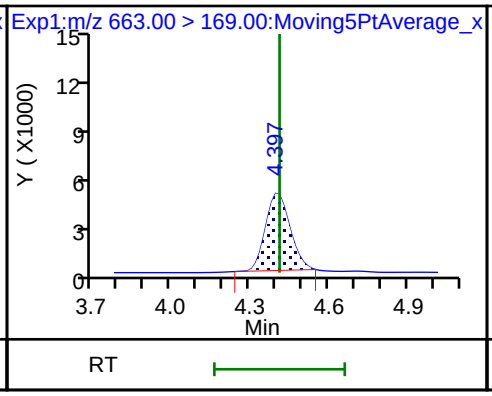
37 Perfluorododecanoic acid



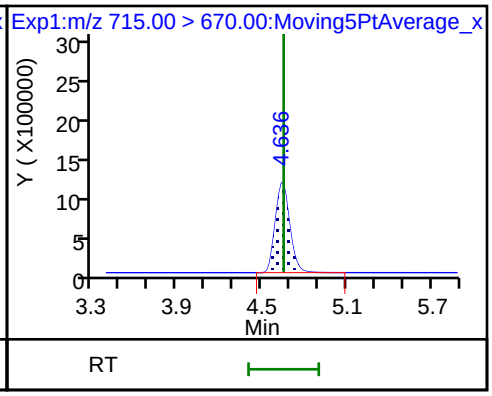
41 Perfluorotridecanoic acid



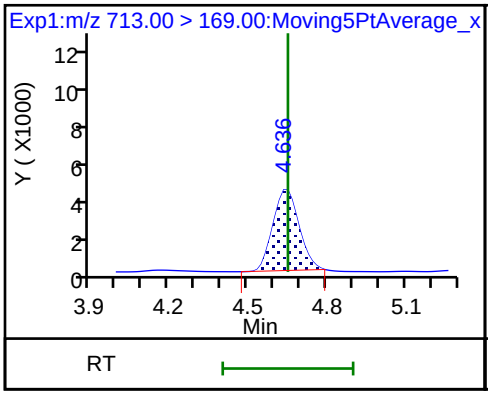
41 Perfluorotridecanoic acid



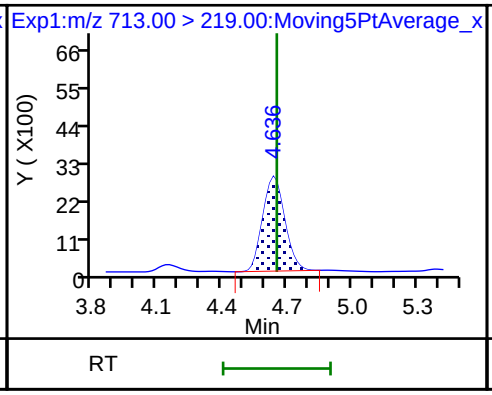
D 43 13C2-PFTeDA



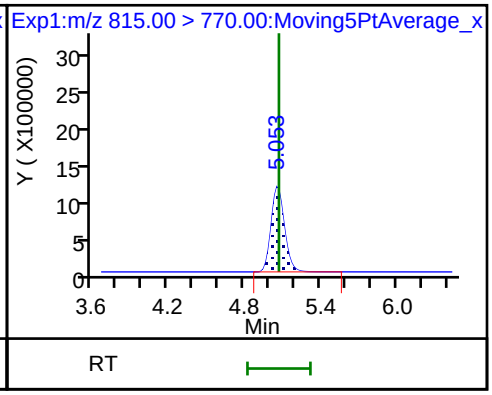
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

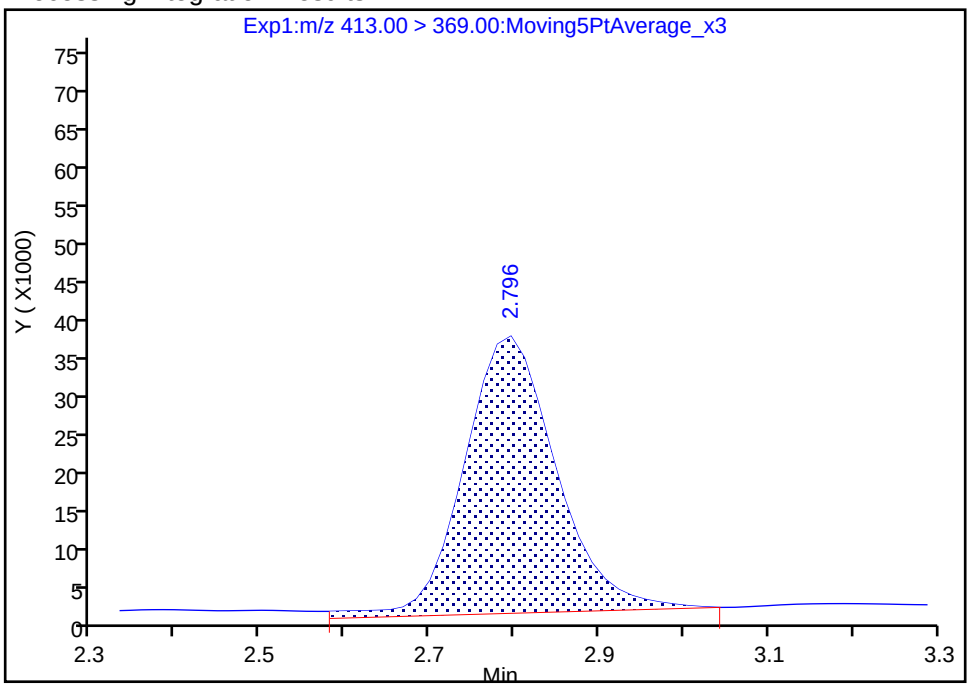
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_005.d				
Injection Date:	22-Jul-2018 06:14:33	Instrument ID:	A9		
Lims ID:	CCVL				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

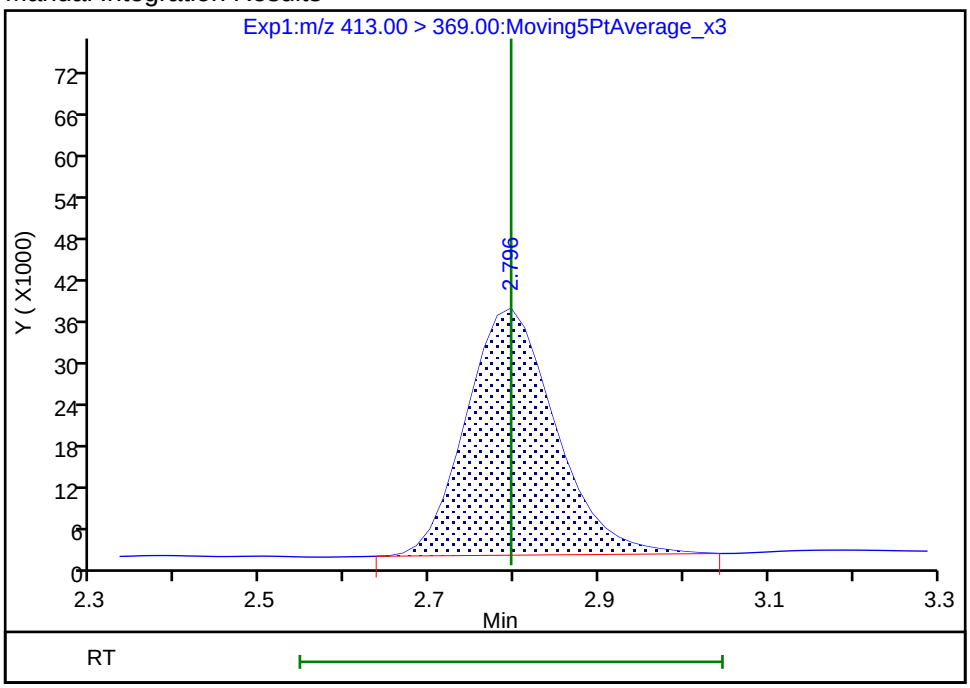
Processing Integration Results

RT: 2.80
Area: 270608
Amount: 0.056931
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 257118
Amount: 0.054092
Amount Units: ng/ml



Reviewer: mongkols, 25-Jul-2018 08:29:50

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

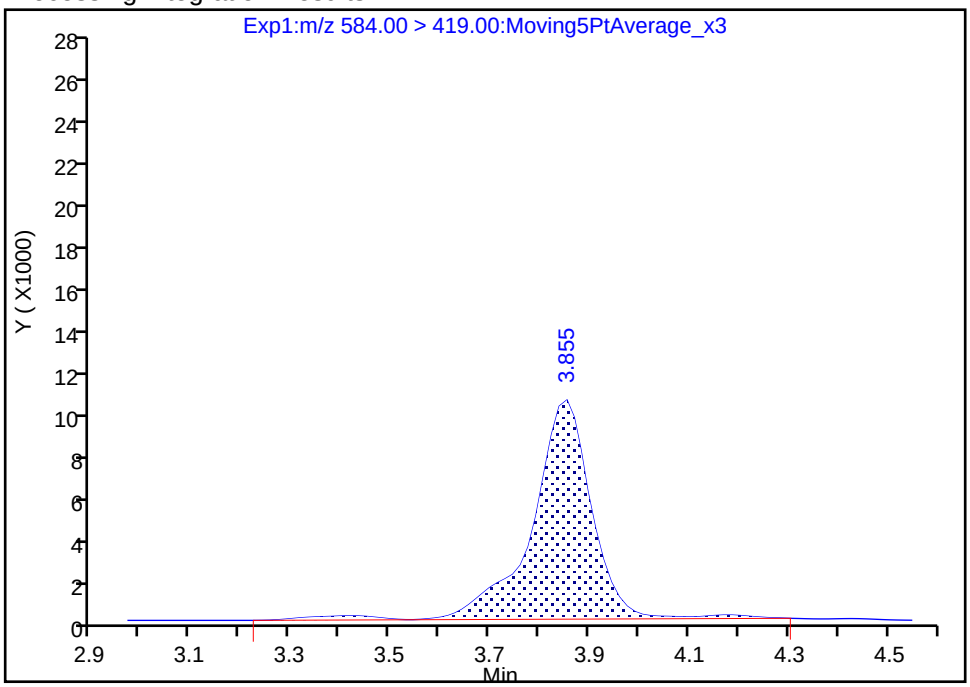
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_005.d				
Injection Date:	22-Jul-2018 06:14:33	Instrument ID:	A9		
Lims ID:	CCVL				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

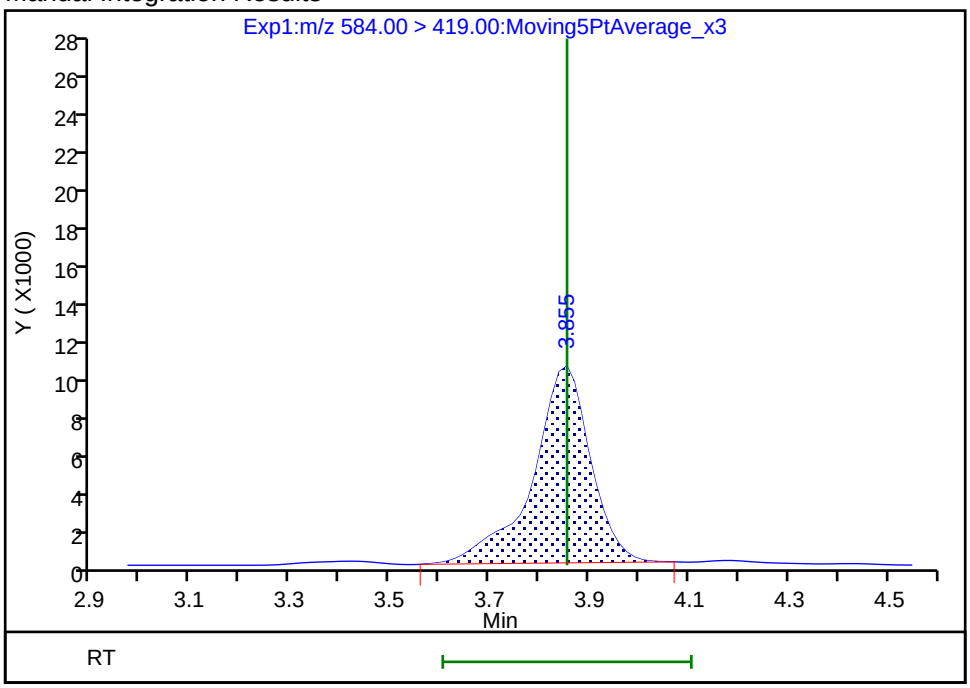
Processing Integration Results

RT: 3.86
Area: 87174
Amount: 0.058466
Amount Units: ng/ml



Manual Integration Results

RT: 3.86
Area: 82166
Amount: 0.055107
Amount Units: ng/ml



Reviewer: mongkols, 25-Jul-2018 08:30:01

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-235506/3 Calibration Date: 07/22/2018 06:22

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	0.9769		1.02	1.00	1.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.095		1.01	1.00	0.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	115.3		0.932	0.884	5.4	30.0
4:2 FTS	AveID	21.47	19.41		0.844	0.934	-9.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	0.9475		1.00	1.00	0.1	30.0
Perfluoropentanesulfonic acid	AveID	52.20	54.72		0.983	0.938	4.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.167		1.06	1.00	6.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.221		0.834	0.910	-8.4	30.0
6:2 FTS	AveID	2.182	2.113		0.918	0.948	-3.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.148		0.998	1.00	-0.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.105		0.987	0.952	3.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.072		0.884	0.928	-4.7	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.080		1.01	1.00	0.8	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.457		1.13	1.00	12.9	30.0
8:2 FTS	AveID	15.89	15.76		0.950	0.958	-0.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.240		1.06	1.00	5.7	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.3868		0.947	0.960	-1.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	0.999		0.966	1.00	-3.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	1.006		1.04	0.964	7.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	1.000		0.996	1.00	-0.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	0.9820		1.01	1.00	1.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.192		1.10	1.00	10.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	1.045		1.04	1.00	4.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1692		0.982	1.00	-1.8	30.0
13C4 PFBA	Ave	0.9738	0.9012		2.31	2.50	-7.5	30.0
13C5-PFPeA	Ave	0.8956	0.8202		2.29	2.50	-8.4	30.0
13C3-PFBS	Ave	0.0113	0.0111		2.27	2.33	-2.2	30.0
13C2 PFHxA	Ave	0.9398	0.8824		2.35	2.50	-6.1	30.0
13C4-PFHpA	Ave	1.089	1.025		2.35	2.50	-5.9	30.0
18O2 PFHxS	Ave	0.6628	0.6744		2.41	2.37	1.7	30.0
M2-6:2FTS	Ave	0.1018	0.0988		2.30	2.38	-3.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-235506/3 Calibration Date: 07/22/2018 06:22

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.9527		2.43	2.50	-2.7	30.0
13C4 PFOS	Ave	0.7102	0.7098		2.39	2.39	-0.0	30.0
13C5 PFNA	Ave	0.9199	0.8809		2.39	2.50	-4.2	30.0
13C8 FOSA	Ave	0.4011	0.3906		2.43	2.50	-2.6	30.0
13C2 PFDA	Ave	0.9555	0.9194		2.41	2.50	-3.8	30.0
M2-8:2FTS	Ave	0.0139	0.0141		2.42	2.40	1.0	30.0
d3-NMeFOSAA	Ave	0.4497	0.4571		2.54	2.50	1.7	30.0
13C2 PFUnA	Ave	0.8725	0.8398		2.41	2.50	-3.8	30.0
d5-NEtFOSAA	Ave	0.3602	0.3746		2.60	2.50	4.0	30.0
13C2 PFDoA	Ave	0.9367	0.9346		2.49	2.50	-0.2	30.0
13C2-PFTeDA	Ave	0.8106	0.8170		2.52	2.50	0.8	30.0
13C2-PFHxDA	Ave	0.8343	0.7971		2.39	2.50	-4.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 22-Jul-2018 06:22:03 ALS Bottle#: 28 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 08:30:39 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 08:30:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.511	0.006	0.543	9319013	2.31		92.5	9664	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.517	0.0	1.000	3641447	1.02		102	497	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.784	0.008	0.641	8481353	2.29		91.6	11331	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.792	0.0	1.000	3716041	1.01		101	1405	
D 47 13C3-PFBS										
301.90 > 83.00	1.834	1.826	0.008	0.656	106302	2.27		97.8	1046	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.834	1.834	0.0	1.000	4661055	0.9319		105	3383	
298.90 > 99.00	1.834	1.834	0.0	1.000	1538874		3.03(1.35-4.05)		3393	
D 60 M2-4:2FTS										
329.00 > 81.00	2.046	2.046	0.0	0.732	838783	NC			1262	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.046	0.0	1.115	828864	0.8445		90.4	9808	
D 7 13C2 PFHxA										
315.00 > 270.00	2.087	2.077	0.010	0.747	9124601	2.35		93.9	14696	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.087	2.087	0.0	1.000	3458226	1.00		100	1812	
313.00 > 119.00	2.087	2.087	0.0	1.000	255551		13.53(6.96-20.87)		1459	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.108	2.108	0.0	1.149	2346845	0.9833		105	7202	
349.00 > 99.00	2.108	2.108	0.0	1.149	1030396		2.28(1.15-3.45)		6660	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.191	2.181	0.010	0.784	936278	NC			6990	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.191	2.191	0.0	1.000	724930	NC			402	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.423	0.0	0.867	10602876	2.35		94.1	32427	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.423	2.423	0.0	1.000	4948890	1.06		106	1324	
363.00 > 169.00	2.436	2.423	0.013	1.005	1035637		4.78(2.17-6.52)		4178	
D 11 18O2 PFHxS										
403.00 > 84.00	2.449	2.436	0.013	0.876	6596785	2.41		102	29452	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.436	2.436	0.0	0.995	3098799	0.8339		91.6	9208	
399.00 > 99.00	2.436	2.436	0.0	0.995	820438		3.78(1.90-5.70)		3118	
65 ADONA										
377.00 > 251.00	2.474	2.474	0.0	0.780	8227204	NC			21870	
377.00 > 85.00	2.474	2.474	0.0	0.780	3418589		2.41(1.05-3.16)		2401	
D 12 M2-6:2FTS										
429.00 > 81.00	2.764	2.764	0.0	0.989	970044	2.30		97.0	3816	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.780	2.780	0.0	1.006	818206	0.9181		96.8	9360	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.796	0.0	1.000	9851758	2.43		97.3	23005	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10340626	2.50			22676	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	4528821	1.00		99.7	662	
413.00 > 169.00	2.796	2.796	0.0	1.000	1625740		2.79(1.36-4.08)		4021	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.812	2.812	0.0	0.887	3088120	0.9865		104	4976	
449.00 > 99.00	2.812	2.812	0.0	0.887	746932		4.13(1.84-5.53)		7930	
D 18 13C4 PFOS										
503.00 > 80.00	3.171	3.171	0.0	1.134	7016680	2.39		99.9	9334	
D 19 13C5 PFNA										
468.00 > 423.00	3.171	3.171	0.0	1.134	9108579	2.39		95.8	26004	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.171	0.0	1.000	2921745	0.8840		95.3	6162	
499.00 > 99.00	3.171	3.171	0.0	1.000	725898		4.03(2.04-6.12)		5226	
20 Perfluorononanoic acid										
463.00 > 419.00	3.190	3.190	0.0	1.006	3933531	1.01		101	1137	
463.00 > 169.00	3.171	3.190	-0.019	1.000	746410		5.27(2.68-8.03)		1934	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.386	3.386	0.0	1.068	3600493	NC			10341	
D 21 13C8 FOSA										
506.00 > 78.00	3.517	3.516	0.001	1.258	4038481	2.43		97.4	11043	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.517	3.517	0.0	1.000	5584737	1.13		113	9226	
D 26 M2-8:2FTS										
529.00 > 81.00	3.532	3.531	0.001	1.263	139187	2.42		101	2360	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.532	3.532	0.0	1.114	1090270	0.9468		98.6	3061	
549.00 > 99.00	3.532	3.532	0.0	1.114	362954		3.00(1.42-4.26)		1610	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.532	3.532	0.0	1.000	877557	0.9501		99.2	3420	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.532	3.532	0.0	1.000	4716022	1.06		106	1375	
513.00 > 169.00	3.532	3.532	0.0	1.000	324787		14.52(7.12-21.35)		1301	
D 23 13C2 PFDA										
515.00 > 470.00	3.532	3.546	-0.014	1.263	9507359	2.41		96.2	19145	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.686	3.685	0.001	1.318	4727022	2.54		102	10318	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.686	3.686	0.0	1.000	1889823	0.9656		96.6	1018	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.840	3.840	0.0	1.211	2846022	1.04		108	4116	
599.00 > 99.00	3.840	3.840	0.0	1.211	588416		4.84(2.14-6.43)		3201	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.855	3.855	0.0	1.379	3873633	2.60		104	5372	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.855	3.855	0.0	1.000	1548736	1.00		99.6	4885	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.855	3.855	0.0	1.000	3411089	1.01		101	1113	
563.00 > 169.00	3.855	3.855	0.0	1.000	300463		11.35(5.24-15.72)		2505	
D 30 13C2 PFUnA										
565.00 > 520.00	3.855	3.870	-0.015	1.379	8683985	2.41		96.2	39039	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.024	4.024	0.0	1.269	4537970	NC			12506	
D 36 13C2 PFDoA										
615.00 > 570.00	4.152	4.152	0.0	1.485	9664224	2.49		99.8	30167	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.152	4.152	0.0	1.000	4606556	1.10		110	1247	
613.00 > 169.00	4.152	4.152	0.0	1.000	483763		9.52(4.68-14.05)		1343	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.412	4.412	0.0	1.063	4040334	1.04		104	1354	
663.00 > 169.00	4.412	4.412	0.0	1.063	604547		6.68(3.09-9.27)		2313	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.652	4.652	0.0	1.664	8448612	2.52		101	16784	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.652	4.652	0.0	1.000	571643	0.9823		98.2	1651	
713.00 > 219.00	4.652	4.652	0.0	1.000	381589		1.50(0.70-2.09)		1186	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.070	5.070	0.0	1.813	8242741	2.39		95.5	10843	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.070	5.070	0.0	1.000	3632783	NC			526	
813.00 > 169.00	5.070	5.070	0.0	1.000	625246		5.81(2.77-8.32)		1367	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.428	5.428	0.0	1.071	2628233	NC			442	
913.00 > 169.00	5.428	5.428	0.0	1.071	480727		5.47(2.55-7.64)		1859	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 25-Jul-2018 08:30:42 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_006.d

Injection Date: 22-Jul-2018 06:22:03 Instrument ID: A9

Lims ID: CCV L4

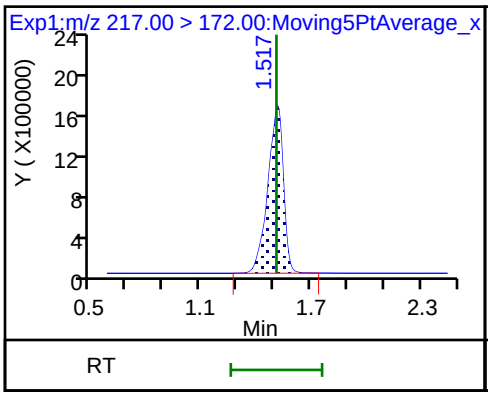
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 28 Worklist Smp#: 3

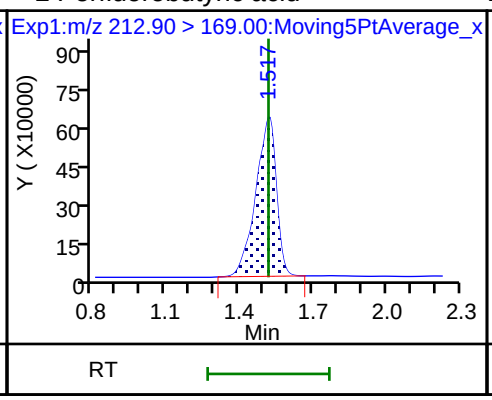
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

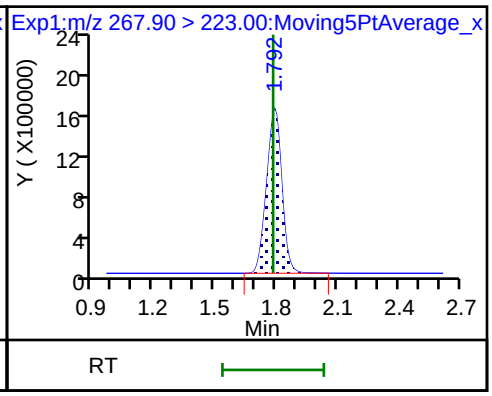
D 1 13C4 PFBA



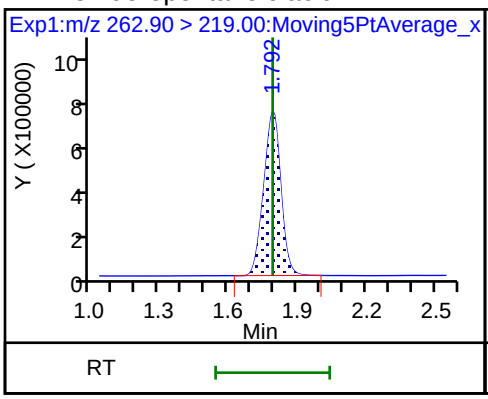
2 Perfluorobutyric acid



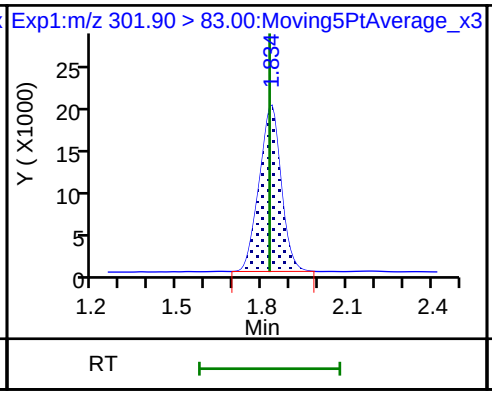
D 3 13C5-PFPeA



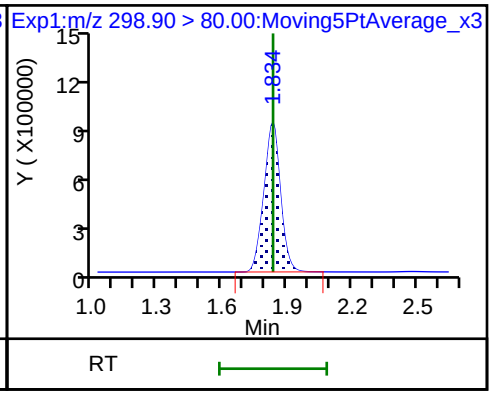
4 Perfluoropentanoic acid



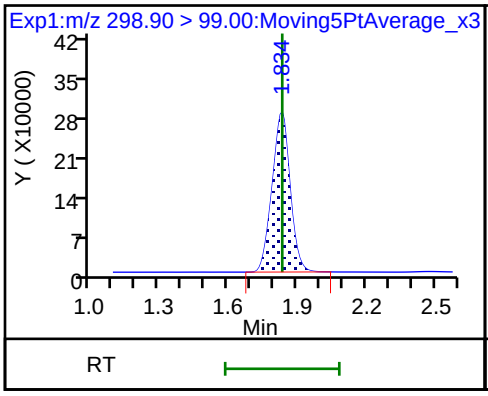
D 47 13C3-PFBS



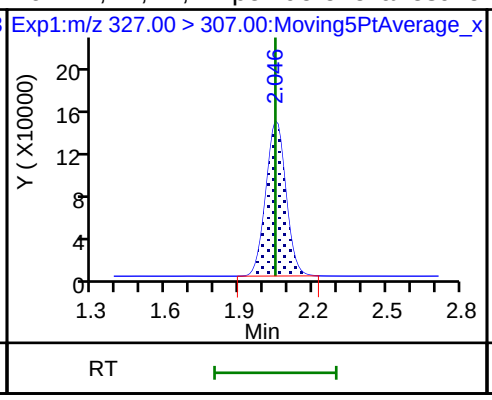
5 Perfluorobutanesulfonic acid



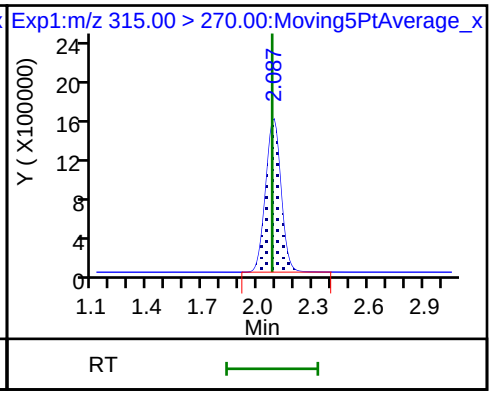
5 Perfluorobutanesulfonic acid



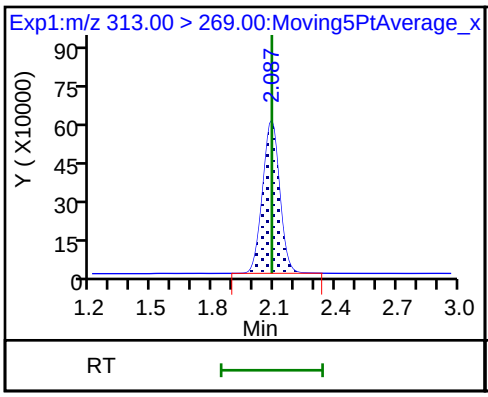
61 1H,1H,2H,2H-perfluorohexanesulfon



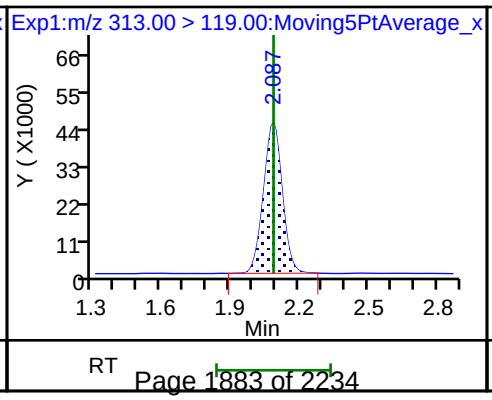
D 7 13C2 PFHxA



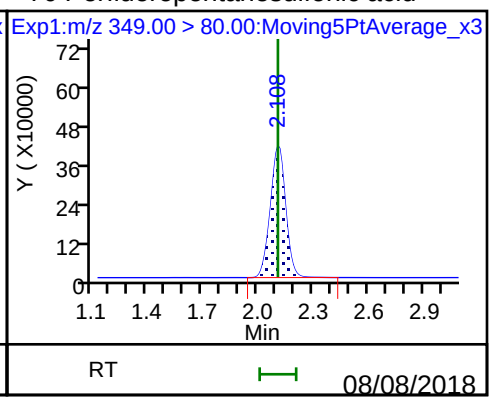
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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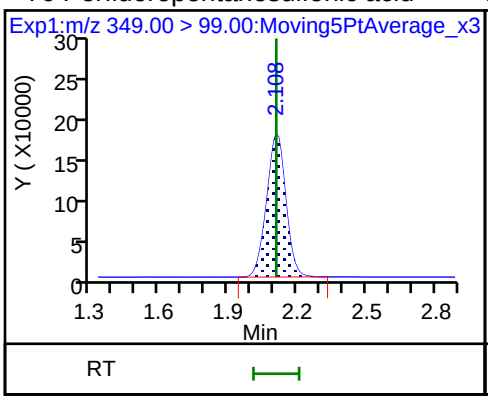
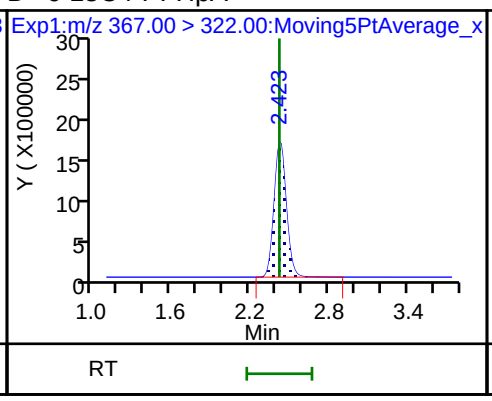


D 9 13C4-PFHpA



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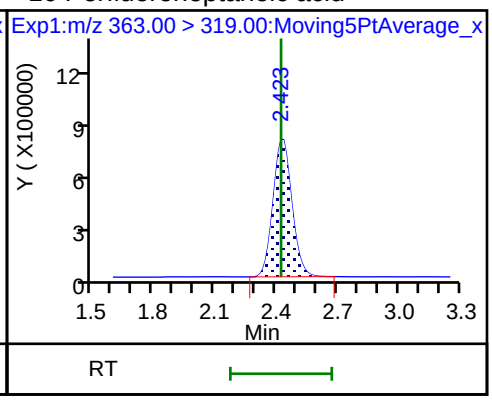
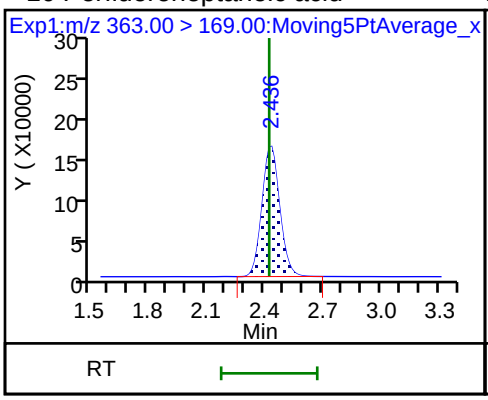
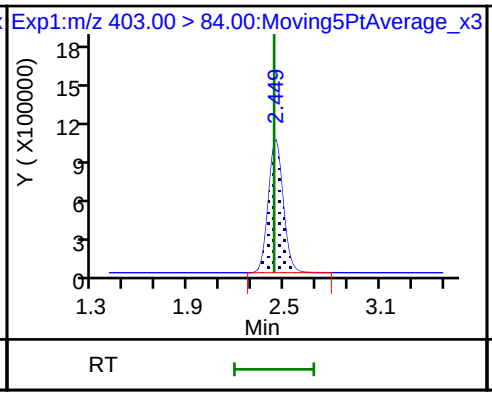


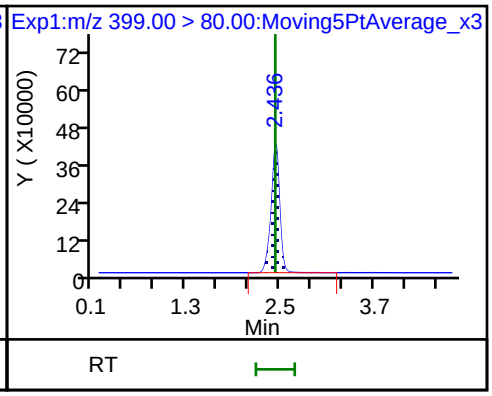
10 Perfluoroheptanoic acid



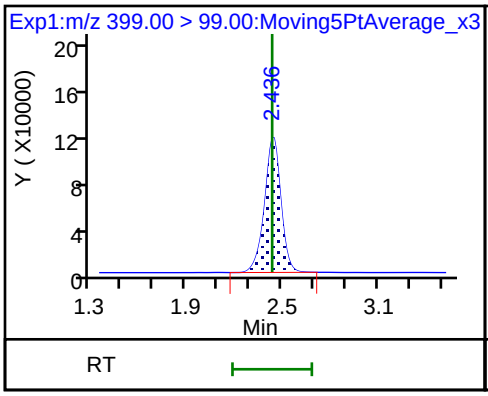
D 11 18O2 PFHxS



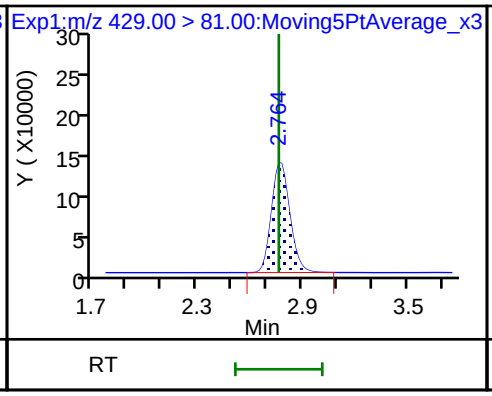
8 Perfluorohexanesulfonic acid



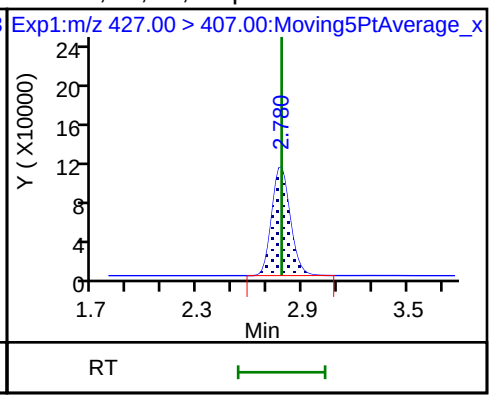
8 Perfluorohexanesulfonic acid



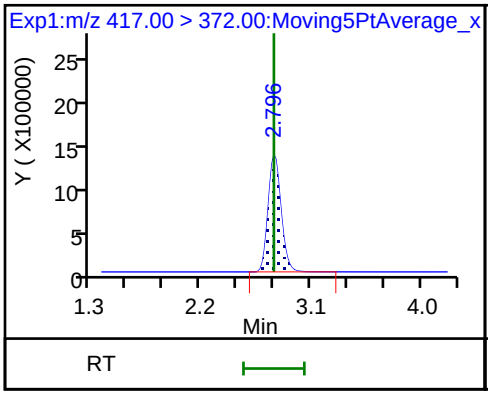
D 12 M2-6:2FTS



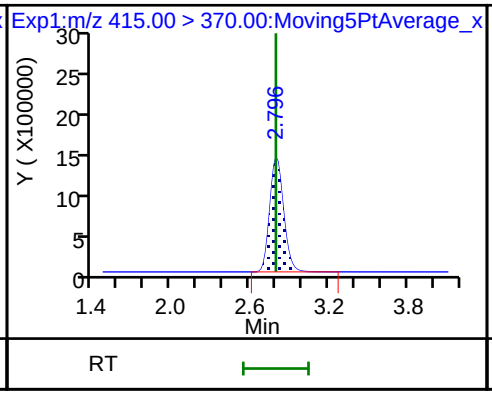
13 1H,1H,2H,2H-perfluorooctanesulfoni



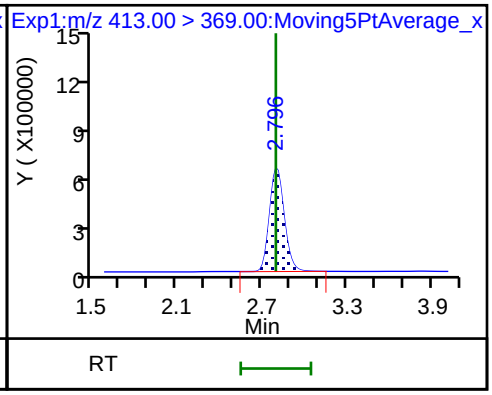
D 14 13C4 PFOA



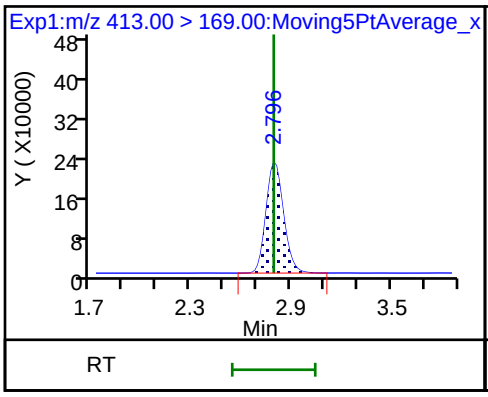
* 62 13C2-PFOA



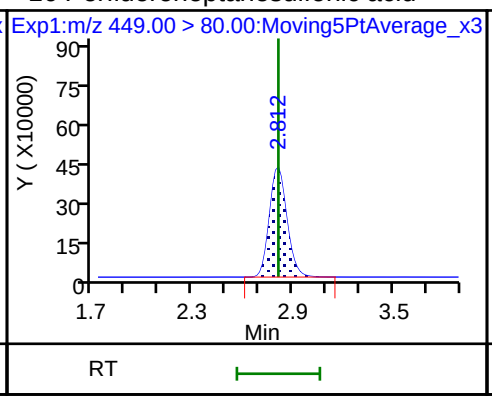
15 Perfluorooctanoic acid



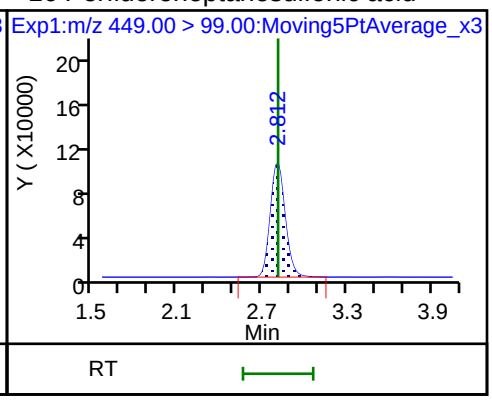
15 Perfluorooctanoic acid



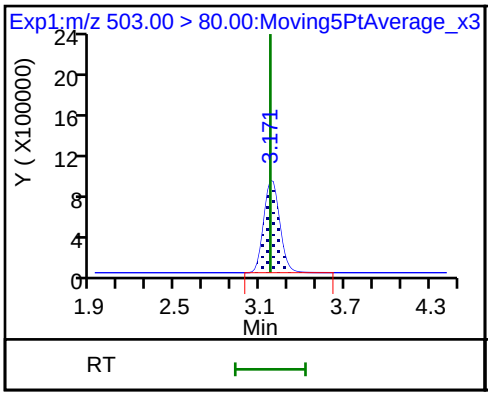
16 Perfluoroheptanesulfonic acid



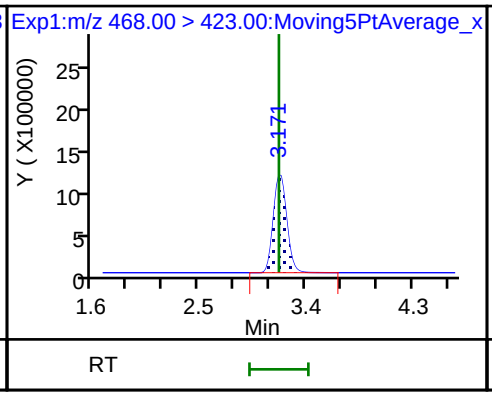
16 Perfluoroheptanesulfonic acid



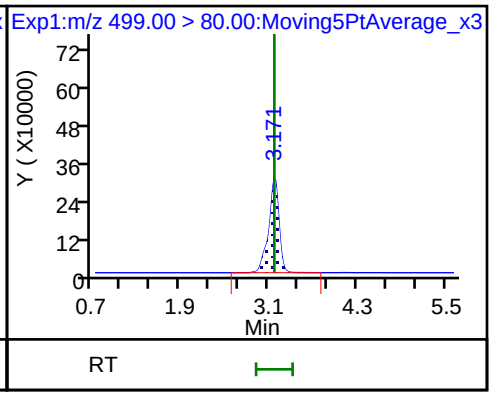
D 18 13C4 PFOS



D 19 13C5 PFNA



17 Perfluorooctane sulfonic acid



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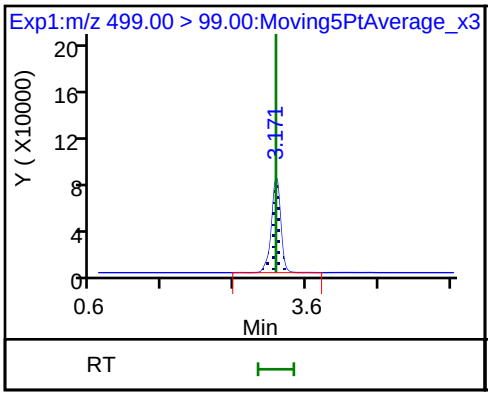
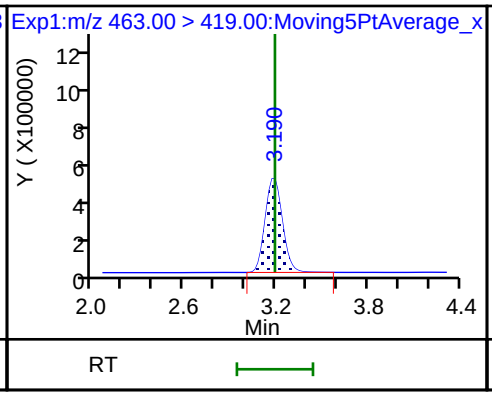


20 Perfluorononanoic acid



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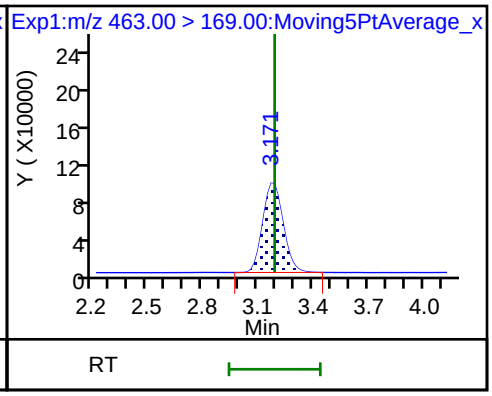
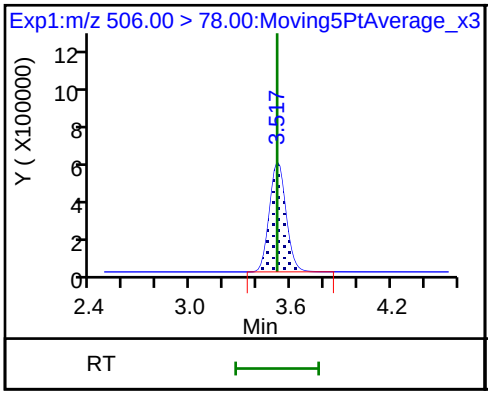
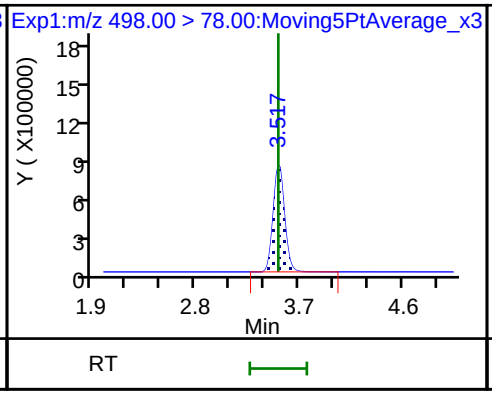


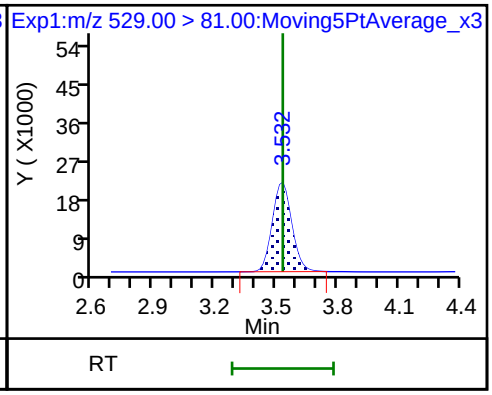
D 21 13C8 FOSA



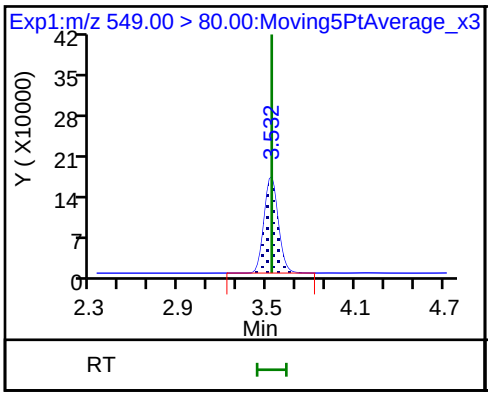
22 Perfluorooctane Sulfonamide



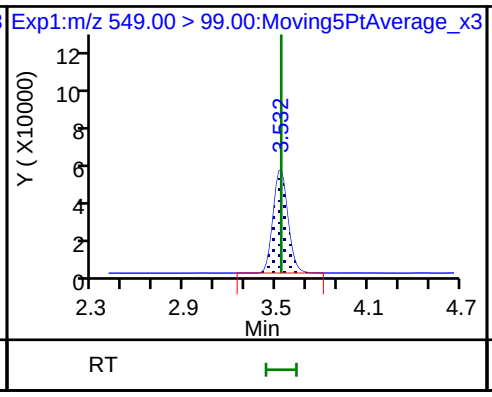
D 26 M2-8:2FTS



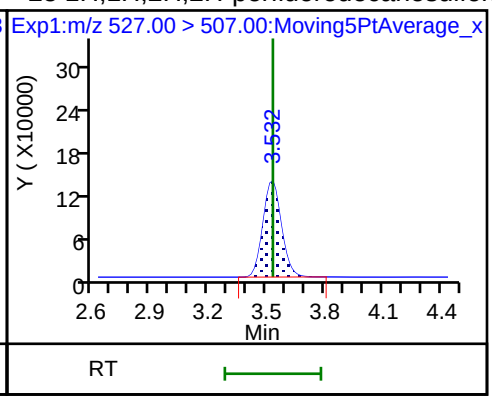
68 Perfluorononanesulfonic acid



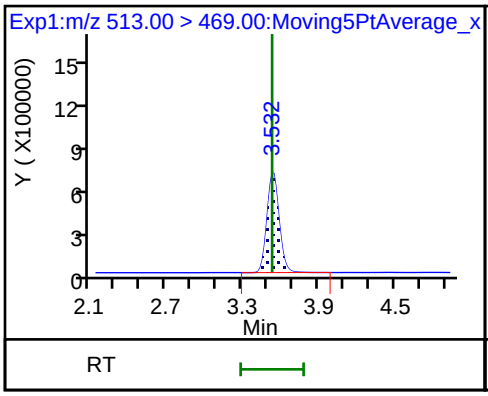
68 Perfluorononanesulfonic acid



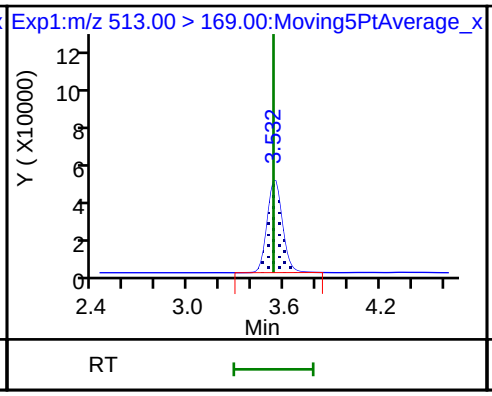
25 1H,1H,2H,2H-perfluorodecanesulfoni



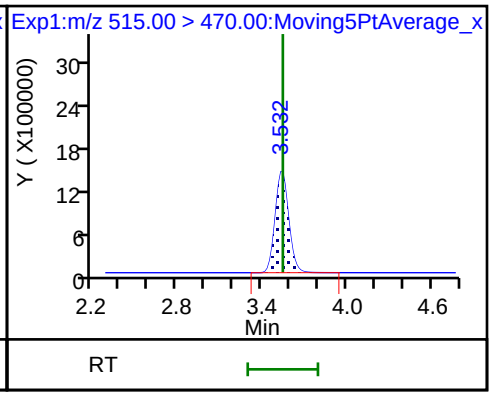
24 Perfluorodecanoic acid



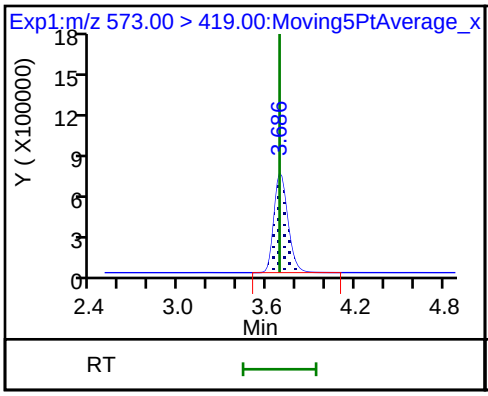
24 Perfluorodecanoic acid



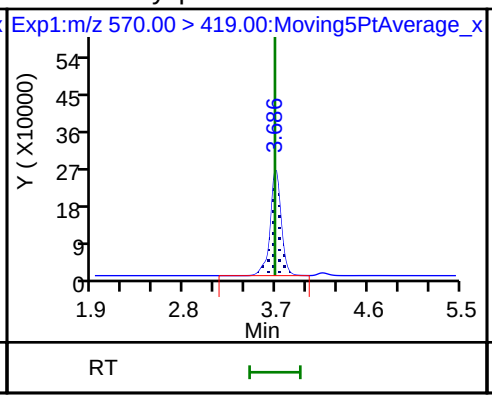
D 23 13C2 PFDA



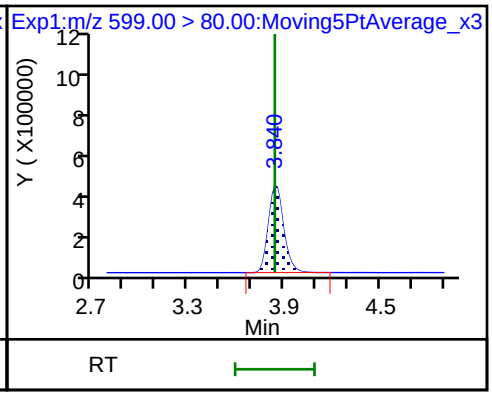
D 27 d3-NMeFOSAA



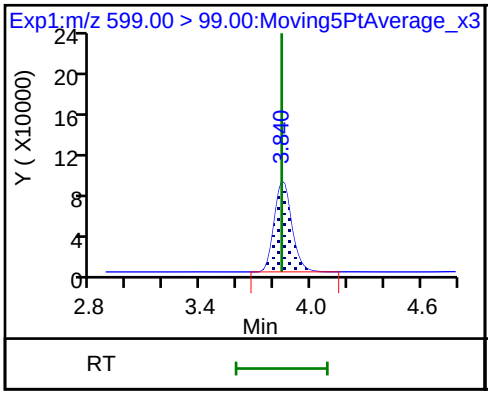
28 N-methyl perfluorooctane sulfonami



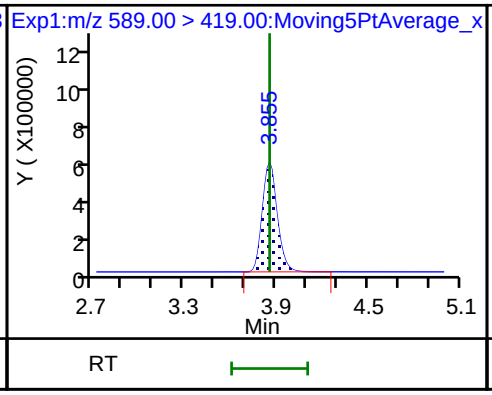
29 Perfluorodecane Sulfonic acid



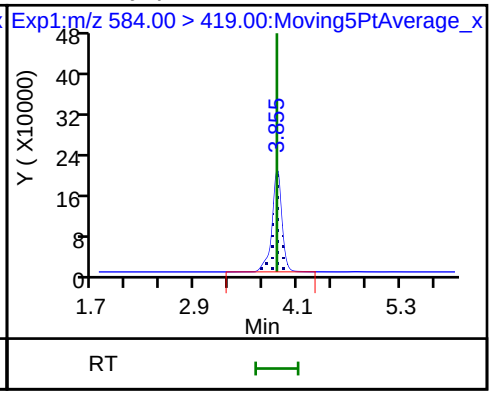
29 Perfluorodecane Sulfonic acid



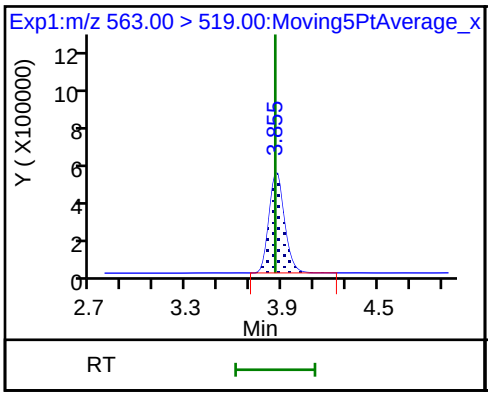
D 32 d5-NEtFOSAA



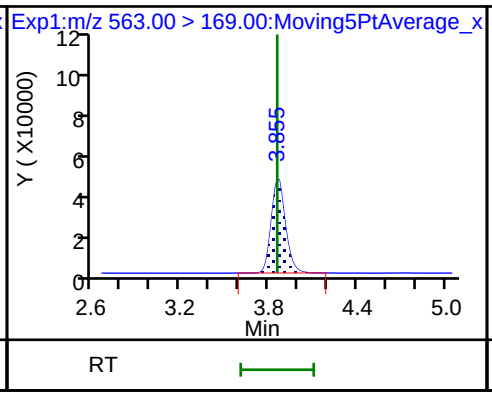
33 N-ethyl perfluorooctane sulfonamid



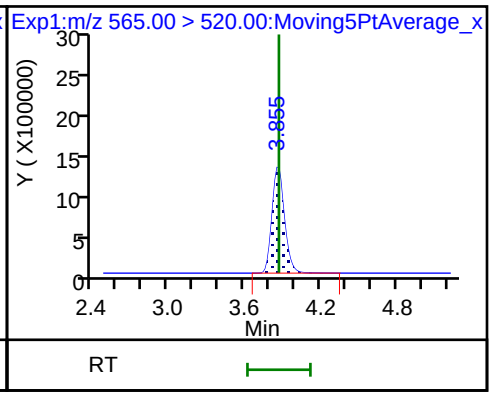
31 Perfluoroundecanoic acid



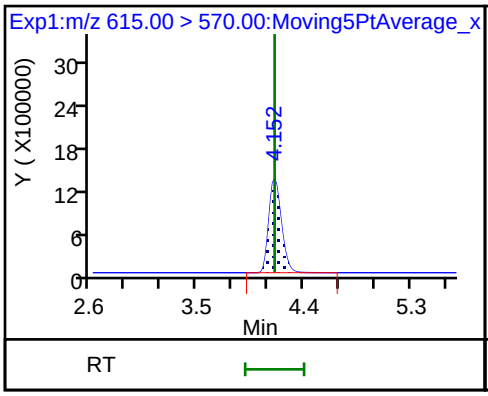
31 Perfluoroundecanoic acid



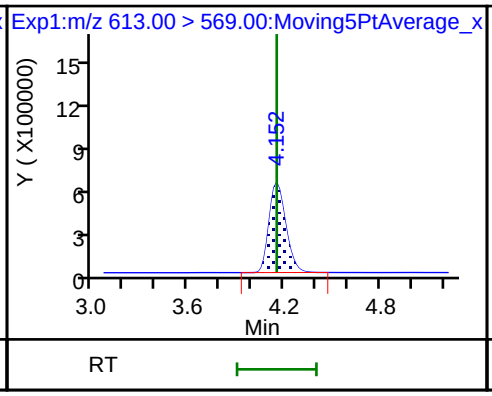
D 30 13C2 PFUnA



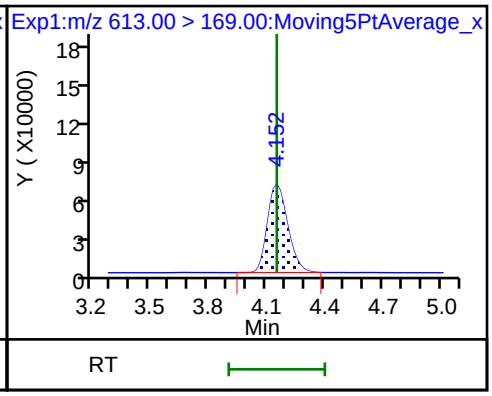
D 36 13C2 PFDoA



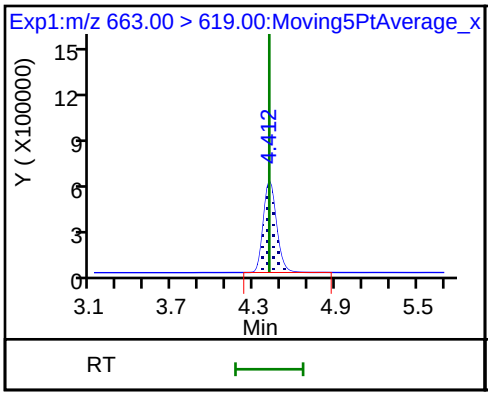
37 Perfluorododecanoic acid



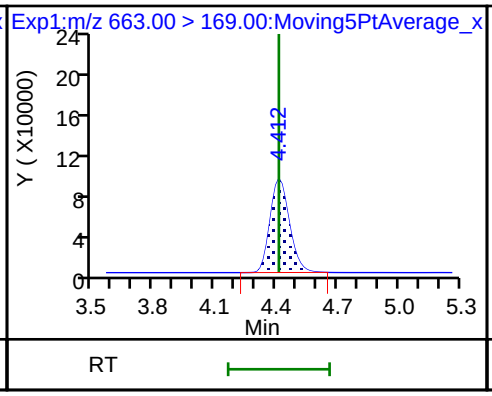
37 Perfluorododecanoic acid



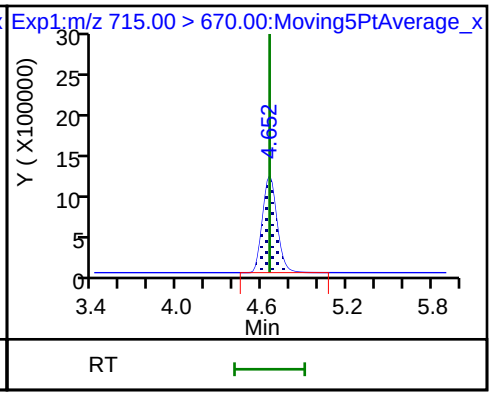
41 Perfluorotridecanoic acid



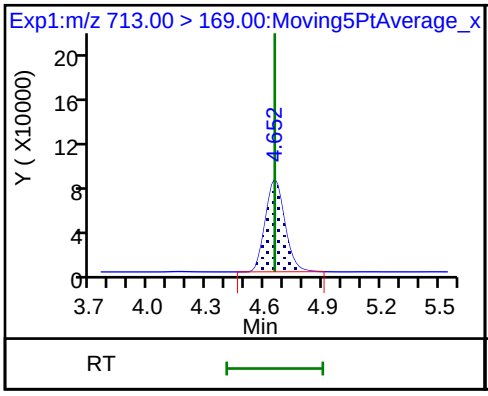
41 Perfluorotridecanoic acid



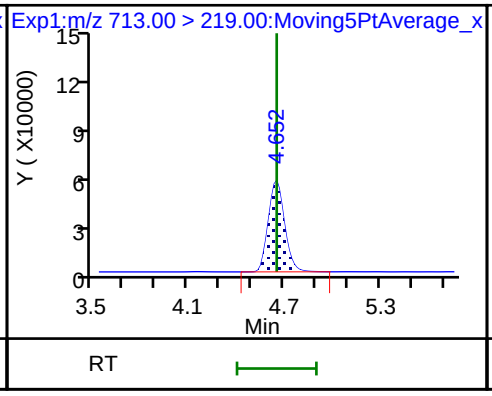
D 43 13C2-PFTeDA



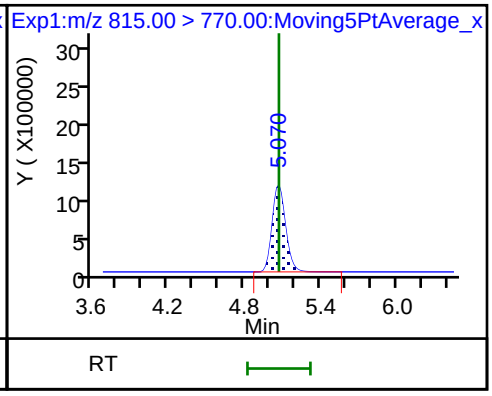
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-235512/1 Calibration Date: 07/22/2018 10:14

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_037.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	1.009		2.63	2.50	5.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.106		2.55	2.50	1.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	108.3		2.19	2.21	-1.0	30.0
4:2 FTS	AveID	21.47	20.10		2.19	2.34	-6.4	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	0.9346		2.47	2.50	-1.2	30.0
Perfluoropentanesulfonic acid	AveID	52.20	55.66		2.50	2.35	6.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.115		2.54	2.50	1.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.300		2.22	2.28	-2.4	30.0
6:2 FTS	AveID	2.182	2.244		2.44	2.37	2.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.114		2.42	2.50	-3.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.239		2.77	2.38	16.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.029		2.40	2.50	-3.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.187		2.45	2.32	5.4	30.0
8:2 FTS	AveID	15.89	14.34		2.16	2.40	-9.8	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.4117		2.52	2.40	5.0	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.112		2.54	2.50	1.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.181		2.52	2.50	0.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.140		2.75	2.50	10.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	1.032		2.66	2.41	10.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	1.025		2.55	2.50	2.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	0.9636		2.48	2.50	-0.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.072		2.48	2.50	-0.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	0.9827		2.46	2.50	-1.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1741		2.53	2.50	1.1	30.0
13C4 PFBA	Ave	0.9738	0.8886		2.28	2.50	-8.7	30.0
13C5-PFPeA	Ave	0.8956	0.8306		2.32	2.50	-7.3	30.0
13C3-PFBS	Ave	0.0113	0.0115		2.37	2.33	2.1	30.0
13C2 PFHxA	Ave	0.9398	0.8933		2.38	2.50	-5.0	30.0
13C4-PFHpA	Ave	1.089	1.002		2.30	2.50	-8.0	30.0
18O2 PFHxS	Ave	0.6628	0.6572		2.34	2.37	-0.8	30.0
M2-6:2FTS	Ave	0.1018	0.0943		2.20	2.38	-7.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-235512/1 Calibration Date: 07/22/2018 10:14

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_037.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.9238		2.36	2.50	-5.7	30.0
13C4 PFOS	Ave	0.7102	0.6585		2.22	2.39	-7.3	30.0
13C5 PFNA	Ave	0.9199	0.8643		2.35	2.50	-6.0	30.0
13C8 FOSA	Ave	0.4011	0.3934		2.45	2.50	-1.9	30.0
M2-8:2FTS	Ave	0.0139	0.0137		2.36	2.40	-1.5	30.0
13C2 PFDA	Ave	0.9555	0.9218		2.41	2.50	-3.5	30.0
d3-NMeFOSAA	Ave	0.4497	0.4056		2.25	2.50	-9.8	30.0
d5-NEtFOSAA	Ave	0.3602	0.3620		2.51	2.50	0.5	30.0
13C2 PFUnA	Ave	0.8725	0.7954		2.28	2.50	-8.8	30.0
13C2 PFDoA	Ave	0.9367	0.8810		2.35	2.50	-5.9	30.0
13C2-PFTeDA	Ave	0.8106	0.7495		2.31	2.50	-7.5	30.0
13C2-PFHxDA	Ave	0.8343	0.7974		2.39	2.50	-4.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_037.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 22-Jul-2018 10:14:45 ALS Bottle#: 29 Worklist Smp#: 1
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:45:53 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:45:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.517	0.0	0.543	9101155	2.28		91.3	9636	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.517	0.0	1.000	9182782	2.63		105	1203	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.791	0.001	0.641	8507419	2.32		92.7	9429	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.792	0.0	1.000	9409177	2.55		102	2357	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.833	-0.007	0.653	109927	2.37		102	1193	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.834	1.834	0.0	1.005	11317017	2.19		99.0	6846	
298.90 > 99.00	1.834	1.834	0.0	1.005	4099687		2.76(1.35-4.05)		6888	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.046	0.0	1.120	2219495	2.19		93.6	15839	
D 60 M2-4:2FTS										
329.00 > 81.00	2.046	2.054	-0.008	0.732	816077	NC			1269	
D 7 13C2 PFHxA										
315.00 > 270.00	2.087	2.085	0.002	0.747	9149421	2.38		95.0	15424	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.087	2.087	0.0	1.000	8551247	2.47		98.8	3586	
313.00 > 119.00	2.087	2.087	0.0	1.000	659067		12.97(6.96-20.87)		2705	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.108	2.108	0.0	1.155	6170927	2.50		107	17851	
349.00 > 99.00	2.108	2.108	0.0	1.155	2646733		2.33(1.15-3.45)		11608	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.191	2.189	0.002	0.784	963068	NC			6099	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.191	2.191	0.0	1.000	1812807	NC			1031	
D 9 13C4-PFHpA										
367.00 > 322.00	2.436	2.433	0.003	0.871	10260023	2.30		92.0	17832	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.436	2.436	0.0	1.000	11437880	2.54		101	2780	
363.00 > 169.00	2.436	2.436	0.0	1.000	2673458		4.28(2.17-6.52)		7390	
D 11 18O2 PFHxS										
403.00 > 84.00	2.448	2.446	0.002	0.876	6367737	2.34		99.2	53060	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.448	2.448	0.0	1.000	7964325	2.22		97.6	11069	
399.00 > 99.00	2.448	2.448	0.0	1.000	2088964		3.81(1.90-5.70)		5731	
65 ADONA										
377.00 > 251.00	2.474	2.474	0.0	0.776	18425392	NC			34855	
377.00 > 85.00	2.474	2.474	0.0	0.776	8927337		2.06(1.05-3.16)		5382	
D 12 M2-6:2FTS										
429.00 > 81.00	2.780	2.776	0.004	0.994	917464	2.20		92.6	4411	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.780	2.780	0.0	1.000	2054845	2.44		103	21964	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10242071	2.50			16791	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	10554253	2.42		96.7	1645	
413.00 > 169.00	2.796	2.796	0.0	1.000	4354430		2.42(1.36-4.08)		7521	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	1.000	9461106	2.36		94.3	19711	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.812	2.812	0.0	0.881	7955226	2.77		116	13990	
449.00 > 99.00	2.812	2.812	0.0	0.881	1824423		4.36(1.84-5.53)		10147	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.190	3.171	0.019	1.000	7427651	2.45		105	10459	
499.00 > 99.00	3.190	3.171	0.019	1.000	1695634		4.38(2.04-6.12)		10745	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.141	8852452	2.35		94.0	16884	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.185	0.005	1.141	6447898	2.22		92.7	10879	
20 Perfluorononanoic acid										
463.00 > 419.00	3.190	3.190	0.0	1.000	9112941	2.40		96.1	2443	
463.00 > 169.00	3.190	3.190	0.0	1.000	1834043		4.97(2.68-8.03)		4360	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.386	3.386	0.0	1.061	8561826	NC			22308	
D 21 13C8 FOSA										
506.00 > 78.00	3.532	3.529	0.003	1.263	4029105	2.45		98.1	13177	
D 26 M2-8:2FTS										
529.00 > 81.00	3.532	3.529	0.003	1.263	134446	2.36		98.5	2286	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.532	3.532	0.0	1.000	1927516	2.16		90.2	5229	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.532	3.532	0.0	1.000	12539920	2.54		102	11182	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.532	3.532	0.0	1.107	2665702	2.52		105	6301	
549.00 > 99.00	3.532	3.532	0.0	1.107	879139		3.03(1.42-4.26)		4334	
D 23 13C2 PFDA										
515.00 > 470.00	3.546	3.544	0.002	1.268	9441038	2.41		96.5	21611	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.546	3.546	0.0	1.000	11149458	2.52		101	3213	
513.00 > 169.00	3.546	3.546	0.0	1.000	779845		14.30(7.12-21.35)		2731	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.699	3.698	0.001	1.323	4153730	2.25		90.2	9507	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.699	3.699	0.0	1.000	4733157	2.75		110	2499	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.855	3.855	0.0	1.379	3707088	2.51		100	5495	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.855	3.855	0.0	1.209	6709753	2.66		110	10471	
599.00 > 99.00	3.855	3.855	0.0	1.209	1526780		4.39(2.14-6.43)		8589	
D 30 13C2 PFUnA										
565.00 > 520.00	3.870	3.869	0.001	1.384	8146189	2.28		91.2	23664	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.870	3.870	0.0	1.004	3800843	2.55		102	7397	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.870	3.870	0.0	1.000	7849397	2.48		99.3	2381	
563.00 > 169.00	3.870	3.870	0.0	1.000	786673		9.98(5.24-15.72)		4768	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.024	4.024	0.0	1.261	9735061	NC			29054	
D 36 13C2 PFDoA										
615.00 > 570.00	4.152	4.151	0.001	1.485	9023615	2.35		94.1	28778	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.152	4.152	0.0	1.000	9674025	2.48		99.3	2955	
613.00 > 169.00	4.152	4.152	0.0	1.000	1070911		9.03(4.68-14.05)		2891	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.412	4.412	0.0	1.063	8867019	2.46		98.2	3458	
663.00 > 169.00	4.412	4.412	0.0	1.063	1558721		5.69(3.09-9.27)		3646	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.652	4.651	0.001	1.664	7676655	2.31		92.5	16161	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.652	4.652	0.0	1.000	1336560	2.53		101	3007	
713.00 > 219.00	4.652	4.652	0.0	1.000	943339		1.42(0.70-2.09)		3461	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.070	5.070	0.0	1.813	8166625	2.39		95.6	9277	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.070	5.070	0.0	1.000	7855922	NC			1128	
813.00 > 169.00	5.070	5.070	0.0	1.000	1540858		5.10(2.77-8.32)		2200	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.428	5.427	0.001	1.070	6464934	NC			1054	
913.00 > 169.00	5.428	5.427	0.001	1.070	1231345		5.25(2.55-7.64)		2842	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 25-Jul-2018 09:45:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_037.d

Injection Date: 22-Jul-2018 10:14:45 Instrument ID: A9

Lims ID: CCV L5

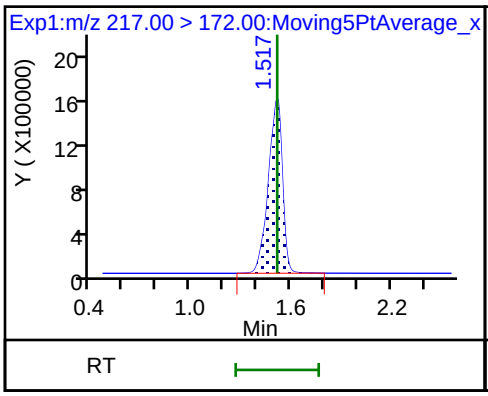
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 29 Worklist Smp#: 1

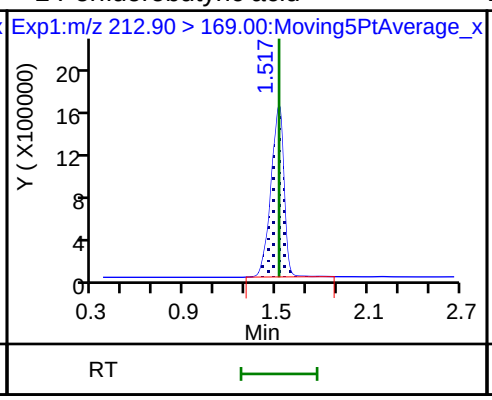
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

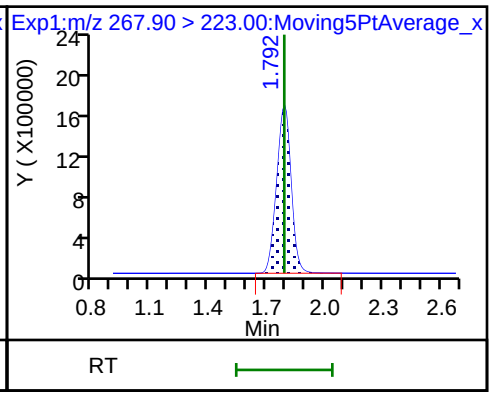
D 1 13C4 PFBA



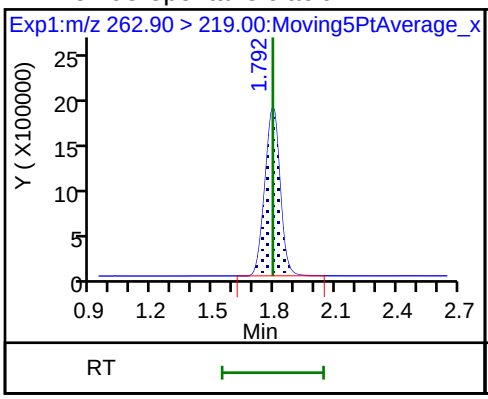
2 Perfluorobutyric acid



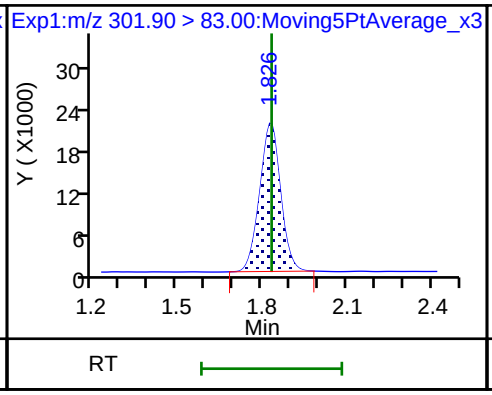
D 3 13C5-PFPeA



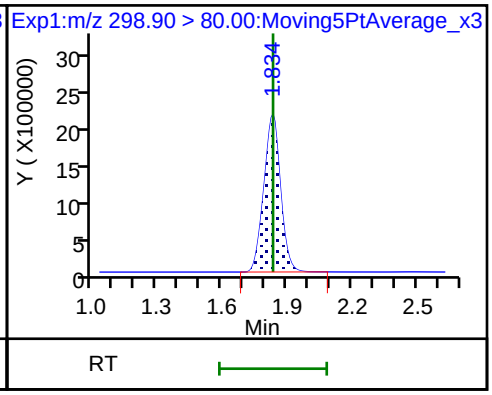
4 Perfluoropentanoic acid



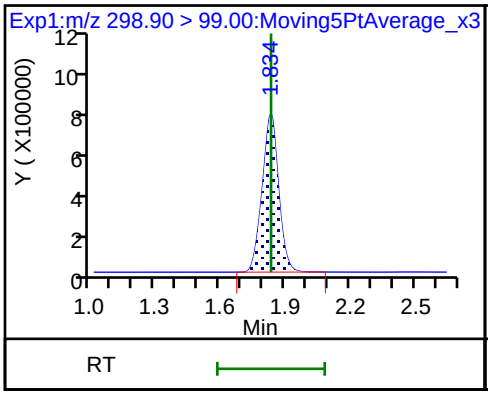
D 47 13C3-PFBS



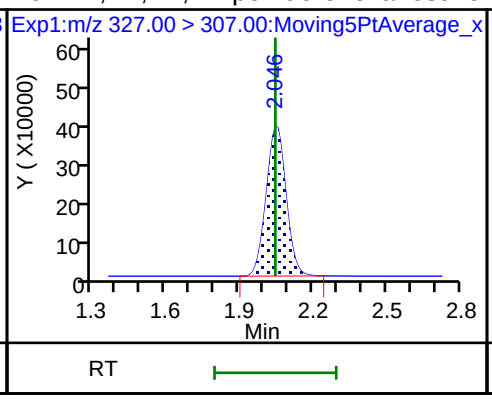
5 Perfluorobutanesulfonic acid



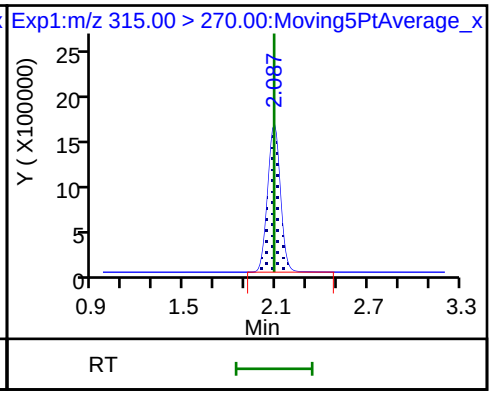
5 Perfluorobutanesulfonic acid



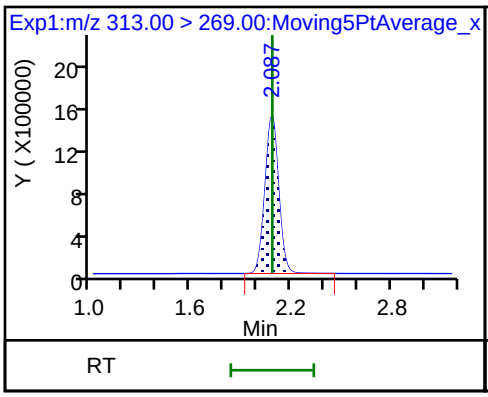
61 1H,1H,2H,2H-perfluorohexanesulfon



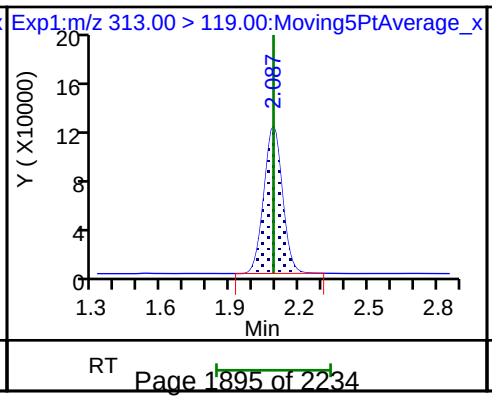
D 7 13C2 PFHxA



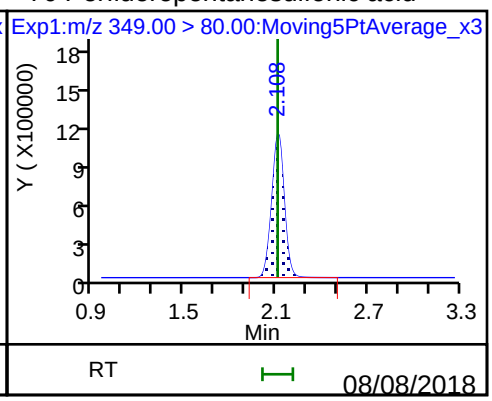
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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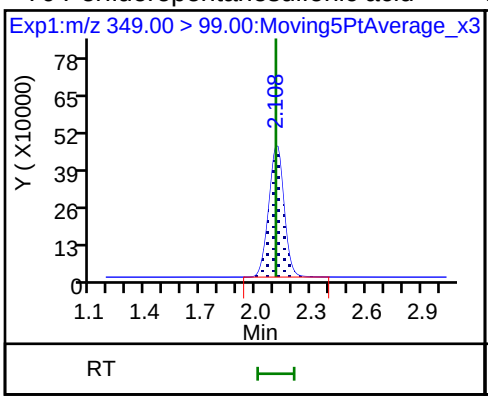
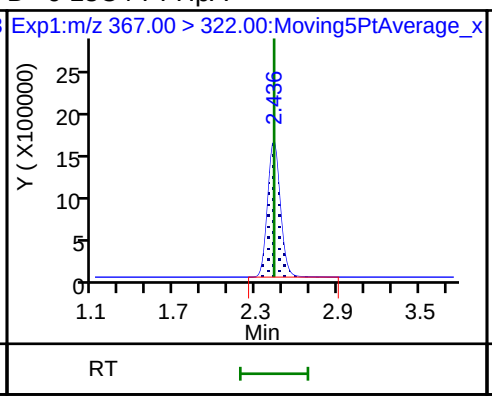
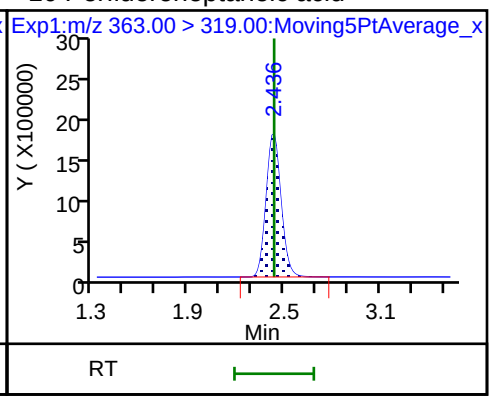


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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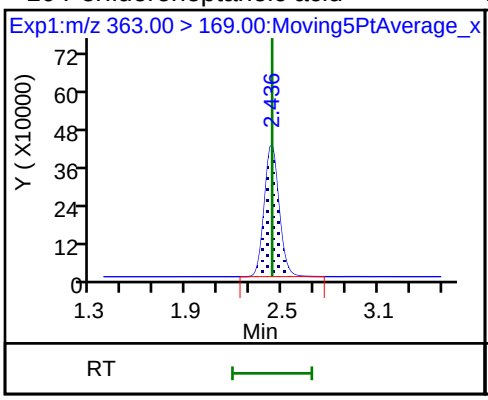
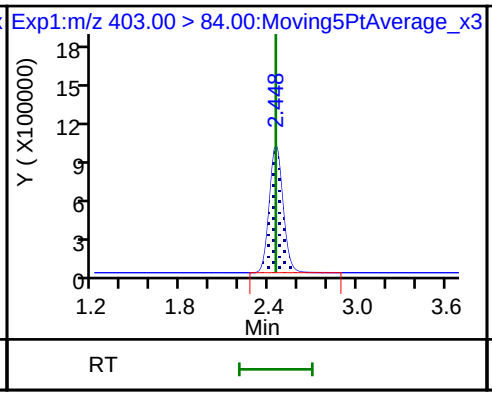
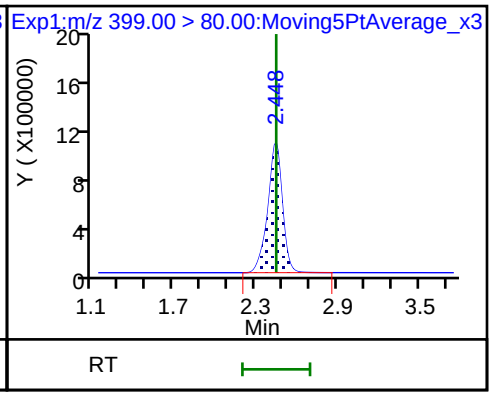


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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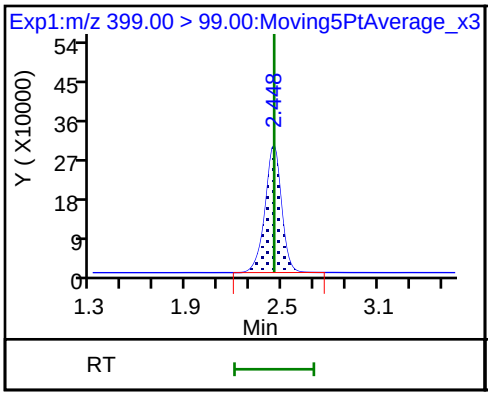
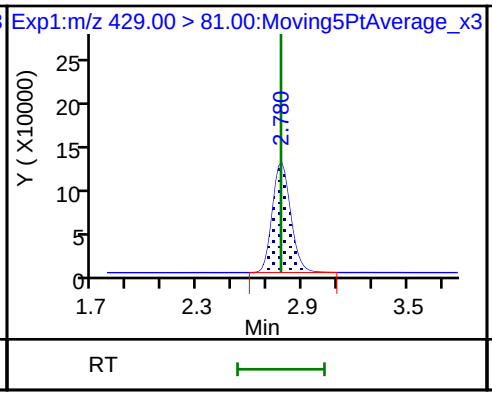
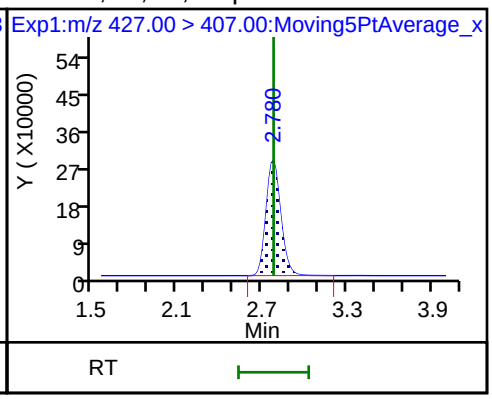


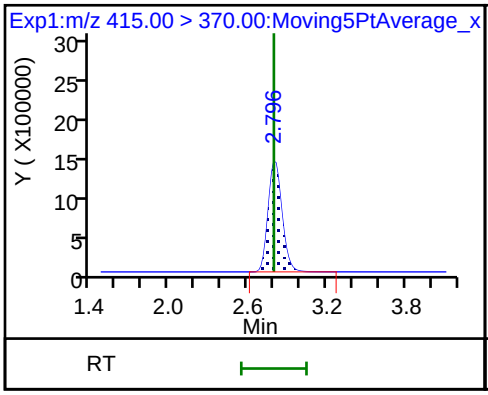
D 12 M2-6:2FTS



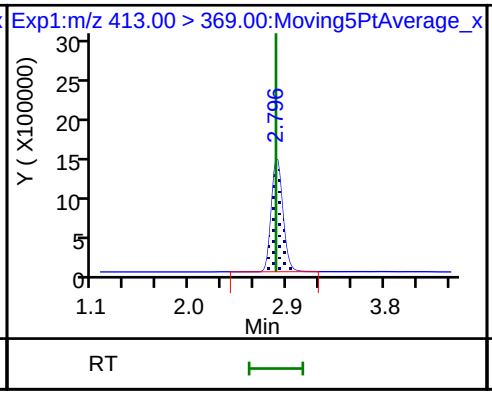
13 1H,1H,2H,2H-perfluorooctanesulfoni



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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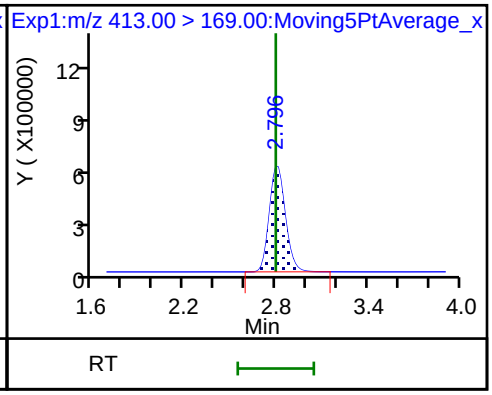
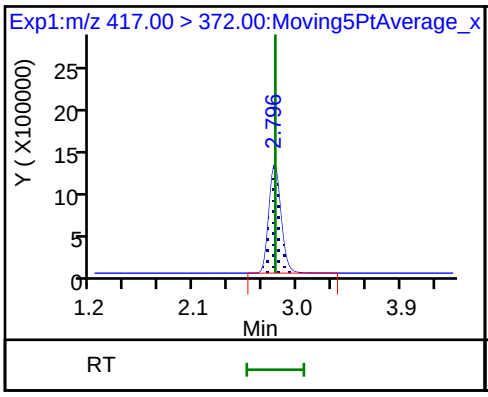
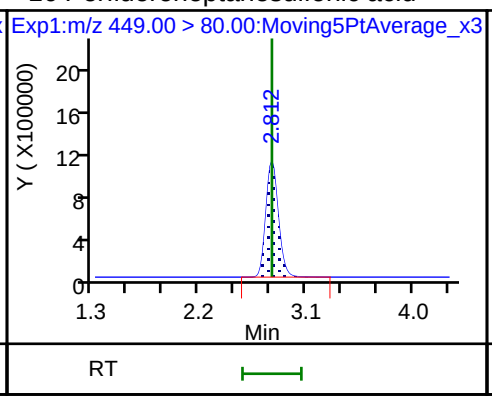


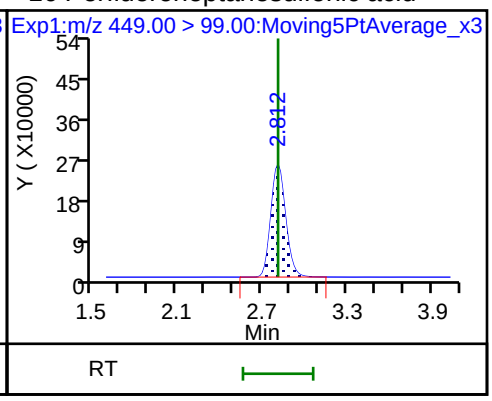
D 14 13C4 PFOA



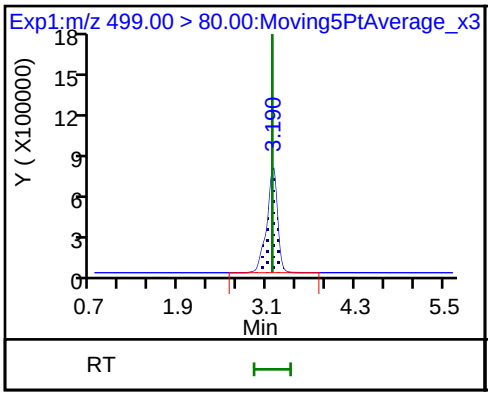
16 Perfluoroheptanesulfonic acid



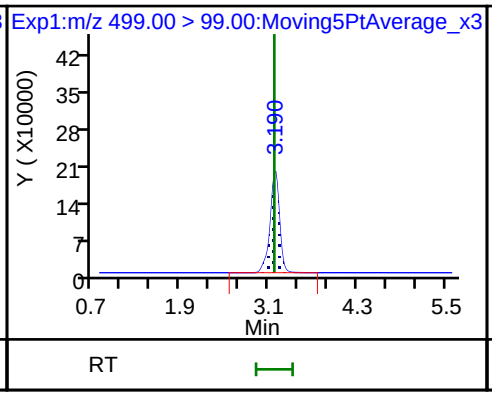
16 Perfluoroheptanesulfonic acid



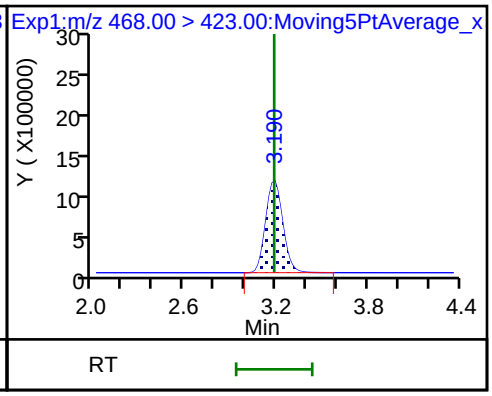
17 Perfluorooctane sulfonic acid



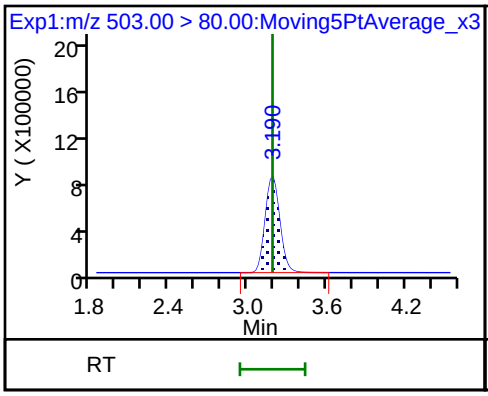
17 Perfluorooctane sulfonic acid



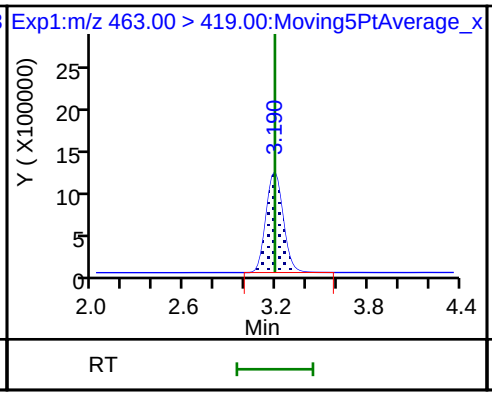
D 19 13C5 PFNA



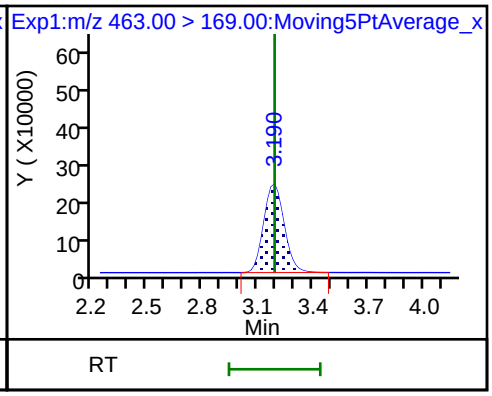
D 18 13C4 PFOS



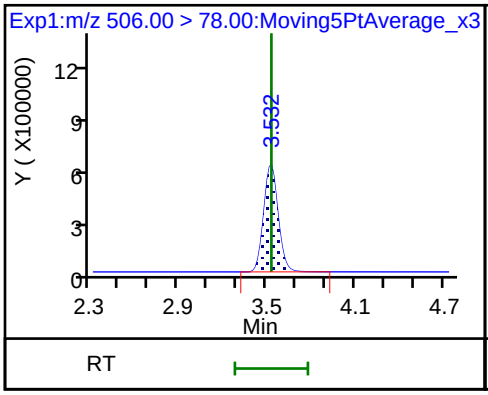
20 Perfluorononanoic acid



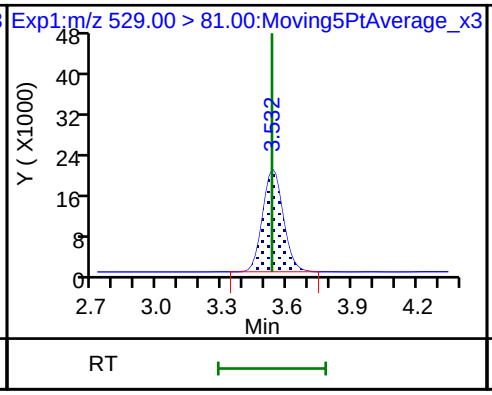
20 Perfluorononanoic acid



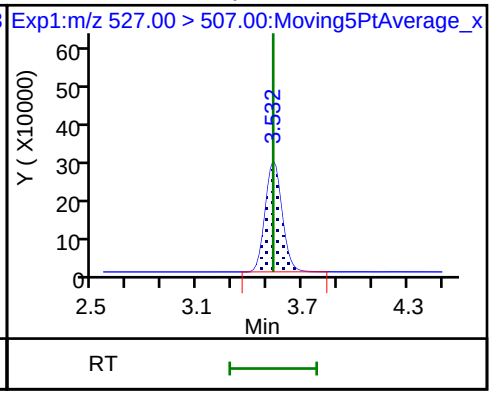
D 21 13C8 FOSA



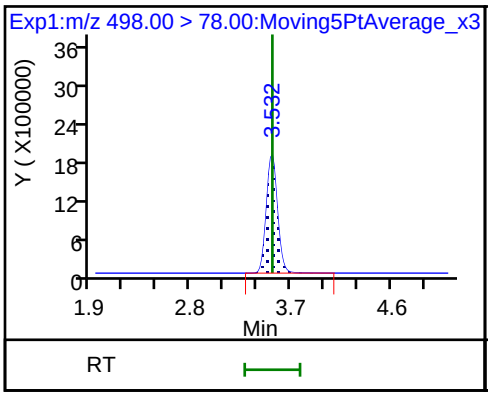
D 26 M2-8:2FTS



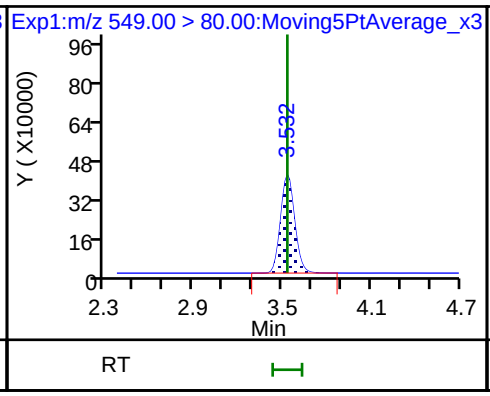
25 1H,1H,2H,2H-perfluorodecanesulfoni



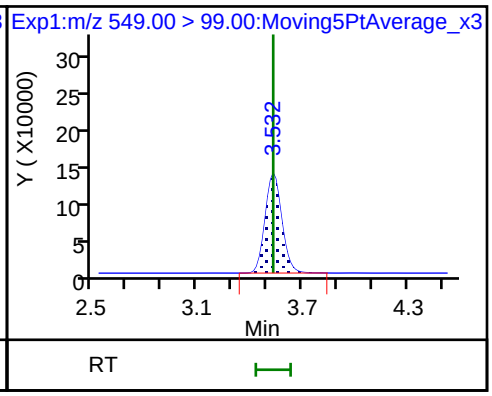
22 Perfluorooctane Sulfonamide



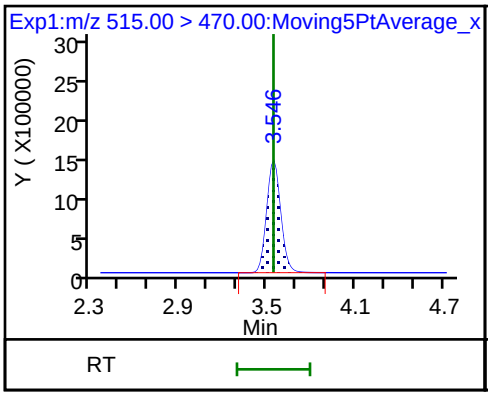
68 Perfluorononanesulfonic acid



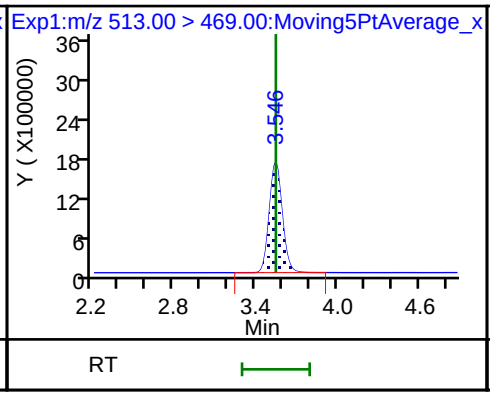
68 Perfluorononanesulfonic acid



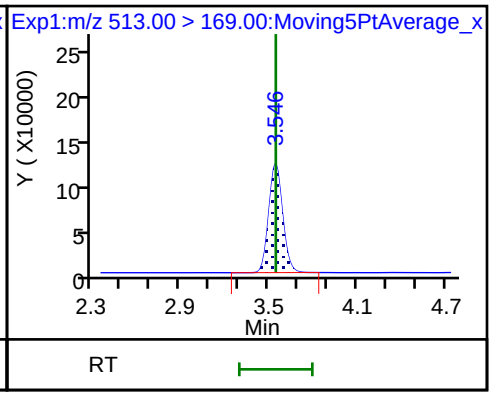
D 23 13C2 PFDA



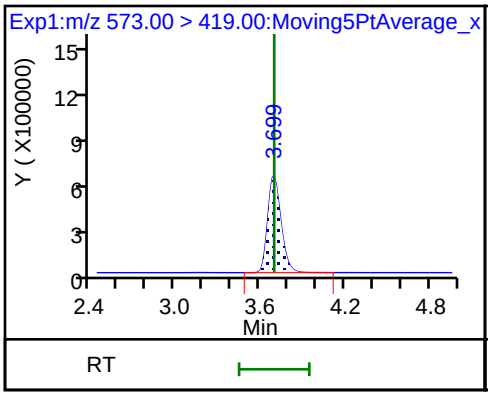
24 Perfluorodecanoic acid



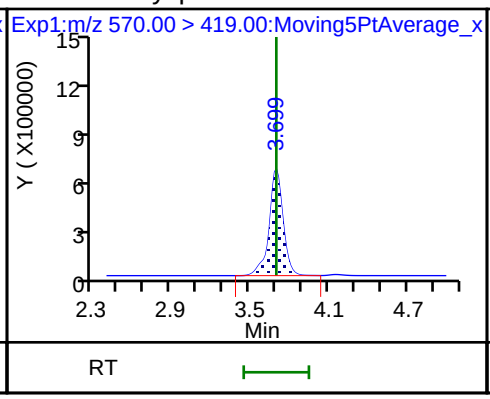
24 Perfluorodecanoic acid



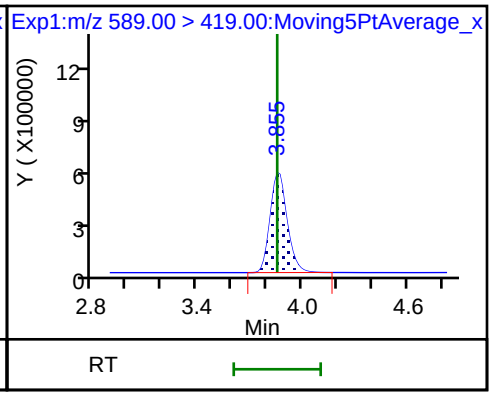
D 27 d3-NMeFOSAA



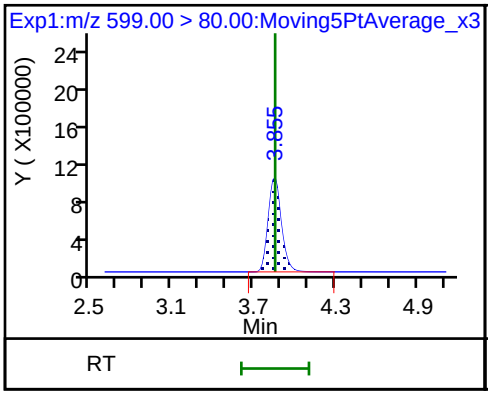
28 N-methyl perfluorooctane sulfonami



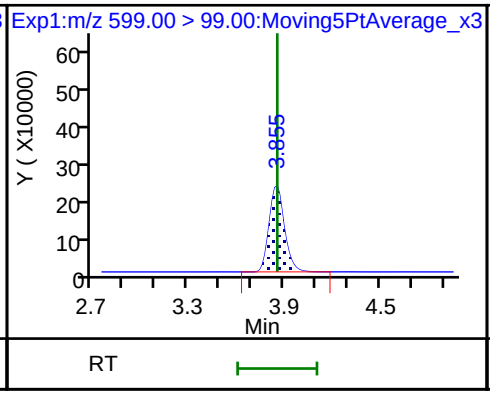
D 32 d5-NEtFOSAA



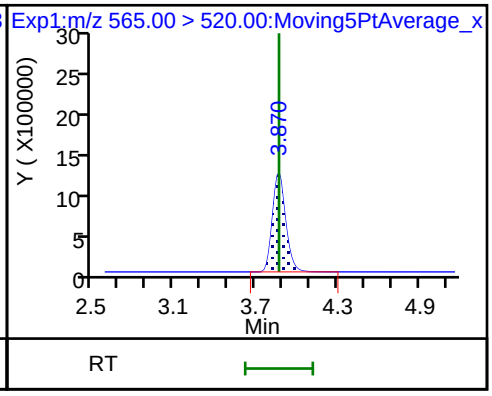
29 Perfluorodecane Sulfonic acid



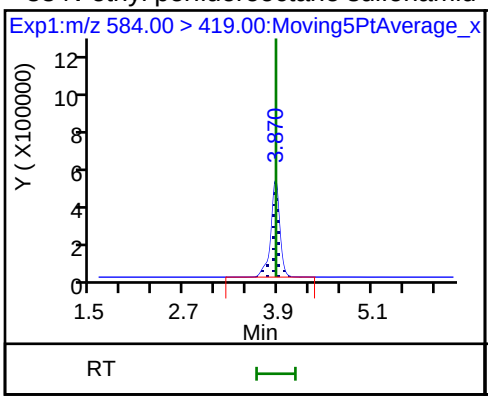
29 Perfluorodecane Sulfonic acid



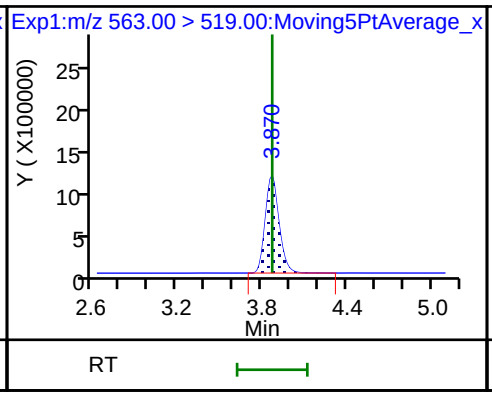
D 30 13C2 PFUnA



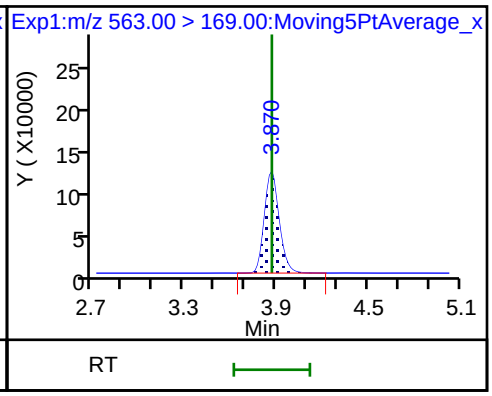
33 N-ethyl perfluorooctane sulfonamid



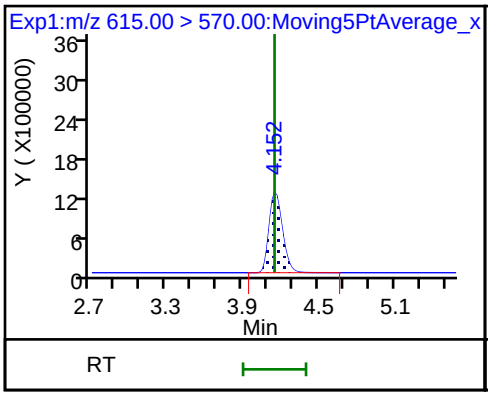
31 Perfluoroundecanoic acid



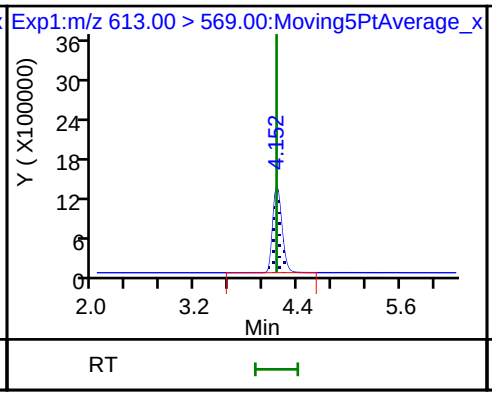
31 Perfluoroundecanoic acid



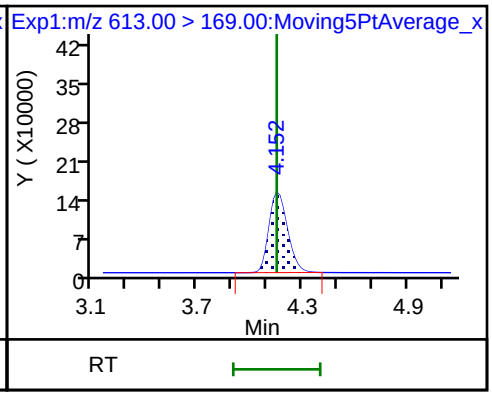
D 36 13C2 PFDoA



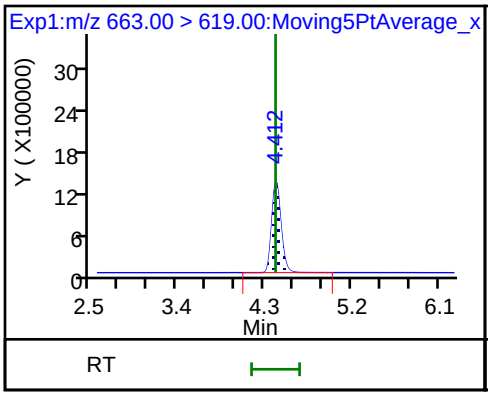
37 Perfluorododecanoic acid



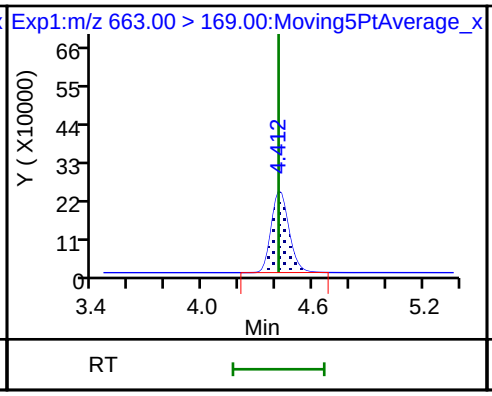
37 Perfluorododecanoic acid



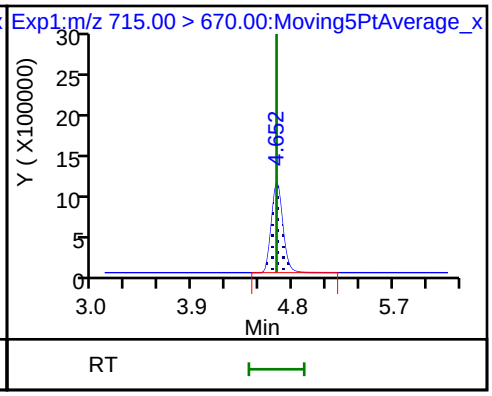
41 Perfluorotridecanoic acid



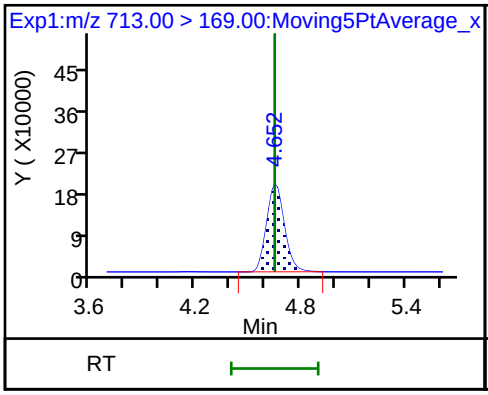
41 Perfluorotridecanoic acid



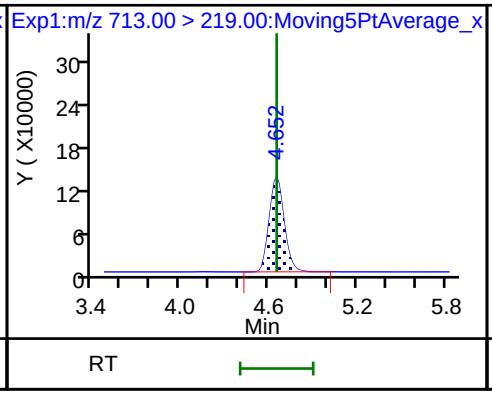
D 43 13C2-PFTeDA



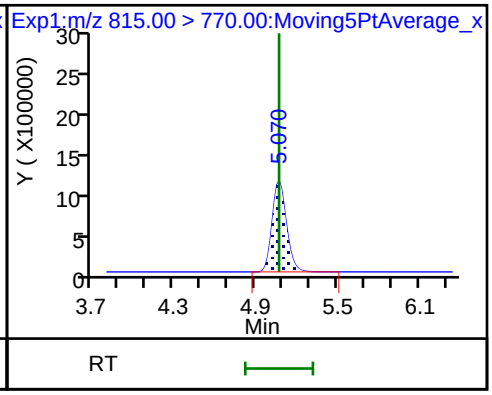
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-235512/12 Calibration Date: 07/22/2018 11:37

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	0.9609		1.00	1.00	0.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.082		0.997	1.00	-0.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	115.1		0.930	0.884	5.2	30.0
4:2 FTS	AveID	21.47	20.12		0.875	0.934	-6.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	0.9647		1.02	1.00	1.9	30.0
Perfluoropentanesulfonic acid	AveID	52.20	55.77		1.00	0.938	6.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.121		1.02	1.00	2.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.238		0.845	0.910	-7.1	30.0
6:2 FTS	AveID	2.182	2.033		0.883	0.948	-6.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.138		0.989	1.00	-1.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.082		0.966	0.952	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.093		0.901	0.928	-2.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.113		1.04	1.00	3.9	30.0
8:2 FTS	AveID	15.89	15.23		0.918	0.958	-4.2	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.3799		0.930	0.960	-3.2	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.507		1.15	1.00	14.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.286		1.10	1.00	9.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.047		1.01	1.00	1.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	0.9743		1.01	0.964	4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	0.9738		0.971	1.00	-2.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	0.9680		0.997	1.00	-0.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.077		0.998	1.00	-0.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	0.9428		0.942	1.00	-5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1736		1.01	1.00	0.8	30.0
13C4 PFBA	Ave	0.9738	0.9508		2.44	2.50	-2.4	30.0
13C5-PFPeA	Ave	0.8956	0.8847		2.47	2.50	-1.2	30.0
13C3-PFBS	Ave	0.0113	0.0115		2.36	2.33	1.4	30.0
13C2 PFHxA	Ave	0.9398	0.9128		2.43	2.50	-2.9	30.0
13C4-PFHpA	Ave	1.089	1.103		2.53	2.50	1.3	30.0
18O2 PFHxS	Ave	0.6628	0.7118		2.54	2.37	7.4	30.0
M2-6:2FTS	Ave	0.1018	0.1068		2.49	2.38	4.9	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-235512/12 Calibration Date: 07/22/2018 11:37

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.22LLA_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	1.009		2.57	2.50	3.0	30.0
13C4 PFOS	Ave	0.7102	0.7630		2.57	2.39	7.4	30.0
13C5 PFNA	Ave	0.9199	0.9291		2.52	2.50	1.0	30.0
13C8 FOSA	Ave	0.4011	0.3999		2.49	2.50	-0.3	30.0
M2-8:2FTS	Ave	0.0139	0.0135		2.33	2.40	-2.7	30.0
13C2 PFDA	Ave	0.9555	0.9543		2.50	2.50	-0.1	30.0
d3-NMeFOSAA	Ave	0.4497	0.4629		2.57	2.50	2.9	30.0
d5-NEtFOSAA	Ave	0.3602	0.3771		2.62	2.50	4.7	30.0
13C2 PFUnA	Ave	0.8725	0.8950		2.56	2.50	2.6	30.0
13C2 PFDoA	Ave	0.9367	0.9829		2.62	2.50	4.9	30.0
13C2-PFTeDA	Ave	0.8106	0.8469		2.61	2.50	4.5	30.0
13C2-PFHxDA	Ave	0.8343	0.8191		2.45	2.50	-1.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_048.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 22-Jul-2018 11:37:20 ALS Bottle#: 28 Worklist Smp#: 12
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:50:46 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:50:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.517	0.0	0.543	9243144	2.44		97.6	9147	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.517	0.0	1.000	3552506	1.00		100	381	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.791	0.001	0.641	8600633	2.47		98.8	9441	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.792	0.0	1.000	3721905	1.00		99.7	989	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.833	-0.007	0.653	103589	2.36		101	1096	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.834	1.834	0.0	1.005	4531655	0.9298		105	3176	
298.90 > 99.00	1.834	1.834	0.0	1.005	1534921		2.95(1.35-4.05)		2821	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.046	0.0	1.120	837069	0.8751		93.7	10454	
D 60 M2-4:2FTS										
329.00 > 81.00	2.046	2.054	-0.008	0.732	817690	NC			1305	
D 7 13C2 PFHxA										
315.00 > 270.00	2.087	2.085	0.002	0.747	8874201	2.43		97.1	14123	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.087	2.087	0.0	1.000	3424346	1.02		102	1545	
313.00 > 119.00	2.087	2.087	0.0	1.000	249561		13.72(6.96-20.87)		1090	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.108	2.108	0.0	1.155	2330599	1.00		107	5429	
349.00 > 99.00	2.108	2.108	0.0	1.155	1004139		2.32(1.15-3.45)		4235	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.191	2.189	0.002	0.784	843840	NC			5488	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.191	2.191	0.0	1.000	705046	NC			431	
D 9 13C4-PFHpA										
367.00 > 322.00	2.436	2.433	0.003	0.871	10723804	2.53		101	16277	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.436	2.436	0.0	1.000	4807206	1.02		102	1361	
363.00 > 169.00	2.436	2.436	0.0	1.000	1072377		4.48(2.17-6.52)		3357	
D 11 18O2 PFHxS										
403.00 > 84.00	2.448	2.446	0.002	0.876	6545699	2.54		107	44686	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.448	2.448	0.0	1.000	3117239	0.8454		92.9	6056	
399.00 > 99.00	2.448	2.448	0.0	1.000	846794		3.68(1.90-5.70)		2806	
65 ADONA										
377.00 > 251.00	2.474	2.474	0.0	0.776	7881119	NC			17586	
377.00 > 85.00	2.474	2.474	0.0	0.776	3562401		2.21(1.05-3.16)		2214	
D 12 M2-6:2FTS										
429.00 > 81.00	2.780	2.776	0.004	0.994	986377	2.49		105	4408	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.780	2.780	0.0	1.000	800487	0.8834		93.2	11000	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		9721611	2.50			20299	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	4469397	0.9893		98.8	644	
413.00 > 169.00	2.796	2.796	0.0	1.000	1596542		2.80(1.36-4.08)		3606	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	1.000	9805312	2.57		103	17560	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.812	2.812	0.0	0.881	3055603	0.9659		101	4655	
449.00 > 99.00	2.812	2.812	0.0	0.881	726612		4.21(1.84-5.53)		3381	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.171	0.0	0.994	3010400	0.9013		97.1	5092	
499.00 > 99.00	3.190	3.171	0.019	1.000	676671		4.45(2.04-6.12)		6523	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.141	9032396	2.52		101	23722	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.185	0.005	1.141	7090995	2.57		107	11746	
20 Perfluorononanoic acid										
463.00 > 419.00	3.190	3.190	0.0	1.000	4020197	1.04		104	1162	
463.00 > 169.00	3.190	3.190	0.0	1.000	740723		5.43(2.68-8.03)		2054	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.386	3.386	0.0	1.061	3654018	NC			11651	
D 21 13C8 FOSA										
506.00 > 78.00	3.532	3.529	0.003	1.263	3887868	2.49		99.7	10343	
D 26 M2-8:2FTS										
529.00 > 81.00	3.532	3.529	0.003	1.263	126030	2.33		97.3	1177	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.532	3.532	0.0	1.000	767542	0.9177		95.8	2902	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.532	3.532	0.0	1.000	5454509	1.15		115	7677	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.532	3.532	0.0	1.107	1081916	0.9297		96.8	2912	
549.00 > 99.00	3.532	3.532	0.0	1.107	361953		2.99(1.42-4.26)		1925	
D 23 13C2 PFDA										
515.00 > 470.00	3.546	3.544	0.002	1.268	9277704	2.50		99.9	33630	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.546	3.546	0.0	1.000	4771388	1.10		110	1215	
513.00 > 169.00	3.546	3.546	0.0	1.000	311818		15.30(7.12-21.35)		1075	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.685	3.698	-0.013	1.318	4500334	2.57		103	11852	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.699	3.699	0.0	1.004	1884183	1.01		101	1178	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.855	3.855	0.0	1.379	3666168	2.62		105	5935	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.855	3.855	0.0	1.209	2786659	1.01		104	3934	
599.00 > 99.00	3.855	3.855	0.0	1.209	588917		4.73(2.14-6.43)		3866	
D 30 13C2 PFUnA										
565.00 > 520.00	3.870	3.869	0.001	1.384	8701145	2.56		103	22588	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.870	3.870	0.0	1.004	1428025	0.9705		97.1	3695	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.870	3.870	0.0	1.000	3369160	1.00		99.7	976	
563.00 > 169.00	3.870	3.870	0.0	1.000	305198		11.04(5.24-15.72)		1645	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.024	4.024	0.0	1.261	4663624	NC			12340	
D 36 13C2 PFDoA										
615.00 > 570.00	4.152	4.151	0.001	1.485	9555049	2.62		105	34391	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.152	4.152	0.0	1.000	4117057	1.00		99.8	1240	
613.00 > 169.00	4.152	4.152	0.0	1.000	424813		9.69(4.68-14.05)		1195	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.412	4.412	0.0	1.063	3603302	0.9422		94.2	1298	
663.00 > 169.00	4.412	4.412	0.0	1.063	593413		6.07(3.09-9.27)		1835	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.652	4.651	0.001	1.664	8233608	2.61		104	18223	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.652	4.652	0.0	1.000	571846	1.01		101	1719	
713.00 > 219.00	4.652	4.652	0.0	1.000	375493		1.52(0.70-2.09)		1160	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.070	5.070	0.0	1.813	7962956	2.45		98.2	9532	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.070	5.070	0.0	1.000	3368702	NC			542	
813.00 > 169.00	5.070	5.070	0.0	1.000	569156		5.92(2.77-8.32)		1042	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.427	5.427	0.0	1.070	2566903	NC			530	
913.00 > 169.00	5.413	5.427	-0.014	1.068	471533		5.44(2.55-7.64)		1977	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 25-Jul-2018 09:50:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_048.d

Injection Date: 22-Jul-2018 11:37:20 Instrument ID: A9

Lims ID: CCV L4

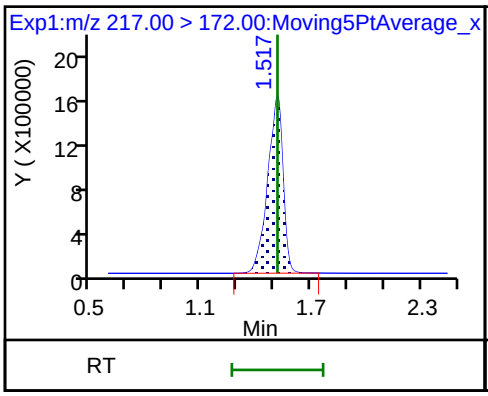
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 28 Worklist Smp#: 12

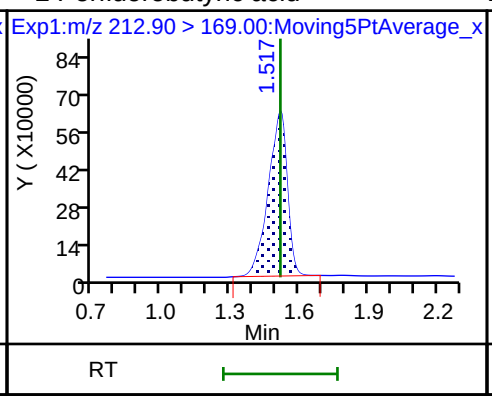
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

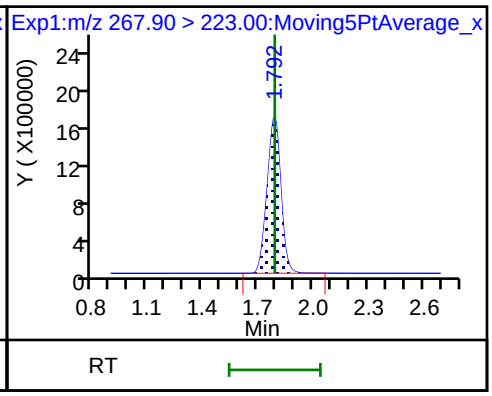
D 1 13C4 PFBA



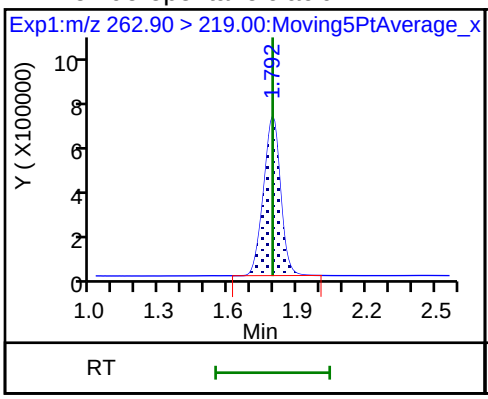
2 Perfluorobutyric acid



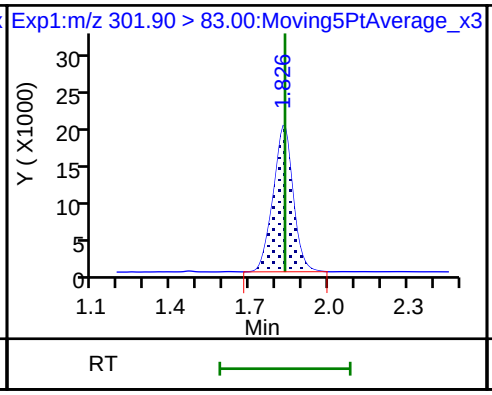
D 3 13C5-PFPeA



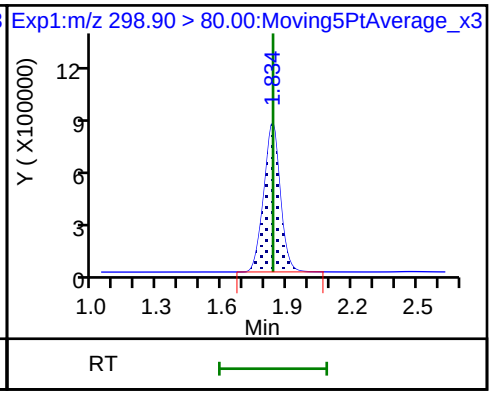
4 Perfluoropentanoic acid



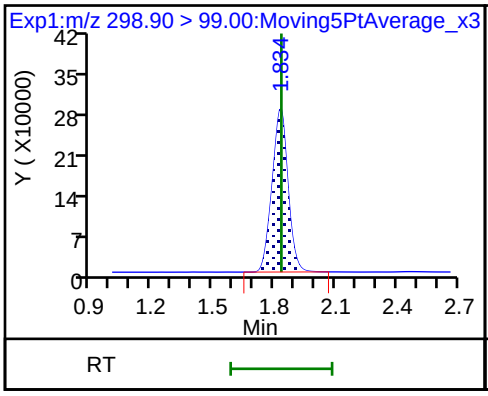
D 47 13C3-PFBS



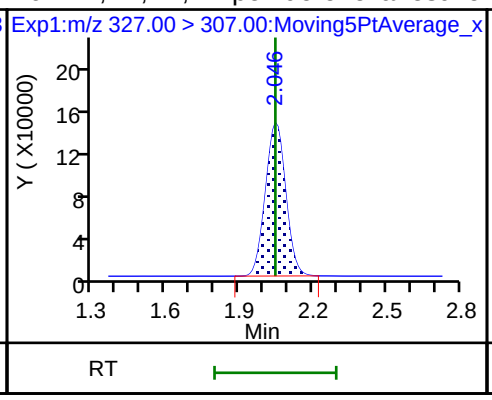
5 Perfluorobutanesulfonic acid



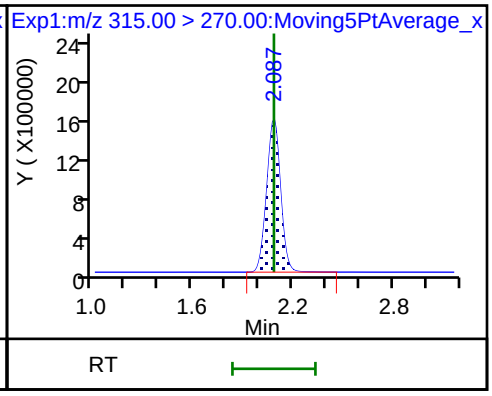
5 Perfluorobutanesulfonic acid



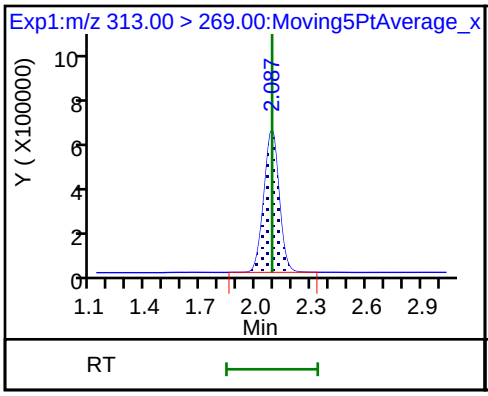
61 1H,1H,2H,2H-perfluorohexanesulfon



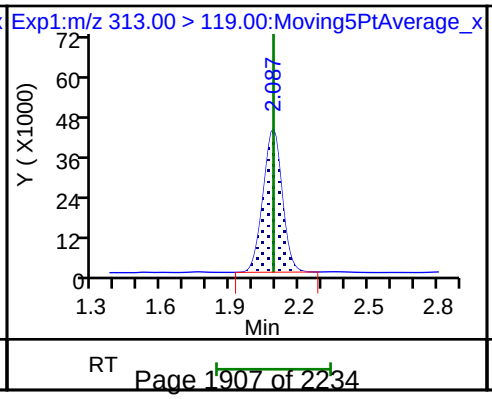
D 7 13C2 PFHxA



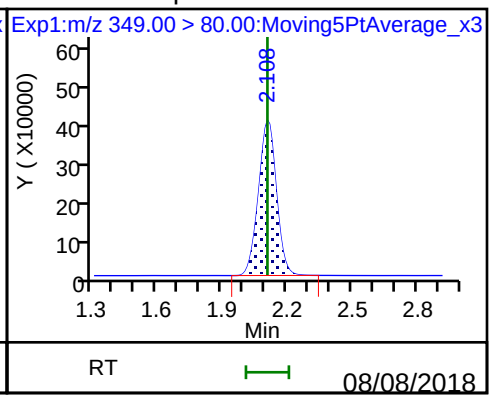
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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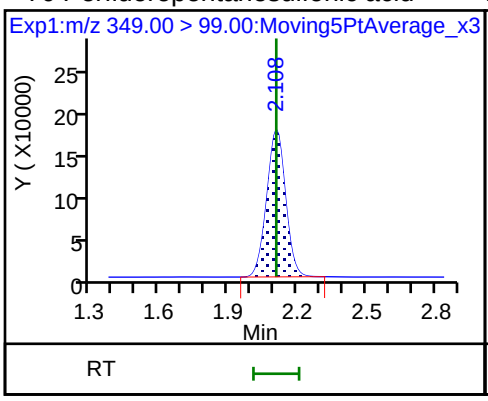
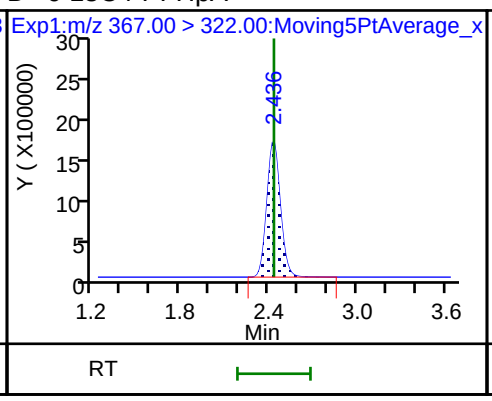
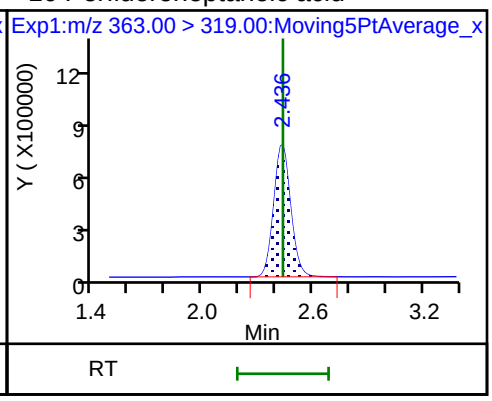


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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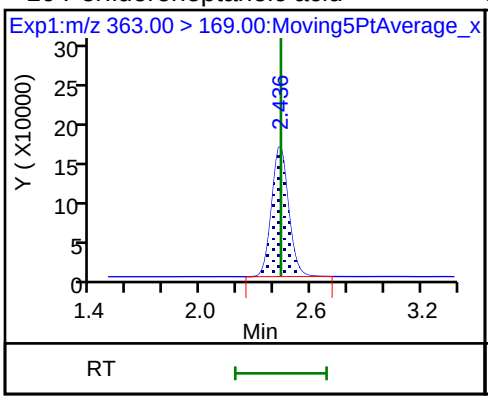
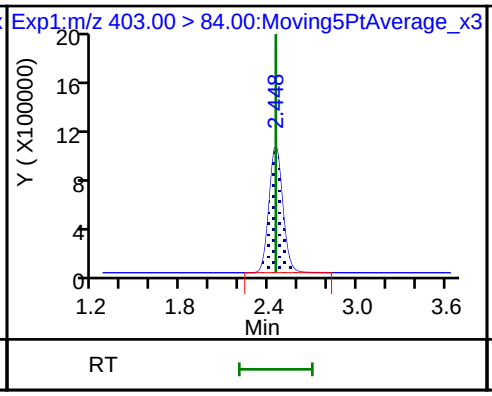
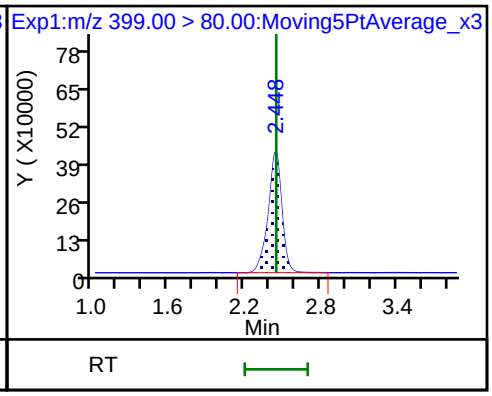


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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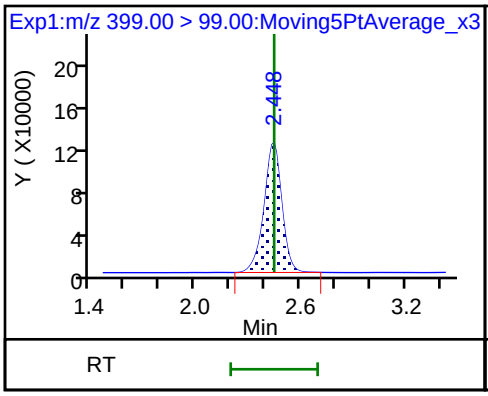
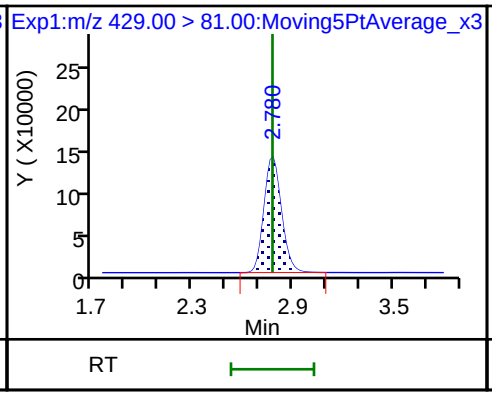
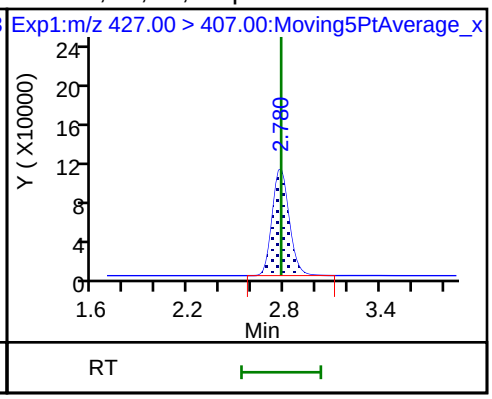


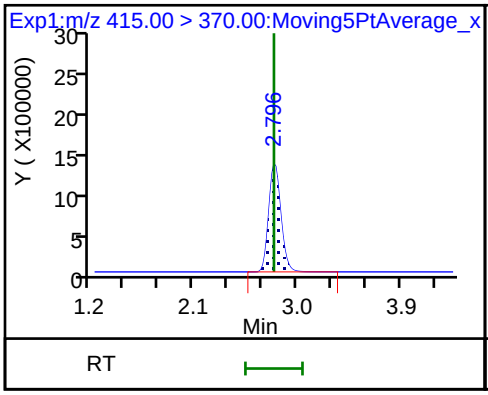
D 12 M2-6:2FTS



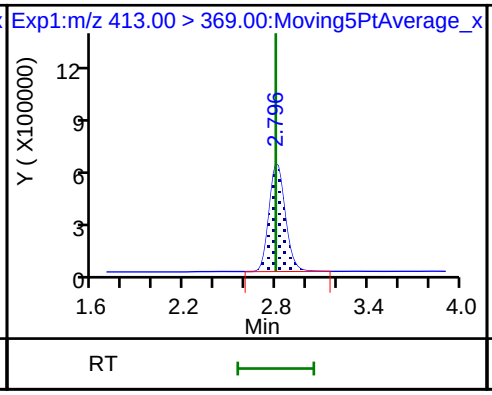
13 1H,1H,2H,2H-perfluorooctanesulfoni



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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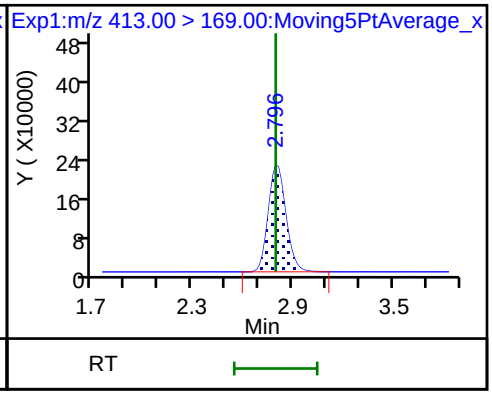
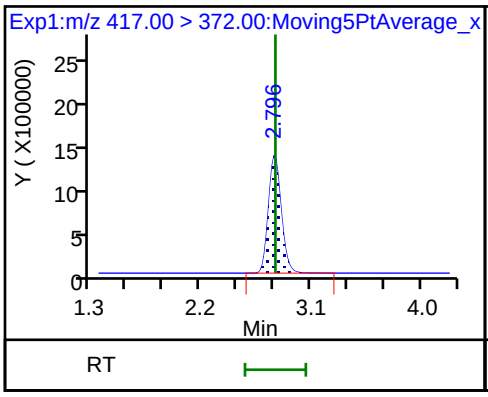
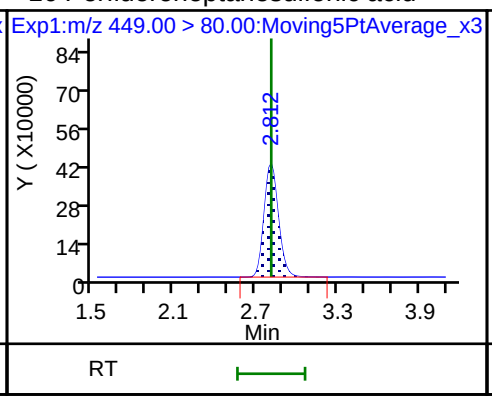


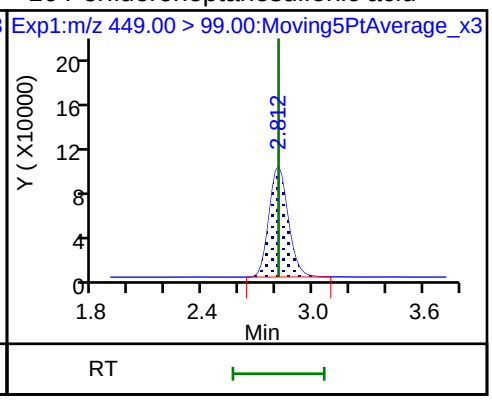
D 14 13C4 PFOA



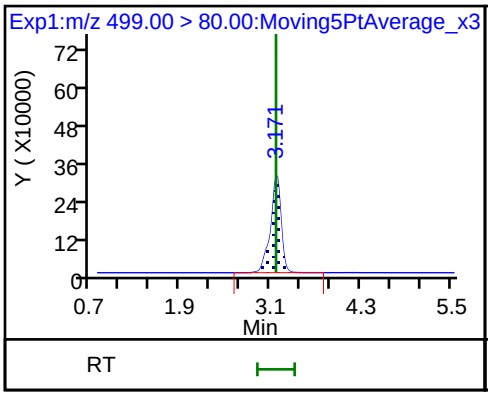
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



17 Perfluorooctane sulfonic acid



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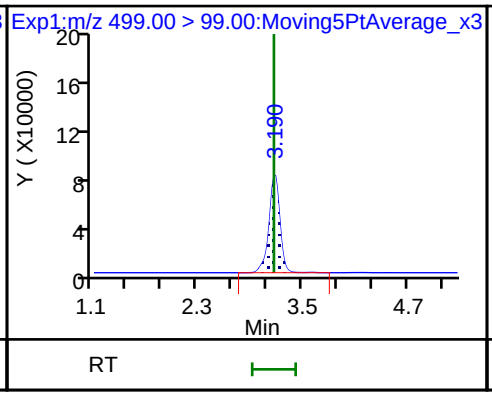
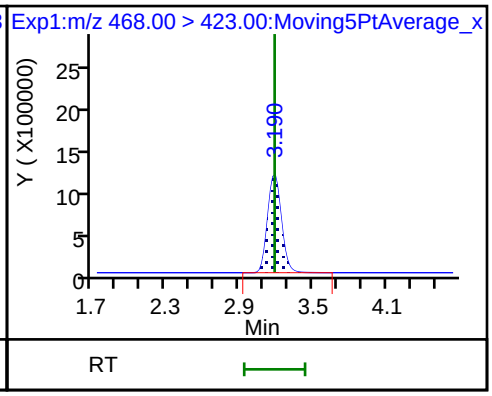


D 19 13C5 PFNA



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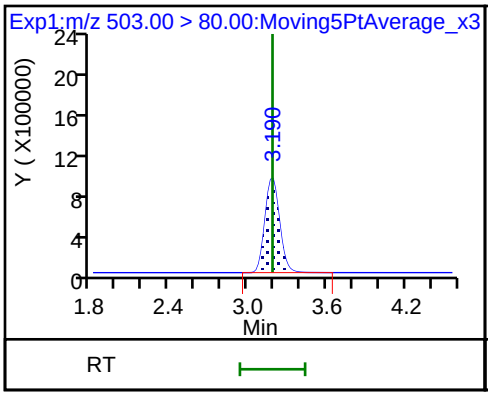
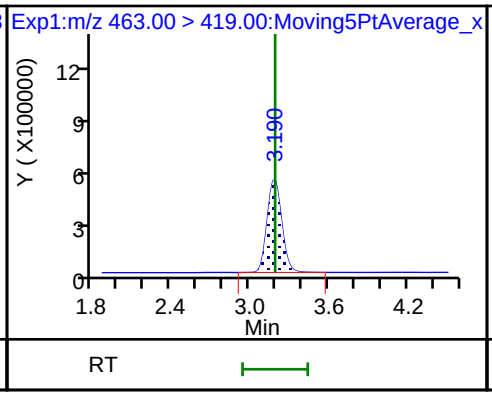
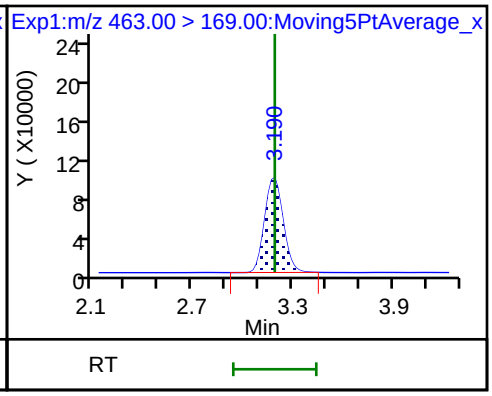


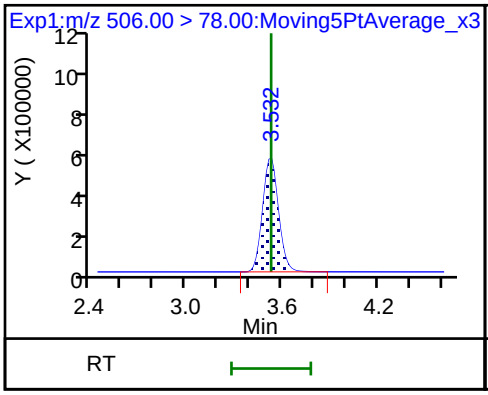
20 Perfluorononanoic acid



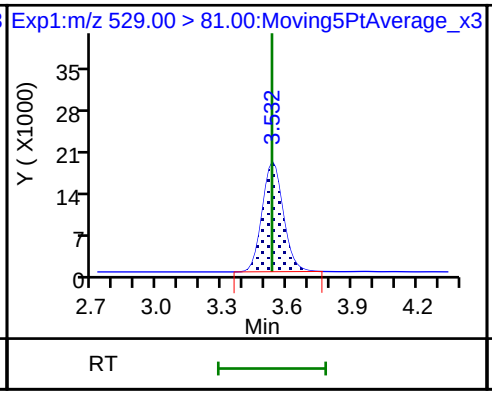
20 Perfluorononanoic acid



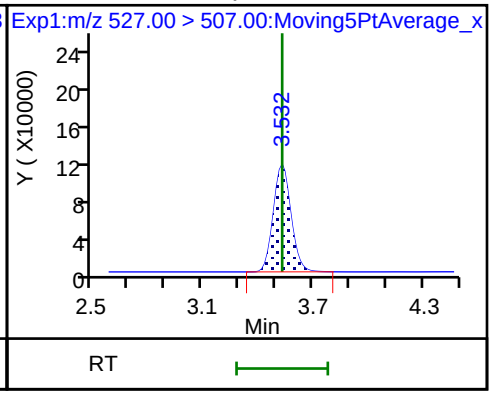
D 21 13C8 FOSA



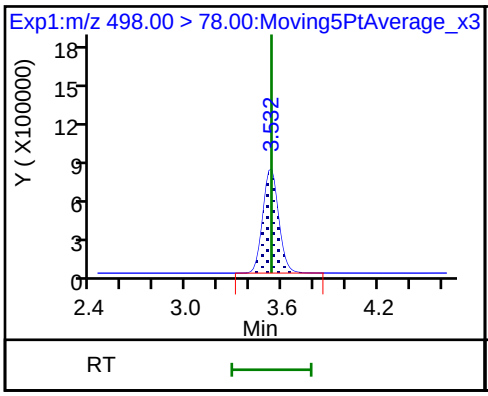
D 26 M2-8:2FTS



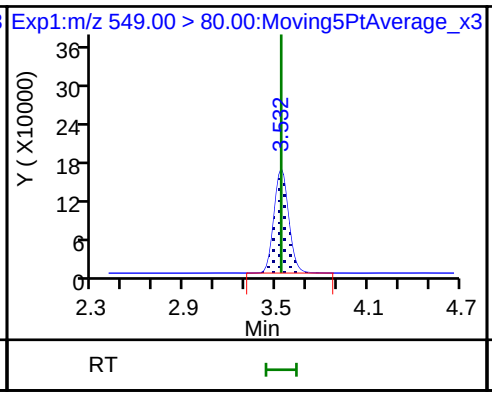
25 1H,1H,2H,2H-perfluorodecanesulfoni



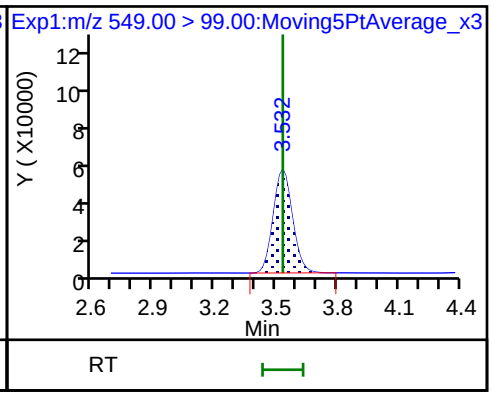
22 Perfluorooctane Sulfonamide



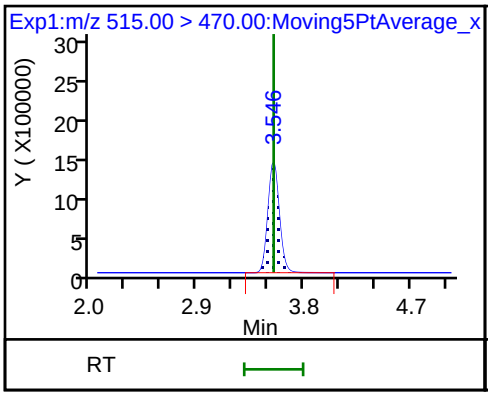
68 Perfluorononanesulfonic acid



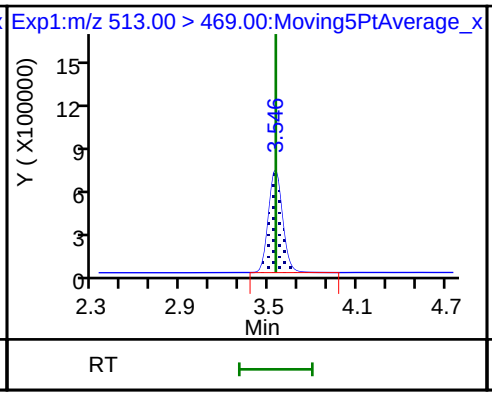
68 Perfluorononanesulfonic acid



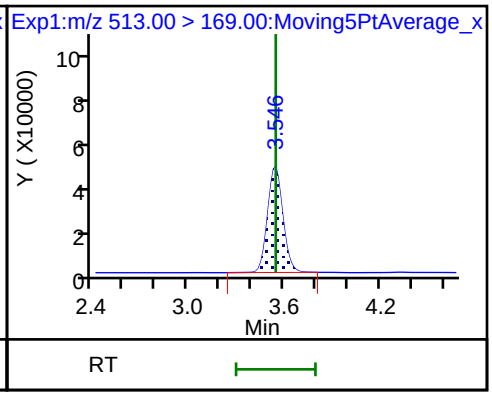
D 23 13C2 PFDA



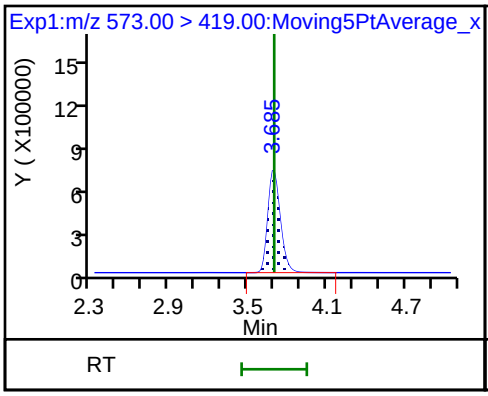
24 Perfluorodecanoic acid



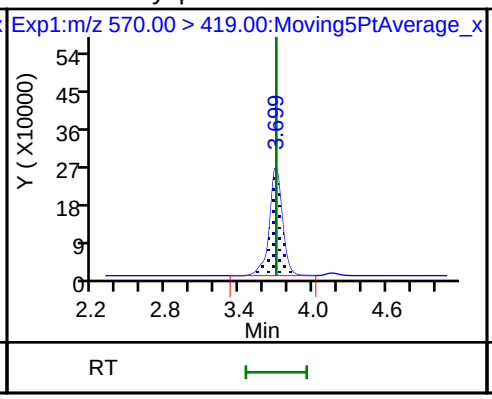
24 Perfluorodecanoic acid



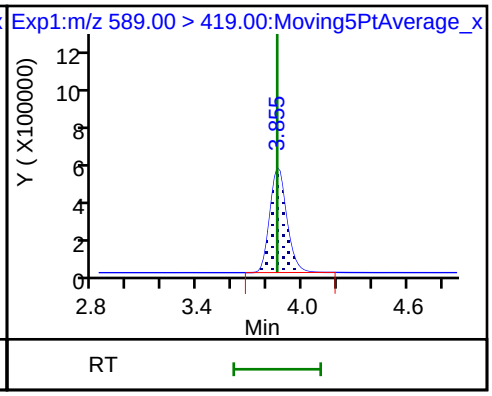
D 27 d3-NMeFOSAA



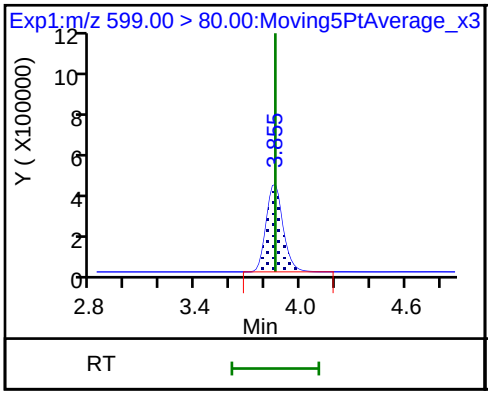
28 N-methyl perfluorooctane sulfonami



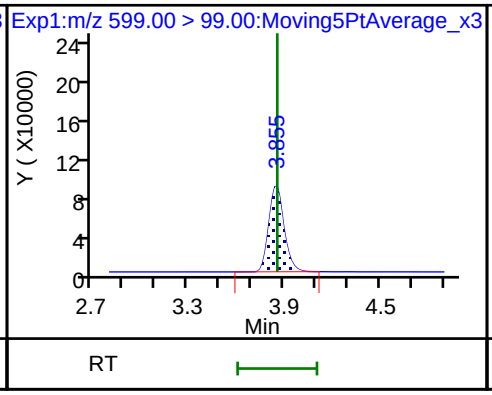
D 32 d5-NEtFOSAA



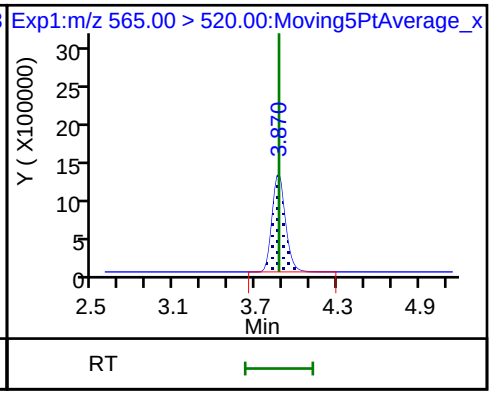
29 Perfluorodecane Sulfonic acid



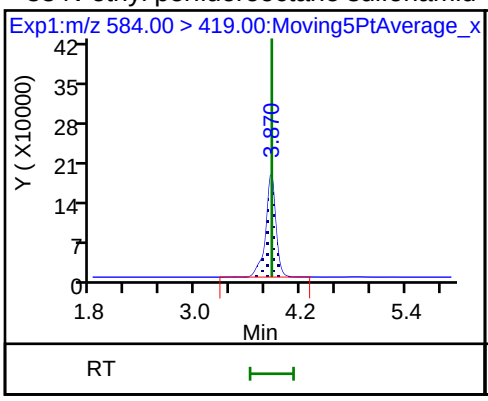
29 Perfluorodecane Sulfonic acid



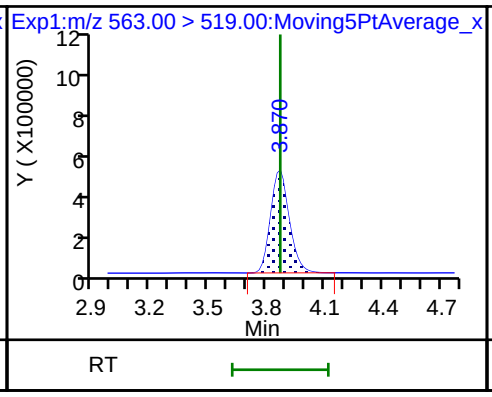
D 30 13C2 PFUnA



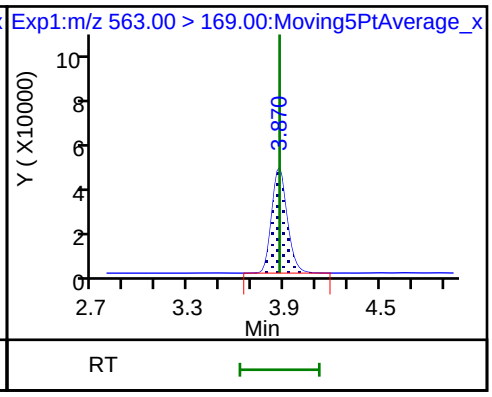
33 N-ethyl perfluorooctane sulfonamid



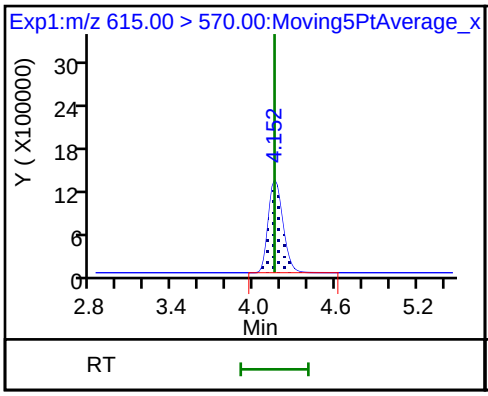
31 Perfluoroundecanoic acid



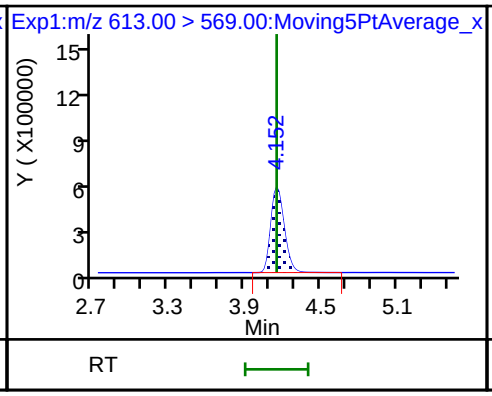
31 Perfluoroundecanoic acid



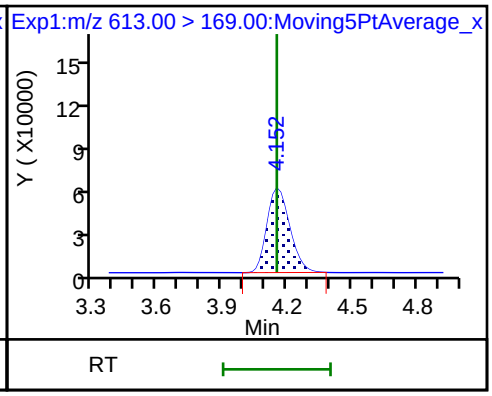
D 36 13C2 PFDoA



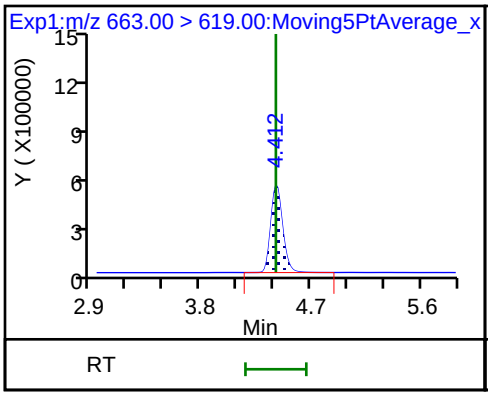
37 Perfluorododecanoic acid



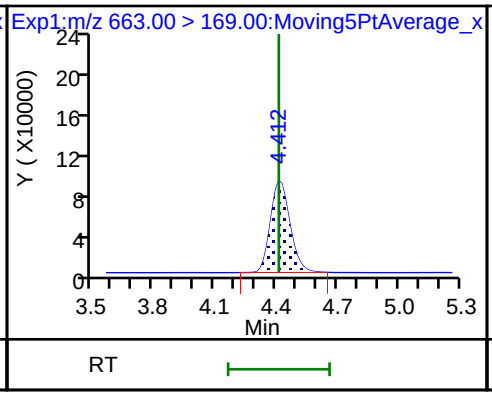
37 Perfluorododecanoic acid



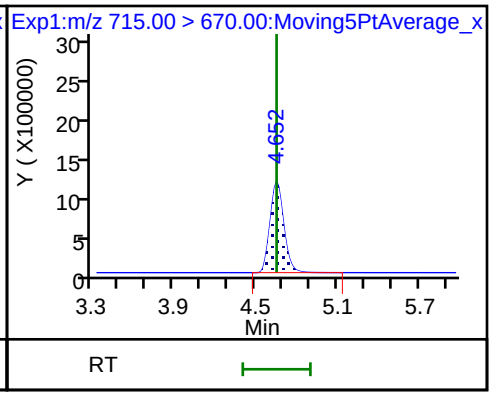
41 Perfluorotridecanoic acid



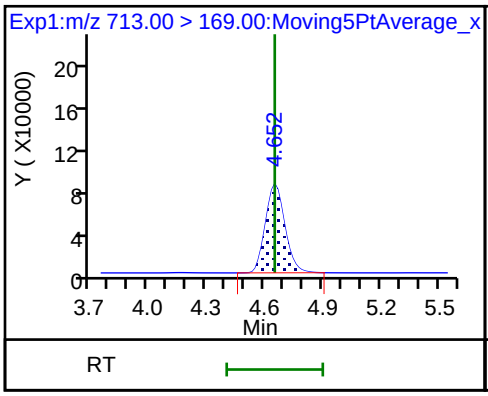
41 Perfluorotridecanoic acid



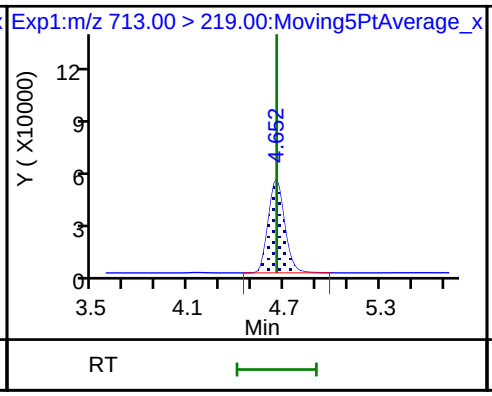
D 43 13C2-PFTeDA



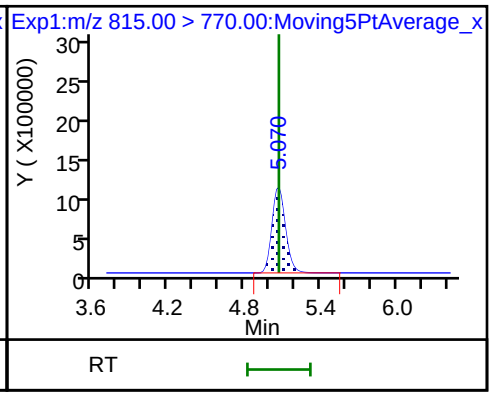
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-236275/2 Calibration Date: 07/26/2018 09:51

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	1.032		0.0538	0.0500	7.7	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.175		0.0541	0.0500	8.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	112.4		0.0454	0.0442	2.7	30.0
4:2 FTS	AveID	21.47	19.41		0.400	0.0467	-9.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	1.126		0.0595	0.0500	19.0	30.0
Perfluoropentanesulfonic acid	AveID	52.20	49.89		0.0448	0.0469	-4.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.241		0.0564	0.0500	12.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.343		0.0459	0.0455	0.8	30.0
6:2 FTS	AveID	2.182	2.147		0.400	0.0474	-1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.207		0.0539	0.0476	13.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.262		0.0549	0.0501	9.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.094		0.0451	0.0464	-2.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.117		0.0522	0.0500	4.3	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.231		0.0528	0.0500	5.6	30.0
8:2 FTS	AveID	15.89	16.44		0.400	0.0479	3.4	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.4214		0.0516	0.0480	7.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.297		0.0553	0.0500	10.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.019		0.400	0.0500	-1.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	1.019		0.0525	0.0482	9.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	1.047		0.0522	0.0500	4.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	1.158		0.0596	0.0500	19.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.219		0.0565	0.0500	13.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	1.000		0.0500	0.0500	-0.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1640		0.0476	0.0500	-4.7	30.0
13C4 PFBA	Ave	0.9738	0.8955		2.30	2.50	-8.0	30.0
13C5-PFPeA	Ave	0.8956	0.8690		2.43	2.50	-3.0	30.0
13C3-PFBS	Ave	0.0113	0.0108		2.22	2.33	-4.4	30.0
13C2 PFHxA	Ave	0.9398	0.8664		2.30	2.50	-7.8	30.0
13C4-PFHpA	Ave	1.089	1.033		2.37	2.50	-5.1	30.0
18O2 PFHxS	Ave	0.6628	0.6367		2.27	2.37	-3.9	30.0
M2-6:2FTS	Ave	0.1018	0.1100		2.56	2.38	8.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCVL 320-236275/2 Calibration Date: 07/26/2018 09:51

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.9717		2.48	2.50	-0.8	30.0
13C4 PFOS	Ave	0.7102	0.6859		2.31	2.39	-3.4	30.0
13C5 PFNA	Ave	0.9199	0.9154		2.49	2.50	-0.5	30.0
13C8 FOSA	Ave	0.4011	0.3913		2.44	2.50	-2.4	30.0
M2-8:2FTS	Ave	0.0139	0.0150		2.58	2.40	7.7	30.0
13C2 PFDA	Ave	0.9555	1.003		2.62	2.50	5.0	30.0
d3-NMeFOSAA	Ave	0.4497	0.4294		2.39	2.50	-4.5	30.0
13C2 PFUnA	Ave	0.8725	0.8630		2.47	2.50	-1.1	30.0
d5-NEtFOSAA	Ave	0.3602	0.3844		2.67	2.50	6.7	30.0
13C2 PFDoA	Ave	0.9367	0.9288		2.48	2.50	-0.8	30.0
13C2-PFTeDA	Ave	0.8106	0.7960		2.46	2.50	-1.8	30.0
13C2-PFHxDA	Ave	0.8343	0.7701		2.31	2.50	-7.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\2018.07.26LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 26-Jul-2018 09:51:48 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 26-Jul-2018 14:16:04 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: barnettj Date: 26-Jul-2018 14:14:30

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.538	1.537	0.001	0.541	7417128	2.30		92.0	10102	
2 Perfluorobutyric acid										
212.90 > 169.00	1.538	1.538	0.0	1.000	153043	0.0538		108	19.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.817	1.816	0.001	0.639	7198029	2.43		97.0	13094	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.817	1.817	0.0	1.000	169167	0.0541		108	46.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.860	1.858	0.002	0.654	83207	2.22		95.6	1035	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.860	1.860	0.0	1.000	177783	0.0454		103	209	
298.90 > 99.00	1.860	1.860	0.0	1.000	67349		2.64(1.35-4.05)		201	
D 60 M2-4:2FTS										
329.00 > 81.00	2.077	2.074	0.003	0.730	653055	NC			2100	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.077	2.077	0.0	1.116	32432	0.0422		90.4	628	
D 7 13C2 PFHxA										
315.00 > 270.00	2.118	2.116	0.002	0.745	7176182	2.30		92.2	14498	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.118	2.118	0.0	1.000	161572	0.0595		119	77.9	
313.00 > 119.00	2.118	2.118	0.0	1.000	9790		16.50(6.96-20.87)		48.2	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.149	2.149	0.0	1.155	83739	0.0448		95.6	364	
349.00 > 99.00	2.149	2.149	0.0	1.155	42448		1.97(1.15-3.45)		258	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.222	2.220	0.002	0.782	568056	NC			3377	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.222	2.222	0.0	1.000	28209	NC			18.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.474	2.459	0.015	0.870	8560534	2.37		94.9	28420	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.474	2.474	0.0	1.000	212415	0.0564		113	41.5	
363.00 > 169.00	2.474	2.474	0.0	1.000	50042		4.24(2.17-6.52)		59.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.487	2.485	0.002	0.875	4989149	2.27		96.1	25344	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.487	2.487	0.0	1.000	128878	0.0459		101	320	
399.00 > 99.00	2.474	2.487	-0.013	0.995	33378		3.86(1.90-5.70)		152	
65 ADONA										
377.00 > 251.00	2.514	2.514	0.0	0.780	339501	NC			1099	
377.00 > 85.00	2.514	2.514	0.0	0.780	136078		2.49(1.05-3.16)		215	
D 12 M2-6:2FTS										
429.00 > 81.00	2.811	2.808	0.003	0.989	865494	2.56		108	3676	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.811	2.811	0.0	1.000	37088	0.0466		98.4	522	
D 14 13C4 PFOA										
417.00 > 372.00	2.843	2.840	0.003	1.000	8049068	2.48		99.2	16063	
* 62 13C2-PFOA										
415.00 > 370.00	2.843	2.843	0.0		8283170	2.50			27281	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.843	2.843	0.0	1.000	203439	0.0549		110	32.9	
413.00 > 169.00	2.843	2.843	0.0	1.000	78569		2.59(1.36-4.08)		250	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.843	2.843	0.0	0.882	130592	0.0539		113	301	
449.00 > 99.00	2.843	2.843	0.0	0.882	27062		4.83(1.84-5.53)		289	
D 18 13C4 PFOS										
503.00 > 80.00	3.224	3.221	0.003	1.134	5431220	2.31		96.6	7912	
D 19 13C5 PFNA										
468.00 > 423.00	3.224	3.221	0.003	1.134	7582381	2.49		99.5	22288	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.207	3.207	0.0	0.995	115382	0.0451		97.2	303	
499.00 > 99.00	3.224	3.207	0.017	1.000	33098		3.49(2.04-6.12)		491	
20 Perfluorononanoic acid										
463.00 > 419.00	3.224	3.224	0.0	1.000	169414	0.0522		104	64.8	
463.00 > 169.00	3.224	3.224	0.0	1.000	30738		5.51(2.68-8.03)		129	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.419	3.419	0.0	1.060	146489	NC			543	
D 21 13C8 FOSA										
506.00 > 78.00	3.546	3.543	0.003	1.247	3241084	2.44		97.6	10241	
D 26 M2-8:2FTS										
529.00 > 81.00	3.560	3.558	0.002	1.252	118875	2.58		108	2340	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.546	3.546	0.0	1.000	209452	0.0528		106	1011	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.574	3.572	0.002	1.257	8308114	2.62		105	20732	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.560	3.560	0.0	1.000	39085	0.0495		103	250	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.560	3.560	0.0	1.104	45965	0.0516		107	236	
549.00 > 99.00	3.560	3.560	0.0	1.104	14531		3.16(1.42-4.26)		112	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.574	3.574	0.0	1.000	215516	0.0553		111	77.5	
513.00 > 169.00	3.574	3.574	0.0	1.000	13798		15.62(7.12-21.35)		82.7	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.730	3.714	0.016	1.312	3556462	2.39		95.5	8829	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.730	3.730	0.0	1.000	72483	0.0492		98.5	52.5	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.897	3.883	0.014	1.371	3184271	2.67		107	4452	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.883	3.883	0.0	1.204	111564	0.0525		109	328	
599.00 > 99.00	3.883	3.883	0.0	1.204	21802		5.12(2.14-6.43)		366	
D 30 13C2 PFUnA										
565.00 > 520.00	3.897	3.896	0.001	1.371	7148016	2.47		98.9	15148	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.897	3.897	0.0	1.000	66698	0.0522		104	236	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.897	3.897	0.0	1.000	165518	0.0596		119	58.6	
563.00 > 169.00	3.897	3.897	0.0	1.000	16017		10.33(5.24-15.72)		99.0	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.055	4.055	0.0	1.258	187349	NC			1138	
D 36 13C2 PFDoA										
615.00 > 570.00	4.187	4.186	0.001	1.473	7693281	2.48		99.2	20551	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.187	4.187	0.0	1.000	187633	0.0565		113	58.3	
613.00 > 169.00	4.187	4.187	0.0	1.000	16641		11.28(4.68-14.05)		93.1	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.458	4.458	0.0	1.065	153909	0.0500		100.0	48.7	
663.00 > 169.00	4.458	4.458	0.0	1.065	27488		5.60(3.09-9.27)		113	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.698	4.683	0.015	1.652	6593270	2.46		98.2	12728	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.698	4.698	0.0	1.000	21631	0.0476		95.3	82.0	
713.00 > 219.00	4.683	4.698	-0.015	0.997	13788		1.57(0.70-2.09)		78.9	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.104	5.086	0.018	1.795	6378621	2.31		92.3	4951	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.104	5.104	0.0	1.000	200731	NC			37.7	
813.00 > 169.00	5.104	5.104	0.0	1.000	34211		5.87(2.77-8.32)		100	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.455	5.455	0.0	1.069	106492	NC			25.8	
913.00 > 169.00	5.455	5.455	0.0	1.069	20008		5.32(2.55-7.64)		135	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 26-Jul-2018 14:16:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\2018.07.26LLA_005.d

Injection Date: 26-Jul-2018 09:51:48 Instrument ID: A9

Lims ID: CCVL

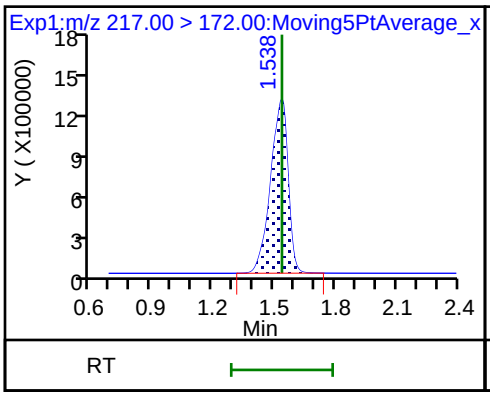
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2

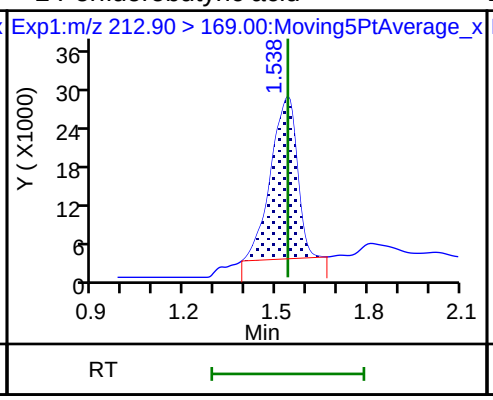
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

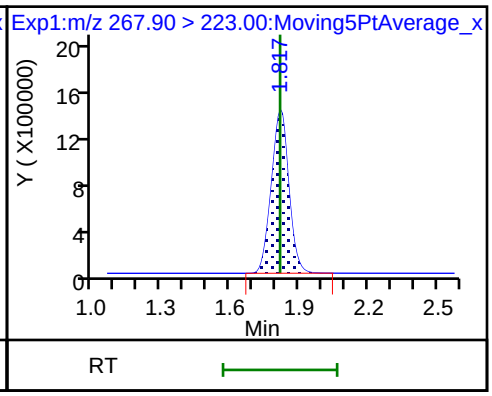
D 1 13C4 PFBA



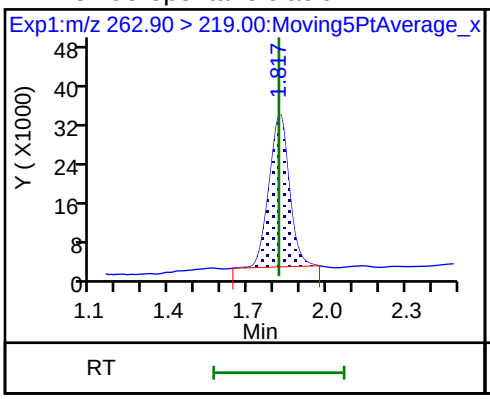
2 Perfluorobutyric acid



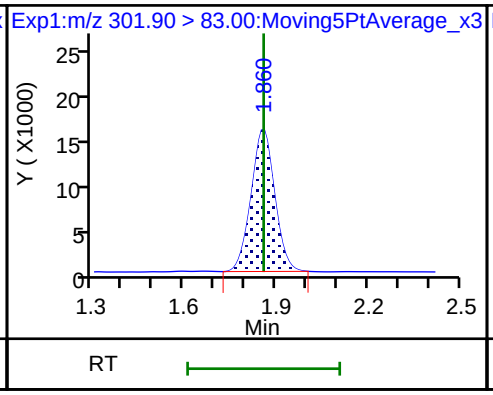
D 3 13C5-PFPeA



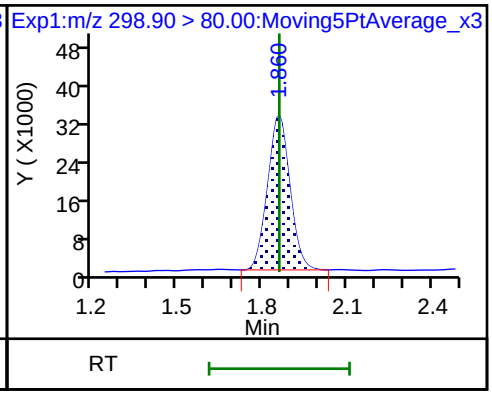
4 Perfluoropentanoic acid



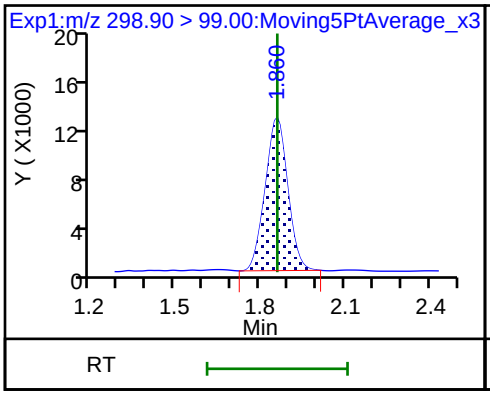
D 47 13C3-PFBS



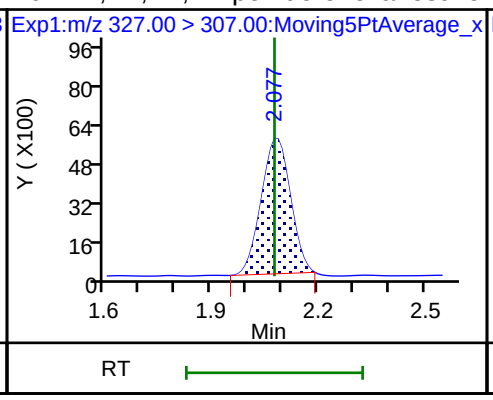
5 Perfluorobutanesulfonic acid



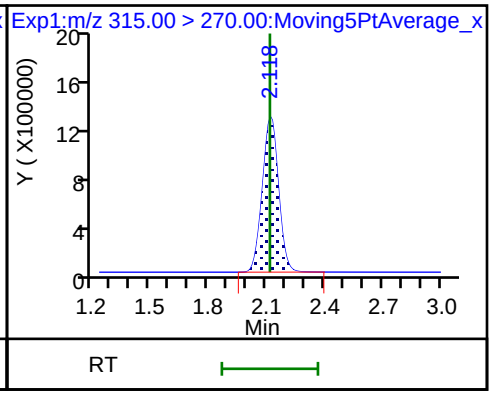
5 Perfluorobutanesulfonic acid



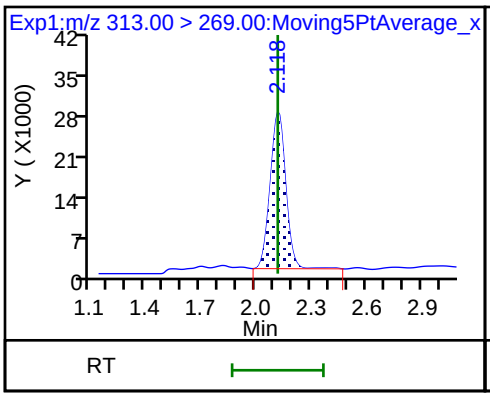
61 1H,1H,2H,2H-perfluorohexanesulfon



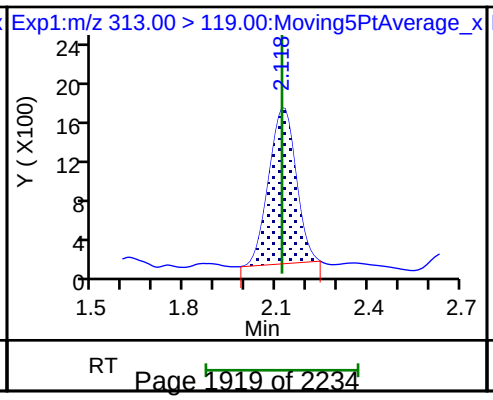
D 7 13C2 PFHxA



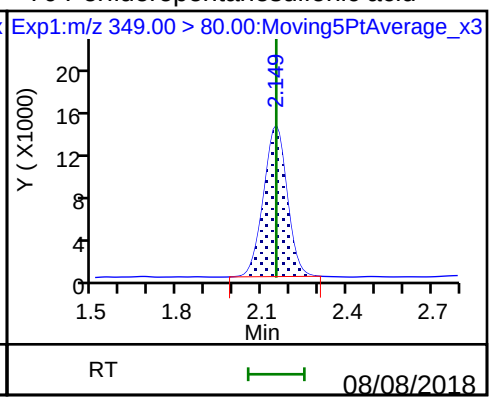
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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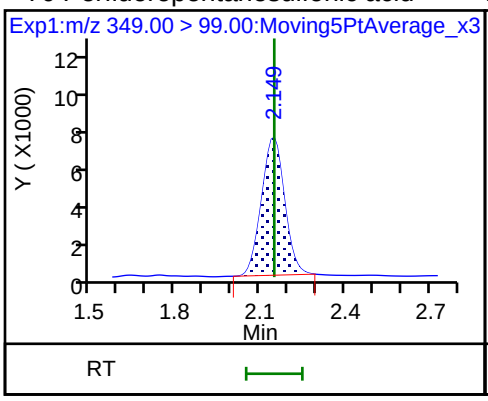
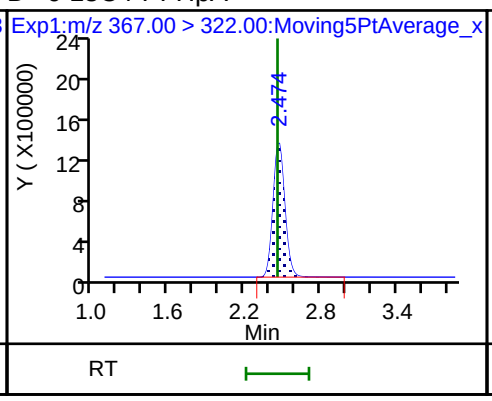


D 9 13C4-PFHpA



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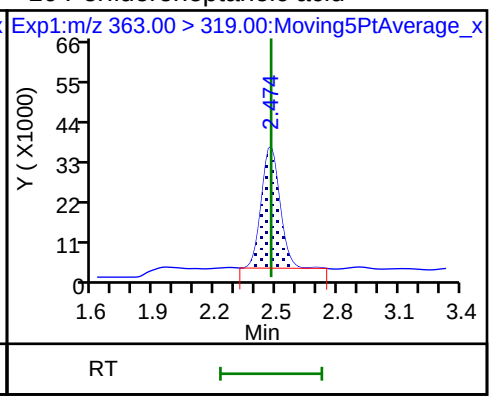

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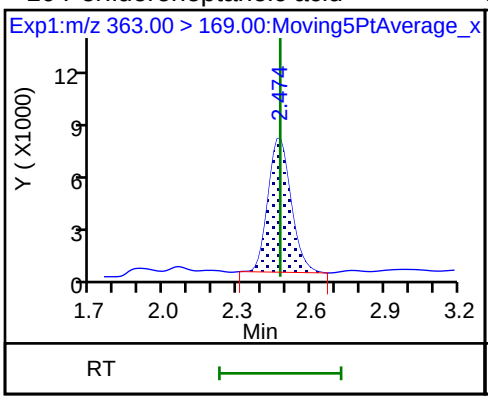
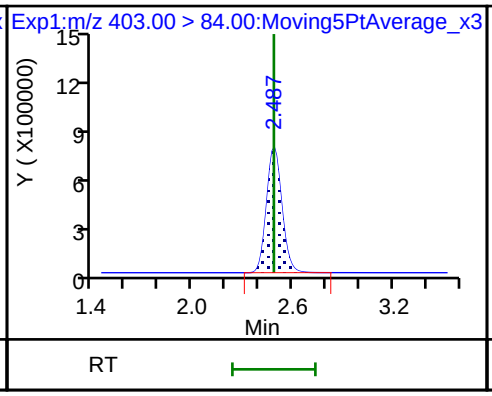
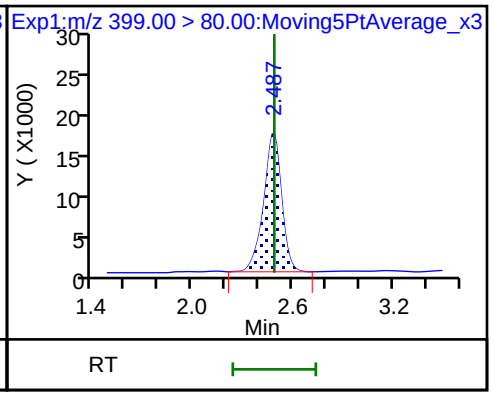


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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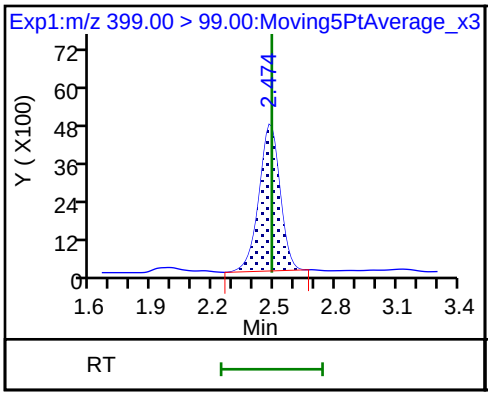
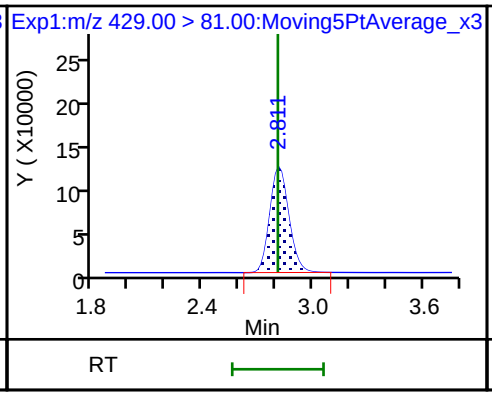
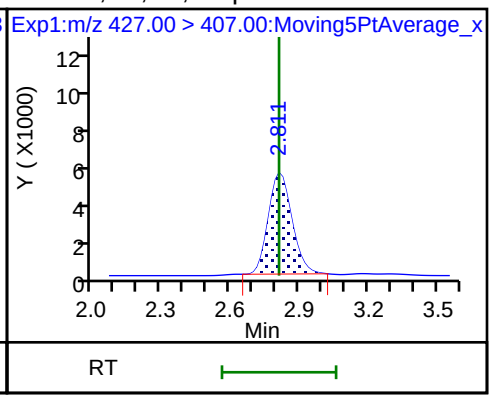


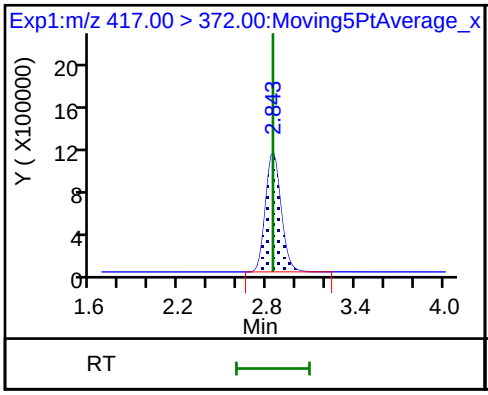
D 12 M2-6:2FTS



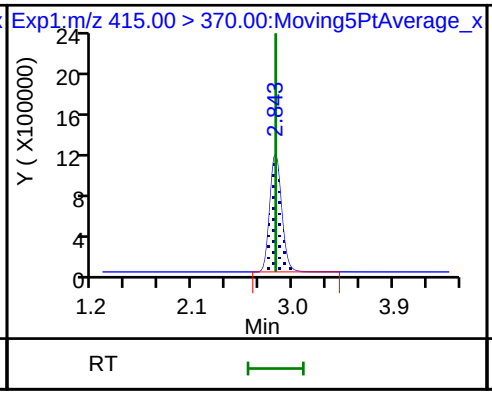
13 1H,1H,2H,2H-perfluorooctanesulfoni



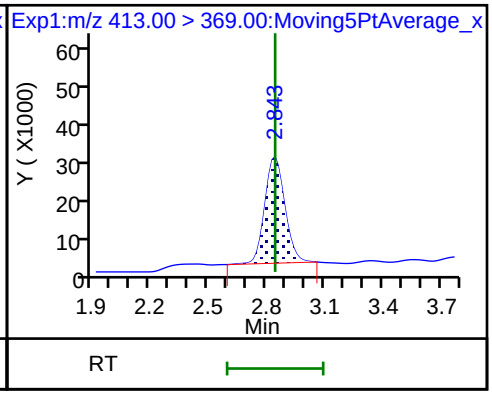
D 14 13C4 PFOA



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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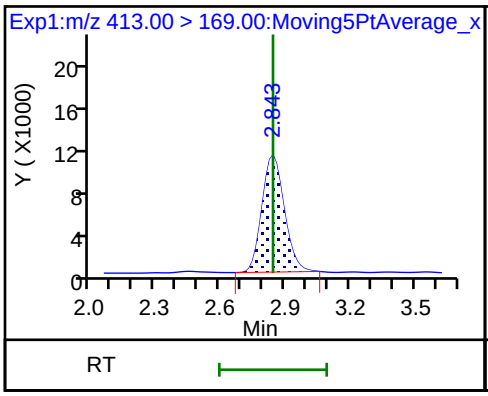
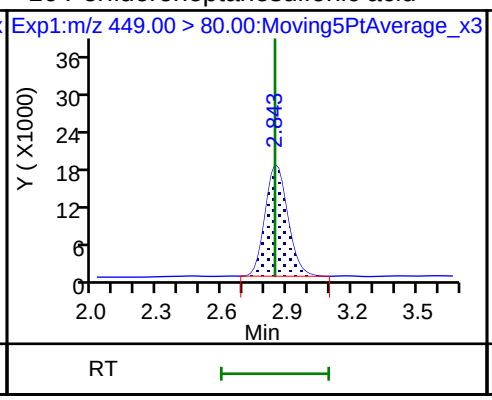
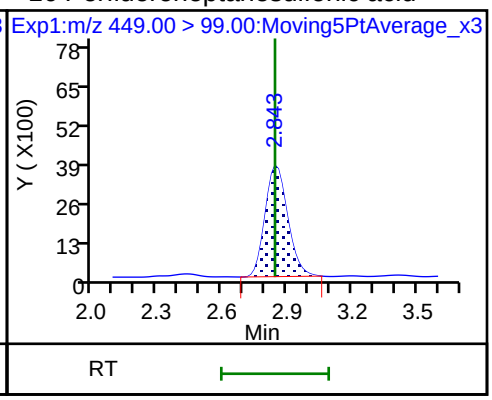


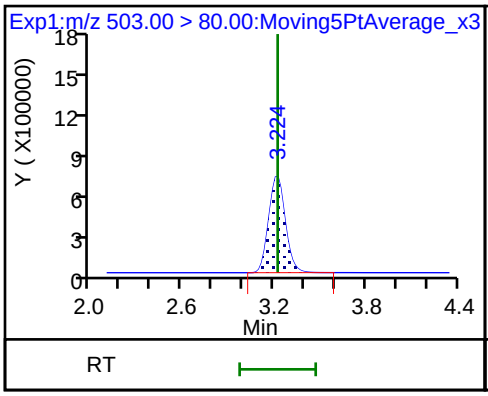
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS



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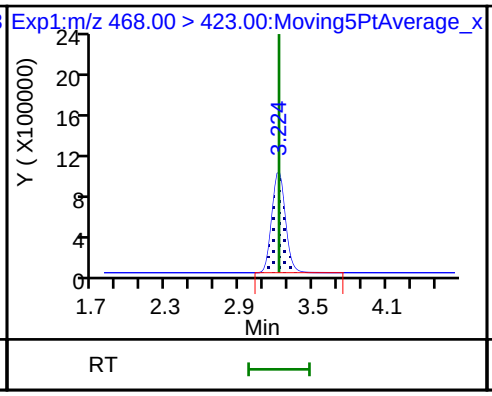
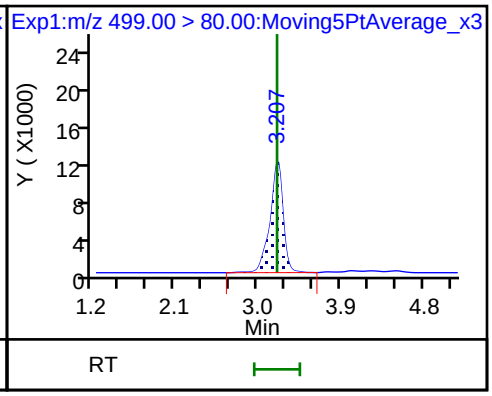


17 Perfluorooctane sulfonic acid



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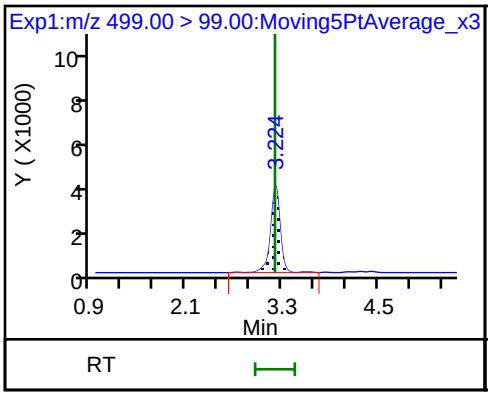
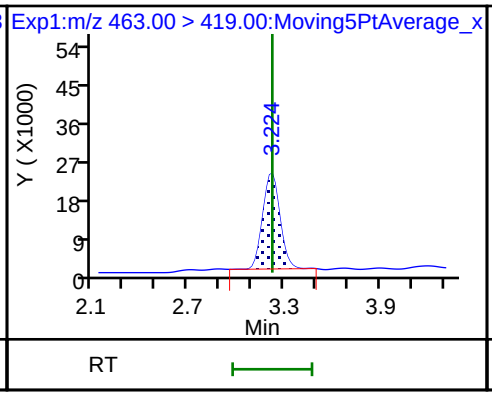


20 Perfluorononanoic acid



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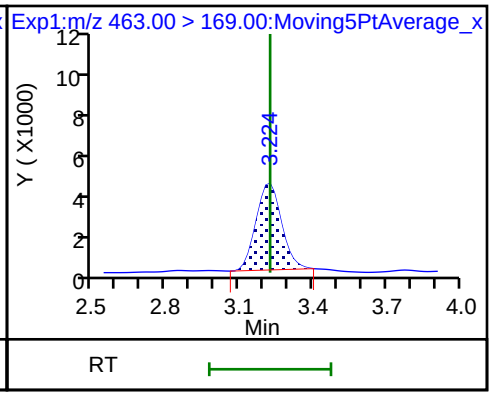
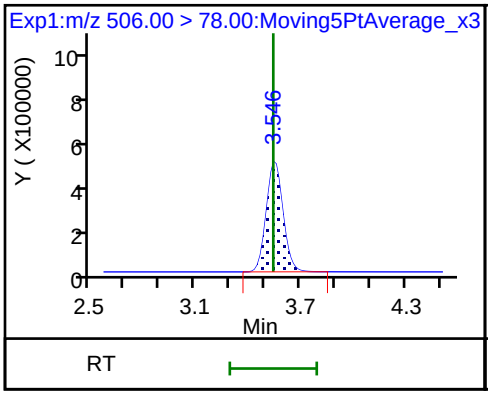
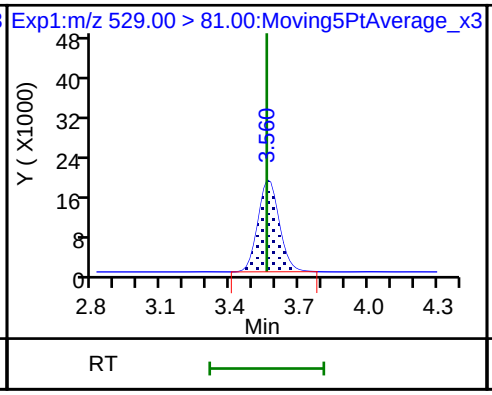


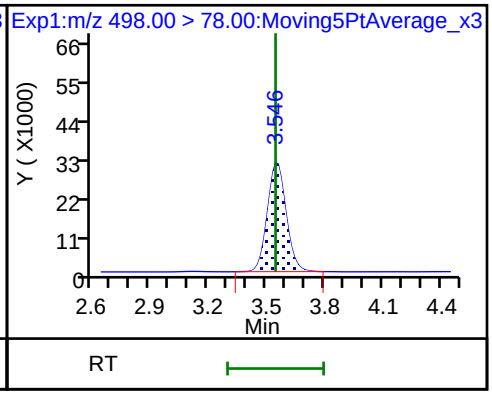
D 21 13C8 FOSA



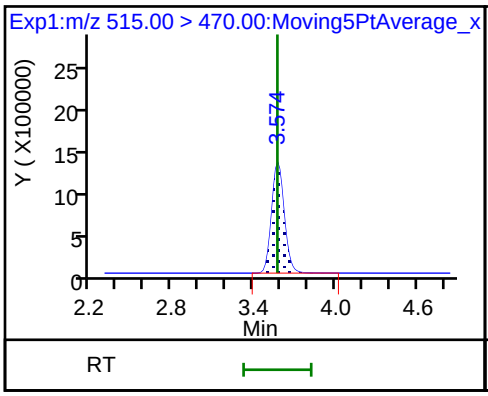
D 26 M2-8:2FTS



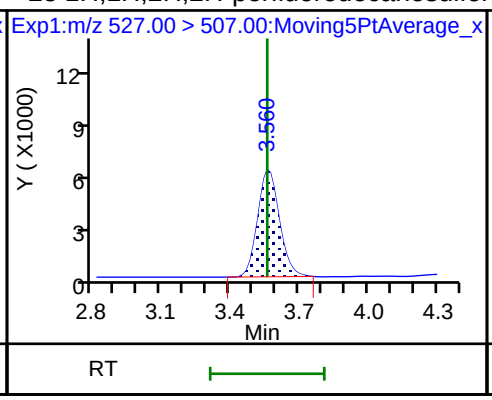
22 Perfluorooctane Sulfonamide



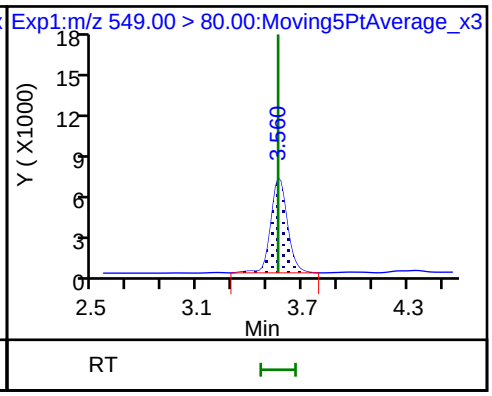
D 23 13C2 PFDA



25 1H,1H,2H,2H-perfluorodecanesulfoni



68 Perfluorononanesulfonic acid



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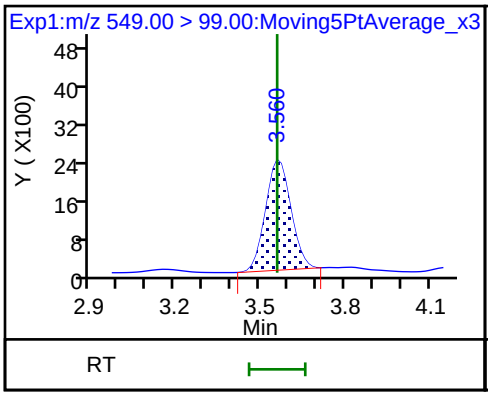
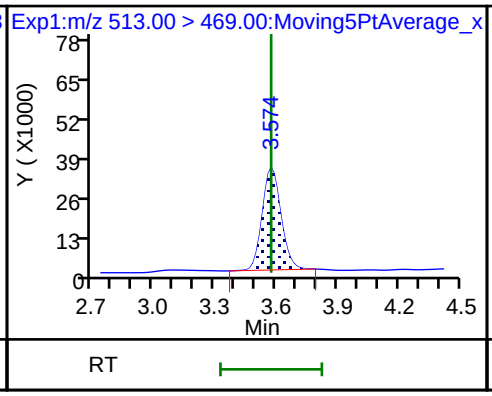
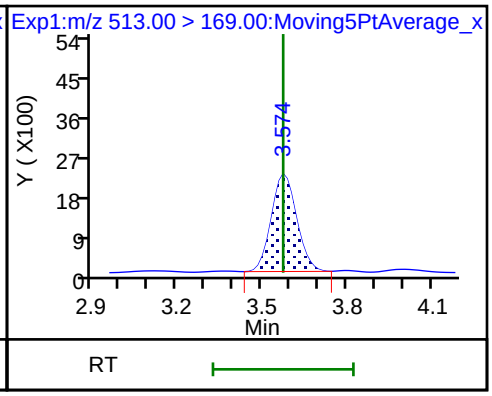


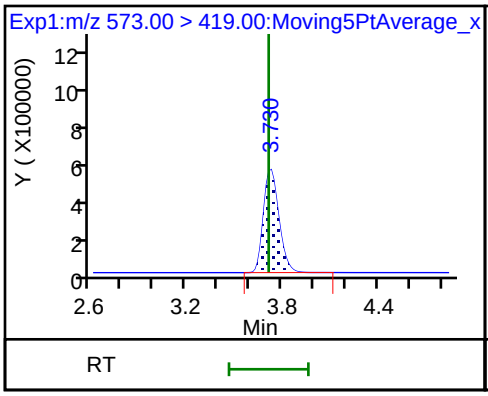
24 Perfluorodecanoic acid



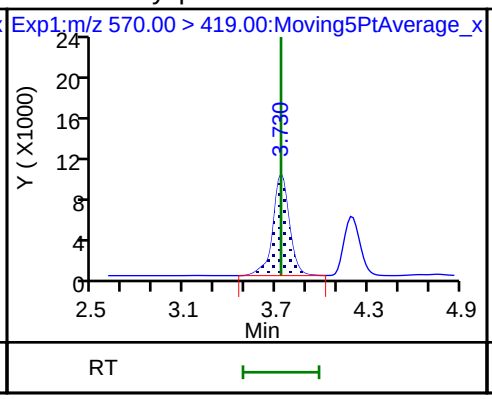
24 Perfluorodecanoic acid



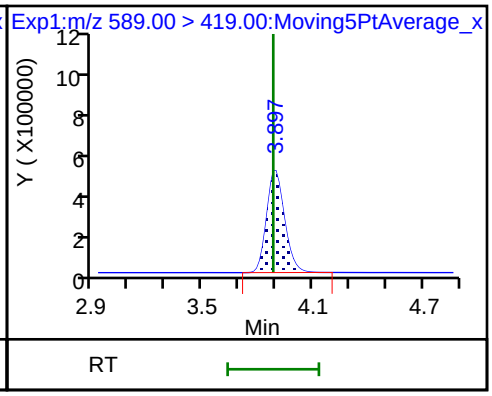
D 27 d3-NMeFOSAA



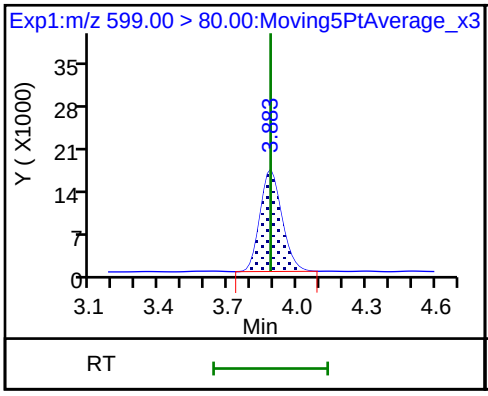
28 N-methyl perfluorooctane sulfonami



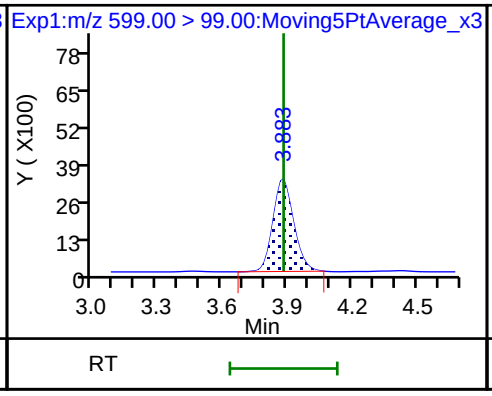
D 32 d5-NEtFOSAA



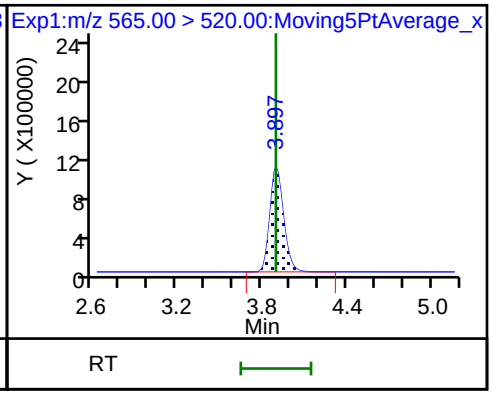
29 Perfluorodecane Sulfonic acid



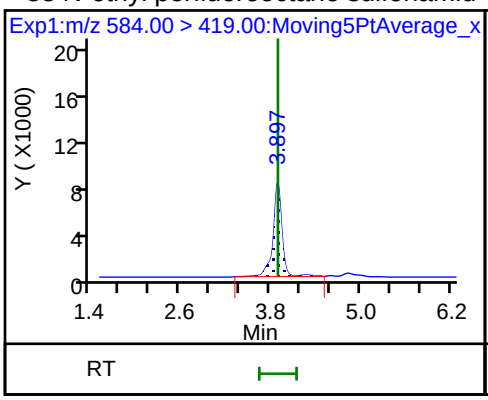
29 Perfluorodecane Sulfonic acid



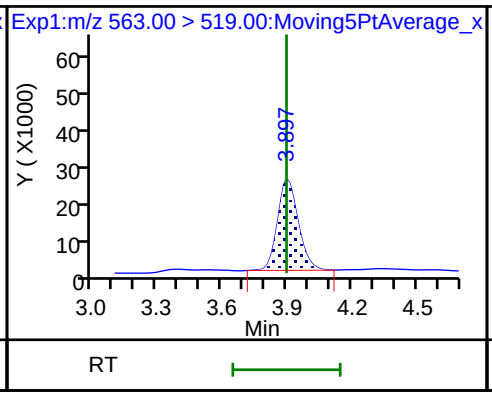
D 30 13C2 PFUnA



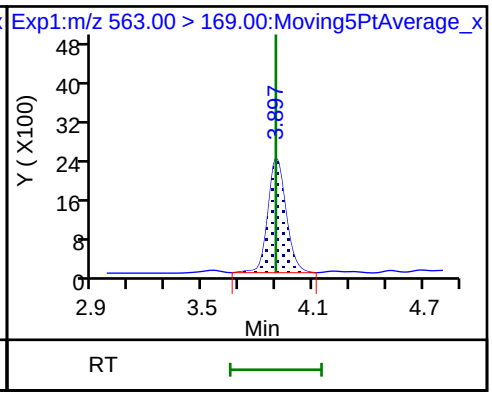
33 N-ethyl perfluorooctane sulfonamid



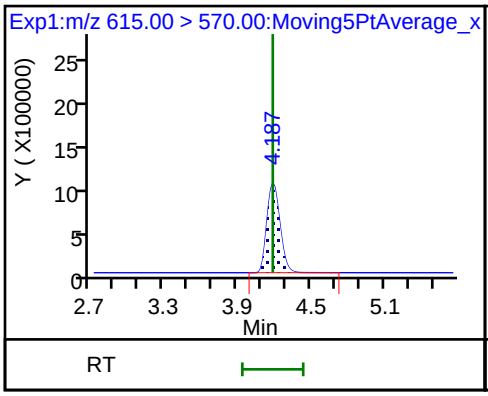
31 Perfluoroundecanoic acid



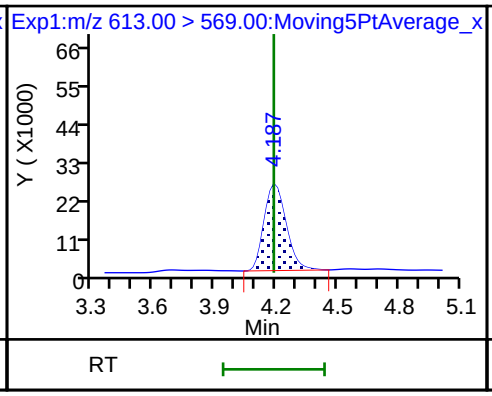
31 Perfluoroundecanoic acid



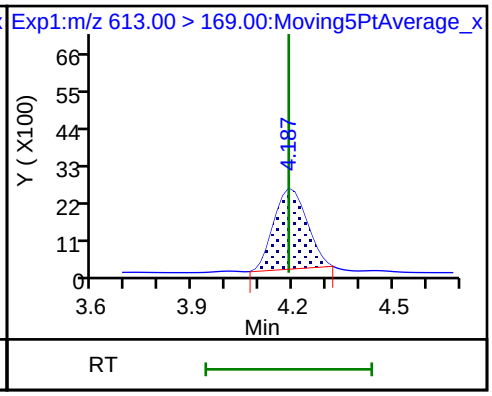
D 36 13C2 PFDoA



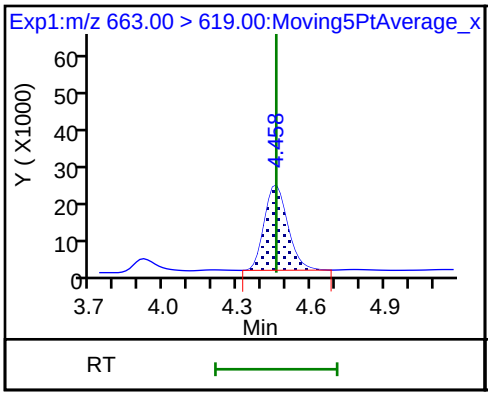
37 Perfluorododecanoic acid



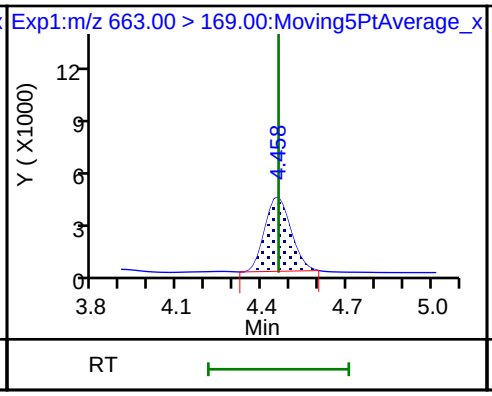
37 Perfluorododecanoic acid



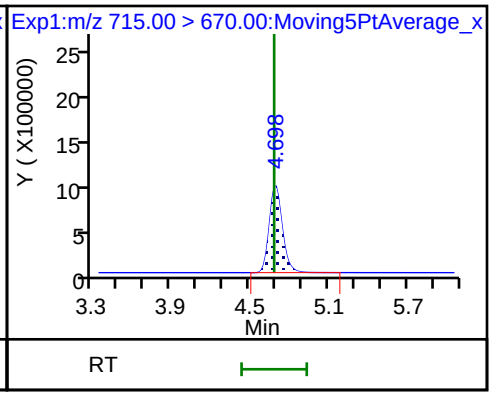
41 Perfluorotridecanoic acid



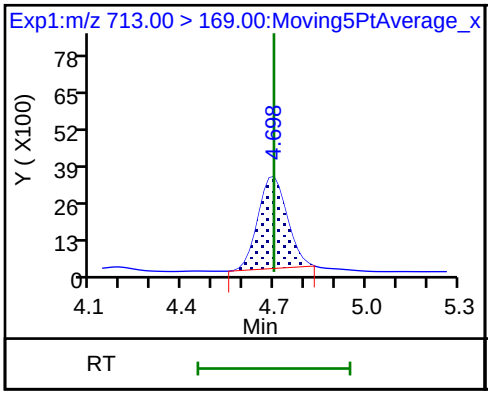
41 Perfluorotridecanoic acid



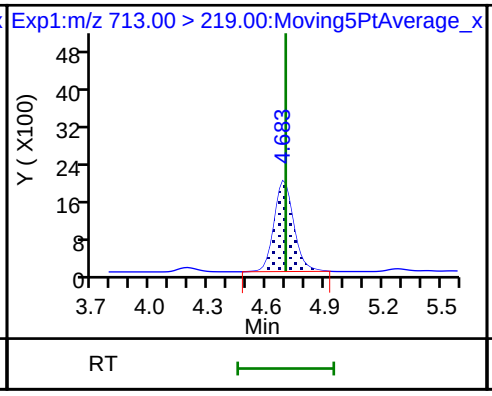
D 43 13C2-PFTeDA



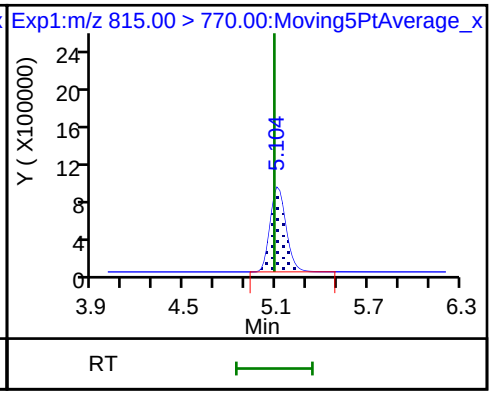
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236275/3 Calibration Date: 07/26/2018 09:59

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	0.9782		1.02	1.00	2.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.087		1.00	1.00	0.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	110.4		0.892	0.884	0.9	30.0
4:2 FTS	AveID	21.47	21.17		0.921	0.934	-1.4	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	0.9383		0.991	1.00	-0.9	30.0
Perfluoropentanesulfonic acid	AveID	52.20	55.40		0.996	0.938	6.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.183		1.08	1.00	7.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.306		0.892	0.910	-2.0	30.0
6:2 FTS	AveID	2.182	2.271		0.987	0.948	4.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.075		0.960	0.952	0.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.136		0.987	1.00	-1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.071		1.00	1.00	0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.136		0.936	0.928	0.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.413		1.11	1.00	11.5	30.0
8:2 FTS	AveID	15.89	15.41		0.929	0.958	-3.1	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.3873		0.948	0.960	-1.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.309		1.12	1.00	11.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.050		1.01	1.00	1.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	1.037		1.07	0.964	11.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	0.8966		0.894	1.00	-10.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	1.023		1.05	1.00	5.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.125		1.04	1.00	4.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	1.011		1.01	1.00	1.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1660		0.964	1.00	-3.6	30.0
13C4 PFBA	Ave	0.9738	0.8904		2.29	2.50	-8.6	30.0
13C5-PFPeA	Ave	0.8956	0.8617		2.41	2.50	-3.8	30.0
13C3-PFBS	Ave	0.0113	0.0107		2.21	2.33	-5.2	30.0
13C2 PFHxA	Ave	0.9398	0.8545		2.27	2.50	-9.1	30.0
13C4-PFHpA	Ave	1.089	1.037		2.38	2.50	-4.8	30.0
18O2 PFHxS	Ave	0.6628	0.6126		2.19	2.37	-7.6	30.0
M2-6:2FTS	Ave	0.1018	0.0930		2.17	2.38	-8.7	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236275/3 Calibration Date: 07/26/2018 09:59

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.9667		2.47	2.50	-1.3	30.0
13C4 PFOS	Ave	0.7102	0.6770		2.28	2.39	-4.7	30.0
13C5 PFNA	Ave	0.9199	0.9077		2.47	2.50	-1.3	30.0
13C8 FOSA	Ave	0.4011	0.3660		2.28	2.50	-8.8	30.0
M2-8:2FTS	Ave	0.0139	0.0148		2.54	2.40	6.1	30.0
13C2 PFDA	Ave	0.9555	0.9164		2.40	2.50	-4.1	30.0
d3-NMeFOSAA	Ave	0.4497	0.4051		2.25	2.50	-9.9	30.0
13C2 PFUnA	Ave	0.8725	0.7846		2.25	2.50	-10.1	30.0
d5-NEtFOSAA	Ave	0.3602	0.3758		2.61	2.50	4.3	30.0
13C2 PFDoA	Ave	0.9367	0.9034		2.41	2.50	-3.6	30.0
13C2-PFTeDA	Ave	0.8106	0.7252		2.24	2.50	-10.5	30.0
13C2-PFHxDA	Ave	0.8343	0.6897		2.07	2.50	-17.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\2018.07.26LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 26-Jul-2018 09:59:19 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 26-Jul-2018 14:16:09 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: barnettj Date: 26-Jul-2018 14:15:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.544	1.537	0.007	0.544	7611313	2.29		91.4	9606	
2 Perfluorobutyric acid										
212.90 > 169.00	1.544	1.544	0.0	1.000	2978063	1.02		102	416	
D 3 13C5-PFPeA										
267.90 > 223.00	1.825	1.816	0.009	0.642	7366009	2.41		96.2	13057	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.825	1.825	0.0	1.000	3203804	1.00		100	896	
D 47 13C3-PFBS										
301.90 > 83.00	1.868	1.858	0.010	0.658	85226	2.21		94.8	1219	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.868	1.868	0.0	1.000	3576636	0.8920		101	4130	
298.90 > 99.00	1.868	1.868	0.0	1.000	1256315		2.85(1.35-4.05)		3632	
D 60 M2-4:2FTS										
329.00 > 81.00	2.096	2.074	0.022	0.738	705904	NC			2431	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.085	2.085	0.0	1.116	724875	0.9211		98.6	10568	
D 7 13C2 PFHxA										
315.00 > 270.00	2.127	2.116	0.011	0.749	7304279	2.27		90.9	16818	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.127	2.127	0.0	1.000	2741359	0.99		99.1	1258	
313.00 > 119.00	2.127	2.127	0.0	1.000	201092		13.63(6.96-20.87)		882	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.148	2.148	0.0	1.150	1904983	1.00		106	6501	
349.00 > 99.00	2.148	2.148	0.0	1.150	848610		2.24(1.15-3.45)		6181	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.231	2.220	0.011	0.785	641057	NC			4124	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.231	2.231	0.0	1.000	555357	NC			380	
D 9 13C4-PFHpA										
367.00 > 322.00	2.472	2.459	0.013	0.870	8865308	2.38		95.2	24283	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.472	2.472	0.0	1.000	4195506	1.08		108	789	
363.00 > 169.00	2.472	2.472	0.0	1.000	934700		4.49(2.17-6.52)		1339	
D 11 18O2 PFHxS										
403.00 > 84.00	2.485	2.485	0.0	0.875	4953994	2.19		92.4	22585	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.485	2.485	0.0	1.000	2489325	0.8920		98.0	5446	
399.00 > 99.00	2.485	2.485	0.0	1.000	686257		3.63(1.90-5.70)		4169	
65 ADONA										
377.00 > 251.00	2.525	2.525	0.0	0.784	6794368	NC			16180	
377.00 > 85.00	2.525	2.525	0.0	0.784	2775503		2.45(1.05-3.16)		4281	
D 12 M2-6:2FTS										
429.00 > 81.00	2.824	2.808	0.016	0.994	755124	2.17		91.3	3496	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.824	2.824	0.0	1.000	684409	0.9866		104	8658	
D 14 13C4 PFOA										
417.00 > 372.00	2.840	2.840	0.0	1.000	8263100	2.47		98.7	20672	
* 62 13C2-PFOA										
415.00 > 370.00	2.840	2.840	0.0		8548152	2.50			17552	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.856	2.856	0.0	1.006	3758459	0.9872		98.6	604	
413.00 > 169.00	2.840	2.856	-0.016	1.000	1384571		2.71(1.36-4.08)		3067	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.856	2.856	0.0	0.887	2368788	0.9598		101	4646	
449.00 > 99.00	2.856	2.856	0.0	0.887	586335		4.04(1.84-5.53)		4518	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.222	3.222	0.0	1.000	2440012	0.9364		101	6281	
499.00 > 99.00	3.222	3.222	0.0	1.000	578253		4.22(2.04-6.12)		6855	
D 19 13C5 PFNA										
468.00 > 423.00	3.222	3.221	0.001	1.134	7759312	2.47		98.7	13794	
D 18 13C4 PFOS										
503.00 > 80.00	3.222	3.221	0.001	1.134	5532210	2.28		95.3	7282	
20 Perfluorononanoic acid										
463.00 > 419.00	3.222	3.222	0.0	1.000	3325623	1.00		100	1195	
463.00 > 169.00	3.222	3.222	0.0	1.000	636158		5.23(2.68-8.03)		2757	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.433	3.433	0.0	1.066	2895608	NC			9521	
D 21 13C8 FOSA										
506.00 > 78.00	3.558	3.543	0.015	1.253	3128222	2.28		91.2	8243	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.558	3.558	0.0	1.000	4270678	1.11		111	7156	
D 26 M2-8:2FTS										
529.00 > 81.00	3.572	3.558	0.014	1.258	120843	2.54		106	3167	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.572	3.572	0.0	1.000	744698	0.9286		96.9	2355	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.572	3.572	0.0	1.109	860649	0.9480		98.7	3579	
549.00 > 99.00	3.572	3.572	0.0	1.109	297101		2.90(1.42-4.26)		2348	
D 23 13C2 PFDA										
515.00 > 470.00	3.586	3.572	0.014	1.263	7833310	2.40		95.9	15177	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.586	3.586	0.0	1.000	4101137	1.12		112	1351	
513.00 > 169.00	3.586	3.586	0.0	1.000	258070		15.89(7.12-21.35)		1312	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.730	3.714	0.016	1.313	3463145	2.25		90.1	7686	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.730	3.730	0.0	1.000	1454141	1.01		101	871	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.897	3.883	0.013	1.372	3212323	2.61		104	6487	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.883	3.883	0.0	1.205	2314984	1.07		111	4884	
599.00 > 99.00	3.883	3.883	0.0	1.205	489517		4.73(2.14-6.43)		4933	
D 30 13C2 PFUnA										
565.00 > 520.00	3.897	3.896	0.0	1.372	6706543	2.25		89.9	9587	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.897	3.897	0.0	1.000	1152004	0.8935		89.4	2726	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.912	3.912	0.0	1.004	2744688	1.05		105	918	
563.00 > 169.00	3.912	3.912	0.0	1.004	261222		10.51(5.24-15.72)		1769	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.054	4.054	0.0	1.259	3587722	NC			10216	
D 36 13C2 PFDoA										
615.00 > 570.00	4.187	4.186	0.001	1.474	7722220	2.41		96.4	12564	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.187	4.187	0.0	1.000	3474597	1.04		104	923	
613.00 > 169.00	4.187	4.187	0.0	1.000	369447		9.40(4.68-14.05)		1002	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.458	4.458	0.0	1.065	3121657	1.01		101	883	
663.00 > 169.00	4.458	4.458	0.0	1.065	476953		6.54(3.09-9.27)		1540	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.698	4.683	0.015	1.654	6198802	2.24		89.5	14303	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.698	4.698	0.0	1.000	411524	0.9638		96.4	1367	
713.00 > 219.00	4.683	4.698	-0.015	0.997	311933		1.32(0.70-2.09)		1217	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.103	5.086	0.017	1.797	5895831	2.07		82.7	5243	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.103	5.103	0.0	1.000	2388431	NC			428	
813.00 > 169.00	5.103	5.103	0.0	1.000	435792		5.48(2.77-8.32)		973	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.455	5.455	0.0	1.069	1747877	NC			381	
913.00 > 169.00	5.455	5.455	0.0	1.069	329909		5.30(2.55-7.64)		1522	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 26-Jul-2018 14:16:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\2018.07.26LLA_006.d

Injection Date: 26-Jul-2018 09:59:19 Instrument ID: A9

Lims ID: CCV L4

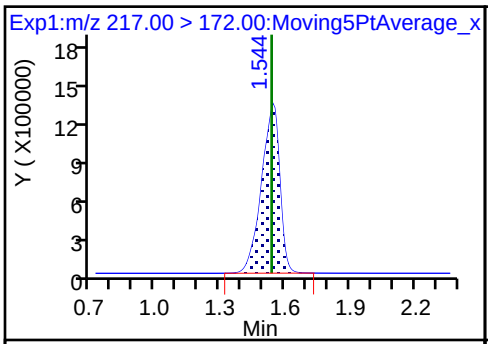
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 3

Injection Vol: 20.0 ul Dil. Factor: 1.0000

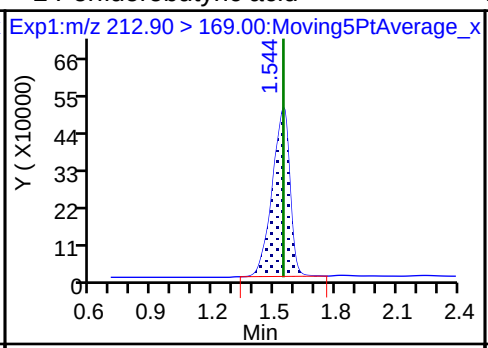
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



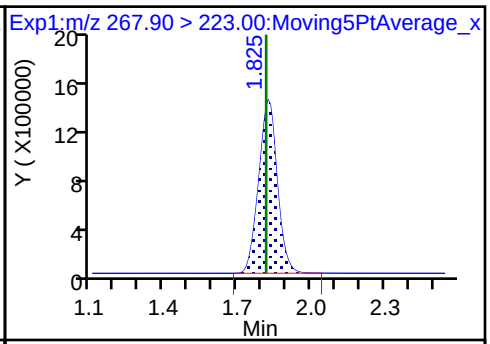
RT

2 Perfluorobutyric acid



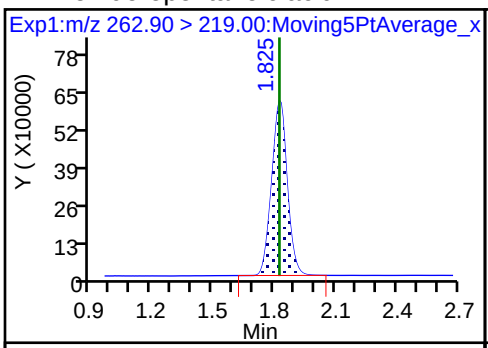
RT

D 3 13C5-PFPeA



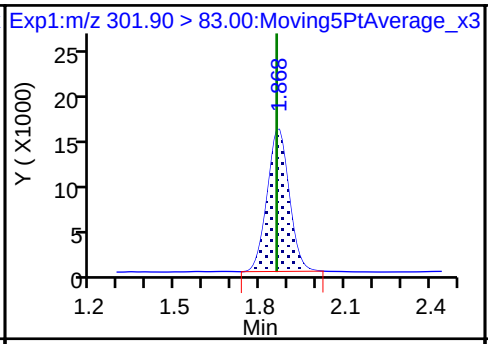
RT

4 Perfluoropentanoic acid



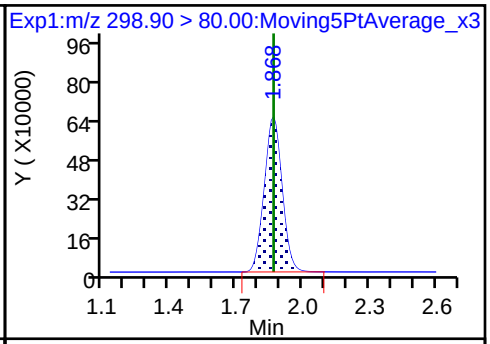
RT

D 47 13C3-PFBS



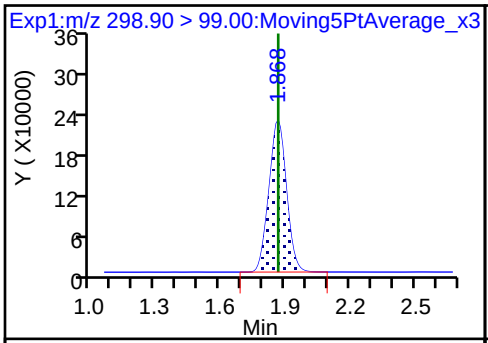
RT

5 Perfluorobutanesulfonic acid



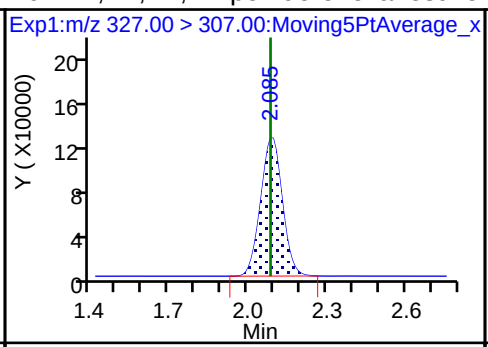
RT

5 Perfluorobutanesulfonic acid



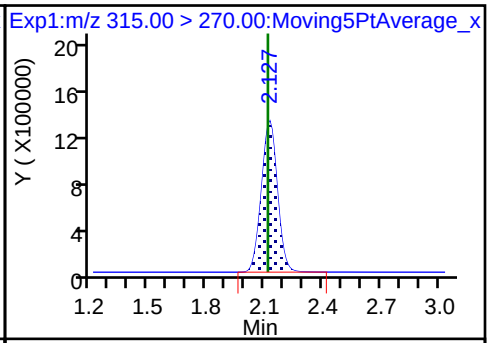
RT

61 1H,1H,2H,2H-perfluorohexanesulfon



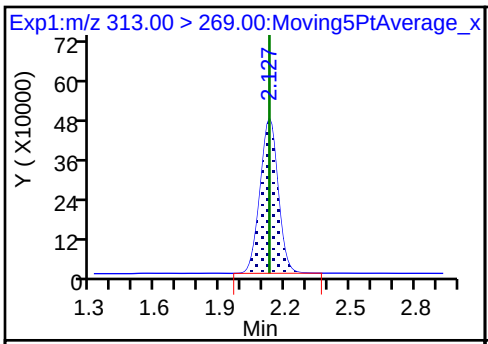
RT

D 7 13C2 PFHxA



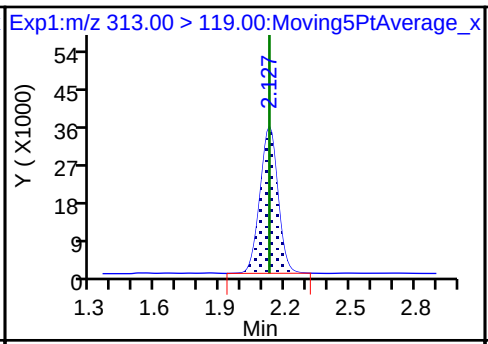
RT

6 Perfluorohexanoic acid



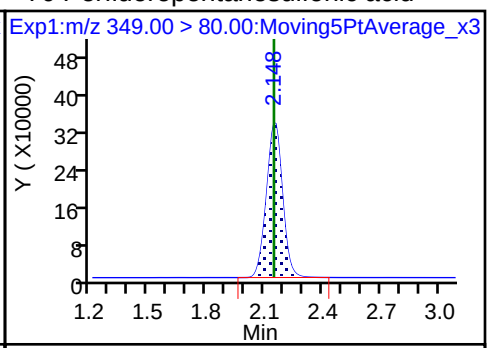
RT

6 Perfluorohexanoic acid



RT

70 Perfluoropentanesulfonic acid



RT

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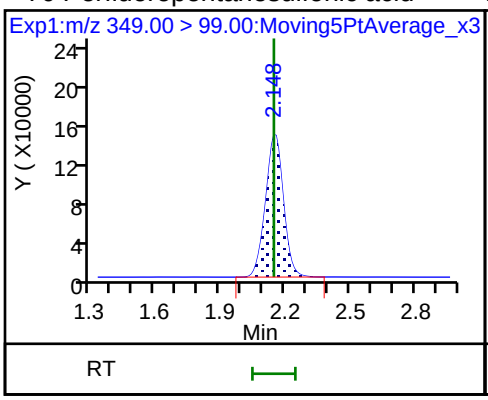
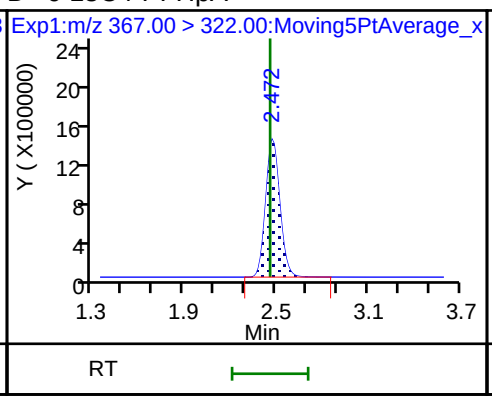
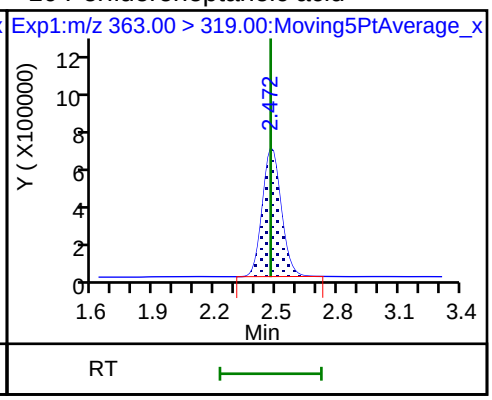


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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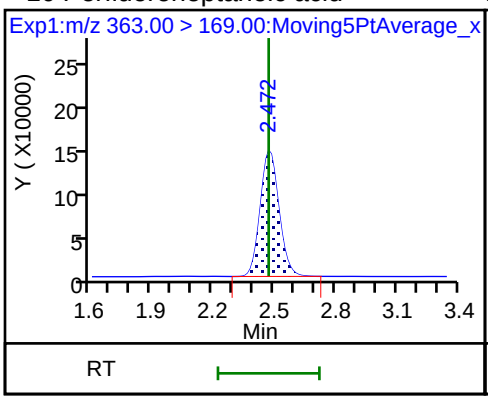
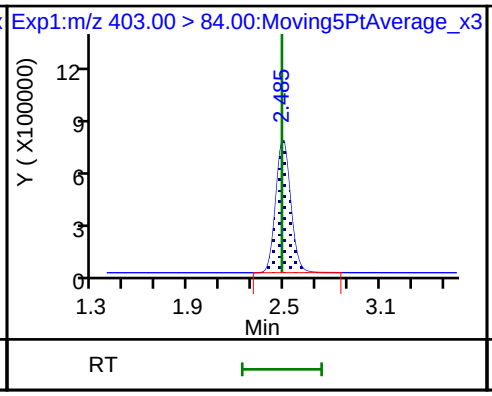
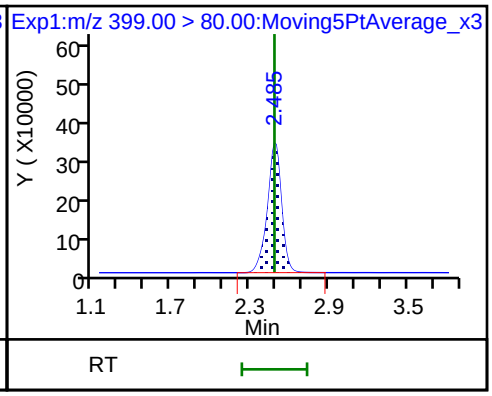


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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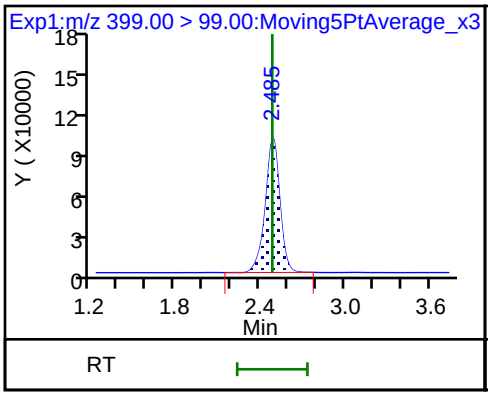
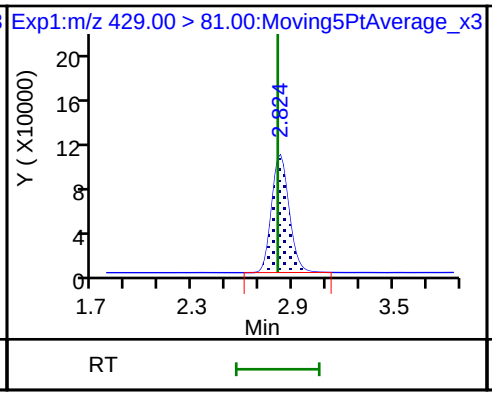
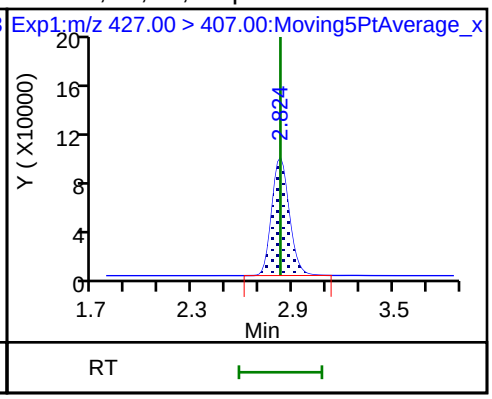


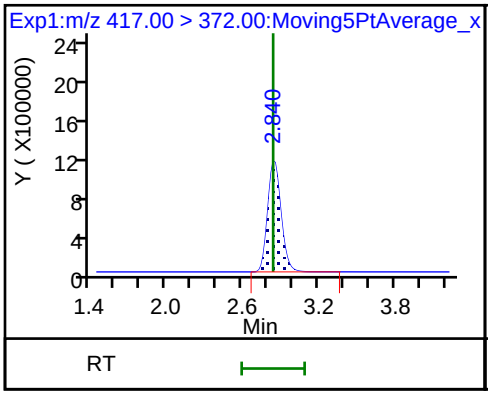
D 12 M2-6:2FTS



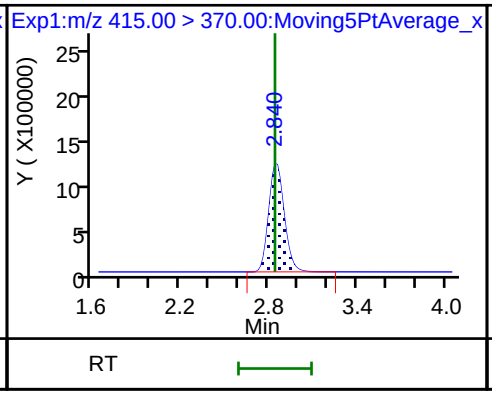
13 1H,1H,2H,2H-perfluorooctanesulfoni



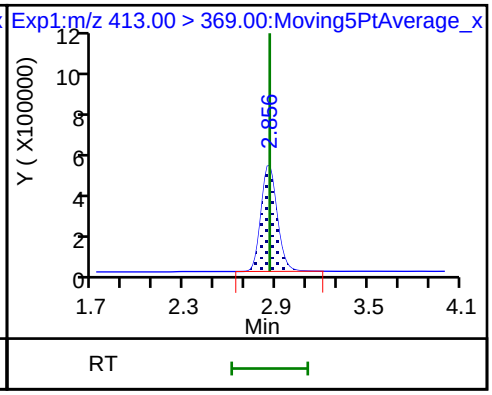
D 14 13C4 PFOA



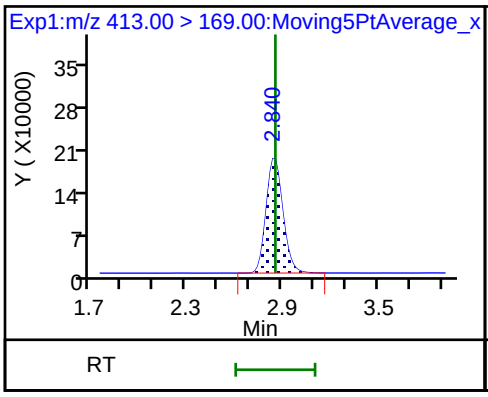
* 62 13C2-PFOA



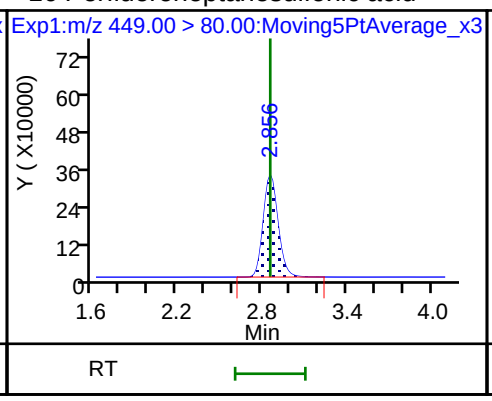
15 Perfluorooctanoic acid



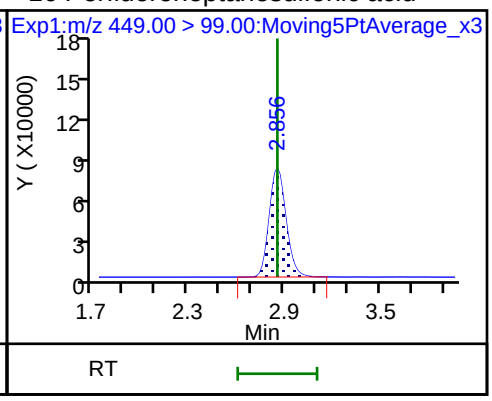
15 Perfluorooctanoic acid



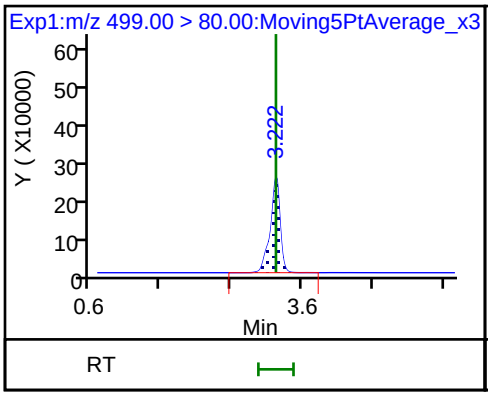
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



17 Perfluorooctane sulfonic acid



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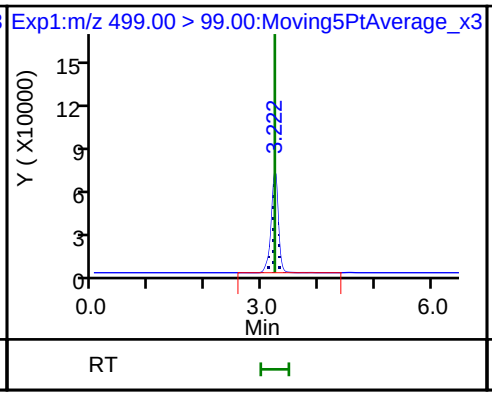
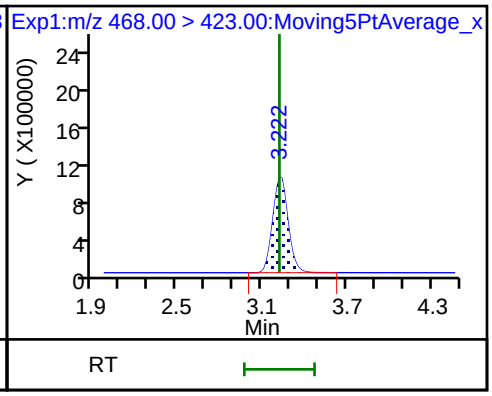
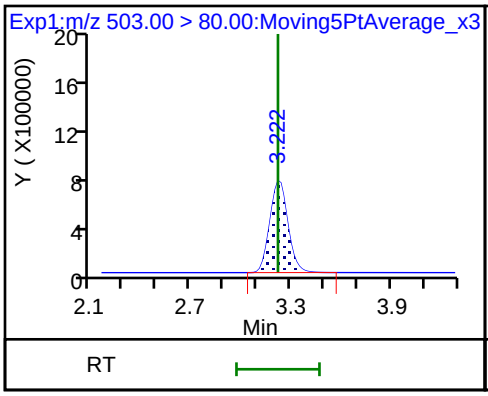


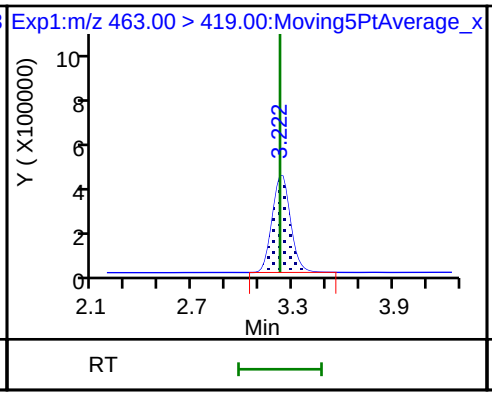
D 19 13C5 PFNA



D 18 13C4 PFOS



20 Perfluorononanoic acid



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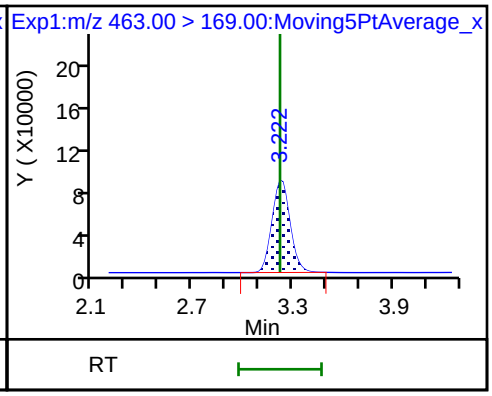
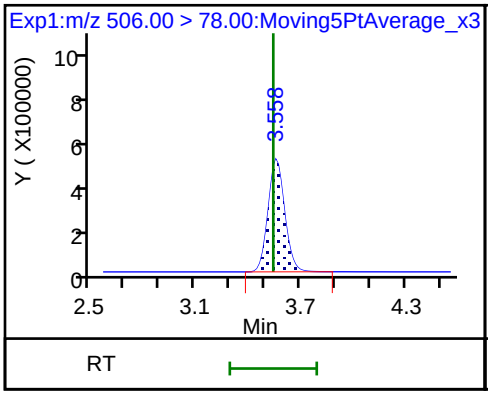
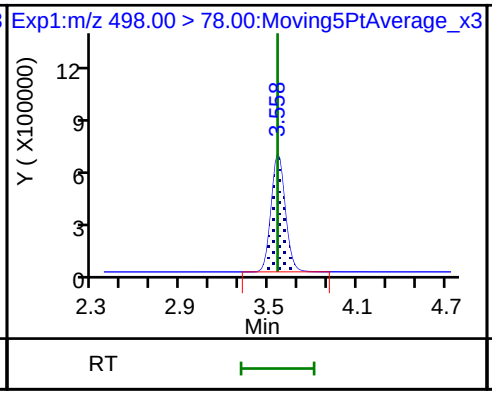


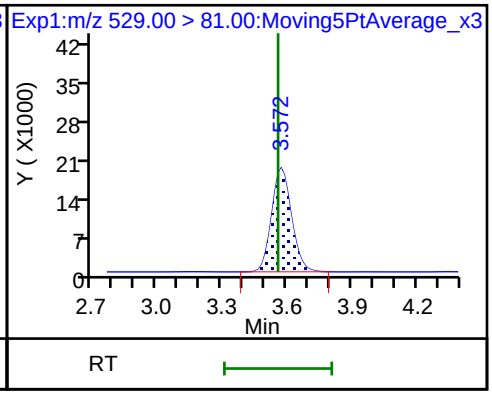
D 21 13C8 FOSA



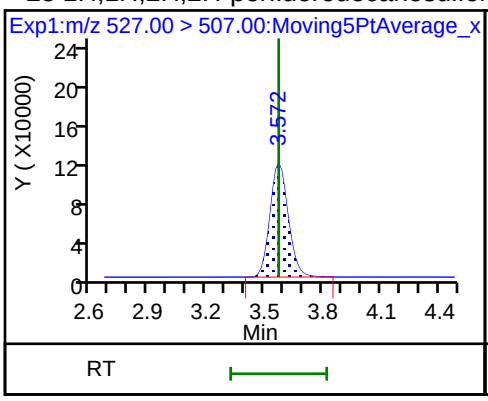
22 Perfluorooctane Sulfonamide



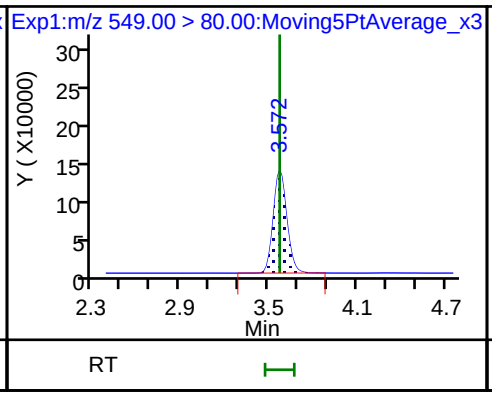
D 26 M2-8:2FTS



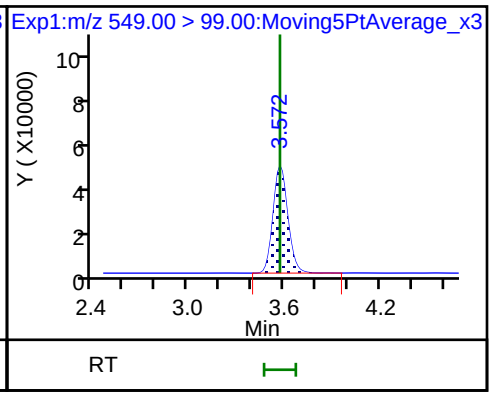
25 1H,1H,2H,2H-perfluorodecanesulfoni



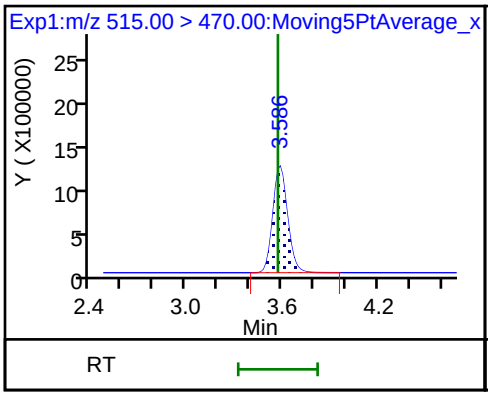
68 Perfluorononanesulfonic acid



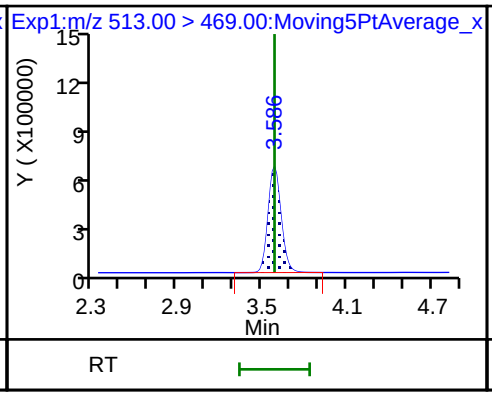
68 Perfluorononanesulfonic acid



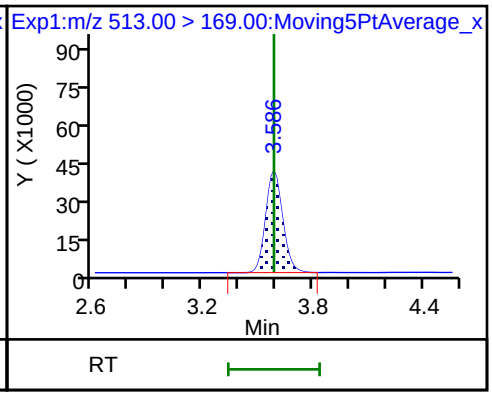
D 23 13C2 PFDA



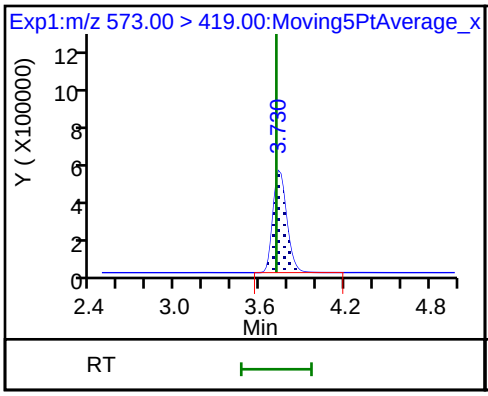
24 Perfluorodecanoic acid



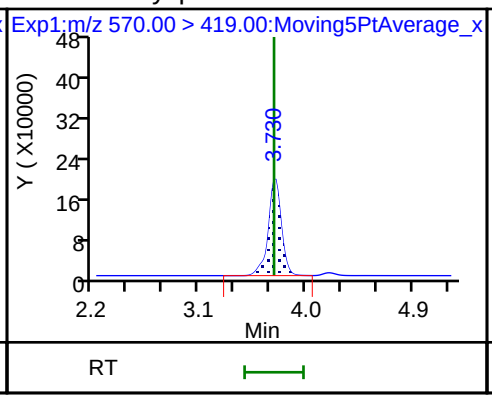
24 Perfluorodecanoic acid



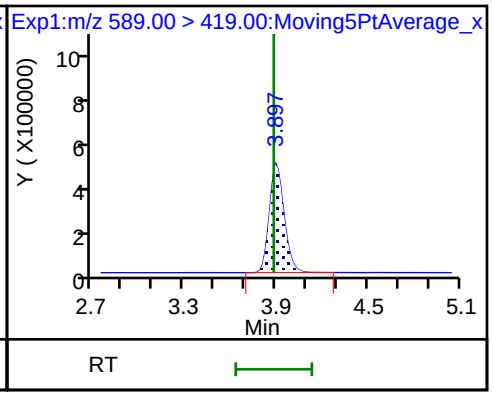
D 27 d3-NMeFOSAA



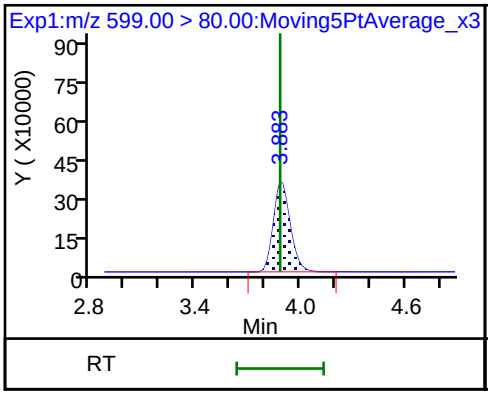
28 N-methyl perfluorooctane sulfonami



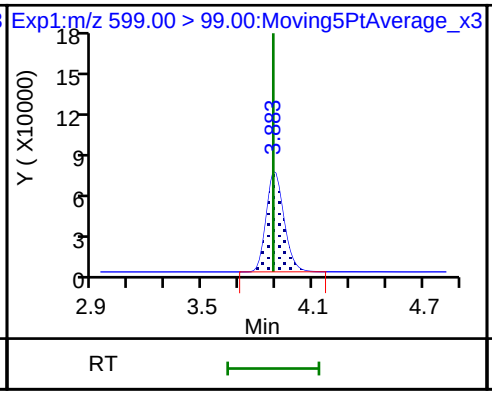
D 32 d5-NEtFOSAA



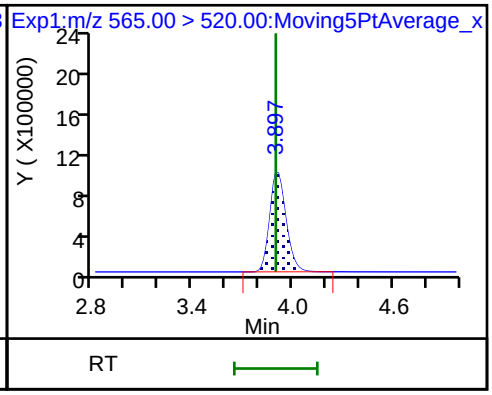
29 Perfluorodecane Sulfonic acid



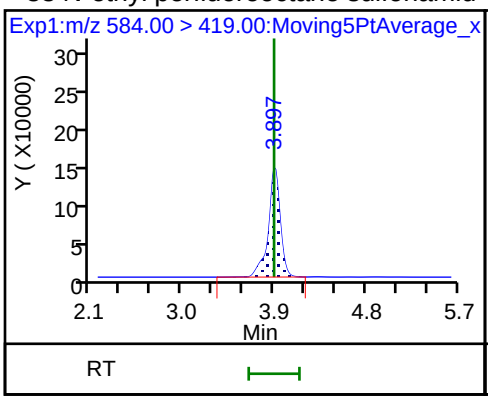
29 Perfluorodecane Sulfonic acid



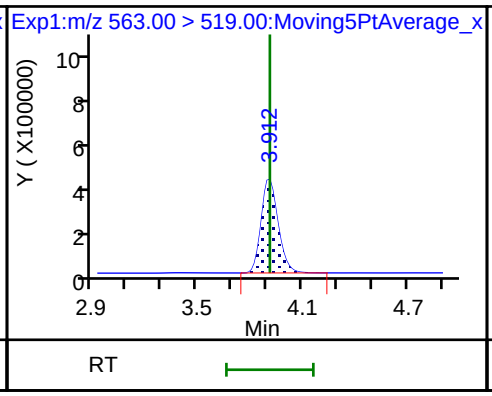
D 30 13C2 PFUnA



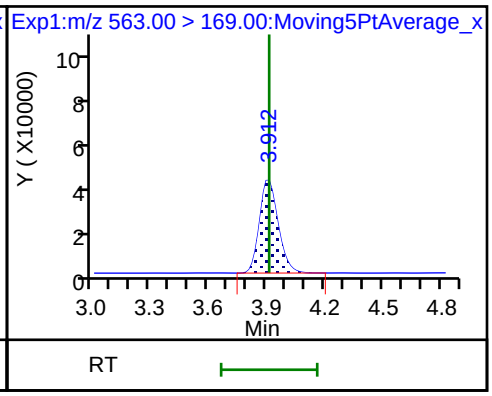
33 N-ethyl perfluorooctane sulfonamid



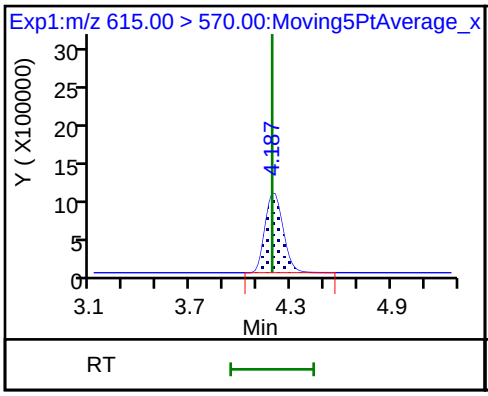
31 Perfluoroundecanoic acid



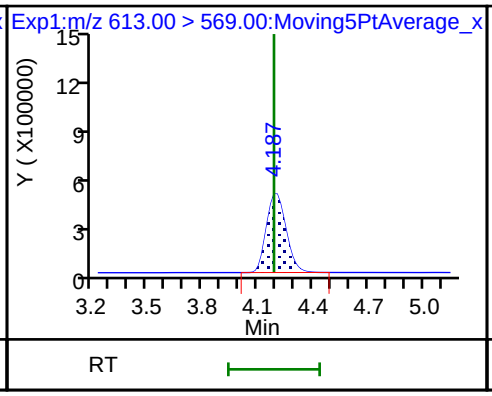
31 Perfluoroundecanoic acid



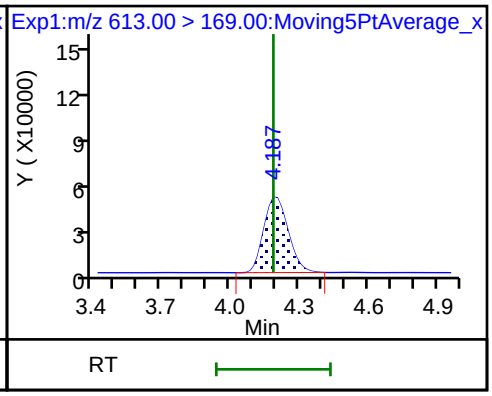
D 36 13C2 PFDoA



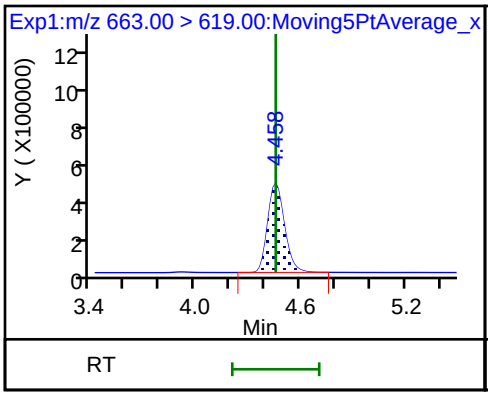
37 Perfluorododecanoic acid



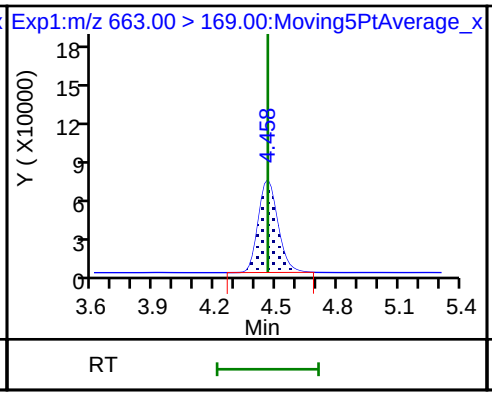
37 Perfluorododecanoic acid



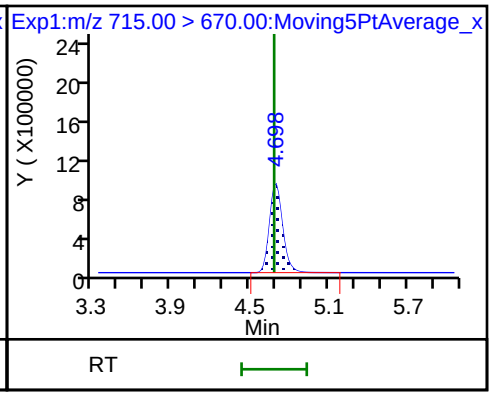
41 Perfluorotridecanoic acid



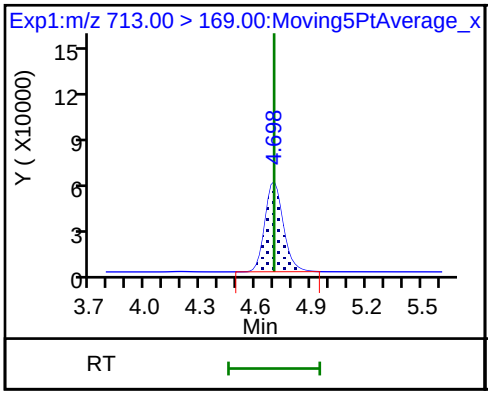
41 Perfluorotridecanoic acid



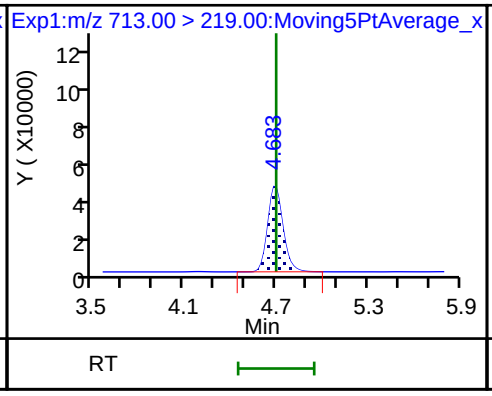
D 43 13C2-PFTeDA



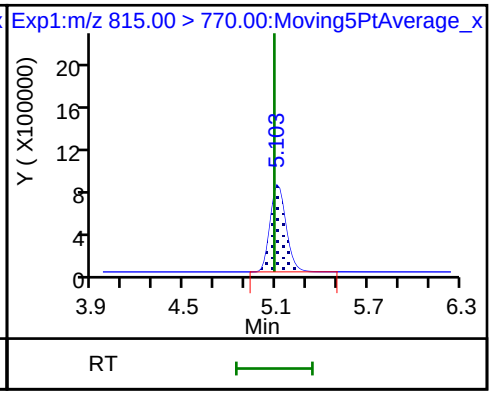
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236374/1 Calibration Date: 07/26/2018 13:15

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLBB_060.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	0.999		1.04	1.00	4.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.127		1.04	1.00	3.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	109.7		0.886	0.884	0.3	30.0
4:2 FTS	AveID	21.47	22.89		0.996	0.934	6.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	0.9498		1.00	1.00	0.4	30.0
Perfluoropentanesulfonic acid	AveID	52.20	53.45		0.960	0.938	2.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.237		1.13	1.00	12.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.303		0.890	0.910	-2.2	30.0
6:2 FTS	AveID	2.182	2.209		0.960	0.948	1.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.153		1.00	1.00	0.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.146		1.02	0.952	7.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.122		0.925	0.928	-0.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.190		1.11	1.00	11.1	30.0
8:2 FTS	AveID	15.89	15.29		0.922	0.958	-3.8	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.4013		0.982	0.960	2.3	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.355		1.10	1.00	9.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.298		1.11	1.00	10.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.151		1.11	1.00	11.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	1.068		1.10	0.964	14.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	0.9056		0.903	1.00	-9.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	0.9483		0.977	1.00	-2.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.113		1.03	1.00	3.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	1.003		1.00	1.00	0.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1635		0.950	1.00	-5.0	30.0
13C4 PFBA	Ave	0.9738	0.9137		2.35	2.50	-6.2	30.0
13C5-PFPeA	Ave	0.8956	0.8778		2.45	2.50	-2.0	30.0
13C3-PFBS	Ave	0.0113	0.0108		2.22	2.33	-4.7	30.0
13C2 PFHxA	Ave	0.9398	0.8931		2.38	2.50	-5.0	30.0
13C4-PFHpA	Ave	1.089	1.007		2.31	2.50	-7.6	30.0
18O2 PFHxS	Ave	0.6628	0.6114		2.18	2.37	-7.8	30.0
M2-6:2FTS	Ave	0.1018	0.0991		2.31	2.38	-2.7	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236374/1 Calibration Date: 07/26/2018 13:15

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLBB_060.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.9654		2.46	2.50	-1.4	30.0
13C4 PFOS	Ave	0.7102	0.6683		2.25	2.39	-5.9	30.0
13C5 PFNA	Ave	0.9199	0.8443		2.29	2.50	-8.2	30.0
13C8 FOSA	Ave	0.4011	0.3798		2.37	2.50	-5.3	30.0
M2-8:2FTS	Ave	0.0139	0.0156		2.68	2.40	12.1	30.0
13C2 PFDA	Ave	0.9555	0.9397		2.46	2.50	-1.6	30.0
d3-NMeFOSAA	Ave	0.4497	0.4216		2.34	2.50	-6.2	30.0
d5-NEtFOSAA	Ave	0.3602	0.3719		2.58	2.50	3.3	30.0
13C2 PFUnA	Ave	0.8725	0.8463		2.42	2.50	-3.0	30.0
13C2 PFDoA	Ave	0.9367	0.9052		2.42	2.50	-3.4	30.0
13C2-PFTeDA	Ave	0.8106	0.7722		2.38	2.50	-4.7	30.0
13C2-PFHxDA	Ave	0.8343	0.6952		2.08	2.50	-16.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\2018.07.26LLBB_060.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 26-Jul-2018 13:15:03 ALS Bottle#: 13 Worklist Smp#: 1
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 26-Jul-2018 15:19:47 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK051

First Level Reviewer: hannigana Date: 26-Jul-2018 15:19:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.545	1.538	0.007	0.543	7565602	2.35		93.8	9641	
2 Perfluorobutyric acid										
212.90 > 169.00	1.545	1.545	0.0	1.000	3022275	1.04		104	305	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.826	1.826	0.0	1.000	3277863	1.04		104	510	
D 3 13C5-PFPeA										
267.90 > 223.00	1.826	1.826	0.0	0.642	7268890	2.45		98.0	12210	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.860	1.860	0.0	1.000	3460246	0.8864		100	3751	
298.90 > 99.00	1.860	1.860	0.0	1.000	1277708		2.71(1.35-4.05)		1971	
D 47 13C3-PFBS										
301.90 > 83.00	1.860	1.860	0.0	0.654	82972	2.22		95.3	953	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.087	2.087	0.0	1.122	762964	1.00		107	8501	
D 60 M2-4:2FTS										
329.00 > 81.00	2.087	2.087	0.0	0.734	680067	NC			1928	
D 7 13C2 PFHxA										
315.00 > 270.00	2.129	2.118	0.011	0.749	7395245	2.38		95.0	17232	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.129	2.129	0.0	1.000	2809601	1.00		100	1112	
313.00 > 119.00	2.129	2.129	0.0	1.000	192574		14.59(6.96-20.87)		828	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.150	2.150	0.0	1.155	1789291	0.9605		102	6091	
349.00 > 99.00	2.150	2.150	0.0	1.155	830656		2.15(1.15-3.45)		3369	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.233	2.233	0.0	1.000	542117	NC			368	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.233	2.233	0.0	0.785	611484	NC			4442	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.474	2.474	0.0	1.000	4126406	1.13		113	746	
363.00 > 169.00	2.474	2.474	0.0	1.000	887038		4.65(2.17-6.52)		1131	
D 9 13C4-PFHpA										
367.00 > 322.00	2.474	2.474	0.0	0.870	8337559	2.31		92.4	28639	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.487	2.487	0.0	1.000	2401692	0.8903		97.8	5368	
399.00 > 99.00	2.487	2.487	0.0	1.000	628802		3.82(1.90-5.70)		2207	
D 11 18O2 PFHxS										
403.00 > 84.00	2.487	2.487	0.0	0.875	4789022	2.18		92.2	19952	
65 ADONA										
377.00 > 251.00	2.527	2.527	0.0	0.784	6730440	NC			16347	
377.00 > 85.00	2.527	2.527	0.0	0.784	2799775		2.40(1.05-3.16)		3515	
D 12 M2-6:2FTS										
429.00 > 81.00	2.828	2.812	0.016	0.994	779703	2.31		97.3	2666	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.828	2.828	0.0	1.000	687499	0.9598		101	6289	
* 62 13C2-PFOA										
415.00 > 370.00	2.844	2.844	0.0		8280503	2.50			19607	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.844	2.844	0.0	1.000	3691732	1.00		100	535	
413.00 > 169.00	2.844	2.844	0.0	1.000	1320617		2.80(1.36-4.08)		3361	
D 14 13C4 PFOA										
417.00 > 372.00	2.844	2.844	0.0	1.000	7994123	2.46		98.6	17452	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.859	2.859	0.0	0.887	2414427	1.02		107	4925	
449.00 > 99.00	2.859	2.859	0.0	0.887	574201		4.20(1.84-5.53)		5311	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.224	3.224	0.0	1.000	2304207	0.9247		99.6	4751	
499.00 > 99.00	3.224	3.224	0.0	1.000	553295		4.16(2.04-6.12)		4737	
D 19 13C5 PFNA										
468.00 > 423.00	3.224	3.224	0.0	1.134	6991495	2.29		91.8	16669	
D 18 13C4 PFOS										
503.00 > 80.00	3.224	3.224	0.0	1.134	5290413	2.25		94.1	7343	
20 Perfluorononanoic acid										
463.00 > 419.00	3.242	3.242	0.0	1.005	3328169	1.11		111	1099	
463.00 > 169.00	3.242	3.242	0.0	1.005	592163		5.62(2.68-8.03)		2029	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.436	3.436	0.0	1.066	2966651	NC			5937	
D 21 13C8 FOSA										
506.00 > 78.00	3.574	3.560	0.014	1.257	3144900	2.37		94.7	7647	
D 26 M2-8:2FTS										
529.00 > 81.00	3.574	3.560	0.014	1.257	123605	2.68		112	2154	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.574	3.574	0.0	1.000	4220472	1.10		110	5170	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.574	3.574	0.0	1.109	852792	0.9823		102	3956	
549.00 > 99.00	3.574	3.574	0.0	1.109	295212		2.89(1.42-4.26)		1723	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.574	3.574	0.0	1.000	755962	0.9216		96.2	3367	
D 23 13C2 PFDA										
515.00 > 470.00	3.589	3.574	0.015	1.262	7781460	2.46		98.4	26695	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.589	3.589	0.0	1.000	4039841	1.11		111	1218	
513.00 > 169.00	3.589	3.589	0.0	1.000	263011		15.36(7.12-21.35)		1494	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.746	3.730	0.016	1.317	3491153	2.34		93.8	6953	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.746	3.746	0.0	1.000	1607239	1.11		111	14805	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.897	3.897	0.0	1.209	2279615	1.10		114	4595	
599.00 > 99.00	3.897	3.897	0.0	1.209	513378		4.44(2.14-6.43)		3712	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.897	3.897	0.0	1.371	3079771	2.58		103	4338	
D 30 13C2 PFUnA										
565.00 > 520.00	3.913	3.897	0.016	1.376	7008091	2.42		97.0	14051	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.913	3.913	0.0	1.000	2658418	0.9768		97.7	860	
563.00 > 169.00	3.913	3.913	0.0	1.000	250083		10.63(5.24-15.72)		1389	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.913	3.913	0.0	1.004	1115608	0.9026		90.3	2491	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.071	4.071	0.0	1.263	3768887	NC			12186	
D 36 13C2 PFDoA										
615.00 > 570.00	4.205	4.187	0.018	1.479	7495468	2.42		96.6	20295	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.205	4.205	0.0	1.000	3335563	1.03		103	840	
613.00 > 169.00	4.205	4.205	0.0	1.000	364875		9.14(4.68-14.05)		1513	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.458	4.458	0.0	1.060	3007981	1.00		100	770	
663.00 > 169.00	4.458	4.458	0.0	1.060	501053		6.00(3.09-9.27)		1378	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.699	4.683	0.016	1.652	6394431	2.38		95.3	12357	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.699	4.699	0.0	1.000	418305	0.9497		95.0	1329	
713.00 > 219.00	4.683	4.699	-0.016	0.997	294696		1.42(0.70-2.09)		1379	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.104	5.104	0.0	1.000	2426752	NC			426	
813.00 > 169.00	5.104	5.104	0.0	1.000	429987		5.64(2.77-8.32)		910	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.104	5.104	0.0	1.795	5756441	2.08		83.3	5264	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.456	5.456	0.0	1.069	1755552	NC			418	
913.00 > 169.00	5.456	5.456	0.0	1.069	320365		5.48(2.55-7.64)		1334	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 26-Jul-2018 15:19:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\2018.07.26LLBB_060.d

Injection Date: 26-Jul-2018 13:15:03 Instrument ID: A9

Lims ID: CCV L4

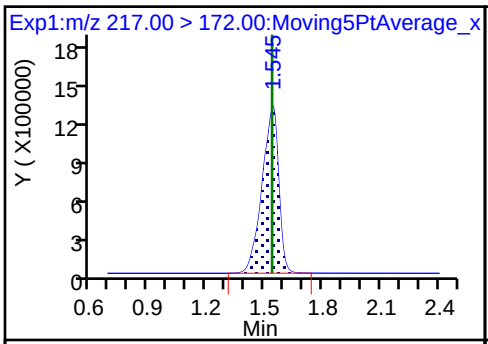
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 1

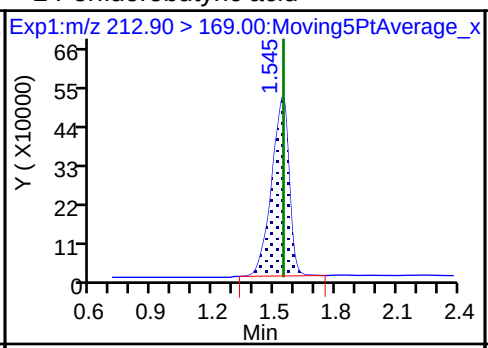
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

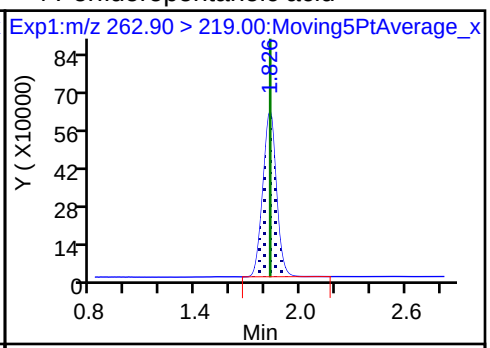
D 1 13C4 PFBA



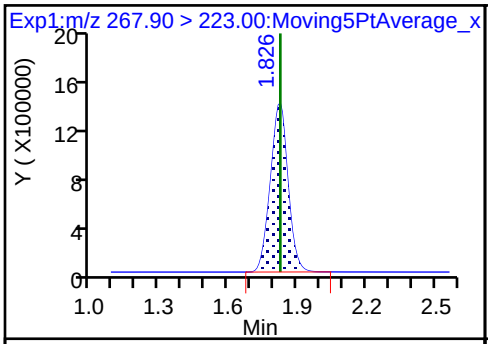
2 Perfluorobutyric acid



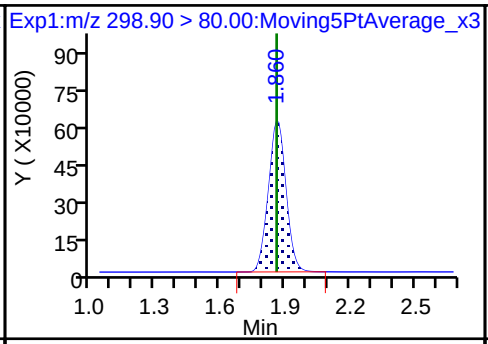
4 Perfluoropentanoic acid



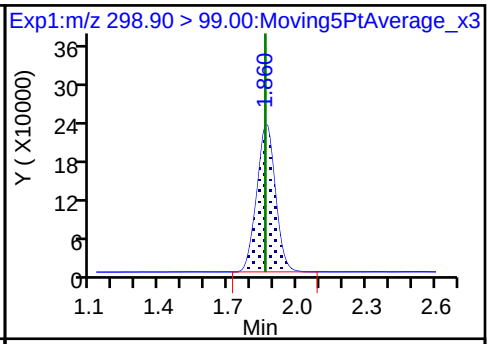
D 3 13C5-PFPeA



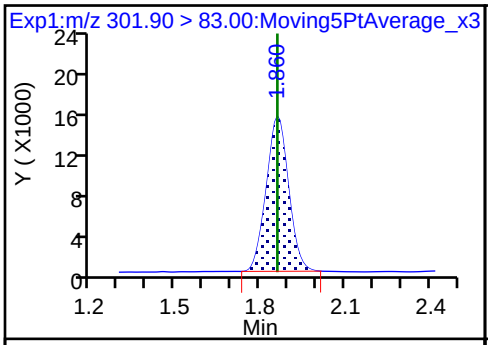
5 Perfluorobutanesulfonic acid



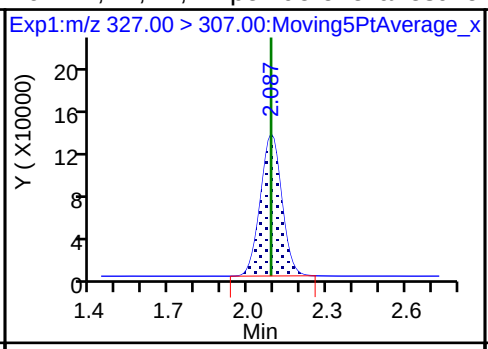
5 Perfluorobutanesulfonic acid



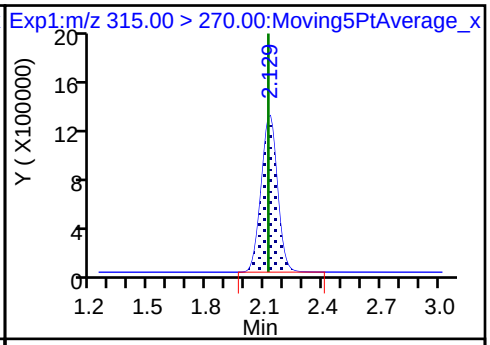
D 47 13C3-PFBS



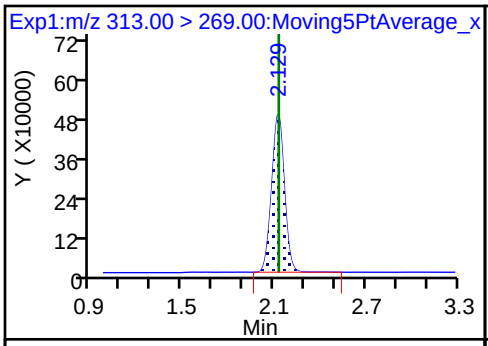
61 1H,1H,2H,2H-perfluorohexanesulfon



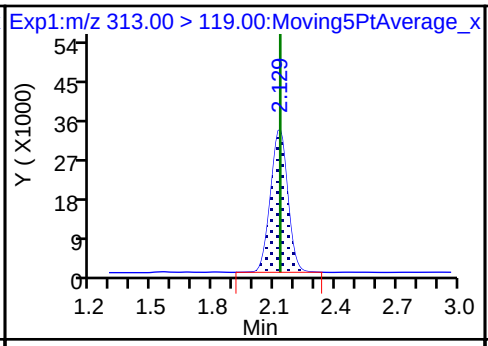
D 7 13C2 PFHxA



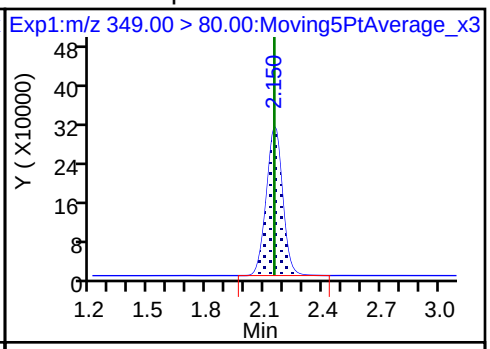
6 Perfluorohexanoic acid



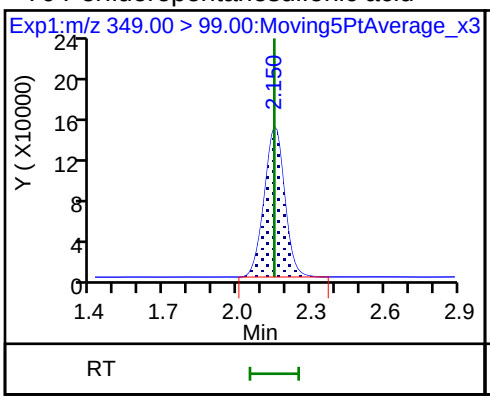
6 Perfluorohexanoic acid



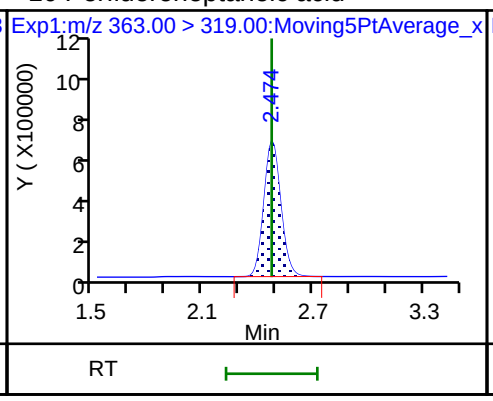
70 Perfluoropentanesulfonic acid



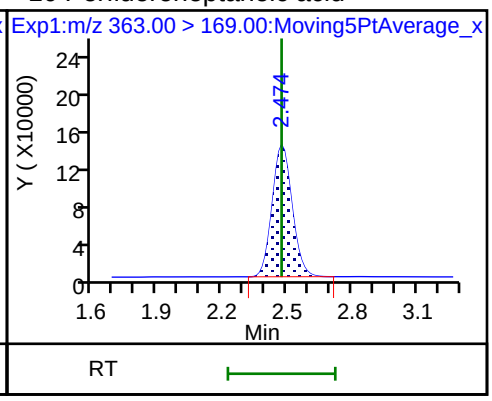
70 Perfluoropentanesulfonic acid



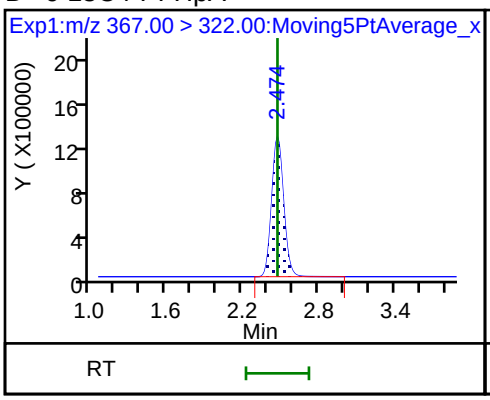
10 Perfluoroheptanoic acid



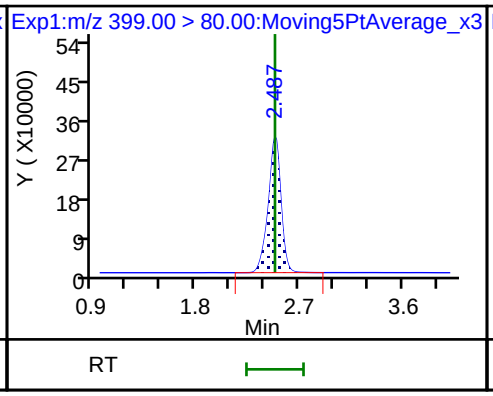
10 Perfluoroheptanoic acid



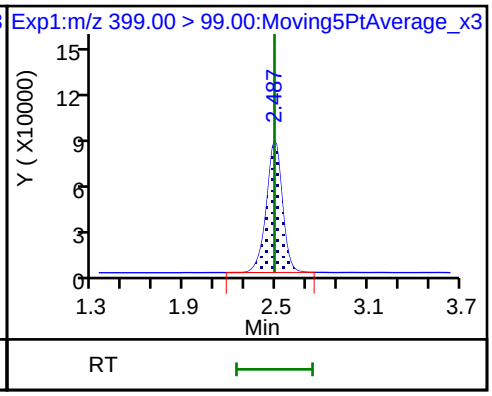
D 9 13C4-PFHpA



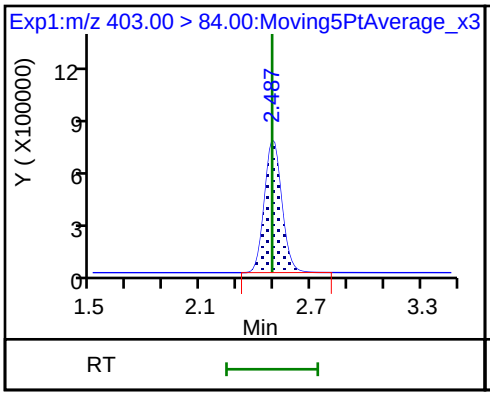
8 Perfluorohexanesulfonic acid



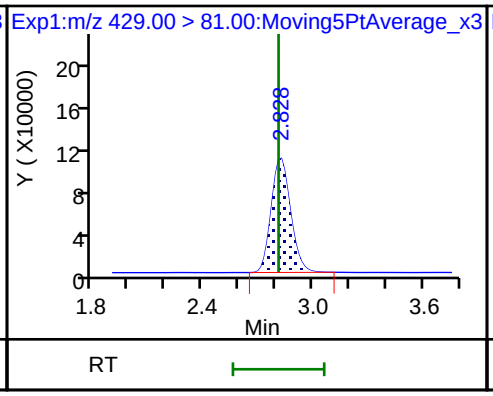
8 Perfluorohexanesulfonic acid



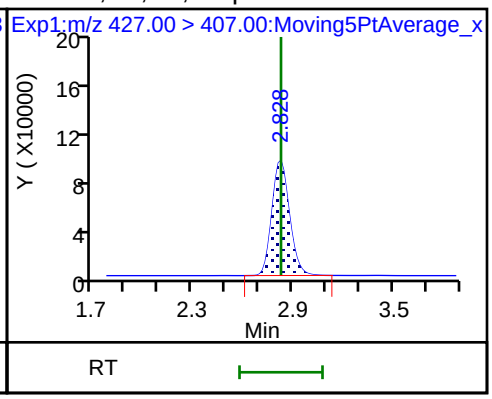
D 11 18O2 PFHxS



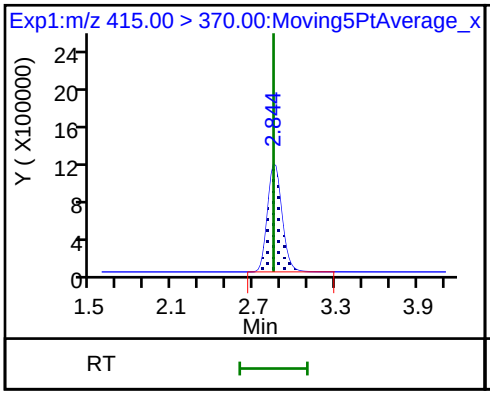
D 12 M2-6:2FTS



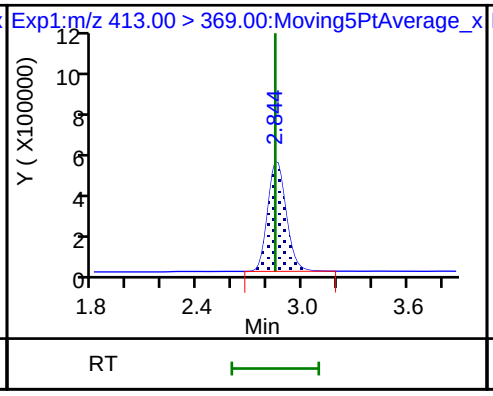
13 1H,1H,2H,2H-perfluorooctanesulfoni



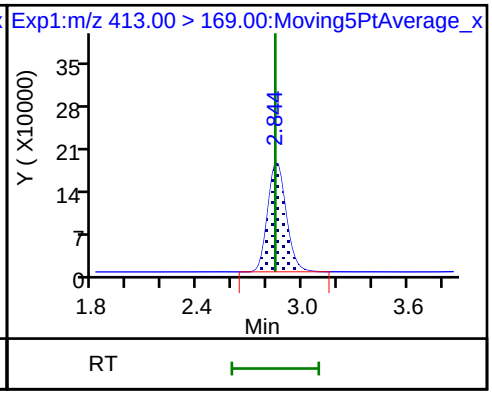
* 62 13C2-PFOA



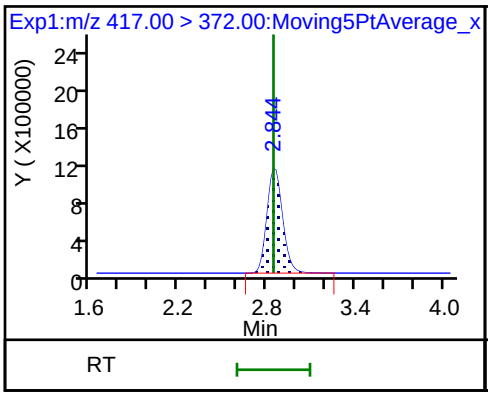
15 Perfluorooctanoic acid



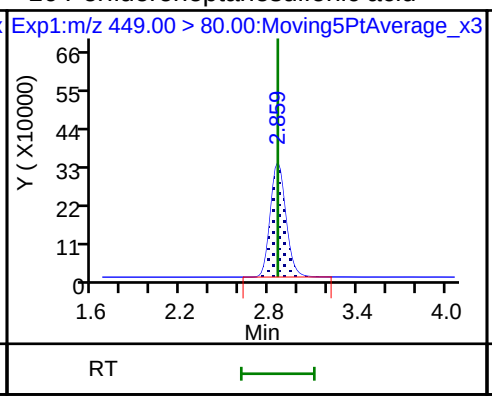
15 Perfluorooctanoic acid



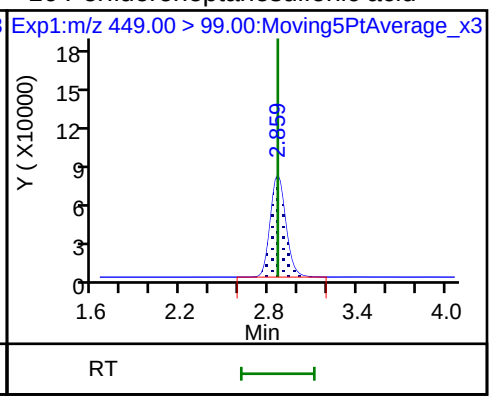
D 14 13C4 PFOA



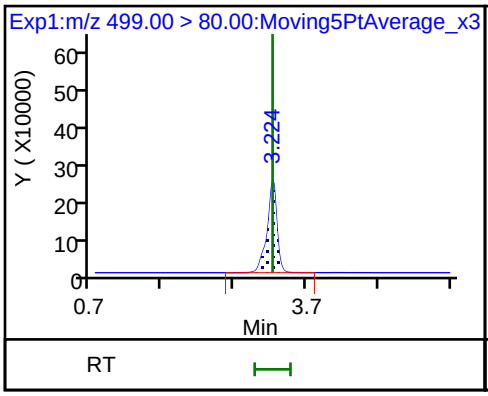
16 Perfluoroheptanesulfonic acid



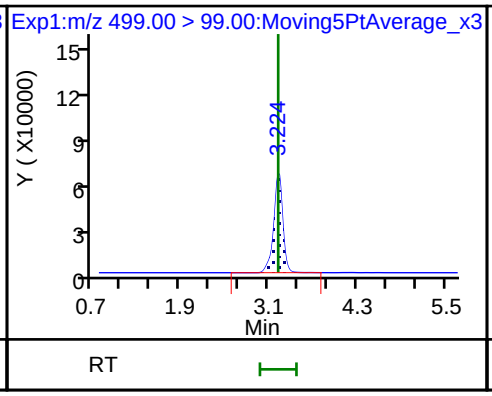
16 Perfluoroheptanesulfonic acid



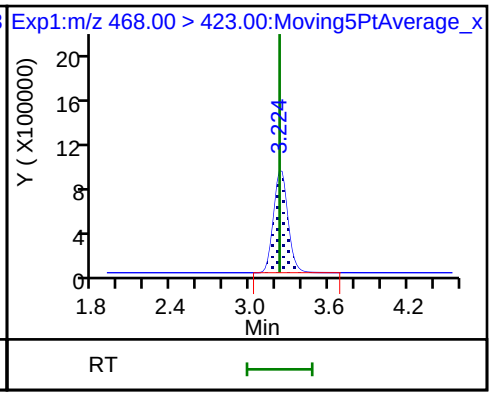
17 Perfluorooctane sulfonic acid



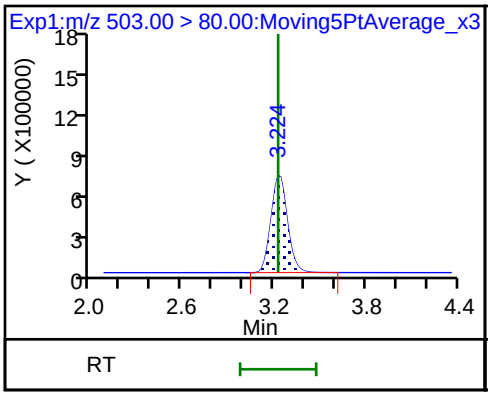
17 Perfluorooctane sulfonic acid



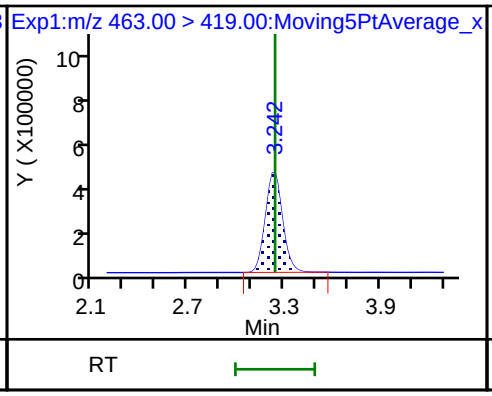
D 19 13C5 PFNA



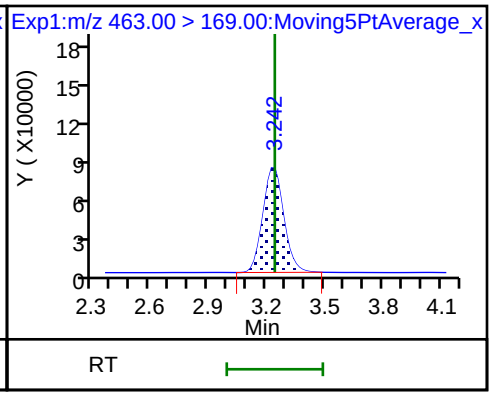
D 18 13C4 PFOS



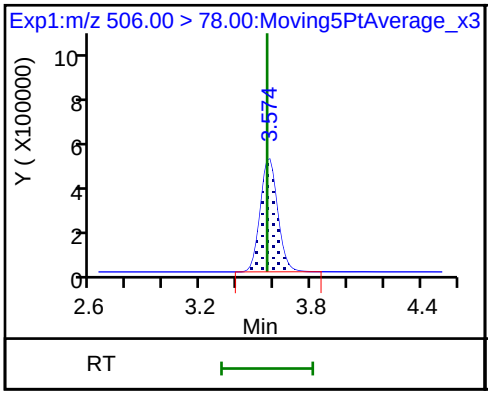
20 Perfluorononanoic acid



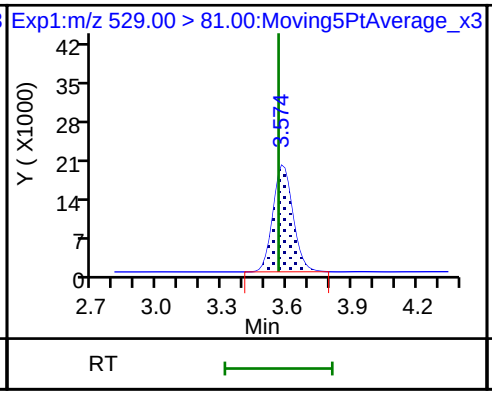
20 Perfluorononanoic acid



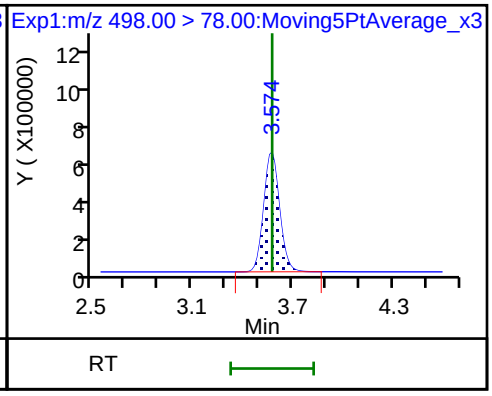
D 21 13C8 FOSA



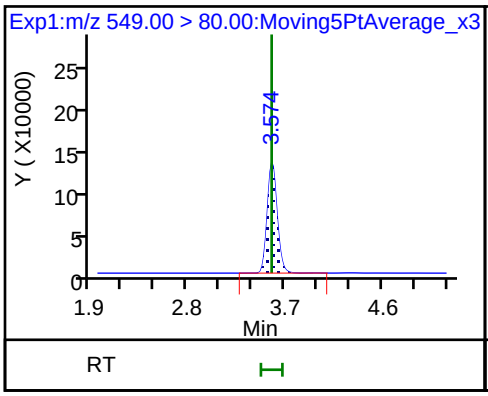
D 26 M2-8:2FTS



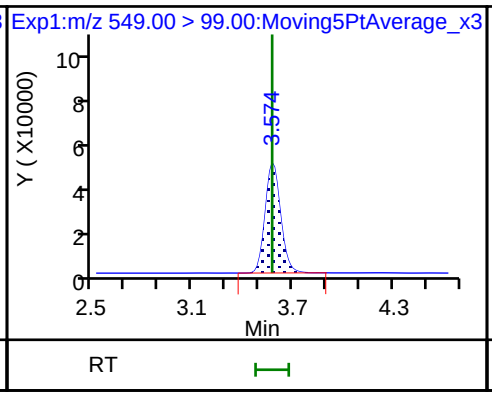
22 Perfluorooctane Sulfonamide



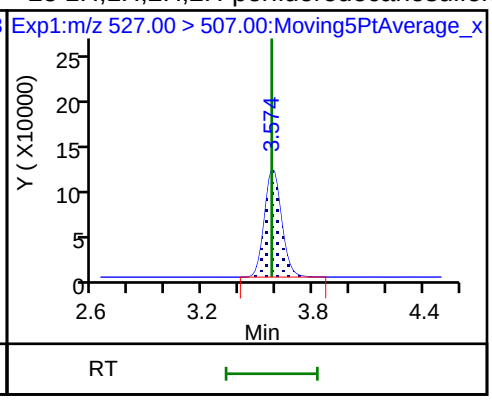
68 Perfluorononanesulfonic acid



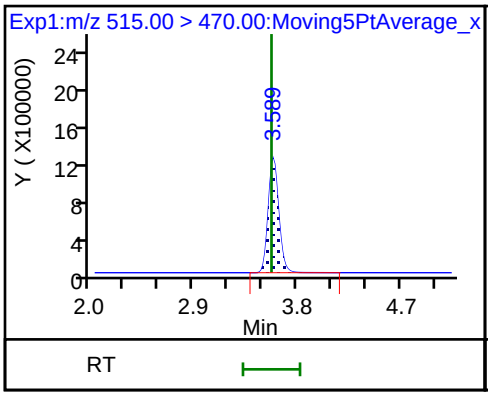
68 Perfluorononanesulfonic acid



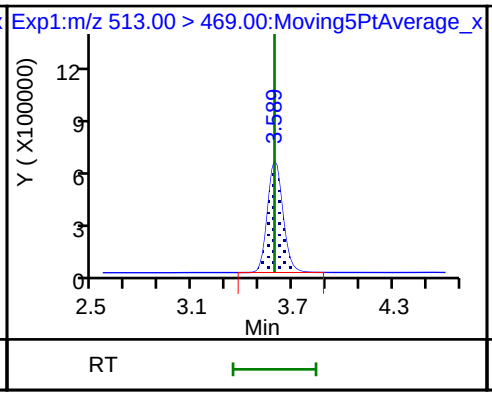
25 1H,1H,2H,2H-perfluorodecanesulfoni



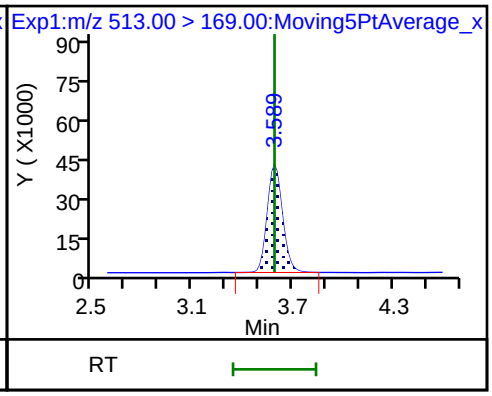
D 23 13C2 PFDA



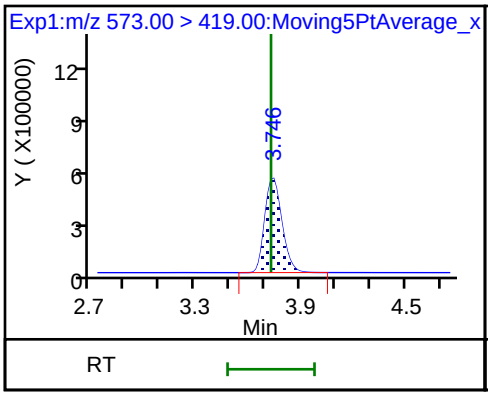
24 Perfluorodecanoic acid



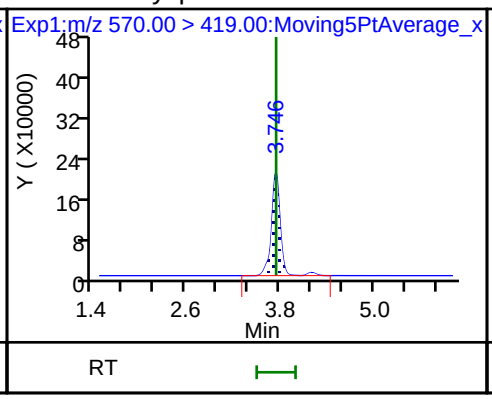
24 Perfluorodecanoic acid



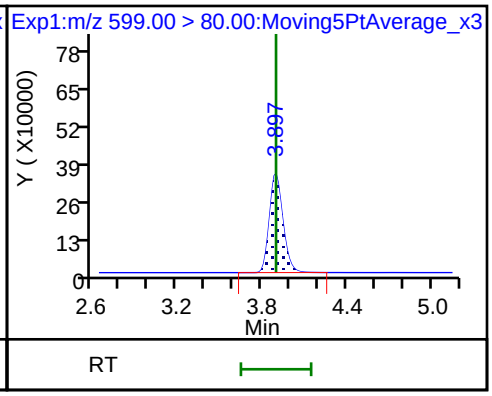
D 27 d3-NMeFOSAA



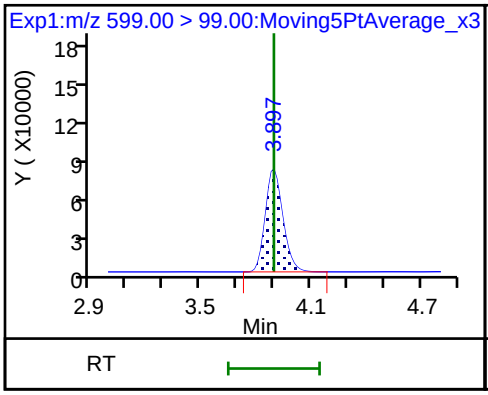
28 N-methyl perfluorooctane sulfonami



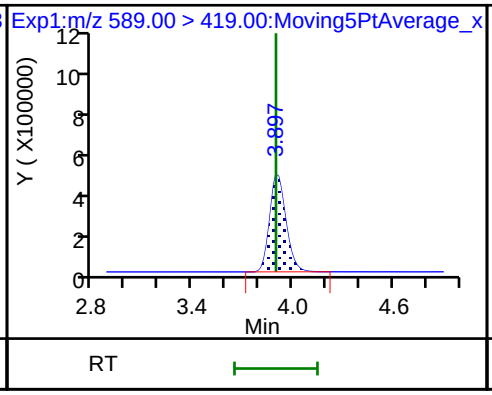
29 Perfluorodecane Sulfonic acid



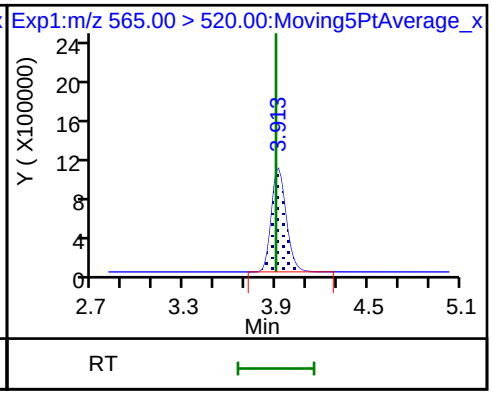
29 Perfluorodecane Sulfonic acid



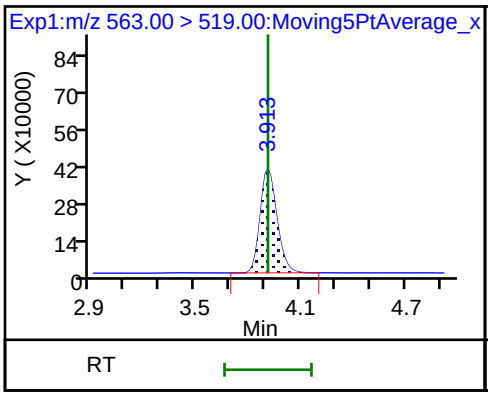
D 32 d5-NEtFOSAA



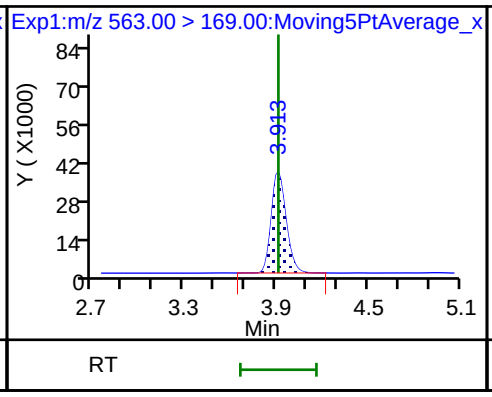
D 30 13C2 PFUnA



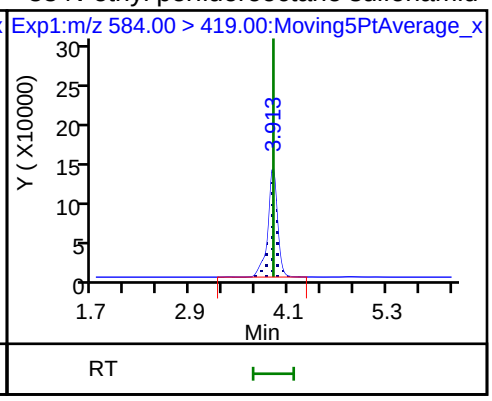
31 Perfluoroundecanoic acid



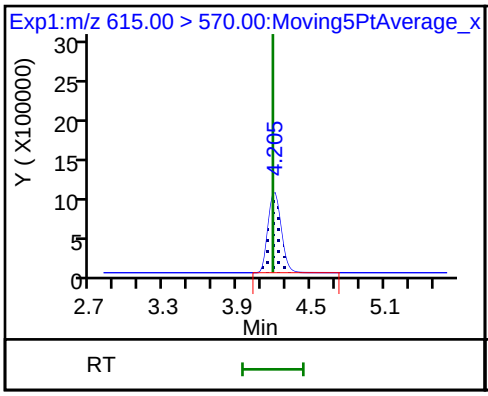
31 Perfluoroundecanoic acid



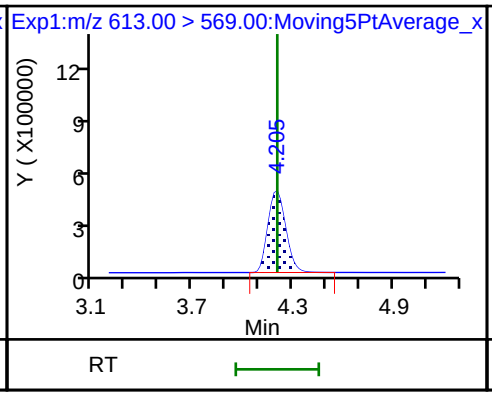
33 N-ethyl perfluorooctane sulfonamid



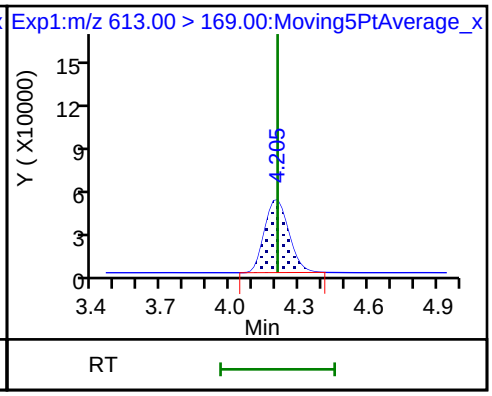
D 36 13C2 PFDoA



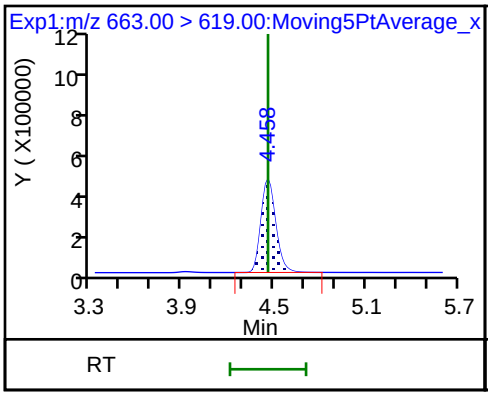
37 Perfluorododecanoic acid



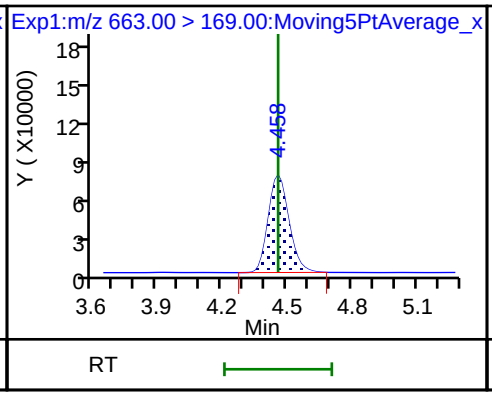
37 Perfluorododecanoic acid



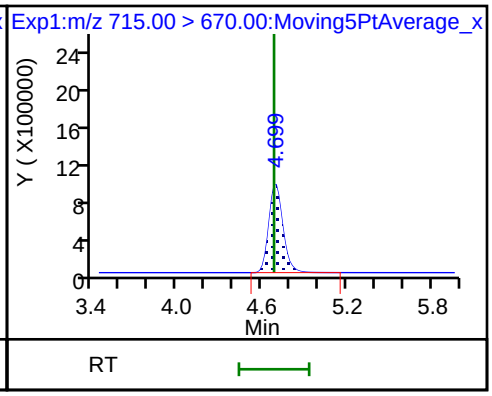
41 Perfluorotridecanoic acid



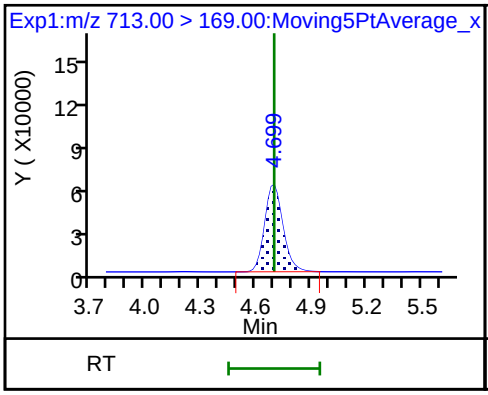
41 Perfluorotridecanoic acid



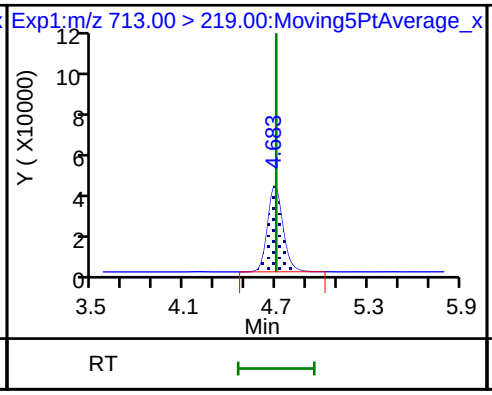
D 43 13C2-PFTeDA



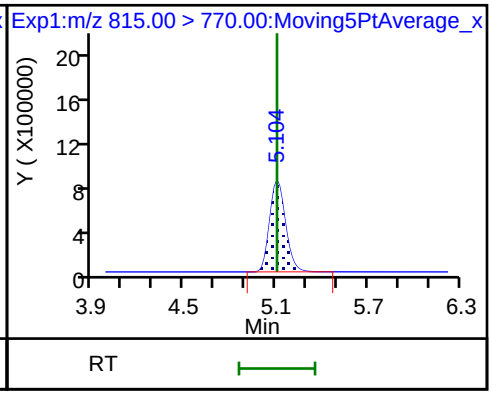
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236374/5 Calibration Date: 07/26/2018 13:45

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLBB_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9584	1.001		2.61	2.50	4.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.085	1.090		2.51	2.50	0.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	109.4	117.6		2.38	2.21	7.5	30.0
4:2 FTS	AveID	21.47	23.81		2.59	2.34	10.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9463	0.9486		2.51	2.50	0.2	30.0
Perfluoropentanesulfonic acid	AveID	52.20	58.45		2.63	2.35	12.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.102		2.51	2.50	0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.332	1.356		2.32	2.28	1.8	30.0
6:2 FTS	AveID	2.182	2.234		2.43	2.37	2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.152	1.169		2.54	2.50	1.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.066	1.180		2.63	2.38	10.7	30.0
Perfluorononanoic acid (PFNA)	AveID	1.071	1.088		2.54	2.50	1.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.126	1.211		2.49	2.32	7.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.061	3.121		2.55	2.50	1.9	30.0
8:2 FTS	AveID	15.89	16.91		2.55	2.40	6.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.174	1.234		2.63	2.50	5.1	30.0
Perfluorononanesulfonic acid	AveID	0.3922	0.4062		2.49	2.40	3.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.035	1.095		2.64	2.50	5.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.9343	1.107		2.86	2.41	18.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	1.003	0.9315		2.32	2.50	-7.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9708	0.9689		2.50	2.50	-0.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.079	1.010		2.34	2.50	-6.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.001	1.011		2.53	2.50	1.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1722	0.1614		2.34	2.50	-6.3	30.0
13C4 PFBA	Ave	0.9738	0.9258		2.38	2.50	-4.9	30.0
13C5-PFPeA	Ave	0.8956	0.8921		2.49	2.50	-0.4	30.0
13C3-PFBS	Ave	0.0113	0.0104		2.14	2.33	-8.0	30.0
13C2 PFHxA	Ave	0.9398	0.9082		2.42	2.50	-3.4	30.0
13C4-PFHpA	Ave	1.089	1.082		2.48	2.50	-0.7	30.0
18O2 PFHxS	Ave	0.6628	0.6344		2.26	2.37	-4.3	30.0
M2-6:2FTS	Ave	0.1018	0.1035		2.41	2.38	1.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Lab Sample ID: CCV 320-236374/5 Calibration Date: 07/26/2018 13:45

Instrument ID: A9 Calib Start Date: 07/20/2018 19:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 07/20/2018 20:17

Lab File ID: 2018.07.26LLBB_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9793	0.998		2.55	2.50	1.9	30.0
13C4 PFOS	Ave	0.7102	0.6685		2.25	2.39	-5.9	30.0
13C5 PFNA	Ave	0.9199	0.9314		2.53	2.50	1.2	30.0
13C8 FOSA	Ave	0.4011	0.3833		2.39	2.50	-4.4	30.0
13C2 PFDA	Ave	0.9555	0.9518		2.49	2.50	-0.4	30.0
M2-8:2FTS	Ave	0.0139	0.0152		2.62	2.40	9.3	30.0
d3-NMeFOSAA	Ave	0.4497	0.4465		2.48	2.50	-0.7	30.0
13C2 PFUnA	Ave	0.8725	0.8428		2.41	2.50	-3.4	30.0
d5-NEtFOSAA	Ave	0.3602	0.3758		2.61	2.50	4.3	30.0
13C2 PFDoA	Ave	0.9367	0.9675		2.58	2.50	3.3	30.0
13C2-PFTeDA	Ave	0.8106	0.8308		2.56	2.50	2.5	30.0
13C2-PFHxDA	Ave	0.8343	0.8403		2.52	2.50	0.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\2018.07.26LLBB_064.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 26-Jul-2018 13:45:05 ALS Bottle#: 14 Worklist Smp#: 5
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub1

Method: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 26-Jul-2018 15:20:35 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK051

First Level Reviewer: hannigana Date: 26-Jul-2018 15:20:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.545	1.538	0.007	0.543	7284919	2.38		95.1	8654	
2 Perfluorobutyric acid										
212.90 > 169.00	1.545	1.545	0.0	1.000	7294536	2.61		104	469	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.826	1.826	0.0	1.000	7652341	2.51		100	418	
D 3 13C5-PFPeA										
267.90 > 223.00	1.826	1.826	0.0	0.642	7019849	2.49		99.6	10595	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.870	1.860	0.010	1.005	8507148	2.38		108	8386	
298.90 > 99.00	1.870	1.860	0.010	1.005	3103342		2.74(1.35-4.05)		3335	
D 47 13C3-PFBS										
301.90 > 83.00	1.861	1.860	0.001	0.654	76072	2.14		92.0	721	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.087	2.087	0.0	1.122	1818809	2.59		111	14979	
D 60 M2-4:2FTS										
329.00 > 81.00	2.087	2.087	0.0	0.734	635710	NC			1472	
D 7 13C2 PFHxA										
315.00 > 270.00	2.129	2.118	0.011	0.749	7145966	2.42		96.6	18347	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.129	2.129	0.0	1.000	6778424	2.51		100	1572	
313.00 > 119.00	2.129	2.129	0.0	1.000	517275		13.10(6.96-20.87)		1348	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.150	2.150	0.0	1.155	4484706	2.63		112	12972	
349.00 > 99.00	2.150	2.150	0.0	1.155	2014592		2.23(1.15-3.45)		4399	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.233	2.233	0.0	1.000	1353171	NC			703	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.233	2.233	0.0	0.785	687160	NC			4641	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.474	2.474	0.0	1.000	9380863	2.51		100	1325	
363.00 > 169.00	2.474	2.474	0.0	1.000	2239670		4.19(2.17-6.52)		2692	
D 9 13C4-PFHpA										
367.00 > 322.00	2.474	2.474	0.0	0.870	8514018	2.48		99.3	19049	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.488	2.487	0.001	1.000	6158815	2.32		102	11789	
399.00 > 99.00	2.488	2.487	0.001	1.000	1617017		3.81(1.90-5.70)		3035	
D 11 18O2 PFHxS										
403.00 > 84.00	2.488	2.487	0.001	0.875	4721963	2.26		95.7	22001	
65 ADONA										
377.00 > 251.00	2.527	2.527	0.0	0.784	15405789	NC			32487	
377.00 > 85.00	2.527	2.527	0.0	0.784	6877524		2.24(1.05-3.16)		7089	
D 12 M2-6:2FTS										
429.00 > 81.00	2.812	2.812	0.0	0.989	773544	2.41		102	2322	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.812	2.828	-0.016	1.000	1724541	2.43		102	17045	
* 62 13C2-PFOA										
415.00 > 370.00	2.844	2.844	0.0		7868632	2.50			16328	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.844	2.844	0.0	1.000	9188855	2.54		101	1187	
413.00 > 169.00	2.844	2.844	0.0	1.000	3318786		2.77(1.36-4.08)		5553	
D 14 13C4 PFOA										
417.00 > 372.00	2.844	2.844	0.0	1.000	7851568	2.55		102	15785	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.860	2.859	0.001	0.887	5909246	2.63		111	10783	
449.00 > 99.00	2.860	2.859	0.001	0.887	1478679		4.00(1.84-5.53)		7021	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.225	3.224	0.001	1.000	5909530	2.49		108	9199	
499.00 > 99.00	3.225	3.224	0.001	1.000	1415669		4.17(2.04-6.12)		7668	
D 19 13C5 PFNA										
468.00 > 423.00	3.225	3.224	0.001	1.134	7328703	2.53		101	15157	
D 18 13C4 PFOS										
503.00 > 80.00	3.225	3.224	0.001	1.134	5028602	2.25		94.1	7145	
20 Perfluorononanoic acid										
463.00 > 419.00	3.225	3.242	-0.017	1.000	7973749	2.54		102	2541	
463.00 > 169.00	3.225	3.242	-0.017	1.000	1505669		5.30(2.68-8.03)		3498	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.436	3.436	0.0	1.066	6917695	NC			9403	
D 21 13C8 FOSA										
506.00 > 78.00	3.560	3.560	0.0	1.252	3015902	2.39		95.6	9820	
D 26 M2-8:2FTS										
529.00 > 81.00	3.574	3.560	0.014	1.257	114590	2.62		109	1070	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.560	3.574	-0.014	1.000	9411537	2.55		102	10740	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.574	3.574	0.0	1.109	2051243	2.49		104	7257	
549.00 > 99.00	3.574	3.574	0.0	1.109	717727		2.86(1.42-4.26)		2549	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.574	3.574	0.0	1.000	1938076	2.55		106	6273	
D 23 13C2 PFDA										
515.00 > 470.00	3.574	3.574	0.0	1.257	7489002	2.49		99.6	13552	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.574	3.589	-0.015	1.000	9239874	2.63		105	2351	
513.00 > 169.00	3.574	3.589	-0.015	1.000	656820		14.07(7.12-21.35)		1558	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.731	3.730	0.001	1.312	3513326	2.48		99.3	4810	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.731	3.746	-0.015	1.000	3846010	2.64		106	17378	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.884	3.897	-0.013	1.204	5613426	2.86		118	7228	
599.00 > 99.00	3.884	3.897	-0.013	1.204	1226859		4.58(2.14-6.43)		6449	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.897	3.897	0.0	1.370	2956916	2.61		104	5370	
D 30 13C2 PFUnA										
565.00 > 520.00	3.897	3.897	0.0	1.370	6631425	2.41		96.6	14762	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.897	3.913	-0.016	1.000	6425360	2.50		99.8	2074	
563.00 > 169.00	3.897	3.913	-0.016	1.000	596561		10.77(5.24-15.72)		2896	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.897	3.913	-0.016	1.000	2754243	2.32		92.8	5043	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.055	4.071	-0.016	1.258	8562573	NC			15662	
D 36 13C2 PFDoA										
615.00 > 570.00	4.188	4.187	0.001	1.472	7613098	2.58		103	9943	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.188	4.205	-0.017	1.000	7691817	2.34		93.6	2069	
613.00 > 169.00	4.188	4.205	-0.017	1.000	925300		8.31(4.68-14.05)		2340	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.458	4.458	0.0	1.065	7698063	2.53		101	2217	
663.00 > 169.00	4.458	4.458	0.0	1.065	1266416		6.08(3.09-9.27)		2648	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.699	4.683	0.016	1.652	6537456	2.56		103	15788	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.699	4.699	0.0	1.000	1055102	2.34		93.7	2280	
713.00 > 219.00	4.683	4.699	-0.016	0.997	811522		1.30(0.70-2.09)		2320	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.104	5.104	0.0	1.000	6428691	NC			1083	
813.00 > 169.00	5.104	5.104	0.0	1.000	1257675		5.11(2.77-8.32)		2002	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.104	5.104	0.0	1.795	6611769	2.52		101	6163	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.456	5.456	0.0	1.069	4880382	NC			1060	
913.00 > 169.00	5.456	5.456	0.0	1.069	954775		5.11(2.55-7.64)		2250	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 26-Jul-2018 15:20:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61704.b\2018.07.26LLBB_064.d

Injection Date: 26-Jul-2018 13:45:05 Instrument ID: A9

Lims ID: CCV L5

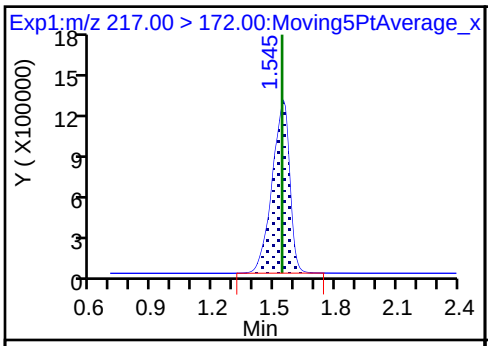
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 5

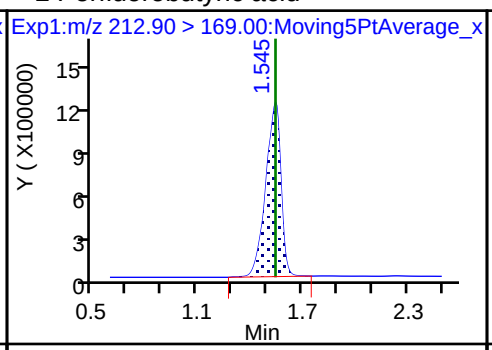
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

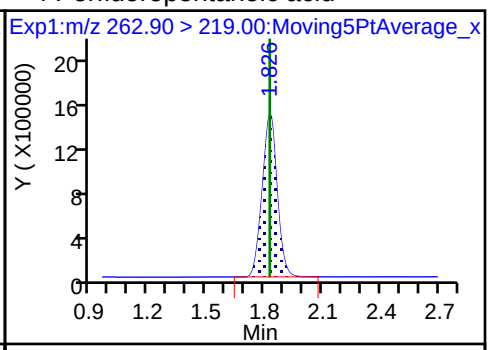
D 1 13C4 PFBA



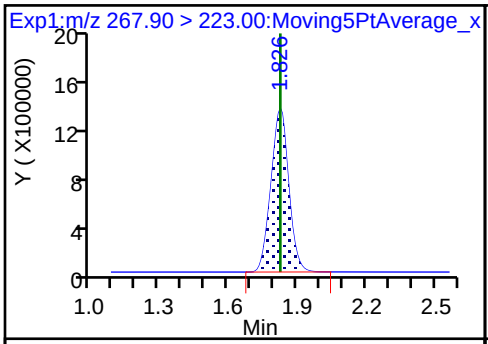
2 Perfluorobutyric acid



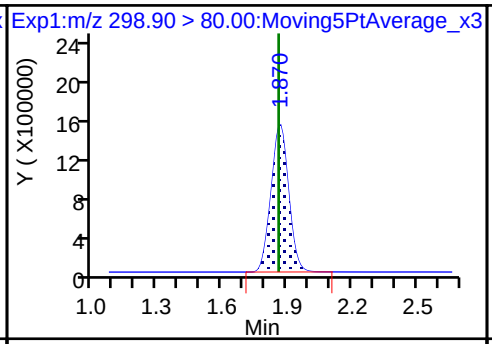
4 Perfluoropentanoic acid



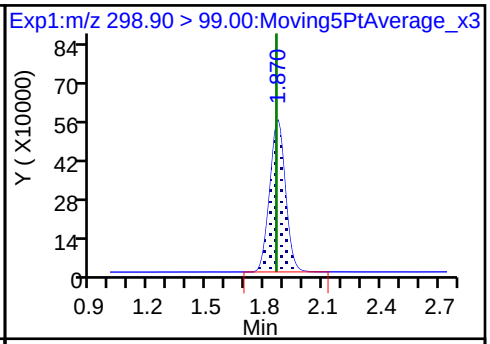
D 3 13C5-PFPeA



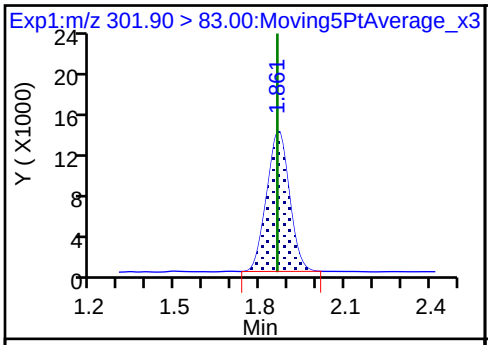
5 Perfluorobutanesulfonic acid



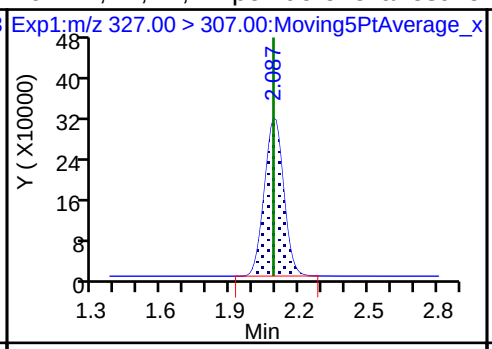
5 Perfluorobutanesulfonic acid



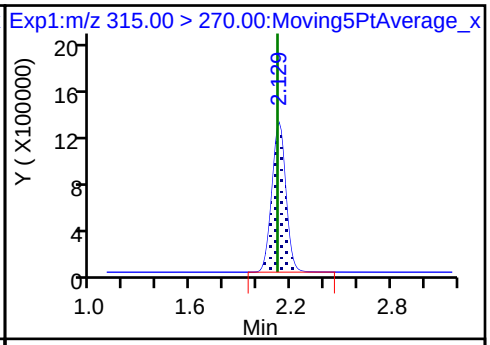
D 47 13C3-PFBS



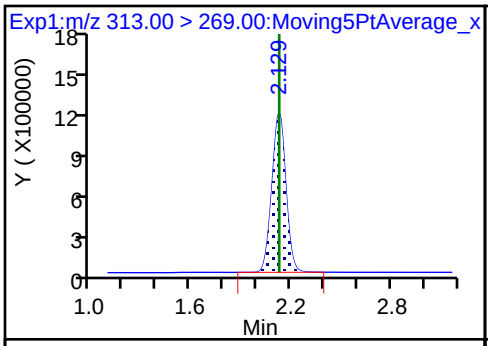
61 1H,1H,2H,2H-perfluorohexanesulfon



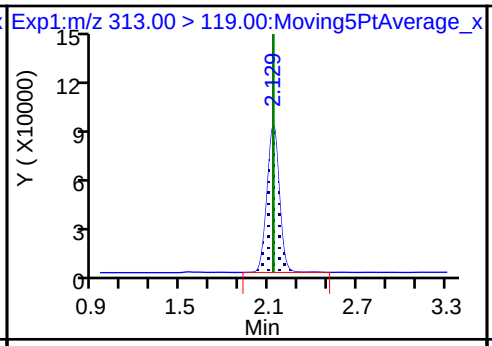
D 7 13C2 PFHxA



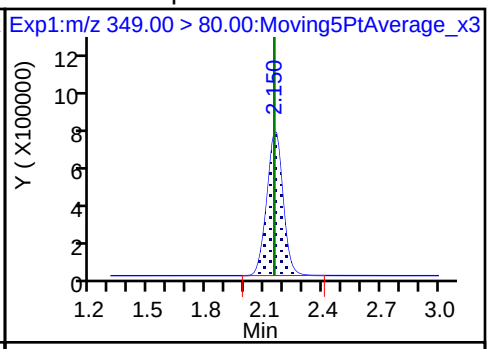
6 Perfluorohexanoic acid



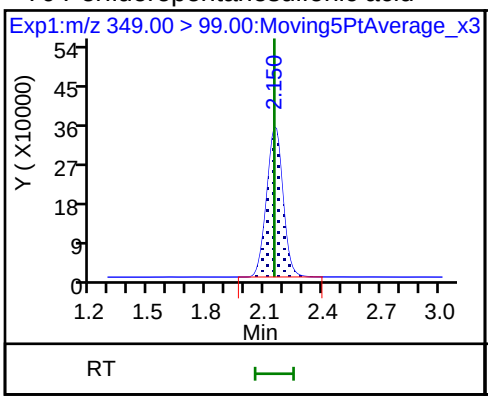
6 Perfluorohexanoic acid



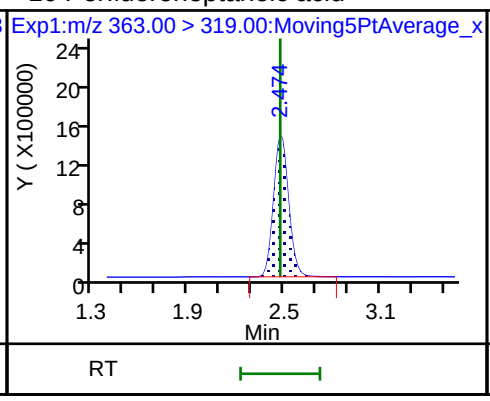
70 Perfluoropentanesulfonic acid



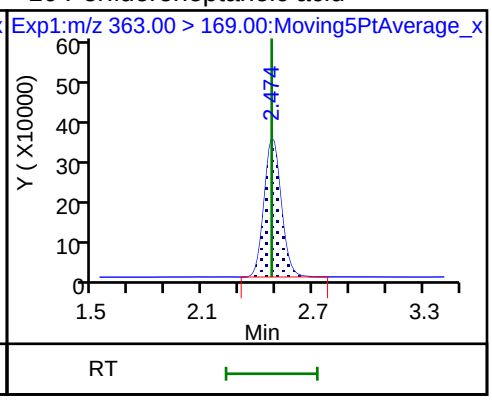
70 Perfluoropentanesulfonic acid



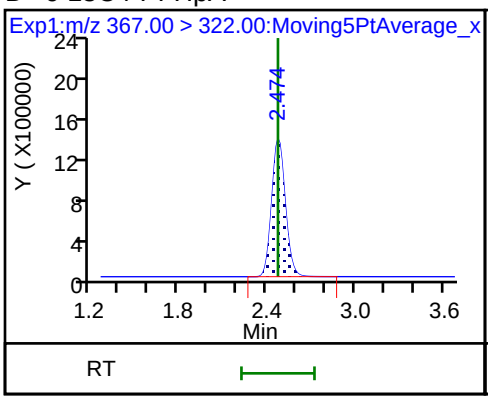
10 Perfluoroheptanoic acid



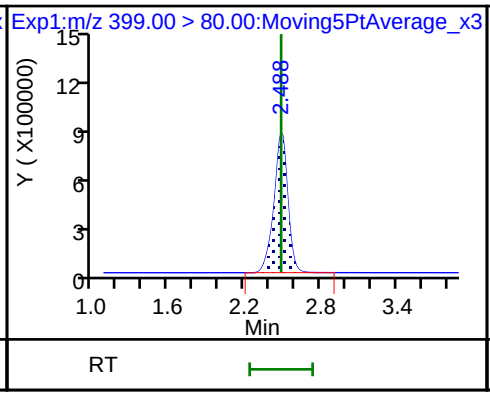
10 Perfluoroheptanoic acid



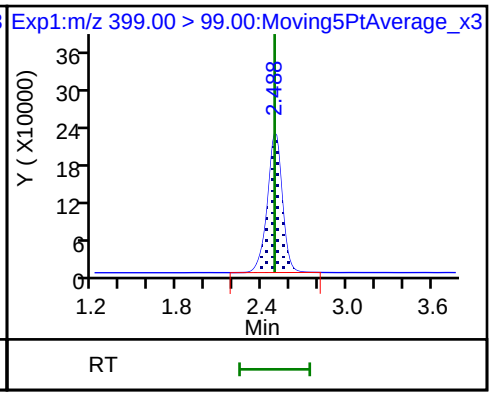
D 9 13C4-PFHpA



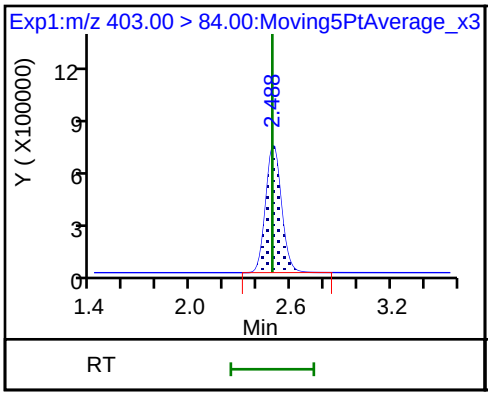
8 Perfluorohexanesulfonic acid



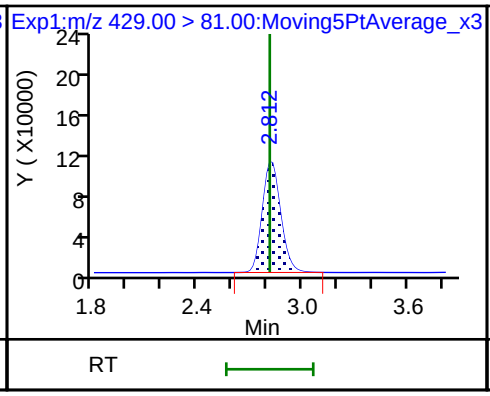
8 Perfluorohexanesulfonic acid



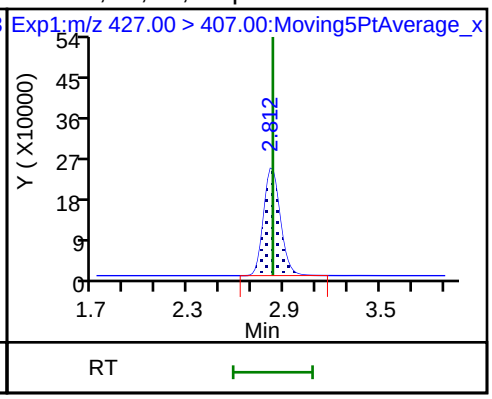
D 11 18O2 PFHxS



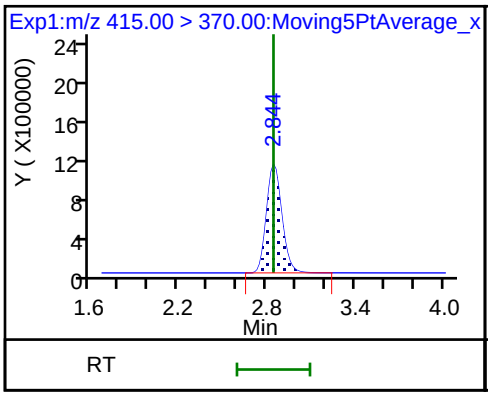
D 12 M2-6:2FTS



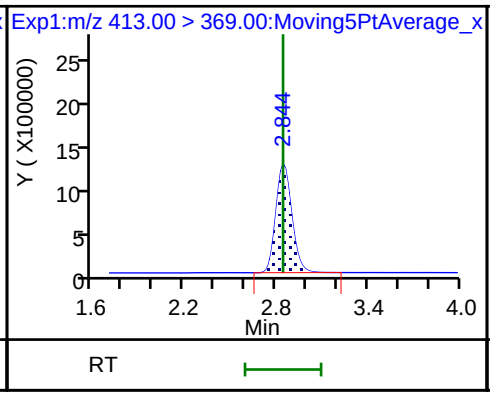
13 1H,1H,2H,2H-perfluorooctanesulfoni



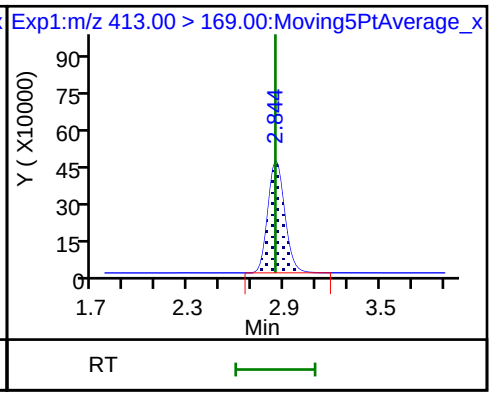
* 62 13C2-PFOA



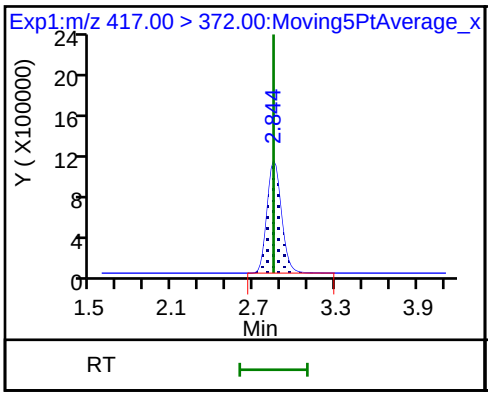
15 Perfluorooctanoic acid



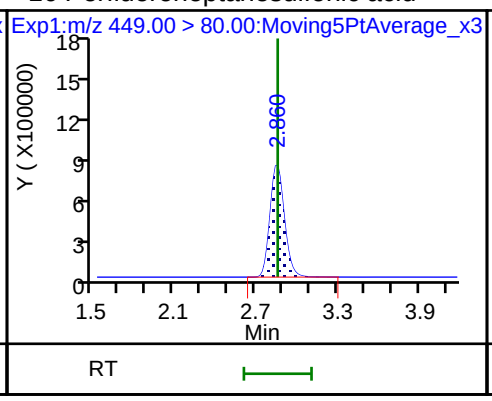
15 Perfluorooctanoic acid



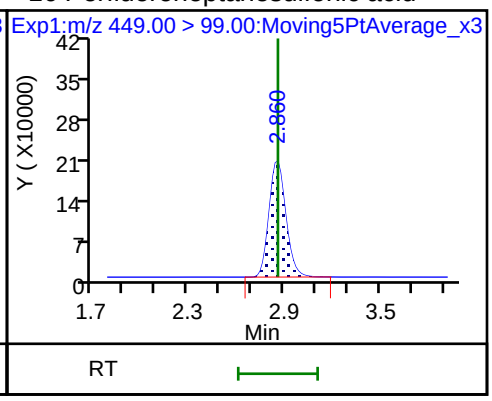
D 14 13C4 PFOA



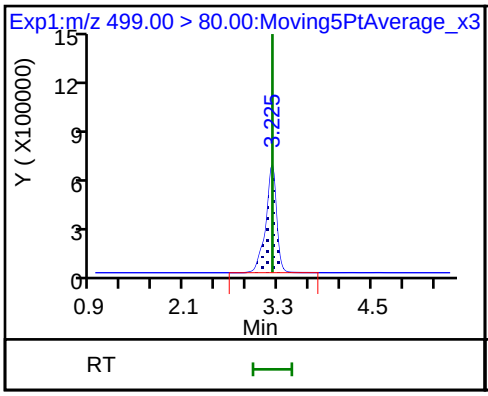
16 Perfluoroheptanesulfonic acid



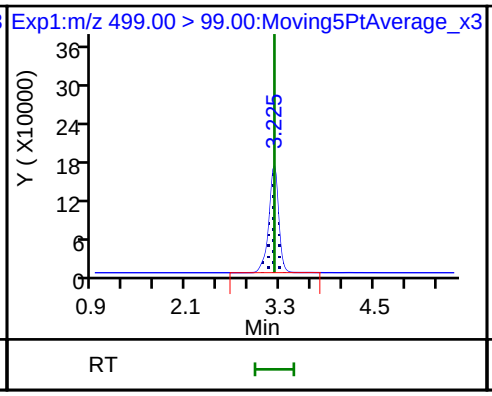
16 Perfluoroheptanesulfonic acid



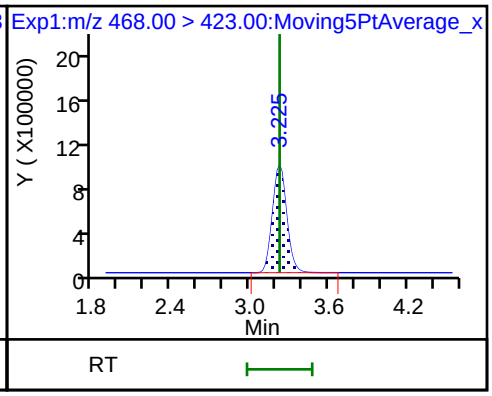
17 Perfluorooctane sulfonic acid



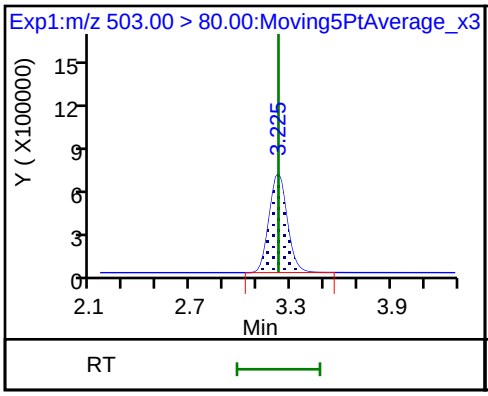
17 Perfluorooctane sulfonic acid



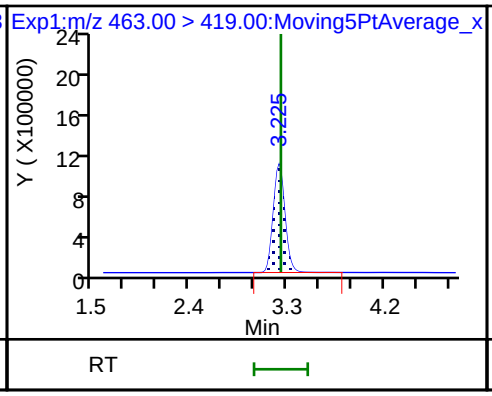
D 19 13C5 PFNA



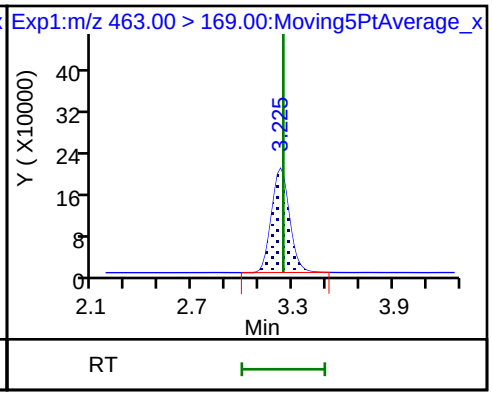
D 18 13C4 PFOS



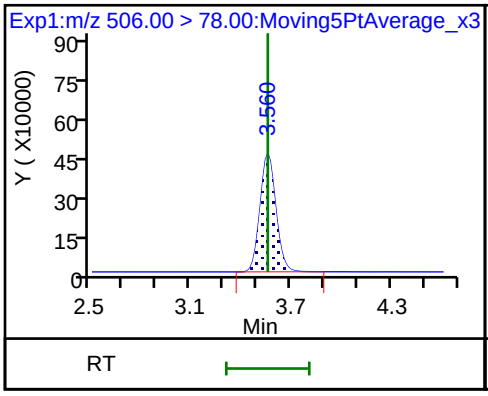
20 Perfluorononanoic acid



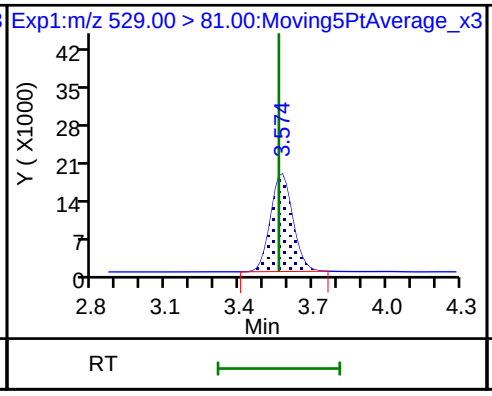
20 Perfluorononanoic acid



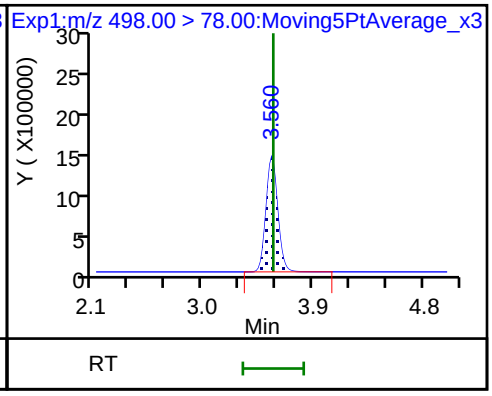
D 21 13C8 FOSA



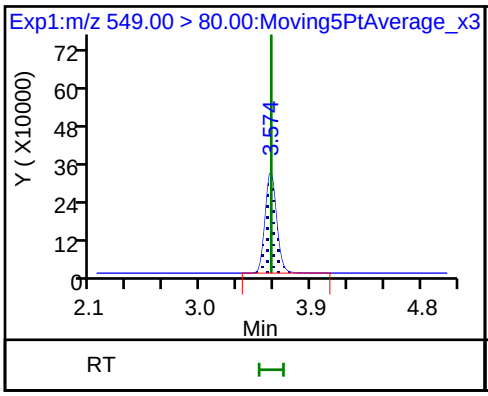
D 26 M2-8:2FTS



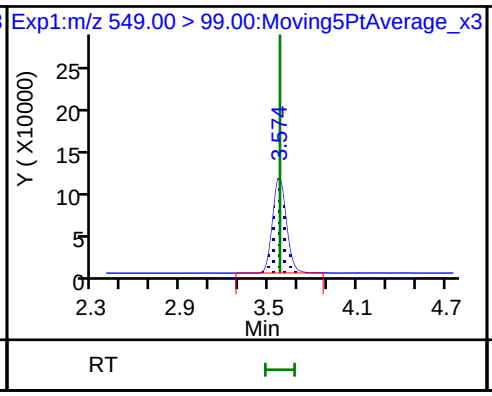
22 Perfluorooctane Sulfonamide



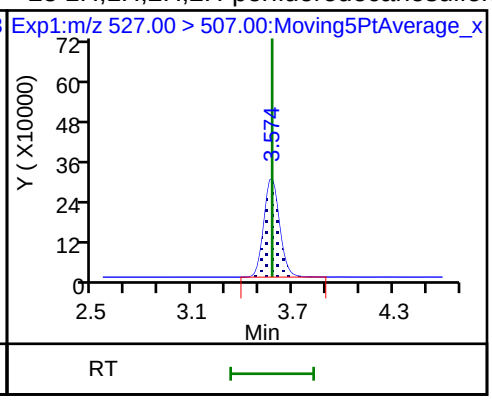
68 Perfluorononanesulfonic acid



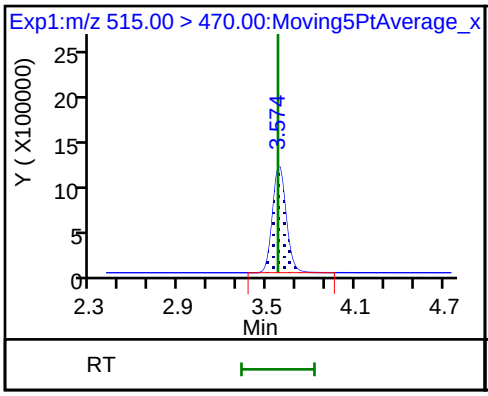
68 Perfluorononanesulfonic acid



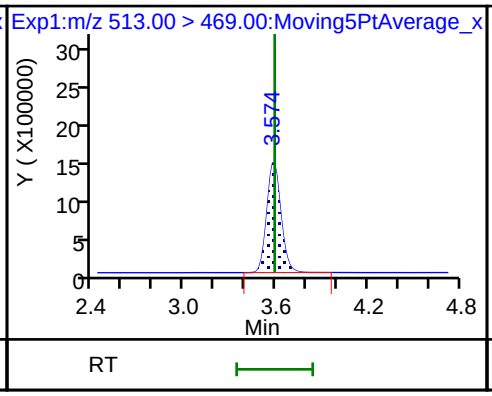
25 1H,1H,2H,2H-perfluorodecanesulfoni



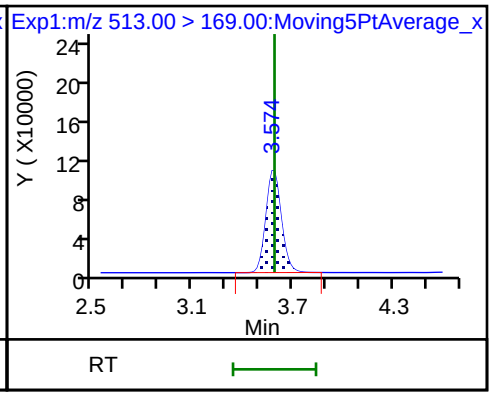
D 23 13C2 PFDA



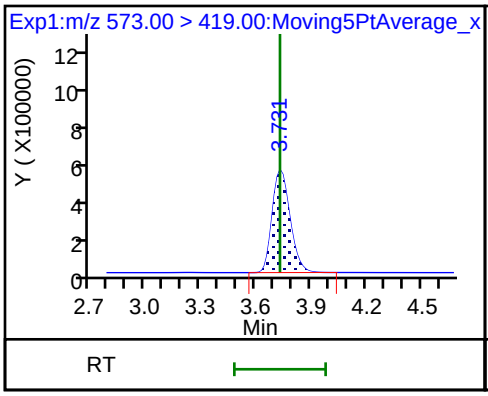
24 Perfluorodecanoic acid



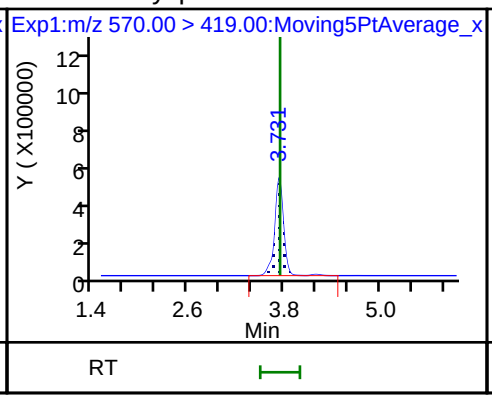
24 Perfluorodecanoic acid



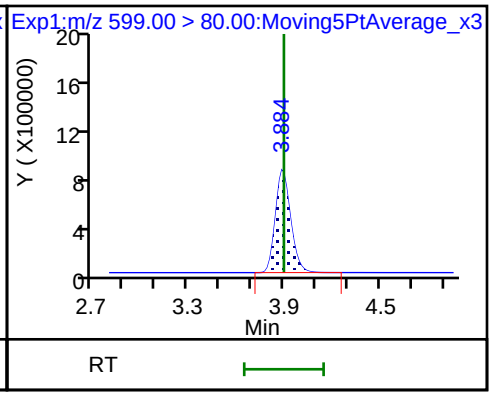
D 27 d3-NMeFOSAA



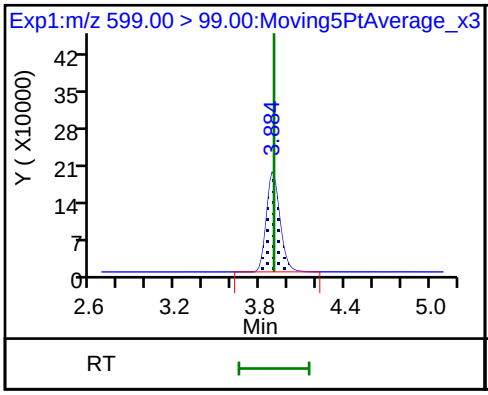
28 N-methyl perfluorooctane sulfonami



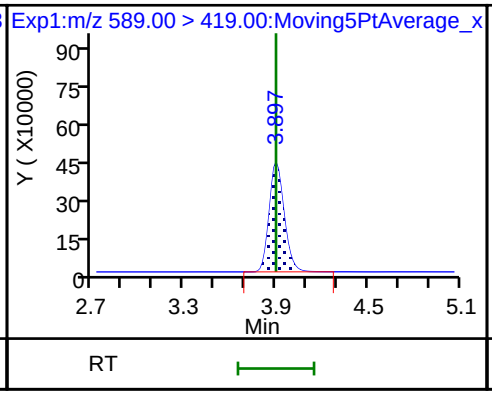
29 Perfluorodecane Sulfonic acid



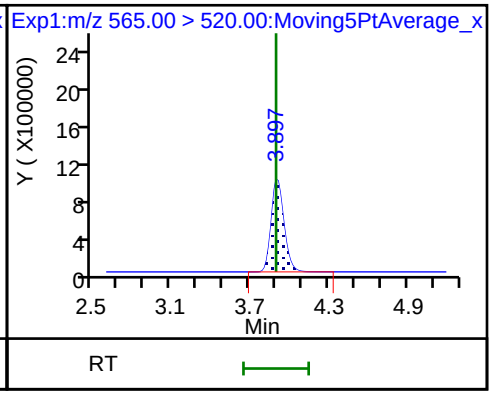
29 Perfluorodecane Sulfonic acid



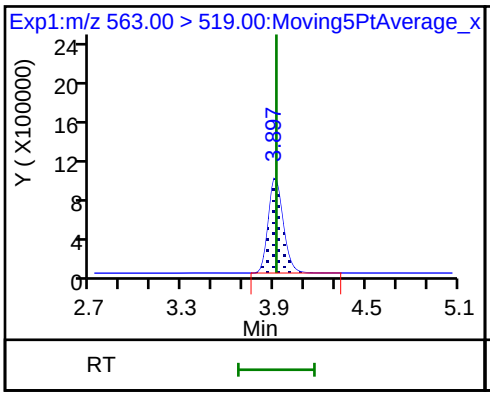
D 32 d5-NEtFOSAA



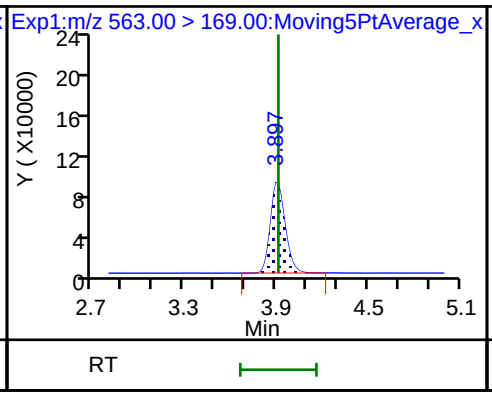
D 30 13C2 PFUnA



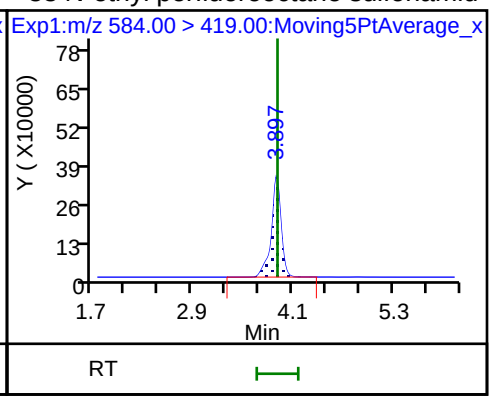
31 Perfluoroundecanoic acid



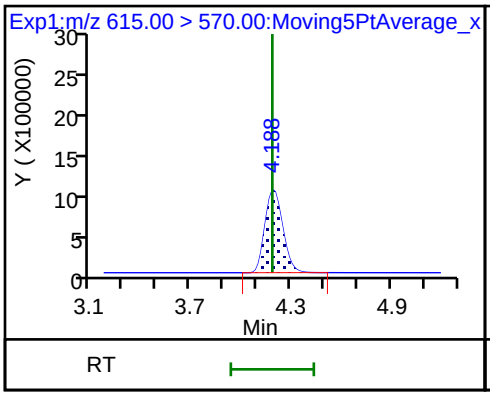
31 Perfluoroundecanoic acid



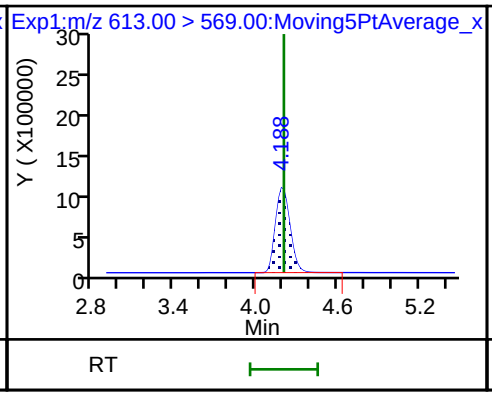
33 N-ethyl perfluorooctane sulfonamid



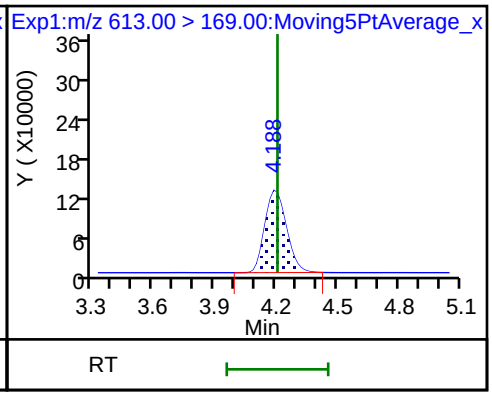
D 36 13C2 PFDoA



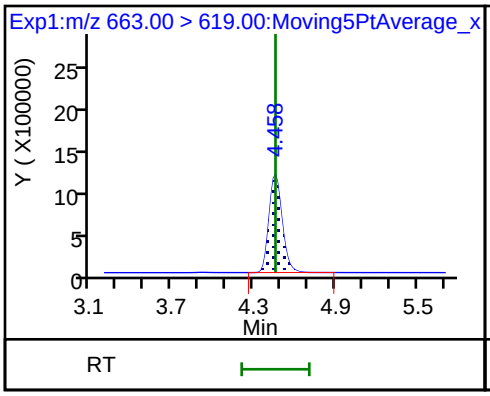
37 Perfluorododecanoic acid



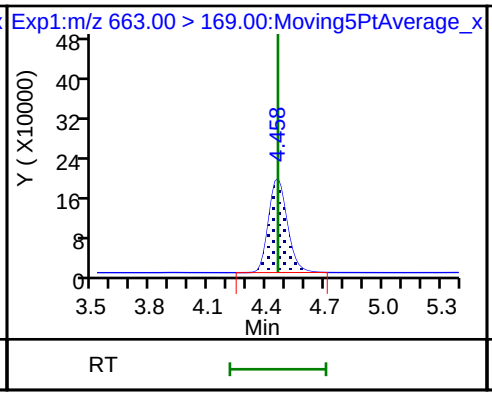
37 Perfluorododecanoic acid



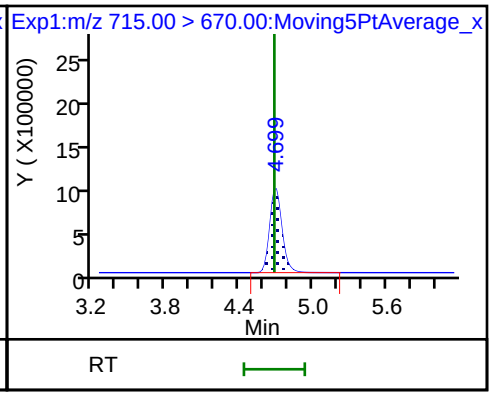
41 Perfluorotridecanoic acid



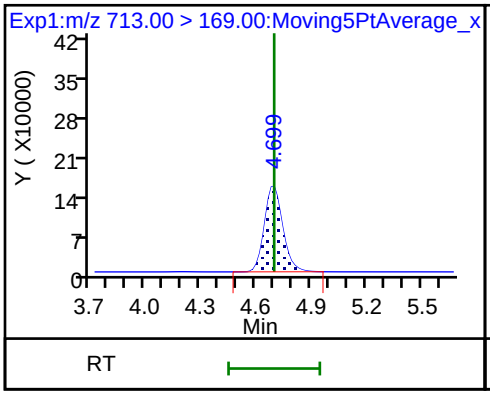
41 Perfluorotridecanoic acid



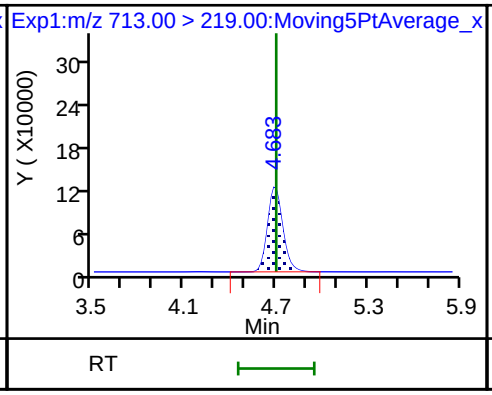
D 43 13C2-PFTeDA



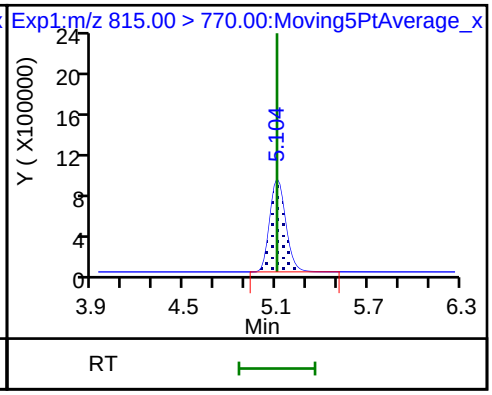
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-234633/1-A
Matrix: Solid
Lab File ID: 2018.07.30LLA_006.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.00(g)
Date Analyzed: 07/30/2018 03:36
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.20	U	0.30	0.20	0.078
335-67-1	Perfluorooctanoic acid (PFOA)	0.20	U M	0.30	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.20	U	0.30	0.20	0.081
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.18	U	0.40	0.18	0.059
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.20	U	0.30	0.20	0.062
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.50	U M	1.0	0.50	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	95		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	95		50-150
STL00994	18O2 PFHxS	96		50-150
STL00991	13C4 PFOS	96		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_006.d
Lims ID: MB 320-234633/1-A
Client ID:
Sample Type: MB
Inject. Date: 30-Jul-2018 03:36:46 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-234633/1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:45:31 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:45:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.400	1.389	0.011	1.004	14401	0.007542			7.1	
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.396	-0.001	0.541	4856970	2.39		95.6	98459	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.640	-0.003	0.635	3431452	2.42		96.7	56442	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.674	-0.003	0.648	82005	2.20		94.8	648	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.738	3744975	2.25		90.0	81053	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.000	2.014	-0.014	0.775	332868	NC			11251	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.225	0.012	1.000	15921	0.006485			174	
399.00 > 99.00	2.251	2.225	0.026	1.006	5788		2.75(1.50-4.49)		18.3	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.240	-0.014	0.863	3811143	2.22		88.9	93171	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4976666	2.26		95.6	76254	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.545	0.009	1.000	8552	0.0180			194	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.564	-0.010	0.990	667416	1.39		58.7	9765	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.571	0.008		4382707	2.50			71089	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.587	2.571	0.016	1.003	11107	0.006096			12.5	
413.00 > 169.00	2.602	2.571	0.031	1.009	19385		0.57(0.84-2.52)		109	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3753120	2.24		89.5	61132	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.946	2.935	0.011	1.000	19188	0.0119			396	M
499.00 > 99.00	2.940	2.935	0.005	0.998	4558		4.21(2.31-6.93)		29.5	M
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.953	-0.007	1.142	3421265	2.37		94.6	79127	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.953	-0.007	1.142	3497646	2.28		95.6	62576	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.299	-0.004	1.278	1136929	2.28		95.1	21818	
D 23 13C2 PFDA										
515.00 > 470.00	3.303	3.314	-0.011	1.281	2935372	2.55		102	48112	
D 21 13C8 FOSA										
506.00 > 78.00	3.318	3.322	-0.004	1.287	4314882	1.92		76.7	56906	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.467	-0.013	1.339	977354	2.57		103	21272	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.627	3.628	-0.001	0.997	5538	0.004825			32.7	M
563.00 > 169.00	3.627	3.628	-0.001	0.997	1185		4.67(2.12-6.36)		47.2	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.640	-0.013	1.406	1145375	2.87		115	3597	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.640	-0.003	1.410	2312291	2.49		99.8	43979	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.930	-0.002	1.523	2049714	2.33		93.0	22748	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.437	-0.011	1.716	1995949	2.32		92.8	20424	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.832	4.823	0.009	1.002	27560	NC			5.2	
813.00 > 169.00	4.832	4.823	0.009	1.002	5089		5.42(2.86-8.58)		67.3	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.842	-0.019	1.870	3071210	2.35		94.0	13082	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 09:45:32 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_006.d

Injection Date: 30-Jul-2018 03:36:46 Instrument ID: A8_N

Lims ID: MB 320-234633/1-A

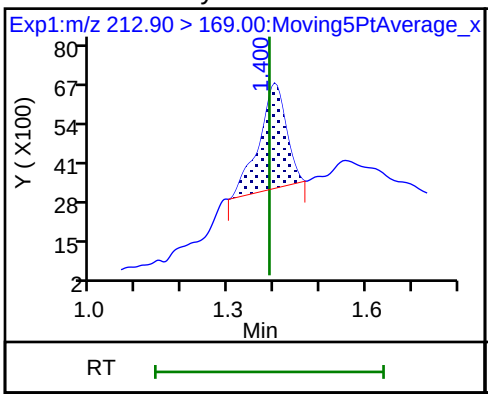
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 1 Worklist Smp#: 4

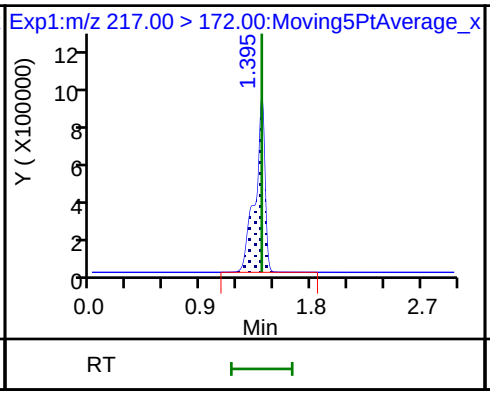
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

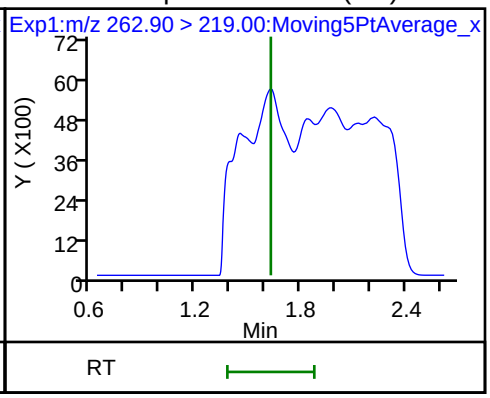
2 Perfluorobutyric acid



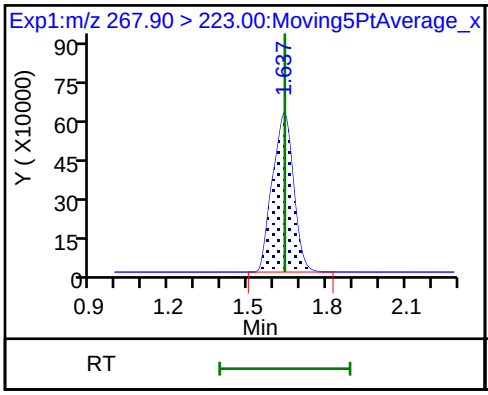
D 1 13C4 PFBA



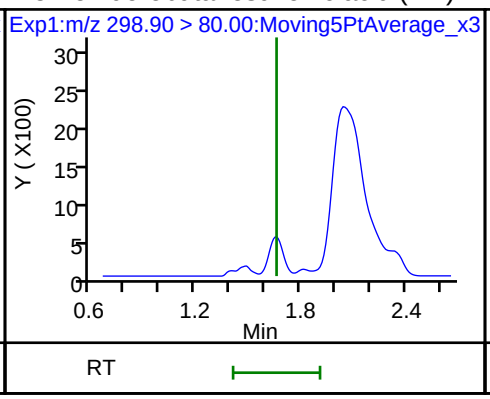
4 Perfluoropentanoic acid (ND)



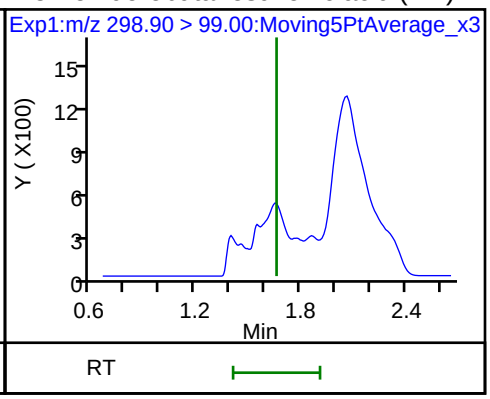
D 3 13C5-PFPeA



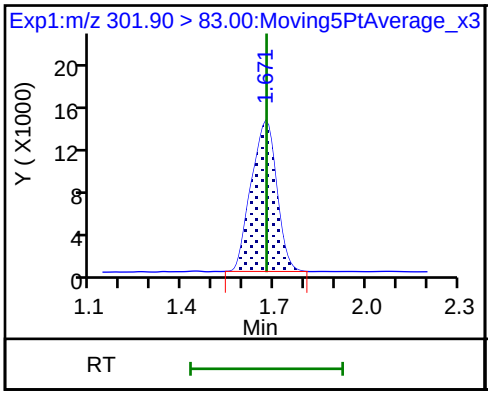
5 Perfluorobutanesulfonic acid (ND)



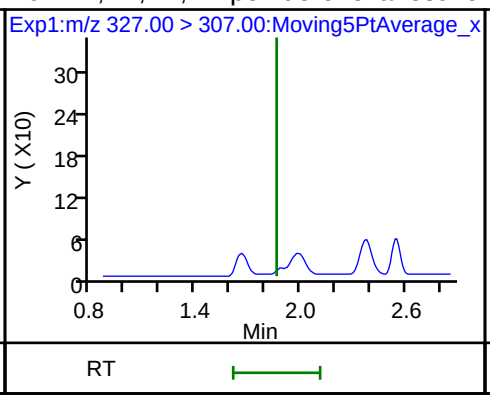
5 Perfluorobutanesulfonic acid (ND)



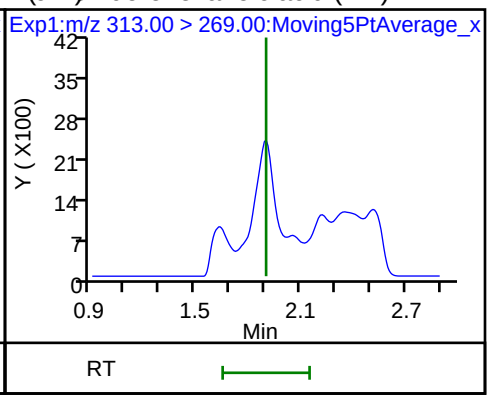
D 47 13C3-PFBS



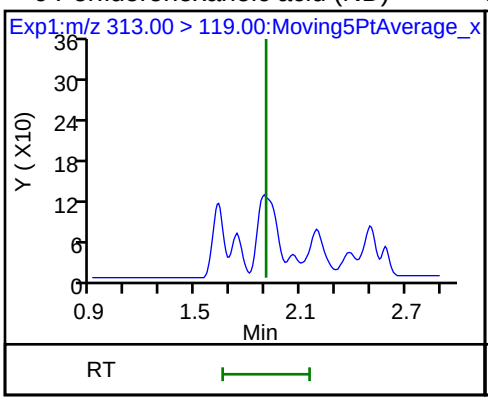
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



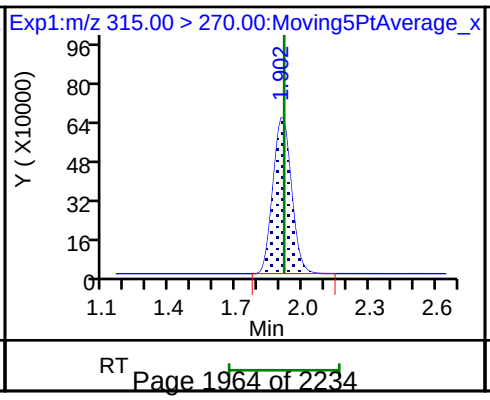
6 Perfluorohexanoic acid (ND)



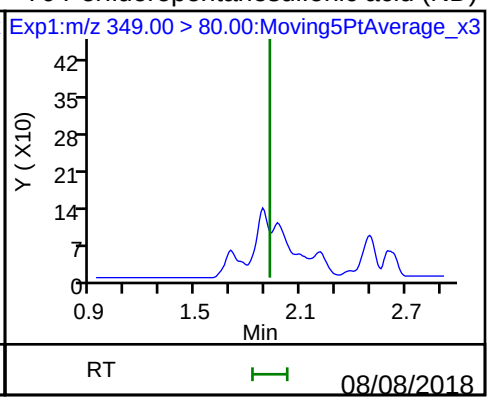
6 Perfluorohexanoic acid (ND)



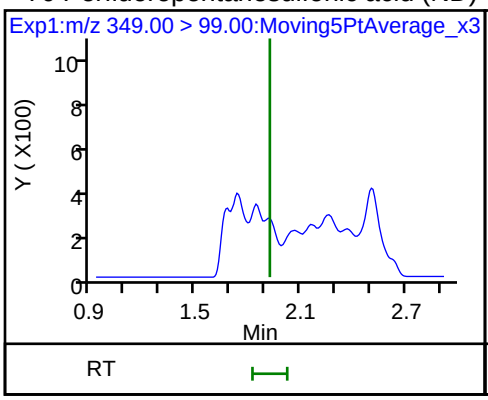
D 7 13C2 PFHxA



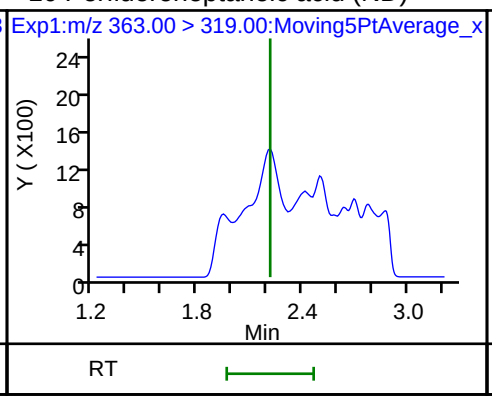
70 Perfluoropentanesulfonic acid (ND)



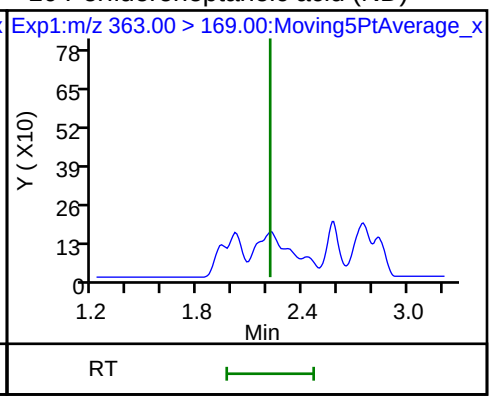
70 Perfluoropentanesulfonic acid (ND)



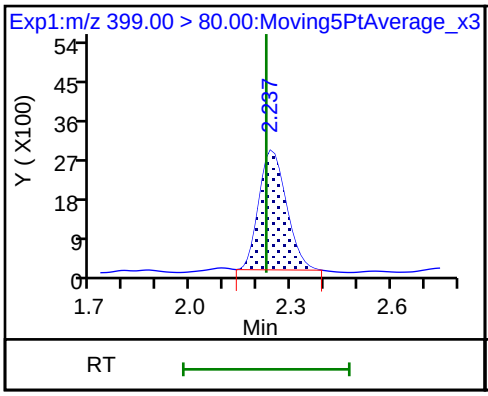
10 Perfluoroheptanoic acid (ND)



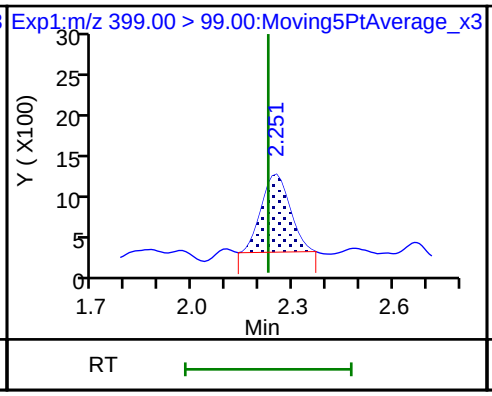
10 Perfluoroheptanoic acid (ND)



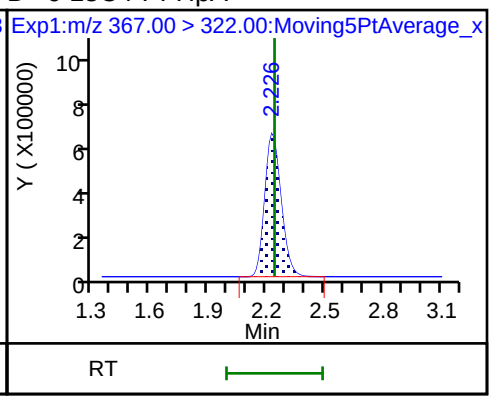
8 Perfluorohexanesulfonic acid



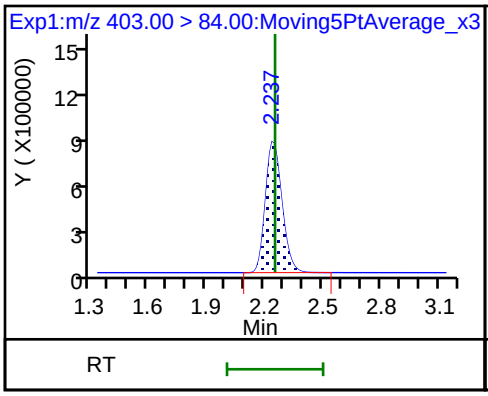
8 Perfluorohexanesulfonic acid



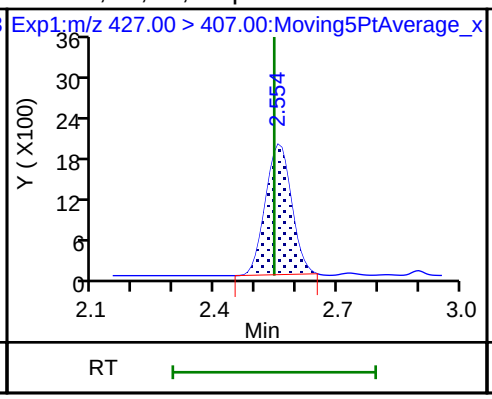
D 9 13C4-PFHpA



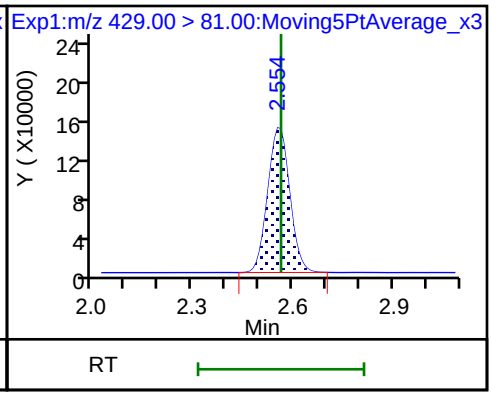
D 11 18O2 PFHxS



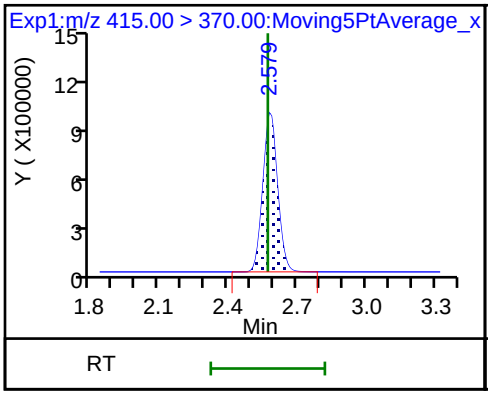
13 1H,1H,2H,2H-perfluorooctanesulfon



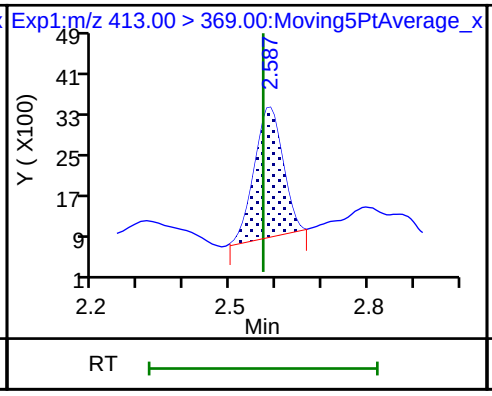
D 12 M2-6:2FTS



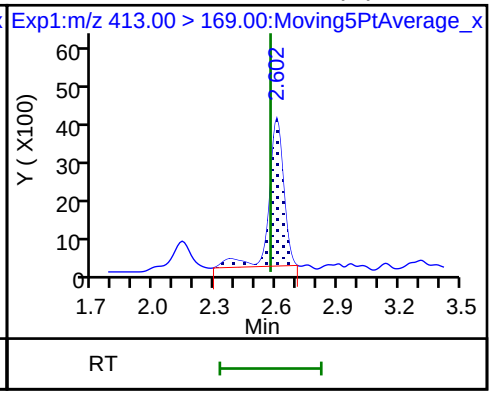
* 62 13C2-PFOA



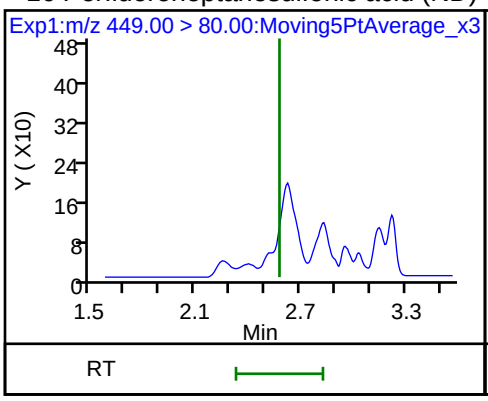
15 Perfluorooctanoic acid



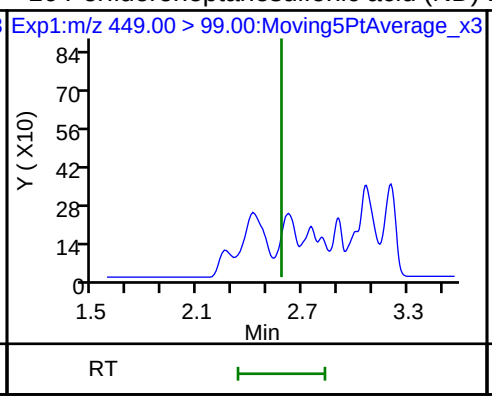
15 Perfluorooctanoic acid (M)



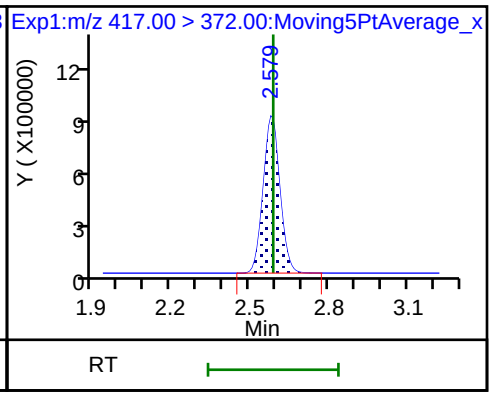
16 Perfluoroheptanesulfonic acid (ND)



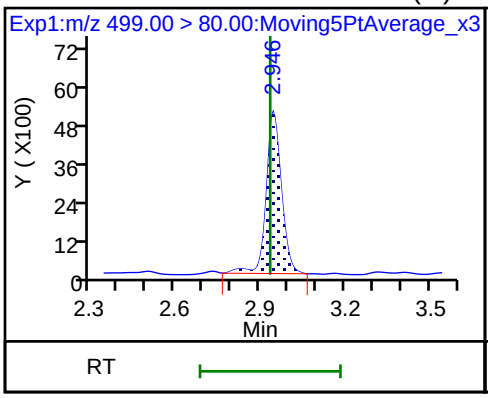
16 Perfluoroheptanesulfonic acid (ND)



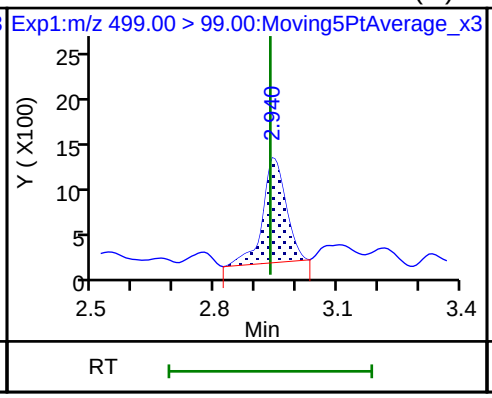
D 14 13C4 PFOA



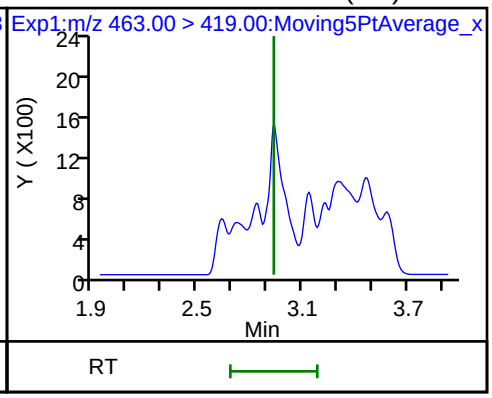
17 Perfluorooctane sulfonic acid (M)



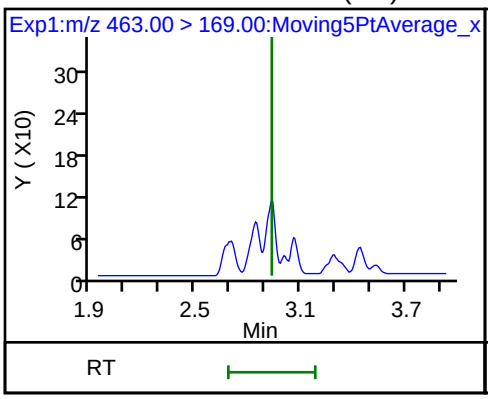
17 Perfluorooctane sulfonic acid (M)



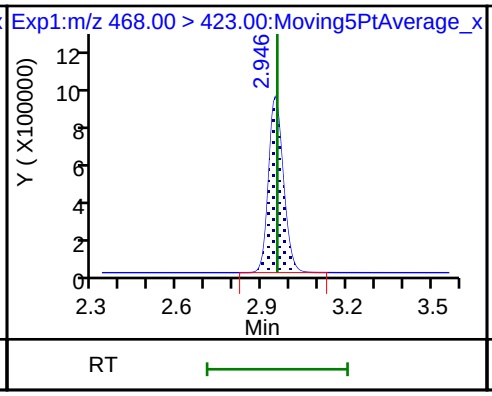
20 Perfluorononanoic acid (ND)



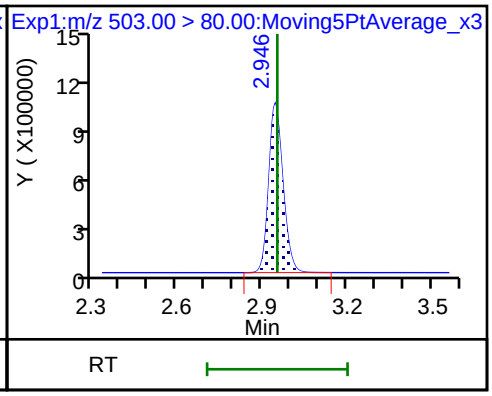
20 Perfluorononanoic acid (ND)



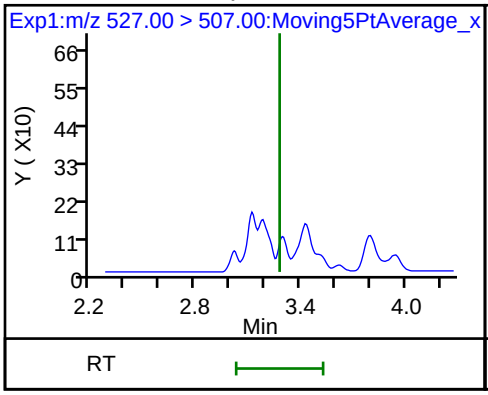
D 19 13C5 PFNA



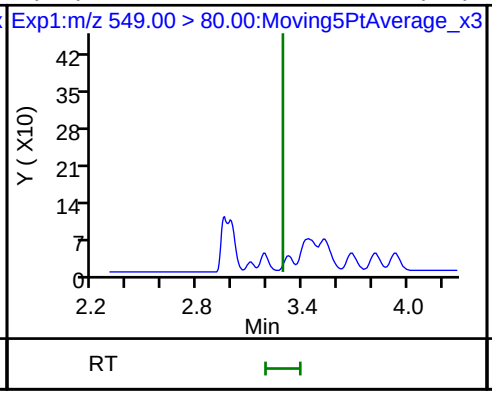
D 18 13C4 PFOS



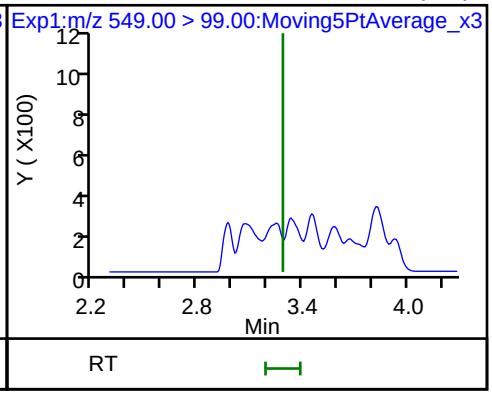
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



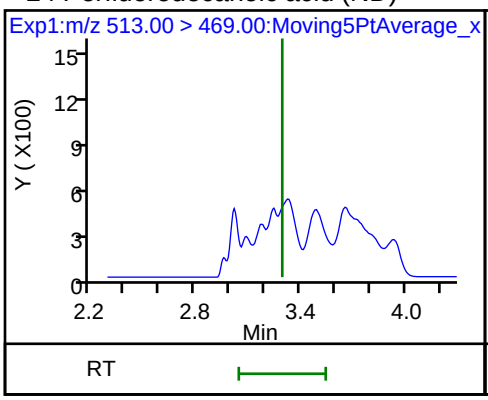
68 Perfluorononanesulfonic acid (ND)



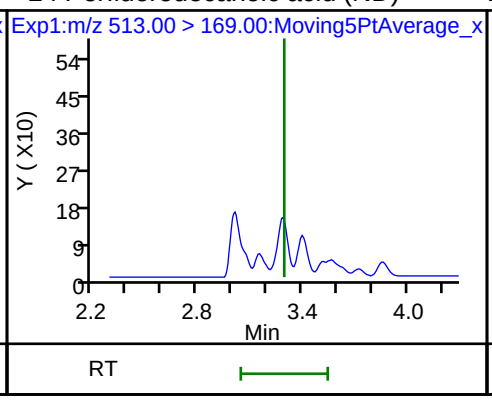
68 Perfluorononanesulfonic acid (ND)



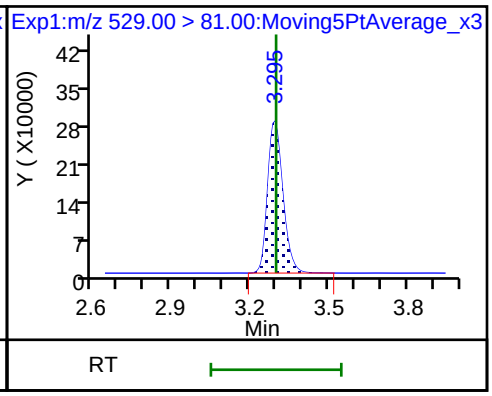
24 Perfluorodecanoic acid (ND)



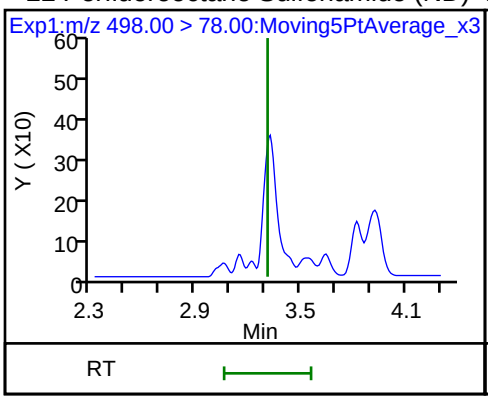
24 Perfluorodecanoic acid (ND)



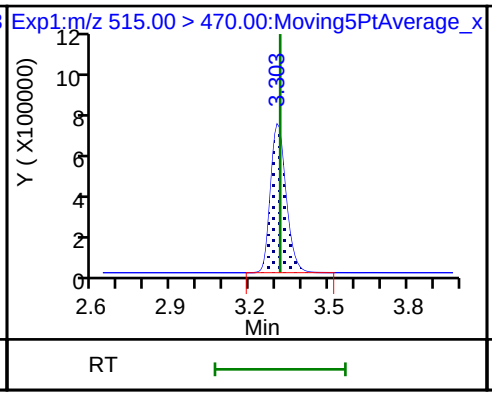
D 26 M2-8:2FTS



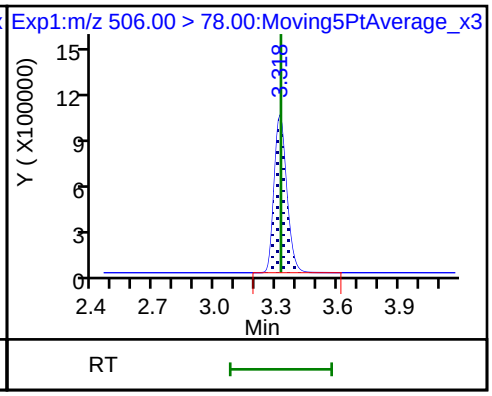
22 Perfluorooctane Sulfonamide (ND)



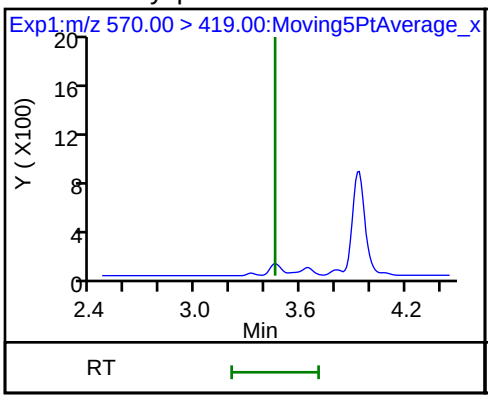
D 23 13C2 PFDA



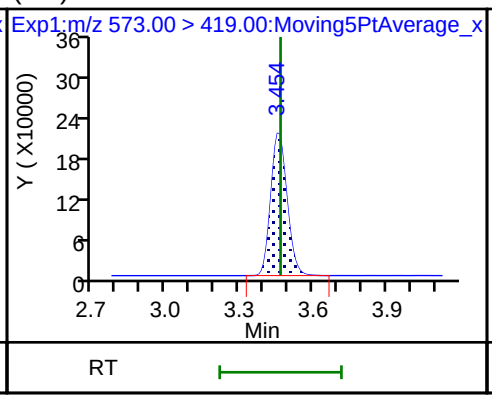
D 21 13C8 FOSA



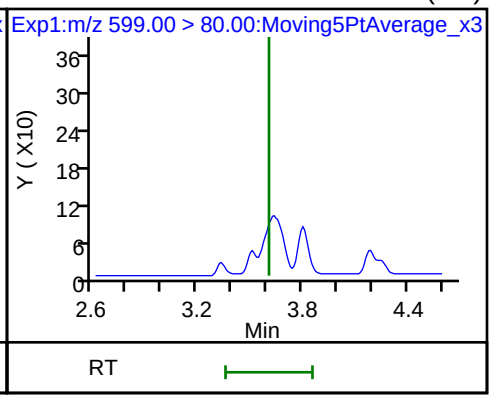
28 N-methyl perfluorooctane sulfonamid (ND)



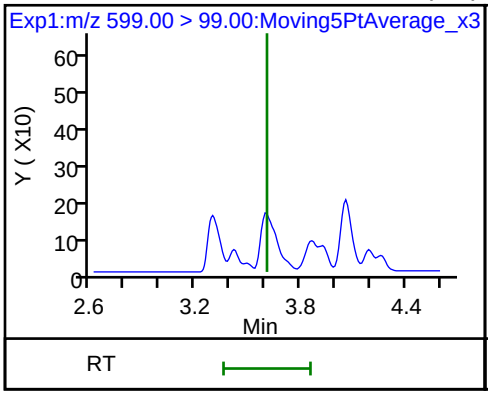
D 27 d3-NMeFOSAA



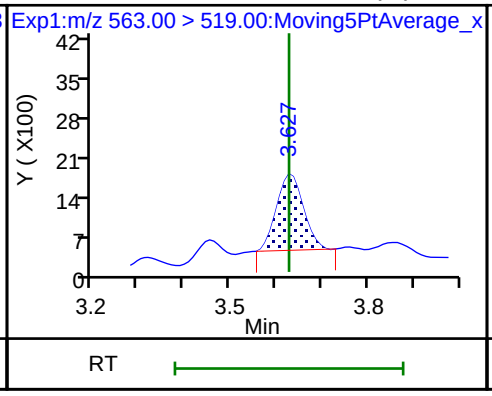
29 Perfluorodecane Sulfonic acid (ND)



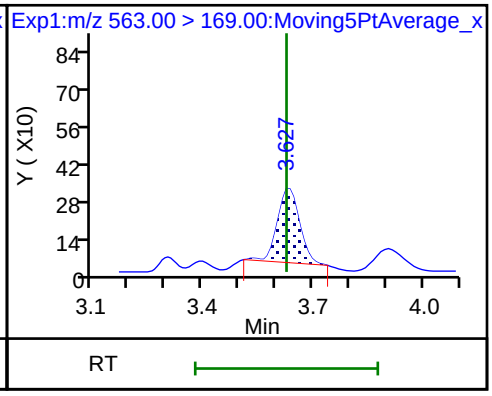
29 Perfluorodecane Sulfonic acid (ND)



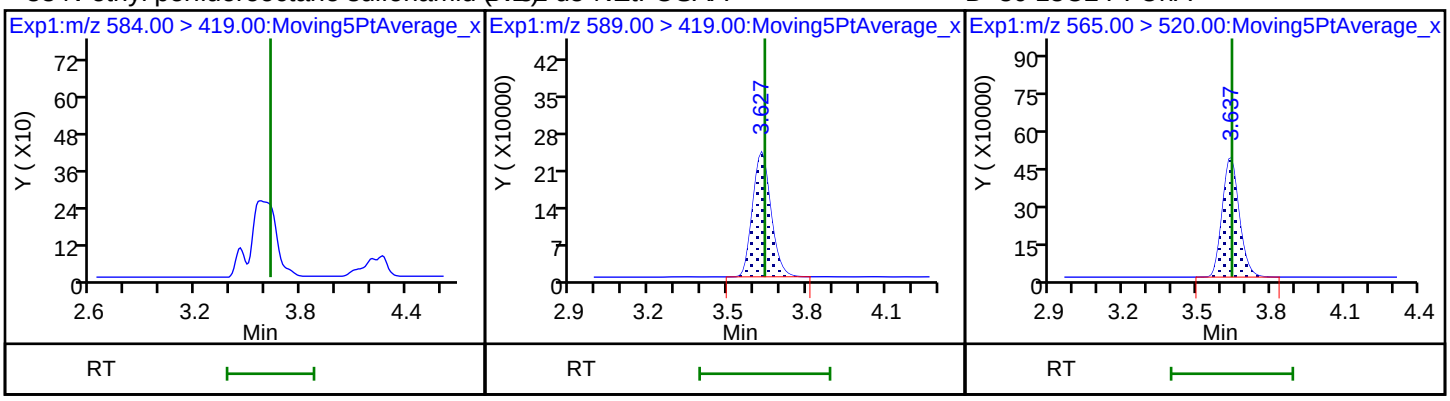
31 Perfluoroundecanoic acid (M)



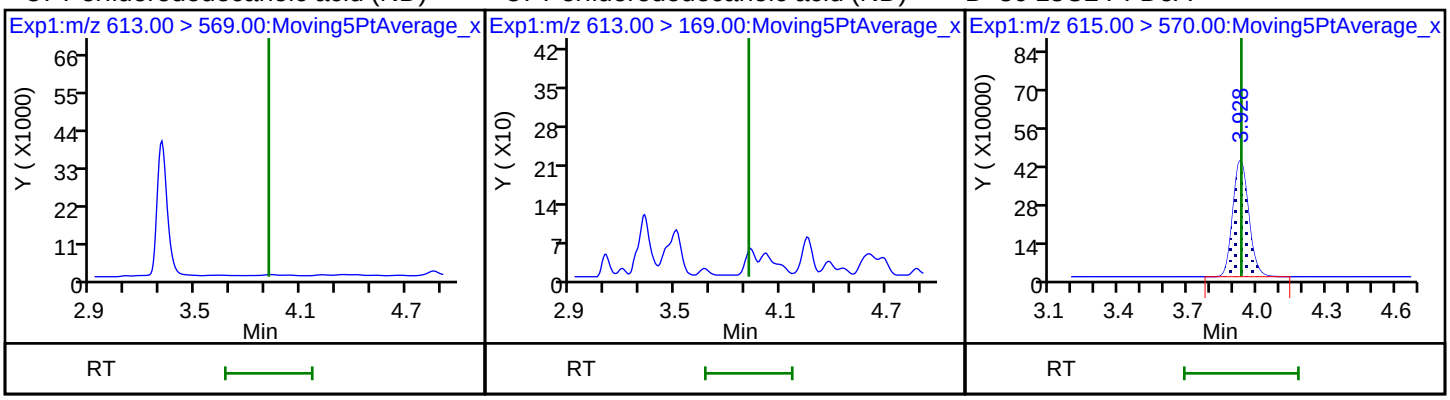
31 Perfluoroundecanoic acid



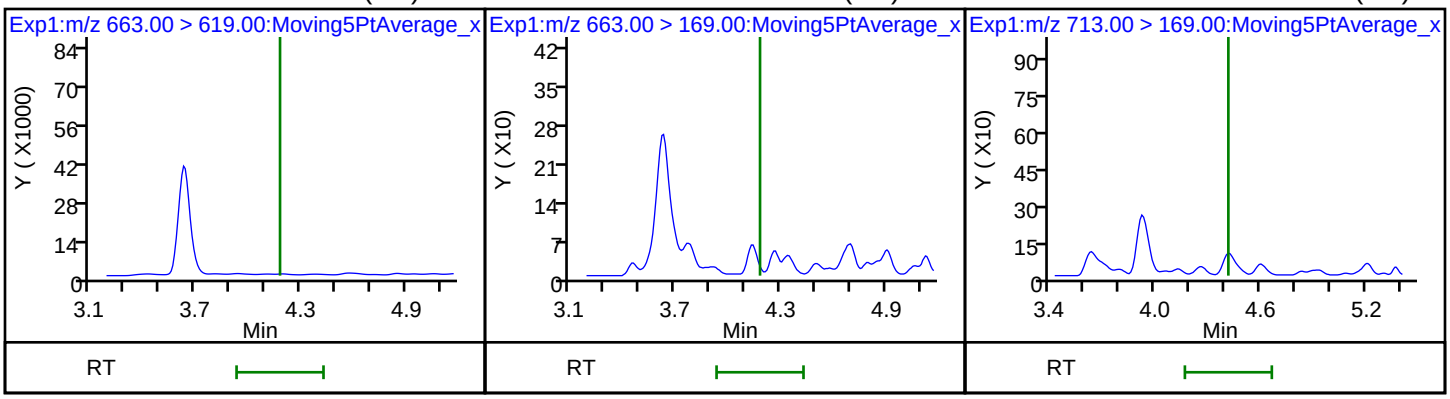
33 N-ethyl perfluorooctane sulfonamid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA



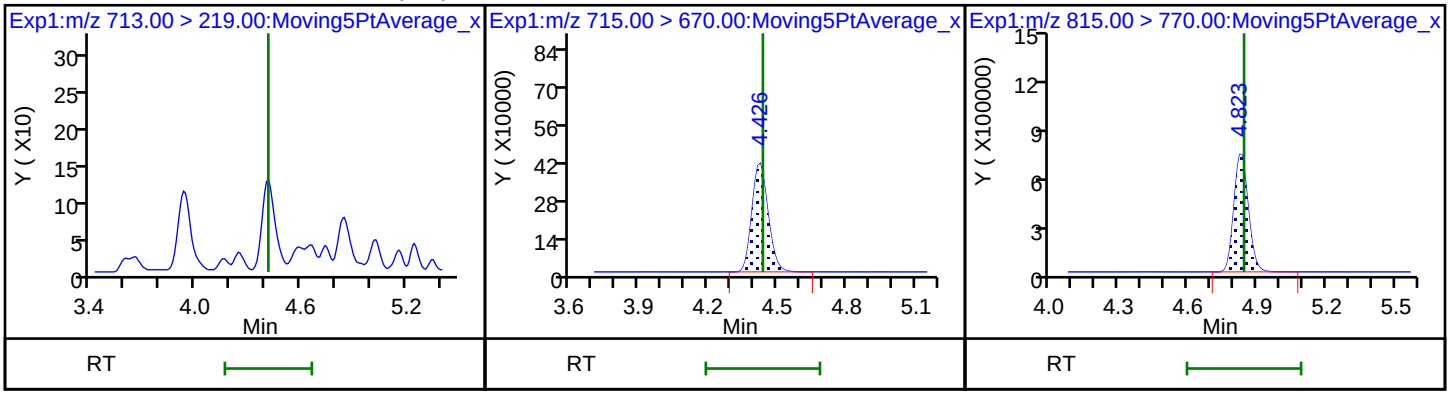
37 Perfluorododecanoic acid (ND) 37 Perfluorododecanoic acid (ND) D 36 13C2 PFDoA



41 Perfluorotridecanoic acid (ND) 41 Perfluorotridecanoic acid (ND) 42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND) D 43 13C2-PFTeDA D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

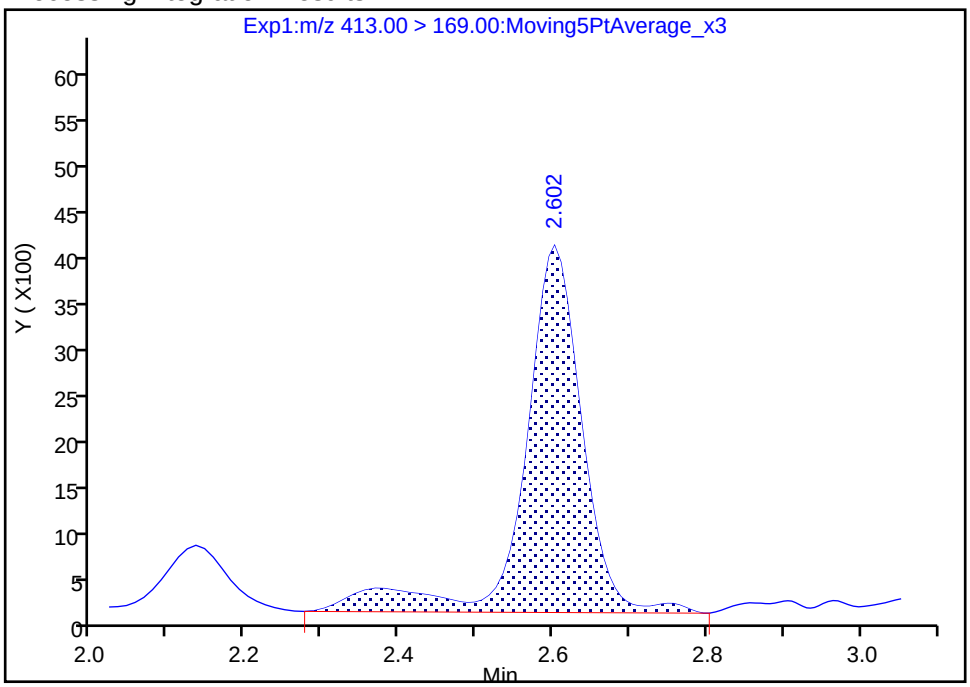
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_006.d				
Injection Date:	30-Jul-2018 03:36:46	Instrument ID:	A8_N		
Lims ID:	MB 320-234633/1-A				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	1	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

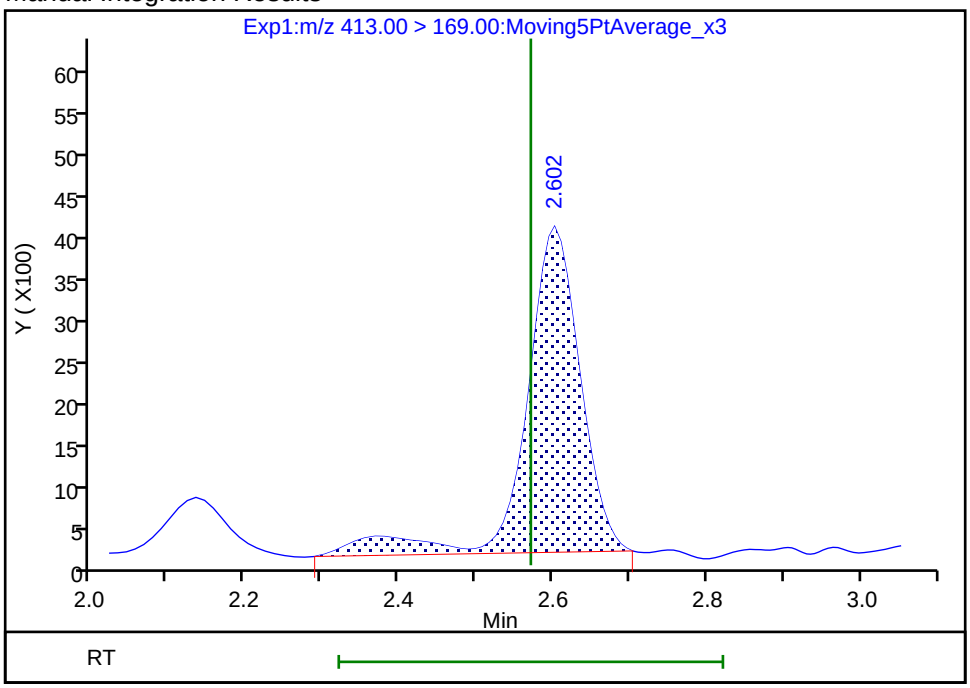
Processing Integration Results

RT: 2.60
Area: 21003
Amount: 0.006096
Amount Units: ng/ml



Manual Integration Results

RT: 2.60
Area: 19385
Amount: 0.006096
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:45:00

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

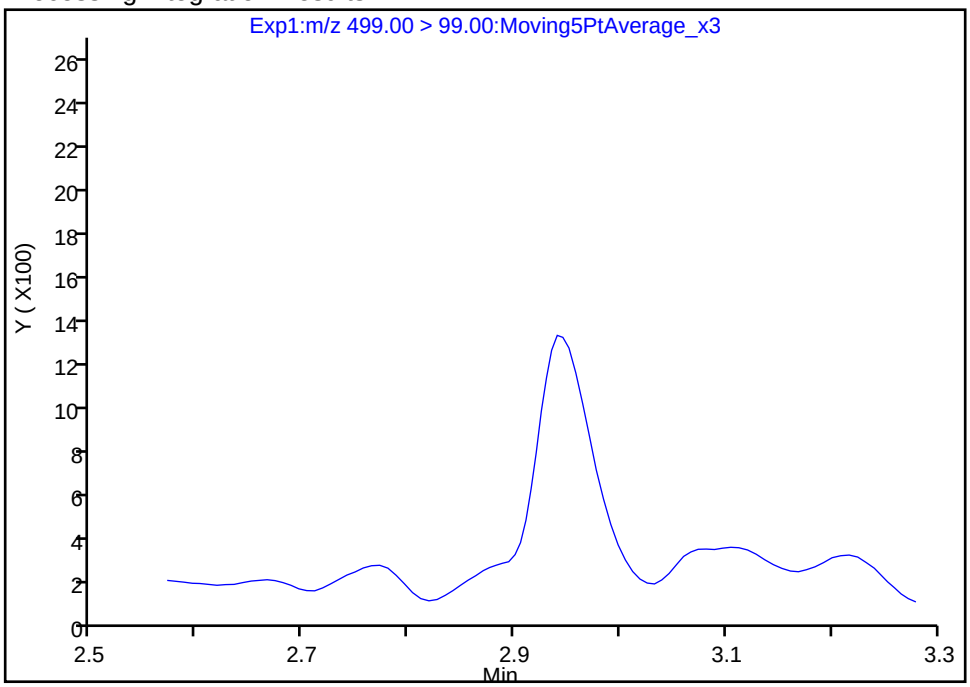
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_006.d				
Injection Date:	30-Jul-2018 03:36:46	Instrument ID:	A8_N		
Lims ID:	MB 320-234633/1-A				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	1	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

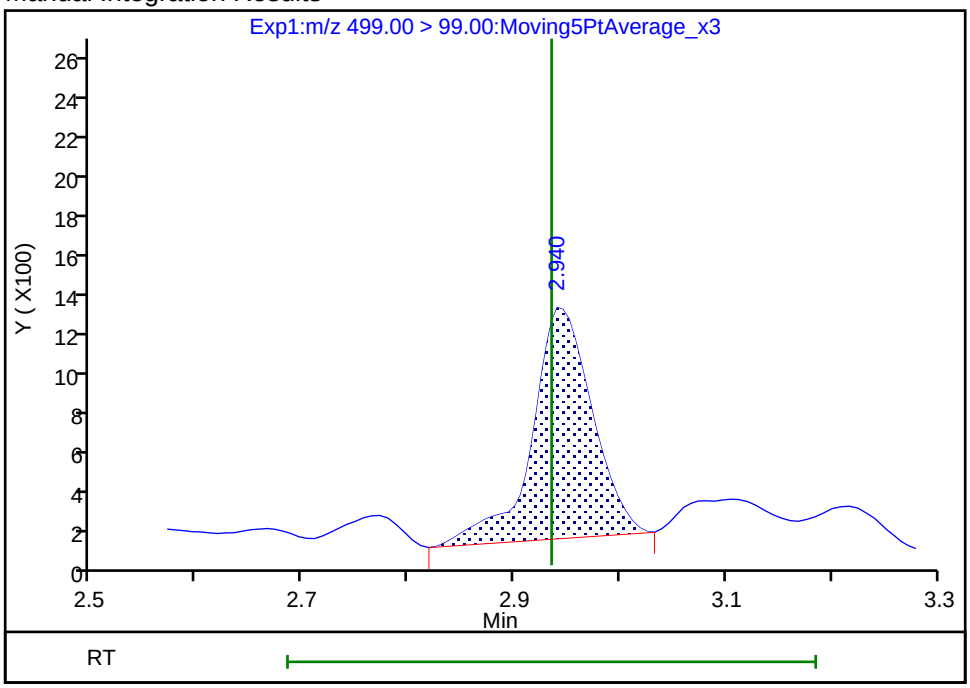
Processing Integration Results

RT: 2.94
Area: 0
Amount: 0.012646
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 4558
Amount: 0.011866
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:45:11

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

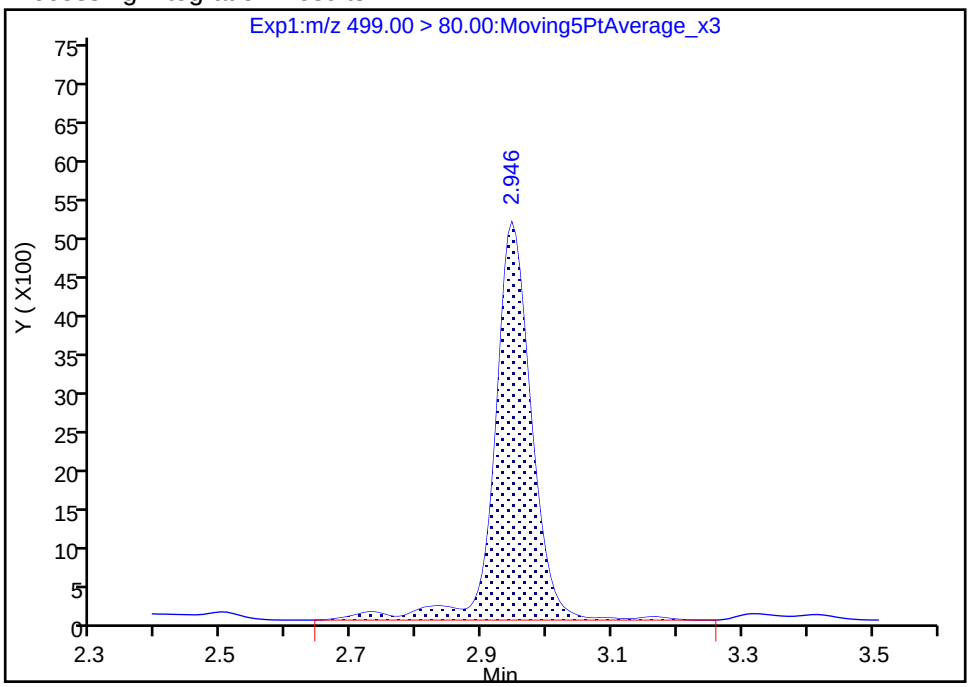
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_006.d				
Injection Date:	30-Jul-2018 03:36:46	Instrument ID:	A8_N		
Lims ID:	MB 320-234633/1-A				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	1	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

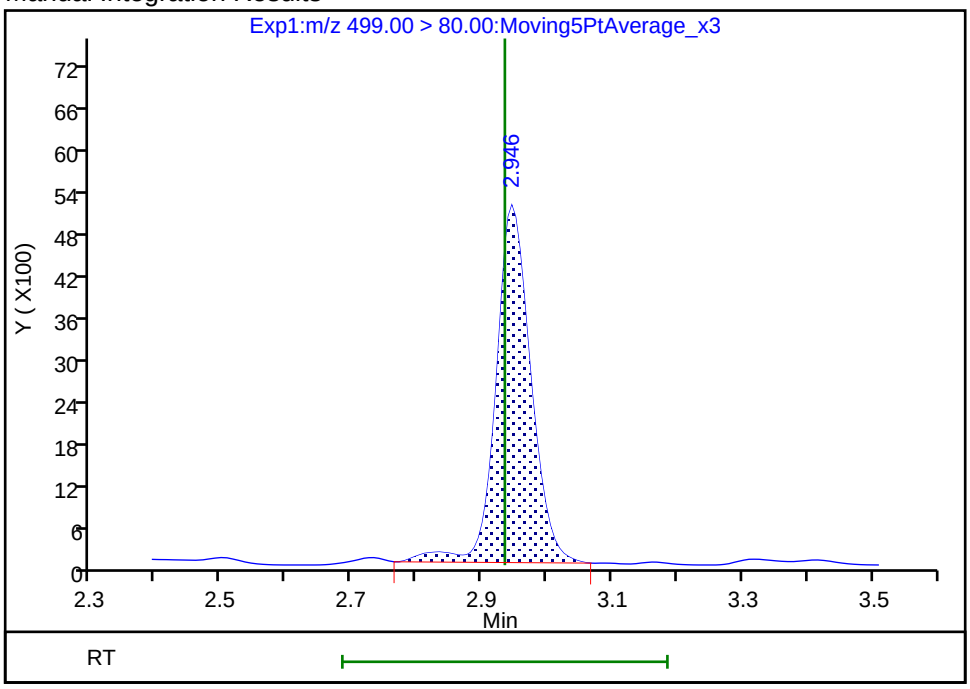
Processing Integration Results

RT: 2.95
Area: 20449
Amount: 0.012646
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 19188
Amount: 0.011866
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 09:45:11

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-234634/1-A
Matrix: Water
Lab File ID: 2018.07.22LLA_038.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: 3535
Date Extracted: 07/18/2018 08:54
Sample wt/vol: 250(mL)
Date Analyzed: 07/22/2018 10:22
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235512
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	92		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	90		50-150
STL00994	18O2 PFHxS	99		50-150
STL00991	13C4 PFOS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_038.d
Lims ID: MB 320-234634/1-A
Client ID:
Sample Type: MB
Inject. Date: 22-Jul-2018 10:22:17 ALS Bottle#: 27 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-234634/1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:45:53 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:46:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.517	0.0	0.543	9140082	2.21		88.6	8859	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.791	0.001	0.641	8662636	2.28		91.3	8208	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.833	-0.007	0.653	102450	2.14		92.0	893	
D 7 13C2 PFHxA										
315.00 > 270.00	2.087	2.085	0.002	0.747	8834537	2.22		88.7	14049	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.191	2.189	0.002	0.784	1030202	NC			5490	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.433	-0.010	0.867	10808511	2.34		93.7	20878	
D 11 18O2 PFHxS										
403.00 > 84.00	2.448	2.446	0.002	0.876	6578166	2.34		99.0	79468	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.448	2.448	0.0	1.000	26219	0.007076			51.4	
399.00 > 99.00	2.436	2.448	-0.012	0.995	5022		5.22(1.90-5.70)		17.6	
D 12 M2-6:2FTS										
429.00 > 81.00	2.764	2.776	-0.012	0.989	1087919	2.52		106	3405	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.780	2.780	0.0	1.006	7448	0.007452			104	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10595163	2.50			19524	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	19983	0.004293			3.0	
413.00 > 169.00	2.796	2.796	0.0	1.000	6863		2.91(1.36-4.08)		15.9	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	1.000	10102009	2.43		97.4	14930	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.141	8760265	2.25		89.9	13561	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.185	0.005	1.141	6680328	2.22		92.9	8649	
D 21 13C8 FOSA										
506.00 > 78.00	3.533	3.529	0.004	1.264	3769596	2.22		88.7	10347	
D 26 M2-8:2FTS										
529.00 > 81.00	3.533	3.529	0.004	1.264	135924	2.31		96.3	1372	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.518	3.532	-0.014	0.996	4255	0.000922			8.2	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.544	0.004	1.269	9774631	2.41		96.6	35072	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.687	3.698	-0.011	1.319	4430801	2.32		93.0	10350	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.701	3.699	0.002	1.004	5280	0.002878			3.9	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.857	3.855	0.002	1.380	3568238	2.34		93.5	6732	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.869	0.003	1.385	8736905	2.36		94.5	21898	
D 36 13C2 PFDoA										
615.00 > 570.00	4.154	4.151	0.003	1.486	8582114	2.16		86.5	24098	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.653	4.651	0.002	1.664	7262703	2.11		84.6	15995	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.072	5.070	0.002	1.814	6436478	1.82		72.8	6489	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.072	5.070	0.002	1.000	63361	NC			10.3	
813.00 > 169.00	5.072	5.070	0.002	1.000	7876		8.04(2.77-8.32)		20.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 25-Jul-2018 09:46:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_038.d

Injection Date: 22-Jul-2018 10:22:17 Instrument ID: A9

Lims ID: MB 320-234634/1-A

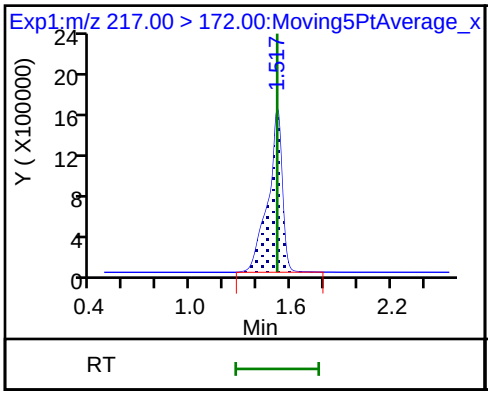
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 27 Worklist Smp#: 2

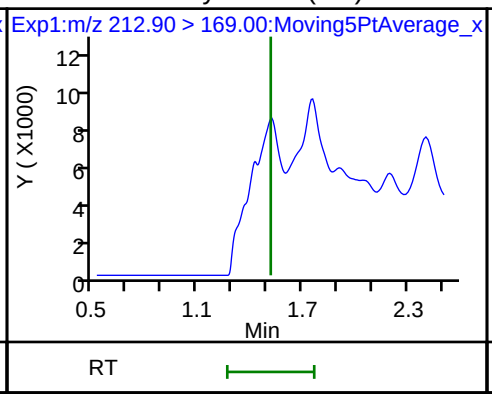
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

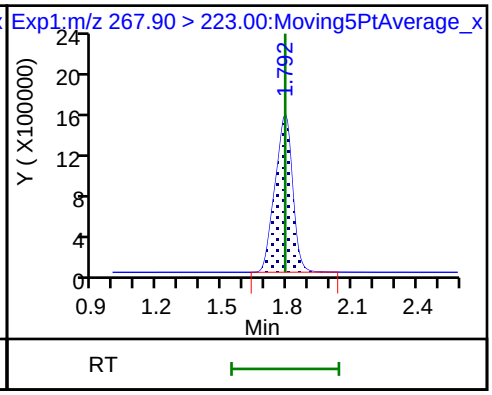
D 1 13C4 PFBA



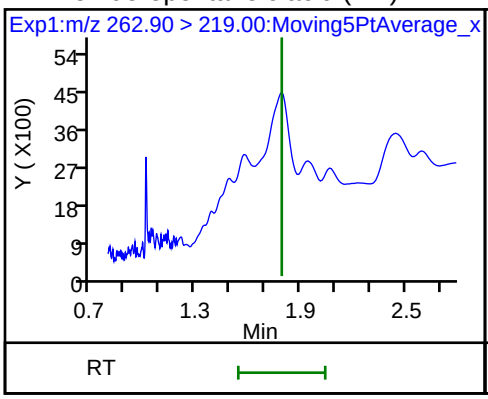
2 Perfluorobutyric acid (ND)



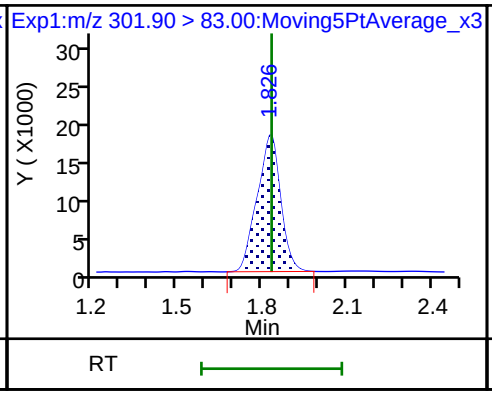
D 3 13C5-PFPeA



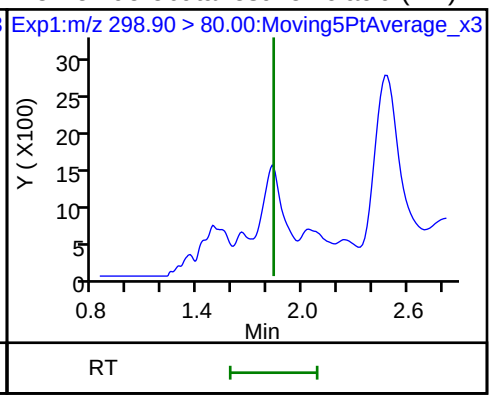
4 Perfluoropentanoic acid (ND)



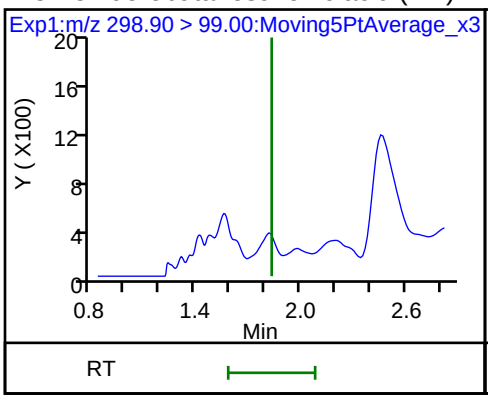
D 47 13C3-PFBS



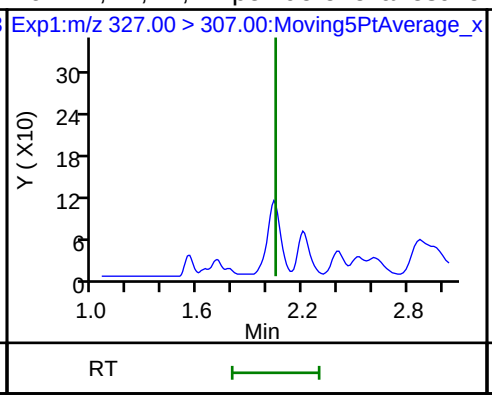
5 Perfluorobutanesulfonic acid (ND)



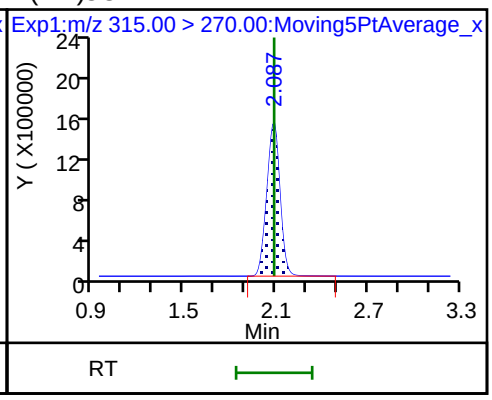
5 Perfluorobutanesulfonic acid (ND)



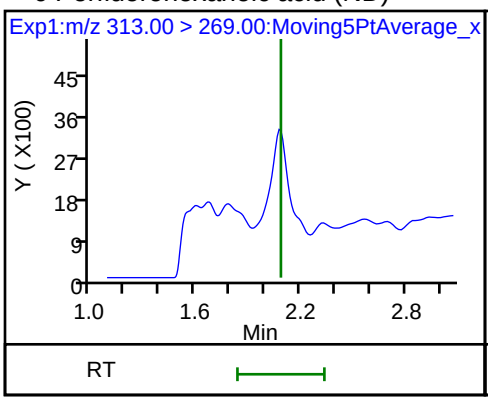
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



D 70 13C2 PFHxA



6 Perfluorohexanoic acid (ND)



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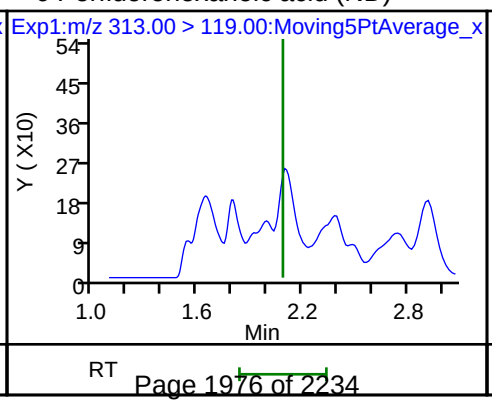
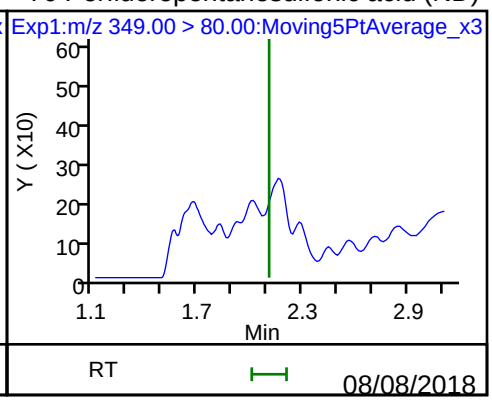


70 Perfluoropentanesulfonic acid (ND)



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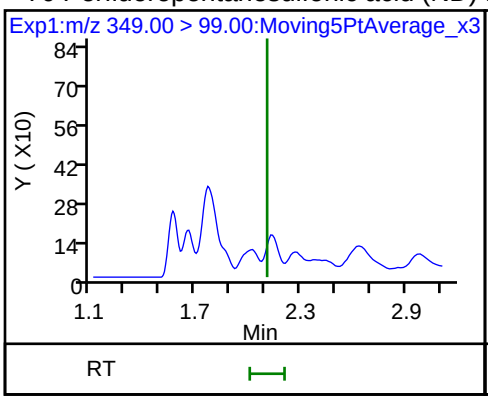
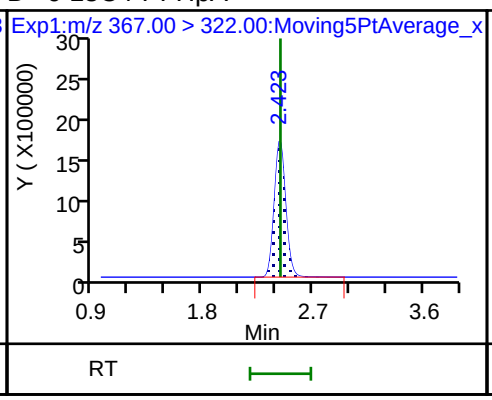
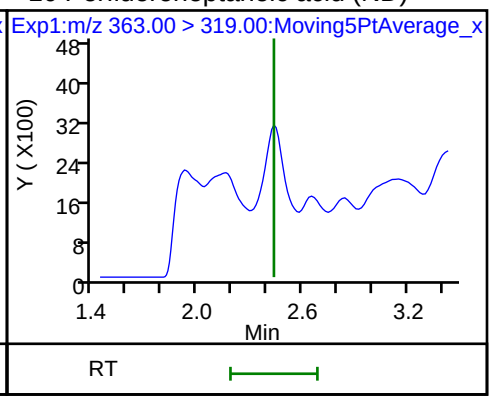


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid (ND)



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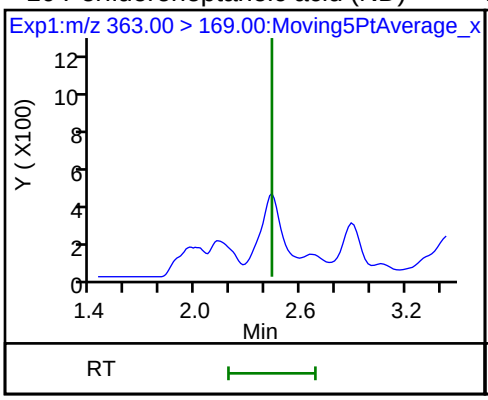
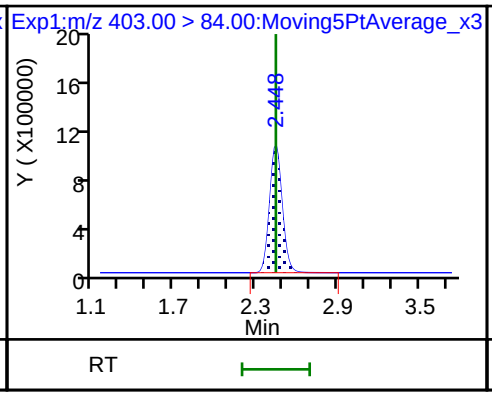
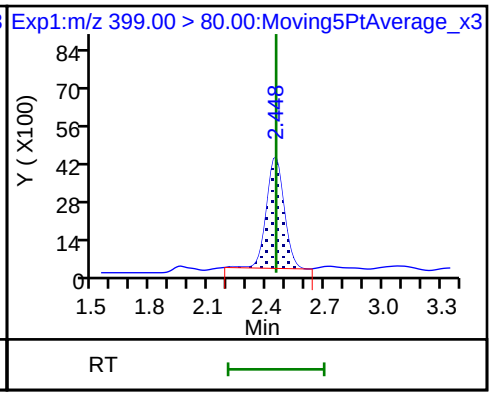


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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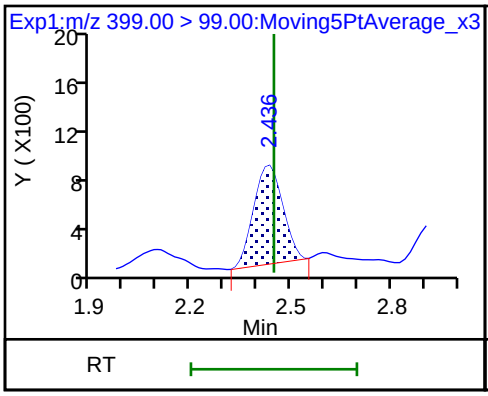
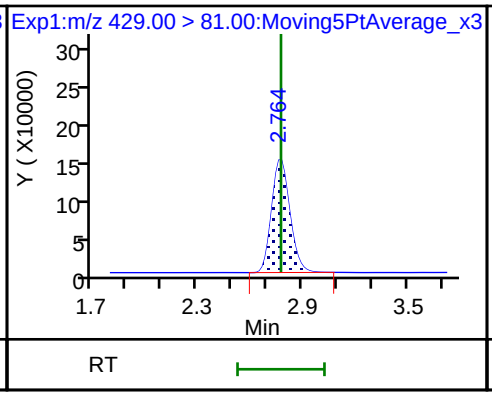
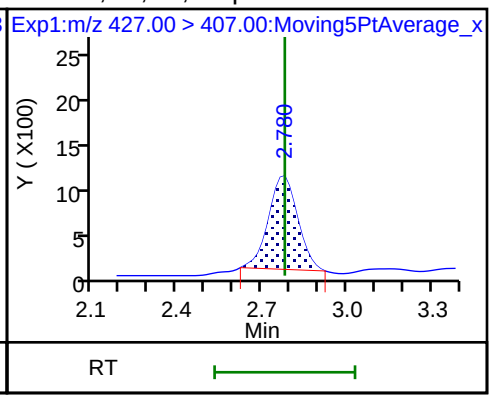


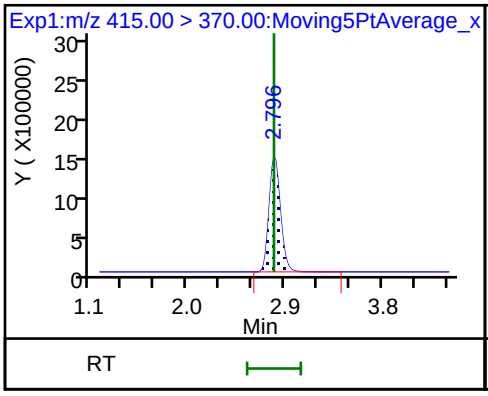
D 12 M2-6:2FTS



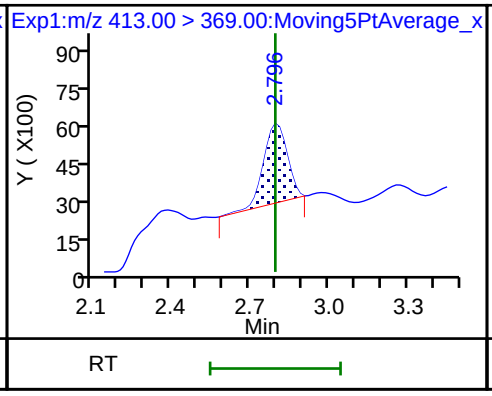
13 1H,1H,2H,2H-perfluorooctanesulfoni



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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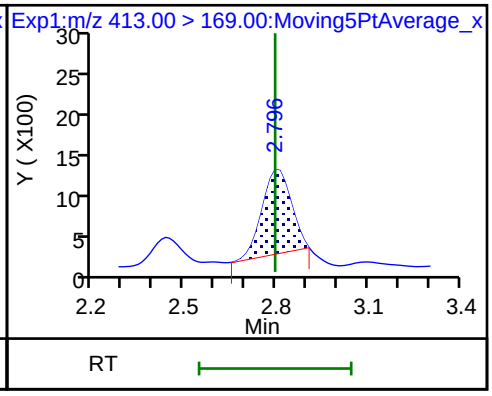
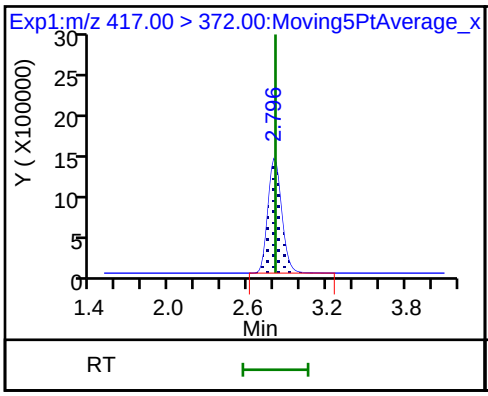
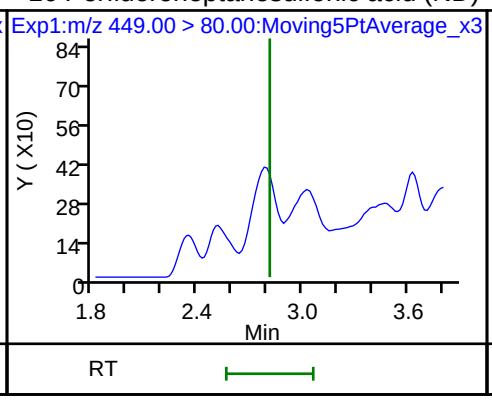


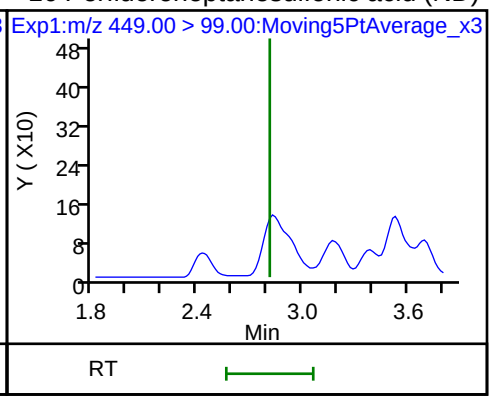
D 14 13C4 PFOA



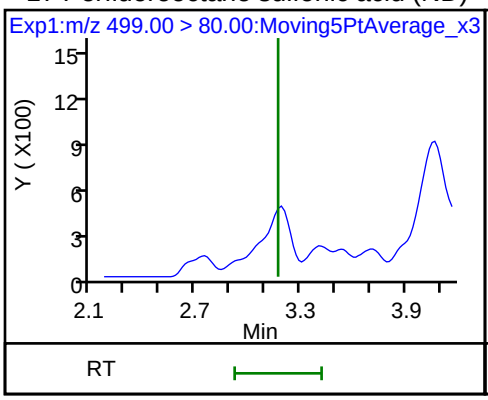
16 Perfluoroheptanesulfonic acid (ND)



16 Perfluoroheptanesulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)



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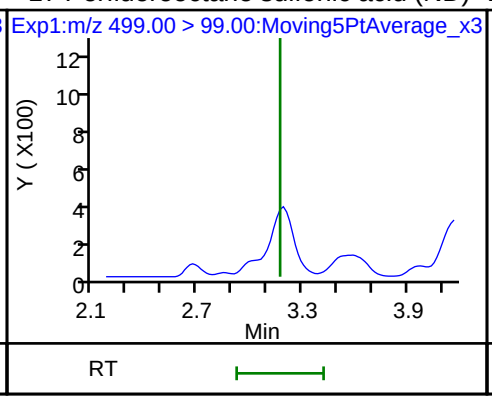
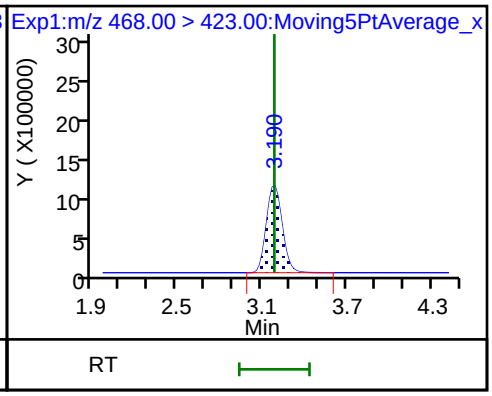


D 19 13C5 PFNA



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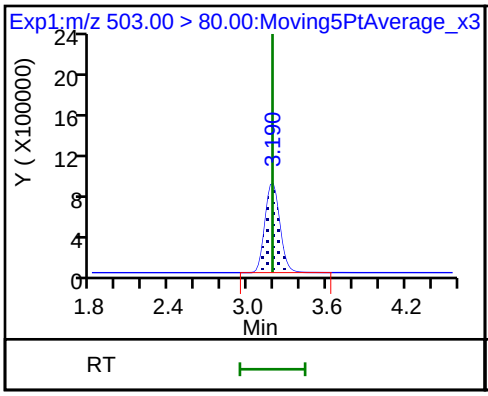
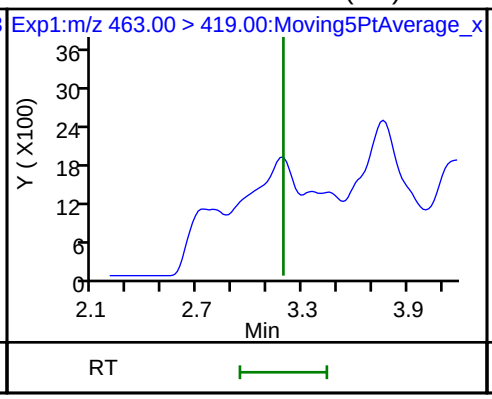
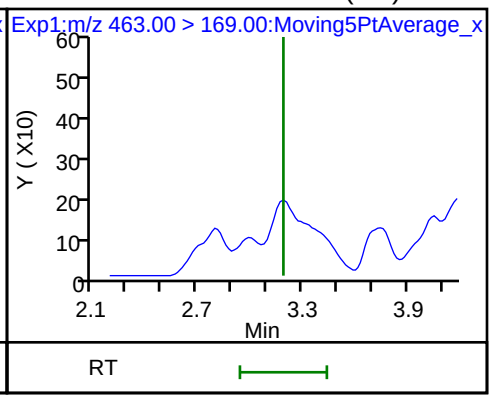


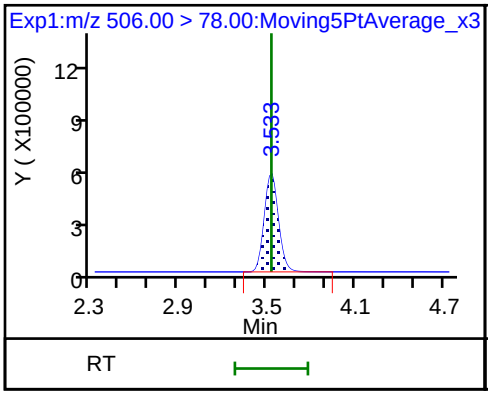
20 Perfluorononanoic acid (ND)



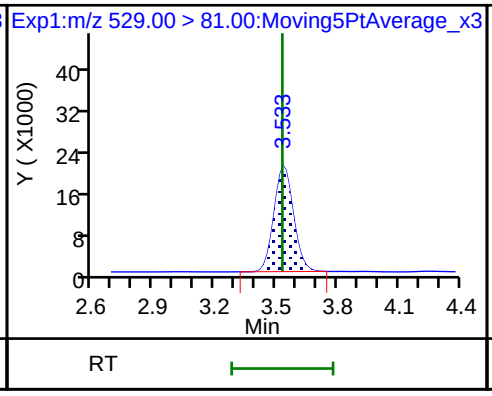
20 Perfluorononanoic acid (ND)



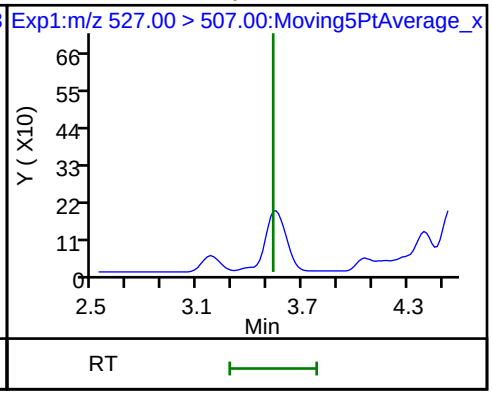
D 21 13C8 FOSA



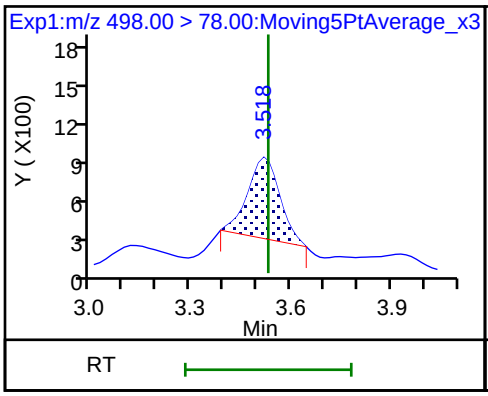
D 26 M2-8:2FTS



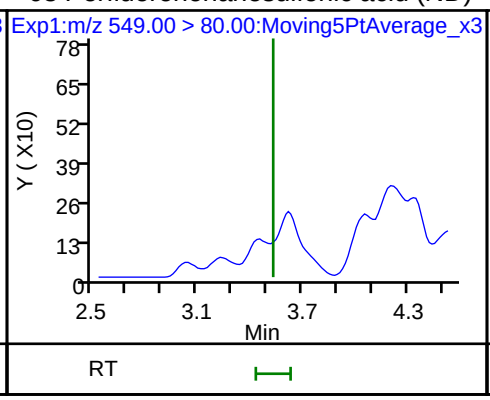
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



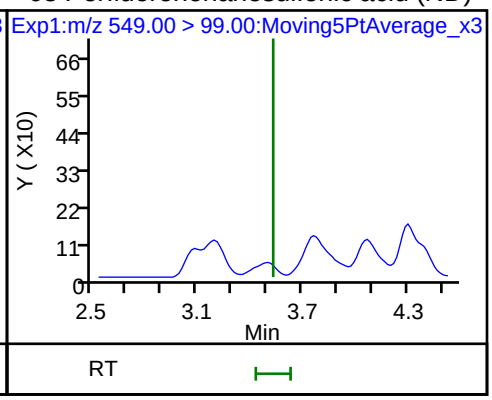
22 Perfluorooctane Sulfonamide



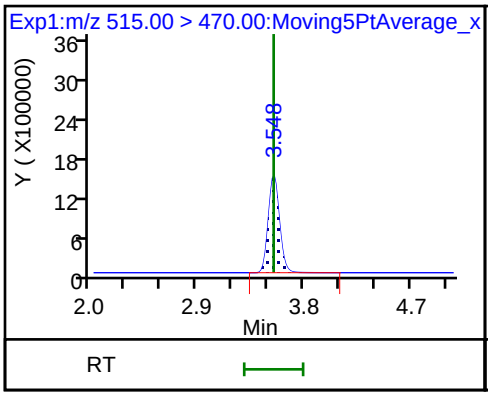
68 Perfluorononanesulfonic acid (ND)



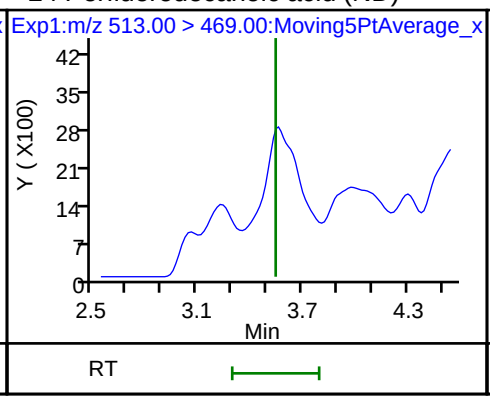
68 Perfluorononanesulfonic acid (ND)



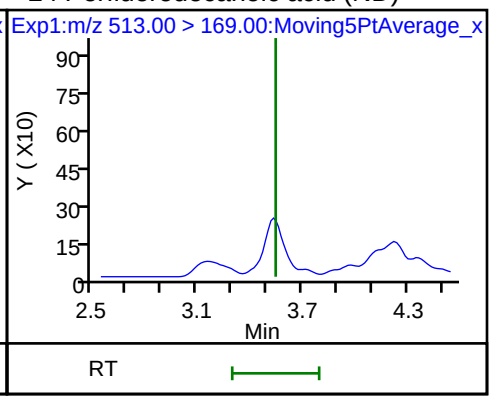
D 23 13C2 PFDA



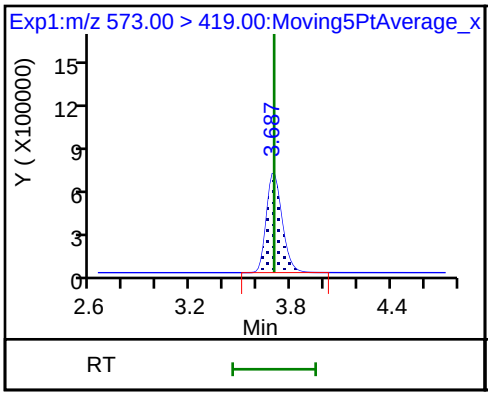
24 Perfluorodecanoic acid (ND)



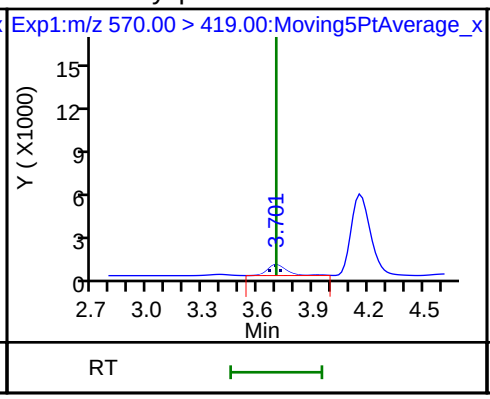
24 Perfluorodecanoic acid (ND)



D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami



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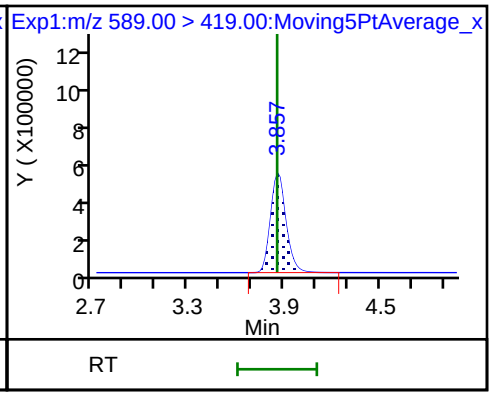
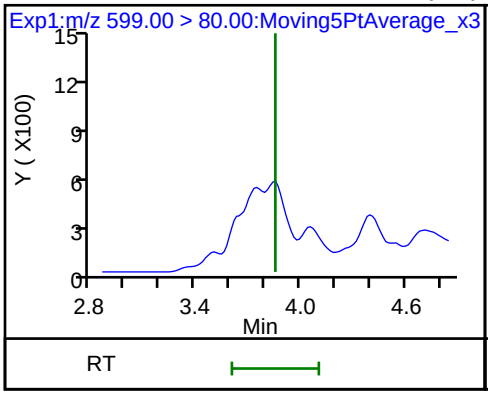
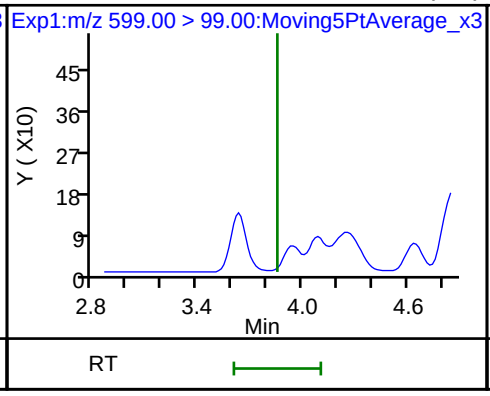


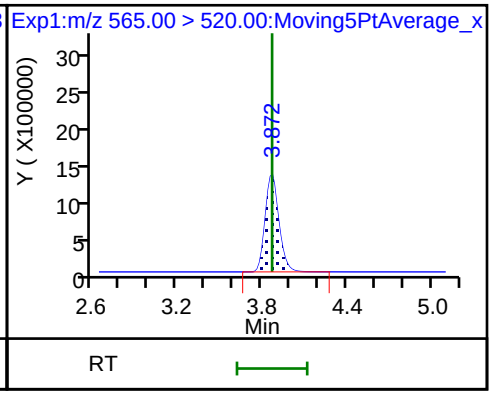
29 Perfluorodecane Sulfonic acid (ND)



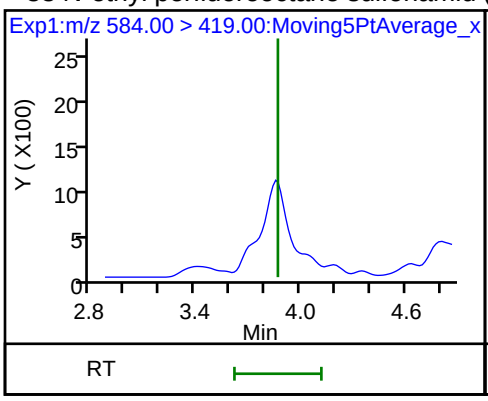
29 Perfluorodecane Sulfonic acid (ND)



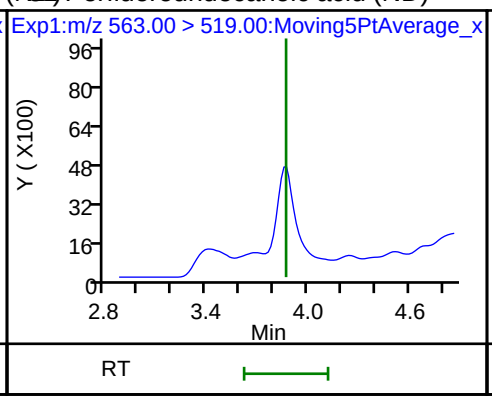
D 30 13C2 PFUnA



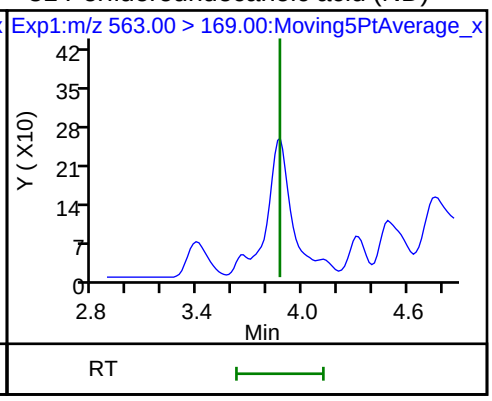
33 N-ethyl perfluorooctane sulfonamid (ND)



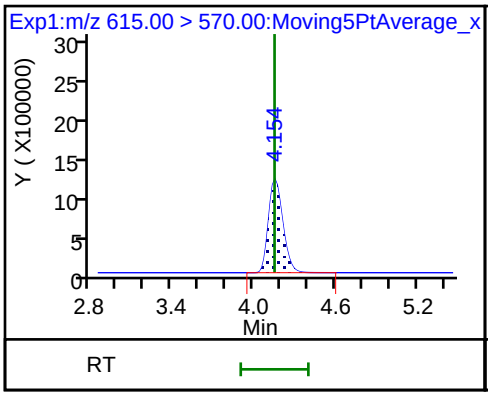
31 Perfluoroundecanoic acid (ND)



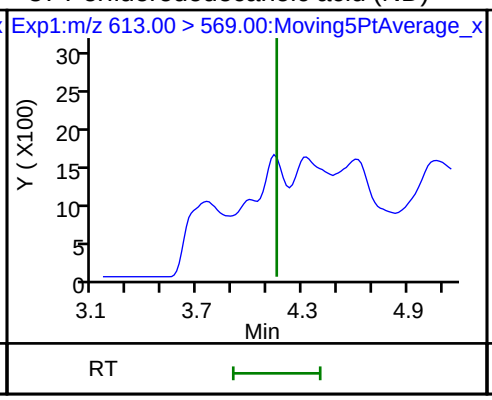
31 Perfluoroundecanoic acid (ND)



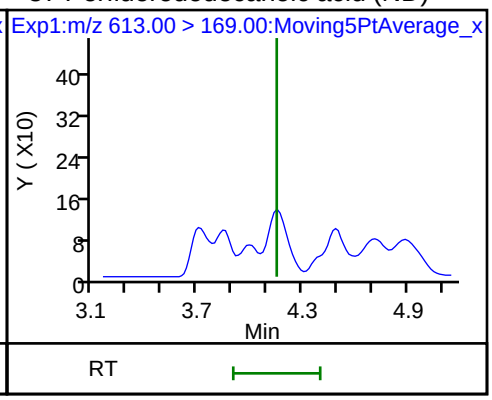
D 36 13C2 PFDoA



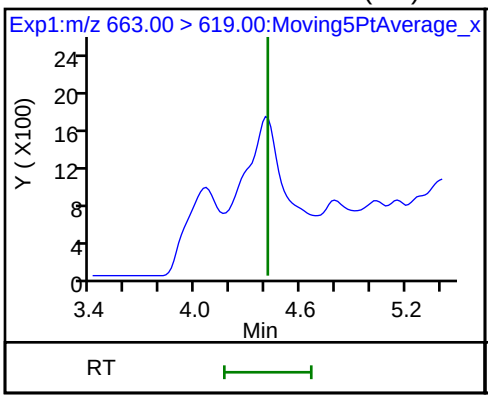
37 Perfluorododecanoic acid (ND)



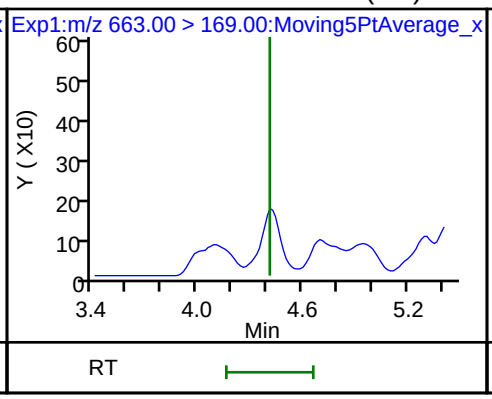
37 Perfluorododecanoic acid (ND)



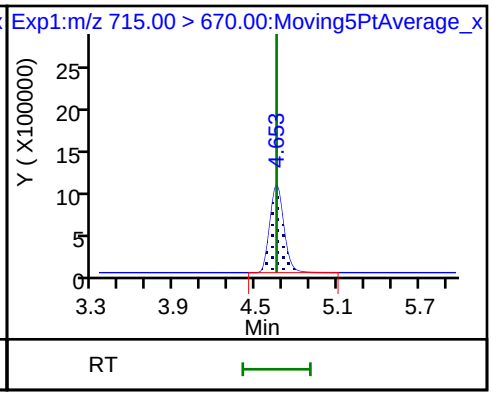
41 Perfluorotridecanoic acid (ND)



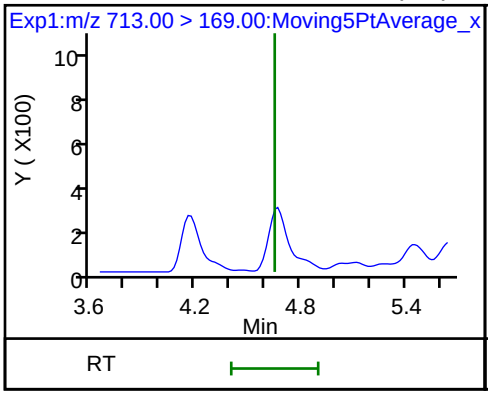
41 Perfluorotridecanoic acid (ND)



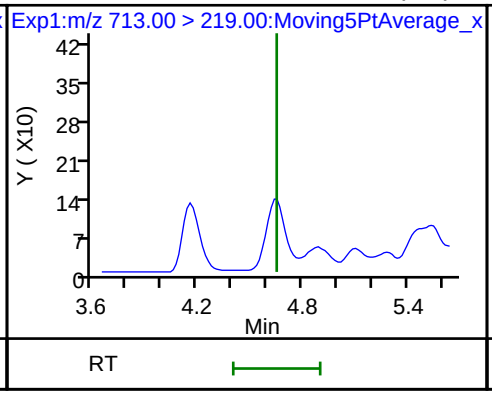
D 43 13C2-PFTeDA



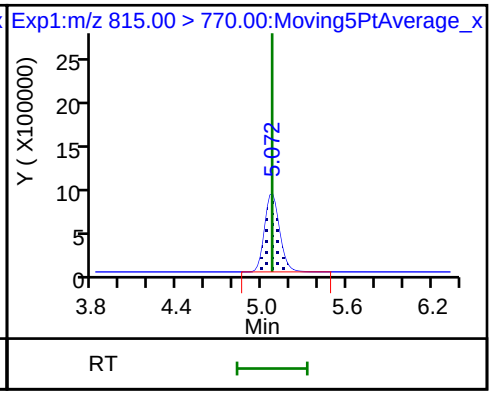
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-234662/1-A
Matrix: Solid
Lab File ID: 2018.07.28LLB_015.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: SHAKE
Date Extracted: 07/18/2018 10:19
Sample wt/vol: 5.00(g)
Date Analyzed: 07/29/2018 01:08
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236778
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.20	U	0.30	0.20	0.078
335-67-1	Perfluorooctanoic acid (PFOA)	0.20	U M	0.30	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.20	U	0.30	0.20	0.081
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.18	U	0.40	0.18	0.059
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.20	U	0.30	0.20	0.062
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.50	U M	1.0	0.50	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	87		50-150
STL01892	13C4-PFHpA	86		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	87		50-150
STL00994	18O2 PFHxS	86		50-150
STL00991	13C4 PFOS	89		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_015.d
Lims ID: MB 320-234662/1-A
Client ID:
Sample Type: MB
Inject. Date: 29-Jul-2018 01:08:42 ALS Bottle#: 8 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-234662/1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:55:02 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:55:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.397	1.397	0.0	1.004	14667	0.007430			7.2	M
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.397	-0.006	0.539	5021332	2.21		88.3	81756	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.633	0.0	0.633	3675838	2.32		92.6	61504	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.667	-0.001	0.646	83826	2.01		86.6	588	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.905	0.001	0.738	4006205	2.15		86.1	99513	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.002	0.001	0.776	324869	NC			11116	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.864	4126949	2.15		86.1	64436	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.868	4991818	2.03		85.7	70488	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.242	-0.001	1.000	35057	0.0142			332	
399.00 > 99.00	2.229	2.242	-0.013	0.995	15090		2.32(1.50-4.49)		42.3	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.557	-0.002	1.000	12142	0.0226			211	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.564	-0.009	0.990	756286	1.41		59.4	13924	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.582	-0.002		4904357	2.50			48572	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.580	2.582	-0.002	1.000	7792	0.003930			7.9	M
413.00 > 169.00	2.596	2.582	0.014	1.006	19481		0.40(0.84-2.52)		116	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.588	-0.008	1.000	4084293	2.18		87.1	57870	
16 Perfluoroheptanesulfonic acid										R
449.00 > 80.00	2.588	2.590	-0.002	0.878	2252	0.001068			59.9	R
449.00 > 99.00	2.588	2.590	-0.002	0.878	2102		1.07(1.94-5.82)		12.1	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.947	0.001	1.142	3642943	2.13		89.0	68080	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.947	0.001	1.142	3500467	2.16		86.5	63766	
20 Perfluorononanoic acid										
463.00 > 419.00	2.942	2.948	-0.006	0.998	1699	0.001063			6.2	
463.00 > 169.00	2.942	2.948	-0.006	0.998	359		4.73(1.90-5.69)		26.0	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.948	2.948	0.0	1.000	120337	0.0714			1049	M
499.00 > 99.00	2.948	2.948	0.0	1.000	28592		4.21(2.31-6.93)		196	M
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.298	0.001	1.279	1153769	2.07		86.2	21945	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.314	-0.007	1.282	3130139	2.43		97.2	55426	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.314	0.001	1.285	5474820	2.18		87.0	50294	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.466	-0.008	1.340	1035905	2.43		97.4	28078	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.629	0.002	1.407	1215525	2.72		109	5202	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.639	0.001	1.411	2583134	2.49		99.6	68238	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.640	3.643	-0.003	1.000	7685	0.005994			35.6	
563.00 > 169.00	3.640	3.643	-0.003	1.000	1681		4.57(2.12-6.36)		49.3	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.643	-0.003	1.003	3711	0.008181			120	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.799	-0.004	1.287	3647	NC			124	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.930	0.001	1.523	2224812	2.26		90.3	20556	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.437	-0.010	1.716	2214721	2.30		92.0	15594	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.838	4.840	-0.002	1.000	29867	NC			5.2	
813.00 > 169.00	4.838	4.840	-0.002	1.000	5762		5.18(2.86-8.58)		55.3	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.838	4.842	-0.004	1.875	3451380	2.36		94.4	11608	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 30-Jul-2018 15:55:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_015.d

Injection Date: 29-Jul-2018 01:08:42 Instrument ID: A8_N

Lims ID: MB 320-234662/1-A

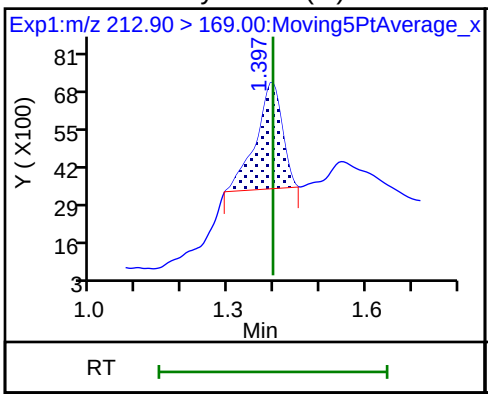
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 8 Worklist Smp#: 2

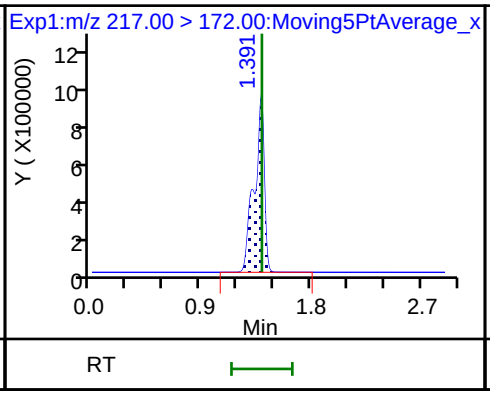
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

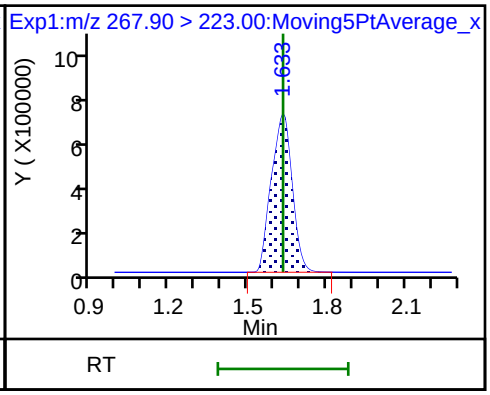
2 Perfluorobutyric acid (M)



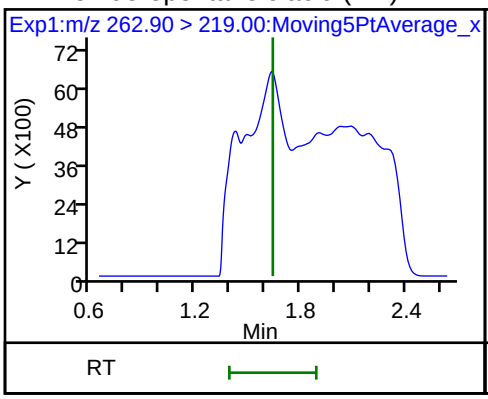
D 1 13C4 PFBA



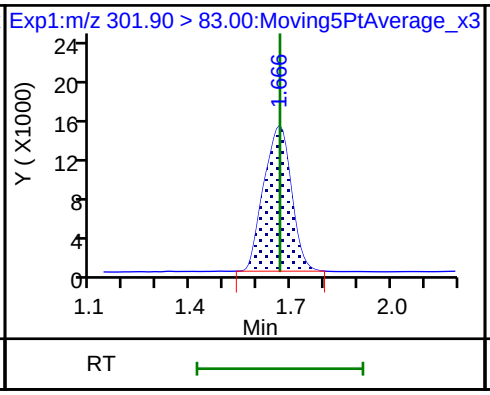
D 3 13C5-PFPeA



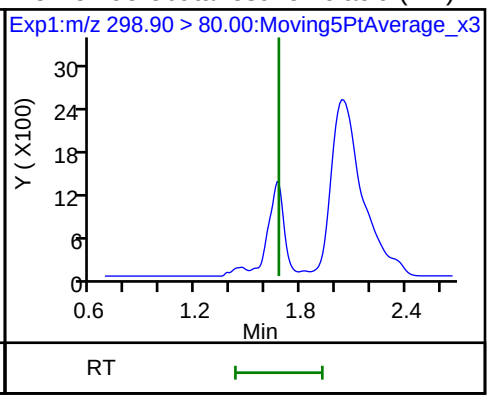
4 Perfluoropentanoic acid (ND)



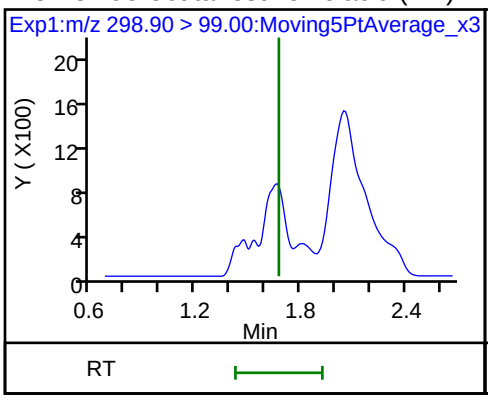
D 47 13C3-PFBS



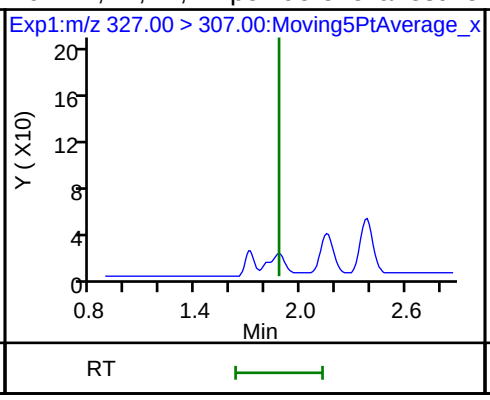
5 Perfluorobutanesulfonic acid (ND)



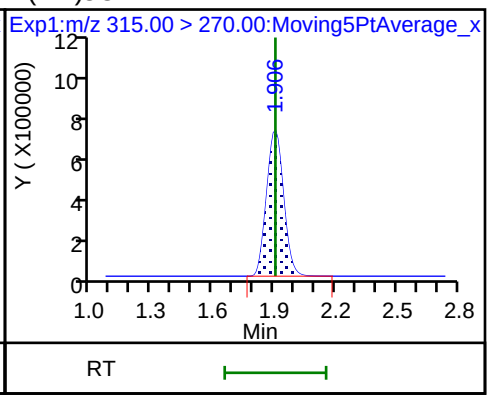
5 Perfluorobutanesulfonic acid (ND)



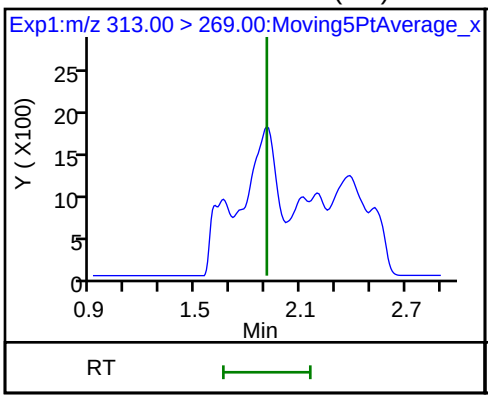
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



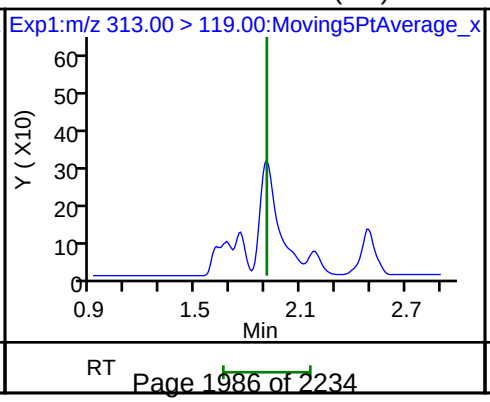
D 70 13C2 PFHxA



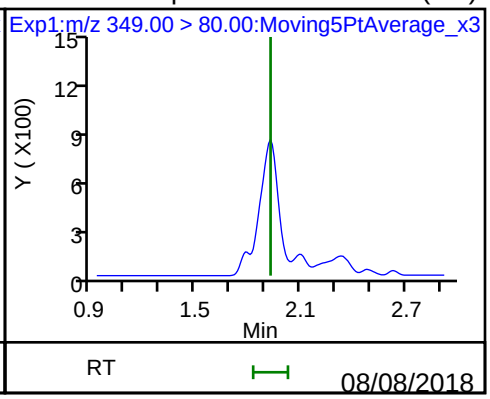
6 Perfluorohexanoic acid (ND)



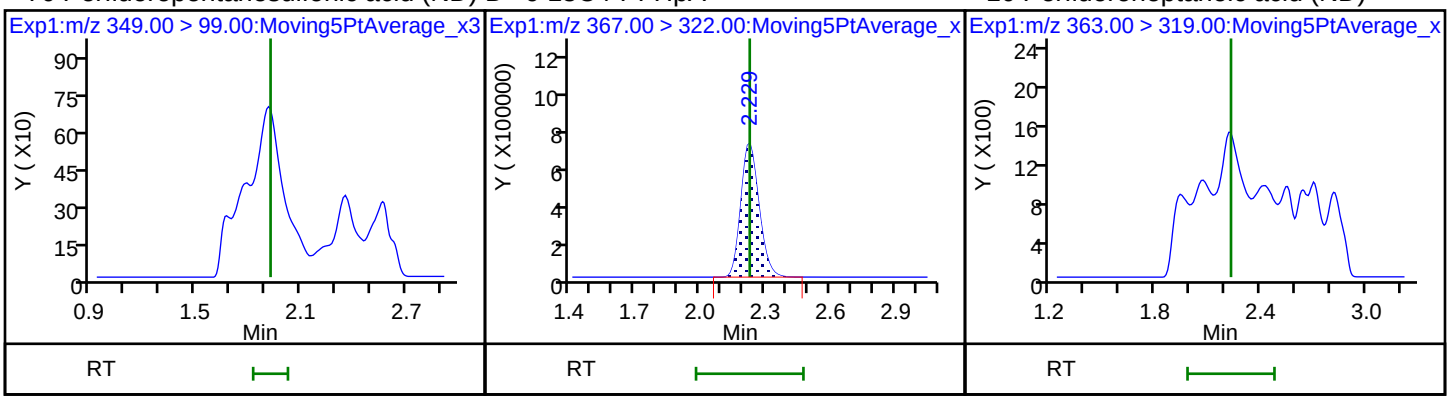
6 Perfluorohexanoic acid (ND)



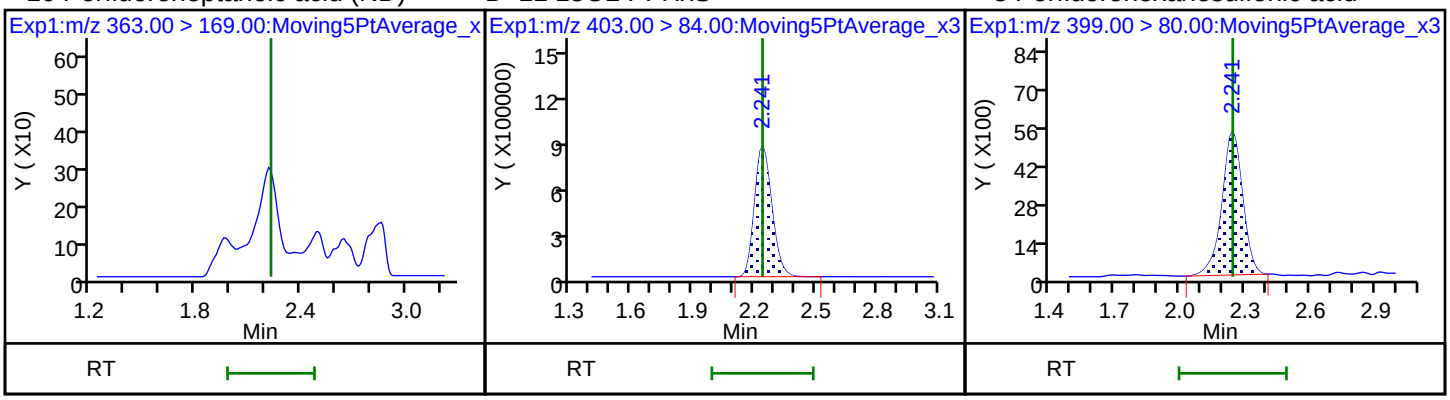
70 Perfluoropentanesulfonic acid (ND)



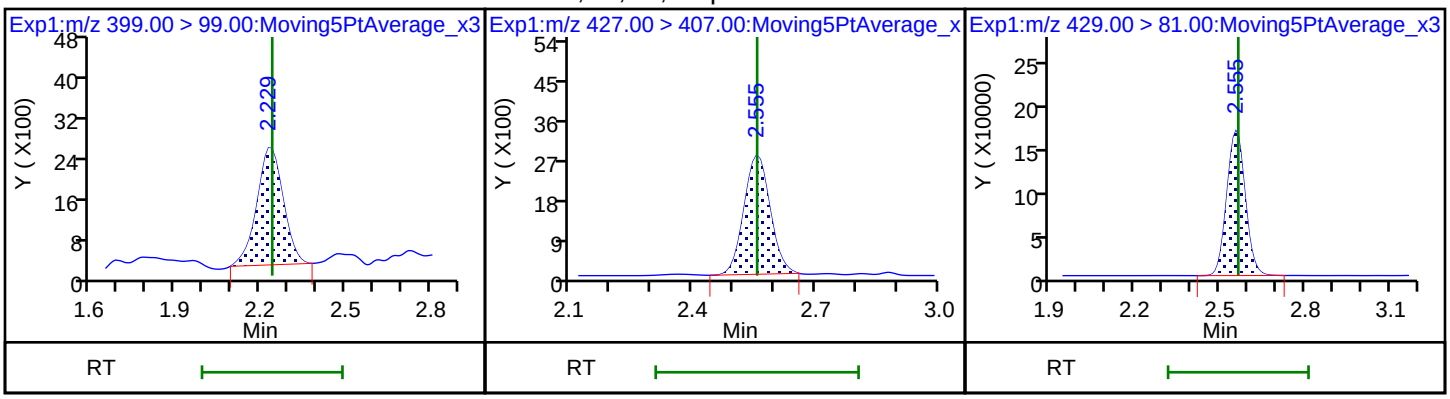
70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA 10 Perfluoroheptanoic acid (ND)



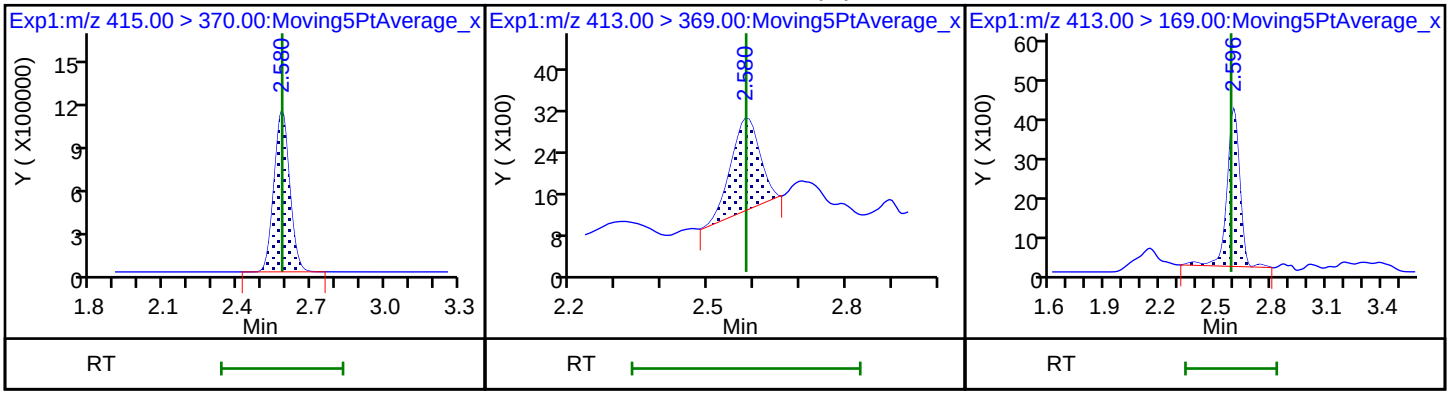
10 Perfluoroheptanoic acid (ND) D 11 18O2 PFHxS 8 Perfluorohexanesulfonic acid



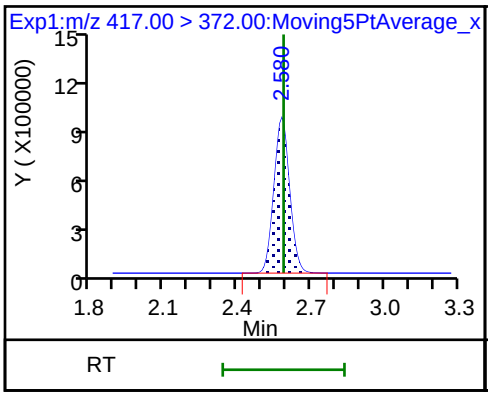
8 Perfluorohexanesulfonic acid 13 1H,1H,2H,2H-perfluorooctanesulfon D 12 M2-6:2FTS



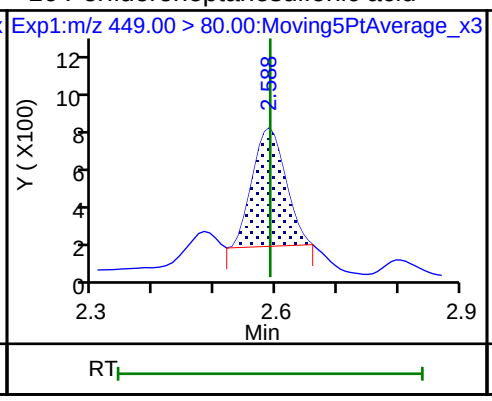
* 62 13C2-PFOA 15 Perfluorooctanoic acid (M) 15 Perfluorooctanoic acid



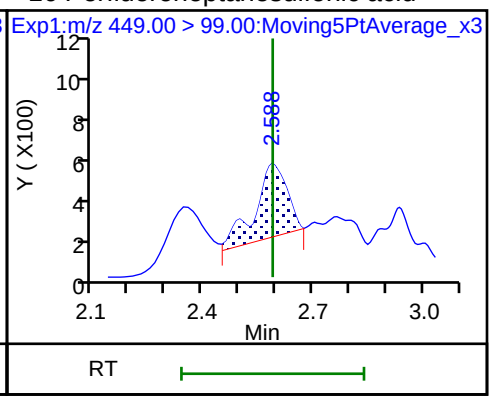
D 14 13C4 PFOA



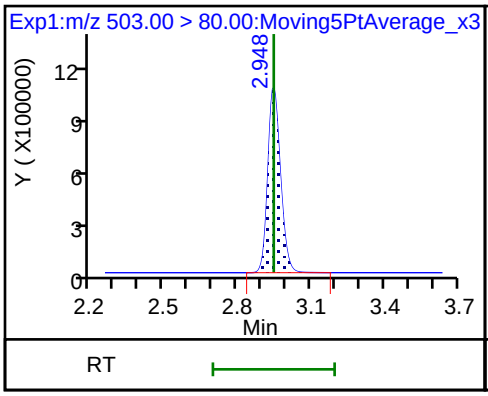
16 Perfluoroheptanesulfonic acid



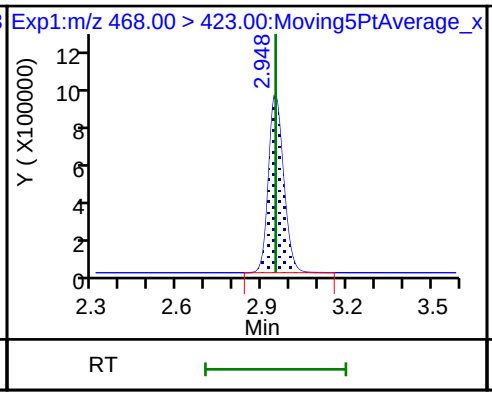
16 Perfluoroheptanesulfonic acid



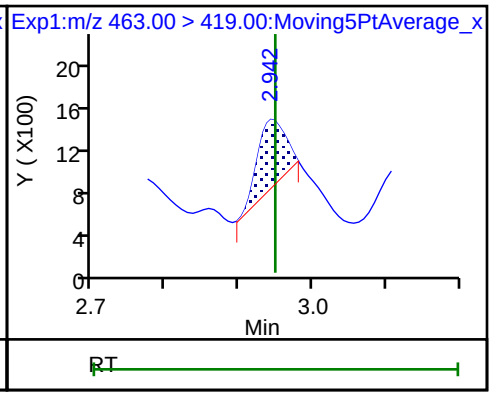
D 18 13C4 PFOS



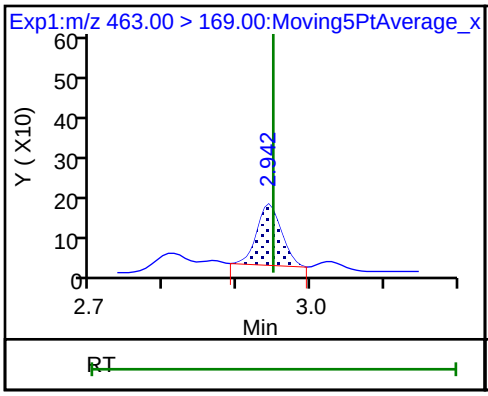
D 19 13C5 PFNA



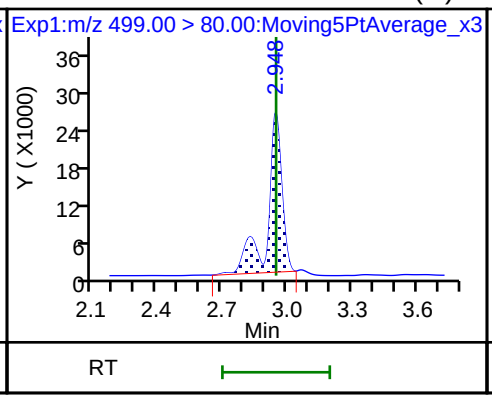
20 Perfluorononanoic acid



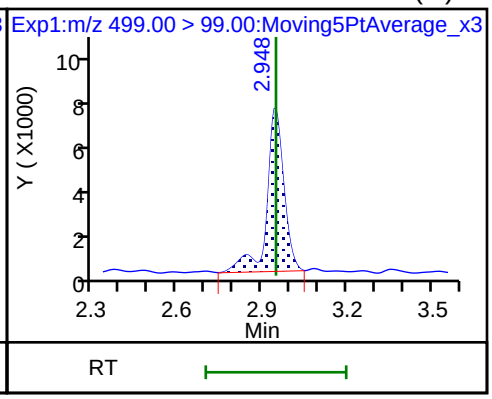
20 Perfluorononanoic acid



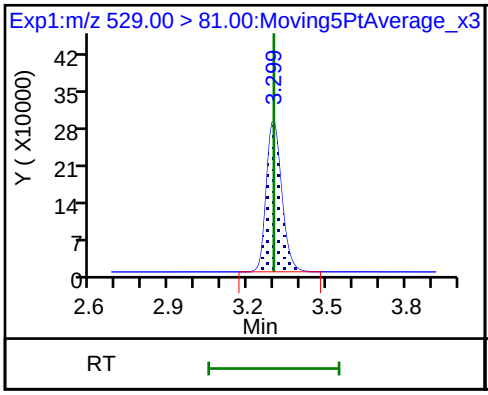
17 Perfluorooctane sulfonic acid (M)



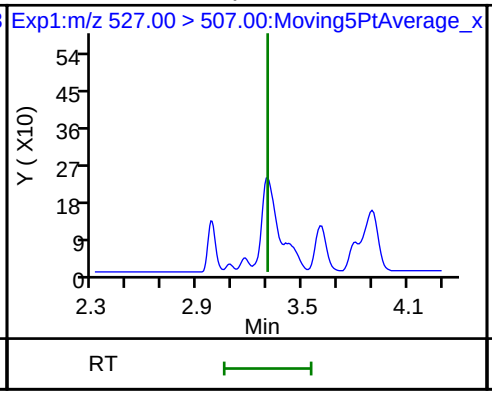
17 Perfluorooctane sulfonic acid (M)



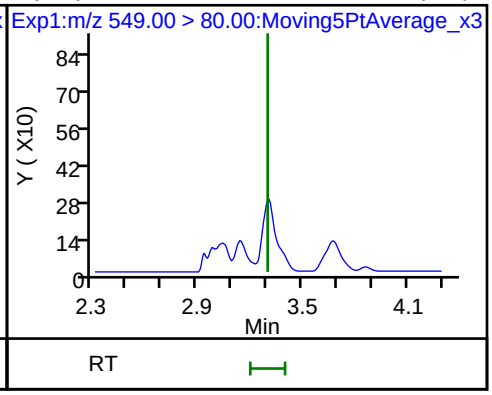
D 26 M2-8:2FTS



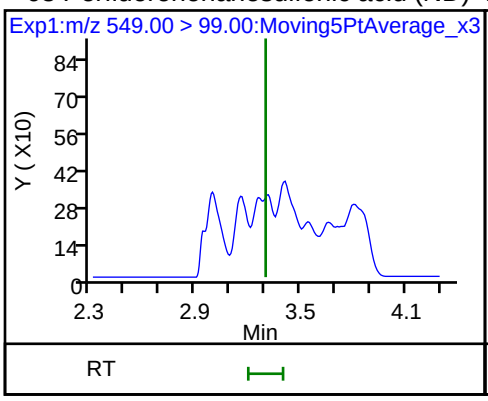
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



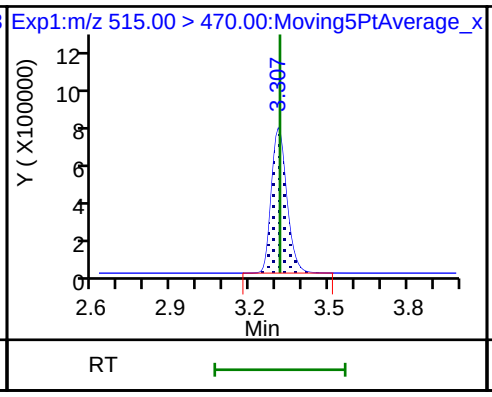
68 Perfluorononanesulfonic acid (ND)



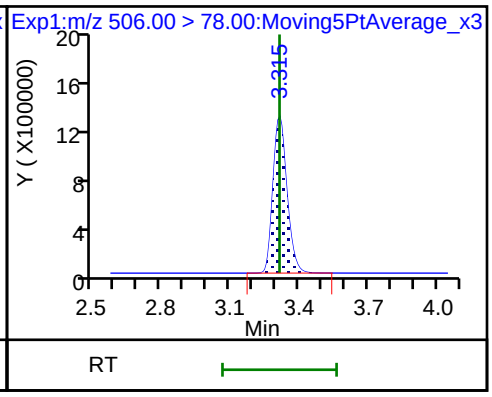
68 Perfluorononanesulfonic acid (ND)



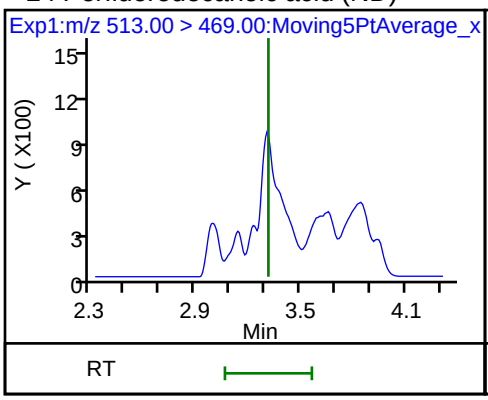
D 23 13C2 PFDA



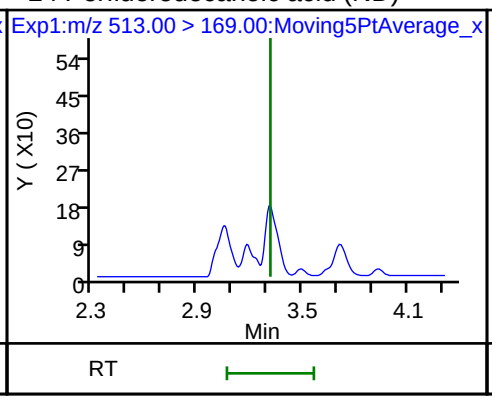
D 21 13C8 FOSA



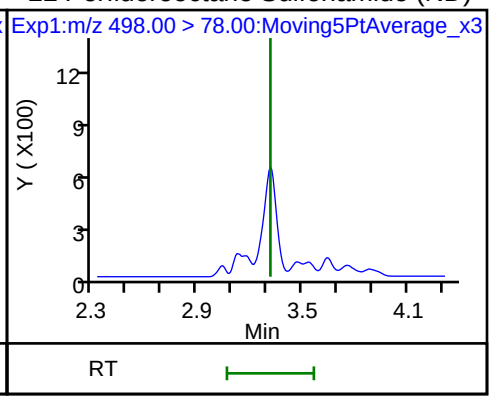
24 Perfluorodecanoic acid (ND)



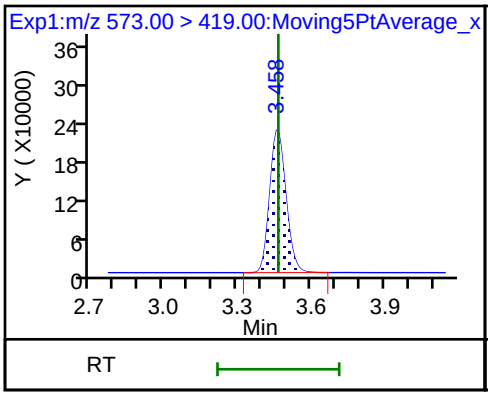
24 Perfluorodecanoic acid (ND)



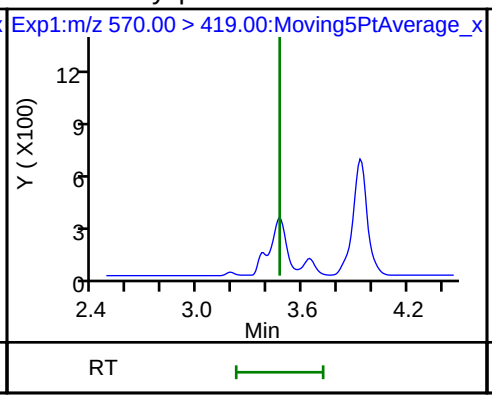
22 Perfluorooctane Sulfonamide (ND)



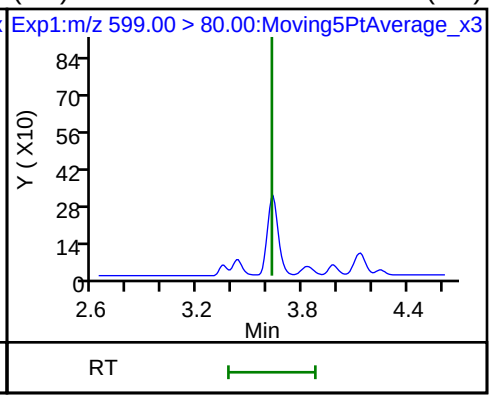
D 27 d3-NMeFOSAA



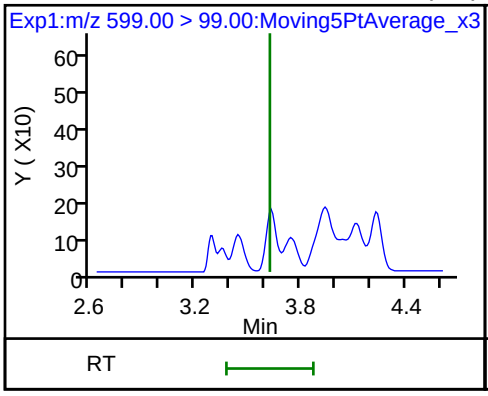
28 N-methyl perfluorooctane sulfonami (ND)



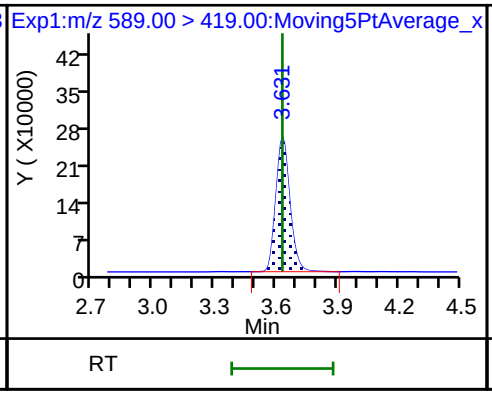
29 Perfluorodecane Sulfonic acid (ND)



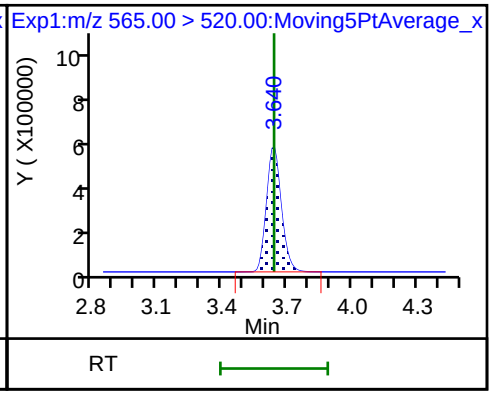
29 Perfluorodecane Sulfonic acid (ND)



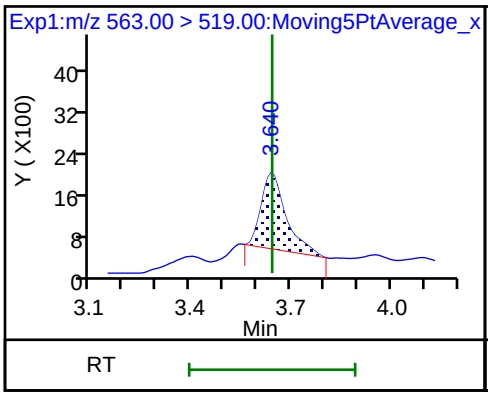
D 32 d5-NEtFOSAA



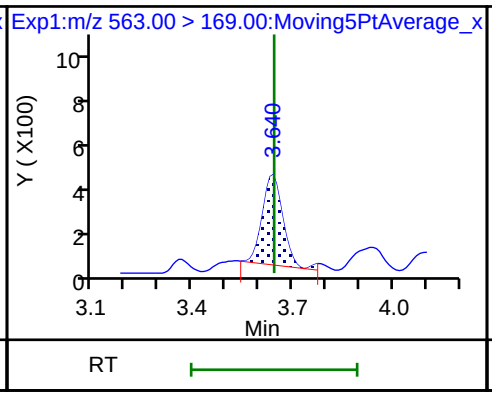
D 30 13C2 PFUnA



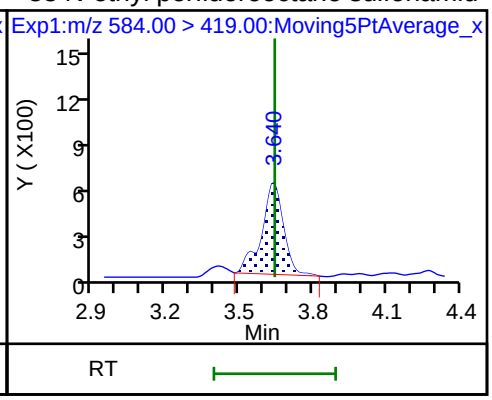
31 Perfluoroundecanoic acid



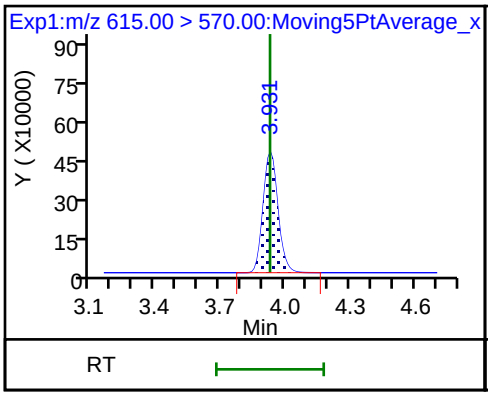
31 Perfluoroundecanoic acid



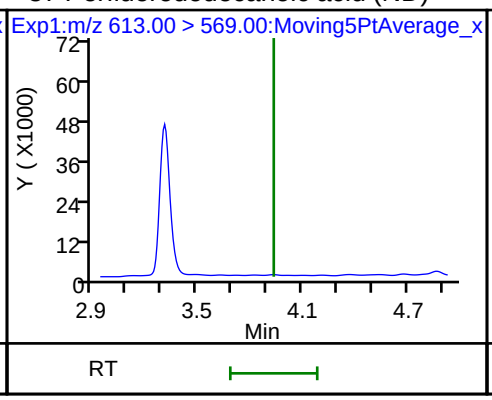
33 N-ethyl perfluorooctane sulfonamid



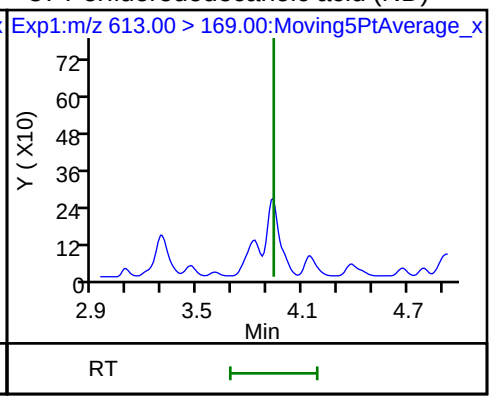
D 36 13C2 PFDoA



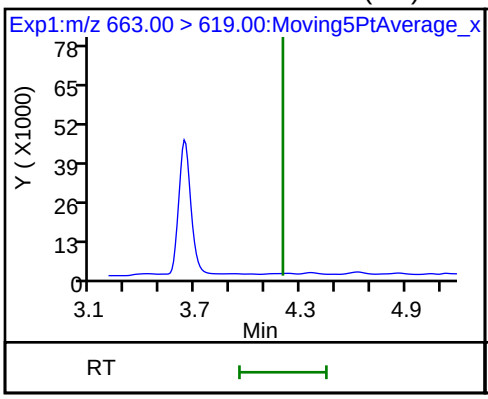
37 Perfluorododecanoic acid (ND)



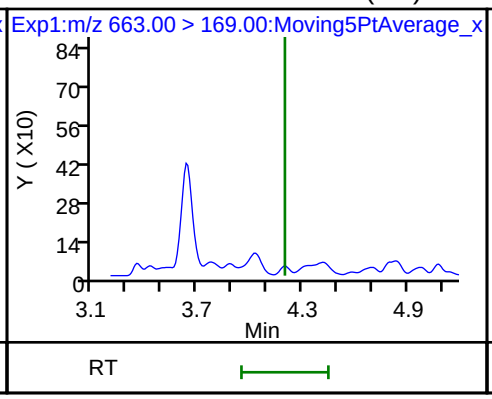
37 Perfluorododecanoic acid (ND)



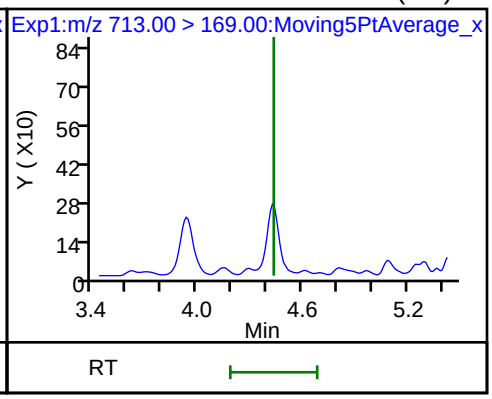
41 Perfluorotridecanoic acid (ND)



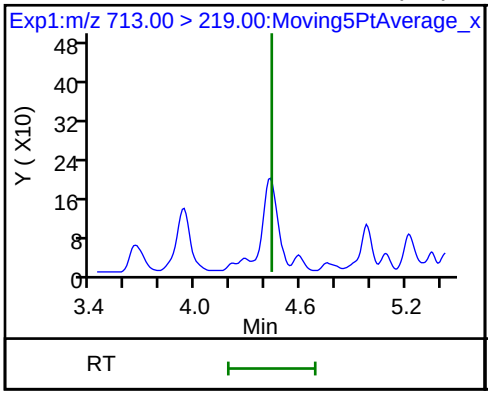
41 Perfluorotridecanoic acid (ND)



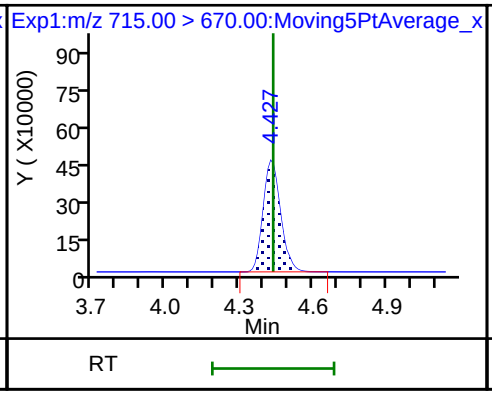
42 Perfluorotetradecanoic acid (ND)



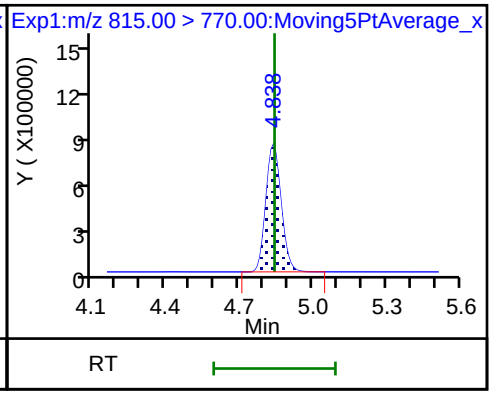
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

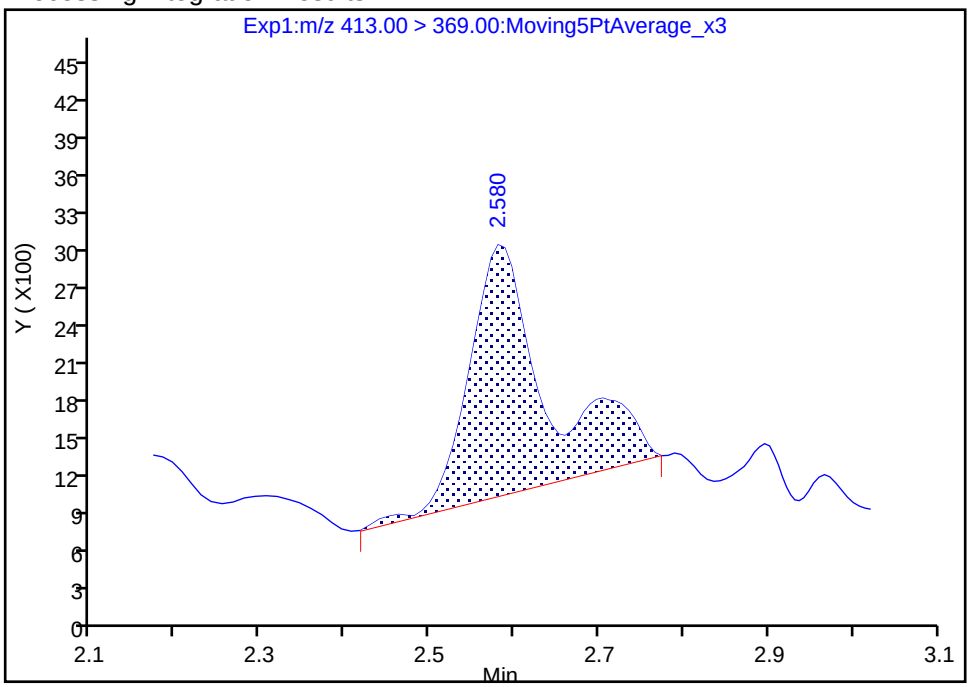
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_015.d				
Injection Date:	29-Jul-2018 01:08:42	Instrument ID:	A8_N		
Lims ID:	MB 320-234662/1-A				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

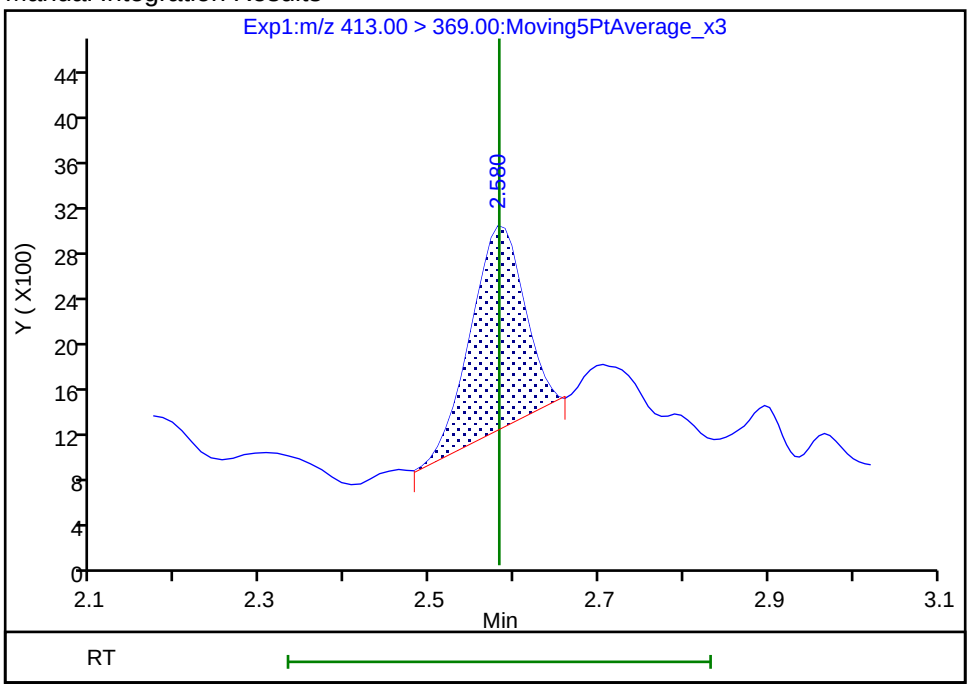
Processing Integration Results

RT: 2.58
Area: 12571
Amount: 0.006340
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 7792
Amount: 0.003930
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:54:23

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

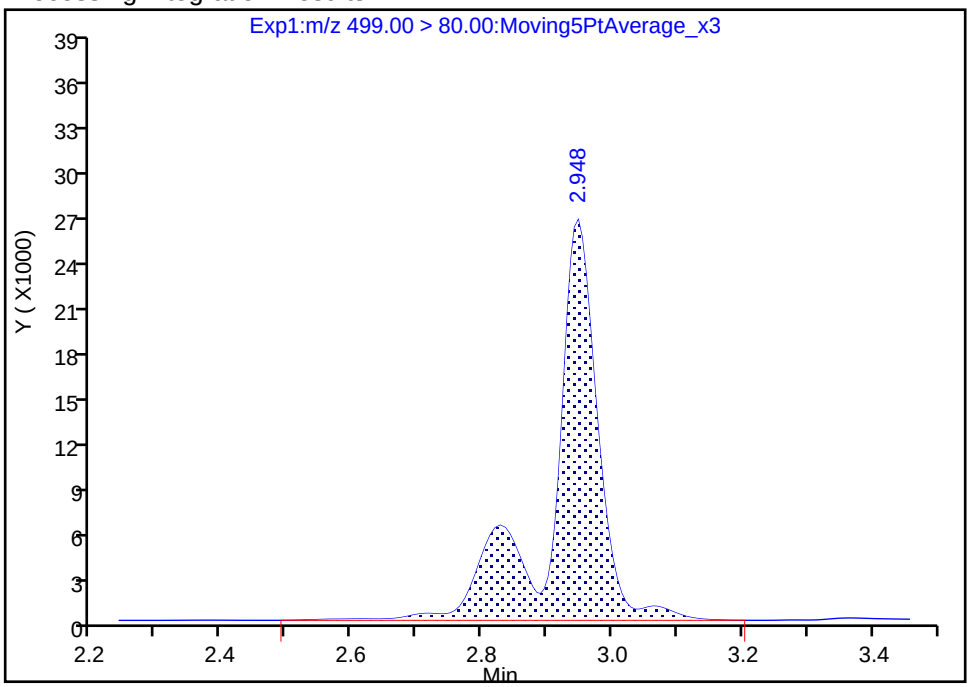
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_015.d				
Injection Date:	29-Jul-2018 01:08:42	Instrument ID:	A8_N		
Lims ID:	MB 320-234662/1-A				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

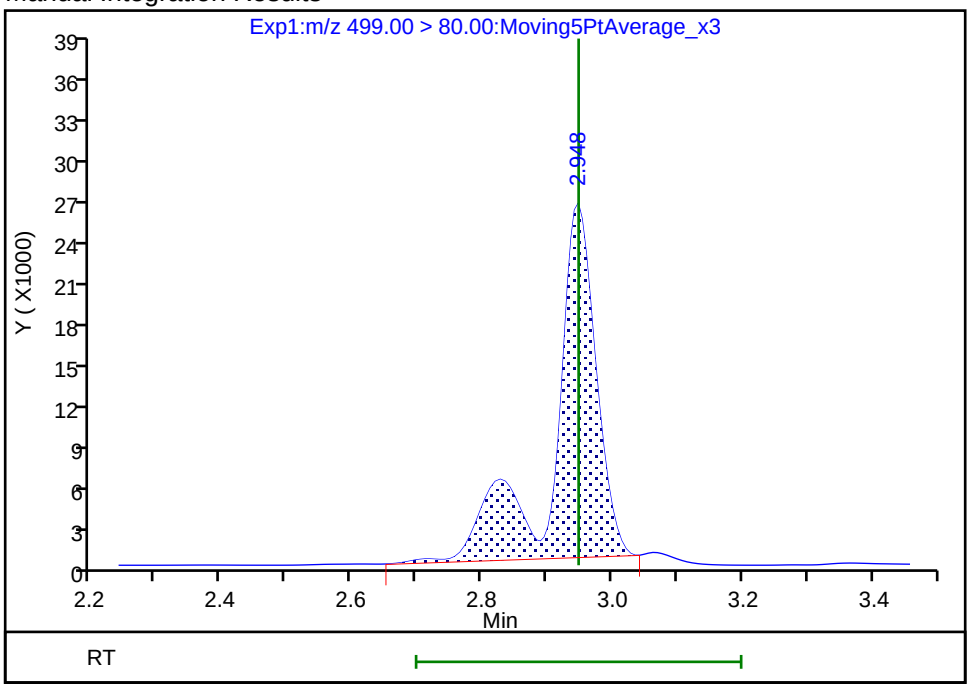
Processing Integration Results

RT: 2.95
Area: 133384
Amount: 0.079194
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 120337
Amount: 0.071448
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:54:42

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

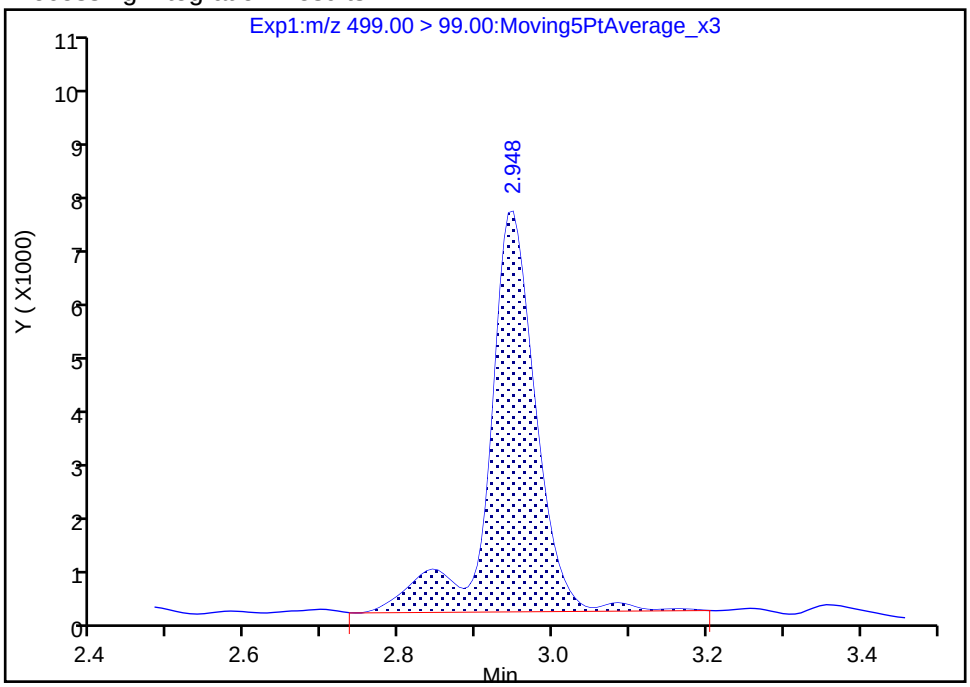
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_015.d				
Injection Date:	29-Jul-2018 01:08:42	Instrument ID:	A8_N		
Lims ID:	MB 320-234662/1-A				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	8	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

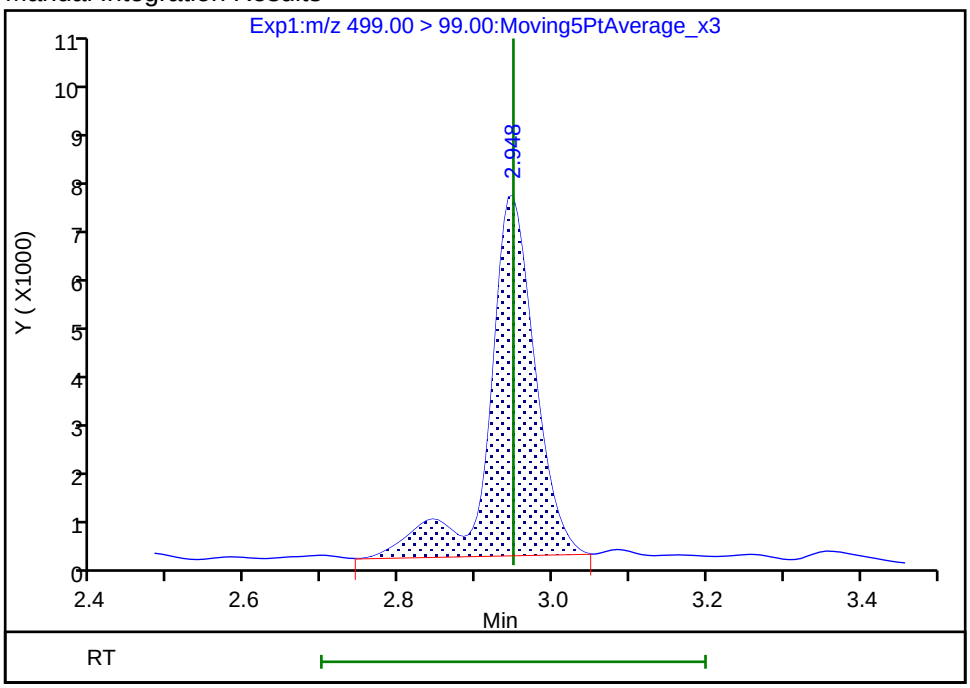
Processing Integration Results

RT: 2.95
Area: 29515
Amount: 0.079194
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 28592
Amount: 0.071448
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 15:54:48

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-235506/1
Matrix: Water
Lab File ID: 2018.07.22LLA_004.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/22/2018 06:07
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235506
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00800	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	91		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	98		50-150
STL00991	13C4 PFOS	98		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 22-Jul-2018 06:07:04 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 09:23:19 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 08:29:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.511	0.006	0.543	9316799	2.26		90.3	8219	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.784	0.008	0.641	8768748	2.31		92.4	10894	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.792	0.0	1.000	11799	0.003099			4.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.826	0.0	0.653	101398	2.12		91.0	1003	
D 60 M2-4:2FTS										
329.00 > 81.00	2.046	2.046	0.0	0.732	826486	NC			1304	
D 7 13C2 PFHxA										
315.00 > 270.00	2.077	2.077	0.0	0.743	9186073	2.31		92.2	20593	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.181	2.181	0.0	0.780	882993	NC			4228	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.423	0.0	0.867	10623724	2.30		92.1	16971	
D 11 18O2 PFHxS										
403.00 > 84.00	2.436	2.436	0.0	0.871	6539377	2.33		98.4	25925	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.448	2.436	0.012	1.005	29456	0.007996			65.5	
399.00 > 99.00	2.436	2.436	0.0	1.000	6253		4.71(1.90-5.70)		28.3	
D 12 M2-6:2FTS										
429.00 > 81.00	2.764	2.764	0.0	0.989	1073802	2.49		105	4394	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.796	0.0	1.000	9826736	2.37		94.7	15152	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10596275	2.50			17294	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	13147	0.002904			1.8	
413.00 > 169.00	2.796	2.796	0.0	1.000	7043		1.87(1.36-4.08)		20.2	
D 18 13C4 PFOS										
503.00 > 80.00	3.171	3.171	0.0	1.134	7017870	2.33		97.5	8697	
D 19 13C5 PFNA										
468.00 > 423.00	3.171	3.171	0.0	1.134	8985956	2.30		92.2	13870	
D 21 13C8 FOSA										
506.00 > 78.00	3.516	3.516	0.0	1.258	4281004	2.52		101	14183	
D 26 M2-8:2FTS										
529.00 > 81.00	3.531	3.531	0.0	1.263	128047	2.17		90.7	1599	
D 23 13C2 PFDA										
515.00 > 470.00	3.531	3.546	-0.015	1.263	9636943	2.38		95.2	23696	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.685	3.685	0.0	1.318	4627007	2.43		97.1	9309	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.855	3.855	0.0	1.379	3916232	2.56		103	7420	
D 30 13C2 PFUnA										
565.00 > 520.00	3.855	3.870	-0.015	1.379	8580283	2.32		92.8	16907	
D 36 13C2 PFDoA										
615.00 > 570.00	4.152	4.152	0.0	1.485	9030407	2.27		91.0	13012	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.652	4.652	0.0	1.664	7449144	2.17		86.7	12468	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.053	5.070	-0.017	1.807	7225975	2.04		81.7	5808	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.070	5.070	0.0	1.003	68347	NC			11.8	
813.00 > 169.00	5.070	5.070	0.0	1.003	9423		7.25(2.77-8.32)		28.2	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 25-Jul-2018 08:29:24 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61454.b\2018.07.22LLA_004.d

Injection Date: 22-Jul-2018 06:07:04 Instrument ID: A9

Lims ID: CCB

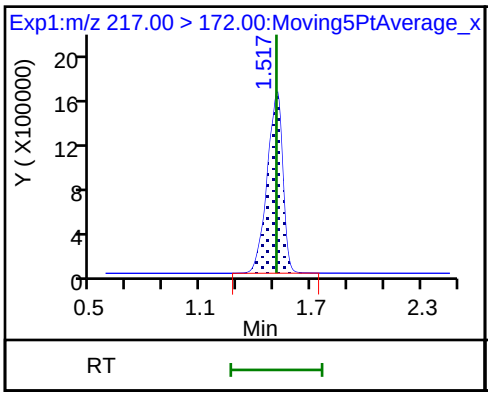
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 1

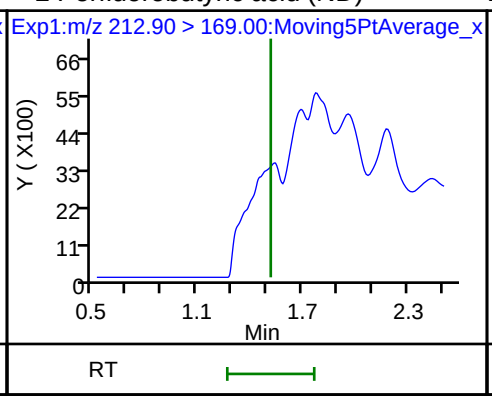
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

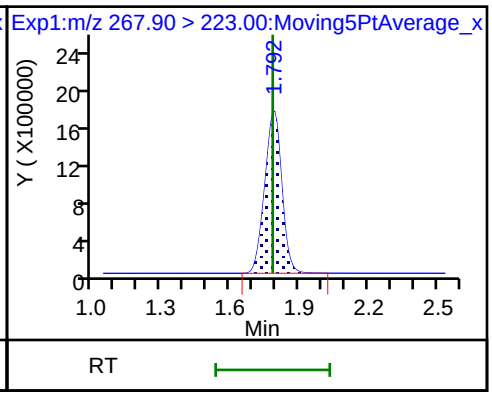
D 1 13C4 PFBA



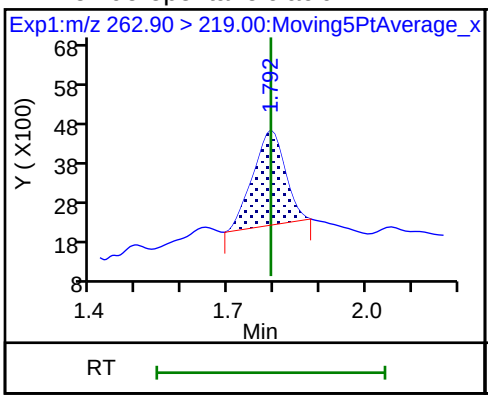
2 Perfluorobutyric acid (ND)



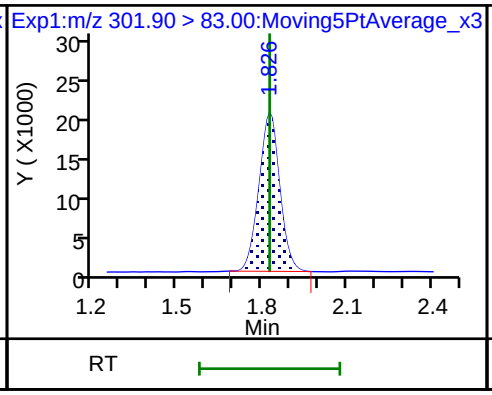
D 3 13C5-PFPeA



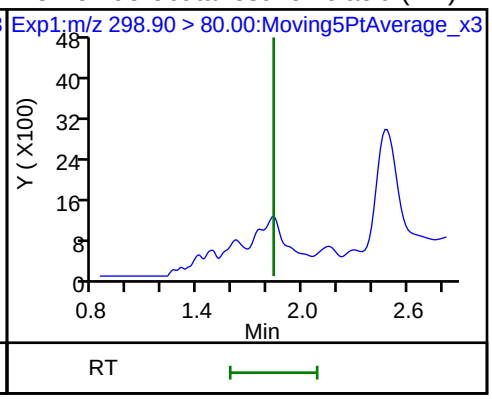
4 Perfluoropentanoic acid



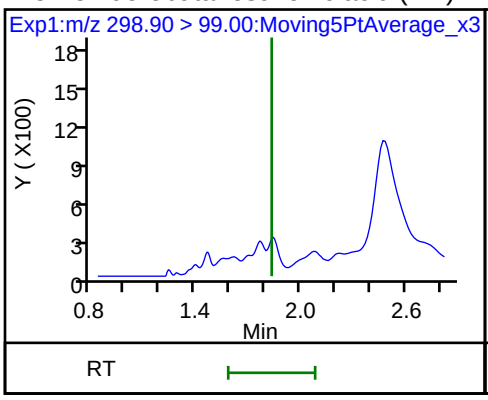
D 47 13C3-PFBS



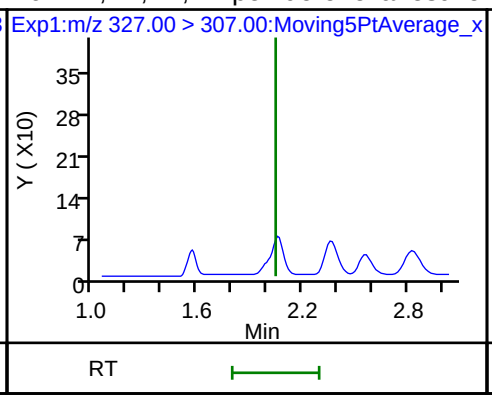
5 Perfluorobutanesulfonic acid (ND)



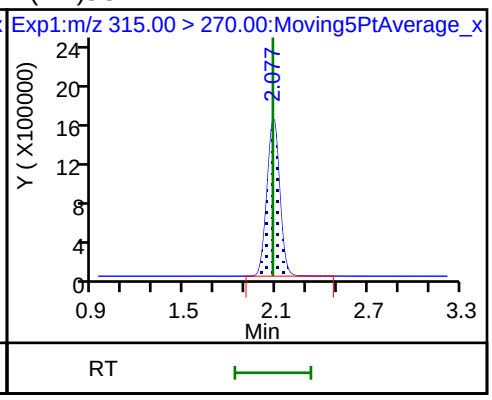
5 Perfluorobutanesulfonic acid (ND)



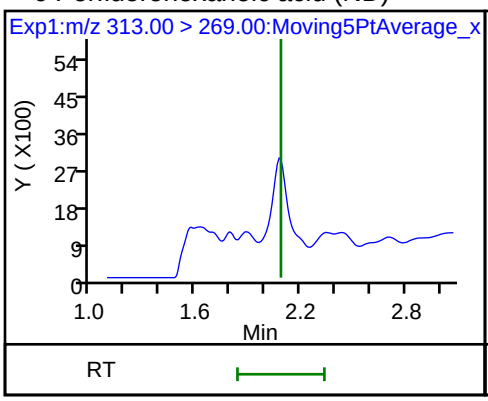
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



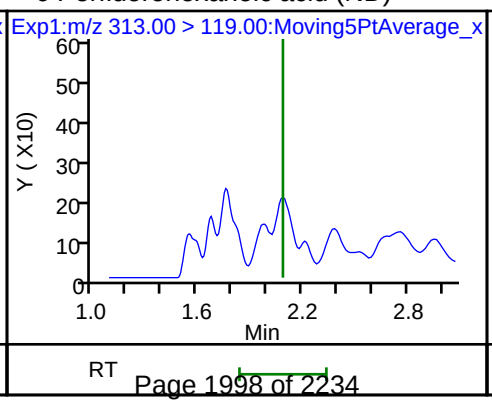
D 70 13C2 PFHxA



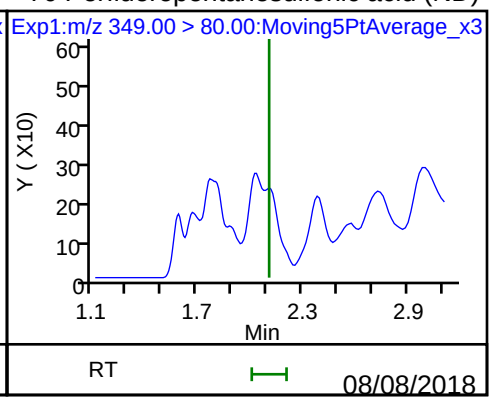
6 Perfluorohexanoic acid (ND)



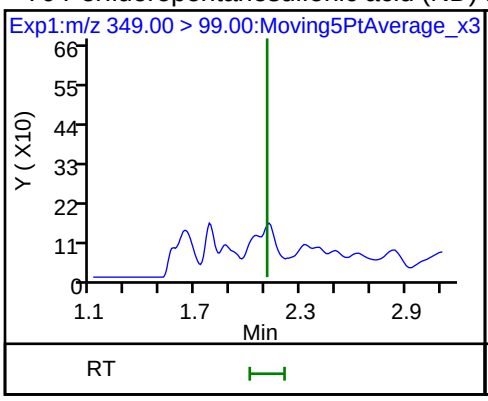
6 Perfluorohexanoic acid (ND)



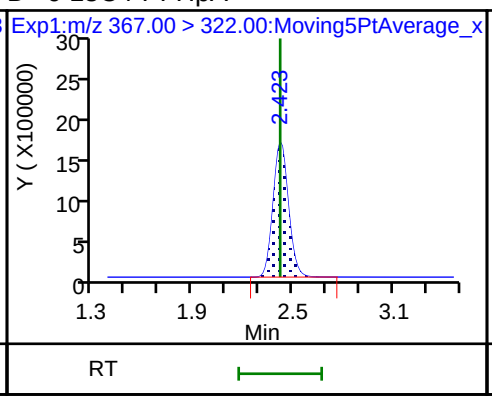
70 Perfluoropentanesulfonic acid (ND)



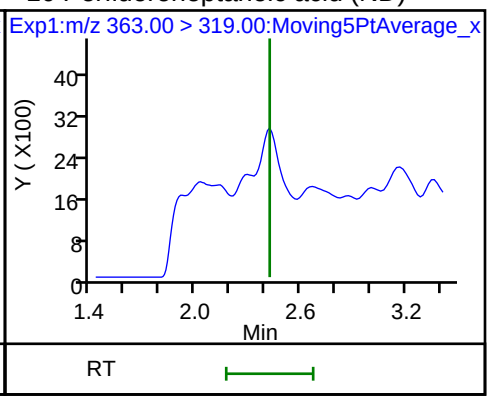
70 Perfluoropentanesulfonic acid (ND)



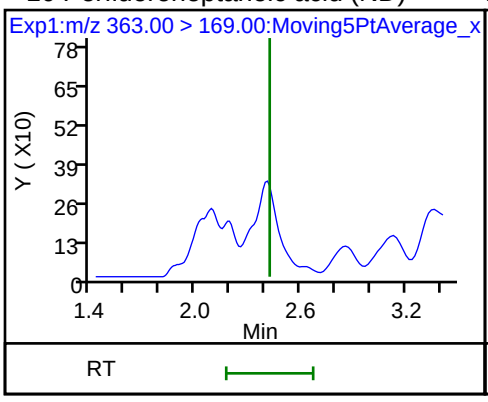
D 9 13C4-PFHpA



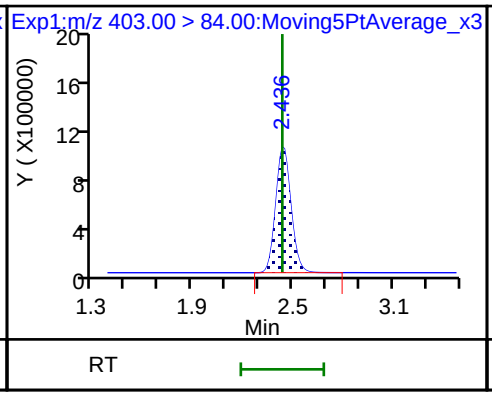
10 Perfluoroheptanoic acid (ND)



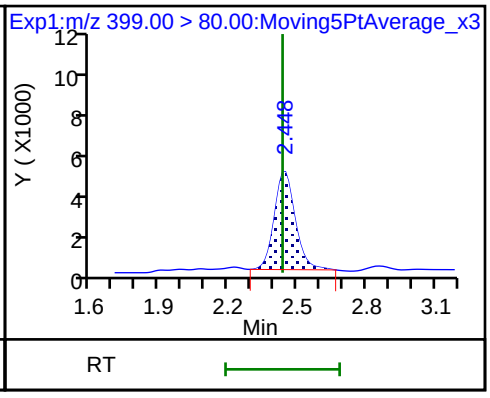
10 Perfluoroheptanoic acid (ND)



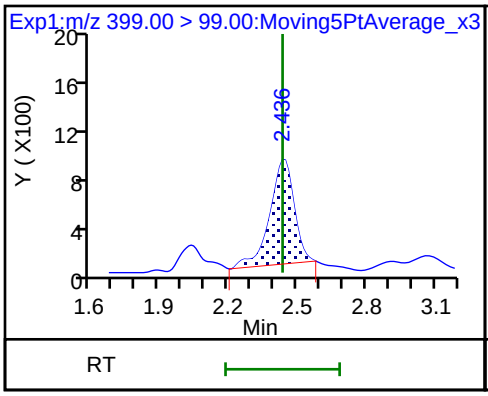
D 11 18O2 PFHxS



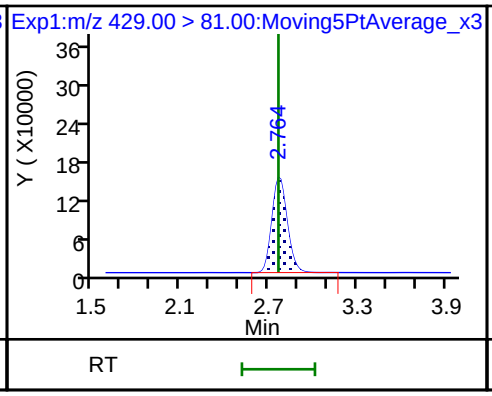
8 Perfluorohexanesulfonic acid



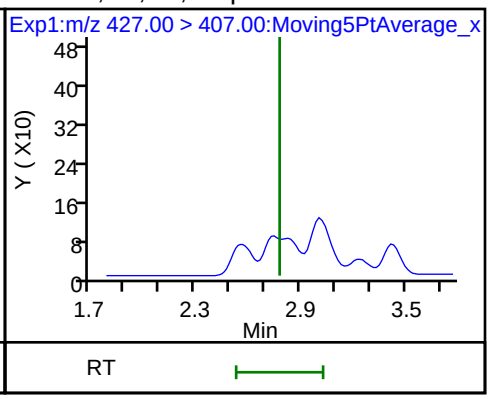
8 Perfluorohexanesulfonic acid



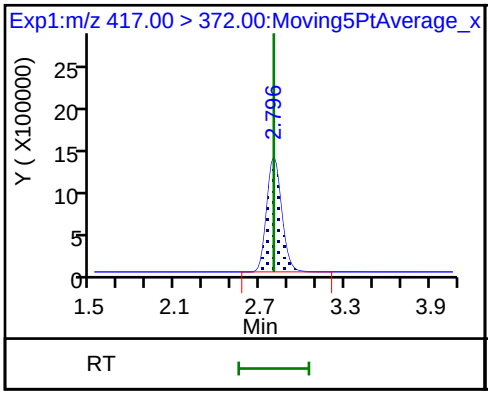
D 12 M2-6:2FTS



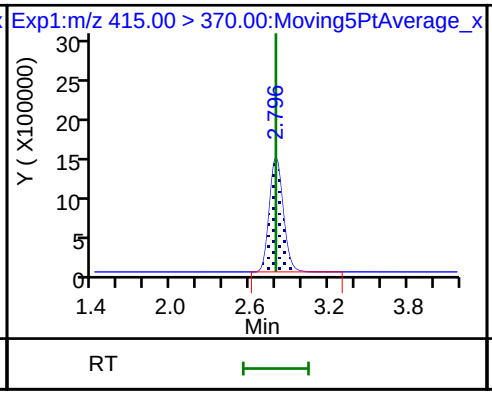
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



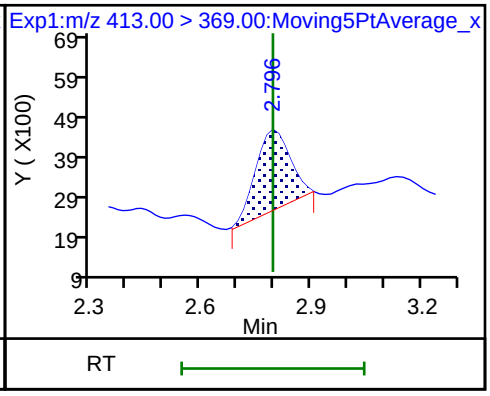
D 14 13C4 PFOA



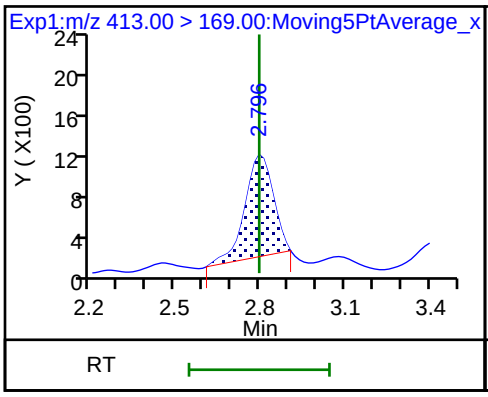
* 62 13C2-PFOA



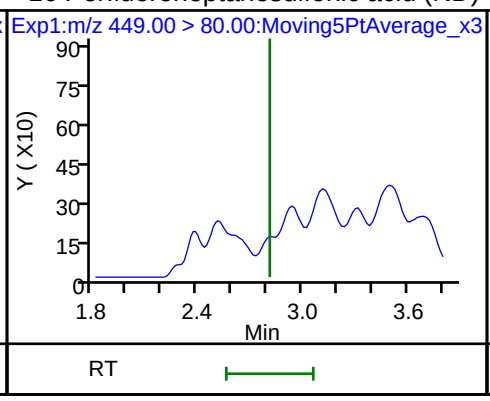
15 Perfluorooctanoic acid



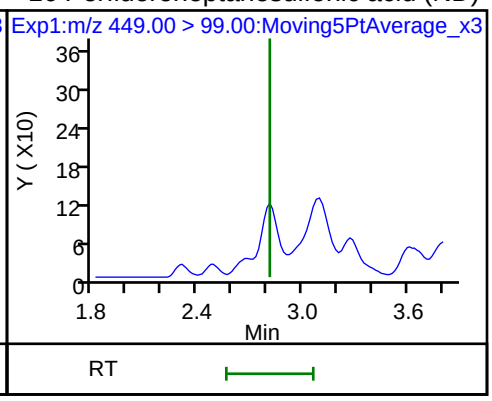
15 Perfluorooctanoic acid



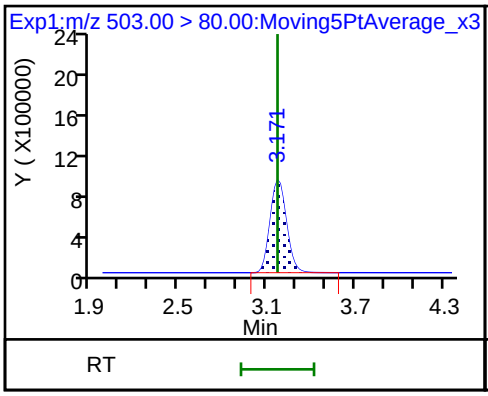
16 Perfluoroheptanesulfonic acid (ND)



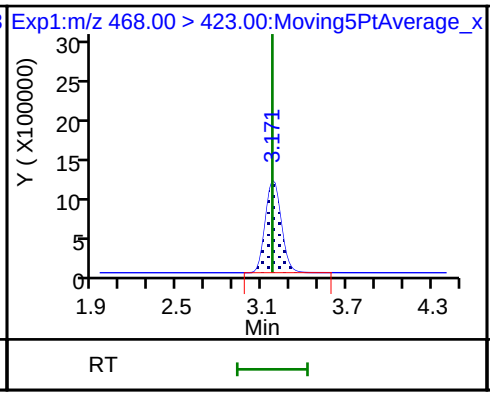
16 Perfluoroheptanesulfonic acid (ND)



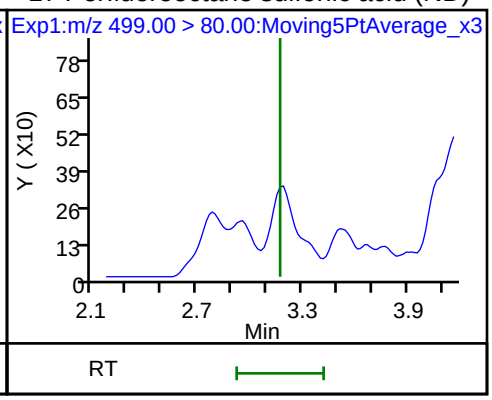
D 18 13C4 PFOS



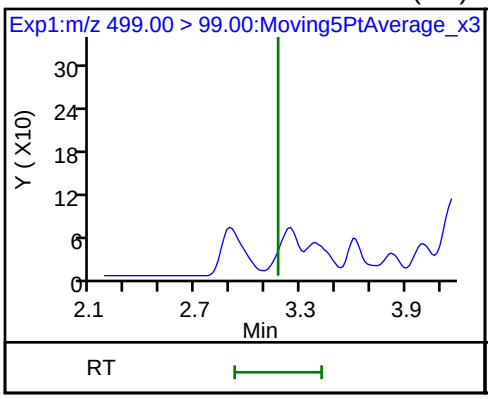
D 19 13C5 PFNA



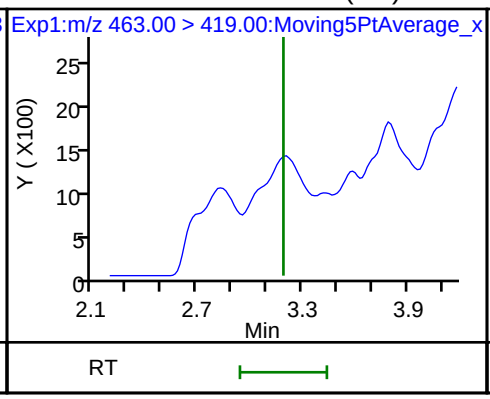
17 Perfluorooctane sulfonic acid (ND)



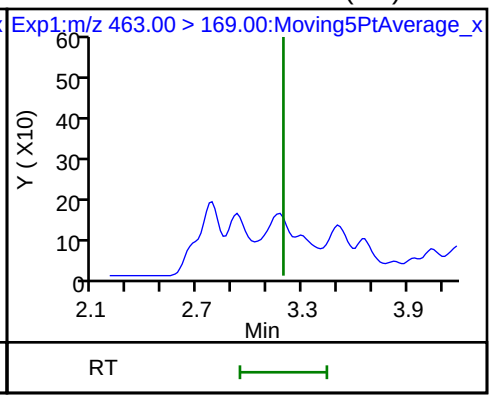
17 Perfluorooctane sulfonic acid (ND)



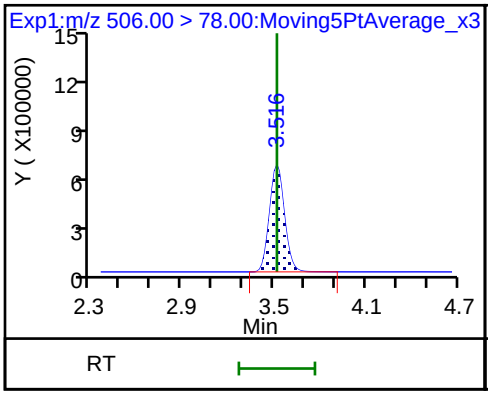
20 Perfluorononanoic acid (ND)



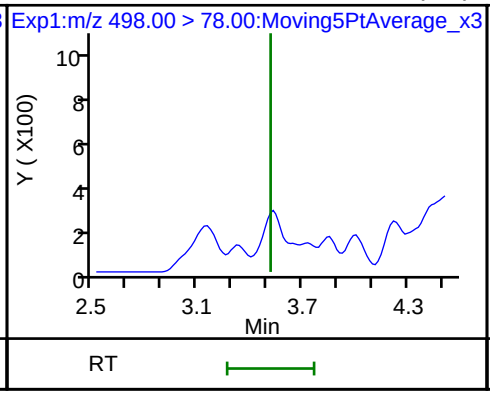
20 Perfluorononanoic acid (ND)



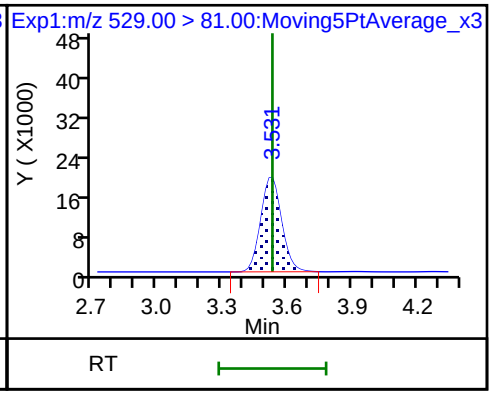
D 21 13C8 FOSA



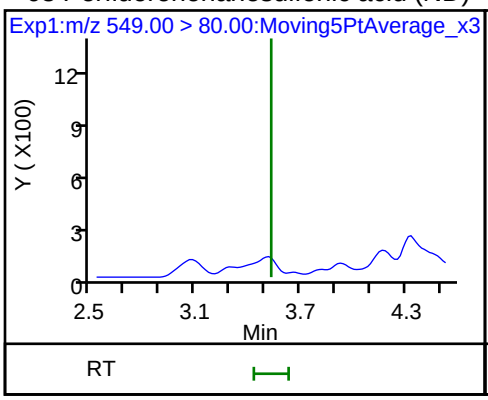
22 Perfluorooctane Sulfonamide (ND)



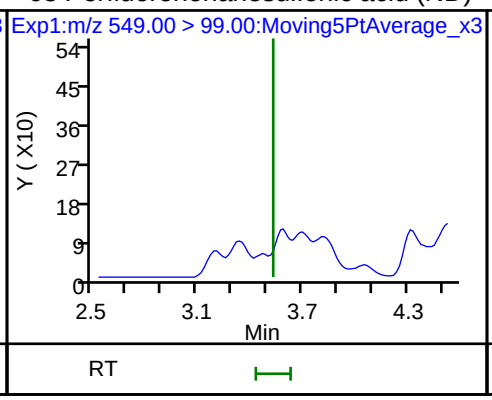
D 26 M2-8:2FTS



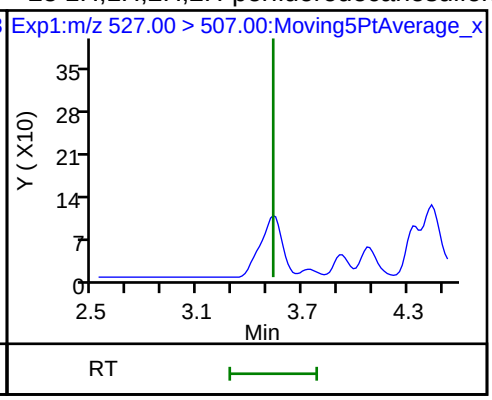
68 Perfluorononanesulfonic acid (ND)



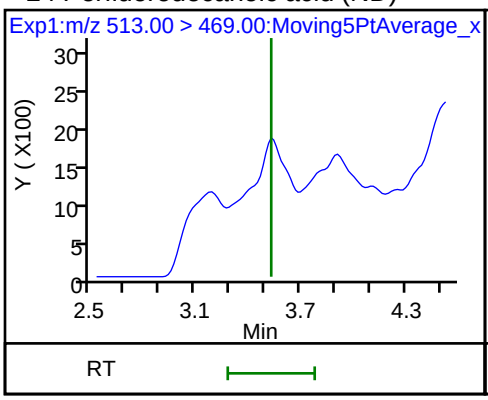
68 Perfluorononanesulfonic acid (ND)



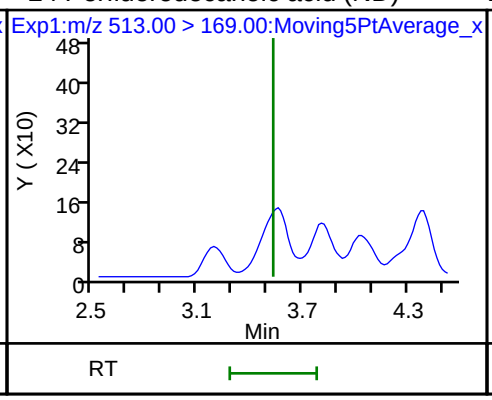
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



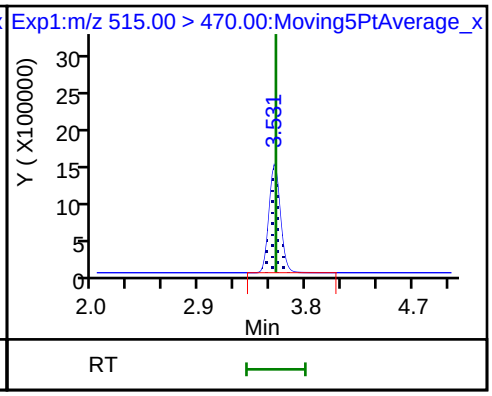
24 Perfluorodecanoic acid (ND)



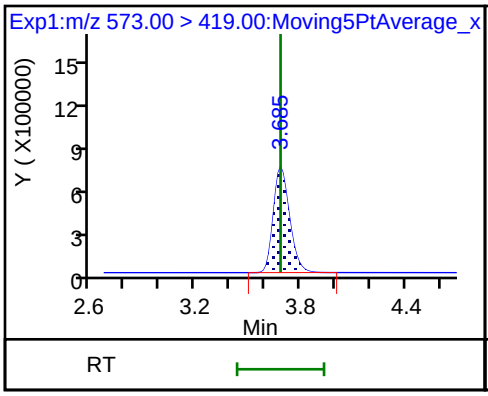
24 Perfluorodecanoic acid (ND)



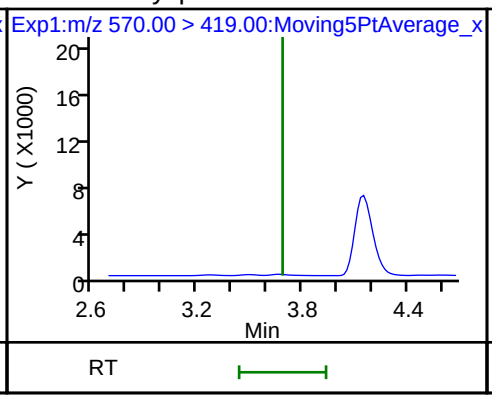
D 23 13C2 PFDA



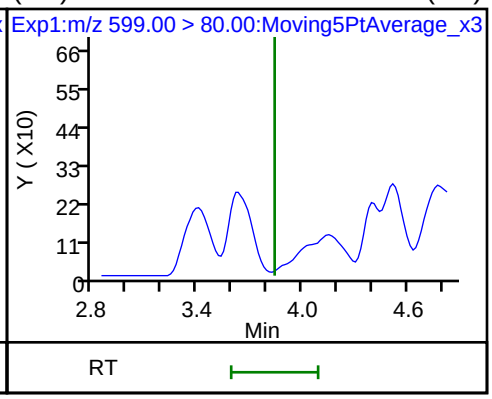
D 27 d3-NMeFOSAA



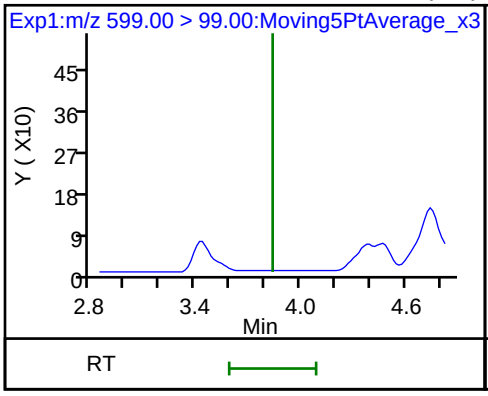
28 N-methyl perfluorooctane sulfonami (ND)



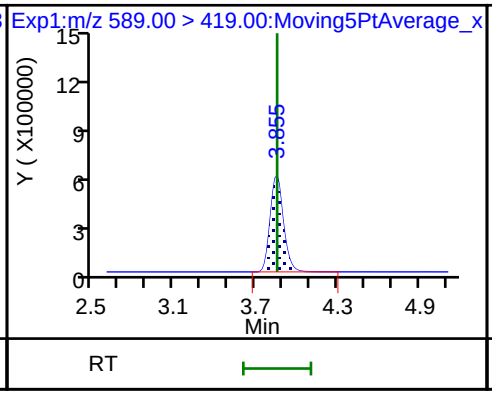
29 Perfluorodecane Sulfonic acid (ND)



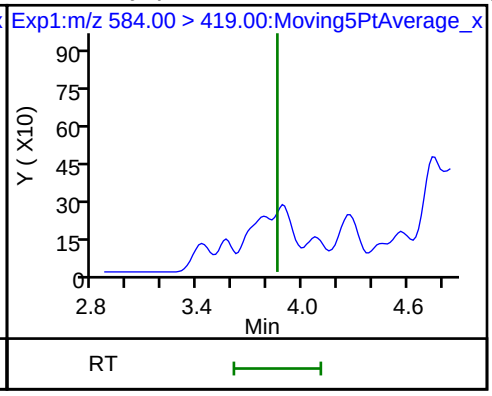
29 Perfluorodecane Sulfonic acid (ND)



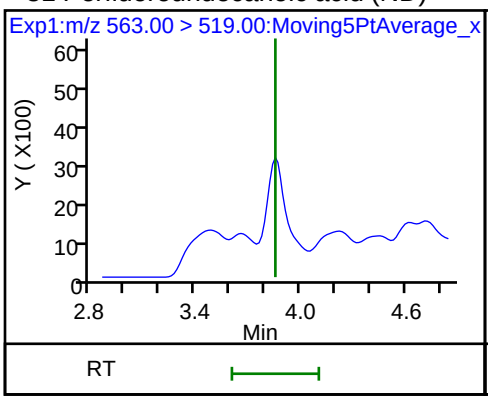
D 32 d5-NEtFOSAA



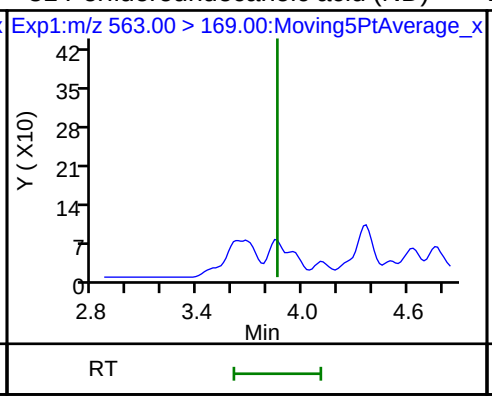
33 N-ethyl perfluorooctane sulfonamid (ND)



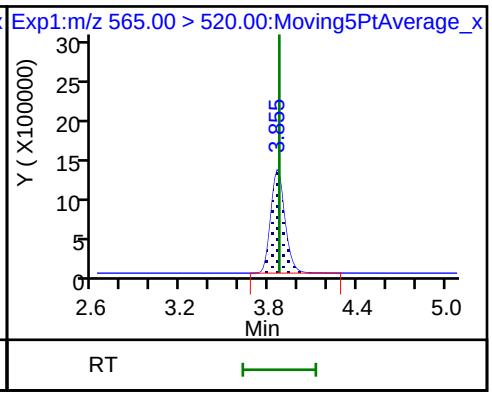
31 Perfluoroundecanoic acid (ND)



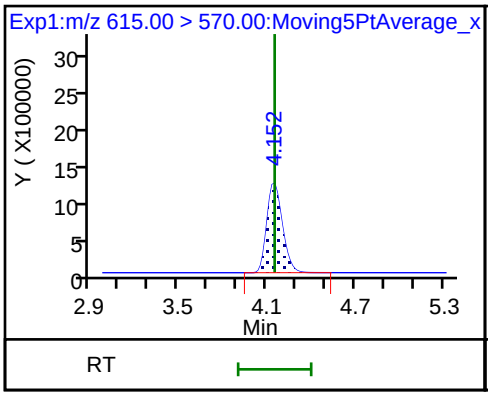
31 Perfluoroundecanoic acid (ND)



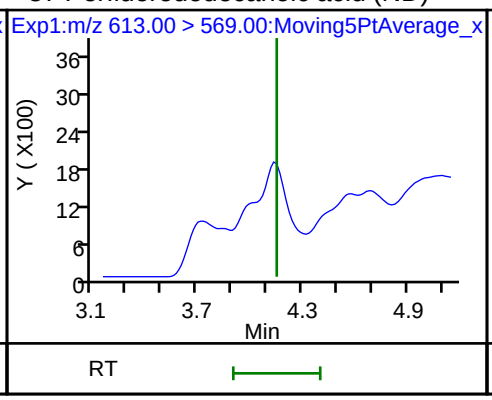
D 30 13C2 PFUnA



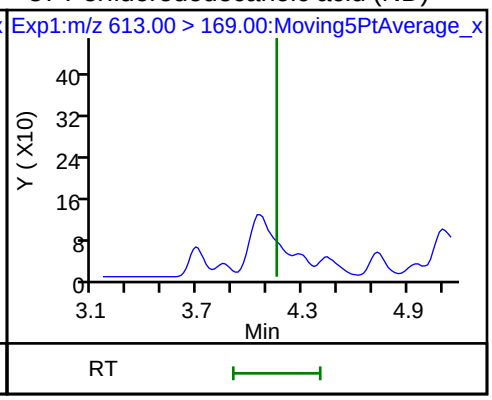
D 36 13C2 PFDoA



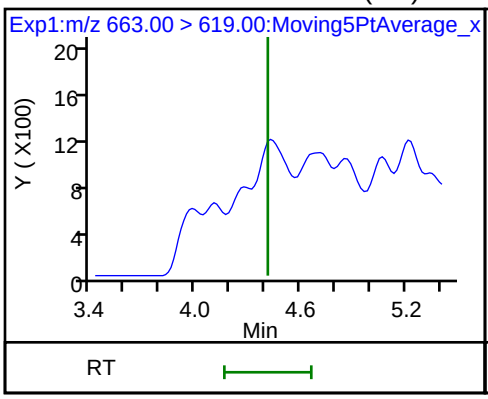
37 Perfluorododecanoic acid (ND)



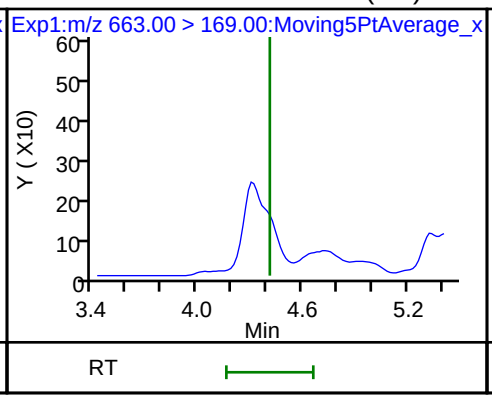
37 Perfluorododecanoic acid (ND)



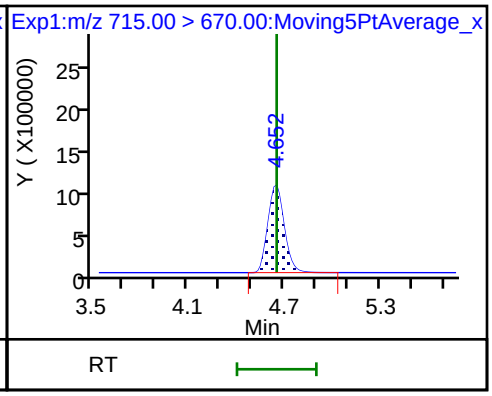
41 Perfluorotridecanoic acid (ND)



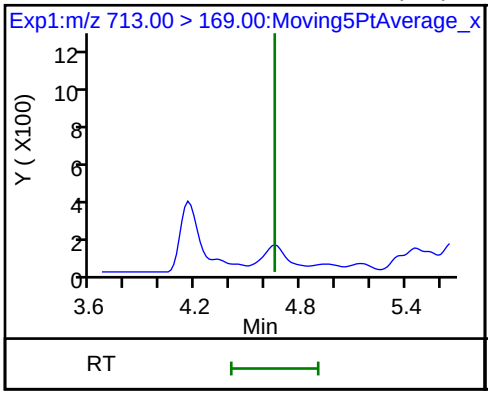
41 Perfluorotridecanoic acid (ND)



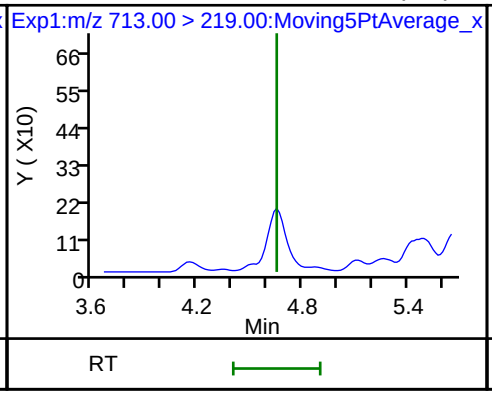
D 43 13C2-PFTeDA



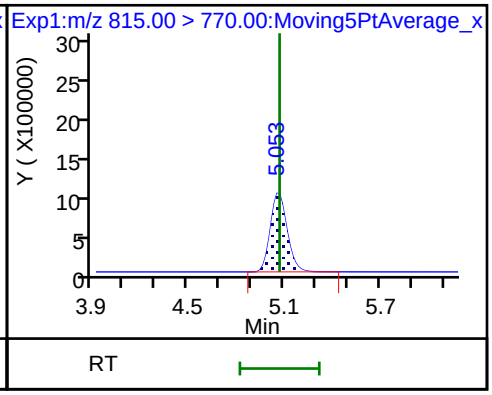
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-236275/1
Matrix: Water
Lab File ID: 2018.07.26LLA_004.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/26/2018 09:44
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236275
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00667	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	105		50-150
STL01892	13C4-PFHpA	102		50-150
STL00990	13C4 PFOA	104		50-150
STL00995	13C5 PFNA	107		50-150
STL00994	18O2 PFHxS	96		50-150
STL00991	13C4 PFOS	102		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\2018.07.26LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 26-Jul-2018 09:44:16 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 26-Jul-2018 14:15:58 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: barnettj Date: 26-Jul-2018 14:13:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.538	1.537	0.001	0.541	7289358	2.39		95.7	9381	
D 3 13C5-PFPeA										
267.90 > 223.00	1.817	1.816	0.001	0.639	7153637	2.55		102	13143	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.817	1.825	-0.008	1.000	10525	0.003389			2.9	
D 47 13C3-PFBS										
301.90 > 83.00	1.860	1.858	0.002	0.654	85891	2.43		105	1308	
D 60 M2-4:2FTS										
329.00 > 81.00	2.087	2.074	0.013	0.734	694235	NC			2419	
D 7 13C2 PFHxA										
315.00 > 270.00	2.118	2.116	0.002	0.745	7341393	2.50		99.9	17993	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.222	2.220	0.002	0.782	591713	NC			3940	
D 9 13C4-PFHpA										
367.00 > 322.00	2.474	2.459	0.015	0.870	8703534	2.56		102	19176	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.474	2.472	0.002	1.000	10658	0.002785			2.0	
363.00 > 169.00	2.488	2.472	0.016	1.005	2635		4.04(2.17-6.52)		4.4	
D 11 18O2 PFHxS										
403.00 > 84.00	2.488	2.485	0.003	0.875	4722147	2.28		96.3	22241	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.488	2.485	0.003	1.000	17750	0.006673			45.4	
399.00 > 99.00	2.501	2.485	0.016	1.005	4744		3.74(1.90-5.70)		29.3	
D 12 M2-6:2FTS										
429.00 > 81.00	2.812	2.808	0.004	0.989	791534	2.49		105	3597	
D 14 13C4 PFOA										
417.00 > 372.00	2.844	2.840	0.004	1.000	7986446	2.61		104	22655	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
* 62 13C2-PFOA										
415.00 > 370.00	2.844	2.840	0.004		7818446	2.50			18319	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.844	2.856	-0.012	1.000	23750	0.006454			2.7	
413.00 > 169.00	2.840	2.856	-0.016	0.999	0		0.00(1.36-4.08)			
D 18 13C4 PFOS										
503.00 > 80.00	3.225	3.221	0.004	1.134	5404530	2.43		102	7708	
D 19 13C5 PFNA										
468.00 > 423.00	3.225	3.221	0.004	1.134	7712917	2.68		107	16550	
D 21 13C8 FOSA										
506.00 > 78.00	3.560	3.543	0.017	1.252	3099178	2.47		98.8	7832	
D 26 M2-8:2FTS										
529.00 > 81.00	3.574	3.558	0.016	1.257	120756	2.78		116	2406	
D 23 13C2 PFDA										
515.00 > 470.00	3.589	3.572	0.017	1.262	8065577	2.70		108	17756	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.731	3.714	0.017	1.312	3804155	2.71		108	9425	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.897	3.883	0.014	1.371	3161675	2.81		112	4983	
D 30 13C2 PFUnA										
565.00 > 520.00	3.913	3.896	0.017	1.376	7126077	2.61		104	18685	
D 36 13C2 PFDoA										
615.00 > 570.00	4.188	4.186	0.002	1.473	7560785	2.58		103	26709	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.699	4.683	0.016	1.652	6651153	2.62		105	10787	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.104	5.086	0.018	1.795	6315031	2.42		96.8	7662	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.104	5.103	0.001	1.000	57128	NC			10.4	
813.00 > 169.00	5.104	5.103	0.001	1.000	8635		6.62(2.77-8.32)		27.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 26-Jul-2018 14:16:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180726-61677.b\2018.07.26LLA_004.d

Injection Date: 26-Jul-2018 09:44:16 Instrument ID: A9

Lims ID: CCB

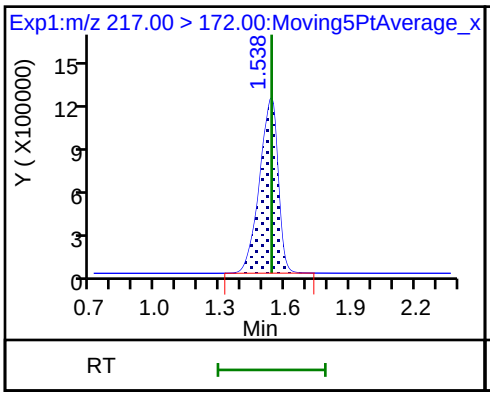
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 1

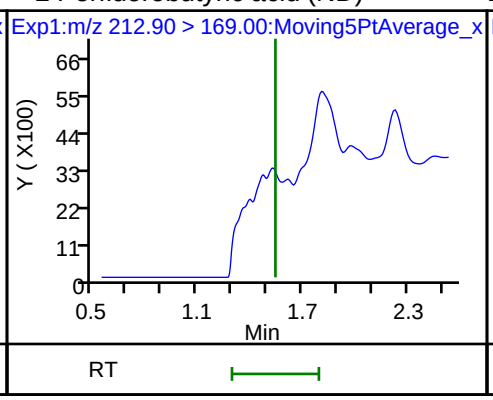
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

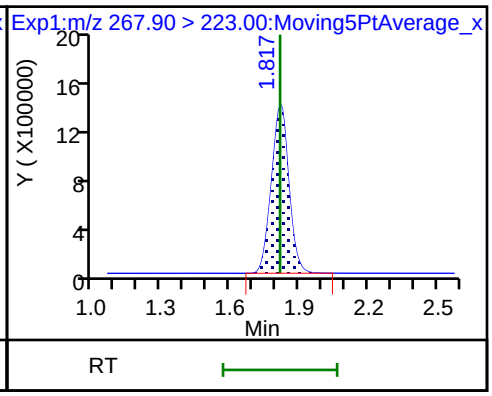
D 1 13C4 PFBA



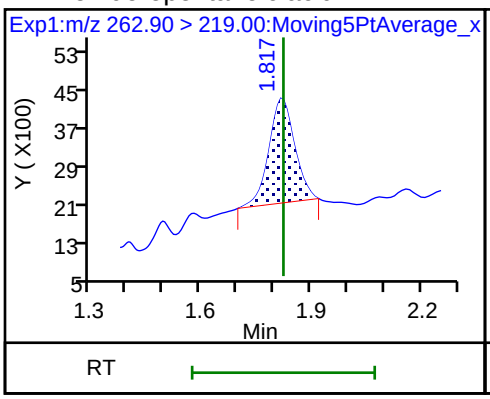
2 Perfluorobutyric acid (ND)



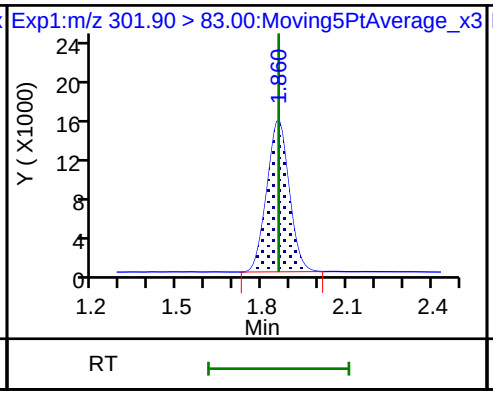
D 3 13C5-PFPeA



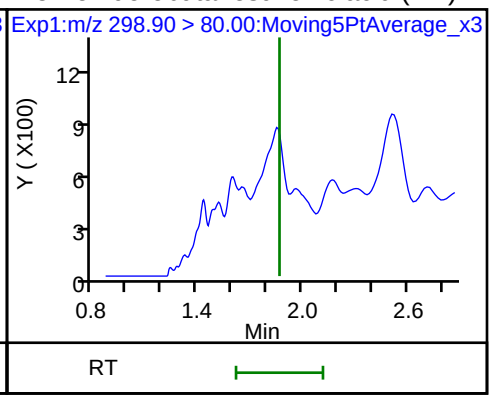
4 Perfluoropentanoic acid



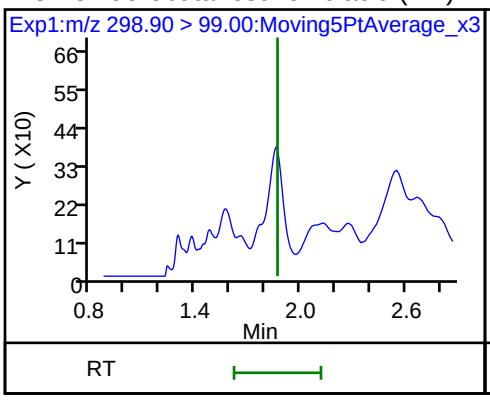
D 47 13C3-PFBS



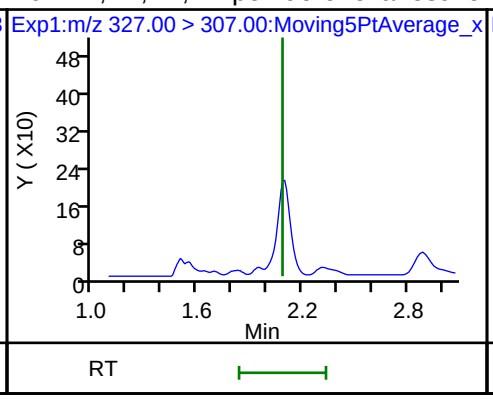
5 Perfluorobutanesulfonic acid (ND)



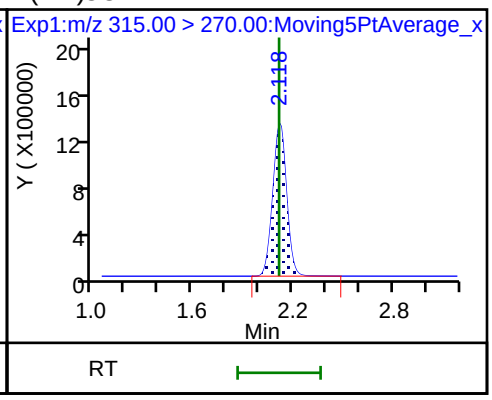
5 Perfluorobutanesulfonic acid (ND)



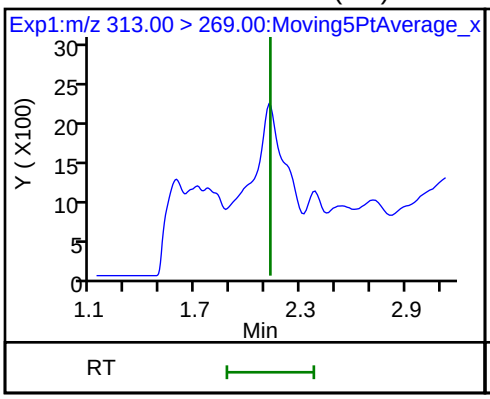
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



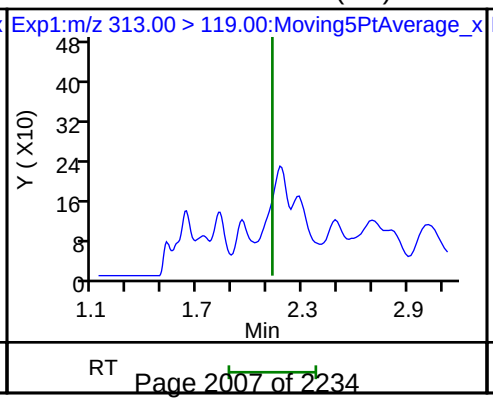
D 70 13C2 PFHxA



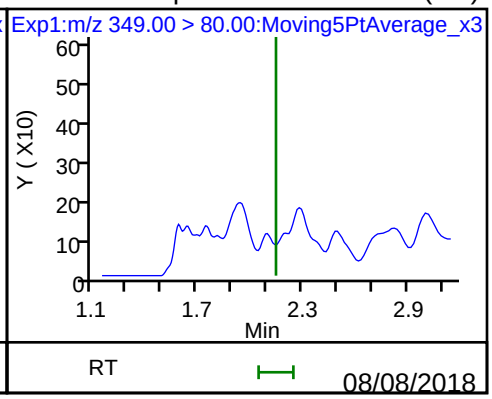
6 Perfluorohexanoic acid (ND)



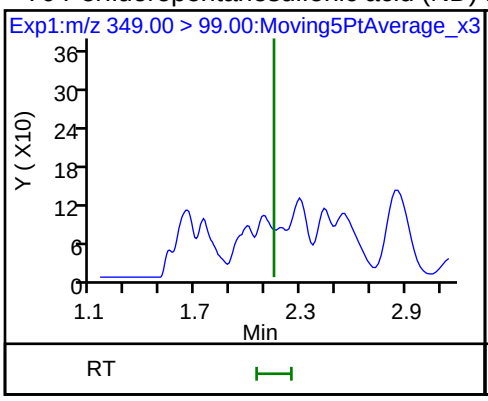
6 Perfluorohexanoic acid (ND)



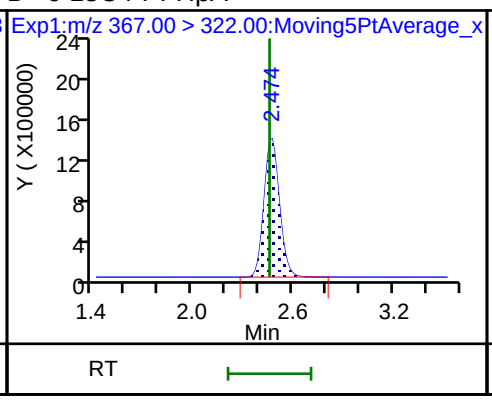
70 Perfluoropentanesulfonic acid (ND)



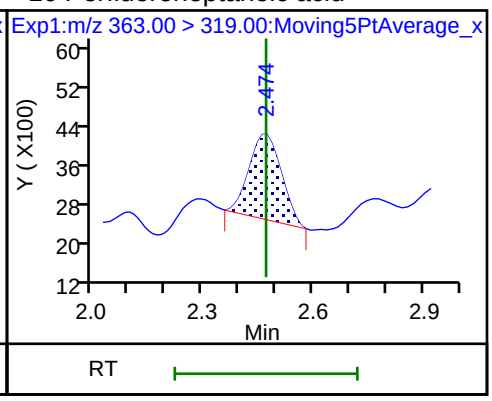
70 Perfluoropentanesulfonic acid (ND)



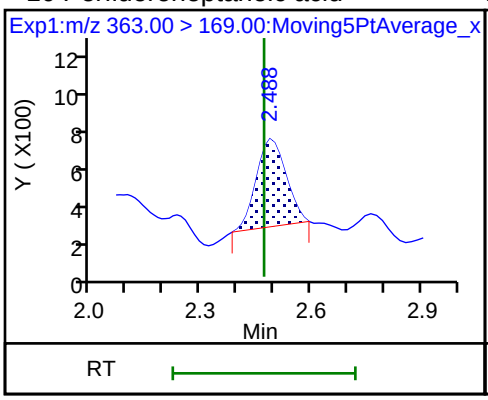
D 9 13C4-PFHpA



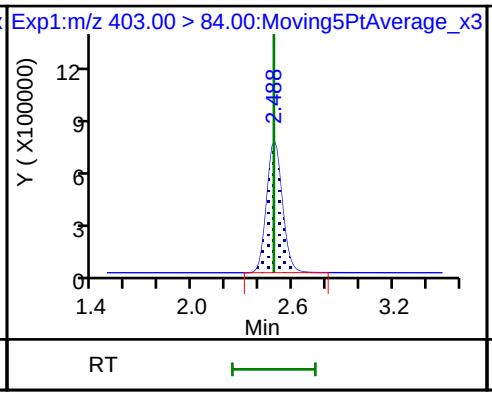
10 Perfluoroheptanoic acid



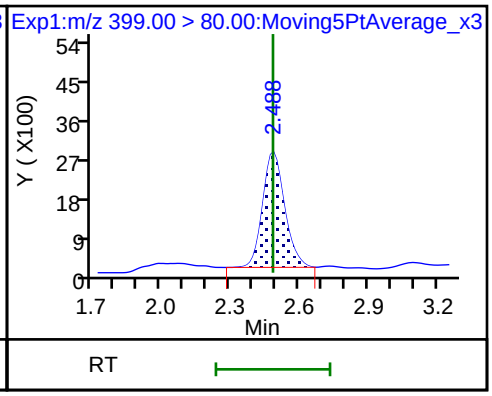
10 Perfluoroheptanoic acid



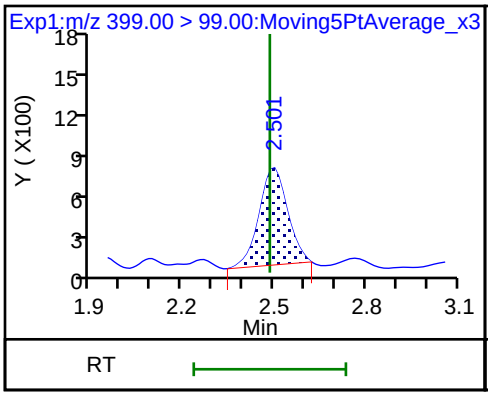
D 11 18O2 PFHxS



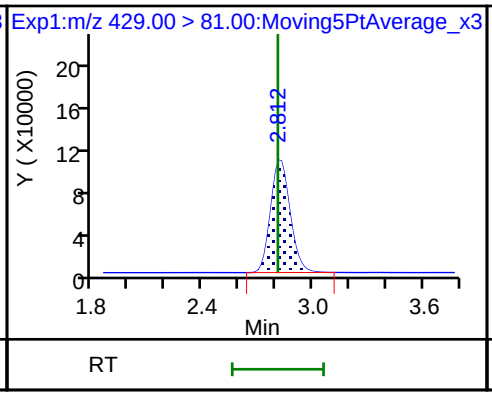
8 Perfluorohexanesulfonic acid



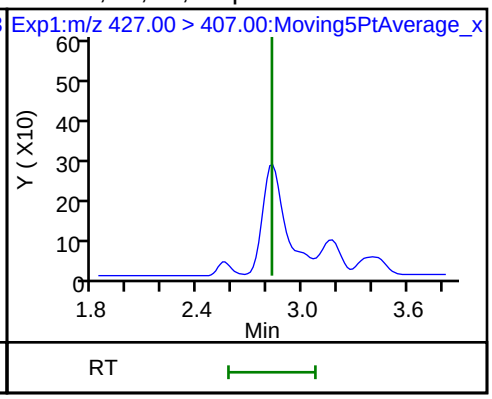
8 Perfluorohexanesulfonic acid



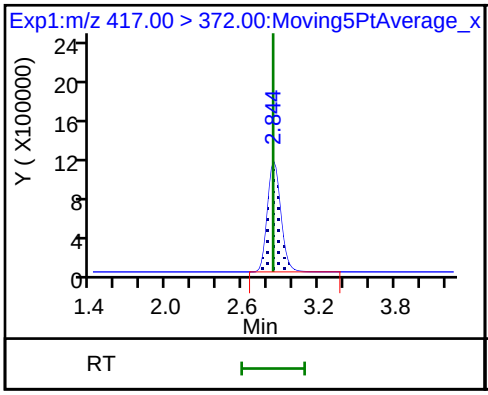
D 12 M2-6:2FTS



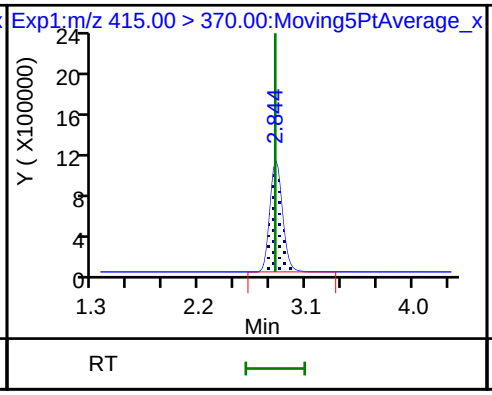
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



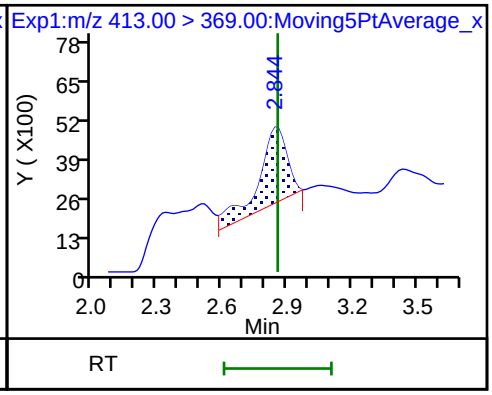
D 14 13C4 PFOA



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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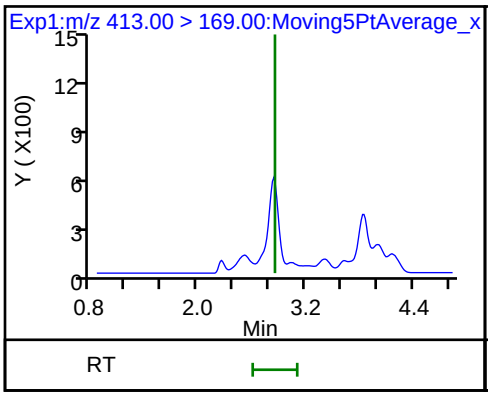
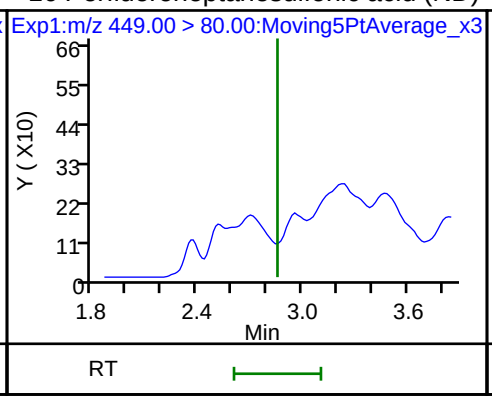
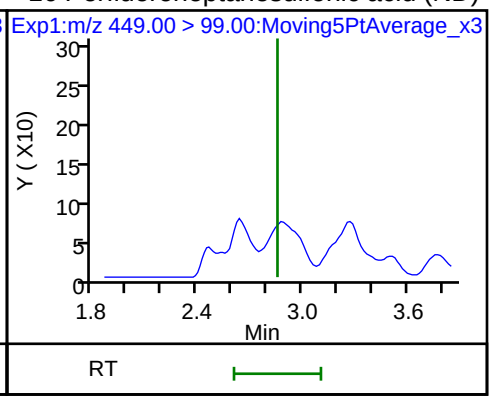


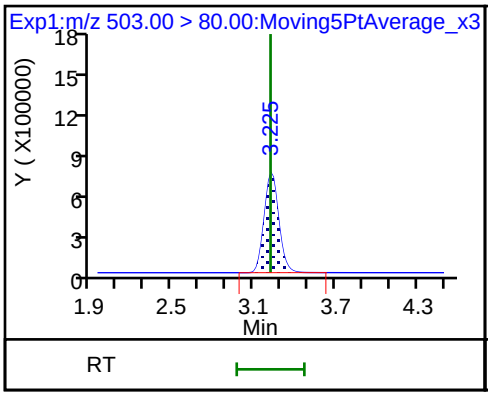
16 Perfluoroheptanesulfonic acid (ND)



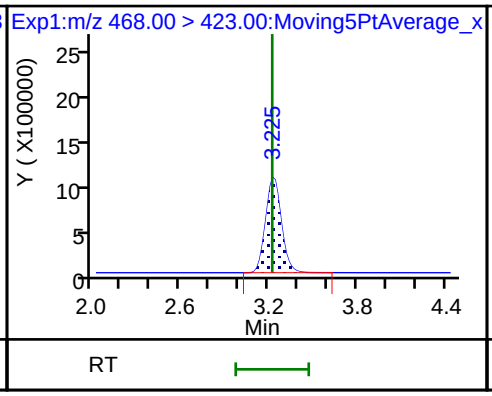
16 Perfluoroheptanesulfonic acid (ND)



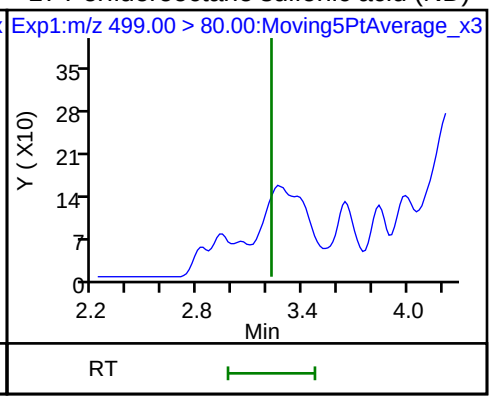
D 18 13C4 PFOS



D 19 13C5 PFNA



17 Perfluorooctane sulfonic acid (ND)



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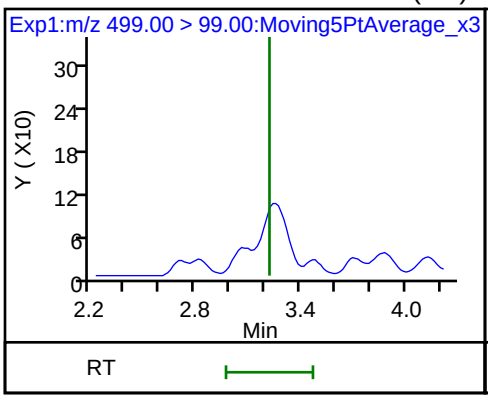
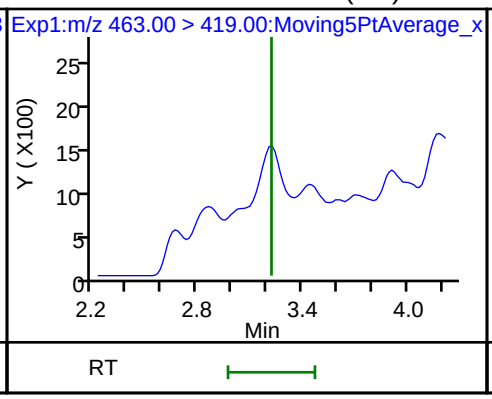


20 Perfluorononanoic acid (ND)



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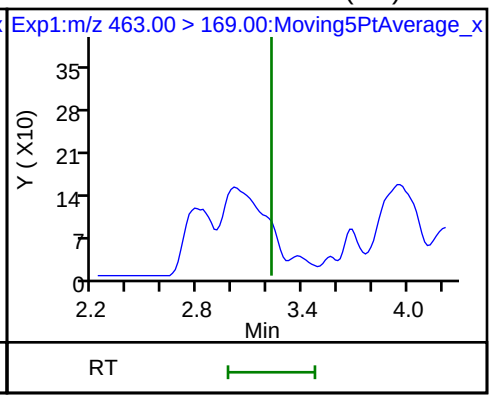
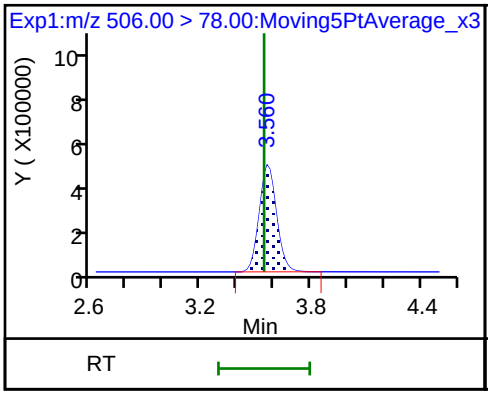
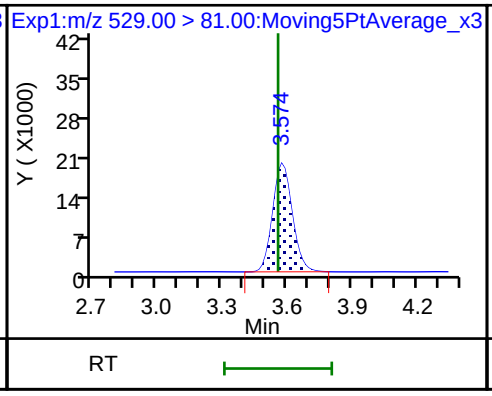


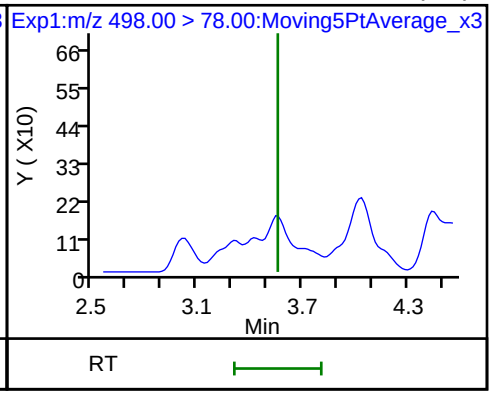
D 21 13C8 FOSA



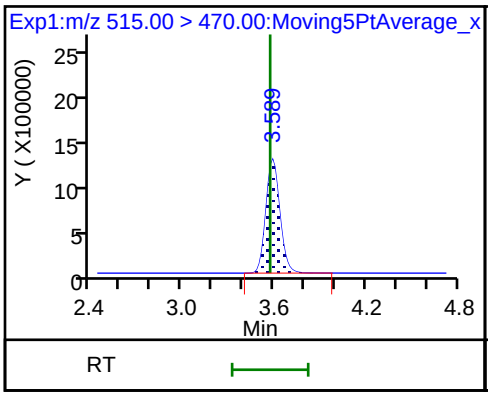
D 26 M2-8:2FTS



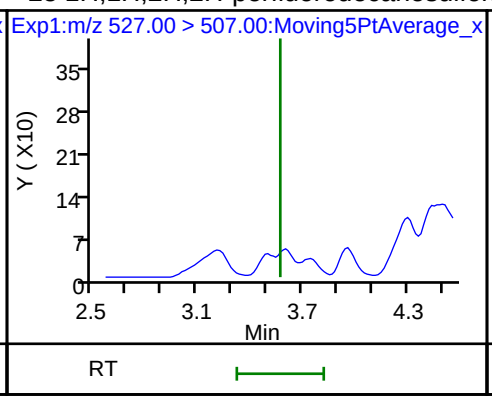
22 Perfluorooctane Sulfonamide (ND)



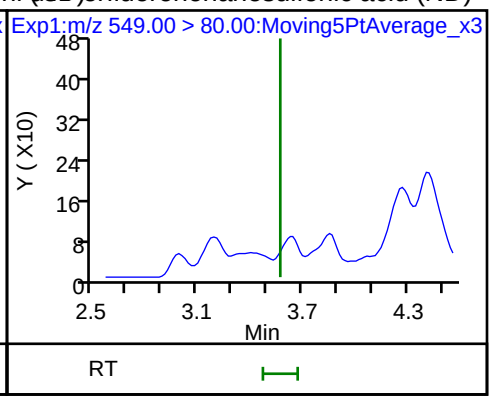
D 23 13C2 PFDA



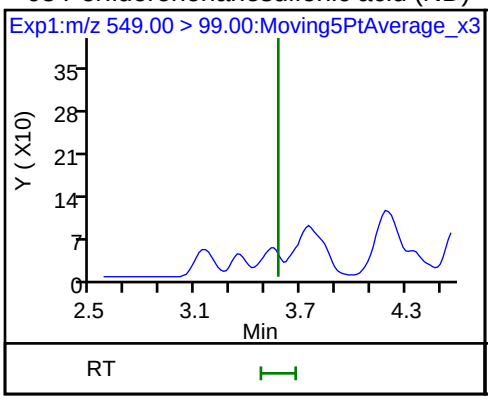
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



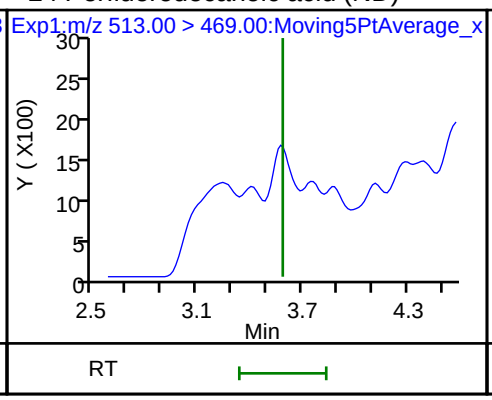
68 Perfluorononanesulfonic acid (ND)



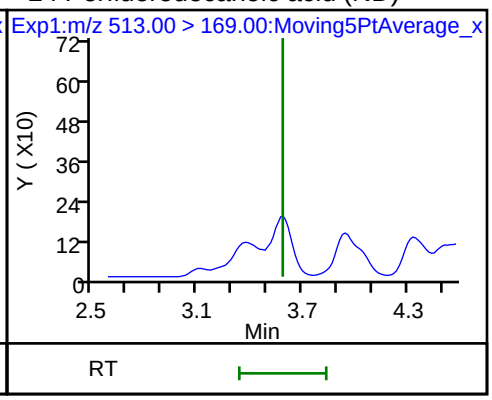
68 Perfluorononanesulfonic acid (ND)



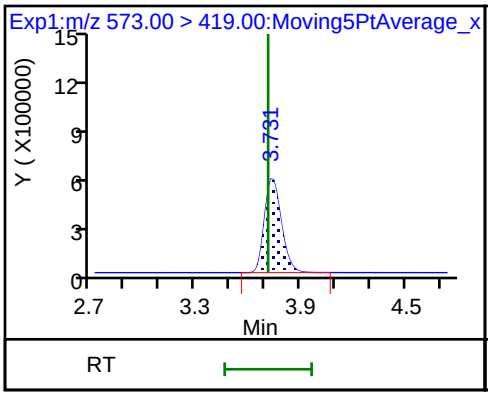
24 Perfluorodecanoic acid (ND)



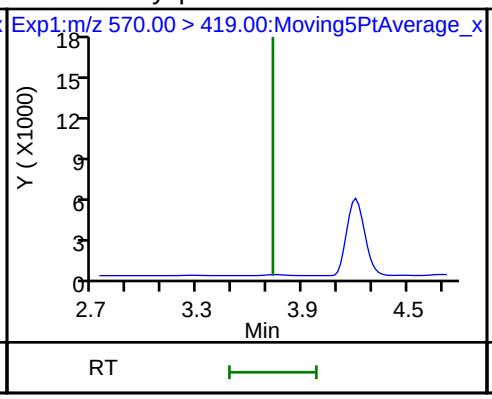
24 Perfluorodecanoic acid (ND)



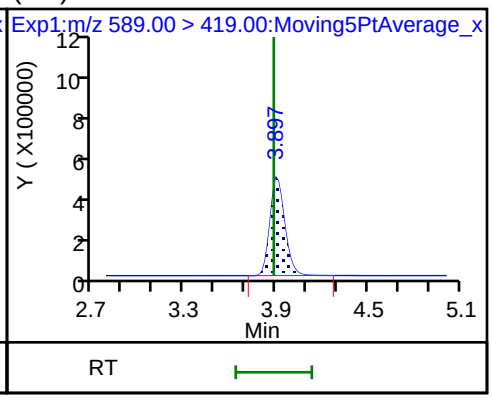
D 27 d3-NMeFOSAA



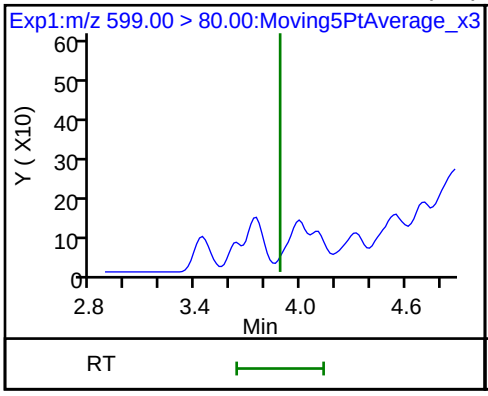
28 N-methyl perfluorooctane sulfonami (ND)



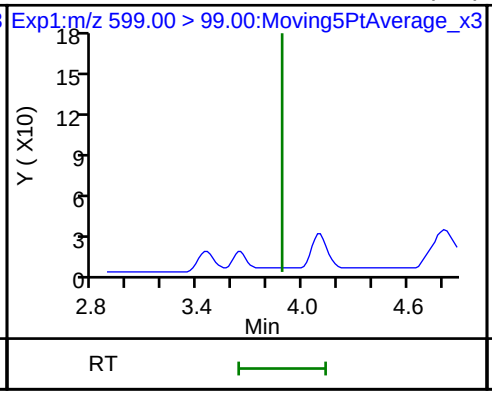
D 32 d5-NEtFOSAA



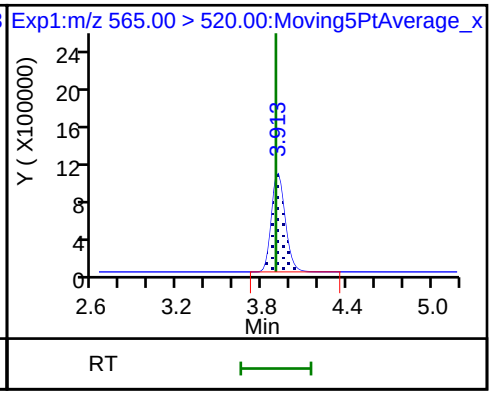
29 Perfluorodecane Sulfonic acid (ND)



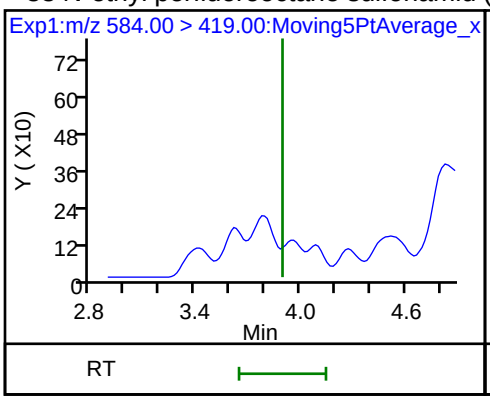
29 Perfluorodecane Sulfonic acid (ND)



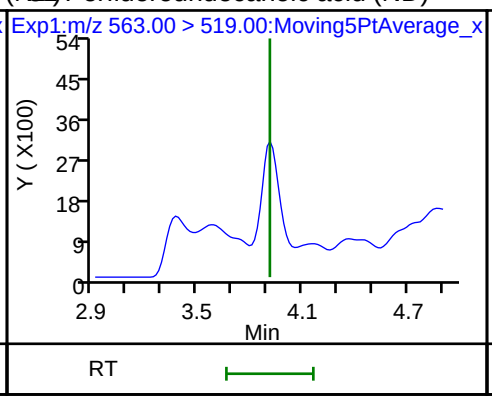
D 30 13C2 PFUnA



33 N-ethyl perfluorooctane sulfonamid (ND)



31 Perfluoroundecanoic acid (ND)



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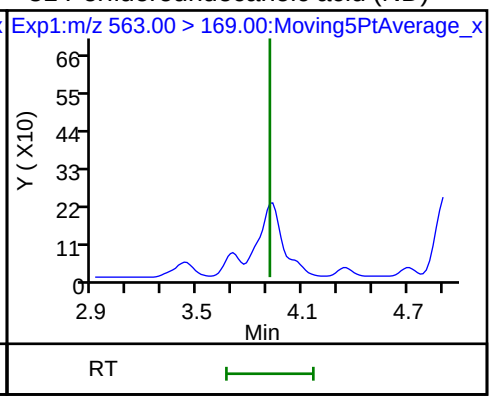
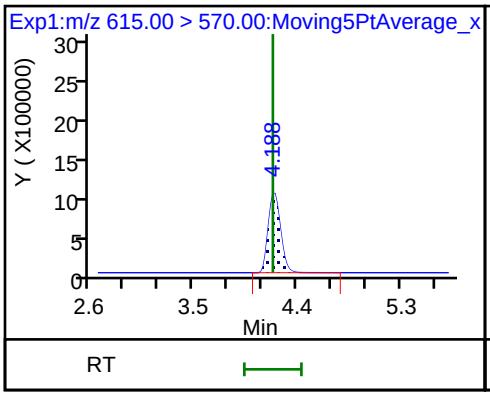
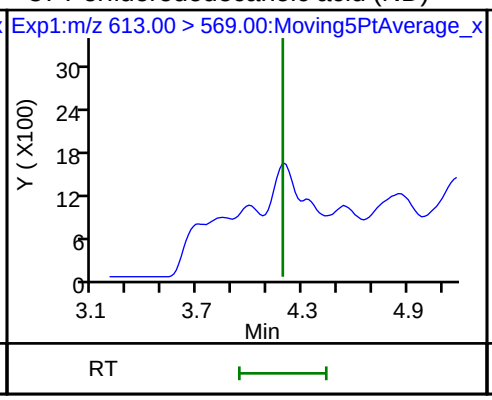


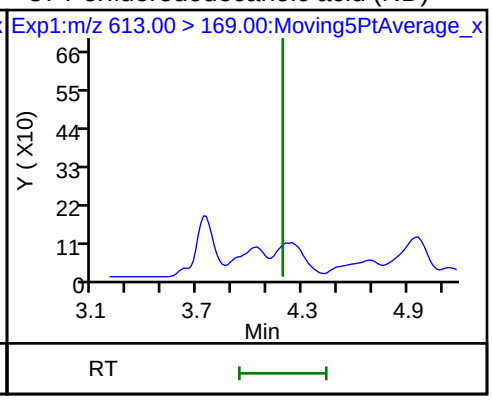
D 36 13C2 PFDoA



37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)



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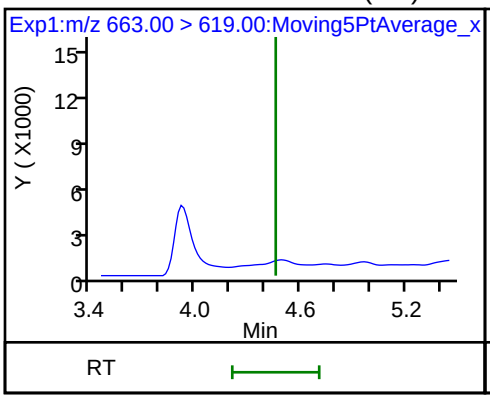
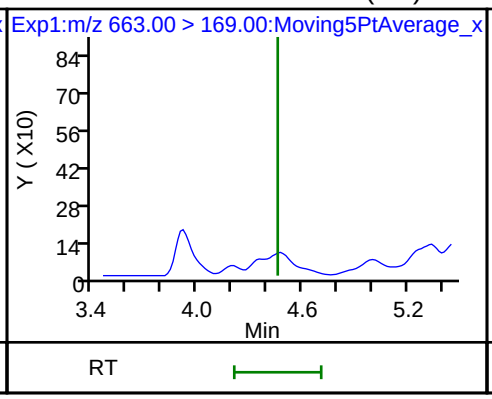
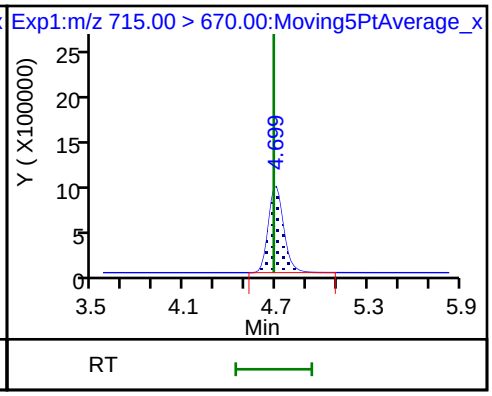


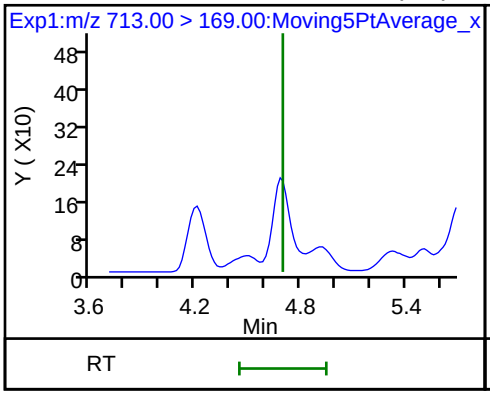
41 Perfluorotridecanoic acid (ND)



D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



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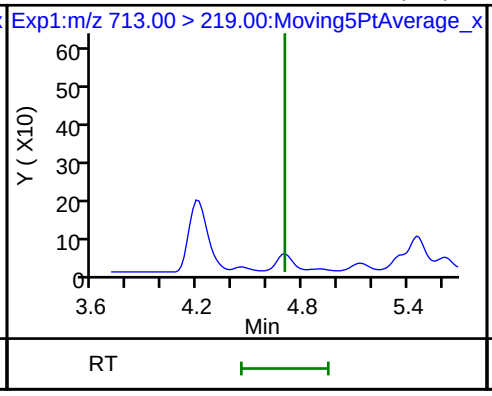
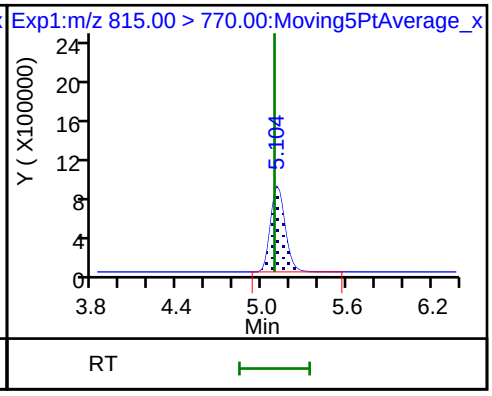


D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-236773/1
Matrix: Solid
Lab File ID: 2018.07.28LLAA_004.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/28/2018 19:47
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236773
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00669	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	107		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	102		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	100		50-150
STL00991	13C4 PFOS	102		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 28-Jul-2018 19:47:39 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 14:41:05 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 14:41:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.396	0.001	0.540	4764815	2.63		105	82555	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.632	0.008	0.634	3297077	2.61		104	61685	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.665	0.001	0.644	82591	2.49		107	623	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.866	0.010	0.725	405793	NC			6020	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.905	0.0	0.736	3710991	2.50		100	64030	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.002	0.001	0.774	280602	NC			9610	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.861	3800398	2.49		99.5	63334	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.254	2.237	0.017	1.006	15317	0.006690			226	
399.00 > 99.00	2.254	2.237	0.017	1.006	4641		3.30(1.50-4.49)		13.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.866	4640910	2.36		100.0	44250	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.564	0.0	0.991	699811	1.64		69.0	9423	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.579	0.009		3907074	2.50			58069	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.588	2.579	0.009	1.000	8058	0.004369			8.1	
413.00 > 169.00	2.588	2.579	0.009	1.000	4994		1.61(0.84-2.52)		23.5	M
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	1.000	3799337	2.54		102	44703	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										R
463.00 > 419.00	2.954	2.945	0.009	1.002	2388	0.001588			6.8	R
463.00 > 169.00	2.948	2.945	0.003	1.000	216		11.06(1.90-5.69)		11.7	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.948	0.0	1.139	3292292	2.55		102	35559	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.948	0.0	1.139	3317090	2.43		102	43059	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.295	0.004	1.002	2672	0.004606			94.6	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.299	-0.008	1.272	1024900	2.30		96.2	16503	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.307	0.0	1.278	2874473	2.80		112	43955	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.314	0.001	1.281	5289820	2.64		106	38514	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.467	-0.009	1.336	952799	2.81		112	34487	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.630	3.630	0.0	1.403	1050674	2.95		118	2719	
D 30 13C2 PFUnA										
565.00 > 520.00	3.630	3.640	-0.010	1.403	2365700	2.86		115	45937	
D 36 13C2 PFDoA										
615.00 > 570.00	3.920	3.930	-0.010	1.515	2093381	2.66		107	16359	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.437	-0.010	1.710	2103096	2.74		110	16483	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.832	0.001	1.002	29651	NC			5.0	
813.00 > 169.00	4.824	4.832	-0.008	1.000	5073		5.84(2.86-8.58)		65.4	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.833	-0.009	1.864	3300220	2.83		113	14097	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 14:41:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_004.d

Injection Date: 28-Jul-2018 19:47:39 Instrument ID: A8_N

Lims ID: CCB

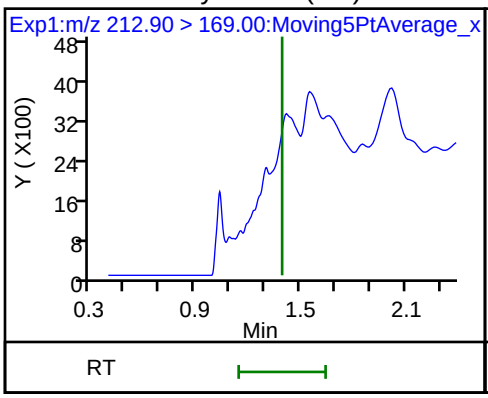
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 1

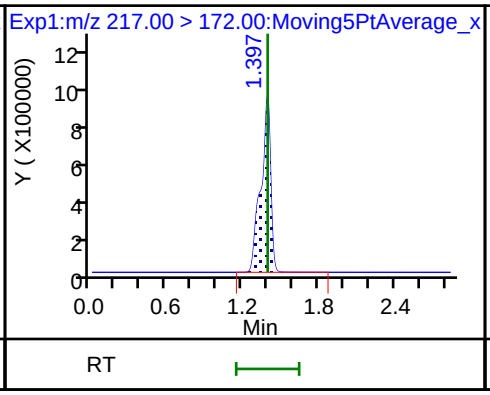
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

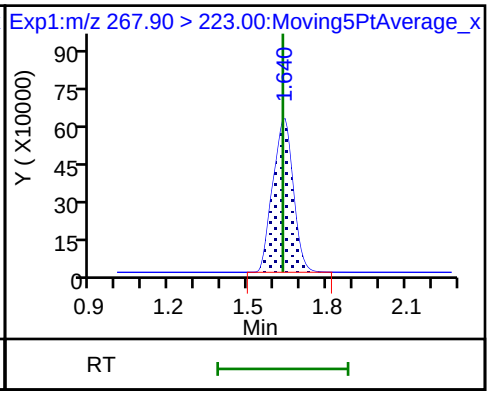
2 Perfluorobutyric acid (ND)



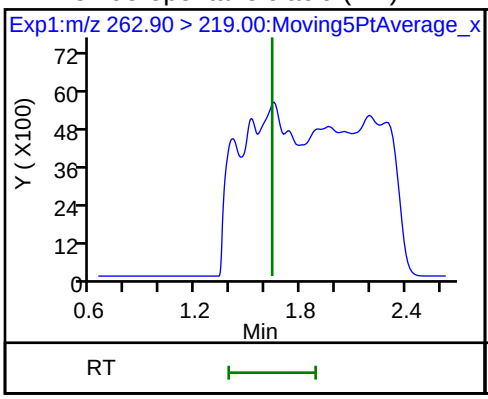
D 1 13C4 PFBA



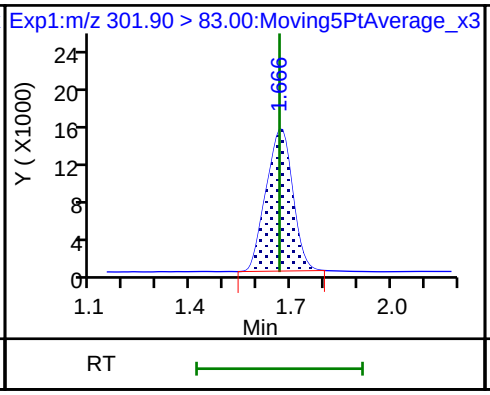
D 3 13C5-PFPeA



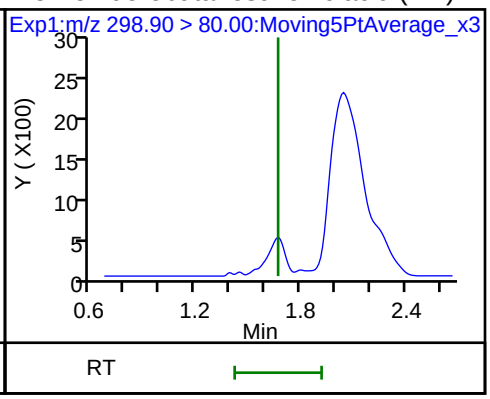
4 Perfluoropentanoic acid (ND)



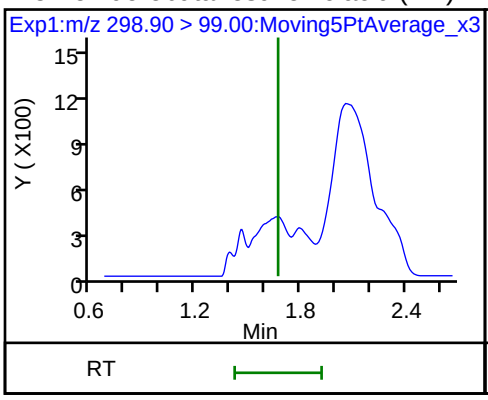
D 47 13C3-PFBS



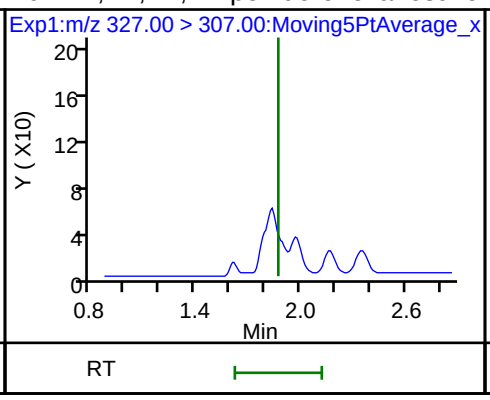
5 Perfluorobutanesulfonic acid (ND)



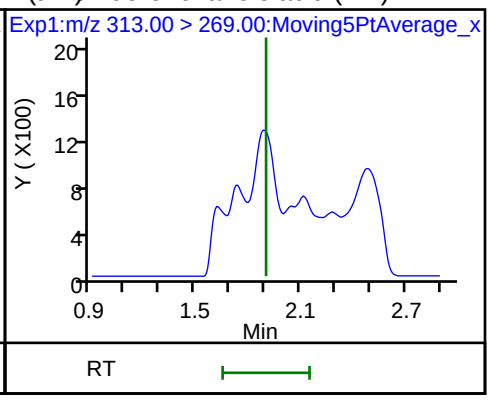
5 Perfluorobutanesulfonic acid (ND)



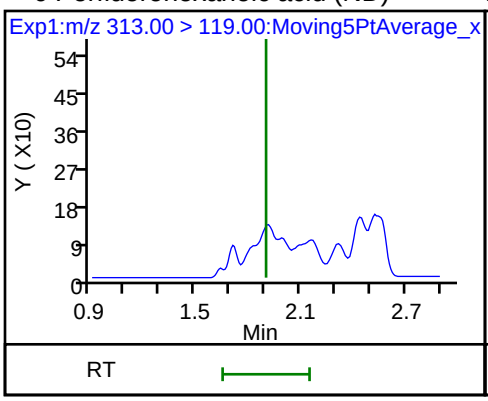
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



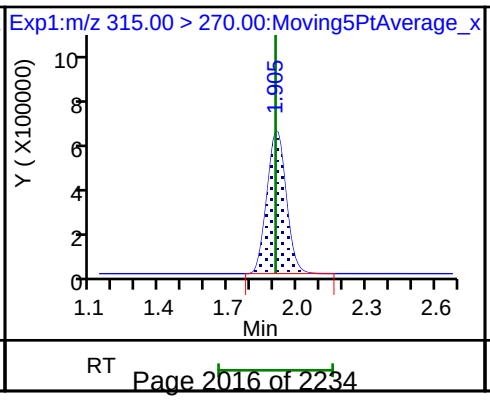
6 Perfluorohexanoic acid (ND)



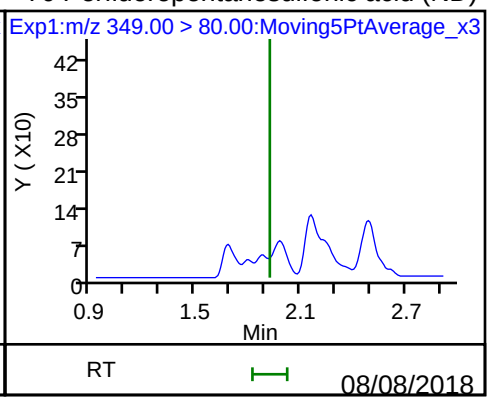
6 Perfluorohexanoic acid (ND)



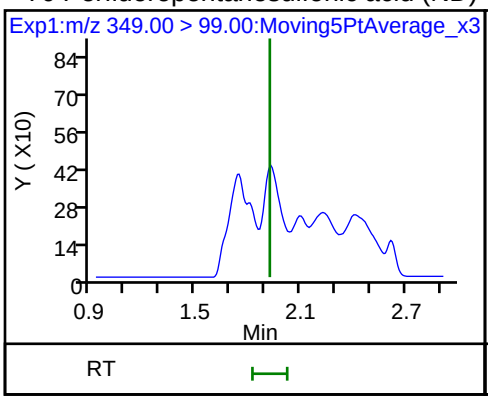
D 7 13C2 PFHxA



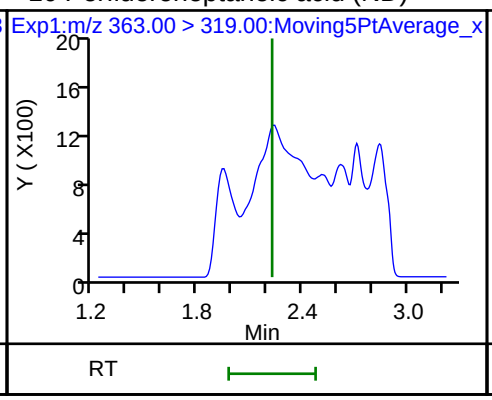
70 Perfluoropentanesulfonic acid (ND)



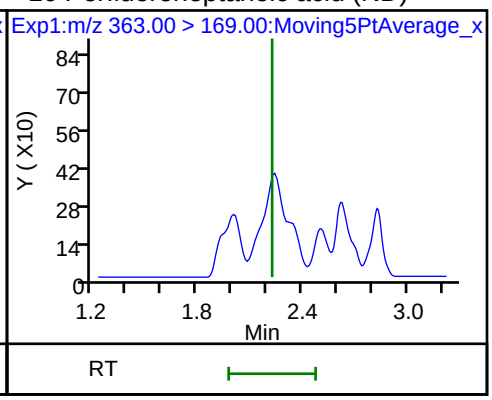
70 Perfluoropentanesulfonic acid (ND)



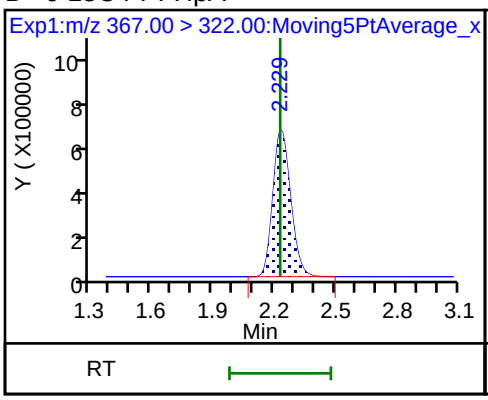
10 Perfluoroheptanoic acid (ND)



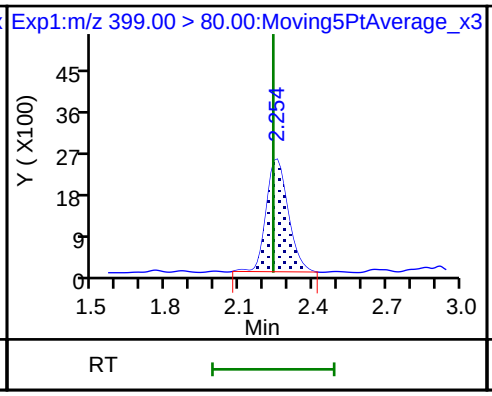
10 Perfluoroheptanoic acid (ND)



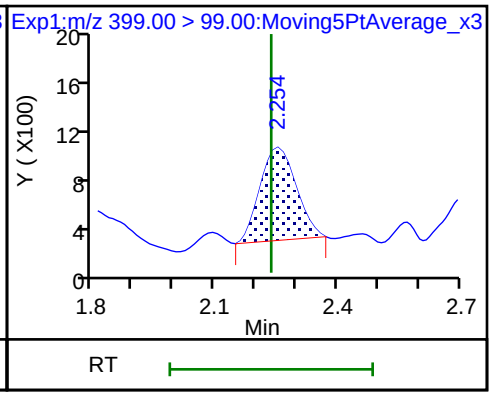
D 9 13C4-PFHpA



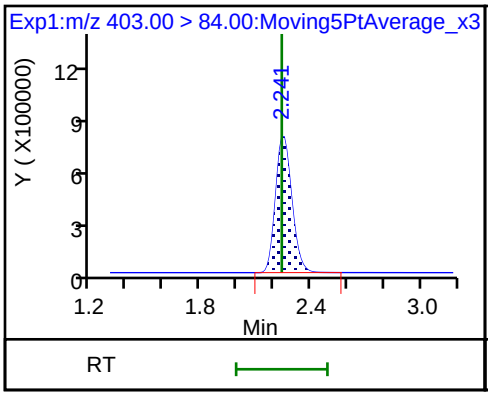
8 Perfluorohexanesulfonic acid



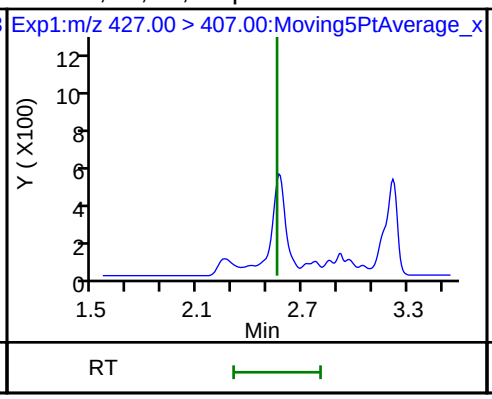
8 Perfluorohexanesulfonic acid



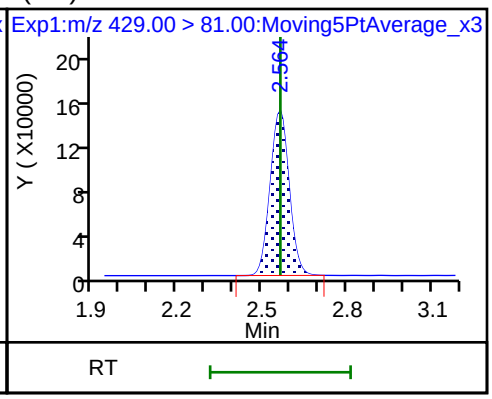
D 11 18O2 PFHxS



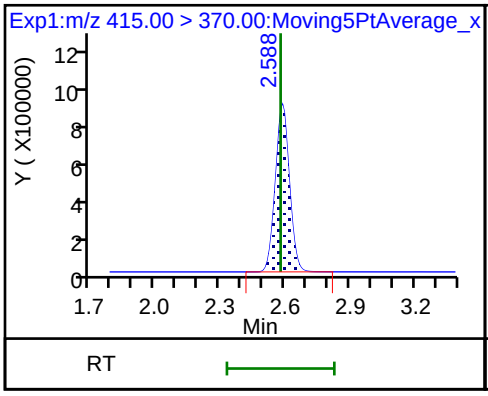
13 1H,1H,2H,2H-perfluorooctanesulfonic acid (ND)



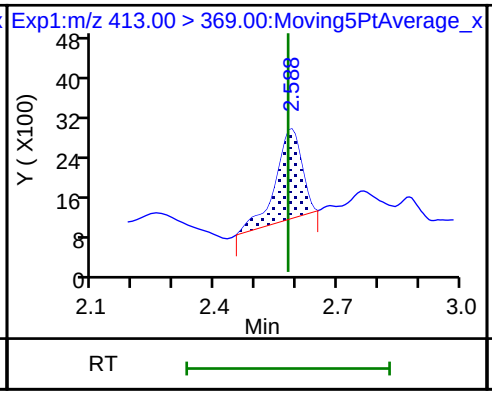
D 12 M2-6:2FTS



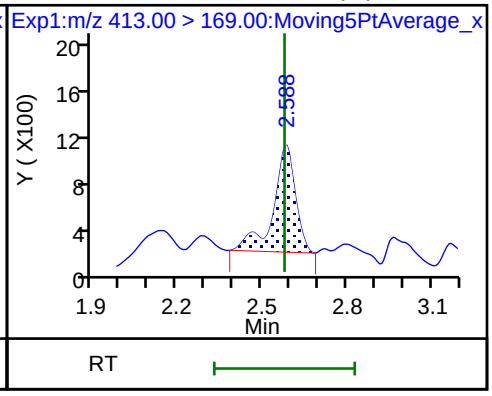
* 62 13C2-PFOA



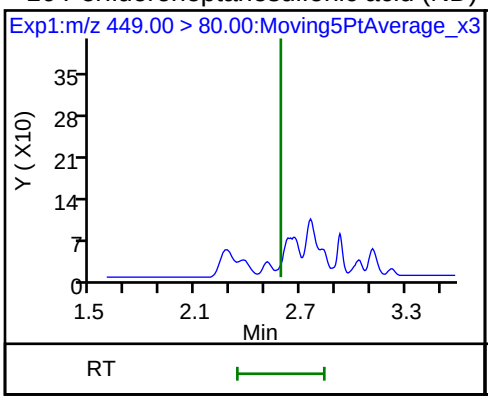
15 Perfluorooctanoic acid



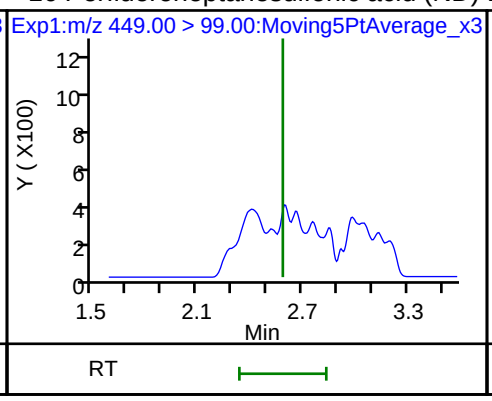
15 Perfluorooctanoic acid (M)



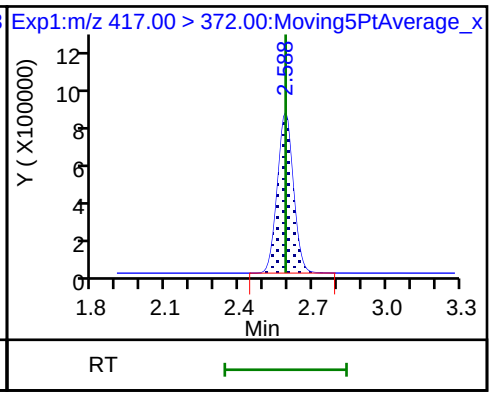
16 Perfluoroheptanesulfonic acid (ND)



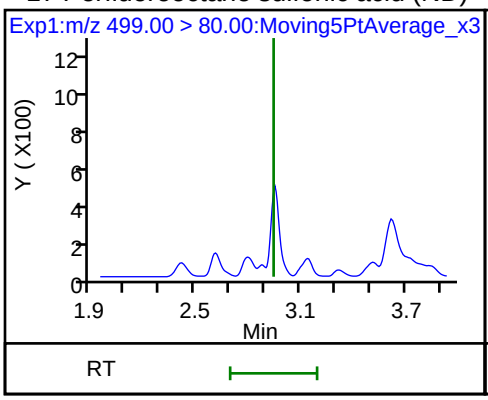
16 Perfluoroheptanesulfonic acid (ND)



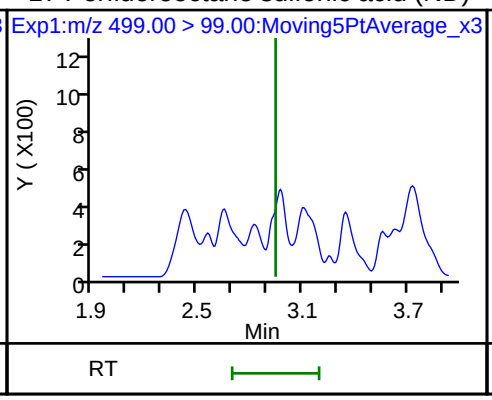
D 14 13C4 PFOA



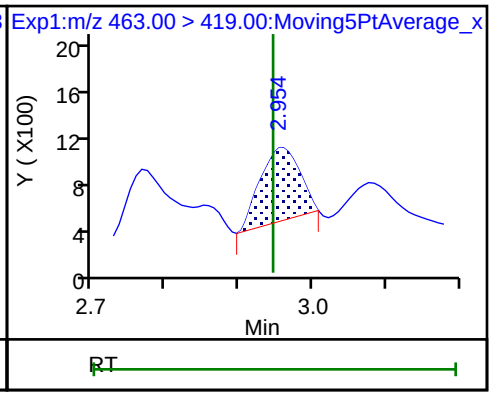
17 Perfluorooctane sulfonic acid (ND)



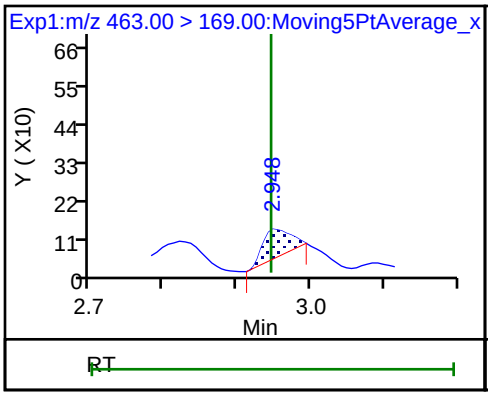
17 Perfluorooctane sulfonic acid (ND)



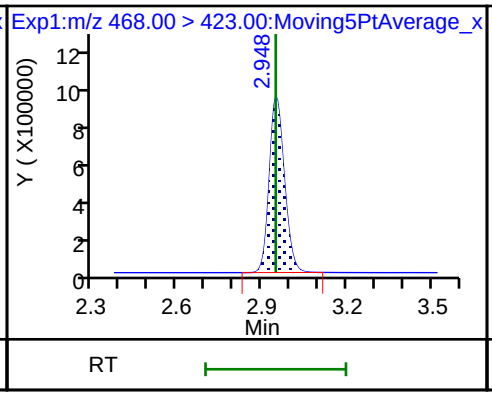
20 Perfluorononanoic acid



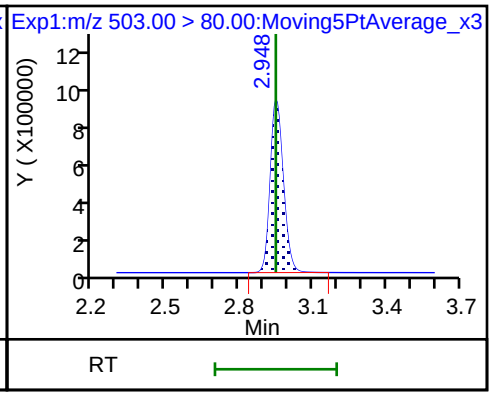
20 Perfluorononanoic acid



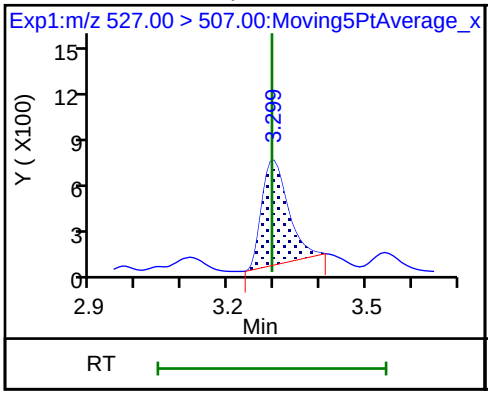
D 19 13C5 PFNA



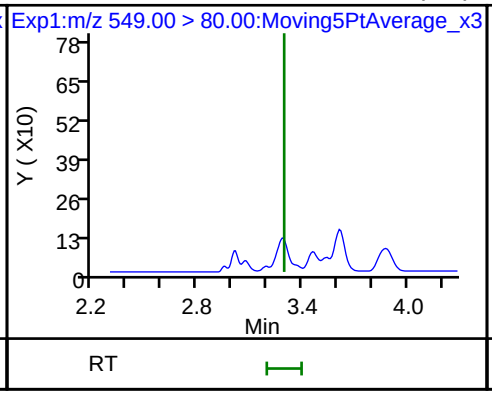
D 18 13C4 PFOS



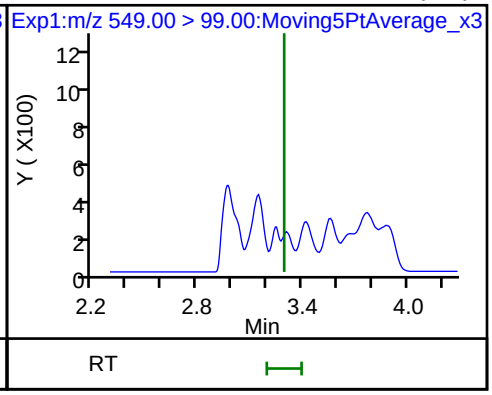
25 1H,1H,2H,2H-perfluorodecanesulfoni



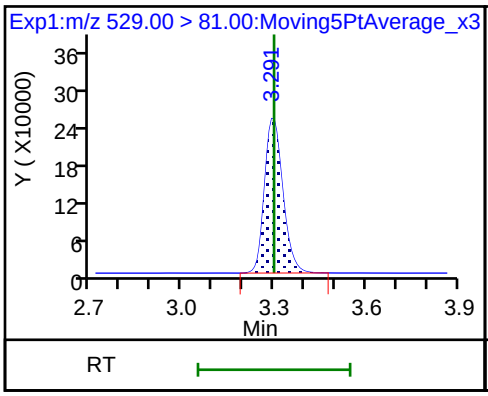
68 Perfluorononanesulfonic acid (ND)



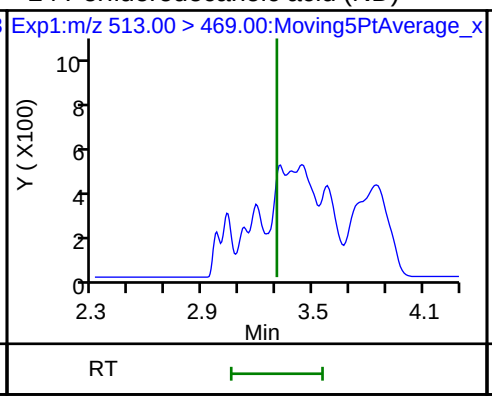
68 Perfluorononanesulfonic acid (ND)



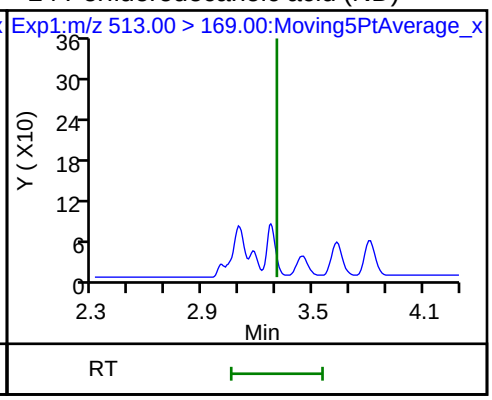
D 26 M2-8:2FTS



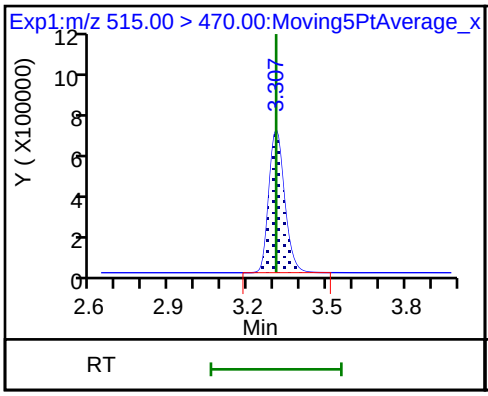
24 Perfluorodecanoic acid (ND)



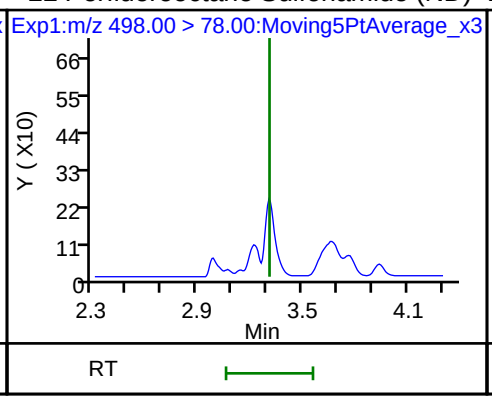
24 Perfluorodecanoic acid (ND)



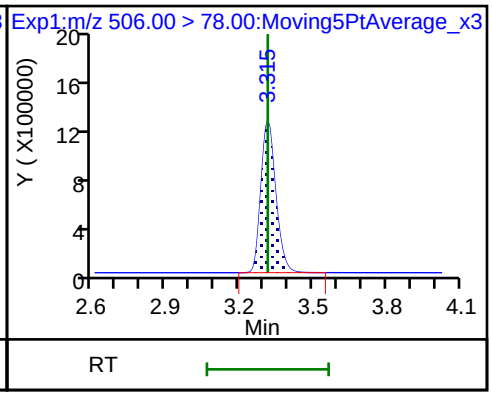
D 23 13C2 PFDA



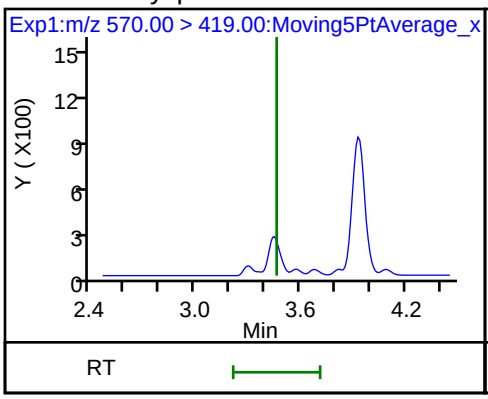
22 Perfluorooctane Sulfonamide (ND)



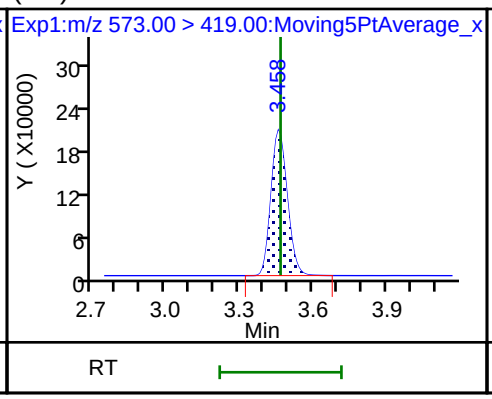
D 21 13C8 FOSA



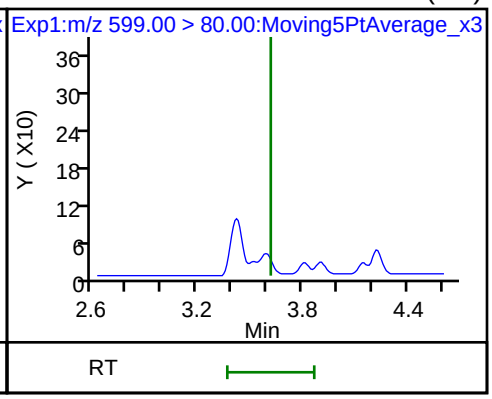
28 N-methyl perfluorooctane sulfonamid (ND)



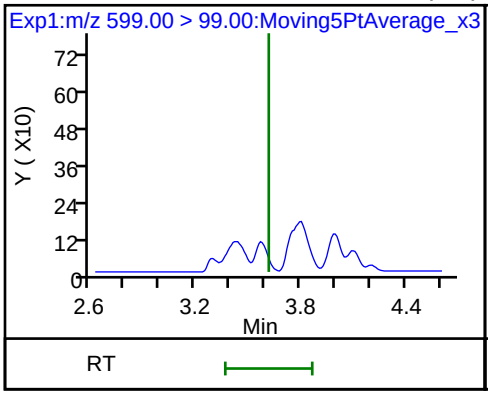
D 27 d3-NMeFOSAA



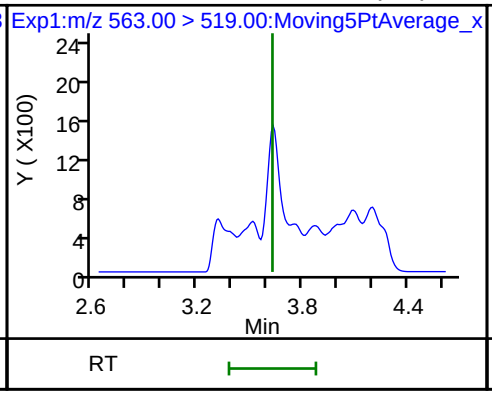
29 Perfluorodecane Sulfonic acid (ND)



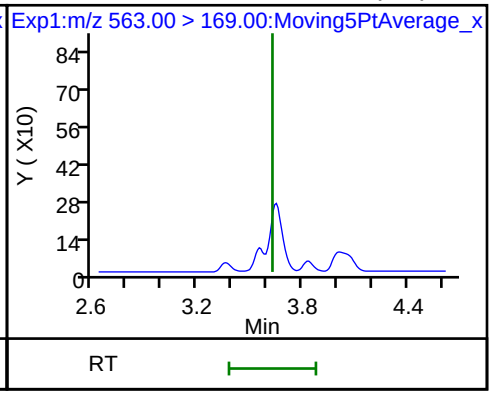
29 Perfluorodecane Sulfonic acid (ND)



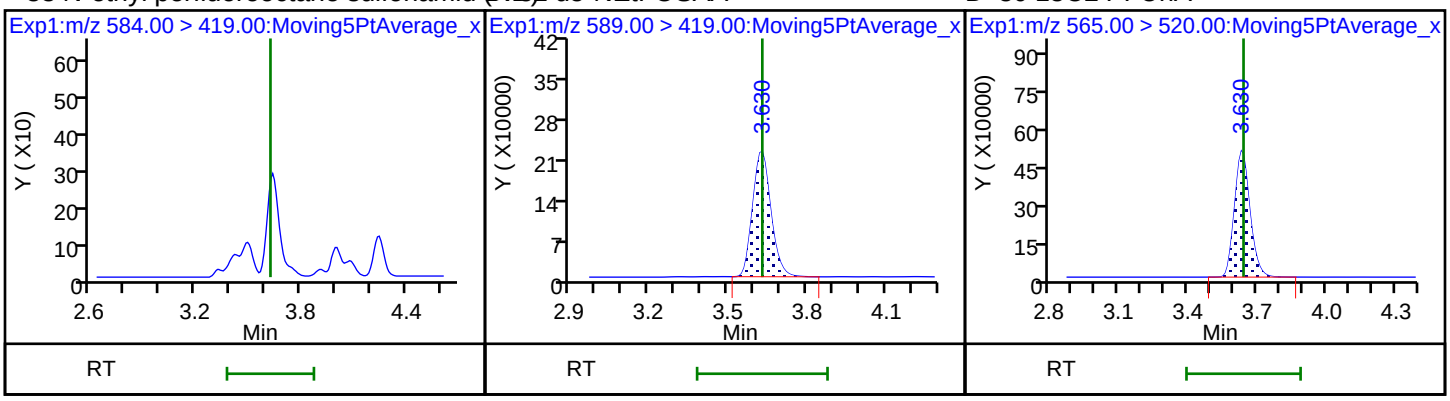
31 Perfluoroundecanoic acid (ND)



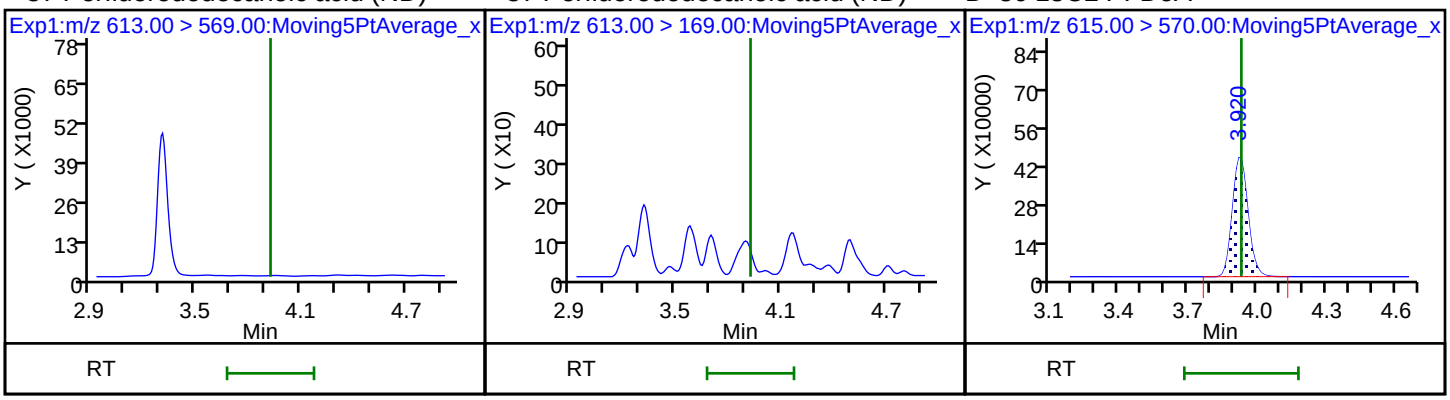
31 Perfluoroundecanoic acid (ND)



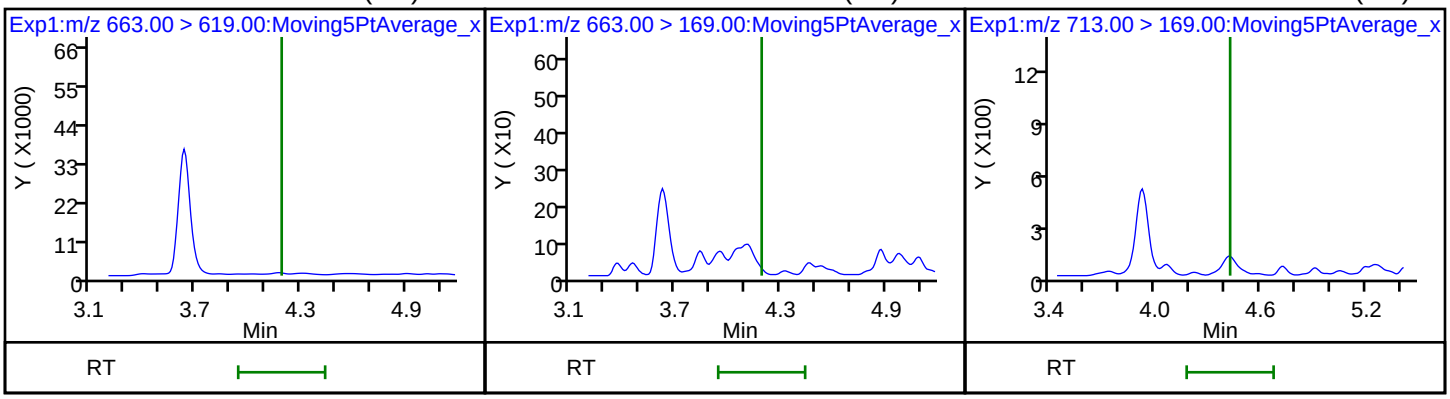
33 N-ethyl perfluorooctane sulfonamid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA



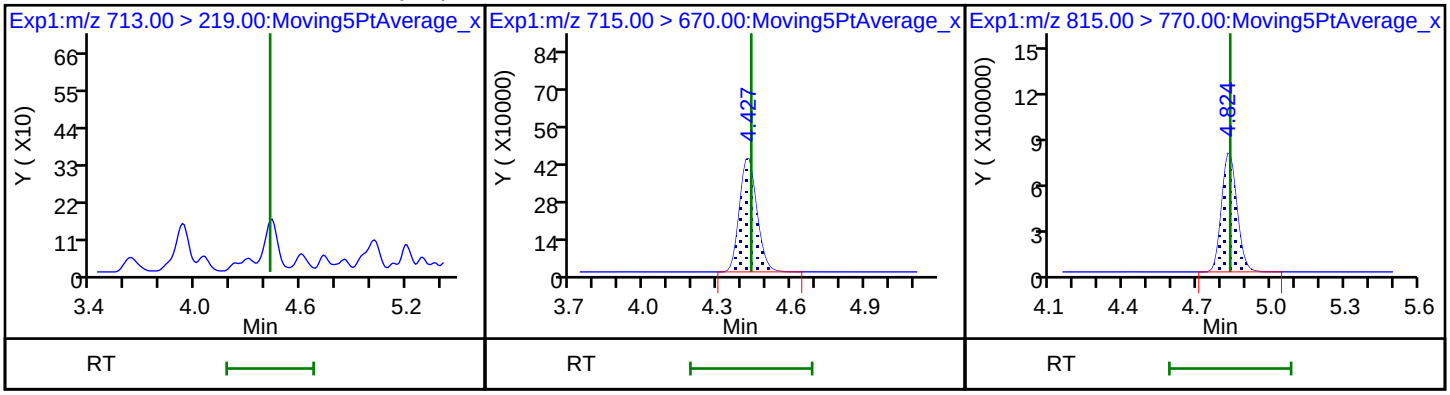
37 Perfluorododecanoic acid (ND) 37 Perfluorododecanoic acid (ND) D 36 13C2 PFDoA



41 Perfluorotridecanoic acid (ND) 41 Perfluorotridecanoic acid (ND) 42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND) D 43 13C2-PFTeDA D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

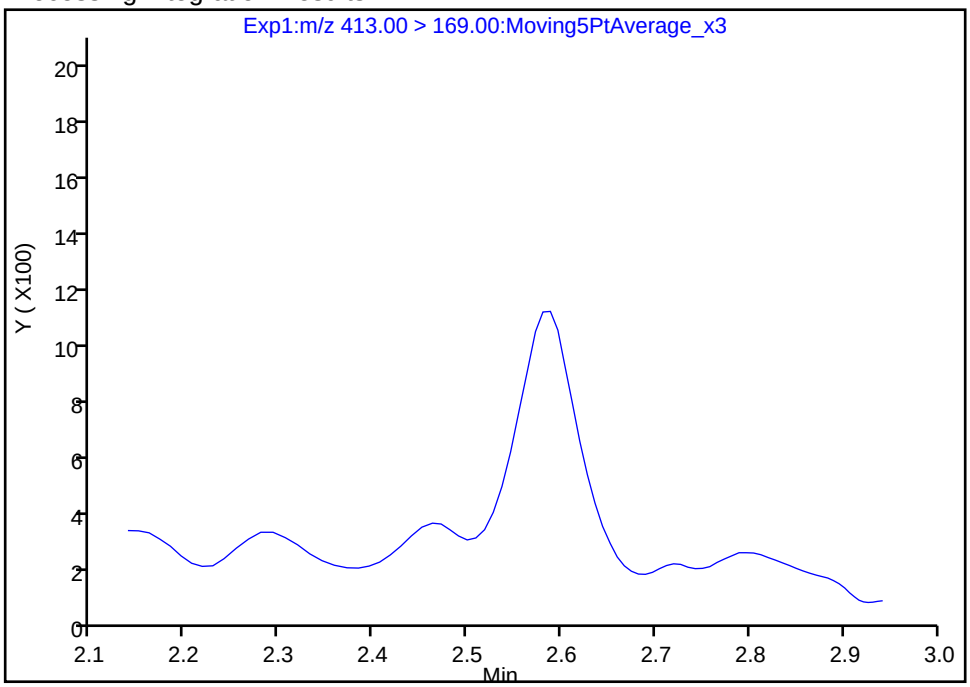
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61814.b\2018.07.28LLAA_004.d				
Injection Date:	28-Jul-2018 19:47:39	Instrument ID:	A8_N		
Lims ID:	CCB				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	20	Worklist Smp#:	1
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

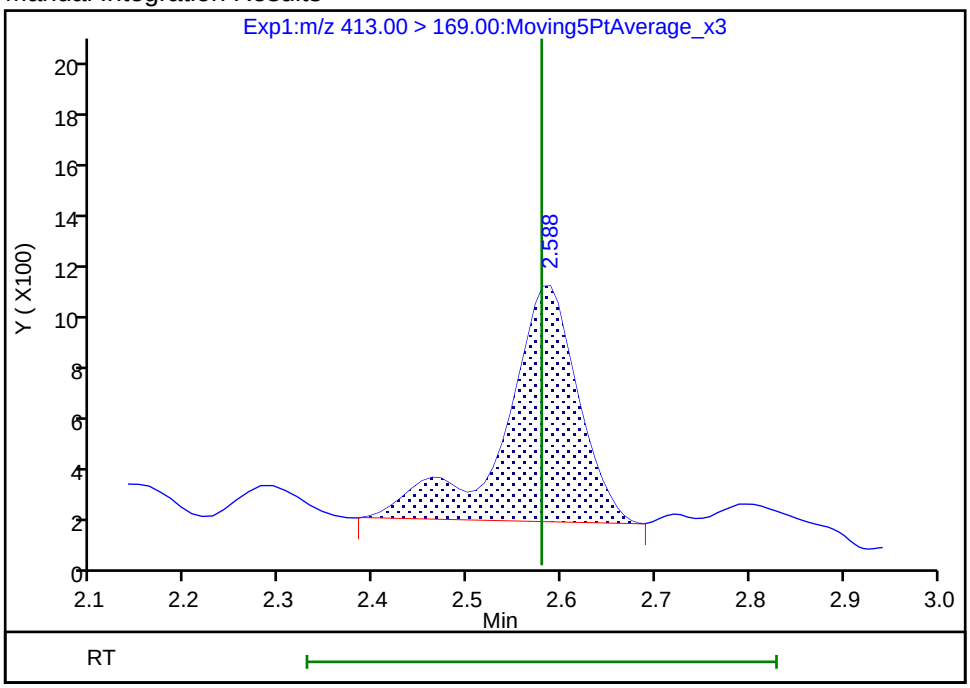
Processing Integration Results

RT: 2.59
Area: 0
Amount: 0.004369
Amount Units: ng/ml



Manual Integration Results

RT: 2.59
Area: 4994
Amount: 0.004369
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 14:40:52

Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-236836/1
Matrix: Solid
Lab File ID: 2018.07.30LLA_003.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/30/2018 03:13
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00565	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	104		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	102		50-150
STL00991	13C4 PFOS	104		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_003.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 30-Jul-2018 03:13:20 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 11:54:32 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jul-2018 11:51:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.396	-0.001	0.541	4900271	2.63		105	103924	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.640	-0.003	0.635	3446152	2.65		106	66232	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.674	-0.003	0.648	82242	2.41		104	731	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.875	-0.002	0.726	392931	NC			4895	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.738	3808294	2.50		99.8	84063	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.014	-0.015	0.775	332849	NC			12030	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.225	0.012	1.000	13624	0.005654			161	
399.00 > 99.00	2.250	2.225	0.025	1.006	5723		2.38(1.50-4.49)		19.7	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3758045	2.39		95.6	71481	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4884390	2.42		102	48292	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.564	-0.010	0.990	692135	1.58		66.4	13787	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.571	0.008		4019794	2.50			50743	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.571	0.008	1.000	6002	0.003273			7.7	
413.00 > 169.00	2.579	2.571	0.008	1.000	4573		1.31(0.84-2.52)		29.2	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3777641	2.46		98.2	47494	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										
463.00 > 419.00	2.930	2.935	-0.005	0.997	1048	0.000676			5.1	
463.00 > 169.00	2.951	2.935	0.016	1.004	512		2.05(1.90-5.69)		30.5	
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.953	-0.013	1.140	3394119	2.56		102	58131	
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.953	-0.013	1.140	3495536	2.49		104	51792	
D 26 M2-8:2FTS										
529.00 > 81.00	3.287	3.299	-0.012	1.275	1143733	2.50		104	20420	
D 23 13C2 PFDA										
515.00 > 470.00	3.303	3.314	-0.011	1.281	3062017	2.90		116	58005	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.322	-0.003	1.287	5679020	2.75		110	57013	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.467	-0.013	1.339	1050888	3.01		121	25665	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.618	3.640	-0.022	1.403	1196170	3.26		131	4026	
D 30 13C2 PFUnA										
565.00 > 520.00	3.628	3.640	-0.012	1.407	2511661	2.95		118	58834	
D 36 13C2 PFDoA										
615.00 > 570.00	3.918	3.930	-0.012	1.519	2150418	2.66		106	17188	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.437	-0.022	1.712	2098574	2.66		106	19472	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.823	0.0	1.000	30274	NC			5.5	
813.00 > 169.00	4.823	4.823	0.0	1.000	4945		6.12(2.86-8.58)		71.8	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.842	-0.019	1.870	3256426	2.72		109	13027	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 11:55:33 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_003.d

Injection Date: 30-Jul-2018 03:13:20 Instrument ID: A8_N

Lims ID: CCB

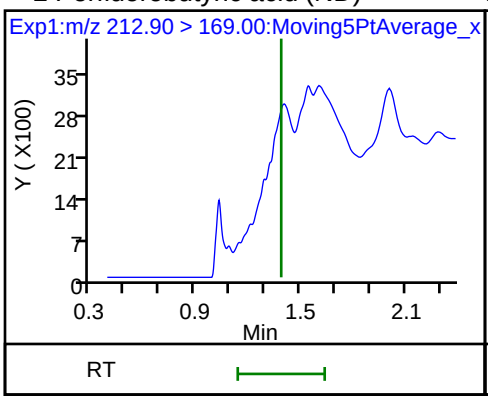
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 1

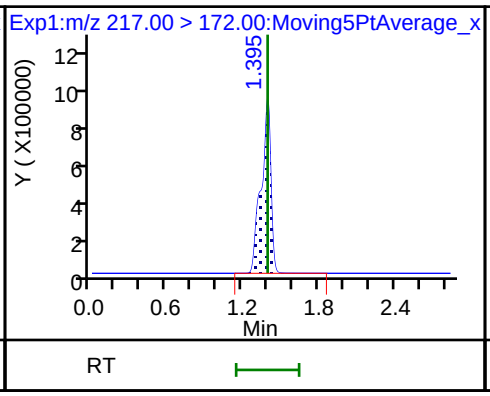
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

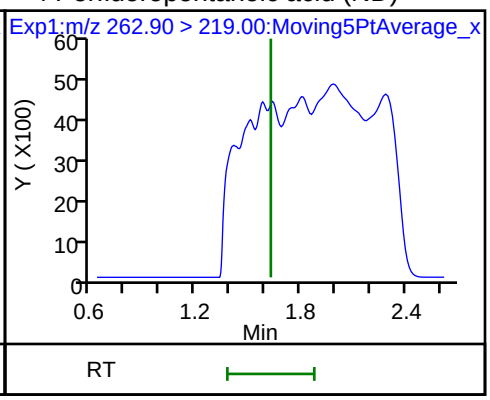
2 Perfluorobutyric acid (ND)



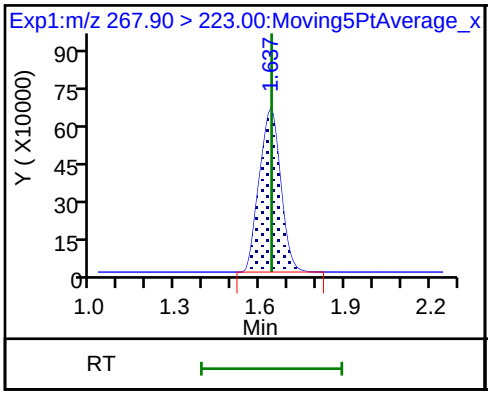
D 1 13C4 PFBA



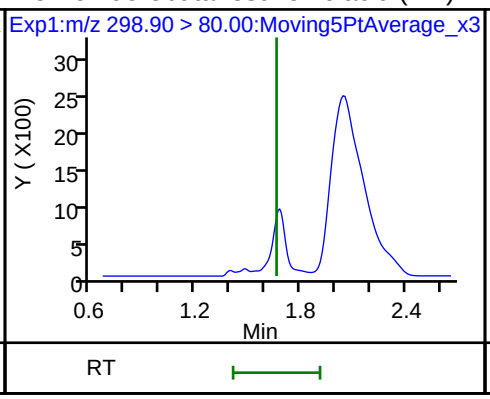
4 Perfluoropentanoic acid (ND)



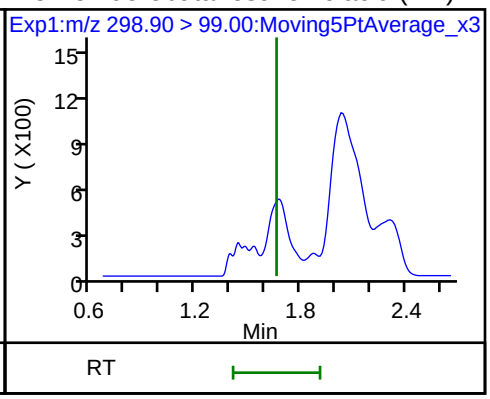
D 3 13C5-PFPeA



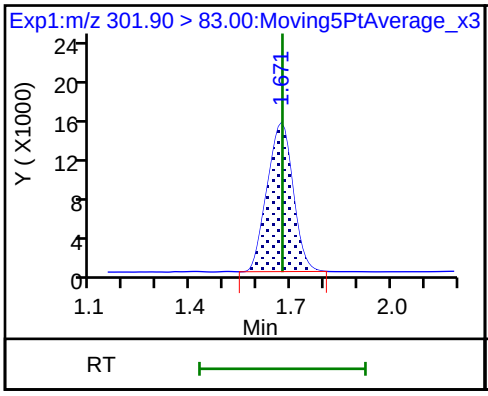
5 Perfluorobutanesulfonic acid (ND)



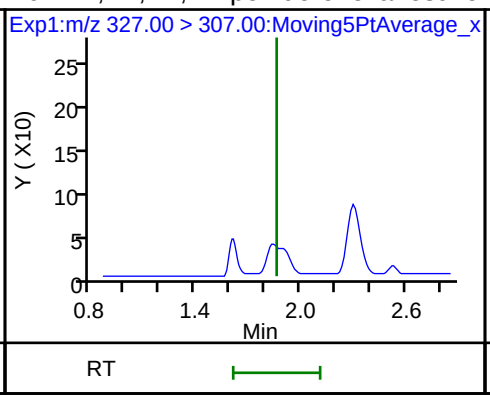
5 Perfluorobutanesulfonic acid (ND)



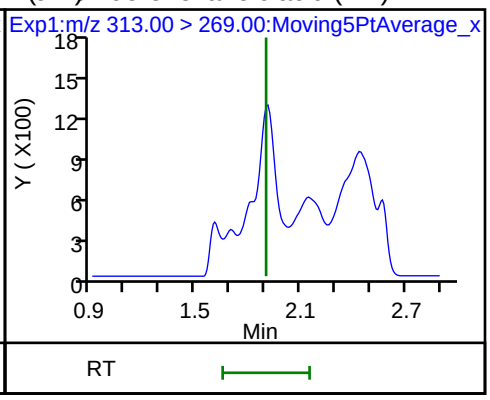
D 47 13C3-PFBS



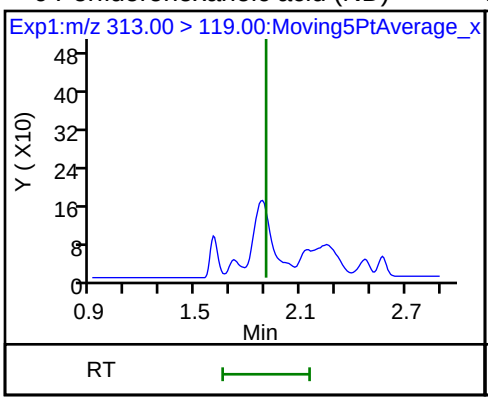
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



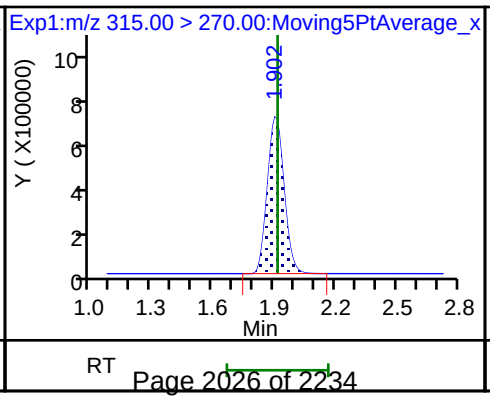
6 Perfluorohexanoic acid (ND)



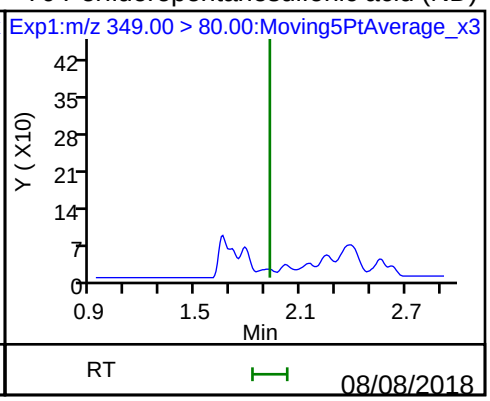
6 Perfluorohexanoic acid (ND)



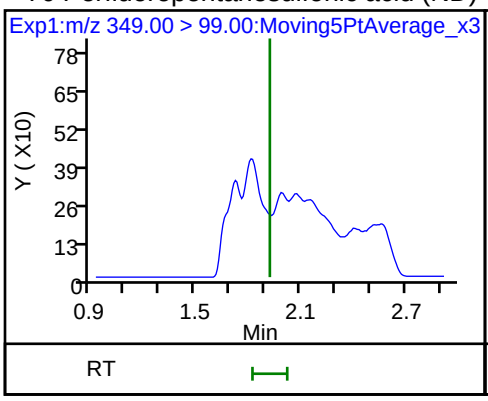
D 7 13C2 PFHxA



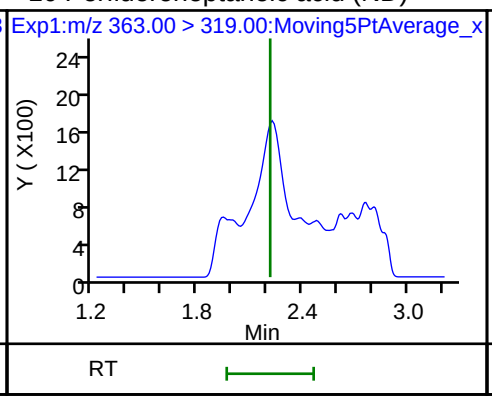
70 Perfluoropentanesulfonic acid (ND)



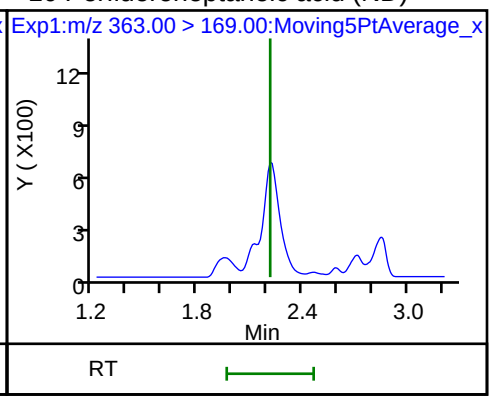
70 Perfluoropentanesulfonic acid (ND)



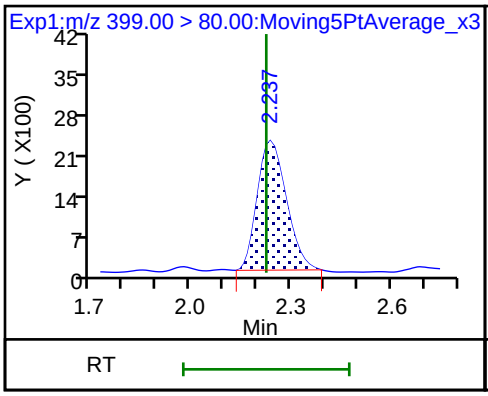
10 Perfluoroheptanoic acid (ND)



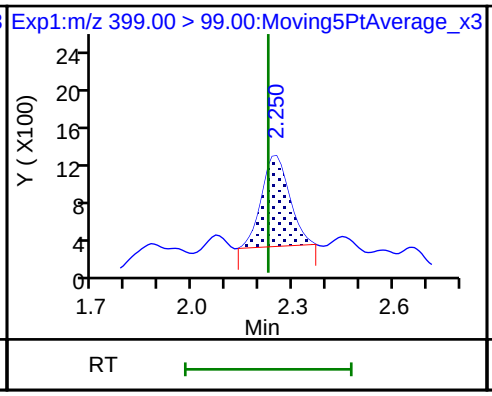
10 Perfluoroheptanoic acid (ND)



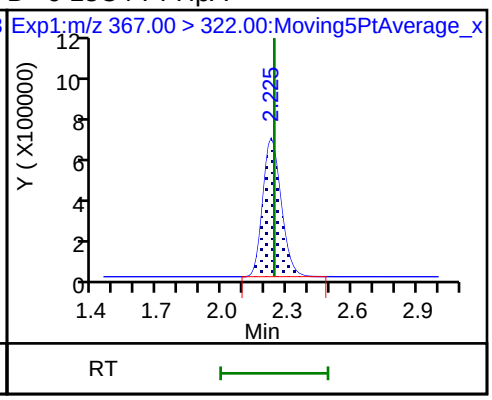
8 Perfluorohexanesulfonic acid



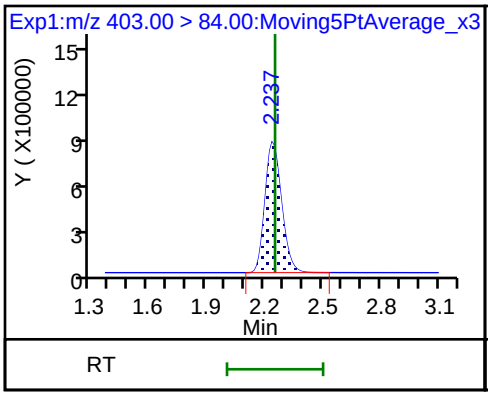
8 Perfluorohexanesulfonic acid



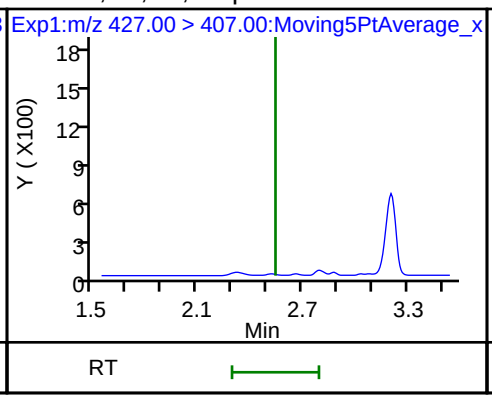
D 9 13C4-PFHpA



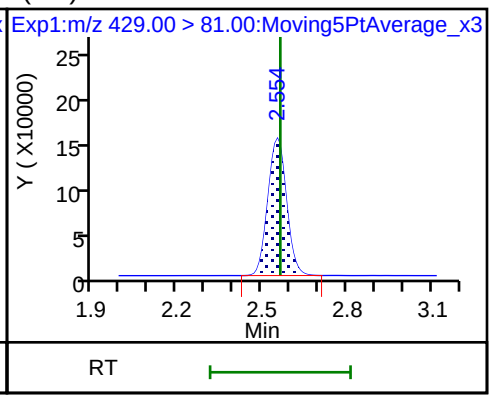
D 11 18O2 PFHxS



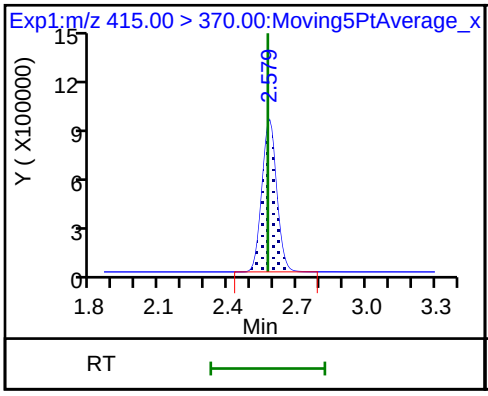
13 1H,1H,2H,2H-perfluorooctanesulfonic acid (ND)



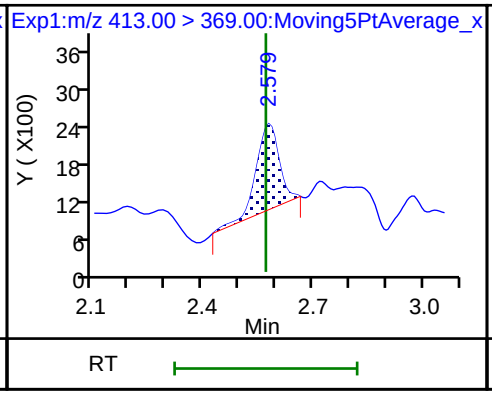
D 12 M2-6:2FTS



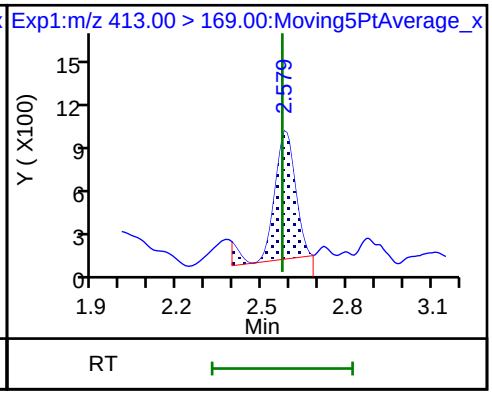
* 62 13C2-PFOA



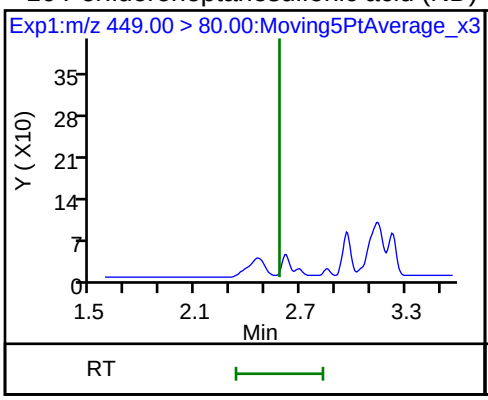
15 Perfluorooctanoic acid



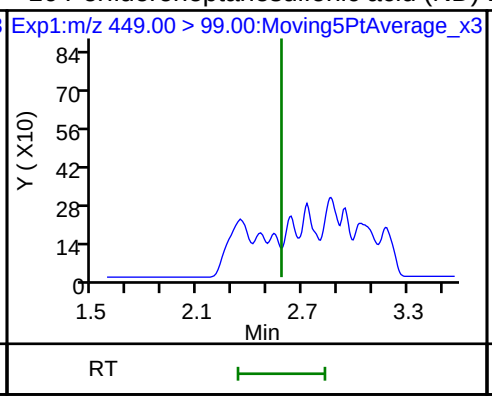
15 Perfluorooctanoic acid



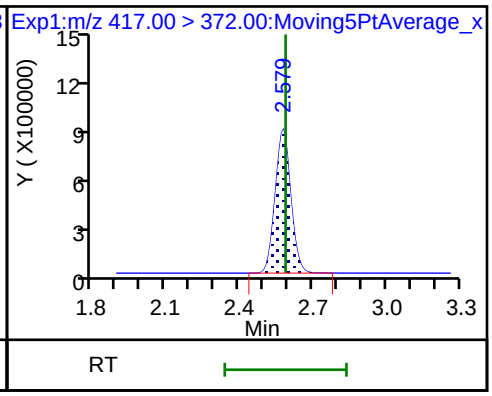
16 Perfluoroheptanesulfonic acid (ND)



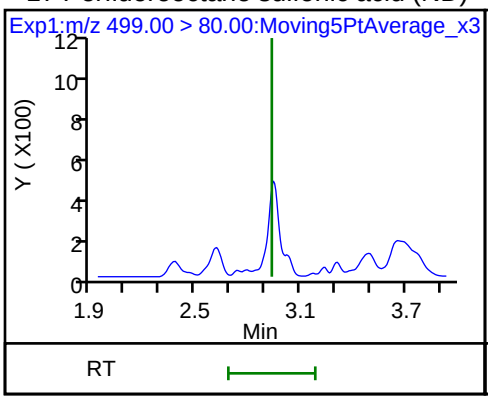
16 Perfluoroheptanesulfonic acid (ND)



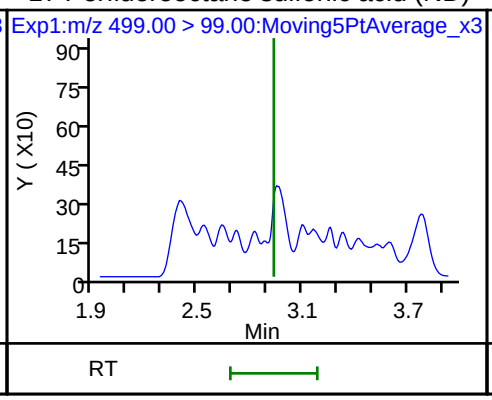
D 14 13C4 PFOA



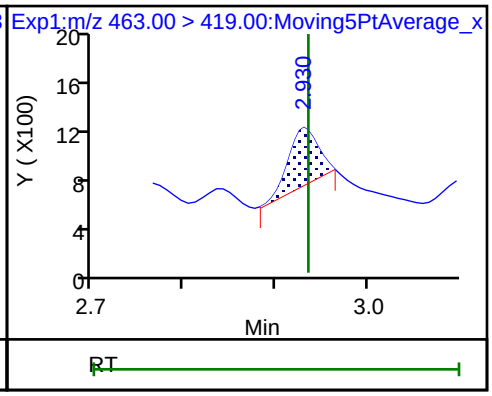
17 Perfluorooctane sulfonic acid (ND)



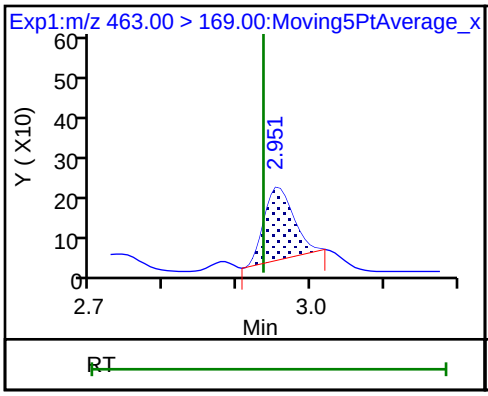
17 Perfluorooctane sulfonic acid (ND)



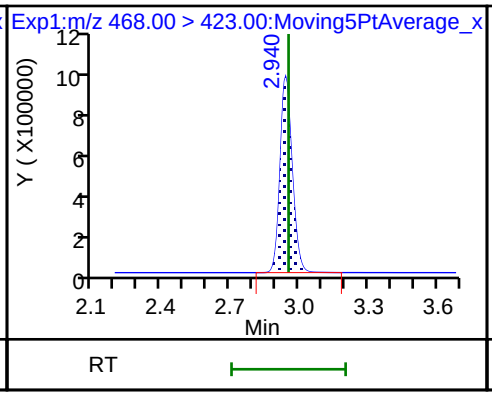
20 Perfluorononanoic acid



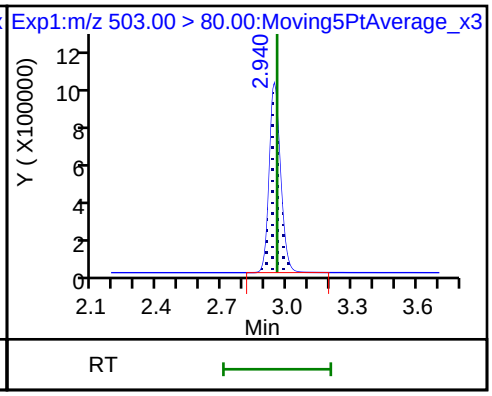
20 Perfluorononanoic acid



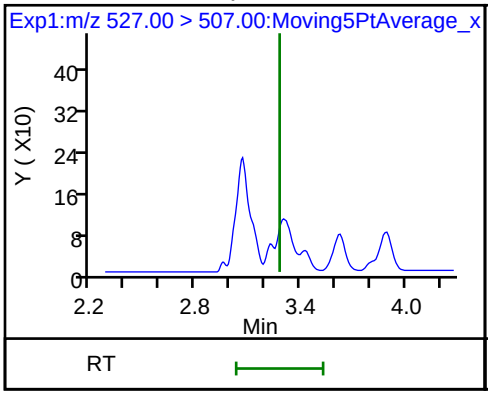
D 19 13C5 PFNA



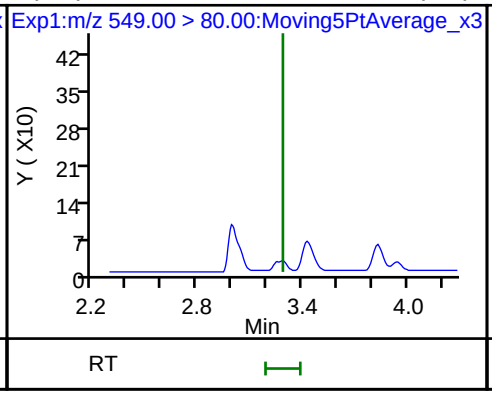
D 18 13C4 PFOS



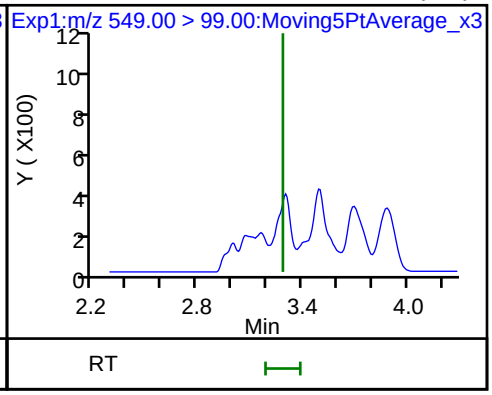
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



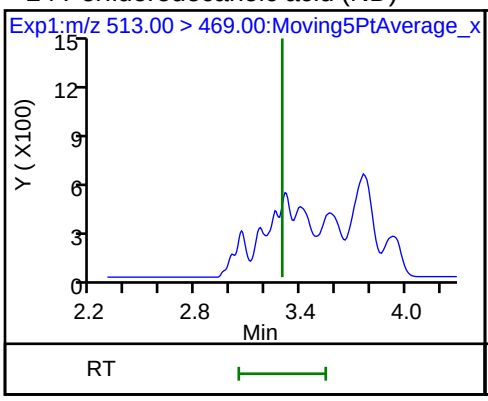
68 Perfluorononanesulfonic acid (ND)



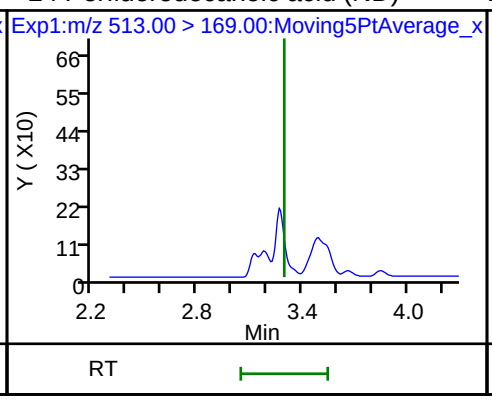
68 Perfluorononanesulfonic acid (ND)



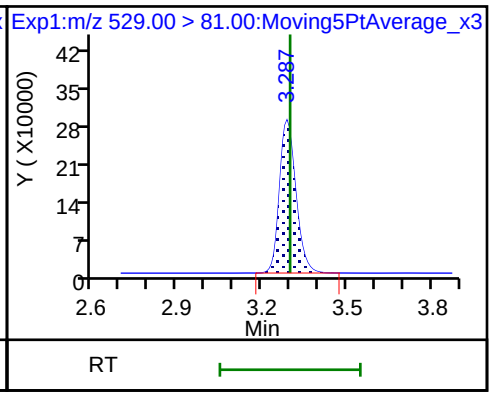
24 Perfluorodecanoic acid (ND)



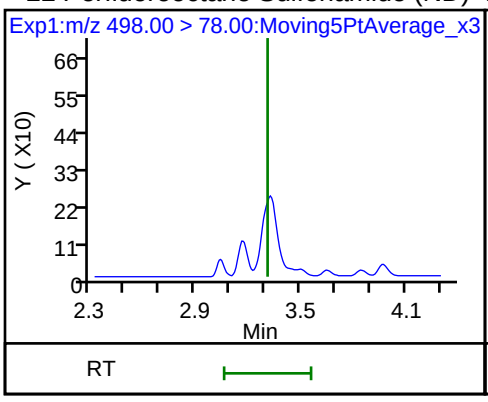
24 Perfluorodecanoic acid (ND)



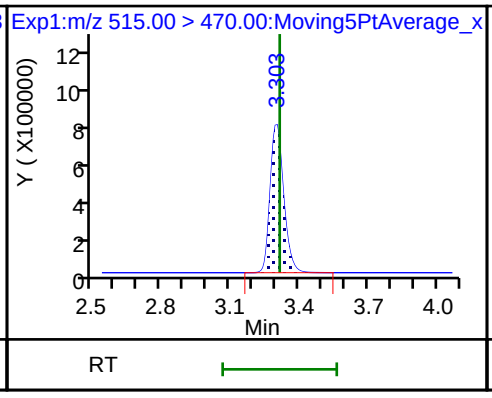
D 26 M2-8:2FTS



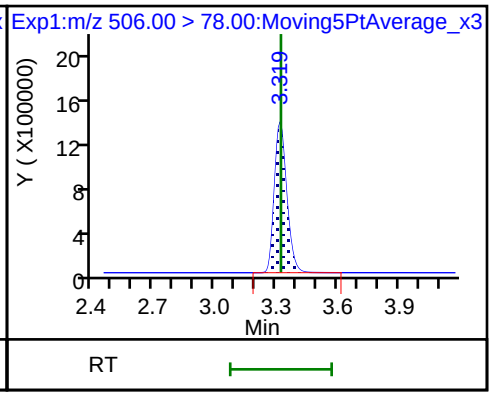
22 Perfluorooctane Sulfonamide (ND)



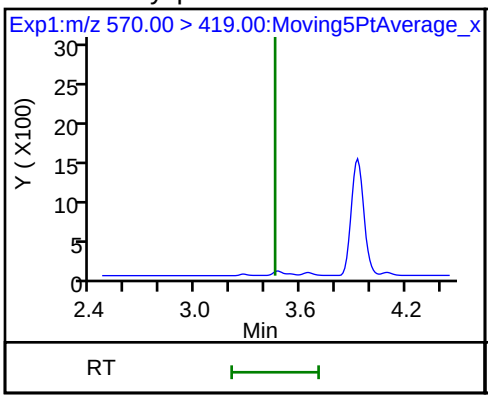
D 23 13C2 PFDA



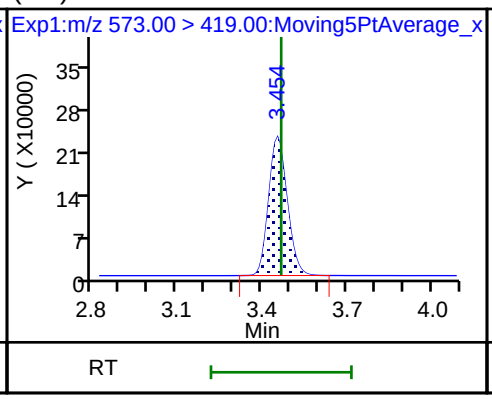
D 21 13C8 FOSA



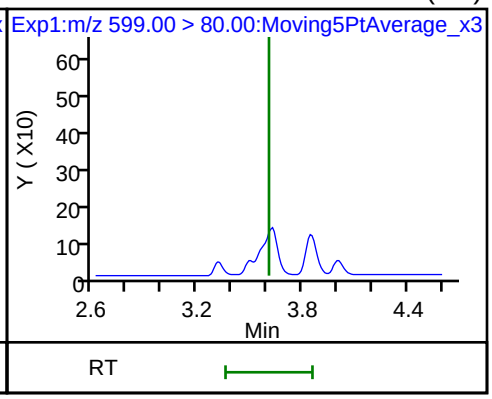
28 N-methyl perfluorooctane sulfonamid (ND)



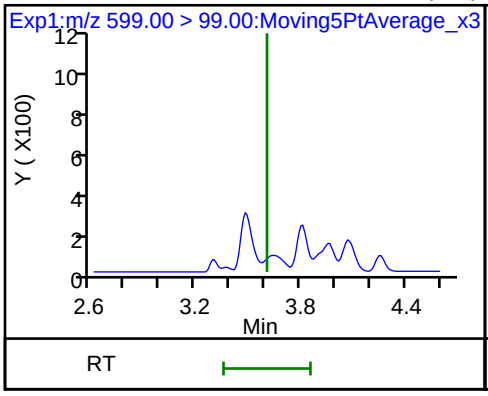
D 27 d3-NMeFOSAA



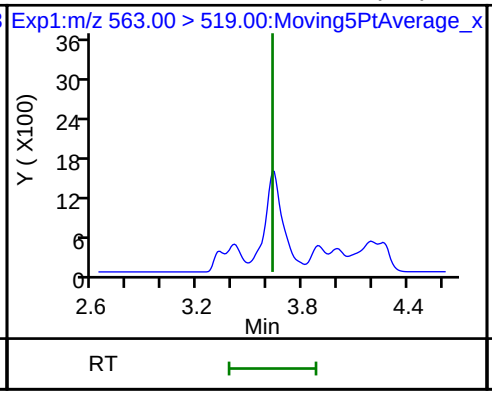
29 Perfluorodecane Sulfonic acid (ND)



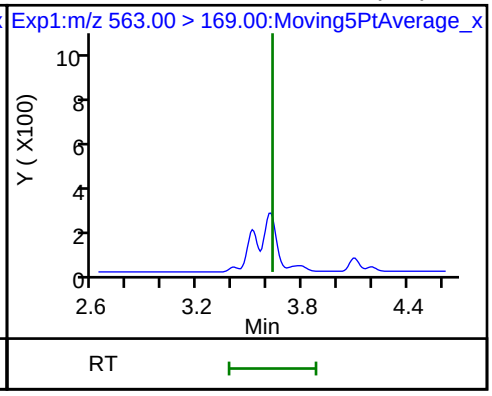
29 Perfluorodecane Sulfonic acid (ND)



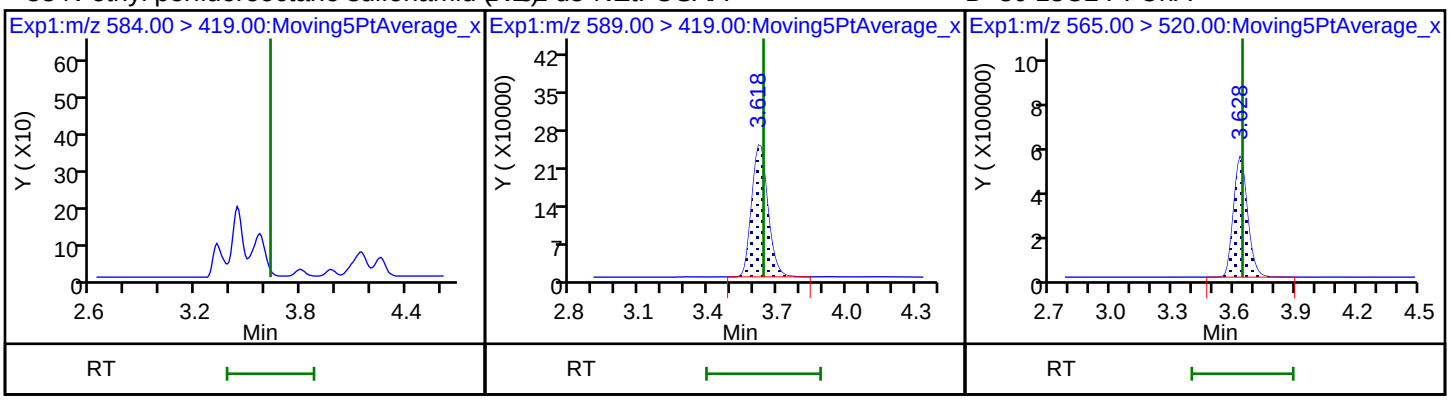
31 Perfluoroundecanoic acid (ND)



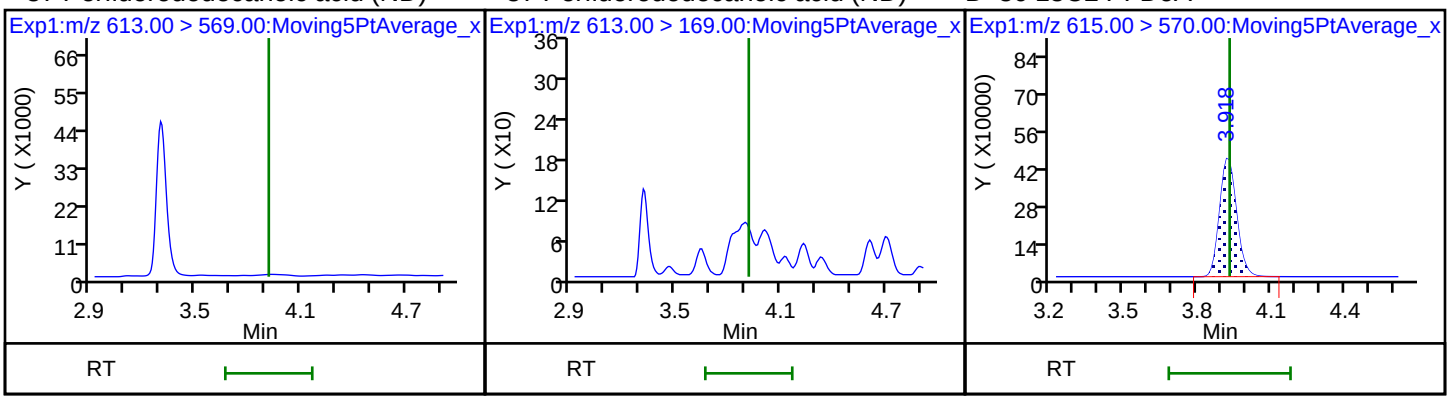
31 Perfluoroundecanoic acid (ND)



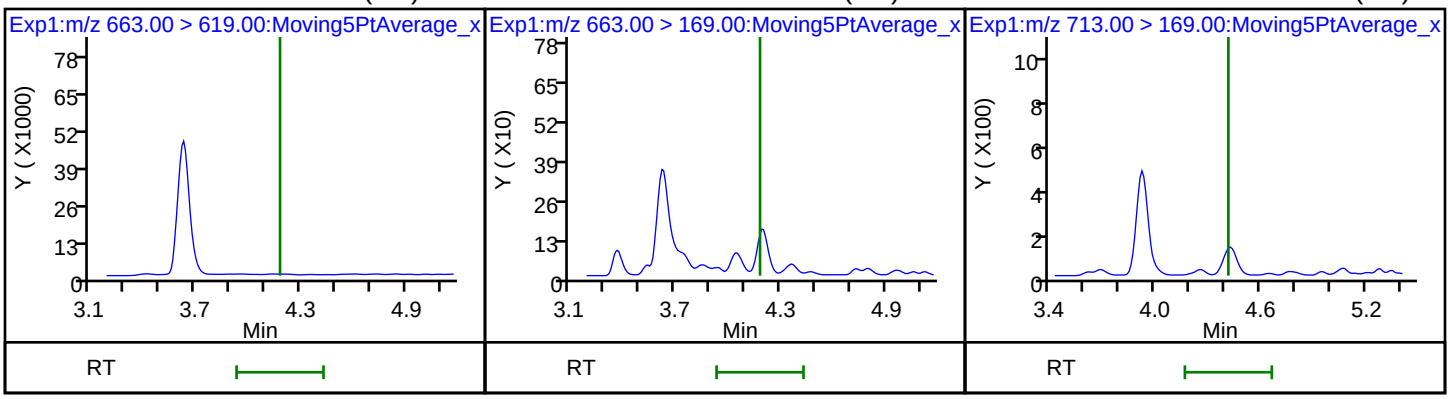
33 N-ethyl perfluorooctane sulfonamid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA



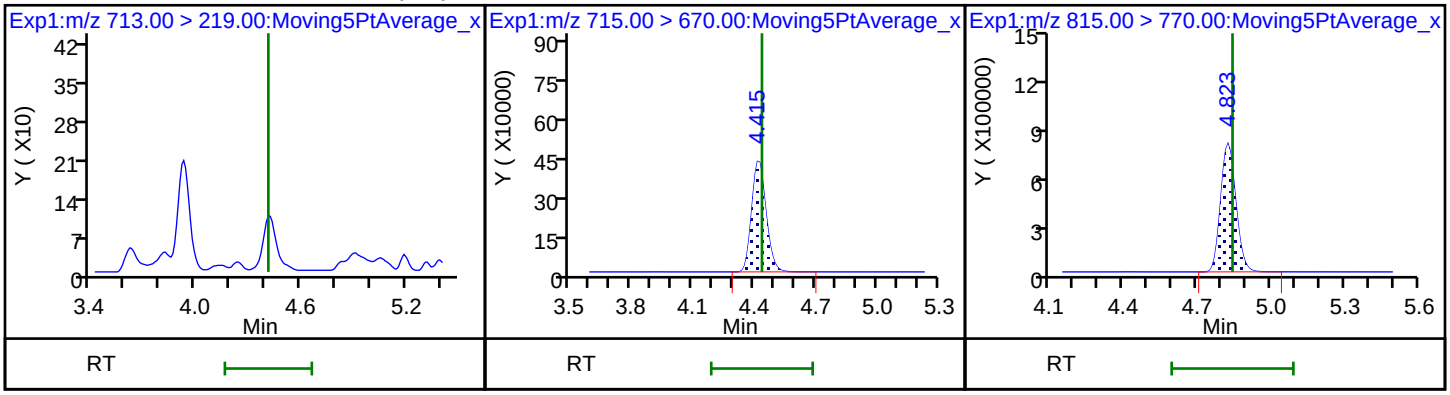
37 Perfluorododecanoic acid (ND) 37 Perfluorododecanoic acid (ND) D 36 13C2 PFDoA



41 Perfluorotridecanoic acid (ND) 41 Perfluorotridecanoic acid (ND) 42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND) D 43 13C2-PFTeDA D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-237043/1
Matrix: Solid
Lab File ID: 2018.07.31LLA_004.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/31/2018 15:36
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237043
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00656	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	96		50-150
STL01892	13C4-PFHpA	102		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	98		50-150
STL00994	18O2 PFHxS	99		50-150
STL00991	13C4 PFOS	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 31-Jul-2018 15:36:36 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 08:33:49 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 09:03:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.389	1.397	-0.008	1.000	10009	0.005429			2.1	
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.402	-0.013	0.539	4502240	2.39		95.7	95501	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.640	-0.011	0.632	2957452	2.44		97.7	47503	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.675	-0.013	0.645	80261	2.23		96.1	320	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.885	-0.013	0.726	505567	NC			5144	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.737	3250662	2.37		94.6	82577	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.014	-0.015	0.775	254569	NC			11166	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.229	-0.004	0.863	3348808	2.56		102	63307	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.241	-0.004	1.000	14966	0.006557			84.7	
399.00 > 99.00	2.237	2.241	-0.004	1.000	7269		2.06(1.50-4.49)		9.3	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.254	-0.017	0.868	4645123	2.34		98.8	51966	
D 12 M2-6:2FTS										
429.00 > 81.00	2.553	2.564	-0.011	0.990	897213	2.19		92.2	10244	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3297600	2.47		98.7	43156	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.587	2.588	-0.001	1.003	7594	0.004938			5.7	
413.00 > 169.00	2.588	2.588	0.0	1.004	0		0.00(0.84-2.52)			

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.588	-0.009		3476165	2.50			33992	
20 Perfluorononanoic acid										R
463.00 > 419.00	2.947	2.948	-0.001	1.000	1811	0.001452			2.2	R
463.00 > 169.00	2.936	2.948	-0.012	0.996	285		6.35(1.90-5.69)		9.3	
D 18 13C4 PFOS										
503.00 > 80.00	2.947	2.953	-0.006	1.143	3237391	2.27		94.9	44381	
D 19 13C5 PFNA										
468.00 > 423.00	2.947	2.960	-0.013	1.143	2889870	2.45		97.9	43039	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.307	-0.016	1.276	939166	1.99		83.1	12017	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.315	-0.008	1.282	2237379	2.29		91.6	45821	
D 21 13C8 FOSA										
506.00 > 78.00	3.314	3.322	-0.008	1.285	4969377	2.44		97.6	48002	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.476	-0.018	1.341	544433	2.46		98.5	16753	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.630	3.640	-0.010	1.408	628371	2.60		104	5983	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.650	-0.010	1.412	1712928	2.26		90.3	36128	
D 36 13C2 PFDoA										
615.00 > 570.00	3.930	3.941	-0.011	1.524	1565927	2.03		81.3	23861	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.437	0.0	1.721	1359412	1.94		77.5	7723	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.833	0.009	1.000	16652	NC			1.6	
813.00 > 169.00	4.842	4.833	0.009	1.000	3554		4.69(2.86-8.58)		34.1	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.842	0.0	1.878	1943515	1.56		62.6	3079	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL0_00008 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 09:03:14 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61899.b\2018.07.31LLA_004.d

Injection Date: 31-Jul-2018 15:36:36 Instrument ID: A8_N

Lims ID: CCB

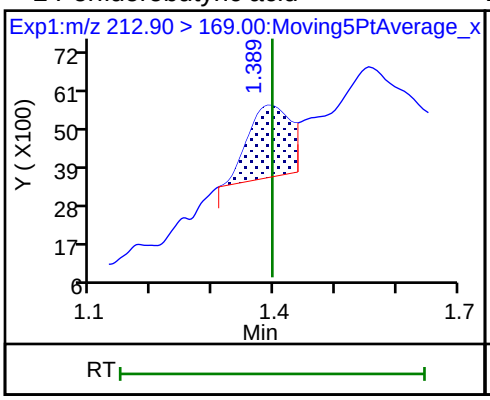
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 1

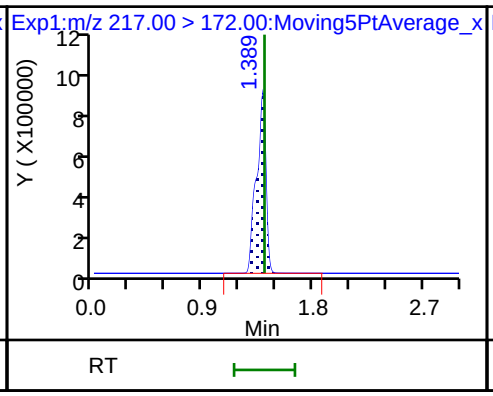
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

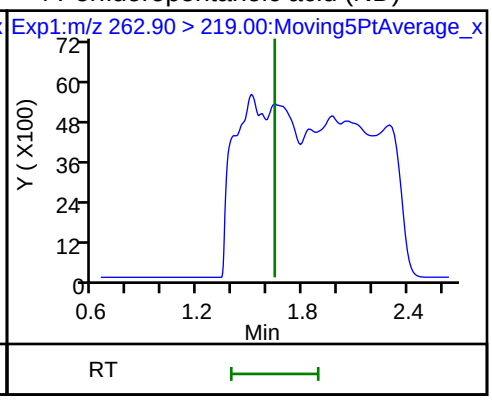
2 Perfluorobutyric acid



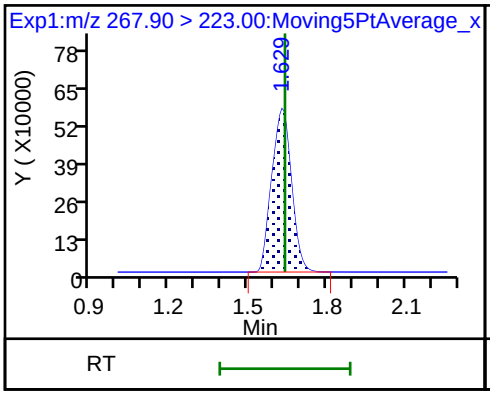
D 1 13C4 PFBA



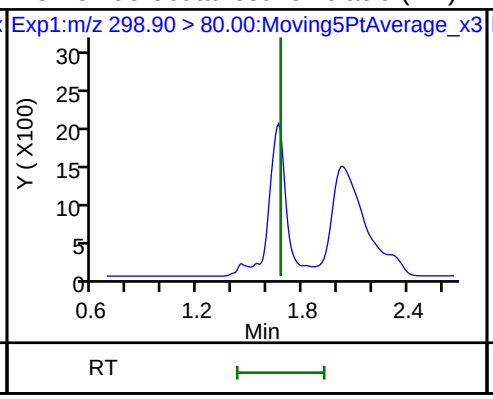
4 Perfluoropentanoic acid (ND)



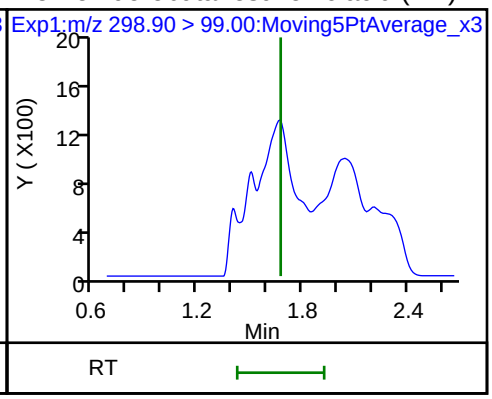
D 3 13C5-PFPeA



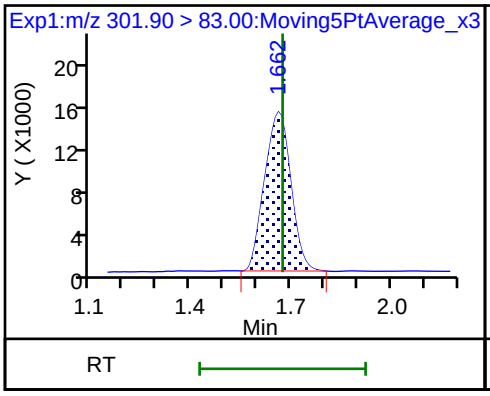
5 Perfluorobutanesulfonic acid (ND)



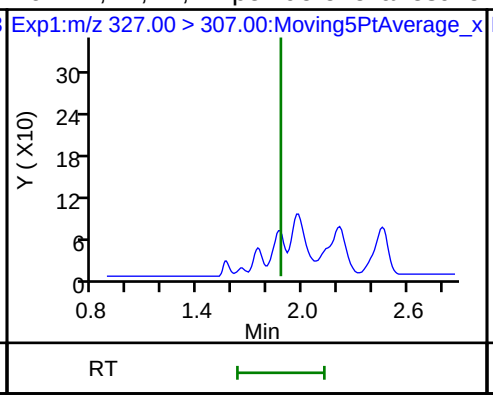
5 Perfluorobutanesulfonic acid (ND)



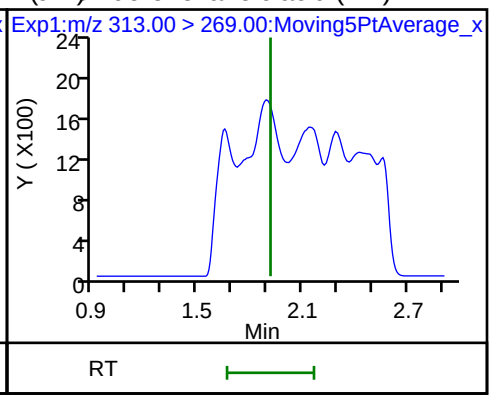
D 47 13C3-PFBS



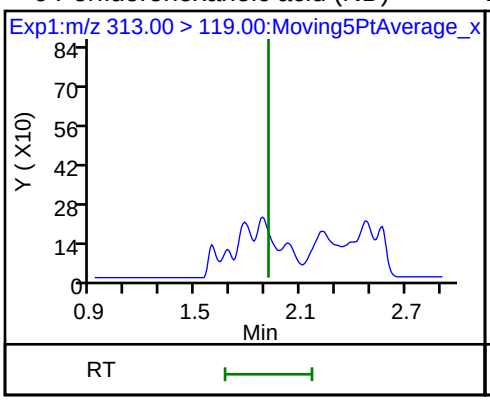
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



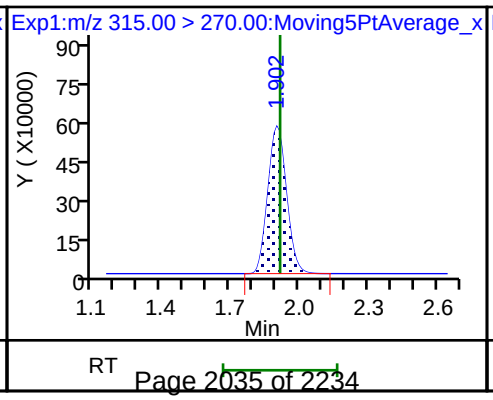
6 Perfluorohexanoic acid (ND)



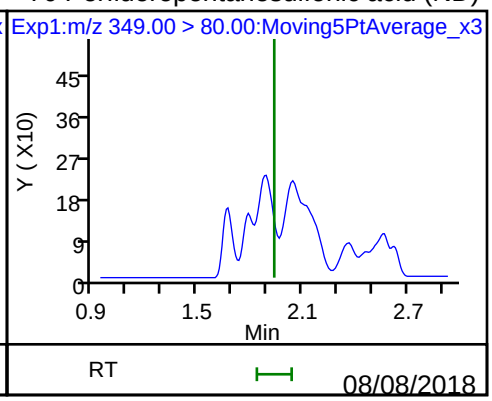
6 Perfluorohexanoic acid (ND)



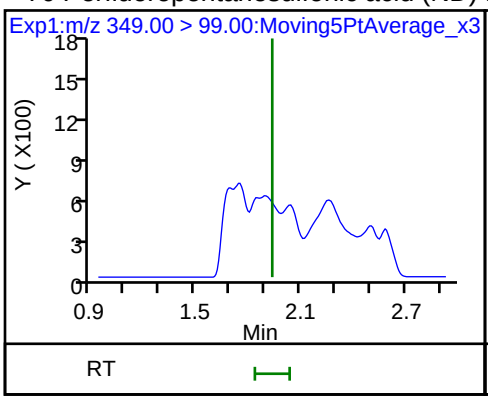
D 7 13C2 PFHxA



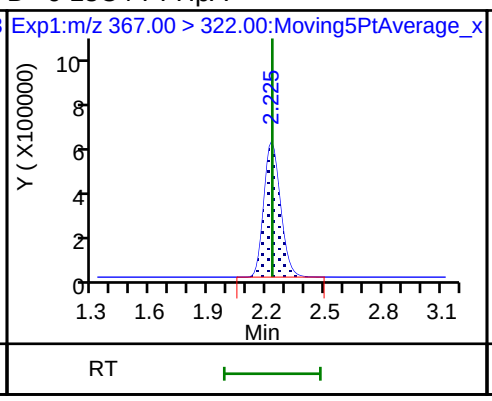
70 Perfluoropentanesulfonic acid (ND)



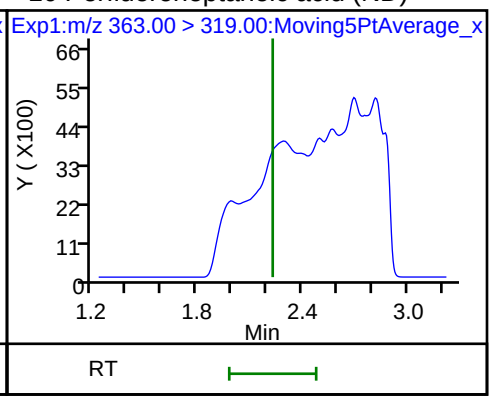
70 Perfluoropentanesulfonic acid (ND)



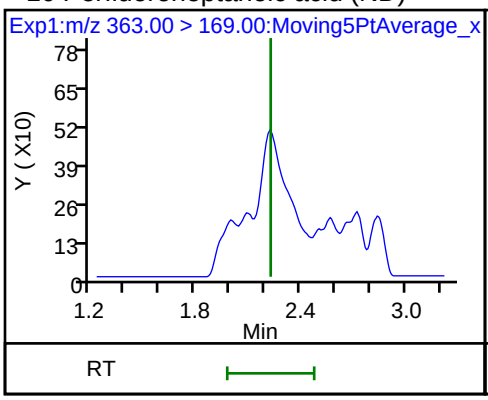
D 9 13C4-PFHpA



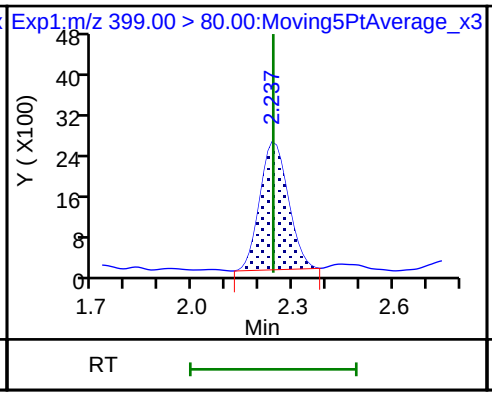
10 Perfluoroheptanoic acid (ND)



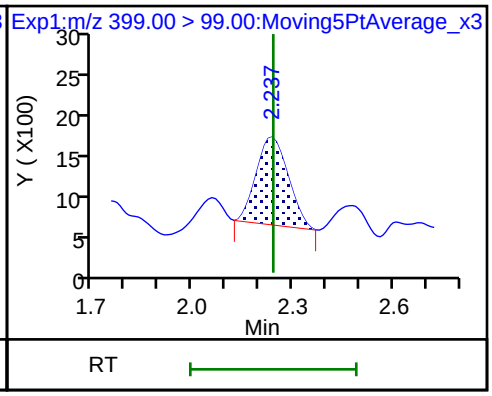
10 Perfluoroheptanoic acid (ND)



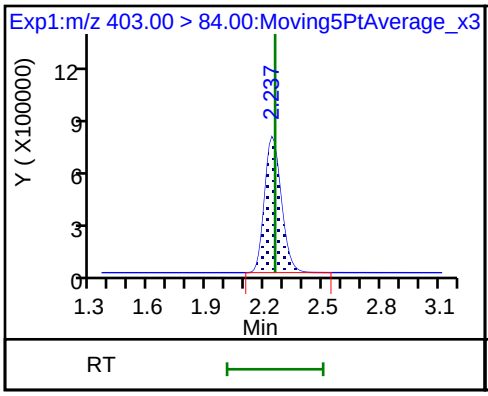
8 Perfluorohexanesulfonic acid



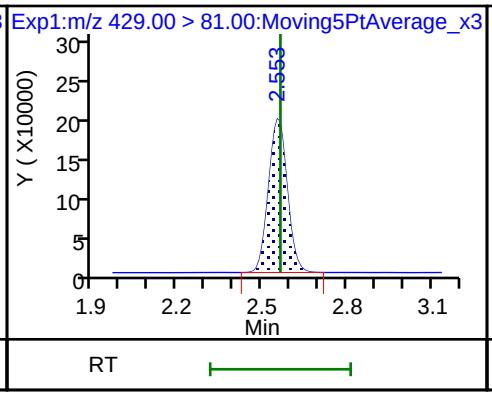
8 Perfluorohexanesulfonic acid



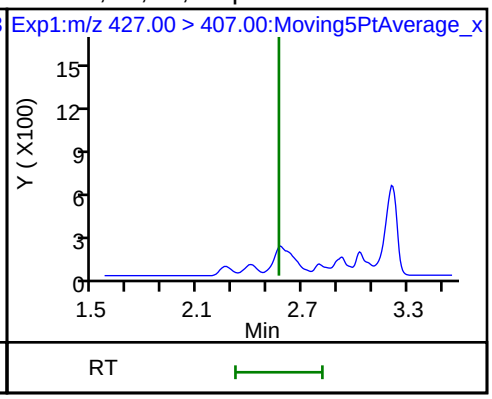
D 11 18O2 PFHxS



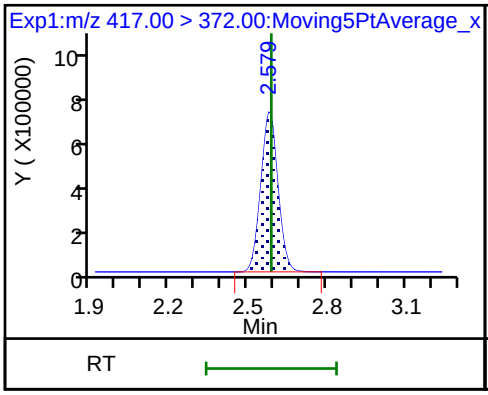
D 12 M2-6:2FTS



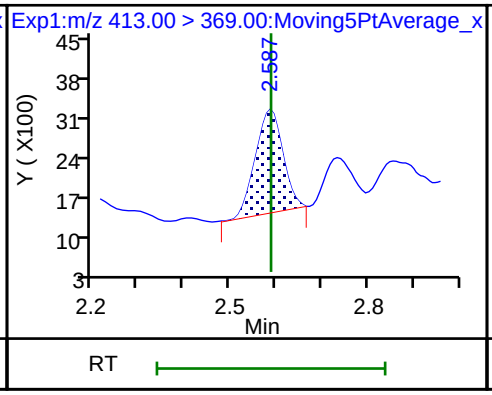
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



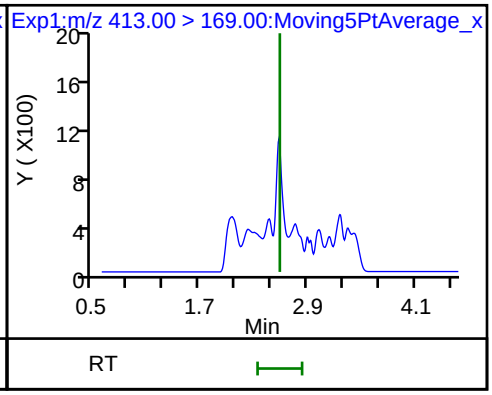
D 14 13C4 PFOA



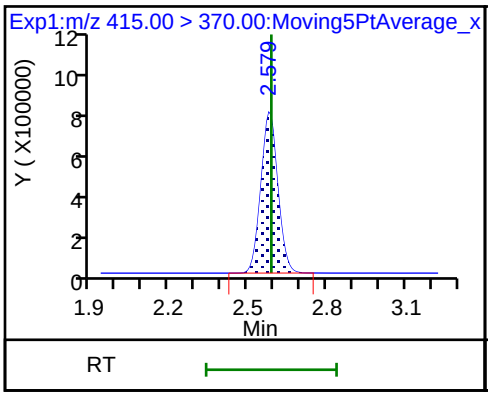
15 Perfluorooctanoic acid



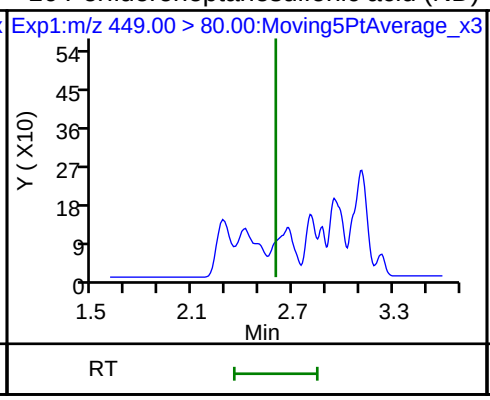
15 Perfluorooctanoic acid



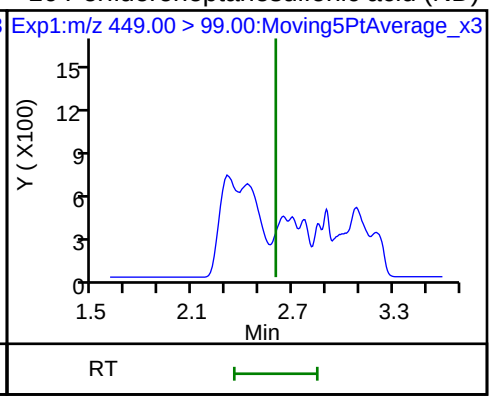
* 62 13C2-PFOA



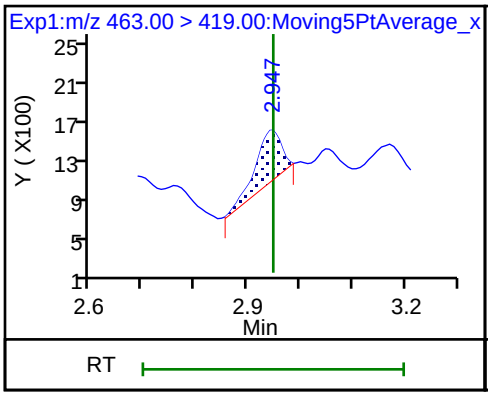
16 Perfluoroheptanesulfonic acid (ND)



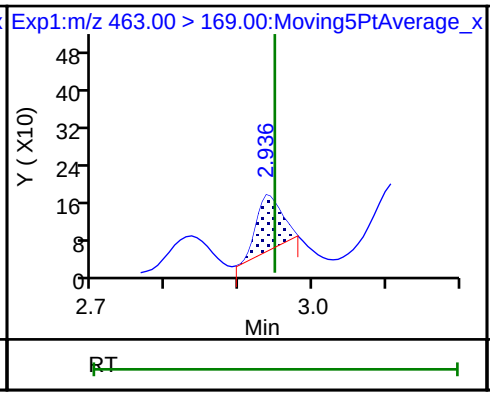
16 Perfluoroheptanesulfonic acid (ND)



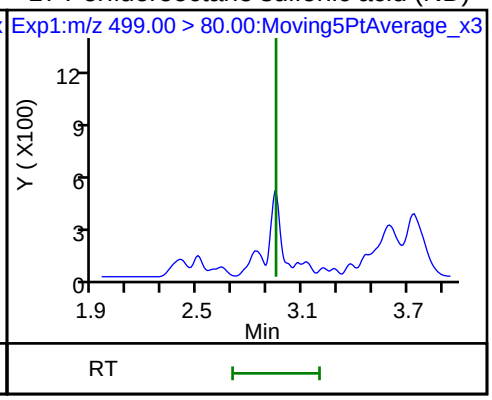
20 Perfluorononanoic acid



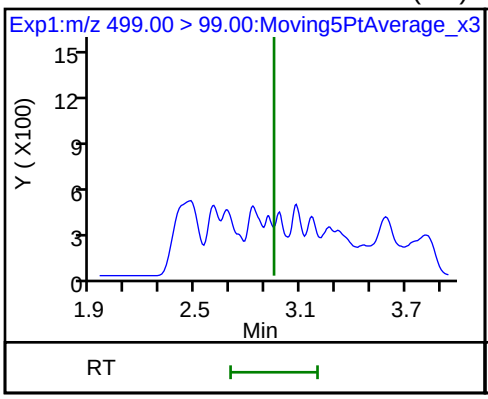
20 Perfluorononanoic acid



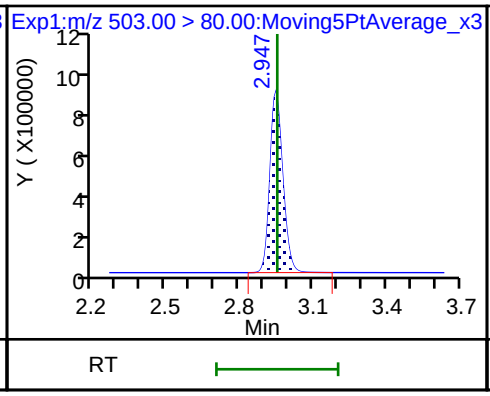
17 Perfluorooctane sulfonic acid (ND)



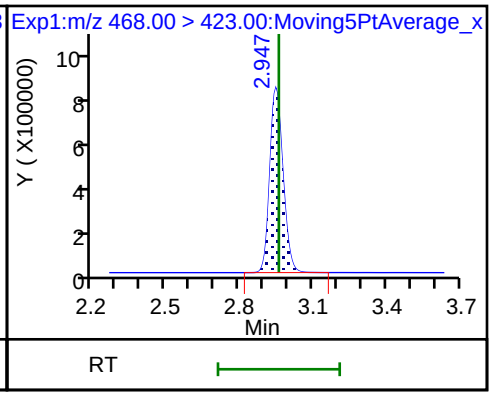
17 Perfluorooctane sulfonic acid (ND)



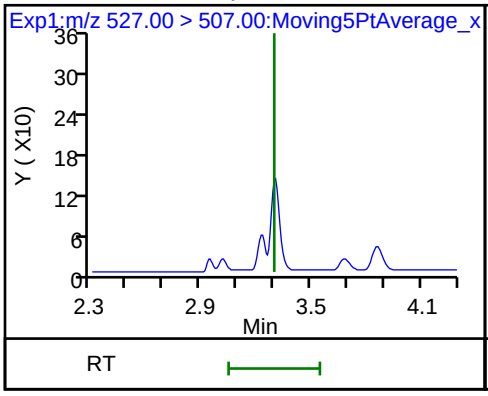
D 18 13C4 PFOS



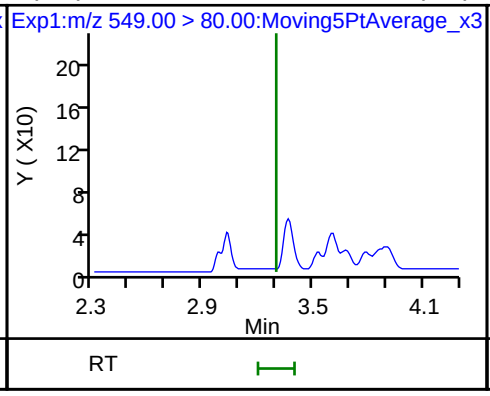
D 19 13C5 PFNA



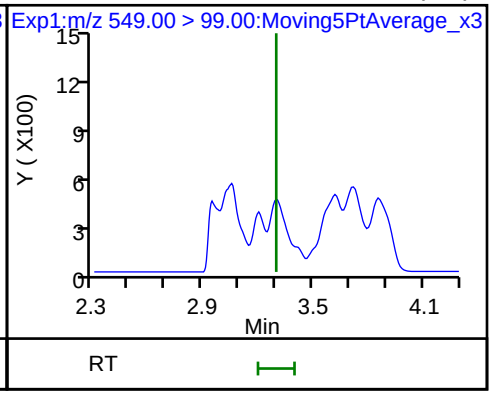
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



68 Perfluorononanesulfonic acid (ND)



68 Perfluorononanesulfonic acid (ND)



Report Date: 01-Aug-2018 09:03:14 Chrom Revision: 2.3 19-Jul-2018 15:14:50
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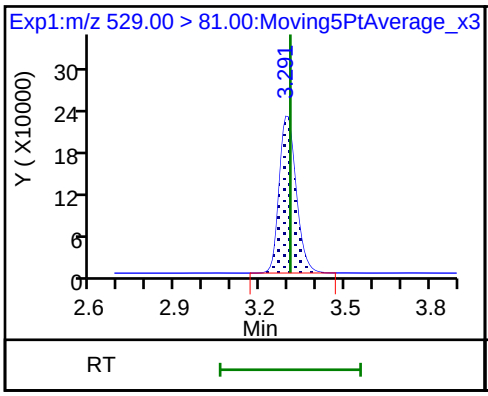
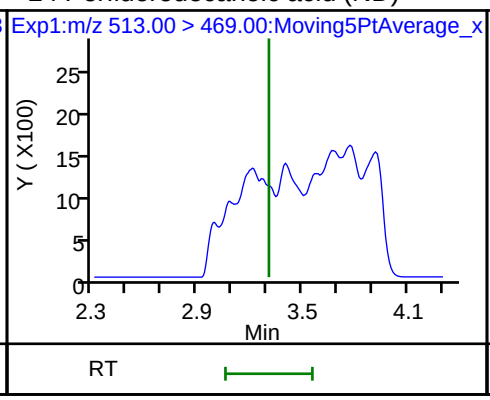
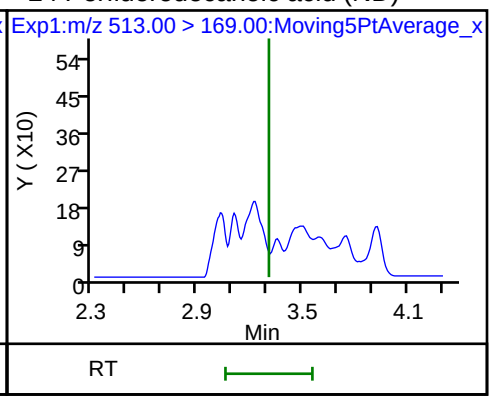
D 26 M2-8:2FTS



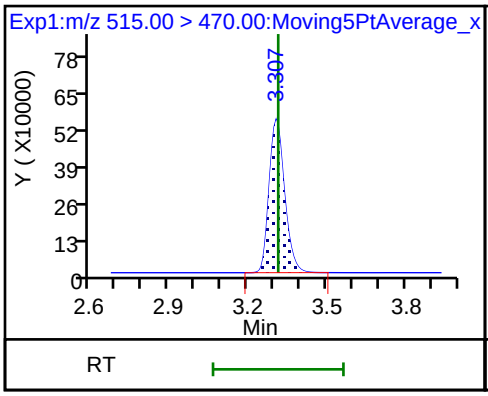
24 Perfluorodecanoic acid (ND)



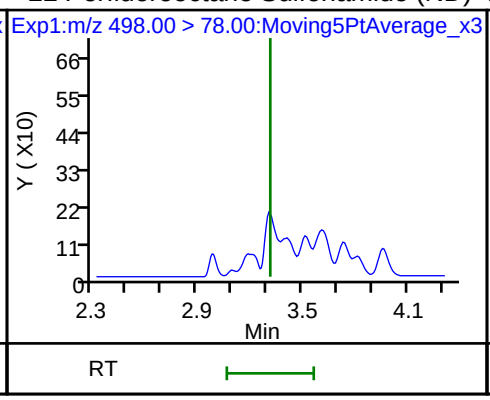
24 Perfluorodecanoic acid (ND)



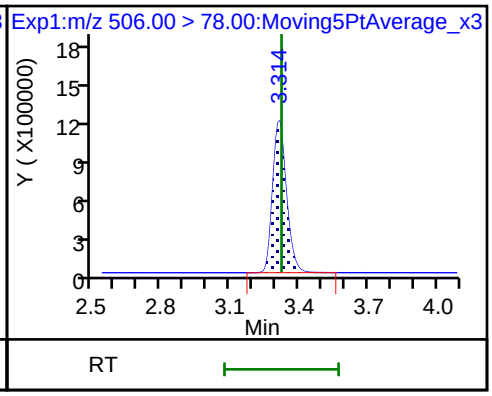
D 23 13C2 PFDA



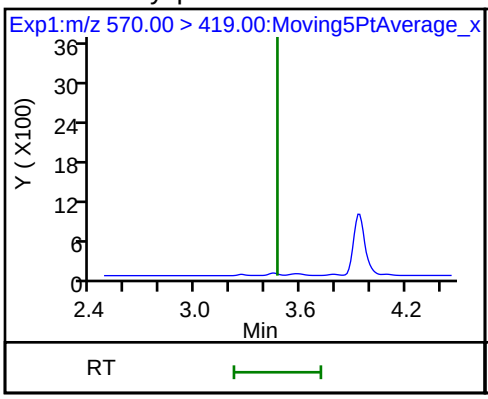
22 Perfluorooctane Sulfonamide (ND)



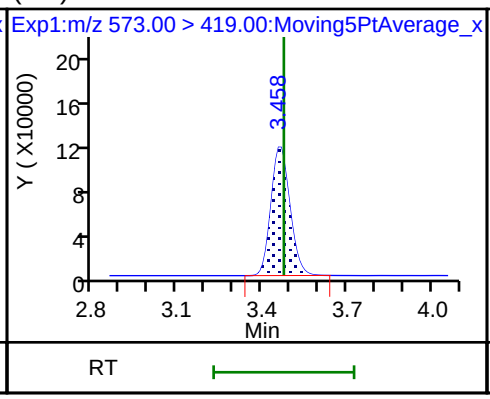
D 21 13C8 FOSA



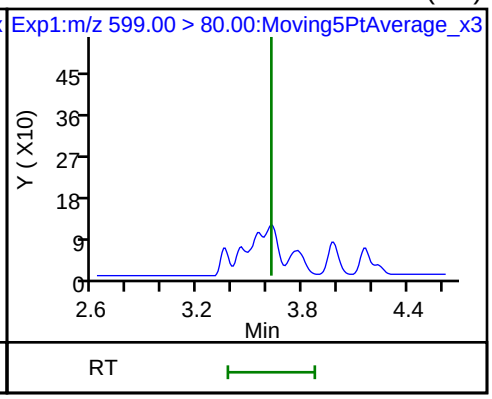
28 N-methyl perfluorooctane sulfonamid (ND)



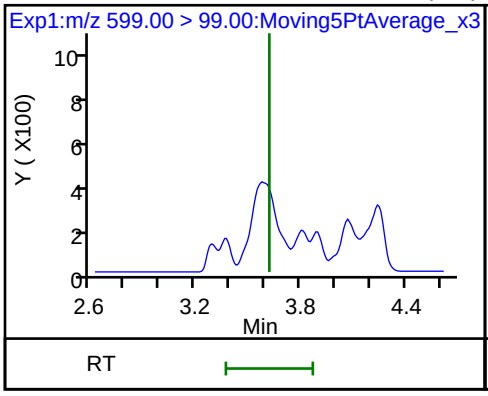
27 d3-NMeFOSAA



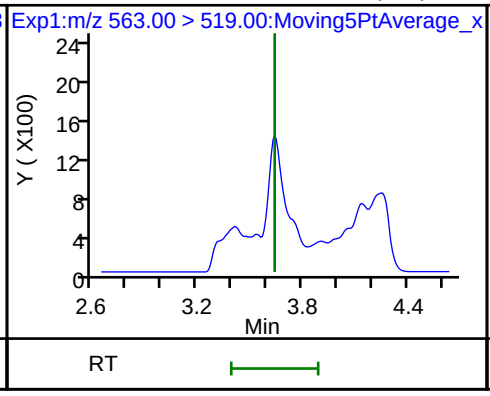
29 Perfluorodecane Sulfonic acid (ND)



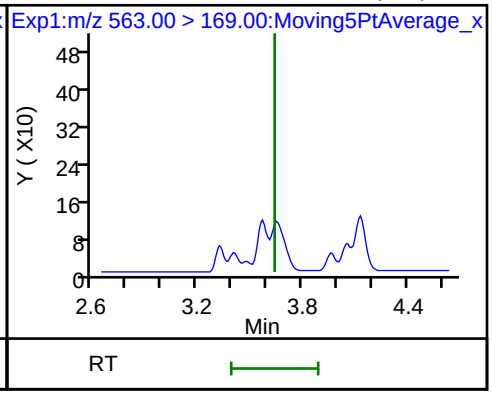
29 Perfluorodecane Sulfonic acid (ND)



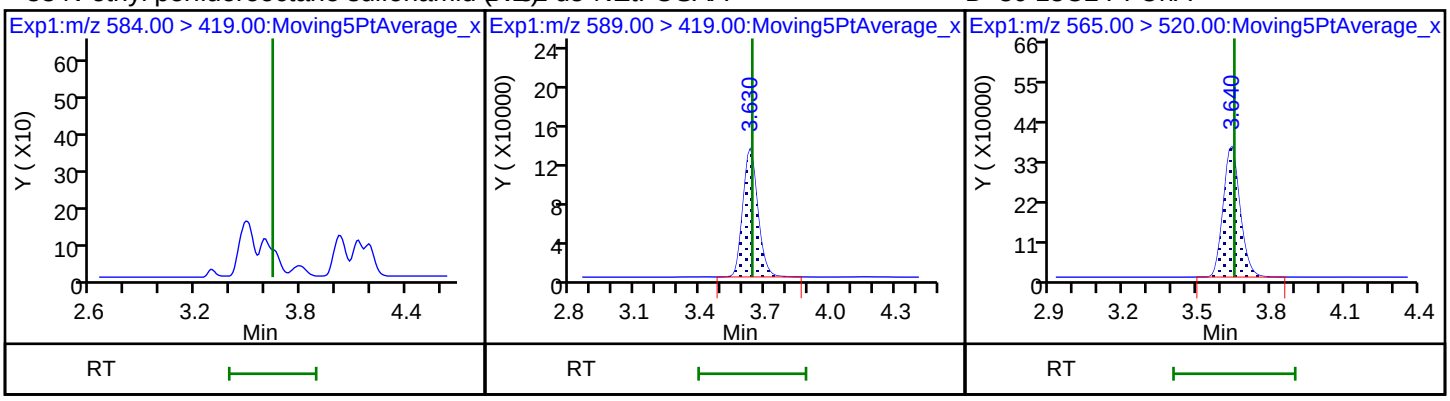
31 Perfluoroundecanoic acid (ND)



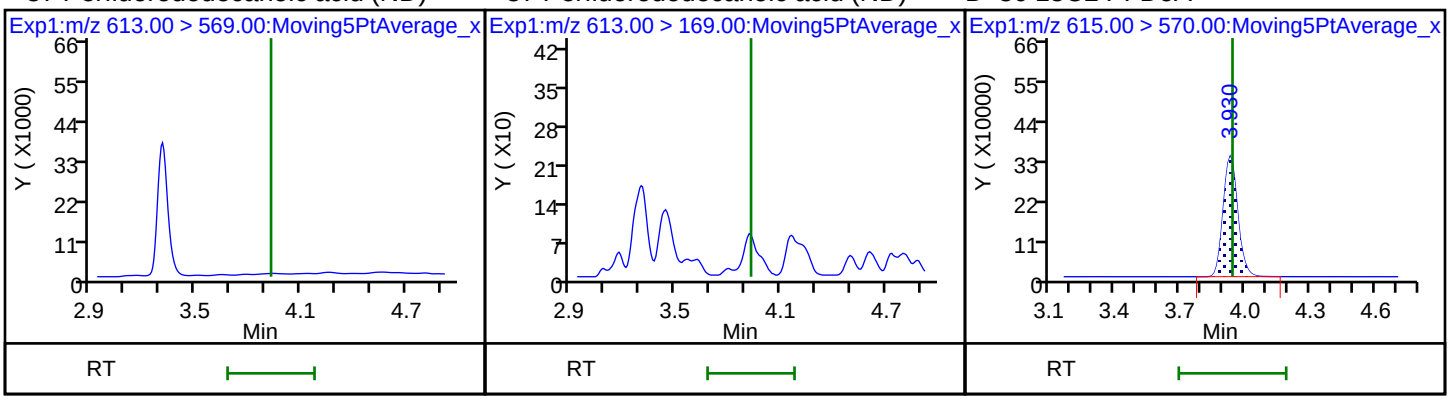
31 Perfluoroundecanoic acid (ND)



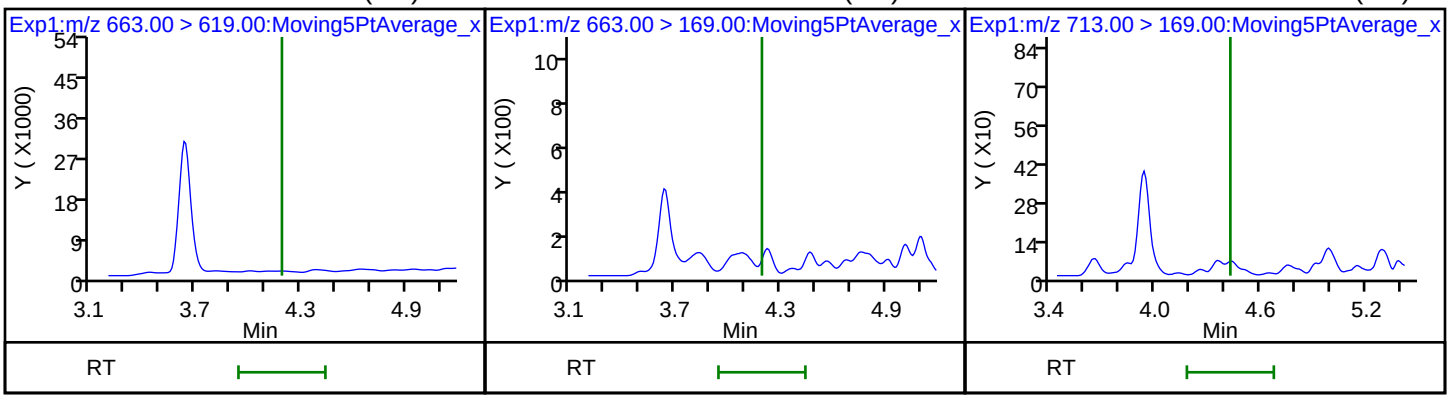
33 N-ethyl perfluorooctane sulfonamid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA



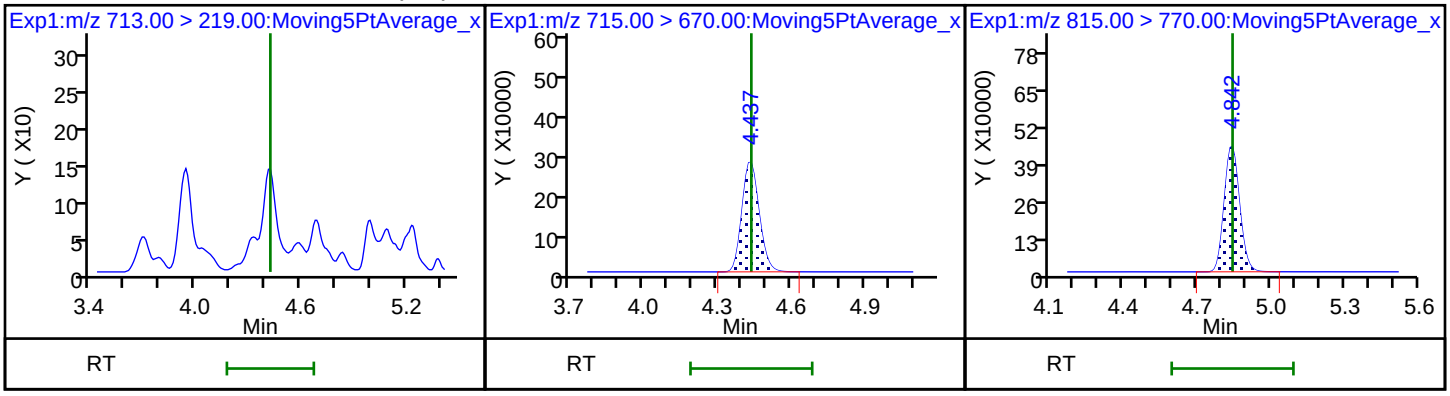
37 Perfluorododecanoic acid (ND) 37 Perfluorododecanoic acid (ND) D 36 13C2 PFDoA



41 Perfluorotridecanoic acid (ND) 41 Perfluorotridecanoic acid (ND) 42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND) D 43 13C2-PFTeDA D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: ICB 320-235323/9
Matrix: Water
Lab File ID: 2018.07.20LLA_011.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/20/2018 20:25
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235323
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00619	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	101		50-150
STL01892	13C4-PFHpA	101		50-150
STL00990	13C4 PFOA	103		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	108		50-150
STL00991	13C4 PFOS	101		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_011.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 20-Jul-2018 20:25:21 ALS Bottle#: 8 Worklist Smp#: 9
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 21-Jul-2018 10:24:28 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 21-Jul-2018 10:02:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.515	0.002	0.539	9039508	2.54		102	16599	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.789	0.003	1.000	11755	0.003246			5.6	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.789	0.003	0.637	8340604	2.55		102	23100	
D 47 13C3-PFBS										
301.90 > 83.00	1.834	1.827	0.007	0.652	97320	2.36		101	1197	
D 60 M2-4:2FTS										
329.00 > 81.00	2.056	2.051	0.005	0.731	792034	NC			2121	
D 7 13C2 PFHxA										
315.00 > 270.00	2.088	2.085	0.003	0.742	8789011	2.56		102	43598	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.192	2.189	0.003	0.779	781905	NC			5331	
D 9 13C4-PFHpA										
367.00 > 322.00	2.436	2.431	0.005	0.866	10067056	2.53		101	51455	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.436	2.433	0.003	1.000	16257	0.003673			5.4	
363.00 > 169.00	2.436	2.433	0.003	1.000	3153		5.16(2.17-6.52)		24.5	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.446	0.003	1.000	21573	0.006189			37.5	
399.00 > 99.00	2.449	2.446	0.003	1.000	6050		3.57(1.90-5.70)		26.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.449	2.447	0.002	0.871	6187909	2.56		108	40077	
D 12 M2-6:2FTS										
429.00 > 81.00	2.781	2.779	0.002	0.989	892814	2.40		101	3077	
D 14 13C4 PFOA										
417.00 > 372.00	2.813	2.804	0.009	1.000	9247525	2.59		103	34528	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
* 62 13C2-PFOA										
415.00 > 370.00	2.813	2.804	0.009		9124760	2.50			28786	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.813	2.806	0.007	1.000	21864	0.005131			3.4	
413.00 > 169.00	2.813	2.806	0.007	1.000	8884		2.46(1.36-4.08)		28.8	
D 19 13C5 PFNA										
468.00 > 423.00	3.191	3.189	0.002	1.135	8563556	2.55		102	26212	
D 18 13C4 PFOS										
503.00 > 80.00	3.191	3.189	0.002	1.135	6227825	2.40		101	6960	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.404	3.398	0.006	1.067	3809	NC			10.3	
D 21 13C8 FOSA										
506.00 > 78.00	3.518	3.519	-0.001	1.251	3729013	2.55		102	10878	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.533	3.519	0.014	1.004	5960	0.001305			7.0	
D 26 M2-8:2FTS										
529.00 > 81.00	3.533	3.540	-0.007	1.256	122711	2.42		101	2676	
D 23 13C2 PFDA										
515.00 > 470.00	3.548	3.548	0.0	1.261	8975256	2.57		103	36560	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.701	3.698	0.003	1.316	4135098	2.52		101	12733	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.701	3.702	-0.001	1.000	22026	0.0129			15.0	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.872	3.866	0.006	1.377	3631310	2.76		110	6504	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.870	0.002	1.377	8199985	2.57		103	21484	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.872	3.870	0.002	1.000	26438	0.0181			58.5	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.000	23226	0.007294			7.5	
563.00 > 169.00	3.886	3.872	0.014	1.004	3089		7.52(5.24-15.72)		13.4	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.042	4.026	0.016	1.266	3303	NC			13.0	
D 36 13C2 PFDoA										
615.00 > 570.00	4.172	4.162	0.010	1.483	8617795	2.52		101	27757	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006	1.660	7505207	2.54		101	17751	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.073	5.081	-0.008	1.804	6870031	2.26		90.2	7213	
45 Perfluorohexadecanoic acid										M
813.00 > 769.00	5.090	5.083	0.007	1.003	79567	NC			12.9	
813.00 > 169.00	5.090	5.083	0.007	1.003	12349		6.44(2.77-8.32)		30.2	M
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.445	5.443	0.002	1.073	22523	NC			3.9	
913.00 > 169.00	5.445	5.443	0.002	1.073	3840		5.87(2.55-7.64)		10.9	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 21-Jul-2018 10:24:33 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_011.d

Injection Date: 20-Jul-2018 20:25:21 Instrument ID: A9

Lims ID: ICB

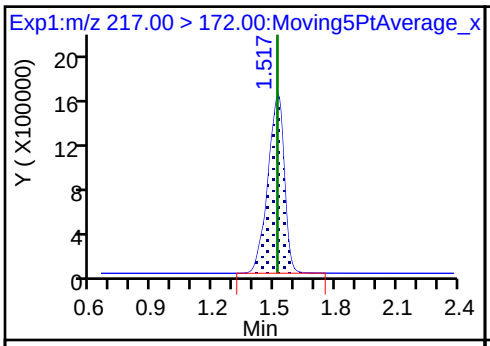
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 8 Worklist Smp#: 9

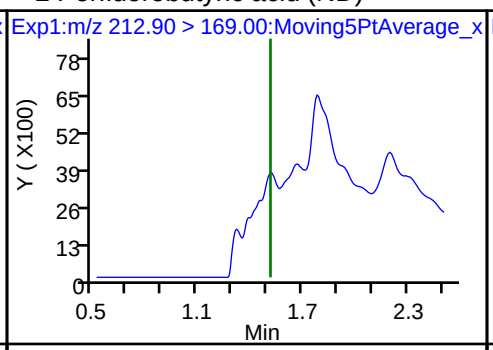
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

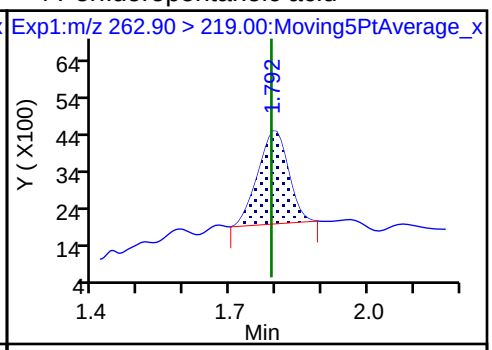
D 1 13C4 PFBA



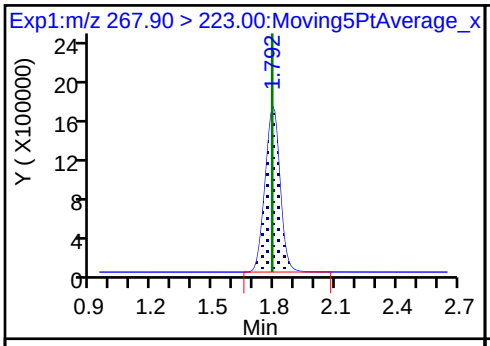
2 Perfluorobutyric acid (ND)



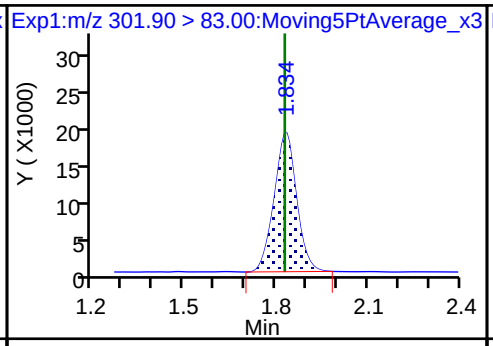
4 Perfluoropentanoic acid



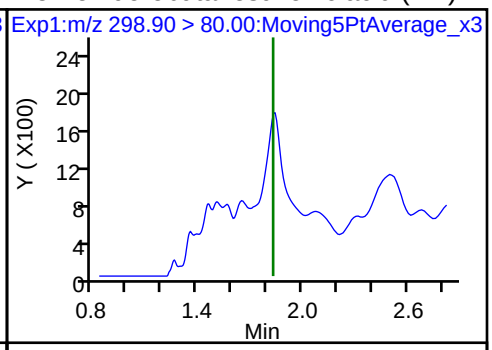
D 3 13C5-PFPeA



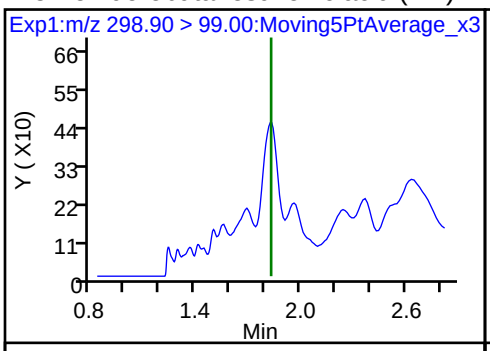
D 47 13C3-PFBS



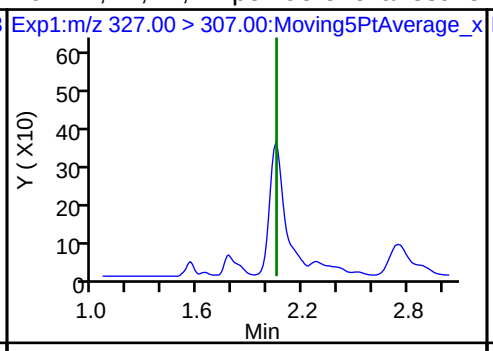
5 Perfluorobutanesulfonic acid (ND)



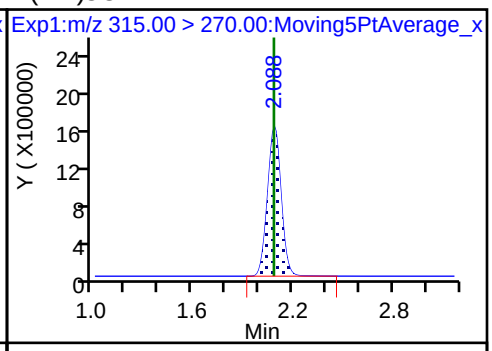
5 Perfluorobutanesulfonic acid (ND)



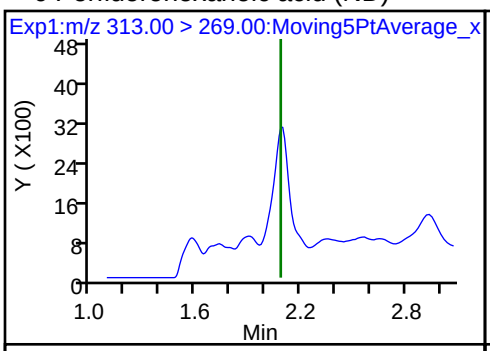
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



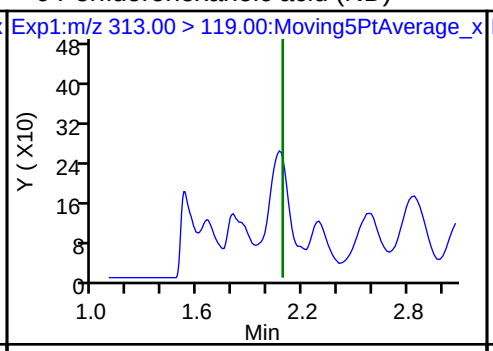
D 70 13C2 PFHxA



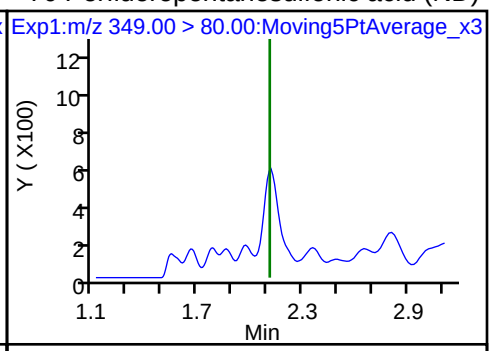
6 Perfluorohexanoic acid (ND)



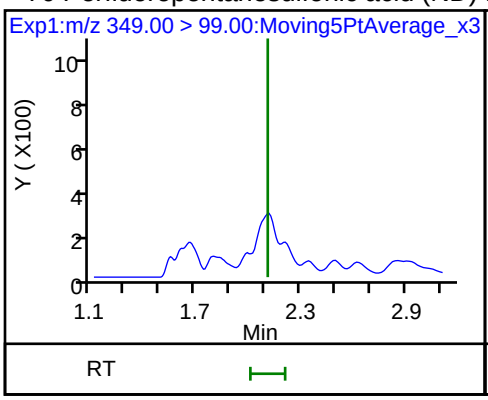
6 Perfluorohexanoic acid (ND)



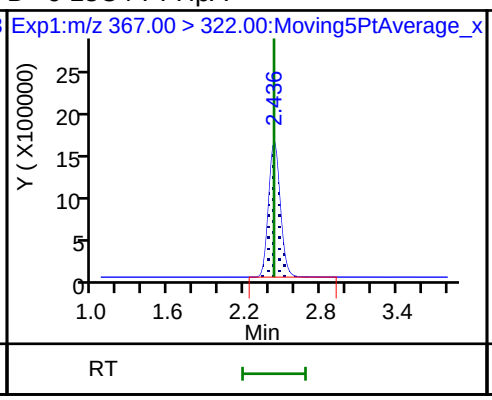
70 Perfluoropentanesulfonic acid (ND)



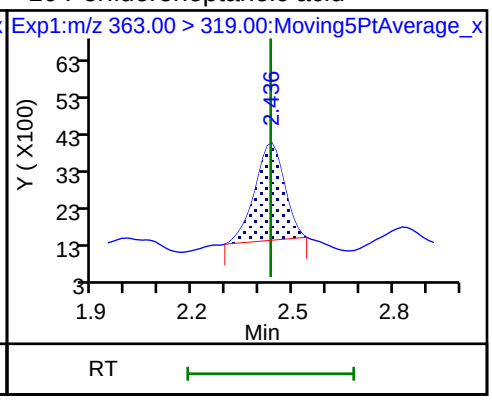
70 Perfluoropentanesulfonic acid (ND)



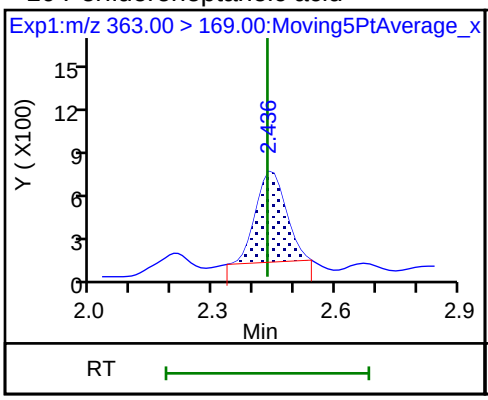
D 9 13C4-PFHpA



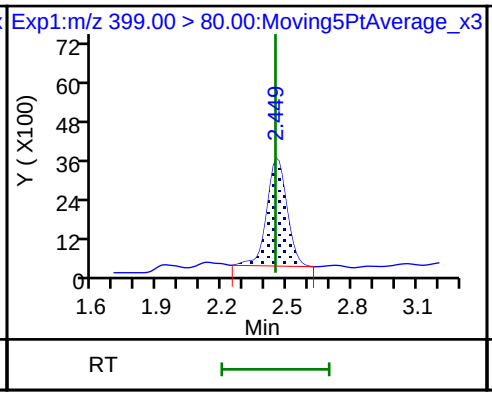
10 Perfluoroheptanoic acid



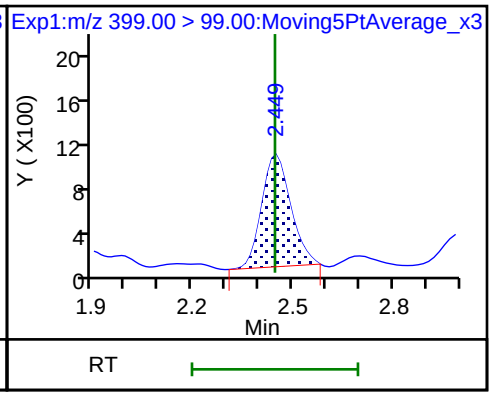
10 Perfluoroheptanoic acid



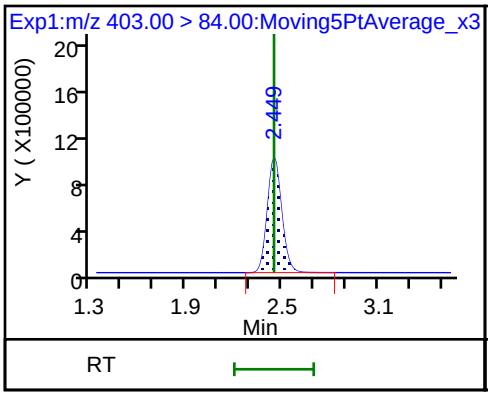
8 Perfluorohexanesulfonic acid



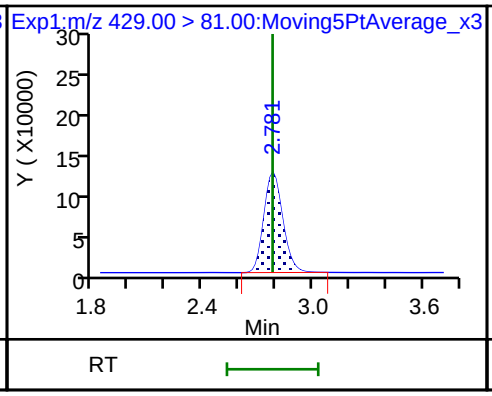
8 Perfluorohexanesulfonic acid



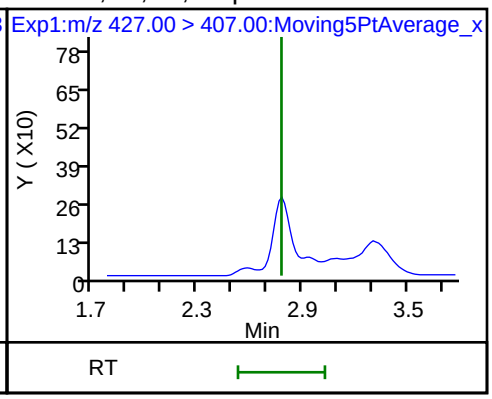
D 11 18O2 PFHxS



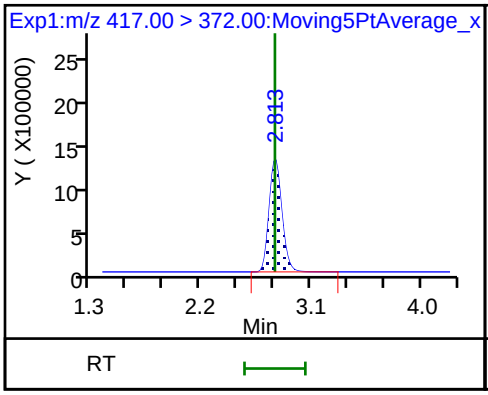
D 12 M2-6:2FTS



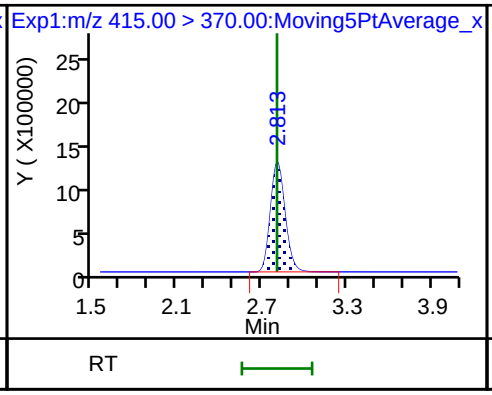
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



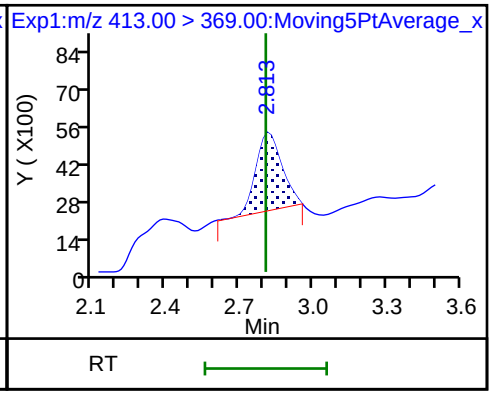
D 14 13C4 PFOA



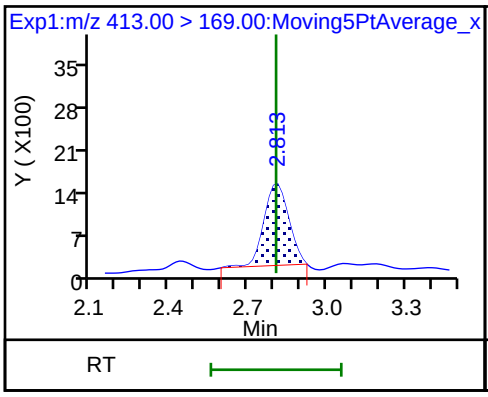
* 62 13C2-PFOA



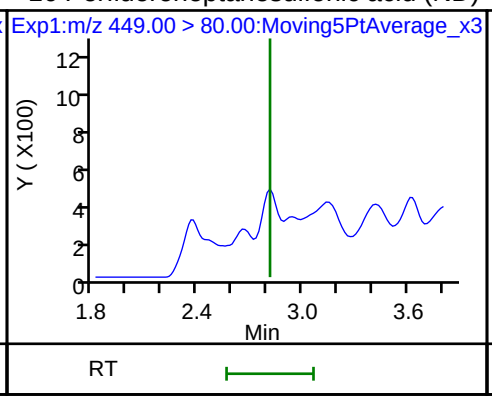
15 Perfluorooctanoic acid



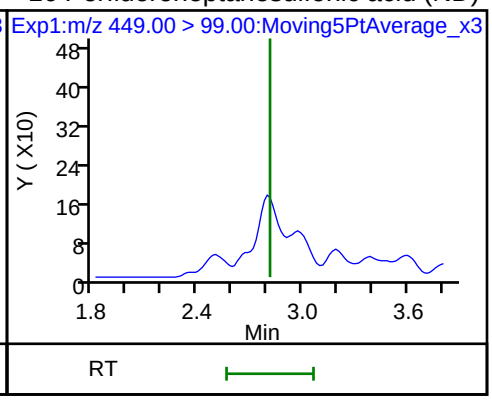
15 Perfluorooctanoic acid



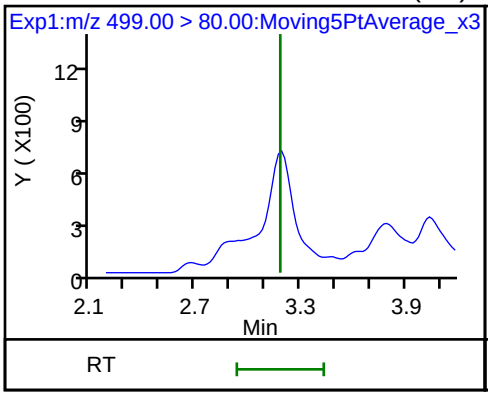
16 Perfluoroheptanesulfonic acid (ND)



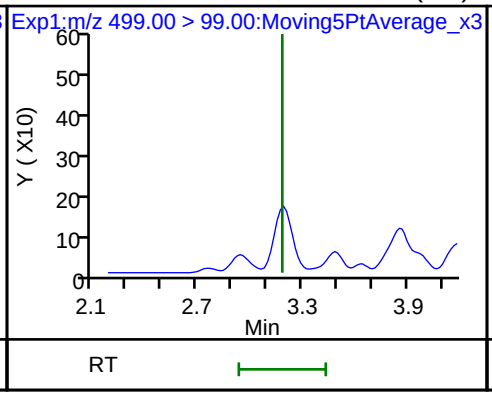
16 Perfluoroheptanesulfonic acid (ND)



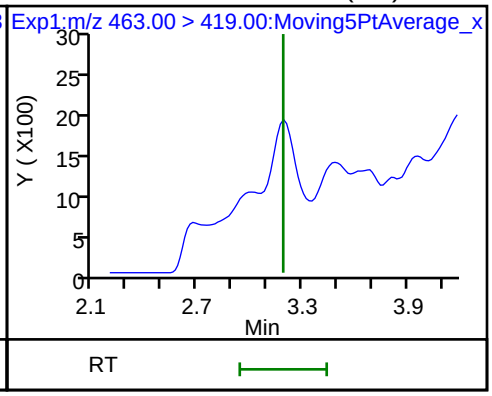
17 Perfluorooctane sulfonic acid (ND)



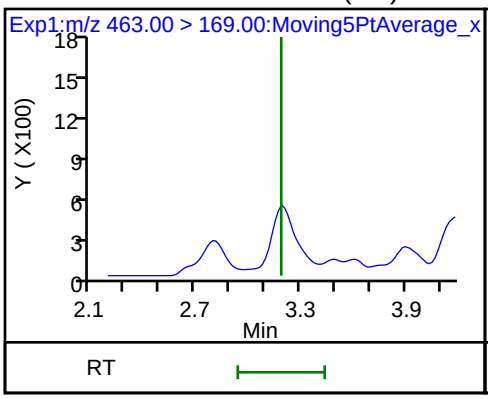
17 Perfluorooctane sulfonic acid (ND)



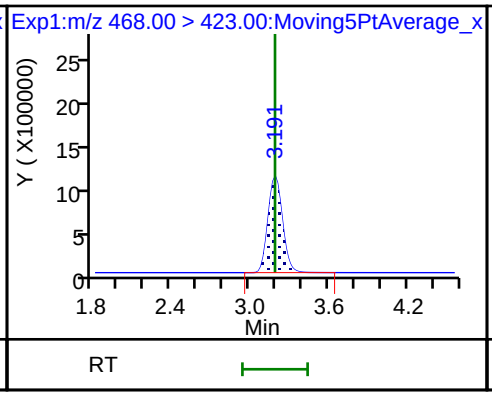
20 Perfluorononanoic acid (ND)



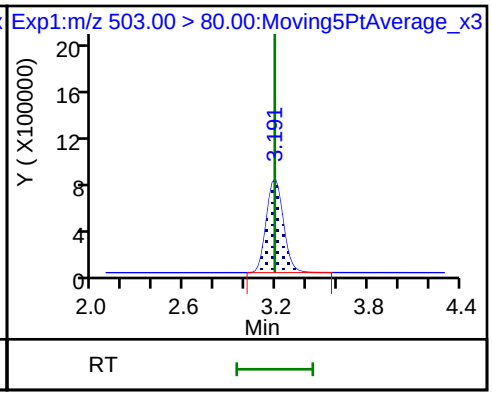
20 Perfluorononanoic acid (ND)



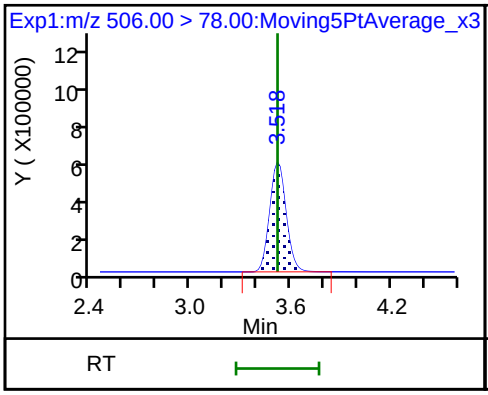
D 19 13C5 PFNA



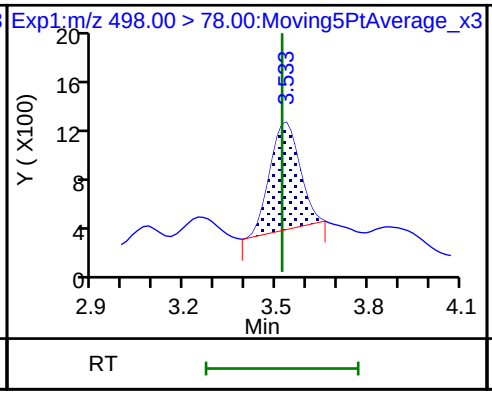
D 18 13C4 PFOS



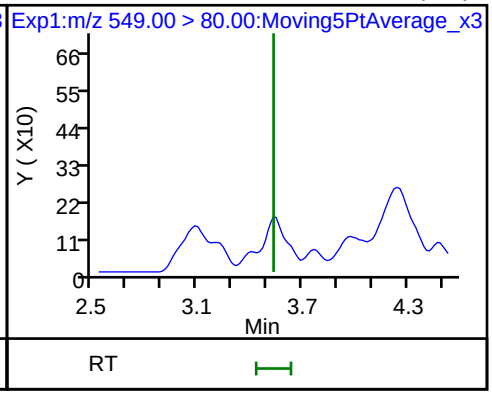
D 21 13C8 FOSA



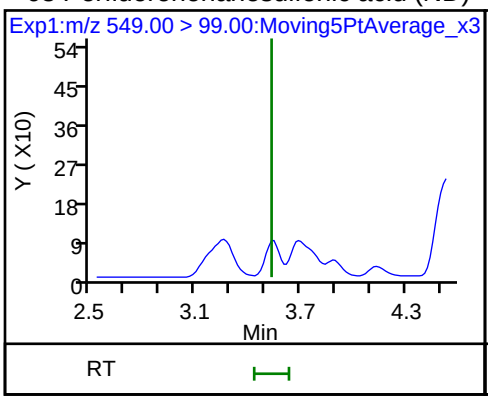
22 Perfluorooctane Sulfonamide



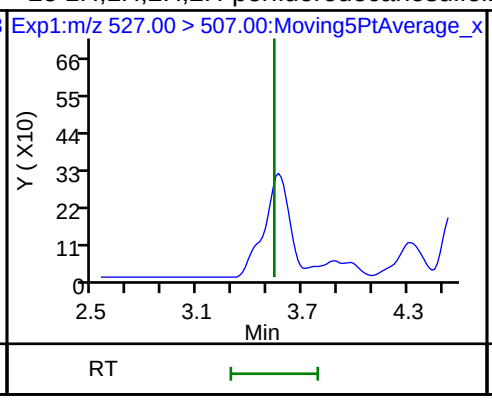
68 Perfluorononanesulfonic acid (ND)



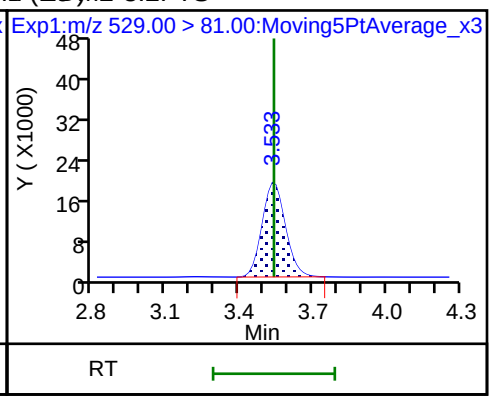
68 Perfluorononanesulfonic acid (ND)



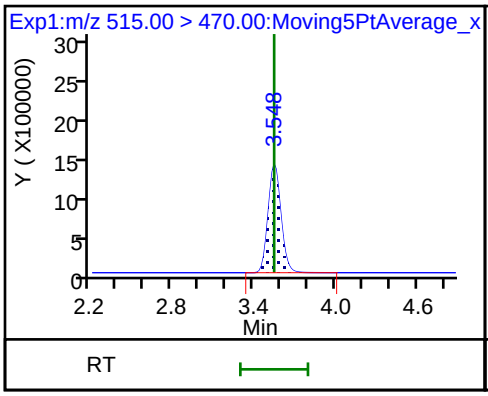
25 1H,1H,2H,2H-perfluorodecanesulfonic acid (ND)



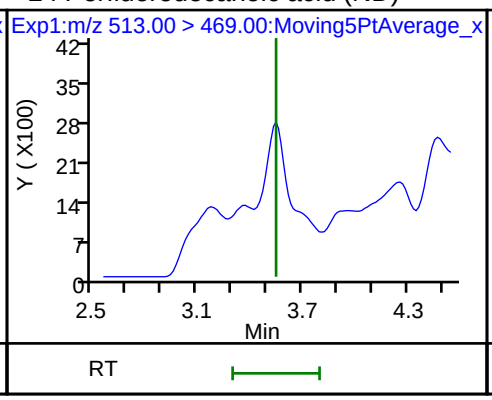
D 26 M2-8:2FTS



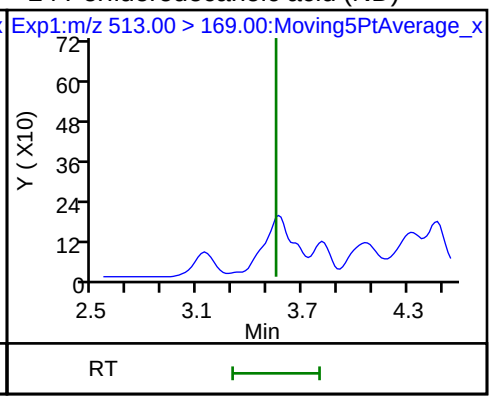
D 23 13C2 PFDA



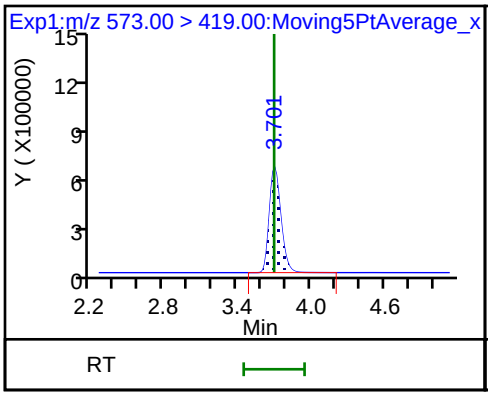
24 Perfluorodecanoic acid (ND)



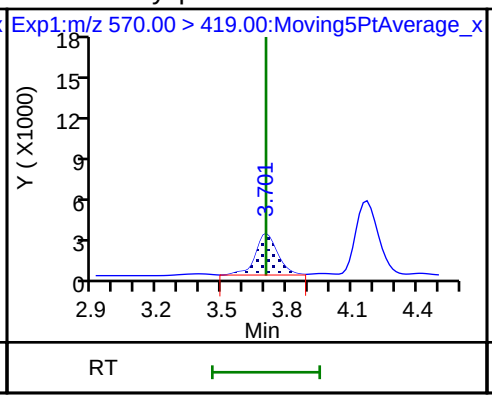
24 Perfluorodecanoic acid (ND)



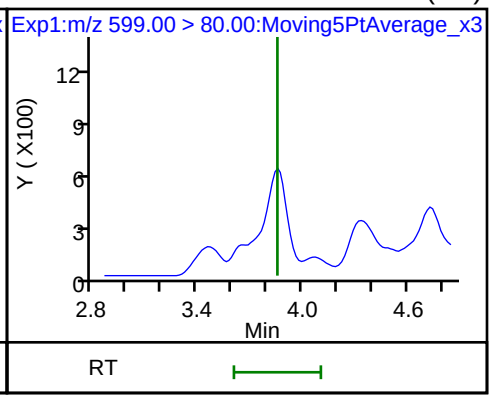
D 27 d3-NMeFOSAA



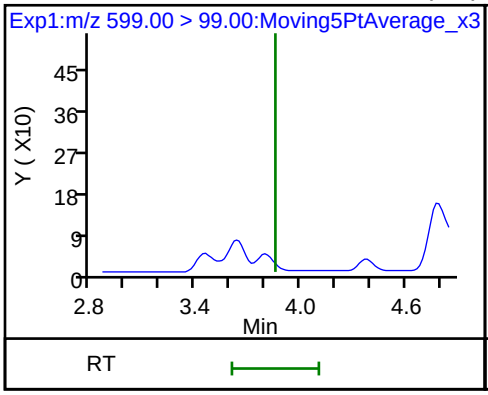
28 N-methyl perfluorooctane sulfonami



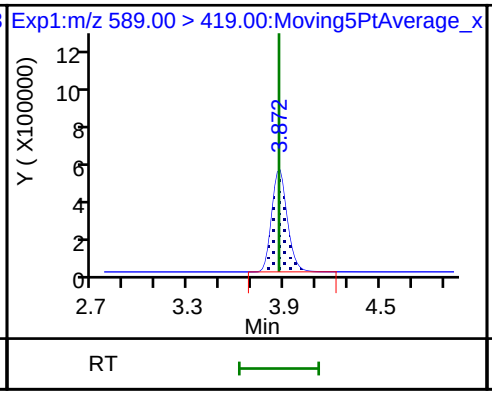
29 Perfluorodecane Sulfonic acid (ND)



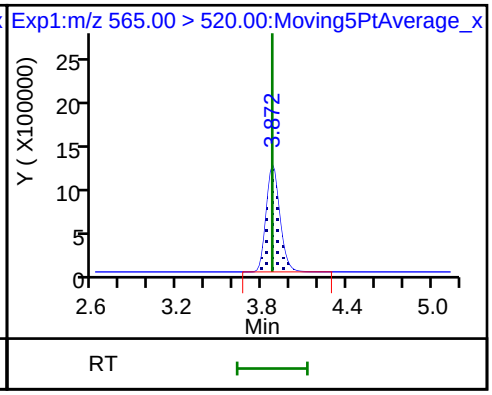
29 Perfluorodecane Sulfonic acid (ND)



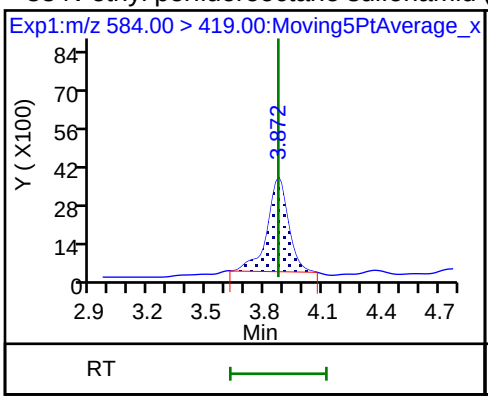
D 32 d5-NEtFOSAA



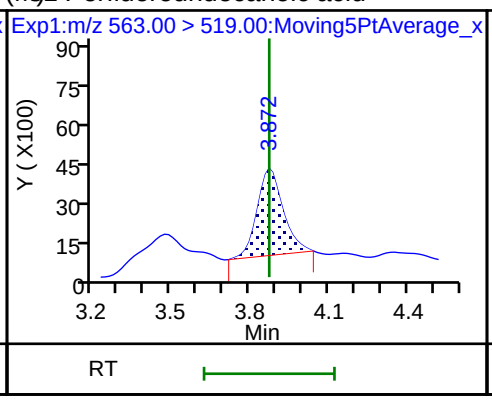
D 30 13C2 PFUnA



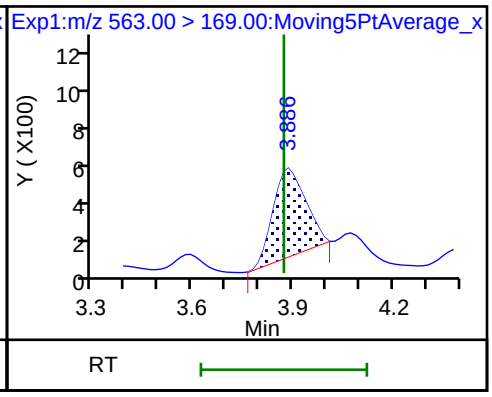
33 N-ethyl perfluorooctane sulfonamid (ND)



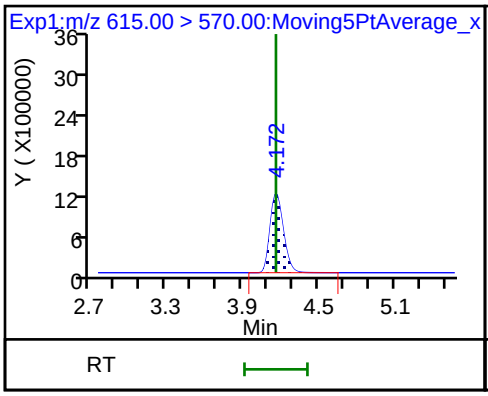
31 Perfluoroundecanoic acid



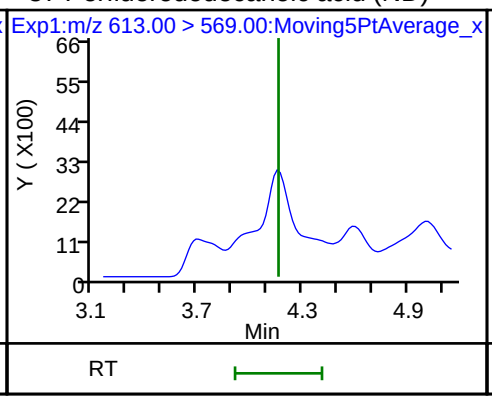
31 Perfluoroundecanoic acid



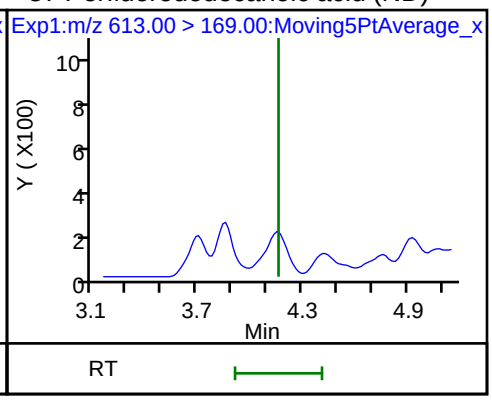
D 36 13C2 PFDoA



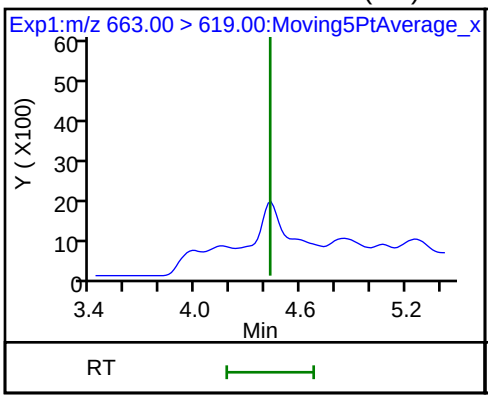
37 Perfluorododecanoic acid (ND)



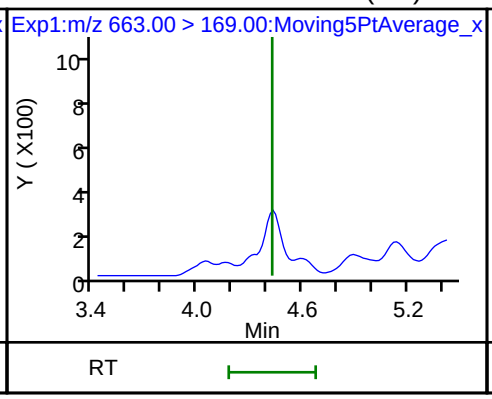
37 Perfluorododecanoic acid (ND)



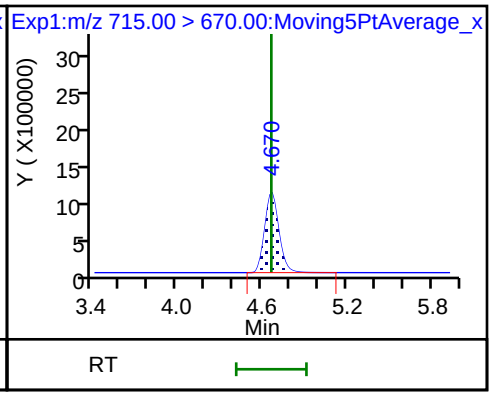
41 Perfluorotridecanoic acid (ND)



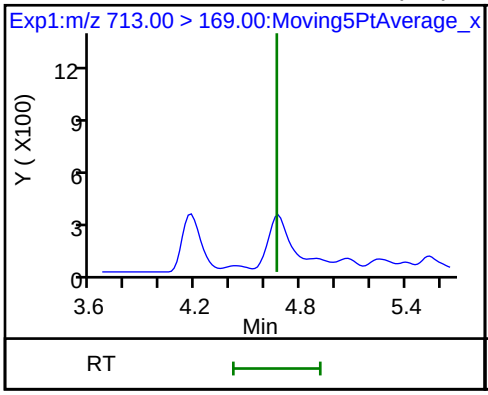
41 Perfluorotridecanoic acid (ND)



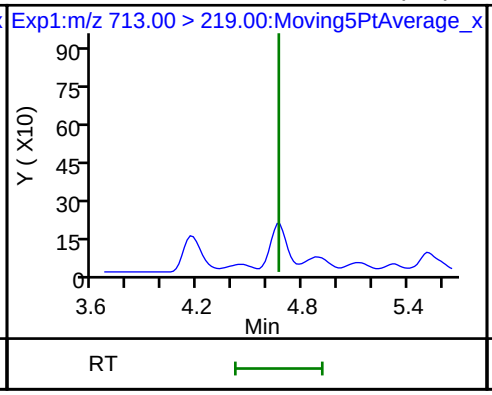
D 43 13C2-PFTeDA



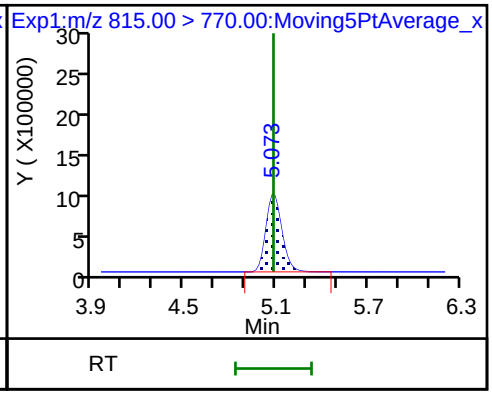
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: ICB 320-235668/9
Matrix: Solid
Lab File ID: 2018.07.23LLICAL_009.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/23/2018 17:05
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235668
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00755	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	96		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	100		50-150
STL00995	13C5 PFNA	100		50-150
STL00994	18O2 PFHxS	98		50-150
STL00991	13C4 PFOS	97		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 23-Jul-2018 17:05:54 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:48 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:28:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.540	5145109	2.44		97.5	81007	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.638	0.002	0.634	3717952	2.52		101	64007	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.670	0.005	0.647	86346	2.23		96.1	615	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.877	-0.001	0.725	626187	NC			6042	
D 7 13C2 PFHxA										
315.00 > 270.00	1.916	1.909	0.007	0.740	4230282	2.45		97.9	92704	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.007	0.007	0.778	214697	NC			7333	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.230	-0.001	0.861	4421489	2.48		99.3	83046	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.243	-0.002	0.994	19662	0.007552			46.6	
399.00 > 99.00	2.254	2.243	0.011	1.000	7162		2.75(1.50-4.49)		22.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.254	2.246	0.008	0.871	5277790	2.31		97.6	48716	
65 ADONA										
377.00 > 251.00	2.280	2.272	0.008	0.773	5598	NC			84.5	
377.00 > 85.00	2.280	2.272	0.008	0.773	2480		2.26(0.84-2.53)		14.1	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.559	0.005	0.991	1194990	2.40		101	16501	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.585	0.003	1.000	4367968	2.51		100	61577	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.585	0.003		4552759	2.50			54789	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.586	0.002	1.000	13835	0.006525			11.1	
413.00 > 169.00	2.588	2.586	0.002	1.000	6917		2.00(0.84-2.52)		38.9	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.949	-0.001	1.139	3673563	2.31		96.6	37919	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.950	-0.002	1.139	3746490	2.49		99.7	73288	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.950	-0.002	1.000	11444	0.006689			26.8	
463.00 > 169.00	2.954	2.950	0.004	1.002	2607		4.39(1.90-5.69)		97.1	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.161	0.003	1.073	5734	NC			54.5	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.296	-0.005	1.272	1425312	2.75		115	18720	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.291	3.297	-0.006	1.000	1982	0.002457			87.0	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.309	-0.002	1.278	3139942	2.63		105	35453	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.311	-0.004	1.278	5853837	2.51		100	43308	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.323	3.314	0.009	1.005	3457	0.001485			45.3	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.462	-0.004	1.336	913491	2.31		92.5	25050	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.635	-0.004	1.403	1073290	2.59		103	4762	
D 30 13C2 PFUnA										
565.00 > 520.00	3.631	3.638	-0.007	1.403	2415684	2.51		100	56729	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.640	3.638	0.002	1.003	10571	0.008816			37.3	M
563.00 > 169.00	3.640	3.638	0.002	1.003	2370		4.46(2.12-6.36)		30.9	M
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.640	3.639	0.001	1.003	4102	0.0102			47.3	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.800	-0.005	1.287	8408	NC			118	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.934	-0.003	1.519	2294139	2.51		100	17445	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.198	-0.005	1.067	3561	0.003694			1.3	
663.00 > 169.00	4.193	4.198	-0.005	1.067	1739		2.05(1.25-3.76)		20.1	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.435	-0.008	1.710	2211001	2.47		98.9	12431	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.840	-0.007	1.867	3242688	2.39		95.6	11215	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.840	-0.007	1.000	34086	NC			5.4	
813.00 > 169.00	4.833	4.840	-0.007	1.000	5784		5.89(2.86-8.58)		62.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.174	5.184	-0.010	1.070	8308	NC			1.8	
913.00 > 169.00	5.182	5.184	-0.002	1.072	967		8.59(3.83-11.48)		12.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:41:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_009.d

Injection Date: 23-Jul-2018 17:05:54 Instrument ID: A8_N

Lims ID: ICB

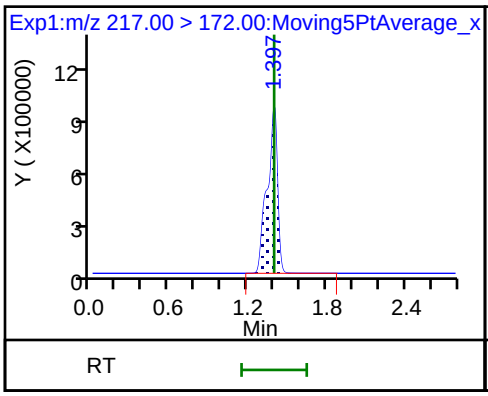
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9

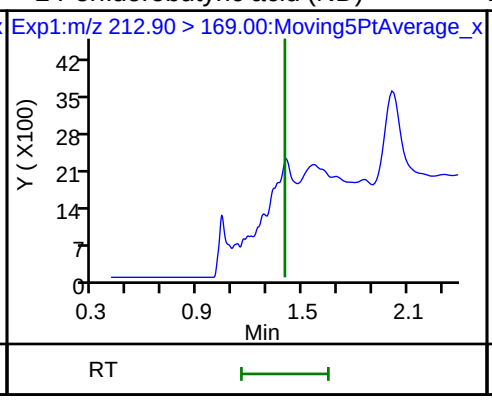
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

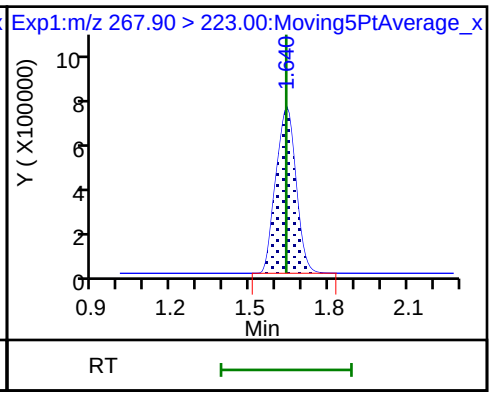
D 1 13C4 PFBA



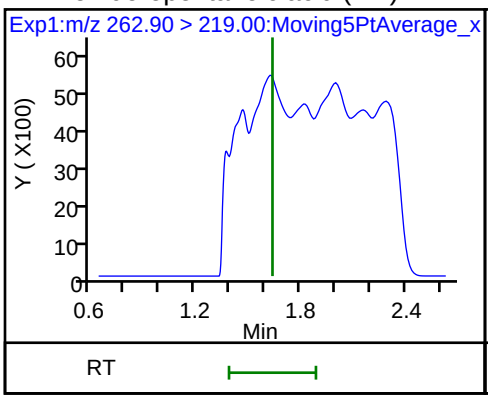
2 Perfluorobutyric acid (ND)



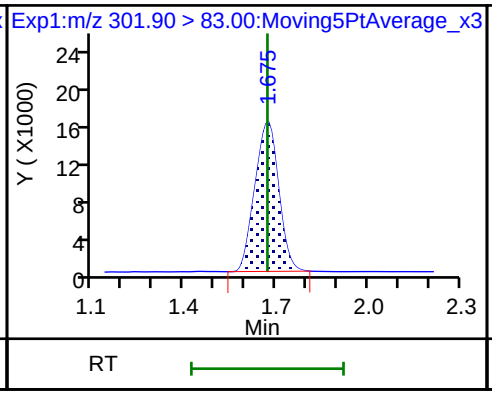
D 3 13C5-PFPeA



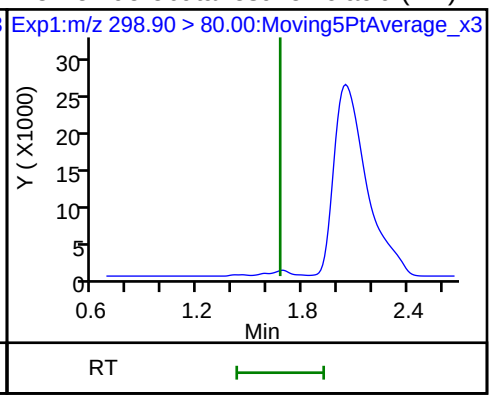
4 Perfluoropentanoic acid (ND)



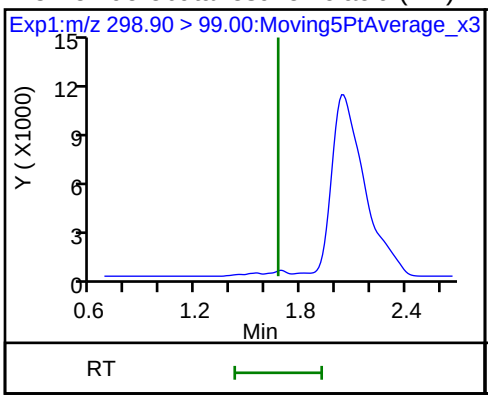
D 47 13C3-PFBS



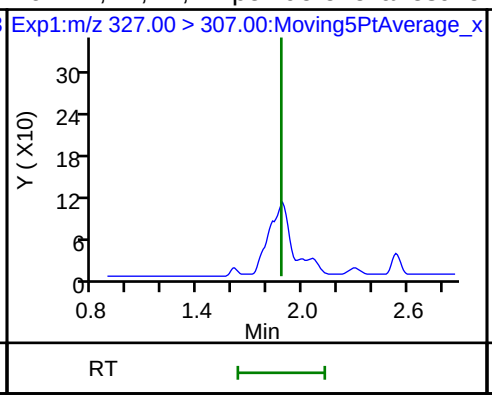
5 Perfluorobutanesulfonic acid (ND)



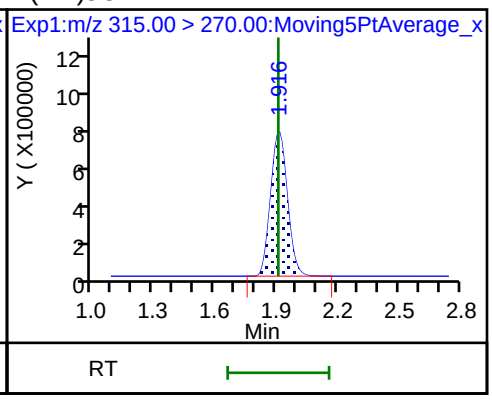
5 Perfluorobutanesulfonic acid (ND)



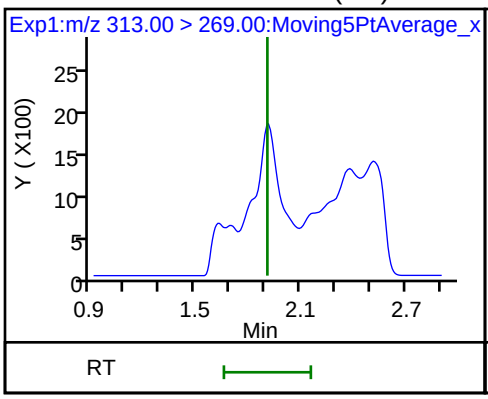
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



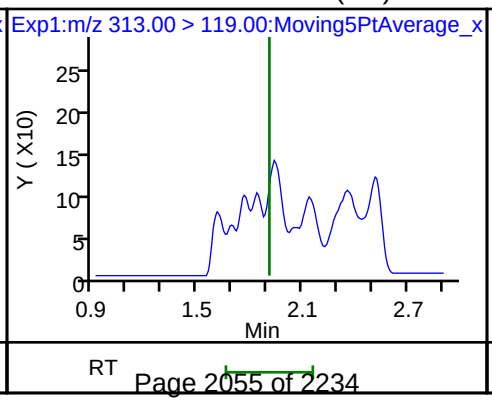
D 70 13C2 PFHxA



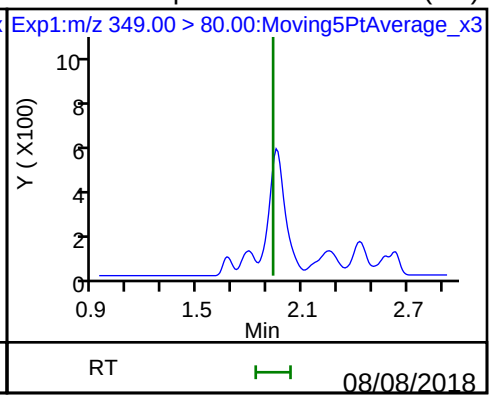
6 Perfluorohexanoic acid (ND)



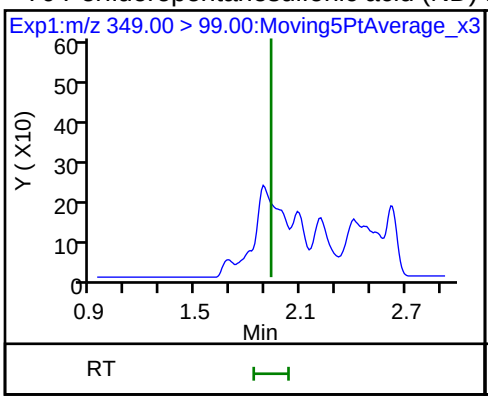
6 Perfluorohexanoic acid (ND)



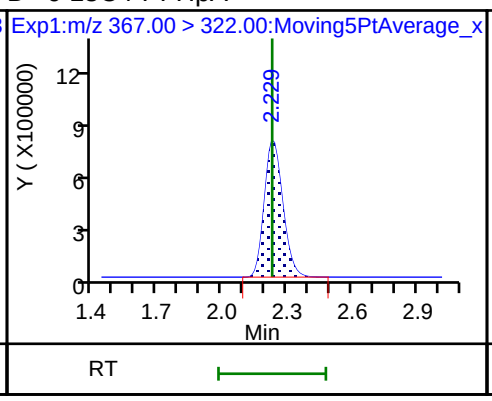
70 Perfluoropentanesulfonic acid (ND)



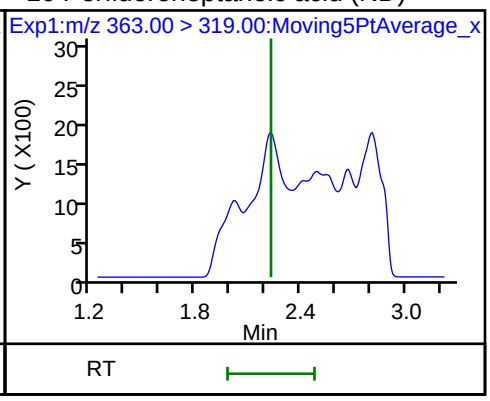
70 Perfluoropentanesulfonic acid (ND)



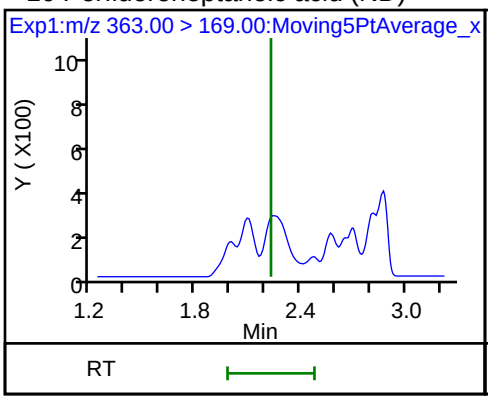
D 9 13C4-PFHpA



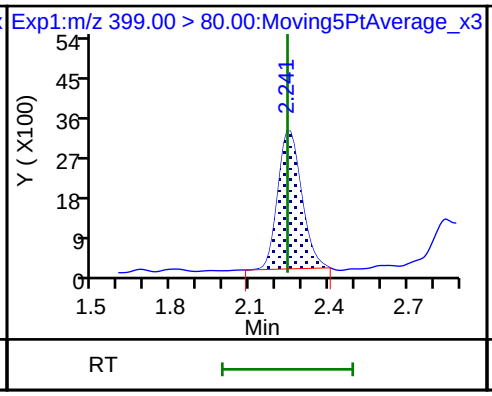
10 Perfluoroheptanoic acid (ND)



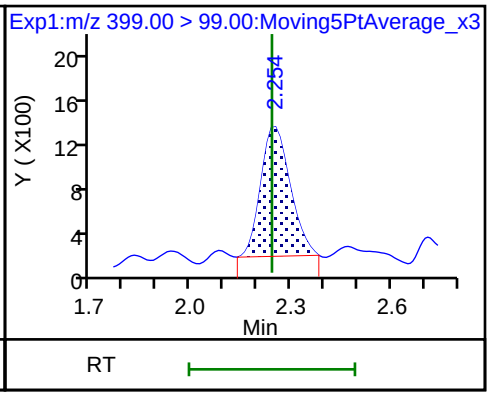
10 Perfluoroheptanoic acid (ND)



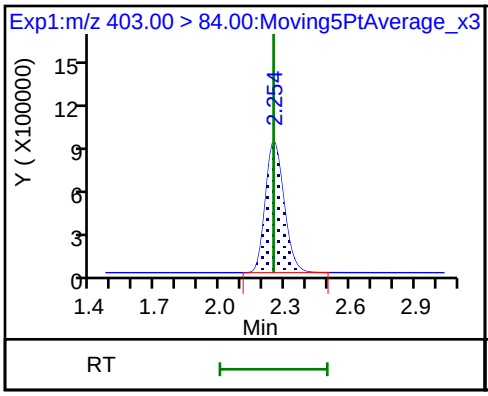
8 Perfluorohexanesulfonic acid



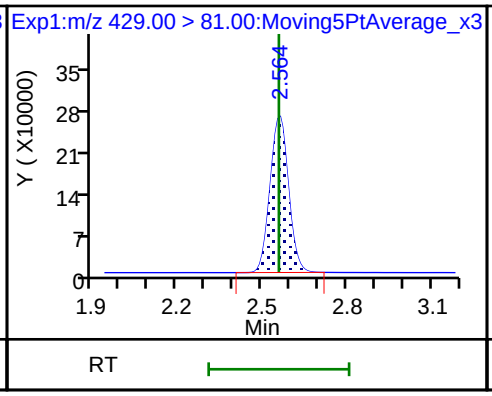
8 Perfluorohexanesulfonic acid



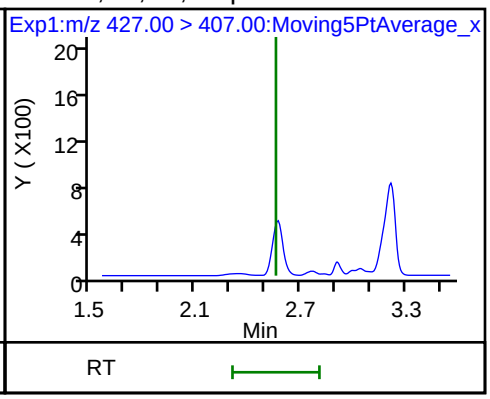
D 11 18O2 PFHxS



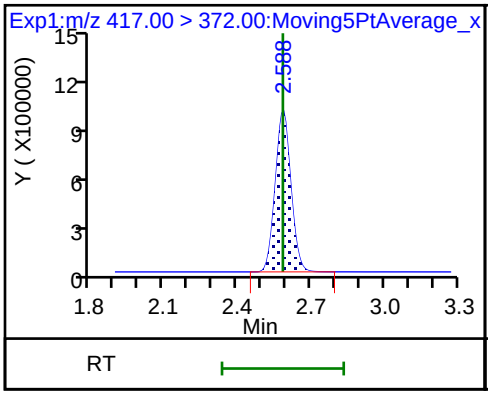
D 12 M2-6:2FTS



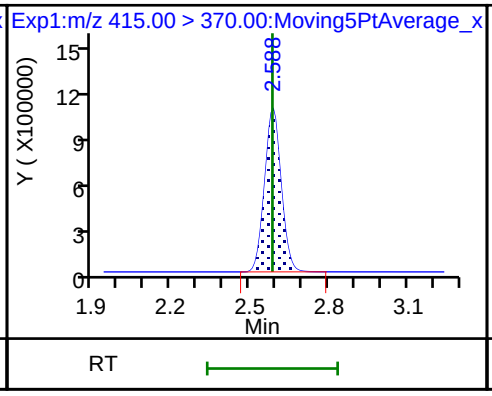
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



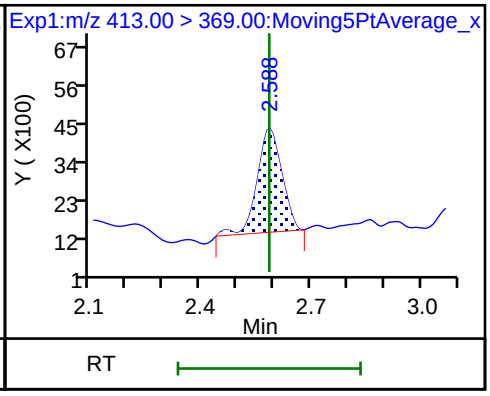
D 14 13C4 PFOA



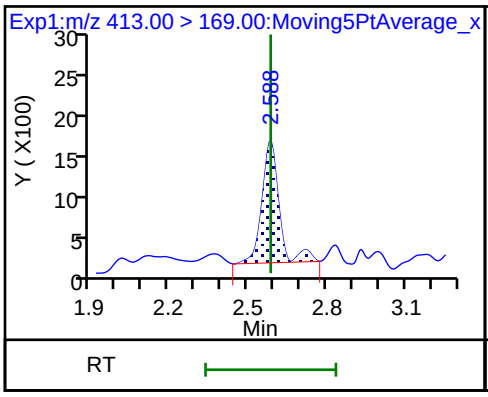
* 62 13C2-PFOA



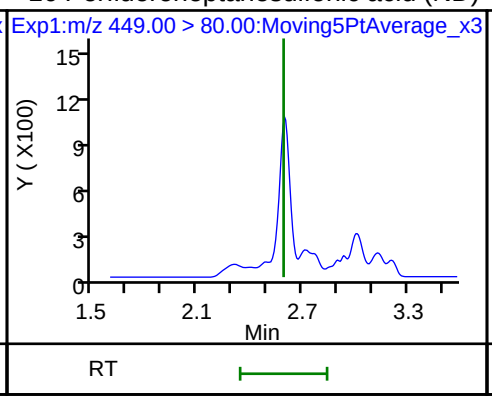
15 Perfluorooctanoic acid



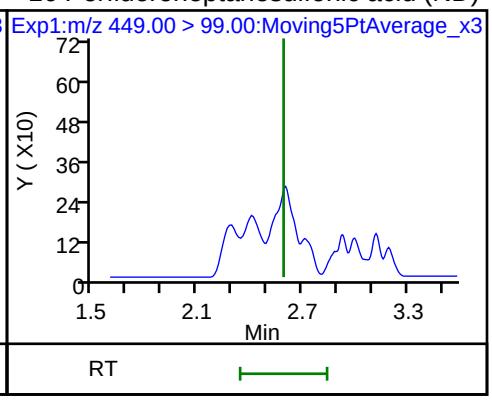
15 Perfluorooctanoic acid



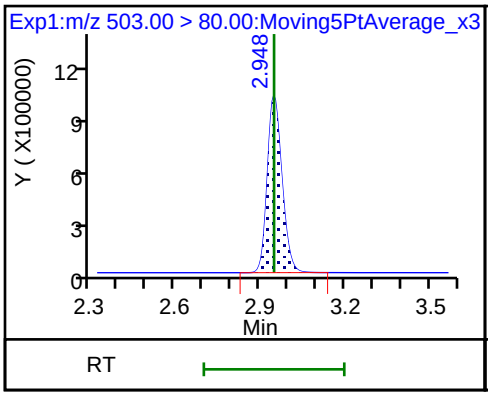
16 Perfluoroheptanesulfonic acid (ND)



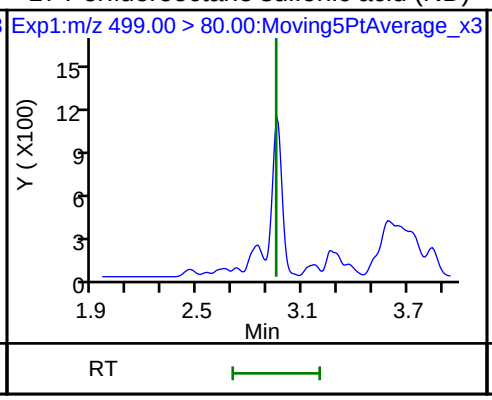
16 Perfluoroheptanesulfonic acid (ND)



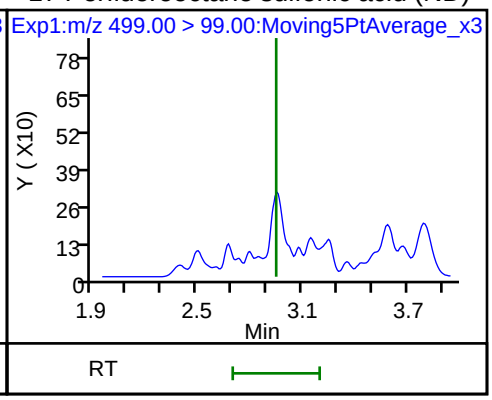
D 18 13C4 PFOS



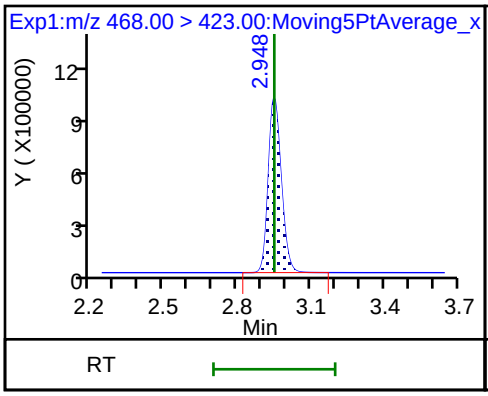
17 Perfluorooctane sulfonic acid (ND)



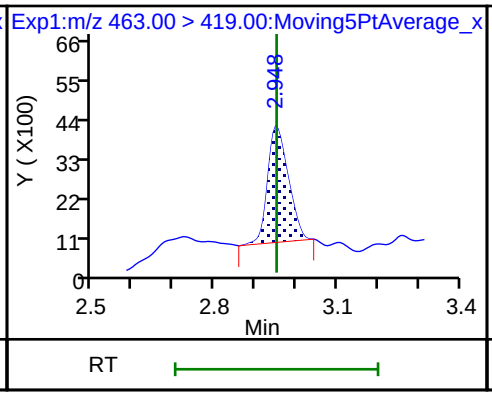
17 Perfluorooctane sulfonic acid (ND)



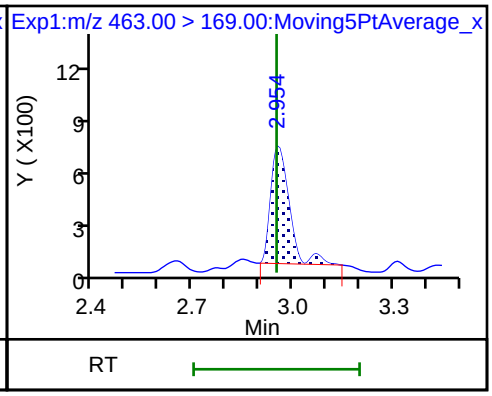
D 19 13C5 PFNA



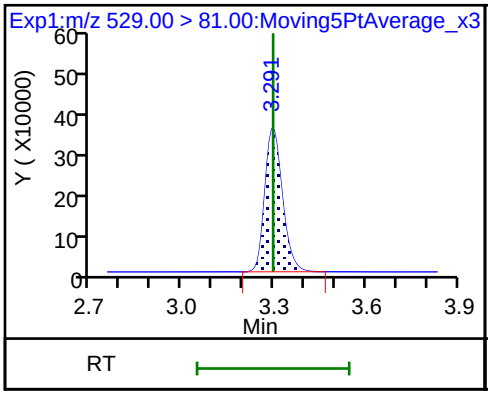
20 Perfluorononanoic acid



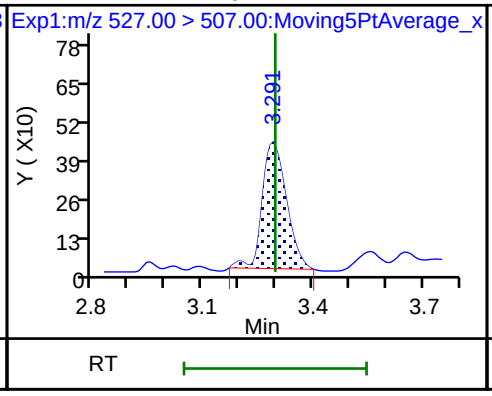
20 Perfluorononanoic acid



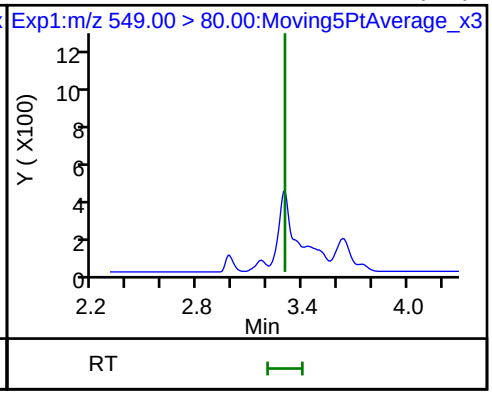
D 26 M2-8:2FTS



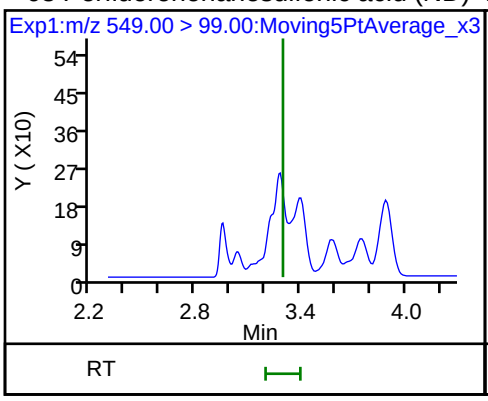
25 1H,1H,2H,2H-perfluorodecanesulfoni



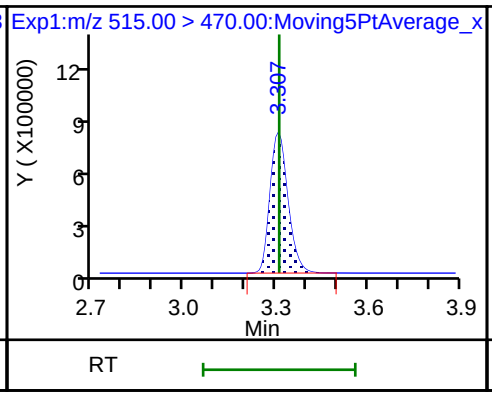
68 Perfluorononanesulfonic acid (ND)



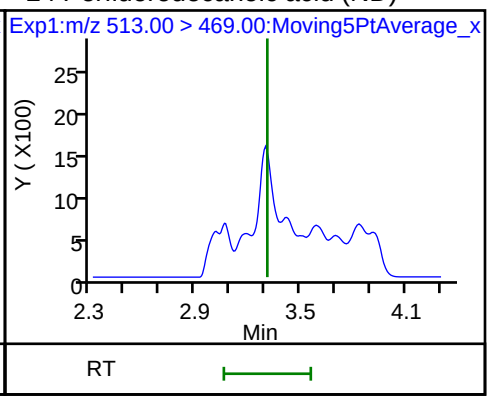
68 Perfluorononanesulfonic acid (ND)



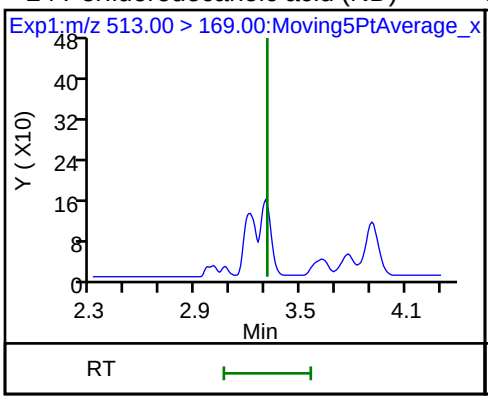
D 23 13C2 PFDA



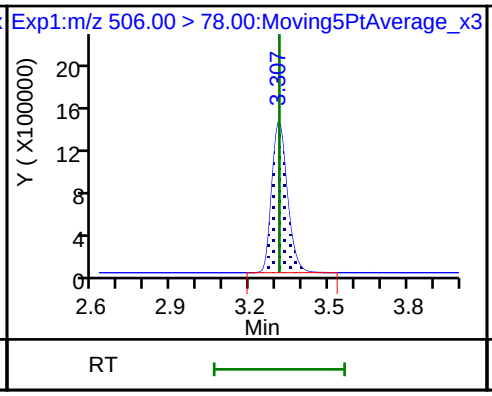
24 Perfluorodecanoic acid (ND)



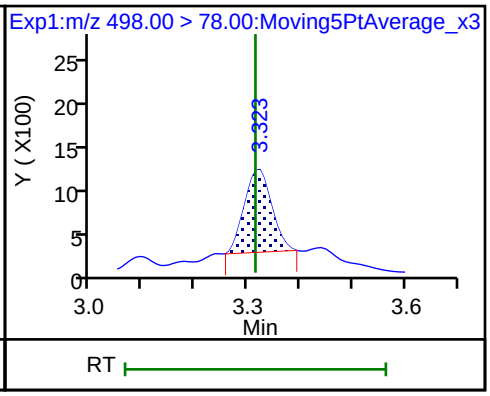
24 Perfluorodecanoic acid (ND)



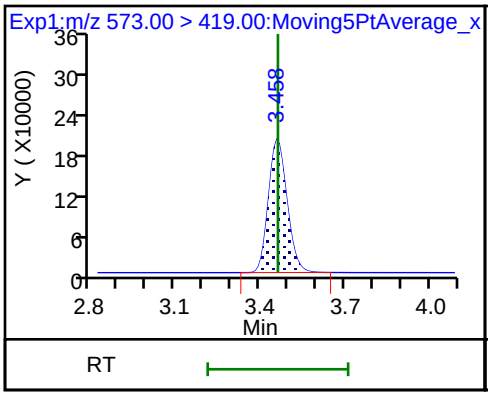
D 21 13C8 FOSA



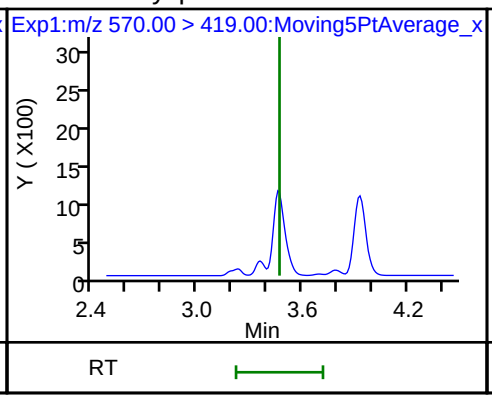
22 Perfluorooctane Sulfonamide



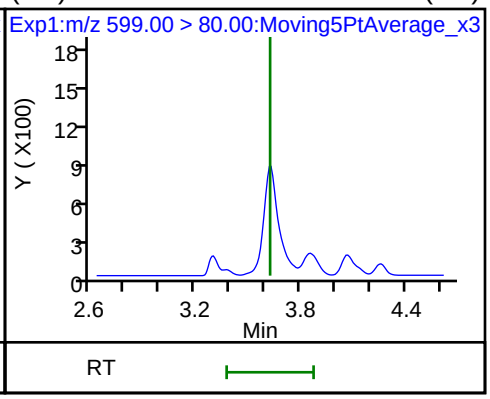
D 27 d3-NMeFOSAA



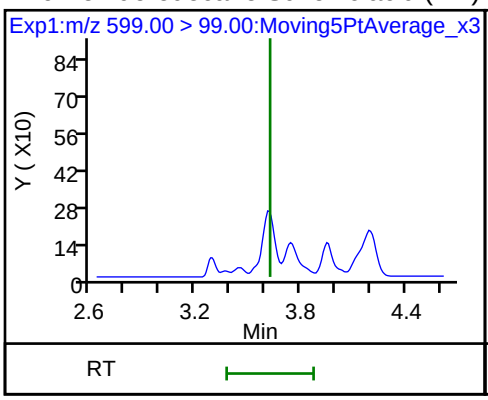
28 N-methyl perfluorooctane sulfonami (ND)



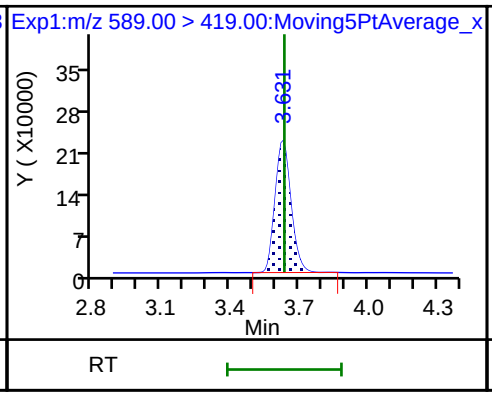
29 Perfluorodecane Sulfonic acid (ND)



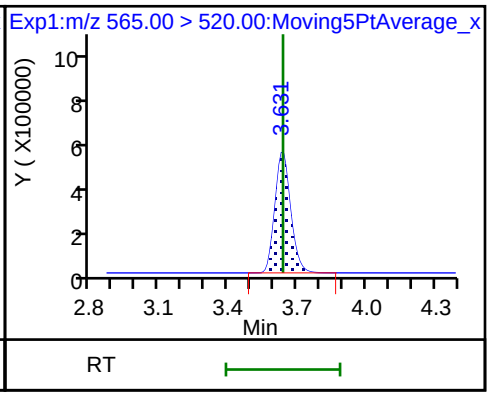
29 Perfluorodecane Sulfonic acid (ND)



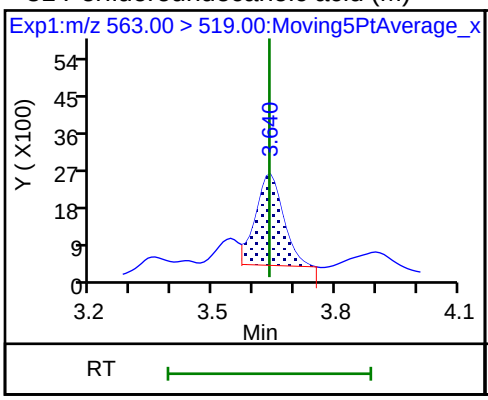
D 32 d5-NEtFOSAA



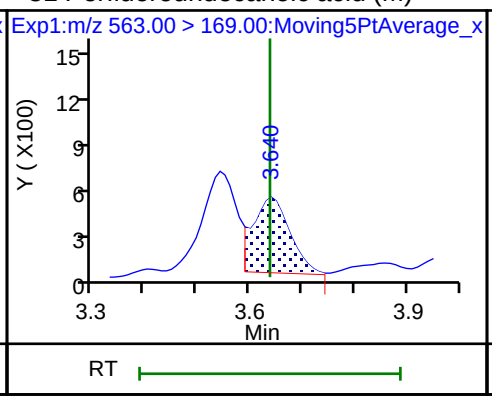
D 30 13C2 PFUnA



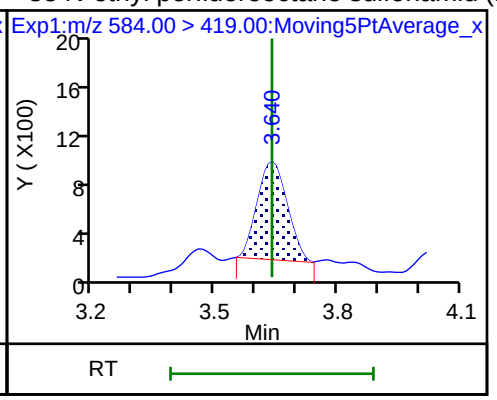
31 Perfluoroundecanoic acid (M)



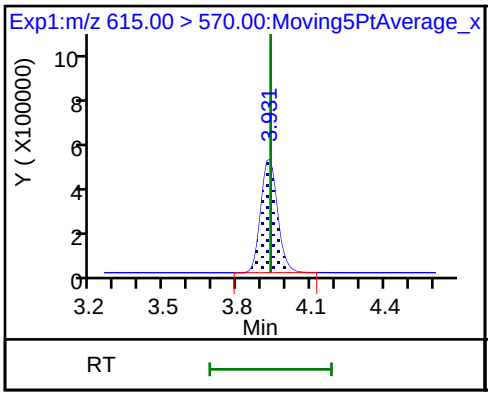
31 Perfluoroundecanoic acid (M)



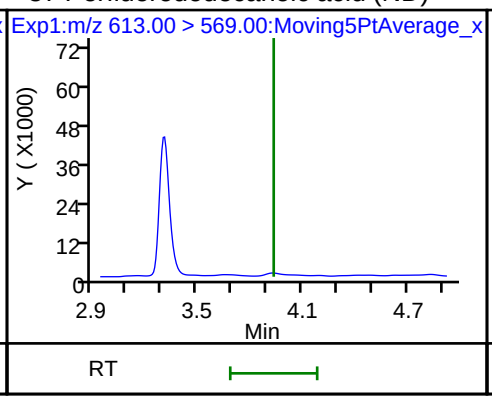
33 N-ethyl perfluorooctane sulfonamid (M)



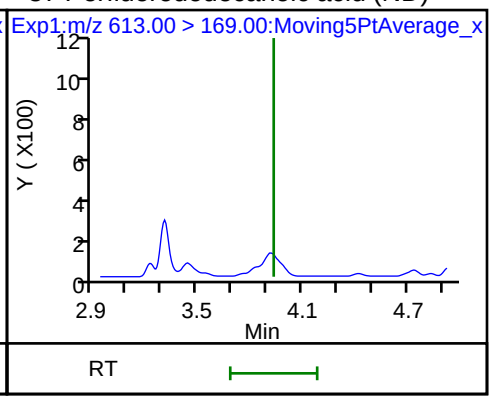
D 36 13C2 PFDoA



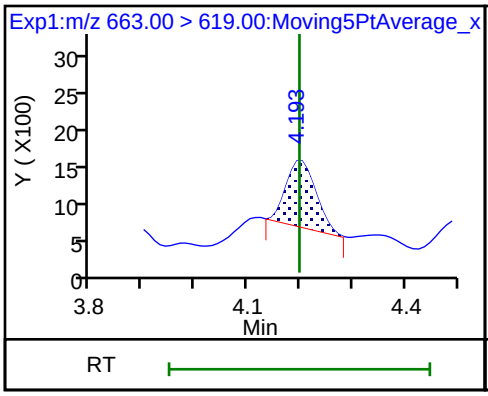
37 Perfluorododecanoic acid (ND)



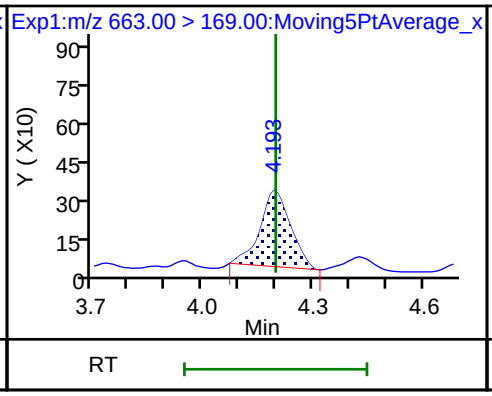
37 Perfluorododecanoic acid (ND)



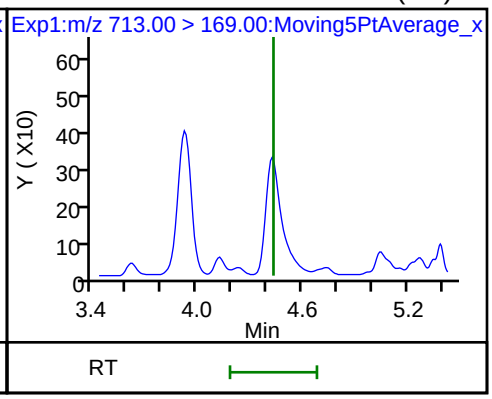
41 Perfluorotridecanoic acid



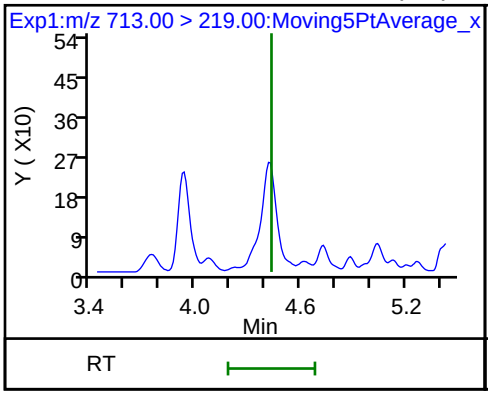
41 Perfluorotridecanoic acid



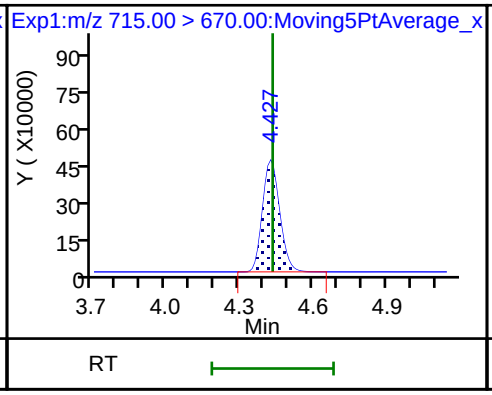
42 Perfluorotetradecanoic acid (ND)



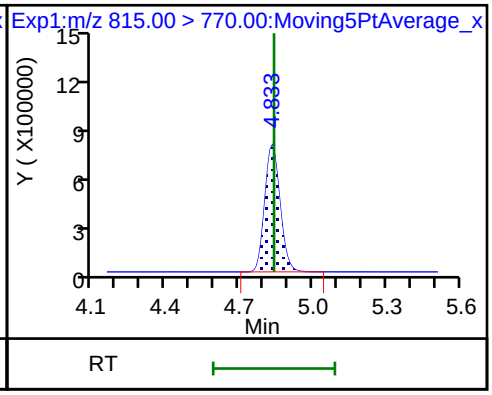
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: ICB 320-236979/9
Matrix: Solid
Lab File ID: 2018.07.30LLICA_009.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/30/2018 16:08
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236979
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U M	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00866	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	100		50-150
STL01892	13C4-PFHpA	102		50-150
STL00990	13C4 PFOA	103		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	95		50-150
STL00991	13C4 PFOS	99		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 30-Jul-2018 16:08:36 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:40:59 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 30-Jul-2018 16:40:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.436	1.412	0.024	0.541	4622700	2.44		97.5	62952	
D 3 13C5-PFPeA										
267.90 > 223.00	1.684	1.658	0.026	0.635	2985319	2.45		97.9	34410	
D 47 13C3-PFBS										
301.90 > 83.00	1.720	1.693	0.027	0.648	84072	2.32		99.9	312	
D 60 M2-4:2FTS										
329.00 > 81.00	1.938	1.905	0.033	0.731	530060	NC			3841	
D 7 13C2 PFHxA										
315.00 > 270.00	1.971	1.942	0.029	0.743	3366228	2.43		97.2	72748	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.072	2.040	0.032	0.781	225101	NC			7783	
D 9 13C4-PFHpA										
367.00 > 322.00	2.294	2.267	0.027	0.865	3348301	2.54		102	42319	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.320	2.284	0.036	1.006	19141	0.008659			68.2	
399.00 > 99.00	2.320	2.284	0.036	1.006	7306		2.62(1.50-4.49)		8.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.307	2.288	0.019	0.870	4499011	2.25		95.0	38825	
D 12 M2-6:2FTS										
429.00 > 81.00	2.629	2.603	0.026	0.991	982325	2.38		100	9895	
* 62 13C2-PFOA										
415.00 > 370.00	2.653	2.631	0.022		3502239	2.50			42746	
D 14 13C4 PFOA										
417.00 > 372.00	2.653	2.631	0.022	1.000	3474560	2.58		103	54008	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.653	2.631	0.022	1.000	9006	0.005558			5.2	
413.00 > 169.00	2.631	2.631	0.0	0.992	0		0.00(0.84-2.52)			

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	3.023	3.000	0.023	1.139	3399712	2.36		98.9	23763	
D 19 13C5 PFNA										
468.00 > 423.00	3.023	3.000	0.023	1.139	3036839	2.55		102	64204	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.246	3.212	0.034	1.074	6660	NC			49.3	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.377	3.347	0.030	1.117	3447	0.003095			49.9	
549.00 > 99.00	3.377	3.347	0.030	1.117	1366		2.52(1.33-3.97)		7.3	
D 26 M2-8:2FTS										
529.00 > 81.00	3.377	3.350	0.027	1.273	1201339	2.53		106	10268	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.377	3.350	0.027	1.000	824	0.001237			53.0	
D 21 13C8 FOSA										
506.00 > 78.00	3.387	3.356	0.031	1.276	4999255	2.44		97.5	38151	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.387	3.357	0.030	1.000	3970	0.002005			29.7	
D 23 13C2 PFDA										
515.00 > 470.00	3.387	3.361	0.026	1.276	2509151	2.55		102	61823	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.536	3.515	0.021	1.333	578488	2.60		104	15604	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.706	3.683	0.023	1.397	609788	2.50		100	9654	
D 30 13C2 PFUnA										
565.00 > 520.00	3.706	3.687	0.019	1.397	1931479	2.53		101	44046	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.874	3.848	0.026	1.282	6281	NC			85.2	
D 36 13C2 PFDoA										
615.00 > 570.00	4.007	3.983	0.024	1.510	1715544	2.21		88.4	27705	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.500	4.481	0.019	1.696	1646922	2.33		93.1	11569	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.903	4.888	0.015	1.000	26408	NC			4.9	
813.00 > 169.00	4.903	4.888	0.015	1.000	5292		4.99(2.86-8.58)		53.6	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.903	4.888	0.015	1.848	2929370	2.34		93.6	6121	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.246	5.229	0.017	1.070	8071	NC			2.2	
913.00 > 169.00	5.246	5.229	0.017	1.070	1037		7.78(3.83-11.48)		8.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 16:41:09 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_009.d

Injection Date: 30-Jul-2018 16:08:36 Instrument ID: A8_N

Lims ID: ICB

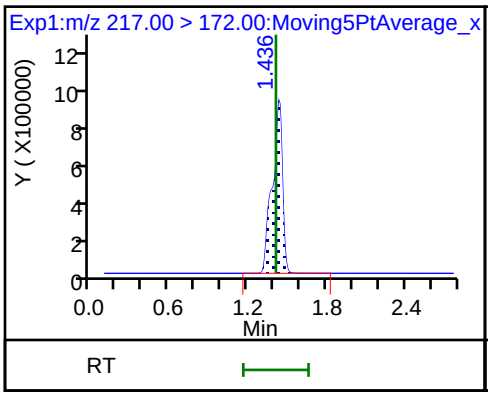
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 9

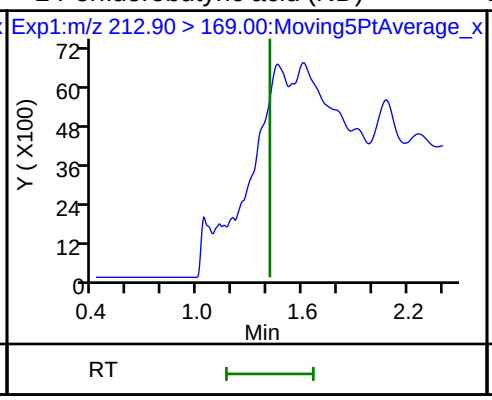
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

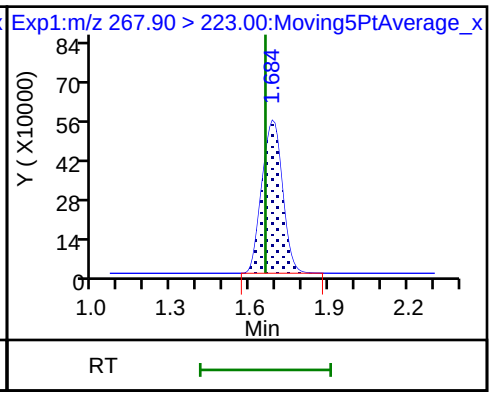
D 1 13C4 PFBA



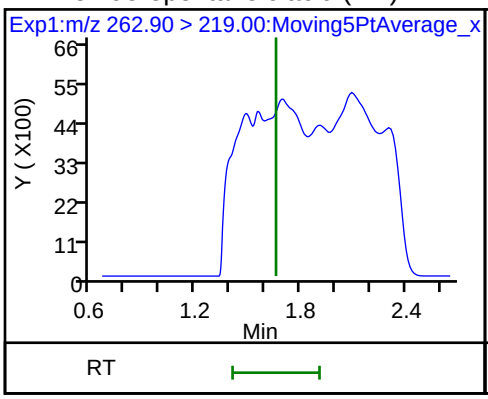
2 Perfluorobutyric acid (ND)



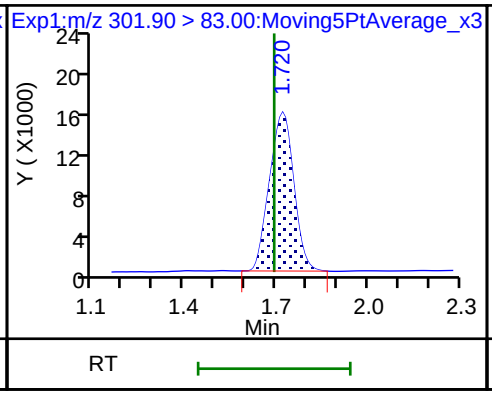
D 3 13C5-PFPeA



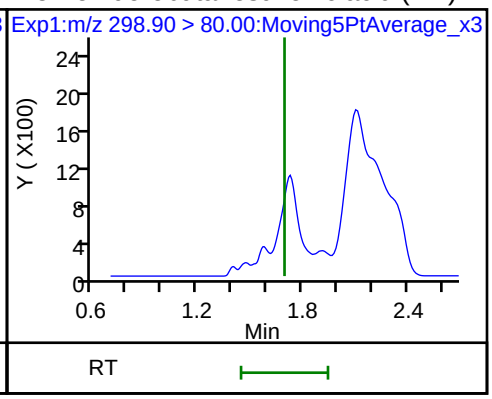
4 Perfluoropentanoic acid (ND)



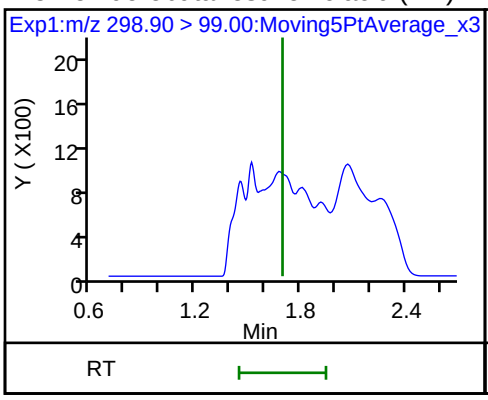
D 47 13C3-PFBS



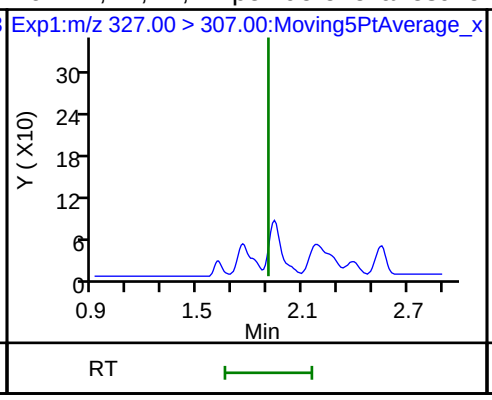
5 Perfluorobutanesulfonic acid (ND)



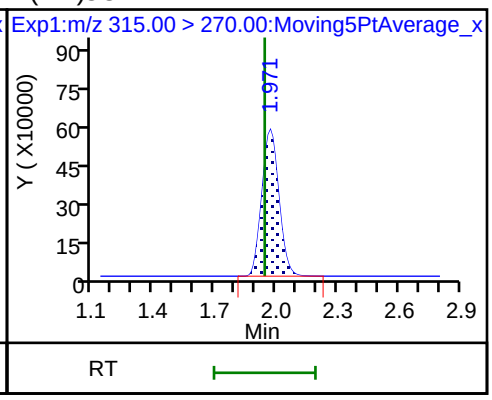
5 Perfluorobutanesulfonic acid (ND)



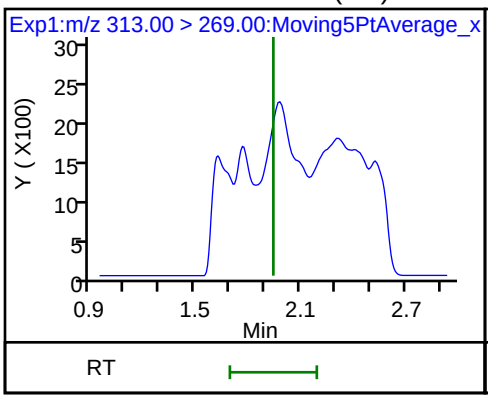
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



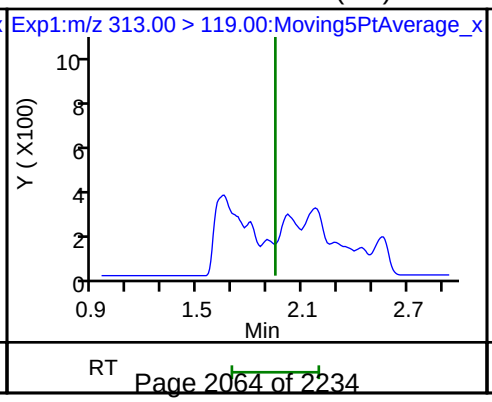
D 70 13C2 PFHxA



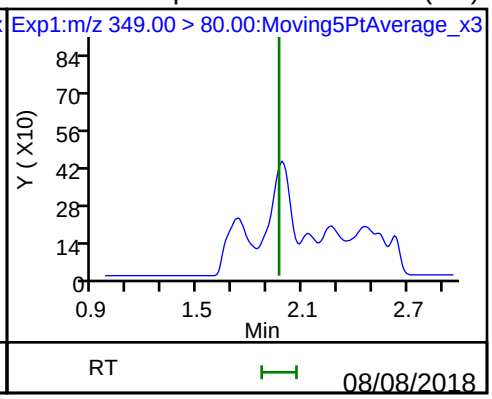
6 Perfluorohexanoic acid (ND)



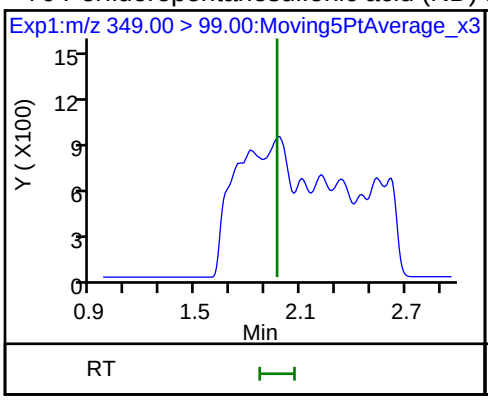
6 Perfluorohexanoic acid (ND)



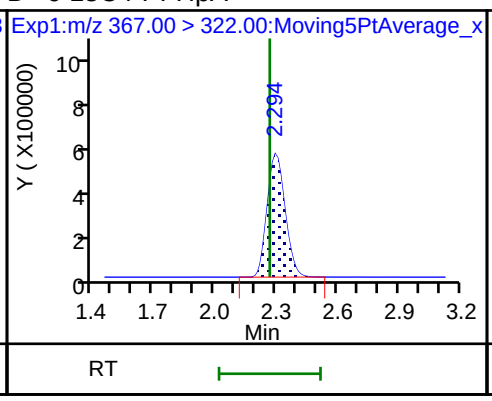
70 Perfluoropentanesulfonic acid (ND)



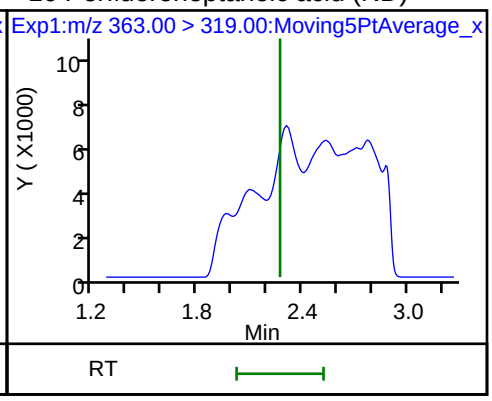
70 Perfluoropentanesulfonic acid (ND)



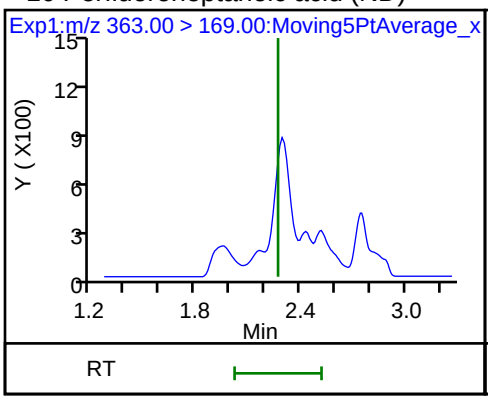
D 9 13C4-PFHpA



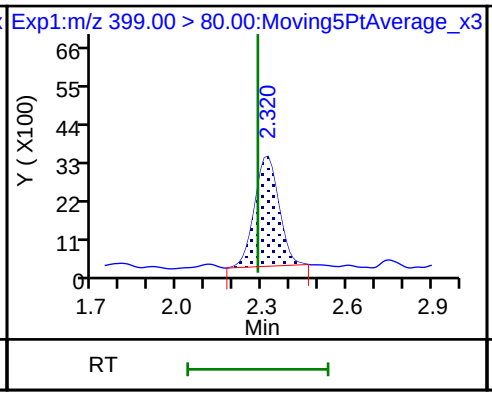
10 Perfluoroheptanoic acid (ND)



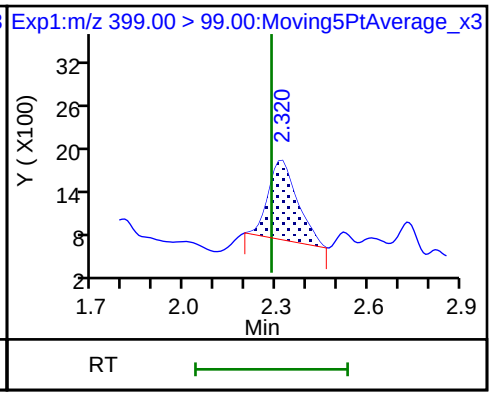
10 Perfluoroheptanoic acid (ND)



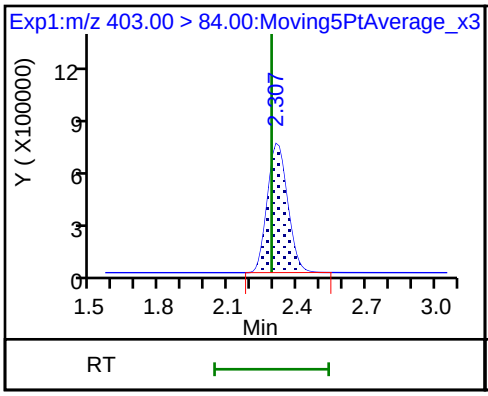
8 Perfluorohexanesulfonic acid



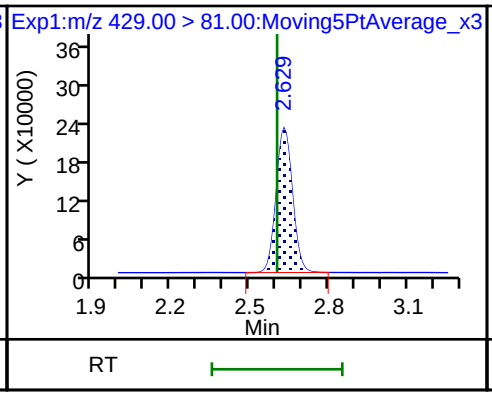
8 Perfluorohexanesulfonic acid



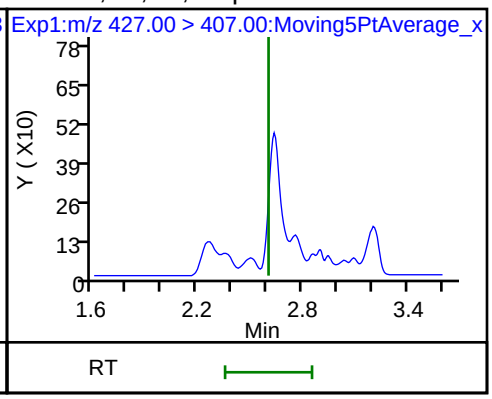
D 11 18O2 PFHxS



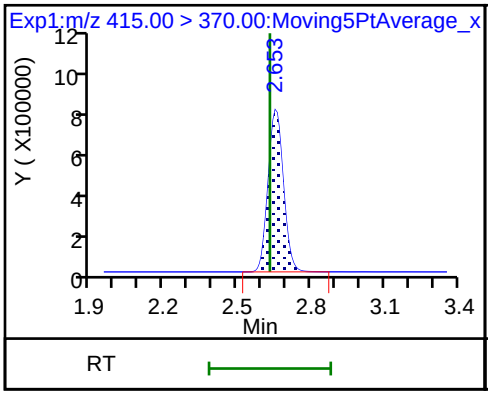
D 12 M2-6:2FTS



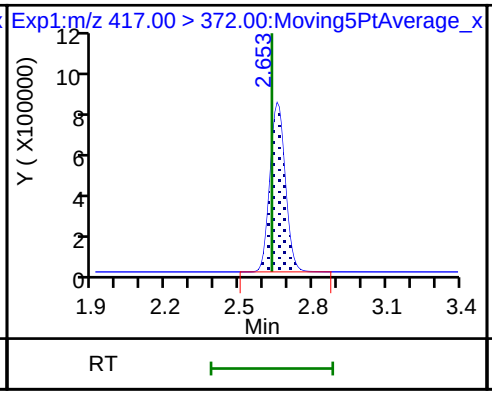
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



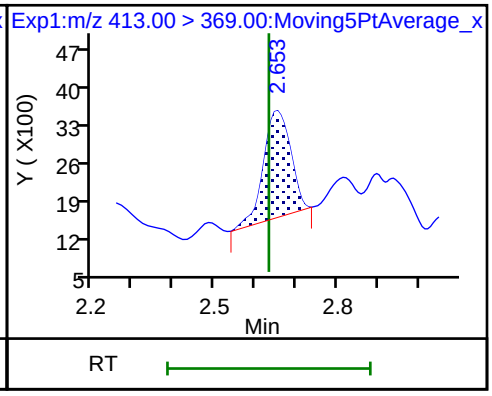
* 62 13C2-PFOA



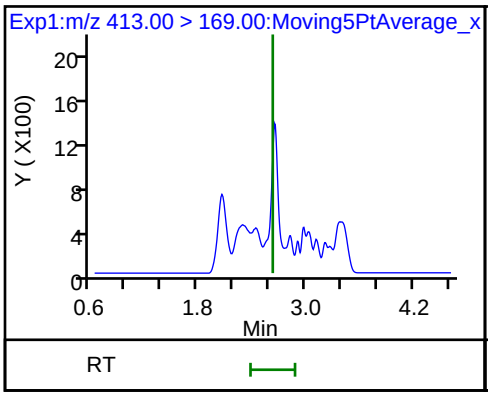
D 14 13C4 PFOA



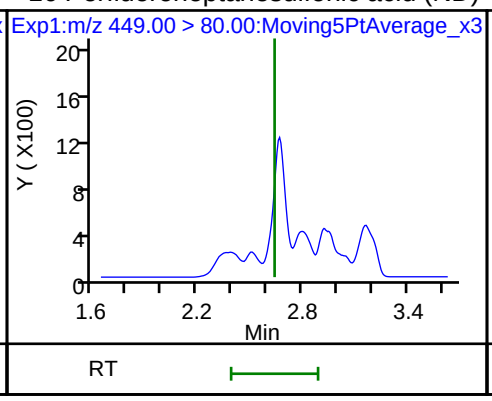
15 Perfluorooctanoic acid



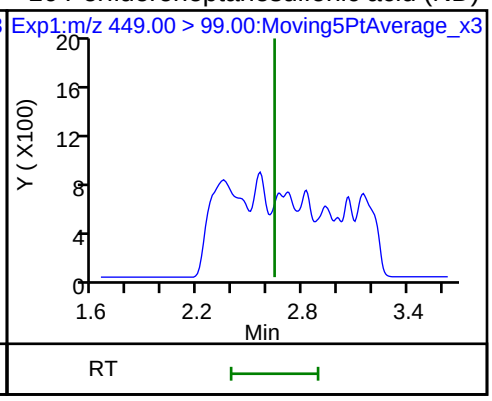
15 Perfluorooctanoic acid



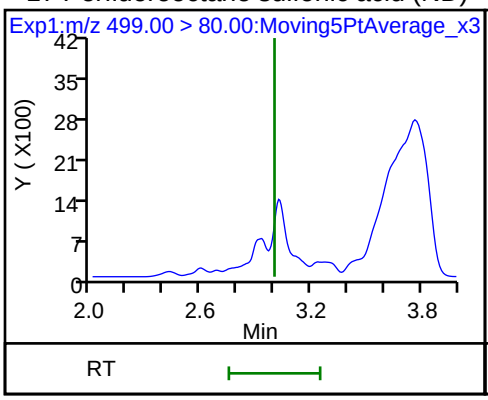
16 Perfluoroheptanesulfonic acid (ND)



16 Perfluoroheptanesulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)



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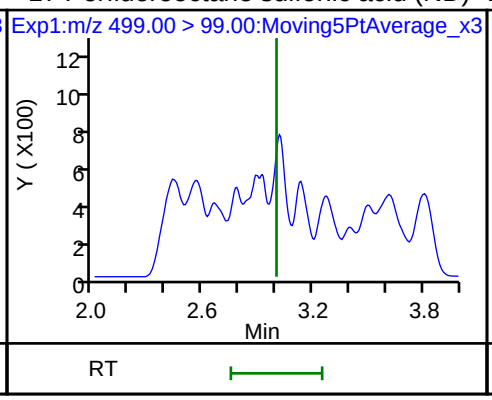
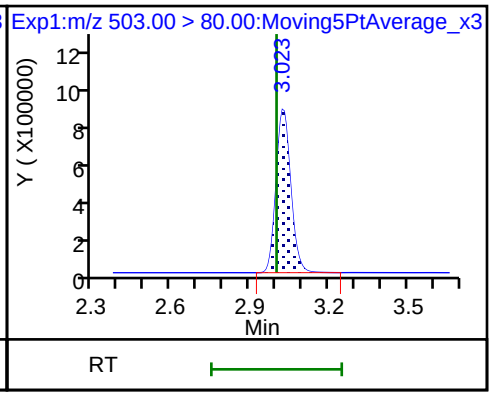
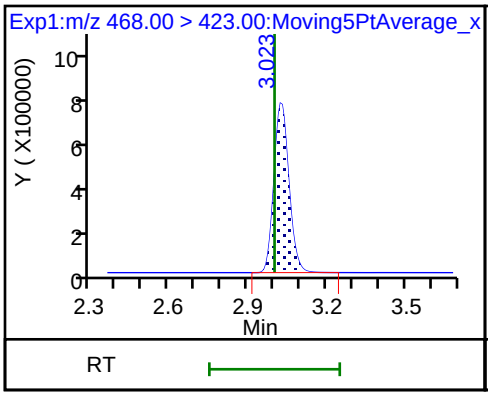


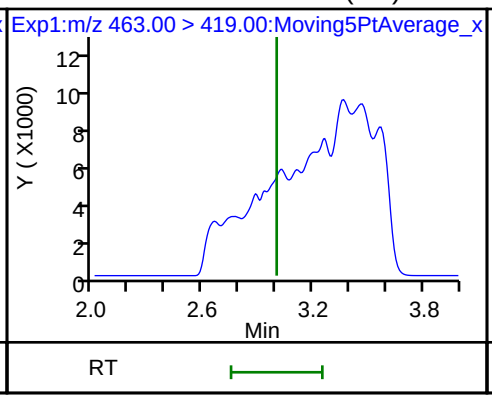
D 18 13C4 PFOS



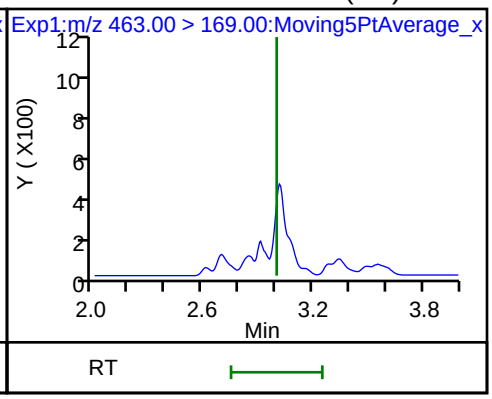
D 19 13C5 PFNA



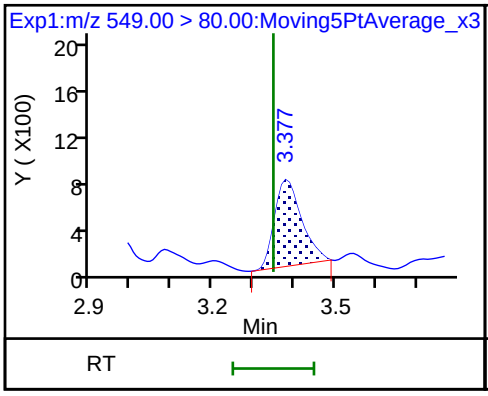
20 Perfluorononanoic acid (ND)



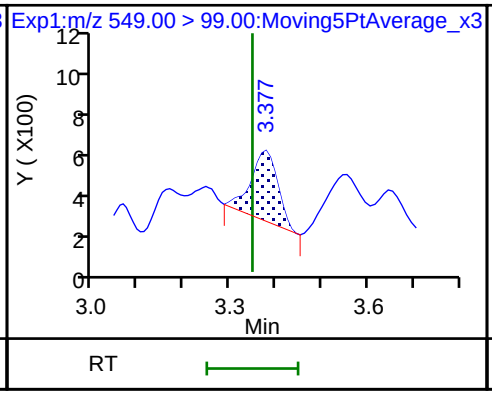
20 Perfluorononanoic acid (ND)



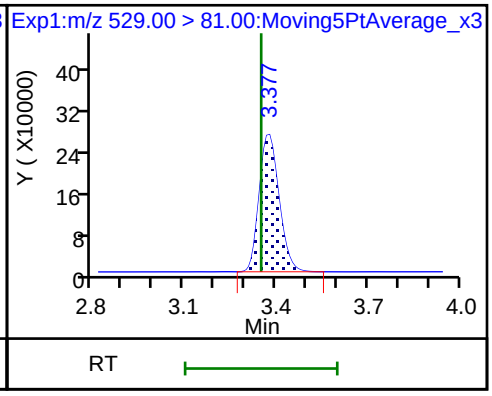
68 Perfluorononanesulfonic acid



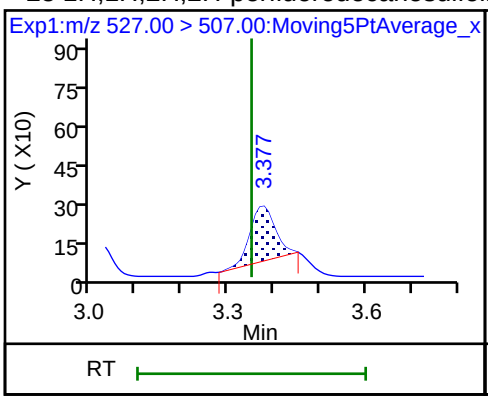
68 Perfluorononanesulfonic acid



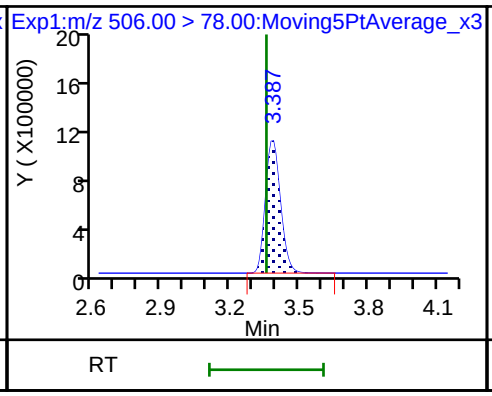
D 26 M2-8:2FTS



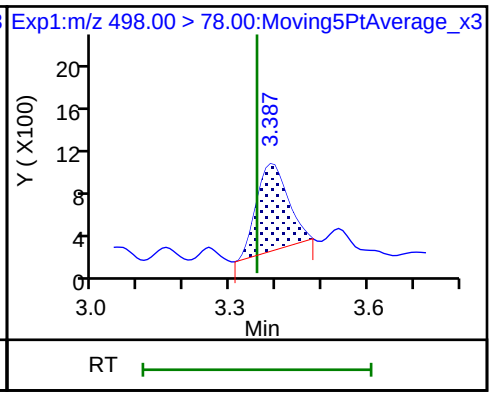
25 1H,1H,2H,2H-perfluorodecanesulfon



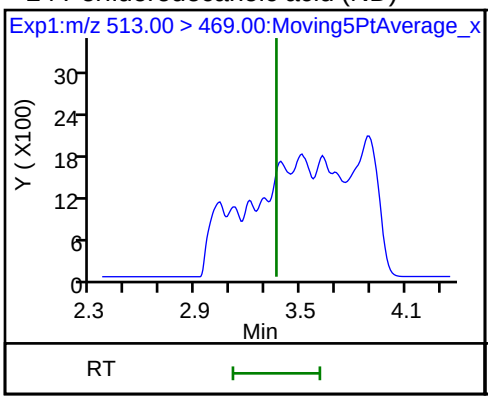
D 21 13C8 FOSA



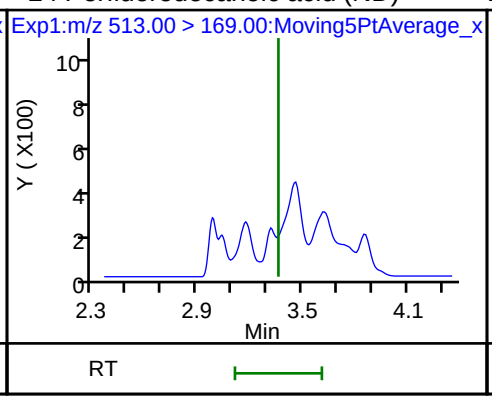
22 Perfluorooctane Sulfonamide



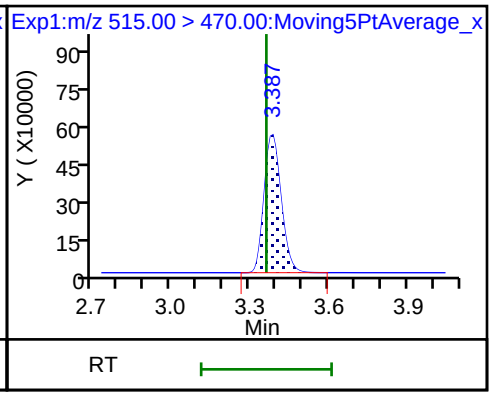
24 Perfluorodecanoic acid (ND)



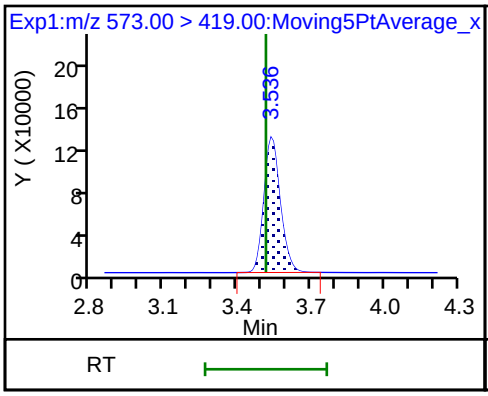
24 Perfluorodecanoic acid (ND)



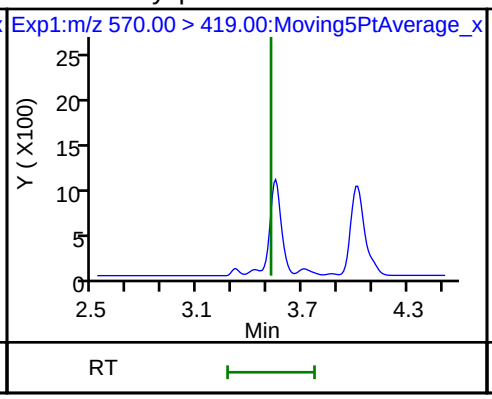
D 23 13C2 PFDA



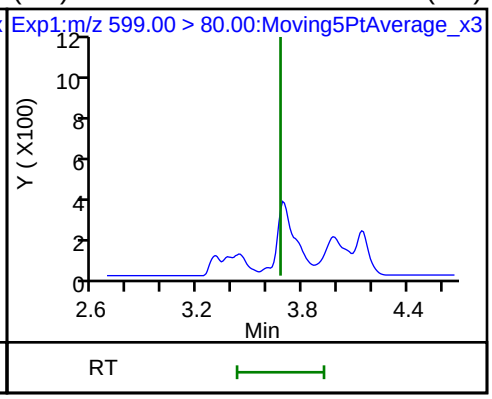
D 27 d3-NMeFOSAA



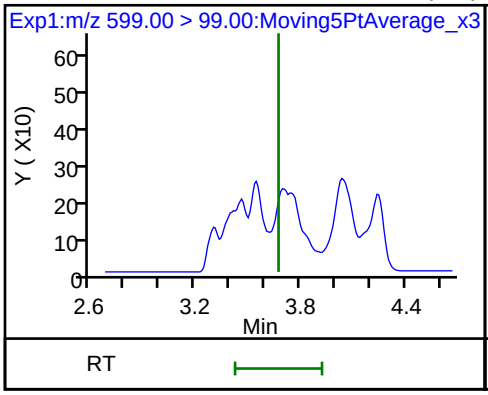
28 N-methyl perfluorooctane sulfonami (ND)



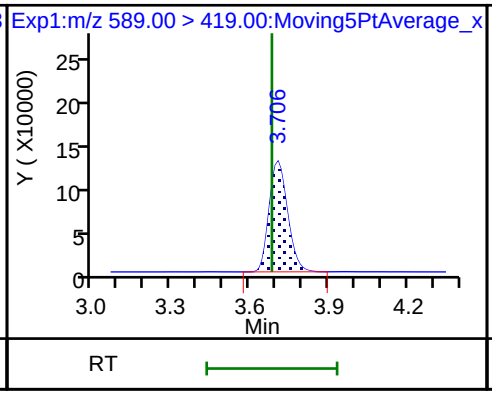
29 Perfluorodecane Sulfonic acid (ND)



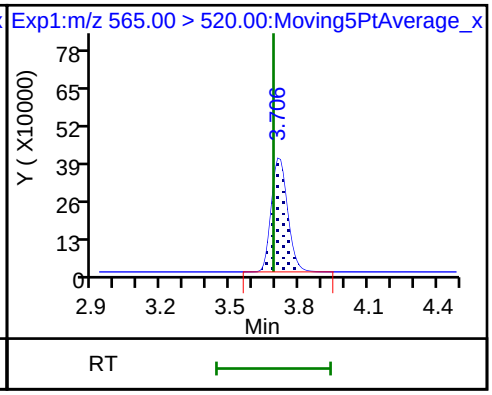
29 Perfluorodecane Sulfonic acid (ND)



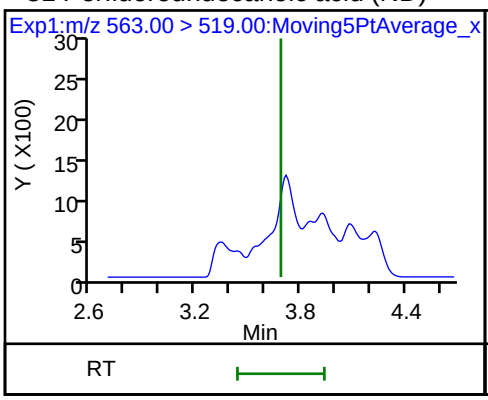
D 32 d5-NEtFOSAA



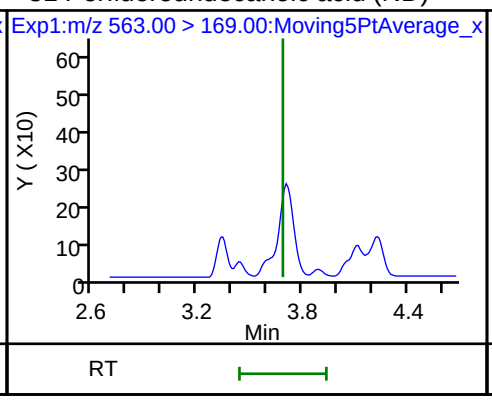
D 30 13C2 PFUnA



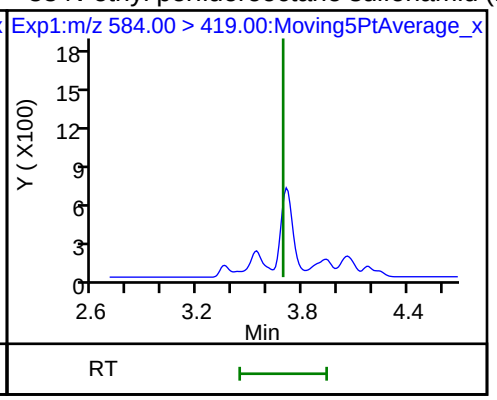
31 Perfluoroundecanoic acid (ND)



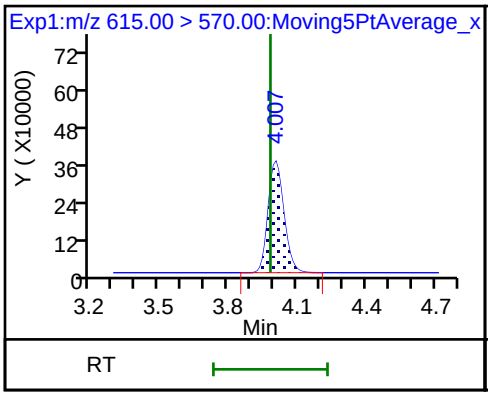
31 Perfluoroundecanoic acid (ND)



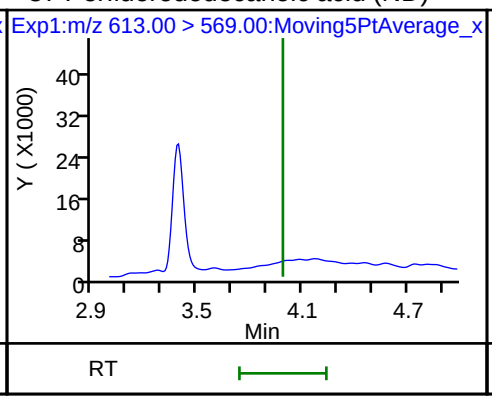
33 N-ethyl perfluorooctane sulfonamid (ND)



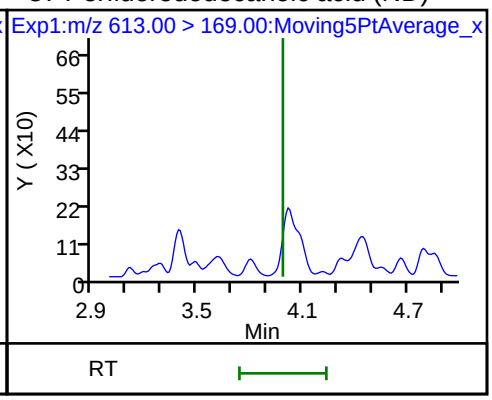
D 36 13C2 PFDoA



37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)



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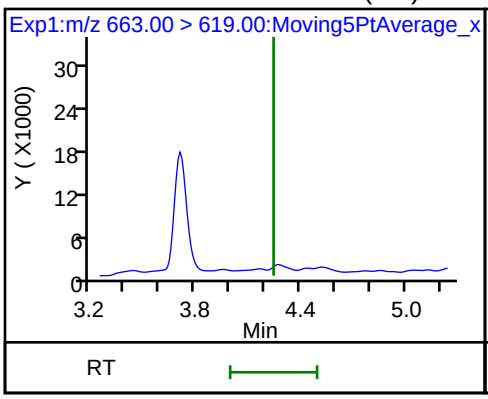
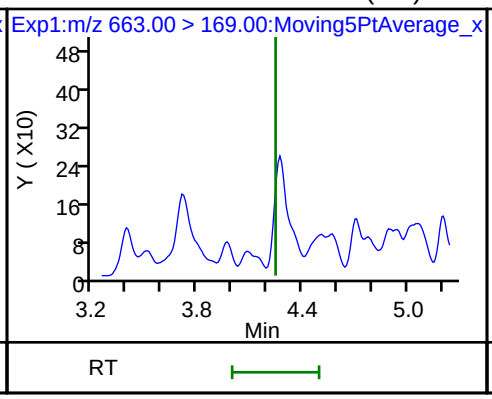
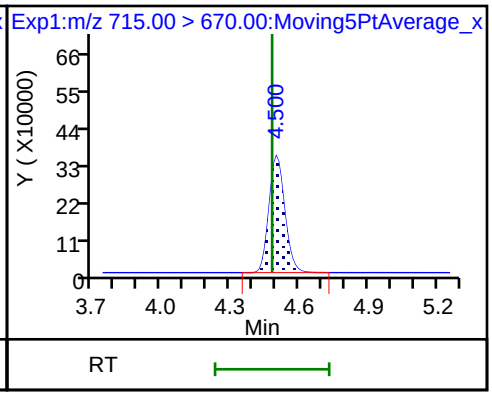


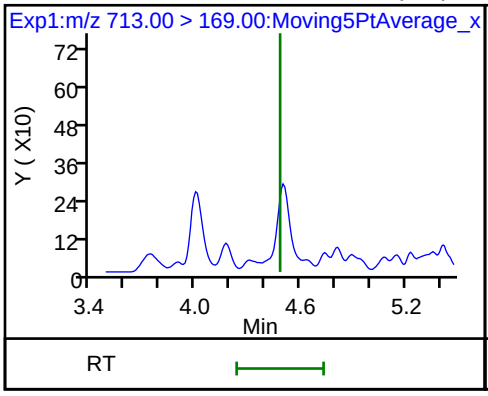
41 Perfluorotridecanoic acid (ND)



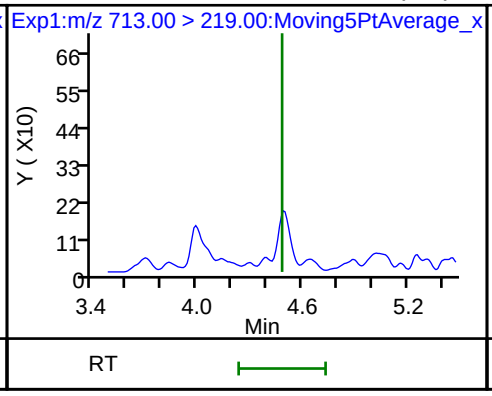
D 43 13C2-PFTeDA



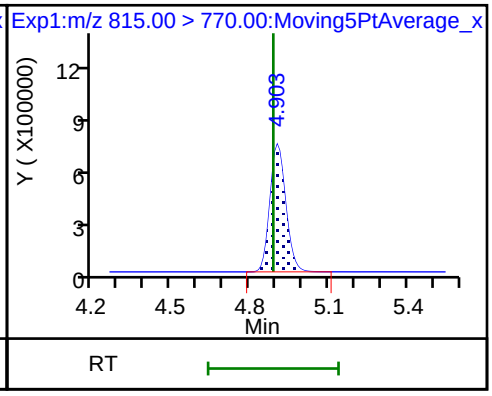
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: ICB 320-237402/9
Matrix: Solid
Lab File ID: 2018.08.01LLICAL_009.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 08/01/2018 13:53
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237402
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0158	J	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0104	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	98		50-150
STL01892	13C4-PFHpA	101		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	100		50-150
STL00991	13C4 PFOS	97		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 01-Aug-2018 13:53:52 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:58:46 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:38:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.395	-0.005	0.539	4889055	2.44		97.5	81516	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.636	-0.007	0.632	3248663	2.46		98.4	56732	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.669	-0.007	0.645	86259	2.27		97.7	341	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.005	44905	0.0158			260	
298.90 > 99.00	1.671	1.671	0.0	1.005	18814		2.39(1.25-3.74)		82.1	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.872	0.001	0.726	633862	NC			6074	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.903	-0.001	0.738	3571587	2.50		99.9	70138	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.000	2.000	0.0	0.775	153812	NC			3245	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.225	0.001	0.863	3493904	2.52		101	53883	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	24894	0.0104			150	
399.00 > 99.00	2.237	2.237	0.0	1.000	6493		3.83(1.50-4.49)		11.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.238	-0.001	0.868	4899705	2.35		99.5	54829	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.556	-0.002	0.990	956795	2.36		99.2	12182	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.580	-0.001	1.000	3305316	2.47		98.8	45659	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.581	-0.002		3483672	2.50			38586	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.581	-0.002	1.000	4889	0.003198			3.2	
413.00 > 169.00	2.579	2.581	-0.002	1.000	5997		0.82(0.84-2.52)		30.1	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.946	0.0	1.142	3348920	2.33		97.4	45767	
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.948	-0.002	1.142	2960639	2.54		102	57405	
20 Perfluorononanoic acid										R
463.00 > 419.00	2.946	2.949	-0.003	1.000	2315	0.001810			4.2	R
463.00 > 169.00	2.971	2.949	0.022	1.009	1905		1.22(1.90-5.69)		56.6	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.161	3.158	0.003	1.073	3830	NC			42.8	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.292	0.003	1.278	970764	2.45		102	15957	
D 23 13C2 PFDA										
515.00 > 470.00	3.303	3.306	-0.003	1.281	2210132	2.54		101	35772	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.312	0.007	1.287	5456061	2.58		103	72425	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.313	0.006	1.000	5013	0.002327			46.0	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.459	-0.005	1.339	512783	2.42		97.0	12381	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.627	0.001	1.407	569737	2.51		100	5690	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.637	3.633	0.004	1.003	4030	0.0198			109	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.634	0.003	1.410	1678284	2.50		100.0	39198	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.803	3.792	0.011	1.291	7478	NC			127	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.925	0.003	1.523	1429719	2.46		98.4	18629	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.423	-0.008	1.712	1158919	2.37		95.0	5397	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.826	-0.002	1.870	2024012	2.41		96.3	2949	
45 Perfluorohexadecanoic acid										M
813.00 > 769.00	4.814	4.827	-0.013	0.998	16756	NC			1.1	M
813.00 > 169.00	4.814	4.827	-0.013	0.998	3720		4.50(2.86-8.58)		38.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:58:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_009.d

Injection Date: 01-Aug-2018 13:53:52 Instrument ID: A8_N

Lims ID: ICB

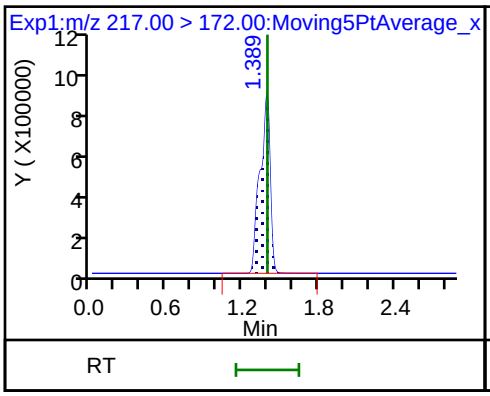
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 9

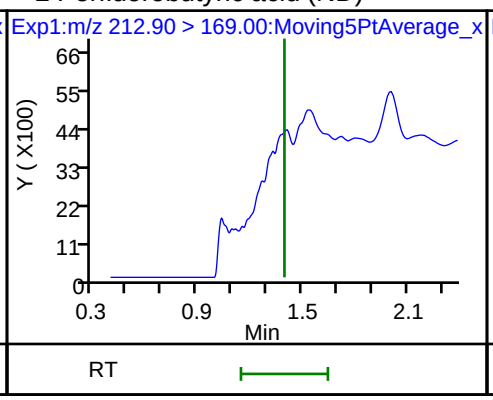
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

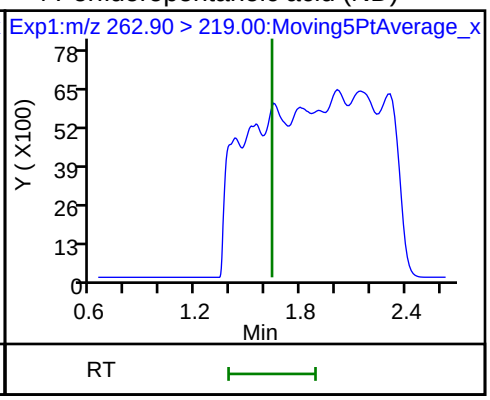
D 1 13C4 PFBA



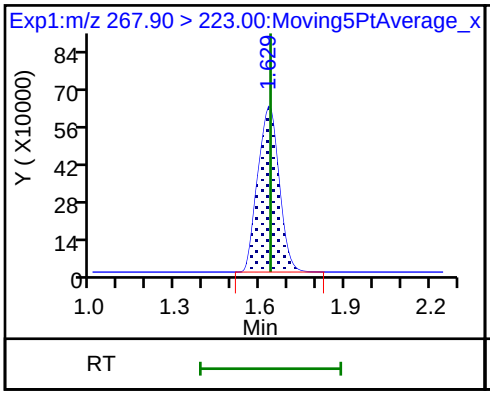
2 Perfluorobutyric acid (ND)



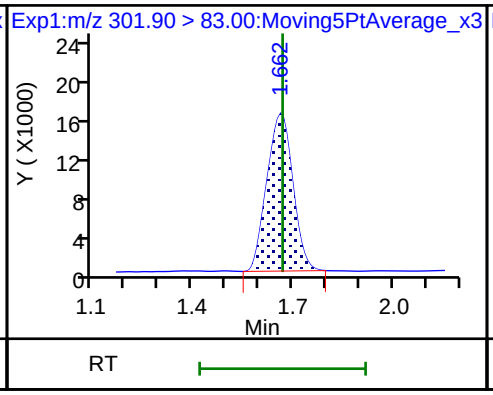
4 Perfluoropentanoic acid (ND)



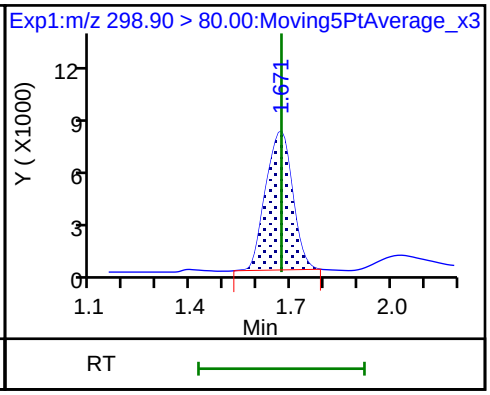
D 3 13C5-PFPeA



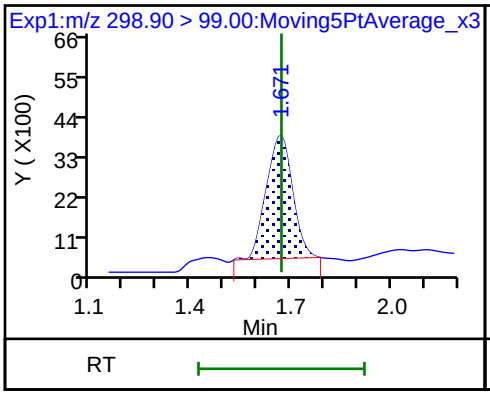
D 47 13C3-PFBS



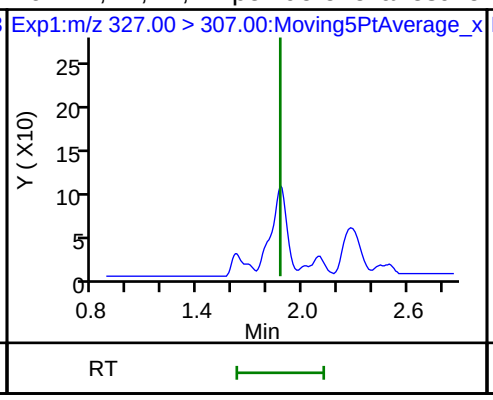
5 Perfluorobutanesulfonic acid



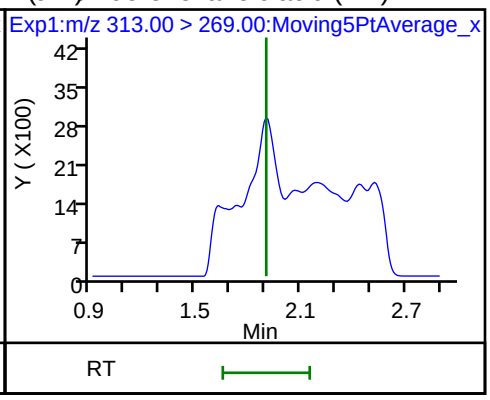
5 Perfluorobutanesulfonic acid



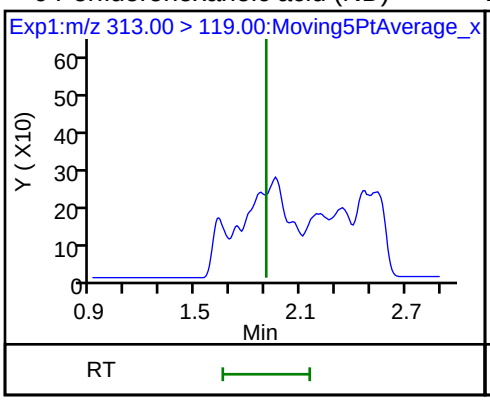
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



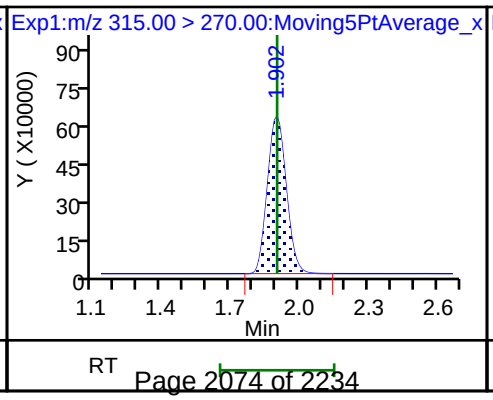
6 Perfluorohexanoic acid (ND)



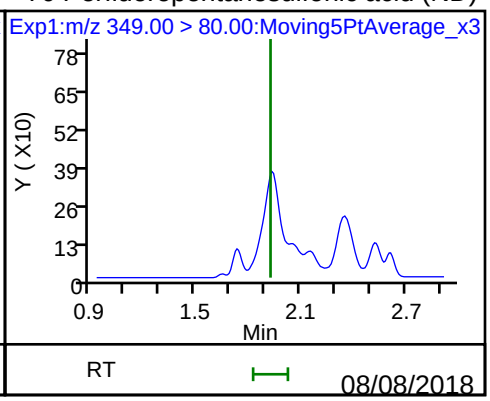
6 Perfluorohexanoic acid (ND)



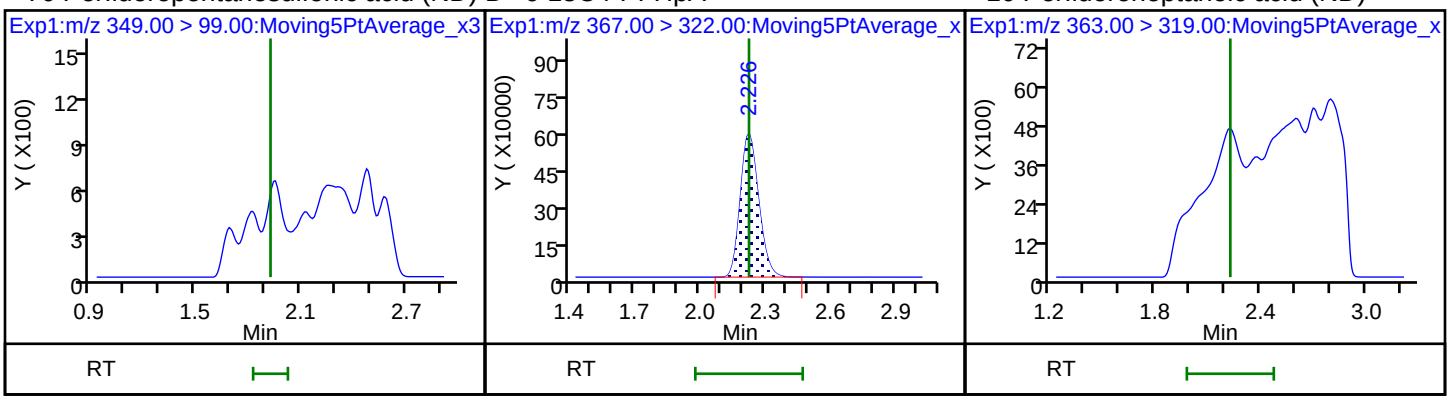
D 7 13C2 PFHxA



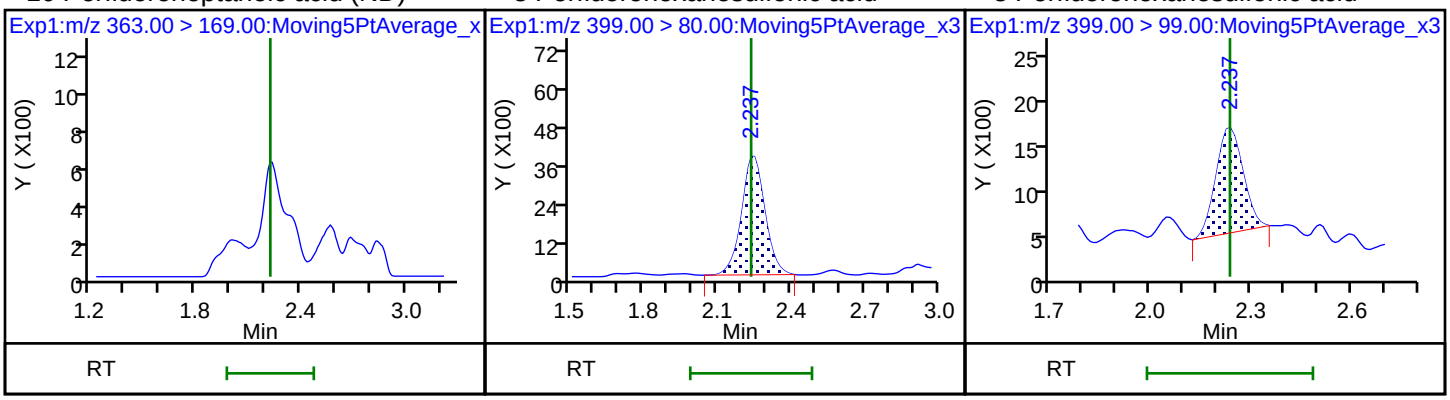
70 Perfluoropentanesulfonic acid (ND)



70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA 10 Perfluoroheptanoic acid (ND)



10 Perfluoroheptanoic acid (ND) 8 Perfluorohexanesulfonic acid 8 Perfluorohexanesulfonic acid



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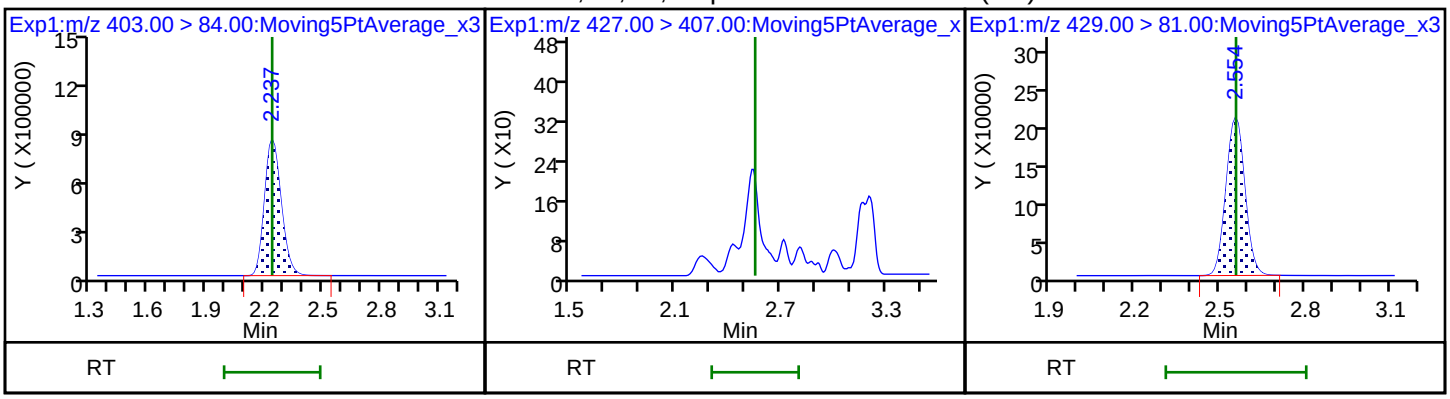
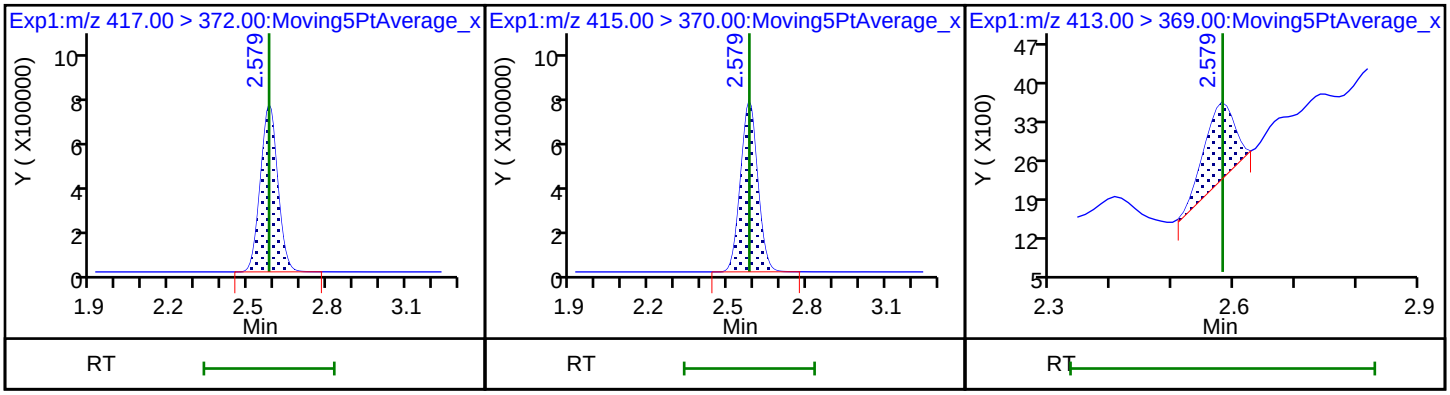
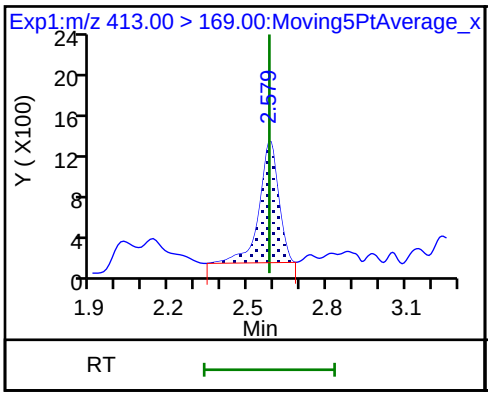


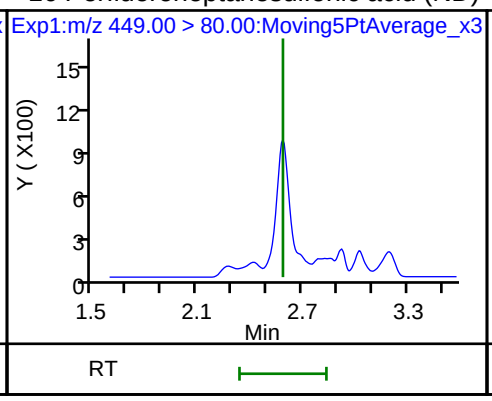
D 14 13C4 PFOA * 62 13C2-PFOA 15 Perfluorooctanoic acid



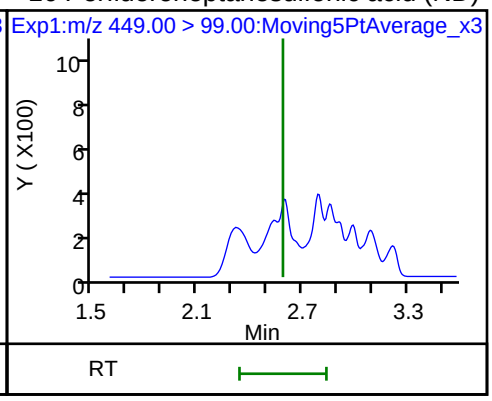
15 Perfluorooctanoic acid



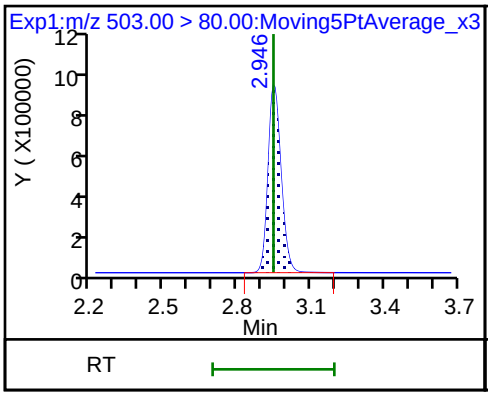
16 Perfluoroheptanesulfonic acid (ND)



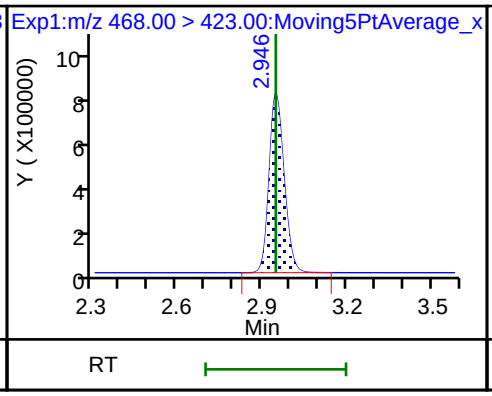
16 Perfluoroheptanesulfonic acid (ND)



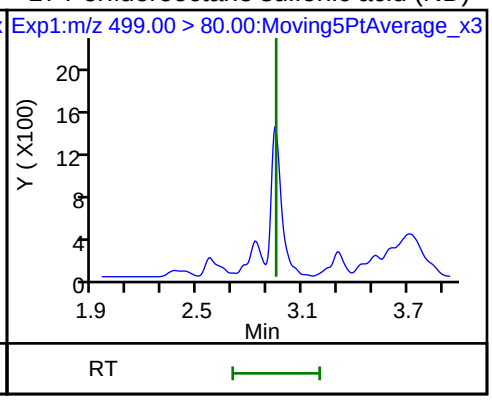
D 18 13C4 PFOS



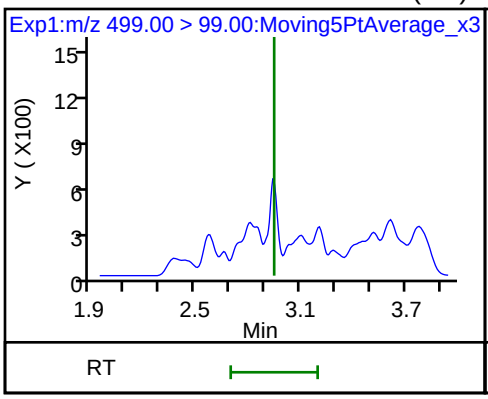
D 19 13C5 PFNA



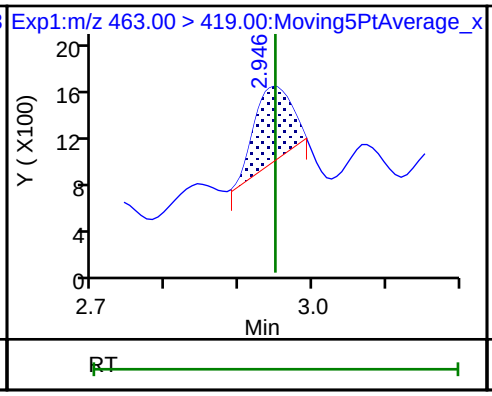
17 Perfluorooctane sulfonic acid (ND)



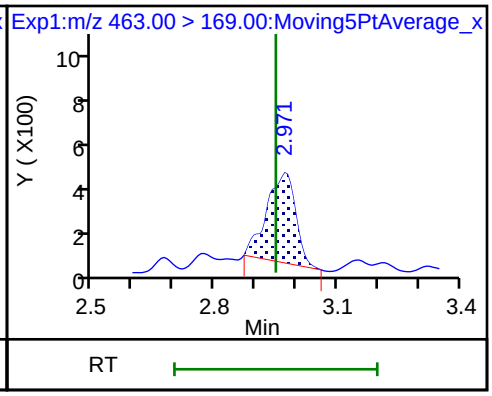
17 Perfluorooctane sulfonic acid (ND)



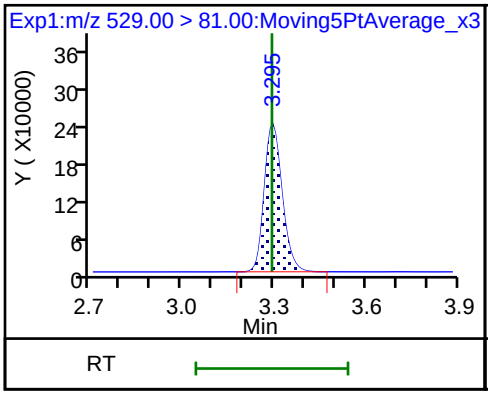
20 Perfluorononanoic acid



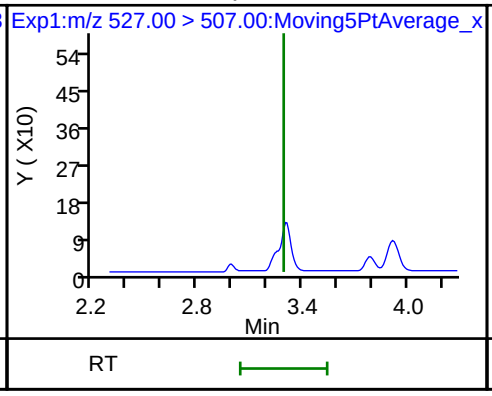
20 Perfluorononanoic acid



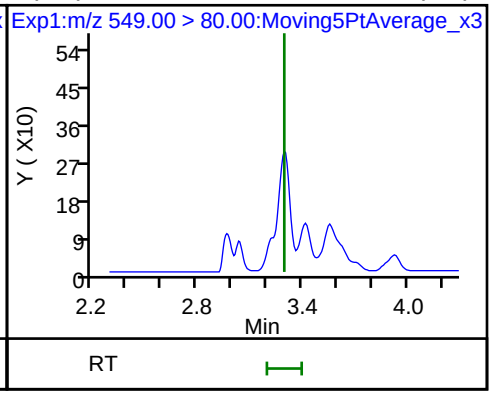
D 26 M2-8:2FTS



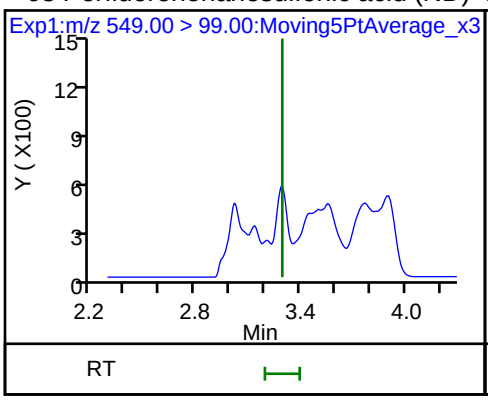
25 1H,1H,2H,2H-perfluorodecanesulfoni



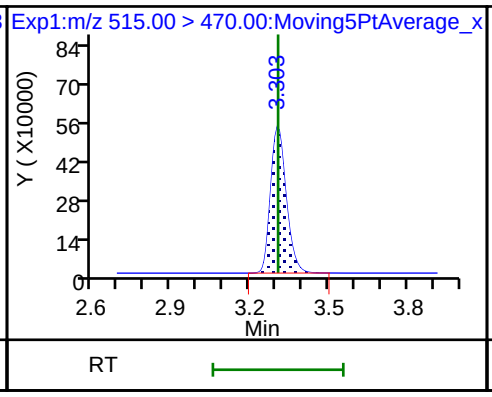
(ND) 1H,1H,2H,2H-perfluorononanesulfonic acid (ND)



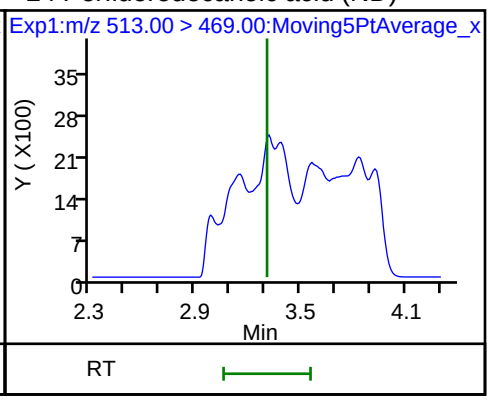
68 Perfluorononanesulfonic acid (ND)



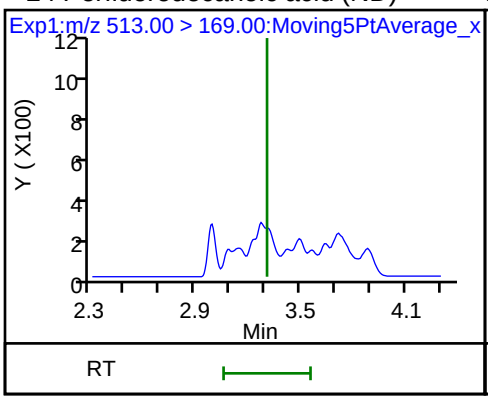
D 23 13C2 PFDA



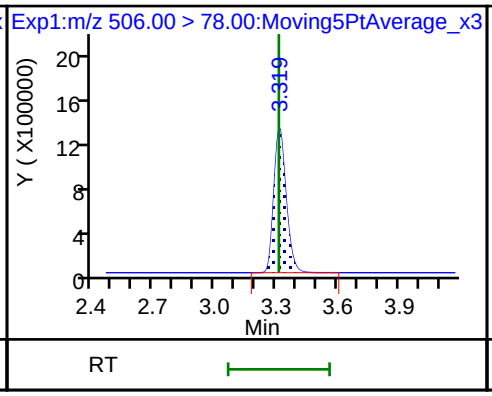
24 Perfluorodecanoic acid (ND)



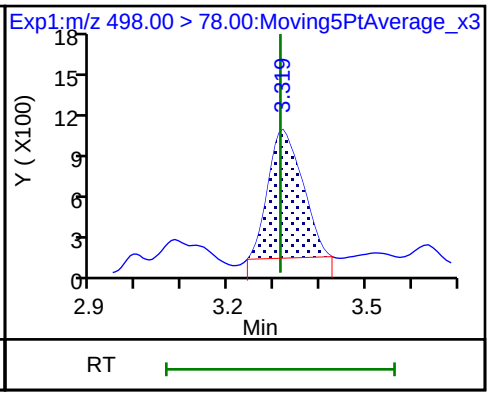
24 Perfluorodecanoic acid (ND)



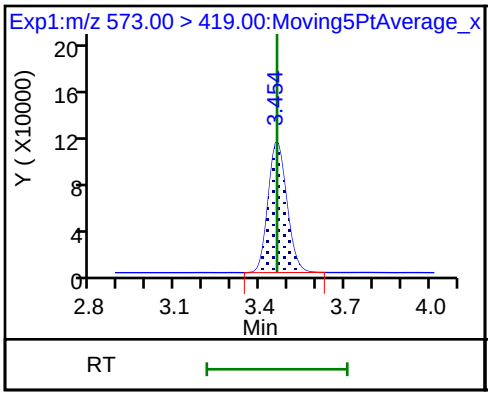
D 21 13C8 FOSA



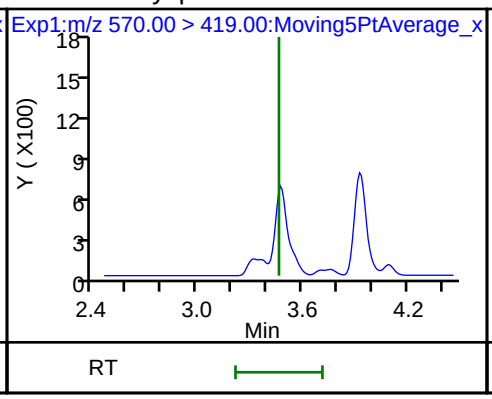
22 Perfluorooctane Sulfonamide



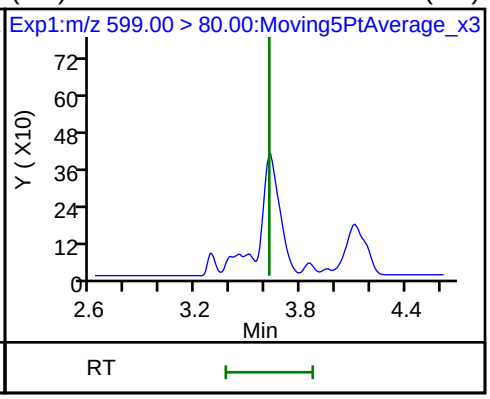
D 27 d3-NMeFOSAA



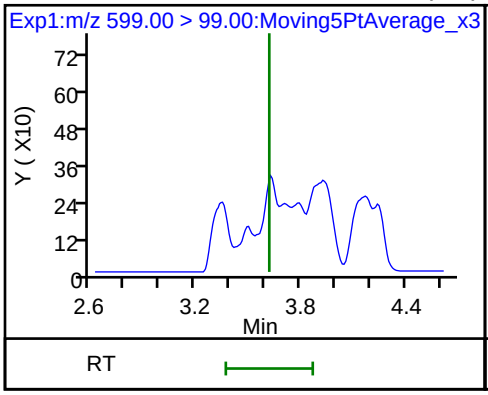
28 N-methyl perfluorooctane sulfonami (ND)



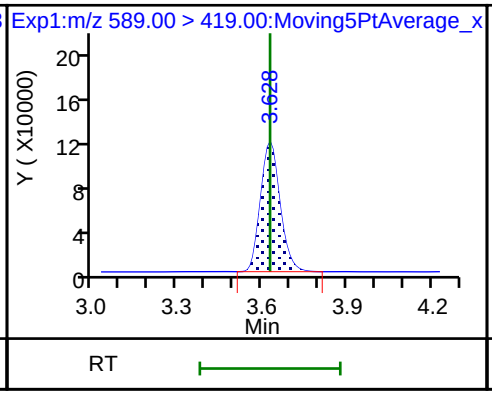
29 Perfluorodecane Sulfonic acid (ND)



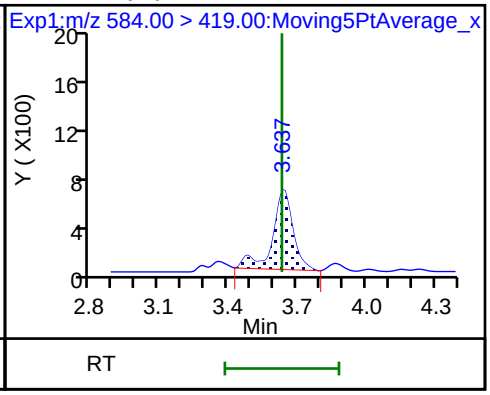
29 Perfluorodecane Sulfonic acid (ND)



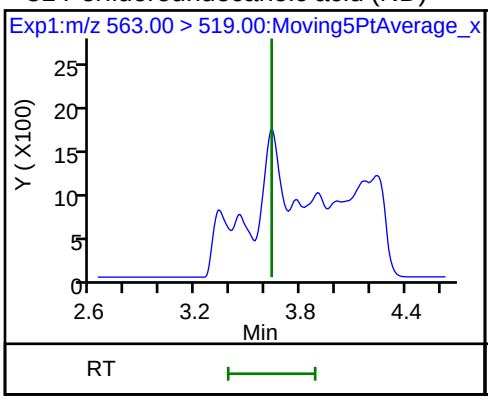
D 32 d5-NEtFOSAA



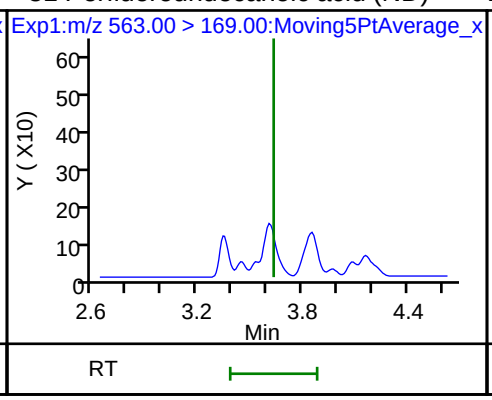
33 N-ethyl perfluorooctane sulfonamid



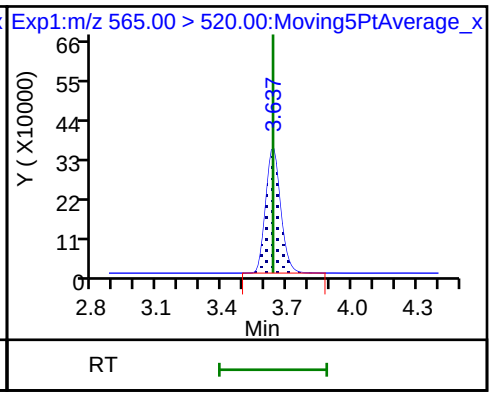
31 Perfluoroundecanoic acid (ND)



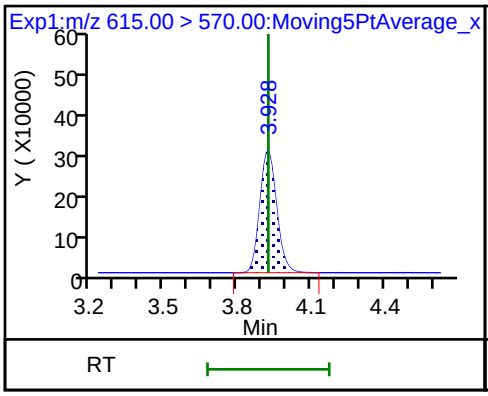
31 Perfluoroundecanoic acid (ND)



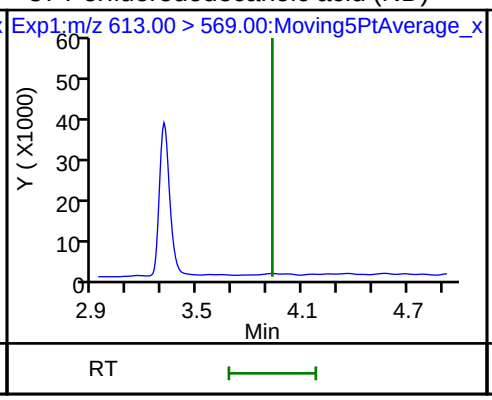
D 30 13C2 PFUnA



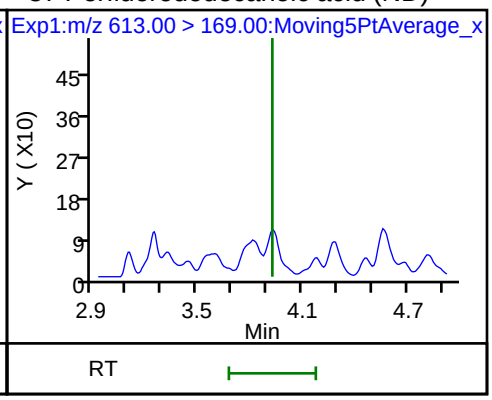
D 36 13C2 PFDoA



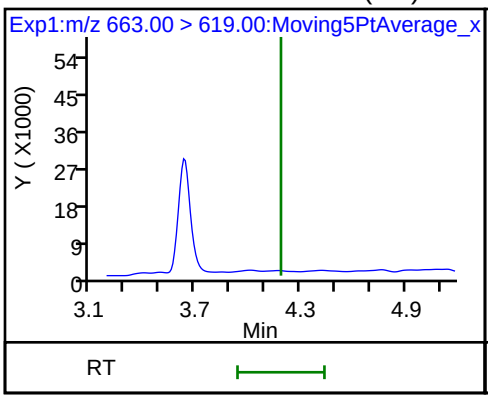
37 Perfluorododecanoic acid (ND)



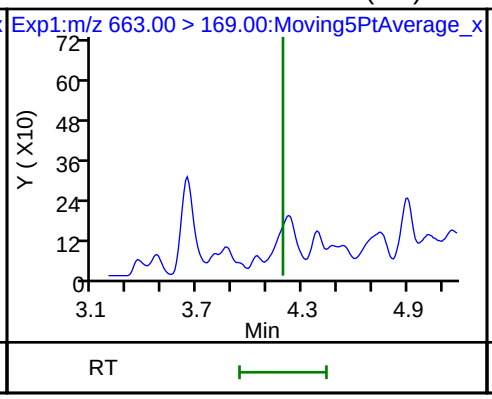
37 Perfluorododecanoic acid (ND)



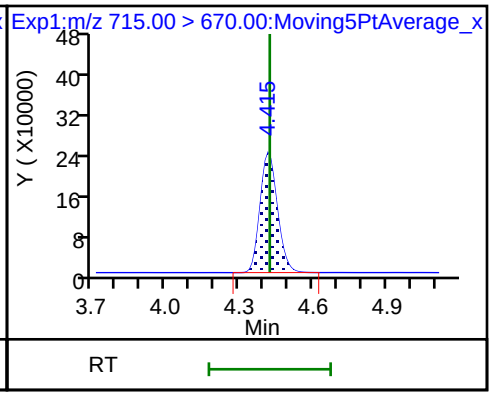
41 Perfluorotridecanoic acid (ND)



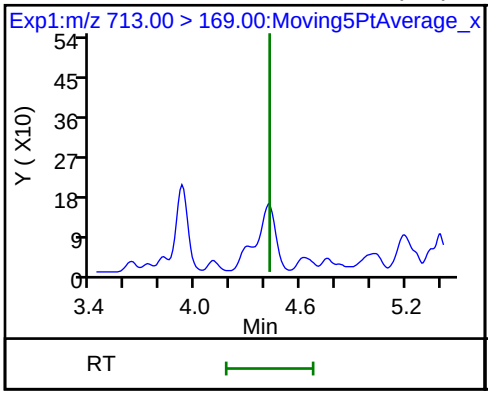
41 Perfluorotridecanoic acid (ND)



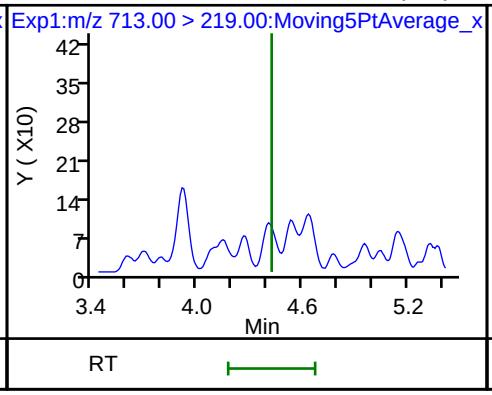
D 43 13C2-PFTeDA



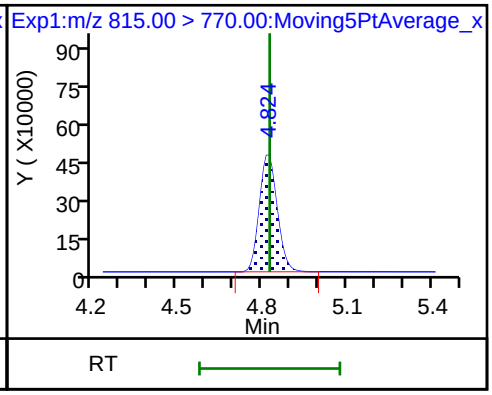
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-234633/2-A
Matrix: Solid
Lab File ID: 2018.07.30LLA_007.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.00(g)
Date Analyzed: 07/30/2018 03:44
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.73		0.30	0.20	0.078
335-67-1	Perfluorooctanoic acid (PFOA)	1.65		0.30	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.68		0.30	0.20	0.081
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.57		0.40	0.18	0.059
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.50		0.30	0.20	0.062
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.80		1.0	0.50	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	101		50-150
STL01892	13C4-PFHpA	98		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	100		50-150
STL00994	18O2 PFHxS	99		50-150
STL00991	13C4 PFOS	98		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_007.d
Lims ID: LCS 320-234633/2-A
Client ID:
Sample Type: LCS
Inject. Date: 30-Jul-2018 03:44:35 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-234633/2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:46:06 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:46:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.395	1.389	0.006	1.000	1661655	0.8789		87.9	680	M
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.396	-0.001	0.541	4809446	2.48		99.3	86160	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.629	0.008	1.000	1481687	0.8688		86.9	699	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.640	-0.003	0.635	3562296	2.63		105	80197	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.662	0.009	1.000	2231647	0.7859		88.9	6358	
298.90 > 99.00	1.671	1.662	0.009	1.000	932275		2.39(1.25-3.74)		3549	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.674	-0.003	0.648	83162	2.34		101	598	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.873	1.863	0.010	1.120	333024	0.5447		58.3	19598	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.902	0.0	1.000	1384803	0.8865		88.6	3725	
313.00 > 119.00	1.902	1.902	0.0	1.000	126151		10.98(5.03-15.10)		3098	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.738	3684519	2.32		92.9	79820	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.151	2121086	0.8324		88.7	45367	
349.00 > 99.00	1.924	1.924	0.0	1.151	799215		2.65(1.36-4.07)		6203	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.000	1.999	0.001	1.000	284814	NC			1532	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.000	2.014	-0.014	0.775	347292	NC			12228	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.226	2.214	0.012	1.000	1520929	0.8643		86.4	3479	
363.00 > 169.00	2.226	2.214	0.012	1.000	565616		2.69(1.13-3.40)		8775	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.225	0.012	1.000	1818191	0.7496		82.4	13822	
399.00 > 99.00	2.237	2.225	0.012	1.000	633549		2.87(1.50-4.49)		2182	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.240	-0.014	0.863	3990346	2.44		97.6	85679	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4916865	2.34		99.0	68947	
65 ADONA										
377.00 > 251.00	2.264	2.263	0.001	0.770	4111972	NC			49049	
377.00 > 85.00	2.264	2.263	0.001	0.770	2335539		1.76(0.84-2.53)		9455	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.545	0.009	1.000	422784	0.8544		90.1	10388	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.564	-0.010	0.990	696607	1.53		64.2	13870	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.571	0.008		4179916	2.50			77860	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.571	0.008	1.000	1524509	0.8226		82.2	2164	
413.00 > 169.00	2.579	2.571	0.008	1.000	795683		1.92(0.84-2.52)		4466	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.579	0.008	0.880	1672355	0.8490		89.2	27600	
449.00 > 99.00	2.587	2.579	0.008	0.880	462189		3.62(1.94-5.82)		4430	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3817450	2.39		95.5	61383	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.940	2.935	0.005	1.000	1416463	0.9002		97.0	34692	
499.00 > 99.00	2.940	2.935	0.005	1.000	337160		4.20(2.31-6.93)		3244	
20 Perfluorononanoic acid										
463.00 > 419.00	2.940	2.935	0.005	1.000	1332056	0.8419		84.2	4543	
463.00 > 169.00	2.940	2.935	0.005	1.000	313836		4.24(1.90-5.69)		10817	
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.953	-0.013	1.140	3464413	2.51		100	107648	
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.953	-0.013	1.140	3403176	2.33		97.5	53987	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.153	3.145	0.008	1.072	2135285	NC			13120	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.287	3.280	0.007	1.000	527680	0.8524		89.0	18192	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.287	0.008	1.121	939059	0.8830		92.0	23703	
549.00 > 99.00	3.287	3.287	0.0	1.118	371321		2.53(1.33-3.97)		3777	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.303	3.295	0.008	1.000	1114008	0.9158		91.6	7619	
513.00 > 169.00	3.303	3.295	0.008	1.000	197358		5.64(2.36-7.09)		6977	
D 26 M2-8:2FTS										
529.00 > 81.00	3.287	3.299	-0.012	1.275	1092661	2.30		95.9	18168	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.311	0.008	1.002	1641993	0.8690		86.9	29423	
D 23 13C2 PFDA										
515.00 > 470.00	3.303	3.314	-0.011	1.281	2956890	2.69		108	42608	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.322	-0.011	1.284	4749817	2.21		88.6	41936	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.454	0.009	1.003	347883	0.8920		89.2	2480	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.467	-0.013	1.339	989281	2.73		109	24384	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.618	3.607	0.011	1.230	833361	0.8825		91.6	19626	
599.00 > 99.00	3.618	3.607	0.011	1.230	282575		2.95(1.39-4.16)		5991	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.628	3.628	0.0	1.000	988359	0.8382		83.8	4614	
563.00 > 169.00	3.628	3.628	0.0	1.000	164047		6.02(2.12-6.36)		6750	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.628	3.628	0.0	1.000	340144	0.8468		84.7	11791	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.640	-0.012	1.407	1076428	2.82		113	3481	
D 30 13C2 PFUnA										
565.00 > 520.00	3.628	3.640	-0.012	1.407	2375530	2.69		107	49904	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.782	0.010	1.290	3177058	NC			60253	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.918	0.010	1.000	839616	0.8788		87.9	257	
613.00 > 169.00	3.928	3.918	0.010	1.000	199103		4.22(2.13-6.40)		3757	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.930	-0.002	1.523	2207596	2.63		105	25582	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.182	4.182	0.0	1.065	795638	0.8578		85.8	253	
663.00 > 169.00	4.182	4.182	0.0	1.065	256893		3.10(1.25-3.76)		3943	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.415	0.011	1.000	195893	0.9174		91.7	3965	
713.00 > 219.00	4.415	4.415	0.0	0.998	137066		1.43(0.71-2.13)		2314	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.437	-0.011	1.716	2129334	2.59		104	18879	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.823	0.0	1.000	977921	NC			182	
813.00 > 169.00	4.823	4.823	0.0	1.000	157648		6.20(2.86-8.58)		2413	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.842	-0.019	1.870	2853803	2.29		91.6	11725	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.165	0.008	1.073	907385	NC			182	
913.00 > 169.00	5.173	5.165	0.008	1.073	115997		7.82(3.83-11.48)		1979	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 09:46:06 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_007.d

Injection Date: 30-Jul-2018 03:44:35 Instrument ID: A8_N

Lims ID: LCS 320-234633/2-A

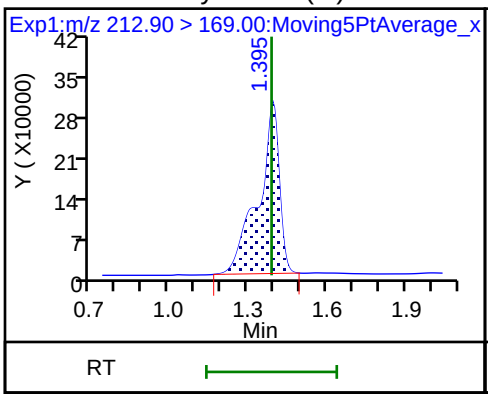
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 2 Worklist Smp#: 5

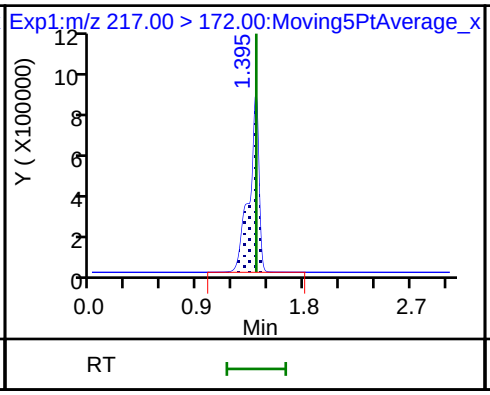
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

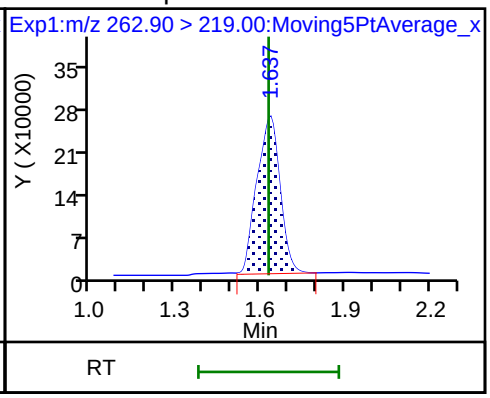
2 Perfluorobutyric acid (M)



D 1 13C4 PFBA



4 Perfluoropentanoic acid



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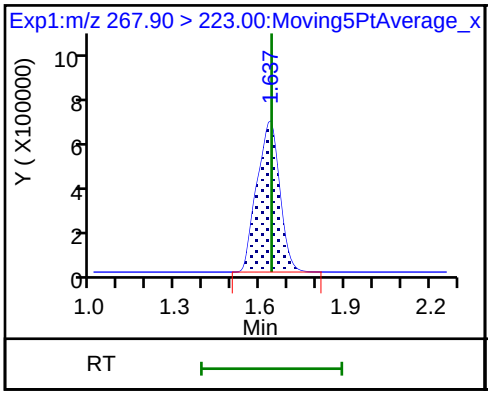
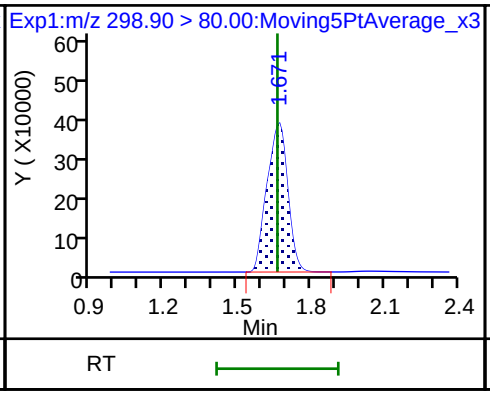


5 Perfluorobutanesulfonic acid



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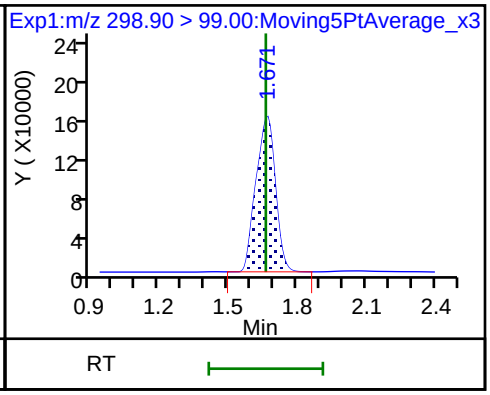
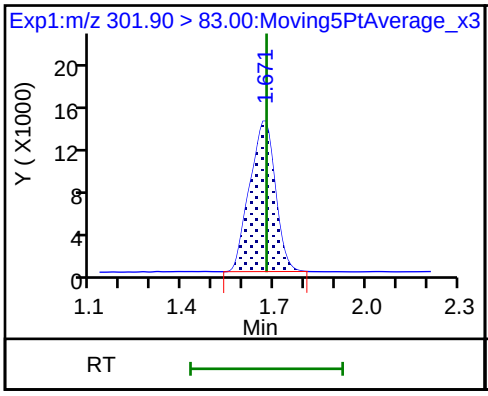
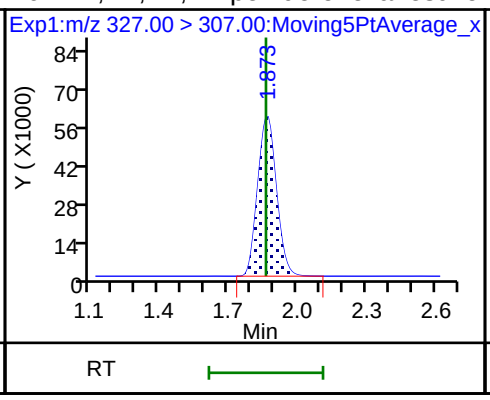


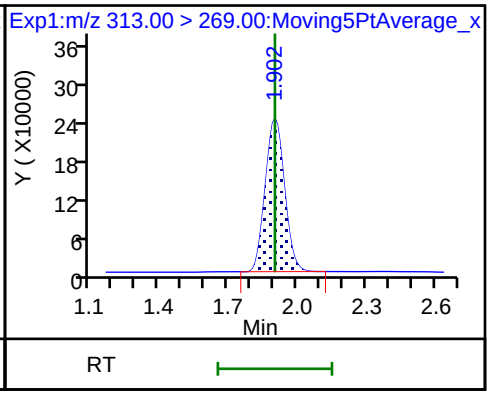
D 47 13C3-PFBS



61 1H,1H,2H,2H-perfluorohexanesulfoni



6 Perfluorohexanoic acid



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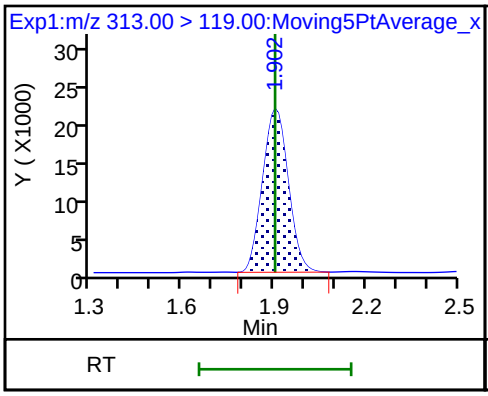
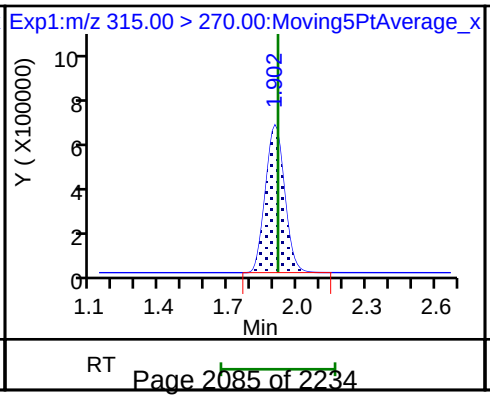


D 7 13C2 PFHxA



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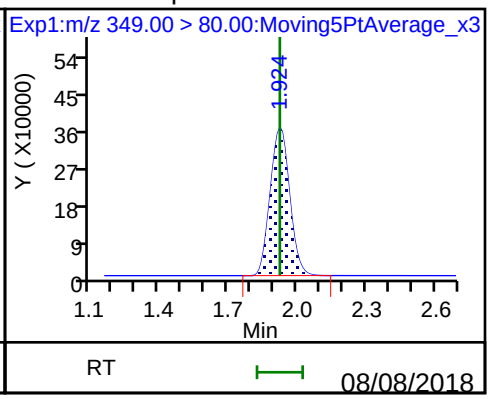

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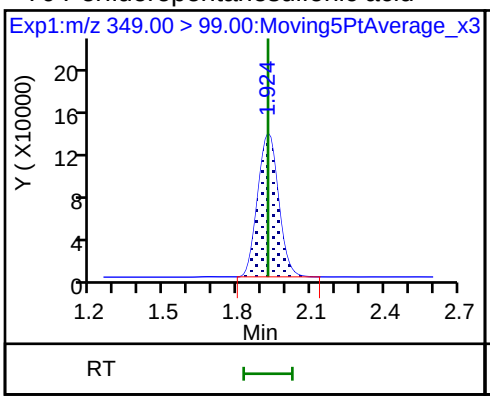
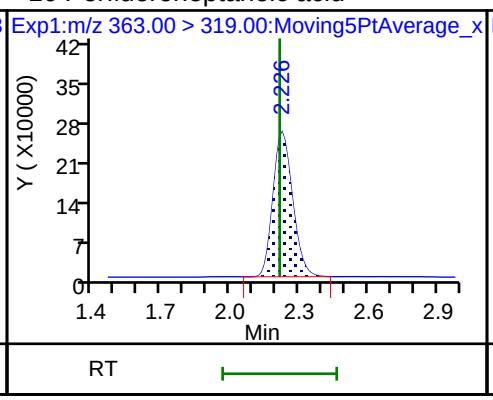


10 Perfluoroheptanoic acid



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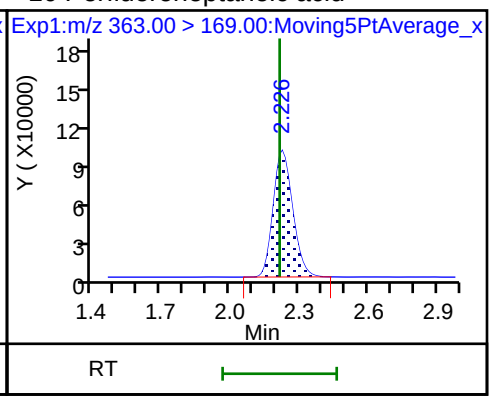

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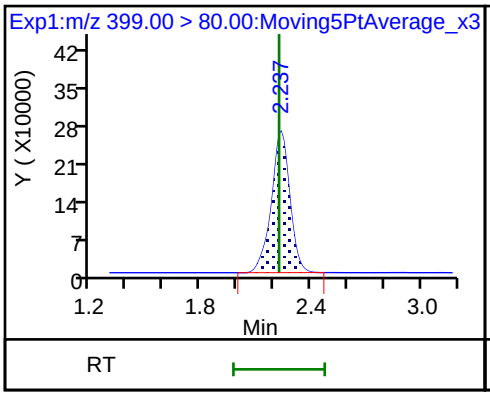

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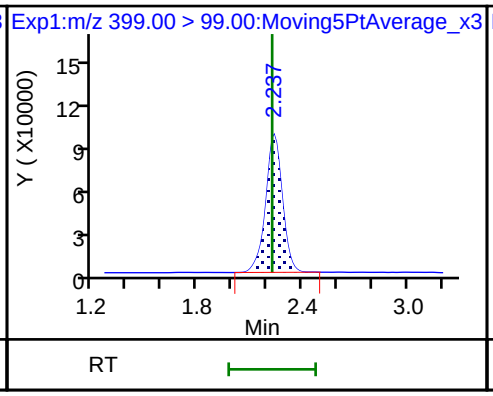
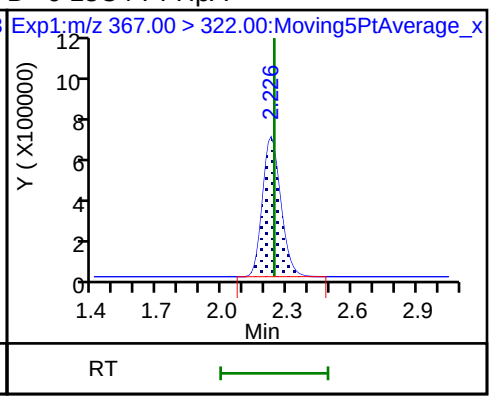
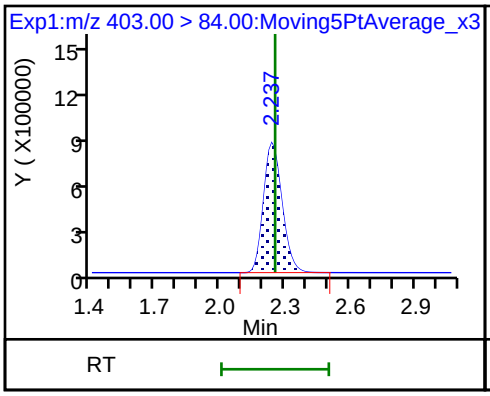


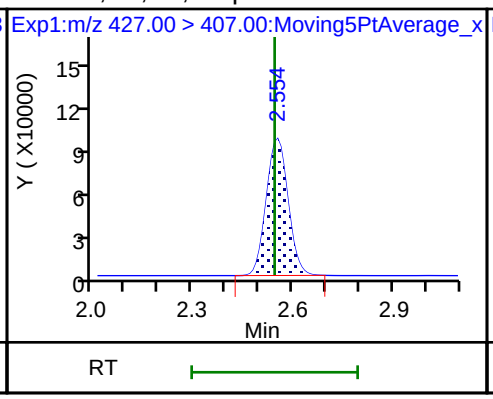
D 9 13C4-PFHpA



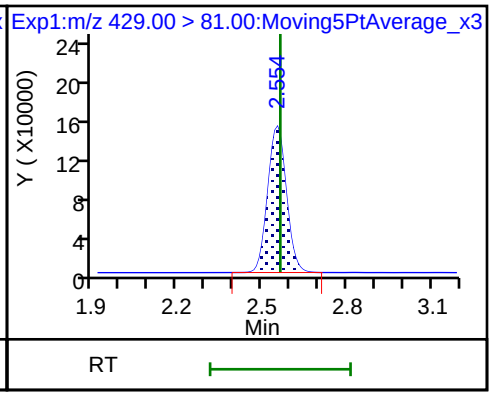
D 11 18O2 PFHxS



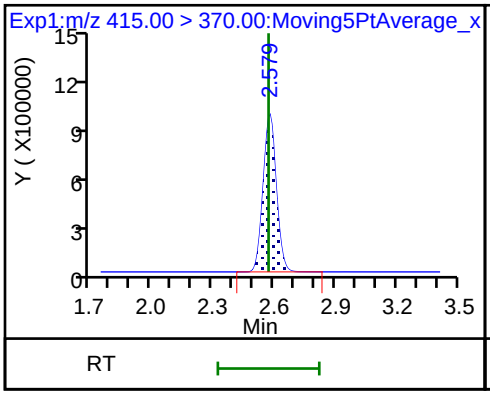
13 1H,1H,2H,2H-perfluorooctanesulfon



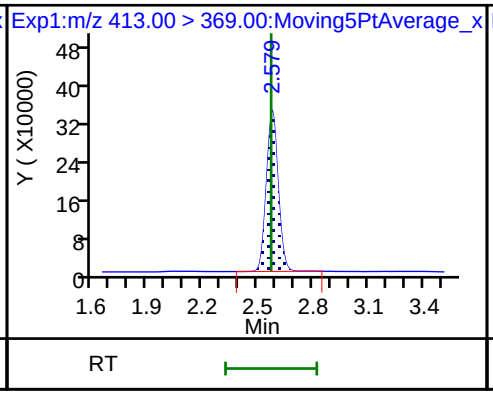
D 12 M2-6:2FTS



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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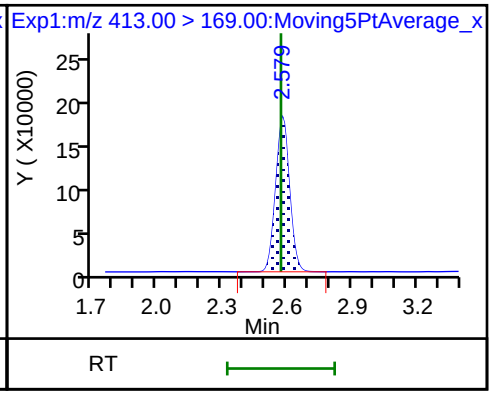
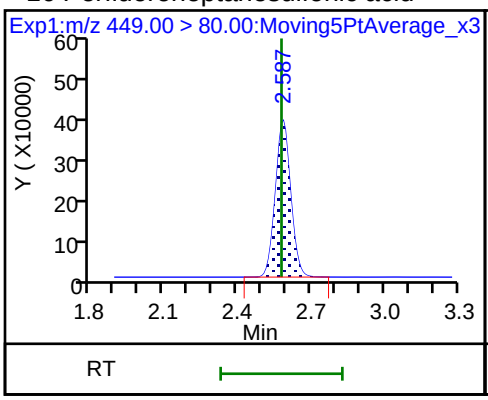


16 Perfluoroheptanesulfonic acid



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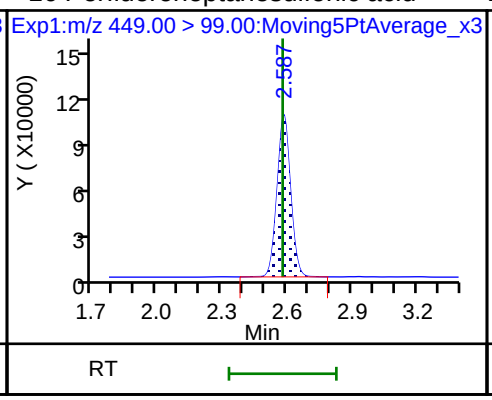
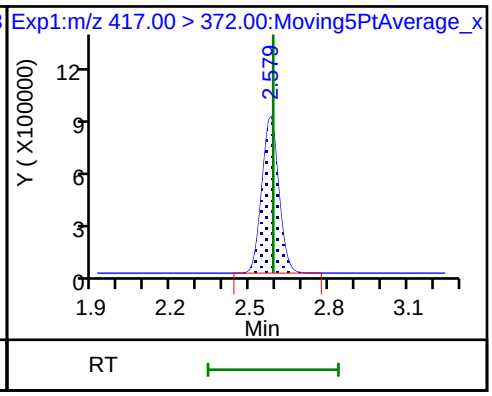
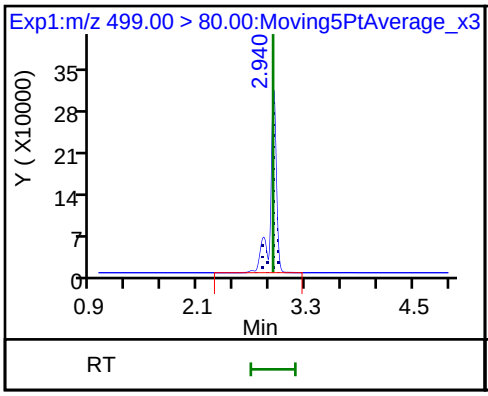


D 14 13C4 PFOA



17 Perfluorooctane sulfonic acid



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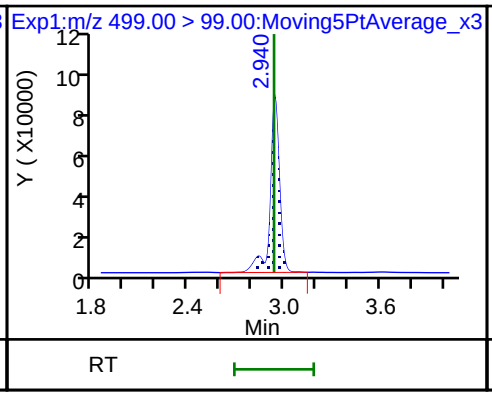
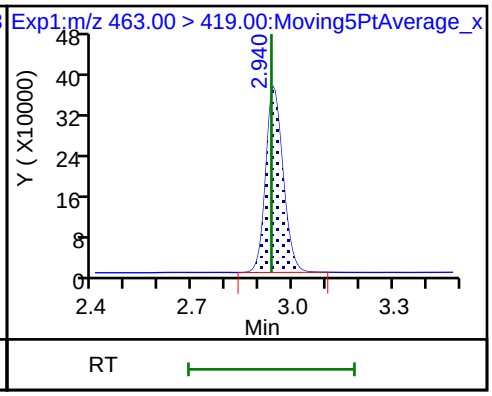


20 Perfluorononanoic acid



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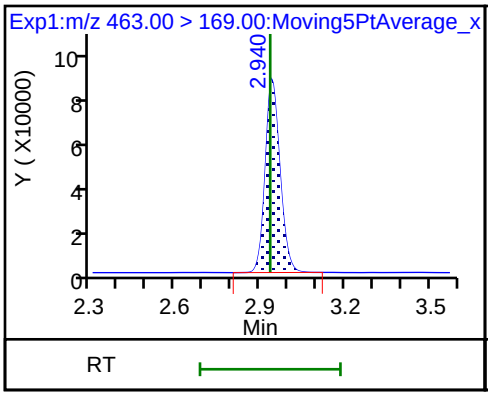
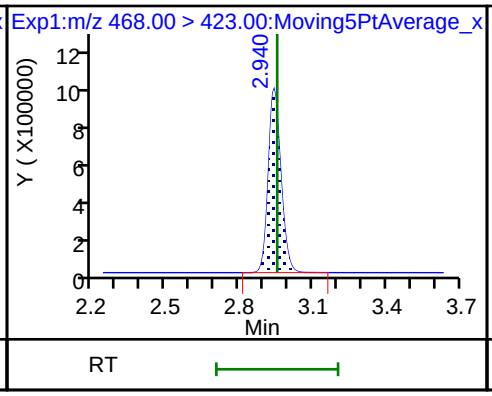


D 19 13C5 PFNA



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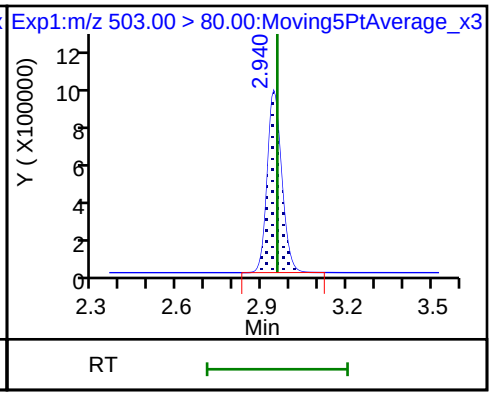
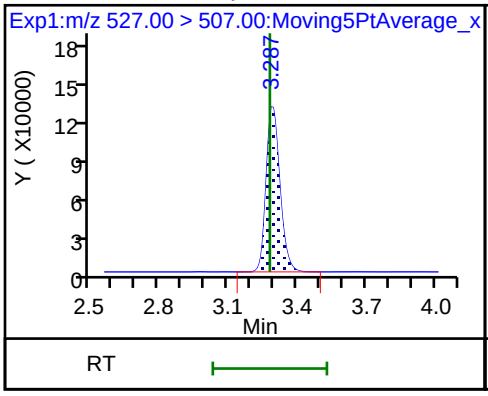
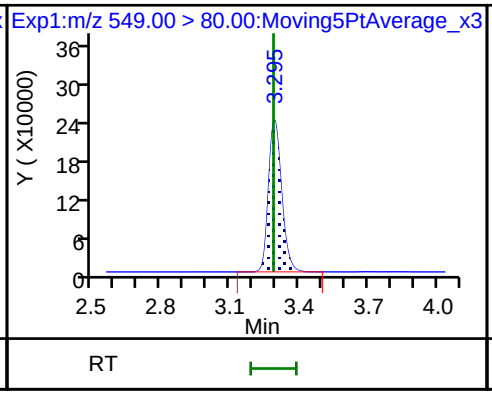


25 1H,1H,2H,2H-perfluorodecanesulfoni



68 Perfluorononanesulfonic acid



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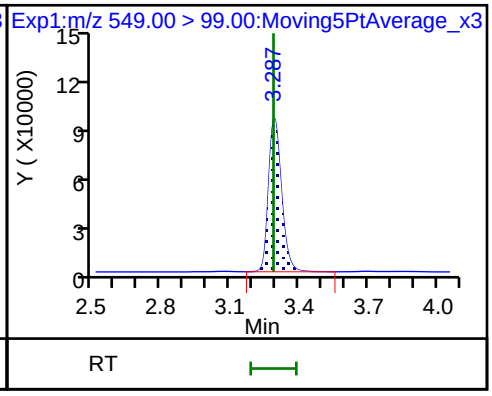
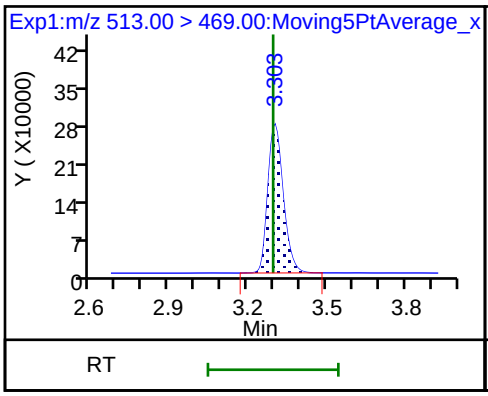


24 Perfluorodecanoic acid



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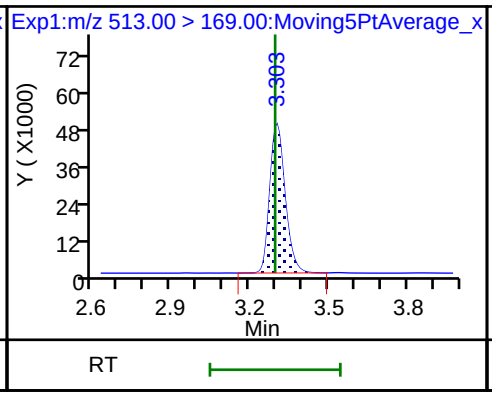
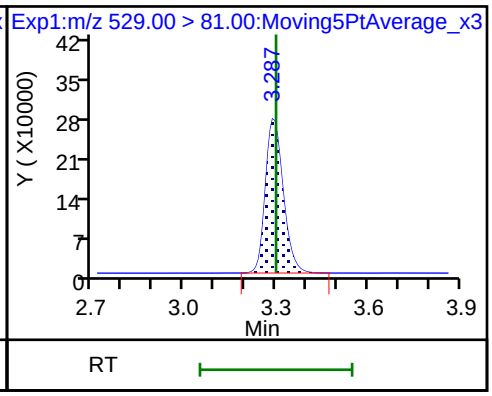
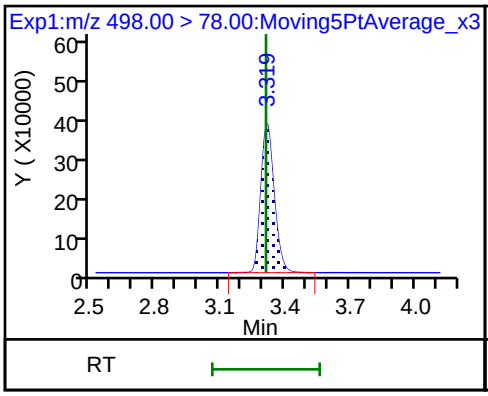


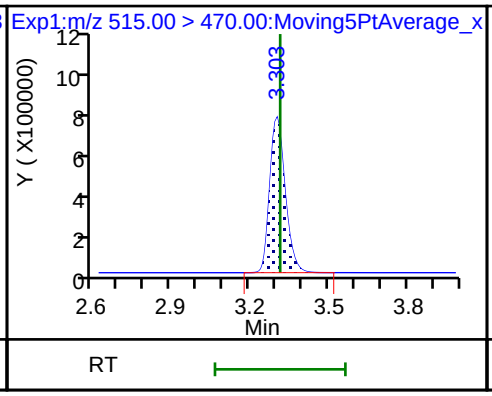
D 26 M2-8:2FTS



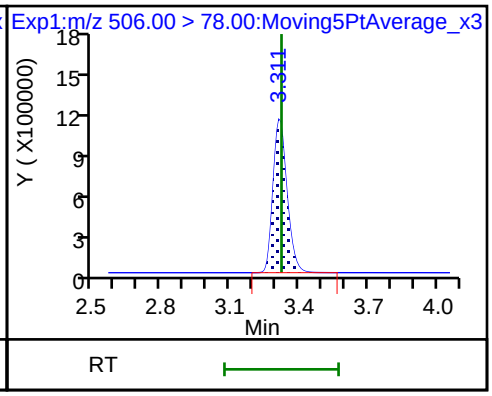
22 Perfluorooctane Sulfonamide



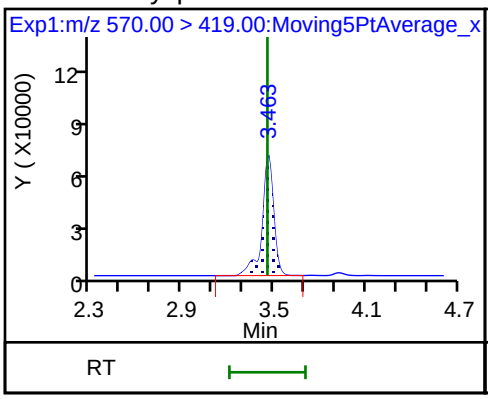
D 23 13C2 PFDA



D 21 13C8 FOSA



28 N-methyl perfluorooctane sulfonami



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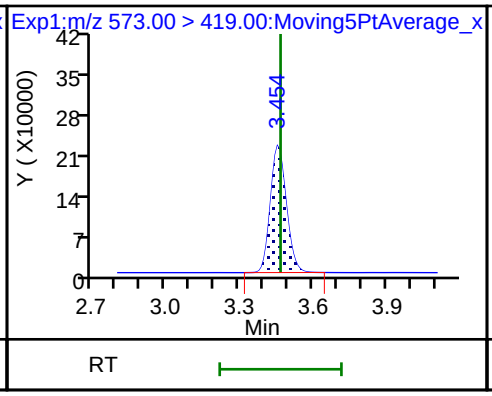
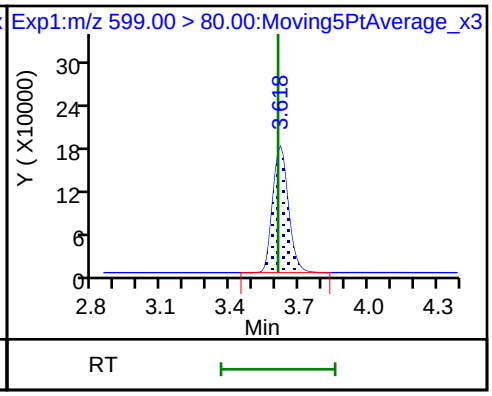
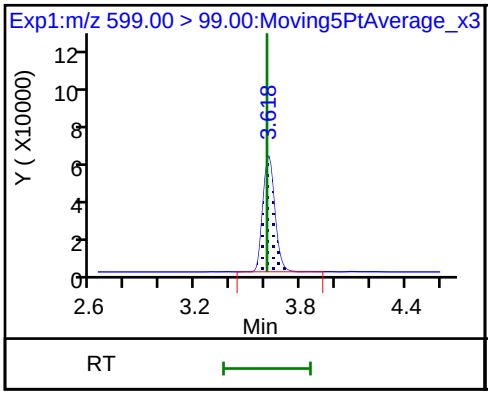


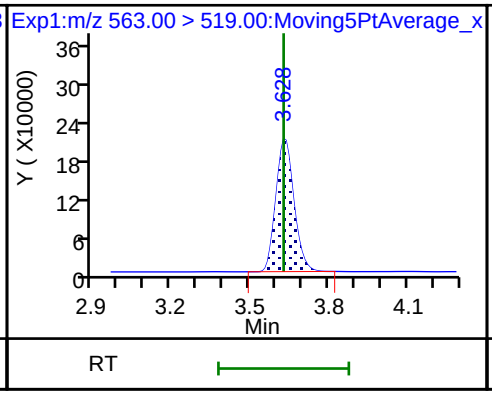
29 Perfluorodecane Sulfonic acid



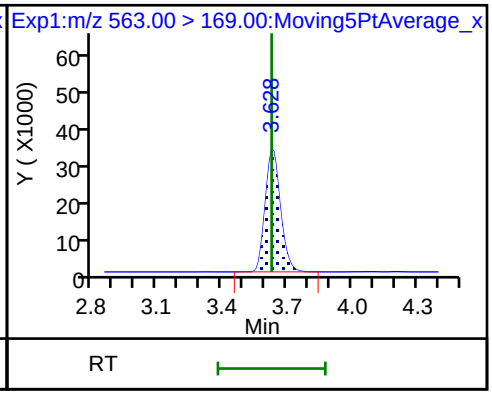
29 Perfluorodecane Sulfonic acid



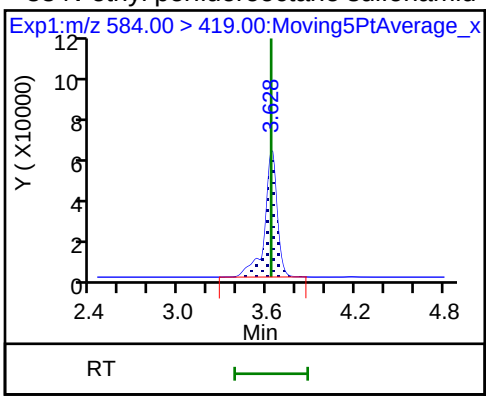
31 Perfluoroundecanoic acid



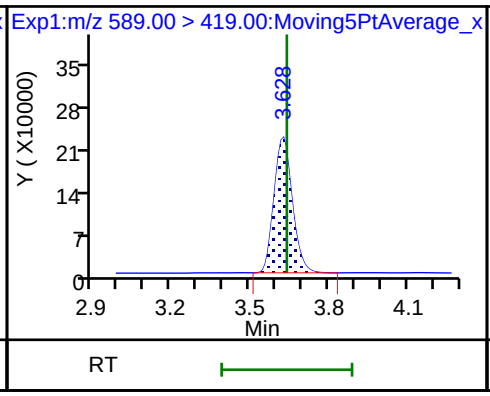
31 Perfluoroundecanoic acid



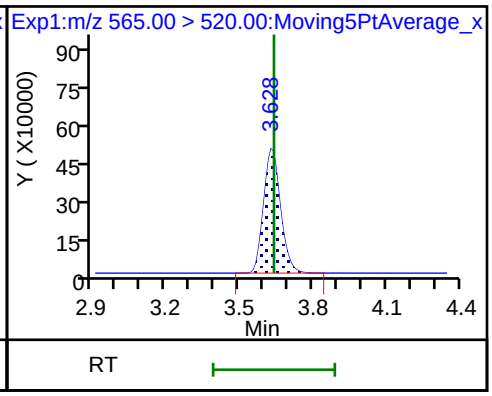
33 N-ethyl perfluorooctane sulfonamid



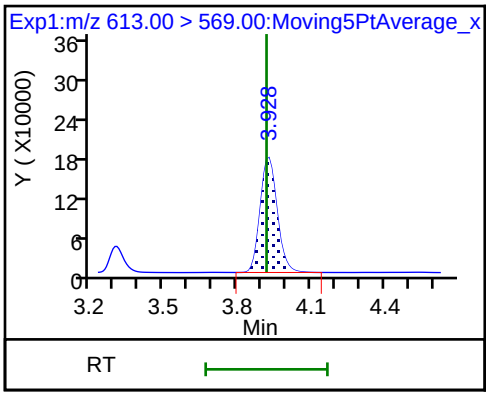
D 32 d5-NEtFOSAA



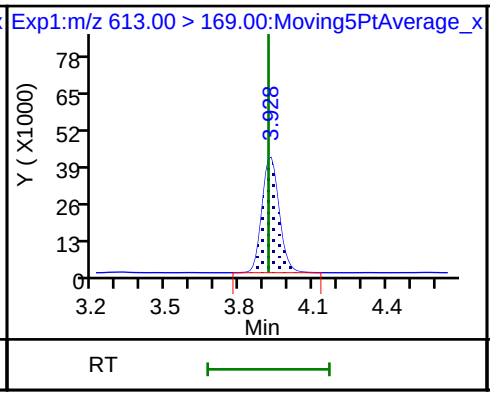
D 30 13C2 PFUnA



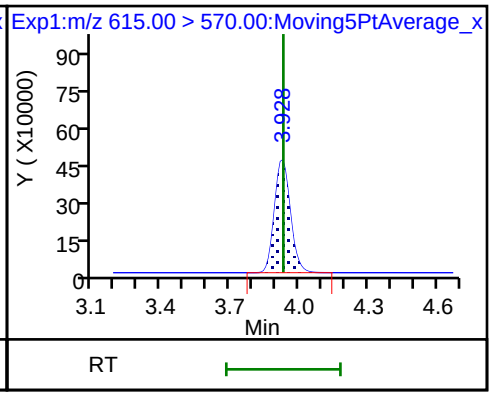
37 Perfluorododecanoic acid



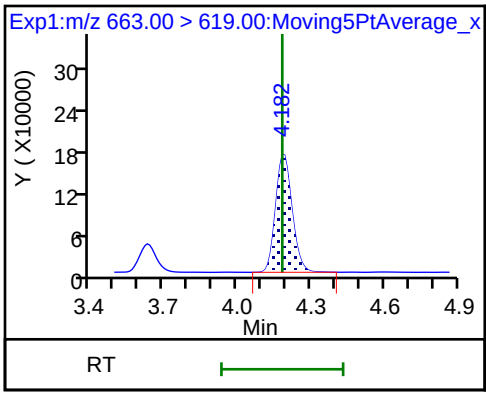
37 Perfluorododecanoic acid



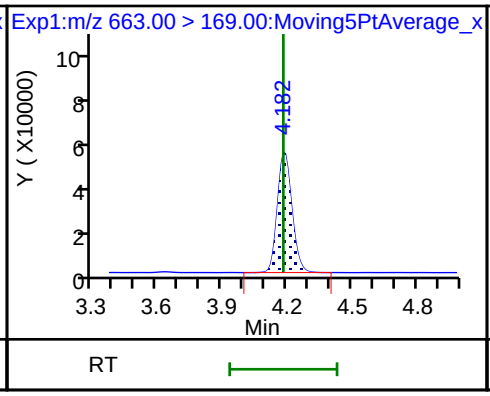
D 36 13C2 PFDoA



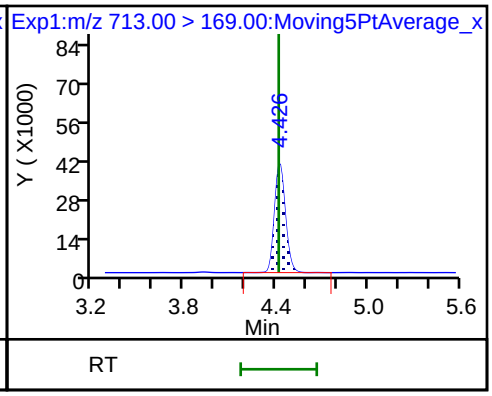
41 Perfluorotridecanoic acid



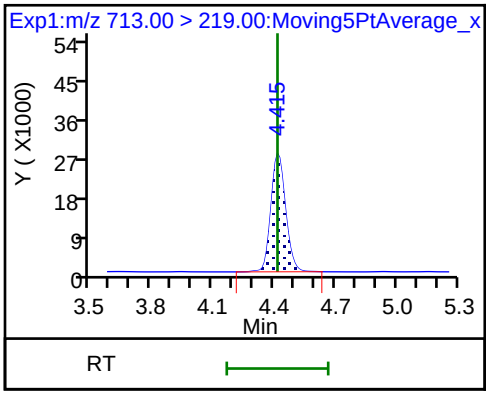
41 Perfluorotridecanoic acid



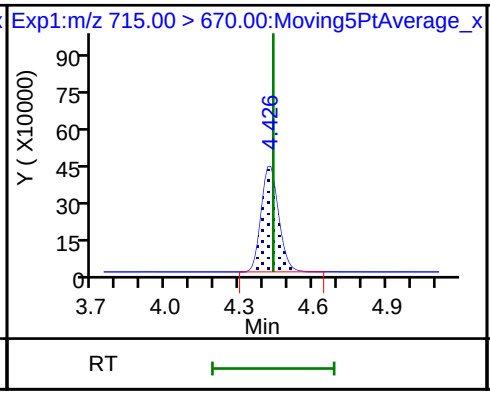
42 Perfluorotetradecanoic acid



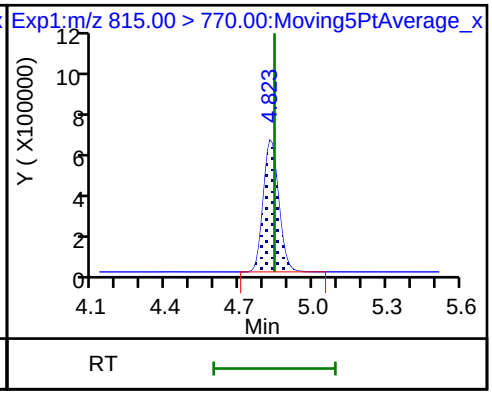
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-234634/2-A
Matrix: Water
Lab File ID: 2018.07.22LLA_039.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: 3535
Date Extracted: 07/18/2018 08:54
Sample wt/vol: 250(mL)
Date Analyzed: 07/22/2018 10:29
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235512
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	40.5		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	38.0		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	38.4		2.0	1.5	0.52
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.5		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	31.1		2.0	1.0	0.38
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34.7		4.0	3.0	1.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	90		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	93		50-150
STL00994	18O2 PFHxS	92		50-150
STL00991	13C4 PFOS	91		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_039.d
Lims ID: LCS 320-234634/2-A
Client ID:
Sample Type: LCS
Inject. Date: 22-Jul-2018 10:29:46 ALS Bottle#: 28 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-234634/2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:45:53 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:47:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.517	0.0	0.543	8991514	2.20		87.9	8222	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.517	0.0	1.000	3396112	0.9853		98.5	421	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.791	0.001	0.641	8342780	2.22		88.7	8678	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.792	0.0	1.000	3428187	0.9464		94.6	794	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.833	-0.007	0.653	99319	2.09		90.0	1097	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.834	1.834	0.0	1.005	4035631	0.8636		97.7	2629	
298.90 > 99.00	1.826	1.834	-0.008	1.000	1361293		2.96(1.35-4.05)		2072	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.046	0.0	1.120	796247	0.8683		93.0	8509	
D 7 13C2 PFHxA										
315.00 > 270.00	2.077	2.085	-0.008	0.743	8643797	2.19		87.6	14651	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.087	2.087	0.0	1.005	3051976	0.9328		93.3	1209	
313.00 > 119.00	2.087	2.087	0.0	1.005	222116		13.74(6.96-20.87)		826	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.108	2.108	0.0	1.155	1956469	0.8774		93.5	4325	
349.00 > 99.00	2.108	2.108	0.0	1.155	874313		2.24(1.15-3.45)		3420	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.181	2.189	-0.008	0.780	1055758	NC			5809	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.181	2.191	-0.010	1.000	693079	NC			372	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.433	-0.010	0.867	10220908	2.23		89.4	19327	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.423	2.436	-0.013	1.000	4552865	1.01		101	1111	
363.00 > 169.00	2.423	2.436	-0.013	1.000	1001305		4.55(2.17-6.52)		3390	
D 11 18O2 PFHxS										
403.00 > 84.00	2.436	2.446	-0.010	0.871	6050475	2.17		91.9	30259	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.436	2.448	-0.012	1.000	2648300	0.7770		85.4	4634	
399.00 > 99.00	2.436	2.448	-0.012	1.000	708264		3.74(1.90-5.70)		2053	
65 ADONA										
377.00 > 251.00	2.474	2.474	0.0	0.780	7340529	NC			13041	
377.00 > 85.00	2.474	2.474	0.0	0.780	3170739		2.32(1.05-3.16)		1661	
D 12 M2-6:2FTS										
429.00 > 81.00	2.764	2.776	-0.012	0.989	957731	2.24		94.3	3071	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.764	2.780	-0.016	1.000	809807	0.9204		97.1	12391	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10498649	2.50			20707	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	4224706	0.9511		95.0	611	
413.00 > 169.00	2.796	2.796	0.0	1.000	1472337		2.87(1.36-4.08)		3261	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	1.000	9640366	2.34		93.8	18788	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.812	2.812	0.0	0.887	2674968	0.9267		97.3	4022	
449.00 > 99.00	2.812	2.812	0.0	0.887	663837		4.03(1.84-5.53)		3275	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.171	0.0	1.000	2642030	0.8669		93.4	2578	
499.00 > 99.00	3.171	3.171	0.0	1.000	605863		4.36(2.04-6.12)		3721	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.141	8963592	2.32		92.8	18320	
D 18 13C4 PFOS										
503.00 > 80.00	3.171	3.185	-0.014	1.134	6470155	2.17		90.8	7373	
20 Perfluorononanoic acid										
463.00 > 419.00	3.190	3.190	0.0	1.000	3684724	0.9596		96.0	925	
463.00 > 169.00	3.171	3.190	-0.019	0.994	674576		5.46(2.68-8.03)		2181	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.386	3.386	0.0	1.068	3109538	NC			7467	
D 21 13C8 FOSA										
506.00 > 78.00	3.516	3.529	-0.013	1.258	3543972	2.10		84.2	10606	
D 26 M2-8:2FTS										
529.00 > 81.00	3.531	3.529	0.002	1.263	128555	2.20		91.9	1803	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.531	3.532	-0.001	1.000	768852	0.9012		94.1	2674	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.531	3.532	-0.001	1.004	4471757	1.03		103	6338	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.531	3.532	-0.001	1.114	865935	0.8155		85.0	2428	
549.00 > 99.00	3.531	3.532	-0.001	1.114	301650		2.87(1.42-4.26)		1253	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.546	3.544	0.002	1.268	9494417	2.37		94.6	20721	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.546	3.546	0.0	1.000	4402729	0.9878		98.8	1086	
513.00 > 169.00	3.546	3.546	0.0	1.000	293167		15.02(7.12-21.35)		1662	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.685	3.698	-0.013	1.318	4093608	2.17		86.7	9315	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.699	3.699	0.0	1.004	1627166	0.9601		96.0	894	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.855	3.855	0.0	1.379	3474681	2.30		91.9	6022	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.840	3.855	-0.015	1.211	2264946	0.8955		92.9	3898	
599.00 > 99.00	3.840	3.855	-0.015	1.211	490125		4.62(2.14-6.43)		3924	
D 30 13C2 PFUnA										
565.00 > 520.00	3.870	3.869	0.001	1.384	8772751	2.39		95.8	26276	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.855	3.870	-0.015	1.000	1241164	0.8900		89.0	2443	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.870	3.870	0.0	1.000	3229963	0.9481		94.8	940	
563.00 > 169.00	3.870	3.870	0.0	1.000	290176		11.13(5.24-15.72)		2424	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.008	4.024	-0.016	1.264	3777058	NC			11742	
D 36 13C2 PFDoA										
615.00 > 570.00	4.152	4.151	0.001	1.485	8852252	2.25		90.0	28296	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.152	4.152	0.0	1.000	3747417	0.9807		98.1	952	
613.00 > 169.00	4.152	4.152	0.0	1.000	384644		9.74(4.68-14.05)		1564	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.412	4.412	0.0	1.063	3185770	0.8991		89.9	1163	
663.00 > 169.00	4.412	4.412	0.0	1.063	478347		6.66(3.09-9.27)		1588	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.652	4.651	0.001	1.664	6970619	2.05		81.9	19185	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.652	4.652	0.0	1.000	437563	0.9113		91.1	1193	
713.00 > 219.00	4.652	4.652	0.0	1.000	291728		1.50(0.70-2.09)		982	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.070	5.070	0.0	1.813	5518296	1.58		63.0	7106	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.070	5.070	0.0	1.000	2045254	NC			341	
813.00 > 169.00	5.070	5.070	0.0	1.000	352330		5.80(2.77-8.32)		645	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.427	-0.014	1.068	821951	NC			207	
913.00 > 169.00	5.413	5.427	-0.014	1.068	152450		5.39(2.55-7.64)		789	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 25-Jul-2018 09:47:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_039.d

Injection Date: 22-Jul-2018 10:29:46 Instrument ID: A9

Lims ID: LCS 320-234634/2-A

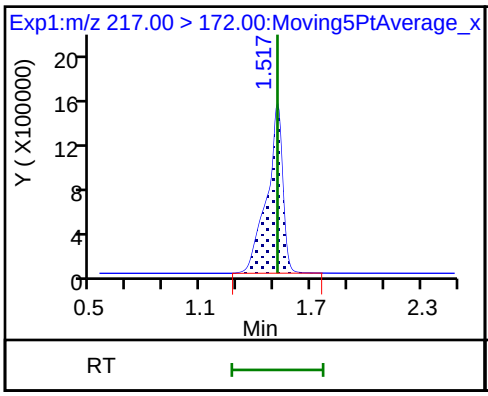
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 28 Worklist Smp#: 3

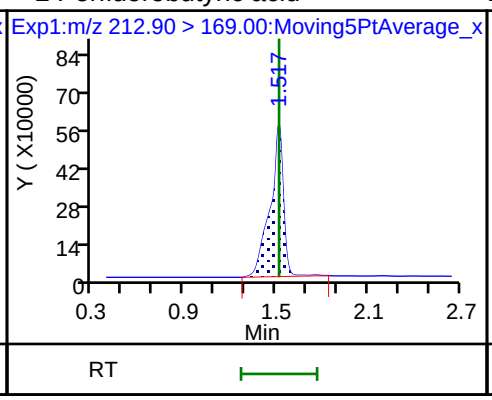
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

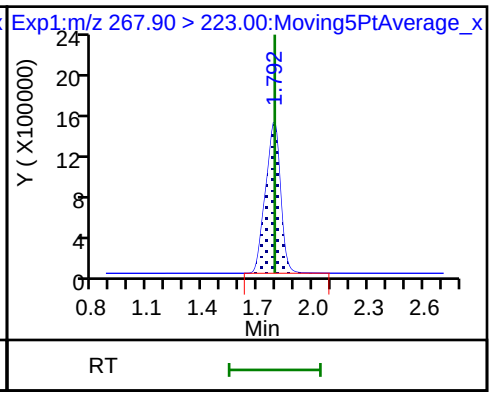
D 1 13C4 PFBA



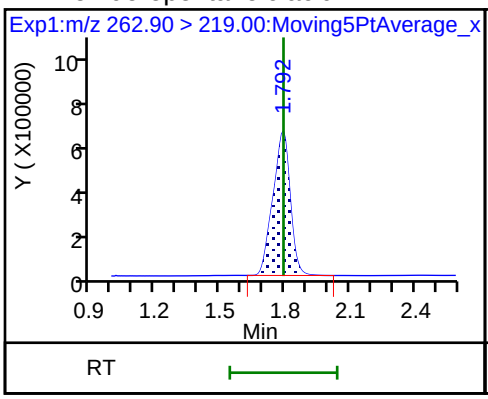
2 Perfluorobutyric acid



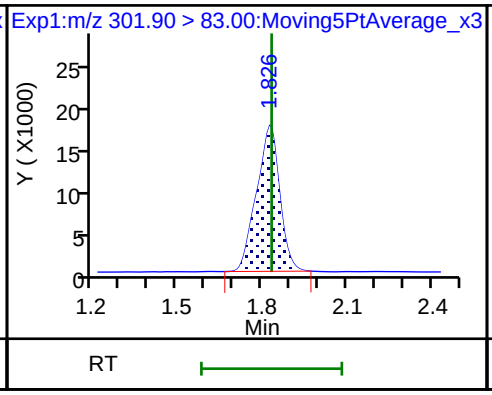
D 3 13C5-PFPeA



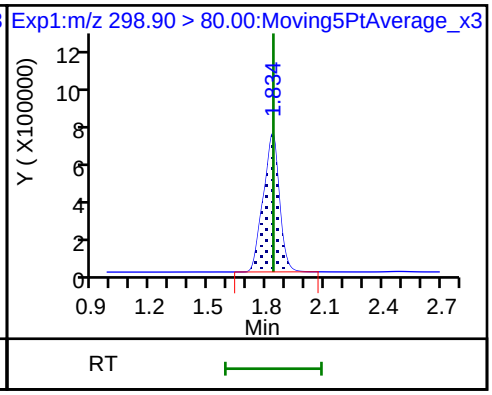
4 Perfluoropentanoic acid



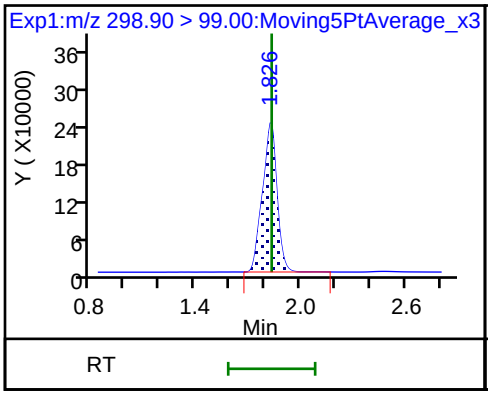
D 47 13C3-PFBS



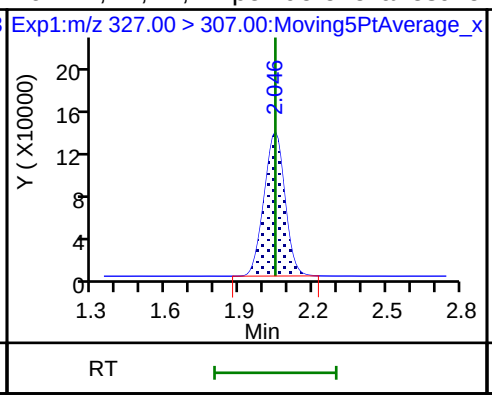
5 Perfluorobutanesulfonic acid



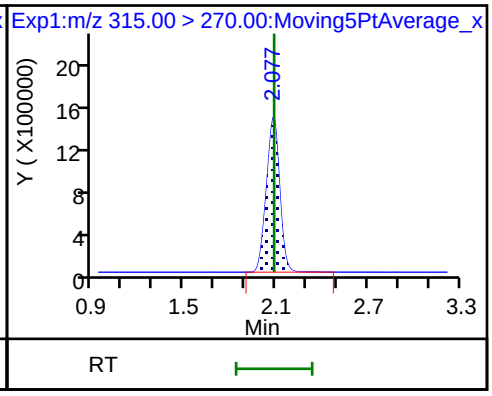
5 Perfluorobutanesulfonic acid



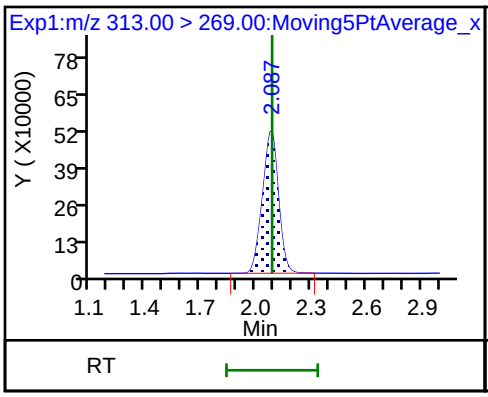
61 1H,1H,2H,2H-perfluorohexanesulfon



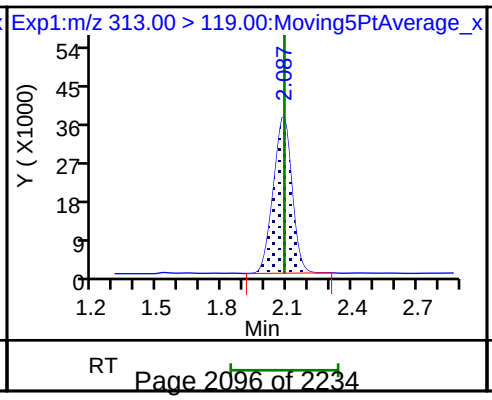
D 7 13C2 PFHxA



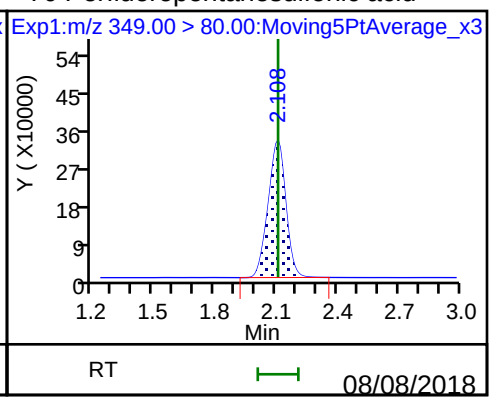
6 Perfluorohexanoic acid



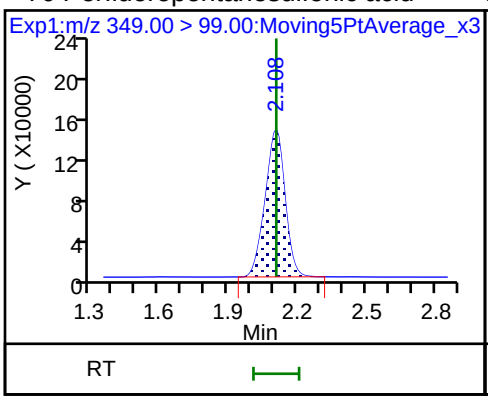
6 Perfluorohexanoic acid



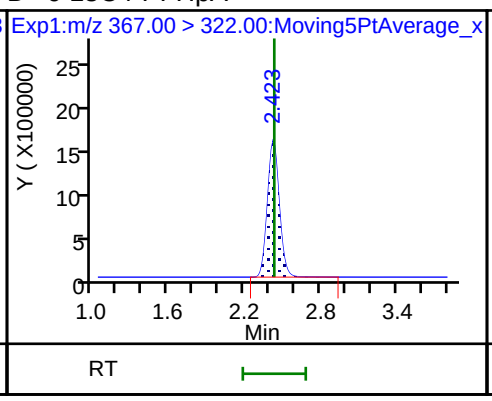
70 Perfluoropentanesulfonic acid



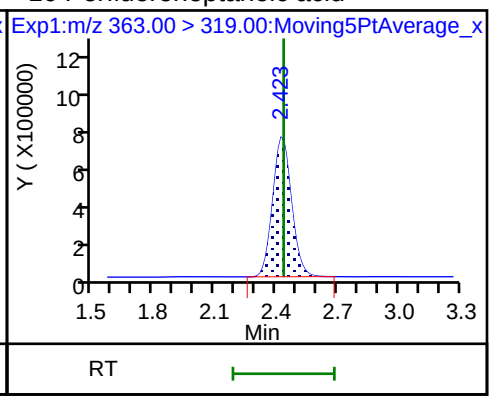
70 Perfluoropentanesulfonic acid



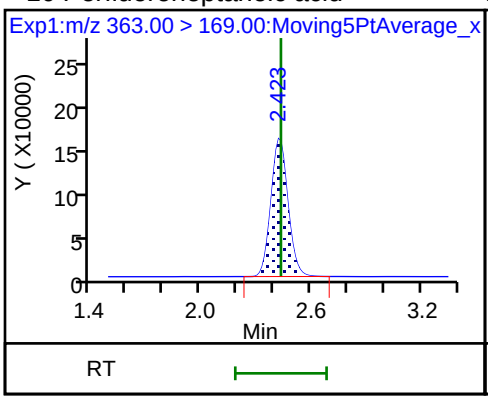
D 9 13C4-PFHpA



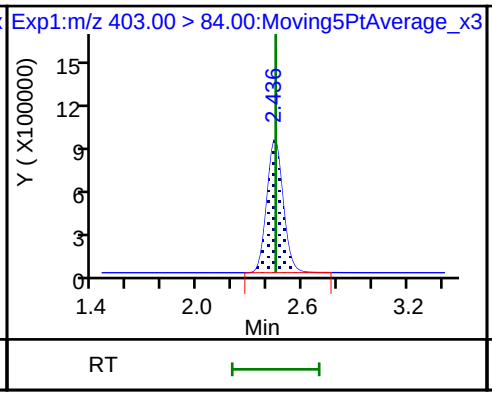
10 Perfluoroheptanoic acid



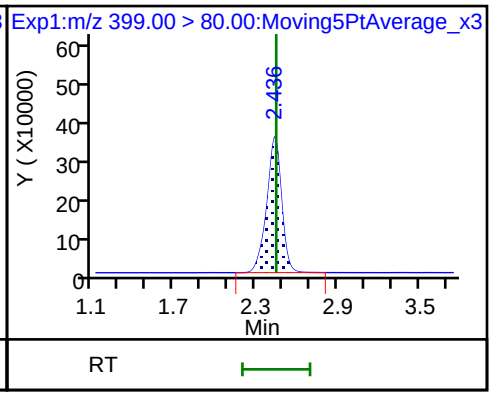
10 Perfluoroheptanoic acid



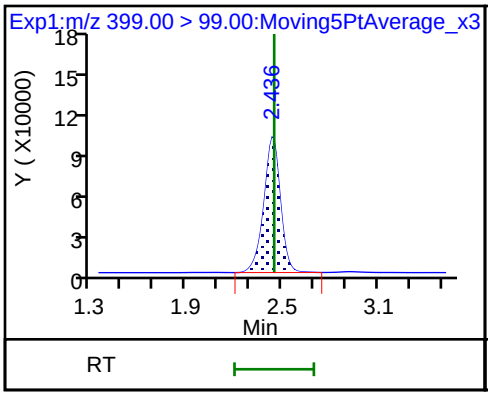
D 11 18O2 PFHxS



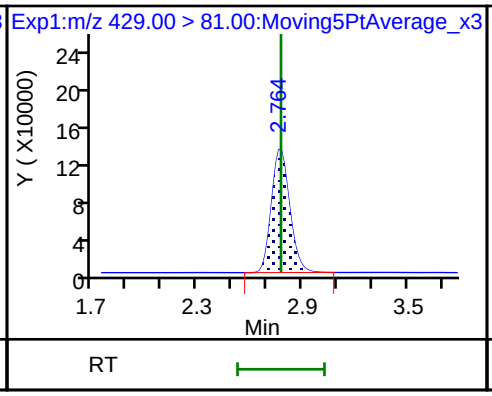
8 Perfluorohexanesulfonic acid



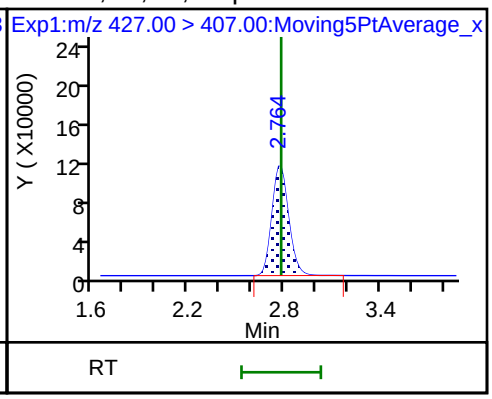
8 Perfluorohexanesulfonic acid



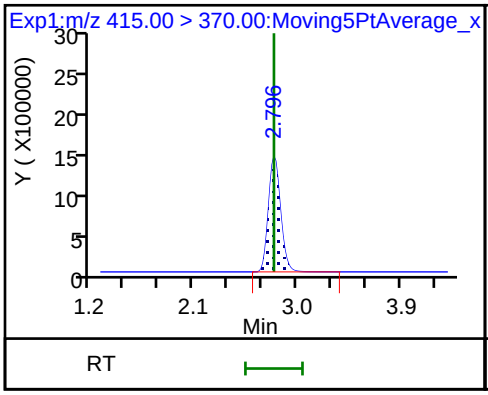
D 12 M2-6:2FTS



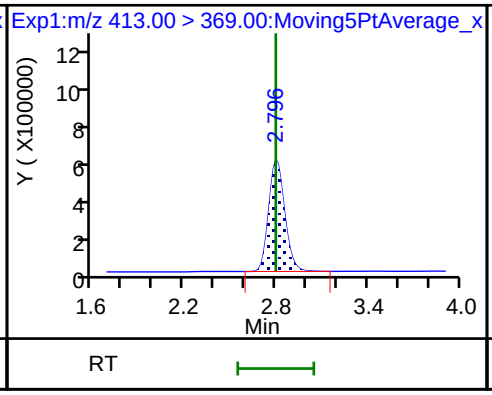
13 1H,1H,2H,2H-perfluorooctanesulfoni



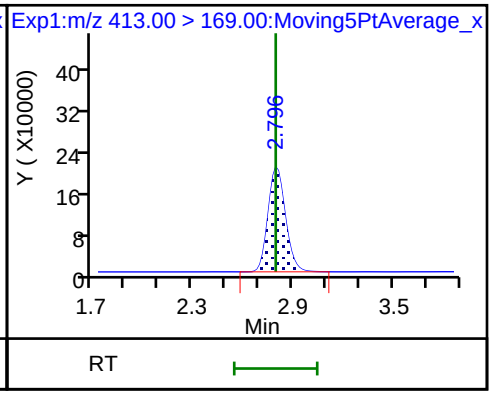
* 62 13C2-PFOA



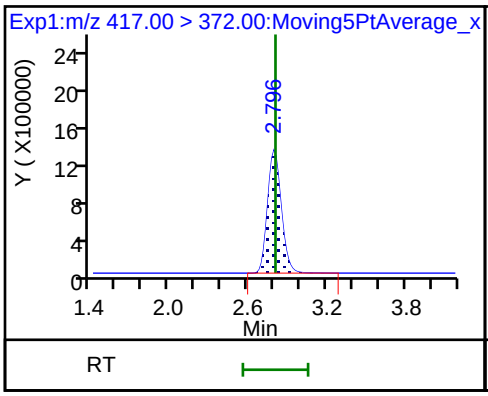
15 Perfluorooctanoic acid



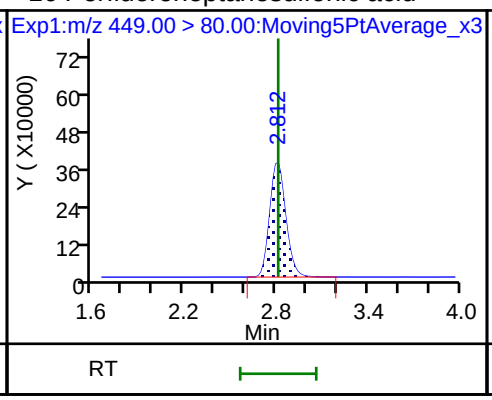
15 Perfluorooctanoic acid



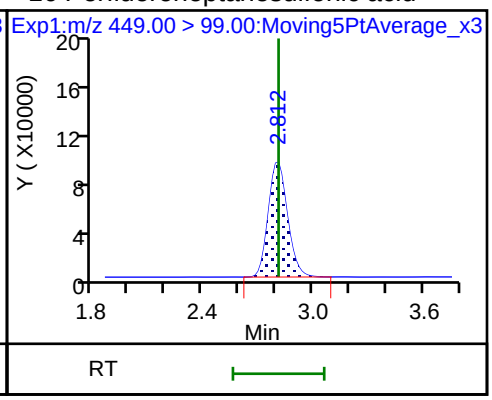
D 14 13C4 PFOA



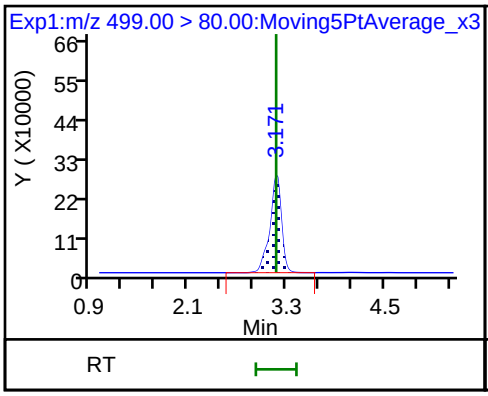
16 Perfluoroheptanesulfonic acid



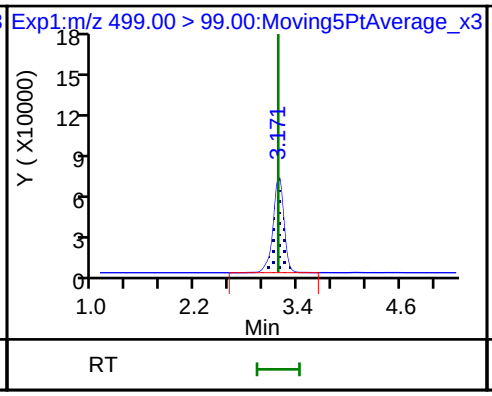
16 Perfluoroheptanesulfonic acid



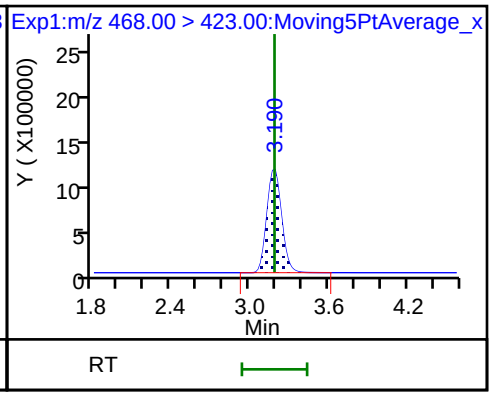
17 Perfluorooctane sulfonic acid



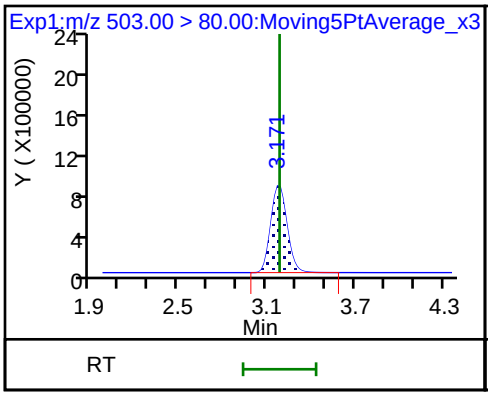
17 Perfluorooctane sulfonic acid



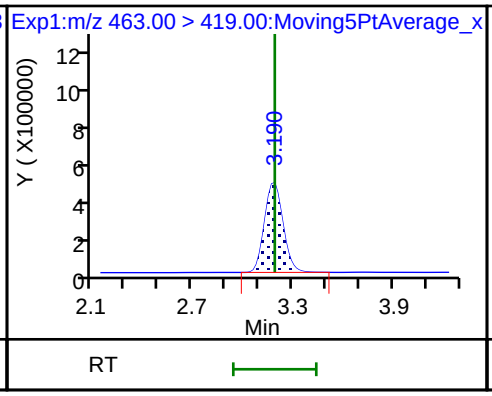
D 19 13C5 PFNA



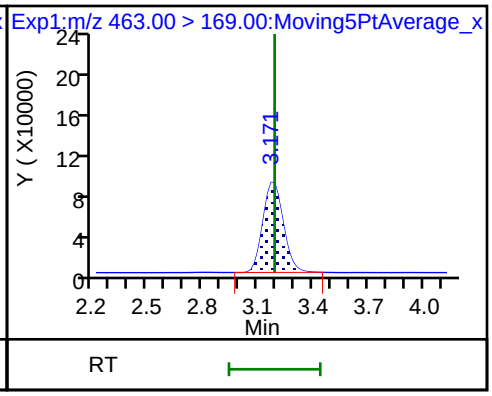
D 18 13C4 PFOS



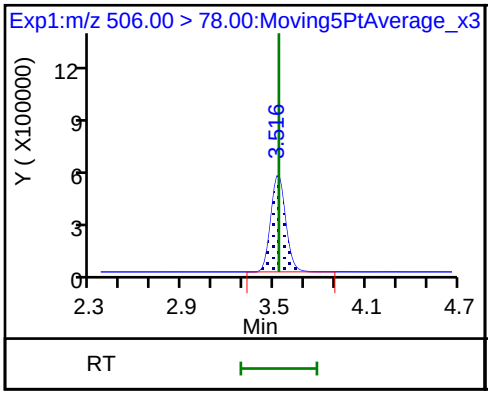
20 Perfluorononanoic acid



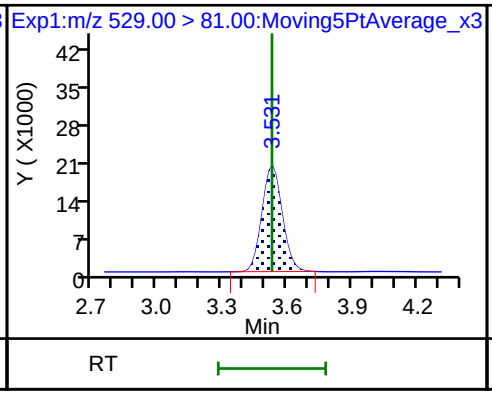
20 Perfluorononanoic acid



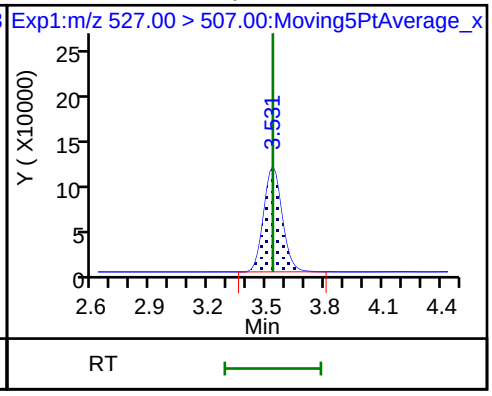
D 21 13C8 FOSA



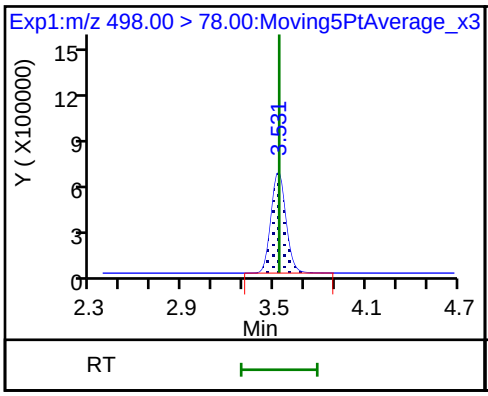
D 26 M2-8:2FTS



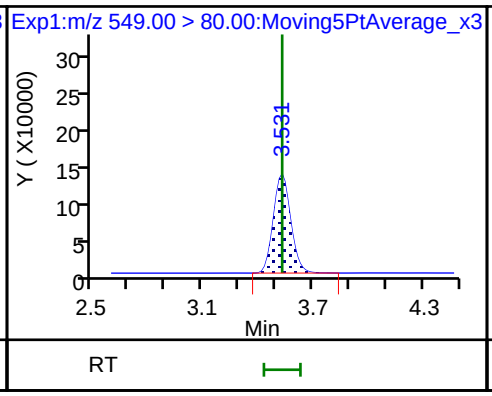
25 1H,1H,2H,2H-perfluorodecanesulfoni



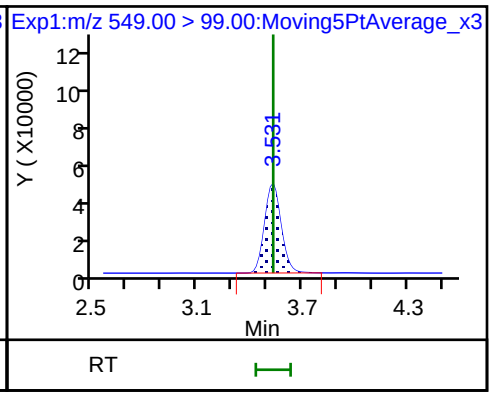
22 Perfluorooctane Sulfonamide



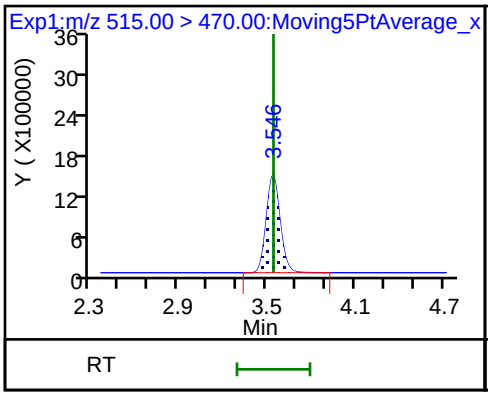
68 Perfluorononanesulfonic acid



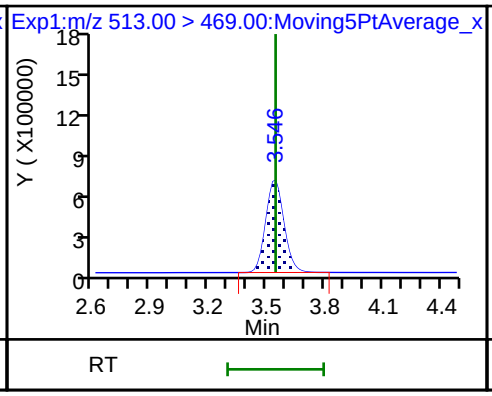
68 Perfluorononanesulfonic acid



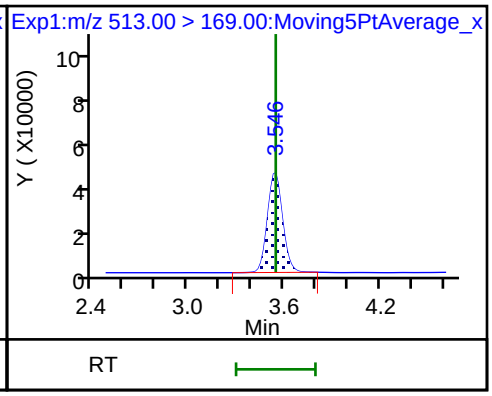
D 23 13C2 PFDA



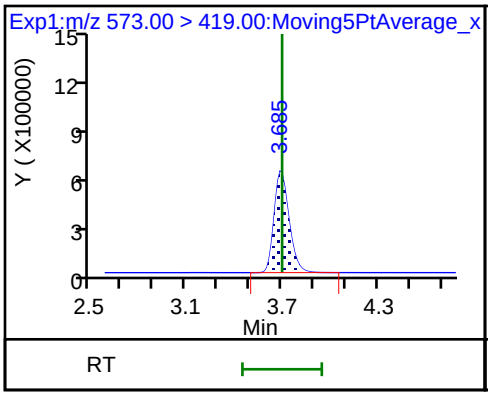
24 Perfluorodecanoic acid



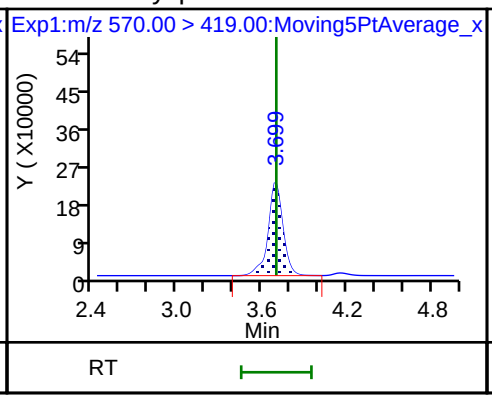
24 Perfluorodecanoic acid



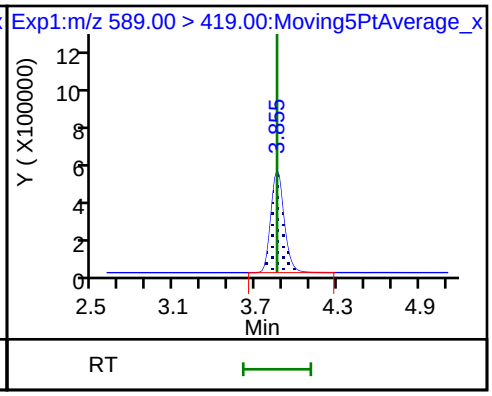
D 27 d3-NMeFOSAA



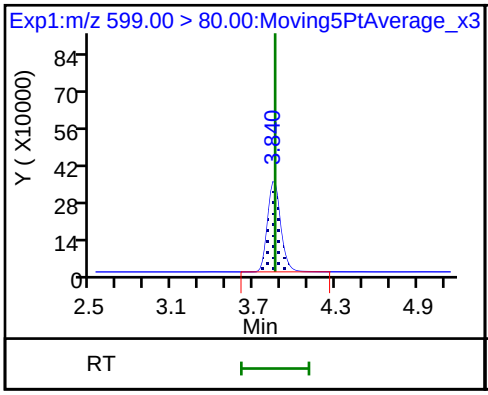
28 N-methyl perfluorooctane sulfonami



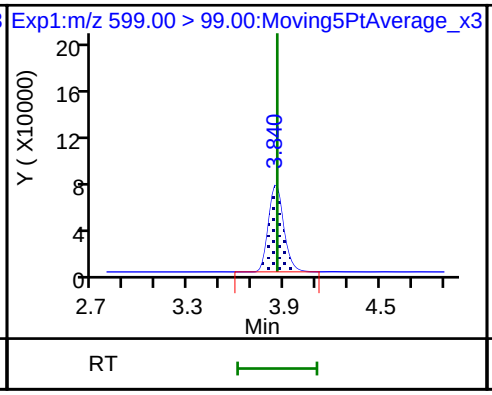
D 32 d5-NEtFOSAA



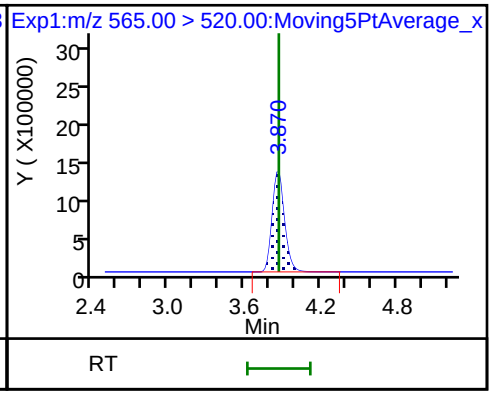
29 Perfluorodecane Sulfonic acid



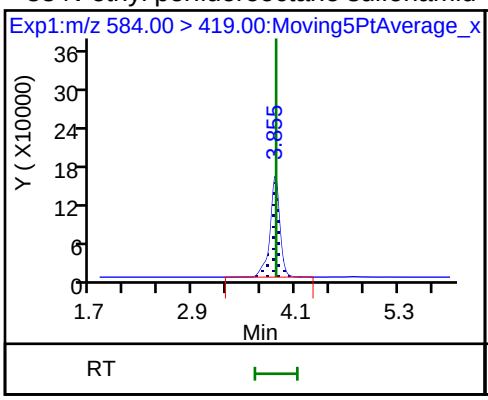
29 Perfluorodecane Sulfonic acid



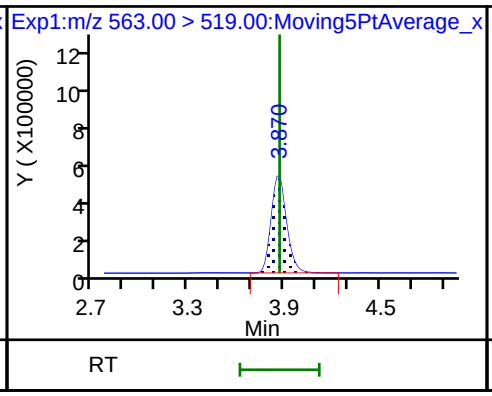
D 30 13C2 PFUnA



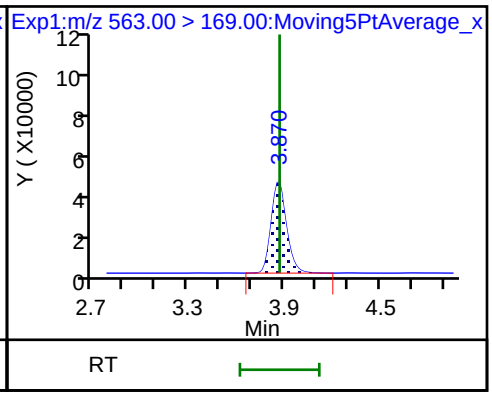
33 N-ethyl perfluorooctane sulfonamid



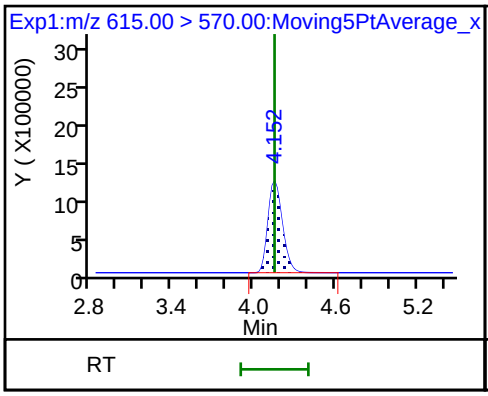
31 Perfluoroundecanoic acid



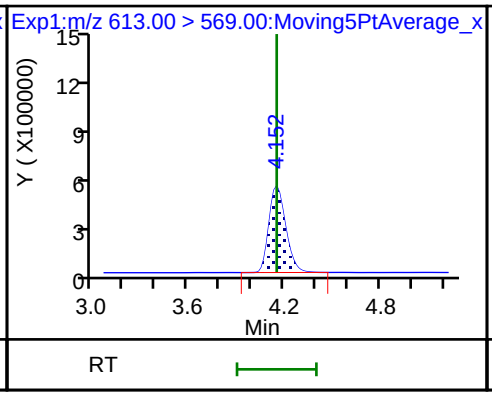
31 Perfluoroundecanoic acid



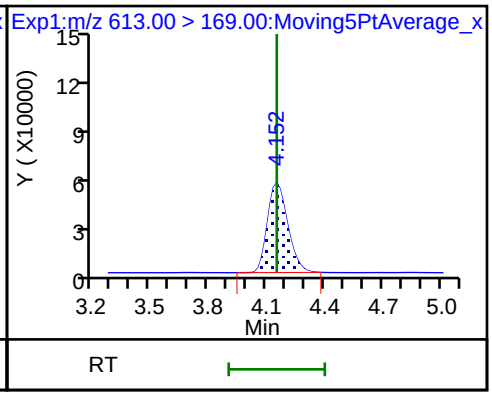
D 36 13C2 PFDoA



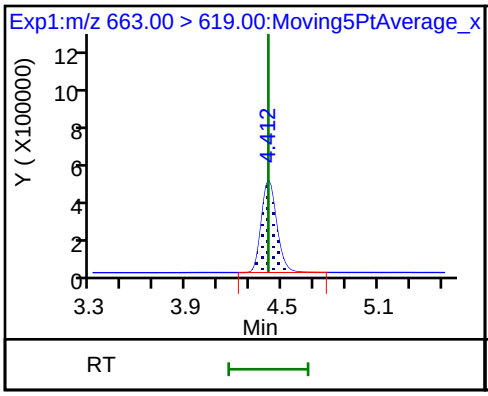
37 Perfluorododecanoic acid



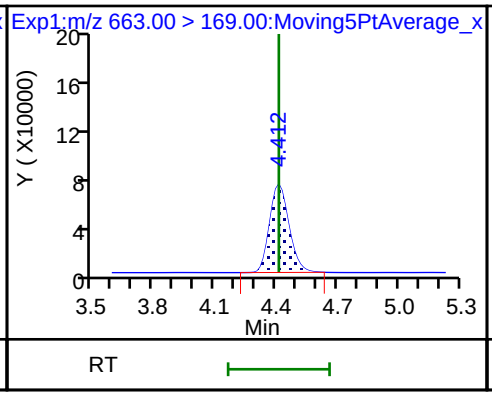
37 Perfluorododecanoic acid



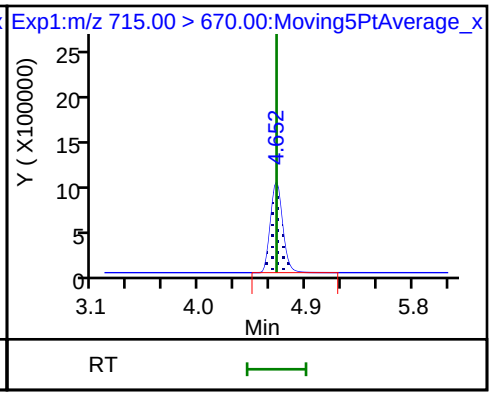
41 Perfluorotridecanoic acid



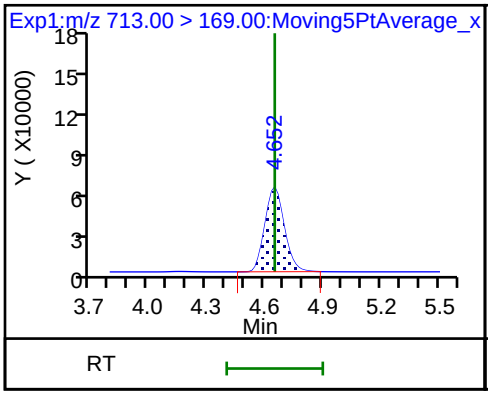
41 Perfluorotridecanoic acid



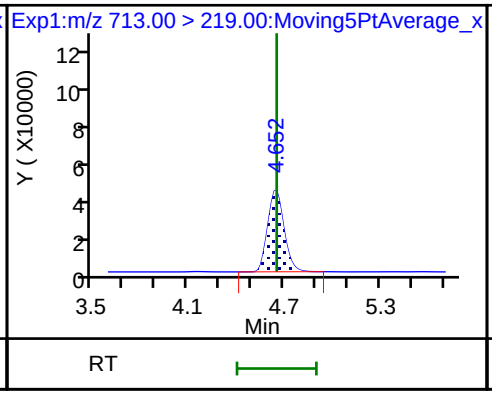
D 43 13C2-PFTeDA



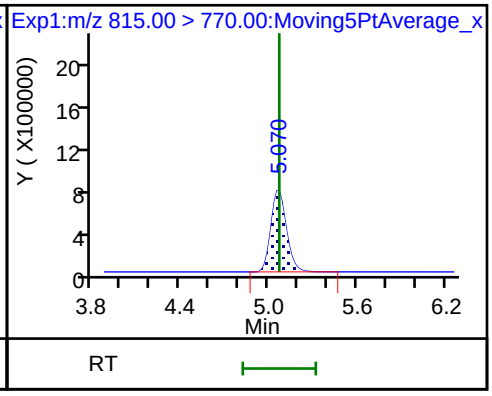
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-234662/2-A
Matrix: Solid
Lab File ID: 2018.07.28LLB_016.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: SHAKE
Date Extracted: 07/18/2018 10:19
Sample wt/vol: 5.00(g)
Date Analyzed: 07/29/2018 01:16
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236778
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.77		0.30	0.20	0.078
335-67-1	Perfluorooctanoic acid (PFOA)	1.75		0.30	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.71		0.30	0.20	0.081
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.55		0.40	0.18	0.059
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.43		0.30	0.20	0.062
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.67		1.0	0.50	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	101		50-150
STL01892	13C4-PFHpA	97		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	102		50-150
STL00991	13C4 PFOS	99		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_016.d
Lims ID: LCS 320-234662/2-A
Client ID:
Sample Type: LCS
Inject. Date: 29-Jul-2018 01:16:35 ALS Bottle#: 9 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-234662/2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 15:55:58 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 15:55:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.391	1.397	-0.006	1.000	1816455	0.8677		86.8	749	M
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.397	-0.006	0.539	5325137	2.62		105	120539	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.633	0.0	0.632	3733734	2.63		105	68751	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.641	-0.008	1.000	1529444	0.8556		85.6	731	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.667	-0.001	0.646	87154	2.34		101	573	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.676	-0.010	1.000	2300372	0.7729		87.4	6649	
298.90 > 99.00	1.666	1.676	-0.010	1.000	959209		2.40(1.25-3.74)		3581	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.867	1.877	-0.010	1.120	380616	0.5940		63.6	17300	
D 7 13C2 PFHxA										
315.00 > 270.00	1.896	1.905	-0.009	0.734	4035383	2.42		96.9	79022	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.896	1.906	-0.010	1.000	1462727	0.8550		85.5	3599	
313.00 > 119.00	1.896	1.906	-0.010	1.000	135908		10.76(5.03-15.10)		3409	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.917	1.928	-0.011	1.150	2146513	0.8038		85.7	41001	
349.00 > 99.00	1.917	1.928	-0.011	1.150	821451		2.61(1.36-4.07)		7123	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.993	2.002	-0.009	0.772	351105	NC			15314	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.993	2.004	-0.011	1.000	287050	NC			1040	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.228	-0.009	0.859	4144882	2.41		96.6	78825	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.230	-0.011	1.000	1615932	0.8840		88.4	3904	
363.00 > 169.00	2.219	2.230	-0.011	1.000	611835		2.64(1.13-3.40)		8036	
D 11 18O2 PFHxS										
403.00 > 84.00	2.230	2.240	-0.010	0.864	5330104	2.42		102	74882	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.230	2.242	-0.012	1.000	1880152	0.7151		78.6	14475	
399.00 > 99.00	2.230	2.242	-0.012	1.000	633917		2.97(1.50-4.49)		1848	
65 ADONA										
377.00 > 251.00	2.268	2.268	0.0	0.771	4329162	NC			61018	
377.00 > 85.00	2.268	2.268	0.0	0.771	2496859		1.73(0.84-2.53)		10282	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.557	-0.001	1.004	456794	0.8586		90.6	6186	
D 12 M2-6:2FTS										
429.00 > 81.00	2.547	2.564	-0.017	0.987	749019	1.56		65.8	11473	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.582	-0.001		4388705	2.50			54392	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.582	-0.001	1.003	1661865	0.8755		87.5	2310	
413.00 > 169.00	2.581	2.582	-0.001	1.003	861200		1.93(0.84-2.52)		3935	
D 14 13C4 PFOA										
417.00 > 372.00	2.573	2.588	-0.015	0.997	3910359	2.33		93.1	54610	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.590	-0.009	0.877	1685299	0.8002		84.1	29650	
449.00 > 99.00	2.581	2.590	-0.009	0.877	478096		3.53(1.94-5.82)		3890	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.947	-0.004	1.140	3638642	2.37		99.3	51250	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.947	-0.004	1.140	3705485	2.56		102	94696	
20 Perfluorononanoic acid										
463.00 > 419.00	2.943	2.948	-0.005	1.000	1442662	0.8525		85.3	5738	
463.00 > 169.00	2.943	2.948	-0.005	1.000	336511		4.29(1.90-5.69)		18444	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.943	2.948	-0.005	1.000	1406632	0.8361		90.1	25528	
499.00 > 99.00	2.943	2.948	-0.005	1.000	326115		4.31(2.31-6.93)		3878	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.158	3.164	-0.006	1.073	2280837	NC			21258	
D 26 M2-8:2FTS										
529.00 > 81.00	3.286	3.298	-0.012	1.273	1181632	2.36		98.7	20757	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.286	3.300	-0.014	1.000	534437	0.7990		83.4	11001	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.294	3.300	-0.006	1.119	973454	0.8561		89.2	20713	
549.00 > 99.00	3.286	3.300	-0.014	1.116	372538		2.61(1.33-3.97)		3250	
D 23 13C2 PFDA										
515.00 > 470.00	3.301	3.314	-0.013	1.279	3193244	2.77		111	71880	
D 21 13C8 FOSA										
506.00 > 78.00	3.309	3.314	-0.005	1.282	4864526	2.16		86.4	61194	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.301	3.315	-0.014	1.000	1162999	0.8853		88.5	6783	
513.00 > 169.00	3.301	3.315	-0.014	1.000	197351		5.89(2.36-7.09)		8147	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.309	3.315	-0.006	1.000	1675997	0.8661		86.6	28541	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.452	3.466	-0.014	1.337	1078813	2.83		113	33563	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.461	3.469	-0.008	1.003	378331	0.8896		89.0	3313	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.616	3.624	-0.008	1.229	874635	0.8663		89.9	23177	
599.00 > 99.00	3.616	3.624	-0.008	1.229	274183		3.19(1.39-4.16)		4824	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.626	3.629	-0.003	1.405	1253648	3.13		125	4053	
D 30 13C2 PFUnA										
565.00 > 520.00	3.635	3.639	-0.004	1.408	2516547	2.71		108	65866	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.635	3.643	-0.008	1.000	1035418	0.8289		82.9	4112	
563.00 > 169.00	3.635	3.643	-0.008	1.000	175958		5.88(2.12-6.36)		7215	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.626	3.643	-0.017	1.000	367040	0.7845		78.5	10225	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.790	3.799	-0.009	1.288	3543689	NC			52941	
D 36 13C2 PFDoA										
615.00 > 570.00	3.926	3.930	-0.004	1.521	2268773	2.57		103	21687	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.926	3.935	-0.009	1.000	858964	0.8748		87.5	244	
613.00 > 169.00	3.926	3.935	-0.009	1.000	216567		3.97(2.13-6.40)		4148	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.190	4.199	-0.009	1.067	852652	0.8945		89.4	246	
663.00 > 169.00	4.190	4.199	-0.009	1.067	260416		3.27(1.25-3.76)		3524	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.425	4.435	-0.010	1.000	211191	0.9536		95.4	3101	
713.00 > 219.00	4.415	4.435	-0.020	0.998	145881		1.45(0.71-2.13)		2471	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.437	-0.012	1.714	2208433	2.56		102	16798	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.832	4.840	-0.008	1.000	1110461	NC			179	
813.00 > 169.00	4.832	4.840	-0.008	1.000	189443		5.86(2.86-8.58)		1835	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.832	4.842	-0.010	1.872	3434703	2.62		105	13510	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.180	-0.007	1.070	1047106	NC			188	
913.00 > 169.00	5.173	5.180	-0.007	1.070	130938		8.00(3.83-11.48)		1690	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 30-Jul-2018 15:55:59 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_016.d

Injection Date: 29-Jul-2018 01:16:35 Instrument ID: A8_N

Lims ID: LCS 320-234662/2-A

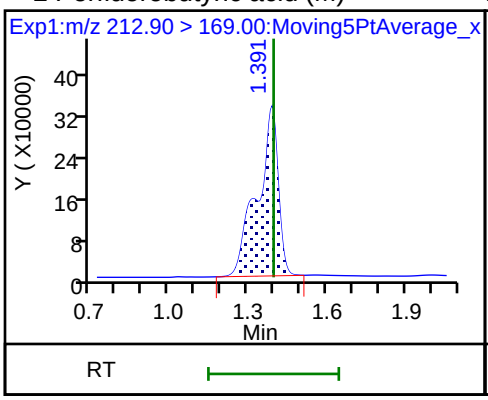
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 9 Worklist Smp#: 3

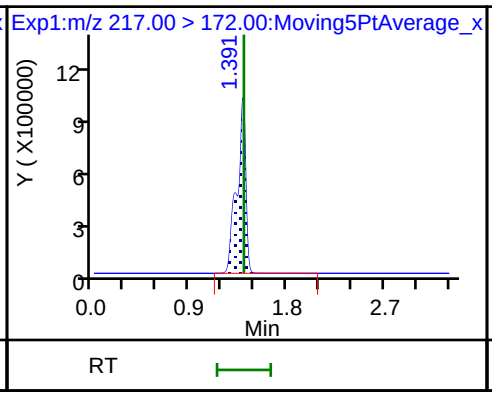
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

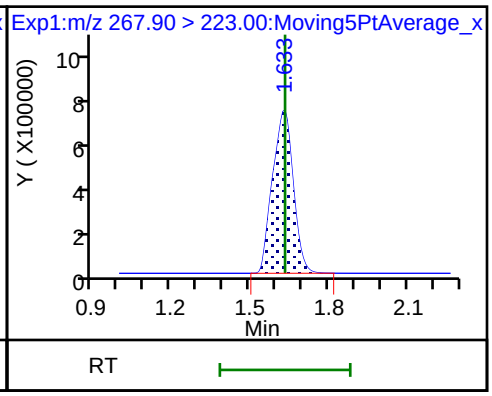
2 Perfluorobutyric acid (M)



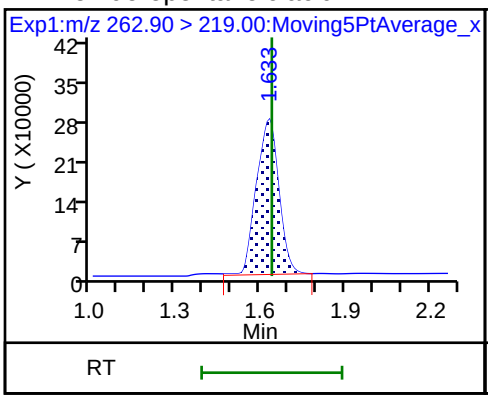
D 1 13C4 PFBA



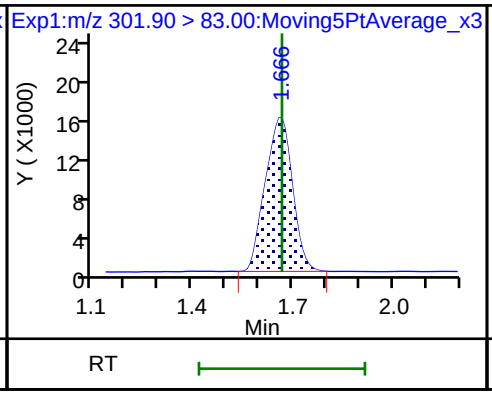
D 3 13C5-PFPeA



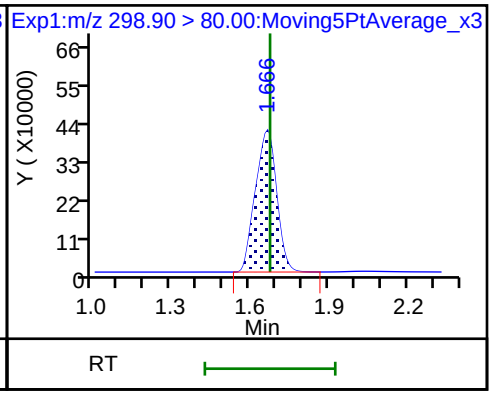
4 Perfluoropentanoic acid



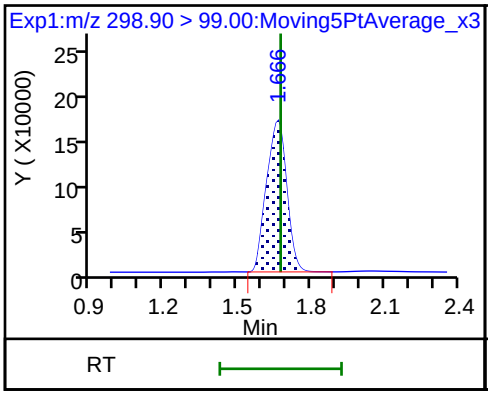
D 47 13C3-PFBS



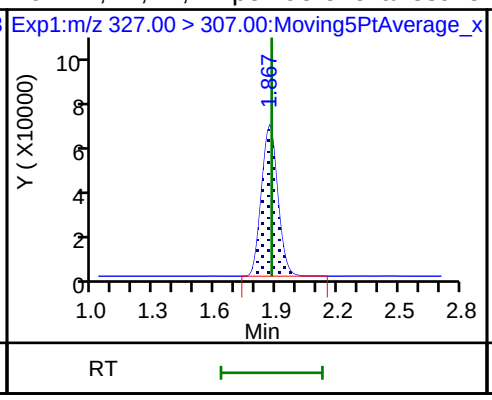
5 Perfluorobutanesulfonic acid



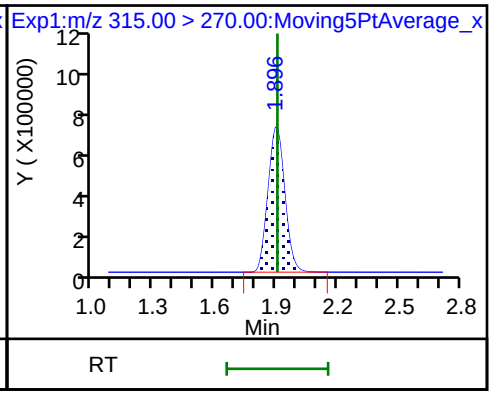
5 Perfluorobutanesulfonic acid



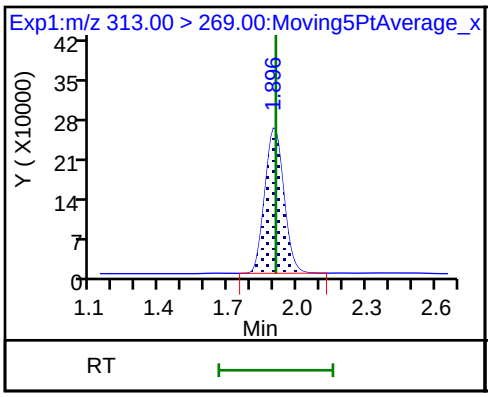
61 1H,1H,2H,2H-perfluorohexanesulfon



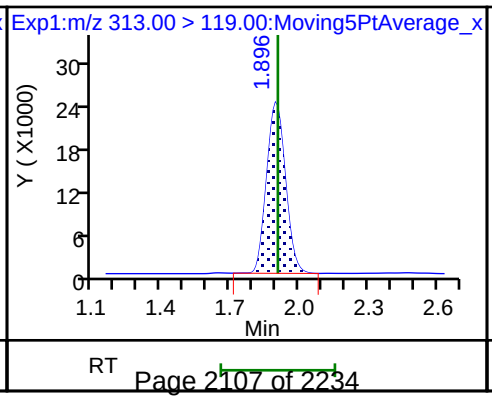
D 7 13C2 PFHxA



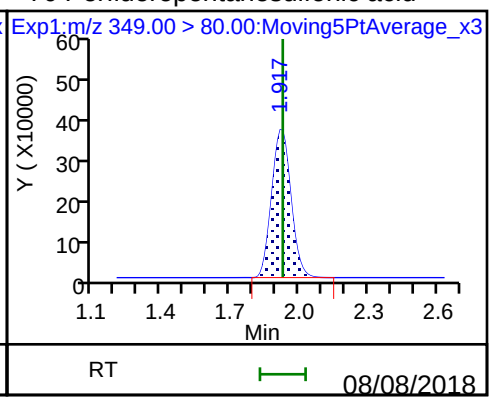
6 Perfluorohexanoic acid



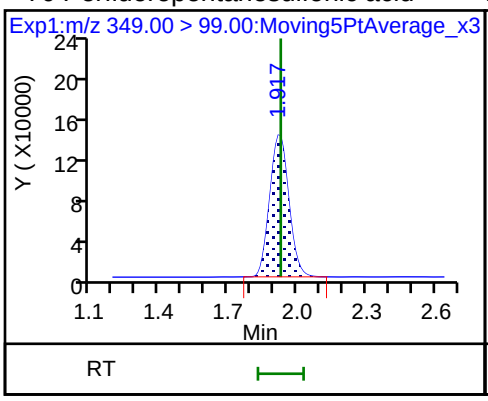
6 Perfluorohexanoic acid



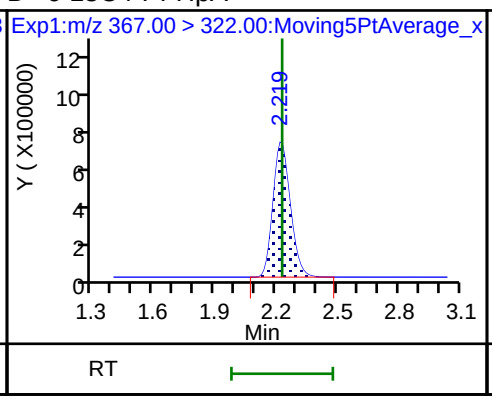
70 Perfluoropentanesulfonic acid



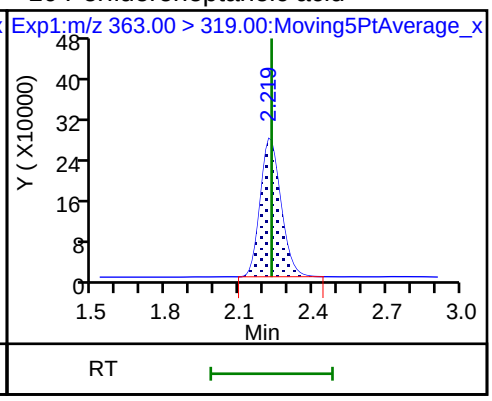
70 Perfluoropentanesulfonic acid



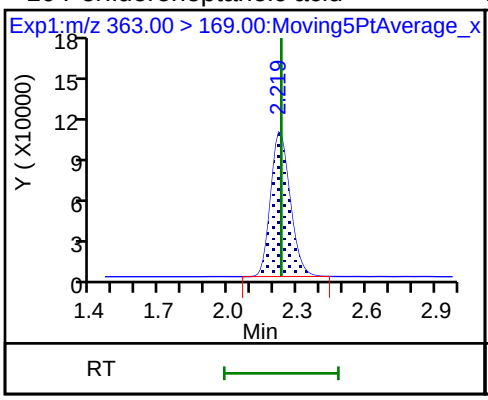
D 9 13C4-PFHpA



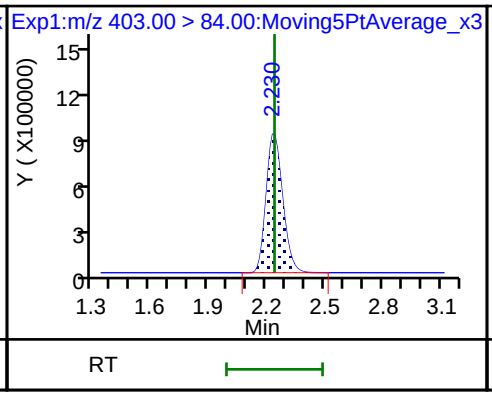
10 Perfluoroheptanoic acid



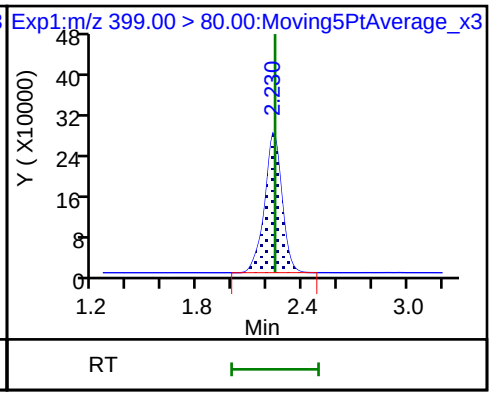
10 Perfluoroheptanoic acid



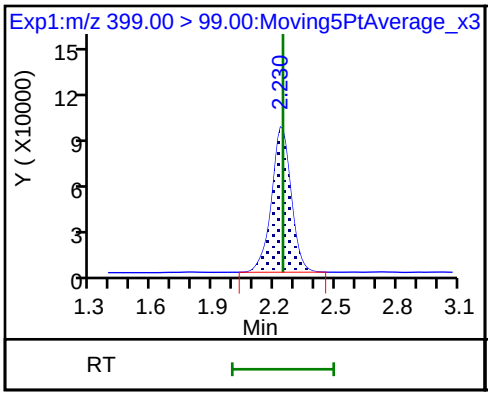
D 11 18O2 PFHxS



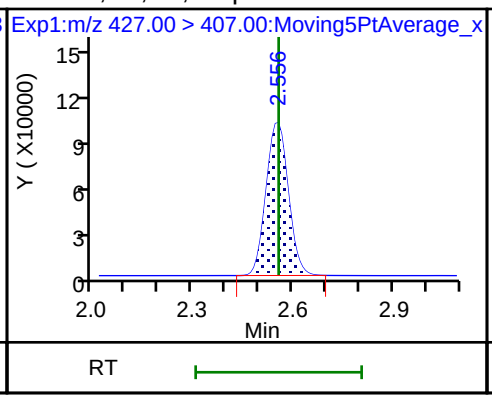
8 Perfluorohexanesulfonic acid



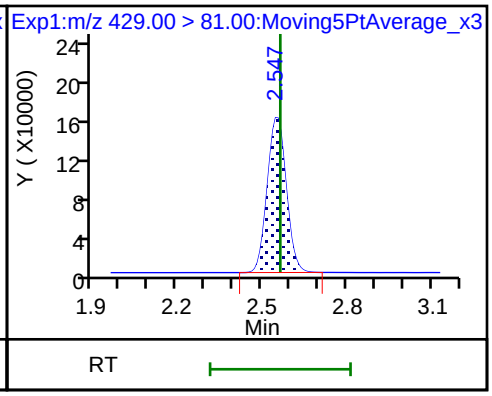
8 Perfluorohexanesulfonic acid



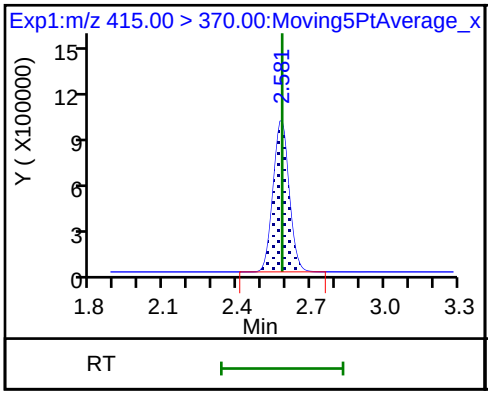
13 1H,1H,2H,2H-perfluorooctanesulfon



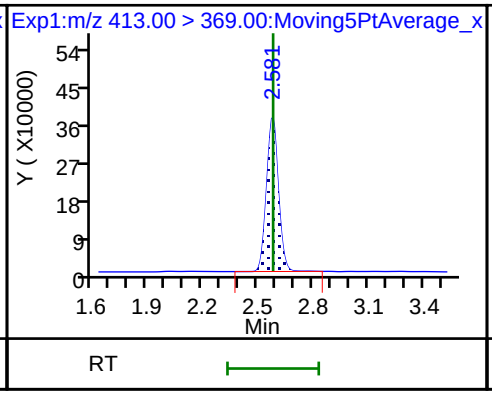
D 12 M2-6:2FTS



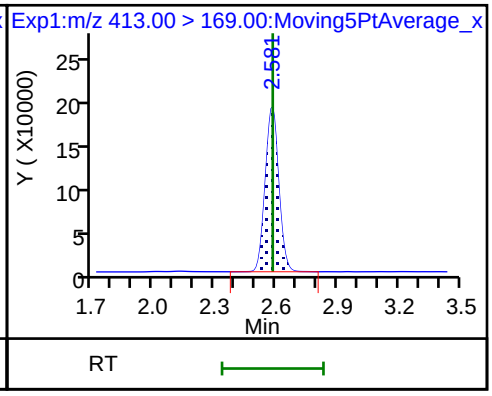
* 62 13C2-PFOA



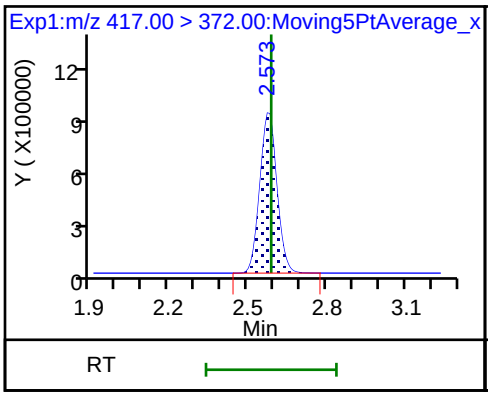
15 Perfluorooctanoic acid



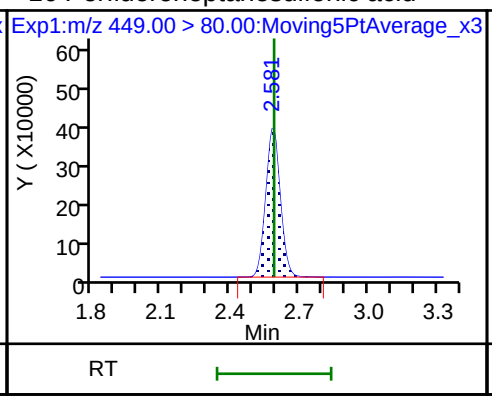
15 Perfluorooctanoic acid



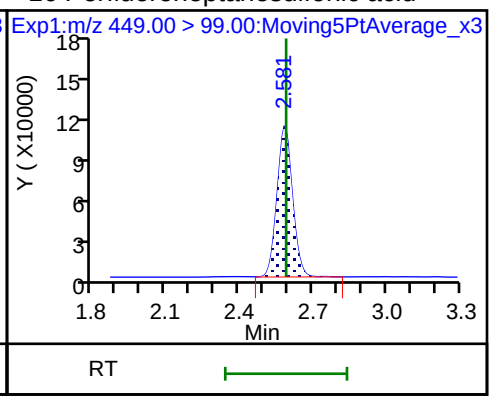
D 14 13C4 PFOA



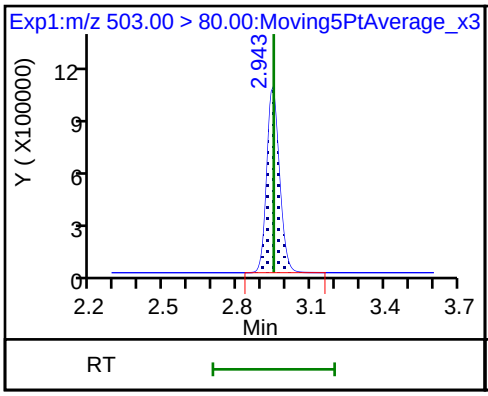
16 Perfluoroheptanesulfonic acid



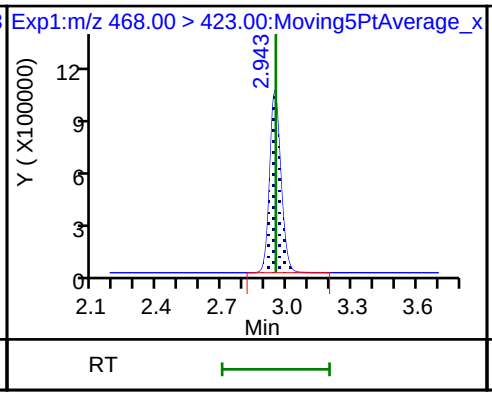
16 Perfluoroheptanesulfonic acid



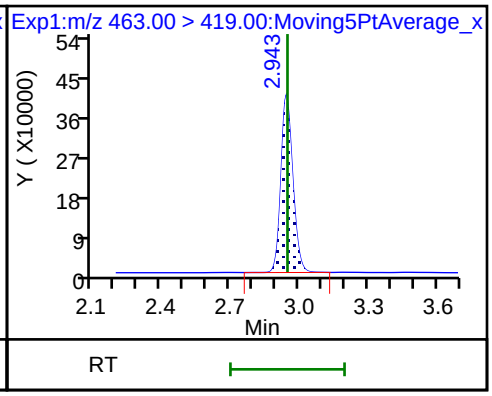
D 18 13C4 PFOS



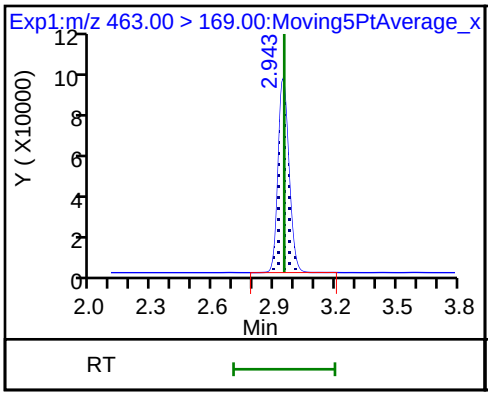
D 19 13C5 PFNA



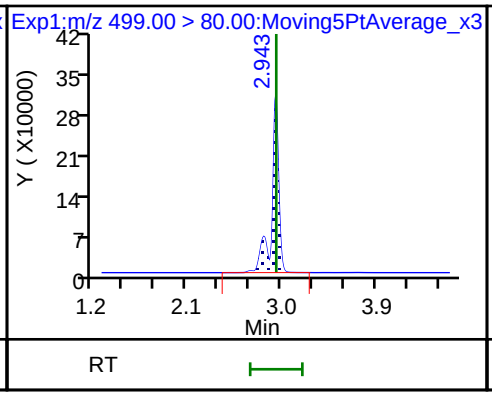
20 Perfluorononanoic acid



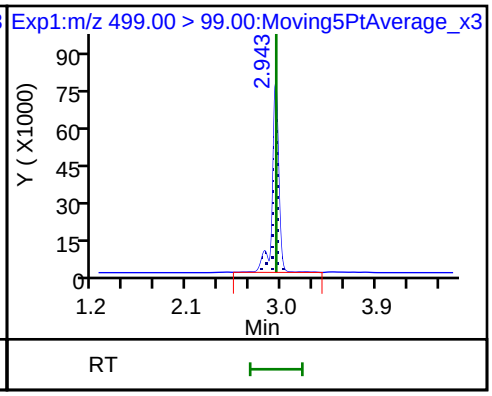
20 Perfluorononanoic acid



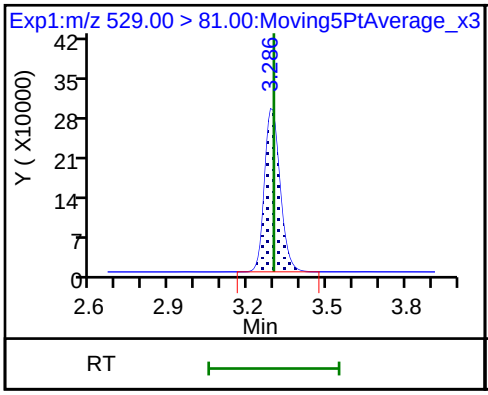
17 Perfluorooctane sulfonic acid



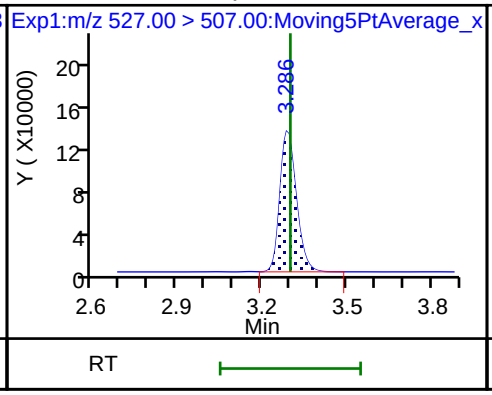
17 Perfluorooctane sulfonic acid



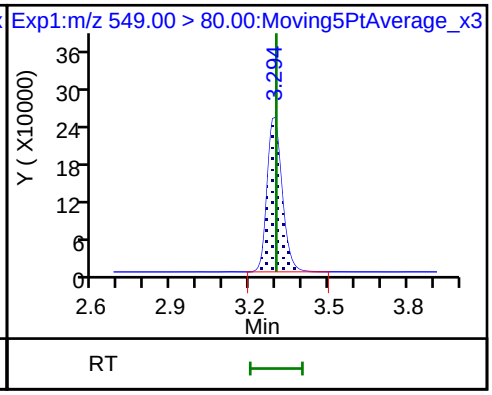
D 26 M2-8:2FTS



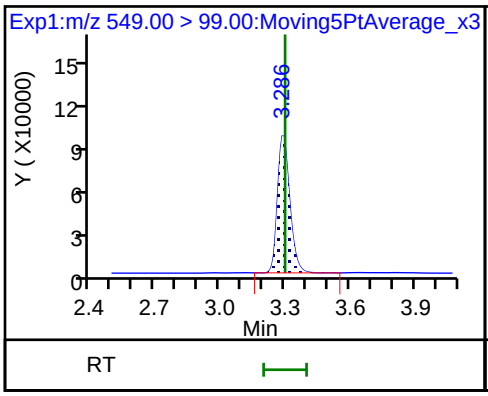
25 1H,1H,2H,2H-perfluorodecanesulfoni



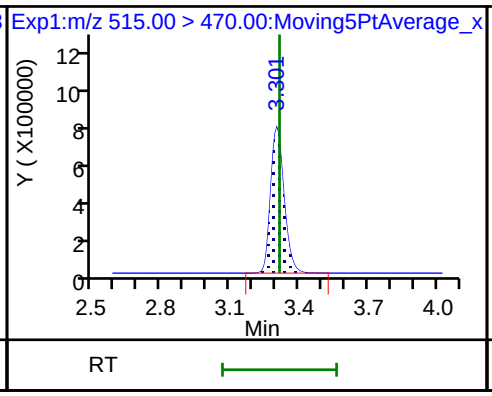
68 Perfluorononanesulfonic acid



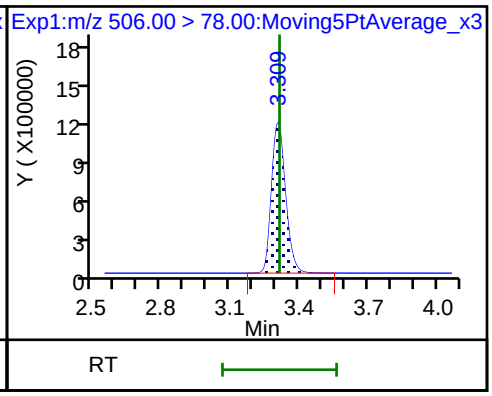
68 Perfluorononanesulfonic acid



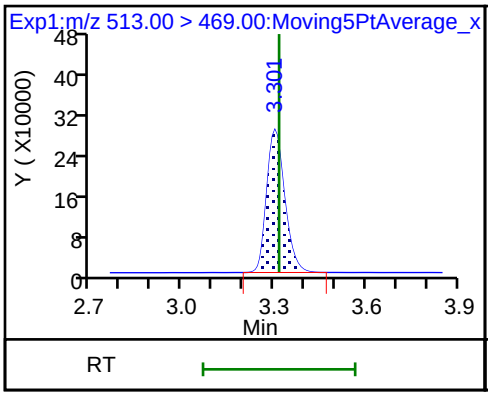
D 23 13C2 PFDA



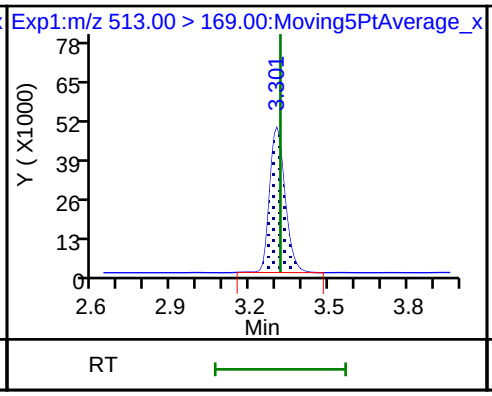
D 21 13C8 FOSA



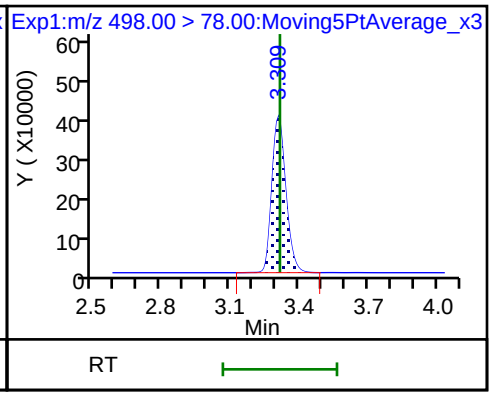
24 Perfluorodecanoic acid



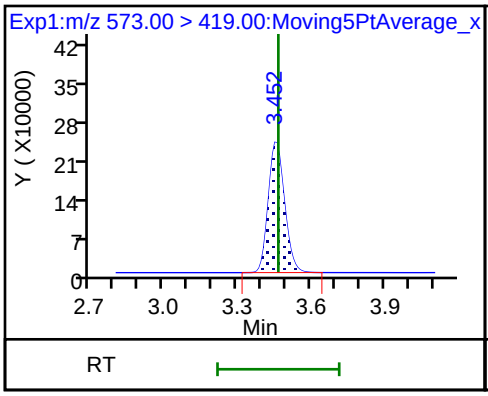
24 Perfluorodecanoic acid



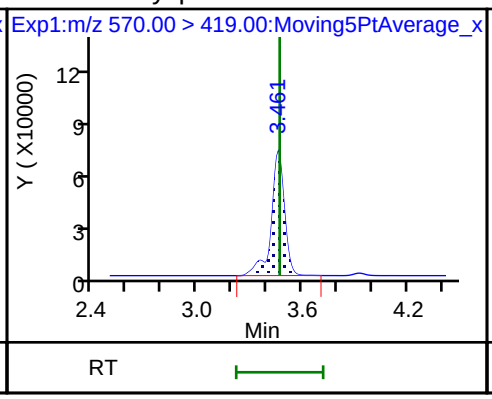
22 Perfluorooctane Sulfonamide



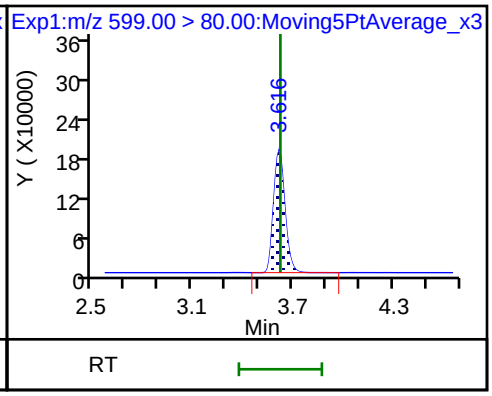
D 27 d3-NMeFOSAA



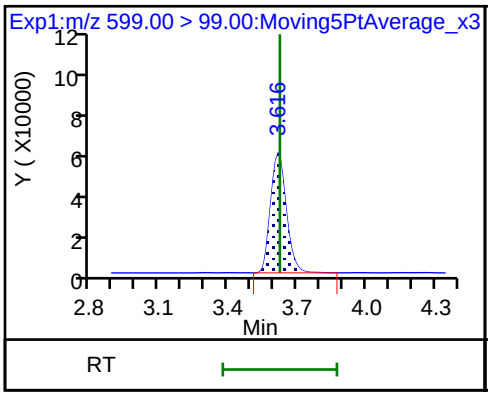
28 N-methyl perfluorooctane sulfonami



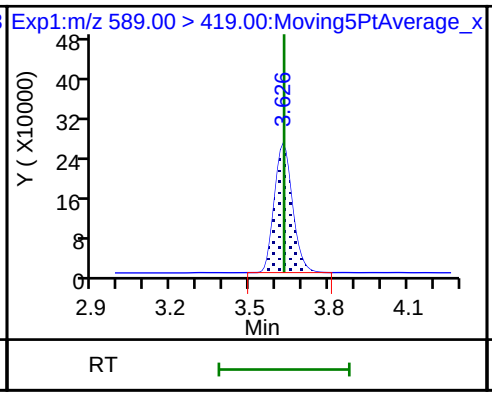
29 Perfluorodecane Sulfonic acid



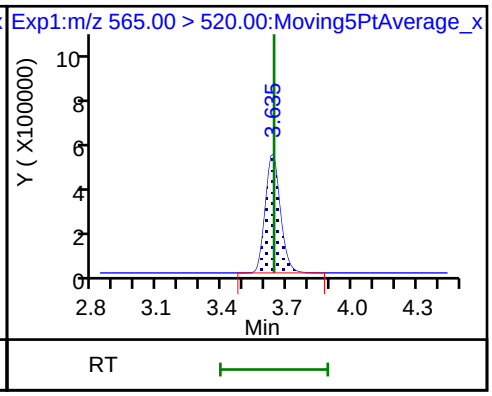
29 Perfluorodecane Sulfonic acid



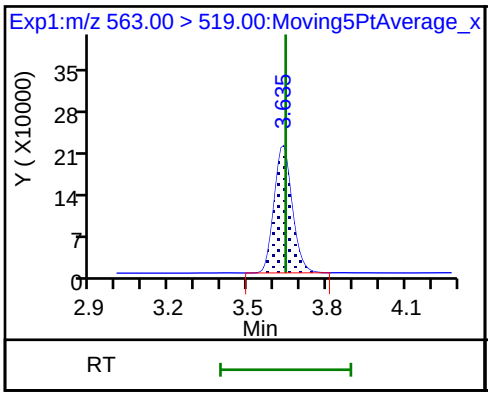
D 32 d5-NEtFOSAA



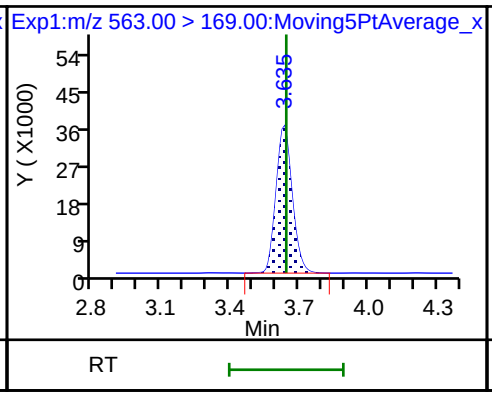
D 30 13C2 PFUnA



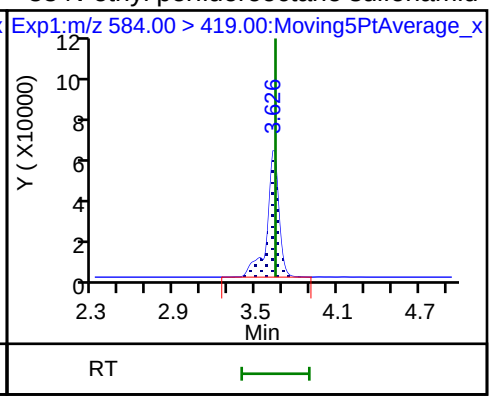
31 Perfluoroundecanoic acid



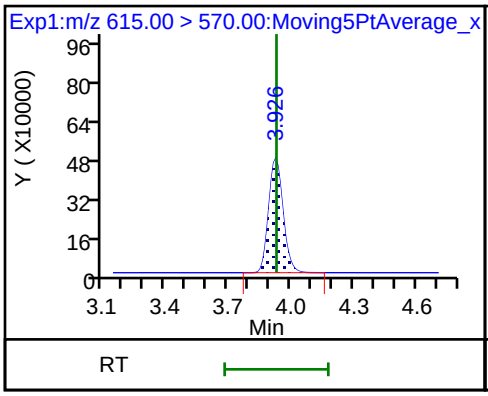
31 Perfluoroundecanoic acid



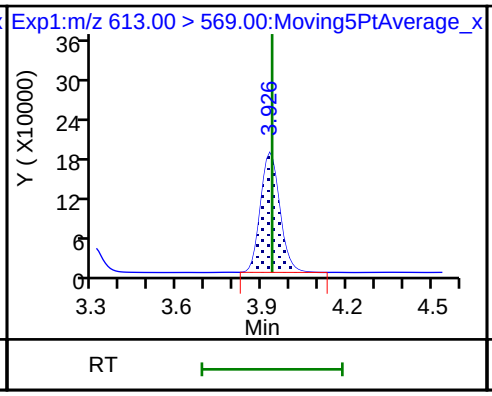
33 N-ethyl perfluorooctane sulfonamid



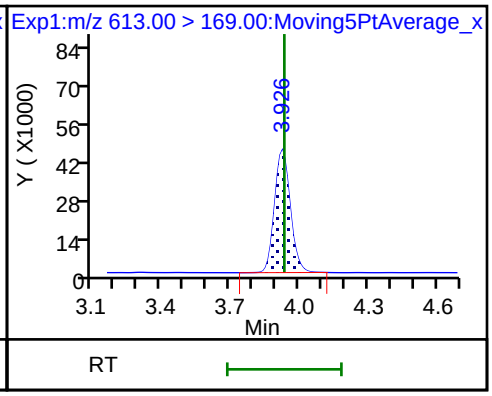
D 36 13C2 PFDoA



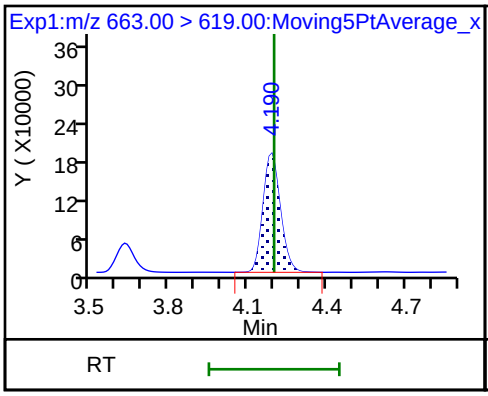
37 Perfluorododecanoic acid



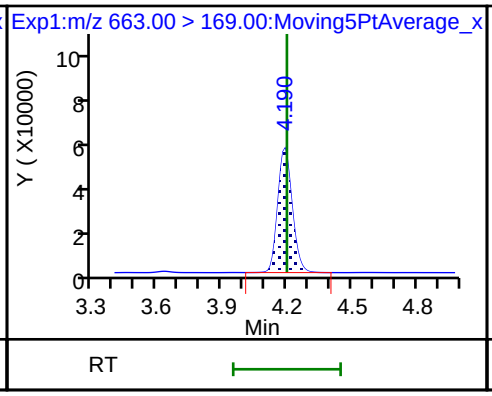
37 Perfluorododecanoic acid



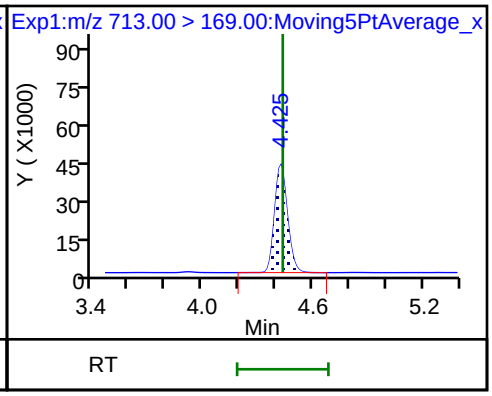
41 Perfluorotridecanoic acid



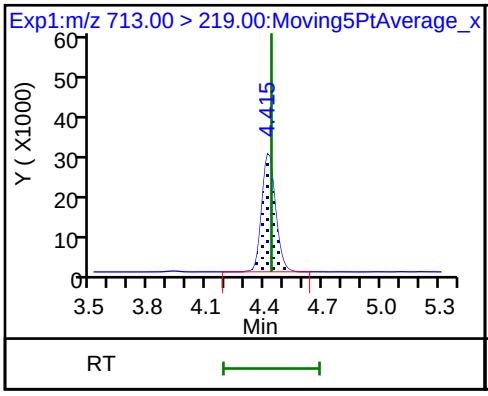
41 Perfluorotridecanoic acid



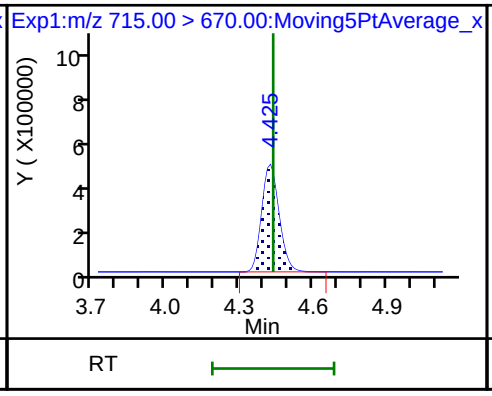
42 Perfluorotetradecanoic acid



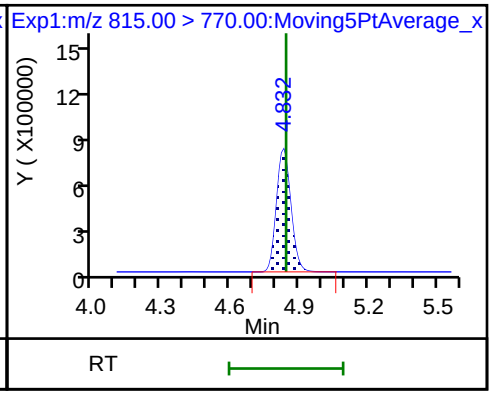
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCSD 320-234634/3-A
Matrix: Water
Lab File ID: 2018.07.22LLA_040.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: 3535
Date Extracted: 07/18/2018 08:54
Sample wt/vol: 250(mL)
Date Analyzed: 07/22/2018 10:37
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235512
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	38.3		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	37.3		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	39.3		2.0	1.5	0.52
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.9		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	30.9		2.0	1.0	0.38
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	33.4		4.0	3.0	1.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	91		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	93		50-150
STL00994	18O2 PFHxS	99		50-150
STL00991	13C4 PFOS	94		50-150

Report Date: 25-Jul-2018 09:47:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_040.d
Lims ID: LCSD 320-234634/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 22-Jul-2018 10:37:18 ALS Bottle#: 29 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-234634/3-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 25-Jul-2018 09:45:53 Calib Date: 20-Jul-2018 20:17:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180721-61400.b\2018.07.20LLA_010.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: mongkols Date: 25-Jul-2018 09:47:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.517	1.517	0.0	0.543	9231626	2.27		90.7	8000	
2 Perfluorobutyric acid										
212.90 > 169.00	1.517	1.517	0.0	1.000	3360714	0.9496		95.0	399	
D 3 13C5-PFPeA										
267.90 > 223.00	1.792	1.791	0.001	0.641	8674460	2.32		92.7	9222	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.792	1.792	0.0	1.000	3331753	0.8846		88.5	768	
D 47 13C3-PFBS										
301.90 > 83.00	1.826	1.833	-0.007	0.653	99848	2.11		90.9	967	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.834	1.834	0.0	1.005	4099034	0.8725		98.7	2754	
298.90 > 99.00	1.834	1.834	0.0	1.005	1381663		2.97(1.35-4.05)		2193	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.046	2.046	0.0	1.120	780788	0.8469		90.7	7282	
D 7 13C2 PFHxA										
315.00 > 270.00	2.087	2.085	0.002	0.747	8945164	2.28		91.1	14469	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.087	2.087	0.0	1.000	3097142	0.9147		91.5	1219	
313.00 > 119.00	2.087	2.087	0.0	1.000	231254		13.39(6.96-20.87)		927	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.108	2.108	0.0	1.155	2044681	0.9121		97.2	5300	
349.00 > 99.00	2.108	2.108	0.0	1.155	890393		2.30(1.15-3.45)		3584	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.191	2.189	0.002	0.784	1085354	NC			7702	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.191	2.191	0.0	1.000	661907	NC			395	
D 9 13C4-PFHpA										
367.00 > 322.00	2.423	2.433	-0.010	0.867	10714558	2.35		94.2	19826	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.423	2.436	-0.013	1.000	4506729	0.9567		95.7	1076	
363.00 > 169.00	2.423	2.436	-0.013	1.000	1004109		4.49(2.17-6.52)		3430	
D 11 18O2 PFHxS										
403.00 > 84.00	2.448	2.446	0.002	0.876	6472012	2.34		98.8	35960	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.436	2.448	-0.012	0.995	2814973	0.7721		84.8	4663	
399.00 > 99.00	2.436	2.448	-0.012	0.995	704189		4.00(1.90-5.70)		1930	
65 ADONA										
377.00 > 251.00	2.474	2.474	0.0	0.776	7834403	NC			15240	
377.00 > 85.00	2.474	2.474	0.0	0.776	3228540		2.43(1.05-3.16)		1676	
D 12 M2-6:2FTS										
429.00 > 81.00	2.780	2.776	0.004	0.994	936558	2.20		92.7	3464	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.780	2.780	0.0	1.000	819121	0.9520		100	11231	
* 62 13C2-PFOA										
415.00 > 370.00	2.796	2.796	0.0		10446207	2.50			20045	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.796	2.796	0.0	1.000	4253535	0.9321		93.1	589	
413.00 > 169.00	2.796	2.796	0.0	1.000	1445275		2.94(1.36-4.08)		3188	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.808	-0.012	1.000	9904190	2.42		96.8	20212	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.812	2.812	0.0	0.881	2759616	0.9244		97.1	3929	
449.00 > 99.00	2.812	2.812	0.0	0.881	630131		4.38(1.84-5.53)		3354	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.171	0.0	0.994	2634506	0.8359		90.1	2441	
499.00 > 99.00	3.171	3.171	0.0	0.994	635848		4.14(2.04-6.12)		2837	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.185	0.005	1.141	8978784	2.34		93.4	14992	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.185	0.005	1.141	6691428	2.25		94.3	8170	
20 Perfluorononanoic acid										
463.00 > 419.00	3.190	3.190	0.0	1.000	3775620	0.9816		98.2	989	
463.00 > 169.00	3.190	3.190	0.0	1.000	672266		5.62(2.68-8.03)		2313	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.386	3.386	0.0	1.061	3064820	NC			9343	
D 21 13C8 FOSA										
506.00 > 78.00	3.531	3.529	0.002	1.263	3667307	2.19		87.5	9103	
D 26 M2-8:2FTS										
529.00 > 81.00	3.531	3.529	0.002	1.263	135100	2.33		97.1	1728	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.531	3.532	-0.001	1.000	813845	0.9077		94.8	3183	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.531	3.532	-0.001	1.000	4653658	1.04		104	6674	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.531	3.532	-0.001	1.107	889555	0.8101		84.4	2284	
549.00 > 99.00	3.531	3.532	-0.001	1.107	324009		2.75(1.42-4.26)		1563	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.546	3.544	0.002	1.268	9876918	2.47		99.0	35185	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.546	3.546	0.0	1.000	4640671	1.00		100	1396	
513.00 > 169.00	3.546	3.546	0.0	1.000	276380		16.79(7.12-21.35)		1179	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.685	3.698	-0.013	1.318	4342770	2.31		92.4	9385	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.699	3.699	0.0	1.004	1682475	0.9357		93.6	975	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.855	3.855	0.0	1.379	3725296	2.47		99.0	7877	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.840	3.855	-0.015	1.204	2375083	0.9080		94.2	3936	
599.00 > 99.00	3.840	3.855	-0.015	1.204	489360		4.85(2.14-6.43)		2390	
D 30 13C2 PFUnA										
565.00 > 520.00	3.870	3.869	0.001	1.384	9020115	2.47		99.0	24808	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.855	3.870	-0.015	1.000	1259475	0.8424		84.2	3063	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.870	3.870	0.0	1.000	3186051	0.9096		91.0	971	
563.00 > 169.00	3.870	3.870	0.0	1.000	324070		9.83(5.24-15.72)		2220	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.023	4.024	-0.001	1.261	3847210	NC			14959	
D 36 13C2 PFDoA										
615.00 > 570.00	4.152	4.151	0.001	1.485	9091398	2.32		92.9	24119	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.152	4.152	0.0	1.000	3804142	0.9694		96.9	1109	
613.00 > 169.00	4.152	4.152	0.0	1.000	392961		9.68(4.68-14.05)		1488	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.412	4.412	0.0	1.063	3537228	0.9721		97.2	1228	
663.00 > 169.00	4.412	4.412	0.0	1.063	546521		6.47(3.09-9.27)		1417	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.652	4.651	0.001	1.664	7630106	2.25		90.1	15669	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.652	4.652	0.0	1.000	453254	0.8624		86.2	1174	
713.00 > 219.00	4.652	4.652	0.0	1.000	317691		1.43(0.70-2.09)		1190	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.070	5.070	0.0	1.813	6473522	1.86		74.3	7566	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.070	5.070	0.0	1.000	2303802	NC			390	
813.00 > 169.00	5.070	5.070	0.0	1.000	402521		5.72(2.77-8.32)		787	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.427	-0.014	1.068	1093784	NC			241	
913.00 > 169.00	5.413	5.427	-0.014	1.068	200716		5.45(2.55-7.64)		892	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 25-Jul-2018 09:47:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180723-61456.b\2018.07.22LLA_040.d

Injection Date: 22-Jul-2018 10:37:18 Instrument ID: A9

Lims ID: LCSD 320-234634/3-A

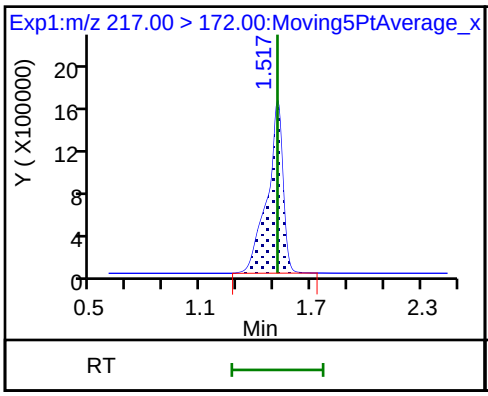
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 29 Worklist Smp#: 4

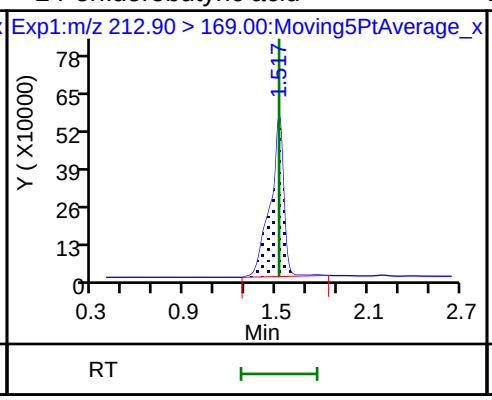
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



2 Perfluorobutyric acid



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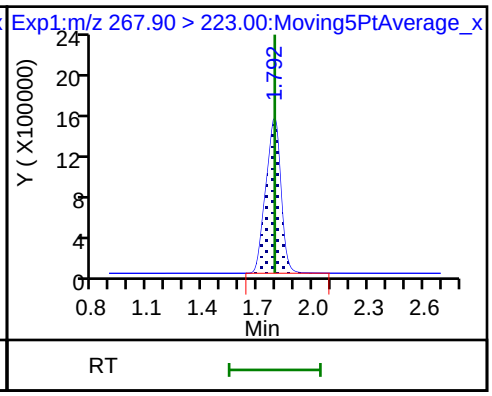
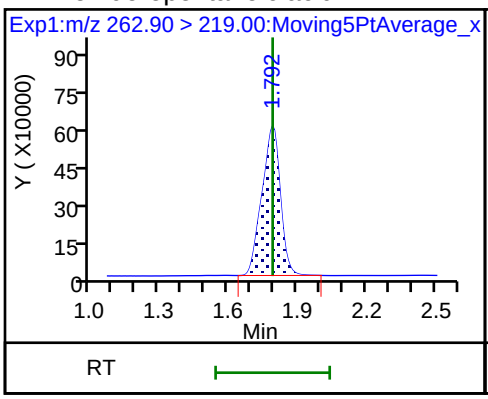
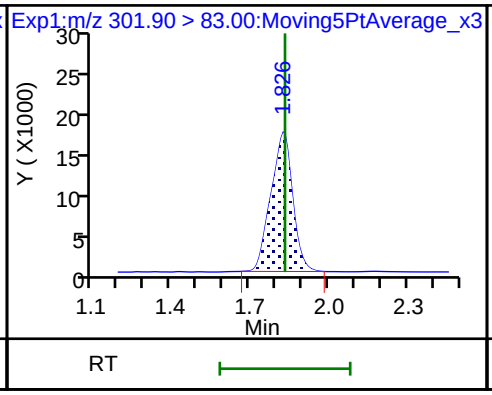


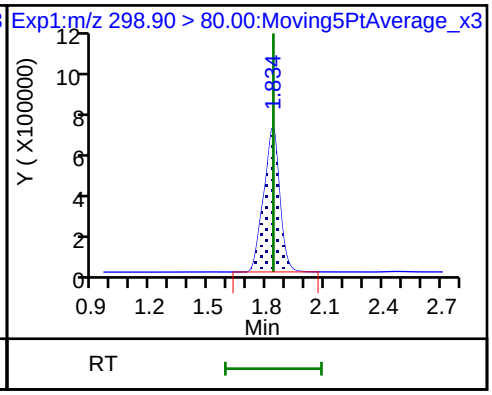
4 Perfluoropentanoic acid



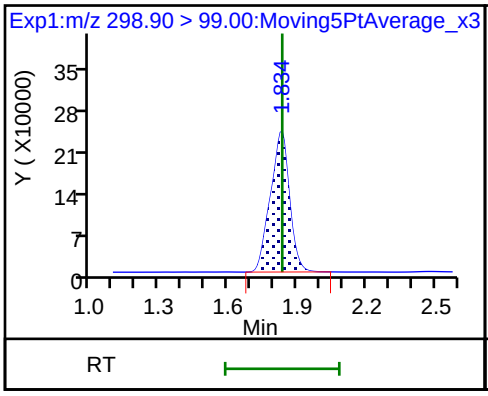
D 47 13C3-PFBS



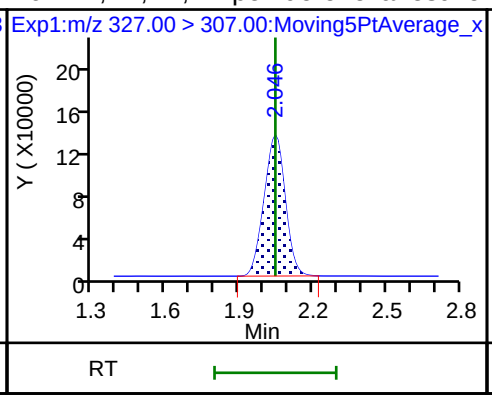
5 Perfluorobutanesulfonic acid



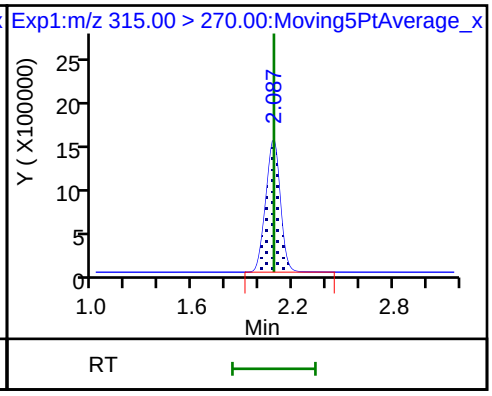
5 Perfluorobutanesulfonic acid



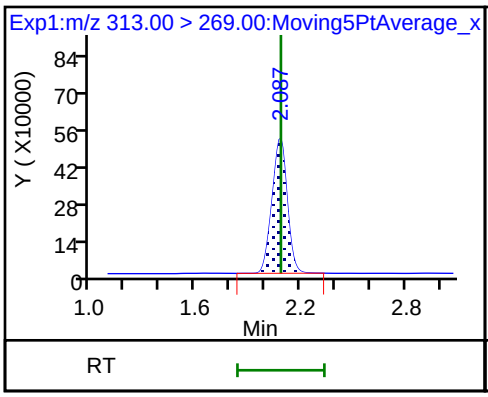
61 1H,1H,2H,2H-perfluorohexanesulfon



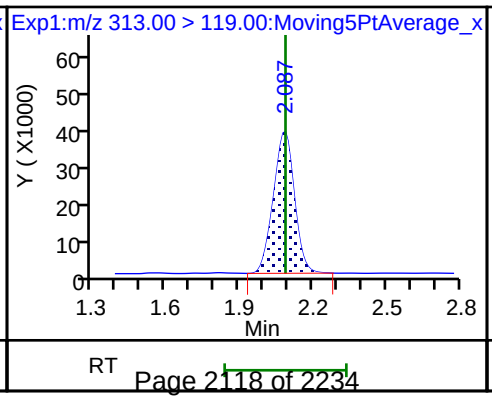
D 7 13C2 PFHxA



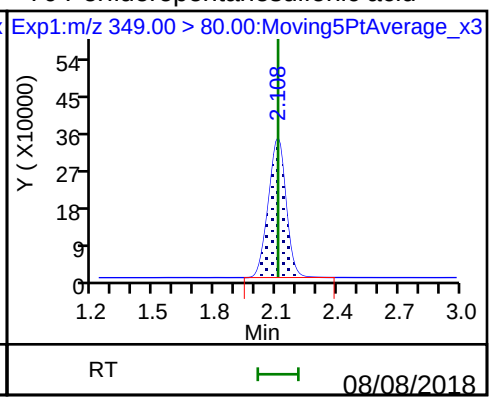
6 Perfluorohexanoic acid



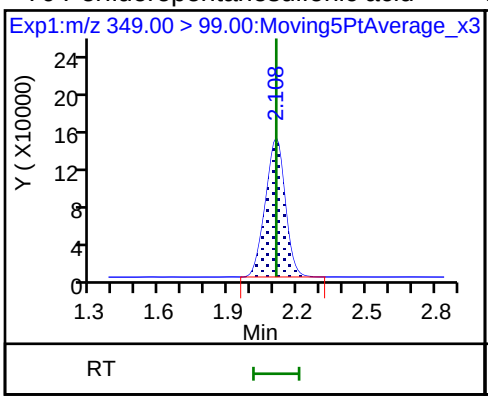
6 Perfluorohexanoic acid



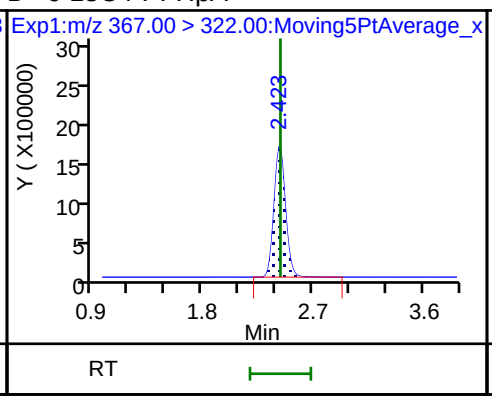
70 Perfluoropentanesulfonic acid



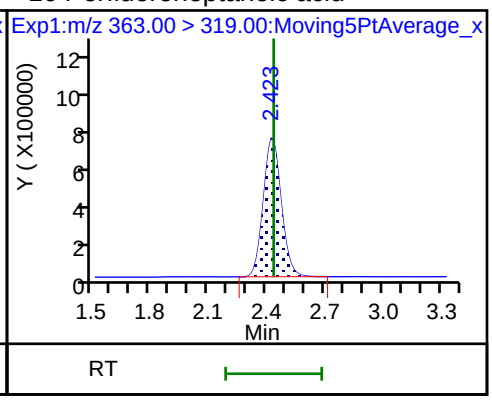
70 Perfluoropentanesulfonic acid



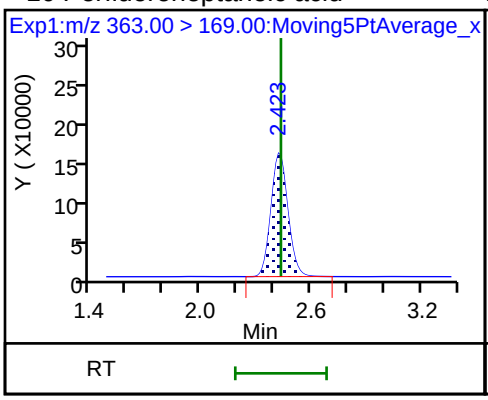
D 9 13C4-PFHpA



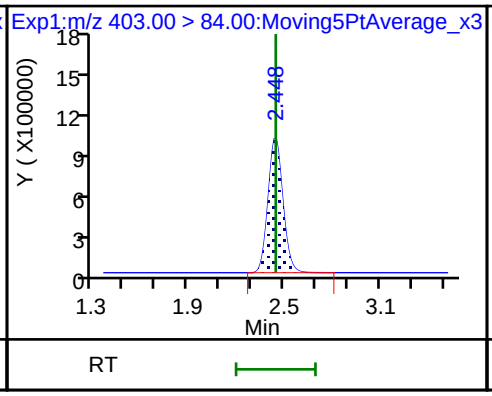
10 Perfluoroheptanoic acid



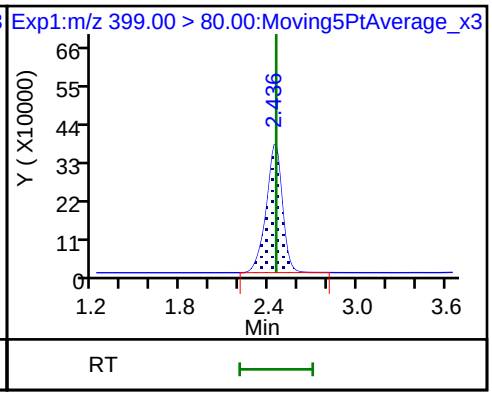
10 Perfluoroheptanoic acid



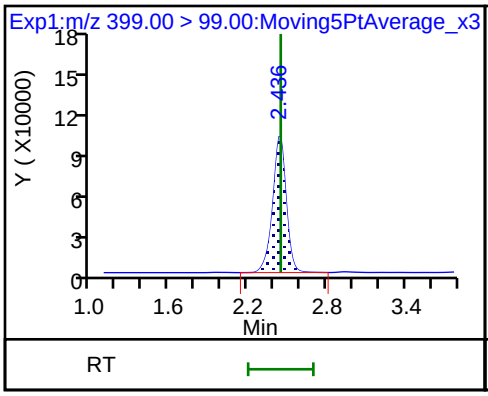
D 11 18O2 PFHxS



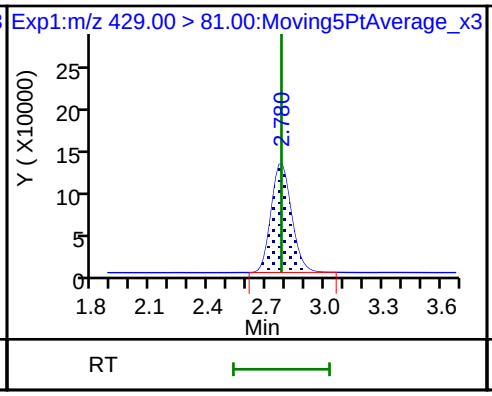
8 Perfluorohexanesulfonic acid



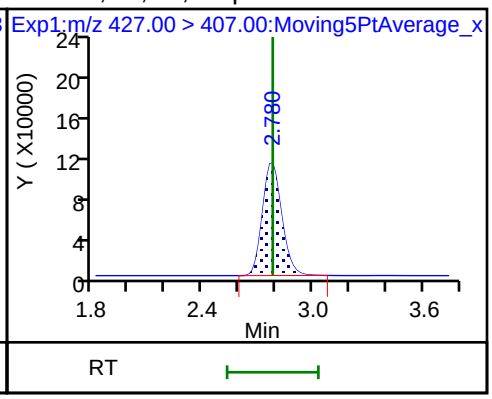
8 Perfluorohexanesulfonic acid



D 12 M2-6:2FTS



13 1H,1H,2H,2H-perfluorooctanesulfoni



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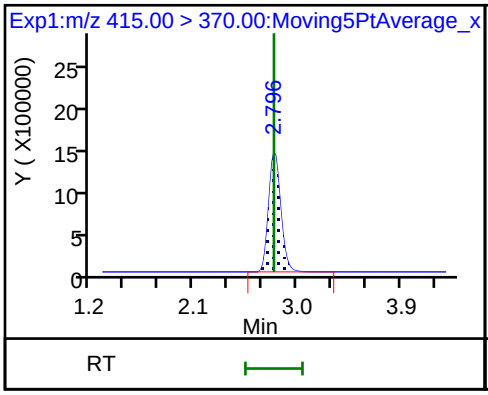
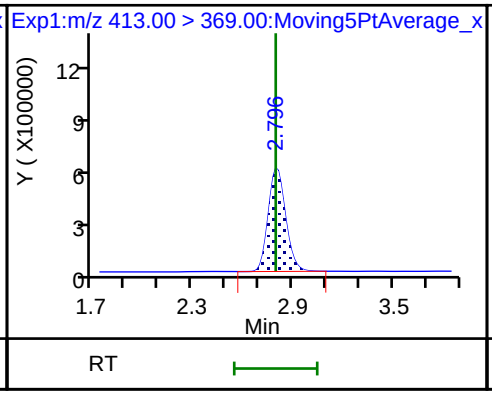
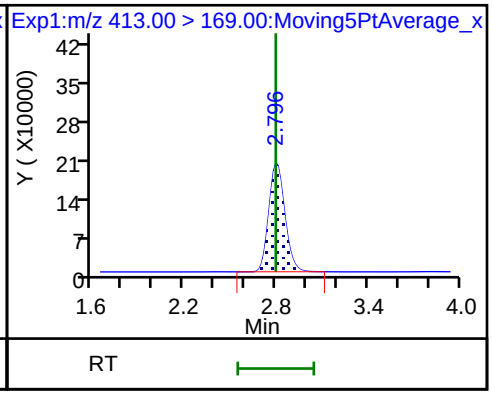


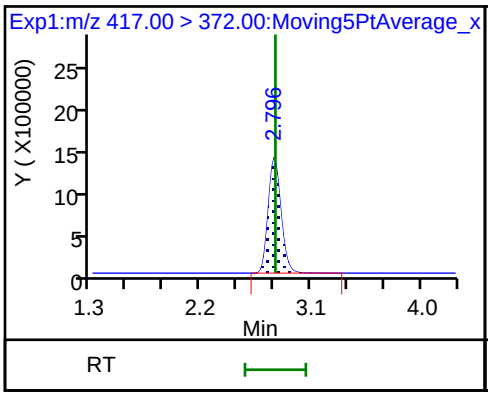
15 Perfluorooctanoic acid



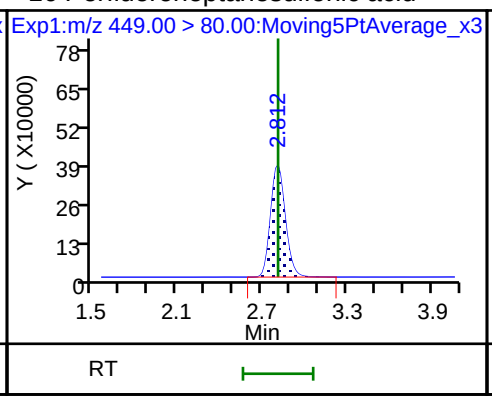
15 Perfluorooctanoic acid



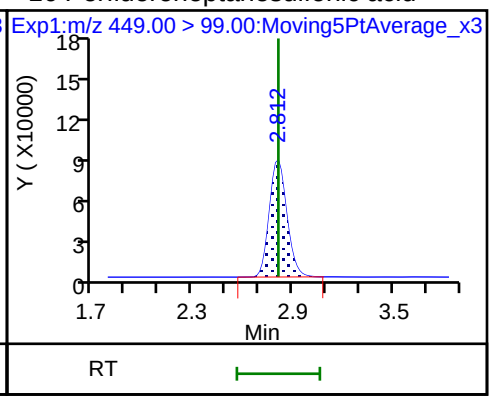
D 14 13C4 PFOA



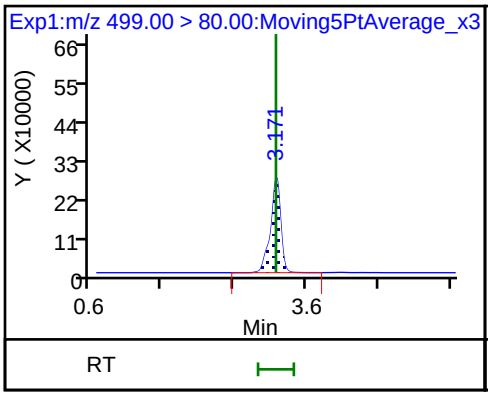
16 Perfluoroheptanesulfonic acid



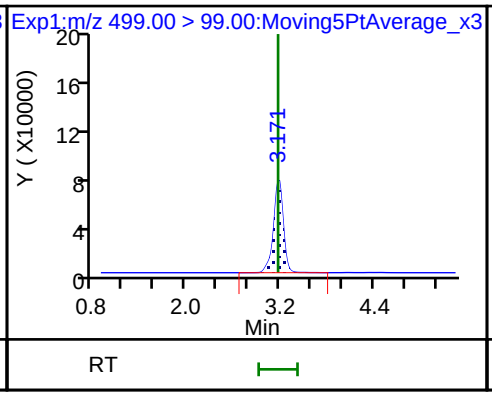
16 Perfluoroheptanesulfonic acid



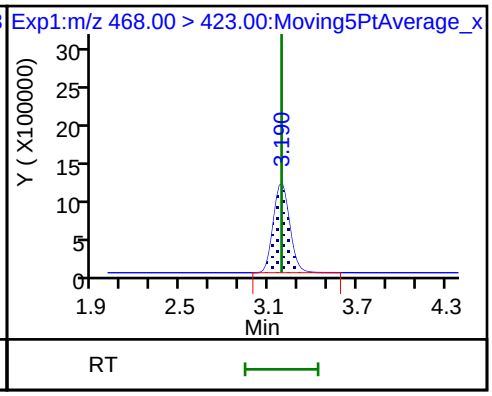
17 Perfluorooctane sulfonic acid



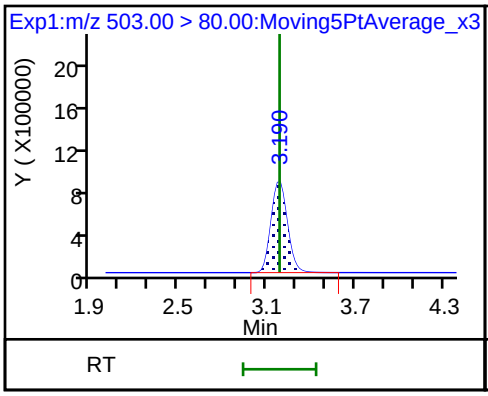
17 Perfluorooctane sulfonic acid



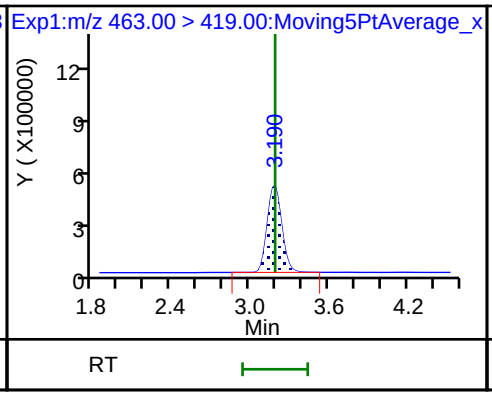
D 19 13C5 PFNA



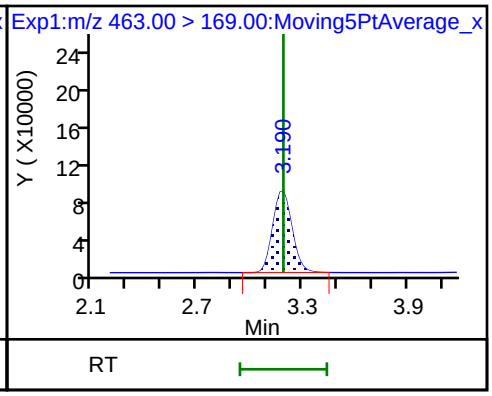
D 18 13C4 PFOS



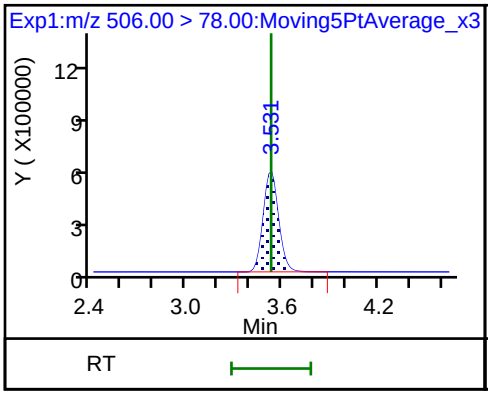
20 Perfluorononanoic acid



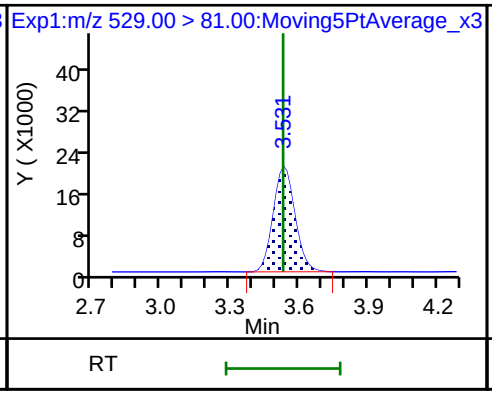
20 Perfluorononanoic acid



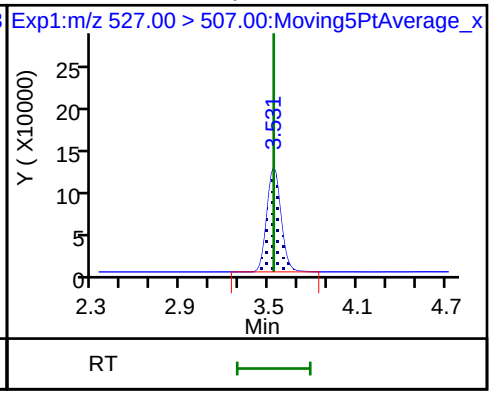
D 21 13C8 FOSA



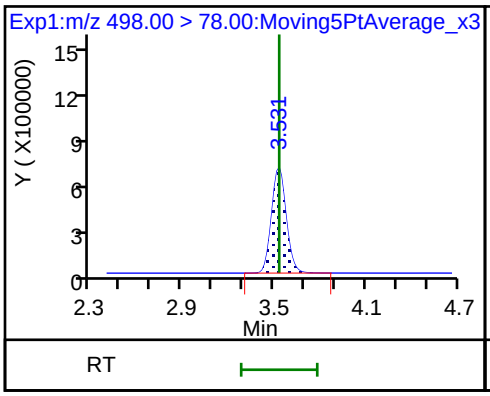
D 26 M2-8:2FTS



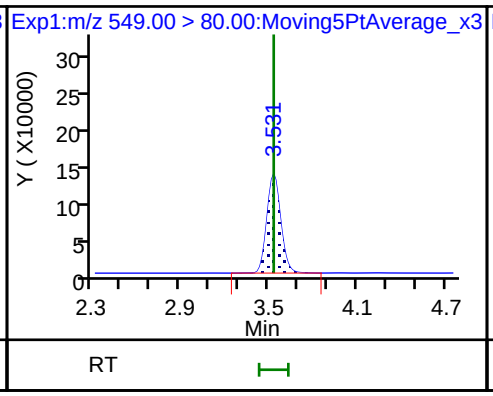
25 1H,1H,2H,2H-perfluorodecanesulfoni



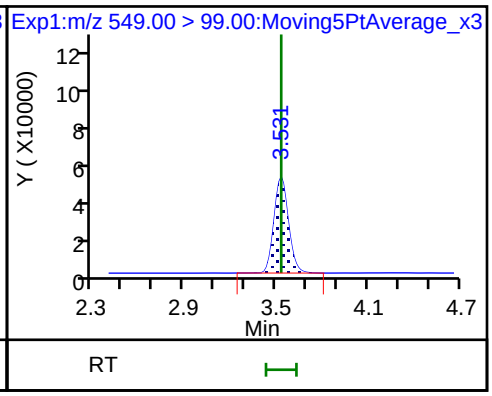
22 Perfluorooctane Sulfonamide



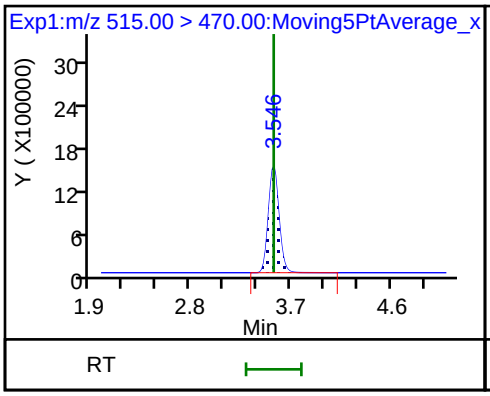
68 Perfluorononanesulfonic acid



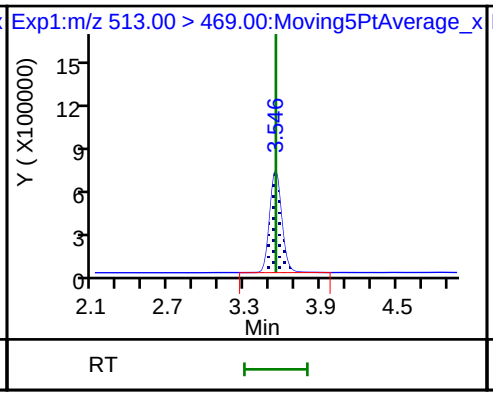
68 Perfluorononanesulfonic acid



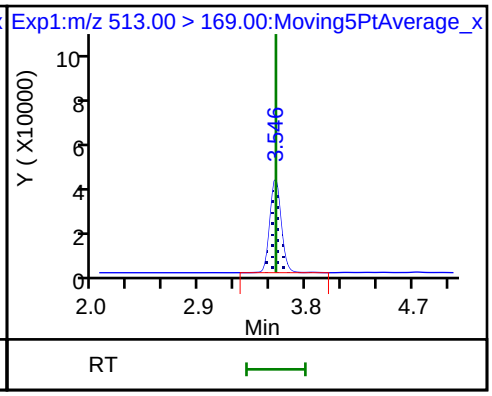
D 23 13C2 PFDA



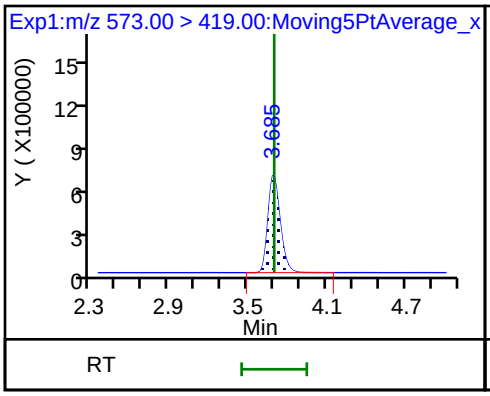
24 Perfluorodecanoic acid



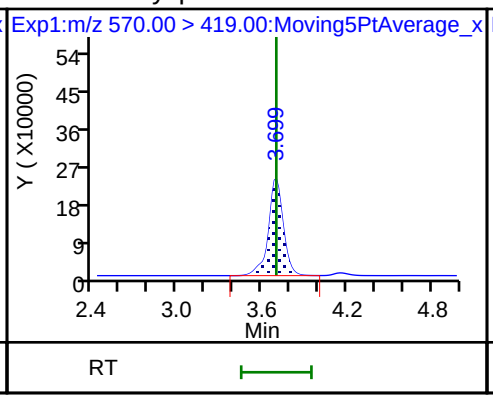
24 Perfluorodecanoic acid



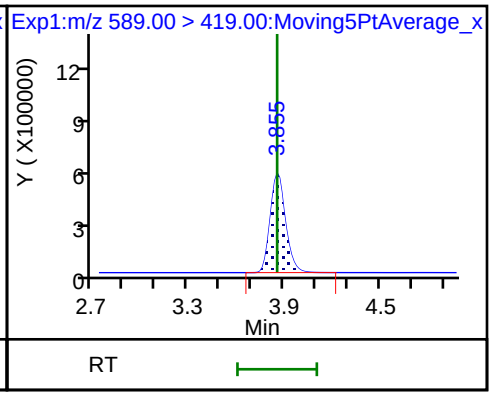
D 27 d3-NMeFOSAA



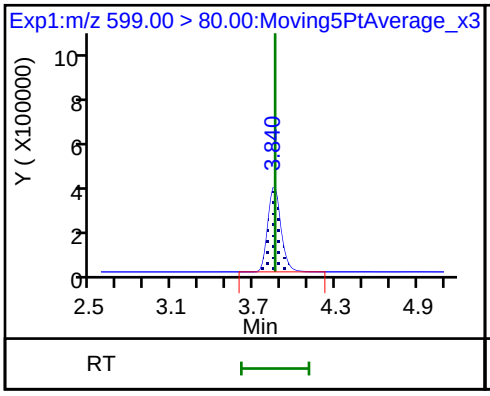
28 N-methyl perfluorooctane sulfonami



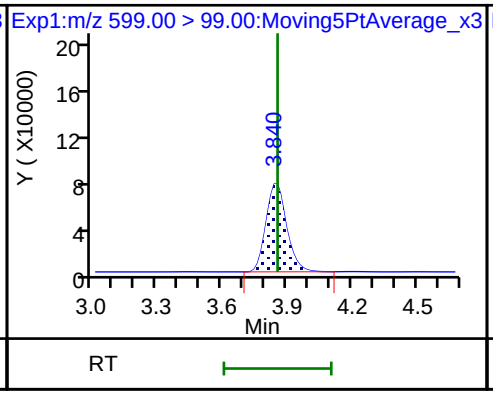
D 32 d5-NEtFOSAA



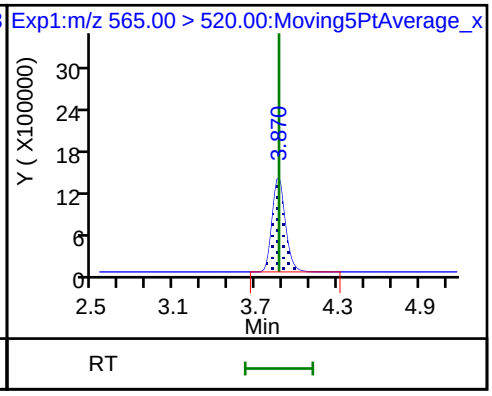
29 Perfluorodecane Sulfonic acid



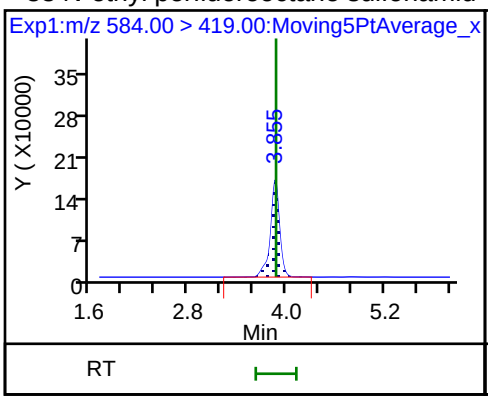
29 Perfluorodecane Sulfonic acid



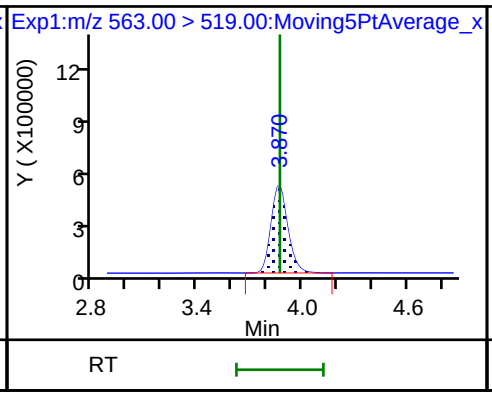
D 30 13C2 PFUnA



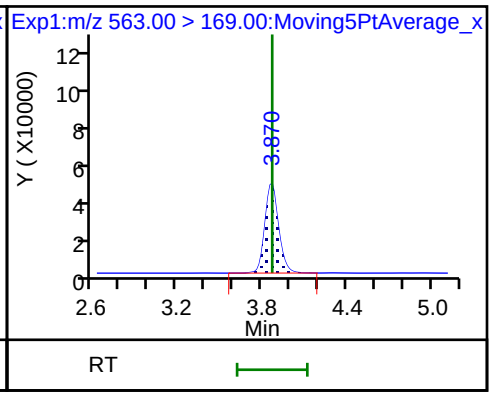
33 N-ethyl perfluorooctane sulfonamid



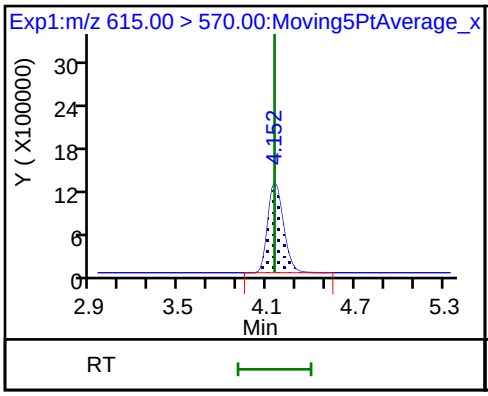
31 Perfluoroundecanoic acid



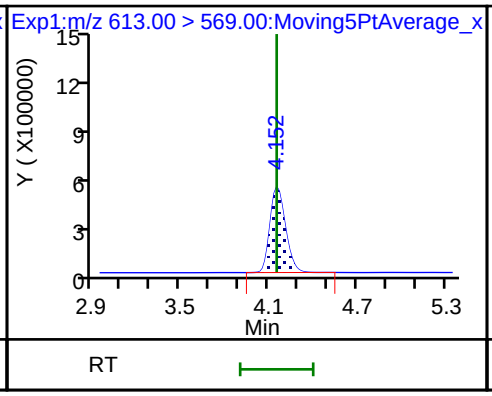
31 Perfluoroundecanoic acid



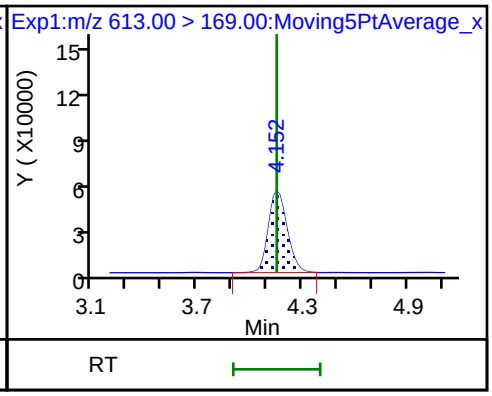
D 36 13C2 PFDoA



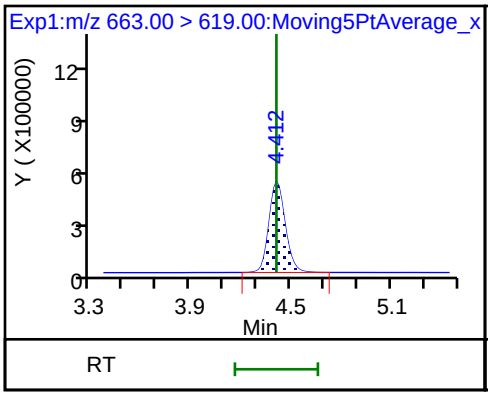
37 Perfluorododecanoic acid



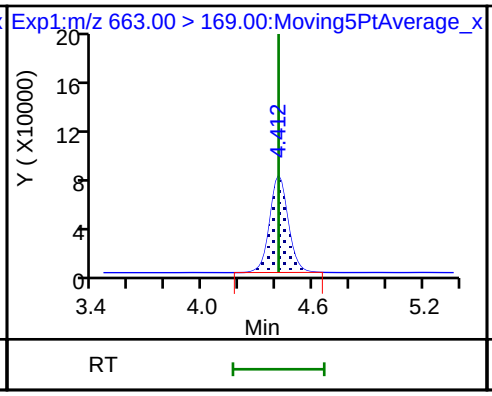
37 Perfluorododecanoic acid



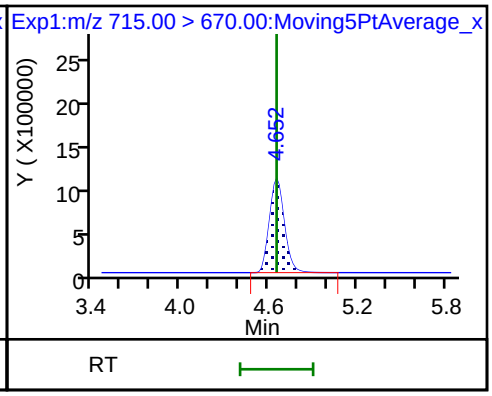
41 Perfluorotridecanoic acid



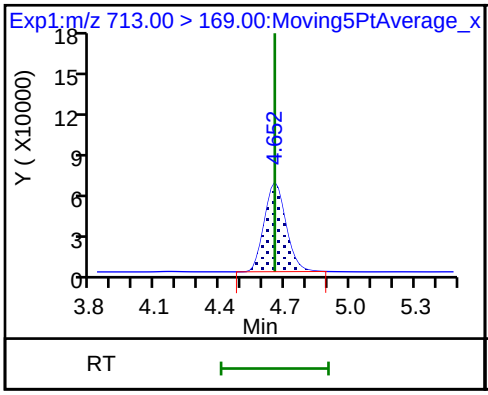
41 Perfluorotridecanoic acid



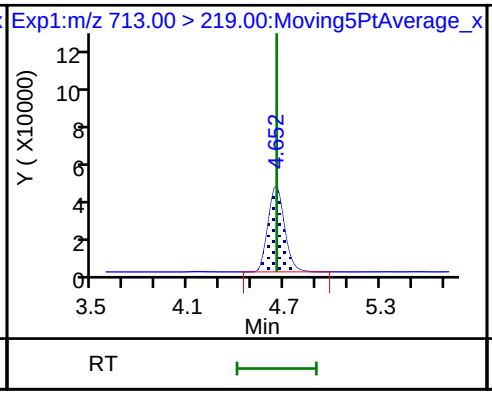
D 43 13C2-PFTeDA



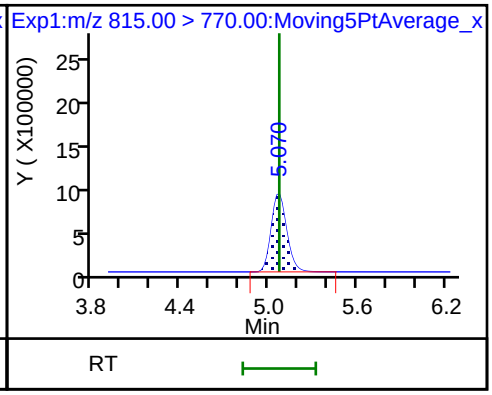
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE10-SB2-01 MS
Lab Sample ID: 320-41149-2 MS
Matrix: Solid
Lab File ID: 2018.07.30LLA_009.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 14:10
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.04(g)
Date Analyzed: 07/30/2018 04:00
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 4.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.98		0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	2.13		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.92		0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.71		0.42	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	4.63	J1	0.31	0.21	0.064
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16.1	4	1.0	0.52	0.25

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	79		50-150
STL01892	13C4-PFHpA	86		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	91		50-150
STL00994	18O2 PFHxS	81		50-150
STL00991	13C4 PFOS	83		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_009.d
Lims ID: 320-41149-A-2-B MS
Client ID: GRE10-SB2-01
Sample Type: MS
Inject. Date: 30-Jul-2018 04:00:14 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-2-b MS
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:50:19 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:50:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.389	1.389	0.0	1.000	2087836	1.05		105	280	M
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.396	-0.007	0.539	5044619	2.46		98.5	84873	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.629	1.629	0.0	1.000	1562910	0.9297		93.0	374	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.640	-0.011	0.632	3511279	2.46		98.2	39672	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.662	1.662	0.0	1.000	1926485	0.8226		93.1	1378	
298.90 > 99.00	1.662	1.662	0.0	1.000	797161		2.42(1.25-3.74)		726	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.674	-0.012	0.645	68581	1.83		78.6	150	
61 1H,1H,2H,2H-perfluorohexanesulfoni										M
327.00 > 307.00	1.863	1.863	0.0	1.121	836612	1.66		178	995	M
D 60 M2-4:2FTS										
329.00 > 81.00	1.671	1.875	-0.204	0.648	9630	NC			3.8	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.902	1.902	0.0	1.000	1634071	1.13		113	563	M
313.00 > 119.00	1.902	1.902	0.0	1.000	142069		11.50(5.03-15.10)		1025	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.916	-0.014	0.738	3425769	2.04		81.7	62298	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.923	1.924	-0.001	1.157	1707164	0.8124		86.6	1496	
349.00 > 99.00	1.923	1.924	-0.001	1.157	637908		2.68(1.36-4.07)		1841	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	1.999	0.0	1.000	273563	NC			586	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.014	-0.015	0.775	305577	NC			5038	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.214	0.011	1.000	1565297	0.9545		95.4	1012	
363.00 > 169.00	2.225	2.214	0.011	1.000	586818		2.67(1.13-3.40)		5093	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.225	0.012	1.000	4642003	2.22		244	2359	
399.00 > 99.00	2.237	2.225	0.012	1.000	1562180		2.97(1.50-4.49)		2410	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.240	-0.015	0.863	3718558	2.15		86.1	81607	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.253	-0.016	0.868	4230347	1.91		80.6	73382	
65 ADONA										
377.00 > 251.00	2.263	2.263	0.0	0.770	4008191	NC			27477	
377.00 > 85.00	2.263	2.263	0.0	0.770	2302697		1.74(0.84-2.53)		9335	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.545	0.009	1.000	537986	0.8628		91.0	6280	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.564	-0.010	0.990	877796	1.82		76.6	2416	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.571	0.008		4417662	2.50			63994	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.571	0.008	1.000	1866930	1.03		102	725	
413.00 > 169.00	2.579	2.571	0.008	1.000	971527		1.92(0.84-2.52)		4646	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.579	0.008	0.880	1467199	0.8268		86.9	2207	
449.00 > 99.00	2.587	2.579	0.008	0.880	386122		3.80(1.94-5.82)		1788	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.588	-0.009	1.000	3751337	2.22		88.8	50341	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.940	2.935	0.005	1.000	10996864	7.76		836	16138	
499.00 > 99.00	2.940	2.935	0.005	1.000	2690665		4.09(2.31-6.93)		12537	
20 Perfluorononanoic acid										
463.00 > 419.00	2.940	2.935	0.005	1.000	1398315	0.9225		92.3	1201	
463.00 > 169.00	2.940	2.935	0.005	1.000	331296		4.22(1.90-5.69)		4080	
D 19 13C5 PFNA										
468.00 > 423.00	2.940	2.953	-0.013	1.140	3318987	2.28		91.1	47172	
D 18 13C4 PFOS										
503.00 > 80.00	2.940	2.953	-0.013	1.140	3065821	1.99		83.1	6107	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.153	3.145	0.008	1.072	1946795	NC			11965	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.287	3.280	0.007	1.000	644424	0.8787		91.7	20279	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.287	3.287	0.0	1.118	951179	0.99		103	542	
549.00 > 99.00	3.287	3.287	0.0	1.118	356462		2.67(1.33-3.97)		1067	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.295	3.295	0.0	1.000	1306413	0.9745		97.5	979	
513.00 > 169.00	3.295	3.295	0.0	1.000	213452		6.12(2.36-7.09)		3773	
D 26 M2-8:2FTS										
529.00 > 81.00	3.287	3.299	-0.012	1.275	1295622	2.57		108	2988	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.310	3.311	-0.001	1.000	2220919	1.28		128	563	
D 23 13C2 PFDA										
515.00 > 470.00	3.295	3.314	-0.019	1.278	3258794	2.81		112	62972	
D 21 13C8 FOSA										
506.00 > 78.00	3.310	3.322	-0.012	1.284	4370465	1.93		77.1	58721	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.454	0.0	1.000	353306	0.8235		82.3	4015	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.467	-0.013	1.339	1088335	2.84		114	10843	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.607	3.607	0.0	1.227	722472	0.8493		88.1	307	
599.00 > 99.00	3.607	3.607	0.0	1.227	258074		2.80(1.39-4.16)		1173	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.627	3.628	-0.001	1.000	1065607	0.8591		85.9	998	
563.00 > 169.00	3.627	3.628	-0.001	1.000	194451		5.48(2.12-6.36)		2300	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.627	3.628	-0.001	1.003	340474	0.8599		86.0	9708	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.618	3.640	-0.022	1.403	1061060	2.63		105	5805	
D 30 13C2 PFUnA										
565.00 > 520.00	3.627	3.640	-0.013	1.407	2499014	2.67		107	52912	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.782	3.782	0.0	1.286	3006554	NC			37287	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.917	3.918	-0.001	1.000	905411	0.8732		87.3	103	
613.00 > 169.00	3.917	3.918	-0.001	1.000	225338		4.02(2.13-6.40)		718	
D 36 13C2 PFDoA										
615.00 > 570.00	3.917	3.930	-0.013	1.519	2395990	2.70		108	16783	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.172	4.182	-0.010	1.065	786254	0.7810		78.1	223	
663.00 > 169.00	4.172	4.182	-0.010	1.065	241324		3.26(1.25-3.76)		1640	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.415	4.415	0.0	1.000	188398	0.9146		91.5	1040	
713.00 > 219.00	4.404	4.415	-0.011	0.998	138380		1.36(0.71-2.13)		966	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.437	-0.022	1.712	2054162	2.37		94.7	8537	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.823	0.0	1.000	1124015	NC			220	
813.00 > 169.00	4.823	4.823	0.0	1.000	185763		6.05(2.86-8.58)		917	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.842	-0.019	1.870	3414605	2.59		104	8531	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.165	5.165	0.0	1.071	1147537	NC			329	
913.00 > 169.00	5.165	5.165	0.0	1.071	138572		8.28(3.83-11.48)		730	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 09:50:20 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_009.d

Injection Date: 30-Jul-2018 04:00:14 Instrument ID: A8_N

Lims ID: 320-41149-A-2-B MS

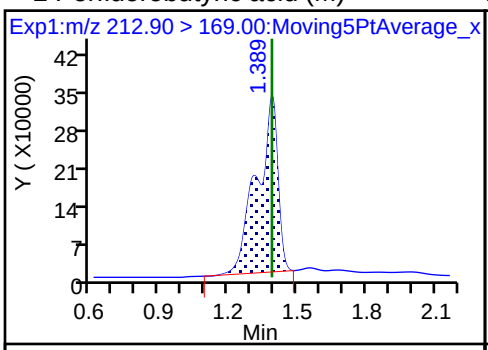
Client ID: GRE10-SB2-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 4 Worklist Smp#: 7

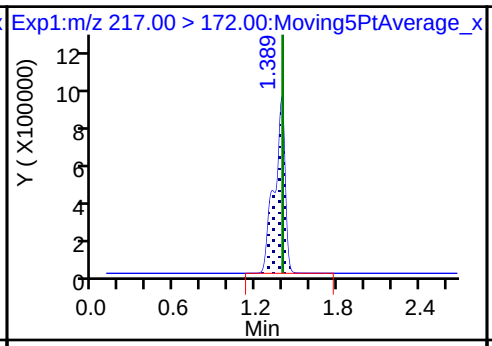
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

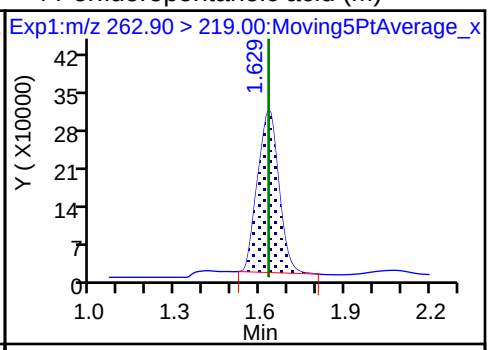
2 Perfluorobutyric acid (M)



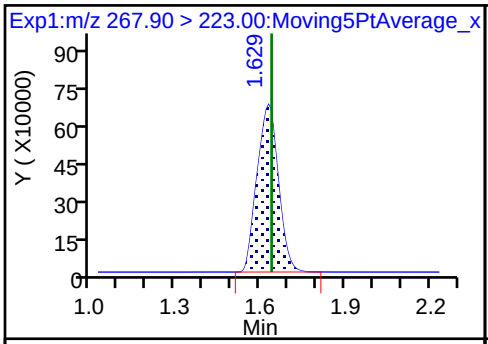
D 1 13C4 PFBA



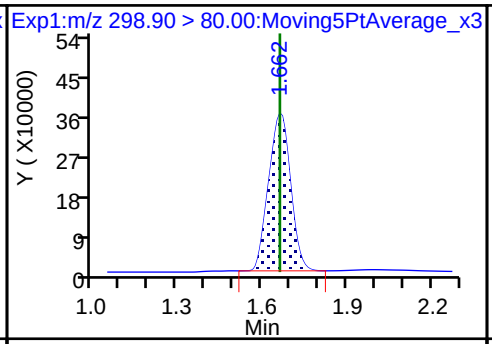
4 Perfluoropentanoic acid (M)



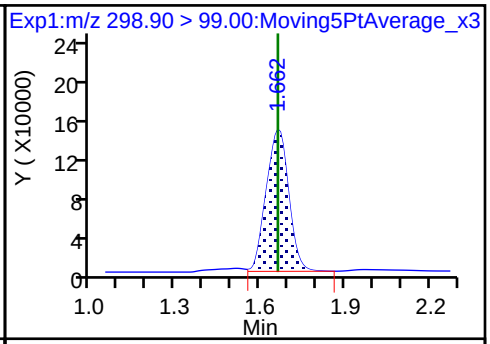
D 3 13C5-PFPeA



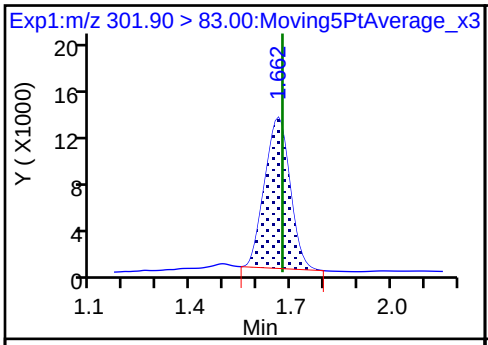
5 Perfluorobutanesulfonic acid



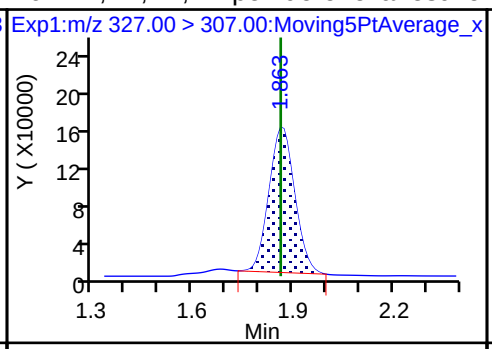
5 Perfluorobutanesulfonic acid



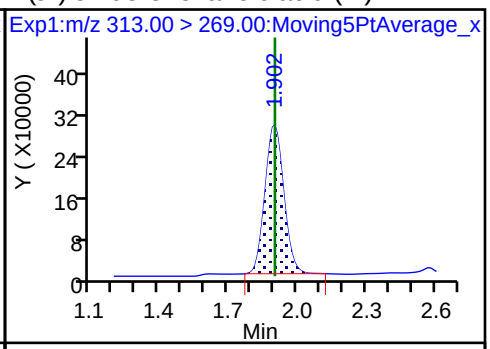
D 47 13C3-PFBS



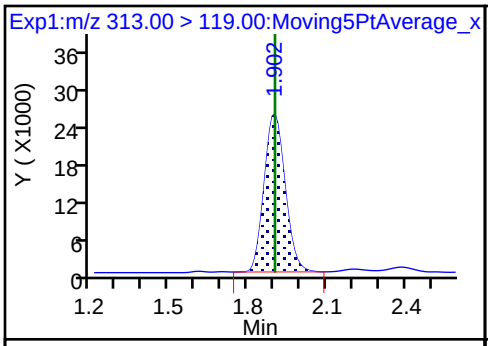
61 1H,1H,2H,2H-perfluorohexanesulfoni (M)



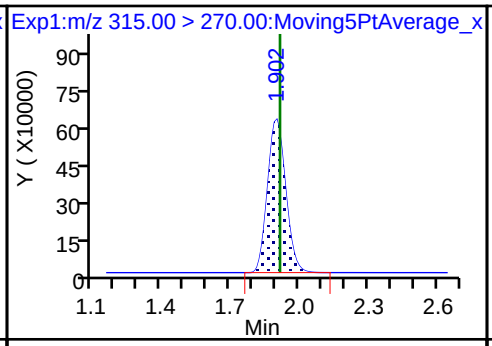
6 Perfluorohexanoic acid (M)



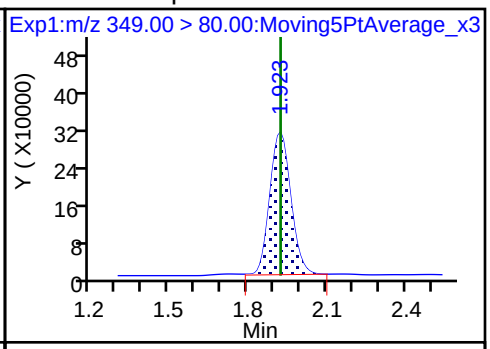
6 Perfluorohexanoic acid



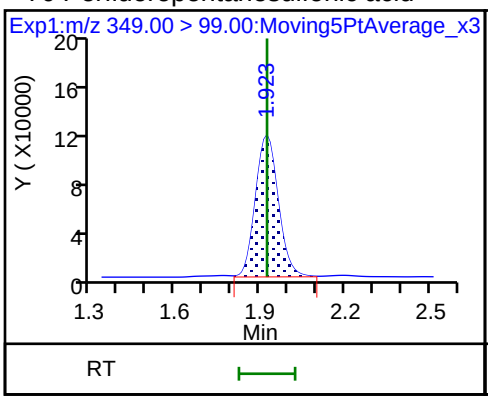
D 7 13C2 PFHxA



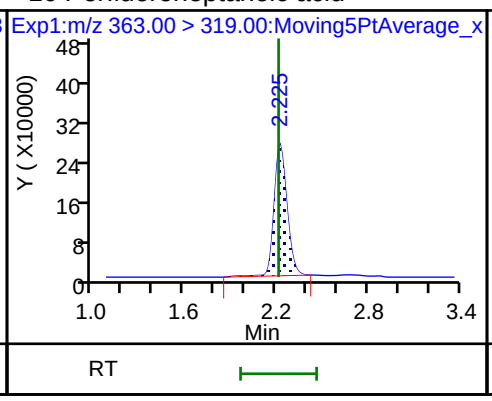
70 Perfluoropentanesulfonic acid



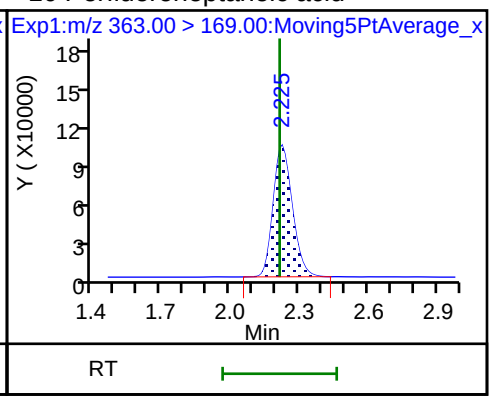
70 Perfluoropentanesulfonic acid



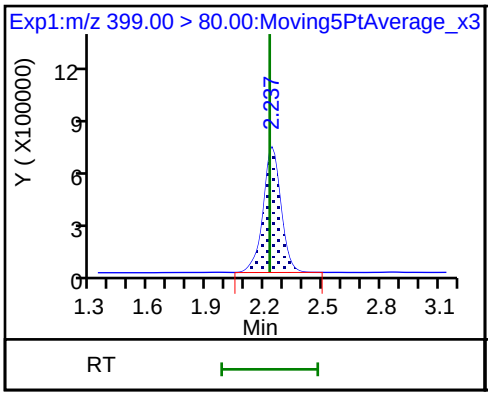
10 Perfluoroheptanoic acid



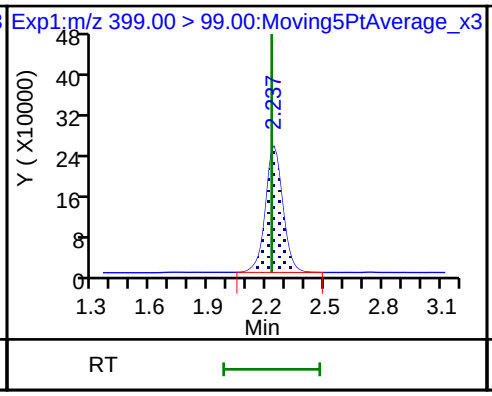
10 Perfluoroheptanoic acid



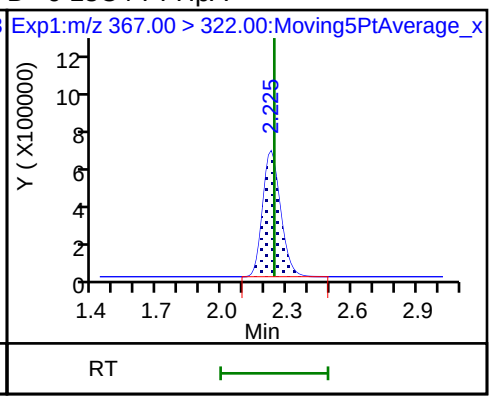
8 Perfluorohexanesulfonic acid



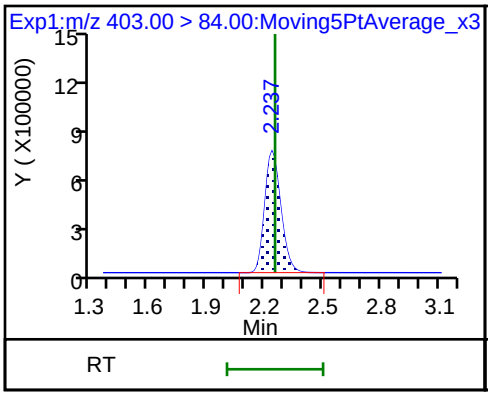
8 Perfluorohexanesulfonic acid



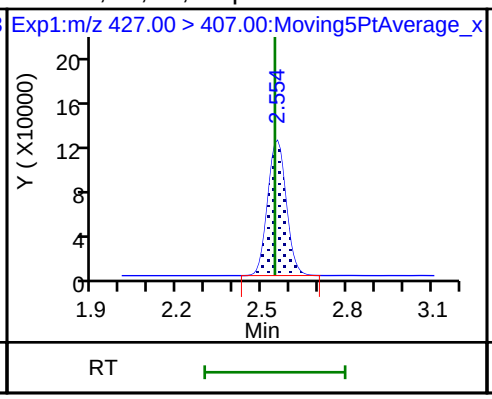
D 9 13C4-PFHpA



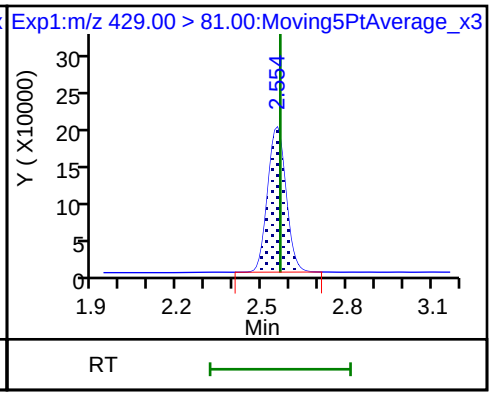
D 11 18O2 PFHxS



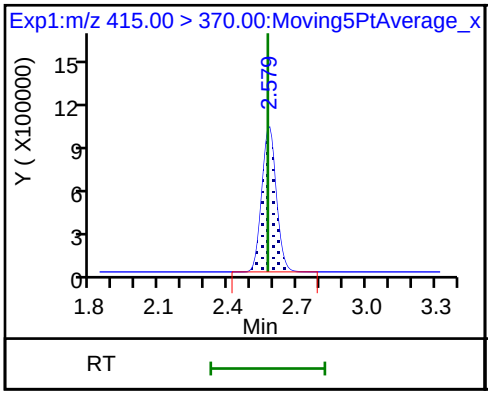
13 1H,1H,2H,2H-perfluorooctanesulfon



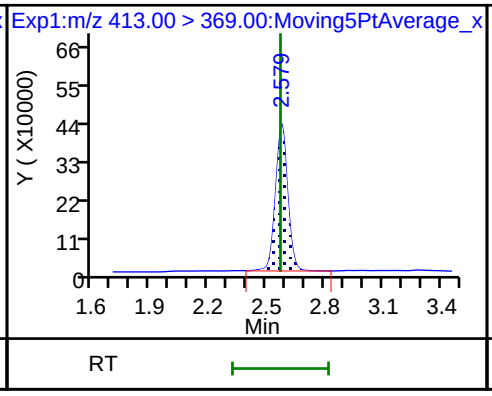
D 12 M2-6:2FTS



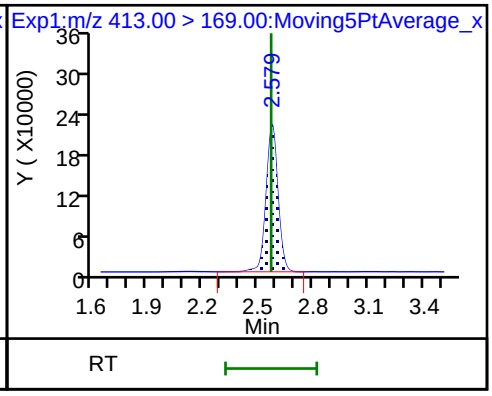
* 62 13C2-PFOA



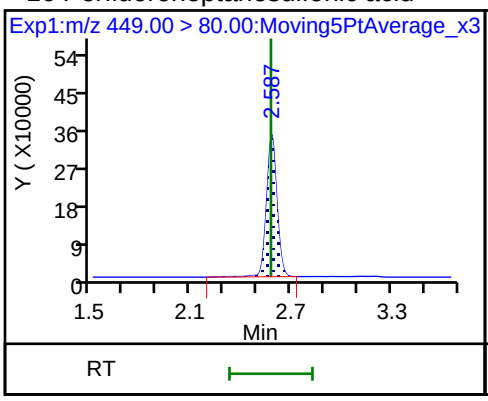
15 Perfluorooctanoic acid



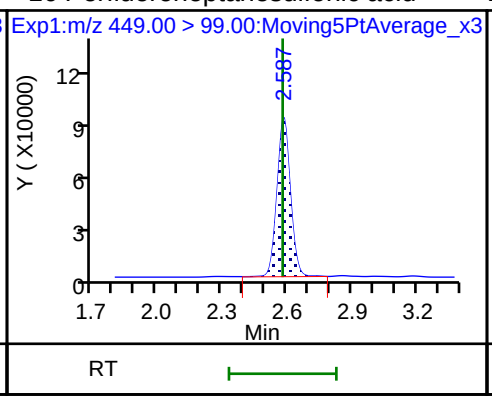
15 Perfluorooctanoic acid



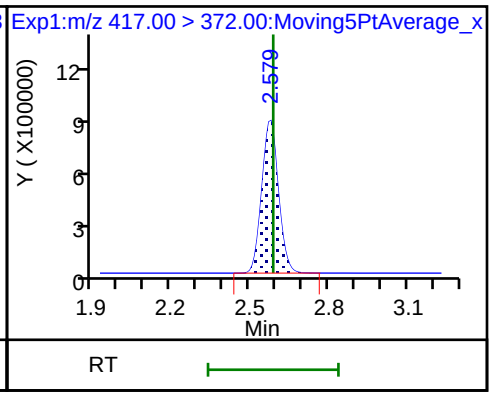
16 Perfluoroheptanesulfonic acid



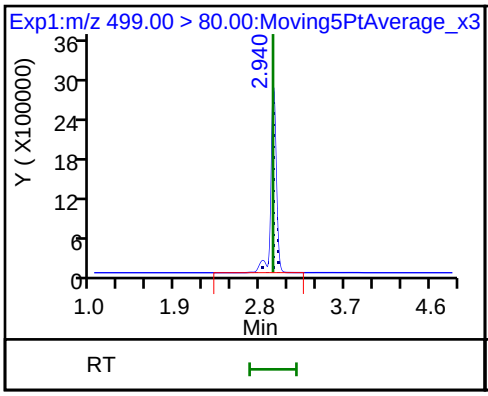
16 Perfluoroheptanesulfonic acid



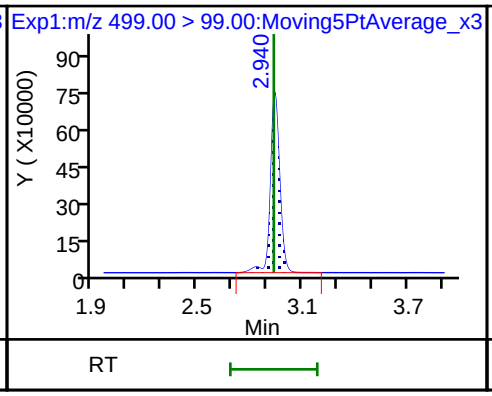
D 14 13C4 PFOA



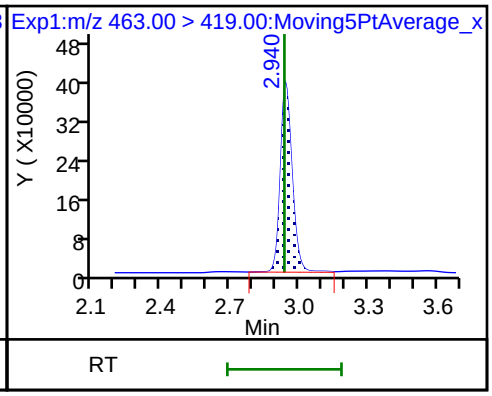
17 Perfluorooctane sulfonic acid



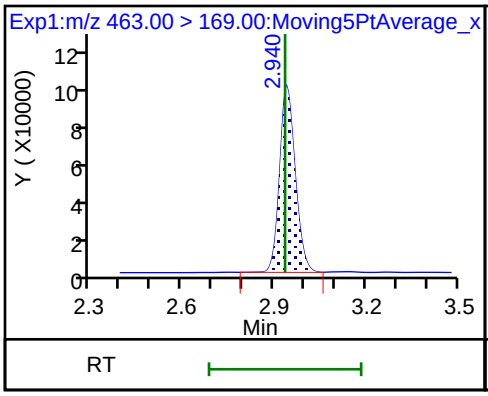
17 Perfluorooctane sulfonic acid



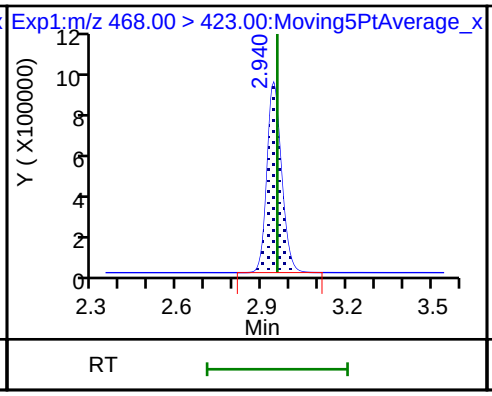
20 Perfluorononanoic acid



20 Perfluorononanoic acid



D 19 13C5 PFNA



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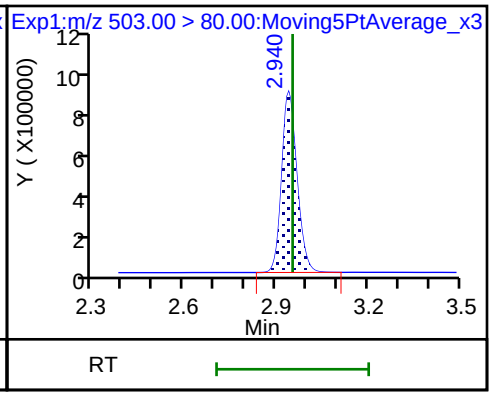
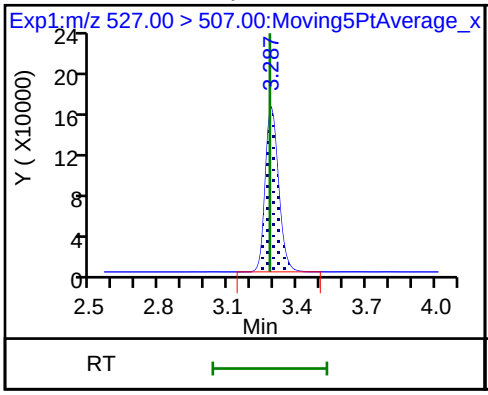
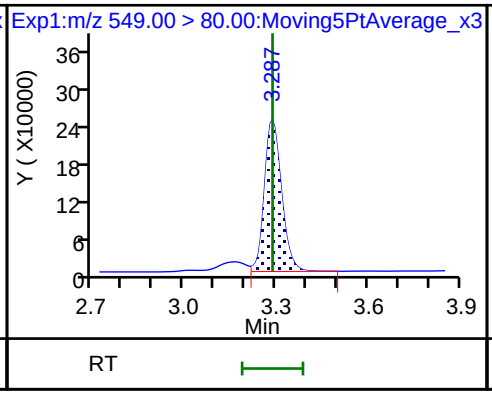


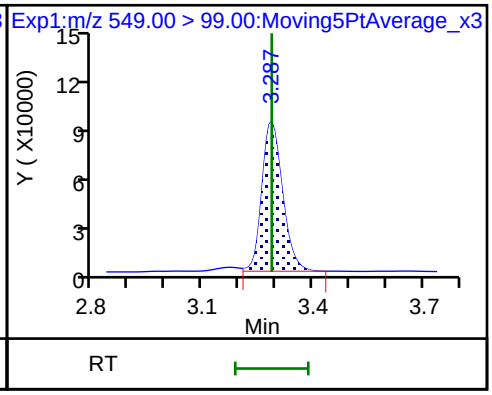
25 1H,1H,2H,2H-perfluorodecanesulfoni



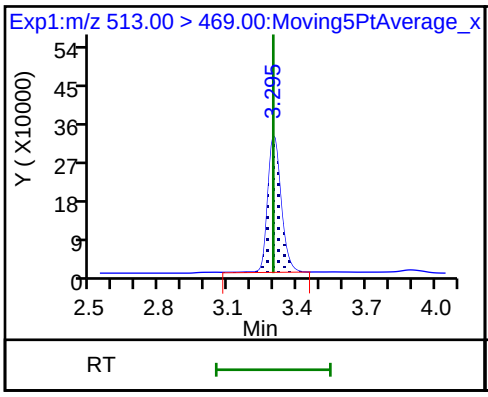
68 Perfluorononanesulfonic acid



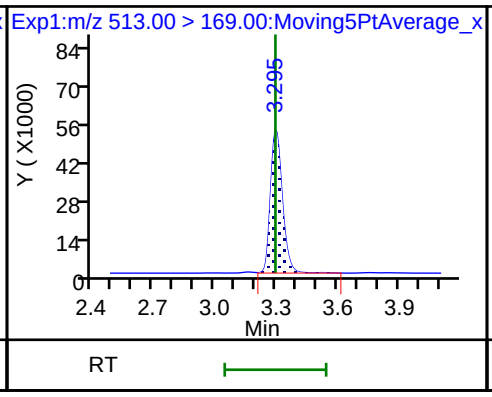
68 Perfluorononanesulfonic acid



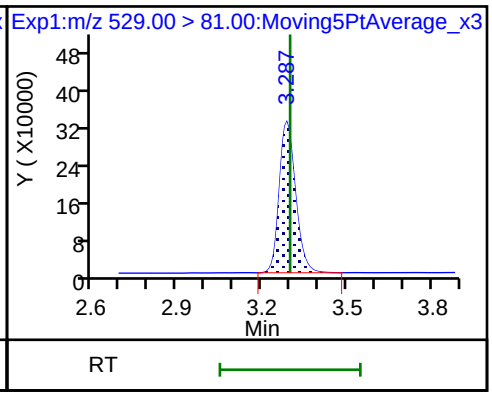
24 Perfluorodecanoic acid



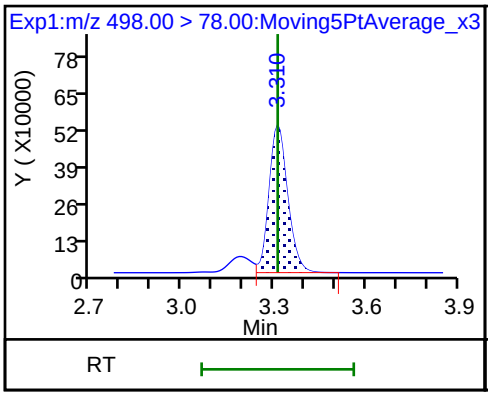
24 Perfluorodecanoic acid



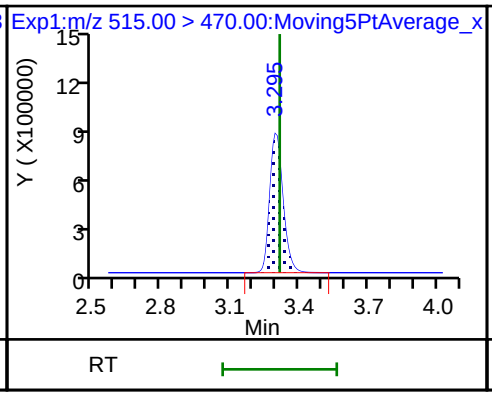
D 26 M2-8:2FTS



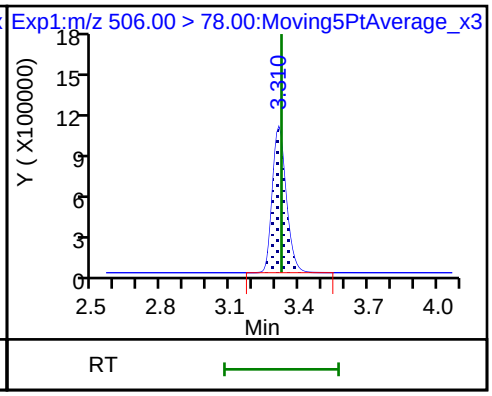
22 Perfluorooctane Sulfonamide



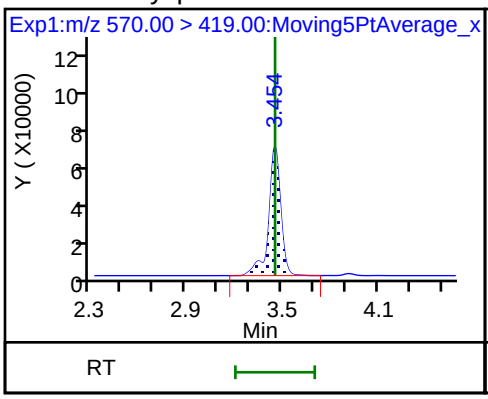
D 23 13C2 PFDA



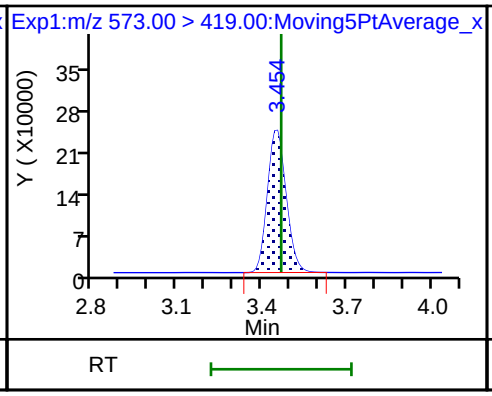
D 21 13C8 FOSA



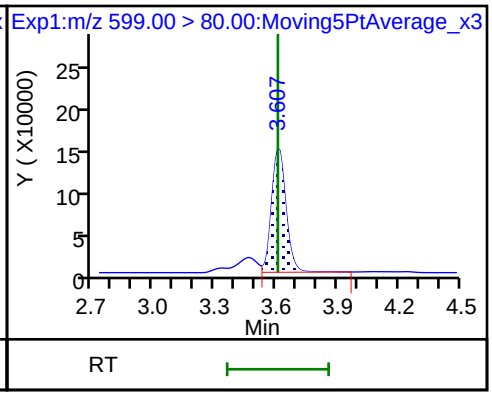
28 N-methyl perfluorooctane sulfonami



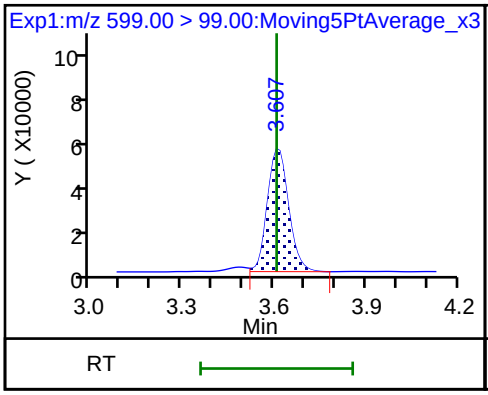
D 27 d3-NMeFOSAA



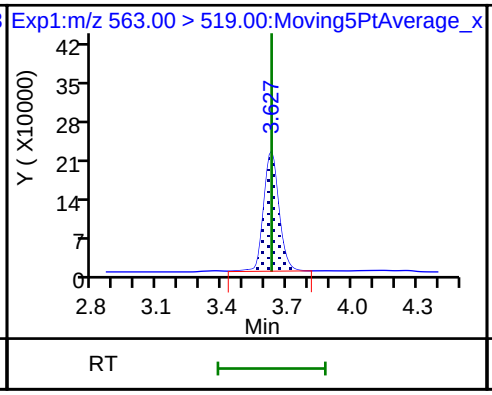
29 Perfluorodecane Sulfonic acid



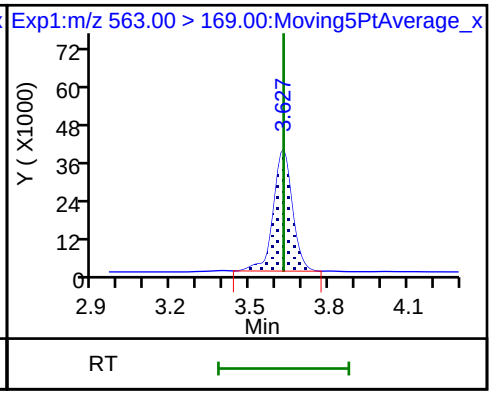
29 Perfluorodecane Sulfonic acid



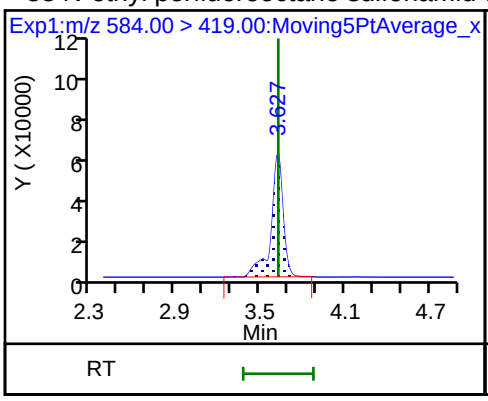
31 Perfluoroundecanoic acid



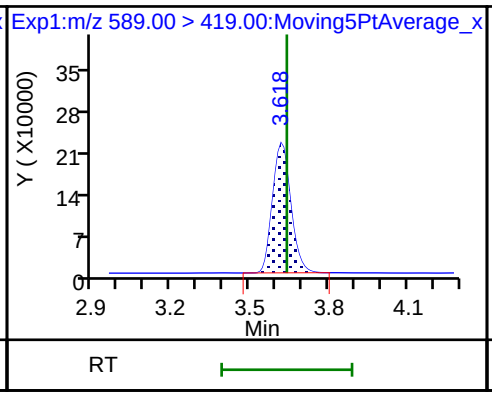
31 Perfluoroundecanoic acid



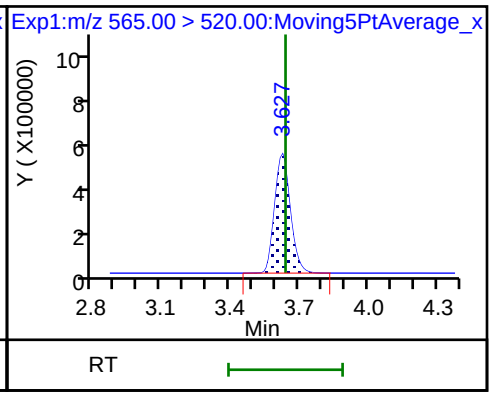
33 N-ethyl perfluorooctane sulfonamid



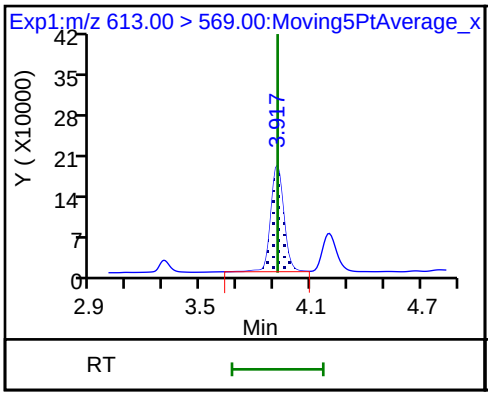
D 32 d5-NEtFOSAA



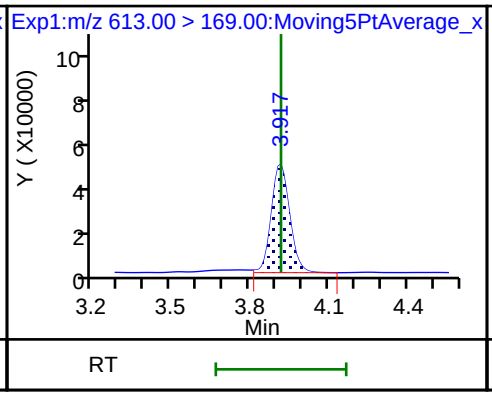
D 30 13C2 PFUnA



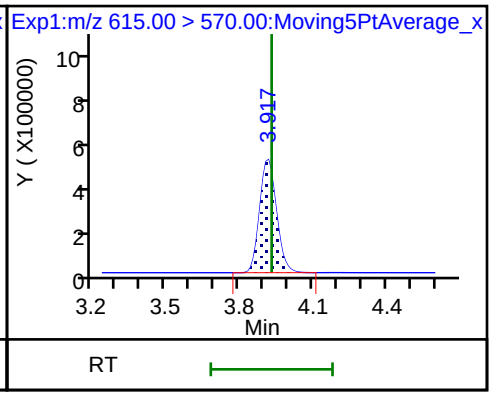
37 Perfluorododecanoic acid



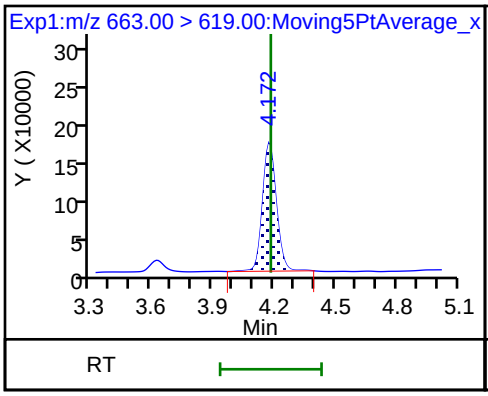
37 Perfluorododecanoic acid



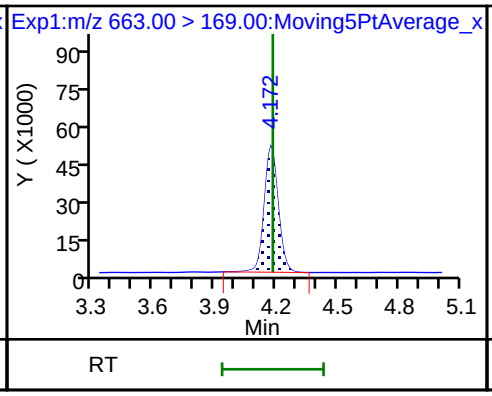
D 36 13C2 PFDoA



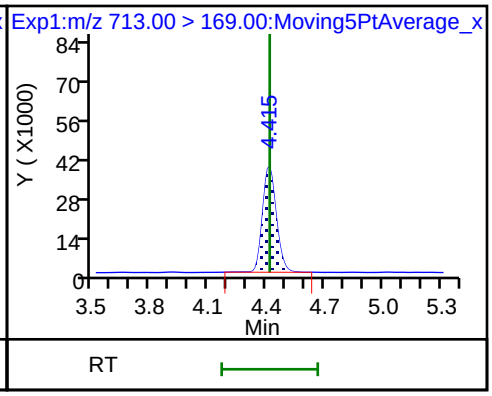
41 Perfluorotridecanoic acid



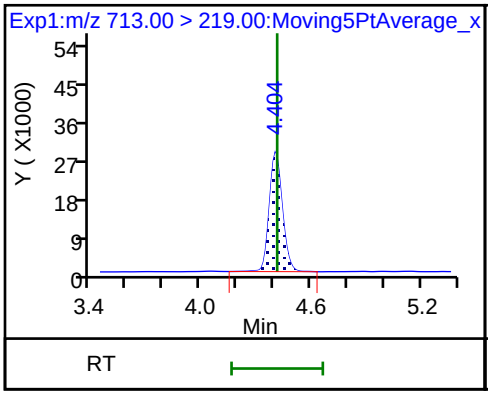
41 Perfluorotridecanoic acid



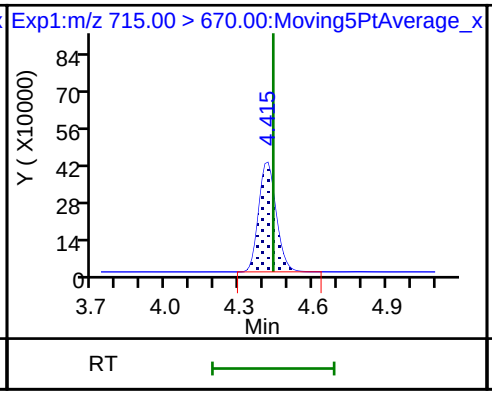
42 Perfluorotetradecanoic acid



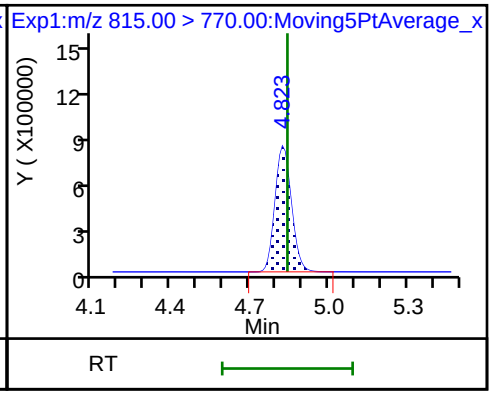
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB1-01 MS | Lab Sample ID: 320-41149-19 MS

Matrix: Solid | Lab File ID: 2018.07.28LLB_018.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 14:15

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.10(g) | Date Analyzed: 07/29/2018 01:32

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.73		0.31	0.21	0.081
335-67-1	Perfluorooctanoic acid (PFOA)	16.0	4	0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	6.91		0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.05		0.42	0.19	0.061
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*37.3*	*E 4*	*0.31*	0.21	*0.064*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*326*	*E 4*	*1.0*	0.52	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	94		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	84		50-150
STL00995	13C5 PFNA	53		50-150
STL00994	18O2 PFHxS	80		50-150
STL00991	13C4 PFOS	53		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_018.d
Lims ID: 320-41149-A-19-B MS
Client ID: GRE07-SB1-01
Sample Type: MS
Inject. Date: 29-Jul-2018 01:32:14 ALS Bottle#: 11 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-19-b
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:00:26 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 16:00:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.397	1.397	0.0	1.000	4983100	2.83		283	426	M
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.397	0.0	0.541	4482311	2.44		97.7	78760	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.633	0.0	0.633	3250737	2.54		101	31228	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.641	1.641	-0.001	1.005	3134603	2.01		201	519	M
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.667	-0.001	0.646	73456	2.19		94.0	131	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.676	-0.001	1.005	3686471	1.47		166	2836	
298.90 > 99.00	1.666	1.676	-0.010	1.000	1503793		2.45(1.25-3.74)		994	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.875	-0.009	0.723	11463	NC			3.4	
61 1H,1H,2H,2H-perfluorohexanesulfoni										M
327.00 > 307.00	1.876	1.877	-0.001	1.126	1039152	1.92		206	1279	M
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.905	0.0	0.738	3153900	2.10		84.0	49884	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.906	-0.001	1.000	5857057	4.38		438	2252	
313.00 > 119.00	1.905	1.906	-0.001	1.000	491087		11.93(5.03-15.10)		2606	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	3826915	1.70		181	3728	
349.00 > 99.00	1.927	1.928	-0.001	1.157	1454813		2.63(1.36-4.07)		4390	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.002	0.001	0.776	269808	NC			4755	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.004	-0.001	1.000	254203	NC			373	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.228	0.001	0.864	3151270	2.04		81.4	44898	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.230	-0.001	1.000	3161368	2.27		227	1567	
363.00 > 169.00	2.229	2.230	-0.001	1.000	1238043		2.55(1.13-3.40)		7017	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.240	0.001	0.868	3752970	1.89		79.8	39668	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.241	2.242	-0.001	1.000	33265920	18.0		1975	23449	E
399.00 > 99.00	2.241	2.242	-0.001	1.000	12187129		2.73(1.50-4.49)		14439	
65 ADONA										
377.00 > 251.00	2.280	2.268	0.012	0.773	3303790	NC			22926	
377.00 > 85.00	2.267	2.268	-0.001	0.769	2019490		1.64(0.84-2.53)		5666	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.555	2.557	-0.002	1.000	26079234	40.5		4269	100235	E
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.564	-0.009	0.990	907118	2.10		88.4	2579	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.582	-0.002		3957623	2.50			55755	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.582	0.006	1.000	11896877	7.71		770	4308	
413.00 > 169.00	2.588	2.582	0.006	1.000	6500162		1.83(0.84-2.52)		13444	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	1.003	3177711	2.10		83.9	47667	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.588	2.590	-0.002	0.878	3168238	3.11		326	529	
449.00 > 99.00	2.588	2.590	-0.002	0.878	864281		3.67(1.94-5.82)		1178	M
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.947	0.001	1.142	1761713	1.27		53.3	3178	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.947	0.001	1.142	1739339	1.33		53.3	25398	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.948	0.0	1.000	2641323	3.33		333	1644	
463.00 > 169.00	2.948	2.948	0.0	1.000	652817		4.05(1.90-5.69)		6808	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.948	2.948	0.0	1.000	127807129	156.9		16909	198598	E
499.00 > 99.00	2.948	2.948	0.0	1.000	42224377		3.03(2.31-6.93)		115535	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.164	0.0	1.073	2063167	NC			11373	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.298	0.001	1.279	1351050	3.00		125	2612	
25 1H,1H,2H,2H-perfluorodecanesulfoni										E
527.00 > 507.00	3.299	3.300	-0.001	1.000	71329420	93.3		9736	1602420	E
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.300	-0.001	1.119	2216182	4.03		419	29.5	
549.00 > 99.00	3.299	3.300	-0.001	1.119	794315		2.79(1.33-3.97)		84.7	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.314	-0.007	1.282	2107510	2.03		81.1	38673	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.314	0.001	1.285	3049725	1.50		60.1	1211	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.315	-0.008	1.000	2594007	2.99		299	1291	
513.00 > 169.00	3.307	3.315	-0.008	1.000	445751		5.82(2.36-7.09)		982	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.323	3.315	0.008	1.002	10207337	8.41		841	186	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.466	-0.008	1.340	969729	2.82		113	6109	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.469	-0.002	1.003	401227	1.05		105	2887	
35 MeFOSA										
512.00 > 169.00	3.733	3.498	0.235		26928	NC			48.1	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.624	-0.003	1.228	2800782	5.73		594	56.8	
599.00 > 99.00	3.621	3.624	-0.003	1.228	970244		2.89(1.39-4.16)		266	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.629	0.002	1.407	1171446	3.25		130	6515	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.639	0.001	1.411	2332884	2.79		111	44994	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.640	3.643	-0.003	1.000	1815369	1.57		157	173	M
563.00 > 169.00	3.631	3.643	-0.012	0.997	320650		5.66(2.12-6.36)		31.1	M
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.643	-0.003	1.003	592187	1.35		135	4769	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.799	-0.004	1.287	2952463	NC			24963	
D 36 13C2 PFDoA										
615.00 > 570.00	3.920	3.930	-0.010	1.519	1980442	2.49		99.6	15428	
37 Perfluorododecanoic acid										M
613.00 > 569.00	3.920	3.935	-0.015	1.000	1687717	1.97		197	244	
613.00 > 169.00	3.920	3.935	-0.015	1.000	410731		4.11(2.13-6.40)		395	M
41 Perfluorotridecanoic acid										M
663.00 > 619.00	4.174	4.199	-0.025	1.065	815458	0.9800		98.0	60.9	M
663.00 > 169.00	4.164	4.199	-0.035	1.062	248330		3.28(1.25-3.76)		41.9	M
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.416	4.435	-0.019	1.000	225479	1.29		129	814	
713.00 > 219.00	4.416	4.435	-0.019	1.000	160999		1.40(0.71-2.13)		1157	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.416	4.437	-0.021	1.711	1745324	2.25		89.8	10849	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.840	-0.007	1.000	926448	NC			176	
813.00 > 169.00	4.833	4.840	-0.007	1.000	154462		6.00(2.86-8.58)		636	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.873	2404777	2.04		81.5	7441	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.182	5.180	0.002	1.072	908410	NC			261	
913.00 > 169.00	5.174	5.180	-0.006	1.070	111155		8.17(3.83-11.48)		702	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 30-Jul-2018 16:00:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_018.d

Injection Date: 29-Jul-2018 01:32:14 Instrument ID: A8_N

Lims ID: 320-41149-A-19-B MS

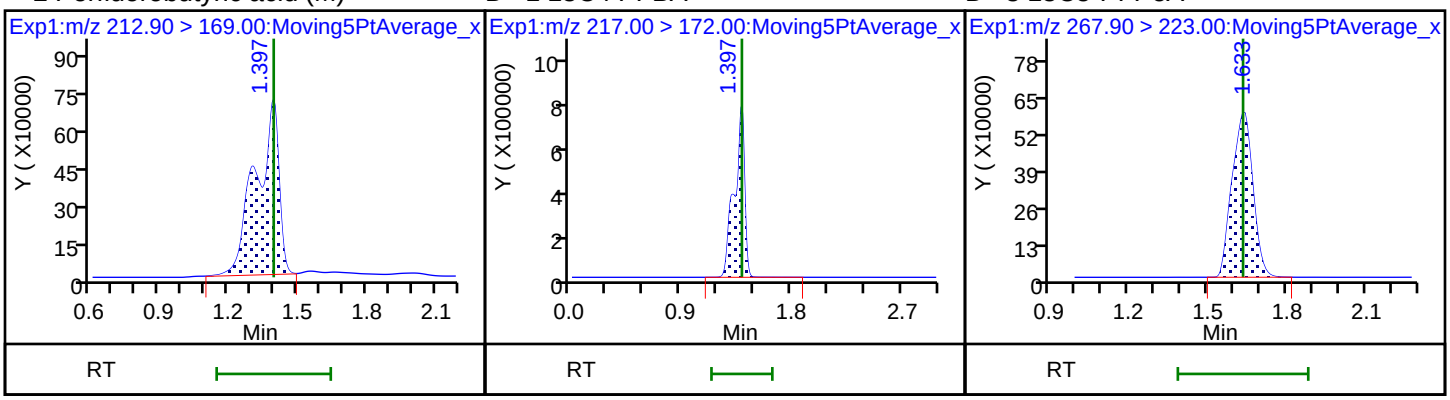
Client ID: GRE07-SB1-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 11 Worklist Smp#: 5

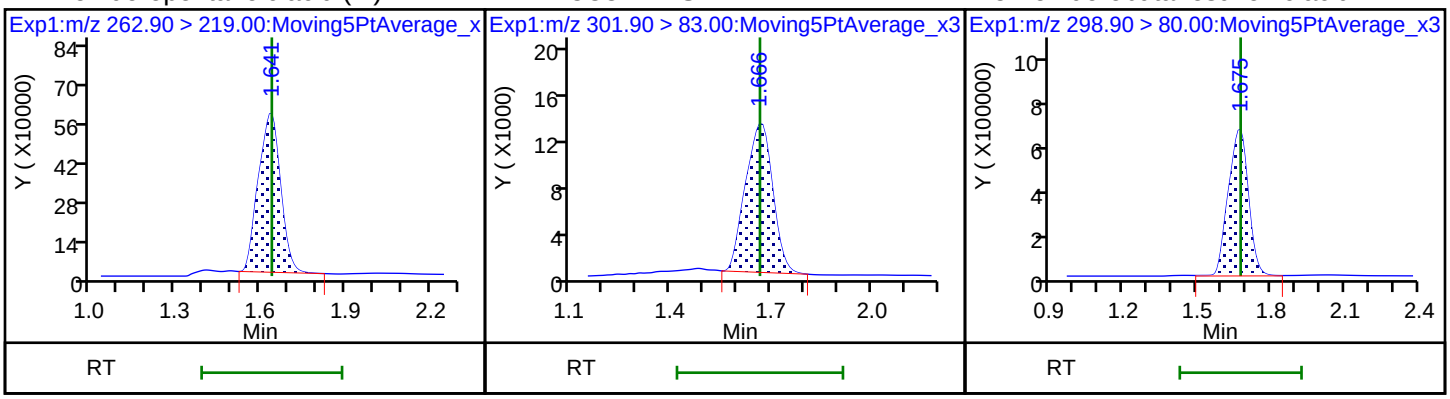
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

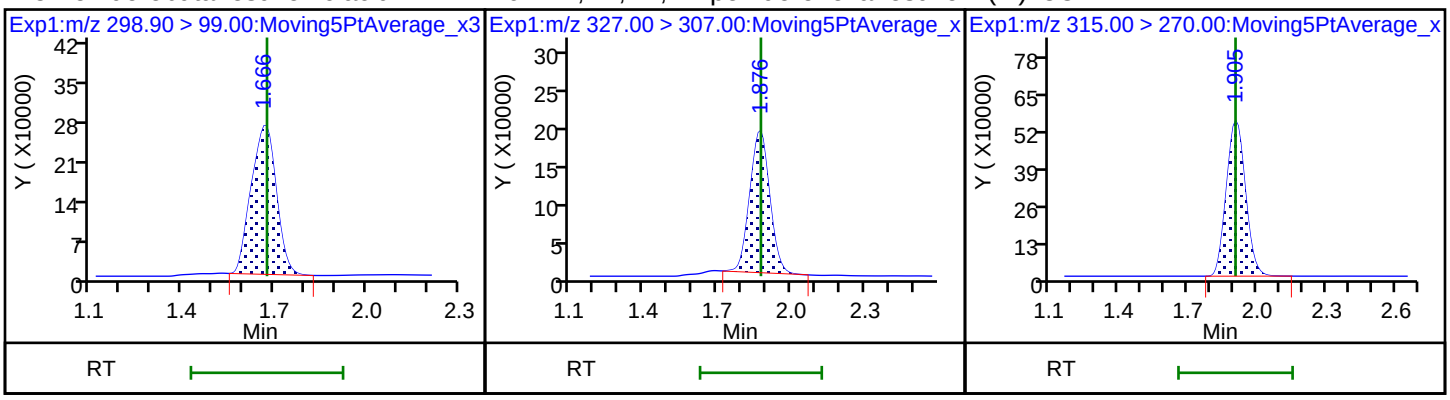
2 Perfluorobutyric acid (M) D 1 13C4 PFBA D 3 13C5-PFPeA



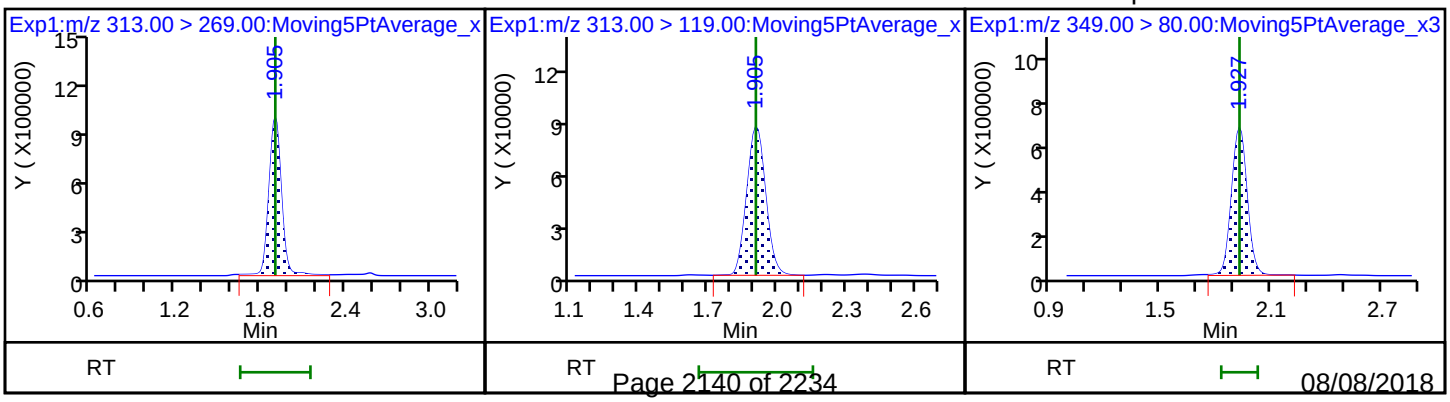
4 Perfluoropentanoic acid (M) D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid



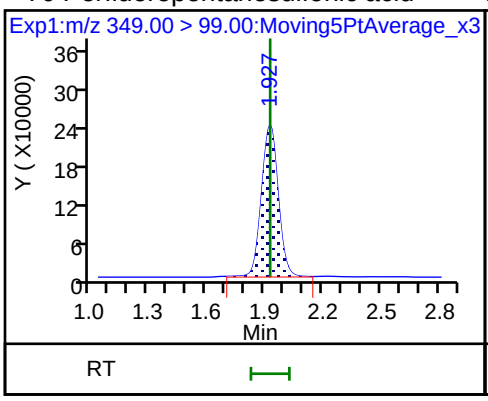
5 Perfluorobutanesulfonic acid 61 1H,1H,2H,2H-perfluorohexanesulfon D (M)13C2 PFHxA



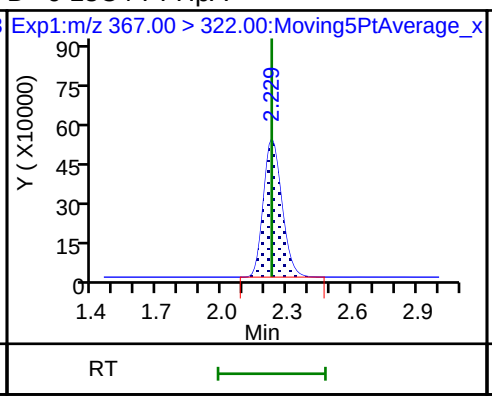
6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid



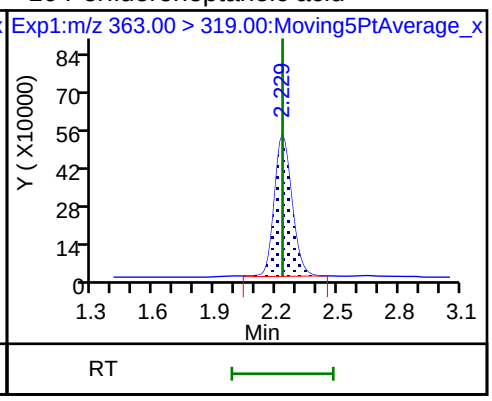
70 Perfluoropentanesulfonic acid



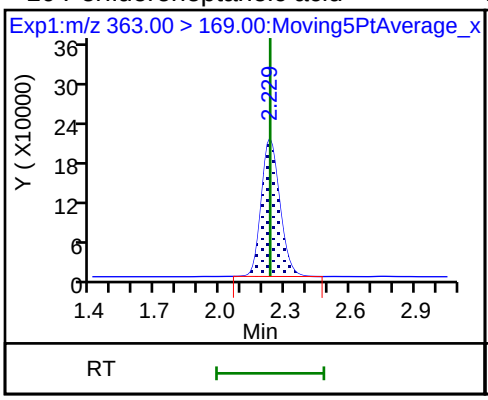
D 9 13C4-PFHpA



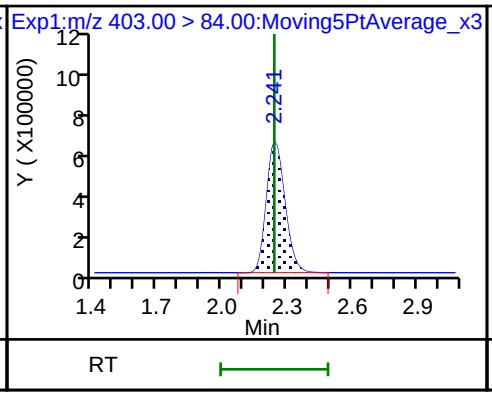
10 Perfluoroheptanoic acid



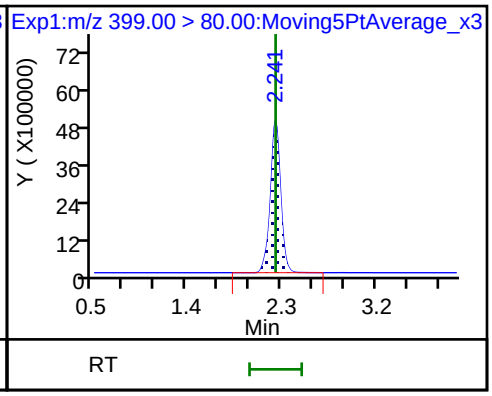
10 Perfluoroheptanoic acid



D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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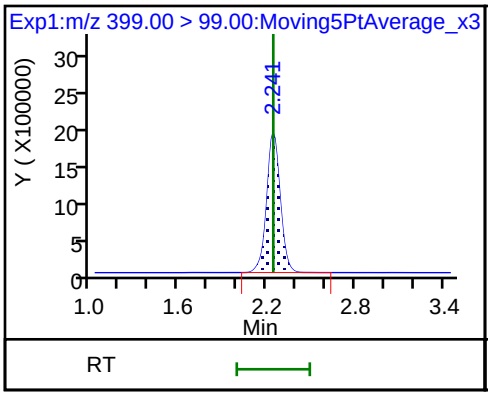
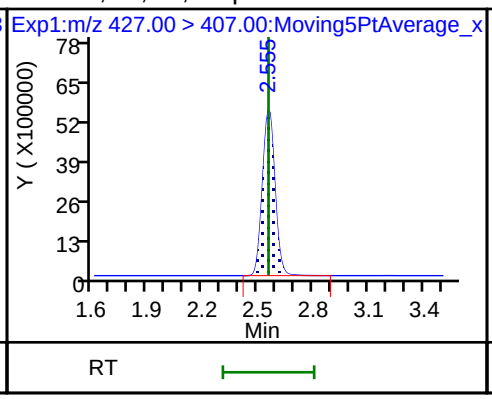
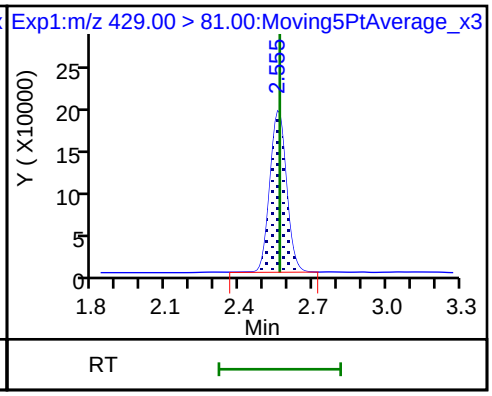


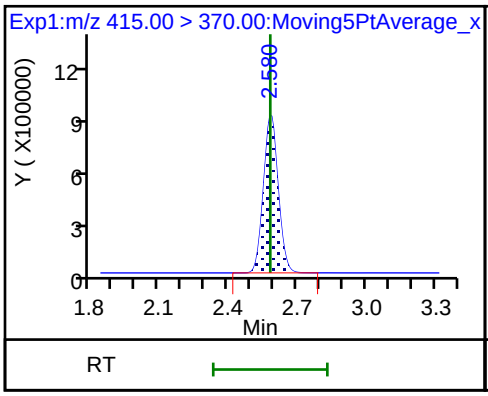
13 1H,1H,2H,2H-perfluorooctanesulfon



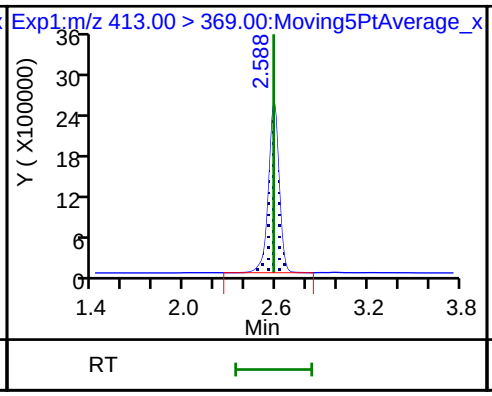
D 12 M2-6:2FTS



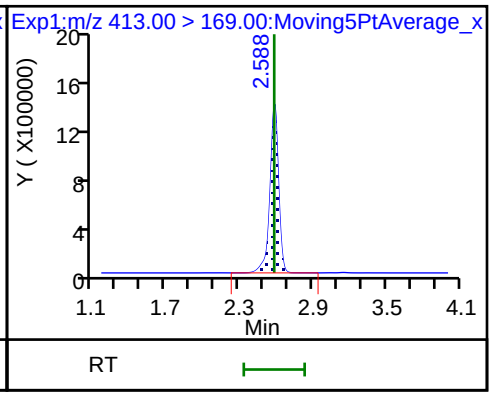
* 62 13C2-PFOA



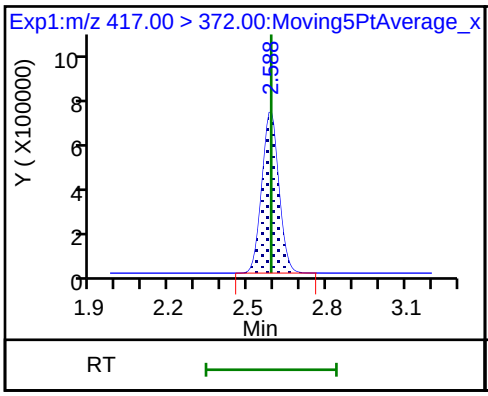
15 Perfluorooctanoic acid



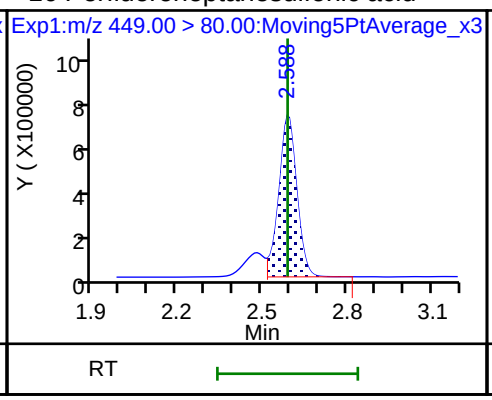
15 Perfluorooctanoic acid



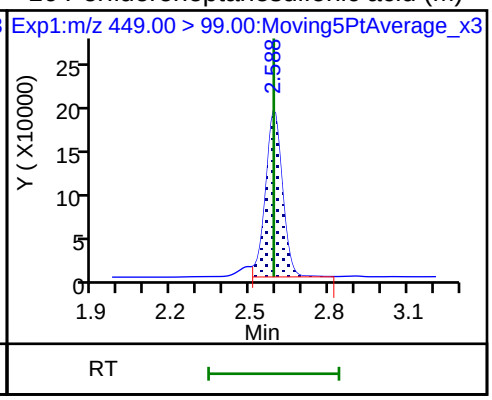
D 14 13C4 PFOA



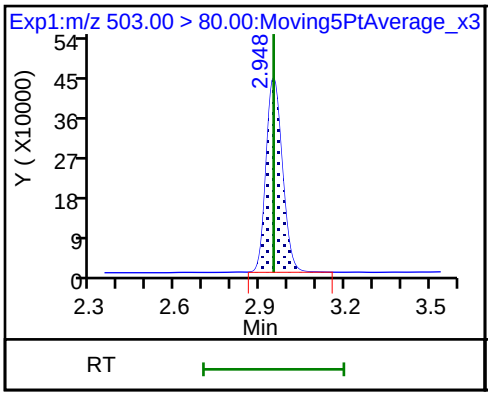
16 Perfluoroheptanesulfonic acid



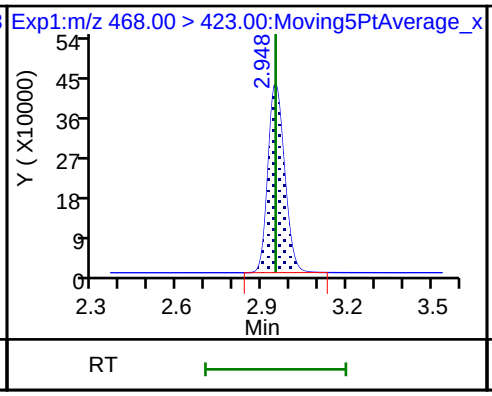
16 Perfluoroheptanesulfonic acid (M)



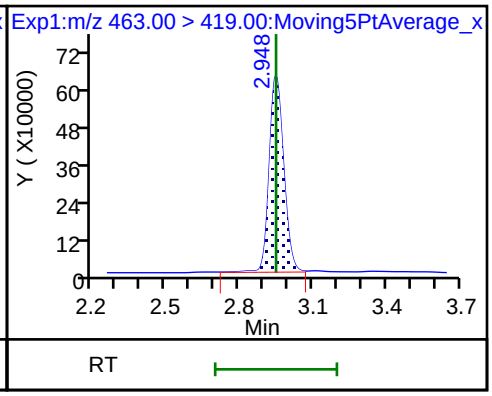
D 18 13C4 PFOS



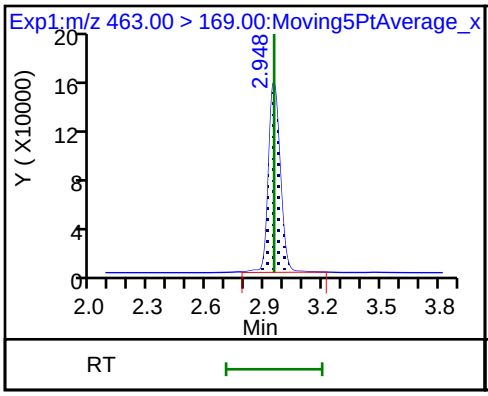
D 19 13C5 PFNA



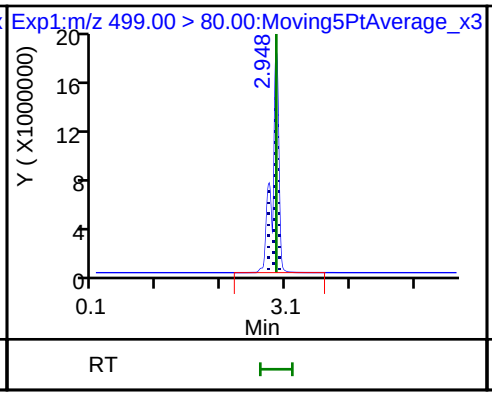
20 Perfluorononanoic acid



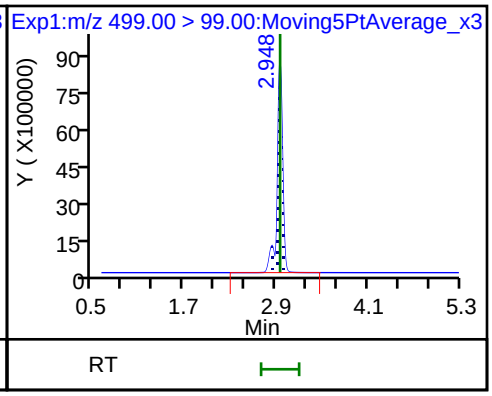
20 Perfluorononanoic acid



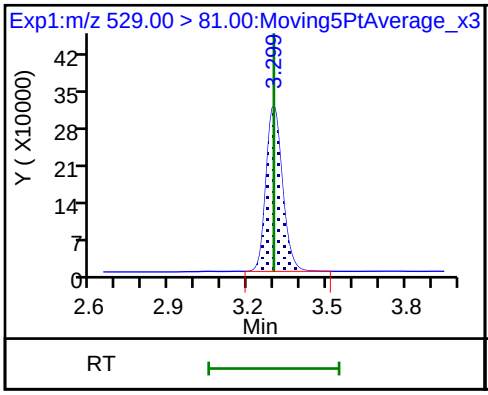
17 Perfluorooctane sulfonic acid



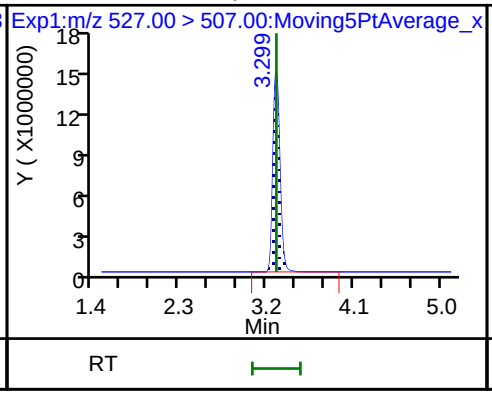
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS



25 1H,1H,2H,2H-perfluorodecanesulfoni



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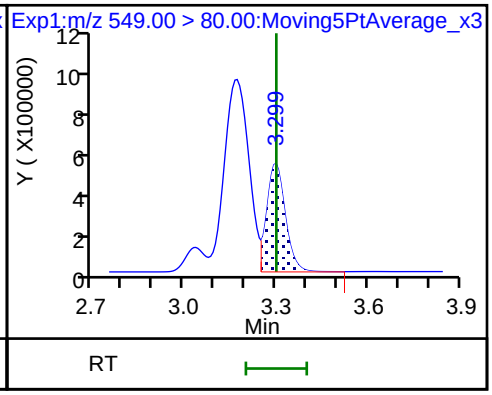

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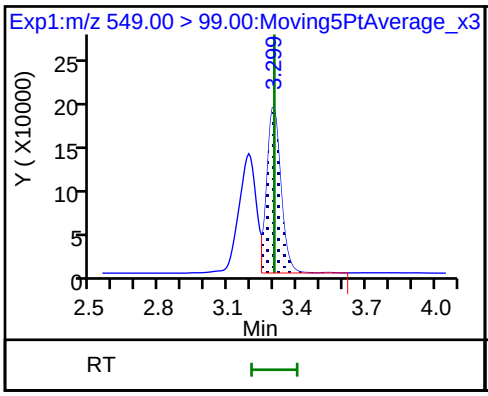
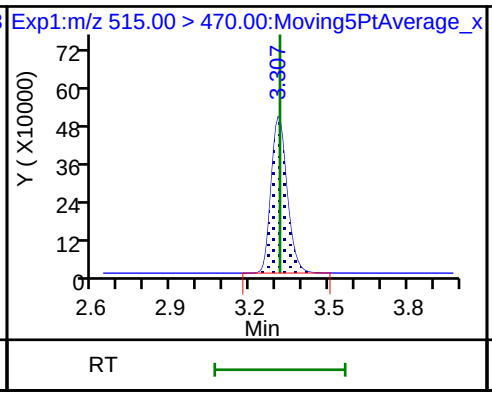
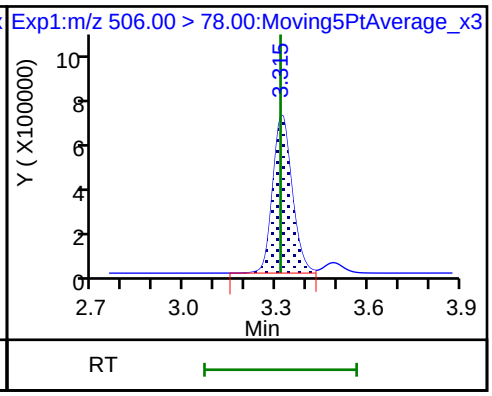


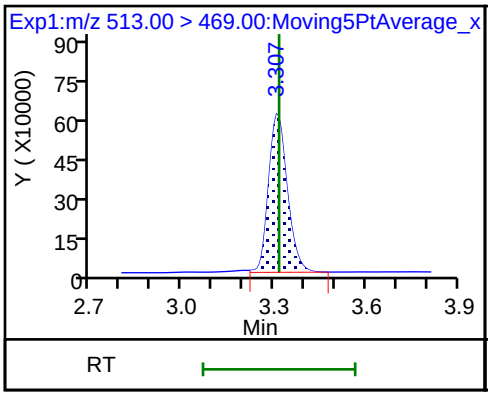
D 23 13C2 PFDA



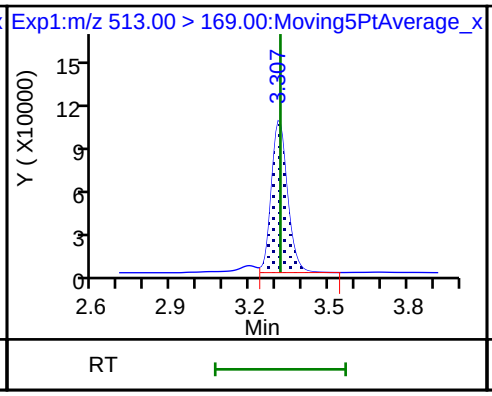
D 21 13C8 FOSA



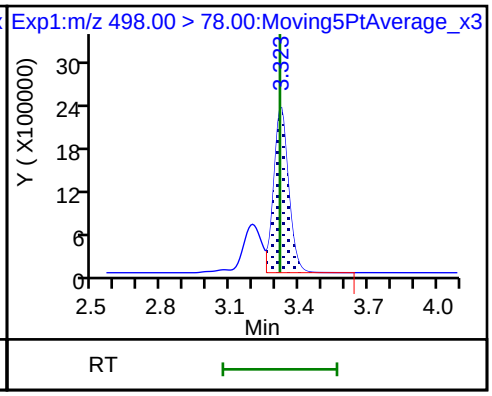
24 Perfluorodecanoic acid



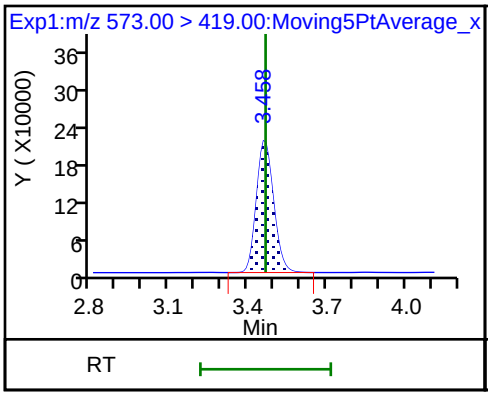
24 Perfluorodecanoic acid



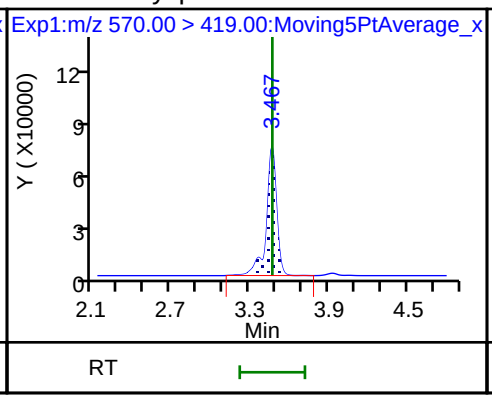
22 Perfluorooctane Sulfonamide



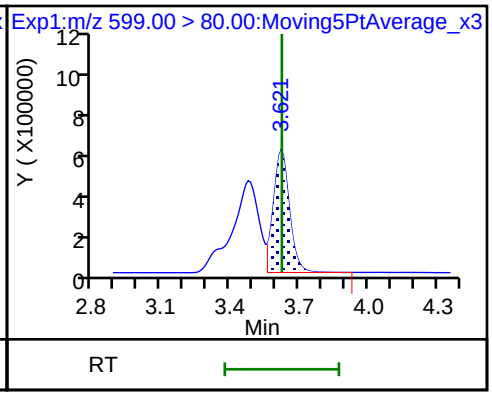
D 27 d3-NMeFOSAA



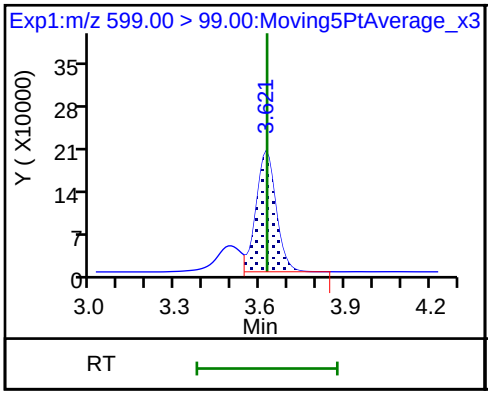
28 N-methyl perfluorooctane sulfonami



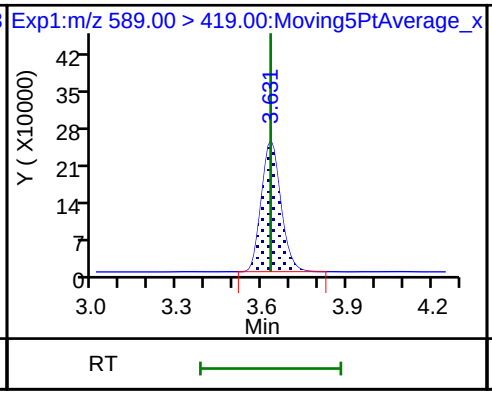
29 Perfluorodecane Sulfonic acid



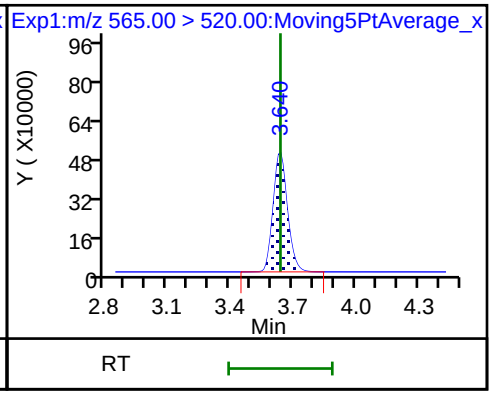
29 Perfluorodecane Sulfonic acid



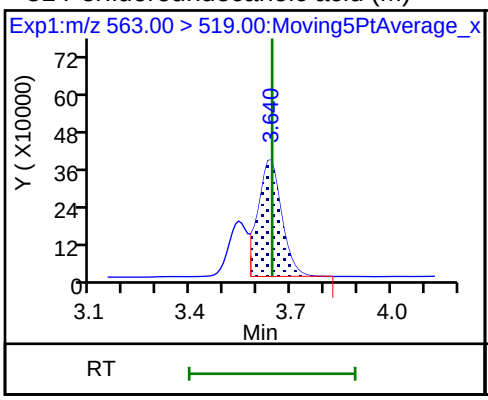
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA



31 Perfluoroundecanoic acid (M)



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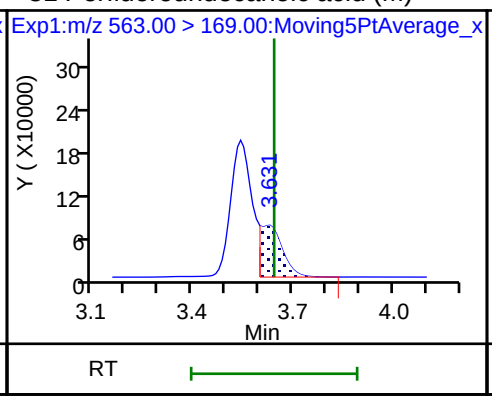
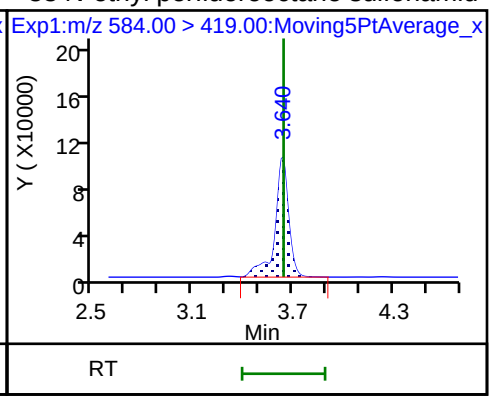
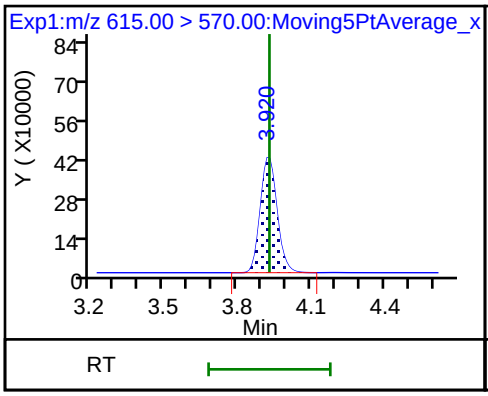


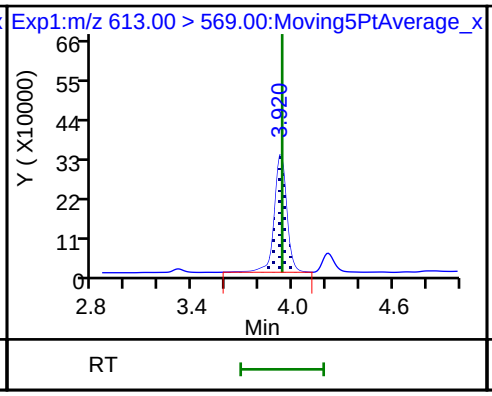
33 N-ethyl perfluorooctane sulfonamid



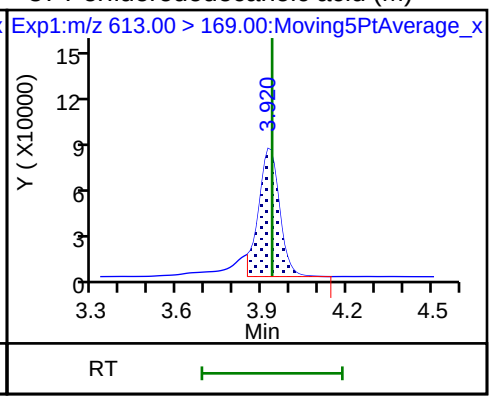
D 36 13C2 PFDoA



37 Perfluorododecanoic acid



37 Perfluorododecanoic acid (M)



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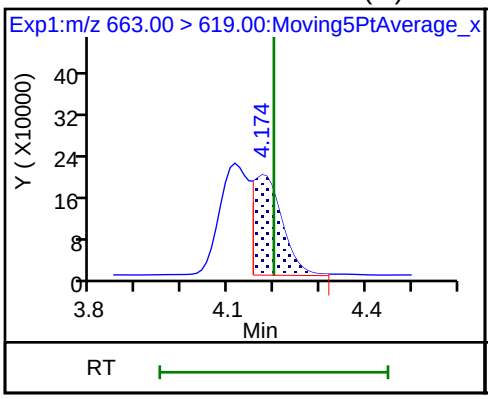
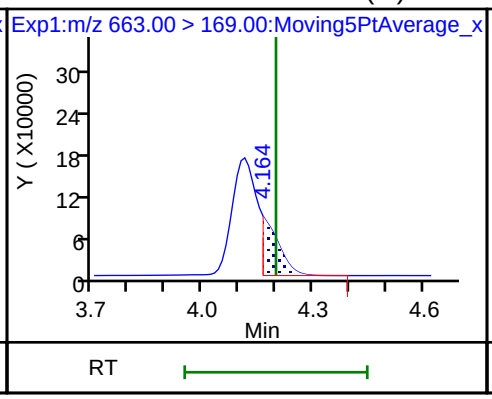
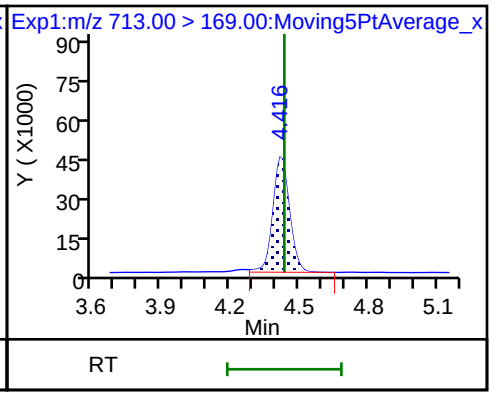


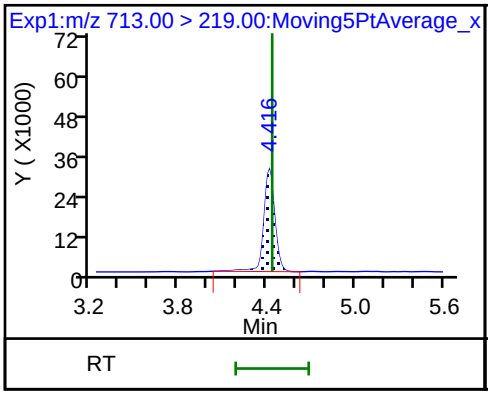
41 Perfluorotridecanoic acid (M)



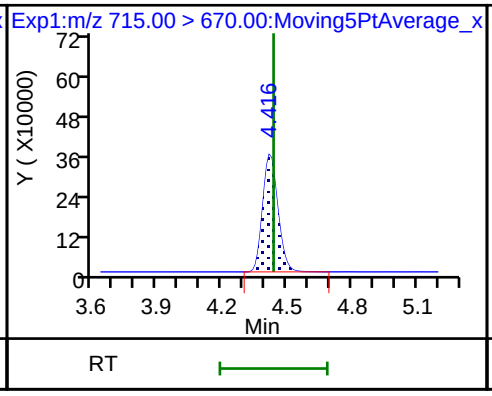
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



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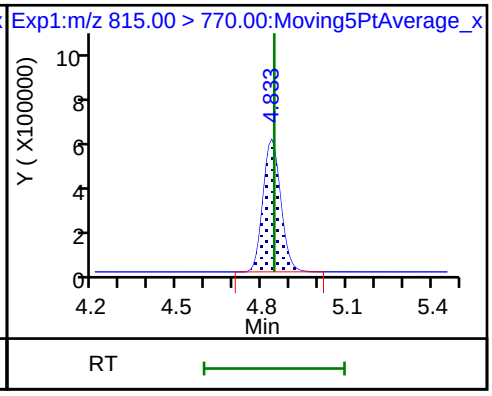


FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB1-01 MS DL | Lab Sample ID: 320-41149-19 MS DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_008.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 14:15

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.10(g) | Date Analyzed: 07/31/2018 18:05

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 50

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*5.02*	*J D M*	*16*	10	*4.1*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*17.9*	*4 D*	*16*	10	*5.2*
375-95-1	*Perfluorononanoic acid (PFNA)*	*7.92*	*J J1 D*	*16*	10	*4.2*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*3.49*	*J D*	*21*	9.4	*3.1*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	40.1	4 D	16	10	3.2
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	553	4 D	52	26	12

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	64	M	50-150
STL01892	13C4-PFHpA	75		50-150
STL00990	13C4 PFOA	82		50-150
STL00995	13C5 PFNA	79		50-150
STL00994	18O2 PFHxS	72		50-150
STL00991	13C4 PFOS	67		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_008.d
Lims ID: 320-41149-A-19-B MS
Client ID: GRE07-SB1-01
Sample Type: MS
Inject. Date: 31-Jul-2018 18:05:15 ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 50.0000
Sample Info: 320-41149-a-19-b 50X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:35:20 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:35:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.397	1.391	0.006	1.004	117779	0.0628		314	18.8	M
D 1 13C4 PFBA										M
217.00 > 172.00	1.391	1.394	-0.003	0.539	91555	0.0390		78.0	1154	M
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.633	0.0	1.000	53906	0.0371		185	20.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.633	60066	0.0398		79.6	1120	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.666	0.0	1.000	75220	0.0336		190	313	
298.90 > 99.00	1.666	1.666	0.0	1.000	33408		2.25(1.25-3.74)		84.8	
D 47 13C3-PFBS										M
301.90 > 83.00	1.666	1.670	-0.004	0.646	1342	0.0300		64.4	5.5	M
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.866	0.010	1.126	14884	0.0338		181	282	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.905	1.906	-0.001	1.000	107500	0.0743		372	138	M
313.00 > 119.00	1.905	1.906	-0.001	1.000	11212		9.59(5.03-15.10)		142	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.911	-0.006	0.738	67828	0.0396		79.2	1824	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.927	0.0	1.157	77503	0.0384		204	813	
349.00 > 99.00	1.927	1.927	0.0	1.157	28699		2.70(1.36-4.07)		104	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	1.997	0.006	0.776	4186	NC			112	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.003	0.0	1.000	3414	NC			13.4	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.223	0.006	0.864	61557	0.0377		75.5	1803	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.229	0.0	1.000	67676	0.0483		242	27.8	M
363.00 > 169.00	2.229	2.229	0.0	1.000	27558		2.46(1.13-3.40)		232	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.241	0.0	1.000	800824	0.3862		2122	3669	
399.00 > 99.00	2.241	2.241	0.0	1.000	267416		2.99(1.50-4.49)		395	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.248	-0.007	0.868	84413	0.0341		72.0	4828	
65 ADONA										
377.00 > 251.00	2.267	2.267	0.0	0.769	63999	NC			611	
377.00 > 85.00	2.267	2.267	0.0	0.769	38036		1.68(0.84-2.53)		137	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.553	0.002	0.996	542887	0.8433		4448	6138	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.562	0.002	0.994	18151	0.0355		74.8	220	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.578	0.002		86700	0.0500			3902	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.578	0.002	1.000	273666	0.1720		859	217	
413.00 > 169.00	2.580	2.578	0.002	1.000	155861		1.76(0.84-2.52)		753	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.586	-0.006	1.000	68242	0.0410		81.9	3851	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.586	0.002	0.878	62737	0.0396		208	365	
449.00 > 99.00	2.588	2.586	0.002	0.878	18396		3.41(1.94-5.82)		72.7	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.946	0.002	1.000	95088	0.0762		381	122	
463.00 > 169.00	2.948	2.946	0.002	1.000	23478		4.05(1.90-5.69)		711	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.946	0.002	1.000	7213412	5.32		28670	48091	
499.00 > 99.00	2.948	2.946	0.002	1.000	1725326		4.18(2.31-6.93)		11984	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.952	-0.004	1.142	56848	0.0319		66.8	1137	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.952	-0.004	1.142	57797	0.0393		78.5	2653	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.070	37099	NC			568	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.296	-0.005	1.276	26988	0.0459		95.7	302	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.291	3.296	-0.005	1.000	3123341	4.17		21786	95315	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.291	3.296	-0.005	1.117	52643	0.0565		294	41.8	
549.00 > 99.00	3.291	3.296	-0.005	1.117	22940		2.29(1.33-3.97)		69.2	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.311	-0.004	1.282	47096	0.0386		77.3	2279	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.307	3.311	-0.004	1.000	59299	0.0579		290	94.1	R
513.00 > 169.00	3.307	3.311	-0.004	1.000	7760		7.64(2.36-7.09)		74.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.319	-0.012	1.282	89514	0.0353		70.5	670	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.319	-0.004	1.002	293791	0.1658		829	255	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.464	-0.006	1.340	12348	0.0448		89.6	576	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.467	3.464	0.003	1.003	4647	0.0183		91.5	172	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.628	0.003	1.407	9915	0.0329		65.8	92.9	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.628	-0.007	1.228	49627	0.0624		323	48.6	
599.00 > 99.00	3.621	3.628	-0.007	1.228	22727		2.18(1.39-4.16)		148	
D 30 13C2 PFUnA										
565.00 > 520.00	3.631	3.638	-0.007	1.407	43520	0.0460		91.9	2223	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.638	0.002	1.003	6258	0.0346		173	150	
31 Perfluoroundecanoic acid										Ma
563.00 > 519.00	3.640	3.638	0.002	1.003	27244	0.0349		174	48.6	a
563.00 > 169.00	3.631	3.638	-0.007	1.000	4997		5.45(2.12-6.36)		23.1	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.803	-0.008	1.287	55686	NC			1281	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.928	0.003	1.000	23209	0.0365		183	18.6	
613.00 > 169.00	3.931	3.928	0.003	1.000	6424		3.61(2.13-6.40)		113	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.928	0.003	1.523	29441	0.0306		61.3	591	
41 Perfluorotridecanoic acid										Ma
663.00 > 619.00	4.183	4.193	-0.010	1.064	14717	0.0273		136	7.5	a
663.00 > 169.00	4.164	4.193	-0.029	1.059	3955		3.72(1.25-3.76)		22.4	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.426	0.001	1.716	24341	0.0278		55.6	200	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.426	0.001	1.000	3921	0.0302		151	61.5	
713.00 > 219.00	4.427	4.426	0.001	1.000	2943		1.33(0.71-2.13)		51.5	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.833	0.0	1.873	32153	0.0207		41.5	62.0	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.833	4.833	0.0	1.000	18075	NC			1.6	R
813.00 > 169.00	4.833	4.833	0.0	1.000	1779		10.16(2.86-8.58)		19.7	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.174	5.174	0.0	1.070	8629	NC			3.5	
913.00 > 169.00	5.174	5.174	0.0	1.070	1388		6.22(3.83-11.48)		16.4	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

a - User Assigned ID

Report Date: 01-Aug-2018 12:35:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_008.d

Injection Date: 31-Jul-2018 18:05:15 Instrument ID: A8_N

Lims ID: 320-41149-A-19-B MS

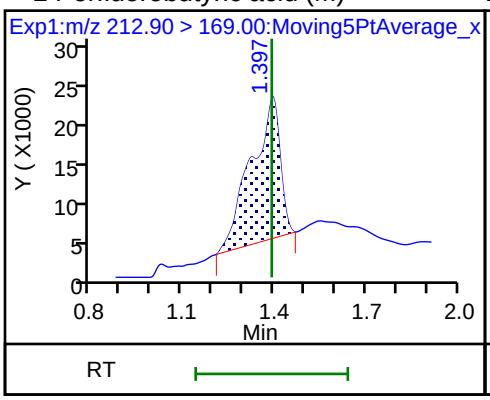
Client ID: GRE07-SB1-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 2 Worklist Smp#: 3

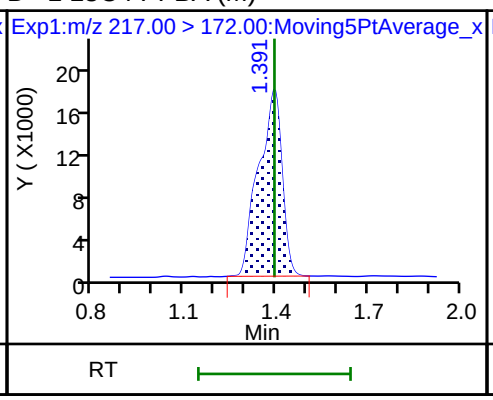
Injection Vol: 2.0 ul Dil. Factor: 50.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

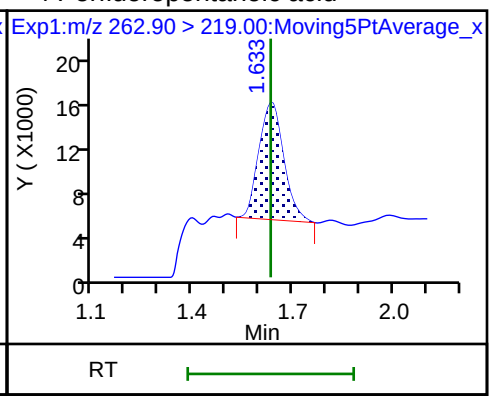
2 Perfluorobutyric acid (M)



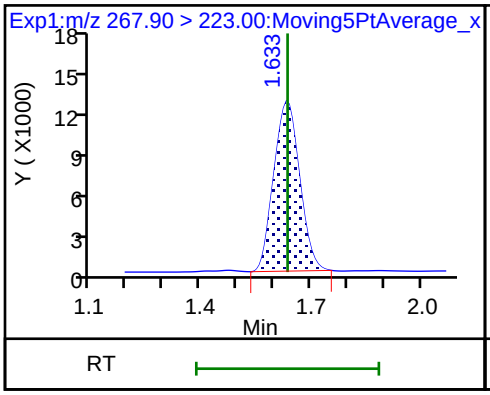
D 1 13C4 PFBA (M)



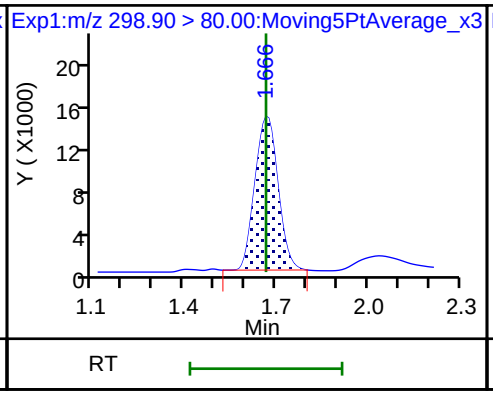
4 Perfluoropentanoic acid



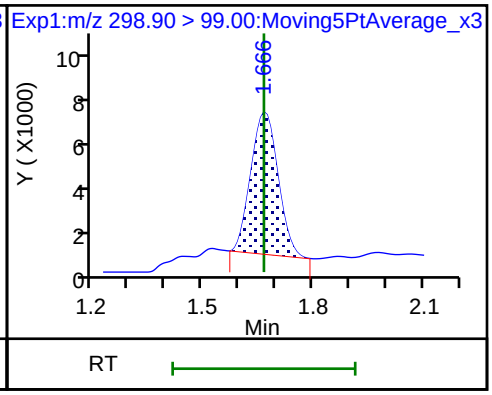
D 3 13C5-PFPeA



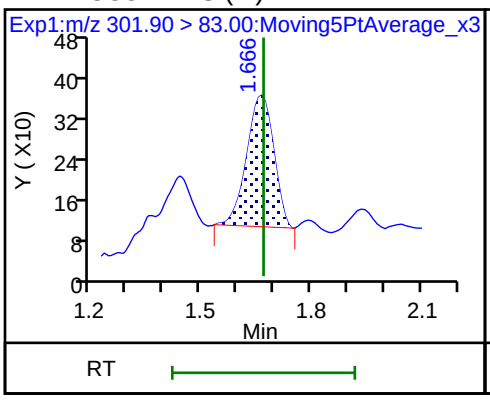
5 Perfluorobutanesulfonic acid



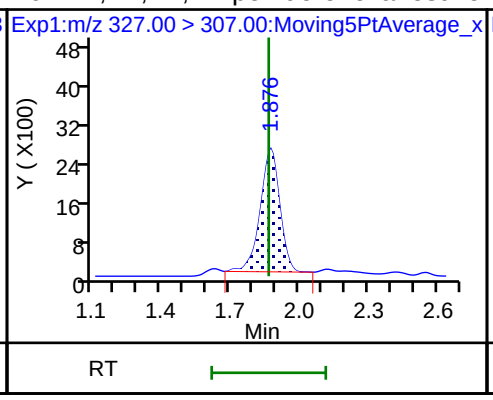
5 Perfluorobutanesulfonic acid



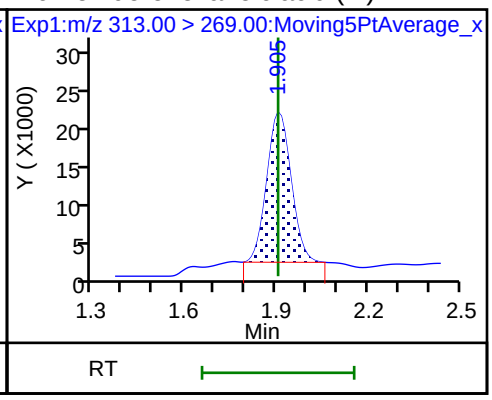
D 47 13C3-PFBS (M)



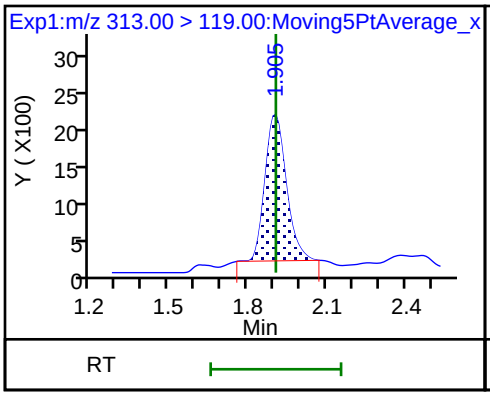
61 1H,1H,2H,2H-perfluorohexanesulfoni



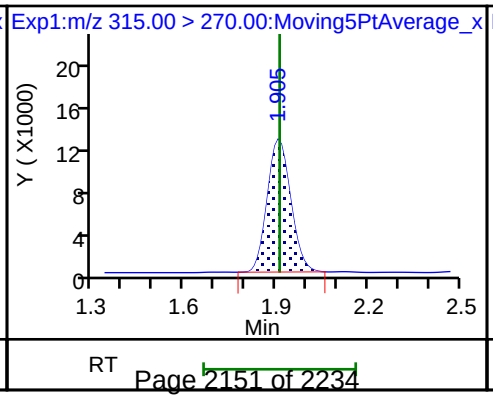
6 Perfluorohexanoic acid (M)



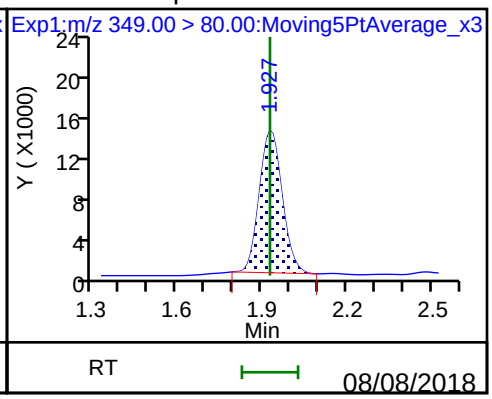
6 Perfluorohexanoic acid



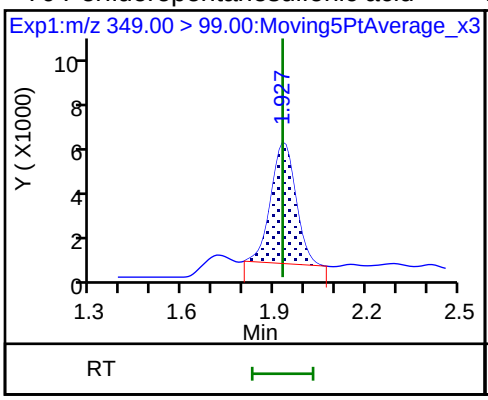
D 7 13C2 PFHxA



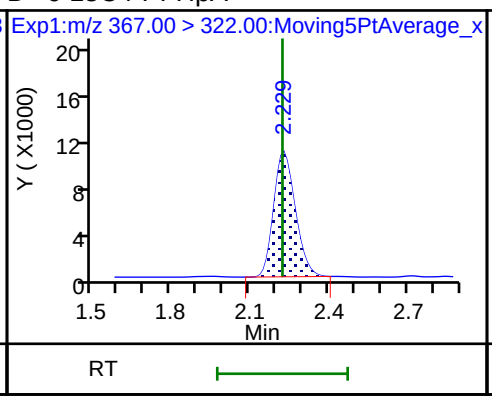
70 Perfluoropentanesulfonic acid



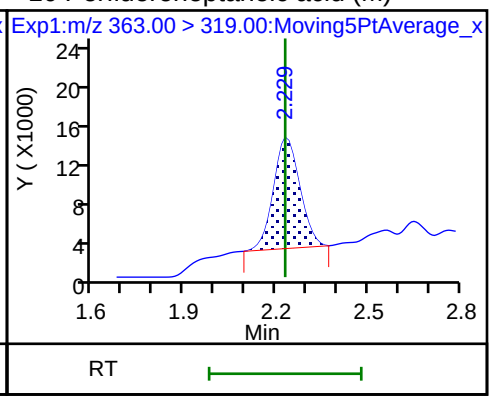
70 Perfluoropentanesulfonic acid



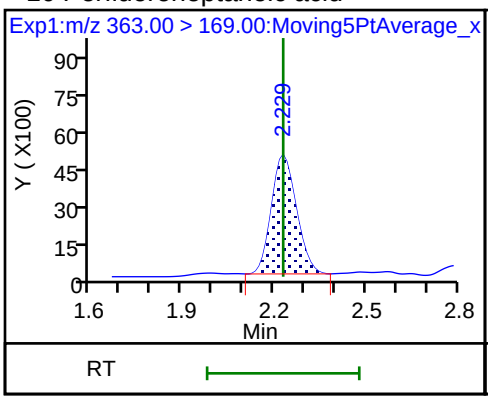
D 9 13C4-PFHpA



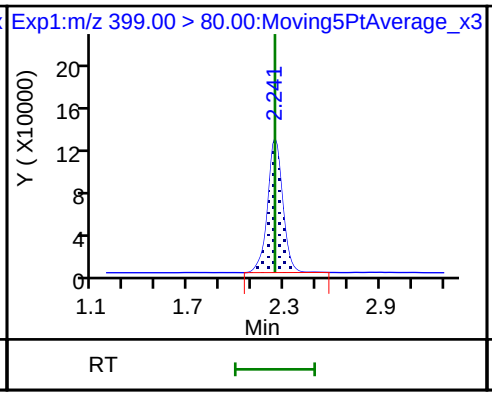
10 Perfluoroheptanoic acid (M)



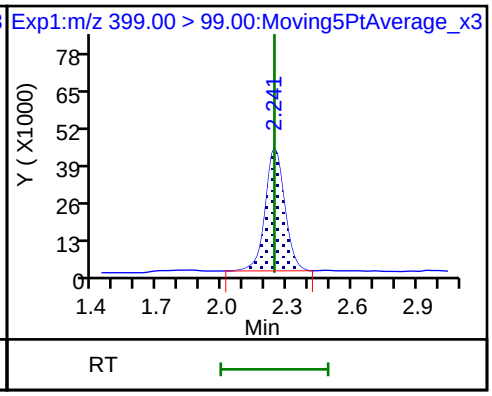
10 Perfluoroheptanoic acid



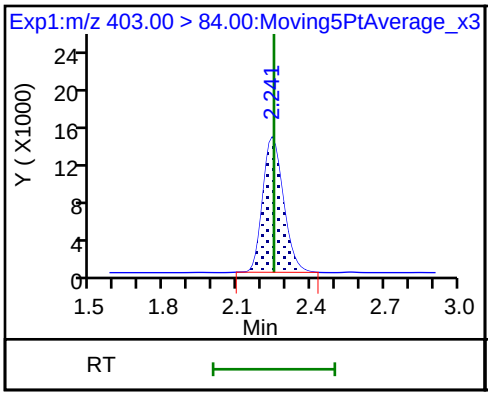
8 Perfluorohexanesulfonic acid



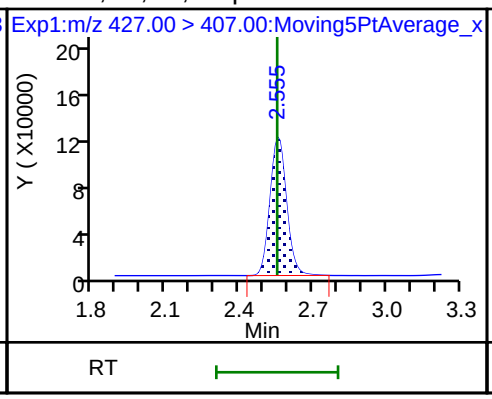
8 Perfluorohexanesulfonic acid



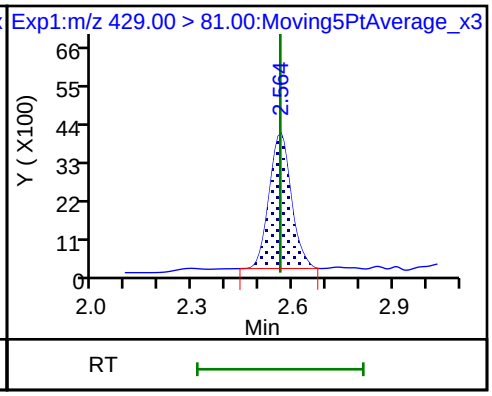
D 11 18O2 PFHxS



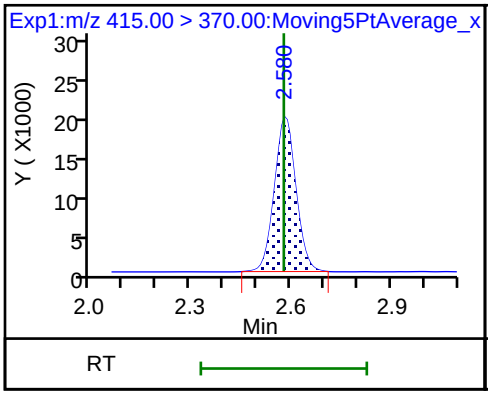
13 1H,1H,2H,2H-perfluorooctanesulfon



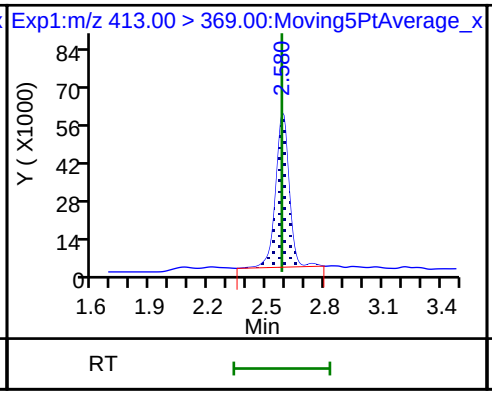
D 12 M2-6:2FTS



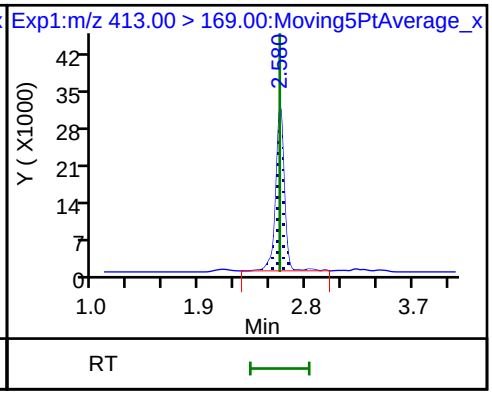
* 62 13C2-PFOA



15 Perfluorooctanoic acid

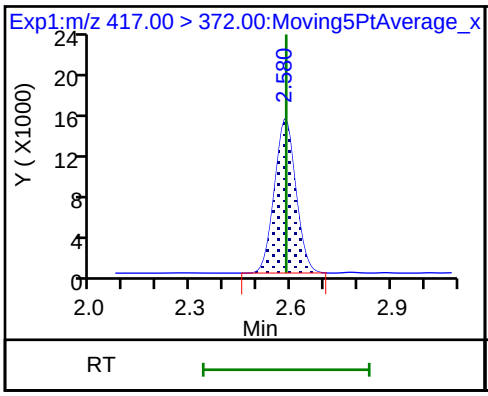


15 Perfluorooctanoic acid

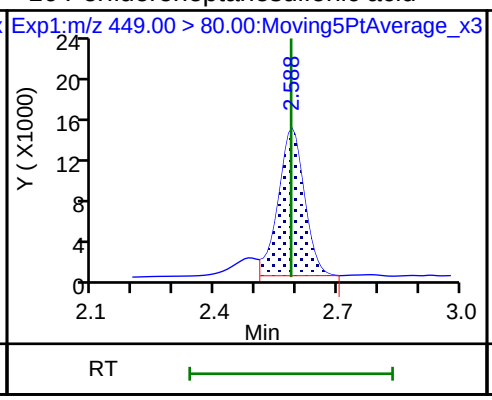


Report Date: 01-Aug-2018 12:35:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_008.d

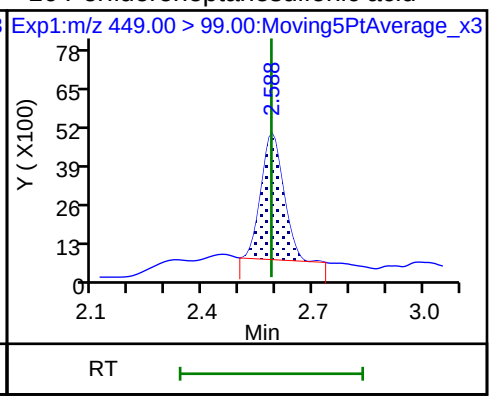
D 14 13C4 PFOA



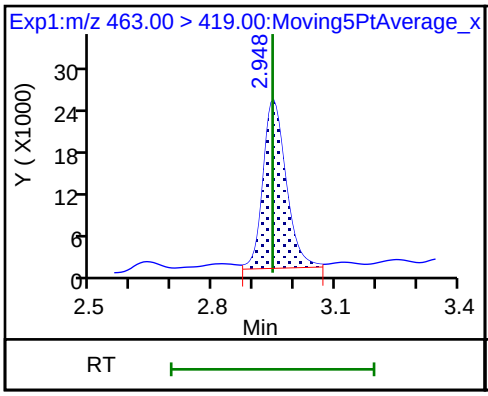
16 Perfluoroheptanesulfonic acid



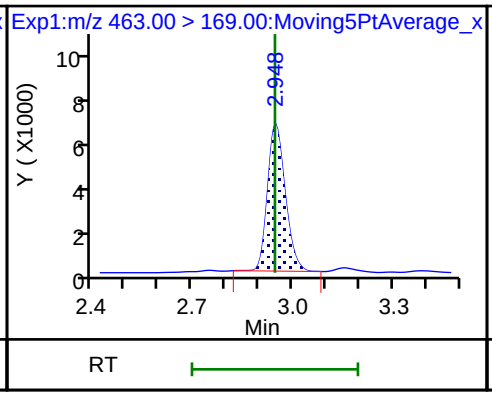
16 Perfluoroheptanesulfonic acid



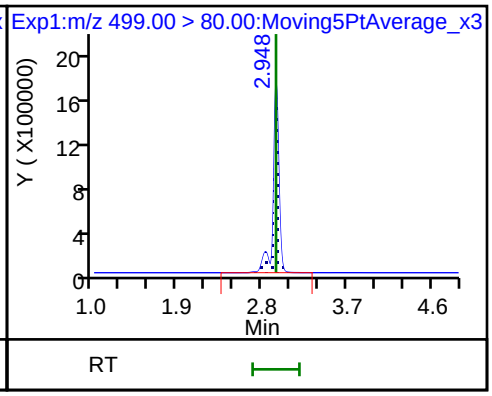
20 Perfluorononanoic acid



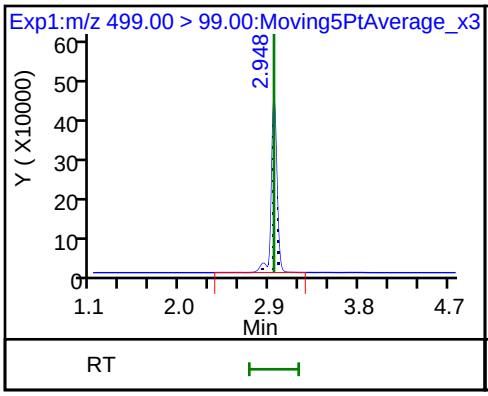
20 Perfluorononanoic acid



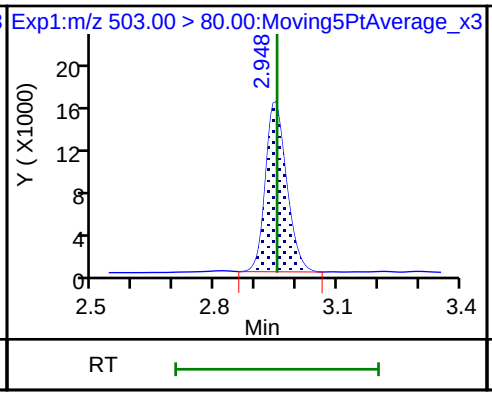
17 Perfluorooctane sulfonic acid



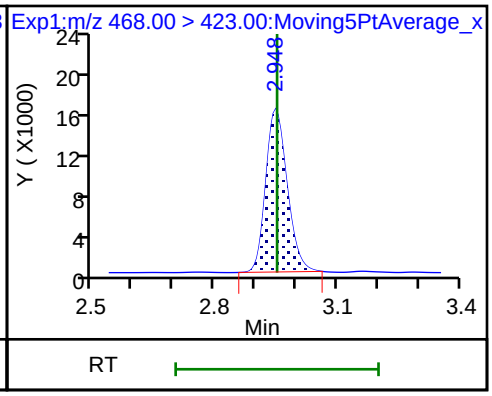
17 Perfluorooctane sulfonic acid



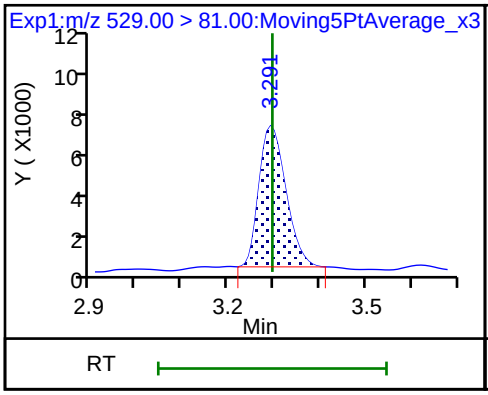
D 18 13C4 PFOS



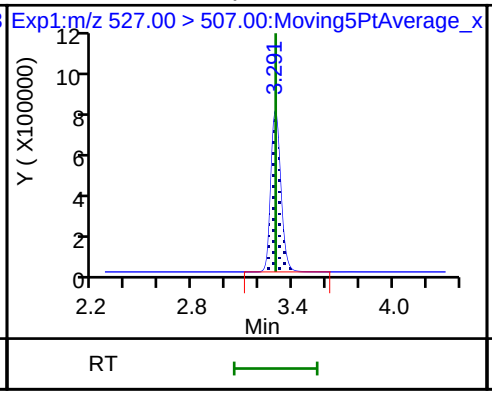
D 19 13C5 PFNA



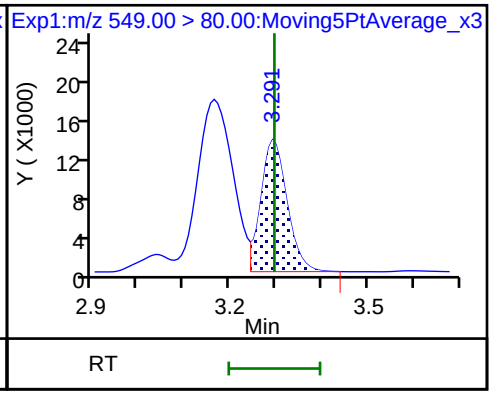
D 26 M2-8:2FTS



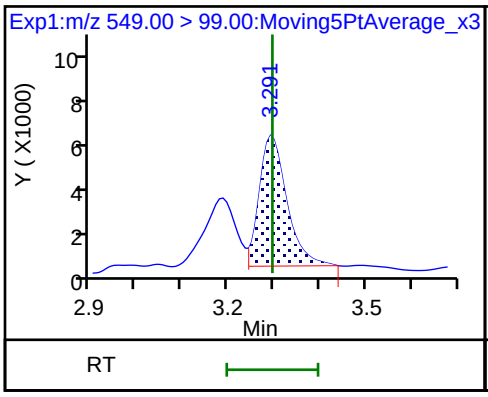
25 1H,1H,2H,2H-perfluorodecanesulfoni



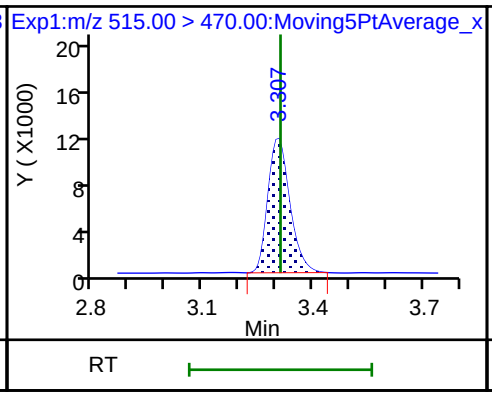
68 Perfluorononanesulfonic acid



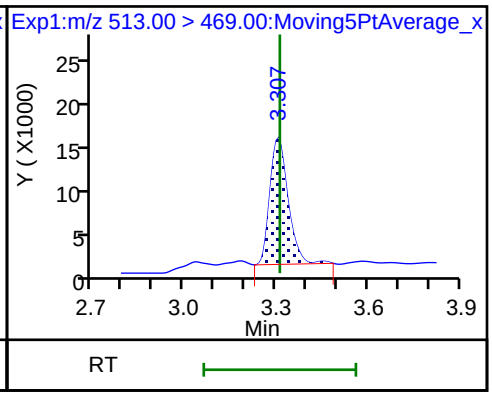
68 Perfluorononanesulfonic acid



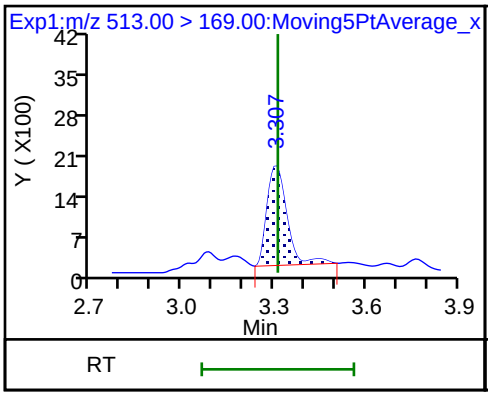
D 23 13C2 PFDA



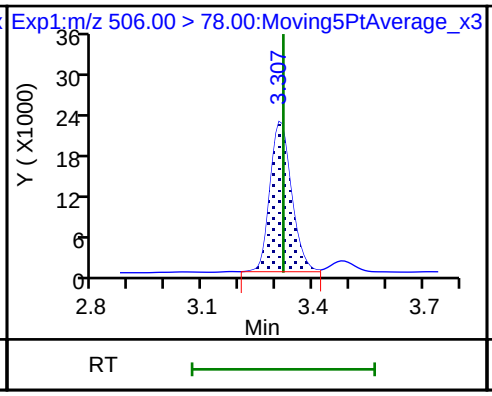
24 Perfluorodecanoic acid



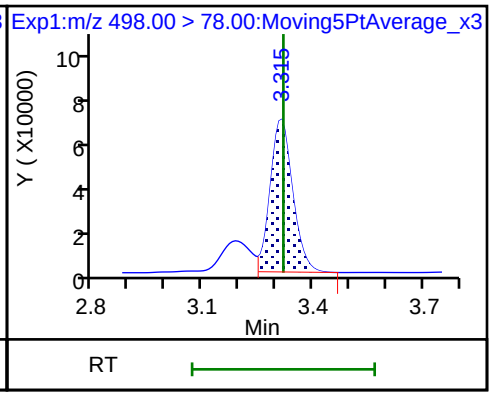
24 Perfluorodecanoic acid



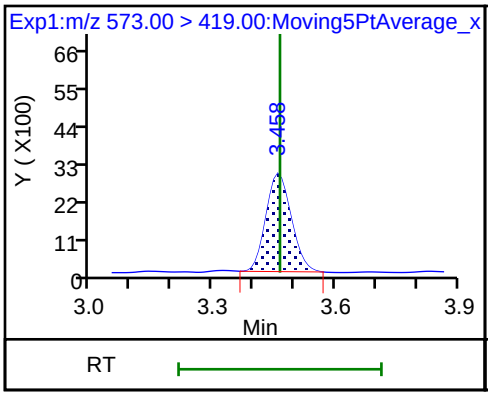
D 21 13C8 FOSA



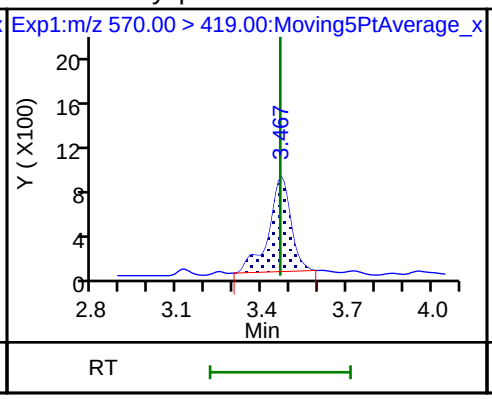
22 Perfluorooctane Sulfonamide



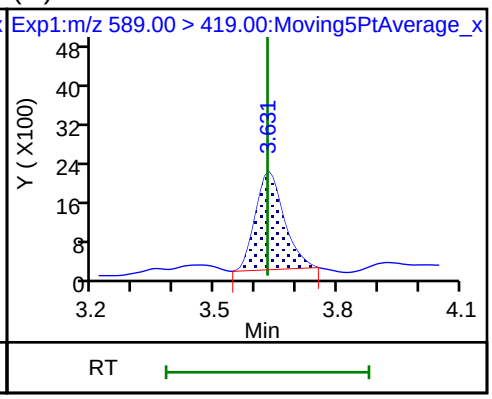
D 27 d3-NMeFOSAA



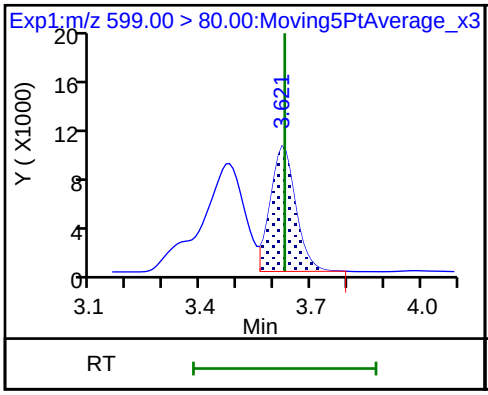
28 N-methyl perfluorooctane sulfonamid



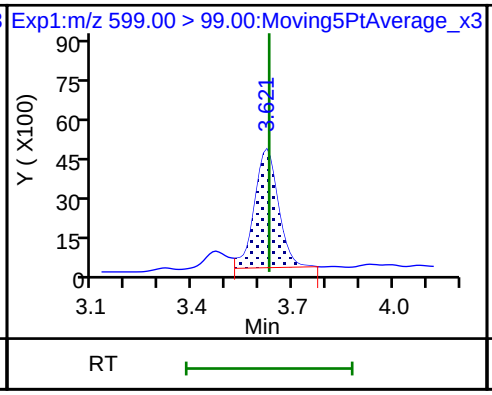
D 32 d5-NEtFOSAA



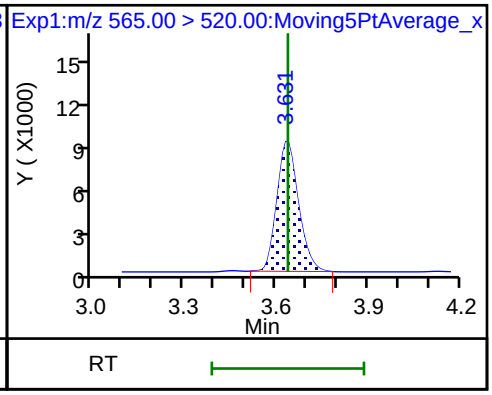
29 Perfluorodecane Sulfonic acid



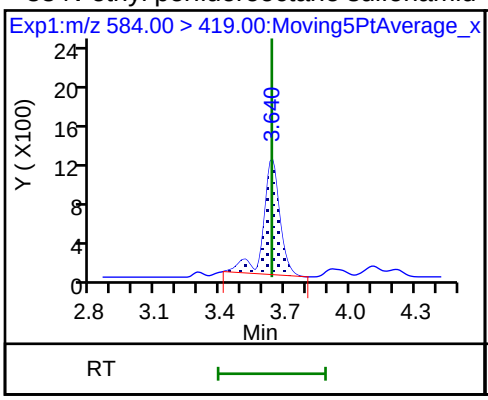
29 Perfluorodecane Sulfonic acid



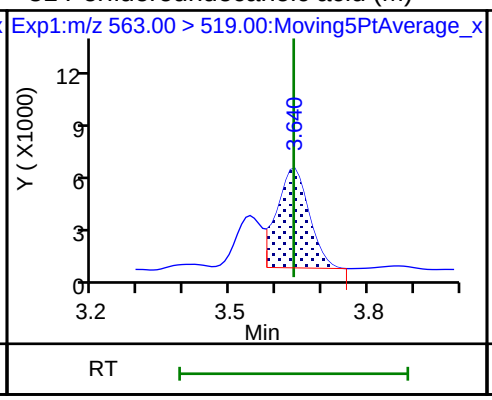
D 30 13C2 PFUnA



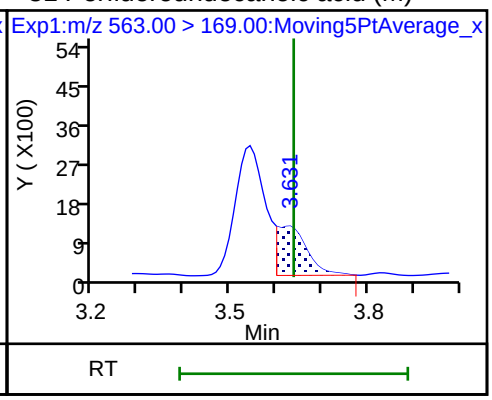
33 N-ethyl perfluorooctane sulfonamid



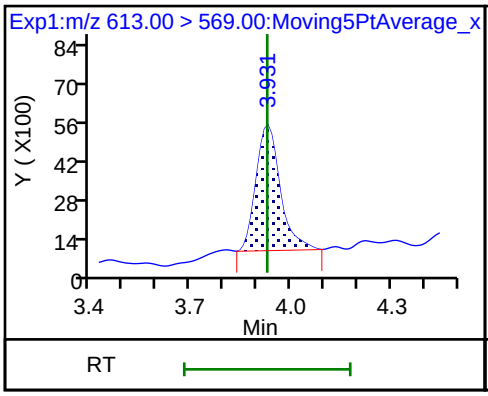
31 Perfluoroundecanoic acid (M)



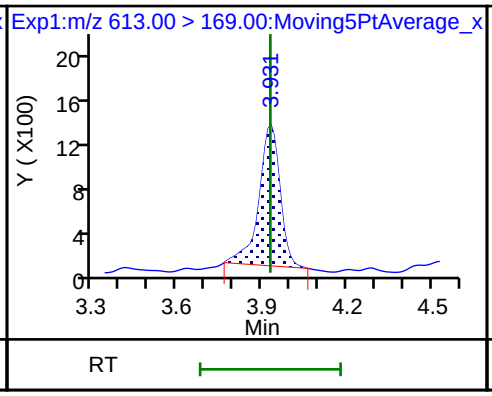
31 Perfluoroundecanoic acid (M)



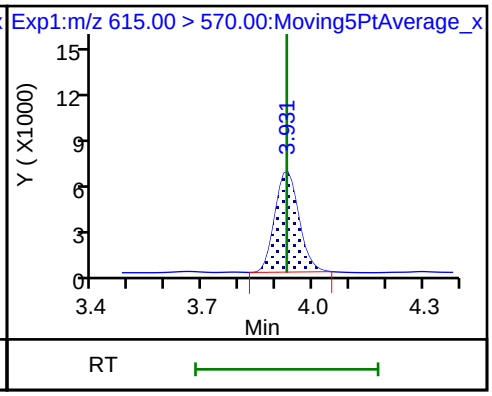
37 Perfluorododecanoic acid



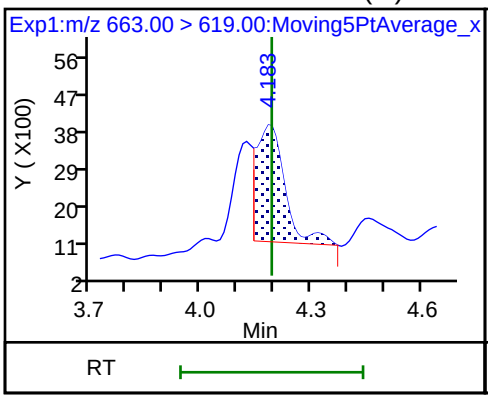
37 Perfluorododecanoic acid



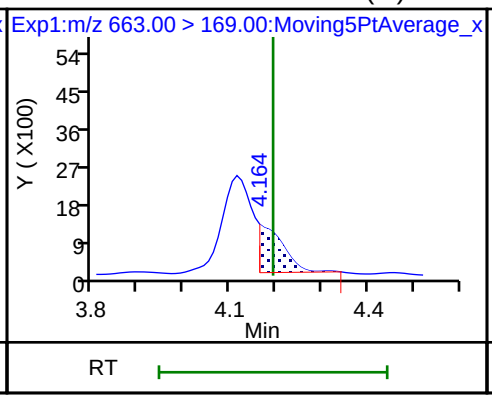
D 36 13C2 PFDoA



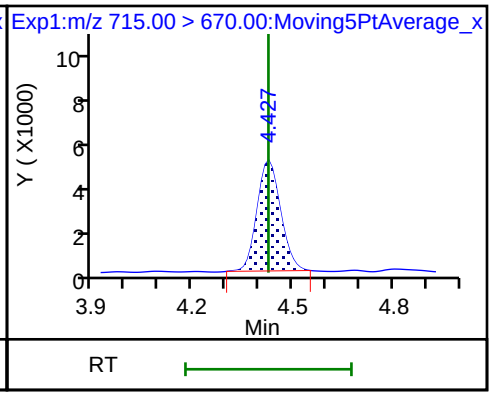
41 Perfluorotridecanoic acid (M)



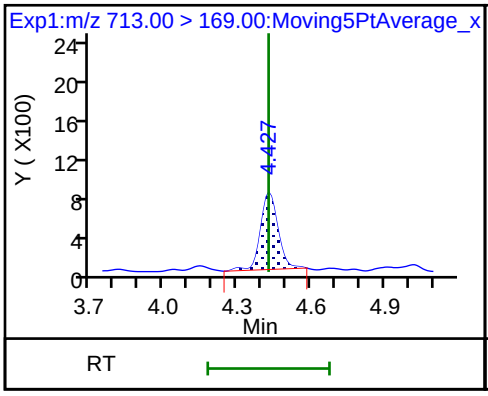
41 Perfluorotridecanoic acid (M)



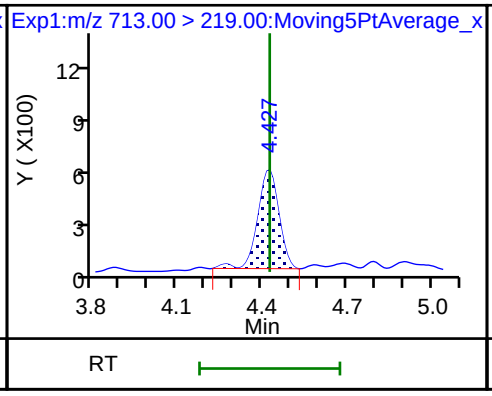
D 43 13C2-PFTeDA



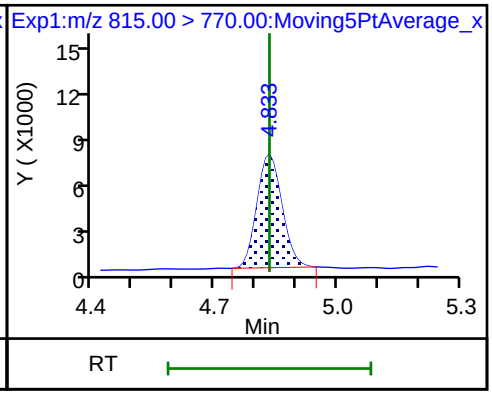
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

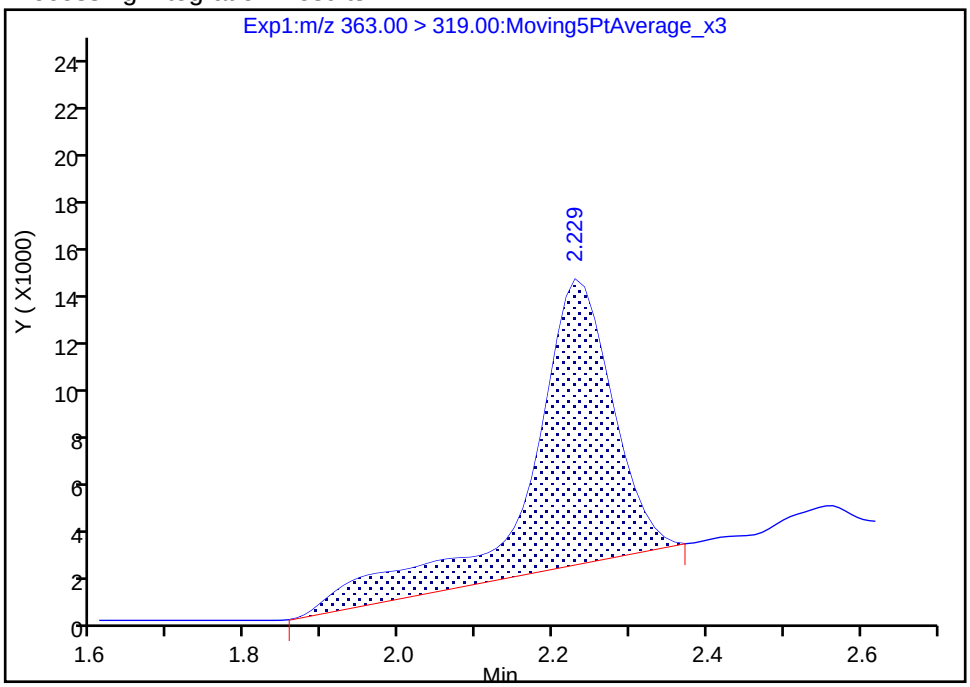
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_008.d				
Injection Date:	31-Jul-2018 18:05:15	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-B MS				
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	2	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

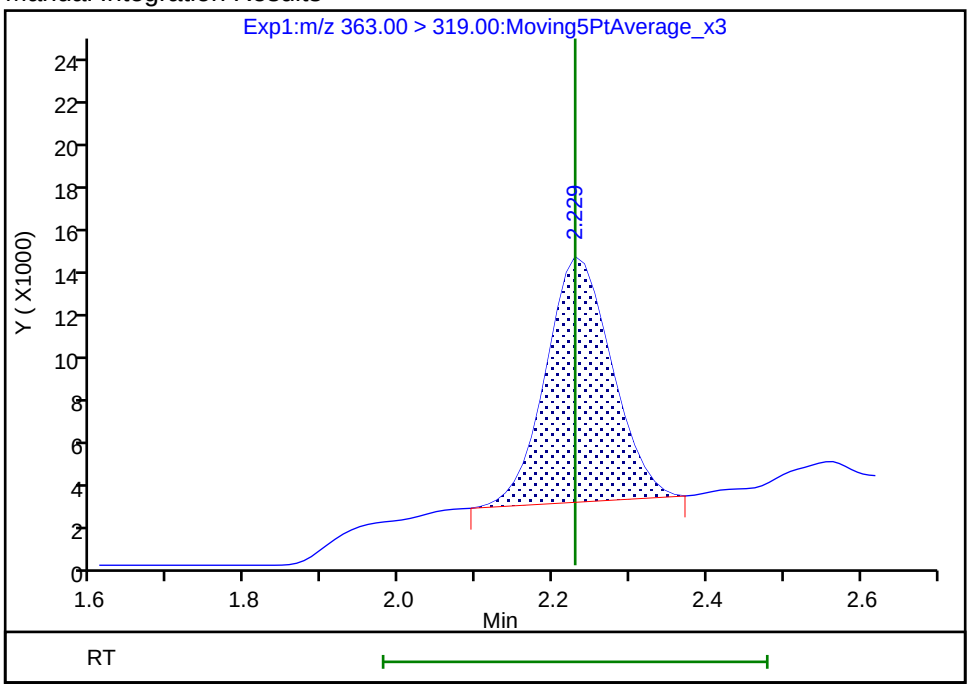
Processing Integration Results

RT: 2.23
Area: 91222
Amount: 0.065133
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 67676
Amount: 0.048321
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:28:36

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

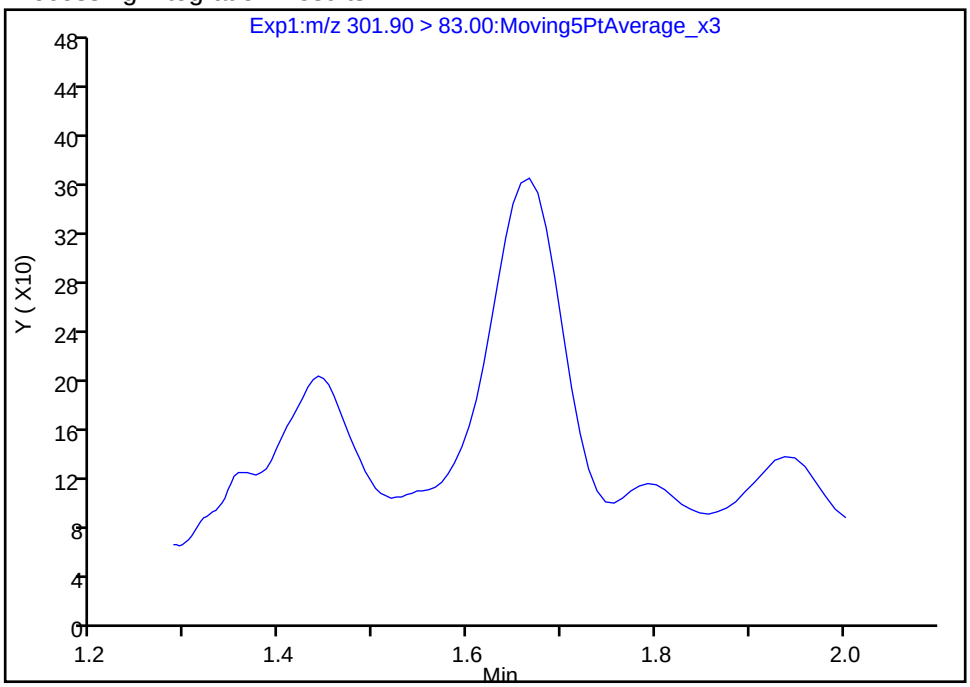
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_008.d				
Injection Date:	31-Jul-2018 18:05:15	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-B MS				
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	2	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

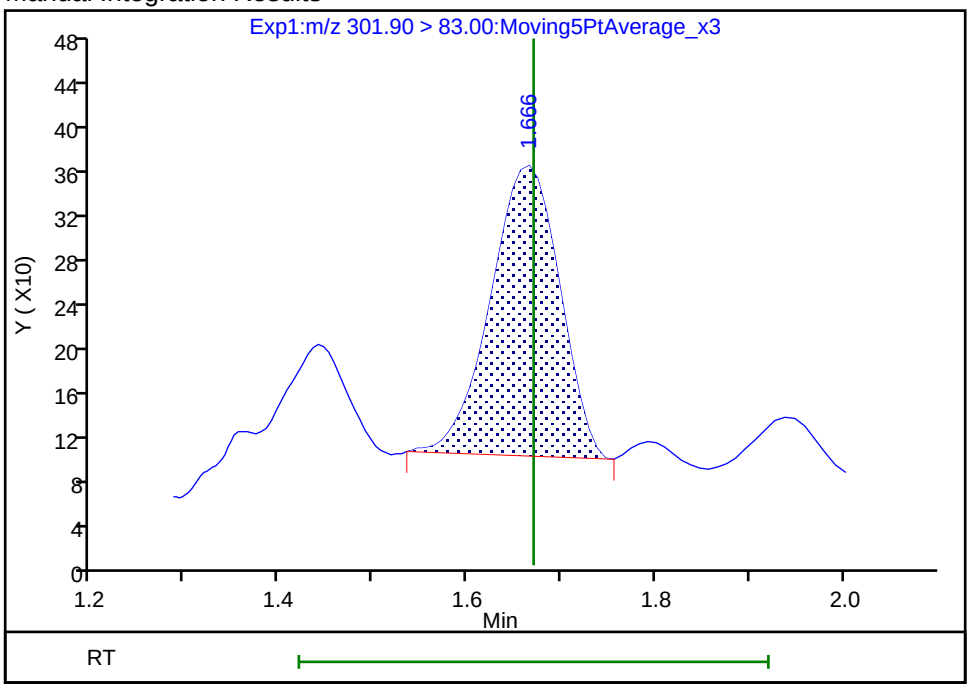
Processing Integration Results

Not Detected
Expected RT: 1.67



Manual Integration Results

RT: 1.67
Area: 1342
Amount: 0.029951
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:27:21
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41149-1
SDG No.:
Client Sample ID: GRE10-SB2-01 MSD
Lab Sample ID: 320-41149-2 MSD
Matrix: Solid
Lab File ID: 2018.07.30LLA_010.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/09/2018 14:10
Extraction Method: SHAKE
Date Extracted: 07/18/2018 08:48
Sample wt/vol: 5.08(g)
Date Analyzed: 07/30/2018 04:08
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: 4.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236836
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.97		0.31	0.21	0.080
335-67-1	Perfluorooctanoic acid (PFOA)	2.08		0.31	0.21	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.93		0.31	0.21	0.084
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.73		0.41	0.19	0.061
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	4.59	J1	0.31	0.21	0.064
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16.6	4	1.0	0.52	0.25

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	75		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	87		50-150
STL00994	18O2 PFHxS	78		50-150
STL00991	13C4 PFOS	81		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_010.d
Lims ID: 320-41149-A-2-C MSD
Client ID: GRE10-SB2-01
Sample Type: MSD
Inject. Date: 30-Jul-2018 04:08:04 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-2-c MSD
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 09:51:32 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 09:51:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.391	1.389	0.002	1.000	1997897	1.08		108	272	M
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.396	-0.005	0.541	4713993	2.28		91.0	84295	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.632	1.629	0.003	1.000	1486897	0.9373		93.7	374	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.632	1.640	-0.008	0.635	3313450	2.29		91.7	39915	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.665	1.662	0.003	1.000	1884486	0.8402		95.0	1338	
298.90 > 99.00	1.665	1.662	0.003	1.000	806069		2.34(1.25-3.74)		707	
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.674	-0.009	0.647	65686	1.73		74.5	138	
61 1H,1H,2H,2H-perfluorohexanesulfoni										M
327.00 > 307.00	1.866	1.863	0.003	1.120	864099	1.79		192	1055	M
D 60 M2-4:2FTS										
329.00 > 81.00	1.746	1.875	-0.129	0.679	8964	NC			11.4	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.895	1.902	-0.007	1.000	1542215	1.05		105	484	M
313.00 > 119.00	1.895	1.902	-0.007	1.000	138734		11.12(5.03-15.10)		774	
D 7 13C2 PFHxA										
315.00 > 270.00	1.895	1.916	-0.021	0.737	3479482	2.05		82.1	67610	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.916	1.924	-0.008	1.150	1730341	0.8598		91.7	1434	
349.00 > 99.00	1.916	1.924	-0.008	1.150	658667		2.63(1.36-4.07)		2184	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.991	1.999	-0.008	1.000	272093	NC			528	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.991	2.014	-0.023	0.774	335222	NC			6747	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.217	2.214	0.003	1.000	1539189	0.9532		95.3	1141	
363.00 > 169.00	2.217	2.214	0.003	1.000	586890		2.62(1.13-3.40)		6335	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.228	2.225	0.003	1.000	4556220	2.22		244	2277	
399.00 > 99.00	2.228	2.225	0.003	1.000	1533799		2.97(1.50-4.49)		2840	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.240	-0.023	0.862	3661459	2.10		83.8	79223	
D 11 18O2 PFHxS										
403.00 > 84.00	2.228	2.253	-0.025	0.866	4153726	1.85		78.3	70727	
65 ADONA										
377.00 > 251.00	2.266	2.263	0.003	0.772	3819530	NC			25816	
377.00 > 85.00	2.266	2.263	0.003	0.772	2234952		1.71(0.84-2.53)		8534	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.546	2.545	0.001	1.000	520485	0.8719		92.0	5453	
D 12 M2-6:2FTS										
429.00 > 81.00	2.546	2.564	-0.018	0.990	840442	1.72		72.5	2215	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.571	0.001		4466558	2.50			92316	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.571	0.001	1.000	1783966	1.01		101	787	
413.00 > 169.00	2.572	2.571	0.001	1.000	964914		1.85(0.84-2.52)		4932	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.580	2.579	0.001	0.879	1460706	0.8304		87.2	2439	
449.00 > 99.00	2.580	2.579	0.001	0.879	395428		3.69(1.94-5.82)		2044	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.588	-0.016	1.000	3647922	2.13		85.4	51564	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.936	2.935	0.001	1.000	11283523	8.03		865	17124	
499.00 > 99.00	2.936	2.935	0.001	1.000	2726387		4.14(2.31-6.93)		19163	
20 Perfluorononanoic acid										
463.00 > 419.00	2.936	2.935	0.001	1.000	1368233	0.9354		93.5	1133	
463.00 > 169.00	2.936	2.935	0.001	1.000	320718		4.27(1.90-5.69)		5538	
D 19 13C5 PFNA										
468.00 > 423.00	2.936	2.953	-0.017	1.142	3202854	2.17		86.9	38810	
D 18 13C4 PFOS										
503.00 > 80.00	2.936	2.953	-0.017	1.142	3039283	1.95		81.5	6236	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.147	3.145	0.002	1.072	1964478	NC			12020	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.283	3.280	0.003	1.000	621884	0.9433		98.5	17540	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.283	3.287	-0.004	1.118	929804	0.9790		102	498	
549.00 > 99.00	3.283	3.287	-0.004	1.118	345937		2.69(1.33-3.97)		1104	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.295	0.004	1.002	1195046	0.9400		94.0	903	
513.00 > 169.00	3.299	3.295	0.004	1.002	220815		5.41(2.36-7.09)		3680	
D 26 M2-8:2FTS										
529.00 > 81.00	3.283	3.299	-0.016	1.276	1164637	2.29		95.6	3121	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.307	3.311	-0.004	1.000	2082324	1.34		134	508	
D 23 13C2 PFDA										
515.00 > 470.00	3.291	3.314	-0.023	1.279	3090485	2.63		105	59729	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.322	-0.015	1.286	3904567	1.70		68.1	52555	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.448	3.454	-0.006	1.000	386650	0.8811		88.1	2820	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.448	3.467	-0.019	1.341	1113184	2.87		115	13670	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.611	3.607	0.004	1.230	805920	0.9557		99.1	329	
599.00 > 99.00	3.611	3.607	0.004	1.230	267995		3.01(1.39-4.16)		1321	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.621	3.628	-0.007	1.000	1063113	0.9244		92.4	1032	
563.00 > 169.00	3.621	3.628	-0.007	1.000	178116		5.97(2.12-6.36)		929	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.621	3.628	-0.007	1.003	361565	0.8896		89.0	8818	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.611	3.640	-0.029	1.404	1089060	2.67		107	6299	
D 30 13C2 PFUnA										
565.00 > 520.00	3.621	3.640	-0.019	1.408	2317043	2.45		98.1	49302	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.784	3.782	0.002	1.289	2868442	NC			31570	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.910	3.918	-0.008	1.000	921567	0.9203		92.0	116	
613.00 > 169.00	3.910	3.918	-0.008	1.000	223703		4.12(2.13-6.40)		1063	
D 36 13C2 PFDoA										
615.00 > 570.00	3.910	3.930	-0.020	1.520	2313979	2.58		103	15861	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.173	4.182	-0.009	1.067	711525	0.7319		73.2	195	
663.00 > 169.00	4.173	4.182	-0.009	1.067	222143		3.20(1.25-3.76)		1339	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.405	4.415	-0.010	1.000	190564	0.9506		95.1	1288	
713.00 > 219.00	4.405	4.415	-0.010	1.000	129599		1.47(0.71-2.13)		1098	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.405	4.437	-0.032	1.713	1999045	2.28		91.2	9682	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.824	4.823	0.001	1.000	1090678	NC			203	
813.00 > 169.00	4.824	4.823	0.001	1.000	166269		6.56(2.86-8.58)		854	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.842	-0.018	1.875	3091501	2.32		92.9	7460	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.166	5.165	0.001	1.071	1013439	NC			293	
913.00 > 169.00	5.166	5.165	0.001	1.071	126537		8.01(3.83-11.48)		684	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 31-Jul-2018 09:51:33 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180729-61834.b\2018.07.30LLA_010.d

Injection Date: 30-Jul-2018 04:08:04 Instrument ID: A8_N

Lims ID: 320-41149-A-2-C MSD

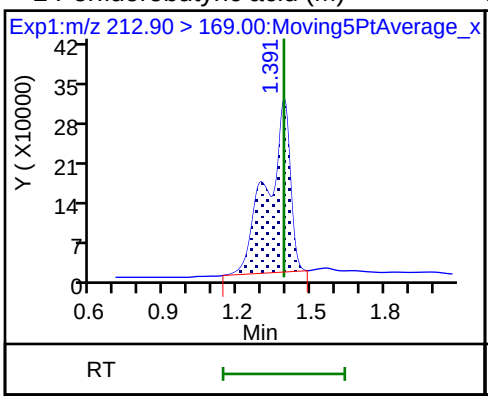
Client ID: GRE10-SB2-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 5 Worklist Smp#: 8

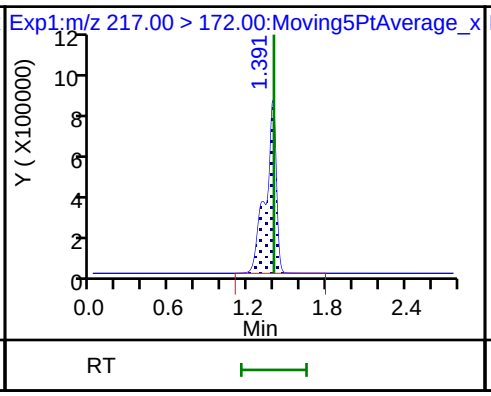
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

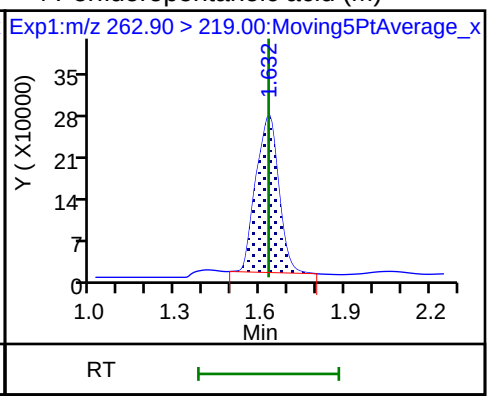
2 Perfluorobutyric acid (M)



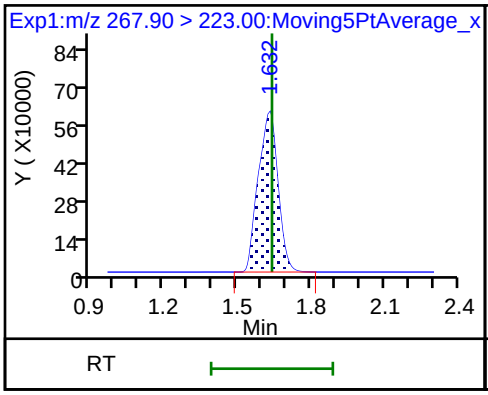
D 1 13C4 PFBA



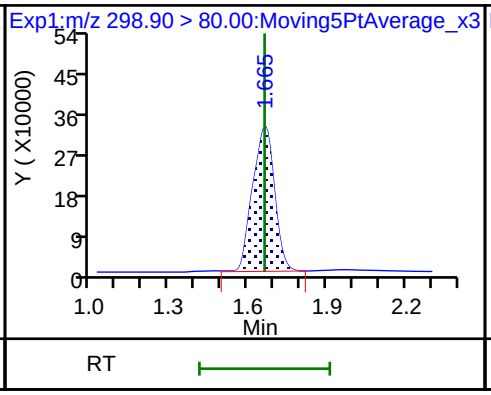
4 Perfluoropentanoic acid (M)



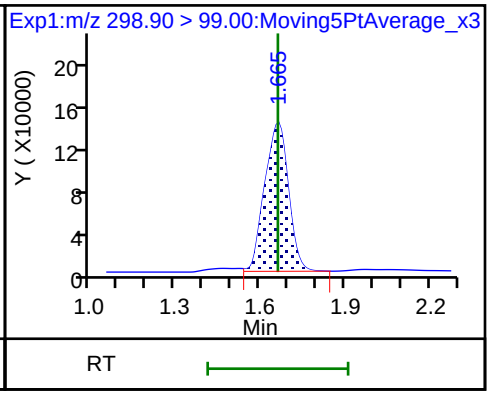
D 3 13C5-PFPeA



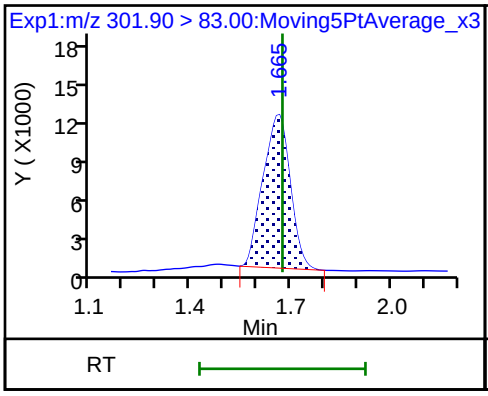
5 Perfluorobutanesulfonic acid



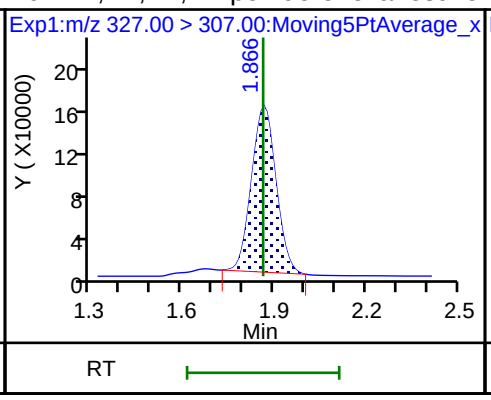
5 Perfluorobutanesulfonic acid



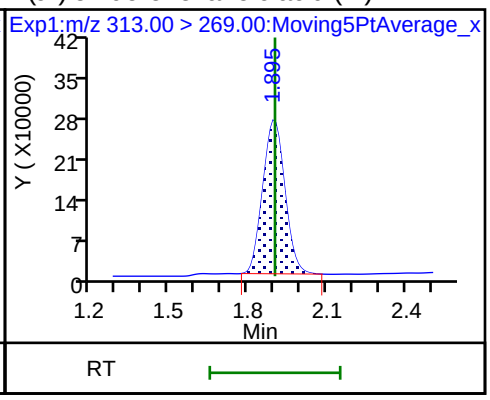
D 47 13C3-PFBS



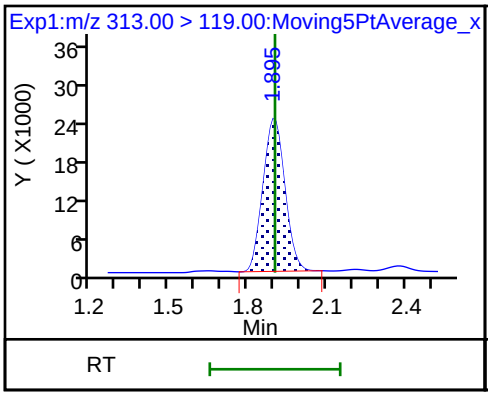
61 1H,1H,2H,2H-perfluorohexanesulfoni (M)



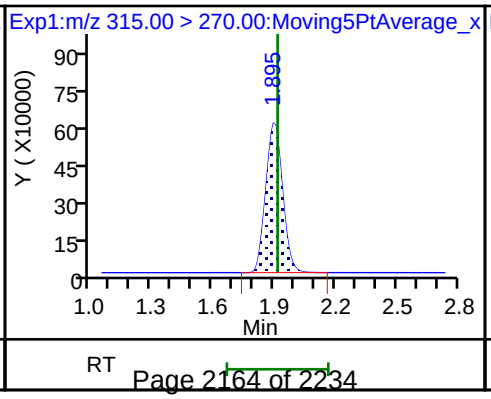
6 Perfluorohexanoic acid (M)



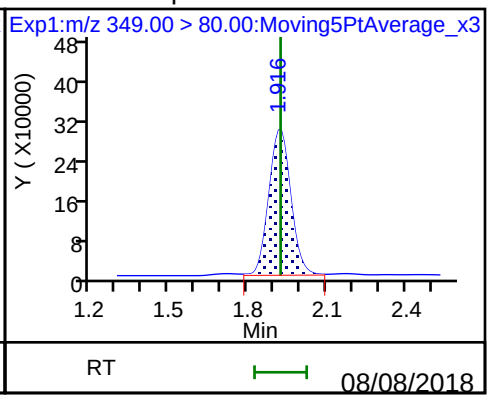
6 Perfluorohexanoic acid



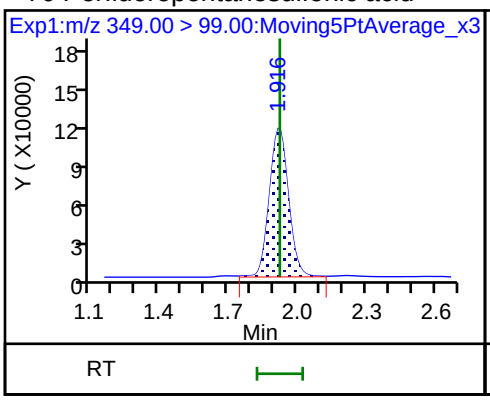
D 7 13C2 PFHxA



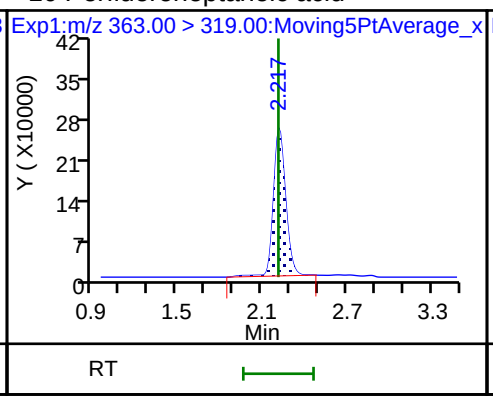
70 Perfluoropentanesulfonic acid



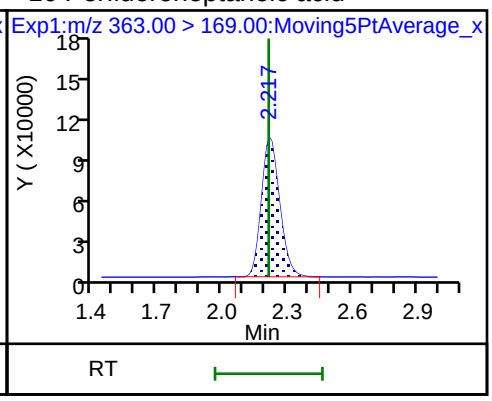
70 Perfluoropentanesulfonic acid



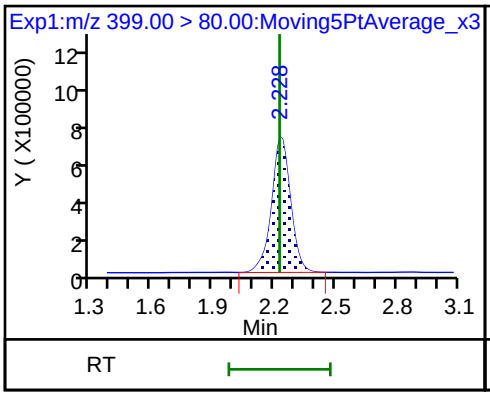
10 Perfluoroheptanoic acid



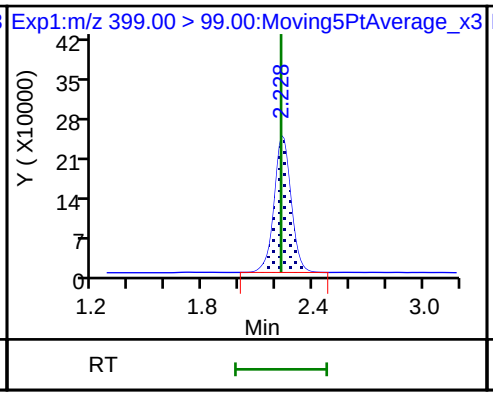
10 Perfluoroheptanoic acid



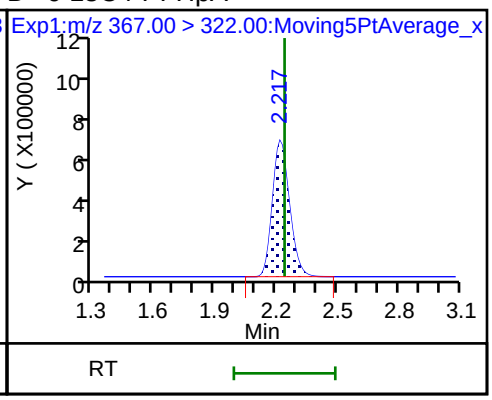
8 Perfluorohexanesulfonic acid



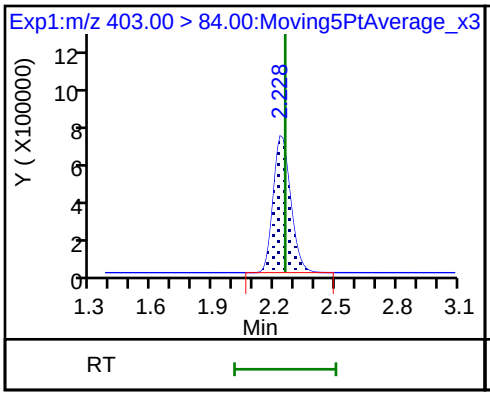
8 Perfluorohexanesulfonic acid



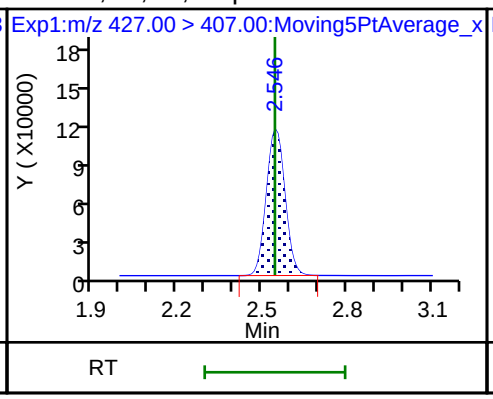
D 9 13C4-PFHpA



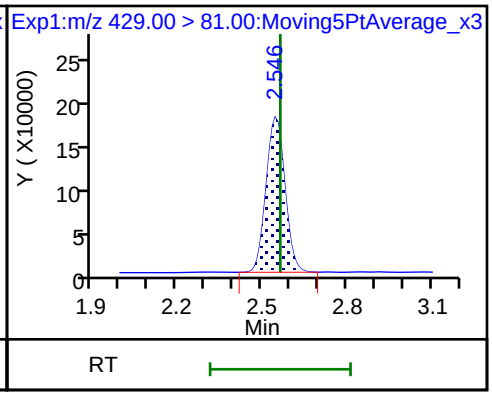
D 11 18O2 PFHxS



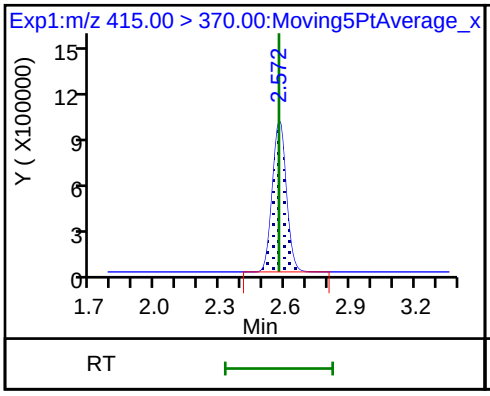
13 1H,1H,2H,2H-perfluorooctanesulfon



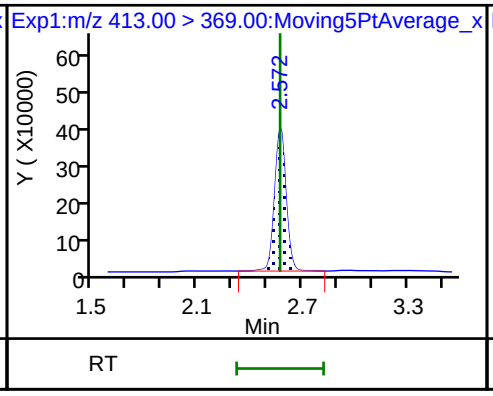
D 12 M2-6:2FTS



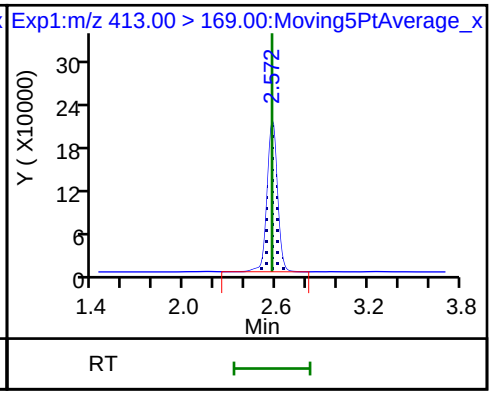
* 62 13C2-PFOA



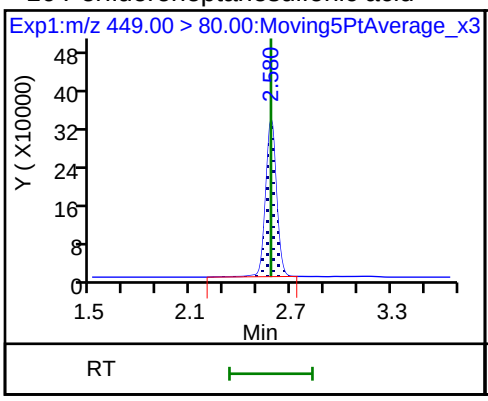
15 Perfluorooctanoic acid



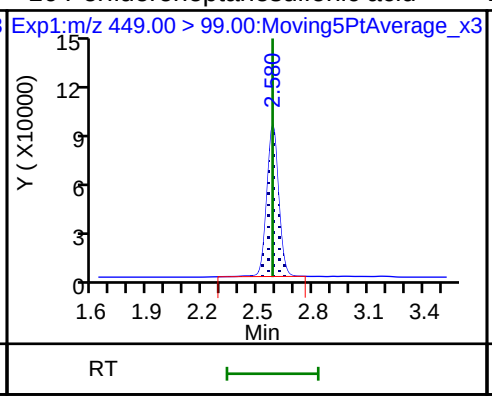
15 Perfluorooctanoic acid



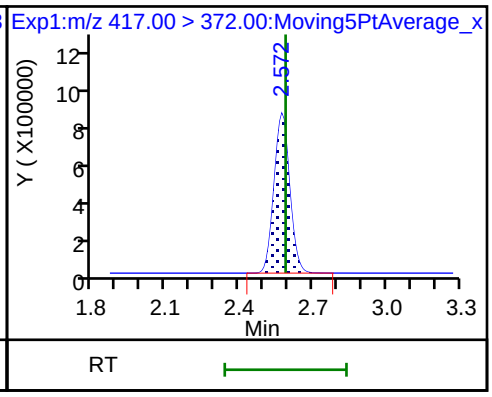
16 Perfluoroheptanesulfonic acid



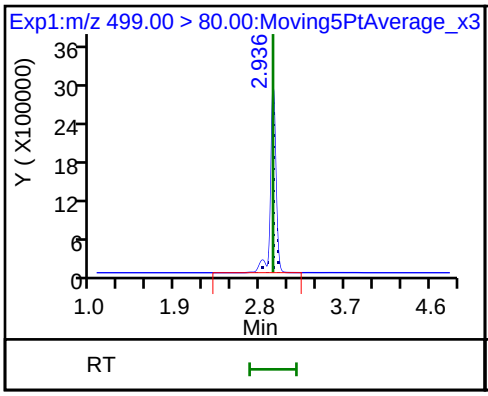
16 Perfluoroheptanesulfonic acid



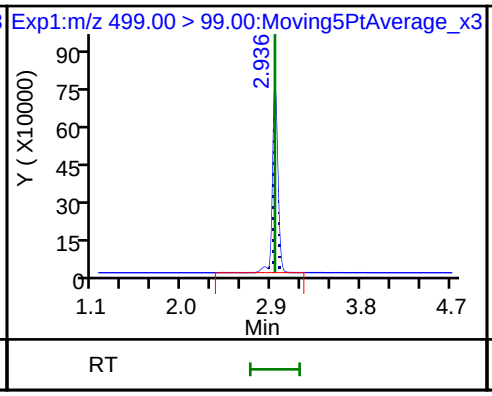
D 14 13C4 PFOA



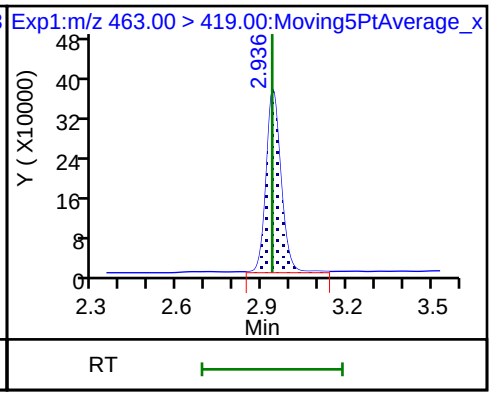
17 Perfluorooctane sulfonic acid



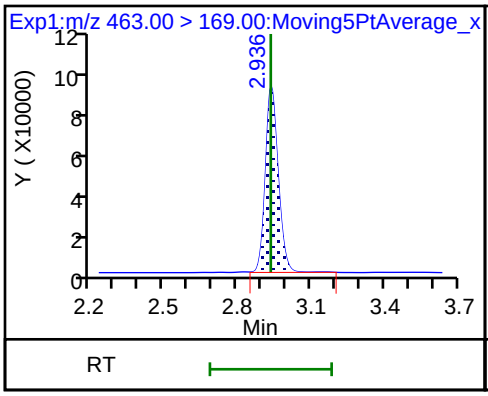
17 Perfluorooctane sulfonic acid



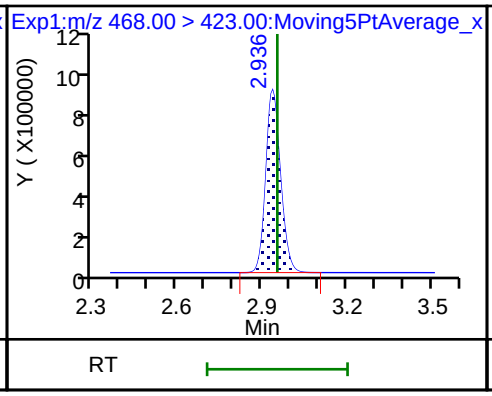
20 Perfluorononanoic acid



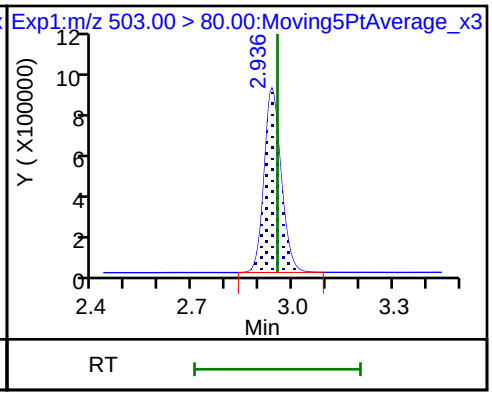
20 Perfluorononanoic acid



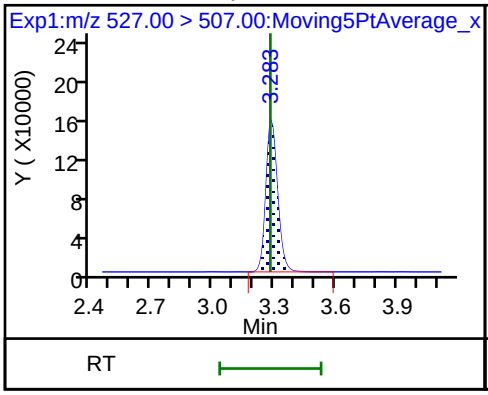
D 19 13C5 PFNA



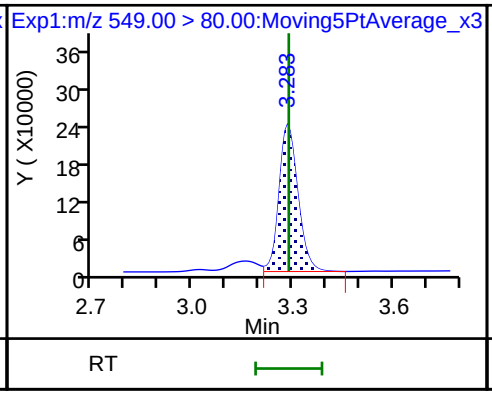
D 18 13C4 PFOS



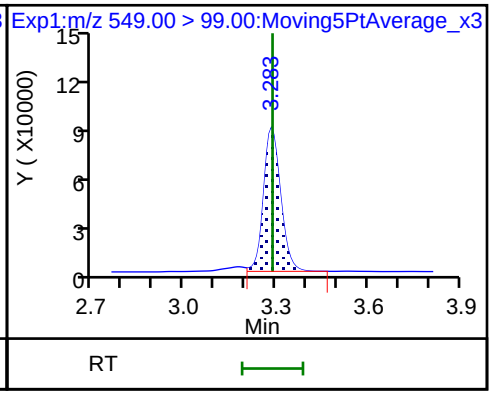
25 1H,1H,2H,2H-perfluorodecanesulfoni



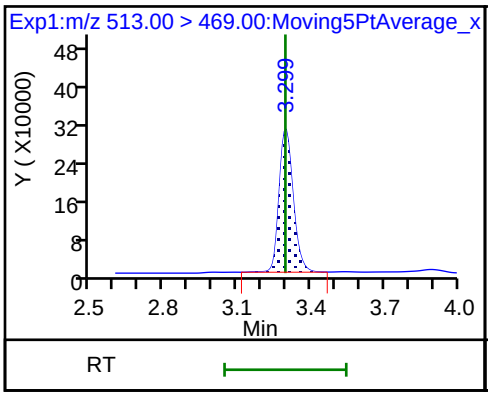
68 Perfluorononanesulfonic acid



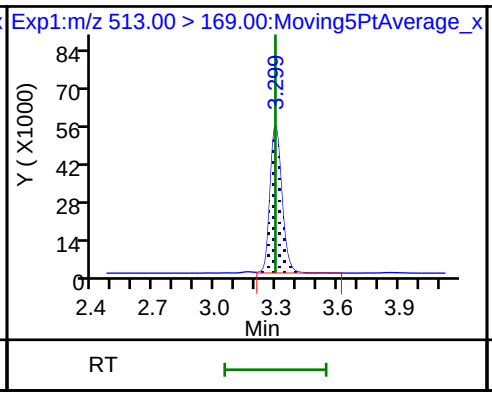
68 Perfluorononanesulfonic acid



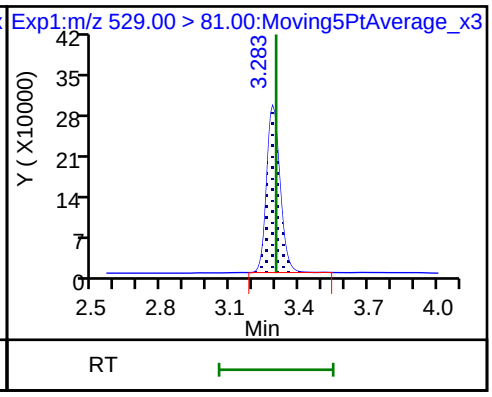
24 Perfluorodecanoic acid



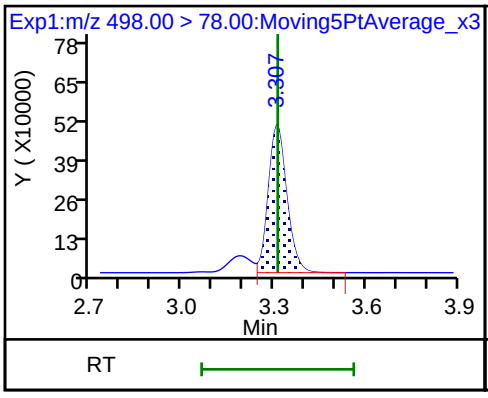
24 Perfluorodecanoic acid



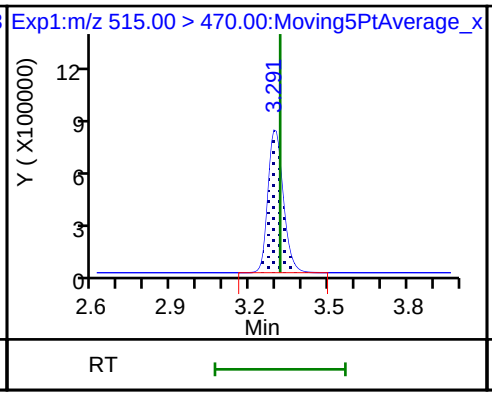
D 26 M2-8:2FTS



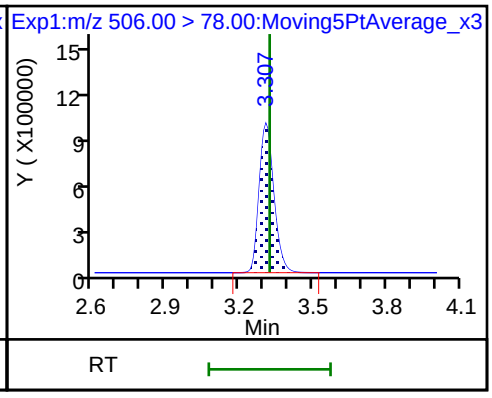
22 Perfluorooctane Sulfonamide



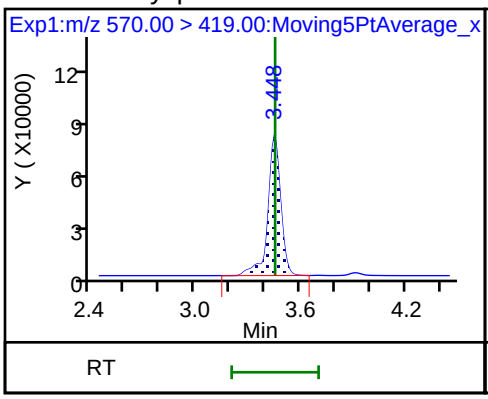
D 23 13C2 PFDA



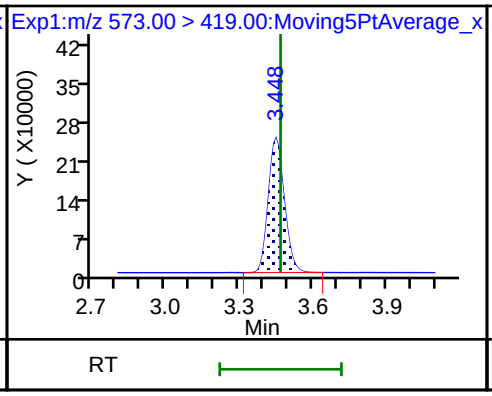
D 21 13C8 FOSA



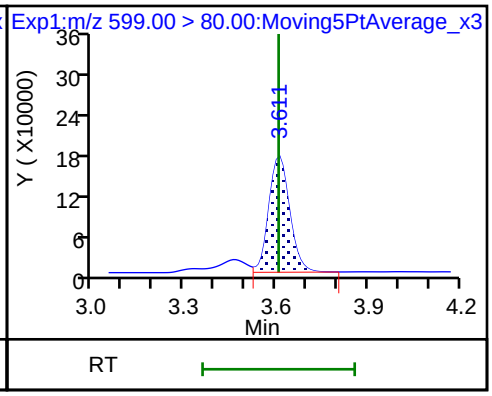
28 N-methyl perfluorooctane sulfonami



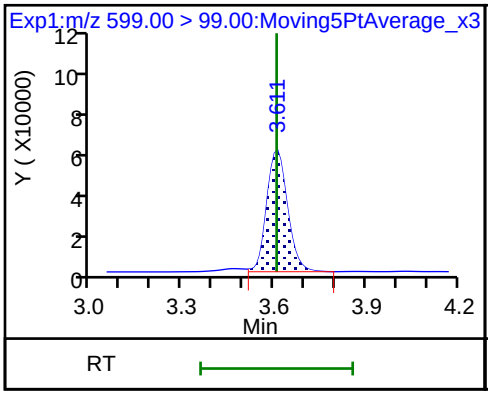
D 27 d3-NMeFOSAA



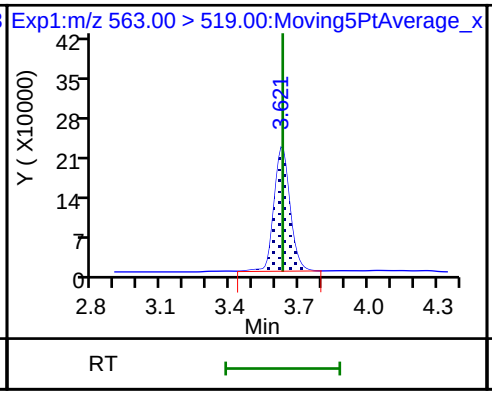
29 Perfluorodecane Sulfonic acid



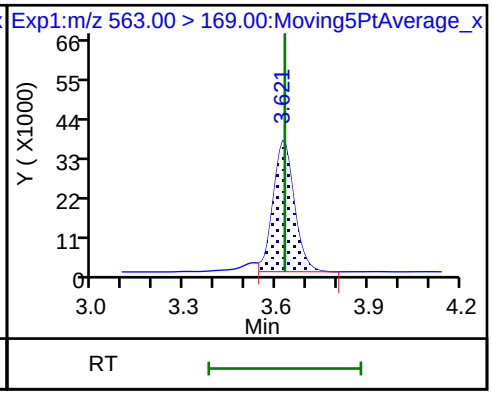
29 Perfluorodecane Sulfonic acid



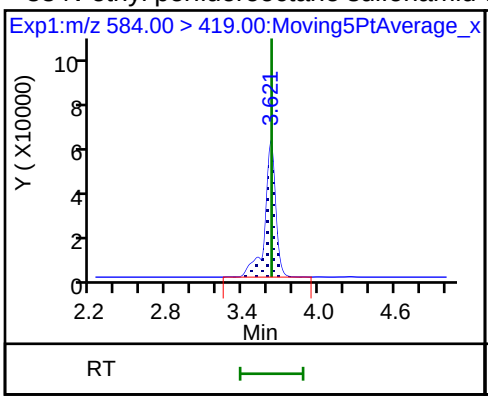
31 Perfluoroundecanoic acid



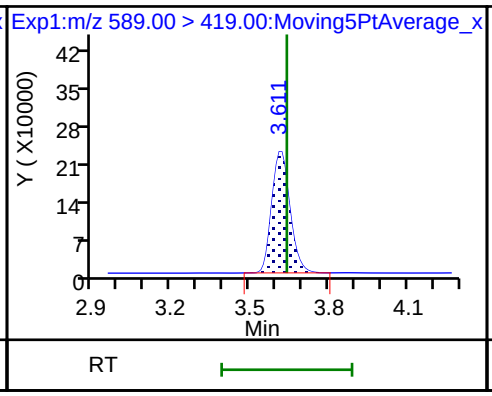
31 Perfluoroundecanoic acid



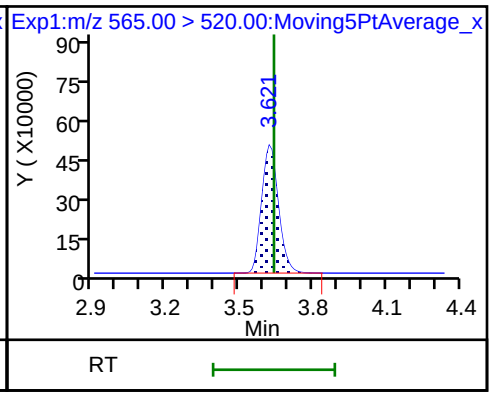
33 N-ethyl perfluorooctane sulfonamid



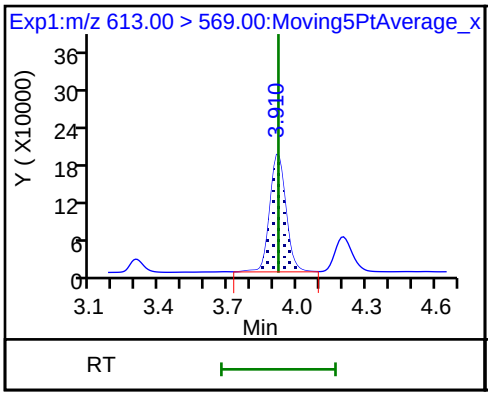
D 32 d5-NEtFOSAA



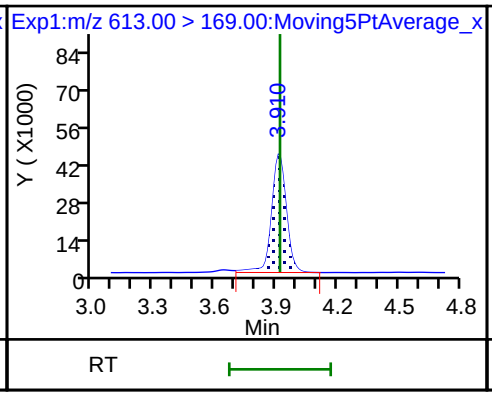
D 30 13C2 PFUnA



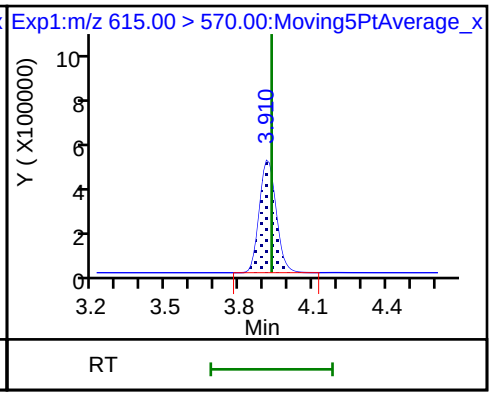
37 Perfluorododecanoic acid



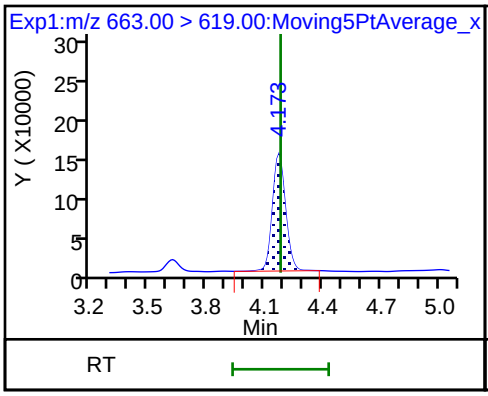
37 Perfluorododecanoic acid



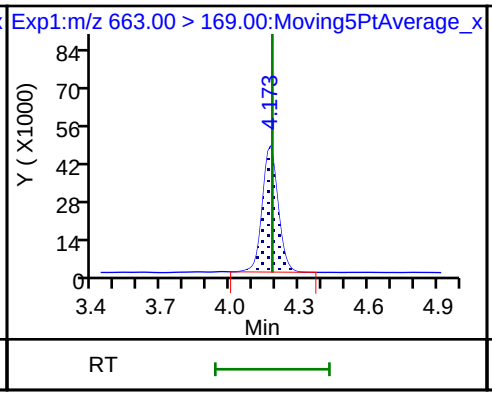
D 36 13C2 PFDoA



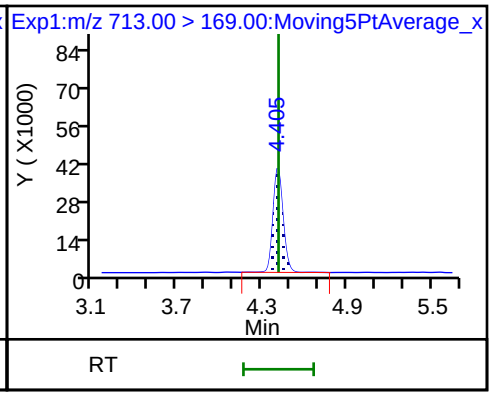
41 Perfluorotridecanoic acid



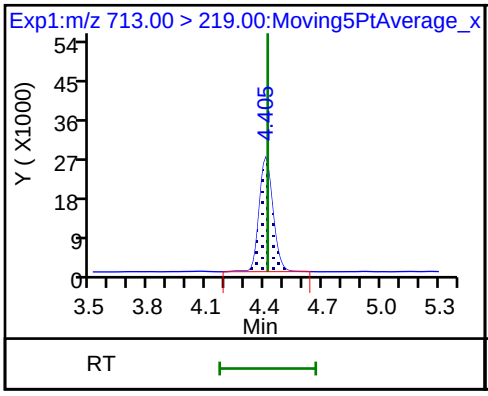
41 Perfluorotridecanoic acid



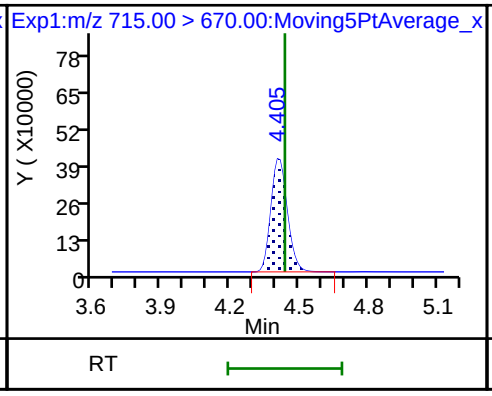
42 Perfluorotetradecanoic acid



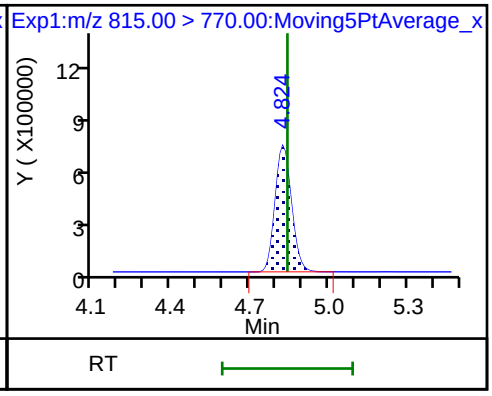
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB1-01 MSD | Lab Sample ID: 320-41149-19 MSD

Matrix: Solid | Lab File ID: 2018.07.28LLB_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 14:15

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.03(g) | Date Analyzed: 07/29/2018 01:40

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236778 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.94		0.32	0.21	0.082
335-67-1	Perfluorooctanoic acid (PFOA)	14.4	4	0.32	0.21	0.11
375-95-1	Perfluorononanoic acid (PFNA)	6.66	J1	0.32	0.21	0.085
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.15	M	0.42	0.19	0.062
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*32.7*	*E 4*	*0.32*	0.21	*0.065*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*297*	*E 4*	*1.1*	0.53	*0.25*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	90		50-150
STL01892	13C4-PFHpA	83		50-150
STL00990	13C4 PFOA	81		50-150
STL00995	13C5 PFNA	53		50-150
STL00994	18O2 PFHxS	80		50-150
STL00991	13C4 PFOS	54		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_019.d
Lims ID: 320-41149-A-19-C MSD
Client ID: GRE07-SB1-01
Sample Type: MSD
Inject. Date: 29-Jul-2018 01:40:03 ALS Bottle#: 12 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41149-a-19-c ms
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 16:02:37 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: ruangyotsakuld Date: 30-Jul-2018 16:02:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.391	1.397	-0.006	1.000	4651666	2.42		242	492	M
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.397	-0.006	0.539	4892522	2.55		102	57966	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.633	0.0	0.633	3383675	2.52		101	29084	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.633	1.641	-0.008	1.000	3570122	2.20		220	633	M
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.667	0.0	0.646	73322	2.08		89.6	155	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.667	1.676	-0.009	1.000	3745024	1.50		169	3694	
298.90 > 99.00	1.667	1.676	-0.009	1.000	1493096		2.51(1.25-3.74)		949	M
D 60 M2-4:2FTS										
329.00 > 81.00	1.867	1.875	-0.008	0.724	4645	NC			4.0	
61 1H,1H,2H,2H-perfluorohexanesulfoni										M
327.00 > 307.00	1.867	1.877	-0.010	1.120	1095539	2.03		218	1125	M
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.905	0.001	0.739	3500428	2.22		89.0	62972	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.896	1.906	-0.010	0.995	6060776	4.08		408	1984	
313.00 > 119.00	1.907	1.906	0.0	1.000	513298		11.81(5.03-15.10)		2707	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.928	0.0	1.157	4116603	1.83		195	7922	
349.00 > 99.00	1.928	1.928	0.0	1.157	1458682		2.82(1.36-4.07)		3923	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.004	2.002	0.002	0.777	292799	NC			7332	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.004	2.004	0.0	1.000	269543	NC			478	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.228	-0.009	0.860	3351769	2.07		82.7	52870	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.005	3462277	2.34		234	1969	
363.00 > 169.00	2.219	2.230	-0.011	1.000	1255260		2.76(1.13-3.40)		10764	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.240	0.002	0.869	3959907	1.90		80.4	40213	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.230	2.242	-0.012	0.995	30311892	15.5		1705	18242	E
399.00 > 99.00	2.242	2.242	0.0	1.000	11026930		2.75(1.50-4.49)		15338	
65 ADONA										
377.00 > 251.00	2.268	2.268	0.0	0.772	3413329	NC			22455	
377.00 > 85.00	2.268	2.268	0.0	0.772	1993885		1.71(0.84-2.53)		6319	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.555	2.557	-0.002	1.004	21575752	33.5		3538	89865	E
D 12 M2-6:2FTS										
429.00 > 81.00	2.546	2.564	-0.018	0.987	905626	2.00		84.2	2370	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.582	-0.001		4144664	2.50			63245	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.582	-0.001	1.000	10712450	6.85		684	4025	
413.00 > 169.00	2.581	2.582	-0.001	1.000	5815295		1.84(0.84-2.52)		11314	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.588	-0.007	1.000	3221456	2.03		81.2	52572	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.581	2.590	-0.009	0.879	2929006	2.73		286	541	
449.00 > 99.00	2.581	2.590	-0.009	0.879	829346		3.53(1.94-5.82)		1274	M
D 18 13C4 PFOS										
503.00 > 80.00	2.937	2.947	-0.010	1.138	1855706	1.28		53.6	3755	
D 19 13C5 PFNA										
468.00 > 423.00	2.942	2.947	-0.005	1.140	1816534	1.33		53.1	25248	
20 Perfluorononanoic acid										
463.00 > 419.00	2.942	2.948	-0.006	1.000	2622401	3.16		316	2380	
463.00 > 169.00	2.942	2.948	-0.006	1.000	632213		4.15(1.90-5.69)		10297	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.942	2.948	-0.006	1.002	120729385	140.7		15163	124022	E
499.00 > 99.00	2.942	2.948	-0.006	1.002	40203944		3.00(2.31-6.93)		124319	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.164	-0.008	1.075	2117658	NC			10784	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.298	-0.006	1.276	1354225	2.87		120	3304	
25 1H,1H,2H,2H-perfluorodecanesulfoni										E
527.00 > 507.00	3.292	3.300	-0.008	1.000	69943140	91.2		9524	407349	E
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.300	-0.008	1.121	2287699	3.94		411	31.4	
549.00 > 99.00	3.284	3.300	-0.016	1.118	841235		2.72(1.33-3.97)		90.9	
D 23 13C2 PFDA										
515.00 > 470.00	3.299	3.314	-0.015	1.279	2260572	2.08		83.1	45367	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.314	-0.007	1.282	3336618	1.57		62.8	1254	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.315	-0.016	1.000	2719083	2.92		292	1648	
513.00 > 169.00	3.299	3.315	-0.016	1.000	470174		5.78(2.36-7.09)		1144	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.307	3.315	-0.008	1.000	10891853	8.21		821	190	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.450	3.466	-0.016	1.337	1000232	2.78		111	6947	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.459	3.469	-0.010	1.003	368552	0.9347		93.5	464	
35 MeFOSA										
512.00 > 169.00	3.726	3.498	0.228		23323	NC			50.5	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.614	3.624	-0.010	1.230	2997950	5.82		604	53.2	
599.00 > 99.00	3.614	3.624	-0.010	1.230	1065308		2.81(1.39-4.16)		252	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.629	-0.005	1.404	1077995	2.85		114	6231	
D 30 13C2 PFUnA										
565.00 > 520.00	3.624	3.639	-0.015	1.404	2524938	2.88		115	40810	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.624	3.643	-0.019	1.000	1835305	1.46		146	151	M
563.00 > 169.00	3.592	3.643	-0.051	0.991	335589		5.47(2.12-6.36)		28.9	M
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.624	3.643	-0.019	1.000	576025	1.43		143	5295	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.788	3.799	-0.011	1.290	2952024	NC			22839	
D 36 13C2 PFDoA										
615.00 > 570.00	3.913	3.930	-0.017	1.516	2062251	2.47		99.0	15459	
37 Perfluorododecanoic acid										M
613.00 > 569.00	3.913	3.935	-0.022	1.000	1754584	1.97		197	221	
613.00 > 169.00	3.913	3.935	-0.022	1.000	433947		4.04(2.13-6.40)		375	M
41 Perfluorotridecanoic acid										M
663.00 > 619.00	4.168	4.199	-0.031	1.065	884652	1.02		102	62.2	M
663.00 > 169.00	4.158	4.199	-0.041	1.063	273265		3.24(1.25-3.76)		42.0	M
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.412	4.435	-0.023	1.000	256179	1.33		133	1240	
713.00 > 219.00	4.412	4.435	-0.023	1.000	175633		1.46(0.71-2.13)		956	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.412	4.437	-0.025	1.710	1923285	2.36		94.5	10108	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.830	4.840	-0.010	1.000	1114324	NC			214	
813.00 > 169.00	4.830	4.840	-0.010	1.000	169374		6.58(2.86-8.58)		828	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.830	4.842	-0.012	1.872	2850114	2.31		92.3	7817	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.171	5.180	-0.009	1.071	997709	NC			280	
913.00 > 169.00	5.171	5.180	-0.009	1.071	121709		8.20(3.83-11.48)		766	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 30-Jul-2018 16:02:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_019.d

Injection Date: 29-Jul-2018 01:40:03 Instrument ID: A8_N

Lims ID: 320-41149-A-19-C MSD

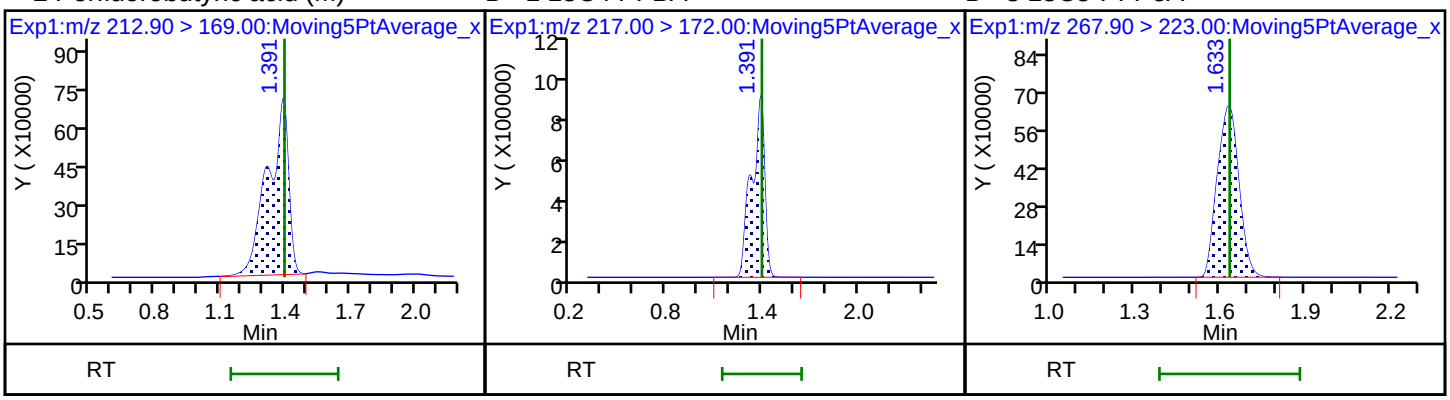
Client ID: GRE07-SB1-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 12 Worklist Smp#: 6

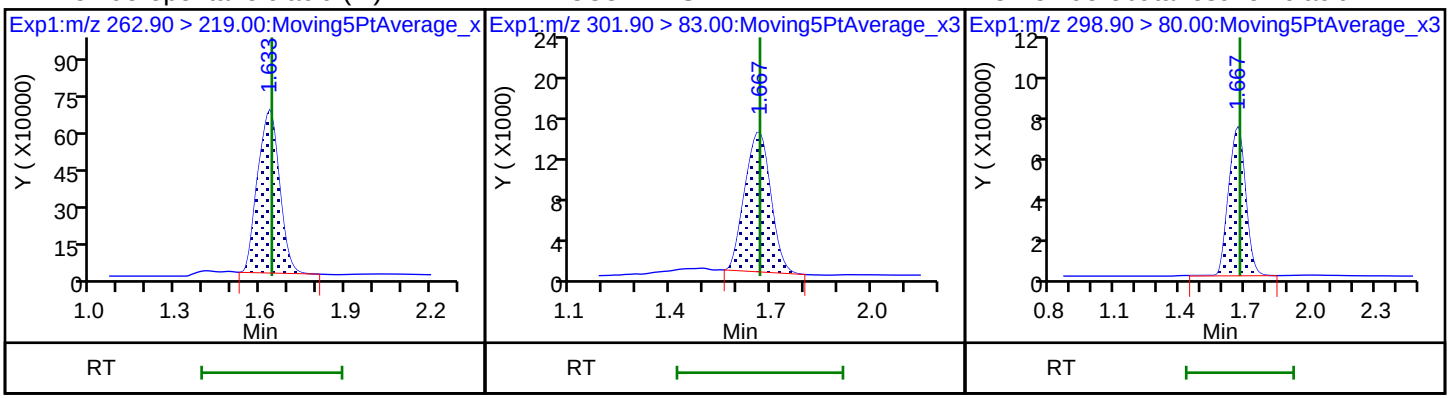
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

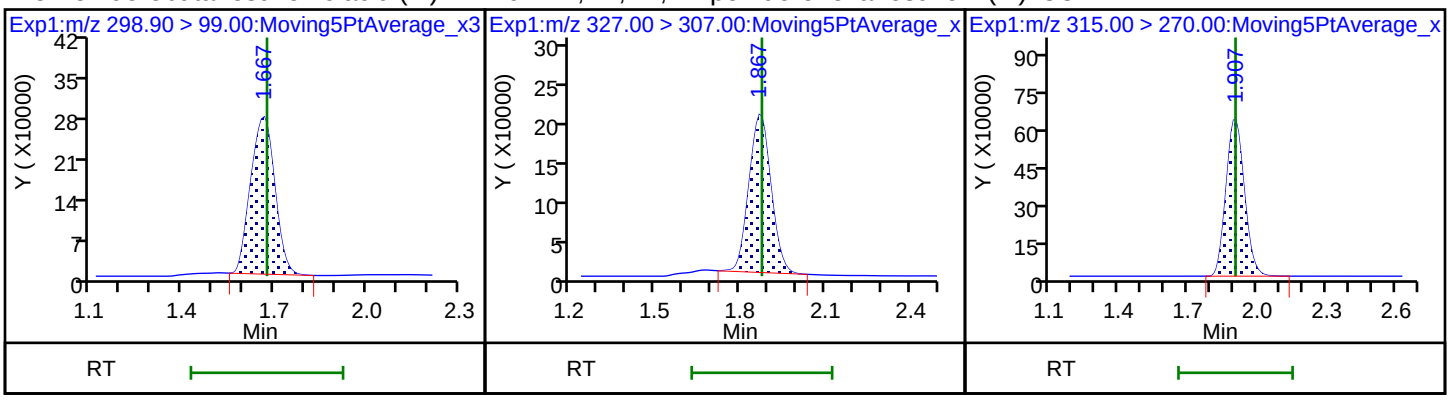
2 Perfluorobutyric acid (M) D 1 13C4 PFBA D 3 13C5-PFPeA



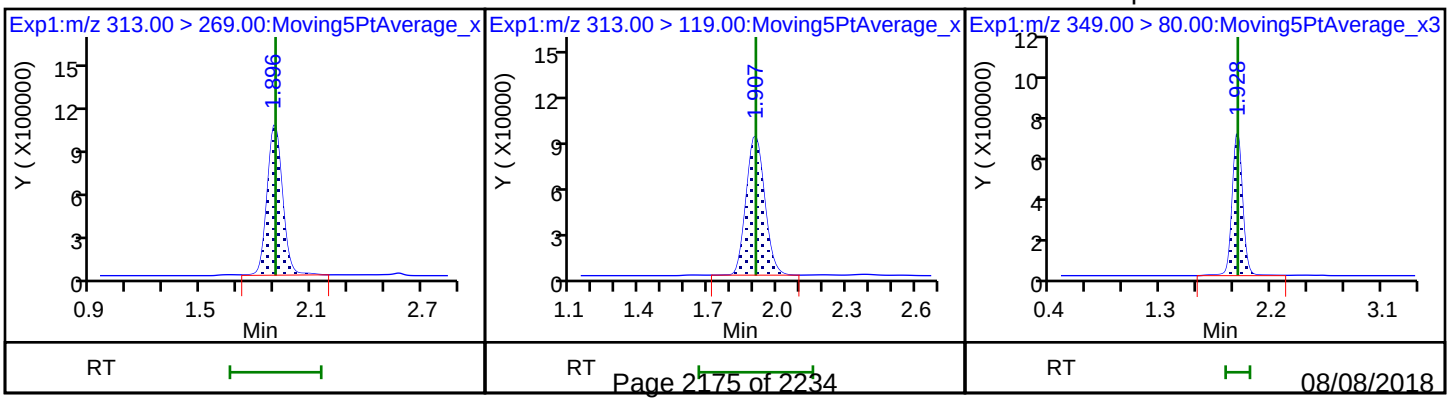
4 Perfluoropentanoic acid (M) D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid



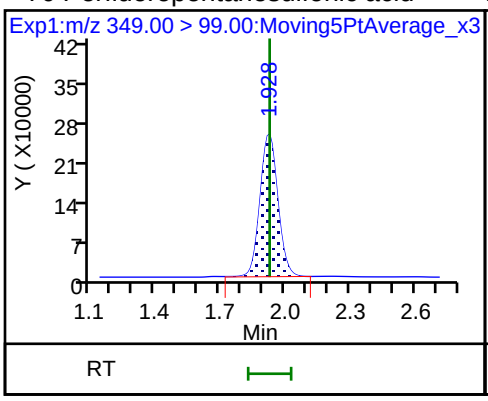
5 Perfluorobutanesulfonic acid (M) 61 1H,1H,2H,2H-perfluorohexanesulfon D (M) 13C2 PFHxA



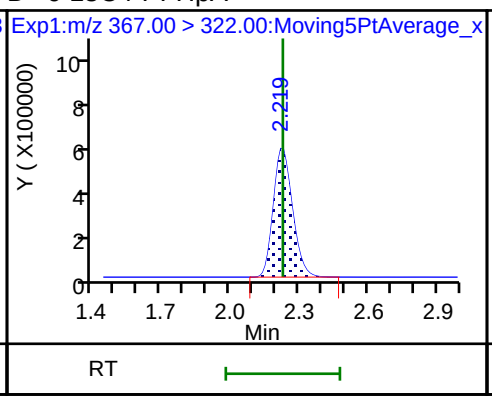
6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid



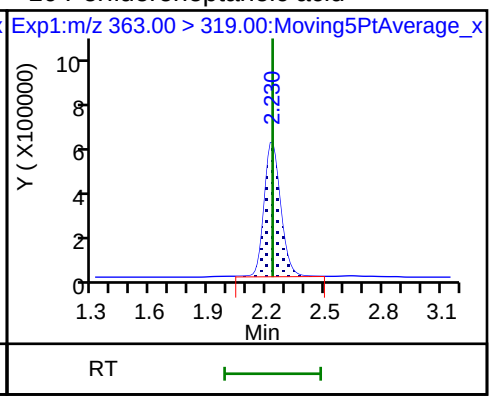
70 Perfluoropentanesulfonic acid



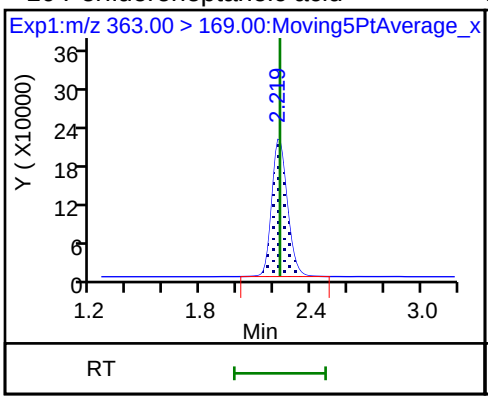
D 9 13C4-PFHpA



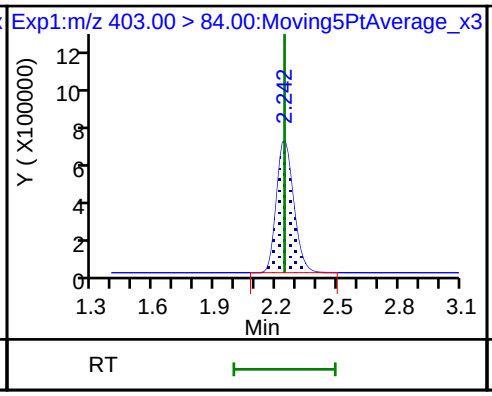
10 Perfluoroheptanoic acid



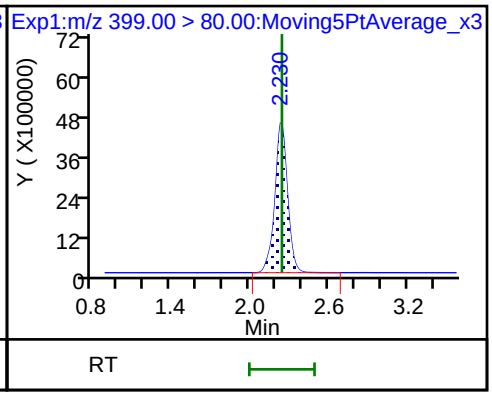
10 Perfluoroheptanoic acid



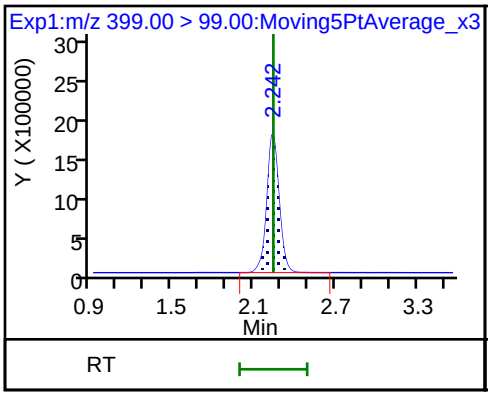
D 11 18O2 PFHxS



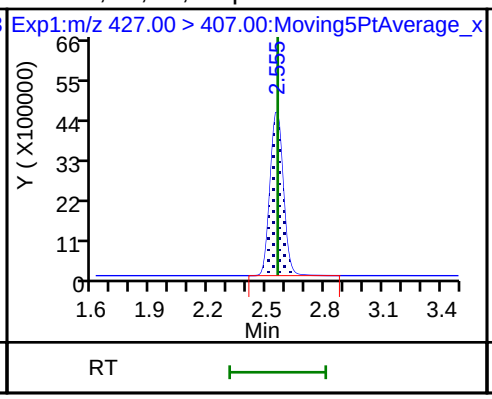
8 Perfluorohexanesulfonic acid



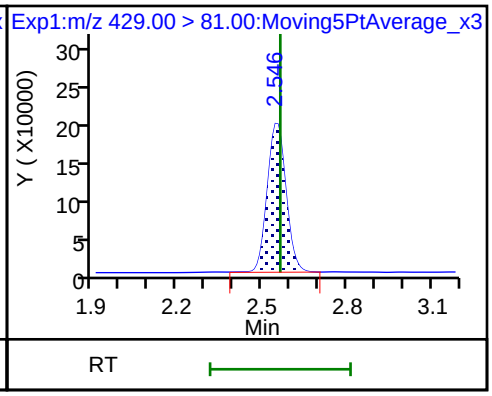
8 Perfluorohexanesulfonic acid



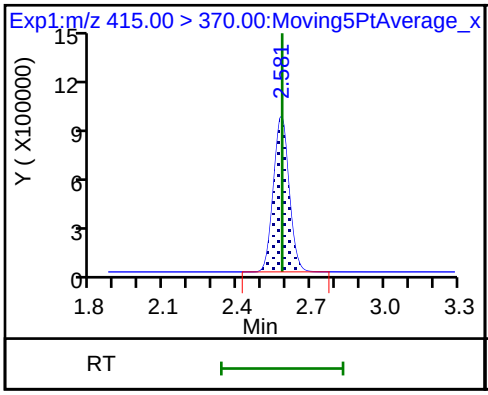
13 1H,1H,2H,2H-perfluorooctanesulfon



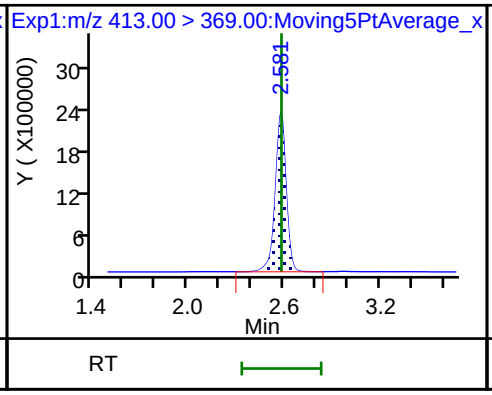
D 12 M2-6:2FTS



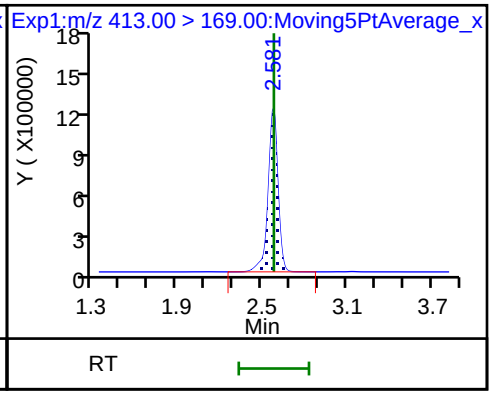
* 62 13C2-PFOA



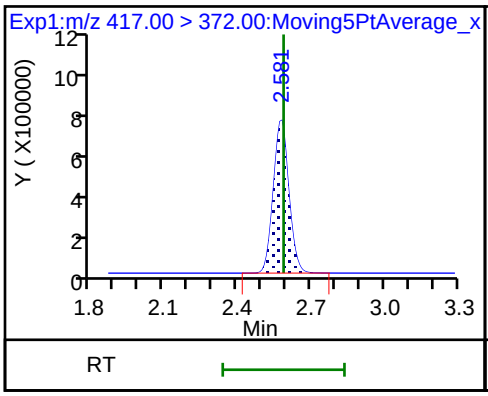
15 Perfluorooctanoic acid



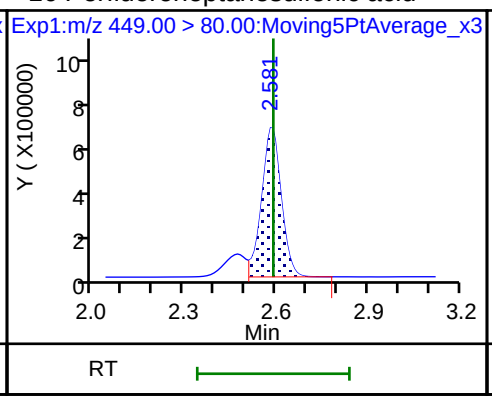
15 Perfluorooctanoic acid



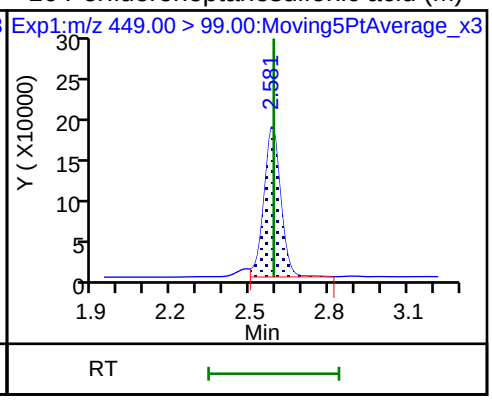
D 14 13C4 PFOA



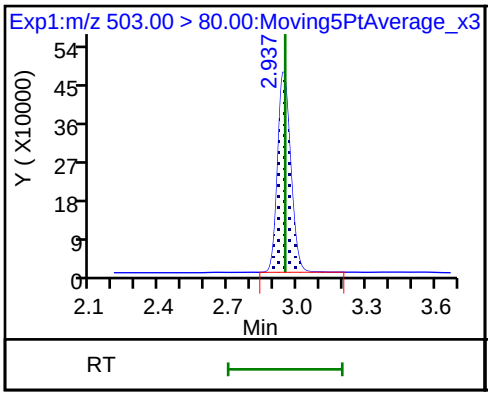
16 Perfluoroheptanesulfonic acid



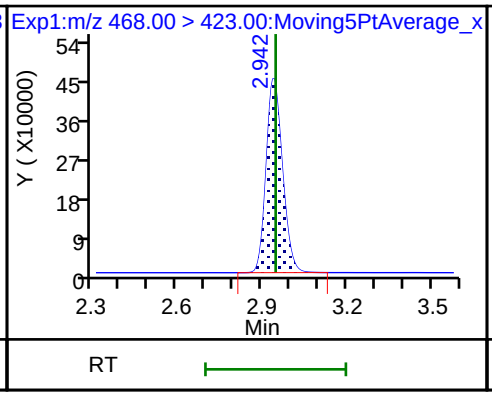
16 Perfluoroheptanesulfonic acid (M)



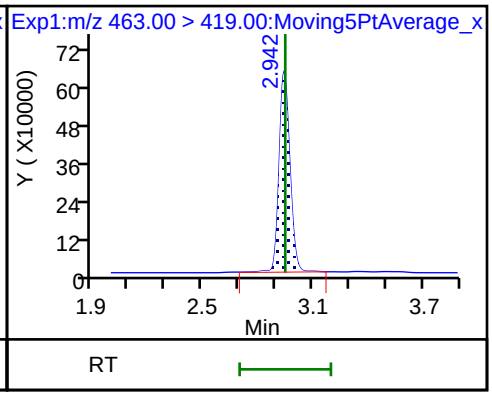
D 18 13C4 PFOS



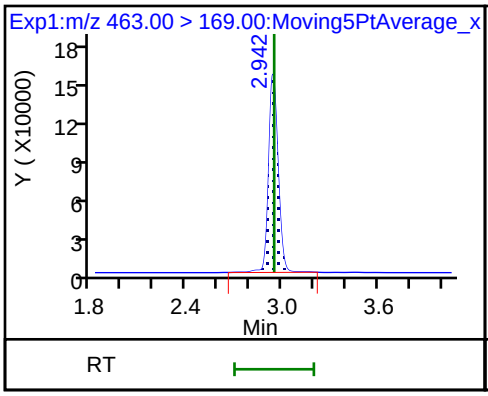
D 19 13C5 PFNA



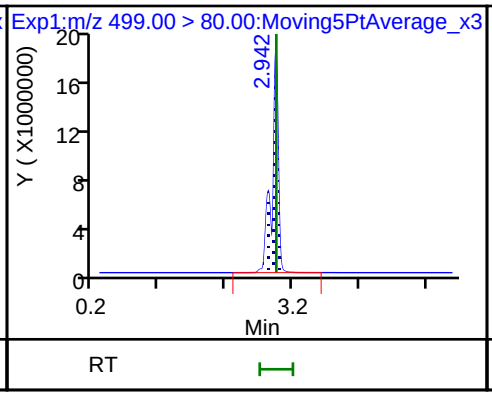
20 Perfluorononanoic acid



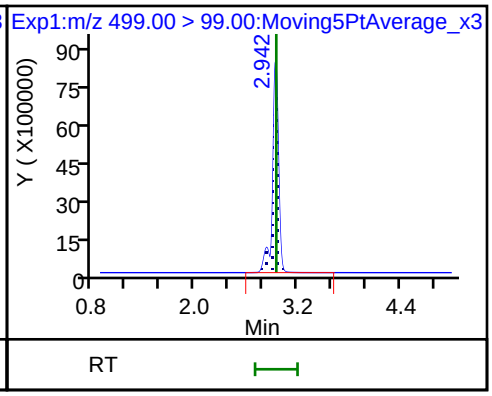
20 Perfluorononanoic acid



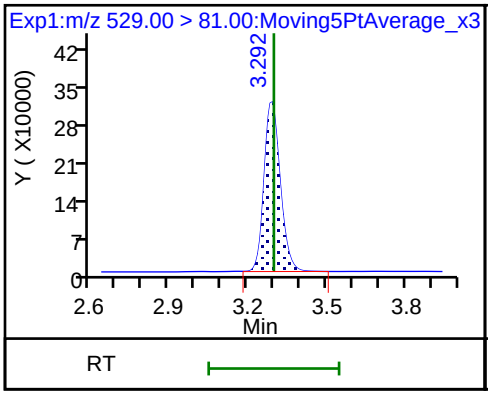
17 Perfluorooctane sulfonic acid



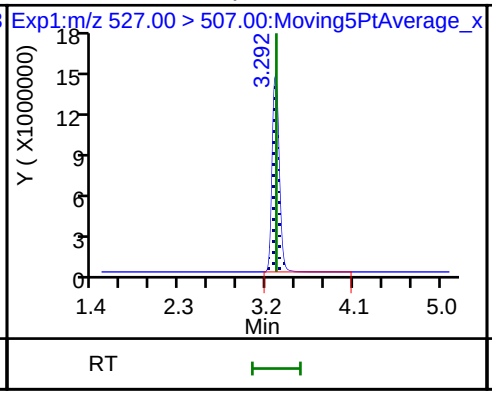
17 Perfluorooctane sulfonic acid



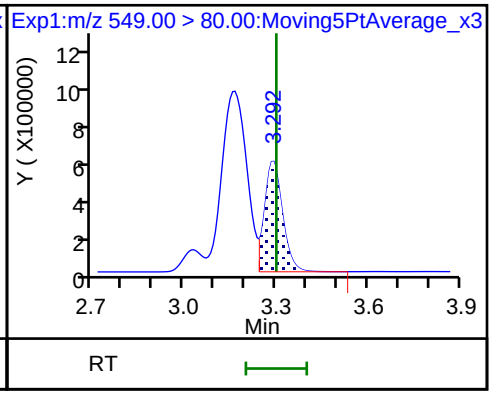
D 26 M2-8:2FTS



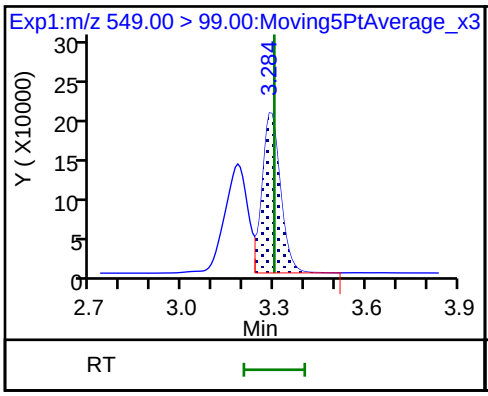
25 1H,1H,2H,2H-perfluorodecanesulfoni



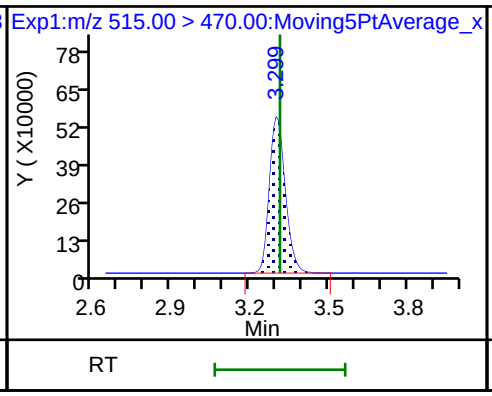
68 Perfluorononanesulfonic acid



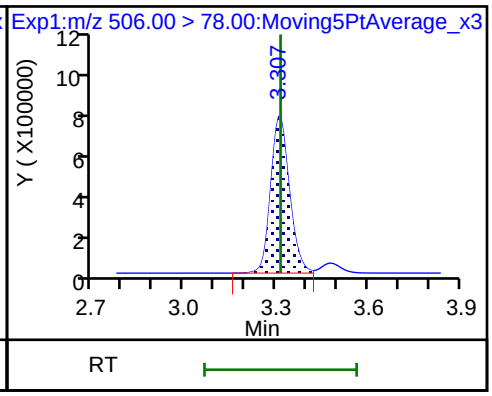
68 Perfluorononanesulfonic acid



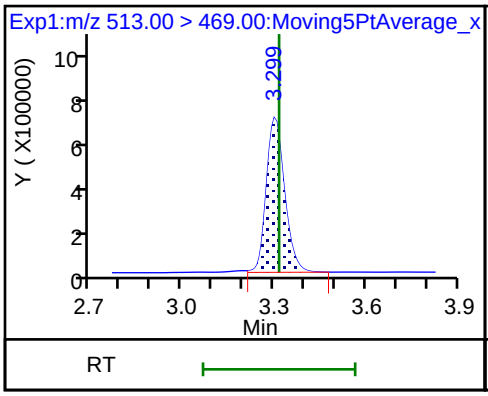
D 23 13C2 PFDA



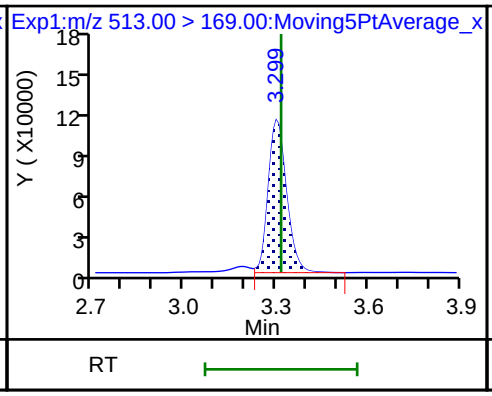
D 21 13C8 FOSA



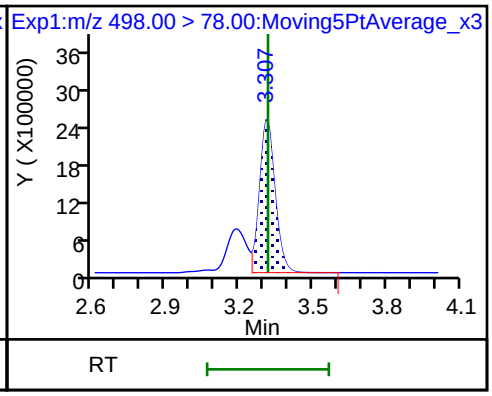
24 Perfluorodecanoic acid



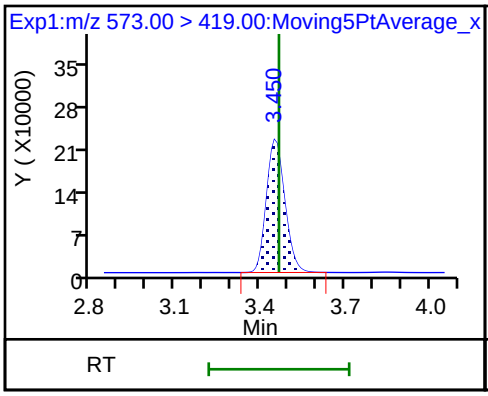
24 Perfluorodecanoic acid



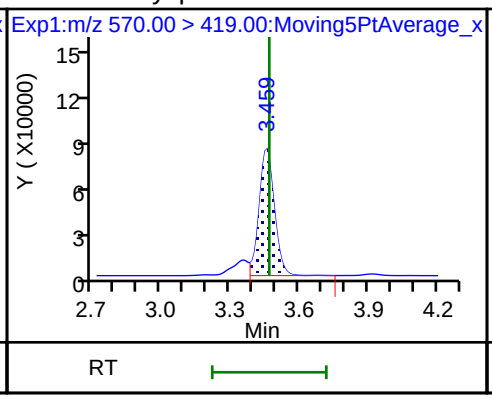
22 Perfluorooctane Sulfonamide



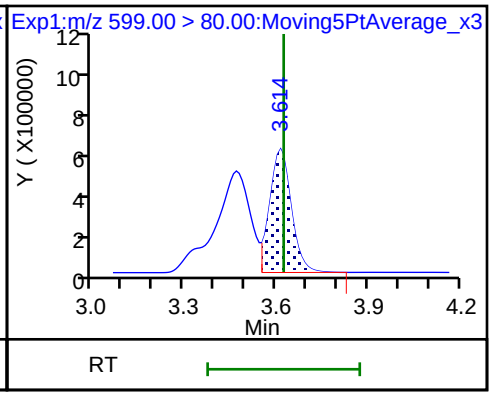
D 27 d3-NMeFOSAA



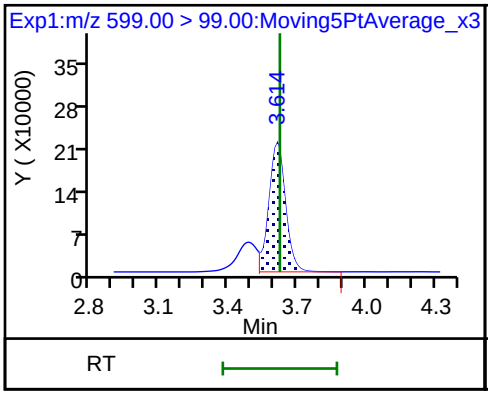
28 N-methyl perfluorooctane sulfonami



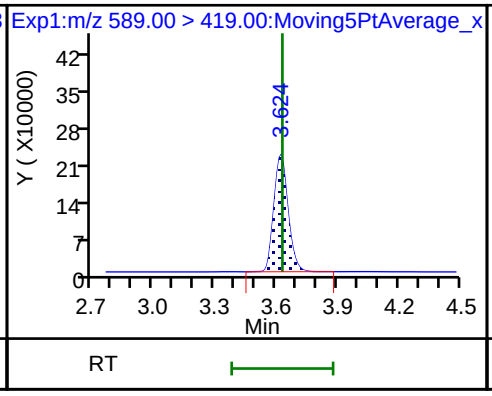
29 Perfluorodecane Sulfonic acid



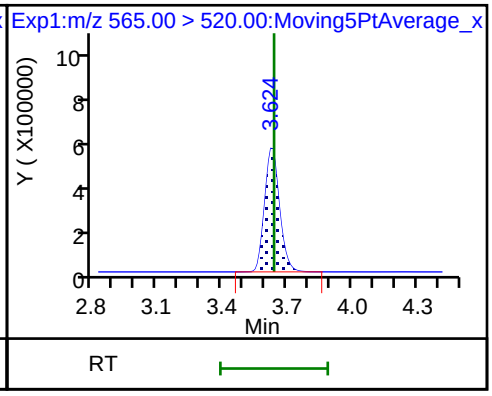
29 Perfluorodecane Sulfonic acid



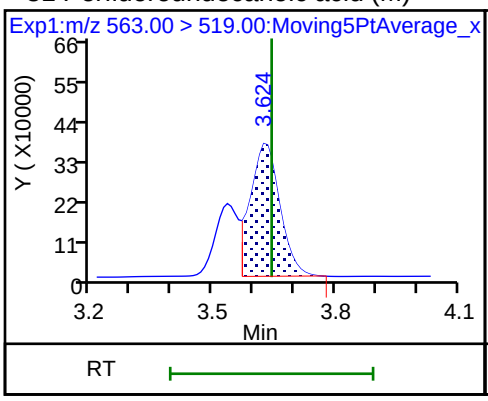
D 32 d5-NEtFOSAA



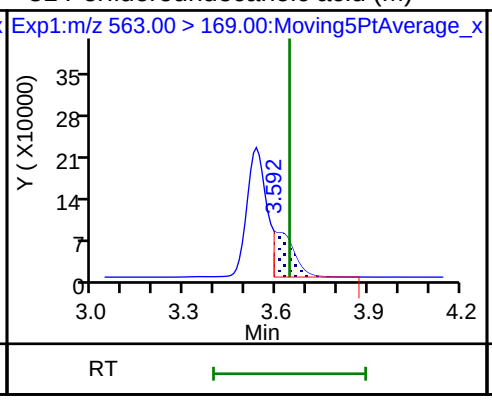
D 30 13C2 PFUnA



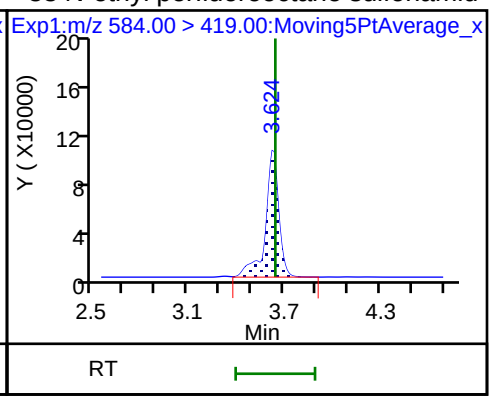
31 Perfluoroundecanoic acid (M)



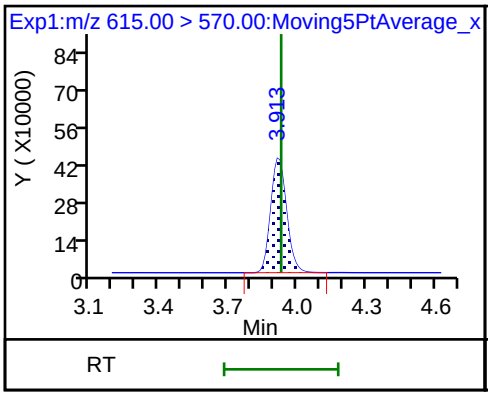
31 Perfluoroundecanoic acid (M)



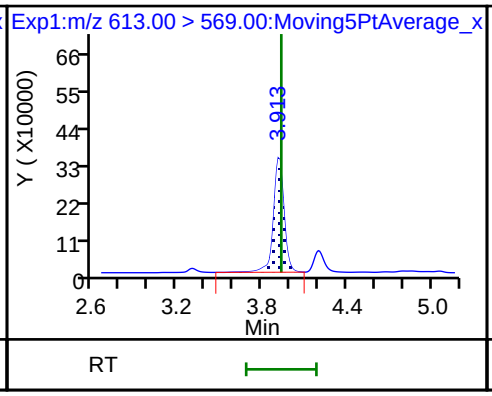
33 N-ethyl perfluorooctane sulfonamid



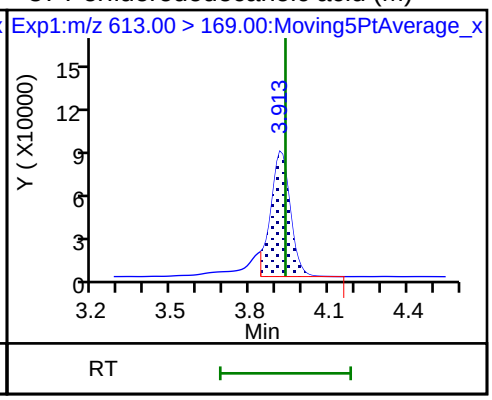
D 36 13C2 PFDoA



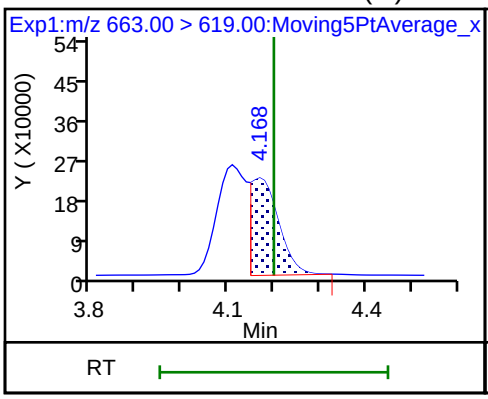
37 Perfluorododecanoic acid



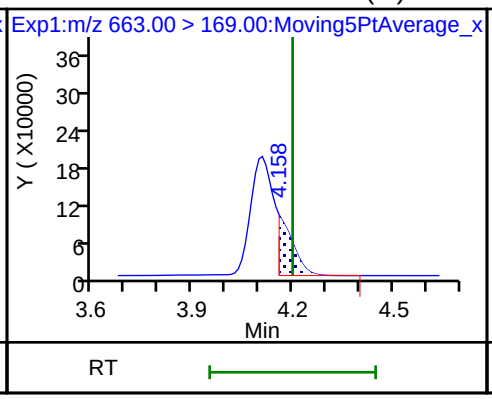
37 Perfluorododecanoic acid (M)



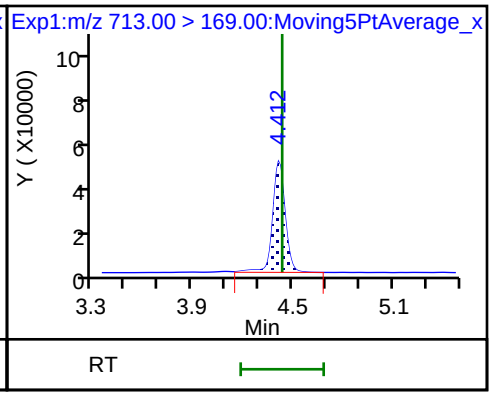
41 Perfluorotridecanoic acid (M)



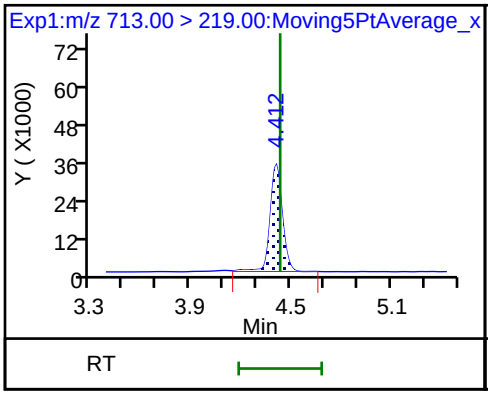
41 Perfluorotridecanoic acid (M)



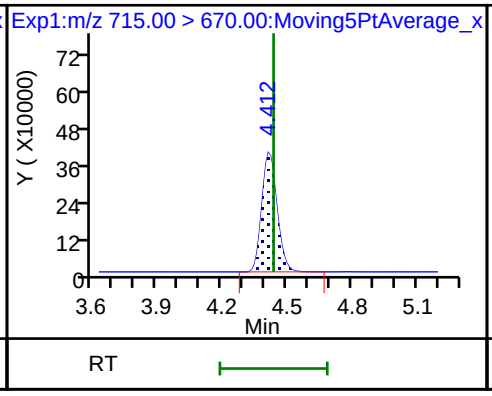
42 Perfluorotetradecanoic acid



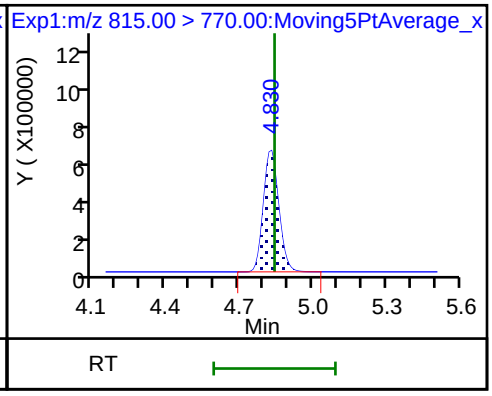
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

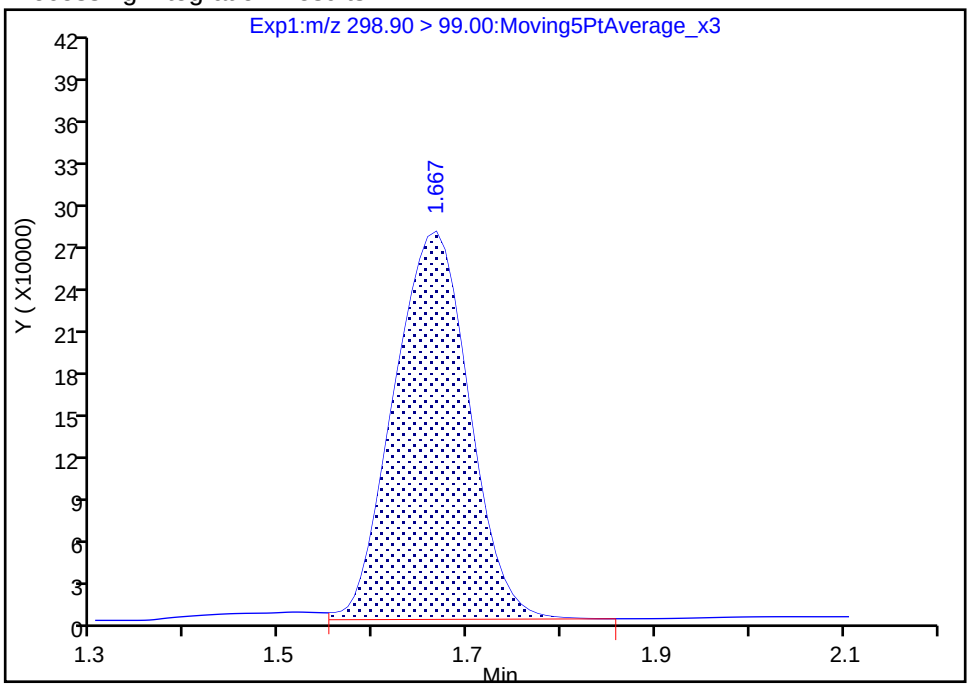
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61816.b\2018.07.28LLB_019.d				
Injection Date:	29-Jul-2018 01:40:03	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-C MSD				
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	12	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

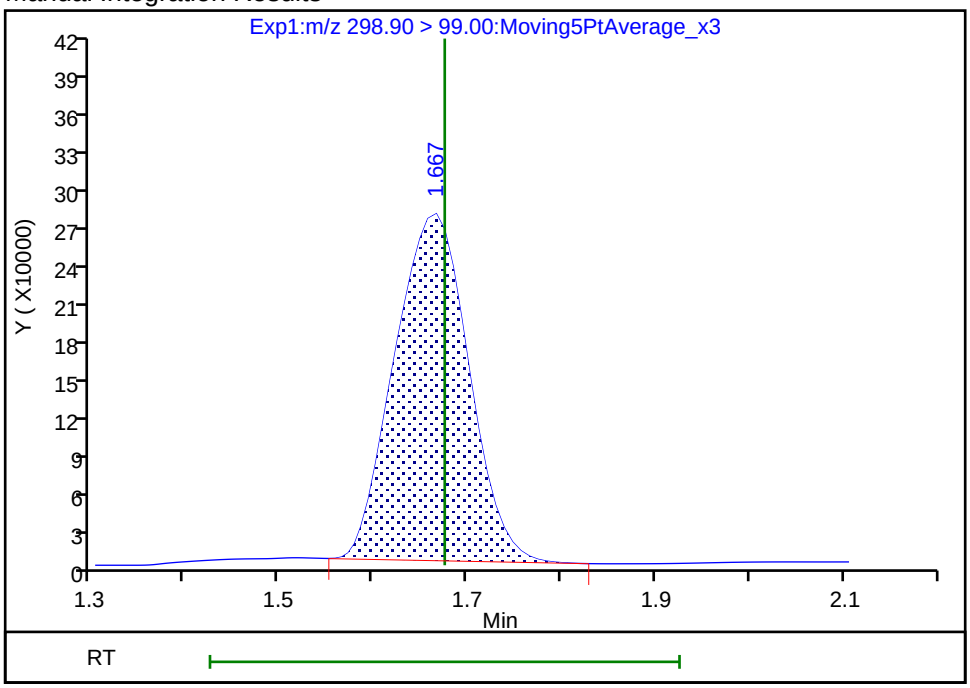
Processing Integration Results

RT: 1.67
Area: 1534006
Amount: 1.495754
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 1493096
Amount: 1.495754
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-Jul-2018 16:01:18

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41149-1

SDG No.:

Client Sample ID: GRE07-SB1-01 MSD DL | Lab Sample ID: 320-41149-19 MSD DL

Matrix: Solid | Lab File ID: 2018.07.31LLA_009.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/11/2018 14:15

Extraction Method: SHAKE | Date Extracted: 07/18/2018 10:19

Sample wt/vol: 5.03(g) | Date Analyzed: 07/31/2018 18:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 50

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 5.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237052 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*4.60*	*J D M*	*16*	11	*4.1*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*14.5*	*J 4 D*	*16*	11	*5.3*
375-95-1	*Perfluorononanoic acid (PFNA)*	*7.42*	*J D J1*	*16*	11	*4.3*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*3.35*	*J D*	*21*	9.5	*3.1*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	38.9	4 D	16	11	3.3
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	487	4 D	53	26	13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	58	M	50-150
STL01892	13C4-PFHpA	77		50-150
STL00990	13C4 PFOA	81		50-150
STL00995	13C5 PFNA	68		50-150
STL00994	18O2 PFHxS	63		50-150
STL00991	13C4 PFOS	61		50-150

Report Date: 01-Aug-2018 12:35:44 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_009.d
Lims ID: 320-41149-A-19-C MSD
Client ID: GRE07-SB1-01
Sample Type: MSD
Inject. Date: 31-Jul-2018 18:13:05 ALS Bottle#: 3 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 50.0000
Sample Info: 320-41149-a-19-c msd 50X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 12:35:43 Calib Date: 30-Jul-2018 16:00:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180730-61882.b\2018.07.30LLICA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: mongkols Date: 01-Aug-2018 12:32:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.397	1.391	0.006	1.000	97678	0.0486		243	17.7	M
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.394	0.003	0.539	98244	0.0378		75.5	1473	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.633	0.0	1.000	64304	0.0432		216	27.2	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.631	61572	0.0368		73.6	1378	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.666	0.001	0.995	71123	0.0318		180	307	
298.90 > 99.00	1.667	1.666	0.001	0.995	33699		2.11(1.25-3.74)		88.2	
D 47 13C3-PFBS										M
301.90 > 83.00	1.676	1.670	0.006	0.647	1342	0.0270		58.1	7.2	M
61 1H,1H,2H,2H-perfluorohexanesulfoni										M
327.00 > 307.00	1.877	1.866	0.011	1.120	15420	0.0350		187	280	M
6 Perfluorohexanoic acid										
313.00 > 269.00	1.906	1.906	0.0	1.000	126846	0.0896		448	162	
313.00 > 119.00	1.906	1.906	0.0	1.000	9666		13.12(5.03-15.10)		104	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.911	-0.005	0.736	66377	0.0349		69.9	1774	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.927	0.001	1.151	78751	0.0390		208	818	
349.00 > 99.00	1.928	1.927	0.001	1.151	24823		3.17(1.36-4.07)		99.0	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.004	1.997	0.007	0.774	4680	NC			219	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.993	2.003	-0.010	0.994	4480	NC			18.4	
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.223	0.007	0.861	69360	0.0384		76.8	2391	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.230	2.229	0.001	1.000	68959	0.0437		218	28.6	M
363.00 > 169.00	2.230	2.229	0.001	1.000	25756		2.68(1.13-3.40)		254	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.241	0.001	1.000	739959	0.3688		2026	3654	
399.00 > 99.00	2.242	2.241	0.001	1.000	242327		3.05(1.50-4.49)		356	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.248	-0.006	0.866	81670	0.0297		62.9	2810	
65 ADONA										
377.00 > 251.00	2.268	2.267	0.001	0.769	67652	NC			602	
377.00 > 85.00	2.268	2.267	0.001	0.769	42981		1.57(0.84-2.53)		145	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.553	0.004	1.000	473946	0.8176		4312	5062	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.562	-0.005	0.987	16344	0.0289		60.8	164	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.578	0.012		96092	0.0500			4367	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.582	2.578	0.004	1.000	239063	0.1375		687	167	
413.00 > 169.00	2.582	2.578	0.004	1.000	134214		1.78(0.84-2.52)		513	
D 14 13C4 PFOA										
417.00 > 372.00	2.582	2.586	-0.004	0.997	74581	0.0404		80.8	3405	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.590	2.586	0.004	0.878	61241	0.0380		199	417	
449.00 > 99.00	2.590	2.586	0.004	0.878	17504		3.50(1.94-5.82)		66.8	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.946	0.004	1.000	84339	0.0704		352	114	
463.00 > 169.00	2.950	2.946	0.004	1.000	20882		4.04(1.90-5.69)		467	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.950	2.946	0.004	1.000	6390314	4.63		24923	37997	
499.00 > 99.00	2.950	2.946	0.004	1.000	1518704		4.21(2.31-6.93)		9730	
D 18 13C4 PFOS										
503.00 > 80.00	2.950	2.952	-0.002	1.139	57932	0.0294		61.4	1070	
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.952	-0.002	1.139	55482	0.0340		68.0	2208	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.158	3.161	-0.003	1.071	35444	NC			586	
D 26 M2-8:2FTS										
529.00 > 81.00	3.294	3.296	-0.002	1.272	32325	0.0496		103	572	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.294	3.296	-0.002	1.000	2978652	3.32		17347	184443	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.294	3.296	-0.002	1.117	58043	0.0612		319	49.7	
549.00 > 99.00	3.294	3.296	-0.002	1.117	22897		2.53(1.33-3.97)		56.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.302	3.311	-0.009	1.275	50574	0.0374		74.9	2030	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.309	3.311	-0.002	1.002	68167	0.0620		310	111	
513.00 > 169.00	3.302	3.311	-0.009	1.000	11220		6.08(2.36-7.09)		165	
D 21 13C8 FOSA										
506.00 > 78.00	3.309	3.319	-0.010	1.278	92063	0.0327		65.4	893	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.309	3.319	-0.010	1.000	308574	0.1693		846	281	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.452	3.464	-0.012	1.333	10162	0.0333		66.5	447	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.471	3.464	0.007	1.005	3212	0.0154		76.8	95.1	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.616	3.628	-0.012	1.396	12312	0.0368		73.7	136	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.616	3.628	-0.012	1.226	55218	0.0681		353	52.2	
599.00 > 99.00	3.616	3.628	-0.012	1.226	20353		2.71(1.39-4.16)		104	
D 30 13C2 PFUnA										
565.00 > 520.00	3.636	3.638	-0.002	1.404	37633	0.0359		71.7	1951	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.636	3.638	-0.002	1.005	7360	0.0327		164	184	
31 Perfluoroundecanoic acid										Ma
563.00 > 519.00	3.636	3.638	-0.002	1.000	34291	0.0508		254	58.8	a
563.00 > 169.00	3.626	3.638	-0.012	0.997	6714		5.11(2.12-6.36)		32.6	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.790	3.803	-0.013	1.285	54984	NC			1462	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.926	3.928	-0.002	1.000	26304	0.0345		173	20.0	
613.00 > 169.00	3.926	3.928	-0.002	1.000	6664		3.95(2.13-6.40)		98.9	
D 36 13C2 PFDoA										
615.00 > 570.00	3.926	3.928	-0.002	1.516	35281	0.0331		66.3	940	
41 Perfluorotridecanoic acid										M
663.00 > 619.00	4.180	4.193	-0.013	1.065	14547	0.0225		112	7.4	M
663.00 > 169.00	4.170	4.193	-0.023	1.062	4580		3.18(1.25-3.76)		29.6	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.426	-0.001	1.709	26989	0.0278		55.6	202	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.425	4.426	-0.001	1.000	3626	0.0252		126	60.5	
713.00 > 219.00	4.415	4.426	-0.011	0.998	2674		1.36(0.71-2.13)		48.2	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.832	4.833	-0.001	1.866	35650	0.0208		41.5	68.4	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.832	4.833	-0.001	1.000	13809	NC			1.4	
813.00 > 169.00	4.832	4.833	-0.001	1.000	1836		7.52(2.86-8.58)		22.7	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.174	-0.001	1.070	11966	NC			4.5	
913.00 > 169.00	5.165	5.174	-0.009	1.069	1157		10.34(3.83-11.48)		13.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

a - User Assigned ID

Report Date: 01-Aug-2018 12:35:44 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_009.d

Injection Date: 31-Jul-2018 18:13:05 Instrument ID: A8_N

Lims ID: 320-41149-A-19-C MSD

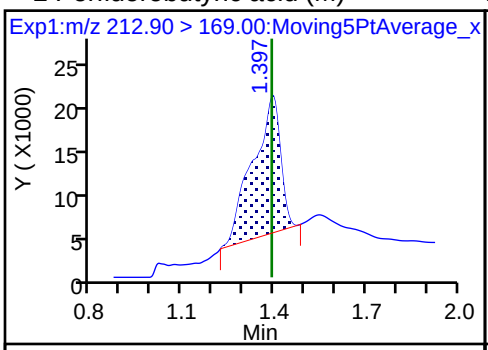
Client ID: GRE07-SB1-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 3 Worklist Smp#: 4

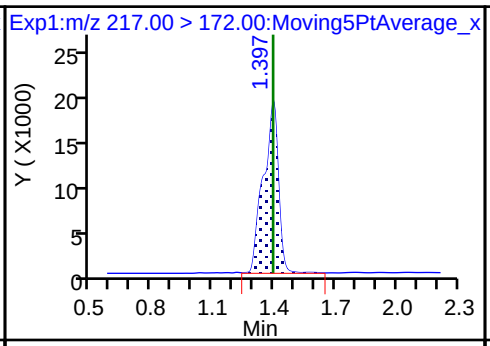
Injection Vol: 2.0 ul Dil. Factor: 50.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

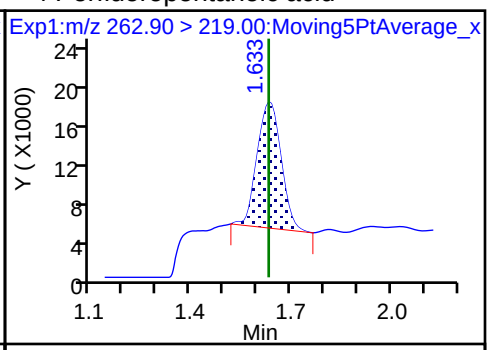
2 Perfluorobutyric acid (M)



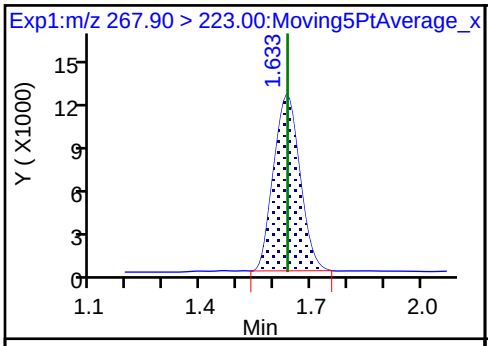
D 1 13C4 PFBA



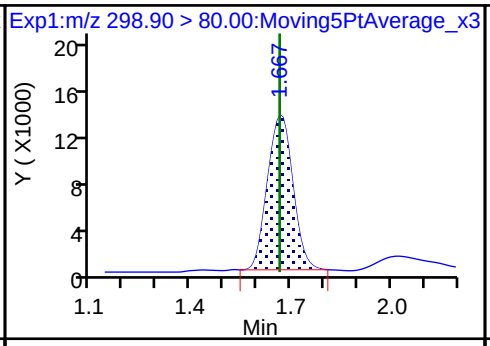
4 Perfluoropentanoic acid



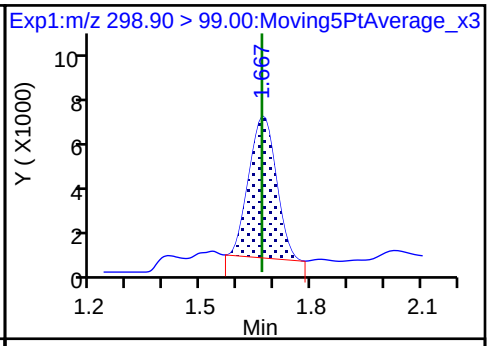
D 3 13C5-PFPeA



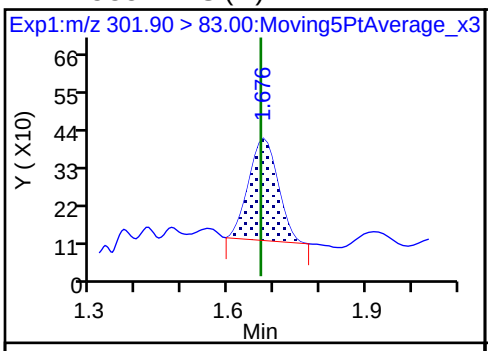
5 Perfluorobutanesulfonic acid



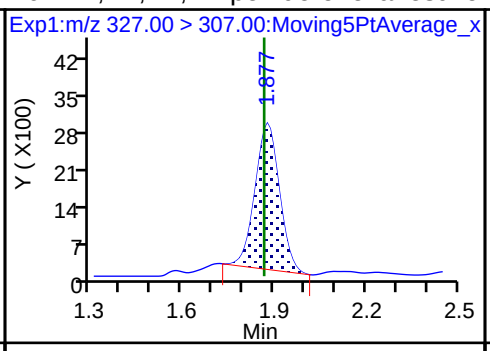
5 Perfluorobutanesulfonic acid



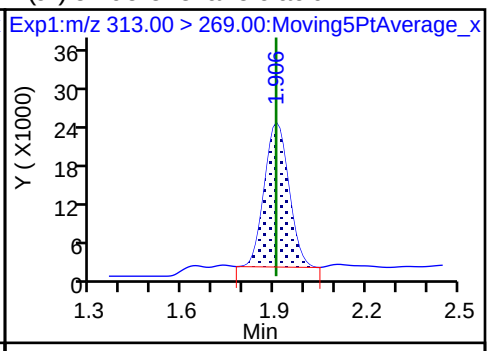
D 47 13C3-PFBS (M)



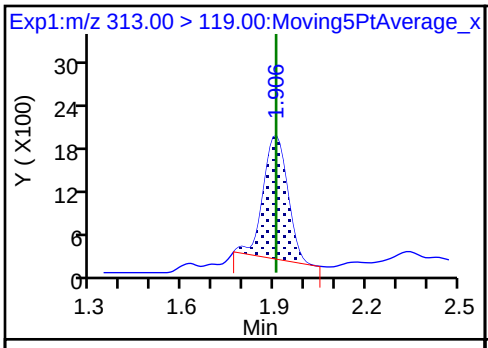
61 1H,1H,2H,2H-perfluorohexanesulfoni (M)



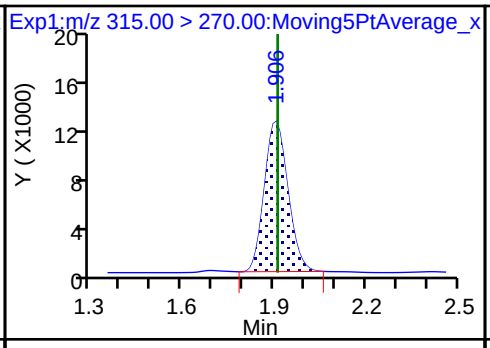
6 Perfluorohexanoic acid



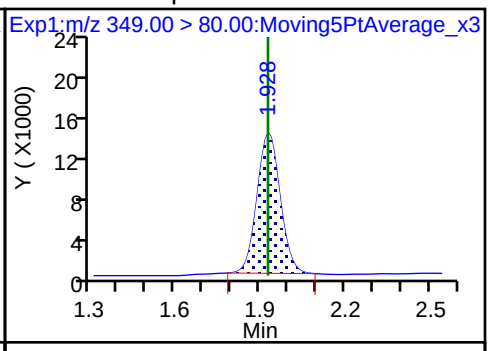
6 Perfluorohexanoic acid



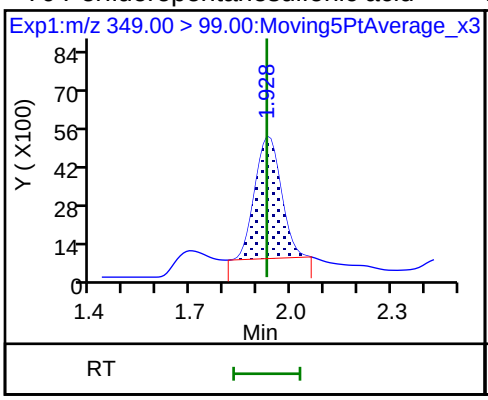
D 7 13C2 PFHxA



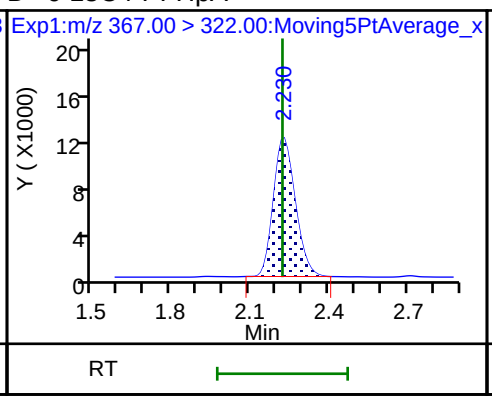
70 Perfluoropentanesulfonic acid



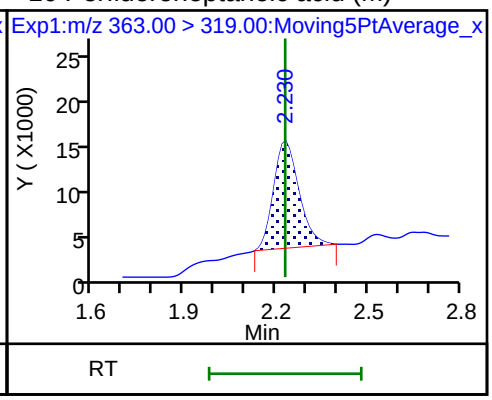
70 Perfluoropentanesulfonic acid



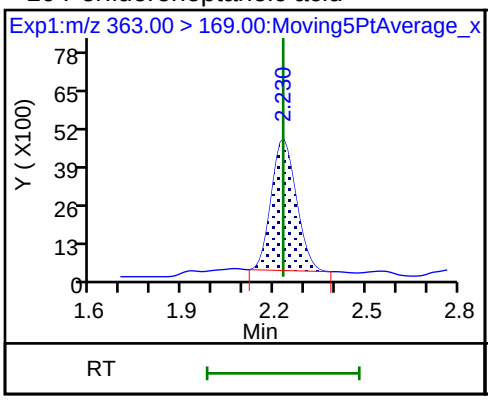
D 9 13C4-PFHpA



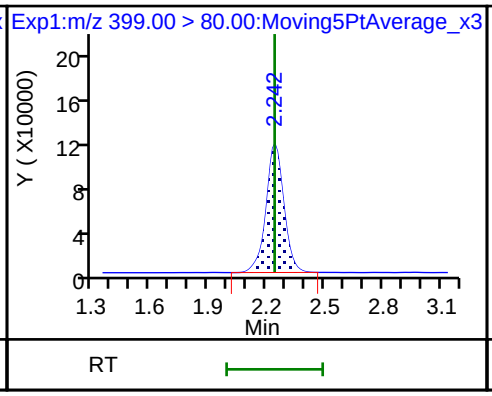
10 Perfluoroheptanoic acid (M)



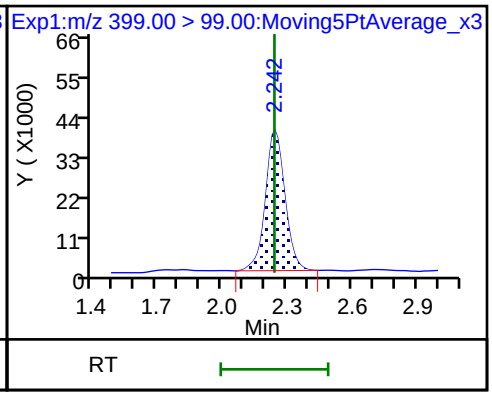
10 Perfluoroheptanoic acid



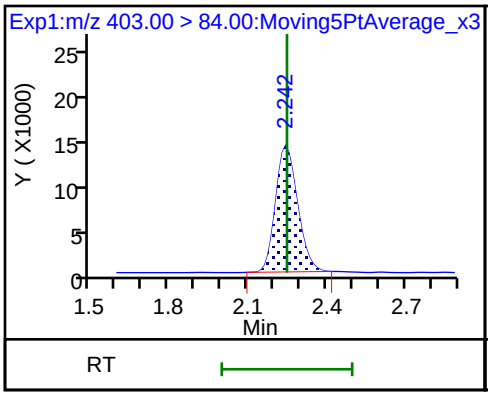
8 Perfluorohexanesulfonic acid



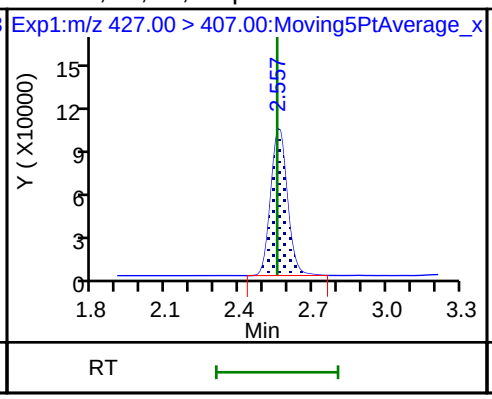
8 Perfluorohexanesulfonic acid



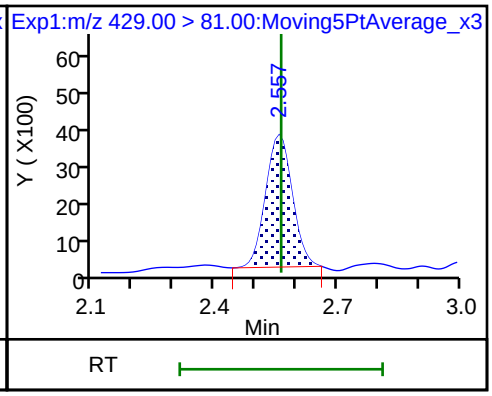
D 11 18O2 PFHxS



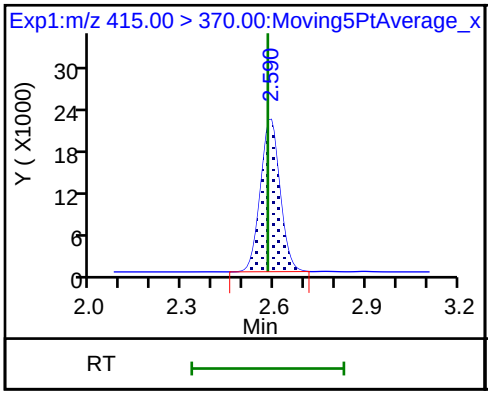
13 1H,1H,2H,2H-perfluorooctanesulfon



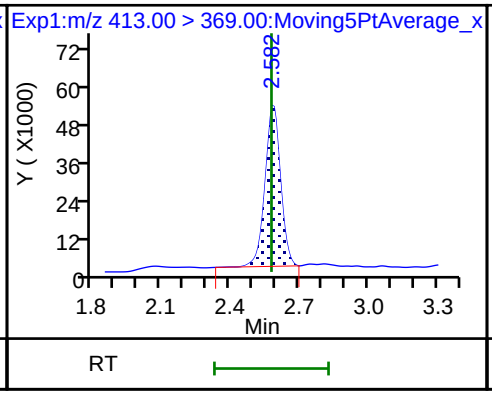
D 12 M2-6:2FTS



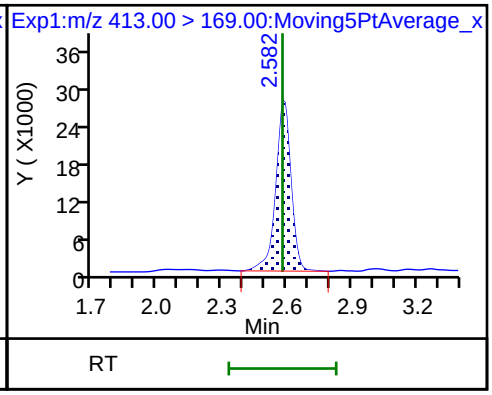
* 62 13C2-PFOA



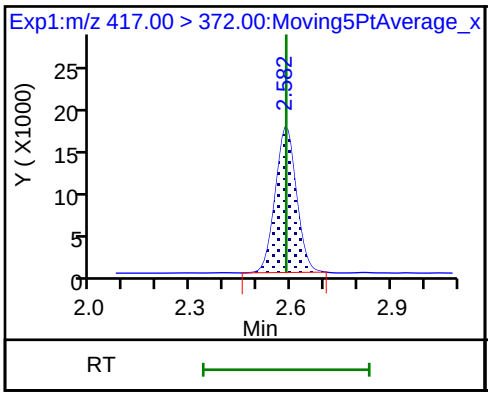
15 Perfluorooctanoic acid



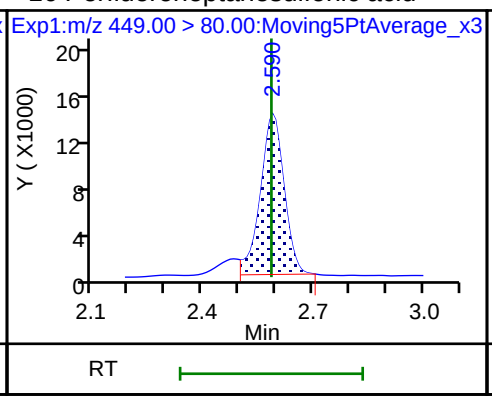
15 Perfluorooctanoic acid



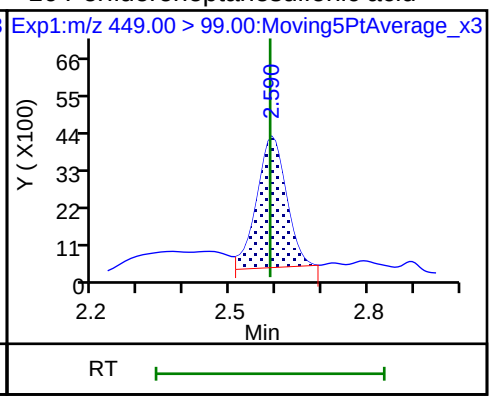
D 14 13C4 PFOA



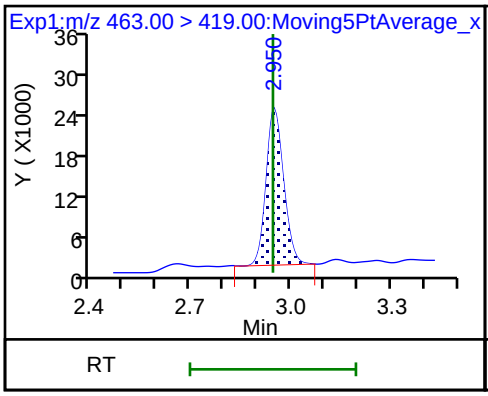
16 Perfluoroheptanesulfonic acid



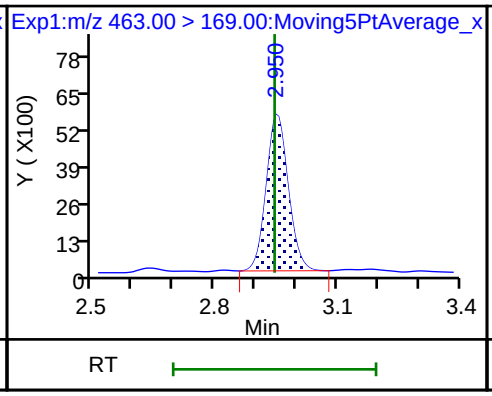
16 Perfluoroheptanesulfonic acid



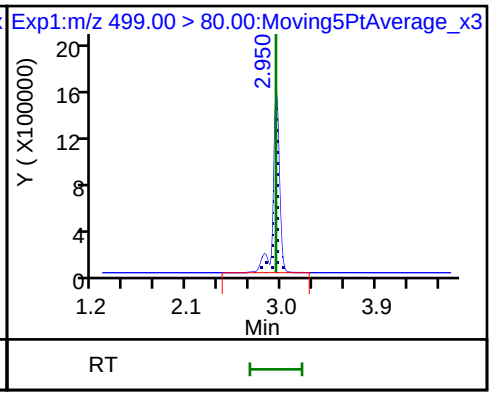
20 Perfluorononanoic acid



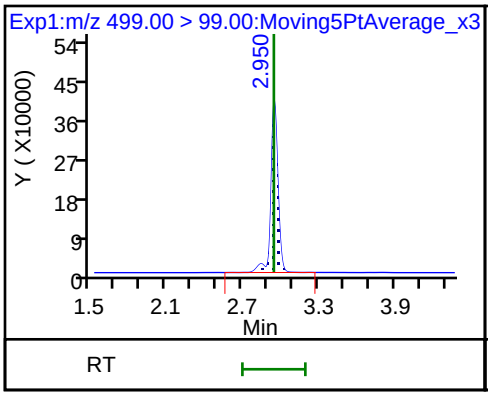
20 Perfluorononanoic acid



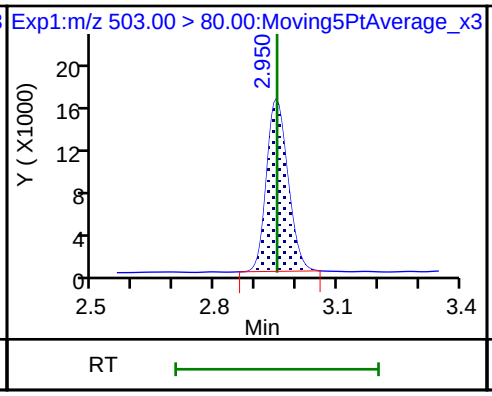
17 Perfluorooctane sulfonic acid



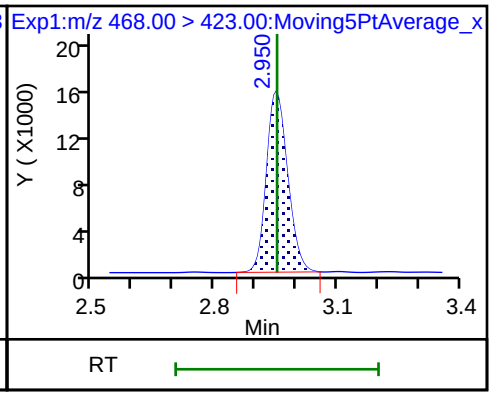
17 Perfluorooctane sulfonic acid



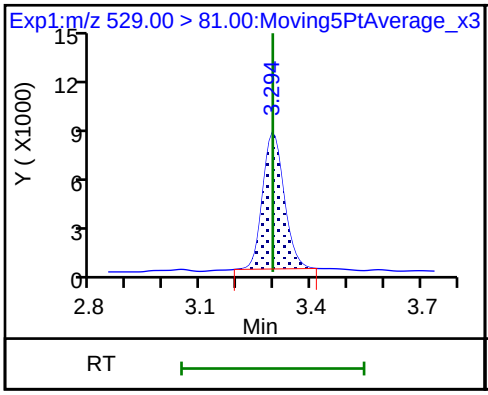
D 18 13C4 PFOS



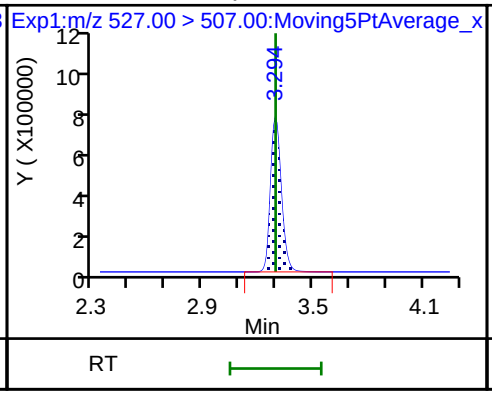
D 19 13C5 PFNA



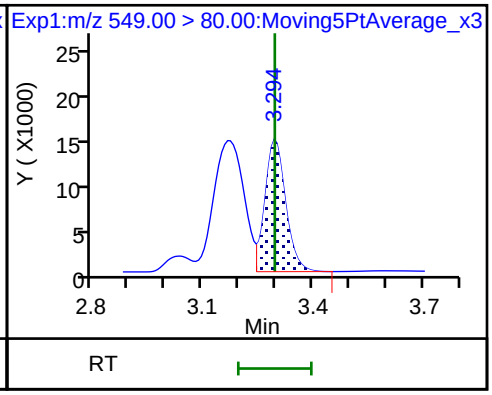
D 26 M2-8:2FTS



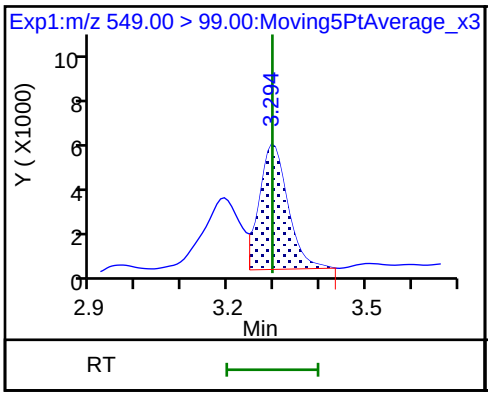
25 1H,1H,2H,2H-perfluorodecanesulfoni



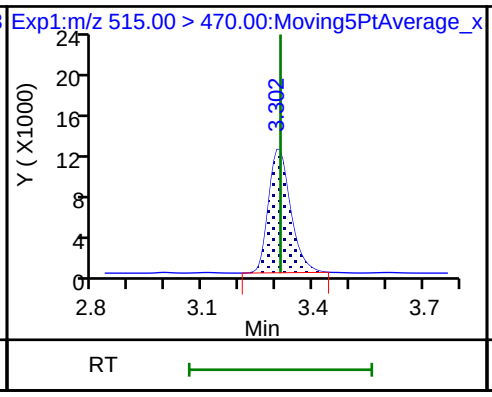
68 Perfluorononanesulfonic acid



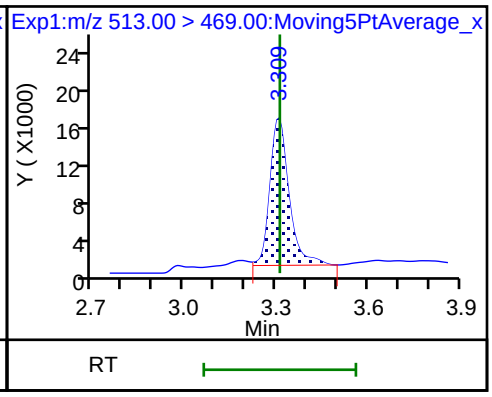
68 Perfluorononanesulfonic acid



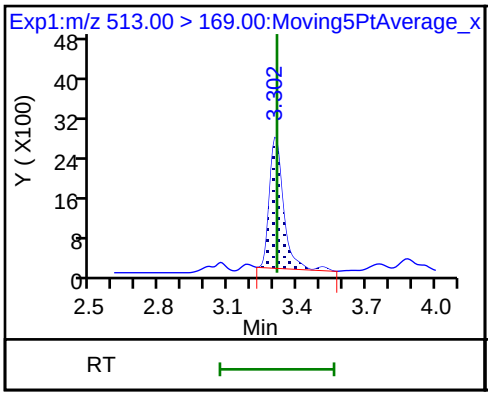
D 23 13C2 PFDA



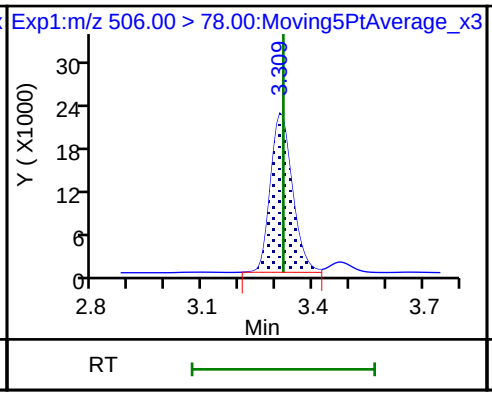
24 Perfluorodecanoic acid



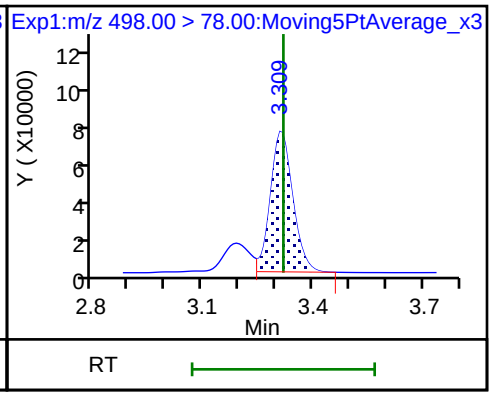
24 Perfluorodecanoic acid



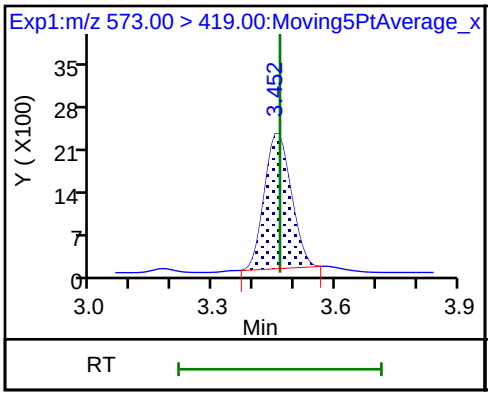
D 21 13C8 FOSA



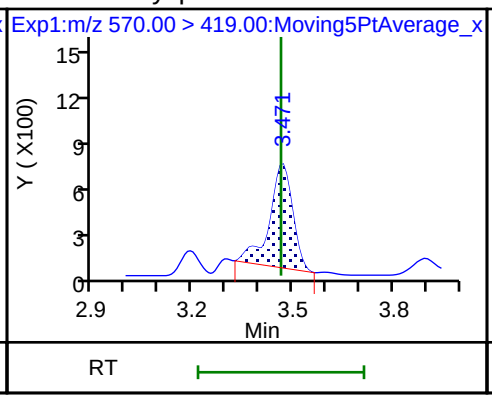
22 Perfluorooctane Sulfonamide



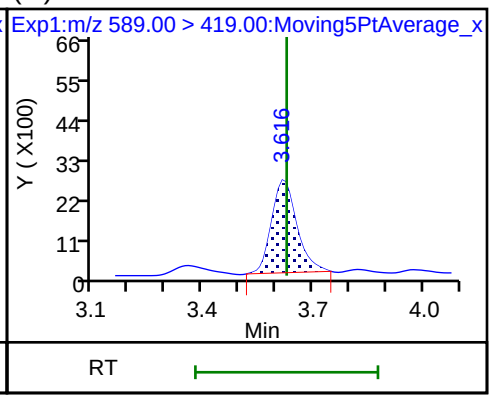
D 27 d3-NMeFOSAA



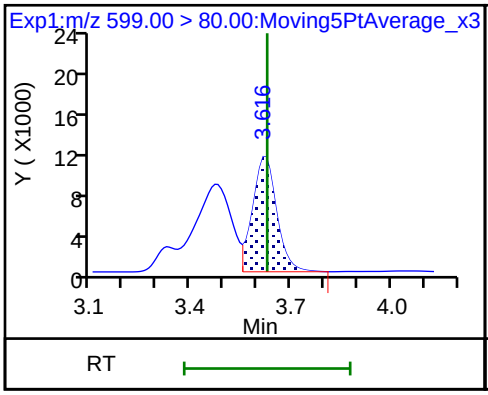
28 N-methyl perfluorooctane sulfonamid



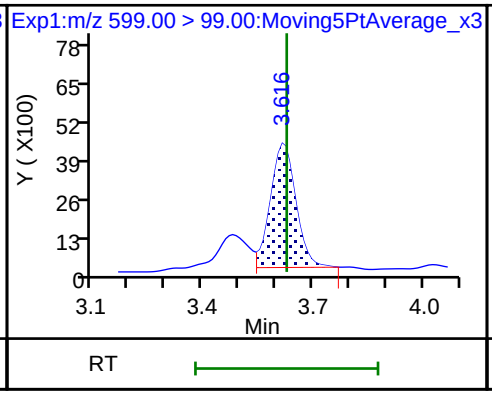
D 32 d5-NEtFOSAA



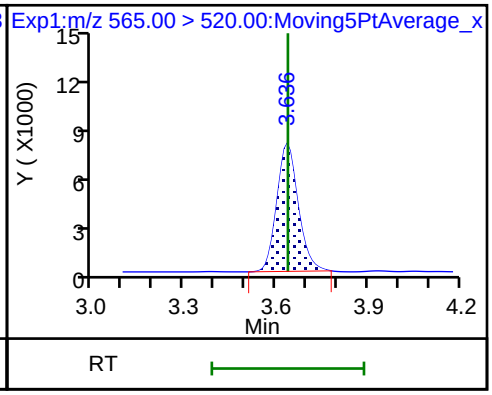
29 Perfluorodecane Sulfonic acid



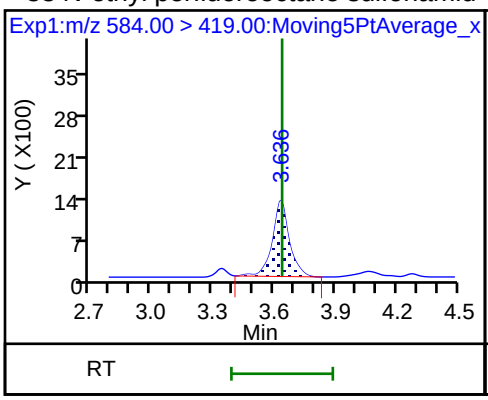
29 Perfluorodecane Sulfonic acid



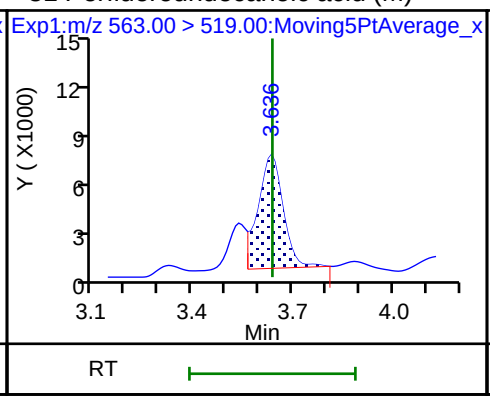
D 30 13C2 PFUnA



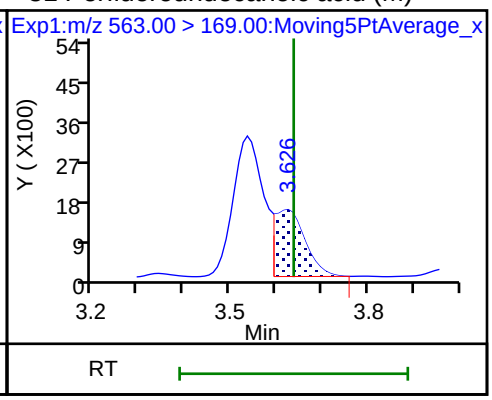
33 N-ethyl perfluorooctane sulfonamid



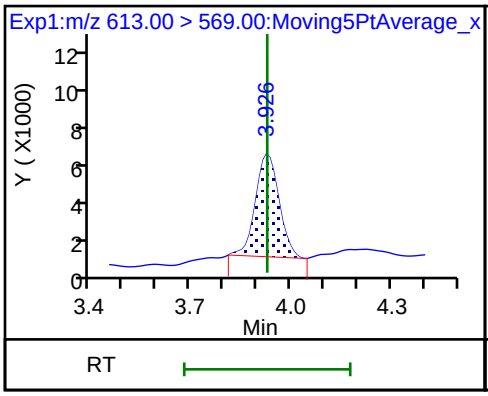
31 Perfluoroundecanoic acid (M)



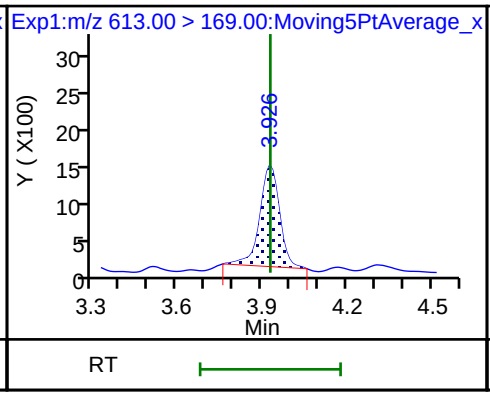
31 Perfluoroundecanoic acid (M)



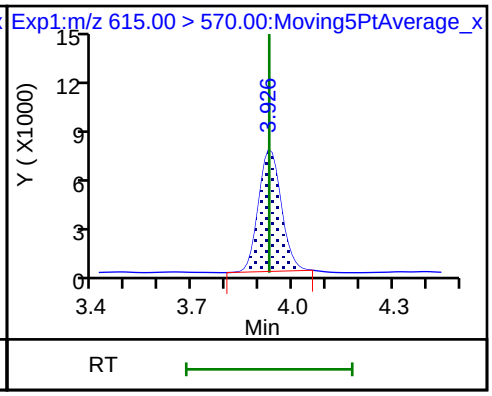
37 Perfluorododecanoic acid



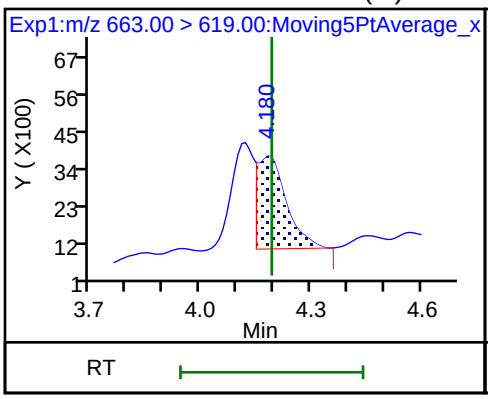
37 Perfluorododecanoic acid



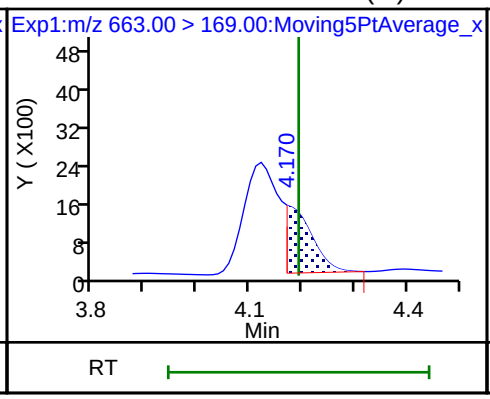
D 36 13C2 PFDoA



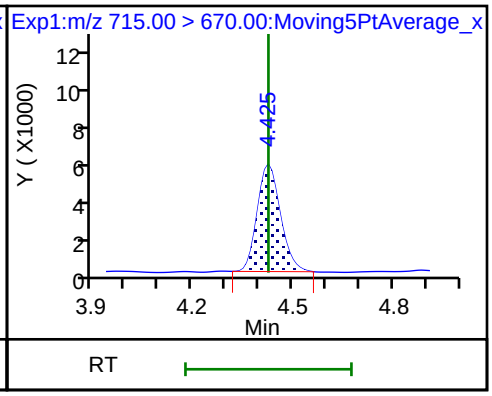
41 Perfluorotridecanoic acid (M)



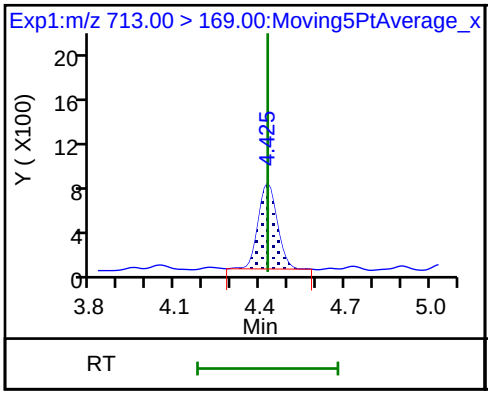
41 Perfluorotridecanoic acid (M)



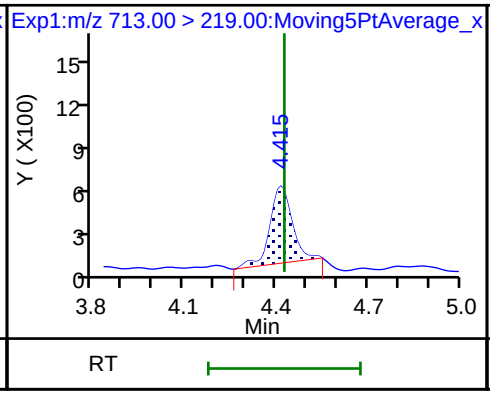
D 43 13C2-PFTeDA



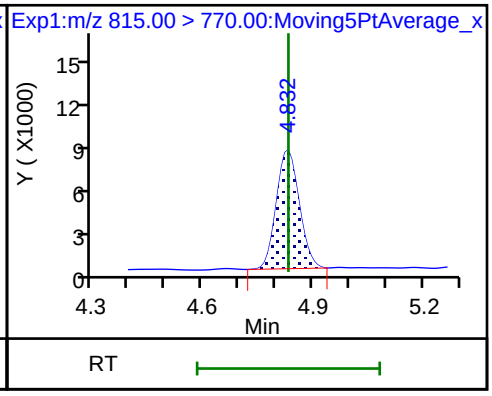
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

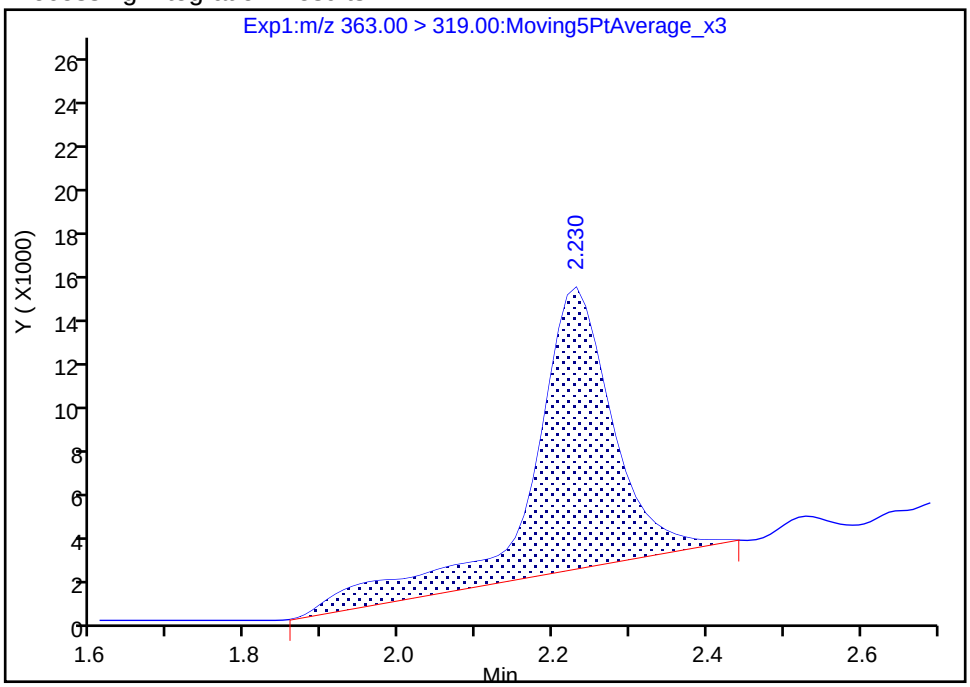
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_009.d				
Injection Date:	31-Jul-2018 18:13:05	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-C MSD				
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	3	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

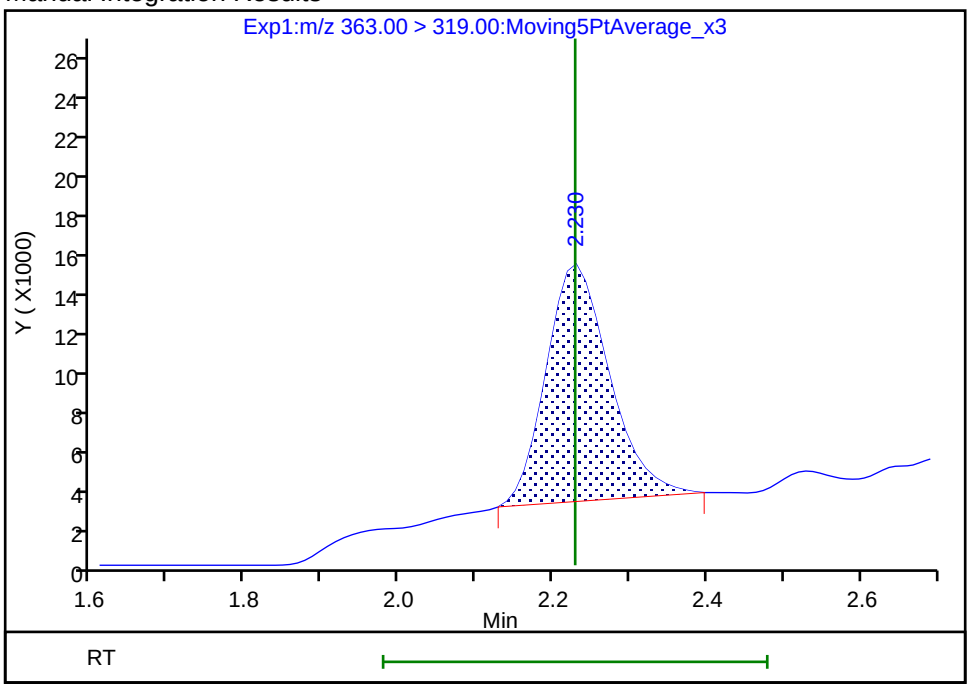
Processing Integration Results

RT: 2.23
Area: 96604
Amount: 0.061216
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 68959
Amount: 0.043698
Amount Units: ng/ml



Reviewer: mongkols, 01-Aug-2018 12:30:48

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

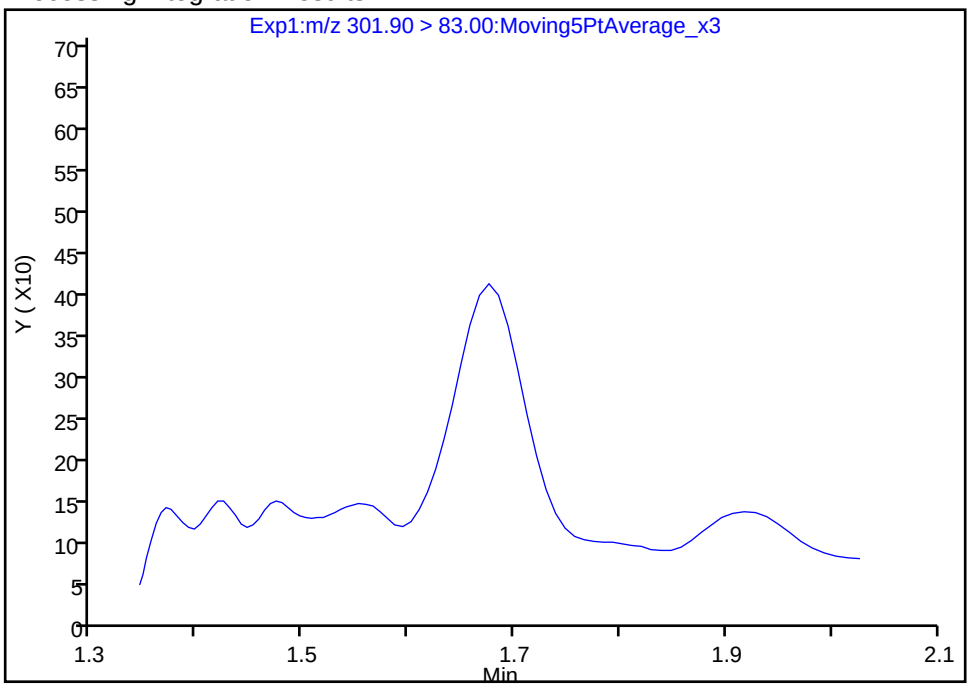
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180730-61903.b\2018.07.31LLA_009.d				
Injection Date:	31-Jul-2018 18:13:05	Instrument ID:	A8_N		
Lims ID:	320-41149-A-19-C MSD				
Client ID:	GRE07-SB1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	3	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

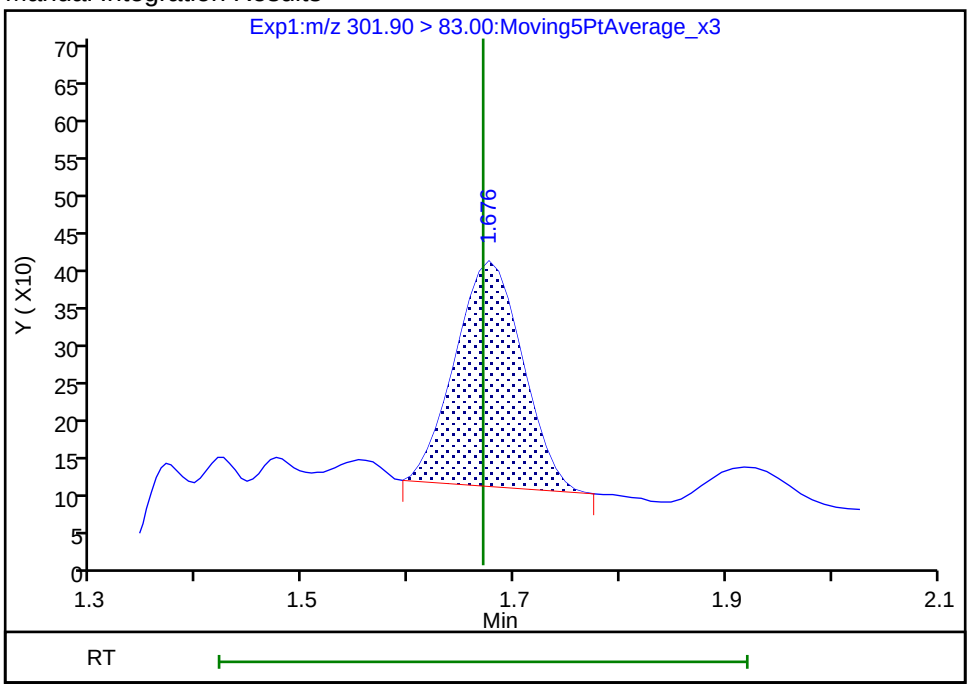
Not Detected
Expected RT: 1.67

Processing Integration Results



RT: 1.68
Area: 1342
Amount: 0.027023
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 01-Aug-2018 12:30:05
Audit Action: Manually Integrated Audit Reason: Assign Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Start Date: 07/20/2018 19:32

Analysis Batch Number: 235323 End Date: 07/20/2018 20:32

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-235323/2		07/20/2018 19:32	1	2018.07.20LLA_004.d	Acquity 2.1(mm)
IC 320-235323/3		07/20/2018 19:40	1	2018.07.20LLA_005.d	Acquity 2.1(mm)
IC 320-235323/4		07/20/2018 19:47	1	2018.07.20LLA_006.d	Acquity 2.1(mm)
IC 320-235323/5 ICIS		07/20/2018 19:55	1	2018.07.20LLA_007.d	Acquity 2.1(mm)
IC 320-235323/6		07/20/2018 20:02	1	2018.07.20LLA_008.d	Acquity 2.1(mm)
IC 320-235323/7		07/20/2018 20:10	1	2018.07.20LLA_009.d	Acquity 2.1(mm)
IC 320-235323/8		07/20/2018 20:17	1	2018.07.20LLA_010.d	Acquity 2.1(mm)
ICB 320-235323/9		07/20/2018 20:25	1	2018.07.20LLA_011.d	Acquity 2.1(mm)
ICV 320-235323/10		07/20/2018 20:32	1	2018.07.20LLA_012.d	Acquity 2.1(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Start Date: 07/22/2018 06:07

Analysis Batch Number: 235506 End Date: 07/22/2018 09:07

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-235506/1		07/22/2018 06:07	1	2018.07.22LLA_004.d	Acquity 2.1(mm)
CCVL 320-235506/2		07/22/2018 06:14	1	2018.07.22LLA_005.d	Acquity 2.1(mm)
CCV 320-235506/3 CCVIS		07/22/2018 06:22	1	2018.07.22LLA_006.d	Acquity 2.1(mm)
CCV 320-235506/14		07/22/2018 07:44	1		Acquity 2.1(mm)
CCV 320-235506/25		07/22/2018 09:07	1		Acquity 2.1(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Start Date: 07/22/2018 10:14

Analysis Batch Number: 235512 End Date: 07/22/2018 11:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-235512/1		07/22/2018 10:14	1	2018.07.22LLA_037.d	Acquity 2.1(mm)
MB 320-234634/1-A		07/22/2018 10:22	1	2018.07.22LLA_038.d	Acquity 2.1(mm)
LCS 320-234634/2-A		07/22/2018 10:29	1	2018.07.22LLA_039.d	Acquity 2.1(mm)
LCSD 320-234634/3-A		07/22/2018 10:37	1	2018.07.22LLA_040.d	Acquity 2.1(mm)
ZZZZZ		07/22/2018 10:44	1		Acquity 2.1(mm)
320-41149-10		07/22/2018 10:52	1	2018.07.22LLA_042.d	Acquity 2.1(mm)
320-41149-11		07/22/2018 10:59	1	2018.07.22LLA_043.d	Acquity 2.1(mm)
320-41149-12		07/22/2018 11:07	1	2018.07.22LLA_044.d	Acquity 2.1(mm)
320-41149-21		07/22/2018 11:14	1	2018.07.22LLA_045.d	Acquity 2.1(mm)
ZZZZZ		07/22/2018 11:22	1		Acquity 2.1(mm)
ZZZZZ		07/22/2018 11:29	1		Acquity 2.1(mm)
CCV 320-235512/12		07/22/2018 11:37	1	2018.07.22LLA_048.d	Acquity 2.1(mm)
ZZZZZ		07/22/2018 11:44	1		Acquity 2.1(mm)
ZZZZZ		07/22/2018 11:52	1		Acquity 2.1(mm)
CCV 320-235512/15		07/22/2018 11:59	1		Acquity 2.1(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 07/23/2018 16:11

Analysis Batch Number: 235668 End Date: 07/23/2018 17:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-235668/2		07/23/2018 16:11	1	2018.07.23LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-235668/3		07/23/2018 16:19	1	2018.07.23LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-235668/4		07/23/2018 16:26	1	2018.07.23LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-235668/5 ICIS		07/23/2018 16:34	1	2018.07.23LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-235668/6		07/23/2018 16:42	1	2018.07.23LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-235668/7		07/23/2018 16:50	1	2018.07.23LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-235668/8		07/23/2018 16:58	1	2018.07.23LLICAL 008.d	GeminiC18 3x100 3(mm)
ICB 320-235668/9		07/23/2018 17:05	1	2018.07.23LLICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-235668/10		07/23/2018 17:13	1	2018.07.23LLICAL 010.d	GeminiC18 3x100 3(mm)
CCB 320-235668/11		07/23/2018 17:21	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Start Date: 07/26/2018 09:44

Analysis Batch Number: 236275 End Date: 07/26/2018 12:15

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-236275/1		07/26/2018 09:44	1	2018.07.26LLA_004.d	Acquity 2.1(mm)
CCVL 320-236275/2		07/26/2018 09:51	1	2018.07.26LLA_005.d	Acquity 2.1(mm)
CCV 320-236275/3 CCVIS		07/26/2018 09:59	1	2018.07.26LLA_006.d	Acquity 2.1(mm)
CCV 320-236275/20		07/26/2018 12:15	1		Acquity 2.1(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A9 Start Date: 07/26/2018 13:15

Analysis Batch Number: 236374 End Date: 07/26/2018 13:45

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-236374/1		07/26/2018 13:15	1	2018.07.26LLBB_060.d	Acquity 2.1(mm)
320-41149-1		07/26/2018 13:37	1	2018.07.26LLBB_063.d	Acquity 2.1(mm)
CCV 320-236374/5		07/26/2018 13:45	1	2018.07.26LLBB_064.d	Acquity 2.1(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 07/28/2018 19:47

Analysis Batch Number: 236773 End Date: 07/28/2018 23:42

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-236773/1		07/28/2018 19:47	1	2018.07.28LLAA_004.d	GeminiC18 3x100 3(mm)
CCVL 320-236773/2		07/28/2018 19:55	1	2018.07.28LLAA_005.d	GeminiC18 3x100 3(mm)
CCV 320-236773/3 CCVIS		07/28/2018 20:03	1	2018.07.28LLAA_040.d	GeminiC18 3x100 3(mm)
CCV 320-236773/14		07/28/2018 21:29	1		GeminiC18 3x100 3(mm)
CCV 320-236773/25		07/28/2018 22:55	1		GeminiC18 3x100 3(mm)
CCV 320-236773/31		07/28/2018 23:42	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 07/29/2018 01:00

Analysis Batch Number: 236778 End Date: 07/29/2018 04:32

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-236778/1		07/29/2018 01:00	1	2018.07.28LLB_014.d	GeminiC18 3x100 3(mm)
MB 320-234662/1-A		07/29/2018 01:08	1	2018.07.28LLB_015.d	GeminiC18 3x100 3(mm)
LCS 320-234662/2-A		07/29/2018 01:16	1	2018.07.28LLB_016.d	GeminiC18 3x100 3(mm)
320-41149-19		07/29/2018 01:24	1	2018.07.28LLB_017.d	GeminiC18 3x100 3(mm)
320-41149-19 MS		07/29/2018 01:32	1	2018.07.28LLB_018.d	GeminiC18 3x100 3(mm)
320-41149-19 MSD		07/29/2018 01:40	1	2018.07.28LLB_019.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 01:47	1		GeminiC18 3x100 3(mm)
320-41149-28		07/29/2018 01:55	1	2018.07.28LLB_021.d	GeminiC18 3x100 3(mm)
320-41149-29		07/29/2018 02:03	1	2018.07.28LLB_022.d	GeminiC18 3x100 3(mm)
320-41149-30		07/29/2018 02:11	1	2018.07.28LLB_023.d	GeminiC18 3x100 3(mm)
320-41149-31		07/29/2018 02:19	1	2018.07.28LLB_024.d	GeminiC18 3x100 3(mm)
CCV 320-236778/12		07/29/2018 02:27	1	2018.07.28LLB_025.d	GeminiC18 3x100 3(mm)
320-41149-32		07/29/2018 02:35	1	2018.07.28LLB_026.d	GeminiC18 3x100 3(mm)
320-41149-33		07/29/2018 02:42	1	2018.07.28LLB_027.d	GeminiC18 3x100 3(mm)
320-41149-34		07/29/2018 02:50	1	2018.07.28LLB_028.d	GeminiC18 3x100 3(mm)
320-41149-35		07/29/2018 02:58	1	2018.07.28LLB_029.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 03:06	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 03:14	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 03:21	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 03:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 03:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 03:45	1		GeminiC18 3x100 3(mm)
CCV 320-236778/23		07/29/2018 03:53	1	2018.07.28LLB_036.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 04:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 04:09	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 04:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 04:24	1		GeminiC18 3x100 3(mm)
CCV 320-236778/28		07/29/2018 04:32	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 07/30/2018 03:13

Analysis Batch Number: 236836 End Date: 07/30/2018 07:00

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-236836/1		07/30/2018 03:13	1	2018.07.30LLA_003.d	GeminiC18 3x100 3(mm)
CCVL 320-236836/2		07/30/2018 03:21	1	2018.07.30LLA_004.d	GeminiC18 3x100 3(mm)
CCV 320-236836/3 CCVIS		07/30/2018 03:28	1	2018.07.30LLA_005.d	GeminiC18 3x100 3(mm)
MB 320-234633/1-A		07/30/2018 03:36	1	2018.07.30LLA_006.d	GeminiC18 3x100 3(mm)
LCS 320-234633/2-A		07/30/2018 03:44	1	2018.07.30LLA_007.d	GeminiC18 3x100 3(mm)
320-41149-2		07/30/2018 03:52	1	2018.07.30LLA_008.d	GeminiC18 3x100 3(mm)
320-41149-2 MS		07/30/2018 04:00	1	2018.07.30LLA_009.d	GeminiC18 3x100 3(mm)
320-41149-2 MSD		07/30/2018 04:08	1	2018.07.30LLA_010.d	GeminiC18 3x100 3(mm)
320-41149-3		07/30/2018 04:15	1	2018.07.30LLA_011.d	GeminiC18 3x100 3(mm)
320-41149-4		07/30/2018 04:23	1	2018.07.30LLA_012.d	GeminiC18 3x100 3(mm)
320-41149-5		07/30/2018 04:31	1	2018.07.30LLA_013.d	GeminiC18 3x100 3(mm)
320-41149-6		07/30/2018 04:39	1	2018.07.30LLA_014.d	GeminiC18 3x100 3(mm)
320-41149-7		07/30/2018 04:47	1	2018.07.30LLA_015.d	GeminiC18 3x100 3(mm)
CCV 320-236836/14		07/30/2018 04:54	1	2018.07.30LLA_016.d	GeminiC18 3x100 3(mm)
320-41149-8		07/30/2018 05:02	1	2018.07.30LLA_017.d	GeminiC18 3x100 3(mm)
320-41149-9		07/30/2018 05:10	1	2018.07.30LLA_018.d	GeminiC18 3x100 3(mm)
320-41149-13		07/30/2018 05:18	1	2018.07.30LLA_019.d	GeminiC18 3x100 3(mm)
320-41149-14		07/30/2018 05:26	1	2018.07.30LLA_020.d	GeminiC18 3x100 3(mm)
320-41149-15		07/30/2018 05:34	1	2018.07.30LLA_021.d	GeminiC18 3x100 3(mm)
320-41149-16		07/30/2018 05:42	1	2018.07.30LLA_022.d	GeminiC18 3x100 3(mm)
320-41149-17		07/30/2018 05:50	1	2018.07.30LLA_023.d	GeminiC18 3x100 3(mm)
320-41149-18		07/30/2018 05:57	1	2018.07.30LLA_024.d	GeminiC18 3x100 3(mm)
320-41149-20		07/30/2018 06:05	1	2018.07.30LLA_025.d	GeminiC18 3x100 3(mm)
320-41149-22		07/30/2018 06:13	1	2018.07.30LLA_026.d	GeminiC18 3x100 3(mm)
CCV 320-236836/25		07/30/2018 06:21	1	2018.07.30LLA_027.d	GeminiC18 3x100 3(mm)
320-41149-23		07/30/2018 06:29	1	2018.07.30LLA_028.d	GeminiC18 3x100 3(mm)
320-41149-24		07/30/2018 06:36	1	2018.07.30LLA_029.d	GeminiC18 3x100 3(mm)
320-41149-25		07/30/2018 06:44	1	2018.07.30LLA_030.d	GeminiC18 3x100 3(mm)
320-41149-26		07/30/2018 06:52	1	2018.07.30LLA_031.d	GeminiC18 3x100 3(mm)
CCV 320-236836/30		07/30/2018 07:00	1	2018.07.30LLA_032.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 07/30/2018 15:14

Analysis Batch Number: 236979 End Date: 07/30/2018 16:16

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-236979/2		07/30/2018 15:14	1	2018.07.30LLICA 002.d	GeminiC18 3x100 3(mm)
IC 320-236979/3		07/30/2018 15:21	1	2018.07.30LLICA 003.d	GeminiC18 3x100 3(mm)
IC 320-236979/4		07/30/2018 15:29	1	2018.07.30LLICA 004.d	GeminiC18 3x100 3(mm)
IC 320-236979/5 ICIS		07/30/2018 15:37	1	2018.07.30LLICA 005.d	GeminiC18 3x100 3(mm)
IC 320-236979/6		07/30/2018 15:45	1	2018.07.30LLICA 006.d	GeminiC18 3x100 3(mm)
IC 320-236979/7		07/30/2018 15:53	1	2018.07.30LLICA 007.d	GeminiC18 3x100 3(mm)
IC 320-236979/8		07/30/2018 16:00	1	2018.07.30LLICA 008.d	GeminiC18 3x100 3(mm)
ICB 320-236979/9		07/30/2018 16:08	1	2018.07.30LLICA 009.d	GeminiC18 3x100 3(mm)
ICV 320-236979/10		07/30/2018 16:16	1	2018.07.30LLICA 010.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 07/31/2018 15:36

Analysis Batch Number: 237043 End Date: 07/31/2018 16:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-237043/1		07/31/2018 15:36	1	2018.07.31LLA_004.d	GeminiC18 3x100 3(mm)
CCVL 320-237043/2		07/31/2018 15:44	1	2018.07.31LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-237043/3 CCVIS		07/31/2018 15:52	1	2018.07.30LLBB_064.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 16:00	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 16:07	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 16:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 16:23	5		GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 16:31	1		GeminiC18 3x100 3(mm)
CCV 320-237043/9		07/31/2018 16:39	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 07/31/2018 17:49

Analysis Batch Number: 237052 End Date: 07/31/2018 20:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-237052/1		07/31/2018 17:49	1	2018.07.31LLA_006.d	GeminiC18 3x100 3(mm)
320-41149-19 DL		07/31/2018 17:57	50	2018.07.31LLA_007.d	GeminiC18 3x100 3(mm)
320-41149-19 MS DL		07/31/2018 18:05	50	2018.07.31LLA_008.d	GeminiC18 3x100 3(mm)
320-41149-19 MSD DL		07/31/2018 18:13	50	2018.07.31LLA_009.d	GeminiC18 3x100 3(mm)
320-41149-27 DL		07/31/2018 18:20	100	2018.07.31LLA_010.d	GeminiC18 3x100 3(mm)
320-41149-28 DL		07/31/2018 18:28	50	2018.07.31LLA_011.d	GeminiC18 3x100 3(mm)
320-41149-29 DL		07/31/2018 18:36	50	2018.07.31LLA_012.d	GeminiC18 3x100 3(mm)
320-41149-30 DL		07/31/2018 18:44	100	2018.07.31LLA_013.d	GeminiC18 3x100 3(mm)
320-41149-31 DL		07/31/2018 18:52	100	2018.07.31LLA_014.d	GeminiC18 3x100 3(mm)
320-41149-32 DL		07/31/2018 18:59	20	2018.07.31LLA_015.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 19:07	1		GeminiC18 3x100 3(mm)
CCV 320-237052/12		07/31/2018 19:15	1	2018.07.31LLA_017.d	GeminiC18 3x100 3(mm)
320-41149-34 DL		07/31/2018 19:23	10	2018.07.31LLA_018.d	GeminiC18 3x100 3(mm)
320-41149-35 DL		07/31/2018 19:31	10	2018.07.31LLA_019.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 19:38	1		GeminiC18 3x100 3(mm)
320-41149-27		07/31/2018 19:46	1	2018.07.31LLA_021.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 19:54	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 20:02	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/31/2018 20:10	1		GeminiC18 3x100 3(mm)
CCV 320-237052/22		07/31/2018 20:33	1	2018.07.31LLA_027.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 08/01/2018 12:59

Analysis Batch Number: 237402 End Date: 08/01/2018 14:09

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-237402/2		08/01/2018 12:59	1	2018.08.01LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-237402/3		08/01/2018 13:06	1	2018.08.01LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-237402/4		08/01/2018 13:14	1	2018.08.01LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-237402/5 ICIS		08/01/2018 13:22	1	2018.08.01LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-237402/6		08/01/2018 13:30	1	2018.08.01LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-237402/7		08/01/2018 13:38	1	2018.08.01LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-237402/8		08/01/2018 13:46	1	2018.08.01LLICAL 008.d	GeminiC18 3x100 3(mm)
ICB 320-237402/9		08/01/2018 13:53	1	2018.08.01LLICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-237402/10		08/01/2018 14:01	1	2018.08.01LLICAL 010.d	GeminiC18 3x100 3(mm)
CCB 320-237402/11		08/01/2018 14:09	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: A8_N Start Date: 08/01/2018 15:04

Analysis Batch Number: 237446 End Date: 08/01/2018 17:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-237446/1		08/01/2018 15:04	1	2018.08.01LLB_012.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/01/2018 15:12	1		GeminiC18 3x100 3(mm)
320-41149-3 DL		08/01/2018 15:19	5	2018.08.01LLB_014.d	GeminiC18 3x100 3(mm)
320-41149-16 DL		08/01/2018 15:27	10	2018.08.01LLB_015.d	GeminiC18 3x100 3(mm)
320-41149-17 DL		08/01/2018 15:35	10	2018.08.01LLB_016.d	GeminiC18 3x100 3(mm)
320-41149-18 DL		08/01/2018 15:43	5	2018.08.01LLB_017.d	GeminiC18 3x100 3(mm)
CCV 320-237446/7		08/01/2018 15:51	1	2018.08.01LLB_023.d	GeminiC18 3x100 3(mm)
320-41149-20 DL		08/01/2018 16:22	10	2018.08.01LLBB_018.d	GeminiC18 3x100 3(mm)
320-41149-22 DL		08/01/2018 16:30	10	2018.08.01LLBB_019.d	GeminiC18 3x100 3(mm)
320-41149-23 DL		08/01/2018 16:37	10	2018.08.01LLBB_020.d	GeminiC18 3x100 3(mm)
320-41149-24 DL		08/01/2018 16:45	10	2018.08.01LLBB_021.d	GeminiC18 3x100 3(mm)
320-41149-25 DL		08/01/2018 16:53	20	2018.08.01LLBB_022.d	GeminiC18 3x100 3(mm)
CCV 320-237446/16		08/01/2018 17:01	1	2018.08.01LLBB_023.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234633 Batch Start Date: 07/18/18 08:48 Batch Analyst: Palomar, Karla J

Batch Method: SHAKE Batch End Date: 07/27/18 18:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00085	LCPFC-IS 00059	LCPFCSP 00161	
MB 320-234633/1		SHAKE, EPA 537 (Mod)		5.00 g	10.00 mL	500 uL	500 uL		
LCS 320-234633/2		SHAKE, EPA 537 (Mod)		5.00 g	10.00 mL	500 uL	500 uL	500 uL	
320-41149-A-2	GRE10-SB2-01	SHAKE, EPA 537 (Mod)	T	5.06 g	10.00 mL	500 uL	500 uL		
320-41149-A-2 MS	GRE10-SB2-01	SHAKE, EPA 537 (Mod)	T	5.04 g	10.00 mL	500 uL	500 uL	500 uL	
320-41149-A-2 MSD	GRE10-SB2-01	SHAKE, EPA 537 (Mod)	T	5.08 g	10.00 mL	500 uL	500 uL	500 uL	
320-41149-A-3	GRE10-SB2-02	SHAKE, EPA 537 (Mod)	T	5.05 g	10.00 mL	500 uL	500 uL		
320-41149-A-4	GRE10-SB1-01	SHAKE, EPA 537 (Mod)	T	5.07 g	10.00 mL	500 uL	500 uL		
320-41149-A-5	GRE10-SB1-01D	SHAKE, EPA 537 (Mod)	T	5.02 g	10.00 mL	500 uL	500 uL		
320-41149-A-6	GRE10-SB3-01	SHAKE, EPA 537 (Mod)	T	5.08 g	10.00 mL	500 uL	500 uL		
320-41149-A-7	GRE09-SB1-01	SHAKE, EPA 537 (Mod)	T	5.00 g	10.00 mL	500 uL	500 uL		
320-41149-A-8	GRE09-SB1-01D	SHAKE, EPA 537 (Mod)	T	5.08 g	10.00 mL	500 uL	500 uL		
320-41149-A-9	GRE09-SB2-01	SHAKE, EPA 537 (Mod)	T	5.02 g	10.00 mL	500 uL	500 uL		
320-41149-A-13	GRE03-SB3-01	SHAKE, EPA 537 (Mod)	T	5.00 g	10.00 mL	500 uL	500 uL		
320-41149-A-14	GRE03-SB3-02	SHAKE, EPA 537 (Mod)	T	5.05 g	10.00 mL	500 uL	500 uL		
320-41149-A-15	GRE04-SB1-01	SHAKE, EPA 537 (Mod)	T	5.09 g	10.00 mL	500 uL	500 uL		
320-41149-A-16	GRE06-SB1-01	SHAKE, EPA 537 (Mod)	T	5.04 g	10.00 mL	500 uL	500 uL		
320-41149-A-17	GRE06-SB1-01D	SHAKE, EPA 537 (Mod)	T	5.10 g	10.00 mL	500 uL	500 uL		
320-41149-A-18	GRE06-SB2-01	SHAKE, EPA 537 (Mod)	T	5.03 g	10.00 mL	500 uL	500 uL		
320-41149-A-20	GRE07-SB1-02	SHAKE, EPA 537 (Mod)	T	5.10 g	10.00 mL	500 uL	500 uL		
320-41149-A-22	GRE03-SB1-01	SHAKE, EPA 537 (Mod)	T	5.03 g	10.00 mL	500 uL	500 uL		
320-41149-A-23	GRE03-SB2-01	SHAKE, EPA 537 (Mod)	T	5.03 g	10.00 mL	500 uL	500 uL		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234633 Batch Start Date: 07/18/18 08:48 Batch Analyst: Palomar, Karla J

Batch Method: SHAKE Batch End Date: 07/27/18 18:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00085	LCPFC-IS 00059	LCPFCSP 00161	
320-41149-A-24	GRE03-SB4-01	SHAKE, EPA 537 (Mod)	T	5.01 g	10.00 mL	500 uL	500 uL		
320-41149-A-25	GRE03-SB5-01	SHAKE, EPA 537 (Mod)	T	5.06 g	10.00 mL	500 uL	500 uL		
320-41149-A-26	GRE04-SB2-01	SHAKE, EPA 537 (Mod)	T	5.04 g	10.00 mL	500 uL	500 uL		

Batch Notes	
Acetic Acid ID	1289826
Analyst ID - Aliquot Step	TWL
Balance ID	QA-070
Batch Comment	Samples labels match with client ID KJP 7-3-18 ENVI Carb Lot # 103370
Analyst ID - Final Volume Step	TWL
Hexane ID	1313829
Internal Standard ID#	1376589
Manifold ID	K
Methanol ID	1289785
Methanolic Potassium Hydroxide ID	1298888
Millipore Water Dispense Date	7/27/18
Sodium Hydroxide ID	1313848
Ammonium Hydroxide/MeOH ID	1315176
pH Indicator ID	0818
Analyst ID - Reagent Drop Witness	KJP
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	VPM
Blank Sand Lot #	162639
SPE Cartridge Lot ID	018038142A
SPE Cartridge Type	WAX 150mg

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234634 Batch Start Date: 07/18/18 08:53 Batch Analyst: Kouchari, Shamiran

Batch Method: 3535 Batch End Date: 07/18/18 16:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00085	LCPFC-IS 00065
MB 320-234634/1		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCS 320-234634/2		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCSD 320-234634/3		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
320-41149-A-1	GRE-ER-SB-01	3535, EPA 537 (Mod)	T	340.19 g	28.73 g	311.5 mL	10.00 mL	500 uL	500 uL
320-41149-A-10	GRE-FB-POT-01	3535, EPA 537 (Mod)	T	358.77 g	28.91 g	329.9 mL	10.00 mL	500 uL	500 uL
320-41149-A-11	GRE-FB-DI-01	3535, EPA 537 (Mod)	T	320.95 g	28.57 g	292.4 mL	10.00 mL	500 uL	500 uL
320-41149-A-12	GRE-ER-SB-02	3535, EPA 537 (Mod)	T	307.98 g	28.33 g	279.7 mL	10.00 mL	500 uL	500 uL
320-41149-A-21	GRE-ER-SB-03	3535, EPA 537 (Mod)	T	302.46 g	29.09 g	273.4 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00161					
MB 320-234634/1		3535, EPA 537 (Mod)							
LCS 320-234634/2		3535, EPA 537 (Mod)		500 uL					
LCSD 320-234634/3		3535, EPA 537 (Mod)		500 uL					
320-41149-A-1	GRE-ER-SB-01	3535, EPA 537 (Mod)	T						
320-41149-A-10	GRE-FB-POT-01	3535, EPA 537 (Mod)	T						
320-41149-A-11	GRE-FB-DI-01	3535, EPA 537 (Mod)	T						
320-41149-A-12	GRE-ER-SB-02	3535, EPA 537 (Mod)	T						
320-41149-A-21	GRE-ER-SB-03	3535, EPA 537 (Mod)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234634 Batch Start Date: 07/18/18 08:53 Batch Analyst: Kouchari, Shamiran

Batch Method: 3535 Batch End Date: 07/18/18 16:30

Batch Notes	
Analyst ID - Aliquot Step	SKD
Balance ID	QA-078
Batch Comment	Client labels match TA labels, SKD 07/18/18 ENVI Carb Lot # 103370
Analyst ID - Final Volume Step	SKD
H2O ID	07/16/18
Hexane ID	1272464
Internal Standard ID#	1277803
Manifold ID	A
Methanol ID	1304129
Sodium Hydroxide ID	1219662
Pipette ID	I46360G
Analyst ID - Reagent Drop	TWL
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	SKD
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	SKD
Solvent Lot #	1295468
Solvent Name	0.3% NH4OH in meOH
SOP Number	WS-LC-0025
SPE Cartridge Type	Oasis WAX 500mg
Solid Phase Extraction Disk ID	002736075a

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234662 Batch Start Date: 07/18/18 10:18 Batch Analyst: Palomar, Karla J

Batch Method: SHAKE Batch End Date: 07/26/18 17:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00085	LCPFC-IS 00059	LCPFCSP 00161	
MB 320-234662/1		SHAKE, EPA 537 (Mod)		5.00 g	10.00 mL	500 uL	500 uL		
LCS 320-234662/2		SHAKE, EPA 537 (Mod)		5.00 g	10.00 mL	500 uL	500 uL	500 uL	
320-41149-A-19	GRE07-SB1-01	SHAKE, EPA 537 (Mod)	T	5.05 g	10.00 mL	500 uL	500 uL		
320-41149-A-19 MS	GRE07-SB1-01	SHAKE, EPA 537 (Mod)	T	5.10 g	10.00 mL	500 uL	500 uL	500 uL	
320-41149-A-19 MSD	GRE07-SB1-01	SHAKE, EPA 537 (Mod)	T	5.03 g	10.00 mL	500 uL	500 uL	500 uL	
320-41149-A-27	GRE07-SB2-01	SHAKE, EPA 537 (Mod)	T	5.05 g	10.00 mL	500 uL	500 uL		
320-41149-A-28	GRE08-SB1-01	SHAKE, EPA 537 (Mod)	T	5.01 g	10.00 mL	500 uL	500 uL		
320-41149-A-29	GRE08-SB2-01	SHAKE, EPA 537 (Mod)	T	5.00 g	10.00 mL	500 uL	500 uL		
320-41149-A-30	GRE08-SB3-01	SHAKE, EPA 537 (Mod)	T	5.05 g	10.00 mL	500 uL	500 uL		
320-41149-A-31	GRE08-SB4-01	SHAKE, EPA 537 (Mod)	T	5.06 g	10.00 mL	500 uL	500 uL		
320-41149-A-32	GRE07-SB3-01	SHAKE, EPA 537 (Mod)	T	5.02 g	10.00 mL	500 uL	500 uL		
320-41149-A-33	GRE04-SB3-01	SHAKE, EPA 537 (Mod)	T	5.01 g	10.00 mL	500 uL	500 uL		
320-41149-A-34	GRE05-SB1-01	SHAKE, EPA 537 (Mod)	T	5.00 g	10.00 mL	500 uL	500 uL		
320-41149-A-35	GRE05-SB2-01	SHAKE, EPA 537 (Mod)	T	5.01 g	10.00 mL	500 uL	500 uL		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234662 Batch Start Date: 07/18/18 10:18 Batch Analyst: Palomar, Karla J

Batch Method: SHAKE Batch End Date: 07/26/18 17:30

Batch Notes	
Acetic Acid ID	1289826
Analyst ID - Aliquot Step	TWL
Balance ID	QA-070
Batch Comment	Samples labels match with client ID KJP 7-18-18 ENVI Carb Lot # 103369
Analyst ID - Final Volume Step	TWL
Hexane ID	1272462
Internal Standard ID#	1276589
Manifold ID	K
Methanol ID	1289785
Methanolic Potassium Hydroxide ID	1298888
Millipore Water Dispense Date	7/26/18
Sodium Hydroxide ID	1302682
Ammonium Hydroxide/MeOH ID	1302454
pH Indicator ID	0818
Analyst ID - Reagent Drop Witness	KJP
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	SKD
Blank Sand Lot #	162639
SPE Cartridge Lot ID	018038142A
SPE Cartridge Type	WAX 150mg

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC_IDA

Analyst (Print Name) Amani Royce

Reagent ID LC-80:20_00010

Date 8/1/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
39 320-41149	3	10,000	60	300	5x
	16		30		10x
	17		↓		↓
	18		60		5x
	20		30		10x
	22				
	23				
	24				
	25		15		20x

aaa 8/1/18

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC_IDA

Analyst (Print Name) Amani Royce **Reagent ID** LC-80:20_00020

Date 7/30/18

	Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
31	320-41186	1	10,000	15	1500	100x
	↓	2	↓	↓	↓	↓
		2		30	300	10x
36	320-41149	19		↓	1500	50x
	↓	19 MS			↓	50x
		19 MSD		↓		50x
		27		15		100x
		28		30		50x
		29		↓		50x
		30		15		100x
		31		↓	↓	100x
		32		↓	300	20x
		34		30	↓	10x
	↓	35	↓	↓		10x

OAR 7/30/18

Comments:

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-41149-1

SDG No.:

Project: Phase III, ANG - Great Falls

Client Sample ID	Lab Sample ID
GRE10-SB2-01	320-41149-2
GRE10-SB2-02	320-41149-3
GRE10-SB1-01	320-41149-4
GRE10-SB1-01D	320-41149-5
GRE10-SB3-01	320-41149-6
GRE09-SB1-01	320-41149-7
GRE09-SB1-01D	320-41149-8
GRE09-SB2-01	320-41149-9
GRE03-SB3-01	320-41149-13
GRE03-SB3-02	320-41149-14
GRE04-SB1-01	320-41149-15
GRE06-SB1-01	320-41149-16
GRE06-SB1-01D	320-41149-17
GRE06-SB2-01	320-41149-18
GRE07-SB1-01	320-41149-19
GRE07-SB1-02	320-41149-20
GRE03-SB1-01	320-41149-22
GRE03-SB2-01	320-41149-23
GRE03-SB4-01	320-41149-24
GRE03-SB5-01	320-41149-25
GRE04-SB2-01	320-41149-26
GRE07-SB2-01	320-41149-27
GRE08-SB1-01	320-41149-28
GRE08-SB2-01	320-41149-29
GRE08-SB3-01	320-41149-30
GRE08-SB4-01	320-41149-31
GRE07-SB3-01	320-41149-32
GRE04-SB3-01	320-41149-33
GRE05-SB1-01	320-41149-34
GRE05-SB2-01	320-41149-35

Comments:

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-41149-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: D 2216 DL Date: 01/01/2017 12:44

Analyte	Wavelength/ Mass	LOQ (%)	DL (%)
Percent Moisture		0.1	0.1
Percent Solids		0.1	0.1

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-41149-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: D 2216 XMDL Date: 01/01/2017 12:46

Analyte	Wavelength/ Mass	XRL (%)	XMDL (%)
Percent Moisture		0.1	0.1
Percent Solids		0.1	0.1

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: D 2216

Start Date: 07/17/2018 16:46 End Date: 07/17/2018 16:46

Lab Sample Id	D/F	Type	Time	Analytes																							
				% Sol	Moist																						
ZZZZZZ			16:46																								
ZZZZZZ			16:46																								
ZZZZZZ			16:46																								
320-41149-2	1	T	16:46	X	X																						
320-41149-3	1	T	16:46	X	X																						
320-41149-4	1	T	16:46	X	X																						
320-41149-5	1	T	16:46	X	X																						
320-41149-6	1	T	16:46	X	X																						
320-41149-7	1	T	16:46	X	X																						
320-41149-8	1	T	16:46	X	X																						
320-41149-9	1	T	16:46	X	X																						
320-41149-13	1	T	16:46	X	X																						
320-41149-14	1	T	16:46	X	X																						
320-41149-15	1	T	16:46	X	X																						
320-41149-16	1	T	16:46	X	X																						
320-41149-17	1	T	16:46	X	X																						
320-41149-18	1	T	16:46	X	X																						
320-41149-19	1	T	16:46	X	X																						
320-41149-20	1	T	16:46	X	X																						
320-41149-22	1	T	16:46	X	X																						

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: D 2216

Start Date: 07/17/2018 16:46 End Date: 07/17/2018 16:46

Lab Sample Id	D/F	Type	Time	Analytes																							
				% Sol	Moist																						
320-41149-23	1	T	16:46	X	X																						
320-41149-23 DU	1	T	16:46	X	X																						
320-41149-24	1	T	16:46	X	X																						
320-41149-25	1	T	16:46	X	X																						
320-41149-26	1	T	16:46	X	X																						
320-41149-27	1	T	16:46	X	X																						
320-41149-28	1	T	16:46	X	X																						
320-41149-29	1	T	16:46	X	X																						
320-41149-30	1	T	16:46	X	X																						
320-41149-31	1	T	16:46	X	X																						
320-41149-32	1	T	16:46	X	X																						
320-41149-33	1	T	16:46	X	X																						
320-41149-34	1	T	16:46	X	X																						
320-41149-35	1	T	16:46	X	X																						

Prep Types:
T = Total/NA

FORM XIII-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234562 Batch Start Date: 07/17/18 16:46 Batch Analyst: Saechao, Tammy C

Batch Method: D 2216 Batch End Date: 07/18/18 10:29

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry	AnalysisComment	
320-41149-A-2	GRE10-SB2-01	D 2216	T	4	1.06 g	7.38 g	7.09 g	pebbles	
320-41149-A-3	GRE10-SB2-02	D 2216	T	5	1.05 g	9.11 g	7.96 g	pebbles	
320-41149-A-4	GRE10-SB1-01	D 2216	T	6	1.05 g	7.67 g	7.45 g	pebbles	
320-41149-A-5	GRE10-SB1-01D	D 2216	T	7	1.07 g	7.28 g	7.13 g	pebbles	
320-41149-A-6	GRE10-SB3-01	D 2216	T	8	1.07 g	7.61 g	7.08 g	pebbles	
320-41149-A-7	GRE09-SB1-01	D 2216	T	9	1.04 g	6.75 g	6.33 g	pebbles	
320-41149-A-8	GRE09-SB1-01D	D 2216	T	10	1.01 g	6.94 g	6.60 g	pebbles	
320-41149-A-9	GRE09-SB2-01	D 2216	T	11	1.05 g	7.51 g	7.29 g	pebbles	
320-41149-A-13	GRE03-SB3-01	D 2216	T	12	1.06 g	9.45 g	8.78 g	rocks	
320-41149-A-14	GRE03-SB3-02	D 2216	T	13	1.07 g	7.63 g	7.13 g	pebbles	
320-41149-A-15	GRE04-SB1-01	D 2216	T	14	1.02 g	8.93 g	8.52 g	pebbles	
320-41149-A-16	GRE06-SB1-01	D 2216	T	15	1.00 g	9.21 g	8.35 g	pebbles	
320-41149-A-17	GRE06-SB1-01D	D 2216	T	16	1.03 g	7.17 g	6.93 g	pebbles	
320-41149-A-18	GRE06-SB2-01	D 2216	T	17	1.06 g	8.27 g	7.88 g	pebbles	
320-41149-A-19	GRE07-SB1-01	D 2216	T	18	1.08 g	7.79 g	7.41 g	pebbles	
320-41149-A-20	GRE07-SB1-02	D 2216	T	19	1.07 g	7.21 g	6.62 g	pebbles	
320-41149-A-22	GRE03-SB1-01	D 2216	T	20	1.00 g	6.79 g	6.47 g	pebbles	

Batch Notes	
Balance ID	QA-068
Date and Time Samples in Desiccator	07/18/2018 08:17
Date and Time Samples out of Desiccator	07/18/2018 10:29
Date samples were placed in the oven	07/17/2018
Oven Temp In	116 Degrees C
Time samples were place in the oven	16:46
Date samples were removed from oven	07/18/2018
Oven Temp Out	113 Degrees C
Time Samples were removed from oven	08:17
Oven ID	Soil Prep #2
Thermometer ID	151969607

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234562 Batch Start Date: 07/17/18 16:46 Batch Analyst: Saechao, Tammy C

Batch Method: D 2216 Batch End Date: 07/18/18 10:29

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234563 Batch Start Date: 07/17/18 16:46 Batch Analyst: Saechao, Tammy C

Batch Method: D 2216 Batch End Date: 07/18/18 10:34

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry	AnalysisComment	
320-41149-A-23	GRE03-SB2-01	D 2216	T	1	1.01 g	8.06 g	7.54 g	pebbles	
320-41149-A-23 DU	GRE03-SB2-01	D 2216	T	2	1.02 g	7.87 g	7.42 g	pebbles	
320-41149-A-24	GRE03-SB4-01	D 2216	T	3	1.09 g	7.73 g	7.33 g	pebbles	
320-41149-A-25	GRE03-SB5-01	D 2216	T	4	1.04 g	8.03 g	7.38 g	pebbles	
320-41149-A-26	GRE04-SB2-01	D 2216	T	5	1.09 g	11.76 g	11.31 g	pebbles	
320-41149-A-27	GRE07-SB2-01	D 2216	T	6	1.07 g	8.08 g	6.93 g	pebbles	
320-41149-A-28	GRE08-SB1-01	D 2216	T	7	1.00 g	7.63 g	7.40 g	pebbles	
320-41149-A-29	GRE08-SB2-01	D 2216	T	8	1.03 g	7.32 g	7.19 g	pebbles	
320-41149-A-30	GRE08-SB3-01	D 2216	T	9	1.02 g	8.70 g	7.90 g		
320-41149-A-31	GRE08-SB4-01	D 2216	T	10	1.08 g	9.07 g	8.05 g		
320-41149-A-32	GRE07-SB3-01	D 2216	T	11	1.08 g	6.84 g	6.68 g	pebbles	
320-41149-A-33	GRE04-SB3-01	D 2216	T	12	1.05 g	8.13 g	7.69 g	pebbles	
320-41149-A-34	GRE05-SB1-01	D 2216	T	13	1.09 g	8.22 g	8.01 g	pebbles	
320-41149-A-35	GRE05-SB2-01	D 2216	T	14	1.09 g	8.13 g	7.87 g	pebbles	

Batch Notes	
Balance ID	QA-068
Date and Time Samples in Desiccator	07/18/2018 08:17
Date and Time Samples out of Desiccator	07/18/2018 10:34
Date samples were placed in the oven	07/17/2018
Oven Temp In	116 Degrees C
Time samples were place in the oven	16:46
Date samples were removed from oven	07/18/2018
Oven Temp Out	113 Degrees C
Time Samples were removed from oven	08:17
Oven ID	Soil Prep #2
Thermometer ID	151969607

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41149-1

SDG No.:

Batch Number: 234563 Batch Start Date: 07/17/18 16:46 Batch Analyst: Saechao, Tammy C

Batch Method: D 2216 Batch End Date: 07/18/18 10:34

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE KNIDZESS	Lab PM: DAVID ALTUCKER	Carrier Tracking No(s): 7111 9985 9811	COC No: 320-22104-5001.1
Client Contact: Selvam Arunachalam	Phone: (615) 663-7485	E-Mail:		Page: Page 1 of 7
Company: Leidos, Inc.				Job #:
Address: 11951 Freedom Drive	Due Date Requested:			
City: Reston	TAT Requested (days):			
State, Zip: VA, 20190				
Phone:	PO #:			
Email: arunachalams@leidos.com	WO #: TAL project 32010804			
Project Name: Great Falls	Project #:			
Site:	SSOW#:			

Analysis Requested

320-41149 Chain of Custody

Preservation Codes:
- HCL
- NaOH
- Zn Acetate
- Nitric Acid
- NaHSO4
- MeOH
- Amchlor
- Ascorbic Acid
- Ice
- J - DI Water
- K - EDTA
- L - EDA
- M - Hexane
- N - None
- O - AsNaO2
- P - Na2O4S
- Q - Na2SO3
- R - Na2S2O3
- S - H2SO4
- T - TSP Dodecahydrate
- U - Acetone
- V - MCAA
- W - pH 4-5
- Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA_DOD5.1 - TCLP VOCs	~~8260_DOD~~	~~8260B~~ -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
GRE-ER-SB-01	7/9/18	1250	G	~~Solid~~ WATER			2			2	
GRE10-SB2-01		1410	G	Solid			1			1	0.0-0.5FT
GRE10-SB2-01MS		1410	G	Solid		Y	1			1	FOR MS, 0.0-0.5FT
GRE10-SB2-01MSD		1410	G	Solid		Y	1			1	FOR MSD, 0.0-0.5FT
GRE10-SB2-02		1435	G	Solid			1			1	2.4-2.6 FT
GRE10-SB1-01		1510	G	Solid			1			1	0.0-0.5FT
* GRE10-SB1-01D		1510	G	Solid			1			1	0.0-0.5FT
GRE10-SB3-01		1550	G	Solid			1			1	0.0-0.5FT
GRE09-SB1-01		1615	G	Solid			1			1	0.0-0.5FT
GRE09-SB1-01D		1615	G	Solid			1			1	0.0-0.5FT
GRE09-SB2-01		1630	G	Solid			1			1	0.0-0.5FT

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FEDEX

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
MIKE KNIDZESS	7/13/18 16:00	LEIDOS	N/A	7/13/18 16:00	FEDEX
N/A		FEDEX		7-14-18 916	TASPR

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

* No ID on Container. Identify base on time. ~~on~~ Container. DH 7/14/18

Ver: 08/04/2016

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE KLIDZESS	Lab PM: DAVID ALTUCKER	Carrier Tracking No(s): 7111 9985 9811	COC No: 320-22104-5001.2
Client Contact: Selvam Arunachalam	Phone: (615) 663-7485	E-Mail:		Page: Page 2 of 7
Company: Leidos, Inc.				Job #:
Address: 11951 Freedom Drive	Due Date Requested:			
City: Reston	TAT Requested (days):			
State, Zip: VA, 20190				
Phone:	PO #:			
Email: arunachalams@leidos.com	WO #: TAL project 32010804			
Project Name: Great Falls	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA_DOD5.1 - TCLP VOCs	~~8260-DOD~~	~~8260B~~	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
GRE-FB-POT-01	7/9/18	1705	G	~~Solid~~ WATER			2			2	TRIZMA PRESERVED
GRE-FB-DI-01	7/10/18	0915	G	~~Solid~~ WATER			2			2	
GRE-ER-SB-02		0920	G	~~Solid~~ WATER			2			2	
GRE03-SB3-01		1030	G	Solid			1			1	0.4-0.9 FT
GRE03-SB3-02		1105	G	Solid			1			1	2.4-2.9 FT
GRE04-SB1-01		1145	G	Solid			1			1	0.6-1.1 FT
GRE06-SB1-01	7/11/18	1305	G	Solid			1			1	0.4-0.9 FT
GRE06-SB1-01D		1305	G	Solid			1			1	0.4-0.9 FT
GRE06-SB2-01		1340	G	Solid			1			1	0.4-0.7 FT
GRE07-SB1-01		1415	G	Solid			1			1	0.0-0.5 FT
GRE07-SB1-01MS		1415	G	Solid		Y	1			1	0.0-0.5 FT MS

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FEDEX

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
MIKE KLIDZESS	7/13/18 16:00	LEIDOS	N/A	7/13/18 16:00	FEDEX
N/A		FEDEX		7-14-18 910	TAC

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 08/04/2016

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE KLIDZEJS	Lab PM: DAVID ALTUCKER	Carrier Tracking No(s): 7111 9985 9816	COC No: 320-22104-5001.3
Client Contact: Selvam Arunachalam	Phone: (615) 663-7485	E-Mail:		Page: Page 3 of 7
Company: Leidos, Inc.				Job #:
Address: 11951 Freedom Drive	Due Date Requested:			
City: Reston	TAT Requested (days):			
State, Zip: VA, 20190				
Phone:	PO #:			
Email: arunachalams@leidos.com	WO #: TAL project 32010804			
Project Name: Great Falls	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA_DOD5.1 -	~~8260_DOD~~ - TCLP VOCs	~~8270B~~ -										Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N											
GRE07-SB1-01MSD	7/11/18	1415	G	Solid		Y	1												1	0.0-0.5FT MSD
GRE07-SB1-02		1435	G	Solid			1												1	2.7-2.9FT
GRE-FR-SB-03		1910	G	WATER			2												2	
GRE03-SB1-01		1955	G	Solid			1												1	0.0-0.5FT
GRE03-SB2-01		2025	G	Solid			1												1	0.0-0.5FT
GRE03-SB4-01		2050	G	Solid			1												1	0.0-0.4FT
GRE03-SB5-01		2105	G	Solid			1												1	0.0-0.5FT
GRE04-SB2-01	7/12/18	1155	G	Solid			1												1	0.2-0.7FT
* GRE07-SB2-01		1235	G	Solid			1												1	0.0-0.5FT
GRE08-SB1-01		1325	G	Solid			1												1	0.0-0.5FT
GRE08-SB2-01		1355	G	Solid																0.0-0.3FT

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: FEDEX

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
MIKE KLIDZEJS	7/13/18 16:00	LEIDOS	N/A	7/13/18 16:00	FEDEX
N/A		FEDEX		7-14-18 9 10	TASAC

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 08/04/2016

* Label Time @ 1335 - DH 7/14/18

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE KUIDZEJS	Lab PM: DAVID ALTUCKER	Carrier Tracking No(s): 7111 9985 9811	COC No: 320-22104-5001.4
Client Contact: Selvam Arunachalam	Phone: (615) 663-7485	E-Mail:		Page: Page 4 of 7
Company: Leidos, Inc.				Job #:
Address: 11951 Freedom Drive	Due Date Requested:			
City: Reston	TAT Requested (days):			
State, Zip: VA, 20190				
Phone:	PO #:			
Email: arunachalams@leidos.com	WO #: TAL project 32010804			
Project Name: Great Falls	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA_DOD5.1 -	~~8260-DoD~~ TCLP - VOCs	~~8260B~~	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	X	
GRE08-SB3-01	7/12/18	1417	G	Solid			1			1	0.0-0.5 FT
GRE08-SB4-01	↓	1435	G	Solid			1			1	0.0-0.5 FT
GRE07-SB3-01	7/13/18	0820	G	Solid			1			1	0.0-0.5 FT
GRE04-SB3-01		0840	G	Solid			1			1	0.0-0.5 FT
GRE05-SB1-01		0910	G	Solid			1			1	0.0-0.5 FT
GRE05-SB2-01		0935	G	Solid			1			1	0.0-0.5 FT
GRE-10W-S-01	↓	1055	C	Solid			~~1~~	1		1	
				Solid			MK 7/13/18				
				Solid							
				Solid			MK 7/13/18				
				Solid							

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: FedEx

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
MIKE KUIDZEJS	7/13/18 16:00	LEIDOS	N/A	7/13/18 16:00	FEDEX
N/A		FEDEX		7-14-18 9:05	TAS

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 08/04/2016

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Alltucker, David R	Carrier Tracking No(s):	COC No: 320-124039.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: david.alltucker@testamericainc.com	State of Origin: Virginia	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 320-41149-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 8/1/2018			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Phase III, ANG - Great Falls	Project #: 32010804			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B_DOD5/1311_Z TCLP Volatile Organic Compounds	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GRE-IDW-S-01 (320-41149-36)	7/13/18	10:55 Eastern		Solid			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 7-17-18 1635	Company TA Sac	Received by:	Date/Time: 7/18/18 0900	Company TAGEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 0.9 to 0.0 transfer, AC		

Ver: 09/20/2016

08/08/2018

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 320-41149-1

Login Number: 41149
List Number: 1
Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 320-41149-1

Login Number: 41149
List Number: 2
Creator: Quint, Jessica A

List Source: TestAmerica Denver
List Creation: 07/18/18 04:38 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Job Number: 320-41333-1

Job Description: Phase III, ANG-Mutiple - Great Falls

For:
Leidos, Inc.
11251 Roger Bacon Drive
Reston, VA 20190

Attention: Selvam Arunachalam

Approved for release.
Linda C. Laver
Project Manager II
8/10/2018 9:57 AM

Designee for
David R Alltucker, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
david.alltucker@testamericainc.com
08/10/2018

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Method PFC DOD CCAL Data 1245

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.
D	The reported value is from a dilution.
U	Undetected at the Limit of Detection.
M	Manual integrated compound.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
Q	One or more quality control criteria failed.
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job Narrative
320-41333-1

Receipt
The samples were received on 7/20/2018 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1º C.

Receipt Exceptions
The following sample was listed on the Chain of Custody (COC) as having 2 containers; however, the lab only received 1 container: GRE09-SD1-01 (320-41333-11).

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

LCMS
Method(s) EPA 537 (Mod): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) EPA 537 (Mod): Due to the high concentration of several analytes, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-235966 and analytical batch 320-236782 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) EPA 537 (Mod): The matrix spike duplicate (MSD) recovery for Perfluorononanoic acid (PFNA) in preparation batch 320-235966 and analytical batch 320-236782 was outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) EPA 537 (Mod): The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: 7-MW28-PRL07-01 (320-41333-1), 7-MW1-PRL06-01 (320-41333-2), 8-MW12-PRL03-01 (320-41333-5), 8-MW12-PRL03-01 (320-41333-5[MS]), 8-MW12-PRL03-01 (320-41333-5[MSD]), GRE09-SW1-01 (320-41333-10), 7-MW34-PRL06-01 (320-41333-12) and MW-GRE08-01-01 (320-41333-17). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): Results for sample 7-MW28-PRL07-01 (320-41333-1), 8-MW12-PRL03-01 (320-41333-5), 8-MW12-PRL03-01 (320-41333-5[MS]), 8-MW12-PRL03-01 (320-41333-5[MSD]), 7-MW34-PRL06-01 (320-41333-12) and MW-GRE08-01-01 (320-41333-17) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

Method(s) EPA 537 (Mod): Isotope Dilution Analyte (IDA) recoveries are above the method recommended limit for 13C5 PFNA and 13C4 PFOS in the following sample: 7-MW1-PRL06-01 (320-41333-2). This sample was re-analyzed at dilution with IDA recoveries within control limits. Both sets of data are reported. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) EPA 537 (Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C4 PFOS: 7-MW34-PRL06-01 (320-41333-12). This IDA was within method recommended limits in the analysis of the undiluted extract and both sets of data have been reported. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method(s) EPA 537 (Mod): The concentration of Perfluorooctanesulfonic acid (PFOS) associated with the following samples exceeded the instrument calibration range: GRE09-SD1-01 (320-41333-11). This analyte has been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-235966 and analytical batch 320-237784 were outside control limits for Perfluorononanoic acid (PFNA). Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) EPA 537 (Mod): Due to the high concentration of several analytes, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-235966 and analytical batch 320-237784 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) EPA 537 (Mod): The following samples were diluted to bring the concentration of target analytes within the calibration range: 7-MW28-PRL07-01 (320-41333-1), 8-MW12-PRL03-01 (320-41333-5), 8-MW12-PRL03-01 (320-41333-5[MS]), 8-MW12-PRL03-01 (320-41333-5[MSD]), 7-MW34-PRL06-01 (320-41333-12) and MW-GRE08-01-01 (320-41333-17). Elevated reporting limits (RLs) are provided.

Method(s) EPA 537 (Mod): Results for samples 7-MW1-PRL06-01 (320-41333-2) and GRE09-SW1-01 (320-41333-10) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method(s) EPA 537 (Mod): The following samples were diluted to bring the concentration of several analytes within the calibration range: 7-MW1-PRL06-01 (320-41333-2) and GRE09-SW1-01 (320-41333-10). Elevated reporting limits (RLs) are provided.

Method(s) EPA 537 (Mod): The following sample was diluted to bring the concentration of Perfluorooctanesulfonic acid (PFOS) within the calibration range: GRE09-SD1-01 (320-41333-11). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3535: Due to the nature of the sample matrix, the entire sample could not be eluted through the SPE column, because the sample clogged the SPE column. The initial volumes used for the following samples deviated from the standard procedure: 7-MW34-PRL06-01 (320-41333-12). The reporting limits (RLs) have been adjusted proportionately. Preparation Batch 320-235966

Method(s) 1311: The ZHE method requires 180mL of sample, but the lab received on 120mL of the following sample: GRE-IDW-W-01 (320-41333-15). There is less than 1 mm of sediment in the sample and it was assumed to be pure water. Preparation batch 280-423614 .

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: 7-MW28-PRL07-01 — Lab Sample ID: 320-41333-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	750	E	1.7	0.50	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	550	E	1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	3.0		1.7	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	800	E	1.7	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2100	E	1.7	0.31	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	250		3.3	0.91	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	730	D	33	10	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	550	D	33	8.9	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	1300	D	33	7.6	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	3200	D	33	6.3	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	240	D	66	18	ng/L	20		EPA 537 (Mod)	Total/NA

Client Sample ID: 7-MW1-PRL06-01 — Lab Sample ID: 320-41333-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	2700	E	1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	3000	E M	1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	6.7		1.7	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	770	E	1.7	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7400	E	1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	120		3.3	0.92	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	3900	D	170	51	ng/L	100		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	3900	D M	170	45	ng/L	100		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	950	D	170	38	ng/L	100		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	20000	D	170	32	ng/L	100		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	150	J D M	330	92	ng/L	100		EPA 537 (Mod)	Total/NA

Client Sample ID: 8-MW14-PRL04-01 — Lab Sample ID: 320-41333-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	58		1.7	0.53	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	44		1.7	0.47	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.67	J	1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	38		1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	200		1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	30		3.5	0.95	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: GRE-ER-MW-01 — Lab Sample ID: 320-41333-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.61	J	1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: 8-MW12-PRL03-01 — Lab Sample ID: 320-41333-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	660	E J1	1.6	0.49	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: 8-MW12-PRL03-01 (Continued) — Lab Sample ID: 320-41333-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	670	E J1	1.6	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	48	J1	1.6	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	130		1.6	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1400	E J1	1.6	0.30	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1000	E J1	3.2	0.88	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	630	J1 D	32	9.8	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	760	J1 D	32	8.6	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	54	J1 D	32	8.3	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	140	J1 D	32	7.4	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	2100	D J1	32	6.1	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1100	J1 D	64	18	ng/L	20		EPA 537 (Mod)	Total/NA

Client Sample ID: 7-MW04-PRL04-01 — Lab Sample ID: 320-41333-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	150		1.7	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	69	M	1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	43		1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	170		1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	11	M	3.4	0.94	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: 7-MW04-PRL04-01D — Lab Sample ID: 320-41333-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	160		1.7	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	63		1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	41	M	1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	160		1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	10		3.4	0.94	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: GRE-ER-SD-01 — Lab Sample ID: 320-41333-8

No Detections.

Client Sample ID: GRE-ER-SW-01 — Lab Sample ID: 320-41333-9

No Detections.

Client Sample ID: GRE09-SW1-01 — Lab Sample ID: 320-41333-10

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1100	E	2.0	0.59	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	3900	E	2.0	0.53	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	110		2.0	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	370	E	2.0	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4200	E	2.0	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4100	E	3.9	1.1	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	1300	D	98	30	ng/L	50		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	6200	D M	98	26	ng/L	50		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: GRE09-SW1-01 (Continued) — Lab Sample ID: 320-41333-10

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA) - DL	130	D	98	25	ng/L	50		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	360	D	98	22	ng/L	50		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	8400	D	98	19	ng/L	50		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	5300	D	200	54	ng/L	50		EPA 537 (Mod)	Total/NA

Client Sample ID: GRE09-SD1-01 — Lab Sample ID: 320-41333-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1.1	M	0.47	0.12	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	8.0		0.47	0.16	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.29	J M	0.47	0.13	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.34	J M	0.63	0.092	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.6	M	0.47	0.097	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	32	E	1.6	0.38	ug/Kg	1	☼	EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	1.3	D	0.94	0.24	ug/Kg	2	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	7.7	D M	0.94	0.31	ug/Kg	2	☼	EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.34	J D M	0.94	0.25	ug/Kg	2	☼	EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.35	J D M	1.3	0.18	ug/Kg	2	☼	EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	8.7	D	0.94	0.19	ug/Kg	2	☼	EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	33	D	3.1	0.75	ug/Kg	2	☼	EPA 537 (Mod)	Total/NA

Client Sample ID: 7-MW34-PRL06-01 — Lab Sample ID: 320-41333-12

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	460		2.3	0.71	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	300	M	2.3	0.63	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	1.1	J	2.3	0.60	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	160	M	2.3	0.53	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1100	E	2.3	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	13		4.6	1.3	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	430	D	23	7.1	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	310	D M	23	6.3	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	150	D M	23	5.3	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1300	D	23	4.4	ng/L	10		EPA 537 (Mod)	Total/NA

Client Sample ID: MW-GRE10-01-01 — Lab Sample ID: 320-41333-13

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.66	J	1.6	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4	J	1.6	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.5	J	1.6	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.6		1.6	0.30	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6	J M	3.2	0.88	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: MW-GRE03-01-01 — Lab Sample ID: 320-41333-14

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	4.6		1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	3.7		1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.2		1.7	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	15		1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.4	M	3.3	0.91	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: GRE-IDW-W-01 — Lab Sample ID: 320-41333-15

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.0076	J	0.010	0.0016	mg/L	1		8260B	TCLP

Client Sample ID: GRE-RB-01 — Lab Sample ID: 320-41333-16

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.98	J	1.8	0.56	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: MW-GRE08-01-01 — Lab Sample ID: 320-41333-17

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	16		1.6	0.48	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	17		1.6	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.80	J	1.6	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	45	M	1.6	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	160		1.6	0.30	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	580	E	3.2	0.87	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	14	D	7.9	2.4	ng/L	5		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	18	D M	7.9	2.1	ng/L	5		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	48	D M	7.9	1.8	ng/L	5		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	160	D	7.9	1.5	ng/L	5		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	600	D	16	4.4	ng/L	5		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 7-MW28-PRL07-01

Lab Sample ID: 320-41333-1

Date Collected: 07/16/18 11:27
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	750	E	1.7	0.50	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorooctanoic acid (PFOA)	550	E	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorononanoic acid (PFNA)	3.0		1.7	0.43	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorobutanesulfonic acid (PFBS)	800	E	1.7	0.38	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorohexanesulfonic acid (PFHxS)	2100	E	1.7	0.31	ng/L		07/24/18 17:51	07/29/18 05:35	1
Perfluorooctanesulfonic acid (PFOS)	250		3.3	0.91	ng/L		07/24/18 17:51	07/29/18 05:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*77*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C4-PFHpA	*54*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C4 PFOA	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C5 PFNA	*90*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
18O2 PFHxS	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*
13C4 PFOS	*89*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:35*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	730	D	33	10	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorooctanoic acid (PFOA)	550	D	33	8.9	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorononanoic acid (PFNA)	25	U	33	8.6	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorobutanesulfonic acid (PFBS)	1300	D	33	7.6	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorohexanesulfonic acid (PFHxS)	3200	D	33	6.3	ng/L		07/24/18 17:51	08/03/18 06:40	20
Perfluorooctanesulfonic acid (PFOS)	240	D	66	18	ng/L		07/24/18 17:51	08/03/18 06:40	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C4-PFHpA	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C4 PFOA	*68*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C5 PFNA	*63*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
18O2 PFHxS	*59*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*
13C4 PFOS	*57*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:40*	*20*

Client Sample ID: 7-MW1-PRL06-01

Lab Sample ID: 320-41333-2

Date Collected: 07/16/18 13:57
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	2700	E	1.7	0.51	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorooctanoic acid (PFOA)	3000	E M	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorononanoic acid (PFNA)	6.7		1.7	0.43	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorobutanesulfonic acid (PFBS)	770	E	1.7	0.38	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorohexanesulfonic acid (PFHxS)	7400	E	1.7	0.32	ng/L		07/24/18 17:51	07/29/18 05:43	1
Perfluorooctanesulfonic acid (PFOS)	120		3.3	0.92	ng/L		07/24/18 17:51	07/29/18 05:43	1

Client Sample ID: 7-MW1-PRL06-01

Lab Sample ID: 320-41333-2

Date Collected: 07/16/18 13:57

Matrix: Water

Date Received: 07/20/18 09:10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	137		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C4-PFHpA	64		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C4 PFOA	80		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C5 PFNA	197	Q	50 - 150	07/24/18 17:51	07/29/18 05:43	1
18O2 PFHxS	65		50 - 150	07/24/18 17:51	07/29/18 05:43	1
13C4 PFOS	185	Q	50 - 150	07/24/18 17:51	07/29/18 05:43	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	3900	D	170	51	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorooctanoic acid (PFOA)	3900	D M	170	45	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorononanoic acid (PFNA)	120	U	170	43	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorobutanesulfonic acid (PFBS)	950	D	170	38	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorohexanesulfonic acid (PFHxS)	20000	D	170	32	ng/L		07/24/18 17:51	08/07/18 22:50	100
Perfluorooctanesulfonic acid (PFOS)	150	J D M	330	92	ng/L		07/24/18 17:51	08/07/18 22:50	100

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	115	M	50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C4-PFHpA	83		50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C4 PFOA	81		50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C5 PFNA	86		50 - 150	07/24/18 17:51	08/07/18 22:50	100
18O2 PFHxS	89		50 - 150	07/24/18 17:51	08/07/18 22:50	100
13C4 PFOS	75		50 - 150	07/24/18 17:51	08/07/18 22:50	100

Client Sample ID: 8-MW14-PRL04-01

Lab Sample ID: 320-41333-3

Date Collected: 07/16/18 17:03

Matrix: Water

Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	58		1.7	0.53	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorooctanoic acid (PFOA)	44		1.7	0.47	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorononanoic acid (PFNA)	0.67	J	1.7	0.45	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorobutanesulfonic acid (PFBS)	38		1.7	0.40	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorohexanesulfonic acid (PFHxS)	200		1.7	0.33	ng/L		07/24/18 17:51	08/03/18 07:03	1
Perfluorooctanesulfonic acid (PFOS)	30		3.5	0.95	ng/L		07/24/18 17:51	08/03/18 07:03	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	58		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C4-PFHpA	60		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C4 PFOA	66		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C5 PFNA	65		50 - 150	07/24/18 17:51	08/03/18 07:03	1
18O2 PFHxS	58		50 - 150	07/24/18 17:51	08/03/18 07:03	1
13C4 PFOS	59		50 - 150	07/24/18 17:51	08/03/18 07:03	1

Client Sample ID: GRE-ER-MW-01

Lab Sample ID: 320-41333-4

Date Collected: 07/17/18 07:15
Date Received: 07/20/18 09:10
Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U M	1.7	0.53	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorooctanoic acid (PFOA)	1.3	U M	1.7	0.47	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorononanoic acid (PFNA)	1.3	U M	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorobutanesulfonic acid (PFBS)	0.86	U	1.7	0.40	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorohexanesulfonic acid (PFHxS)	**0.61**	**J**	1.7	0.33	ng/L		07/24/18 17:51	07/29/18 05:58	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	0.95	ng/L		07/24/18 17:51	07/29/18 05:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*78*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C4-PFHpA	*74*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C4 PFOA	*75*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C5 PFNA	*78*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*
13C4 PFOS	*77*		*50 - 150*	*07/24/18 17:51*	*07/29/18 05:58*	*1*

Client Sample ID: 8-MW12-PRL03-01

Lab Sample ID: 320-41333-5

Date Collected: 07/17/18 08:33
Date Received: 07/20/18 09:10
Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**660**	**E J1**	1.6	0.49	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorooctanoic acid (PFOA)	**670**	**E J1**	1.6	0.43	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorononanoic acid (PFNA)	**48**	**J1**	1.6	0.42	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorobutanesulfonic acid (PFBS)	**130**		1.6	0.37	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorohexanesulfonic acid (PFHxS)	**1400**	**E J1**	1.6	0.30	ng/L		07/24/18 17:51	07/29/18 06:06	1
Perfluorooctanesulfonic acid (PFOS)	**1000**	**E J1**	3.2	0.88	ng/L		07/24/18 17:51	07/29/18 06:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*92*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C4-PFHpA	*65*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C4 PFOA	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C5 PFNA	*85*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
18O2 PFHxS	*74*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*
13C4 PFOS	*90*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:06*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**630**	**J1 D**	32	9.8	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorooctanoic acid (PFOA)	**760**	**J1 D**	32	8.6	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorononanoic acid (PFNA)	**54**	**J1 D**	32	8.3	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorobutanesulfonic acid (PFBS)	**140**	**J1 D**	32	7.4	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorohexanesulfonic acid (PFHxS)	**2100**	**D J1**	32	6.1	ng/L		07/24/18 17:51	08/03/18 07:11	20
Perfluorooctanesulfonic acid (PFOS)	**1100**	**J1 D**	64	18	ng/L		07/24/18 17:51	08/03/18 07:11	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*57*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*

Client Sample ID: 8-MW12-PRL03-01 Lab Sample ID: 320-41333-5

Date Collected: 07/17/18 08:33 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*63*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
13C4 PFOA	*64*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
13C5 PFNA	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
18O2 PFHxS	*57*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*
13C4 PFOS	*52*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:11*	*20*

Client Sample ID: 7-MW04-PRL04-01 Lab Sample ID: 320-41333-6

Date Collected: 07/17/18 12:43 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**150**		1.7	0.52	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorooctanoic acid (PFOA)	**69**	**M**	1.7	0.46	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.45	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorobutanesulfonic acid (PFBS)	**43**		1.7	0.40	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorohexanesulfonic acid (PFHxS)	**170**		1.7	0.33	ng/L		07/24/18 17:51	08/03/18 07:35	1
Perfluorooctanesulfonic acid (PFOS)	**11**	**M**	3.4	0.94	ng/L		07/24/18 17:51	08/03/18 07:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*58*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C4-PFHpA	*63*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C4 PFOA	*69*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C5 PFNA	*67*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
18O2 PFHxS	*65*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*
13C4 PFOS	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:35*	*1*

Client Sample ID: 7-MW04-PRL04-01D Lab Sample ID: 320-41333-7

Date Collected: 07/17/18 12:43 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**160**		1.7	0.52	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorooctanoic acid (PFOA)	**63**		1.7	0.46	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.45	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorobutanesulfonic acid (PFBS)	**41**	**M**	1.7	0.39	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorohexanesulfonic acid (PFHxS)	**160**		1.7	0.33	ng/L		07/24/18 17:51	07/29/18 06:45	1
Perfluorooctanesulfonic acid (PFOS)	**10**		3.4	0.94	ng/L		07/24/18 17:51	07/29/18 06:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*66*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C4-PFHpA	*62*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C4 PFOA	*68*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C5 PFNA	*72*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
18O2 PFHxS	*68*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*
13C4 PFOS	*71*		*50 - 150*	*07/24/18 17:51*	*07/29/18 06:45*	*1*

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: GRE-ER-SD-01

Lab Sample ID: 320-41333-8
Date Collected: 07/17/18 16:10
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.4	U	1.8	0.56	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorooctanoic acid (PFOA)	1.4	U M	1.8	0.50	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorobutanesulfonic acid (PFBS)	0.92	U	1.8	0.42	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorohexanesulfonic acid (PFHxS)	0.92	U	1.8	0.35	ng/L		07/24/18 17:51	08/03/18 07:58	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	1.0	ng/L		07/24/18 17:51	08/03/18 07:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C4-PFHpA	*73*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C4 PFOA	*78*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C5 PFNA	*74*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
18O2 PFHxS	*72*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*
13C4 PFOS	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 07:58*	*1*

Client Sample ID: GRE-ER-SW-01

Lab Sample ID: 320-41333-9
Date Collected: 07/17/18 16:15
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	U	1.7	0.53	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorooctanoic acid (PFOA)	1.3	U M	1.7	0.47	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.45	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorobutanesulfonic acid (PFBS)	0.87	U	1.7	0.40	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorohexanesulfonic acid (PFHxS)	0.87	U M	1.7	0.33	ng/L		07/24/18 17:51	08/03/18 08:06	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	0.96	ng/L		07/24/18 17:51	08/03/18 08:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*61*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C4-PFHpA	*66*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C4 PFOA	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C5 PFNA	*67*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
18O2 PFHxS	*62*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*
13C4 PFOS	*60*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:06*	*1*

Client Sample ID: GRE09-SW1-01

Lab Sample ID: 320-41333-10
Date Collected: 07/17/18 16:17
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**1100**	**E**	2.0	0.59	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorooctanoic acid (PFOA)	**3900**	**E**	2.0	0.53	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorononanoic acid (PFNA)	**110**		2.0	0.51	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorobutanesulfonic acid (PFBS)	**370**	**E**	2.0	0.45	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorohexanesulfonic acid (PFHxS)	**4200**	**E**	2.0	0.37	ng/L		07/24/18 17:51	07/29/18 07:09	1
Perfluorooctanesulfonic acid (PFOS)	**4100**	**E**	3.9	1.1	ng/L		07/24/18 17:51	07/29/18 07:09	1

Client Sample ID: GRE09-SW1-01 — Lab Sample ID: 320-41333-10

Date Collected: 07/17/18 16:17 **Matrix: Water**
Date Received: 07/20/18 09:10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	112		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C4-PFHpA	70		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C4 PFOA	59		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C5 PFNA	76		50 - 150	07/24/18 17:51	07/29/18 07:09	1
18O2 PFHxS	66		50 - 150	07/24/18 17:51	07/29/18 07:09	1
13C4 PFOS	89		50 - 150	07/24/18 17:51	07/29/18 07:09	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1300	D	98	30	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorooctanoic acid (PFOA)	6200	D M	98	26	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorononanoic acid (PFNA)	130	D	98	25	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorobutanesulfonic acid (PFBS)	360	D	98	22	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorohexanesulfonic acid (PFHxS)	8400	D	98	19	ng/L		07/24/18 17:51	08/07/18 22:58	50
Perfluorooctanesulfonic acid (PFOS)	5300	D	200	54	ng/L		07/24/18 17:51	08/07/18 22:58	50

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	74	M	50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C4-PFHpA	61		50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C4 PFOA	63		50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C5 PFNA	62		50 - 150	07/24/18 17:51	08/07/18 22:58	50
18O2 PFHxS	59		50 - 150	07/24/18 17:51	08/07/18 22:58	50
13C4 PFOS	59		50 - 150	07/24/18 17:51	08/07/18 22:58	50

Client Sample ID: GRE09-SD1-01 — Lab Sample ID: 320-41333-11

Date Collected: 07/17/18 16:30 **Matrix: Solid**
Date Received: 07/20/18 09:10 **Percent Solids: 62.6**

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.1	M	0.47	0.12	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorooctanoic acid (PFOA)	8.0		0.47	0.16	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorononanoic acid (PFNA)	0.29	J M	0.47	0.13	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorobutanesulfonic acid (PFBS)	0.34	J M	0.63	0.092	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorohexanesulfonic acid (PFHxS)	8.6	M	0.47	0.097	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1
Perfluorooctanesulfonic acid (PFOS)	32	E	1.6	0.38	ug/Kg	☼	07/27/18 10:32	08/06/18 03:43	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	95		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C4-PFHpA	99		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C4 PFOA	90		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C5 PFNA	93		50 - 150	07/27/18 10:32	08/06/18 03:43	1
18O2 PFHxS	104		50 - 150	07/27/18 10:32	08/06/18 03:43	1
13C4 PFOS	93		50 - 150	07/27/18 10:32	08/06/18 03:43	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.3	D	0.94	0.24	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2

Client Sample ID: GRE09-SD1-01

Lab Sample ID: 320-41333-11

Date Collected: 07/17/18 16:30
Date Received: 07/20/18 09:10

Matrix: Solid
Percent Solids: 62.6

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	7.7	D M	0.94	0.31	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorononanoic acid (PFNA)	0.34	J D M	0.94	0.25	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorobutanesulfonic acid (PFBS)	0.35	J D M	1.3	0.18	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorohexanesulfonic acid (PFHxS)	8.7	D	0.94	0.19	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2
Perfluorooctanesulfonic acid (PFOS)	33	D	3.1	0.75	ug/Kg	☼	07/27/18 10:32	08/07/18 16:34	2

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*83*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C4-PFHpA	*81*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C4 PFOA	*87*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C5 PFNA	*92*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
18O2 PFHxS	*85*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*
13C4 PFOS	*84*		*50 - 150*	*07/27/18 10:32*	*08/07/18 16:34*	*2*

Client Sample ID: 7-MW34-PRL06-01

Lab Sample ID: 320-41333-12

Date Collected: 07/18/18 08:13
Date Received: 07/20/18 09:10

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	460		2.3	0.71	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorooctanoic acid (PFOA)	300	M	2.3	0.63	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorononanoic acid (PFNA)	1.1	J	2.3	0.60	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorobutanesulfonic acid (PFBS)	160	M	2.3	0.53	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorohexanesulfonic acid (PFHxS)	1100	E	2.3	0.44	ng/L		07/24/18 17:51	07/29/18 07:17	1
Perfluorooctanesulfonic acid (PFOS)	13		4.6	1.3	ng/L		07/24/18 17:51	07/29/18 07:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*59*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C4-PFHpA	*51*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C4 PFOA	*56*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C5 PFNA	*62*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
18O2 PFHxS	*57*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*
13C4 PFOS	*58*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:17*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	430	D	23	7.1	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorooctanoic acid (PFOA)	310	D M	23	6.3	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorononanoic acid (PFNA)	17	U	23	6.0	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorobutanesulfonic acid (PFBS)	150	D M	23	5.3	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorohexanesulfonic acid (PFHxS)	1300	D	23	4.4	ng/L		07/24/18 17:51	08/03/18 08:21	10
Perfluorooctanesulfonic acid (PFOS)	35	U M	46	13	ng/L		07/24/18 17:51	08/03/18 08:21	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*52*	*M*	*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*

Client Sample ID: 7-MW34-PRL06-01 Lab Sample ID: 320-41333-12

Date Collected: 07/18/18 08:13 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*58*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
13C4 PFOA	*55*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
13C5 PFNA	*54*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
18O2 PFHxS	*51*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*
13C4 PFOS	*45*	*Q*	*50 - 150*	*07/24/18 17:51*	*08/03/18 08:21*	*10*

Client Sample ID: MW-GRE10-01-01 Lab Sample ID: 320-41333-13

Date Collected: 07/18/18 12:12 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.66**	**J**	1.6	0.49	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorooctanoic acid (PFOA)	**1.4**	**J**	1.6	0.43	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorononanoic acid (PFNA)	1.2	U	1.6	0.42	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorobutanesulfonic acid (PFBS)	**1.5**	**J**	1.6	0.37	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorohexanesulfonic acid (PFHxS)	**2.6**		1.6	0.30	ng/L		07/24/18 17:51	08/03/18 08:29	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**J M**	3.2	0.88	ng/L		07/24/18 17:51	08/03/18 08:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*69*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C4-PFHpA	*78*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C4 PFOA	*81*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C5 PFNA	*79*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
18O2 PFHxS	*76*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*
13C4 PFOS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:29*	*1*

Client Sample ID: MW-GRE03-01-01 Lab Sample ID: 320-41333-14

Date Collected: 07/18/18 13:48 **Matrix: Water**
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**4.6**		1.7	0.51	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorooctanoic acid (PFOA)	**3.7**		1.7	0.45	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorononanoic acid (PFNA)	1.2	U	1.7	0.43	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorobutanesulfonic acid (PFBS)	**3.2**		1.7	0.38	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorohexanesulfonic acid (PFHxS)	**15**		1.7	0.32	ng/L		07/24/18 17:51	08/03/18 08:37	1
Perfluorooctanesulfonic acid (PFOS)	**7.4**	**M**	3.3	0.91	ng/L		07/24/18 17:51	08/03/18 08:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*68*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C4-PFHpA	*74*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C4 PFOA	*78*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C5 PFNA	*72*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
18O2 PFHxS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*
13C4 PFOS	*68*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:37*	*1*

Client Sample ID: GRE-IDW-W-01

Lab Sample ID: 320-41333-15

Date Collected: 07/18/18 15:00
Matrix: Water
Date Received: 07/20/18 09:10

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0040	U	0.010	0.0016	mg/L			08/06/18 12:31	1
2-Butanone (MEK)	0.040	U	0.10	0.018	mg/L			08/06/18 12:31	1
Carbon tetrachloride	0.0040	U	0.010	0.0019	mg/L			08/06/18 12:31	1
Chlorobenzene	0.0040	U	0.010	0.0017	mg/L			08/06/18 12:31	1
Chloroform	**0.0076**	**J**	0.010	0.0016	mg/L			08/06/18 12:31	1
1,2-Dichloroethane	0.0040	U	0.010	0.0013	mg/L			08/06/18 12:31	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			08/06/18 12:31	1
Tetrachloroethene	0.0040	U	0.010	0.0020	mg/L			08/06/18 12:31	1
Trichloroethene	0.0040	U	0.010	0.0016	mg/L			08/06/18 12:31	1
Vinyl chloride	0.0020	U	0.010	0.0010	mg/L			08/06/18 12:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*78 - 120*		*08/06/18 12:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*64 - 129*		*08/06/18 12:31*	*1*
4-Bromofluorobenzene (Surr)	*100*		*78 - 121*		*08/06/18 12:31*	*1*
Dibromofluoromethane (Surr)	*106*		*79 - 119*		*08/06/18 12:31*	*1*

Client Sample ID: GRE-RB-01

Lab Sample ID: 320-41333-16

Date Collected: 07/18/18 15:15
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.98**	**J**	1.8	0.56	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorooctanoic acid (PFOA)	1.4	U M	1.8	0.50	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorobutanesulfonic acid (PFBS)	0.92	U	1.8	0.42	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorohexanesulfonic acid (PFHxS)	0.92	U	1.8	0.35	ng/L		07/24/18 17:51	08/03/18 08:45	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	1.0	ng/L		07/24/18 17:51	08/03/18 08:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*64*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C4-PFHpA	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C4 PFOA	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C5 PFNA	*71*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
18O2 PFHxS	*67*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*
13C4 PFOS	*64*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:45*	*1*

Client Sample ID: MW-GRE08-01-01

Lab Sample ID: 320-41333-17

Date Collected: 07/19/18 14:35
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**16**		1.6	0.48	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorooctanoic acid (PFOA)	**17**		1.6	0.43	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorononanoic acid (PFNA)	**0.80**	**J**	1.6	0.41	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorobutanesulfonic acid (PFBS)	**45**	**M**	1.6	0.37	ng/L		07/24/18 17:51	07/29/18 07:48	1
Perfluorohexanesulfonic acid (PFHxS)	**160**		1.6	0.30	ng/L		07/24/18 17:51	07/29/18 07:48	1

Client Sample Results

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: MW-GRE08-01-01

Lab Sample ID: 320-41333-17

Date Collected: 07/19/18 14:35
Matrix: Water
Date Received: 07/20/18 09:10

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**580**	**E**	3.2	0.87	ng/L		07/24/18 17:51	07/29/18 07:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*66*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C4-PFHpA	*63*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C4 PFOA	*62*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C5 PFNA	*64*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
18O2 PFHxS	*68*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*
13C4 PFOS	*65*		*50 - 150*	*07/24/18 17:51*	*07/29/18 07:48*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**14**	**D**	7.9	2.4	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorooctanoic acid (PFOA)	**18**	**D M**	7.9	2.1	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorononanoic acid (PFNA)	6.0	U	7.9	2.1	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorobutanesulfonic acid (PFBS)	**48**	**D M**	7.9	1.8	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorohexanesulfonic acid (PFHxS)	**160**	**D**	7.9	1.5	ng/L		07/24/18 17:51	08/03/18 08:53	5
Perfluorooctanesulfonic acid (PFOS)	**600**	**D**	16	4.4	ng/L		07/24/18 17:51	08/03/18 08:53	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*51*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C4-PFHpA	*60*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C4 PFOA	*62*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C5 PFNA	*60*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
18O2 PFHxS	*58*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*
13C4 PFOS	*52*		*50 - 150*	*07/24/18 17:51*	*08/03/18 08:53*	*5*

Default Detection Limits

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Leach: 1311

Analyte	LOQ	DL	Units	Method
1,1-Dichloroethene	0.010	0.0023	mg/L	8260B
1,2-Dichloroethane	0.010	0.0013	mg/L	8260B
2-Butanone (MEK)	0.10	0.018	mg/L	8260B
Benzene	0.010	0.0016	mg/L	8260B
Carbon tetrachloride	0.010	0.0019	mg/L	8260B
Chlorobenzene	0.010	0.0017	mg/L	8260B
Chloroform	0.010	0.0016	mg/L	8260B
Tetrachloroethene	0.010	0.0020	mg/L	8260B
Trichloroethene	0.010	0.0016	mg/L	8260B
Vinyl chloride	0.010	0.0010	mg/L	8260B

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.46	ng/L	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	2.0	0.61	ng/L	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.38	ng/L	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	4.0	1.1	ng/L	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	2.0	0.54	ng/L	EPA 537 (Mod)

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Prep: SHAKE

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.40	0.059	ug/Kg	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	0.30	0.078	ug/Kg	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	0.30	0.062	ug/Kg	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	0.30	0.081	ug/Kg	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	1.0	0.24	ug/Kg	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	0.30	0.10	ug/Kg	EPA 537 (Mod)

Surrogate Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	BFB	DBFM
Lab Sample ID	**Client Sample ID**	**(78-120)**	**(64-129)**	**(78-121)**	**(79-119)**
320-41333-15	GRE-IDW-W-01	106	106	100	106
320-41333-15 MS	GRE-IDW-W-01	103	107	98	107
320-41333-15 MSD	GRE-IDW-W-01	103	104	98	104
LB3 280-423614/1-A	Method Blank	107	103	98	105
LCS 280-423614/2-A	Lab Control Sample	105	106	99	108

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Isotope Dilution Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)					
		3C3-PFBS	PFHpA	PFOA	PFNA	PFHxS	PFOS
Lab Sample ID	**Client Sample ID**	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-41333-11	GRE09-SD1-01	95	99	90	93	104	93
320-41333-11 - DL	GRE09-SD1-01	83	81	87	92	85	84
LCS 320-236486/2-A	Lab Control Sample	74	85	81	84	85	79
MB 320-236486/1-A	Method Blank	79	84	82	83	86	79

Surrogate Legend

13C3-PFBS = 13C3-PFBS
PFHpA = 13C4-PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)					
		3C3-PFBS	PFHpA	PFOA	PFNA	PFHxS	PFOS
Lab Sample ID	**Client Sample ID**	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-41333-1	7-MW28-PRL07-01	77	54	64	90	64	89
320-41333-1 - DL	7-MW28-PRL07-01	61	61	68	63	59	57
320-41333-2	7-MW1-PRL06-01	137	64	80	197 Q	65	185 Q
320-41333-2 - DL	7-MW1-PRL06-01	115 M	83	81	86	89	75
320-41333-3	8-MW14-PRL04-01	58	60	66	65	58	59
320-41333-4	GRE-ER-MW-01	78	74	75	78	76	77
320-41333-5	8-MW12-PRL03-01	92	65	64	85	74	90
320-41333-5 - DL	8-MW12-PRL03-01	57	63	64	61	57	52
320-41333-5 MS	8-MW12-PRL03-01	96	68	61	83	75	91
320-41333-5 MS - DL	8-MW12-PRL03-01	63	62	63	64	60	55
320-41333-5 MSD	8-MW12-PRL03-01	96	72	65	89	78	97
320-41333-5 MSD - DL	8-MW12-PRL03-01	61 M	65	68	66	62	59
320-41333-6	7-MW04-PRL04-01	58	63	69	67	65	61
320-41333-7	7-MW04-PRL04-01D	66	62	68	72	68	71
320-41333-8	GRE-ER-SD-01	70	73	78	74	72	71
320-41333-9	GRE-ER-SW-01	61	66	71	67	62	60
320-41333-10	GRE09-SW1-01	112	70	59	76	66	89
320-41333-10 - DL	GRE09-SW1-01	74 M	61	63	62	59	59
320-41333-12	7-MW34-PRL06-01	59	51	56	62	57	58
320-41333-12 - DL	7-MW34-PRL06-01	52 M	58	55	54	51	45 Q
320-41333-13	MW-GRE10-01-01	69	78	81	79	76	70
320-41333-14	MW-GRE03-01-01	68	74	78	72	70	68
320-41333-16	GRE-RB-01	64	70	71	71	67	64
320-41333-17	MW-GRE08-01-01	66	63	62	64	68	65
320-41333-17 - DL	MW-GRE08-01-01	51	60	62	60	58	52
LCS 320-235966/2-A	Lab Control Sample	70	75	77	75	70	69
MB 320-235966/1-A	Method Blank	70	75	79	74	70	68

Surrogate Legend

13C3-PFBS = 13C3-PFBS
PFHpA = 13C4-PFHpA

Isotope Dilution Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: LB3 280-423614/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 424938

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0040	U	0.010	0.0016	mg/L			08/06/18 12:11	1
2-Butanone (MEK)	0.040	U	0.10	0.018	mg/L			08/06/18 12:11	1
Carbon tetrachloride	0.0040	U	0.010	0.0019	mg/L			08/06/18 12:11	1
Chlorobenzene	0.0040	U	0.010	0.0017	mg/L			08/06/18 12:11	1
Chloroform	0.0040	U	0.010	0.0016	mg/L			08/06/18 12:11	1
1,2-Dichloroethane	0.0040	U	0.010	0.0013	mg/L			08/06/18 12:11	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			08/06/18 12:11	1
Tetrachloroethene	0.0040	U	0.010	0.0020	mg/L			08/06/18 12:11	1
Trichloroethene	0.0040	U	0.010	0.0016	mg/L			08/06/18 12:11	1
Vinyl chloride	0.0020	U	0.010	0.0010	mg/L			08/06/18 12:11	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*107*		*78 - 120*		*08/06/18 12:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*64 - 129*		*08/06/18 12:11*	*1*
4-Bromofluorobenzene (Surr)	*98*		*78 - 121*		*08/06/18 12:11*	*1*
Dibromofluoromethane (Surr)	*105*		*79 - 119*		*08/06/18 12:11*	*1*

Lab Sample ID: LCS 280-423614/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 424938

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.0500	0.0511		mg/L		102	74 - 135
2-Butanone (MEK)	0.200	0.177	M	mg/L		89	44 - 150
Carbon tetrachloride	0.0500	0.0529		mg/L		106	67 - 135
Chlorobenzene	0.0500	0.0476		mg/L		95	76 - 135
Chloroform	0.0500	0.0515		mg/L		103	76 - 120
1,2-Dichloroethane	0.0500	0.0519		mg/L		104	70 - 135
1,1-Dichloroethene	0.0500	0.0545		mg/L		109	71 - 136
Tetrachloroethene	0.0500	0.0498		mg/L		100	70 - 135
Trichloroethene	0.0500	0.0517		mg/L		103	73 - 135
Vinyl chloride	0.0500	0.0532		mg/L		106	40 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*105*		*78 - 120*
1,2-Dichloroethane-d4 (Surr)	*106*		*64 - 129*
4-Bromofluorobenzene (Surr)	*99*		*78 - 121*
Dibromofluoromethane (Surr)	*108*		*79 - 119*

Lab Sample ID: 320-41333-15 MS — **Client Sample ID: GRE-IDW-W-01**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 424938

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.0040	U	0.0500	0.0516		mg/L		103	74 - 135
2-Butanone (MEK)	0.040	U	0.200	0.209	M	mg/L		105	44 - 150
Carbon tetrachloride	0.0040	U	0.0500	0.0533		mg/L		107	67 - 135

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 320-41333-15 MS
Matrix: Water
Analysis Batch: 424938

Client Sample ID: GRE-IDW-W-01
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorobenzene	0.0040	U	0.0500	0.0485		mg/L		97	76 - 135
Chloroform	0.0076	J	0.0500	0.0606		mg/L		106	76 - 120
1,2-Dichloroethane	0.0040	U	0.0500	0.0542		mg/L		108	70 - 135
1,1-Dichloroethene	0.0080	U	0.0500	0.0542		mg/L		108	71 - 136
Tetrachloroethene	0.0040	U	0.0500	0.0502		mg/L		100	70 - 135
Trichloroethene	0.0040	U	0.0500	0.0517		mg/L		103	73 - 135
Vinyl chloride	0.0020	U	0.0500	0.0576		mg/L		115	40 - 144

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*103*		*78 - 120*
1,2-Dichloroethane-d4 (Surr)	*107*		*64 - 129*
4-Bromofluorobenzene (Surr)	*98*		*78 - 121*
Dibromofluoromethane (Surr)	*107*		*79 - 119*

Lab Sample ID: 320-41333-15 MSD
Matrix: Water
Analysis Batch: 424938

Client Sample ID: GRE-IDW-W-01
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	0.0040	U	0.0500	0.0512		mg/L		102	74 - 135	1	20
2-Butanone (MEK)	0.040	U	0.200	0.218	M	mg/L		109	44 - 150	4	32
Carbon tetrachloride	0.0040	U	0.0500	0.0526		mg/L		105	67 - 135	1	21
Chlorobenzene	0.0040	U	0.0500	0.0485		mg/L		97	76 - 135	0	20
Chloroform	0.0076	J	0.0500	0.0598		mg/L		104	76 - 120	1	20
1,2-Dichloroethane	0.0040	U	0.0500	0.0525		mg/L		105	70 - 135	3	20
1,1-Dichloroethene	0.0080	U	0.0500	0.0531		mg/L		106	71 - 136	2	20
Tetrachloroethene	0.0040	U	0.0500	0.0503		mg/L		101	70 - 135	0	20
Trichloroethene	0.0040	U	0.0500	0.0510		mg/L		102	73 - 135	1	20
Vinyl chloride	0.0020	U	0.0500	0.0548		mg/L		110	40 - 144	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*103*		*78 - 120*
1,2-Dichloroethane-d4 (Surr)	*104*		*64 - 129*
4-Bromofluorobenzene (Surr)	*98*		*78 - 121*
Dibromofluoromethane (Surr)	*104*		*79 - 119*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Lab Sample ID: MB 320-235966/1-A
Matrix: Water
Analysis Batch: 237784

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 235966

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		07/24/18 17:51	08/03/18 06:24	1
Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	0.54	ng/L		07/24/18 17:51	08/03/18 06:24	1
Perfluorononanoic acid (PFNA)	1.5	U	2.0	0.52	ng/L		07/24/18 17:51	08/03/18 06:24	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		07/24/18 17:51	08/03/18 06:24	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: MB 320-235966/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 237784 — **Prep Batch: 235966**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		07/24/18 17:51	08/03/18 06:24	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	1.1	ng/L		07/24/18 17:51	08/03/18 06:24	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3-PFBS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:24*	*1*
13C4-PFHpA	*75*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:24*	*1*
13C4 PFOA	*79*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:24*	*1*
13C5 PFNA	*74*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:24*	*1*
18O2 PFHxS	*70*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:24*	*1*
13C4 PFOS	*68*		*50 - 150*	*07/24/18 17:51*	*08/03/18 06:24*	*1*

Lab Sample ID: LCS 320-235966/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 237784 — **Prep Batch: 235966**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	40.0	39.4		ng/L		98	80 - 113
Perfluorooctanoic acid (PFOA)	40.0	39.2		ng/L		98	80 - 107
Perfluorononanoic acid (PFNA)	40.0	38.7		ng/L		97	83 - 113
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9		ng/L		101	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.1		ng/L		91	81 - 106
Perfluorooctanesulfonic acid (PFOS)	37.1	35.5		ng/L		96	82 - 112

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3-PFBS	*70*		*50 - 150*
13C4-PFHpA	*75*		*50 - 150*
13C4 PFOA	*77*		*50 - 150*
13C5 PFNA	*75*		*50 - 150*
18O2 PFHxS	*70*		*50 - 150*
13C4 PFOS	*69*		*50 - 150*

Lab Sample ID: 320-41333-5 MS — **Client Sample ID: 8-MW12-PRL03-01**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 236782 — **Prep Batch: 235966**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	660	E J1	32.5	672	E 4	ng/L		31	80 - 113
Perfluorooctanoic acid (PFOA)	670	E J1	32.5	765	E 4	ng/L		279	80 - 107
Perfluorononanoic acid (PFNA)	48	J1	32.5	82.7		ng/L		105	83 - 113
Perfluorobutanesulfonic acid (PFBS)	130		28.7	158	4	ng/L		91	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	1400	E J1	29.6	1460	E 4	ng/L		206	81 - 106
Perfluorooctanesulfonic acid (PFOS)	1000	E J1	30.2	1070	E 4	ng/L		124	82 - 112

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C3-PFBS	96		50 - 150
13C4-PFHpA	68		50 - 150
13C4 PFOA	61		50 - 150
13C5 PFNA	83		50 - 150
18O2 PFHxS	75		50 - 150
13C4 PFOS	91		50 - 150

Lab Sample ID: 320-41333-5 MSD **Client Sample ID: 8-MW12-PRL03-01**

Matrix: Water **Prep Type: Total/NA**

Analysis Batch: 236782 **Prep Batch: 235966**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	660	E J1	32.7	628	E 4	ng/L		-105	80 - 113	7	30
Perfluorooctanoic acid (PFOA)	670	E J1	32.8	688	E 4	ng/L		43	80 - 107	11	30
Perfluorononanoic acid (PFNA)	48	J1	32.7	92.7	J1	ng/L		135	83 - 113	11	30
Perfluorobutanesulfonic acid (PFBS)	130		28.9	163	4	ng/L		107	87 - 120	3	30
Perfluorohexanesulfonic acid (PFHxS)	1400	E J1	29.8	1370	E 4	ng/L		-102	81 - 106	6	30
Perfluorooctanesulfonic acid (PFOS)	1000	E J1	30.4	997	E 4	ng/L		-135	82 - 112	8	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C3-PFBS	96		50 - 150
13C4-PFHpA	72		50 - 150
13C4 PFOA	65		50 - 150
13C5 PFNA	89		50 - 150
18O2 PFHxS	78		50 - 150
13C4 PFOS	97		50 - 150

Lab Sample ID: MB 320-236486/1-A **Client Sample ID: Method Blank**

Matrix: Solid **Prep Type: Total/NA**

Analysis Batch: 238093 **Prep Batch: 236486**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.20	U	0.30	0.078	ug/Kg		07/27/18 10:32	08/06/18 03:27	1
Perfluorooctanoic acid (PFOA)	0.20	U	0.30	0.10	ug/Kg		07/27/18 10:32	08/06/18 03:27	1
Perfluorononanoic acid (PFNA)	0.20	U	0.30	0.081	ug/Kg		07/27/18 10:32	08/06/18 03:27	1
Perfluorobutanesulfonic acid (PFBS)	0.18	U	0.40	0.059	ug/Kg		07/27/18 10:32	08/06/18 03:27	1
Perfluorohexanesulfonic acid (PFHxS)	0.20	U	0.30	0.062	ug/Kg		07/27/18 10:32	08/06/18 03:27	1
Perfluorooctanesulfonic acid (PFOS)	0.50	U	1.0	0.24	ug/Kg		07/27/18 10:32	08/06/18 03:27	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	79		50 - 150	07/27/18 10:32	08/06/18 03:27	1
13C4-PFHpA	84		50 - 150	07/27/18 10:32	08/06/18 03:27	1
13C4 PFOA	82		50 - 150	07/27/18 10:32	08/06/18 03:27	1
13C5 PFNA	83		50 - 150	07/27/18 10:32	08/06/18 03:27	1
18O2 PFHxS	86		50 - 150	07/27/18 10:32	08/06/18 03:27	1
13C4 PFOS	79		50 - 150	07/27/18 10:32	08/06/18 03:27	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-236486/2-A
Matrix: Solid
Analysis Batch: 238093

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 236486

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	2.00	1.74		ug/Kg		87	76 - 124
Perfluorooctanoic acid (PFOA)	2.00	1.80		ug/Kg		90	76 - 121
Perfluorononanoic acid (PFNA)	2.00	1.82		ug/Kg		91	74 - 126
Perfluorobutanesulfonic acid (PFBS)	1.77	1.73		ug/Kg		98	73 - 142
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.54		ug/Kg		85	75 - 121
Perfluorooctanesulfonic acid (PFOS)	1.86	1.77		ug/Kg		95	69 - 131

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3-PFBS	*74*		*50 - 150*
13C4-PFHpA	*85*		*50 - 150*
13C4 PFOA	*81*		*50 - 150*
13C5 PFNA	*84*		*50 - 150*
18O2 PFHxS	*85*		*50 - 150*
13C4 PFOS	*79*		*50 - 150*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Lab Sample ID: 320-41333-5 MS
Matrix: Water
Analysis Batch: 237784

Client Sample ID: 8-MW12-PRL03-01
Prep Type: Total/NA
Prep Batch: 235966

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA) - DL	630	J1 D	32.5	755	4 D	ng/L		400	80 - 113
Perfluorooctanoic acid (PFOA) - DL	760	J1 D	32.5	866	4 D	ng/L		315	80 - 107
Perfluorononanoic acid (PFNA) - DL	54	J1 D	32.5	91.2	J1 D	ng/L		115	83 - 113
Perfluorobutanesulfonic acid (PFBS) - DL	140	J1 D	28.7	158	4 D	ng/L		53	87 - 120
Perfluorohexanesulfonic acid (PFHxS) - DL	2100	D J1	29.6	2100	4 D	ng/L		84	81 - 106
Perfluorooctanesulfonic acid (PFOS) - DL	1100	J1 D	30.2	1160	4 D M	ng/L		65	82 - 112

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C3-PFBS - DL	*63*		*50 - 150*
13C4-PFHpA - DL	*62*		*50 - 150*
13C4 PFOA - DL	*63*		*50 - 150*
13C5 PFNA - DL	*64*		*50 - 150*
18O2 PFHxS - DL	*60*		*50 - 150*
13C4 PFOS - DL	*55*		*50 - 150*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Lab Sample ID: 320-41333-5 MSD
Matrix: Water
Analysis Batch: 237784

Client Sample ID: 8-MW12-PRL03-01
Prep Type: Total/NA
Prep Batch: 235966

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA) - DL	630	J1 D	32.7	683	4 D	ng/L		175	80 - 113	10	30
Perfluorooctanoic acid (PFOA) - DL	760	J1 D	32.8	792	4 D	ng/L		85	80 - 107	9	30
Perfluorononanoic acid (PFNA) - DL	54	J1 D	32.7	95.9	J1 D	ng/L		128	83 - 113	5	30
Perfluorobutanesulfonic acid (PFBS) - DL	140	J1 D	28.9	169	4 D	ng/L		90	87 - 120	7	30
Perfluorohexanesulfonic acid (PFHxS) - DL	2100	D J1	29.8	1940	4 D	ng/L		-443	81 - 106	8	30
Perfluorooctanesulfonic acid (PFOS) - DL	1100	J1 D	30.4	1070	4 D M	ng/L		-226	82 - 112	8	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C3-PFBS - DL	*61*	*M*	*50 - 150*
13C4-PFHpA - DL	*65*		*50 - 150*
13C4 PFOA - DL	*68*		*50 - 150*
13C5 PFNA - DL	*66*		*50 - 150*
18O2 PFHxS - DL	*62*		*50 - 150*
13C4 PFOS - DL	*59*		*50 - 150*

QC Association Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

GC/MS VOA

Leach Batch: 423614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-15	GRE-IDW-W-01	TCLP	Water	1311	
LB3 280-423614/1-A	Method Blank	TCLP	Water	1311	
LCS 280-423614/2-A	Lab Control Sample	TCLP	Water	1311	
320-41333-15 MS	GRE-IDW-W-01	TCLP	Water	1311	
320-41333-15 MSD	GRE-IDW-W-01	TCLP	Water	1311	

Analysis Batch: 424938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-15	GRE-IDW-W-01	TCLP	Water	8260B	423614
LB3 280-423614/1-A	Method Blank	TCLP	Water	8260B	423614
LCS 280-423614/2-A	Lab Control Sample	TCLP	Water	8260B	423614
320-41333-15 MS	GRE-IDW-W-01	TCLP	Water	8260B	423614
320-41333-15 MSD	GRE-IDW-W-01	TCLP	Water	8260B	423614

LCMS

Prep Batch: 235966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-1	7-MW28-PRL07-01	Total/NA	Water	3535	
320-41333-1 - DL	7-MW28-PRL07-01	Total/NA	Water	3535	
320-41333-2	7-MW1-PRL06-01	Total/NA	Water	3535	
320-41333-2 - DL	7-MW1-PRL06-01	Total/NA	Water	3535	
320-41333-3	8-MW14-PRL04-01	Total/NA	Water	3535	
320-41333-4	GRE-ER-MW-01	Total/NA	Water	3535	
320-41333-5 - DL	8-MW12-PRL03-01	Total/NA	Water	3535	
320-41333-5	8-MW12-PRL03-01	Total/NA	Water	3535	
320-41333-6	7-MW04-PRL04-01	Total/NA	Water	3535	
320-41333-7	7-MW04-PRL04-01D	Total/NA	Water	3535	
320-41333-8	GRE-ER-SD-01	Total/NA	Water	3535	
320-41333-9	GRE-ER-SW-01	Total/NA	Water	3535	
320-41333-10	GRE09-SW1-01	Total/NA	Water	3535	
320-41333-10 - DL	GRE09-SW1-01	Total/NA	Water	3535	
320-41333-12	7-MW34-PRL06-01	Total/NA	Water	3535	
320-41333-12 - DL	7-MW34-PRL06-01	Total/NA	Water	3535	
320-41333-13	MW-GRE10-01-01	Total/NA	Water	3535	
320-41333-14	MW-GRE03-01-01	Total/NA	Water	3535	
320-41333-16	GRE-RB-01	Total/NA	Water	3535	
320-41333-17 - DL	MW-GRE08-01-01	Total/NA	Water	3535	
320-41333-17	MW-GRE08-01-01	Total/NA	Water	3535	
MB 320-235966/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-235966/2-A	Lab Control Sample	Total/NA	Water	3535	
320-41333-5 MS - DL	8-MW12-PRL03-01	Total/NA	Water	3535	
320-41333-5 MS	8-MW12-PRL03-01	Total/NA	Water	3535	
320-41333-5 MSD - DL	8-MW12-PRL03-01	Total/NA	Water	3535	
320-41333-5 MSD	8-MW12-PRL03-01	Total/NA	Water	3535	

Prep Batch: 236486

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-11	GRE09-SD1-01	Total/NA	Solid	SHAKE	
320-41333-11 - DL	GRE09-SD1-01	Total/NA	Solid	SHAKE	

LCMS (Continued)

Prep Batch: 236486 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-236486/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-236486/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Analysis Batch: 236782

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-1	7-MW28-PRL07-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-2	7-MW1-PRL06-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-4	GRE-ER-MW-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-5	8-MW12-PRL03-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-7	7-MW04-PRL04-01D	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-10	GRE09-SW1-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-12	7-MW34-PRL06-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-17	MW-GRE08-01-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-5 MS	8-MW12-PRL03-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-5 MSD	8-MW12-PRL03-01	Total/NA	Water	EPA 537 (Mod)	235966

Analysis Batch: 237784

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-1 - DL	7-MW28-PRL07-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-3	8-MW14-PRL04-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-5 - DL	8-MW12-PRL03-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-6	7-MW04-PRL04-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-8	GRE-ER-SD-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-9	GRE-ER-SW-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-12 - DL	7-MW34-PRL06-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-13	MW-GRE10-01-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-14	MW-GRE03-01-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-16	GRE-RB-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-17 - DL	MW-GRE08-01-01	Total/NA	Water	EPA 537 (Mod)	235966
MB 320-235966/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	235966
LCS 320-235966/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-5 MS - DL	8-MW12-PRL03-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-5 MSD - DL	8-MW12-PRL03-01	Total/NA	Water	EPA 537 (Mod)	235966

Analysis Batch: 238093

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-11	GRE09-SD1-01	Total/NA	Solid	EPA 537 (Mod)	236486
MB 320-236486/1-A	Method Blank	Total/NA	Solid	EPA 537 (Mod)	236486
LCS 320-236486/2-A	Lab Control Sample	Total/NA	Solid	EPA 537 (Mod)	236486

Analysis Batch: 238576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-11 - DL	GRE09-SD1-01	Total/NA	Solid	EPA 537 (Mod)	236486

Analysis Batch: 238595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-2 - DL	7-MW1-PRL06-01	Total/NA	Water	EPA 537 (Mod)	235966
320-41333-10 - DL	GRE09-SW1-01	Total/NA	Water	EPA 537 (Mod)	235966

QC Association Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

General Chemistry

Analysis Batch: 236247

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41333-11	GRE09-SD1-01	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: 7-MW28-PRL07-01 — Lab Sample ID: 320-41333-1

Date Collected: 07/16/18 11:27
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 05:35	JRB	TAL SAC
Total/NA	Prep	3535	DL		235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	20	237784	08/03/18 06:40	S1M	TAL SAC

Client Sample ID: 7-MW1-PRL06-01 — Lab Sample ID: 320-41333-2

Date Collected: 07/16/18 13:57
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 05:43	JRB	TAL SAC
Total/NA	Prep	3535	DL		235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	100	238595	08/07/18 22:50	ABH	TAL SAC

Client Sample ID: 8-MW14-PRL04-01 — Lab Sample ID: 320-41333-3

Date Collected: 07/16/18 17:03
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237784	08/03/18 07:03	S1M	TAL SAC

Client Sample ID: GRE-ER-MW-01 — Lab Sample ID: 320-41333-4

Date Collected: 07/17/18 07:15
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 05:58	JRB	TAL SAC

Client Sample ID: 8-MW12-PRL03-01 — Lab Sample ID: 320-41333-5

Date Collected: 07/17/18 08:33
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 06:06	JRB	TAL SAC
Total/NA	Prep	3535	DL		235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	20	237784	08/03/18 07:11	S1M	TAL SAC

Client Sample ID: 7-MW04-PRL04-01 — Lab Sample ID: 320-41333-6

Date Collected: 07/17/18 12:43 — **Matrix: Water**
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237784	08/03/18 07:35	S1M	TAL SAC

Client Sample ID: 7-MW04-PRL04-01D — Lab Sample ID: 320-41333-7

Date Collected: 07/17/18 12:43 — **Matrix: Water**
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 06:45	JRB	TAL SAC

Client Sample ID: GRE-ER-SD-01 — Lab Sample ID: 320-41333-8

Date Collected: 07/17/18 16:10 — **Matrix: Water**
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237784	08/03/18 07:58	S1M	TAL SAC

Client Sample ID: GRE-ER-SW-01 — Lab Sample ID: 320-41333-9

Date Collected: 07/17/18 16:15 — **Matrix: Water**
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237784	08/03/18 08:06	S1M	TAL SAC

Client Sample ID: GRE09-SW1-01 — Lab Sample ID: 320-41333-10

Date Collected: 07/17/18 16:17 — **Matrix: Water**
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 07:09	JRB	TAL SAC
Total/NA	Prep	3535	DL		235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	50	238595	08/07/18 22:58	ABH	TAL SAC

Client Sample ID: GRE09-SD1-01 — Lab Sample ID: 320-41333-11

Date Collected: 07/17/18 16:30 — **Matrix: Solid**
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	236247	07/26/18 11:14	TCS	TAL SAC

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: GRE09-SD1-01 — Lab Sample ID: 320-41333-11

Date Collected: 07/17/18 16:30
Date Received: 07/20/18 09:10
Matrix: Solid
Percent Solids: 62.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			236486	07/27/18 10:32	HJA	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	238093	08/06/18 03:43	JRB	TAL SAC
Total/NA	Prep	SHAKE	DL		236486	07/27/18 10:32	HJA	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	2	238576	08/07/18 16:34	ABH	TAL SAC

Client Sample ID: 7-MW34-PRL06-01 — Lab Sample ID: 320-41333-12

Date Collected: 07/18/18 08:13
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 07:17	JRB	TAL SAC
Total/NA	Prep	3535	DL		235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	237784	08/03/18 08:21	S1M	TAL SAC

Client Sample ID: MW-GRE10-01-01 — Lab Sample ID: 320-41333-13

Date Collected: 07/18/18 12:12
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237784	08/03/18 08:29	S1M	TAL SAC

Client Sample ID: MW-GRE03-01-01 — Lab Sample ID: 320-41333-14

Date Collected: 07/18/18 13:48
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237784	08/03/18 08:37	S1M	TAL SAC

Client Sample ID: GRE-IDW-W-01 — Lab Sample ID: 320-41333-15

Date Collected: 07/18/18 15:00
Date Received: 07/20/18 09:10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			423614	07/25/18 11:55	DFB1	TAL DEN
TCLP	Analysis	8260B		1	424938	08/06/18 12:31	TAW	TAL DEN

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Client Sample ID: GRE-RB-01

Lab Sample ID: 320-41333-16

Date Collected: 07/18/18 15:15
Matrix: Water
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	237784	08/03/18 08:45	S1M	TAL SAC

Client Sample ID: MW-GRE08-01-01

Lab Sample ID: 320-41333-17

Date Collected: 07/19/18 14:35
Matrix: Water
Date Received: 07/20/18 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	236782	07/29/18 07:48	JRB	TAL SAC
Total/NA	Prep	3535	DL		235966	07/24/18 17:51	JER	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	5	237784	08/03/18 08:53	S1M	TAL SAC

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-29-19

Analysis Method	Prep Method	Matrix	Analyte

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	01-08-19
Arizona	State Program	9	AZ0713	12-20-18
California	State Program	9	2513	01-18-19
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-19
Georgia	State Program	4	N/A	01-08-19 *
Illinois	NELAP	5	200017	04-30-19
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-19
Louisiana	NELAP	6	02096	06-30-19
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-18
New Hampshire	NELAP	1	205310	04-28-19
New Jersey	NELAP	2	CO004	06-30-19
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-08-19
Oklahoma	State Program	6	8614	08-31-18
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-19
South Carolina	State Program	4	72002001	01-08-19
Texas	NELAP	6	T104704183-17-14	09-30-18
US Fish & Wildlife	Federal			07-31-19
USDA	Federal			03-26-21
Utah	NELAP	8	QUAN5	06-30-13 *
Virginia	NELAP	3	460232	06-14-19
West Virginia DEP	State Program	3	354	12-31-18
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
1311	TCLP Extraction	SW846	TAL DEN
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
5030B	Purge and Trap	SW846	TAL DEN
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Leidos, Inc.
Project/Site: Phase III, ANG-Mutiple - Great Falls

TestAmerica Job ID: 320-41333-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41333-1	7-MW28-PRL07-01	Water	07/16/18 11:27	07/20/18 09:10
320-41333-2	7-MW1-PRL06-01	Water	07/16/18 13:57	07/20/18 09:10
320-41333-3	8-MW14-PRL04-01	Water	07/16/18 17:03	07/20/18 09:10
320-41333-4	GRE-ER-MW-01	Water	07/17/18 07:15	07/20/18 09:10
320-41333-5	8-MW12-PRL03-01	Water	07/17/18 08:33	07/20/18 09:10
320-41333-6	7-MW04-PRL04-01	Water	07/17/18 12:43	07/20/18 09:10
320-41333-7	7-MW04-PRL04-01D	Water	07/17/18 12:43	07/20/18 09:10
320-41333-8	GRE-ER-SD-01	Water	07/17/18 16:10	07/20/18 09:10
320-41333-9	GRE-ER-SW-01	Water	07/17/18 16:15	07/20/18 09:10
320-41333-10	GRE09-SW1-01	Water	07/17/18 16:17	07/20/18 09:10
320-41333-11	GRE09-SD1-01	Solid	07/17/18 16:30	07/20/18 09:10
320-41333-12	7-MW34-PRL06-01	Water	07/18/18 08:13	07/20/18 09:10
320-41333-13	MW-GRE10-01-01	Water	07/18/18 12:12	07/20/18 09:10
320-41333-14	MW-GRE03-01-01	Water	07/18/18 13:48	07/20/18 09:10
320-41333-15	GRE-IDW-W-01	Water	07/18/18 15:00	07/20/18 09:10
320-41333-16	GRE-RB-01	Water	07/18/18 15:15	07/20/18 09:10
320-41333-17	MW-GRE08-01-01	Water	07/19/18 14:35	07/20/18 09:10

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235668

Lab Sample ID: IC 320-235668/2 Client Sample ID:

Date Analyzed: 07/23/18 16:11 Lab File ID: 2018.07.23LLICAL_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.64	Baseline	hannigana	07/23/18 16:44
Perfluorohexanoic acid (PFHxA)	1.92	Assign Peak	hannigana	07/23/18 16:43
Perfluorononanoic acid (PFNA)	2.96	Baseline	hannigana	07/23/18 17:20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.47	Assign Peak	hannigana	07/23/18 16:45

Lab Sample ID: IC 320-235668/3 Client Sample ID:

Date Analyzed: 07/23/18 16:19 Lab File ID: 2018.07.23LLICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.95	Baseline	hannigana	07/23/18 16:48
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.63	Isomers	hannigana	07/23/18 16:48

Lab Sample ID: IC 320-235668/4 Client Sample ID:

Date Analyzed: 07/23/18 16:26 Lab File ID: 2018.07.23LLICAL_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.64	Baseline	hannigana	07/23/18 16:49

Lab Sample ID: IC 320-235668/8 Client Sample ID:

Date Analyzed: 07/23/18 16:58 Lab File ID: 2018.07.23LLICAL_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.95	Isomers	hannigana	07/23/18 17:10

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236782

Lab Sample ID: CCVL 320-236782/2 Client Sample ID:

Date Analyzed: 07/29/18 05:03 Lab File ID: 2018.07.28LLB_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroundecanoic acid (PFUnA)	3.64	Split Peak	barnettj	07/30/18 10:33

Lab Sample ID: 320-41333-2 Client Sample ID: 7-MW1-PRL06-01

Date Analyzed: 07/29/18 05:43 Lab File ID: 2018.07.28LLB_046.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.60	Isomers	mongkols	07/31/18 12:18

Lab Sample ID: 320-41333-4 Client Sample ID: GRE-ER-MW-01

Date Analyzed: 07/29/18 05:58 Lab File ID: 2018.07.28LLB_048.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	mongkols	07/31/18 12:28
Perfluorooctanoic acid (PFOA)	2.59	Baseline	mongkols	07/31/18 12:29
Perfluorononanoic acid (PFNA)		Invalid Compound ID	mongkols	07/31/18 12:29

Lab Sample ID: 320-41333-7 Client Sample ID: 7-MW04-PRL04-01D

Date Analyzed: 07/29/18 06:45 Lab File ID: 2018.07.28LLB_054.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 12:33

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 236782

Lab Sample ID: 320-41333-12 Client Sample ID: 7-MW34-PRL06-01

Date Analyzed: 07/29/18 07:17 Lab File ID: 2018.07.28LLB_058.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	mongkols	07/31/18 12:35
Perfluorooctanoic acid (PFOA)	2.59	Isomers	mongkols	07/31/18 12:35

Lab Sample ID: 320-41333-17 Client Sample ID: MW-GRE08-01-01

Date Analyzed: 07/29/18 07:48 Lab File ID: 2018.07.28LLB_062.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.67	Baseline	mongkols	07/31/18 12:37

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237402

Lab Sample ID: IC 320-237402/2 Client Sample ID:

Date Analyzed: 08/01/18 12:59 Lab File ID: 2018.08.01LLICAL_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.40	Baseline	roycea	08/01/18 14:23
Perfluorohexanoic acid (PFHxA)	1.90	Assign Peak	roycea	08/01/18 14:24
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	roycea	08/01/18 14:24
Perfluorooctanoic acid (PFOA)	2.58	Baseline	roycea	08/01/18 14:23
Perfluorononanoic acid (PFNA)	2.95	Baseline	roycea	08/01/18 14:25
Perfluorooctanesulfonic acid (PFOS)	2.95	Assign Peak	roycea	08/01/18 14:24
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.47	Baseline	roycea	08/01/18 14:25
Perfluorodecanesulfonic acid (PFDS)	3.63	Baseline	roycea	08/01/18 14:26
Perfluoroundecanoic acid (PFUnA)	3.64	Baseline	roycea	08/01/18 14:27
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.65	Baseline	roycea	08/01/18 14:26

Lab Sample ID: IC 320-237402/3 Client Sample ID:

Date Analyzed: 08/01/18 13:06 Lab File ID: 2018.08.01LLICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	1.91	Baseline	roycea	08/01/18 14:29
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	roycea	08/01/18 14:29
Perfluorooctanoic acid (PFOA)	2.59	Baseline	roycea	08/01/18 14:28
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.47	Assign Peak	roycea	08/01/18 14:29

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237402

Lab Sample ID: IC 320-237402/5 ICIS Client Sample ID:

Date Analyzed: 08/01/18 13:22 Lab File ID: 2018.08.01LLICAL_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.95	Isomers	roycea	08/01/18 14:33

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237784

Lab Sample ID: MB 320-235966/1-A Client Sample ID:

Date Analyzed: 08/03/18 06:24 Lab File ID: 2018.08.03LLA_013.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)		Invalid Compound ID	mongkols	08/06/18 11:16

Lab Sample ID: 320-41333-5 MS DL Client Sample ID: 8-MW12-PRL03-01 MS DL

Date Analyzed: 08/03/18 07:19 Lab File ID: 2018.08.03LLA_020.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.98	Isomers	mongkols	08/06/18 11:20

Lab Sample ID: 320-41333-5 MSD DL Client Sample ID: 8-MW12-PRL03-01 MSD DL

Date Analyzed: 08/03/18 07:27 Lab File ID: 2018.08.03LLA_021.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.70	Assign Peak	mongkols	08/06/18 11:21
Perfluorooctanesulfonic acid (PFOS)	2.99	Isomers	mongkols	08/06/18 11:22

Lab Sample ID: 320-41333-6 Client Sample ID: 7-MW04-PRL04-01

Date Analyzed: 08/03/18 07:35 Lab File ID: 2018.08.03LLA_022.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.61	Baseline	mongkols	08/06/18 11:22
Perfluorooctanesulfonic acid (PFOS)	2.98	Baseline	mongkols	08/06/18 11:22

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237784

Lab Sample ID: CCV 320-237784/12 Client Sample ID:

Date Analyzed: 08/03/18 07:42 Lab File ID: 2018.08.03LLA_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.66	Baseline	mongkols	08/06/18 11:23
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.66	Isomers	mongkols	08/06/18 11:24

Lab Sample ID: CCV 320-237784/13 Client Sample ID:

Date Analyzed: 08/03/18 07:50 Lab File ID: 2018.08.03LLA_024.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.67	Baseline	mongkols	08/06/18 11:24
Perfluorooctanesulfonic acid (PFOS)	2.98	Isomers	mongkols	08/06/18 11:25

Lab Sample ID: 320-41333-8 Client Sample ID: GRE-ER-SD-01

Date Analyzed: 08/03/18 07:58 Lab File ID: 2018.08.03LLA_025.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.62	Baseline	mongkols	08/06/18 11:25

Lab Sample ID: 320-41333-9 Client Sample ID: GRE-ER-SW-01

Date Analyzed: 08/03/18 08:06 Lab File ID: 2018.08.03LLA_026.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.28	Baseline	mongkols	08/06/18 11:26
Perfluorooctanoic acid (PFOA)	2.61	Baseline	mongkols	08/06/18 11:26

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237784

Lab Sample ID: 320-41333-12 DL Client Sample ID: 7-MW34-PRL06-01 DL

Date Analyzed: 08/03/18 08:21 Lab File ID: 2018.08.03LLA_028.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.70	Baseline	mongkols	08/06/18 11:27
Perfluorobutanesulfonic acid (PFBS)	1.70	Baseline	mongkols	08/06/18 11:27
Perfluorooctanoic acid (PFOA)	2.62	Isomers	mongkols	08/06/18 11:27
Perfluorooctanesulfonic acid (PFOS)	2.98	Baseline	mongkols	08/06/18 11:27

Lab Sample ID: 320-41333-13 Client Sample ID: MW-GRE10-01-01

Date Analyzed: 08/03/18 08:29 Lab File ID: 2018.08.03LLA_029.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.00	Baseline	mongkols	08/06/18 11:28

Lab Sample ID: 320-41333-14 Client Sample ID: MW-GRE03-01-01

Date Analyzed: 08/03/18 08:37 Lab File ID: 2018.08.03LLA_030.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.87	Baseline	mongkols	08/06/18 11:28

Lab Sample ID: 320-41333-16 Client Sample ID: GRE-RB-01

Date Analyzed: 08/03/18 08:45 Lab File ID: 2018.08.03LLA_031.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.64	Baseline	mongkols	08/06/18 11:29

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 237784

Lab Sample ID: 320-41333-17 DL Client Sample ID: MW-GRE08-01-01 DL

Date Analyzed: 08/03/18 08:53 Lab File ID: 2018.08.03LLA_032.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.71	Baseline	mongkols	08/06/18 11:29
Perfluorooctanoic acid (PFOA)	2.64	Baseline	mongkols	08/06/18 11:30

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 238089

Lab Sample ID: CCB 320-238089/1 Client Sample ID:

Date Analyzed: 08/05/18 23:56 Lab File ID: 2018.08.05LLA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.55	Split Peak	barnettj	08/06/18 17:03

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 238093

Lab Sample ID: 320-41333-11 Client Sample ID: GRE09-SD1-01

Date Analyzed: 08/06/18 03:43 Lab File ID: 2018.08.05LLA_033.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.66	Baseline	barnettj	08/06/18 16:29
Perfluoroheptanoic acid (PFHpA)	2.19	Baseline	barnettj	08/06/18 16:30
Perfluorohexanesulfonic acid (PFHxS)	2.22	Baseline	barnettj	08/06/18 16:30
Perfluorononanoic acid (PFNA)	2.91	Baseline	barnettj	08/06/18 16:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 238193

Lab Sample ID: IC 320-238193/3 Client Sample ID:

Date Analyzed: 08/06/18 11:17 Lab File ID: 2018.08.06LLICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.39	Incomplete Integration	westendorfc	08/06/18 15:52

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 238576

Lab Sample ID: 320-41333-11 DL Client Sample ID: GRE09-SD1-01 DL

Date Analyzed: 08/07/18 16:34 Lab File ID: 2018.08.07LLBB_019.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.68	Baseline	hannigana	08/08/18 13:32
Perfluorooctanoic acid (PFOA)	2.58	Isomers	hannigana	08/08/18 13:32
Perfluorononanoic acid (PFNA)	2.94	Baseline	hannigana	08/08/18 13:33

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 238595

Lab Sample ID: 320-41333-2 DL Client Sample ID: 7-MW1-PRL06-01 DL

Date Analyzed: 08/07/18 22:50 Lab File ID: 2018.08.07LLBB_067.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.65	Assign Peak	hannigana	08/08/18 12:23
Perfluorooctanoic acid (PFOA)	2.58	Isomers	hannigana	08/08/18 12:23
Perfluorooctanesulfonic acid (PFOS)	2.82	Baseline	hannigana	08/08/18 12:24

Lab Sample ID: 320-41333-10 DL Client Sample ID: GRE09-SW1-01 DL

Date Analyzed: 08/07/18 22:58 Lab File ID: 2018.08.07LLBB_068.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.67	Assign Peak	hannigana	08/08/18 12:23
Perfluorooctanoic acid (PFOA)	2.58	Isomers	hannigana	08/08/18 12:25

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Instrument ID: VMS_MS1 Analysis Batch Number: 424541

Lab Sample ID: STD003 280-424541/12 IC Client Sample ID:

Date Analyzed: 08/02/18 08:53 Lab File ID: MS1_5075.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)		Invalid Compound ID	wickhamt	08/02/18 11:48
2-Chloroethyl vinyl ether		Invalid Compound ID	wickhamt	08/02/18 11:34

Lab Sample ID: STD02 280-424541/14 IC Client Sample ID:

Date Analyzed: 08/02/18 09:33 Lab File ID: MS1_5077.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:48

Lab Sample ID: STD05 280-424541/15 IC Client Sample ID:

Date Analyzed: 08/02/18 09:53 Lab File ID: MS1_5078.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:47

Lab Sample ID: STD10 280-424541/16 IC Client Sample ID:

Date Analyzed: 08/02/18 10:14 Lab File ID: MS1_5079.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:47

Lab Sample ID: STD30 280-424541/17 IC Client Sample ID:

Date Analyzed: 08/02/18 10:34 Lab File ID: MS1_5080.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:46

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Instrument ID: VMS_MS1 Analysis Batch Number: 424541

Lab Sample ID: STD60 280-424541/18 IC Client Sample ID:

Date Analyzed: 08/02/18 10:54 Lab File ID: MS1_5081.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
TBA-d9 (IS)	5.59	Assign Peak	wickhamt	08/02/18 11:40
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 11:45
m-Xylene & p-Xylene	9.93	Wrong peak	wickhamt	08/02/18 11:42

Lab Sample ID: ICV 280-424541/19 Client Sample ID:

Date Analyzed: 08/02/18 11:35 Lab File ID: MS1_5083.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/02/18 12:31

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Instrument ID: VMS_MS1 Analysis Batch Number: 424938

Lab Sample ID: CCV 280-424938/2 Client Sample ID:

Date Analyzed: 08/06/18 07:47 Lab File ID: MS1_5228.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/06/18 08:08

Lab Sample ID: LCS 280-423614/2-A Client Sample ID:

Date Analyzed: 08/06/18 11:50 Lab File ID: MS1_5240.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/06/18 12:19

Lab Sample ID: 320-41333-15 MS Client Sample ID: GRE-IDW-W-01 MS

Date Analyzed: 08/06/18 12:51 Lab File ID: MS1_5243.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/06/18 13:39

Lab Sample ID: 320-41333-15 MSD Client Sample ID: GRE-IDW-W-01 MSD

Date Analyzed: 08/06/18 13:12 Lab File ID: MS1_5244.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/06/18 13:41

Lab Sample ID: CCVC 280-424938/33 Client Sample ID:

Date Analyzed: 08/06/18 16:15 Lab File ID: MS1_5253.D GC Column: DB-624 (60.25 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone (MEK)	6.59	Shouldering	wickhamt	08/07/18 06:52

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00087	01/17/19	07/17/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM3HFPO-DA_00004	200 uL	13C3 HFPO-DA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA_00004	05/18/21	WELLINGTON, Lot M3HFPODA0518			(Purchased Reagent)		13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCMPFC_ALL_SU_00088	01/17/19	07/17/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM3HFPO-DA_00004	200 uL	13C3 HFPO-DA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA_00004	05/18/21	WELLINGTON, Lot M3HFPODA0518			(Purchased Reagent)		13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-IS_00054	12/01/18	06/01/18	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC-IS_00059	12/13/18	06/13/18	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00007	12/01/18	06/05/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00075	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00007	12/01/18	06/05/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL0_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL1_00006	11/18/18	06/05/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00151	500 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.02335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0237 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.02395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutyric acid	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid	0.025 ng/mL
							Perfluorododecanoic acid	0.025 ng/mL
							Perfluorodecane Sulfonic acid	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic acid	0.0238 ng/mL
							Perfluorohexanoic acid	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025025 ng/mL
							Perfluorononanesulfonic acid	0.024 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide	0.025 ng/mL
							Perfluoropentanoic acid	0.025 ng/mL
							Perfluoropentanesulfonic acid	0.02345 ng/mL
							Perfluorotetradecanoic acid	0.025 ng/mL
							Perfluorotridecanoic acid	0.025 ng/mL
							Perfluoroundecanoic acid	0.025 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00151	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LCPFCSP_00148	200 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.00934 ug/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.00948 ug/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.00958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							Perfluorobutyric acid	0.01 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.00884 ug/mL
							Perfluorodecanoic acid	0.01 ug/mL
							Perfluorododecanoic acid	0.01 ug/mL
							Perfluorodecane Sulfonic acid	0.00964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.01 ug/mL
							Perfluoroheptanesulfonic acid	0.00952 ug/mL
							Perfluorohexanoic acid	0.01 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0091 ug/mL
							Perfluorononanoic acid (PFNA)	0.01 ug/mL
							Perfluorooctanoic acid (PFOA)	0.01001 ug/mL
							Perfluorononanesulfonic acid	0.0096 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.00928 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctane Sulfonamide	0.01 ug/mL
							Perfluoropentanoic acid	0.01 ug/mL
							Perfluoropentanesulfonic acid	0.00938 ug/mL
							Perfluorotetradecanoic acid	0.01 ug/mL
							Perfluorotridecanoic acid	0.01 ug/mL
							Perfluoroundecanoic acid	0.01 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
...LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
...LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
...LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
...LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
...LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL1_00007	01/16/19	07/25/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	0.25 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.02335 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.02395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutyric acid	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid	0.025 ng/mL
							Perfluorododecanoic acid	0.025 ng/mL
							Perfluorodecane Sulfonic acid	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic acid	0.0238 ng/mL
							Perfluorohexanoic acid	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025025 ng/mL
							Perfluorononanesulfonic acid	0.024 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide	0.025 ng/mL
							Perfluoropentanoic acid	0.025 ng/mL
							Perfluoropentanesulfonic acid	0.02345 ng/mL
							Perfluorotetradecanoic acid	0.025 ng/mL
							Perfluorotridecanoic acid	0.025 ng/mL
							Perfluoroundecanoic acid	0.025 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL2_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00151	1000 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.0467 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0474 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutyric acid	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid	0.05 ng/mL
							Perfluorododecanoic acid	0.05 ng/mL
							Perfluorodecane Sulfonic acid	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic acid	0.0476 ng/mL
							Perfluorohexanoic acid	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorononanesulfonic acid	0.048 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide	0.05 ng/mL
							Perfluoropentanoic acid	0.05 ng/mL
							Perfluoropentanesulfonic acid	0.0469 ng/mL
							Perfluorotetradecanoic acid	0.05 ng/mL
							Perfluorotridecanoic acid	0.05 ng/mL
							Perfluoroundecanoic acid	0.05 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00151	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LCPFCSP_00148	200 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.00934 ug/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.00948 ug/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.00958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-methyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							Perfluorobutyric acid	0.01 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.00884 ug/mL
							Perfluorodecanoic acid	0.01 ug/mL
							Perfluorododecanoic acid	0.01 ug/mL
							Perfluorodecane Sulfonic acid	0.00964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.01 ug/mL
							Perfluoroheptanesulfonic acid	0.00952 ug/mL
							Perfluorohexanoic acid	0.01 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0091 ug/mL
							Perfluorononanoic acid (PFNA)	0.01 ug/mL
							Perfluorooctanoic acid (PFOA)	0.01001 ug/mL
							Perfluorononanesulfonic acid	0.0096 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.00928 ug/mL
							Perfluorooctane Sulfonamide	0.01 ug/mL
							Perfluoropentanoic acid	0.01 ug/mL
							Perfluoropentanesulfonic acid	0.00938 ug/mL
							Perfluorotetradecanoic acid	0.01 ug/mL
							Perfluorotridecanoic acid	0.01 ug/mL
							Perfluoroundecanoic acid	0.01 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
...LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
...LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
...LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
...LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
...LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL2_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	0.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.0467 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0474 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutyric acid	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid	0.05 ng/mL
							Perfluorododecanoic acid	0.05 ng/mL
							Perfluorodecane Sulfonic acid	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic acid	0.0476 ng/mL
							Perfluorohexanoic acid	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorononanesulfonic acid	0.048 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide	0.05 ng/mL
							Perfluoropentanoic acid	0.05 ng/mL
							Perfluoropentanesulfonic acid	0.0469 ng/mL
							Perfluorotetradecanoic acid	0.05 ng/mL
							Perfluorotridecanoic acid	0.05 ng/mL
							Perfluoroundecanoic acid	0.05 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL3_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.2335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.2395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutyric acid	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL
							Perfluorodecanoic acid	0.25 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid	0.25 ng/mL
							Perfluorodecane Sulfonic acid	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic acid	0.238 ng/mL
							Perfluorohexanoic acid	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25025 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide	0.25 ng/mL
							Perfluoropentanoic acid	0.25 ng/mL
							Perfluoropentanesulfonic acid	0.2345 ng/mL
							Perfluorotetradecanoic acid	0.25 ng/mL
							Perfluorotridecanoic acid	0.25 ng/mL
							Perfluoroundecanoic acid	0.25 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL3_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	2.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.2335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.2395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutyric acid	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL
							Perfluorodecanoic acid	0.25 ng/mL
							Perfluorododecanoic acid	0.25 ng/mL
							Perfluorodecane Sulfonic acid	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic acid	0.238 ng/mL
							Perfluorohexanoic acid	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25025 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide	0.25 ng/mL
							Perfluoropentanoic acid	0.25 ng/mL
							Perfluoropentanesulfonic acid	0.2345 ng/mL
							Perfluorotetradecanoic acid	0.25 ng/mL
							Perfluorotridecanoic acid	0.25 ng/mL
							Perfluoroundecanoic acid	0.25 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL4_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	400 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.934 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.948 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.958 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1.001 ng/mL
							Perfluorononanesulfonic acid	0.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL4_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	10 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.934 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.948 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.958 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1.001 ng/mL
							Perfluorononanesulfonic acid	0.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL5_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	1000 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	2.335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	2.37 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	2.395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutyric acid	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluorodecanoic acid	2.5 ng/mL
							Perfluorododecanoic acid	2.5 ng/mL
							Perfluorodecane Sulfonic acid	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic acid	2.38 ng/mL
							Perfluorohexanoic acid	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorononanesulfonic acid	2.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide	2.5 ng/mL
							Perfluoropentanoic acid	2.5 ng/mL
							Perfluoropentanesulfonic acid	2.345 ng/mL
							Perfluorotetradecanoic acid	2.5 ng/mL
							Perfluorotridecanoic acid	2.5 ng/mL
							Perfluoroundecanoic acid	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL5_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	25 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	2.335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	2.37 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	2.395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutyric acid	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluorodecanoic acid	2.5 ng/mL
							Perfluorododecanoic acid	2.5 ng/mL
							Perfluorodecane Sulfonic acid	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic acid	2.38 ng/mL
							Perfluorohexanoic acid	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorononanesulfonic acid	2.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide	2.5 ng/mL
							Perfluoropentanoic acid	2.5 ng/mL
							Perfluoropentanesulfonic acid	2.345 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid	2.5 ng/mL
							Perfluorotridecanoic acid	2.5 ng/mL
							Perfluoroundecanoic acid	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL6_00006	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	2 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	4.67 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	4.74 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	4.79 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5.005 ng/mL
							Perfluorononanesulfonic acid	4.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluoropentanesulfonic acid	4.69 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL6_00007	01/16/19	07/25/18	MeOH/H2O, Lot 090285	30 mL	LCMPFC_ICALSU_00001	1.5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	7.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	4.67 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	4.74 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	4.79 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5.005 ng/mL
							Perfluorononanesulfonic acid	4.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluoropentanesulfonic acid	4.69 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL7_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	4 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	9.34 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	9.48 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	9.58 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutyric acid	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid	10 ng/mL
							Perfluorododecanoic acid	10 ng/mL
							Perfluorodecane Sulfonic acid	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic acid	9.52 ng/mL
							Perfluorohexanoic acid	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10.01 ng/mL
							Perfluorononanesulfonic acid	9.6 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide	10 ng/mL
							Perfluoropentanoic acid	10 ng/mL
							Perfluoropentanesulfonic acid	9.38 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid	10 ng/mL
							Perfluorotridecanoic acid	10 ng/mL
							Perfluoroundecanoic acid	10 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC_LL7_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	30 mL	LCMPFC_ICALSU_00001	1.5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	15 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	9.34 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	9.48 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	9.58 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutyric acid	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid	10 ng/mL
							Perfluorododecanoic acid	10 ng/mL
							Perfluorodecane Sulfonic acid	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic acid	9.52 ng/mL
							Perfluorohexanoic acid	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10.01 ng/mL
							Perfluorononanesulfonic acid	9.6 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide	10 ng/mL
							Perfluoropentanoic acid	10 ng/mL
							Perfluoropentanesulfonic acid	9.38 ng/mL
							Perfluorotetradecanoic acid	10 ng/mL
							Perfluorotridecanoic acid	10 ng/mL
							Perfluoroundecanoic acid	10 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_FULL_00012	12/05/18	07/05/18	MeOH/H2O, Lot 09285	10 mL	LCMPFC_ALL_SU_00075	0.5 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFCIC_FULL_00012	12/05/18	07/05/18	MeOH/H2O, Lot 09285	10 mL	LCMPFC_ALL_SU_00075	0.5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00155	1.25 mL	Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00008	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00010	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00015	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFDA_00020	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23	Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00155	12/17/18	06/17/18	Methanol, Lot 180632	250 mL	LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFCIC_FULL_00013	01/25/19	07/31/18	MeOH/H2O, Lot 09285	100 mL	LCMPFC_ICALSU_00001	5 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFCIC_FULL_00013	01/25/19	07/31/18	MeOH/H2O, Lot 09285	100 mL	LCMPFC_ICALSU_00001	5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFAC-24PAR_00002	125 uL	Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.28 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5-PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFAC-24PAR_00002	04/18/23	Wellington Laboratories, Lot PFAC24PAR0418			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00161	01/16/19	07/16/18	Methanol, Lot 180632	250 mL	LC11CIPF3OUdS_00002	100 uL	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	0.01884 ug/mL
					LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LC9CI-PF3ONS_00002	100 uL	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	0.01864 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCDONA_00002	100 uL	ADONA	0.02 ug/mL
					LCHFPO-DA_00002	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid	0.02 ug/mL
					LCPFHxDA_00010	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFODA_00010	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic acid	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid	0.02 ug/mL
.LC11CIPF3OUdS_00002	09/30/21	Wellington Labs, Lot 11CIPF3OUdS0916			(Purchased Reagent)		11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	47.1 ug/mL
.LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
.LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
.LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
.LC9CI-PF3ONS_00002	09/30/21	Wellington Labs, Lot 9CIPF3ONS0916			(Purchased Reagent)		9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	46.6 ug/mL
.LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCDONA_00002	03/26/23	WELLINGTON, Lot NADONA0318			(Purchased Reagent)		ADONA	50 ug/mL
.LCHFPO-DA_00002	03/26/21	WELLINGTON, Lot HFPODA0318			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL
.LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic acid	47.6 ug/mL
.LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00010	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
.LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
.LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00010	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
.LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
MV-2cleve+AVA_00037	10/31/18	07/20/18	P&T Methanol, Lot 177891	10 mL	MV-568720_00022	202.5 uL	Acrolein	399.938 ug/mL
					MV-569723_00004	160 uL	2-Chloroethyl vinyl ether	40 ug/mL
					MV-569724_00016	160 uL	Vinyl acetate	80 ug/mL
.MV-568720_00022	10/31/18	RESTEK, Lot A0137497			(Purchased Reagent)		Acrolein	19750 ug/mL
.MV-569723_00004	12/31/20	RESTEK, Lot A0133302			(Purchased Reagent)		2-Chloroethyl vinyl ether	2500 ug/mL
.MV-569724_00016	10/31/18	RESTEK, Lot A0137562			(Purchased Reagent)		Vinyl acetate	5000 ug/mL
MV-568718-D_00014	05/31/22	RESTEK, Lot A0127975			(Purchased Reagent)		1,4-Dichlorobenzene-d4	250 ug/mL
							Chlorobenzene-d5	250 ug/mL
							Fluorobenzene	250 ug/mL
							TBA-d9 (IS)	5000 ug/mL
MV-ARCH SS A_00101	01/25/19	07/25/18	P&T Methanol, Lot 177891	50 mL	MV-567650_00027	5 mL	1,2-Dichloroethane-d4 (Surr)	250 ug/mL
							4-Bromofluorobenzene (Surr)	250 ug/mL
							Dibromofluoromethane (Surr)	250 ug/mL
							Toluene-d8 (Surr)	250 ug/mL
.MV-567650_00027	01/31/22	Restek, Lot A0124069			(Purchased Reagent)		1,2-Dichloroethane-d4 (Surr)	2500 ug/mL
							4-Bromofluorobenzene (Surr)	2500 ug/mL
							Dibromofluoromethane (Surr)	2500 ug/mL
							Toluene-d8 (Surr)	2500 ug/mL
MV-BFB_00026							1,2-Dichloroethene, Total	
							1,2-Dichloroethene, Total (URS)	
							1,3-Dichloropropene, Total	
							TAH	
							Tentatively Identified Compound	
							Total BTEX	
							Trihalomethanes, Total	
							Xylenes, Total	
							Xylenes, Total (URS)	
					MV-STS110N1_00066	1.25 mL	BFB	50 ug/mL
.MV-STS110N1_00066	10/31/19	Ultra Scientific, Lot CH-3248Z			(Purchased Reagent)		BFB	2000 ug/mL
MV-Gas/Ket A_00075	12/30/18	06/30/18	P&T Methanol, Lot 178178	10 mL	MV-569721_00006	128 uL	2-Butanone (MEK)	160 ug/mL
					MV-569722_00008	160 uL	Vinyl chloride	40 ug/mL
.MV-569721_00006	10/31/20	RESTEK, Lot A0131486			(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
.MV-569722_00008	10/31/20	RESTEK, Lot A0131502			(Purchased Reagent)		Vinyl chloride	2500 ug/mL
MV-Gas/Ket A_00076	01/25/19	07/25/18	P&T Methanol, Lot 178178	10 mL	MV-569721_00006	128 uL	2-Butanone (MEK)	160 ug/mL
							2-Hexanone	160 ug/mL
							4-Methyl-2-pentanone (MIBK)	160 ug/mL
							Acetone	160 ug/mL
					MV-569722_00008	160 uL	Bromomethane	40 ug/mL
							Chloroethane	40 ug/mL
							Chloromethane	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dichlorodifluoromethane	40 ug/mL
							Dichlorofluoromethane	40 ug/mL
							Trichlorofluoromethane	40 ug/mL
							Vinyl chloride	40 ug/mL
					MV-569727_00006	640 uL	Cyclohexanone	1600 ug/mL
.MV-569721_00006	10/31/20		RESTEK, Lot A0131486		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
							2-Hexanone	12500 ug/mL
							4-Methyl-2-pentanone (MIBK)	12500 ug/mL
							Acetone	12500 ug/mL
.MV-569722_00008	10/31/20		RESTEK, Lot A0131502		(Purchased Reagent)		Bromomethane	2500 ug/mL
							Chloroethane	2500 ug/mL
							Chloromethane	2500 ug/mL
							Dichlorodifluoromethane	2500 ug/mL
							Dichlorofluoromethane	2500 ug/mL
							Trichlorofluoromethane	2500 ug/mL
							Vinyl chloride	2500 ug/mL
.MV-569727_00006	03/31/19		RESTEK, Lot A0118487		(Purchased Reagent)		Cyclohexanone	25000 ug/mL
MV-Gas/Ket B_00043	11/30/18	05/28/18	P&T Methanol, Lot 177891	10 mL	MV-569721.sec_00005	128 uL	2-Butanone (MEK)	160 ug/mL
					MV-569722.sec_00004	160 uL	Vinyl chloride	40 ug/mL
.MV-569721.sec_00005	01/31/20		RESTEK, Lot A0113880		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
.MV-569722.sec_00004	01/31/20		RESTEK, Lot A0124116		(Purchased Reagent)		Vinyl chloride	2500 ug/mL
MV-Gas/Ket B_00044	11/30/18	07/17/18	P&T Methanol, Lot 177891	10 mL	MV-569721.sec_00005	128 uL	2-Butanone (MEK)	160 ug/mL
					MV-569722.sec_00004	160 uL	Vinyl chloride	40 ug/mL
.MV-569721.sec_00005	01/31/20		RESTEK, Lot A0113880		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
.MV-569722.sec_00004	01/31/20		RESTEK, Lot A0124116		(Purchased Reagent)		Vinyl chloride	2500 ug/mL
MV-Main A_00037	12/31/18	06/30/18	P&T Methanol, Lot 177891	20 mL	MV-571992_00001	320 uL	1,1,1,2-Tetrachloroethane	40 ug/mL
							1,1,1-Trichloroethane	40 ug/mL
							1,1,2,2-Tetrachloroethane	40 ug/mL
							1,1,2-Trichloro-1,2,2-trifluoroethane	40 ug/mL
							1,1,2-Trichloroethane	40 ug/mL
							1,1-Dichloroethane	40 ug/mL
							1,1-Dichloroethene	40 ug/mL
							1,1-Dichloropropene	40 ug/mL
							1,2,3-Trichlorobenzene	40 ug/mL
							1,2,3-Trichloropropane	40 ug/mL
							1,2,4-Trichlorobenzene	40 ug/mL
							1,2,4-Trimethylbenzene	40 ug/mL
							1,2-Dibromo-3-Chloropropane	40 ug/mL
							1,2-Dichlorobenzene	40 ug/mL
							1,2-Dichloroethane	40 ug/mL
							1,2-Dichloropropane	40 ug/mL
							1,3,5-Trimethylbenzene	40 ug/mL
							1,3-Dichlorobenzene	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,3-Dichloropropane	40 ug/mL
							1,4-Dichlorobenzene	40 ug/mL
							1,4-Dioxane	800 ug/mL
							2,2-Dichloropropane	40 ug/mL
							2-Chlorotoluene	40 ug/mL
							2-Methyl-2-propanol	400 ug/mL
							3-Chloro-1-propene	40 ug/mL
							4-Chlorotoluene	40 ug/mL
							4-Isopropyltoluene	40 ug/mL
							Acrylonitrile	400 ug/mL
							Benzene	40 ug/mL
							Bromobenzene	40 ug/mL
							Bromoform	40 ug/mL
							Carbon disulfide	40 ug/mL
							Carbon tetrachloride	40 ug/mL
							Chlorobenzene	40 ug/mL
							Chlorobromomethane	40 ug/mL
							Chlorodibromomethane	40 ug/mL
							Chloroform	40 ug/mL
							cis-1,2-Dichloroethene	40 ug/mL
							cis-1,3-Dichloropropene	40 ug/mL
							Cyclohexane	40 ug/mL
							Dibromomethane	40 ug/mL
							Dichlorobromomethane	40 ug/mL
							Ethyl ether	40 ug/mL
							Ethyl methacrylate	40 ug/mL
							Ethylbenzene	40 ug/mL
							Ethylene Dibromide	40 ug/mL
							Hexachlorobutadiene	40 ug/mL
							Hexane	40 ug/mL
							Iodomethane	40 ug/mL
							Isobutyl alcohol	1000 ug/mL
							Isopropylbenzene	40 ug/mL
							m-Xylene & p-Xylene	40 ug/mL
							Methyl acetate	80 ug/mL
							Methyl tert-butyl ether	40 ug/mL
							Methylcyclohexane	40 ug/mL
							Methylene Chloride	40 ug/mL
							n-Butylbenzene	40 ug/mL
							N-Propylbenzene	40 ug/mL
							Naphthalene	40 ug/mL
							o-Xylene	40 ug/mL
							sec-Butylbenzene	40 ug/mL
							Styrene	40 ug/mL
							tert-Butylbenzene	40 ug/mL
							Tetrachloroethene	40 ug/mL
							Tetrahydrofuran	80 ug/mL
							Toluene	40 ug/mL

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							trans-1,2-Dichloroethene	40 ug/mL
							trans-1,3-Dichloropropene	40 ug/mL
							trans-1,4-Dichloro-2-butene	40 ug/mL
							Trichloroethene	40 ug/mL
					MV-CUS17739_00002	800 uL	1-Chlorohexane	40 ug/mL
							2-Pentanone	160 ug/mL
							sec-Butyl Alcohol	1200 ug/mL
.MV-571992_00001	12/31/18	RESTEK, Lot A0123711			(Purchased Reagent)		1,1,1,2-Tetrachloroethane	2500 ug/mL
							1,1,1-Trichloroethane	2500 ug/mL
							1,1,2,2-Tetrachloroethane	2500 ug/mL
							1,1,2-Trichloro-1,2,2-trifluor oethane	2500 ug/mL
							1,1,2-Trichloroethane	2500 ug/mL
							1,1-Dichloroethane	2500 ug/mL
							1,1-Dichloroethene	2500 ug/mL
							1,1-Dichloropropene	2500 ug/mL
							1,2,3-Trichlorobenzene	2500 ug/mL
							1,2,3-Trichloropropane	2500 ug/mL
							1,2,4-Trichlorobenzene	2500 ug/mL
							1,2,4-Trimethylbenzene	2500 ug/mL
							1,2-Dibromo-3-Chloropropane	2500 ug/mL
							1,2-Dichlorobenzene	2500 ug/mL
							1,2-Dichloroethane	2500 ug/mL
							1,2-Dichloropropane	2500 ug/mL
							1,3,5-Trimethylbenzene	2500 ug/mL
							1,3-Dichlorobenzene	2500 ug/mL
							1,3-Dichloropropane	2500 ug/mL
							1,4-Dichlorobenzene	2500 ug/mL
							1,4-Dioxane	50000 ug/mL
							2,2-Dichloropropane	2500 ug/mL
							2-Chlorotoluene	2500 ug/mL
							2-Methyl-2-propanol	25000 ug/mL
							3-Chloro-1-propene	2500 ug/mL
							4-Chlorotoluene	2500 ug/mL
							4-Isopropyltoluene	2500 ug/mL
							Acrylonitrile	25000 ug/mL
							Benzene	2500 ug/mL
							Bromobenzene	2500 ug/mL
							Bromoform	2500 ug/mL
							Carbon disulfide	2500 ug/mL
							Carbon tetrachloride	2500 ug/mL
							Chlorobenzene	2500 ug/mL
							Chlorobromomethane	2500 ug/mL
							Chlorodibromomethane	2500 ug/mL
							Chloroform	2500 ug/mL
							cis-1,2-Dichloroethene	2500 ug/mL
							cis-1,3-Dichloropropene	2500 ug/mL
							Cyclohexane	2500 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibromomethane	2500 ug/mL
							Dichlorobromomethane	2500 ug/mL
							Ethyl ether	2500 ug/mL
							Ethyl methacrylate	2500 ug/mL
							Ethylbenzene	2500 ug/mL
							Ethylene Dibromide	2500 ug/mL
							Hexachlorobutadiene	2500 ug/mL
							Hexane	2500 ug/mL
							Iodomethane	2500 ug/mL
							Isobutyl alcohol	62500 ug/mL
							Isopropylbenzene	2500 ug/mL
							m-Xylene & p-Xylene	2500 ug/mL
							Methyl acetate	5000 ug/mL
							Methyl tert-butyl ether	2500 ug/mL
							Methylcyclohexane	2500 ug/mL
							Methylene Chloride	2500 ug/mL
							n-Butylbenzene	2500 ug/mL
							N-Propylbenzene	2500 ug/mL
							Naphthalene	2500 ug/mL
							o-Xylene	2500 ug/mL
							sec-Butylbenzene	2500 ug/mL
							Styrene	2500 ug/mL
							tert-Butylbenzene	2500 ug/mL
							Tetrachloroethene	2500 ug/mL
							Tetrahydrofuran	5000 ug/mL
							Toluene	2500 ug/mL
							trans-1,2-Dichloroethene	2500 ug/mL
							trans-1,3-Dichloropropene	2500 ug/mL
							trans-1,4-Dichloro-2-butene	2500 ug/mL
							Trichloroethene	2500 ug/mL
.MV-CUS17739_00002	07/31/19		Ultra, Lot CR-2819		(Purchased Reagent)		1-Chlorohexane	1000 ug/mL
							2-Pentanone	4000 ug/mL
							sec-Butyl Alcohol	30000 ug/mL
MV-Main B_00022	12/31/18	08/01/18	P&T Methanol, Lot 127999	20 mL	MV-571992.sec_00001	320 uL	1,1-Dichloroethene	40 ug/mL
							1,2-Dichloroethane	40 ug/mL
							Benzene	40 ug/mL
							Carbon tetrachloride	40 ug/mL
							Chlorobenzene	40 ug/mL
							Chloroform	40 ug/mL
							Tetrachloroethene	40 ug/mL
							Trichloroethene	40 ug/mL
.MV-571992.sec_00001	12/31/18		RESTEK, Lot A0123775		(Purchased Reagent)		1,1-Dichloroethene	2500 ug/mL
							1,2-Dichloroethane	2500 ug/mL
							Benzene	2500 ug/mL
							Carbon tetrachloride	2500 ug/mL
							Chlorobenzene	2500 ug/mL
							Chloroform	2500 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Tetrachloroethene	2500 ug/mL
							Trichloroethene	2500 ug/mL
MV-Supp A_00031	11/20/18	06/30/18	P&T Methanol, Lot 12799	10 mL	mv-570808_00004	160 uL	1,2,3-Trimethylbenzene	40 ug/mL
							2-Chloro-1,3-butadiene	40 ug/mL
							2-Nitropropane	80 ug/mL
							Isopropyl alcohol	400 ug/mL
							Methacrylonitrile	400 ug/mL
							n-Butanol	1000 ug/mL
					mv-570809_00004	160 uL	Ethyl acetate	80 ug/mL
							Methyl methacrylate	80 ug/mL
					mv-571993_00002	160 uL	Acetonitrile	400 ug/mL
							Isopropyl ether	40 ug/mL
							Propionitrile	400 ug/mL
							Tert-amyl methyl ether	40 ug/mL
							Tert-butyl ethyl ether	40 ug/mL
					mv-571994_00002	240 uL	Ethanol	2400 ug/mL
					mv-VO-TAOH-5_00005	800 uL	cis-1,4-Dichloro-2-butene	80 ug/mL
.mv-570808_00004	05/31/19	Restek, Lot A0132816			(Purchased Reagent)		1,2,3-Trimethylbenzene	2500 ug/mL
							2-Chloro-1,3-butadiene	2500 ug/mL
							2-Nitropropane	5000 ug/mL
							Isopropyl alcohol	25000 ug/mL
							Methacrylonitrile	25000 ug/mL
							n-Butanol	62500 ug/mL
.mv-570809_00004	04/30/19	Restek, Lot A0131668			(Purchased Reagent)		Ethyl acetate	5000 ug/mL
							Methyl methacrylate	5000 ug/mL
.mv-571993_00002	11/30/19	RESTEK, Lot A0132831			(Purchased Reagent)		Acetonitrile	25000 ug/mL
							Isopropyl ether	2500 ug/mL
							Propionitrile	25000 ug/mL
							Tert-amyl methyl ether	2500 ug/mL
							Tert-butyl ethyl ether	2500 ug/mL
.mv-571994_00002	11/30/20	RESTEK, Lot A0132270			(Purchased Reagent)		Ethanol	100000 ug/mL
.mv-VO-TAOH-5_00005	11/20/18	SPEX, Lot EN180524019			(Purchased Reagent)		cis-1,4-Dichloro-2-butene	1000 ug/mL

Reagent

LC11CIPF3OUdS_00002

h: 4/18/18 SKJ

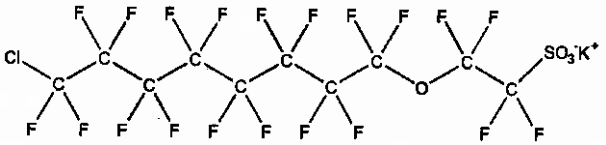
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 11Cl-PF3OUdS **LOT NUMBER:** 11ClPF3OUdS0916

COMPOUND: Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate

STRUCTURE: **CAS #:** 83329-89-9



MOLECULAR FORMULA: $C_{10}F_{20}ClSO_4K$ **MOLECULAR WEIGHT:** 670.69

CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol

47.1 ± 2.4 µg/ml (11Cl-PF3OUdS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 09/30/2016

EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This compound is a minor component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

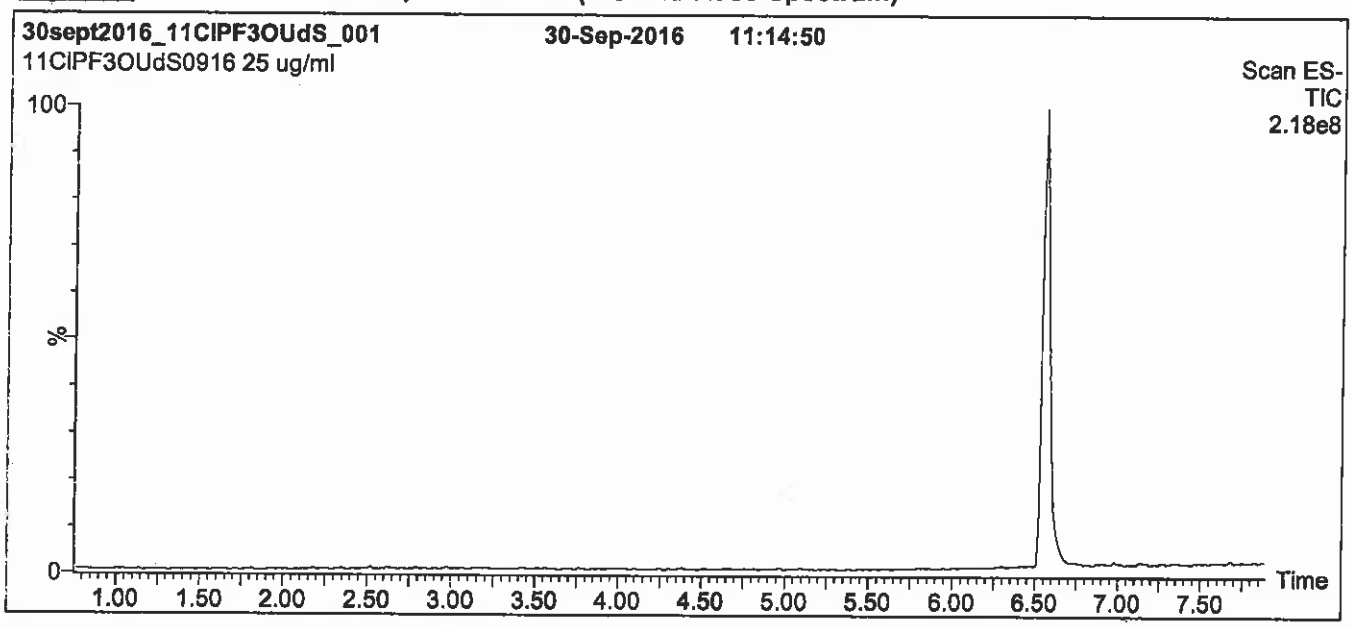
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

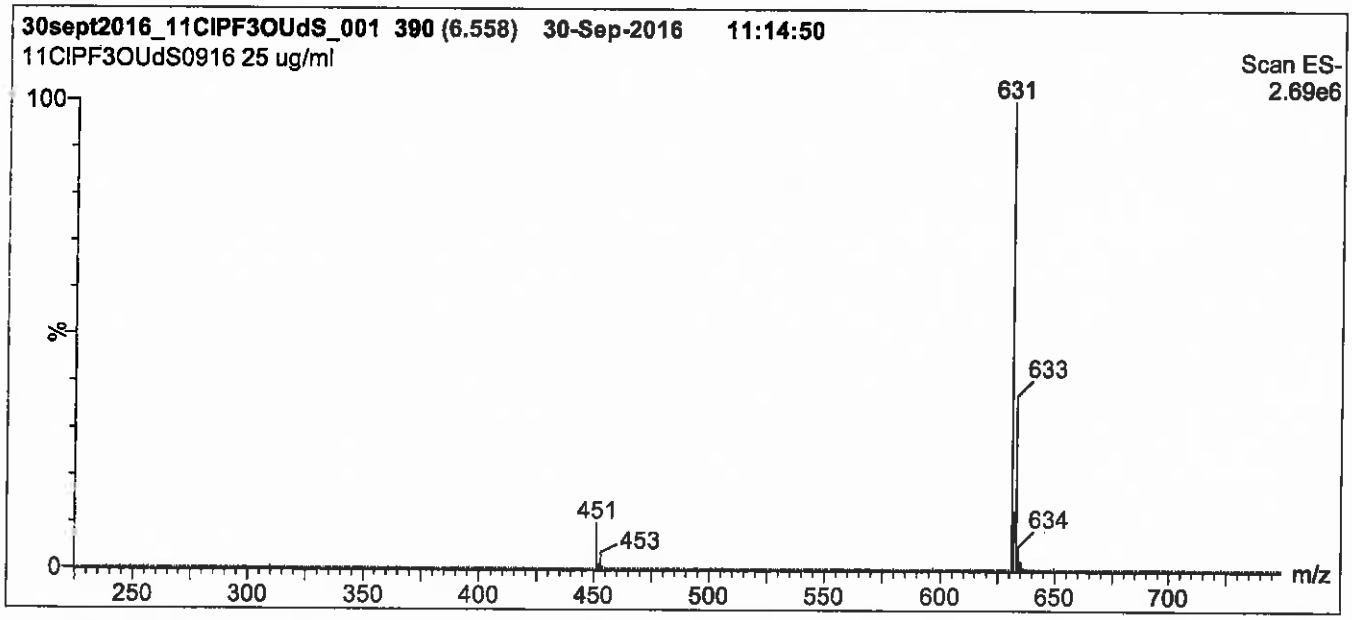
CALA

ANAB ACCREDITED PRODUCER REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **11Cl-PF3OUdS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

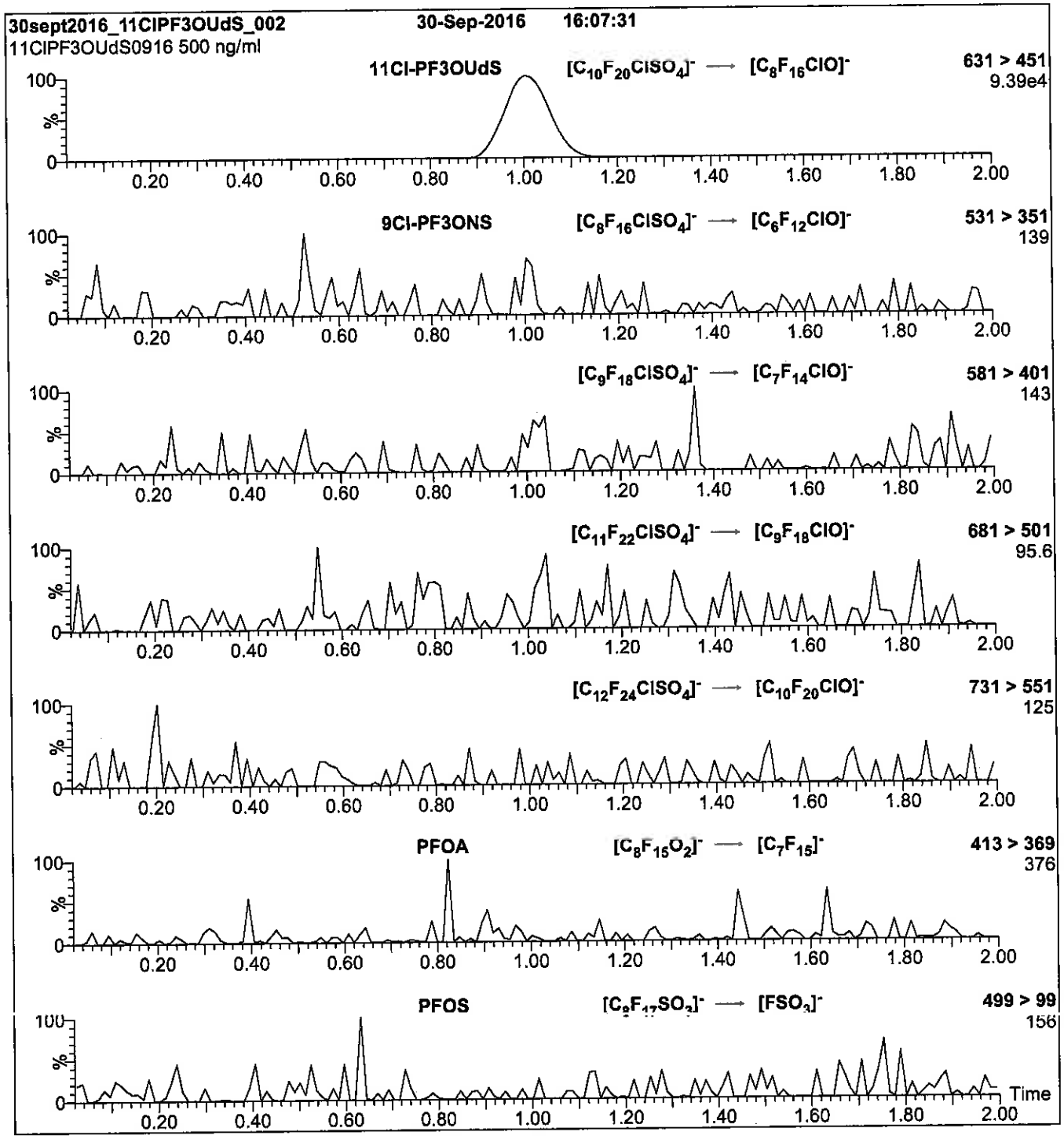
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 45.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **11Cl-PF3OUdS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 11Cl-PF3OUdS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 20

Reagent

LC4:2FTS_00005

r: 9/21/17 SKV

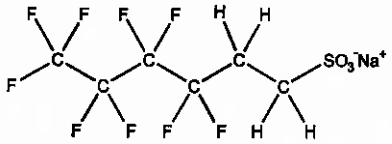
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216

COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_6H_4F_9SO_3Na$ **MOLECULAR WEIGHT:** 350.13

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

46.7 ± 2.3 µg/ml (4:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 12/12/2016

EXPIRY DATE: (mm/dd/yyyy) 12/12/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/21/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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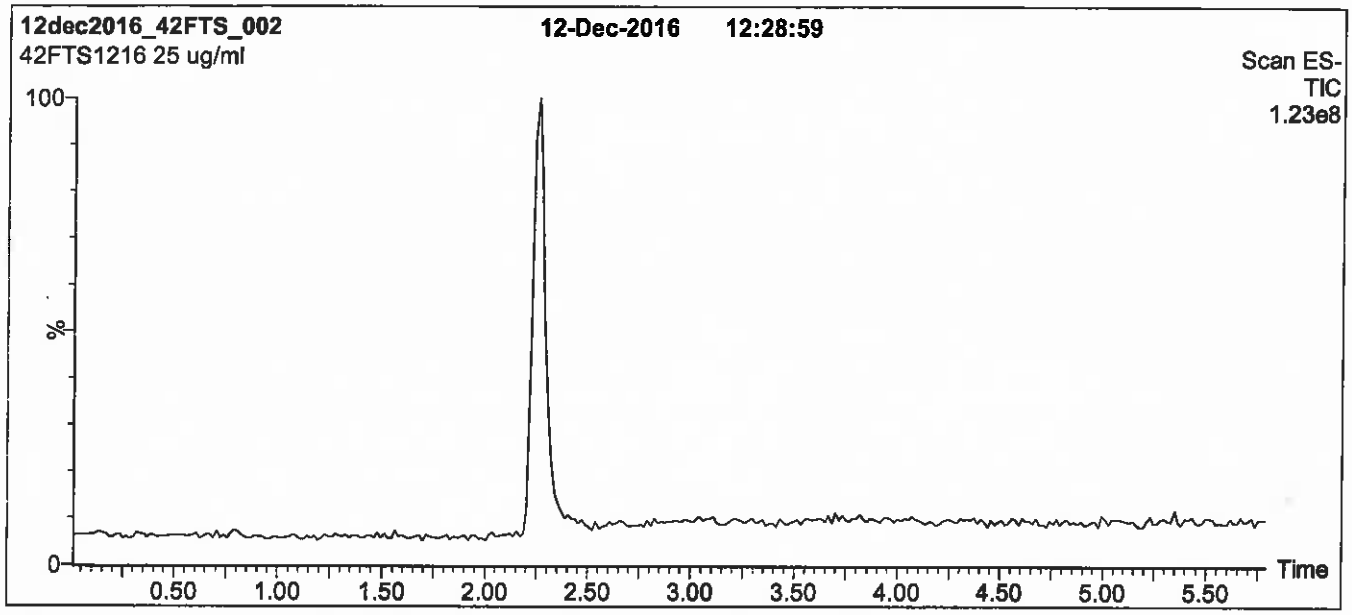
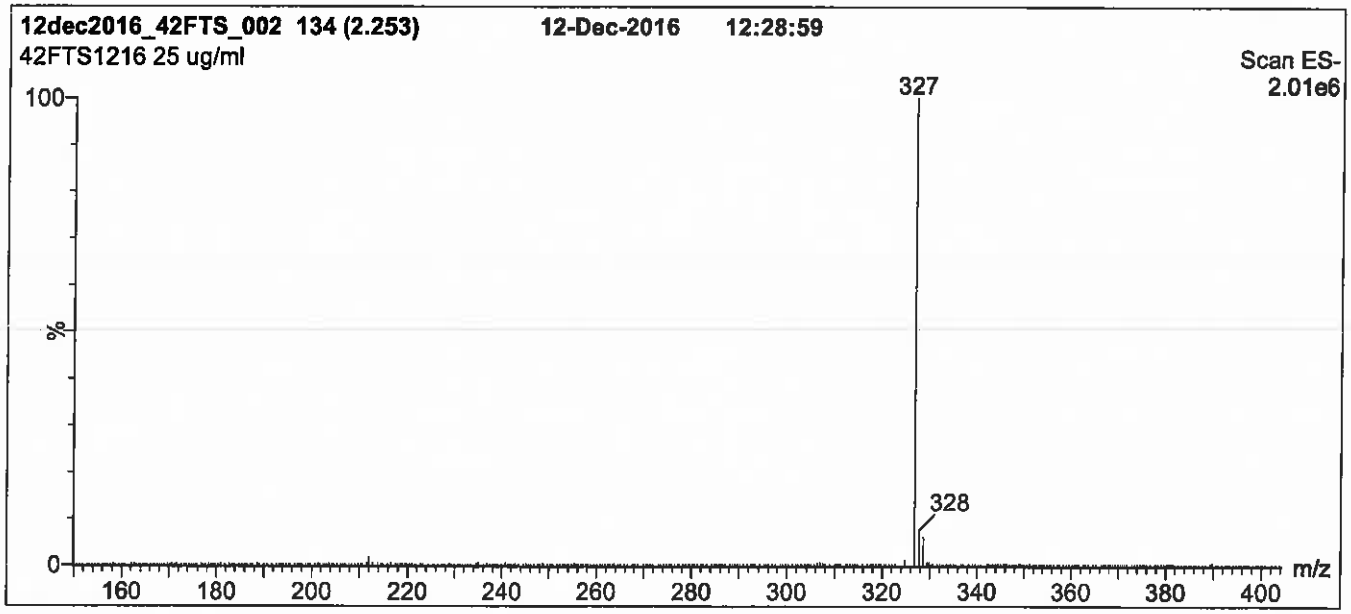
Figure 1: **4:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

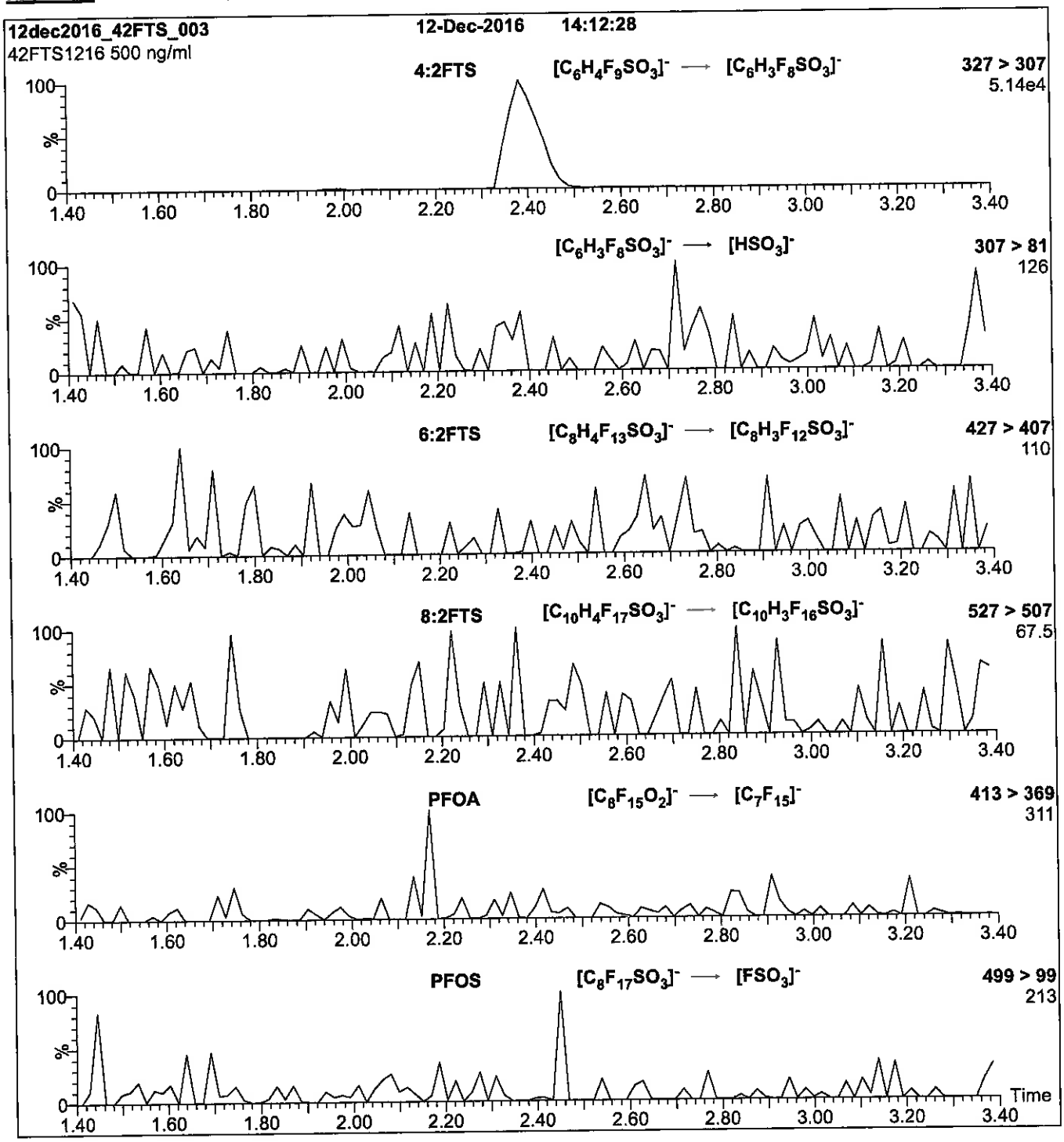
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 4:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 25

Reagent

LC6:2FTS_00007

r: 9/21/17 SKW

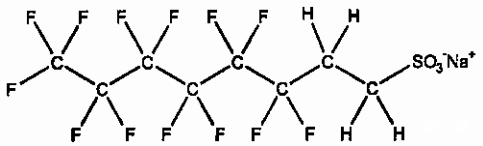
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0417

COMPOUND: Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_8H_4F_{13}SO_3Na$ **MOLECULAR WEIGHT:** 450.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.4 ± 2.4 µg/ml (6:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 04/20/2017

EXPIRY DATE: (mm/dd/yyyy) 04/20/2022

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/24/2017 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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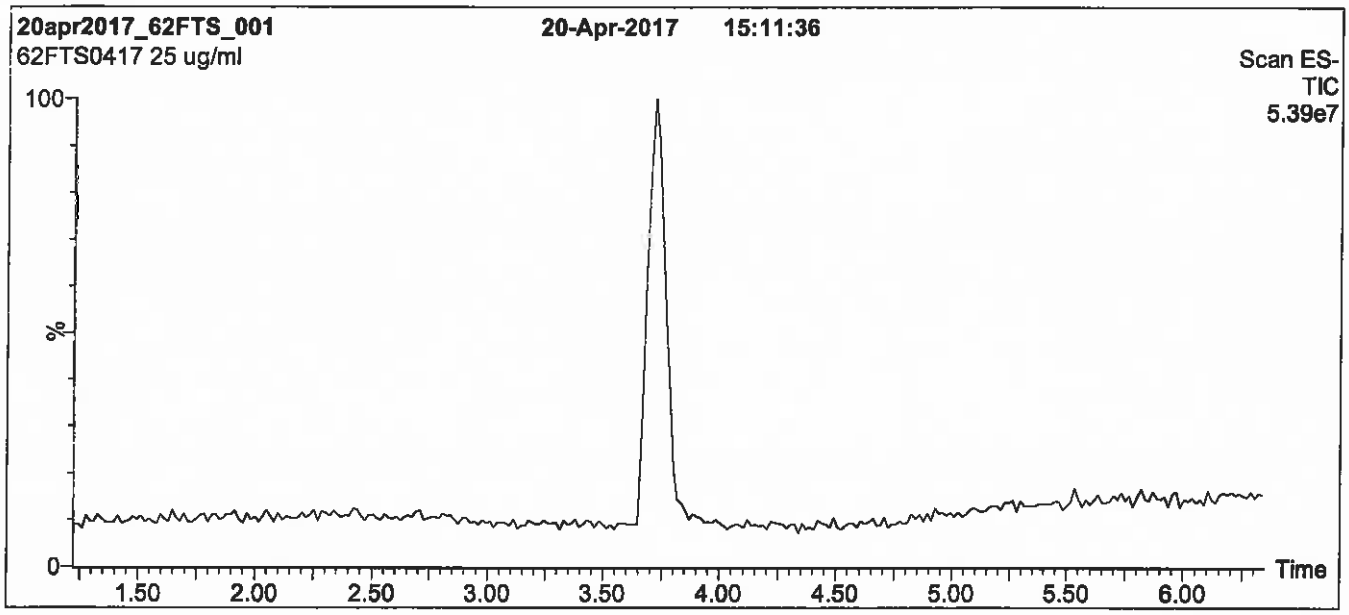
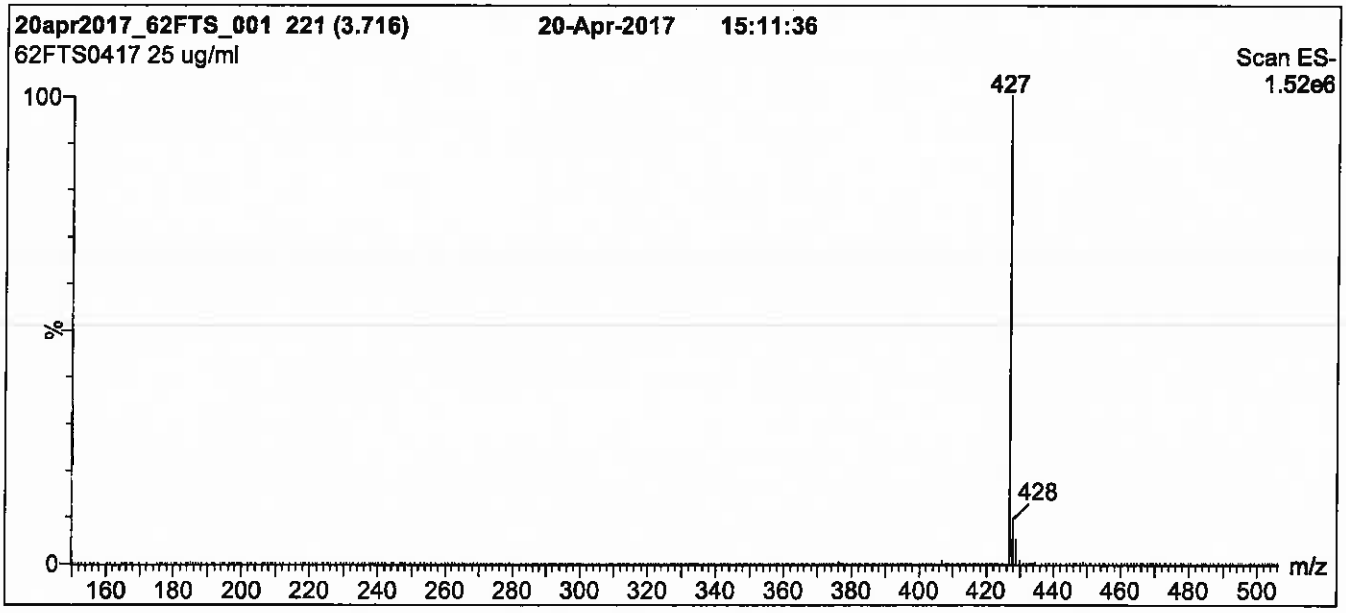
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

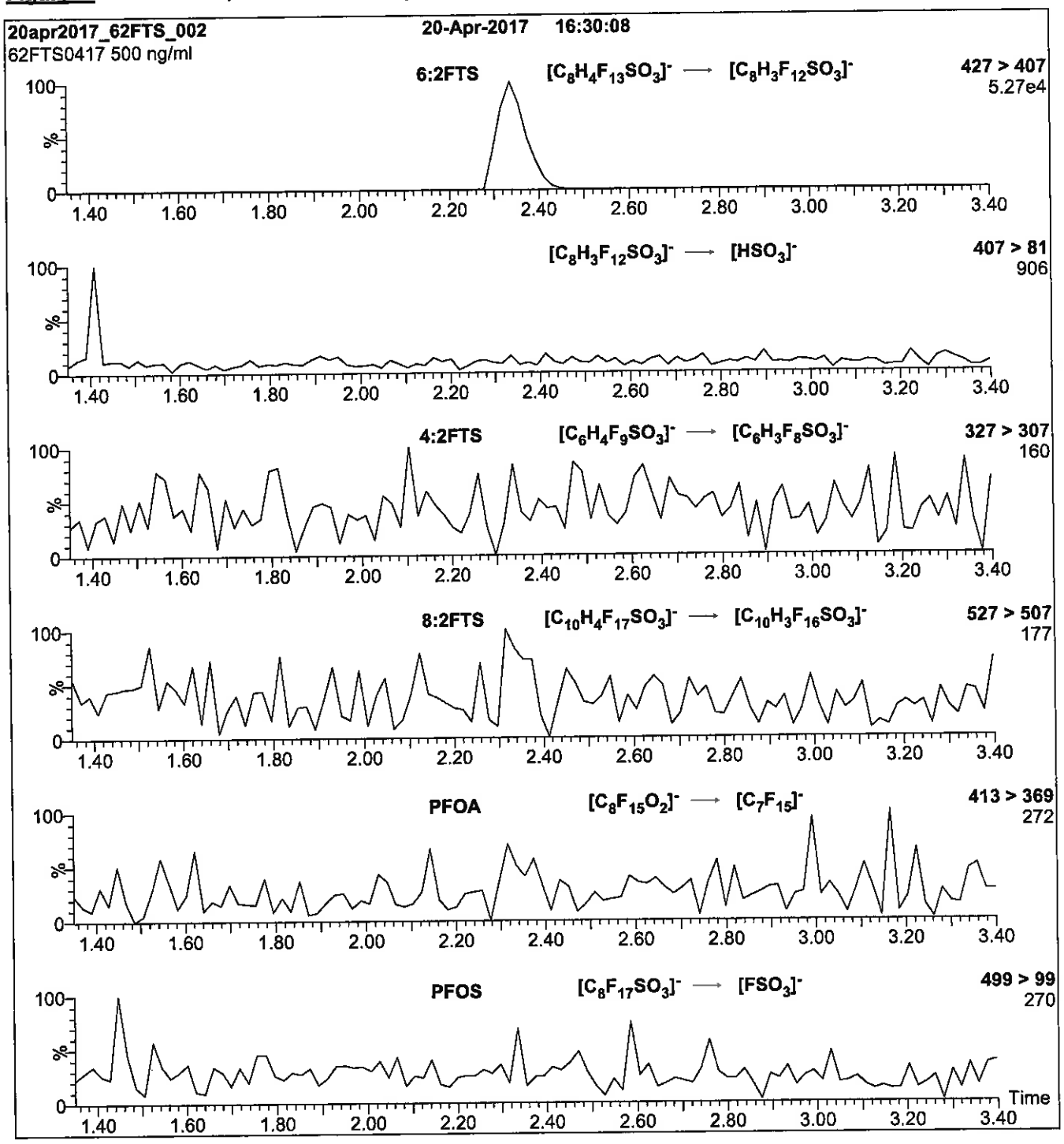
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LC8:2FTS_00007

r: 9/21/17 SK

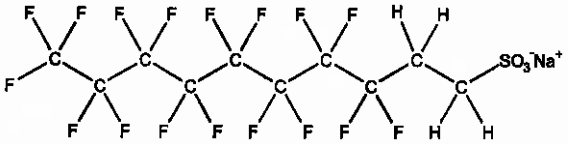
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1216

COMPOUND: Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{10}H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 550.16

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.9 ± 2.4 µg/ml (8:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 12/12/2016

EXPIRY DATE: (mm/dd/yyyy) 12/12/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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Certified By: B.G. Chittim **Date:** 12/21/2016 (mm/dd/yyyy)

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Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

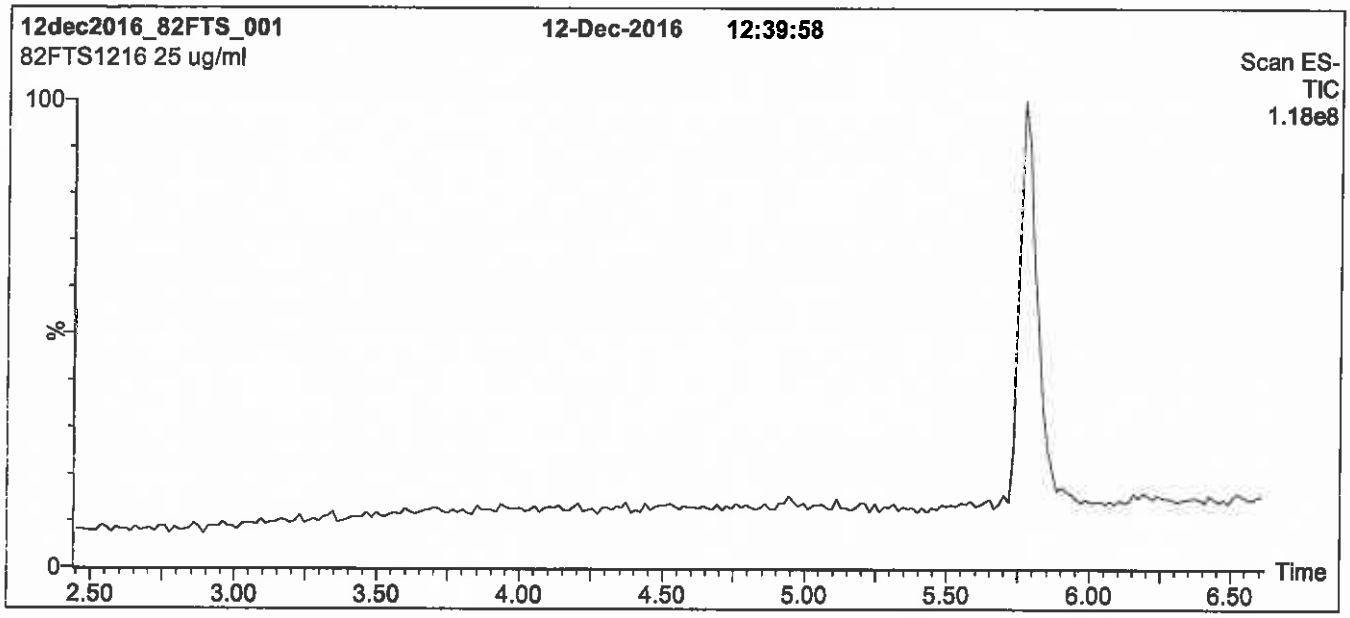
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

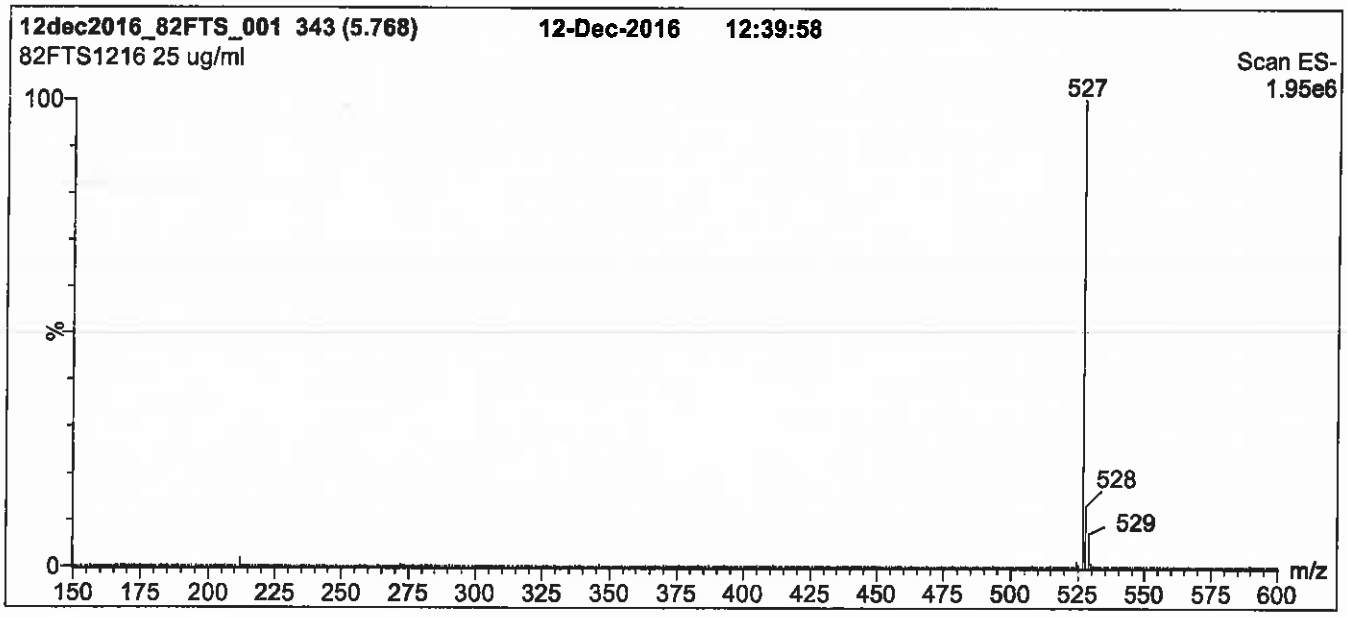
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

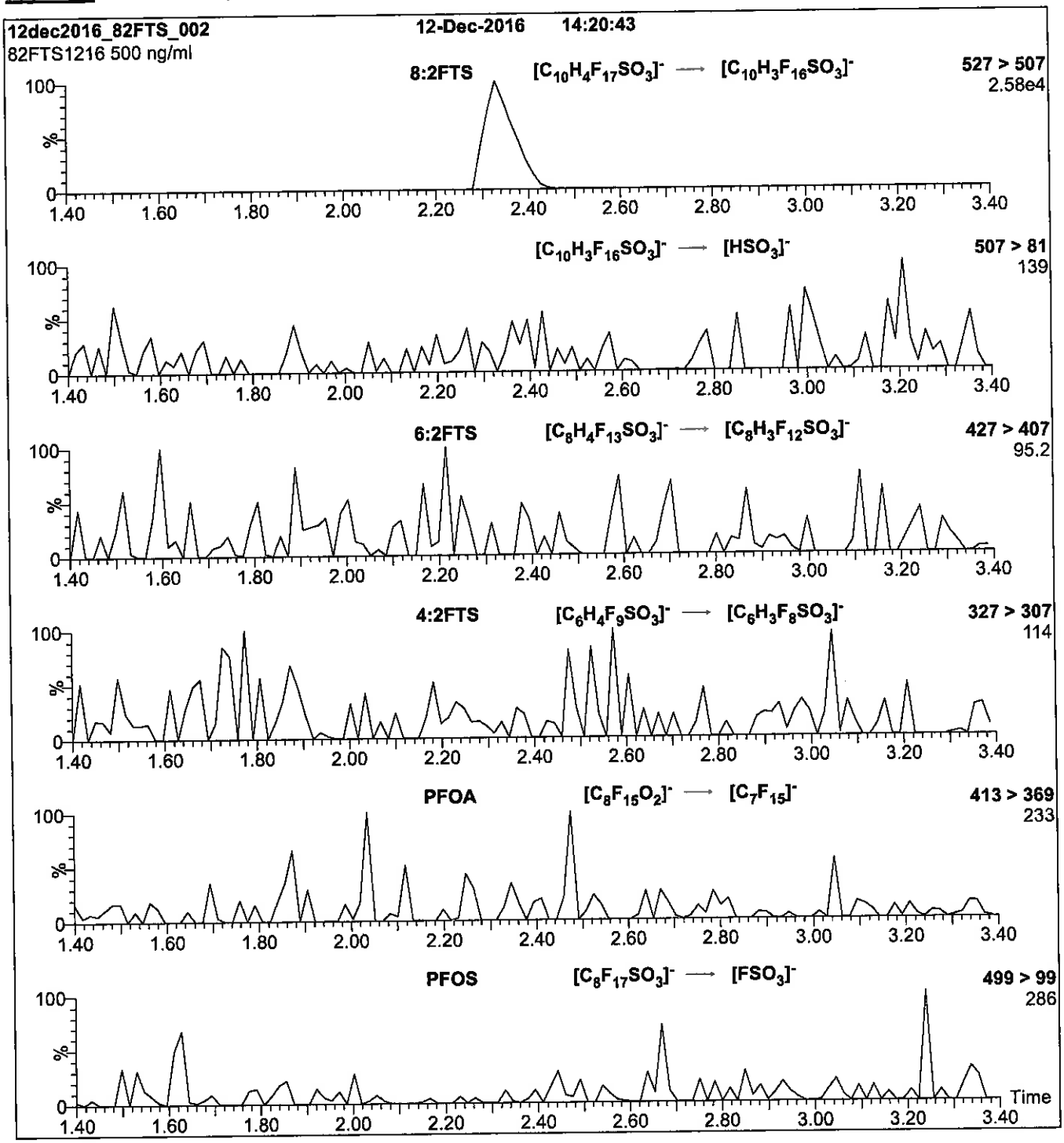
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 30

Reagent

LC9CI-PF3ONS_00002

P: 4/25/18 SKV

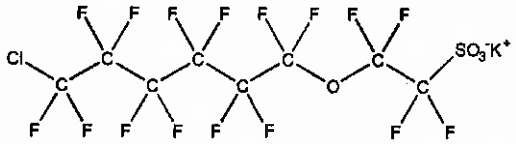
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 9Cl-PF3ONS **LOT NUMBER:** 9ClPF3ONS0916

COMPOUND: Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate

STRUCTURE: **CAS #:** 73606-19-6



MOLECULAR FORMULA: $C_8F_{16}ClSO_4K$ **MOLECULAR WEIGHT:** 570.67

CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol

46.6 ± 2.3 µg/ml (9Cl-PF3ONS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 09/30/2016

EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This compound is the major component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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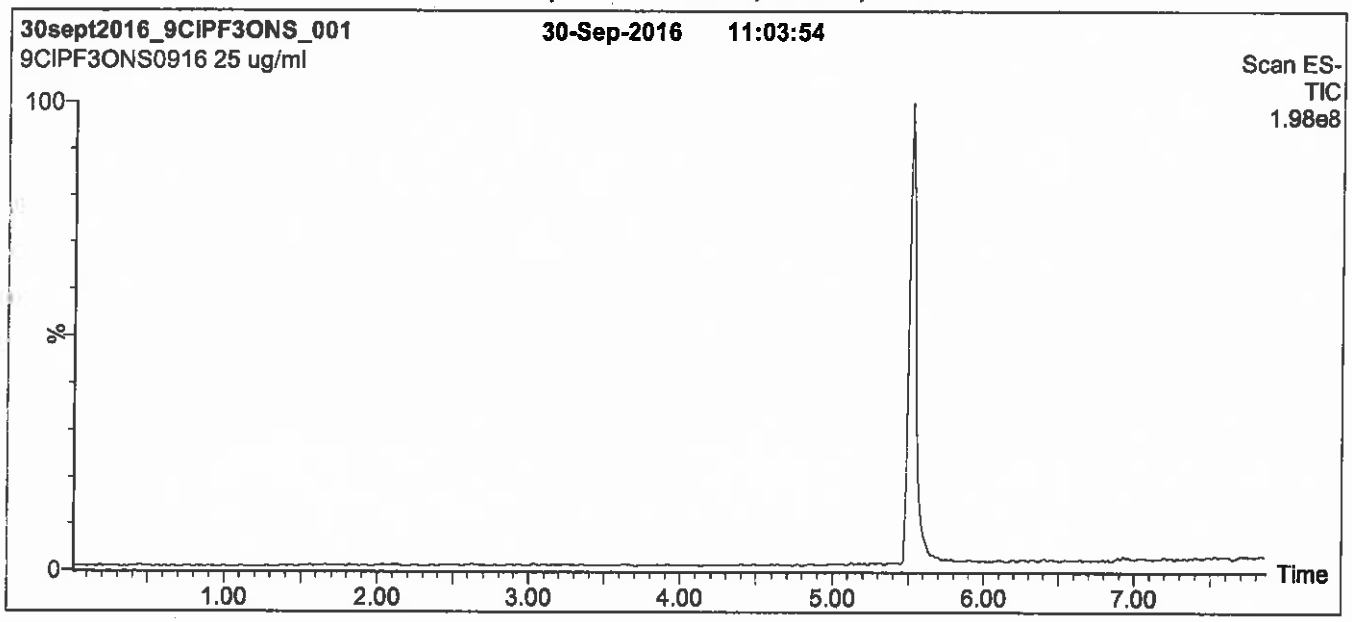
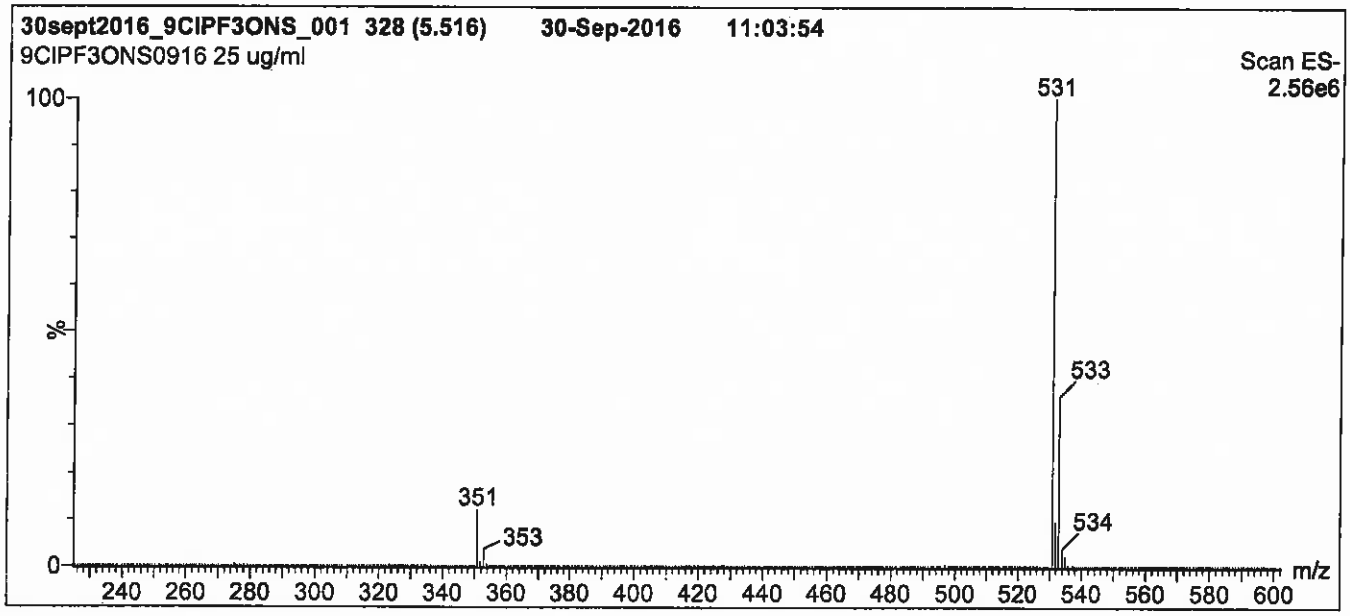
Figure 1: 9Cl-PF3ONS; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

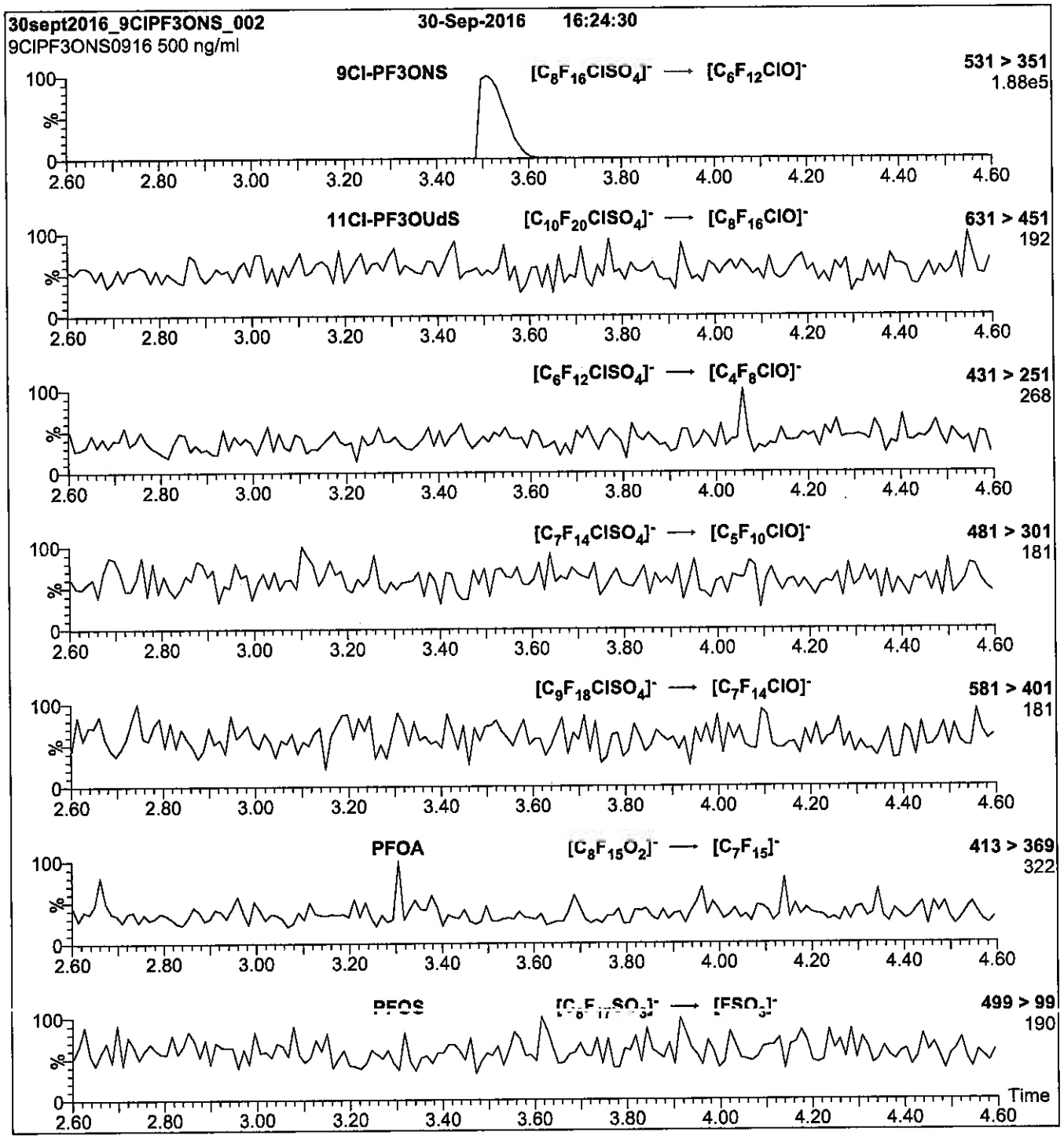
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **9Cl-PF3ONS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 9Cl-PF3ONS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LCbr-NEtFOSAA_00001

DF 4/18/18 SEV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NEtFOSAA
LOT NUMBER:	brNEtFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid moiety to its respective methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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HANDLING:

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SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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CALA

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Table A: **br-NEtFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

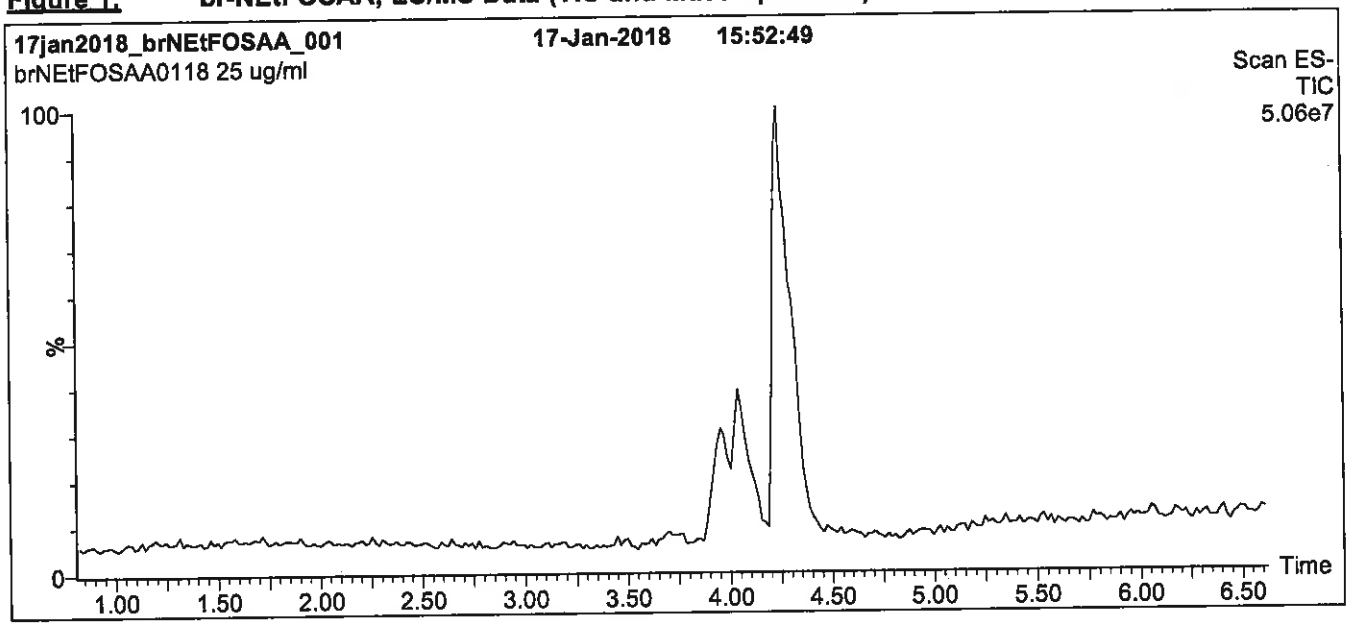
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(C_2H_5)CH_2CO_2H$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	2.2
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	5.4
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(C_2H_5)CH_2CO_2H$	10.4
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	0.3
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	0.3
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF_2CF(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	0.3
9	Other Unidentified Isomers		1.3

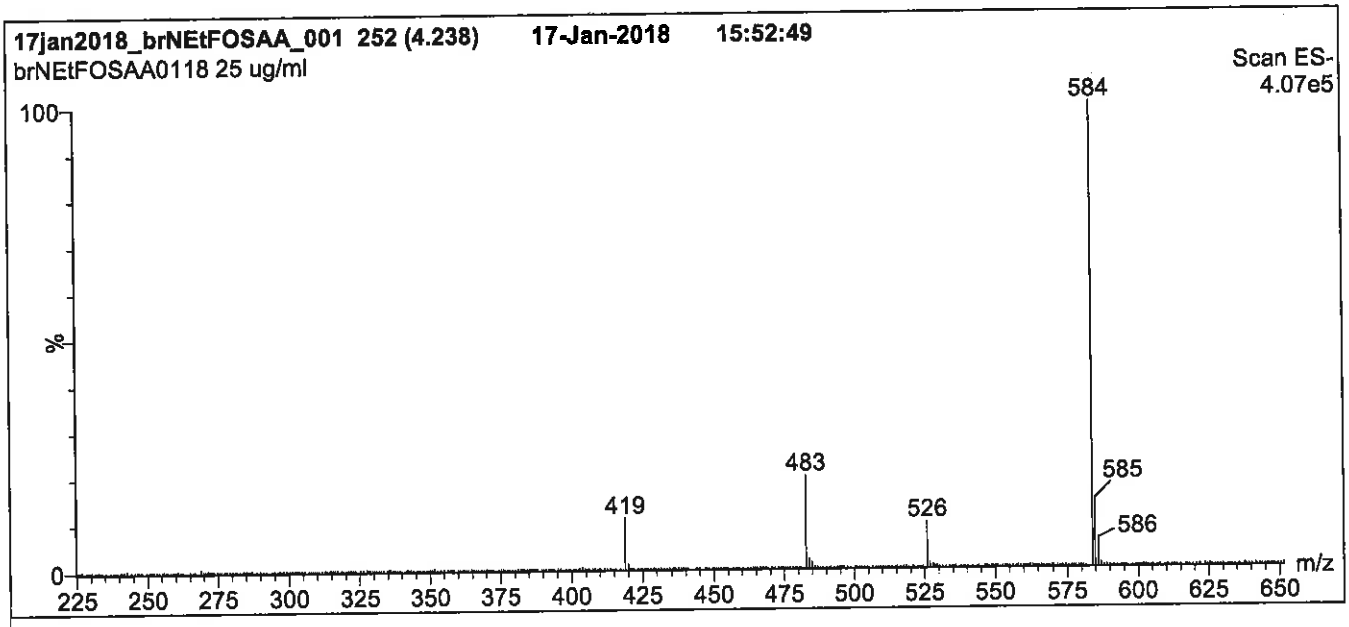
* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 03/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: **br-NEtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

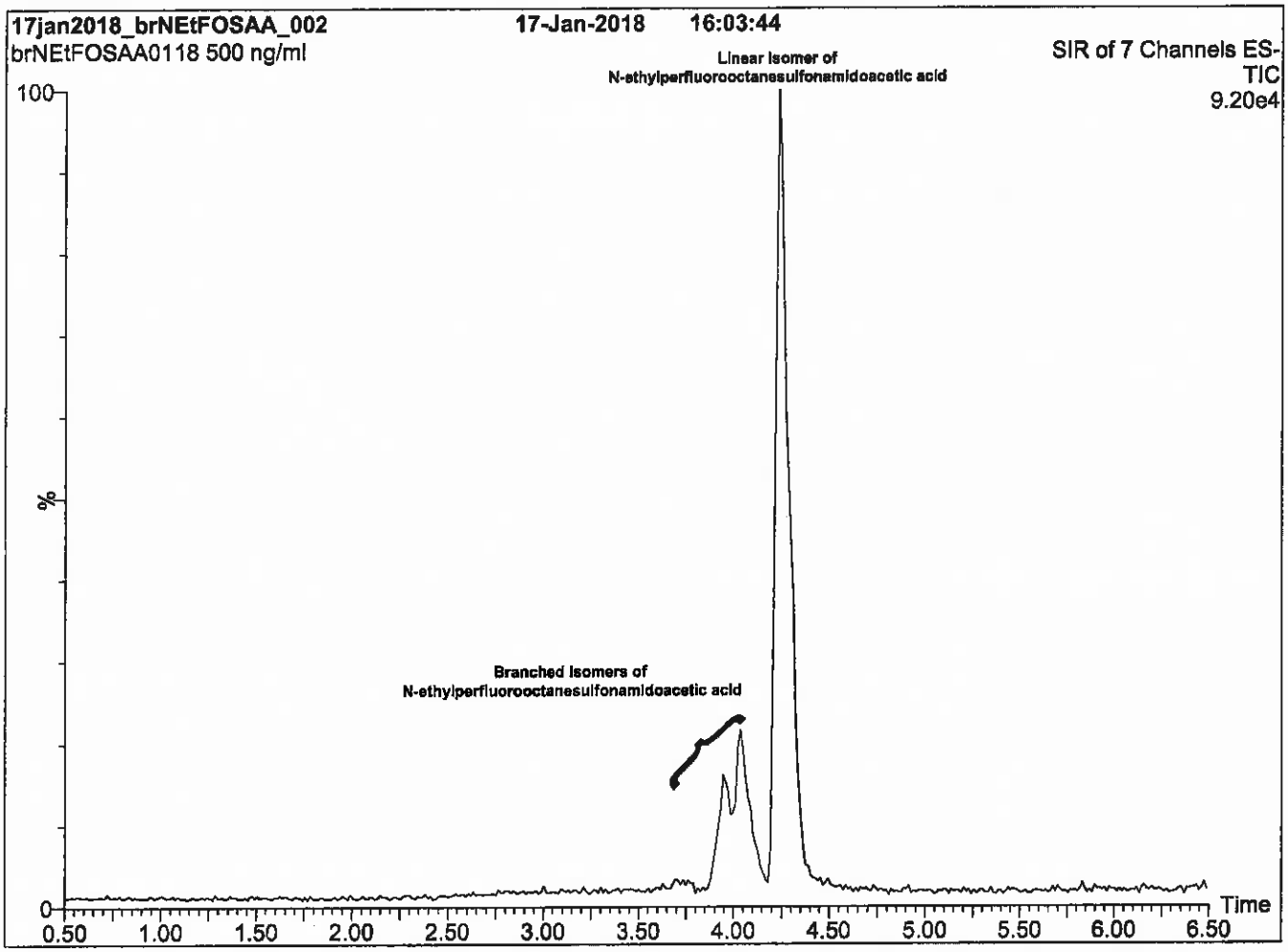
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-NEtFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

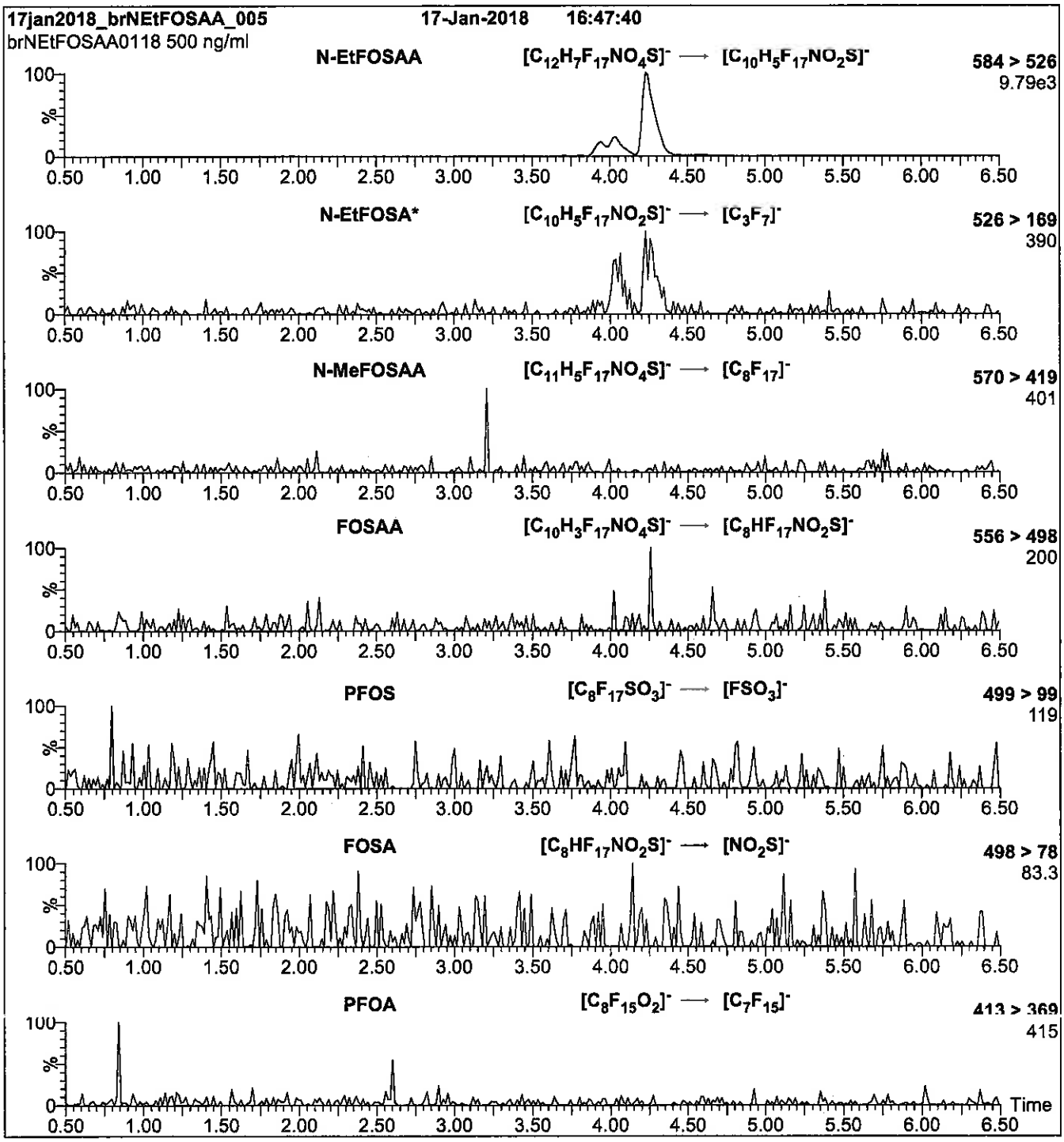
Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-NEtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



*Note: N-EtFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection:	On-column	**MS Parameters**	
Mobile phase:	Same as Figure 2	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 11-40 (variable)	
Flow:	300 µl/min		

Reagent

LCbr-NMeFOSAA_00001

r. 4/18/18 SKD

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NMeFOSAA
LOT NUMBER:	brNMeFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-methylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid molety to its respective methyl ester.

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SYNTHESIS / CHARACTERIZATION:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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Table A: **br-NMeFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

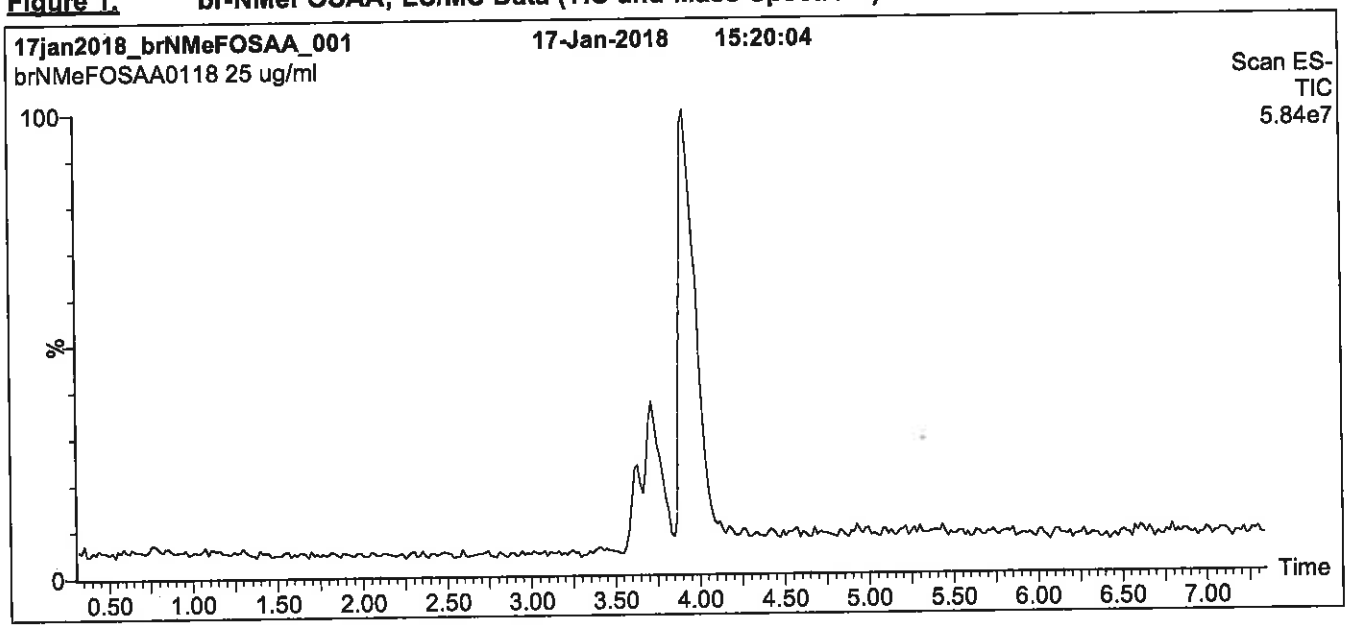
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(CH_3)CH_2CO_2H$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(CH_3)CH_2CO_2H$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(CH_3)CH_2CO_2H$	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(CH_3)CH_2CO_2H$	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	0.2
7	Other Unidentified Isomers		1.1

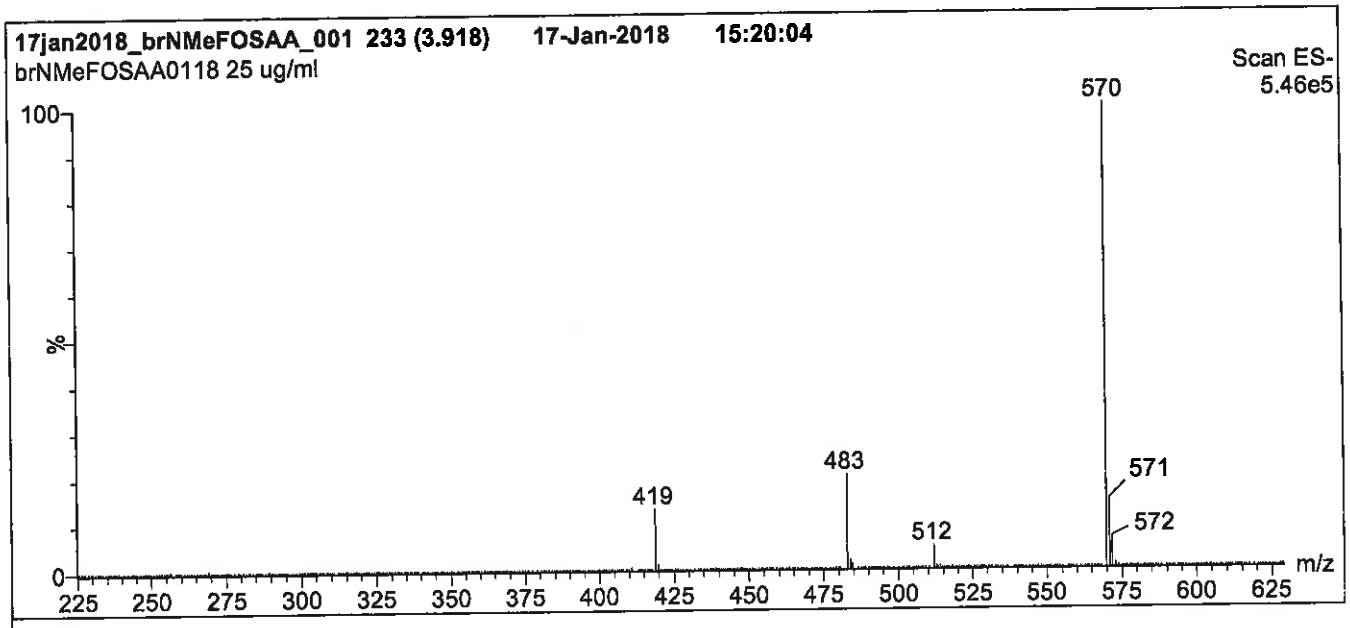
* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 03/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: **br-NMeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

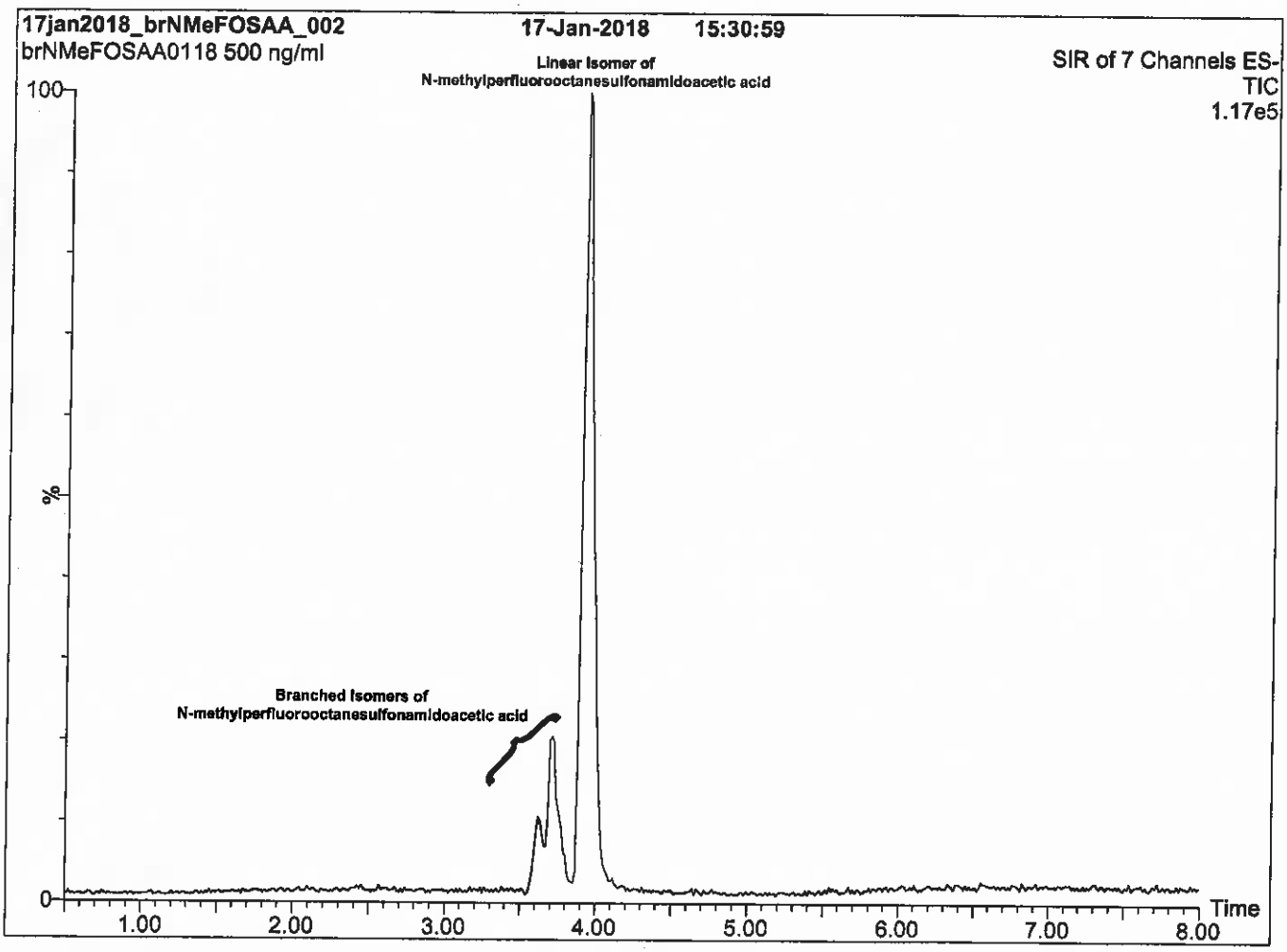
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-NMeFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

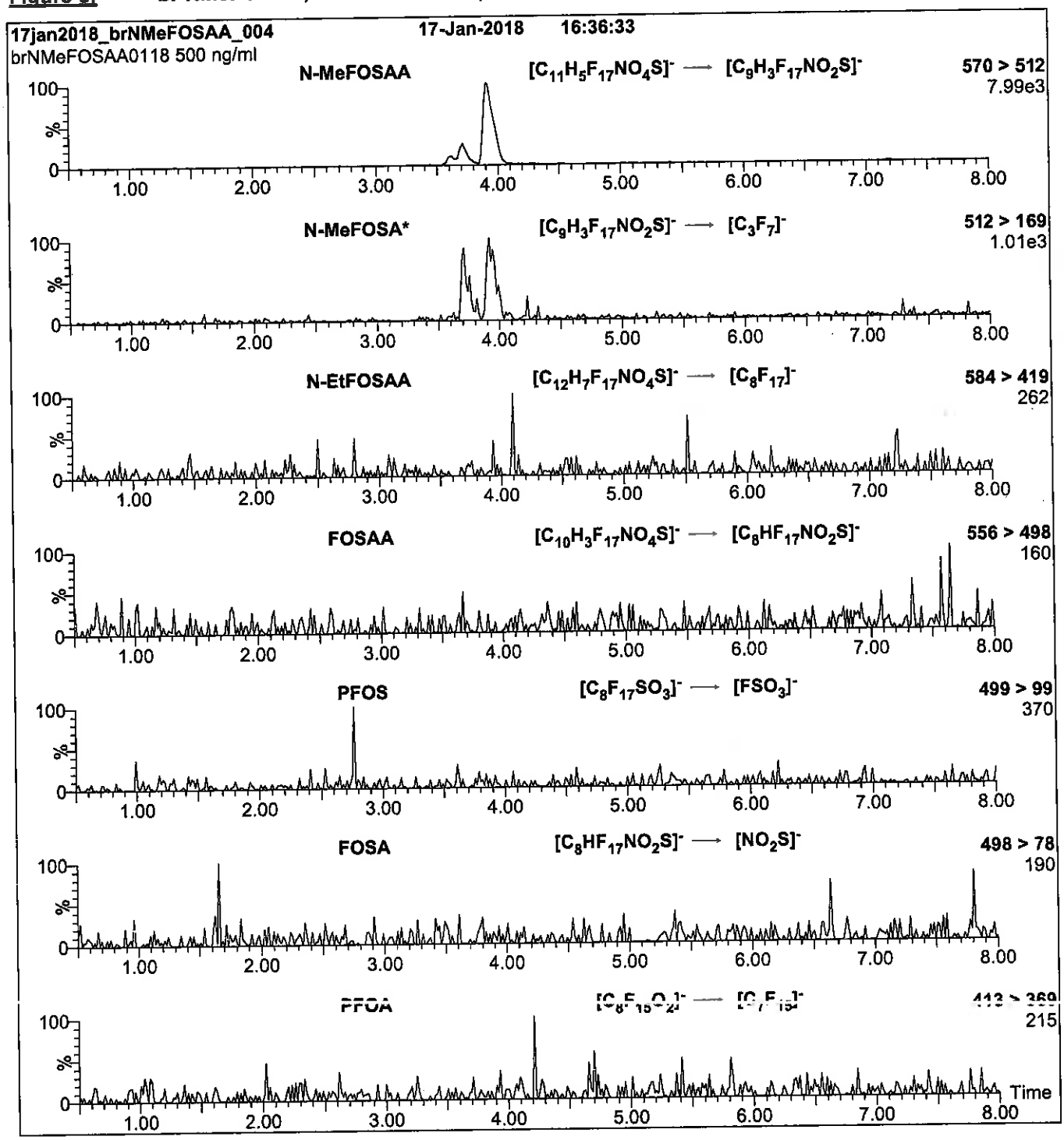
Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-NMeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



***Note**: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11-40 (variable)

Reagent

LCd3-NMeFOSAA_00008

R: 5/30/18 CBW

1263171
ID: LCd3-NMeFOSAA_00008
Exp:11/06/22 Prpd:CBW Opn:05/30/18
d3-N-MeFOSAA

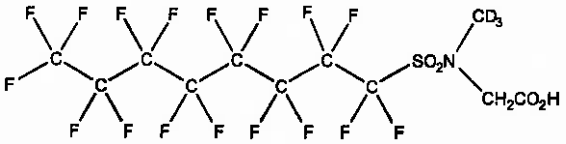
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1117

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{11}D_3H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 574.23

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_3$

LAST TESTED: (mm/dd/yyyy) 11/08/2017

EXPIRY DATE: (mm/dd/yyyy) 11/08/2022

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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CALA

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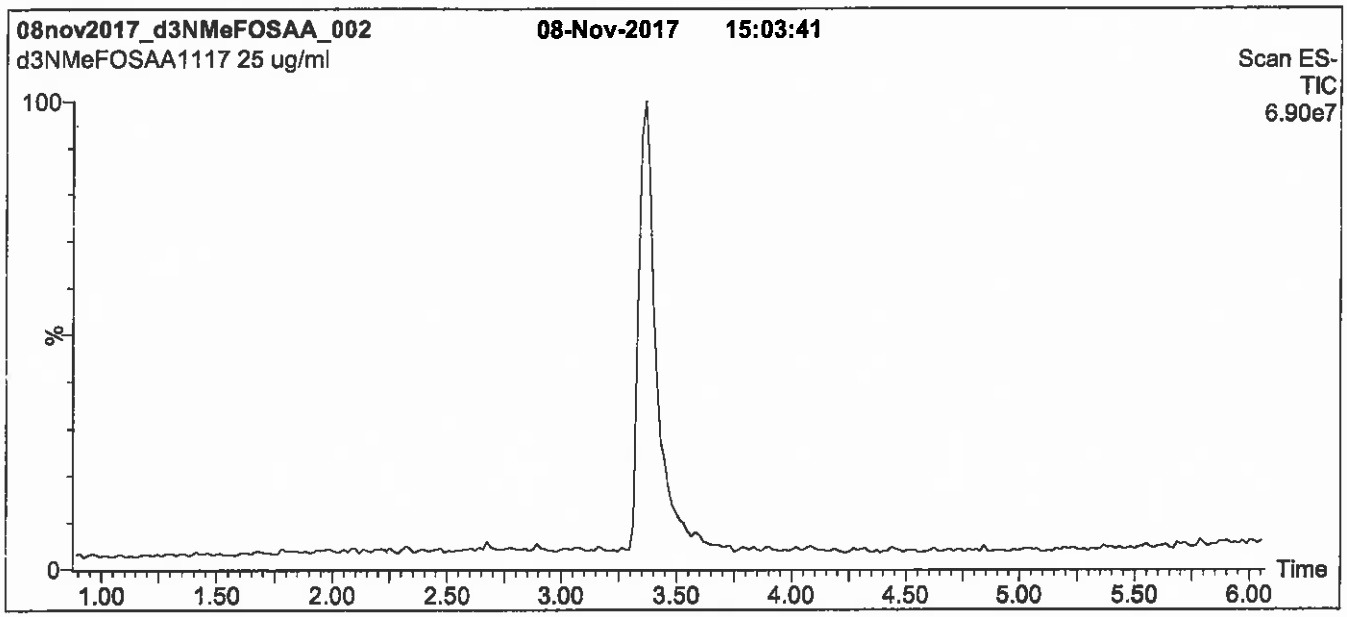
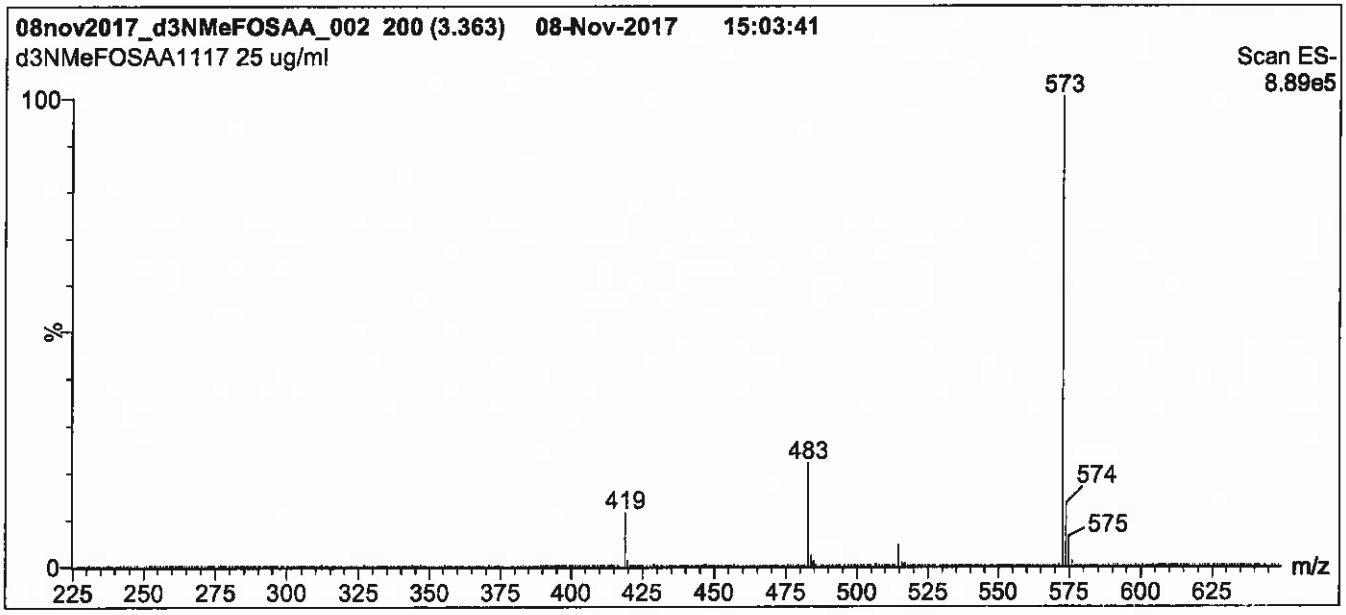
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
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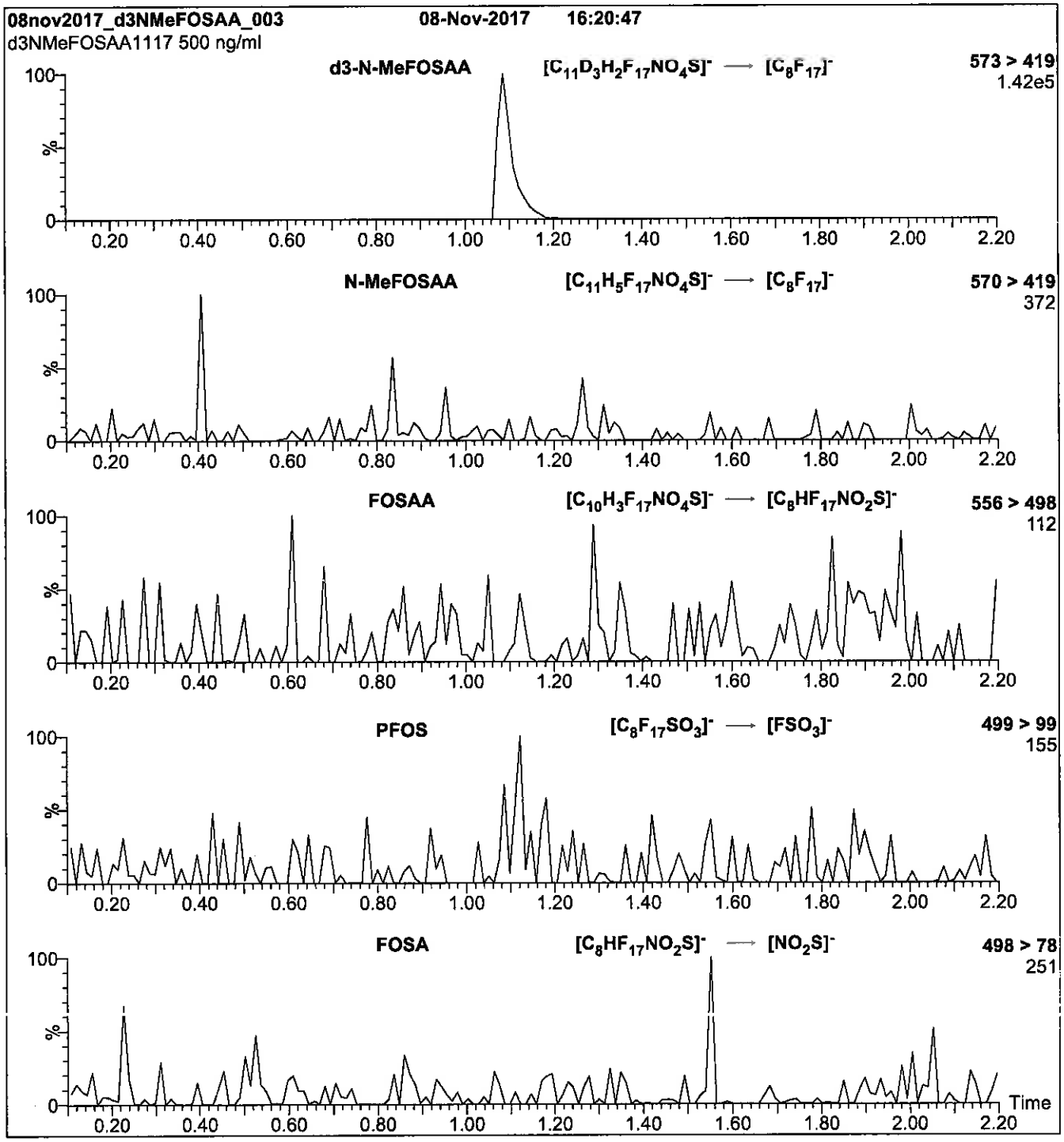
Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 20

Reagent

LCd3-NMeFOSAA_00009

1287340
ID: LCd3-NMeFOSAA_00009
Exp:11/08/22 Prpd:CBW Opr:06/26/18
d3-N-MeFOSAA

R: 6/26/18 CBW

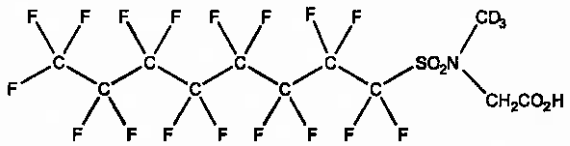
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1117

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



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CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
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LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

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Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

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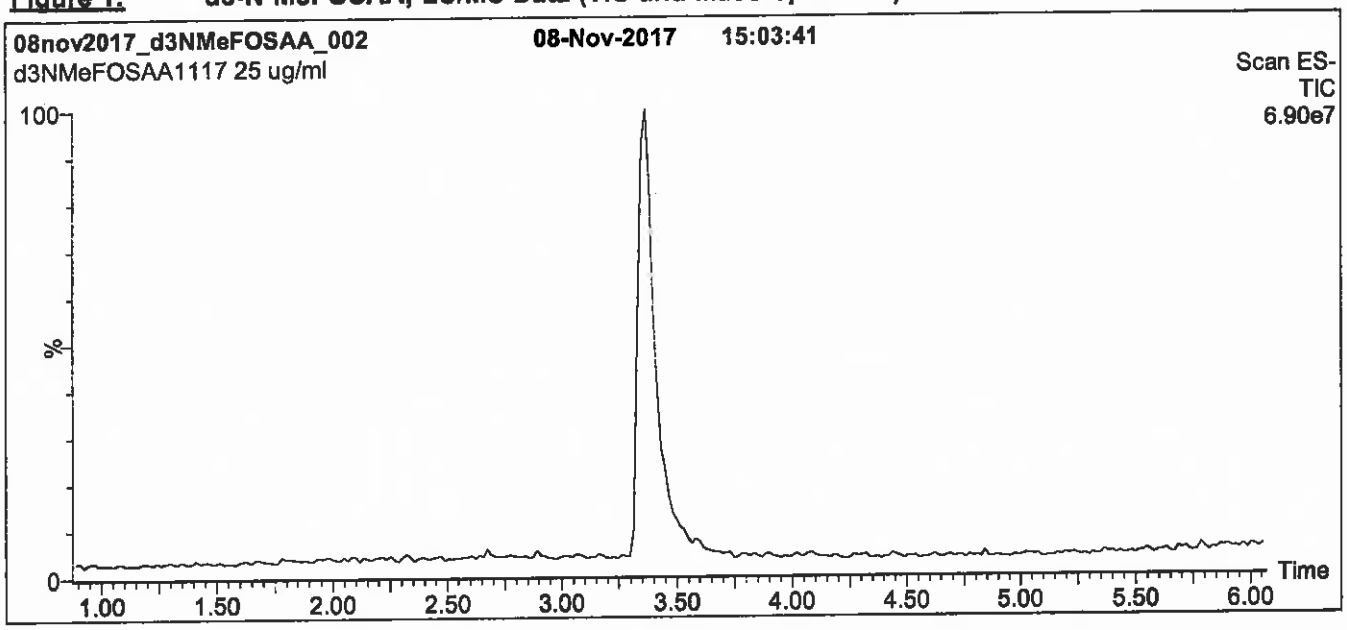
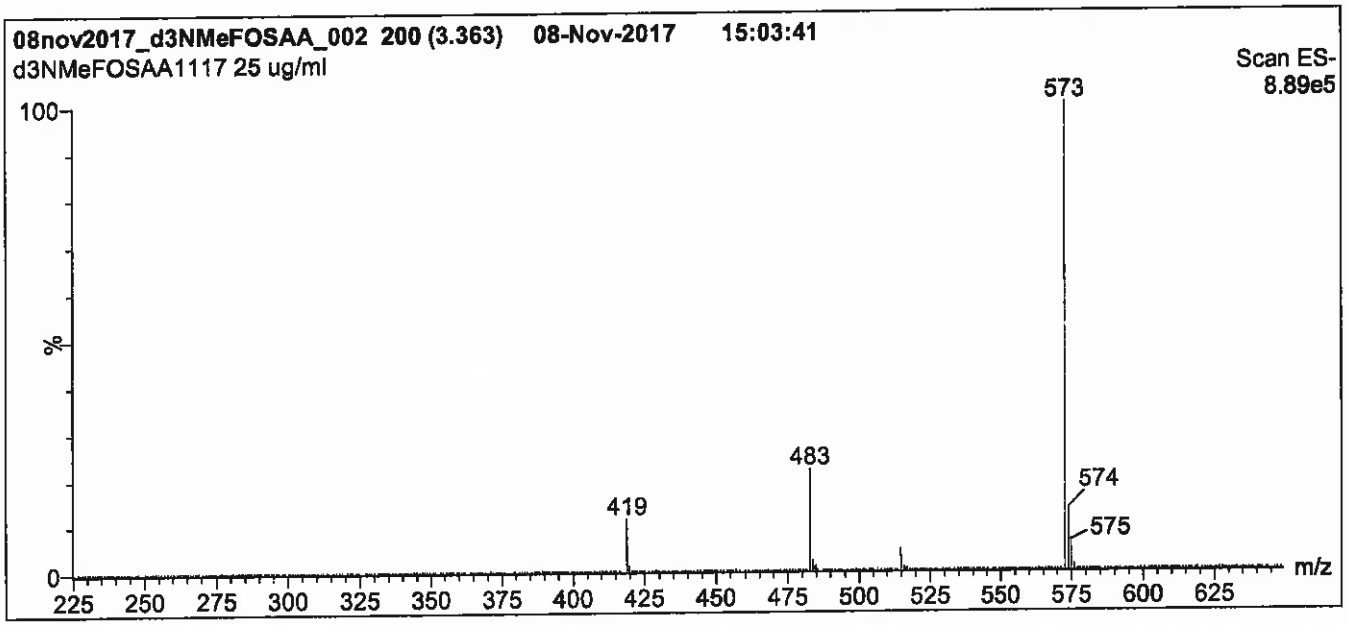
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

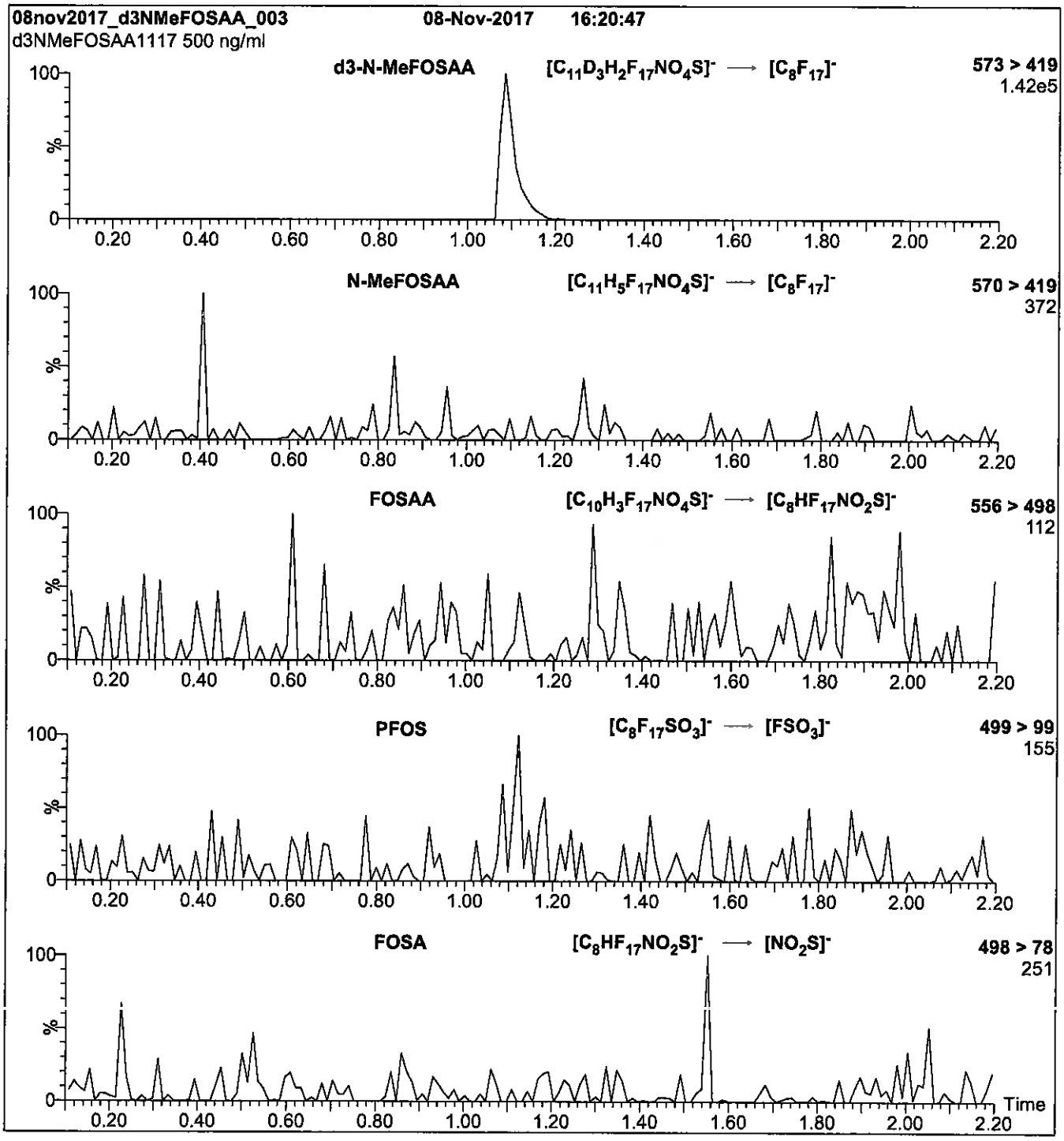
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d3-N-MeFOSAA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 20
Flow:	300 µl/min	

Reagent

LCd5-NEtFOSAA_00008

K: 5/30/18 CBW

1263180
ID: LCd5-NEtFOSAA_00008
Exp:11/08/22 Prpd:CBW Opn:05/30/18
d5-N-EtFOSAA

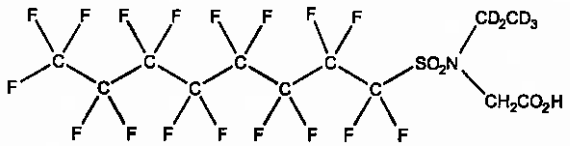
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1117

COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 590.26

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_5$

LAST TESTED: (mm/dd/yyyy) 11/08/2017

EXPIRY DATE: (mm/dd/yyyy) 11/08/2022

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • Info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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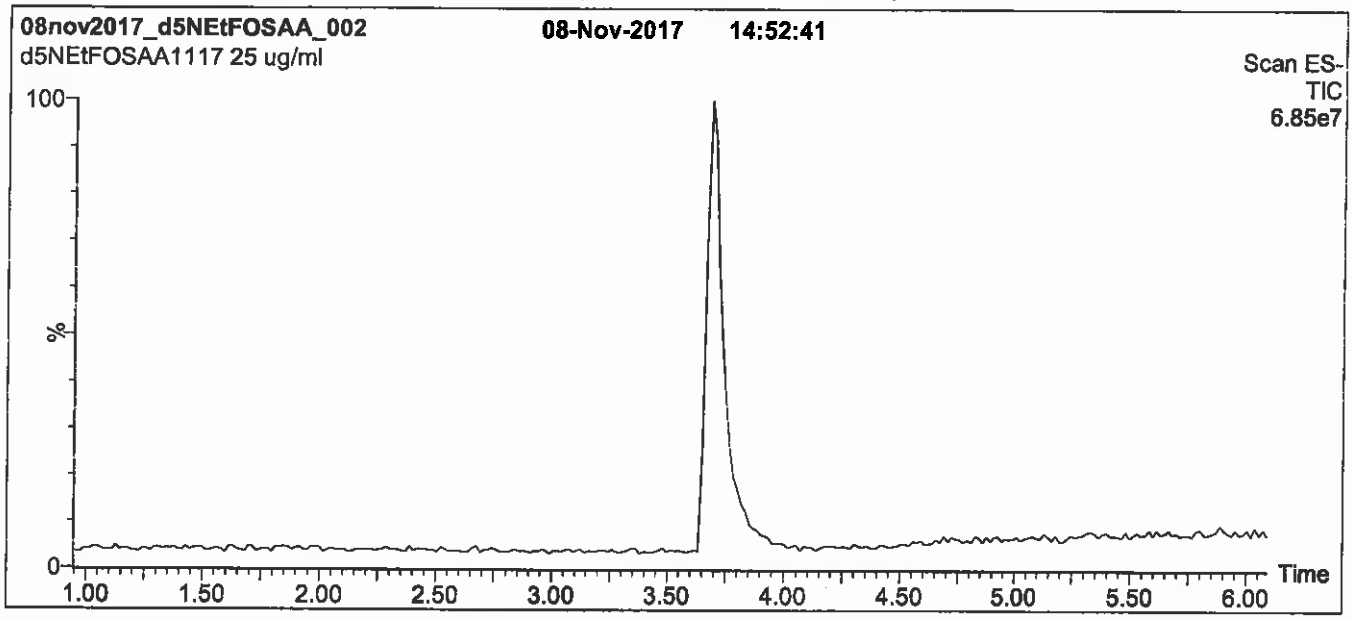
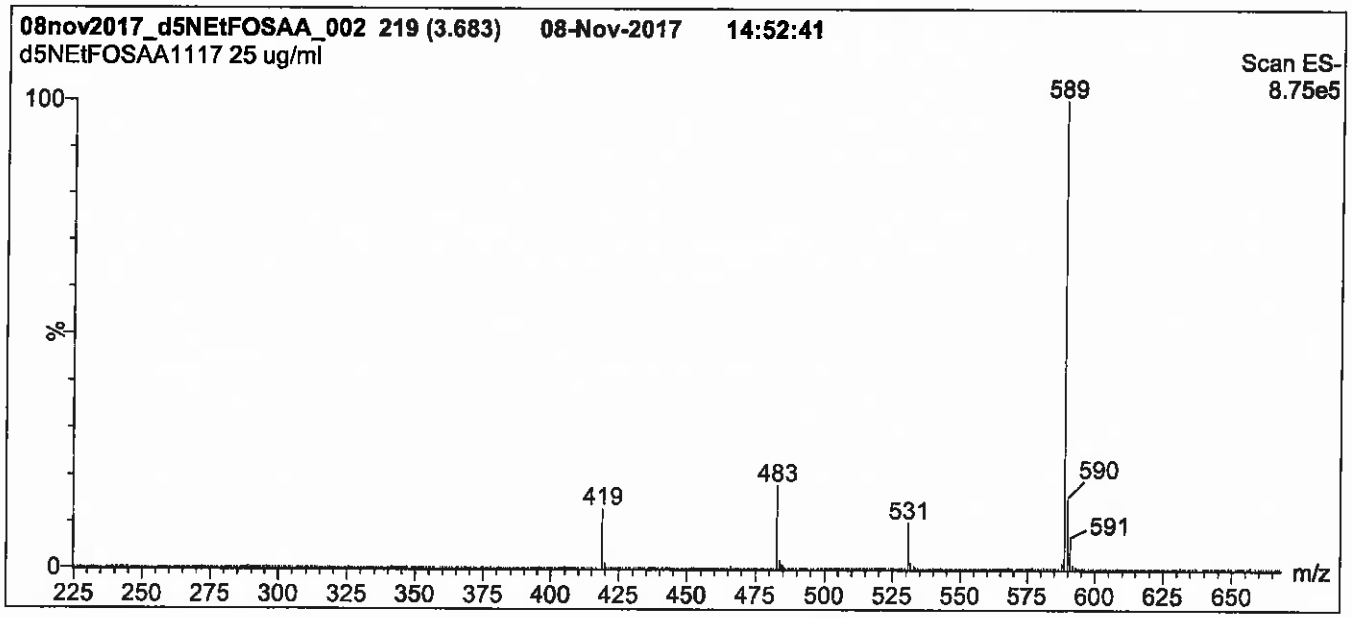
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

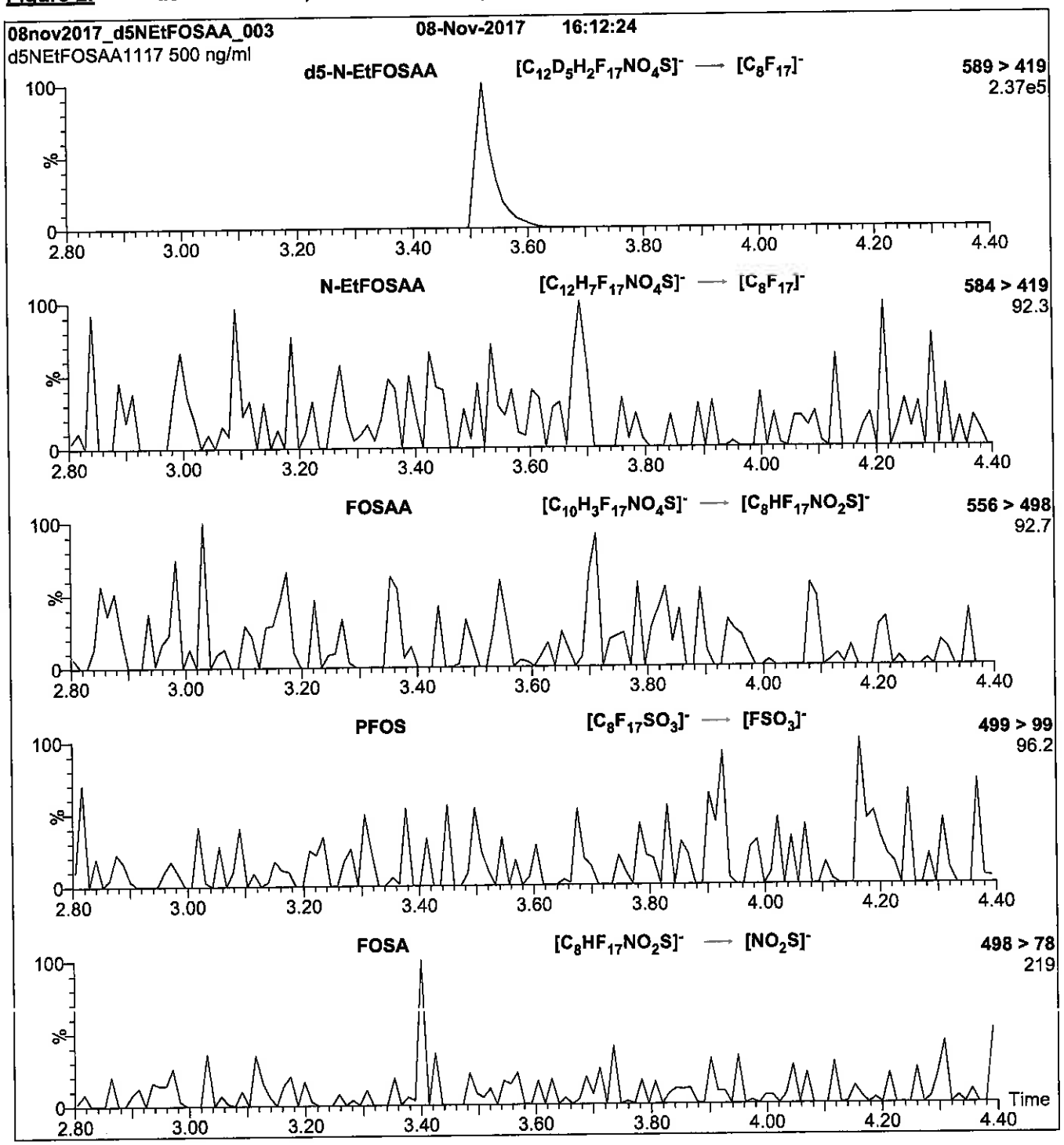
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 20

Reagent

LCd5-NEtFOSAA_00009

1287349
ID: LCd5-NEtFOSAA_00009
Exp:11/08/22 Prpd:CBW Opn:05/26/18
d5-N-EtFOSAA

R: 6/26/18 CBW

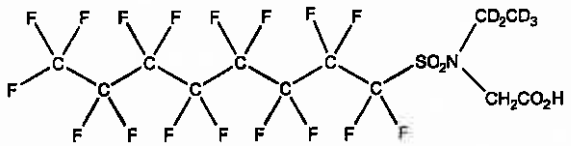
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1117

COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



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CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_5$

LAST TESTED: (mm/dd/yyyy) 11/08/2017

EXPIRY DATE: (mm/dd/yyyy) 11/08/2022

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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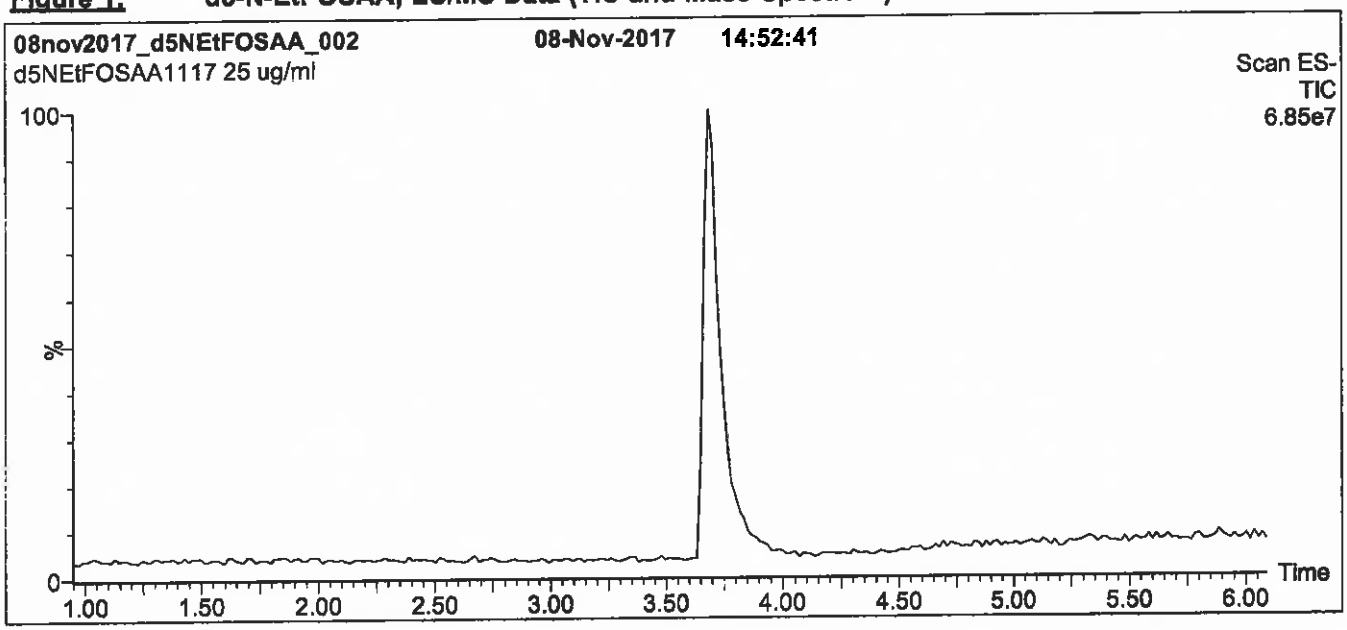
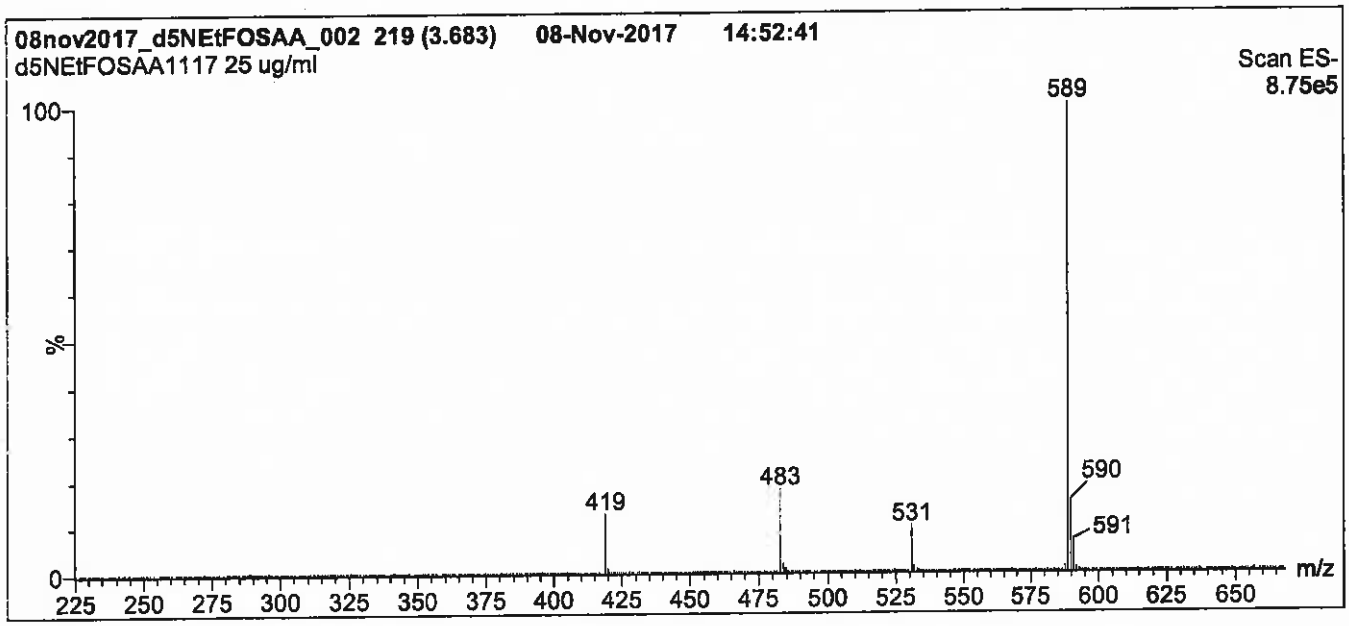
Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

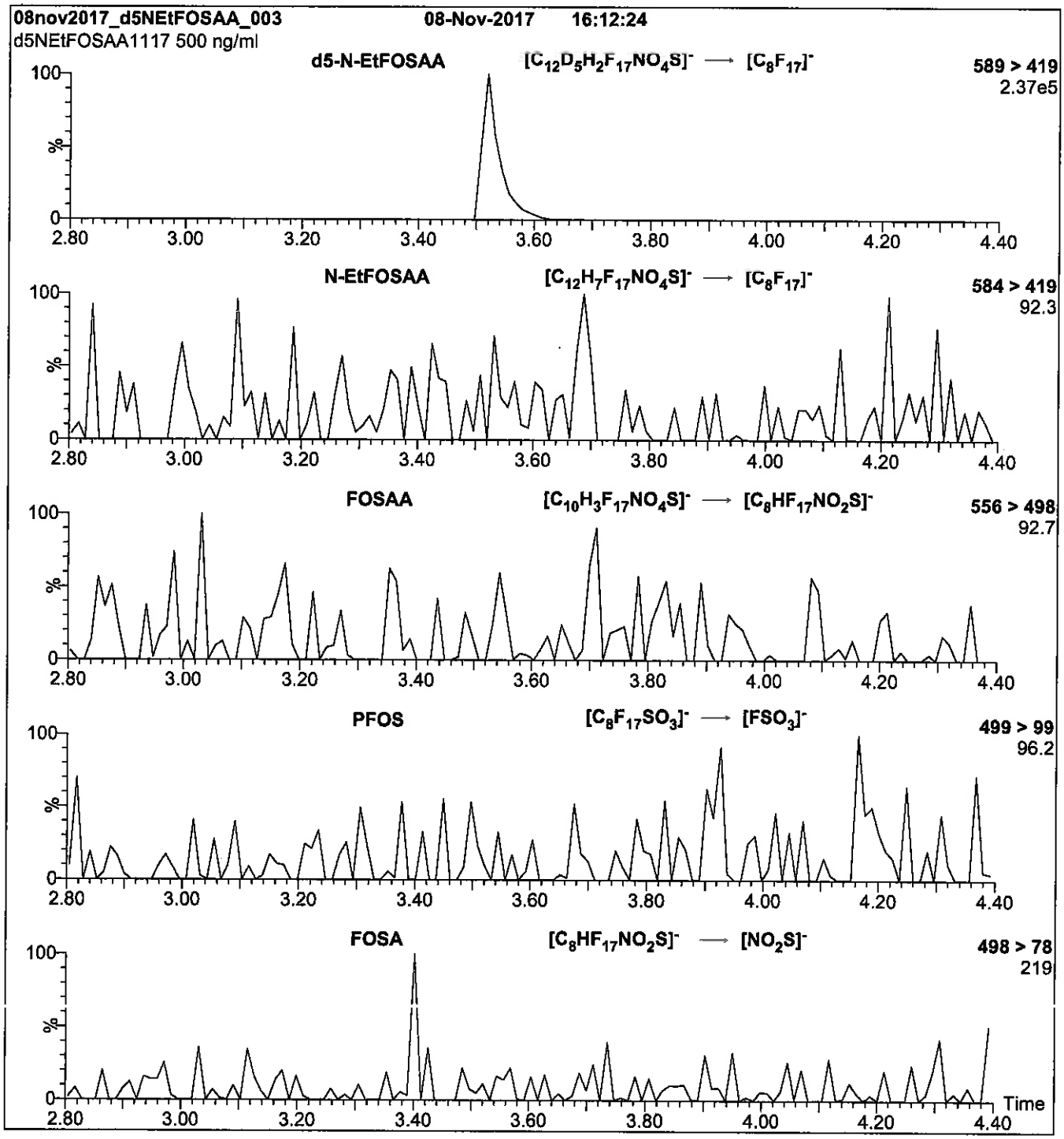
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d5-N-EtFOSAA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 20
Flow:	300 µl/min	

Reagent

LCDONA_00002

r: 4/18/18 SKD

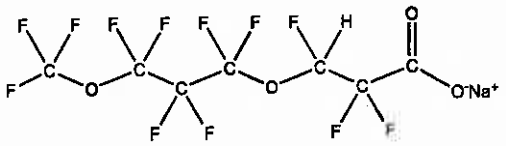
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: NaDONA
LOT NUMBER: NaDONA0318
COMPOUND: Sodium dodecafluoro-3H-4,8-dioxanonanoate

STRUCTURE:

CAS #: 958445-44-8 (ammonium salt)



MOLECULAR FORMULA: $C_7HF_{12}O_4Na$
MOLECULAR WEIGHT: 400.05
CONCENTRATION: 50 ± 2.5 µg/ml (Na Salt)
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/26/2018
EXPIRY DATE: (mm/dd/yyyy) 03/26/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as ADONA.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/27/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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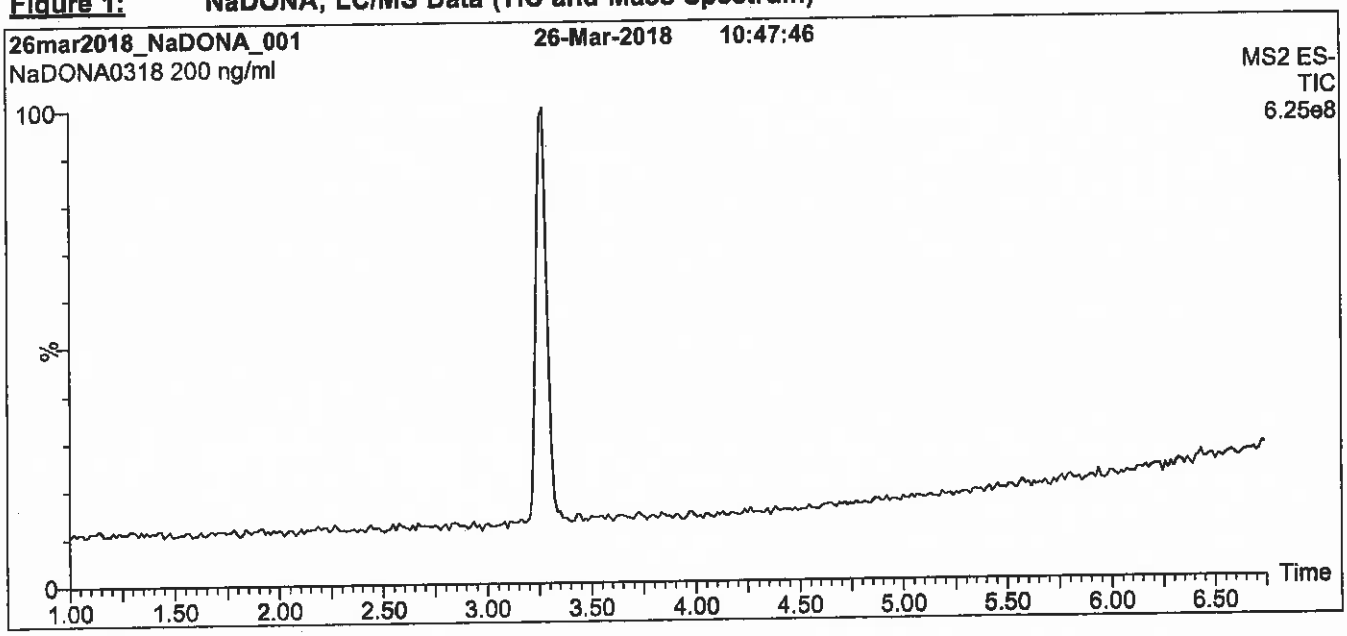
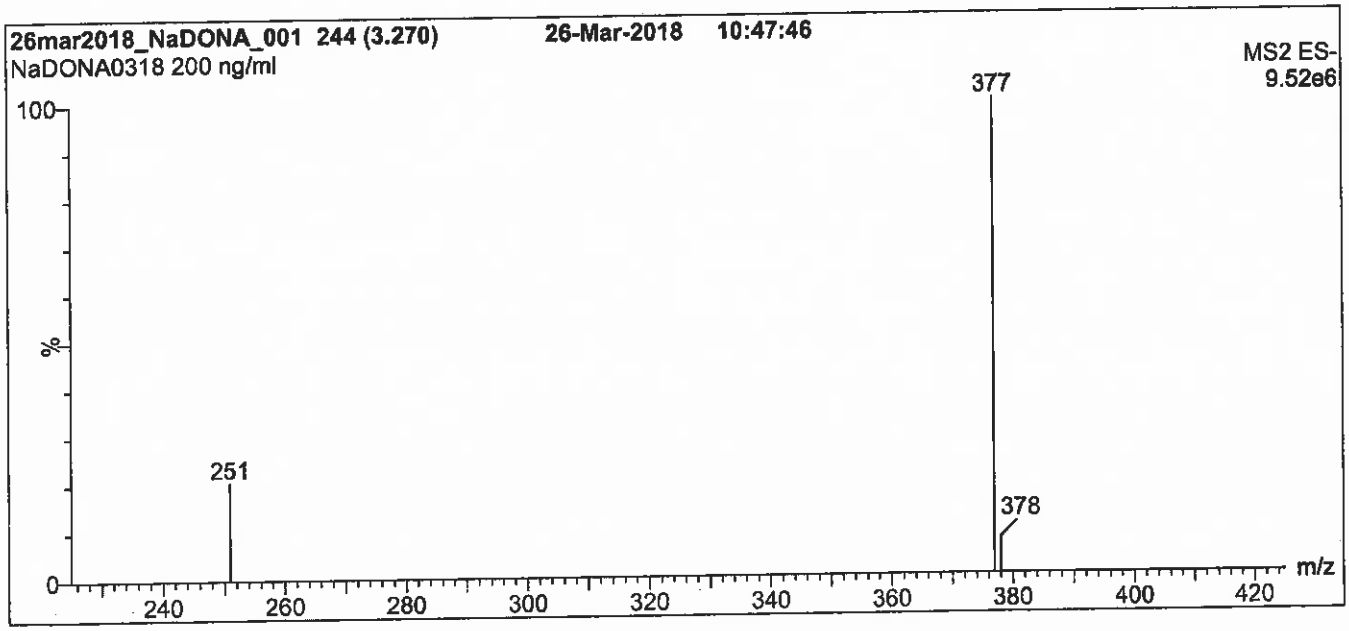
Figure 1: **NaDONA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

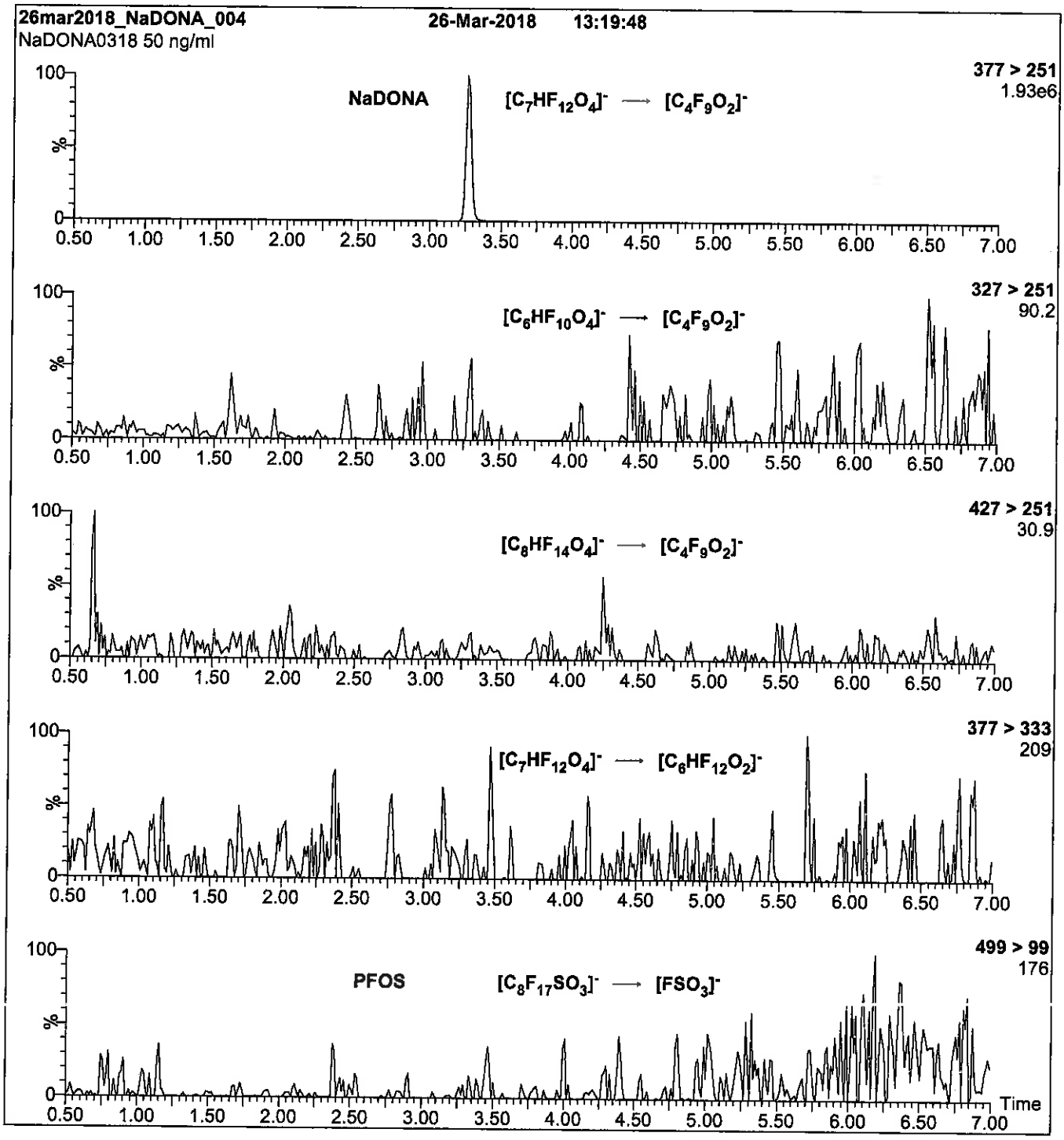
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.70
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **NaDONA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (NaDONA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.65e-3
Collision Energy (eV) = 10

Reagent

LCHFPO-DA_00002

P: 4/18/18 SW

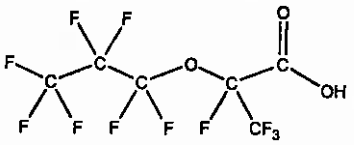
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: HFPO-DA **LOT NUMBER:** HFPODA0318

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid

STRUCTURE: **CAS #:** 13252-13-6



MOLECULAR FORMULA: $C_6HF_{11}O_3$ **MOLECULAR WEIGHT:** 330.05

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 03/26/2018

EXPIRY DATE: (mm/dd/yyyy) 03/26/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/28/2018 (mm/dd/yyyy)

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UNCERTAINTY:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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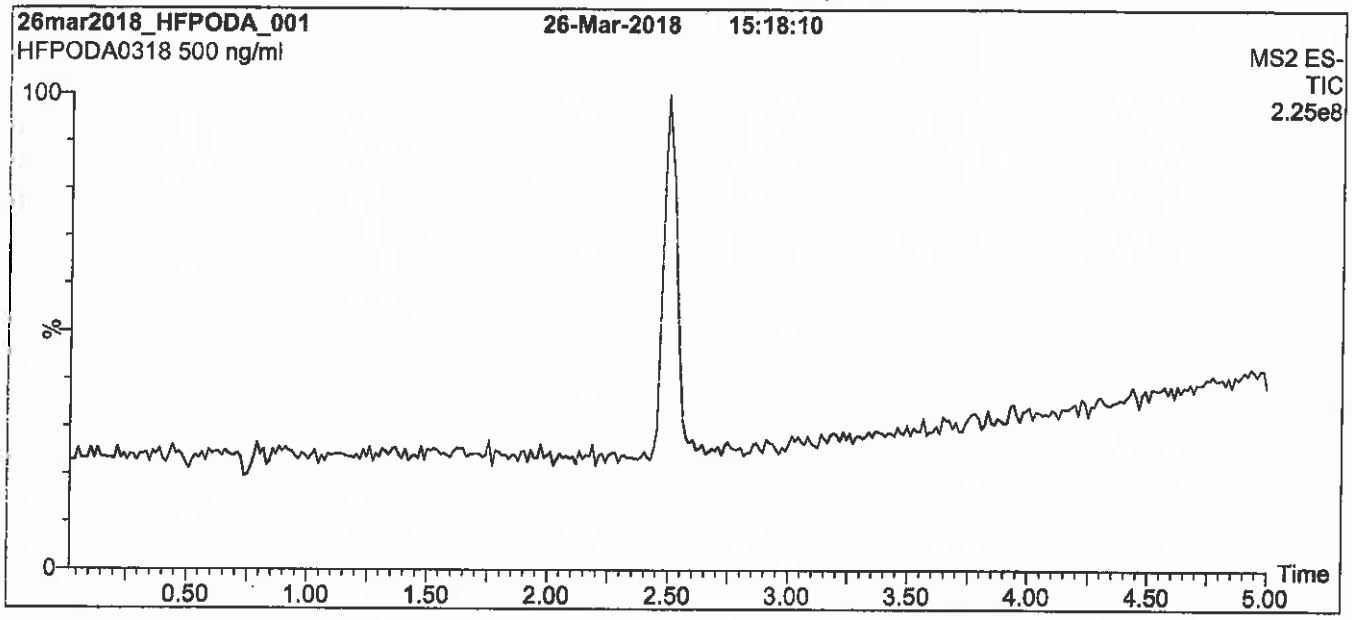
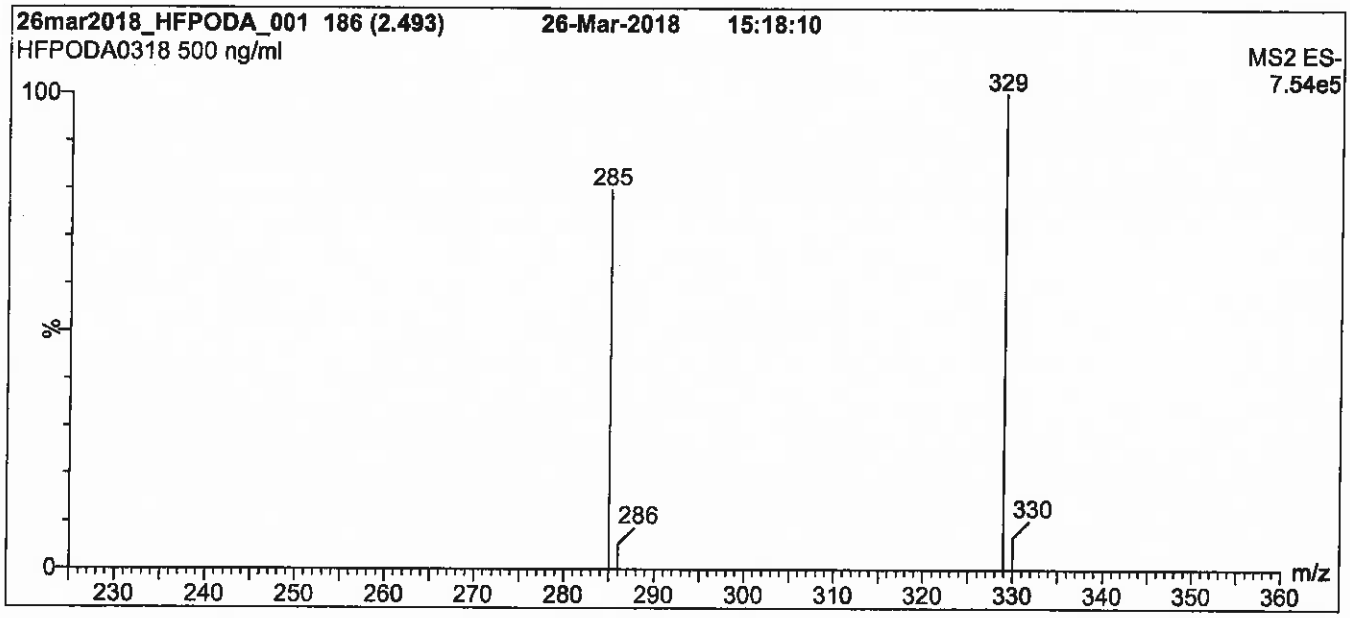
Figure 1: **HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

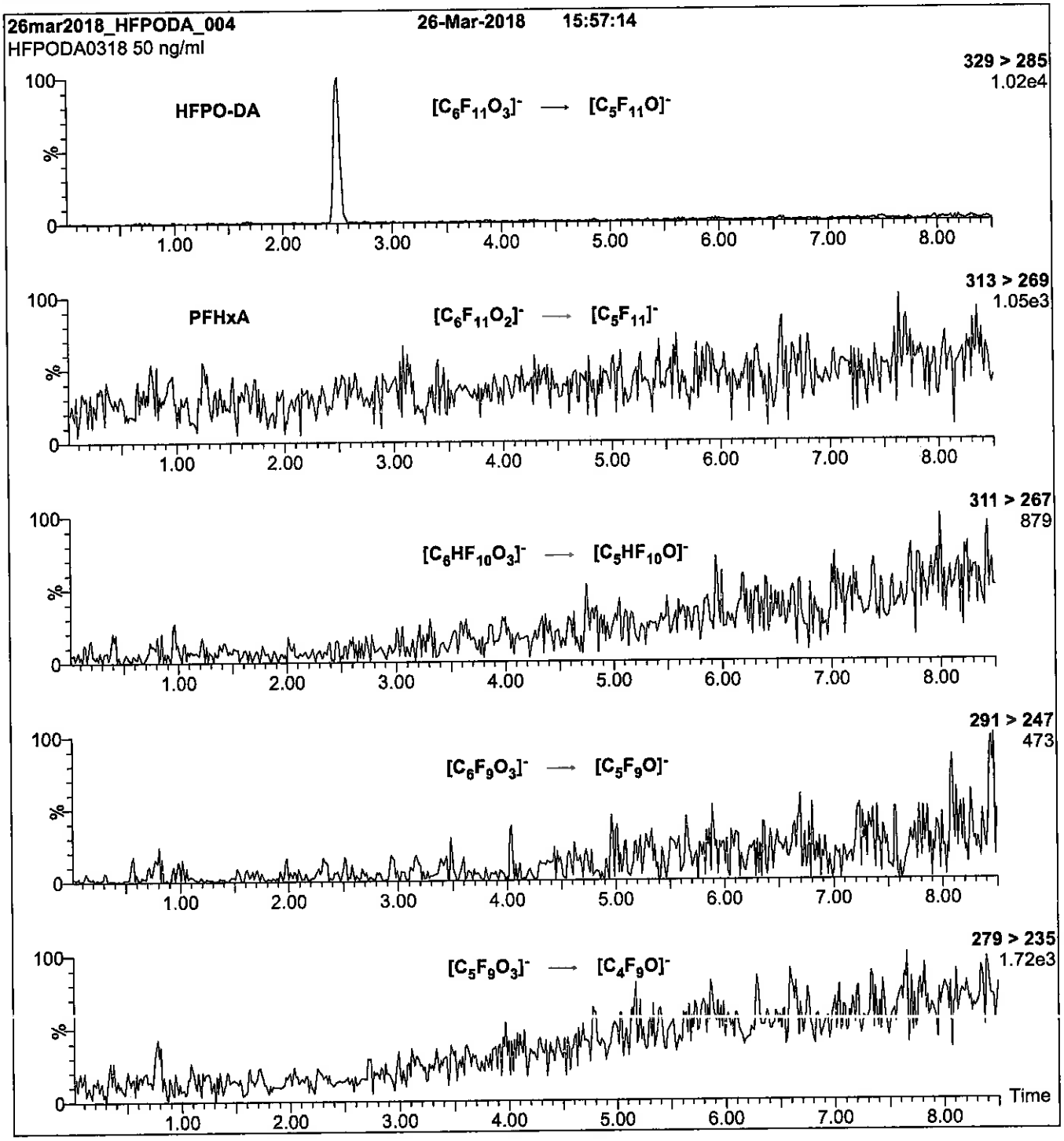
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

Figure 2: **HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.69e-3
Collision Energy (eV) = 6

Reagent

LCM2-6:FTS_00008

R: 5/30/18 CBW

1263197
ID: LCM2-6:FTS_00008
Exp:02/16/23 Prpd:CBW Opn:05/30/18
M2-6:2FTS

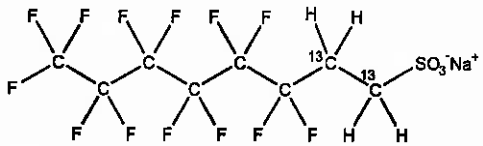
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0218

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.5 ± 2.4 µg/ml (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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Certified By: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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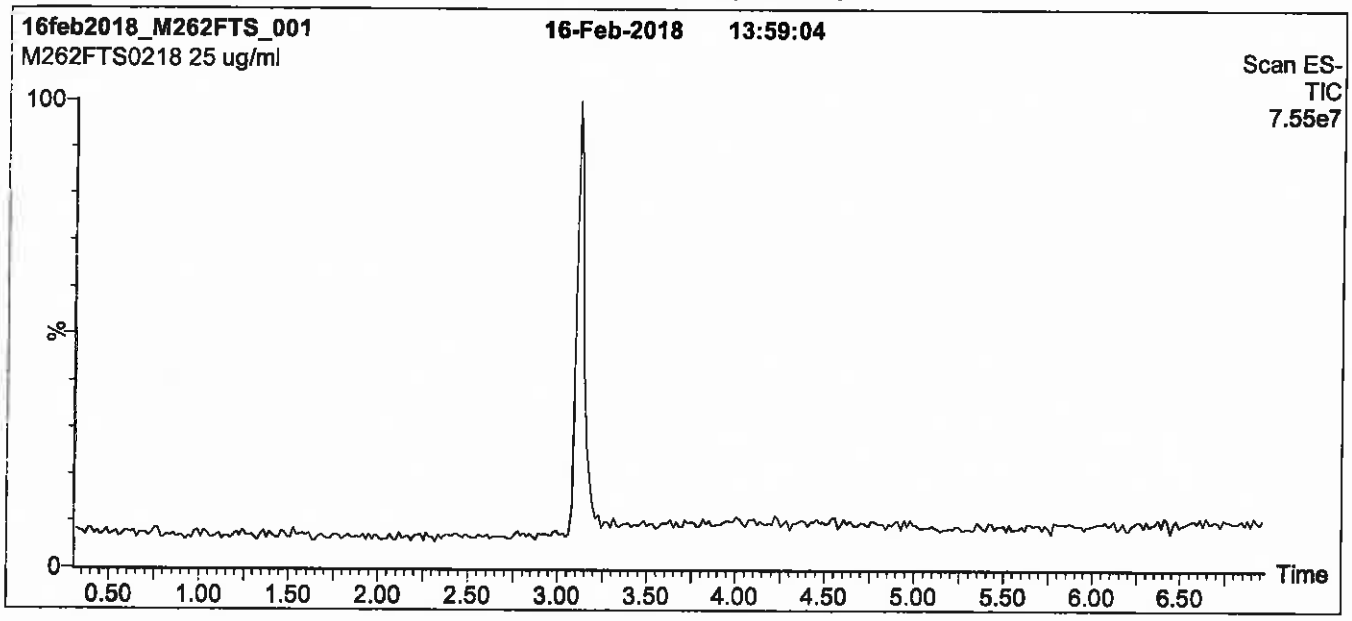
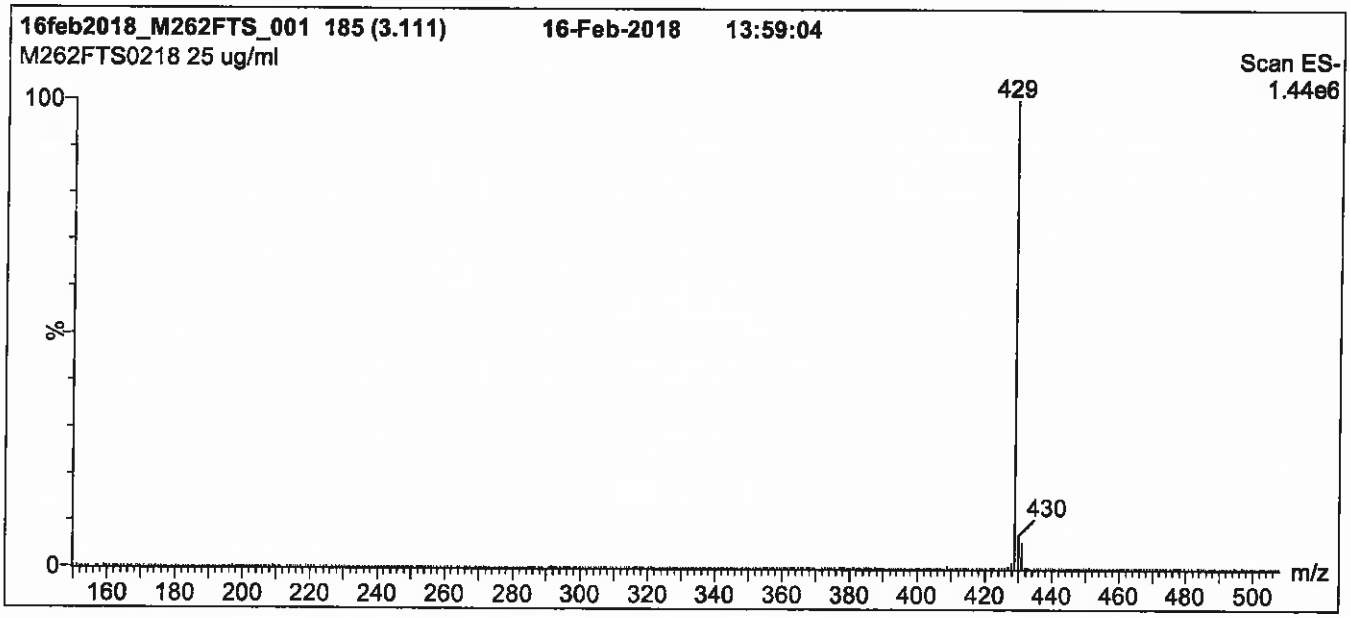




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

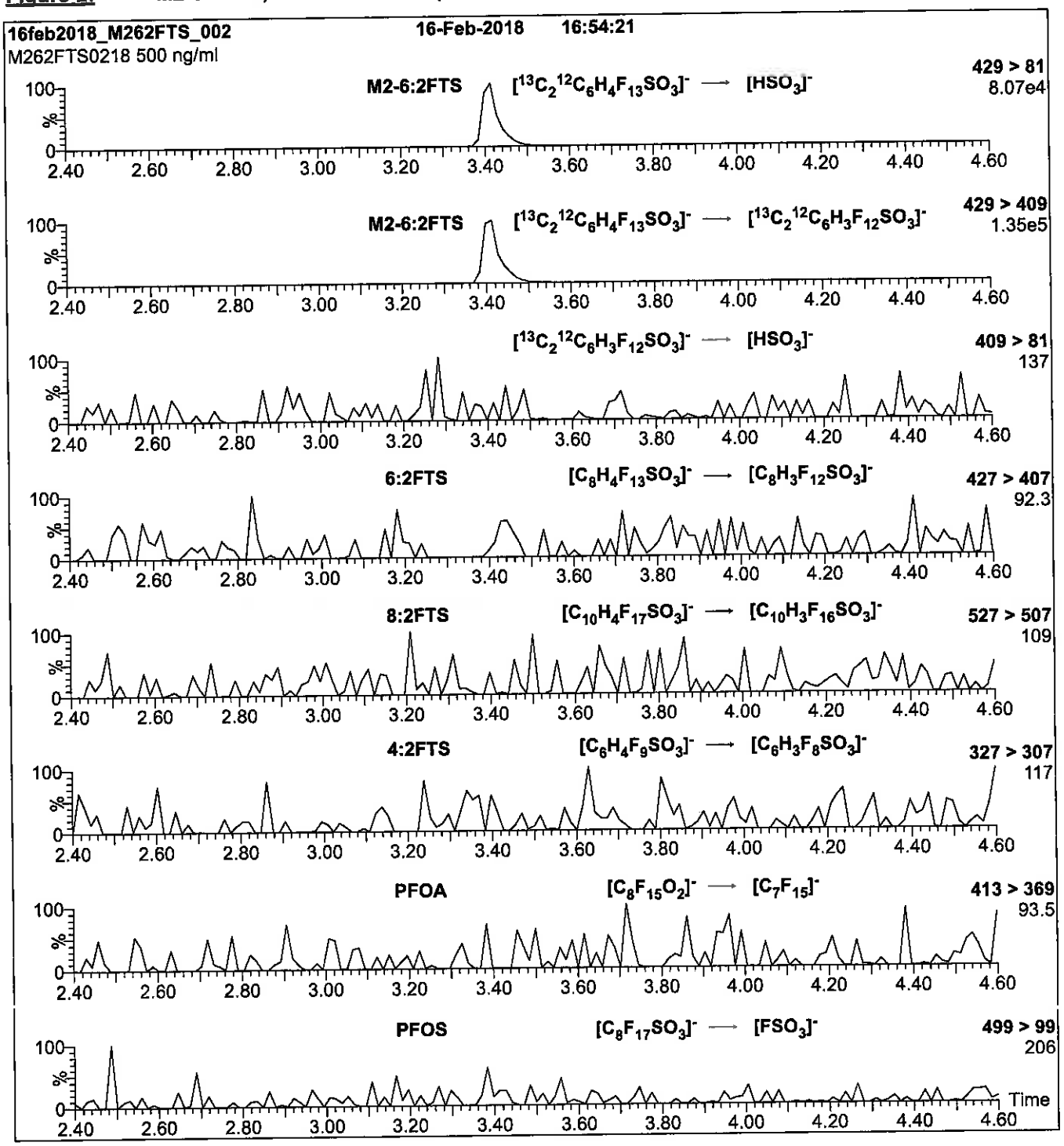
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCM2-6:FTS_00009

1287352
ID: LCM2-6:FTS_00009
Exp:02/16/23 Prpd:CBW Opn:06/26/18
M2-6:2FTS

R: 6/26/18 EBC

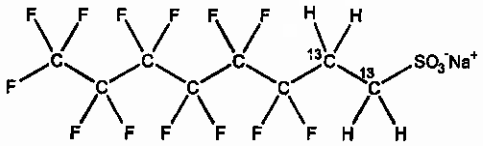
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0218

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.5 ± 2.4 µg/ml (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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B.G. Chittim, General Manager

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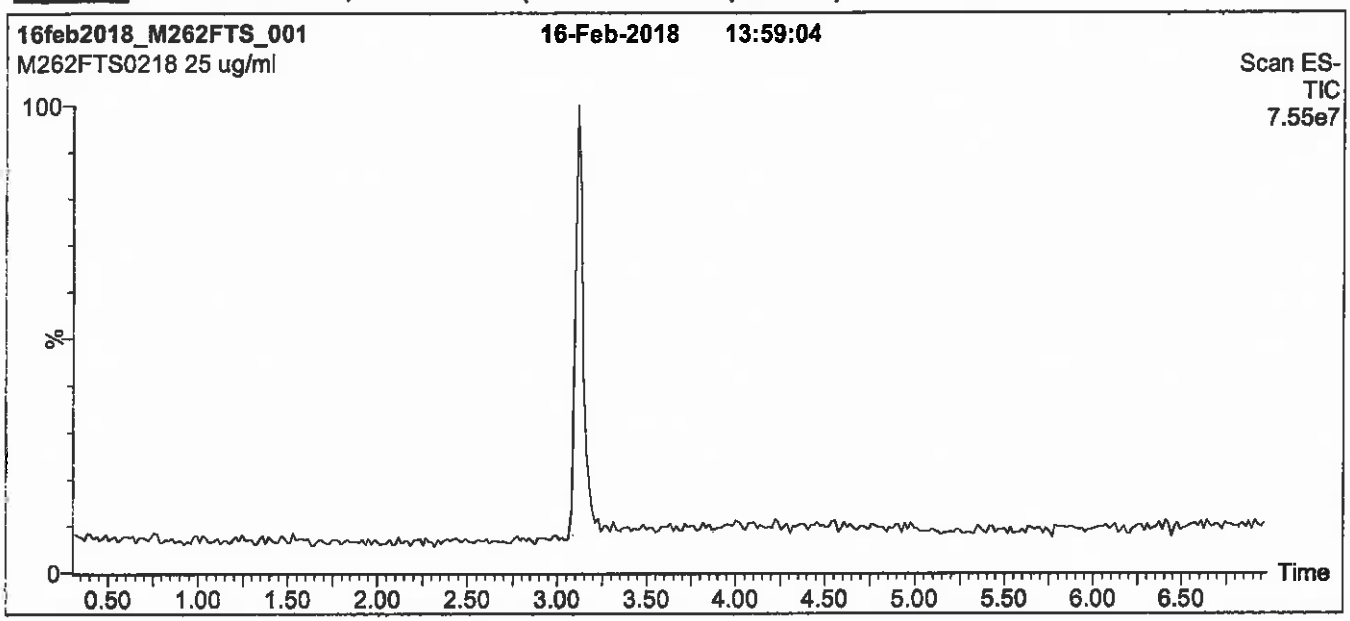
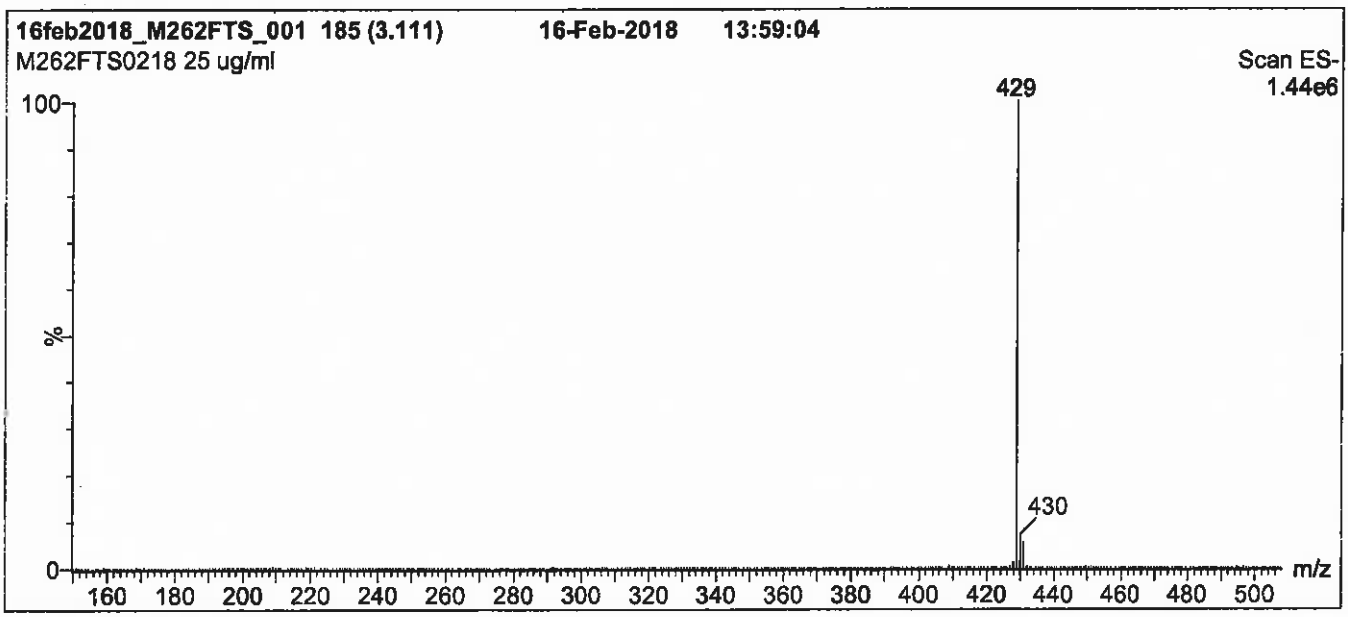




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

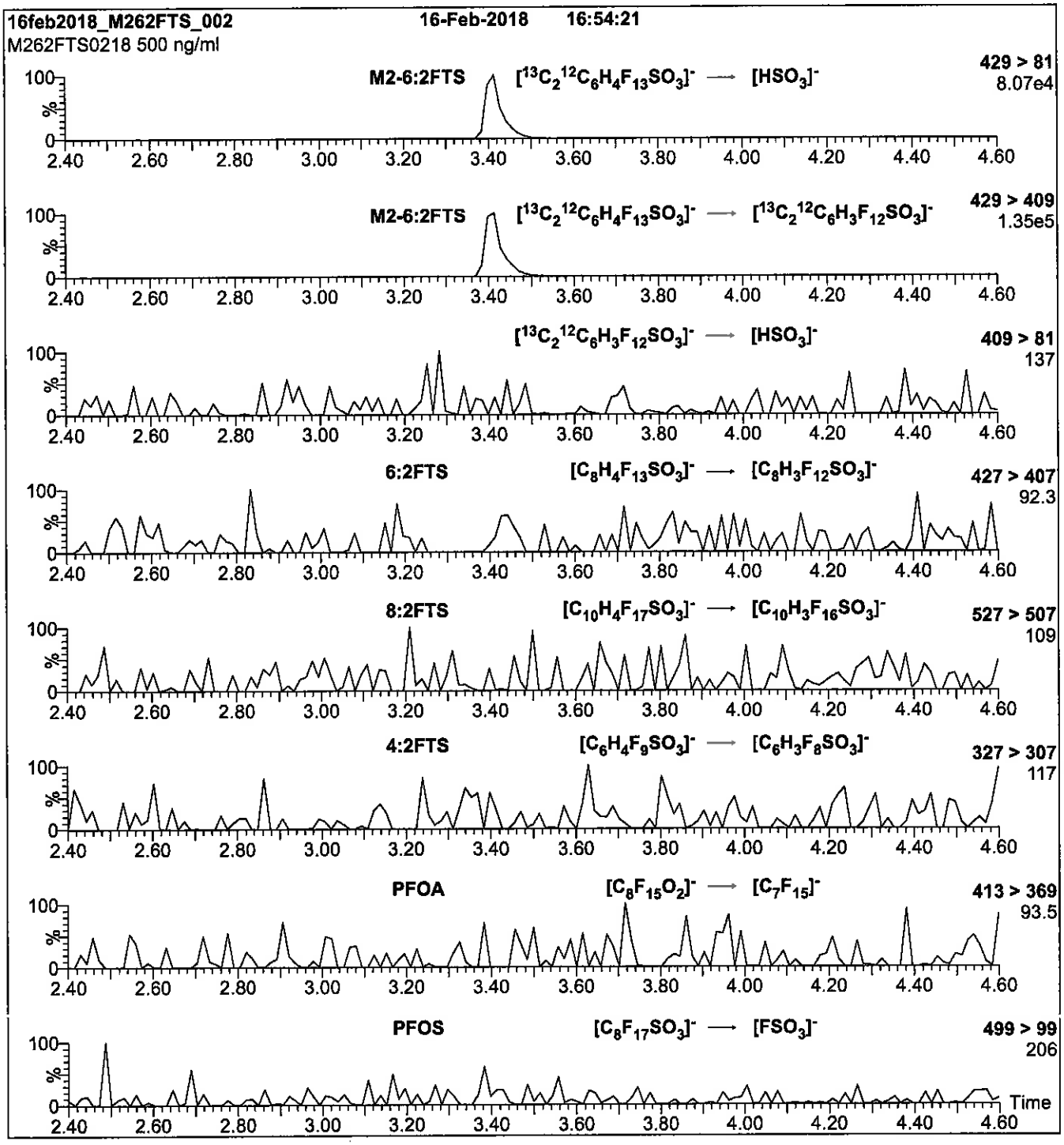
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2-6:2FTS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00010

1263198
ID: LCM2-8:2FTS_00010
Exp:01/24/23 Prpd:CBW Opn:05/30/18
M2-8:2FTS

R: 5/30/18 CBW

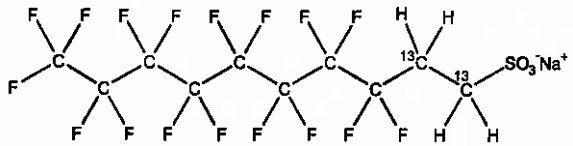
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 552.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.9 ± 2.4 µg/ml (M2-8:2FTS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2-$^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 01/24/2018

EXPIRY DATE: (mm/dd/yyyy) 01/24/2023

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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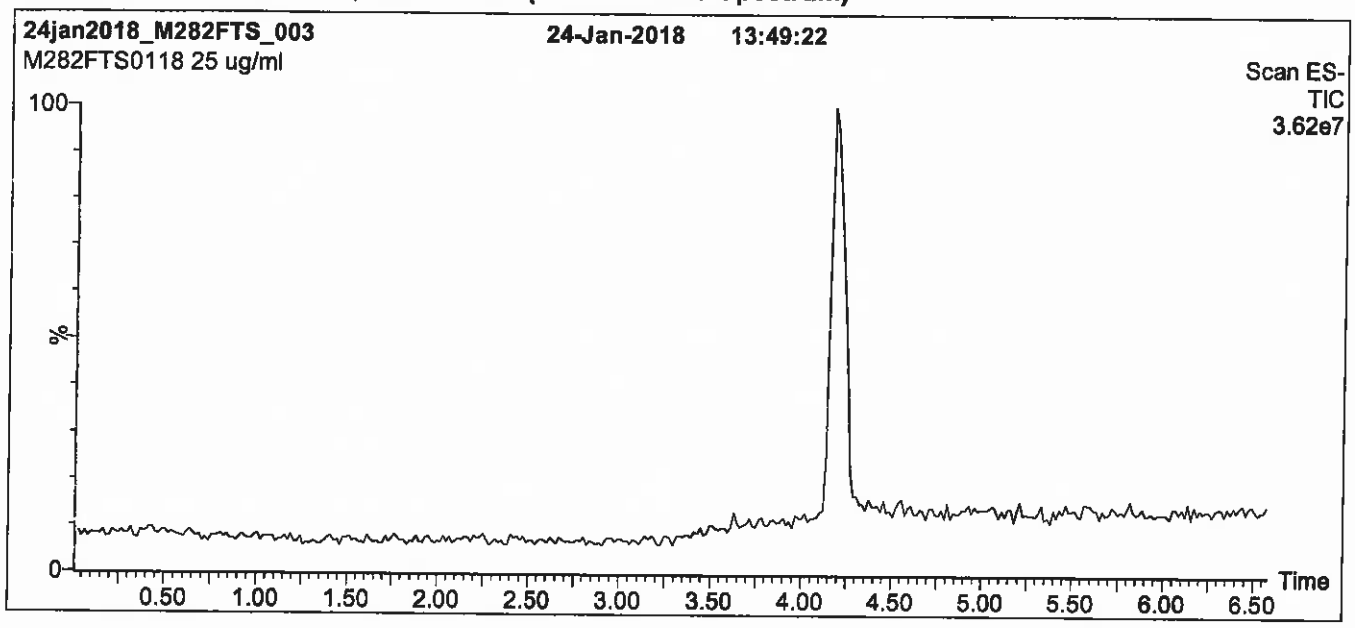
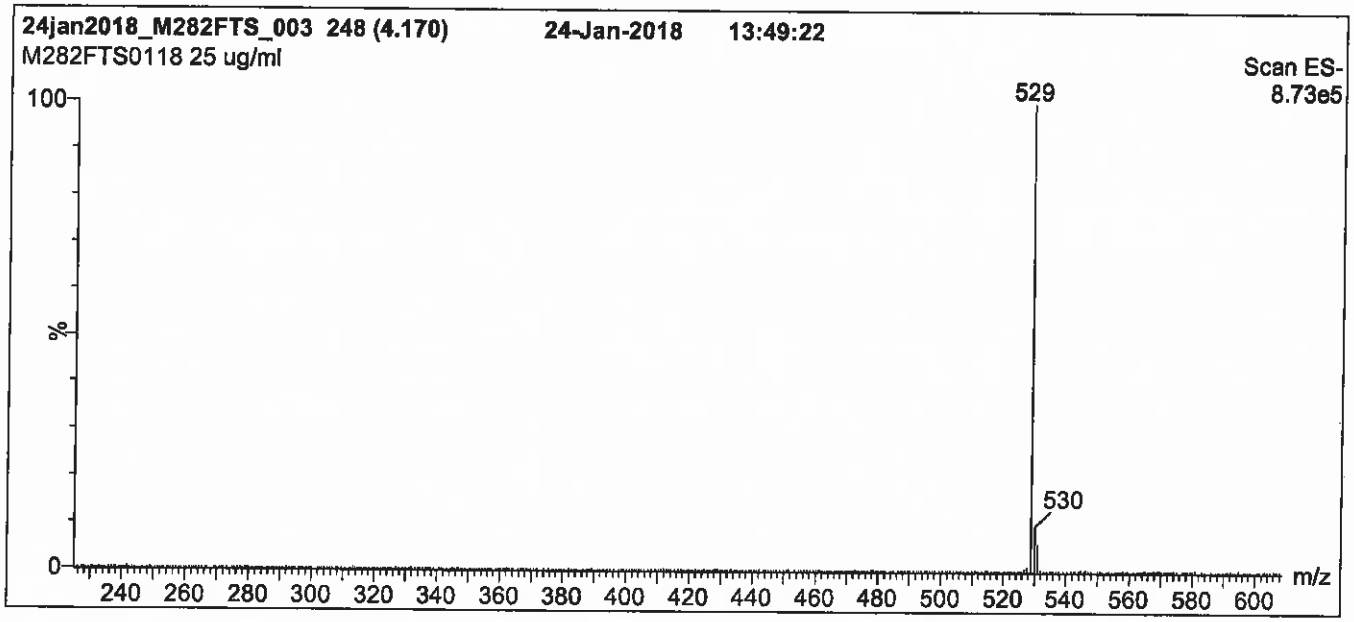
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

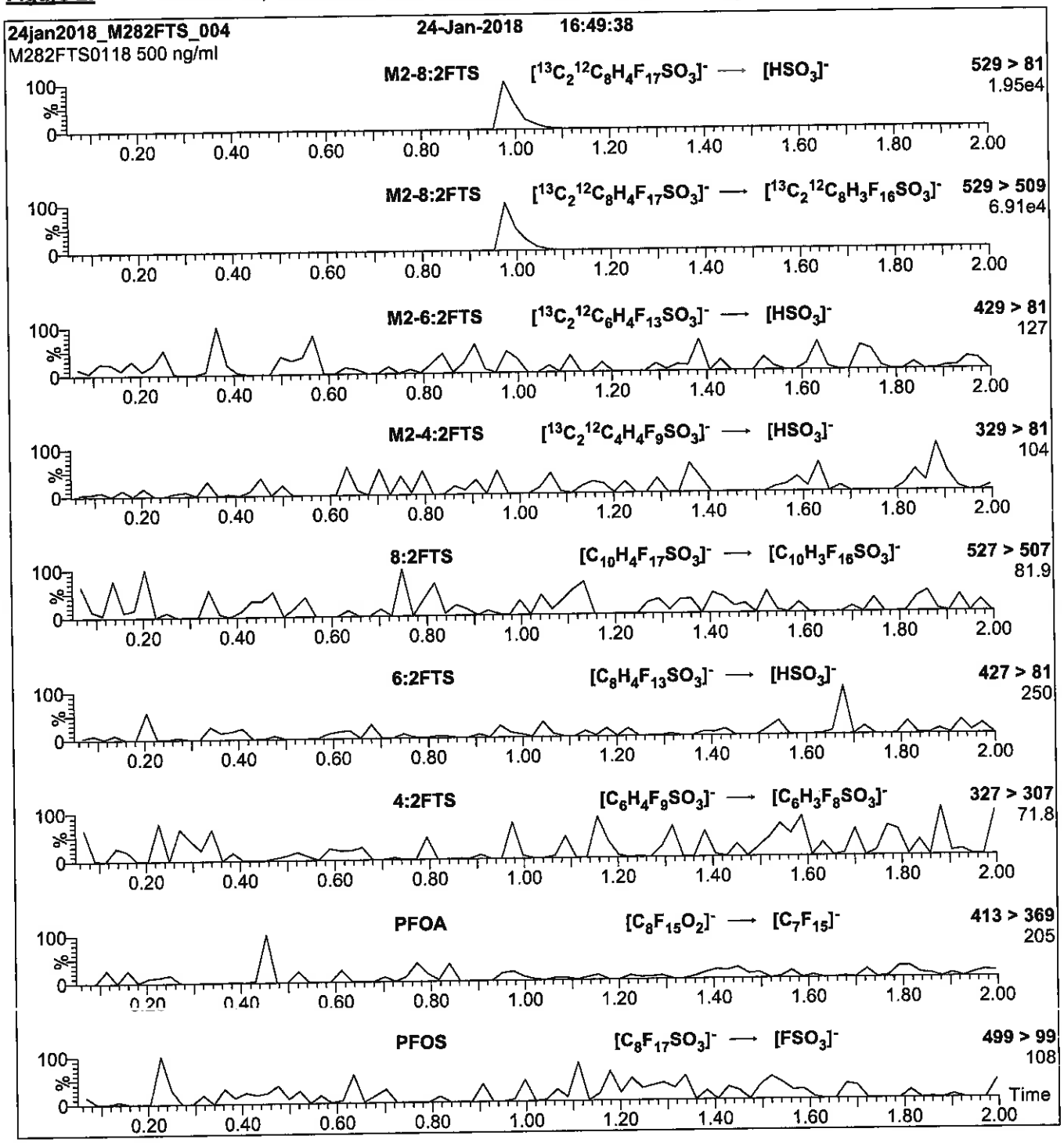
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00011

1287355
ID: LCM2-8:2FTS_03011
Exp:01/24/23 Prpd:CBW Opn:06/26/18
M2-8:2FTS

R: 6/26/18 CBW

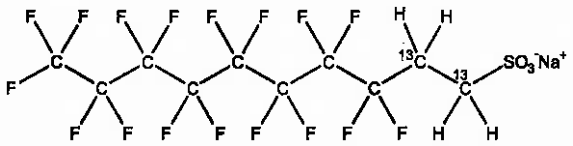
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C
LAST TESTED: (mm/dd/yyyy)	01/24/2018		(1,2-$^{13}C_2$)
EXPIRY DATE: (mm/dd/yyyy)	01/24/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/26/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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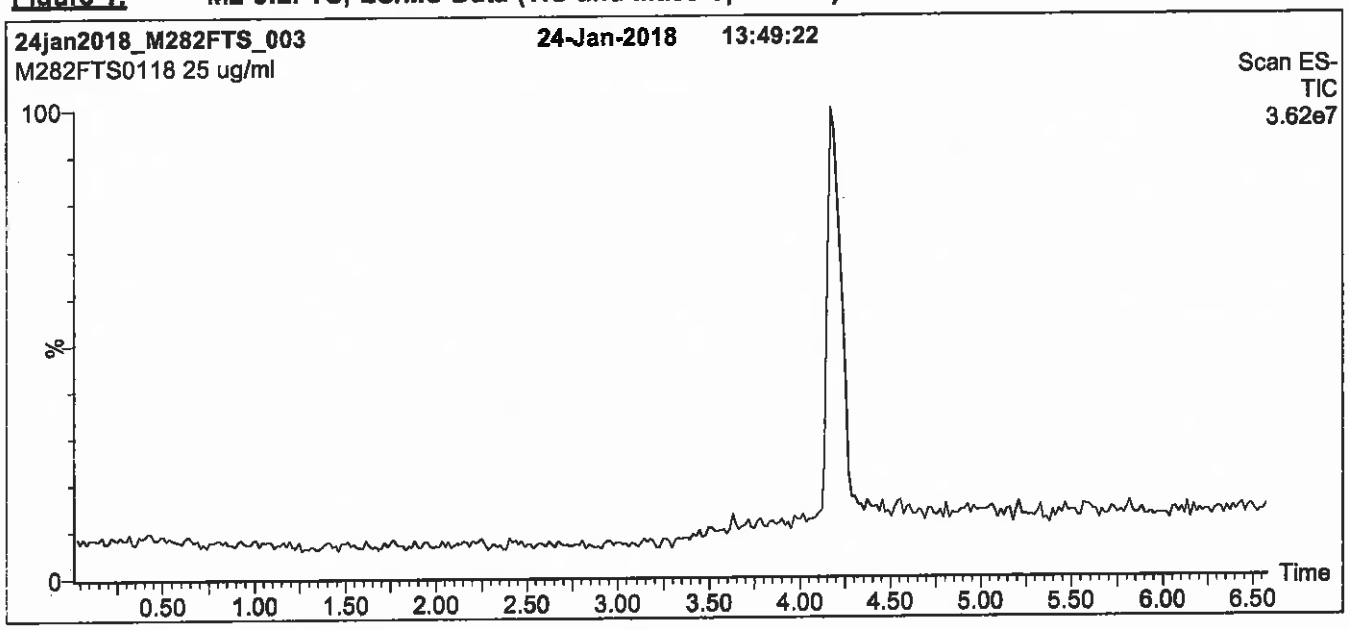
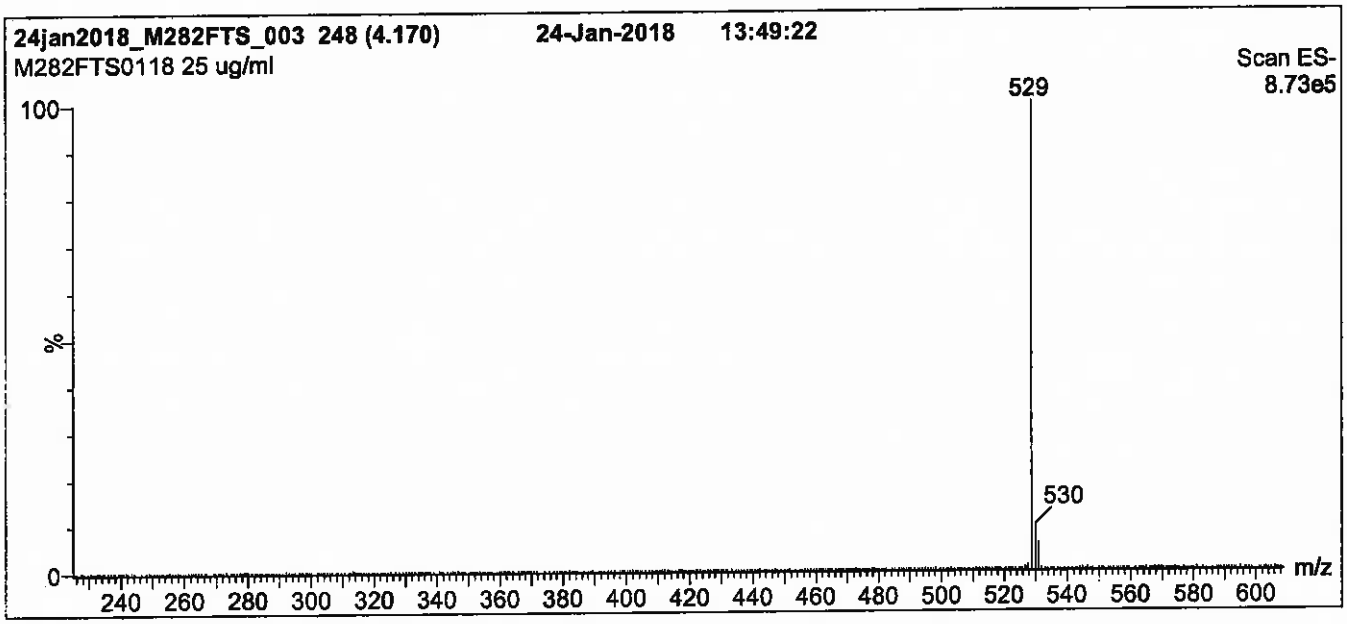




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

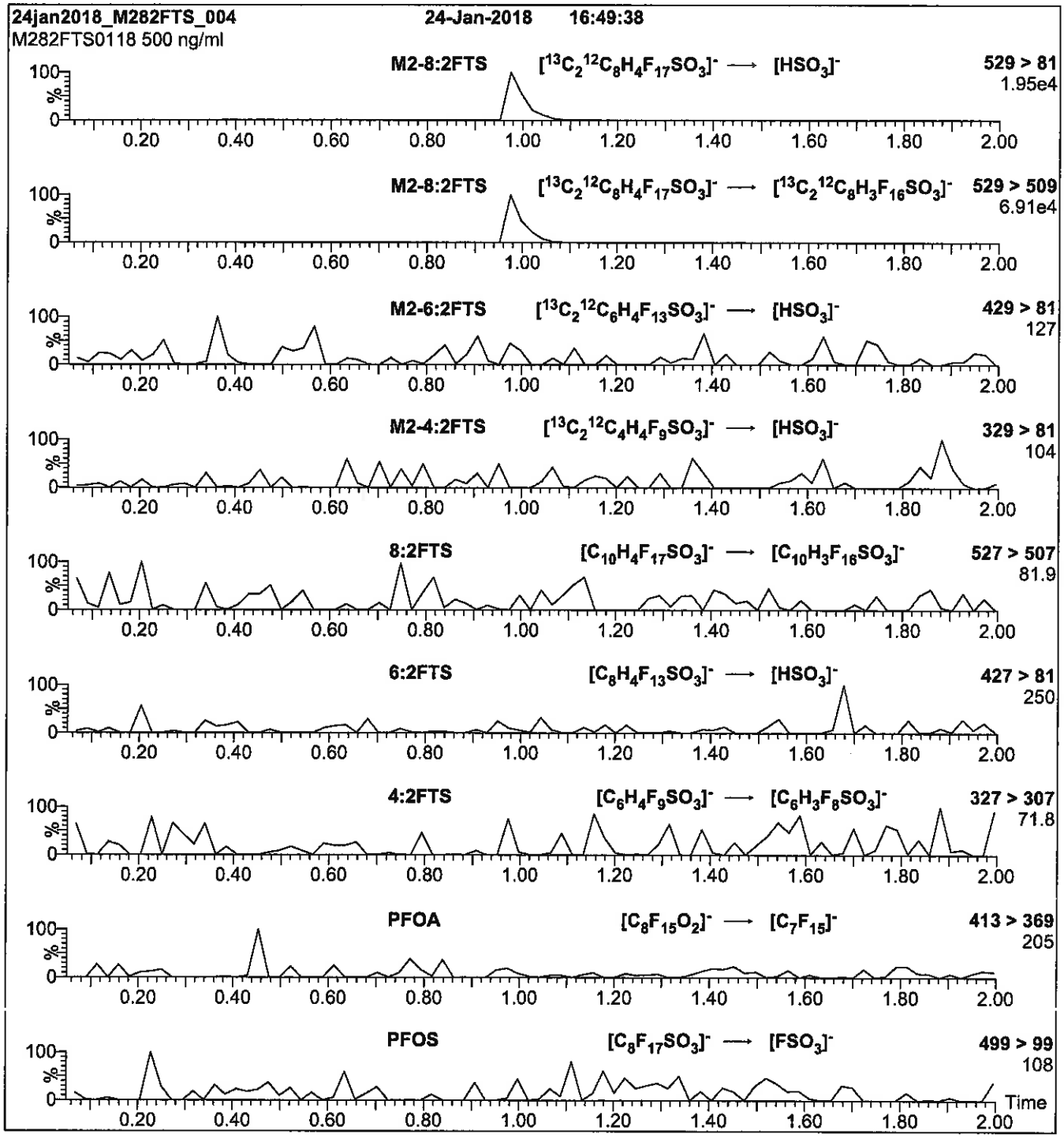
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2-8:2FTS)	**MS Parameters**	
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25	
Flow:	300 µl/min		

Reagent

LCM2PFHxDA_00016

1263133
ID: LCM2PFHxDA_00016
Exp:07/13/22 Prpd:CBW Opn:06/30/18
13C2-PFHxDA at 50ug/mL

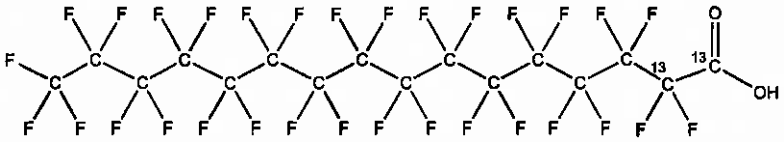
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA0717
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{14}HF_{31}O_2$
MOLECULAR WEIGHT: 816.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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CALA

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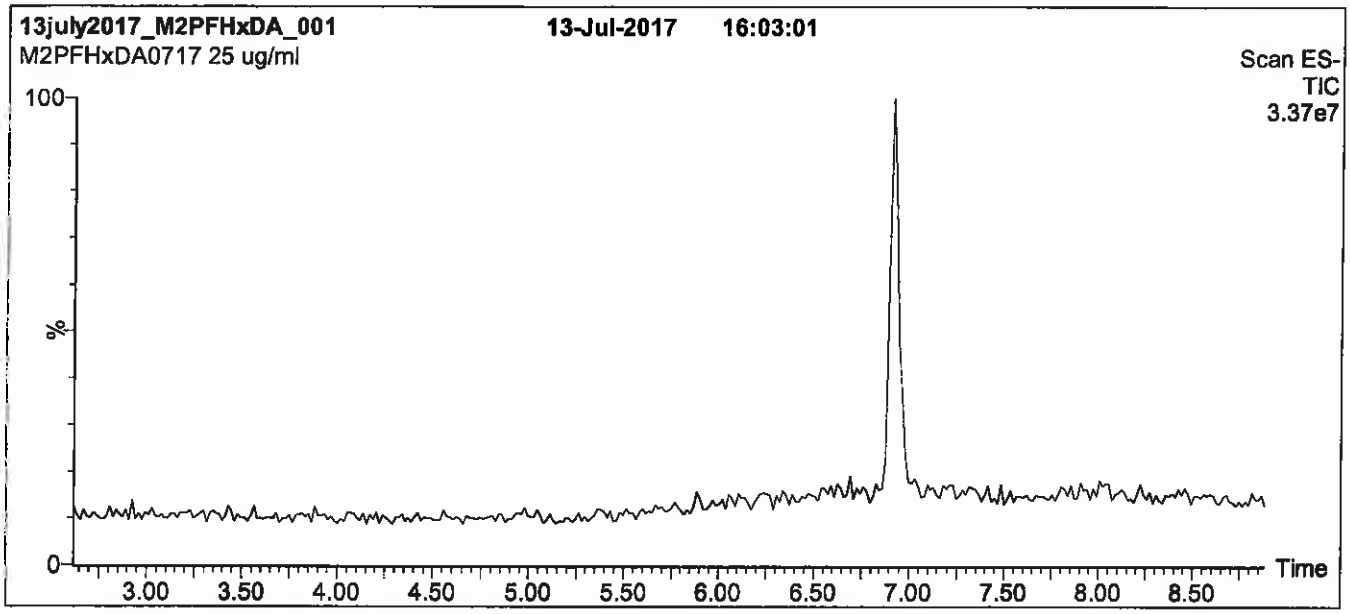
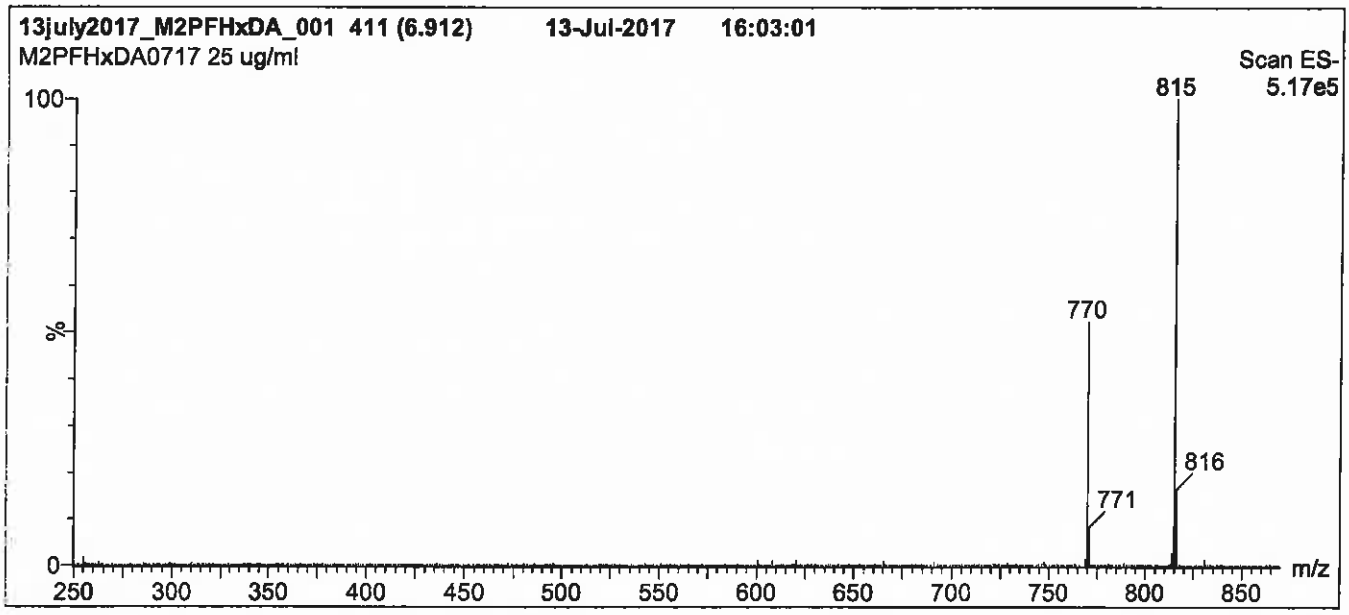
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

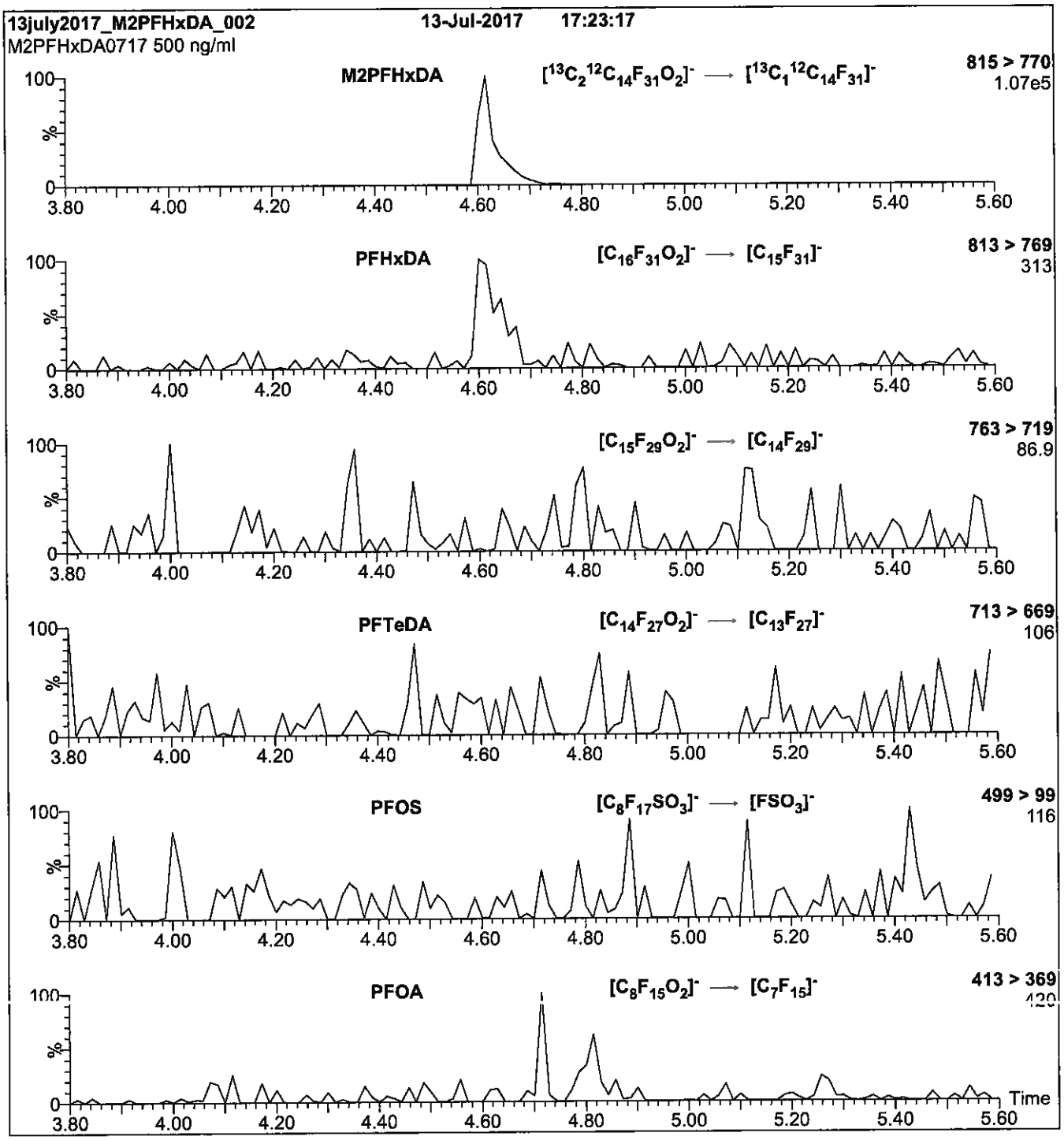
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCM2PFHxDA_00017

1287278
ID: LCM2PFHxDA_00017
Exp:07/13/22 Prpd:CBW Opn:06/26/18
13C2-PFHxDA at 50ug/mL.

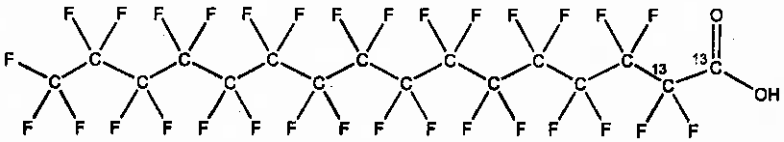
R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA0717
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

STRUCTURE:
CAS #: Not available



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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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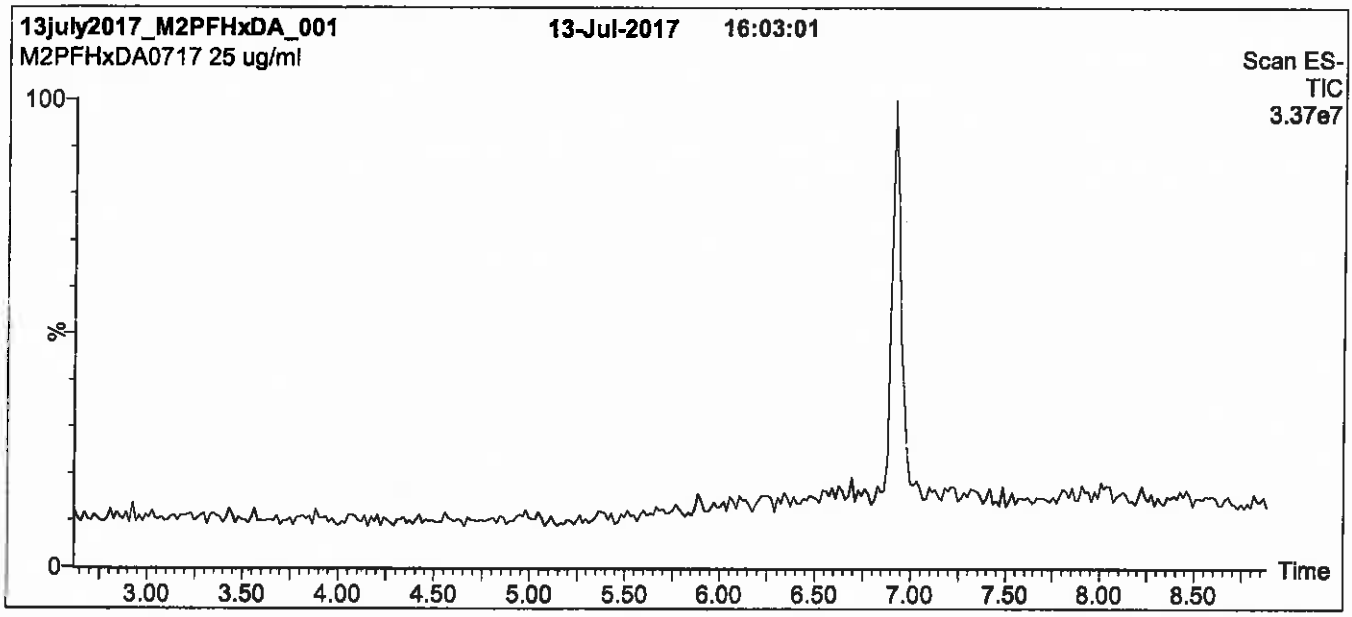
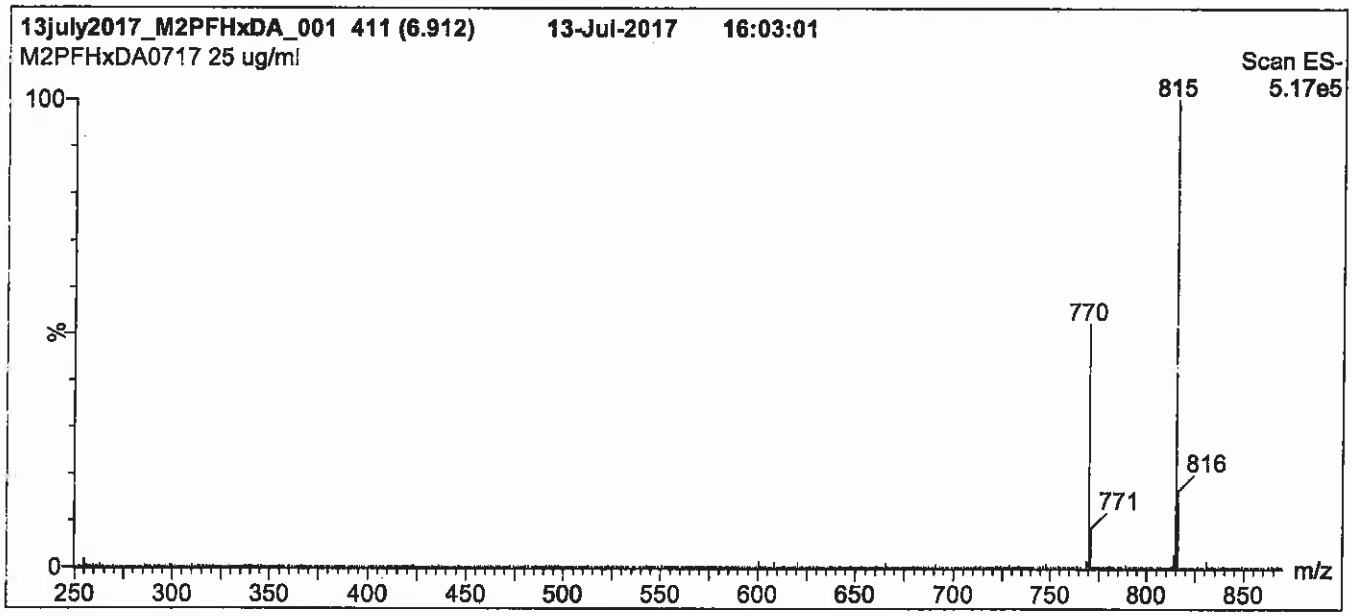
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

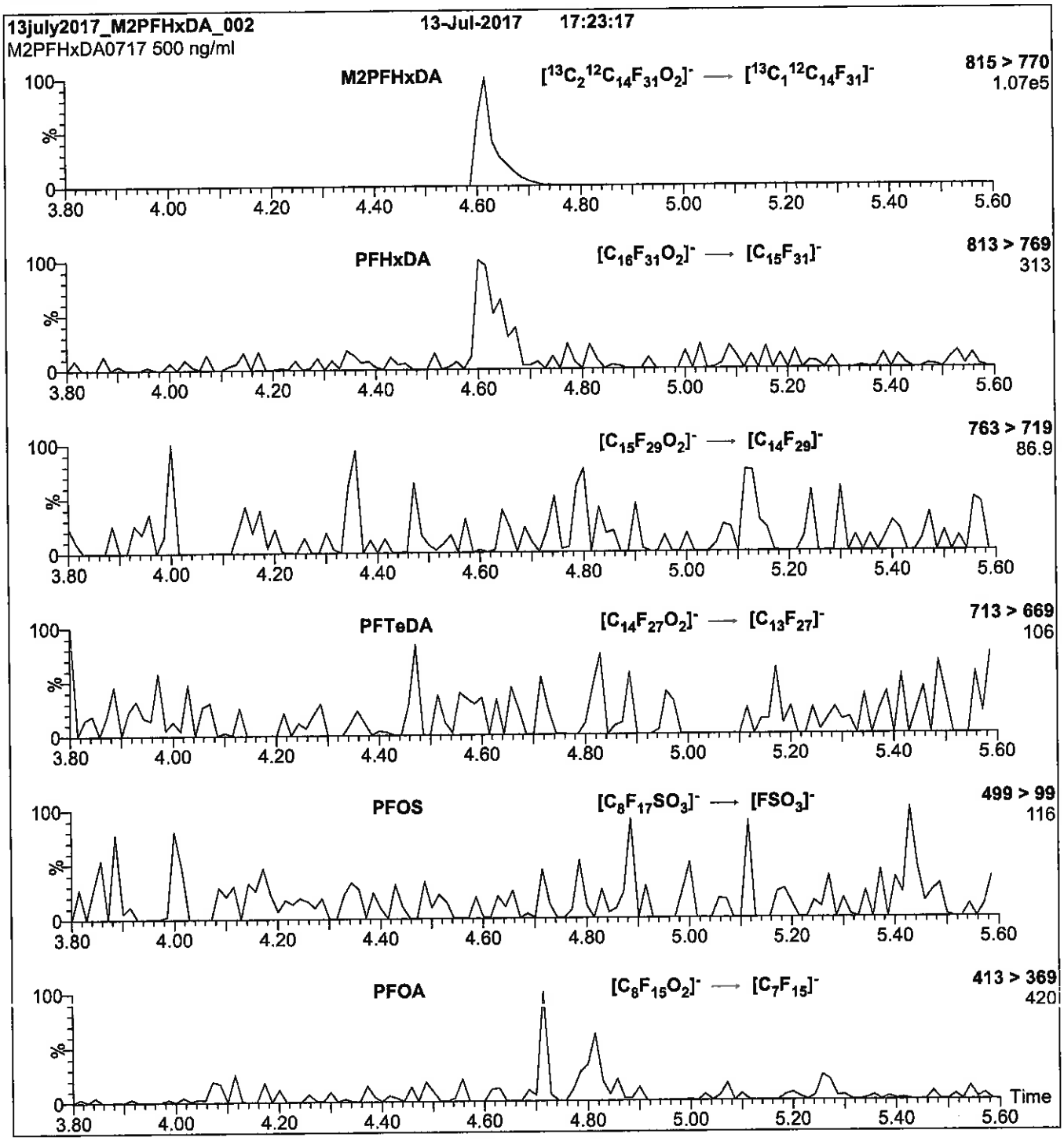
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCM2PFOA_00008

r. 5/3/17 SKW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

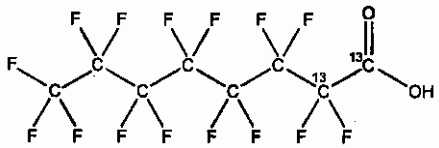
PRODUCT CODE: M2PFOA

LOT NUMBER: M2PFOA0216

COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6HF_{16}O_2$

MOLECULAR WEIGHT: 416.05

CONCENTRATION: 50 ± 2.5 µg/ml

SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 02/12/2016

EXPIRY DATE: (mm/dd/yyyy) 02/12/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/24/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB

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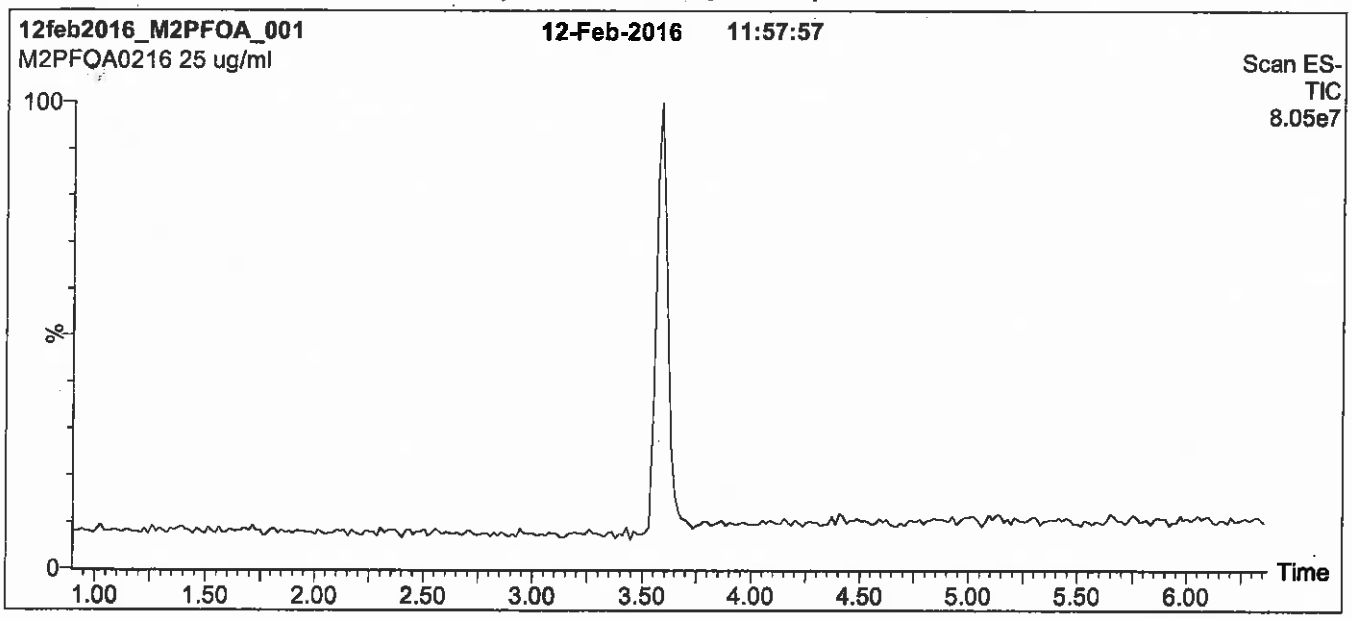
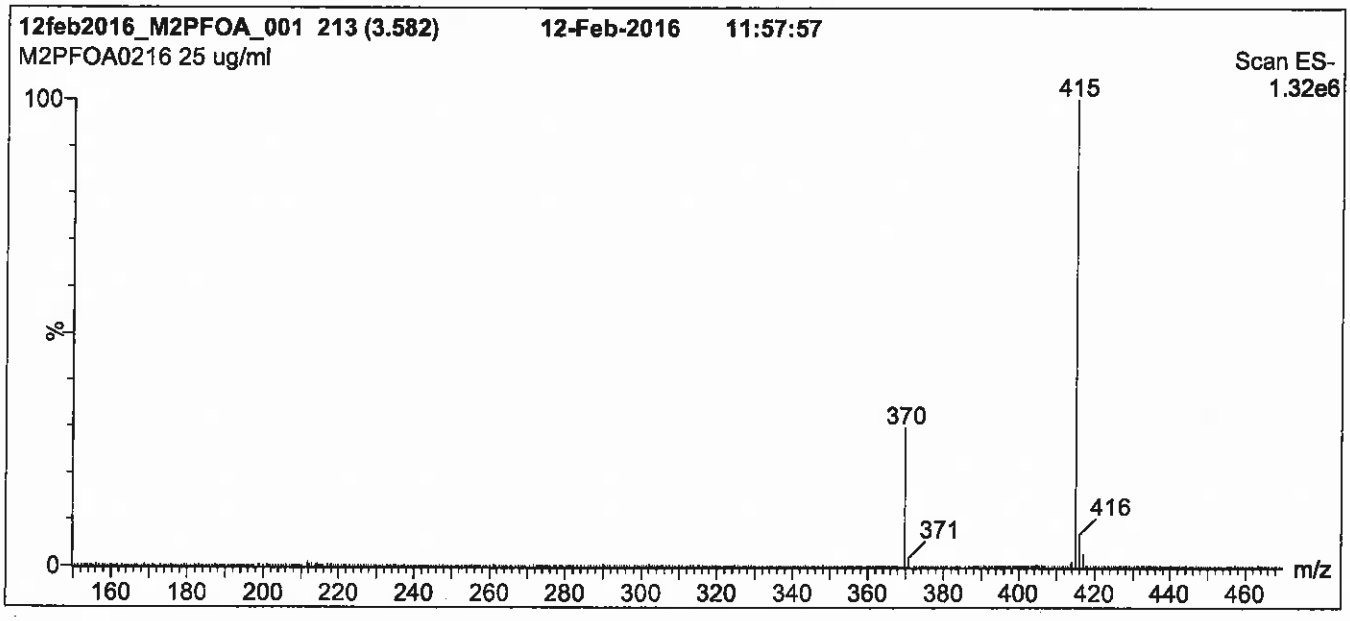
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

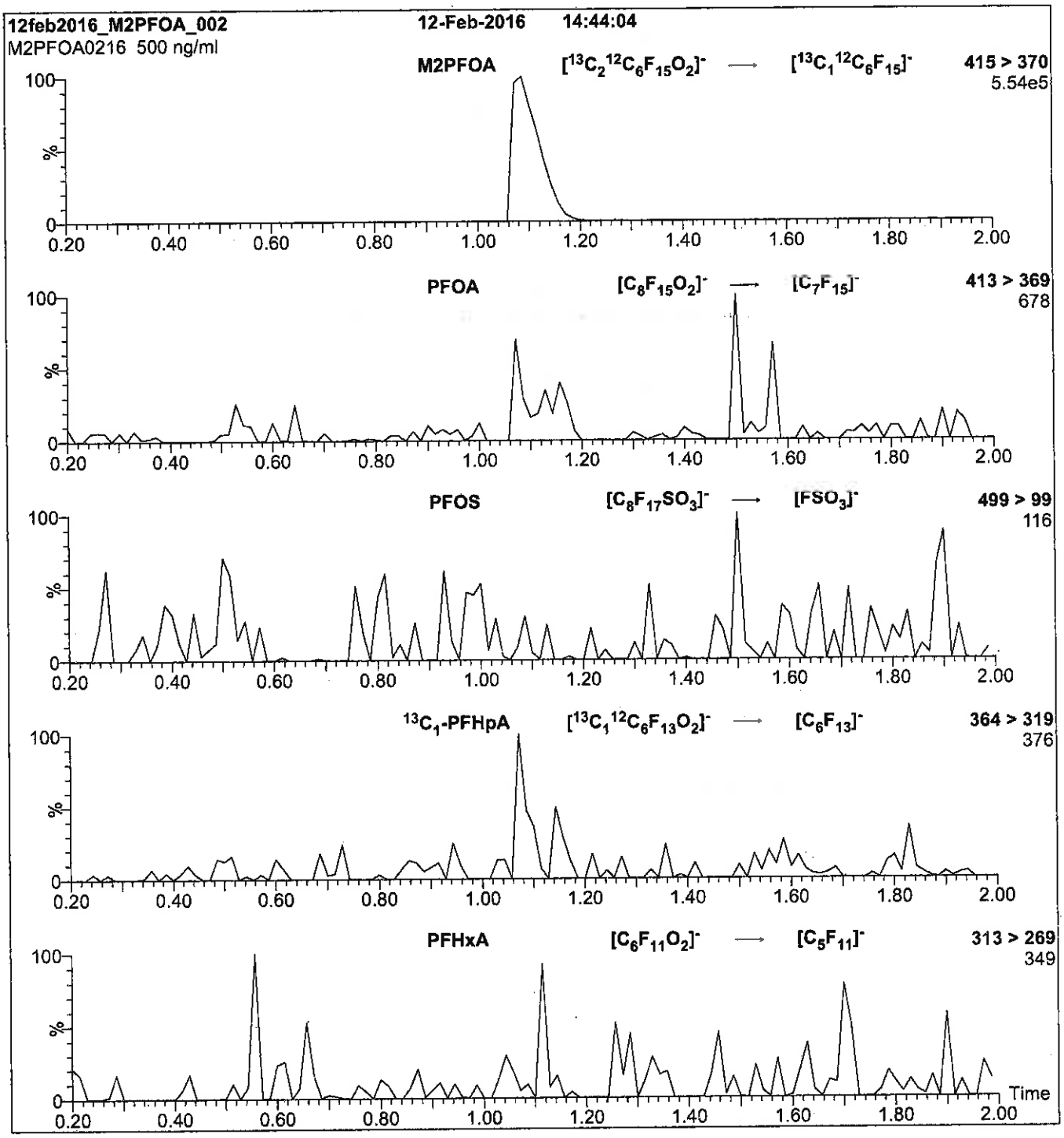
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

Reagent

LCM2PFOA_00012

1287307
ID: LCM2PFOA_00012
Exp:10/26/22 Prpd:CBW Opn:06/26/18
13C2-PFOA Stock 50ug/mL

R: 6/26/18 CBW

WELLINGTON LABORATORIES

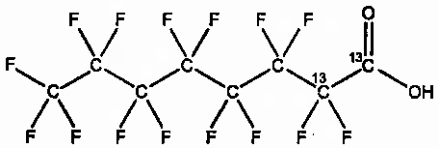
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

LOT NUMBER: M2PFOA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 416.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/26/2017
EXPIRY DATE: (mm/dd/yyyy) 10/26/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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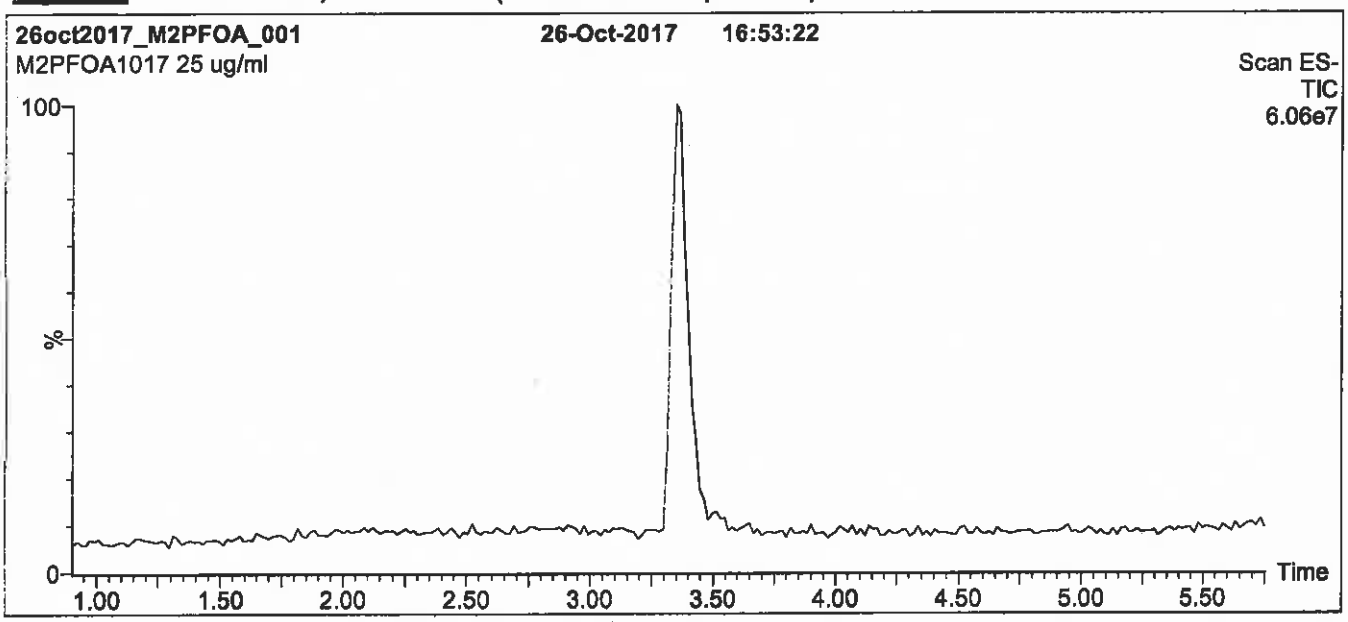
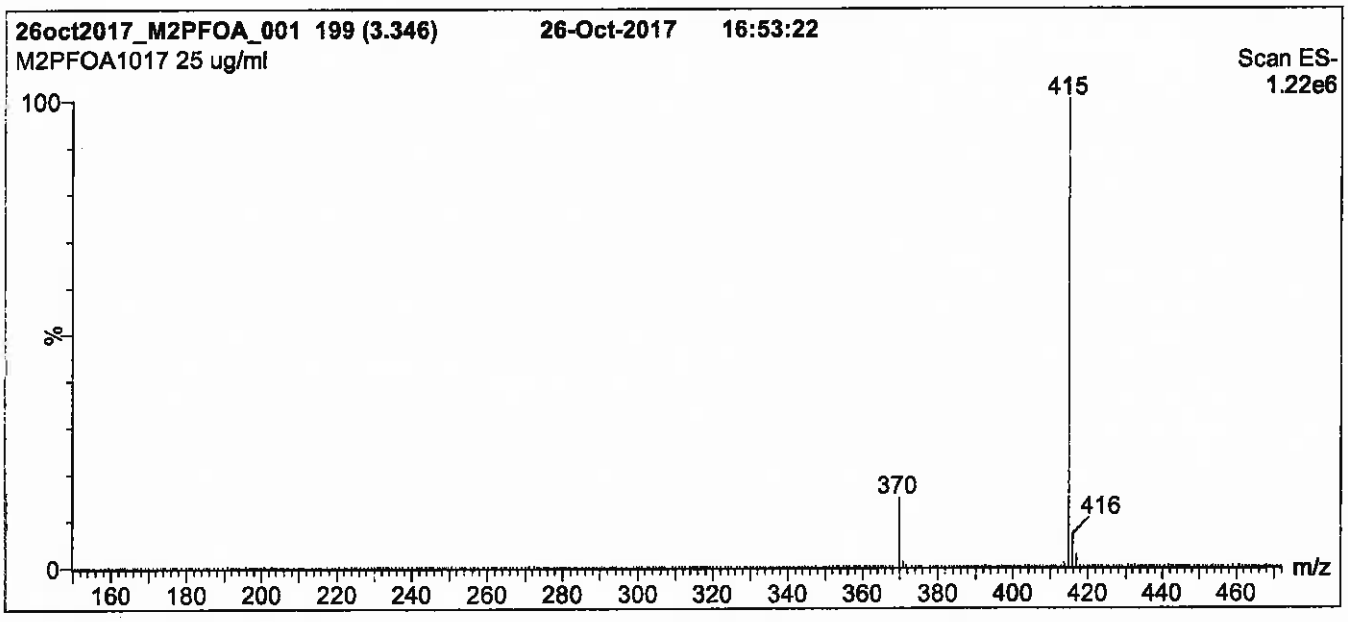
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

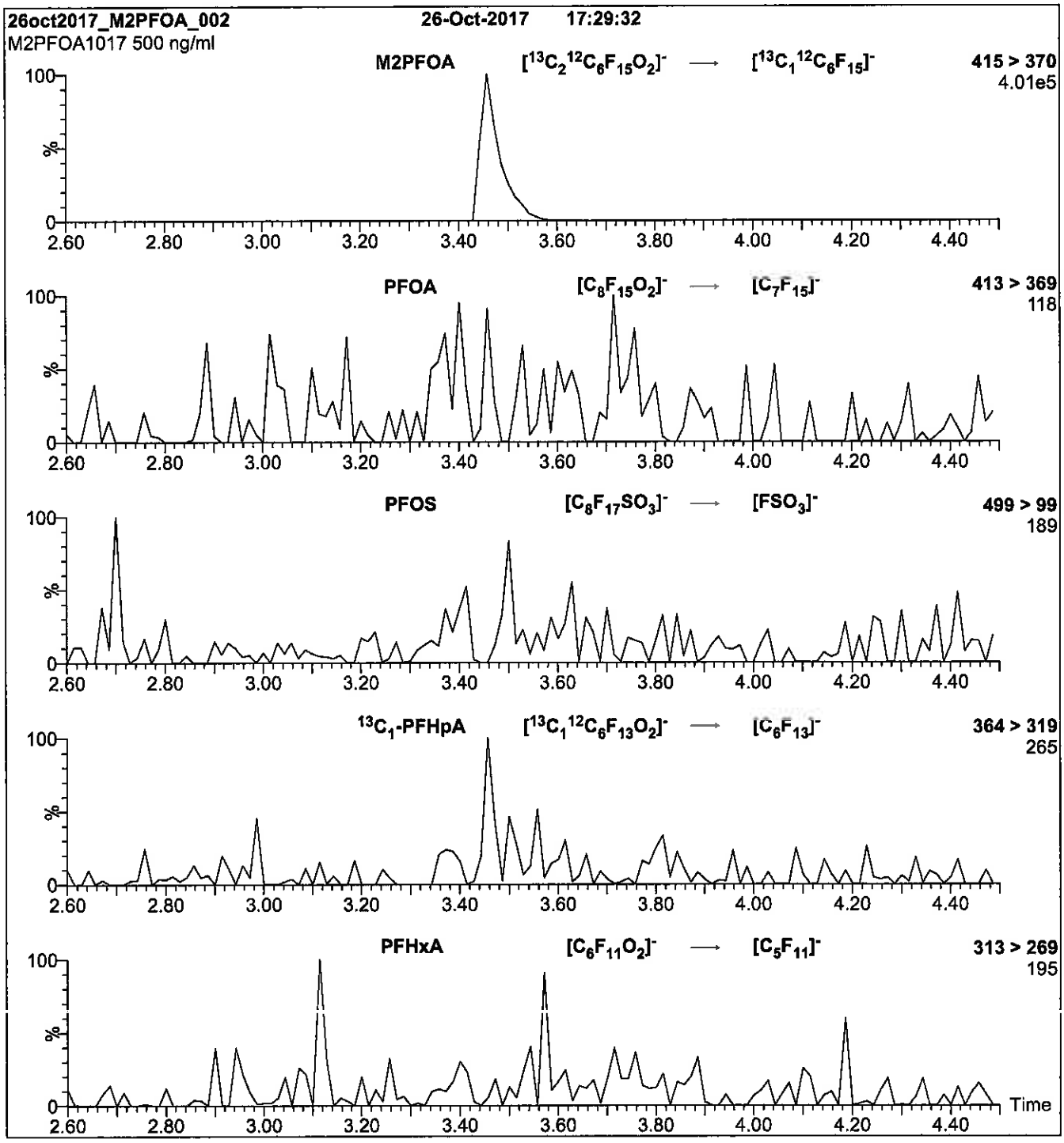
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFOA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 10
Flow:	300 µl/min	

Reagent

LCM2PFTeDA_00014

1263136
ID: LCM2PFTeDA_00014
Exp:11/30/22 Prpd:CBW Opn:05/30/18
13C2-PFTeDA at 50ug/mL

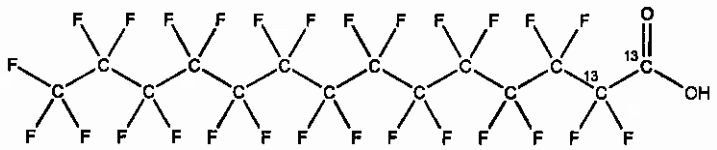
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{12}HF_{27}O_2$
MOLECULAR WEIGHT: 716.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
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Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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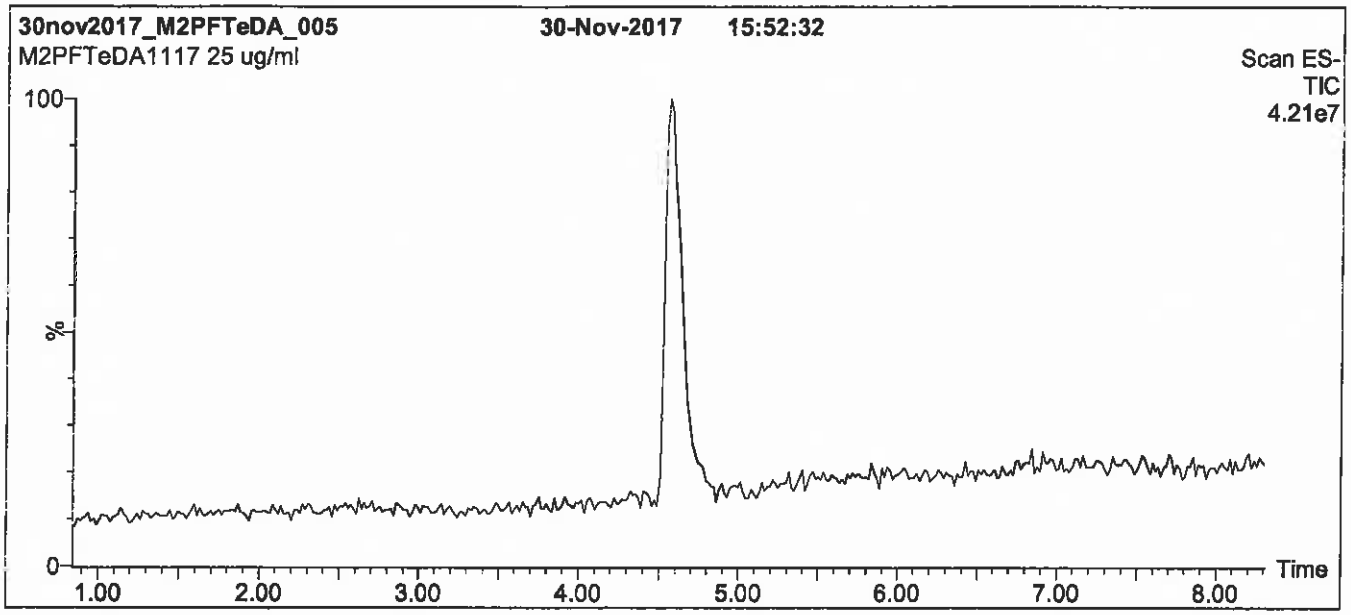
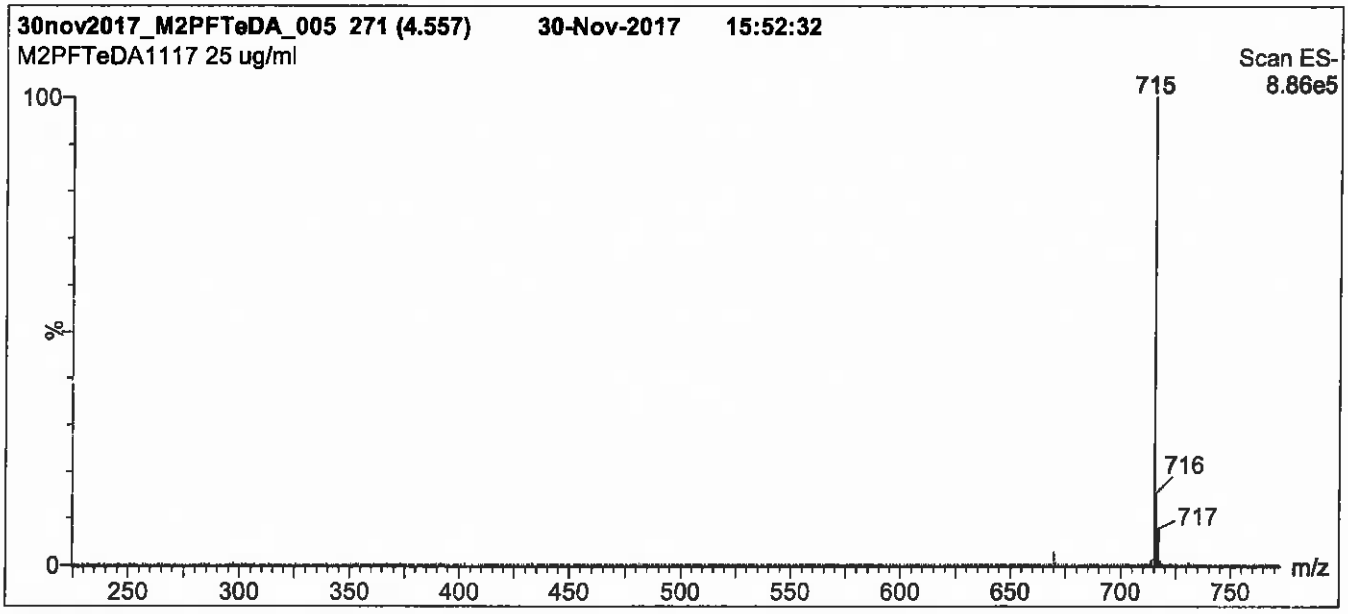
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

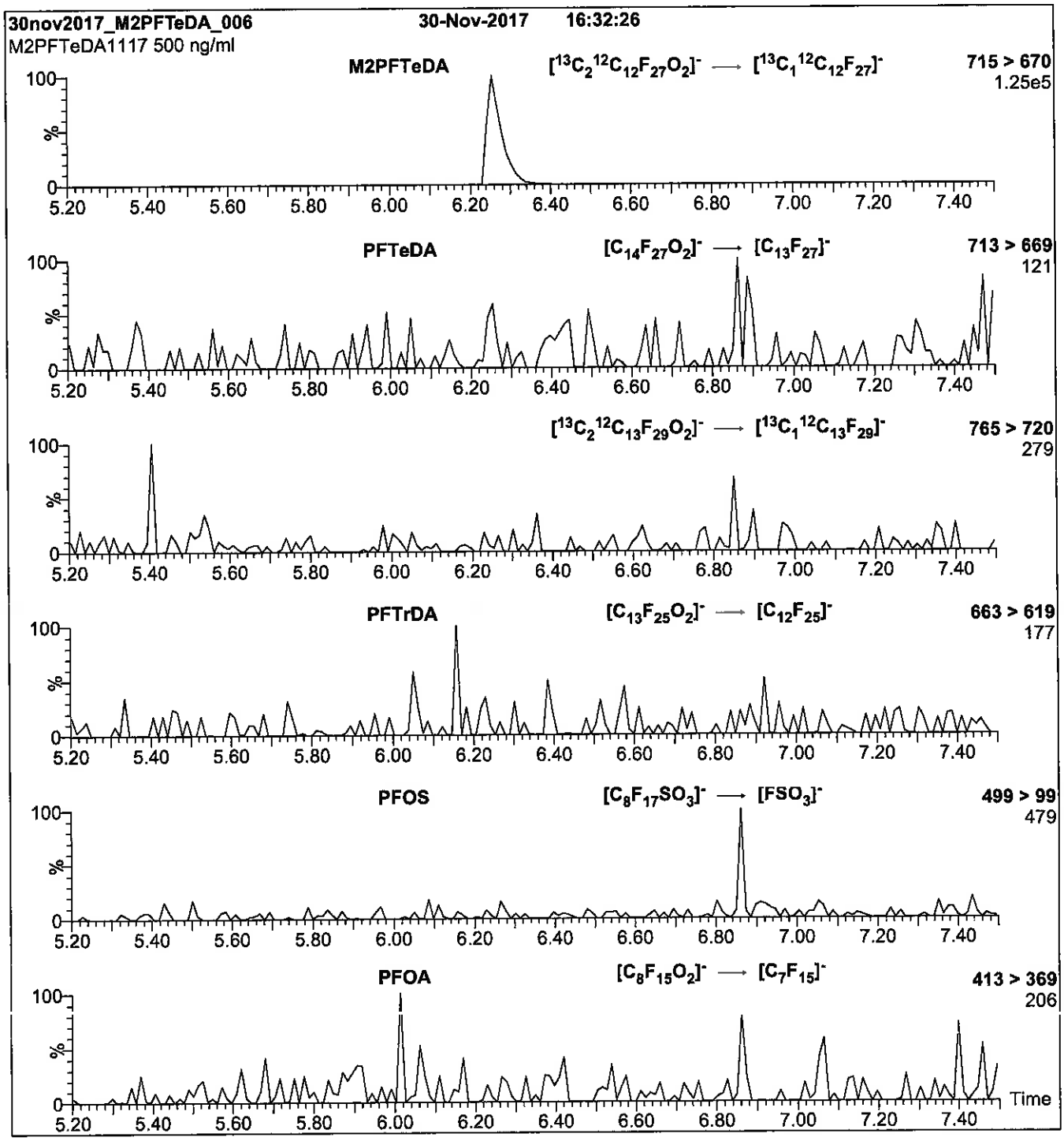
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFTeDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

Reagent

LCM2PFTeDA_00015

1287281
ID: LCM2PFTeDA_00015
Exp:11/30/22 Prpd:CBW Opn:06/26/18
13C2-PFTeDA at 50ug/mL

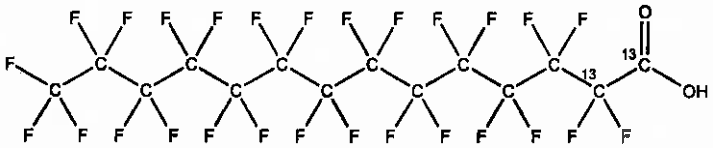
R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{12}HF_{27}O_2$
MOLECULAR WEIGHT: 716.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 11/30/2017
EXPIRY DATE: (mm/dd/yyyy) 11/30/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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CALA

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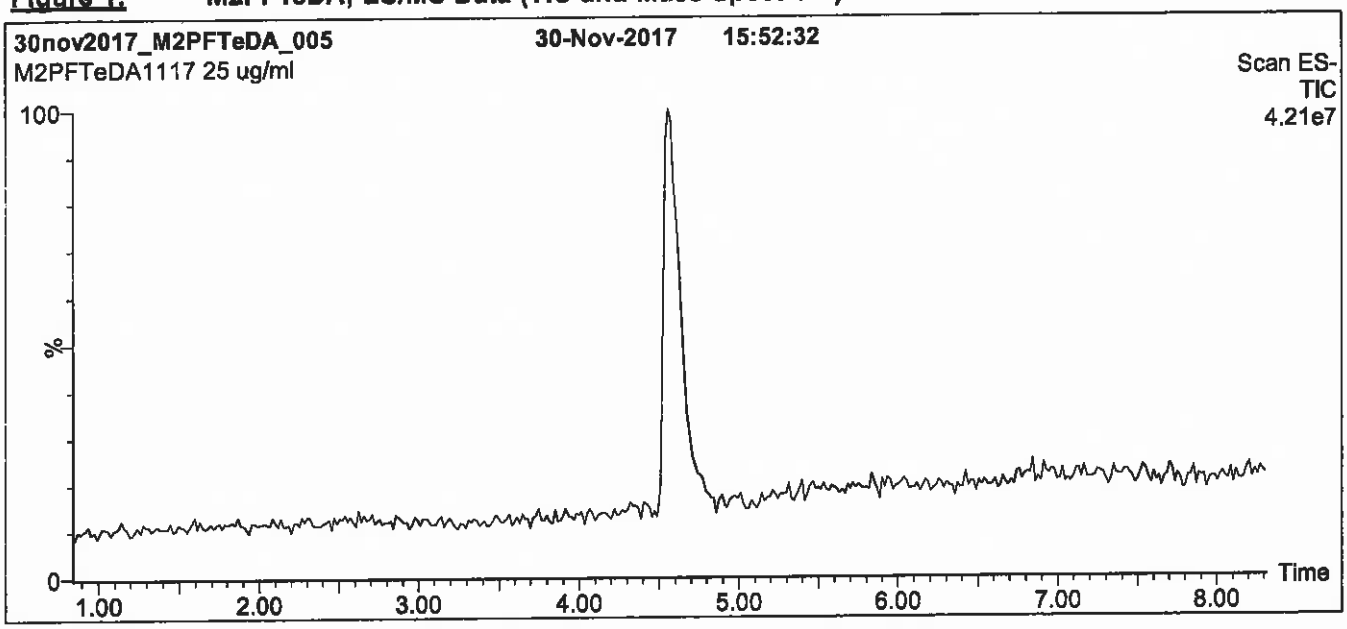
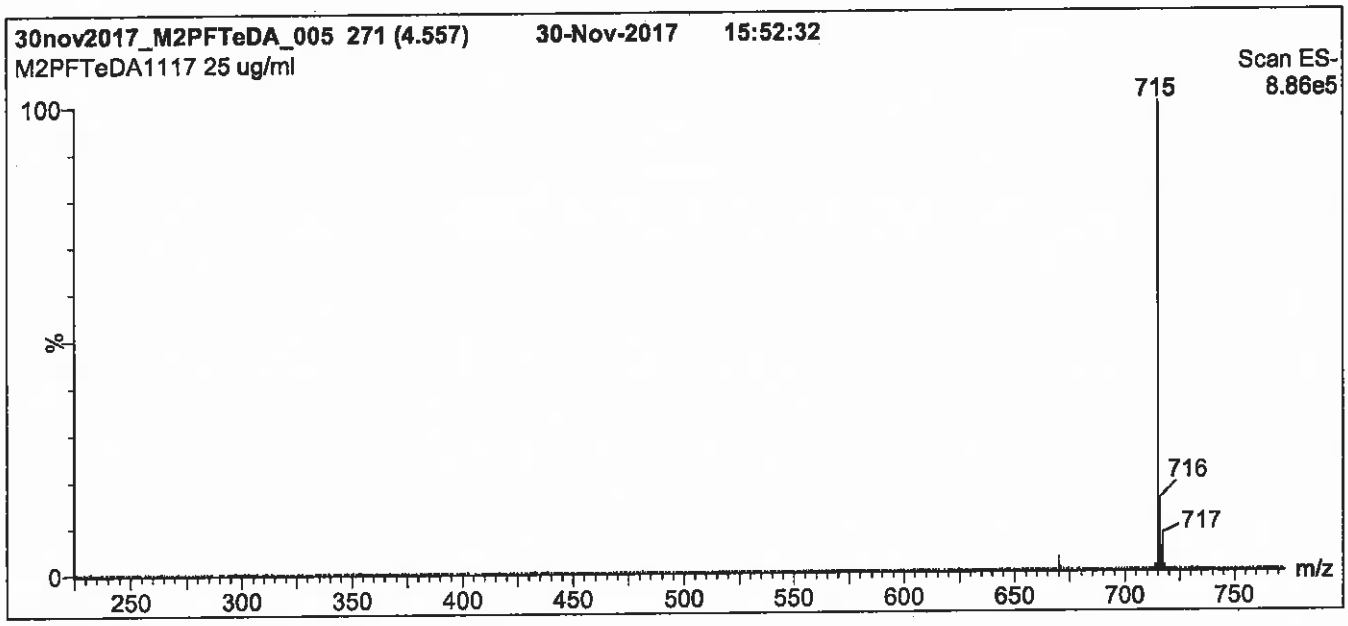




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

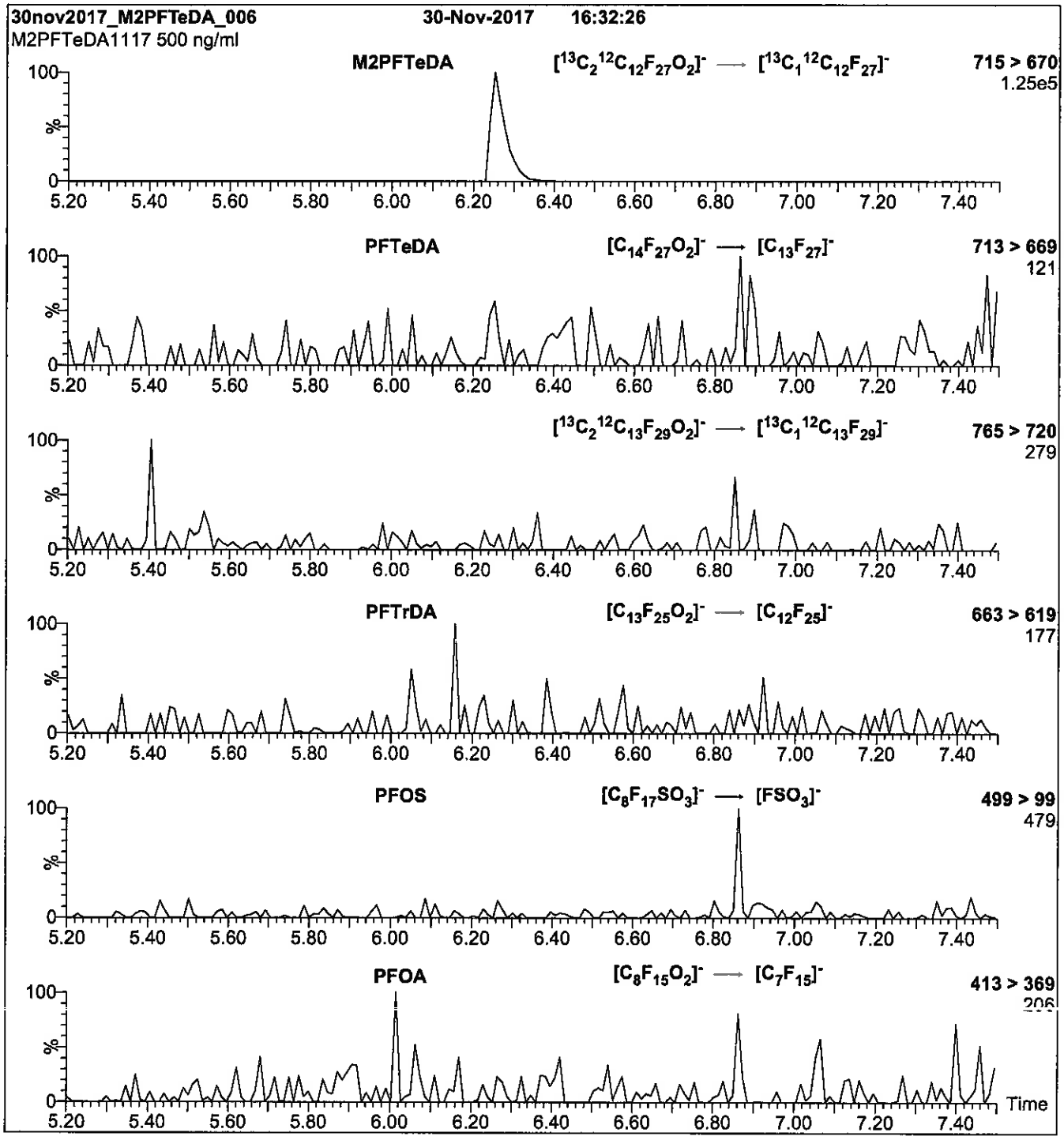
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

Reagent

LCM3HFPO-DA_00004

1287358

ID: LCM3HFPO-DA_00004

Exp:05/18/21 Prpd:CBW Opn:06/26/18

M3HFPO-DA

R: 6/26/18 CBW

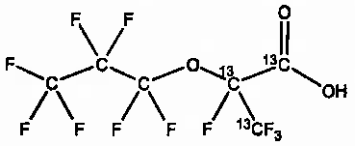
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA0518

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-$^{13}C_3$-propanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3HF_{11}O_3$	**MOLECULAR WEIGHT:**	333.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	05/18/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.5% of two constitutional isomers.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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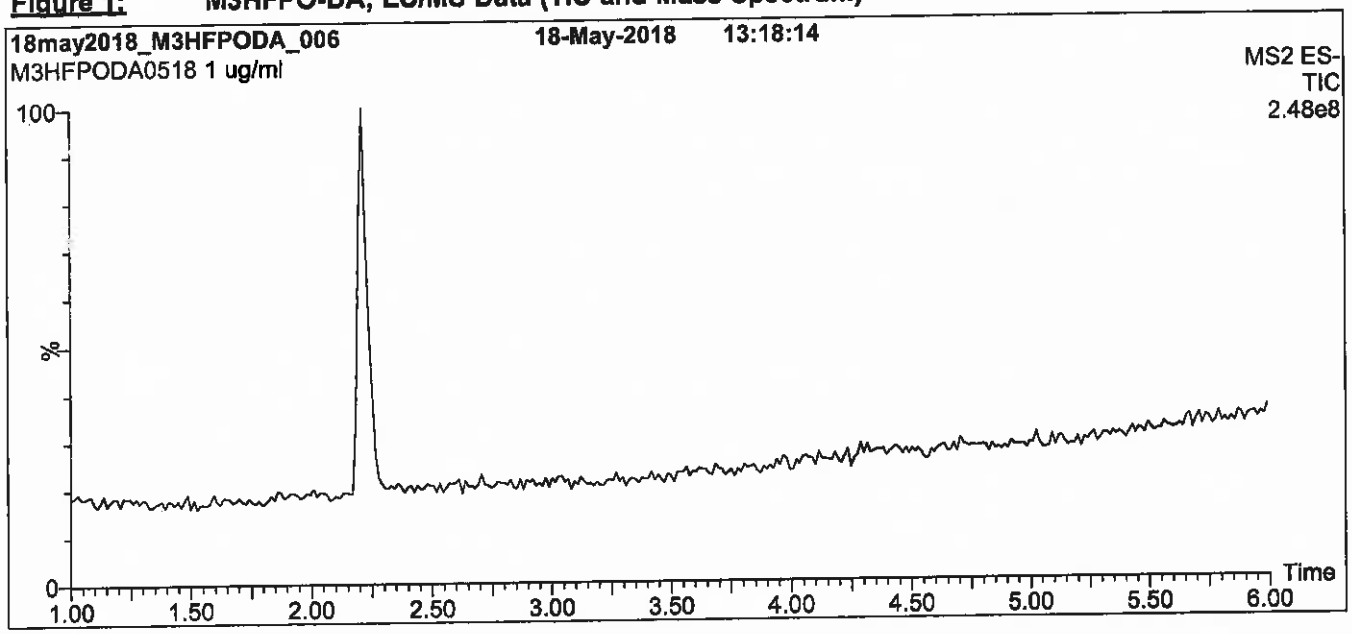
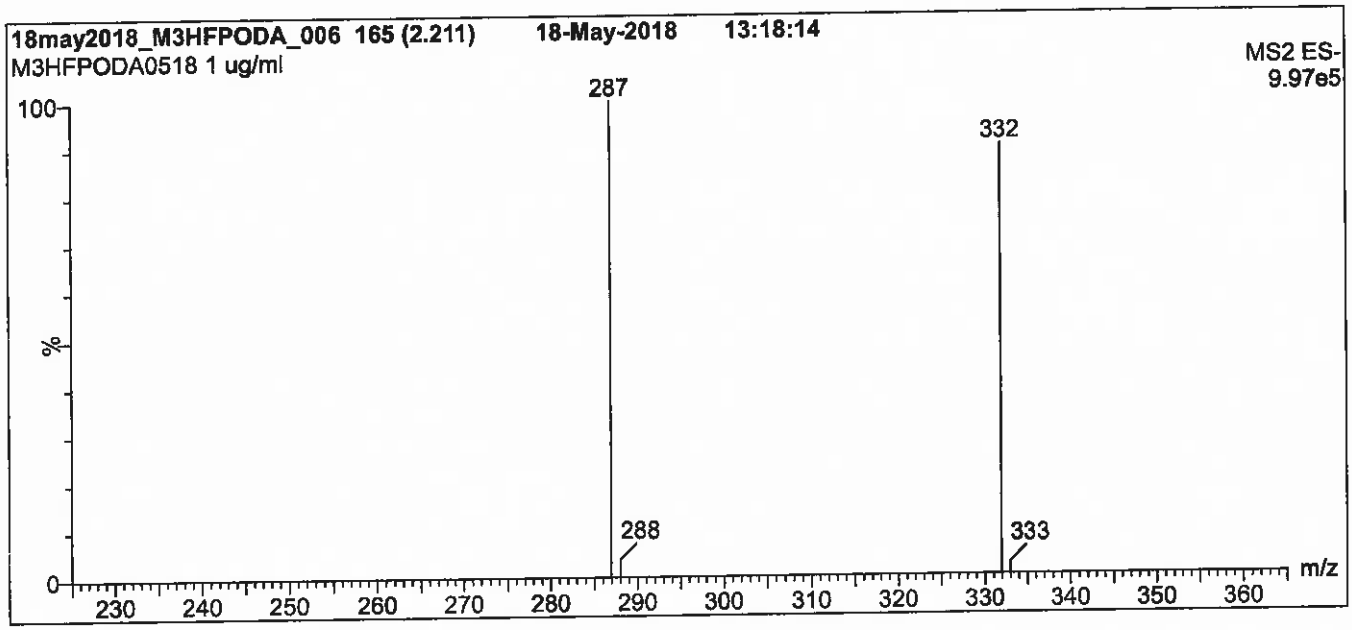
Figure 1: **M3HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

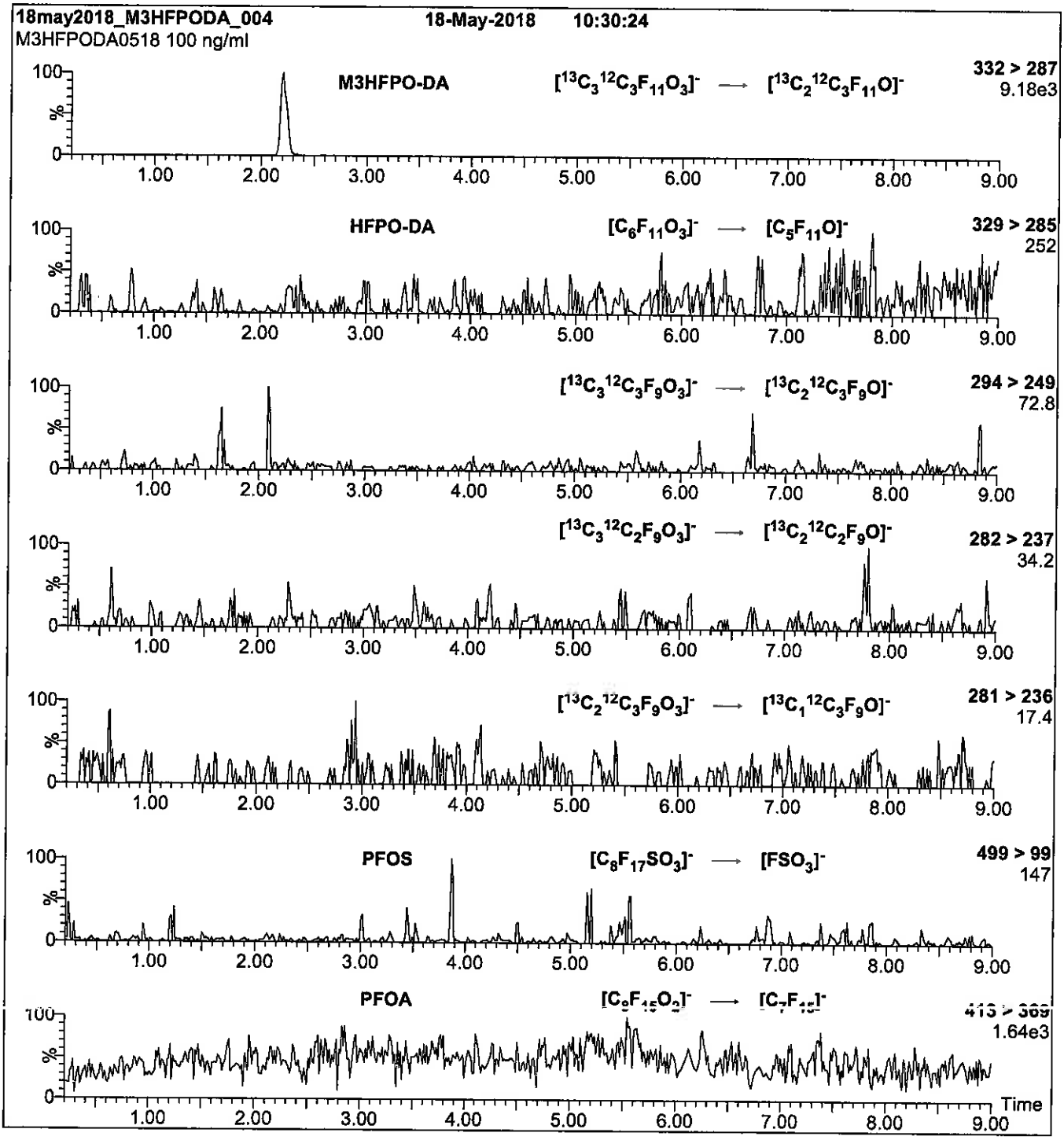
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M3HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M3HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 6

Reagent

LCM4PFHPA_00014

1263142
ID: LCM4PFHPA_00014
Exp:05/03/22 Prpd:CBW Opn:05/30/18
13C4-Perfluoroheptanoic a

R: 12T 5/30/18 CBW

WELLINGTON LABORATORIES

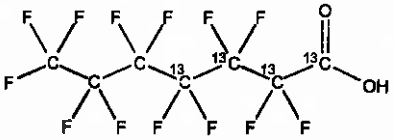
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/03/2017
EXPIRY DATE: (mm/dd/yyyy) 05/03/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/11/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

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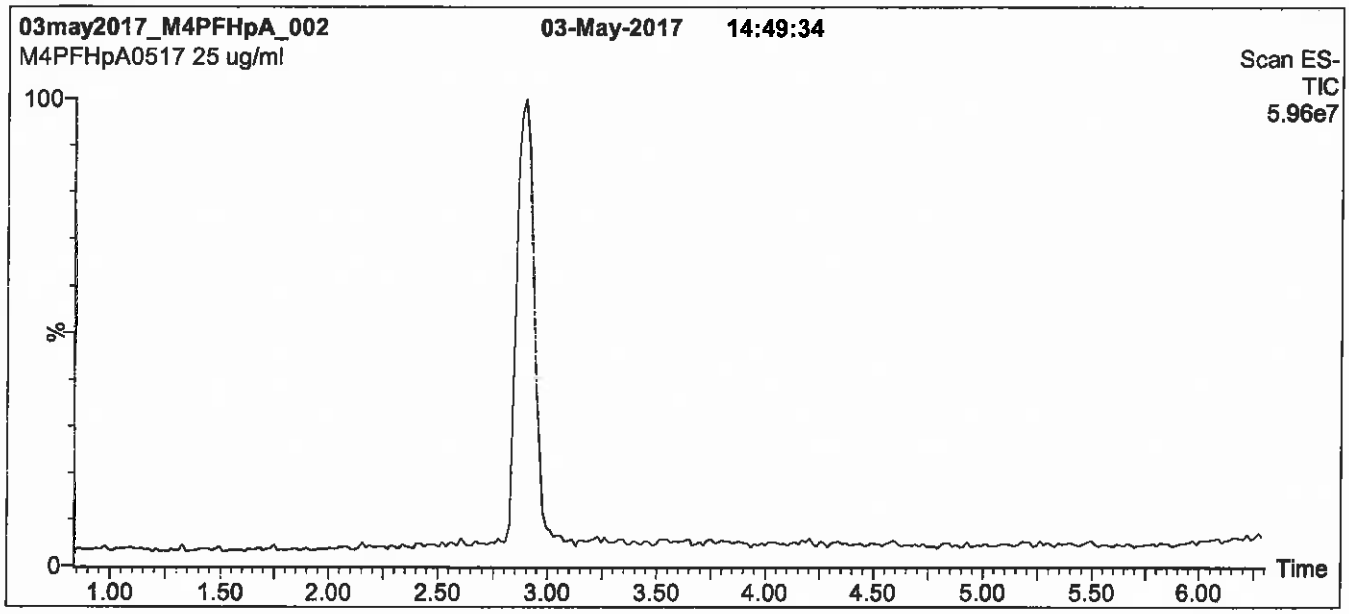
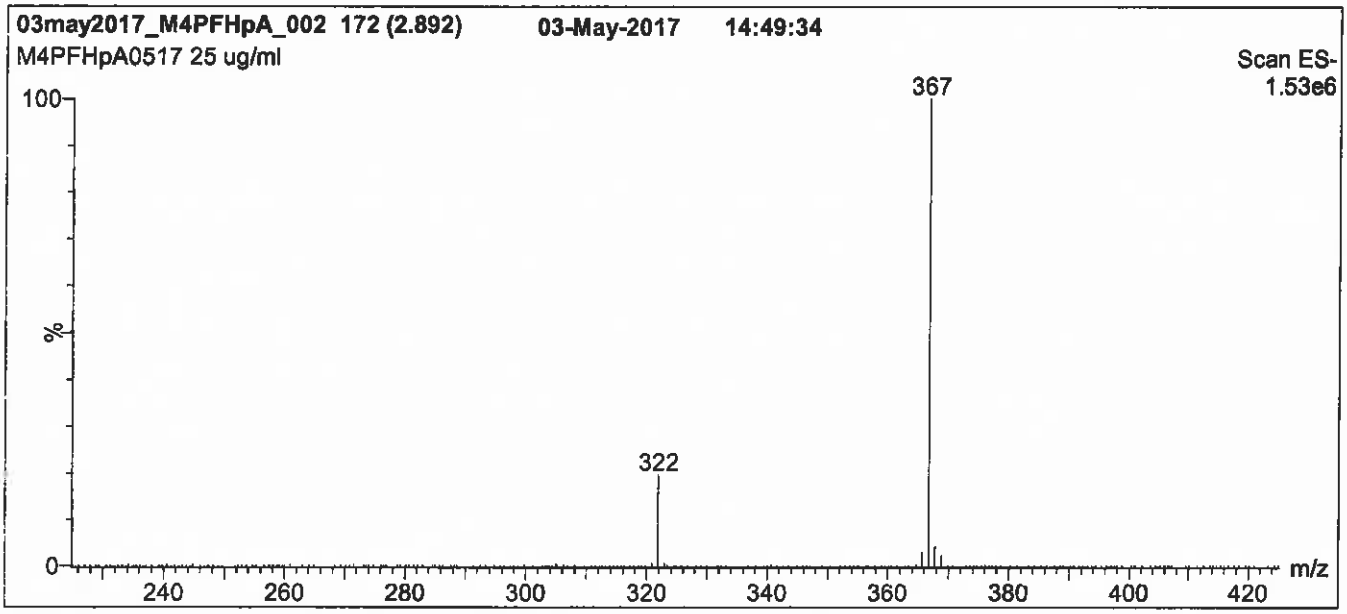
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

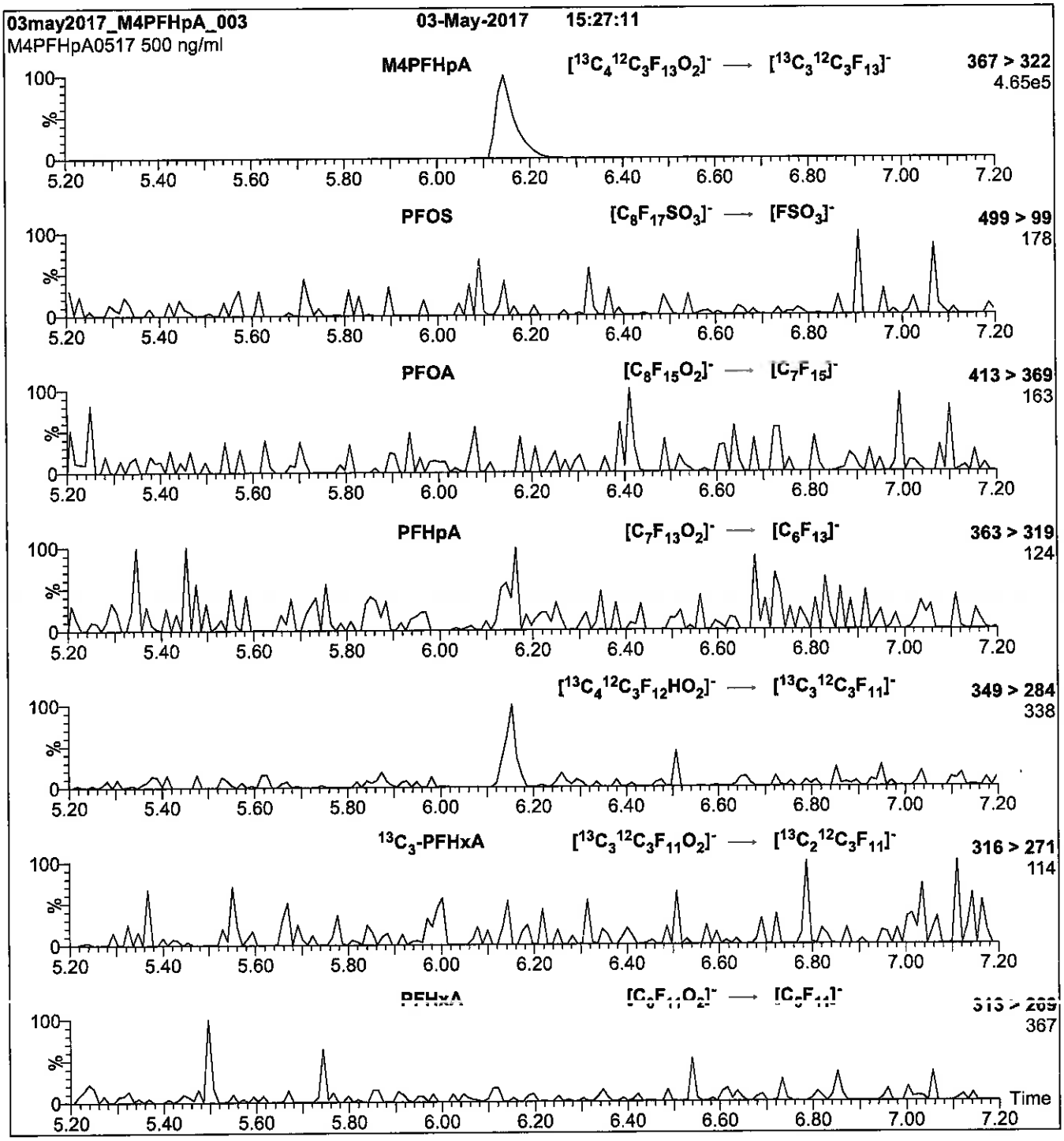
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 9

Reagent

LCM4PFHPA_00015

1287287
ID: LCM4PFHPA_00015
Exp:05/03/22 Prpd:CBW Opn:06/26/18
13C4-Perfluoroheptanoic a

R 6/26/18 CBW

WELLINGTON LABORATORIES

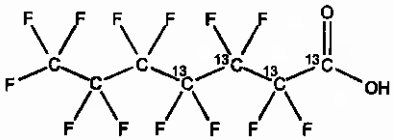
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/03/2017
EXPIRY DATE: (mm/dd/yyyy) 05/03/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/11/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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HAZARDS:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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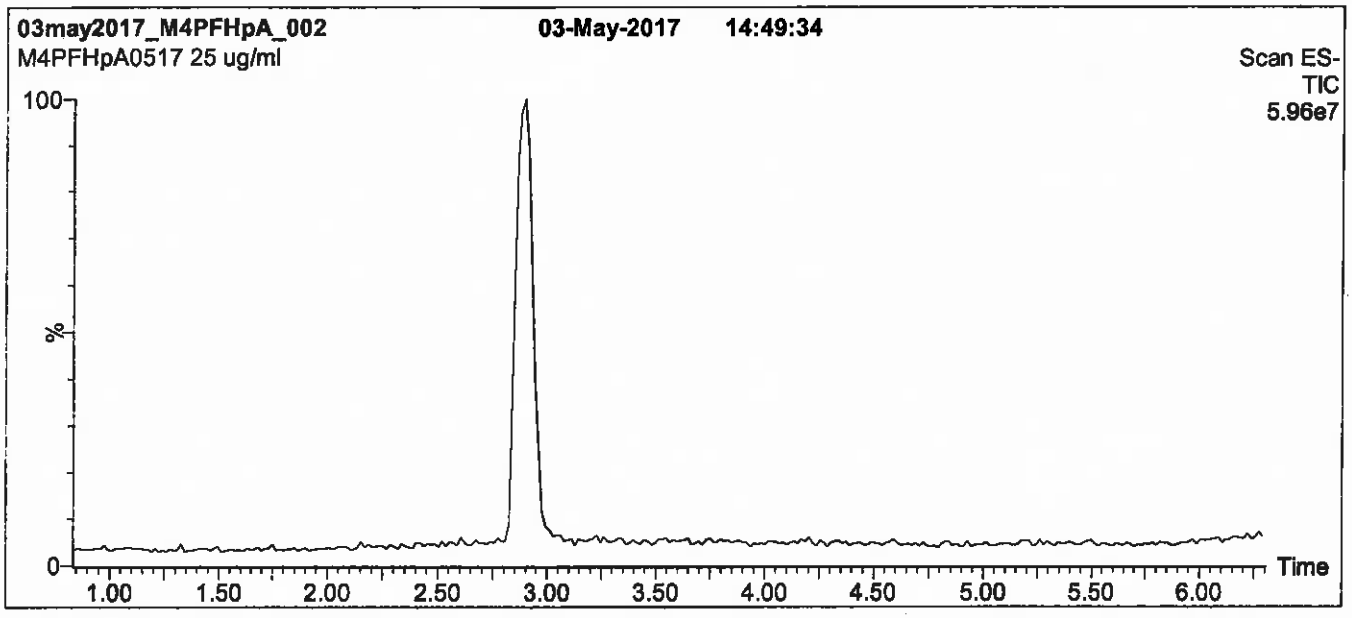

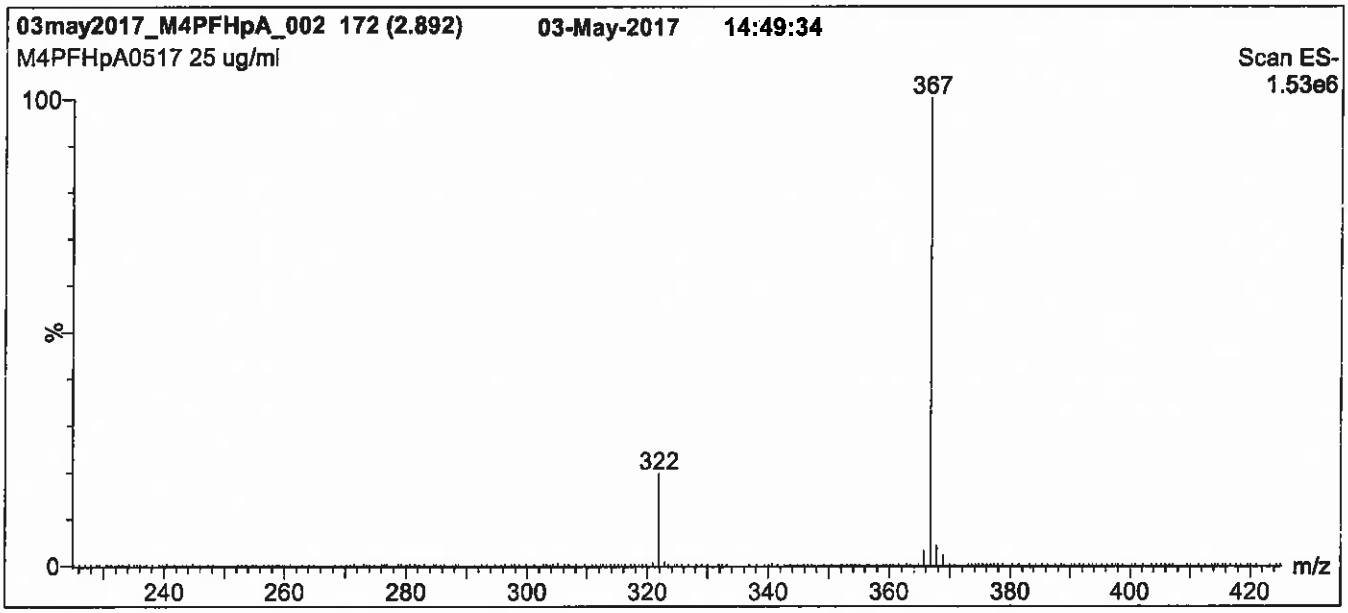

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Column: Acquity UPLC BEH Shield RP_{18}
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Ramp to 90% organic over 8 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
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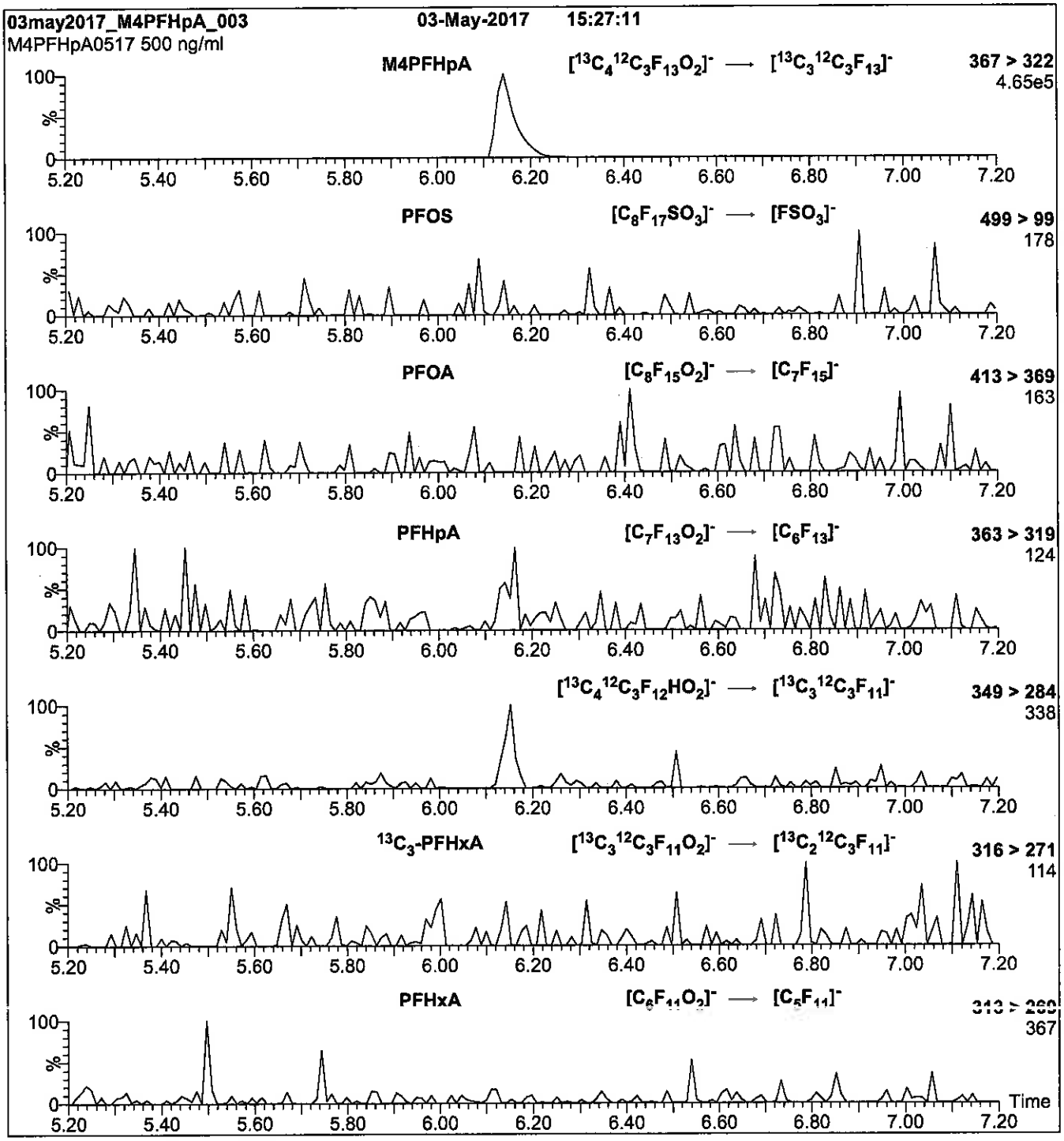
Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 9

Reagent

LCM5PFPEA_00015

1263145
ID: LCM5PFPEA_00015
Exp:07/20/22 Prpd:CBW Opn:05/30/18
13C5-Perfluoropentanoic a

R: 5/30/18 CBW

WELLINGTON LABORATORIES

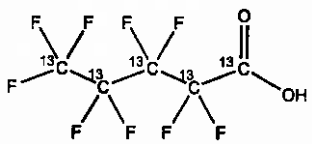
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 269.01
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/20/2017
EXPIRY DATE: (mm/dd/yyyy) 07/20/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_5$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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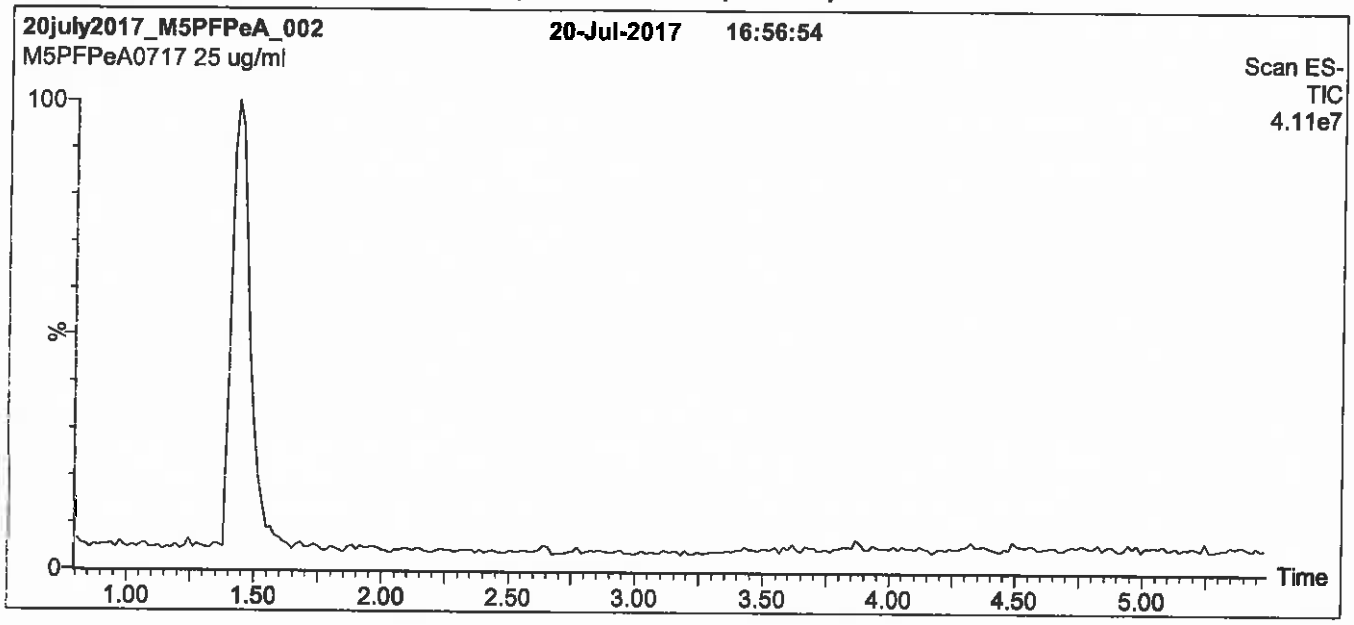
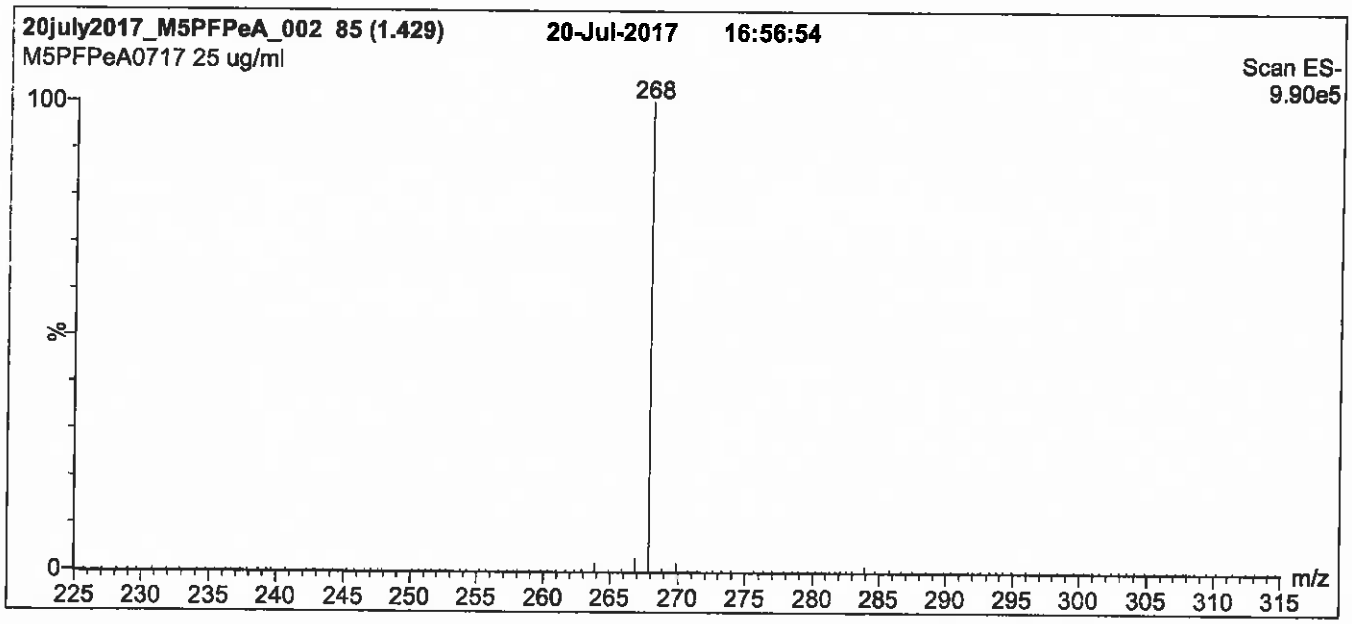
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

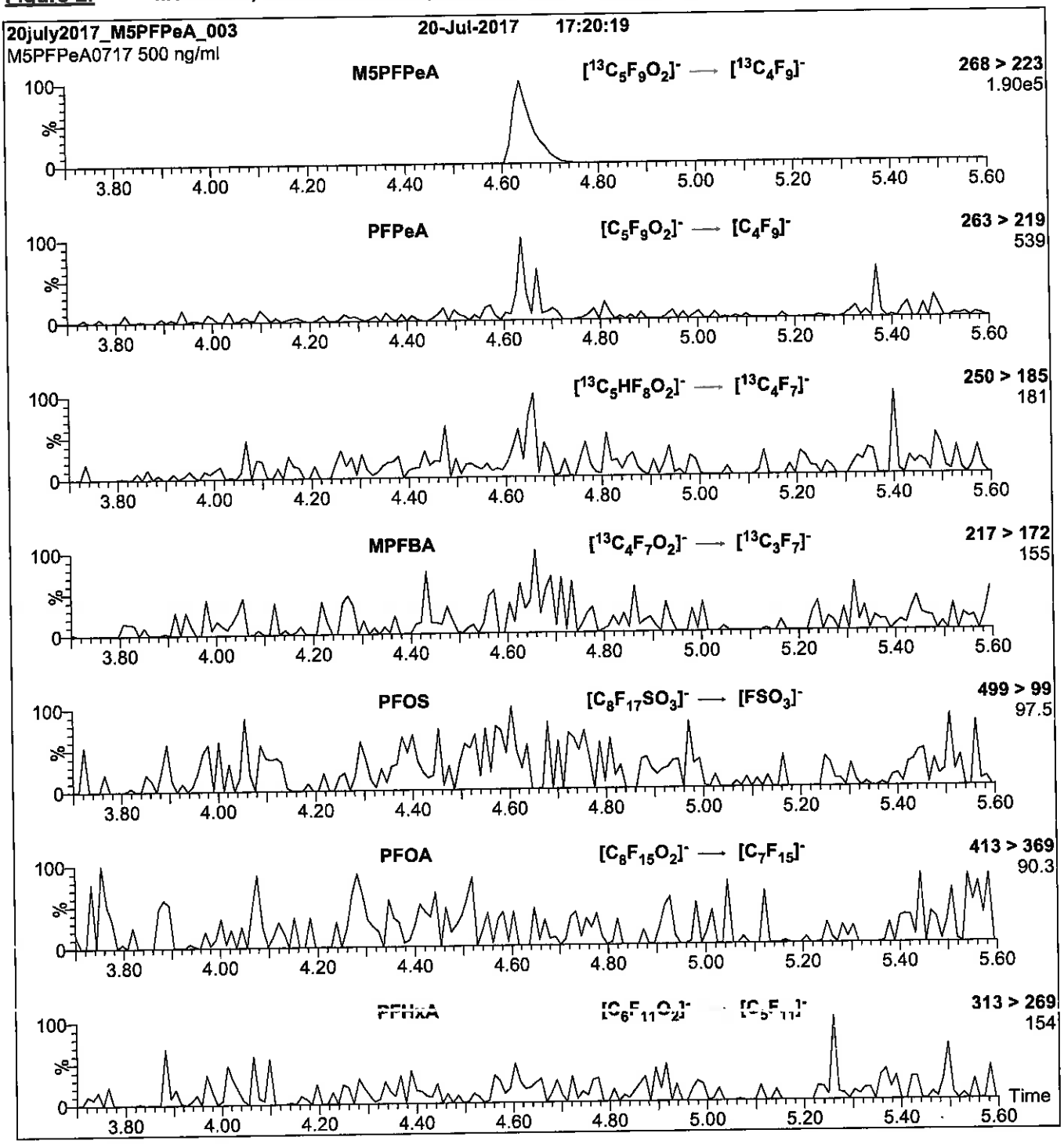
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 9

Reagent

LCM5PFPEA_00016

1287290
ID: LCM5PFPEA_00016
Exp:07/20/22 Prpd:CBW Opn:06/26/18
13C5-Perfluoropentanoic a

R: 6/26/18 CBW

WELLINGTON LABORATORIES

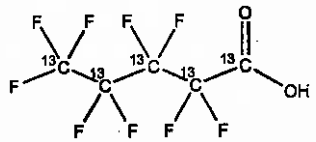
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



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Water (<1%)

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LAST TESTED: (mm/dd/yyyy) 07/20/2017
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RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_6$)

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CALA

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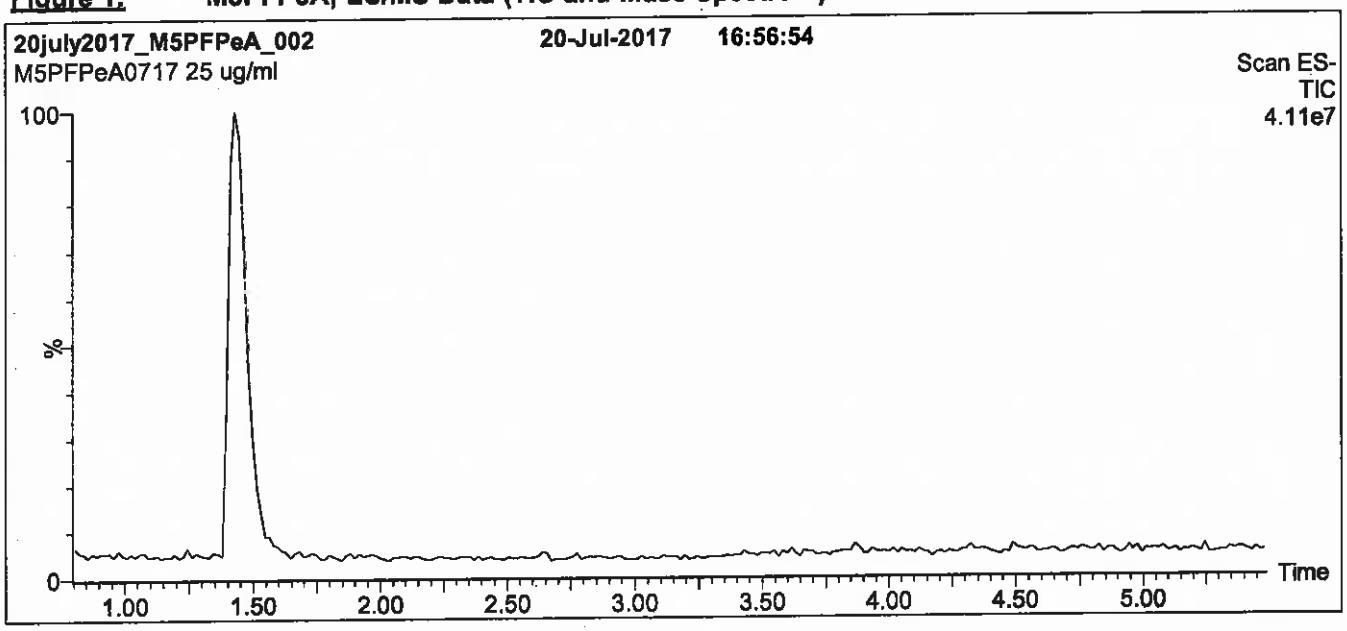

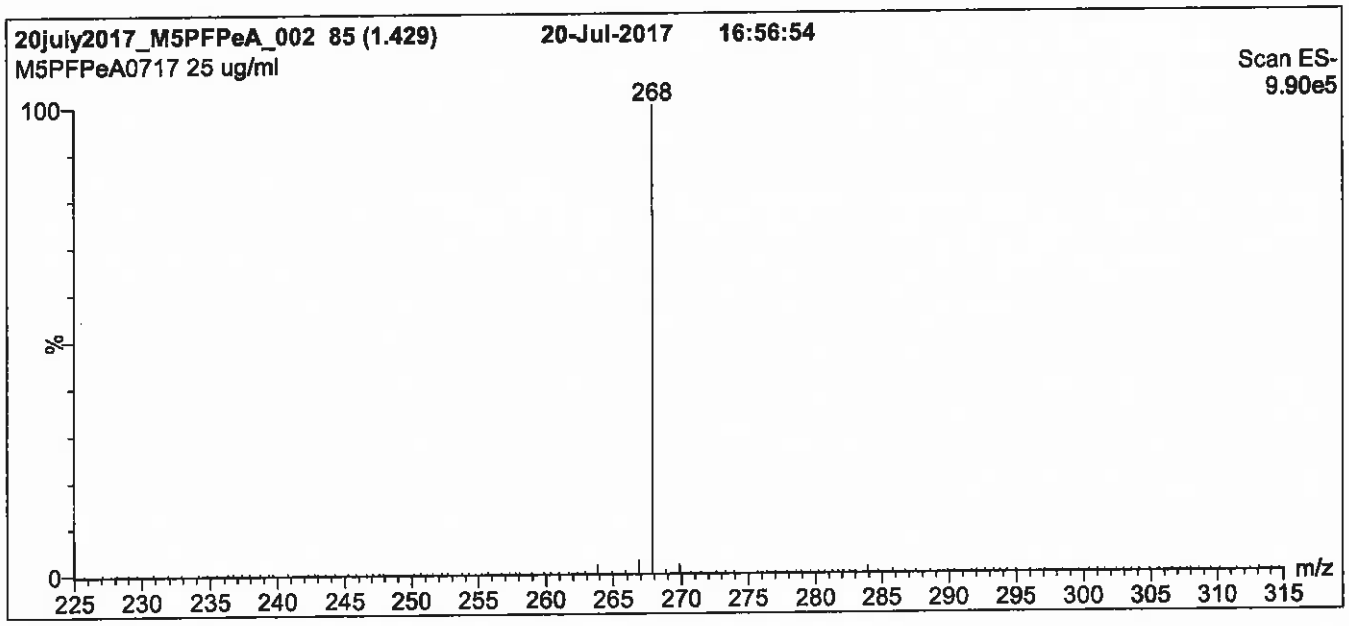

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Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

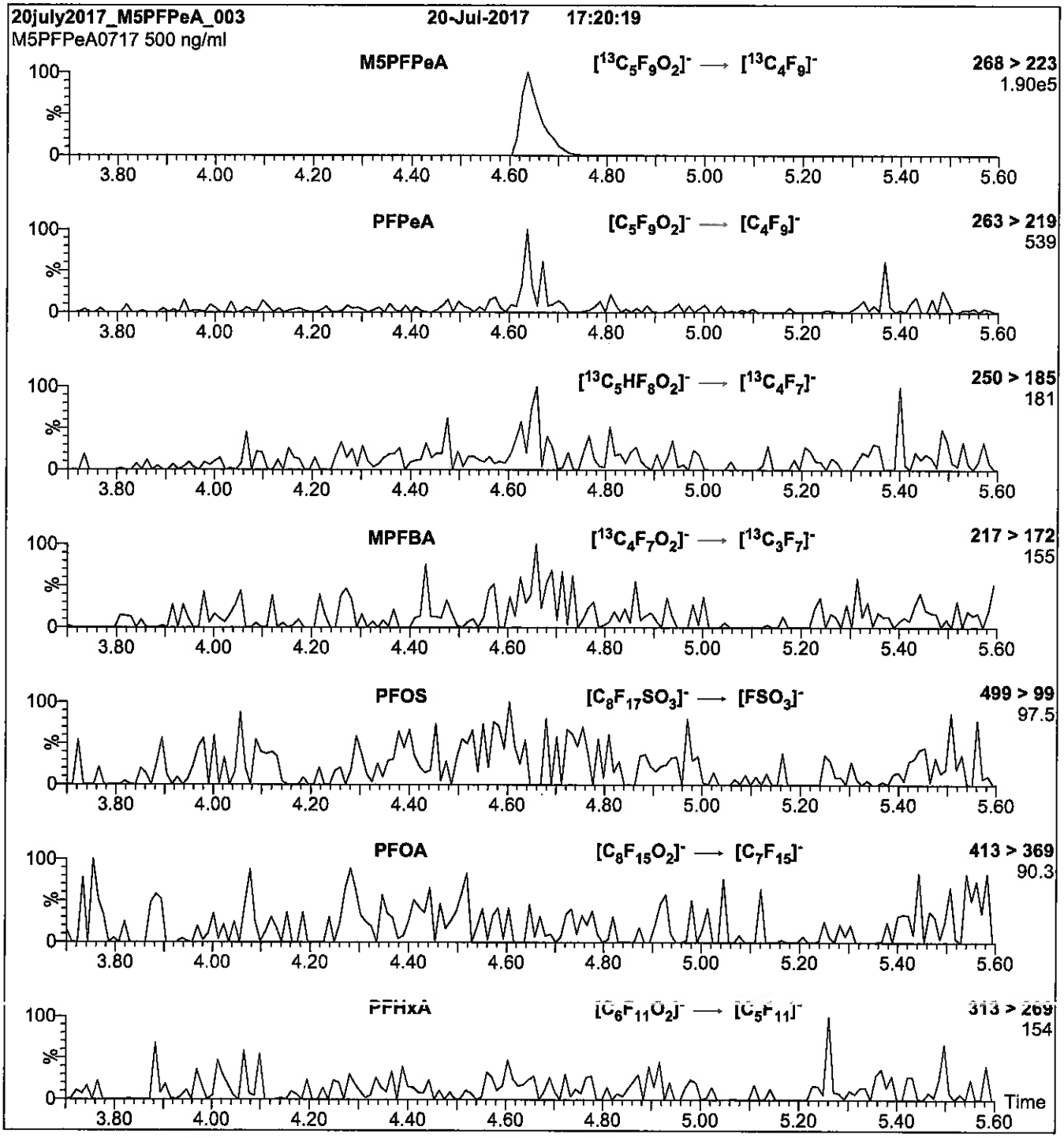
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M5PFPeA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCM8FOSA_00019

1263151
ID: LCM8FOSA_00019
Exp:10/11/22 Prpd:CBW Opn:05/30/18
13C8-Perfluorooctanesulfo

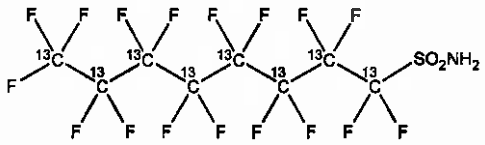
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8FOSA-I
LOT NUMBER: M8FOSA1017I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	10/11/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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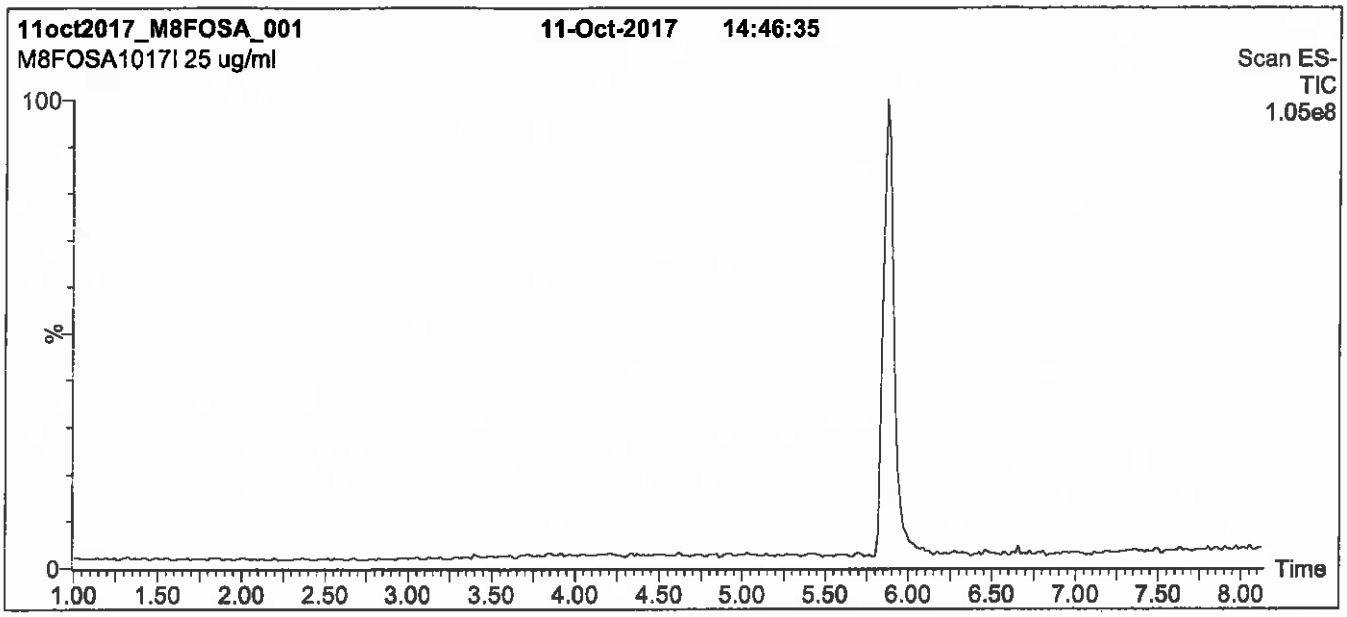
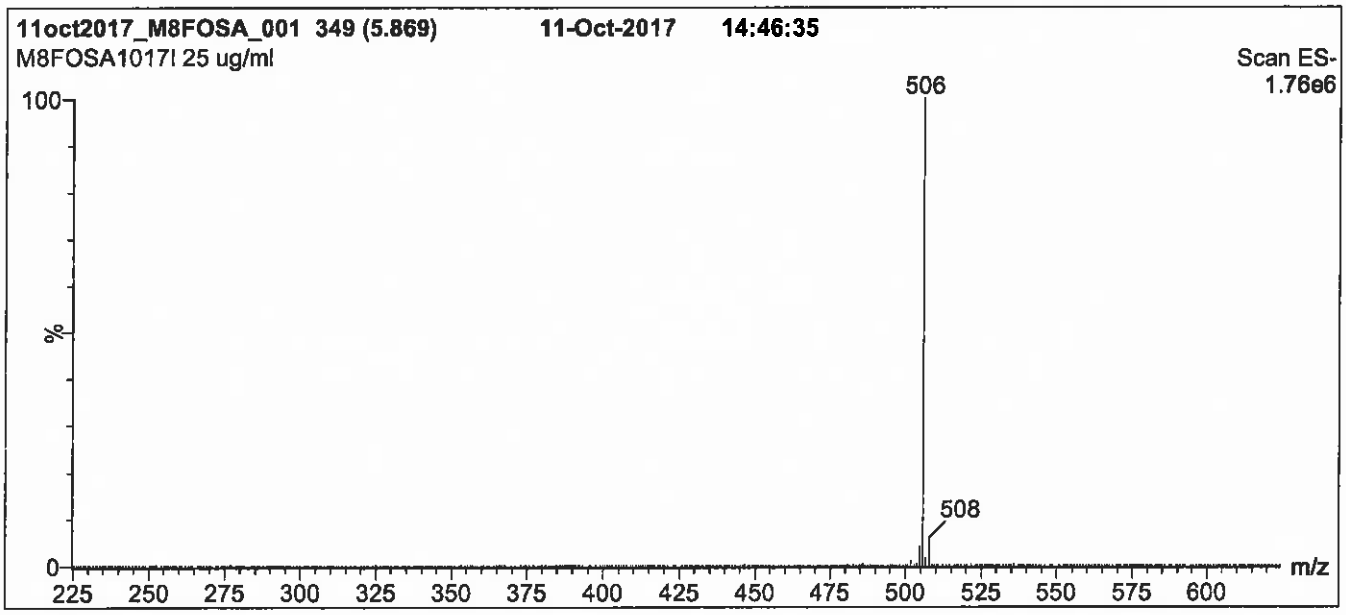
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

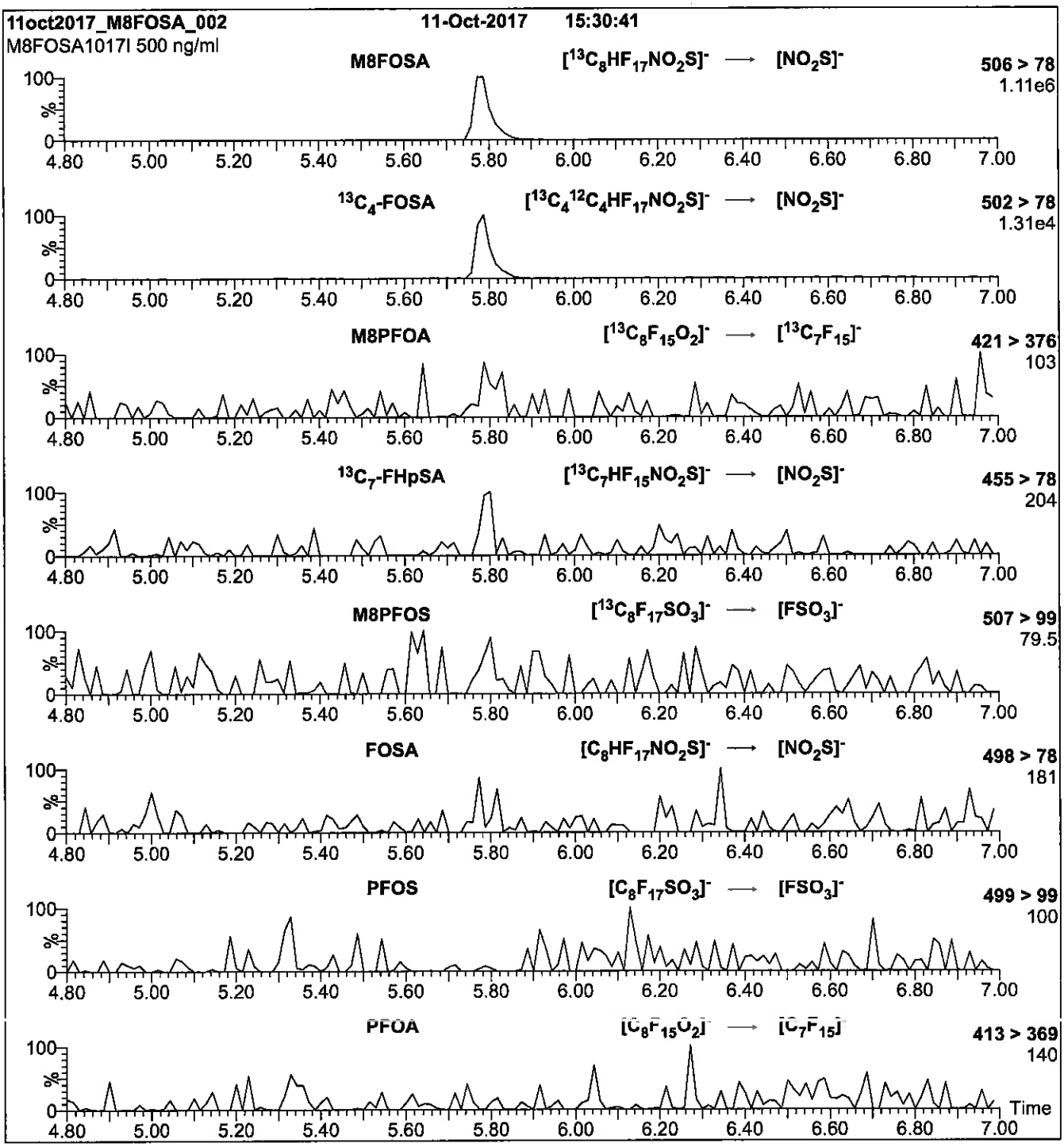
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 30

Reagent

LCM8FOSA_00020

1287296
ID: LCM8FOSA_00020
Exp:10/11/22 Pipd:CBW Opn:06/26/18
13C8-Perfluorooctanesulfo

R: 6/26/18 CBW

WELLINGTON LABORATORIES

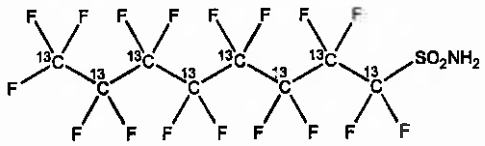
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1017I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_8H_2F_{17}NO_2S$
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/11/2017
EXPIRY DATE: (mm/dd/yyyy) 10/11/2022
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_8$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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CALA

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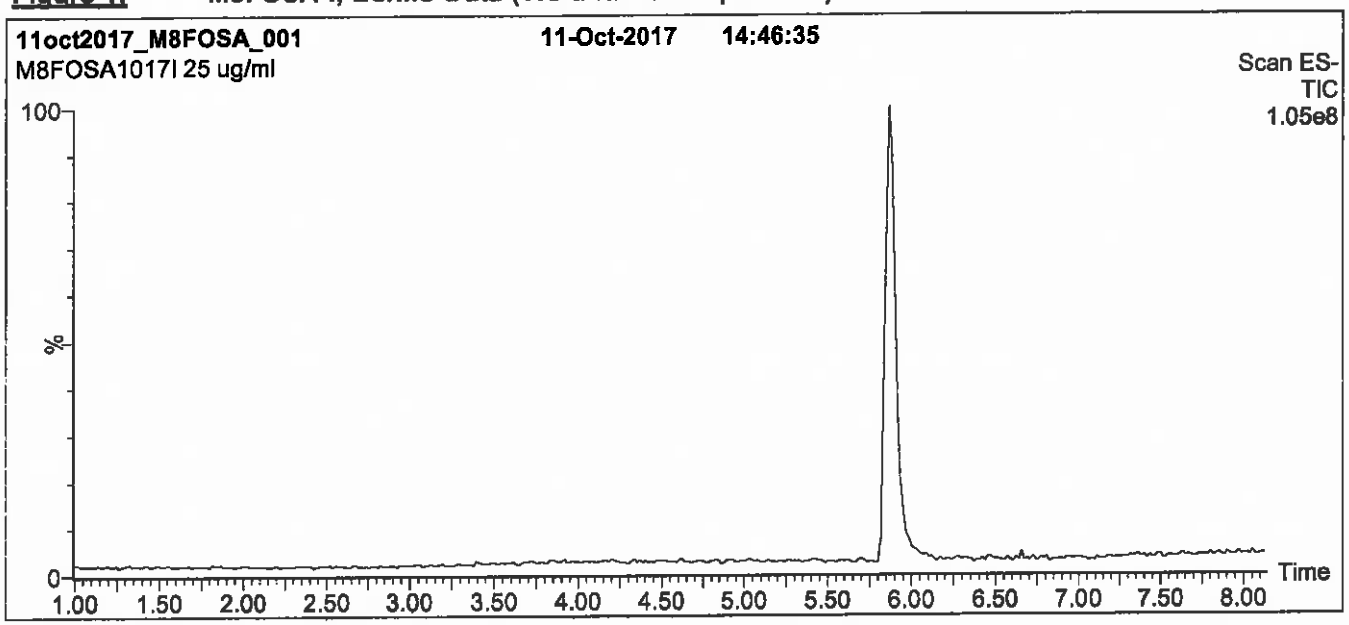
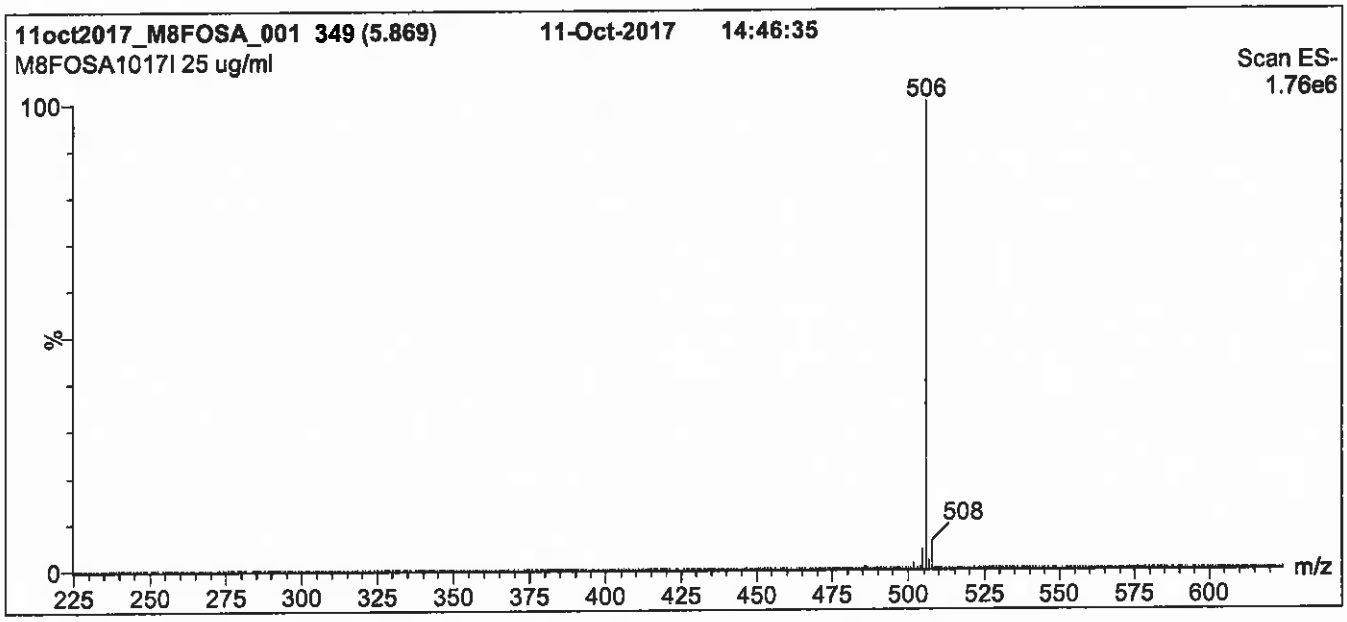
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

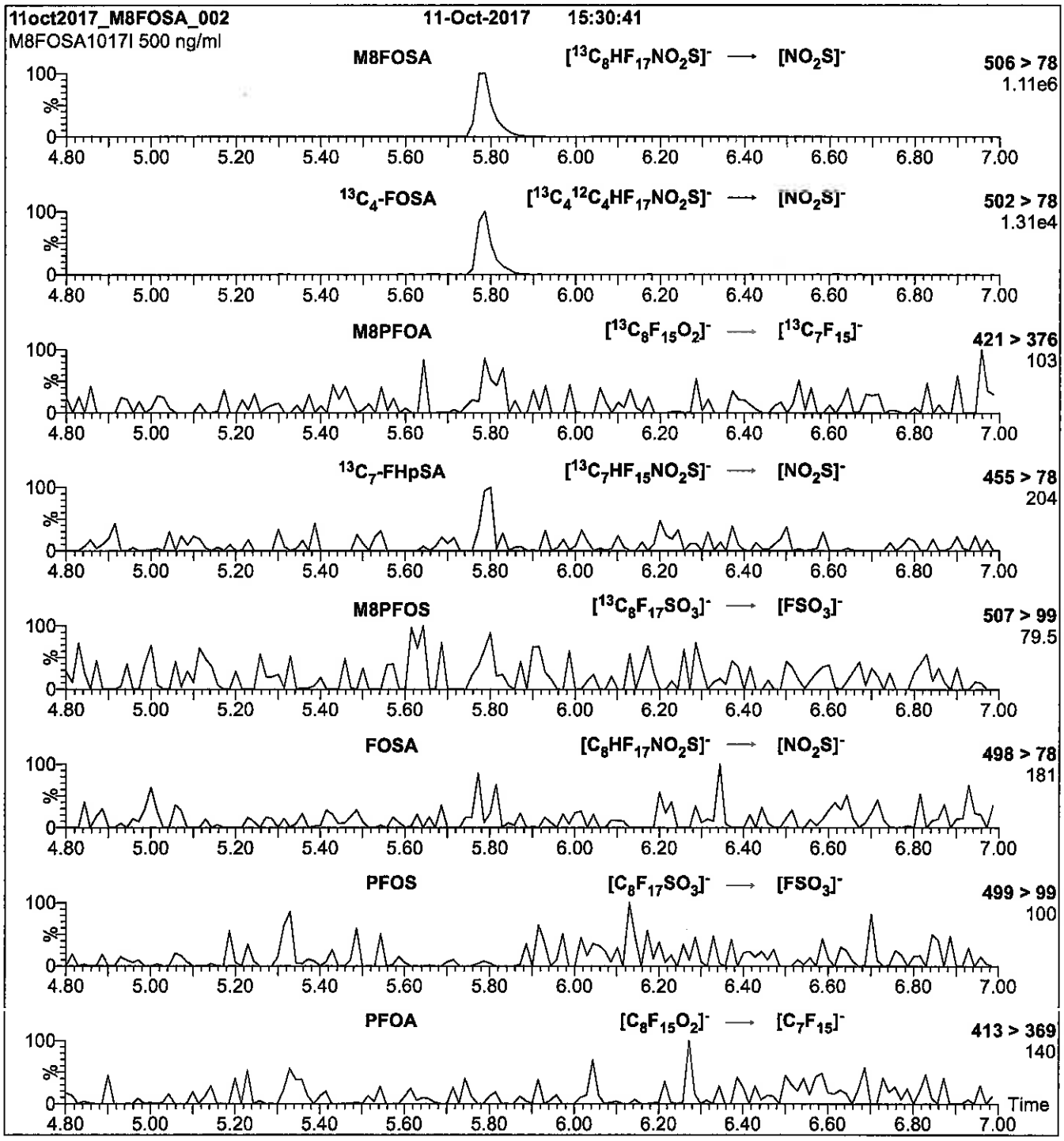
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00015

1263154
ID: LCMPFBA_00015
Exp:02/16/23 Prpd:CBW Opn:05/30/18
13C4-Perfluorobutanoic ac

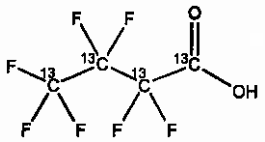
R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFBA
LOT NUMBER: MPFBA0218
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid

STRUCTURE:



CAS #: Not available

MOLECULAR FORMULA: $^{13}C_4HF_7O_2$
MOLECULAR WEIGHT: 218.01
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/22/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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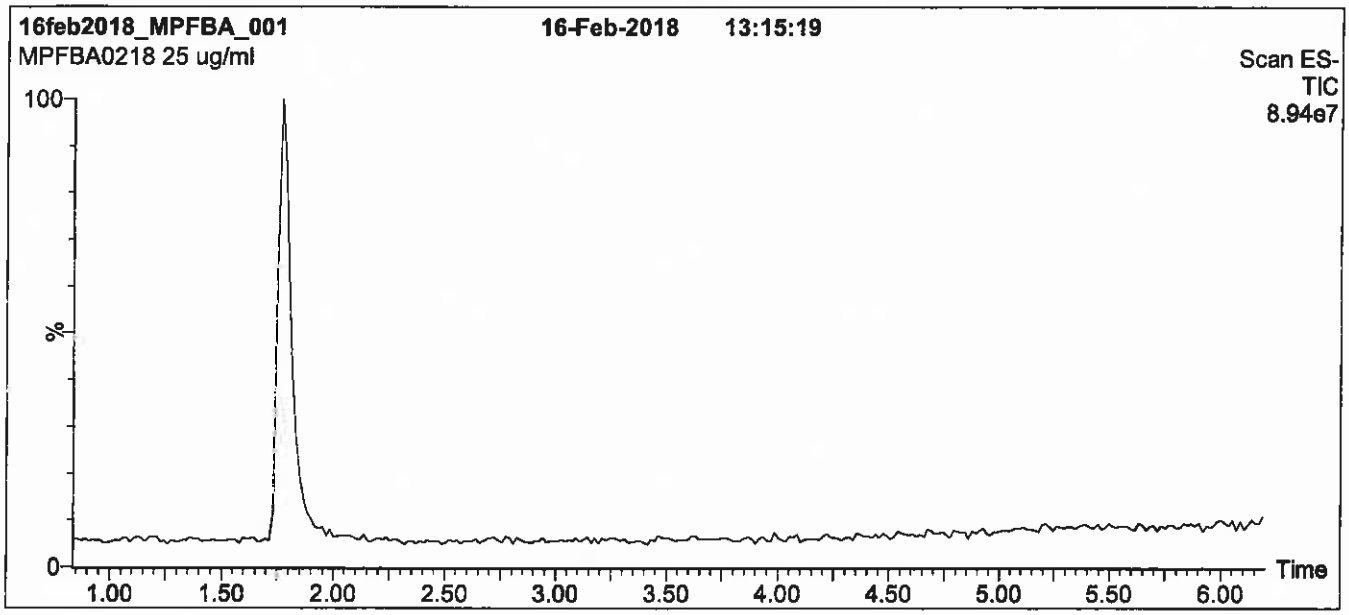
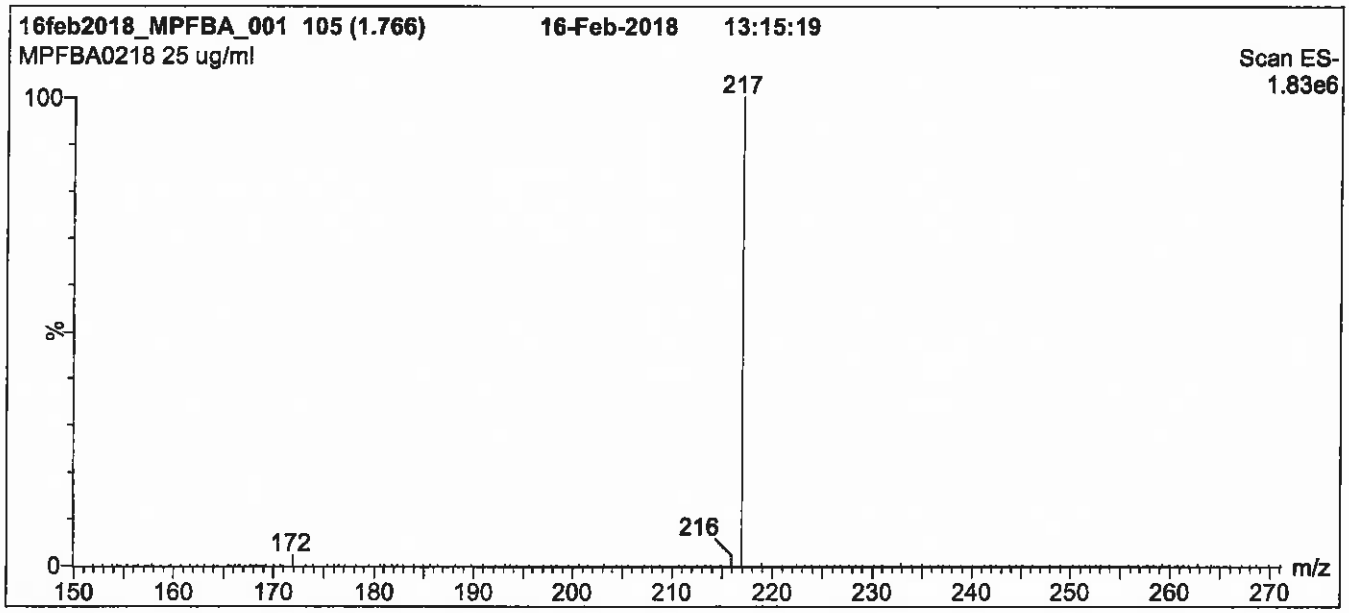
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

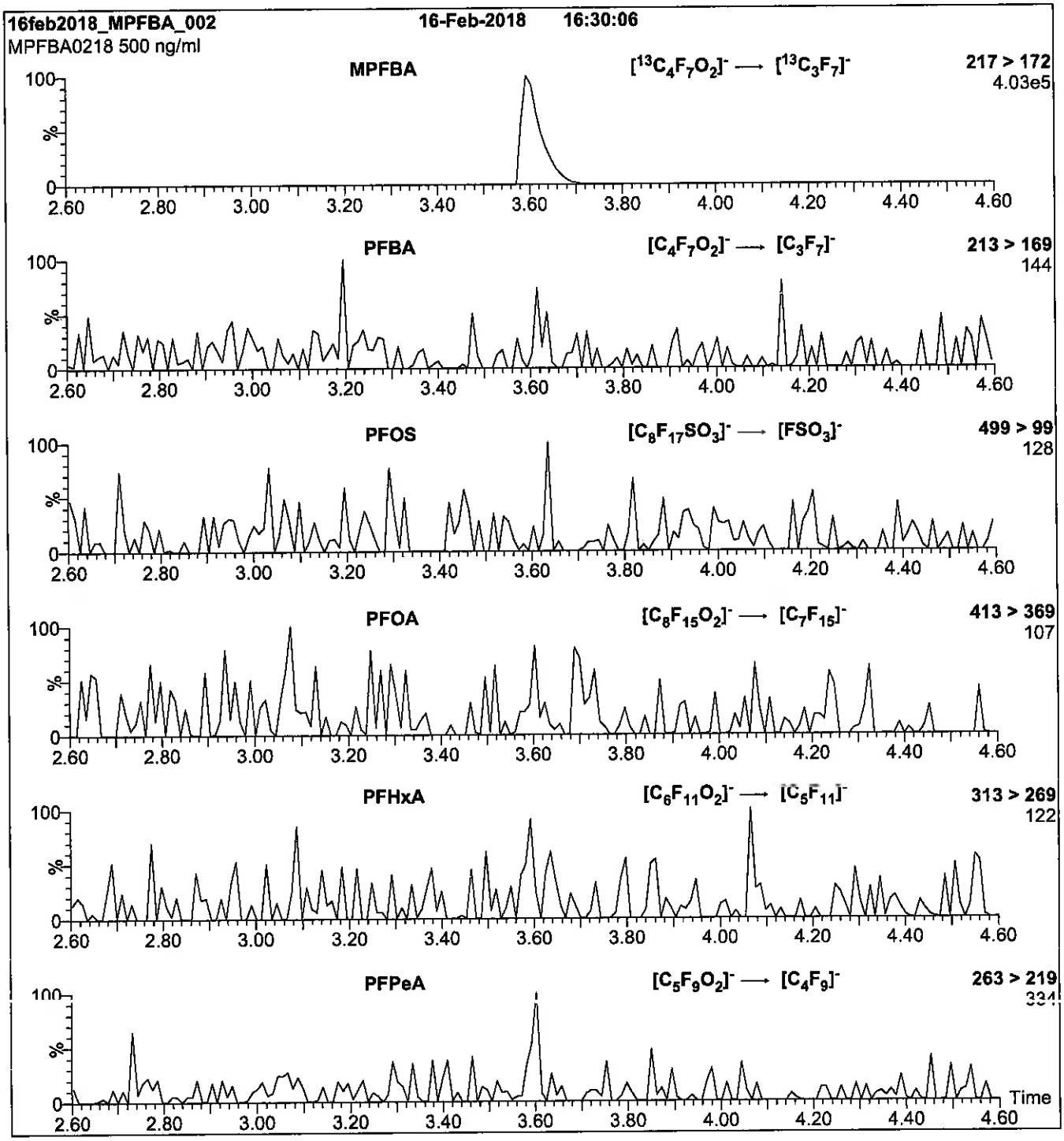
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 10

Reagent

LCMPFBA_00016

1287299
ID: LCMPFBA_00016
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorobutanoic ac

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

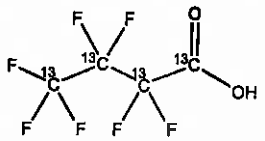
PRODUCT CODE: MPFBA

LOT NUMBER: MPFBA0218

COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4HF_7O_2$

MOLECULAR WEIGHT: 218.01

CONCENTRATION: 50 ± 2.5 µg/ml

SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 02/16/2018

EXPIRY DATE: (mm/dd/yyyy) 02/16/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/22/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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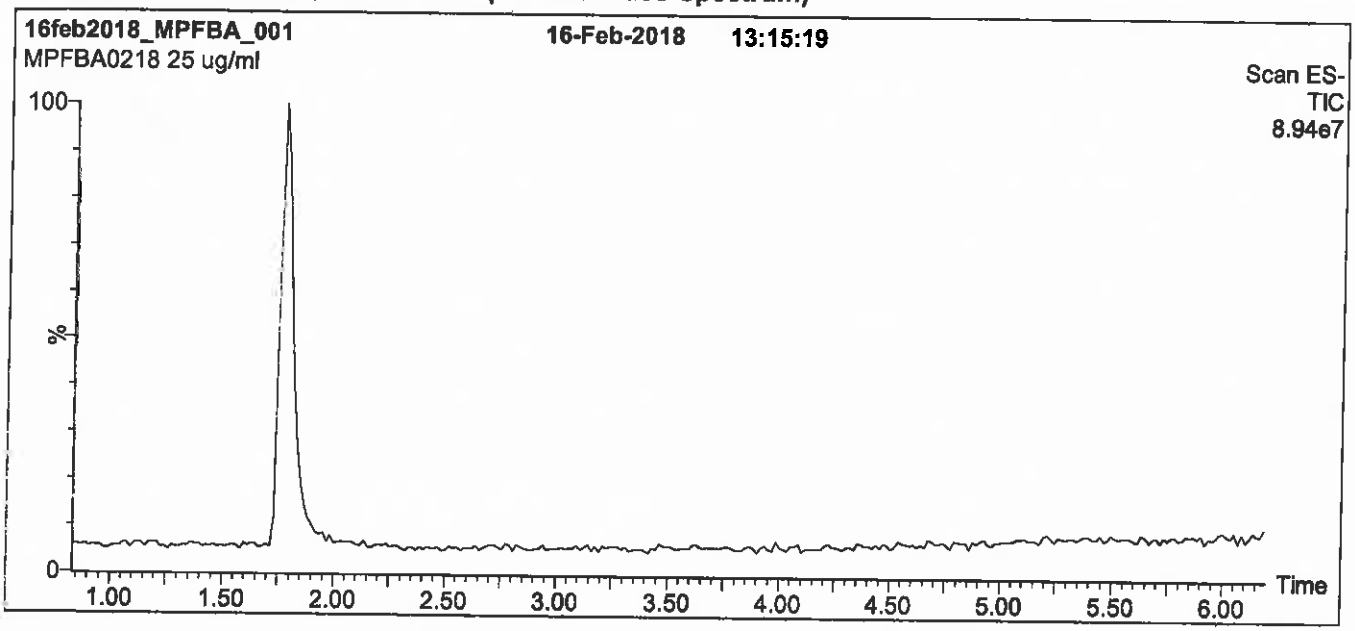
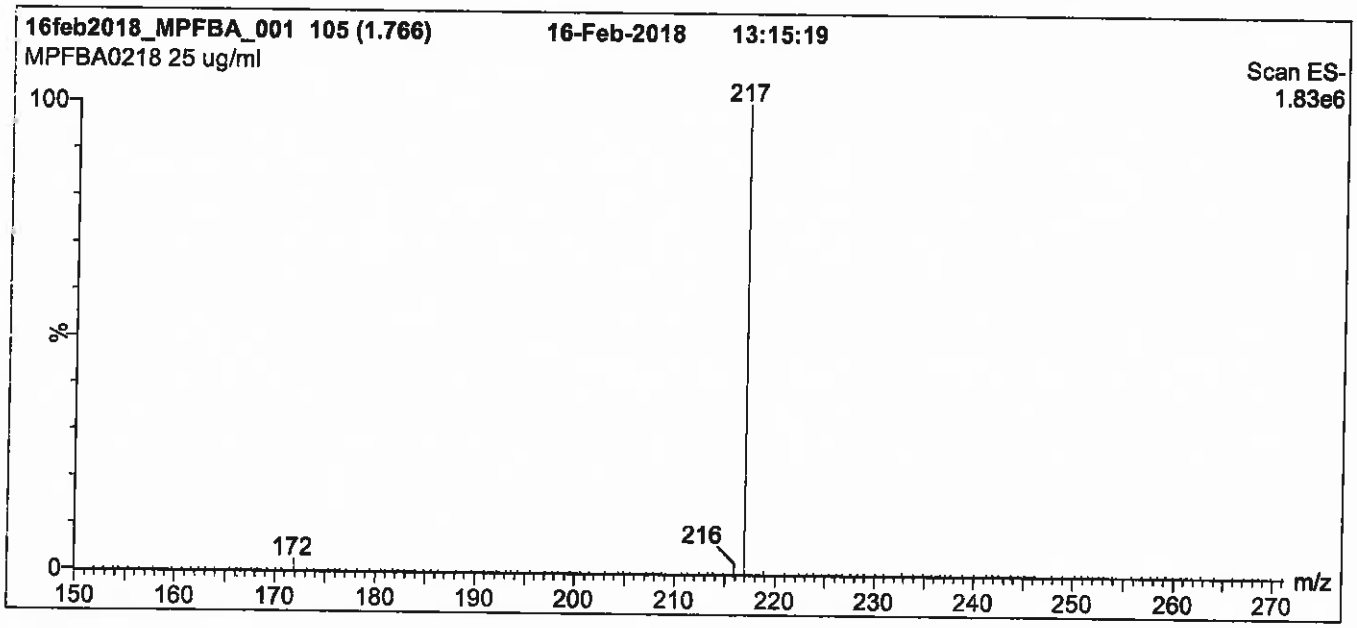
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

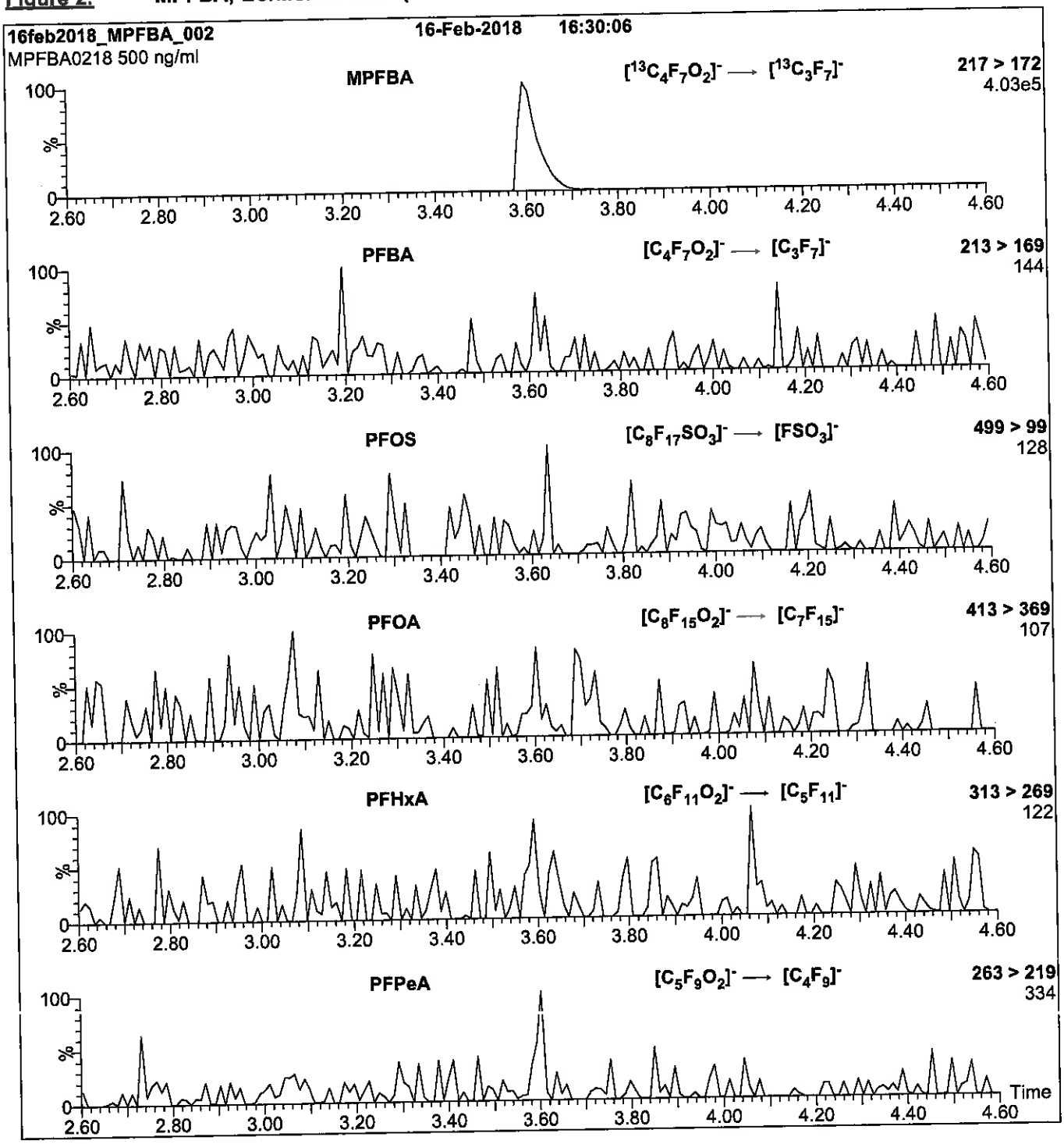
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 10

Reagent

LCMPFBS_00008

1263177
ID: LCMPFBS_00008
Exp:02/15/23 Prpd:CBW Opn:05/30/18
13C3-Perfluorobutanesulfo

R: 5/30/18

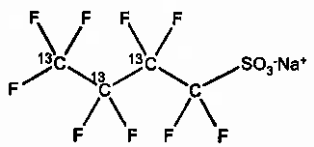
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBS **LOT NUMBER:** M3PFBS0218

COMPOUND: Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_3{}^{12}CF_9SO_3Na$ **MOLECULAR WEIGHT:** 325.06

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
46.5 ± 2.3 µg/ml (M3PFBS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (2,3,4-$^{13}C_3$)

LAST TESTED: (mm/dd/yyyy) 02/15/2018

EXPIRY DATE: (mm/dd/yyyy) 02/15/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/16/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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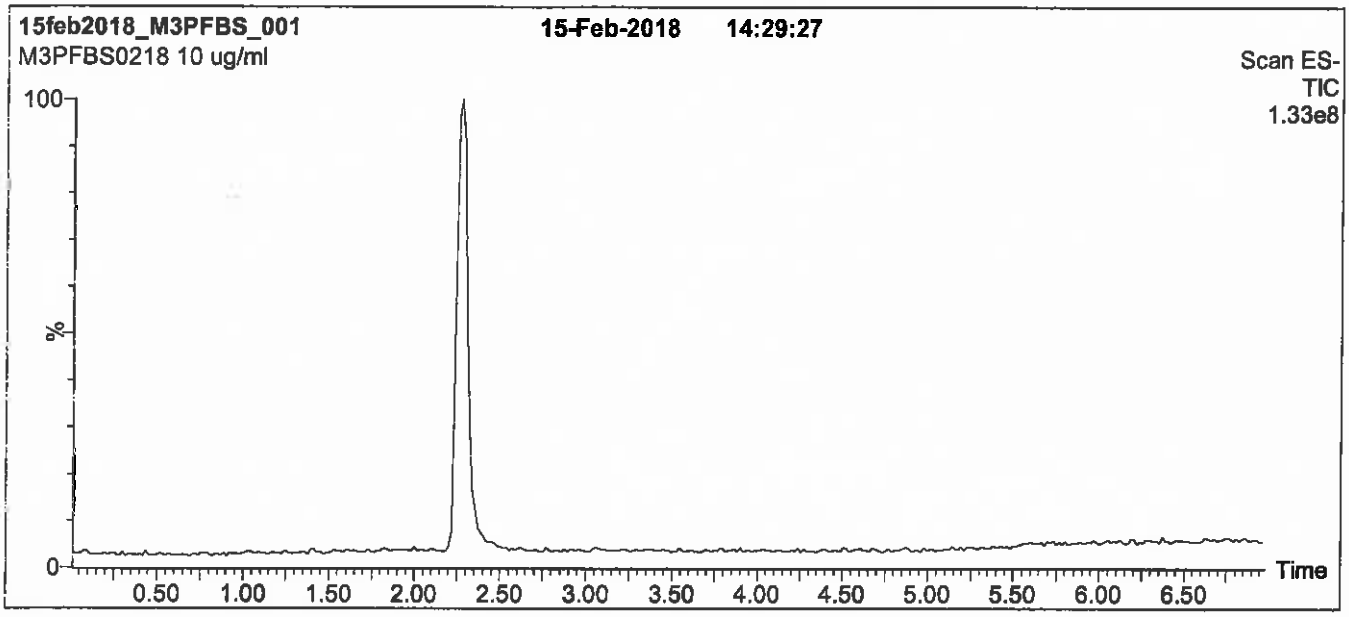
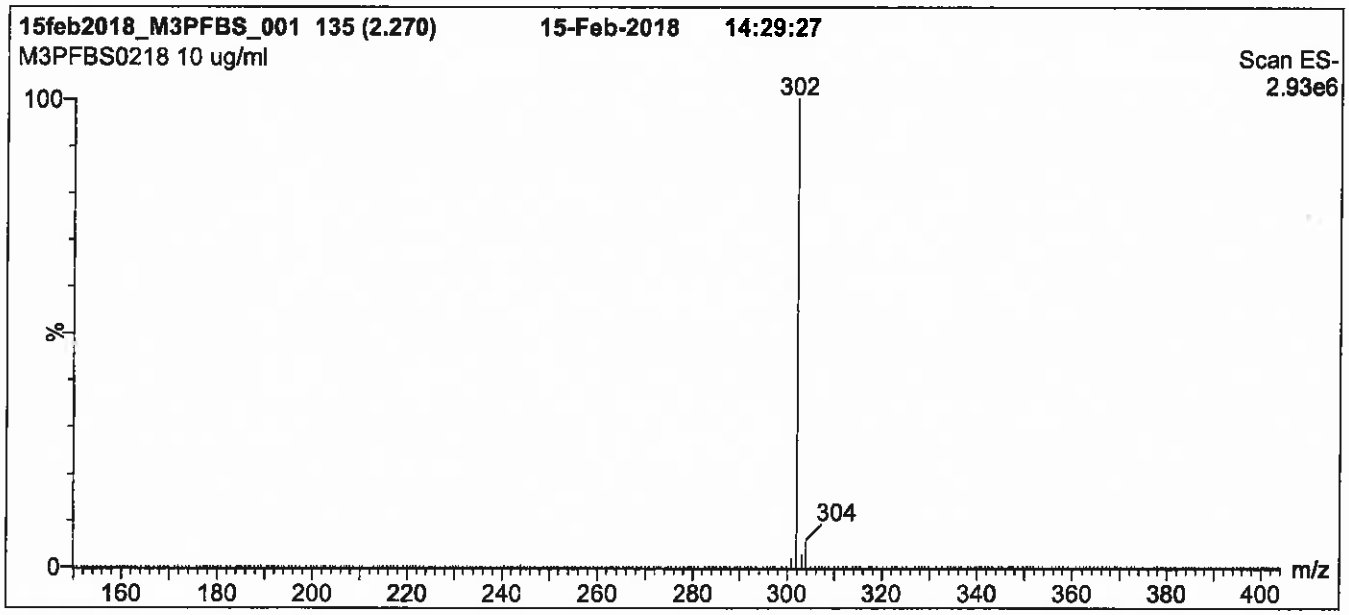
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

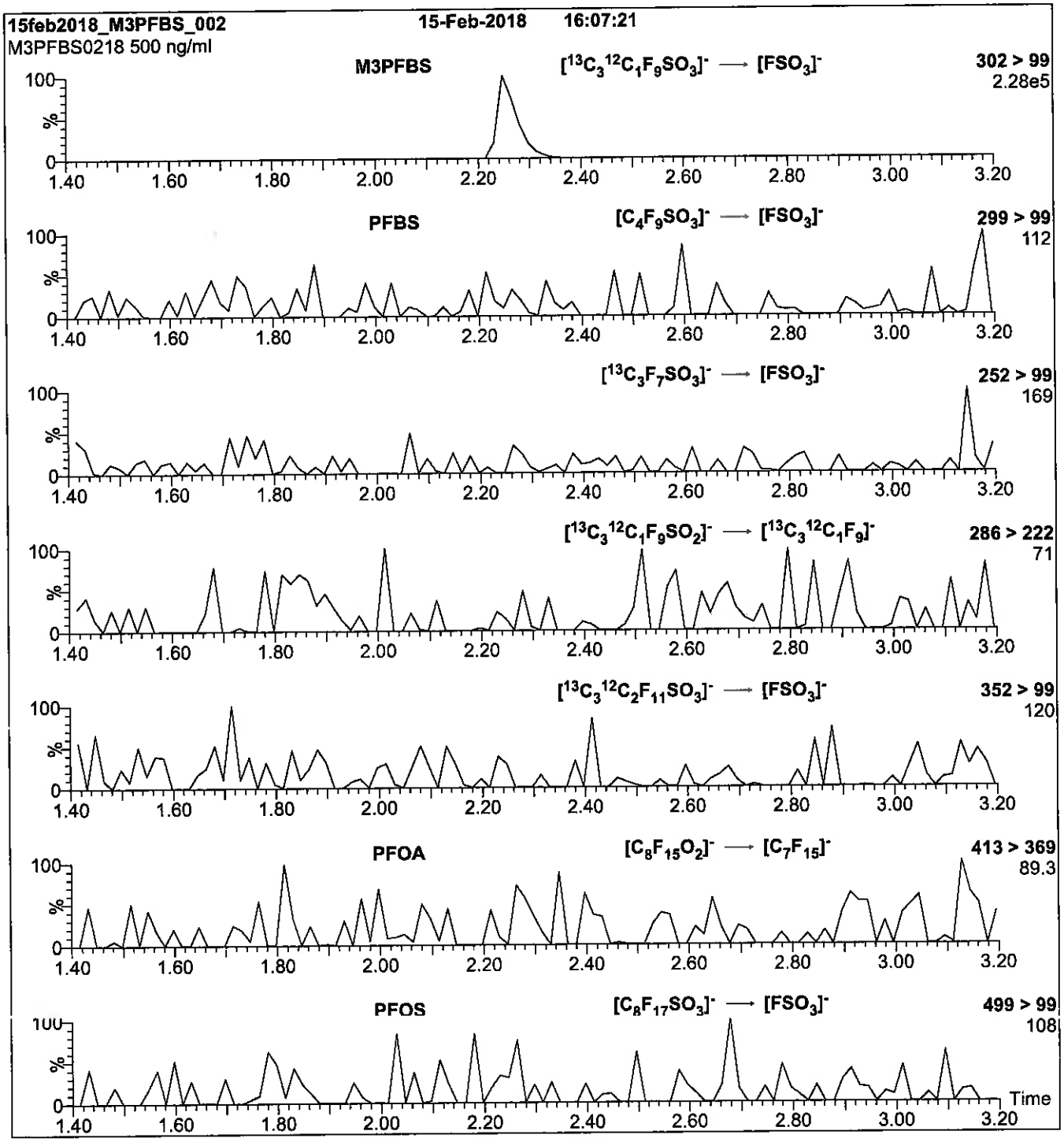
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 25

Reagent

LCMPFBS_00009

1287346
ID: LCMPFBS_00009
Exp:02/15/23 Prpd:CBW Opn:06/26/18
13C3-Perfluorobutanesulfo

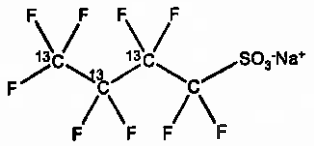
R-6/26/18 cbw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBS
LOT NUMBER: M3PFBS0218
COMPOUND: Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_3{}^{12}CF_9SO_3Na$
MOLECULAR WEIGHT: 325.06
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
46.5 ± 2.3 µg/ml (M3PFBS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (2,3,4-$^{13}C_3$)
LAST TESTED: (mm/dd/yyyy) 02/15/2018
EXPIRY DATE: (mm/dd/yyyy) 02/15/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 02/16/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

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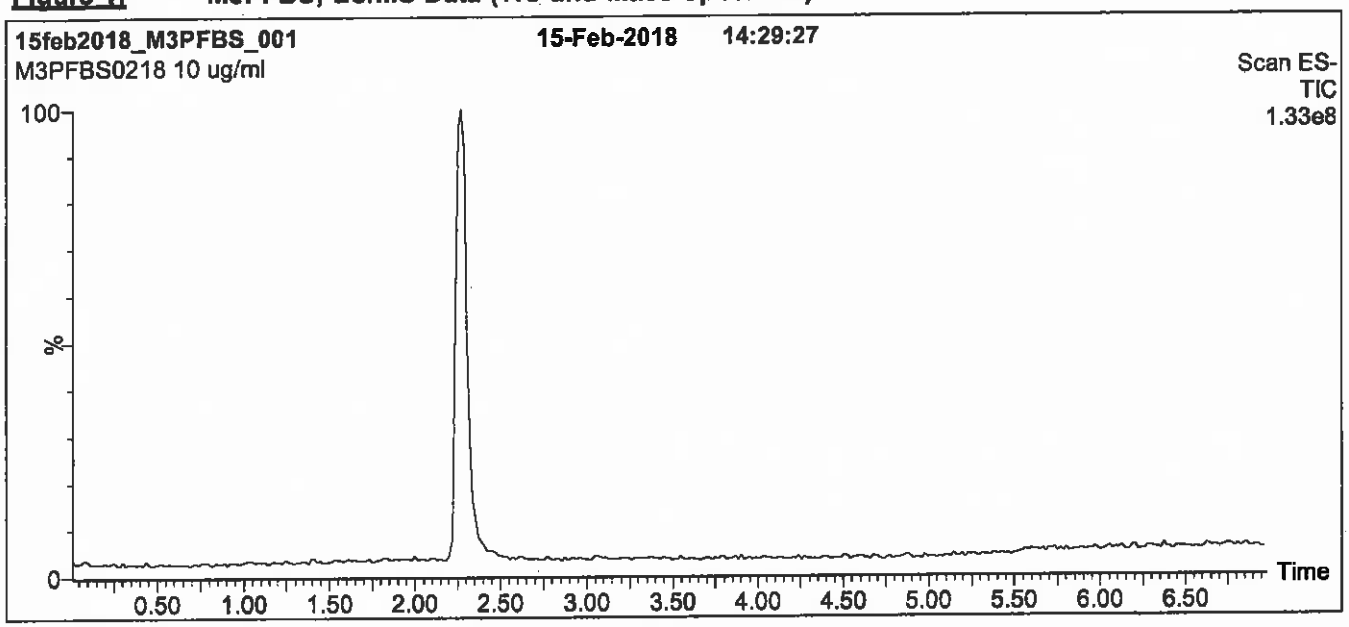
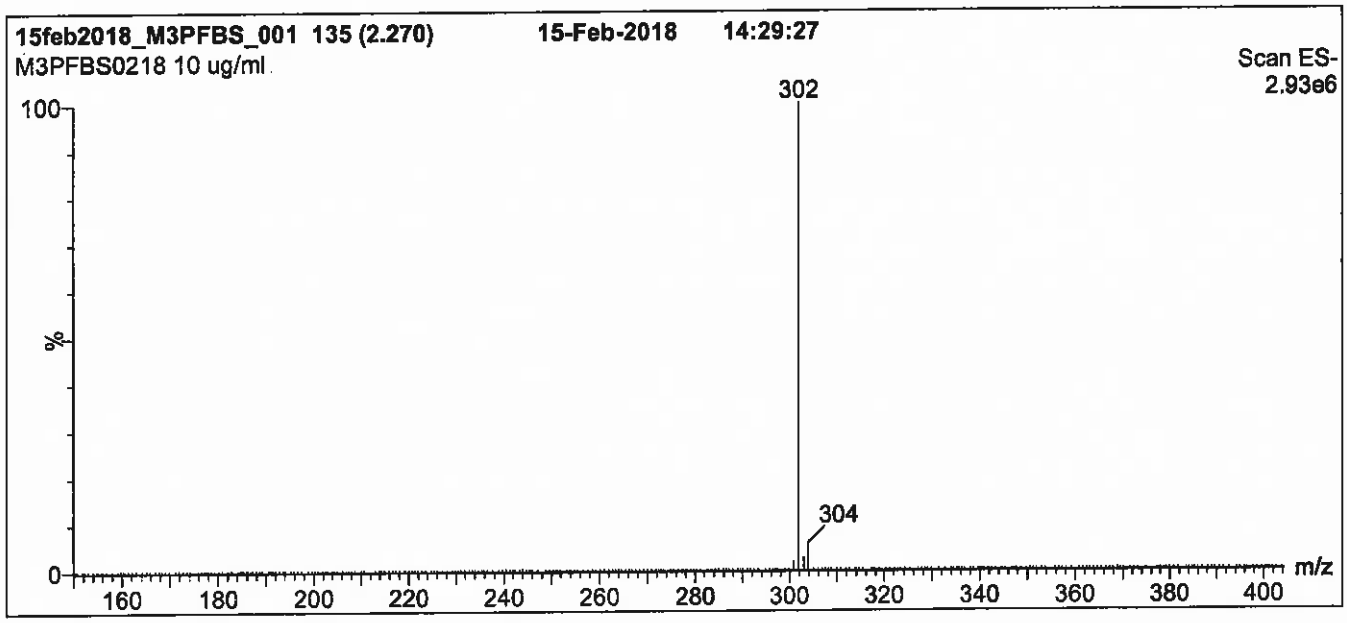




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

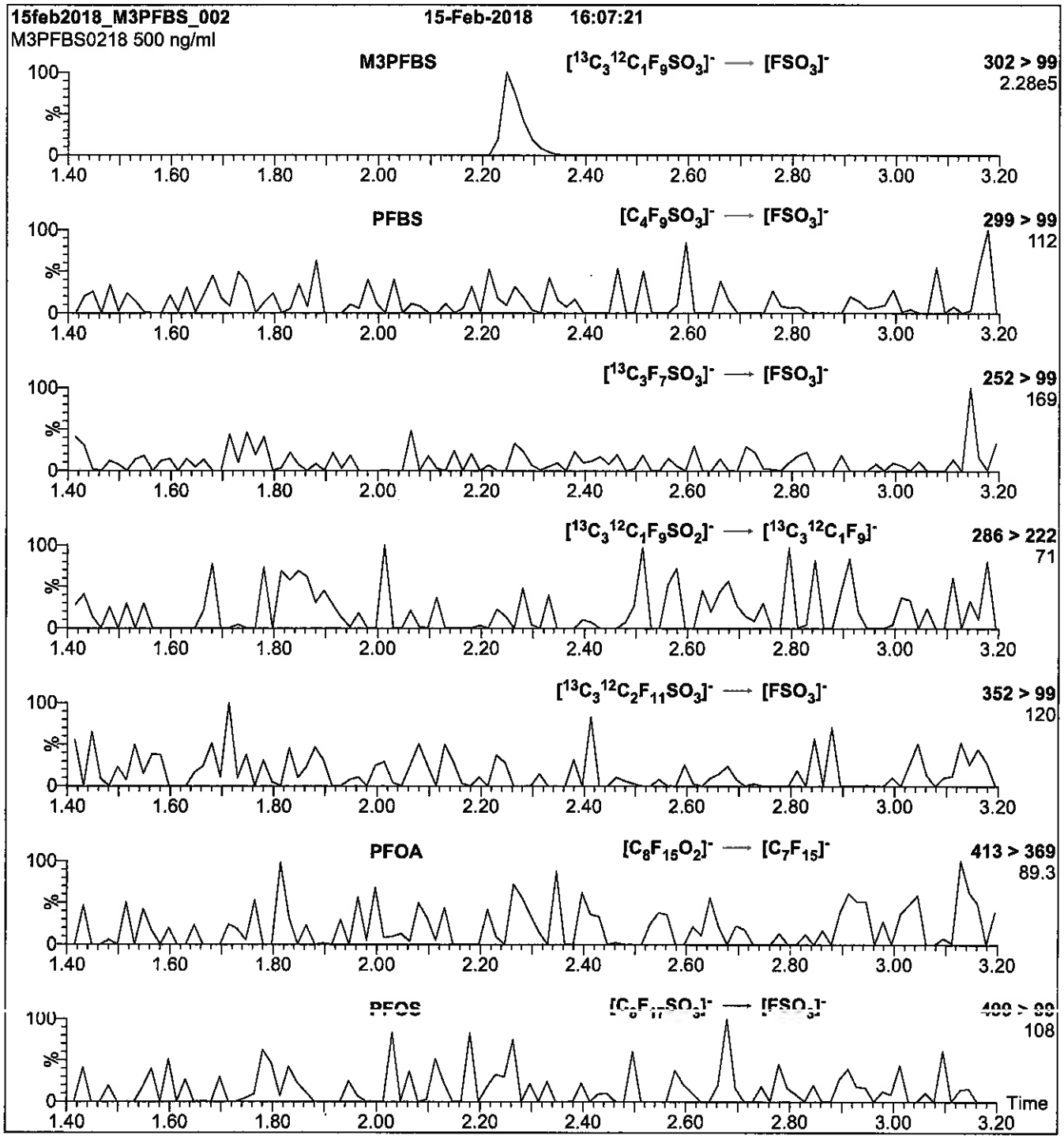
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 25

Reagent

LCMPFDA_00020

R: 5/30/18 CEW

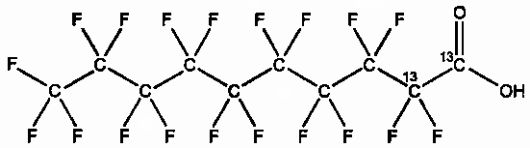
1263165
ID: LCMPFDA_00020
Exp:02/16/23 Prpd:CBW Opn:05/30/18
13C2-Perfluoromodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0218
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
MOLECULAR WEIGHT: 516.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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UNCERTAINTY:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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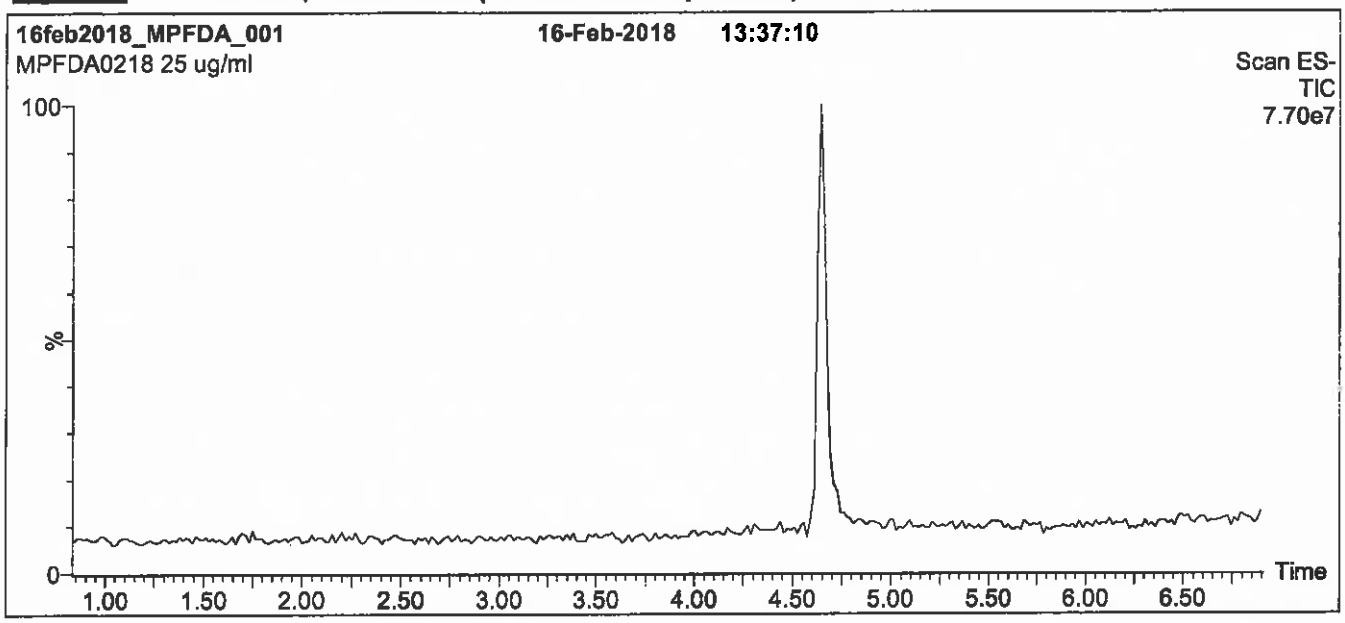
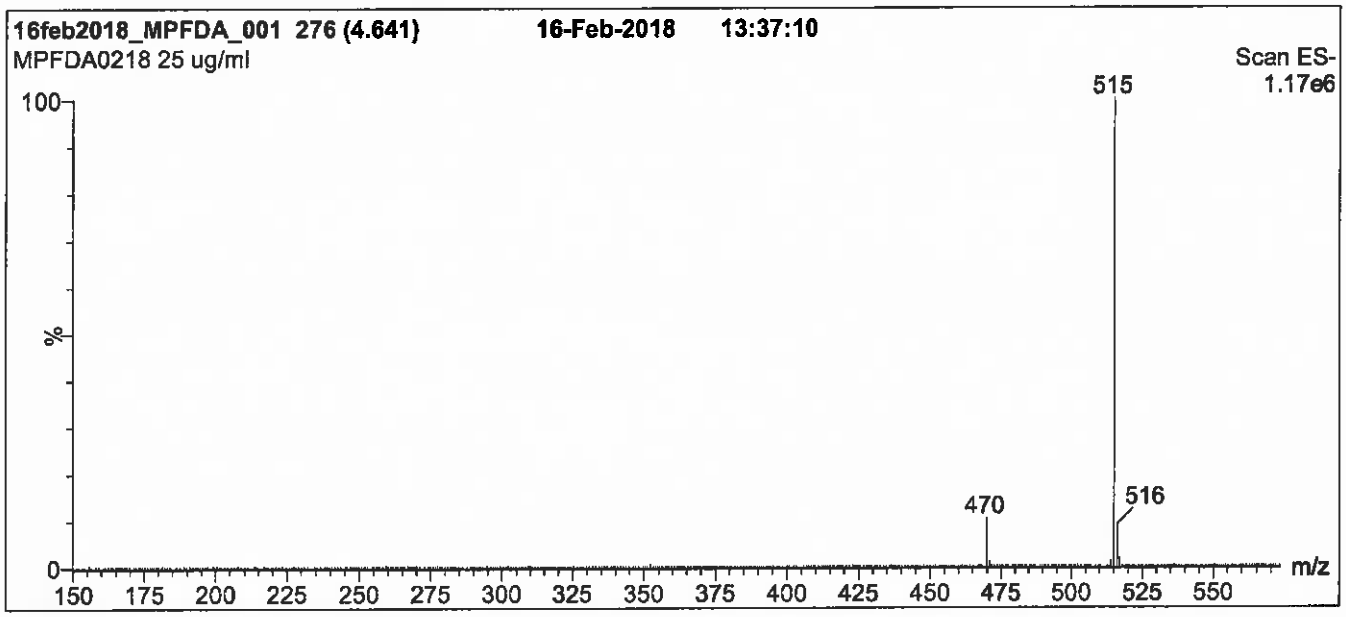
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

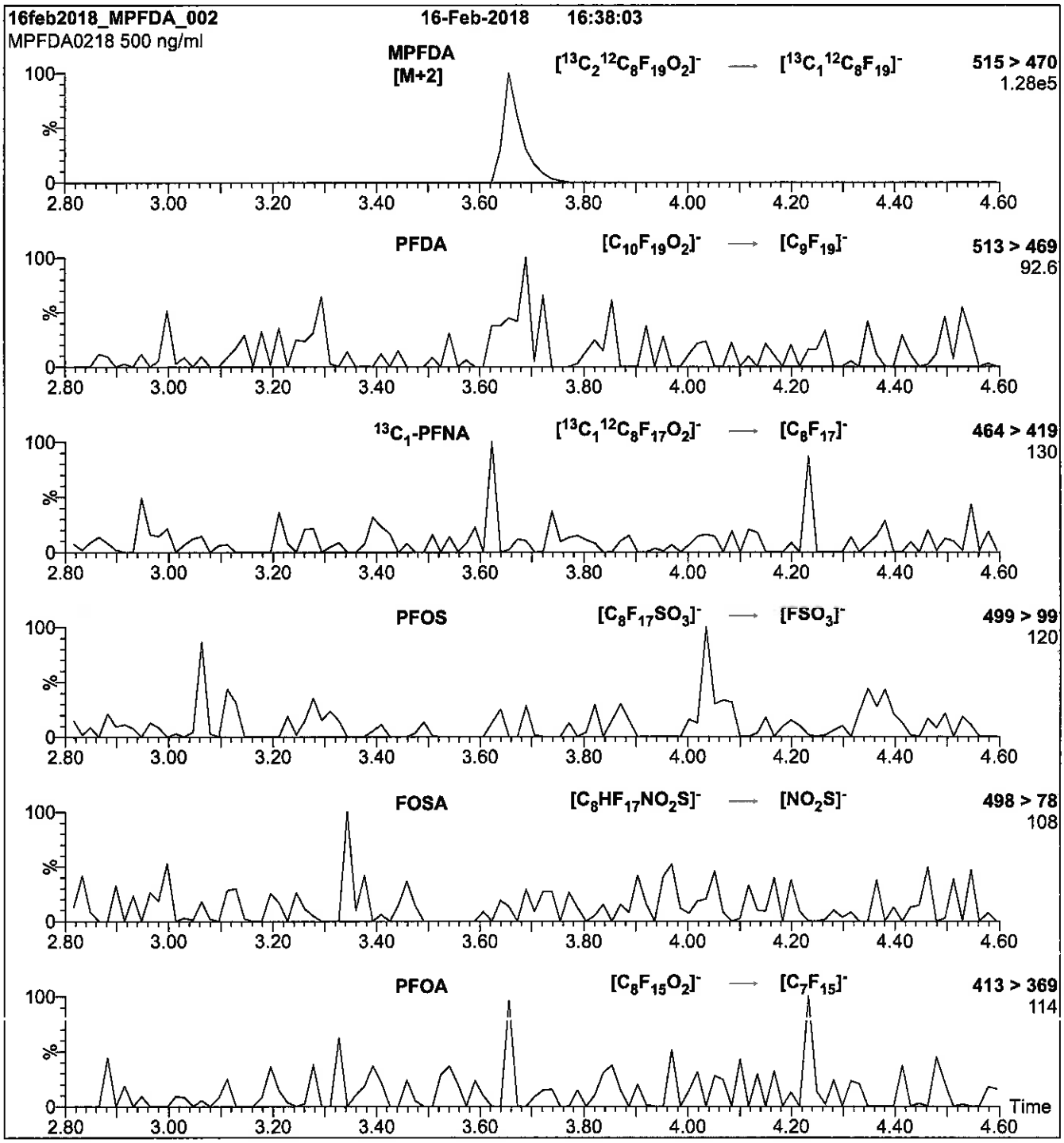
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFDA_00021

1287334
ID: LCMPFDA_00021
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C2-Perfluorodecanoic a

R:6/26/18 CBW

WELLINGTON LABORATORIES

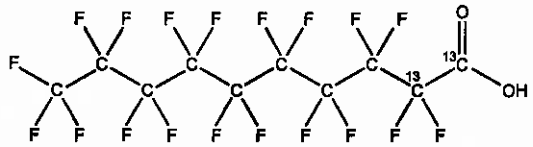
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

LOT NUMBER: MPFDA0218

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 516.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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CALA

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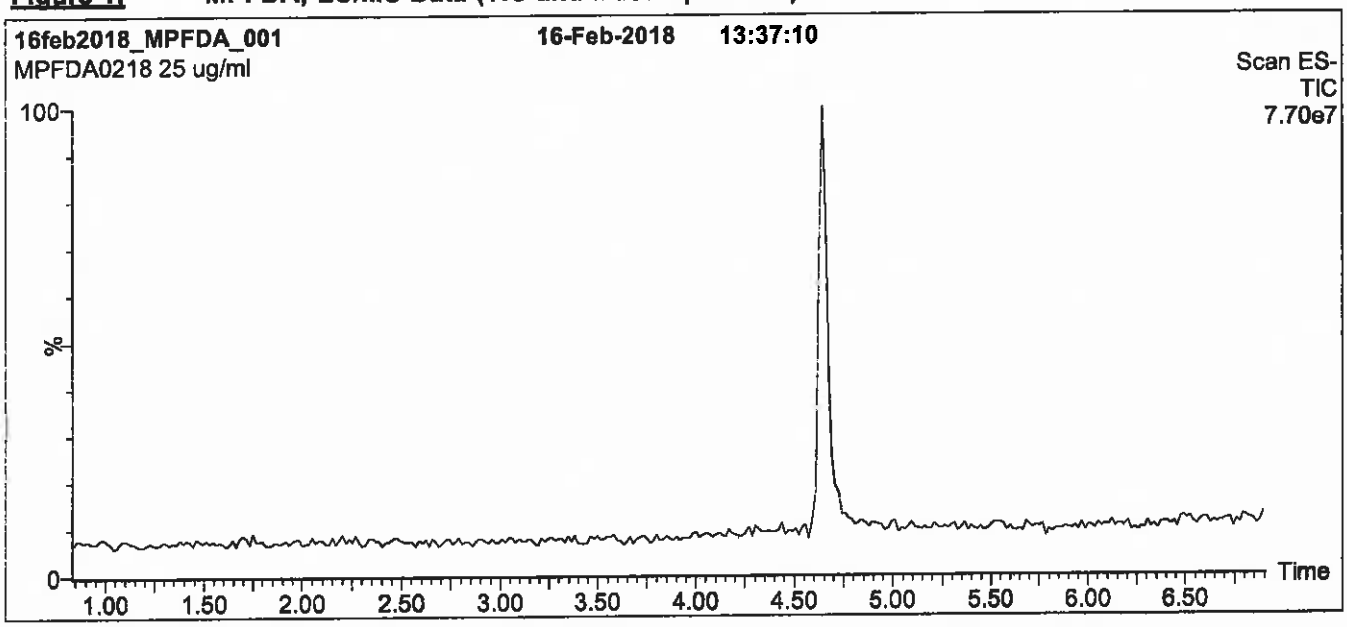
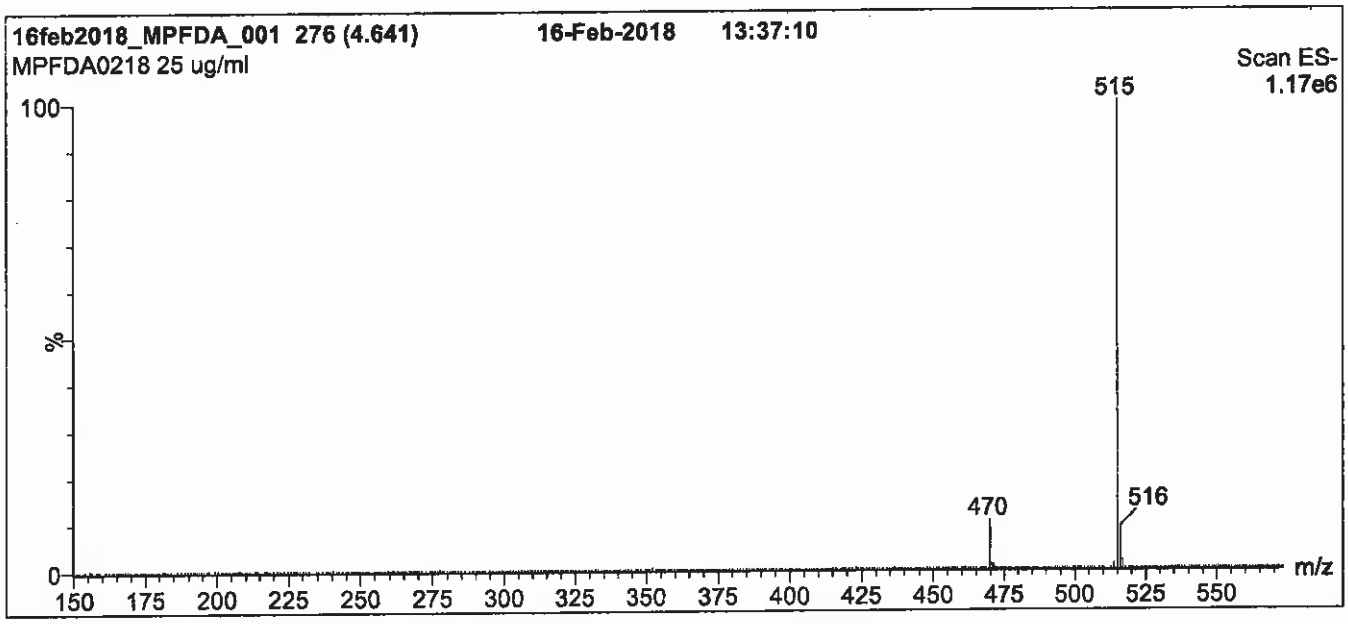




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

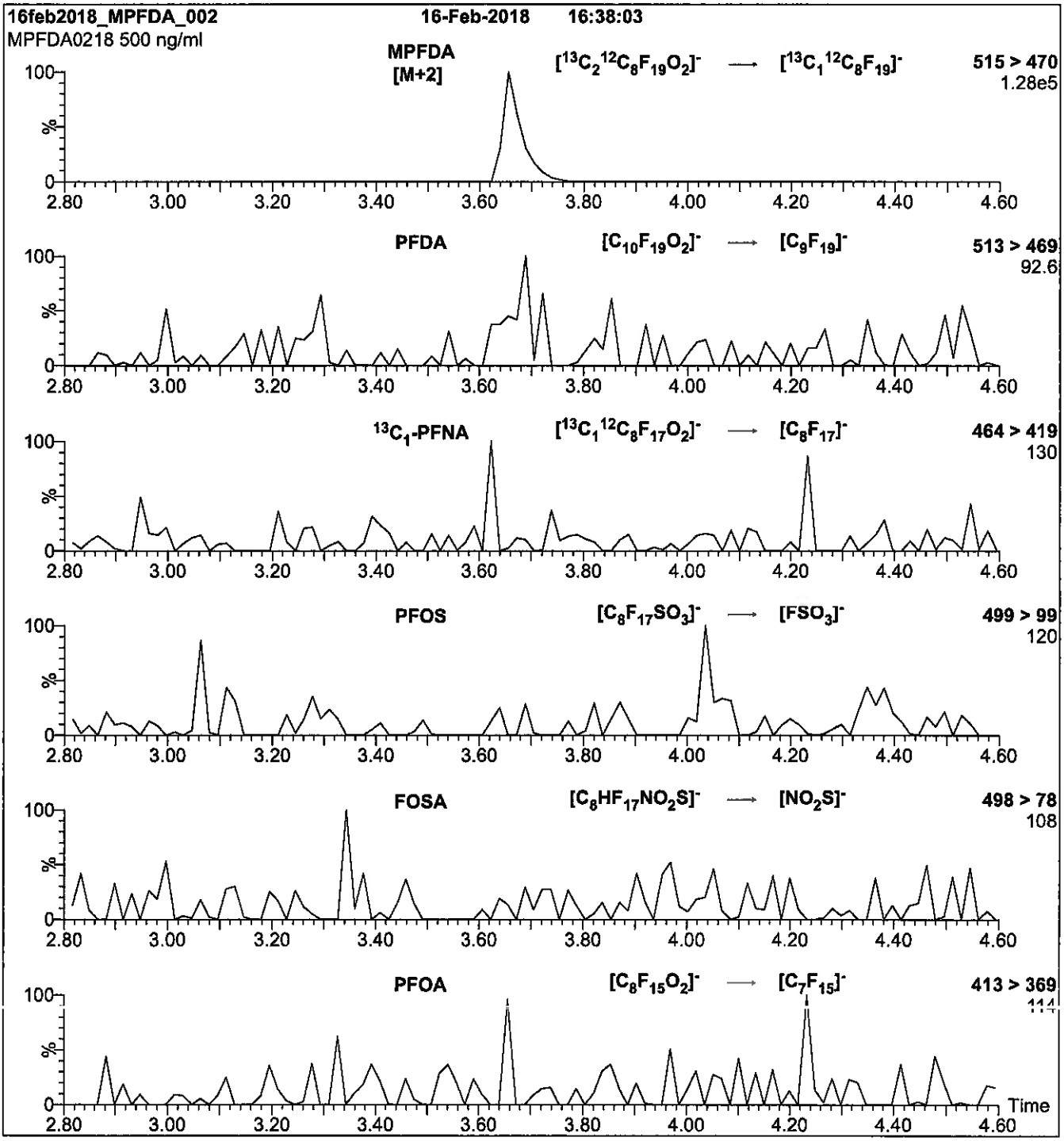
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 13
Flow:	300 µl/min	

Reagent

LCMPFDoA_00015

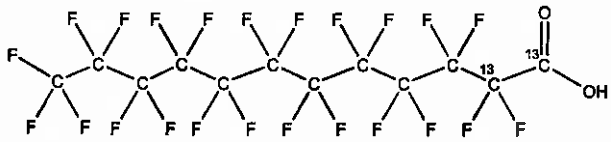
1263139
ID: LCMPFDoA_00015
Exp:02/16/23 Prpd:CBW Opn:05/30/18
13C2-Perfluorododecanoic

R: 5/30/18 cbw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA
LOT NUMBER: MPFDoA0218
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{10}HF_{23}O_2$
MOLECULAR WEIGHT: 616.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 02/23/2018 (mm/dd/yyyy)
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CALA

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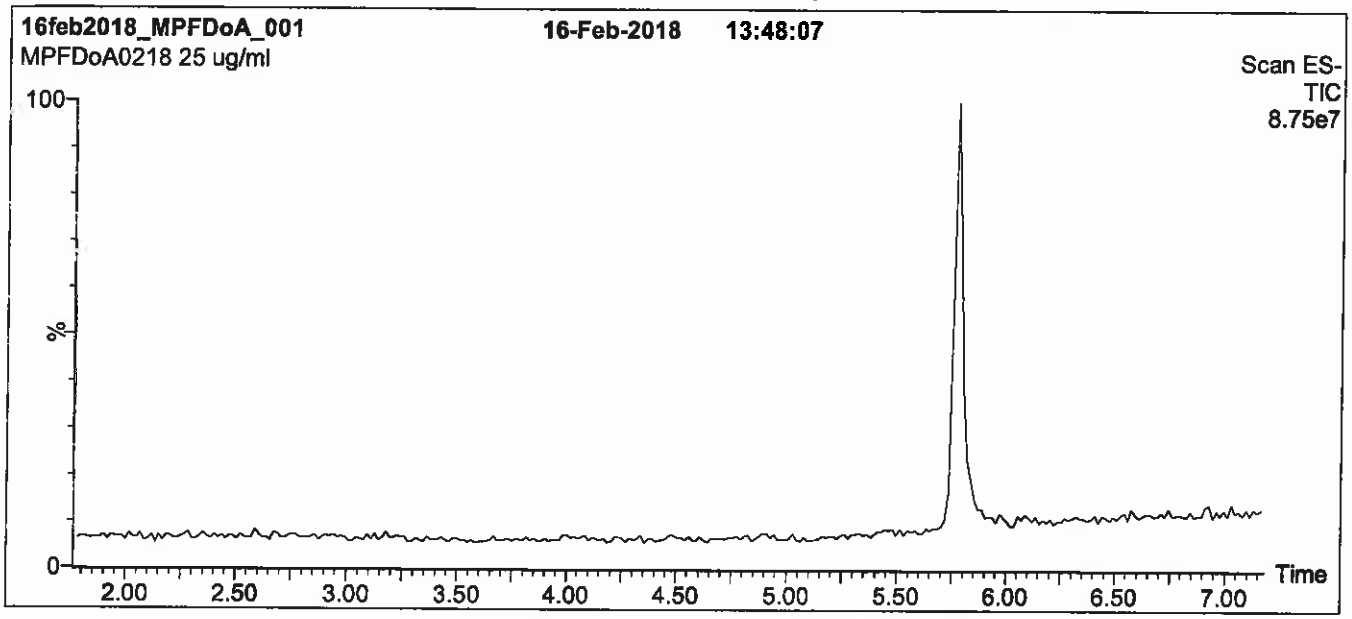

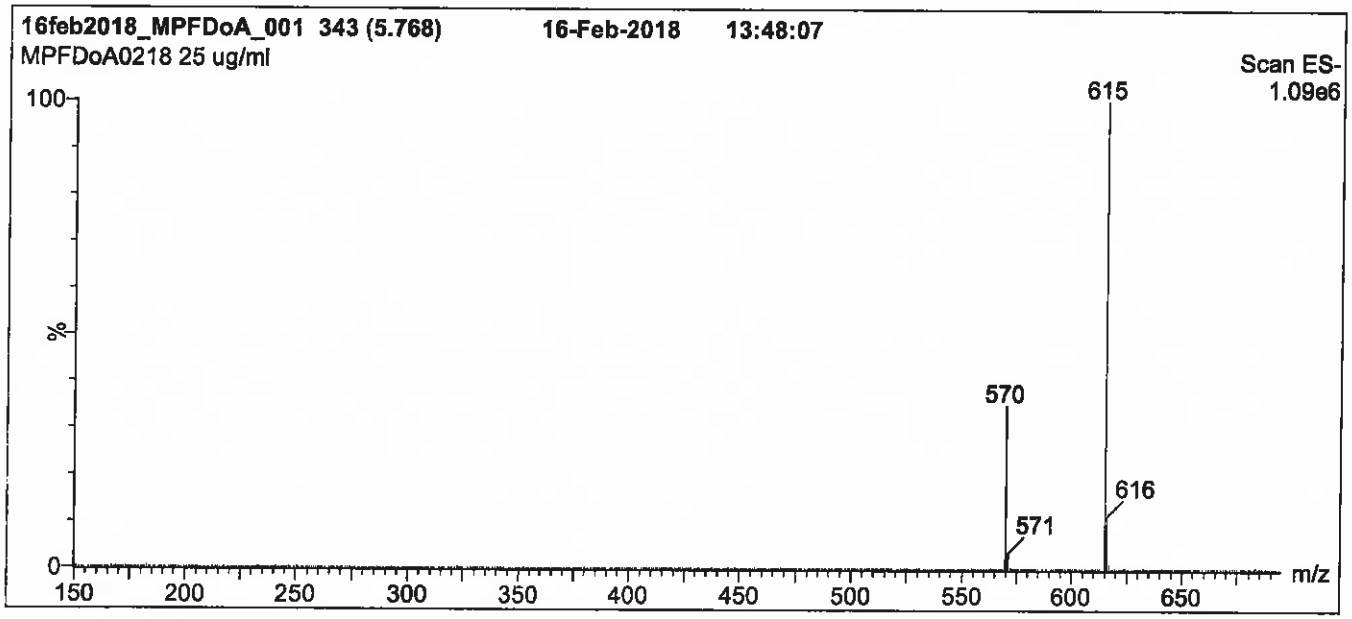

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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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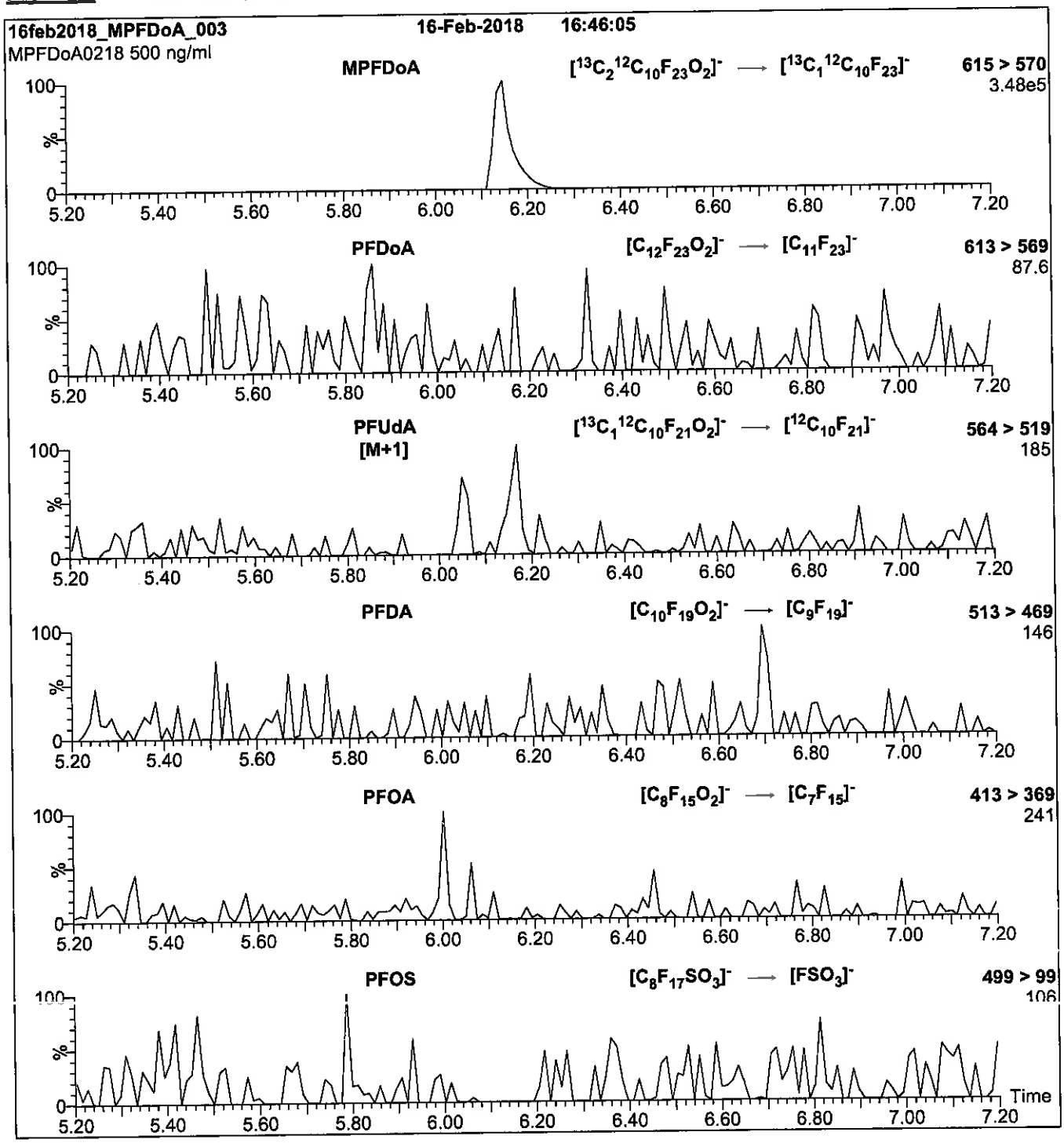


Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00016

1287284
ID: LCMPFDoA_00016
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C2-Perfluorododecanoic

#6/26/18 CBW

WELLINGTON LABORATORIES

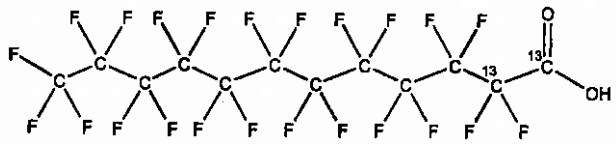
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0218

STRUCTURE:

CAS #: Not available



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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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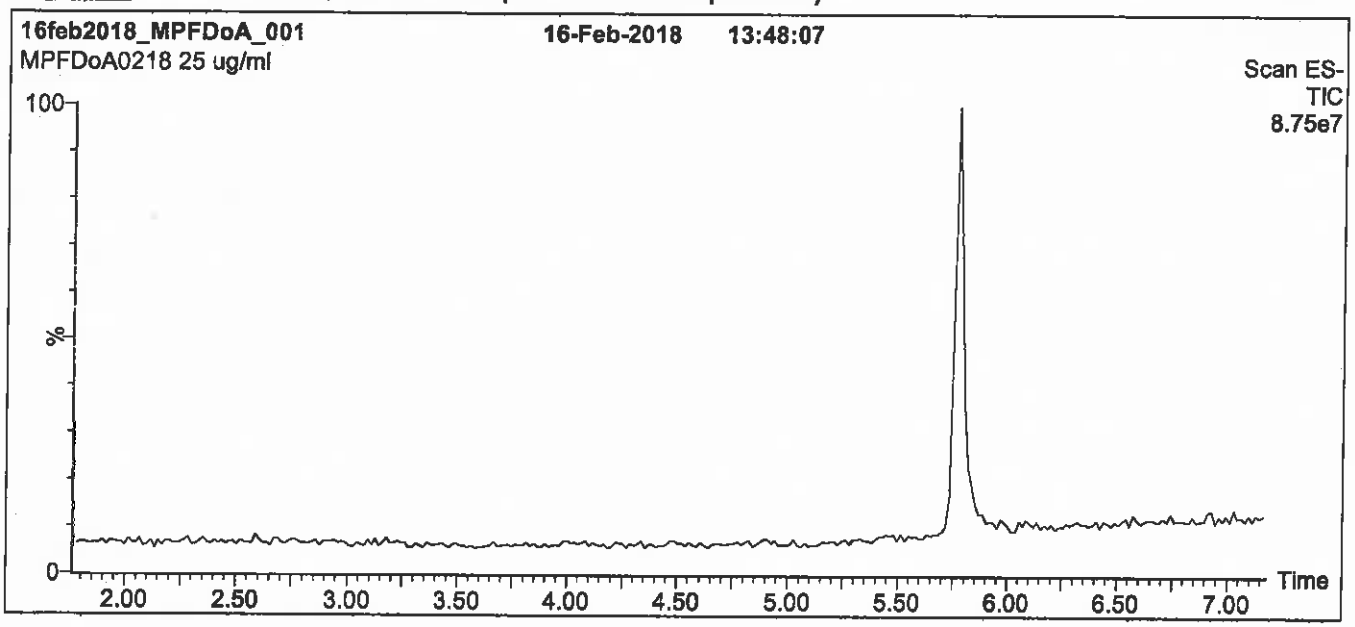
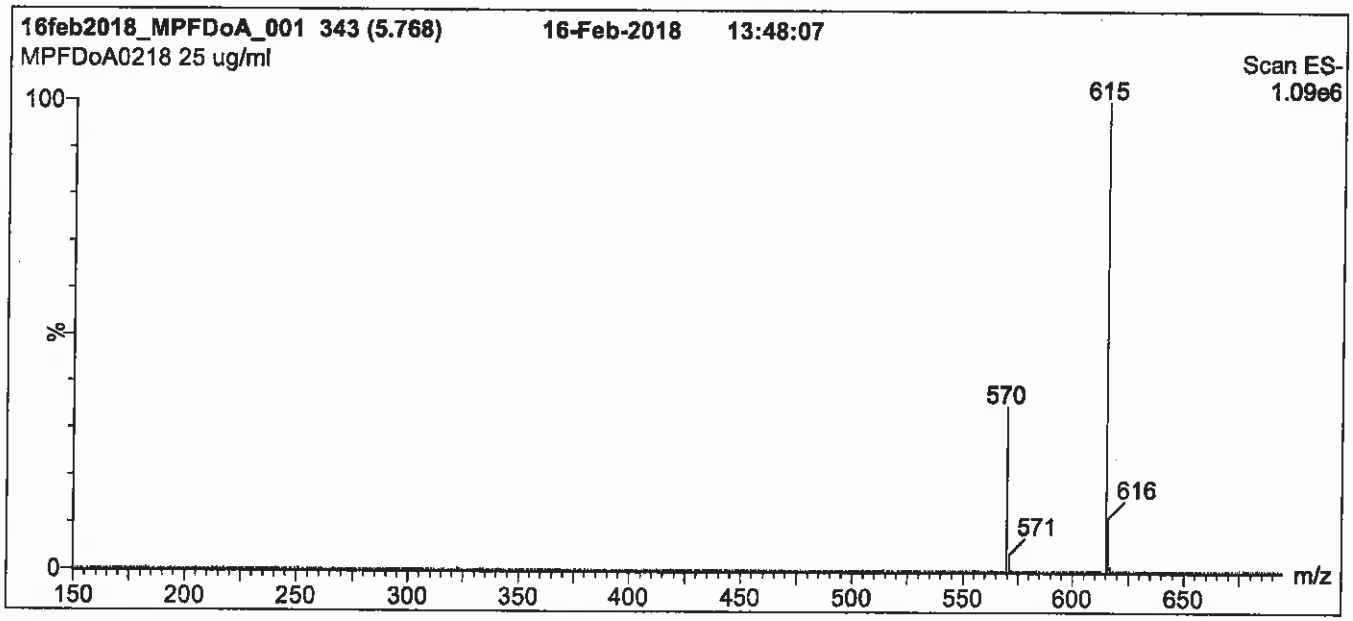
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

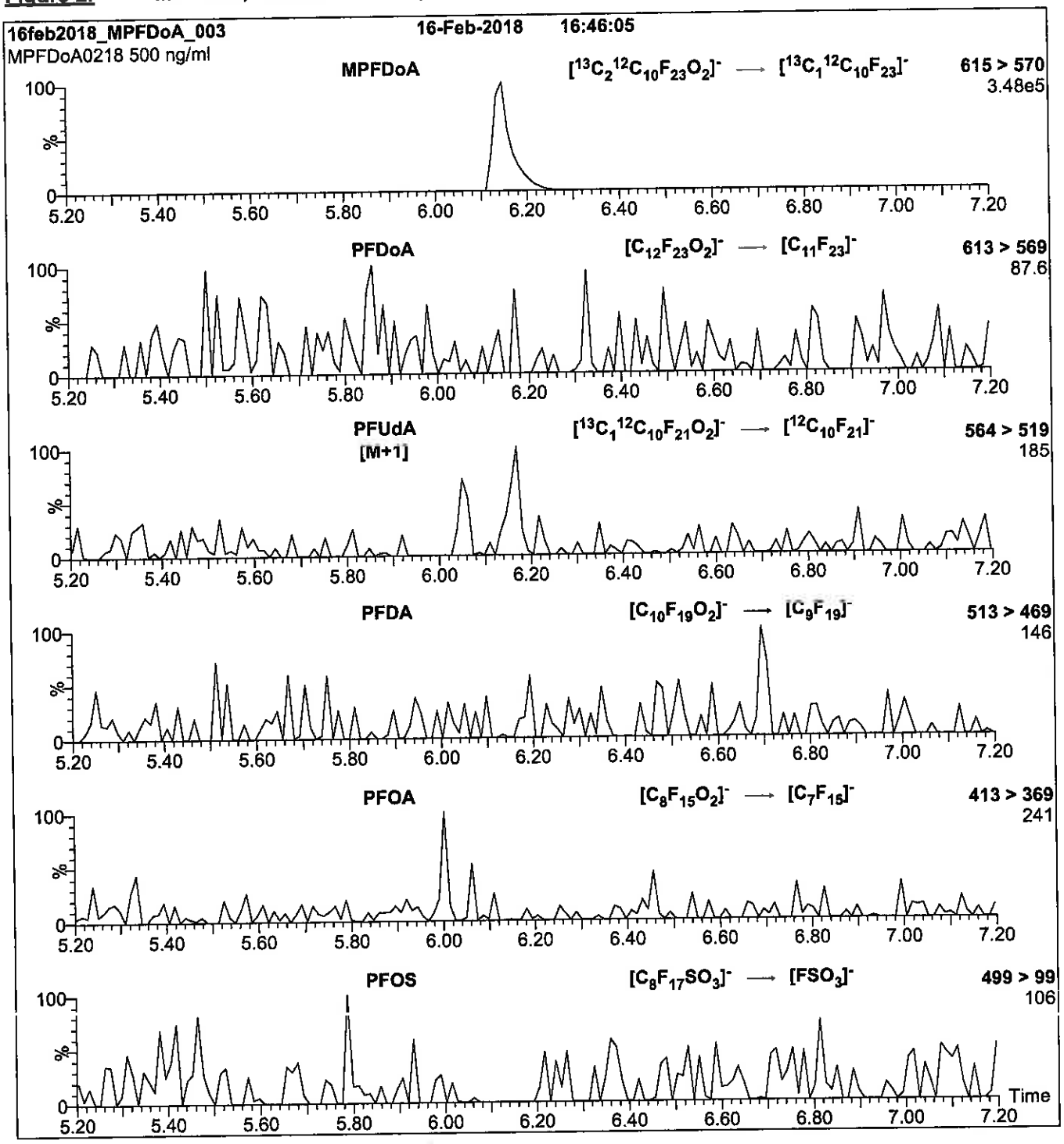
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00022

R: 5/30/18 CBW

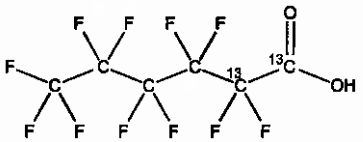
1263168
ID: LCMPFHxA_00022
Exp:10/27/22 Prpd:CBW Opn:05/30/18
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA1017
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
MOLECULAR WEIGHT: 316.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 10/27/2017
EXPIRY DATE: (mm/dd/yyyy) 10/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and < 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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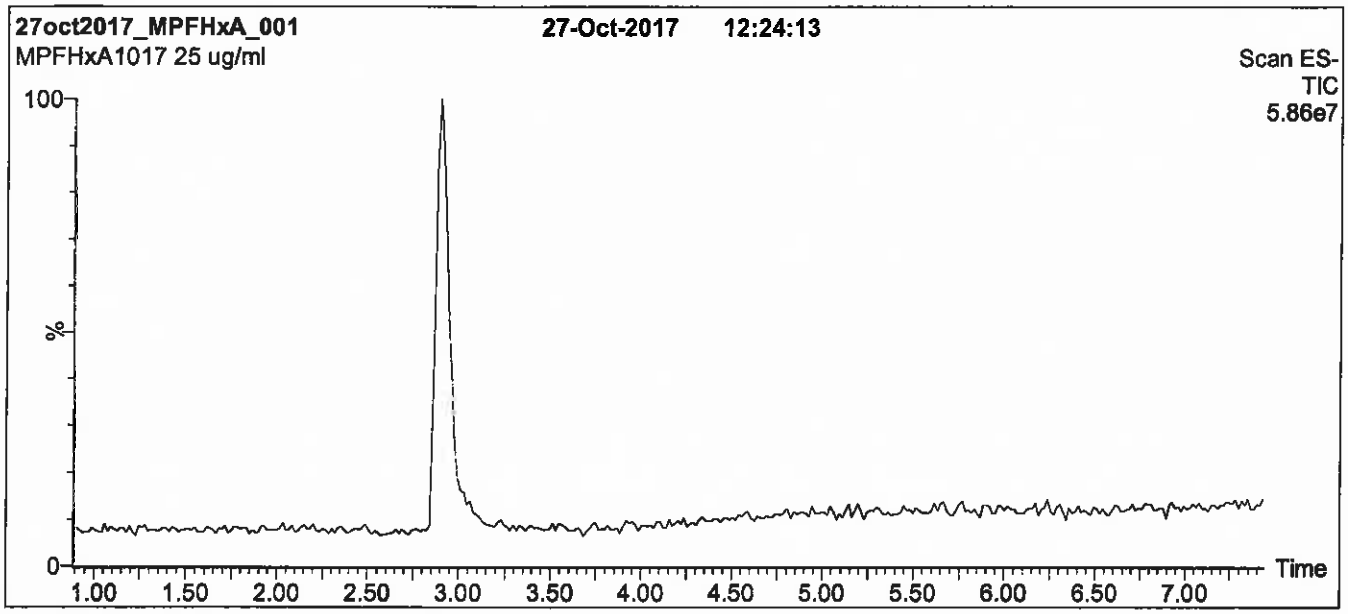
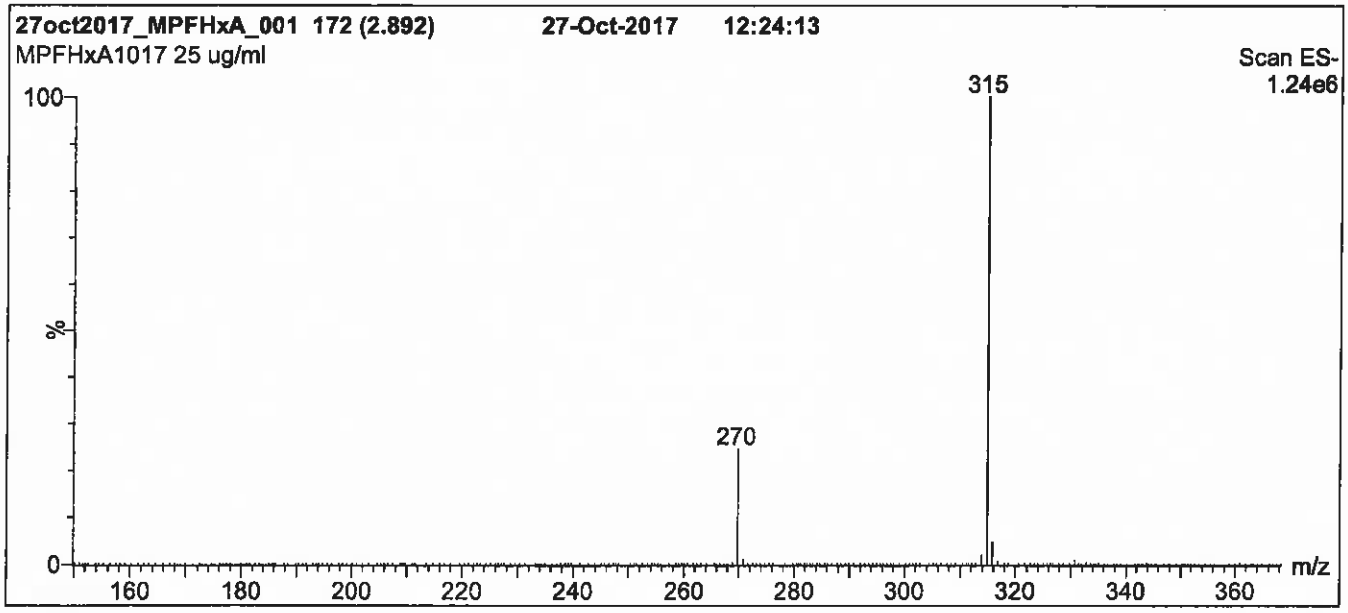




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

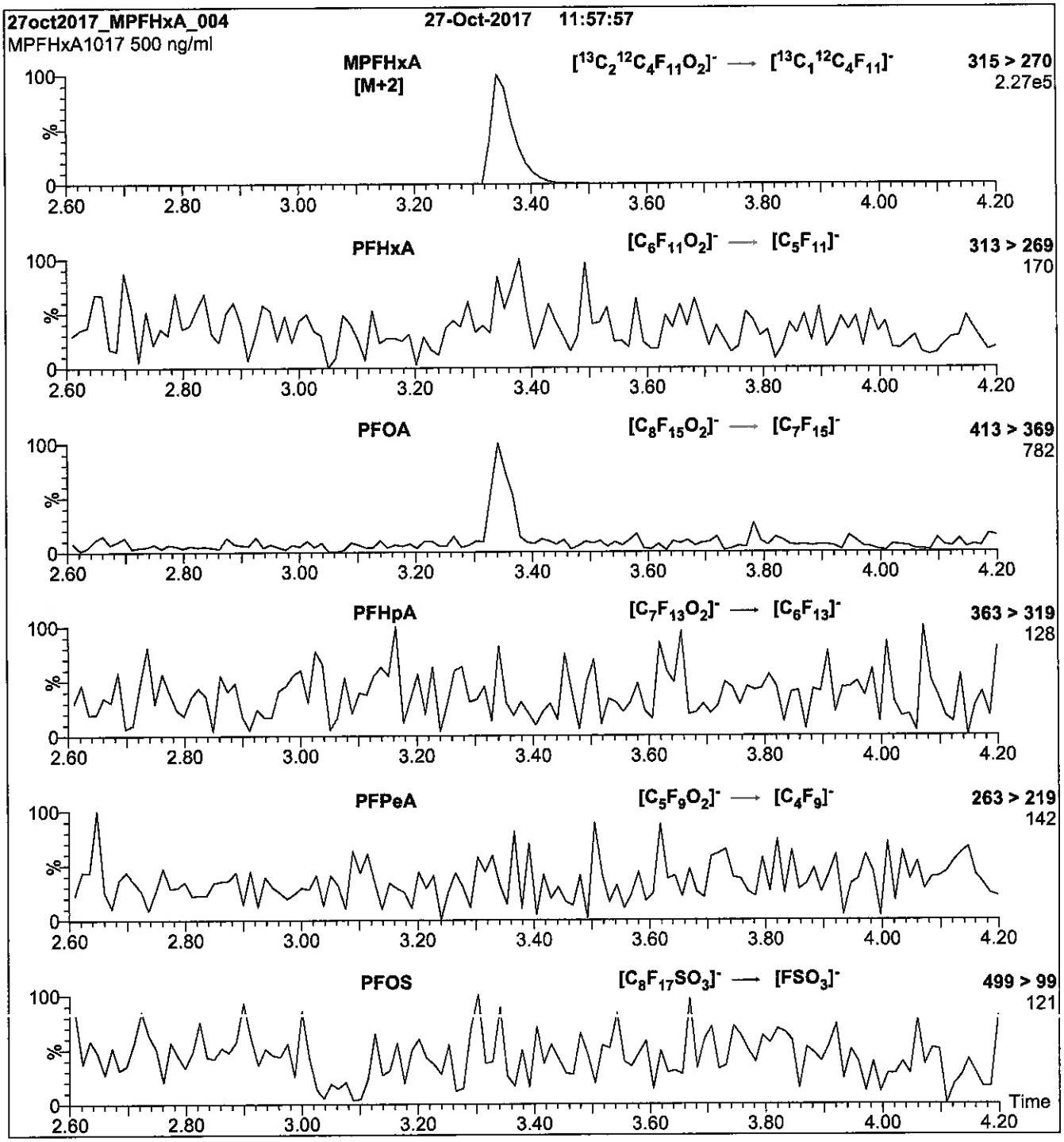
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxA_00023

1287337
ID: LCMPFHxA_00023
Exp:10/27/22 Prpd:CBW Opn:06/26/18
13C2-Perfluorohexanoic ac

R: 6/26/18 CBW

WELLINGTON LABORATORIES

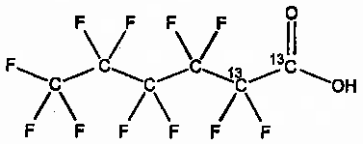
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

LOT NUMBER: MPFHxA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 316.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/27/2017
EXPIRY DATE: (mm/dd/yyyy) 10/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

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ADDITIONAL INFORMATION:

- See page 2 for further details.
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Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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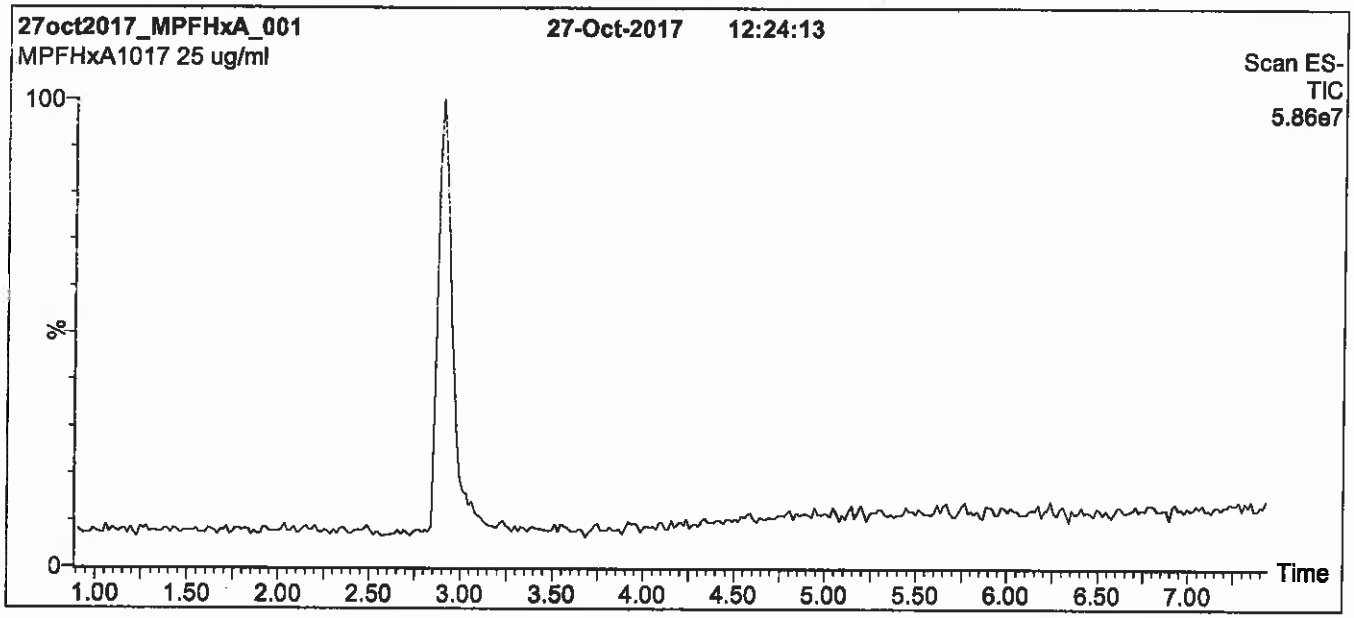
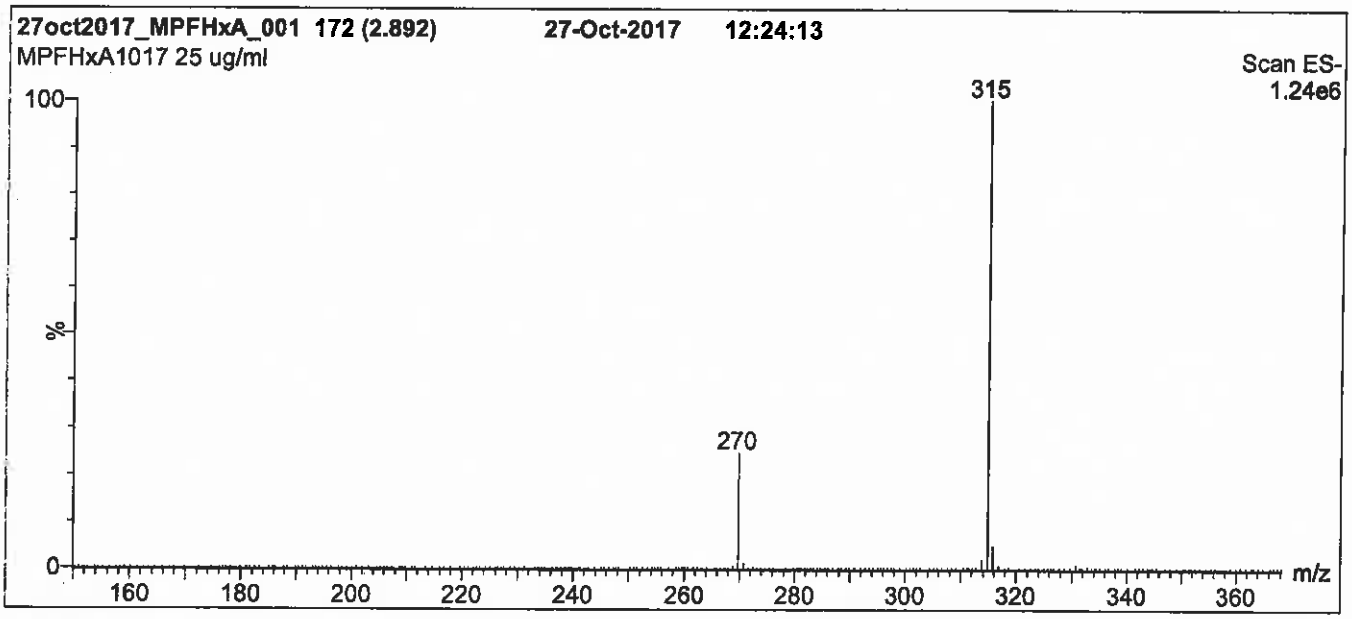




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

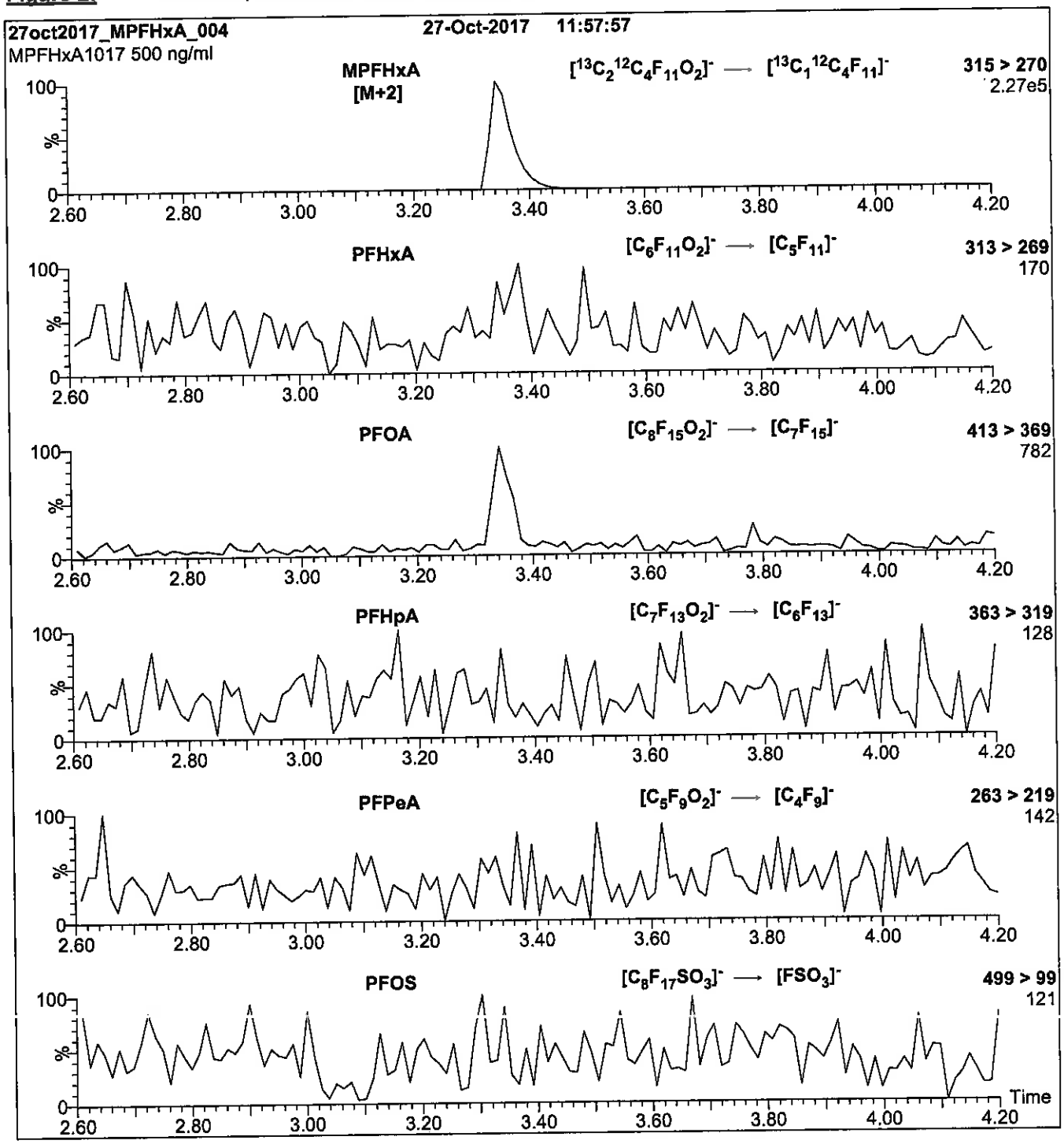
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFHxA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxS_00015

R: 5/30/18 CSW

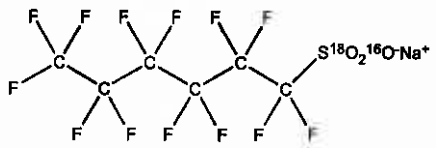
1263157
ID: LCMPFHxS_00015
Exp:03/22/23 Prpd:CBW Opn:05/30/18
18O2-Perfluorohexanesulfo

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS
LOT NUMBER: MPFHxS0318
COMPOUND: Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $C_6F_{13}S^{18}O_2{}^{16}ONa$
MOLECULAR WEIGHT: 426.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (MPFHxS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: >94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy) 03/22/2018
EXPIRY DATE: (mm/dd/yyyy) 03/22/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFHpS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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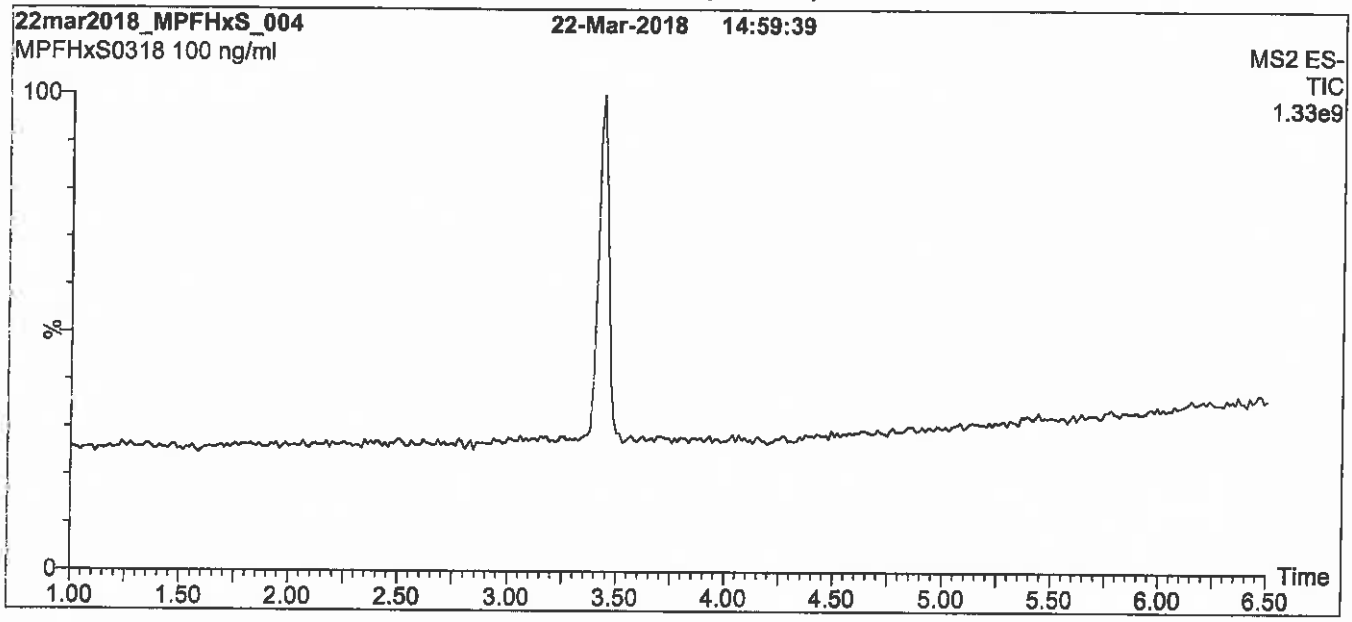
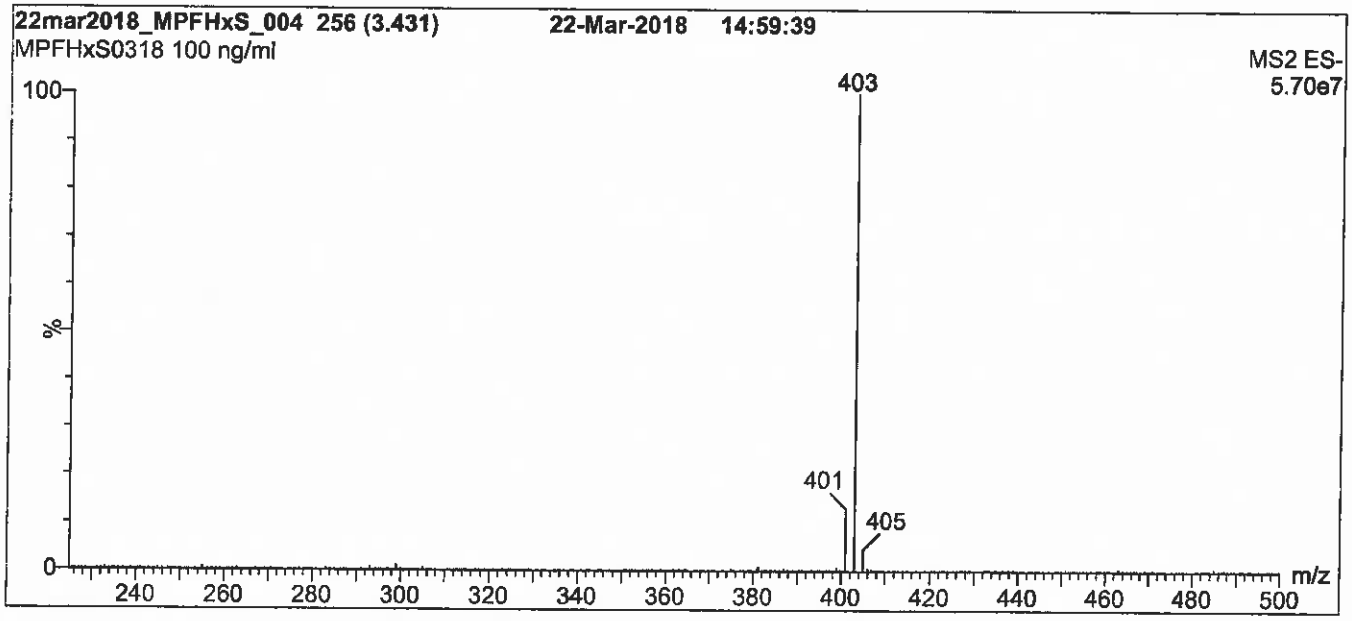
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

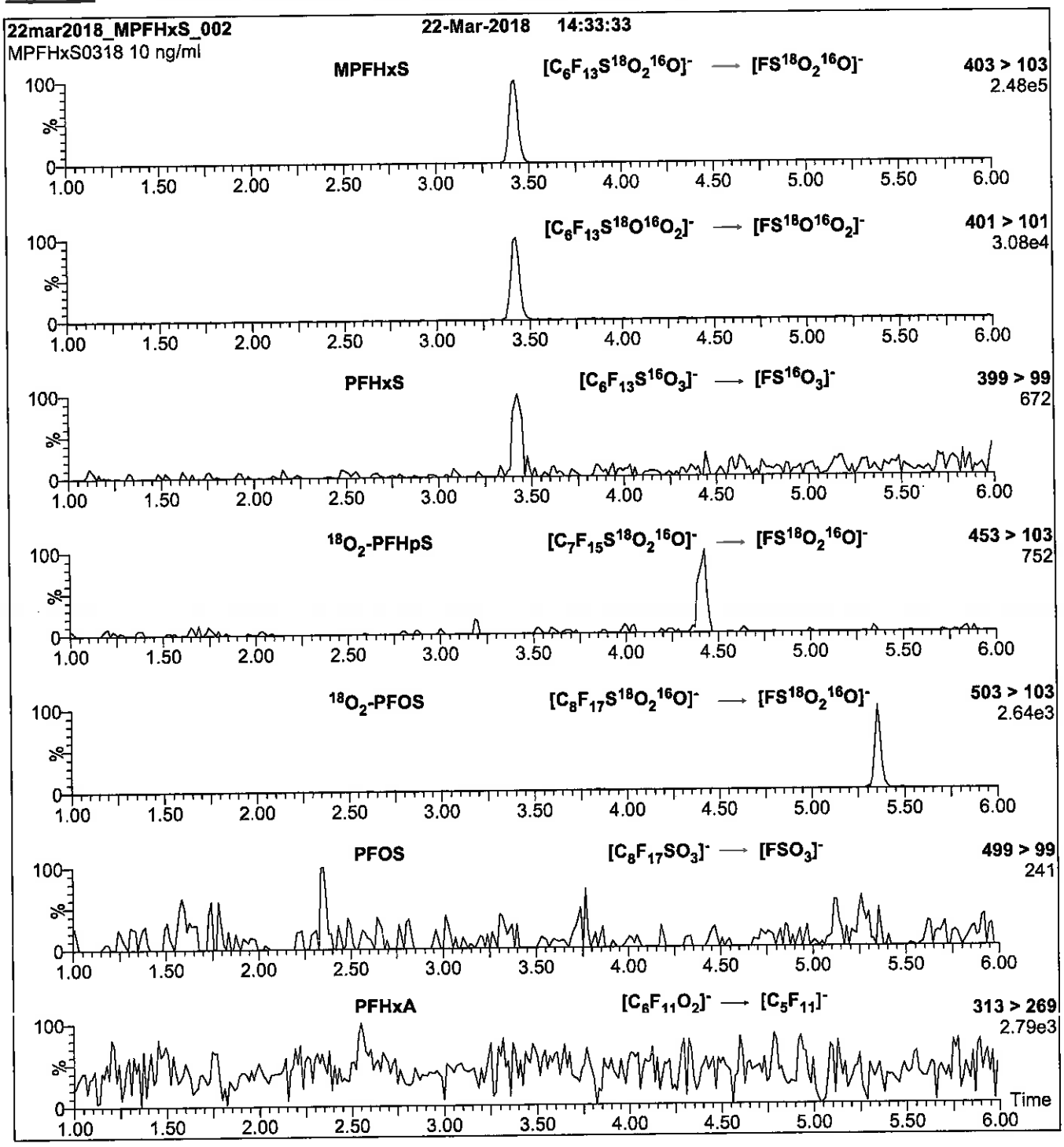
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.64e-3
Collision Energy (eV) = 32

Reagent

LCMPFHxS_00016

1287304
ID: LCMPFHxS_00016
Exp:03/22/23 Prpd:CBW Opn:06/26/18
18O2-Perfluorohexanesulfo

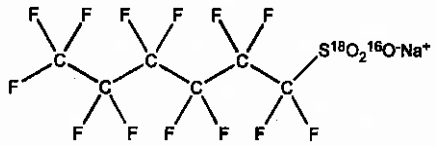
K: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS
LOT NUMBER: MPFHxS0318
COMPOUND: Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate

STRUCTURE:
CAS #: 1585941-14-5



MOLECULAR FORMULA: $C_6F_{13}S^{18}O_2{}^{16}ONa$
MOLECULAR WEIGHT: 426.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (MPFHxS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: >94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy) 03/22/2018
EXPIRY DATE: (mm/dd/yyyy) 03/22/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFHpS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

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CALA

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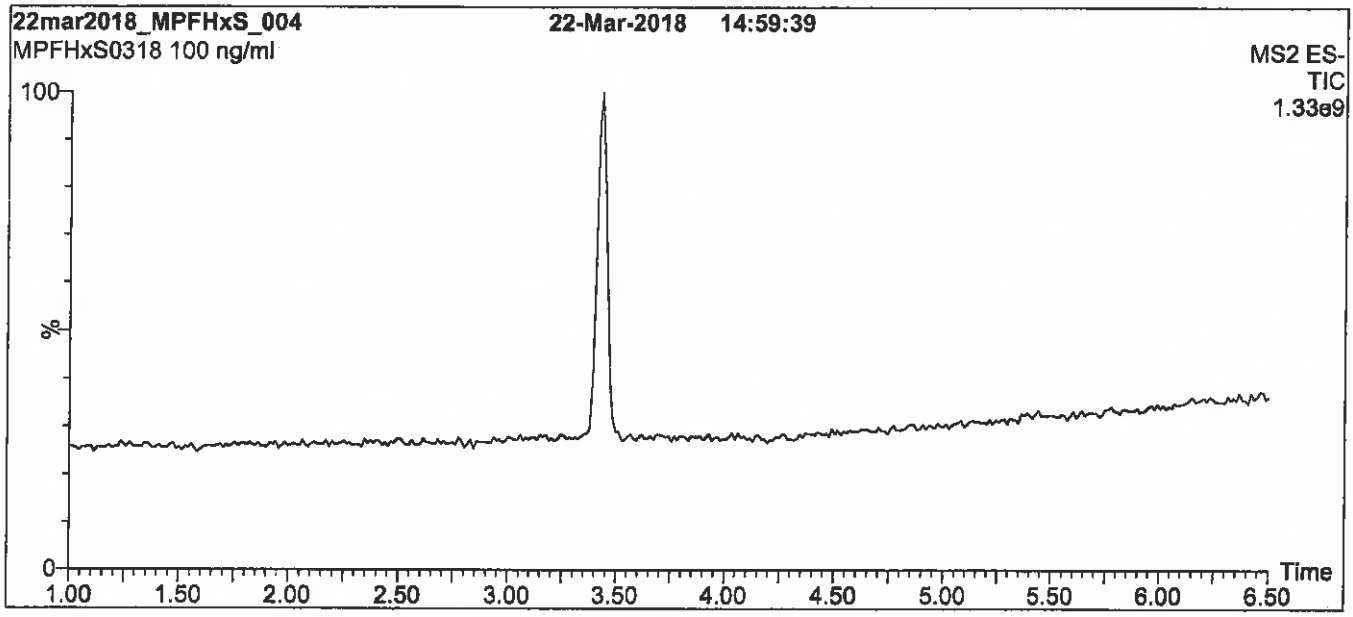
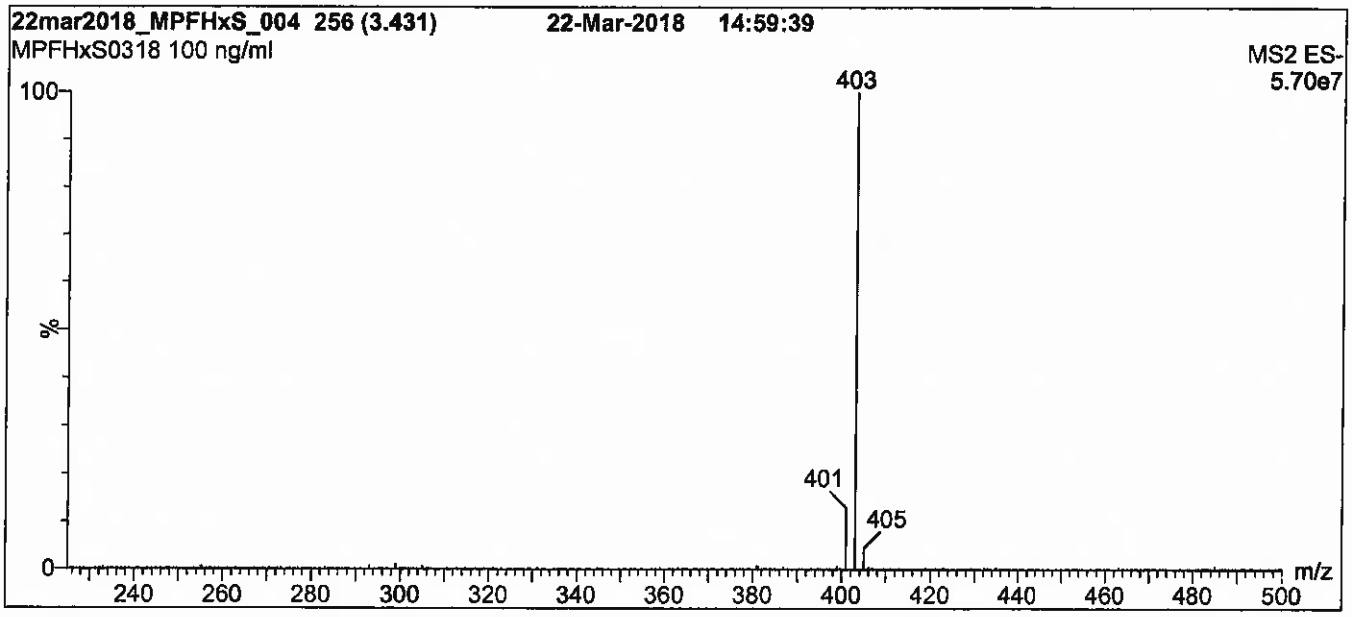
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

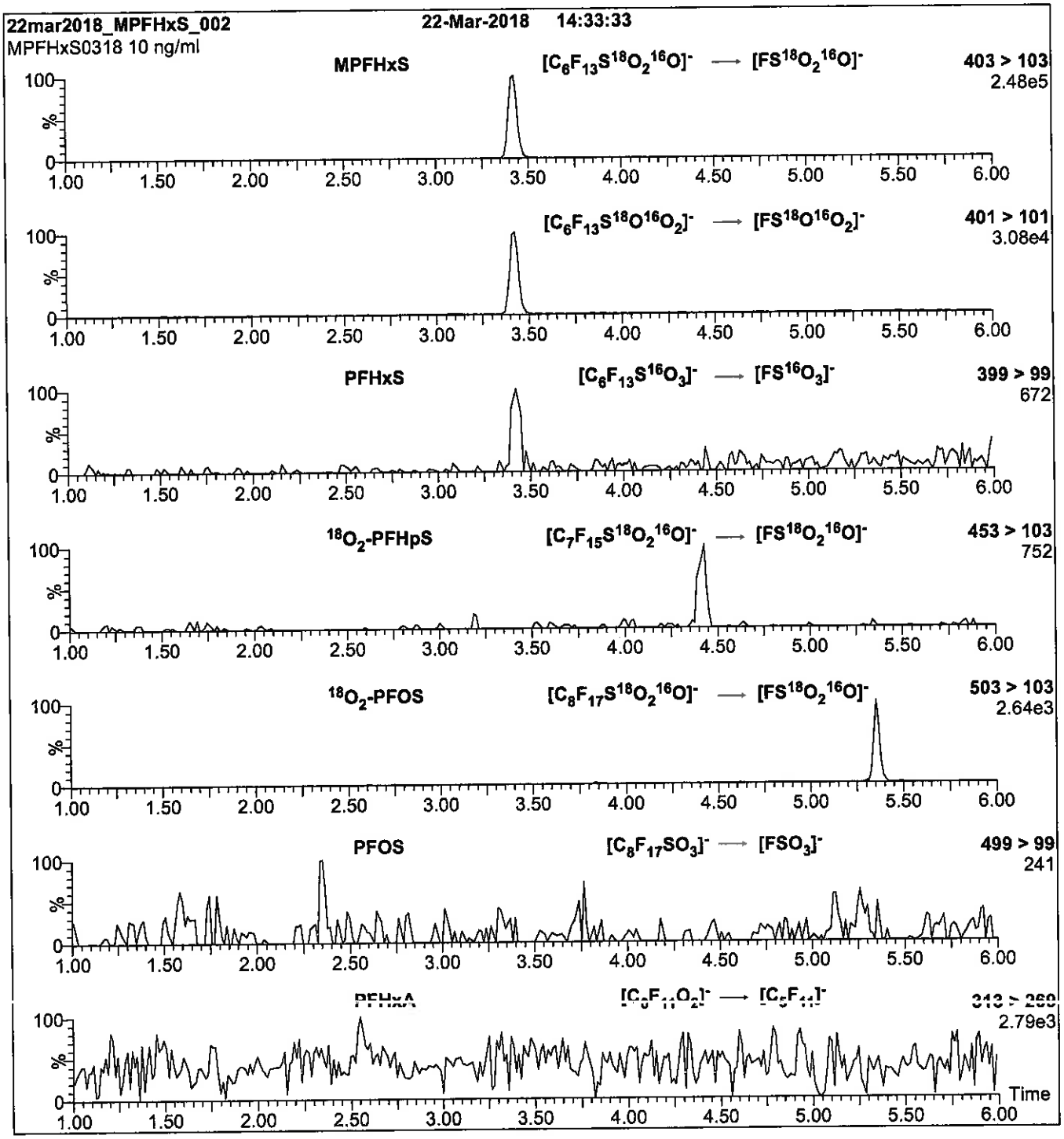
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.64e-3
Collision Energy (eV) = 32

Reagent

LCMPFNA_00015

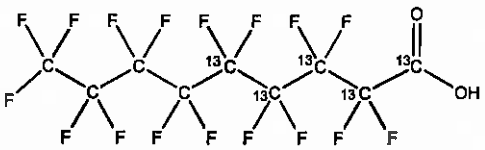
1263148
ID: LCMPFNA_00015
Exp:12/14/22 Rpd:CBW Opn:05/30/18
13C5-Perfluorononanoic aci

R: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFNA
LOT NUMBER: MPFNA1217
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5{}^{12}C_4HF_{17}O_2$
MOLECULAR WEIGHT: 469.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy) 12/14/2017
EXPIRY DATE: (mm/dd/yyyy) 12/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

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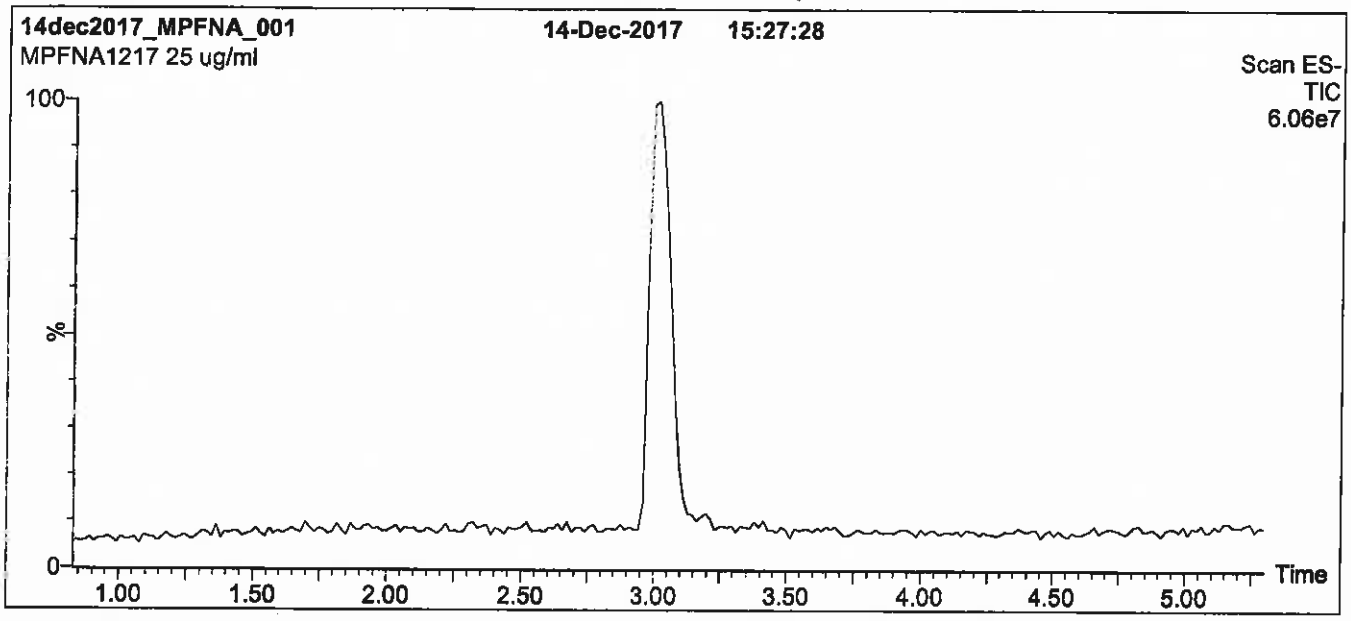
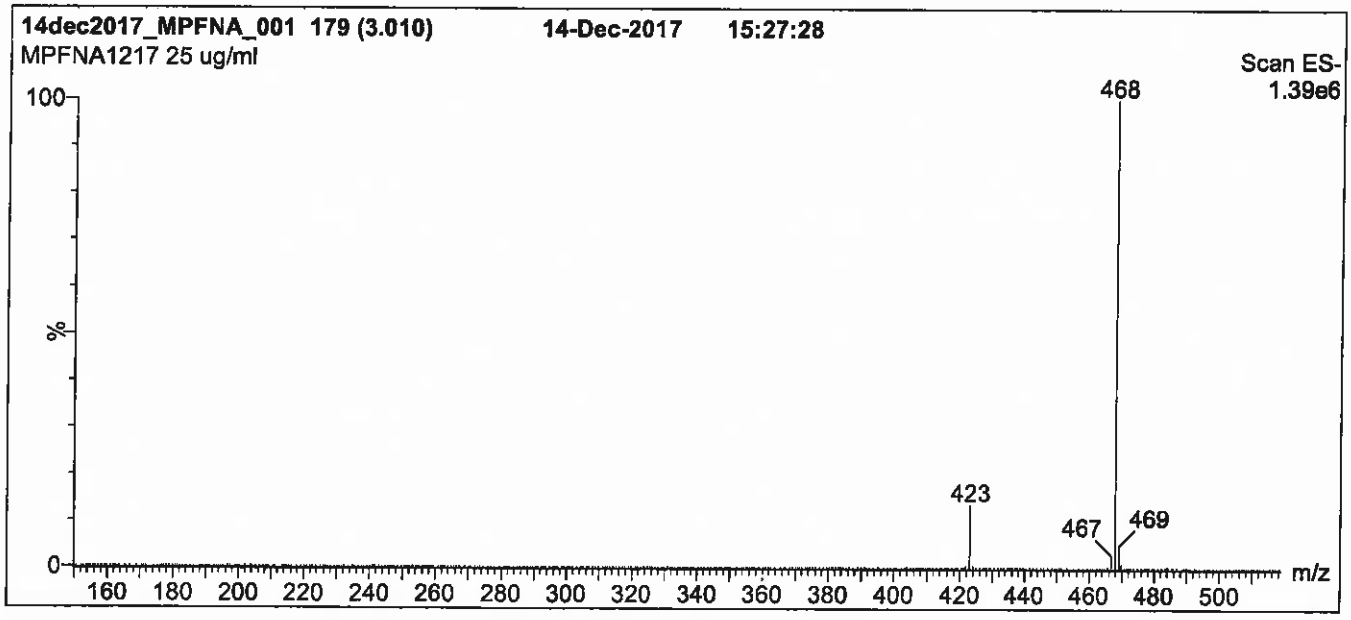
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

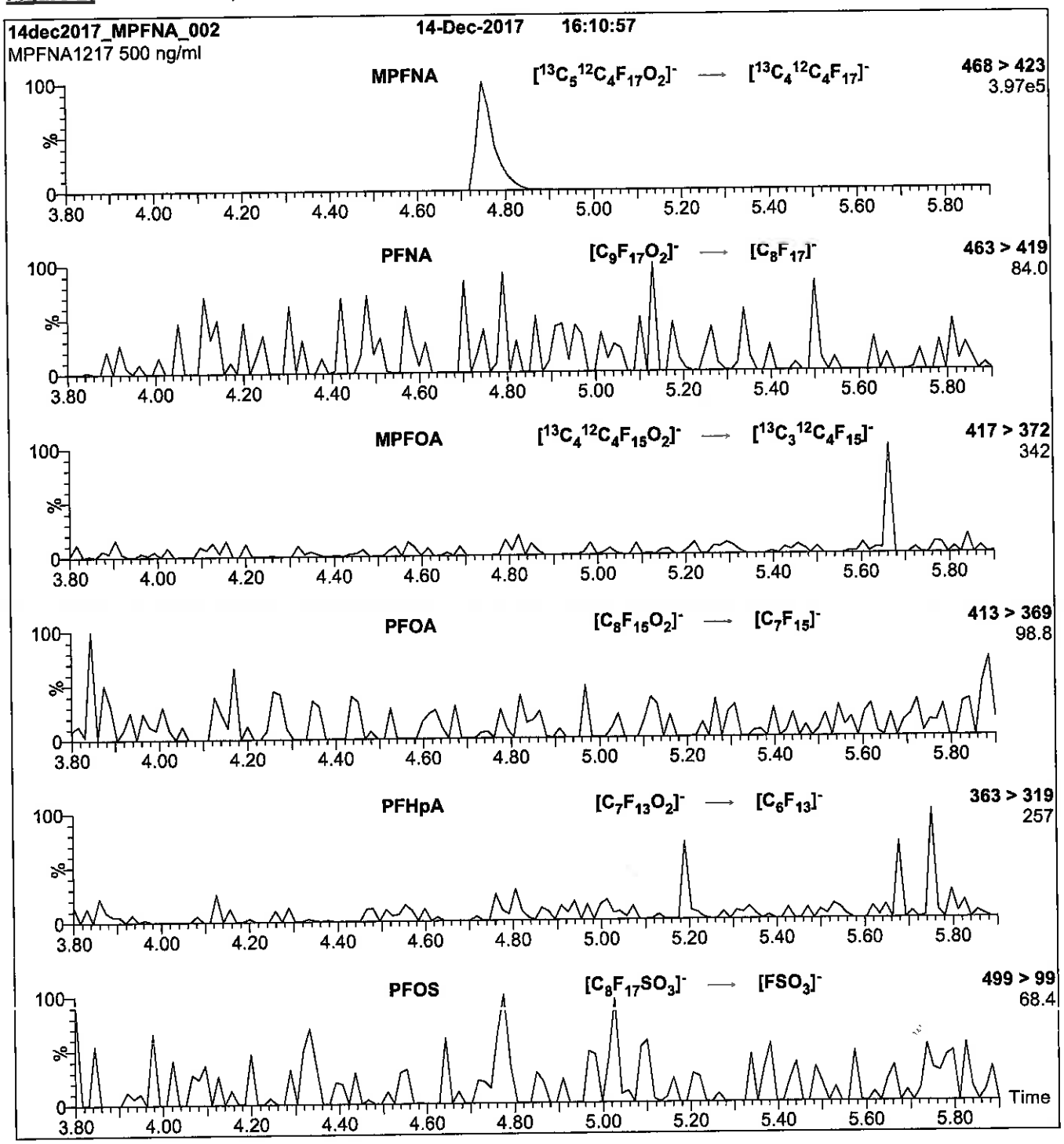
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

Reagent

LCMPFNA_00016

1287293
ID: LCMPFNA_00016
Exp:12/14/22 Prpd:CBW Opn:06/26/18
13C5-Perfluorononanoic acid

R: 6/26/18 CBW

WELLINGTON LABORATORIES

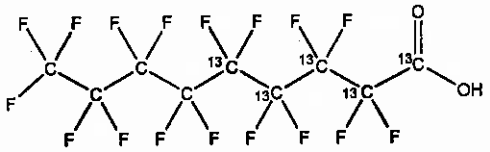
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid

LOT NUMBER: MPFNA1217

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5{}^{12}C_4HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/14/2017
EXPIRY DATE: (mm/dd/yyyy) 12/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 469.04
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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CALA

ANAB ACCREDITED

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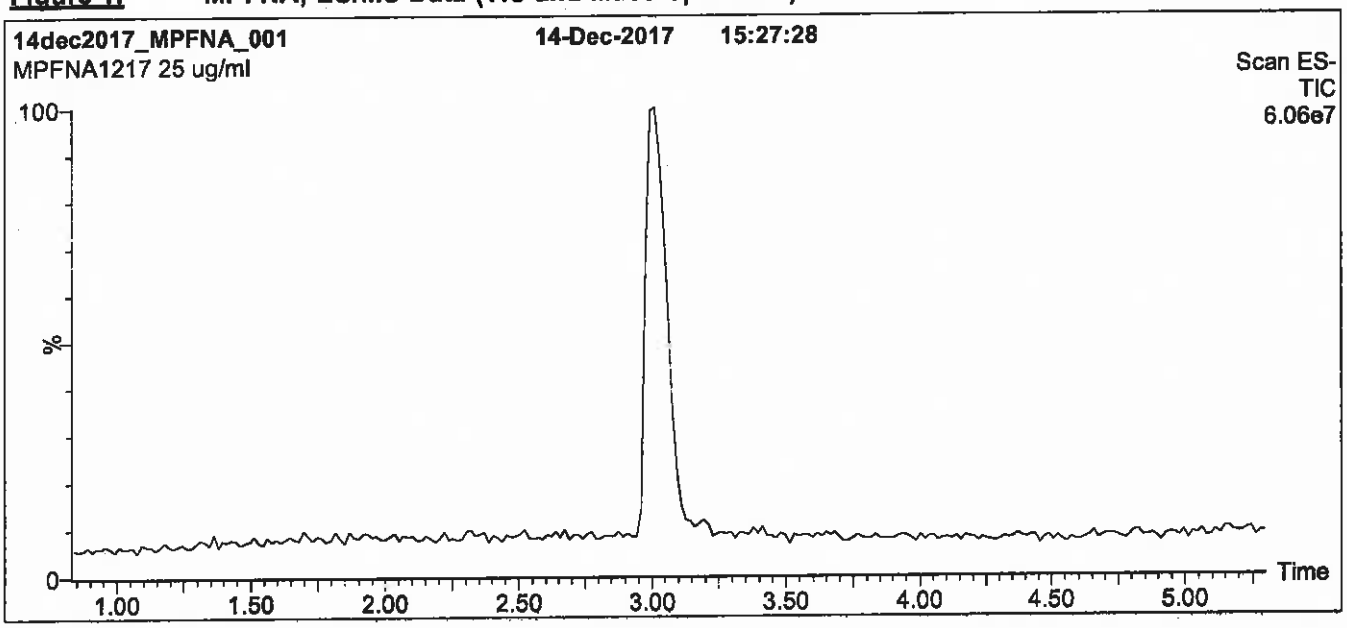
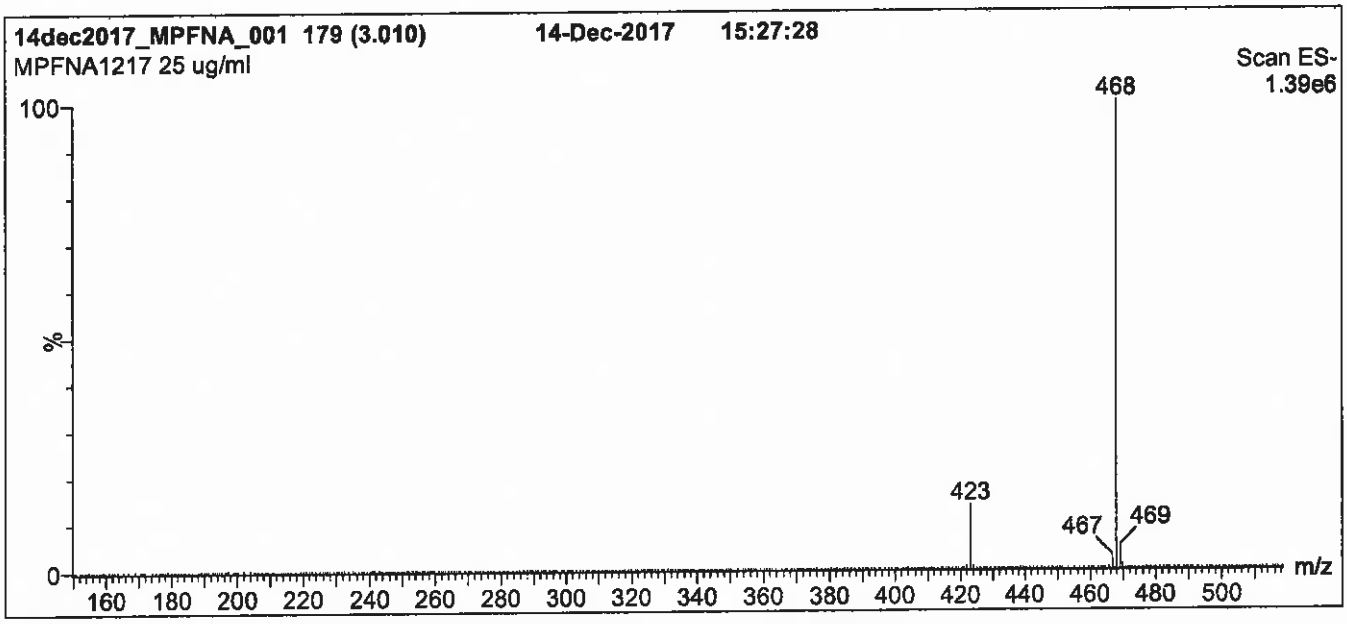
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

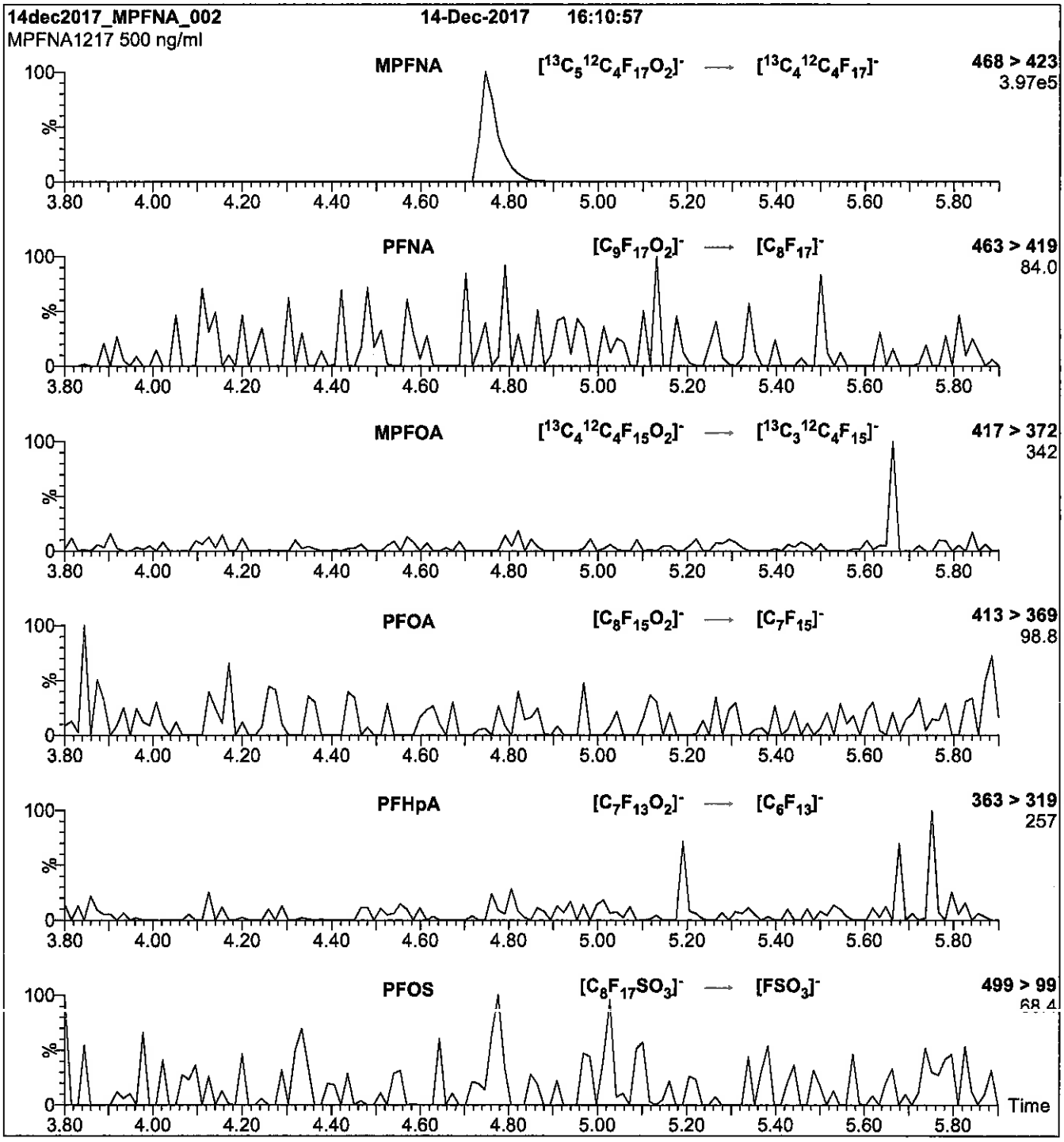
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFNA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 11
Flow:	300 µl/min	

Reagent

LCMPFOA_00019

1263125
ID: LCMPFOA_00019
Exp:05/04/23 Prpd:CBW Opn:05/30/18
13C4-Perfluorooctanoic ac

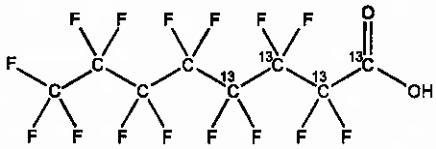
r: 5/30/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
LOT NUMBER: MPFOA0418
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$
MOLECULAR WEIGHT: 418.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 05/04/2018
EXPIRY DATE: (mm/dd/yyyy) 05/04/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim, General Manager **Date:** 05/17/2018 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HANDLING:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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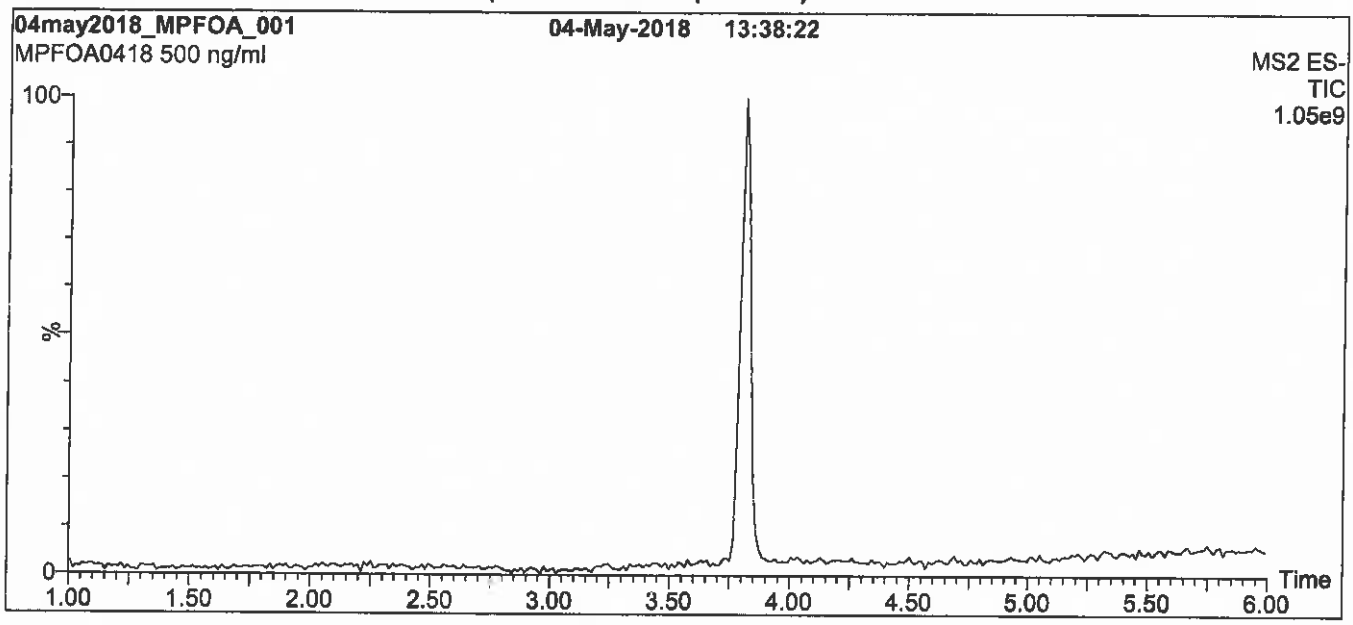
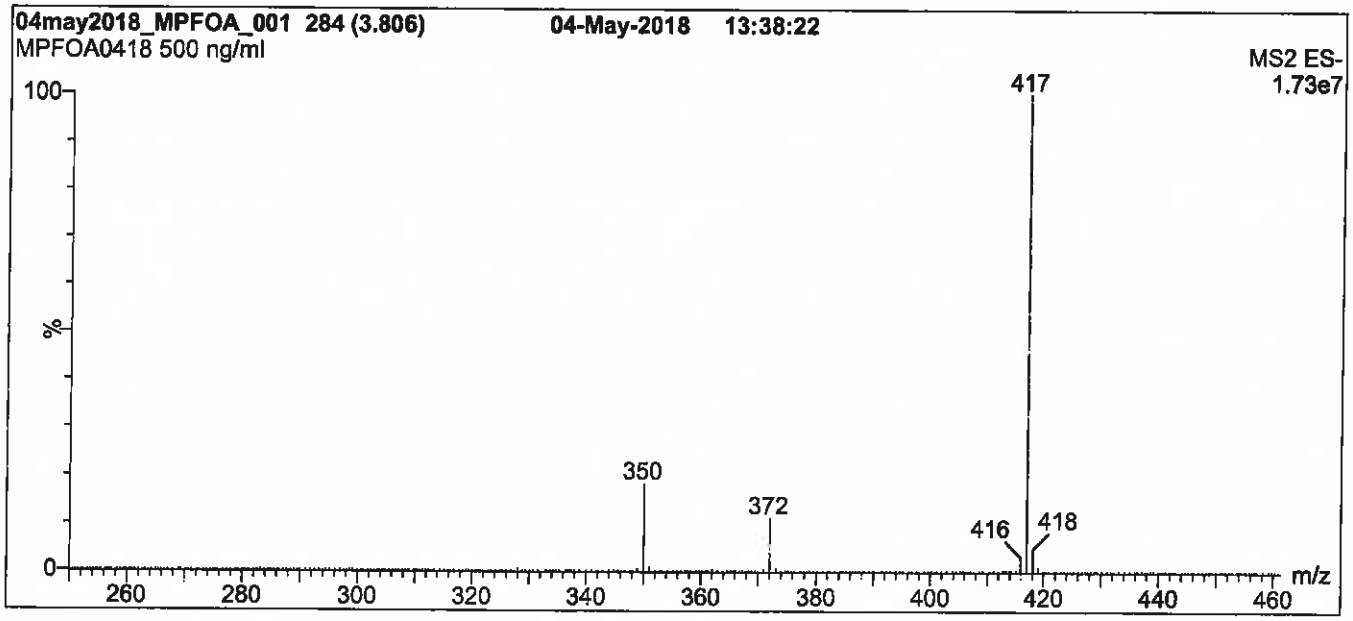




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

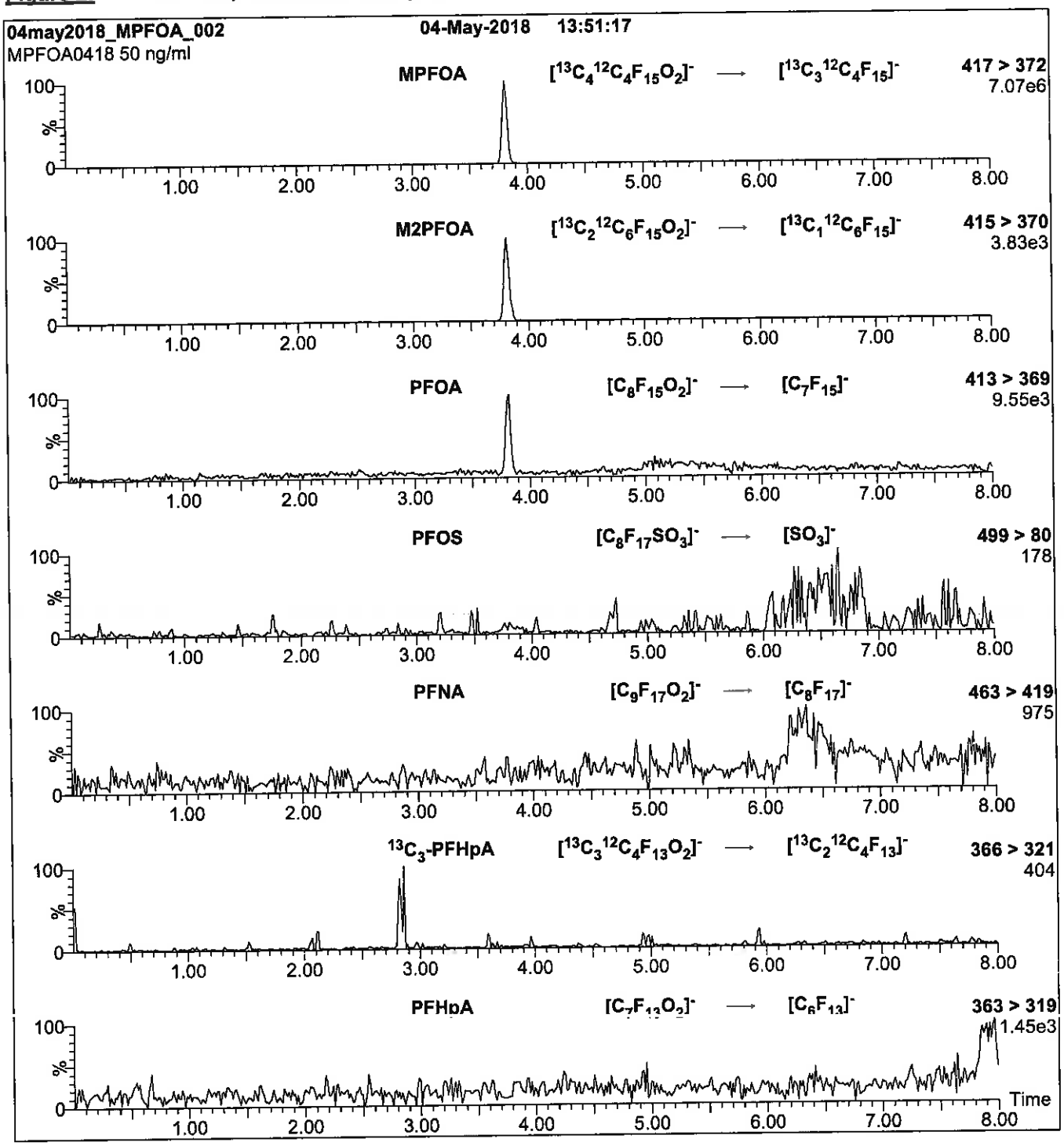
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFOA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 8

Reagent

LCMPFOA_00020

1287275
ID: LCMPFOA_00020
Exp:05/04/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorooctanoic ac

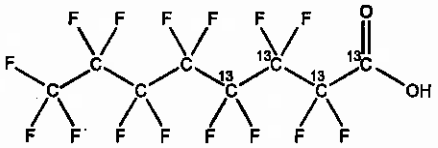
R: CBW 6/26/18

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOA
LOT NUMBER: MPFOA0418
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

STRUCTURE:
CAS #: 960315-48-4



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MOLECULAR WEIGHT: 418.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 05/04/2018
EXPIRY DATE: (mm/dd/yyyy) 05/04/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/13/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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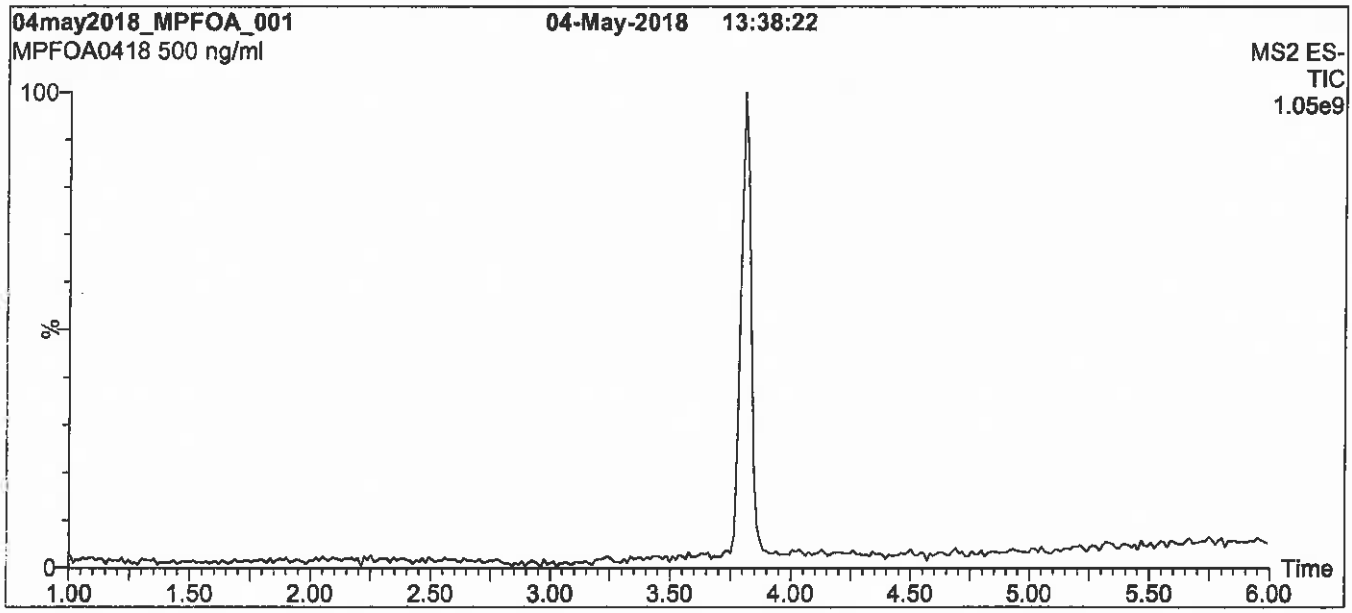

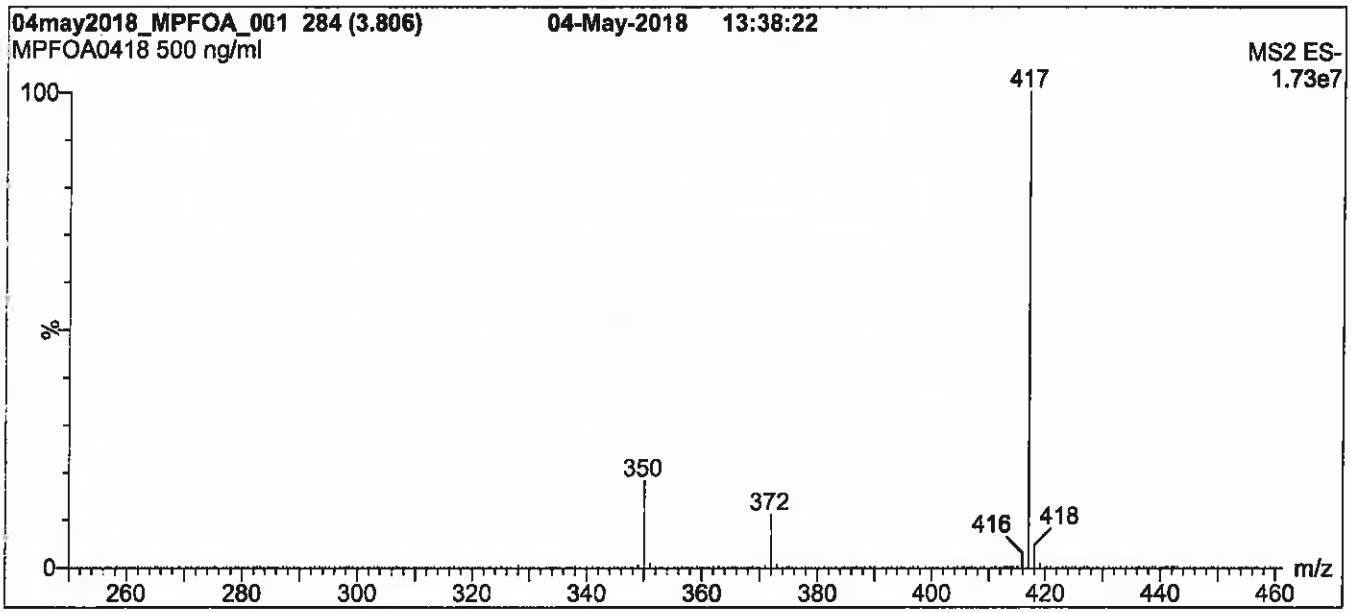

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Ramp to 80% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
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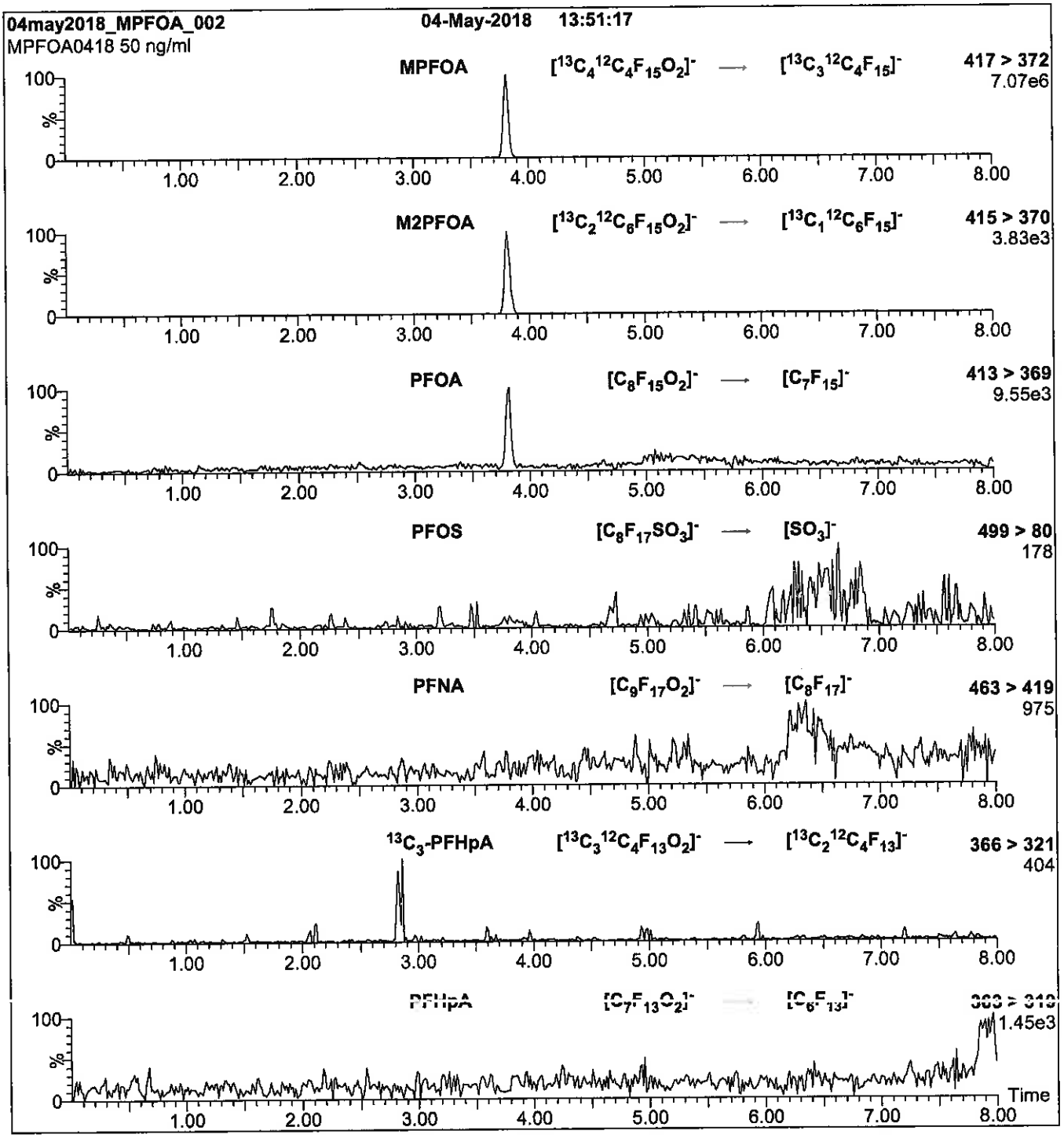
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFOA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 8

Reagent

LCMPFOS_00027

1263174
ID: LCMPFOS_00027
Exp:02/15/23 Prpd:CBW Opn:05/30/18
13C4-Perfluorooctanesulfo

K: 5/30/18 CBW

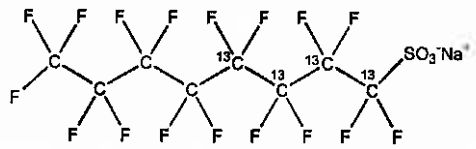
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0218

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 526.08

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 02/15/2018

EXPIRY DATE: (mm/dd/yyyy) 02/15/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.6% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

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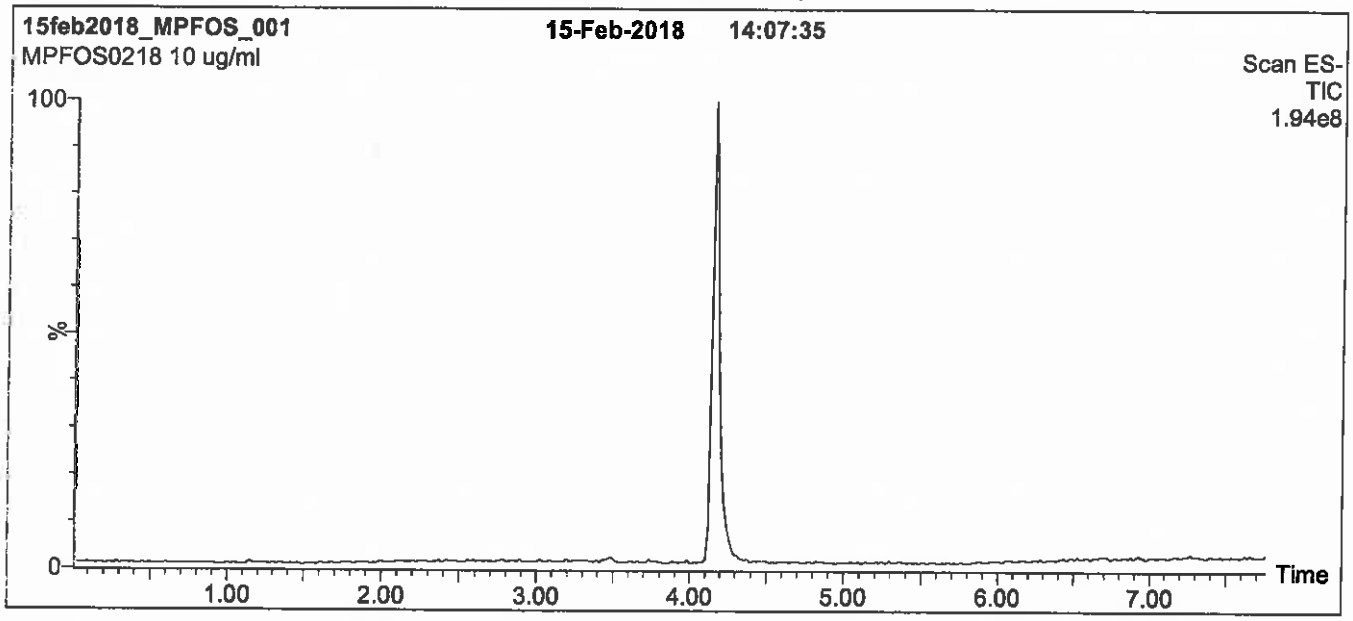
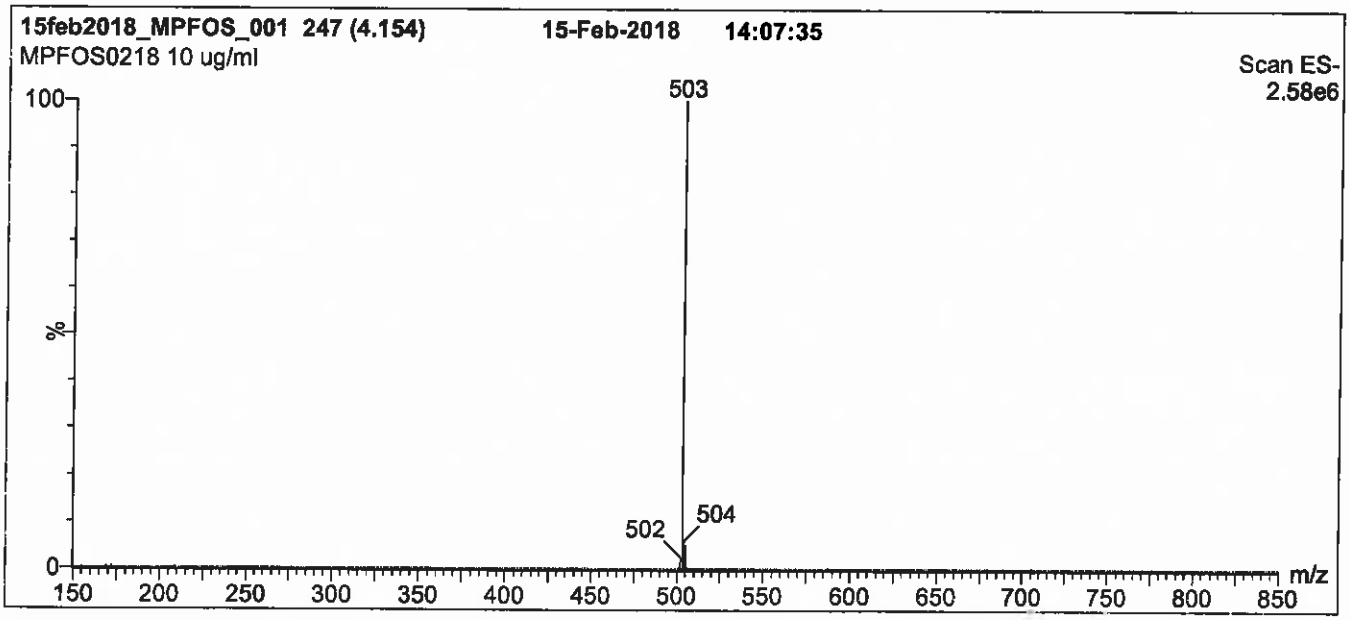
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

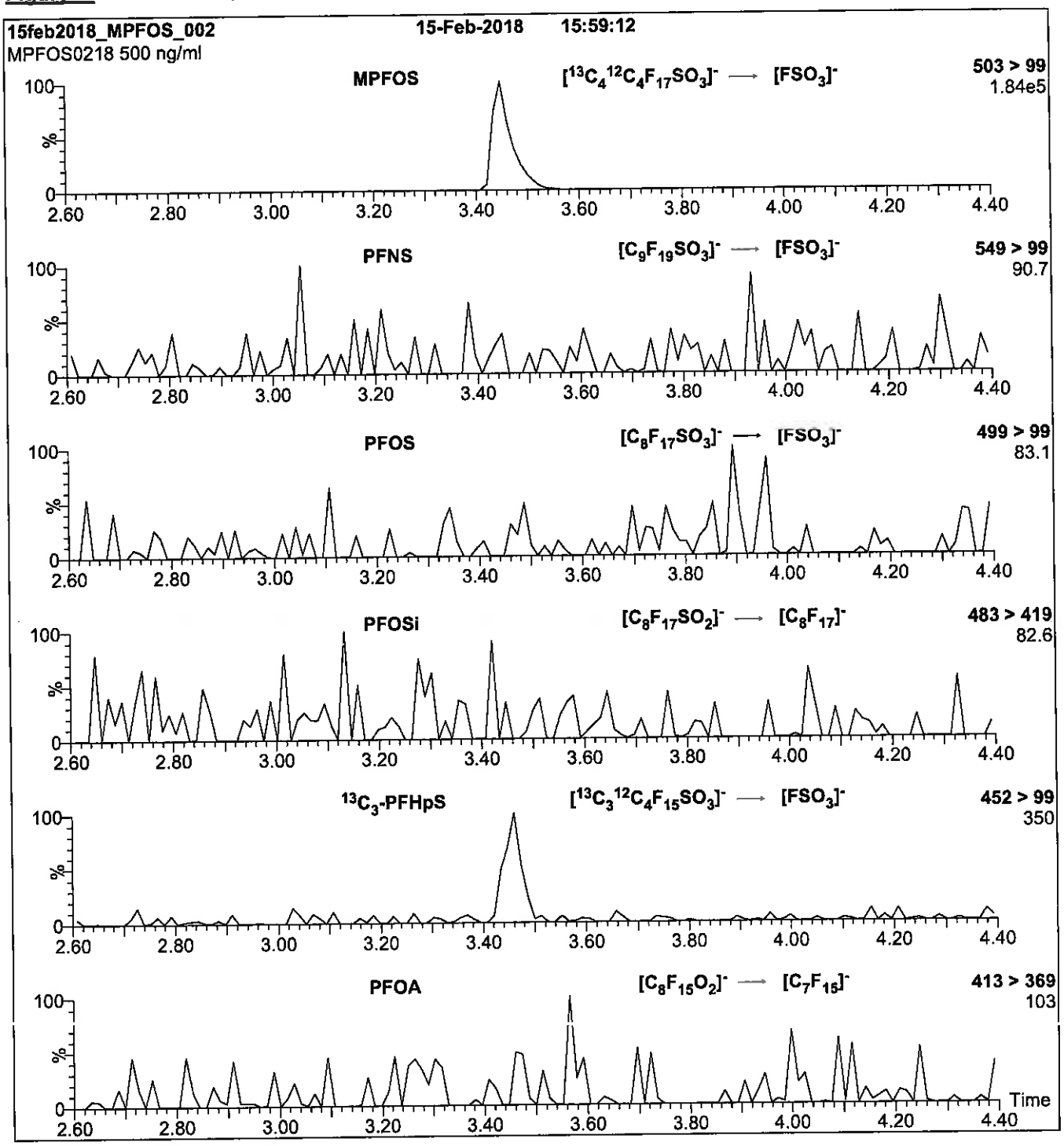
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00028

1287343
ID: LCMPFOS_00028
Exp:06/15/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorooctanesulfo

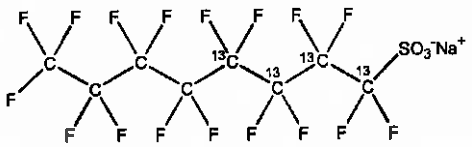
R=6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS
LOT NUMBER: MPFOS0618
COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4F_{17}SO_3Na$
MOLECULAR WEIGHT: 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.8 ± 2.4 µg/ml (MPFOS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 06/15/2018
EXPIRY DATE: (mm/dd/yyyy) 06/15/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/18/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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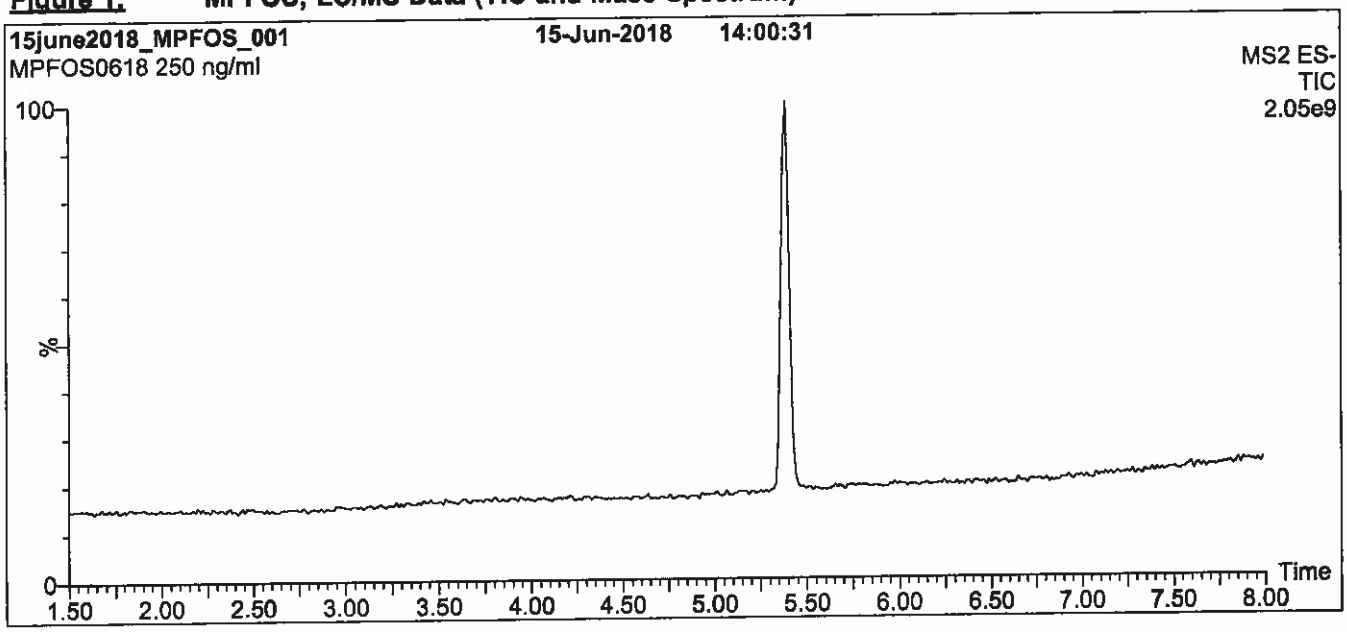
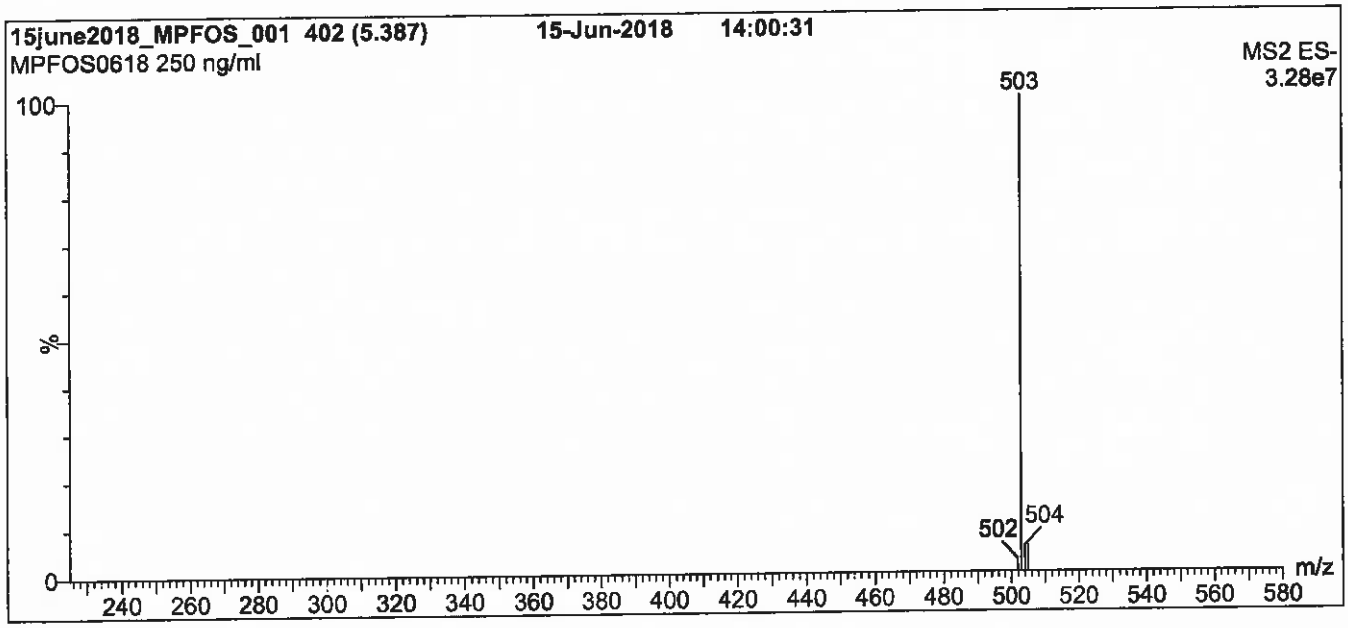
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

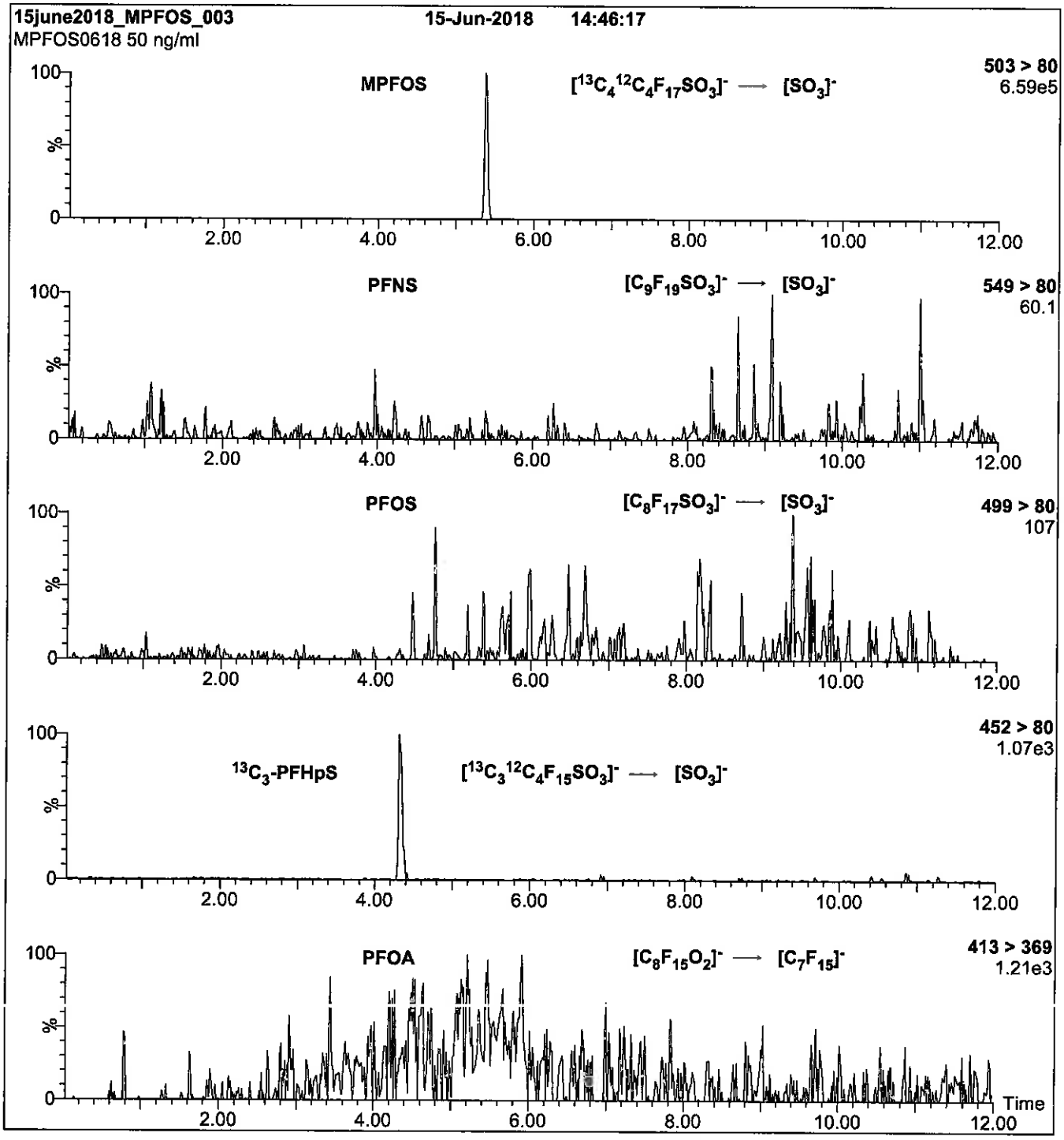
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFOS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.41e-3
Collision Energy (eV) = 42

Reagent

LCMPFUdA_00017

R: 5/30/18 CBW

1263162
ID: LCMPFUdA_00017
Exp:11/22/21 Prpd:CBW Opn:05/30/18
13C2-Perfluoroundecanoic

WELLINGTON LABORATORIES

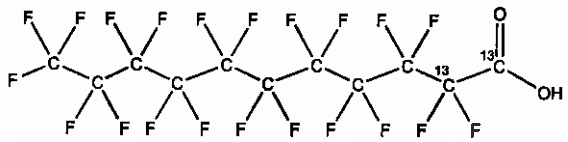
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

LOT NUMBER: MPFUdA1116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_9HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/07/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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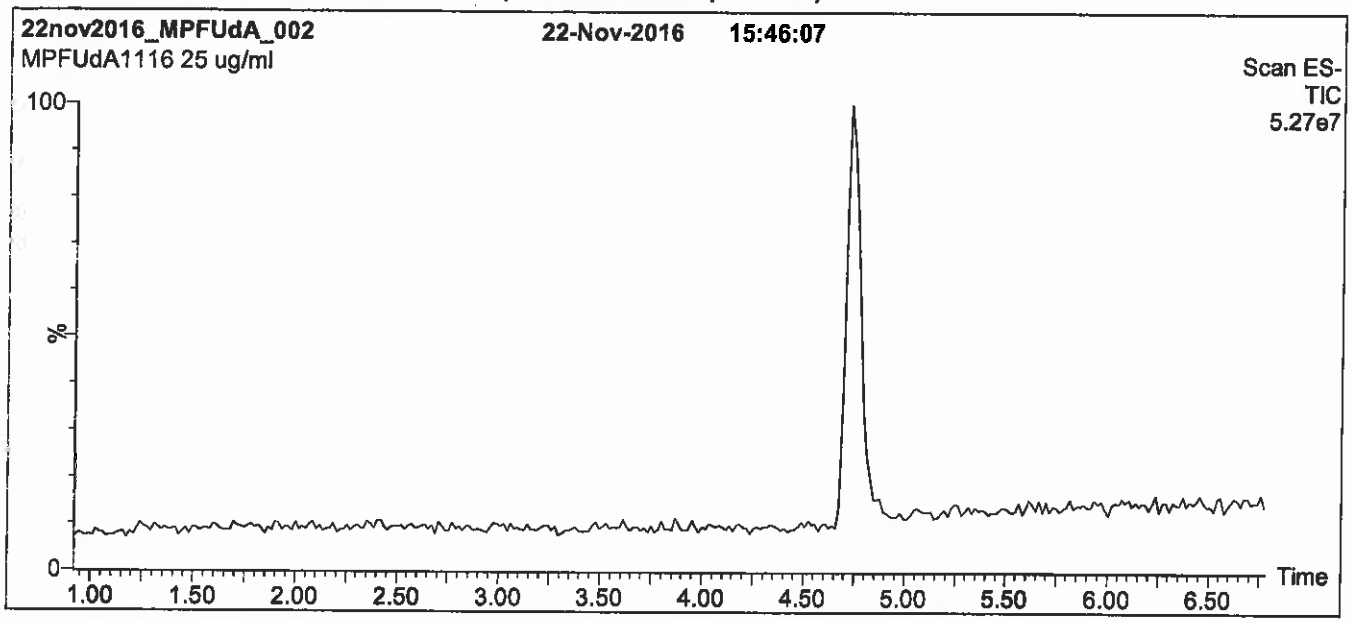
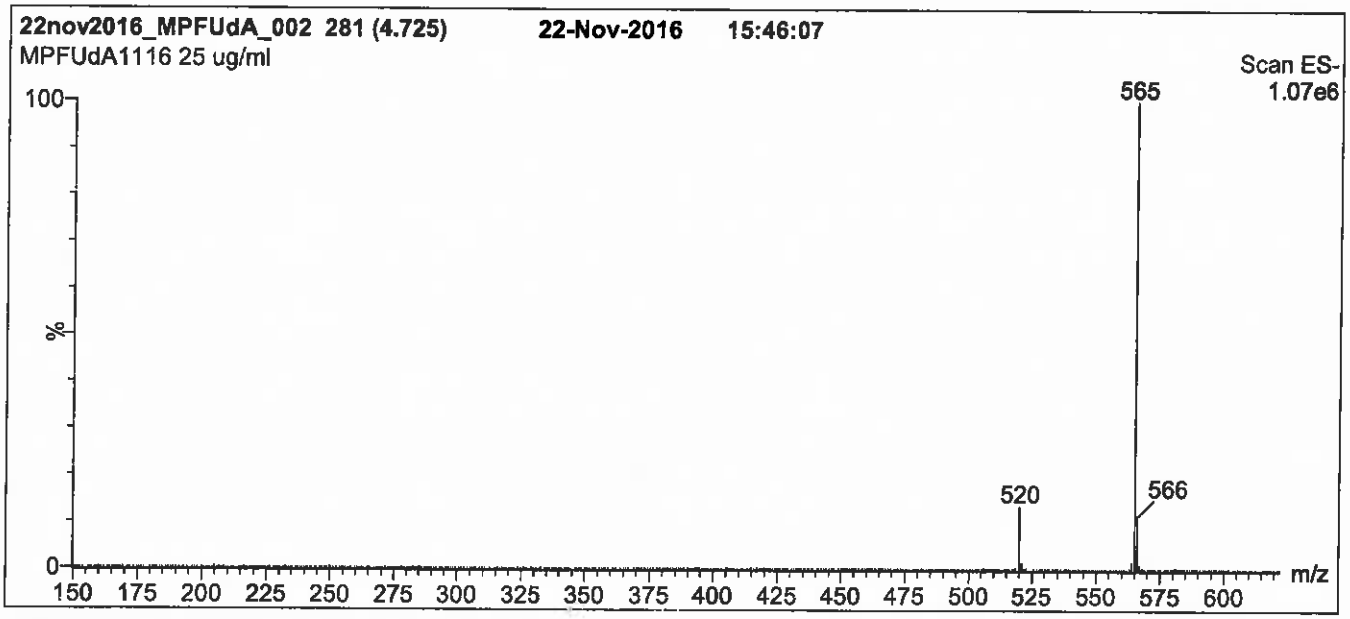
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

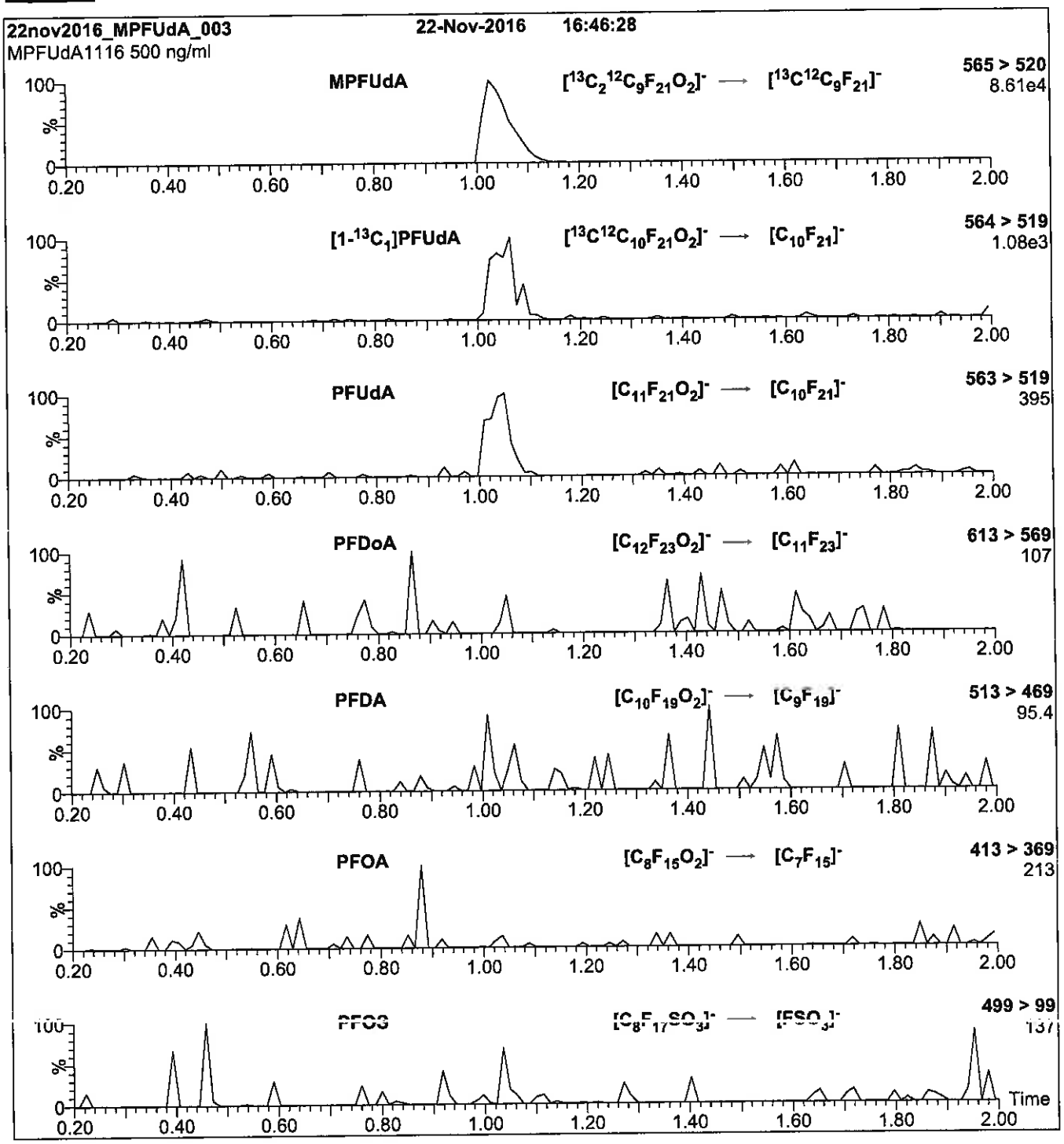
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFUdA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCMPFUdA_00018

1287321
ID: LCMPFUdA_00018
Exp:05/11/23 Prpd:CBW Opn:06/26/18
13C2-Perfluoroundecanoic

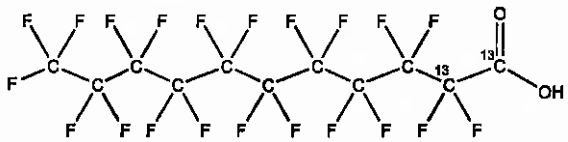
R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
LOT NUMBER: MPFUdA0518
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_9HF_{21}O_2$
MOLECULAR WEIGHT: 566.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 05/11/2018
EXPIRY DATE: (mm/dd/yyyy) 05/11/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim, General Manager **Date:** 05/25/2018 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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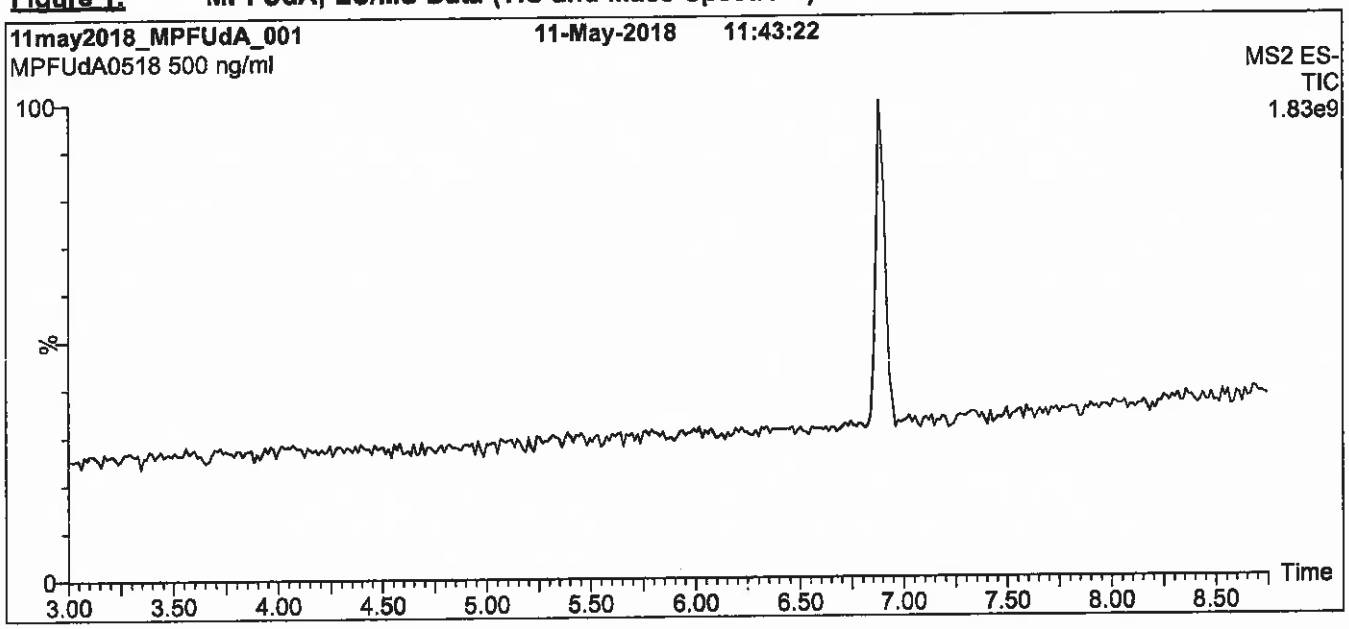
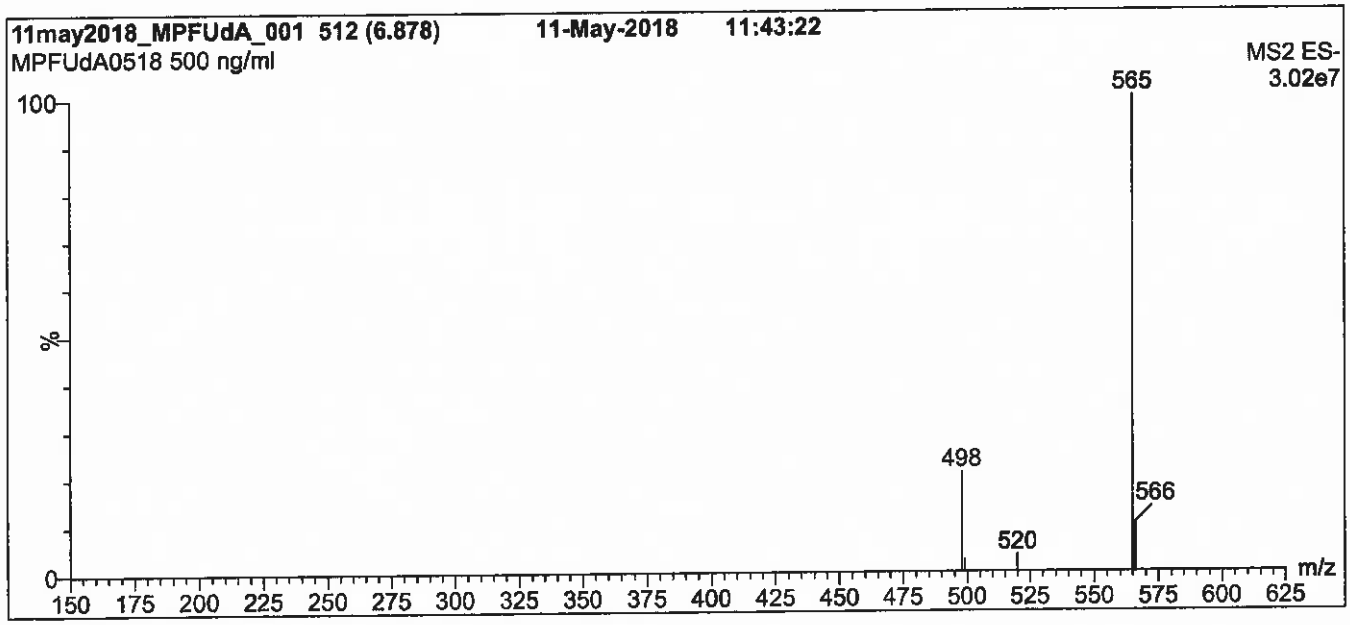
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

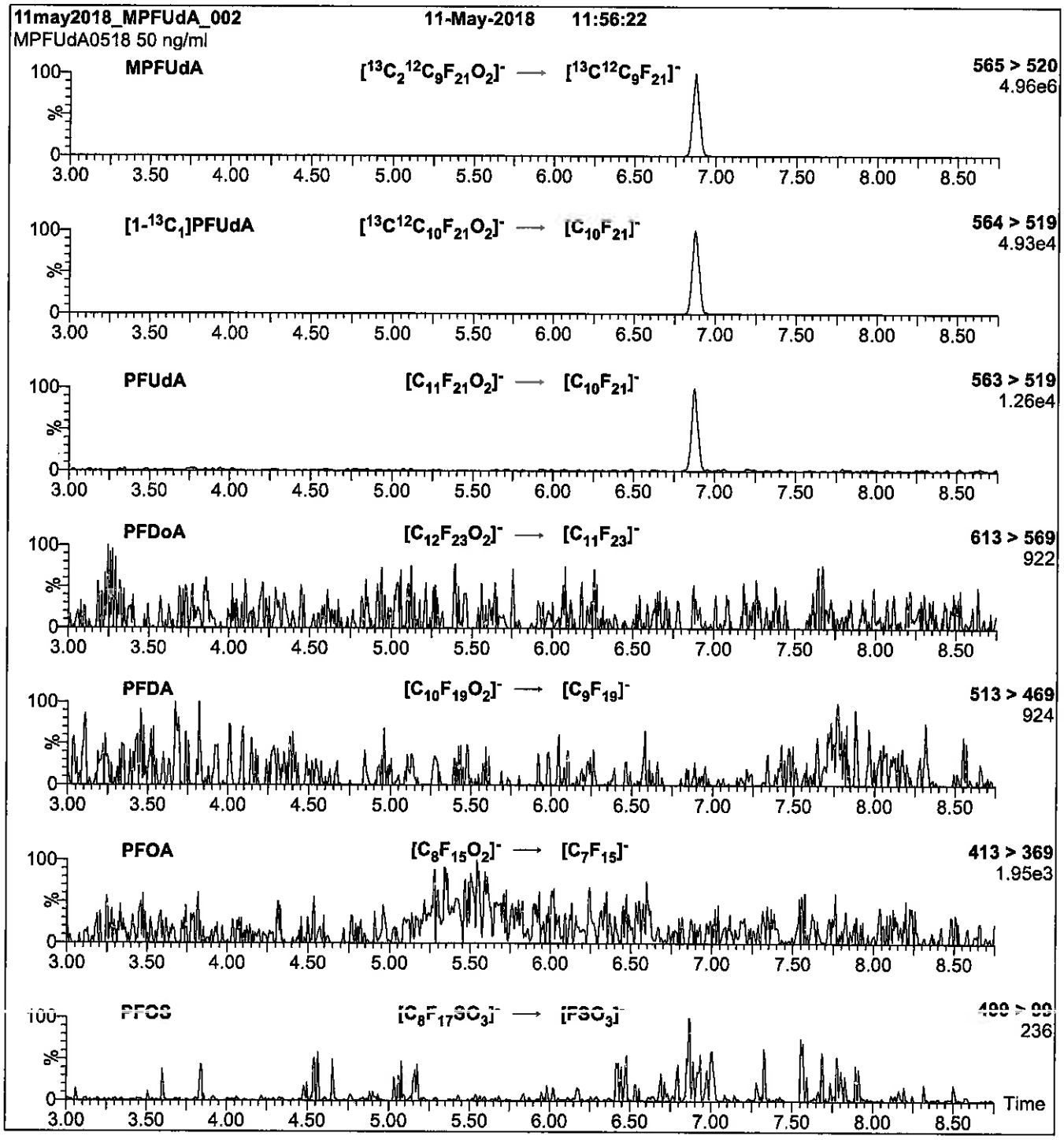
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFUdA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.51e-3
Collision Energy (eV) = 12

Reagent

LCPFAC-24PAR_00002

1310191
ID: LCPFAC-24PAR_00002
Exp:04/18/23 Prpd:TTP Opn:07/24/18
PFAC/PFAS Mix

Rec: 7/24/18 TP
Open: 7/24/18 TP
Exp: 4/18/23

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-24PAR

Native Per- and Poly-fluoroalkyl Substance Precision and Recovery Standard Solution

PRODUCT CODE:	PFAC-24PAR
LOT NUMBER:	PFAC24PAR0418
SOLVENT(S):	Methanol / Isopropanol (4%) / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	04/09/2018
LAST TESTED: (mm/dd/yyyy)	04/18/2018
EXPIRY DATE: (mm/dd/yyyy)	04/18/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

PFAC-24PAR is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C_4-C_{14}), seven native perfluoroalkylsulfonates (C_4, C_5, C_7, C_9, and C_{10} linear; C_6 and C_8 linear and branched), three native telomer sulfonates (4:2, 6:2, and 8:2), two native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide. The components and their concentrations are given in Table A.

The individual native perfluoroalkylcarboxylic acids, native perfluoroalkylsulfonates, native telomer sulfonates, native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of PFHxSK
Table C: Isomeric Components and Percent Composition of PFOSK
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: **PFAC-24PAR; Components and Concentrations (ng/ml, ± 5% in Methanol / Isopropanol (4%) / Water (<1%))**

Compound	Abbreviation	Concentration *** (ng/ml)	Peak Assignment in Figure 1
Perfluoro-n-butanoic acid	PFBA	2000	A
Perfluoro-n-pentanoic acid	PFPeA	2000	B
Perfluoro-n-hexanoic acid	PFHxA	2000	E
Perfluoro-n-heptanoic acid	PFHpA	2000	G
Perfluoro-n-octanoic acid	PFOA	2000	K
Perfluoro-n-nonanoic acid	PFNA	2000	M
Perfluoro-n-decanoic acid	PFDA	2000	Q
Perfluoro-n-undecanoic acid	PFUdA	2000	V
Perfluoro-n-dodecanoic acid	PFDoA	2000	X
Perfluoro-n-tridecanoic acid	PFTrDA	2000	Y
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	Z
Perfluoro-1-octanesulfonamide	FOSA	2000	T
N-methylperfluoro-1-octanesulfonamidoacetic acid	N-MeFOSAA	2000	S
N-ethylperfluoro-1-octanesulfonamidoacetic acid	N-EtFOSAA	2000	U

Compound	Abbreviation	Concentration *** (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000	1880	F
Potassium perfluorohexanesulfonate*	PFHxSK: linear isomer	1620	1480	I
	PFHxSK: ∑ branched isomers	378	344	H
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000	1900	L
Potassium perfluorooctanesulfonate**	PFOSK: linear isomer	1580	1460	O
	PFOSK: ∑ branched isomers	422	391	N
Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000	1920	R
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	W
Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate	4:2FTS	2000	1870	D
Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate	6:2FTS	2000	1900	J
Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate	8:2FTS	2000	1920	P

* See Table B for percent composition of linear and branched PFHxSK isomers.
** See Table C for percent composition of linear and branched PFOSK isomers.
*** Concentrations have been rounded to three significant figures.

Table B: **PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR	
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9	18.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0	
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9	
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2	
7	Other Unidentified Isomers		0.5	

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

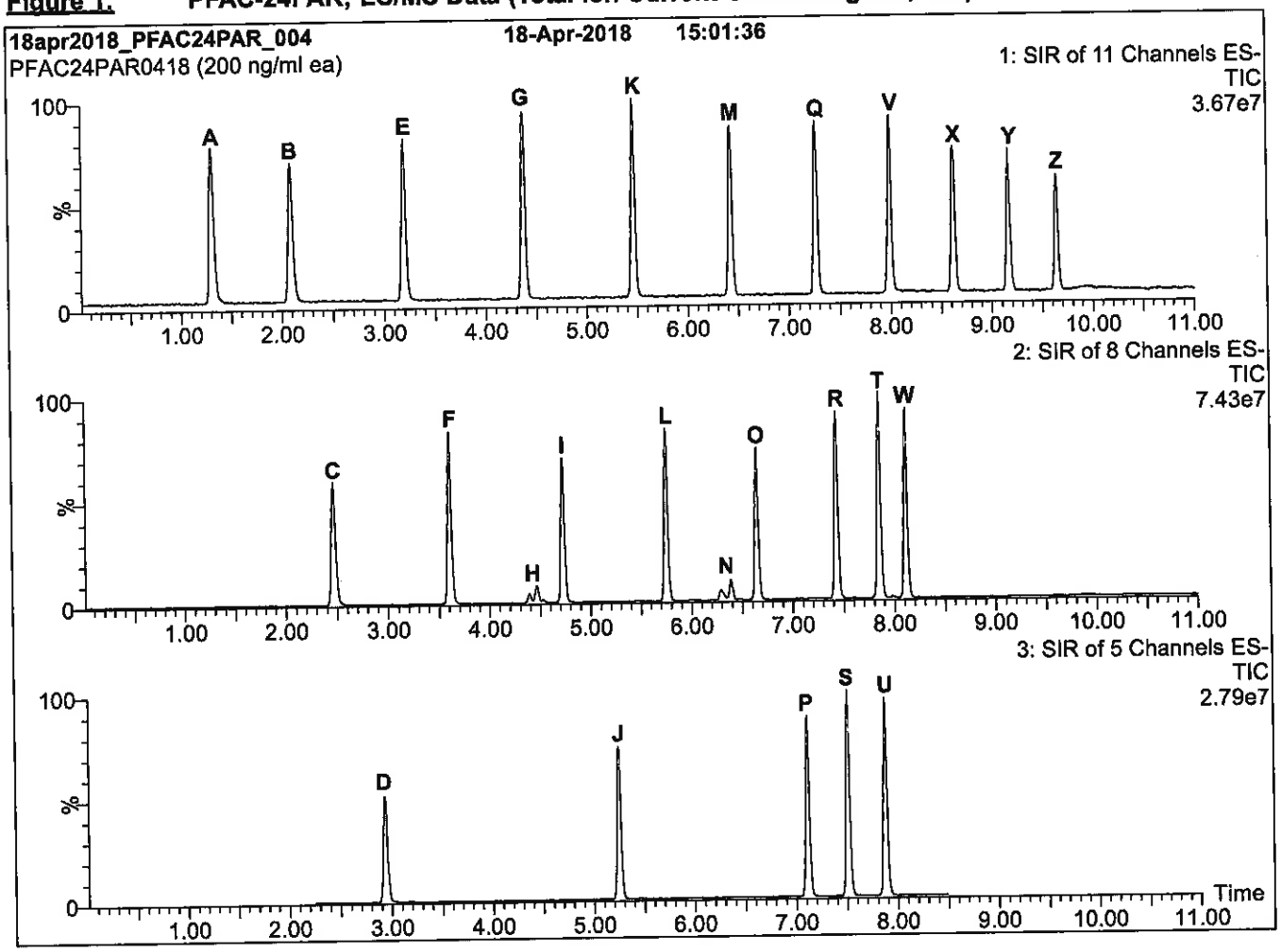
Table C: **PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR	
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2	21.1
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6	
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9	
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2	
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5	
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0	
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2	
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.03	
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.4	
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07	

* Percent of total perfluorooctanesulfonate isomers only.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 04/24/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Figure 1: **PFAC-24PAR; LC/MS Data (Total Ion Current Chromatogram; SIR)**



Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 10 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 15 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = variable (2-38)
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**

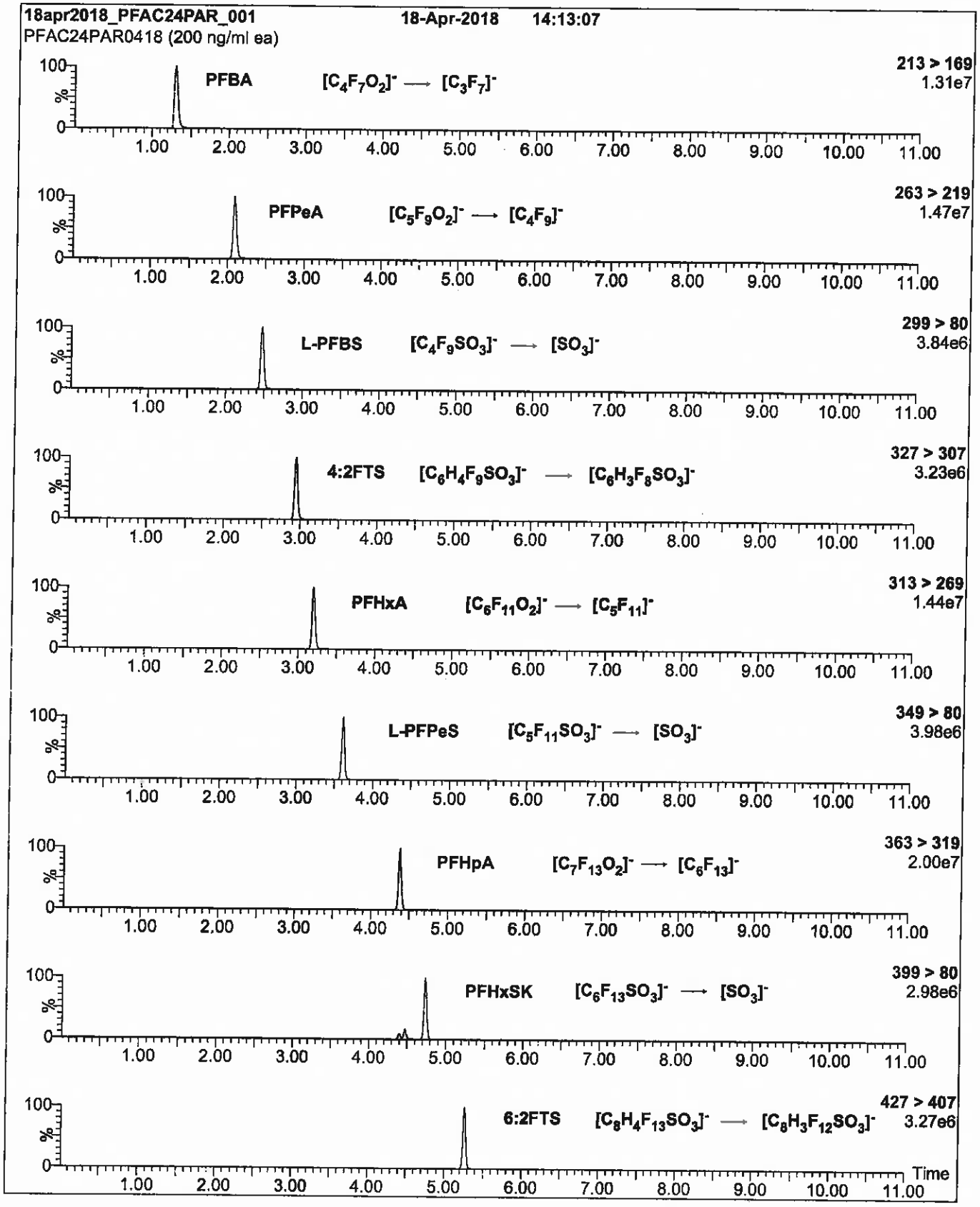


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**

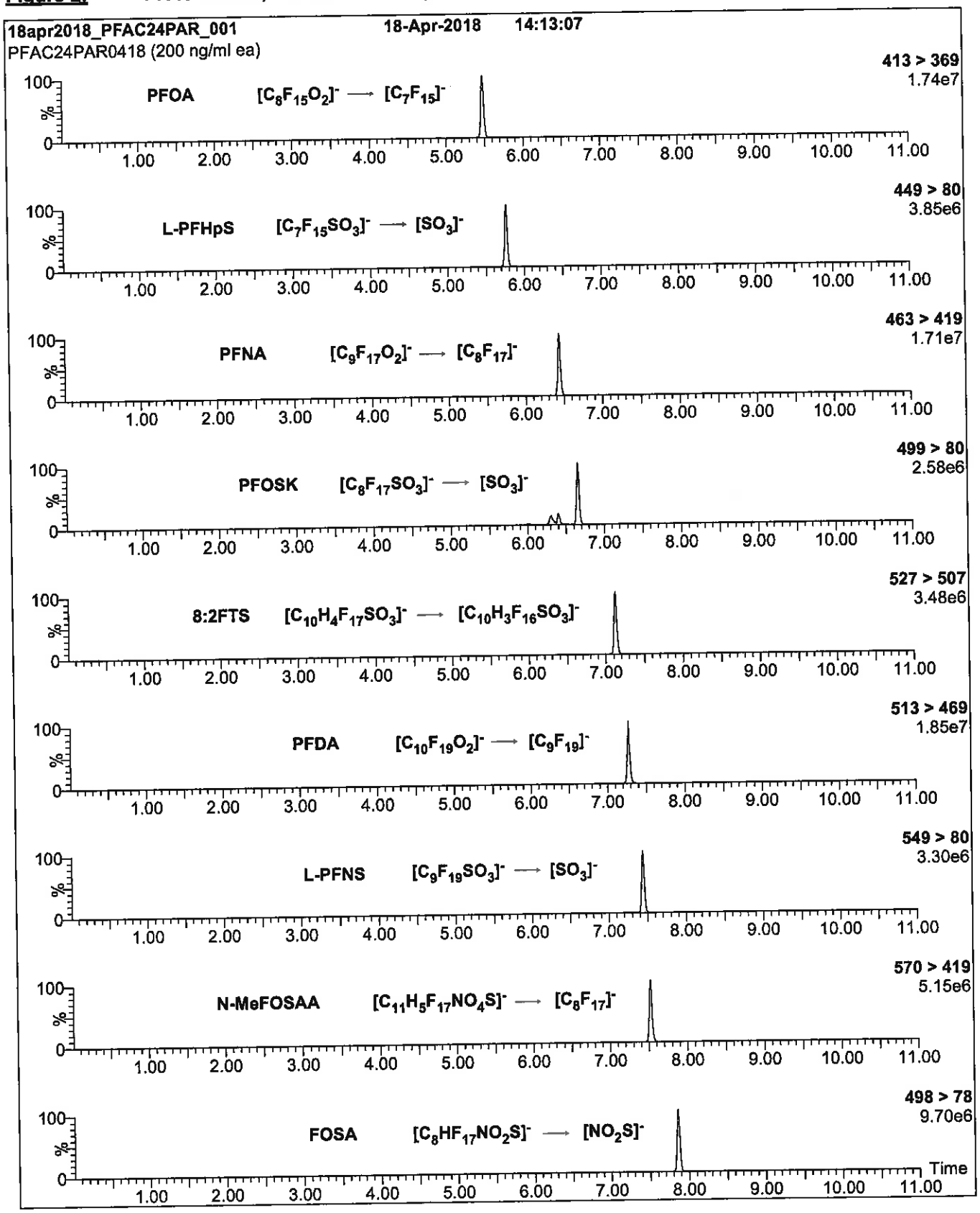
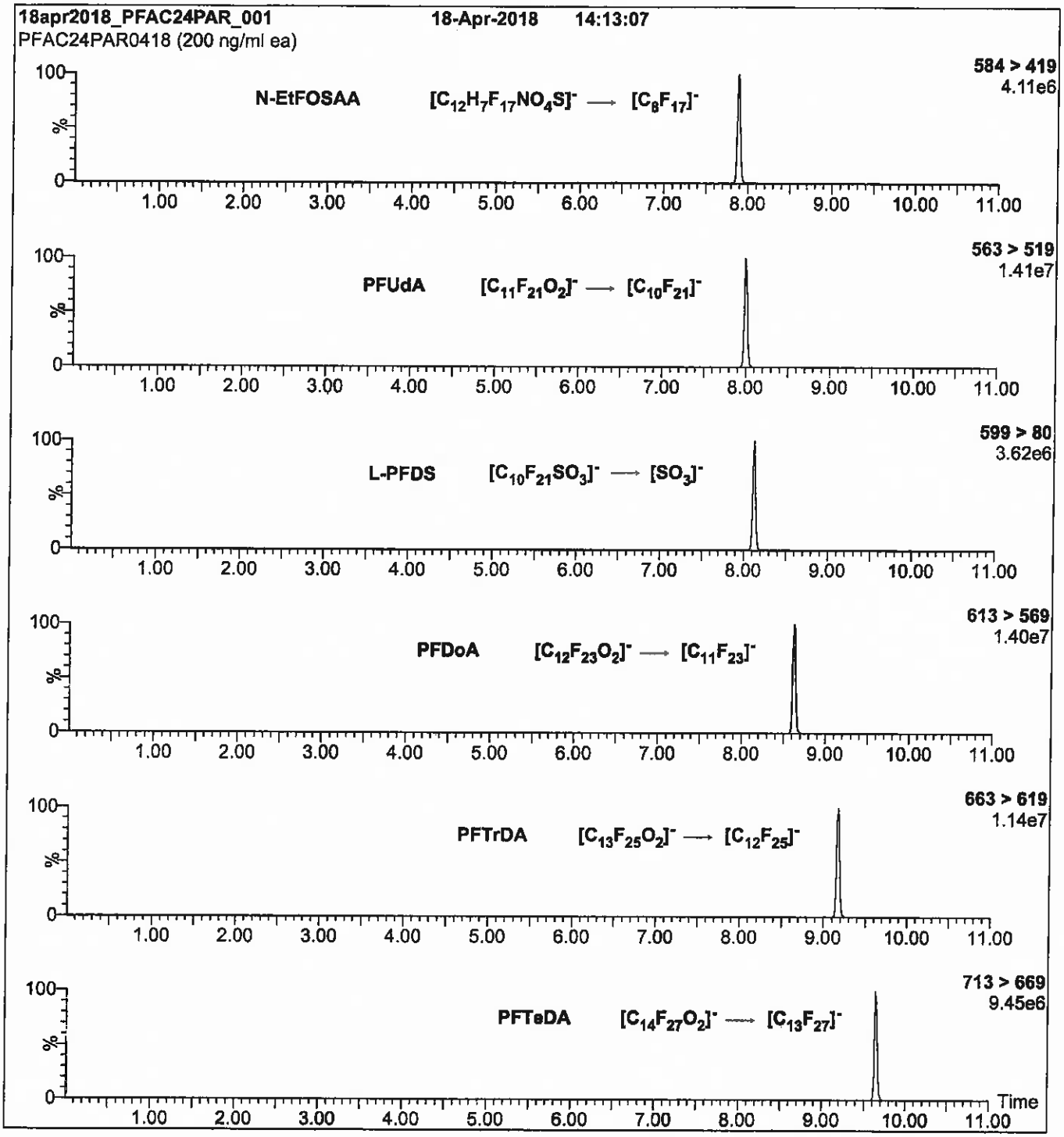


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFAC-24PAR)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.47e-3

Collision Energy (eV) = 8-64 (variable)

Reagent

LCPFBA_00008

P: 9/21/17 SKV

WELLINGTON LABORATORIES

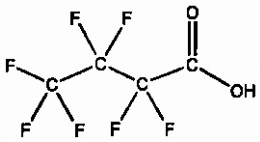
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid

LOT NUMBER: PFBA0517

STRUCTURE:

CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 214.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

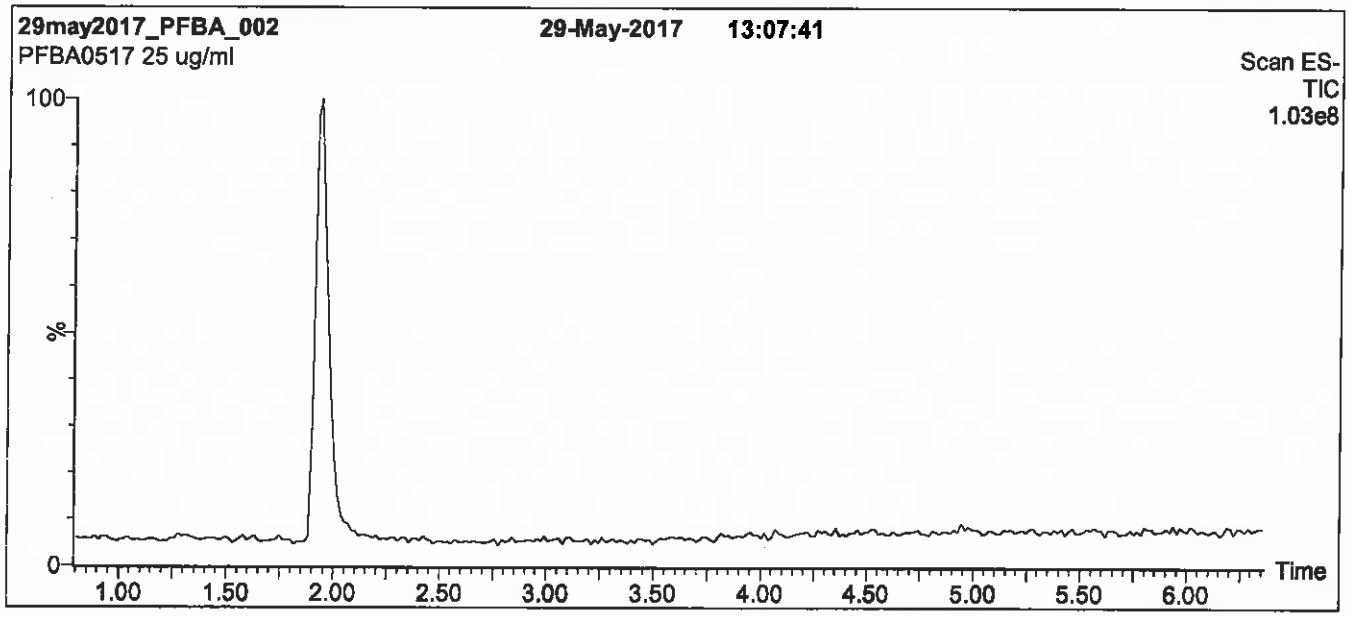
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

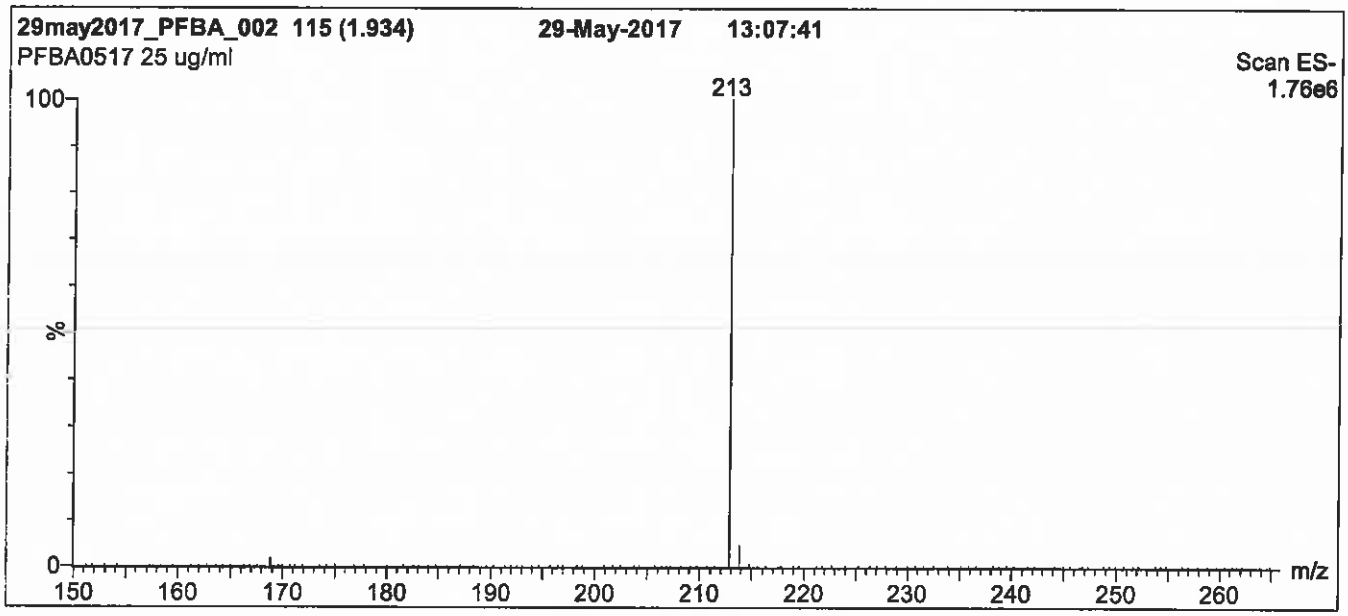
CALA

ANAB ACCREDITED SUPPLIER OF REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

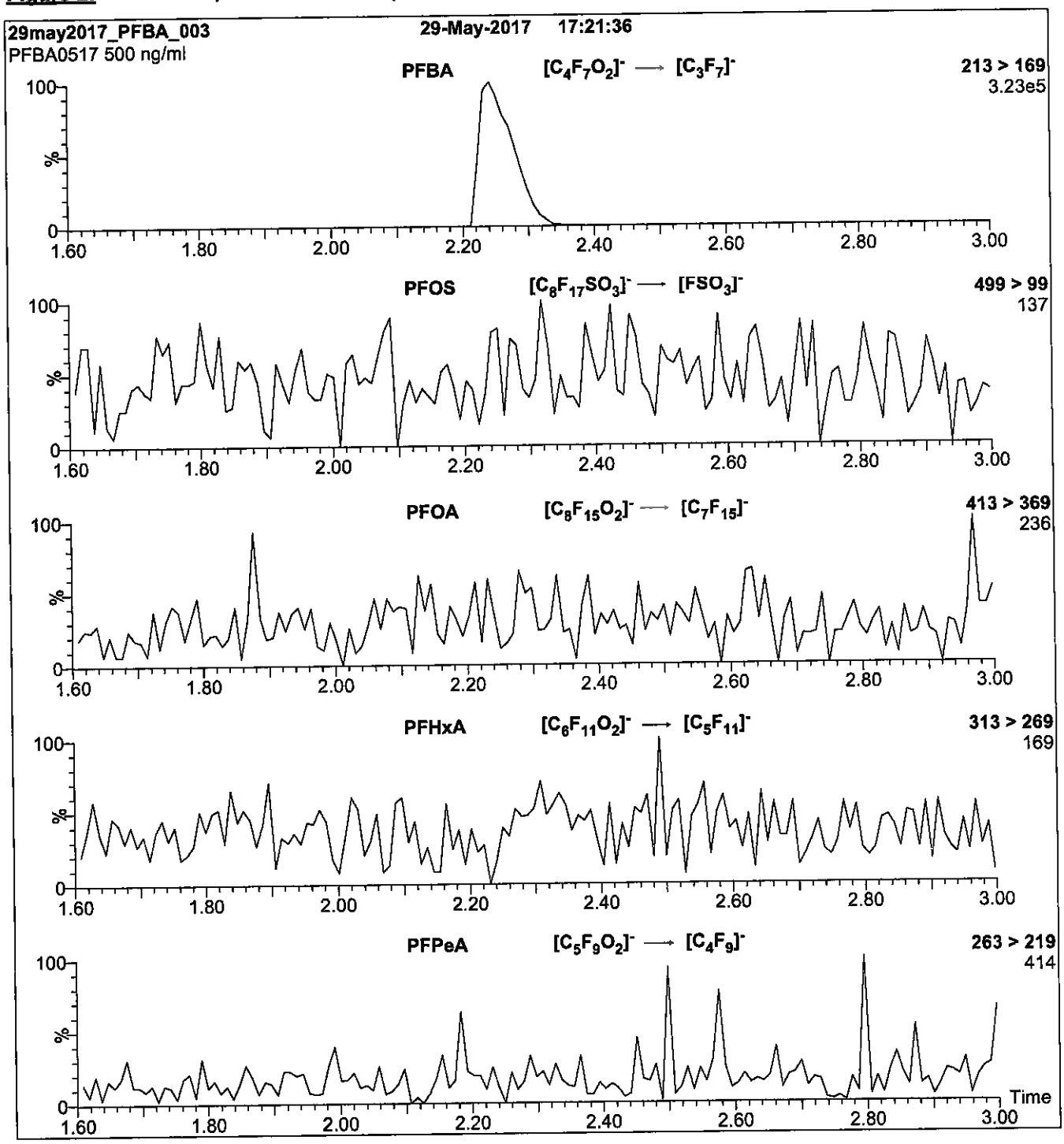
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00009

D: 2/16/18 SW

WELLINGTON LABORATORIES

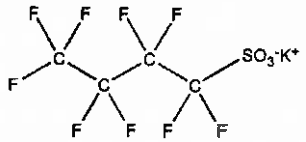
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
COMPOUND: Potassium perfluoro-1-butanesulfonate

LOT NUMBER: LPFBS0917

STRUCTURE:

CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/21/2017
EXPIRY DATE: (mm/dd/yyyy) 09/21/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 338.19
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED

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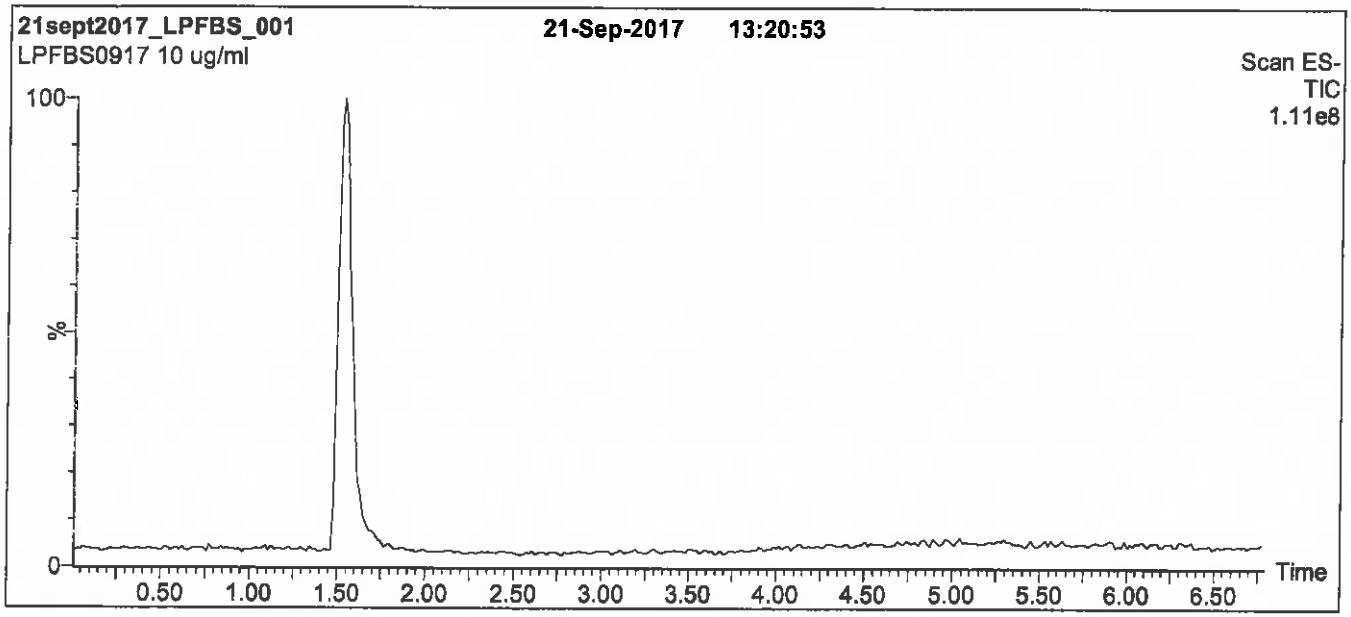
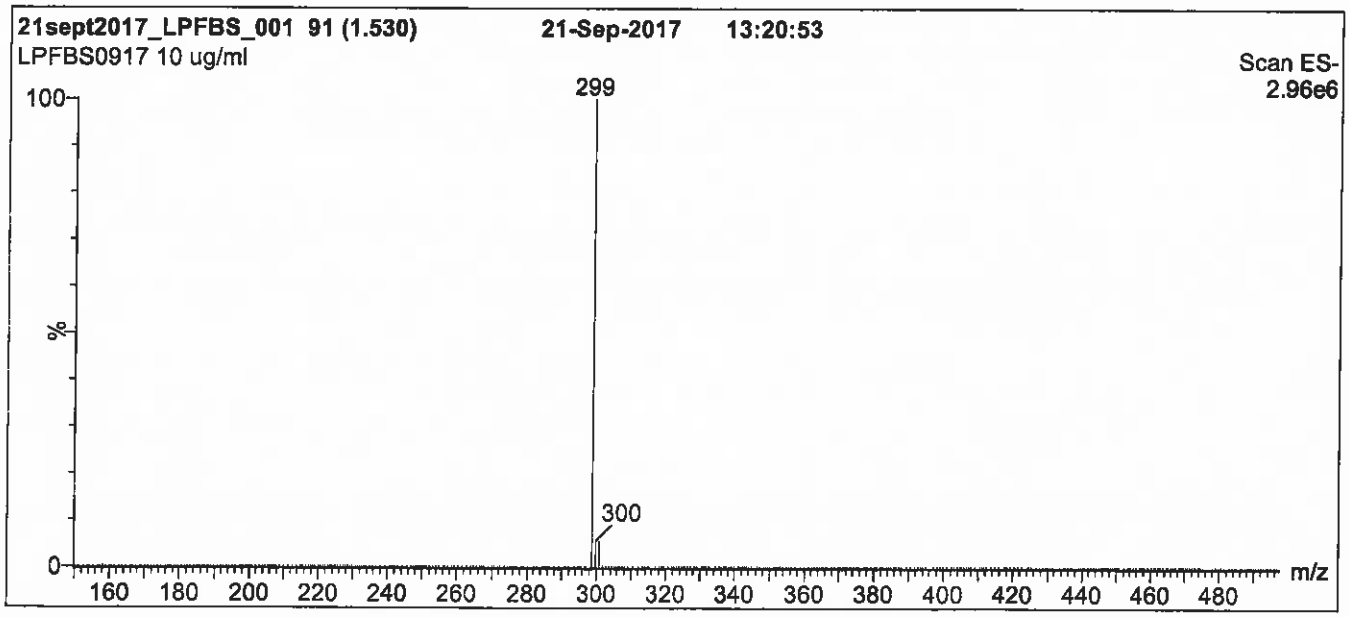
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

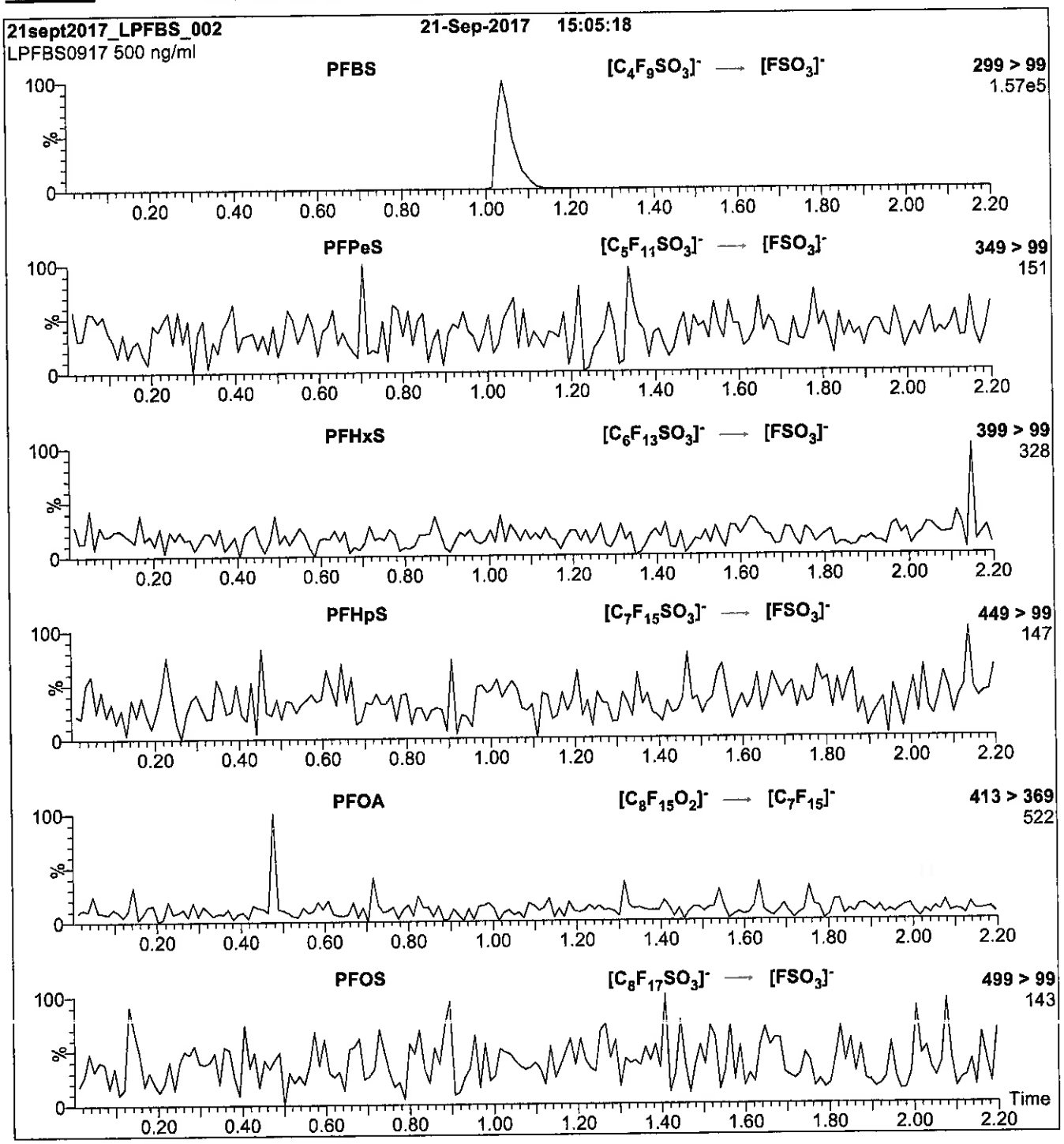
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00008

n: 9/21/17 SKV

WELLINGTON LABORATORIES

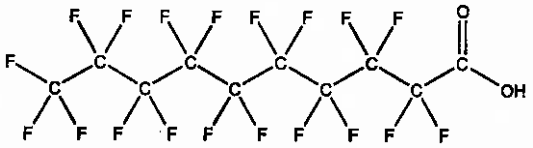
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid

LOT NUMBER: PFDA0517

STRUCTURE:

CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 514.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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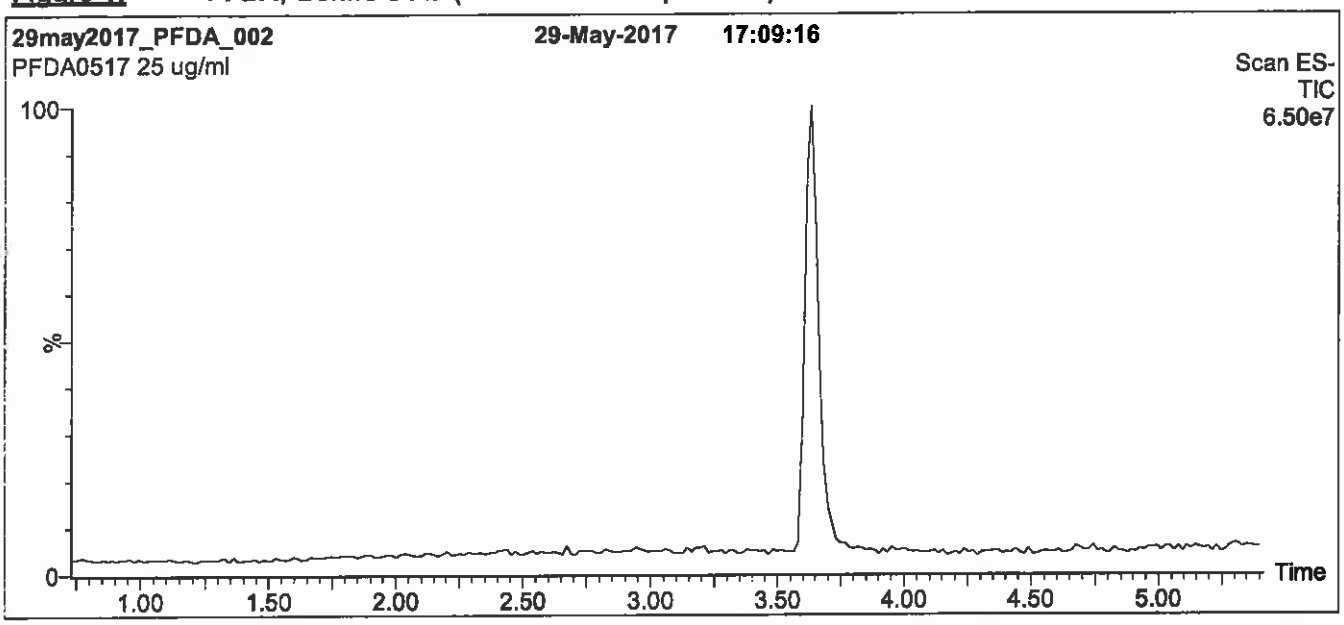
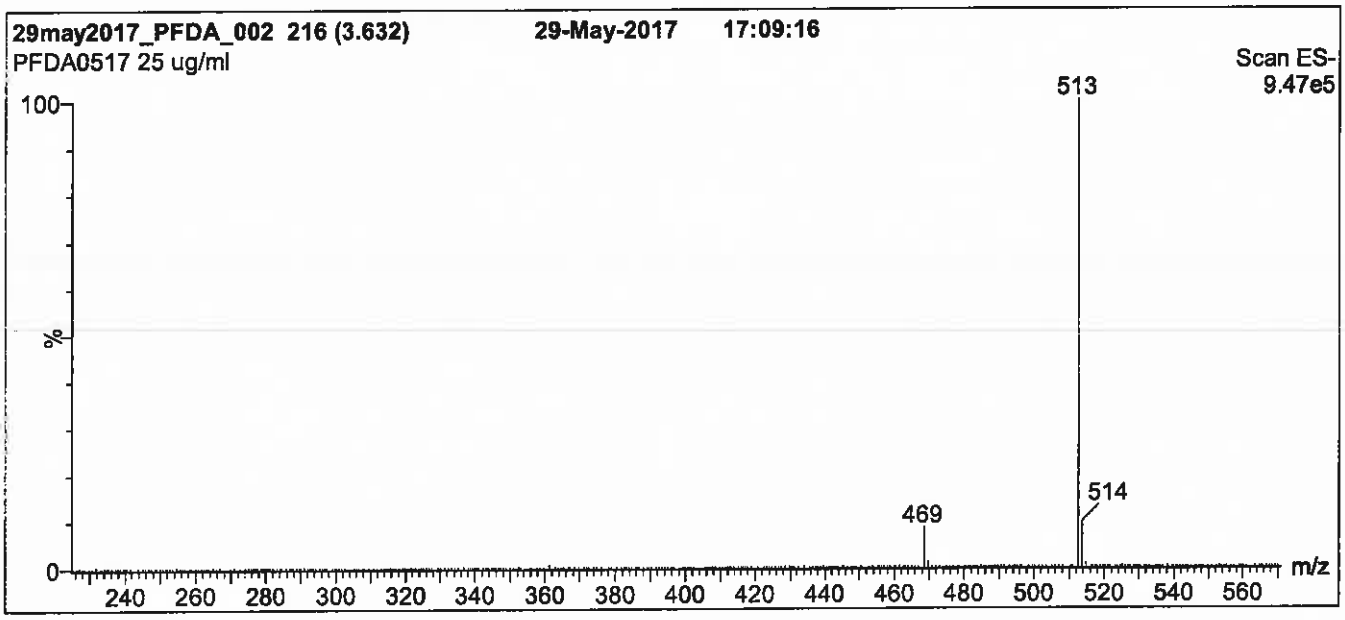




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

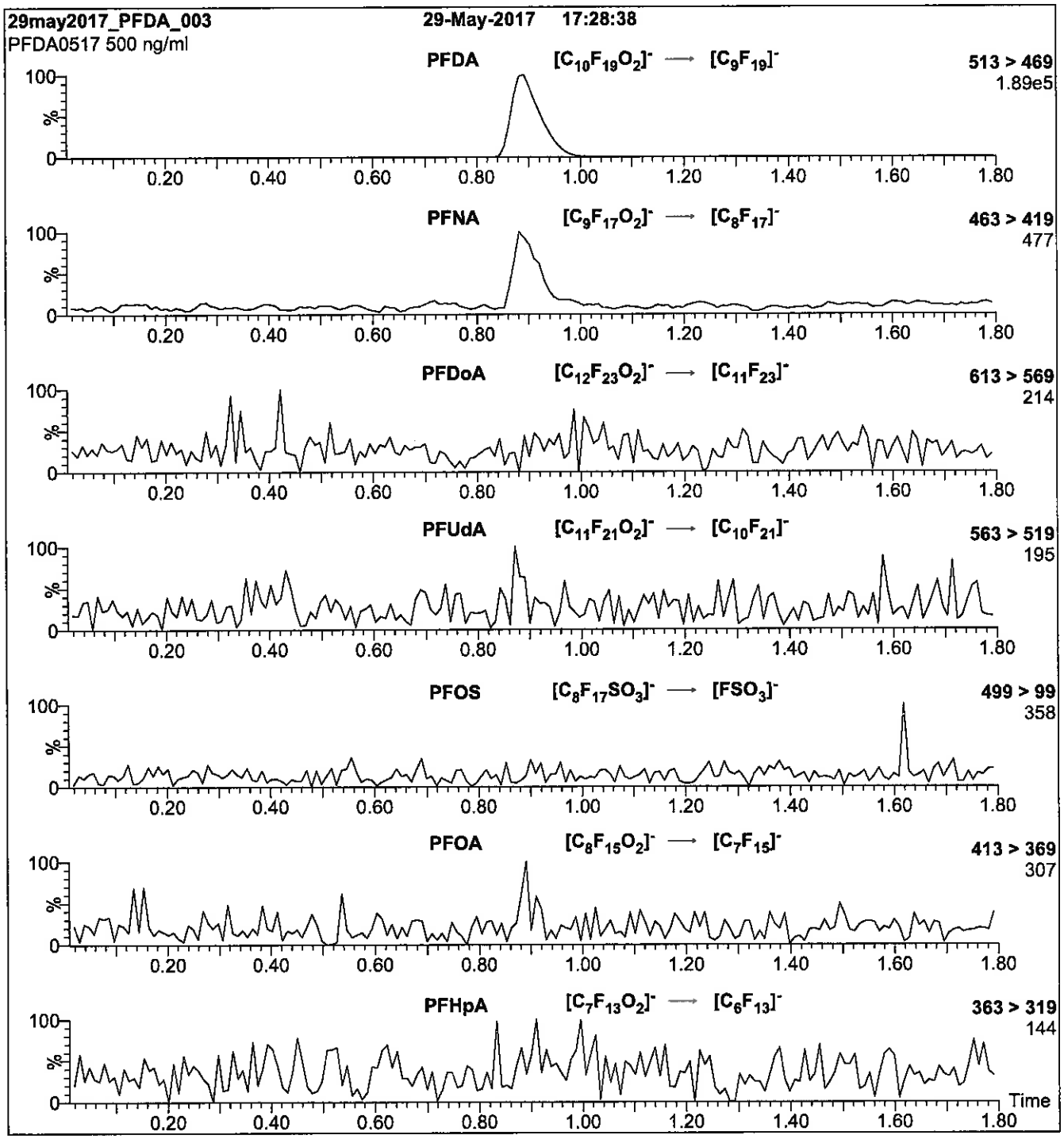
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00008

r: 10/20/17 SKV

WELLINGTON LABORATORIES

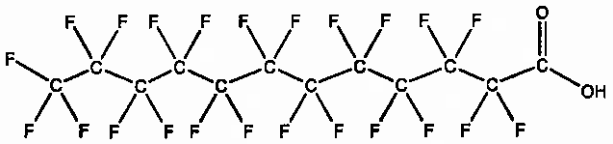
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDoA
COMPOUND: Perfluoro-n-dodecanoic acid

LOT NUMBER: PFDoA0517

STRUCTURE:

CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 614.10
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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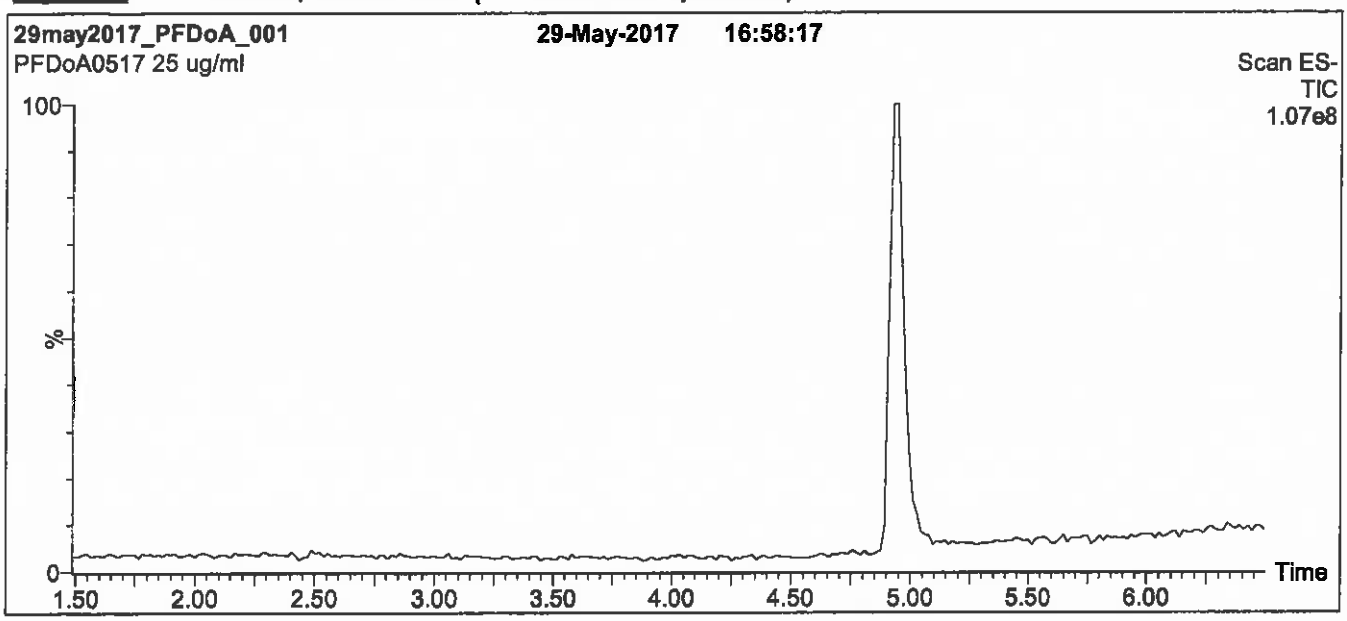
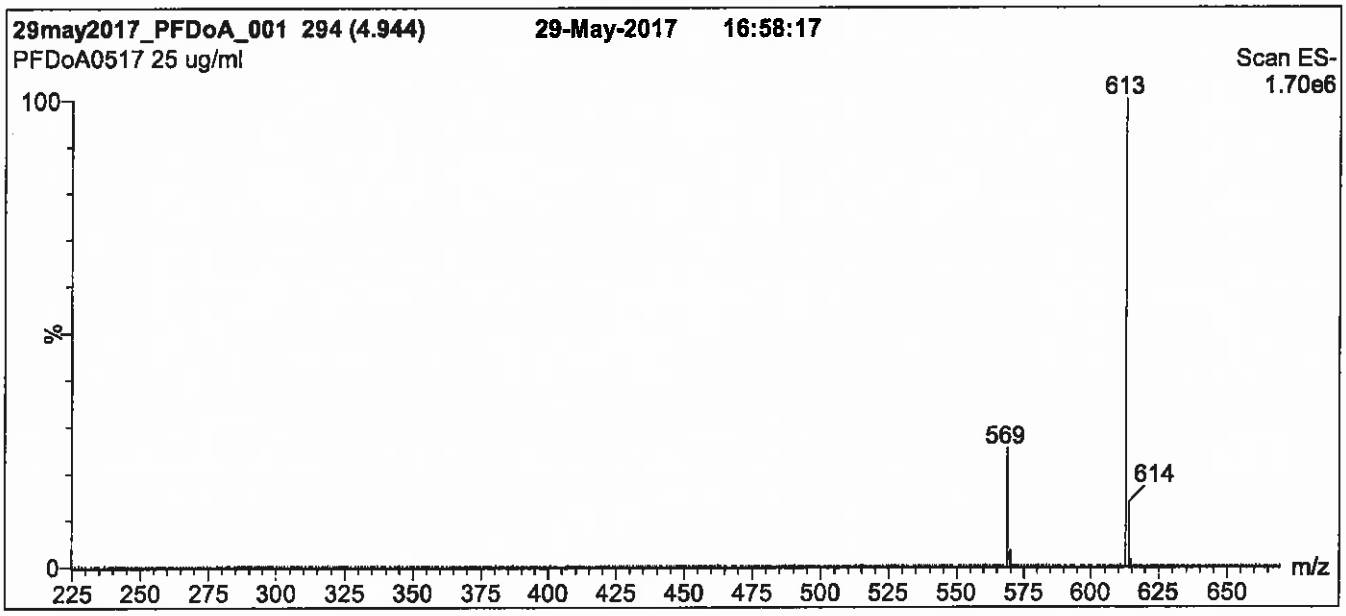
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

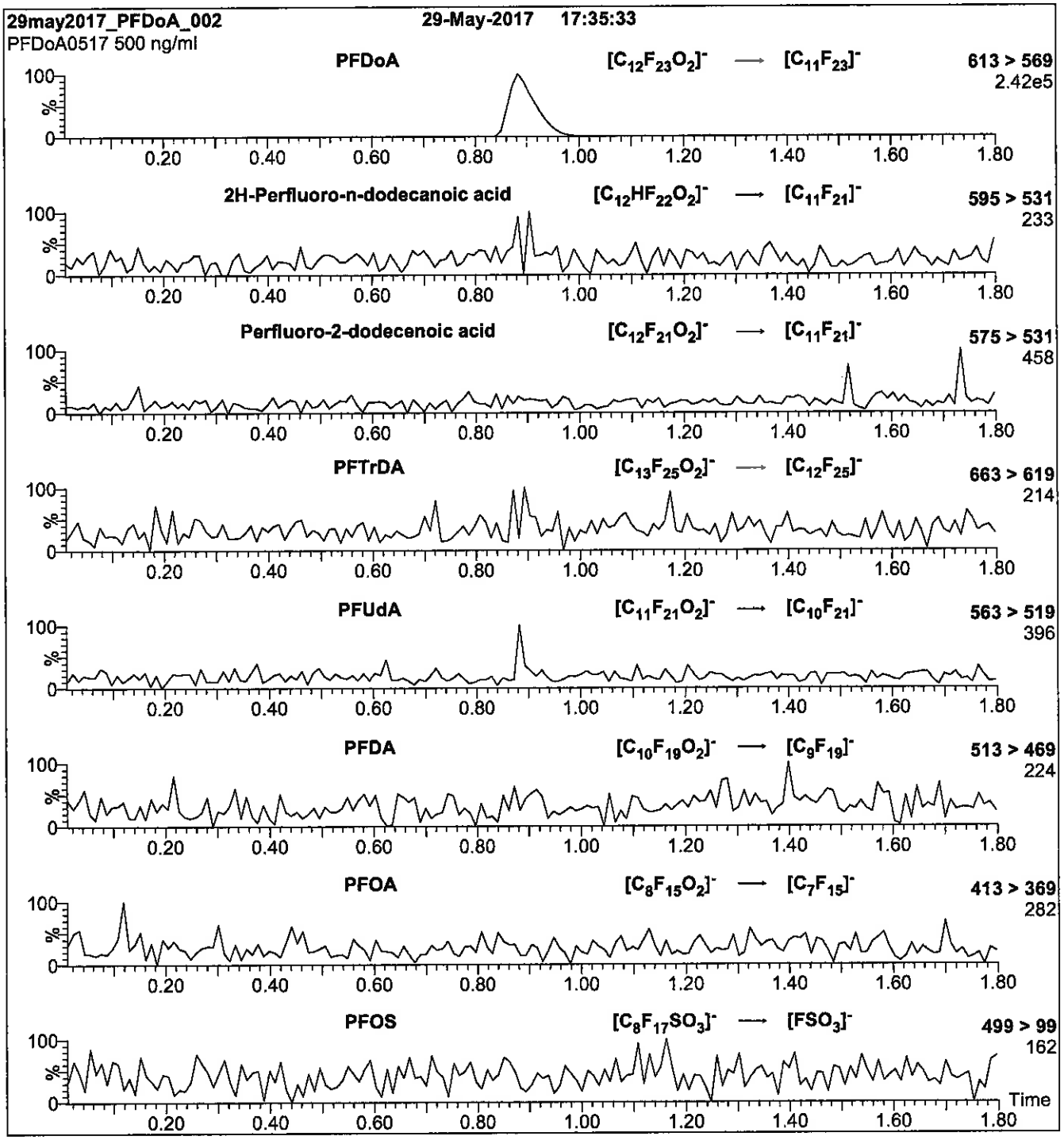
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00010

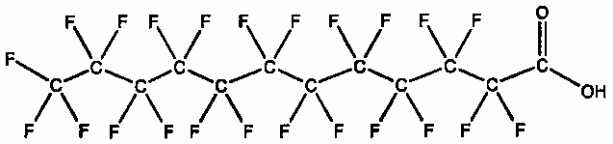
r: 10/20/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDoA
LOT NUMBER: PFDoA0517
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE:
CAS #: 307-55-1



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Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

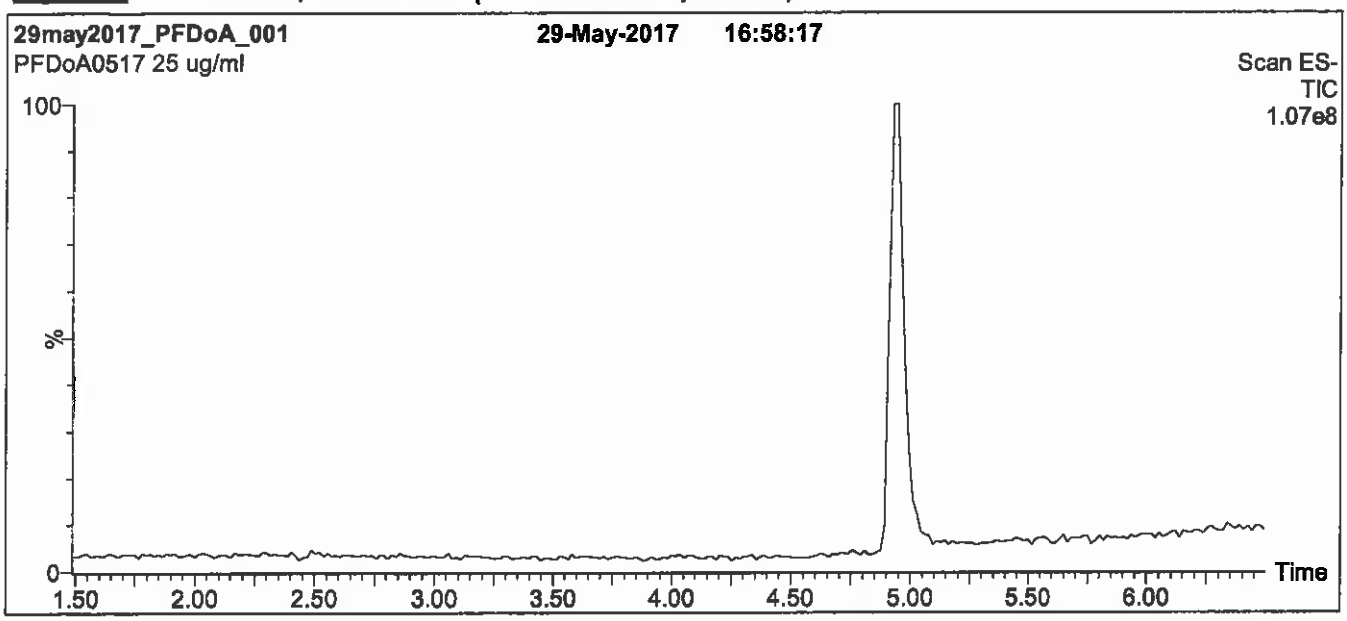
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

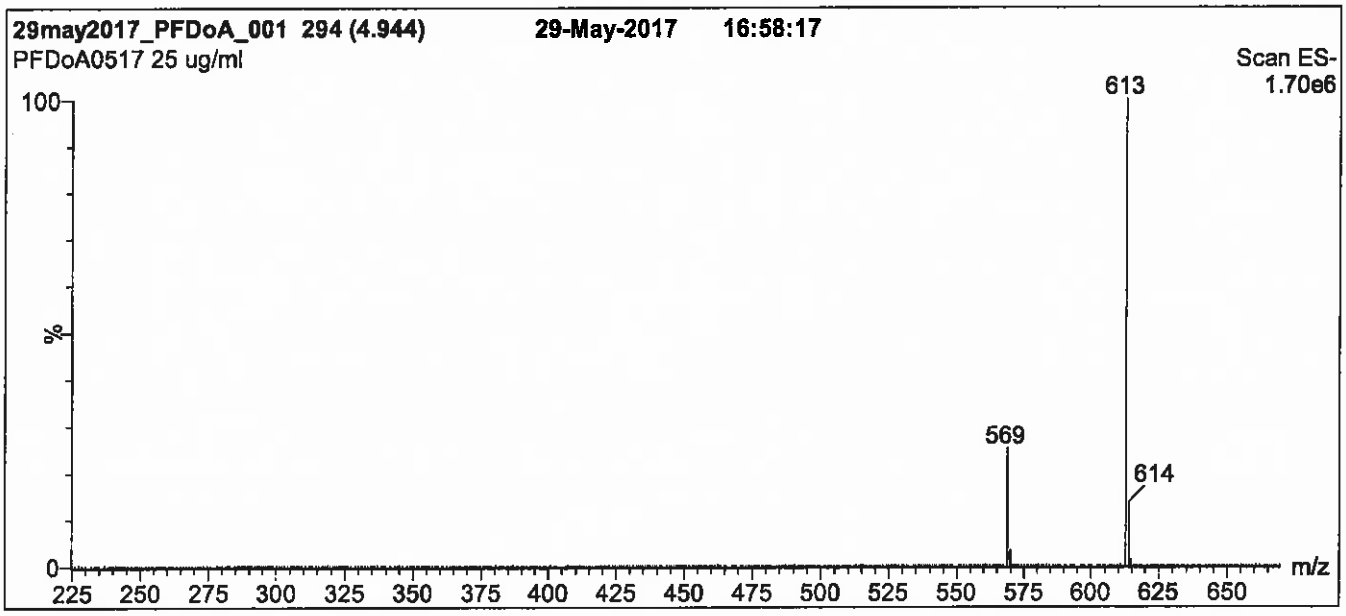
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

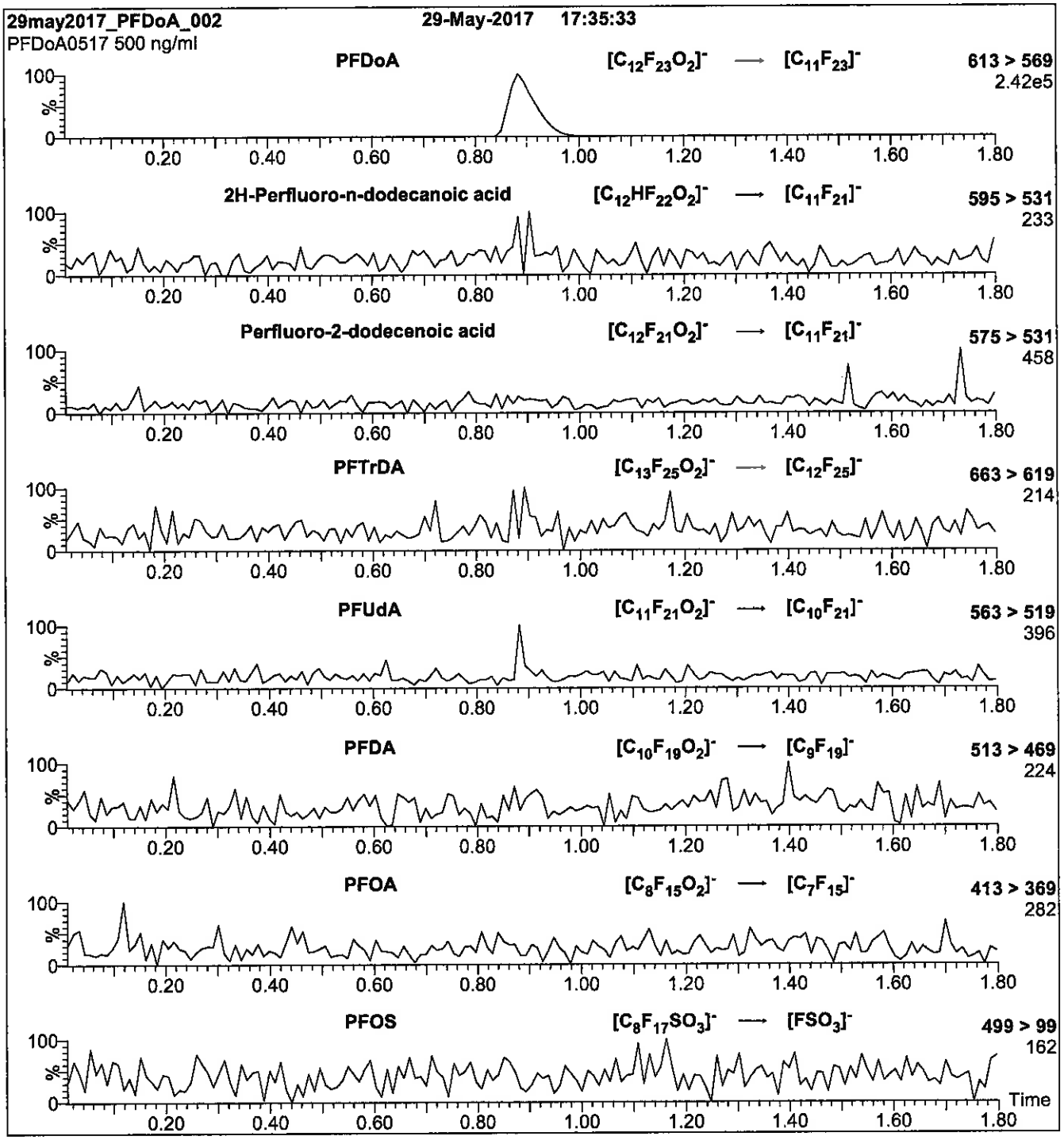
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCPFDS_00008

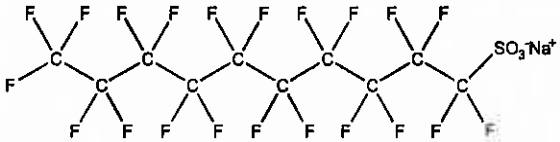
P: 2/16/18 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS1117
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:
CAS #: 2806-15-7



MOLECULAR FORMULA: $C_{10}F_{21}SO_3Na$
MOLECULAR WEIGHT: 622.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
48.2 ± 2.4 µg/ml (PFDS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/08/2017
EXPIRY DATE: (mm/dd/yyyy) 11/08/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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CALA

ANAB ACCREDITED

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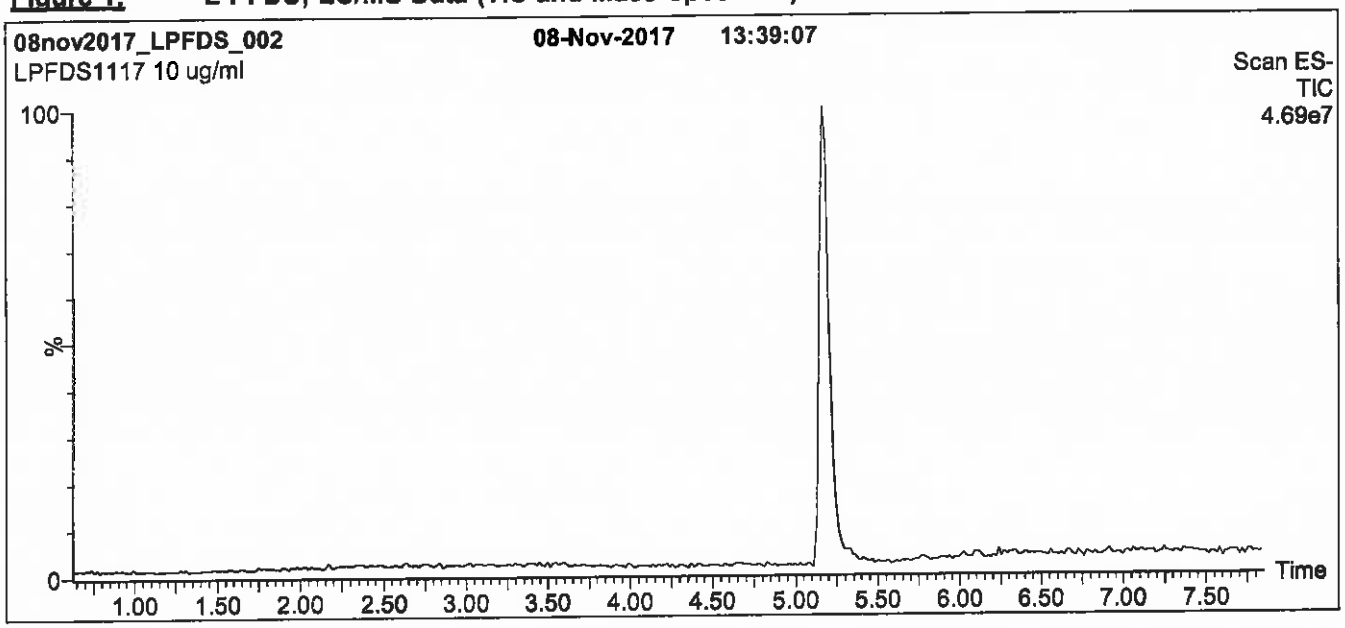
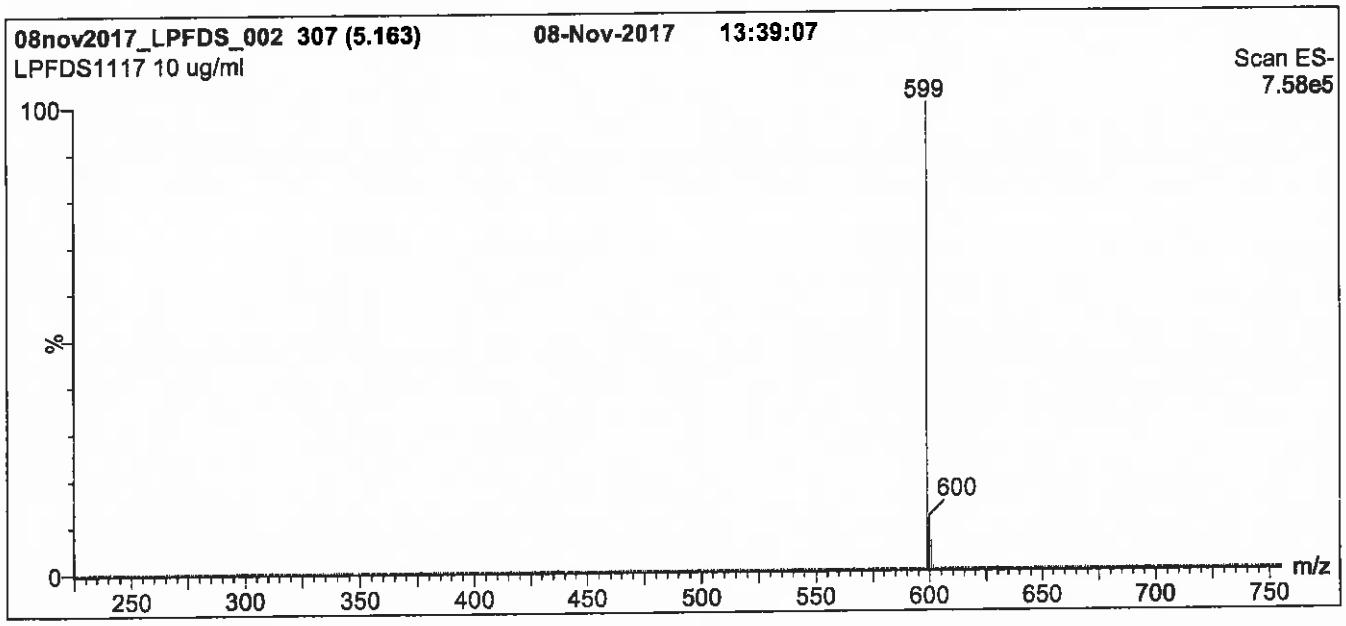
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

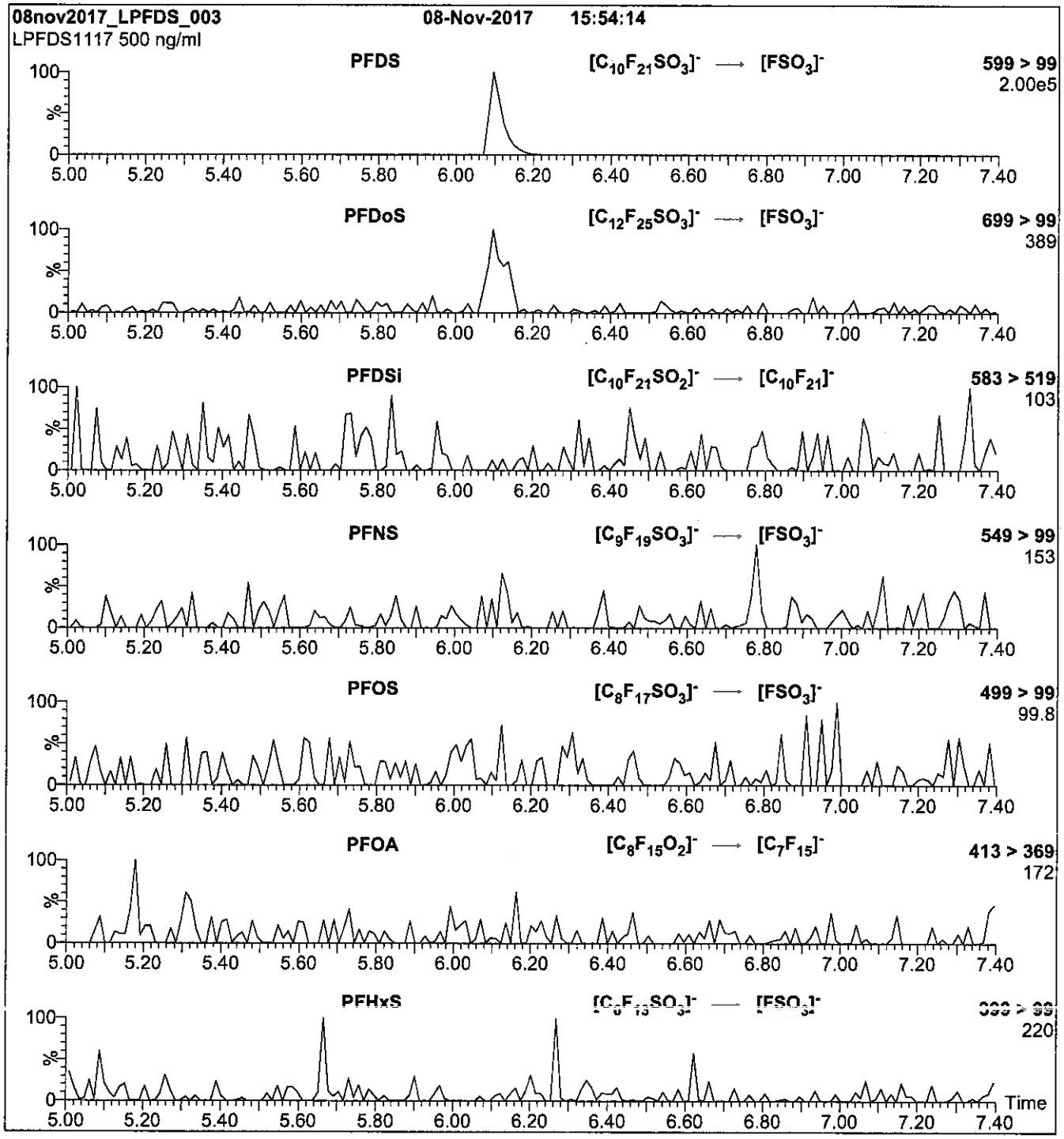
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFDS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFDS)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 50
Flow:	300 µl/min	

Reagent

LCPFHpA_00011

P 2/16/18 SKJ

WELLINGTON LABORATORIES

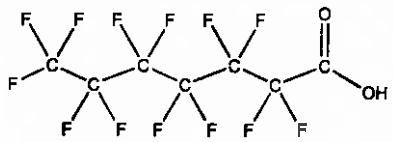
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0917

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/29/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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$$u_r(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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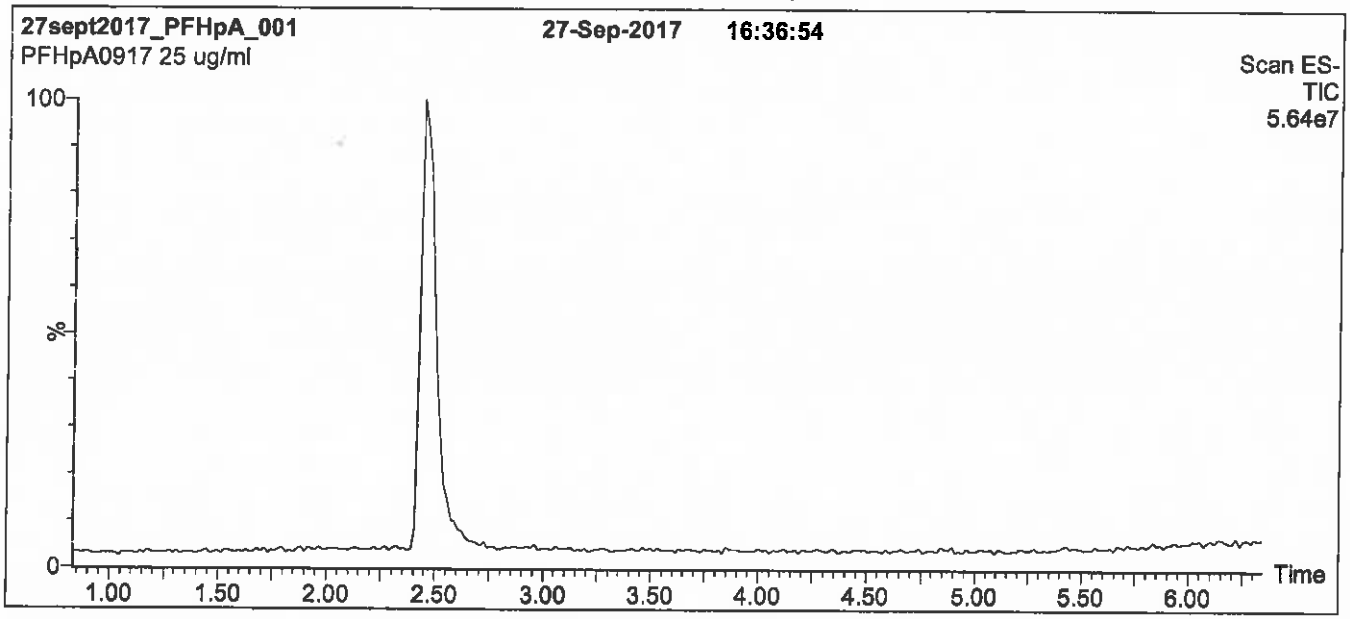
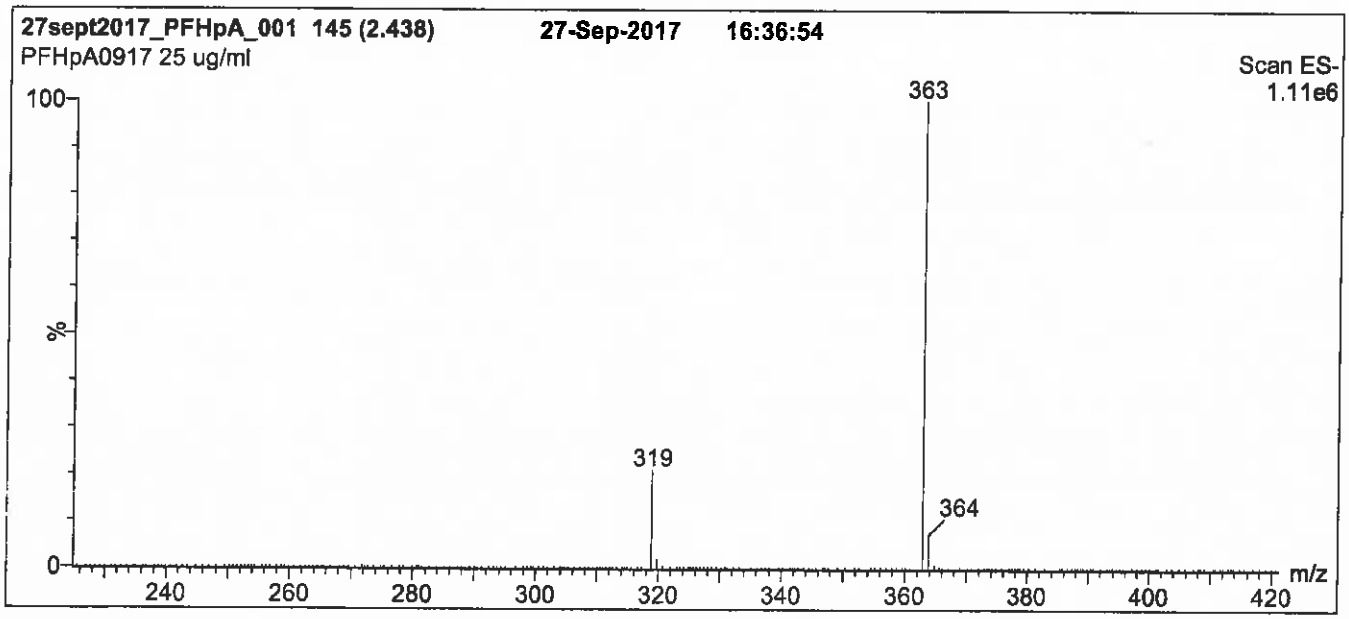
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

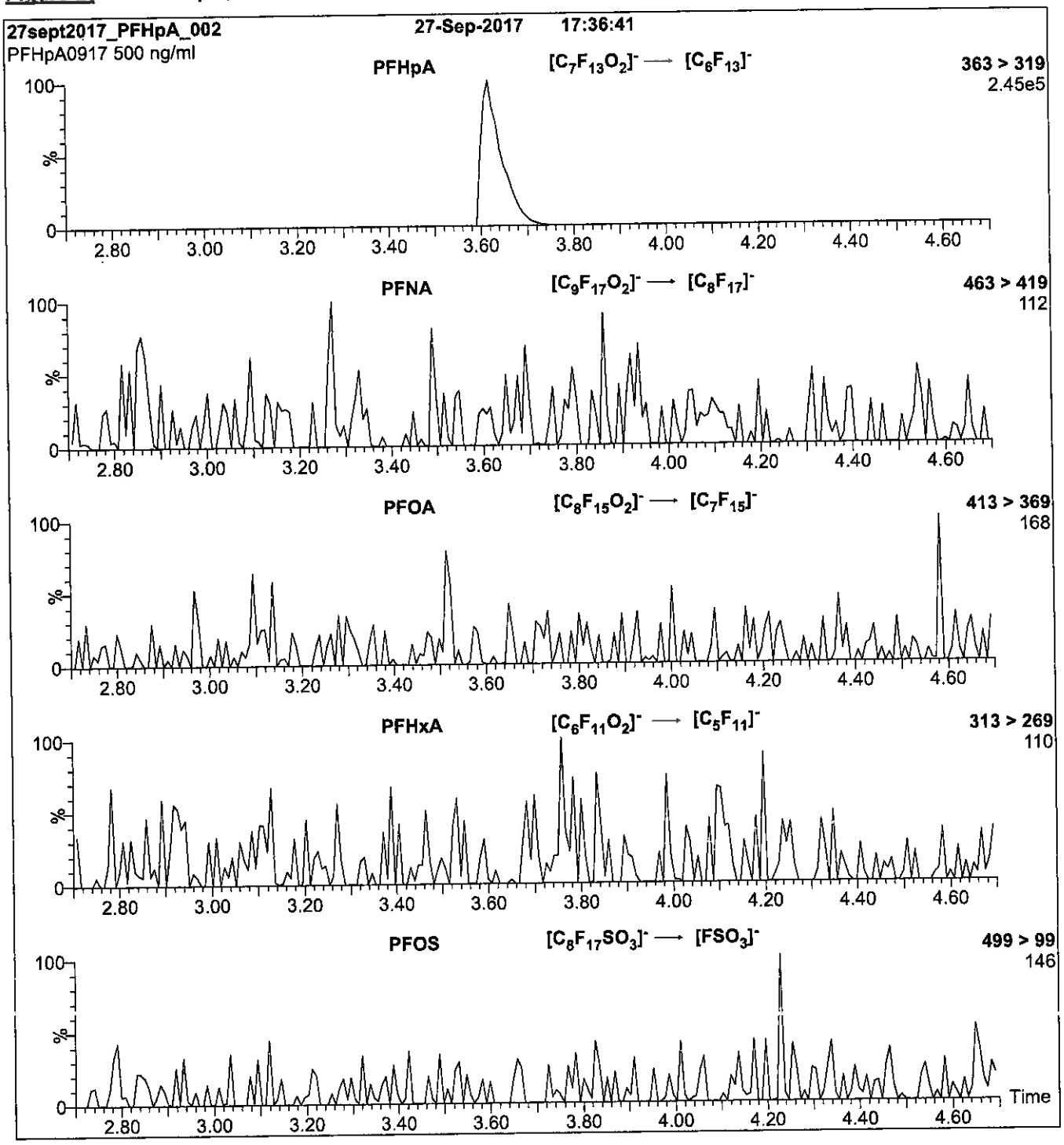
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

Reagent

LCPFHpSA_00003

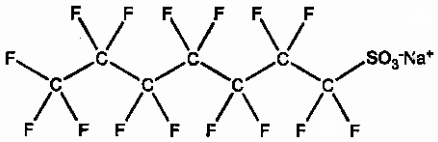
R: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate
LOT NUMBER: LPFHpS0817

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $C_7F_{15}SO_3Na$
MOLECULAR WEIGHT: 472.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.6 ± 2.4 µg/ml (PFHpS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/01/2017
EXPIRY DATE: (mm/dd/yyyy) 09/01/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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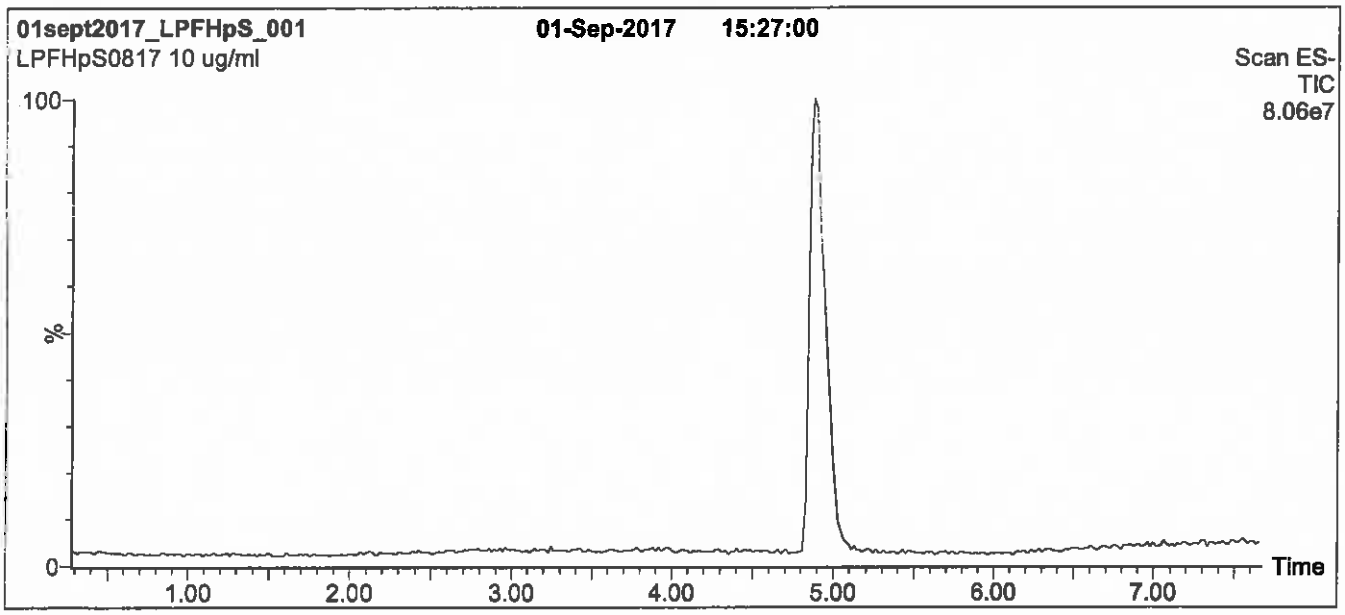

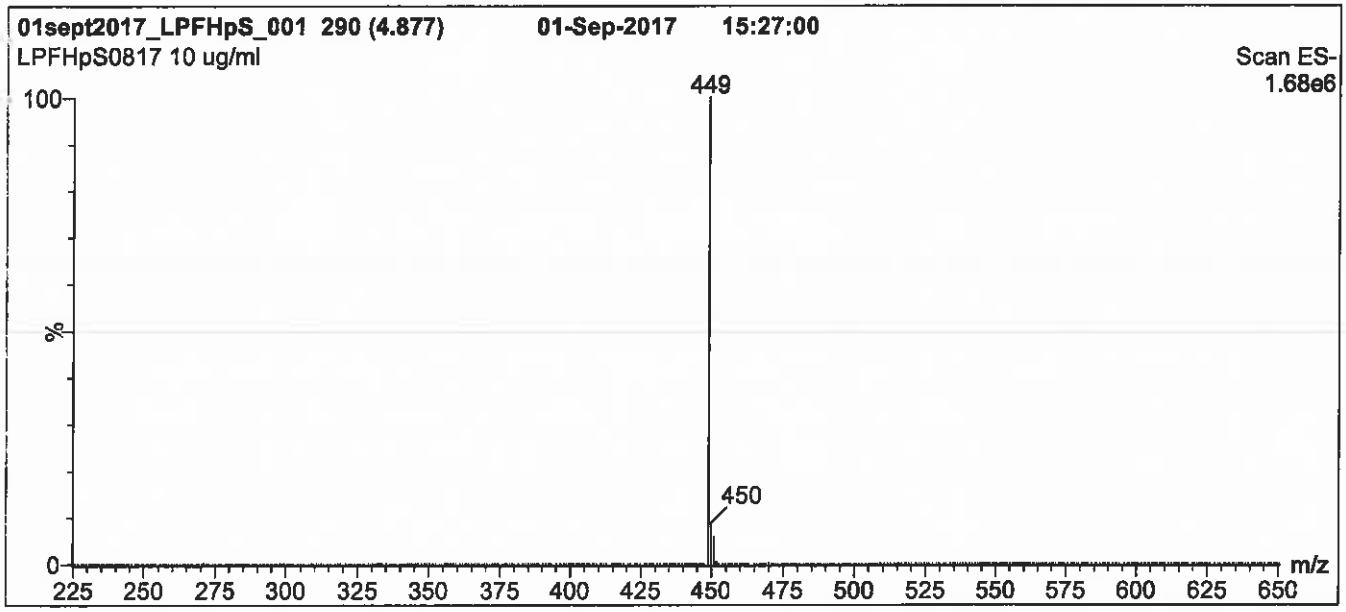

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

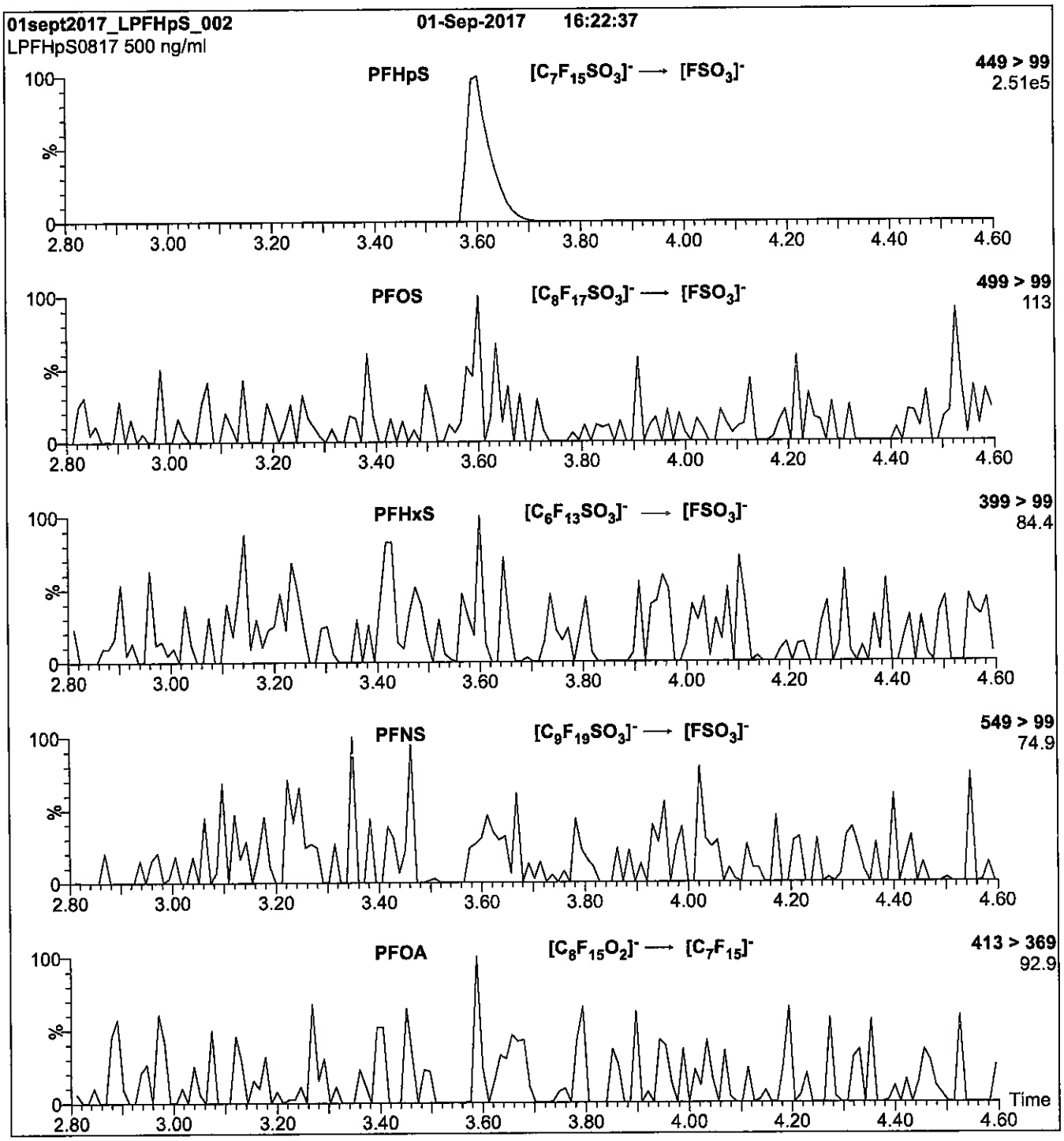
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFHpS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00010

r: 2/16/18 SKJ

WELLINGTON LABORATORIES

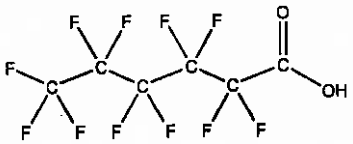
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA0917

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 1.0% of branched isomers.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

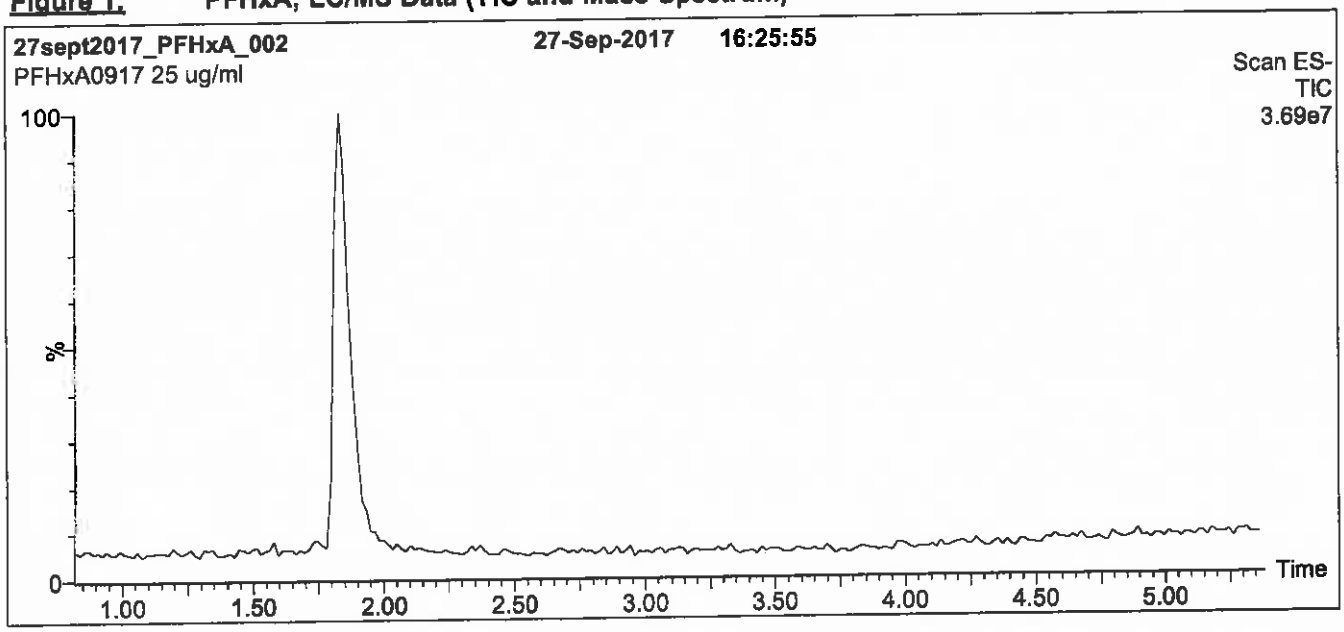
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

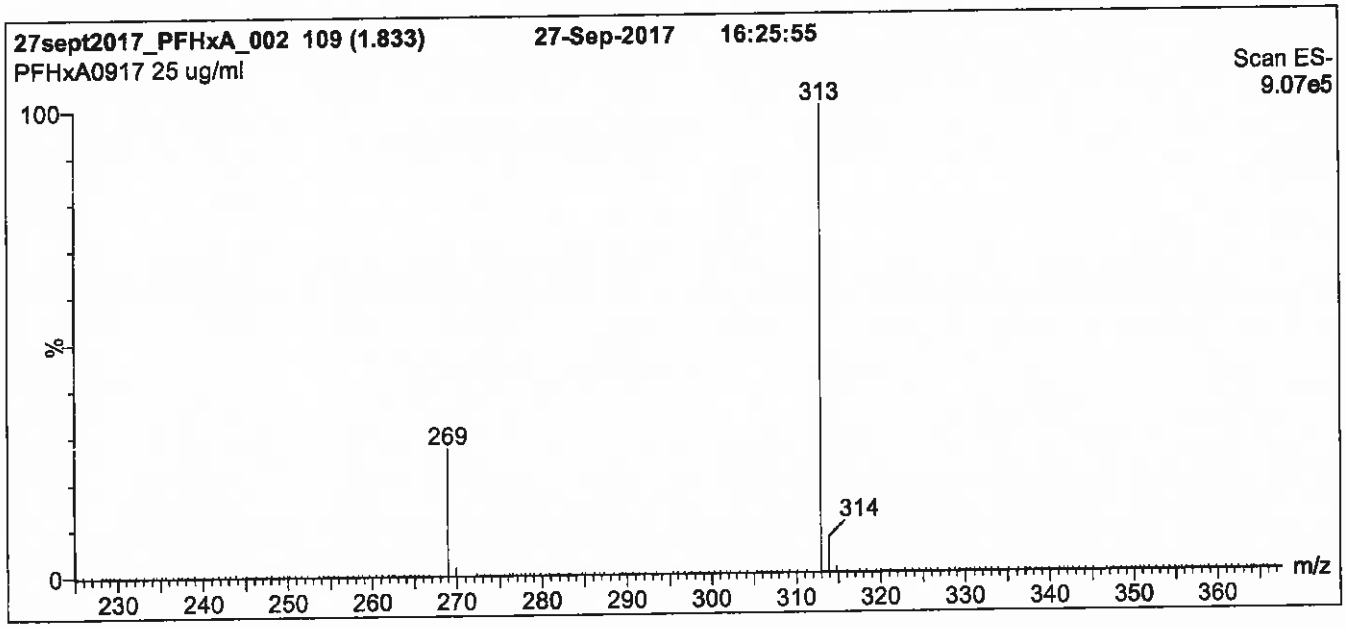
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

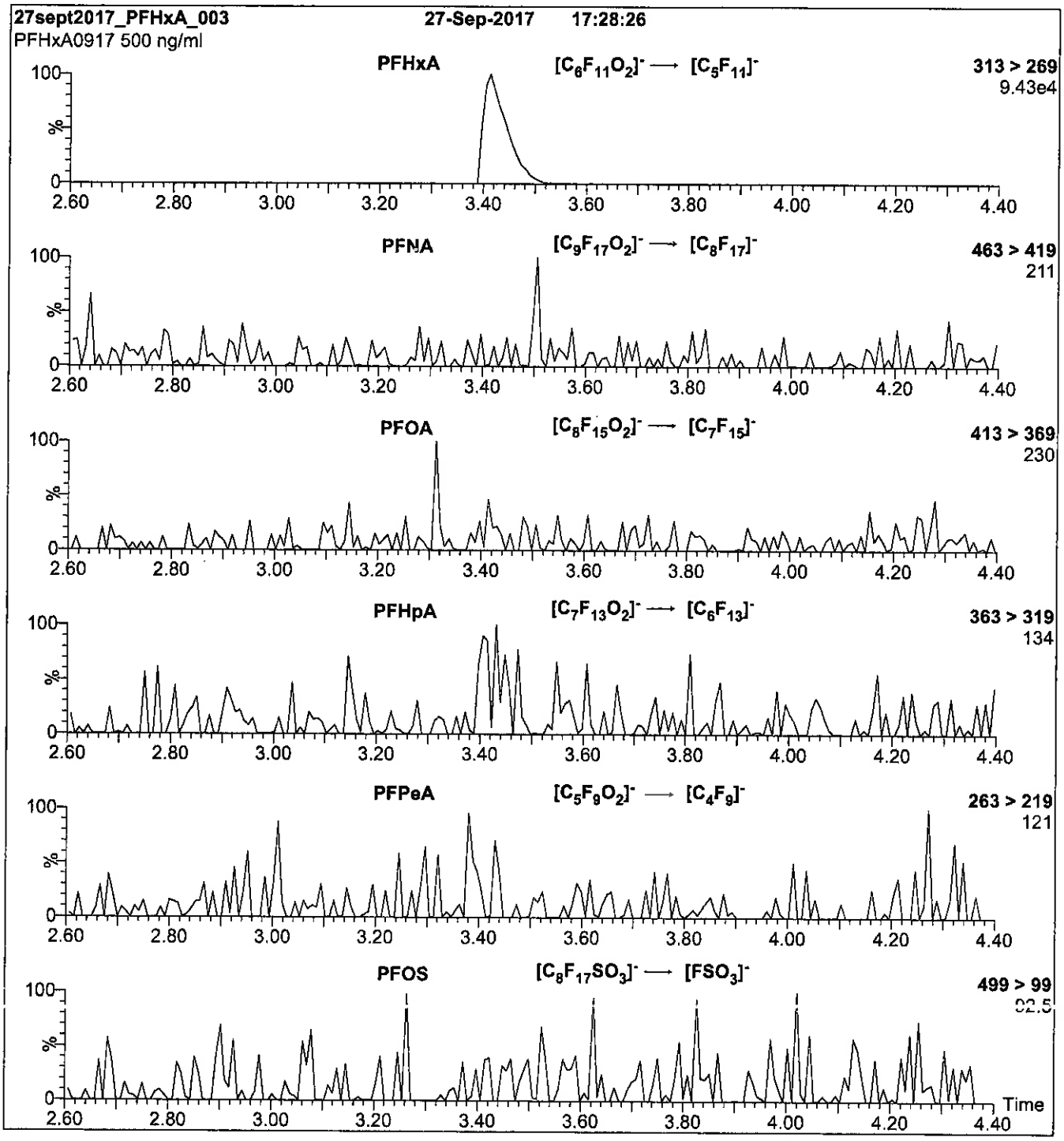
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFHxA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 10
Flow:	300 µl/min	

Reagent

LCPFHxDA_00010

r: 9/21/17 SCJ

WELLINGTON LABORATORIES

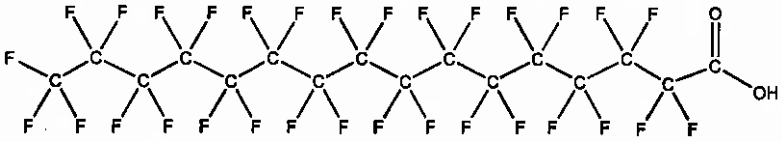
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA
COMPOUND: Perfluoro-n-hexadecanoic acid

LOT NUMBER: PFHxDA0717

STRUCTURE:

CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 814.13
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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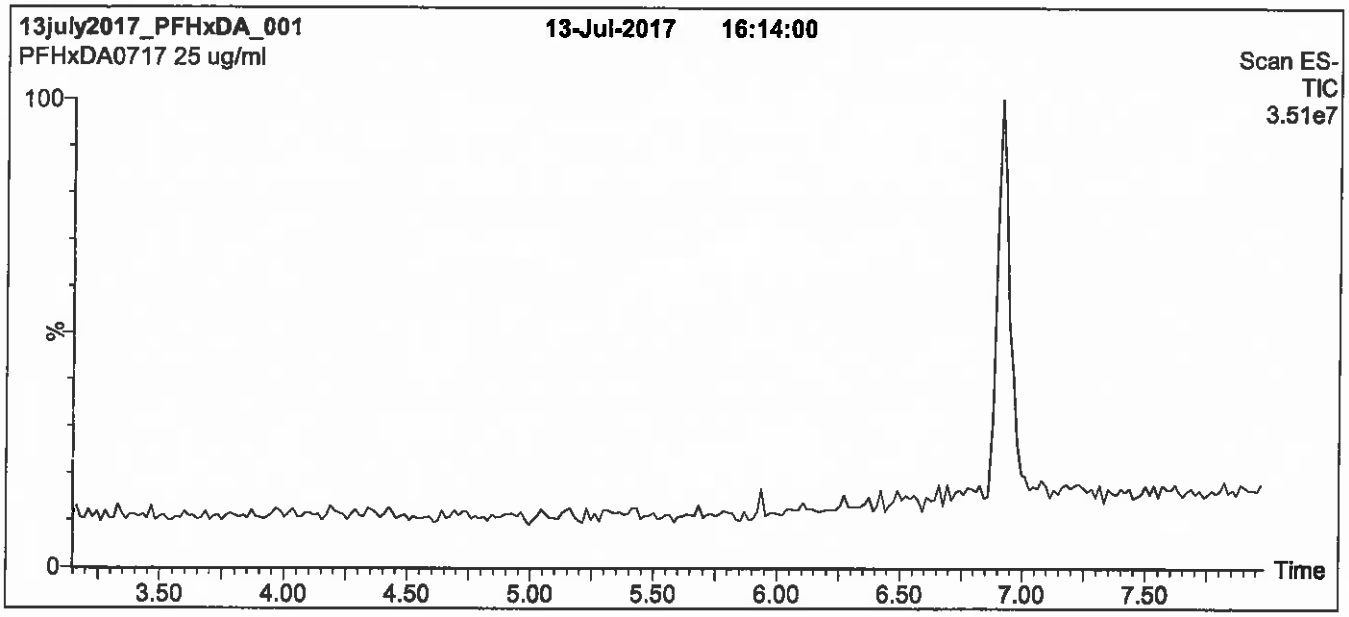
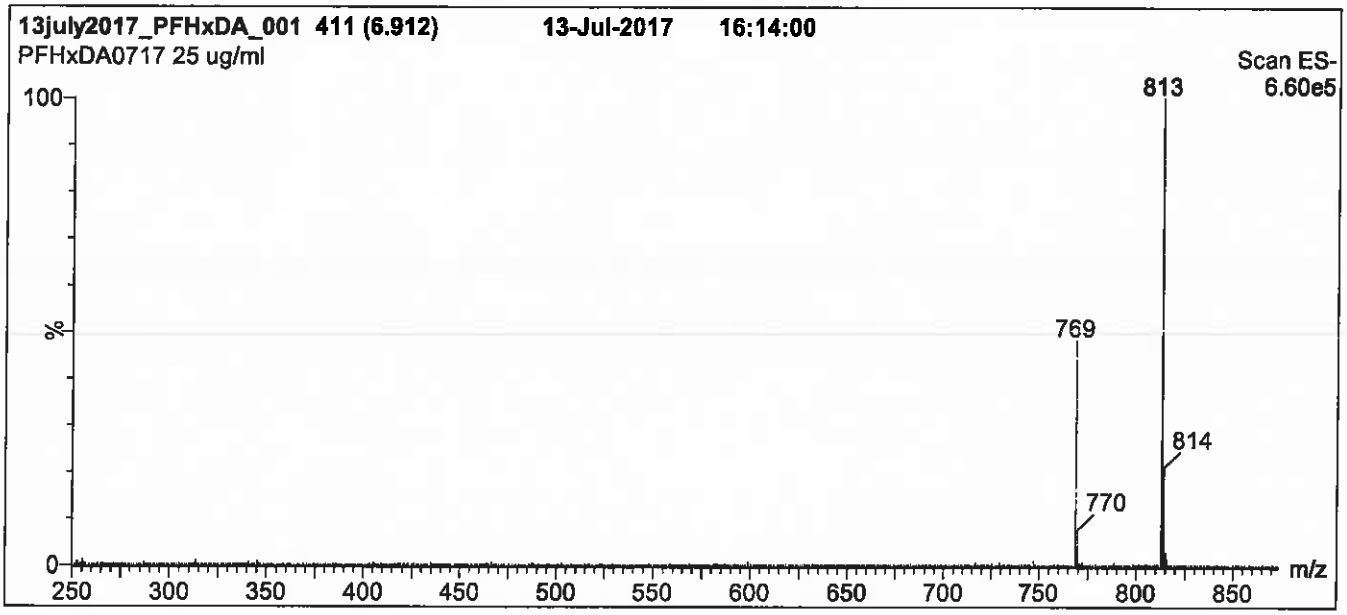
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

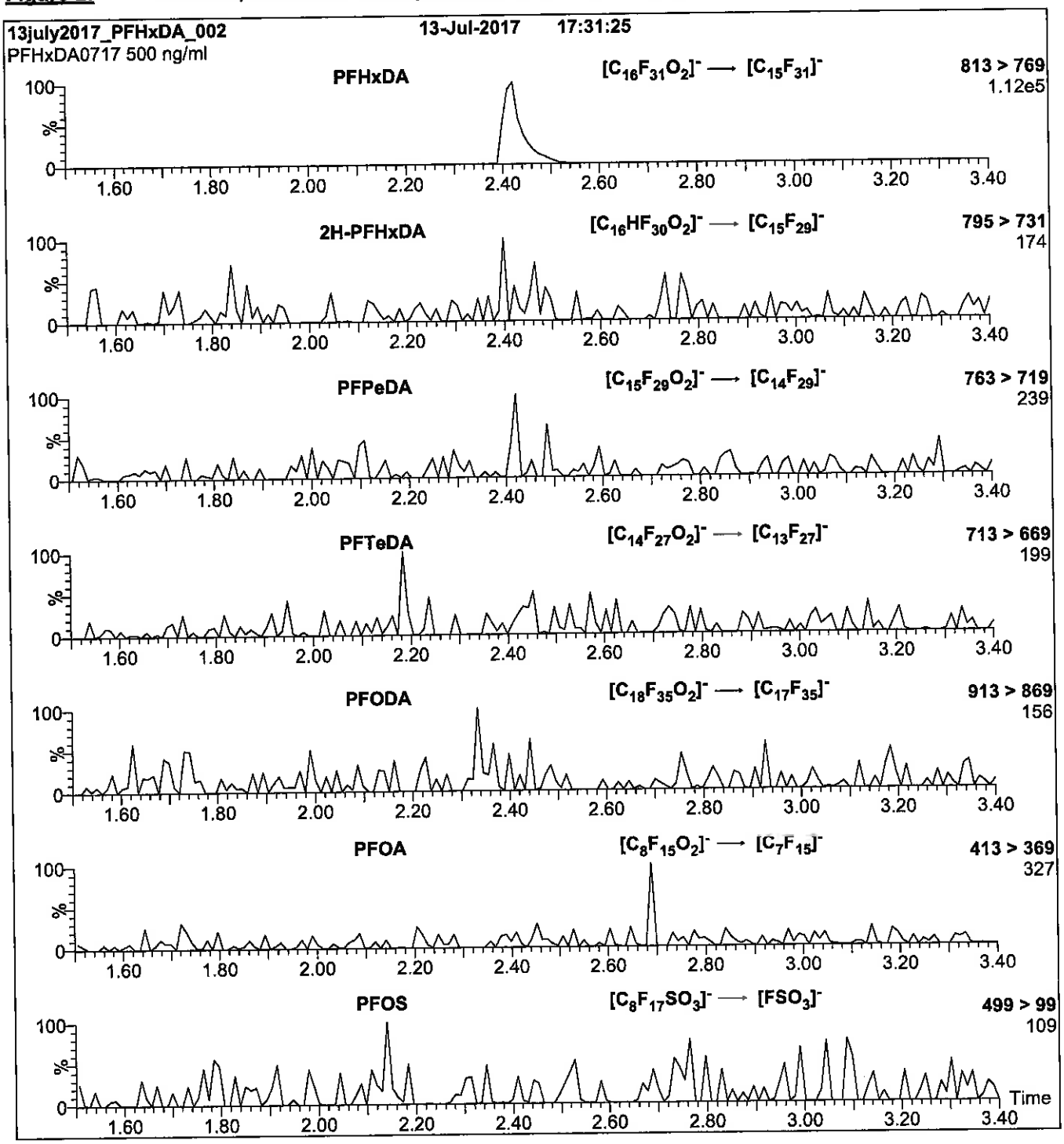
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.13e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00006

P: 10/20/A SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0117
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/03/2017
LAST TESTED: (mm/dd/yyyy)	01/04/2017
EXPIRY DATE: (mm/dd/yyyy)	01/04/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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HOMOGENEITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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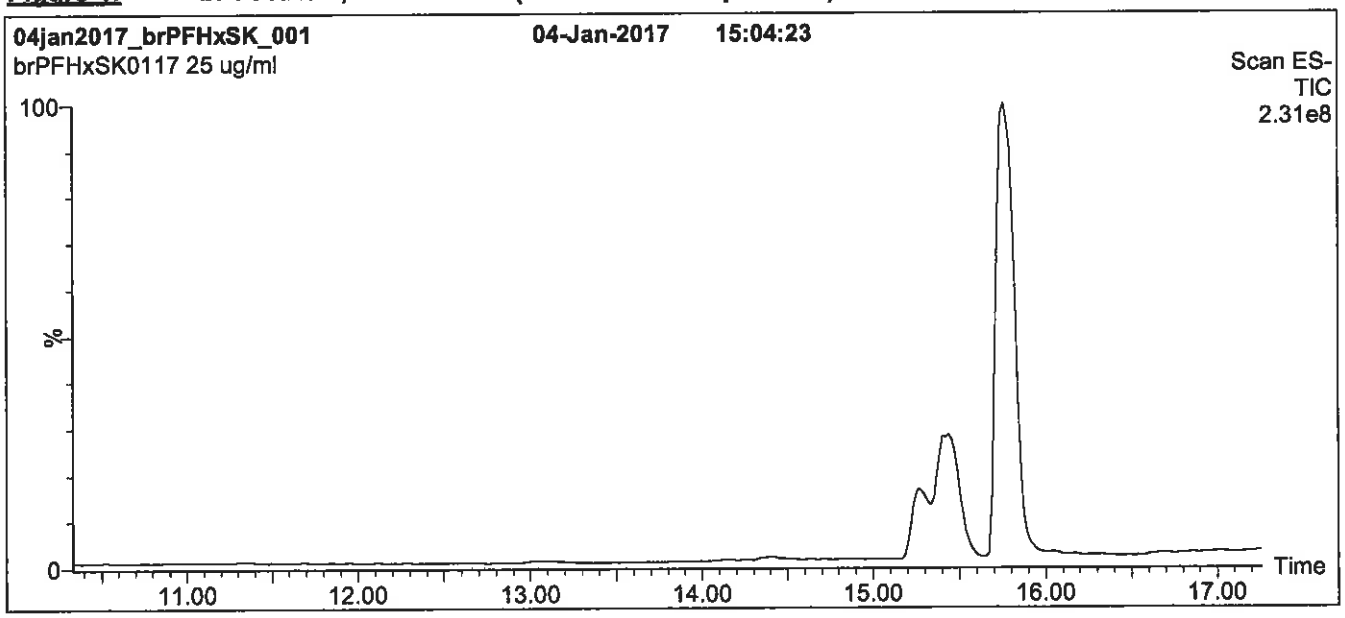
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

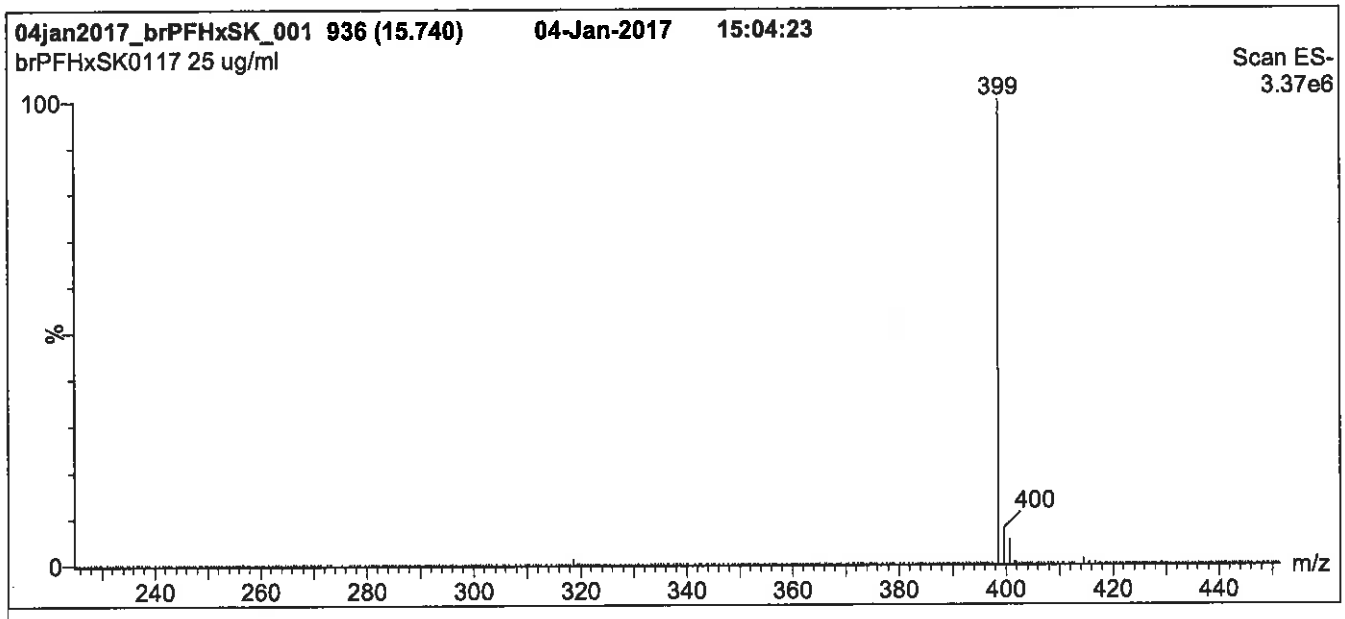
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 01/20/2017 (mm/dd/yyyy)

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

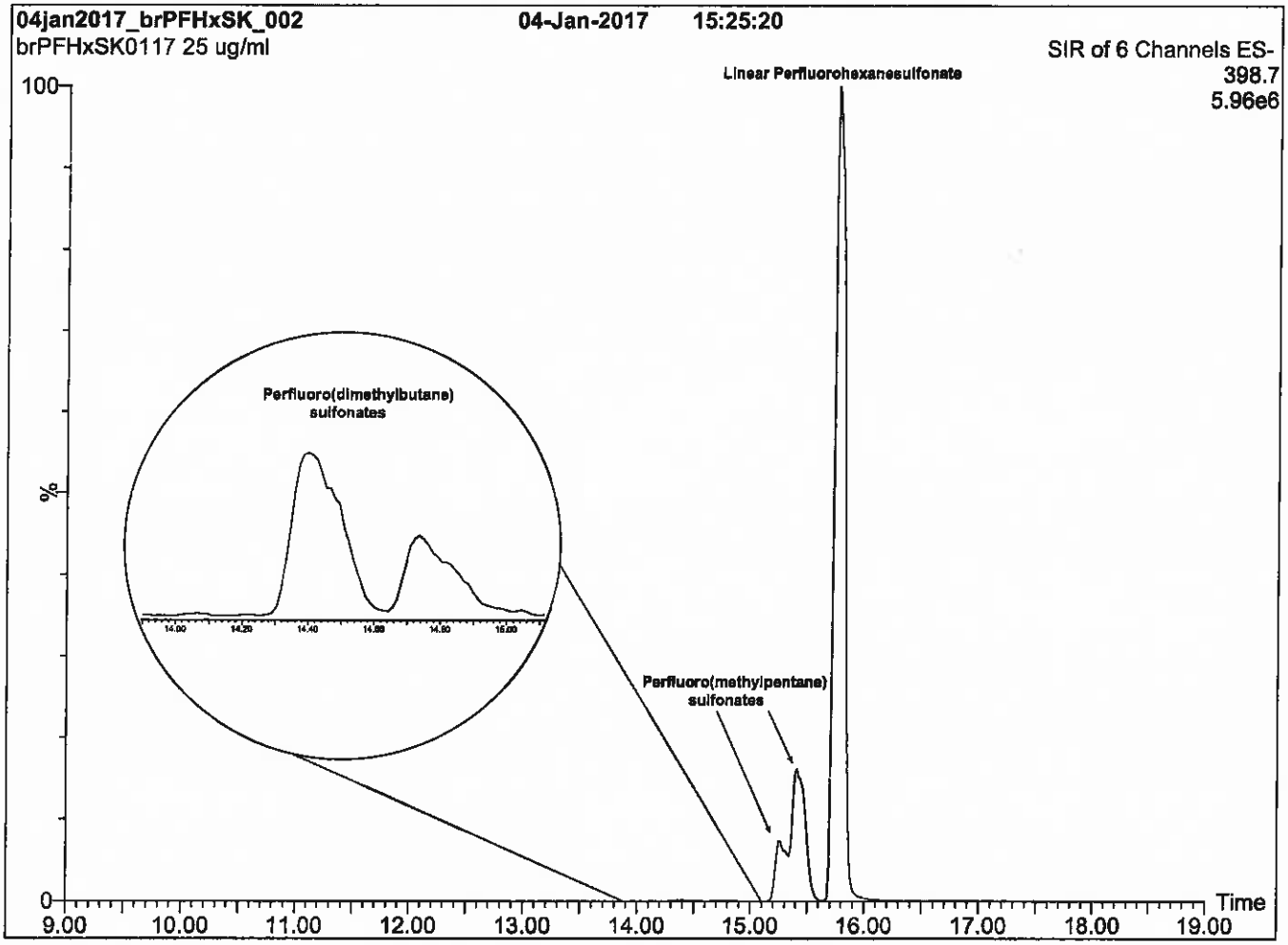
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFHxSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

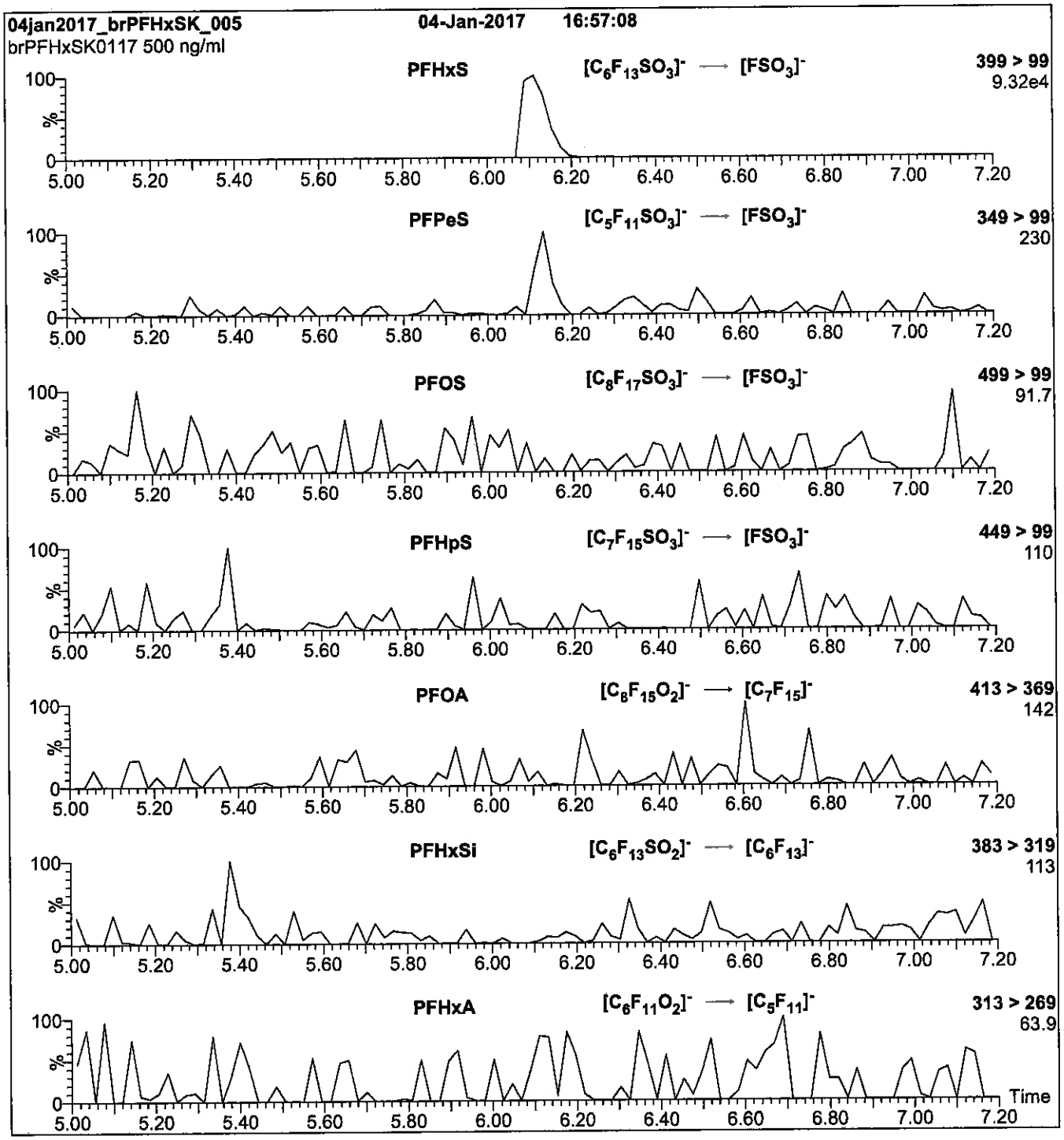
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00010

r: 2/16/18 SKJ

WELLINGTON LABORATORIES

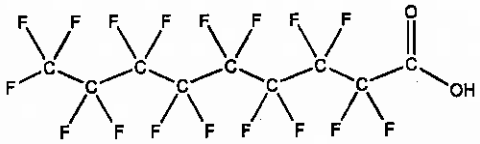
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA0717

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/20/2017
EXPIRY DATE: (mm/dd/yyyy) 07/20/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

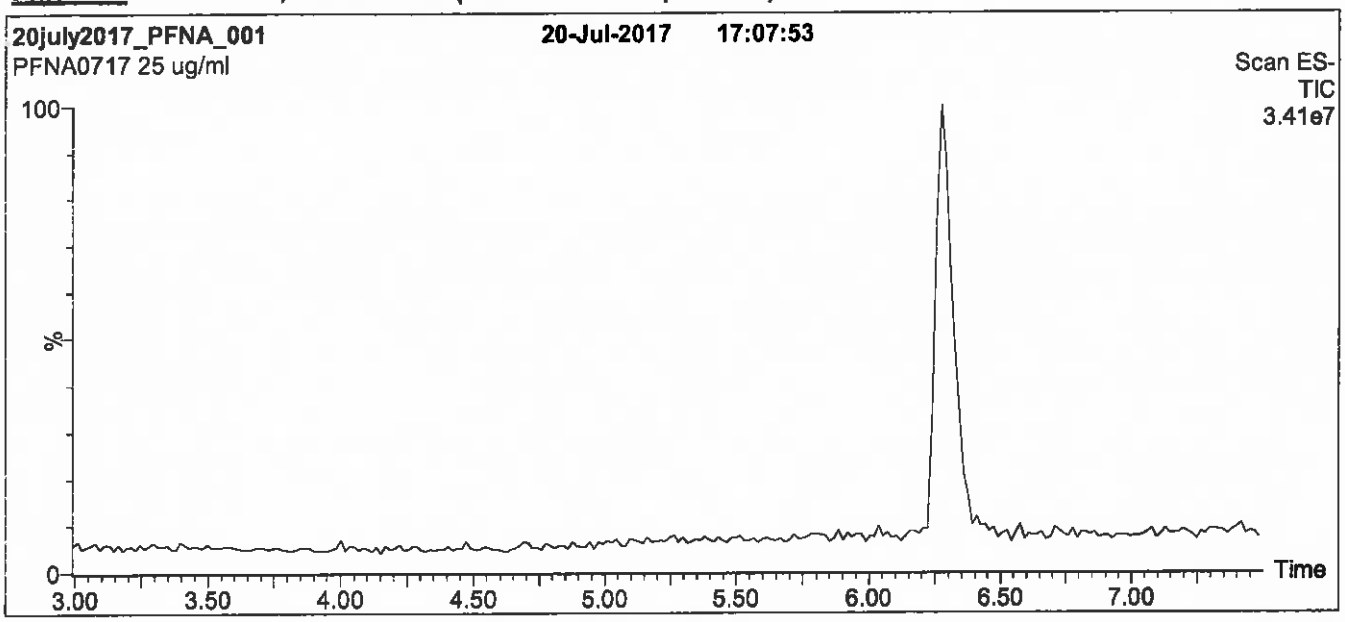
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

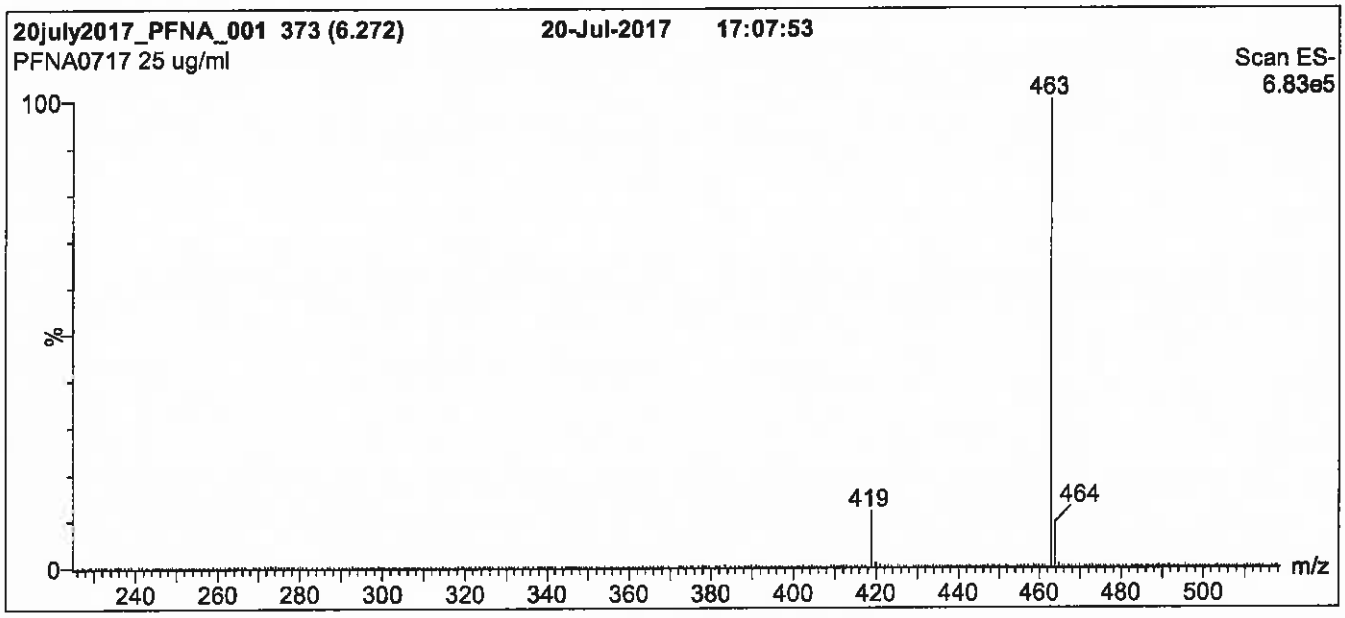
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

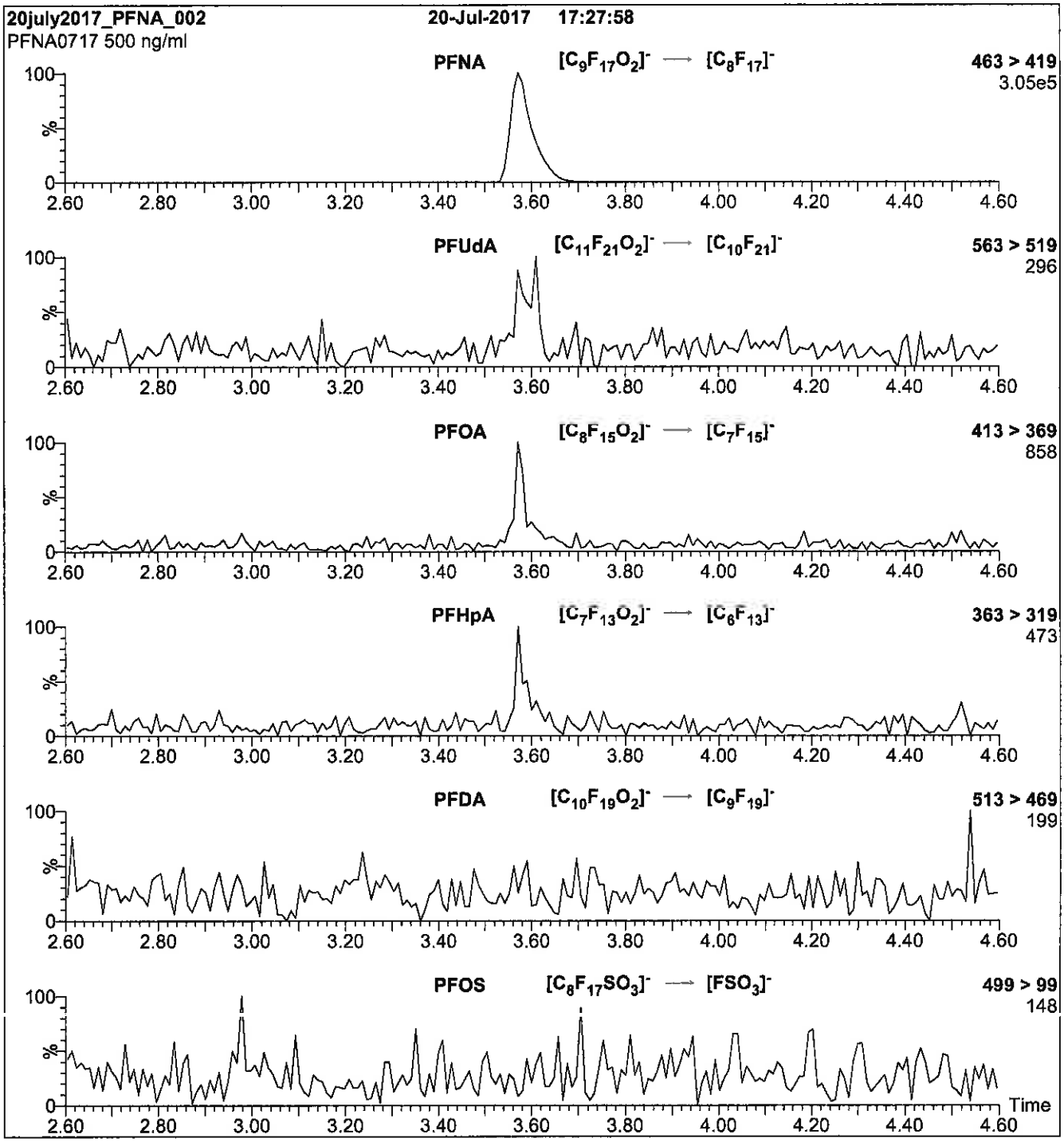
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFNS_00003

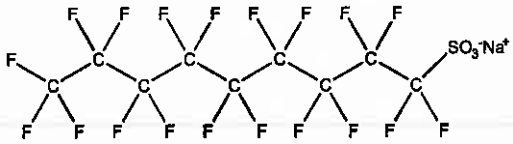
1106804
ID: LCPFNS_00003
Exp: 09/27/22 Prpd: SKV
L-PFNS at 48.0ug/mL

r: 12/4/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFNS
LOT NUMBER: LPFNS0917
COMPOUND: Sodium perfluoro-1-nonanesulfonate
STRUCTURE:
CAS #: 98789-57-2



MOLECULAR FORMULA: $C_9F_{19}SO_3Na$
MOLECULAR WEIGHT: 572.12
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
48.0 ± 2.4 µg/ml (PFNS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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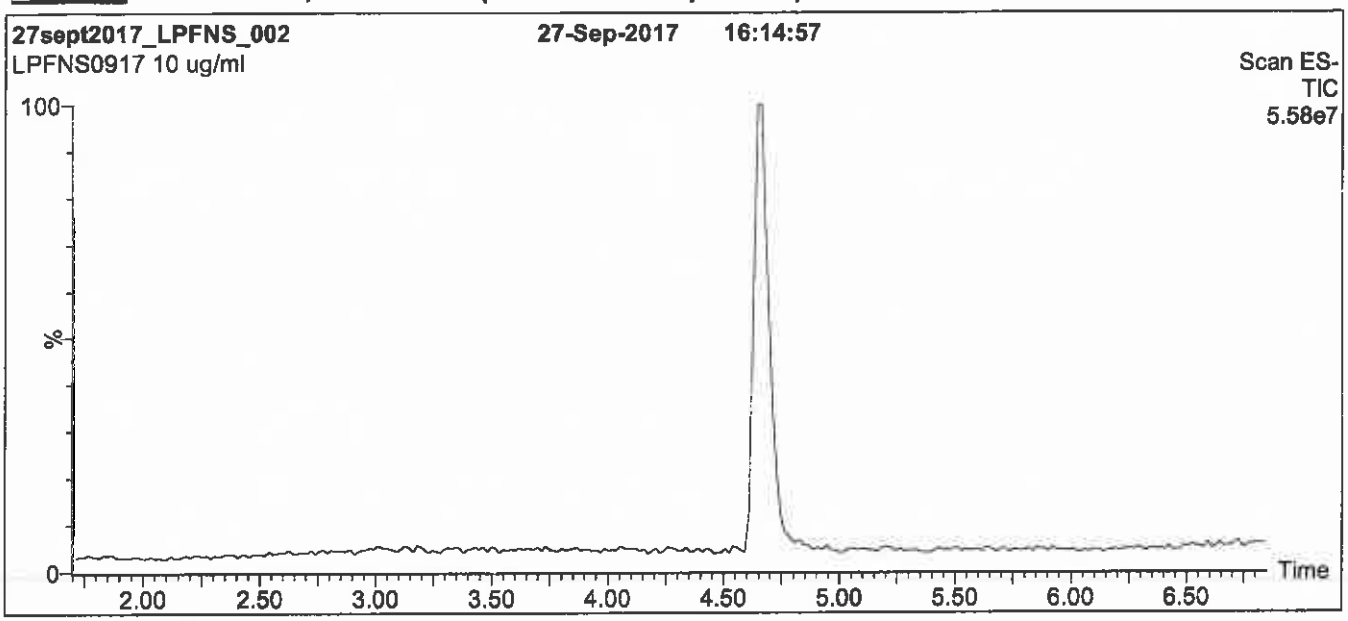
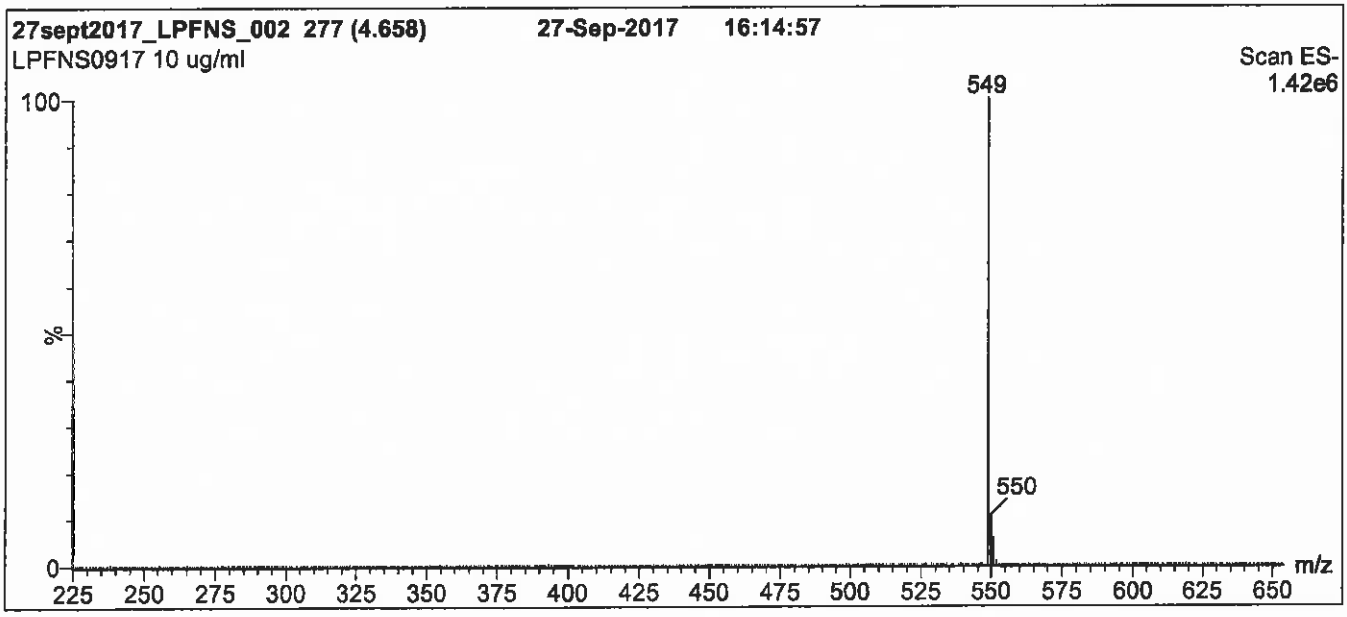
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

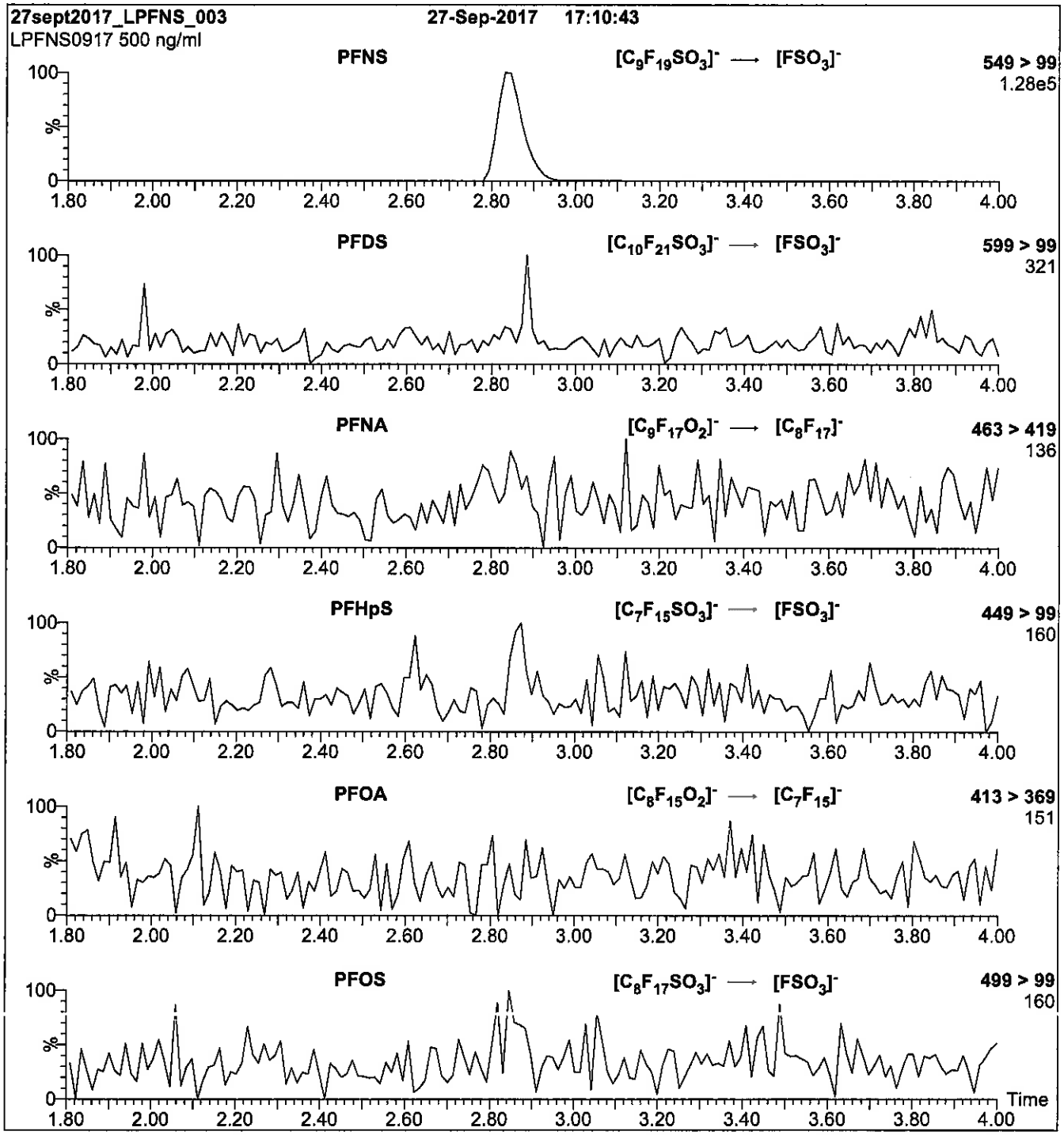
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFNS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 45

Reagent

LCPFOA_00011

P: 10/20/17 SKV

WELLINGTON LABORATORIES

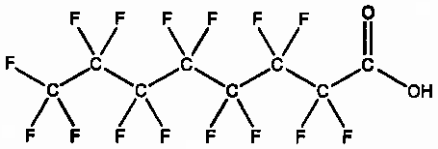
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA0917

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

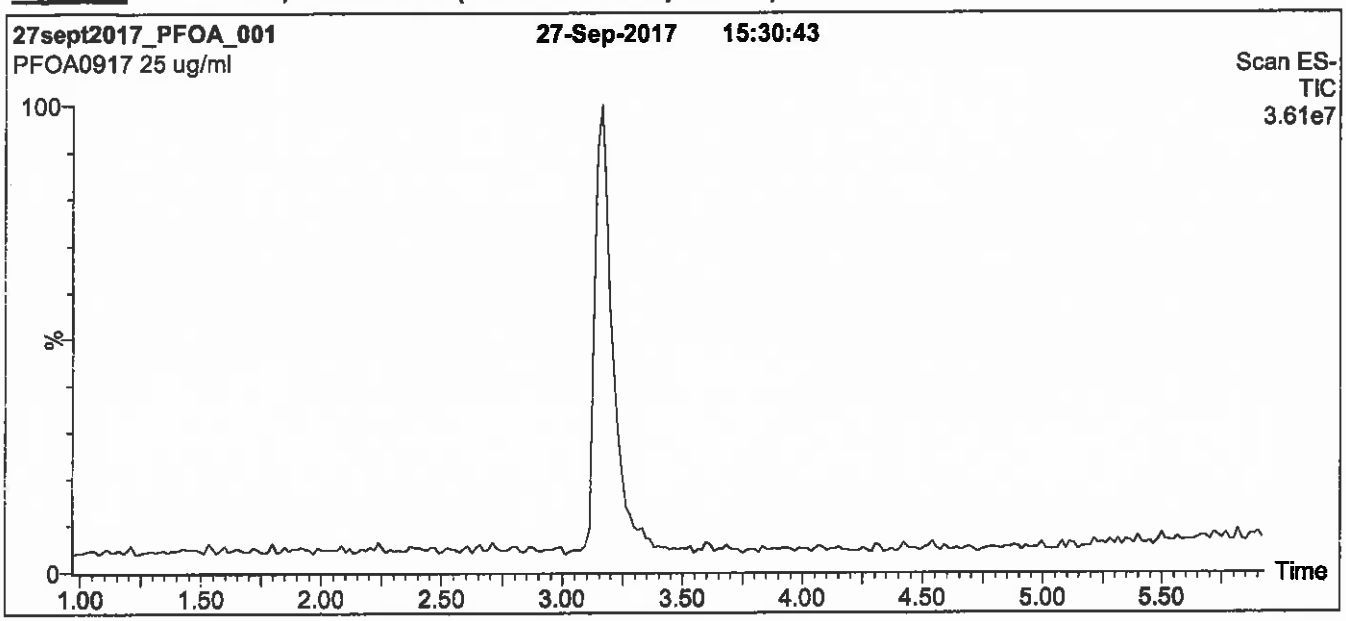
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

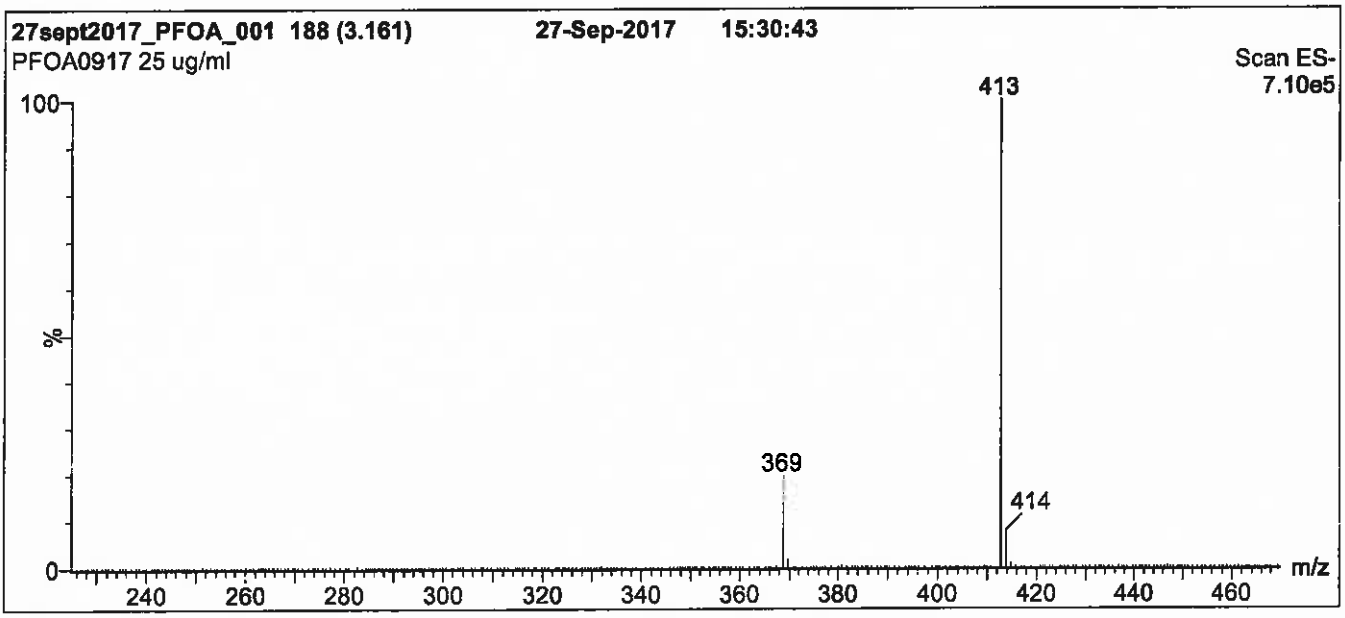
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

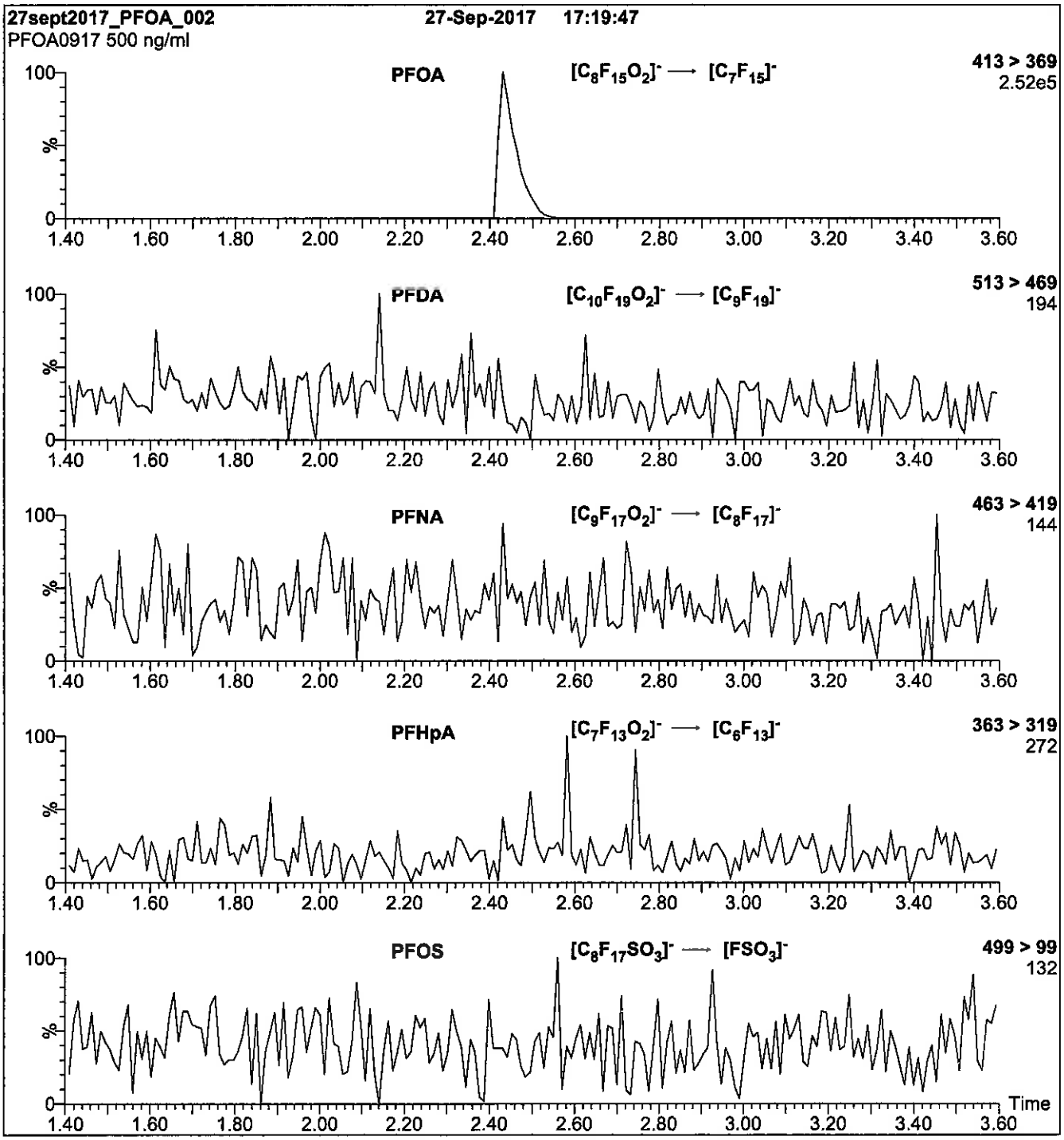
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFOA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 11
Flow:	300 µl/min	

Reagent

LCPFODA_00010

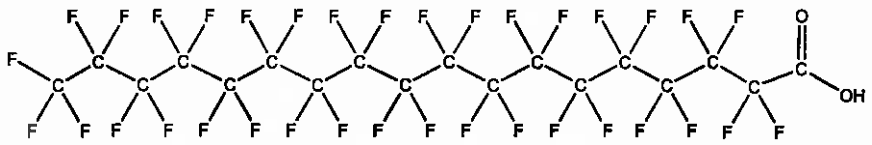
r. 9/21/17 SKW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
LOT NUMBER: PFODA0717
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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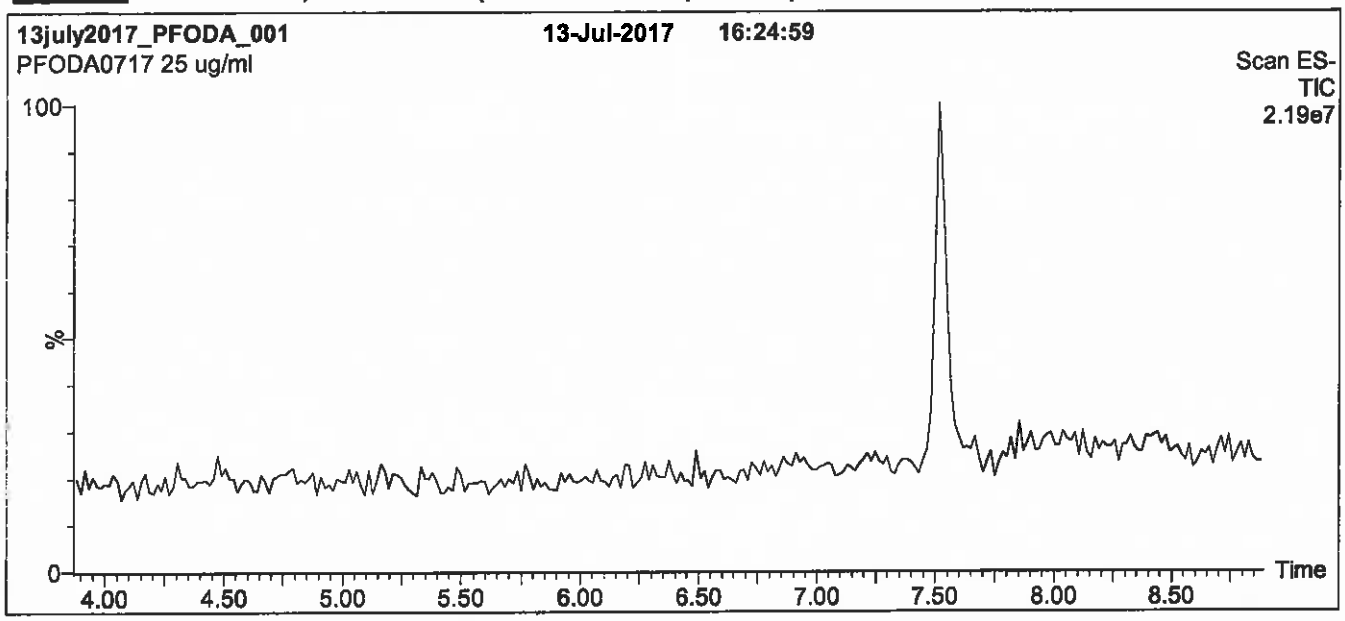
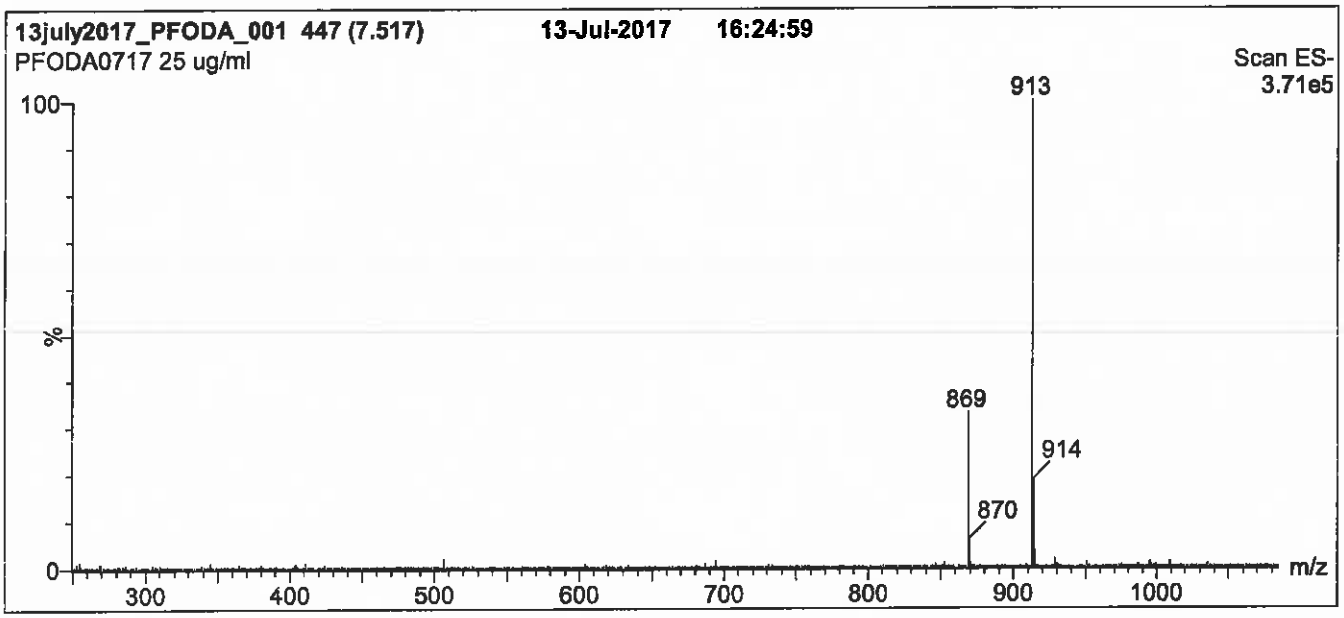
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

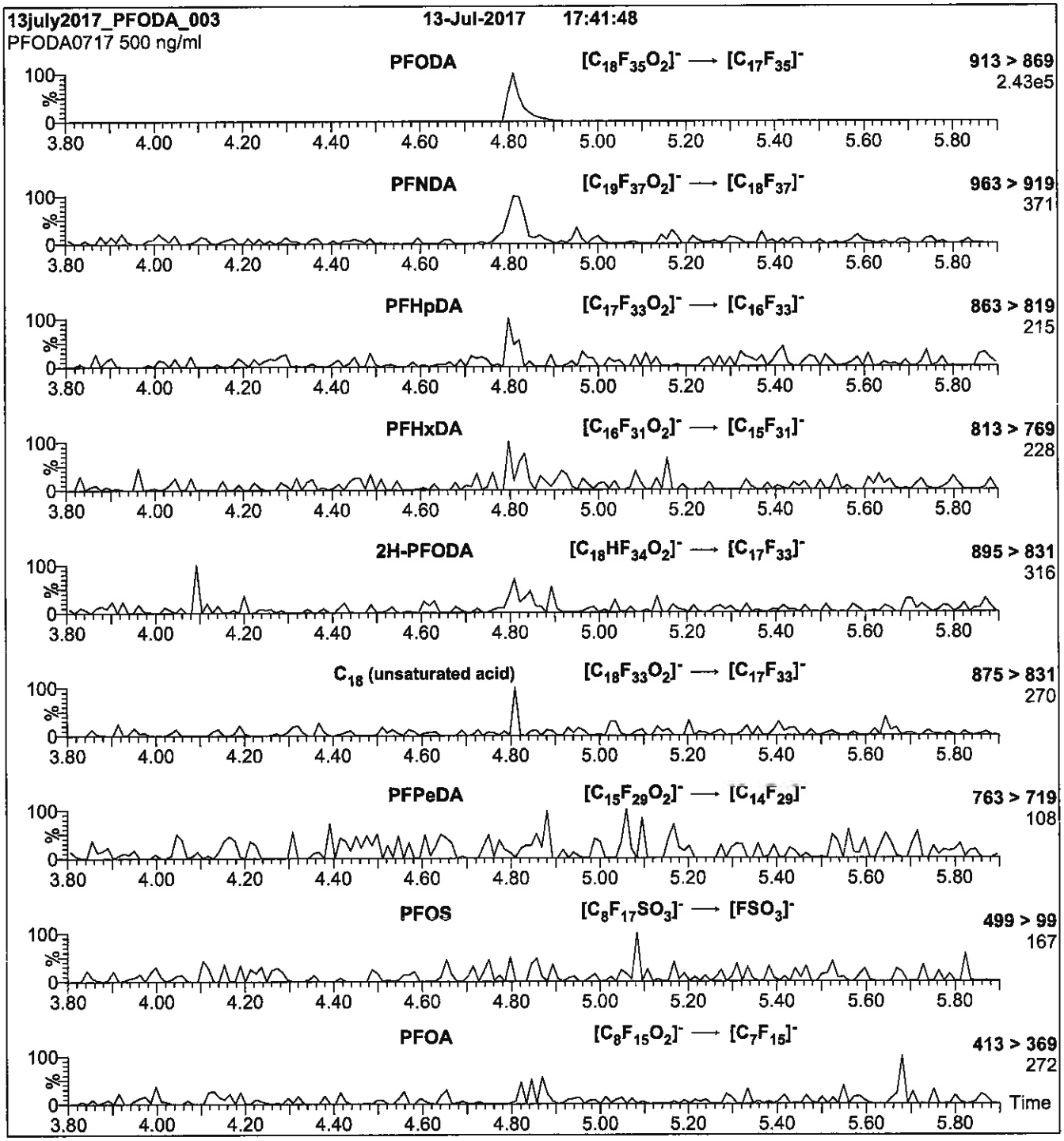
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00007

P: 10/20/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0117
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/09/2017
LAST TESTED: (mm/dd/yyyy)	01/12/2017
EXPIRY DATE: (mm/dd/yyyy)	01/12/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

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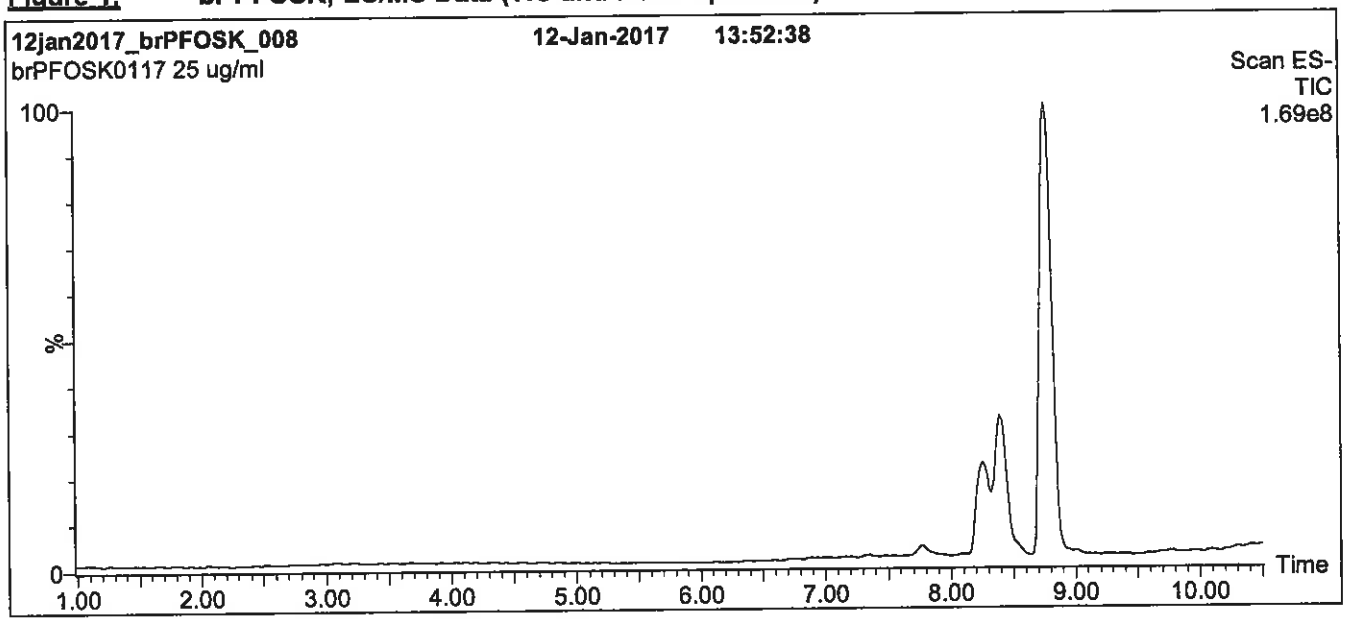
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

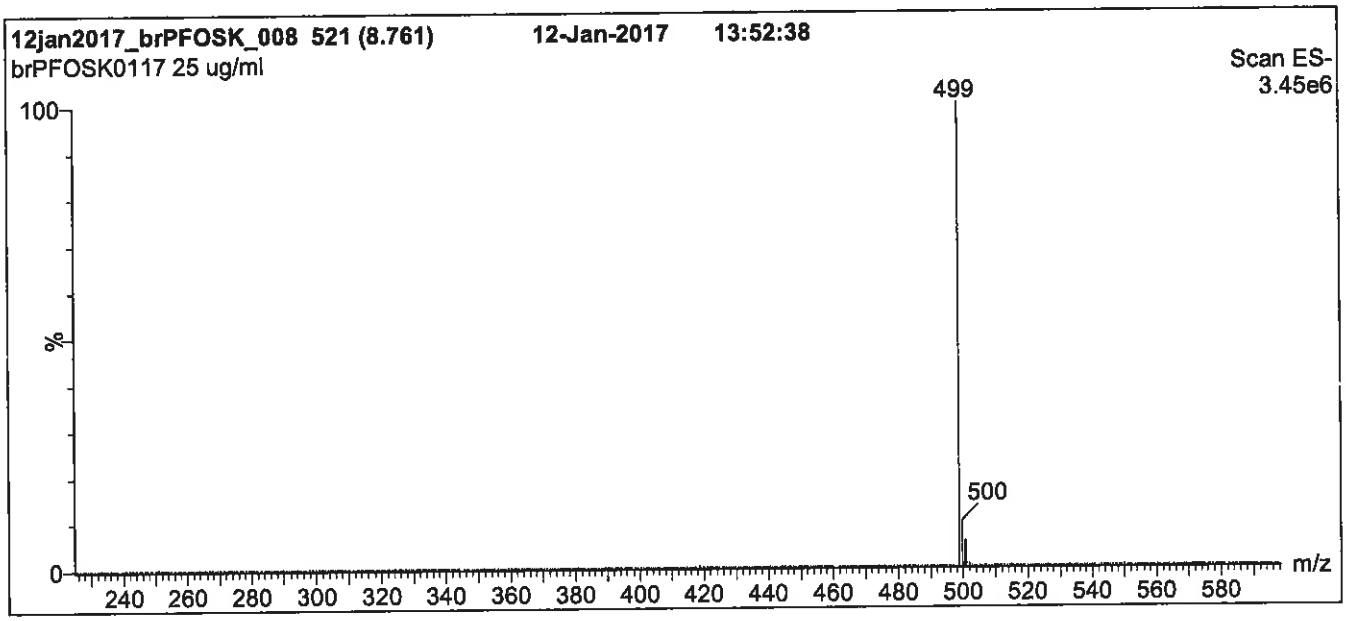
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 01/20/2017 (mm/dd/yyyy)

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

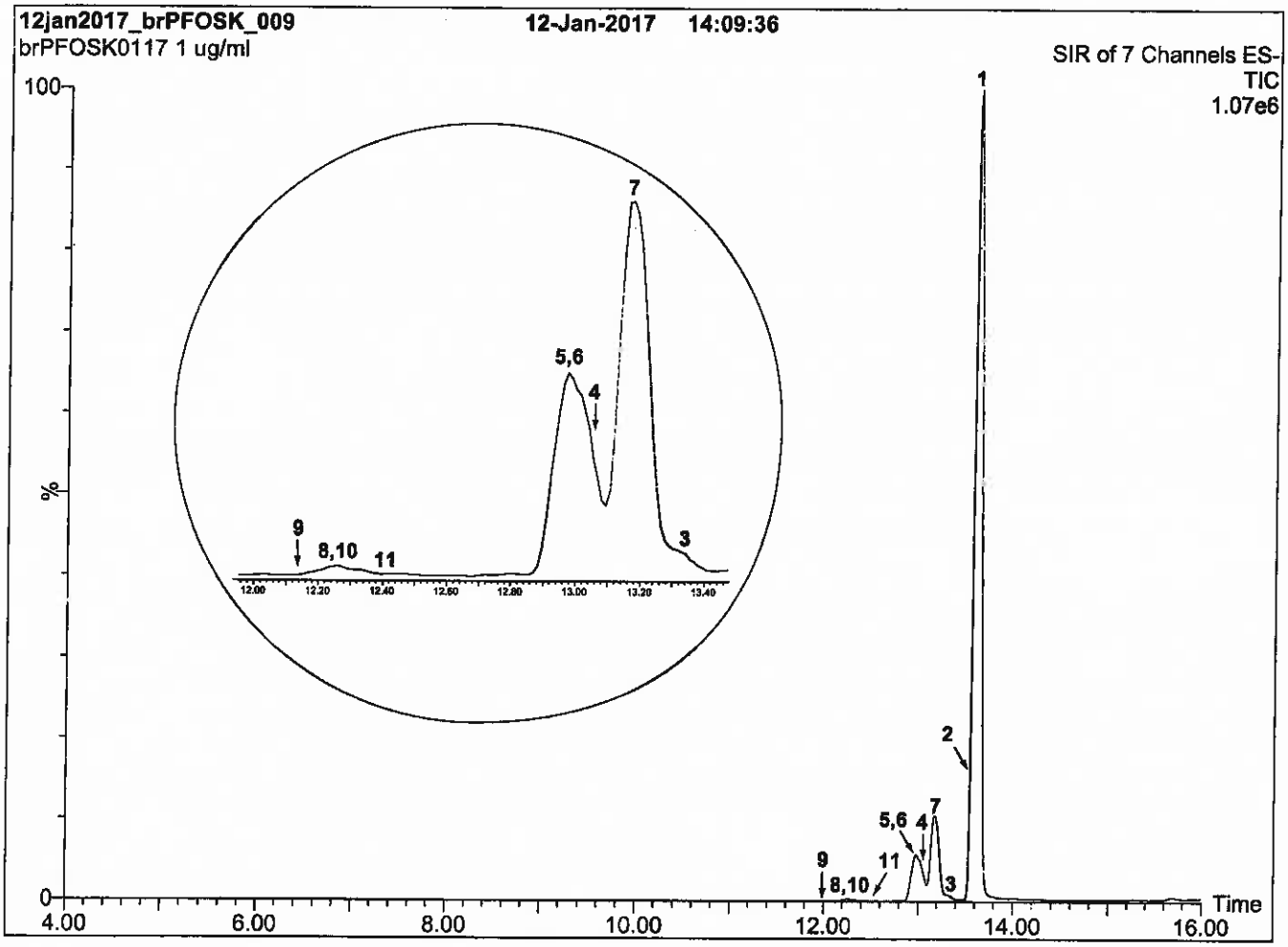
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

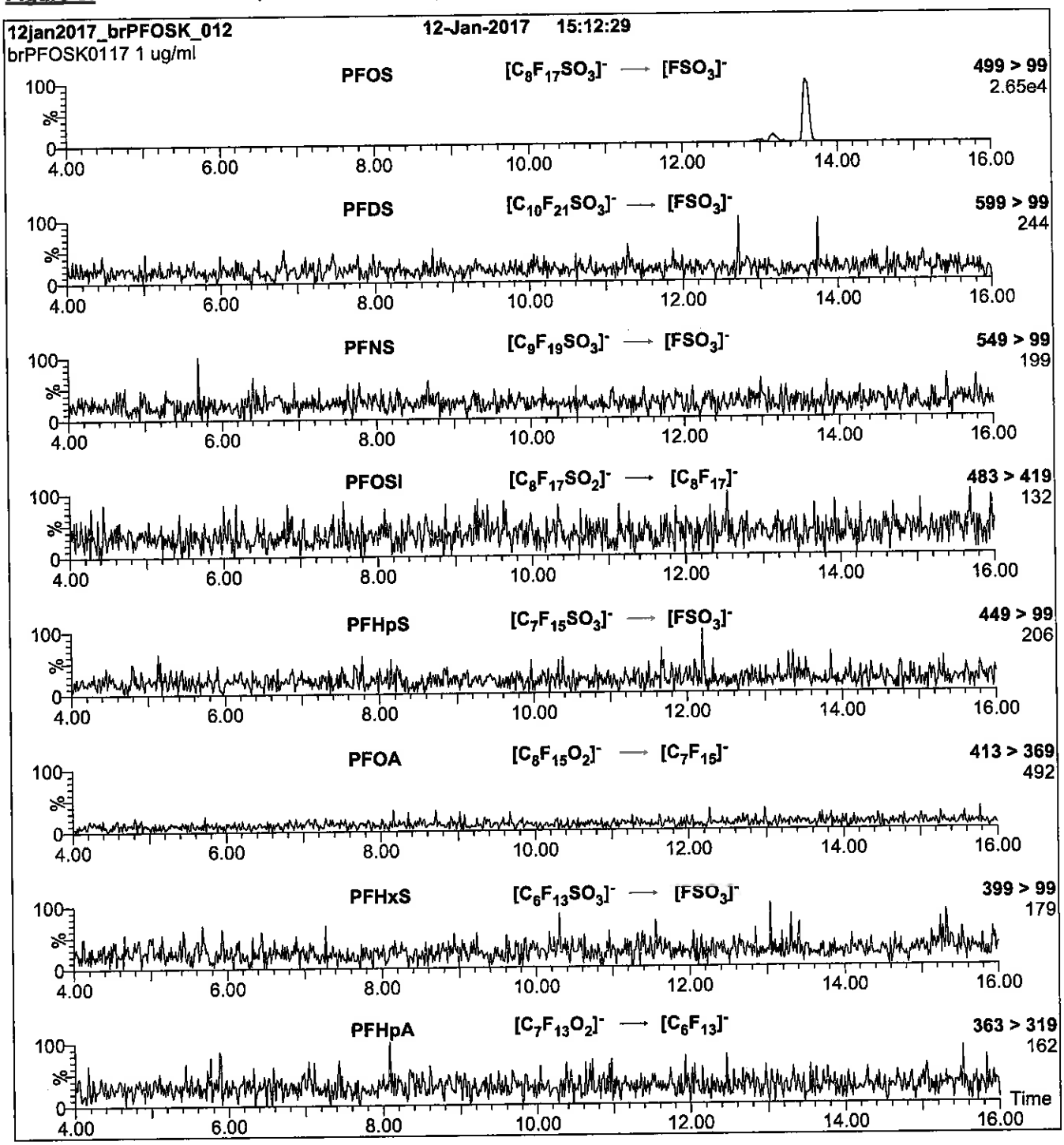
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00013

r: 2/6/16 SK

WELLINGTON LABORATORIES

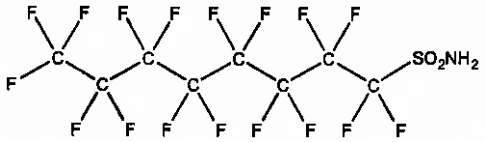
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0817I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA: $C_8H_2F_{17}NO_2S$
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/01/2017
EXPIRY DATE: (mm/dd/yyyy) 09/01/2022
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 499.14
SOLVENT(S): Isopropanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 09/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED

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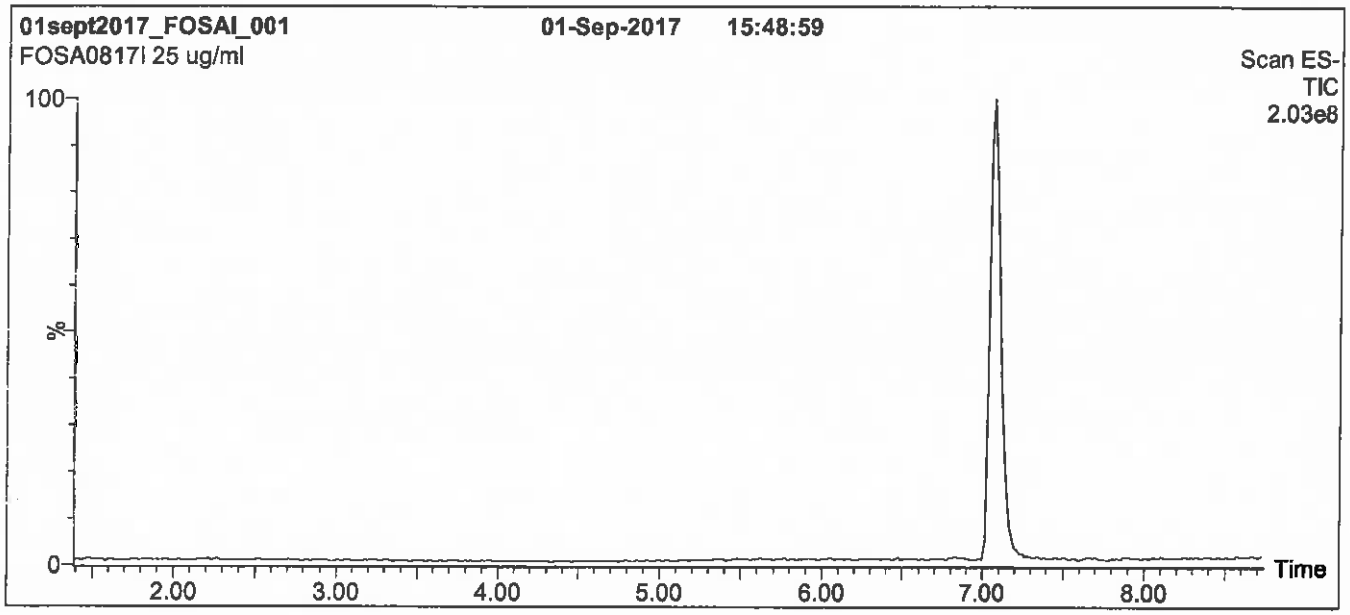
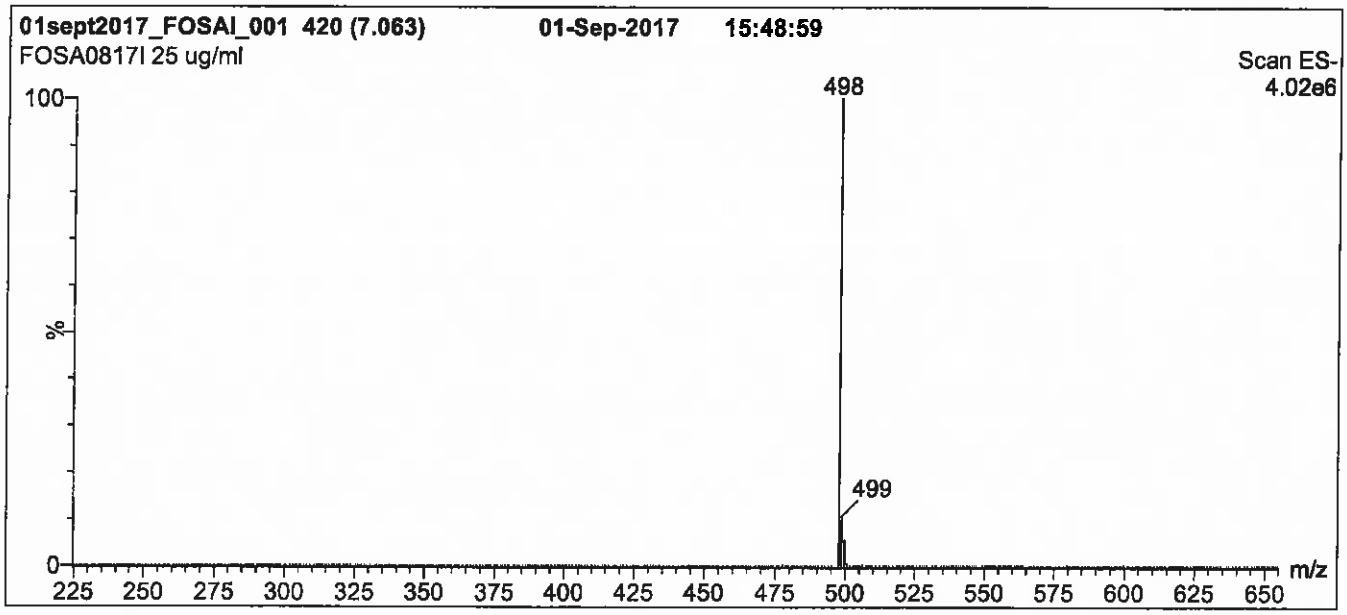
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

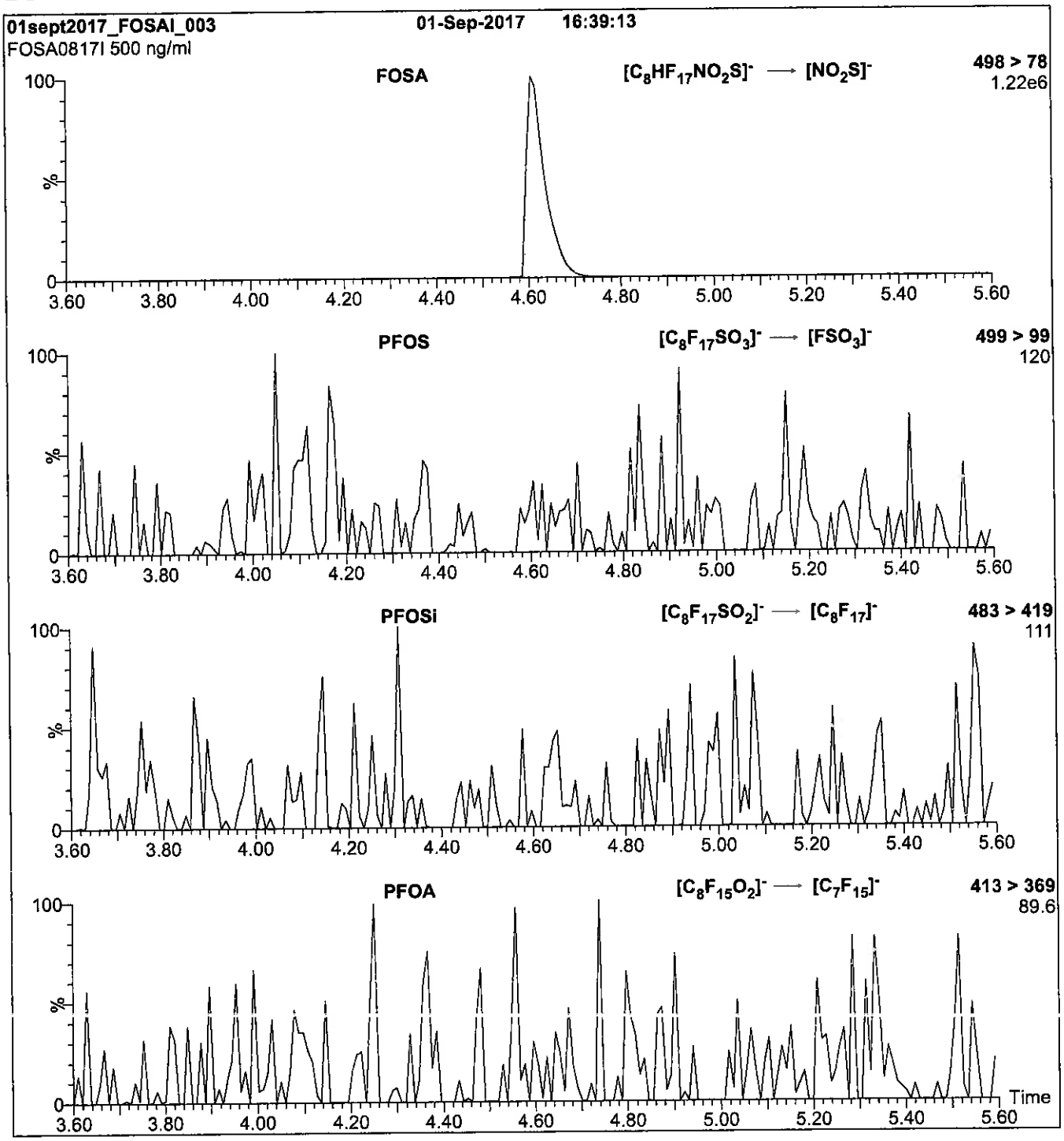
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml FOSA-I)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00008

r: 10/20/17 SV

WELLINGTON LABORATORIES

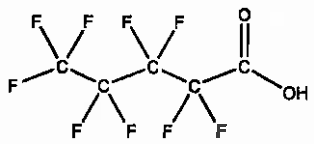
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0617

STRUCTURE:

CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 264.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/14/2017
EXPIRY DATE: (mm/dd/yyyy) 06/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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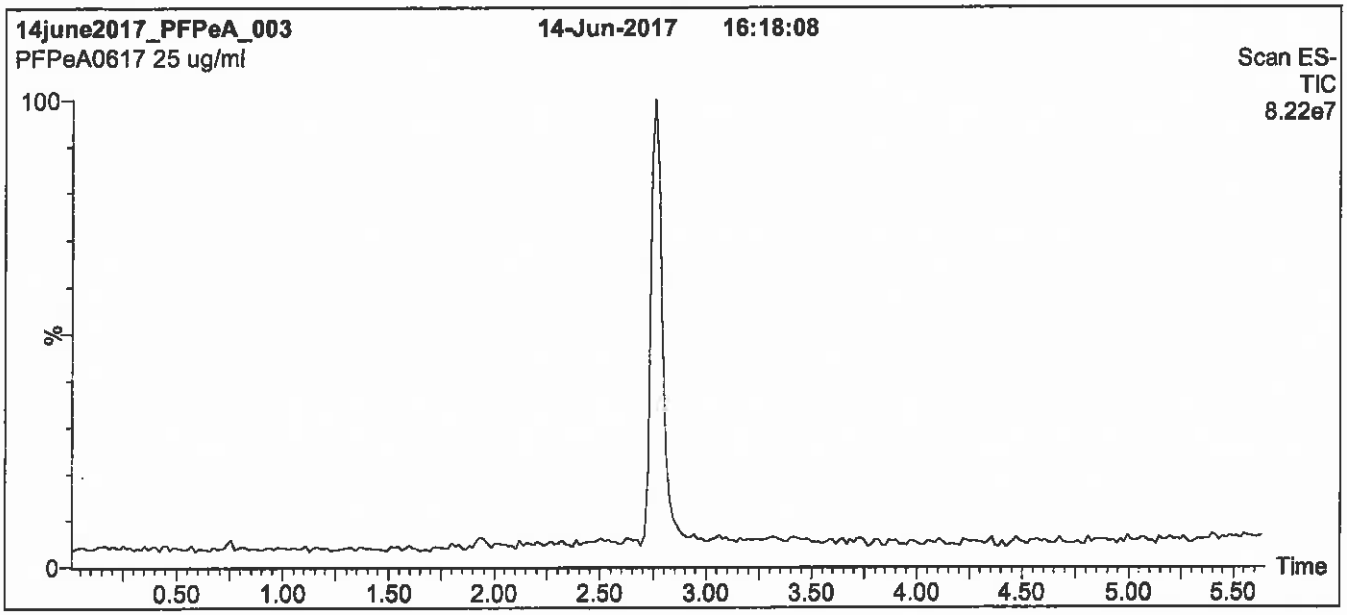
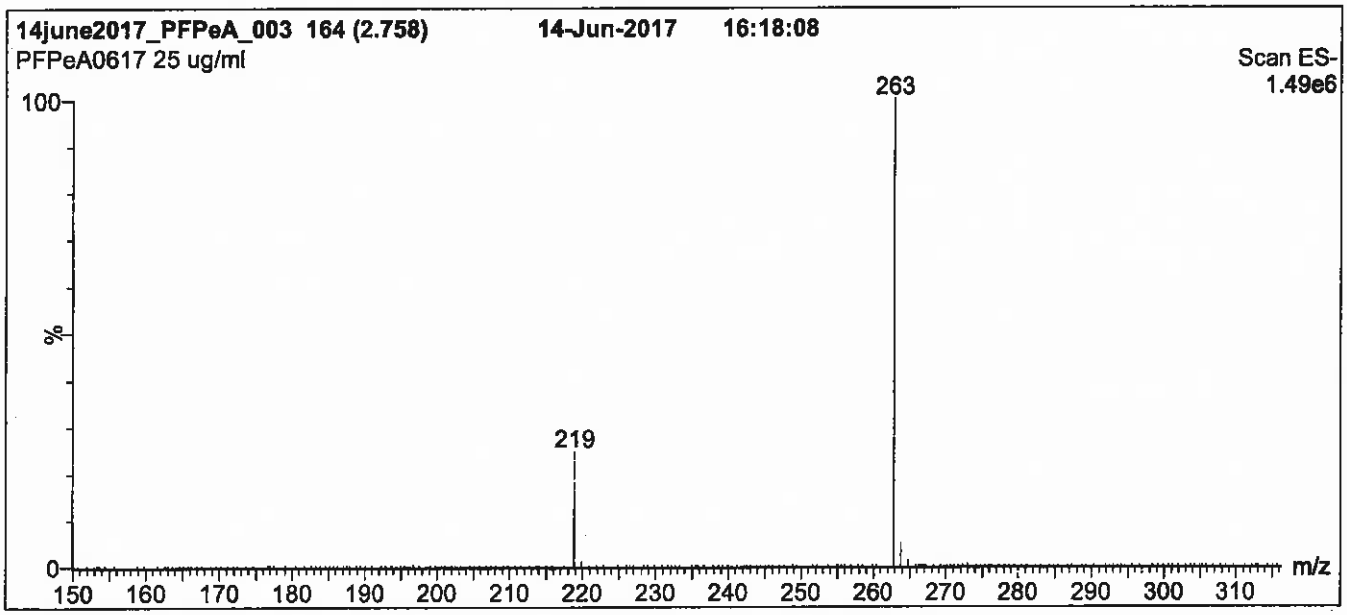
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

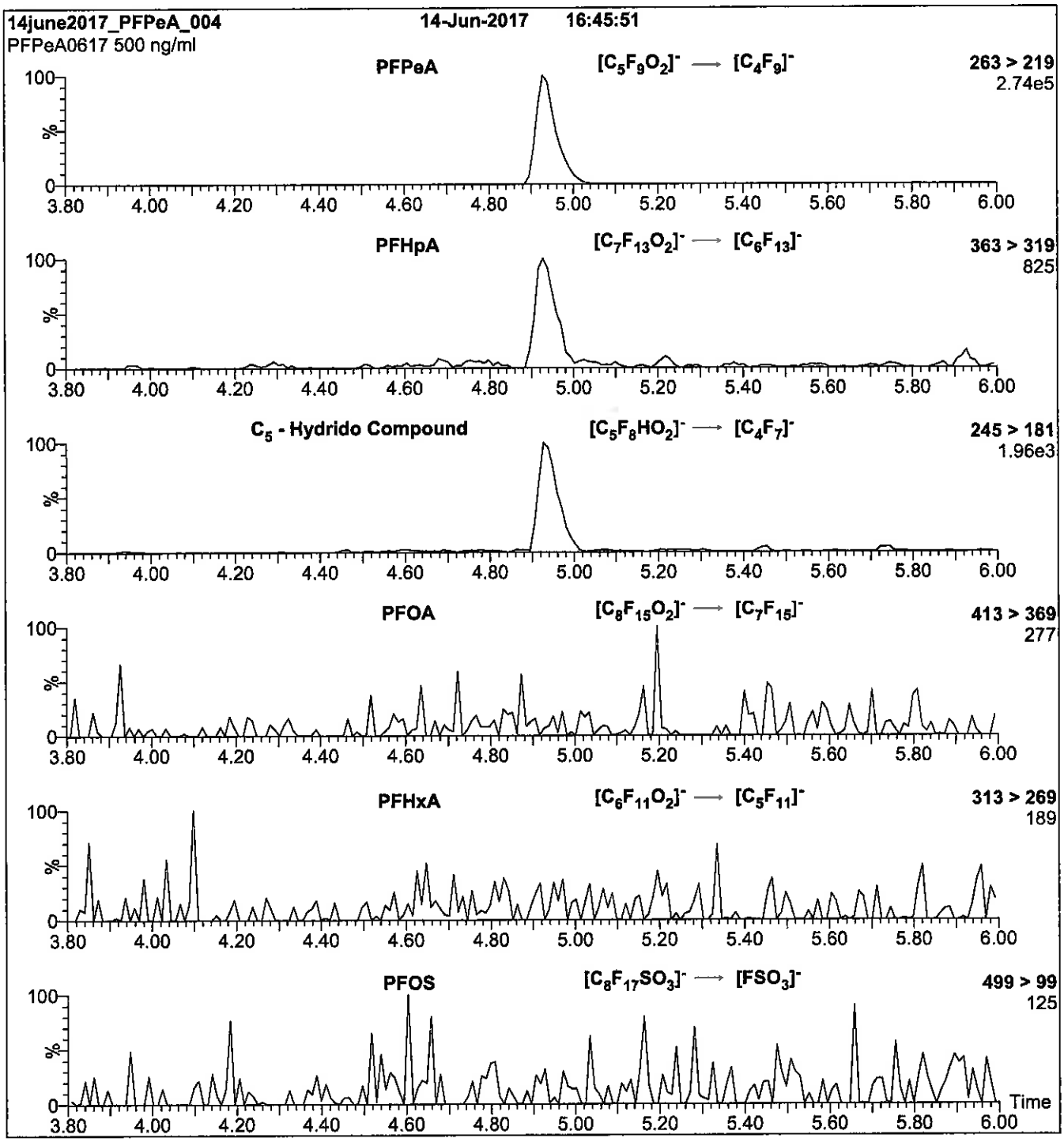
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFPeA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCPFPeA_00010

r: 10/20/17 SV

WELLINGTON LABORATORIES

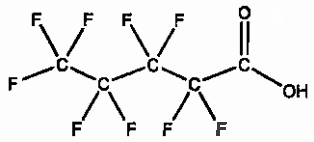
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0617

STRUCTURE:

CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 264.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/14/2017
EXPIRY DATE: (mm/dd/yyyy) 06/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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CALA

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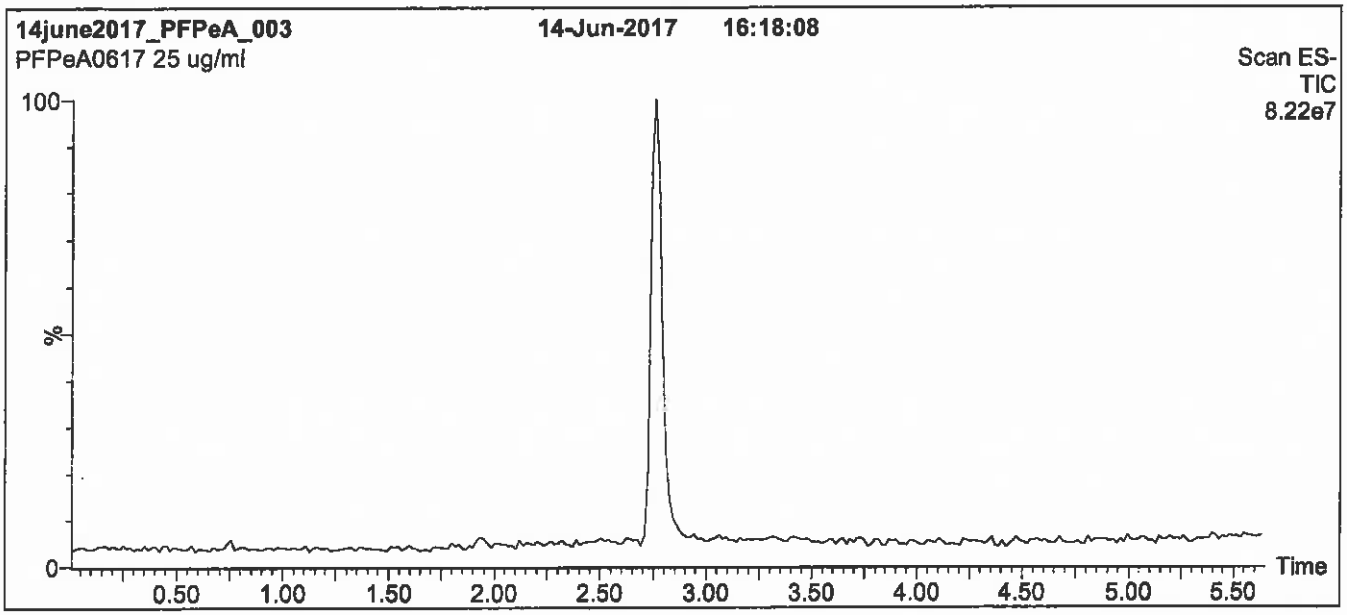
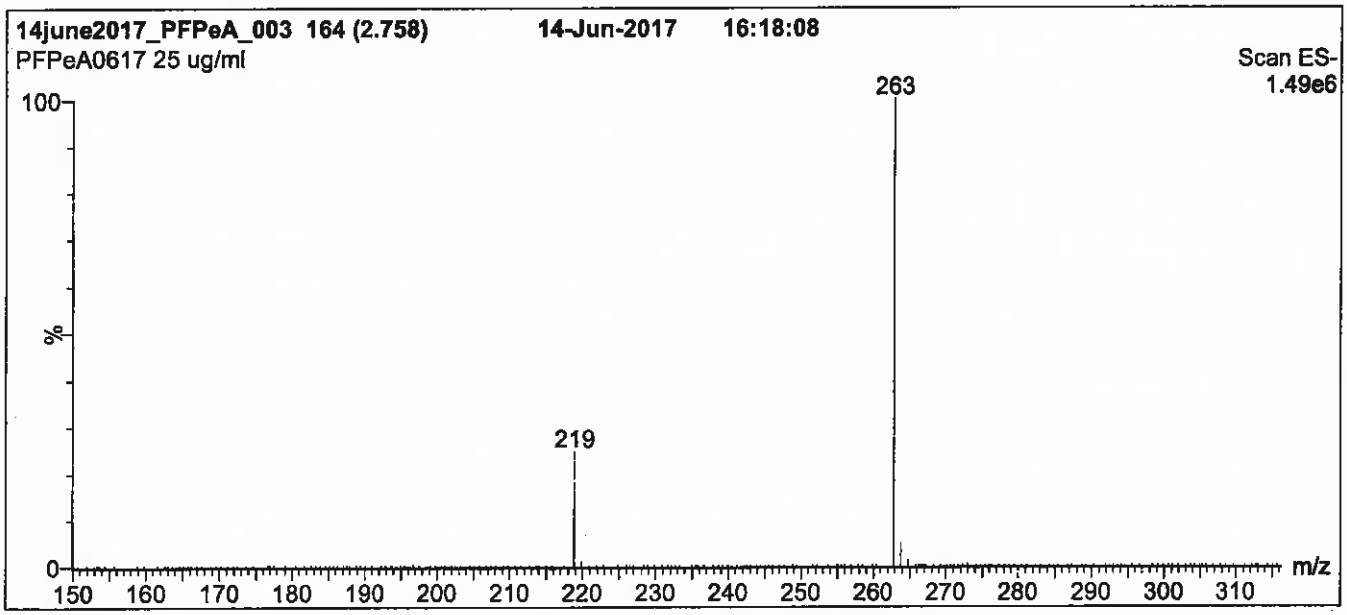




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

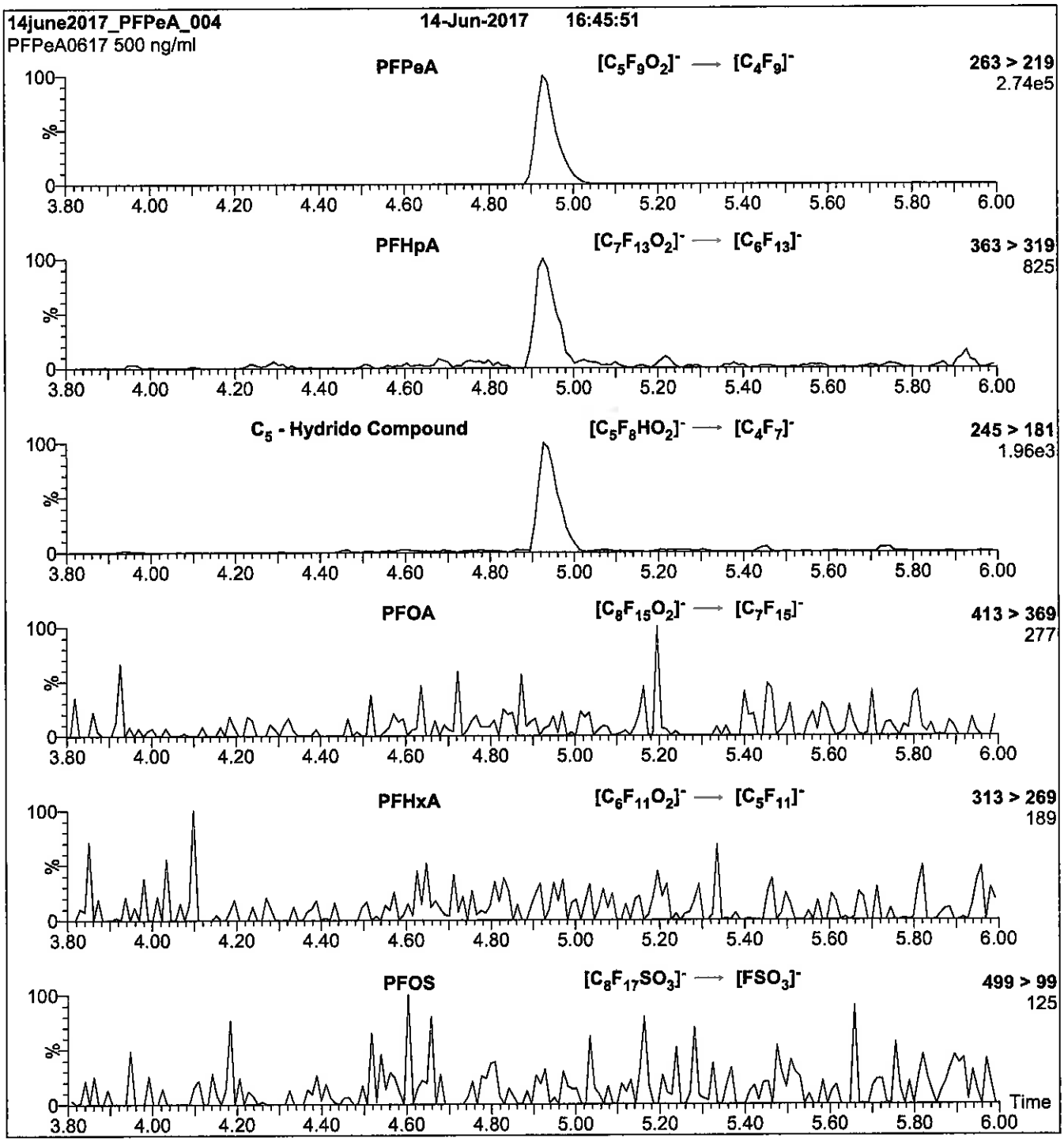
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFPeA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCPFPeS_00003

1106801
ID: LCPFPeS_00003
Exp: 01/11/22 Prpd: SKV
PF-1-pentanesulfonate Na

P: 12/4/17 SKV

WELLINGTON LABORATORIES

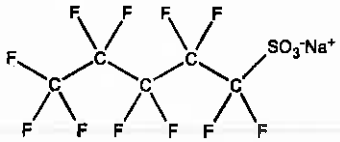
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate

LOT NUMBER: LPFPeS0117

STRUCTURE:

CAS #: 630402-22-1



MOLECULAR FORMULA: $C_5F_{11}SO_3Na$
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
46.9 ± 2.3 µg/ml (PFPeS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/11/2017
EXPIRY DATE: (mm/dd/yyyy) 01/11/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 372.09
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 09/06/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

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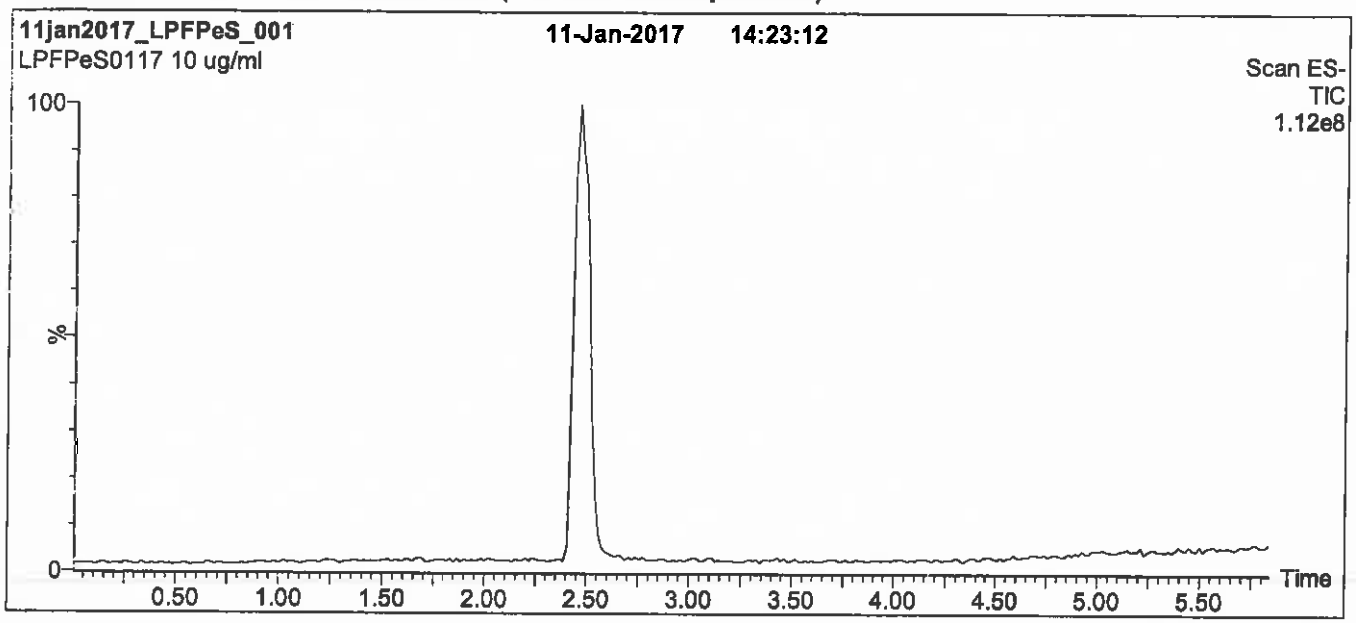
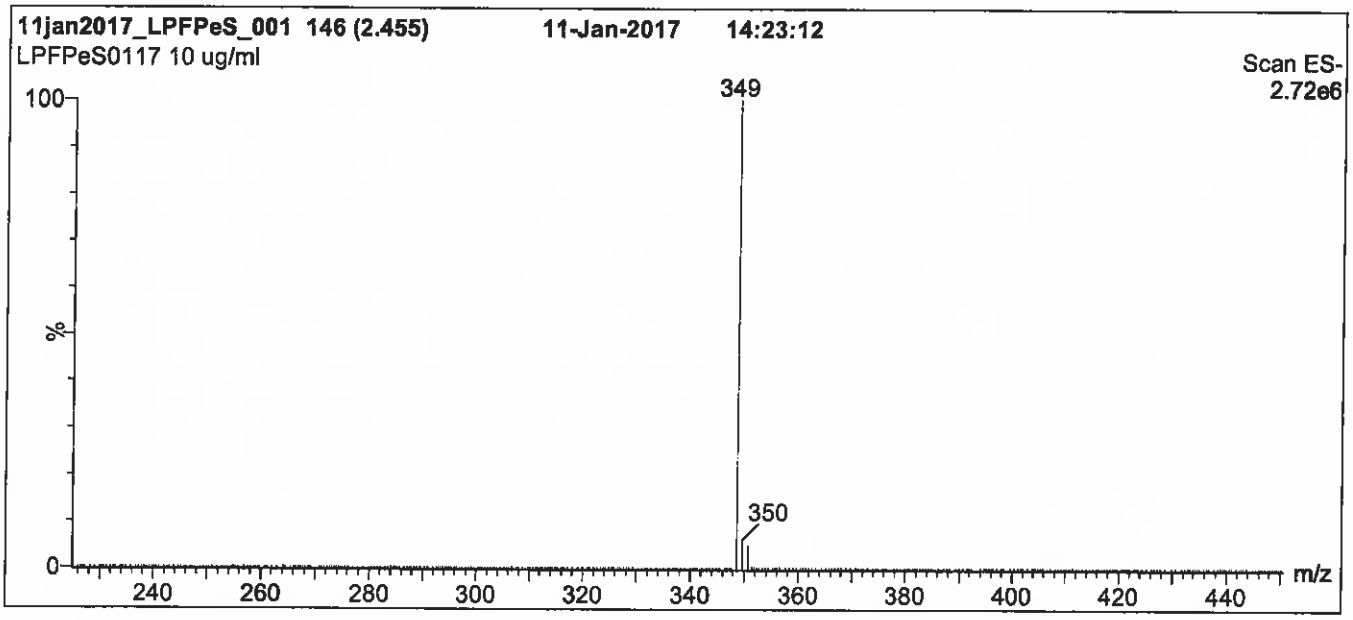
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions over 0.5 min.
Time: 10 min

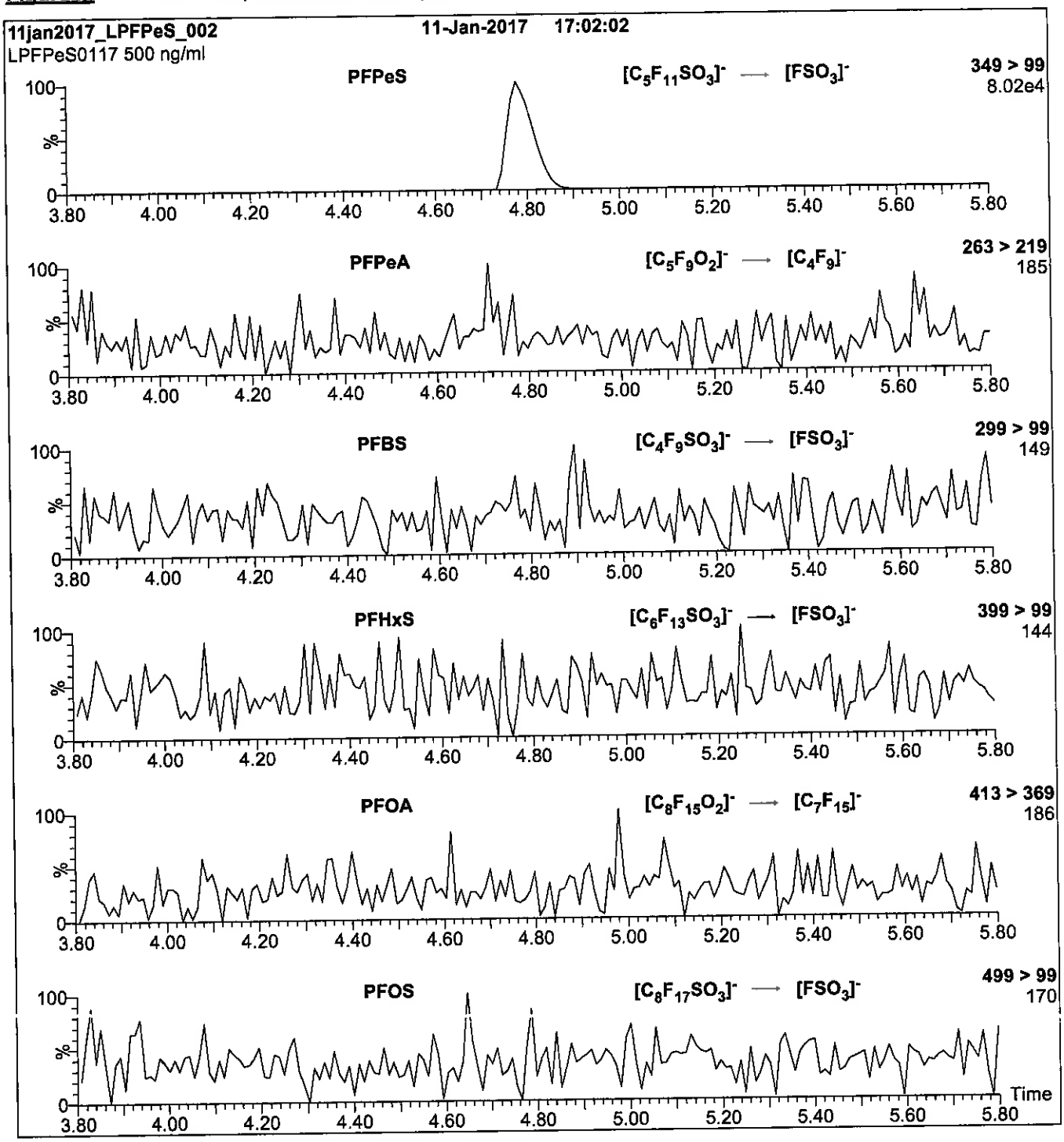
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

Reagent

LCPFTeDA_00008

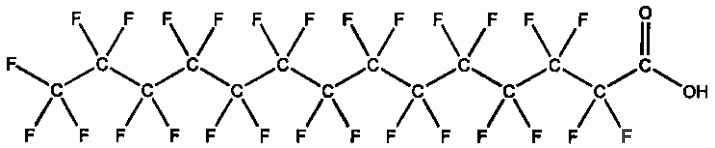
P: 9/21/17 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA0916
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

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Certified By: B.G. Chittim **Date:** 10/05/2016 (mm/dd/yyyy)

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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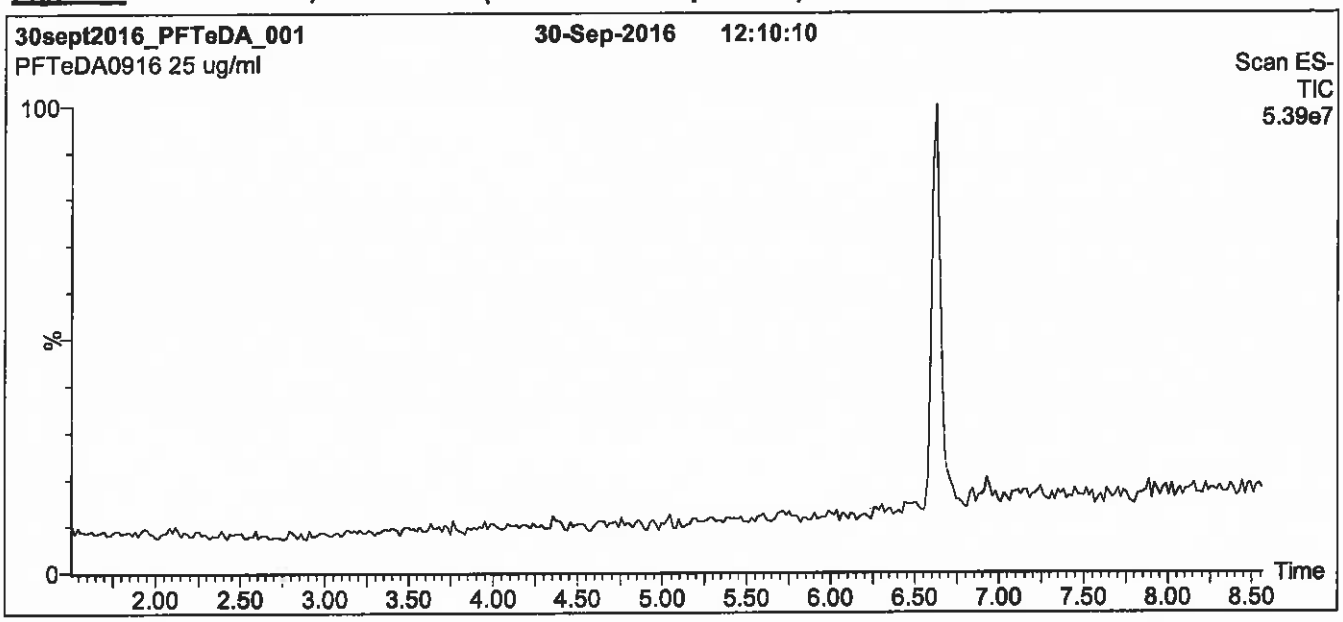
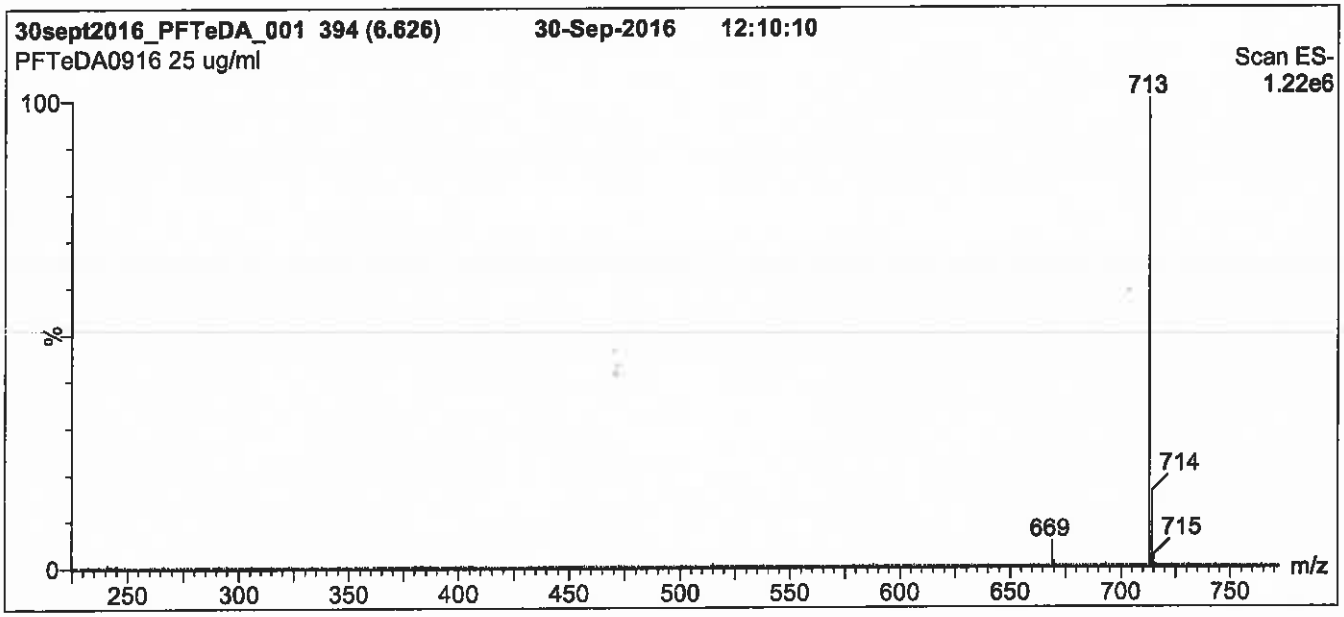
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

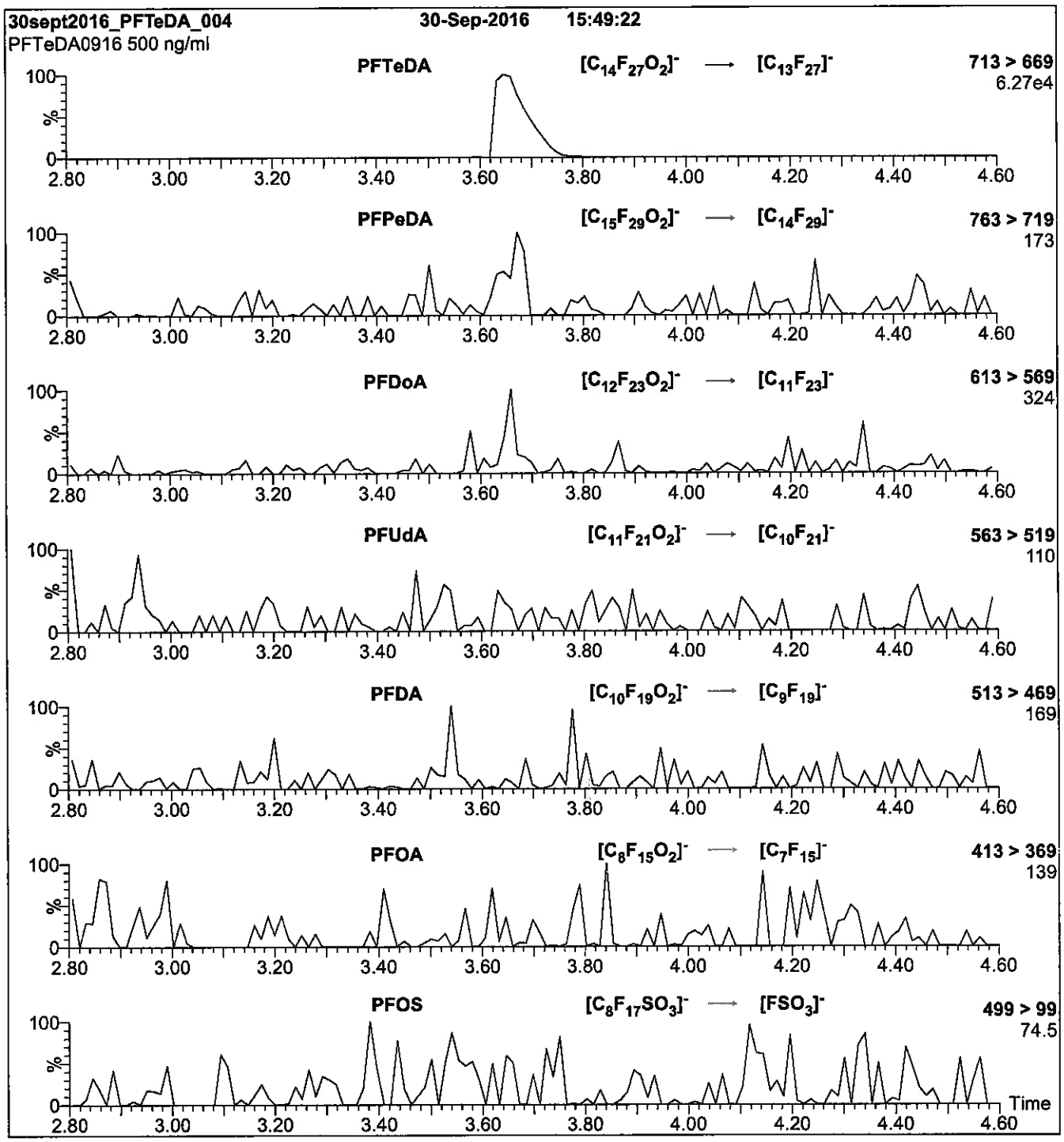
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00009

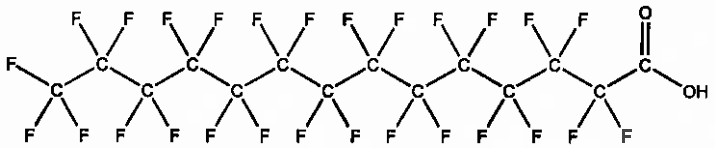
P: 9/21/17 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA0916
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/05/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

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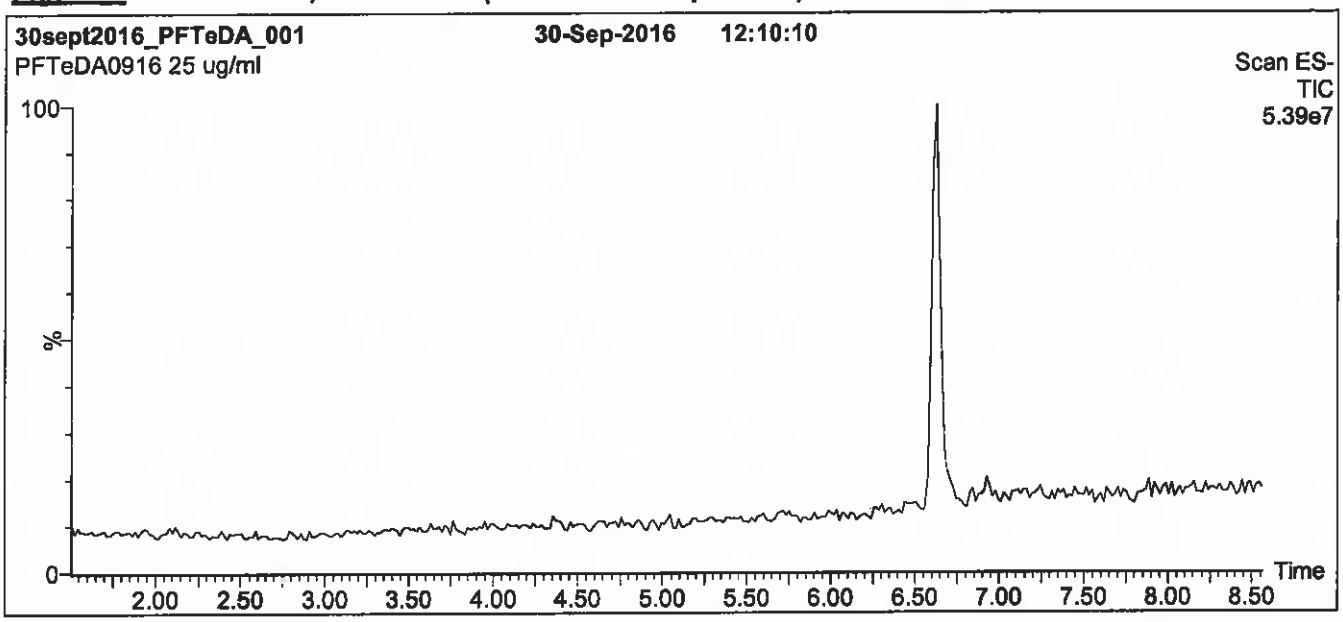

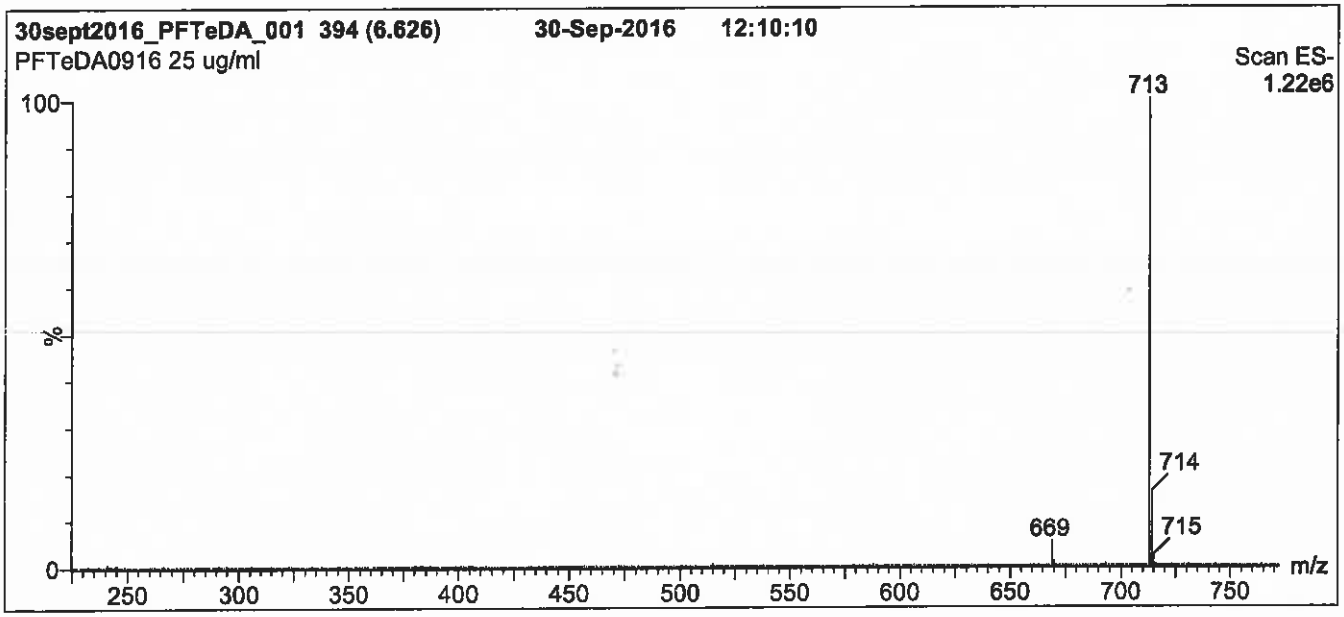

Conditions for Figure 1:

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MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
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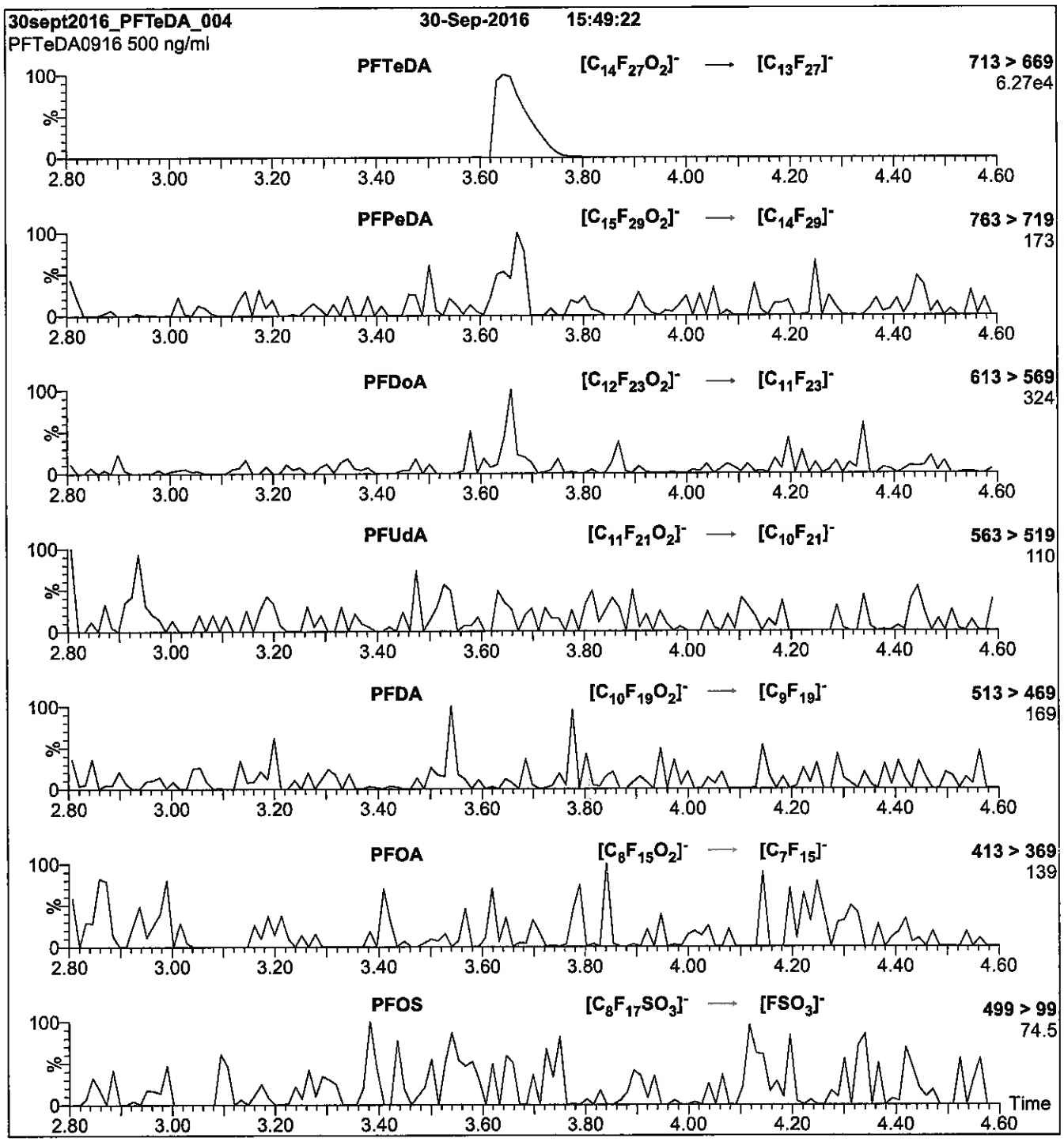
Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00008

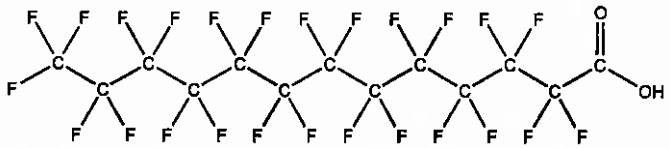
r: 9/21/17 SAN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid
LOT NUMBER: PFTrDA0517

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/02/2017
EXPIRY DATE: (mm/dd/yyyy) 05/02/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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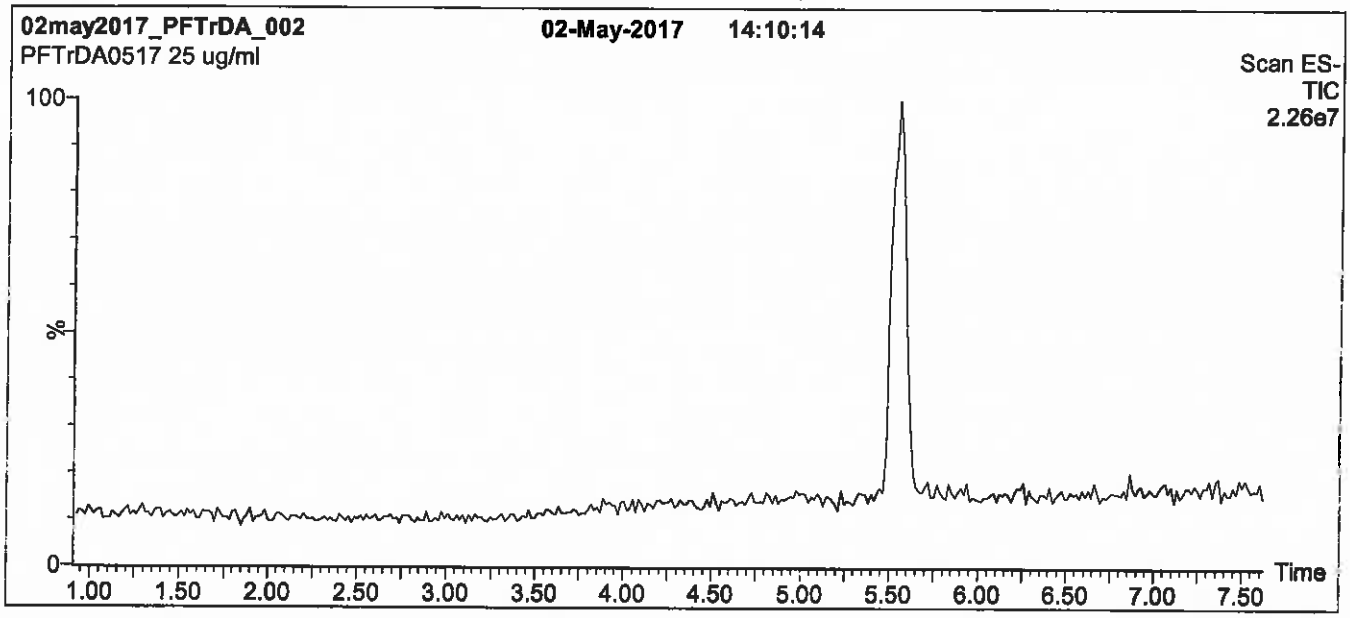
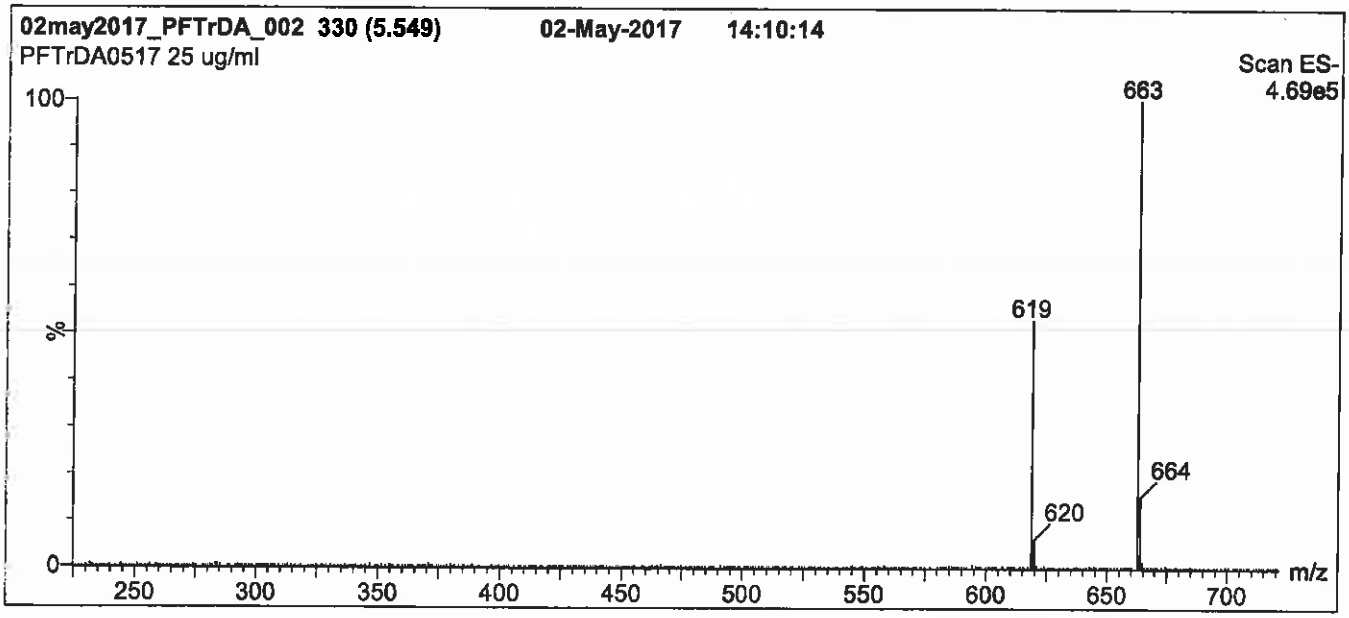
Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

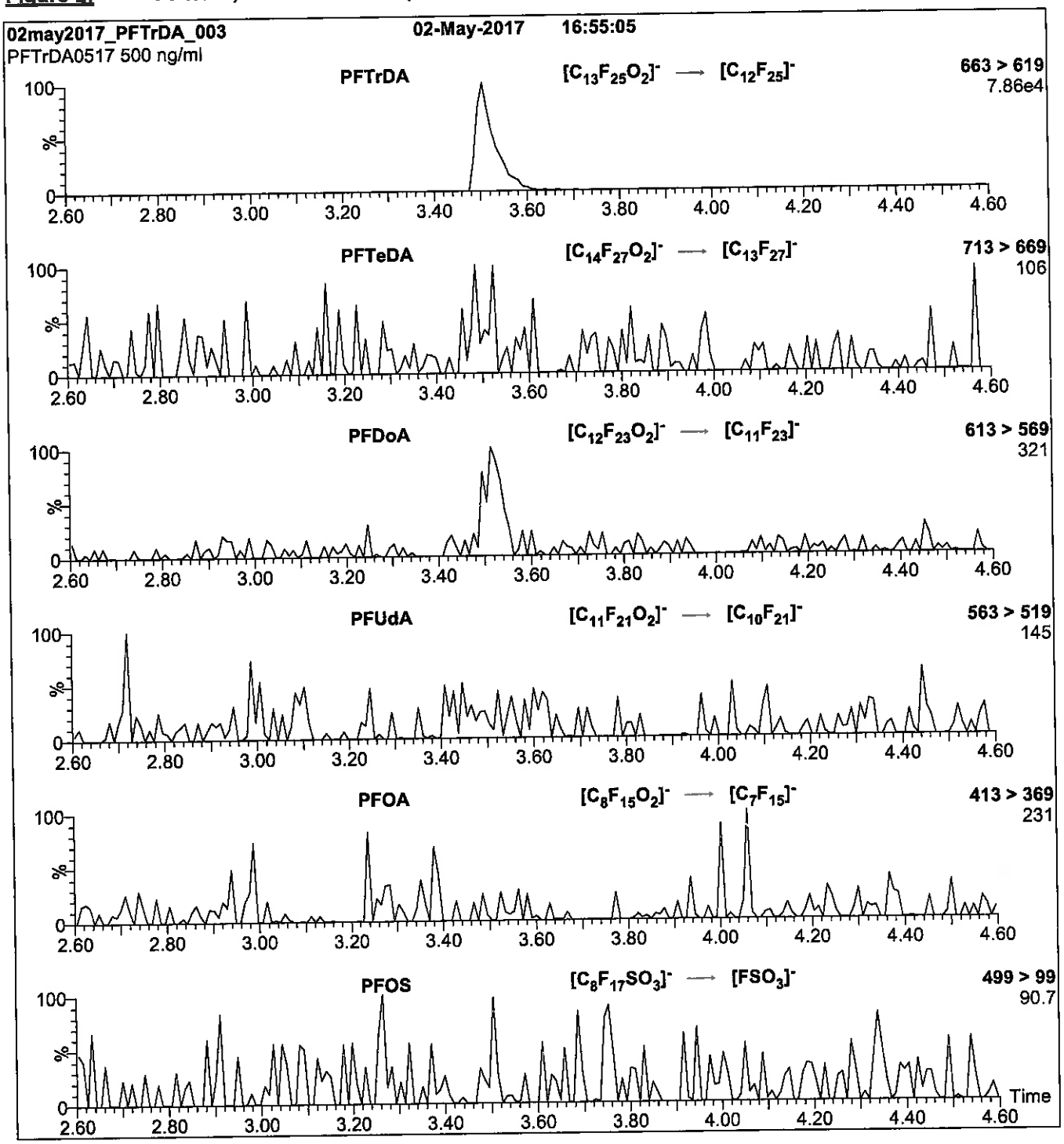
Flow: 300 µl/min .

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 15

Reagent

LCPFTrDA_00009

r: 9/21/17 SAN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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COMPOUND: Perfluoro-n-tridecanoic acid
LOT NUMBER: PFTrDA0517

STRUCTURE:
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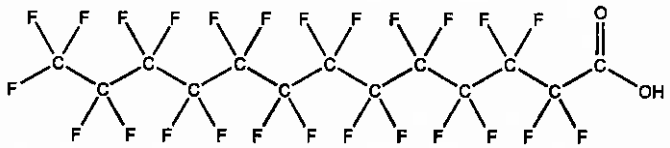

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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

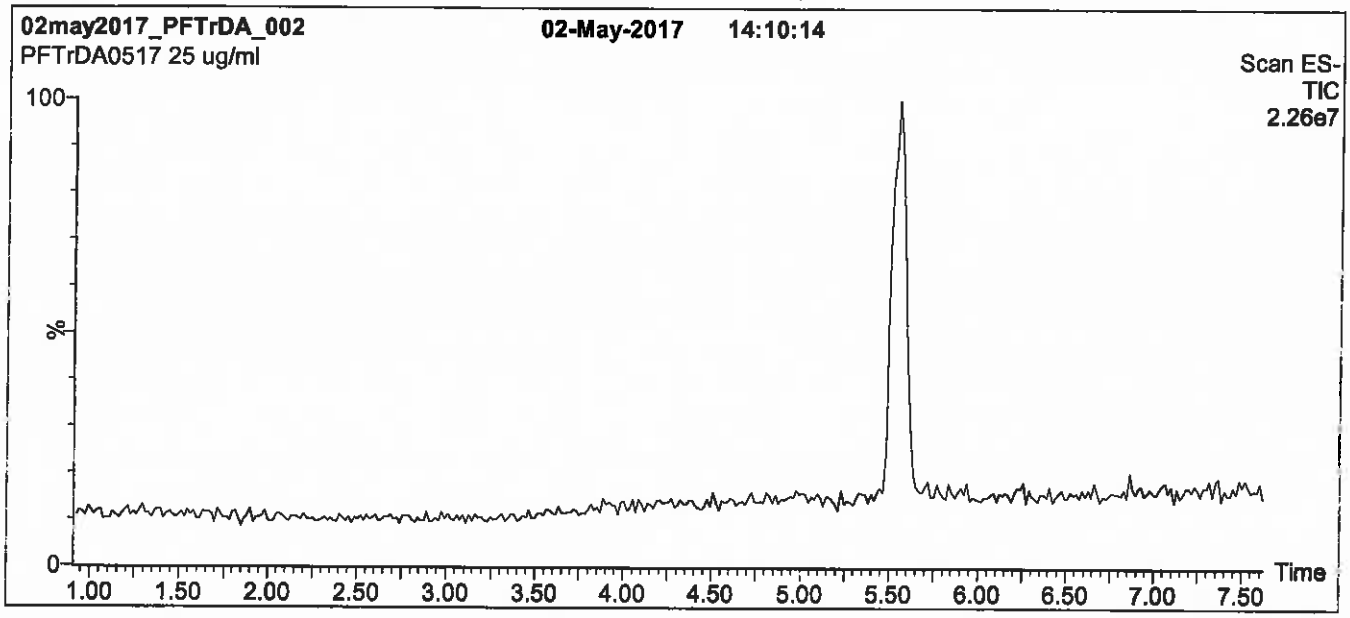
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

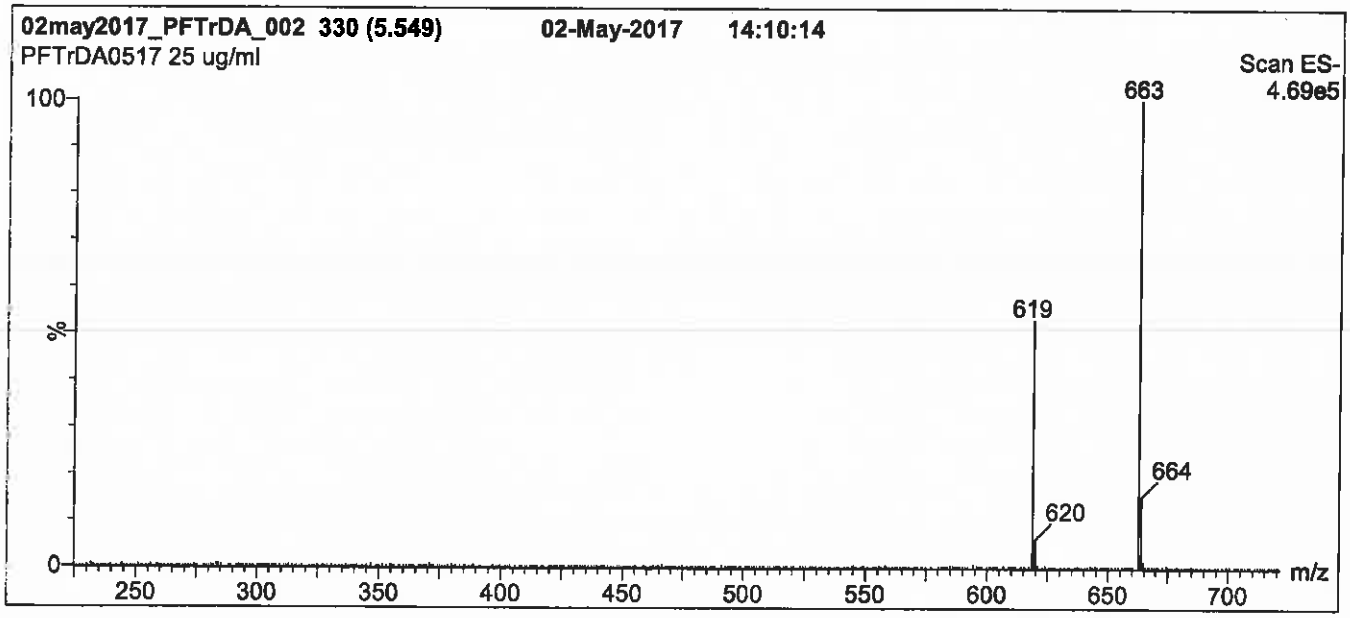
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

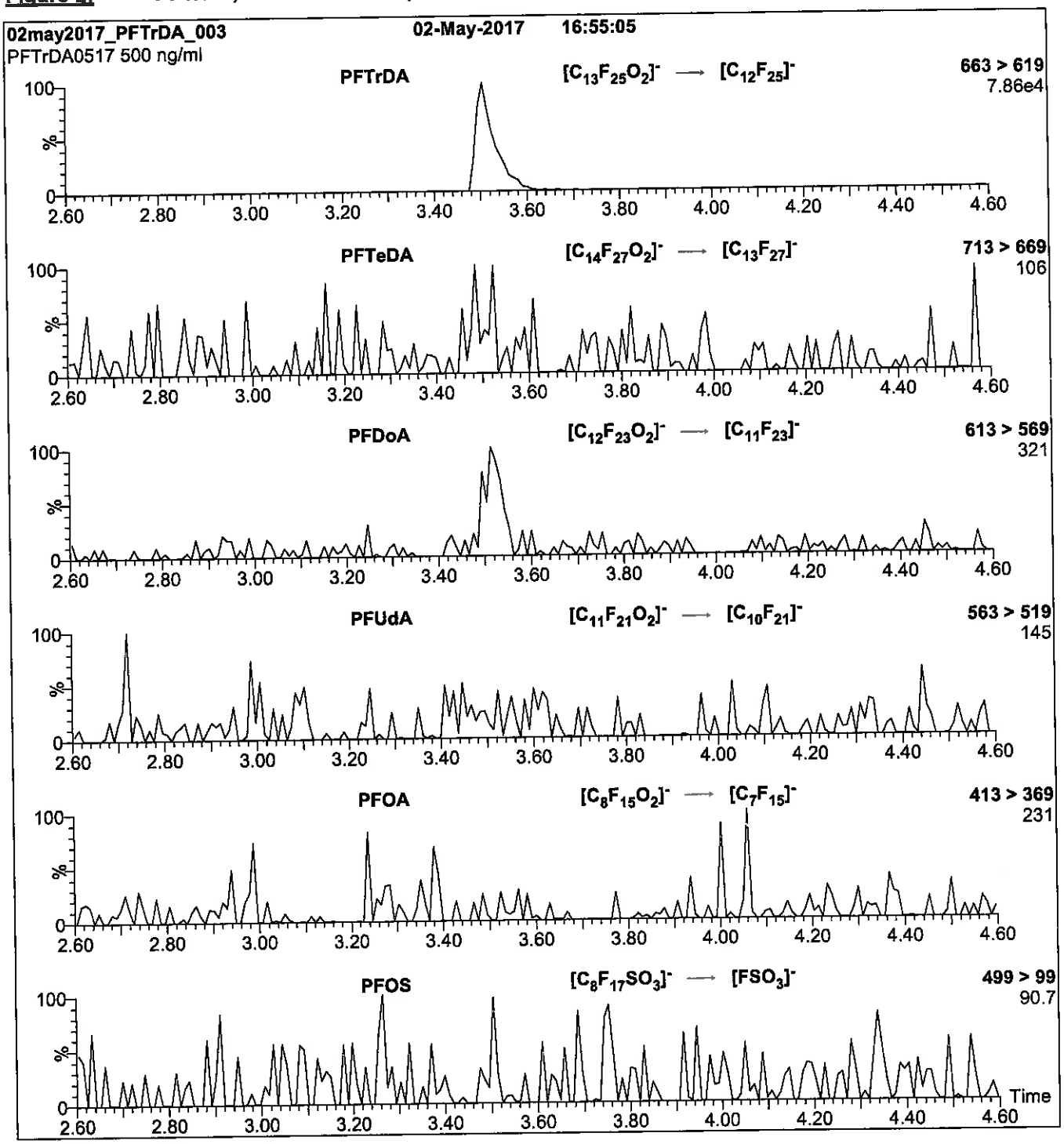
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00008

r: 9/2/17 SKJ

WELLINGTON LABORATORIES

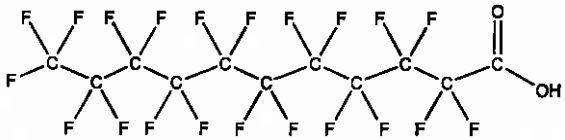
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid

LOT NUMBER: PFUdA1016

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 564.09
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/18/2016
EXPIRY DATE: (mm/dd/yyyy) 10/18/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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LIMITED WARRANTY:

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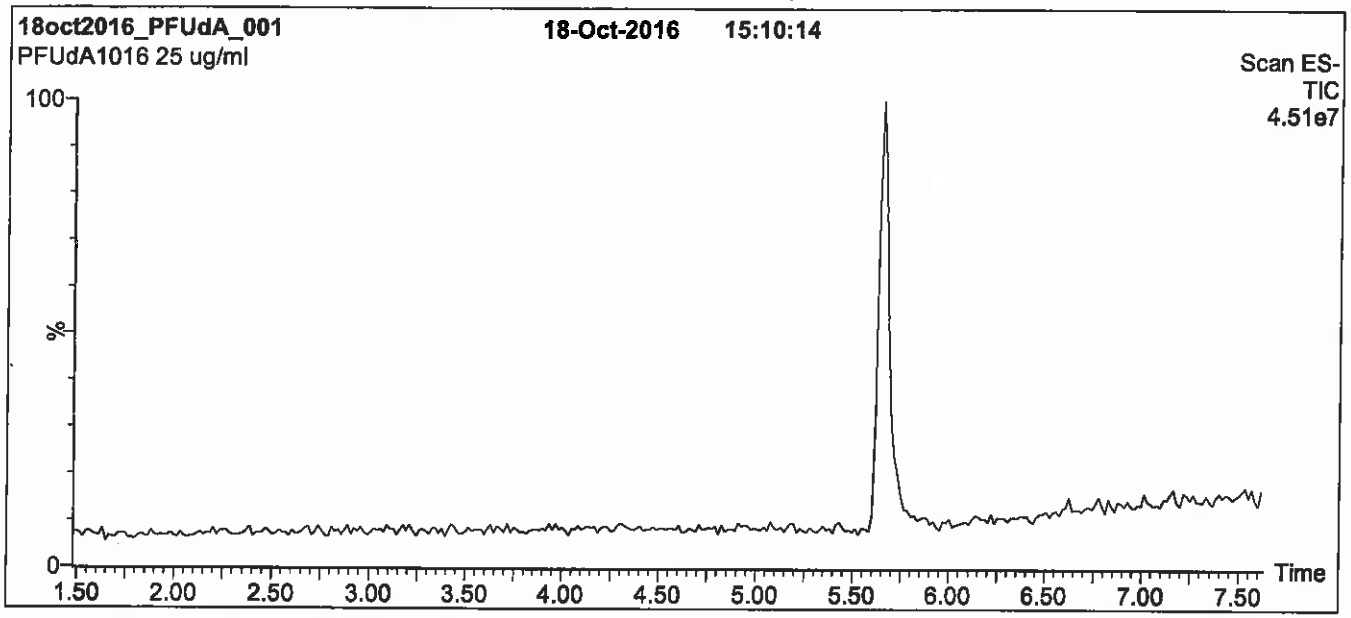
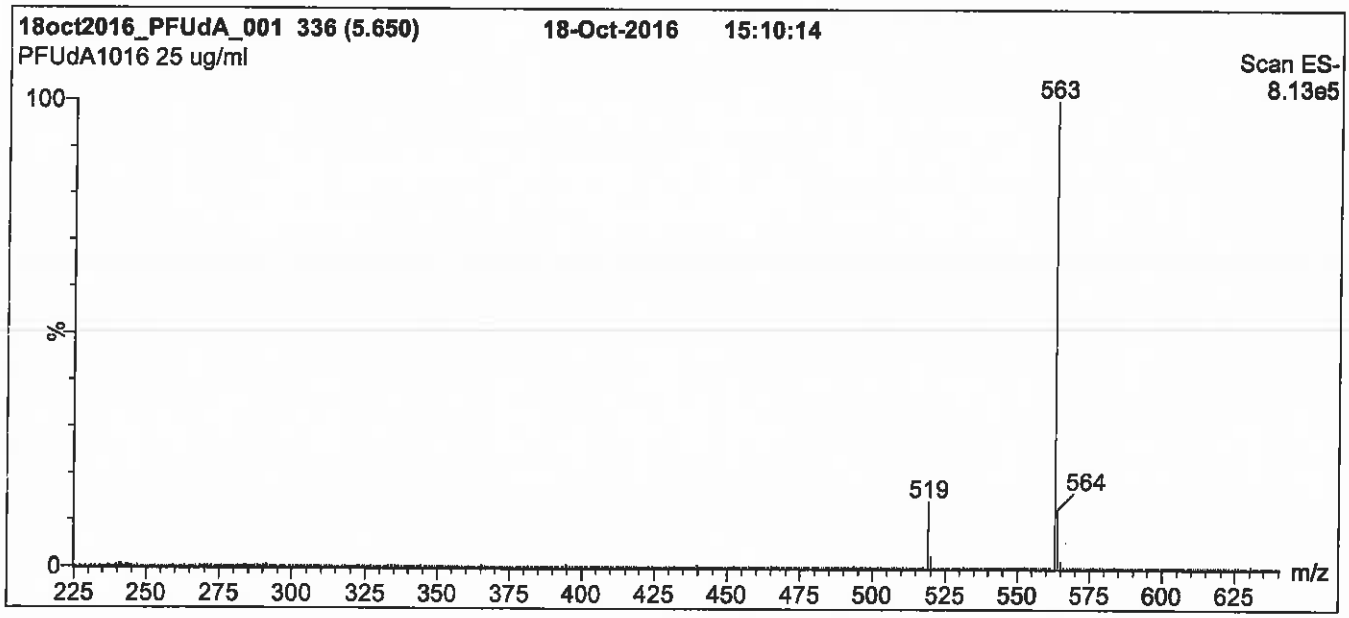
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

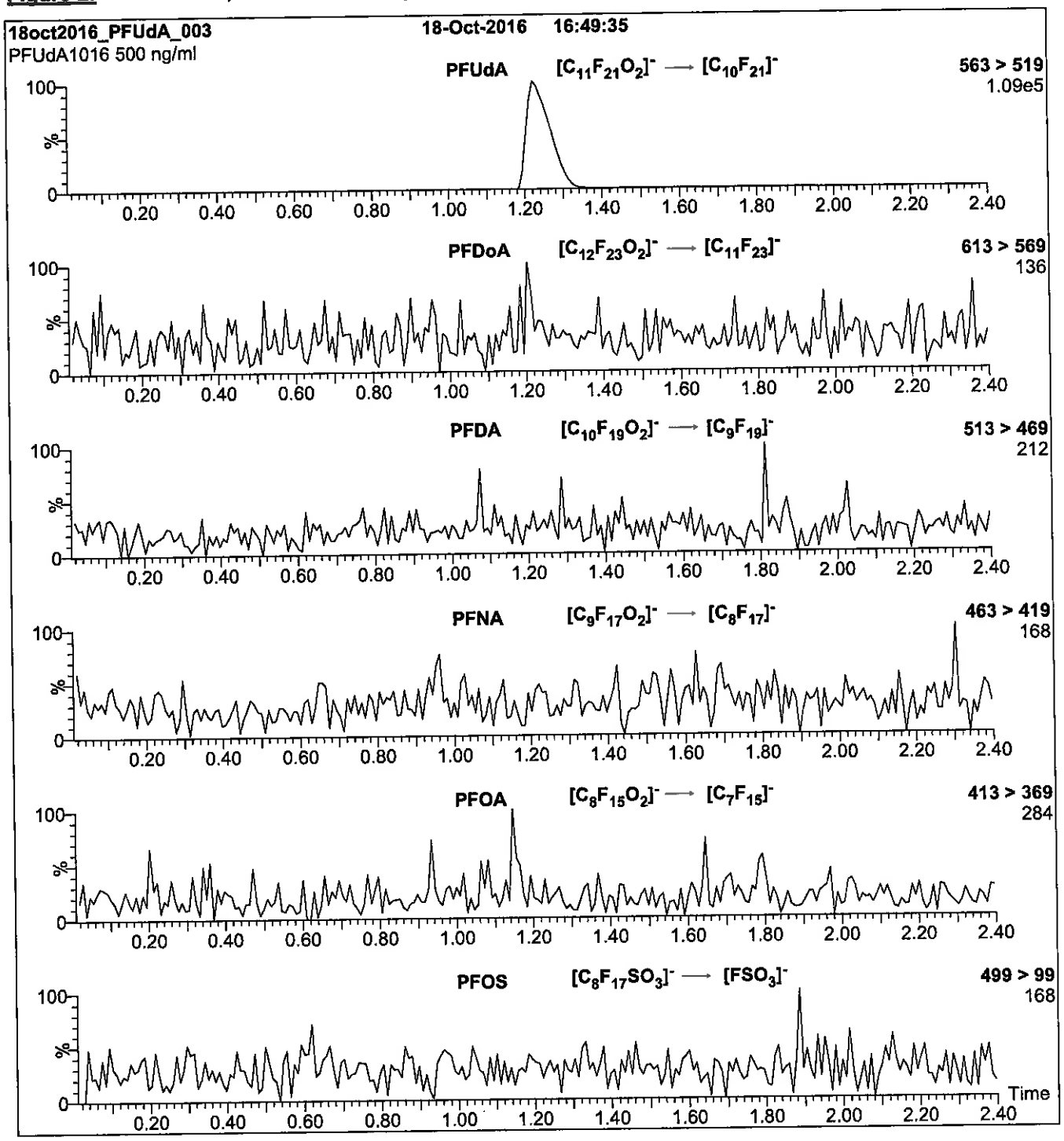
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Reagent

MV-567650_00027

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ISO Guide 34 Accredited
Reference Material Producer
Certificate #3222.01

ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 567650 **Lot No.:** A0124069

Description : 8260 Surrogate Standard

8260 Surrogate Standard 2,500 ug/ml, P&T Methanol, 5 ml/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2022 **Storage:** 0°C or colder

C E R T I F I E D V A L U E S

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Dibromofluoromethane		2,521.2 µg/mL	+/- 14.6582	µg/mL	Gravimetric
	CAS # 1868-53-7	(Lot 0012016)		+/- 141.3584	µg/mL	Unstressed
	Purity 99%			+/- 144.6660	µg/mL	Stressed
2	1,2-Dichloroethane-d4		2,513.8 µg/mL	+/- 14.6157	µg/mL	Gravimetric
	CAS # 17060-07-0	(Lot PR-25433)		+/- 140.9489	µg/mL	Unstressed
	Purity 98%			+/- 144.2469	µg/mL	Stressed
3	Toluene-d8		2,519.4 µg/mL	+/- 14.6480	µg/mL	Gravimetric
	CAS # 2037-26-5	(Lot PR-27311)		+/- 141.2603	µg/mL	Unstressed
	Purity 99%			+/- 144.5656	µg/mL	Stressed
4	1-Bromo-4-fluorobenzene (BFB)		2,520.8 µg/mL	+/- 14.6559	µg/mL	Gravimetric
	CAS # 460-00-4	(Lot 20401KOV)		+/- 141.3360	µg/mL	Unstressed
	Purity 99%			+/- 144.6430	µg/mL	Stressed

Solvent: P&T Methanol
CAS # 67-56-1
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

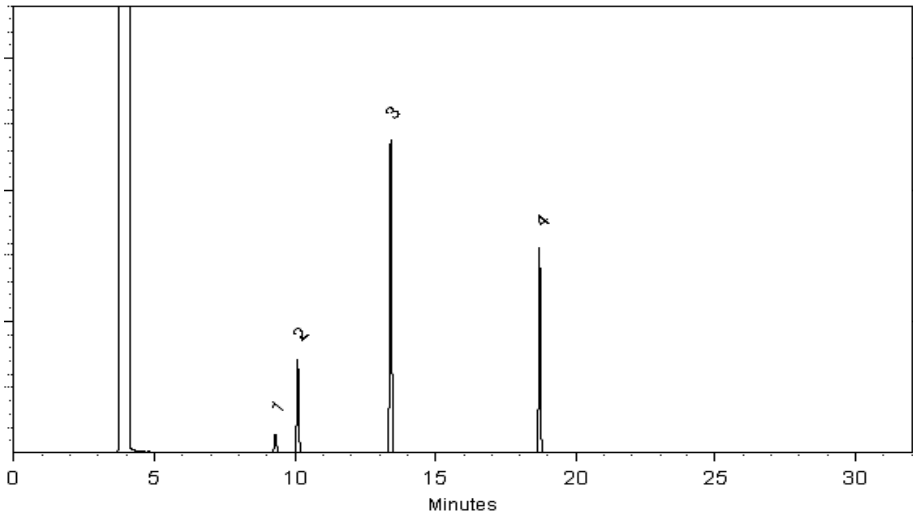
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Isaiah Harrison - Mix Technician

Date Mixed: 09-Jan-2017 **Balance:** 1128342314

Amanda Miller - Operations Tech-ARM QC

Date Passed: 11-Jan-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-568718-D_00014

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ISO Guide 34 Accredited
Reference Material Producer
Certificate #3222.01

ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

rec'd 3/1/18

Catalog No. : 568718 **Lot No.:** A0127975

Description : 8260 Internal Standard 2014

8260 Internal Standard 2014 250-5,000 ug/ml, P&T Methanol, 5 ml/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : May 31, 2022 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)		Expanded Uncertainty (95% C.L.; K=2)			
1	tert-Butyl-d9-alcohol		5,022.1	µg/mL	+/-	29.1976	µg/mL	Gravimetric
	CAS # 25725-11-5	(Lot I-201)			+/-	107.5241	µg/mL	Unstressed
	Purity 99%				+/-	110.6500	µg/mL	Stressed
2	2-Butanone-d5		1,257.5	µg/mL	+/-	7.3114	µg/mL	Gravimetric
	CAS # 24313-50-6	(Lot M-276)			+/-	26.9239	µg/mL	Unstressed
	Purity 99%				+/-	27.7067	µg/mL	Stressed
3	Fluorobenzene		250.8	µg/mL	+/-	1.4613	µg/mL	Gravimetric
	CAS # 462-06-6	(Lot BCBK8171V)			+/-	5.3699	µg/mL	Unstressed
	Purity 99%				+/-	5.5259	µg/mL	Stressed
4	1,4-Dioxane-d8		5,009.4	µg/mL	+/-	29.1236	µg/mL	Gravimetric
	CAS # 17647-74-4	(Lot I-19942)			+/-	107.2514	µg/mL	Unstressed
	Purity 99%				+/-	110.3694	µg/mL	Stressed
5	Chlorobenzene-d5		251.7	µg/mL	+/-	1.4666	µg/mL	Gravimetric
	CAS # 3114-55-4	(Lot PR-21944)			+/-	5.3891	µg/mL	Unstressed
	Purity 99%				+/-	5.5458	µg/mL	Stressed
6	1,4-Dichlorobenzene-d4		251.3	µg/mL	+/-	1.4645	µg/mL	Gravimetric
	CAS # 3855-82-1	(Lot PR-18488)			+/-	5.3813	µg/mL	Unstressed
	Purity 99%				+/-	5.5377	µg/mL	Stressed

Solvent: P&T Methanol/Water (90:10)
CAS # 67-56-1/7732-18-5
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

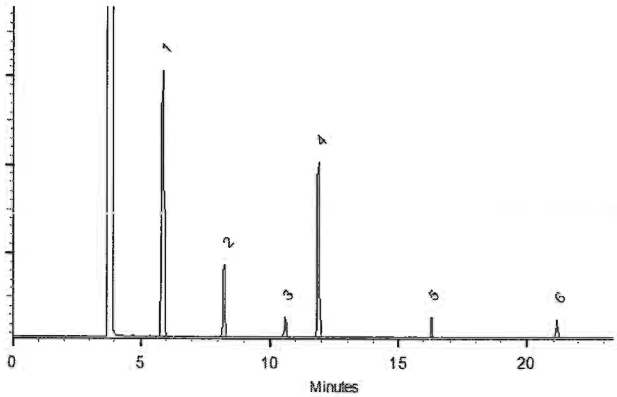
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Matt Fragassi - Mix Technician

Date Mixed: 30-May-2017 **Balance:** 1128342314

Justine Albertson - Operations Tech-ARM QC

Date Passed: 06-Jun-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
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Label Conditions	Standard Conditions	Non-Standard Conditions
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0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

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- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

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- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569721.sec_00005

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ISO Guide 34 Accredited
Reference Material Producer
Certificate #3222.01

ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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Catalog No. : 569721.sec **Lot No.:** A0123880

Description : 8260 List 1/ Std #2 Ketones (2015)

8260 List 1/ Std #2 Ketones (2015) 12,500 µg/ml, P&T Methanol/Water (90:10), 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

C E R T I F I E D V A L U E S

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Acetone **CAS #** 67-64-1.SEC (Lot P14A572) **Purity** 99%	12,501.6 µg/mL	+/- 73.1996 µg/mL +/- 754.3267 µg/mL +/- 756.1173 µg/mL	Gravimetric Unstressed Stressed
2	2-Butanone (MEK) **CAS #** 78-93-3.SEC (Lot RA58J) **Purity** 99%	12,503.6 µg/mL	+/- 73.2113 µg/mL +/- 754.4473 µg/mL +/- 756.2383 µg/mL	Gravimetric Unstressed Stressed
3	4-Methyl-2-pentanone (MIBK) **CAS #** 108-10-1.SEC (Lot E29T040) **Purity** 99%	12,506.0 µg/mL	+/- 73.2254 µg/mL +/- 754.5921 µg/mL +/- 756.3834 µg/mL	Gravimetric Unstressed Stressed
4	2-Hexanone **CAS #** 591-78-6.SEC (Lot V3NRA) **Purity** 99%	12,504.0 µg/mL	+/- 73.2137 µg/mL +/- 754.4715 µg/mL +/- 756.2625 µg/mL	Gravimetric Unstressed Stressed

Solvent: P&T Methanol/Water (90:10)
CAS # 67-56-1/7732-18-5
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

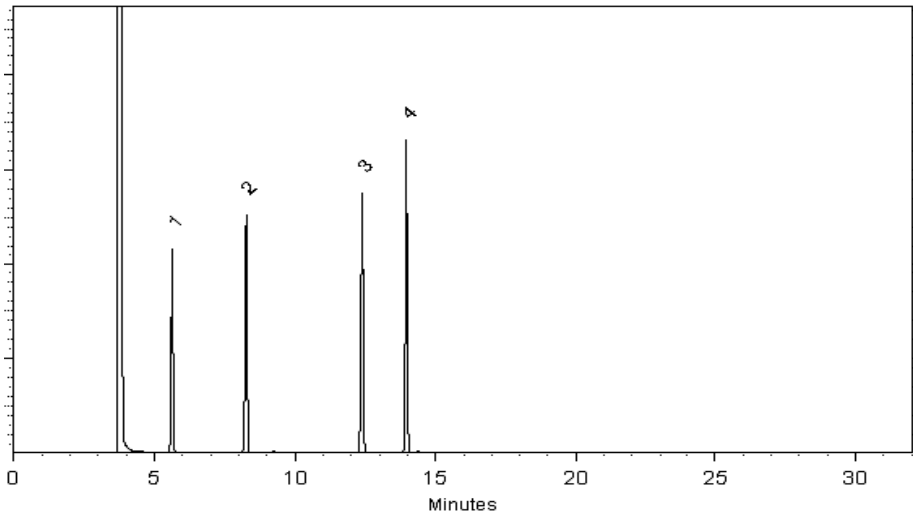
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Date Mixed: 03-Jan-2017 **Balance:** 1127510105

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 05-Jan-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569722.sec_00004

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ISO Guide 34 Accredited
Reference Material Producer
Certificate #3222.01

ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569722.SEC **Lot No.:** A0124116

Description : 8260 List 1 / Std #3 Gases (2015)

8260 List 1 / Std #3 Gases (2015) 2,500 ug/ml, P&T Methanol, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

C E R T I F I E D V A L U E S

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Dichlorodifluoromethane (CFC-12)	2,503.4 µg/mL	+/- 19.5506	µg/mL	Gravimetric
	CAS # 75-71-8.SEC (Lot 23586)		+/- 140.9699	µg/mL	Unstressed
	Purity 99%		+/- 144.2404	µg/mL	Stressed
2	Chloromethane (methyl chloride)	2,508.1 µg/mL	+/- 21.1963	µg/mL	Gravimetric
	CAS # 74-87-3.SEC (Lot 18343)		+/- 141.4639	µg/mL	Unstressed
	Purity 99%		+/- 144.7353	µg/mL	Stressed
3	Vinyl chloride	2,518.6 µg/mL	+/- 19.4186	µg/mL	Gravimetric
	CAS # 75-01-4.SEC (Lot MKBK6872V)		+/- 141.7924	µg/mL	Unstressed
	Purity 99%		+/- 145.0836	µg/mL	Stressed
4	1,3-Butadiene	2,504.0 µg/mL	+/- 20.5722	µg/mL	Gravimetric
	CAS # 106-99-0.SEC (Lot 22331)		+/- 141.1450	µg/mL	Unstressed
	Purity 99%		+/- 144.4130	µg/mL	Stressed
5	Bromomethane (methyl bromide)	2,498.5 µg/mL	+/- 19.9806	µg/mL	Gravimetric
	CAS # 74-83-9.SEC (Lot Q119-46)		+/- 140.7602	µg/mL	Unstressed
	Purity 99%		+/- 144.0229	µg/mL	Stressed
6	Chloroethane (ethyl chloride)	2,494.9 µg/mL	+/- 17.8868	µg/mL	Gravimetric
	CAS # 75-00-3.SEC (Lot 00004202)		+/- 140.2786	µg/mL	Unstressed
	Purity 99%		+/- 143.5429	µg/mL	Stressed
7	Dichlorofluoromethane (CFC-21)	2,503.4 µg/mL	+/- 20.0421	µg/mL	Gravimetric
	CAS # 75-43-4.SEC (Lot SHBC0858V)		+/- 141.0350	µg/mL	Unstressed
	Purity 99%		+/- 144.3039	µg/mL	Stressed

8	Trichlorofluoromethane (CFC-11)		2,503.2	µg/mL	+/-	18.7037	µg/mL	Gravimetric
	CAS # 75-69-4.SEC	(Lot Q12B-59)			+/-	140.8450	µg/mL	Unstressed
	Purity 99%				+/-	144.1179	µg/mL	Stressed

Solvent: P&T Methanol
CAS # 67-56-1
Purity 99%

Column:
60m x 0.25mm x 1.4µm
Rtx-502.2 (cat.#10916)

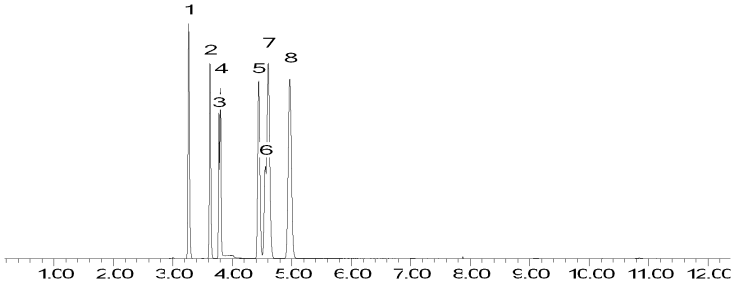
Carrier Gas:
helium-constant flow 2.0 mL/min.

Temp. Program:
40°C (hold 6 min.) to 100°C
@ 6°C/min.

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Brandon Reish - Mix Technician

Date Mixed: 12-Jan-2017 **Balance:** 1127510105

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 17-Jan-2017

Manufactured under Restek's ISO 9001:2008 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569727_00006

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ISO Guide 34 Accredited
Reference Material Producer
Certificate #3222.01

ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569727 **Lot No.:** A0118487

Description : 8260 List 2/ Std #3 Cyclohexanone (2015)

8260 List 2/ Std #3 Cyclohexanone (2015) 25,000 µg/ml, Water, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : March 31, 2019 **Storage:** 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Cyclohexanone	25,000.4 µg/mL	+/- 146.3826 µg/mL	Gravimetric
	CAS # 108-94-1 (Lot MKBN5282V)		+/- 1,508.4819 µg/mL	Unstressed
	Purity 99%		+/- 1,512.0629 µg/mL	Stressed

Solvent: Water
CAS # 7732-18-5
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

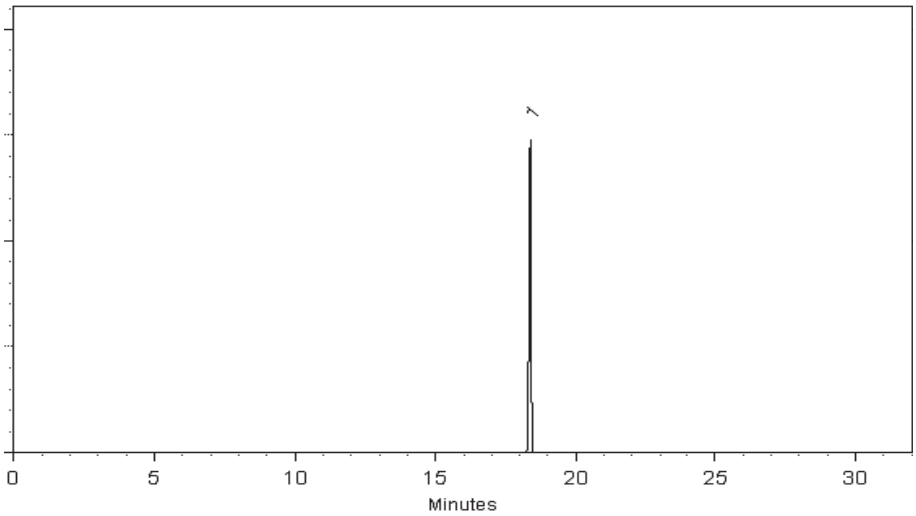
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Joseph Jaglowski - Mix Technician

Date Mixed: 31-Mar-2016 **Balance:** B442140311

Jodi E. Breon - QA Analyst

Date Passed: 04-Apr-2016

Manufactured under Restek's ISO 9001:2008 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-CUS17739_00002

Certificate of Analysis

Custom Standard

Product Number: CUS-17739 **Page:** 1 of 1

Lot Number: CR-2819 **Lot Issue Date:** 19-Jun-2017 **Expiration Date:** 31-Jul-2019

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with ULTRA Scientific's ISO 9001 registered quality system. A review of the gravimetric preparation data by our ISO 17025 accredited laboratory serves to verify the concentration of each analyte. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
1-chlorohexane	000544-10-5	RM04263	998.8 ± 5.0 µg/mL
2-pentanone	000107-87-9	RM03775	4020 ± 20 µg/mL
sec-butanol	000078-92-2	RM01299	30116 ± 151 µg/mL

Matrix: methanol (purge & trap grade)

Storage: Store Frozen (-25° to -10°C).

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

ISO 9001
Registered
TUV USA, Inc.

John Russo
President

Monica Bourgeois
Director of QA/RA

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Reagent

MV-STS110N1_00066

Certificate of Analysis

4-Bromofluorobenzene Solution

Product Number: STS-110N **Page:** 1 of 1

Lot Number: CH-3248Z **Lot Issue Date:** 31-Aug-2016 **Expiration Date:** 31-Oct-2019

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
4-bromofluorobenzene	000460-00-4	RM03365	2005 ± 10 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store Frozen (-25° to -10°C).

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

John Russo
President

Vincent Wang, Ph.D.
Director of QA/RA

ISO 9001
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TUV USA, Inc.

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Method 8260B

Volatile Organic Compounds (GC/MS) by Method 8260B

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Matrix: Water (TCLP) Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TOL #	BFB #
GRE-IDW-W-01	320-41333-15	106	106	106	100
	LB3 280-423614/1-A	105	103	107	98
	LCS 280-423614/2-A	108	106	105	99
GRE-IDW-W-01 MS	320-41333-15 MS	107	107	103	98
GRE-IDW-W-01 MSD	320-41333-15 MSD	104	104	103	98

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	79-119
DCA = 1,2-Dichloroethane-d4 (Surr)	64-129
TOL = Toluene-d8 (Surr)	78-120
BFB = 4-Bromofluorobenzene (Surr)	78-121

Column to be used to flag recovery values

FORM II 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Matrix: Water (TCLP) Level: Low Lab File ID: MS1_5240.D

Lab ID: LCS 280-423614/2-A Client ID:

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC	QC LIMITS REC	#
Benzene	0.0500	0.0511	102	74-135	
2-Butanone (MEK)	0.200	0.177	89	44-150	M
Carbon tetrachloride	0.0500	0.0529	106	67-135	
Chlorobenzene	0.0500	0.0476	95	76-135	
Chloroform	0.0500	0.0515	103	76-120	
1,2-Dichloroethane	0.0500	0.0519	104	70-135	
1,1-Dichloroethene	0.0500	0.0545	109	71-136	
Tetrachloroethene	0.0500	0.0498	100	70-135	
Trichloroethene	0.0500	0.0517	103	73-135	
Vinyl chloride	0.0500	0.0532	106	40-144	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Matrix: Water (TCLP) Level: Low Lab File ID: MS1_5243.D

Lab ID: 320-41333-15 MS Client ID: GRE-IDW-W-01 MS

COMPOUND	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC	QC LIMITS REC	#
Benzene	0.0500	0.0040 U	0.0516	103	74-135	
2-Butanone (MEK)	0.200	0.040 U	0.209	105	44-150	M
Carbon tetrachloride	0.0500	0.0040 U	0.0533	107	67-135	
Chlorobenzene	0.0500	0.0040 U	0.0485	97	76-135	
Chloroform	0.0500	0.0076 J	0.0606	106	76-120	
1,2-Dichloroethane	0.0500	0.0040 U	0.0542	108	70-135	
1,1-Dichloroethene	0.0500	0.0080 U	0.0542	108	71-136	
Tetrachloroethene	0.0500	0.0040 U	0.0502	100	70-135	
Trichloroethene	0.0500	0.0040 U	0.0517	103	73-135	
Vinyl chloride	0.0500	0.0020 U	0.0576	115	40-144	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Matrix: Water (TCLP) Level: Low Lab File ID: MS1_5244.D

Lab ID: 320-41333-15 MSD Client ID: GRE-IDW-W-01 MSD

COMPOUND	SPIKE ADDED (mg/L)	MSD CONCENTRATION (mg/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Benzene	0.0500	0.0512	102	1	20	74-135	
2-Butanone (MEK)	0.200	0.218	109	4	32	44-150	M
Carbon tetrachloride	0.0500	0.0526	105	1	21	67-135	
Chlorobenzene	0.0500	0.0485	97	0	20	76-135	
Chloroform	0.0500	0.0598	104	1	20	76-120	
1,2-Dichloroethane	0.0500	0.0525	105	3	20	70-135	
1,1-Dichloroethene	0.0500	0.0531	106	2	20	71-136	
Tetrachloroethene	0.0500	0.0503	101	0	20	70-135	
Trichloroethene	0.0500	0.0510	102	1	20	73-135	
Vinyl chloride	0.0500	0.0548	110	5	24	40-144	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab File ID: MS1_5072.D BFB Injection Date: 08/02/2018

Instrument ID: VMS_MS1 BFB Injection Time: 07:34

Analysis Batch No.: 424541

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.1	
75	30.0 - 60.0 % of mass 95	49.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.7	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	50.0 - 120.00 % of mass 95	74.3	
175	5.0 - 9.0 % of mass 174	5.9	(7.9) 1
176	95.0 - 101.0 % of mass 174	72.7	(97.9) 1
177	5.0 - 9.0 % of mass 176	5.7	(7.8) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD003 280-424541/12	MS1_5075.D	08/02/2018	08:53
	STD01 280-424541/13	MS1_5076.D	08/02/2018	09:13
	STD02 280-424541/14	MS1_5077.D	08/02/2018	09:33
	STD05 280-424541/15	MS1_5078.D	08/02/2018	09:53
	STD10 280-424541/16	MS1_5079.D	08/02/2018	10:14
	STD30 280-424541/17	MS1_5080.D	08/02/2018	10:34
	STD60 280-424541/18	MS1_5081.D	08/02/2018	10:54
	ICV 280-424541/19	MS1_5083.D	08/02/2018	11:35
	STD01 280-424541/20	MS1_5084.D	08/02/2018	11:55
	STD02 280-424541/21	MS1_5085.D	08/02/2018	12:15
	STD05 280-424541/22	MS1_5086.D	08/02/2018	12:36
	ICIS 280-424541/23	MS1_5087.D	08/02/2018	12:56
	STD30 280-424541/24	MS1_5088.D	08/02/2018	13:16
	STD60 280-424541/25	MS1_5089.D	08/02/2018	13:37
	ICV 280-424541/26	MS1_5091.D	08/02/2018	14:17

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab File ID: MS1_5226.D BFB Injection Date: 08/06/2018

Instrument ID: VMS_MS1 BFB Injection Time: 07:02

Analysis Batch No.: 424938

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.3	
75	30.0 - 60.0 % of mass 95	50.5	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	50.0 - 120.00 % of mass 95	77.1	
175	5.0 - 9.0 % of mass 174	5.8	(7.6) 1
176	95.0 - 101.0 % of mass 174	76.4	(99.1) 1
177	5.0 - 9.0 % of mass 176	4.9	(6.4) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-424938/2	MS1_5228.D	08/06/2018	07:47
	CCV 280-424938/3	MS1_5229.D	08/06/2018	08:07
	LCS 280-423614/2-A	MS1_5240.D	08/06/2018	11:50
	LB3 280-423614/1-A	MS1_5241.D	08/06/2018	12:11
GRE-IDW-W-01	320-41333-15	MS1_5242.D	08/06/2018	12:31
GRE-IDW-W-01 MS	320-41333-15 MS	MS1_5243.D	08/06/2018	12:51
GRE-IDW-W-01 MSD	320-41333-15 MSD	MS1_5244.D	08/06/2018	13:12
	CCVC 280-424938/33	MS1_5253.D	08/06/2018	16:15

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Sample No.: ICIS 280-424541/23 Date Analyzed: 08/02/2018 12:56

Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): MS1_5087.D Heated Purge: (Y/N) N

Calibration ID: 33279

		TBAd9		FB		CBNZd5	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		201981	5.60	2198487	7.53	442983	9.79
UPPER LIMIT		403962	6.10	4396974	8.03	885966	10.29
LOWER LIMIT		100991	5.10	1099244	7.03	221492	9.29
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-424541/26		204330	5.59	2158753	7.53	435634	9.79
CCV 280-424938/2		171503	5.58	2111006	7.53	444184	9.79
CCV 280-424938/3		178279	5.59	2172779	7.53	449004	9.79
LCS 280-423614/2-A		158381	5.58	2003825	7.53	427883	9.79
LB3 280-423614/1-A		153483	5.60	2007259	7.53	414145	9.79
320-41333-15	GRE-IDW-W-01	151467	5.59	1977303	7.53	408859	9.79
320-41333-15 MS	GRE-IDW-W-01 MS	167126	5.58	1964440	7.53	423414	9.79
320-41333-15 MSD	GRE-IDW-W-01 MSD	169730	5.60	2046579	7.53	433842	9.79
CCVC 280-424938/33		177062	5.59	2067090	7.53	446910	9.79

TBAd9 = TBA-d9 (IS)
FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Sample No.: ICIS 280-424541/23 Date Analyzed: 08/02/2018 12:56

Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): MS1_5087.D Heated Purge: (Y/N) N

Calibration ID: 33279

		DCBd4					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		615228	11.60				
UPPER LIMIT		1230456	12.10				
LOWER LIMIT		307614	11.10				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-424541/26		604764	11.60				
CCV 280-424938/2		661102	11.60				
CCV 280-424938/3		628175	11.60				
LCS 280-423614/2-A		609852	11.60				
LB3 280-423614/1-A		584277	11.62				
320-41333-15	GRE-IDW-W-01	582034	11.60				
320-41333-15 MS	GRE-IDW-W-01 MS	612336	11.60				
320-41333-15 MSD	GRE-IDW-W-01 MSD	626701	11.62				
CCVC 280-424938/33		648746	11.60				

DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 320-41333-1

SDG No.:

Client Sample ID: GRE-IDW-W-01 | Lab Sample ID: 320-41333-15

Matrix: Water (TCLP) | Lab File ID: MS1_5242.D

Analysis Method: 8260B | Date Collected: 07/18/2018 15:00

Sample wt/vol: 2(mL) | Date Analyzed: 08/06/2018 12:31

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-624 (60.25) ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 424938 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0040	U	0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.040	U	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0040	U	0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0040	U	0.010	0.0040	0.0017
67-66-3	Chloroform	0.0076	J	0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0040	U	0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0080	U	0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0040	U	0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0040	U	0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0020	U	0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	106		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		64-129
460-00-4	4-Bromofluorobenzene (Surr)	100		78-121
1868-53-7	Dibromofluoromethane (Surr)	106		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5242.D
Lims ID: 320-41333-A-15-A
Client ID: GRE-IDW-W-01
Sample Type: Client
Inject. Date: 06-Aug-2018 12:31:30 ALS Bottle#: 25 Worklist Smp#: 22
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: 320-41333-A-15-A 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 13:37:48

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.584	0.000	35	151467	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	1977303	12.5	
* 149 1,4-Dioxane-d8	96	8.727	8.773	-0.046	0	17779	0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	408859	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	582034	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	92	445588	13.0	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.274	-0.014	99	377586	13.0	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2051955	13.0	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	634192	12.2	
$ 152 Trifluorotoluene (Surr)	1		0.000				ND	
$ 4 BFB	95		4.591				ND	
24 Dichlorodifluoromethane	85		3.923				ND	
26 Chloromethane	50		4.160				ND	
22 Chlorotrifluoroethene	116		4.248				ND	
27 Vinyl chloride	62		4.286				ND	
25 1,2-Dichloro-1,1,2,2-tetra	85		4.472				ND	
28 Ethylene oxide	43		4.565				ND	U
29 Bromomethane	94		4.635				ND	
31 Chloroethane	64		4.691				ND	
23 2-Chloro-1,1,1-Trifluoroet	118		4.737				ND	
32 Dichlorofluoromethane	67		4.830				ND	
33 Trichlorofluoromethane	101		4.914				ND	
34 Ethanol	45		4.928				ND	
36 Ethyl ether	59		5.096				ND	
38 Propene oxide	58		5.180				ND	
39 Acrolein	56		5.221				ND	
40 Acetone	43		5.319				ND	
42 1,1,2-Trichloro-1,2,2-trif	151		5.333				ND	
41 Isopropyl alcohol	45		5.333				ND	
43 1,1-Dichloroethene	96		5.361				ND	
35 1,2-Dichloro-1,1,2-trifluo	117		5.505				ND	
45 Iodomethane	142		5.529				ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/l	Flags
44 Acetonitrile	41		5.529				ND	
37 1,1,1-Trifluoro-2,2-dichlo	83		5.533				ND	
46 Methyl acetate	43		5.557				ND	
47 3-Chloro-1-propene	41		5.612				ND	U
48 Carbon disulfide	76		5.626				ND	U
49 2-Methyl-2-propanol	59		5.654				ND	
50 Methylene Chloride	84		5.696				ND	
51 Acrylonitrile	53		5.836				ND	
52 Methyl tert-butyl ether	73		5.878				ND	
53 trans-1,2-Dichloroethene	96		5.920				ND	
54 Hexane	57		6.101				ND	
55 Vinyl acetate	43		6.157				ND	
56 Isopropyl ether	87		6.199				ND	
57 1,1-Dichloroethane	63		6.227				ND	
58 2-Chloro-1,3-butadiene	53		6.297				ND	
59 Tert-butyl ethyl ether	59		6.464				ND	
61 2-Butanone (MEK)	43		6.590				ND	
60 Ethyl acetate	43		6.590				ND	U
63 Propionitrile	54		6.632				ND	
62 sec-Butyl Alcohol	45		6.646				ND	U
64 cis-1,2-Dichloroethene	96		6.646				ND	
65 2,2-Dichloropropane	77		6.688				ND	
66 Methacrylonitrile	41		6.772				ND	
67 Chlorobromomethane	128		6.841				ND	
68 Chloroform	83	6.855	6.855	0.000	93	54906	0.7558	
69 Tetrahydrofuran	42		6.883				ND	
70 Isobutyl alcohol	41		7.051				ND	
71 1,1,1-Trichloroethane	97		7.079				ND	
72 Cyclohexane	56		7.163				ND	
73 1,1-Dichloropropene	75		7.177				ND	
74 Carbon tetrachloride	117		7.233				ND	
19 2,2-Dimethylpentane	57		7.251				ND	
17 2,4-Dimethylpentane	43		7.293				ND	
75 1,2-Dichloroethane	62		7.330				ND	
77 Benzene	78		7.358				ND	
76 Tert-amyl methyl ether	73		7.358				ND	
9 n-Heptane	43		7.456				ND	
10 2,2,3-Trimethylbutane	57		7.502				ND	
78 n-Butanol	56		7.554				ND	U
12 3,3-Dimethylpentane	43		7.768				ND	
18 2-Methylhexane	43		7.810				ND	
79 Trichloroethene	95		7.819				ND	
80 2-Pentanone	43		7.847				ND	
81 Methyl methacrylate	100		7.945				ND	
15 3-Methylhexane	43		7.949				ND	
11 2,3-Dimethylpentane	56		7.949				ND	
82 1,2-Dichloropropane	63		8.001				ND	
83 Methylcyclohexane	55		8.029				ND	
84 1,4-Dioxane	88		8.057				ND	
85 Dibromomethane	93		8.098				ND	
86 Dichlorobromomethane	83		8.168				ND	
20 3-Ethylpentane	43		8.214				ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/l	Flags
87 2-Nitropropane	41		8.294				ND	
88 2-Chloroethyl vinyl ether	63		8.308				ND	
89 cis-1,3-Dichloropropene	75		8.489				ND	
90 4-Methyl-2-pentanone (MIBK	43		8.545				ND	
91 Toluene	91		8.769				ND	
92 Ethyl methacrylate	69		8.853				ND	
93 trans-1,3-Dichloropropene	75		8.867				ND	
94 1,1,2-Trichloroethane	97		9.020				ND	
95 2-Hexanone	43		9.132				ND	
96 1,3-Dichloropropane	76		9.160				ND	
97 Tetrachloroethene	164		9.202				ND	
98 Chlorodibromomethane	129		9.341				ND	
13 Dimethyl disulfide	94		9.388				ND	
99 Tetrahydrothiophene	60		9.397				ND	
100 Ethylene Dibromide	107		9.467				ND	
101 1-Chlorohexane	91		9.705				ND	U
102 Chlorobenzene	112		9.816				ND	
103 1,1,1,2-Tetrachloroethane	131		9.844				ND	
104 Ethylbenzene	106		9.858				ND	U
105 m-Xylene & p-Xylene	106		9.928				ND	
106 Styrene	104		10.249				ND	
109 o-Xylene	106		10.249				ND	
107 Bromoform	173		10.445				ND	
108 Isopropylbenzene	105		10.515				ND	U
110 cis-1,4-Dichloro-2-butene	53		10.515				ND	
111 Cyclohexanone	55		10.626				ND	U
112 1,1,2,2-Tetrachloroethane	83		10.696				ND	
113 trans-1,4-Dichloro-2-buten	53		10.724				ND	
114 1,2,3-Trichloropropane	110		10.766				ND	
116 Bromobenzene	156		10.822				ND	
115 N-Propylbenzene	120		10.822				ND	
120 1,3,5-Trimethylbenzene	105		10.934				ND	
117 2-Chlorotoluene	126		10.948				ND	
118 4-Chlorotoluene	126		11.017				ND	
119 tert-Butylbenzene	119		11.227				ND	
121 1,2,4-Trimethylbenzene	105		11.255				ND	
143 Pentachloroethane	167		11.283				ND	
122 sec-Butylbenzene	134		11.408				ND	
123 4-Isopropyltoluene	119		11.506				ND	
124 1,3-Dichlorobenzene	146		11.562				ND	
126 1,4-Dichlorobenzene	146		11.632				ND	
125 1,2,3-Trimethylbenzene	105		11.632				ND	
127 n-Butylbenzene	91		11.855				ND	
128 1,2-Dichlorobenzene	146		11.981				ND	
129 1,2-Dibromo-3-Chloropropan	157		12.707				ND	
21 1,3,5-Trichlorobenzene	180		12.945				ND	
14 n-Nonyl Aldehyde	57		13.340				ND	
130 1,2,4-Trichlorobenzene	180		13.657				ND	
131 Hexachlorobutadiene	225		13.825				ND	
132 Naphthalene	128		14.006				ND	
133 1,2,3-Trichlorobenzene	180		14.327				ND	
161 n-Nonane TIC	1		0.000				ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/l	Flags
158 1-Chlorohexane TIC	1		0.000				ND	
160 Cyclohexane TIC	1		0.000				ND	
159 Methyl cyclohexane TIC	1		0.000				ND	
S 140 1,2-Dichloroethene, Total	96		2.000				ND	
S 136 1,2-Dichloroethene, Total	1		0.000				ND	
S 134 Trihalomethanes, Total	1				0		0.7558	
S 137 Total BTEX	1		0.000				ND	
S 139 Xylenes, Total (URS)	1		0.000				ND	
S 135 1,3-Dichloropropene, Total	1		0.000				ND	
S 153 TAH	1				0		0	
S 138 Xylenes, Total	106		0.000				ND	
T 141 Dichloroacetonitrile TIC	74		1.000				ND	
T 142 2,3-dichloro-1-propene TIC	75		1.000				ND	
T 30 Propene oxide TIC	58		5.334				ND	
T 156 4-Ethyltoluene TIC	1		0.000				ND	
T 157 1,3-Butadiene TIC	1		0.000				ND	
T 16 2-Butoxyethanol TIC	1		0.000				ND	
T 155 Dicyclopentadiene TIC	1		0.000				ND	
T 154 Propene TIC	1		0.000				ND	

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

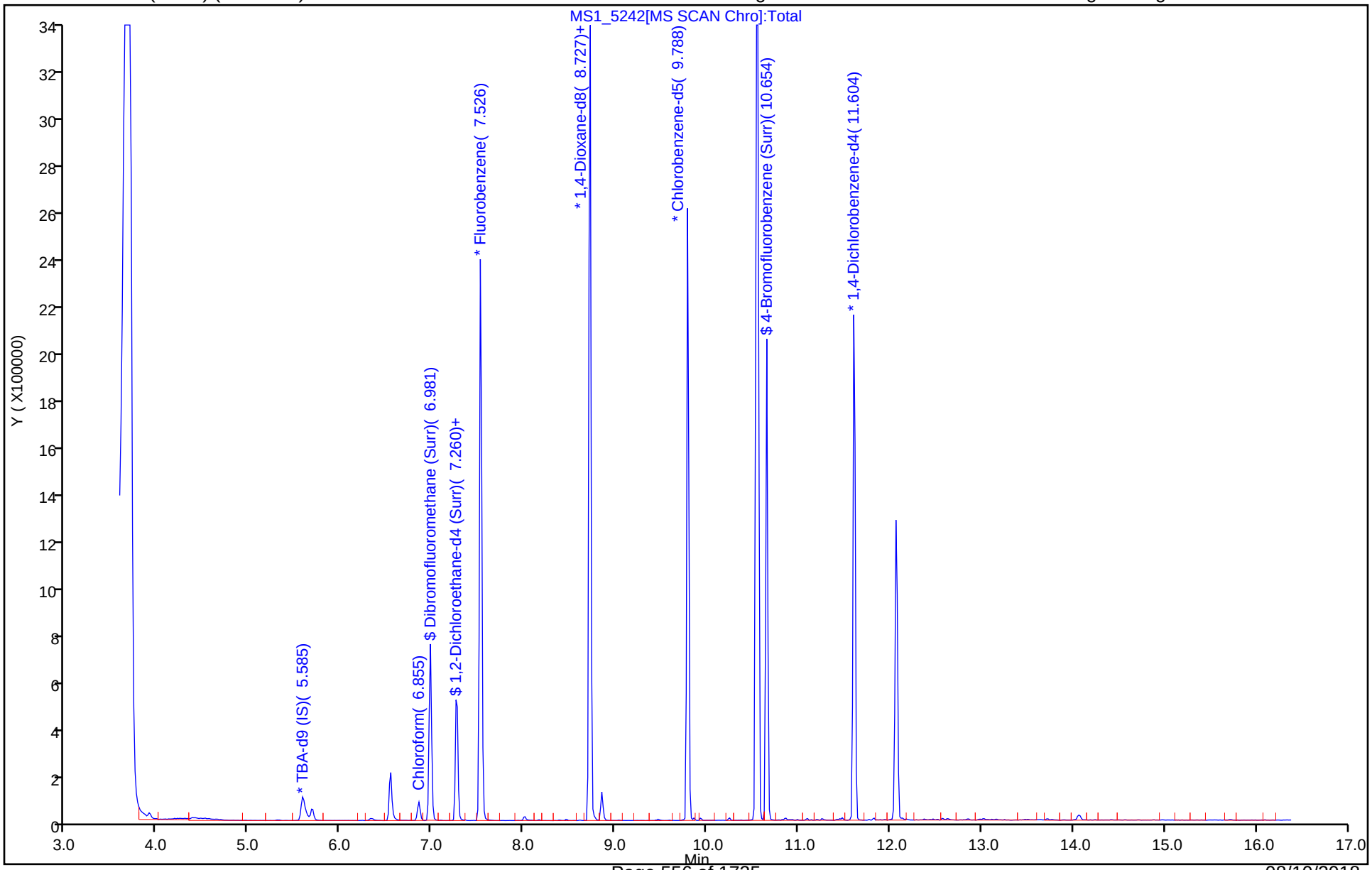
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5242.D				
Injection Date:	06-Aug-2018 12:31:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	320-41333-A-15-A	Lab Sample ID:	280-41333-15	Worklist Smp#:	22
Client ID:	GRE-IDW-W-01				
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	25
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5242.D				
Lims ID:	320-41333-A-15-A				
Client ID:	GRE-IDW-W-01				
Sample Type:	Client				
Inject. Date:	06-Aug-2018 12:31:30	ALS Bottle#:	25	Worklist Smp#:	22
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	320-41333-A-15-A 2ml af				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 13:37:48

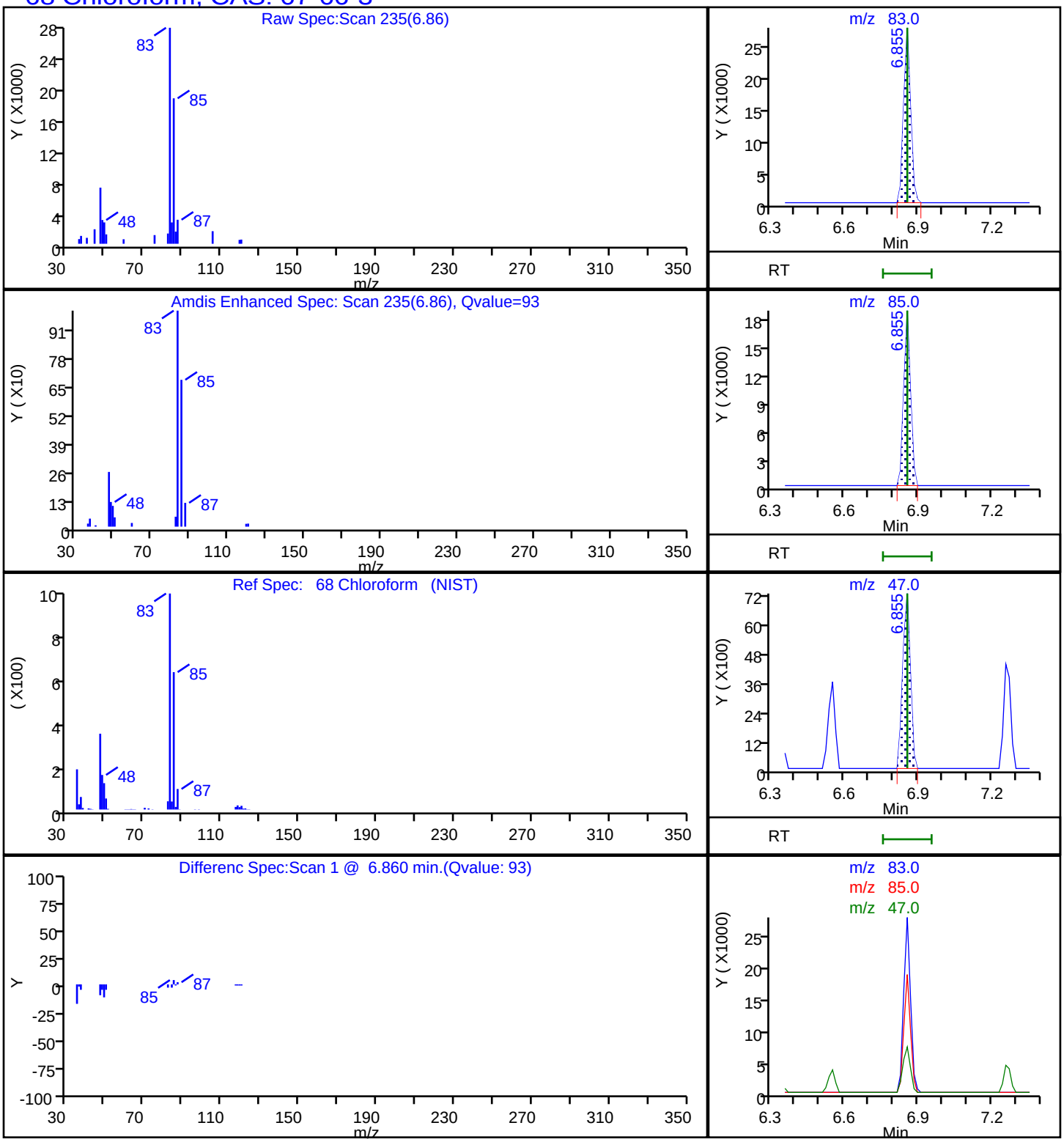
Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	13.0	106.46
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	13.0	106.17
$ 7 Toluene-d8 (Surr)	12.3	13.0	106.44
$ 8 4-Bromofluorobenzene (Surr)	12.3	12.2	99.53

Report Date: 07-Aug-2018 06:54:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5242.D				
Injection Date:	06-Aug-2018 12:31:30	Instrument ID:	VMS_MS1		
Lims ID:	320-41333-A-15-A	Lab Sample ID:	280-41333-15		
Client ID:	GRE-IDW-W-01				
Operator ID:	wickhamt	ALS Bottle#:	25	Worklist Smp#:	22
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

68 Chloroform, CAS: 67-66-3



FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD003 280-424541/12	MS1_5075.D
Level 2	STD01 280-424541/13	MS1_5076.D
Level 3	STD02 280-424541/14	MS1_5077.D
Level 4	STD05 280-424541/15	MS1_5078.D
Level 5	STD10 280-424541/16	MS1_5079.D
Level 6	STD30 280-424541/17	MS1_5080.D
Level 7	STD60 280-424541/18	MS1_5081.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Dichlorodifluoromethane	0.2474 0.3097	0.2548 0.3123	0.2273	0.3086	0.3220	Ave		0.2832				13.6		15.0			
Chloromethane	0.4412 0.3178	0.3234 0.3202	0.3316	0.3383	0.3361	Ave		0.3441			0.1000	12.7		15.0			
Vinyl chloride	0.3351 0.3205	0.3221 0.3106	0.3376	0.3396	0.3457	Ave		0.3302				3.8		30.0			
Bromomethane	0.2341 0.2434	0.2350 0.2357	0.2422	0.2507	0.2471	Ave		0.2412				2.7		15.0			
Chloroethane	0.2572 0.2342	0.2375 0.2245	0.2420	0.2456	0.2446	Ave		0.2408				4.2		15.0			
Dichlorofluoromethane	0.5465 0.5206	0.5108 0.5254	0.5674	0.5419	0.5459	Ave		0.5369				3.6		15.0			
Trichlorofluoromethane	0.4288 0.4203	0.4082 0.4243	0.4255	0.4161	0.4351	Ave		0.4226				2.1		15.0			
Ethyl ether	0.1305 0.1135	0.1203 0.1278	0.1233	0.1284	0.1276	Ave		0.1245				4.8		15.0			
Acrolein	0.0140 0.0145	0.0147 0.0147	0.0160	0.0151	0.0149	Ave		0.0148				4.2		15.0			
Acetone	0.0505 0.0193	0.0276 0.0192	0.0258	0.0216	0.0203	Lin2	0.0371	0.0195							0.9980		0.9900
1,1,2-Trichloro-1,2,2-trifluoroethane	0.1777 0.1818	0.1891 0.2071	0.1966	0.1862	0.2056	Ave		0.1920				6.0		15.0			
1,1-Dichloroethene	0.2748 0.2465	0.2695 0.2777	0.2760	0.2627	0.2783	Ave		0.2694				4.3		30.0			
Iodomethane	0.3975 0.3885	0.4040 0.4341	0.4148	0.4340	0.4314	Ave		0.4149				4.5		15.0			
Methyl acetate	0.0765 0.0507	0.0632 0.0562	0.0586	0.0566	0.0565	Ave		0.0597				13.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
3-Chloro-1-propene	0.5030 0.4549	0.5191 0.4880	0.5163	0.5204	0.5192	Ave		0.5030				4.8		15.0			
Carbon disulfide	1.2562 1.0916	1.2002 1.1637	1.2385	1.2105	1.2475	Ave		1.2012				4.8		15.0			
t-Butyl alcohol	1.0596 1.1813	1.1885 1.3433	1.2293	1.2686	1.2508	Ave		1.2173				7.3		15.0			
Methylene Chloride	0.6068 0.2281	0.3200 0.2539	0.2851	0.2698	0.2591	Lin2	0.1086	0.2372							0.9950		0.9900
Acrylonitrile	0.0296 0.0275	0.0296 0.0304	0.0306	0.0308	0.0305	Ave		0.0299				3.8		15.0			
Methyl tert-butyl ether	0.3239 0.3073	0.3303 0.3450	0.3298	0.3416	0.3347	Ave		0.3304				3.8		15.0			
trans-1,2-Dichloroethene	0.3066 0.2748	0.3083 0.3096	0.3040	0.3032	0.3079	Ave		0.3021				4.0		15.0			
Hexane	3.0378 2.2415	2.4803 2.4360	2.6496	2.3470	2.6427	Ave		2.5478				10.3		15.0			
Vinyl acetate	0.1954 0.2172	0.2122 0.2227	0.2174	0.2260	0.2304	Ave		0.2173				5.3		15.0			
1,1-Dichloroethane	0.5263 0.4788	0.5215 0.5274	0.5382	0.5435	0.5453	Ave		0.5259			0.1000	4.3		15.0			
2-Butanone (MEK)	+++++ 0.0309	0.0411 0.0309	0.0304	0.0296	0.0297	Ave		0.0321				13.9		15.0			
sec-Butyl Alcohol	1.2217 1.1062	1.1785 1.2261	1.0333	1.0942	1.1443	Ave		1.1435				6.2		15.0			
cis-1,2-Dichloroethene	0.3040 0.2780	0.3044 0.3123	0.3116	0.3103	0.3090	Ave		0.3042				3.9		15.0			
2,2-Dichloropropane	0.4490 0.3921	0.4275 0.4367	0.4306	0.4186	0.4346	Ave		0.4270				4.2		15.0			
Bromochloromethane	0.0874 0.0843	0.0875 0.0966	0.0902	0.0926	0.0925	Ave		0.0901				4.6		15.0			
Chloroform	0.4556 0.4212	0.4560 0.4691	0.4676	0.4726	0.4725	Ave		0.4592				4.0		30.0			
Tetrahydrofuran	+++++ 0.0199	0.0337 0.0222	0.0292	0.0251	0.0228	Lin2	0.0259	0.0215							0.9950		0.9900
Isobutyl alcohol	0.5820 0.4192	0.4699 0.4787	0.4294	0.4417	0.4394	Ave		0.4657				11.9		15.0			
1,1,1-Trichloroethane	0.4303 0.4034	0.4285 0.4489	0.4471	0.4310	0.4525	Ave		0.4345				3.9		15.0			
Cyclohexane	0.6000 0.5306	0.6010 0.5728	0.6222	0.5492	0.6127	Ave		0.5841				5.9		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
1,1-Dichloropropene	0.4287 0.3921	0.4216 0.4362	0.4398	0.4121	0.4419	Ave		0.4246				4.2		15.0			
Carbon tetrachloride	0.3862 0.3434	0.3538 0.3882	0.3776	0.3526	0.3801	Ave		0.3689				5.0		15.0			
1,2-Dichloroethane	+++++ 0.2061	0.2285 0.2295	0.2291	0.2296	0.2287	Ave		0.2252				4.2		15.0			
Benzene	1.1751 1.0534	1.1849 1.1263	1.2231	1.1961	1.2018	Ave		1.1658				5.0		15.0			
Trichloroethene	0.2920 0.2726	0.2860 0.3085	0.3030	0.2949	0.3052	Ave		0.2946				4.3		15.0			
2-Pentanone	0.0545 0.0533	0.0509 0.0599	0.0557	0.0572	0.0582	Ave		0.0557				5.5		15.0			
1,2-Dichloropropane	0.2715 0.2401	0.2644 0.2677	0.2649	0.2663	0.2675	Ave		0.2632				4.0		30.0			
Methylcyclohexane	0.4873 0.4247	0.4780 0.4593	0.4918	0.4407	0.4868	Ave		0.4669				5.6		15.0			
1,4-Dioxane	+++++ 0.0008	0.0006 0.0009	0.0006	0.0007	0.0008	Ave		0.0007				14.6		15.0			
Dibromomethane	0.0862 0.0810	0.0862 0.0922	0.0894	0.0909	0.0890	Ave		0.0878				4.3		15.0			
Bromodichloromethane	0.2769 0.2631	0.2704 0.2968	0.2814	0.2824	0.2871	Ave		0.2797				3.9		15.0			
2-Chloroethyl vinyl ether	+++++ 0.0423	0.0300 0.0484	0.0327	0.0356	0.0375	Lin1	-0.027	0.0461							0.9930		0.9900
cis-1,3-Dichloropropene	1.4543 1.5173	1.5514 1.6887	1.5772	1.6380	1.6562	Ave		1.5833				5.3		15.0			
4-Methyl-2-pentanone (MIBK)	0.0605 0.0736	0.0682 0.0737	0.0715	0.0747	0.0755	Ave		0.0711				7.4		15.0			
Toluene	1.2457 1.0643	1.1971 1.1153	1.2451	1.2024	1.2099	Ave		1.1828				5.8		30.0			
Ethyl methacrylate	0.7147 0.6327	0.6380 0.7262	0.6359	0.6777	0.6900	Ave		0.6736				5.8		15.0			
trans-1,3-Dichloropropene	0.1989 0.2240	0.2109 0.2544	0.2237	0.2346	0.2406	Ave		0.2267				8.2		15.0			
1,1,2-Trichloroethane	0.1131 0.1078	0.1149 0.1208	0.1204	0.1188	0.1183	Ave		0.1163				4.0		15.0			
2-Hexanone	0.2119 0.2342	0.2105 0.2340	0.2180	0.2348	0.2415	Ave		0.2264				5.6		15.0			
1,3-Dichloropropane	1.0725 1.0273	1.1179 1.1398	1.1355	1.1369	1.1264	Ave		1.1080				3.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Tetrachloroethene	1.1404 1.0353	1.0880 1.1710	1.1186	1.0192	1.1532	Ave		1.1037				5.3		15.0			
Dibromochloromethane	0.5925 0.6536	0.6210 0.7456	0.6445	0.6700	0.6859	Ave		0.6590				7.4		15.0			
1,2-Dibromoethane (EDB)	0.4596 0.4897	0.5176 0.5521	0.5275	0.5296	0.5389	Ave		0.5164				6.1		15.0			
1-Chlorohexane	2.1880 1.9326	2.0846 2.1154	2.1378	1.8924	2.1728	Ave		2.0748				5.6		15.0			
Chlorobenzene	3.2818 3.0733	3.3694 3.3399	3.4230	3.3094	3.3934	Ave		3.3129			0.3000	3.5		15.0			
1,1,1,2-Tetrachloroethane	0.9448 0.9984	0.9625 1.1494	0.9839	1.0170	1.0515	Ave		1.0154				6.8		15.0			
Ethylbenzene	2.1109 2.0203	2.0983 2.2108	2.1627	2.0650	2.1800	Ave		2.1211				3.2		30.0			
m-Xylene & p-Xylene	2.6219 2.3858	2.5791 2.5901	2.5850	2.4915	2.6204	Ave		2.5534				3.4		15.0			
o-Xylene	2.2994 2.2757	2.3643 2.4297	2.3865	2.3724	2.4571	Ave		2.3693				2.7		15.0			
Styrene	3.0577 3.4425	3.2492 3.6439	3.4438	3.5799	3.6841	Ave		3.4430				6.5		15.0			
Bromoform	0.2234 0.3042	0.2475 0.3543	0.2738	0.2867	0.3112	Lin2	-0.029	0.3073			0.1000				0.9910		0.9900
Isopropylbenzene	5.0866 4.2873	4.8721 4.3246	4.9832	4.6706	4.9061	Ave		4.7329				6.7		15.0			
Cyclohexanone	0.0076 0.0113	0.0089 0.0118	0.0095	0.0106	0.0108	Ave		0.0101				14.7		15.0			
1,1,2,2-Tetrachloroethane	0.4082 0.3687	0.3877 0.4091	0.4259	0.4193	0.4123	Ave		0.4045			0.3000	4.9		15.0			
trans-1,4-Dichloro-2-butene	0.0897 0.0949	0.0944 0.1083	0.0988	0.0990	0.0997	Ave		0.0978				5.9		15.0			
1,2,3-Trichloropropane	0.0993 0.0994	0.1104 0.1116	0.1079	0.1141	0.1102	Ave		0.1076				5.5		15.0			
Bromobenzene	0.7721 0.8075	0.8448 0.9301	0.8641	0.8665	0.8749	Ave		0.8515				5.9		15.0			
N-Propylbenzene	1.3664 1.2538	1.3231 1.4009	1.3819	1.2715	1.3768	Ave		1.3392				4.3		15.0			
1,3,5-Trimethylbenzene	4.0279 3.6744	3.9519 3.7575	4.0787	3.9182	4.0510	Ave		3.9228				3.9		15.0			
2-Chlorotoluene	1.0038 1.0013	1.0331 1.1198	1.0779	1.0486	1.0861	Ave		1.0530				4.2		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
4-Chlorotoluene	1.0349 0.9760	1.0488 1.0793	1.0639	1.0200	1.0545	Ave		1.0396				3.3		15.0			
tert-Butylbenzene	3.8976 3.5732	3.8861 3.8014	4.0172	3.7298	3.9876	Ave		3.8418				4.0		15.0			
1,2,4-Trimethylbenzene	3.9629 3.5429	3.9271 3.7110	4.0963	3.8356	3.9443	Ave		3.8600				4.7		15.0			
sec-Butylbenzene	1.0092 0.9999	1.0674 1.0929	1.0945	0.9810	1.0874	Ave		1.0475				4.7		15.0			
4-Isopropyltoluene	4.4928 3.9938	4.3874 4.0462	4.5347	4.1731	4.4802	Ave		4.3012				5.3		15.0			
1,3-Dichlorobenzene	1.8108 1.7067	1.8416 1.8570	1.8932	1.8361	1.8774	Ave		1.8318				3.4		15.0			
1,4-Dichlorobenzene	1.7428 1.6152	1.7799 1.7668	1.8067	1.7435	1.7741	Ave		1.7470				3.6		15.0			
n-Butylbenzene	4.3936 3.9891	4.4440 3.9665	4.6073	4.1007	4.4732	Ave		4.2821				6.0		15.0			
1,2-Dichlorobenzene	1.3893 1.3156	1.4202 1.4439	1.4589	1.4414	1.4486	Ave		1.4168				3.5		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.0498	0.0352 0.0574	0.0480	0.0514	0.0518	Lin2	-0.018	0.0545							0.9960		0.9900
1,2,4-Trichlorobenzene	0.8711 0.8835	0.9195 0.9511	0.9422	0.9638	0.9552	Ave		0.9266				3.9		15.0			
Hexachlorobutadiene	0.7623 0.7394	0.7695 0.7834	0.7934	0.7179	0.7860	Ave		0.7646				3.6		15.0			
Naphthalene	1.0167 1.0639	1.0999 1.1367	1.1331	1.1871	1.1784	Ave		1.1165				5.5		15.0			
1,2,3-Trichlorobenzene	0.6204 0.6394	0.6807 0.6743	0.6878	0.7044	0.7005	Ave		0.6725				4.7		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD003 280-424541/12	MS1_5075.D
Level 2	STD01 280-424541/13	MS1_5076.D
Level 3	STD02 280-424541/14	MS1_5077.D
Level 4	STD05 280-424541/15	MS1_5078.D
Level 5	STD10 280-424541/16	MS1_5079.D
Level 6	STD30 280-424541/17	MS1_5080.D
Level 7	STD60 280-424541/18	MS1_5081.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Dichlorodifluoromethane	FB	Ave	12700 1607609	44046 3295611	77457	262015	564155	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chloromethane	FB	Ave	22645 1649433	55899 3378862	113002	287230	588713	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Vinyl chloride	FB	Ave	17197 1663573	55674 3276951	115053	288301	605543	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromomethane	FB	Ave	12014 1263233	40617 2487024	82533	212846	432819	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chloroethane	FB	Ave	13199 1215873	41063 2368826	82454	208499	428415	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Dichlorofluoromethane	FB	Ave	28050 2702237	88299 5543482	193349	460095	956401	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Trichlorofluoromethane	FB	Ave	22007 2181784	70561 4476447	144994	353258	762226	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Ethyl ether	FB	Ave	6697 589044	20792 1348510	42022	109027	223449	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Acrolein	FB	Ave	7177 754395	25428 1545886	54542	128287	261551	3.00 300	10.00 600	20.0	50.0	100.0
Acetone	FB	Lin2	10363 401189	19102 809150	35136	73297	142461	1.20 120	4.00 240	8.00	20.0	40.0
1,1,2-Trichloro-1,2,2-trifluoroetha ne	FB	Ave	9123 943667	32680 2185427	67004	158047	360256	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1-Dichloroethene	FB	Ave	14103 1279482	46581 2929771	94056	223075	487569	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Iodomethane	FB	Ave	20404 2016771	69836 4580085	141353	368517	755810	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Methyl acetate	FB	Ave	7849 526019	21852 1185621	39913	96138	198097	0.600 60.0	2.00 120	4.00	10.0	20.0
3-Chloro-1-propene	FB	Ave	25817 2361056	89729 5148897	175913	441817	909580	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Carbon disulfide	FB	Ave	64477 5666306	207465 12279155	422013	1027781	2185345	0.300 30.0	1.00 60.0	2.00	5.00	10.0
t-Butyl alcohol	TBAd 9	Ave	2294 262033	8512 618695	17233	47895	95029	3.00 300	10.0 600	20.0	50.0	100
Methylene Chloride	FB	Lin2	31143 1184219	55320 2678804	97146	229104	453852	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Acrylonitrile	FB	Ave	15171 1427463	51204 3207740	104191	261884	534223	3.00 300	10.0 600	20.0	50.0	100
Methyl tert-butyl ether	FB	Ave	16623 1594990	57090 3640553	112364	289997	586404	0.300 30.0	1.00 60.0	2.00	5.00	10.0
trans-1,2-Dichloroethene	FB	Ave	15738 1426670	53301 3267087	103588	257423	539385	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Hexane	CBNZ d5	Ave	31098 2356635	85907 5250704	183126	405524	933281	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Vinyl acetate	FB	Ave	20057 2254728	73369 4699784	148146	383823	807364	0.600 60.0	2.00 120	4.00	10.0	20.0
1,1-Dichloroethane	FB	Ave	27015 2485350	90139 5564790	183375	461484	955292	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Butanone (MEK)	FB	Ave	+++++ 640657	28429 1302396	41493	100443	208155	+++++ 120	4.00 240	8.00	20.0	40.0
sec-Butyl Alcohol	TBAd 9	Ave	7935 736148	25321 1694104	43455	123938	260819	9.00 900	30.0 1800	60.0	150	300
cis-1,2-Dichloroethene	FB	Ave	15605 1443283	52624 3295665	106162	263432	541403	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2,2-Dichloropropane	FB	Ave	23044 2035165	73905 4607883	146736	355420	761324	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromochloromethane	FB	Ave	4486 437412	15128 1019268	30721	78637	161964	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chloroform	FB	Ave	23384 2186138	78819 4950029	159333	401244	827738	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Tetrahydrofuran	FB	Lin2	+++++ 207066	11644 469376	19913	42560	79975	+++++ 60.0	2.00 120	4.00	10.0	20.0
Isobutyl alcohol	TBAd 9	Ave	3150 232449	8413 551153	15048	41687	83466	7.50 750	25.0 1500	50.0	125	250
1,1,1-Trichloroethane	FB	Ave	22085 2094001	74070 4736877	152331	365896	792643	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Cyclohexane	FB	Ave	30794 2754325	103890 6043382	212024	466257	1073292	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1-Dichloropropene	FB	Ave	22001 2035350	72878 4602816	149854	349914	774076	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Carbon tetrachloride	FB	Ave	19824 1782446	61167 4095789	128677	299384	665835	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1,2-Dichloroethane	FB	Ave	+++++ 1069725	39492 2421140	78066	194972	400706	+++++ 30.0	1.00 60.0	2.00	5.00	10.0
Benzene	FB	Ave	60313 5467947	204816 11883656	416772	1015513	2105308	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Trichloroethene	FB	Ave	14989 1414865	49445 3254862	103252	250410	534671	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Pentanone	FB	Ave	11194 1107233	35223 2526845	75914	194363	407613	1.20 120	4.00 240	8.00	20.0	40.0
1,2-Dichloropropane	FB	Ave	13937 1246070	45696 2824297	90254	226060	468579	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Methylcyclohexane	FB	Ave	25013 2204443	82622 4846395	167587	374200	852769	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,4-Dioxane	FB	Ave	+++++ 78499	2195 182854	4025	12733	29075	+++++ 600	20.0 1200	40.0	100	200
Dibromomethane	FB	Ave	4425 420276	14906 972742	30446	77167	155855	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromodichloromethane	FB	Ave	14210 1365855	46734 3131431	95902	239790	502920	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Chloroethyl vinyl ether	FB	Lin1	+++++ 219639	5179 510394	11144	30251	65666	+++++ 30.0	1.00 60.0	2.00	5.00	10.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	14888 1595241	53734 3639978	109008	283019	584896	0.300 30.0	1.00 60.0	2.00	5.00	10.0
4-Methyl-2-pentanone (MIBK)	FB	Ave	12417 1528689	47145 3109898	97429	253596	528863	1.20 120	4.00 240	8.00	20.0	40.0
Toluene	FB	Ave	63938 5524520	206925 11767863	424249	1020901	2119622	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Ethyl methacrylate	CBNZ d5	Ave	7316 665198	22096 1565228	43949	117097	243658	0.300 30.0	1.00 60.0	2.00	5.00	10.0
trans-1,3-Dichloropropene	FB	Ave	10211 1162612	36456 2684455	76214	199217	421536	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1,2-Trichloroethane	FB	Ave	5807 559577	19857 1274746	41015	100846	207294	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Hexanone	CBNZ d5	Ave	8677 984750	29170 2017731	60268	162252	341167	1.20 120	4.00 240	8.00	20.0	40.0
1,3-Dichloropropane	CBNZ d5	Ave	10979 1080009	38720 2456863	78479	196436	397780	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Tetrachloroethene	CBNZ d5	Ave	11674 1088504	37682 2524145	77313	176096	407265	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Dibromochloromethane	CBNZ d5	Ave	6065 687122	21508 1607038	44546	115760	242209	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2-Dibromoethane (EDB)	CBNZ d5	Ave	4705 514796	17928 1190133	36459	91506	190306	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1-Chlorohexane	CBNZ d5	Ave	22399 2031866	72202 4559602	147755	326975	767322	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Chlorobenzene	CBNZ d5	Ave	33596 3231093	116700 7199151	236578	571821	1198370	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Ave	9672 1049644	33337 2477455	68003	175726	371334	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Ethylbenzene	CBNZ d5	Ave	21609 2124084	72676 4765351	149473	356805	769867	0.300 30.0	1.00 60.0	2.00	5.00	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	26840 2508264	89330 5582840	178662	430496	925395	0.300 30.0	1.00 60.0	2.00	5.00	10.0
o-Xylene	CBNZ d5	Ave	23539 2392581	81889 5237199	164944	409924	867725	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Styrene	CBNZ d5	Ave	31302 3619275	112539 7854293	238015	618546	1301023	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromoform	CBNZ d5	Lin2	2287 319845	8574 763589	18925	49542	109895	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Isopropylbenzene	DCBd 4	Ave	70873 6327757	231347 13051965	467529	1087749	2382186	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Cyclohexanone	CBNZ d5	Ave	3117 476407	12290 1017930	26350	73302	153088	12.0 1200	40.0 2400	80.0	200	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	5688 544180	18410 1234693	39960	97663	200198	0.300 30.0	1.00 60.0	2.00	5.00	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	1250 140039	4483 326861	9267	23057	48429	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	1383 146713	5241 336848	10121	26573	53523	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Bromobenzene	DCBd 4	Ave	10758 1191870	40116 2807153	81075	201811	424825	0.300 30.0	1.00 60.0	2.00	5.00	10.0
N-Propylbenzene	DCBd 4	Ave	19038 1850570	62827 4228117	129652	296132	668508	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	56122 5423026	187654 11340451	382672	912523	1966980	0.300 30.0	1.00 60.0	2.00	5.00	10.0
2-Chlorotoluene	DCBd 4	Ave	13986 1477889	49057 3379698	101132	244211	527365	0.300 30.0	1.00 60.0	2.00	5.00	10.0
4-Chlorotoluene	DCBd 4	Ave	14419 1440429	49802 3257500	99812	237560	512020	0.300 30.0	1.00 60.0	2.00	5.00	10.0
tert-Butylbenzene	DCBd 4	Ave	54306 5273697	184528 11472922	376895	868638	1936218	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	55217 5229068	186475 11199960	384319	893281	1915213	0.300 30.0	1.00 60.0	2.00	5.00	10.0
sec-Butylbenzene	DCBd 4	Ave	14061 1475759	50686 3298491	102684	228466	527982	0.300 30.0	1.00 60.0	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 08:53 Calibration End Date: 08/02/2018 10:54 Calibration ID: 33278

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
4-Isopropyltoluene	DCBd 4	Ave	62600 5894557	208331 12211753	425447	971889	2175391	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	25231 2518936	87445 5604443	177625	427610	911595	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	24283 2383941	84516 5332369	169505	406037	861432	0.300 30.0	1.00 60.0	2.00	5.00	10.0
n-Butylbenzene	DCBd 4	Ave	61218 5887503	211017 11971153	432266	955019	2172024	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	19358 1941765	67437 4357629	136872	335681	703378	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Lin2	+++++ 73435	1673 173215	4508	11972	25148	+++++ 30.0	1.00 60.0	2.00	5.00	10.0
1,2,4-Trichlorobenzene	DCBd 4	Ave	12138 1303964	43662 2870406	88397	224468	463813	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Hexachlorobutadiene	DCBd 4	Ave	10622 1091279	36541 2364233	74442	167192	381635	0.300 30.0	1.00 60.0	2.00	5.00	10.0
Naphthalene	DCBd 4	Ave	14166 1570155	52226 3430633	106307	276470	572176	0.300 30.0	1.00 60.0	2.00	5.00	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	8644 943710	32321 2035072	64531	164057	340129	0.300 30.0	1.00 60.0	2.00	5.00	10.0

Curve Type Legend:

Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D
Lims ID: std003
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 02-Aug-2018 08:53:30 ALS Bottle#: 12 Worklist Smp#: 12
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std003
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:49 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:35:23

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.598	0.000	84	180421	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2138567	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	426543	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	580556	12.5	12.5	
24 Dichlorodifluoromethane	85	3.922	3.922	0.000	49	12700	0.3000	0.2621	
26 Chloromethane	50	4.174	4.174	0.000	95	22645	0.3000	0.3847	
27 Vinyl chloride	62	4.299	4.300	-0.001	91	17197	0.3000	0.3045	
29 Bromomethane	94	4.635	4.635	0.000	90	12014	0.3000	0.2912	
31 Chloroethane	64	4.704	4.705	-0.001	98	13199	0.3000	0.3204	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	96	28050	0.3000	0.3053	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	97	22007	0.3000	0.3044	
36 Ethyl ether	59	5.096	5.096	0.000	92	6697	0.3000	0.3145	
39 Acrolein	56	5.221	5.221	0.000	93	7177	3.00	2.83	
40 Acetone	43	5.319	5.319	0.000	98	10363	1.20	1.20	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	92	9123	0.3000	0.2777	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	14103	0.3000	0.3060	
45 Iodomethane	142	5.529	5.529	-0.001	99	20404	0.3000	0.2874	
46 Methyl acetate	43	5.556	5.557	-0.001	96	7849	0.6000	0.7678	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	25817	0.3000	0.3000	
48 Carbon disulfide	76	5.626	5.626	0.000	98	64477	0.3000	0.3138	
49 2-Methyl-2-propanol	59	5.668	5.654	0.014	32	2294	3.00	2.61	
50 Methylene Chloride	84	5.696	5.696	0.000	95	31143	0.3000	0.3098	
51 Acrylonitrile	53	5.836	5.836	0.000	96	15171	3.00	2.97	
52 Methyl tert-butyl ether	73	5.892	5.892	0.000	96	16623	0.3000	0.2941	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	96	15738	0.3000	0.3045	
54 Hexane	57	6.101	6.101	0.000	92	31098	0.3000	0.3577	
55 Vinyl acetate	43	6.171	6.157	0.014	96	20057	0.6000	0.5394	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	95	27015	0.3000	0.3003	
61 2-Butanone (MEK)	43		6.590				ND	ND	U
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	47	7935	9.00	9.62	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	80	15605	0.3000	0.2998	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	90	23044	0.3000	0.3154	
67 Chlorobromomethane	128	6.841	6.841	0.000	90	4486	0.3000	0.2909	
68 Chloroform	83	6.855	6.855	0.000	95	23384	0.3000	0.2976	
69 Tetrahydrofuran	42		6.883				ND	ND	
70 Isobutyl alcohol	41	7.065	7.051	0.014	38	3150	7.50	9.37	
71 1,1,1-Trichloroethane	97	7.093	7.079	0.014	98	22085	0.3000	0.2971	
72 Cyclohexane	56	7.163	7.163	0.000	0	30794	0.3000	0.3082	
73 1,1-Dichloropropene	75	7.190	7.191	-0.001	95	22001	0.3000	0.3028	
74 Carbon tetrachloride	117	7.232	7.232	0.000	95	19824	0.3000	0.3141	
75 1,2-Dichloroethane	62		7.330				ND	ND	
77 Benzene	78	7.358	7.358	0.000	96	60313	0.3000	0.3024	
9 n-Heptane	43	7.456	7.456	0.000	92	29357	0.3000	0.3279	
79 Trichloroethene	95	7.819	7.819	0.000	98	14989	0.3000	0.2974	
80 2-Pentanone	43	7.861	7.847	0.014	97	11194	1.20	1.18	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	94	13937	0.3000	0.3095	
83 Methylcyclohexane	55	8.028	8.029	-0.001	0	25013	0.3000	0.3131	
84 1,4-Dioxane	88		8.056				ND	ND	
85 Dibromomethane	93	8.098	8.098	0.000	93	4425	0.3000	0.2945	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	14210	0.3000	0.2969	
88 2-Chloroethyl vinyl ether	63		8.308				ND	ND	U
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	94	14888	0.3000	0.2756	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	93	12417	1.20	1.02	
91 Toluene	91	8.783	8.769	0.014	98	63938	0.3000	0.3160	
92 Ethyl methacrylate	69	8.852	8.853	-0.001	55	7316	0.3000	0.3183	
93 trans-1,3-Dichloropropene	75	8.866	8.867	0.000	96	10211	0.3000	0.2632	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	86	5807	0.3000	0.2918	
95 2-Hexanone	43	9.146	9.132	0.014	91	8677	1.20	1.12	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	94	10979	0.3000	0.2904	
97 Tetrachloroethene	164	9.202	9.202	0.000	97	11674	0.3000	0.3100	
98 Chlorodibromomethane	129	9.341	9.341	0.000	87	6065	0.3000	0.2697	
100 Ethylene Dibromide	107	9.481	9.467	0.014	94	4705	0.3000	0.2670	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	22399	0.3000	0.3164	
102 Chlorobenzene	112	9.816	9.816	0.000	96	33596	0.3000	0.2972	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	75	9672	0.3000	0.2792	
104 Ethylbenzene	106	9.858	9.858	0.000	98	21609	0.3000	0.2985	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	99	26840	0.3000	0.3080	
106 Styrene	104	10.249	10.249	0.000	81	31302	0.3000	0.2664	
109 o-Xylene	106	10.249	10.249	0.000	91	23539	0.3000	0.2911	
107 Bromoform	173	10.445	10.445	0.000	90	2287	0.3000	0.3123	
108 Isopropylbenzene	105	10.514	10.515	-0.001	96	70873	0.3000	0.3224	
111 Cyclohexanone	55	10.626	10.626	0.000	87	3117	12.0	9.06	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	87	5688	0.3000	0.3028	
113 trans-1,4-Dichloro-2-buten	53	10.738	10.724	0.014	1	1250	0.3000	0.2751	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	81	1383	0.3000	0.2769	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	19038	0.3000	0.3061	
116 Bromobenzene	156	10.822	10.822	0.000	51	10758	0.3000	0.2720	
120 1,3,5-Trimethylbenzene	105	10.933	10.934	-0.001	94	56122	0.3000	0.3080	
117 2-Chlorotoluene	126	10.947	10.947	0.000	95	13986	0.3000	0.2860	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	14419	0.3000	0.2986	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	54306	0.3000	0.3044	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	55217	0.3000	0.3080	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	14061	0.3000	0.2890	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	62600	0.3000	0.3134	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	96	25231	0.3000	0.2966	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	93	24283	0.3000	0.2993	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	61218	0.3000	0.3078	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	95	19358	0.3000	0.2942	
129 1,2-Dibromo-3-Chloropropan	157		12.707				ND	ND	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	92	12138	0.3000	0.2820	
131 Hexachlorobutadiene	225	13.824	13.825	-0.001	94	10622	0.3000	0.2991	
132 Naphthalene	128	14.006	14.006	0.000	94	14166	0.3000	0.2732	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	91	8644	0.3000	0.2768	
S 140 1,2-Dichloroethene, Total	96				0		0.6000	0.6043	
S 134 Trihalomethanes, Total	1				0		1.20	1.18	
S 139 Xylenes, Total (URS)	1				0		0.6000	0.5992	
S 138 Xylenes, Total	106				0		0.6000	0.5992	
S 136 1,2-Dichloroethene, Total	1				0		0.6000	0.6043	
S 135 1,3-Dichloropropene, Total	1				0		0.6000	0.5388	
S 137 Total BTEX	1				0			1.52	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	0.15	Units: uL
MV-2cleve+AVA_00037	Amount Added:	0.15	Units: uL
MV-Gas/Ket A_00076	Amount Added:	0.15	Units: uL

Report Date: 02-Aug-2018 13:04:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D

Injection Date: 02-Aug-2018 08:53:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

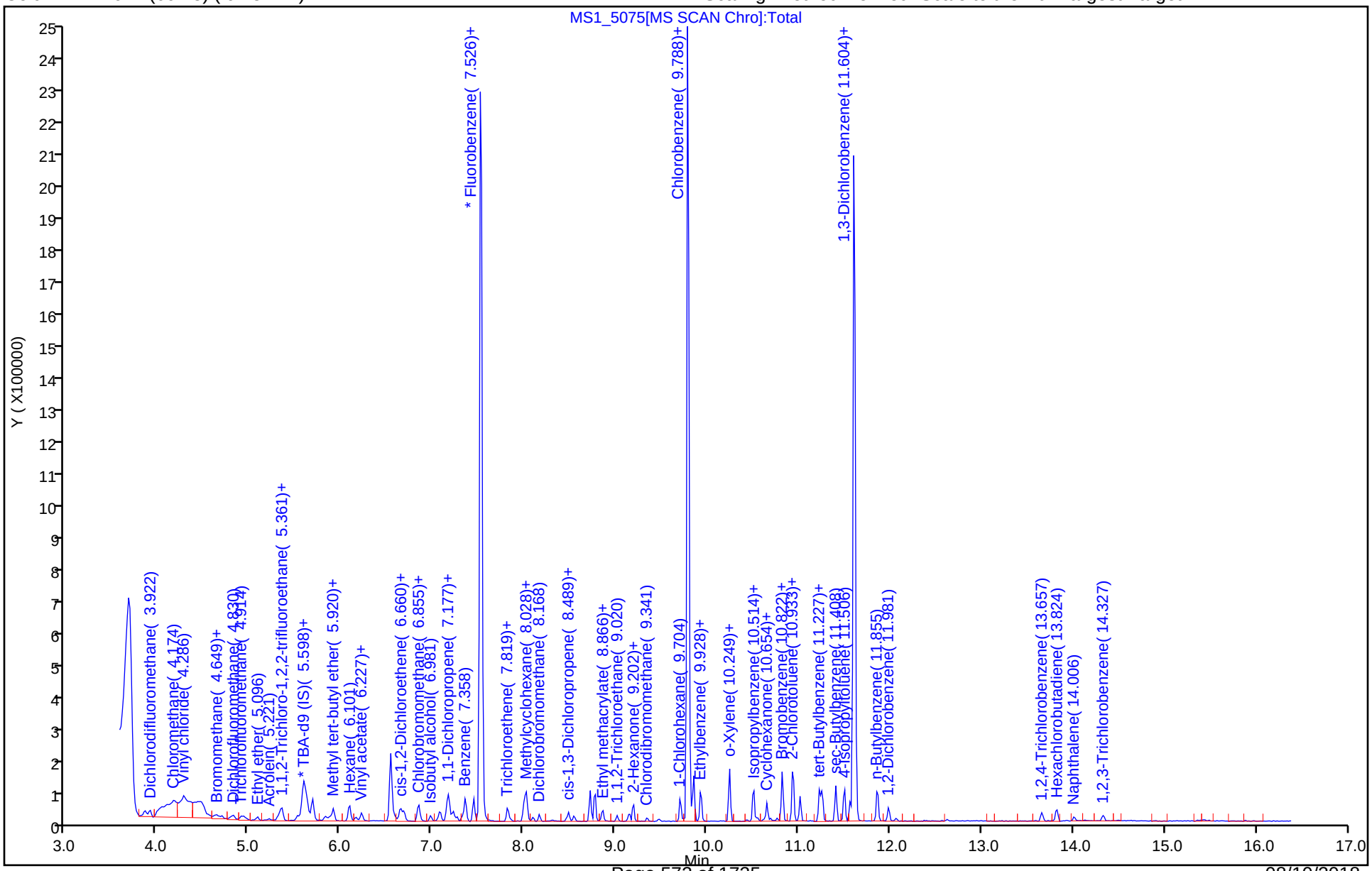
Lims ID: std003 Worklist Smp#: 12

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 12

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



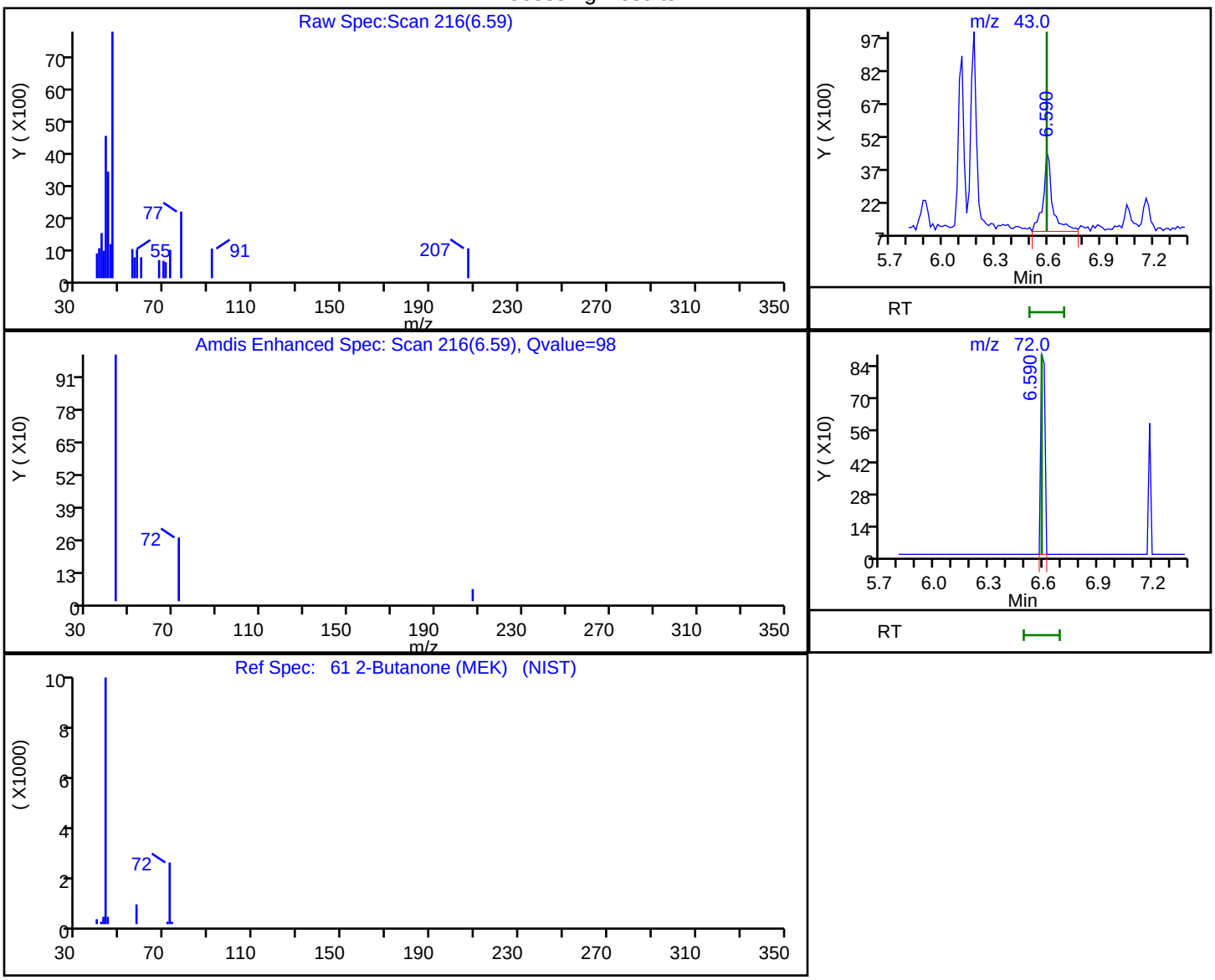
User Disabled Compound Report

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D				
Injection Date:	02-Aug-2018 08:53:30	Instrument ID:	VMS_MS1		
Lims ID:	std003				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	12	Worklist Smp#:	12
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Processing Results



RT	Mass	Response	Amount
6.59	43.00	13677	1.212010
6.59	72.00	1454	

Reviewer: wickhamt, 02-Aug-2018 11:48:39

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Report Date: 02-Aug-2018 13:04:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

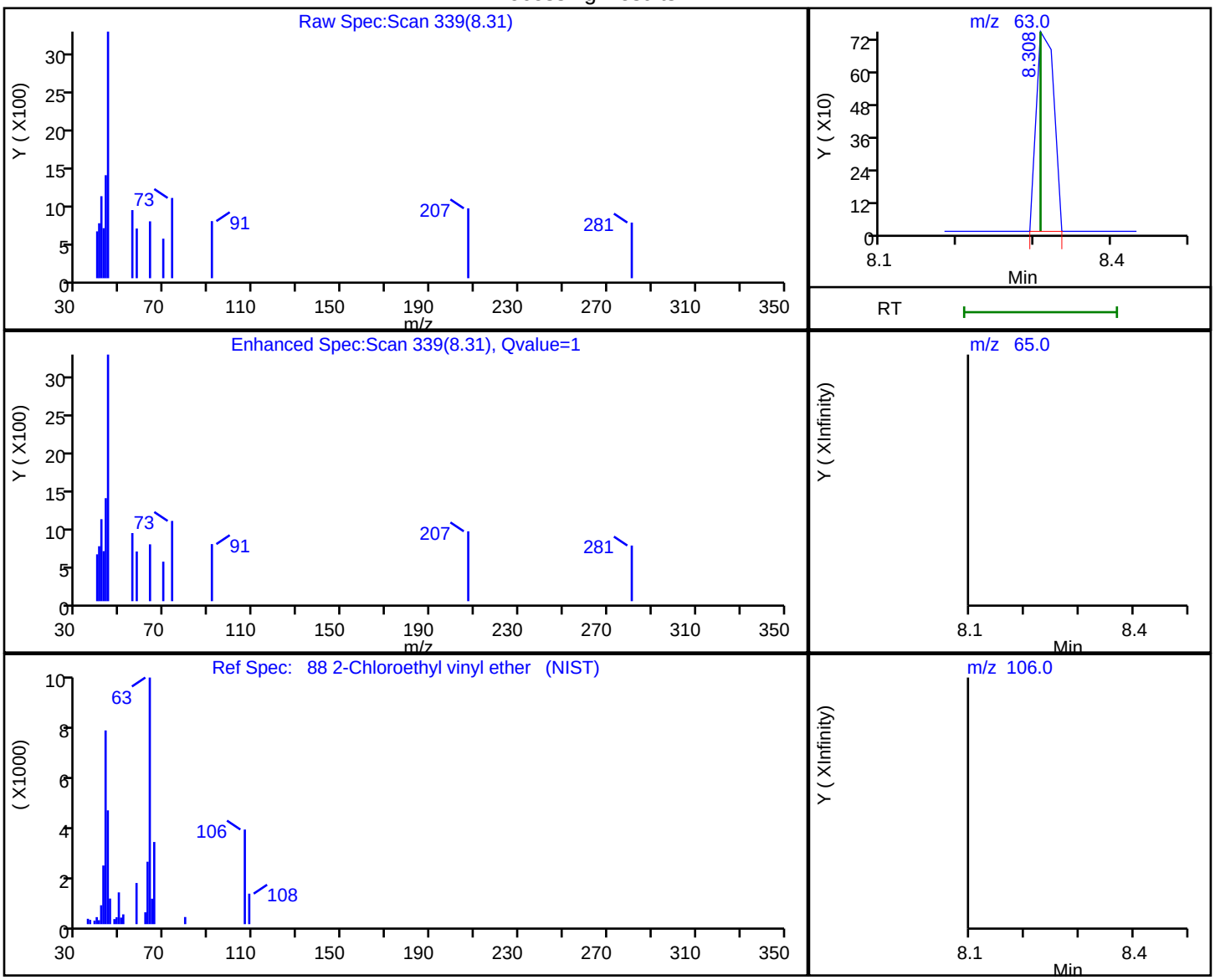
User Disabled Compound Report

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5075.D				
Injection Date:	02-Aug-2018 08:53:30	Instrument ID:	VMS_MS1		
Lims ID:	std003				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	12	Worklist Smp#:	12
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

88 2-Chloroethyl vinyl ether, CAS: 110-75-8

Processing Results



RT	Mass	Response	Amount
8.31	63.00	1191	0.305634
8.31	65.00	0	
8.31	106.00	0	

Reviewer: wickhamt, 02-Aug-2018 11:34:32

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5076.D
Lims ID: std01
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 02-Aug-2018 09:13:30 ALS Bottle#: 13 Worklist Smp#: 13
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std01
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:51 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:36:29

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	84	179047	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2160770	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	432947	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	593551	12.5	12.5	
24 Dichlorodifluoromethane	85	3.909	3.922	-0.013	99	44046	1.00	0.8998	
26 Chloromethane	50	4.160	4.174	-0.014	98	55899	1.00	0.9398	
27 Vinyl chloride	62	4.286	4.300	-0.014	94	55674	1.00	0.9755	
29 Bromomethane	94	4.635	4.635	0.000	91	40617	1.00	0.9743	
31 Chloroethane	64	4.691	4.705	-0.014	99	41063	1.00	0.9865	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	88299	1.00	0.9513	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	70561	1.00	0.9659	
36 Ethyl ether	59	5.082	5.096	-0.014	93	20792	1.00	0.9663	
39 Acrolein	56	5.221	5.221	0.000	99	25428	10.0	9.91	
40 Acetone	43	5.319	5.319	0.000	99	19102	4.00	3.77	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	97	32680	1.00	0.9845	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	98	46581	1.00	1.00	
45 Iodomethane	142	5.529	5.529	0.000	99	69836	1.00	0.9737	
46 Methyl acetate	43	5.543	5.557	-0.014	95	21852	2.00	2.12	
47 3-Chloro-1-propene	41	5.599	5.612	-0.013	88	89729	1.00	1.03	
48 Carbon disulfide	76	5.626	5.626	0.000	99	207465	1.00	1.00	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	91	8512	10.0	9.76	
50 Methylene Chloride	84	5.696	5.696	0.000	94	55320	1.00	0.8916	
51 Acrylonitrile	53	5.836	5.836	0.000	98	51204	10.0	9.92	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	96	57090	1.00	1.00	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	53301	1.00	1.02	
54 Hexane	57	6.087	6.101	-0.014	93	85907	1.00	0.9735	
55 Vinyl acetate	43	6.157	6.157	0.000	97	73369	2.00	1.95	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	90139	1.00	0.99	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	28429	4.00	5.12	
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	25321	30.0	30.9	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	82	52624	1.00	1.00	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	88	73905	1.00	1.00	
67 Chlorobromomethane	128	6.842	6.841	0.001	93	15128	1.00	0.9708	
68 Chloroform	83	6.856	6.855	0.001	94	78819	1.00	0.99	
69 Tetrahydrofuran	42	6.883	6.883	0.000	88	11644	2.00	1.93	
70 Isobutyl alcohol	41	7.051	7.051	0.000	92	8413	25.0	25.2	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	74070	1.00	0.9861	
72 Cyclohexane	56	7.163	7.163	0.000	0	103890	1.00	1.03	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	97	72878	1.00	0.99	
74 Carbon tetrachloride	117	7.233	7.232	0.001	98	61167	1.00	0.9593	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	39492	1.00	1.01	
77 Benzene	78	7.358	7.358	0.000	96	204816	1.00	1.02	
9 n-Heptane	43	7.456	7.456	0.000	91	91370	1.00	1.01	
79 Trichloroethene	95	7.819	7.819	0.000	98	49445	1.00	0.9709	
80 2-Pentanone	43	7.847	7.847	0.000	98	35223	4.00	3.66	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	95	45696	1.00	1.00	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	82622	1.00	1.02	
84 1,4-Dioxane	88	8.057	8.056	0.001	81	2195	20.0	17.2	
85 Dibromomethane	93	8.099	8.098	0.000	94	14906	1.00	0.9818	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	46734	1.00	0.9665	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	86	5179	1.00	1.24	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	53734	1.00	0.9798	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	95	47145	4.00	3.84	
91 Toluene	91	8.769	8.769	0.000	98	206925	1.00	1.01	
92 Ethyl methacrylate	69	8.853	8.853	0.000	90	22096	1.00	0.9471	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	36456	1.00	0.9301	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	90	19857	1.00	0.9877	
95 2-Hexanone	43	9.132	9.132	0.000	95	29170	4.00	3.72	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	95	38720	1.00	1.01	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	37682	1.00	0.9858	
98 Chlorodibromomethane	129	9.342	9.341	0.001	90	21508	1.00	0.9423	
100 Ethylene Dibromide	107	9.467	9.467	0.000	97	17928	1.00	1.00	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	72202	1.00	1.00	
102 Chlorobenzene	112	9.816	9.816	0.000	97	116700	1.00	1.02	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	87	33337	1.00	0.9479	
104 Ethylbenzene	106	9.858	9.858	0.000	99	72676	1.00	0.9892	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	89330	1.00	1.01	
109 o-Xylene	106	10.249	10.249	0.000	90	81889	1.00	1.00	
106 Styrene	104	10.249	10.249	0.000	84	112539	1.00	0.9437	
107 Bromoform	173	10.445	10.445	0.000	95	8574	1.00	0.8997	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	231347	1.00	1.03	
111 Cyclohexanone	55	10.626	10.626	0.000	92	12290	40.0	35.2	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	91	18410	1.00	0.9586	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	71	4483	1.00	0.9650	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	83	5241	1.00	1.03	
116 Bromobenzene	156	10.822	10.822	0.000	52	40116	1.00	0.99	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	62827	1.00	0.9880	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	187654	1.00	1.01	
117 2-Chlorotoluene	126	10.948	10.947	0.001	96	49057	1.00	0.9812	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	49802	1.00	1.01	
119 tert-Butylbenzene	119	11.227	11.227	0.000	94	184528	1.00	1.01	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	97	186475	1.00	1.02	
122 sec-Butylbenzene	134	11.409	11.408	0.000	95	50686	1.00	1.02	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	208331	1.00	1.02	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	87445	1.00	1.01	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	84516	1.00	1.02	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	211017	1.00	1.04	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	67437	1.00	1.00	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	76	1673	1.00	0.9778	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	43662	1.00	0.99	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	36541	1.00	1.01	
132 Naphthalene	128	14.020	14.006	0.014	97	52226	1.00	0.9851	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	32321	1.00	1.01	
S 140 1,2-Dichloroethene, Total	96				0		2.00	2.02	
S 135 1,3-Dichloropropene, Total	1				0		2.00	1.91	
S 137 Total BTEX	1				0			5.03	
S 136 1,2-Dichloroethene, Total	1				0		2.00	2.02	
S 134 Trihalomethanes, Total	1				0		4.00	3.80	
S 139 Xylenes, Total (URS)	1				0		2.00	2.01	
S 138 Xylenes, Total	106				0		2.00	2.01	

Reagents:

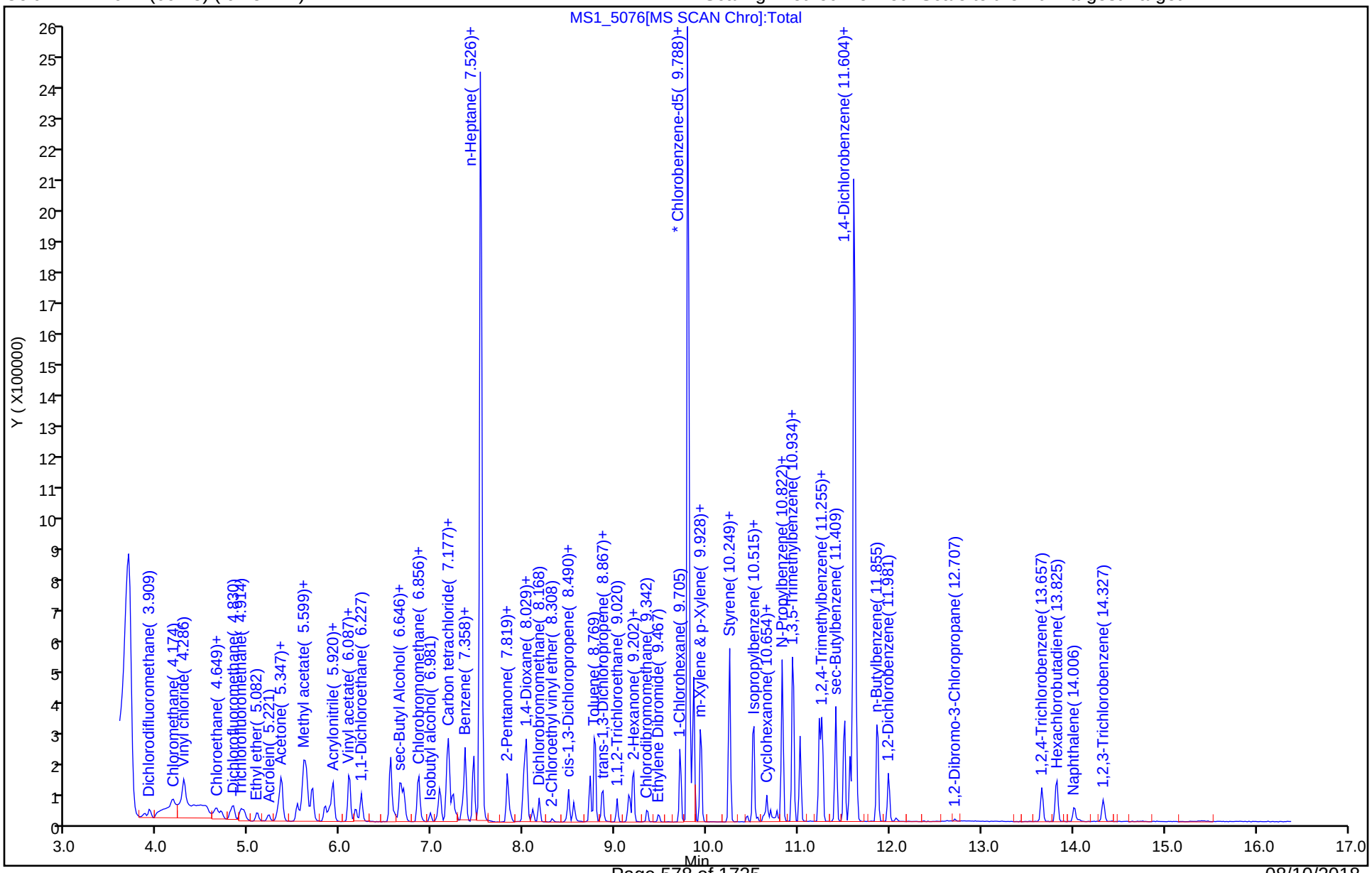
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	0.50	Units: uL
MV-2cleve+AVA_00037	Amount Added:	0.50	Units: uL
MV-Gas/Ket A_00076	Amount Added:	0.50	Units: uL

Report Date: 02-Aug-2018 13:04:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5076.D				
Injection Date:	02-Aug-2018 09:13:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std01			Worklist Smp#:	13
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	13
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5077.D
Lims ID: std02
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 02-Aug-2018 09:33:30 ALS Bottle#: 14 Worklist Smp#: 14
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std02
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:54 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:37:25

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	85	175228	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2129666	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	431963	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	586383	12.5	12.5	
24 Dichlorodifluoromethane	85	3.909	3.922	-0.013	100	77457	2.00	1.61	
26 Chloromethane	50	4.160	4.174	-0.014	99	113002	2.00	1.93	
27 Vinyl chloride	62	4.286	4.300	-0.014	92	115053	2.00	2.05	
29 Bromomethane	94	4.635	4.635	0.000	89	82533	2.00	2.01	
31 Chloroethane	64	4.691	4.705	-0.014	100	82454	2.00	2.01	
32 Dichlorofluoromethane	67	4.816	4.830	-0.014	98	193349	2.00	2.11	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	100	144994	2.00	2.01	
36 Ethyl ether	59	5.082	5.096	-0.014	93	42022	2.00	1.98	
39 Acrolein	56	5.207	5.221	-0.014	99	54542	20.0	21.6	
40 Acetone	43	5.305	5.319	-0.014	100	35136	8.00	8.69	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	96	67004	2.00	2.05	
43 1,1-Dichloroethene	96	5.347	5.361	-0.014	97	94056	2.00	2.05	
45 Iodomethane	142	5.529	5.529	0.000	99	141353	2.00	2.00	
46 Methyl acetate	43	5.543	5.557	-0.014	95	39913	4.00	3.92	
47 3-Chloro-1-propene	41	5.598	5.612	-0.014	88	175913	2.00	2.05	
48 Carbon disulfide	76	5.626	5.626	0.000	99	422013	2.00	2.06	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	17233	20.0	20.2	
50 Methylene Chloride	84	5.696	5.696	0.000	95	97146	2.00	1.95	
51 Acrylonitrile	53	5.822	5.836	-0.014	99	104191	20.0	20.5	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	96	112364	2.00	2.00	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	103588	2.00	2.01	
54 Hexane	57	6.087	6.101	-0.014	93	183126	2.00	2.08	
55 Vinyl acetate	43	6.157	6.157	0.000	97	148146	4.00	4.00	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	183375	2.00	2.05	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	41493	8.00	7.59	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	95	43455	60.0	54.2	
64 cis-1,2-Dichloroethene	96	6.646	6.660	-0.014	83	106162	2.00	2.05	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	146736	2.00	2.02	
67 Chlorobromomethane	128	6.841	6.841	0.000	96	30721	2.00	2.00	
68 Chloroform	83	6.855	6.855	0.000	95	159333	2.00	2.04	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	19913	4.00	4.23	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	15048	50.0	46.1	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	99	152331	2.00	2.06	
72 Cyclohexane	56	7.163	7.163	0.000	0	212024	2.00	2.13	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	98	149854	2.00	2.07	
74 Carbon tetrachloride	117	7.233	7.232	0.001	98	128677	2.00	2.05	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	78066	2.00	2.03	
77 Benzene	78	7.358	7.358	0.000	96	416772	2.00	2.10	
9 n-Heptane	43	7.456	7.456	0.000	92	188925	2.00	2.12	
79 Trichloroethene	95	7.819	7.819	0.000	98	103252	2.00	2.06	
80 2-Pentanone	43	7.847	7.847	0.000	99	75914	8.00	8.00	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	90254	2.00	2.01	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	167587	2.00	2.11	
84 1,4-Dioxane	88	8.057	8.056	0.001	89	4025	40.0	32.0	
85 Dibromomethane	93	8.098	8.098	0.000	95	30446	2.00	2.03	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	95902	2.00	2.01	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	88	11144	2.00	2.01	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	109008	2.00	1.99	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	95	97429	8.00	8.04	
91 Toluene	91	8.769	8.769	0.000	98	424249	2.00	2.11	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	43949	2.00	1.89	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	98	76214	2.00	1.97	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	41015	2.00	2.07	
95 2-Hexanone	43	9.132	9.132	0.000	97	60268	8.00	7.70	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	94	78479	2.00	2.05	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	77313	2.00	2.03	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	44546	2.00	1.96	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	36459	2.00	2.04	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	147755	2.00	2.06	
102 Chlorobenzene	112	9.816	9.816	0.000	96	236578	2.00	2.07	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	91	68003	2.00	1.94	
104 Ethylbenzene	106	9.858	9.858	0.000	98	149473	2.00	2.04	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	178662	2.00	2.02	
106 Styrene	104	10.249	10.249	0.000	85	238015	2.00	2.00	
109 o-Xylene	106	10.249	10.249	0.000	89	164944	2.00	2.01	
107 Bromoform	173	10.445	10.445	0.000	94	18925	2.00	1.88	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	467529	2.00	2.11	
111 Cyclohexanone	55	10.626	10.626	0.000	93	26350	80.0	75.6	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	93	39960	2.00	2.11	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	82	9267	2.00	2.02	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	81	10121	2.00	2.01	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	129652	2.00	2.06	
116 Bromobenzene	156	10.822	10.822	0.000	51	81075	2.00	2.03	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	382672	2.00	2.08	
117 2-Chlorotoluene	126	10.948	10.947	0.001	95	101132	2.00	2.05	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	99812	2.00	2.05	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	376895	2.00	2.09	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	384319	2.00	2.12	
122 sec-Butylbenzene	134	11.408	11.408	0.000	94	102684	2.00	2.09	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	425447	2.00	2.11	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	177625	2.00	2.07	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	96	169505	2.00	2.07	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	432266	2.00	2.15	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	136872	2.00	2.06	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	79	4508	2.00	2.09	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	88397	2.00	2.03	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	74442	2.00	2.08	
132 Naphthalene	128	14.006	14.006	0.000	98	106307	2.00	2.03	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	94	64531	2.00	2.05	
S 140 1,2-Dichloroethene, Total	96				0		4.00	4.06	
S 134 Trihalomethanes, Total	1				0		8.00	7.88	
S 139 Xylenes, Total (URS)	1				0		4.00	4.04	
S 138 Xylenes, Total	106				0		4.00	4.04	
S 136 1,2-Dichloroethene, Total	1				0		4.00	4.06	
S 135 1,3-Dichloropropene, Total	1				0		4.00	3.97	
S 137 Total BTEX	1				0			10.3	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	1.00	Units: uL
MV-2cleve+AVA_00037	Amount Added:	1.00	Units: uL
MV-Gas/Ket A_00076	Amount Added:	1.00	Units: uL

Report Date: 02-Aug-2018 13:04:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5077.D

Injection Date: 02-Aug-2018 09:33:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

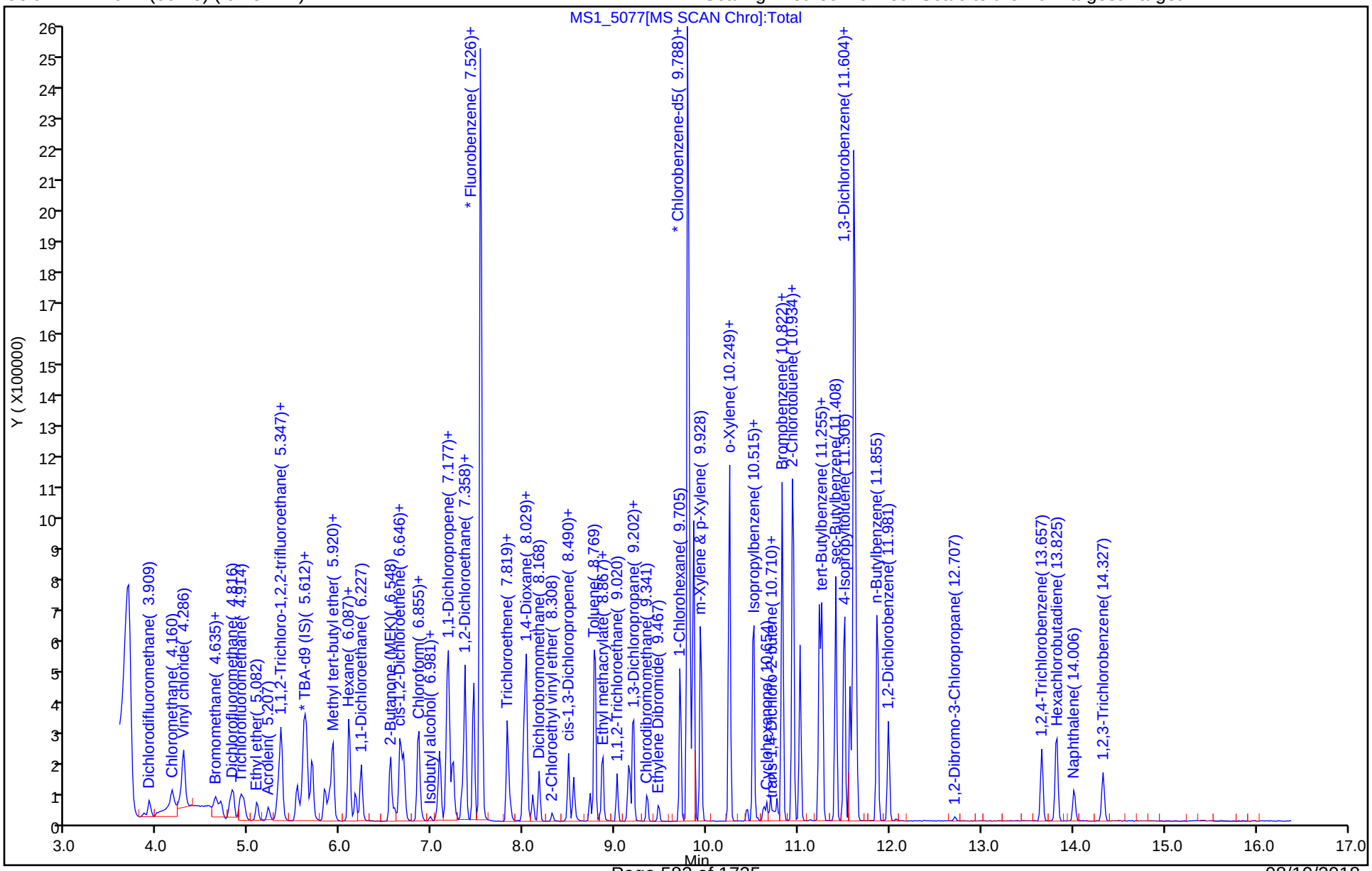
Lims ID: std02 Worklist Smp#: 14

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 14

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

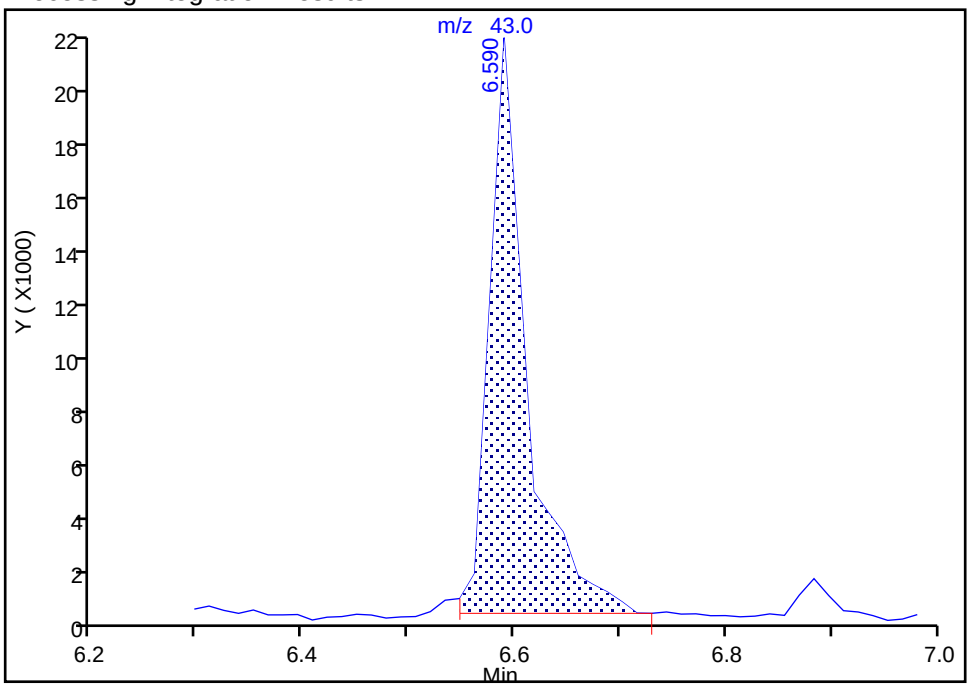
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5077.D				
Injection Date:	02-Aug-2018 09:33:30	Instrument ID:	VMS_MS1		
Lims ID:	std02				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	14	Worklist Smp#:	14
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

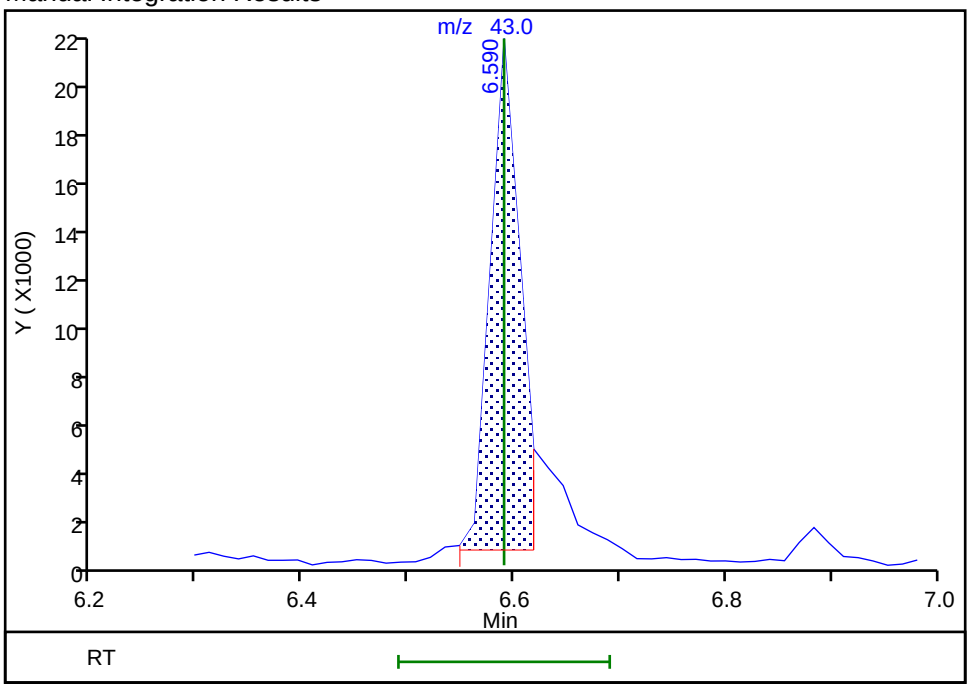
Processing Integration Results

RT: 6.59
Area: 51916
Amount: 8.706078
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 41493
Amount: 7.588832
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:48:12
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5078.D
Lims ID: std05
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 02-Aug-2018 09:53:30 ALS Bottle#: 15 Worklist Smp#: 15
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std05
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:04:57 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:39:16

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	88	188777	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2122554	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	431963	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	582229	12.5	12.5	
24 Dichlorodifluoromethane	85	3.922	3.922	0.000	100	262015	5.00	5.45	
26 Chloromethane	50	4.160	4.174	-0.014	99	287230	5.00	4.92	
27 Vinyl chloride	62	4.286	4.300	-0.014	92	288301	5.00	5.14	
29 Bromomethane	94	4.635	4.635	0.000	91	212846	5.00	5.20	
31 Chloroethane	64	4.691	4.705	-0.014	100	208499	5.00	5.10	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	460095	5.00	5.05	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	353258	5.00	4.92	
36 Ethyl ether	59	5.096	5.096	0.000	92	109027	5.00	5.16	
39 Acrolein	56	5.221	5.221	0.000	99	128287	50.0	50.9	
40 Acetone	43	5.319	5.319	0.000	100	73297	20.0	20.3	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	97	158047	5.00	4.85	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	223075	5.00	4.88	
45 Iodomethane	142	5.529	5.529	0.000	99	368517	5.00	5.23	
46 Methyl acetate	43	5.543	5.557	-0.014	96	96138	10.0	9.48	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	85	441817	5.00	5.17	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1027781	5.00	5.04	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	47895	50.0	52.1	
50 Methylene Chloride	84	5.696	5.696	0.000	95	229104	5.00	5.23	
51 Acrylonitrile	53	5.836	5.836	0.000	99	261884	50.0	51.7	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	96	289997	5.00	5.17	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	257423	5.00	5.02	
54 Hexane	57	6.087	6.101	-0.014	92	405524	5.00	4.61	
55 Vinyl acetate	43	6.157	6.157	0.000	97	383823	10.0	10.4	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	461484	5.00	5.17	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	100443	20.0	18.4	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	96	123938	150.0	143.5	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	82	263432	5.00	5.10	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	355420	5.00	4.90	
67 Chlorobromomethane	128	6.841	6.841	0.000	96	78637	5.00	5.14	
68 Chloroform	83	6.855	6.855	0.000	95	401244	5.00	5.15	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	42560	10.0	10.5	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	41687	125.0	118.5	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	365896	5.00	4.96	
72 Cyclohexane	56	7.163	7.163	0.000	0	466257	5.00	4.70	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	97	349914	5.00	4.85	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	299384	5.00	4.78	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	194972	5.00	5.10	
77 Benzene	78	7.358	7.358	0.000	96	1015513	5.00	5.13	
9 n-Heptane	43	7.456	7.456	0.000	92	425559	5.00	4.79	
79 Trichloroethene	95	7.819	7.819	0.000	98	250410	5.00	5.01	
80 2-Pentanone	43	7.847	7.847	0.000	99	194363	20.0	20.6	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	97	226060	5.00	5.06	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	374200	5.00	4.72	
84 1,4-Dioxane	88	8.056	8.056	0.000	91	12733	100.0	101.6	
85 Dibromomethane	93	8.098	8.098	0.000	96	77167	5.00	5.17	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	239790	5.00	5.05	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	30251	5.00	4.45	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	283019	5.00	5.17	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	253596	20.0	21.0	
91 Toluene	91	8.769	8.769	0.000	98	1020901	5.00	5.08	
92 Ethyl methacrylate	69	8.853	8.853	0.000	70	117097	5.00	5.03	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	199217	5.00	5.17	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	100846	5.00	5.11	
95 2-Hexanone	43	9.132	9.132	0.000	95	162252	20.0	20.7	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	196436	5.00	5.13	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	176096	5.00	4.62	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	115760	5.00	5.08	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	91506	5.00	5.13	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	326975	5.00	4.56	
102 Chlorobenzene	112	9.816	9.816	0.000	94	571821	5.00	4.99	
103 1,1,1,2-Tetrachloroethane	131	9.858	9.844	0.014	94	175726	5.00	5.01	
104 Ethylbenzene	106	9.858	9.858	0.000	98	356805	5.00	4.87	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	430496	5.00	4.88	
109 o-Xylene	106	10.249	10.249	0.000	89	409924	5.00	5.01	
106 Styrene	104	10.249	10.249	0.000	86	618546	5.00	5.20	
107 Bromoform	173	10.445	10.445	0.000	96	49542	5.00	4.76	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1087749	5.00	4.93	
111 Cyclohexanone	55	10.626	10.626	0.000	92	73302	200.0	210.3	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	94	97663	5.00	5.18	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	86	23057	5.00	5.06	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	26573	5.00	5.30	
116 Bromobenzene	156	10.822	10.822	0.000	53	201811	5.00	5.09	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	296132	5.00	4.75	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	912523	5.00	4.99	
117 2-Chlorotoluene	126	10.947	10.947	0.000	96	244211	5.00	4.98	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	237560	5.00	4.91	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	868638	5.00	4.85	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	893281	5.00	4.97	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	228466	5.00	4.68	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	971889	5.00	4.85	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	427610	5.00	5.01	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	406037	5.00	4.99	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	955019	5.00	4.79	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	335681	5.00	5.09	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	79	11972	5.00	5.05	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	224468	5.00	5.20	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	167192	5.00	4.69	
132 Naphthalene	128	14.006	14.006	0.000	97	276470	5.00	5.32	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	164057	5.00	5.24	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.1	
S 135 1,3-Dichloropropene, Total	1				0		10.0	10.3	
S 137 Total BTEX	1				0			25.0	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.1	
S 134 Trihalomethanes, Total	1				0		20.0	20.0	
S 139 Xylenes, Total (URS)	1				0		10.0	9.89	
S 138 Xylenes, Total	106				0		10.0	9.89	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

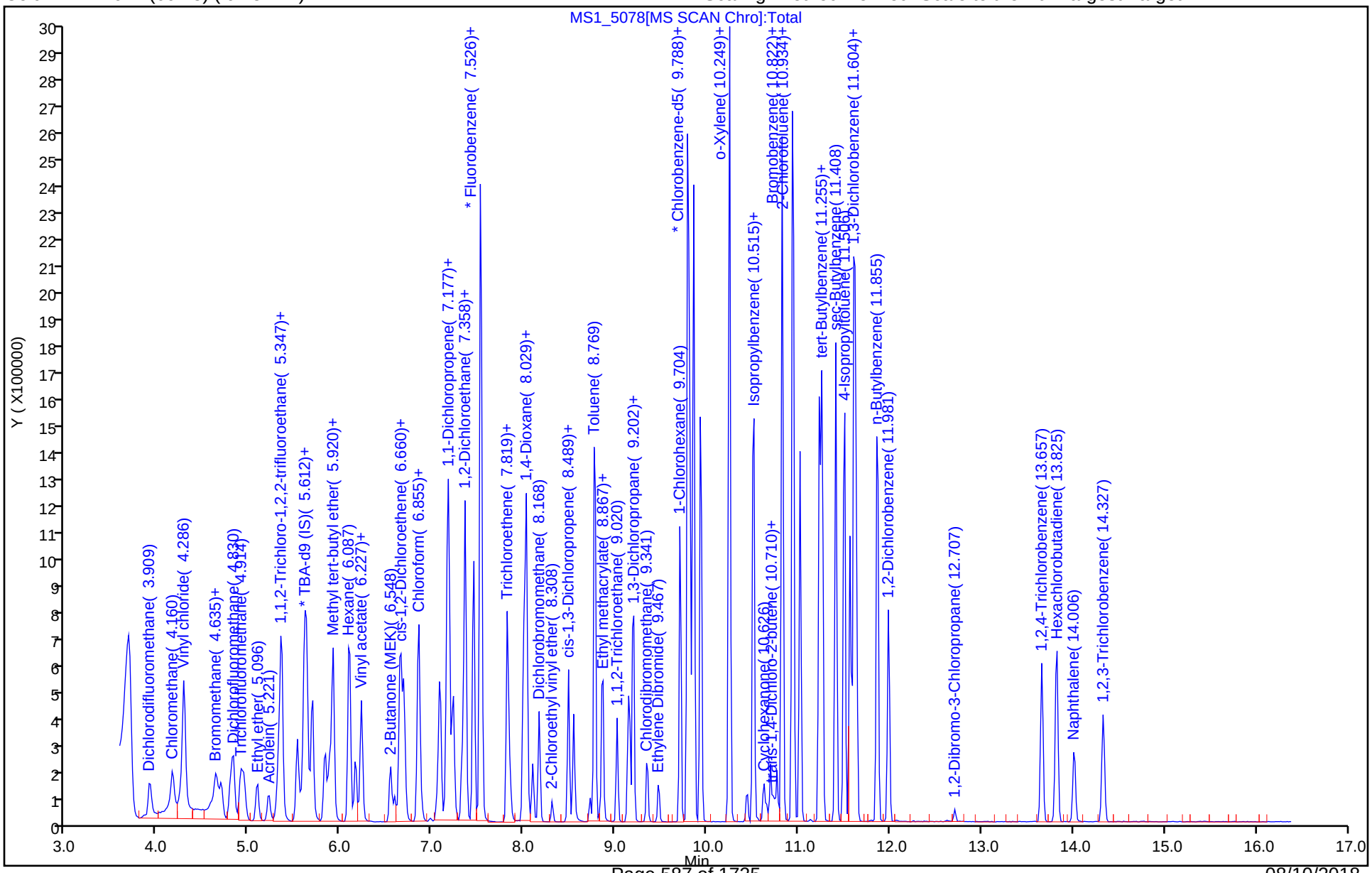
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	2.50	Units: uL
MV-2cleve+AVA_00037	Amount Added:	2.50	Units: uL
MV-Gas/Ket A_00076	Amount Added:	2.50	Units: uL

Report Date: 02-Aug-2018 13:04:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5078.D				
Injection Date:	02-Aug-2018 09:53:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std05			Worklist Smp#:	15
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	15
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

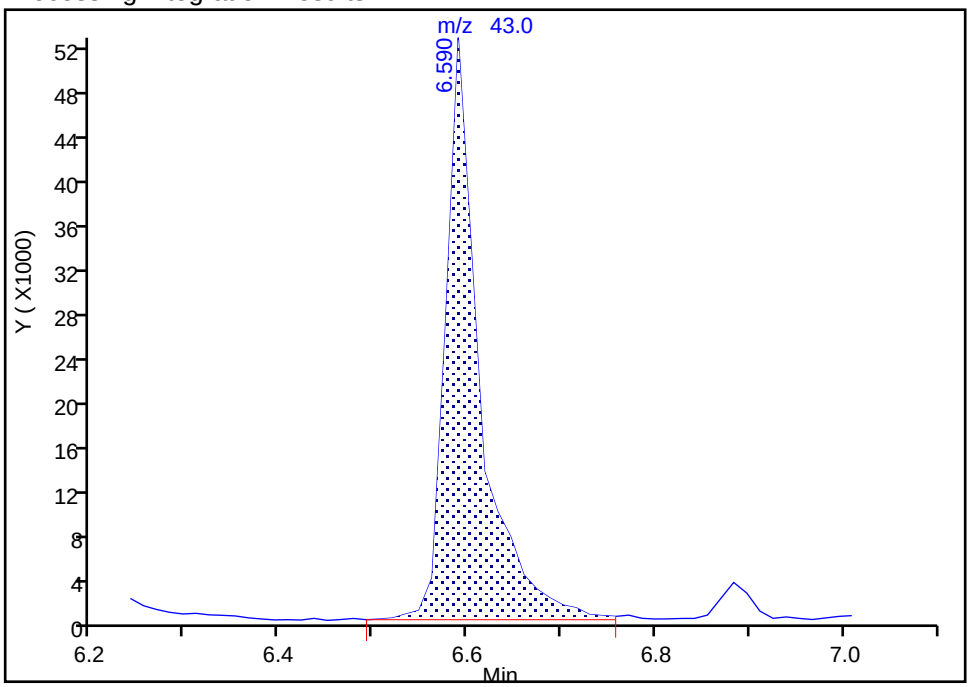
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5078.D				
Injection Date:	02-Aug-2018 09:53:30	Instrument ID:	VMS_MS1		
Lims ID:	std05				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	15	Worklist Smp#:	15
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

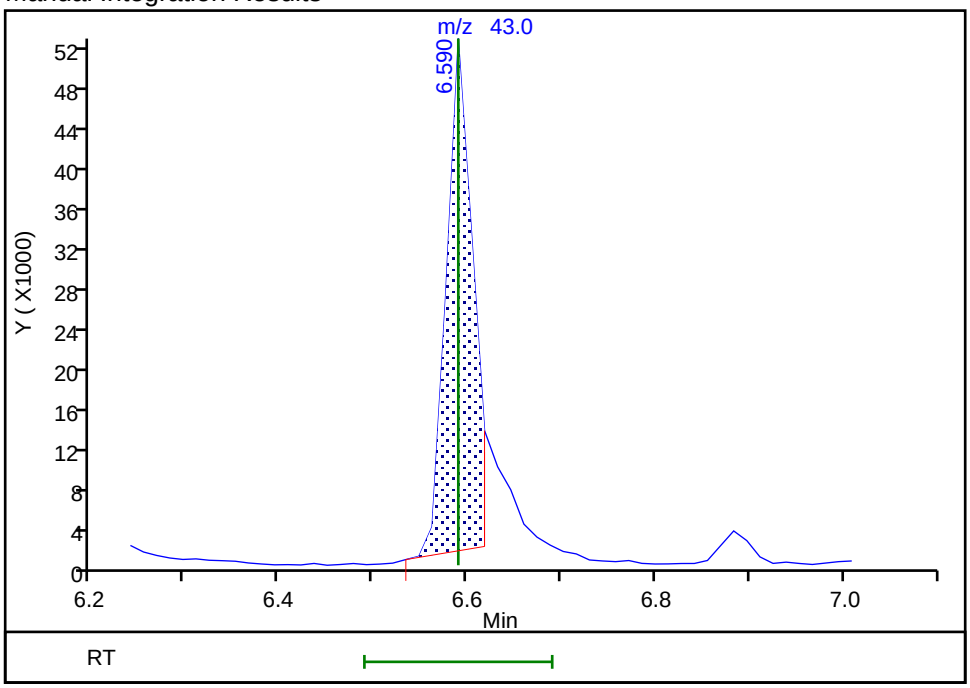
Processing Integration Results

RT: 6.59
Area: 131560
Amount: 23.156389
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 100443
Amount: 18.432002
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:47:46
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5079.D
Lims ID: std10
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 02-Aug-2018 10:14:30 ALS Bottle#: 16 Worklist Smp#: 16
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std10
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:00 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:33:36

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.598	0.000	87	189941	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2189799	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	92	441437	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	606950	12.5	12.5	
24 Dichlorodifluoromethane	85	3.922	3.922	0.000	100	564155	10.0	11.4	
26 Chloromethane	50	4.174	4.174	0.000	99	588713	10.0	9.77	
27 Vinyl chloride	62	4.300	4.300	0.000	97	605543	10.0	10.5	
29 Bromomethane	94	4.635	4.635	0.000	91	432819	10.0	10.2	
31 Chloroethane	64	4.705	4.705	0.000	100	428415	10.0	10.2	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	956401	10.0	10.2	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	762226	10.0	10.3	
36 Ethyl ether	59	5.096	5.096	0.000	92	223449	10.0	10.2	
39 Acrolein	56	5.221	5.221	0.000	100	261551	100.0	100.5	
40 Acetone	43	5.319	5.319	0.000	100	142461	40.0	39.9	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.347	0.000	96	360256	10.0	10.7	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	98	487569	10.0	10.3	
45 Iodomethane	142	5.529	5.529	0.000	99	755810	10.0	10.4	
46 Methyl acetate	43	5.557	5.557	0.000	97	198097	20.0	18.9	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	87	909580	10.0	10.3	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2185345	10.0	10.4	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	93	95029	100.0	102.7	
50 Methylene Chloride	84	5.696	5.696	0.000	94	453852	10.0	10.5	
51 Acrylonitrile	53	5.836	5.836	0.000	99	534223	100.0	102.1	
52 Methyl tert-butyl ether	73	5.892	5.892	0.000	96	586404	10.0	10.1	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	539385	10.0	10.2	
54 Hexane	57	6.101	6.101	0.000	91	933281	10.0	10.4	
55 Vinyl acetate	43	6.157	6.157	0.000	97	807364	20.0	21.2	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	955292	10.0	10.4	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	208155	40.0	37.0	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	94	260819	300.0	300.2	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	82	541403	10.0	10.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	91	761324	10.0	10.2	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	161964	10.0	10.3	
68 Chloroform	83	6.855	6.855	0.000	95	827738	10.0	10.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	90	79975	20.0	20.0	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	83466	250.0	235.9	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	792643	10.0	10.4	
72 Cyclohexane	56	7.163	7.163	0.000	0	1073292	10.0	10.5	
73 1,1-Dichloropropene	75	7.191	7.191	0.000	98	774076	10.0	10.4	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	665835	10.0	10.3	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	400706	10.0	10.2	
77 Benzene	78	7.358	7.358	0.000	96	2105308	10.0	10.3	
9 n-Heptane	43	7.456	7.456	0.000	92	951643	10.0	10.4	
79 Trichloroethene	95	7.819	7.819	0.000	98	534671	10.0	10.4	
80 2-Pentanone	43	7.847	7.847	0.000	99	407613	40.0	41.8	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	97	468579	10.0	10.2	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	852769	10.0	10.4	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	29075	200.0	224.9	
85 Dibromomethane	93	8.098	8.098	0.000	95	155855	10.0	10.1	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	502920	10.0	10.3	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	65666	10.0	8.71	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	584896	10.0	10.5	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	528863	40.0	42.5	
91 Toluene	91	8.769	8.769	0.000	98	2119622	10.0	10.2	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	243658	10.0	10.2	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	421536	10.0	10.6	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	207294	10.0	10.2	
95 2-Hexanone	43	9.132	9.132	0.000	96	341167	40.0	42.7	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	397780	10.0	10.2	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	407265	10.0	10.4	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	242209	10.0	10.4	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	190306	10.0	10.4	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	767322	10.0	10.5	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1198370	10.0	10.2	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	371334	10.0	10.4	
104 Ethylbenzene	106	9.858	9.858	0.000	98	769867	10.0	10.3	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	925395	10.0	10.3	
106 Styrene	104	10.249	10.249	0.000	86	1301023	10.0	10.7	
109 o-Xylene	106	10.249	10.249	0.000	89	867725	10.0	10.4	
107 Bromoform	173	10.445	10.445	0.000	98	109895	10.0	10.2	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	2382186	10.0	10.4	
111 Cyclohexanone	55	10.626	10.626	0.000	92	153088	400.0	429.9	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	200198	10.0	10.2	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	93	48429	10.0	10.2	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	86	53523	10.0	10.2	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	668508	10.0	10.3	
116 Bromobenzene	156	10.822	10.822	0.000	97	424825	10.0	10.3	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1966980	10.0	10.3	
117 2-Chlorotoluene	126	10.947	10.947	0.000	96	527365	10.0	10.3	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	512020	10.0	10.1	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	1936218	10.0	10.4	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1915213	10.0	10.2	
122 sec-Butylbenzene	134	11.408	11.408	0.000	94	527982	10.0	10.4	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	2175391	10.0	10.4	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	911595	10.0	10.2	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	861432	10.0	10.2	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2172024	10.0	10.4	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	703378	10.0	10.2	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	81	25148	10.0	9.83	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	463813	10.0	10.3	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	381635	10.0	10.3	
132 Naphthalene	128	14.006	14.006	0.000	97	572176	10.0	10.6	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	340129	10.0	10.4	
S 140 1,2-Dichloroethene, Total	96				0		20.0	20.4	
S 134 Trihalomethanes, Total	1				0		40.0	41.2	
S 139 Xylenes, Total (URS)	1				0		20.0	20.6	
S 138 Xylenes, Total	106				0		20.0	20.6	
S 136 1,2-Dichloroethene, Total	1				0		20.0	20.4	
S 135 1,3-Dichloropropene, Total	1				0		20.0	21.1	
S 137 Total BTEX	1				0			51.4	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main A_00037	Amount Added:	5.00	Units: uL
MV-2cleve+AVA_00037	Amount Added:	5.00	Units: uL
MV-Gas/Ket A_00076	Amount Added:	5.00	Units: uL

Report Date: 02-Aug-2018 13:05:01 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5079.D

Injection Date: 02-Aug-2018 10:14:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

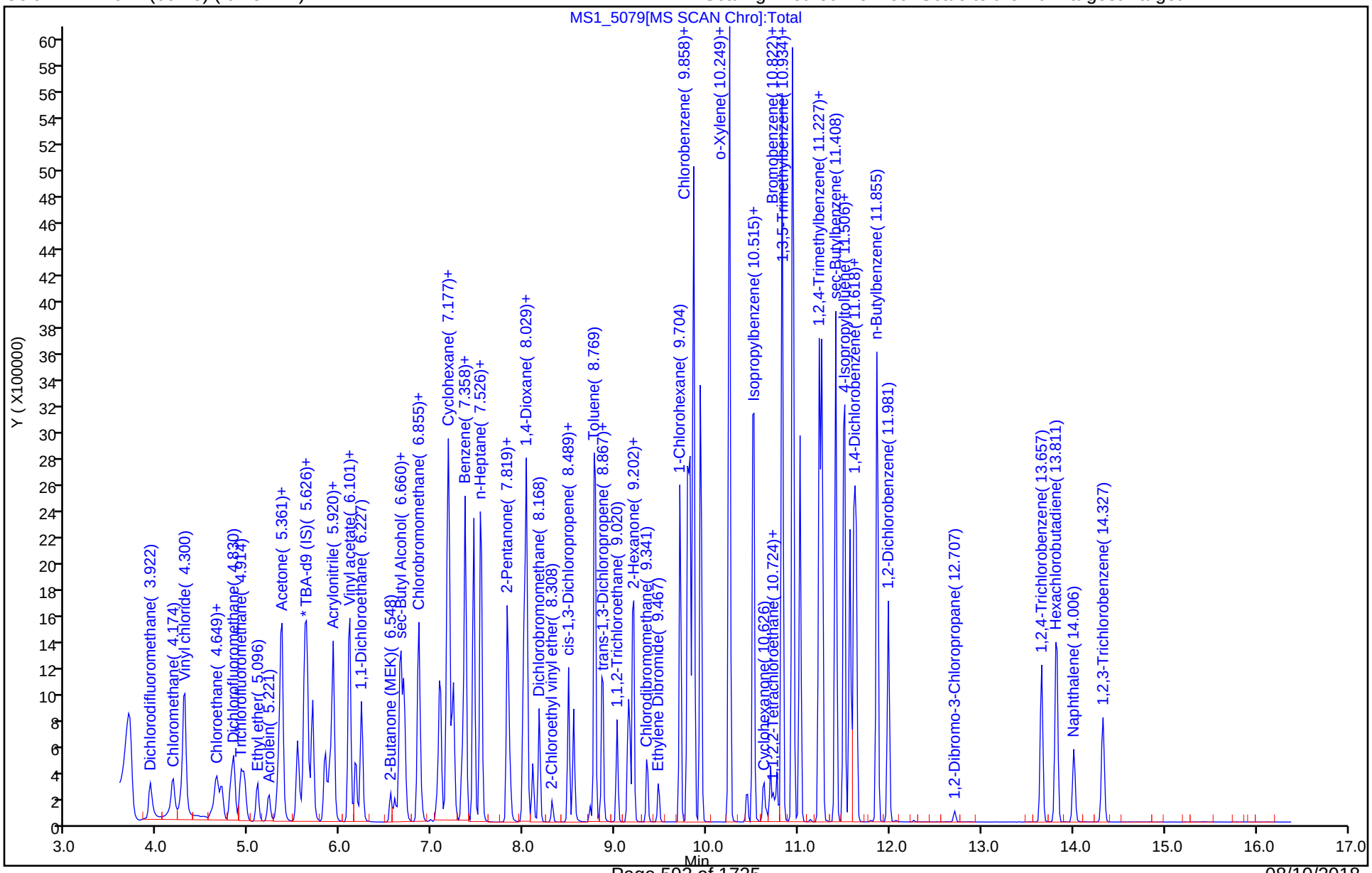
Lims ID: std10 Worklist Smp#: 16

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 16

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

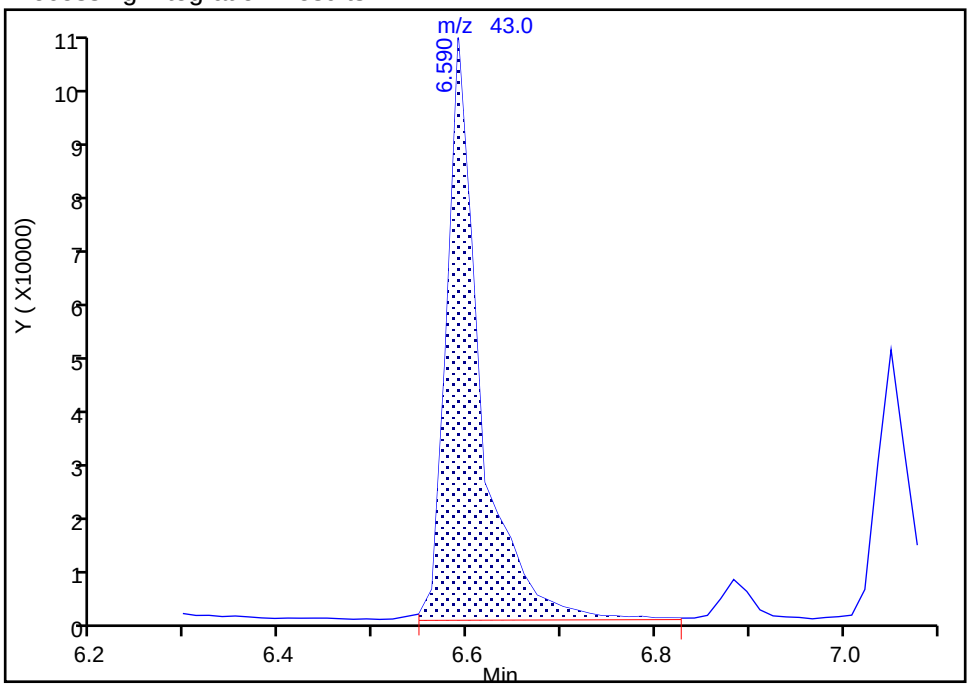
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5079.D				
Injection Date:	02-Aug-2018 10:14:30	Instrument ID:	VMS_MS1		
Lims ID:	std10				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	16	Worklist Smp#:	16
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

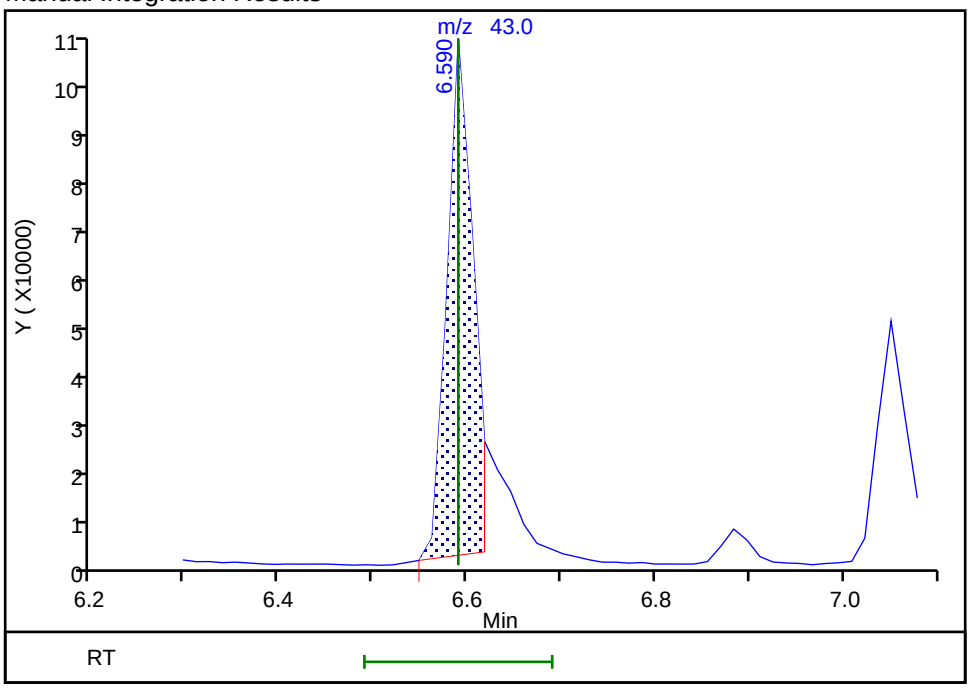
Processing Integration Results

RT: 6.59
Area: 268882
Amount: 44.826127
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 208155
Amount: 37.024924
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:47:00
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5080.D
Lims ID: std30
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 02-Aug-2018 10:34:30 ALS Bottle#: 17 Worklist Smp#: 17
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std30
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:03 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:40:43

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	90	184853	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2162852	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	91	438061	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	97	614964	12.5	12.5	
24 Dichlorodifluoromethane	85	3.923	3.922	0.000	100	1607609	30.0	32.8	
26 Chloromethane	50	4.160	4.174	-0.014	99	1649433	30.0	27.7	
27 Vinyl chloride	62	4.286	4.300	-0.014	98	1663573	30.0	29.1	
29 Bromomethane	94	4.635	4.635	0.000	90	1263233	30.0	30.3	
31 Chloroethane	64	4.691	4.705	-0.014	100	1215873	30.0	29.2	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	2702237	30.0	29.1	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	2181784	30.0	29.8	
36 Ethyl ether	59	5.096	5.096	0.000	91	589044	30.0	27.3	
39 Acrolein	56	5.207	5.221	-0.014	100	754395	300.0	293.6	
40 Acetone	43	5.319	5.319	0.000	100	401189	120.0	117.3	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.347	0.000	96	943667	30.0	28.4	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	1279482	30.0	27.5	
45 Iodomethane	142	5.529	5.529	0.000	99	2016771	30.0	28.1	
46 Methyl acetate	43	5.543	5.557	-0.014	97	526019	60.0	50.9	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	88	2361056	30.0	27.1	
48 Carbon disulfide	76	5.626	5.626	0.000	99	5666306	30.0	27.3	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	262033	300.0	291.1	
50 Methylene Chloride	84	5.696	5.696	0.000	94	1184219	30.0	28.4	
51 Acrylonitrile	53	5.822	5.836	-0.014	99	1427463	300.0	276.3	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	95	1594990	30.0	27.9	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	1426670	30.0	27.3	
54 Hexane	57	6.101	6.101	0.000	90	2356635	30.0	26.4	
55 Vinyl acetate	43	6.157	6.157	0.000	97	2254728	60.0	60.0	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	2485350	30.0	27.3	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	640657	120.0	115.4	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	97	736148	900.0	870.7	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	81	1443283	30.0	27.4	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	91	2035165	30.0	27.5	
67 Chlorobromomethane	128	6.841	6.841	0.000	93	437412	30.0	28.0	
68 Chloroform	83	6.855	6.855	0.000	95	2186138	30.0	27.5	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	207066	60.0	54.4	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	232449	750.0	675.0	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	2094001	30.0	27.9	
72 Cyclohexane	56	7.163	7.163	0.000	0	2754325	30.0	27.3	
73 1,1-Dichloropropene	75	7.177	7.191	-0.014	98	2035350	30.0	27.7	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	1782446	30.0	27.9	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	1069725	30.0	27.4	
77 Benzene	78	7.358	7.358	0.000	97	5467947	30.0	27.1	
9 n-Heptane	43	7.456	7.456	0.000	91	2421389	30.0	26.7	
79 Trichloroethene	95	7.819	7.819	0.000	99	1414865	30.0	27.8	
80 2-Pentanone	43	7.847	7.847	0.000	99	1107233	120.0	114.9	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	98	1246070	30.0	27.4	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	2204443	30.0	27.3	
84 1,4-Dioxane	88	8.057	8.056	0.000	91	78499	600.0	614.8	
85 Dibromomethane	93	8.098	8.098	0.000	96	420276	30.0	27.7	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	1365855	30.0	28.2	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	219639	30.0	28.1	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	97	1595241	30.0	28.7	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	1528689	120.0	124.3	
91 Toluene	91	8.769	8.769	0.000	99	5524520	30.0	27.0	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	665198	30.0	28.2	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	1162612	30.0	29.6	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	559577	30.0	27.8	
95 2-Hexanone	43	9.132	9.132	0.000	96	984750	120.0	124.1	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	95	1080009	30.0	27.8	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	1088504	30.0	28.1	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	687122	30.0	29.8	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	514796	30.0	28.4	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	2031866	30.0	27.9	
102 Chlorobenzene	112	9.816	9.816	0.000	94	3231093	30.0	27.8	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	1049644	30.0	29.5	
104 Ethylbenzene	106	9.858	9.858	0.000	98	2124084	30.0	28.6	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	2508264	30.0	28.0	
109 o-Xylene	106	10.249	10.249	0.000	88	2392581	30.0	28.8	
106 Styrene	104	10.249	10.249	0.000	87	3619275	30.0	30.0	
107 Bromoform	173	10.445	10.445	0.000	98	319845	30.0	29.8	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	6327757	30.0	27.2	
111 Cyclohexanone	55	10.612	10.626	-0.014	94	476407	1200.0	1348.0	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	544180	30.0	27.3	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	96	140039	30.0	29.1	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	86	146713	30.0	27.7	
116 Bromobenzene	156	10.822	10.822	0.000	97	1191870	30.0	28.5	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	1850570	30.0	28.1	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	95	5423026	30.0	28.1	
117 2-Chlorotoluene	126	10.948	10.947	0.001	96	1477889	30.0	28.5	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	1440429	30.0	28.2	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	5273697	30.0	27.9	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	5229068	30.0	27.5	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	1475759	30.0	28.6	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	5894557	30.0	27.9	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	2518936	30.0	28.0	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	2383941	30.0	27.7	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	5887503	30.0	27.9	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	1941765	30.0	27.9	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	82	73435	30.0	27.7	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	1303964	30.0	28.6	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	1091279	30.0	29.0	
132 Naphthalene	128	14.006	14.006	0.000	97	1570155	30.0	28.6	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	943710	30.0	28.5	
S 140 1,2-Dichloroethene, Total	96				0		60.0	54.7	
S 135 1,3-Dichloropropene, Total	1				0		60.0	58.4	
S 137 Total BTEX	1				0			139.5	
S 136 1,2-Dichloroethene, Total	1				0		60.0	54.7	
S 134 Trihalomethanes, Total	1				0		120.0	115.3	
S 139 Xylenes, Total (URS)	1				0		60.0	56.8	
S 138 Xylenes, Total	106				0		60.0	56.8	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-Main A_00037	Amount Added: 15.00	Units: uL
MV-2cleve+AVA_00037	Amount Added: 15.00	Units: uL
MV-Gas/Ket A_00076	Amount Added: 15.00	Units: uL

Report Date: 02-Aug-2018 13:05:04 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5080.D

Injection Date: 02-Aug-2018 10:34:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

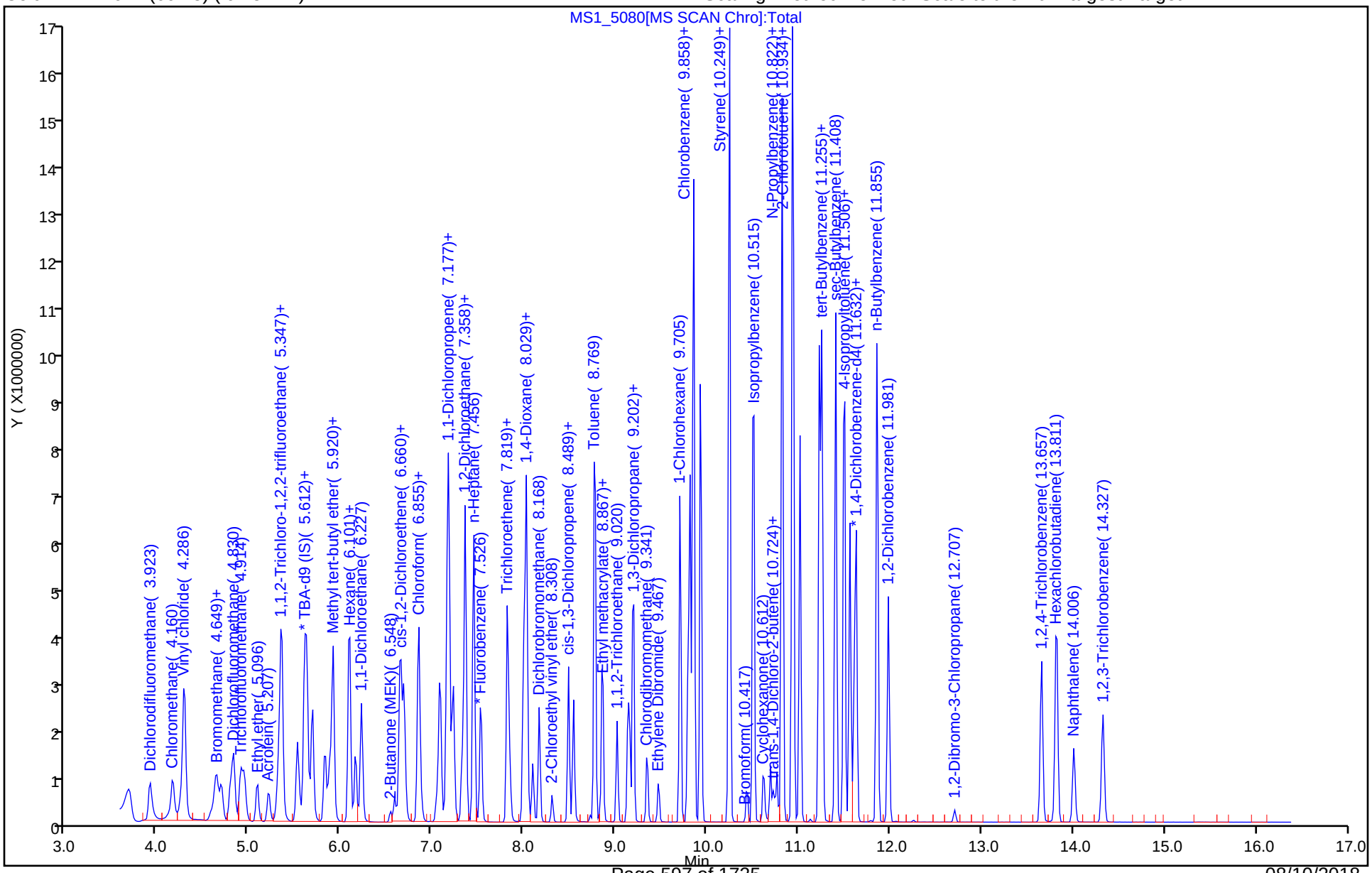
Lims ID: std30 Worklist Smp#: 17

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 17

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver

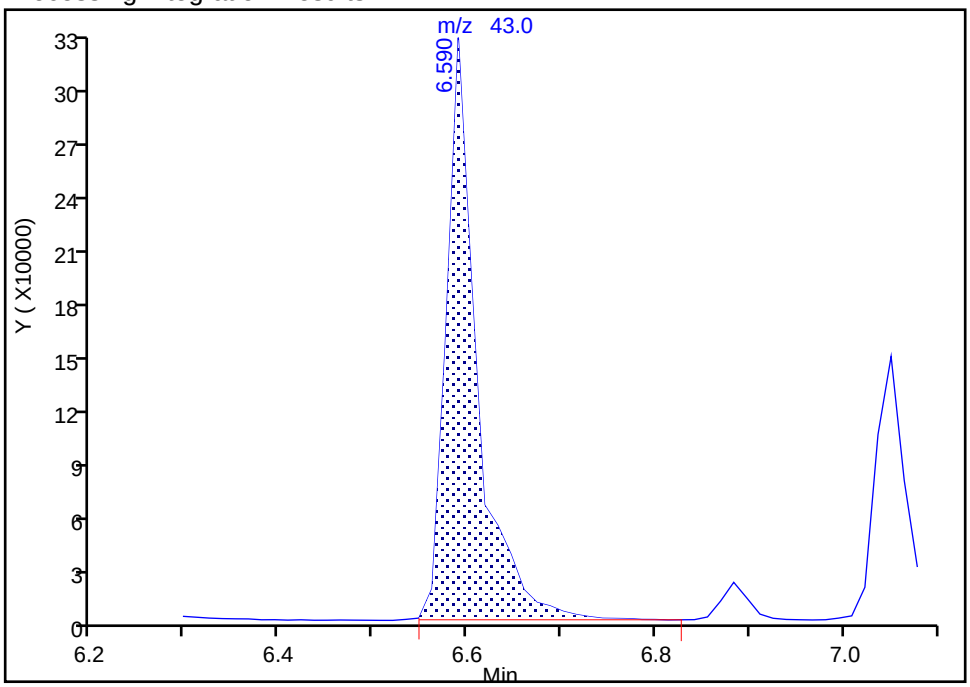
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5080.D				
Injection Date:	02-Aug-2018 10:34:30	Instrument ID:	VMS_MS1		
Lims ID:	std30				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	17	Worklist Smp#:	17
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

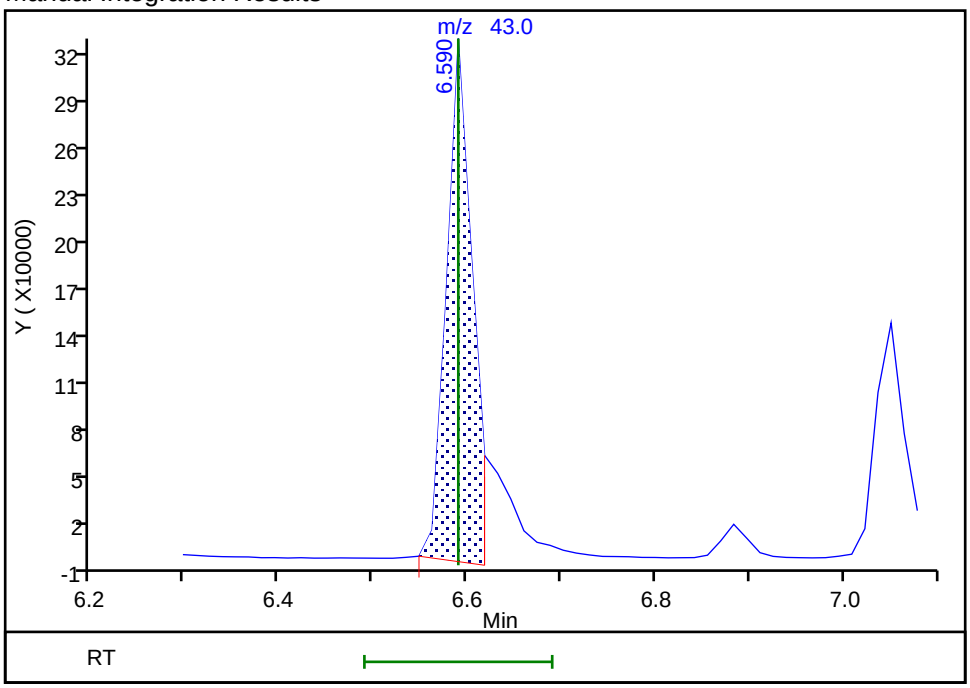
Processing Integration Results

RT: 6.59
Area: 745302
Amount: 124.1607
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 640657
Amount: 115.3746
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:46:19
Audit Action: Assigned New Baseline Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D
Lims ID: std60
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 02-Aug-2018 10:54:30 ALS Bottle#: 18 Worklist Smp#: 18
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std60
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub66

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:05 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 11:43:48

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	86	191906	250.0	250.0	a
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2198213	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	449059	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.618	11.604	0.014	96	628762	12.5	12.5	
24 Dichlorodifluoromethane	85	3.923	3.922	0.001	100	3295611	60.0	66.2	
26 Chloromethane	50	4.160	4.174	-0.014	99	3378862	60.0	55.8	
27 Vinyl chloride	62	4.286	4.300	-0.014	98	3276951	60.0	56.4	
29 Bromomethane	94	4.635	4.635	0.000	90	2487024	60.0	58.6	
31 Chloroethane	64	4.691	4.705	-0.014	100	2368826	60.0	55.9	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	5543482	60.0	58.7	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	4476447	60.0	60.2	
36 Ethyl ether	59	5.096	5.096	0.000	91	1348510	60.0	61.6	
39 Acrolein	56	5.207	5.221	-0.014	100	1545886	599.9	592.0	
40 Acetone	43	5.319	5.319	0.000	100	809150	240.0	234.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.347	0.000	97	2185427	60.0	64.7	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	2929771	60.0	61.9	
45 Iodomethane	142	5.529	5.529	0.000	99	4580085	60.0	62.8	
46 Methyl acetate	43	5.543	5.557	-0.014	97	1185621	120.0	112.8	
47 3-Chloro-1-propene	41	5.599	5.612	-0.013	89	5148897	60.0	58.2	
48 Carbon disulfide	76	5.626	5.626	0.000	99	12279155	60.0	58.1	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	618695	600.0	662.1	
50 Methylene Chloride	84	5.696	5.696	0.000	97	2678804	60.0	63.8	
51 Acrylonitrile	53	5.836	5.836	0.000	99	3207740	600.0	610.9	
52 Methyl tert-butyl ether	73	5.892	5.892	0.000	95	3640553	60.0	62.7	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	99	3267087	60.0	61.5	
54 Hexane	57	6.101	6.101	0.000	89	5250704	60.0	57.4	
55 Vinyl acetate	43	6.157	6.157	0.000	97	4699784	120.0	123.0	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	5564790	60.0	60.2	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	1302396	240.0	230.8	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	97	1694104	1800.0	1930.0	
64 cis-1,2-Dichloroethene	96	6.660	6.660	0.000	80	3295665	60.0	61.6	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	90	4607883	60.0	61.4	
67 Chlorobromomethane	128	6.842	6.841	0.001	95	1019268	60.0	64.3	
68 Chloroform	83	6.855	6.855	0.000	94	4950029	60.0	61.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	90	469376	120.0	122.9	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	551153	1500.0	1541.6	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	4736877	60.0	62.0	
72 Cyclohexane	56	7.163	7.163	0.000	0	6043382	60.0	58.8	
73 1,1-Dichloropropene	75	7.191	7.191	0.000	98	4602816	60.0	61.6	
74 Carbon tetrachloride	117	7.233	7.232	0.001	98	4095789	60.0	63.1	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	2421140	60.0	61.1	
77 Benzene	78	7.358	7.358	0.000	98	11883656	60.0	58.0	
9 n-Heptane	43	7.456	7.456	0.000	91	5245197	60.0	57.0	
79 Trichloroethene	95	7.819	7.819	0.000	99	3254862	60.0	62.8	
80 2-Pentanone	43	7.847	7.847	0.000	99	2526845	240.0	258.1	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	2824297	60.0	61.0	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	4846395	60.0	59.0	
84 1,4-Dioxane	88	8.057	8.056	0.001	93	182854	1200.0	1409.0	
85 Dibromomethane	93	8.098	8.098	0.000	96	972742	60.0	63.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	3131431	60.0	63.7	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	510394	60.0	63.5	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	97	3639978	60.0	64.0	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	95	3109898	240.0	248.8	
91 Toluene	91	8.783	8.769	0.014	99	11767863	60.0	56.6	
92 Ethyl methacrylate	69	8.853	8.853	0.000	91	1565228	60.0	64.7	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.001	97	2684455	60.0	67.3	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	1274746	60.0	62.3	
95 2-Hexanone	43	9.132	9.132	0.000	95	2017731	240.0	248.1	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	90	2456863	60.0	61.7	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	2524145	60.0	63.7	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	1607038	60.0	67.9	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	1190133	60.0	64.1	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	4559602	60.0	61.2	
102 Chlorobenzene	112	9.816	9.816	0.000	93	7199151	60.0	60.5	
103 1,1,1,2-Tetrachloroethane	131	9.858	9.844	0.014	96	2477455	60.0	67.9	
104 Ethylbenzene	106	9.858	9.858	0.000	97	4765351	60.0	62.5	e
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	97	5582840	60.0	60.9	eM
106 Styrene	104	10.249	10.249	0.000	86	7854293	60.0	63.5	
109 o-Xylene	106	10.249	10.249	0.000	86	5237199	60.0	61.5	
107 Bromoform	173	10.445	10.445	0.000	99	763589	60.0	69.3	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	13051965	60.0	54.8	
111 Cyclohexanone	55	10.626	10.626	0.000	92	1017930	2400.0	2809.7	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	1234693	60.0	60.7	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	95	326861	60.0	66.4	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	86	336848	60.0	62.3	
115 N-Propylbenzene	120	10.822	10.822	0.000	96	4228117	60.0	62.8	
116 Bromobenzene	156	10.822	10.822	0.000	96	2807153	60.0	65.5	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	96	11340451	60.0	57.5	
117 2-Chlorotoluene	126	10.948	10.947	0.001	97	3379698	60.0	63.8	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	3257500	60.0	62.3	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	11472922	60.0	59.4	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	11199960	60.0	57.7	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	3298491	60.0	62.6	e

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	95	12211753	60.0	56.4	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	96	5604443	60.0	60.8	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	93	5332369	60.0	60.7	
127 n-Butylbenzene	91	11.855	11.855	0.000	96	11971153	60.0	55.6	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	4357629	60.0	61.1	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	82	173215	60.0	63.5	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	2870406	60.0	61.6	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	2364233	60.0	61.5	
132 Naphthalene	128	14.006	14.006	0.000	98	3430633	60.0	61.1	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	2035072	60.0	60.2	
S 140 1,2-Dichloroethene, Total	96				0		120.0	123.1	
S 134 Trihalomethanes, Total	1				0		240.0	262.1	
S 139 Xylenes, Total (URS)	1				0		120.0	122.4	
S 138 Xylenes, Total	106				0		120.0	122.4	
S 136 1,2-Dichloroethene, Total	1				0		120.0	123.1	
S 135 1,3-Dichloropropene, Total	1				0		120.0	131.3	
S 137 Total BTEX	1				0			299.5	

QC Flag Legend

Processing Flags
- e - Potential Peak Saturated

Review Flags
- M - Manually Integrated
- a - User Assigned ID

Reagents:

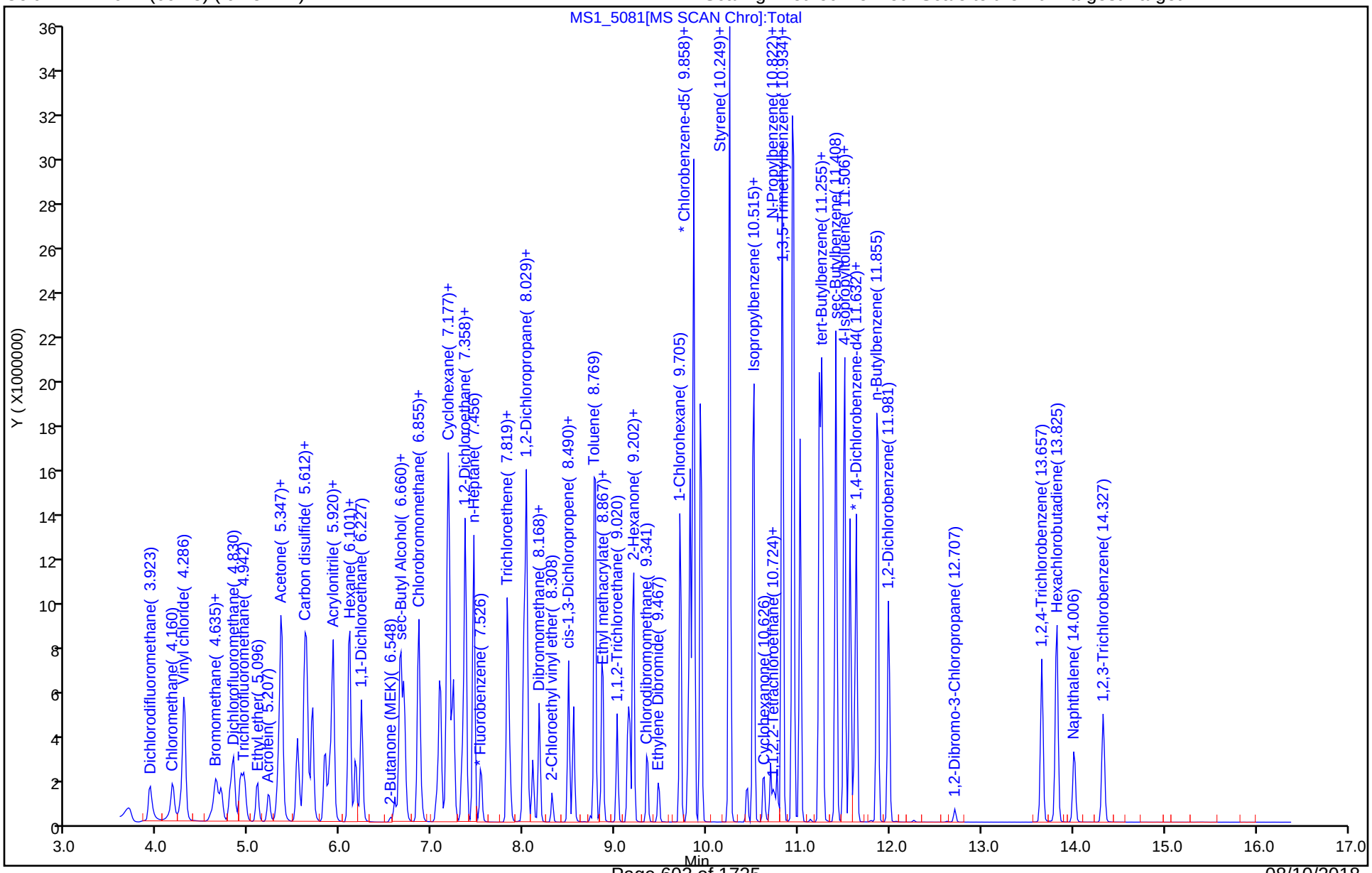
MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-Main A_00037	Amount Added: 30.00	Units: uL
MV-2cleve+AVA_00037	Amount Added: 30.00	Units: uL
MV-Gas/Ket A_00076	Amount Added: 30.00	Units: uL

Report Date: 02-Aug-2018 13:05:06 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Injection Date:	02-Aug-2018 10:54:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std60			Worklist Smp#:	18
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	18
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

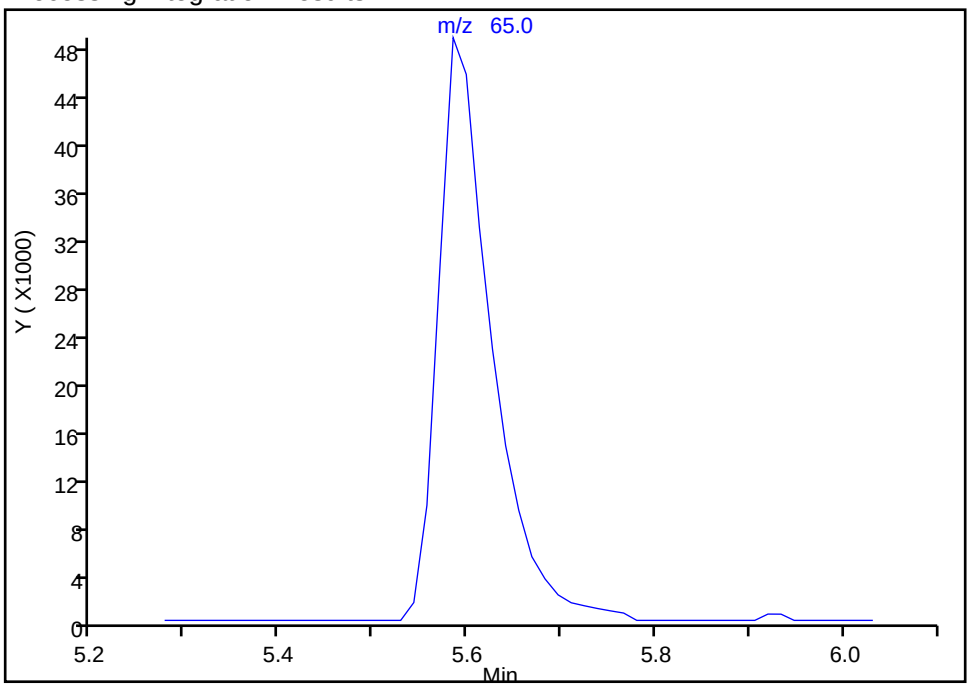
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Injection Date:	02-Aug-2018 10:54:30	Instrument ID:	VMS_MS1		
Lims ID:	std60				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	18	Worklist Smp#:	18
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

* 150 TBA-d9 (IS), CAS: 25725-11-5

Signal: 1

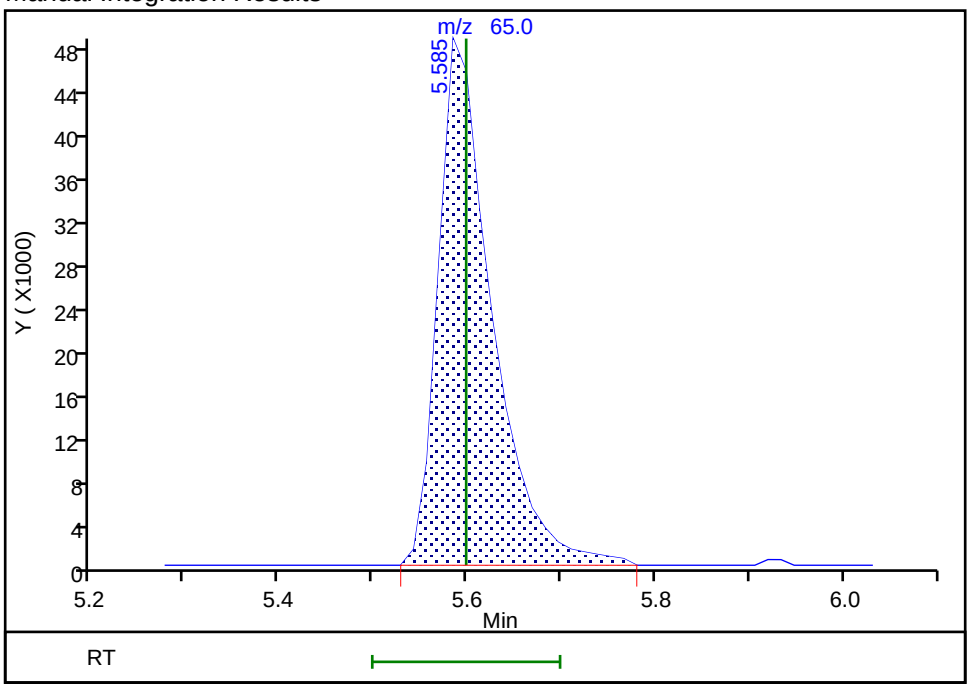
Not Detected
Expected RT: 5.60

Processing Integration Results



RT: 5.58
Area: 191906
Amount: 250.0000
Amount Units: ug/l

Manual Integration Results



Reviewer: wickhamt, 02-Aug-2018 11:40:55
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Denver

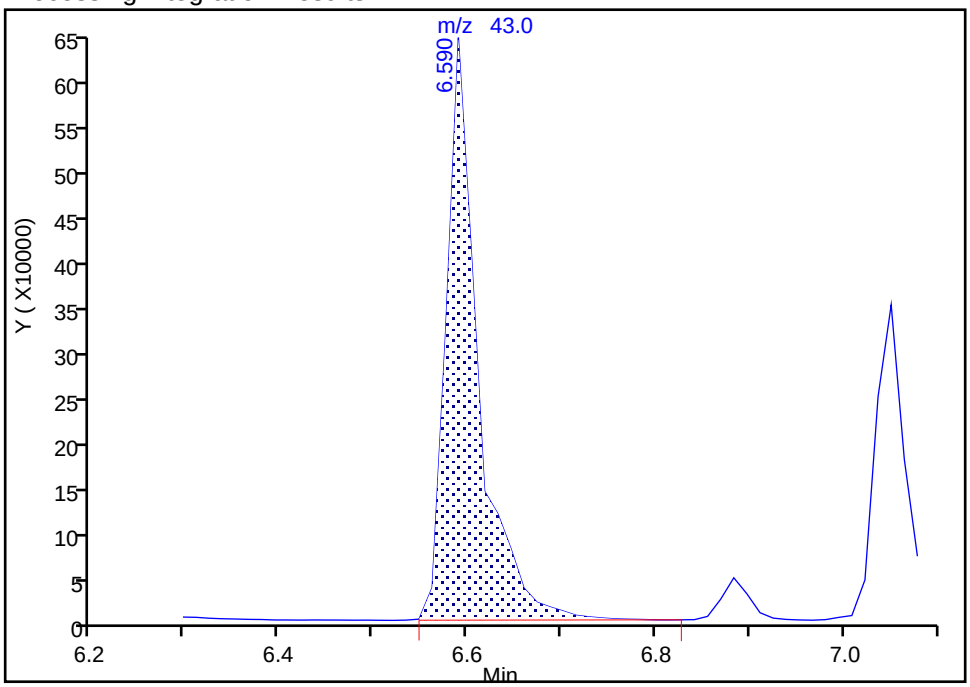
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Injection Date:	02-Aug-2018 10:54:30	Instrument ID:	VMS_MS1		
Lims ID:	std60				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	18	Worklist Smp#:	18
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

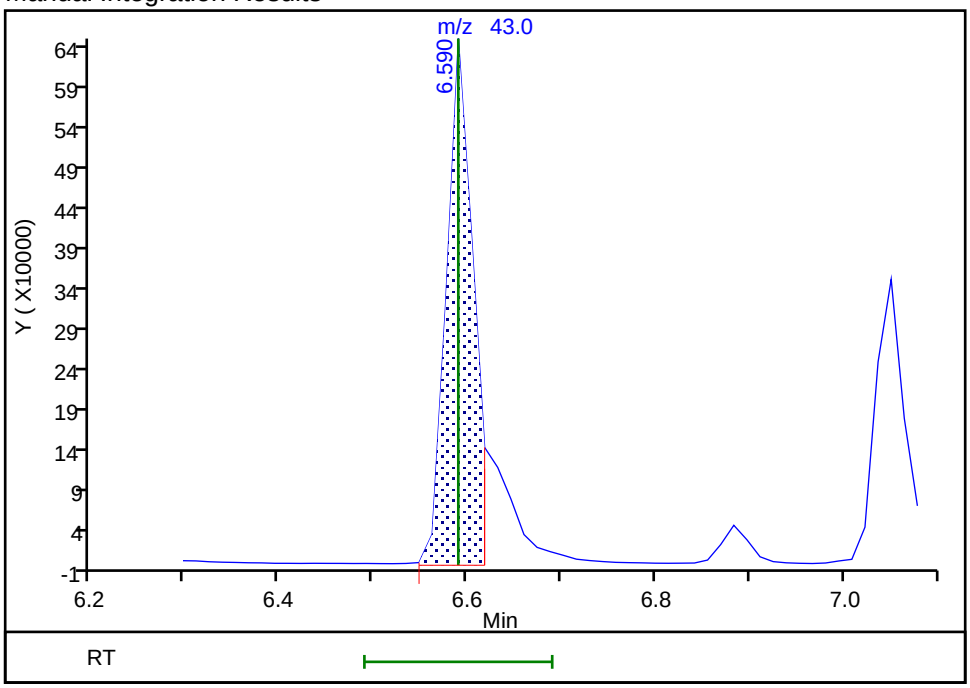
Processing Integration Results

RT: 6.59
Area: 1533988
Amount: 244.6028
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 1302396
Amount: 230.7729
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:45:51
Audit Action: Assigned New Baseline Audit Reason: Shouldering

Manual Integration/User Assign Peak Report

TestAmerica Denver

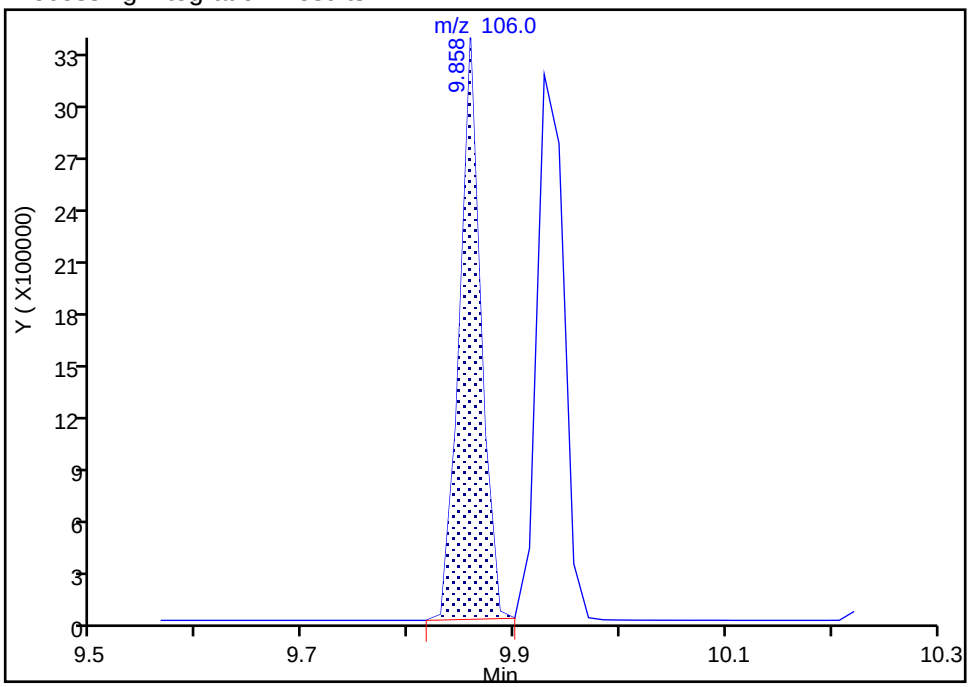
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Injection Date:	02-Aug-2018 10:54:30	Instrument ID:	VMS_MS1		
Lims ID:	std60				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	18	Worklist Smp#:	18
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

105 m-Xylene & p-Xylene, CAS: 179601-23-1

Signal: 1

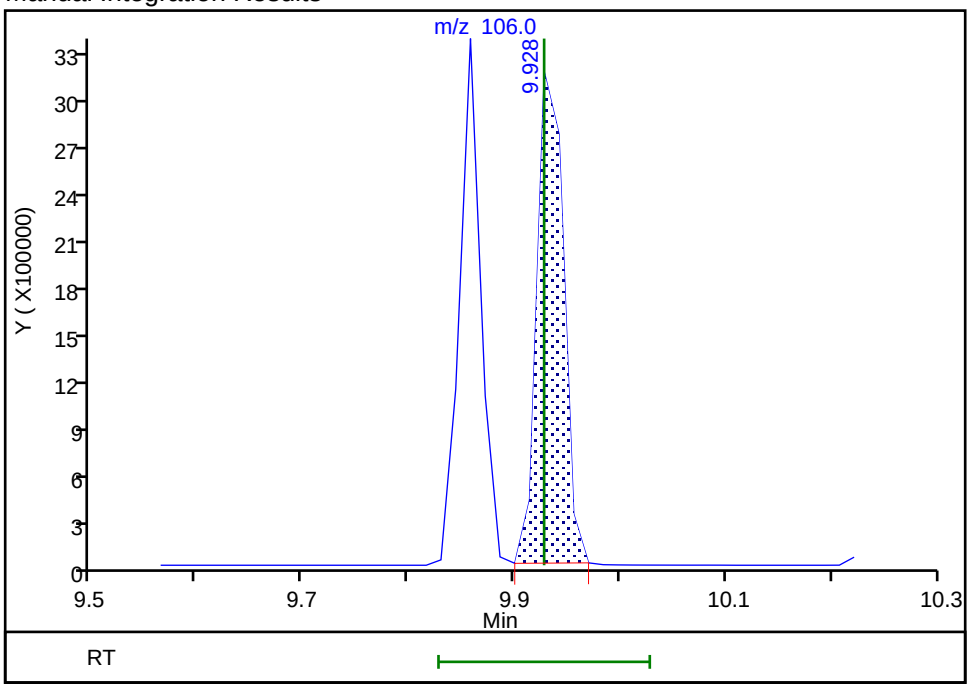
Processing Integration Results

RT: 9.86
Area: 4765351
Amount: 53.076000
Amount Units: ug/l



Manual Integration Results

RT: 9.93
Area: 5582840
Amount: 60.861700
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 11:42:28
Audit Action: Manually Integrated Audit Reason: Wrong peak

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD01 280-424541/20	MS1_5084.D
Level 2	STD02 280-424541/21	MS1_5085.D
Level 3	STD05 280-424541/22	MS1_5086.D
Level 4	ICIS 280-424541/23	MS1_5087.D
Level 5	STD30 280-424541/24	MS1_5088.D
Level 6	STD60 280-424541/25	MS1_5089.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethanol	0.1761 0.1732	0.1947	0.1836	0.1794	0.1635	Ave		0.1784				5.9		15.0			
Isopropyl alcohol	1.1357 0.9564	1.1385	1.0370	0.9929	0.9104	Ave		1.0285				9.1		15.0			
Acetonitrile	0.0097 0.0095	0.0106	0.0095	0.0096	0.0091	Ave		0.0097				5.1		15.0			
Isopropyl ether	0.1730 0.1936	0.1833	0.1866	0.1879	0.1799	Ave		0.1841				3.9		15.0			
2-Chloro-1,3-butadiene	0.4613 0.4653	0.4725	0.4817	0.4267	0.4397	Ave		0.4579				4.5		15.0			
Tert-butyl ethyl ether	0.4749 0.5210	0.4903	0.5101	0.5098	0.4872	Ave		0.4989				3.5		15.0			
Ethyl acetate	0.0890 0.0732	0.0758	0.0755	0.0726	0.0701	Ave		0.0760				8.8		15.0			
Propionitrile	0.0098 0.0109	0.0109	0.0109	0.0107	0.0103	Ave		0.0106				4.1		15.0			
Methacrylonitrile	0.0528 0.0487	0.0510	0.0507	0.0514	0.0483	Ave		0.0505				3.4		15.0			
Tert-amyl methyl ether	0.3396 0.4012	0.3483	0.3750	0.3811	0.3710	Ave		0.3694				6.1		15.0			
n-Butanol	1.0534 0.4667	0.7774	0.5045	0.4699	0.4194	Lin2	16.198	0.4154							0.9910		0.9900
Methyl methacrylate	0.0191 0.0267	0.0224	0.0236	0.0243	0.0244	Ave		0.0234				10.8		15.0			
2-Nitropropane	0.0122 0.0159	0.0129	0.0134	0.0143	0.0145	Ave		0.0139				9.6		15.0			
cis-1,4-Dichloro-2-butene	0.0666 0.0814	0.0680	0.0718	0.0748	0.0751	Ave		0.0730				7.4		15.0			
1,2,3-Trimethylbenzene	3.5072 3.5102	3.5992	3.6257	3.5036	3.3945	Ave		3.5234				2.3		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Dibromofluoromethane (Surr)	0.2283 0.2184	0.2188	0.2082	0.2141	0.2083	Ave		0.2160				3.5		15.0			
1,2-Dichloroethane-d4 (Surr)	0.2001 0.1770	0.1912	0.1799	0.1803	0.1726	Ave		0.1835				5.6		15.0			
Toluene-d8 (Surr)	5.3744 4.5645	5.0531	4.6361	4.6967	4.5442	Ave		4.8115				6.9		15.0			
4-Bromofluorobenzene (Surr)	1.2428 1.1066	1.1602	1.0758	1.0665	1.0507	Ave		1.1171				6.5		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD01 280-424541/20	MS1_5084.D
Level 2	STD02 280-424541/21	MS1_5085.D
Level 3	STD05 280-424541/22	MS1_5086.D
Level 4	ICIS 280-424541/23	MS1_5087.D
Level 5	STD30 280-424541/24	MS1_5088.D
Level 6	STD60 280-424541/25	MS1_5089.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Ethanol	TBAd 9	Ave	7876 521255	16598	44942	86986	239384	60.0 3600	120	300	600	1800
Isopropyl alcohol	TBAd 9	Ave	8468 479753	16176	42304	80218	222176	10.0 600	20.0	50.0	100	300
Acetonitrile	FB	Ave	16579 1006766	36113	83525	168947	475795	10.0 600	20.0	50.0	100	300
Isopropyl ether	FB	Ave	29611 2053371	62657	164088	330511	944084	1.00 60.0	2.00	5.00	10.0	30.0
2-Chloro-1,3-butadiene	FB	Ave	78937 4935095	161516	423473	750446	2307309	1.00 60.0	2.00	5.00	10.0	30.0
Tert-butyl ethyl ether	FB	Ave	81263 5526566	167600	448448	896554	2556087	1.00 60.0	2.00	5.00	10.0	30.0
Ethyl acetate	FB	Ave	30469 1552943	51805	132681	255301	735645	2.00 120	4.00	10.0	20.0	60.0
Propionitrile	FB	Ave	16819 1155098	37155	95680	189066	539219	10.0 600	20.0	50.0	100	300
Methacrylonitrile	FB	Ave	90296 5163340	174367	445708	903897	2531824	10.0 600	20.0	50.0	100	300
Tert-amyl methyl ether	FB	Ave	58110 4255749	119060	329720	670325	1946776	1.00 60.0	2.00	5.00	10.0	30.0
n-Butanol	TBAd 9	Lin2	19635 585244	27613	51457	94916	255873	25.0 1500	50.0	125	250	750
Methyl methacrylate	FB	Ave	6544 566315	15342	41466	85370	255604	2.00 120	4.00	10.0	20.0	60.0
2-Nitropropane	FB	Ave	4161 338106	8831	23572	50306	152333	2.00 120	4.00	10.0	20.0	60.0
cis-1,4-Dichloro-2-butene	DCBd 4	Ave	6258 488257	12662	34897	73667	220875	2.00 120	4.00	10.0	20.0	60.0
1,2,3-Trimethylbenzene	DCBd 4	Ave	164753 10529378	334872	881111	1724400	4990319	1.00 60.0	2.00	5.00	10.0	30.0
Dibromofluoromethane (Surr)	FB	Ave	39061 2316592	74790	183009	376542	1092910	1.00 60.0	2.00	5.00	10.0	30.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 320-41333-1 Analy Batch No.: 424541

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 11:55 Calibration End Date: 08/02/2018 13:37 Calibration ID: 33279

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
1,2-Dichloroethane-d4 (Surr)	FB	Ave	34250 1876880	65375	158176	317167	905428	1.00 60.0	2.00	5.00	10.0	30.0
Toluene-d8 (Surr)	CBNZ d5	Ave	183279 9802890	344888	813774	1664432	4817041	1.00 60.0	2.00	5.00	10.0	30.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	58379 3319369	107948	261441	524912	1544602	1.00 60.0	2.00	5.00	10.0	30.0

Curve Type Legend:
Ave = Average ISTD
Lin2 = Linear 1/conc^2 ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5084.D
Lims ID: std01
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 02-Aug-2018 11:55:30 ALS Bottle#: 21 Worklist Smp#: 20
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std01
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:50 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:23:37

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	70	186397	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2139093	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	426277	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	587188	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	39061	1.00	1.06	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.274	-0.014	98	34250	1.00	1.09	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	183279	1.00	1.12	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	58379	1.00	1.11	
28 Ethylene oxide	43	4.565	4.565	0.000	99	54632	100.0	109.3	
34 Ethanol	45	4.928	4.928	0.000	47	7876	60.0	59.2	
38 Propene oxide	58	5.179	5.179	0.000	0	217253	100.0	95.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	96	8468	10.0	11.0	
44 Acetonitrile	41	5.529	5.529	0.000	98	16579	10.0	10.0	
56 Isopropyl ether	87	6.199	6.199	0.000	95	29611	1.00	0.9401	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	78937	1.00	1.01	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	81263	1.00	0.9519	
60 Ethyl acetate	43	6.590	6.590	0.000	96	30469	2.00	2.34	
63 Propionitrile	54	6.632	6.632	0.000	98	16819	10.0	9.29	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	90296	10.0	10.5	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	96	58110	1.00	0.9193	
78 n-Butanol	56	7.526	7.554	-0.028	83	19635	25.0	24.4	
81 Methyl methacrylate	100	7.959	7.945	0.014	93	6544	2.00	1.63	
87 2-Nitropropane	41	8.294	8.294	0.000	96	4161	2.00	1.75	
99 Tetrahydrothiophene	60		9.397				ND	ND	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	89	6258	2.00	1.83	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	164753	1.00	1.00	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	64997	1.00	0.9735	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.08	Units: uL
MV-Supp A_00031	Amount Added:	0.50	Units: uL

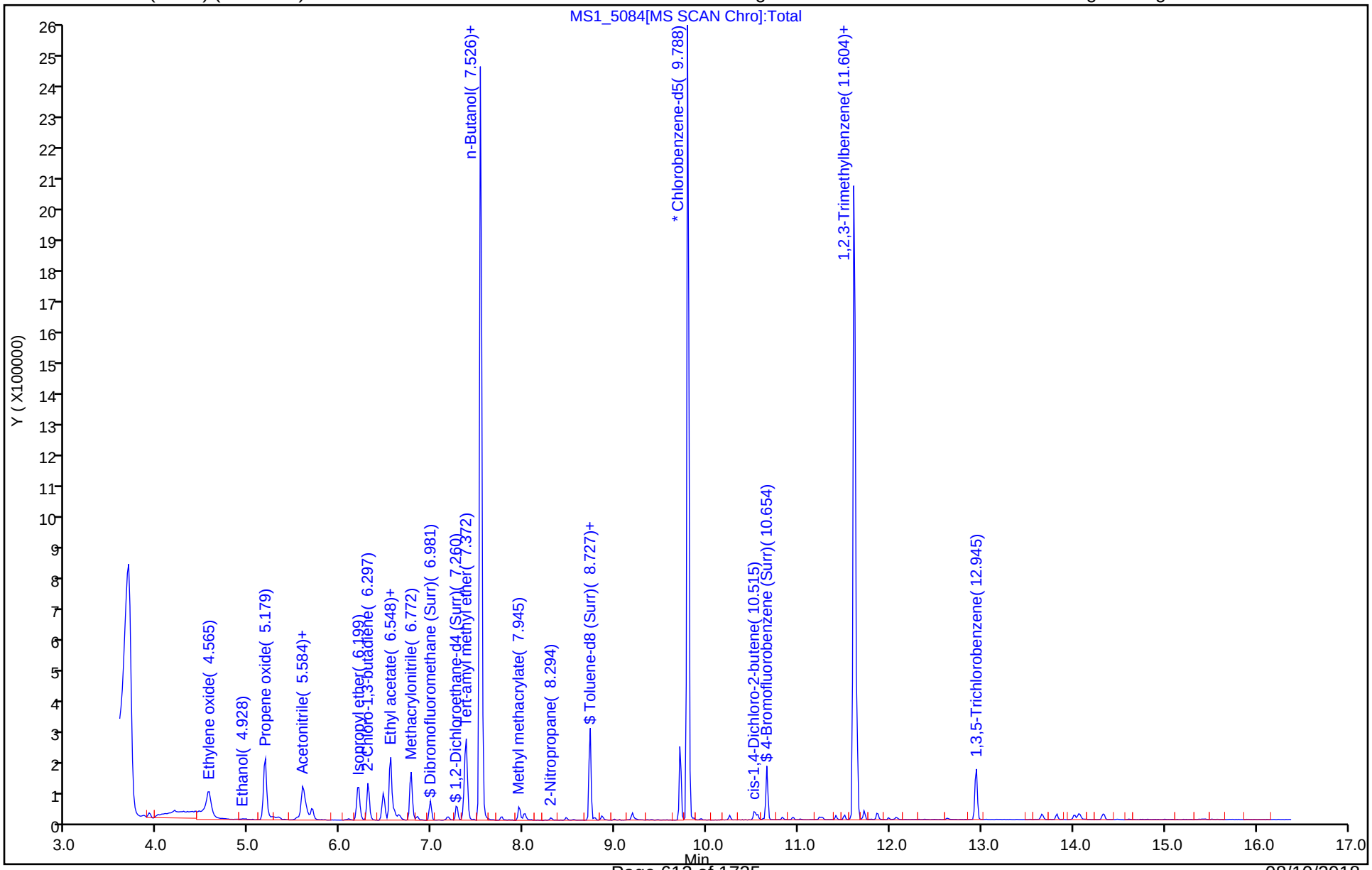
Report Date: 03-Aug-2018 06:40:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5084.D

Injection Date:	02-Aug-2018 11:55:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std01			Worklist Smp#:	20
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	21
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5085.D
Lims ID: std02
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 02-Aug-2018 12:15:30 ALS Bottle#: 22 Worklist Smp#: 21
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std02
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:51 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:23:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	70	177596	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2136526	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	426580	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	581501	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	74790	2.00	2.03	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	65375	2.00	2.08	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	344888	2.00	2.10	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	107948	2.00	2.08	
28 Ethylene oxide	43	4.565	4.565	0.000	99	112843	200.0	210.2	
34 Ethanol	45	4.928	4.928	0.000	96	16598	120.0	131.0	
38 Propene oxide	58	5.180	5.179	0.001	0	455271	200.0	200.9	
41 Isopropyl alcohol	45	5.333	5.333	0.000	94	16176	20.0	22.1	
44 Acetonitrile	41	5.529	5.529	0.000	99	36113	20.0	21.9	
56 Isopropyl ether	87	6.199	6.199	0.000	95	62657	2.00	1.99	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	161516	2.00	2.06	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	167600	2.00	1.97	
60 Ethyl acetate	43	6.590	6.590	0.000	96	51805	4.00	3.99	
63 Propionitrile	54	6.632	6.632	0.000	98	37155	20.0	20.5	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	174367	20.0	20.2	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	96	119060	2.00	1.89	
78 n-Butanol	56	7.540	7.554	-0.014	86	27613	50.0	54.6	
81 Methyl methacrylate	100	7.959	7.945	0.014	91	15342	4.00	3.83	
87 2-Nitropropane	41	8.294	8.294	0.000	98	8831	4.00	3.72	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	85	3106	4.00	3.64	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	88	12662	4.00	3.73	
125 1,2,3-Trimethylbenzene	105	11.646	11.632	0.014	97	334872	2.00	2.04	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	134637	2.00	2.04	

Reagents:

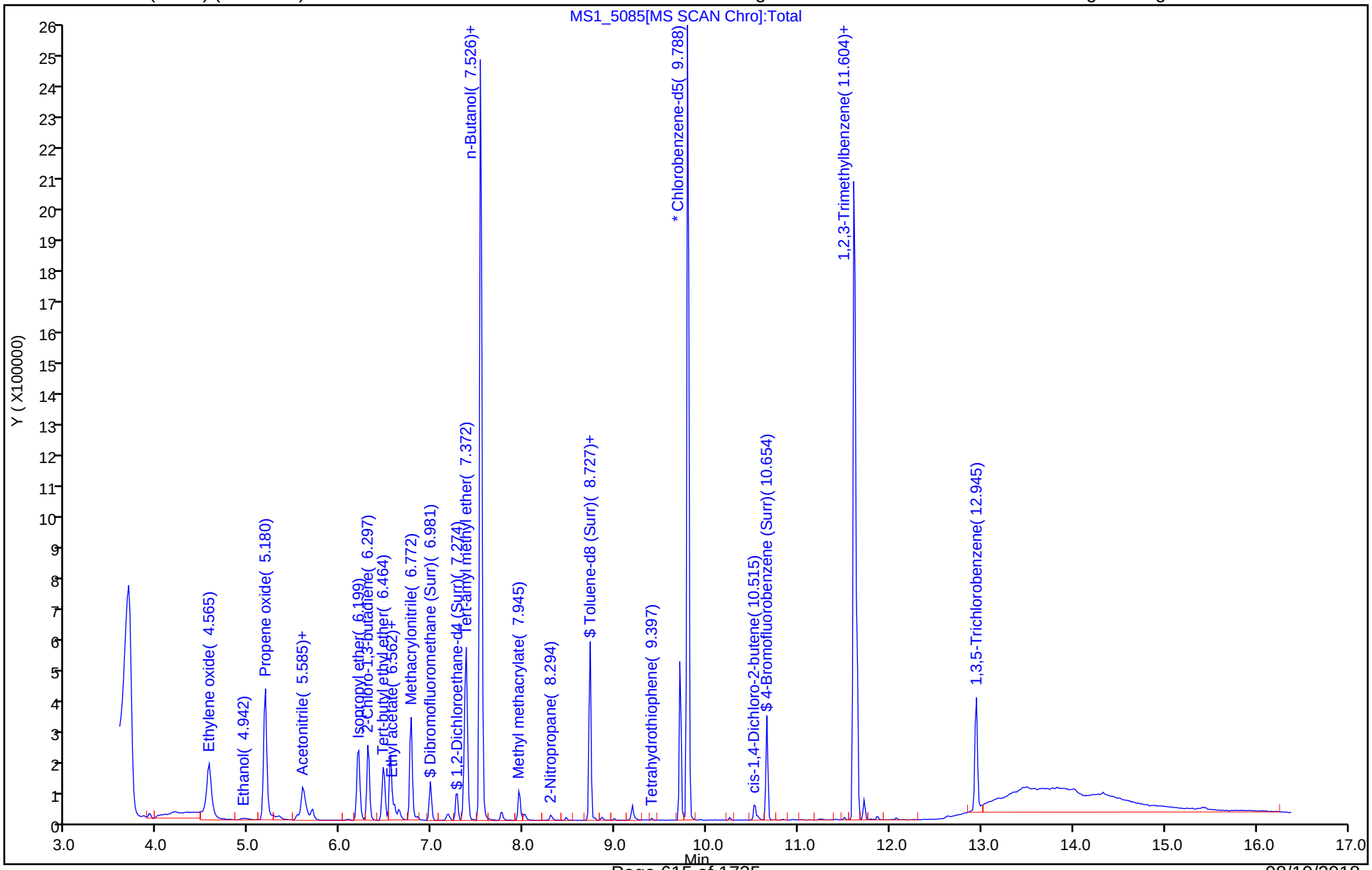
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.16	Units: uL
MV-Supp A_00031	Amount Added:	1.00	Units: uL

Report Date: 03-Aug-2018 06:40:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5085.D				
Injection Date:	02-Aug-2018 12:15:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std02			Worklist Smp#:	21
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	22
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5086.D
Lims ID: std05
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 02-Aug-2018 12:36:30 ALS Bottle#: 23 Worklist Smp#: 22
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std05
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:52 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:24:26

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	68	203979	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2197853	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	438825	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	607539	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	183009	5.00	4.82	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	158176	5.00	4.90	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	813774	5.00	4.82	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	261441	5.00	4.82	
28 Ethylene oxide	43	4.565	4.565	0.000	99	279639	500.0	488.1	
34 Ethanol	45	4.928	4.928	0.000	99	44942	300.0	308.7	
38 Propene oxide	58	5.179	5.179	0.000	0	1200509	500.0	515.0	
41 Isopropyl alcohol	45	5.333	5.333	0.000	98	42304	50.0	50.4	
44 Acetonitrile	41	5.529	5.529	0.000	99	83525	50.0	49.2	
56 Isopropyl ether	87	6.199	6.199	0.000	95	164088	5.00	5.07	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	92	423473	5.00	5.26	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	448448	5.00	5.11	
60 Ethyl acetate	43	6.590	6.590	0.000	99	132681	10.0	9.93	
63 Propionitrile	54	6.632	6.632	0.000	99	95680	50.0	51.4	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	445708	50.0	50.2	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	97	329720	5.00	5.08	
78 n-Butanol	56	7.554	7.554	0.000	87	51457	125.0	112.8	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	41466	10.0	10.1	
87 2-Nitropropane	41	8.294	8.294	0.000	98	23572	10.0	9.66	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	93	8740	10.0	9.96	
110 cis-1,4-Dichloro-2-butene	53	10.514	10.515	0.000	85	34897	10.0	9.84	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	881111	5.00	5.15	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	345854	5.00	5.01	

Reagents:

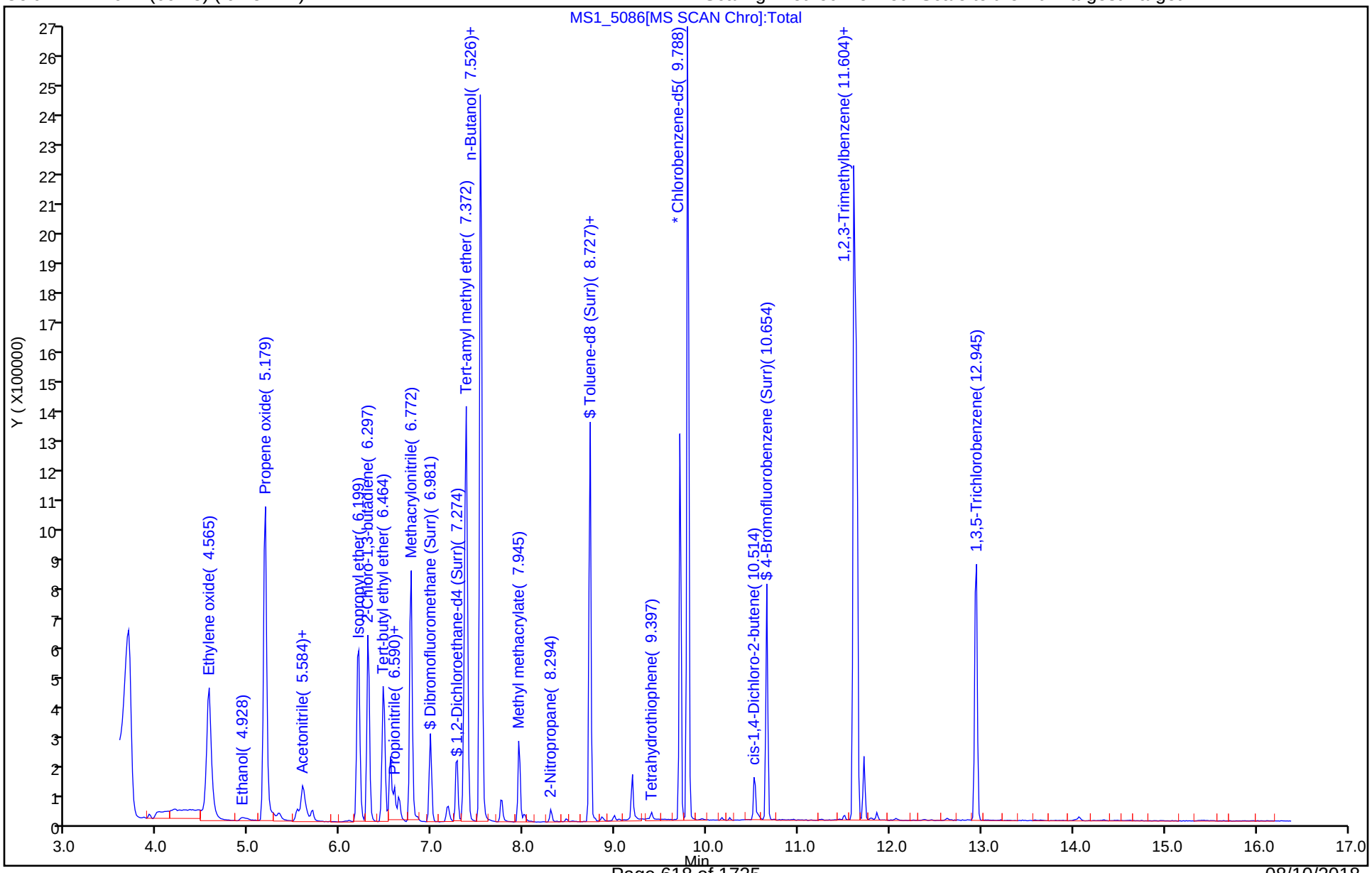
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.40	Units: uL
MV-Supp A_00031	Amount Added:	2.50	Units: uL

Report Date: 03-Aug-2018 06:40:53 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5086.D				
Injection Date:	02-Aug-2018 12:36:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std05			Worklist Smp#:	22
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	23
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5087.D
Lims ID: icis
Client ID:
Sample Type: ICIS Calib Level: 5
Inject. Date: 02-Aug-2018 12:56:30 ALS Bottle#: 24 Worklist Smp#: 23
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: icis
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:53 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:23:13

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.598	0.000	74	201981	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2198487	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	442983	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	615228	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	376542	10.0	9.91	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	317167	10.0	9.83	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	1664432	10.0	9.76	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	524912	10.0	9.55	
28 Ethylene oxide	43	4.565	4.565	0.000	99	550287	1000.0	986.0	
34 Ethanol	45	4.928	4.928	0.000	99	86986	600.0	603.5	
38 Propene oxide	58	5.179	5.179	0.000	0	2494080	1000.0	1069.7	
41 Isopropyl alcohol	45	5.333	5.333	0.000	97	80218	100.0	96.5	
44 Acetonitrile	41	5.529	5.529	0.000	99	168947	100.0	99.5	
56 Isopropyl ether	87	6.199	6.199	0.000	95	330511	10.0	10.2	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	92	750446	10.0	9.32	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	896554	10.0	10.2	
60 Ethyl acetate	43	6.590	6.590	0.000	99	255301	20.0	19.1	
63 Propionitrile	54	6.632	6.632	0.000	99	189066	100.0	101.6	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	903897	100.0	101.8	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	97	670325	10.0	10.3	
78 n-Butanol	56	7.554	7.554	0.000	87	94916	250.0	243.8	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	85370	20.0	20.7	
87 2-Nitropropane	41	8.294	8.294	0.000	99	50306	20.0	20.6	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	93	17446	20.0	19.7	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	85	73667	20.0	20.5	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	1724400	10.0	9.94	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	674856	10.0	9.65	

Reagents:

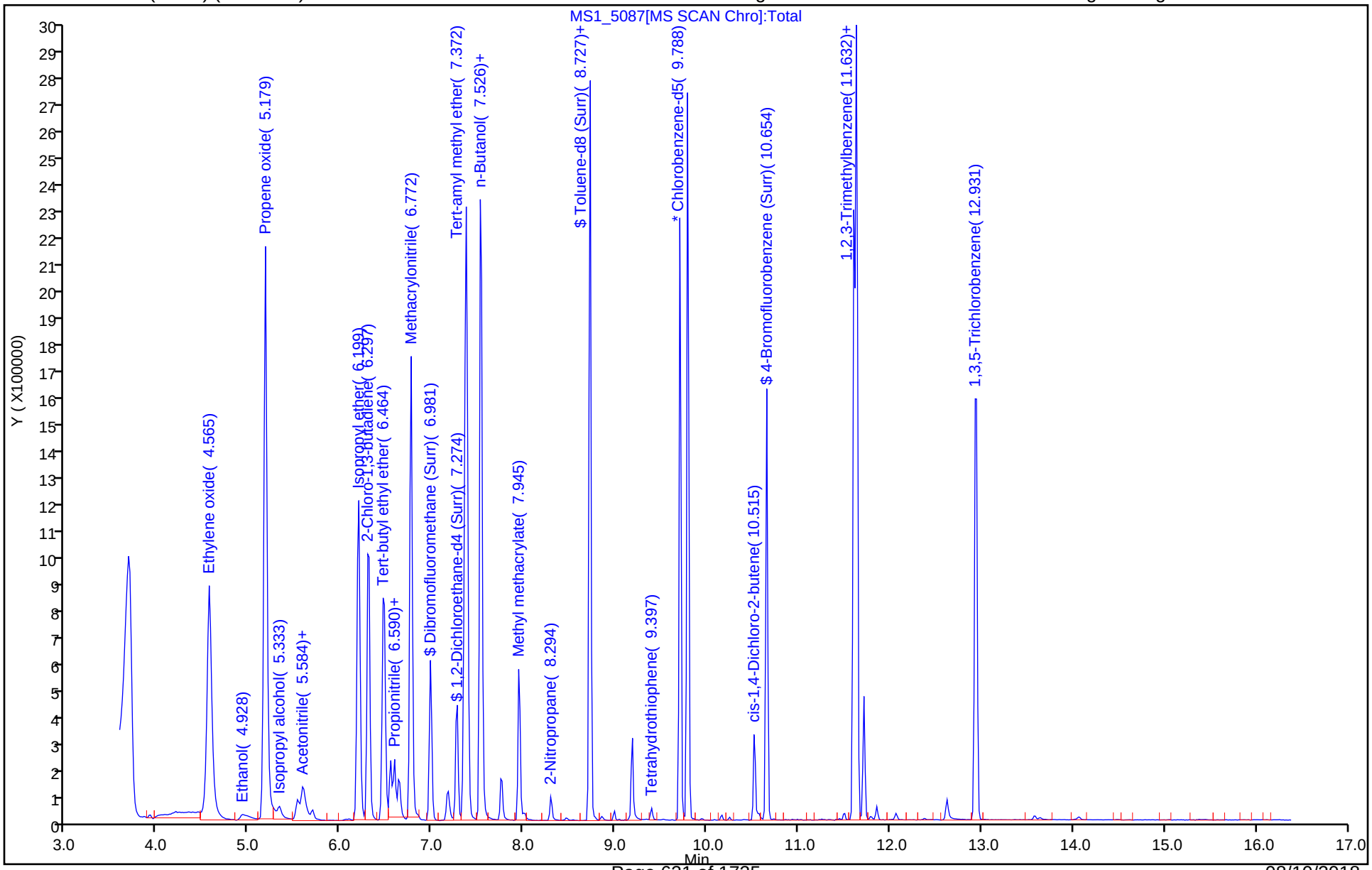
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.80	Units: uL
MV-Supp A_00031	Amount Added:	5.00	Units: uL

Report Date: 03-Aug-2018 06:40:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5087.D				
Injection Date:	02-Aug-2018 12:56:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	icis			Worklist Smp#:	23
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	24
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5088.D
Lims ID: std30
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 02-Aug-2018 13:16:30 ALS Bottle#: 25 Worklist Smp#: 24
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std30
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:54 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 14:05:32

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	69	203378	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2186225	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	441685	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	612555	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	1092910	30.0	28.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.274	-0.014	99	905428	30.0	28.2	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	4817041	30.0	28.3	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	1544602	30.0	28.2	
28 Ethylene oxide	43	4.551	4.565	-0.014	99	1419157	3000.0	3061.6	
34 Ethanol	45	4.928	4.928	0.000	99	239384	1800.0	1649.3	
38 Propene oxide	58	5.179	5.179	0.000	0	6890500	3000.0	2971.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	99	222176	300.0	265.5	
44 Acetonitrile	41	5.529	5.529	0.000	99	475795	300.0	281.8	
56 Isopropyl ether	87	6.199	6.199	0.000	94	944084	30.0	29.3	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	2307309	30.0	28.8	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	2556087	30.0	29.3	
60 Ethyl acetate	43	6.590	6.590	0.000	99	735645	60.0	55.3	
63 Propionitrile	54	6.632	6.632	0.000	99	539219	300.0	291.3	
66 Methacrylonitrile	41	6.772	6.772	0.000	90	2531824	300.0	286.8	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	98	1946776	30.0	30.1	
78 n-Butanol	56	7.540	7.554	-0.014	87	255873	750.0	718.1	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	255604	60.0	62.4	
87 2-Nitropropane	41	8.294	8.294	0.000	97	152333	60.0	62.8	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	92	52212	60.0	59.1	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	81	220875	60.0	61.8	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	4990319	30.0	28.9	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	2019354	30.0	29.0	

Reagents:

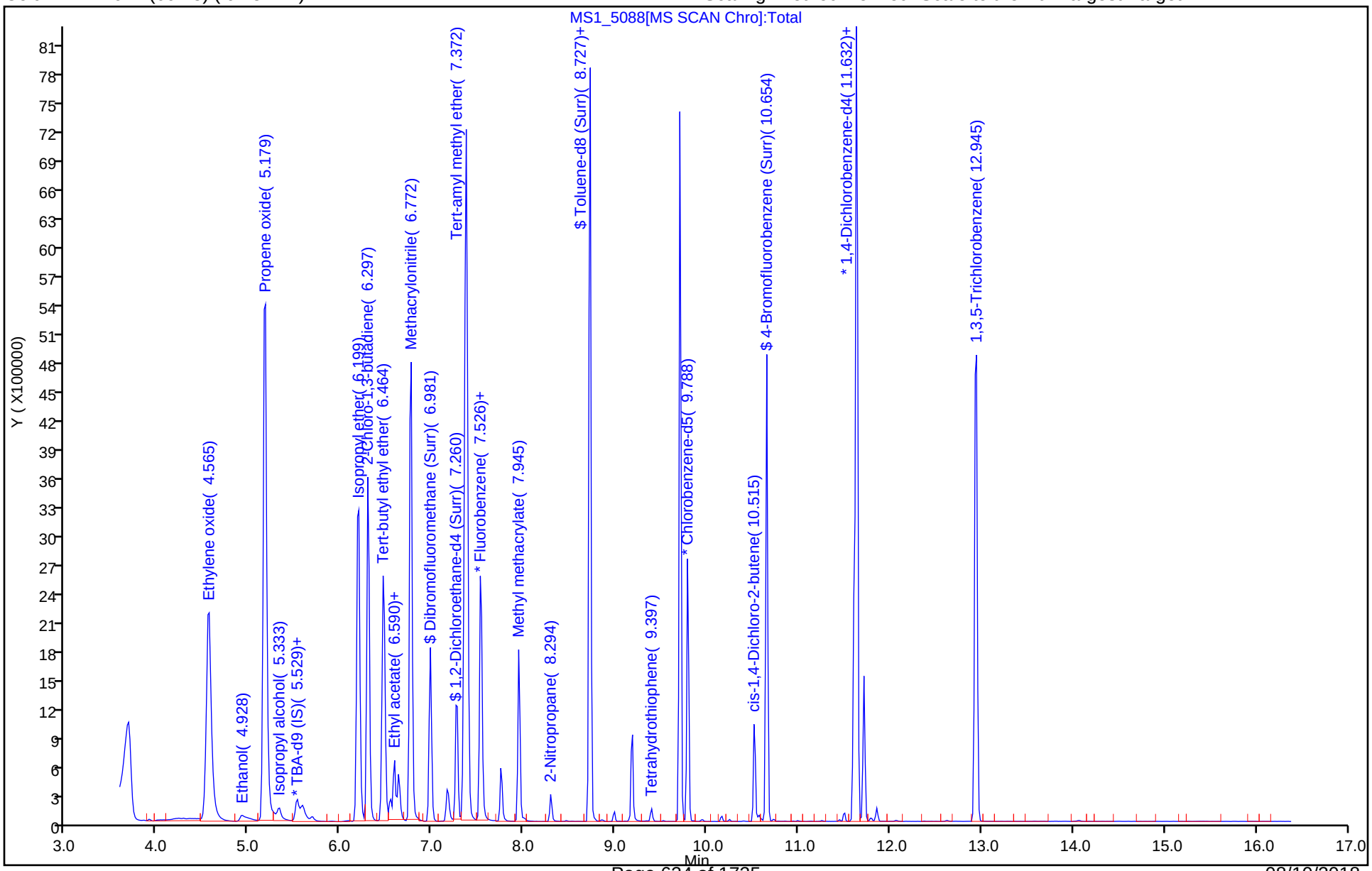
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	2.40	Units: uL
MV-Supp A_00031	Amount Added:	15.00	Units: uL

Report Date: 03-Aug-2018 06:40:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5088.D				
Injection Date:	02-Aug-2018 13:16:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std30			Worklist Smp#:	24
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	25
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D
Lims ID: std60
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 02-Aug-2018 13:37:30 ALS Bottle#: 26 Worklist Smp#: 25
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: std60
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub107

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:40:55 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 02-Aug-2018 14:08:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	68	209015	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2209748	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	447426	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	624935	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	2316592	60.0	60.7	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.261	7.274	-0.013	99	1876880	60.0	57.9	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	92	9802890	60.0	56.9	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	3319369	60.0	59.4	
28 Ethylene oxide	43	4.565	4.565	0.000	100	2087025	6000.0	3806.4	
34 Ethanol	45	4.928	4.928	0.000	100	521255	3600.0	3494.5	
38 Propene oxide	58	5.166	5.179	-0.013	0	13322770	6000.0	5684.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	99	479753	600.0	557.9	
44 Acetonitrile	41	5.529	5.529	0.000	99	1006766	600.0	590.0	
56 Isopropyl ether	87	6.199	6.199	0.000	94	2053371	60.0	63.1	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	91	4935095	60.0	61.0	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	5526566	60.0	62.7	
60 Ethyl acetate	43	6.590	6.590	0.000	99	1552943	120.0	115.6	
63 Propionitrile	54	6.632	6.632	0.000	99	1155098	600.0	617.4	
66 Methacrylonitrile	41	6.772	6.772	0.000	90	5163340	600.0	578.8	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	98	4255749	60.0	65.2	
78 n-Butanol	56	7.540	7.554	-0.014	87	585244	1500.0	1646.0	
81 Methyl methacrylate	100	7.945	7.945	0.000	90	566315	120.0	136.8	
87 2-Nitropropane	41	8.294	8.294	0.000	97	338106	120.0	137.9	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	92	120809	120.0	135.0	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	79	488257	120.0	133.8	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	10529378	60.0	59.8	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	4587055	60.0	64.6	

Reagents:

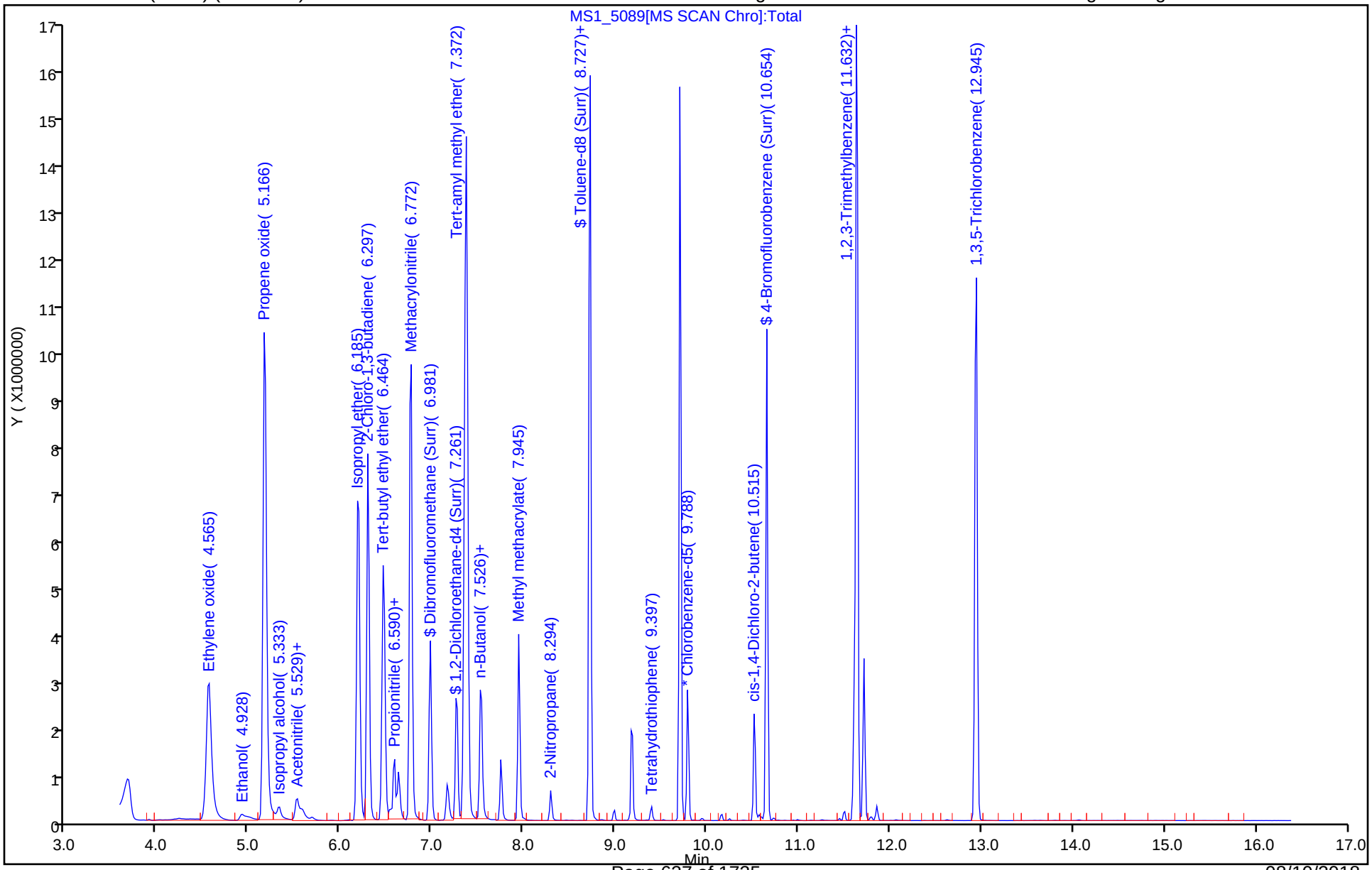
MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00101	Amount Added: 4.80	Units: uL
MV-Supp A_00031	Amount Added: 30.00	Units: uL

Report Date: 03-Aug-2018 06:40:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Injection Date:	02-Aug-2018 13:37:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	std60			Worklist Smp#:	25
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	26
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 280-424541/19 Calibration Date: 08/02/2018 11:35

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5083.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2832	0.2893		0.0102	0.0100	2.2	20.0
Chloromethane	Ave	0.3441	0.3273	0.1000	0.00951	0.0100	-4.9	20.0
Vinyl chloride	Ave	0.3302	0.3312		0.0100	0.0100	0.3	20.0
Bromomethane	Ave	0.2412	0.2524		0.0105	0.0100	4.6	20.0
Chloroethane	Ave	0.2408	0.2412		0.0100	0.0100	0.2	20.0
Trichlorofluoromethane	Ave	0.4226	0.4192		0.00992	0.0100	-0.8	20.0
Acetone	Lin2		0.0220		0.0433	0.0400	8.2	20.0
1,1-Dichloroethene	Ave	0.2694	0.2730		0.0101	0.0100	1.4	20.0
Carbon disulfide	Ave	1.201	1.229		0.0102	0.0100	2.3	20.0
Methylene Chloride	Lin2		0.2581		0.0104	0.0100	4.3	20.0
Methyl tert-butyl ether	Ave	0.3304	0.3416		0.0103	0.0100	3.4	20.0
trans-1,2-Dichloroethene	Ave	0.3021	0.3108		0.0103	0.0100	2.9	20.0
1,1-Dichloroethane	Ave	0.5259	0.5285	0.1000	0.0101	0.0100	0.5	20.0
2-Butanone (MEK)	Ave	0.0321	0.0323		0.0402	0.0400	0.5	20.0
cis-1,2-Dichloroethene	Ave	0.3042	0.3056		0.0100	0.0100	0.4	20.0
2,2-Dichloropropane	Ave	0.4270	0.4062		0.00951	0.0100	-4.9	20.0
Bromochloromethane	Ave	0.0901	0.0935		0.0104	0.0100	3.7	20.0
Chloroform	Ave	0.4592	0.4605		0.0100	0.0100	0.3	20.0
1,1,1-Trichloroethane	Ave	0.4345	0.4358		0.0100	0.0100	0.3	20.0
1,1-Dichloropropene	Ave	0.4246	0.4173		0.00983	0.0100	-1.7	20.0
Carbon tetrachloride	Ave	0.3689	0.3614		0.00980	0.0100	-2.0	20.0
1,2-Dichloroethane	Ave	0.2252	0.2276		0.0101	0.0100	1.0	20.0
Benzene	Ave	1.166	1.162		0.00997	0.0100	-0.3	20.0
Trichloroethene	Ave	0.2946	0.2935		0.00996	0.0100	-0.4	20.0
1,2-Dichloropropane	Ave	0.2632	0.2689		0.0102	0.0100	2.2	20.0
Dibromomethane	Ave	0.0878	0.0878		0.0100	0.0100	-0.0	20.0
Bromodichloromethane	Ave	0.2797	0.2826		0.0101	0.0100	1.0	20.0
cis-1,3-Dichloropropene	Ave	1.583	1.638		0.0103	0.0100	3.4	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.0711	0.0752		0.0423	0.0400	5.7	20.0
Toluene	Ave	1.183	1.187		0.0100	0.0100	0.4	20.0
trans-1,3-Dichloropropene	Ave	0.2267	0.2362		0.0104	0.0100	4.2	20.0
1,1,2-Trichloroethane	Ave	0.1163	0.1221		0.0105	0.0100	5.0	20.0
2-Hexanone	Ave	0.2264	0.2319		0.0410	0.0400	2.4	20.0
1,3-Dichloropropane	Ave	1.108	1.100		0.00993	0.0100	-0.7	20.0
Tetrachloroethene	Ave	1.104	1.048		0.00950	0.0100	-5.0	20.0
Dibromochloromethane	Ave	0.6590	0.6782		0.0103	0.0100	2.9	20.0
1,2-Dibromoethane (EDB)	Ave	0.5164	0.5181		0.0100	0.0100	0.3	20.0
Chlorobenzene	Ave	3.313	3.237	0.3000	0.00977	0.0100	-2.3	20.0
1,1,1,2-Tetrachloroethane	Ave	1.015	1.006		0.00991	0.0100	-0.9	20.0
Ethylbenzene	Ave	2.121	2.036		0.00960	0.0100	-4.0	20.0
m-Xylene & p-Xylene	Ave	2.553	2.464		0.00965	0.0100	-3.5	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 280-424541/19 Calibration Date: 08/02/2018 11:35

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5083.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
o-Xylene	Ave	2.369	2.347		0.00990	0.0100	-1.0	20.0
Styrene	Ave	3.443	3.435		0.00998	0.0100	-0.2	20.0
Bromoform	Lin2		0.3042	0.1000	0.00999	0.0100	-0.0	20.0
Isopropylbenzene	Ave	4.733	4.700		0.00993	0.0100	-0.7	20.0
1,1,2,2-Tetrachloroethane	Ave	0.4045	0.4101	0.3000	0.0101	0.0100	1.4	20.0
1,2,3-Trichloropropane	Ave	0.1076	0.1122		0.0104	0.0100	4.3	20.0
Bromobenzene	Ave	0.8515	0.8615		0.0101	0.0100	1.2	20.0
N-Propylbenzene	Ave	1.339	1.322		0.00987	0.0100	-1.3	20.0
1,3,5-Trimethylbenzene	Ave	3.923	3.888		0.00991	0.0100	-0.9	20.0
2-Chlorotoluene	Ave	1.053	1.060		0.0101	0.0100	0.7	20.0
4-Chlorotoluene	Ave	1.040	1.035		0.00996	0.0100	-0.4	20.0
tert-Butylbenzene	Ave	3.842	3.823		0.00995	0.0100	-0.5	20.0
1,2,4-Trimethylbenzene	Ave	3.860	3.794		0.00983	0.0100	-1.7	20.0
sec-Butylbenzene	Ave	1.047	1.042		0.00995	0.0100	-0.5	20.0
4-Isopropyltoluene	Ave	4.301	4.356		0.0101	0.0100	1.3	20.0
1,3-Dichlorobenzene	Ave	1.832	1.826		0.00997	0.0100	-0.3	20.0
1,4-Dichlorobenzene	Ave	1.747	1.754		0.0100	0.0100	0.4	20.0
n-Butylbenzene	Ave	4.282	4.270		0.00997	0.0100	-0.3	20.0
1,2-Dichlorobenzene	Ave	1.417	1.444		0.0102	0.0100	1.9	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0521		0.00990	0.0100	-1.0	20.0
1,2,4-Trichlorobenzene	Ave	0.9266	0.9672		0.0104	0.0100	4.4	20.0
Hexachlorobutadiene	Ave	0.7646	0.7847		0.0103	0.0100	2.6	20.0
Naphthalene	Ave	1.117	1.189		0.0107	0.0100	6.5	20.0
1,2,3-Trichlorobenzene	Ave	0.6725	0.7213		0.0107	0.0100	7.3	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5083.D
Lims ID: icv
Client ID:
Sample Type: ICV
Inject. Date: 02-Aug-2018 11:35:30 ALS Bottle#: 20 Worklist Smp#: 19
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: icv
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist:

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 02-Aug-2018 13:05:05 Calib Date: 02-Aug-2018 10:54:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt Date: 02-Aug-2018 13:02:55

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.598	-0.014	87	182490	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2135348	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	447202	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	606158	12.5	12.5	
24 Dichlorodifluoromethane	85	3.908	3.922	-0.014	100	494150	10.0	10.2	
26 Chloromethane	50	4.160	4.174	-0.014	99	559100	10.0	9.51	
27 Vinyl chloride	62	4.285	4.300	-0.015	94	565776	10.0	10.0	
29 Bromomethane	94	4.635	4.635	0.000	90	431102	10.0	10.5	
31 Chloroethane	64	4.691	4.705	-0.015	100	412090	10.0	10.0	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	925993	10.0	10.1	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	716143	10.0	9.92	
36 Ethyl ether	59	5.082	5.096	-0.014	92	230025	10.0	10.8	
39 Acrolein	56	5.207	5.221	-0.014	99	257081	100.0	101.4	
40 Acetone	43	5.305	5.319	-0.014	100	150132	40.0	43.3	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.347	-0.014	97	339498	10.0	10.3	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	466401	10.0	10.1	
45 Iodomethane	142	5.528	5.529	-0.001	99	741869	10.0	10.5	
46 Methyl acetate	43	5.542	5.557	-0.015	96	196328	20.0	19.2	
47 3-Chloro-1-propene	41	5.598	5.612	-0.014	90	869466	10.0	10.1	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2099622	10.0	10.2	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	96340	100.0	108.4	
50 Methylene Chloride	84	5.696	5.696	0.000	94	440946	10.0	10.4	
51 Acrylonitrile	53	5.822	5.836	-0.014	99	529376	100.0	103.8	
52 Methyl tert-butyl ether	73	5.878	5.892	-0.014	95	583471	10.0	10.3	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	531006	10.0	10.3	
54 Hexane	57	6.087	6.101	-0.014	92	860633	10.0	9.44	
55 Vinyl acetate	43	6.157	6.157	0.000	97	798195	20.0	21.5	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	96	902873	10.0	10.1	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	220477	40.0	40.2	M
62 sec-Butyl Alcohol	45	6.632	6.646	-0.014	96	263963	300.0	316.2	
64 cis-1,2-Dichloroethene	96	6.646	6.660	-0.014	83	522062	10.0	10.0	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
65 2,2-Dichloropropane	77	6.688	6.688	0.000	91	693863	10.0	9.51	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	159698	10.0	10.4	
68 Chloroform	83	6.855	6.855	0.000	94	786654	10.0	10.0	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	77292	20.0	19.8	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	81809	250.0	240.6	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	99	744391	10.0	10.0	
72 Cyclohexane	56	7.163	7.163	0.000	0	979795	10.0	9.82	
73 1,1-Dichloropropene	75	7.176	7.191	-0.015	98	712922	10.0	9.83	
74 Carbon tetrachloride	117	7.232	7.232	0.000	99	617447	10.0	9.80	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	388734	10.0	10.1	
77 Benzene	78	7.358	7.358	0.000	96	1984918	10.0	9.97	
9 n-Heptane	43	7.456	7.456	0.000	92	868947	10.0	9.72	
79 Trichloroethene	95	7.819	7.819	0.000	99	501351	10.0	9.96	
80 2-Pentanone	43	7.847	7.847	0.000	99	405088	40.0	42.6	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	97	459404	10.0	10.2	
83 Methylcyclohexane	55	8.028	8.029	-0.001	0	764786	10.0	9.59	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	29592	200.0	234.7	
85 Dibromomethane	93	8.098	8.098	0.000	96	149999	10.0	10.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	482794	10.0	10.1	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	90	61539	10.0	8.40	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	585903	10.0	10.3	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	96	513651	40.0	42.3	
91 Toluene	91	8.769	8.769	0.000	98	2027918	10.0	10.0	
92 Ethyl methacrylate	69	8.852	8.853	-0.001	89	233923	10.0	9.71	
93 trans-1,3-Dichloropropene	75	8.866	8.867	0.000	98	403557	10.0	10.4	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	91	208619	10.0	10.5	
95 2-Hexanone	43	9.132	9.132	0.000	96	331914	40.0	41.0	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	393671	10.0	9.93	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	375067	10.0	9.50	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	242626	10.0	10.3	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	185356	10.0	10.0	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	710381	10.0	9.57	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1157917	10.0	9.77	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	360044	10.0	9.91	
104 Ethylbenzene	106	9.858	9.858	0.000	98	728496	10.0	9.60	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	881658	10.0	9.65	
109 o-Xylene	106	10.249	10.249	0.000	89	839497	10.0	9.90	
106 Styrene	104	10.249	10.249	0.000	86	1228878	10.0	9.98	
107 Bromoform	173	10.445	10.445	0.000	98	108814	10.0	10.0	
108 Isopropylbenzene	105	10.514	10.515	-0.001	96	2279065	10.0	9.93	
111 Cyclohexanone	55	10.626	10.626	0.000	92	154381	400.0	427.9	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	198881	10.0	10.1	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	91	48567	10.0	10.2	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	54407	10.0	10.4	
116 Bromobenzene	156	10.822	10.822	0.000	52	417777	10.0	10.1	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	641075	10.0	9.87	
120 1,3,5-Trimethylbenzene	105	10.933	10.934	-0.001	94	1885323	10.0	9.91	
117 2-Chlorotoluene	126	10.947	10.947	0.000	96	514155	10.0	10.1	
118 4-Chlorotoluene	126	11.017	11.017	0.000	98	501949	10.0	9.96	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1853726	10.0	9.95	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1839857	10.0	9.83	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	505286	10.0	9.95	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	2112568	10.0	10.1	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	885401	10.0	9.97	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	850676	10.0	10.0	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2070706	10.0	9.97	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	700455	10.0	10.2	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	80	25286	10.0	9.90	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	469002	10.0	10.4	
131 Hexachlorobutadiene	225	13.824	13.825	-0.001	98	380537	10.0	10.3	
132 Naphthalene	128	14.006	14.006	0.000	97	576787	10.0	10.7	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	349791	10.0	10.7	
S 140 1,2-Dichloroethene, Total	96				0		20.0	20.3	
S 135 1,3-Dichloropropene, Total	1				0		20.0	20.8	
S 136 1,2-Dichloroethene, Total	1				0		20.0	20.3	
S 134 Trihalomethanes, Total	1				0		40.0	40.4	
S 139 Xylenes, Total (URS)	1				0		20.0	19.6	
S 138 Xylenes, Total	106				0		20.0	19.6	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-Main B_00022	Amount Added:	5.00	Units: uL
MV-SS 2-Cleve_00046	Amount Added:	5.00	Units: uL
MV-Gas/Ket B_00044	Amount Added:	5.00	Units: uL

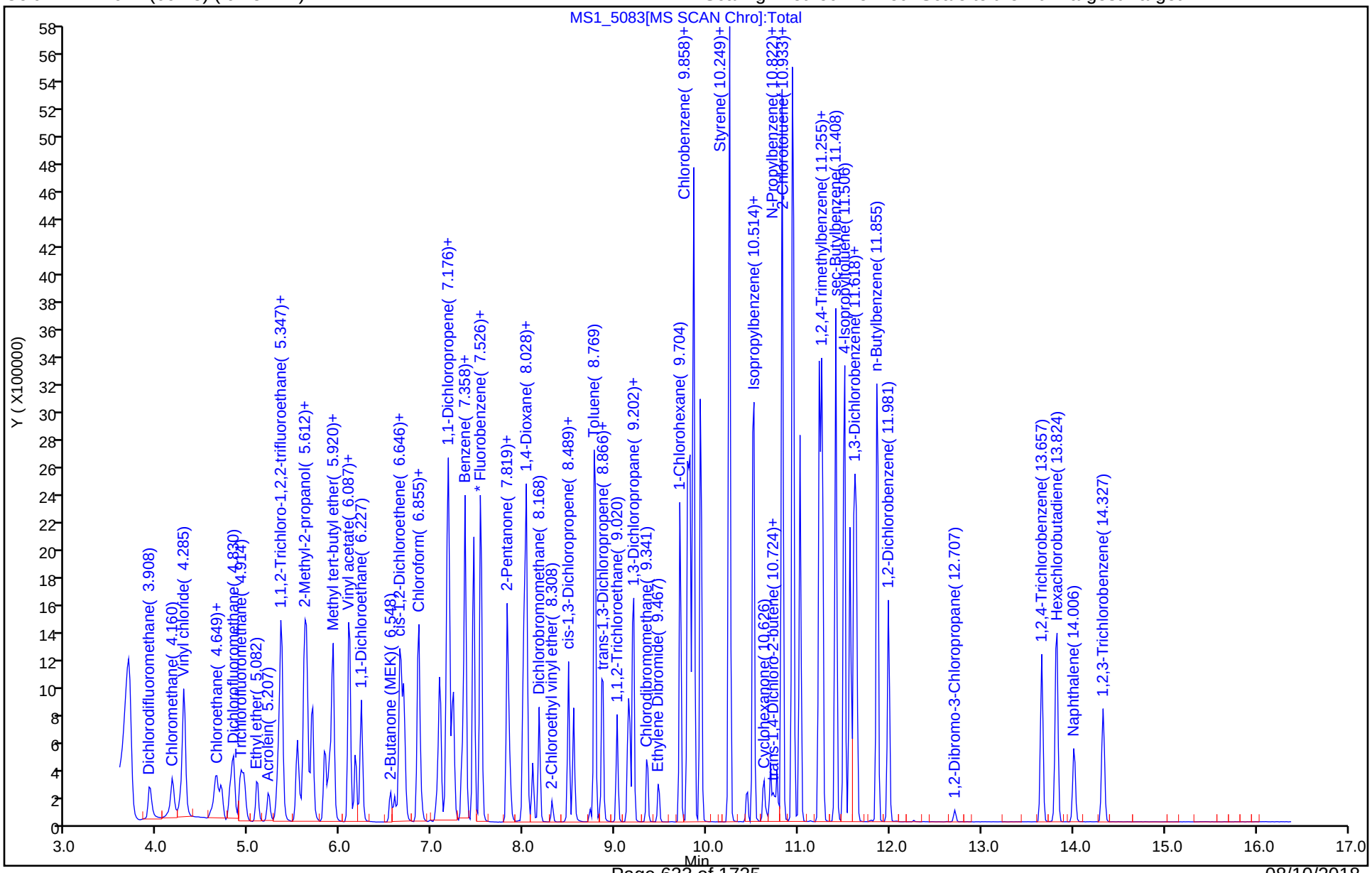
Report Date: 02-Aug-2018 13:05:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5083.D

Injection Date:	02-Aug-2018 11:35:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	icv			Worklist Smp#:	19
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	20
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

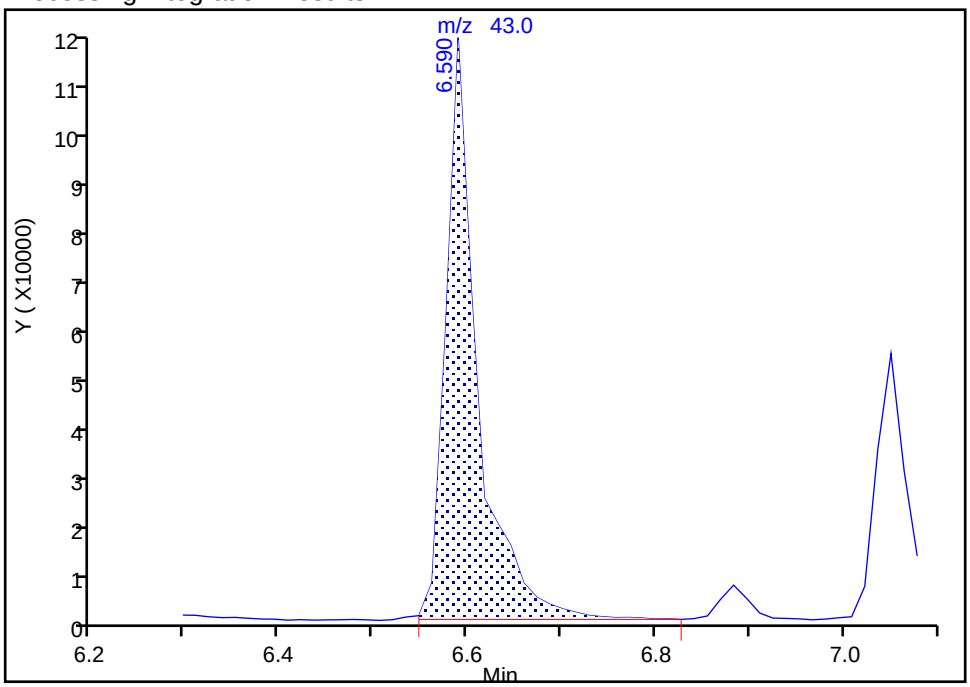
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5083.D				
Injection Date:	02-Aug-2018 11:35:30	Instrument ID:	VMS_MS1		
Lims ID:	icv				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	20	Worklist Smp#:	19
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

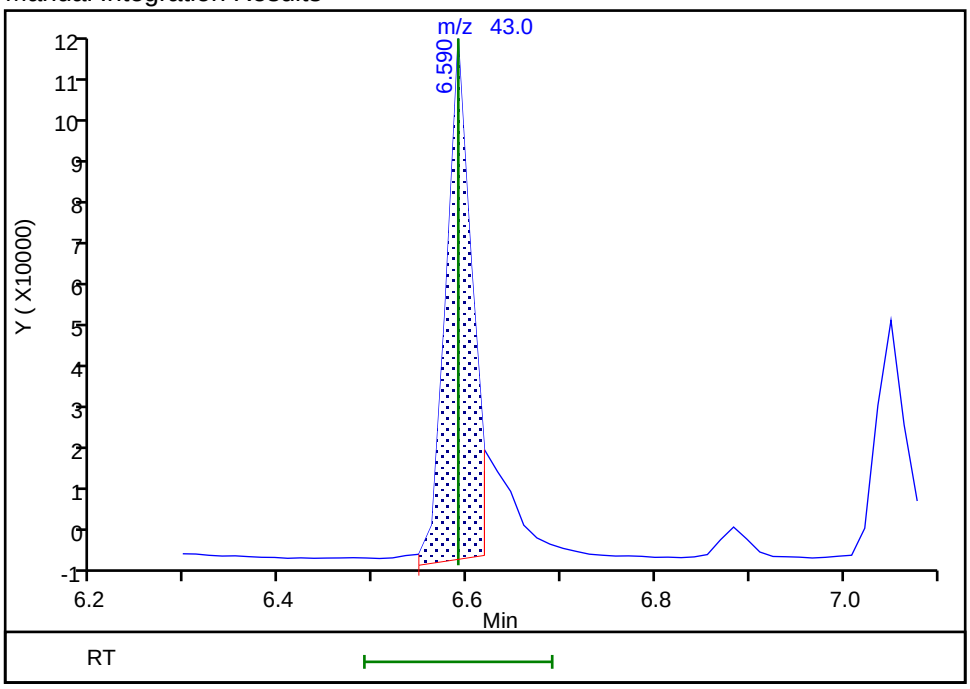
Processing Integration Results

RT: 6.59
Area: 261759
Amount: 47.746829
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 220477
Amount: 40.216679
Amount Units: ug/l



Reviewer: wickhamt, 02-Aug-2018 12:31:17
Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 280-424541/26 Calibration Date: 08/02/2018 14:17

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 13:37

Lab File ID: MS1_5091.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Isopropyl ether	Ave	0.1841	0.1861		0.0101	0.0100	1.1	20.0
Dibromofluoromethane (Surr)	Ave	0.2160	0.2120		0.00982	0.0100	-1.8	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.1835	0.1802		0.00982	0.0100	-1.8	20.0
Toluene-d8 (Surr)	Ave	4.811	4.602		0.00957	0.0100	-4.3	20.0
4-Bromofluorobenzene (Surr)	Ave	1.117	1.048		0.00938	0.0100	-6.2	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5091.D
Lims ID: icv
Client ID:
Sample Type: ICV
Inject. Date: 02-Aug-2018 14:17:30 ALS Bottle#: 28 Worklist Smp#: 26
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: icv
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist:

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 03-Aug-2018 06:59:44 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

First Level Reviewer: wickhamt Date: 03-Aug-2018 06:59:44

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.598	-0.013	68	204330	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2158753	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	435634	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	604764	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	366138	10.0	9.82	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	311263	10.0	9.82	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	1603998	10.0	9.57	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	507044	10.0	9.38	
28 Ethylene oxide	43	4.565	4.565	0.000	99	418930	1000.0	782.1	
34 Ethanol	45	4.928	4.928	0.000	99	80313	600.0	550.8	
38 Propene oxide	58	5.180	5.179	0.001	0	2099052	1000.0	916.8	
41 Isopropyl alcohol	45	5.333	5.333	0.000	97	77926	100.0	92.7	
44 Acetonitrile	41	5.529	5.529	0.000	100	164780	100.0	98.8	
56 Isopropyl ether	87	6.199	6.199	0.000	95	321338	10.0	10.1	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	92	742315	10.0	9.39	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	98	850127	10.0	9.87	
60 Ethyl acetate	43	6.590	6.590	0.000	98	233894	20.0	17.8	
63 Propionitrile	54	6.632	6.632	0.000	99	183020	100.0	100.1	
66 Methacrylonitrile	41	6.772	6.772	0.000	91	881952	100.0	101.2	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	97	629405	10.0	9.87	
78 n-Butanol	56	7.554	7.554	0.000	86	89197	250.0	223.7	
81 Methyl methacrylate	100	7.945	7.945	0.000	91	81358	20.0	20.1	
87 2-Nitropropane	41	8.294	8.294	0.000	98	43315	20.0	18.1	
99 Tetrahydrothiophene	60	9.397	9.397	0.000	92	23181	20.0	26.6	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.001	86	51703	20.0	14.6	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	99	1607264	10.0	9.43	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	97	616227	10.0	8.96	

Reagents:

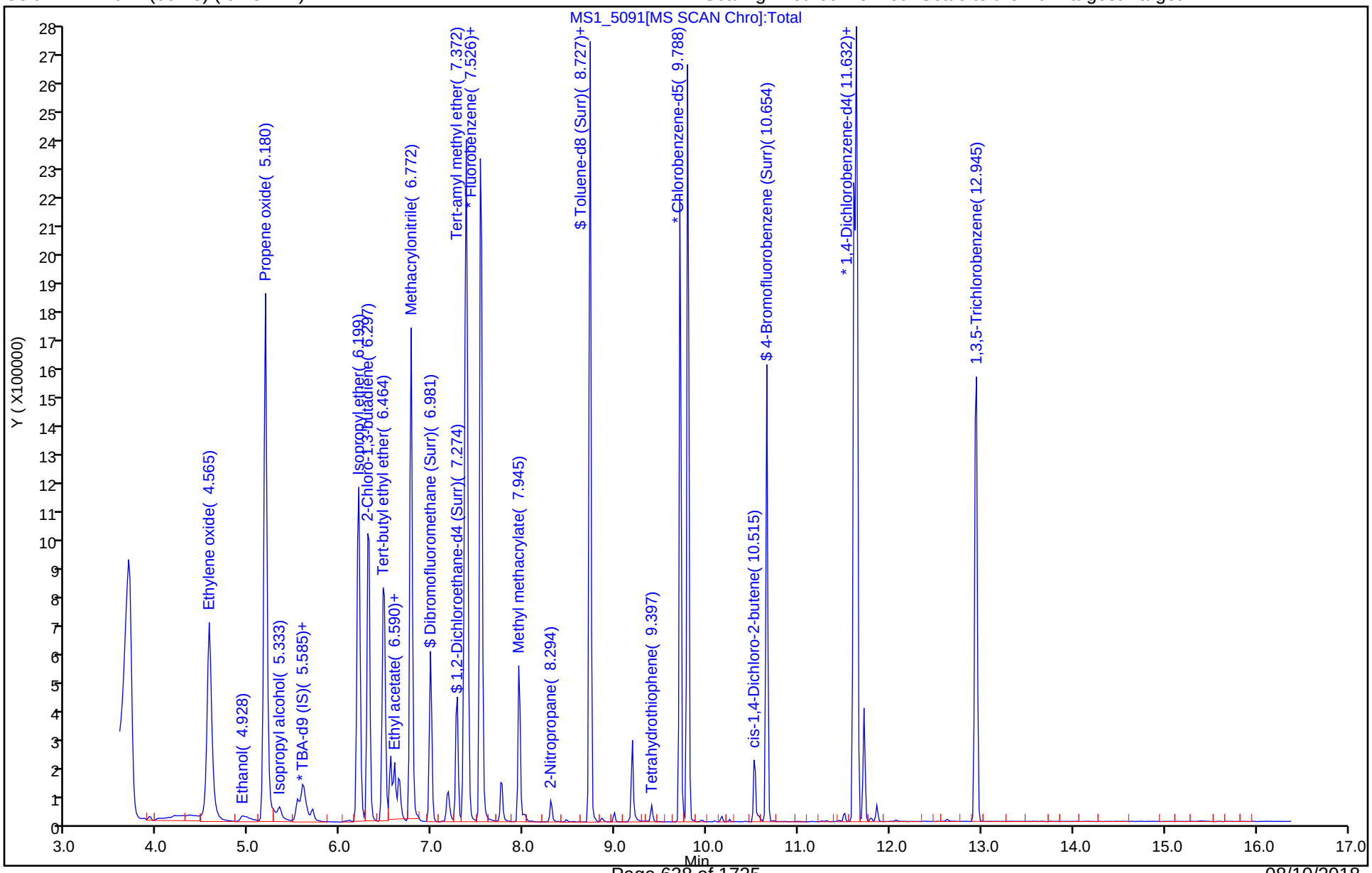
MV-568718-D_00014	Amount Added:	1.00	Units: uL
MV-ARCH SS A_00101	Amount Added:	0.80	Units: uL
MV-Supp B_00021	Amount Added:	5.00	Units: uL

Report Date: 03-Aug-2018 06:59:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5091.D				
Injection Date:	02-Aug-2018 14:17:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	icv			Worklist Smp#:	26
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	28
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 280-424938/2 Calibration Date: 08/06/2018 07:47

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5228.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2832	0.2938		0.0104	0.0100	3.7	20.0
Chloromethane	Ave	0.3441	0.3398	0.1000	0.00987	0.0100	-1.3	20.0
Vinyl chloride	Ave	0.3302	0.3497		0.0106	0.0100	5.9	20.0
Bromomethane	Ave	0.2412	0.2374		0.00985	0.0100	-1.5	20.0
Chloroethane	Ave	0.2408	0.2355		0.00978	0.0100	-2.2	20.0
Trichlorofluoromethane	Ave	0.4226	0.4215		0.00997	0.0100	-0.3	20.0
Acetone	Lin2		0.0213		0.0418	0.0400	4.5	20.0
1,1-Dichloroethene	Ave	0.2694	0.2628		0.00976	0.0100	-2.4	20.0
Carbon disulfide	Ave	1.201	1.185		0.00986	0.0100	-1.4	20.0
Methylene Chloride	Lin2		0.2558		0.0103	0.0100	3.3	20.0
Methyl tert-butyl ether	Ave	0.3304	0.3183		0.00963	0.0100	-3.7	20.0
trans-1,2-Dichloroethene	Ave	0.3021	0.3011		0.00997	0.0100	-0.3	20.0
1,1-Dichloroethane	Ave	0.5259	0.5394	0.1000	0.0103	0.0100	2.6	20.0
2-Butanone (MEK)	Ave	0.0321	0.0308		0.0384	0.0400	-4.1	20.0
cis-1,2-Dichloroethene	Ave	0.3042	0.3034		0.00997	0.0100	-0.3	20.0
2,2-Dichloropropane	Ave	0.4270	0.4380		0.0103	0.0100	2.6	20.0
Bromochloromethane	Ave	0.0901	0.0902		0.0100	0.0100	0.0	20.0
Chloroform	Ave	0.4592	0.4747		0.0103	0.0100	3.4	20.0
1,1,1-Trichloroethane	Ave	0.4345	0.4519		0.0104	0.0100	4.0	20.0
1,1-Dichloropropene	Ave	0.4246	0.4344		0.0102	0.0100	2.3	20.0
Carbon tetrachloride	Ave	0.3689	0.3752		0.0102	0.0100	1.7	20.0
1,2-Dichloroethane	Ave	0.2252	0.2297		0.0102	0.0100	2.0	20.0
Benzene	Ave	1.166	1.188		0.0102	0.0100	1.9	20.0
Trichloroethene	Ave	0.2946	0.3004		0.0102	0.0100	2.0	20.0
1,2-Dichloropropane	Ave	0.2632	0.2627		0.00998	0.0100	-0.2	20.0
Dibromomethane	Ave	0.0878	0.0880		0.0100	0.0100	0.1	20.0
Bromodichloromethane	Ave	0.2797	0.2868		0.0103	0.0100	2.5	20.0
cis-1,3-Dichloropropene	Ave	1.583	1.528		0.00965	0.0100	-3.5	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.0711	0.0741		0.0417	0.0400	4.2	20.0
Toluene	Ave	1.183	1.226		0.0104	0.0100	3.6	20.0
trans-1,3-Dichloropropene	Ave	0.2267	0.2315		0.0102	0.0100	2.1	20.0
1,1,2-Trichloroethane	Ave	0.1163	0.1119		0.00962	0.0100	-3.8	20.0
2-Hexanone	Ave	0.2264	0.2221		0.0392	0.0400	-1.9	20.0
1,3-Dichloropropane	Ave	1.108	1.054		0.00951	0.0100	-4.9	20.0
Tetrachloroethene	Ave	1.104	1.091		0.00989	0.0100	-1.1	20.0
Dibromochloromethane	Ave	0.6590	0.6342		0.00962	0.0100	-3.8	20.0
1,2-Dibromoethane (EDB)	Ave	0.5164	0.4893		0.00947	0.0100	-5.3	20.0
Chlorobenzene	Ave	3.313	3.270	0.3000	0.00987	0.0100	-1.3	20.0
1,1,1,2-Tetrachloroethane	Ave	1.015	1.020		0.0100	0.0100	0.5	20.0
Ethylbenzene	Ave	2.121	2.124		0.0100	0.0100	0.1	20.0
m-Xylene & p-Xylene	Ave	2.553	2.530		0.00991	0.0100	-0.9	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 280-424938/2 Calibration Date: 08/06/2018 07:47

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5228.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
o-Xylene	Ave	2.369	2.372		0.0100	0.0100	0.1	20.0
Styrene	Ave	3.443	3.504		0.0102	0.0100	1.8	20.0
Bromoform	Lin2		0.2723	0.1000	0.00895	0.0100	-10.5	20.0
Isopropylbenzene	Ave	4.733	4.443		0.00939	0.0100	-6.1	20.0
1,1,2,2-Tetrachloroethane	Ave	0.4045	0.3564	0.3000	0.00881	0.0100	-11.9	20.0
1,2,3-Trichloropropane	Ave	0.1076	0.0993		0.00923	0.0100	-7.7	20.0
Bromobenzene	Ave	0.8515	0.8019		0.00942	0.0100	-5.8	20.0
N-Propylbenzene	Ave	1.339	1.254		0.00936	0.0100	-6.4	20.0
1,3,5-Trimethylbenzene	Ave	3.923	3.755		0.00957	0.0100	-4.3	20.0
2-Chlorotoluene	Ave	1.053	1.019		0.00968	0.0100	-3.2	20.0
4-Chlorotoluene	Ave	1.040	0.9768		0.00940	0.0100	-6.0	20.0
tert-Butylbenzene	Ave	3.842	3.635		0.00946	0.0100	-5.4	20.0
1,2,4-Trimethylbenzene	Ave	3.860	3.711		0.00961	0.0100	-3.9	20.0
sec-Butylbenzene	Ave	1.047	1.002		0.00957	0.0100	-4.3	20.0
4-Isopropyltoluene	Ave	4.301	4.131		0.00960	0.0100	-4.0	20.0
1,3-Dichlorobenzene	Ave	1.832	1.754		0.00958	0.0100	-4.2	20.0
1,4-Dichlorobenzene	Ave	1.747	1.669		0.00955	0.0100	-4.5	20.0
n-Butylbenzene	Ave	4.282	4.185		0.00977	0.0100	-2.3	20.0
1,2-Dichlorobenzene	Ave	1.417	1.325		0.00935	0.0100	-6.5	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0390		0.00748	0.0100	-25.2*	20.0
1,2,4-Trichlorobenzene	Ave	0.9266	0.8603		0.00928	0.0100	-7.2	20.0
Hexachlorobutadiene	Ave	0.7646	0.7272		0.00951	0.0100	-4.9	20.0
Naphthalene	Ave	1.117	0.9174		0.00822	0.0100	-17.8	20.0
1,2,3-Trichlorobenzene	Ave	0.6725	0.6110		0.00909	0.0100	-9.1	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 06-Aug-2018 07:47:30 ALS Bottle#: 11 Worklist Smp#: 2
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccv m
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:53 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 08:25:12

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	88	171503	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2111006	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	444184	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	661102	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	476672	12.3	13.1	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.260	0.000	99	387600	12.3	12.5	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2264865	12.3	13.2	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	693735	12.3	11.7	
24 Dichlorodifluoromethane	85	3.909	3.909	0.000	100	496092	10.0	10.4	
26 Chloromethane	50	4.160	4.160	0.000	99	573788	10.0	9.87	
27 Vinyl chloride	62	4.286	4.286	0.000	98	590524	10.0	10.6	
29 Bromomethane	94	4.635	4.635	0.000	91	400976	10.0	9.85	
31 Chloroethane	64	4.691	4.691	0.000	100	397736	10.0	9.78	
32 Dichlorofluoromethane	67	4.816	4.816	0.000	98	945530	10.0	10.4	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	711834	10.0	9.97	
36 Ethyl ether	59	5.082	5.082	0.000	93	196079	10.0	9.33	
39 Acrolein	56	5.207	5.207	0.000	100	241564	100.0	96.3	
40 Acetone	43	5.305	5.305	0.000	100	143541	40.0	41.8	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.333	0.000	98	328761	10.0	10.1	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	443883	10.0	9.76	
45 Iodomethane	142	5.529	5.529	0.000	99	694406	10.0	9.91	
46 Methyl acetate	43	5.543	5.543	0.000	97	178489	20.0	17.7	
47 3-Chloro-1-propene	41	5.598	5.598	0.000	89	843598	10.0	9.93	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2000747	10.0	9.86	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	85461	100.0	102.3	
50 Methylene Chloride	84	5.696	5.696	0.000	94	431987	10.0	10.3	
51 Acrylonitrile	53	5.822	5.822	0.000	98	487561	100.0	96.7	
52 Methyl tert-butyl ether	73	5.878	5.878	0.000	96	537458	10.0	9.63	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	508525	10.0	9.97	
54 Hexane	57	6.087	6.087	0.000	93	825593	10.0	9.12	
55 Vinyl acetate	43	6.157	6.157	0.000	97	742773	20.0	20.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	910979	10.0	10.3	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	207966	40.0	38.4	M
62 sec-Butyl Alcohol	45	6.632	6.632	0.000	96	222530	300.0	283.7	
64 cis-1,2-Dichloroethene	96	6.646	6.646	0.000	84	512445	10.0	9.97	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	739687	10.0	10.3	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	152372	10.0	10.0	
68 Chloroform	83	6.855	6.855	0.000	95	801691	10.0	10.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	87	64680	20.0	16.6	
70 Isobutyl alcohol	41	7.051	7.051	0.000	92	85206	250.0	266.7	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	763220	10.0	10.4	
72 Cyclohexane	56	7.163	7.163	0.000	0	961860	10.0	9.75	
73 1,1-Dichloropropene	75	7.177	7.177	0.000	97	733650	10.0	10.2	
74 Carbon tetrachloride	117	7.232	7.232	0.000	98	633689	10.0	10.2	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	387841	10.0	10.2	
77 Benzene	78	7.358	7.358	0.000	97	2006543	10.0	10.2	
9 n-Heptane	43	7.456	7.456	0.000	92	873851	10.0	9.89	
79 Trichloroethene	95	7.819	7.819	0.000	97	507283	10.0	10.2	
80 2-Pentanone	43	7.847	7.847	0.000	99	336778	40.0	35.8	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	443603	10.0	9.98	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	789142	10.0	10.0	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	25092	200.0	201.3	
85 Dibromomethane	93	8.098	8.098	0.000	95	148536	10.0	10.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	484308	10.0	10.3	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	75103	10.0	10.2	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	543062	10.0	9.65	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	500343	40.0	41.7	
91 Toluene	91	8.769	8.769	0.000	99	2069771	10.0	10.4	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	204468	10.0	8.54	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	391016	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	188995	10.0	9.62	
95 2-Hexanone	43	9.132	9.132	0.000	96	315754	40.0	39.2	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	374388	10.0	9.51	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	387826	10.0	9.89	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	225354	10.0	9.62	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	173874	10.0	9.47	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	705938	10.0	9.57	
102 Chlorobenzene	112	9.816	9.816	0.000	94	1162123	10.0	9.87	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	362598	10.0	10.0	
104 Ethylbenzene	106	9.858	9.858	0.000	98	754848	10.0	10.0	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	899170	10.0	9.91	
106 Styrene	104	10.249	10.249	0.000	85	1245265	10.0	10.2	
109 o-Xylene	106	10.249	10.249	0.000	89	843028	10.0	10.0	
107 Bromoform	173	10.445	10.445	0.000	97	96747	10.0	8.95	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	2349978	10.0	9.39	
111 Cyclohexanone	55	10.626	10.626	0.000	92	138604	400.0	386.8	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	188492	10.0	8.81	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	89	40785	10.0	7.88	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	52504	10.0	9.23	
116 Bromobenzene	156	10.822	10.822	0.000	52	424088	10.0	9.42	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	663012	10.0	9.36	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1985764	10.0	9.57	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	538914	10.0	9.68	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	516605	10.0	9.40	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1922580	10.0	9.46	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1962735	10.0	9.61	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	529908	10.0	9.57	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	2184939	10.0	9.60	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	927667	10.0	9.58	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	882694	10.0	9.55	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2213244	10.0	9.77	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	700843	10.0	9.35	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	20601	10.0	7.48	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	454991	10.0	9.28	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	384624	10.0	9.51	
132 Naphthalene	128	14.006	14.006	0.000	97	485187	10.0	8.22	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	323133	10.0	9.09	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.9	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.9	
S 134 Trihalomethanes, Total	1				0		40.0	39.2	
S 139 Xylenes, Total (URS)	1				0		20.0	19.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.9	
S 138 Xylenes, Total	106				0		20.0	19.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

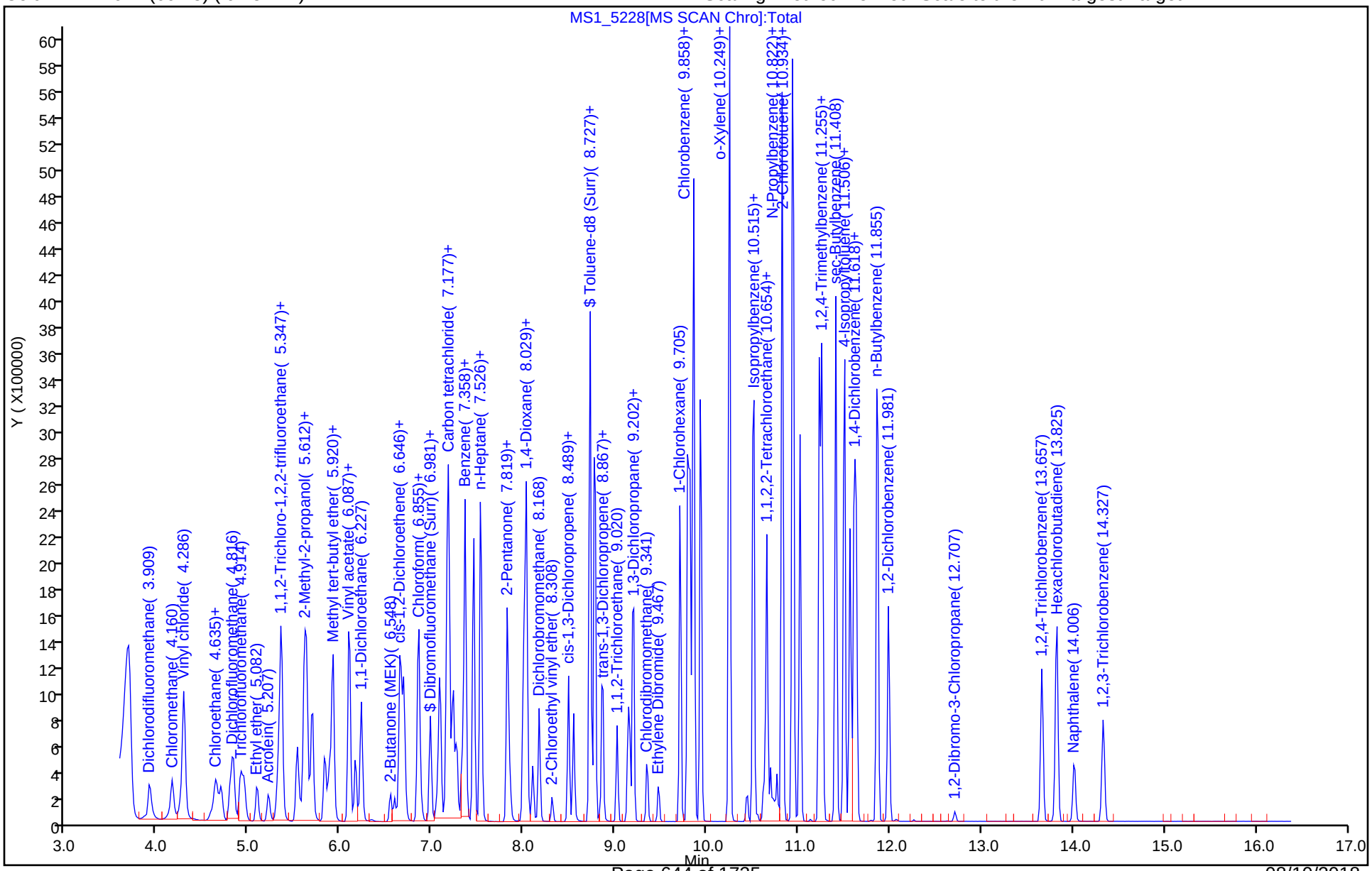
MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D				
Injection Date:	06-Aug-2018 07:47:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	CCV			Worklist Smp#:	2
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	11
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

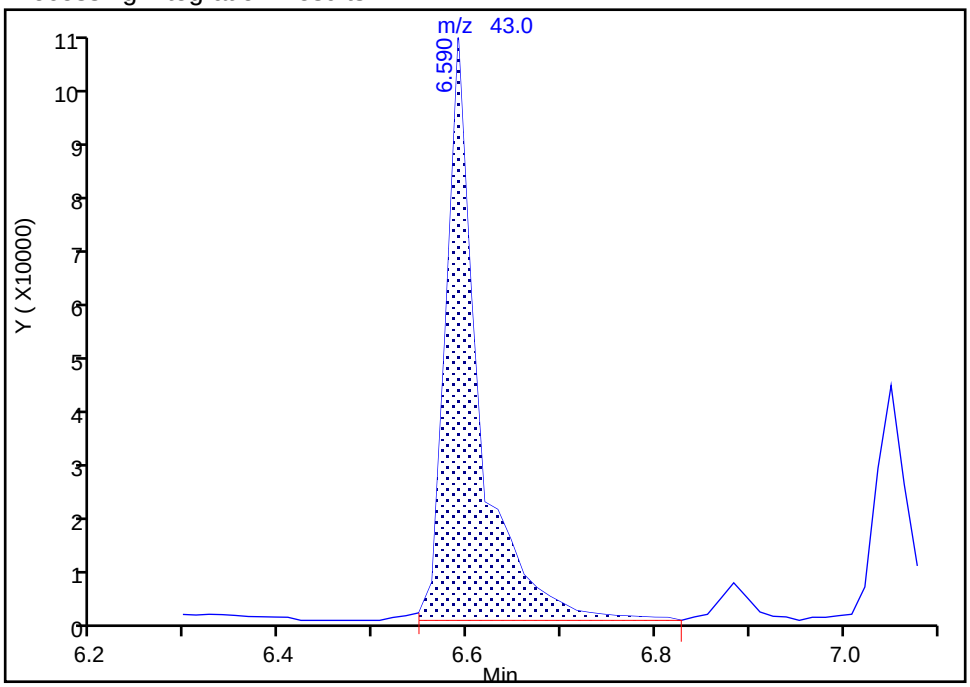
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D				
Injection Date:	06-Aug-2018 07:47:30	Instrument ID:	VMS_MS1		
Lims ID:	CCV				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	11	Worklist Smp#:	2
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

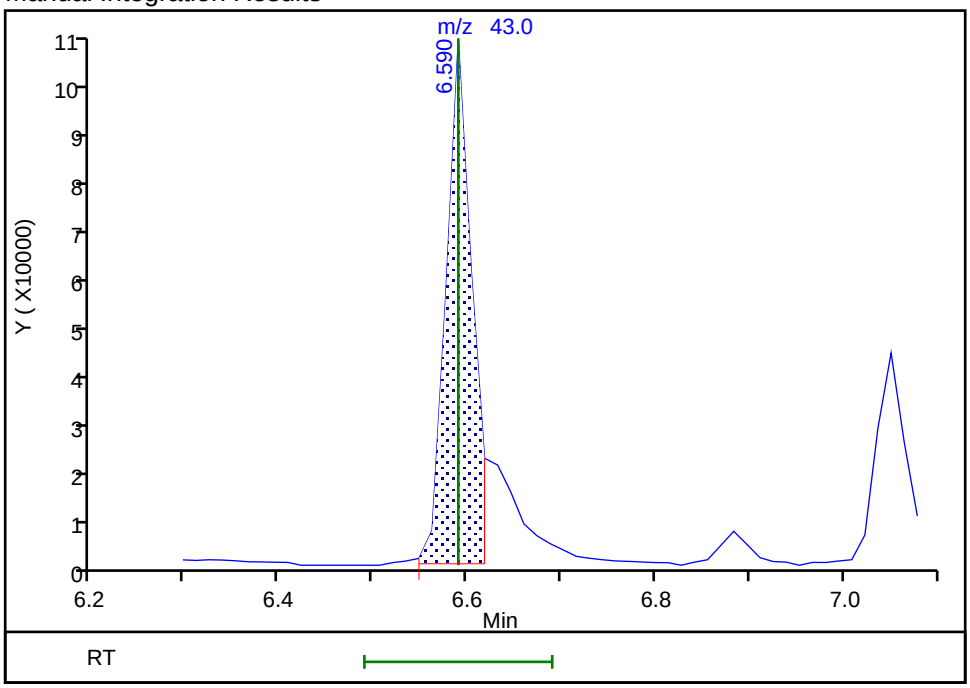
Processing Integration Results

RT: 6.59
Area: 263926
Amount: 48.697233
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 207966
Amount: 38.372001
Amount Units: ug/l



Reviewer: wickhamt, 06-Aug-2018 08:08:25
Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 280-424938/2 Calibration Date: 08/06/2018 07:47

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 13:37

Lab File ID: MS1_5228.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dibromofluoromethane (Surr)	Ave	0.2160	0.2304		0.0131	0.0123	6.7	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.1835	0.1874		0.0125	0.0123	2.1	20.0
Toluene-d8 (Surr)	Ave	4.811	5.203		0.0132	0.0123	8.1	20.0
4-Bromofluorobenzene (Surr)	Ave	1.117	1.071		0.0117	0.0123	-4.1	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 06-Aug-2018 07:47:30 ALS Bottle#: 11 Worklist Smp#: 2
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccv m
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:53 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 08:25:12

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	88	171503	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2111006	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	444184	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	661102	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	476672	12.3	13.1	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.260	7.260	0.000	99	387600	12.3	12.5	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2264865	12.3	13.2	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	693735	12.3	11.7	
24 Dichlorodifluoromethane	85	3.909	3.909	0.000	100	496092	10.0	10.4	
26 Chloromethane	50	4.160	4.160	0.000	99	573788	10.0	9.87	
27 Vinyl chloride	62	4.286	4.286	0.000	98	590524	10.0	10.6	
29 Bromomethane	94	4.635	4.635	0.000	91	400976	10.0	9.85	
31 Chloroethane	64	4.691	4.691	0.000	100	397736	10.0	9.78	
32 Dichlorofluoromethane	67	4.816	4.816	0.000	98	945530	10.0	10.4	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	711834	10.0	9.97	
36 Ethyl ether	59	5.082	5.082	0.000	93	196079	10.0	9.33	
39 Acrolein	56	5.207	5.207	0.000	100	241564	100.0	96.3	
40 Acetone	43	5.305	5.305	0.000	100	143541	40.0	41.8	
42 1,1,2-Trichloro-1,2,2-trif	151	5.333	5.333	0.000	98	328761	10.0	10.1	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	99	443883	10.0	9.76	
45 Iodomethane	142	5.529	5.529	0.000	99	694406	10.0	9.91	
46 Methyl acetate	43	5.543	5.543	0.000	97	178489	20.0	17.7	
47 3-Chloro-1-propene	41	5.598	5.598	0.000	89	843598	10.0	9.93	
48 Carbon disulfide	76	5.626	5.626	0.000	99	2000747	10.0	9.86	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	94	85461	100.0	102.3	
50 Methylene Chloride	84	5.696	5.696	0.000	94	431987	10.0	10.3	
51 Acrylonitrile	53	5.822	5.822	0.000	98	487561	100.0	96.7	
52 Methyl tert-butyl ether	73	5.878	5.878	0.000	96	537458	10.0	9.63	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	508525	10.0	9.97	
54 Hexane	57	6.087	6.087	0.000	93	825593	10.0	9.12	
55 Vinyl acetate	43	6.157	6.157	0.000	97	742773	20.0	20.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	910979	10.0	10.3	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	207966	40.0	38.4	M
62 sec-Butyl Alcohol	45	6.632	6.632	0.000	96	222530	300.0	283.7	
64 cis-1,2-Dichloroethene	96	6.646	6.646	0.000	84	512445	10.0	9.97	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	739687	10.0	10.3	
67 Chlorobromomethane	128	6.841	6.841	0.000	92	152372	10.0	10.0	
68 Chloroform	83	6.855	6.855	0.000	95	801691	10.0	10.3	
69 Tetrahydrofuran	42	6.883	6.883	0.000	87	64680	20.0	16.6	
70 Isobutyl alcohol	41	7.051	7.051	0.000	92	85206	250.0	266.7	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	763220	10.0	10.4	
72 Cyclohexane	56	7.163	7.163	0.000	0	961860	10.0	9.75	
73 1,1-Dichloropropene	75	7.177	7.177	0.000	97	733650	10.0	10.2	
74 Carbon tetrachloride	117	7.232	7.232	0.000	98	633689	10.0	10.2	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	387841	10.0	10.2	
77 Benzene	78	7.358	7.358	0.000	97	2006543	10.0	10.2	
9 n-Heptane	43	7.456	7.456	0.000	92	873851	10.0	9.89	
79 Trichloroethene	95	7.819	7.819	0.000	97	507283	10.0	10.2	
80 2-Pentanone	43	7.847	7.847	0.000	99	336778	40.0	35.8	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	443603	10.0	9.98	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	789142	10.0	10.0	
84 1,4-Dioxane	88	8.056	8.056	0.000	90	25092	200.0	201.3	
85 Dibromomethane	93	8.098	8.098	0.000	95	148536	10.0	10.0	
86 Dichlorobromomethane	83	8.168	8.168	0.000	100	484308	10.0	10.3	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	75103	10.0	10.2	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	543062	10.0	9.65	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	500343	40.0	41.7	
91 Toluene	91	8.769	8.769	0.000	99	2069771	10.0	10.4	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	204468	10.0	8.54	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	391016	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	188995	10.0	9.62	
95 2-Hexanone	43	9.132	9.132	0.000	96	315754	40.0	39.2	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	374388	10.0	9.51	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	387826	10.0	9.89	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	225354	10.0	9.62	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	173874	10.0	9.47	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	705938	10.0	9.57	
102 Chlorobenzene	112	9.816	9.816	0.000	94	1162123	10.0	9.87	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	362598	10.0	10.0	
104 Ethylbenzene	106	9.858	9.858	0.000	98	754848	10.0	10.0	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	899170	10.0	9.91	
106 Styrene	104	10.249	10.249	0.000	85	1245265	10.0	10.2	
109 o-Xylene	106	10.249	10.249	0.000	89	843028	10.0	10.0	
107 Bromoform	173	10.445	10.445	0.000	97	96747	10.0	8.95	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	2349978	10.0	9.39	
111 Cyclohexanone	55	10.626	10.626	0.000	92	138604	400.0	386.8	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	188492	10.0	8.81	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	89	40785	10.0	7.88	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	52504	10.0	9.23	
116 Bromobenzene	156	10.822	10.822	0.000	52	424088	10.0	9.42	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	663012	10.0	9.36	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1985764	10.0	9.57	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	538914	10.0	9.68	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	516605	10.0	9.40	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1922580	10.0	9.46	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1962735	10.0	9.61	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	529908	10.0	9.57	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	2184939	10.0	9.60	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	927667	10.0	9.58	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	882694	10.0	9.55	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	2213244	10.0	9.77	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	700843	10.0	9.35	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	20601	10.0	7.48	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	454991	10.0	9.28	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	384624	10.0	9.51	
132 Naphthalene	128	14.006	14.006	0.000	97	485187	10.0	8.22	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	323133	10.0	9.09	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.9	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.9	
S 134 Trihalomethanes, Total	1				0		40.0	39.2	
S 139 Xylenes, Total (URS)	1				0		20.0	19.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.9	
S 138 Xylenes, Total	106				0		20.0	19.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5228.D

Injection Date: 06-Aug-2018 07:47:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

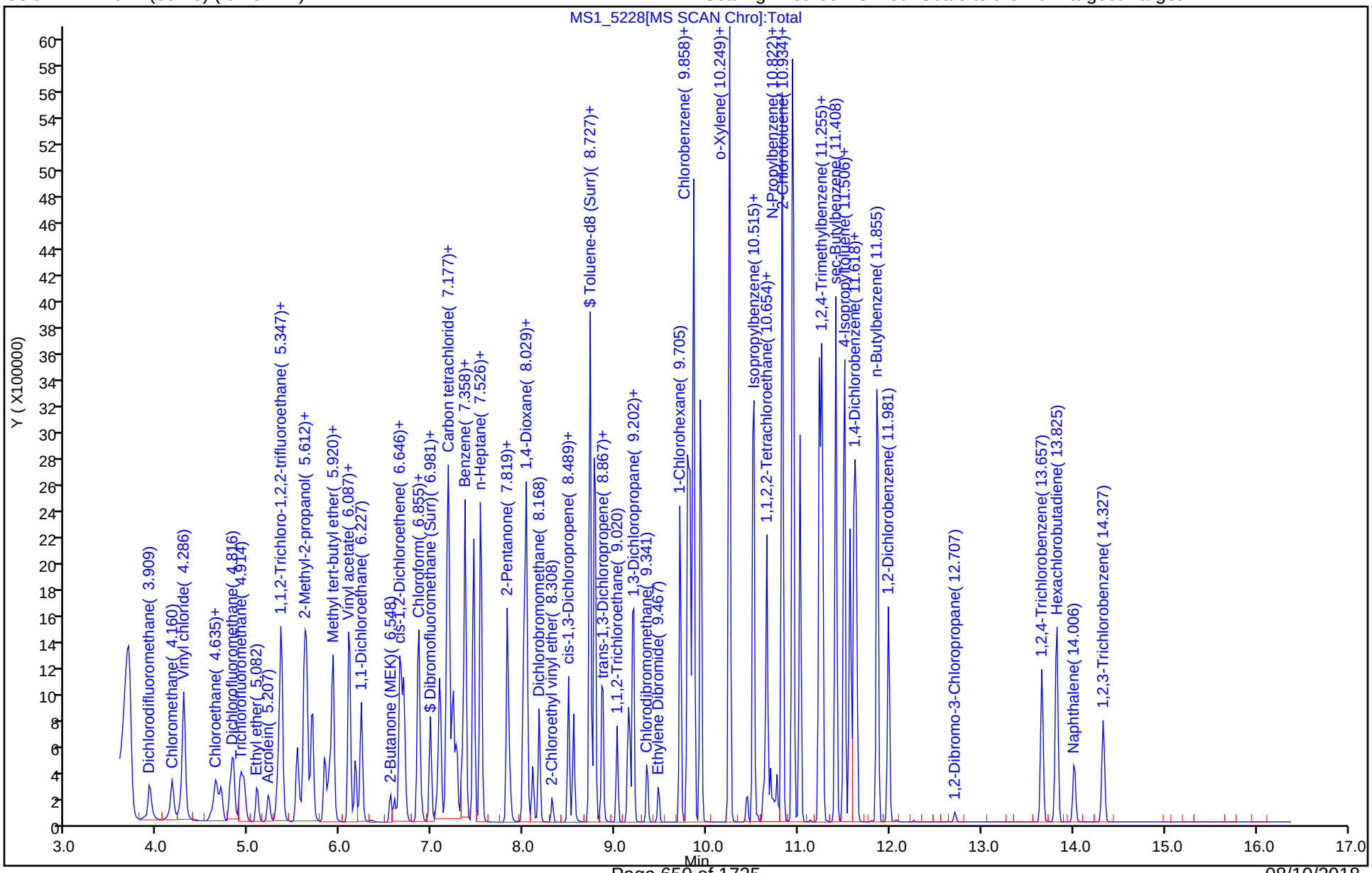
Lims ID: CCV Worklist Smp#: 2

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 11

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVC 280-424938/33 Calibration Date: 08/06/2018 16:15

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5253.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2832	0.2064		0.00729	0.0100	-27.1	50.0
Chloromethane	Ave	0.3441	0.2981	0.1000	0.00866	0.0100	-13.4	50.0
Vinyl chloride	Ave	0.3302	0.2879		0.00872	0.0100	-12.8	50.0
Bromomethane	Ave	0.2412	0.2256		0.00935	0.0100	-6.5	50.0
Chloroethane	Ave	0.2408	0.2154		0.00894	0.0100	-10.6	50.0
Trichlorofluoromethane	Ave	0.4226	0.3298		0.00780	0.0100	-22.0	50.0
Acetone	Lin2		0.0226		0.0446	0.0400	11.6	50.0
1,1-Dichloroethene	Ave	0.2694	0.2328		0.00864	0.0100	-13.6	50.0
Carbon disulfide	Ave	1.201	1.073		0.00893	0.0100	-10.7	50.0
Methylene Chloride	Lin2		0.2622		0.0106	0.0100	6.0	50.0
Methyl tert-butyl ether	Ave	0.3304	0.3396		0.0103	0.0100	2.8	50.0
trans-1,2-Dichloroethene	Ave	0.3021	0.2865		0.00948	0.0100	-5.2	50.0
1,1-Dichloroethane	Ave	0.5259	0.5255	0.1000	0.00999	0.0100	-0.0	50.0
2-Butanone (MEK)	Ave	0.0321	0.0324		0.0404	0.0400	1.0	50.0
cis-1,2-Dichloroethene	Ave	0.3042	0.3011		0.00990	0.0100	-1.0	50.0
2,2-Dichloropropane	Ave	0.4270	0.3806		0.00891	0.0100	-10.9	50.0
Bromochloromethane	Ave	0.0901	0.0931		0.0103	0.0100	3.3	50.0
Chloroform	Ave	0.4592	0.4696		0.0102	0.0100	2.3	50.0
1,1,1-Trichloroethane	Ave	0.4345	0.4027		0.00927	0.0100	-7.3	50.0
1,1-Dichloropropene	Ave	0.4246	0.3802		0.00895	0.0100	-10.5	50.0
Carbon tetrachloride	Ave	0.3689	0.3215		0.00872	0.0100	-12.8	50.0
1,2-Dichloroethane	Ave	0.2252	0.2360		0.0105	0.0100	4.8	50.0
Benzene	Ave	1.166	1.144		0.00981	0.0100	-1.9	50.0
Trichloroethene	Ave	0.2946	0.2763		0.00938	0.0100	-6.2	50.0
1,2-Dichloropropane	Ave	0.2632	0.2600		0.00988	0.0100	-1.2	50.0
Dibromomethane	Ave	0.0878	0.0910		0.0104	0.0100	3.6	50.0
Bromodichloromethane	Ave	0.2797	0.2813		0.0101	0.0100	0.6	50.0
cis-1,3-Dichloropropene	Ave	1.583	1.443		0.00911	0.0100	-8.9	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.0711	0.0789		0.0444	0.0400	11.0	50.0
Toluene	Ave	1.183	1.157		0.00978	0.0100	-2.2	50.0
trans-1,3-Dichloropropene	Ave	0.2267	0.2316		0.0102	0.0100	2.2	50.0
1,1,2-Trichloroethane	Ave	0.1163	0.1189		0.0102	0.0100	2.2	50.0
2-Hexanone	Ave	0.2264	0.2313		0.0409	0.0400	2.1	50.0
1,3-Dichloropropane	Ave	1.108	1.074		0.00969	0.0100	-3.1	50.0
Tetrachloroethene	Ave	1.104	0.9159		0.00830	0.0100	-17.0	50.0
Dibromochloromethane	Ave	0.6590	0.6250		0.00948	0.0100	-5.2	50.0
1,2-Dibromoethane (EDB)	Ave	0.5164	0.4936		0.00956	0.0100	-4.4	50.0
Chlorobenzene	Ave	3.313	3.033	0.3000	0.00915	0.0100	-8.5	50.0
1,1,1,2-Tetrachloroethane	Ave	1.015	0.9580		0.00944	0.0100	-5.6	50.0
Ethylbenzene	Ave	2.121	1.878		0.00885	0.0100	-11.5	50.0
m-Xylene & p-Xylene	Ave	2.553	2.228		0.00873	0.0100	-12.7	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVC 280-424938/33 Calibration Date: 08/06/2018 16:15

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 08:53

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 10:54

Lab File ID: MS1_5253.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
o-Xylene	Ave	2.369	2.179		0.00920	0.0100	-8.0	50.0
Styrene	Ave	3.443	3.254		0.00945	0.0100	-5.5	50.0
Bromoform	Lin2		0.2700	0.1000	0.00888	0.0100	-11.2	50.0
Isopropylbenzene	Ave	4.733	3.833		0.00810	0.0100	-19.0	50.0
1,1,2,2-Tetrachloroethane	Ave	0.4045	0.3787	0.3000	0.00936	0.0100	-6.4	50.0
1,2,3-Trichloropropane	Ave	0.1076	0.1042		0.00969	0.0100	-3.1	50.0
Bromobenzene	Ave	0.8515	0.7798		0.00916	0.0100	-8.4	50.0
N-Propylbenzene	Ave	1.339	1.064		0.00795	0.0100	-20.5	50.0
1,3,5-Trimethylbenzene	Ave	3.923	3.317		0.00846	0.0100	-15.4	50.0
2-Chlorotoluene	Ave	1.053	0.9299		0.00883	0.0100	-11.7	50.0
4-Chlorotoluene	Ave	1.040	0.8879		0.00854	0.0100	-14.6	50.0
tert-Butylbenzene	Ave	3.842	3.107		0.00809	0.0100	-19.1	50.0
1,2,4-Trimethylbenzene	Ave	3.860	3.315		0.00859	0.0100	-14.1	50.0
sec-Butylbenzene	Ave	1.047	0.8087		0.00772	0.0100	-22.8	50.0
4-Isopropyltoluene	Ave	4.301	3.460		0.00805	0.0100	-19.5	50.0
1,3-Dichlorobenzene	Ave	1.832	1.633		0.00891	0.0100	-10.9	50.0
1,4-Dichlorobenzene	Ave	1.747	1.573		0.00900	0.0100	-10.0	50.0
n-Butylbenzene	Ave	4.282	3.354		0.00783	0.0100	-21.7	50.0
1,2-Dichlorobenzene	Ave	1.417	1.311		0.00925	0.0100	-7.5	50.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0425		0.00812	0.0100	-18.8	50.0
1,2,4-Trichlorobenzene	Ave	0.9266	0.8483		0.00915	0.0100	-8.5	50.0
Hexachlorobutadiene	Ave	0.7646	0.5673		0.00742	0.0100	-25.8	50.0
Naphthalene	Ave	1.117	1.029		0.00921	0.0100	-7.9	50.0
1,2,3-Trichlorobenzene	Ave	0.6725	0.6390		0.00950	0.0100	-5.0	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D
Lims ID: ccvc
Client ID:
Sample Type: CCVC
Inject. Date: 06-Aug-2018 16:15:30 ALS Bottle#: 36 Worklist Smp#: 33
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccvc
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:50 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 07-Aug-2018 06:52:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.584	0.001	87	177062	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2067090	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	446910	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	648746	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	459434	12.3	12.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	392953	12.3	12.9	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2129743	12.3	12.4	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	666021	12.3	11.5	
24 Dichlorodifluoromethane	85	3.923	3.923	0.001	100	341261	10.0	7.29	
26 Chloromethane	50	4.174	4.160	0.014	99	493001	10.0	8.66	
27 Vinyl chloride	62	4.300	4.286	0.014	98	476067	10.0	8.72	
29 Bromomethane	94	4.649	4.635	0.014	91	373053	10.0	9.35	
31 Chloroethane	64	4.705	4.691	0.014	100	356154	10.0	8.94	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	855808	10.0	9.64	
33 Trichlorofluoromethane	101	4.942	4.914	0.028	100	545300	10.0	7.80	
36 Ethyl ether	59	5.096	5.096	0.000	93	210141	10.0	10.2	
39 Acrolein	56	5.221	5.221	0.000	100	245148	100.0	99.8	
40 Acetone	43	5.319	5.319	0.000	100	149730	40.0	44.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	256128	10.0	8.07	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	384891	10.0	8.64	
45 Iodomethane	142	5.529	5.529	0.000	100	672408	10.0	9.80	
46 Methyl acetate	43	5.557	5.557	0.000	97	195624	20.0	19.8	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	798694	10.0	9.60	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1773890	10.0	8.93	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	93977	100.0	109.0	
50 Methylene Chloride	84	5.696	5.696	0.000	95	433619	10.0	10.6	
51 Acrylonitrile	53	5.836	5.836	0.000	98	518502	100.0	105.0	
52 Methyl tert-butyl ether	73	5.892	5.878	0.014	97	561603	10.0	10.3	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	473767	10.0	9.48	
54 Hexane	57	6.101	6.101	0.000	92	614041	10.0	6.74	
55 Vinyl acetate	43	6.171	6.157	0.014	97	763382	20.0	21.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	869044	10.0	10.0	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	214467	40.0	40.4	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	250975	300.0	309.9	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	82	497886	10.0	9.90	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	93	629456	10.0	8.91	
67 Chlorobromomethane	128	6.842	6.841	0.001	93	154010	10.0	10.3	
68 Chloroform	83	6.855	6.855	0.000	95	776626	10.0	10.2	
69 Tetrahydrofuran	42	6.883	6.883	0.000	88	73098	20.0	19.3	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	93164	250.0	282.4	
71 1,1,1-Trichloroethane	97	7.093	7.079	0.014	99	665975	10.0	9.27	
72 Cyclohexane	56	7.163	7.163	0.000	0	746129	10.0	7.73	
73 1,1-Dichloropropene	75	7.191	7.177	0.014	97	628715	10.0	8.95	
74 Carbon tetrachloride	117	7.233	7.233	0.001	97	531592	10.0	8.72	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	390195	10.0	10.5	
77 Benzene	78	7.358	7.358	0.000	97	1891810	10.0	9.81	
9 n-Heptane	43	7.456	7.456	0.000	92	646461	10.0	7.47	
79 Trichloroethene	95	7.819	7.819	0.000	98	456821	10.0	9.38	
80 2-Pentanone	43	7.847	7.847	0.000	99	373346	40.0	40.5	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	429933	10.0	9.88	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	587300	10.0	7.61	
84 1,4-Dioxane	88	8.057	8.057	0.000	95	28259	200.0	231.6	
85 Dibromomethane	93	8.098	8.098	0.000	95	150519	10.0	10.4	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	465172	10.0	10.1	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	79696	10.0	11.0	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	515885	10.0	9.11	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	522101	40.0	44.4	
91 Toluene	91	8.783	8.769	0.014	98	1912864	10.0	9.78	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	221395	10.0	9.19	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	383027	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	196606	10.0	10.2	
95 2-Hexanone	43	9.132	9.132	0.000	97	330722	40.0	40.9	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	383992	10.0	9.69	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	327471	10.0	8.30	
98 Chlorodibromomethane	129	9.355	9.341	0.014	90	223455	10.0	9.48	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	176474	10.0	9.56	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	538949	10.0	7.27	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1084224	10.0	9.15	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	342523	10.0	9.44	
104 Ethylbenzene	106	9.858	9.858	0.000	98	671445	10.0	8.85	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	796652	10.0	8.73	
106 Styrene	104	10.249	10.249	0.000	86	1163550	10.0	9.45	
109 o-Xylene	106	10.249	10.249	0.000	89	779091	10.0	9.20	
107 Bromoform	173	10.445	10.445	0.000	96	96529	10.0	8.88	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1989230	10.0	8.10	
111 Cyclohexanone	55	10.626	10.626	0.000	92	153231	400.0	425.0	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	96	196525	10.0	9.36	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	87	45226	10.0	8.91	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	54067	10.0	9.69	
116 Bromobenzene	156	10.822	10.822	0.000	55	404736	10.0	9.16	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	552272	10.0	7.95	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1721529	10.0	8.46	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	482602	10.0	8.83	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	460828	10.0	8.54	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1612438	10.0	8.09	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1720230	10.0	8.59	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	419713	10.0	7.72	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	1795928	10.0	8.05	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	847508	10.0	8.91	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	816127	10.0	9.00	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	1740711	10.0	7.83	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	680422	10.0	9.25	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	22033	10.0	8.12	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	440244	10.0	9.15	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	294440	10.0	7.42	
132 Naphthalene	128	14.020	14.006	0.014	97	533806	10.0	9.21	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	331662	10.0	9.50	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.4	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.4	
S 134 Trihalomethanes, Total	1				0		40.0	38.6	
S 137 Total BTEX	1				0			46.4	
S 139 Xylenes, Total (URS)	1				0		20.0	17.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.3	
S 138 Xylenes, Total	106				0		20.0	17.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

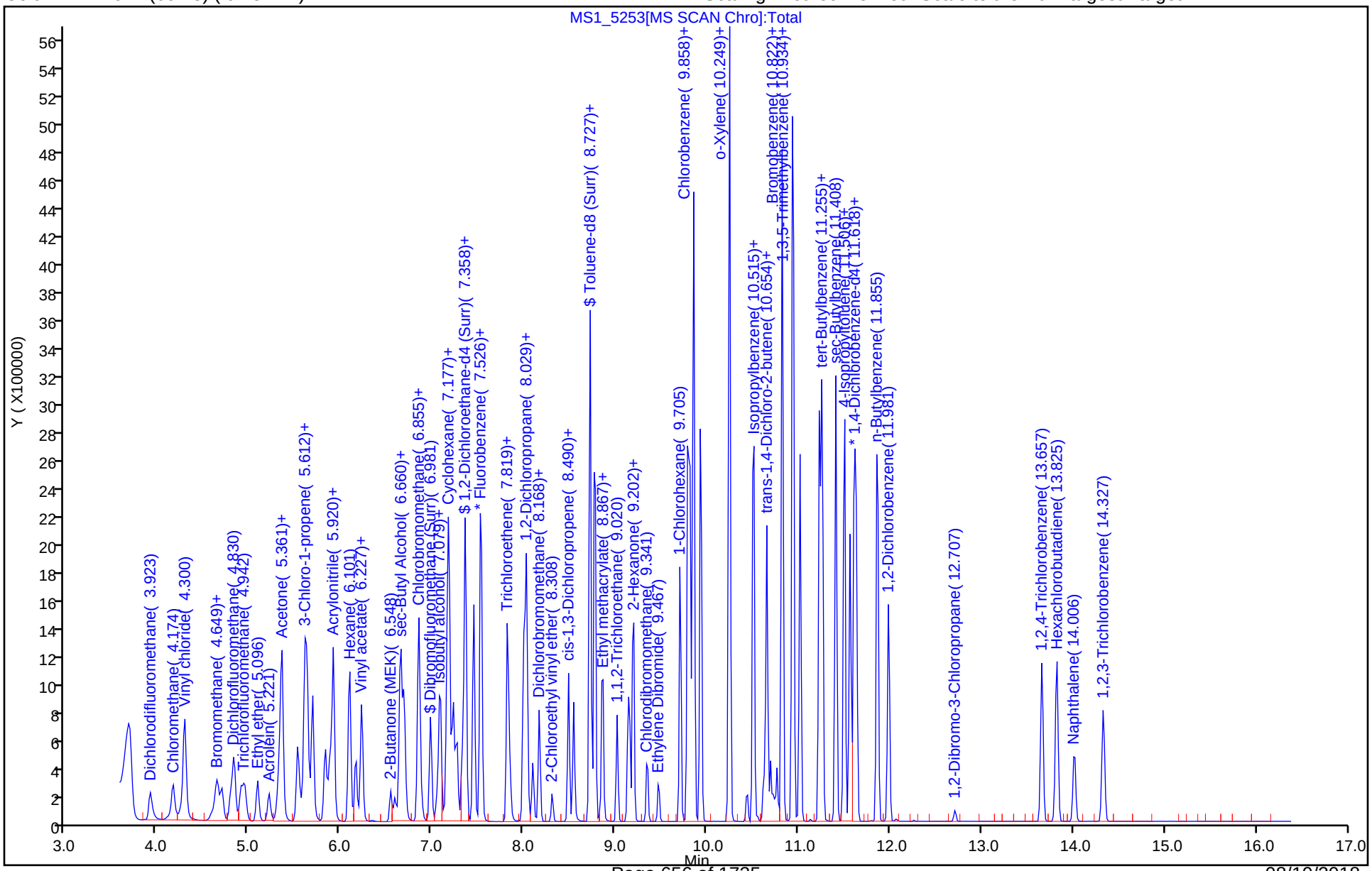
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D				
Injection Date:	06-Aug-2018 16:15:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	ccvc			Worklist Smp#:	33
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	36
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



Manual Integration/User Assign Peak Report

TestAmerica Denver

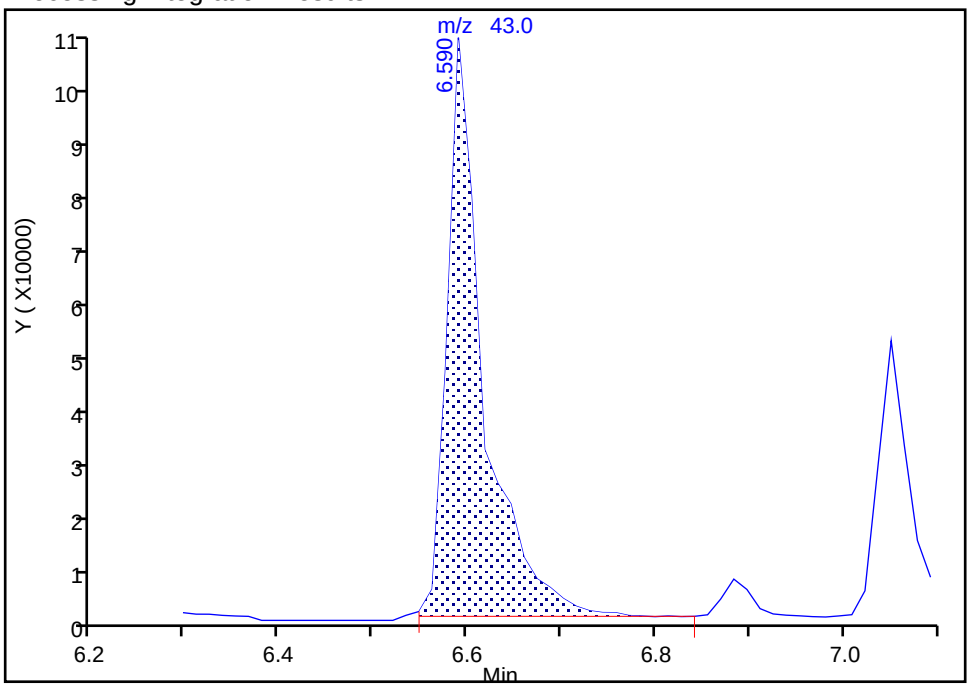
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D				
Injection Date:	06-Aug-2018 16:15:30	Instrument ID:	VMS_MS1		
Lims ID:	ccvc				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	36	Worklist Smp#:	33
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

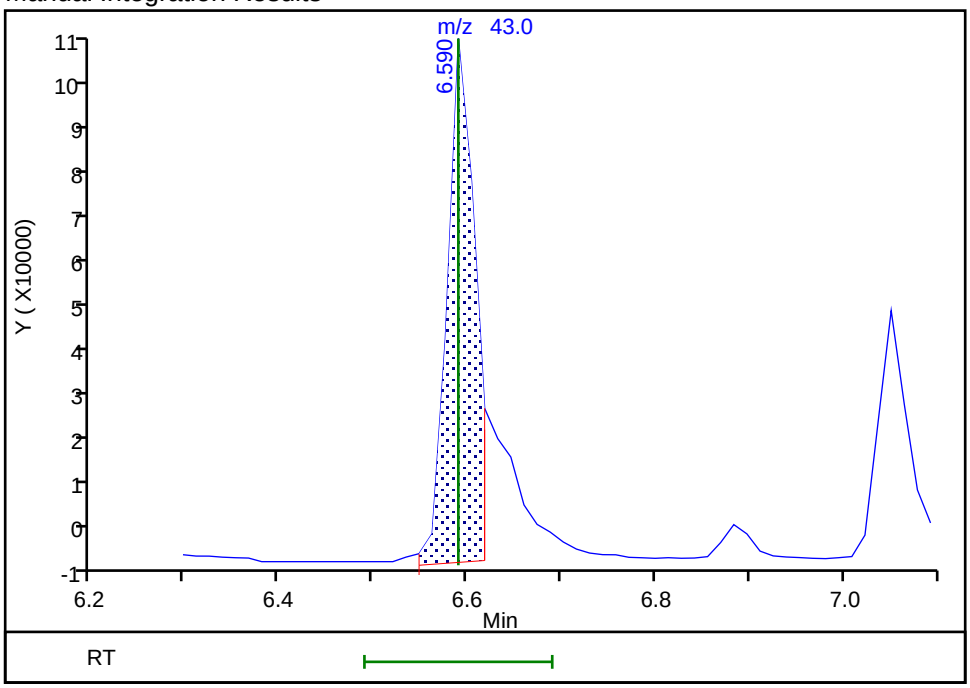
Processing Integration Results

RT: 6.59
Area: 269759
Amount: 50.830939
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 214467
Amount: 40.412216
Amount Units: ug/l



Reviewer: wickhamt, 07-Aug-2018 06:52:02
Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVC 280-424938/33 Calibration Date: 08/06/2018 16:15

Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 08/02/2018 13:37

Lab File ID: MS1_5253.D Conc. Units: mg/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dibromofluoromethane (Surr)	Ave	0.2160	0.2268		0.0129	0.0123	5.0	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.1835	0.1940		0.0129	0.0123	5.7	50.0
Toluene-d8 (Surr)	Ave	4.811	4.863		0.0124	0.0123	1.1	50.0
4-Bromofluorobenzene (Surr)	Ave	1.117	1.048		0.0115	0.0123	-6.2	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D
Lims ID: ccvc
Client ID:
Sample Type: CCVC
Inject. Date: 06-Aug-2018 16:15:30 ALS Bottle#: 36 Worklist Smp#: 33
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: ccvc
Operator ID: wickhamt Instrument ID: VMS_MS1
Sublist: chrom-AQ_VMS1_8260*sub76

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:54:50 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 07-Aug-2018 06:52:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.584	0.001	87	177062	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2067090	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	446910	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	648746	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	459434	12.3	12.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	392953	12.3	12.9	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2129743	12.3	12.4	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	666021	12.3	11.5	
24 Dichlorodifluoromethane	85	3.923	3.923	0.001	100	341261	10.0	7.29	
26 Chloromethane	50	4.174	4.160	0.014	99	493001	10.0	8.66	
27 Vinyl chloride	62	4.300	4.286	0.014	98	476067	10.0	8.72	
29 Bromomethane	94	4.649	4.635	0.014	91	373053	10.0	9.35	
31 Chloroethane	64	4.705	4.691	0.014	100	356154	10.0	8.94	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	855808	10.0	9.64	
33 Trichlorofluoromethane	101	4.942	4.914	0.028	100	545300	10.0	7.80	
36 Ethyl ether	59	5.096	5.096	0.000	93	210141	10.0	10.2	
39 Acrolein	56	5.221	5.221	0.000	100	245148	100.0	99.8	
40 Acetone	43	5.319	5.319	0.000	100	149730	40.0	44.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	256128	10.0	8.07	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	384891	10.0	8.64	
45 Iodomethane	142	5.529	5.529	0.000	100	672408	10.0	9.80	
46 Methyl acetate	43	5.557	5.557	0.000	97	195624	20.0	19.8	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	798694	10.0	9.60	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1773890	10.0	8.93	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	93977	100.0	109.0	
50 Methylene Chloride	84	5.696	5.696	0.000	95	433619	10.0	10.6	
51 Acrylonitrile	53	5.836	5.836	0.000	98	518502	100.0	105.0	
52 Methyl tert-butyl ether	73	5.892	5.878	0.014	97	561603	10.0	10.3	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	473767	10.0	9.48	
54 Hexane	57	6.101	6.101	0.000	92	614041	10.0	6.74	
55 Vinyl acetate	43	6.171	6.157	0.014	97	763382	20.0	21.2	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	869044	10.0	10.0	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	214467	40.0	40.4	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	250975	300.0	309.9	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	82	497886	10.0	9.90	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	93	629456	10.0	8.91	
67 Chlorobromomethane	128	6.842	6.841	0.001	93	154010	10.0	10.3	
68 Chloroform	83	6.855	6.855	0.000	95	776626	10.0	10.2	
69 Tetrahydrofuran	42	6.883	6.883	0.000	88	73098	20.0	19.3	
70 Isobutyl alcohol	41	7.051	7.051	0.000	94	93164	250.0	282.4	
71 1,1,1-Trichloroethane	97	7.093	7.079	0.014	99	665975	10.0	9.27	
72 Cyclohexane	56	7.163	7.163	0.000	0	746129	10.0	7.73	
73 1,1-Dichloropropene	75	7.191	7.177	0.014	97	628715	10.0	8.95	
74 Carbon tetrachloride	117	7.233	7.233	0.001	97	531592	10.0	8.72	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	390195	10.0	10.5	
77 Benzene	78	7.358	7.358	0.000	97	1891810	10.0	9.81	
9 n-Heptane	43	7.456	7.456	0.000	92	646461	10.0	7.47	
79 Trichloroethene	95	7.819	7.819	0.000	98	456821	10.0	9.38	
80 2-Pentanone	43	7.847	7.847	0.000	99	373346	40.0	40.5	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	429933	10.0	9.88	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	587300	10.0	7.61	
84 1,4-Dioxane	88	8.057	8.057	0.000	95	28259	200.0	231.6	
85 Dibromomethane	93	8.098	8.098	0.000	95	150519	10.0	10.4	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	465172	10.0	10.1	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	79696	10.0	11.0	
89 cis-1,3-Dichloropropene	75	8.490	8.489	0.001	96	515885	10.0	9.11	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	522101	40.0	44.4	
91 Toluene	91	8.783	8.769	0.014	98	1912864	10.0	9.78	
92 Ethyl methacrylate	69	8.853	8.853	0.000	89	221395	10.0	9.19	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	383027	10.0	10.2	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	196606	10.0	10.2	
95 2-Hexanone	43	9.132	9.132	0.000	97	330722	40.0	40.9	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	383992	10.0	9.69	
97 Tetrachloroethene	164	9.202	9.202	0.000	98	327471	10.0	8.30	
98 Chlorodibromomethane	129	9.355	9.341	0.014	90	223455	10.0	9.48	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	176474	10.0	9.56	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	538949	10.0	7.27	
102 Chlorobenzene	112	9.816	9.816	0.000	95	1084224	10.0	9.15	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	342523	10.0	9.44	
104 Ethylbenzene	106	9.858	9.858	0.000	98	671445	10.0	8.85	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	796652	10.0	8.73	
106 Styrene	104	10.249	10.249	0.000	86	1163550	10.0	9.45	
109 o-Xylene	106	10.249	10.249	0.000	89	779091	10.0	9.20	
107 Bromoform	173	10.445	10.445	0.000	96	96529	10.0	8.88	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1989230	10.0	8.10	
111 Cyclohexanone	55	10.626	10.626	0.000	92	153231	400.0	425.0	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	96	196525	10.0	9.36	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	87	45226	10.0	8.91	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	54067	10.0	9.69	
116 Bromobenzene	156	10.822	10.822	0.000	55	404736	10.0	9.16	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	552272	10.0	7.95	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	1721529	10.0	8.46	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	482602	10.0	8.83	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	460828	10.0	8.54	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	1612438	10.0	8.09	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	1720230	10.0	8.59	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	419713	10.0	7.72	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	1795928	10.0	8.05	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	847508	10.0	8.91	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	816127	10.0	9.00	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	1740711	10.0	7.83	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	680422	10.0	9.25	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	77	22033	10.0	8.12	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	440244	10.0	9.15	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	294440	10.0	7.42	
132 Naphthalene	128	14.020	14.006	0.014	97	533806	10.0	9.21	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	331662	10.0	9.50	
S 140 1,2-Dichloroethene, Total	96				0		20.0	19.4	
S 136 1,2-Dichloroethene, Total	1				0		20.0	19.4	
S 134 Trihalomethanes, Total	1				0		40.0	38.6	
S 137 Total BTEX	1				0			46.4	
S 139 Xylenes, Total (URS)	1				0		20.0	17.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	19.3	
S 138 Xylenes, Total	106				0		20.0	17.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

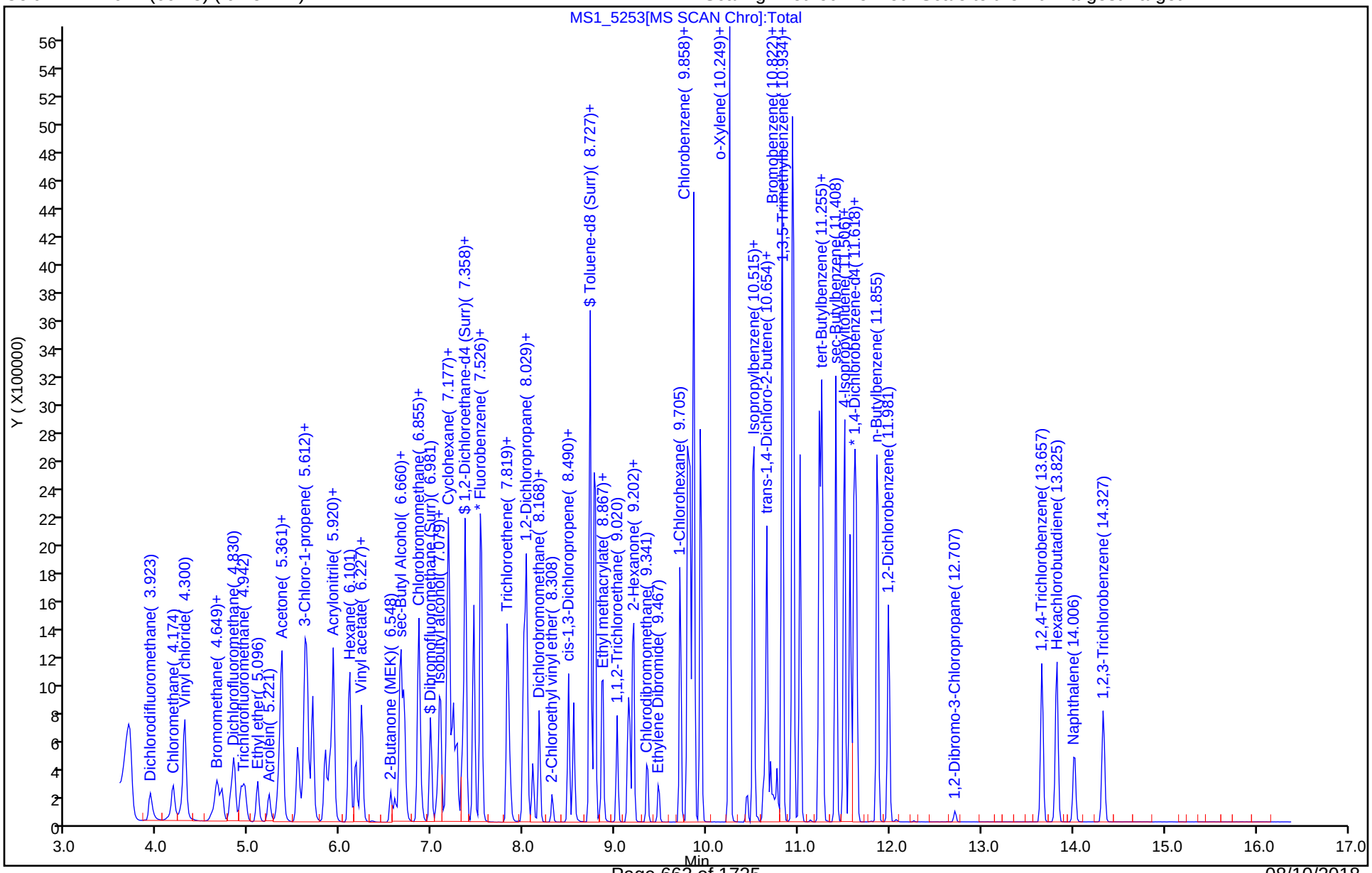
MV-Main A_00037	Amount Added:	5.00	Units: uL	
MV-Gas/Ket A_00075	Amount Added:	5.00	Units: uL	
MV-2cleve+AVA_00036	Amount Added:	5.00	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5253.D				
Injection Date:	06-Aug-2018 16:15:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	ccvc			Worklist Smp#:	33
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	36
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D				
Lims ID:	BFB				
Client ID:					
Sample Type:	BFB				
Inject. Date:	02-Aug-2018 07:34:30	ALS Bottle#:	100	Worklist Smp#:	1
Injection Vol:	1.0 uL	Dil. Factor:	1.0000		
Sample Info:	bfb				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	02-Aug-2018 13:05:09	Calib Date:	02-Aug-2018 10:54:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5081.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0314				
First Level Reviewer: wickhamt		Date:	02-Aug-2018 08:13:23		

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
$ 4 BFB	95	4.597	4.597	0.000	93	59992	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

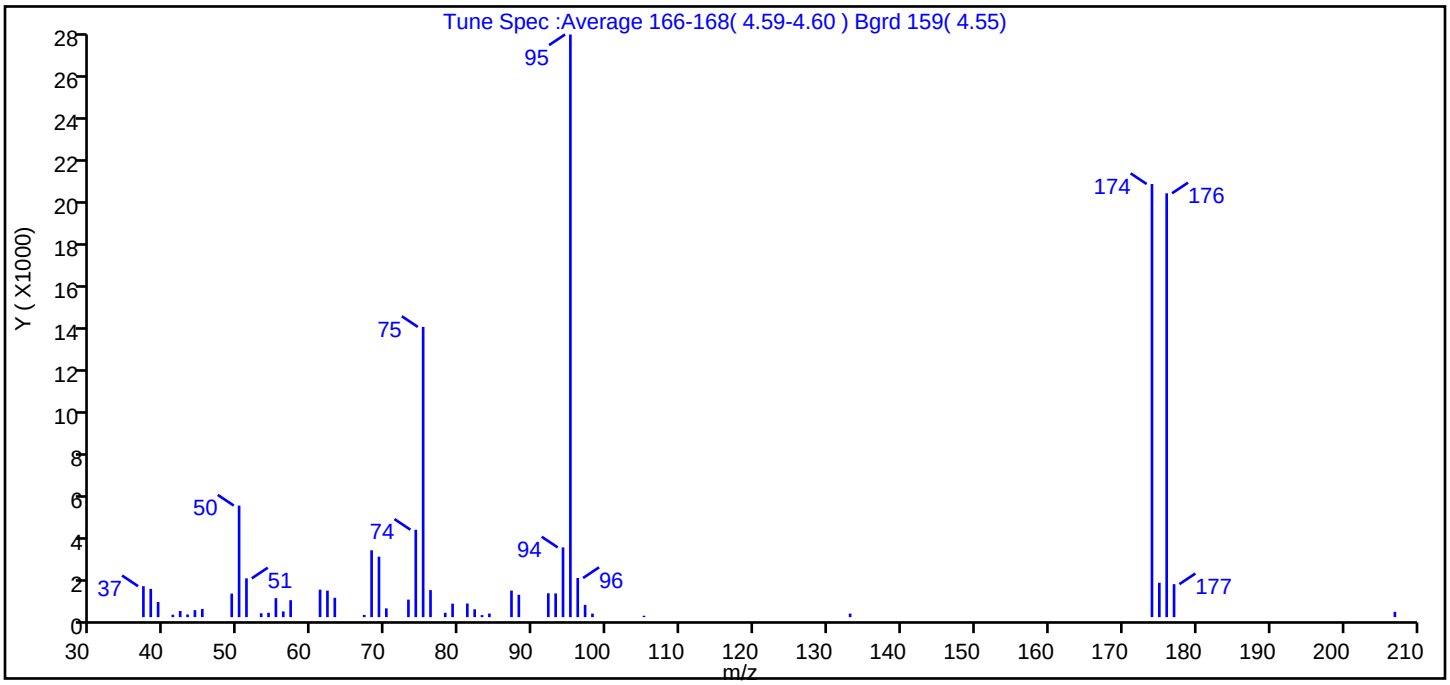
MV-BFB_00026 Amount Added: 1.00 Units: uL

MS Tune Report

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D
Injection Date: 02-Aug-2018 07:34:30 Instrument ID: VMS_MS1
Lims ID: BFB
Client ID:
Operator ID: wickhamt ALS Bottle#: 100 Worklist Smp#: 1
Injection Vol: 1.0 uL Dil. Factor: 1.0000
Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid
Tune Method: BFB Method 8260

$ 4 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base peak, 100% relative abundance	100.0
50	15 to 40% of m/z 95	19.1
75	30 to 60% of m/z 95	49.8
96	5 to 9% of m/z 95	6.7
173	Less than 2% of m/z 174	0.0 (0.0)
174	50 to 120% of m/z 95	74.3
175	5 to 9% of m/z 174	5.9 (7.9)
176	Greater than 95% but less than 101% of m/z 174	72.7 (97.9)
177	5 to 9% of m/z 176	5.7 (7.8)

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D\AQ_VMS1_8260.rslt\spectra.
Injection Date: 02-Aug-2018 07:34:30
Spectrum: Tune Spec :Average 166-168(4.59-4.60) Bgrd 159(4.55)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 49

m/z	Y	m/z	Y	m/z	Y	m/z	Y
37.00	1467	55.00	899	76.00	1282	96.00	1855
38.00	1341	56.00	270	78.00	207	97.00	581
39.00	717	57.00	804	79.00	640	98.00	167
41.00	114	61.00	1304	81.00	647	105.00	66
42.00	291	62.00	1258	82.00	372	133.00	167
43.00	126	63.00	917	83.00	97	174.00	20528
44.00	332	67.00	105	84.00	171	175.00	1629
45.00	389	68.00	3170	87.00	1260	176.00	20088
49.00	1116	69.00	2866	88.00	1060	177.00	1563
50.00	5288	70.00	416	92.00	1131	207.00	252
51.00	1839	73.00	831	93.00	1124		
53.00	184	74.00	4142	94.00	3305		
54.00	207	75.00	13756	95.00	27616		

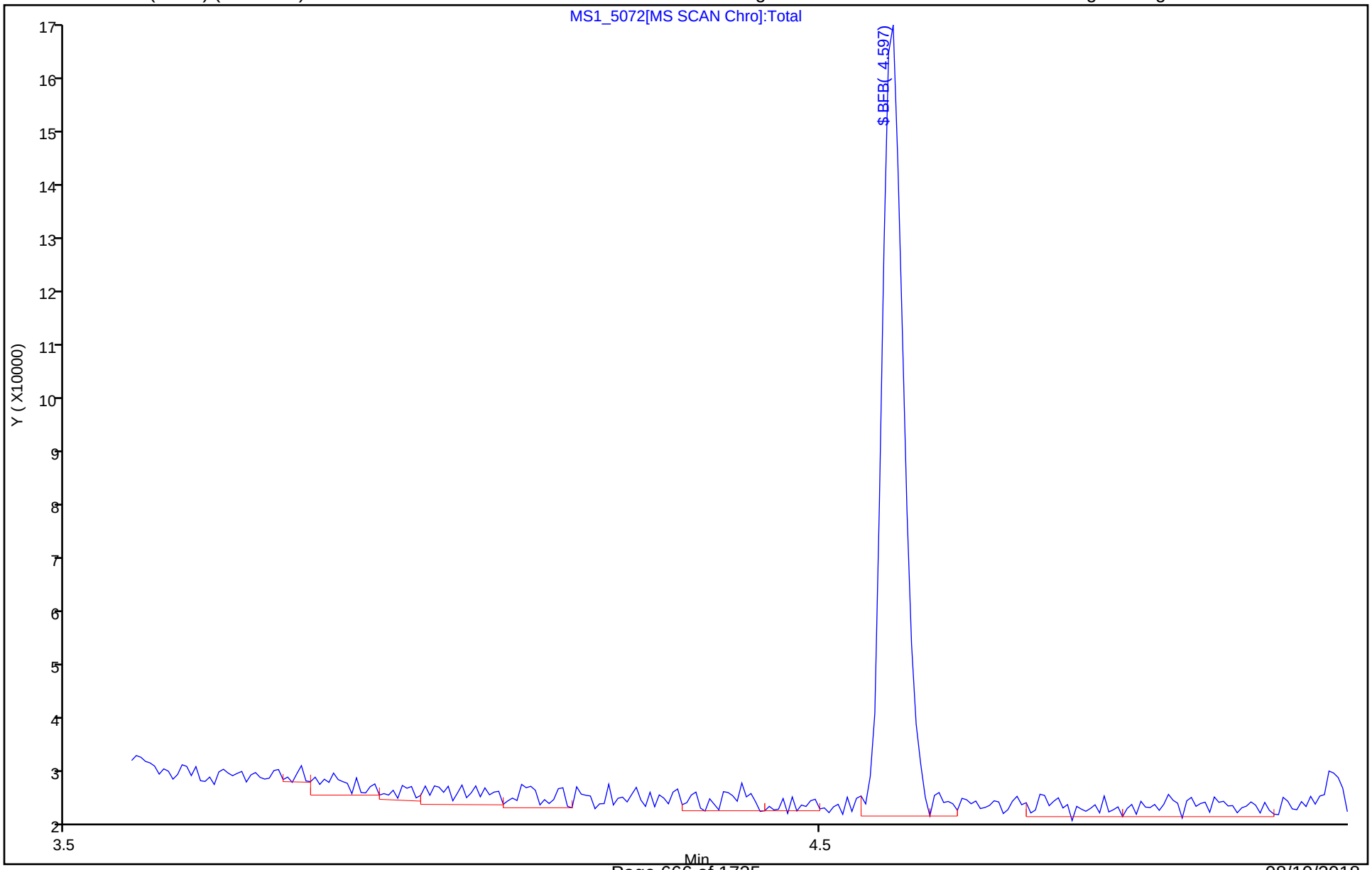
Report Date: 02-Aug-2018 13:05:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5072.D

Injection Date:	02-Aug-2018 07:34:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	BFB			Worklist Smp#:	1
Client ID:					
Injection Vol:	1.0 uL	Dil. Factor:	1.0000	ALS Bottle#:	100
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D				
Lims ID:	BFB				
Client ID:					
Sample Type:	BFB				
Inject. Date:	06-Aug-2018 07:02:30	ALS Bottle#:	100	Worklist Smp#:	1
Injection Vol:	1.0 uL	Dil. Factor:	1.0000		
Sample Info:	bfb				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:54:52	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				
First Level Reviewer: wickhamt		Date:	06-Aug-2018 08:06:48		

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
$ 4 BFB	95	4.591	4.591	0.000	92	118858	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

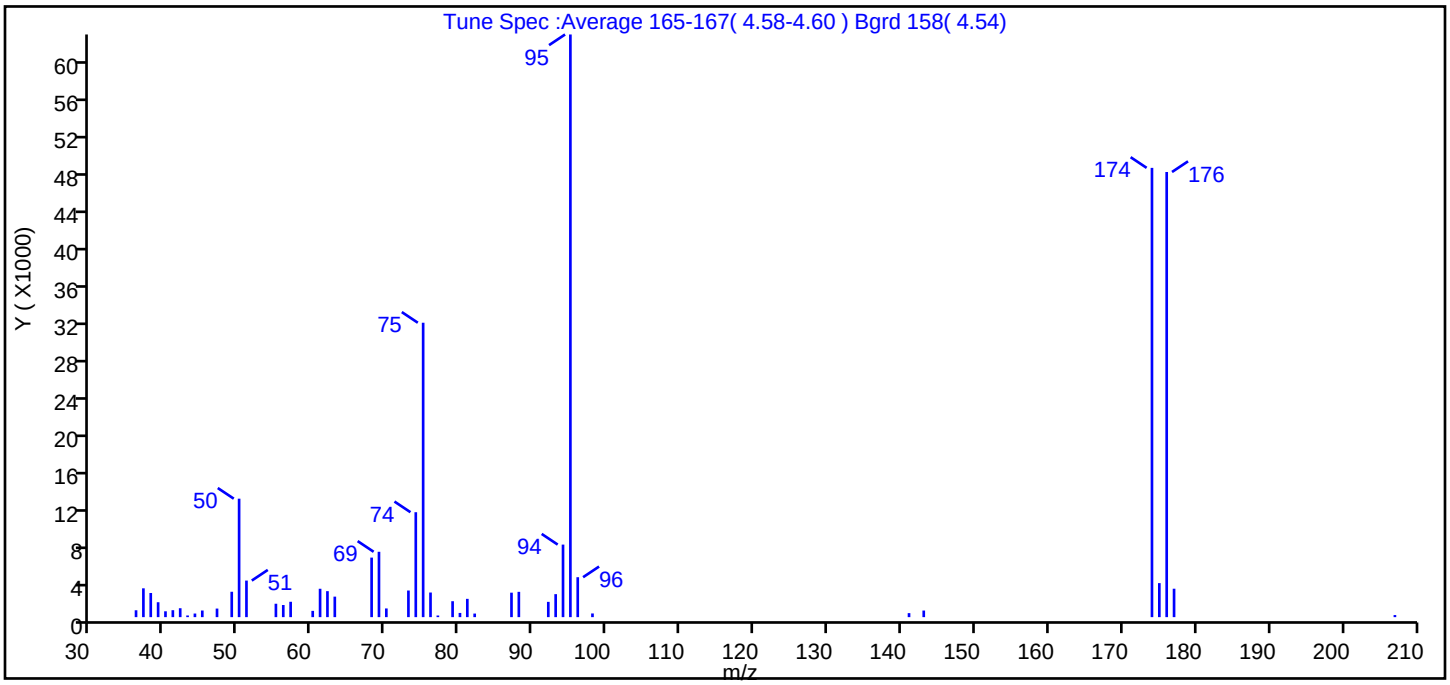
MV-BFB_00026 Amount Added: 1.00 Units: uL

MS Tune Report

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D				
Injection Date:	06-Aug-2018 07:02:30	Instrument ID:	VMS_MS1		
Lims ID:	BFB				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	100	Worklist Smp#:	1
Injection Vol:	1.0 uL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Tune Method:	BFB Method 8260				

$ 4 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base peak, 100% relative abundance	100.0
50	15 to 40% of m/z 95	20.3
75	30 to 60% of m/z 95	50.5
96	5 to 9% of m/z 95	6.9
173	Less than 2% of m/z 174	0.0 (0.0)
174	50 to 120% of m/z 95	77.1
175	5 to 9% of m/z 174	5.8 (7.6)
176	Greater than 95% but less than 101% of m/z 174	76.4 (99.1)
177	5 to 9% of m/z 176	4.9 (6.4)

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D\AQ_VMS1_8260.rslt\spectra.
Injection Date: 06-Aug-2018 07:02:30
Spectrum: Tune Spec :Average 165-167(4.58-4.60) Bgrd 158(4.54)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 48

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	733	50.00	12618	73.00	2836	93.00	2449
37.00	3070	51.00	3895	74.00	11177	94.00	7728
38.00	2572	55.00	1428	75.00	31360	95.00	62064
39.00	1589	56.00	1292	76.00	2623	96.00	4254
40.00	623	57.00	1637	77.00	174	98.00	393
41.00	740	60.00	668	79.00	1697	141.00	427
42.00	949	61.00	3023	80.00	448	143.00	703
43.00	177	62.00	2768	81.00	1949	174.00	47856
44.00	384	63.00	2184	82.00	381	175.00	3624
45.00	707	68.00	6343	87.00	2607	176.00	47416
47.00	913	69.00	6962	88.00	2695	177.00	3028
49.00	2704	70.00	926	92.00	1628	207.00	222

Report Date: 07-Aug-2018 06:54:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5226.D

Injection Date: 06-Aug-2018 07:02:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

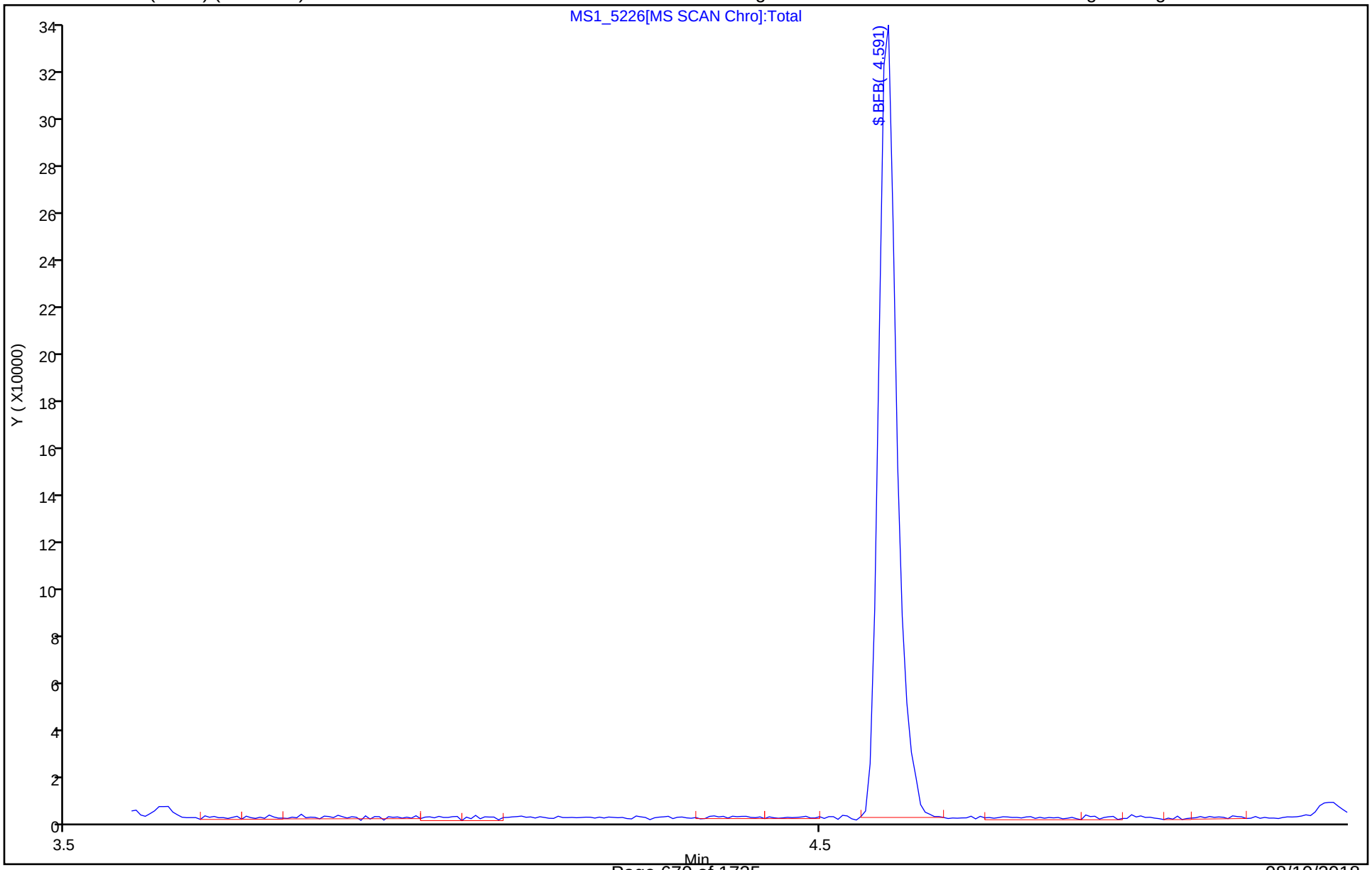
Lims ID: BFB Worklist Smp#: 1

Client ID:

Injection Vol: 1.0 uL Dil. Factor: 1.0000 ALS Bottle#: 100

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: LB3 280-423614/1-A
Matrix: Water (TCLP)
Lab File ID: MS1_5241.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 2(mL)
Date Analyzed: 08/06/2018 12:11
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 424938
Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0040	U	0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.040	U	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0040	U	0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0040	U	0.010	0.0040	0.0017
67-66-3	Chloroform	0.0040	U	0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0040	U	0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0080	U	0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0040	U	0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0040	U	0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0020	U	0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	107		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		64-129
460-00-4	4-Bromofluorobenzene (Surr)	98		78-121
1868-53-7	Dibromofluoromethane (Surr)	105		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5241.D
Lims ID: LB3 280-423614/1-A
Client ID:
Sample Type: LB3
Inject. Date: 06-Aug-2018 12:11:30 ALS Bottle#: 24 Worklist Smp#: 21
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LB3 280-423614/1-A 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 12:30:36

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.584	0.014	35	153483	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2007259	12.5	12.5	
* 149 1,4-Dioxane-d8	96	8.727	8.773	-0.046	0	18910		0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	414145	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.618	11.604	0.014	97	584277	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	446921	12.3	12.9	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	99	371995	12.3	12.6	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2086081	12.3	13.1	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	626697	12.3	12.0	
$ 152 Trifluorotoluene (Surr)	1		0.000					ND	
$ 4 BFB	95		4.591					ND	
24 Dichlorodifluoromethane	85		3.923					ND	
26 Chloromethane	50		4.160					ND	
22 Chlorotrifluoroethene	116		4.248					ND	
27 Vinyl chloride	62		4.286					ND	
25 1,2-Dichloro-1,1,2,2-tetra	85		4.472					ND	
28 Ethylene oxide	43		4.565					ND	U
29 Bromomethane	94		4.635					ND	
31 Chloroethane	64		4.691					ND	
23 2-Chloro-1,1,1-Trifluoroet	118		4.737					ND	
32 Dichlorofluoromethane	67		4.830					ND	
33 Trichlorofluoromethane	101		4.914					ND	
34 Ethanol	45		4.928					ND	
36 Ethyl ether	59	5.095	5.096	-0.001	92	4131		0.2067	
38 Propene oxide	58		5.180					ND	
39 Acrolein	56		5.221					ND	
40 Acetone	43		5.319					ND	
42 1,1,2-Trichloro-1,2,2-trif	151		5.333					ND	
41 Isopropyl alcohol	45		5.333					ND	
43 1,1-Dichloroethene	96		5.361					ND	
35 1,2-Dichloro-1,1,2-trifluo	117		5.505					ND	
45 Iodomethane	142		5.529					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
44 Acetonitrile	41		5.529					ND	
37 1,1,1-Trifluoro-2,2-dichlo	83		5.533					ND	
46 Methyl acetate	43		5.557					ND	
47 3-Chloro-1-propene	41		5.612					ND	U
48 Carbon disulfide	76		5.626					ND	U
49 2-Methyl-2-propanol	59		5.654					ND	
50 Methylene Chloride	84	5.696	5.696	0.000	96	24977		0.1981	
51 Acrylonitrile	53		5.836					ND	
52 Methyl tert-butyl ether	73		5.878					ND	
53 trans-1,2-Dichloroethene	96		5.920					ND	
54 Hexane	57		6.101					ND	
55 Vinyl acetate	43		6.157					ND	
56 Isopropyl ether	87		6.199					ND	
57 1,1-Dichloroethane	63		6.227					ND	
58 2-Chloro-1,3-butadiene	53		6.297					ND	
59 Tert-butyl ethyl ether	59		6.464					ND	
61 2-Butanone (MEK)	43		6.590					ND	
60 Ethyl acetate	43		6.590					ND	U
63 Propionitrile	54		6.632					ND	
62 sec-Butyl Alcohol	45		6.646					ND	U
64 cis-1,2-Dichloroethene	96		6.646					ND	
65 2,2-Dichloropropane	77		6.688					ND	
66 Methacrylonitrile	41		6.772					ND	
67 Chlorobromomethane	128		6.841					ND	
68 Chloroform	83		6.855					ND	
69 Tetrahydrofuran	42		6.883					ND	
70 Isobutyl alcohol	41		7.051					ND	
71 1,1,1-Trichloroethane	97		7.079					ND	
72 Cyclohexane	56		7.163					ND	
73 1,1-Dichloropropene	75		7.177					ND	
74 Carbon tetrachloride	117		7.233					ND	
19 2,2-Dimethylpentane	57		7.251					ND	
17 2,4-Dimethylpentane	43		7.293					ND	
75 1,2-Dichloroethane	62		7.330					ND	
77 Benzene	78		7.358					ND	
76 Tert-amyl methyl ether	73		7.358					ND	
9 n-Heptane	43		7.456					ND	
10 2,2,3-Trimethylbutane	57		7.502					ND	
78 n-Butanol	56		7.554					ND	U
12 3,3-Dimethylpentane	43		7.768					ND	
18 2-Methylhexane	43		7.810					ND	
79 Trichloroethene	95		7.819					ND	
80 2-Pentanone	43		7.847					ND	
81 Methyl methacrylate	100		7.945					ND	
15 3-Methylhexane	43		7.949					ND	
11 2,3-Dimethylpentane	56		7.949					ND	
82 1,2-Dichloropropane	63		8.001					ND	
83 Methylcyclohexane	55		8.029					ND	
84 1,4-Dioxane	88		8.057					ND	
85 Dibromomethane	93		8.098					ND	
86 Dichlorobromomethane	83		8.168					ND	
20 3-Ethylpentane	43		8.214					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
87 2-Nitropropane	41		8.294					ND	
88 2-Chloroethyl vinyl ether	63		8.308					ND	
89 cis-1,3-Dichloropropene	75		8.489					ND	
90 4-Methyl-2-pentanone (MIBK	43		8.545					ND	
91 Toluene	91		8.769					ND	
92 Ethyl methacrylate	69		8.853					ND	
93 trans-1,3-Dichloropropene	75		8.867					ND	
94 1,1,2-Trichloroethane	97		9.020					ND	
95 2-Hexanone	43		9.132					ND	
96 1,3-Dichloropropane	76		9.160					ND	
97 Tetrachloroethene	164		9.202					ND	
98 Chlorodibromomethane	129		9.341					ND	
13 Dimethyl disulfide	94		9.388					ND	
99 Tetrahydrothiophene	60		9.397					ND	
100 Ethylene Dibromide	107		9.467					ND	
101 1-Chlorohexane	91		9.705					ND	U
102 Chlorobenzene	112		9.816					ND	
103 1,1,1,2-Tetrachloroethane	131		9.844					ND	
104 Ethylbenzene	106		9.858					ND	
105 m-Xylene & p-Xylene	106		9.928					ND	
106 Styrene	104		10.249					ND	
109 o-Xylene	106		10.249					ND	
107 Bromoform	173		10.445					ND	
108 Isopropylbenzene	105		10.515					ND	U
110 cis-1,4-Dichloro-2-butene	53		10.515					ND	
111 Cyclohexanone	55		10.626					ND	U
112 1,1,2,2-Tetrachloroethane	83		10.696					ND	
113 trans-1,4-Dichloro-2-buten	53		10.724					ND	
114 1,2,3-Trichloropropane	110		10.766					ND	
116 Bromobenzene	156		10.822					ND	
115 N-Propylbenzene	120		10.822					ND	
120 1,3,5-Trimethylbenzene	105		10.934					ND	
117 2-Chlorotoluene	126		10.948					ND	
118 4-Chlorotoluene	126		11.017					ND	
119 tert-Butylbenzene	119		11.227					ND	
121 1,2,4-Trimethylbenzene	105		11.255					ND	
143 Pentachloroethane	167		11.283					ND	
122 sec-Butylbenzene	134		11.408					ND	
123 4-Isopropyltoluene	119		11.506					ND	
124 1,3-Dichlorobenzene	146		11.562					ND	
126 1,4-Dichlorobenzene	146		11.632					ND	
125 1,2,3-Trimethylbenzene	105		11.632					ND	
127 n-Butylbenzene	91		11.855					ND	
128 1,2-Dichlorobenzene	146		11.981					ND	
129 1,2-Dibromo-3-Chloropropan	157		12.707					ND	
21 1,3,5-Trichlorobenzene	180		12.945					ND	
14 n-Nonyl Aldehyde	57		13.340					ND	
130 1,2,4-Trichlorobenzene	180		13.657					ND	
131 Hexachlorobutadiene	225		13.825					ND	
132 Naphthalene	128		14.006					ND	
133 1,2,3-Trichlorobenzene	180		14.327					ND	
161 n-Nonane TIC	1		0.000					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
158 1-Chlorohexane TIC	1		0.000					ND	
160 Cyclohexane TIC	1		0.000					ND	
159 Methyl cyclohexane TIC	1		0.000					ND	
S 140 1,2-Dichloroethene, Total	96		2.000					ND	
S 136 1,2-Dichloroethene, Total	1		0.000					ND	
S 134 Trihalomethanes, Total	1		0.000					ND	
S 137 Total BTEX	1		0.000					ND	
S 139 Xylenes, Total (URS)	1		0.000					ND	
S 135 1,3-Dichloropropene, Total	1		0.000					ND	
S 153 TAH	1				0			0	
S 138 Xylenes, Total	106		0.000					ND	
T 141 Dichloroacetonitrile TIC	74		1.000					ND	
T 142 2,3-dichloro-1-propene TIC	75		1.000					ND	
T 30 Propene oxide TIC	58		5.334					ND	
T 156 4-Ethyltoluene TIC	1		0.000					ND	
T 157 1,3-Butadiene TIC	1		0.000					ND	
T 16 2-Butoxyethanol TIC	1		0.000					ND	
T 155 Dicyclopentadiene TIC	1		0.000					ND	
T 154 Propene TIC	1		0.000					ND	

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5241.D

Injection Date: 06-Aug-2018 12:11:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

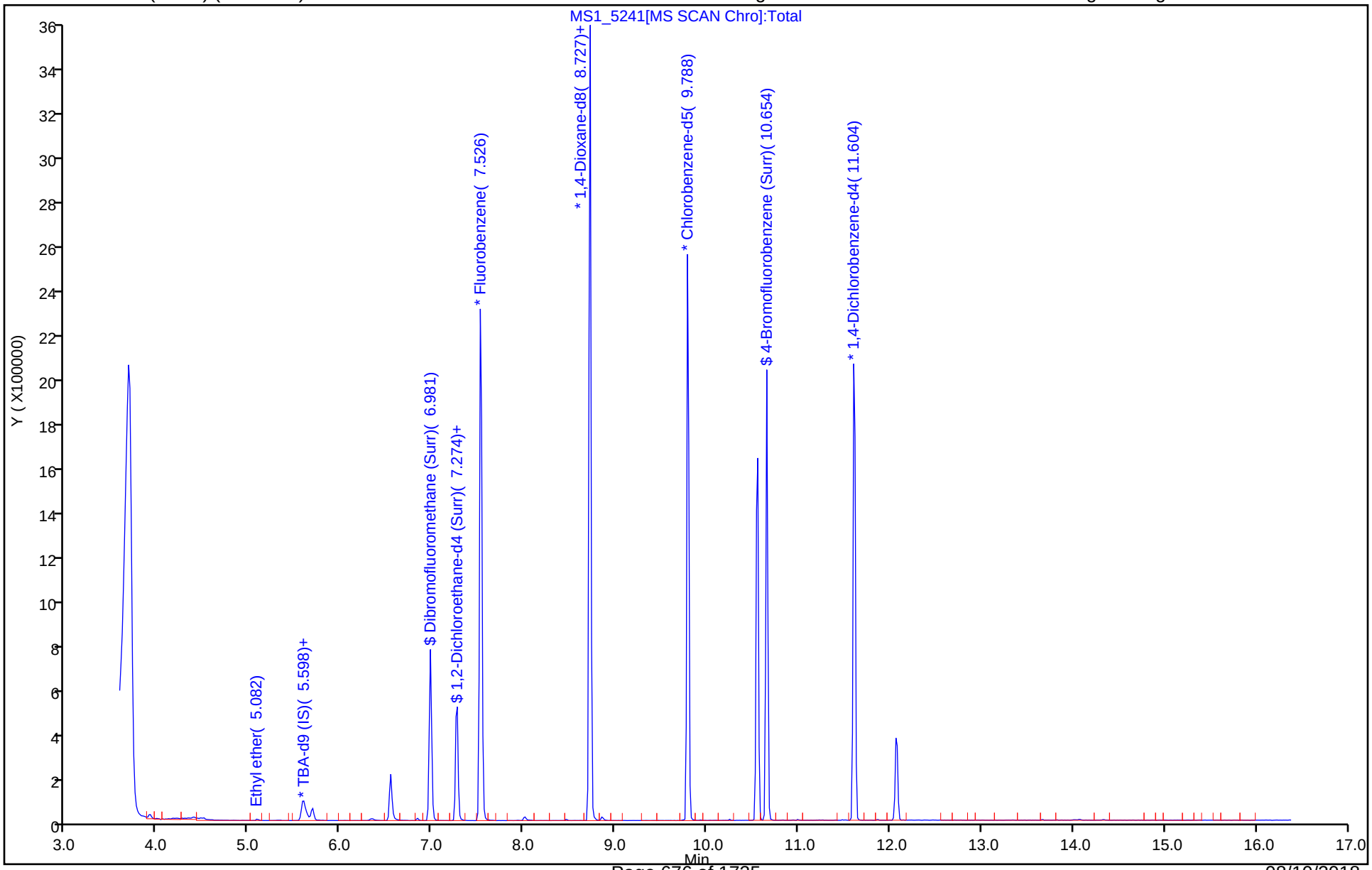
Lims ID: LB3 280-423614/1-A Worklist Smp#: 21

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 24

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5241.D				
Lims ID:	LB3 280-423614/1-A				
Client ID:					
Sample Type:	LB3				
Inject. Date:	06-Aug-2018 12:11:30	ALS Bottle#:	24	Worklist Smp#:	21
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	LB3 280-423614/1-A 2ml af				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 12:30:36

Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	12.9	105.18
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	12.6	103.04
$ 7 Toluene-d8 (Surr)	12.3	13.1	106.83
$ 8 4-Bromofluorobenzene (Surr)	12.3	12.0	97.98

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 280-423614/2-A
Matrix: Water (TCLP)
Lab File ID: MS1_5240.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 2(mL)
Date Analyzed: 08/06/2018 11:50
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 424938
Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0511		0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.177	M	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0529		0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0476		0.010	0.0040	0.0017
67-66-3	Chloroform	0.0515		0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0519		0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0545		0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0498		0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0517		0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0532		0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	105		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		64-129
460-00-4	4-Bromofluorobenzene (Surr)	99		78-121
1868-53-7	Dibromofluoromethane (Surr)	108		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5240.D
Lims ID: LCS 280-423614/2-A
Client ID:
Sample Type: LCS
Inject. Date: 06-Aug-2018 11:50:30 ALS Bottle#: 23 Worklist Smp#: 20
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LCS 280-423614/2-A 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 12:29:43

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	89	158381	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2003825	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	427883	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	609852	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	456554	12.3	13.2	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	382733	12.3	13.0	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2120043	12.3	12.9	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	660728	12.3	12.1	
24 Dichlorodifluoromethane	85	3.922	3.923	0.000	100	239808	5.00	5.28	
26 Chloromethane	50	4.160	4.160	0.000	99	261825	5.00	4.75	
27 Vinyl chloride	62	4.286	4.286	0.000	98	281741	5.00	5.32	
29 Bromomethane	94	4.649	4.635	0.014	91	191443	5.00	4.95	
31 Chloroethane	64	4.705	4.691	0.014	100	188121	5.00	4.87	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	456518	5.00	5.30	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	100	355227	5.00	5.24	
36 Ethyl ether	59	5.096	5.096	0.000	93	103739	5.00	5.20	
39 Acrolein	56	5.221	5.221	0.000	100	114342	50.0	48.0	
40 Acetone	43	5.319	5.319	0.000	100	71370	20.0	21.0	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	182165	5.00	5.92	
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	235265	5.00	5.45	
45 Iodomethane	142	5.529	5.529	0.000	99	344931	5.00	5.19	
46 Methyl acetate	43	5.556	5.557	-0.001	96	92568	10.0	9.66	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	85	417754	5.00	5.18	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1028882	5.00	5.34	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	93	40179	50.0	52.1	
50 Methylene Chloride	84	5.696	5.696	0.000	94	223971	5.00	5.43	
51 Acrylonitrile	53	5.836	5.836	0.000	99	236805	50.0	49.5	
52 Methyl tert-butyl ether	73	5.878	5.878	0.000	97	250363	5.00	4.73	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	97	258751	5.00	5.34	
54 Hexane	57	6.101	6.101	0.000	92	447476	5.00	5.13	
55 Vinyl acetate	43	6.157	6.157	0.000	97	355417	10.0	10.2	
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	439719	5.00	5.22	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	91244	20.0	17.7	M
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	95	103223	150.0	142.5	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	83	247069	5.00	5.07	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	93	352123	5.00	5.14	
67 Chlorobromomethane	128	6.841	6.841	0.000	95	70788	5.00	4.90	
68 Chloroform	83	6.855	6.855	0.000	95	379396	5.00	5.15	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	32829	10.0	8.32	
70 Isobutyl alcohol	41	7.051	7.051	0.000	92	38752	125.0	131.3	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	375078	5.00	5.38	
72 Cyclohexane	56	7.163	7.163	0.000	0	507698	5.00	5.42	
73 1,1-Dichloropropene	75	7.177	7.177	0.000	97	361300	5.00	5.31	
74 Carbon tetrachloride	117	7.232	7.233	0.000	98	312757	5.00	5.29	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	187263	5.00	5.19	
77 Benzene	78	7.358	7.358	0.000	97	954575	5.00	5.11	
9 n-Heptane	43	7.456	7.456	0.000	92	454361	5.00	5.42	
79 Trichloroethene	95	7.819	7.819	0.000	97	244336	5.00	5.17	
80 2-Pentanone	43	7.847	7.847	0.000	99	159620	20.0	17.9	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	214535	5.00	5.09	
83 Methylcyclohexane	55	8.028	8.029	-0.001	0	400057	5.00	5.34	
84 1,4-Dioxane	88	8.056	8.057	-0.001	92	11240	100.0	95.0	
85 Dibromomethane	93	8.098	8.098	0.000	94	69540	5.00	4.94	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	218356	5.00	4.87	
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	92	28987	5.00	4.51	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	252014	5.00	4.65	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	221182	20.0	19.4	
91 Toluene	91	8.769	8.769	0.000	98	996302	5.00	5.25	
92 Ethyl methacrylate	69	8.852	8.853	-0.001	90	89551	5.00	3.88	
93 trans-1,3-Dichloropropene	75	8.866	8.867	-0.001	98	170013	5.00	4.68	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	92671	5.00	4.97	
95 2-Hexanone	43	9.132	9.132	0.000	96	140884	20.0	18.2	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	173305	5.00	4.57	
97 Tetrachloroethene	164	9.202	9.202	0.000	99	188154	5.00	4.98	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	99209	5.00	4.40	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	80864	5.00	4.57	
101 1-Chlorohexane	91	9.704	9.705	-0.001	0	341700	5.00	4.81	
102 Chlorobenzene	112	9.816	9.816	0.000	94	539328	5.00	4.76	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	93	160331	5.00	4.61	
104 Ethylbenzene	106	9.858	9.858	0.000	99	344297	5.00	4.74	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	416694	5.00	4.77	
106 Styrene	104	10.249	10.249	0.000	84	525552	5.00	4.46	
109 o-Xylene	106	10.249	10.249	0.000	90	389257	5.00	4.80	
107 Bromoform	173	10.445	10.445	0.000	95	42211	5.00	4.11	
108 Isopropylbenzene	105	10.514	10.515	-0.001	96	1111287	5.00	4.81	
111 Cyclohexanone	55	10.626	10.626	0.000	93	59798	200.0	173.2	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	96	91212	5.00	4.62	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	81	19763	5.00	4.14	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	25533	5.00	4.87	
116 Bromobenzene	156	10.822	10.822	0.000	52	193742	5.00	4.66	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	308934	5.00	4.73	
120 1,3,5-Trimethylbenzene	105	10.933	10.934	-0.001	94	895333	5.00	4.68	
117 2-Chlorotoluene	126	10.947	10.948	-0.001	95	245097	5.00	4.77	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	235546	5.00	4.64	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	894251	5.00	4.77	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	881125	5.00	4.68	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	245775	5.00	4.81	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	97	1028451	5.00	4.90	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	423795	5.00	4.74	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	407394	5.00	4.78	
127 n-Butylbenzene	91	11.855	11.855	0.000	98	1035325	5.00	4.96	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	326763	5.00	4.73	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	76	9307	5.00	3.83	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	208029	5.00	4.60	
131 Hexachlorobutadiene	225	13.824	13.825	-0.001	98	182174	5.00	4.88	
132 Naphthalene	128	14.020	14.006	0.014	97	220751	5.00	4.05	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	153481	5.00	4.68	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.4	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.4	
S 134 Trihalomethanes, Total	1				0		20.0	18.5	
S 139 Xylenes, Total (URS)	1				0		10.0	9.57	
S 135 1,3-Dichloropropene, Total	1				0		10.0	9.33	
S 138 Xylenes, Total	106				0		10.0	9.57	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MV-Main B_00022	Amount Added:	2.50	Units: uL	
MV-SS 2-Cleve_00046	Amount Added:	2.50	Units: uL	
MV-Gas/Ket B_00043	Amount Added:	2.50	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5240.D

Injection Date: 06-Aug-2018 11:50:30 Instrument ID: VMS_MS1 Operator ID: wickhamt

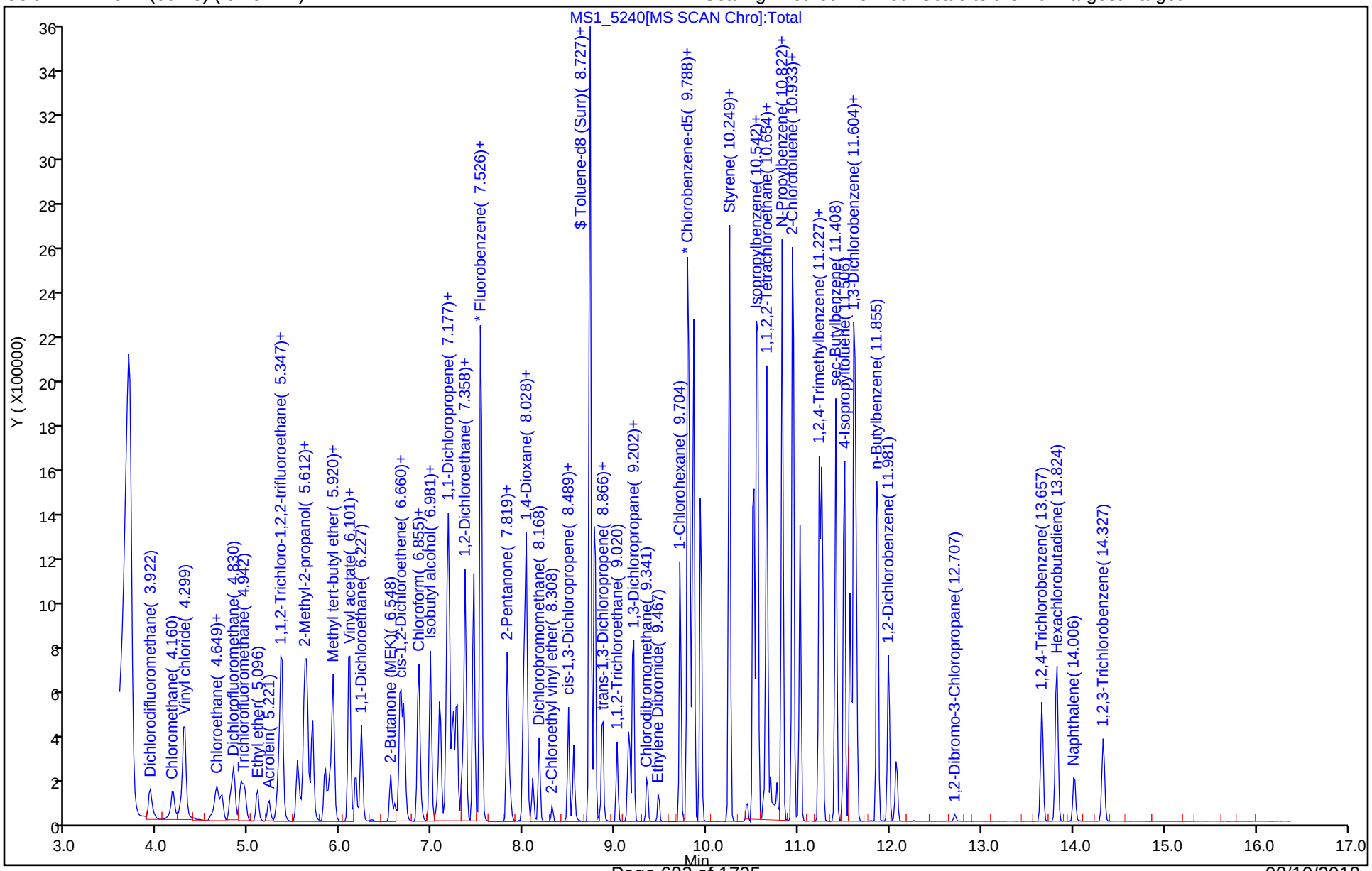
Lims ID: LCS 280-423614/2-A Worklist Smp#: 20

Client ID:

Purge Vol: 20.000 mL Dil. Factor: 1.0000 ALS Bottle#: 23

Method: AQ_VMS1_8260 Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5240.D				
Lims ID:	LCS 280-423614/2-A				
Client ID:					
Sample Type:	LCS				
Inject. Date:	06-Aug-2018 11:50:30	ALS Bottle#:	23	Worklist Smp#:	20
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	LCS 280-423614/2-A 2ml af				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 12:29:43

Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	13.2	107.63
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	13.0	106.20
$ 7 Toluene-d8 (Surr)	12.3	12.9	105.08
$ 8 4-Bromofluorobenzene (Surr)	12.3	12.1	98.97

Manual Integration/User Assign Peak Report

TestAmerica Denver

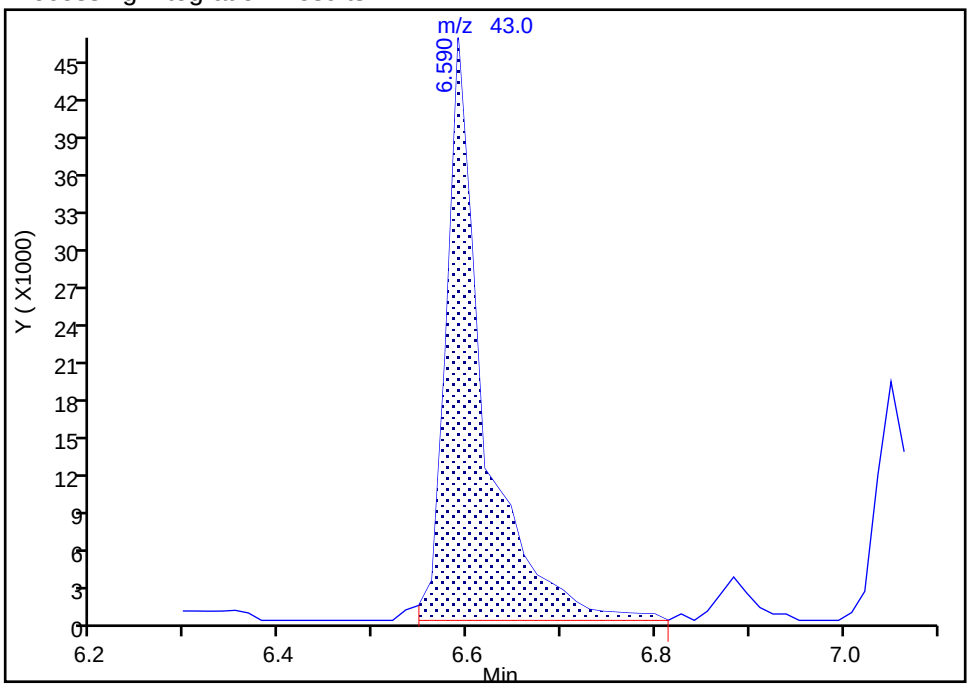
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5240.D				
Injection Date:	06-Aug-2018 11:50:30	Instrument ID:	VMS_MS1		
Lims ID:	LCS 280-423614/2-A				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	23	Worklist Smp#:	20
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

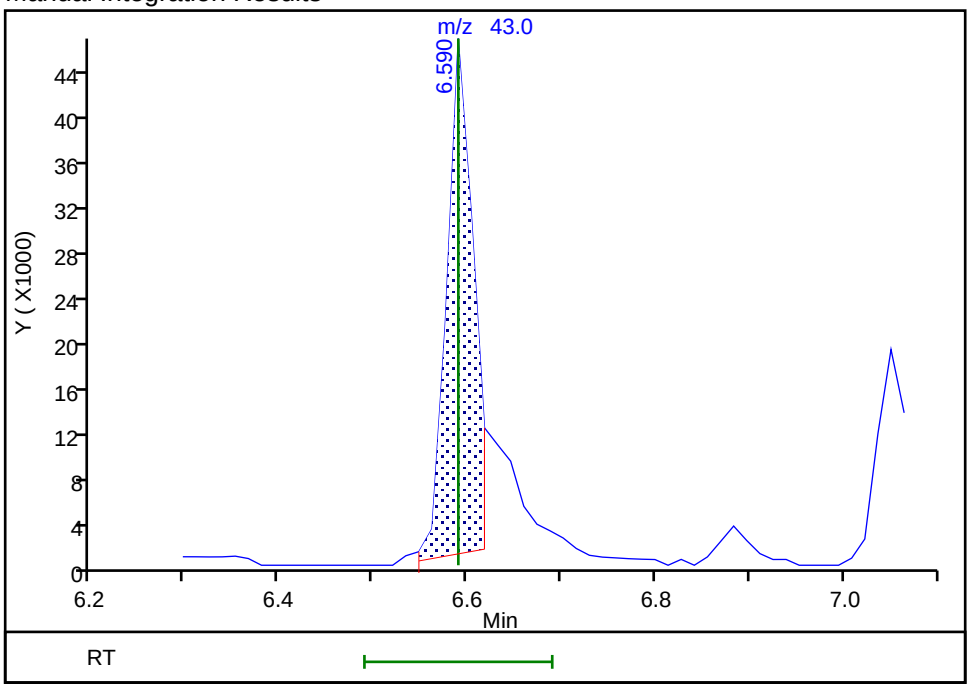
Processing Integration Results

RT: 6.59
Area: 128550
Amount: 24.987561
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 91244
Amount: 17.736017
Amount Units: ug/l



Reviewer: wickhamt, 06-Aug-2018 12:19:53
Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 320-41333-1

SDG No.:

Client Sample ID: GRE-IDW-W-01 MS | Lab Sample ID: 320-41333-15 MS

Matrix: Water (TCLP) | Lab File ID: MS1_5243.D

Analysis Method: 8260B | Date Collected: 07/18/2018 15:00

Sample wt/vol: 2(mL) | Date Analyzed: 08/06/2018 12:51

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-624 (60.25) ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 424938 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0516		0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.209	M	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0533		0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0485		0.010	0.0040	0.0017
67-66-3	Chloroform	0.0606		0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0542		0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0542		0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0502		0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0517		0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0576		0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	103		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		64-129
460-00-4	4-Bromofluorobenzene (Surr)	98		78-121
1868-53-7	Dibromofluoromethane (Surr)	107		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5243.D
Lims ID: 320-41333-A-15-A MS
Client ID:
Sample Type: MS
Inject. Date: 06-Aug-2018 12:51:30 ALS Bottle#: 26 Worklist Smp#: 23
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: 320-41333-A-15-A ms 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 13:40:07

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	88	167126	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	1964440	12.5	12.5	
* 149 1,4-Dioxane-d8	96	8.727	8.773	-0.046	0	17815		0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	90	423414	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	98	612336	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	443299	12.3	13.1	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	379431	12.3	13.2	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2051749	12.3	12.6	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	656845	12.3	12.0	
$ 152 Trifluorotoluene (Surr)	1		0.000					ND	
$ 4 BFB	95	4.649	4.591	0.058	0	27634		NR	
24 Dichlorodifluoromethane	85	3.922	3.923	0.000	100	256150	5.00	5.76	
26 Chloromethane	50	4.174	4.160	0.014	99	279334	5.00	5.17	
22 Chlorotrifluoroethene	116		4.248					ND	
27 Vinyl chloride	62	4.300	4.286	0.014	95	299050	5.00	5.76	
25 1,2-Dichloro-1,1,2,2-tetra	85		4.472					ND	
28 Ethylene oxide	43		4.565					ND	
29 Bromomethane	94	4.649	4.635	0.014	91	205857	5.00	5.43	
31 Chloroethane	64	4.705	4.691	0.014	100	201792	5.00	5.33	
23 2-Chloro-1,1,1-Trifluoroet	118		4.737					ND	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	476884	5.00	5.65	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	100	374170	5.00	5.63	
34 Ethanol	45		4.928					ND	
36 Ethyl ether	59	5.096	5.096	0.000	93	104085	5.00	5.32	
38 Propene oxide	58		5.180					ND	
39 Acrolein	56	5.221	5.221	0.000	98	109579	50.0	47.0	
40 Acetone	43	5.319	5.319	0.000	100	83725	20.0	25.5	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	178526	5.00	5.92	
41 Isopropyl alcohol	45		5.333					ND	U
43 1,1-Dichloroethene	96	5.361	5.361	0.000	98	229280	5.00	5.42	
35 1,2-Dichloro-1,1,2-trifluo	117		5.505					ND	
45 Iodomethane	142	5.529	5.529	0.000	99	338338	5.00	5.19	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
44 Acetonitrile	41		5.529					ND	U
37 1,1,1-Trifluoro-2,2-dichlo	83		5.533					ND	
46 Methyl acetate	43	5.557	5.557	0.000	97	96631	10.0	10.3	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	86	408408	5.00	5.17	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1002293	5.00	5.31	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	44827	50.0	55.1	
50 Methylene Chloride	84	5.696	5.696	0.000	94	224242	5.00	5.56	
51 Acrylonitrile	53	5.836	5.836	0.000	99	248954	50.0	53.1	
52 Methyl tert-butyl ether	73	5.892	5.878	0.014	97	263860	5.00	5.08	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	252432	5.00	5.32	
54 Hexane	57	6.101	6.101	0.000	92	439907	5.00	5.10	
55 Vinyl acetate	43	6.171	6.157	0.014	97	358033	10.0	10.5	
56 Isopropyl ether	87		6.199					ND	U
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	430735	5.00	5.21	
58 2-Chloro-1,3-butadiene	53		6.297					ND	
59 Tert-butyl ethyl ether	59		6.464					ND	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	105432	20.0	20.9	M
60 Ethyl acetate	43		6.590					ND	U
63 Propionitrile	54		6.632					ND	
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	96	111609	150.0	146.0	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	83	239961	5.00	5.02	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	93	337928	5.00	5.04	
66 Methacrylonitrile	41		6.772					ND	
67 Chlorobromomethane	128	6.841	6.841	0.000	94	73184	5.00	5.17	
68 Chloroform	83	6.855	6.855	0.000	95	437272	5.00	6.06	
69 Tetrahydrofuran	42	6.883	6.883	0.000	89	35217	10.0	9.22	
70 Isobutyl alcohol	41	7.051	7.051	0.000	95	43242	125.0	138.9	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	98	368880	5.00	5.40	
72 Cyclohexane	56	7.163	7.163	0.000	0	498687	5.00	5.43	
73 1,1-Dichloropropene	75	7.191	7.177	0.014	97	362308	5.00	5.43	
74 Carbon tetrachloride	117	7.232	7.233	0.000	97	308935	5.00	5.33	
19 2,2-Dimethylpentane	57	7.163	7.251	-0.088	34	23575		NC	
17 2,4-Dimethylpentane	43		7.293					ND	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	97	191946	5.00	5.42	
77 Benzene	78	7.358	7.358	0.000	97	945338	5.00	5.16	
76 Tert-amyl methyl ether	73		7.358					ND	
9 n-Heptane	43	7.456	7.456	0.000	92	455355	5.00	5.54	
10 2,2,3-Trimethylbutane	57	7.456	7.502	-0.046	63	248856		NC	
78 n-Butanol	56		7.554					ND	U
12 3,3-Dimethylpentane	43	7.847	7.768	0.079	76	197045		NC	
18 2-Methylhexane	43	7.847	7.810	0.037	73	197045		NC	
79 Trichloroethene	95	7.819	7.819	0.000	97	239502	5.00	5.17	
80 2-Pentanone	43	7.847	7.847	0.000	99	197045	20.0	22.5	
81 Methyl methacrylate	100		7.945					ND	
15 3-Methylhexane	43	8.029	7.949	0.080	54	41148		NC	
11 2,3-Dimethylpentane	56	8.029	7.949	0.080	44	128866		NC	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	214043	5.00	5.18	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	396622	5.00	5.40	
84 1,4-Dioxane	88	8.056	8.057	-0.001	94	12057	100.0	104.0	
85 Dibromomethane	93	8.098	8.098	0.000	95	71954	5.00	5.21	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	223400	5.00	5.08	
20 3-Ethylpentane	43		8.214					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
87 2-Nitropropane	41		8.294					ND	U
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	92	31279	5.00	4.90	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	255576	5.00	4.77	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	251351	20.0	22.5	
91 Toluene	91	8.783	8.769	0.014	99	979371	5.00	5.27	
92 Ethyl methacrylate	69	8.853	8.853	0.000	87	97388	5.00	4.27	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	181861	5.00	5.10	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	93	97139	5.00	5.31	
95 2-Hexanone	43	9.132	9.132	0.000	97	159595	20.0	20.8	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	96	184991	5.00	4.93	
97 Tetrachloroethene	164	9.202	9.202	0.000	99	187637	5.00	5.02	
98 Chlorodibromomethane	129	9.355	9.341	0.014	89	105553	5.00	4.73	
13 Dimethyl disulfide	94	9.341	9.388	-0.047	1	4368		NC	
99 Tetrahydrothiophene	60		9.397					ND	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	84455	5.00	4.83	
101 1-Chlorohexane	91	9.705	9.705	-0.001	0	345078	5.00	4.91	
102 Chlorobenzene	112	9.816	9.816	0.000	94	544099	5.00	4.85	
103 1,1,1,2-Tetrachloroethane	131	9.858	9.844	0.014	93	161157	5.00	4.69	
104 Ethylbenzene	106	9.858	9.858	0.000	99	346845	5.00	4.83	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	414038	5.00	4.79	
106 Styrene	104	10.249	10.249	0.000	84	533176	5.00	4.57	
109 o-Xylene	106	10.249	10.249	0.000	90	390692	5.00	4.87	
107 Bromoform	173	10.445	10.445	0.000	95	43074	5.00	4.23	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1144536	5.00	4.94	
110 cis-1,4-Dichloro-2-butene	53		10.515					ND	U
111 Cyclohexanone	55	10.626	10.626	0.000	92	71238	200.0	208.5	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	97593	5.00	4.93	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	89	21552	5.00	4.50	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	26671	5.00	5.06	
116 Bromobenzene	156	10.822	10.822	0.000	54	200476	5.00	4.81	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	316991	5.00	4.83	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	900869	5.00	4.69	
117 2-Chlorotoluene	126	10.948	10.948	0.000	95	246543	5.00	4.78	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	237438	5.00	4.66	
119 tert-Butylbenzene	119	11.227	11.227	0.000	93	901735	5.00	4.79	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	894160	5.00	4.73	
143 Pentachloroethane	167		11.283					ND	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	252914	5.00	4.93	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	1037603	5.00	4.92	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	431666	5.00	4.81	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	95	416368	5.00	4.87	
125 1,2,3-Trimethylbenzene	105		11.632					ND	
127 n-Butylbenzene	91	11.869	11.855	0.014	98	1046567	5.00	4.99	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	341302	5.00	4.92	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	75	9921	5.00	4.05	
21 1,3,5-Trichlorobenzene	180		12.945					ND	
14 n-Nonyl Aldehyde	57		13.340					ND	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	222590	5.00	4.90	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	183866	5.00	4.91	
132 Naphthalene	128	14.020	14.006	0.014	97	252548	5.00	4.62	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	167346	5.00	5.08	
161 n-Nonane TIC	1		0.000					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
158 1-Chlorohexane TIC	1		0.000					ND	
160 Cyclohexane TIC	1		0.000					ND	
159 Methyl cyclohexane TIC	1		0.000					ND	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.3	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.3	
S 134 Trihalomethanes, Total	1				0		20.0	20.1	
S 137 Total BTEX	1				0			24.9	
S 139 Xylenes, Total (URS)	1				0		10.0	9.66	
S 135 1,3-Dichloropropene, Total	1				0		10.0	9.87	
S 153 TAH	1				0			0	
S 138 Xylenes, Total	106				0		10.0	9.66	
T 141 Dichloroacetonitrile TIC	74		1.000					ND	
T 142 2,3-dichloro-1-propene TIC	75	7.191	1.000	6.191	91	362308		10.7	
T 30 Propene oxide TIC	58	5.319	5.334	-0.015	10	26097		0.7704	
T 156 4-Ethyltoluene TIC	1	11.255	0.000	11.255	91	894160		26.4	
T 157 1,3-Butadiene TIC	1		0.000					ND	
T 16 2-Butoxyethanol TIC	1		0.000					ND	
T 155 Dicyclopentadiene TIC	1		0.000					ND	
T 154 Propene TIC	1		0.000					ND	

QC Flag Legend

Processing Flags
- NR - Missing Quant Standard
- NC - Not Calibrated

Review Flags
- M - Manually Integrated
- U - Marked Undetected

Reagents:

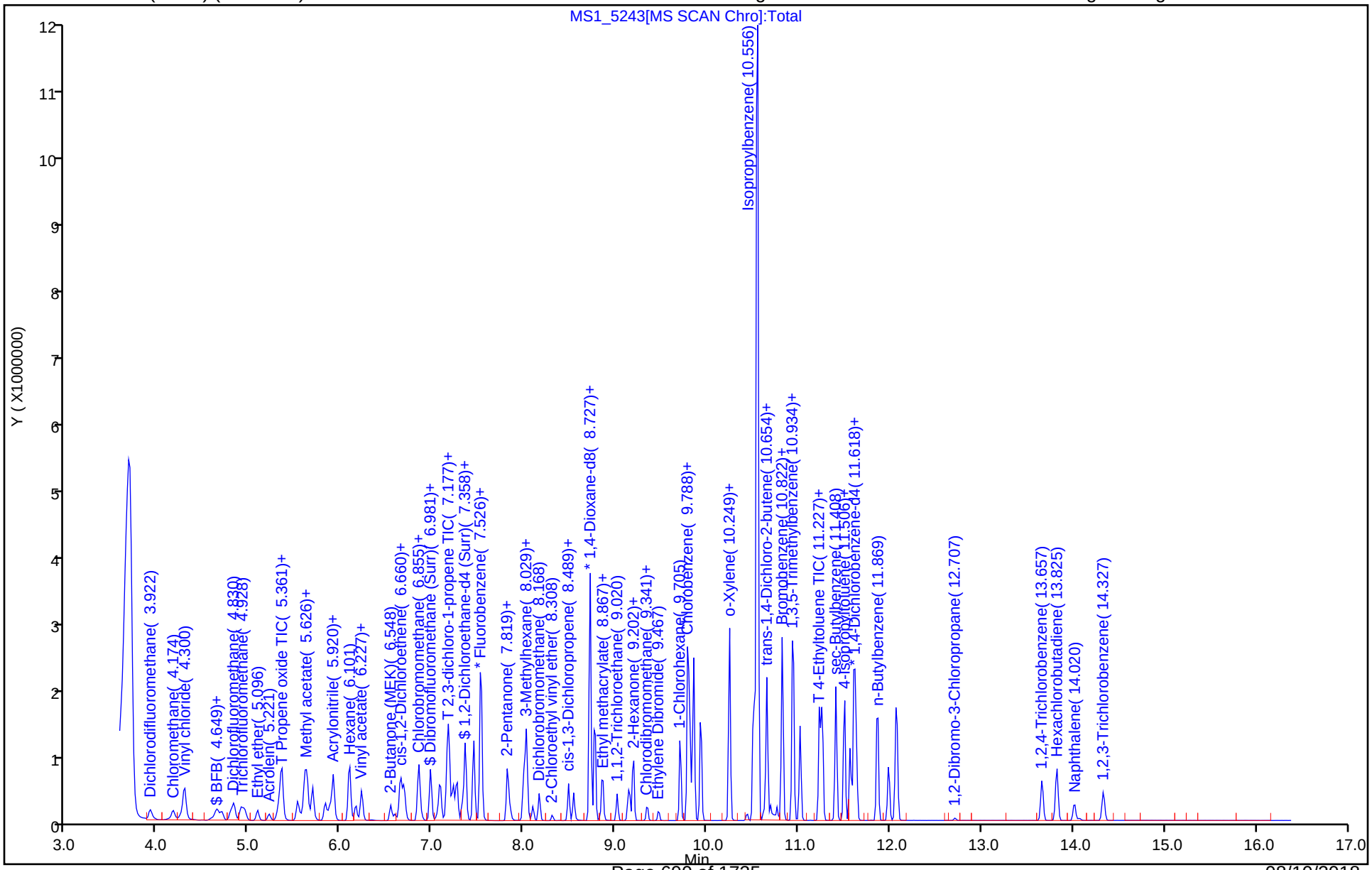
MV-Main B_00022	Amount Added:	2.50	Units: uL	
MV-SS 2-Cleve_00046	Amount Added:	2.50	Units: uL	
MV-Gas/Ket B_00043	Amount Added:	2.50	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:31 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5243.D				
Injection Date:	06-Aug-2018 12:51:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	320-41333-A-15-A MS			Worklist Smp#:	23
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	26
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5243.D				
Lims ID:	320-41333-A-15-A MS				
Client ID:					
Sample Type:	MS				
Inject. Date:	06-Aug-2018 12:51:30	ALS Bottle#:	26	Worklist Smp#:	23
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Sample Info:	320-41333-A-15-A ms 2ml af				
Operator ID:	wickhamt	Instrument ID:	VMS_MS1		
Method:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m				
Limit Group:	MSV - 8260B Water and Solid				
Last Update:	07-Aug-2018 06:52:59	Calib Date:	02-Aug-2018 13:37:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D				
Column 1 :	DB-624 (60.25) (0.25 mm)		Det: MS SCAN		
Process Host:	CTX0316				

First Level Reviewer: wickhamt Date: 06-Aug-2018 13:40:07

Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	13.1	106.61
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	13.2	107.39
$ 7 Toluene-d8 (Surr)	12.3	12.6	102.77
$ 8 4-Bromofluorobenzene (Surr)	12.3	12.0	97.98
$ 4 BFB	0	0	0.00

Manual Integration/User Assign Peak Report

TestAmerica Denver

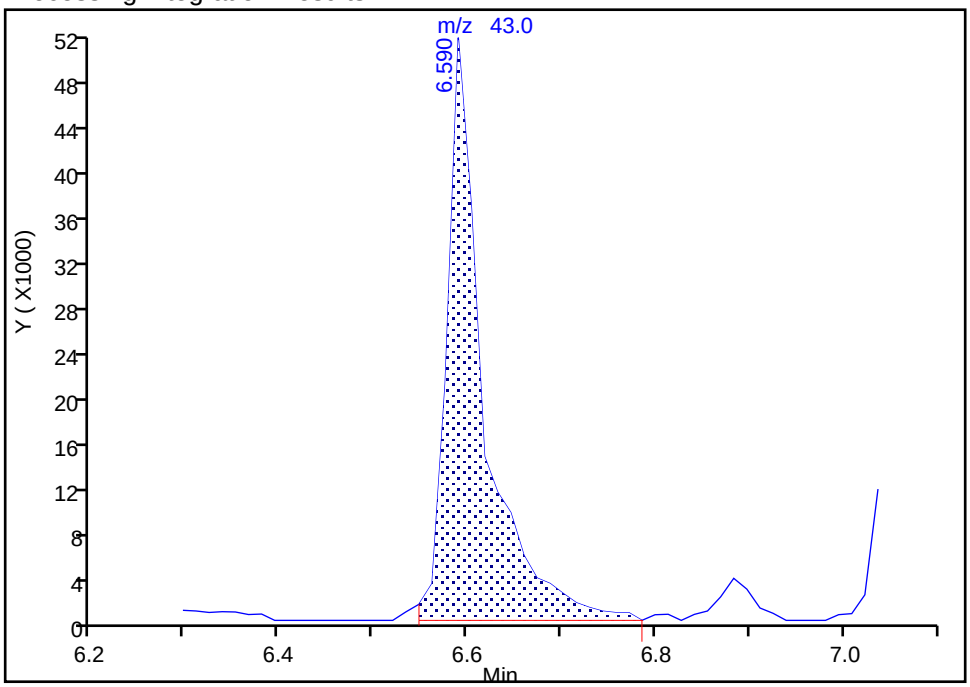
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5243.D				
Injection Date:	06-Aug-2018 12:51:30	Instrument ID:	VMS_MS1		
Lims ID:	320-41333-A-15-A MS				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	26	Worklist Smp#:	23
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

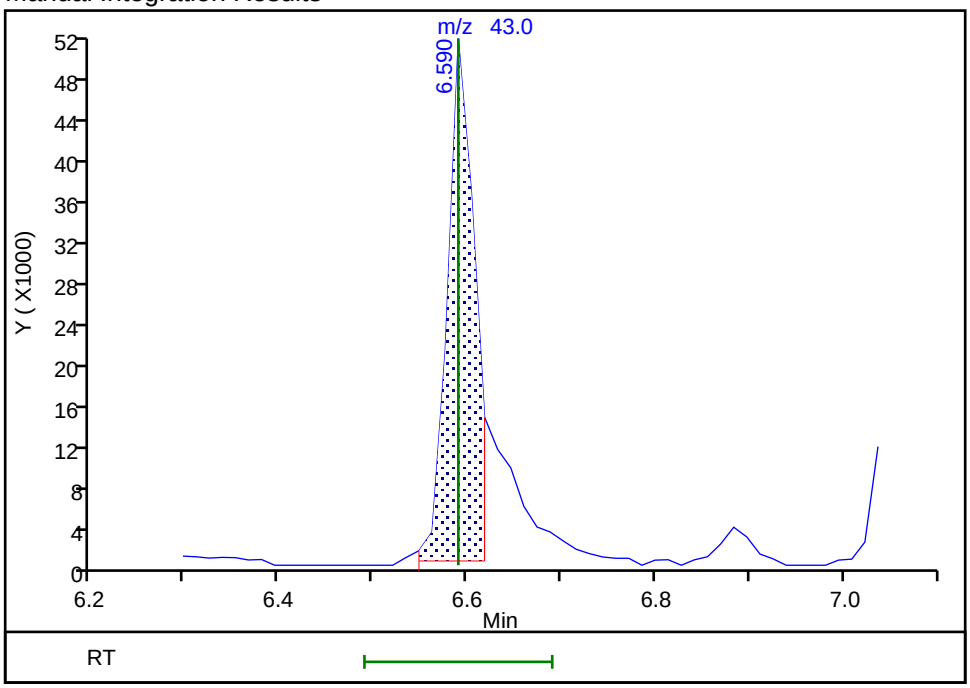
Processing Integration Results

RT: 6.59
Area: 141826
Amount: 28.120864
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 105432
Amount: 20.904763
Amount Units: ug/l



Reviewer: wickhamt, 06-Aug-2018 13:39:29
Audit Action: Assigned New Baseline Audit Reason: Shouldering

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 320-41333-1

SDG No.:

Client Sample ID: GRE-IDW-W-01 MSD | Lab Sample ID: 320-41333-15 MSD

Matrix: Water (TCLP) | Lab File ID: MS1_5244.D

Analysis Method: 8260B | Date Collected: 07/18/2018 15:00

Sample wt/vol: 2(mL) | Date Analyzed: 08/06/2018 13:12

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-624 (60.25) ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 424938 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.0512		0.010	0.0040	0.0016
78-93-3	2-Butanone (MEK)	0.218	M	0.10	0.040	0.018
56-23-5	Carbon tetrachloride	0.0526		0.010	0.0040	0.0019
108-90-7	Chlorobenzene	0.0485		0.010	0.0040	0.0017
67-66-3	Chloroform	0.0598		0.010	0.0040	0.0016
107-06-2	1,2-Dichloroethane	0.0525		0.010	0.0040	0.0013
75-35-4	1,1-Dichloroethene	0.0531		0.010	0.0080	0.0023
127-18-4	Tetrachloroethene	0.0503		0.010	0.0040	0.0020
79-01-6	Trichloroethene	0.0510		0.010	0.0040	0.0016
75-01-4	Vinyl chloride	0.0548		0.010	0.0020	0.0010

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	103		78-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		64-129
460-00-4	4-Bromofluorobenzene (Surr)	98		78-121
1868-53-7	Dibromofluoromethane (Surr)	104		79-119

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5244.D
Lims ID: 320-41333-A-15-A MSD
Client ID:
Sample Type: MSD
Inject. Date: 06-Aug-2018 13:12:30 ALS Bottle#: 27 Worklist Smp#: 24
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: 320-41333-A-15-A msd 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 13:56:32

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.598	5.584	0.014	88	169730	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2046579	12.5	12.5	
* 149 1,4-Dioxane-d8	96	8.727	8.773	-0.046	0	17531		0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	92	433842	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.618	11.604	0.014	96	626701	12.5	12.5	
$ 5 Dibromofluoromethane (Surr	111	6.981	6.981	0.000	93	451455	12.3	12.8	
$ 6 1,2-Dichloroethane-d4 (Sur	65	7.274	7.274	0.000	98	384409	12.3	12.8	
$ 7 Toluene-d8 (Surr)	98	8.727	8.727	0.000	93	2117162	12.3	12.7	
$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	669051	12.3	11.9	
$ 152 Trifluorotoluene (Surr)	1		0.000					ND	
$ 4 BFB	95	4.649	4.591	0.058	0	30281		NR	
24 Dichlorodifluoromethane	85	3.922	3.923	0.000	100	264818	5.00	5.71	
26 Chloromethane	50	4.174	4.160	0.014	99	278581	5.00	4.95	
22 Chlorotrifluoroethene	116		4.248					ND	
27 Vinyl chloride	62	4.300	4.286	0.014	96	296176	5.00	5.48	
25 1,2-Dichloro-1,1,2,2-tetra	85		4.472					ND	
28 Ethylene oxide	43		4.565					ND	U
29 Bromomethane	94	4.649	4.635	0.014	91	216382	5.00	5.48	
31 Chloroethane	64	4.705	4.691	0.014	100	213799	5.00	5.42	
23 2-Chloro-1,1,1-Trifluoroet	118		4.737					ND	
32 Dichlorofluoromethane	67	4.830	4.830	0.000	98	502695	5.00	5.72	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	395537	5.00	5.72	
34 Ethanol	45		4.928					ND	
36 Ethyl ether	59	5.096	5.096	0.000	93	105864	5.00	5.19	
38 Propene oxide	58		5.180					ND	
39 Acrolein	56	5.221	5.221	0.000	99	112300	50.0	46.2	
40 Acetone	43	5.319	5.319	0.000	100	86582	20.0	25.3	
42 1,1,2-Trichloro-1,2,2-trif	151	5.347	5.333	0.014	98	182451	5.00	5.80	
41 Isopropyl alcohol	45		5.333					ND	U
43 1,1-Dichloroethene	96	5.361	5.361	0.000	97	234131	5.00	5.31	
35 1,2-Dichloro-1,1,2-trifluo	117		5.505					ND	
45 Iodomethane	142	5.529	5.529	0.000	99	353557	5.00	5.20	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
44 Acetonitrile	41		5.529					ND	U
37 1,1,1-Trifluoro-2,2-dichlo	83		5.533					ND	
46 Methyl acetate	43	5.557	5.557	0.000	96	99498	10.0	10.2	
47 3-Chloro-1-propene	41	5.612	5.612	0.000	85	395358	5.00	4.80	
48 Carbon disulfide	76	5.626	5.626	0.000	99	1034670	5.00	5.26	
49 2-Methyl-2-propanol	59	5.654	5.654	0.000	92	45846	50.0	55.5	
50 Methylene Chloride	84	5.696	5.696	0.000	95	229203	5.00	5.45	
51 Acrylonitrile	53	5.836	5.836	0.000	99	252743	50.0	51.7	
52 Methyl tert-butyl ether	73	5.892	5.878	0.014	97	274605	5.00	5.08	
53 trans-1,2-Dichloroethene	96	5.920	5.920	0.000	98	263044	5.00	5.32	
54 Hexane	57	6.101	6.101	0.000	91	448852	5.00	5.08	
55 Vinyl acetate	43	6.171	6.157	0.014	97	363665	10.0	10.2	
56 Isopropyl ether	87		6.199					ND	U
57 1,1-Dichloroethane	63	6.227	6.227	0.000	97	440082	5.00	5.11	
58 2-Chloro-1,3-butadiene	53		6.297					ND	
59 Tert-butyl ethyl ether	59		6.464					ND	
61 2-Butanone (MEK)	43	6.590	6.590	0.000	100	114322	20.0	21.8	M
60 Ethyl acetate	43		6.590					ND	U
63 Propionitrile	54		6.632					ND	
62 sec-Butyl Alcohol	45	6.646	6.646	0.000	96	117231	150.0	151.0	
64 cis-1,2-Dichloroethene	96	6.660	6.646	0.014	82	246468	5.00	4.95	
65 2,2-Dichloropropane	77	6.688	6.688	0.000	92	350804	5.00	5.02	
66 Methacrylonitrile	41		6.772					ND	
67 Chlorobromomethane	128	6.841	6.841	0.000	94	76138	5.00	5.16	
68 Chloroform	83	6.855	6.855	0.000	95	449371	5.00	5.98	
69 Tetrahydrofuran	42	6.883	6.883	0.000	90	34553	10.0	8.61	
70 Isobutyl alcohol	41	7.051	7.051	0.000	93	43040	125.0	136.1	
71 1,1,1-Trichloroethane	97	7.079	7.079	0.000	99	379766	5.00	5.34	
72 Cyclohexane	56	7.163	7.163	0.000	0	512140	5.00	5.36	
73 1,1-Dichloropropene	75	7.191	7.177	0.014	97	368411	5.00	5.30	
74 Carbon tetrachloride	117	7.232	7.233	0.000	98	317708	5.00	5.26	
19 2,2-Dimethylpentane	57	7.163	7.251	-0.088	35	23038		NC	
17 2,4-Dimethylpentane	43		7.293					ND	
75 1,2-Dichloroethane	62	7.330	7.330	0.000	98	193468	5.00	5.25	
77 Benzene	78	7.358	7.358	0.000	96	977999	5.00	5.12	
76 Tert-amyl methyl ether	73		7.358					ND	
9 n-Heptane	43	7.456	7.456	0.000	92	456910	5.00	5.33	
10 2,2,3-Trimethylbutane	57	7.456	7.502	-0.046	63	250837		NC	
78 n-Butanol	56		7.554					ND	U
12 3,3-Dimethylpentane	43	7.847	7.768	0.079	75	203239		NC	
18 2-Methylhexane	43	7.847	7.810	0.037	73	203239		NC	
79 Trichloroethene	95	7.819	7.819	0.000	98	245950	5.00	5.10	
80 2-Pentanone	43	7.847	7.847	0.000	99	203239	20.0	22.3	
81 Methyl methacrylate	100		7.945					ND	
15 3-Methylhexane	43	8.029	7.949	0.080	52	41929		NC	
11 2,3-Dimethylpentane	56	8.029	7.949	0.080	50	130996		NC	
82 1,2-Dichloropropane	63	8.001	8.001	0.000	96	219845	5.00	5.10	
83 Methylcyclohexane	55	8.029	8.029	0.000	0	403246	5.00	5.27	
84 1,4-Dioxane	88	8.057	8.057	-0.001	95	12833	100.0	106.2	
85 Dibromomethane	93	8.098	8.098	0.000	95	73224	5.00	5.09	
86 Dichlorobromomethane	83	8.168	8.168	0.000	99	228313	5.00	4.99	
20 3-Ethylpentane	43		8.214					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
87 2-Nitropropane	41		8.294					ND	U
88 2-Chloroethyl vinyl ether	63	8.308	8.308	0.000	91	33714	5.00	5.05	
89 cis-1,3-Dichloropropene	75	8.489	8.489	0.000	96	258610	5.00	4.71	
90 4-Methyl-2-pentanone (MIBK	43	8.545	8.545	0.000	97	262037	20.0	22.5	
91 Toluene	91	8.783	8.769	0.014	98	1002423	5.00	5.18	
92 Ethyl methacrylate	69	8.853	8.853	0.000	85	100107	5.00	4.28	
93 trans-1,3-Dichloropropene	75	8.867	8.867	0.000	98	181423	5.00	4.89	
94 1,1,2-Trichloroethane	97	9.020	9.020	0.000	92	100716	5.00	5.29	
95 2-Hexanone	43	9.132	9.132	0.000	96	167532	20.0	21.3	
96 1,3-Dichloropropane	76	9.160	9.160	0.000	97	187068	5.00	4.86	
97 Tetrachloroethene	164	9.202	9.202	0.000	99	192799	5.00	5.03	
98 Chlorodibromomethane	129	9.355	9.341	0.014	90	105459	5.00	4.61	
13 Dimethyl disulfide	94	9.341	9.388	-0.047	1	3987		NC	
99 Tetrahydrothiophene	60		9.397					ND	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	85782	5.00	4.79	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	349133	5.00	4.85	
102 Chlorobenzene	112	9.816	9.816	0.000	94	558063	5.00	4.85	
103 1,1,1,2-Tetrachloroethane	131	9.858	9.844	0.014	93	165193	5.00	4.69	
104 Ethylbenzene	106	9.858	9.858	0.000	98	353121	5.00	4.80	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	100	420373	5.00	4.74	
106 Styrene	104	10.249	10.249	0.000	84	548836	5.00	4.59	
109 o-Xylene	106	10.249	10.249	0.000	90	394564	5.00	4.80	
107 Bromoform	173	10.445	10.445	0.000	96	44015	5.00	4.22	
108 Isopropylbenzene	105	10.515	10.515	0.000	96	1165186	5.00	4.91	
110 cis-1,4-Dichloro-2-butene	53		10.515					ND	U
111 Cyclohexanone	55	10.626	10.626	0.000	92	75781	200.0	216.5	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	96999	5.00	4.78	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	89	22182	5.00	4.52	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	87	27026	5.00	5.01	
116 Bromobenzene	156	10.822	10.822	0.000	97	202666	5.00	4.75	
115 N-Propylbenzene	120	10.822	10.822	0.000	99	319206	5.00	4.75	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	927912	5.00	4.72	
117 2-Chlorotoluene	126	10.948	10.948	0.000	96	250347	5.00	4.74	
118 4-Chlorotoluene	126	11.017	11.017	0.000	99	239474	5.00	4.59	
119 tert-Butylbenzene	119	11.227	11.227	0.000	94	918256	5.00	4.77	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	98	906708	5.00	4.69	
143 Pentachloroethane	167		11.283					ND	
122 sec-Butylbenzene	134	11.408	11.408	0.000	95	253125	5.00	4.82	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	1051218	5.00	4.87	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	435280	5.00	4.74	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	94	417296	5.00	4.76	
125 1,2,3-Trimethylbenzene	105		11.632					ND	
127 n-Butylbenzene	91	11.869	11.855	0.014	98	1050888	5.00	4.90	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	96	341973	5.00	4.81	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	78	10018	5.00	4.00	
21 1,3,5-Trichlorobenzene	180		12.945					ND	
14 n-Nonyl Aldehyde	57		13.340					ND	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	223777	5.00	4.82	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	98	188759	5.00	4.92	
132 Naphthalene	128	14.020	14.006	0.014	97	256347	5.00	4.58	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	169403	5.00	5.02	
161 n-Nonane TIC	1		0.000					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
158 1-Chlorohexane TIC	1		0.000					ND	
160 Cyclohexane TIC	1		0.000					ND	
159 Methyl cyclohexane TIC	1		0.000					ND	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.3	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.3	
S 134 Trihalomethanes, Total	1				0		20.0	19.8	
S 137 Total BTEX	1				0			24.6	
S 139 Xylenes, Total (URS)	1				0		10.0	9.54	
S 135 1,3-Dichloropropene, Total	1				0		10.0	9.59	
S 153 TAH	1				0			0	
S 138 Xylenes, Total	106				0		10.0	9.54	
T 141 Dichloroacetonitrile TIC	74		1.000					ND	
T 142 2,3-dichloro-1-propene TIC	75	7.191	1.000	6.191	94	368411		10.6	
T 30 Propene oxide TIC	58	5.319	5.334	-0.015	12	28573		0.8233	
T 156 4-Ethyltoluene TIC	1	10.934	0.000	10.934	90	927912		26.7	
T 157 1,3-Butadiene TIC	1		0.000					ND	
T 16 2-Butoxyethanol TIC	1		0.000					ND	
T 155 Dicyclopentadiene TIC	1		0.000					ND	
T 154 Propene TIC	1		0.000					ND	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

NC - Not Calibrated

Review Flags

M - Manually Integrated

U - Marked Undetected

Reagents:

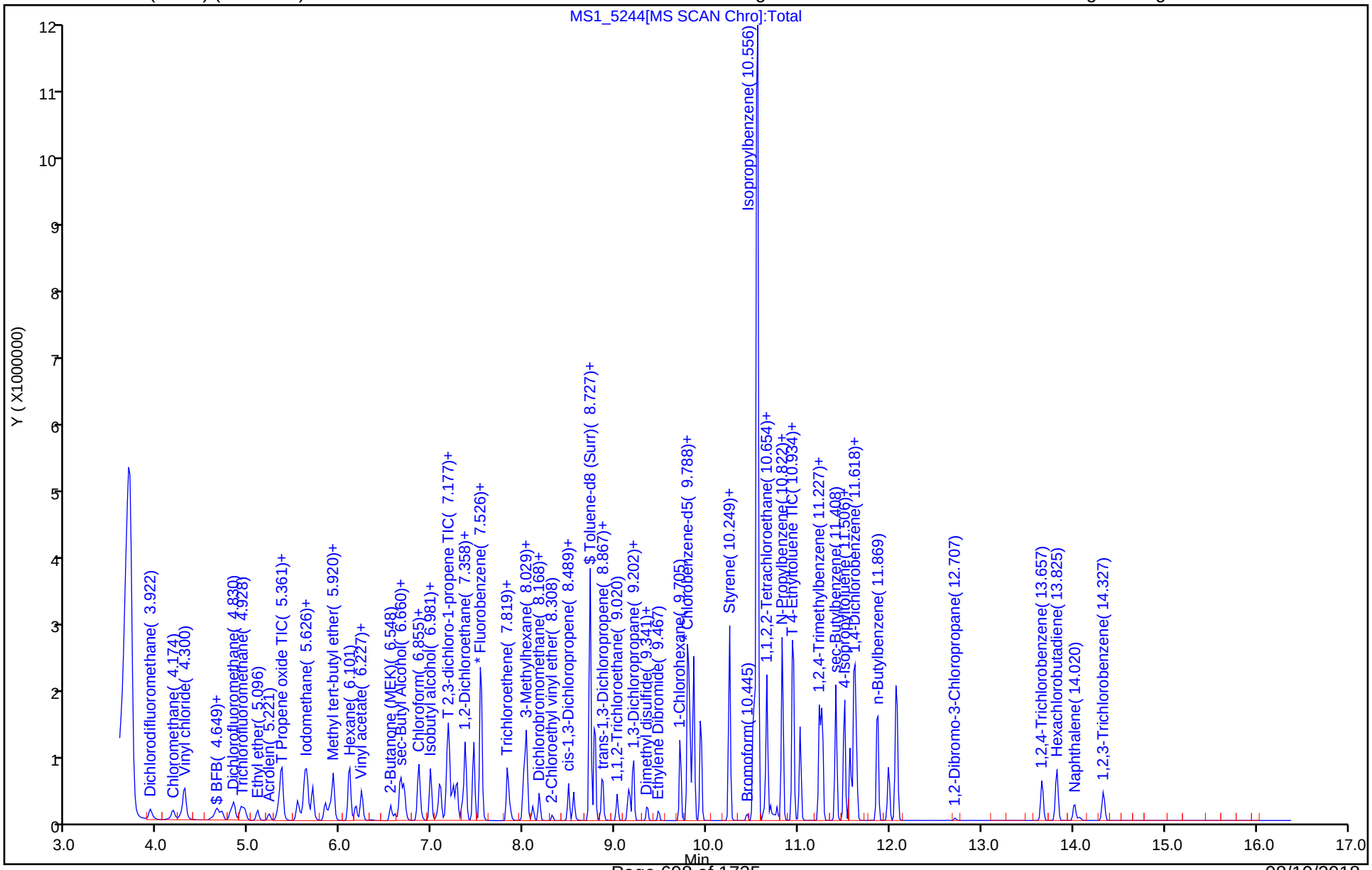
MV-Main B_00022	Amount Added:	2.50	Units: uL	
MV-SS 2-Cleve_00046	Amount Added:	2.50	Units: uL	
MV-Gas/Ket B_00043	Amount Added:	2.50	Units: uL	
MV-568718-D_00014	Amount Added:	1.00	Units: uL	Run Reagent
MV-ARCH SS A_00101	Amount Added:	0.98	Units: uL	Run Reagent

Report Date: 07-Aug-2018 06:54:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5244.D				
Injection Date:	06-Aug-2018 13:12:30	Instrument ID:	VMS_MS1	Operator ID:	wickhamt
Lims ID:	320-41333-A-15-A MSD			Worklist Smp#:	24
Client ID:					
Purge Vol:	20.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	27
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		

Column: DB-624 (60.25) (0.25 mm) Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5244.D
Lims ID: 320-41333-A-15-A MSD
Client ID:
Sample Type: MSD
Inject. Date: 06-Aug-2018 13:12:30 ALS Bottle#: 27 Worklist Smp#: 24
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: 320-41333-A-15-A msd 2ml af
Operator ID: wickhamt Instrument ID: VMS_MS1

Method: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 07-Aug-2018 06:52:59 Calib Date: 02-Aug-2018 13:37:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b\MS1_5089.D

Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0316

First Level Reviewer: wickhamt Date: 06-Aug-2018 13:56:32

Compound	Amount Added	Amount Recovered	% Rec.
$ 5 Dibromofluoromethane (Surr)	12.3	12.8	104.21
$ 6 1,2-Dichloroethane-d4 (Surr)	12.3	12.8	104.43
$ 7 Toluene-d8 (Surr)	12.3	12.7	103.49
$ 8 4-Bromofluorobenzene (Surr)	12.3	11.9	97.52
$ 4 BFB	0	0	0.00

Manual Integration/User Assign Peak Report

TestAmerica Denver

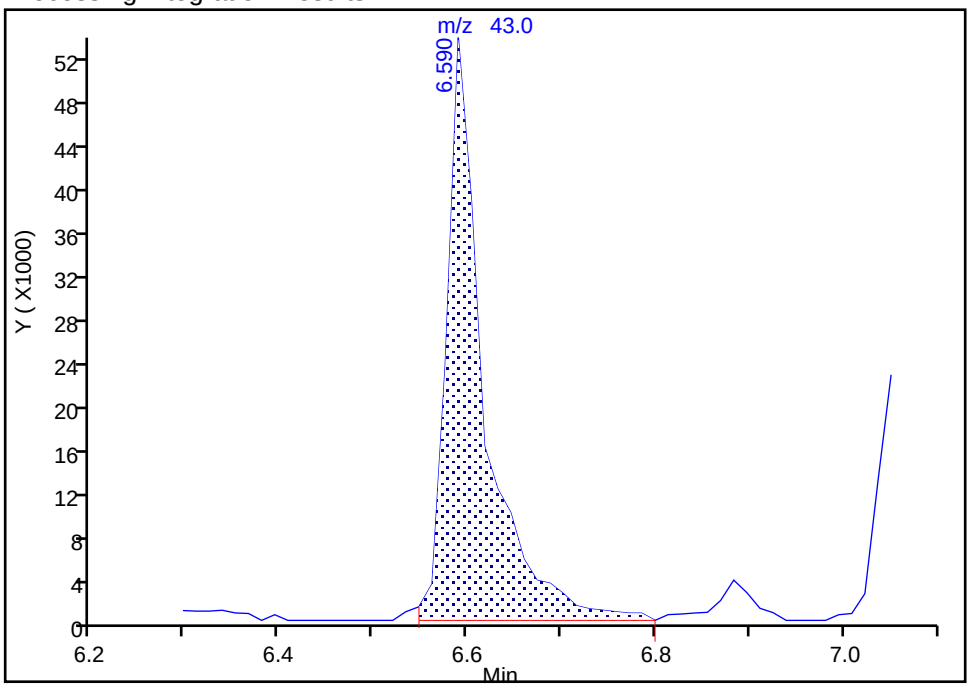
Data File:	\\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b\MS1_5244.D				
Injection Date:	06-Aug-2018 13:12:30	Instrument ID:	VMS_MS1		
Lims ID:	320-41333-A-15-A MSD				
Client ID:					
Operator ID:	wickhamt	ALS Bottle#:	27	Worklist Smp#:	24
Purge Vol:	20.000 mL	Dil. Factor:	1.0000		
Method:	AQ_VMS1_8260	Limit Group:	MSV - 8260B Water and Solid		
Column:	DB-624 (60.25) (0.25 mm)	Detector	MS SCAN		

61 2-Butanone (MEK), CAS: 78-93-3

Signal: 1

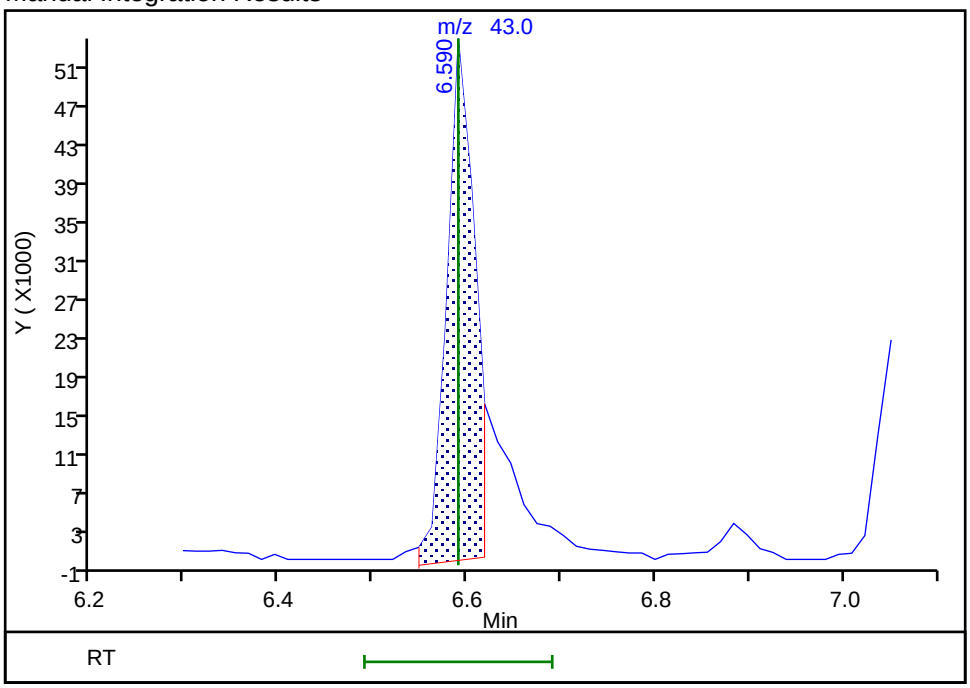
Processing Integration Results

RT: 6.59
Area: 148938
Amount: 28.345791
Amount Units: ug/l



Manual Integration Results

RT: 6.59
Area: 114322
Amount: 21.757695
Amount Units: ug/l



Reviewer: wickhamt, 06-Aug-2018 13:41:10
Audit Action: Assigned New Baseline Audit Reason: Shouldering

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 08/02/2018 07:34

Analysis Batch Number: 424541 End Date: 08/02/2018 19:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-424541/1		08/02/2018 07:34	1	MS1_5072.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 08:32	1		DB-624 (60.25) 0.25(mm)
STD003 280-424541/12 IC		08/02/2018 08:53	1	MS1_5075.D	DB-624 (60.25) 0.25(mm)
STD01 280-424541/13 IC		08/02/2018 09:13	1	MS1_5076.D	DB-624 (60.25) 0.25(mm)
STD02 280-424541/14 IC		08/02/2018 09:33	1	MS1_5077.D	DB-624 (60.25) 0.25(mm)
STD05 280-424541/15 IC		08/02/2018 09:53	1	MS1_5078.D	DB-624 (60.25) 0.25(mm)
STD10 280-424541/16 IC		08/02/2018 10:14	1	MS1_5079.D	DB-624 (60.25) 0.25(mm)
STD30 280-424541/17 IC		08/02/2018 10:34	1	MS1_5080.D	DB-624 (60.25) 0.25(mm)
STD60 280-424541/18 IC		08/02/2018 10:54	1	MS1_5081.D	DB-624 (60.25) 0.25(mm)
ICV 280-424541/19		08/02/2018 11:35	1	MS1_5083.D	DB-624 (60.25) 0.25(mm)
STD01 280-424541/20 IC		08/02/2018 11:55	1	MS1_5084.D	DB-624 (60.25) 0.25(mm)
STD02 280-424541/21 IC		08/02/2018 12:15	1	MS1_5085.D	DB-624 (60.25) 0.25(mm)
STD05 280-424541/22 IC		08/02/2018 12:36	1	MS1_5086.D	DB-624 (60.25) 0.25(mm)
ICIS 280-424541/23		08/02/2018 12:56	1	MS1_5087.D	DB-624 (60.25) 0.25(mm)
STD30 280-424541/24 IC		08/02/2018 13:16	1	MS1_5088.D	DB-624 (60.25) 0.25(mm)
STD60 280-424541/25 IC		08/02/2018 13:37	1	MS1_5089.D	DB-624 (60.25) 0.25(mm)
ICV 280-424541/26		08/02/2018 14:17	1	MS1_5091.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 15:17	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 15:37	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 15:57	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 16:18	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 16:38	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 16:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 17:19	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 17:39	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 18:00	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/02/2018 18:20	1		DB-624 (60.25) 0.25(mm)
CCVC 280-424541/43		08/02/2018 18:40	1		DB-624 (60.25) 0.25(mm)
CCVC 280-424541/44		08/02/2018 19:01	1		DB-624 (60.25) 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 08/06/2018 07:02

Analysis Batch Number: 424938 End Date: 08/06/2018 16:15

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-424938/1		08/06/2018 07:02	1	MS1_5226.D	DB-624 (60.25) 0.25(mm)
CCV 280-424938/2		08/06/2018 07:47	1	MS1_5228.D	DB-624 (60.25) 0.25(mm)
CCV 280-424938/3		08/06/2018 08:07	1	MS1_5229.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 09:08	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 09:28	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 09:48	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 10:09	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 10:29	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 10:49	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 11:10	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 11:30	1		DB-624 (60.25) 0.25(mm)
LCS 280-423614/2-A		08/06/2018 11:50	1	MS1_5240.D	DB-624 (60.25) 0.25(mm)
LB3 280-423614/1-A		08/06/2018 12:11	1	MS1_5241.D	DB-624 (60.25) 0.25(mm)
320-41333-15		08/06/2018 12:31	1	MS1_5242.D	DB-624 (60.25) 0.25(mm)
320-41333-15 MS		08/06/2018 12:51	1	MS1_5243.D	DB-624 (60.25) 0.25(mm)
320-41333-15 MSD		08/06/2018 13:12	1	MS1_5244.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 13:32	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 13:52	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 14:13	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 14:33	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 14:53	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 15:14	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 15:34	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		08/06/2018 15:54	1		DB-624 (60.25) 0.25(mm)
CCVC 280-424938/33		08/06/2018 16:15	1	MS1_5253.D	DB-624 (60.25) 0.25(mm)

Sequence Name: C:\msdchem\1\sequence\080618am.s
Comment:
Operator: wickhamt
Data Path: C:\MSDCHEM\1\DATA\080618am\
Instrument Control Pre-Seq Cmd:
Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:
Data Analysis Post-Seq Cmd:

Test America Denver
Instrument: MS1
DV-MS-0010 (8260B/624) (Circle)
Purge Volume: (20mL/5mL/5g) (Circle)
Tune Time: 07:02 - 16:15
Lims Batch: 424938

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

Sequence Barcode Options
(X) On Mismatch, Inject Anyway
( ) On Mismatch, Don't Inject
( ) Barcode Disabled

8-7-18
Taw

Line			Sample Name/Misc Info		
1)	Sample	100	MS1_5226	BFB	bfb 07:02
2)	Sample	10	MS1_5227	8260	blank
3)	Pause				
4)	Sample	11	MS1_5228	8260	ccv m
5)	Sample	12	MS1_5229	8260	ccv s
6)	Sample	13	MS1_5230	8260	lcs af
7)	Sample	14	MS1_5231	8260	mb af
8)	Sample	15	MS1_5232	8260	LCS 280-423316/2-A 2ml af
9)	Sample	16	MS1_5233	8260	LB 280-423316/1-A 2ml af
10)	Sample	17	MS1_5234	8260	160-29498-C-2-A 2ml
11)	Sample	18	MS1_5235	8260	160-29498-C-2-A ms 2ml
12)	Sample	19	MS1_5236	8260	160-29498-C-2-A msd 2ml
13)	Sample	20	MS1_5237	8260	280-112230-C-1-A 2ml
14)	Sample	21	MS1_5238	8260	280-112289-E-1-A 2ml
15)	Sample	22	MS1_5239	8260	320-41149-A-36-A 2ml
16)	Sample	23	MS1_5240	8260	LCS 280-423614/2-A 2ml af
17)	Sample	24	MS1_5241	8260	LB3 280-423614/1-A 2ml af
18)	Sample	25	MS1_5242	8260	320-41333-A-15-A 2ml af
19)	Sample	26	MS1_5243	8260	320-41333-A-15-A ms 2ml af
20)	Sample	27	MS1_5244	8260	320-41333-A-15-A msd 2ml af
21)	Sample	28	MS1_5245	8260	280-112146-U-2-A 2ml af
22)	Sample	29	MS1_5246	8260	LCS 280-424099/2-A 2ml af
23)	Sample	30	MS1_5247	8260	LB 280-424099/1-A 2ml af
24)	Sample	31	MS1_5248	8260	280-112363-A-1-A 2ml
25)	Sample	32	MS1_5249	8260	320-41401-a-1-a 2ml
26)	Sample	33	MS1_5250	8260	320-41401-a-1-a ms 2ml
27)	Sample	34	MS1_5251	8260	320-41401-a-1-a msd 2ml
28)	Sample	35	MS1_5252	8260	320-41554-A-9-A 2ml
29)	Sample	36	MS1_5253	8260	ccvc 16:15

TestAmerica Laboratories
Worklist Report

Worklist Name: 080618am
Instrument Name: VMS_MS1
Purge Volume: 20.00
Analysis Type: VOA
Batch Directory: \\ChromNA\Denver\ChromData\VMS_MS1\20180806-72706.b
Upload Directory: \\CorpTALSAPP16\280-DN-RawData\Organics\MS\VMS_MS1
Run Reagent: MV-568718-D_00014
Run Reagent: MV-ARCH SS A_00101

Worklist Number: 72706
Chrom Method: AQ_VMS1_8260
Units: mL
Amount Added: 1.000, Units: uL
Amount Added: 0.980, Units: uL

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072706-001	# 1 BFB	MV-BFB_00026	BFB	voaWater	1.000	uL	1.000
280-0072706-002	# 2 CCV	MV-2cleve+AVA_00036 MV-Main A_00037 MV-Gas/Ket A_00075	CCV	voaWater	20.00	mL	1.000
280-0072706-003	# 3 CCV	MV-Supp A_00031 MV-568718-D_00014	CCV	voaWater	20.00	mL	1.000
280-0072706-004	# 4 LCS	MV-Gas/Ket B_00043 MV-Main B_00022 MV-SS 2-Cleve_00046	LCS	voaWater	20.00	mL	1.000
280-0072706-005	# 5 LCSD	MV-Gas/Ket B_00043 MV-Main B_00022 MV-SS 2-Cleve_00046	LCSD	voaWater	20.00	mL	1.000
280-0072706-006	# 6 LCS	MV-Supp B_00021	LCS	voaWater	20.00	mL	1.000
280-0072706-007	# 7 LCSD	MV-Supp B_00021	LCSD	voaWater	20.00	mL	1.000
280-0072706-008	# 8 MB		MB	voaWater	20.00	mL	1.000
280-0072706-009	# 9 280-108595-A-1		Client	voaWater	20.00	mL	1.000
280-0072706-010	#10 280-108595-A-2		Client	voaWater	20.00	mL	1.000
280-0072706-011	#11 280-108595-A-3		Client	voaWater	20.00	mL	1.000
280-0072706-012	#12 LCS 280-423316/2-A	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	LCS	voaWater	2.000	mL	1.000
280-0072706-013	#13 LB 280-423316/1-A		LB	voaWater	2.000	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072706-014	#14 160-29498-C-2-A		Client	voaWater	2.000	mL	1.000
280-0072706-015	#15 160-29498-C-2-A MS	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MS	voaWater	2.000	mL	1.000
280-0072706-016	#16 160-29498-C-2-A MSD	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MSD	voaWater	2.000	mL	1.000
280-0072706-017	#17 280-112230-C-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-018	#18 280-112289-E-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-019	#19 320-41149-A-36-A		Client	voaWater	2.000	mL	1.000
280-0072706-020	#20 LCS 280-423614/2-A	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	LCS	voaWater	2.000	mL	1.000
280-0072706-021	#21 LB3 280-423614/1-A		LB3	voaWater	2.000	mL	1.000
280-0072706-022	#22 320-41333-A-15-A		Client	voaWater	2.000	mL	1.000
280-0072706-023	#23 320-41333-A-15-A MS	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MS	voaWater	2.000	mL	1.000
280-0072706-024	#24 320-41333-A-15-A MSD	MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00043	MSD	voaWater	2.000	mL	1.000
280-0072706-025	#25 280-112146-U-2-A		Client	voaWater	2.000	mL	1.000
280-0072706-026	#26 LCS 280-424099/2-A	MV-Main B_00022 MV-Gas/Ket B_00043 MV-SS 2-Cleve_00046	LCS	voaWater	2.000	mL	1.000
280-0072706-027	#27 LB 280-424099/1-A		LB	voaWater	2.000	mL	1.000
280-0072706-028	#28 280-112363-A-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-029	#29 320-41401-A-1-A		Client	voaWater	2.000	mL	1.000
280-0072706-030	#30 320-41401-A-1-A MS	MV-Main B_00022 MV-Gas/Ket B_00043 MV-SS 2-Cleve_00046	MS	voaWater	2.000	mL	1.000
280-0072706-031	#31 320-41401-A-1-A MSD	MV-Main B_00022 MV-Gas/Ket B_00043 MV-SS 2-Cleve_00046	MSD	voaWater	2.000	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072706-032	#32 320-41554-A-9-A		Client	voaWater	2.000	mL	1.000
280-0072706-033	#33 ccvc	MV-Main A_00037 MV-Gas/Ket A_00075 MV-2cleve+AVA_00036	CCVC	voaWater	20.00	mL	1.000
280-0072706-034	#34 Samp 34		Client	voaWater	2.000	mL	1.000

MS1

Sample Request Form: 49334

den_msvoa_totalbacklog 8/6/2018 1:14:47 PM Assigned to:Wickham, Tom A

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
160-29498-2 2	CRC-B21-0205		8260B	TCLP 8260B	07/26 23:59	08/07/18	CYLS	IL	180	Level 1 radioactive
M RAD SCREEENS REQUIRED PRIOR TO SHIPPING!										
280-112146-2 2	Outfall 001	5mLat	8260B	TCLP 8260B	08/08 23:59	08/06/18	DMH	AR	WC Dpt & 96 & MS-Strge & Mtls-Strge	Unconfirmed
280-112230-1 2	SD052-04_0718_IDW		8260B_DOD5	TCLP 8260B_DOD5	08/06 23:59	08/07/18	SKR	NY	103 & WC Dpt & OP Dpt	Unconfirmed
M Q5/DIL3										
280-112289-1 2	IDW-1-0718		8260B_DOD5	TCLP 8260B_DOD5	08/06 23:59	08/13/18	PJM	IA	114	Unconfirmed
320-41149-36 2	GRE-IDW-S-01		8260B_DOD5	TCLP 8260B_DOD5	08/06 23:59	08/01/18	DRA	VA	178	Unconfirmed
320-41333-15 2	GRE-IDW-W-01	5mLat	8260B_DOD5	TCLP 8260B_DOD5	08/08 23:59	08/05/18	DRA	VA	MS-Strge	Unconfirmed
320-41401-1 2	IDW-Soil-01		8260B_DOD5	TCLP 8260B_DOD5	08/12 23:59	08/09/18	DRA	VA	Quarantine 4	Unconfirmed
320-41554-9 2	IDW-SOIL		8260B_DOD5	TCLP 8260B_DOD5	08/12 23:59	08/12/18	DRA	VA	158	Unconfirmed

1311_Z Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 280-423316

Analyst: Bourgery, David F

Batch Open: 7/23/2018 5:36:00PM

Batch End: 7/24/2018 9:54:00AM

HT 8-6

TCLP Extraction 8-6-18 TAW

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1	LB~280-423316/1 N/A	N/A		2		N/A	N/A	N/A	In Lab	LB 280-423316/1-A
2	LCS~280-423316/2 N/A	N/A		2		N/A	N/A	N/A	In Lab	LCS 280-423316/2-A
3	160-29498-C-2 (8260B)	N/A (160-29498-1)	Solid	2		8/7/18	25_Days	4		160-29498-C-2-A
4	280-112230-C-1 (8260B_DOD5)	N/A (280-112230-1)	Solid	2		8/7/18	12_Days	4		280-112230-C-1-A
5	280-112289-E-1 (8260B_DOD5)	N/A (280-112289-1)	Solid	2		8/13/18	15_Days	4		280-112289-E-1-A
6	320-41149-A-36 (8260B_DOD5)	N/A (320-41149-1)	Solid	2		8/1/18	16_Days	4		320-41149-A-36-A
7	N/A	N/A				N/A	N/A	N/A		
8	N/A	N/A				N/A	N/A	N/A		
9	N/A	N/A				N/A	N/A	N/A		
10	N/A	N/A				N/A	N/A	N/A		
11	N/A	N/A				N/A	N/A	N/A		
12	N/A	N/A				N/A	N/A	N/A		
13	N/A	N/A				N/A	N/A	N/A		
14	N/A	N/A				N/A	N/A	N/A		

MAY CONTAIN RADIOACTIVE MATERIALS
CAT-1
Return all empty sample containers to their original storage location

1311_Z Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 280-423614

Analyst: Bourgery, David F

Batch Open: 7/25/2018 11:55:00AM

Batch End: 7/25/2018 12:55:00PM

HT 8-8

TCLP Extraction 8-6-18 TAW

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	LB3~280-423614/1 N/A	N/A		2		N/A	N/A	N/A	1mL af	LB3 280-423614/1-A
2	LCS~280-423614/2 N/A	N/A		2		N/A	N/A	N/A	1mL af	LCS 280-423614/2-A
3	280-112146-U-2 (8260B)	N/A (280-112146-1)	Water	2		8/6/18	12_Day_Rush	2	used V too 5mL af	280-112146-U-2-A
4	320-41333-A-15 (8260B_DOD5)	N/A (320-41333-1)	Water	2		8/5/18	16_Days	4	used B too 5mL af	320-41333-A-15-A

1311_Z Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 280-424099

Analyst: Bourgery, David F

Batch Open: 7/29/2018 3:42:00PM

Batch End: 7/30/2018 9:30:00AM

TCLP Extraction

HT 872

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	LB~280-424099/1 N/A	N/A		2		N/A	N/A	N/A	8-6-18 Tuesday Sm Lab	LB 280-424099/1-A
2	LCS~280-424099/2 N/A	N/A		2		N/A	N/A	N/A	Sm Lab	LCS 280-424099/2-A
3	280-112363-A-1 N/A	N/A		2		N/A	N/A	N/A		280-112363-A-1-A
4	320-41401-A-1 (8260B_DOD5)	N/A (320-41401-1)	Solid	2		8/9/18	16_Days	4		320-41401-A-1-A
5	320-41554-A-9 (8260B_DOD5)	N/A (320-41554-1)	Solid	2		8/12/18	16_Days	4		320-41554-A-9-A

Sequence Name: C:\msdchem\1\sequence\080218am.s
Comment:
Operator: wickhamt
Data Path: C:\MSDCHEM\1\DATA\080218am\
Instrument Control Pre-Seq Cmd:
Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:
Data Analysis Post-Seq Cmd:

Test America Denver
Instrument: MS1
DV-MS-0010 (8260B/624) (Circle)
Purge Volume: (20mL/5mL/5g) (Circle)
Tune Time: 07:34 - 19:01
Lime Batch: 424541

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

Sequence Barcode Options
(X) On Mismatch, Inject Anyway
( ) On Mismatch, Don't Inject
( ) Barcode Disabled

8-3-18 TAW

Line			Sample Name/Misc Info		
1)	Sample	51	MS1_5070	8260	primer
2)	Sample	100	MS1_5071	BFB	bfb
3)	Sample	100	MS1_5072	BFB	bfb 07:34
4)	Sample	10	MS1_5073	8260	blank
5)	Sample	11	MS1_5074	8260	blank
6)	Sample	12	MS1_5075	8260	std003
7)	Sample	13	MS1_5076	8260	std01
8)	Sample	14	MS1_5077	8260	std02
9)	Sample	15	MS1_5078	8260	std05
10)	Sample	16	MS1_5079	8260	std10
11)	Sample	17	MS1_5080	8260	std30
12)	Sample	18	MS1_5081	8260	std60
13)	Sample	19	MS1_5082	8260	blank
14)	Sample	20	MS1_5083	8260	icv
15)	Sample	21	MS1_5084	8260	std01
16)	Sample	22	MS1_5085	8260	std02
17)	Sample	23	MS1_5086	8260	std05
18)	Sample	24	MS1_5087	8260	icis
19)	Sample	25	MS1_5088	8260	std30
20)	Sample	26	MS1_5089	8260	std60
21)	Sample	27	MS1_5090	8260	blank
22)	Sample	28	MS1_5091	8260	icv
23)	Sample	29	MS1_5092	8260	lcs m
24)	Sample	30	MS1_5093	8260	lcsd m
25)	Sample	31	MS1_5094	8260	lcs s
26)	Sample	32	MS1_5095	8260	lcsd s
27)	Sample	33	MS1_5096	8260	280-112244-C-1E ,DNR,RR dil @2mL
28)	Sample	34	MS1_5097	8260	280-112244-D-2
29)	Sample	35	MS1_5098	8260	280-112244-B-7
30)	Sample	36	MS1_5099	8260	280-112244-D-8
31)	Sample	37	MS1_5100	8260	280-112225-e-2 pH2
32)	Sample	38	MS1_5101	8260	280-112225-d-3 pH2
33)	Sample	39	MS1_5102	8260	ccvc m
34)	Sample	40	MS1_5103	8260	ccvc s 19:01

main ICAL

Supp ICAL

MAIN ICAL
calib ID: 33278
WL: 72600
ICV: 19
good for Q4/Q5

1st level: TAW 8-3-18
2nd level: JC 8/3/18

SUPP ICAL
calib ID: 33279
WL: 72600
ICIS: 23
ICV: 26
good for Q4/Q5 EXCEPT: ethylene oxide -21.8%
tetrahydrothiophene 33%
cis-1,4-dichloro-2-butene -26.8%

TestAmerica Laboratories
Worklist Report

Worklist Name: 080218am
Worklist Number: 72600
Instrument Name: VMS_MS1
Chrom Method: AQ_VMS1_8260
Purge Volume: 20.00
Units: mL
Analysis Type: VOA
Batch Directory: \\ChromNA\Denver\ChromData\VMS_MS1\20180802-72600.b
Upload Directory: \\CorpTALSAPP16\280-DN-RawData\Organics\MS\VMS_MS1
Run Reagent: MV-568718-D_00014
Amount Added: 1.000, Units: uL
Run Reagent: MV-ARCH SS A_00101
Amount Added: 0.980, Units: uL

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072600-001	# 1 BFB	MV-BFB_00026	BFB		voaWater	1.000	uL	1.000
280-0072600-002	# 2 CCV	MV-2cleve+AVA_00036 MV-Main A_00037 MV-Gas/Ket A_00075	CCV		voaWater	20.00	mL	1.000
280-0072600-003	# 3 CCV	MV-Supp A_00031 MV-568718-D_00014	CCV		voaWater	20.00	mL	1.000
280-0072600-004	# 4 LCS	MV-2cleve+AVA_00036 MV-Gas/Ket B_00043	LCS		voaWater	20.00	mL	1.000
280-0072600-005	# 5 LCSD	MV-2cleve+AVA_00036 MV-Gas/Ket B_00043	LCSD		voaWater	20.00	mL	1.000
280-0072600-006	# 6 LCS	MV-Supp B_00021 mv-pentachloB_00008	LCS		voaWater	20.00	mL	1.000
280-0072600-007	# 7 LCSD	MV-Supp B_00021 mv-pentachloB_00008	LCSD		voaWater	20.00	mL	1.000
280-0072600-008	# 8 MB		MB		voaWater	20.00	mL	1.000
280-0072600-009	# 9 280-108595-A-1		Client		voaWater	20.00	mL	1.000
280-0072600-010	#10 280-108595-A-2		Client		voaWater	20.00	mL	1.000
280-0072600-011	#11 280-108595-A-3		Client		voaWater	20.00	mL	1.000
280-0072600-012	#12 std003	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	1	voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072600-013	#13 std01	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	2	voaWater	20.00	mL	1.000
280-0072600-014	#14 std02	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	3	voaWater	20.00	mL	1.000
280-0072600-015	#15 std05	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	4	voaWater	20.00	mL	1.000
280-0072600-016	#16 std10	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	5	voaWater	20.00	mL	1.000
280-0072600-017	#17 std30	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	6	voaWater	20.00	mL	1.000
280-0072600-018	#18 std60	MV-568718-D_00014 MV-Main A_00037 MV-2cleve+AVA_00037 MV-Gas/Ket A_00076	IC	7	voaWater	20.00	mL	1.000
280-0072600-019	#19 icv	MV-568718-D_00014 MV-Main B_00022 MV-SS 2-Cleve_00046 MV-Gas/Ket B_00044	ICV		voaWater	20.00	mL	1.000
280-0072600-020	#20 std01	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	2	voaWater	20.00	mL	1.000
280-0072600-021	#21 std02	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	3	voaWater	20.00	mL	1.000
280-0072600-022	#22 std05	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	4	voaWater	20.00	mL	1.000
280-0072600-023	#23 icis	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	ICIS	5	voaWater	20.00	mL	1.000
280-0072600-024	#24 std30	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	6	voaWater	20.00	mL	1.000
280-0072600-025	#25 std60	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp A_00031	IC	7	voaWater	20.00	mL	1.000
280-0072600-026	#26 icv	MV-568718-D_00014 MV-ARCH SS A_00101 MV-Supp B_00021	ICV		voaWater	20.00	mL	1.000
280-0072600-033	#33 lcs	MV-Gas/Ket B_00044 MV-SS 2-Cleve_00046 MV-Main B_00022	LCS		voaWater	20.00	mL	1.000
280-0072600-034	#34 lcsd	MV-Gas/Ket B_00044 MV-SS 2-Cleve_00046 MV-Main B_00022	LCSD		voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0072600-035	#35 lcs	MV-Supp B_00021	LCS		voaWater	20.00	mL	1.000
280-0072600-036	#36 lcsd	MV-Supp B_00021	LCSD		voaWater	20.00	mL	1.000
280-0072600-037	#37 280-112244-C-1		Client		voaWater	20.00	mL	1.000
280-0072600-038	#38 280-112244-D-2		Client		voaWater	20.00	mL	1.000
280-0072600-039	#39 280-112244-B-7		Client		voaWater	20.00	mL	1.000
280-0072600-040	#40 280-112244-D-8		Client		voaWater	20.00	mL	1.000
280-0072600-041	#41 280-112225-E-2		Client		voaWater	20.00	mL	1.000
280-0072600-042	#42 280-112225-D-3		Client		voaWater	20.00	mL	1.000
280-0072600-043	#43 ccvc	MV-2cleve+AVA_00036 MV-Main A_00037 MV-Gas/Ket A_00075	CCVC		voaWater	20.00	mL	1.000
280-0072600-044	#44 ccvc	MV-Supp A_00031	CCVC		voaWater	20.00	mL	1.000
280-0072600-045	#45 Samp 45		Client		voaWater	20.00	mL	1.000

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Batch Number: 423614 Batch Start Date: 07/25/18 11:55 Batch Analyst: Bourgery, David F

Batch Method: 1311 Batch End Date: 07/25/18 12:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	ExtractFluid	AnalysisComment				
LB3 280-423614/1		1311, 8260B		elga					
LCS 280-423614/2		1311, 8260B		elga					
320-41333-A-15	GRE-IDW-W-01	1311, 8260B	P	elga	used B too				

Batch Notes	
First End time	07/25/18 12:55
First Start time	07/25/18 11:55

Basis	Basis Description
P	TCLP

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Analyst: DB

Date: 7.25.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112146	320-41333	LB3							
Sample No.	2	15								
A. Sample Description										
Number of phases	2	2								
1. Solid	X	X								
2. Liquid	X	X								
a. lighter than water										
b. water	X	X								
c. heavier than water										
B. Percent Solid Phase										
Balance ID	24950431	NCM								
1. Weight of filter (g)	1.17									
2. Weight of subsample										
a. gross weight (g)	1546.99									
b. tare weight (g)	507.40									
c. net weight (g)	1039.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)	1682.58									
b. tare weight (g)	657.91									
c. net weight (g)	1024.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	14.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	1.44	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)	5.77									
b. gross dry weight 2 (g)	1.18									
c. percent dry solids (%)	0.00									
d. Oven Temp (observed) (^oC)	99									
Thermometer Correction Factor	0									
Oven Temp Actual (^oC)	99	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112146	320-41333	LB3							
Sample No.	2	15								
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No										
If yes, write NCM descibing how.										
2. Balance ID										
3. Sample weight, 5.0 +/- 0.1g										
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID										
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing										
b. Stop Time for Mixing										
c. pH reading after mixing										
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**										
a. HCL Lot# used										
b. Pipette ID										
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID										
Termometer Correction Factor										
b. Start Time										
c. Start Temperature (Observed)										
Start Temperature (Actual)	0	0	0	0	0	0	0	0	0	0
d. Finish Time										
e. Finish Temperature (Observed)										
Finish Temperature (Actual)	0	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)										
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1										
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

DV-IP-0012
TCLP/SPLP Worksheet No. 3
Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

Login No.	112146	320-41333	LB3							
Sample No.	2	15								
E. Determination of Sample Size										
1. Particle size reduction? Yes/no										
If yes, write NCM descibing how.										
2. Balance ID										
3. Weight of wet solids after filtration (g)										
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	11-00251	11-00251	11-00251	11-00251						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid										
6. Vol of Fluid = wet solids x 20 (mL)										
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?										
2. Leach start date and time										
3. Leach stop date and time										
4. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate										
Was the sample multiphasic?	FALSE	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112146	320-41333	LB3							
Sample No.	2	15								
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	1	3	1							
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-2cleve+AVA 00037	MV-568718-D 00014	MV-ARCH SS A 00101	MV-BFB 00026
BFB 280-424541/1		8260B		1 uL	1 uL				1 uL
STD003 280-424541/12 IC		8260B		20 mL	20 mL	0.15 uL	1 uL		
STD01 280-424541/13 IC		8260B		20 mL	20 mL	0.5 uL	1 uL		
STD02 280-424541/14 IC		8260B		20 mL	20 mL	1 uL	1 uL		
STD05 280-424541/15 IC		8260B		20 mL	20 mL	2.5 uL	1 uL		
STD10 280-424541/16 IC		8260B		20 mL	20 mL	5 uL	1 uL		
STD30 280-424541/17 IC		8260B		20 mL	20 mL	15 uL	1 uL		
STD60 280-424541/18 IC		8260B		20 mL	20 mL	30 uL	1 uL		
ICV 280-424541/19		8260B		20 mL	20 mL		1 uL		
STD01 280-424541/20 IC		8260B		20 mL	20 mL		1 uL	0.08 uL	
STD02 280-424541/21 IC		8260B		20 mL	20 mL		1 uL	0.16 uL	
STD05 280-424541/22 IC		8260B		20 mL	20 mL		1 uL	0.4 uL	
ICIS 280-424541/23		8260B		20 mL	20 mL		1 uL	0.8 uL	
STD30 280-424541/24 IC		8260B		20 mL	20 mL		1 uL	2.4 uL	
STD60 280-424541/25 IC		8260B		20 mL	20 mL		1 uL	4.8 uL	

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-2cleve+AVA 00037	MV-568718-D 00014	MV-ARCH SS A 00101	MV-BFB 00026
ICV 280-424541/26		8260B		20 mL	20 mL		1 uL	0.8 uL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas/Ket A 00076	MV-Gas/Ket B 00044	MV-Main A 00037	MV-Main B 00022	MV-SS 2-Cleve 00046	MV-Supp A 00031
BFB 280-424541/1		8260B							
STD003 280-424541/12 IC		8260B		0.15 uL		0.15 uL			
STD01 280-424541/13 IC		8260B		0.5 uL		0.5 uL			
STD02 280-424541/14 IC		8260B		1 uL		1 uL			
STD05 280-424541/15 IC		8260B		2.5 uL		2.5 uL			
STD10 280-424541/16 IC		8260B		5 uL		5 uL			
STD30 280-424541/17 IC		8260B		15 uL		15 uL			
STD60 280-424541/18 IC		8260B		30 uL		30 uL			
ICV 280-424541/19		8260B			5 uL		5 uL	5 uL	
STD01 280-424541/20 IC		8260B							0.5 uL
STD02 280-424541/21 IC		8260B							1 uL
STD05 280-424541/22 IC		8260B							2.5 uL
ICIS 280-424541/23		8260B							5 uL

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas/Ket A 00076	MV-Gas/Ket B 00044	MV-Main A 00037	MV-Main B 00022	MV-SS 2-Cleve 00046	MV-Supp A 00031
STD30 280-424541/24 IC		8260B							15 uL
STD60 280-424541/25 IC		8260B							30 uL
ICV 280-424541/26		8260B							

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Supp B 00021					
BFB 280-424541/1		8260B							
STD003 280-424541/12 IC		8260B							
STD01 280-424541/13 IC		8260B							
STD02 280-424541/14 IC		8260B							
STD05 280-424541/15 IC		8260B							
STD10 280-424541/16 IC		8260B							
STD30 280-424541/17 IC		8260B							
STD60 280-424541/18 IC		8260B							
ICV 280-424541/19		8260B							
STD01 280-424541/20 IC		8260B							
STD02 280-424541/21 IC		8260B							

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Batch Number: 424541 Batch Start Date: 08/02/18 07:34 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Supp B 00021					
STD05 280-424541/22 IC		8260B							
ICIS 280-424541/23		8260B							
STD30 280-424541/24 IC		8260B							
STD60 280-424541/25 IC		8260B							
ICV 280-424541/26		8260B		5 uL					

Batch Notes	

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Batch Number: 424938 Batch Start Date: 08/06/18 07:02 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-2cleve+AVA 00036	MV-568718-D 00014	MV-ARCH SS A 00101	MV-BFB 00026
BFB 280-424938/1		8260B		1 uL	1 uL				1 uL
CCV 280-424938/2		8260B		20 mL	20 mL	5 uL	1 uL	0.98 uL	
CCV 280-424938/3		8260B		20 mL	20 mL		1 uL		
LCS 280-423614/2-A		8260B		2 mL	20 mL		1 uL	0.98 uL	
LB3 280-423614/1-A		8260B		2 mL	20 mL		1 uL	0.98 uL	
320-41333-A-15-A	GRE-IDW-W-01	8260B	P	2 mL	20 mL		1 uL	0.98 uL	
320-41333-A-15-A MS	GRE-IDW-W-01	8260B	P	2 mL	20 mL		1 uL	0.98 uL	
320-41333-A-15-A MSD	GRE-IDW-W-01	8260B	P	2 mL	20 mL		1 uL	0.98 uL	
CCVC 280-424938/33		8260B		20 mL	20 mL	5 uL	1 uL	0.98 uL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas/Ket A 00075	MV-Gas/Ket B 00043	MV-Main A 00037	MV-Main B 00022	MV-SS 2-Cleve 00046	MV-Supp A 00031
BFB 280-424938/1		8260B							
CCV 280-424938/2		8260B		5 uL		5 uL			
CCV 280-424938/3		8260B							5 uL
LCS 280-423614/2-A		8260B			2.5 uL		2.5 uL	2.5 uL	
LB3 280-423614/1-A		8260B							
320-41333-A-15-A	GRE-IDW-W-01	8260B	P						
320-41333-A-15-A MS	GRE-IDW-W-01	8260B	P		2.5 uL		2.5 uL	2.5 uL	
320-41333-A-15-A MSD	GRE-IDW-W-01	8260B	P		2.5 uL		2.5 uL	2.5 uL	
CCVC 280-424938/33		8260B		5 uL		5 uL			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 320-41333-1

SDG No.:

Batch Number: 424938 Batch Start Date: 08/06/18 07:02 Batch Analyst: Wickham, Tom A

Batch Method: 8260B Batch End Date:

Batch Notes	

Basis	Basis Description
P	TCLP

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by Method PFAS_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBS #	PFHpA #	PFHxS #	PFOA #	PFNA #	PFOS #
GRE09-SD1-01	320-41333-11	95	99	104	90	93	93
GRE09-SD1-01 DL	320-41333-11 DL	83	81	85	87	92	84
	MB 320-236486/1-A	79	84	86	82	83	79
	LCS 320-236486/2-A	74	85	85	81	84	79

	QC LIMITS
PFBS = 13C3-PFBS	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFOS = 13C4 PFOS	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBS #	PFHpA #	PFHxS #	PFOA #	PFNA #	PFOS #
7-MW28-PRL07-01	320-41333-1	77	54	64	64	90	89
7-MW28-PRL07-01 DL	320-41333-1 DL	61	61	59	68	63	57
7-MW1-PRL06-01	320-41333-2	137	64	65	80	197 Q	185 Q
7-MW1-PRL06-01 DL	320-41333-2 DL	115 M	83	89	81	86	75
8-MW14-PRL04-01	320-41333-3	58	60	58	66	65	59
GRE-ER-MW-01	320-41333-4	78	74	76	75	78	77
8-MW12-PRL03-01	320-41333-5	92	65	74	64	85	90
8-MW12-PRL03-01 DL	320-41333-5 DL	57	63	57	64	61	52
7-MW04-PRL04-01	320-41333-6	58	63	65	69	67	61
7-MW04-PRL04-01D	320-41333-7	66	62	68	68	72	71
GRE-ER-SD-01	320-41333-8	70	73	72	78	74	71
GRE-ER-SW-01	320-41333-9	61	66	62	71	67	60
GRE09-SW1-01	320-41333-10	112	70	66	59	76	89
GRE09-SW1-01 DL	320-41333-10 DL	74 M	61	59	63	62	59
7-MW34-PRL06-01	320-41333-12	59	51	57	56	62	58
7-MW34-PRL06-01 DL	320-41333-12 DL	52 M	58	51	55	54	45 Q
MW-GRE10-01-01	320-41333-13	69	78	76	81	79	70
MW-GRE03-01-01	320-41333-14	68	74	70	78	72	68
GRE-RB-01	320-41333-16	64	70	67	71	71	64
MW-GRE08-01-01	320-41333-17	66	63	68	62	64	65
MW-GRE08-01-01 DL	320-41333-17 DL	51	60	58	62	60	52
	MB 320-235966/1-A	70	75	70	79	74	68
	LCS 320-235966/2-A	70	75	70	77	75	69
8-MW12-PRL03-01 MS	320-41333-5 MS	96	68	75	61	83	91
8-MW12-PRL03-01 MS DL	320-41333-5 MS DL	63	62	60	63	64	55
8-MW12-PRL03-01 MSD	320-41333-5 MSD	96	72	78	65	89	97
8-MW12-PRL03-01 MSD DL	320-41333-5 MSD DL	61 M	65	62	68	66	59

	QC LIMITS
PFBS = 13C3-PFBS	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFOS = 13C4 PFOS	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.03LLA_014.d

Lab ID: LCS 320-235966/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	40.0	39.4	98	80-113	
Perfluorooctanoic acid (PFOA)	40.0	39.2	98	80-107	
Perfluorononanoic acid (PFNA)	40.0	38.7	97	83-113	
13C3-PFBS	93.0	65.5	70	50-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9	101	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.1	91	81-106	
Perfluorooctanesulfonic acid (PFOS)	37.1	35.5	96	82-112	
13C4-PFHpA	100	74.7	75	50-150	
13C4 PFOA	100	77.1	77	50-150	
13C5 PFNA	100	74.6	75	50-150	
18O2 PFHxS	94.6	66.6	70	50-150	
13C4 PFOS	95.6	65.7	69	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 2018.08.05LLA_032.d

Lab ID: LCS 320-236486/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	2.00	1.74	87	76-124	
Perfluorooctanoic acid (PFOA)	2.00	1.80	90	76-121	
Perfluorononanoic acid (PFNA)	2.00	1.82	91	74-126	
13C3-PFBS	4.65	3.45	74	50-150	
Perfluorobutanesulfonic acid (PFBS)	1.77	1.73	98	73-142	
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.54	85	75-121	
Perfluorooctanesulfonic acid (PFOS)	1.86	1.77	95	69-131	
13C4-PFHpA	5.00	4.27	85	50-150	
13C4 PFOA	5.00	4.03	81	50-150	
13C5 PFNA	5.00	4.18	84	50-150	
18O2 PFHxS	4.73	4.00	85	50-150	
13C4 PFOS	4.78	3.76	79	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.07.28LLB_050.d

Lab ID: 320-41333-5 MS Client ID: 8-MW12-PRL03-01 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	32.5	660	672	31	80-113	E 4
Perfluorooctanoic acid (PFOA)	32.5	670	765	279	80-107	E 4
Perfluorononanoic acid (PFNA)	32.5	48	82.7	105	83-113	
13C3-PFBS	75.6	68	72.7	96	50-150	
Perfluorobutanesulfonic acid (PFBS)	28.7	130	158	91	87-120	4
Perfluorohexanesulfonic acid (PFHxS)	29.6	1400	1460	206	81-106	E 4
Perfluorooctanesulfonic acid (PFOS)	30.2	1000	1070	124	82-112	E 4
13C4-PFHpA	81.3	52	55.4	68	50-150	
13C4 PFOA	81.3	51	49.8	61	50-150	
13C5 PFNA	81.3	68	67.8	83	50-150	
18O2 PFHxS	76.9	56	57.4	75	50-150	
13C4 PFOS	77.7	69	71.0	91	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.03LLA_020.d

Lab ID: 320-41333-5 MS DL Client ID: 8-MW12-PRL03-01 MS DL

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	32.5	630	755	400	80-113	4 D
Perfluorooctanoic acid (PFOA)	32.5	760	866	315	80-107	4 D
Perfluorononanoic acid (PFNA)	32.5	54	91.2	115	83-113	J1 D
13C3-PFBS	75.6	42	47.7	63	50-150	
Perfluorobutanesulfonic acid (PFBS)	28.7	140	158	53	87-120	4 D
Perfluorohexanesulfonic acid (PFHxS)	29.6	2100	2100	84	81-106	4 D
Perfluorooctanesulfonic acid (PFOS)	30.2	1100	1160	65	82-112	4 D M
13C4-PFHpA	81.3	50	50.4	62	50-150	
13C4 PFOA	81.3	51	51.0	63	50-150	
13C5 PFNA	81.3	49	52.2	64	50-150	
18O2 PFHxS	76.9	43	46.2	60	50-150	
13C4 PFOS	77.7	40	42.7	55	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.07.28LLB_051.d

Lab ID: 320-41333-5 MSD Client ID: 8-MW12-PRL03-01 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	32.7	628	-105	7	30	80-113	E 4
Perfluorooctanoic acid (PFOA)	32.8	688	43	11	30	80-107	E 4
Perfluorononanoic acid (PFNA)	32.7	92.7	135	11	30	83-113	J1
13C3-PFBS	76.1	73.2	96			50-150	
Perfluorobutanesulfonic acid (PFBS)	28.9	163	107	3	30	87-120	4
Perfluorohexanesulfonic acid (PFHxS)	29.8	1370	-102	6	30	81-106	E 4
Perfluorooctanesulfonic acid (PFOS)	30.4	997	-135	8	30	82-112	E 4
13C4-PFHpA	81.9	58.7	72			50-150	
13C4 PFOA	81.9	53.3	65			50-150	
13C5 PFNA	81.9	72.6	89			50-150	
18O2 PFHxS	77.4	60.7	78			50-150	
13C4 PFOS	78.3	75.5	97			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.03LLA_021.d

Lab ID: 320-41333-5 MSD DL Client ID: 8-MW12-PRL03-01 MSD DL

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	32.7	683	175	10	30	80-113	4 D
Perfluorooctanoic acid (PFOA)	32.8	792	85	9	30	80-107	4 D
Perfluorononanoic acid (PFNA)	32.7	95.9	128	5	30	83-113	J1 D
13C3-PFBS	76.1	46.2	61			50-150	M
Perfluorobutanesulfonic acid (PFBS)	28.9	169	90	7	30	87-120	4 D
Perfluorohexanesulfonic acid (PFHxS)	29.8	1940	-443	8	30	81-106	4 D
Perfluorooctanesulfonic acid (PFOS)	30.4	1070	-226	8	30	82-112	4 D M
13C4-PFHpA	81.9	53.6	65			50-150	
13C4 PFOA	81.9	55.5	68			50-150	
13C5 PFNA	81.9	53.8	66			50-150	
18O2 PFHxS	77.4	47.7	62			50-150	
13C4 PFOS	78.3	46.0	59			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab File ID: 2018.08.03LLA_013.d Lab Sample ID: MB 320-235966/1-A

Matrix: Water Date Extracted: 07/24/2018 17:51

Instrument ID: A8_N Date Analyzed: 08/03/2018 06:24

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
7-MW28-PRL07-01	320-41333-1	2018.07.28L LB_045.d	07/29/2018 05:35
7-MW1-PRL06-01	320-41333-2	2018.07.28L LB_046.d	07/29/2018 05:43
GRE-ER-MW-01	320-41333-4	2018.07.28L LB_048.d	07/29/2018 05:58
8-MW12-PRL03-01	320-41333-5	2018.07.28L LB_049.d	07/29/2018 06:06
8-MW12-PRL03-01 MS	320-41333-5 MS	2018.07.28L LB_050.d	07/29/2018 06:14
8-MW12-PRL03-01 MSD	320-41333-5 MSD	2018.07.28L LB_051.d	07/29/2018 06:22
7-MW04-PRL04-01D	320-41333-7	2018.07.28L LB_054.d	07/29/2018 06:45
GRE09-SW1-01	320-41333-10	2018.07.28L LB_057.d	07/29/2018 07:09
7-MW34-PRL06-01	320-41333-12	2018.07.28L LB_058.d	07/29/2018 07:17
MW-GRE08-01-01	320-41333-17	2018.07.28L LB_062.d	07/29/2018 07:48
	LCS 320-235966/2-A	2018.08.03L LA_014.d	08/03/2018 06:32
7-MW28-PRL07-01 DL	320-41333-1 DL	2018.08.03L LA_015.d	08/03/2018 06:40
8-MW14-PRL04-01	320-41333-3	2018.08.03L LA_018.d	08/03/2018 07:03
8-MW12-PRL03-01 DL	320-41333-5 DL	2018.08.03L LA_019.d	08/03/2018 07:11
8-MW12-PRL03-01 MS DL	320-41333-5 MS DL	2018.08.03L LA_020.d	08/03/2018 07:19
8-MW12-PRL03-01 MSD DL	320-41333-5 MSD DL	2018.08.03L LA_021.d	08/03/2018 07:27
7-MW04-PRL04-01	320-41333-6	2018.08.03L LA_022.d	08/03/2018 07:35
GRE-ER-SD-01	320-41333-8	2018.08.03L LA_025.d	08/03/2018 07:58
GRE-ER-SW-01	320-41333-9	2018.08.03L LA_026.d	08/03/2018 08:06
7-MW34-PRL06-01 DL	320-41333-12 DL	2018.08.03L LA_028.d	08/03/2018 08:21
MW-GRE10-01-01	320-41333-13	2018.08.03L LA_029.d	08/03/2018 08:29
MW-GRE03-01-01	320-41333-14	2018.08.03L LA_030.d	08/03/2018 08:37

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab File ID: 2018.08.03LLA_013.d Lab Sample ID: MB 320-235966/1-A

Matrix: Water Date Extracted: 07/24/2018 17:51

Instrument ID: A8_N Date Analyzed: 08/03/2018 06:24

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
GRE-RB-01	320-41333-16	2018.08.03LLA_031.d	08/03/2018 08:45
MW-GRE08-01-01 DL	320-41333-17 DL	2018.08.03LLA_032.d	08/03/2018 08:53
7-MW1-PRL06-01 DL	320-41333-2 DL	2018.08.07LLBB_067.d	08/07/2018 22:50
GRE09-SW1-01 DL	320-41333-10 DL	2018.08.07LLBB_068.d	08/07/2018 22:58

FORM IV EPA 537 (Mod)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab File ID: 2018.08.05LLA_031.d Lab Sample ID: MB 320-236486/1-A

Matrix: Solid Date Extracted: 07/27/2018 10:32

Instrument ID: A8_N Date Analyzed: 08/06/2018 03:27

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-236486/2-A	2018.08.05LLA_032.d	08/06/2018 03:35
GRE09-SD1-01	320-41333-11	2018.08.05LLA_033.d	08/06/2018 03:43
GRE09-SD1-01 DL	320-41333-11 DL	2018.08.07LLBB_019.d	08/07/2018 16:34

FORM IV EPA 537 (Mod)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Sample No.: IC 320-235668/5 Date Analyzed: 07/23/2018 16:34

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.23LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 40279

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		4466345	2.59				
UPPER LIMIT		6699518	2.79				
LOWER LIMIT		2233173	2.39				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-235668/9		4552759	2.59				
ICV 320-235668/10		4558188	2.58				
CCV 320-236782/3 CCVIS		3848995	2.59				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Sample No.: CCV 320-236782/3 Date Analyzed: 07/29/2018 05:11

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.07.28LLB_042.d Heated Purge: (Y/N) N

Calibration ID: 40279

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3848995	2.59				
UPPER LIMIT		5773493	2.79				
LOWER LIMIT		1924498	2.39				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-236782/1		3705730	2.58				
CCVL 320-236782/2		3966670	2.59				
320-41333-1	7-MW28-PRL07-01	4345591	2.59				
320-41333-2	7-MW1-PRL06-01	2093153	2.60				
320-41333-4	GRE-ER-MW-01	5320614	2.59				
320-41333-5	8-MW12-PRL03-01	3850482	2.59				
320-41333-5 MS	8-MW12-PRL03-01 MS	3696449	2.59				
320-41333-5 MSD	8-MW12-PRL03-01 MSD	3765230	2.58				
CCV 320-236782/14		3634952	2.59				
320-41333-7	7-MW04-PRL04-01D	5668608	2.59				
320-41333-10	GRE09-SW1-01	2883582	2.59				
320-41333-12	7-MW34-PRL06-01	5090709	2.59				
320-41333-17	MW-GRE08-01-01	5585915	2.58				
CCV 320-236782/24		3790816	2.59				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Sample No.: IC 320-237402/5 Date Analyzed: 08/01/2018 13:22

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.08.01LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 40449

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		3424441	2.58				
UPPER LIMIT		5136662	2.78				
LOWER LIMIT		1712221	2.38				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-237402/9		3483672	2.58				
ICV 320-237402/10		3437702	2.57				
CCV 320-237767/3 CCVIS		3501317	2.60				
CCV 320-238089/3 CCVIS		3439312	2.55				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Sample No.: CCV 320-237767/3 Date Analyzed: 08/03/2018 05:29

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.08.03LLA_006.d Heated Purge: (Y/N) N

Calibration ID: 40449

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3501317	2.60				
UPPER LIMIT		5251976	2.80				
LOWER LIMIT		1750659	2.40				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-237767/1		3290653	2.60				
CCVL 320-237767/2		3919106	2.60				
CCV 320-237784/1		3652495	2.60				
MB 320-235966/1-A		4292266	2.60				
LCS 320-235966/2-A		4332369	2.60				
320-41333-1 DL	7-MW28-PRL07-01 DL	377193Q	2.60				
320-41333-3	8-MW14-PRL04-01	4646377	2.61				
320-41333-5 DL	8-MW12-PRL03-01 DL	269223Q	2.60				
320-41333-5 MS DL	8-MW12-PRL03-01 MS DL	275534Q	2.62				
320-41333-5 MSD DL	8-MW12-PRL03-01 MSD DL	290898Q	2.62				
320-41333-6	7-MW04-PRL04-01	4635786	2.61				
CCV 320-237784/12		3399258	2.61				
CCV 320-237784/13		3421631	2.62				
320-41333-8	GRE-ER-SD-01	4180085	2.61				
320-41333-9	GRE-ER-SW-01	4719639	2.61				
320-41333-12 DL	7-MW34-PRL06-01 DL	489984Q	2.62				
320-41333-13	MW-GRE10-01-01	4210984	2.63				
320-41333-14	MW-GRE03-01-01	4394836	2.63				
320-41333-16	GRE-RB-01	4523340	2.64				
320-41333-17 DL	MW-GRE08-01-01 DL	1081296Q	2.64				
CCV 320-237784/22		3457069	2.63				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Sample No.: CCV 320-238089/3 Date Analyzed: 08/06/2018 00:12

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.08.05LLA_006.d Heated Purge: (Y/N) N

Calibration ID: 40449

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3439312	2.55				
UPPER LIMIT		5158968	2.75				
LOWER LIMIT		1719656	2.35				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-238089/1		3360403	2.55				
CCVL 320-238089/2		3508216	2.55				
CCV 320-238093/1		3388818	2.55				
MB 320-236486/1-A		3812374	2.55				
LCS 320-236486/2-A		4066543	2.55				
320-41333-11	GRE09-SD1-01	2822523	2.55				
CCV 320-238093/10		3022318	2.56				
CCV 320-238093/21		3420273	2.56				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Sample No.: IC 320-238193/5 Date Analyzed: 08/06/2018 11:33

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.08.06LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 40493

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		3997336	2.57				
UPPER LIMIT		5996004	2.77				
LOWER LIMIT		1998668	2.37				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-238193/9		4092642	2.57				
ICV 320-238193/10		3797956	2.57				
CCV 320-238519/3 CCVIS		4015152	2.57				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Sample No.: CCV 320-238519/3 Date Analyzed: 08/07/2018 14:53

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.08.07LLB_006.d Heated Purge: (Y/N) N

Calibration ID: 40493

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4015152	2.57				
UPPER LIMIT		6022728	2.77				
LOWER LIMIT		2007576	2.37				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 320-238576/1		4211015	2.57				
320-41333-11 DL	GRE09-SD1-01 DL	2358044	2.58				
CCV 320-238576/11		3846870	2.57				
CCV 320-238595/1		3645178	2.57				
320-41333-2 DL	7-MW1-PRL06-01 DL	46919Q	2.57				
320-41333-10 DL	GRE09-SW1-01 DL	114399Q	2.58				
CCV 320-238595/4		3938886	2.57				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 7-MW28-PRL07-01 | Lab Sample ID: 320-41333-1

Matrix: Water | Lab File ID: 2018.07.28LLB_045.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/16/2018 11:27

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 302.9(mL) | Date Analyzed: 07/29/2018 05:35

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*750*	*E*	*1.7*	1.2	*0.50*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*550*	*E*	*1.7*	1.2	*0.45*
375-95-1	Perfluorononanoic acid (PFNA)	3.0		1.7	1.2	0.43
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*800*	*E*	*1.7*	0.83	*0.38*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*2100*	*E*	*1.7*	0.83	*0.31*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	250		3.3	2.5	0.91

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	77		50-150
STL01892	13C4-PFHpA	54		50-150
STL00990	13C4 PFOA	64		50-150
STL00995	13C5 PFNA	90		50-150
STL00994	18O2 PFHxS	64		50-150
STL00991	13C4 PFOS	89		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_045.d
Lims ID: 320-41333-A-1-A
Client ID: 7-MW28-PRL07-01
Sample Type: Client
Inject. Date: 29-Jul-2018 05:35:14 ALS Bottle#: 34 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-1-
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:16:45 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:17:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.675	-0.009	0.644	65871	1.79		76.8	163	
5 Perfluorobutanesulfonic acid										E
298.90 > 80.00	1.666	1.676	-0.010	1.000	54334413	24.2			9048	E
298.90 > 99.00	1.666	1.676	-0.010	1.000	30382115		1.79(1.25-3.74)		38897	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.229	0.0	0.861	2279580	1.34		53.6	67755	
10 Perfluoroheptanoic acid										E
363.00 > 319.00	2.229	2.230	-0.001	1.000	22731807	22.6			23230	E
363.00 > 169.00	2.229	2.230	-0.001	1.000	8986344		2.53(1.13-3.40)		68435	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.241	0.0	0.866	3290089	1.51		63.7	37854	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.241	2.242	-0.001	1.000	101821409	62.7			30022	E
399.00 > 99.00	2.241	2.242	-0.001	1.000	44593423		2.28(1.50-4.49)		41824	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	1.000	2656313	1.60		63.9	51569	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.590	-0.002		4345591	2.50			67911	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.588	2.590	-0.002	1.000	21612004	16.8			12313	E
413.00 > 169.00	2.588	2.590	-0.002	1.000	12956357		1.67(0.84-2.52)		40203	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.954	2.950	0.004	1.002	11337253	7.63			21358	
499.00 > 99.00	2.948	2.950	-0.002	1.000	2403709		4.72(2.31-6.93)		18937	
20 Perfluorononanoic acid										
463.00 > 419.00	2.954	2.950	0.004	1.002	135835	0.0921			159	
463.00 > 169.00	2.954	2.950	0.004	1.002	30816		4.41(1.90-5.69)		148	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.953	-0.005	1.139	3229656	2.25		90.1	53424	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.953	-0.005	1.139	3214311	2.12		88.6	19589	

QC Flag Legend

Processing Flags

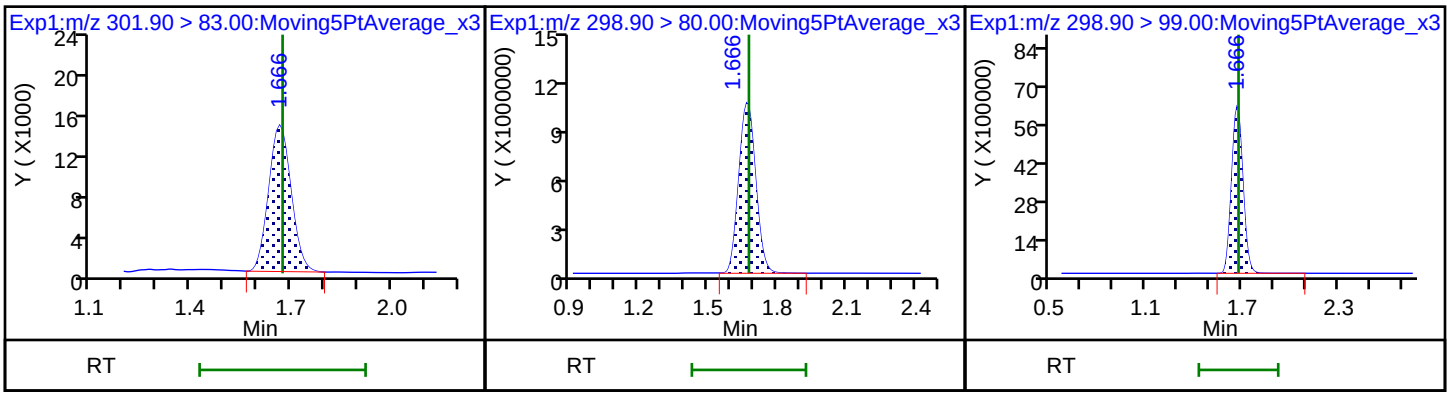
E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 12:17:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

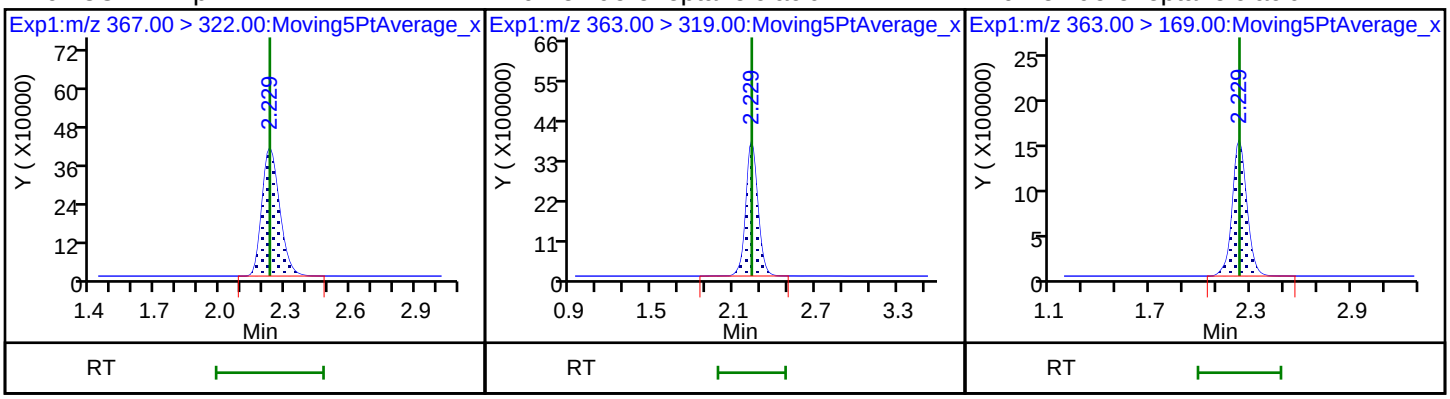
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_045.d				
Injection Date:	29-Jul-2018 05:35:14	Instrument ID:	A8_N		
Lims ID:	320-41333-A-1-A	Lab Sample ID:	320-41333-1		
Client ID:	7-MW28-PRL07-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	34	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

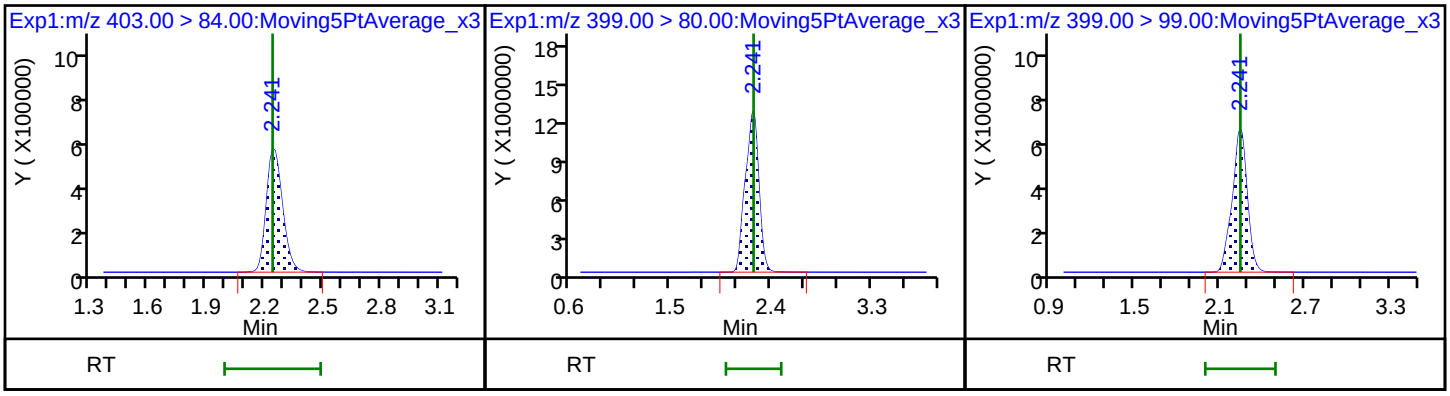
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



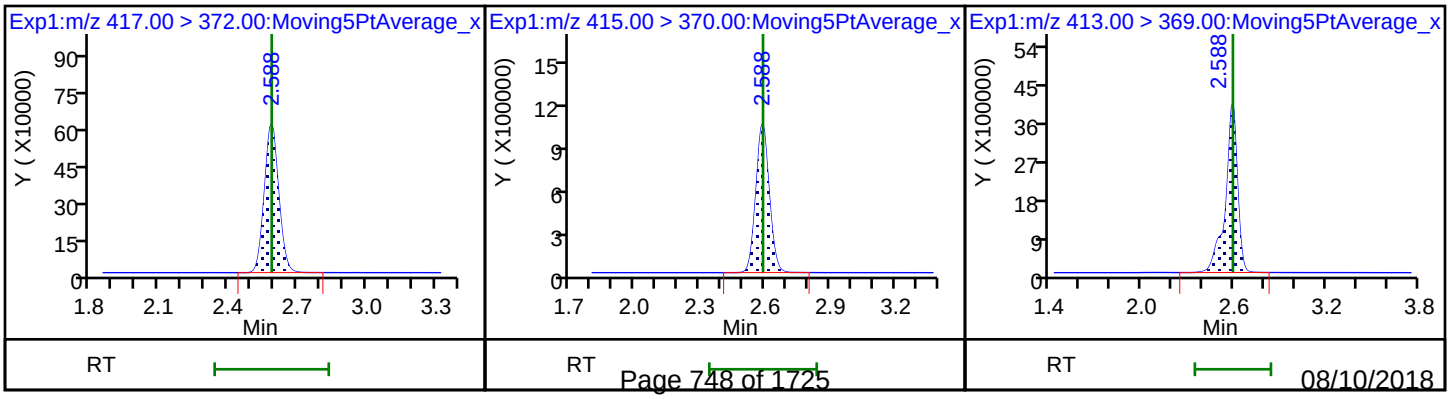
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



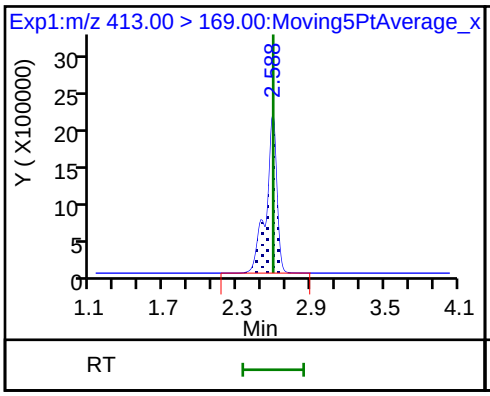
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



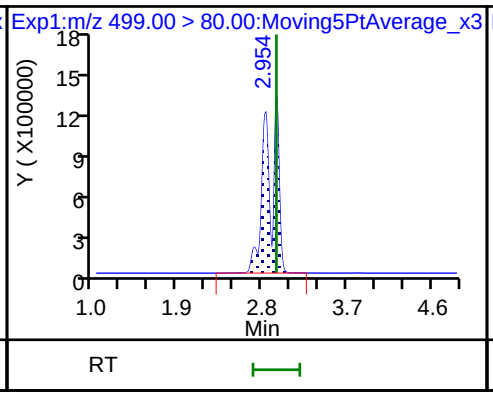
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid



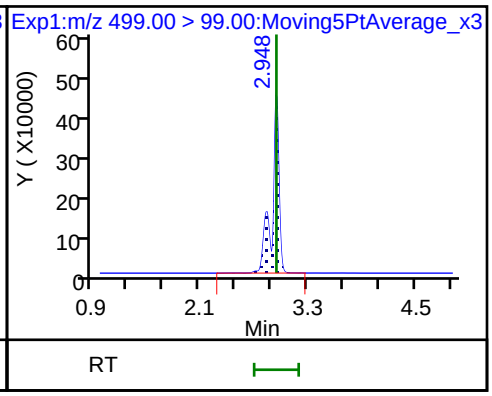
15 Perfluorooctanoic acid



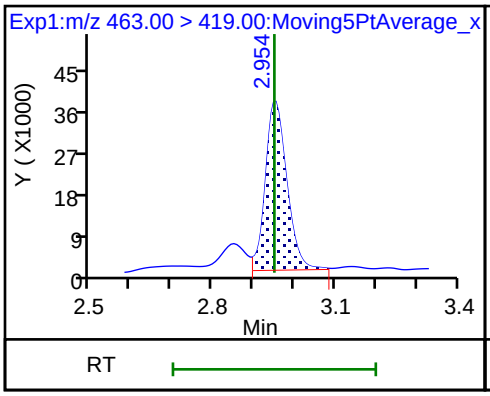
17 Perfluorooctane sulfonic acid



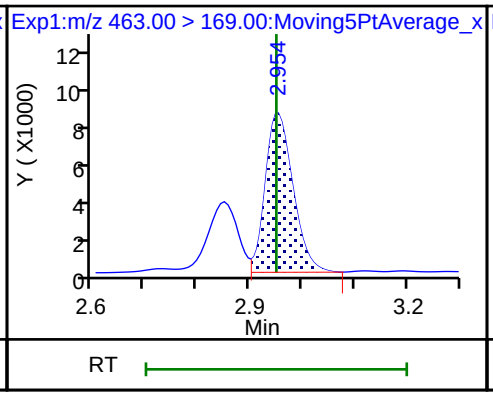
17 Perfluorooctane sulfonic acid



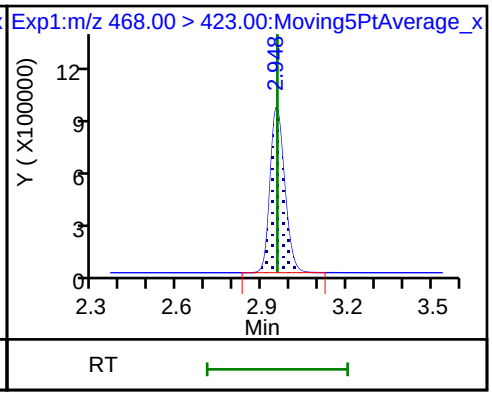
20 Perfluorononanoic acid



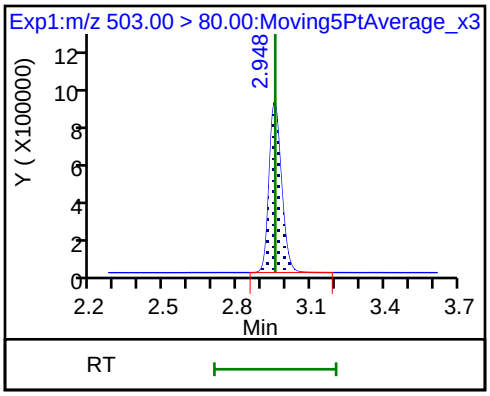
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 7-MW28-PRL07-01 DL | Lab Sample ID: 320-41333-1 DL

Matrix: Water | Lab File ID: 2018.08.03LLA_015.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/16/2018 11:27

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 302.9(mL) | Date Analyzed: 08/03/2018 06:40

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237784 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	730	D	33	25	10
335-67-1	Perfluorooctanoic acid (PFOA)	550	D	33	25	8.9
375-95-1	*Perfluorononanoic acid (PFNA)*	*25*	*U*	*33*	25	*8.6*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1300	D	33	17	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3200	D	33	17	6.3
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*240*	*D*	*66*	50	*18*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	61		50-150
STL01892	13C4-PFHpA	61		50-150
STL00990	13C4 PFOA	68		50-150
STL00995	13C5 PFNA	63		50-150
STL00994	18O2 PFHxS	59		50-150
STL00991	13C4 PFOS	57		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_015.d
Lims ID: 320-41333-A-1-A
Client ID: 7-MW28-PRL07-01
Sample Type: Client
Inject. Date: 03-Aug-2018 06:40:17 ALS Bottle#: 22 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-41333-a-1-a 20X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:16:14 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:17:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.689	1.690	-0.001	0.649	5840	0.0710		61.1	25.7	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.689	1.692	-0.003	1.000	7823707	2.03			5685	
298.90 > 99.00	1.689	1.692	-0.003	1.000	3326774		2.35(1.25-3.74)		11525	
D 9 13C4-PFHpA										
367.00 > 322.00	2.250	2.251	-0.001	0.865	228174	0.0761		60.8	7762	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.250	2.253	-0.003	1.000	2354987	1.11			1388	
363.00 > 169.00	2.250	2.253	-0.003	1.000	860527		2.74(1.13-3.40)		11544	
D 11 18O2 PFHxS										
403.00 > 84.00	2.264	2.264	0.0	0.870	316316	0.0702		59.3	10548	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.264	2.266	-0.002	1.000	15010784	4.85			17490	
399.00 > 99.00	2.264	2.266	-0.002	1.000	4922409		3.05(1.50-4.49)		8223	
D 14 13C4 PFOA										
417.00 > 372.00	2.602	2.602	0.0	1.000	246507	0.0851		68.1	9491	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.602	2.611	-0.009	1.000	1911541	0.8384			1291	
413.00 > 169.00	2.602	2.611	-0.009	1.000	1100470		1.74(0.84-2.52)		7444	
* 62 13C2-PFOA										s
415.00 > 370.00	2.602	2.611	-0.009		377193	0.1250			12460	
D 19 13C5 PFNA										
468.00 > 423.00	2.964	2.964	0.0	1.139	200027	0.0792		63.4	8866	
D 18 13C4 PFOS										
503.00 > 80.00	2.964	2.964	0.0	1.139	212869	0.0684		57.2	4057	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.964	2.973	-0.009	1.000	740754	0.3704			4008	
499.00 > 99.00	2.964	2.973	-0.009	1.000	164443		4.50(2.31-6.93)		1934	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										
463.00 > 419.00	2.964	2.979	-0.015	1.000	6615	0.003828			22.3	
463.00 > 169.00	2.971	2.979	-0.008	1.002	2823		2.34(1.90-5.69)		105	

QC Flag Legend

Processing Flags

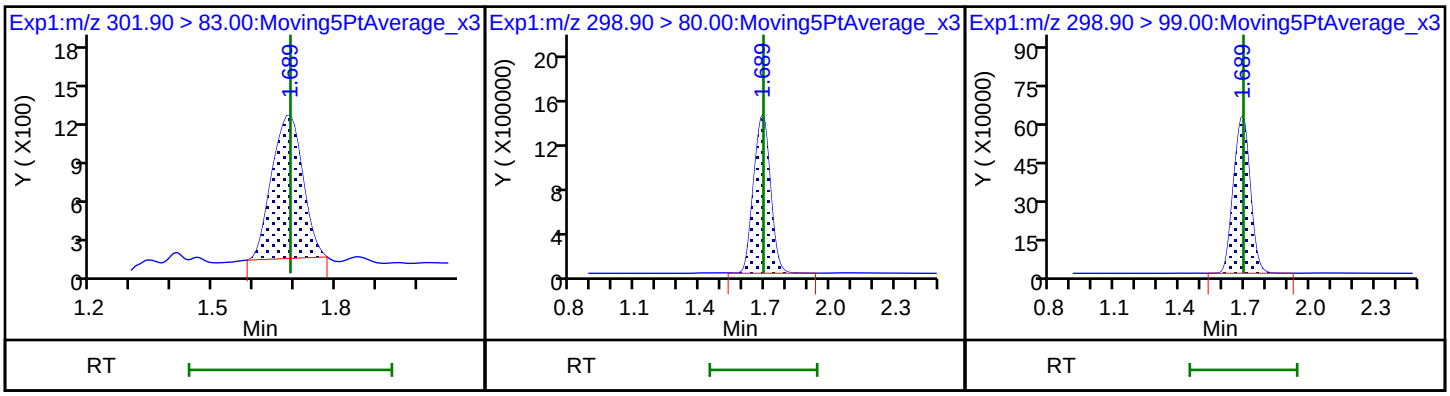
s - Failed ISTD Recovery Test

Report Date: 06-Aug-2018 11:17:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

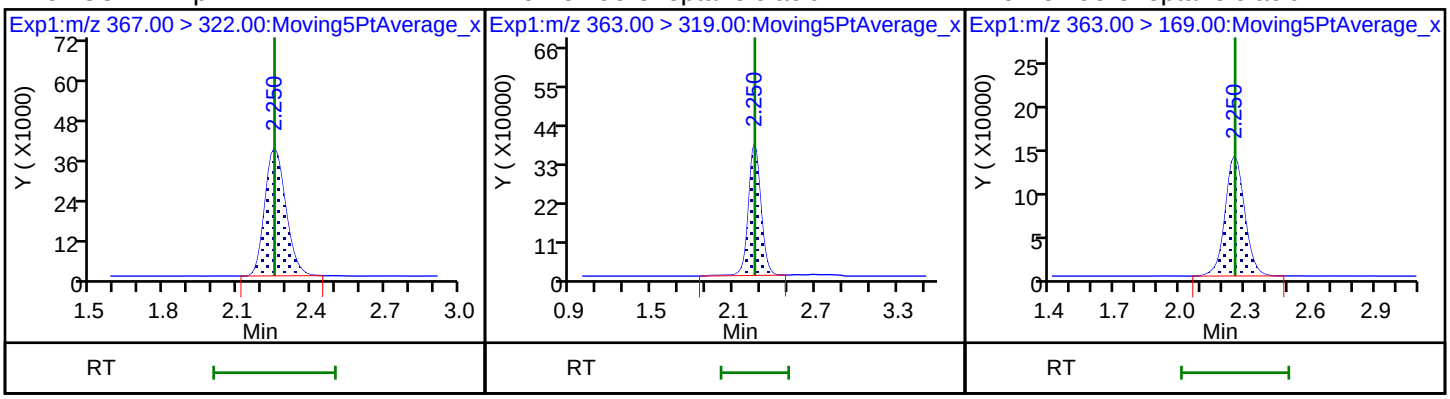
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_015.d				
Injection Date:	03-Aug-2018 06:40:17	Instrument ID:	A8_N		
Lims ID:	320-41333-A-1-A	Lab Sample ID:	320-41333-1		
Client ID:	7-MW28-PRL07-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	22	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

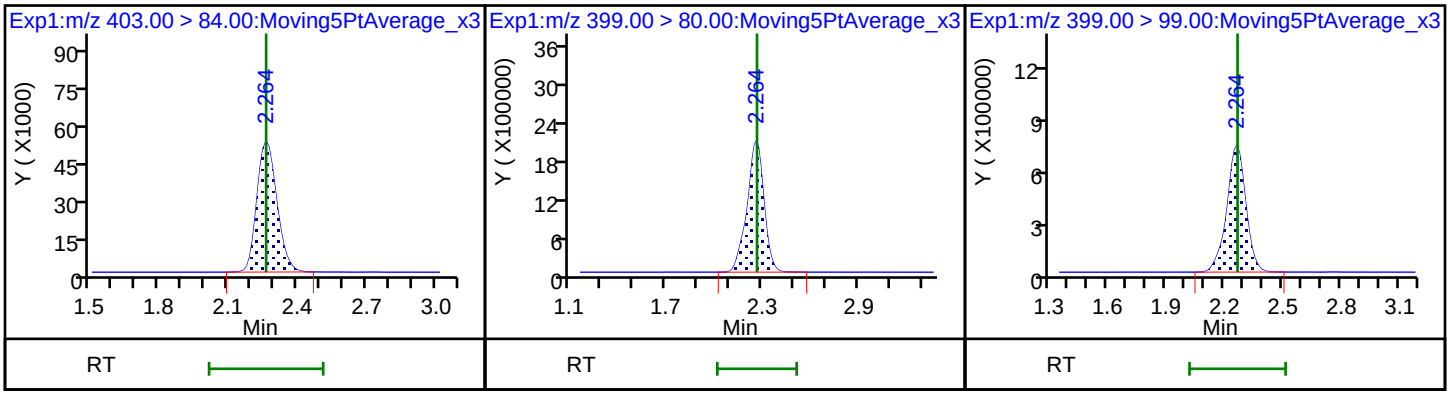
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



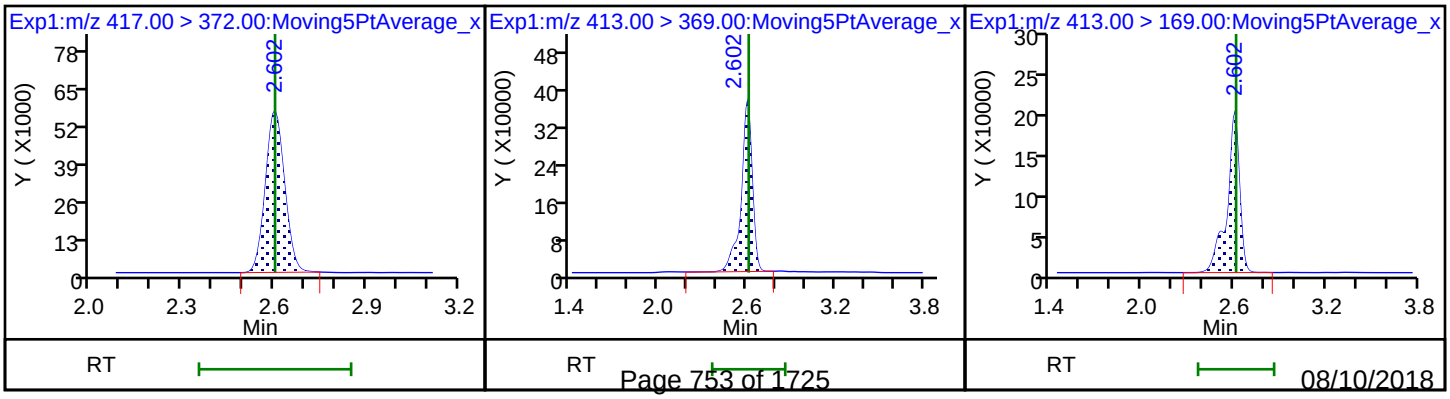
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



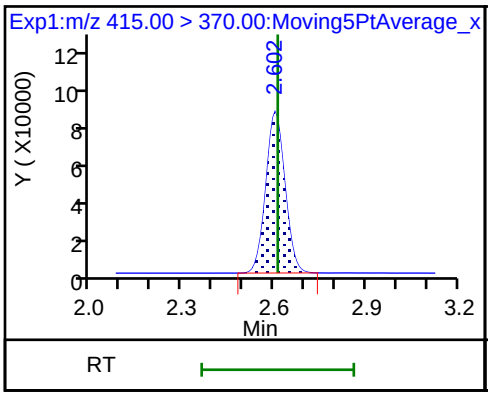
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



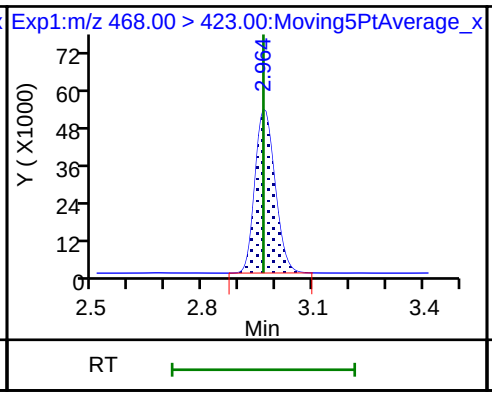
D 14 13C4 PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



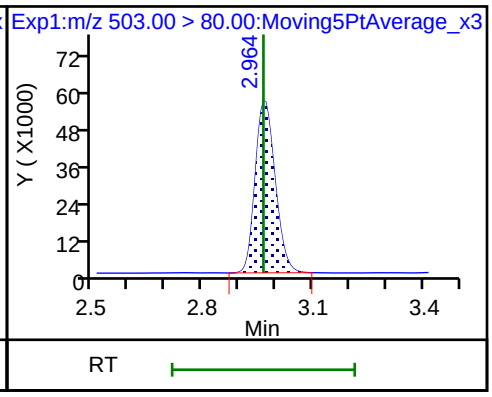
* 62 13C2-PFOA



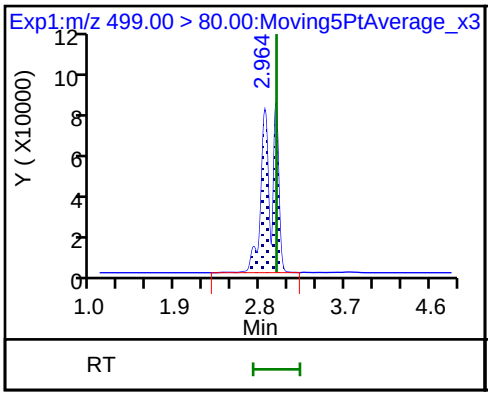
D 19 13C5 PFNA



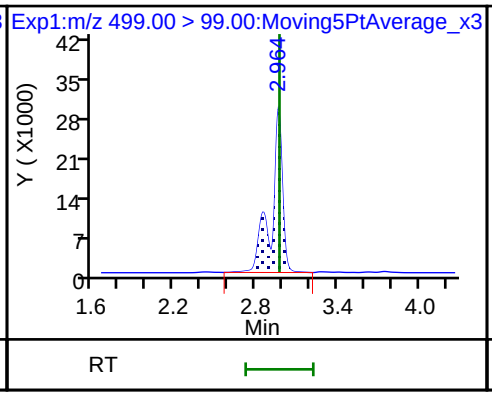
D 18 13C4 PFOS



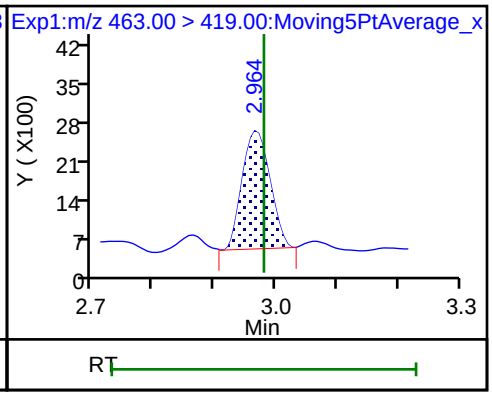
17 Perfluorooctane sulfonic acid



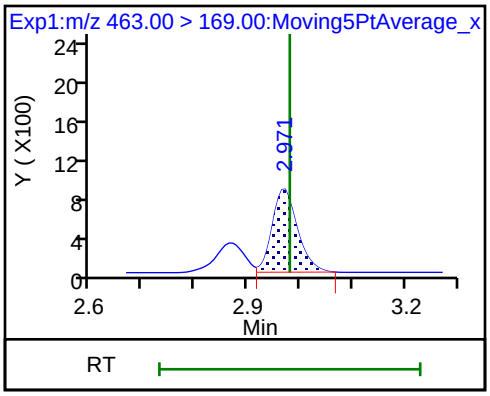
17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



20 Perfluorononanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 7-MW1-PRL06-01 | Lab Sample ID: 320-41333-2

Matrix: Water | Lab File ID: 2018.07.28LLB_046.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/16/2018 13:57

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 300.1(mL) | Date Analyzed: 07/29/2018 05:43

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*2700*	*E*	*1.7*	1.2	*0.51*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*3000*	*E M*	*1.7*	1.2	*0.45*
375-95-1	Perfluorononanoic acid (PFNA)	6.7		1.7	1.2	0.43
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*770*	*E*	*1.7*	0.83	*0.38*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*7400*	*E*	*1.7*	0.83	*0.32*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	120		3.3	2.5	0.92

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	137		50-150
STL01892	13C4-PFHpA	64		50-150
STL00990	13C4 PFOA	80		50-150
STL00995	13C5 PFNA	197	Q	50-150
STL00994	18O2 PFHxS	65		50-150
STL00991	13C4 PFOS	185	Q	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_046.d
Lims ID: 320-41333-A-2-A
Client ID: 7-MW1-PRL06-01
Sample Type: Client
Inject. Date: 29-Jul-2018 05:43:02 ALS Bottle#: 35 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:18:13 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:18:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.674	1.675	-0.001	0.645	56576	3.18		137	104	
5 Perfluorobutanesulfonic acid										E
298.90 > 80.00	1.683	1.676	0.007	1.005	44659182	23.1			8063	E
298.90 > 99.00	1.683	1.676	0.007	1.005	25037119		1.78(1.25-3.74)		23112	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.229	0.0	0.858	1319889	1.61		64.5	23852	
10 Perfluoroheptanoic acid										E
363.00 > 319.00	2.229	2.230	-0.001	1.000	47905383	82.3			24340	E
363.00 > 169.00	2.229	2.230	-0.001	1.000	24441228		1.96(1.13-3.40)		61649	
D 11 18O2 PFHxS										
403.00 > 84.00	2.254	2.241	0.013	0.868	1605914	1.53		64.6	23835	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.217	2.242	-0.025	0.984	175638763	221.7			8172	E
399.00 > 99.00	2.240	2.242	-0.002	0.994	104193861		1.69(1.50-4.49)		18101	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	0.997	1605675	2.00		80.2	26279	
* 62 13C2-PFOA										
415.00 > 370.00	2.596	2.590	0.006		2093153	2.50			31952	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.596	2.590	0.006	1.003	70804282	90.8			14619	EM
413.00 > 169.00	2.588	2.590	-0.002	1.000	50911972		1.39(0.84-2.52)		63136	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.828	2.950	-0.122	0.957	5400488	3.62			16835	
499.00 > 99.00	2.953	2.950	0.003	1.000	836691		6.45(2.31-6.93)		5081	
20 Perfluorononanoic acid										
463.00 > 419.00	2.953	2.950	0.003	1.000	313354	0.2020			278	
463.00 > 169.00	2.953	2.950	0.003	1.000	74370		4.21(1.90-5.69)		255	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.953	2.953	0.0	1.138	3396792	4.92		197	64592	
D 18 13C4 PFOS										
503.00 > 80.00	2.953	2.953	0.0	1.138	3230751	4.42		185	16363	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

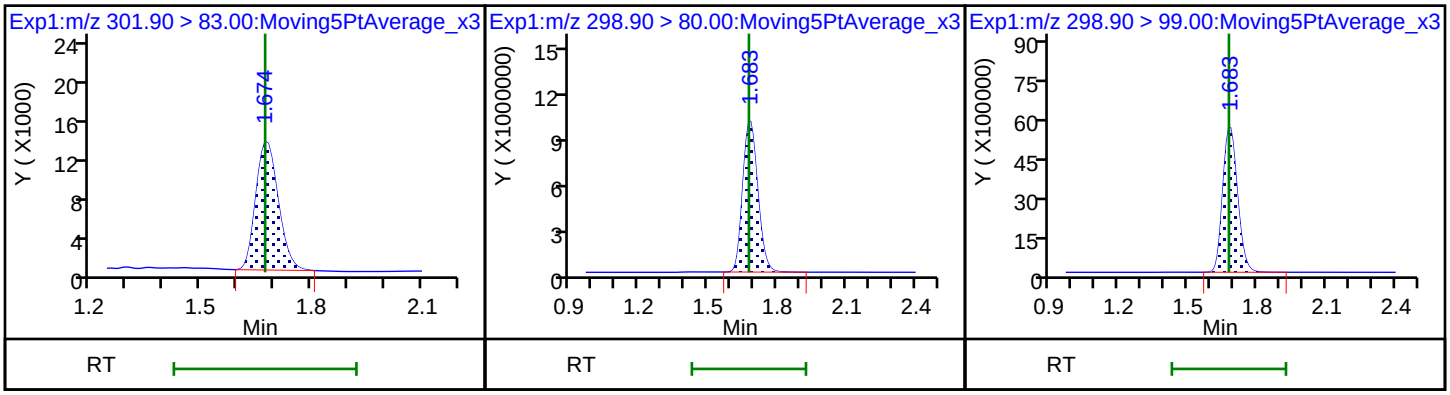
M - Manually Integrated

Report Date: 31-Jul-2018 12:18:14 Chrom Revision: 2.3 19-Jul-2018 15:14:50

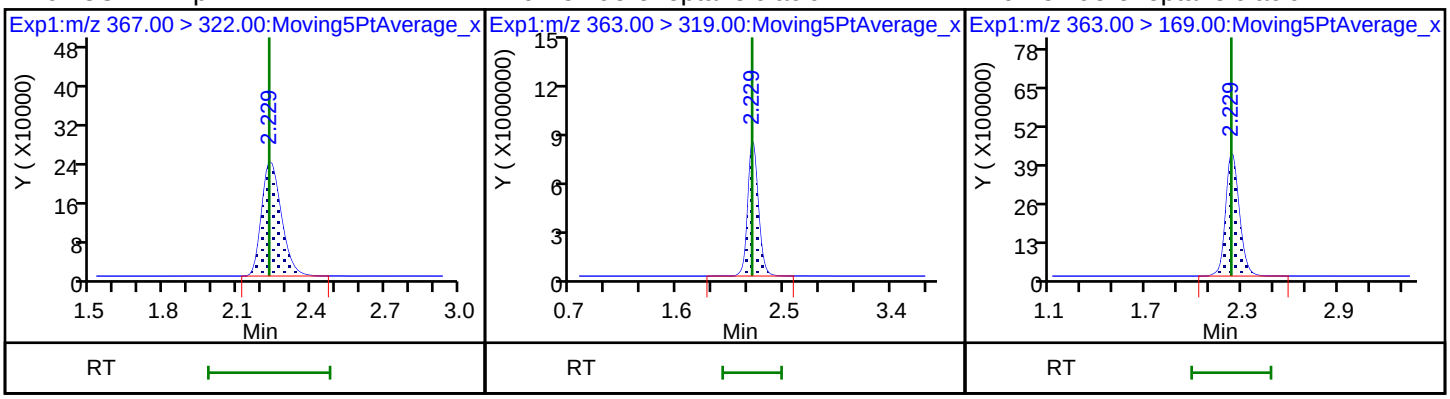
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_046.d				
Injection Date:	29-Jul-2018 05:43:02	Instrument ID:	A8_N		
Lims ID:	320-41333-A-2-A	Lab Sample ID:	320-41333-2		
Client ID:	7-MW1-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	35	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

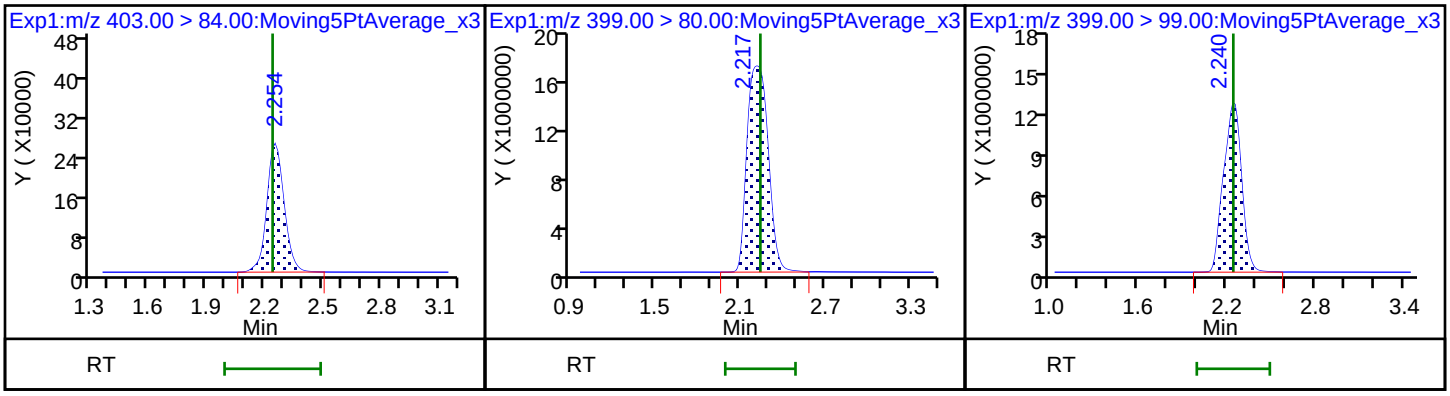
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



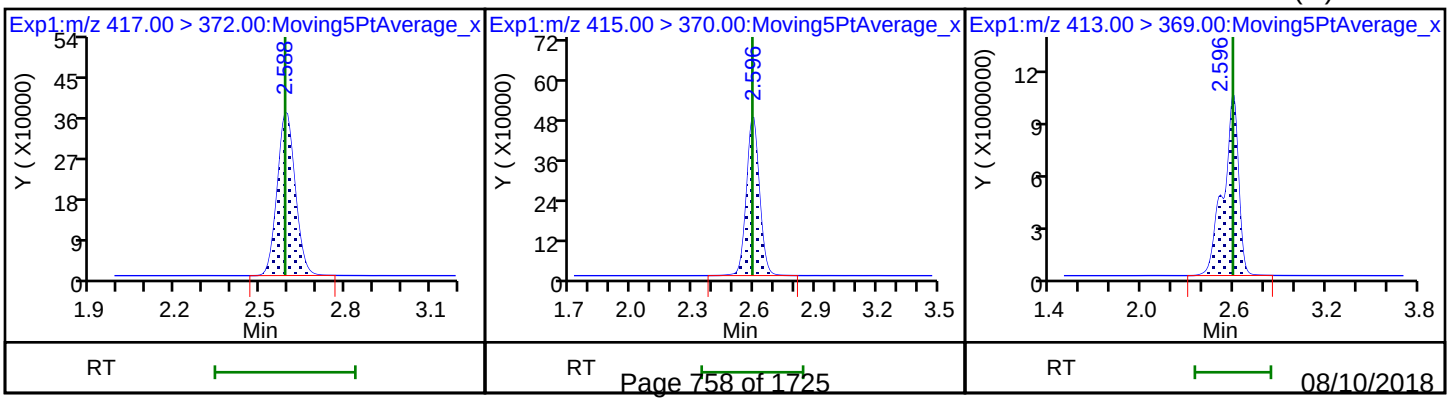
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



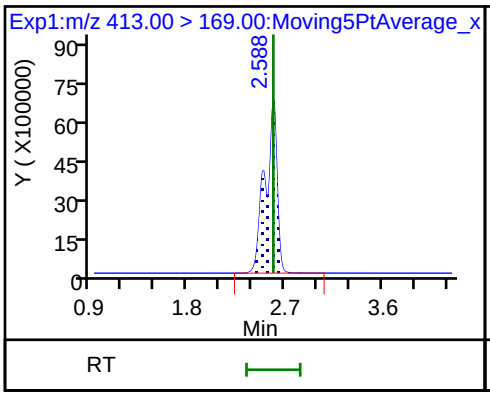
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



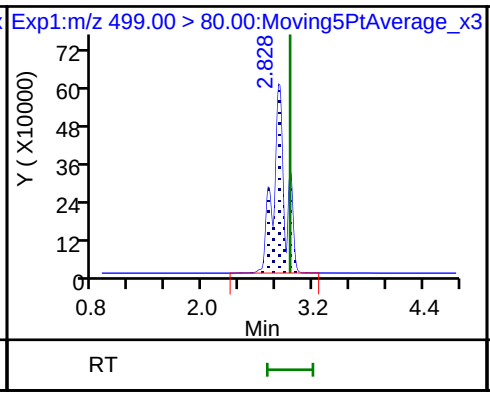
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid (M)



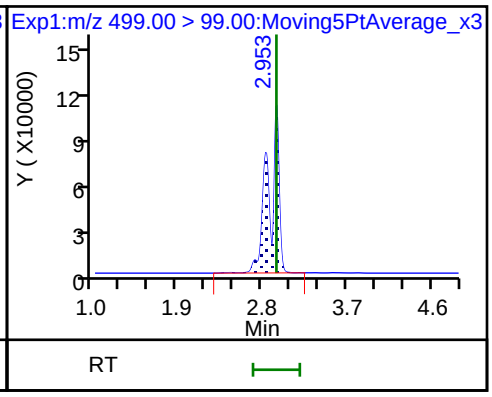
15 Perfluorooctanoic acid



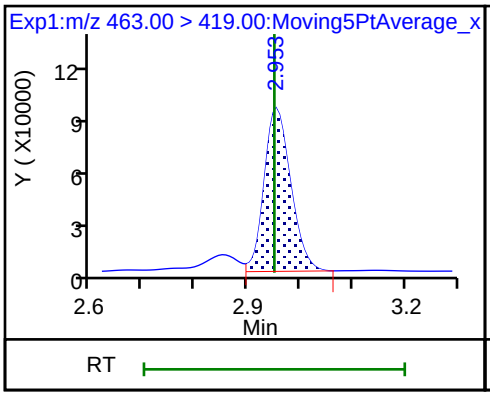
17 Perfluorooctane sulfonic acid



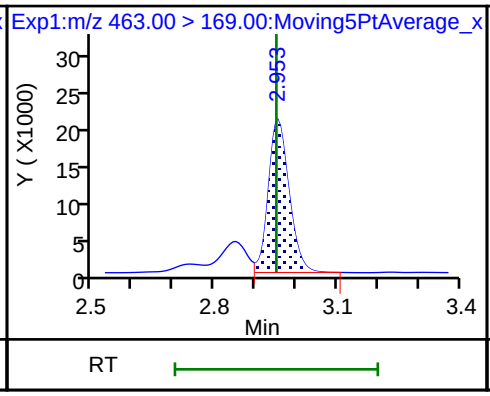
17 Perfluorooctane sulfonic acid



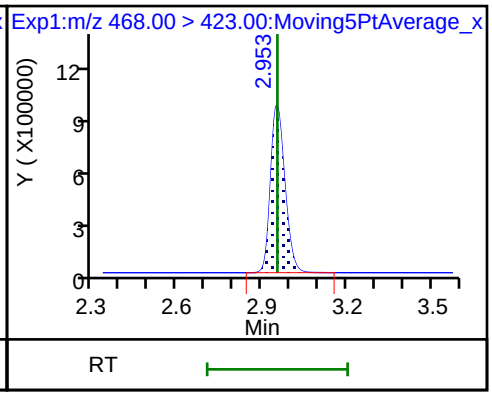
20 Perfluorononanoic acid



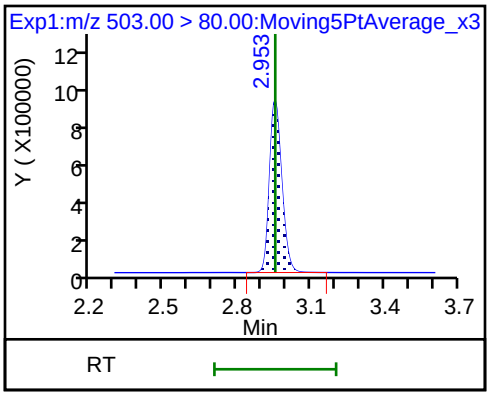
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

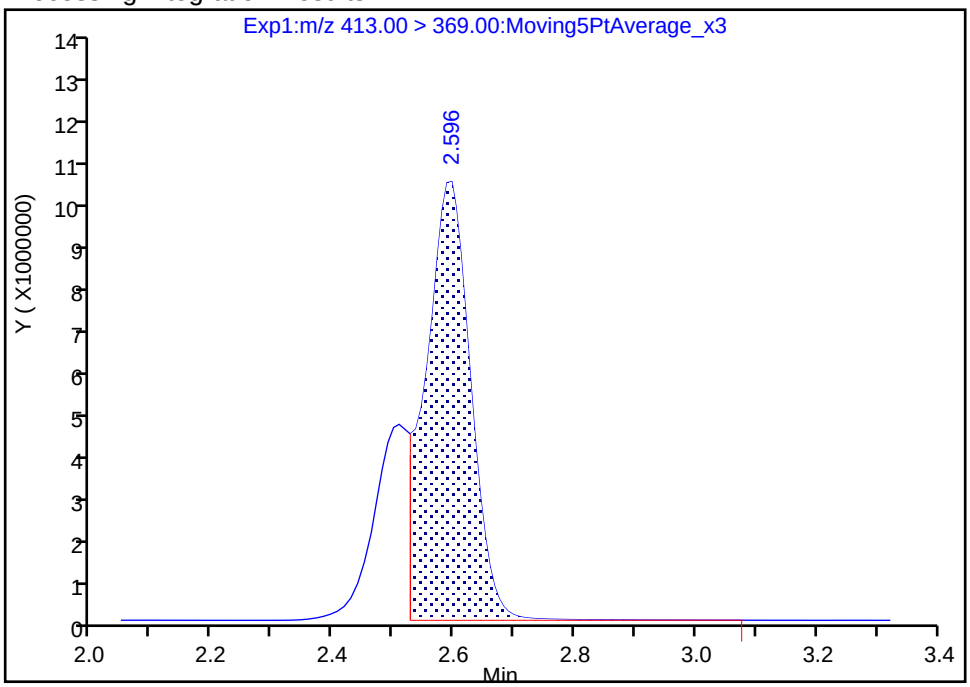
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_046.d				
Injection Date:	29-Jul-2018 05:43:02	Instrument ID:	A8_N		
Lims ID:	320-41333-A-2-A	Lab Sample ID:	320-41333-2		
Client ID:	7-MW1-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	35	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

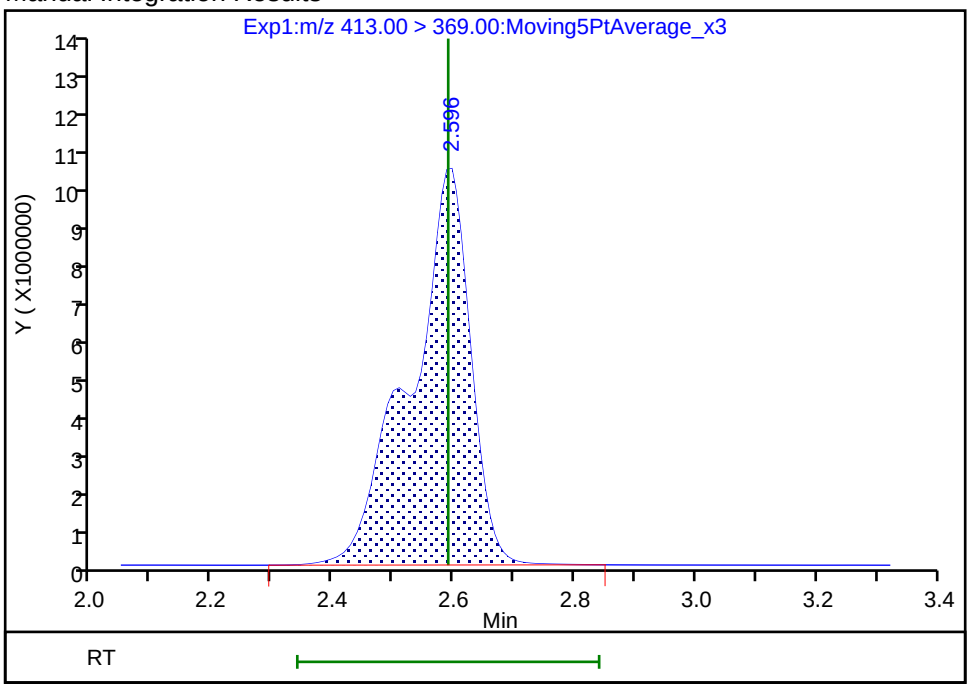
Processing Integration Results

RT: 2.60
Area: 52626881
Amount: 67.516116
Amount Units: ng/ml



Manual Integration Results

RT: 2.60
Area: 70804282
Amount: 90.836280
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:18:08

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: 7-MW1-PRL06-01 DL
Lab Sample ID: 320-41333-2 DL
Matrix: Water
Lab File ID: 2018.08.07LLBB_067.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/16/2018 13:57
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 300.1(mL)
Date Analyzed: 08/07/2018 22:50
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 100
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 238595
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	3900	D	170	120	51
335-67-1	Perfluorooctanoic acid (PFOA)	3900	D M	170	120	45
375-95-1	*Perfluorononanoic acid (PFNA)*	*120*	*U*	*170*	120	*43*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	950	D	170	83	38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	20000	D	170	83	32
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*150*	*J D M*	*330*	250	*92*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	115	M	50-150
STL01892	13C4-PFHpA	83		50-150
STL00990	13C4 PFOA	81		50-150
STL00995	13C5 PFNA	86		50-150
STL00994	18O2 PFHxS	89		50-150
STL00991	13C4 PFOS	75		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_067.d
Lims ID: 320-41333-A-2-A
Client ID: 7-MW1-PRL06-01
Sample Type: Client
Inject. Date: 07-Aug-2018 22:50:26 ALS Bottle#: 42 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 100.0000
Sample Info: 320-41333-a-2-a 100X 235966
Misc. Info.: Plate: 1 Rack: 5
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 12:25:54 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: hannigana Date: 08-Aug-2018 12:23:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										M
301.90 > 83.00	1.647	1.678	-0.031	0.640	1111	0.0268		115	5.1	M
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.679	1.678	0.001	1.020	1031255	0.2841			316	
298.90 > 99.00	1.679	1.678	0.001	1.020	442995		2.33(1.25-3.74)		271	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.223	0.002	0.864	41678	0.0208		83.4	234	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.234	2.223	0.011	1.004	2082507	1.18			402	
363.00 > 169.00	2.225	2.223	0.002	1.000	786417		2.65(1.13-3.40)		1347	
D 11 18O2 PFHxS										
403.00 > 84.00	2.245	2.243	0.002	0.872	54144	0.0211		89.3	447	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.243	0.002	1.000	14724539	5.93			7402	
399.00 > 99.00	2.245	2.243	0.002	1.000	4805306		3.06(1.50-4.49)		3484	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.572	0.008	1.003	37097	0.0202		80.9	216	
* 62 13C2-PFOA										
415.00 > 370.00	2.573	2.572	0.001		46919	0.0250			275	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.580	2.579	0.001	1.000	1985259	1.18			165	M
413.00 > 169.00	2.580	2.579	0.001	1.000	1113945		1.78(0.84-2.52)		1066	M
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.938	0.006	1.144	35554	0.0216		86.4	250	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.938	0.006	1.144	30369	0.0180		75.5	83.7	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.823	2.944	-0.122	0.959	59924	0.0439			45.4	
499.00 > 99.00	2.944	2.944	0.0	1.000	9352		6.41(2.31-6.93)		14.7	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										
463.00 > 419.00	2.944	2.944	0.0	1.000	4440	0.002964			1.5	
463.00 > 169.00	2.944	2.944	0.0	1.000	1396		3.18(1.90-5.69)		10.8	

QC Flag Legend

Review Flags

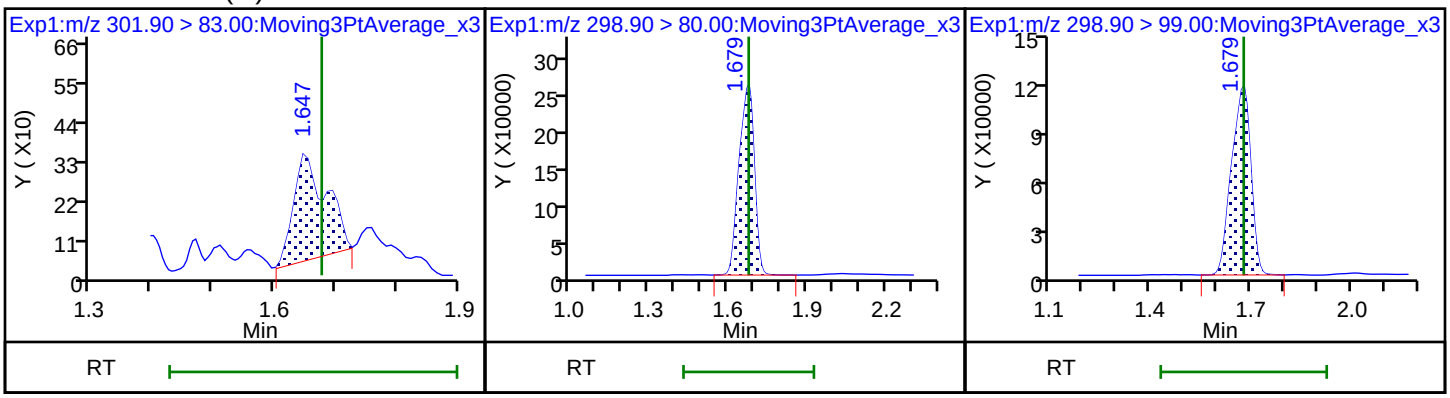
M - Manually Integrated

Report Date: 08-Aug-2018 12:26:01 Chrom Revision: 2.3 19-Jul-2018 15:14:50

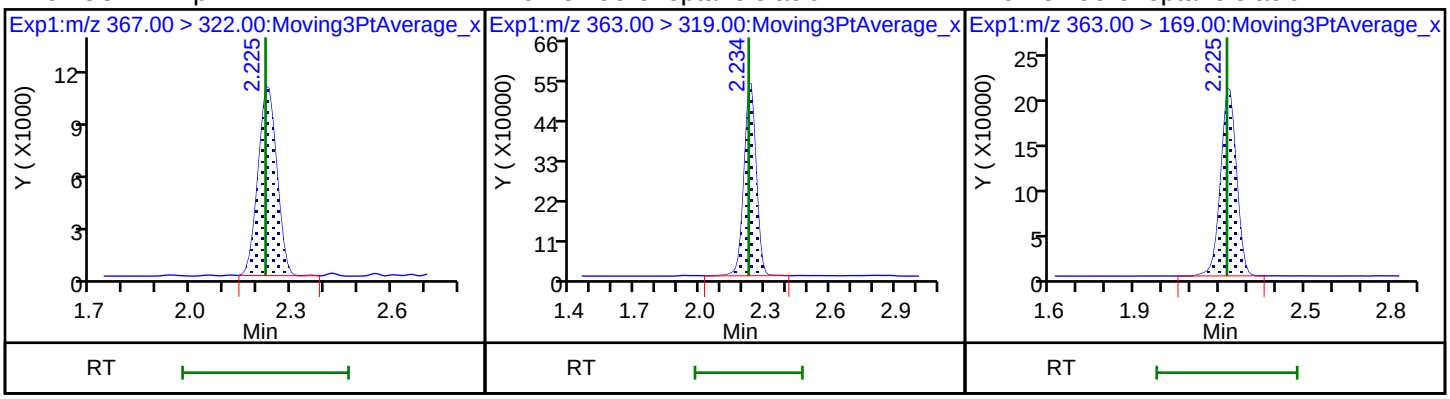
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_067.d				
Injection Date:	07-Aug-2018 22:50:26	Instrument ID:	A8_N		
Lims ID:	320-41333-A-2-A	Lab Sample ID:	320-41333-2		
Client ID:	7-MW1-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	42	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

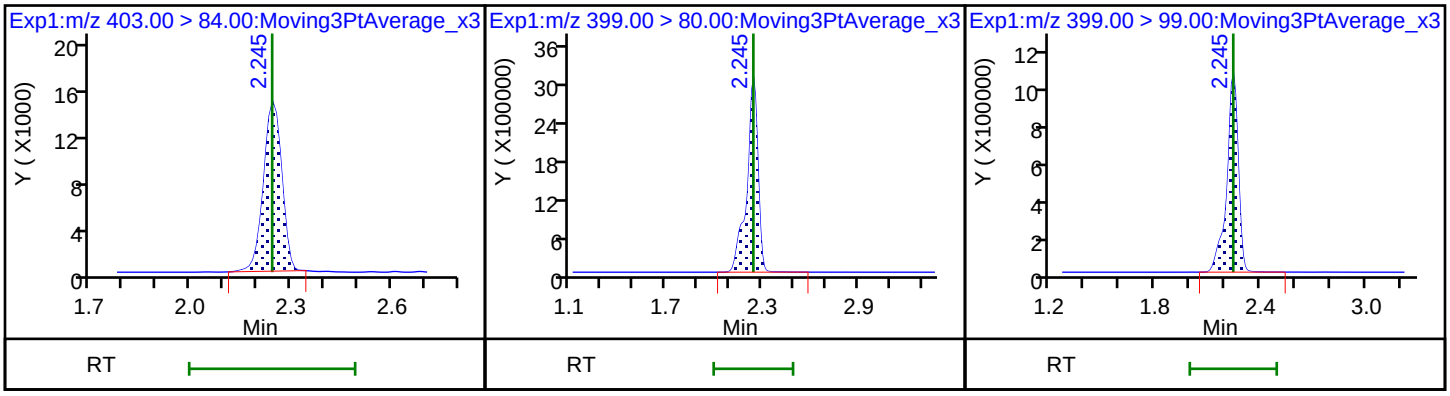
D 47 13C3-PFBS (M) | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



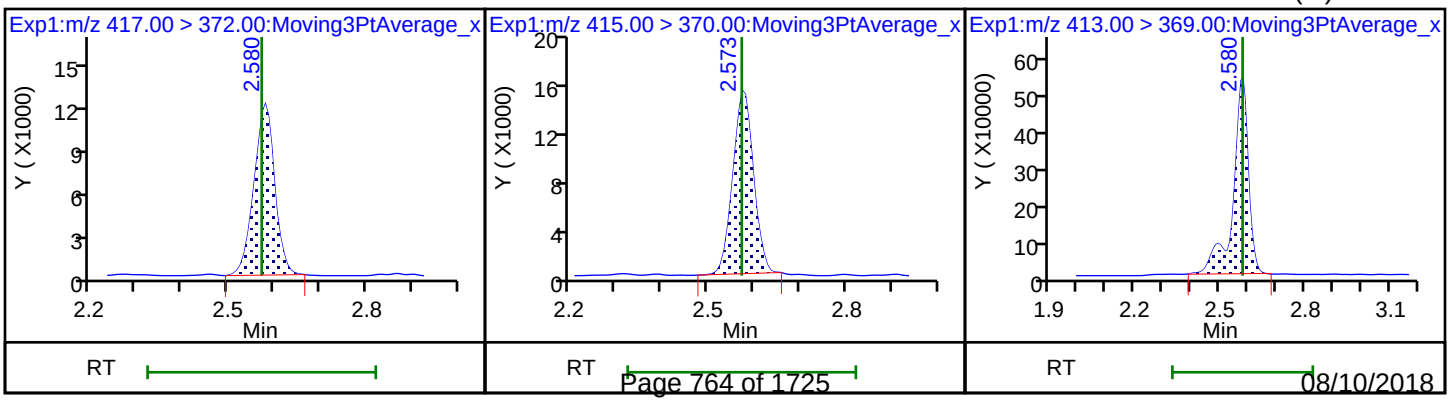
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



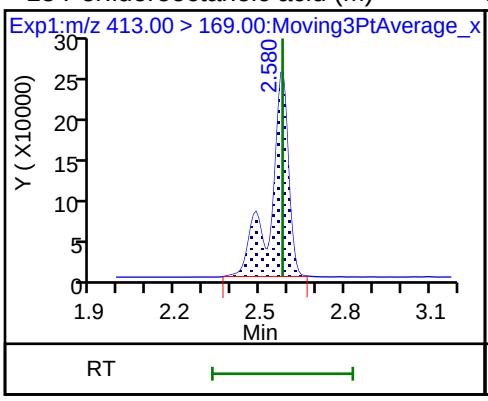
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



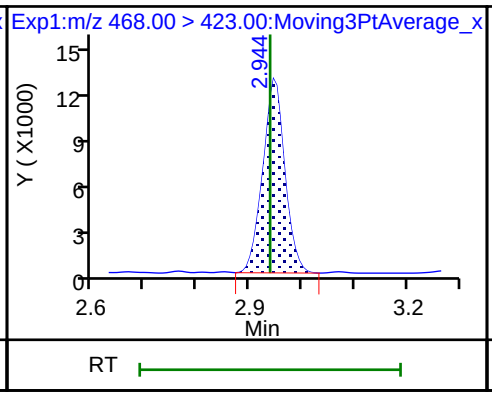
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid (M)



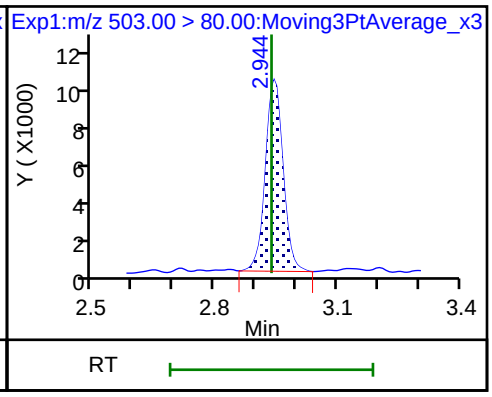
15 Perfluorooctanoic acid (M)



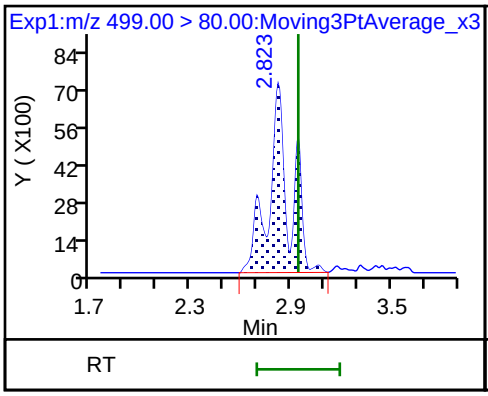
D 19 13C5 PFNA



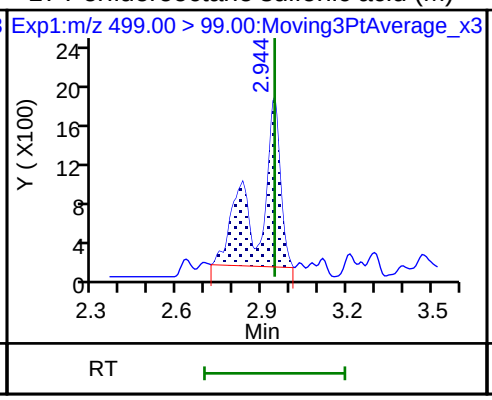
D 18 13C4 PFOS



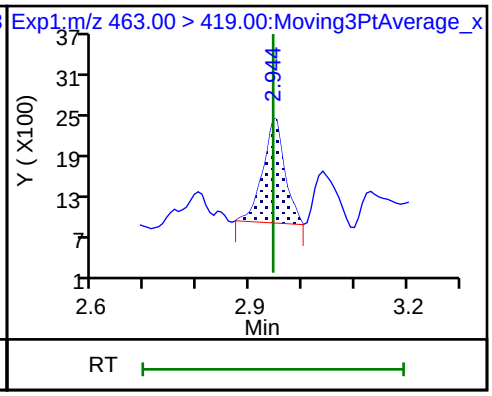
17 Perfluorooctane sulfonic acid



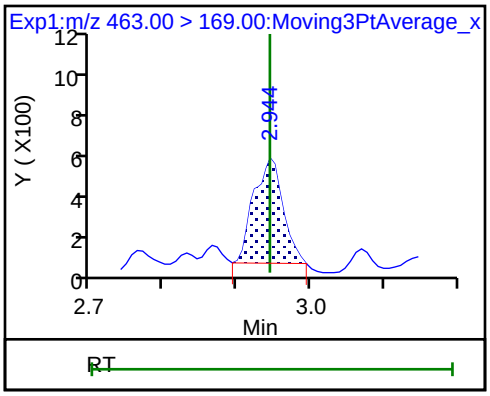
17 Perfluorooctane sulfonic acid (M)



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

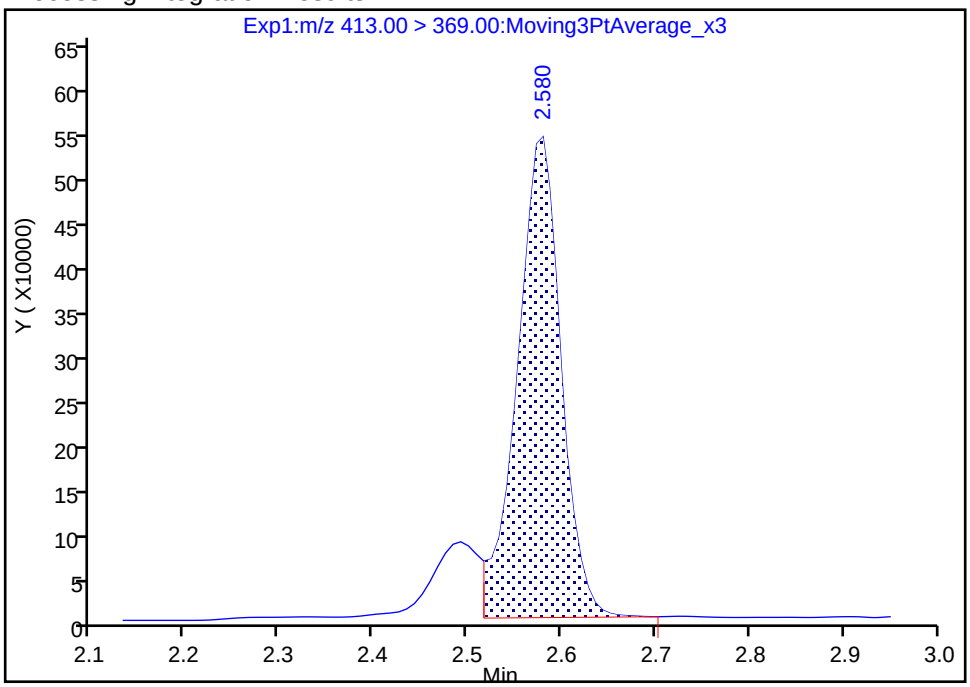
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_067.d				
Injection Date:	07-Aug-2018 22:50:26	Instrument ID:	A8_N		
Lims ID:	320-41333-A-2-A	Lab Sample ID:	320-41333-2		
Client ID:	7-MW1-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	42	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

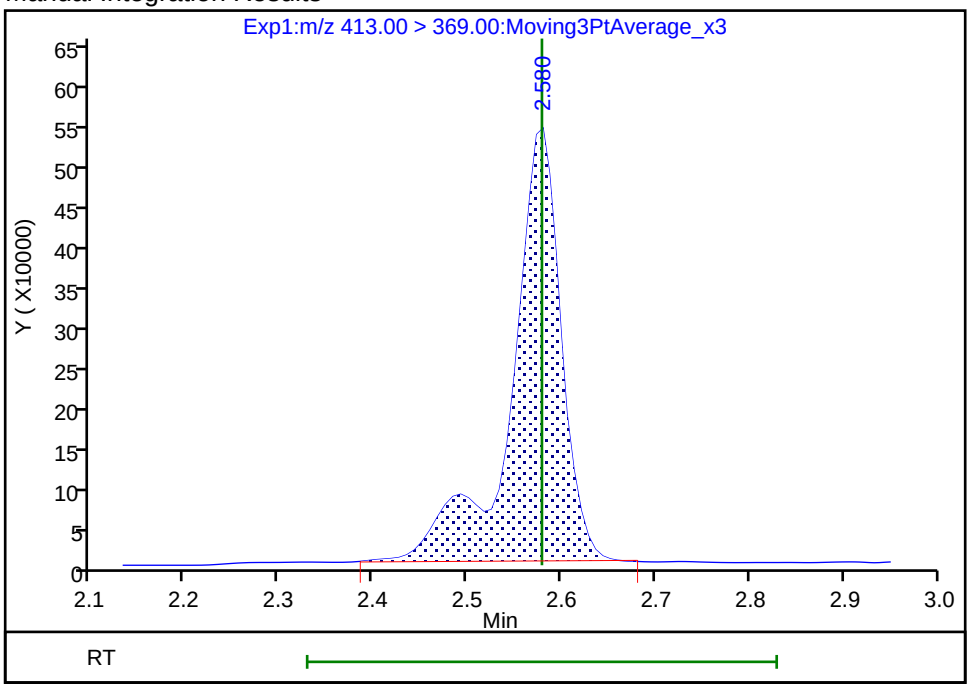
Processing Integration Results

RT: 2.58
Area: 1726599
Amount: 1.029091
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 1985259
Amount: 1.183258
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 12:23:54

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

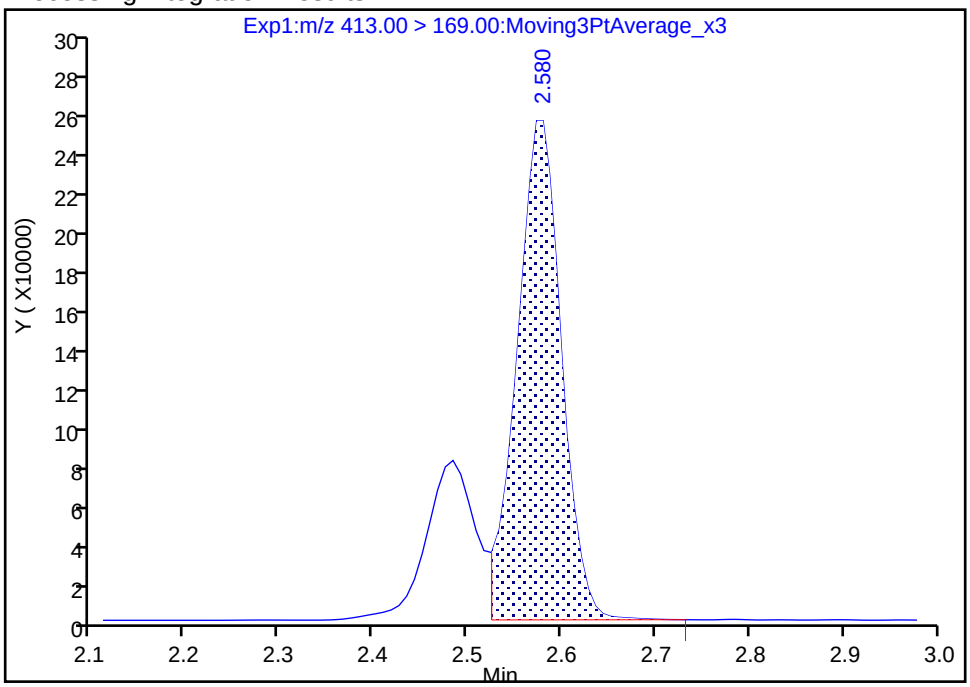
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_067.d				
Injection Date:	07-Aug-2018 22:50:26	Instrument ID:	A8_N		
Lims ID:	320-41333-A-2-A	Lab Sample ID:	320-41333-2		
Client ID:	7-MW1-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	42	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

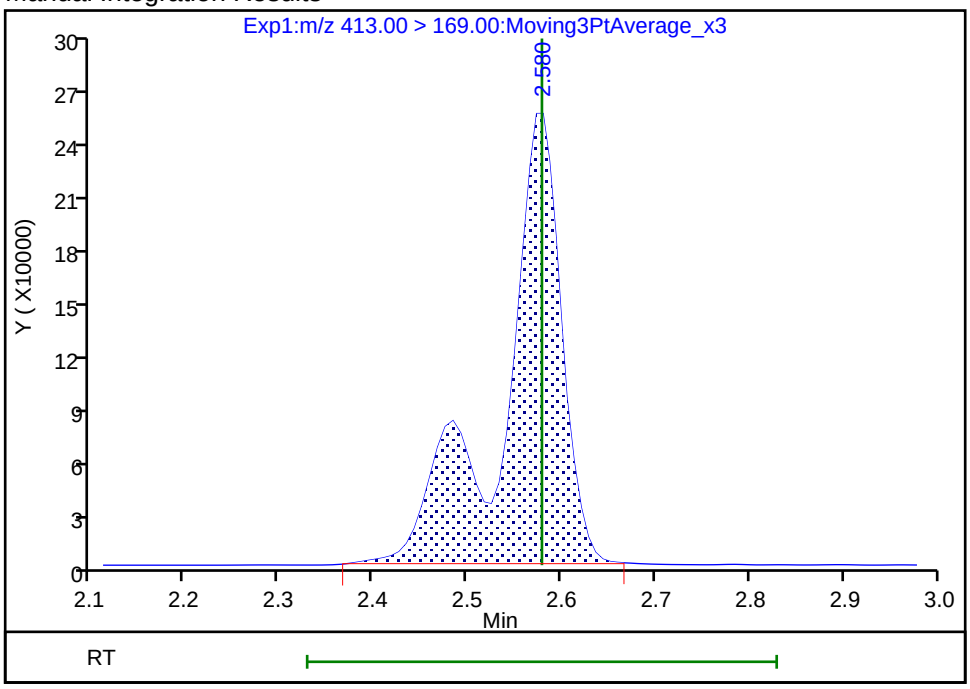
Processing Integration Results

RT: 2.58
Area: 831468
Amount: 1.029091
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 1113945
Amount: 1.183258
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 12:23:58

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_067.d				
Injection Date:	07-Aug-2018 22:50:26	Instrument ID:	A8_N		
Lims ID:	320-41333-A-2-A	Lab Sample ID:	320-41333-2		
Client ID:	7-MW1-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	42	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

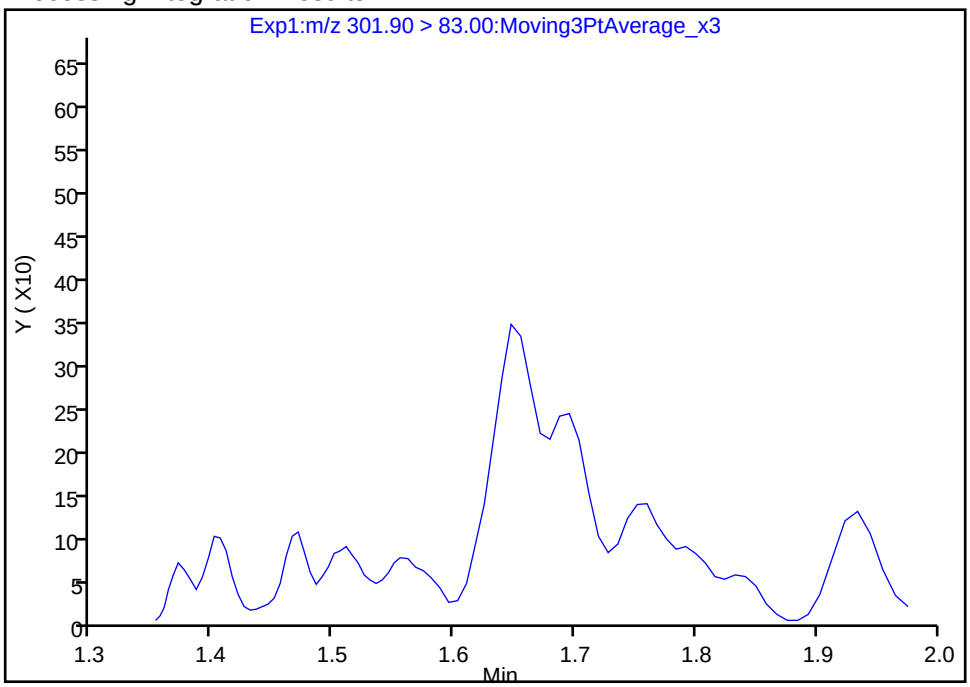
D 47 13C3-PFBS, CAS: STL02337

Signal: 1

Not Detected

Expected RT: 1.68

Processing Integration Results



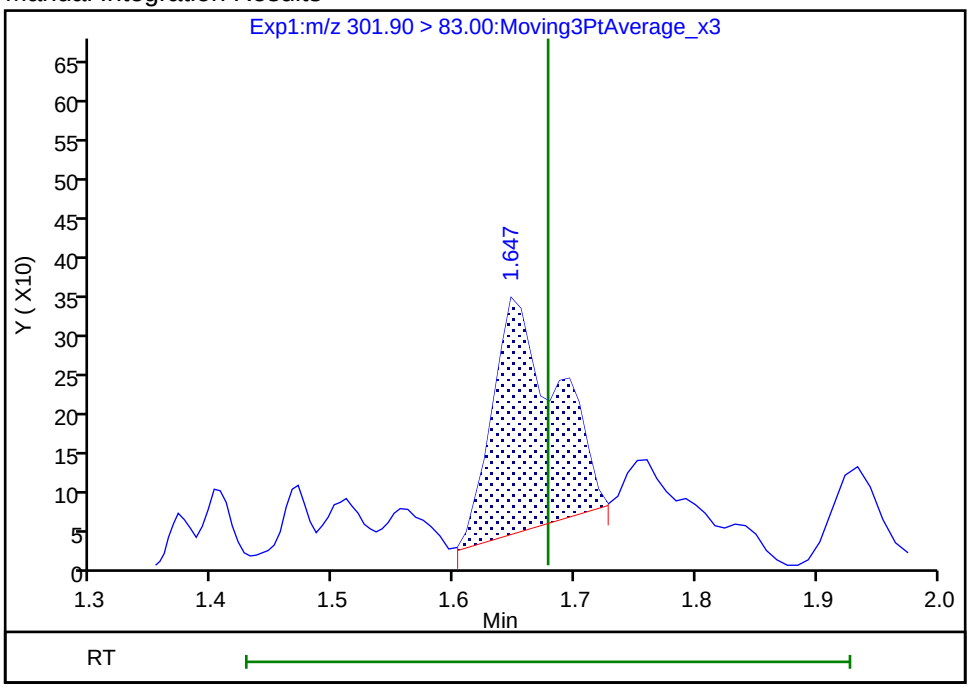
Manual Integration Results

RT: 1.65

Area: 1111

Amount: 0.026838

Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 12:23:36

Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

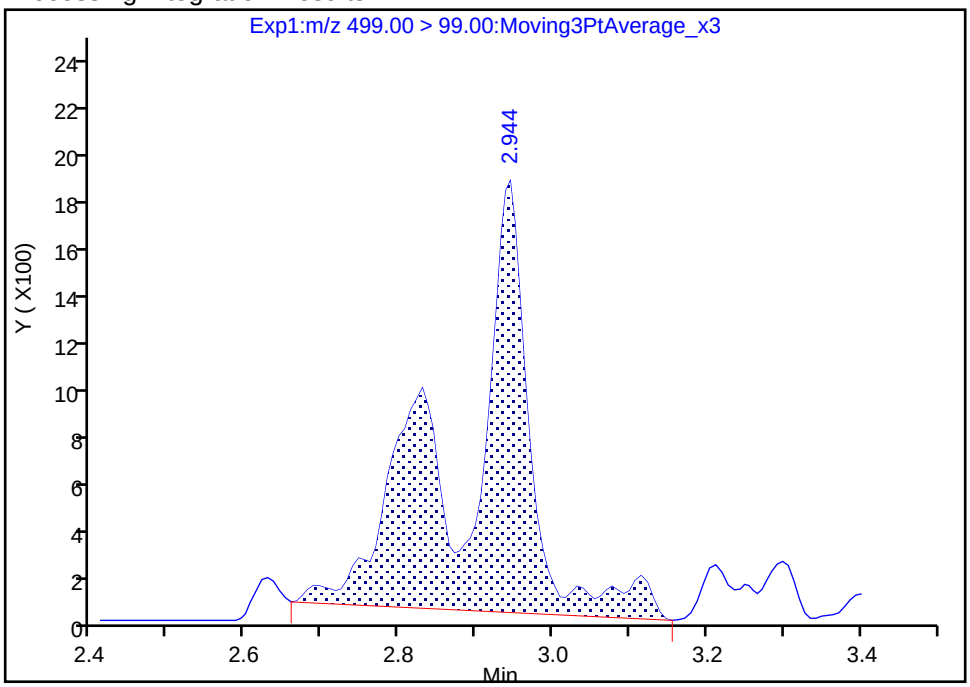
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_067.d				
Injection Date:	07-Aug-2018 22:50:26	Instrument ID:	A8_N		
Lims ID:	320-41333-A-2-A	Lab Sample ID:	320-41333-2		
Client ID:	7-MW1-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	42	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

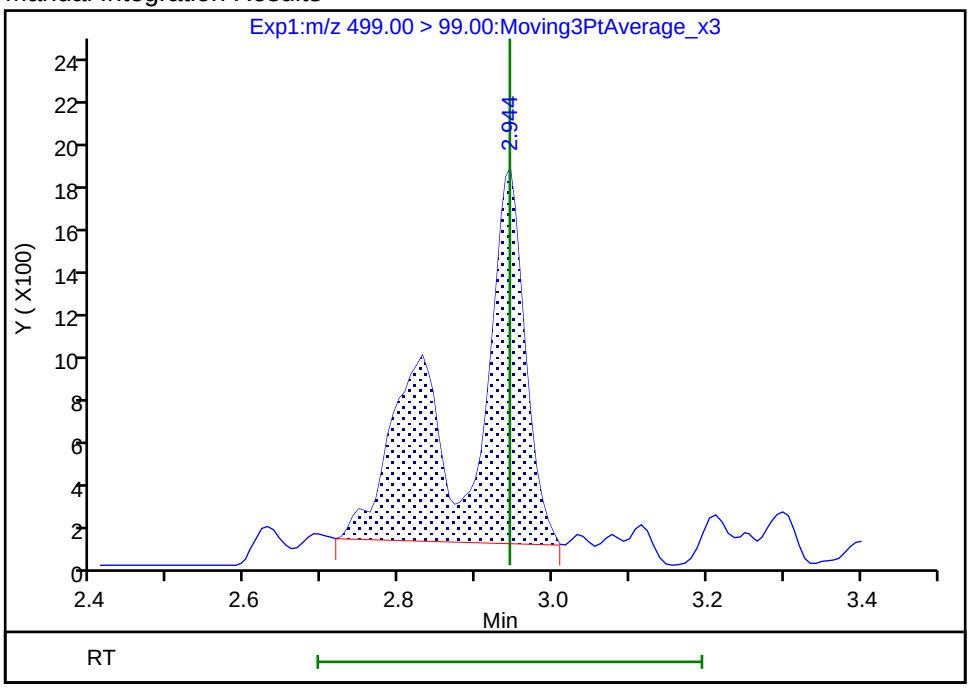
Processing Integration Results

RT: 2.94
Area: 11502
Amount: 0.043920
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 9352
Amount: 0.043920
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 12:24:18

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: 8-MW14-PRL04-01
Lab Sample ID: 320-41333-3
Matrix: Water
Lab File ID: 2018.08.03LLA_018.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/16/2018 17:03
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 288(mL)
Date Analyzed: 08/03/2018 07:03
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	58		1.7	1.3	0.53
335-67-1	Perfluorooctanoic acid (PFOA)	44		1.7	1.3	0.47
375-95-1	Perfluorononanoic acid (PFNA)	0.67	J	1.7	1.3	0.45
375-73-5	Perfluorobutanesulfonic acid (PFBS)	38		1.7	0.87	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	200		1.7	0.87	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	30		3.5	2.6	0.95

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	58		50-150
STL01892	13C4-PFHpA	60		50-150
STL00990	13C4 PFOA	66		50-150
STL00995	13C5 PFNA	65		50-150
STL00994	18O2 PFHxS	58		50-150
STL00991	13C4 PFOS	59		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_018.d
Lims ID: 320-41333-A-3-A
Client ID: 8-MW14-PRL04-01
Sample Type: Client
Inject. Date: 03-Aug-2018 07:03:52 ALS Bottle#: 25 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:19:00 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:19:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.693	1.690	0.003	0.648	67832	1.34		57.6	157	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.702	1.692	0.010	1.005	2418691	1.08			994	
298.90 > 99.00	1.702	1.692	0.010	1.005	1035614		2.34(1.25-3.74)		1522	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.251	0.016	0.868	2778696	1.50		60.1	53830	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.267	2.253	0.014	1.000	2149651	1.67			1094	
363.00 > 169.00	2.267	2.253	0.014	1.000	827954		2.60(1.13-3.40)		12882	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.264	0.016	0.873	3838554	1.38		58.5	47611	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.266	0.014	1.000	10946145	5.83			7875	
399.00 > 99.00	2.280	2.266	0.014	1.000	3644707		3.00(1.50-4.49)		6290	
D 14 13C4 PFOA										
417.00 > 372.00	2.611	2.602	0.009	1.000	2949163	1.65		66.1	47637	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.611	2.611	0.0	1.000	1743293	1.28			1107	
413.00 > 169.00	2.611	2.611	0.0	1.000	1004063		1.74(0.84-2.52)		7255	
* 62 13C2-PFOA										
415.00 > 370.00	2.611	2.611	0.0		4646377	2.50			66203	
D 19 13C5 PFNA										
468.00 > 423.00	2.973	2.964	0.009	1.138	2537242	1.63		65.3	68525	
D 18 13C4 PFOS										
503.00 > 80.00	2.973	2.964	0.009	1.138	2690491	1.40		58.7	29766	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.973	2.973	0.0	1.000	1098716	0.8694			7090	
499.00 > 99.00	2.973	2.973	0.0	1.000	216761		5.07(2.31-6.93)		2514	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										
463.00 > 419.00	2.973	2.979	-0.006	1.000	21195	0.0193			64.8	
463.00 > 169.00	2.973	2.979	-0.006	1.000	6224		3.41(1.90-5.69)		207	

Report Date: 06-Aug-2018 11:19:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_018.d

Injection Date: 03-Aug-2018 07:03:52 Instrument ID: A8_N

Lims ID: 320-41333-A-3-A Lab Sample ID: 320-41333-3

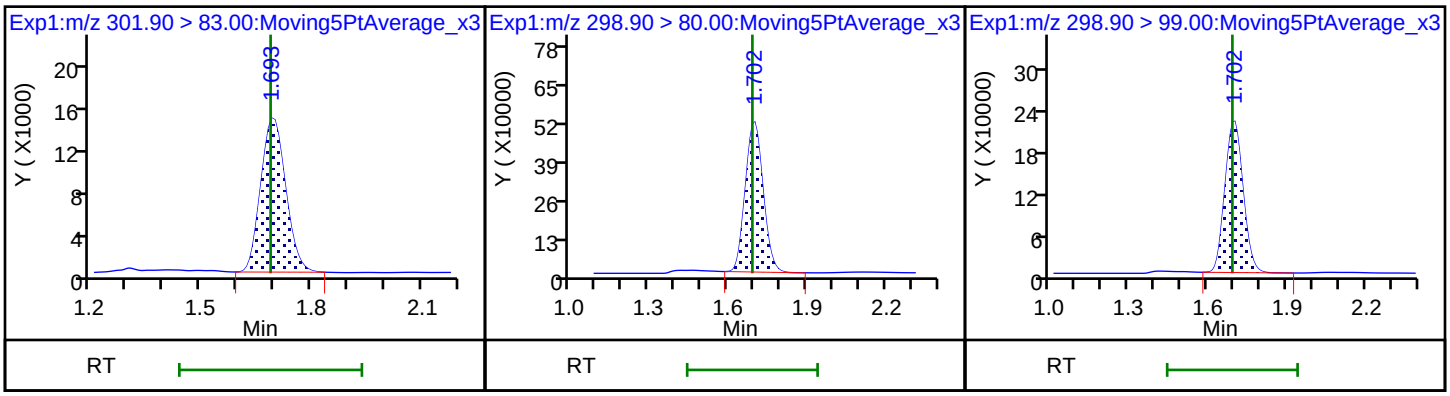
Client ID: 8-MW14-PRL04-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 25 Worklist Smp#: 7

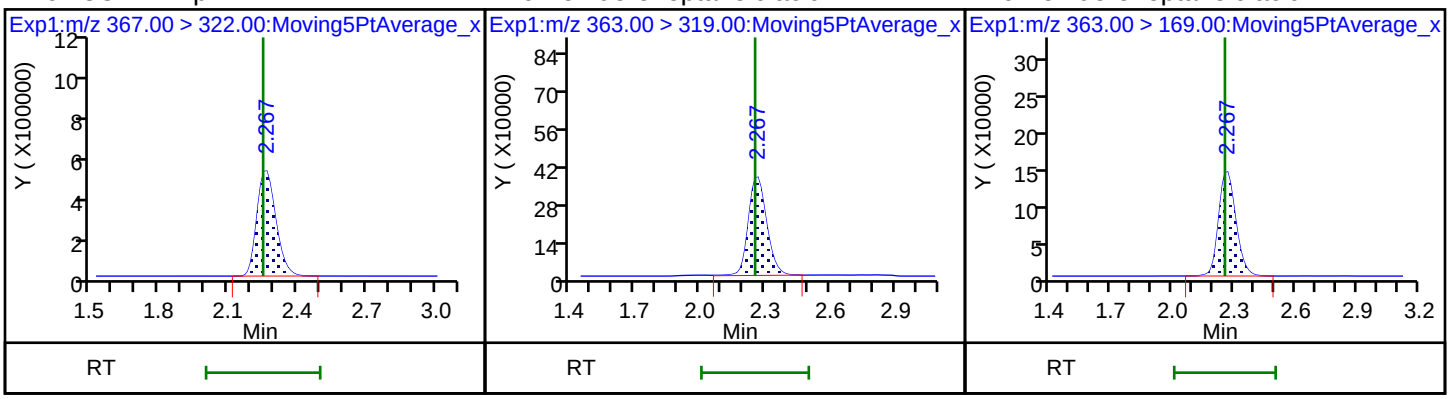
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

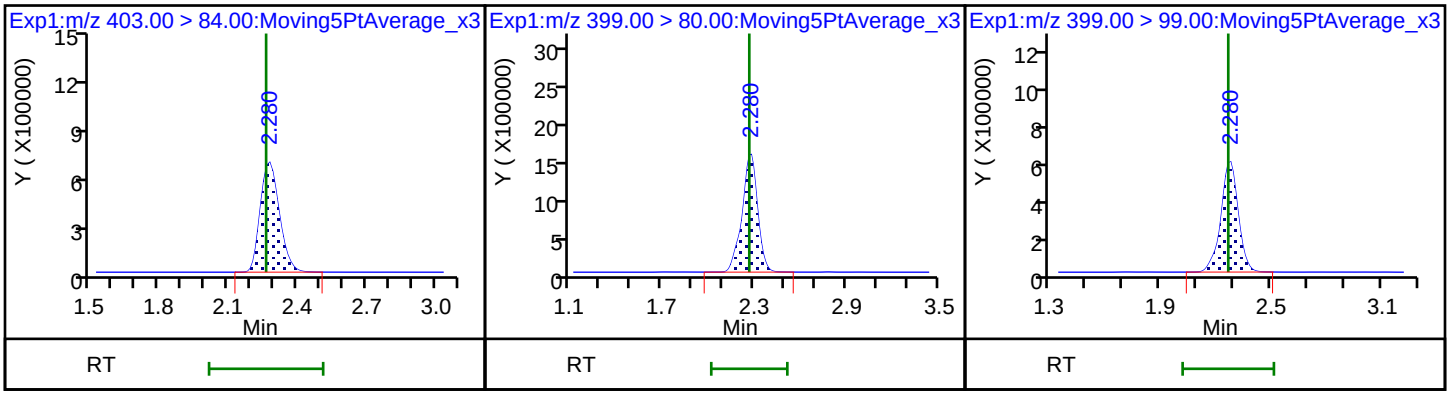
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



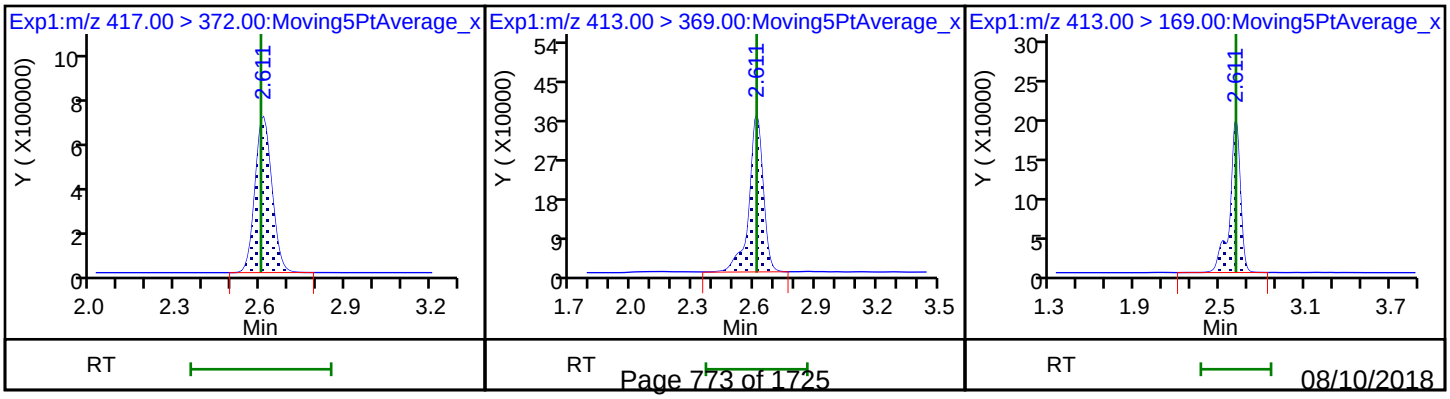
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



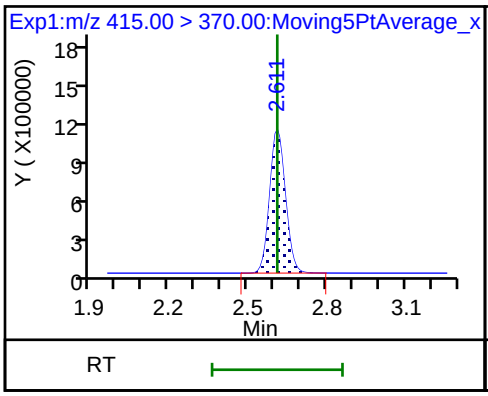
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



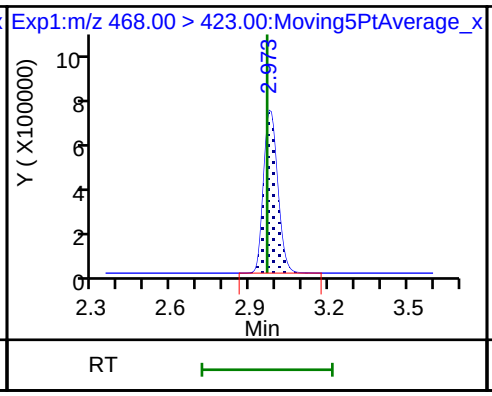
D 14 13C4 PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



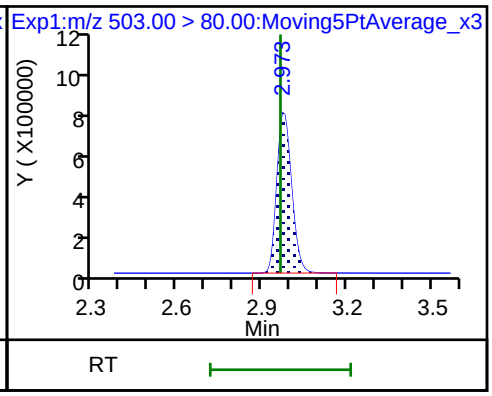
* 62 13C2-PFOA



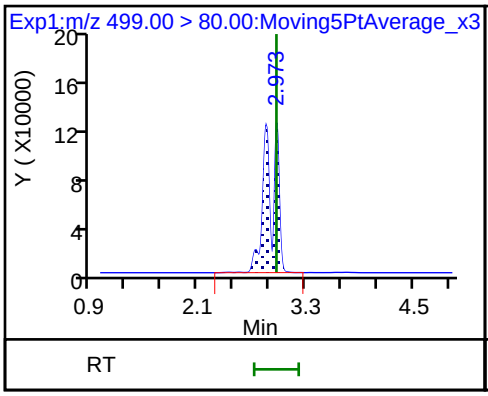
D 19 13C5 PFNA



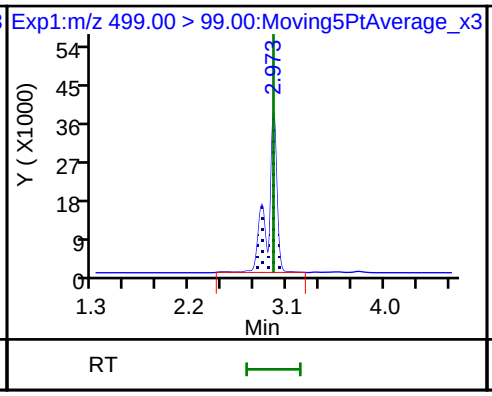
D 18 13C4 PFOS



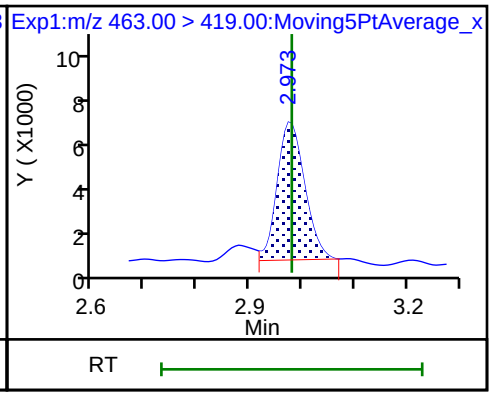
17 Perfluorooctane sulfonic acid



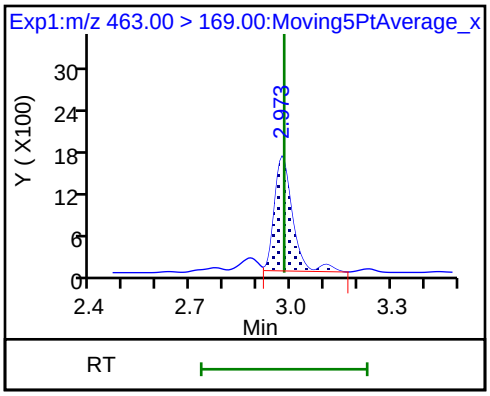
17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



20 Perfluorononanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: GRE-ER-MW-01
Lab Sample ID: 320-41333-4
Matrix: Water
Lab File ID: 2018.07.28LLB_048.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/17/2018 07:15
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 289.3(mL)
Date Analyzed: 07/29/2018 05:58
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236782
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	U M	1.7	1.3	0.53
335-67-1	Perfluorooctanoic acid (PFOA)	1.3	U M	1.7	1.3	0.47
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U M	1.7	1.3	0.45
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.86	U	1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.61	J	1.7	0.86	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	0.95

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	78		50-150
STL01892	13C4-PFHpA	74		50-150
STL00990	13C4 PFOA	75		50-150
STL00995	13C5 PFNA	78		50-150
STL00994	18O2 PFHxS	76		50-150
STL00991	13C4 PFOS	77		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_048.d
Lims ID: 320-41333-A-4-A
Client ID: GRE-ER-MW-01
Sample Type: Client
Inject. Date: 29-Jul-2018 05:58:42 ALS Bottle#: 37 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-4-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:29:11 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:29:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.675	-0.009	0.643	81882	1.81		78.0	775	
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.229	0.001	0.861	3844722	1.85		73.9	98123	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.230	2.230	0.0	1.000	6339	0.003739			12.2	M
363.00 > 169.00	2.254	2.230	0.024	1.011	3795		1.67(1.13-3.40)		51.2	
D 11 18O2 PFHxS										
403.00 > 84.00	2.254	2.241	0.013	0.871	4794418	1.79		75.8	70847	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.254	2.242	0.012	1.000	41799	0.0177			271	
399.00 > 99.00	2.254	2.242	0.012	1.000	13958		2.99(1.50-4.49)		45.5	
D 14 13C4 PFOA										
417.00 > 372.00	2.589	2.588	0.001	1.000	3831599	1.88		75.3	57307	
* 62 13C2-PFOA										
415.00 > 370.00	2.589	2.590	-0.001		5320614	2.50			75052	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.589	2.590	-0.001	1.000	9344	0.005024			11.2	
413.00 > 169.00	2.589	2.590	-0.001	1.000	8174		1.14(0.84-2.52)		45.6	M
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.953	-0.004	1.139	3404464	1.94		77.6	74213	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.953	-0.004	1.139	3418151	1.84		76.9	44719	

QC Flag Legend

Review Flags

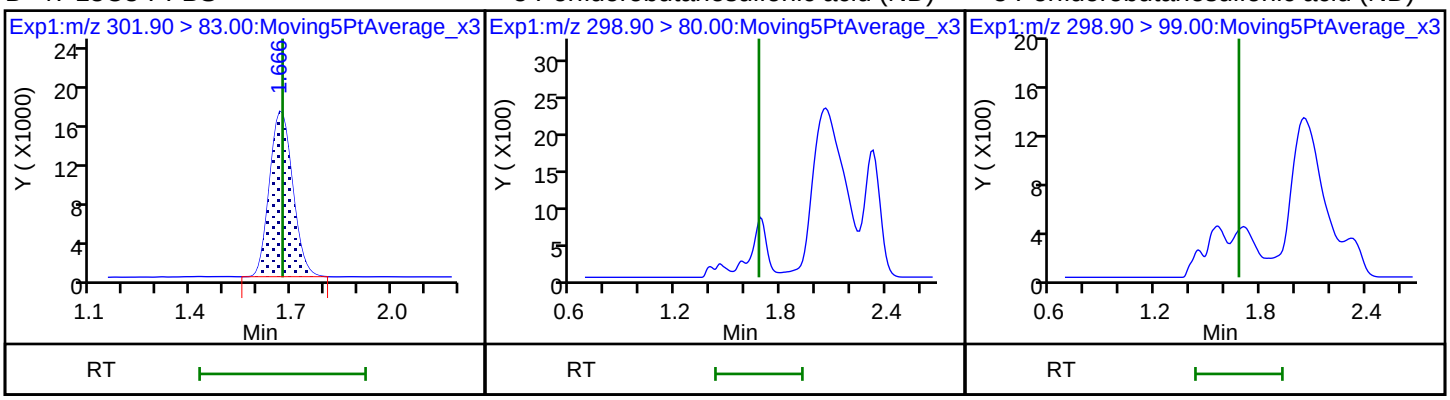
M - Manually Integrated

Report Date: 31-Jul-2018 12:29:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

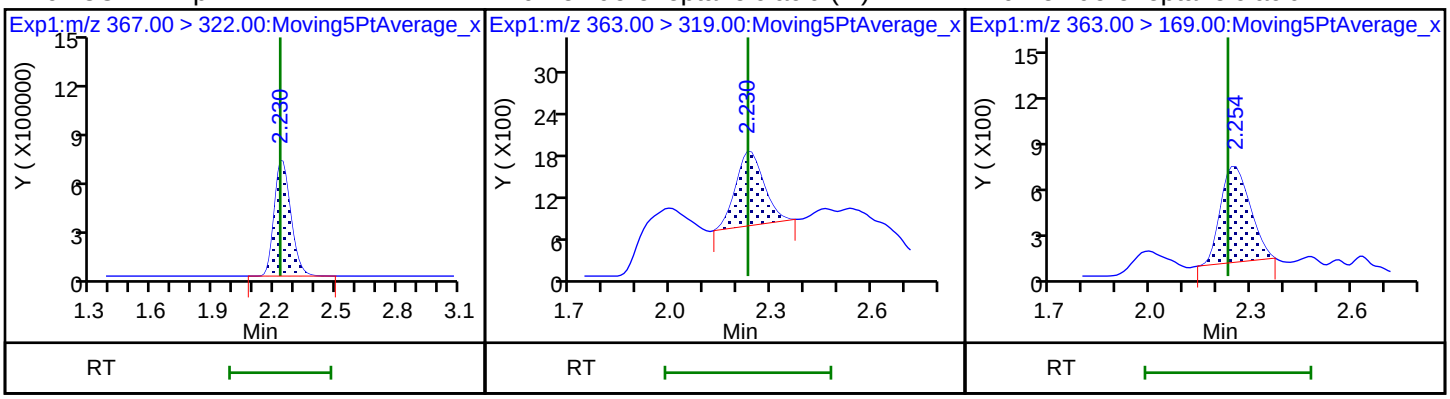
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_048.d				
Injection Date:	29-Jul-2018 05:58:42	Instrument ID:	A8_N		
Lims ID:	320-41333-A-4-A	Lab Sample ID:	320-41333-4		
Client ID:	GRE-ER-MW-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	37	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

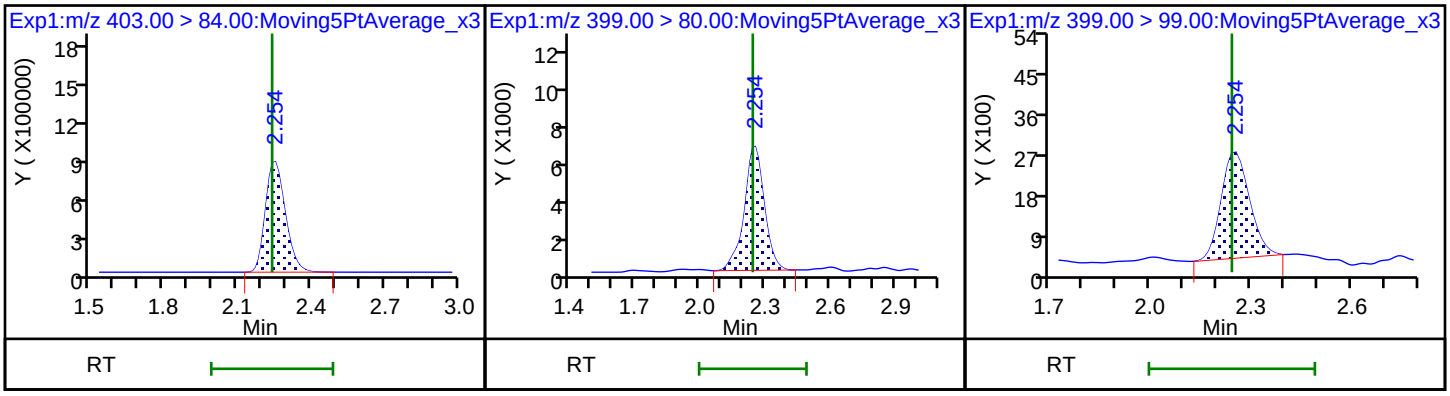
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (ND) | 5 Perfluorobutanesulfonic acid (ND)



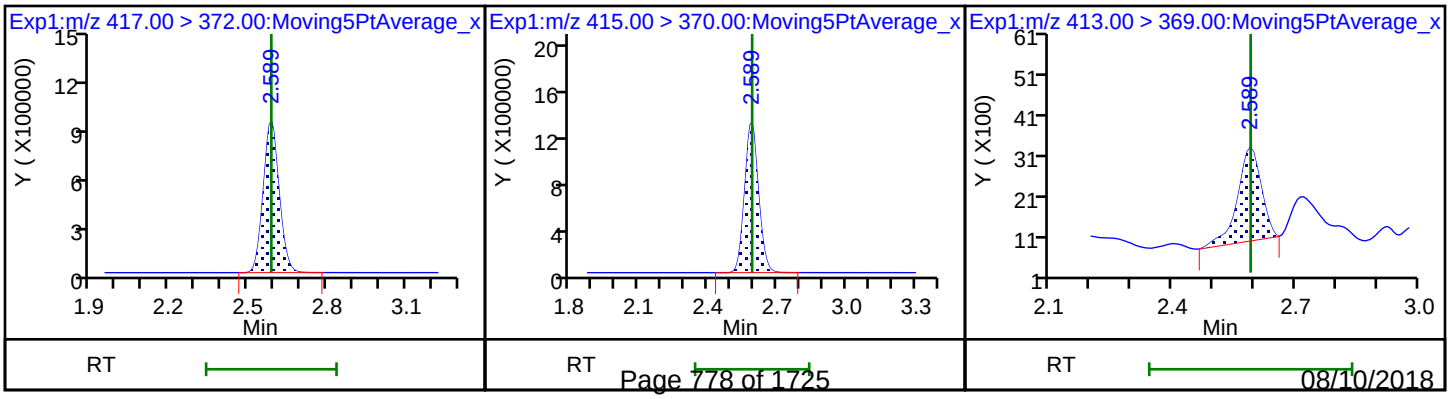
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid



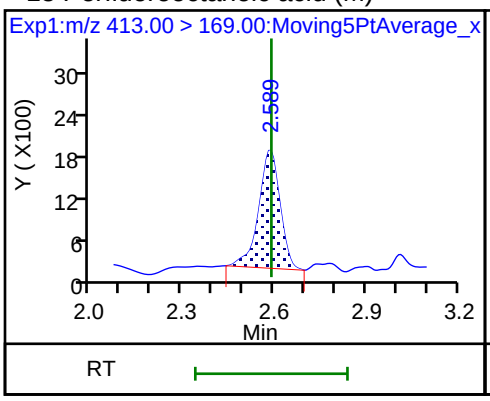
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



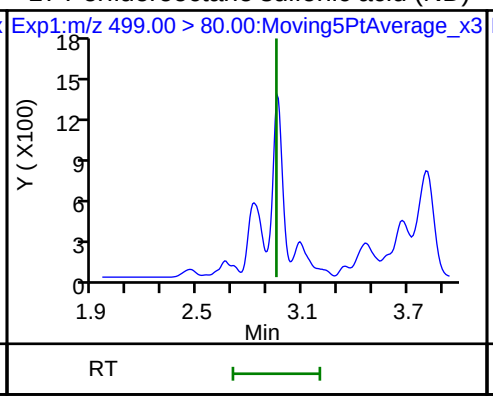
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid



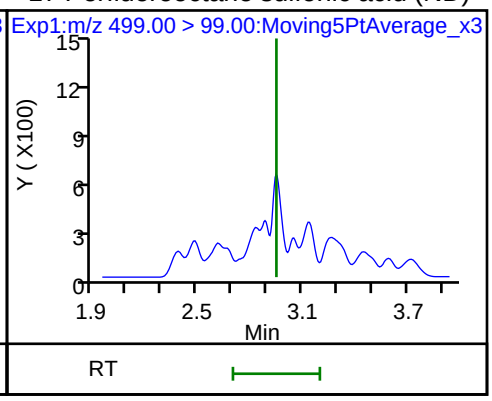
15 Perfluorooctanoic acid (M)



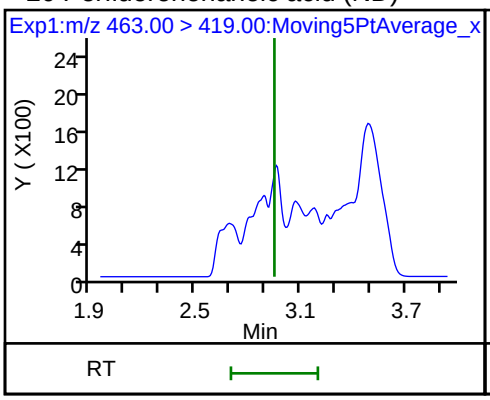
17 Perfluorooctane sulfonic acid (ND)



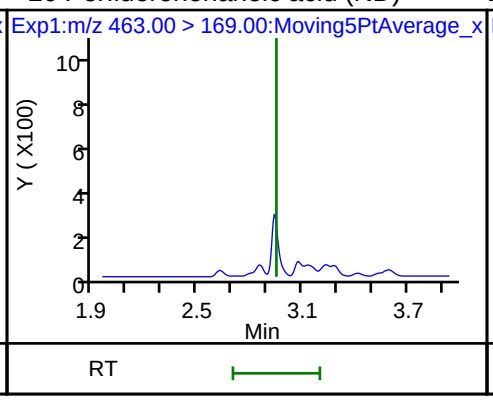
17 Perfluorooctane sulfonic acid (ND)



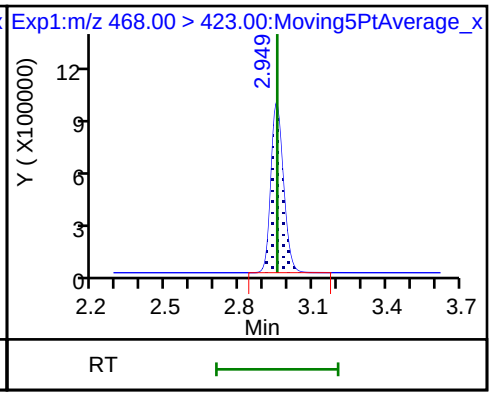
20 Perfluorononanoic acid (ND)



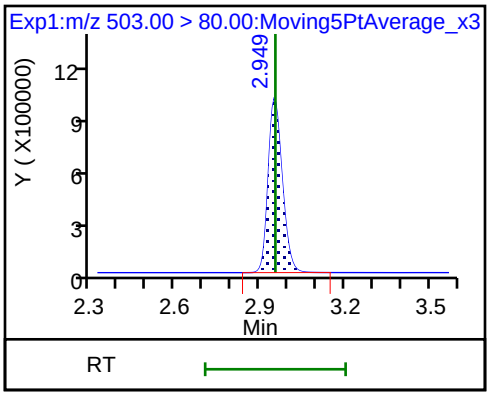
20 Perfluorononanoic acid (ND)



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

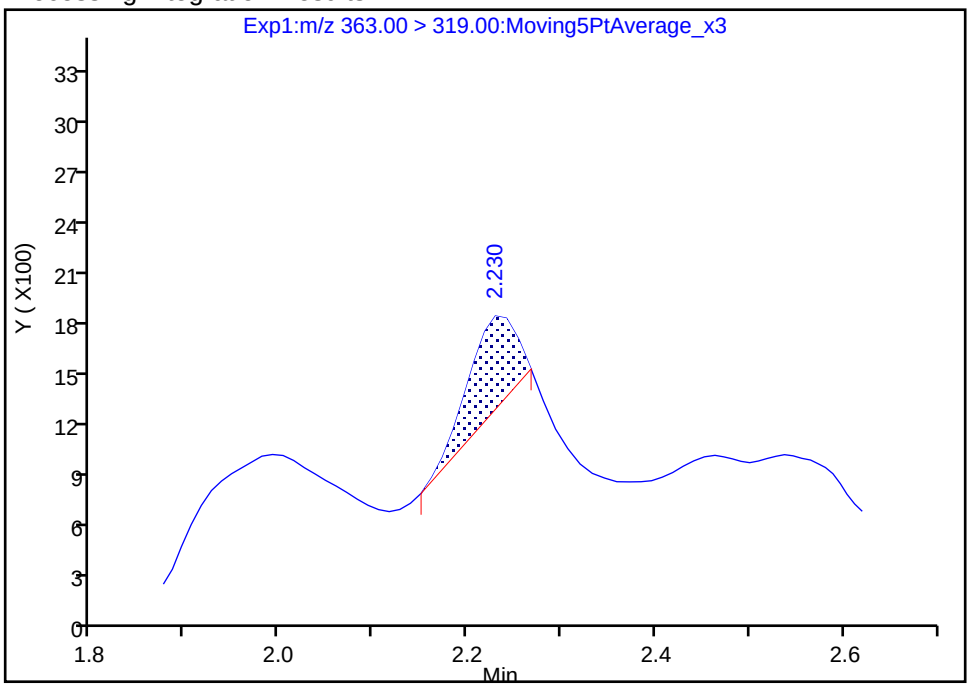
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_048.d				
Injection Date:	29-Jul-2018 05:58:42	Instrument ID:	A8_N		
Lims ID:	320-41333-A-4-A	Lab Sample ID:	320-41333-4		
Client ID:	GRE-ER-MW-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	37	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

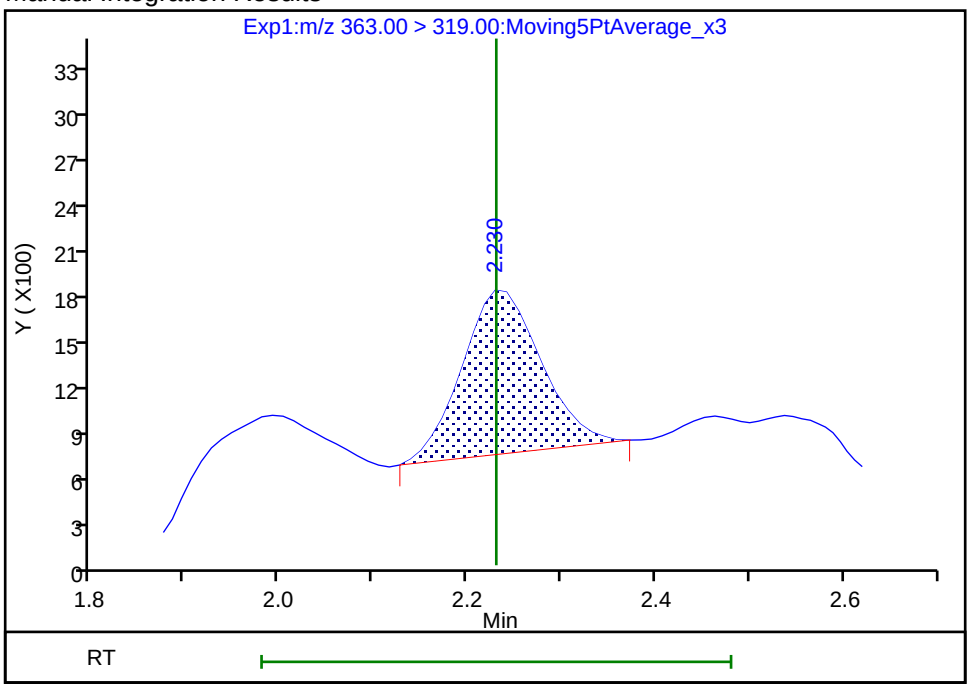
Processing Integration Results

RT: 2.23
Area: 1971
Amount: 0.001162
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 6339
Amount: 0.003739
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:28:50

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

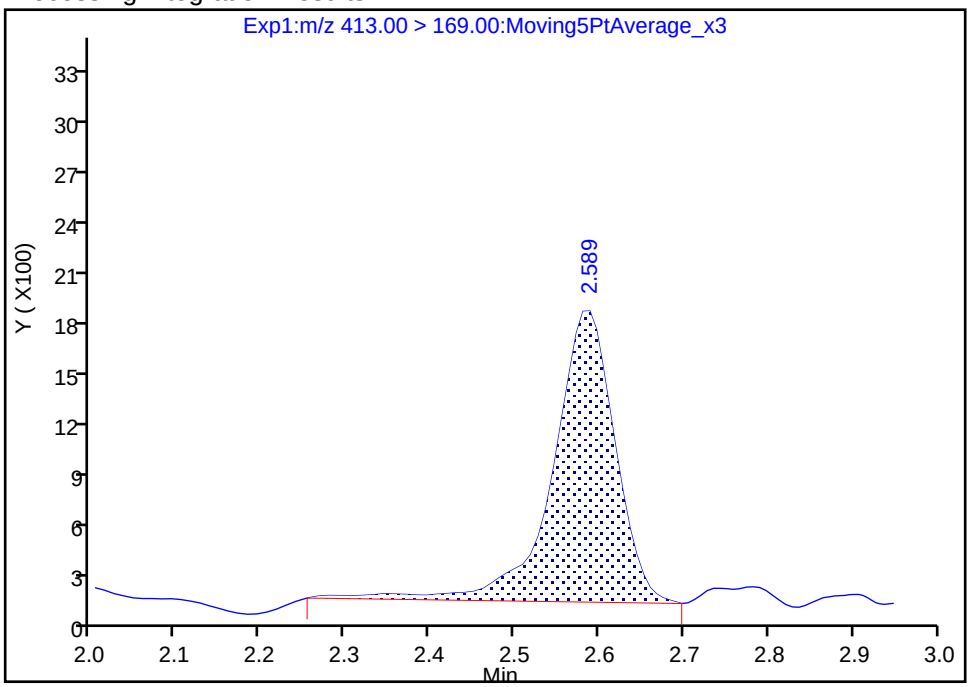
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_048.d				
Injection Date:	29-Jul-2018 05:58:42	Instrument ID:	A8_N		
Lims ID:	320-41333-A-4-A	Lab Sample ID:	320-41333-4		
Client ID:	GRE-ER-MW-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	37	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

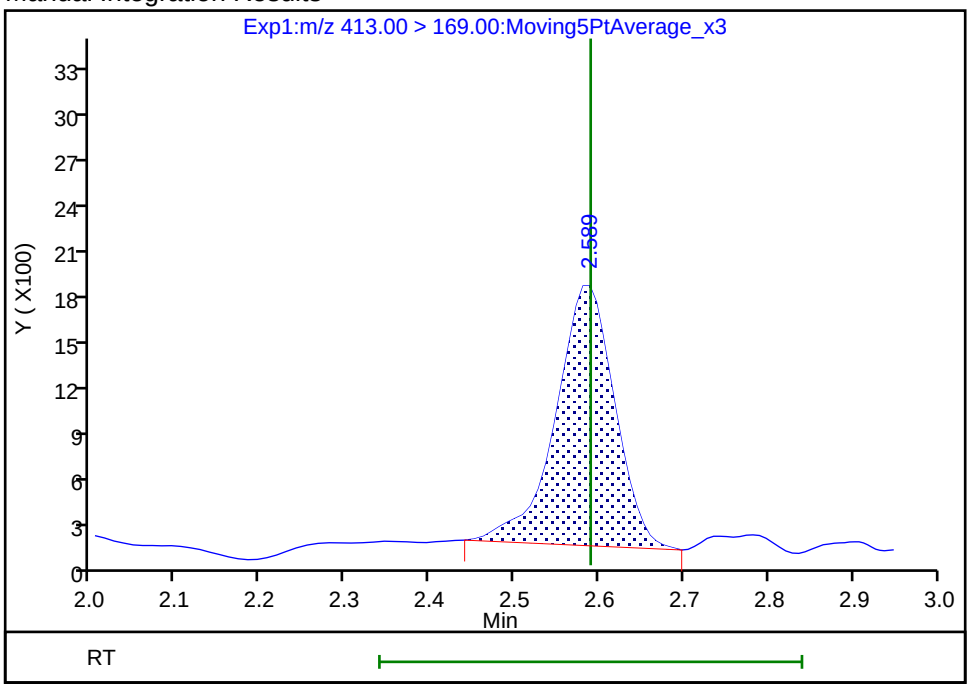
Processing Integration Results

RT: 2.59
Area: 8807
Amount: 0.005024
Amount Units: ng/ml



Manual Integration Results

RT: 2.59
Area: 8174
Amount: 0.005024
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:29:01

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 8-MW12-PRL03-01 | Lab Sample ID: 320-41333-5

Matrix: Water | Lab File ID: 2018.07.28LLB_049.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 08:33

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 312.5(mL) | Date Analyzed: 07/29/2018 06:06

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*660*	*E J1*	*1.6*	1.2	*0.49*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*670*	*E J1*	*1.6*	1.2	*0.43*
375-95-1	Perfluorononanoic acid (PFNA)	48	J1	1.6	1.2	0.42
375-73-5	Perfluorobutanesulfonic acid (PFBS)	130		1.6	0.80	0.37
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*1400*	*E J1*	*1.6*	0.80	*0.30*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*1000*	*E J1*	*3.2*	2.4	*0.88*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	92		50-150
STL01892	13C4-PFHpA	65		50-150
STL00990	13C4 PFOA	64		50-150
STL00995	13C5 PFNA	85		50-150
STL00994	18O2 PFHxS	74		50-150
STL00991	13C4 PFOS	90		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_049.d
Lims ID: 320-41333-A-5-A
Client ID: 8-MW12-PRL03-01
Sample Type: Client
Inject. Date: 29-Jul-2018 06:06:32 ALS Bottle#: 38 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-5-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:29:11 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:29:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.397	-0.006	0.537	3760540	2.11		84.2	61386	
2 Perfluorobutyric acid										E
212.90 > 169.00	1.397	1.397	0.0	1.004	19525455	13.2			6228	E
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.640	0.001	0.634	2605394	2.09		83.6	31086	
4 Perfluoropentanoic acid										E
262.90 > 219.00	1.641	1.641	0.0	1.000	44633743	35.8			13739	E
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.647	69826	2.14		91.9	233	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.676	0.0	1.000	9846066	4.13			3842	
298.90 > 99.00	1.676	1.676	0.0	1.000	4273137		2.30(1.25-3.74)		7303	
D 60 M2-4:2FTS										
329.00 > 81.00	1.703	1.876	-0.173	0.657	65045	NC			43.2	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.877	0.0	1.120	1289892	2.51			33397	
D 7 13C2 PFHxA										
315.00 > 270.00	1.917	1.905	0.012	0.740	2924631	2.00		80.0	51521	
6 Perfluorohexanoic acid										E
313.00 > 269.00	1.917	1.917	0.0	1.000	40623613	32.8			41263	E
313.00 > 119.00	1.917	1.917	0.0	1.000	4756174		8.54(5.03-15.10)		77131	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.939	1.939	0.0	1.157	12300581	5.75			32822	
349.00 > 99.00	1.939	1.939	0.0	1.157	4851065		2.54(1.36-4.07)		25987	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.016	2.003	0.013	0.778	317660	NC			10043	
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.229	0.001	0.861	2463303	1.64		65.4	55485	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										E
363.00 > 319.00	2.230	2.230	0.0	1.000	22479968	20.7			29498	E
363.00 > 169.00	2.230	2.230	0.0	1.000	9221453		2.44(1.13-3.40)		96426	
D 11 18O2 PFHxS										
403.00 > 84.00	2.255	2.241	0.014	0.871	3402663	1.76		74.4	45743	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.242	2.242	0.0	0.994	73311836	43.7			46006	E
399.00 > 99.00	2.242	2.242	0.0	0.994	31762565		2.31(1.50-4.49)		39205	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.566	2.557	0.009	1.000	64330292	140.2			69347	E
D 12 M2-6:2FTS										
429.00 > 81.00	2.566	2.564	0.002	0.991	646052	1.54		64.7	4676	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.588	0.002	1.000	2339709	1.59		63.5	34642	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.590	0.0		3850482	2.50			53320	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.590	2.590	0.0	1.000	23932949	21.1			18815	E
413.00 > 169.00	2.590	2.590	0.0	1.000	14030129		1.71(0.84-2.52)		49196	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.598	2.598	0.0	0.879	3273625	1.95			214	
449.00 > 99.00	2.598	2.598	0.0	0.879	926645		3.53(1.94-5.82)		443	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.955	2.950	0.005	1.000	43543700	32.4			50444	E
499.00 > 99.00	2.950	2.950	0.0	0.998	9768816		4.46(2.31-6.93)		47781	
20 Perfluorononanoic acid										
463.00 > 419.00	2.955	2.950	0.005	1.000	1872407	1.51			3603	
463.00 > 169.00	2.955	2.950	0.005	1.000	450379		4.16(1.90-5.69)		3502	
D 19 13C5 PFNA										
468.00 > 423.00	2.955	2.953	0.002	1.141	2707715	2.13		85.2	49618	
D 18 13C4 PFOS										
503.00 > 80.00	2.955	2.953	0.002	1.141	2904730	2.16		90.3	28597	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.302	3.294	0.008	1.000	1919786	3.41			52087	
D 26 M2-8:2FTS										
529.00 > 81.00	3.302	3.299	0.003	1.275	994549	2.27		94.7	17617	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.309	3.310	-0.001	1.000	35517	0.0303			198	
513.00 > 169.00	3.309	3.310	-0.001	1.000	5193		6.84(2.36-7.09)		137	
D 23 13C2 PFDA										
515.00 > 470.00	3.309	3.315	-0.006	1.278	2852011	2.82		113	43523	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.317	3.317	0.0	1.000	54415	0.0292			74.5	
D 21 13C8 FOSA										
506.00 > 78.00	3.317	3.322	-0.005	1.281	4690365	2.37		95.0	43807	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.471	3.467	0.004	1.340	892851	2.67		107	27986	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.645	3.636	0.009	1.000	5419	0.005190			22.5	
563.00 > 169.00	3.635	3.636	-0.001	0.997	1246		4.35(2.12-6.36)		31.8	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.635	3.640	-0.005	1.404	968440	2.76		110	3059	
D 30 13C2 PFUnA										
565.00 > 520.00	3.645	3.640	0.005	1.407	2103580	2.58		103	40367	
D 36 13C2 PFDoA										
615.00 > 570.00	3.937	3.941	-0.004	1.520	1775835	2.29		91.8	16955	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.437	-0.001	1.713	1450495	1.92		76.7	15020	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.837	0.005	1.000	12580	NC			3.2	
813.00 > 169.00	4.842	4.837	0.005	1.000	2487		5.06(2.86-8.58)		30.7	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.842	0.0	1.869	1485154	1.29		51.7	6535	

QC Flag Legend

Processing Flags

NC - Not Calibrated

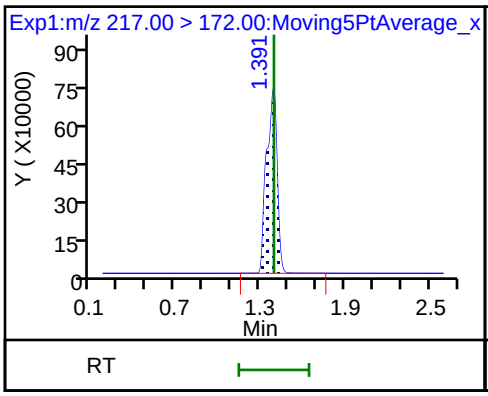
E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 12:29:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

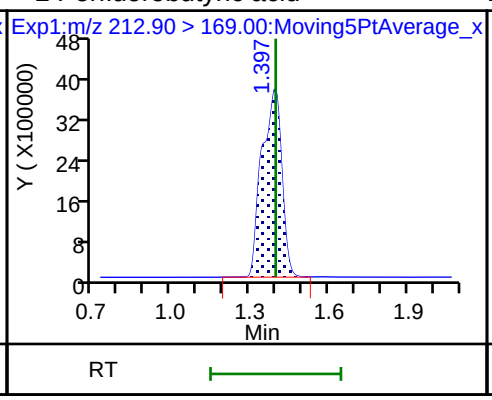
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_049.d				
Injection Date:	29-Jul-2018 06:06:32	Instrument ID:	A8_N		
Lims ID:	320-41333-A-5-A	Lab Sample ID:	320-41333-5		
Client ID:	8-MW12-PRL03-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	38	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

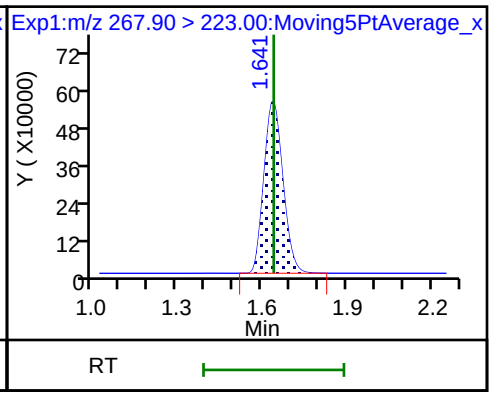
D 1 13C4 PFBA



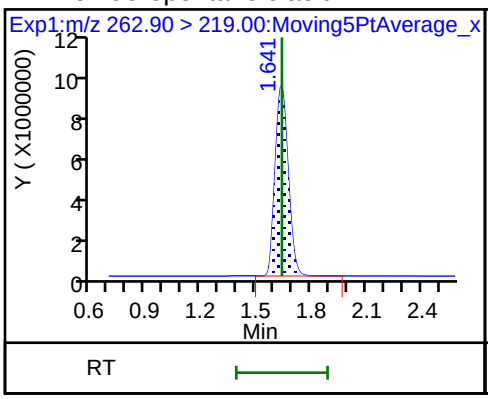
2 Perfluorobutyric acid



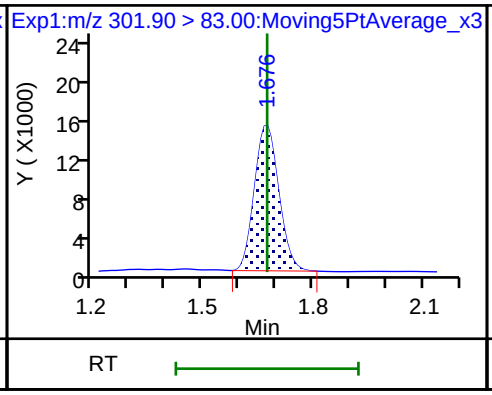
D 3 13C5-PFPeA



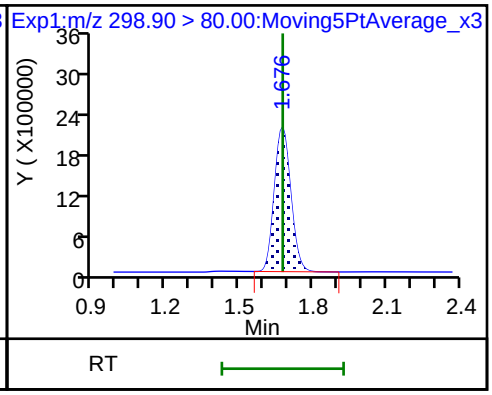
4 Perfluoropentanoic acid



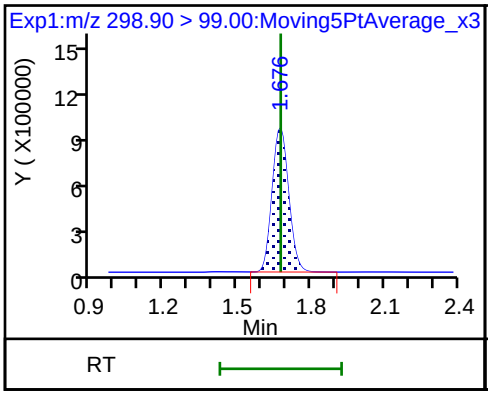
D 47 13C3-PFBS



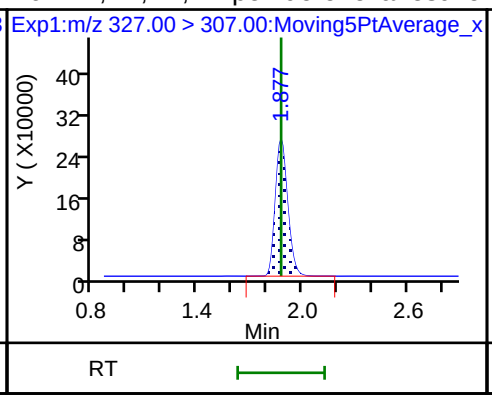
5 Perfluorobutanesulfonic acid



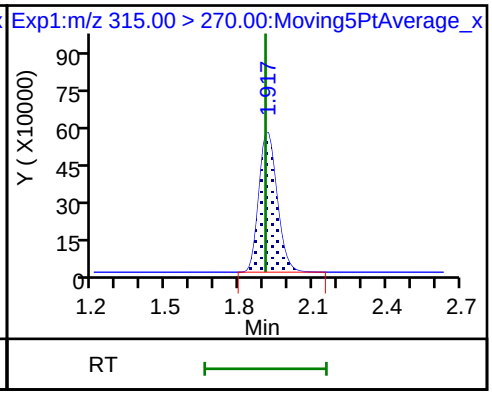
5 Perfluorobutanesulfonic acid



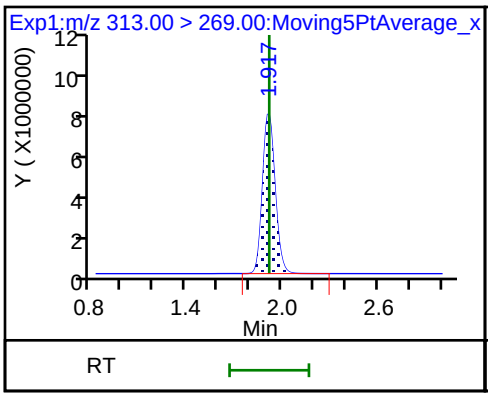
61 1H,1H,2H,2H-perfluorohexanesulfon



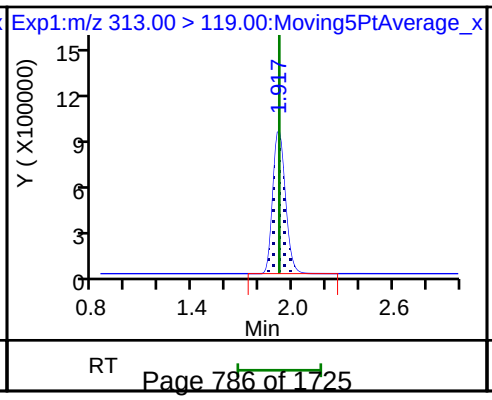
D 7 13C2 PFHxA



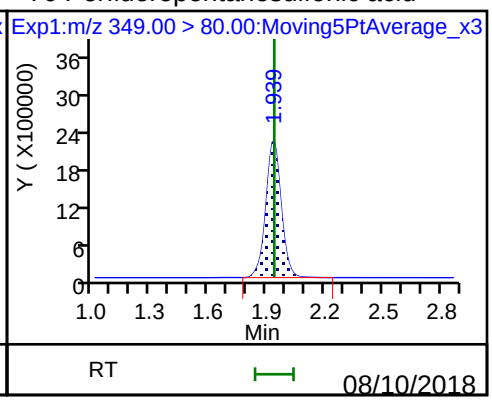
6 Perfluorohexanoic acid



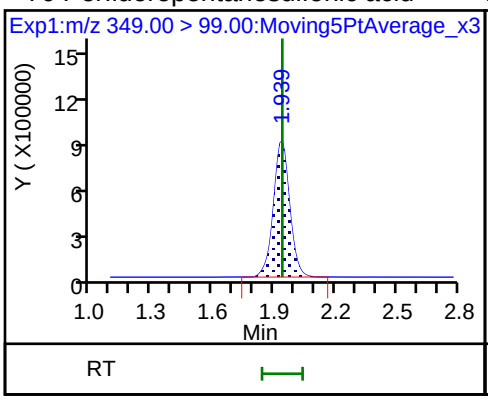
6 Perfluorohexanoic acid



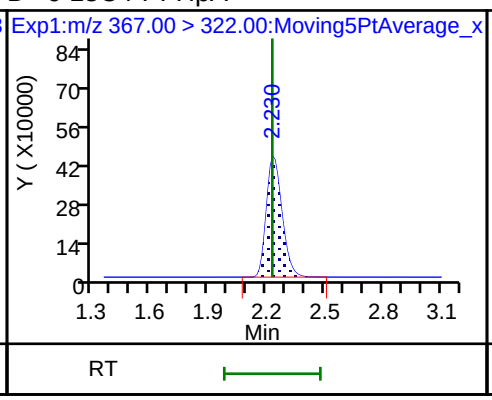
70 Perfluoropentanesulfonic acid



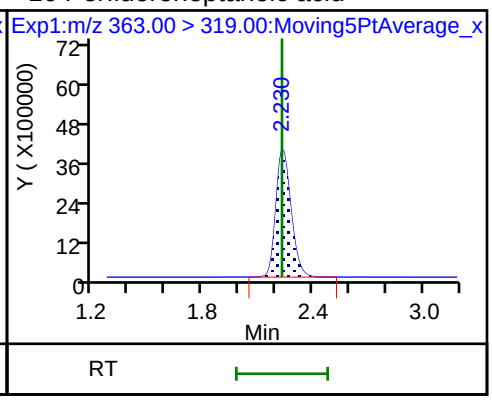
70 Perfluoropentanesulfonic acid



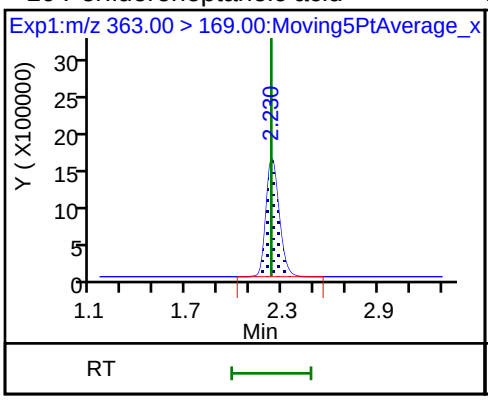
D 9 13C4-PFHpA



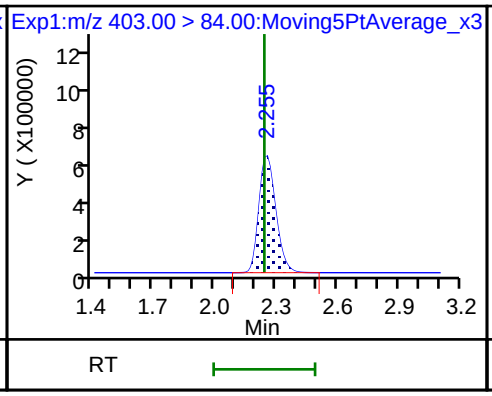
10 Perfluoroheptanoic acid



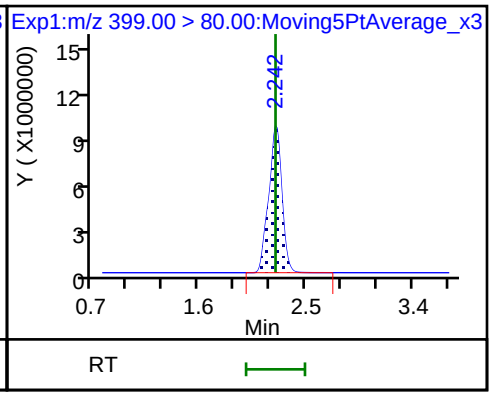
10 Perfluoroheptanoic acid



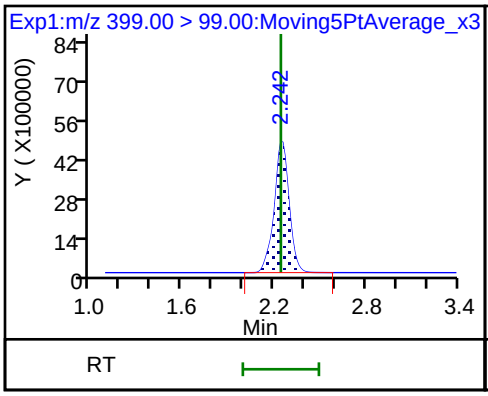
D 11 18O2 PFHxS



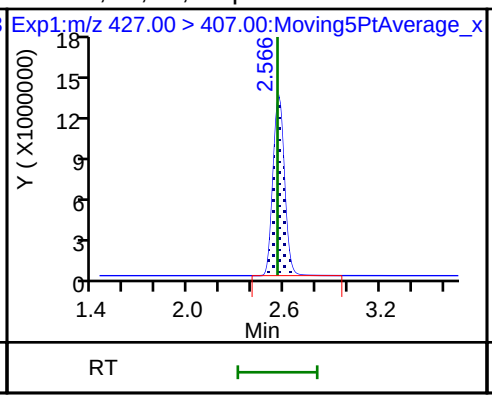
8 Perfluorohexanesulfonic acid



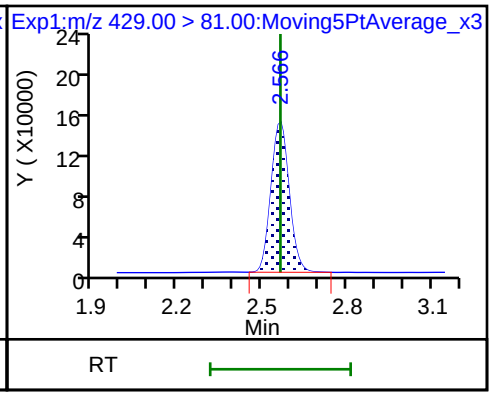
8 Perfluorohexanesulfonic acid



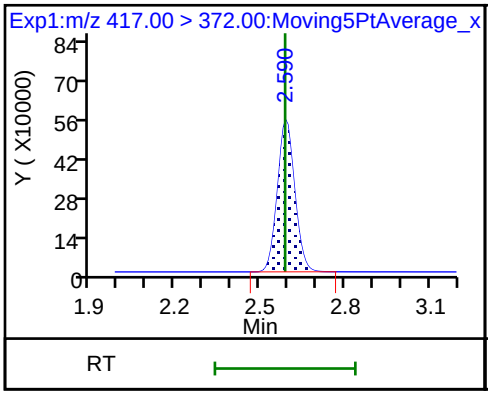
13 1H,1H,2H,2H-perfluorooctanesulfon



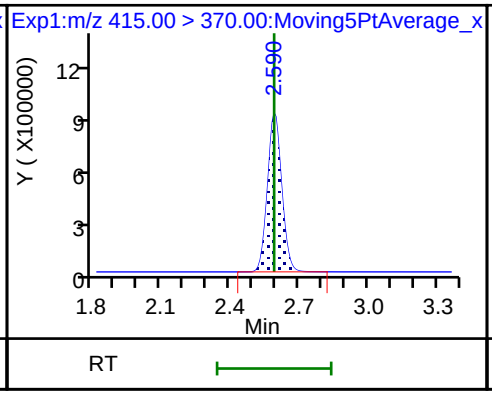
D 12 M2-6:2FTS



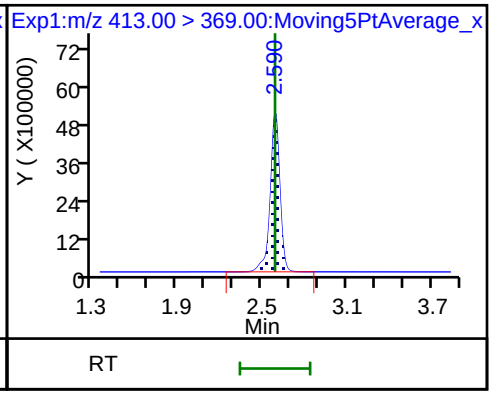
D 14 13C4 PFOA



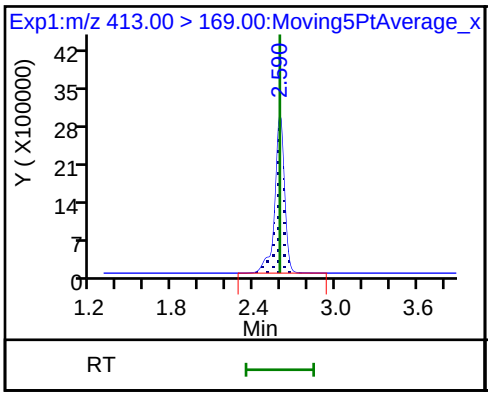
* 62 13C2-PFOA



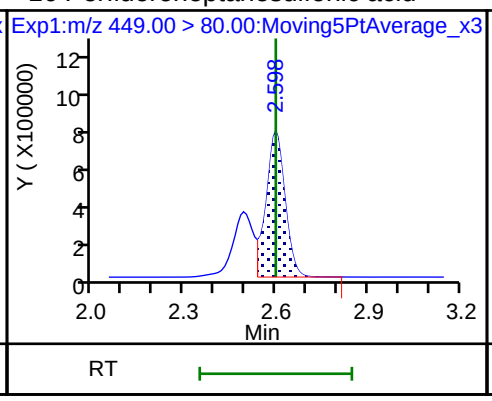
15 Perfluorooctanoic acid



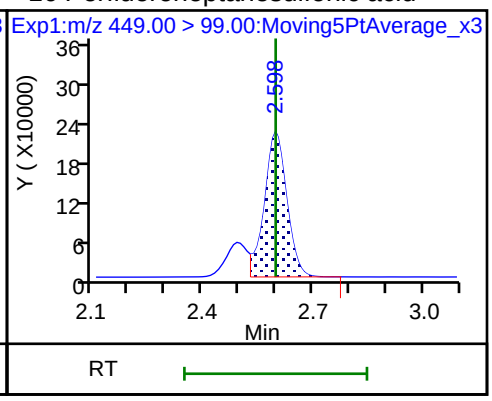
15 Perfluorooctanoic acid



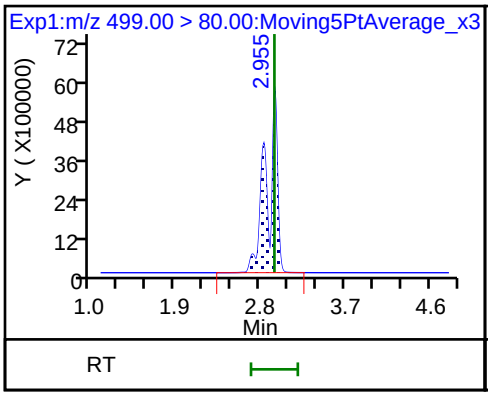
16 Perfluoroheptanesulfonic acid



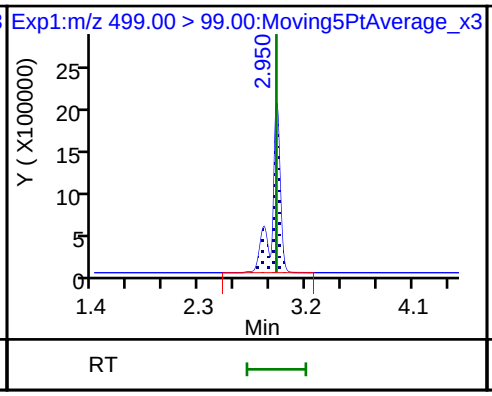
16 Perfluoroheptanesulfonic acid



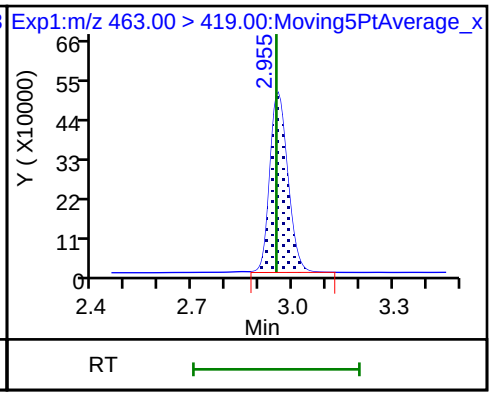
17 Perfluorooctane sulfonic acid



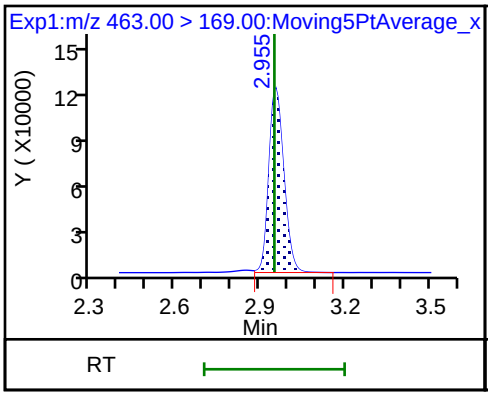
17 Perfluorooctane sulfonic acid



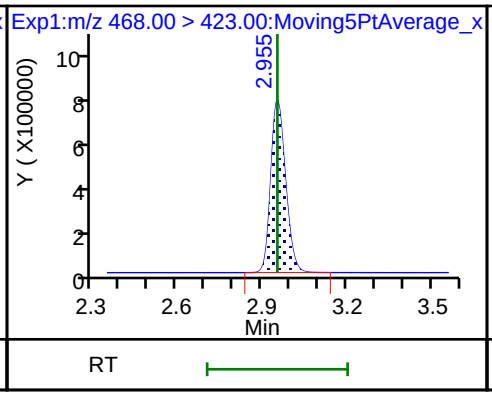
20 Perfluorononanoic acid



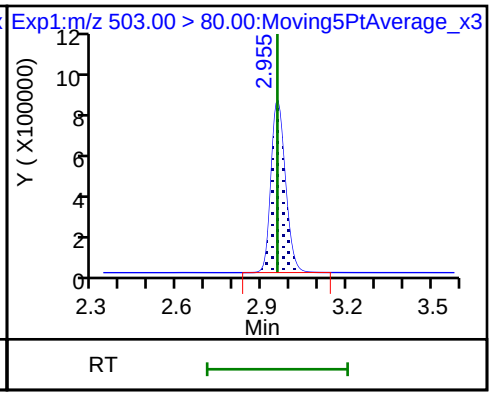
20 Perfluorononanoic acid



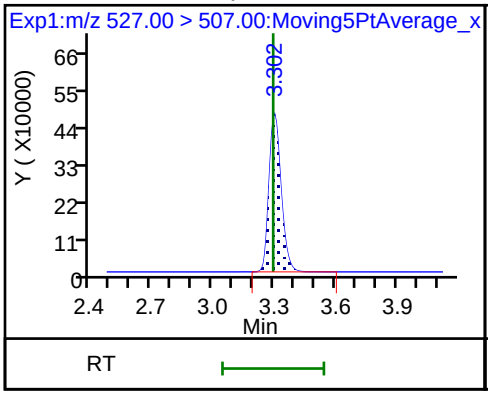
D 19 13C5 PFNA



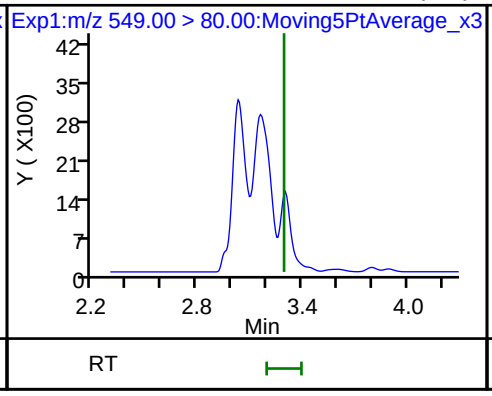
D 18 13C4 PFOS



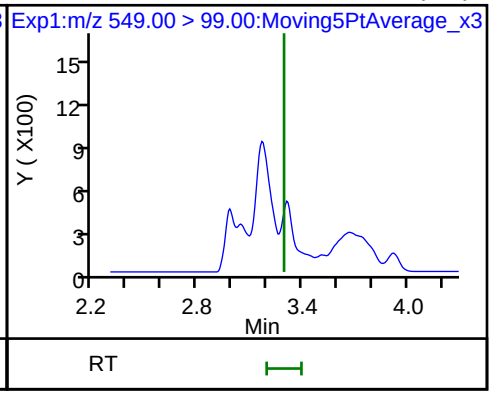
25 1H,1H,2H,2H-perfluorodecanesulfoni



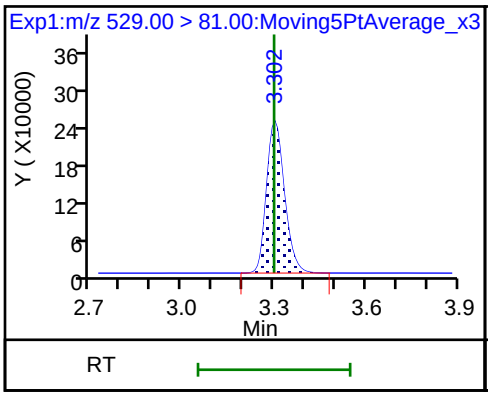
68 Perfluorononanesulfonic acid (ND)



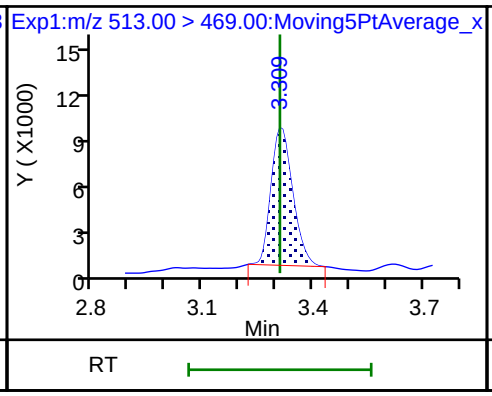
68 Perfluorononanesulfonic acid (ND)



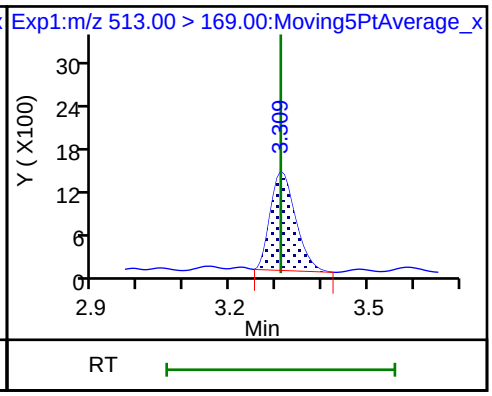
D 26 M2-8:2FTS



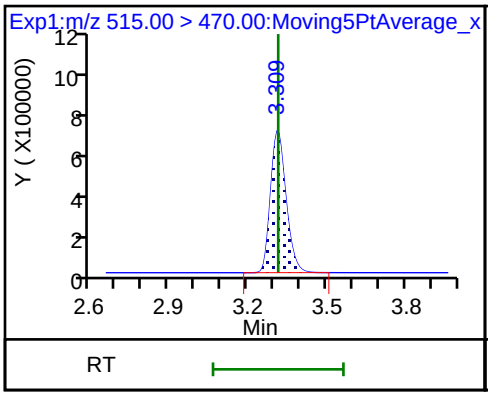
24 Perfluorodecanoic acid



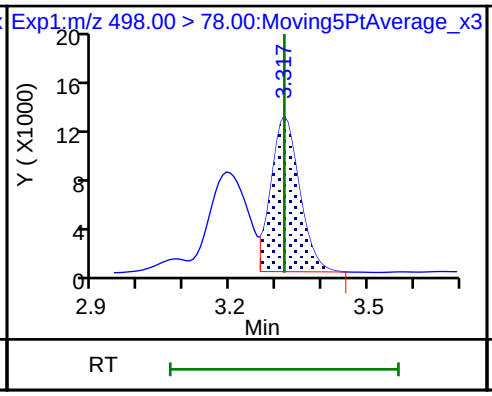
24 Perfluorodecanoic acid



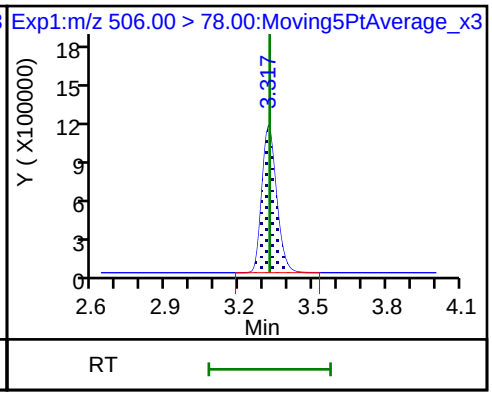
D 23 13C2 PFDA



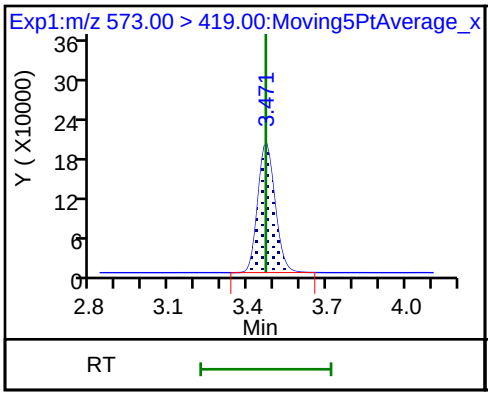
22 Perfluorooctane Sulfonamide



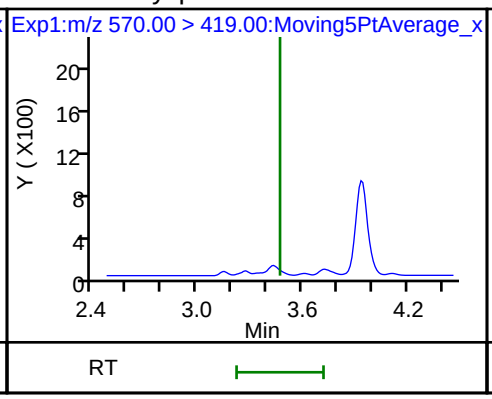
D 21 13C8 FOSA



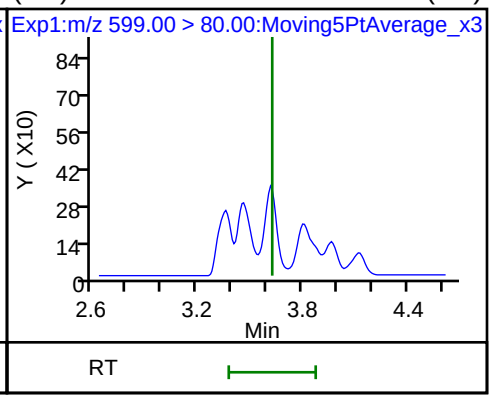
D 27 d3-NMeFOSAA



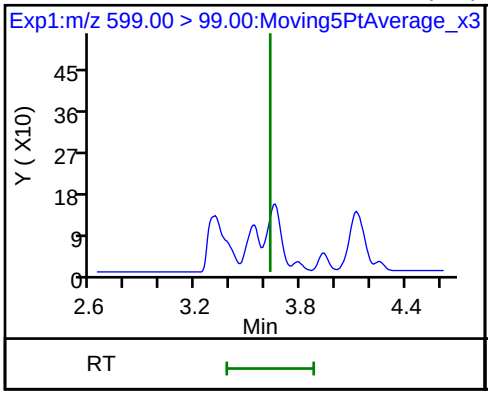
28 N-methyl perfluorooctane sulfonami (ND)



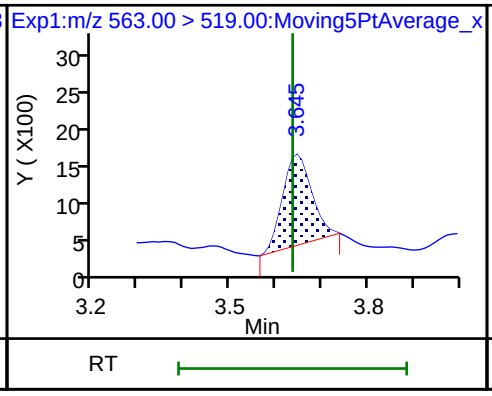
29 Perfluorodecane Sulfonic acid (ND)



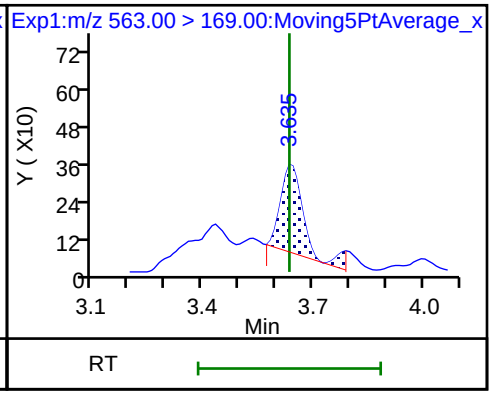
29 Perfluorodecane Sulfonic acid (ND)



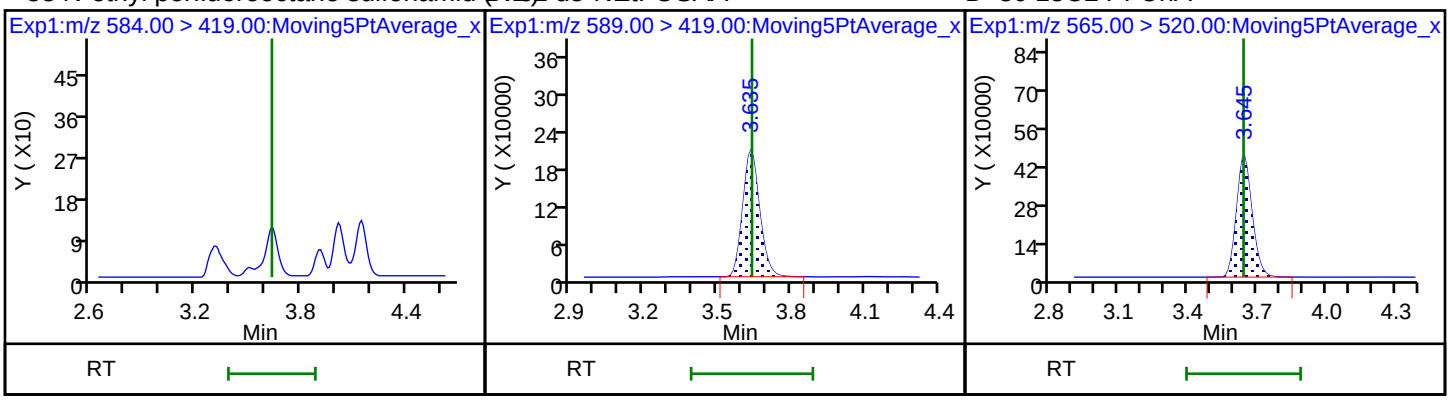
31 Perfluoroundecanoic acid



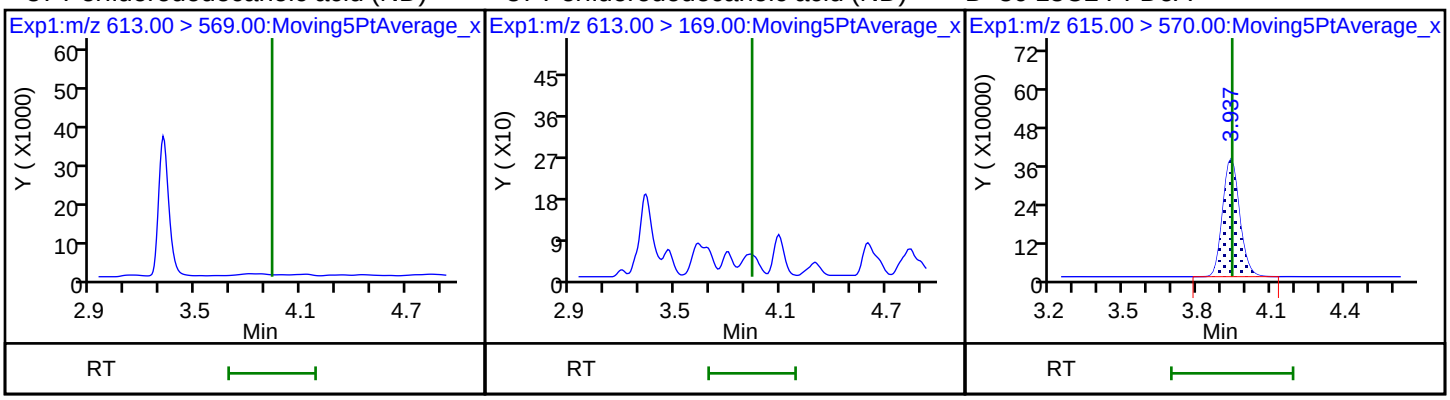
31 Perfluoroundecanoic acid



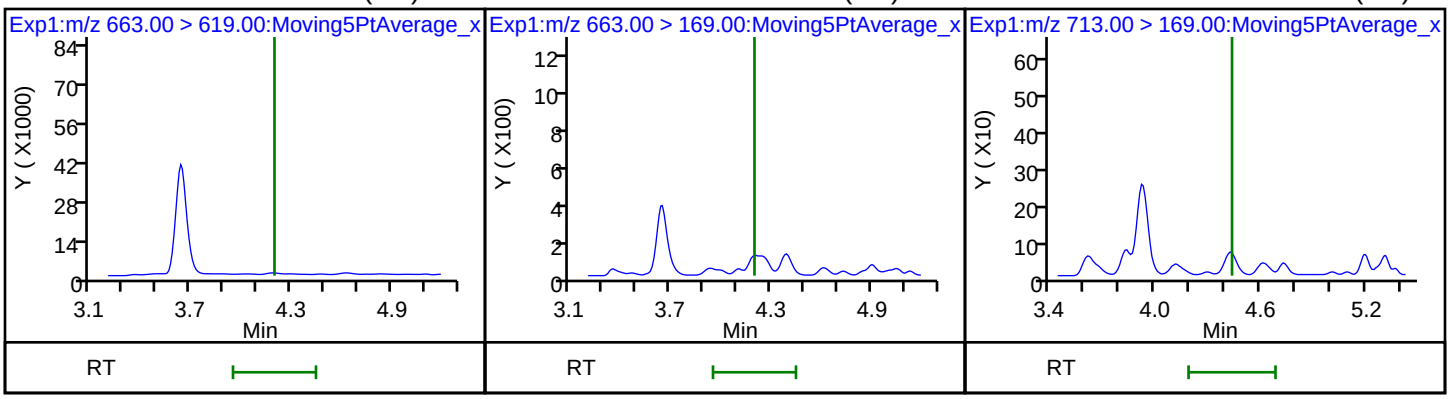
33 N-ethyl perfluorooctane sulfonamid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA



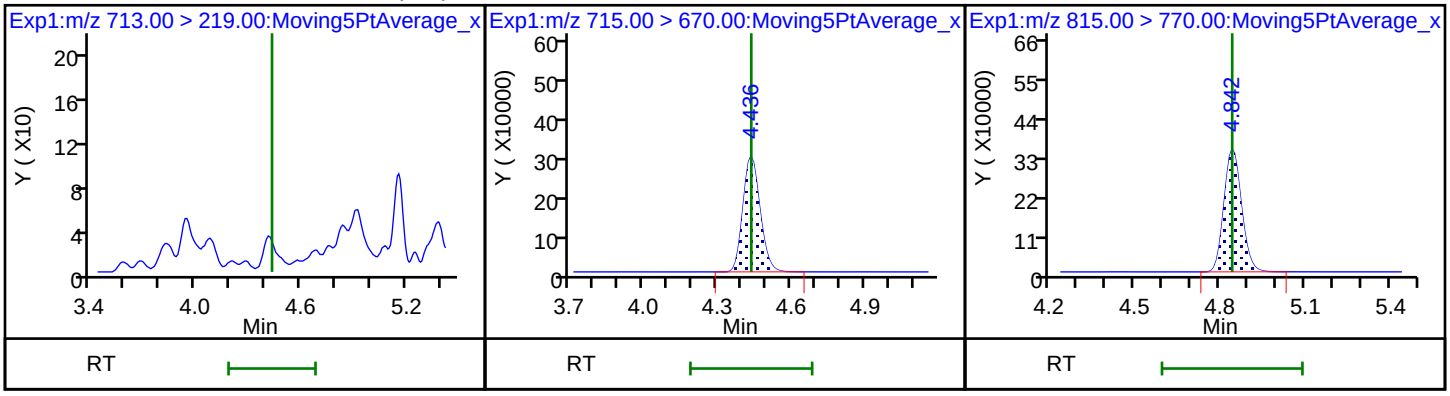
37 Perfluorododecanoic acid (ND) 37 Perfluorododecanoic acid (ND) D 36 13C2 PFDoA



41 Perfluorotridecanoic acid (ND) 41 Perfluorotridecanoic acid (ND) 42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND) D 43 13C2-PFTeDA D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 8-MW12-PRL03-01 DL | Lab Sample ID: 320-41333-5 DL

Matrix: Water | Lab File ID: 2018.08.03LLA_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 08:33

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 312.5(mL) | Date Analyzed: 08/03/2018 07:11

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237784 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	630	J1 D	32	24	9.8
335-67-1	Perfluorooctanoic acid (PFOA)	760	J1 D	32	24	8.6
375-95-1	*Perfluorononanoic acid (PFNA)*	*54*	*J1 D*	*32*	24	*8.3*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*140*	*J1 D*	*32*	16	*7.4*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2100	D J1	32	16	6.1
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1100	J1 D	64	48	18

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	57		50-150
STL01892	13C4-PFHpA	63		50-150
STL00990	13C4 PFOA	64		50-150
STL00995	13C5 PFNA	61		50-150
STL00994	18O2 PFHxS	57		50-150
STL00991	13C4 PFOS	52		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_019.d
Lims ID: 320-41333-A-5-A
Client ID: 8-MW12-PRL03-01
Sample Type: Client
Inject. Date: 03-Aug-2018 07:11:43 ALS Bottle#: 26 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-41333-a-5-a 20X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:19:00 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:20:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.413	1.407	0.006	1.000	1237049	0.6590			642	
D 1 13C4 PFBA										
217.00 > 172.00	1.413	1.411	0.002	0.543	238121	0.0768		61.4	5051	
D 3 13C5-PFPeA										
267.90 > 223.00	1.656	1.653	0.003	0.636	162964	0.0798		63.8	4008	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.656	1.656	0.0	1.000	3718183	2.38			1555	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.690	0.002	0.650	3862	0.0658		56.6	21.8	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.692	1.692	0.0	1.000	567148	0.2227			898	
298.90 > 99.00	1.692	1.692	0.0	1.000	243747		2.33(1.25-3.74)		1095	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.905	1.894	0.011	1.126	111968	0.1958			3563	
D 7 13C2 PFHxA										
315.00 > 270.00	1.938	1.935	0.004	0.744	181348	0.0821		65.7	6758	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.938	1.937	0.001	1.000	3245046	2.12			10120	
313.00 > 119.00	1.938	1.937	0.001	1.000	283443		11.45(5.03-15.10)		5247	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.959	1.959	0.0	1.157	659670	0.2935			6214	
349.00 > 99.00	1.959	1.959	0.0	1.157	264751		2.49(1.36-4.07)		2383	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.036	2.033	0.003	0.782	12707	NC			597	
D 9 13C4-PFHpA										
367.00 > 322.00	2.254	2.251	0.003	0.866	168749	0.0788		63.0	5723	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.254	2.253	0.001	1.000	1529516	0.9770			862	
363.00 > 169.00	2.254	2.253	0.001	1.000	583594		2.62(1.13-3.40)		8949	
D 11 18O2 PFHxS										
403.00 > 84.00	2.267	2.264	0.003	0.871	218633	0.0679		57.5	9169	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.267	2.266	0.001	1.000	6929151	3.24			14578	
399.00 > 99.00	2.267	2.266	0.001	1.000	2320175		2.99(1.50-4.49)		4871	
D 12 M2-6:2FTS										
429.00 > 81.00	2.580	2.579	0.001	0.991	77906	0.1242		105	1760	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.588	2.588	0.0	1.003	15383089	14.2			86456	E
D 14 13C4 PFOA										
417.00 > 372.00	2.611	2.602	0.009	1.003	164351	0.0795		63.6	9767	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.611	2.611	0.0	1.000	1813971	1.19			1322	
413.00 > 169.00	2.611	2.611	0.0	1.000	1016105		1.79(0.84-2.52)		14769	
* 62 13C2-PFOA										
415.00 > 370.00	2.603	2.611	-0.008		269223	0.1250			12572	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.611	2.619	-0.008	0.878	233192	0.1448			272	
449.00 > 99.00	2.611	2.619	-0.008	0.878	55271		4.22(1.94-5.82)		451	
D 19 13C5 PFNA										
468.00 > 423.00	2.973	2.964	0.009	1.142	138083	0.0766		61.3	7267	
D 18 13C4 PFOS										
503.00 > 80.00	2.973	2.964	0.009	1.142	139174	0.0626		52.4	4705	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.973	2.973	0.0	1.000	2333649	1.78			16365	
499.00 > 99.00	2.973	2.973	0.0	1.000	486260		4.80(2.31-6.93)		4088	
20 Perfluorononanoic acid										
463.00 > 419.00	2.973	2.979	-0.006	1.000	100411	0.0842			355	
463.00 > 169.00	2.973	2.979	-0.006	1.000	22374		4.49(1.90-5.69)		904	
D 26 M2-8:2FTS										
529.00 > 81.00	3.315	3.311	0.004	1.273	42143	0.0689		57.5	998	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.315	3.322	-0.007	1.000	91813	0.1931			7277	
D 23 13C2 PFDA										
515.00 > 470.00	3.322	3.327	-0.005	1.276	123929	0.0920		73.6	5906	
D 21 13C8 FOSA										
506.00 > 78.00	3.347	3.343	0.004	1.286	219121	0.0671		53.7	5083	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.338	3.355	-0.017	0.997	1396	0.000807			23.8	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.476	3.473	0.003	1.336	20831	0.0637		51.0	921	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.650	3.647	0.003	1.402	21133	0.0603		48.2	194	
D 30 13C2 PFUnA										
565.00 > 520.00	3.650	3.647	0.003	1.402	76987	0.0742		59.4	2708	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 36 13C2 PFDoA										
615.00 > 570.00	3.941	3.943	-0.002	1.514	60473	0.0673		53.8	1195	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.433	0.004	1.705	40073	0.0531		42.5	219	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.829	0.004	1.857	36310	0.0279		22.4	57.9	

QC Flag Legend

Processing Flags

NC - Not Calibrated

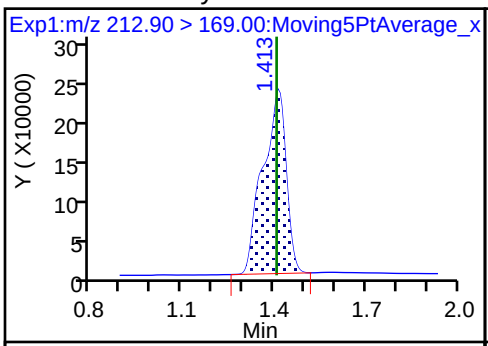
E - Exceeded Maximum Amount

Report Date: 06-Aug-2018 11:20:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

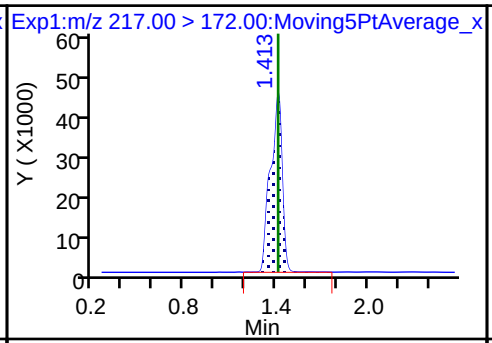
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_019.d				
Injection Date:	03-Aug-2018 07:11:43	Instrument ID:	A8_N		
Lims ID:	320-41333-A-5-A	Lab Sample ID:	320-41333-5		
Client ID:	8-MW12-PRL03-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	26	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

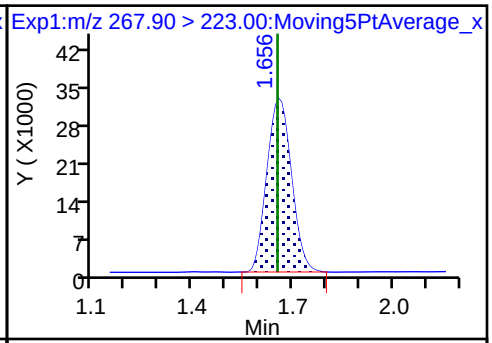
2 Perfluorobutyric acid



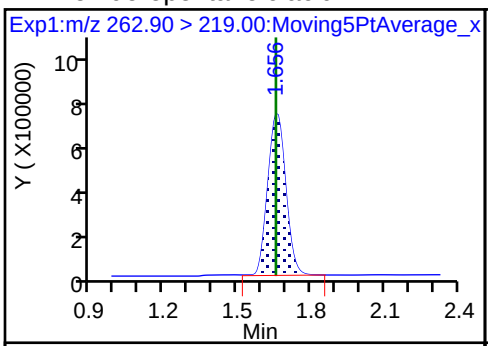
D 1 13C4 PFBA



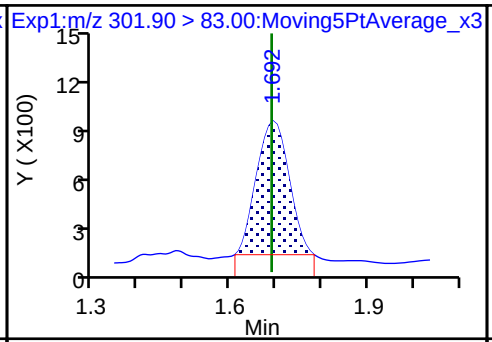
D 3 13C5-PFPeA



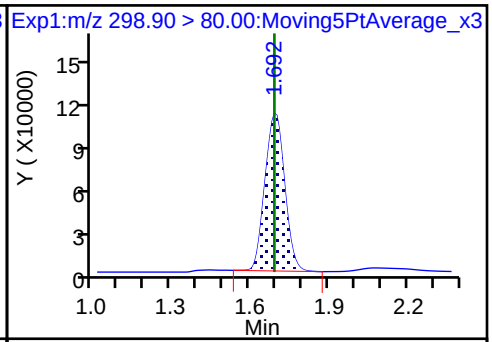
4 Perfluoropentanoic acid



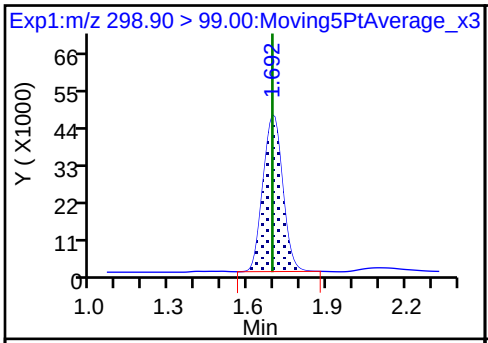
D 47 13C3-PFBS



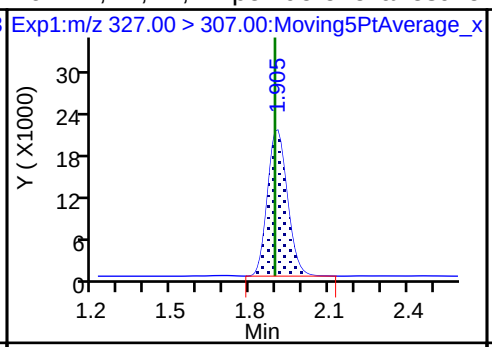
5 Perfluorobutanesulfonic acid



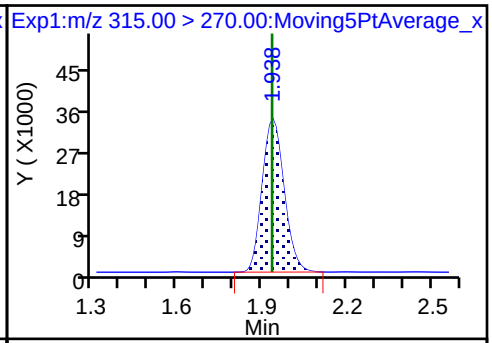
5 Perfluorobutanesulfonic acid



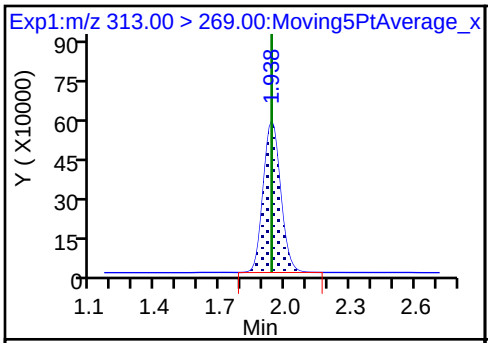
61 1H,1H,2H,2H-perfluorohexanesulfon



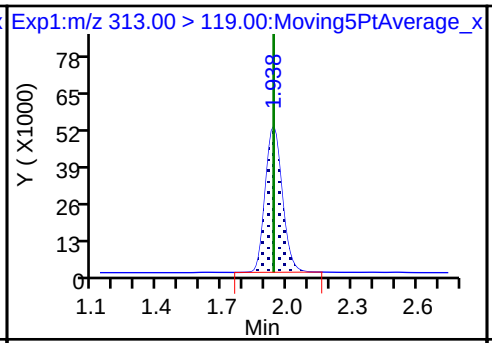
D 7 13C2 PFHxA



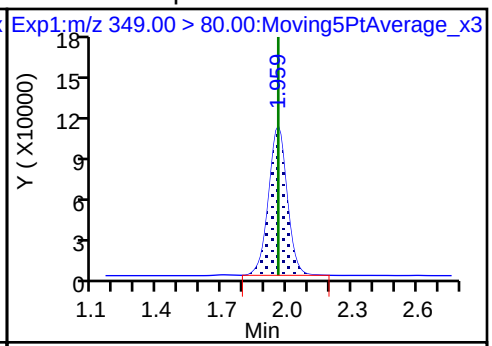
6 Perfluorohexanoic acid



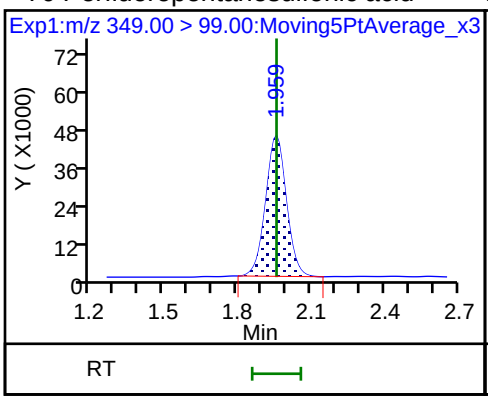
6 Perfluorohexanoic acid



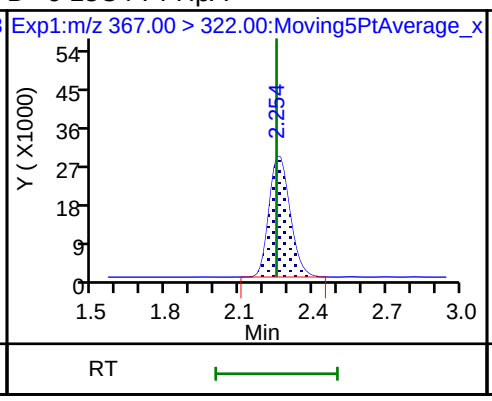
70 Perfluoropentanesulfonic acid



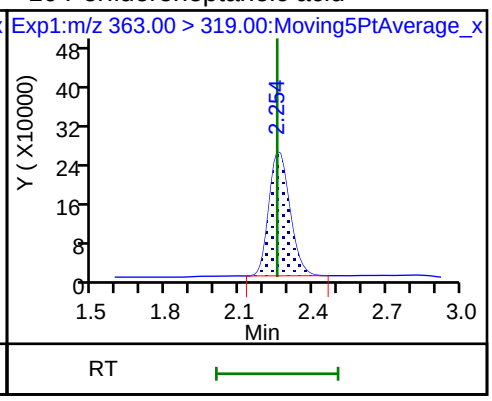
70 Perfluoropentanesulfonic acid



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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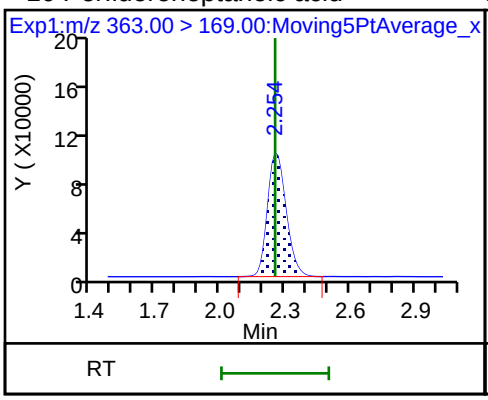
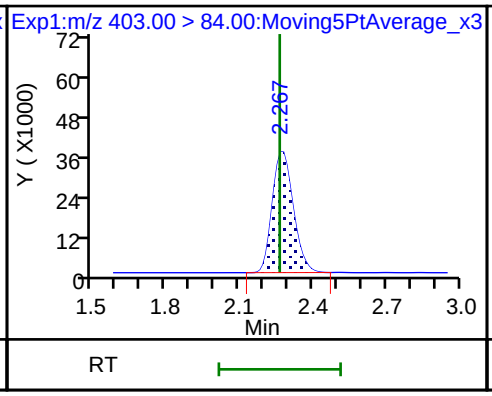
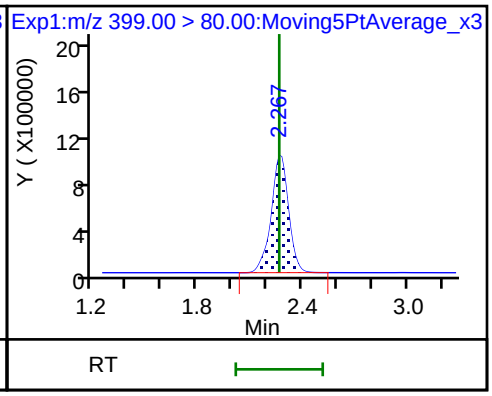


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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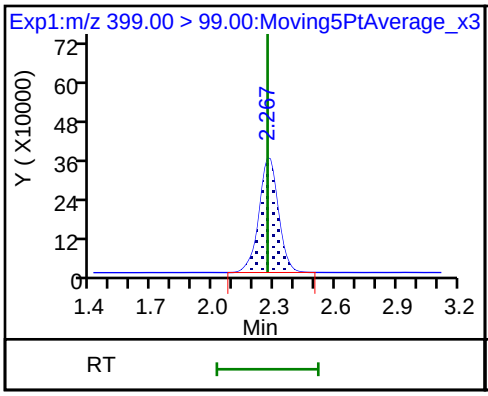
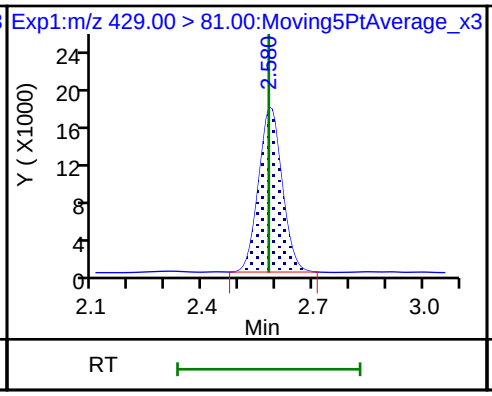
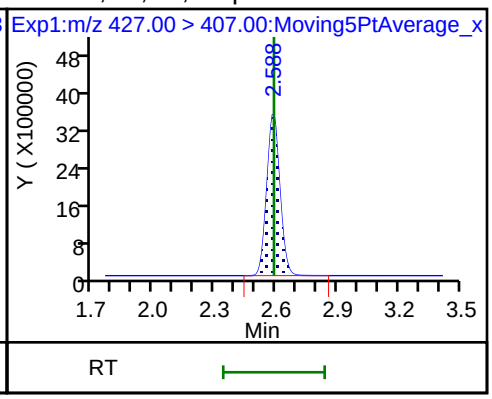


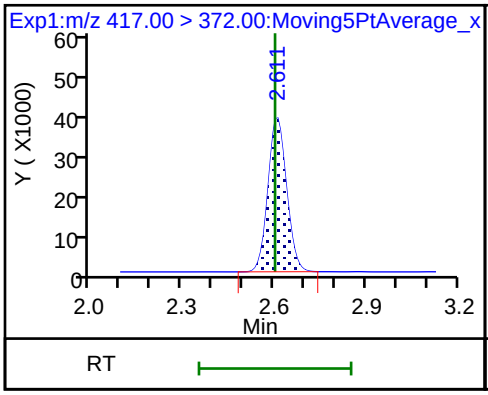
D 12 M2-6:2FTS



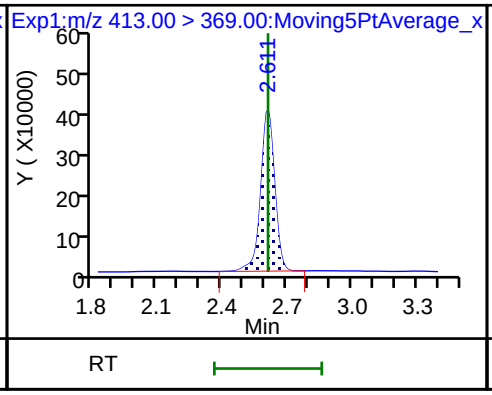
13 1H,1H,2H,2H-perfluorooctanesulfoni



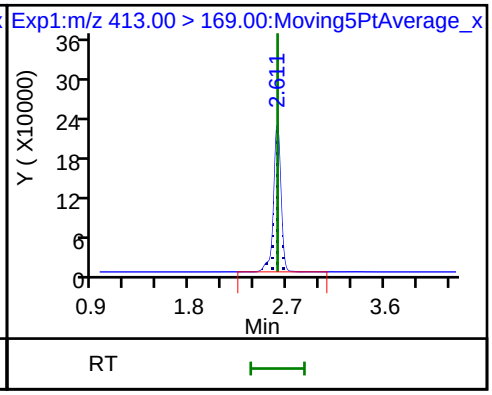
D 14 13C4 PFOA



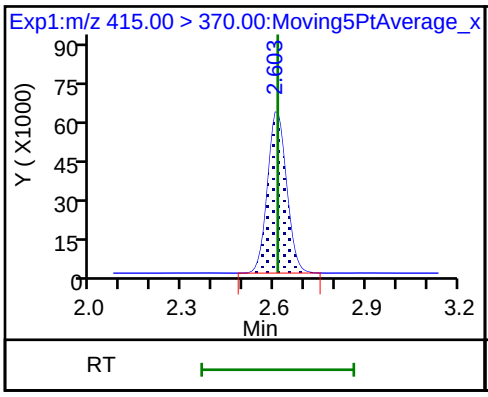
15 Perfluorooctanoic acid



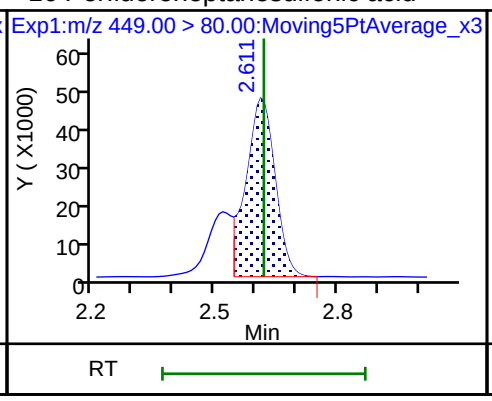
15 Perfluorooctanoic acid



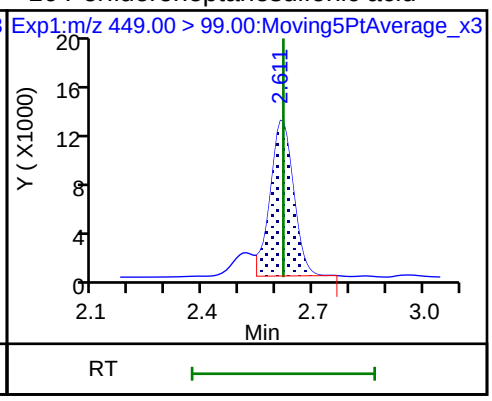
* 62 13C2-PFOA



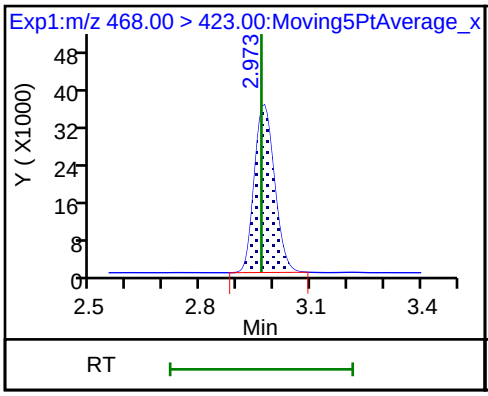
16 Perfluoroheptanesulfonic acid



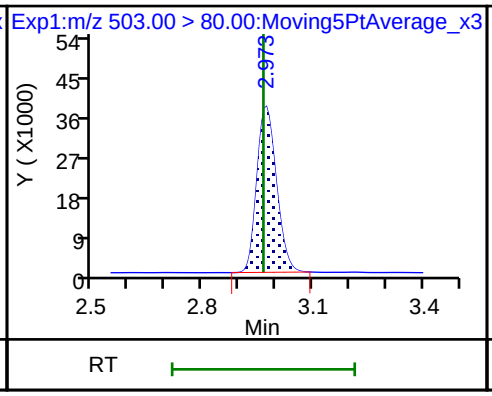
16 Perfluoroheptanesulfonic acid



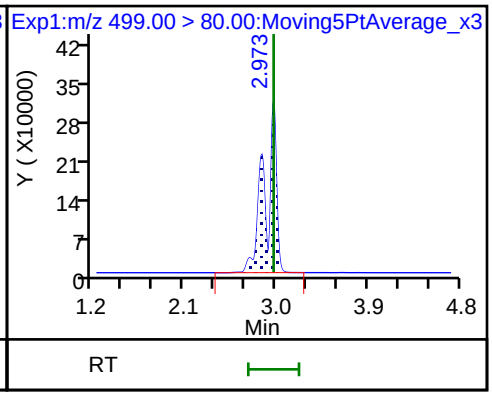
D 19 13C5 PFNA



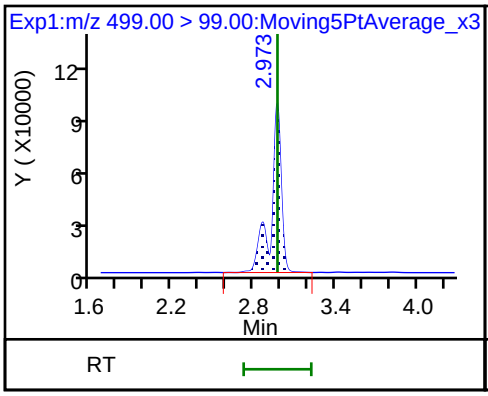
D 18 13C4 PFOS



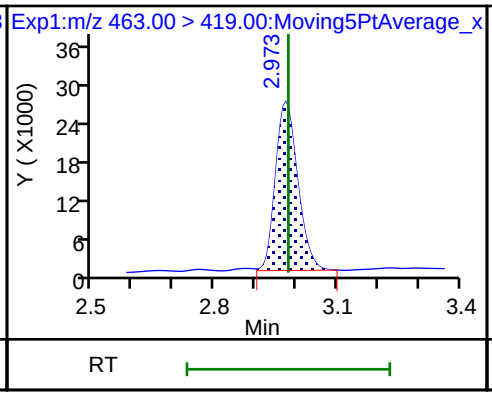
17 Perfluorooctane sulfonic acid



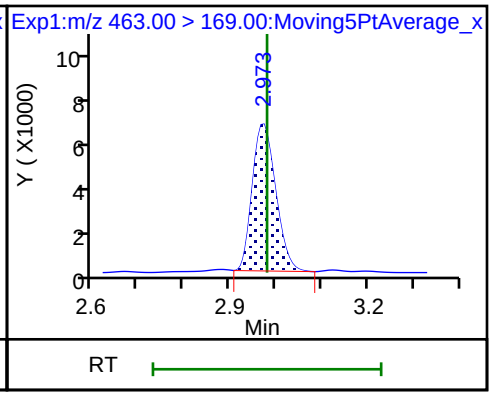
17 Perfluorooctane sulfonic acid



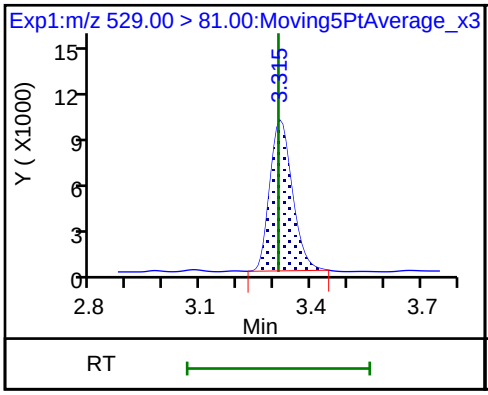
20 Perfluorononanoic acid



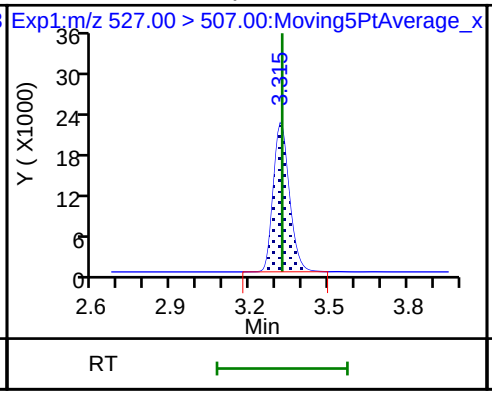
20 Perfluorononanoic acid



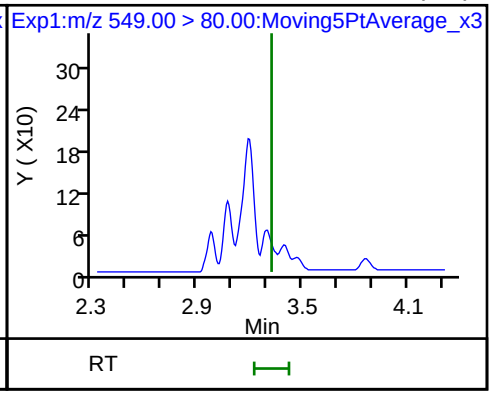
D 26 M2-8:2FTS



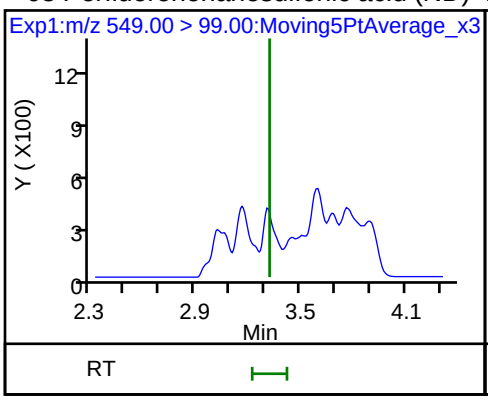
25 1H,1H,2H,2H-perfluorodecanesulfoni



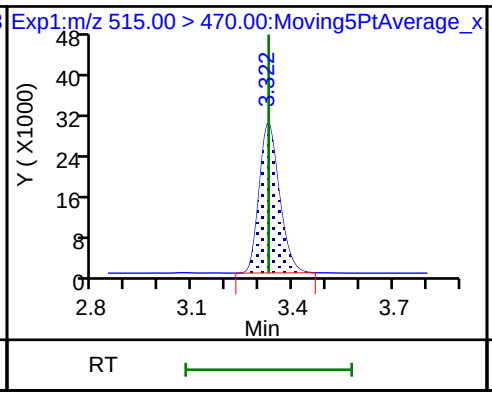
68 Perfluorononanesulfonic acid (ND)



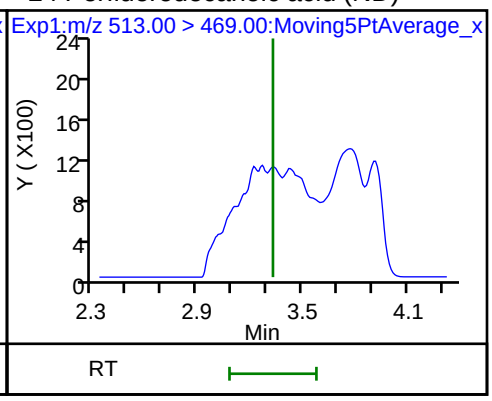
68 Perfluorononanesulfonic acid (ND)



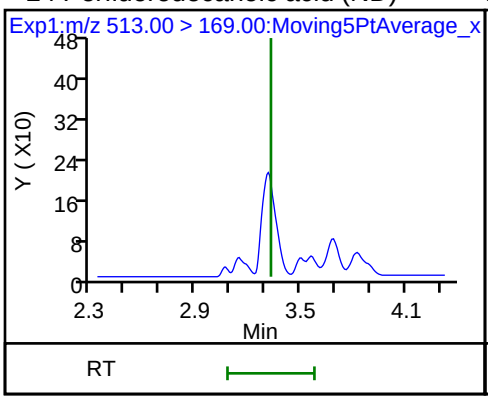
D 23 13C2 PFDA



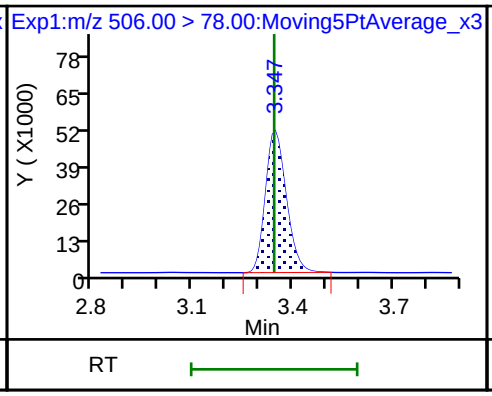
24 Perfluorodecanoic acid (ND)



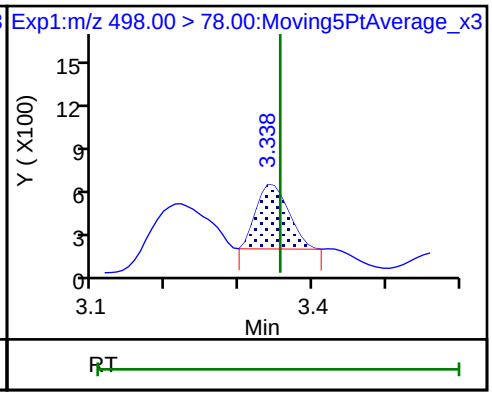
24 Perfluorodecanoic acid (ND)



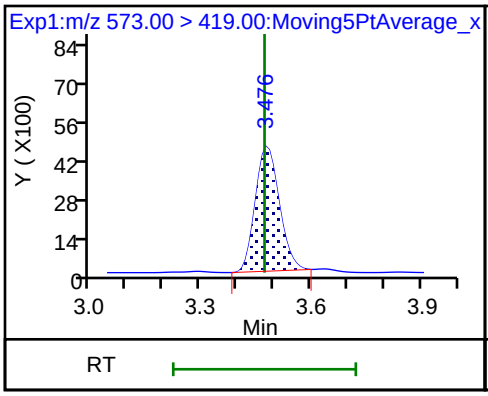
D 21 13C8 FOSA



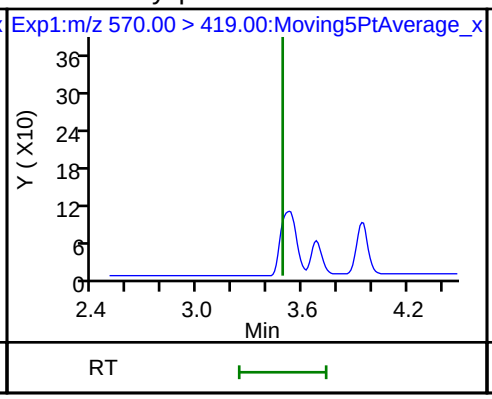
22 Perfluorooctane Sulfonamide



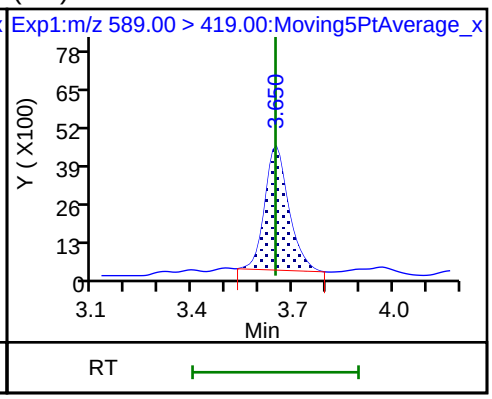
D 27 d3-NMeFOSAA



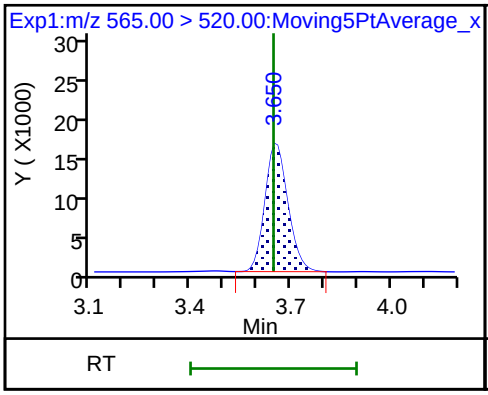
28 N-methyl perfluorooctane sulfonamid (ND)



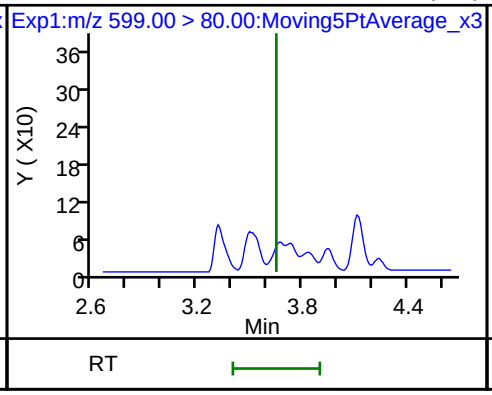
D 32 d5-NEtFOSAA



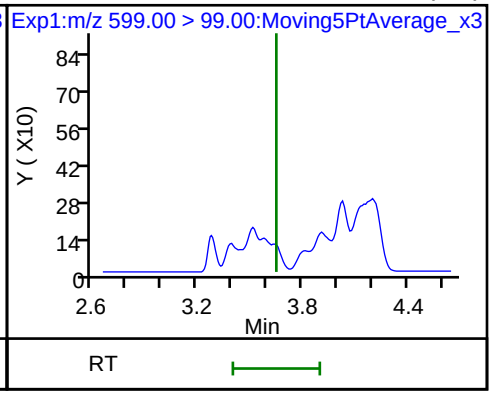
D 30 13C2 PFUnA



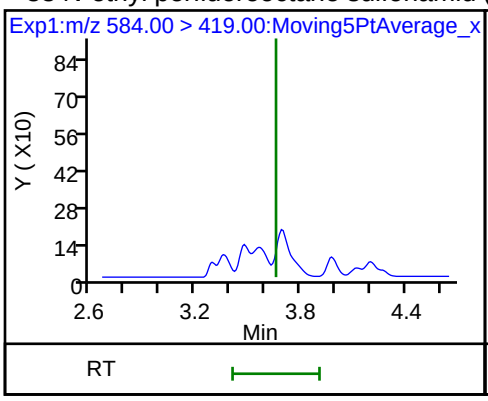
29 Perfluorodecane Sulfonic acid (ND)



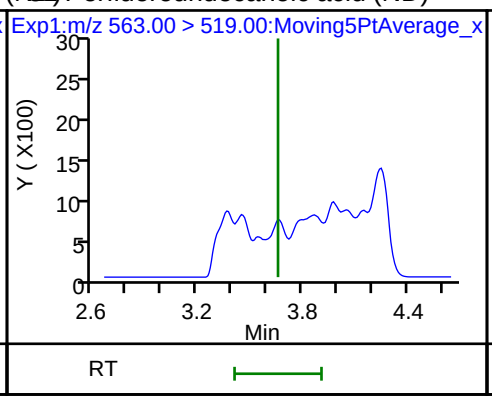
29 Perfluorodecane Sulfonic acid (ND)



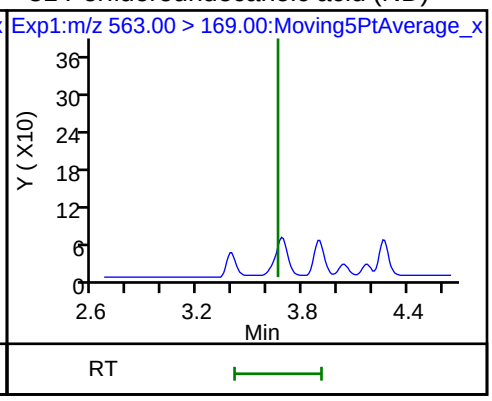
33 N-ethyl perfluorooctane sulfonamid (ND)



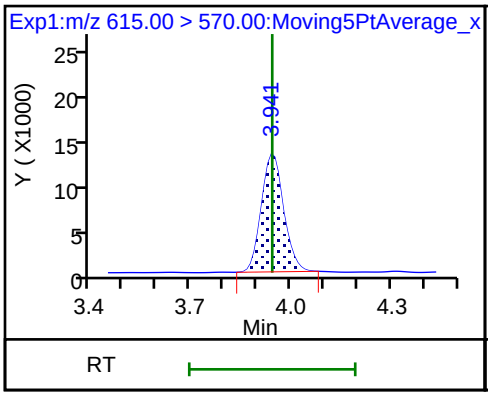
31 Perfluoroundecanoic acid (ND)



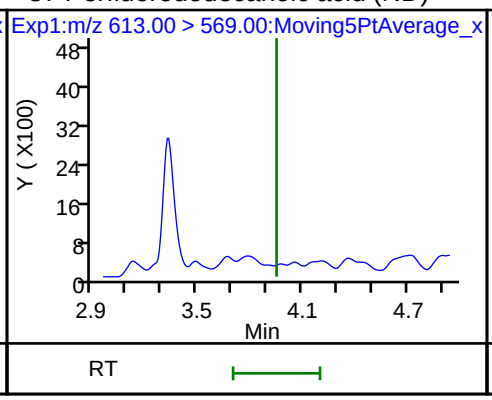
31 Perfluoroundecanoic acid (ND)



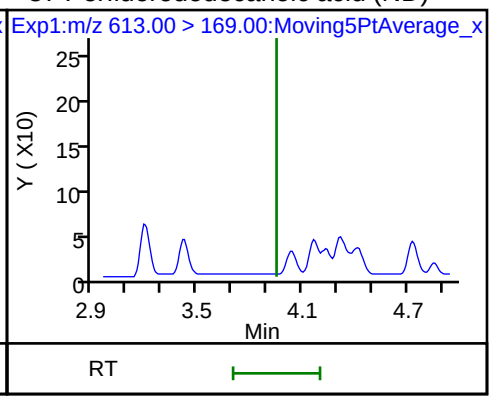
D 36 13C2 PFDoA



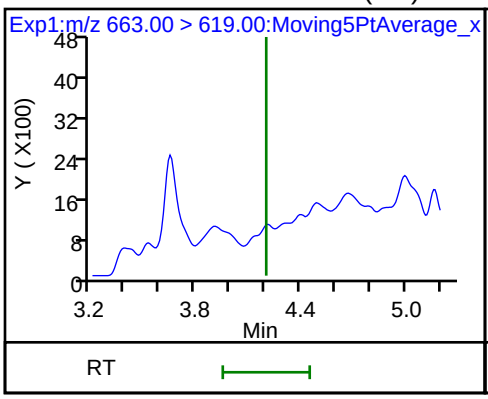
37 Perfluorododecanoic acid (ND)



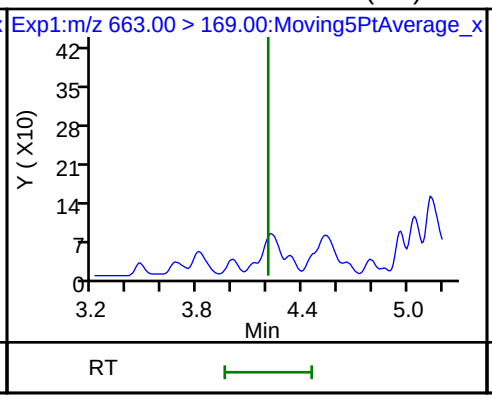
37 Perfluorododecanoic acid (ND)



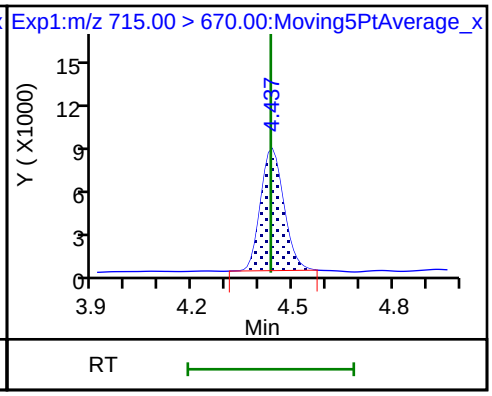
41 Perfluorotridecanoic acid (ND)



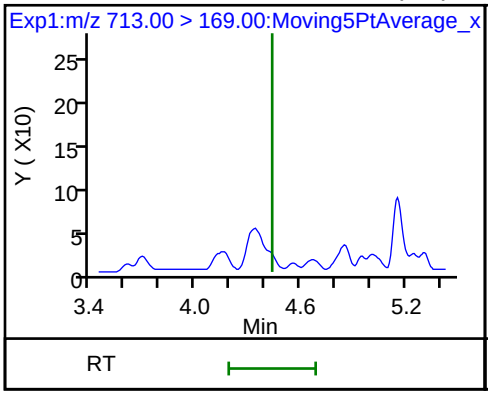
41 Perfluorotridecanoic acid (ND)



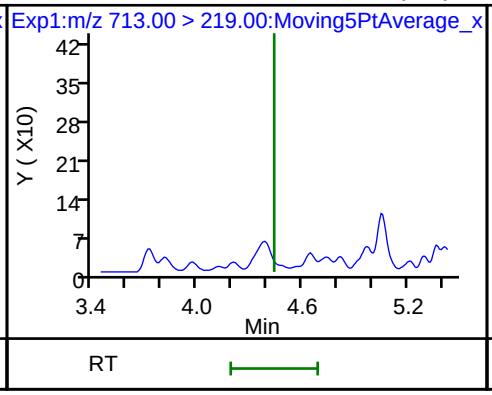
D 43 13C2-PFTeDA



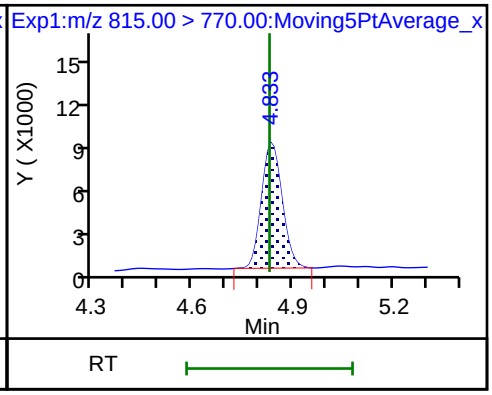
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: 7-MW04-PRL04-01
Lab Sample ID: 320-41333-6
Matrix: Water
Lab File ID: 2018.08.03LLA_022.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/17/2018 12:43
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 291.1(mL)
Date Analyzed: 08/03/2018 07:35
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	150		1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	69	M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.45
375-73-5	Perfluorobutanesulfonic acid (PFBS)	43		1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	170		1.7	0.86	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	M	3.4	2.6	0.94

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	58		50-150
STL01892	13C4-PFHpA	63		50-150
STL00990	13C4 PFOA	69		50-150
STL00995	13C5 PFNA	67		50-150
STL00994	18O2 PFHxS	65		50-150
STL00991	13C4 PFOS	61		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_022.d
Lims ID: 320-41333-A-6-A
Client ID: 7-MW04-PRL04-01
Sample Type: Client
Inject. Date: 03-Aug-2018 07:35:09 ALS Bottle#: 29 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-6-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:23:31 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:23:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.690	0.004	0.648	68161	1.35		58.0	162	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.692	0.002	1.000	2824724	1.26			565	
298.90 > 99.00	1.694	1.692	0.002	1.000	1194265		2.37(1.25-3.74)		1781	
D 9 13C4-PFHpA										
367.00 > 322.00	2.268	2.251	0.017	0.868	2921153	1.58		63.4	62976	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.268	2.253	0.015	1.000	5904929	4.36			2693	
363.00 > 169.00	2.268	2.253	0.015	1.000	2287664		2.58(1.13-3.40)		30092	
D 11 18O2 PFHxS										
403.00 > 84.00	2.281	2.264	0.017	0.873	4283857	1.55		65.4	67494	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.266	0.015	1.000	10388793	4.96			4495	
399.00 > 99.00	2.281	2.266	0.015	1.000	3205630		3.24(1.50-4.49)		5599	
D 14 13C4 PFOA										
417.00 > 372.00	2.613	2.602	0.011	1.000	3055599	1.72		68.7	60985	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.613	2.611	0.002	1.000	2837060	2.01			1489	M
413.00 > 169.00	2.613	2.611	0.002	1.000	1657646		1.71(0.84-2.52)		11092	
* 62 13C2-PFOA										
415.00 > 370.00	2.613	2.611	0.002		4635786	2.50			73532	
D 19 13C5 PFNA										
468.00 > 423.00	2.981	2.964	0.017	1.141	2588386	1.67		66.8	62794	
D 18 13C4 PFOS										
503.00 > 80.00	2.981	2.964	0.017	1.141	2783274	1.45		60.9	28959	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.981	2.973	0.008	1.000	402926	0.3082			1478	M
499.00 > 99.00	2.981	2.973	0.008	1.000	89489		4.50(2.31-6.93)		690	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										
463.00 > 419.00	2.988	2.979	0.009	1.002	9899	0.008854			23.6	
463.00 > 169.00	2.988	2.979	0.009	1.002	3061		3.23(1.90-5.69)		90.2	

QC Flag Legend

Review Flags

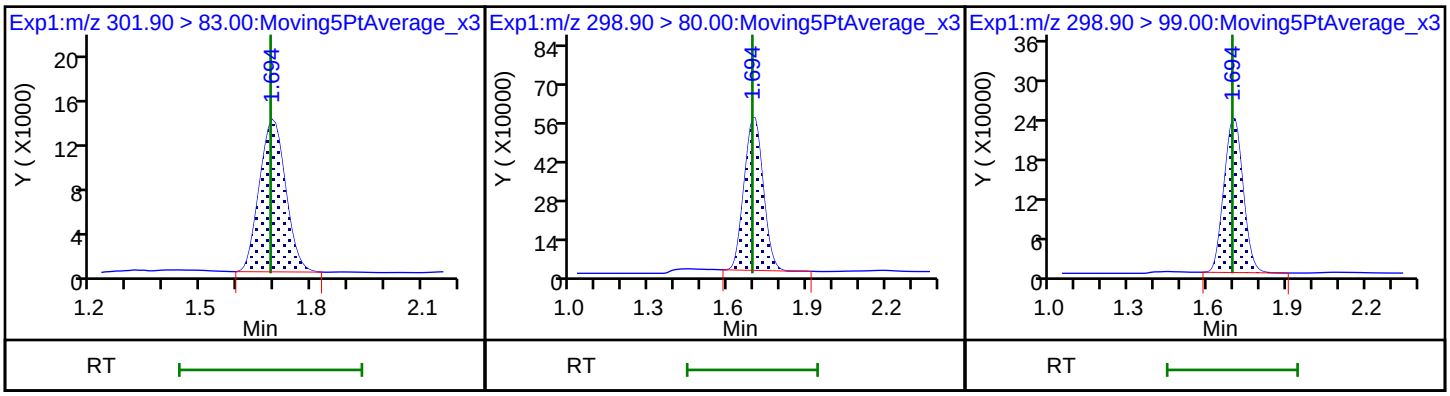
M - Manually Integrated

Report Date: 06-Aug-2018 11:23:32 Chrom Revision: 2.3 19-Jul-2018 15:14:50

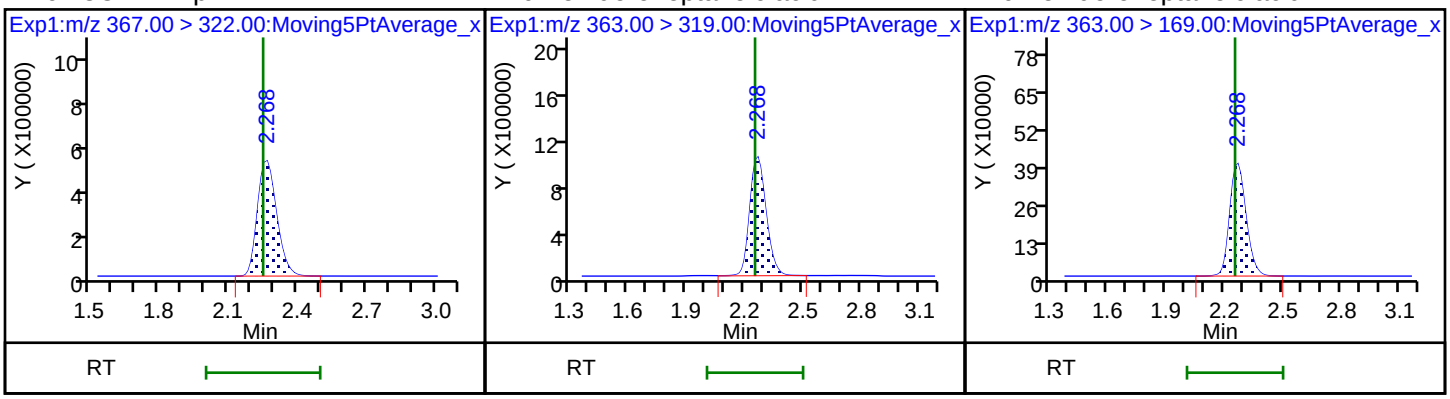
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_022.d				
Injection Date:	03-Aug-2018 07:35:09	Instrument ID:	A8_N		
Lims ID:	320-41333-A-6-A	Lab Sample ID:	320-41333-6		
Client ID:	7-MW04-PRL04-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	29	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

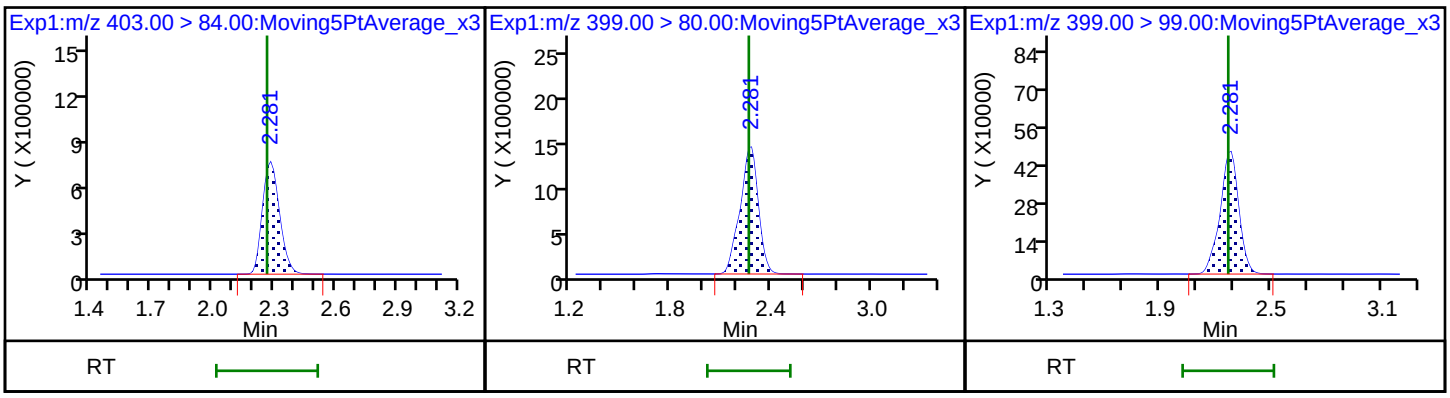
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



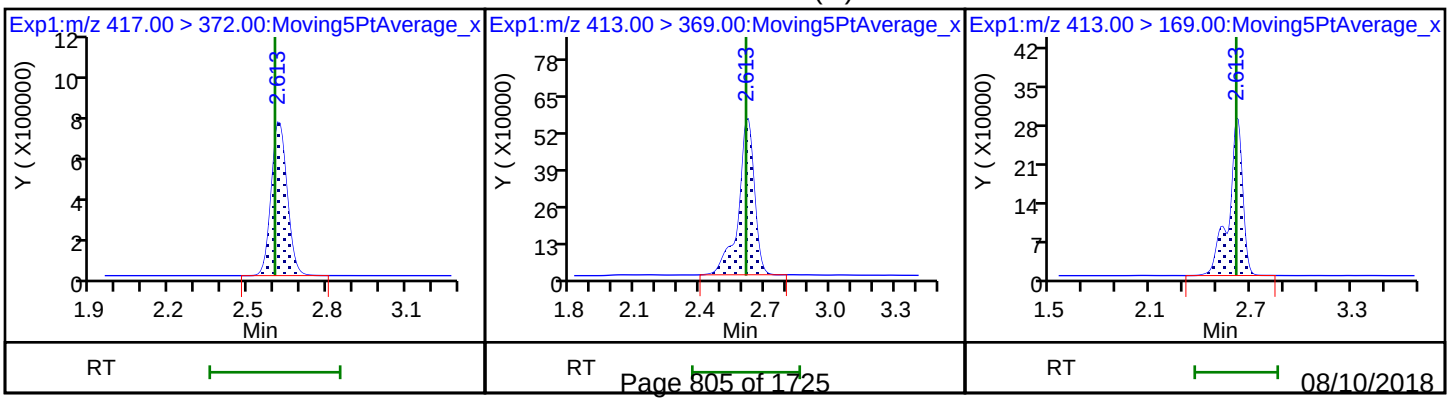
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



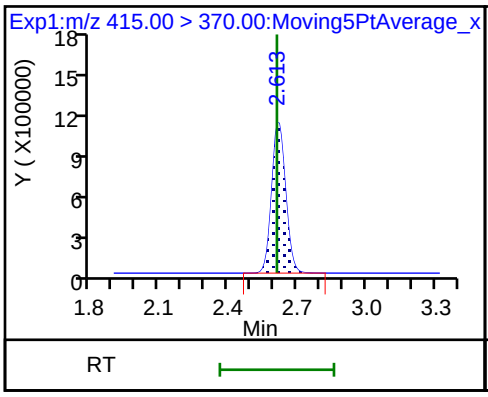
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



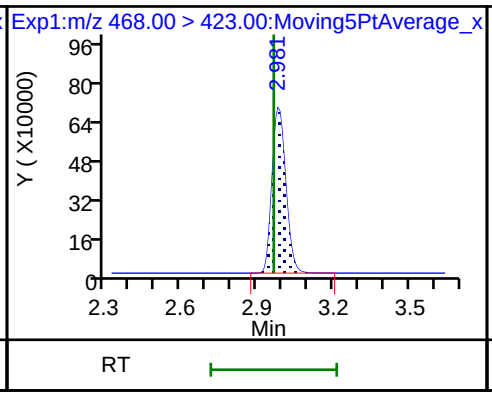
D 14 13C4 PFOA | 15 Perfluorooctanoic acid (M) | 15 Perfluorooctanoic acid



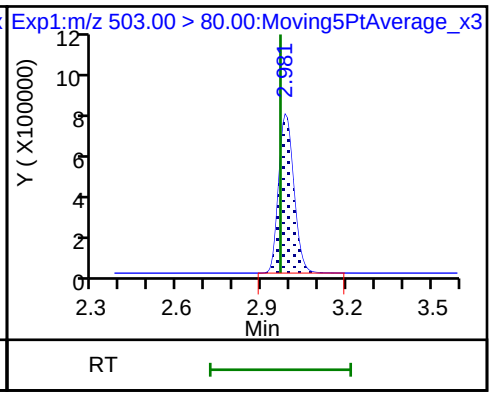
* 62 13C2-PFOA



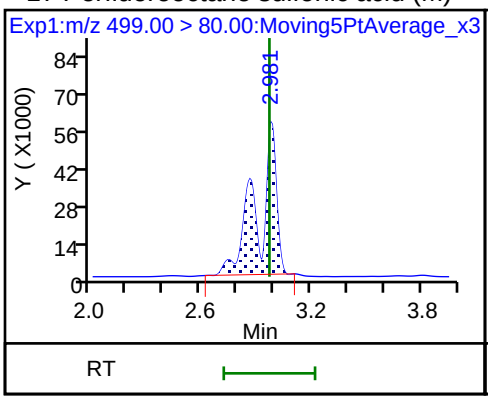
D 19 13C5 PFNA



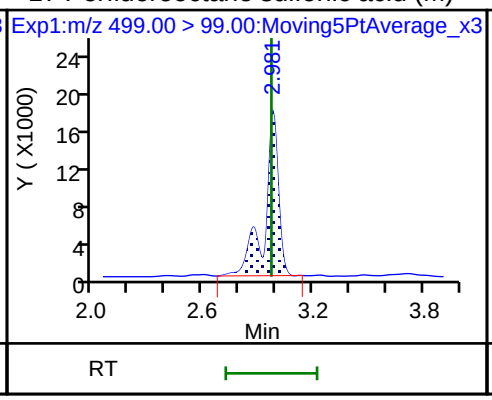
D 18 13C4 PFOS



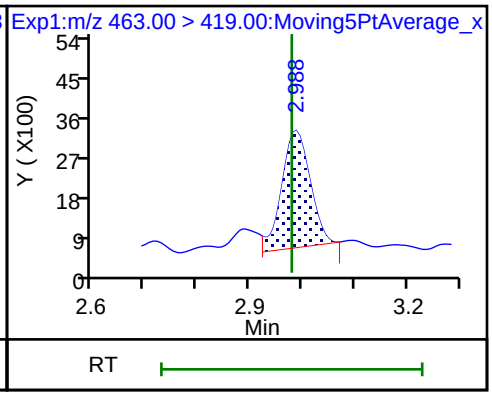
17 Perfluorooctane sulfonic acid (M)



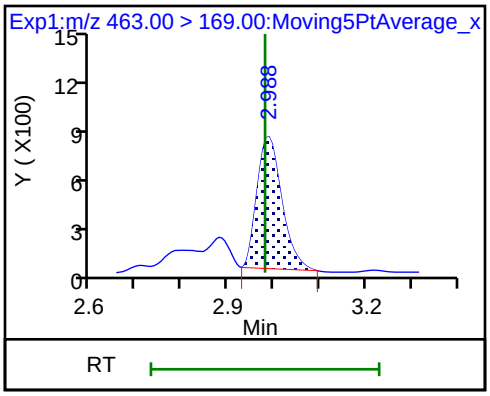
17 Perfluorooctane sulfonic acid (M)



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

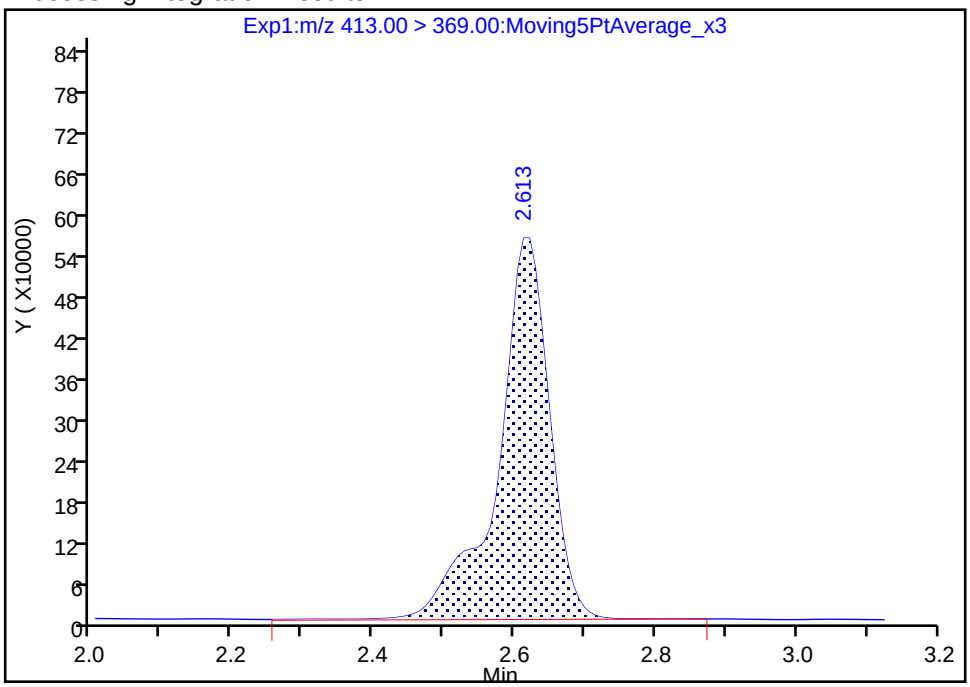
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_022.d				
Injection Date:	03-Aug-2018 07:35:09	Instrument ID:	A8_N		
Lims ID:	320-41333-A-6-A	Lab Sample ID:	320-41333-6		
Client ID:	7-MW04-PRL04-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	29	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

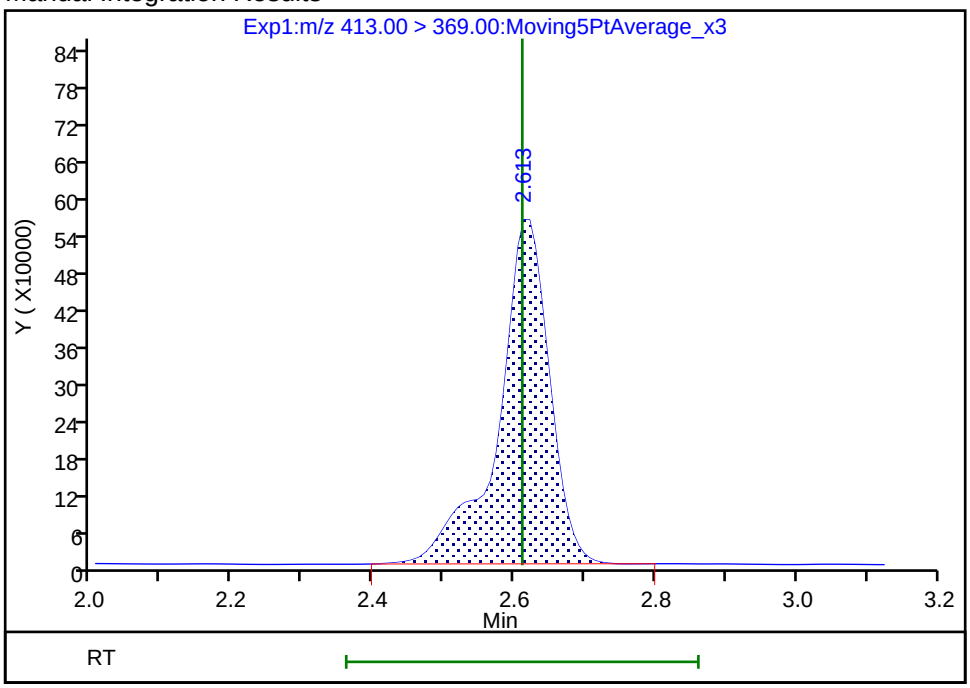
Processing Integration Results

RT: 2.61
Area: 2873125
Amount: 2.033134
Amount Units: ng/ml



Manual Integration Results

RT: 2.61
Area: 2837060
Amount: 2.007613
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:22:47

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

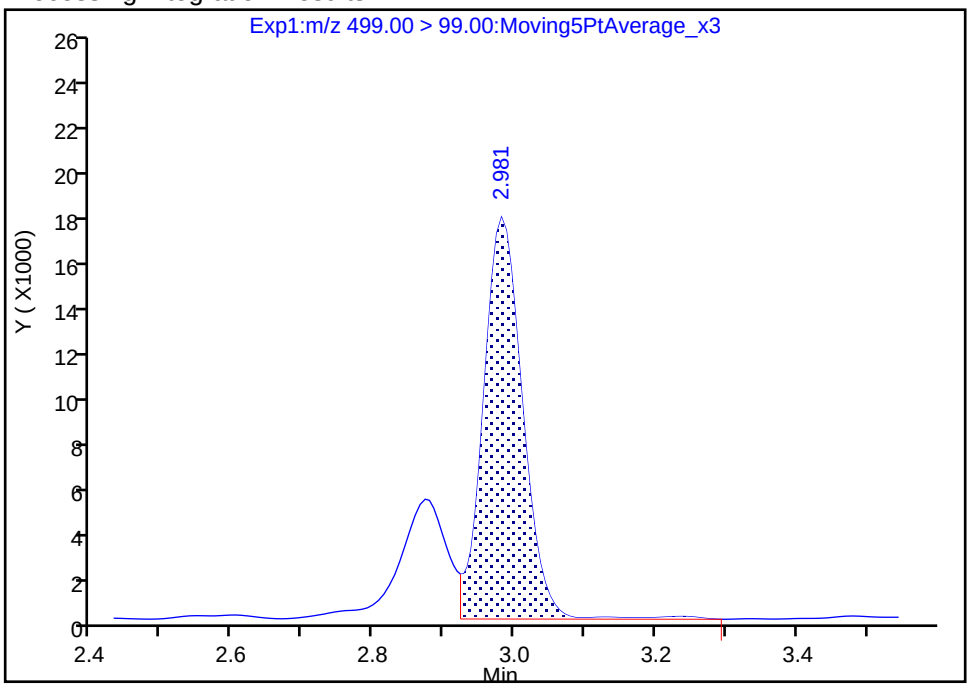
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_022.d				
Injection Date:	03-Aug-2018 07:35:09	Instrument ID:	A8_N		
Lims ID:	320-41333-A-6-A	Lab Sample ID:	320-41333-6		
Client ID:	7-MW04-PRL04-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	29	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

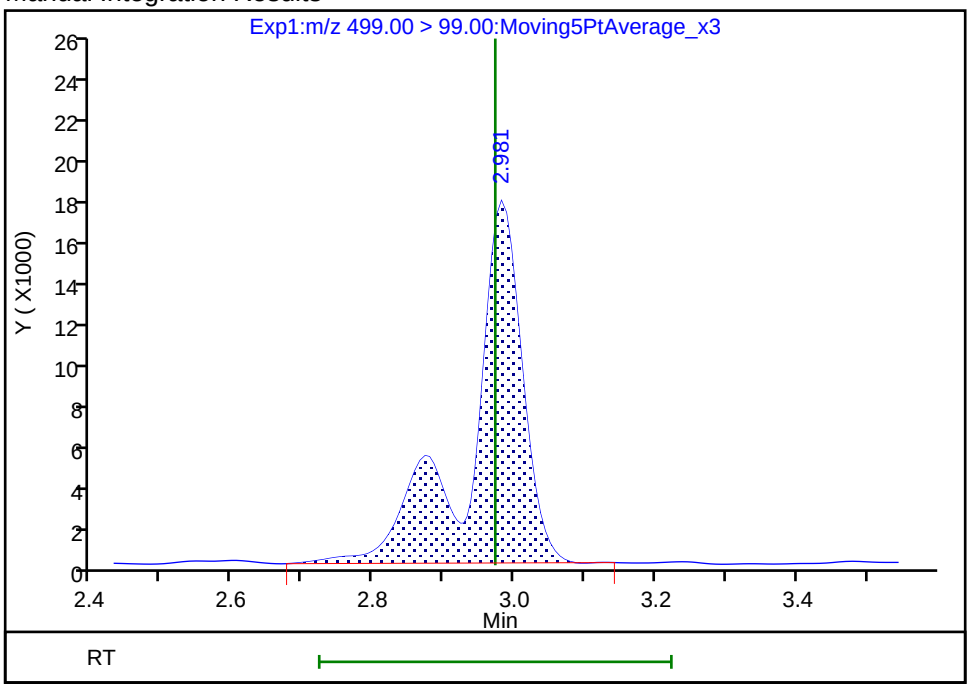
Processing Integration Results

RT: 2.98
Area: 66829
Amount: 0.168819
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 89489
Amount: 0.308195
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:22:52

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

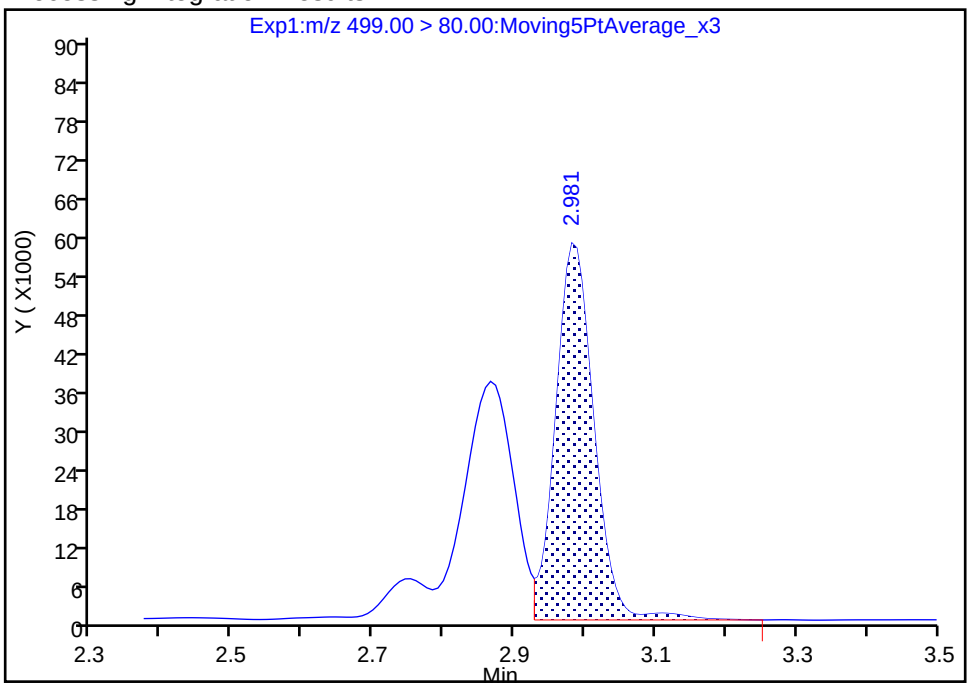
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_022.d				
Injection Date:	03-Aug-2018 07:35:09	Instrument ID:	A8_N		
Lims ID:	320-41333-A-6-A	Lab Sample ID:	320-41333-6		
Client ID:	7-MW04-PRL04-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	29	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

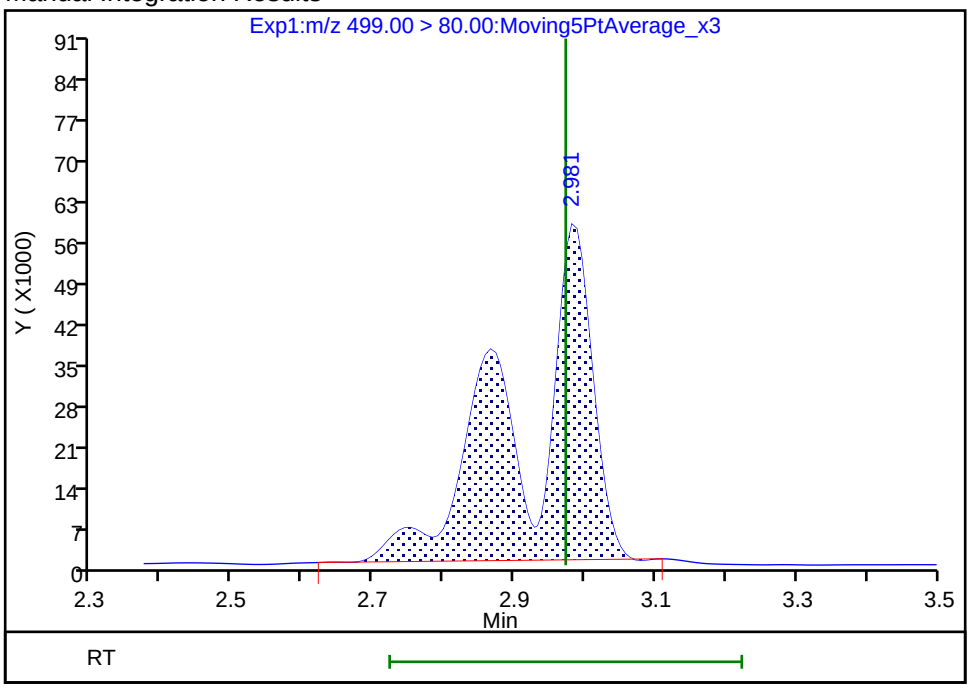
Processing Integration Results

RT: 2.98
Area: 220709
Amount: 0.168819
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 402926
Amount: 0.308195
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:22:55

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: 7-MW04-PRL04-01D
Lab Sample ID: 320-41333-7
Matrix: Water
Lab File ID: 2018.07.28LLB_054.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/17/2018 12:43
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 292(mL)
Date Analyzed: 07/29/2018 06:45
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236782
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	160		1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	63		1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.45
375-73-5	Perfluorobutanesulfonic acid (PFBS)	41	M	1.7	0.86	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	160		1.7	0.86	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10		3.4	2.6	0.94

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	66		50-150
STL01892	13C4-PFHpA	62		50-150
STL00990	13C4 PFOA	68		50-150
STL00995	13C5 PFNA	72		50-150
STL00994	18O2 PFHxS	68		50-150
STL00991	13C4 PFOS	71		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_054.d
Lims ID: 320-41333-A-7-A
Client ID: 7-MW04-PRL04-01D
Sample Type: Client
Inject. Date: 29-Jul-2018 06:45:43 ALS Bottle#: 42 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-7-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:33:52 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:33:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.675	-0.009	0.644	73974	1.54		66.1	208	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.666	1.676	-0.010	1.000	3035966	1.20			857	M
298.90 > 99.00	1.666	1.676	-0.010	1.000	1289129		2.36(1.25-3.74)		1935	
D 9 13C4-PFHpA										
367.00 > 322.00	2.228	2.229	-0.001	0.861	3435666	1.55		62.0	77357	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.228	2.230	-0.002	1.000	7169388	4.73			8758	
363.00 > 169.00	2.228	2.230	-0.002	1.000	2695350		2.66(1.13-3.40)		27963	
D 11 18O2 PFHxS										
403.00 > 84.00	2.239	2.241	-0.002	0.866	4609167	1.62		68.4	81507	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.239	2.242	-0.003	1.000	10883658	4.79			9895	
399.00 > 99.00	2.239	2.242	-0.003	1.000	3481745		3.13(1.50-4.49)		8318	
D 14 13C4 PFOA										
417.00 > 372.00	2.587	2.588	-0.001	1.000	3697019	1.70		68.2	59129	
* 62 13C2-PFOA										
415.00 > 370.00	2.587	2.590	-0.003		5668608	2.50			59155	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.587	2.590	-0.003	1.000	3296608	1.84			3063	
413.00 > 169.00	2.587	2.590	-0.003	1.000	1893301		1.74(0.84-2.52)		9086	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.952	2.950	0.002	1.000	477145	0.3051			3968	
499.00 > 99.00	2.952	2.950	0.002	1.000	99997		4.77(2.31-6.93)		862	
20 Perfluorononanoic acid										
463.00 > 419.00	2.952	2.950	0.002	1.000	14883	0.009633			32.9	
463.00 > 169.00	2.952	2.950	0.002	1.000	4008		3.71(1.90-5.69)		95.1	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.952	2.953	-0.001	1.141	3383040	1.81		72.3	63947	
D 18 13C4 PFOS										
503.00 > 80.00	2.952	2.953	-0.001	1.141	3382606	1.71		71.5	44270	

QC Flag Legend

Review Flags

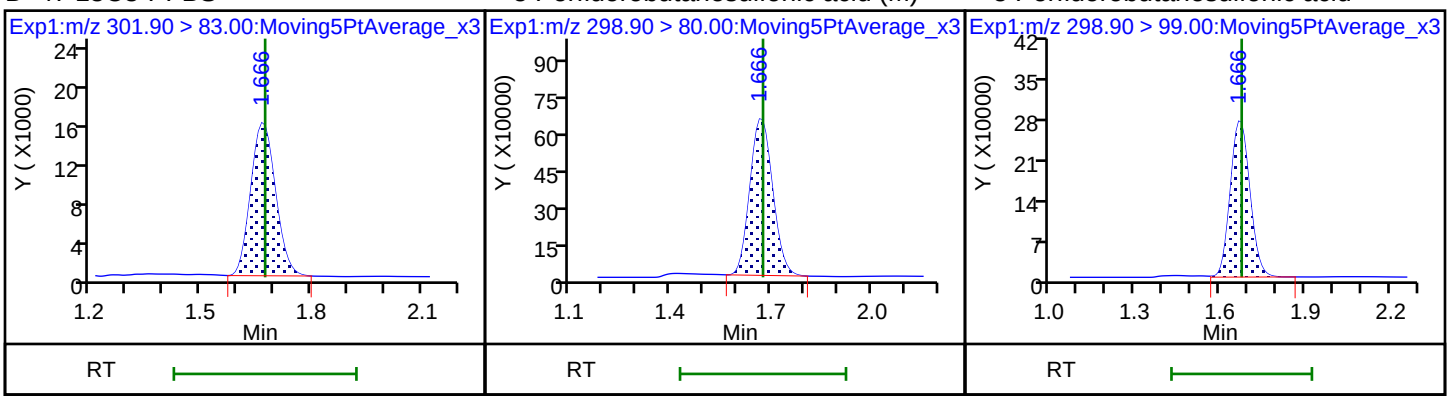
M - Manually Integrated

Report Date: 31-Jul-2018 12:33:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

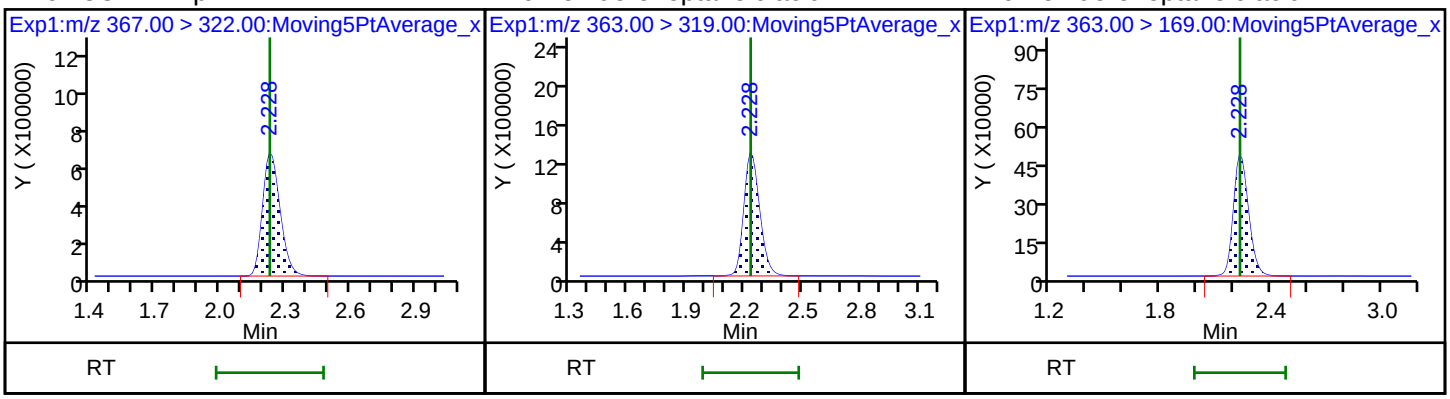
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_054.d				
Injection Date:	29-Jul-2018 06:45:43	Instrument ID:	A8_N		
Lims ID:	320-41333-A-7-A	Lab Sample ID:	320-41333-7		
Client ID:	7-MW04-PRL04-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	42	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

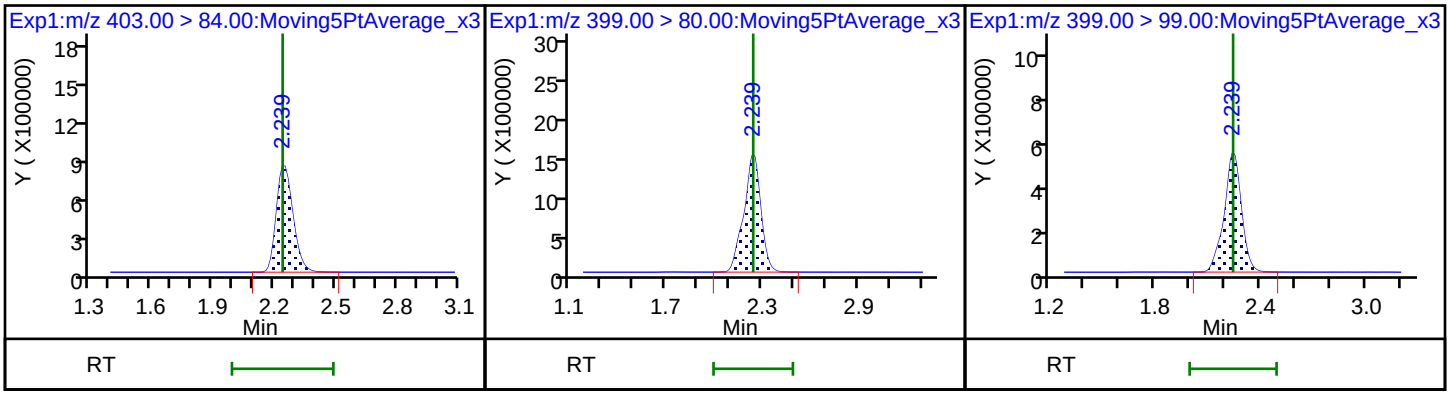
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (M) | 5 Perfluorobutanesulfonic acid



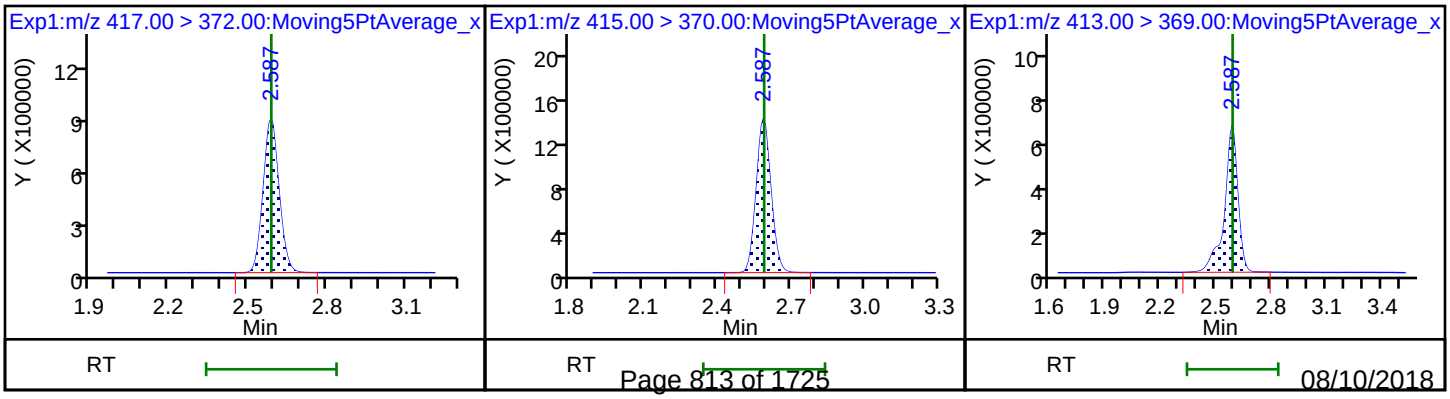
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



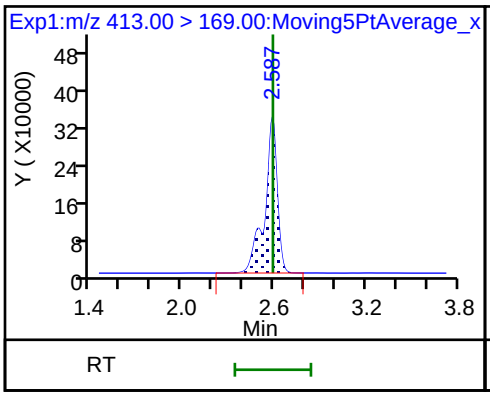
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



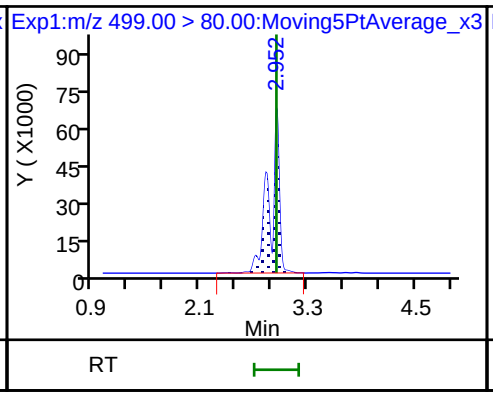
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid



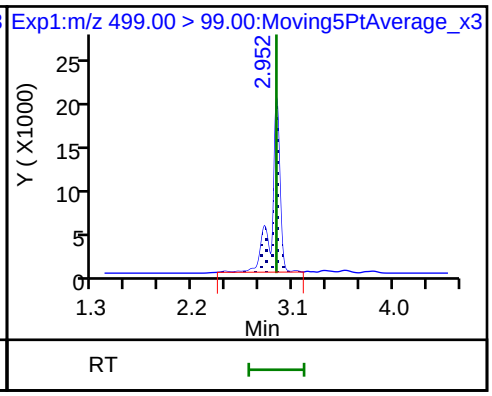
15 Perfluorooctanoic acid



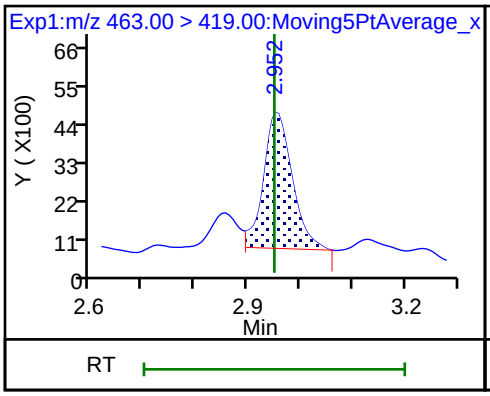
17 Perfluorooctane sulfonic acid



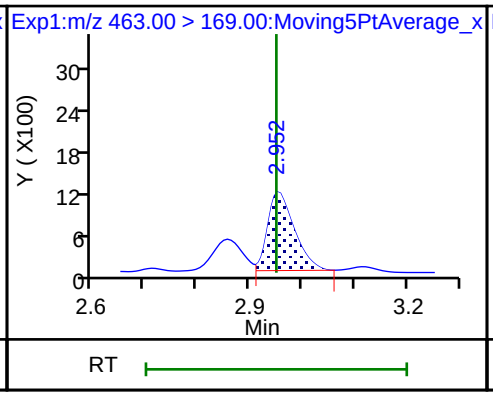
17 Perfluorooctane sulfonic acid



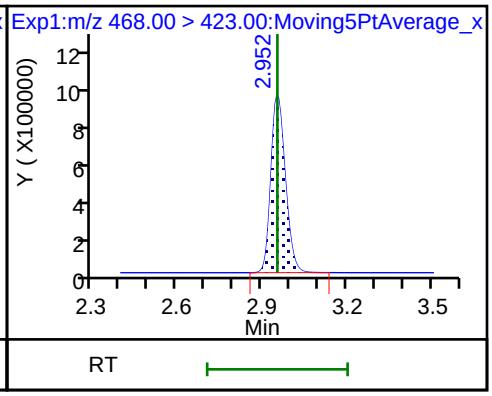
20 Perfluorononanoic acid



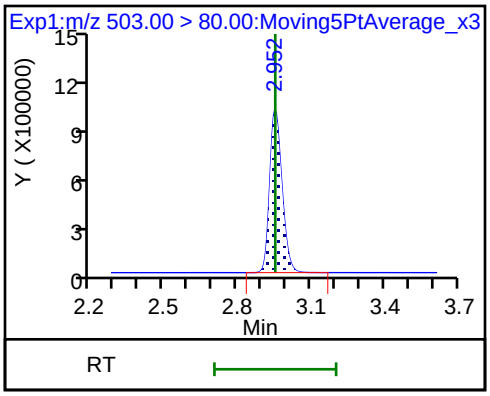
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

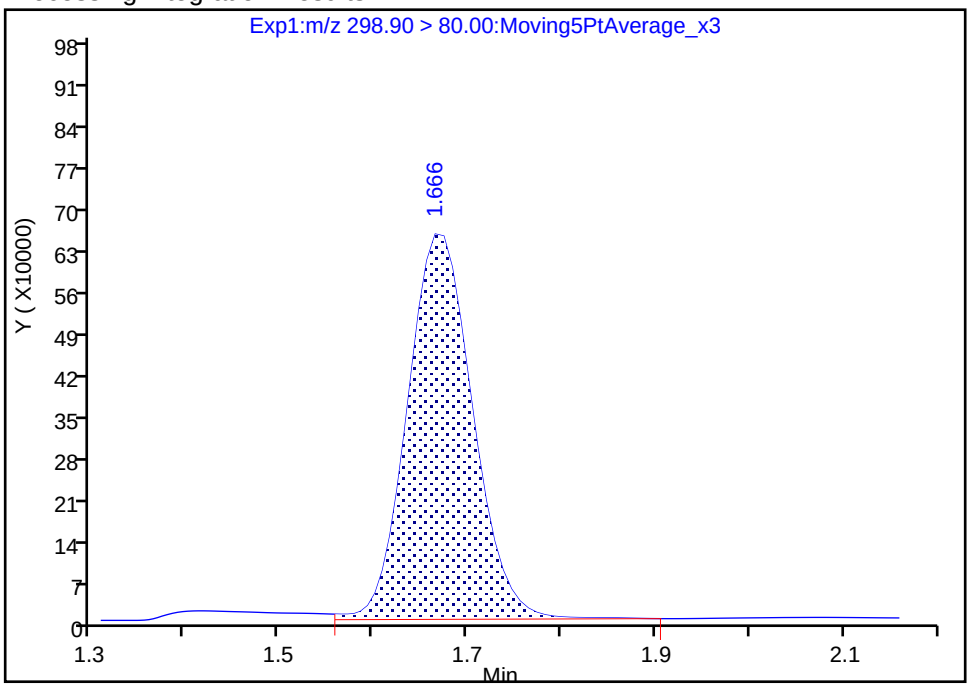
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_054.d				
Injection Date:	29-Jul-2018 06:45:43	Instrument ID:	A8_N		
Lims ID:	320-41333-A-7-A	Lab Sample ID:	320-41333-7		
Client ID:	7-MW04-PRL04-01D				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	42	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

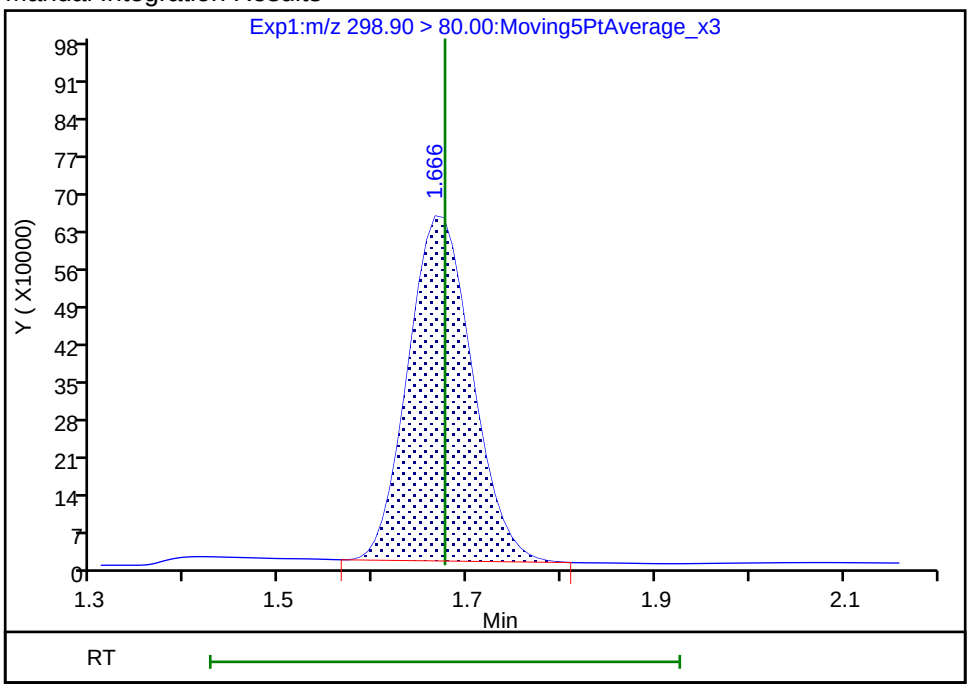
Processing Integration Results

RT: 1.67
Area: 3132374
Amount: 1.240037
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 3035966
Amount: 1.201871
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:33:45

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: GRE-ER-SD-01
Lab Sample ID: 320-41333-8
Matrix: Water
Lab File ID: 2018.08.03LLA_025.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/17/2018 16:10
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 271(mL)
Date Analyzed: 08/03/2018 07:58
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.4	U	1.8	1.4	0.56
335-67-1	Perfluorooctanoic acid (PFOA)	1.4	U M	1.8	1.4	0.50
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.8	1.4	0.48
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.92	U	1.8	0.92	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.92	U	1.8	0.92	0.35
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.0

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	70		50-150
STL01892	13C4-PFHpA	73		50-150
STL00990	13C4 PFOA	78		50-150
STL00995	13C5 PFNA	74		50-150
STL00994	18O2 PFHxS	72		50-150
STL00991	13C4 PFOS	71		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_025.d
Lims ID: 320-41333-A-8-A
Client ID: GRE-ER-SD-01
Sample Type: Client
Inject. Date: 03-Aug-2018 07:58:33 ALS Bottle#: 30 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-8-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:25:46 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:25:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.690	0.002	0.648	73978	1.62		69.8	463	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.251	0.015	0.868	3051013	1.84		73.4	75112	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.264	0.016	0.873	4274759	1.71		72.4	81684	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.280	0.0	1.000	14639	0.007006			73.5	
399.00 > 99.00	2.280	2.280	0.0	1.000	5108		2.87(1.50-4.49)		13.9	
D 14 13C4 PFOA										
417.00 > 372.00	2.611	2.602	0.009	1.000	3143247	1.96		78.3	53747	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.619	2.619	0.0	1.003	7702	0.005298			5.2	M
413.00 > 169.00	2.619	2.619	0.0	1.003	3623		2.13(0.84-2.52)		32.6	M
* 62 13C2-PFOA										
415.00 > 370.00	2.611	2.619	-0.008		4180085	2.50			91257	
D 19 13C5 PFNA										
468.00 > 423.00	2.980	2.964	0.016	1.141	2603686	1.86		74.5	53953	
D 18 13C4 PFOS										
503.00 > 80.00	2.980	2.964	0.016	1.141	2913398	1.69		70.6	39553	

QC Flag Legend

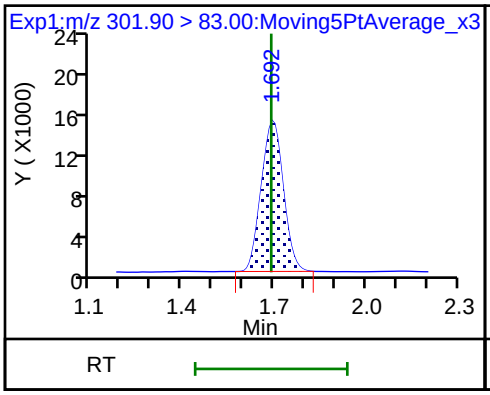
Review Flags
M - Manually Integrated

Report Date: 06-Aug-2018 11:25:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

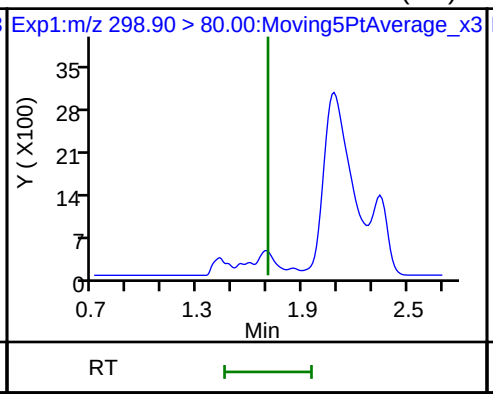
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_025.d				
Injection Date:	03-Aug-2018 07:58:33	Instrument ID:	A8_N		
Lims ID:	320-41333-A-8-A	Lab Sample ID:	320-41333-8		
Client ID:	GRE-ER-SD-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	30	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

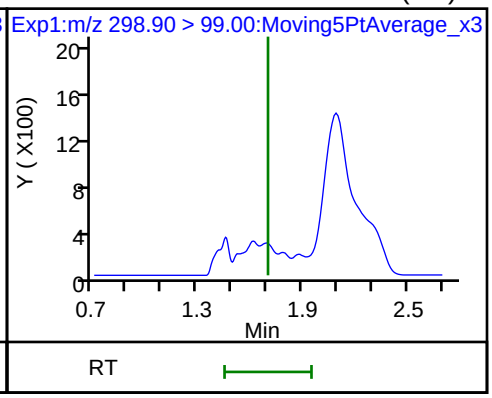
D 47 13C3-PFBS



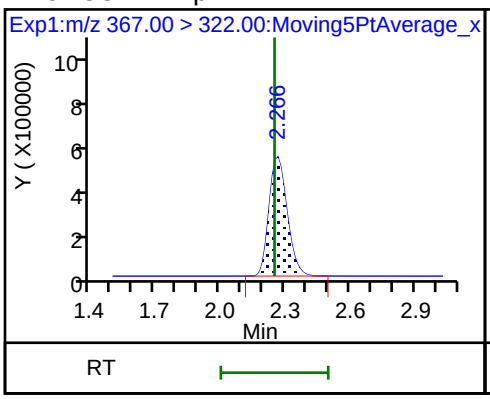
5 Perfluorobutanesulfonic acid (ND)



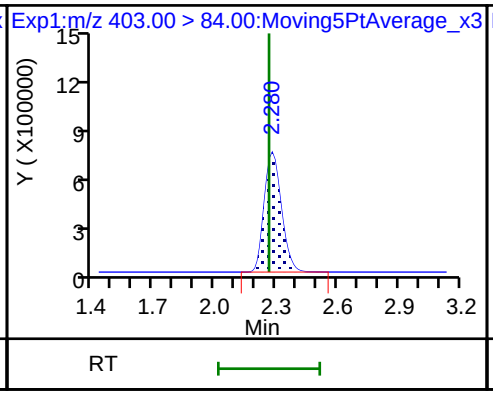
5 Perfluorobutanesulfonic acid (ND)



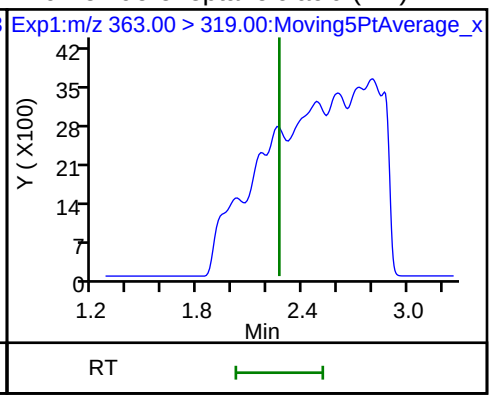
D 9 13C4-PFHpA



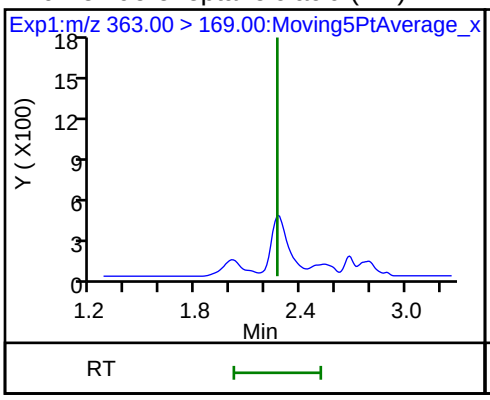
D 11 18O2 PFHxS



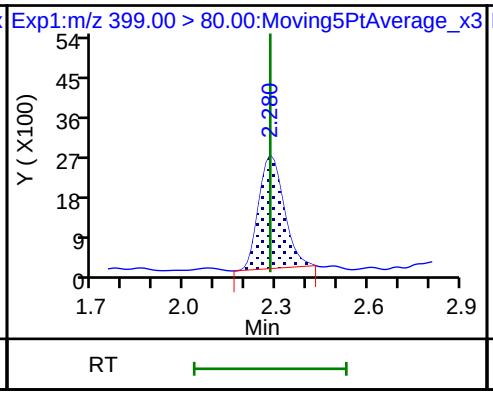
10 Perfluoroheptanoic acid (ND)



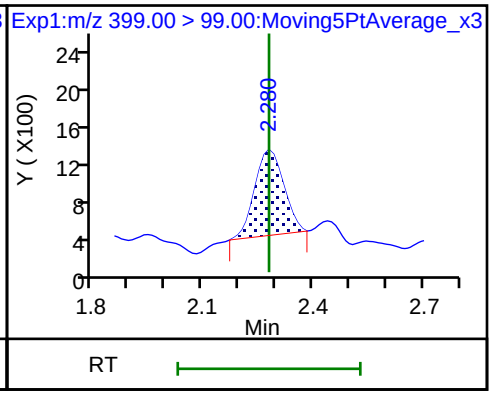
10 Perfluoroheptanoic acid (ND)



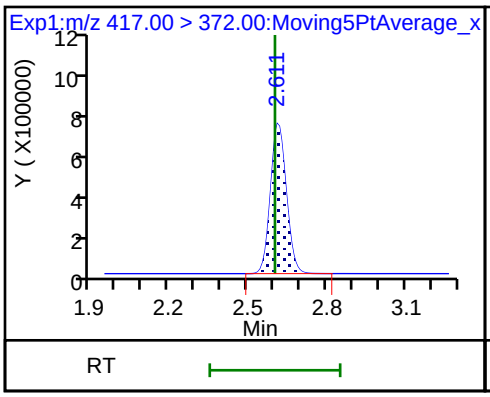
8 Perfluorohexanesulfonic acid



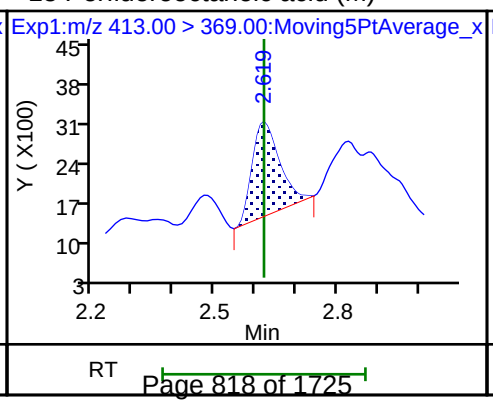
8 Perfluorohexanesulfonic acid



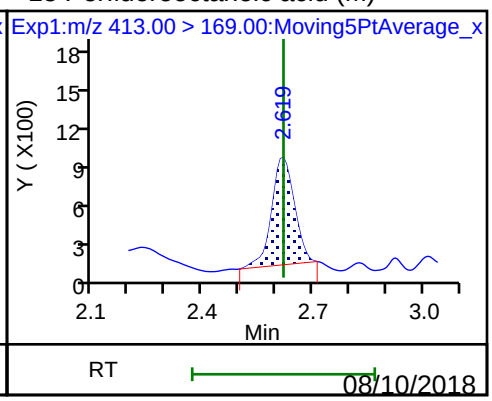
D 14 13C4 PFOA



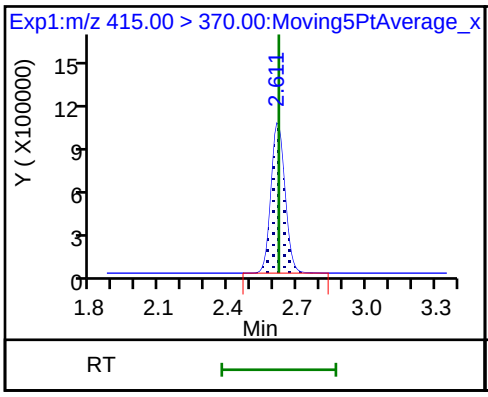
15 Perfluorooctanoic acid (M)



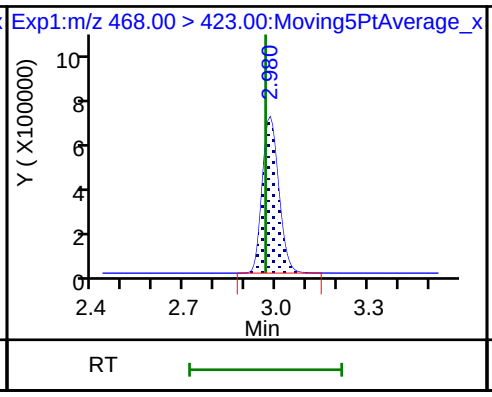
15 Perfluorooctanoic acid (M)



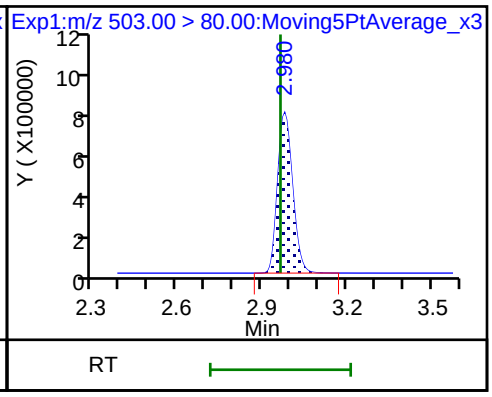
* 62 13C2-PFOA



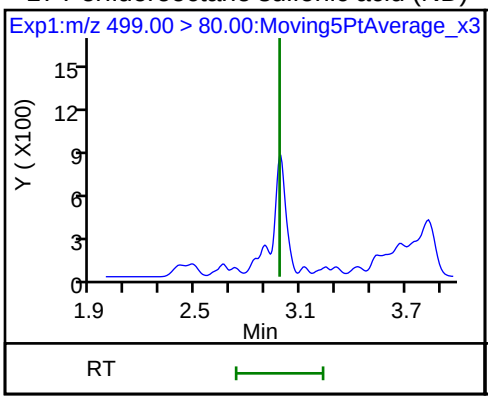
D 19 13C5 PFNA



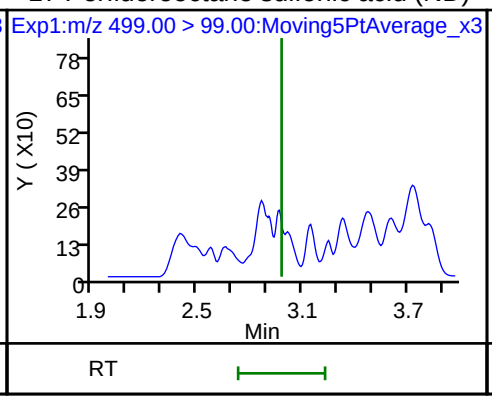
D 18 13C4 PFOS



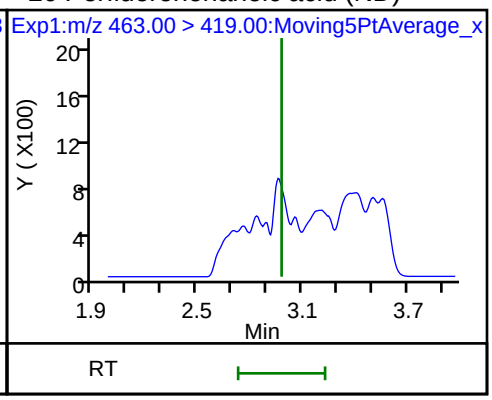
17 Perfluorooctane sulfonic acid (ND)



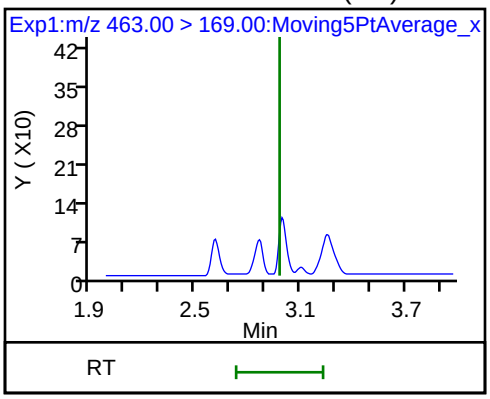
17 Perfluorooctane sulfonic acid (ND)



20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

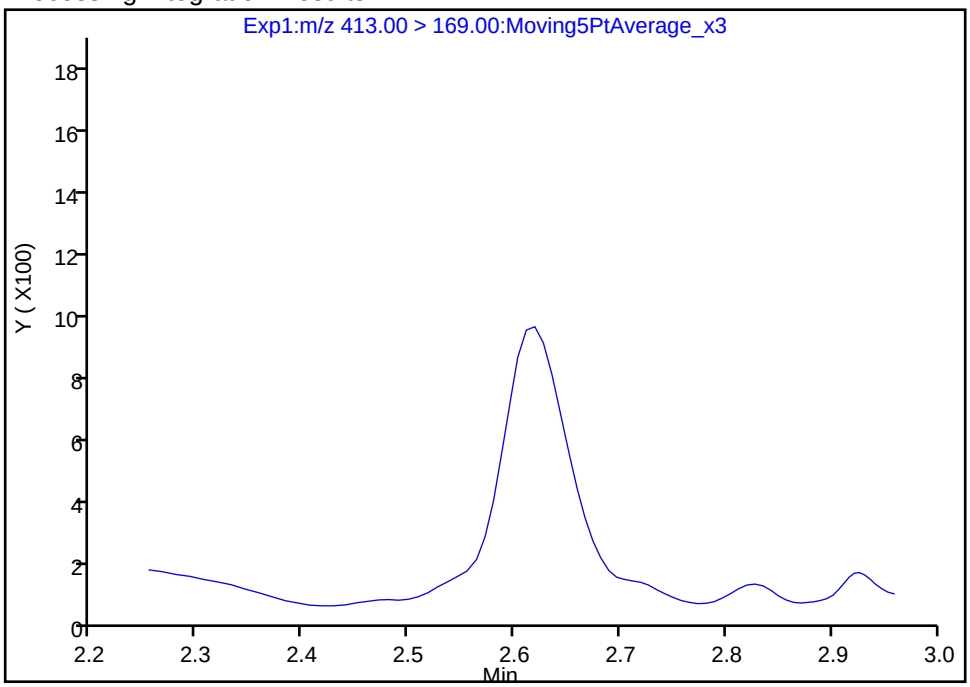
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_025.d				
Injection Date:	03-Aug-2018 07:58:33	Instrument ID:	A8_N		
Lims ID:	320-41333-A-8-A	Lab Sample ID:	320-41333-8		
Client ID:	GRE-ER-SD-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	30	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

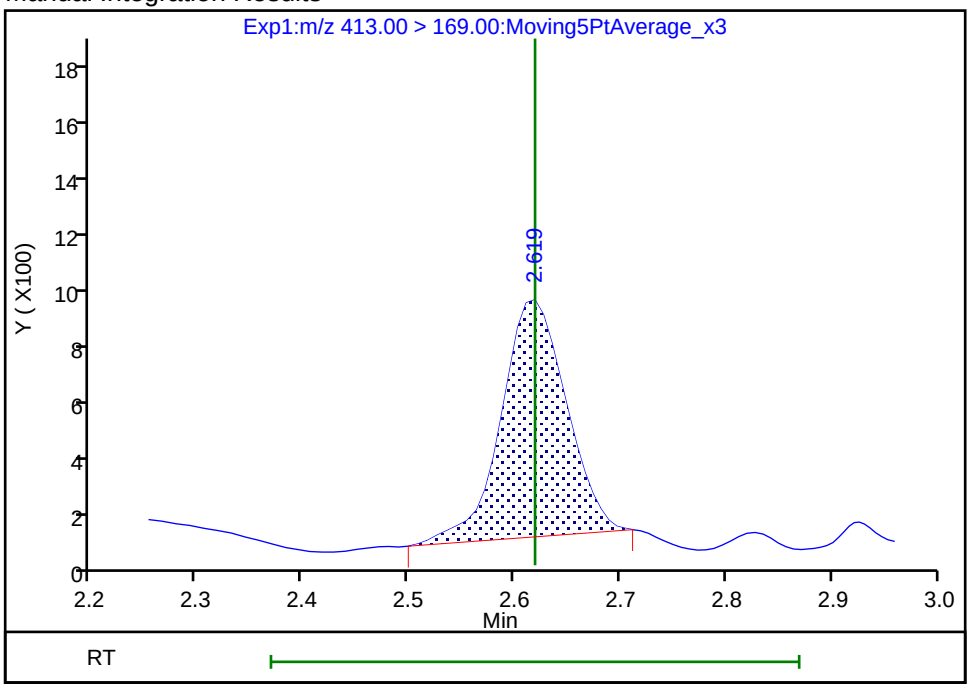
Processing Integration Results

RT: 2.61
Area: 0
Amount: 0.005190
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 3623
Amount: 0.005298
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:25:41

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

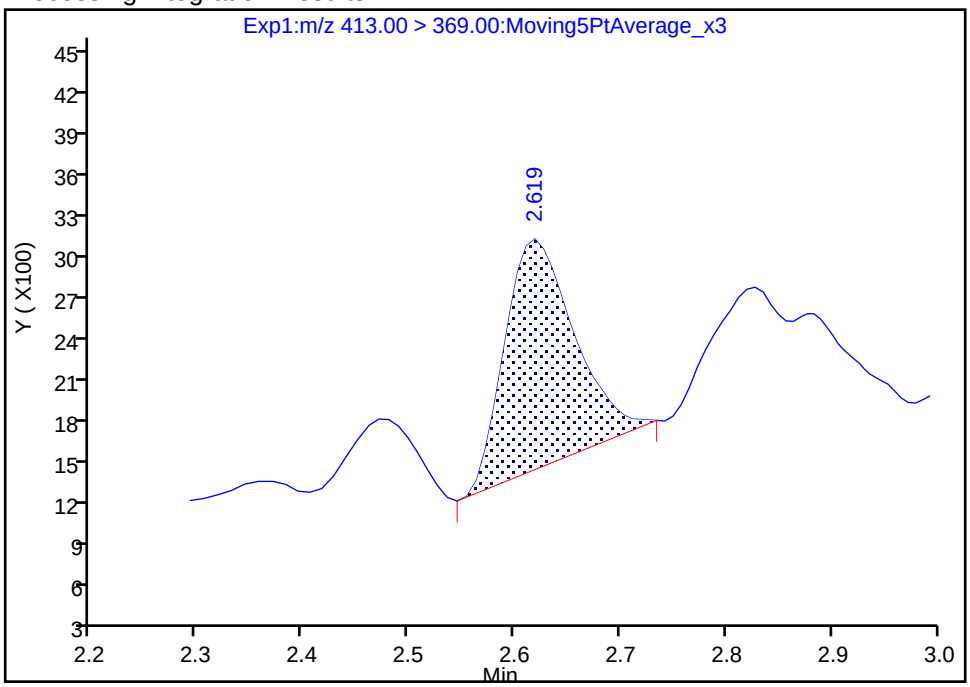
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_025.d				
Injection Date:	03-Aug-2018 07:58:33	Instrument ID:	A8_N		
Lims ID:	320-41333-A-8-A	Lab Sample ID:	320-41333-8		
Client ID:	GRE-ER-SD-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	30	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

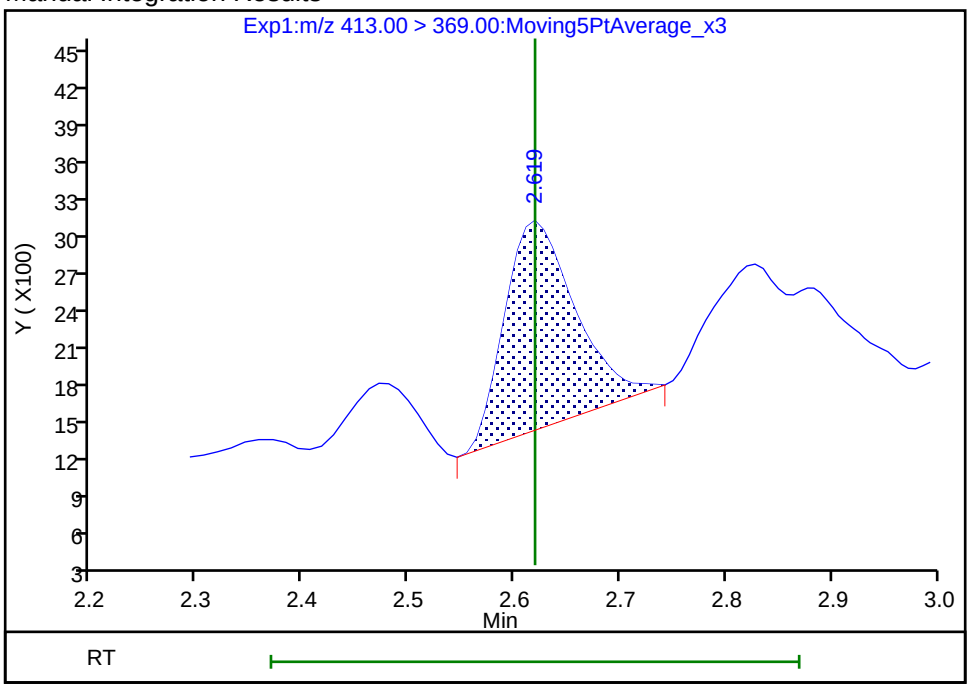
Processing Integration Results

RT: 2.62
Area: 7545
Amount: 0.005190
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 7702
Amount: 0.005298
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:25:41
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: GRE-ER-SW-01
Lab Sample ID: 320-41333-9
Matrix: Water
Lab File ID: 2018.08.03LLA_026.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/17/2018 16:15
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 287.9(mL)
Date Analyzed: 08/03/2018 08:06
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	U	1.7	1.3	0.53
335-67-1	Perfluorooctanoic acid (PFOA)	1.3	U M	1.7	1.3	0.47
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.45
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.87	U	1.7	0.87	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.87	U M	1.7	0.87	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	0.96

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	61		50-150
STL01892	13C4-PFHpA	66		50-150
STL00990	13C4 PFOA	71		50-150
STL00995	13C5 PFNA	67		50-150
STL00994	18O2 PFHxS	62		50-150
STL00991	13C4 PFOS	60		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_026.d
Lims ID: 320-41333-A-9-A
Client ID: GRE-ER-SW-01
Sample Type: Client
Inject. Date: 03-Aug-2018 08:06:22 ALS Bottle#: 31 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-9-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:26:34 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:26:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.690	0.004	0.649	73125	1.42		61.1	536	
D 9 13C4-PFHpA										
367.00 > 322.00	2.269	2.251	0.018	0.869	3105297	1.65		66.2	53224	
D 11 18O2 PFHxS										
403.00 > 84.00	2.282	2.264	0.018	0.874	4163893	1.48		62.4	51075	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.282	2.280	0.002	1.000	9574	0.004704			58.3	M
399.00 > 99.00	2.282	2.280	0.002	1.000	3069		3.12(1.50-4.49)		9.0	
D 14 13C4 PFOA										
417.00 > 372.00	2.612	2.602	0.010	1.000	3216534	1.77		71.0	45538	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.612	2.619	-0.007	1.000	4919	0.003307			4.2	M
413.00 > 169.00	2.612	2.619	-0.007	1.000	3567		1.38(0.84-2.52)		23.4	M
* 62 13C2-PFOA										
415.00 > 370.00	2.612	2.619	-0.007		4719639	2.50			87299	
D 19 13C5 PFNA										
468.00 > 423.00	2.973	2.964	0.009	1.138	2640515	1.67		66.9	51156	
D 18 13C4 PFOS										
503.00 > 80.00	2.973	2.964	0.009	1.138	2787783	1.43		59.9	36458	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Aug-2018 11:26:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_026.d

Injection Date: 03-Aug-2018 08:06:22 Instrument ID: A8_N

Lims ID: 320-41333-A-9-A Lab Sample ID: 320-41333-9

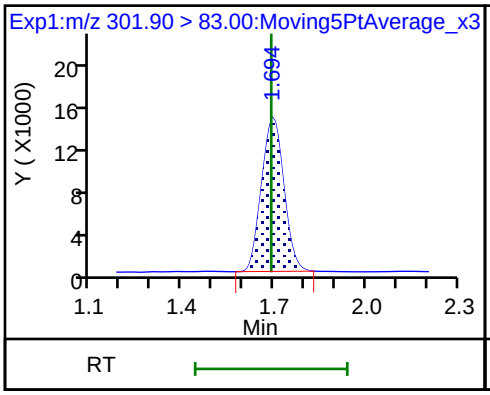
Client ID: GRE-ER-SW-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 31 Worklist Smp#: 15

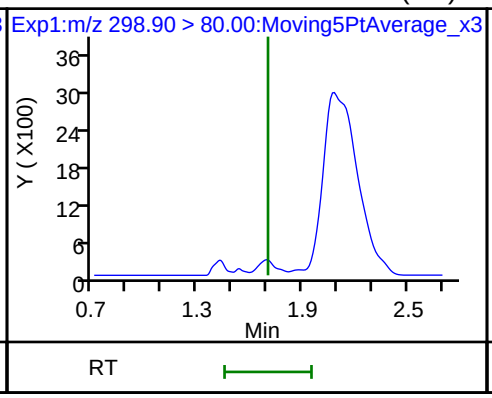
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

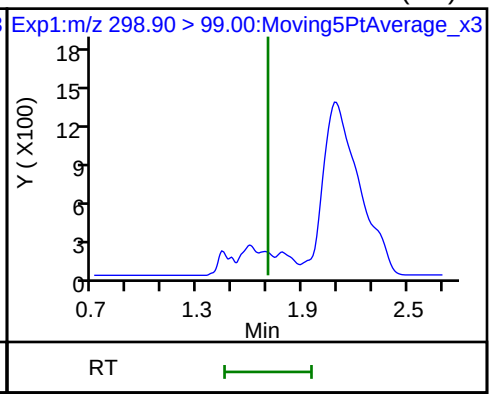
D 47 13C3-PFBS



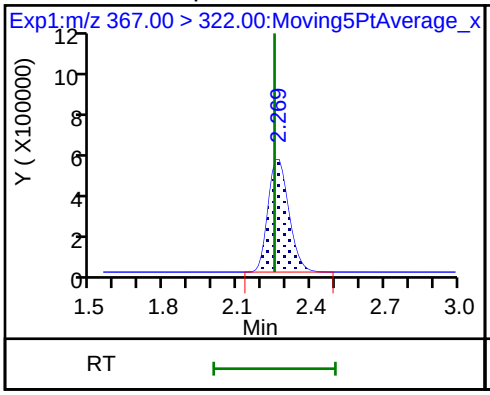
5 Perfluorobutanesulfonic acid (ND)



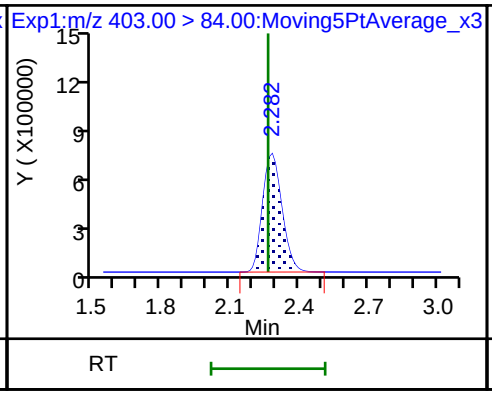
5 Perfluorobutanesulfonic acid (ND)



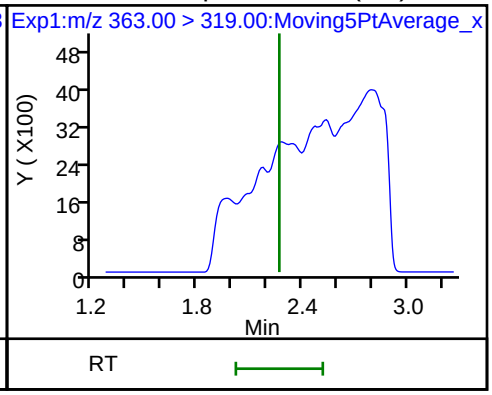
D 9 13C4-PFHpA



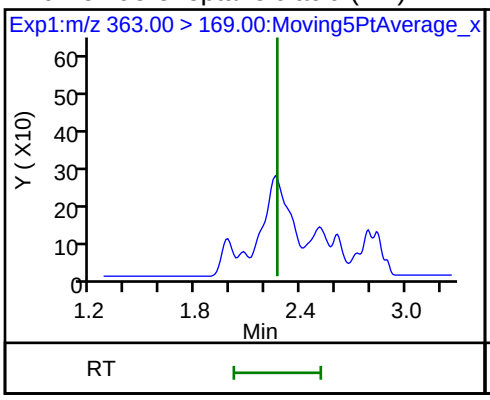
D 11 18O2 PFHxS



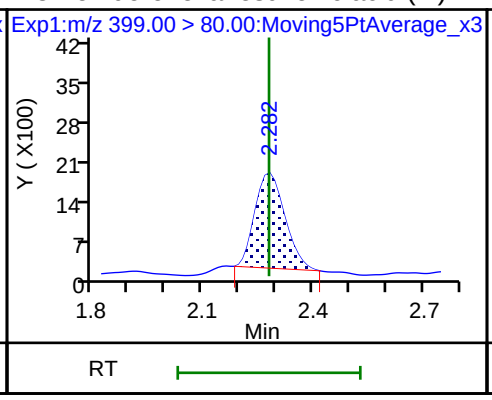
10 Perfluoroheptanoic acid (ND)



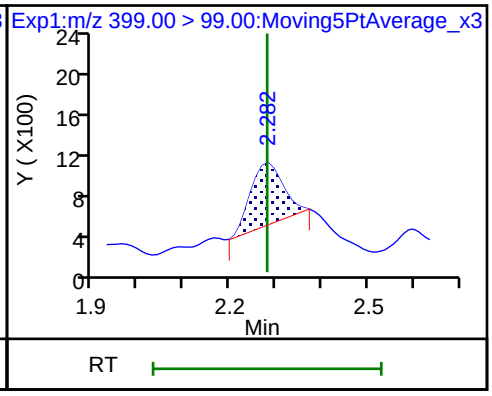
10 Perfluoroheptanoic acid (ND)



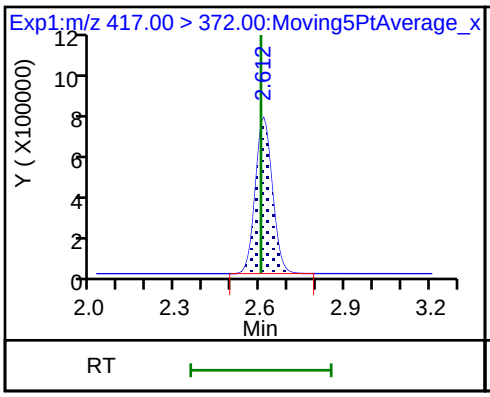
8 Perfluorohexanesulfonic acid (M)



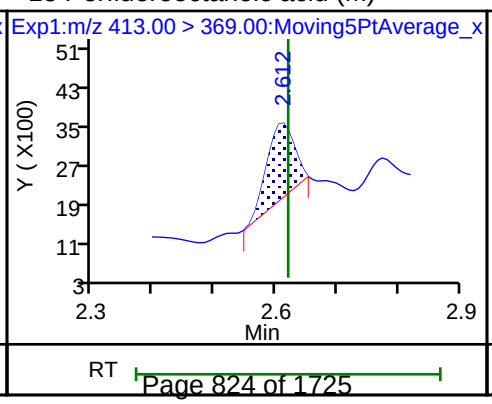
8 Perfluorohexanesulfonic acid



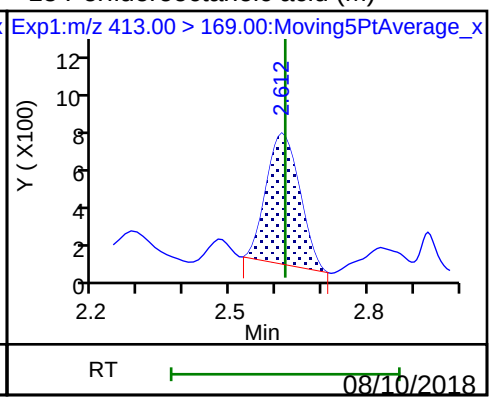
D 14 13C4 PFOA



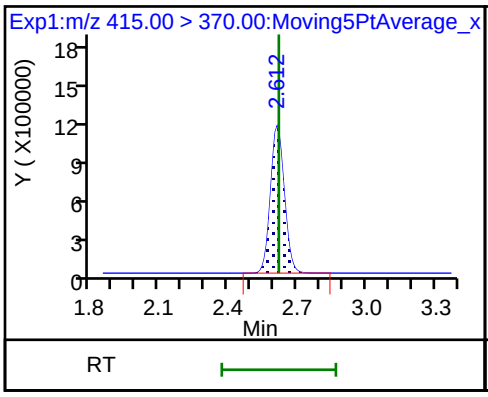
15 Perfluorooctanoic acid (M)



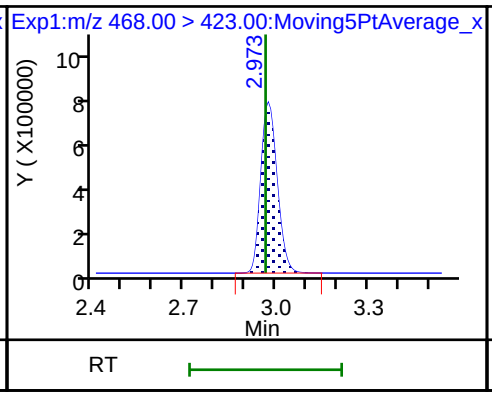
15 Perfluorooctanoic acid (M)



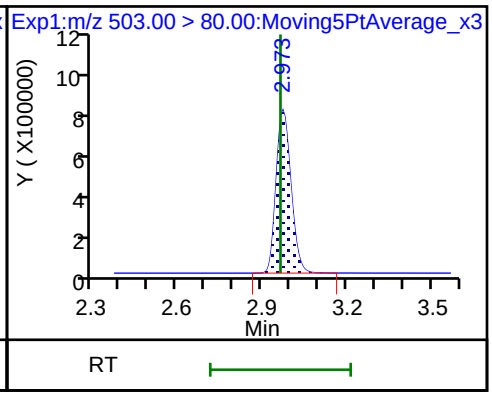
* 62 13C2-PFOA



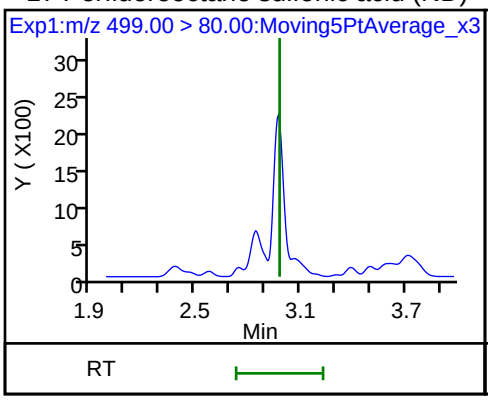
D 19 13C5 PFNA



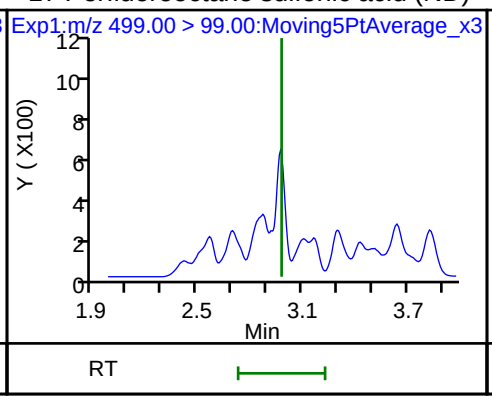
D 18 13C4 PFOS



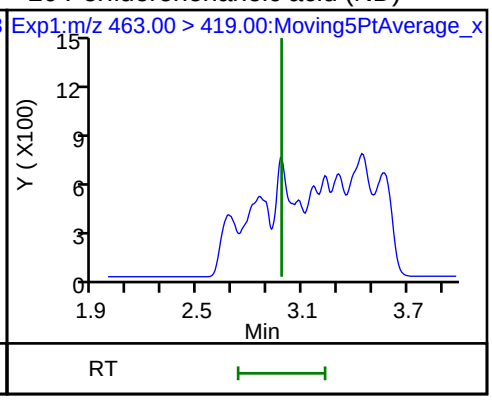
17 Perfluorooctane sulfonic acid (ND)



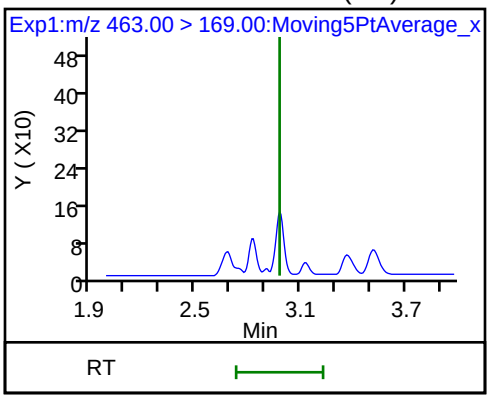
17 Perfluorooctane sulfonic acid (ND)



20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

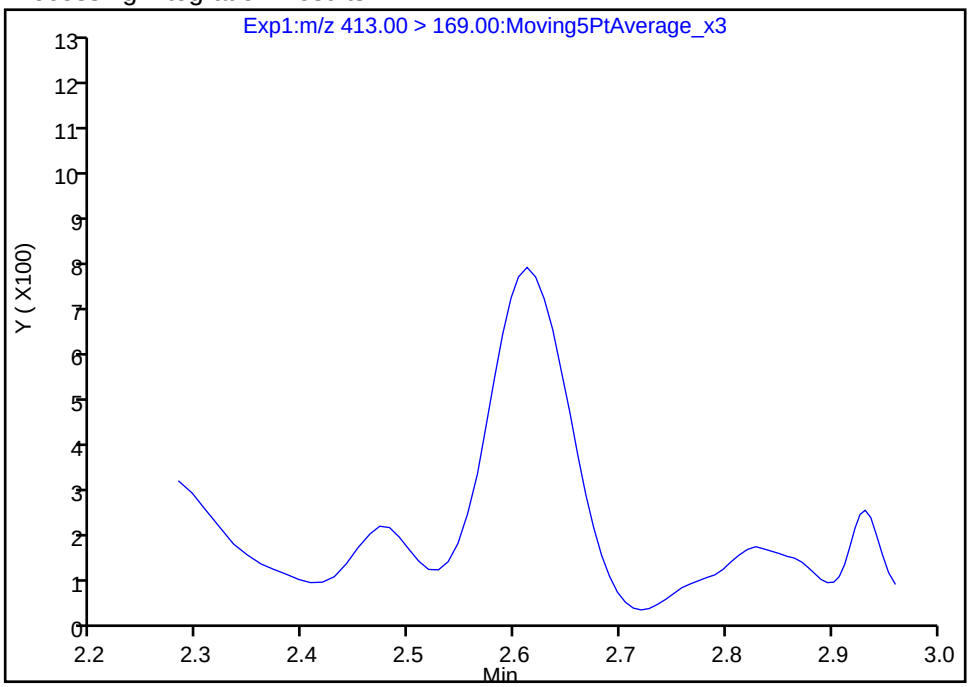
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_026.d				
Injection Date:	03-Aug-2018 08:06:22	Instrument ID:	A8_N		
Lims ID:	320-41333-A-9-A	Lab Sample ID:	320-41333-9		
Client ID:	GRE-ER-SW-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	31	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

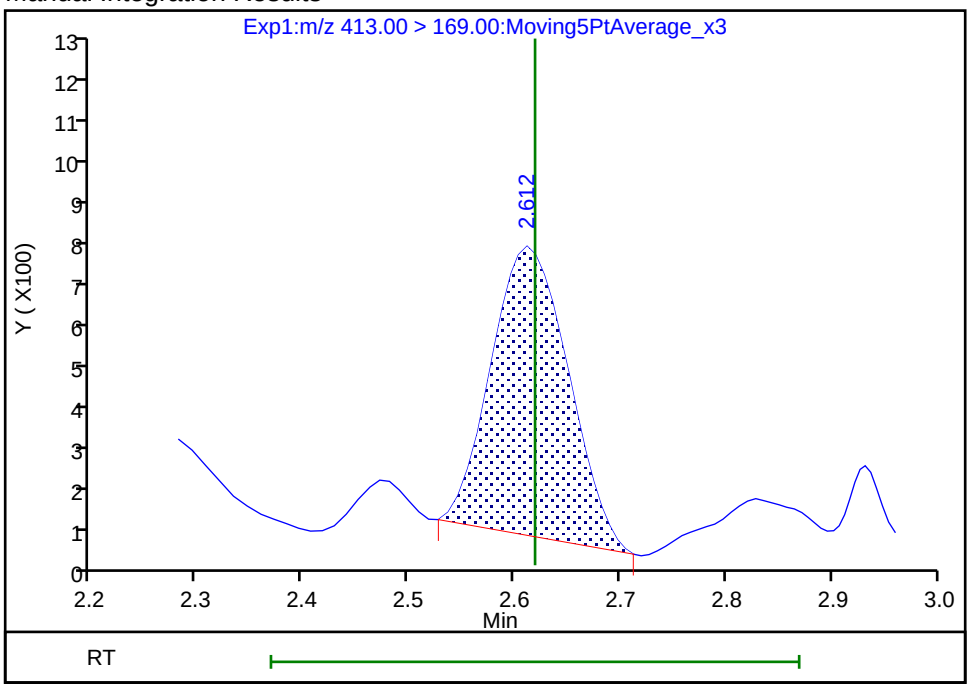
Processing Integration Results

RT: 2.61
Area: 0
Amount: 0.006145
Amount Units: ng/ml



Manual Integration Results

RT: 2.61
Area: 3567
Amount: 0.003307
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:26:29

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

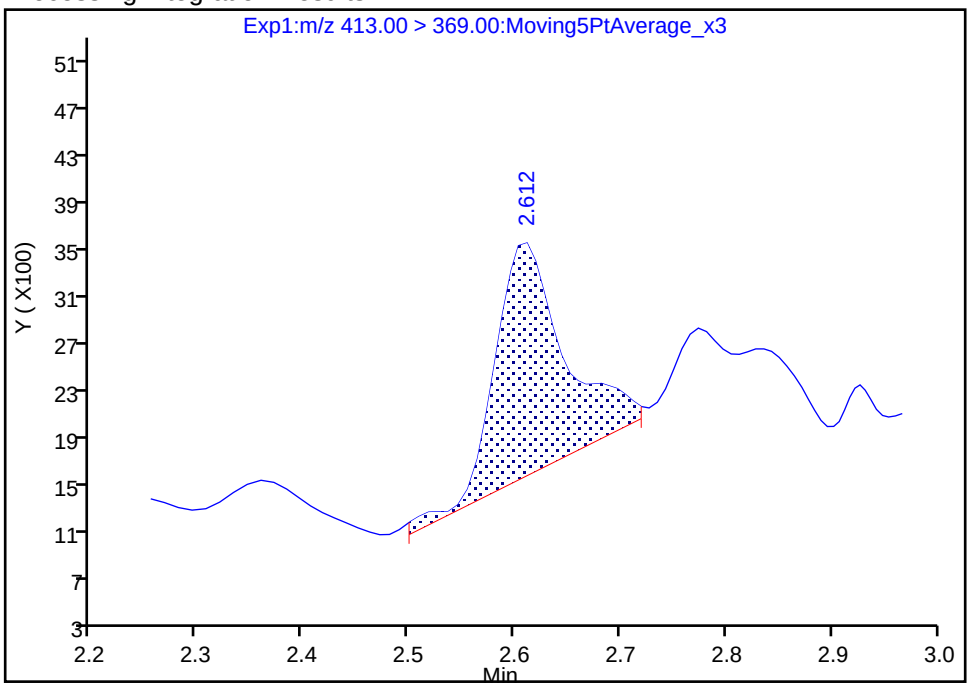
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_026.d				
Injection Date:	03-Aug-2018 08:06:22	Instrument ID:	A8_N		
Lims ID:	320-41333-A-9-A	Lab Sample ID:	320-41333-9		
Client ID:	GRE-ER-SW-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	31	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

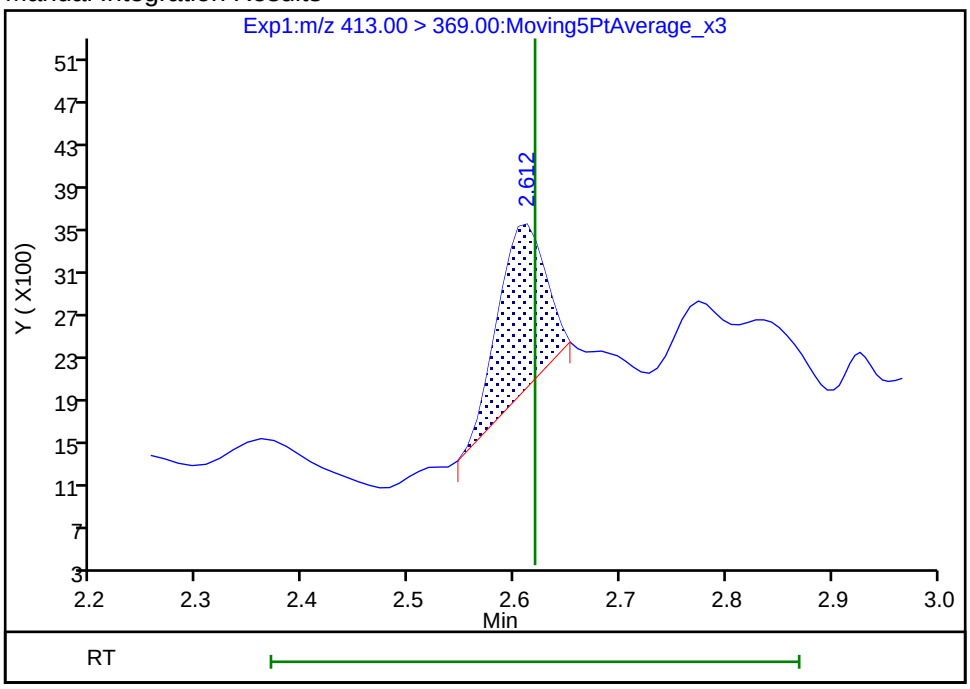
Processing Integration Results

RT: 2.61
Area: 9141
Amount: 0.006145
Amount Units: ng/ml



Manual Integration Results

RT: 2.61
Area: 4919
Amount: 0.003307
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:26:29

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

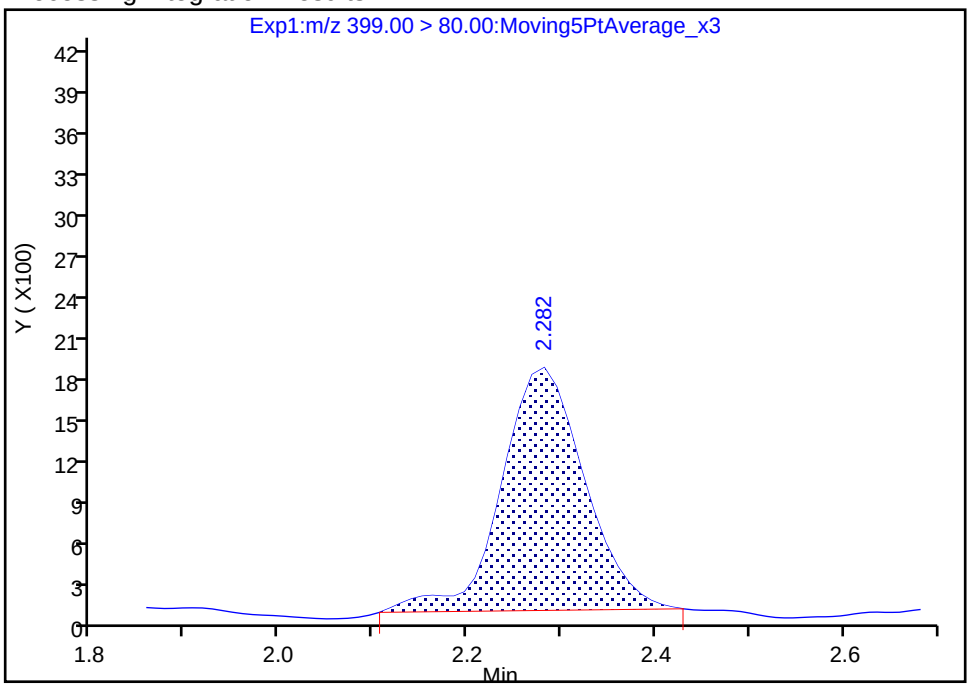
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_026.d				
Injection Date:	03-Aug-2018 08:06:22	Instrument ID:	A8_N		
Lims ID:	320-41333-A-9-A	Lab Sample ID:	320-41333-9		
Client ID:	GRE-ER-SW-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	31	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

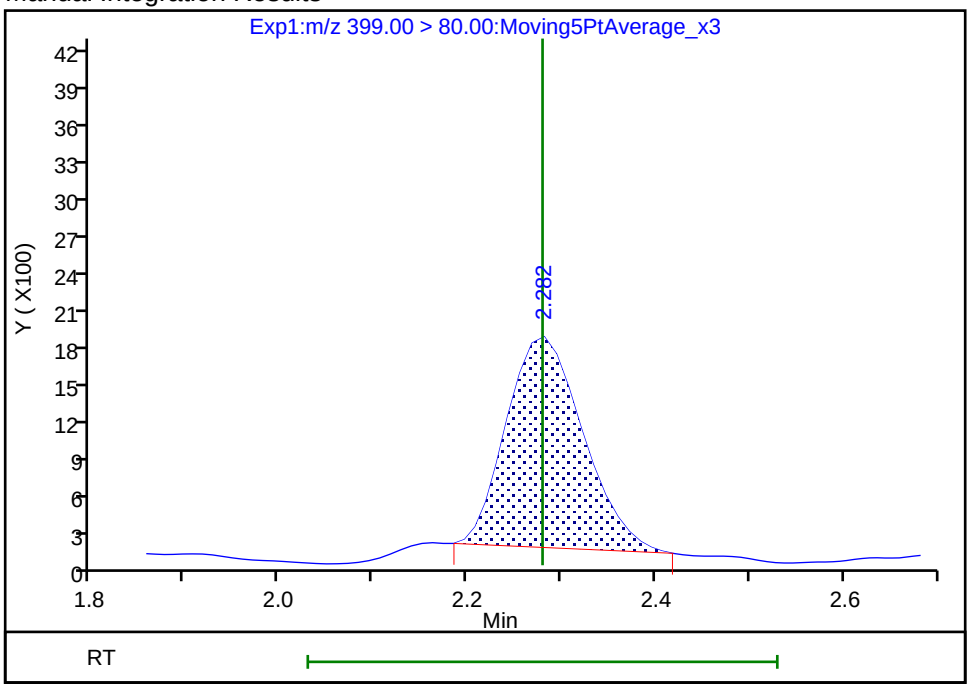
Processing Integration Results

RT: 2.28
Area: 10840
Amount: 0.005326
Amount Units: ng/ml



Manual Integration Results

RT: 2.28
Area: 9574
Amount: 0.004704
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:26:04

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: GRE09-SW1-01 | Lab Sample ID: 320-41333-10

Matrix: Water | Lab File ID: 2018.07.28LLB_057.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 16:17

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 256.4(mL) | Date Analyzed: 07/29/2018 07:09

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*1100*	*E*	*2.0*	1.5	*0.59*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*3900*	*E*	*2.0*	1.5	*0.53*
375-95-1	Perfluorononanoic acid (PFNA)	110		2.0	1.5	0.51
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*370*	*E*	*2.0*	0.98	*0.45*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*4200*	*E*	*2.0*	0.98	*0.37*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*4100*	*E*	*3.9*	2.9	*1.1*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	112		50-150
STL01892	13C4-PFHpA	70		50-150
STL00990	13C4 PFOA	59		50-150
STL00995	13C5 PFNA	76		50-150
STL00994	18O2 PFHxS	66		50-150
STL00991	13C4 PFOS	89		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_057.d
Lims ID: 320-41333-A-10-A
Client ID: GRE09-SW1-01
Sample Type: Client
Inject. Date: 29-Jul-2018 07:09:19 ALS Bottle#: 45 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-10-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:34:55 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:35:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.675	-0.008	0.644	63992	2.61		112	127	
5 Perfluorobutanesulfonic acid										E
298.90 > 80.00	1.676	1.676	0.0	1.005	20920684	9.57			3258	E
298.90 > 99.00	1.676	1.676	0.0	1.005	9828081		2.13(1.25-3.74)		8555	
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.229	0.001	0.861	1980924	1.76		70.3	45112	
10 Perfluoroheptanoic acid										E
363.00 > 319.00	2.230	2.230	0.0	1.000	24711026	28.3			10335	E
363.00 > 169.00	2.230	2.230	0.0	1.000	10904480		2.27(1.13-3.40)		66579	
D 11 18O2 PFHxS										
403.00 > 84.00	2.255	2.241	0.014	0.871	2257803	1.56		65.9	39235	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.242	2.242	0.0	0.994	119347088	107.2			40437	E
399.00 > 99.00	2.242	2.242	0.0	0.994	55382281		2.15(1.50-4.49)		30291	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.588	0.002	1.000	1632241	1.48		59.2	31376	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.590	0.0		2883582	2.50			38779	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.590	2.590	0.0	1.000	79507443	100.3			20170	E
413.00 > 169.00	2.590	2.590	0.0	1.000	58000845		1.37(0.84-2.52)		52062	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.950	2.950	0.0	1.000	104420951	105.2			27678	E
499.00 > 99.00	2.950	2.950	0.0	1.000	29576220		3.53(2.31-6.93)		90348	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.950	0.0	1.000	2372220	2.89			894	
463.00 > 169.00	2.950	2.950	0.0	1.000	589396		4.02(1.90-5.69)		473	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.953	-0.003	1.139	1798543	1.89		75.6	23983	
D 18 13C4 PFOS										
503.00 > 80.00	2.950	2.953	-0.003	1.139	2146317	2.13		89.1	5953	

QC Flag Legend

Processing Flags

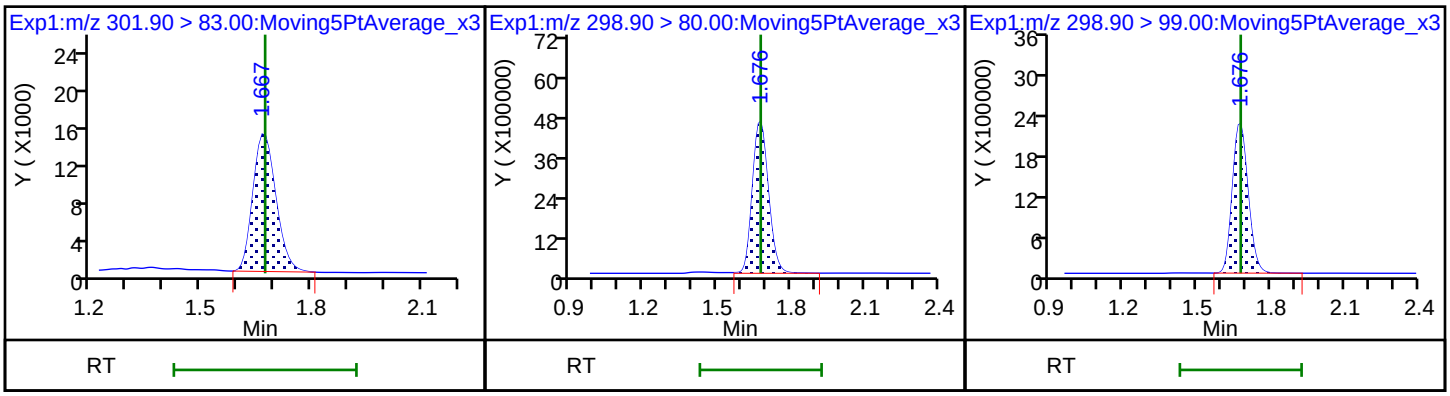
E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 12:35:11 Chrom Revision: 2.3 19-Jul-2018 15:14:50

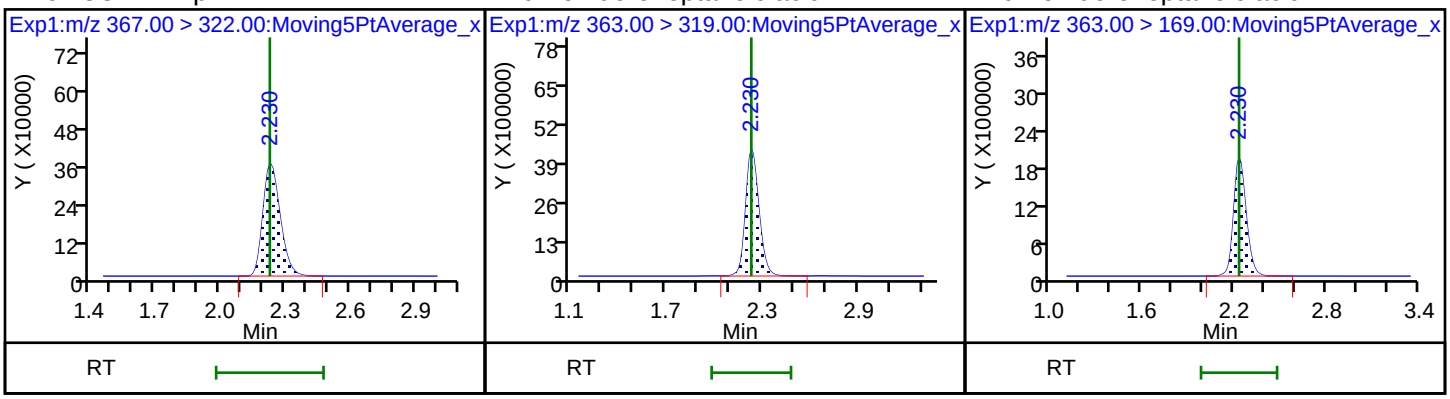
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_057.d				
Injection Date:	29-Jul-2018 07:09:19	Instrument ID:	A8_N		
Lims ID:	320-41333-A-10-A	Lab Sample ID:	320-41333-10		
Client ID:	GRE09-SW1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	45	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

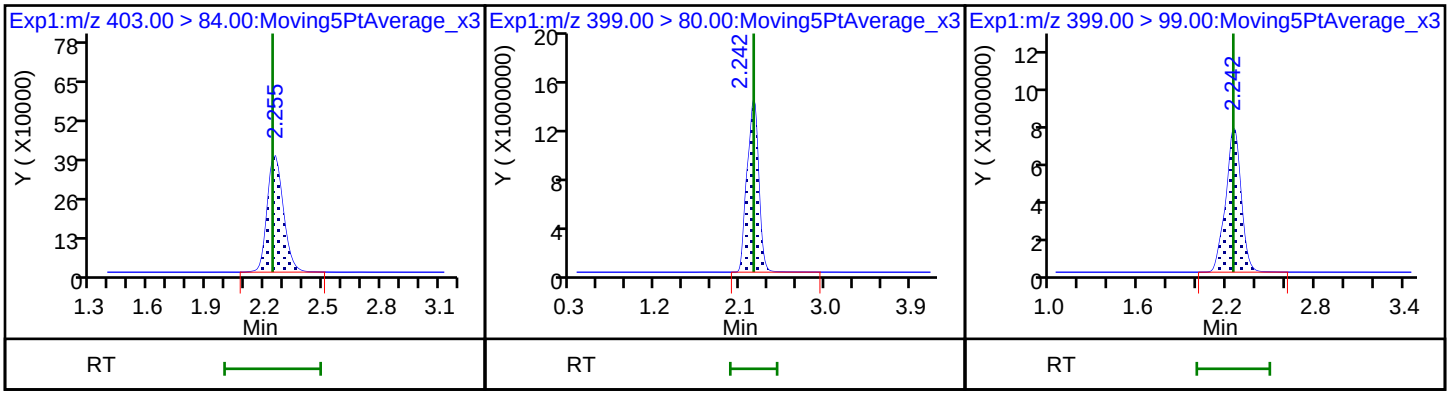
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



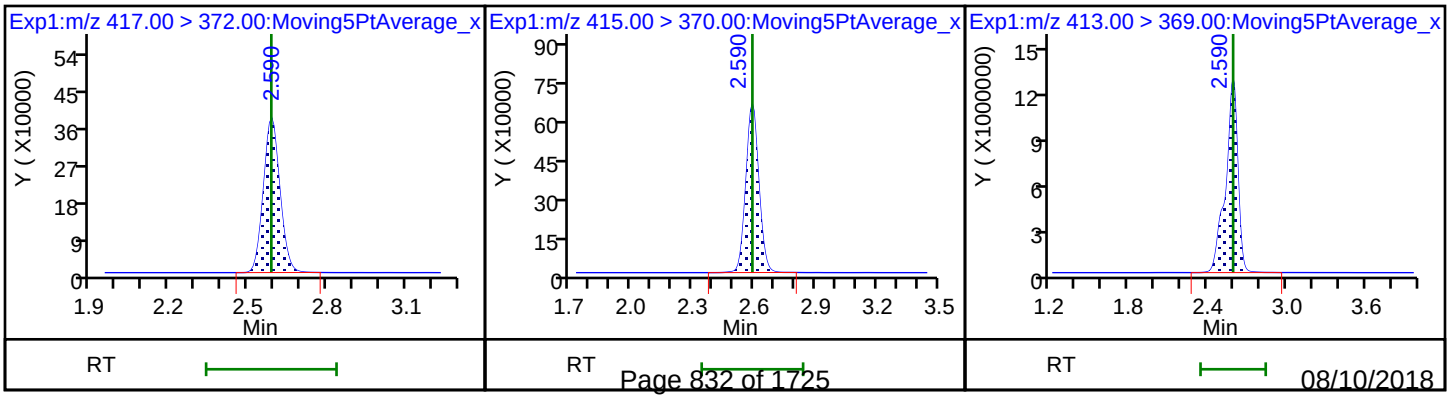
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



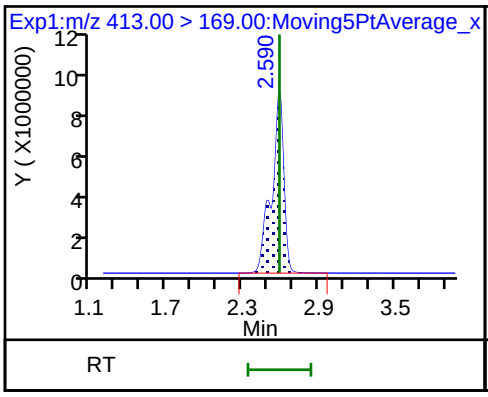
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



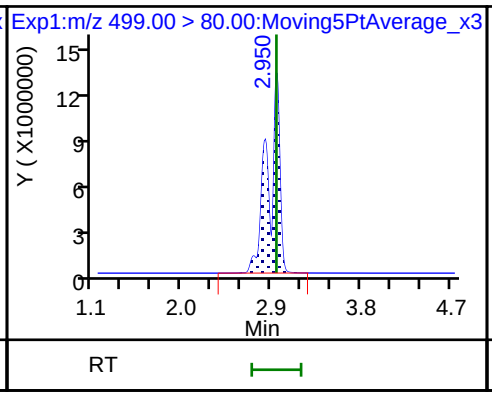
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid



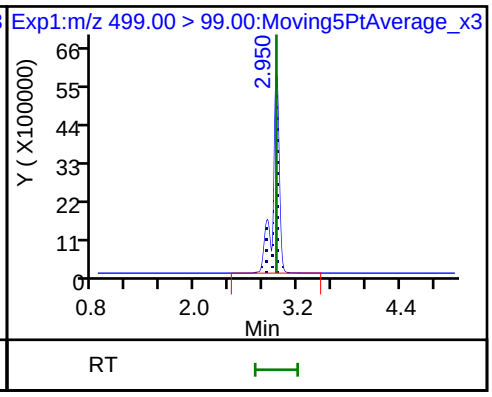
15 Perfluorooctanoic acid



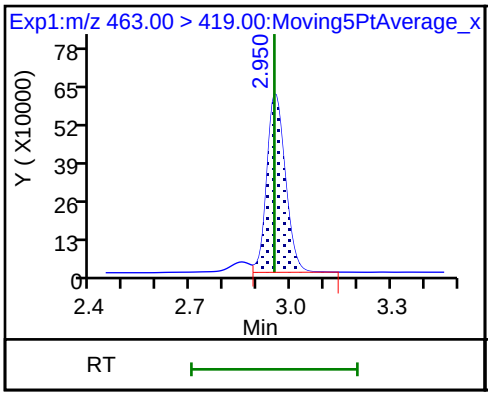
17 Perfluorooctane sulfonic acid



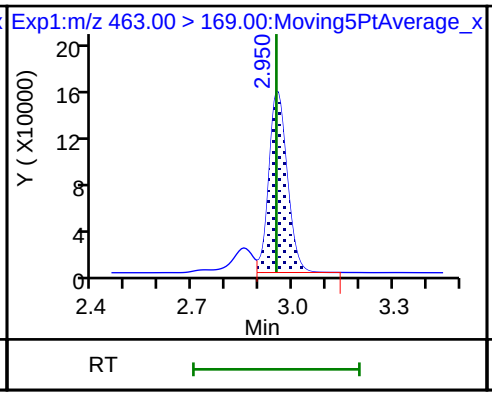
17 Perfluorooctane sulfonic acid



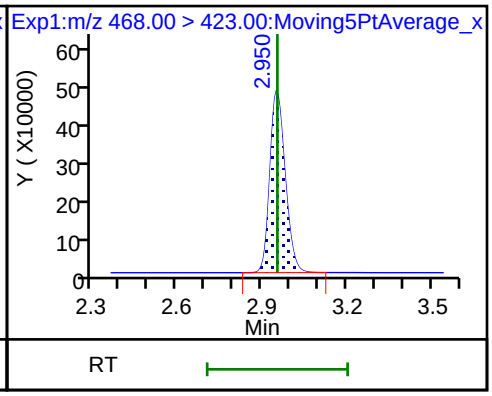
20 Perfluorononanoic acid



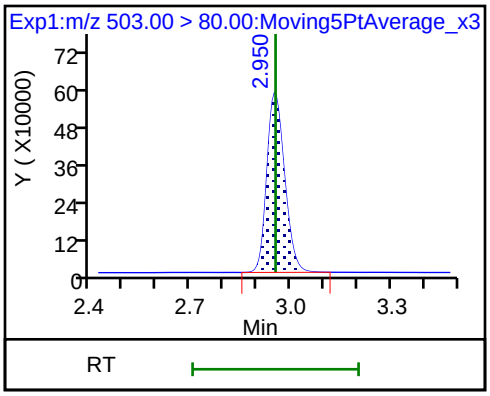
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: GRE09-SW1-01 DL
Lab Sample ID: 320-41333-10 DL
Matrix: Water
Lab File ID: 2018.08.07LLBB_068.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/17/2018 16:17
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 256.4(mL)
Date Analyzed: 08/07/2018 22:58
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 50
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 238595
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1300	D	98	73	30
335-67-1	Perfluorooctanoic acid (PFOA)	6200	D M	98	73	26
375-95-1	*Perfluorononanoic acid (PFNA)*	*130*	*D*	*98*	73	*25*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	360	D	98	49	22
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8400	D	98	49	19
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	5300	D	200	150	54

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	74	M	50-150
STL01892	13C4-PFHpA	61		50-150
STL00990	13C4 PFOA	63		50-150
STL00995	13C5 PFNA	62		50-150
STL00994	18O2 PFHxS	59		50-150
STL00991	13C4 PFOS	59		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_068.d
Lims ID: 320-41333-A-10-A
Client ID: GRE09-SW1-01
Sample Type: Client
Inject. Date: 07-Aug-2018 22:58:14 ALS Bottle#: 43 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 50.0000
Sample Info: 320-41333-a-10-a 50X
Misc. Info.: Plate: 1 Rack: 5
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 12:25:54 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: hannigana Date: 08-Aug-2018 12:23:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										M
301.90 > 83.00	1.668	1.678	-0.010	0.646	1748	0.0346		74.5	8.2	M
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.678	-0.002	1.005	530330	0.1857			158	
298.90 > 99.00	1.676	1.678	-0.002	1.005	229187		2.31(1.25-3.74)		136	
D 9 13C4-PFHpA										
367.00 > 322.00	2.236	2.223	0.013	0.866	74086	0.0304		60.8	436	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.236	2.223	0.013	1.000	1085270	0.6898			241	
363.00 > 169.00	2.236	2.223	0.013	1.000	409285		2.65(1.13-3.40)		719	
D 11 18O2 PFHxS										
403.00 > 84.00	2.247	2.243	0.004	0.870	87374	0.0280		59.1	614	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.247	2.243	0.004	1.000	8603891	4.30			3906	
399.00 > 99.00	2.247	2.243	0.004	1.000	2752603		3.13(1.50-4.49)		2512	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.572	0.002	0.997	70107	0.0314		62.7	531	
* 62 13C2-PFOA										s
415.00 > 370.00	2.581	2.572	0.009		114399	0.0500			514	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.581	2.579	0.002	1.003	5026002	3.17			417	M
413.00 > 169.00	2.574	2.579	-0.005	1.000	2706851		1.86(0.84-2.52)		2316	M
D 19 13C5 PFNA										
468.00 > 423.00	2.941	2.938	0.003	1.139	61987	0.0309		61.8	426	
D 18 13C4 PFOS										
503.00 > 80.00	2.941	2.938	0.003	1.139	58089	0.0283		59.2	156	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.941	2.944	-0.003	1.000	3515927	2.69			2355	
499.00 > 99.00	2.941	2.944	-0.003	1.000	806091		4.36(2.31-6.93)		1080	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										
463.00 > 419.00	2.941	2.944	-0.003	1.000	84045	0.0644			25.0	
463.00 > 169.00	2.941	2.944	-0.003	1.000	21398		3.93(1.90-5.69)		54.8	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

Review Flags

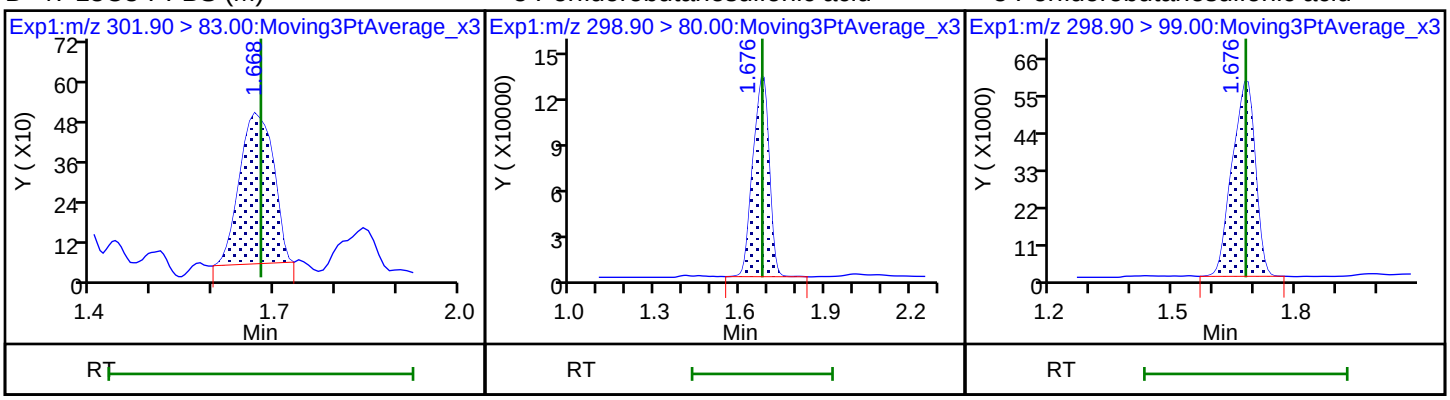
M - Manually Integrated

Report Date: 08-Aug-2018 12:26:03 Chrom Revision: 2.3 19-Jul-2018 15:14:50

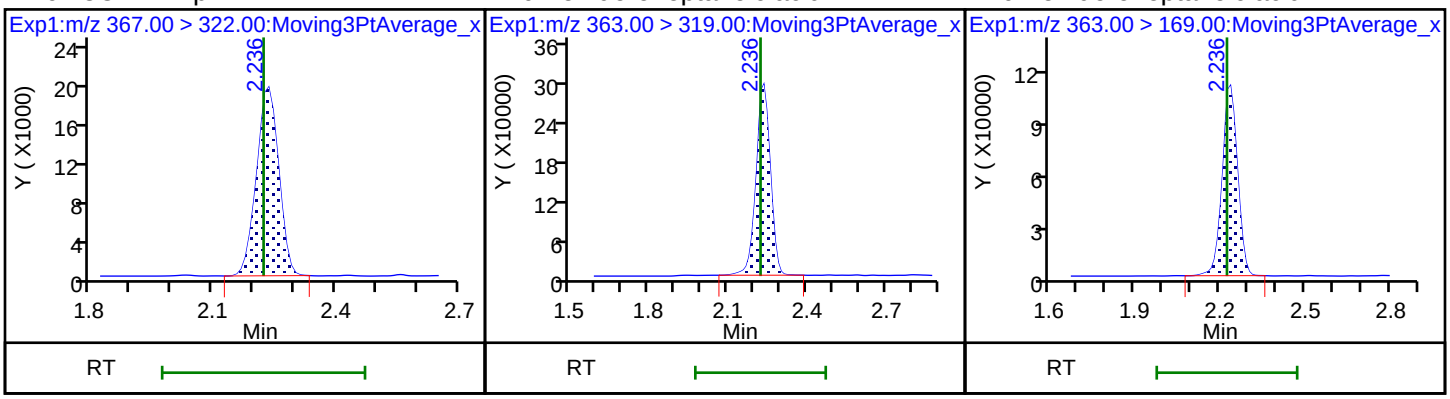
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_068.d				
Injection Date:	07-Aug-2018 22:58:14	Instrument ID:	A8_N		
Lims ID:	320-41333-A-10-A	Lab Sample ID:	320-41333-10		
Client ID:	GRE09-SW1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	43	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

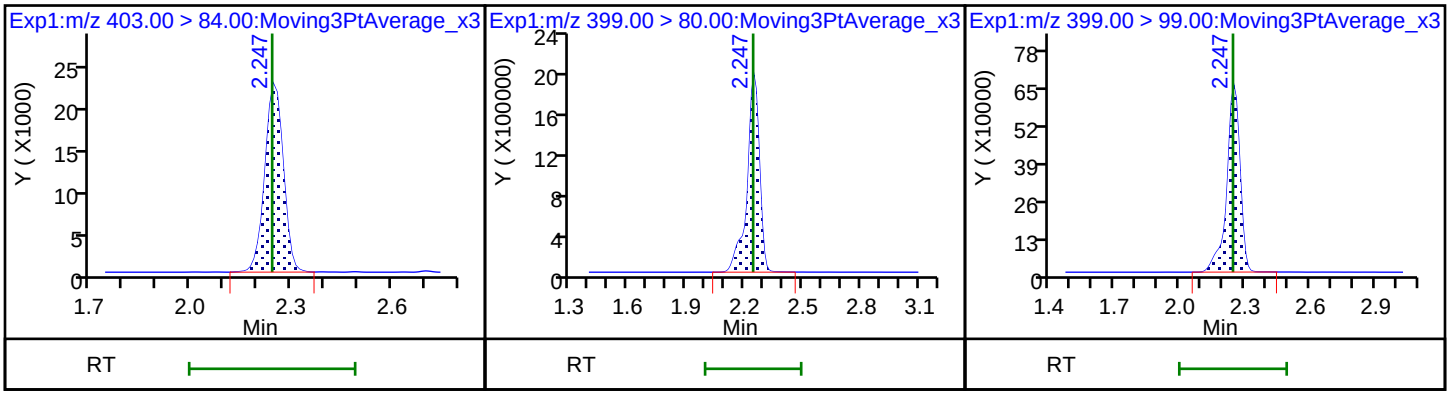
D 47 13C3-PFBS (M) | 5 Perfluorobutanesulfonic acid | 5 Perfluorobutanesulfonic acid



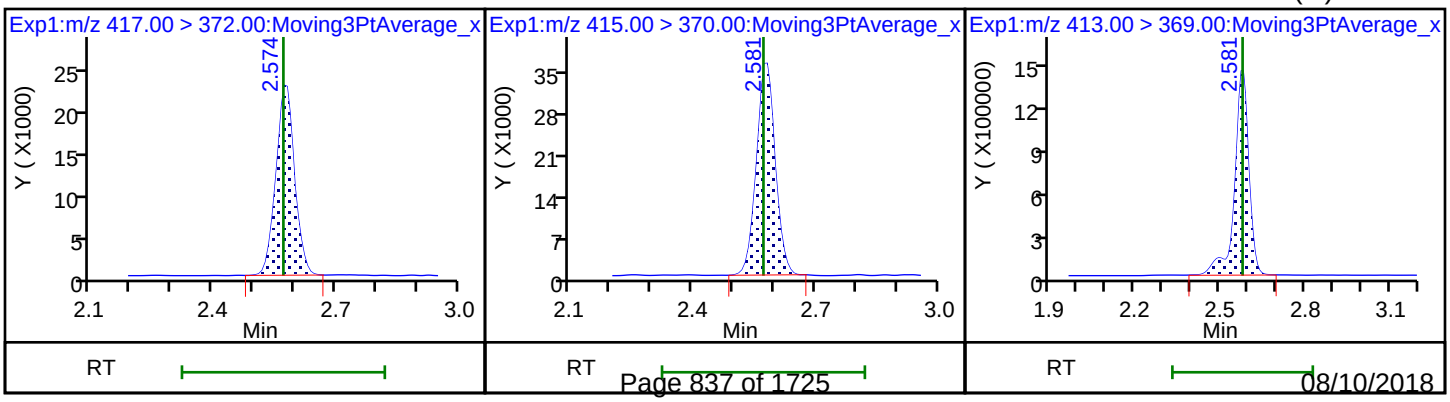
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



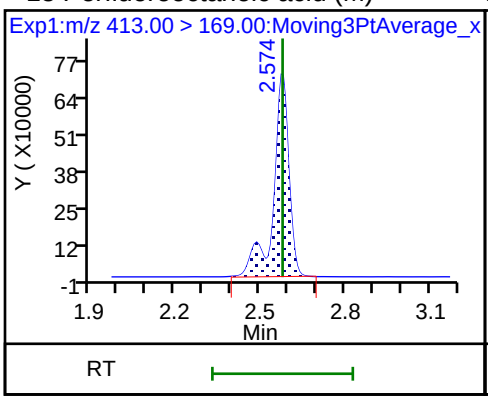
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



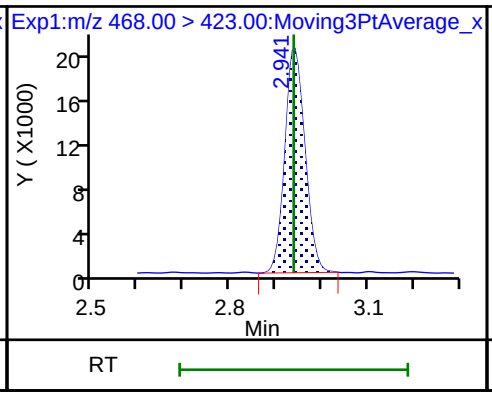
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid (M)



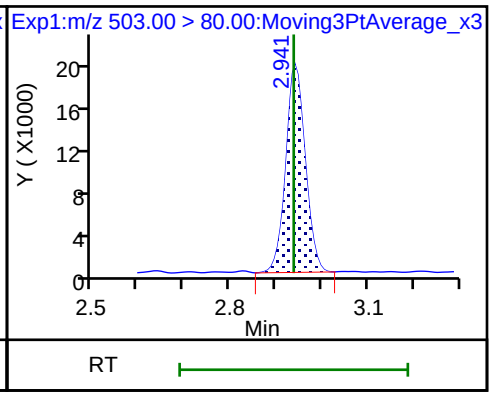
15 Perfluorooctanoic acid (M)



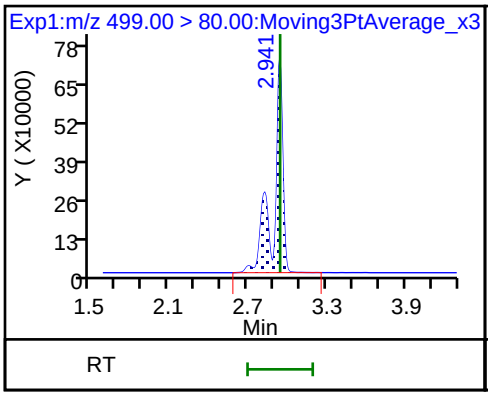
D 19 13C5 PFNA



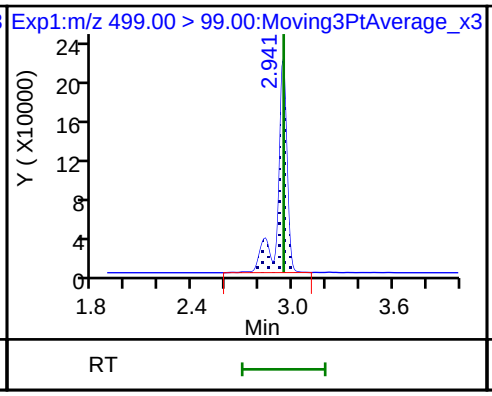
D 18 13C4 PFOS



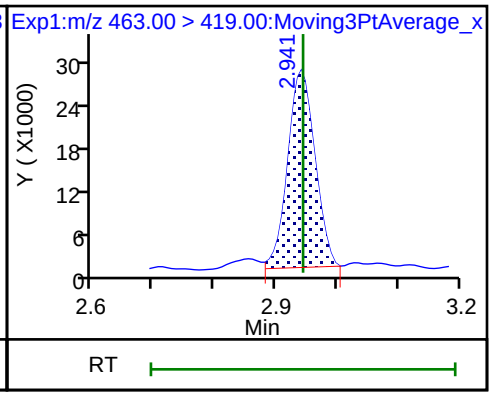
17 Perfluorooctane sulfonic acid



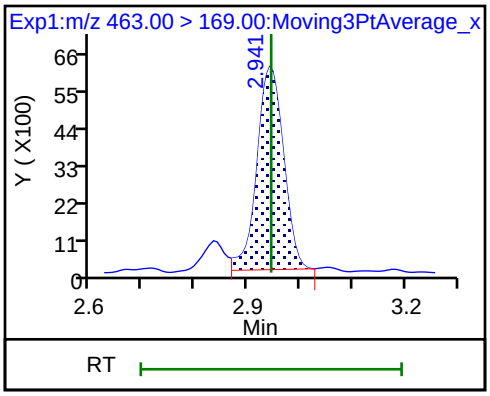
17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

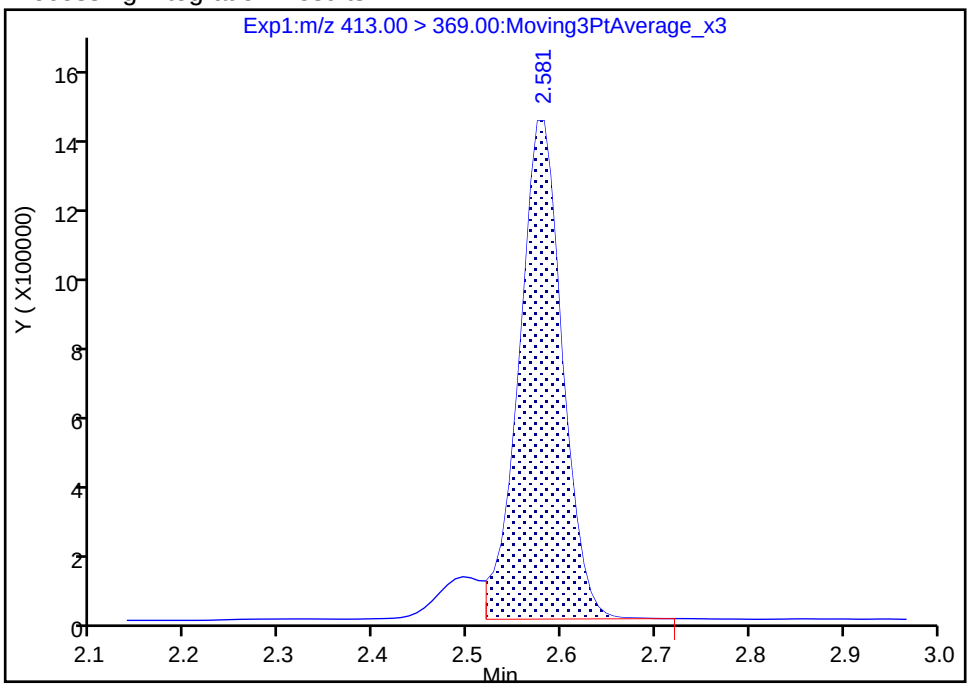
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_068.d				
Injection Date:	07-Aug-2018 22:58:14	Instrument ID:	A8_N		
Lims ID:	320-41333-A-10-A	Lab Sample ID:	320-41333-10		
Client ID:	GRE09-SW1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	43	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

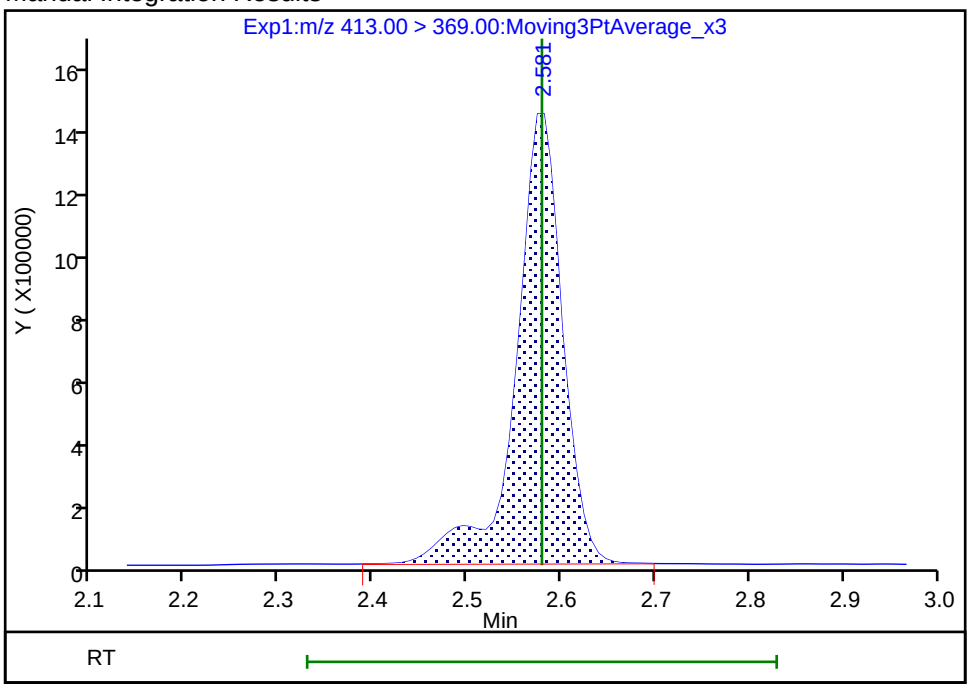
Processing Integration Results

RT: 2.58
Area: 4610710
Amount: 2.908289
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 5026002
Amount: 3.170242
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 12:25:15

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

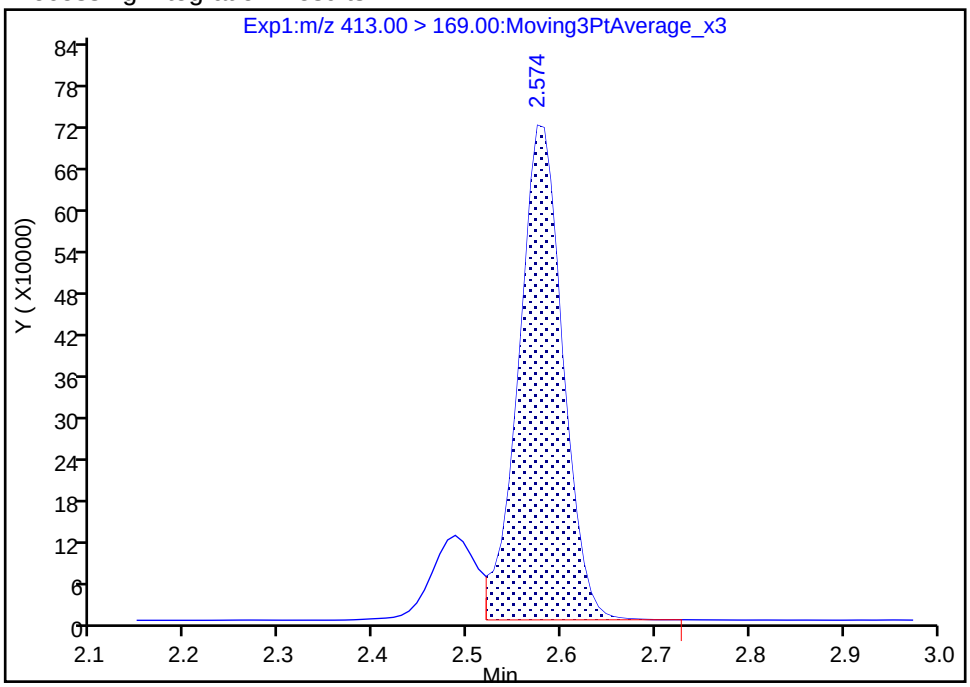
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_068.d				
Injection Date:	07-Aug-2018 22:58:14	Instrument ID:	A8_N		
Lims ID:	320-41333-A-10-A	Lab Sample ID:	320-41333-10		
Client ID:	GRE09-SW1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	43	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

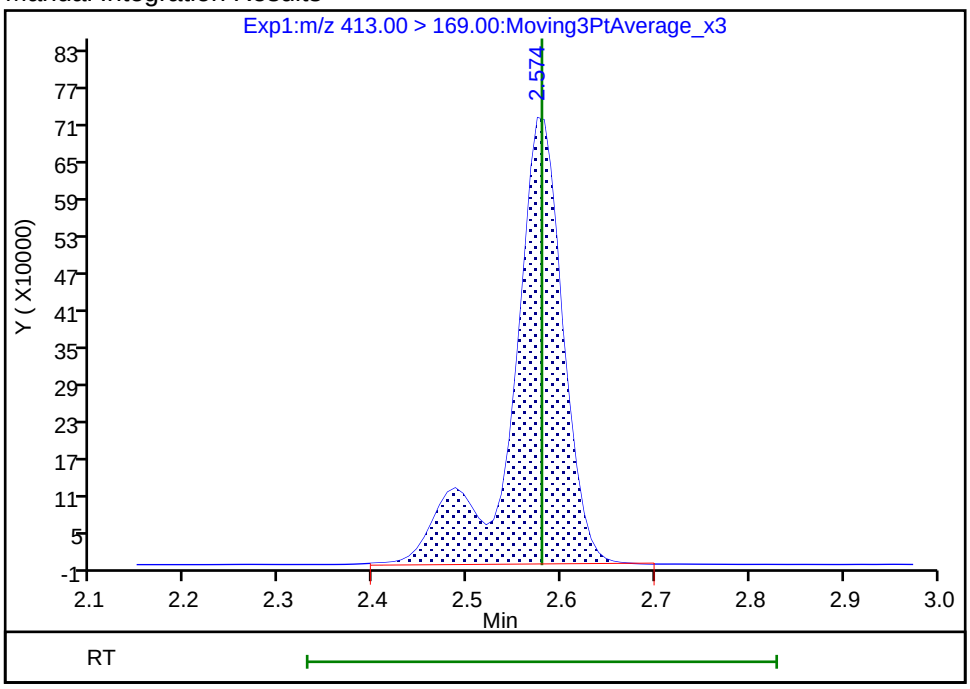
Processing Integration Results

RT: 2.57
Area: 2310745
Amount: 2.908289
Amount Units: ng/ml



Manual Integration Results

RT: 2.57
Area: 2706851
Amount: 3.170242
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 12:25:19

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_068.d				
Injection Date:	07-Aug-2018 22:58:14	Instrument ID:	A8_N		
Lims ID:	320-41333-A-10-A	Lab Sample ID:	320-41333-10		
Client ID:	GRE09-SW1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	43	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

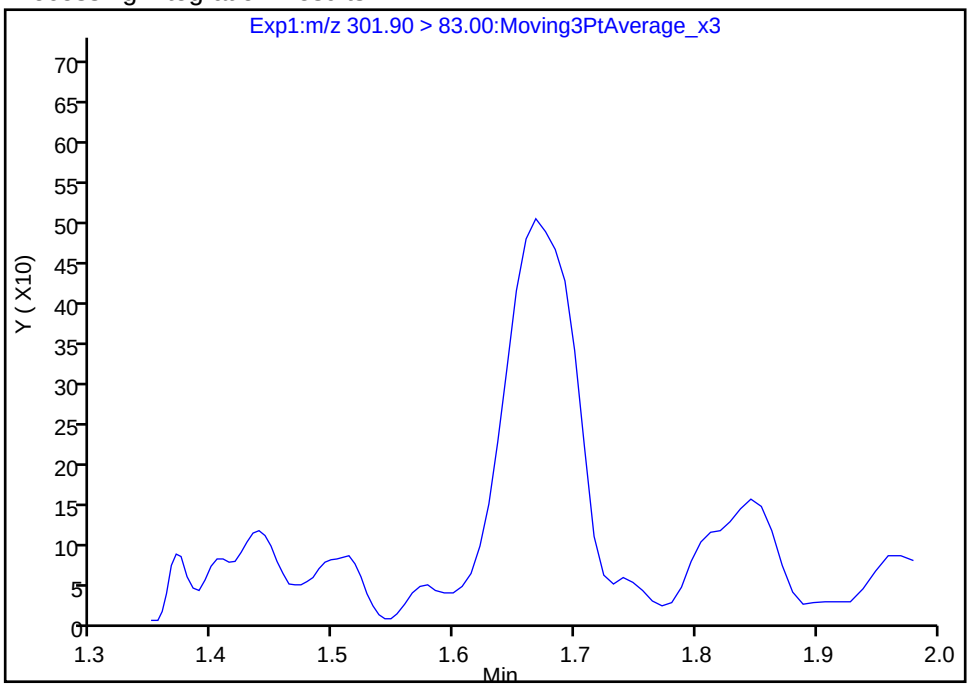
D 47 13C3-PFBS, CAS: STL02337

Signal: 1

Not Detected

Expected RT: 1.68

Processing Integration Results



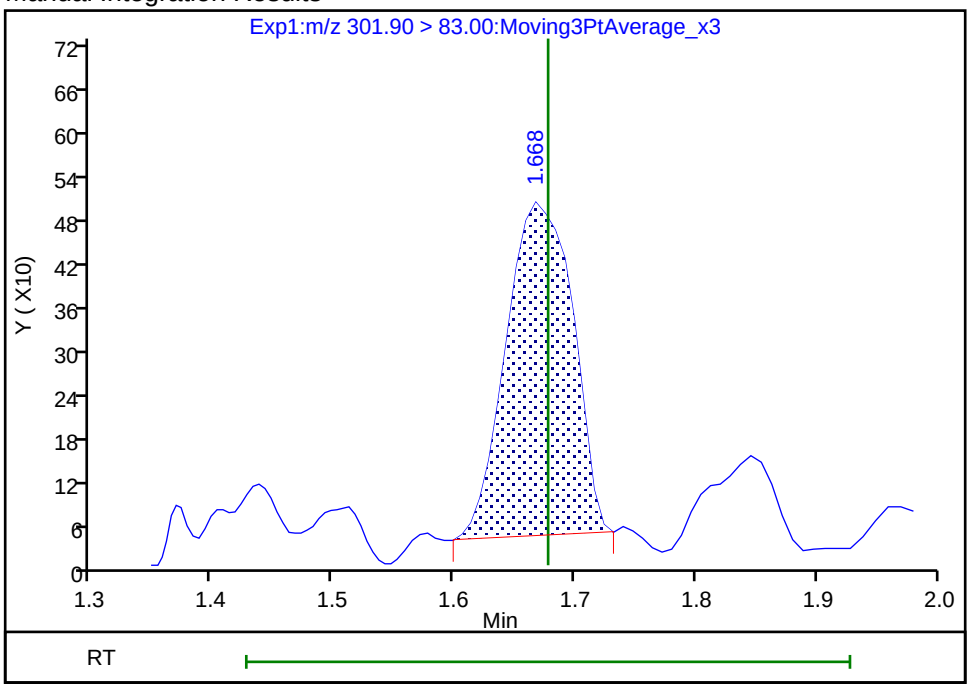
Manual Integration Results

RT: 1.67

Area: 1748

Amount: 0.034636

Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 12:23:17

Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: GRE09-SD1-01 | Lab Sample ID: 320-41333-11

Matrix: Solid | Lab File ID: 2018.08.05LLA_033.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 16:30

Extraction Method: SHAKE | Date Extracted: 07/27/2018 10:32

Sample wt/vol: 5.10(g) | Date Analyzed: 08/06/2018 03:43

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 37.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 238093 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.1	M	0.47	0.31	0.12
335-67-1	Perfluorooctanoic acid (PFOA)	8.0		0.47	0.31	0.16
375-95-1	Perfluorononanoic acid (PFNA)	0.29	J M	0.47	0.31	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.34	J M	0.63	0.28	0.092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.6	M	0.47	0.31	0.097
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*32*	*E*	*1.6*	0.78	*0.38*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	95		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	93		50-150
STL00994	18O2 PFHxS	104		50-150
STL00991	13C4 PFOS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_033.d
Lims ID: 320-41333-A-11-C
Client ID: GRE09-SD1-01
Sample Type: Client
Inject. Date: 06-Aug-2018 03:43:24 ALS Bottle#: 21 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-11-c
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 16:59:51 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 16:31:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.648	1.656	-0.008	0.647	68104	2.21		95.2	118	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.656	1.657	-0.001	1.005	245467	0.1093			63.5	M
298.90 > 99.00	1.656	1.657	-0.001	1.005	98878		2.48(1.25-3.74)		84.4	
D 9 13C4-PFHpA										
367.00 > 322.00	2.194	2.206	-0.012	0.862	2772865	2.47		98.8	54441	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.194	2.207	-0.013	1.000	458237	0.3563			119	M
363.00 > 169.00	2.206	2.207	-0.001	1.005	189283		2.42(1.13-3.40)		1541	
D 11 18O2 PFHxS										
403.00 > 84.00	2.217	2.217	0.0	0.871	4166544	2.47		104	66946	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.217	2.218	-0.001	1.000	5600652	2.75			1131	M
399.00 > 99.00	2.217	2.218	-0.001	1.000	1811600		3.09(1.50-4.49)		2188	
* 62 13C2-PFOA										
415.00 > 370.00	2.546	2.547	-0.001		2822523	2.50			34728	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.546	2.547	-0.001	1.000	2905259	2.56			783	
413.00 > 169.00	2.546	2.547	-0.001	1.000	1562704		1.86(0.84-2.52)		5621	
D 14 13C4 PFOA										
417.00 > 372.00	2.546	2.555	-0.009	1.000	2449995	2.26		90.4	41637	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.912	2.913	-0.001	1.000	88995	0.0940			52.7	M
463.00 > 169.00	2.906	2.913	-0.007	0.998	21206		4.20(1.90-5.69)		185	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.912	2.913	-0.001	1.000	12286454	10.1			6200	E
499.00 > 99.00	2.912	2.913	-0.001	1.000	2874651		4.27(2.31-6.93)		7313	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.912	2.916	-0.004	1.144	2192870	2.32		92.9	40793	
D 18 13C4 PFOS										
503.00 > 80.00	2.912	2.916	-0.004	1.144	2578832	2.21		92.6	1893	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

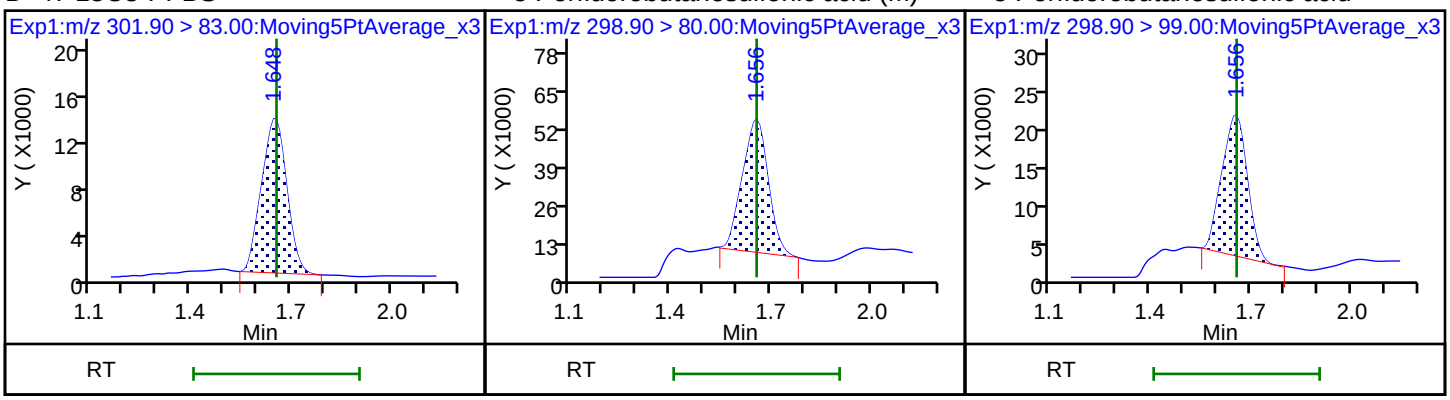
M - Manually Integrated

Report Date: 06-Aug-2018 17:00:03 Chrom Revision: 2.3 19-Jul-2018 15:14:50

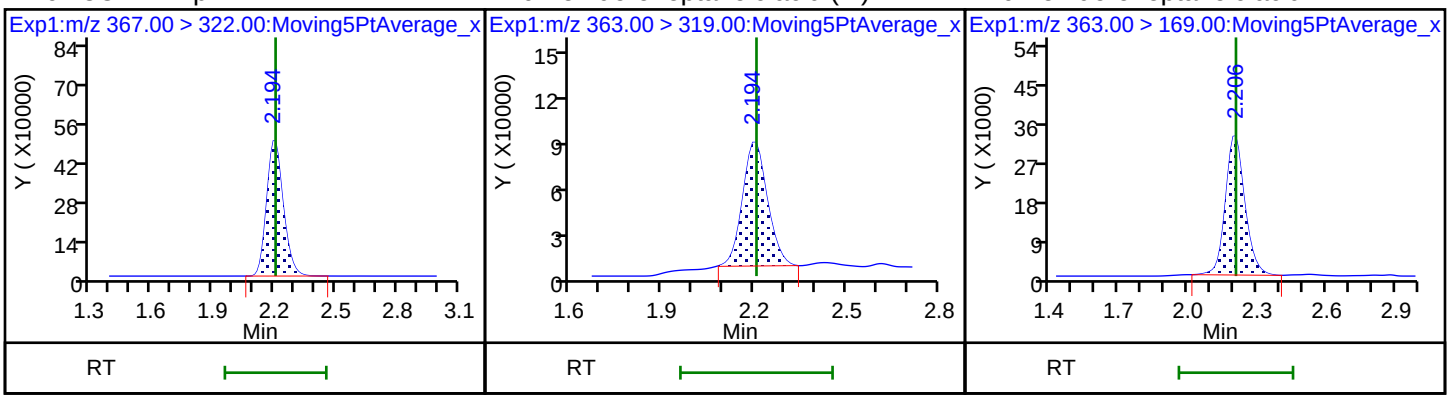
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_033.d				
Injection Date:	06-Aug-2018 03:43:24	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

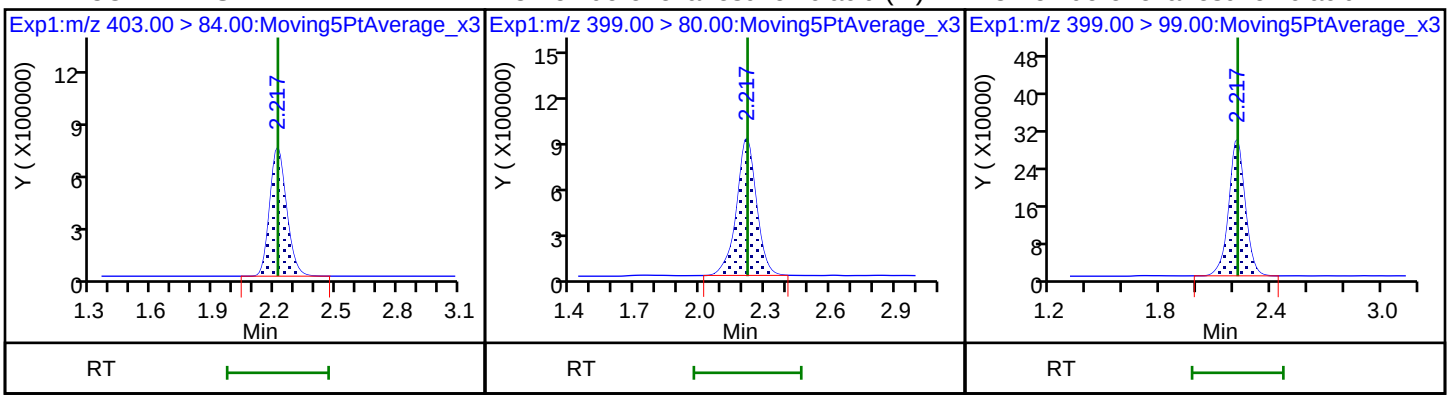
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (M) | 5 Perfluorobutanesulfonic acid



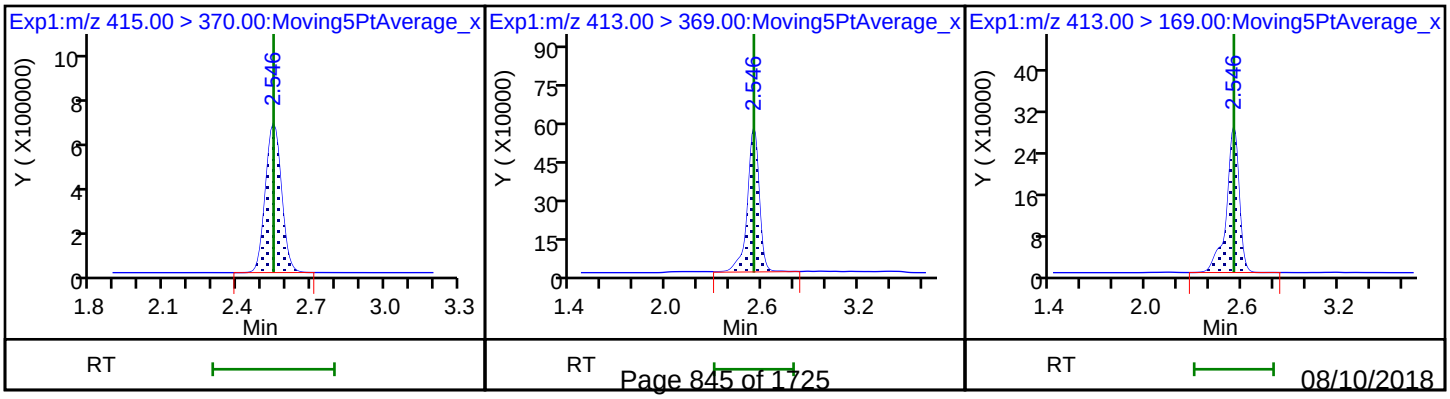
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid (M) | 10 Perfluoroheptanoic acid



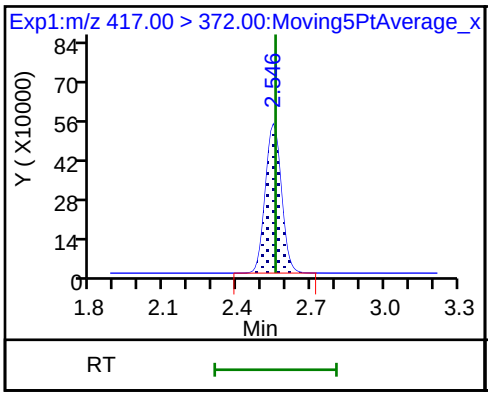
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid (M) | 8 Perfluorohexanesulfonic acid



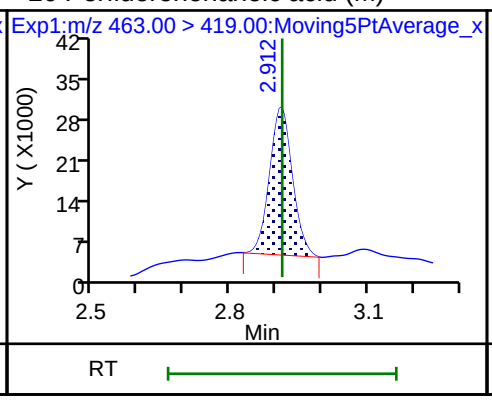
* 62 13C2-PFOA | 15 Perfluorooctanoic acid | 15 Perfluorooctanoic acid



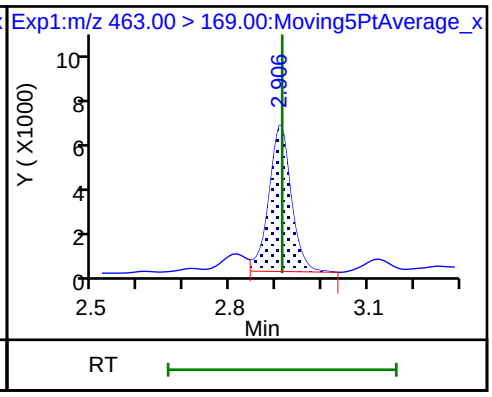
D 14 13C4 PFOA



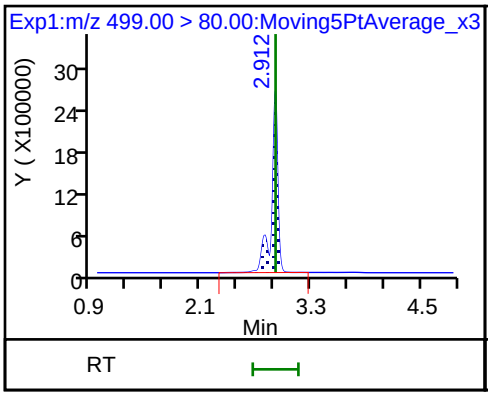
20 Perfluorononanoic acid (M)



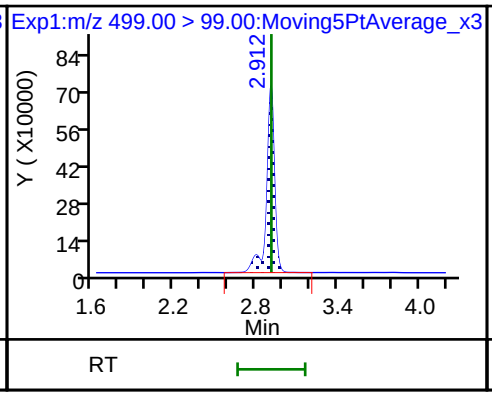
20 Perfluorononanoic acid



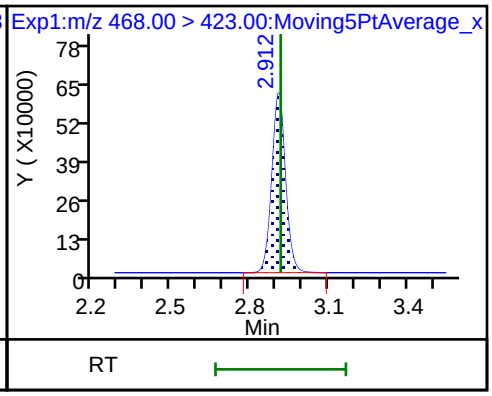
17 Perfluorooctane sulfonic acid



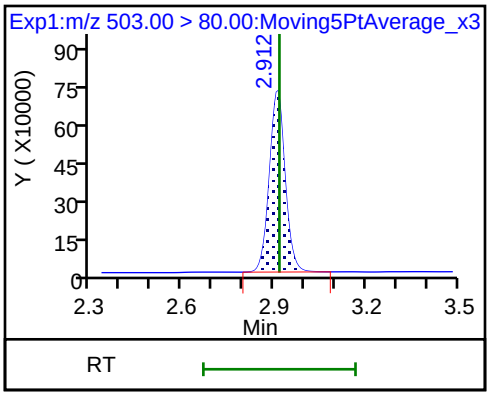
17 Perfluorooctane sulfonic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

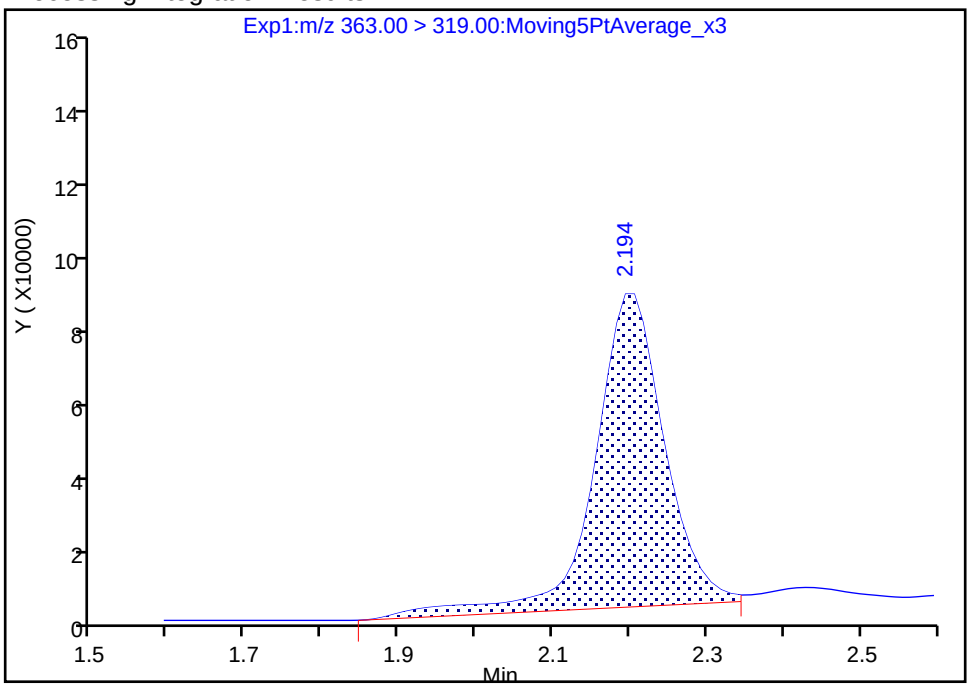
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_033.d				
Injection Date:	06-Aug-2018 03:43:24	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

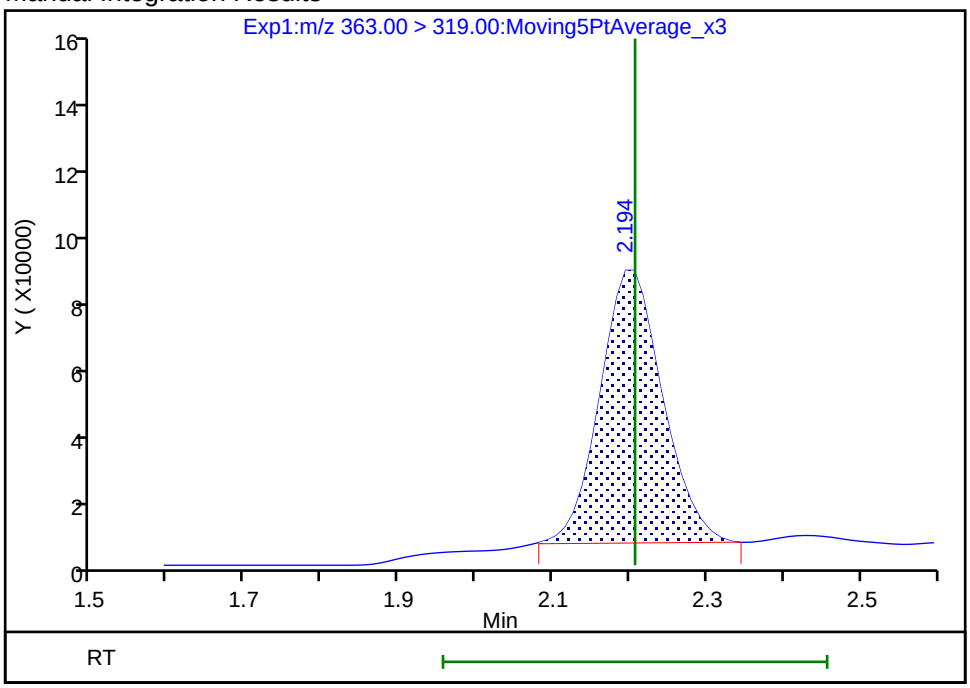
Processing Integration Results

RT: 2.19
Area: 535482
Amount: 0.416330
Amount Units: ng/ml



Manual Integration Results

RT: 2.19
Area: 458237
Amount: 0.356273
Amount Units: ng/ml



Reviewer: barnettj, 06-Aug-2018 16:30:30
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

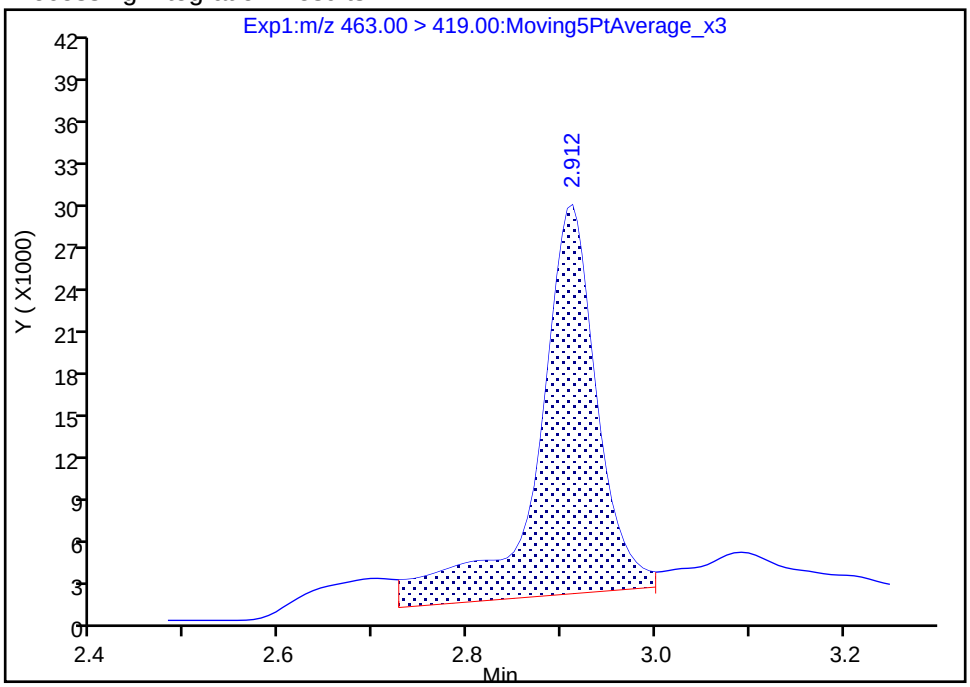
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_033.d				
Injection Date:	06-Aug-2018 03:43:24	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

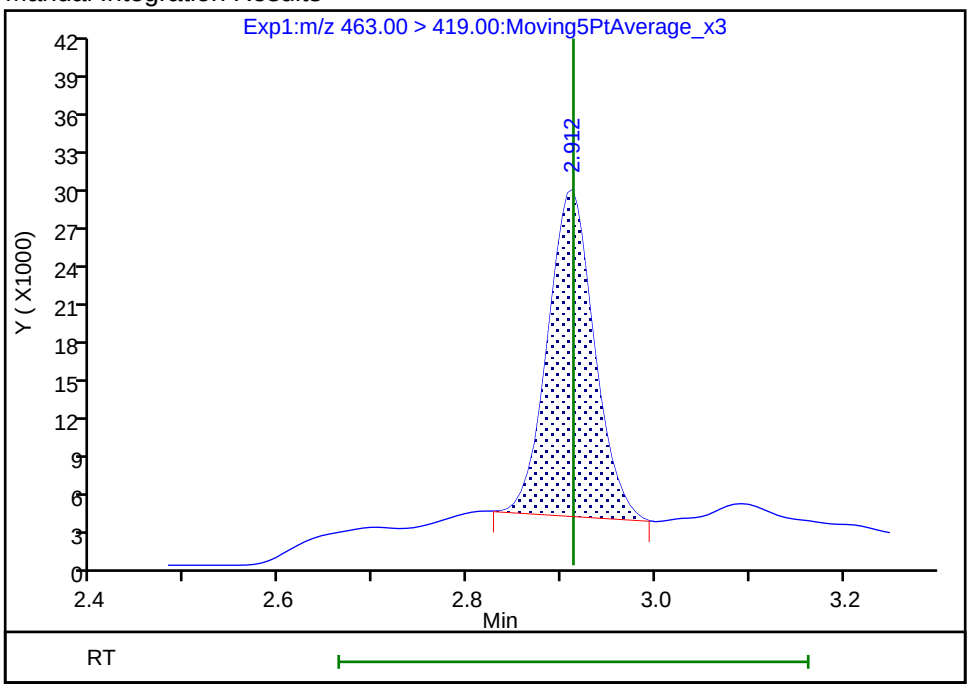
Processing Integration Results

RT: 2.91
Area: 123893
Amount: 0.130799
Amount Units: ng/ml



Manual Integration Results

RT: 2.91
Area: 88995
Amount: 0.093956
Amount Units: ng/ml



Reviewer: barnettj, 06-Aug-2018 16:30:55

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

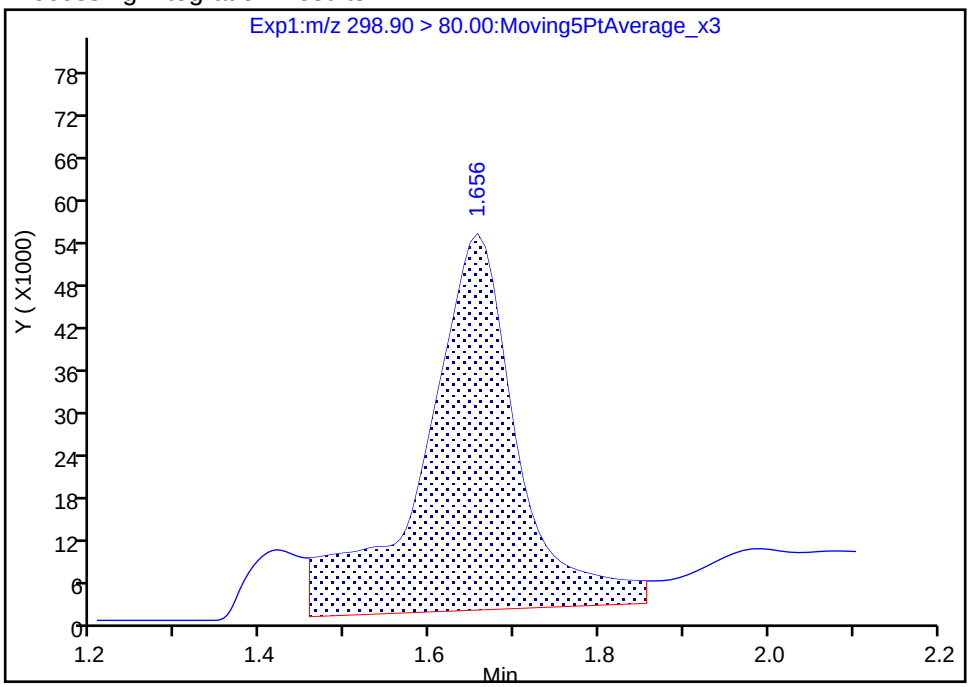
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_033.d				
Injection Date:	06-Aug-2018 03:43:24	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

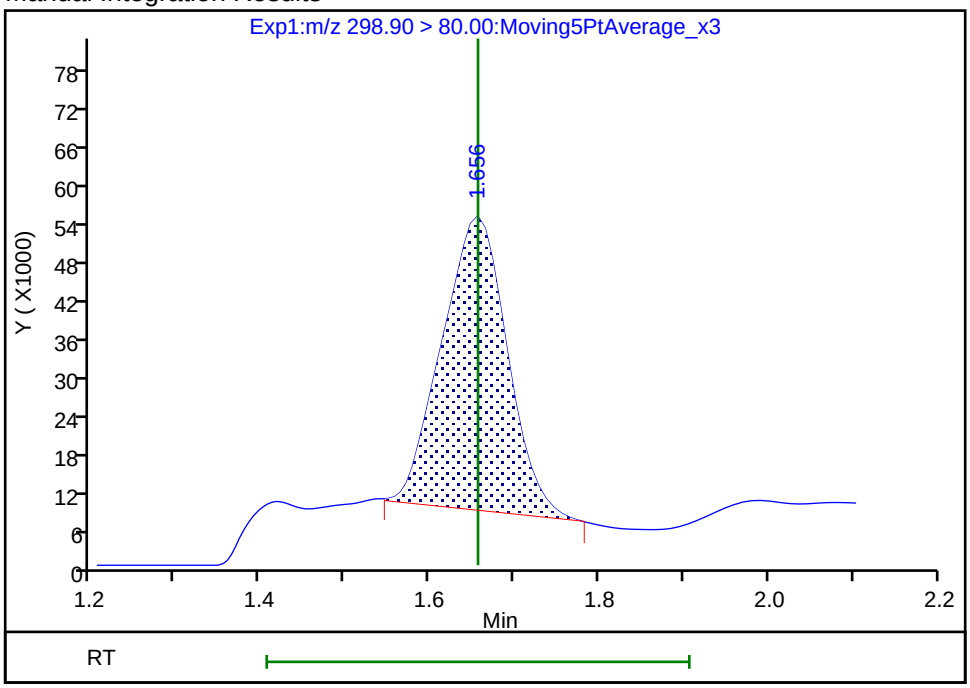
Processing Integration Results

RT: 1.66
Area: 408130
Amount: 0.181780
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 245467
Amount: 0.109330
Amount Units: ng/ml



Reviewer: barnettj, 06-Aug-2018 16:29:56

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

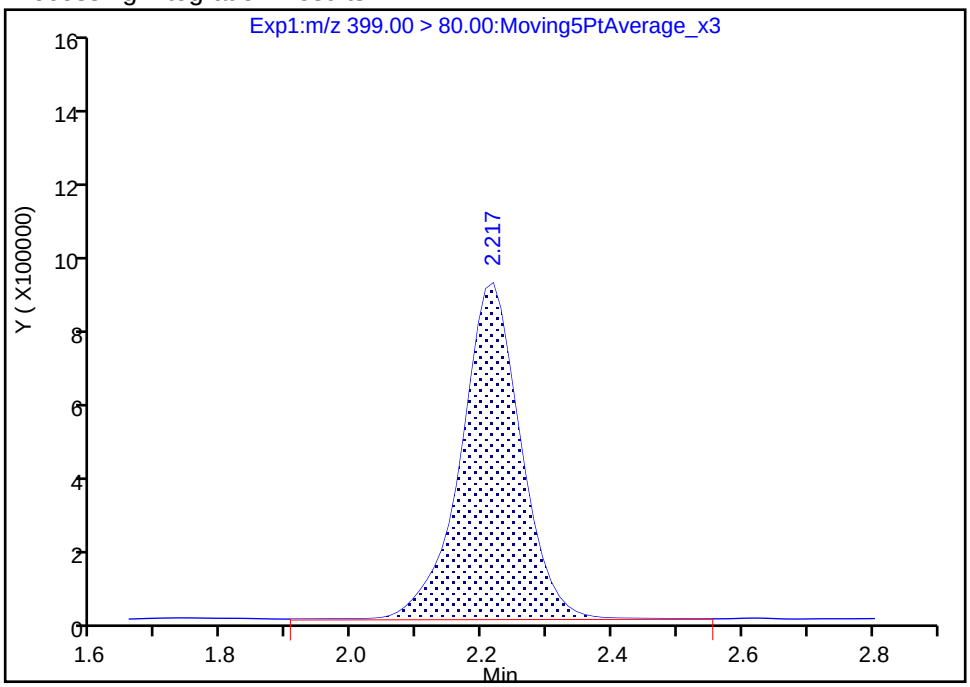
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_033.d				
Injection Date:	06-Aug-2018 03:43:24	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

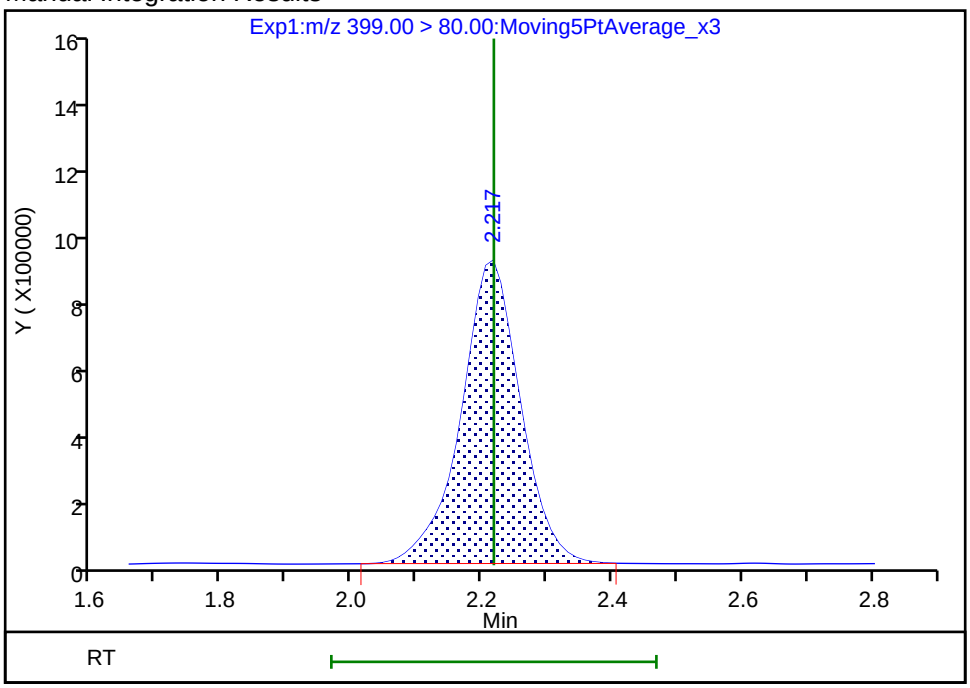
Processing Integration Results

RT: 2.22
Area: 5707242
Amount: 2.802355
Amount Units: ng/ml



Manual Integration Results

RT: 2.22
Area: 5600652
Amount: 2.750017
Amount Units: ng/ml



Reviewer: barnettj, 06-Aug-2018 16:30:15
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: GRE09-SD1-01 DL | Lab Sample ID: 320-41333-11 DL

Matrix: Solid | Lab File ID: 2018.08.07LLBB_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 16:30

Extraction Method: SHAKE | Date Extracted: 07/27/2018 10:32

Sample wt/vol: 5.10(g) | Date Analyzed: 08/07/2018 16:34

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 2

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: 37.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 238576 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*1.3*	*D*	*0.94*	0.63	*0.24*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*7.7*	*D M*	*0.94*	0.63	*0.31*
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.34*	*J D M*	*0.94*	0.63	*0.25*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.35*	*J D M*	*1.3*	0.56	*0.18*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*8.7*	*D*	*0.94*	0.63	*0.19*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	33	D	3.1	1.6	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	83		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	92		50-150
STL00994	18O2 PFHxS	85		50-150
STL00991	13C4 PFOS	84		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_019.d
Lims ID: 320-41333-A-11-C
Client ID: GRE09-SD1-01
Sample Type: Client
Inject. Date: 07-Aug-2018 16:34:44 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 2.0000
Sample Info: 320-41333-a-11-c 2X (#236486)
Misc. Info.: Plate: 1 Rack: 5
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 13:34:05 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: hannigana Date: 08-Aug-2018 13:33:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.678	1.678	0.0	1.000	146907	0.0560			7.7	M
298.90 > 99.00	1.686	1.678	0.008	1.005	58319		2.52(1.25-3.74)		6.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.678	1.684	-0.006	0.651	40173	0.9655		83.0	55.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.233	2.227	0.006	0.866	2046441	1.02		81.5	6793	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.233	2.232	0.001	1.000	358191	0.2060			26.2	
363.00 > 169.00	2.233	2.232	0.001	1.000	139657		2.56(1.13-3.40)		171	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	3281368	1.39			308	
399.00 > 99.00	2.243	2.243	0.0	1.000	1031569		3.18(1.50-4.49)		355	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.247	-0.004	0.870	2580627	1.00		84.7	6416	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.579	2.572	0.007	1.000	2228237	1.23			164	M
413.00 > 169.00	2.579	2.572	0.007	1.000	1279282		1.74(0.84-2.52)		813	M
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.572	0.007		2358044	1.25			5756	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.574	0.005	1.000	1995394	1.08		86.6	7195	
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.935	0.009	1.141	1895287	1.15		91.6	5640	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.935	0.009	1.141	1699856	1.00		84.0	333	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.944	2.938	0.006	1.000	7940463	5.20			777	
499.00 > 99.00	2.944	2.938	0.006	1.000	1789692		4.44(2.31-6.93)		886	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										M
463.00 > 419.00	2.944	2.938	0.006	1.000	86232	0.0540			12.7	M
463.00 > 169.00	2.938	2.938	0.0	0.998	18750		4.60(1.90-5.69)		39.0	

QC Flag Legend

Review Flags

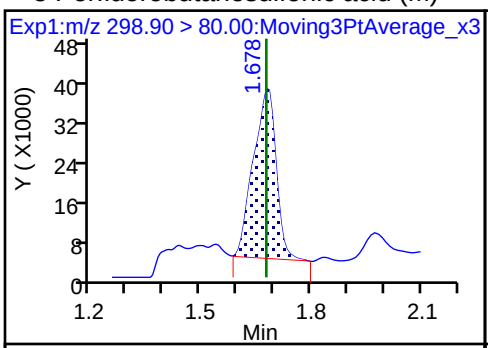
M - Manually Integrated

Report Date: 08-Aug-2018 13:34:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

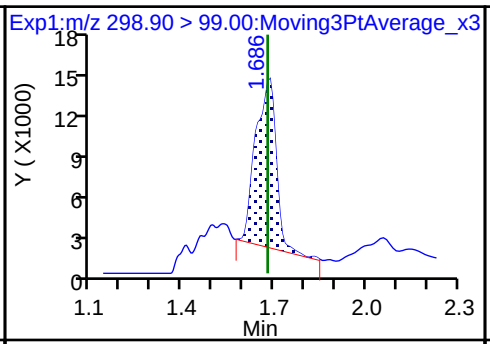
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_019.d				
Injection Date:	07-Aug-2018 16:34:44	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	2.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

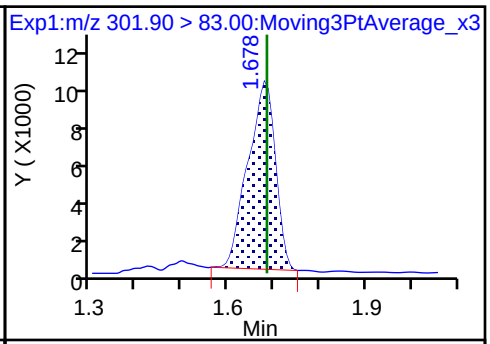
5 Perfluorobutanesulfonic acid (M)



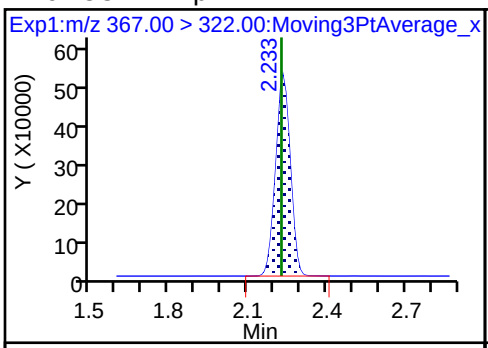
5 Perfluorobutanesulfonic acid



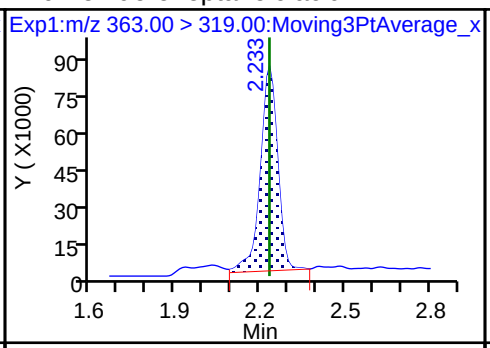
D 47 13C3-PFBS



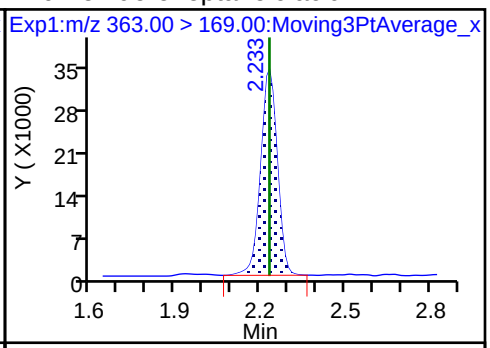
D 9 13C4-PFHpA



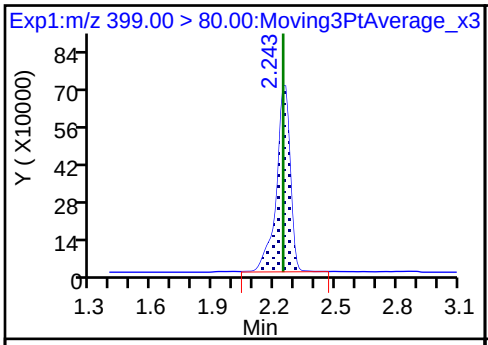
10 Perfluoroheptanoic acid



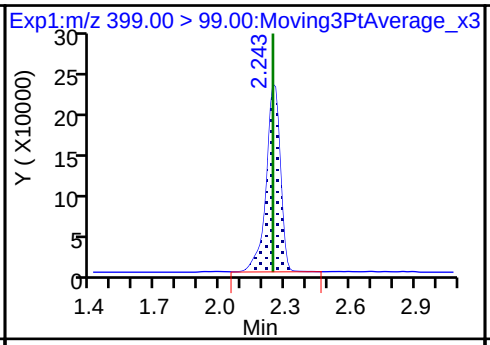
10 Perfluoroheptanoic acid



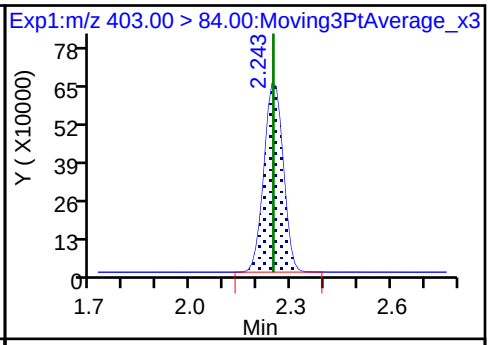
8 Perfluorohexanesulfonic acid



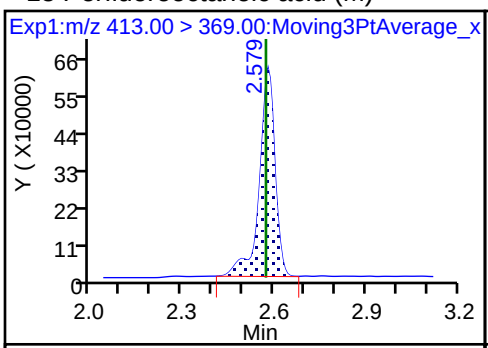
8 Perfluorohexanesulfonic acid



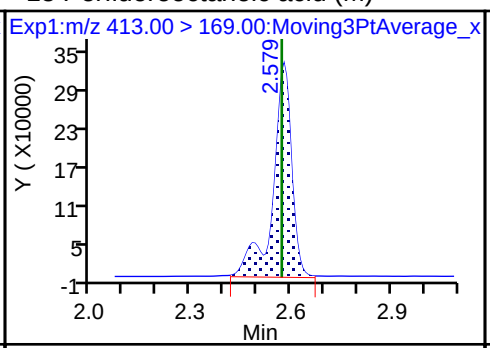
D 11 18O2 PFHxS



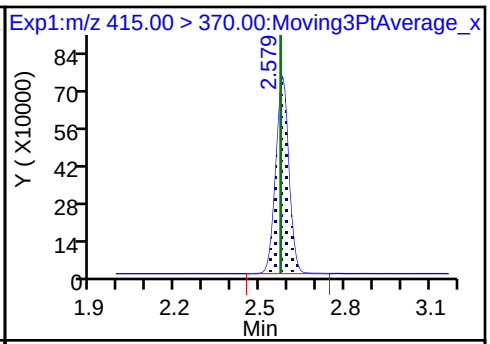
15 Perfluorooctanoic acid (M)



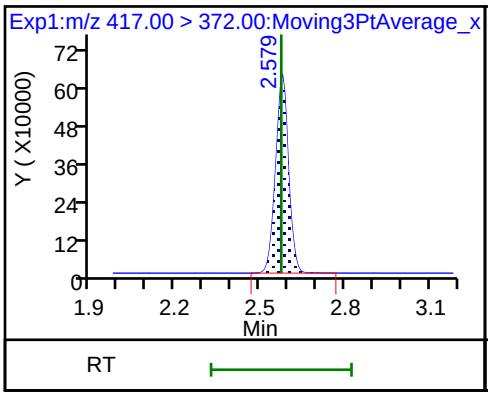
15 Perfluorooctanoic acid (M)



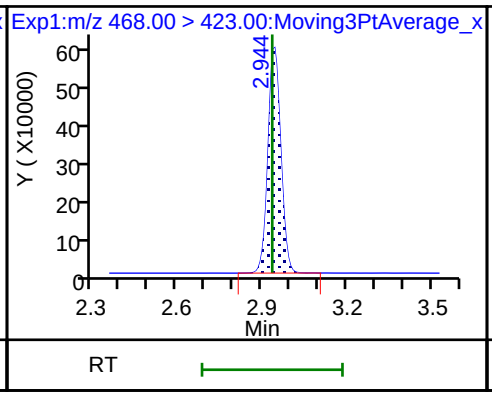
* 62 13C2-PFOA



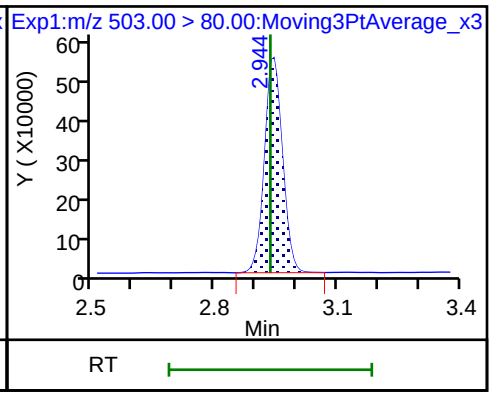
D 14 13C4 PFOA



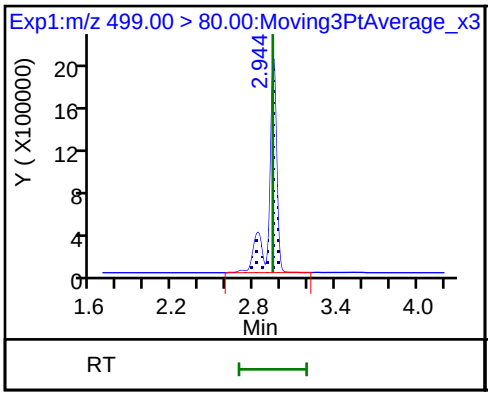
D 19 13C5 PFNA



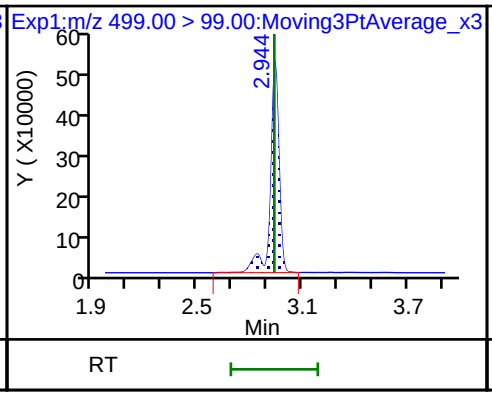
D 18 13C4 PFOS



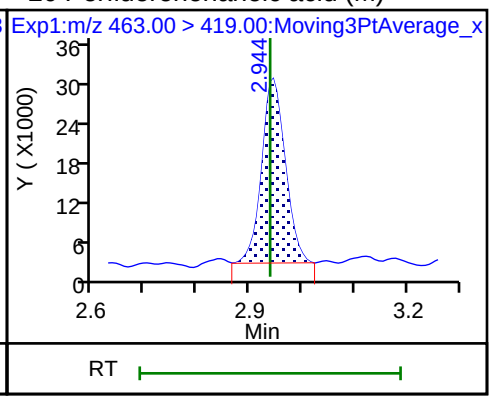
17 Perfluorooctane sulfonic acid



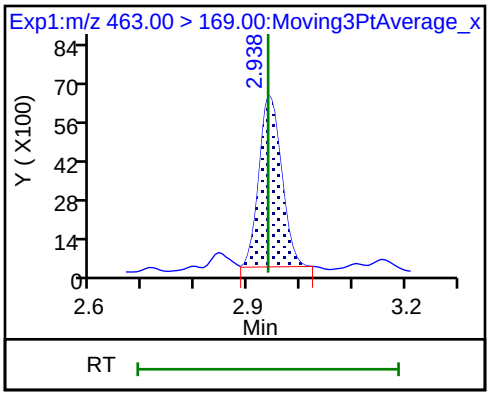
17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid (M)



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

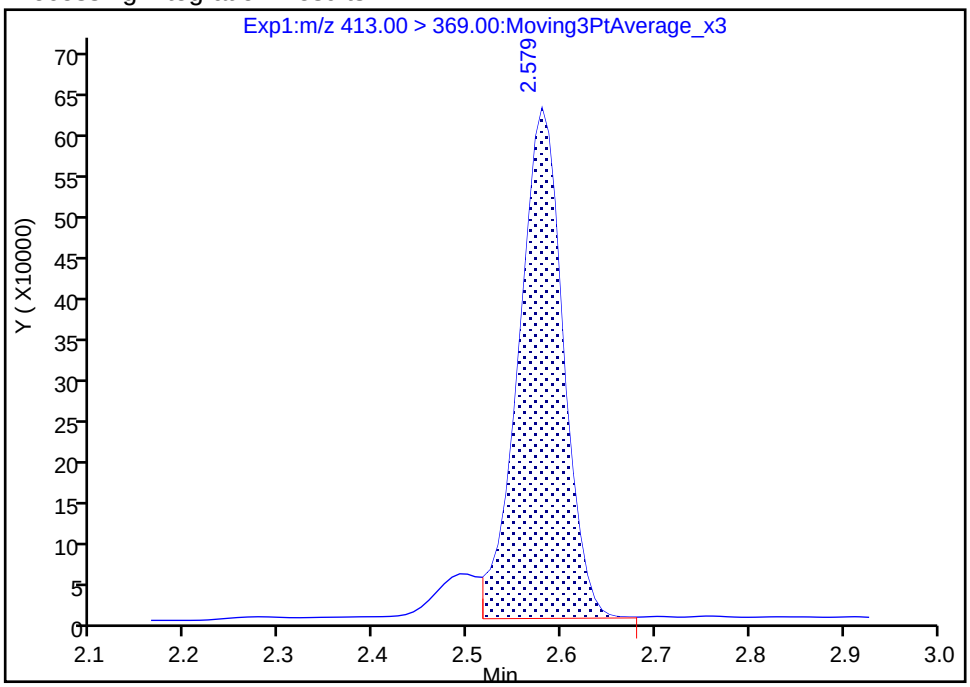
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_019.d				
Injection Date:	07-Aug-2018 16:34:44	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	2.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

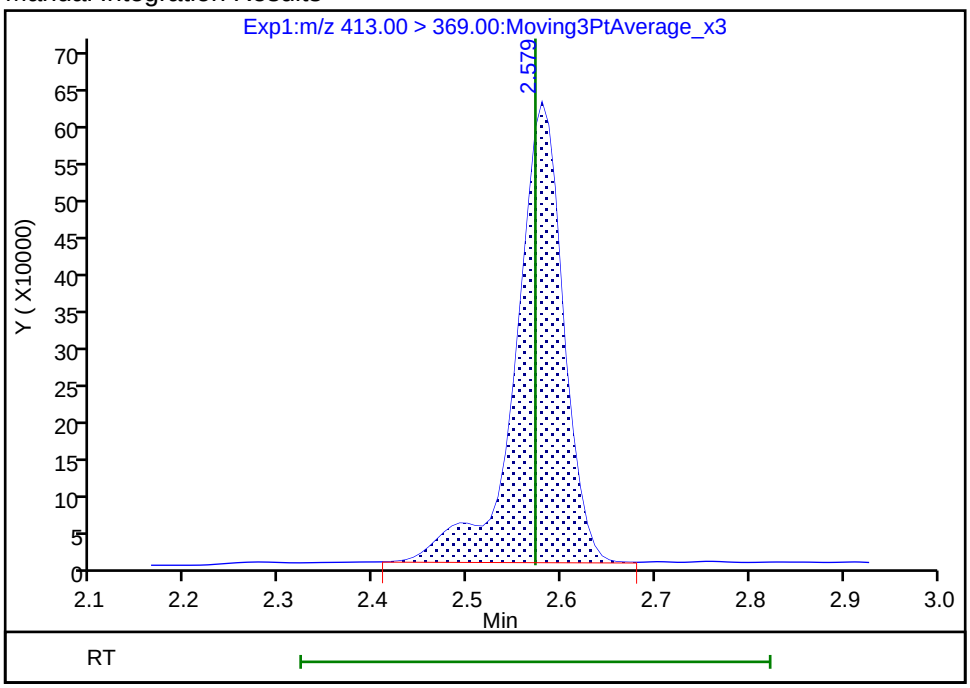
Processing Integration Results

RT: 2.58
Area: 2065381
Amount: 1.144307
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 2228237
Amount: 1.234536
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 13:32:51

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

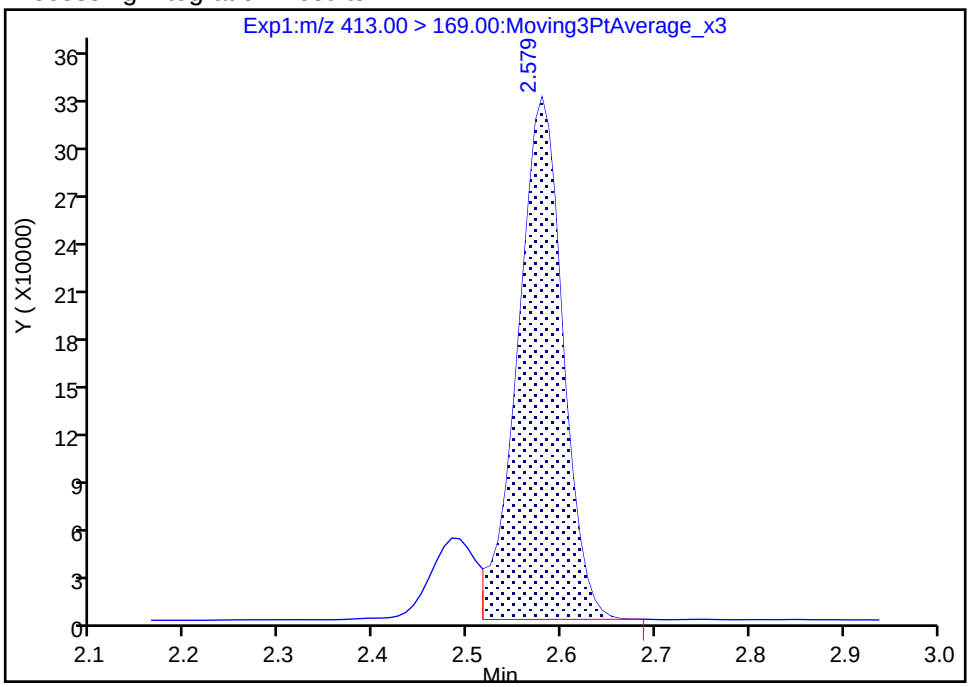
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_019.d				
Injection Date:	07-Aug-2018 16:34:44	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	2.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

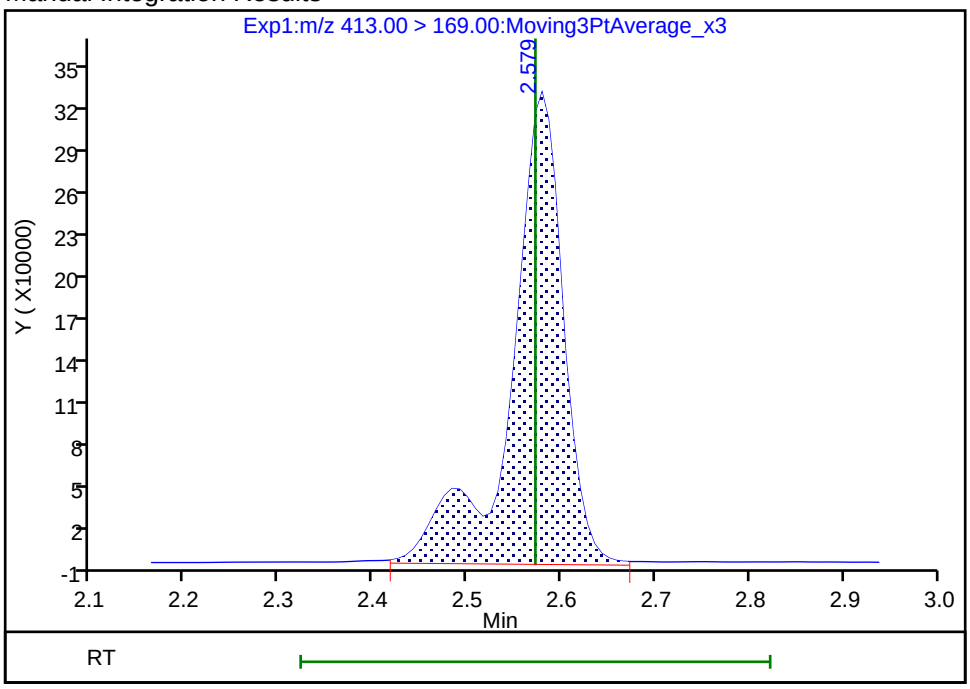
Processing Integration Results

RT: 2.58
Area: 1085593
Amount: 1.144307
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 1279282
Amount: 1.234536
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 13:32:58

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

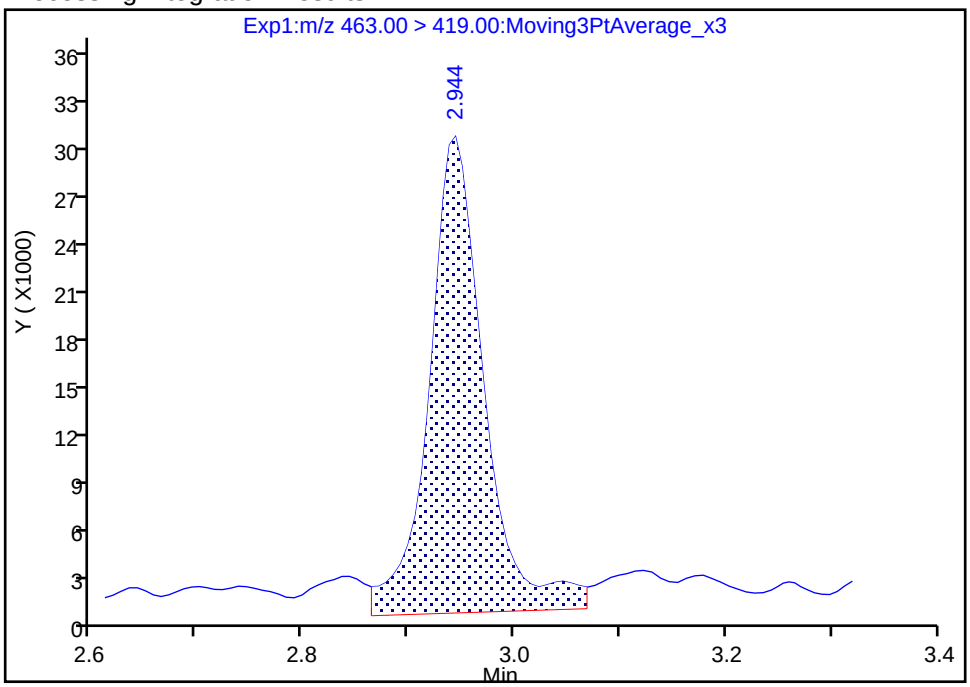
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_019.d				
Injection Date:	07-Aug-2018 16:34:44	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	2.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

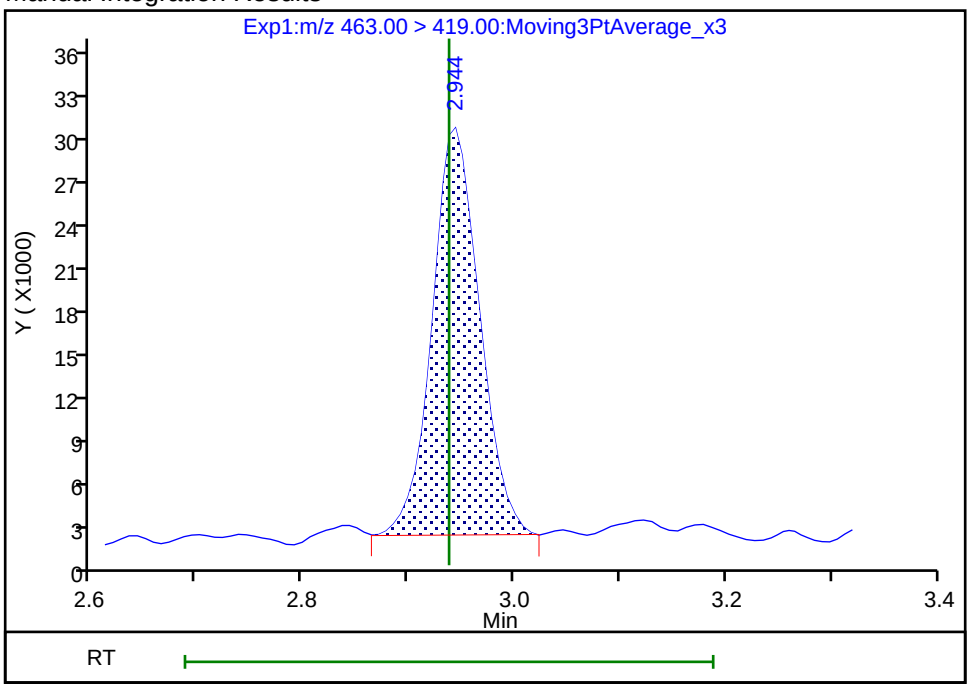
Processing Integration Results

RT: 2.94
Area: 105747
Amount: 0.066210
Amount Units: ng/ml



Manual Integration Results

RT: 2.94
Area: 86232
Amount: 0.053992
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 13:33:13

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

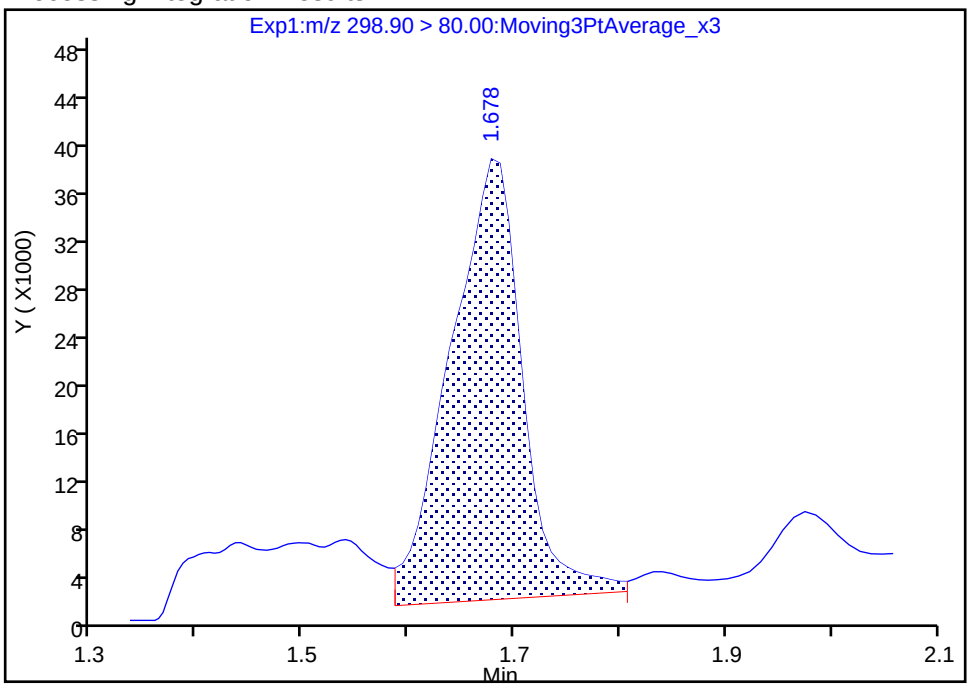
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_019.d				
Injection Date:	07-Aug-2018 16:34:44	Instrument ID:	A8_N		
Lims ID:	320-41333-A-11-C	Lab Sample ID:	320-41333-11		
Client ID:	GRE09-SD1-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	2.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

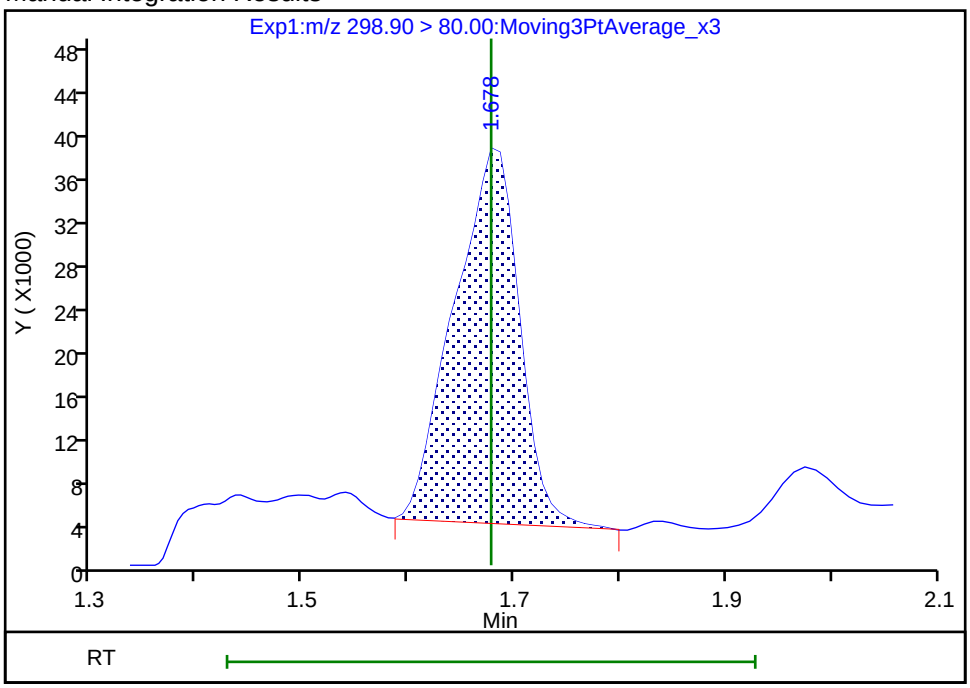
Processing Integration Results

RT: 1.68
Area: 172368
Amount: 0.065667
Amount Units: ng/ml



Manual Integration Results

RT: 1.68
Area: 146907
Amount: 0.055967
Amount Units: ng/ml



Reviewer: hannigana, 08-Aug-2018 13:32:29

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 7-MW34-PRL06-01 | Lab Sample ID: 320-41333-12

Matrix: Water | Lab File ID: 2018.07.28LLB_058.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/18/2018 08:13

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 216(mL) | Date Analyzed: 07/29/2018 07:17

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	460		2.3	1.7	0.71
335-67-1	Perfluorooctanoic acid (PFOA)	300	M	2.3	1.7	0.63
375-95-1	Perfluorononanoic acid (PFNA)	1.1	J	2.3	1.7	0.60
375-73-5	Perfluorobutanesulfonic acid (PFBS)	160	M	2.3	1.2	0.53
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*1100*	*E*	*2.3*	1.2	*0.44*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13		4.6	3.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	59		50-150
STL01892	13C4-PFHpA	51		50-150
STL00990	13C4 PFOA	56		50-150
STL00995	13C5 PFNA	62		50-150
STL00994	18O2 PFHxS	57		50-150
STL00991	13C4 PFOS	58		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_058.d
Lims ID: 320-41333-A-12-A
Client ID: 7-MW34-PRL06-01
Sample Type: Client
Inject. Date: 29-Jul-2018 07:17:10 ALS Bottle#: 46 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-12-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:35:42 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:35:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.647	58873	1.36		58.6	85.1	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.676	1.676	0.0	1.000	6747687	3.36			1060	M
298.90 > 99.00	1.676	1.676	0.0	1.000	2876932		2.35(1.25-3.74)		2496	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.229	0.001	0.861	2547708	1.28		51.2	55640	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	11217422	9.98			9871	
363.00 > 169.00	2.230	2.230	0.0	1.000	4225528		2.65(1.13-3.40)		34629	
D 11 18O2 PFHxS										
403.00 > 84.00	2.255	2.241	0.014	0.871	3457477	1.35		57.2	59376	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.242	2.242	0.0	0.994	39654077	23.2			17572	E
399.00 > 99.00	2.242	2.242	0.0	0.994	14322235		2.77(1.50-4.49)		21205	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.588	0.002	1.000	2733705	1.40		56.1	53337	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.590	0.0		5090709	2.50			57395	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.590	2.590	0.0	1.000	8579673	6.47			5580	M
413.00 > 169.00	2.590	2.590	0.0	1.000	5634894		1.52(0.84-2.52)		13554	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.955	2.950	0.005	1.000	306789	0.2713			1524	
499.00 > 99.00	2.955	2.950	0.005	1.000	74898		4.10(2.31-6.93)		582	
20 Perfluorononanoic acid										
463.00 > 419.00	2.955	2.950	0.005	1.000	27097	0.0229			53.1	
463.00 > 169.00	2.955	2.950	0.005	1.000	6987		3.88(1.90-5.69)		259	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.955	2.953	0.002	1.141	2588700	1.54		61.6	65516	
D 18 13C4 PFOS										
503.00 > 80.00	2.955	2.953	0.002	1.141	2445758	1.38		57.5	18223	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

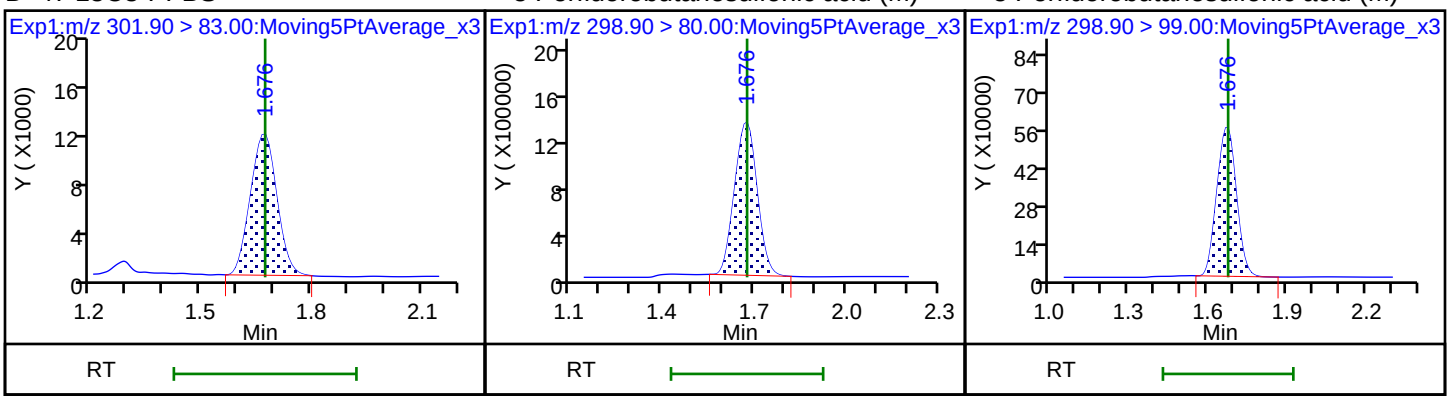
M - Manually Integrated

Report Date: 31-Jul-2018 12:35:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

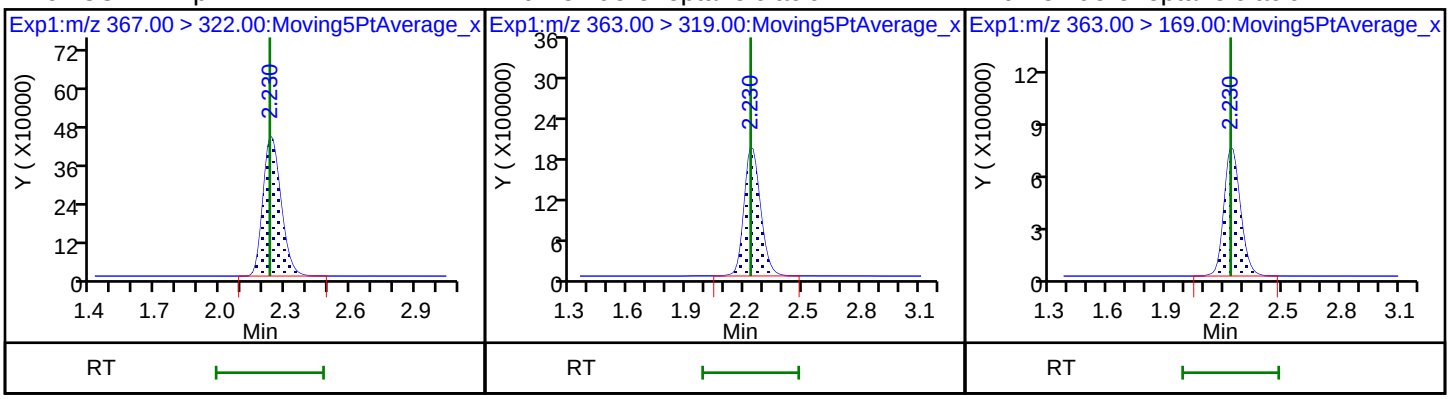
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_058.d				
Injection Date:	29-Jul-2018 07:17:10	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	46	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

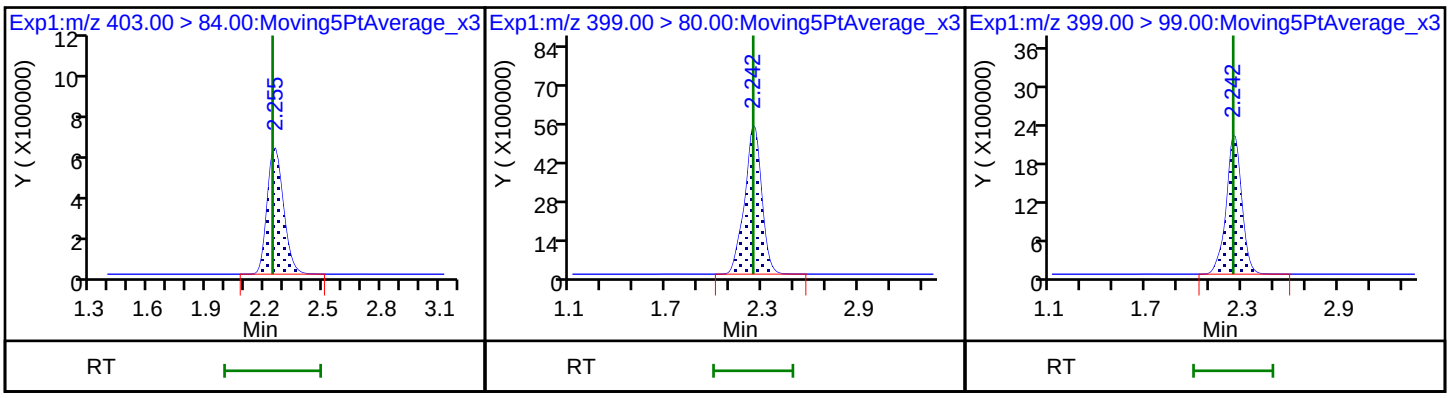
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (M) | 5 Perfluorobutanesulfonic acid (M)



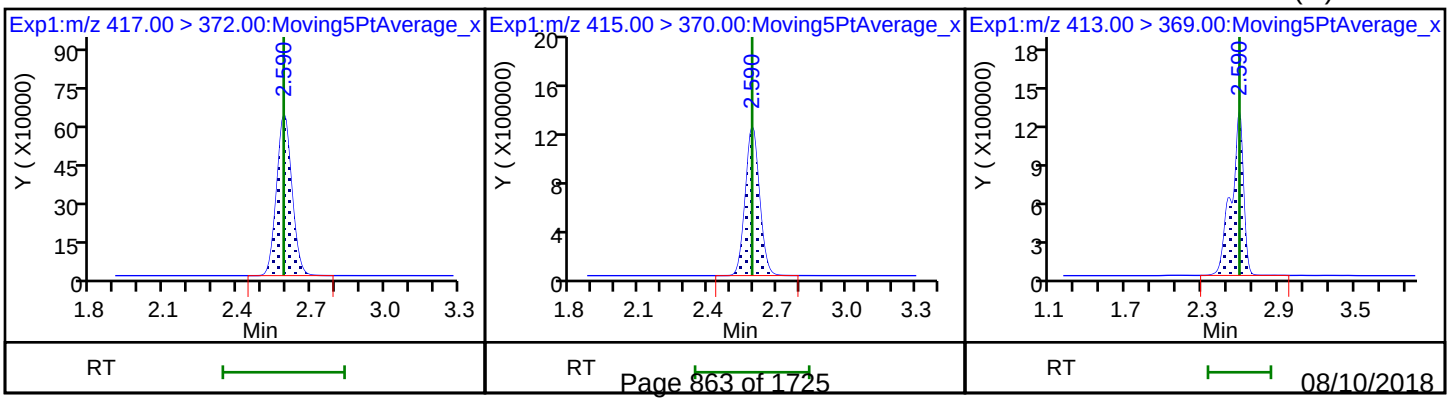
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



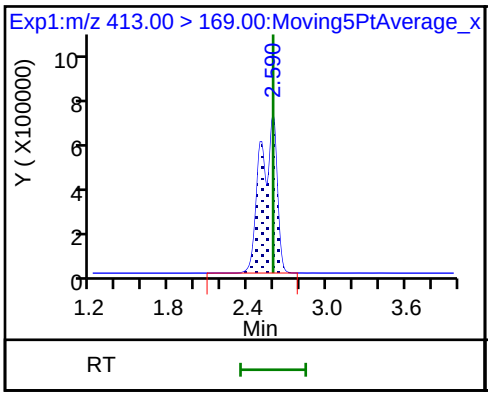
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



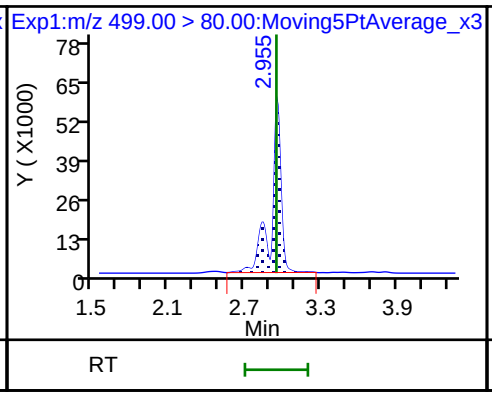
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid (M)



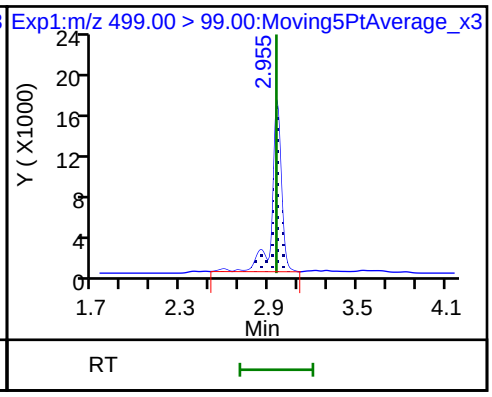
15 Perfluorooctanoic acid



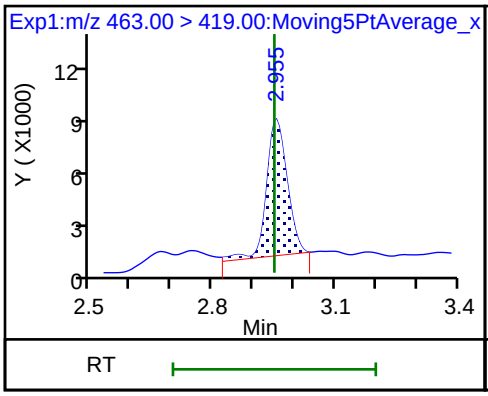
17 Perfluorooctane sulfonic acid



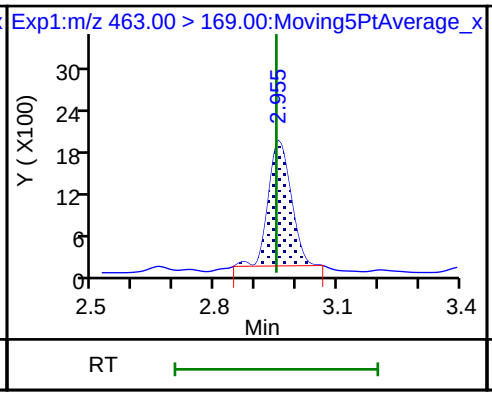
17 Perfluorooctane sulfonic acid



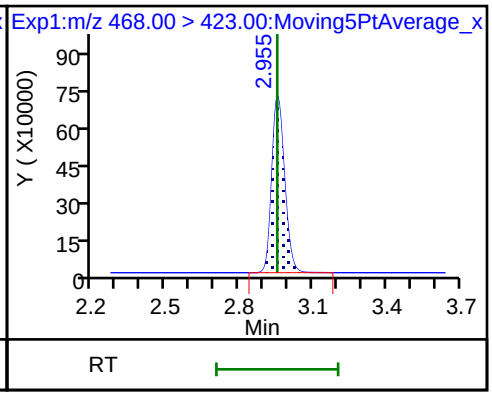
20 Perfluorononanoic acid



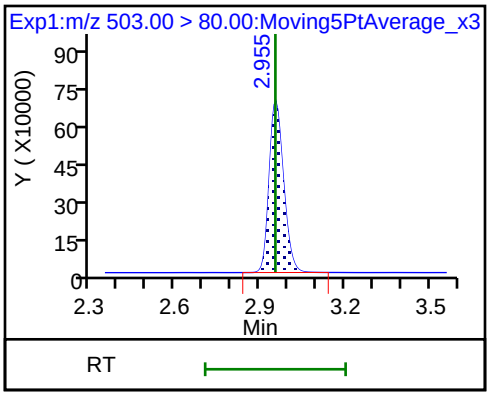
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

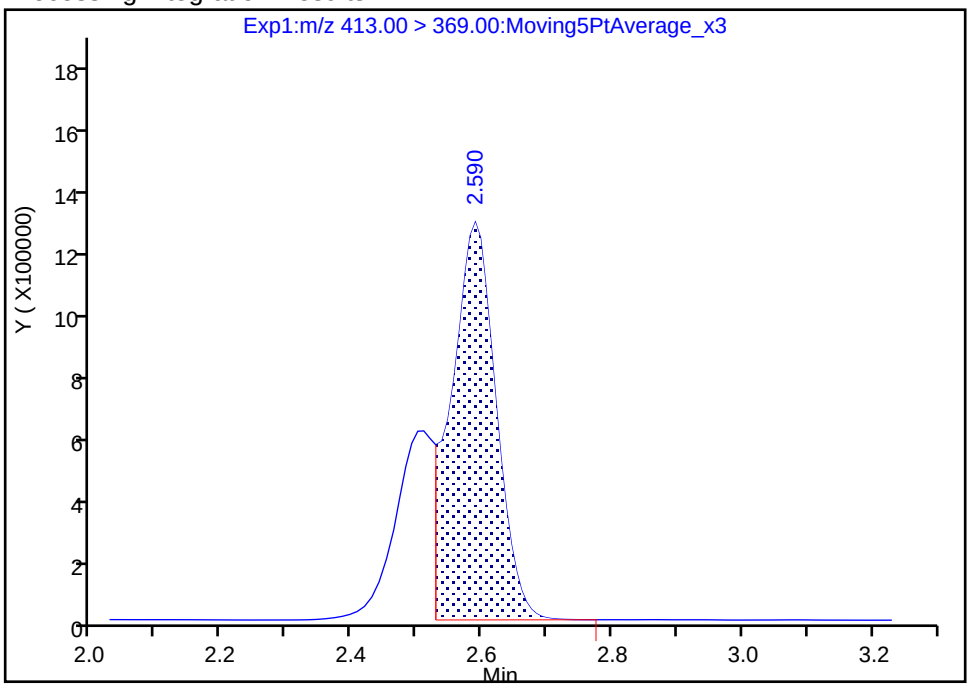
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_058.d				
Injection Date:	29-Jul-2018 07:17:10	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	46	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

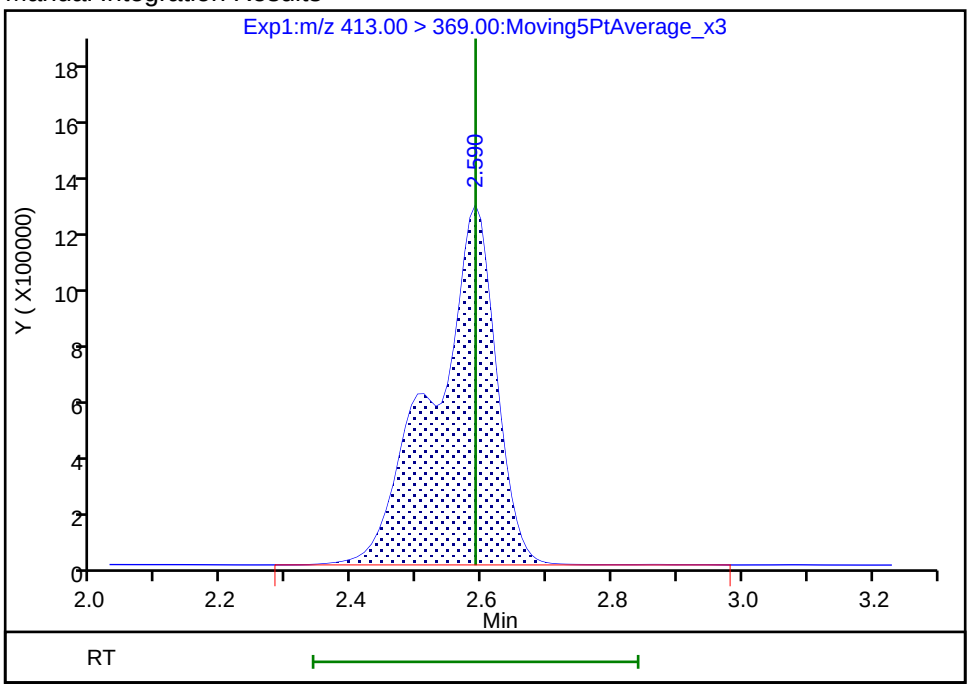
Processing Integration Results

RT: 2.59
Area: 6066781
Amount: 4.571557
Amount Units: ng/ml



Manual Integration Results

RT: 2.59
Area: 8579673
Amount: 6.465119
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:35:34

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

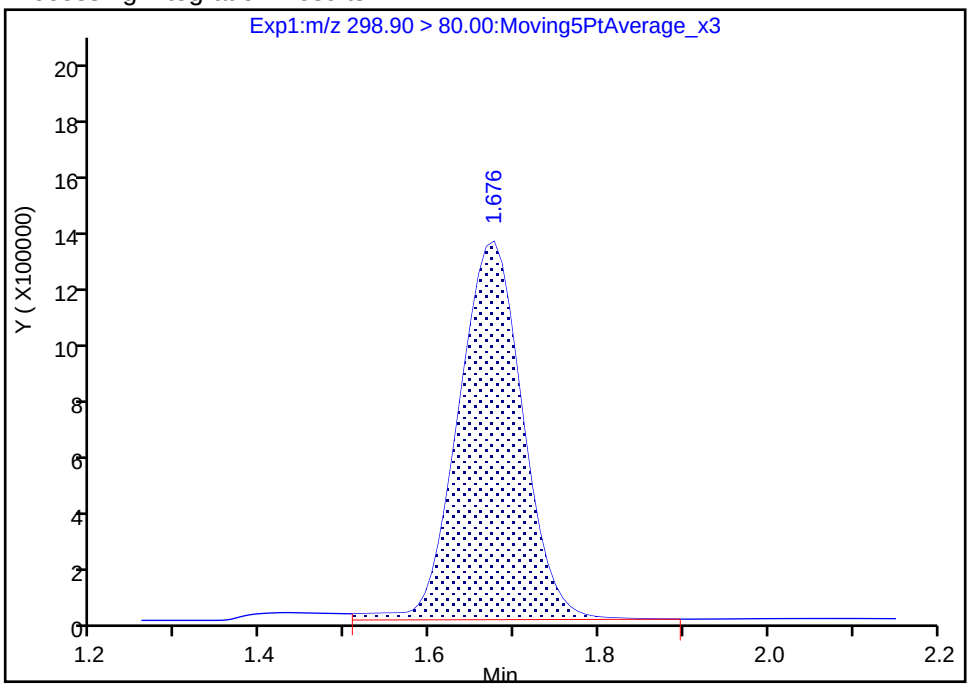
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_058.d				
Injection Date:	29-Jul-2018 07:17:10	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	46	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

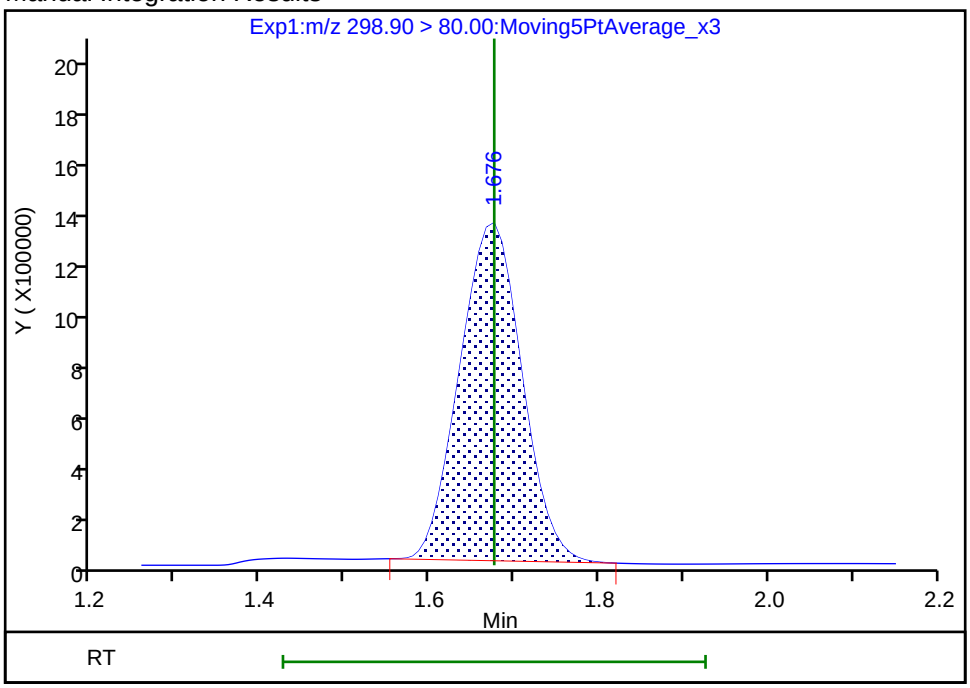
Processing Integration Results

RT: 1.68
Area: 7045741
Amount: 3.504697
Amount Units: ng/ml



Manual Integration Results

RT: 1.68
Area: 6747687
Amount: 3.356439
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:35:24

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

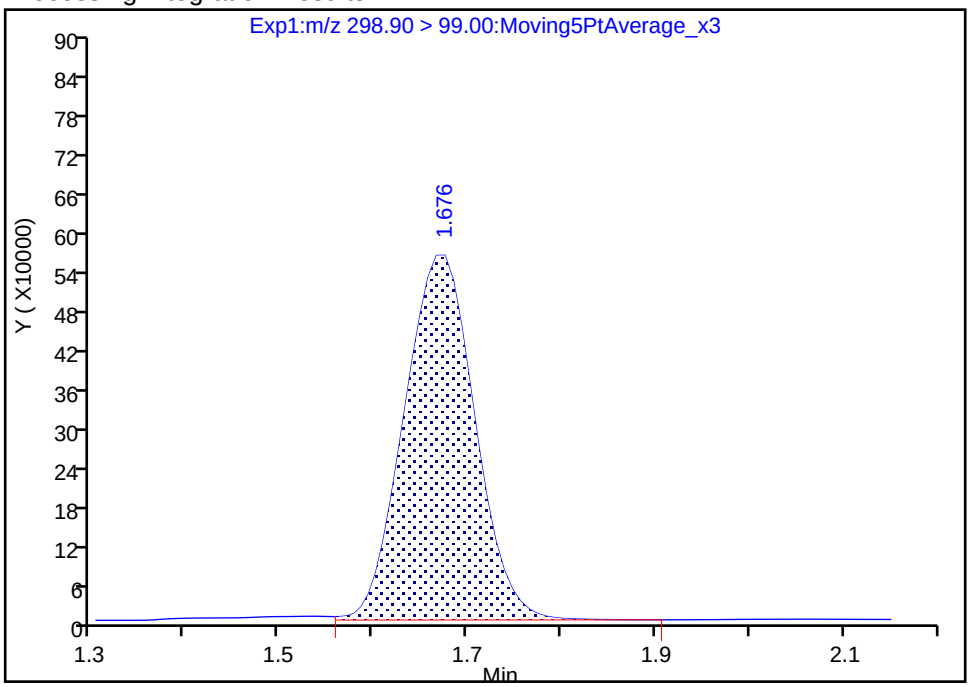
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_058.d				
Injection Date:	29-Jul-2018 07:17:10	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	46	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

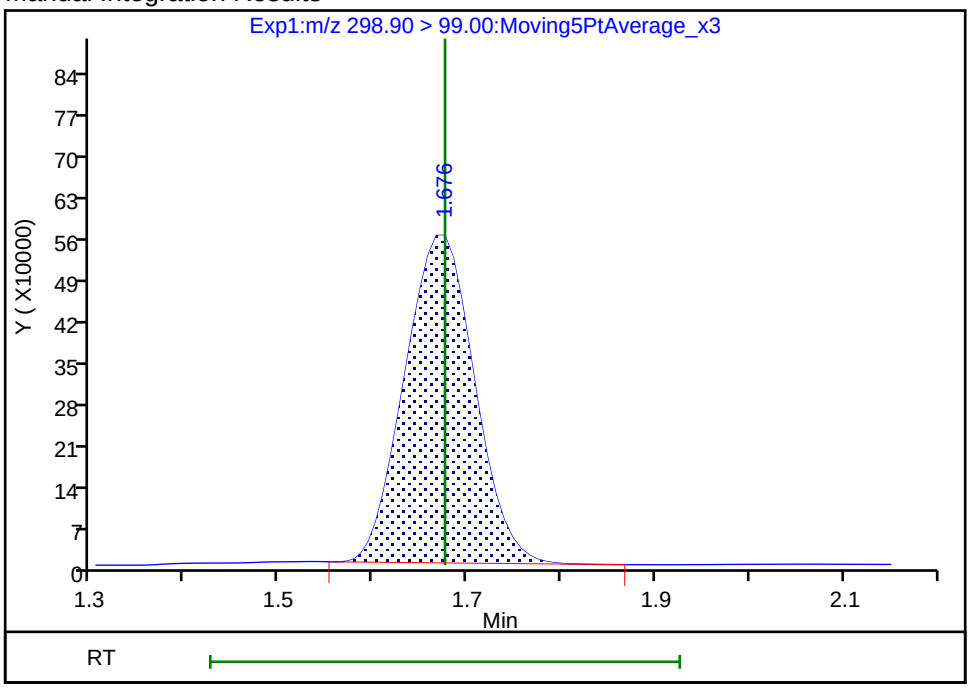
Processing Integration Results

RT: 1.68
Area: 2928185
Amount: 3.504697
Amount Units: ng/ml



Manual Integration Results

RT: 1.68
Area: 2876932
Amount: 3.356439
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:35:27

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 7-MW34-PRL06-01 DL | Lab Sample ID: 320-41333-12 DL

Matrix: Water | Lab File ID: 2018.08.03LLA_028.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/18/2018 08:13

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 216(mL) | Date Analyzed: 08/03/2018 08:21

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237784 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*430*	*D*	*23*	17	*7.1*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*310*	*D M*	*23*	17	*6.3*
375-95-1	*Perfluorononanoic acid (PFNA)*	*17*	*U*	*23*	17	*6.0*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*150*	*D M*	*23*	12	*5.3*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1300	D	23	12	4.4
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*35*	*U M*	*46*	35	*13*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	52	M	50-150
STL01892	13C4-PFHpA	58		50-150
STL00990	13C4 PFOA	55		50-150
STL00995	13C5 PFNA	54		50-150
STL00994	18O2 PFHxS	51		50-150
STL00991	13C4 PFOS	45	Q	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_028.d
Lims ID: 320-41333-A-12-A
Client ID: 7-MW34-PRL06-01
Sample Type: Client
Inject. Date: 03-Aug-2018 08:21:59 ALS Bottle#: 33 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-41333-a-12-a 10X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:27:57 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:27:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										M
301.90 > 83.00	1.702	1.690	0.012	0.650	6484	0.1213		52.2	28.6	M
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.702	1.702	0.0	1.000	711148	0.3327			386	M
298.90 > 99.00	1.702	1.702	0.0	1.000	304755		2.33(1.25-3.74)		1051	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.251	0.016	0.865	281445	0.1444		57.8	9387	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.264	0.016	0.870	354915	0.1212		51.3	9830	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.267	2.267	0.0	1.000	1208862	0.9260			678	
363.00 > 169.00	2.267	2.267	0.0	1.000	453706		2.66(1.13-3.40)		7499	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.280	0.0	1.000	4806820	2.77			7099	
399.00 > 99.00	2.280	2.280	0.0	1.000	1461909		3.29(1.50-4.49)		2921	
D 14 13C4 PFOA										
417.00 > 372.00	2.619	2.602	0.017	1.000	259395	0.1379		55.1	11992	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.619	2.619	0.0	1.000	811883	0.6768			395	M
413.00 > 169.00	2.619	2.619	0.0	1.000	554381		1.46(0.84-2.52)		2979	
* 62 13C2-PFOA										
415.00 > 370.00	2.619	2.619	0.0		489984	0.2500			16224	
D 19 13C5 PFNA										
468.00 > 423.00	2.980	2.964	0.016	1.138	221500	0.1351		54.0	9694	
D 18 13C4 PFOS										
503.00 > 80.00	2.980	2.964	0.016	1.138	216529	0.1070		44.8	4754	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.980	2.980	0.0	1.000	25591	0.0252			228	M
499.00 > 99.00	2.980	2.980	0.0	1.000	7955		3.22(2.31-6.93)		67.1	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										R
463.00 > 419.00	2.994	2.980	0.014	1.005	2050	0.002143			6.7	R
463.00 > 169.00	2.994	2.980	0.014	1.005	1293		1.59(1.90-5.69)		69.8	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

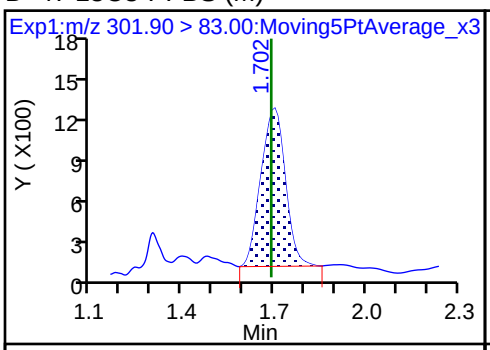
M - Manually Integrated

Report Date: 06-Aug-2018 11:27:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

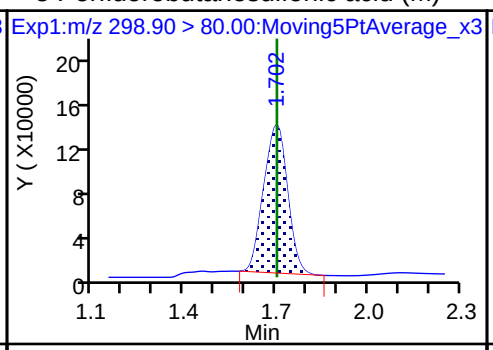
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_028.d				
Injection Date:	03-Aug-2018 08:21:59	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	33	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

D 47 13C3-PFBS (M)



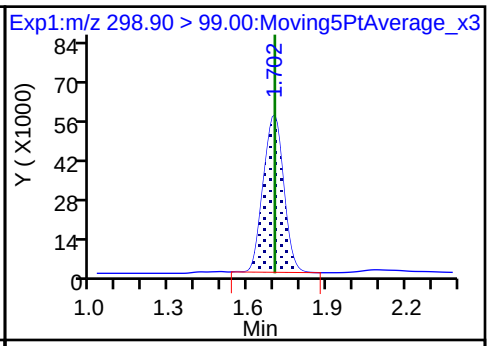
RT

5 Perfluorobutanesulfonic acid (M)



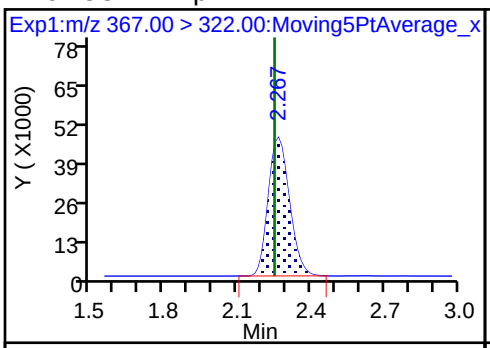
RT

5 Perfluorobutanesulfonic acid



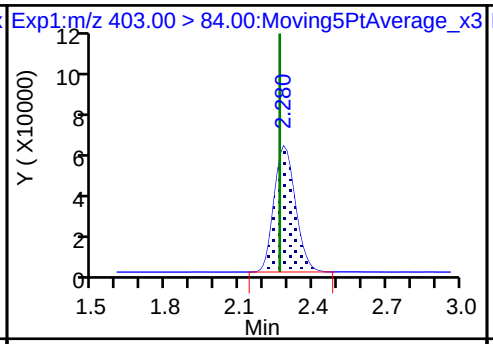
RT

D 9 13C4-PFHpA



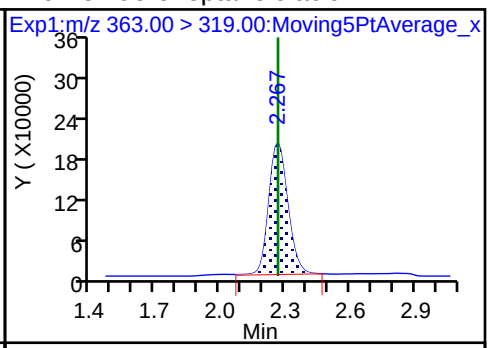
RT

D 11 18O2 PFHxS



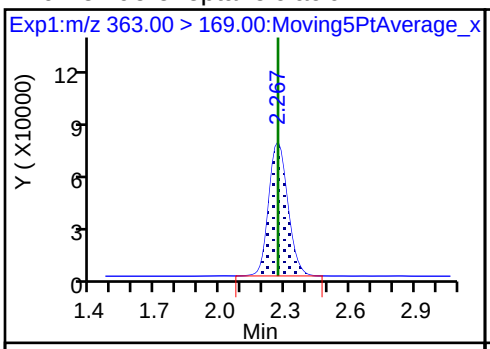
RT

10 Perfluoroheptanoic acid



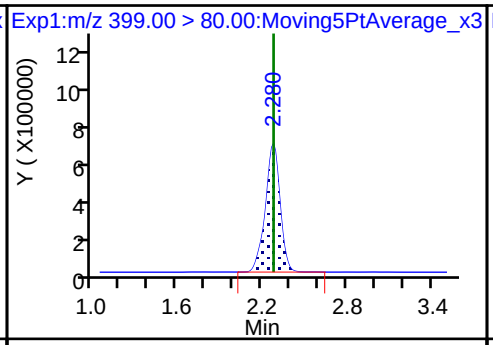
RT

10 Perfluoroheptanoic acid



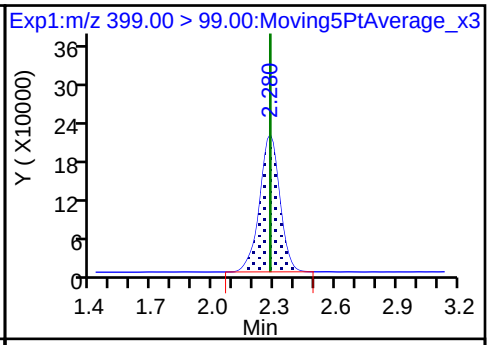
RT

8 Perfluorohexanesulfonic acid



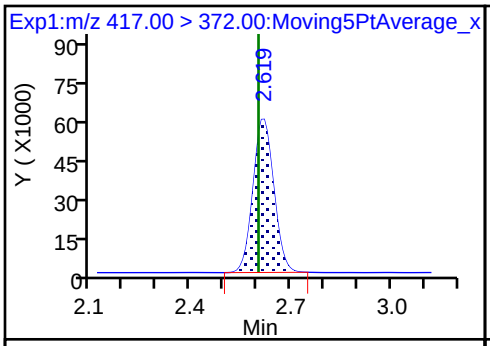
RT

8 Perfluorohexanesulfonic acid



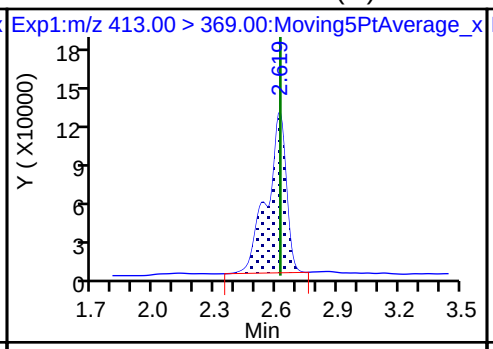
RT

D 14 13C4 PFOA



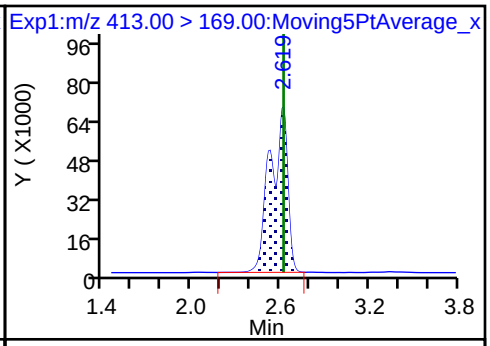
RT

15 Perfluorooctanoic acid (M)



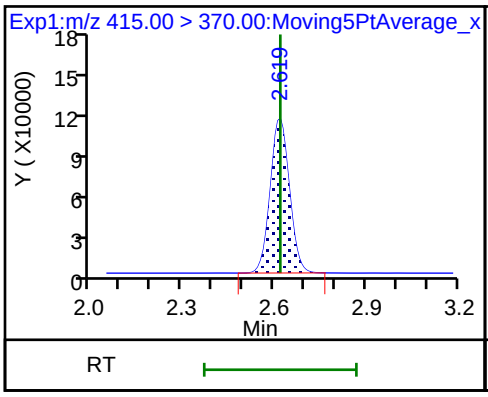
RT

15 Perfluorooctanoic acid

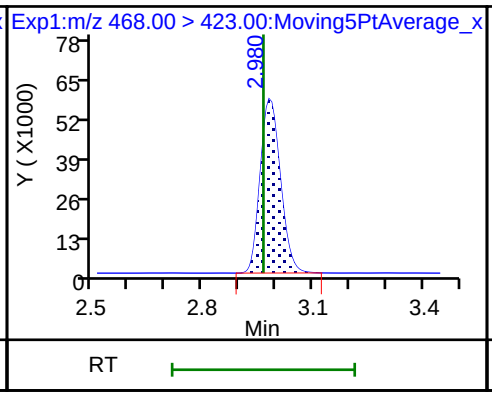


RT

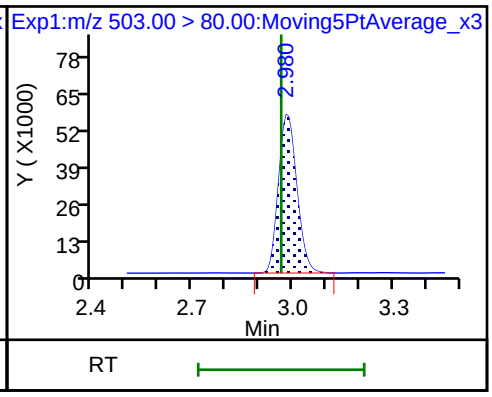
* 62 13C2-PFOA



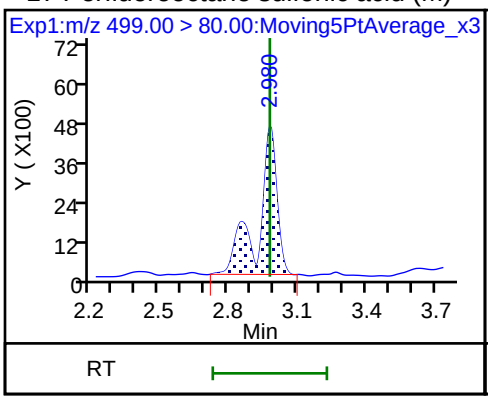
D 19 13C5 PFNA



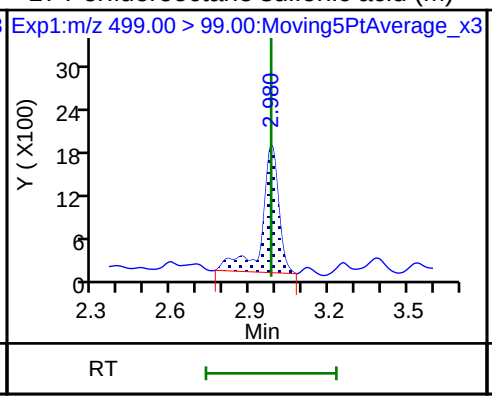
D 18 13C4 PFOS



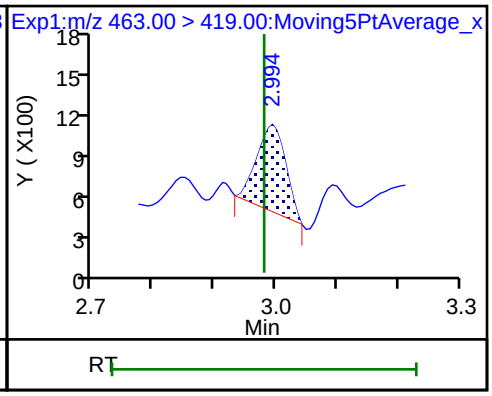
17 Perfluorooctane sulfonic acid (M)



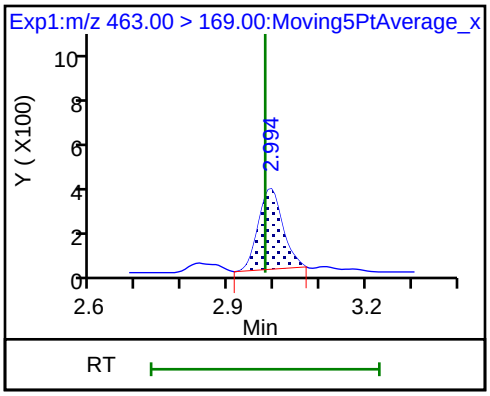
17 Perfluorooctane sulfonic acid (M)



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

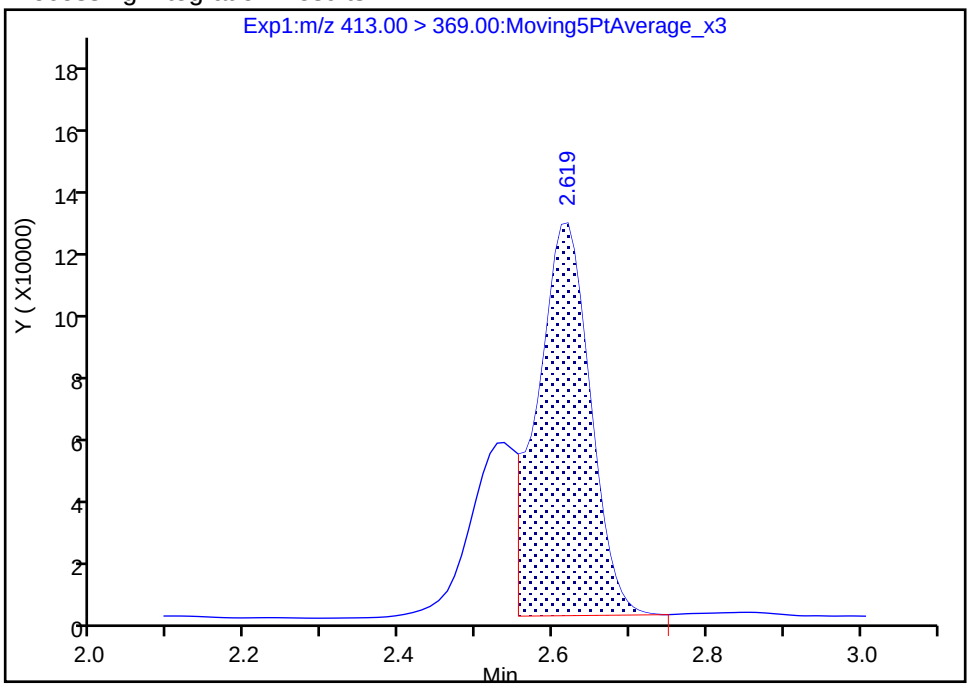
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_028.d				
Injection Date:	03-Aug-2018 08:21:59	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	33	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

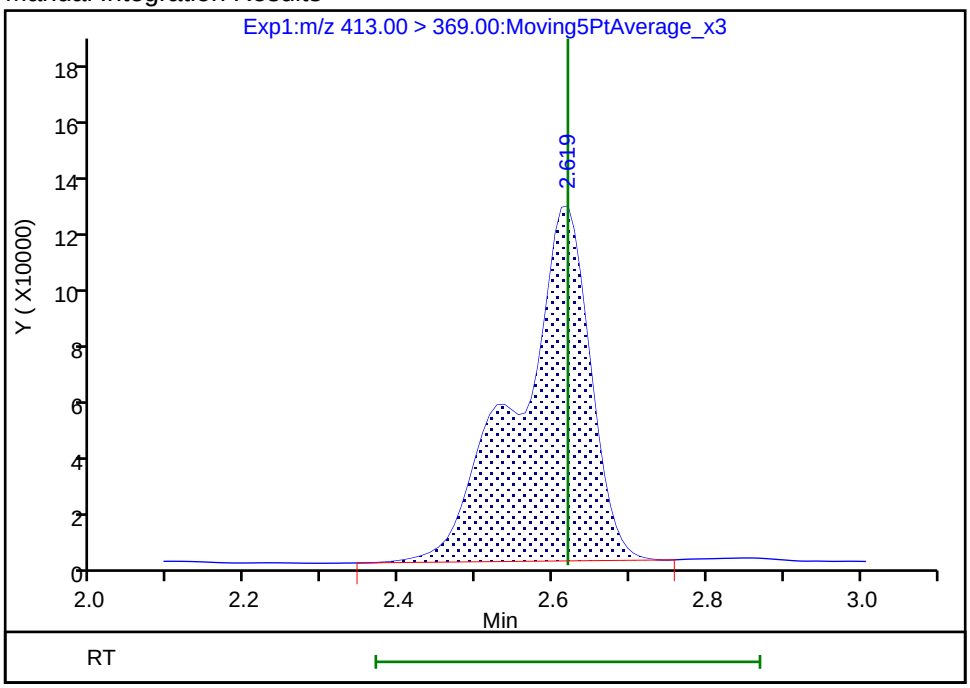
Processing Integration Results

RT: 2.62
Area: 586051
Amount: 0.488519
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 811883
Amount: 0.676768
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:27:37

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

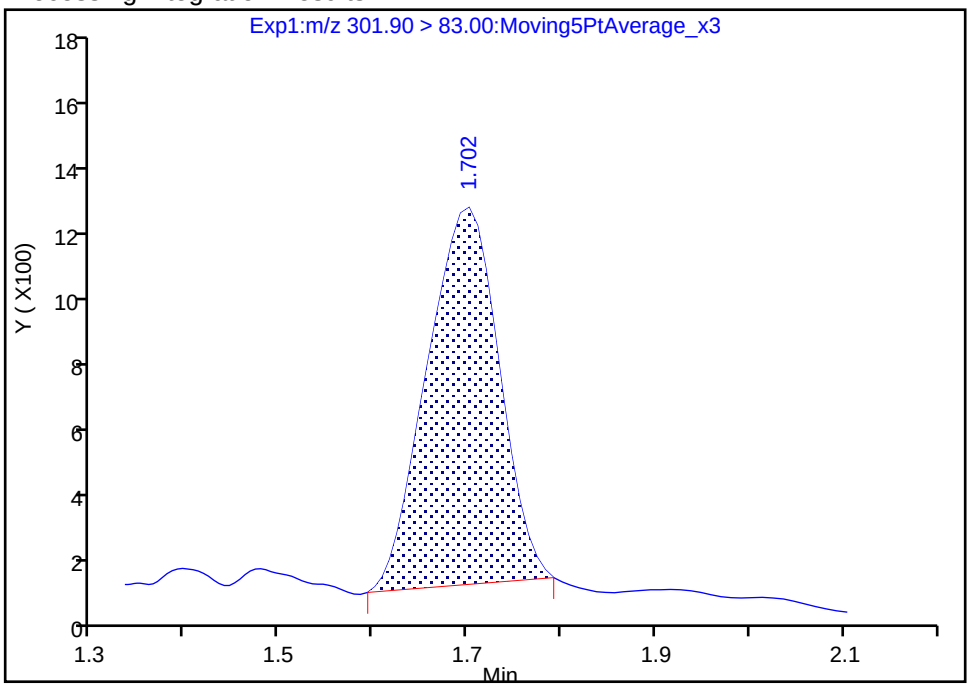
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_028.d				
Injection Date:	03-Aug-2018 08:21:59	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	33	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

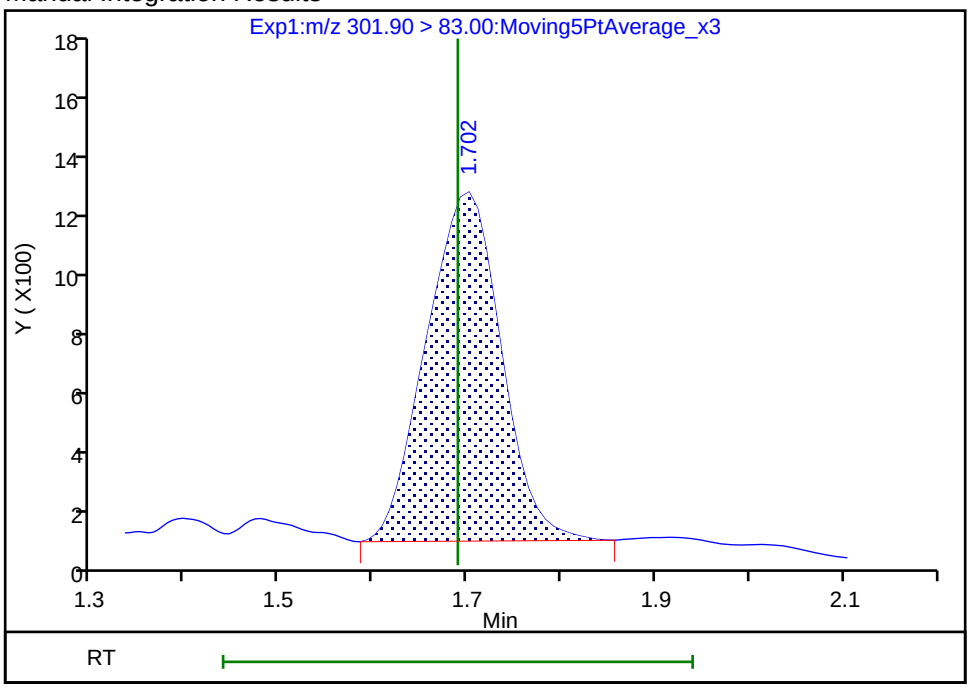
Processing Integration Results

RT: 1.70
Area: 6107
Amount: 0.114293
Amount Units: ng/ml



Manual Integration Results

RT: 1.70
Area: 6484
Amount: 0.121349
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:27:19

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

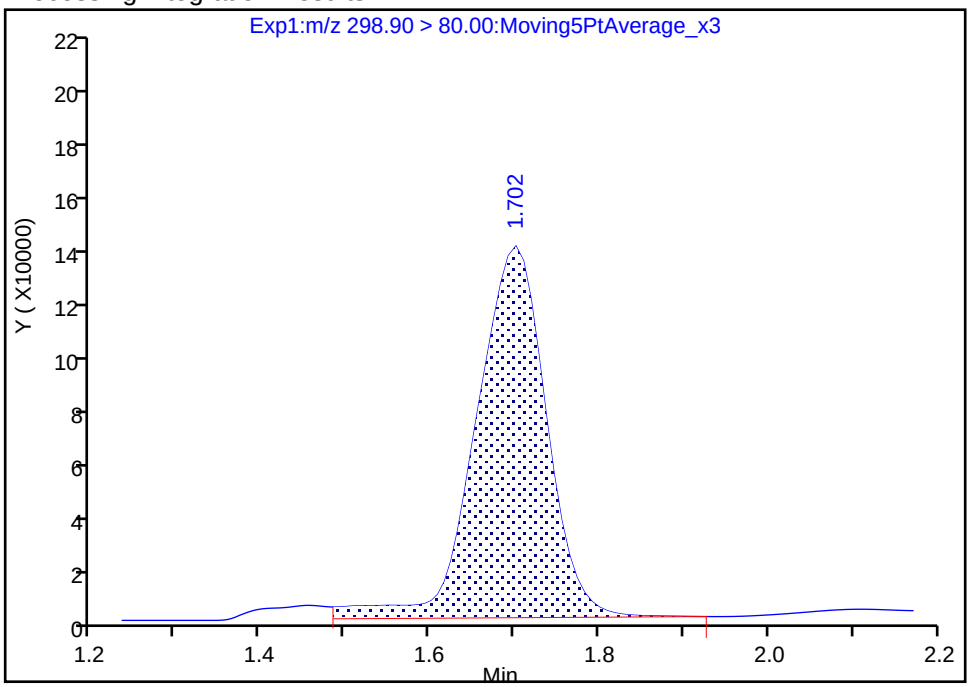
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_028.d				
Injection Date:	03-Aug-2018 08:21:59	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	33	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

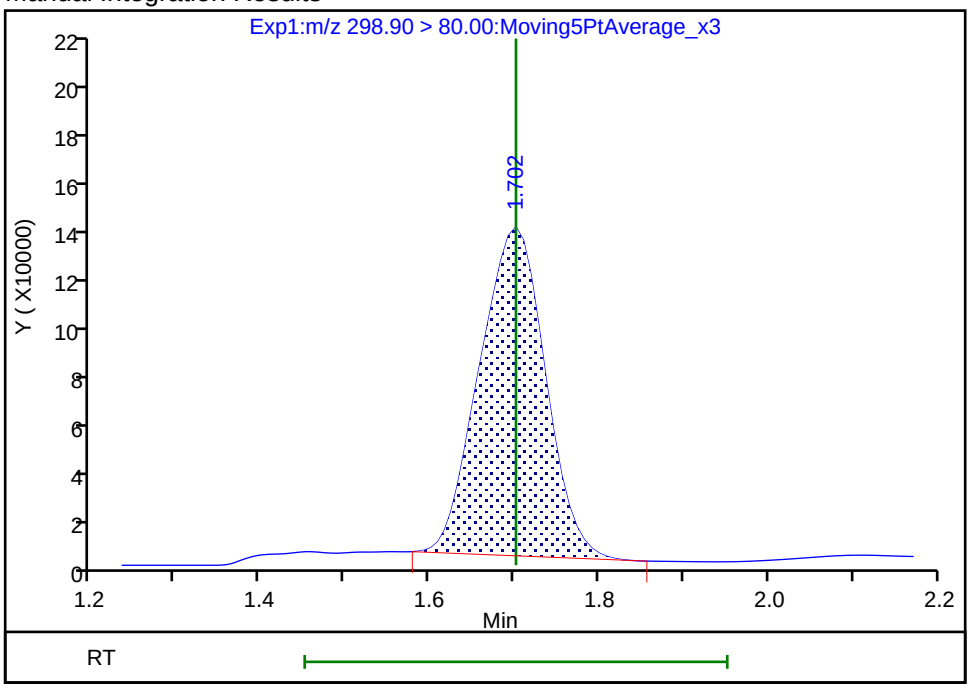
Processing Integration Results

RT: 1.70
Area: 780572
Amount: 0.365166
Amount Units: ng/ml



Manual Integration Results

RT: 1.70
Area: 711148
Amount: 0.332688
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:27:27

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

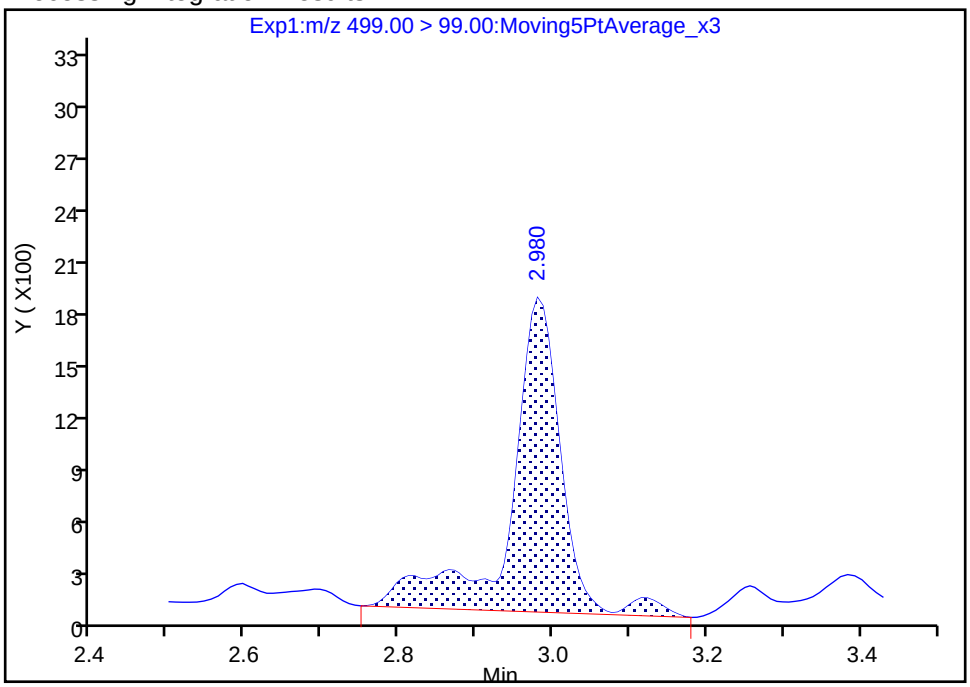
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_028.d				
Injection Date:	03-Aug-2018 08:21:59	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	33	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

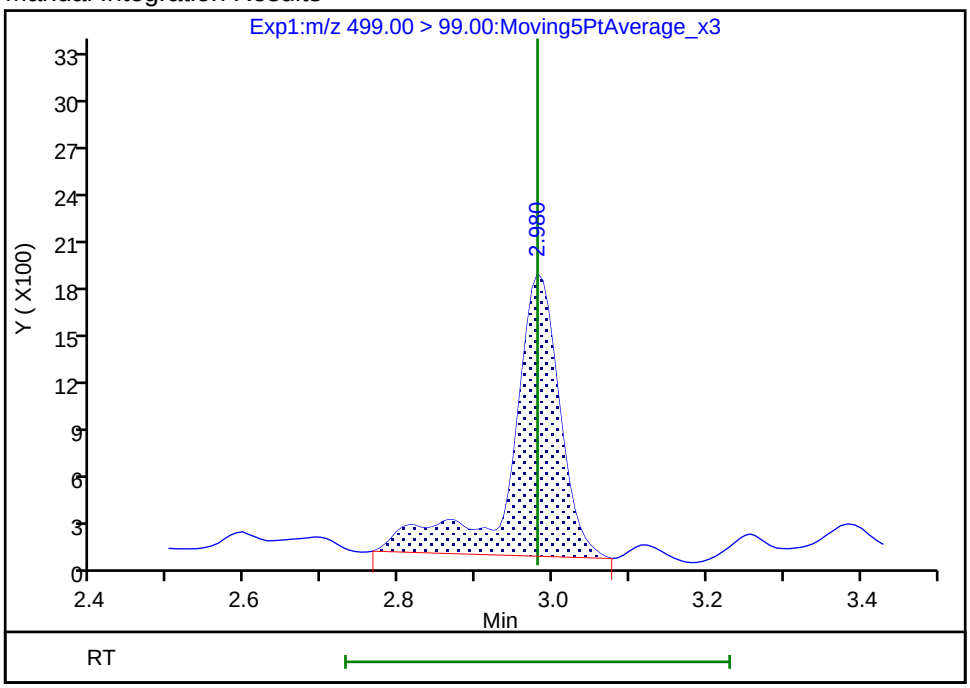
Processing Integration Results

RT: 2.98
Area: 8447
Amount: 0.025783
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 7955
Amount: 0.025161
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:27:47

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

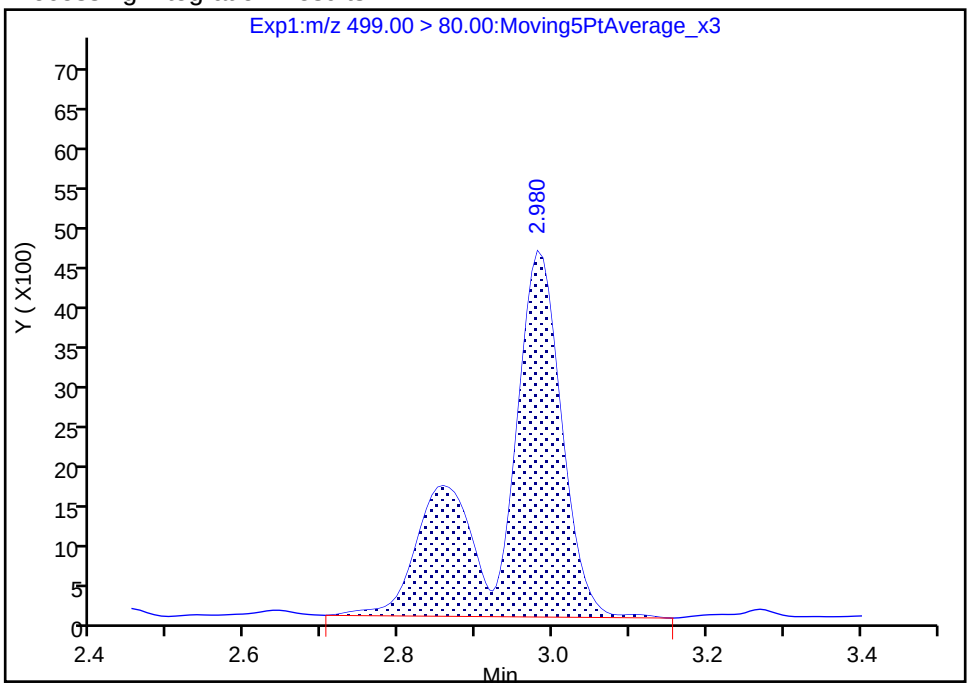
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_028.d				
Injection Date:	03-Aug-2018 08:21:59	Instrument ID:	A8_N		
Lims ID:	320-41333-A-12-A	Lab Sample ID:	320-41333-12		
Client ID:	7-MW34-PRL06-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	33	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

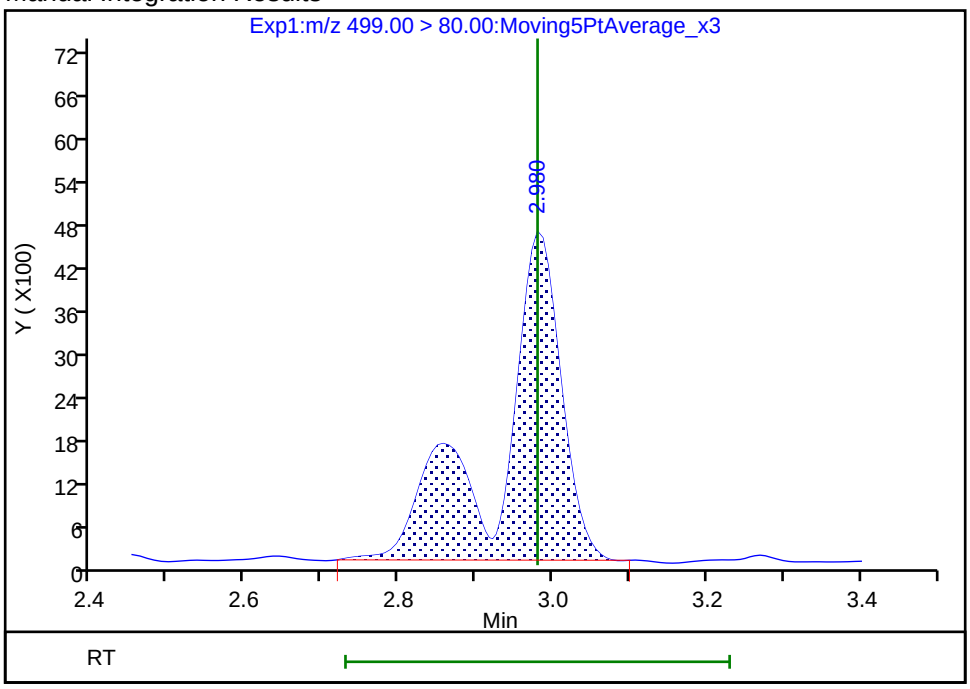
Processing Integration Results

RT: 2.98
Area: 26224
Amount: 0.025783
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 25591
Amount: 0.025161
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:27:50

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: MW-GRE10-01-01
Lab Sample ID: 320-41333-13
Matrix: Water
Lab File ID: 2018.08.03LLA_029.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/18/2018 12:12
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 311.5(mL)
Date Analyzed: 08/03/2018 08:29
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.66	J	1.6	1.2	0.49
335-67-1	Perfluorooctanoic acid (PFOA)	1.4	J	1.6	1.2	0.43
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U	1.6	1.2	0.42
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.5	J	1.6	0.80	0.37
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.6		1.6	0.80	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.6	J M	3.2	2.4	0.88

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	69		50-150
STL01892	13C4-PFHpA	78		50-150
STL00990	13C4 PFOA	81		50-150
STL00995	13C5 PFNA	79		50-150
STL00994	18O2 PFHxS	76		50-150
STL00991	13C4 PFOS	70		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_029.d
Lims ID: 320-41333-A-13-A
Client ID: MW-GRE10-01-01
Sample Type: Client
Inject. Date: 03-Aug-2018 08:29:47 ALS Bottle#: 34 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-13-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:28:34 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:28:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.703	1.690	0.013	0.648	73508	1.60		68.8	263	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.703	1.702	0.001	1.000	113060	0.0467			76.2	
298.90 > 99.00	1.703	1.702	0.001	1.000	48375		2.34(1.25-3.74)		138	
D 9 13C4-PFHpA										
367.00 > 322.00	2.268	2.251	0.017	0.863	3257347	1.94		77.8	80044	
D 11 18O2 PFHxS										
403.00 > 84.00	2.294	2.264	0.030	0.873	4552347	1.81		76.5	48911	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.268	2.267	0.001	1.000	30947	0.0205			15.9	
363.00 > 169.00	2.268	2.267	0.001	1.000	14697		2.11(1.13-3.40)		234	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.280	0.001	0.994	178918	0.0804			169	
399.00 > 99.00	2.281	2.280	0.001	0.994	57687		3.10(1.50-4.49)		95.0	
D 14 13C4 PFOA										
417.00 > 372.00	2.629	2.602	0.027	1.000	3270702	2.02		80.9	65879	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.629	2.619	0.010	1.000	66244	0.0438			38.1	
413.00 > 169.00	2.629	2.619	0.010	1.000	46969		1.41(0.84-2.52)		395	
* 62 13C2-PFOA										
415.00 > 370.00	2.629	2.619	0.010		4210984	2.50			92216	
D 19 13C5 PFNA										
468.00 > 423.00	2.995	2.964	0.031	1.139	2780760	1.97		78.9	67530	
D 18 13C4 PFOS										
503.00 > 80.00	2.995	2.964	0.031	1.139	2905013	1.67		69.9	40849	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.995	2.980	0.015	1.000	69164	0.0507			641	M
499.00 > 99.00	2.995	2.980	0.015	1.000	16495		4.19(2.31-6.93)		104	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										R
463.00 > 419.00	2.995	2.980	0.015	1.000	5491	0.004572			14.5	R
463.00 > 169.00	2.982	2.980	0.002	0.995	685		8.02(1.90-5.69)		37.8	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

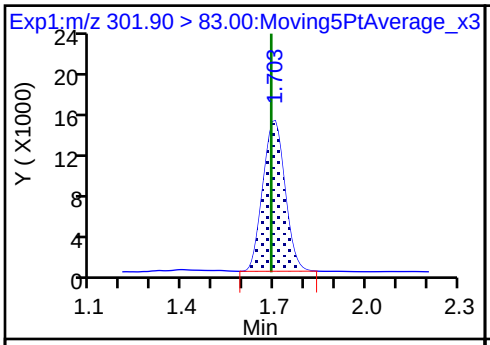
M - Manually Integrated

Report Date: 06-Aug-2018 11:28:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

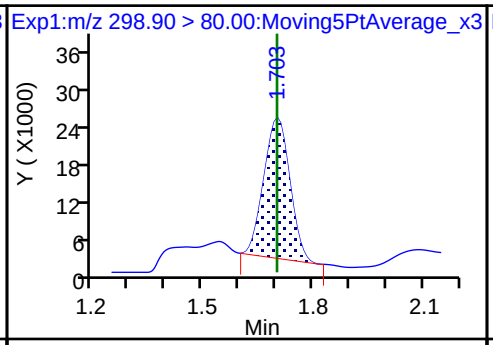
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_029.d				
Injection Date:	03-Aug-2018 08:29:47	Instrument ID:	A8_N		
Lims ID:	320-41333-A-13-A	Lab Sample ID:	320-41333-13		
Client ID:	MW-GRE10-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	34	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

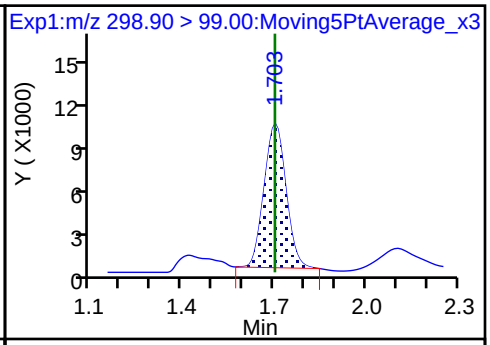
D 47 13C3-PFBS



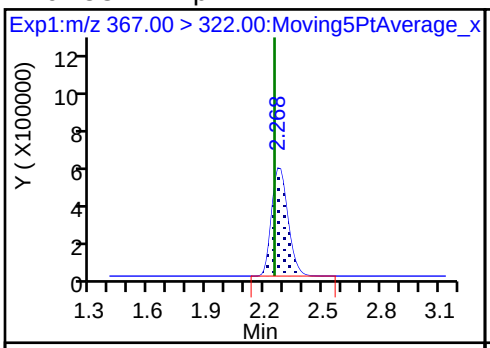
5 Perfluorobutanesulfonic acid



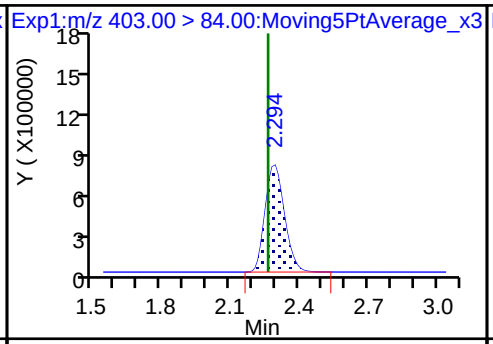
5 Perfluorobutanesulfonic acid



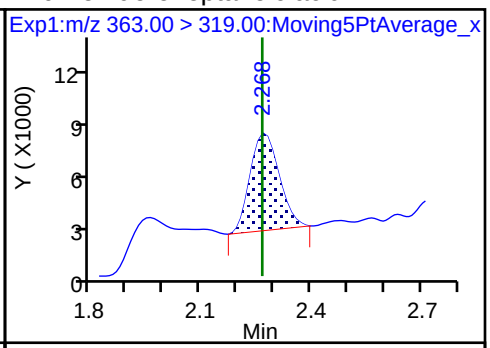
D 9 13C4-PFHpA



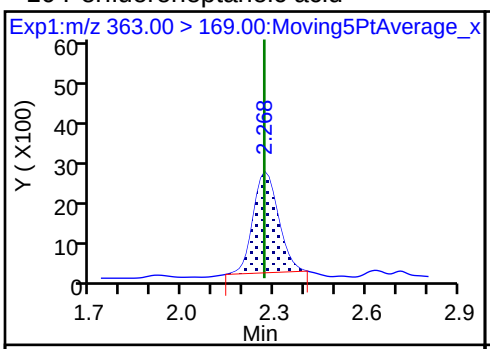
D 11 18O2 PFHxS



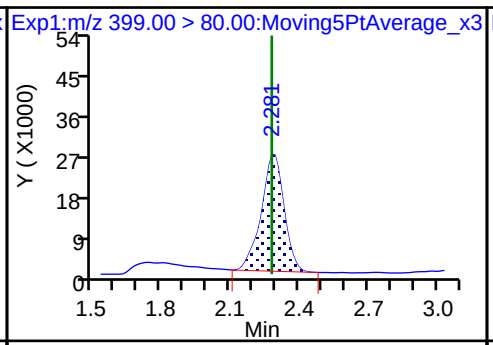
10 Perfluoroheptanoic acid



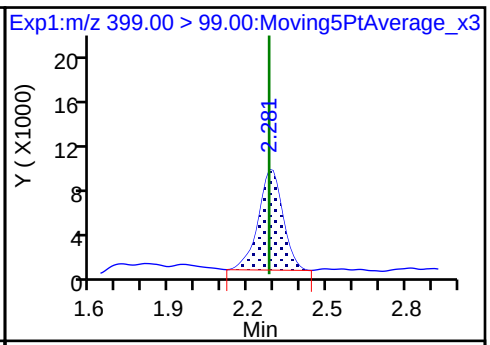
10 Perfluoroheptanoic acid



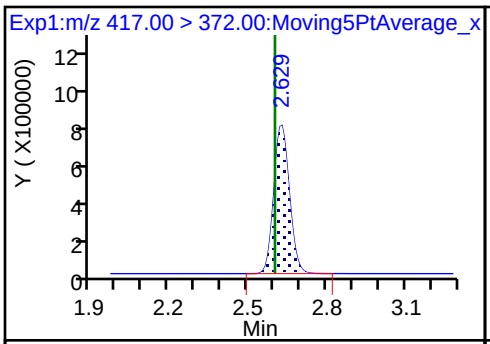
8 Perfluorohexanesulfonic acid



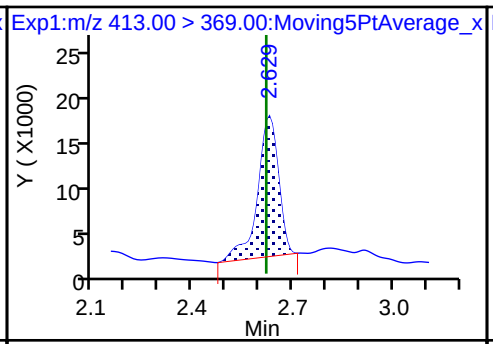
8 Perfluorohexanesulfonic acid



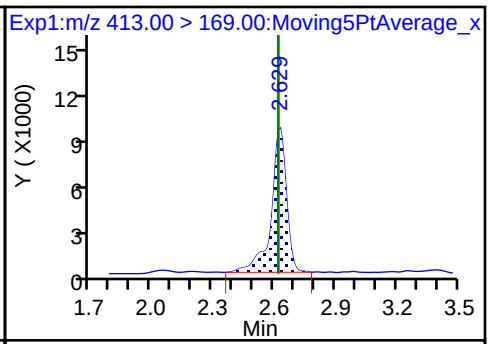
D 14 13C4 PFOA



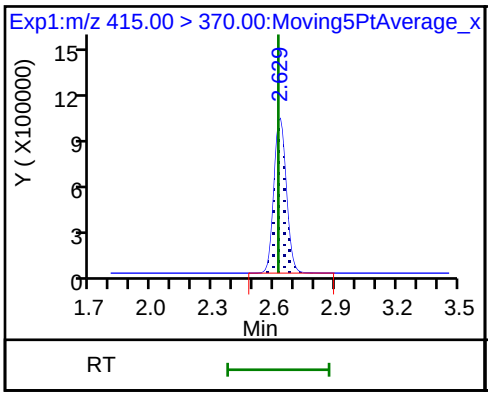
15 Perfluorooctanoic acid



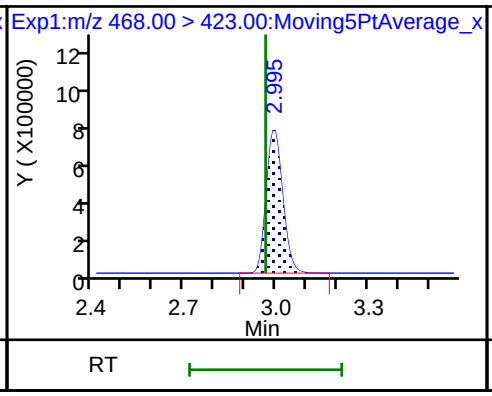
15 Perfluorooctanoic acid



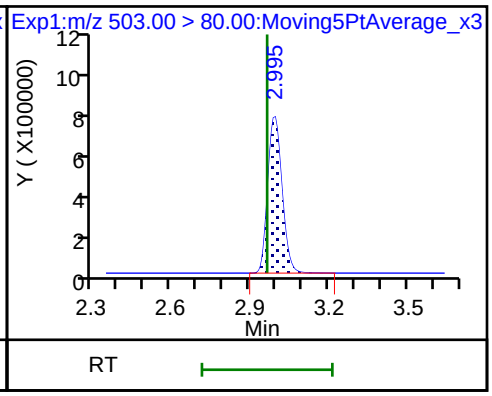
* 62 13C2-PFOA



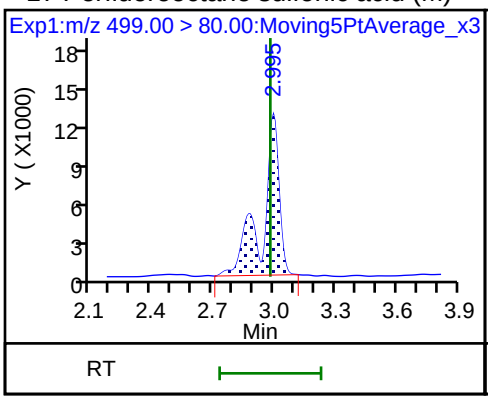
D 19 13C5 PFNA



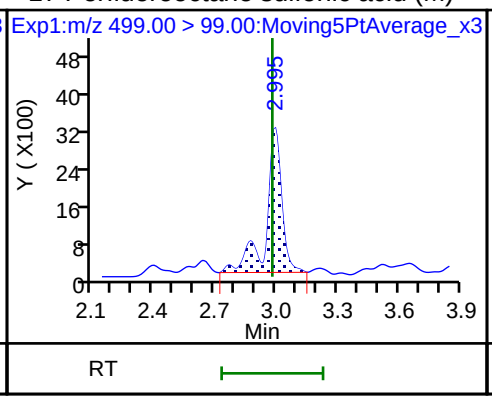
D 18 13C4 PFOS



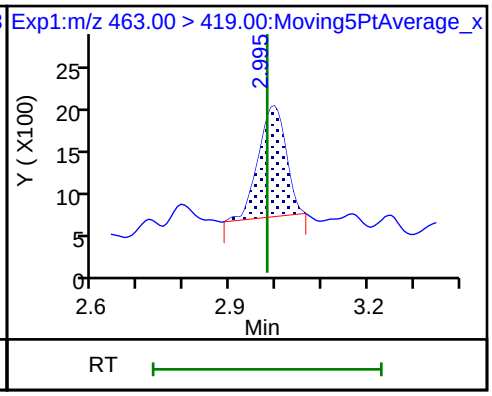
17 Perfluorooctane sulfonic acid (M)



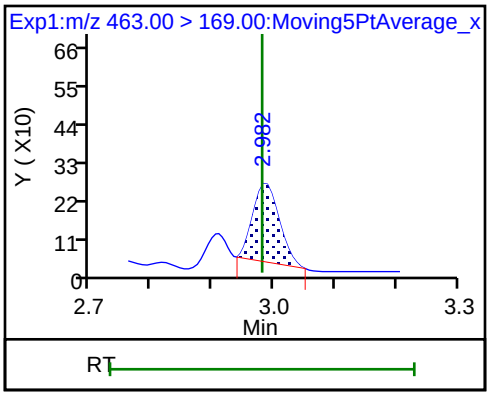
17 Perfluorooctane sulfonic acid (M)



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

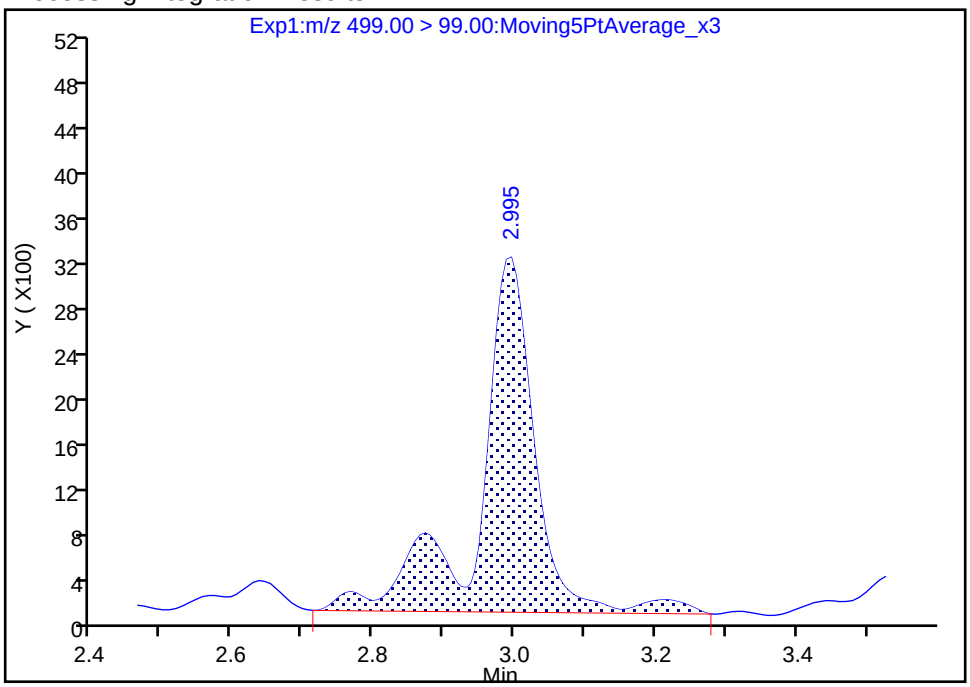
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_029.d				
Injection Date:	03-Aug-2018 08:29:47	Instrument ID:	A8_N		
Lims ID:	320-41333-A-13-A	Lab Sample ID:	320-41333-13		
Client ID:	MW-GRE10-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	34	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

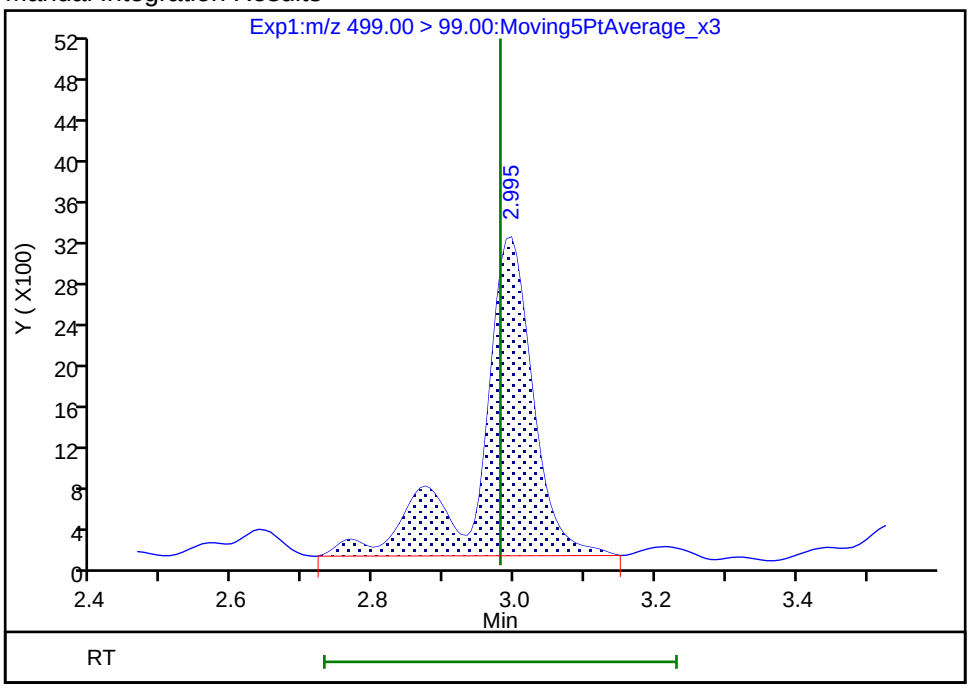
Processing Integration Results

RT: 3.00
Area: 17506
Amount: 0.052364
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 16495
Amount: 0.050686
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:28:24

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

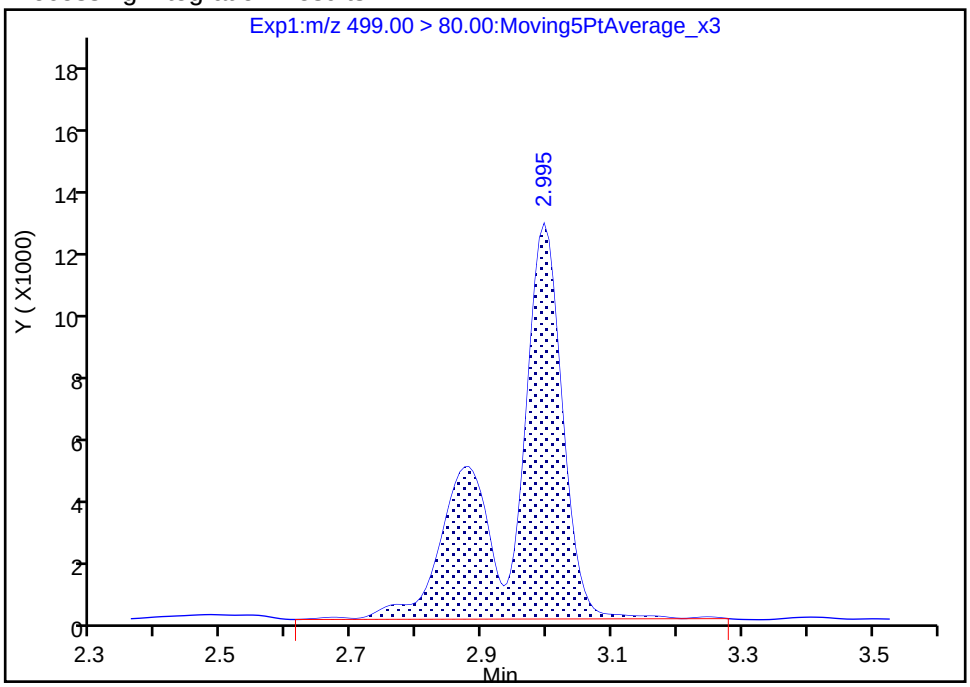
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_029.d				
Injection Date:	03-Aug-2018 08:29:47	Instrument ID:	A8_N		
Lims ID:	320-41333-A-13-A	Lab Sample ID:	320-41333-13		
Client ID:	MW-GRE10-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	34	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

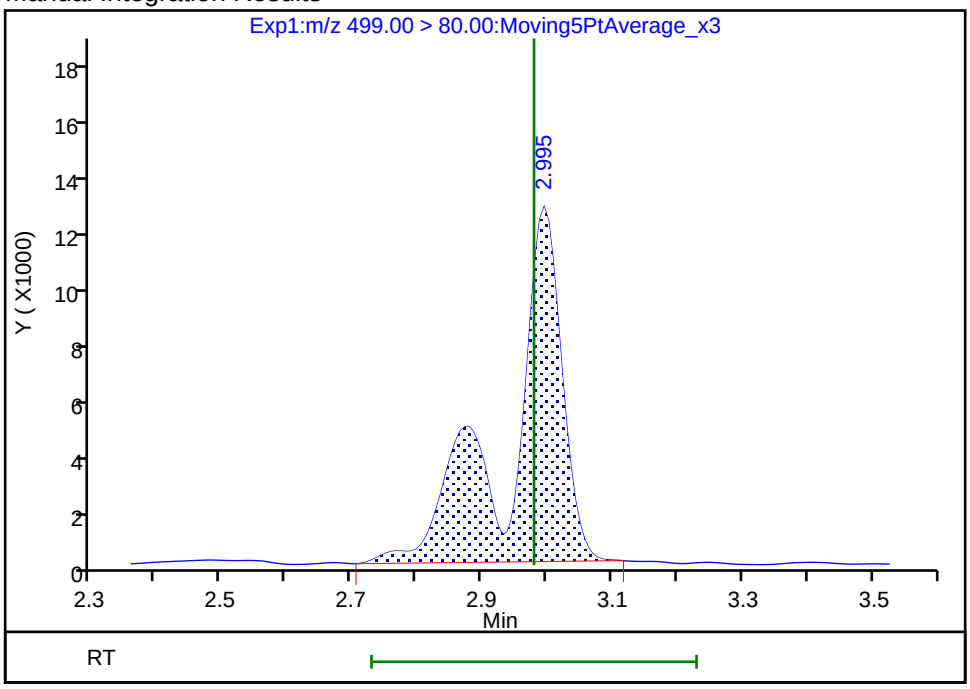
Processing Integration Results

RT: 3.00
Area: 71454
Amount: 0.052364
Amount Units: ng/ml



Manual Integration Results

RT: 3.00
Area: 69164
Amount: 0.050686
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:28:29

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: MW-GRE03-01-01
Lab Sample ID: 320-41333-14
Matrix: Water
Lab File ID: 2018.08.03LLA_030.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/18/2018 13:48
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 301.2(mL)
Date Analyzed: 08/03/2018 08:37
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6		1.7	1.2	0.51
335-67-1	Perfluorooctanoic acid (PFOA)	3.7		1.7	1.2	0.45
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U	1.7	1.2	0.43
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.2		1.7	0.83	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15		1.7	0.83	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.4	M	3.3	2.5	0.91

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	68		50-150
STL01892	13C4-PFHpA	74		50-150
STL00990	13C4 PFOA	78		50-150
STL00995	13C5 PFNA	72		50-150
STL00994	18O2 PFHxS	70		50-150
STL00991	13C4 PFOS	68		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_030.d
Lims ID: 320-41333-A-14-A
Client ID: MW-GRE03-01-01
Sample Type: Client
Inject. Date: 03-Aug-2018 08:37:34 ALS Bottle#: 35 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-14-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:28:54 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:28:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.703	1.690	0.013	0.648	75360	1.57		67.6	247	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.703	1.702	0.001	1.000	239591	0.0964			80.4	
298.90 > 99.00	1.703	1.702	0.001	1.000	103239		2.32(1.25-3.74)		191	
D 9 13C4-PFHpA										
367.00 > 322.00	2.269	2.251	0.017	0.863	3231376	1.85		74.0	69751	
D 11 18O2 PFHxS										
403.00 > 84.00	2.295	2.264	0.031	0.873	4361755	1.66		70.2	67651	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.269	2.267	0.001	1.000	206367	0.1377			95.5	
363.00 > 169.00	2.269	2.267	0.001	1.000	79625		2.59(1.13-3.40)		1057	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.282	2.280	0.002	0.994	975101	0.4574			680	
399.00 > 99.00	2.282	2.280	0.002	0.994	302779		3.22(1.50-4.49)		513	
D 14 13C4 PFOA										
417.00 > 372.00	2.629	2.602	0.027	1.000	3301421	1.96		78.3	79873	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.629	2.619	0.010	1.000	169930	0.1113			86.6	
413.00 > 169.00	2.629	2.619	0.010	1.000	103897		1.64(0.84-2.52)		793	
* 62 13C2-PFOA										
415.00 > 370.00	2.629	2.619	0.010		4394836	2.50			62111	
D 19 13C5 PFNA										
468.00 > 423.00	2.989	2.964	0.025	1.137	2645638	1.80		72.0	49909	
D 18 13C4 PFOS										
503.00 > 80.00	2.989	2.964	0.025	1.137	2963890	1.63		68.4	29596	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.874	2.980	-0.106	0.961	311187	0.2235			1398	M
499.00 > 99.00	2.989	2.980	0.009	1.000	69933		4.45(2.31-6.93)		489	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										R
463.00 > 419.00	2.996	2.980	0.016	1.002	1515	0.001326			3.7	R
463.00 > 169.00	2.982	2.980	0.002	0.998	238		6.37(1.90-5.69)		16.0	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 06-Aug-2018 11:28:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_030.d

Injection Date: 03-Aug-2018 08:37:34 Instrument ID: A8_N

Lims ID: 320-41333-A-14-A Lab Sample ID: 320-41333-14

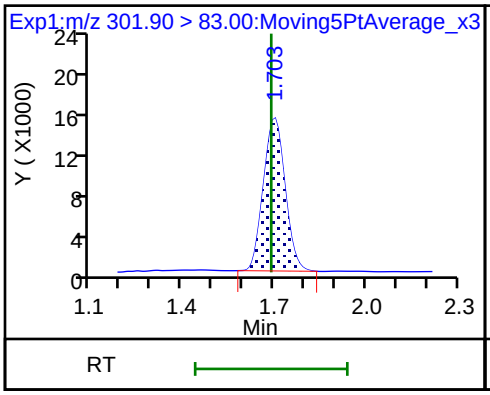
Client ID: MW-GRE03-01-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 35 Worklist Smp#: 19

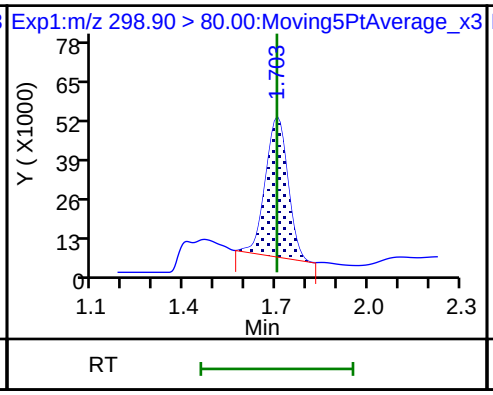
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

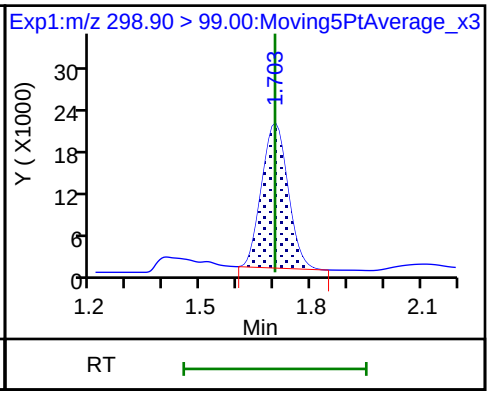
D 47 13C3-PFBS



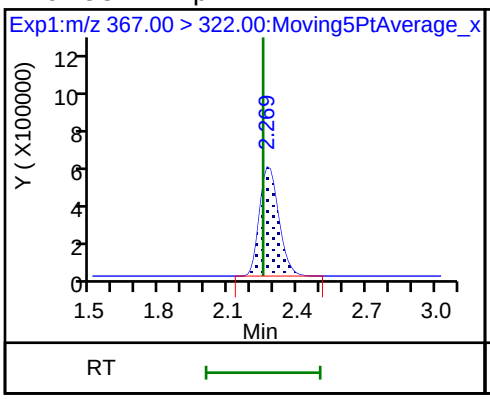
5 Perfluorobutanesulfonic acid



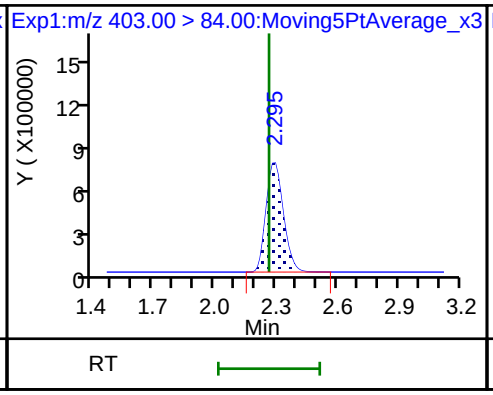
5 Perfluorobutanesulfonic acid



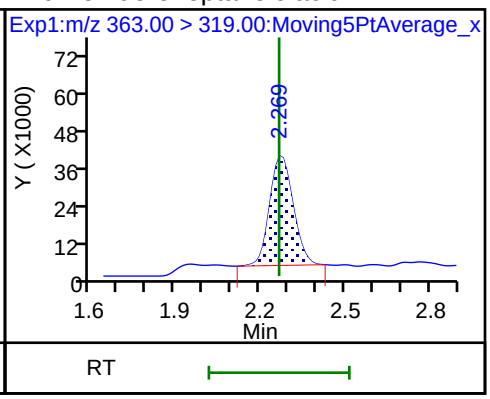
D 9 13C4-PFHpA



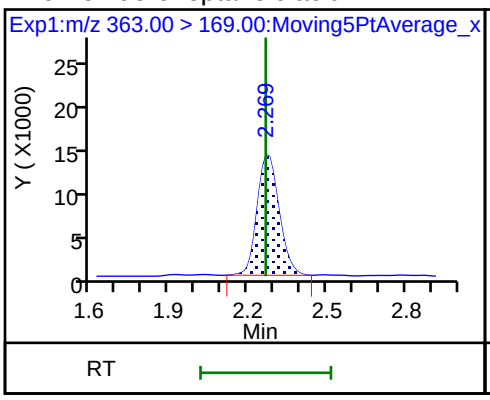
D 11 18O2 PFHxS



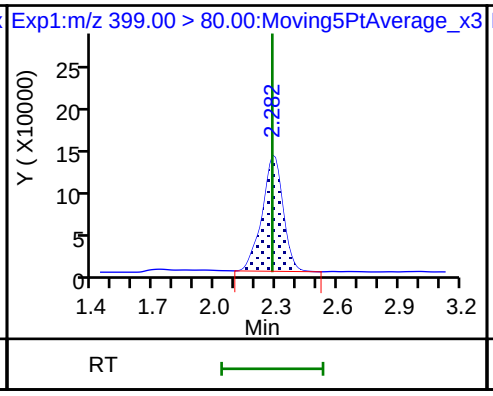
10 Perfluoroheptanoic acid



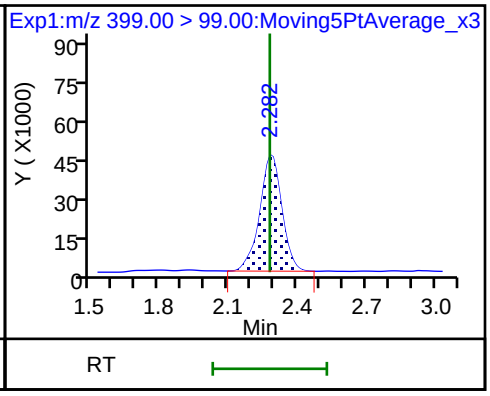
10 Perfluoroheptanoic acid



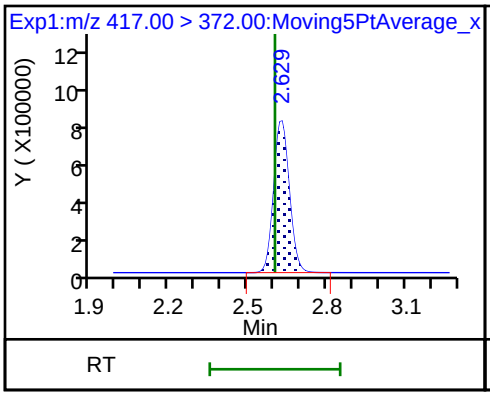
8 Perfluorohexanesulfonic acid



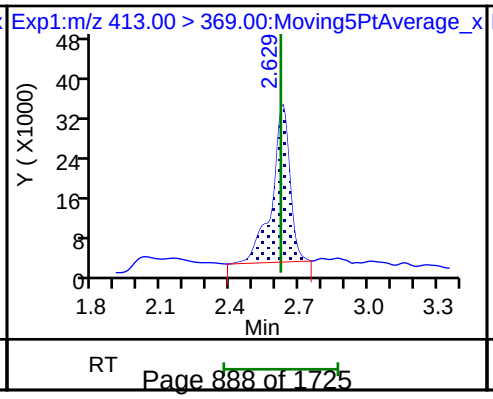
8 Perfluorohexanesulfonic acid



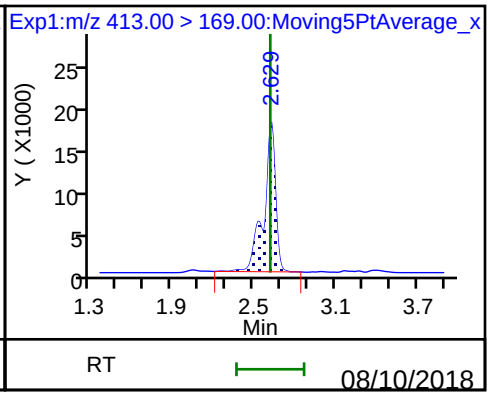
D 14 13C4 PFOA



15 Perfluorooctanoic acid

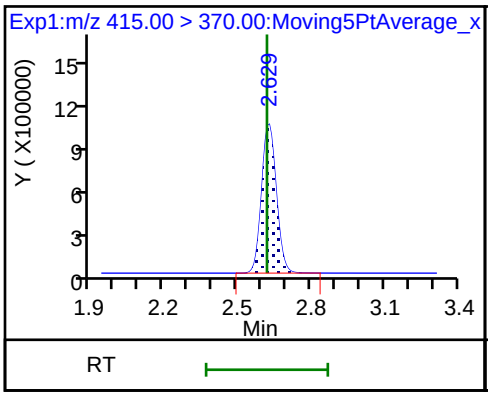


15 Perfluorooctanoic acid

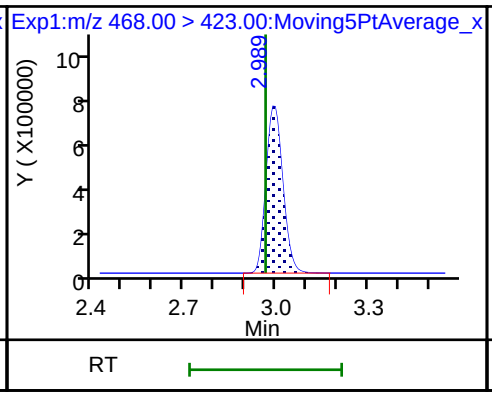


Report Date: 06-Aug-2018 11:28:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_030.d

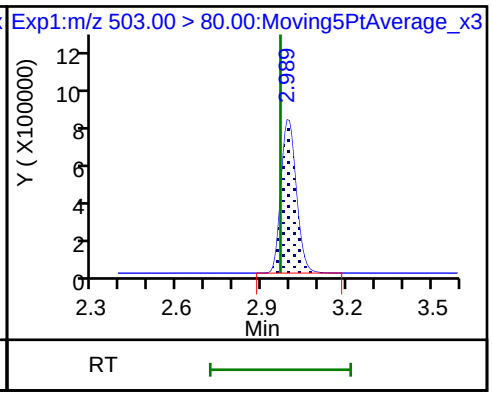
* 62 13C2-PFOA



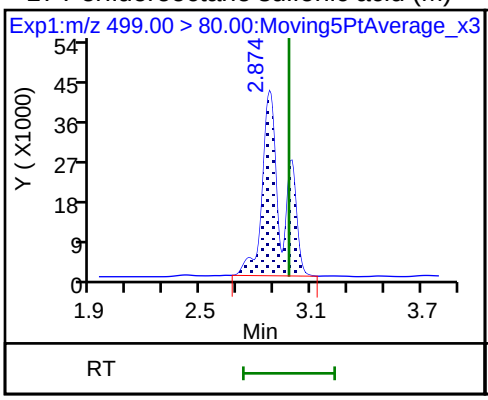
D 19 13C5 PFNA



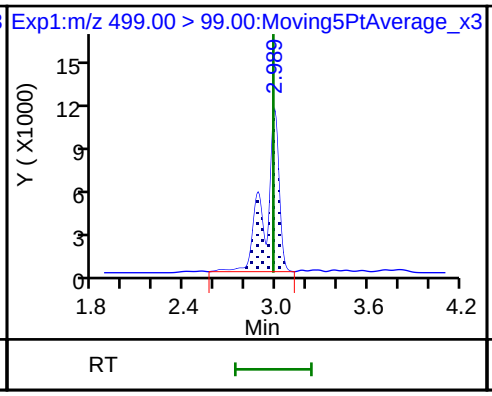
D 18 13C4 PFOS



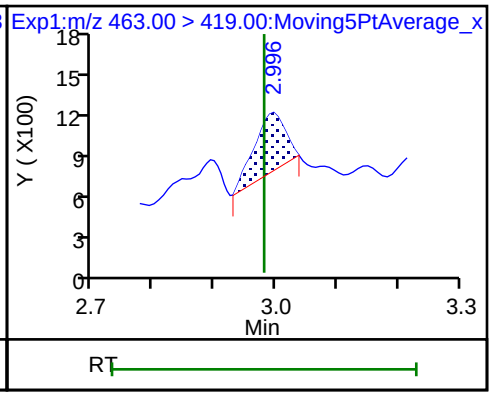
17 Perfluorooctane sulfonic acid (M)



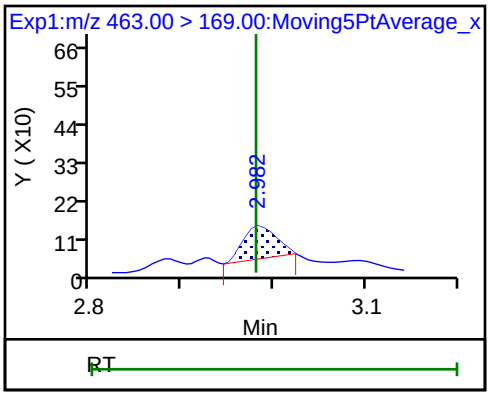
17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

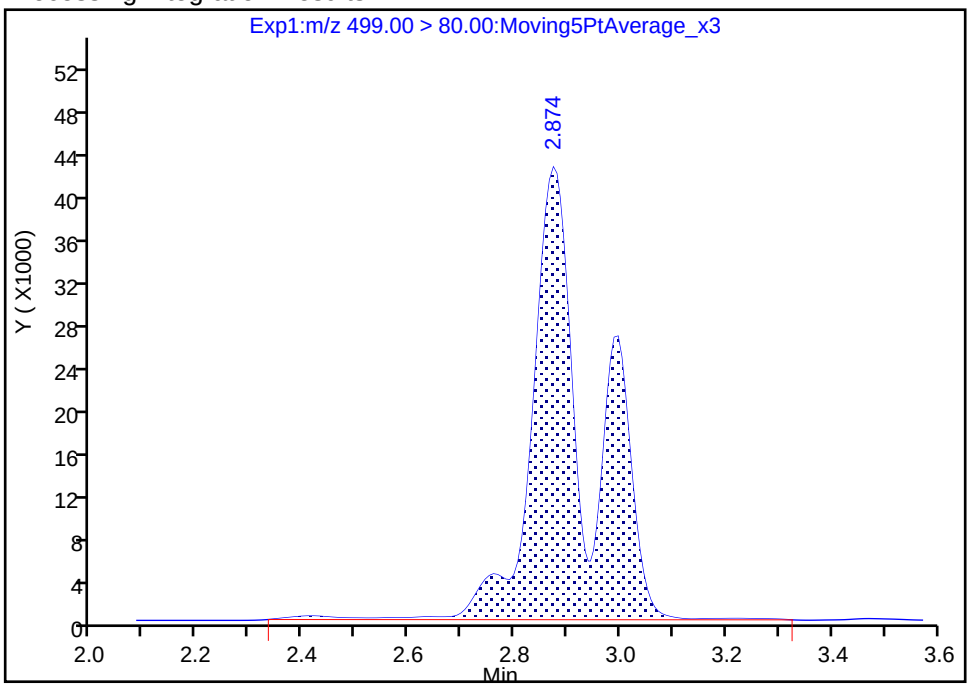
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_030.d				
Injection Date:	03-Aug-2018 08:37:34	Instrument ID:	A8_N		
Lims ID:	320-41333-A-14-A	Lab Sample ID:	320-41333-14		
Client ID:	MW-GRE03-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	35	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

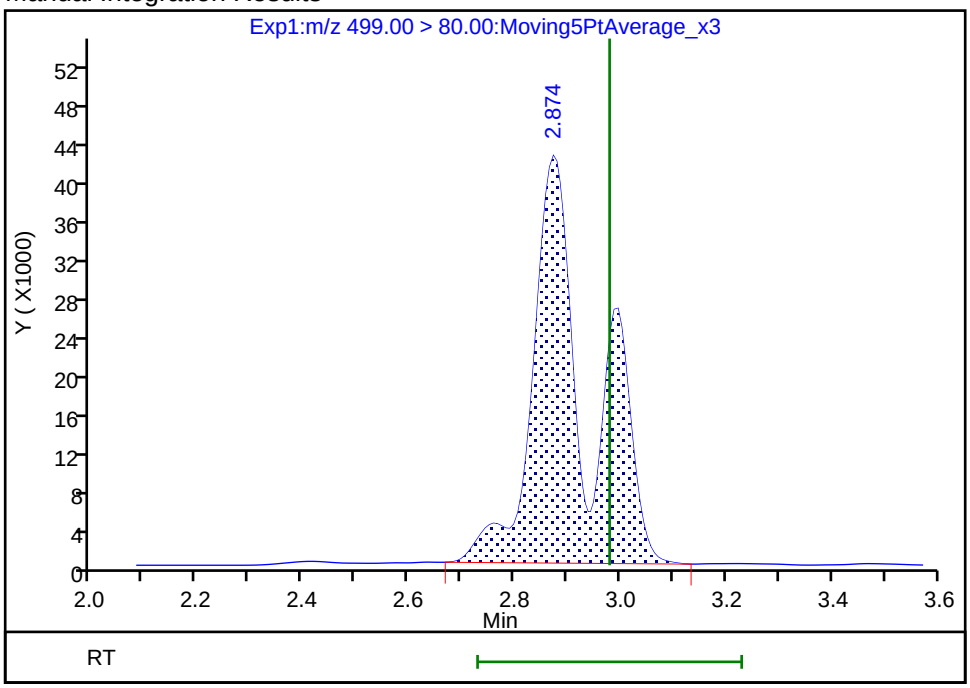
Processing Integration Results

RT: 2.87
Area: 320224
Amount: 0.230011
Amount Units: ng/ml



Manual Integration Results

RT: 2.87
Area: 311187
Amount: 0.223520
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:28:50

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: GRE-RB-01
Lab Sample ID: 320-41333-16
Matrix: Water
Lab File ID: 2018.08.03LLA_031.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/18/2018 15:15
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 270.7(mL)
Date Analyzed: 08/03/2018 08:45
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.98	J	1.8	1.4	0.56
335-67-1	Perfluorooctanoic acid (PFOA)	1.4	U M	1.8	1.4	0.50
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.8	1.4	0.48
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.92	U	1.8	0.92	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.92	U	1.8	0.92	0.35
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.0

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	64		50-150
STL01892	13C4-PFHpA	70		50-150
STL00990	13C4 PFOA	71		50-150
STL00995	13C5 PFNA	71		50-150
STL00994	18O2 PFHxS	67		50-150
STL00991	13C4 PFOS	64		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_031.d
Lims ID: 320-41333-A-16-A
Client ID: GRE-RB-01
Sample Type: Client
Inject. Date: 03-Aug-2018 08:45:22 ALS Bottle#: 36 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-16-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:29:40 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:29:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.703	1.690	0.013	0.646	73449	1.49		64.0	456	
D 9 13C4-PFHpA										
367.00 > 322.00	2.281	2.251	0.030	0.865	3135799	1.74		69.7	76794	
D 11 18O2 PFHxS										
403.00 > 84.00	2.294	2.264	0.030	0.870	4263126	1.58		66.7	65905	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.281	2.267	0.014	1.000	38594	0.0265			21.7	
363.00 > 169.00	2.281	2.267	0.014	1.000	12663		3.05(1.13-3.40)		218	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.294	2.280	0.014	1.000	15325	0.007354			102	
399.00 > 99.00	2.307	2.280	0.027	1.006	4847		3.16(1.50-4.49)		11.6	
D 14 13C4 PFOA										
417.00 > 372.00	2.637	2.602	0.035	1.000	3099738	1.78		71.4	57566	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.637	2.619	0.018	1.000	9275	0.006470			5.2	M
413.00 > 169.00	2.645	2.619	0.026	1.003	3794		2.44(0.84-2.52)		34.3	M
* 62 13C2-PFOA										
415.00 > 370.00	2.637	2.619	0.018		4523340	2.50			99516	
D 19 13C5 PFNA										
468.00 > 423.00	3.002	2.964	0.038	1.138	2696983	1.78		71.3	65455	
D 18 13C4 PFOS										
503.00 > 80.00	3.002	2.964	0.038	1.138	2856675	1.53		64.0	36476	
20 Perfluorononanoic acid										
463.00 > 419.00	3.002	2.980	0.022	1.000	1001	0.000859			4.2	
463.00 > 169.00	3.009	2.980	0.029	1.002	420		2.38(1.90-5.69)		30.4	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Aug-2018 11:29:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_031.d

Injection Date: 03-Aug-2018 08:45:22 Instrument ID: A8_N

Lims ID: 320-41333-A-16-A Lab Sample ID: 320-41333-16

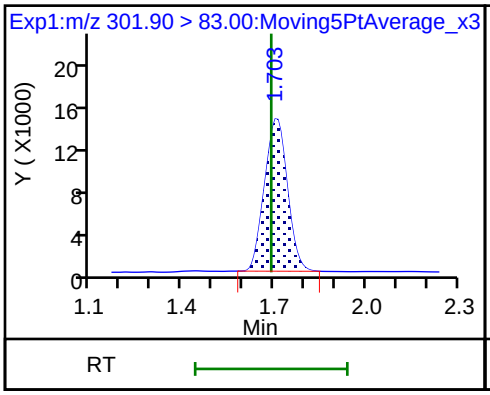
Client ID: GRE-RB-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 36 Worklist Smp#: 20

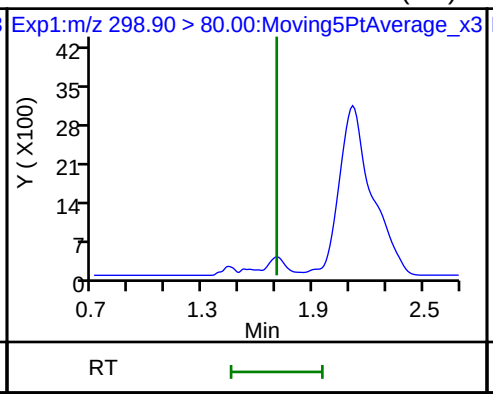
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

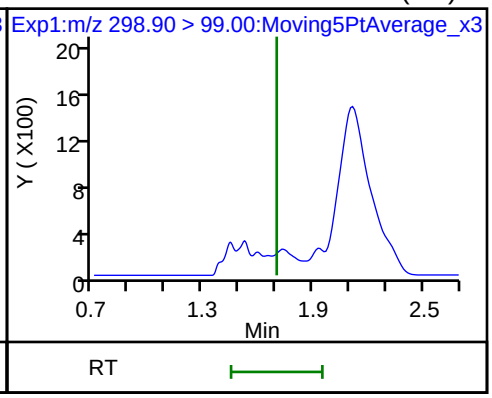
D 47 13C3-PFBS



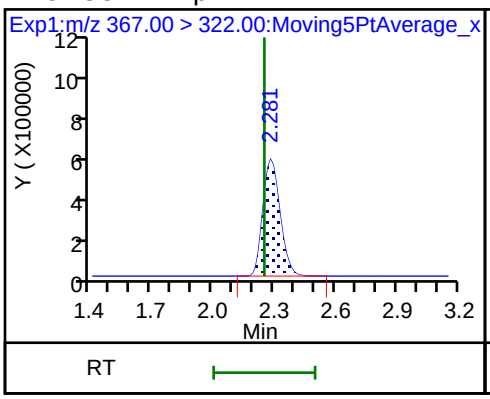
5 Perfluorobutanesulfonic acid (ND)



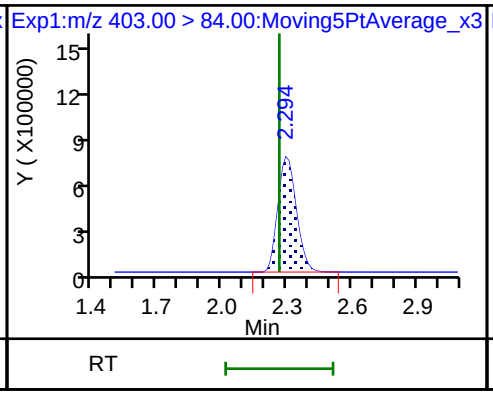
5 Perfluorobutanesulfonic acid (ND)



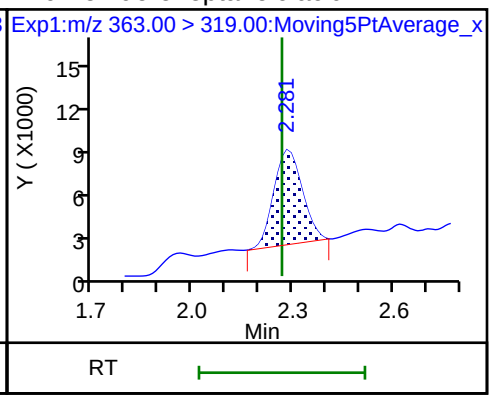
D 9 13C4-PFHpA



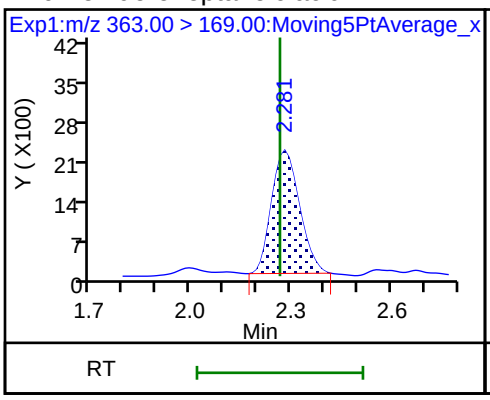
D 11 18O2 PFHxS



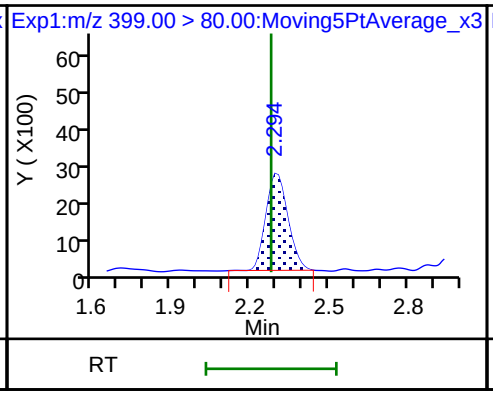
10 Perfluoroheptanoic acid



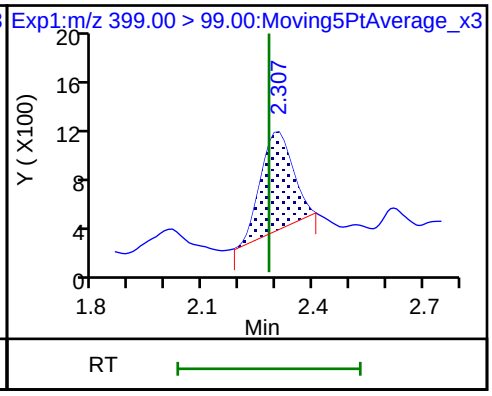
10 Perfluoroheptanoic acid



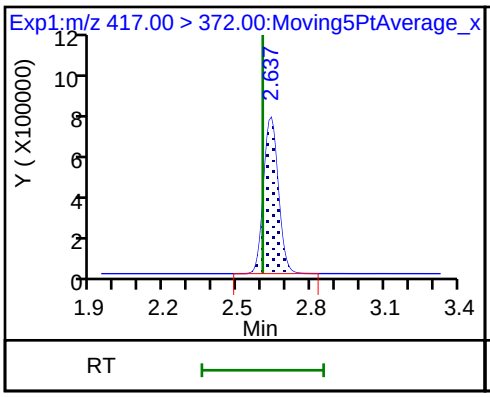
8 Perfluorohexanesulfonic acid



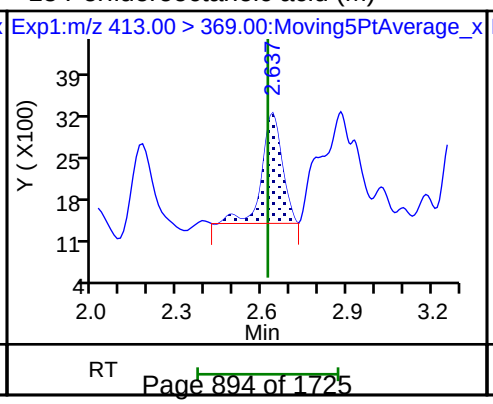
8 Perfluorohexanesulfonic acid



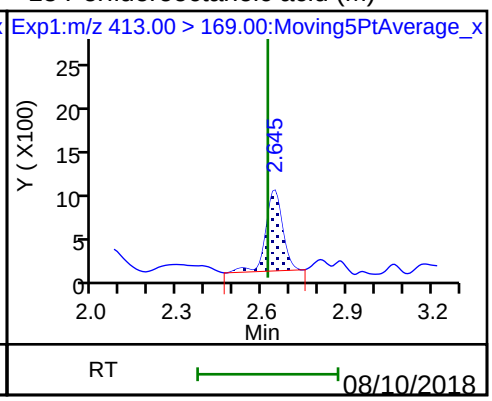
D 14 13C4 PFOA



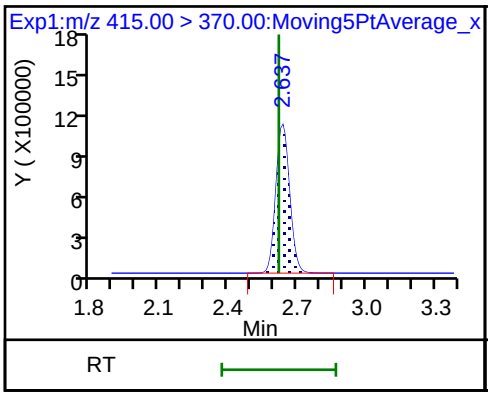
15 Perfluorooctanoic acid (M)



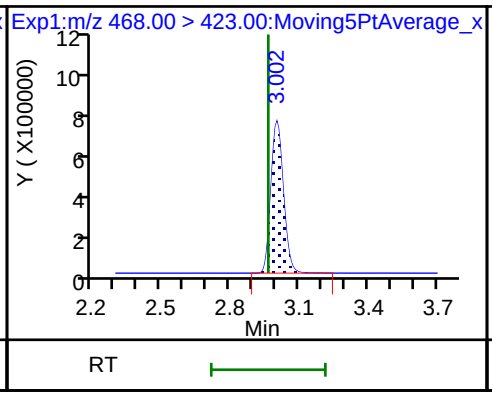
15 Perfluorooctanoic acid (M)



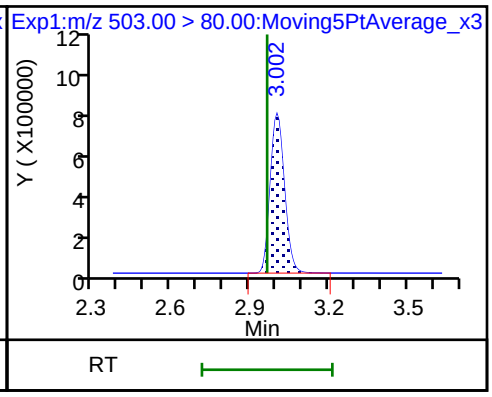
* 62 13C2-PFOA



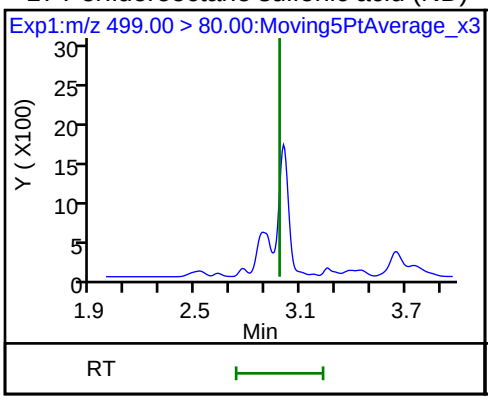
D 19 13C5 PFNA



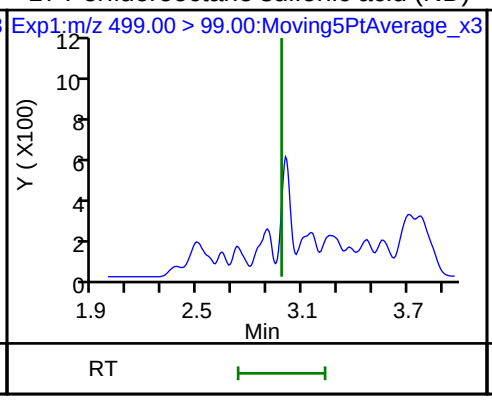
D 18 13C4 PFOS



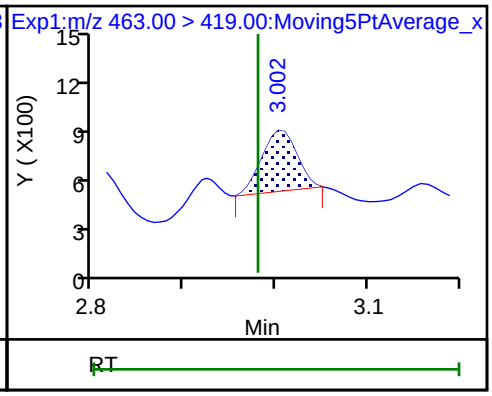
17 Perfluorooctane sulfonic acid (ND)



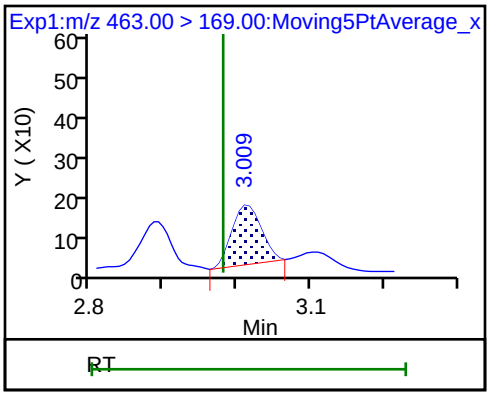
17 Perfluorooctane sulfonic acid (ND)



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

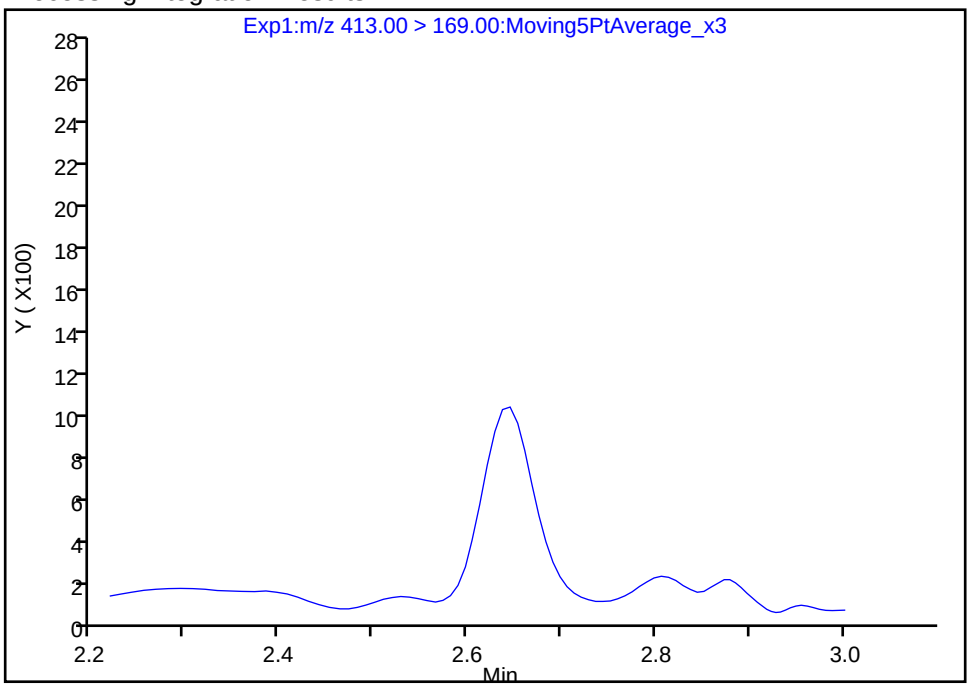
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_031.d				
Injection Date:	03-Aug-2018 08:45:22	Instrument ID:	A8_N		
Lims ID:	320-41333-A-16-A	Lab Sample ID:	320-41333-16		
Client ID:	GRE-RB-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	36	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

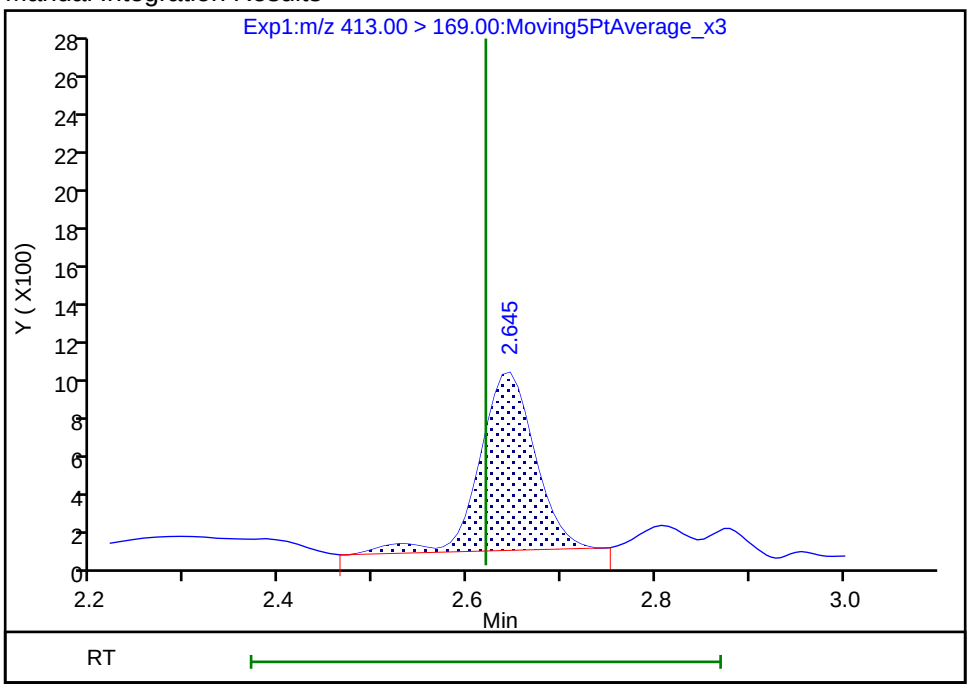
Processing Integration Results

RT: 2.61
Area: 0
Amount: 0.005808
Amount Units: ng/ml



Manual Integration Results

RT: 2.65
Area: 3794
Amount: 0.006470
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:29:34

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

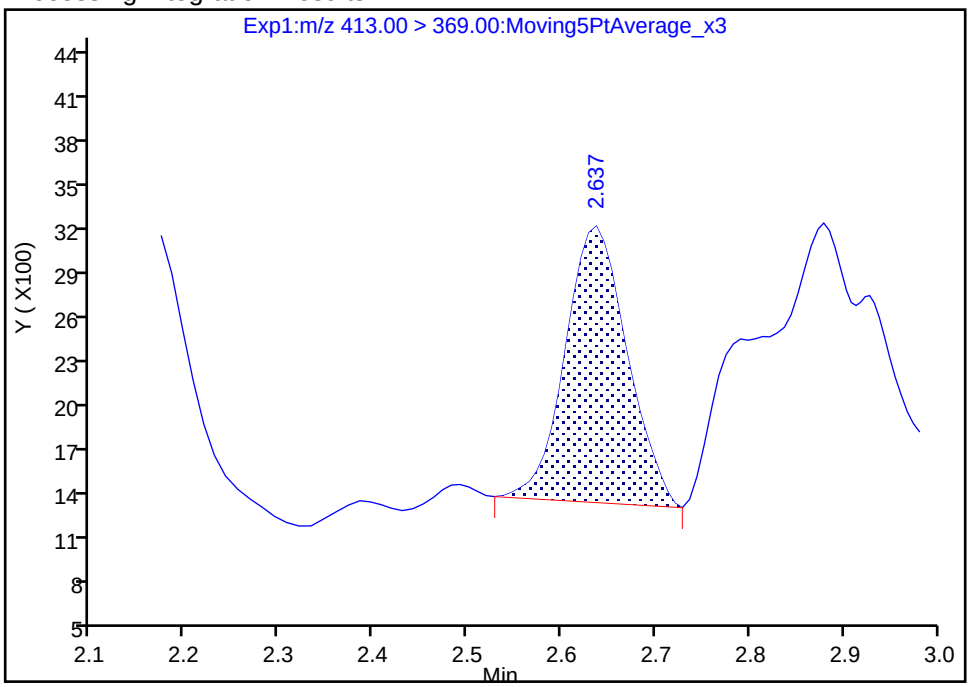
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_031.d				
Injection Date:	03-Aug-2018 08:45:22	Instrument ID:	A8_N		
Lims ID:	320-41333-A-16-A	Lab Sample ID:	320-41333-16		
Client ID:	GRE-RB-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	36	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

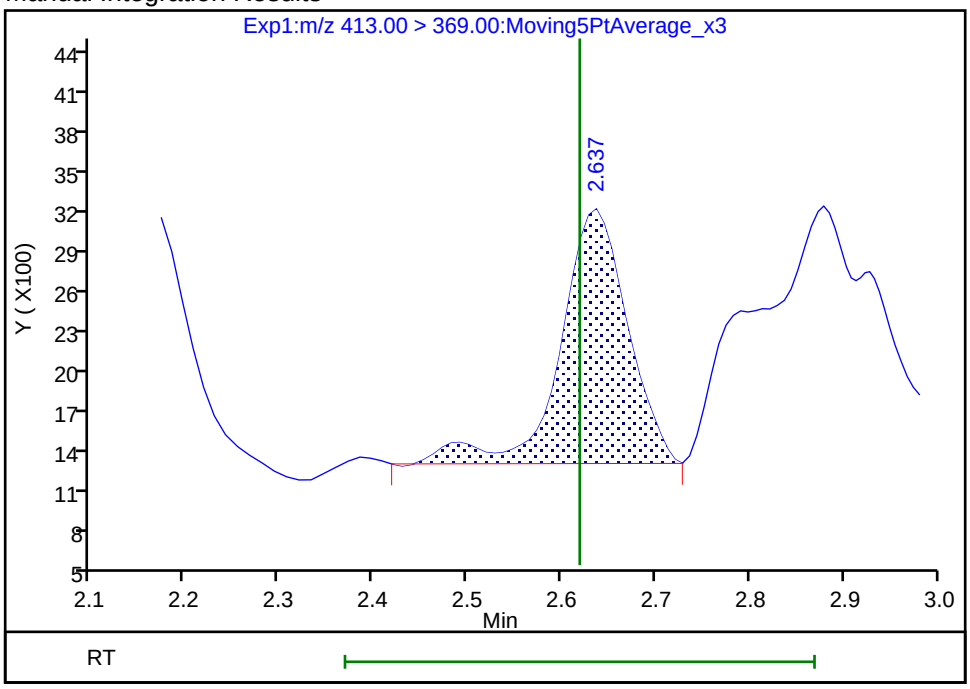
Processing Integration Results

RT: 2.64
Area: 8326
Amount: 0.005808
Amount Units: ng/ml



Manual Integration Results

RT: 2.64
Area: 9275
Amount: 0.006470
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:29:34

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: MW-GRE08-01-01 | Lab Sample ID: 320-41333-17

Matrix: Water | Lab File ID: 2018.07.28LLB_062.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/19/2018 14:35

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 314.8(mL) | Date Analyzed: 07/29/2018 07:48

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	16		1.6	1.2	0.48
335-67-1	Perfluorooctanoic acid (PFOA)	17		1.6	1.2	0.43
375-95-1	Perfluorononanoic acid (PFNA)	0.80	J	1.6	1.2	0.41
375-73-5	Perfluorobutanesulfonic acid (PFBS)	45	M	1.6	0.79	0.37
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	160		1.6	0.79	0.30
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*580*	*E*	*3.2*	2.4	*0.87*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	66		50-150
STL01892	13C4-PFHpA	63		50-150
STL00990	13C4 PFOA	62		50-150
STL00995	13C5 PFNA	64		50-150
STL00994	18O2 PFHxS	68		50-150
STL00991	13C4 PFOS	65		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_062.d
Lims ID: 320-41333-A-17-A
Client ID: MW-GRE08-01-01
Sample Type: Client
Inject. Date: 29-Jul-2018 07:48:25 ALS Bottle#: 50 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-17-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:37:53 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:37:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.675	-0.018	0.642	73198	1.54		66.4	80.1	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.666	1.676	-0.010	1.005	3544772	1.42			423	M
298.90 > 99.00	1.666	1.676	-0.010	1.005	1463339		2.42(1.25-3.74)		487	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.229	0.001	0.864	3441022	1.57		63.0	56540	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	744983	0.4909			402	
363.00 > 169.00	2.218	2.230	-0.012	0.995	267465		2.79(1.13-3.40)		2770	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.241	0.0	0.868	4484012	1.60		67.6	67010	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.242	-0.001	1.000	11017049	4.98			7771	
399.00 > 99.00	2.241	2.242	-0.001	1.000	3750233		2.94(1.50-4.49)		7230	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.588	-0.007	1.000	3301797	1.54		61.8	59811	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.590	-0.009		5585915	2.50			69111	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.590	-0.009	1.000	870341	0.5430			418	
413.00 > 169.00	2.581	2.590	-0.009	1.000	526617		1.65(0.84-2.52)		2884	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.829	2.950	-0.121	0.959	25597489	18.1			38705	E
499.00 > 99.00	2.943	2.950	-0.007	0.998	5714196		4.48(2.31-6.93)		40152	
20 Perfluorononanoic acid										
463.00 > 419.00	2.943	2.950	-0.007	0.998	34063	0.0252			73.1	
463.00 > 169.00	2.949	2.950	-0.001	1.000	8992		3.79(1.90-5.69)		192	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.953	-0.004	1.142	2959657	1.61		64.2	63330	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.953	-0.004	1.142	3055052	1.57		65.5	38141	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

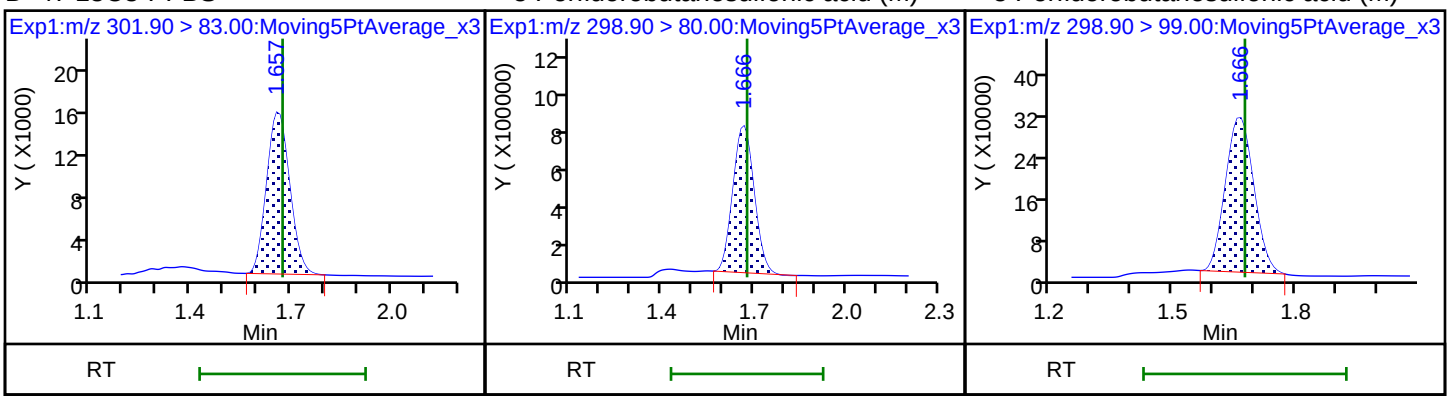
M - Manually Integrated

Report Date: 31-Jul-2018 12:37:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

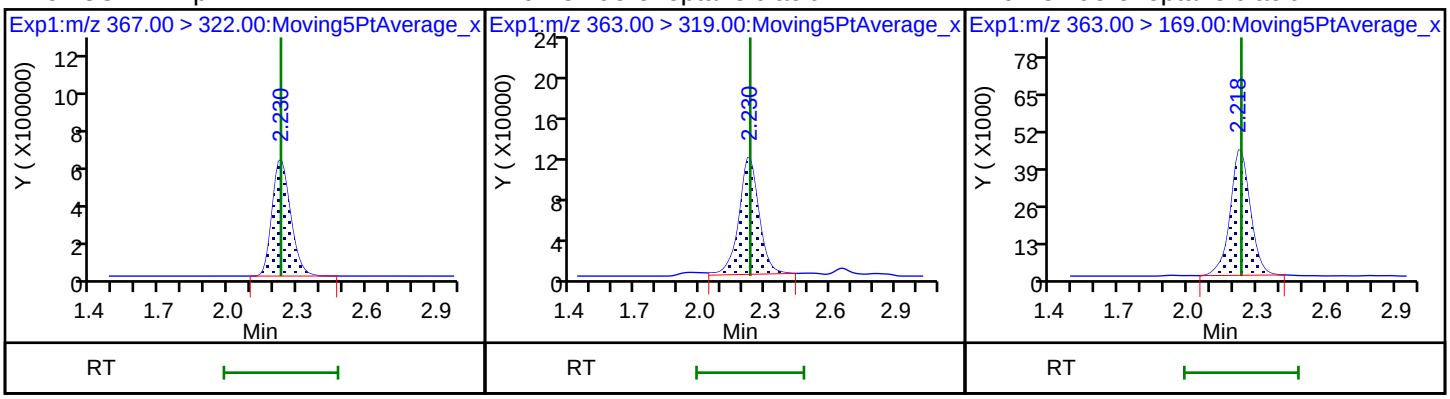
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_062.d				
Injection Date:	29-Jul-2018 07:48:25	Instrument ID:	A8_N		
Lims ID:	320-41333-A-17-A	Lab Sample ID:	320-41333-17		
Client ID:	MW-GRE08-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	50	Worklist Smp#:	23
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		

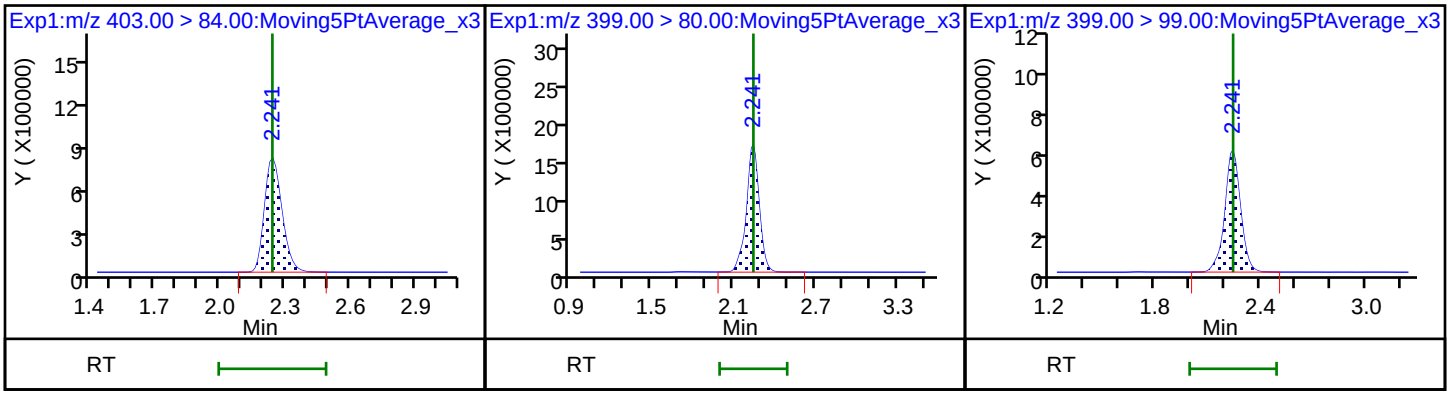
D 47 13C3-PFBS | 5 Perfluorobutanesulfonic acid (M) | 5 Perfluorobutanesulfonic acid (M)



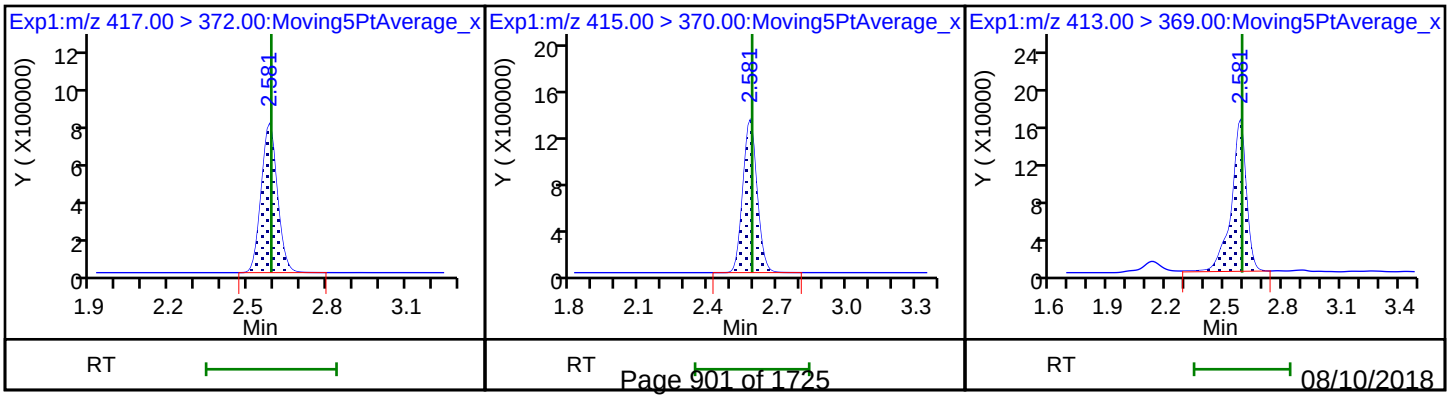
D 9 13C4-PFHpA | 10 Perfluoroheptanoic acid | 10 Perfluoroheptanoic acid



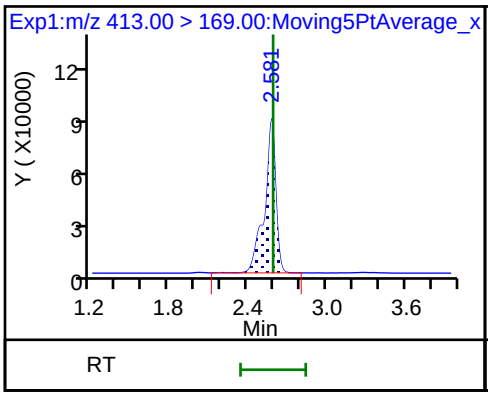
D 11 18O2 PFHxS | 8 Perfluorohexanesulfonic acid | 8 Perfluorohexanesulfonic acid



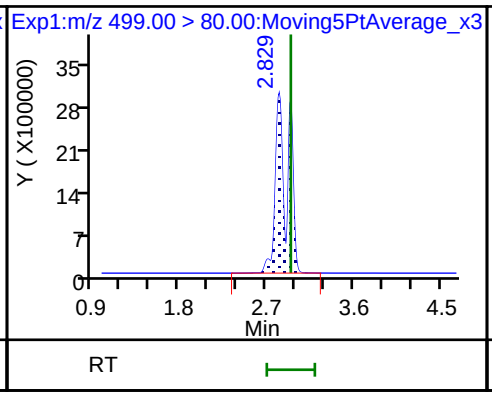
D 14 13C4 PFOA | * 62 13C2-PFOA | 15 Perfluorooctanoic acid



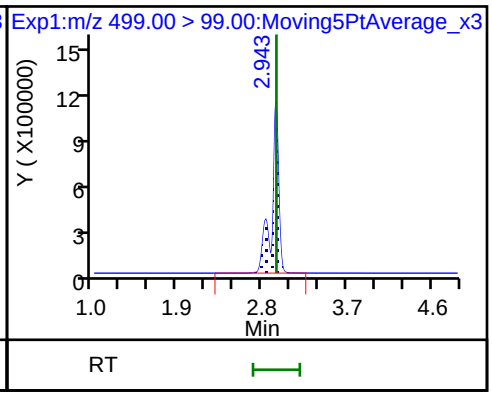
15 Perfluorooctanoic acid



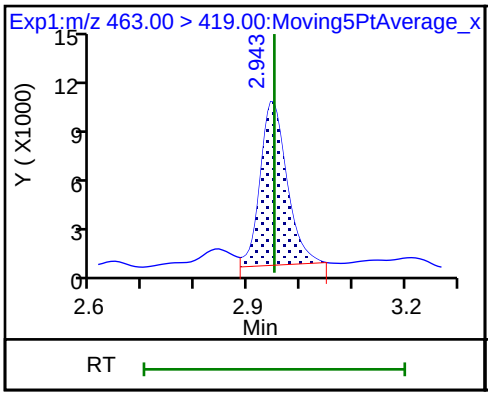
17 Perfluorooctane sulfonic acid



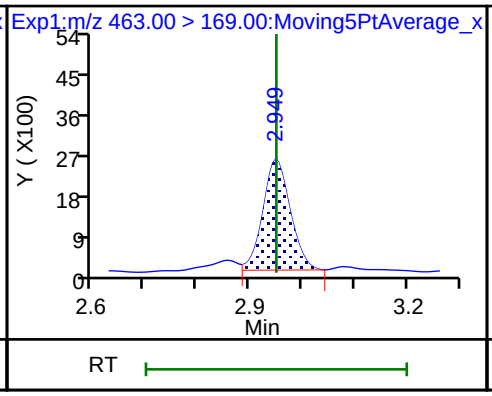
17 Perfluorooctane sulfonic acid



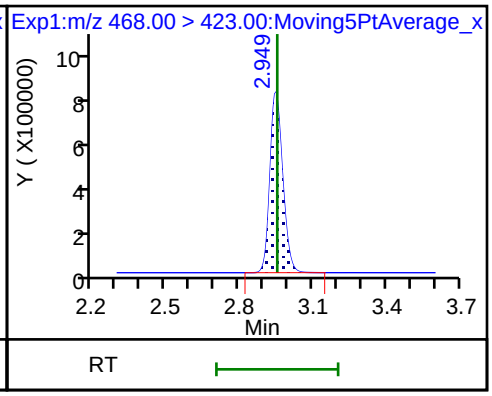
20 Perfluorononanoic acid



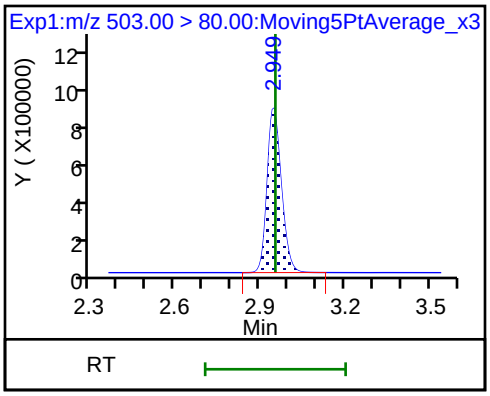
20 Perfluorononanoic acid



D 19 13C5 PFNA



D 18 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

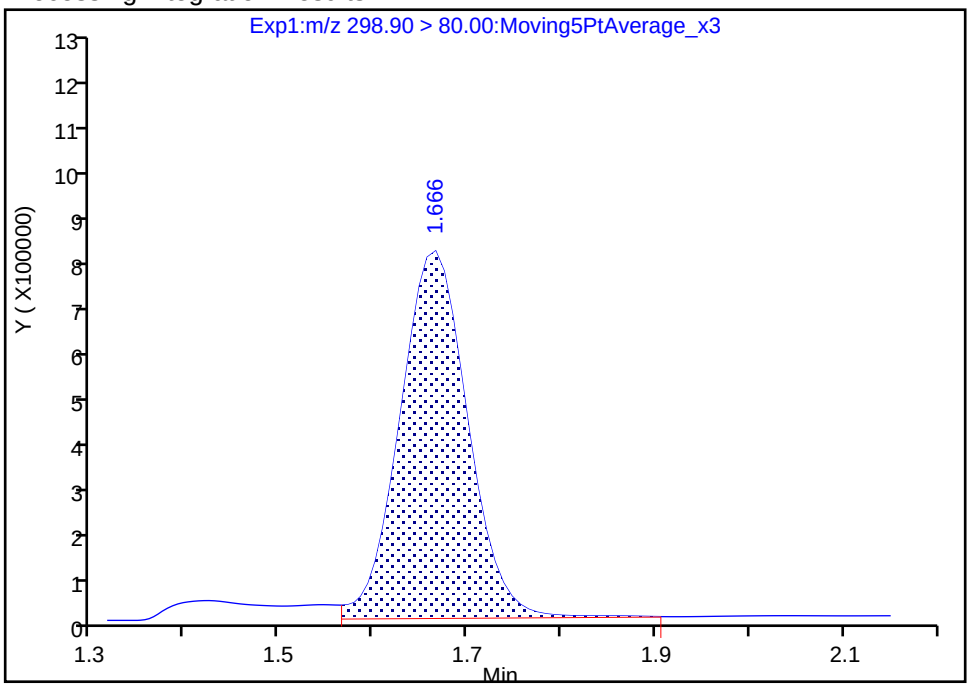
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_062.d				
Injection Date:	29-Jul-2018 07:48:25	Instrument ID:	A8_N		
Lims ID:	320-41333-A-17-A	Lab Sample ID:	320-41333-17		
Client ID:	MW-GRE08-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	50	Worklist Smp#:	23
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

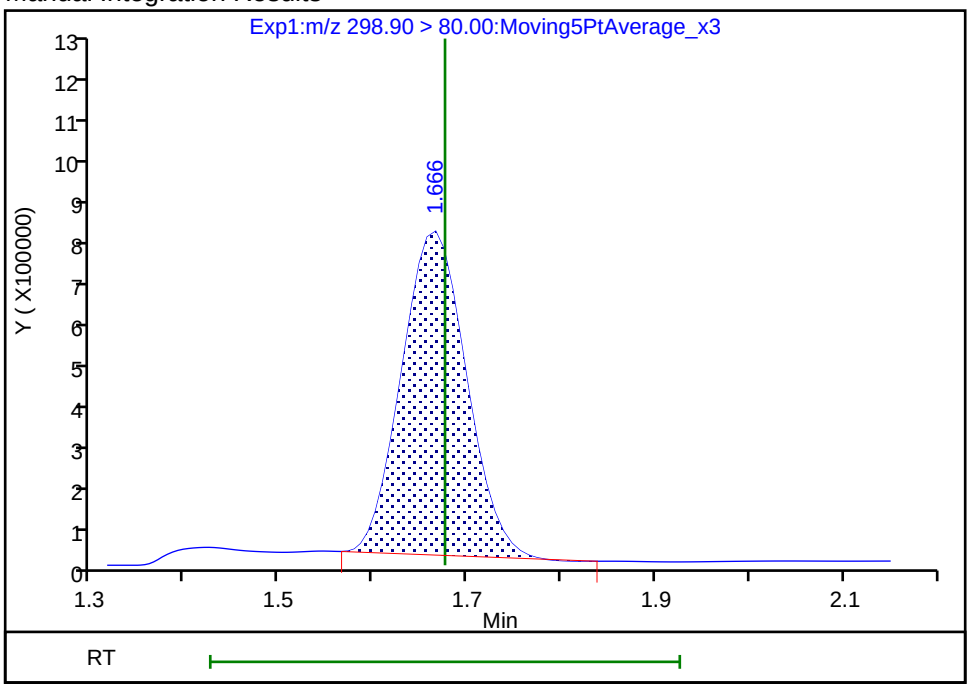
Processing Integration Results

RT: 1.67
Area: 3814227
Amount: 1.525975
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 3544772
Amount: 1.418173
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:37:42

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

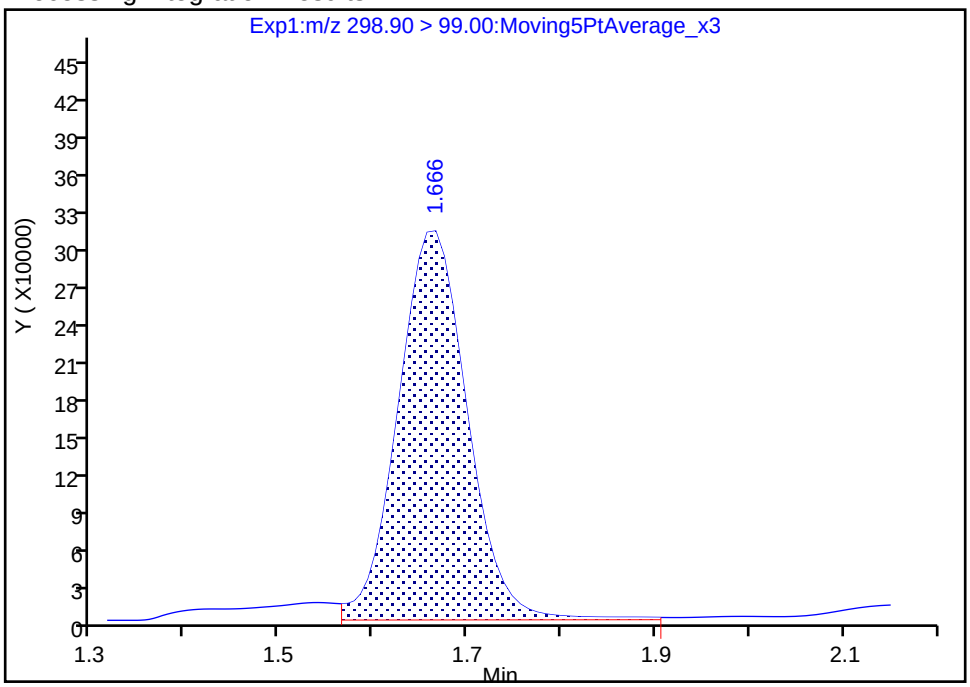
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_062.d				
Injection Date:	29-Jul-2018 07:48:25	Instrument ID:	A8_N		
Lims ID:	320-41333-A-17-A	Lab Sample ID:	320-41333-17		
Client ID:	MW-GRE08-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	50	Worklist Smp#:	23
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

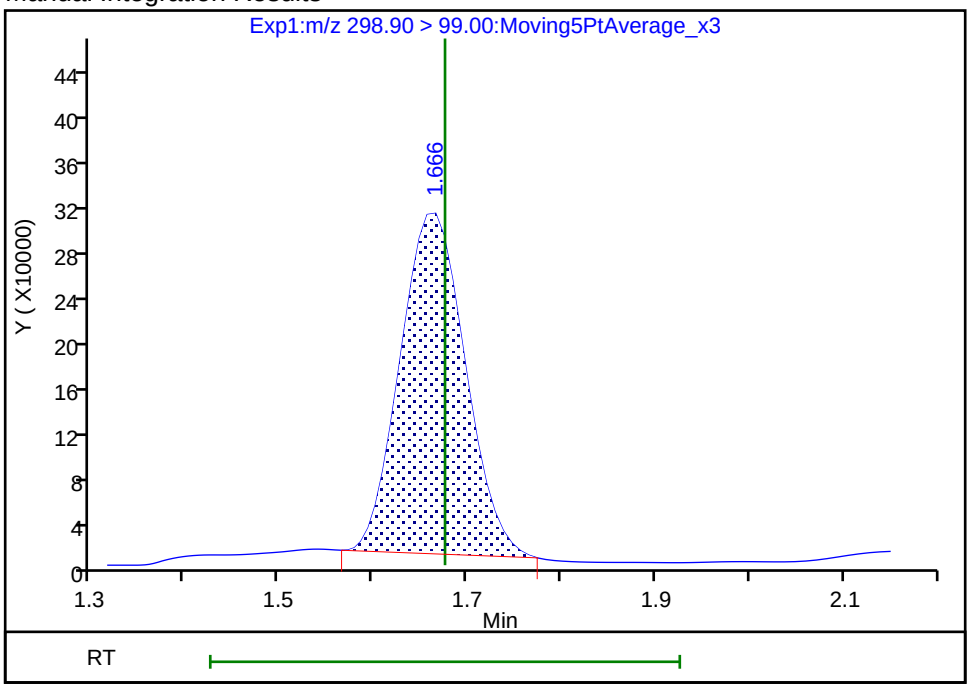
Processing Integration Results

RT: 1.67
Area: 1604430
Amount: 1.525975
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 1463339
Amount: 1.418173
Amount Units: ng/ml



Reviewer: mongkols, 31-Jul-2018 12:37:45

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: MW-GRE08-01-01 DL | Lab Sample ID: 320-41333-17 DL

Matrix: Water | Lab File ID: 2018.08.03LLA_032.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/19/2018 14:35

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 314.8(mL) | Date Analyzed: 08/03/2018 08:53

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237784 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*14*	*D*	*7.9*	6.0	*2.4*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*18*	*D M*	*7.9*	6.0	*2.1*
375-95-1	*Perfluorononanoic acid (PFNA)*	*6.0*	*U*	*7.9*	6.0	*2.1*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*48*	*D M*	*7.9*	4.0	*1.8*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*160*	*D*	*7.9*	4.0	*1.5*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	600	D	16	12	4.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	51		50-150
STL01892	13C4-PFHpA	60		50-150
STL00990	13C4 PFOA	62		50-150
STL00995	13C5 PFNA	60		50-150
STL00994	18O2 PFHxS	58		50-150
STL00991	13C4 PFOS	52		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_032.d
Lims ID: 320-41333-A-17-A
Client ID: MW-GRE08-01-01
Sample Type: Client
Inject. Date: 03-Aug-2018 08:53:10 ALS Bottle#: 37 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 5.0000
Sample Info: 320-41333-a-17-a 5X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:30:11 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:30:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 13C3-PFBS										
301.90 > 83.00	1.712	1.690	0.022	0.649	14088	0.2390		51.4	36.1	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.712	1.702	0.010	1.000	694700	0.2992			189	M
298.90 > 99.00	1.712	1.702	0.010	1.000	313078		2.22(1.25-3.74)		310	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.281	2.251	0.030	0.865	648595	0.3016		60.3	18077	
D 11 18O2 PFHxS										
403.00 > 84.00	2.295	2.264	0.030	0.870	889780	0.2754		58.2	21084	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.281	2.267	0.014	1.000	134913	0.0897			52.8	
363.00 > 169.00	2.281	2.267	0.014	1.000	54736		2.46(1.13-3.40)		635	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.295	2.280	0.014	1.000	2234911	1.03			2385	
399.00 > 99.00	2.295	2.280	0.014	1.000	741879		3.01(1.50-4.49)		1253	
D 14 13C4 PFOA										
417.00 > 372.00	2.637	2.602	0.035	1.000	645000	0.3107		62.1	21804	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.637	2.619	0.018	1.000	169189	0.1134			71.1	M
413.00 > 169.00	2.637	2.619	0.018	1.000	93268		1.81(0.84-2.52)		601	
* 62 13C2-PFOA										s
415.00 > 370.00	2.637	2.619	0.018		1081296	0.5000			31576	
D 19 13C5 PFNA										
468.00 > 423.00	3.002	2.964	0.038	1.138	542783	0.3001		60.0	28246	
D 18 13C4 PFOS										
503.00 > 80.00	3.002	2.964	0.038	1.138	559249	0.2506		52.4	10529	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.885	2.980	-0.095	0.961	4956669	3.77			21502	
499.00 > 99.00	3.002	2.980	0.022	1.000	1071065		4.63(2.31-6.93)		7921	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluorononanoic acid										
463.00 > 419.00	3.016	2.980	0.036	1.005	6369	0.005433			15.5	
463.00 > 169.00	3.002	2.980	0.022	1.000	1793		3.55(1.90-5.69)		75.8	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

Review Flags

M - Manually Integrated

Report Date: 06-Aug-2018 11:30:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_032.d

Injection Date: 03-Aug-2018 08:53:10 Instrument ID: A8_N

Lims ID: 320-41333-A-17-A Lab Sample ID: 320-41333-17

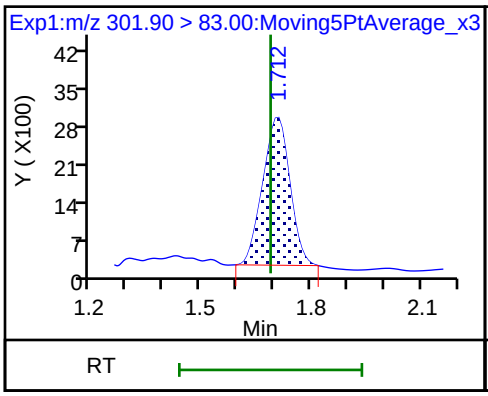
Client ID: MW-GRE08-01-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 37 Worklist Smp#: 21

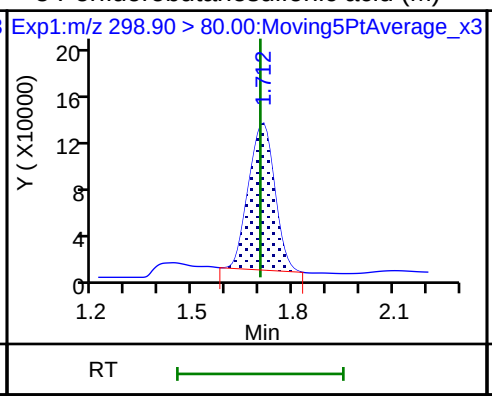
Injection Vol: 2.0 ul Dil. Factor: 5.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

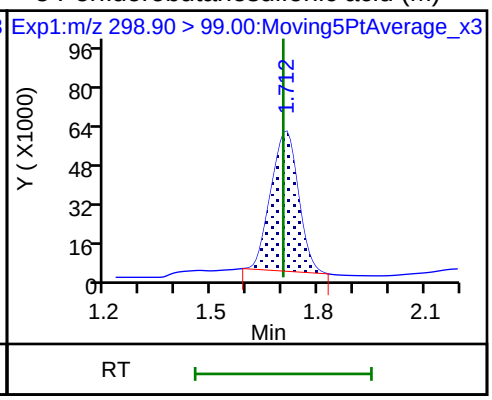
D 47 13C3-PFBS



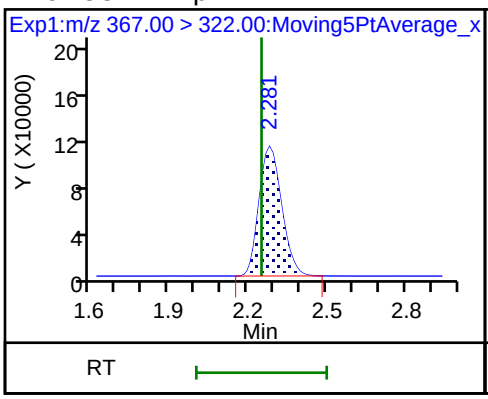
5 Perfluorobutanesulfonic acid (M)



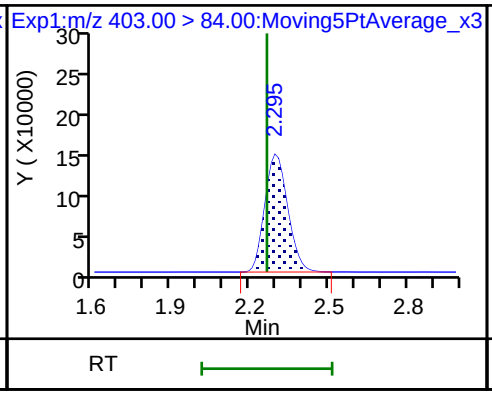
5 Perfluorobutanesulfonic acid (M)



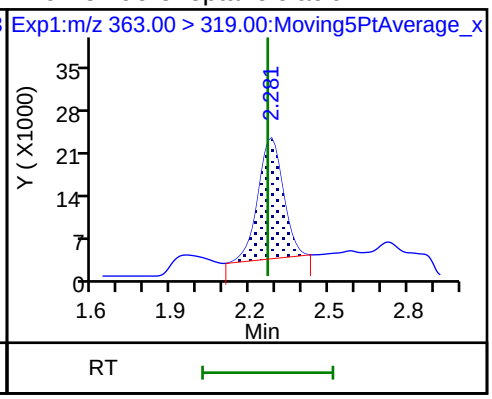
D 9 13C4-PFHpA



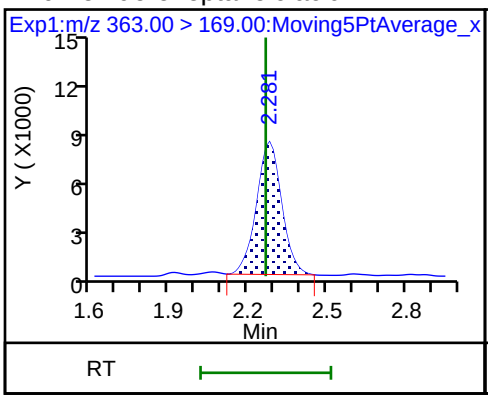
D 11 18O2 PFHxS



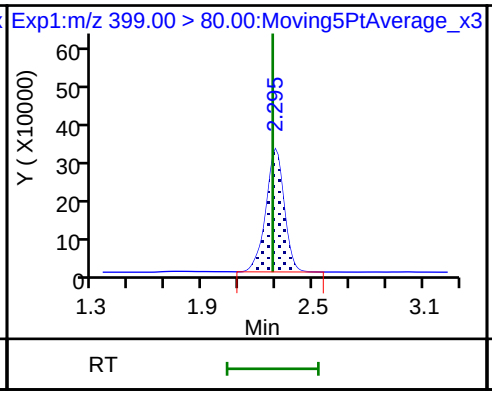
10 Perfluoroheptanoic acid



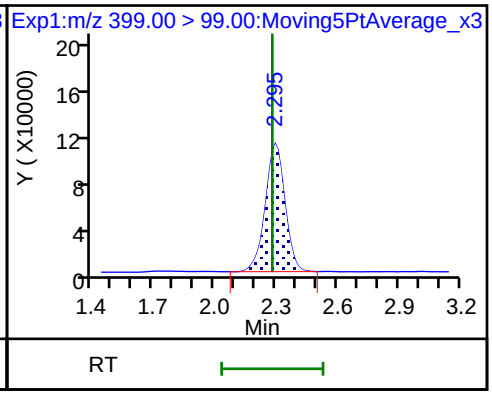
10 Perfluoroheptanoic acid



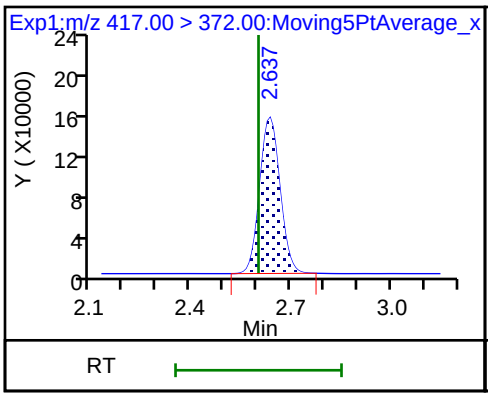
8 Perfluorohexanesulfonic acid



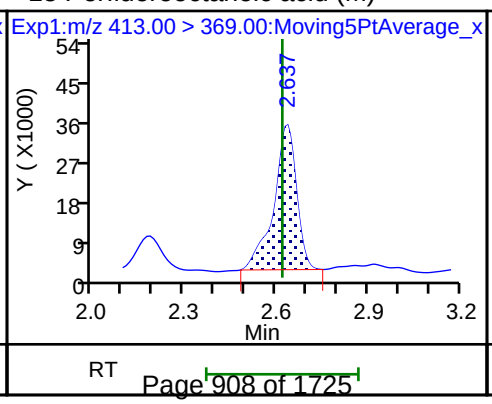
8 Perfluorohexanesulfonic acid



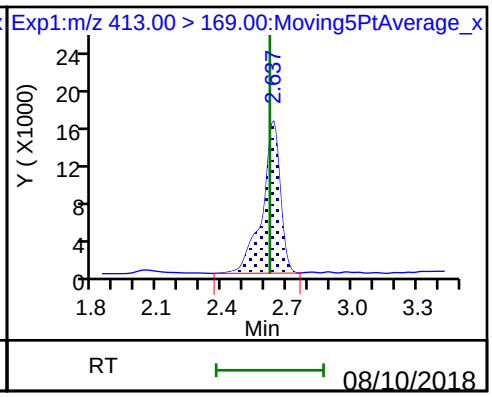
D 14 13C4 PFOA



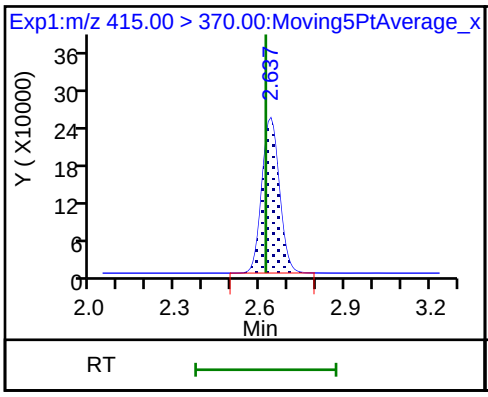
15 Perfluorooctanoic acid (M)



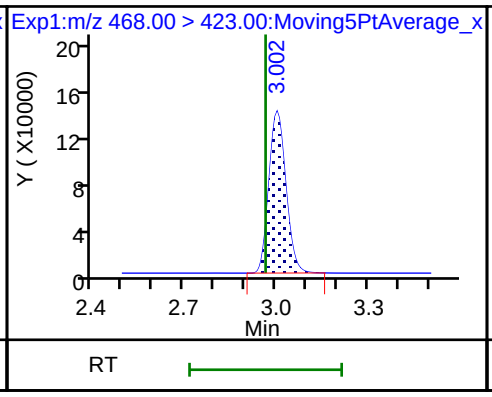
15 Perfluorooctanoic acid



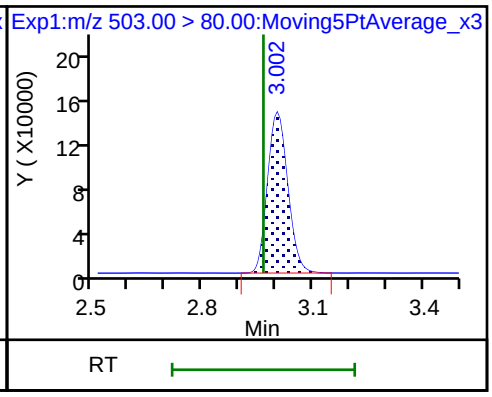
* 62 13C2-PFOA



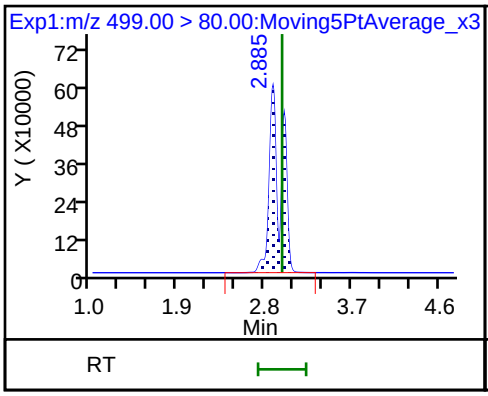
D 19 13C5 PFNA



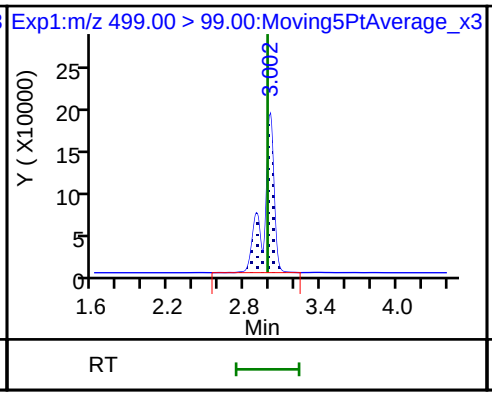
D 18 13C4 PFOS



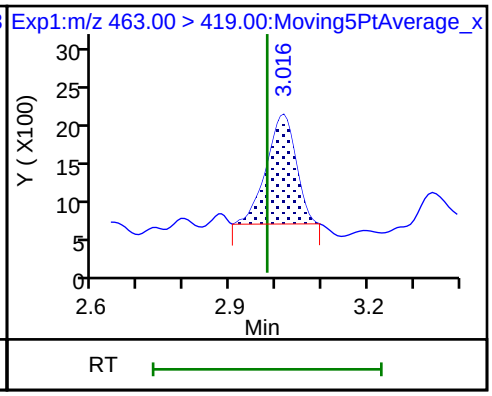
17 Perfluorooctane sulfonic acid



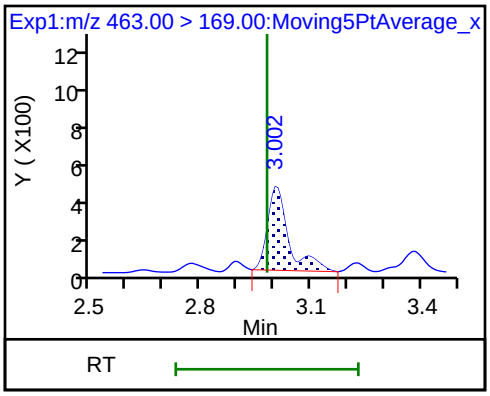
17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



20 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

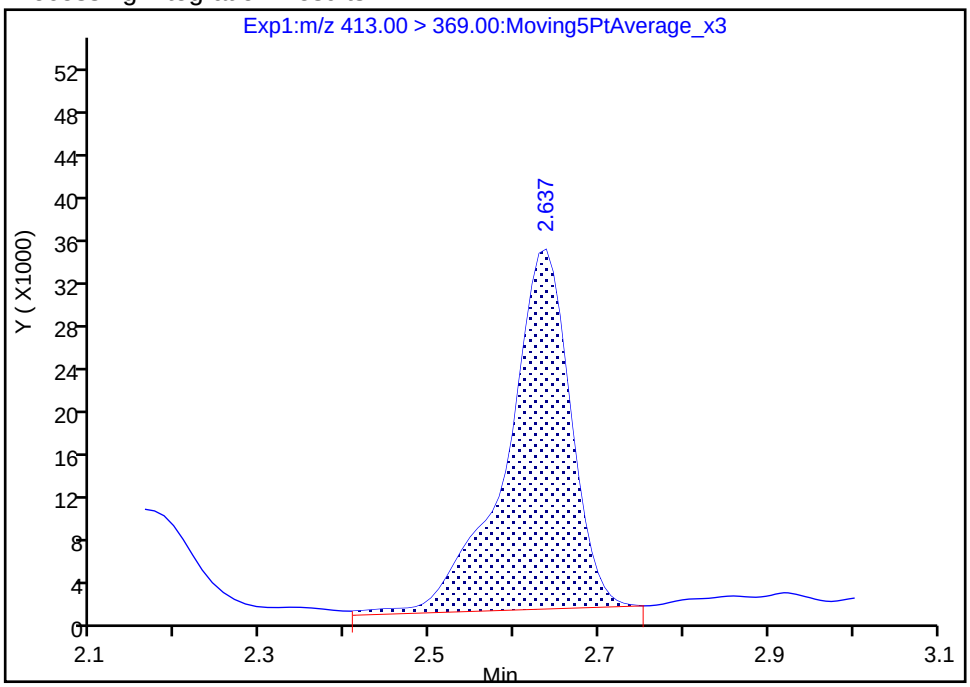
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_032.d				
Injection Date:	03-Aug-2018 08:53:10	Instrument ID:	A8_N		
Lims ID:	320-41333-A-17-A	Lab Sample ID:	320-41333-17		
Client ID:	MW-GRE08-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	37	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

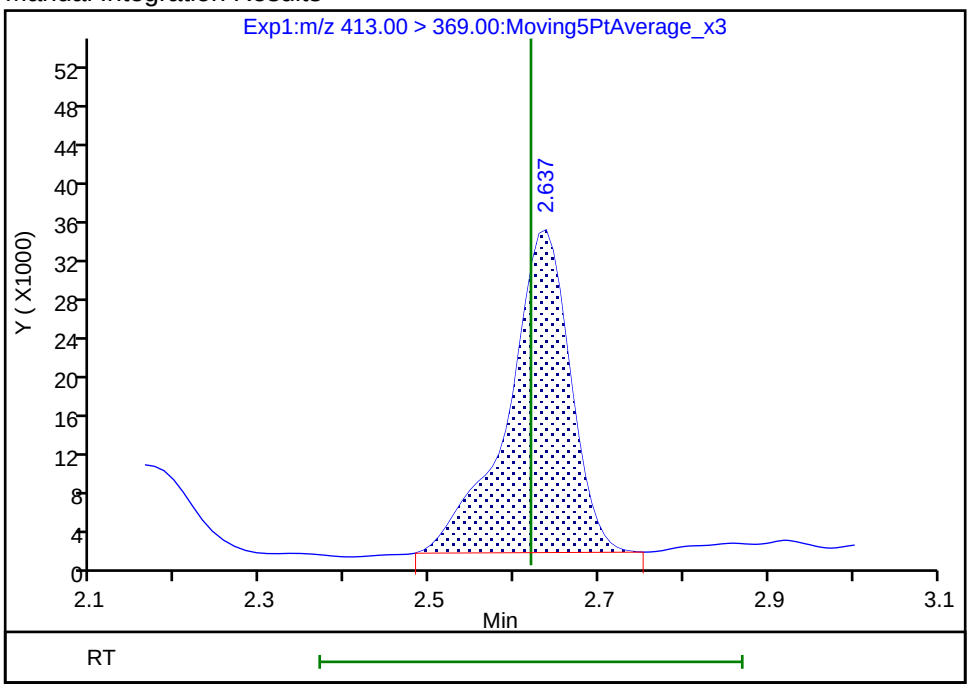
Processing Integration Results

RT: 2.64
Area: 175894
Amount: 0.117931
Amount Units: ng/ml



Manual Integration Results

RT: 2.64
Area: 169189
Amount: 0.113436
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:30:06

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

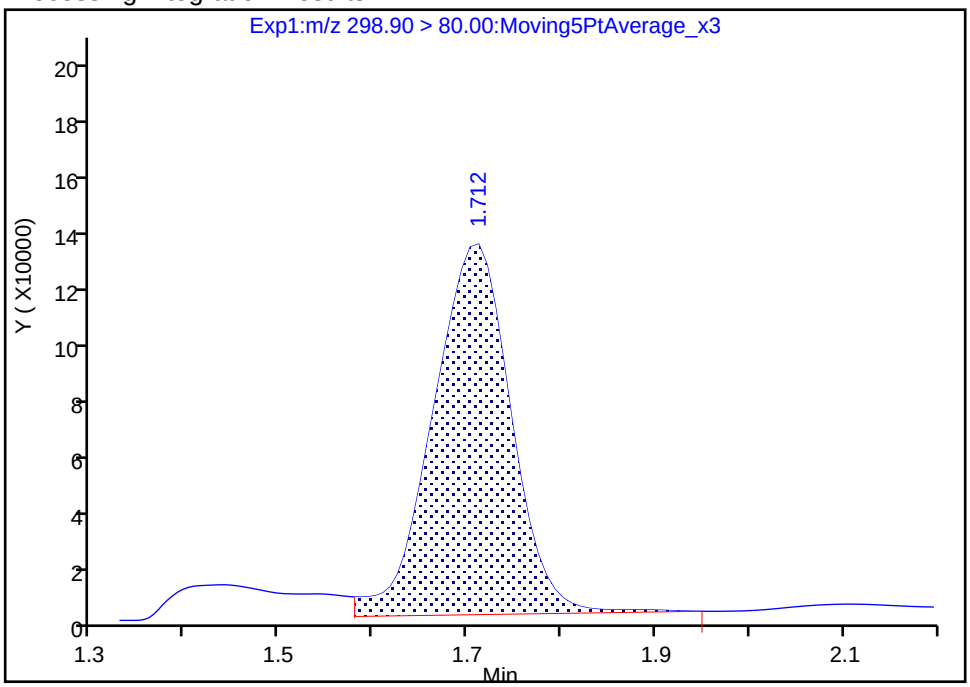
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_032.d				
Injection Date:	03-Aug-2018 08:53:10	Instrument ID:	A8_N		
Lims ID:	320-41333-A-17-A	Lab Sample ID:	320-41333-17		
Client ID:	MW-GRE08-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	37	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

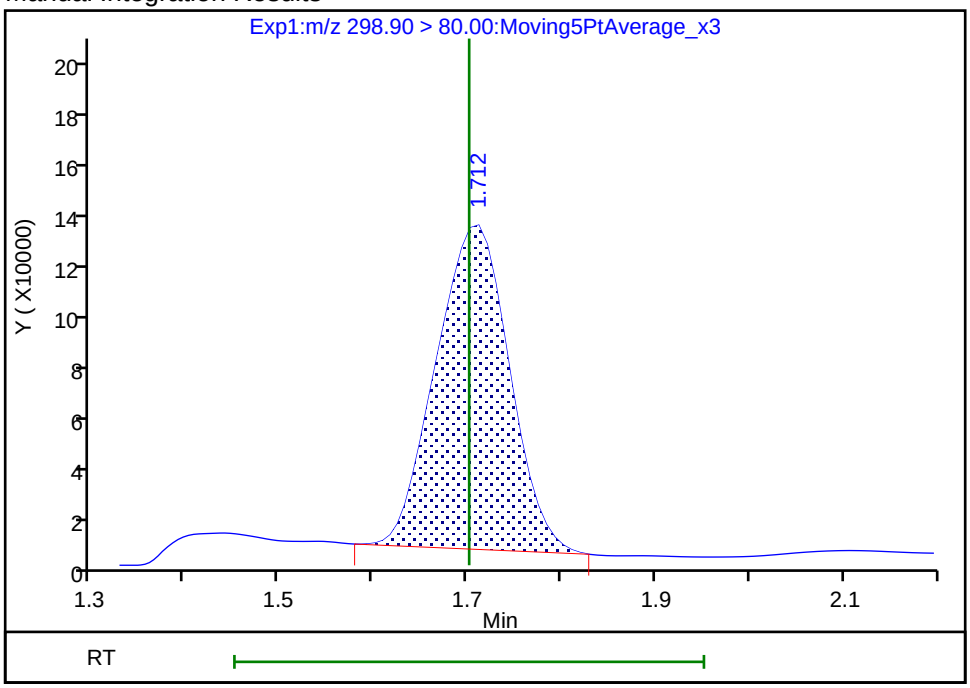
Processing Integration Results

RT: 1.71
Area: 764782
Amount: 0.329336
Amount Units: ng/ml



Manual Integration Results

RT: 1.71
Area: 694700
Amount: 0.299156
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:29:56

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

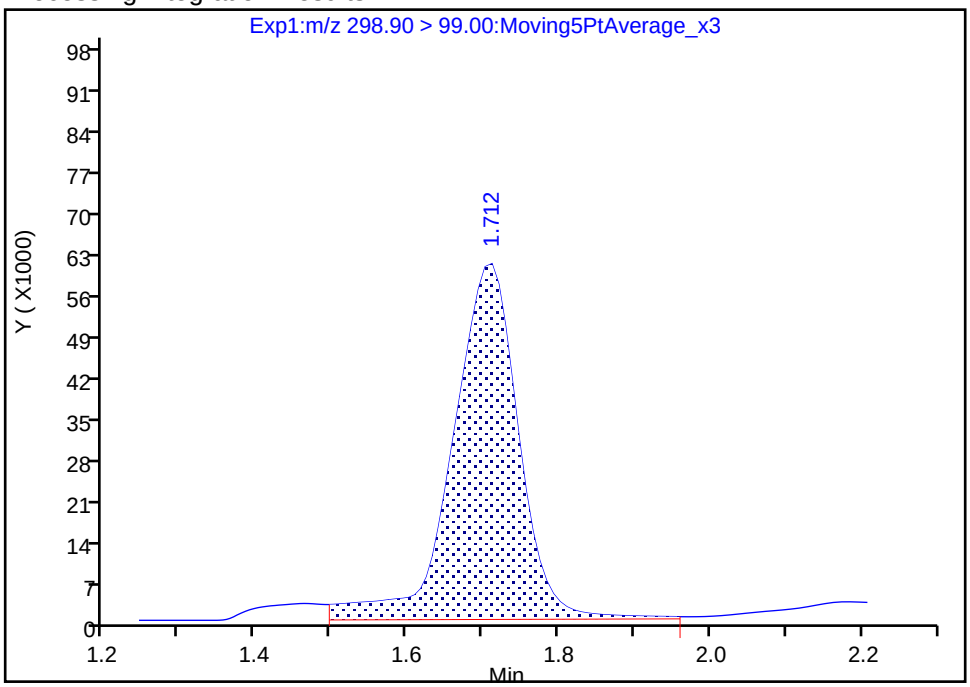
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_032.d				
Injection Date:	03-Aug-2018 08:53:10	Instrument ID:	A8_N		
Lims ID:	320-41333-A-17-A	Lab Sample ID:	320-41333-17		
Client ID:	MW-GRE08-01-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	37	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

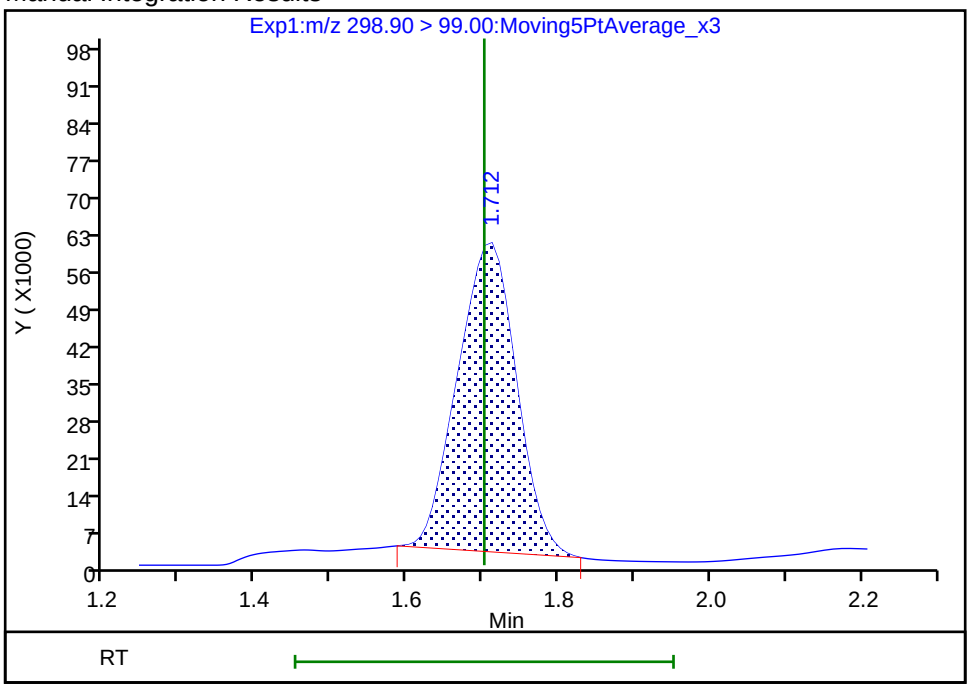
Processing Integration Results

RT: 1.71
Area: 368860
Amount: 0.329336
Amount Units: ng/ml



Manual Integration Results

RT: 1.71
Area: 313078
Amount: 0.299156
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:29:58

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235668/2	2018.07.23LLICAL_002.d
Level 2	IC 320-235668/3	2018.07.23LLICAL_003.d
Level 3	IC 320-235668/4	2018.07.23LLICAL_004.d
Level 4	IC 320-235668/5	2018.07.23LLICAL_005.d
Level 5	IC 320-235668/6	2018.07.23LLICAL_006.d
Level 6	IC 320-235668/7	2018.07.23LLICAL_007.d
Level 7	IC 320-235668/8	2018.07.23LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.0265 0.9920	0.9875 0.9901	0.9536	0.9563	0.9734	AveID		0.9828				2.5		20.0			
Perfluoropentanoic acid (PFPeA)	1.2079 1.1789	1.1940 1.1932	1.1912	1.2040	1.2093	AveID		1.1969				0.9		20.0			
Perfluorobutanesulfonic acid (PFBS)	83.431 77.020	81.651 72.890	80.321	79.939	80.500	AveID		79.393				4.4		20.0			
4:2 FTS	16.911 16.753	17.596 15.492	18.341	17.801	16.767	AveID		17.094				5.4		20.0			
Perfluorohexanoic acid (PFHxA)	1.1014 1.0539	1.0639 1.0384	1.0593	1.0478	1.0548	AveID		1.0599				1.9		20.0			
Perfluoropentanesulfonic acid	67.681 72.473	72.659 67.397	73.502	72.475	72.474	AveID		71.237				3.6		20.0			
Perfluoroheptanoic acid (PFHpA)	1.1475 1.1249	1.0523 1.0985	1.0603	1.1039	1.1303	AveID		1.1025				3.2		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.4765 1.0955	1.1791 1.1157	1.0860	1.1062	1.1077	AveID		1.1667				12.0		20.0			
6:2 FTS	1.7755 1.6421	1.7400 1.7400	1.6589	1.5412	1.7112	AveID		1.6870				4.7		20.0			
Perfluorooctanoic acid (PFOA)	1.3741 1.1910	1.2895 1.1394	1.0998	1.2051	1.1966	AveID		1.2136				7.6		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.3197 1.4411	1.3416 1.3785	1.3970	1.3701	1.4351	AveID		1.3833				3.3		20.0			
Perfluorononanoic acid (PFNA)	+++++ 1.0731	1.3946 1.0461	1.1326	1.0723	1.1318	AveID		1.1417				11.3		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.1335 1.1190	1.0783 1.1558	1.0889	1.0446	1.1147	AveID		1.1050				3.4		20.0			
8:2 FTS	1.3664 1.3555	1.2998 1.3634	1.3670	1.4096	1.3283	AveID		1.3557				2.5		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorononanesulfonic acid	0.6786 0.7824	0.7630 0.7859	0.7318	0.7395	0.7469	AveID		0.7469				4.9		20.0			
Perfluorodecanoic acid (PFDA)	1.1088 1.0114	0.8957 1.0872	1.0127	1.0350	1.0483	AveID		1.0284				6.7		20.0			
Perfluorooctane Sulfonamide (PFOSA)	0.9847 1.0176	1.0027 0.9411	0.9906	0.9943	1.0305	AveID		0.9945				2.9		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9097 0.9476	1.0940 1.0143	1.0304	0.9413	0.9614	AveID		0.9855				6.5		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6438 0.6747	0.6535 0.6825	0.6779	0.6334	0.6763	AveID		0.6631				2.9		20.0			
Perfluoroundecanoic acid (PFUnA)	+++++ 1.1692	1.5126 1.1605	1.2514	1.1602	1.1914	AveID		1.2409				11.1		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.1271 0.9178	0.8549 0.9575	0.9399	0.8420	0.8915	AveID		0.9329				10.2		20.0			
Perfluorododecanoic acid (PFDoA)	1.0991 1.0769	1.1579 1.0444	1.0985	1.0119	1.0849	AveID		1.0819				4.2		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.1585 0.9890	1.0710 1.0152	1.0201	1.0076	1.0911	AveID		1.0504				5.7		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.2505 0.2397	0.2677 0.2500	0.2342	0.2531	0.2598	AveID		0.2507				4.5		20.0			
13C4 PFBA	1.1051 1.2231	1.0960 1.2942	1.1063	1.1386	1.1513	Ave		1.1592				6.3		20.0			
13C5-PFPeA	0.7723 0.8312	0.7876 0.8762	0.8003	0.8050	0.7924	Ave		0.8093				4.3		20.0			
13C3-PFBS	0.0200 0.0228	0.0194 0.0244	0.0197	0.0210	0.0211	Ave		0.0212				8.5		20.0			
13C2 PFHxA	0.9136 0.9772	0.9227 1.0086	0.9254	0.9570	0.9384	Ave		0.9490				3.6		20.0			
13C4-PFHpA	0.9631 1.0016	0.9569 1.0210	0.9633	1.0079	0.9314	Ave		0.9779				3.3		20.0			
18O2 PFHxS	1.1688 1.3497	1.2292 1.4057	1.1928	1.2253	1.2213	Ave		1.2561				6.9		20.0			
M2-6:2FTS	0.2720 0.2756	0.2657 0.2599	0.2687	0.2943	0.2751	Ave		0.2731				4.0		20.0			
13C4 PFOA	0.9768 0.9582	0.9161 0.9783	0.9698	0.9475	0.9497	Ave		0.9566				2.3		20.0			
13C4 PFOS	0.8262 0.9163	0.8292 0.9665	0.8163	0.8943	0.8653	Ave		0.8734				6.3		20.0			
13C5 PFNA	0.7894 0.8514	0.8140 0.8560	0.8298	0.8437	0.7908	Ave		0.8250				3.4		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.3008 0.2688	0.2888 0.2595	0.3051	0.2955	0.2749	Ave		0.2848				6.1		20.0			
13C2 PFDA	0.6604 0.6734	0.6563 0.6259	0.6712	0.6856	0.6225	Ave		0.6565				3.7		20.0			
13C8 FOSA	1.2353 1.2893	1.2357 1.3210	1.2990	1.3106	1.2893	Ave		1.2829				2.7		20.0			
d3-NMeFOSAA	0.1972 0.2349	0.1976 0.2453	0.2108	0.2158	0.2168	Ave		0.2169				8.3		20.0			
d5-NEtFOSAA	0.2189 0.2306	0.2373 0.2288	0.2229	0.2368	0.2205	Ave		0.2280				3.3		20.0			
13C2 PFUnA	0.5264 0.5370	0.5270 0.5213	0.5324	0.5419	0.5151	Ave		0.5287				1.7		20.0			
13C2 PFDoA	0.4856 0.5391	0.4844 0.5407	0.4819	0.5022	0.4845	Ave		0.5026				5.2		20.0			
13C2-PFTeDA	0.4831 0.5125	0.4791 0.5489	0.4793	0.4756	0.4582	Ave		0.4910				6.1		20.0			
13C2-PFHxDA	0.7075 0.7629	0.7636 0.8003	0.7411	0.7454	0.6972	Ave		0.7454				4.7		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235668/2	2018.07.23LLICAL_002.d
Level 2	IC 320-235668/3	2018.07.23LLICAL_003.d
Level 3	IC 320-235668/4	2018.07.23LLICAL_004.d
Level 4	IC 320-235668/5	2018.07.23LLICAL_005.d
Level 5	IC 320-235668/6	2018.07.23LLICAL_006.d
Level 6	IC 320-235668/7	2018.07.23LLICAL_007.d
Level 7	IC 320-235668/8	2018.07.23LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	54662 9835771	100865 19339074	486511	1945262	4994634	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	44952 7944127	87632 15779261	439647	1731603	4270245	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	71164 12610058	130817 23700645	645045	2656453	6706119	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	15240 2898055	29786 5322216	155620	625017	1475833	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	48485 8348472	91488 15806374	452104	1791310	4411390	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	61256 12590452	123522 23253305	626336	2555539	6406319	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	53249 9133436	93835 16928139	471040	1987683	4691766	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	75675 10907663	122912 21540736	543653	2203602	5486367	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	22058 3478669	40852 6471554	194902	768241	1989042	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	64738 9261268	110203 16840284	492381	2041845	5069253	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	50018 10191534	98701 19142608	500662	2083941	5268243	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	+++++ 7406073	105791 13514816	433434	1616264	3988453	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	41880 7714043	77331 15645792	380417	1548724	3988913	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
8:2 FTS		AveID	18973 2829685	33518 5115198	184284	712803	1558921	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorononanesulfonic acid		AveID	25937 5579385	56605 11005221	264461	1134203	2765045	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorodecanoic acid (PFDA)		AveID	35287 5521565	54779 10269789	313494	1267791	2908266	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (PFOSA)		AveID	58617 10636117	115476 18761965	593444	2328173	5920977	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	8643 1804771	20149 3756042	100194	362883	928849	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	24709 4831368	48680 9597480	246002	975593	2513855	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	+++++ 5089468	74289 9129849	307287	1123256	2735087	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	11889 1715766	18908 3306623	96639	356256	875971	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	25717 4706732	52266 8523366	244107	907939	2342729	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	27107 4322525	48345 8285433	226682	904085	2356193	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	5830 995775	11951 2071202	51758	215092	530481	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5325082 4957611	5106874 4883197	5102046	5085441	5130909	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	3721474 3369200	3669835 3306163	3690862	3595441	3531229	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	89735 86122	84276 85519	84487	87401	87641	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4402181 3960776	4299501 3805574	4267996	4274151	4182069	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4640614 4059821	4458677 3852411	4442605	4501447	4150778	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5328016 5175462	5418231 5017633	5203959	5177221	5148729	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	1244953 1061423	1176358 931806	1177369	1248833	1164838	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	4706753 3884099	4268865 3691370	4472663	4231778	4232198	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3806094 3550779	3693870 3486265	3598957	3818414	3686425	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3803819 3450868	3792873 3229889	3826960	3768250	3524069	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1388549 1043782	1289313 937942	1348095	1264179	1173584	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C2 PFDA	13PF OA	Ave	3182411 2729607	3057920 2361487	3095634	3062260	2774374	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C8 FOSA	13PF OA	Ave	5952607 5225954	5758066 4984298	5990646	5853618	5745909	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	950145 952316	920862 925765	972395	963774	966156	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1054820 934717	1105917 863349	1028200	1057814	982550	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2536362 2176487	2455718 1966864	2455525	2420418	2295730	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2339777 2185359	2256995 2040247	2222244	2243127	2159403	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	2327660 2077317	2232553 2071078	2210453	2124401	2042126	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	3409061 3092486	3557979 3019605	3417814	3329175	3106916	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235668/2	2018.07.23LLICAL_002.d
Level 2	IC 320-235668/3	2018.07.23LLICAL_003.d
Level 3	IC 320-235668/4	2018.07.23LLICAL_004.d
Level 4	IC 320-235668/5	2018.07.23LLICAL_005.d
Level 5	IC 320-235668/6	2018.07.23LLICAL_006.d
Level 6	IC 320-235668/7	2018.07.23LLICAL_007.d
Level 7	IC 320-235668/8	2018.07.23LLICAL_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	4.4 0.7	0.5	-3.0	-2.7	-0.9	0.9	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	0.9 -0.3	-0.2	-0.5	0.6	1.0	-1.5	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	5.1 -8.2	2.8	1.2	0.7	1.4	-3.0	30 30	30	30	30	30	30
4:2 FTS	-1.1 -9.4	2.9	7.3	4.1	-1.9	-2.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	3.9 -2.0	0.4	-0.1	-1.1	-0.5	-0.6	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-5.0 -5.4	2.0	3.2	1.7	1.7	1.7	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	4.1 -0.4	-4.6	-3.8	0.1	2.5	2.0	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	26.6 -4.4	1.1	-6.9	-5.2	-5.1	-6.1	30 30	30	30	30	30	30
6:2 FTS	5.2 3.1	3.1	-1.7	-8.6	1.4	-2.7	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	13.2 -6.1	6.3	-9.4	-0.7	-1.4	-1.9	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-4.6 -0.3	-3.0	1.0	-1.0	3.7	4.2	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	+++++ -8.4	22.1	-0.8	-6.1	-0.9	-6.0	 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	2.6 4.6	-2.4	-1.5	-5.5	0.9	1.3	30 30	30	30	30	30	30
8:2 FTS	0.8 0.6	-4.1	0.8	4.0	-2.0	0.0	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-9.1 5.2	2.2	-2.0	-1.0	0.0	4.8	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 235668

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/23/2018 16:11 Calibration End Date: 07/23/2018 16:58 Calibration ID: 40279

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorodecanoic acid (PFDA)	7.8 5.7	-12.9	-1.5	0.6	1.9	-1.7	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (PFOSA)	-1.0 -5.4	0.8	-0.4	0.0	3.6	2.3	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-7.7 2.9	11.0	4.6	-4.5	-2.4	-3.9	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-2.9 2.9	-1.5	2.2	-4.5	2.0	1.7	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	+++++ -6.5	21.9	0.8	-6.5	-4.0	-5.8	 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	20.8 2.6	-8.4	0.7	-9.8	-4.4	-1.6	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	1.6 -3.5	7.0	1.5	-6.5	0.3	-0.5	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	10.3 -3.3	2.0	-2.9	-4.1	3.9	-5.8	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	-0.1 -0.3	6.8	-6.6	1.0	3.6	-4.4	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 23-Jul-2018 16:11:19 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:14 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:45:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.402	1.398	0.004	0.542	5325082	2.38		95.3	109513	
2 Perfluorobutyric acid										
212.90 > 169.00	1.402	1.399	0.003	1.000	54662	0.0261		104	24.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.638	0.002	0.634	3721474	2.39		95.4	63670	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.640	1.639	0.001	1.000	44952	0.0252		101	19.8	M
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.670	0.005	0.647	89735	2.19		94.3	568	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.672	0.003	1.000	71164	0.0232		105	21.3	
298.90 > 99.00	1.675	1.672	0.003	1.000	28574		2.49(1.25-3.74)	105	19.0	
D 60 M2-4:2FTS										
329.00 > 81.00	1.885	1.877	0.008	0.728	645077	NC			7725	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.885	1.878	0.007	1.126	15240	0.0231		98.9	935	
D 7 13C2 PFHxA										
315.00 > 270.00	1.916	1.909	0.007	0.740	4402181	2.41		96.3	85678	
6 Perfluorohexanoic acid										RM
313.00 > 269.00	1.916	1.909	0.007	1.000	48485	0.0260		104	107	RM
313.00 > 119.00	1.916	1.909	0.007	1.000	2434		19.92(5.03-15.10)	104	41.2	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.938	1.931	0.007	1.157	61256	0.0223		95.0	1073	
349.00 > 99.00	1.938	1.931	0.007	1.157	21705		2.82(1.36-4.07)	95.0	272	
67 Perfluoro(2-propoxypropanoic) acid										M
329.10 > 285.00	2.014	2.006	0.008	1.000	7239	NC			27.0	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.007	0.007	0.778	233454	NC			8029	
D 9 13C4-PFHpA										
367.00 > 322.00	2.241	2.230	0.011	0.866	4640614	2.46		98.5	60207	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.241	2.230	0.011	1.000	53249	0.0260		104	66.8	
363.00 > 169.00	2.241	2.230	0.011	1.000	20753		2.57(1.13-3.40)	104	301	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.254	2.243	0.011	1.000	75675	0.0288		127	186	
399.00 > 99.00	2.254	2.243	0.011	1.000	23846		3.17(1.50-4.49)	127	78.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.254	2.246	0.008	0.871	5328016	2.20		93.1	52162	
65 ADONA										
377.00 > 251.00	2.280	2.272	0.008	0.772	124416	NC			1746	
377.00 > 85.00	2.280	2.272	0.008	0.772	80059		1.55(0.84-2.53)		450	
D 12 M2-6:2FTS										
429.00 > 81.00	2.565	2.559	0.005	0.991	1244953	2.37		99.6	16206	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.565	2.559	0.005	1.000	22058	0.0249		105	276	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.585	0.003	1.000	4706753	2.55		102	56843	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.585	0.003		4818596	2.50			57560	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.586	0.002	1.000	64738	0.0283		113	54.1	
413.00 > 169.00	2.588	2.586	0.002	1.000	34186		1.89(0.84-2.52)	113	173	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.596	2.591	0.005	0.879	50018	0.0227		95.4	883	
449.00 > 99.00	2.596	2.591	0.005	0.879	12848		3.89(1.94-5.82)	95.4	224	
D 18 13C4 PFOS										
503.00 > 80.00	2.954	2.949	0.005	1.141	3806094	2.26		94.6	37526	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.954	2.949	0.005	1.000	41880	0.0238		103	413	
499.00 > 99.00	2.954	2.949	0.005	1.000	12223		3.43(2.31-6.93)	103	127	
D 19 13C5 PFNA										
468.00 > 423.00	2.954	2.950	0.004	1.141	3803819	2.39		95.7	68318	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.960	2.950	0.010	1.002	67521	0.0389		155	151	M
463.00 > 169.00	2.960	2.950	0.010	1.002	14385		4.69(1.90-5.69)	155	310	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.161	0.003	1.071	67252	NC			1002	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.296	0.003	1.275	1388549	2.53		106	18857	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.307	3.297	0.010	1.002	18973	0.0241		101	924	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.307	3.299	0.008	1.120	25937	0.0218		90.9	913	
549.00 > 99.00	3.299	3.299	0.0	1.117	10655		2.43(1.33-3.97)	90.9	172	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.315	3.309	0.006	1.281	3182411	2.52		101	64706	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.315	3.309	0.006	1.000	35287	0.0270		108	121	
513.00 > 169.00	3.315	3.309	0.006	1.000	6252		5.64(2.36-7.09)	108	156	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.311	0.004	1.281	5952607	2.41		96.3	68773	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.314	0.001	1.000	58617	0.0248		99.0	1455	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.468	3.462	0.006	1.340	950145	2.27		90.9	34893	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.468	3.468	0.0	1.000	8643	0.0231		92.3	80.4	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.631	3.625	0.006	1.229	24709	0.0234		97.1	878	
599.00 > 99.00	3.631	3.625	0.006	1.229	8995		2.75(1.39-4.16)	97.1	213	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.641	3.635	0.006	1.406	1054820	2.40		96.0	3175	
D 30 13C2 PFUnA										
565.00 > 520.00	3.641	3.638	0.003	1.406	2536362	2.49		99.6	44916	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.641	3.638	0.003	1.000	44361	0.0352		141	131	
563.00 > 169.00	3.641	3.638	0.003	1.000	8518		5.21(2.12-6.36)	141	68.3	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.650	3.639	0.011	1.003	11889	0.0302		121	173	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.806	3.800	0.006	1.288	98527	NC			1570	
D 36 13C2 PFDoA										
615.00 > 570.00	3.941	3.934	0.007	1.523	2339777	2.42		96.6	24670	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.941	3.934	0.007	1.000	25717	0.0254		102	8.1	
613.00 > 169.00	3.931	3.934	-0.003	0.997	6884		3.74(2.13-6.40)	102	114	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.204	4.198	0.006	1.067	27107	0.0276		110	9.4	
663.00 > 169.00	4.204	4.198	0.006	1.067	8378		3.24(1.25-3.76)	110	120	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.433	-0.006	0.998	5830	0.0250		99.9	74.3	
713.00 > 219.00	4.427	4.433	-0.006	0.998	6134		0.95(0.71-2.13)	99.9	98.6	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.438	4.435	0.003	1.714	2327660	2.46		98.4	14703	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.843	4.840	0.003	1.871	3409061	2.37		94.9	10896	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.843	4.840	0.003	1.000	64391	NC			10.3	
813.00 > 169.00	4.843	4.840	0.003	1.000	10137		6.35(2.86-8.58)		118	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.182	5.184	-0.002	1.070	37760	NC			8.5	
913.00 > 169.00	5.189	5.184	0.005	1.072	5340		7.07(3.83-11.48)		85.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:19 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d

Injection Date: 23-Jul-2018 16:11:19 Instrument ID: A8_N

Lims ID: IC L1 Full

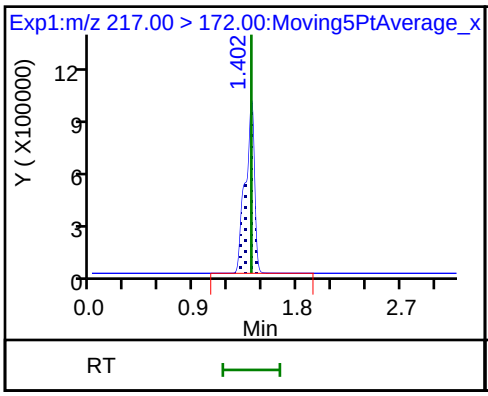
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

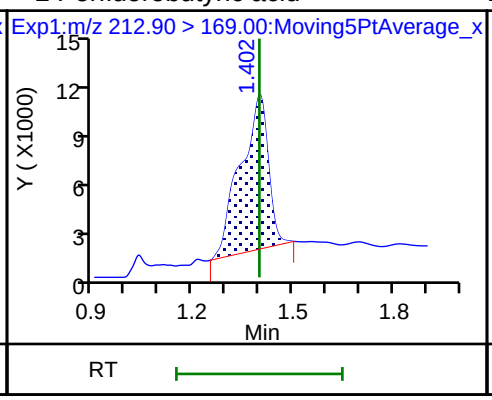
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

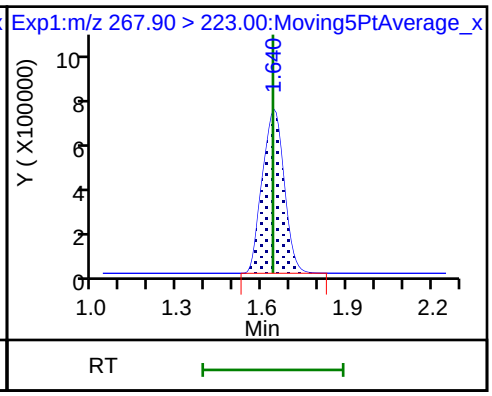
D 1 13C4 PFBA



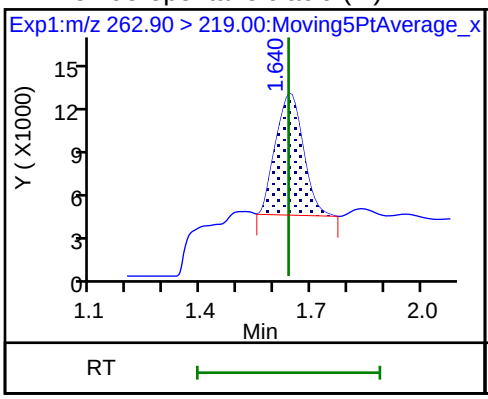
2 Perfluorobutyric acid



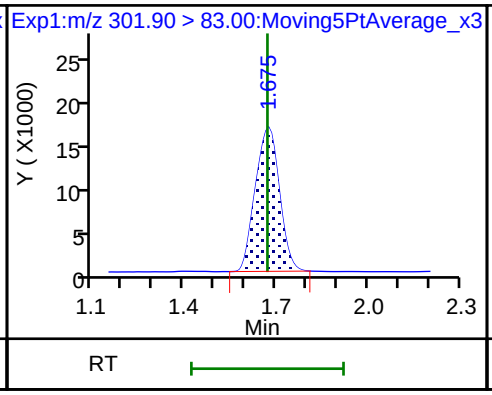
D 3 13C5-PFPeA



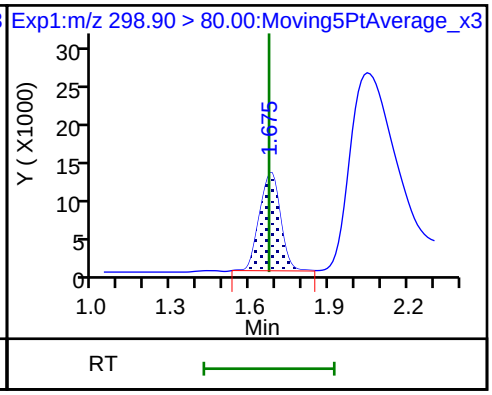
4 Perfluoropentanoic acid (M)



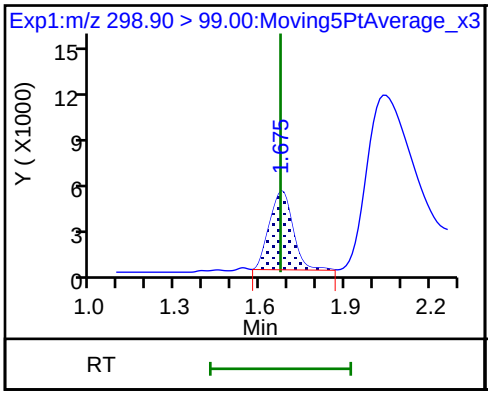
D 47 13C3-PFBS



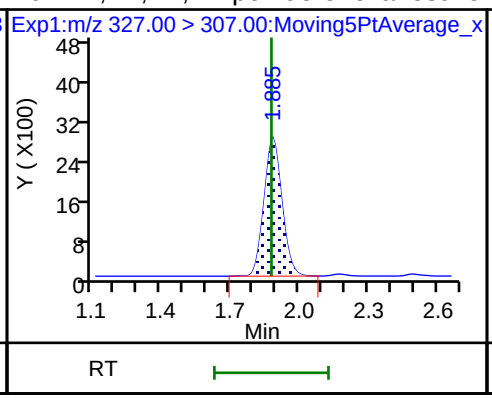
5 Perfluorobutanesulfonic acid



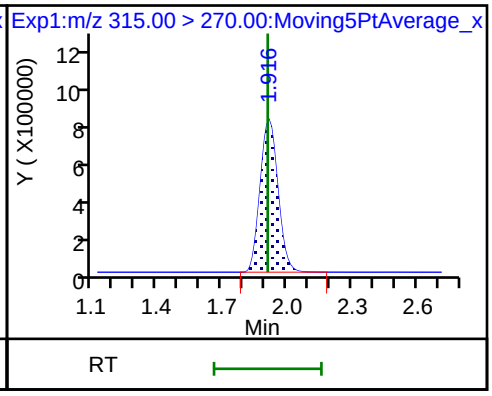
5 Perfluorobutanesulfonic acid



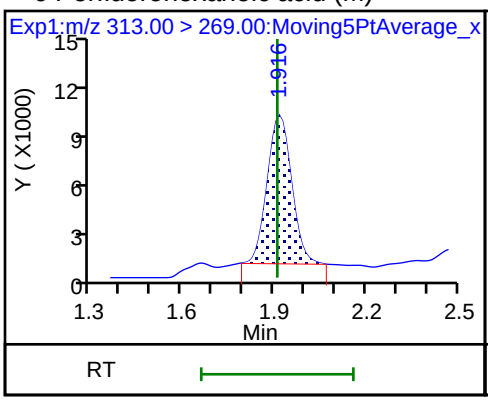
61 1H,1H,2H,2H-perfluorohexanesulfon



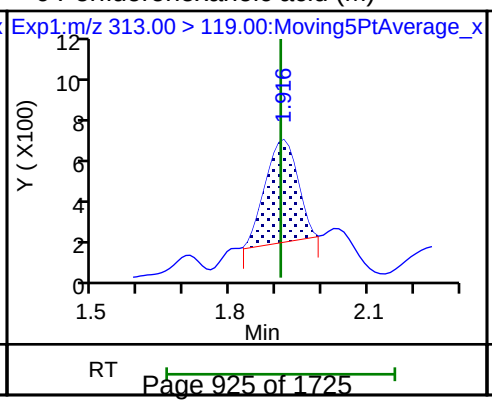
D 7 13C2 PFHxA



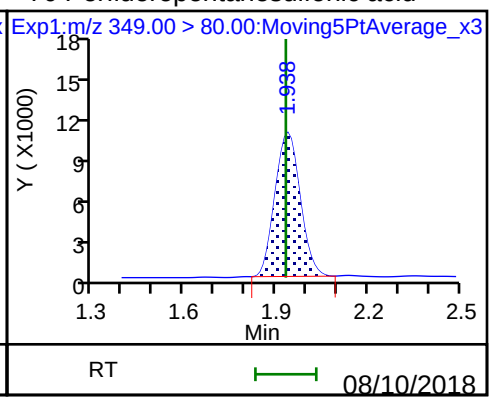
6 Perfluorohexanoic acid (M)



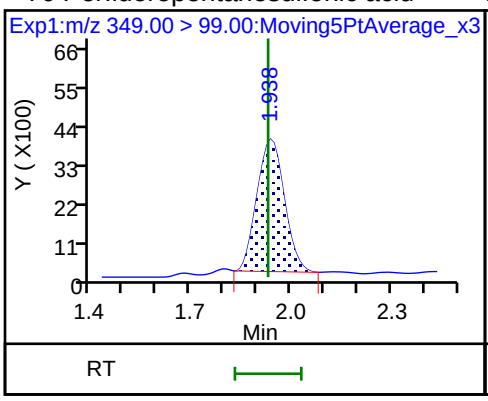
6 Perfluorohexanoic acid (M)



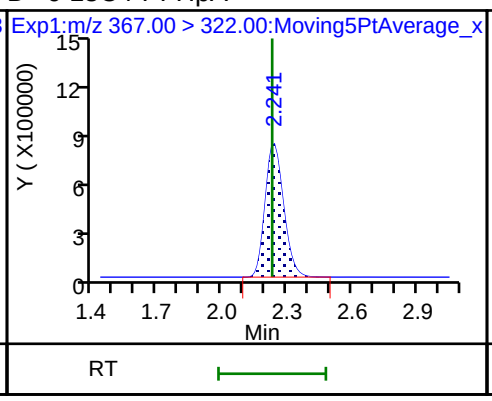
70 Perfluoropentanesulfonic acid



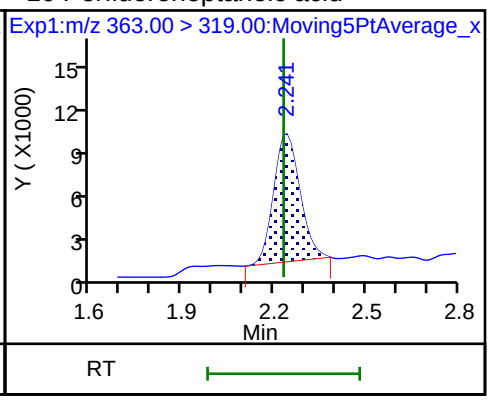
70 Perfluoropentanesulfonic acid



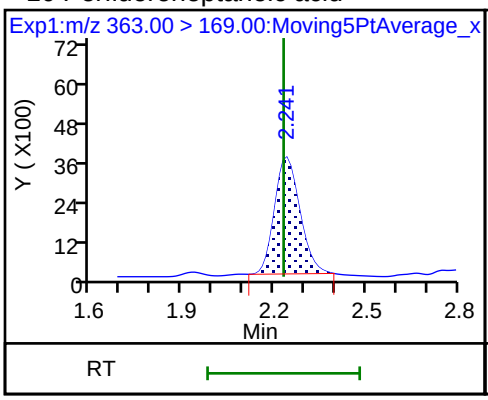
D 9 13C4-PFHpA



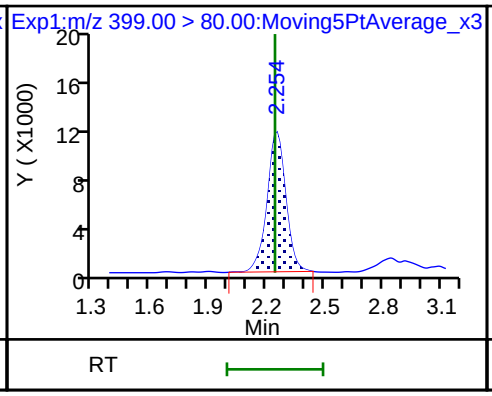
10 Perfluoroheptanoic acid



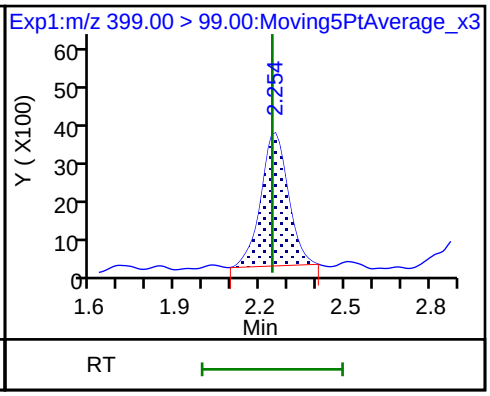
10 Perfluoroheptanoic acid



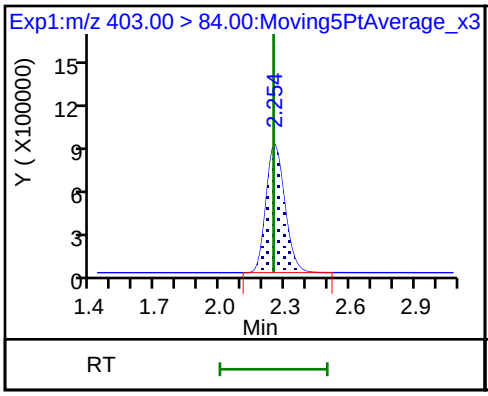
8 Perfluorohexanesulfonic acid



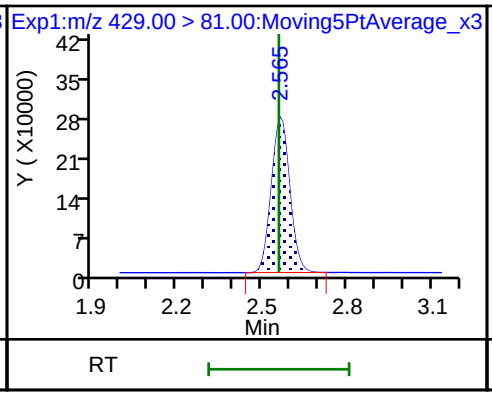
8 Perfluorohexanesulfonic acid



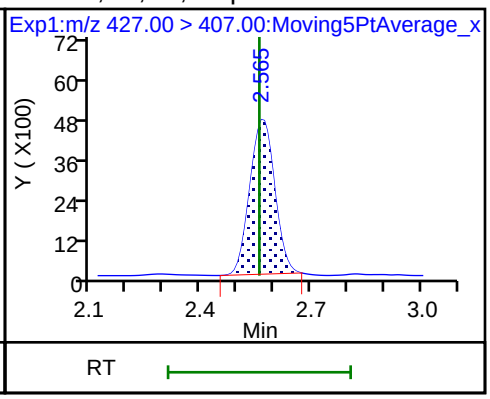
D 11 18O2 PFHxS



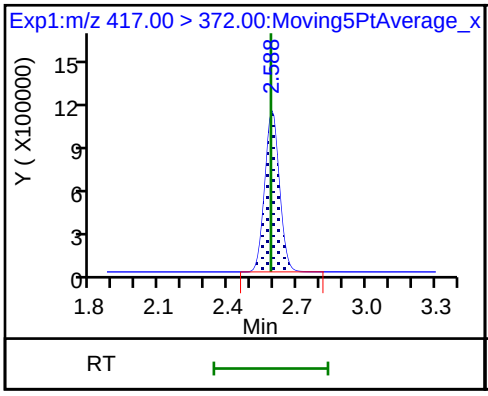
D 12 M2-6:2FTS



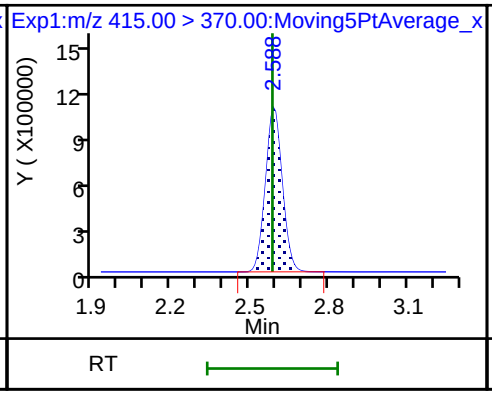
13 1H,1H,2H,2H-perfluorooctanesulfoni



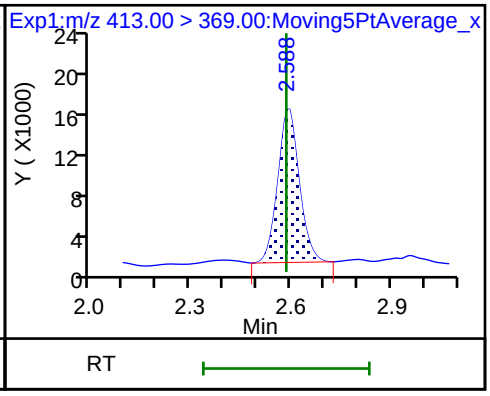
D 14 13C4 PFOA



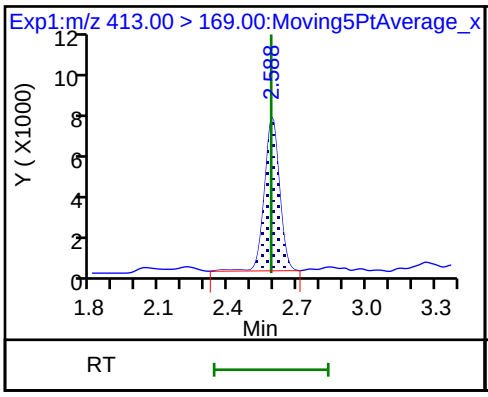
* 62 13C2-PFOA



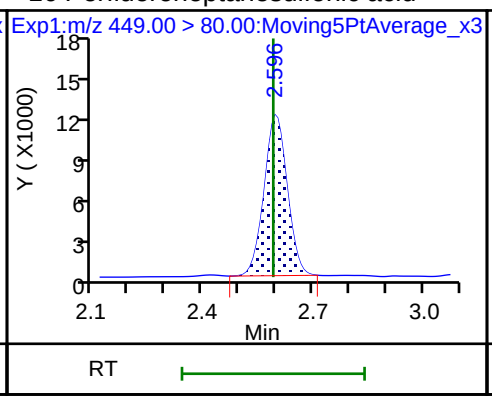
15 Perfluorooctanoic acid



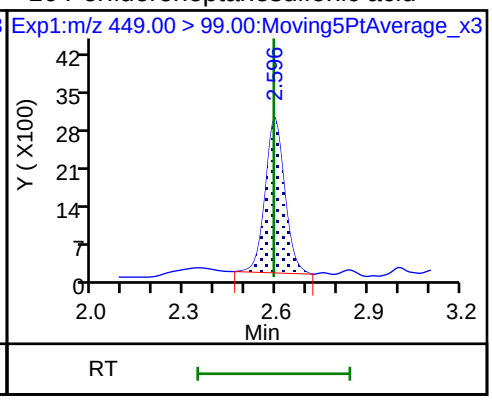
15 Perfluorooctanoic acid



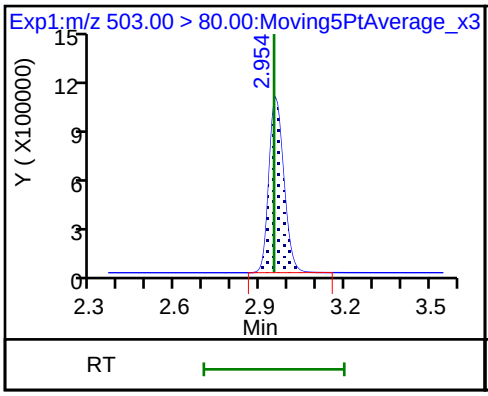
16 Perfluoroheptanesulfonic acid



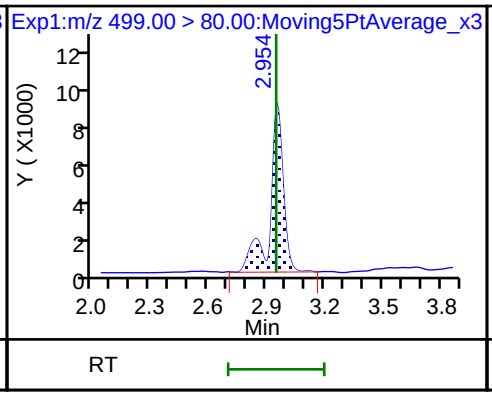
16 Perfluoroheptanesulfonic acid



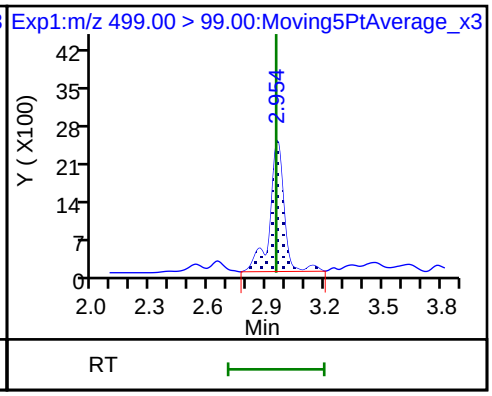
D 18 13C4 PFOS



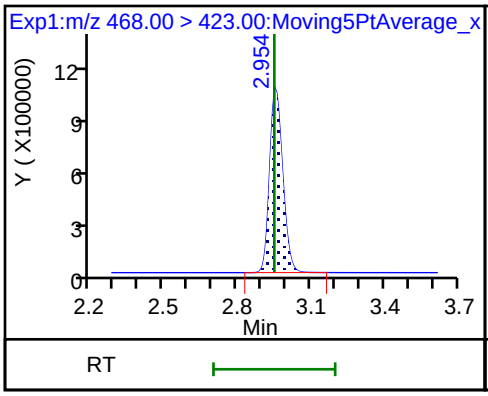
17 Perfluorooctane sulfonic acid



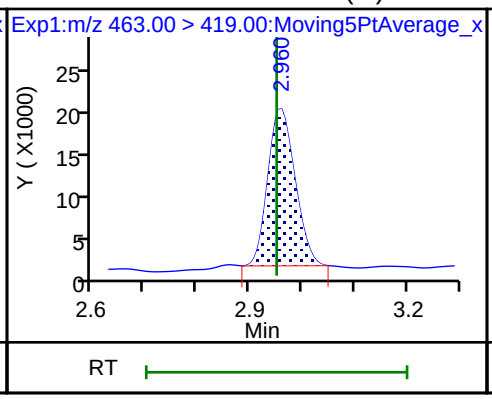
17 Perfluorooctane sulfonic acid



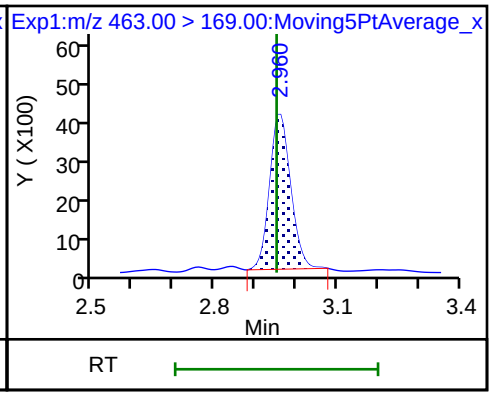
D 19 13C5 PFNA



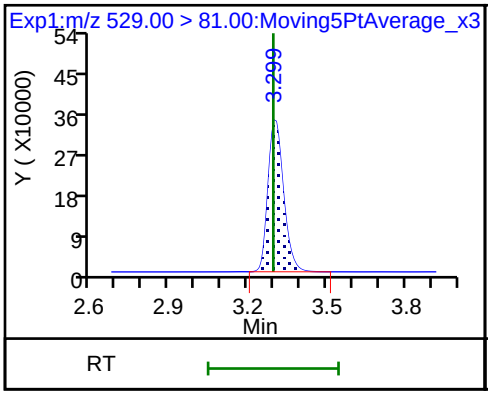
20 Perfluorononanoic acid (M)



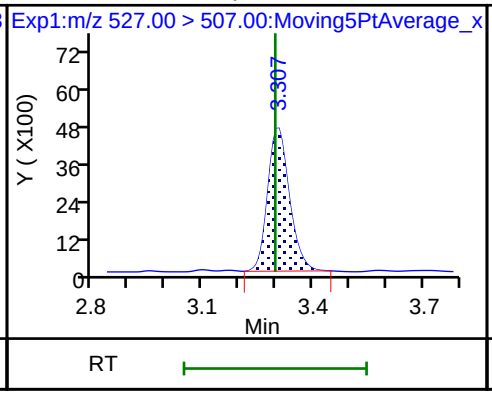
20 Perfluorononanoic acid



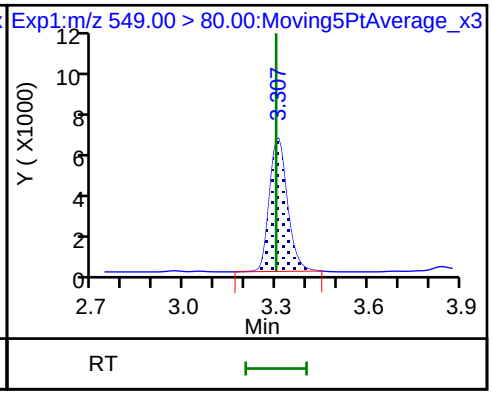
D 26 M2-8:2FTS



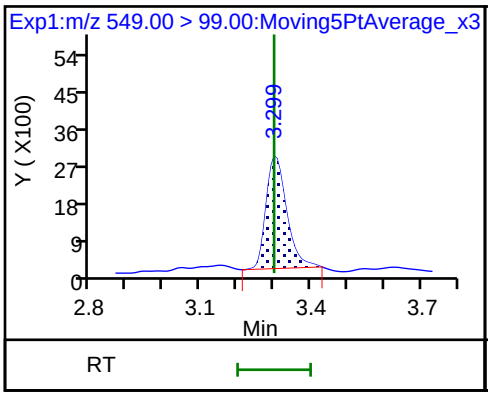
25 1H,1H,2H,2H-perfluorodecanesulfoni



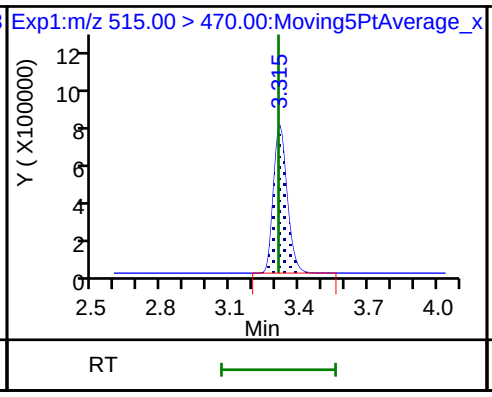
68 Perfluorononanesulfonic acid



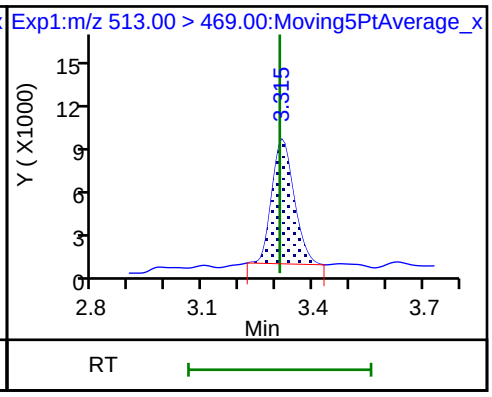
68 Perfluorononanesulfonic acid



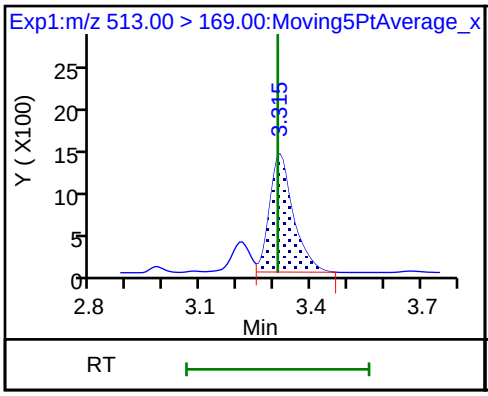
D 23 13C2 PFDA



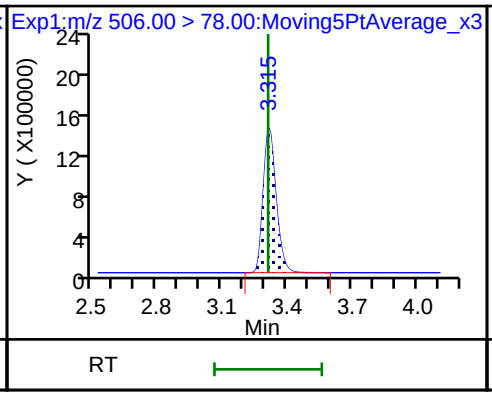
24 Perfluorodecanoic acid



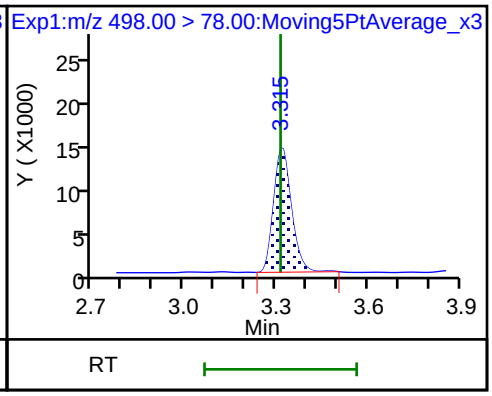
24 Perfluorodecanoic acid



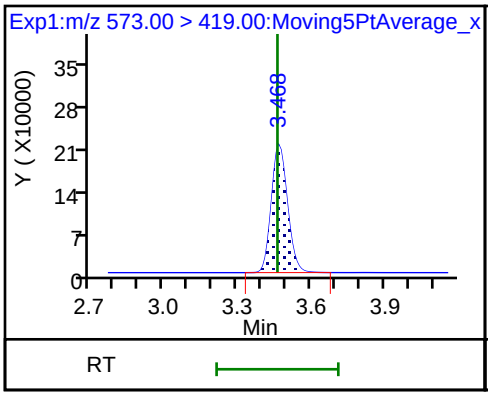
D 21 13C8 FOSA



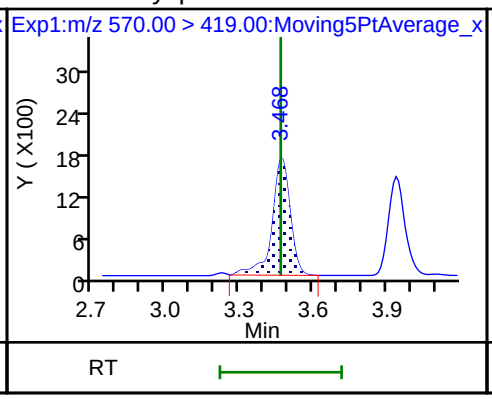
22 Perfluorooctane Sulfonamide



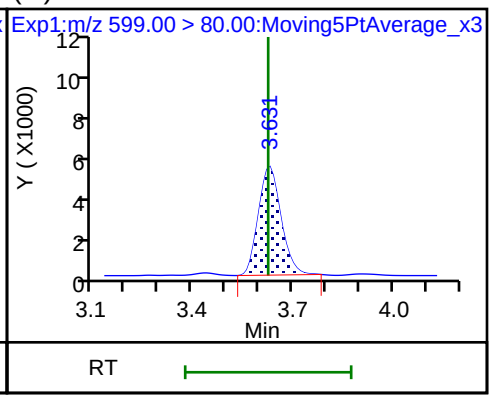
D 27 d3-NMeFOSAA



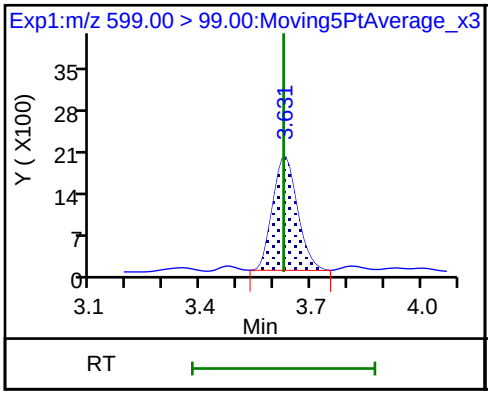
28 N-methyl perfluorooctane sulfonami (M)



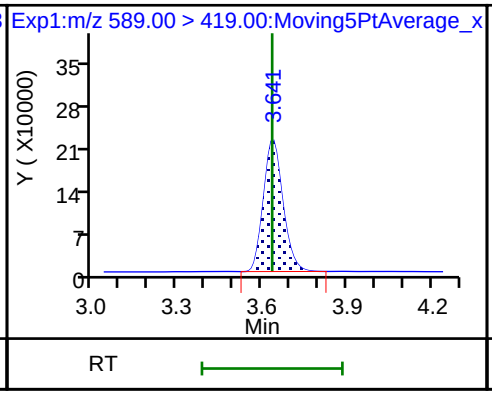
29 Perfluorodecane Sulfonic acid



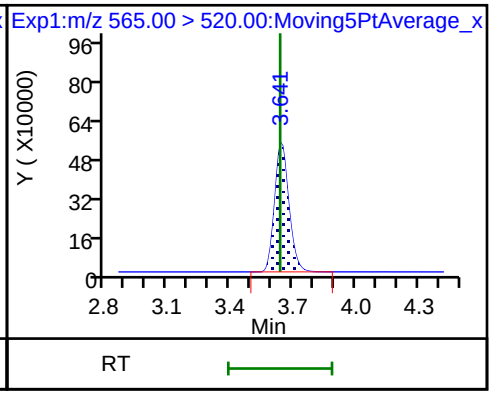
29 Perfluorodecane Sulfonic acid



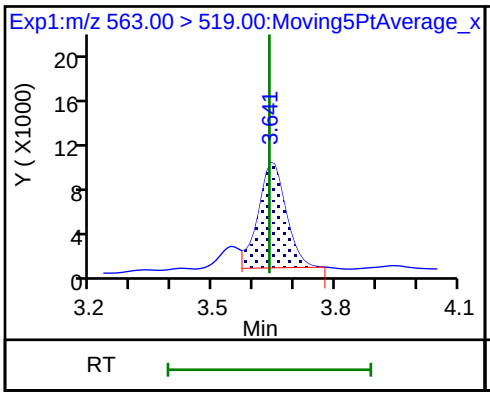
D 32 d5-NEtFOSAA



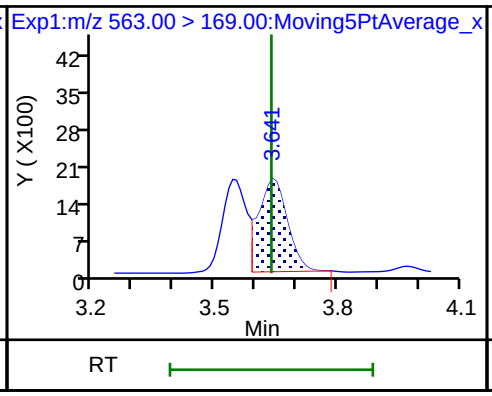
D 30 13C2 PFUnA



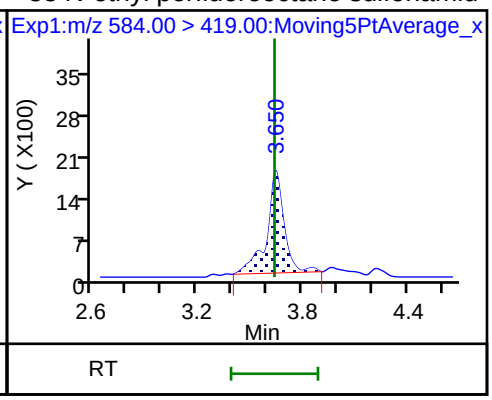
31 Perfluoroundecanoic acid



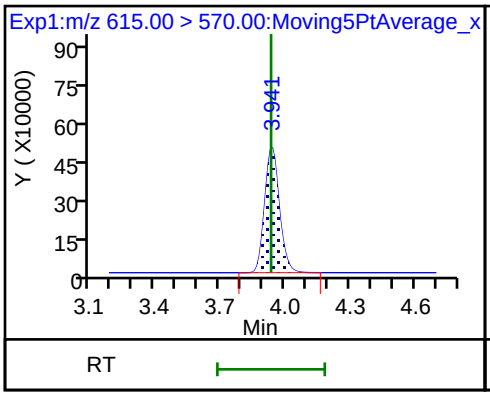
31 Perfluoroundecanoic acid



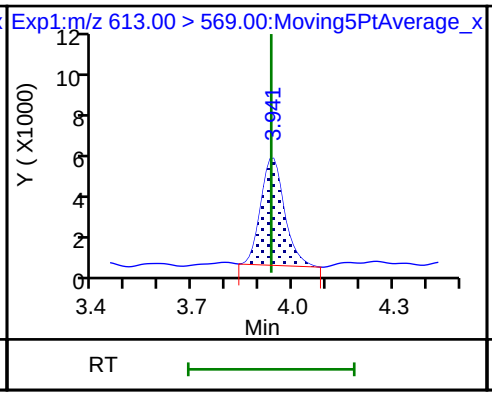
33 N-ethyl perfluorooctane sulfonamid



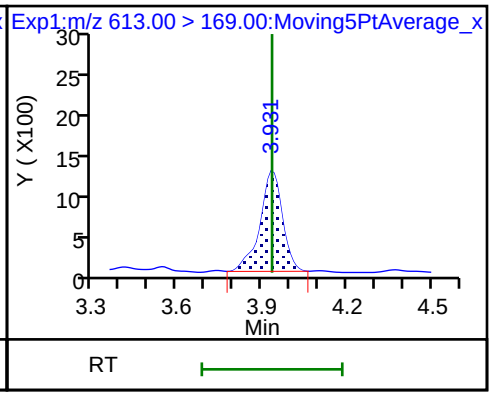
D 36 13C2 PFDoA



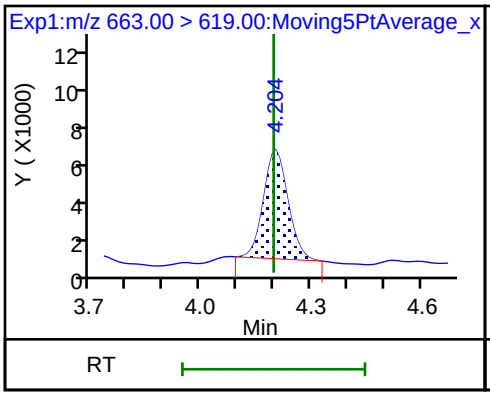
37 Perfluorododecanoic acid



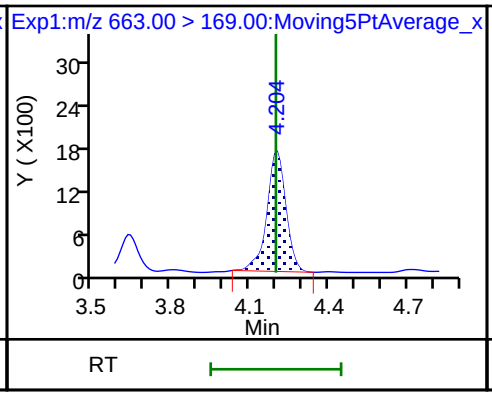
37 Perfluorododecanoic acid



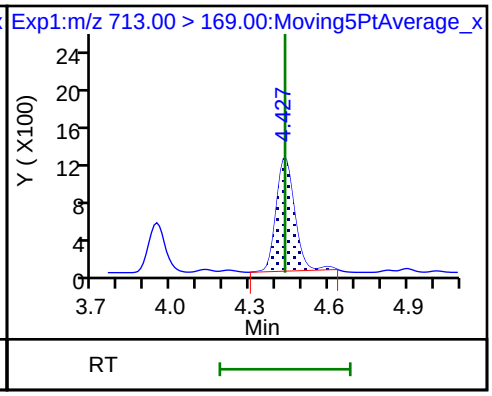
41 Perfluorotridecanoic acid



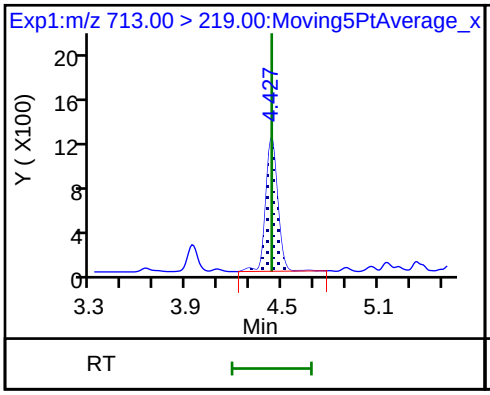
41 Perfluorotridecanoic acid



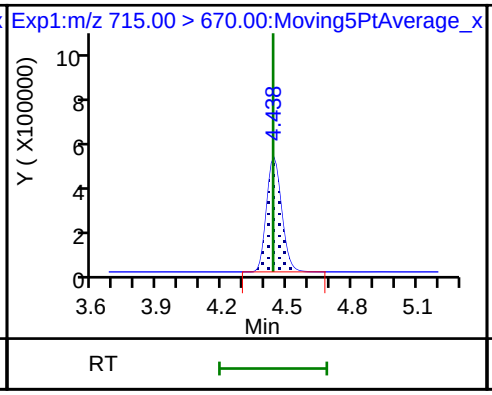
42 Perfluorotetradecanoic acid



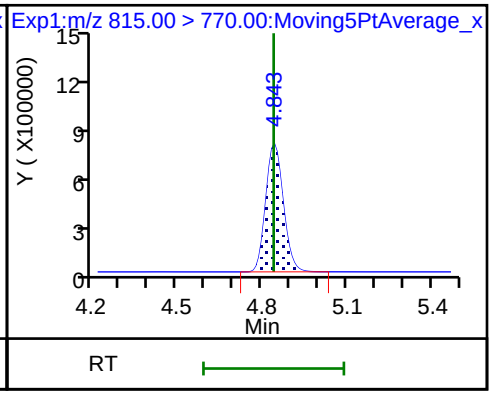
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

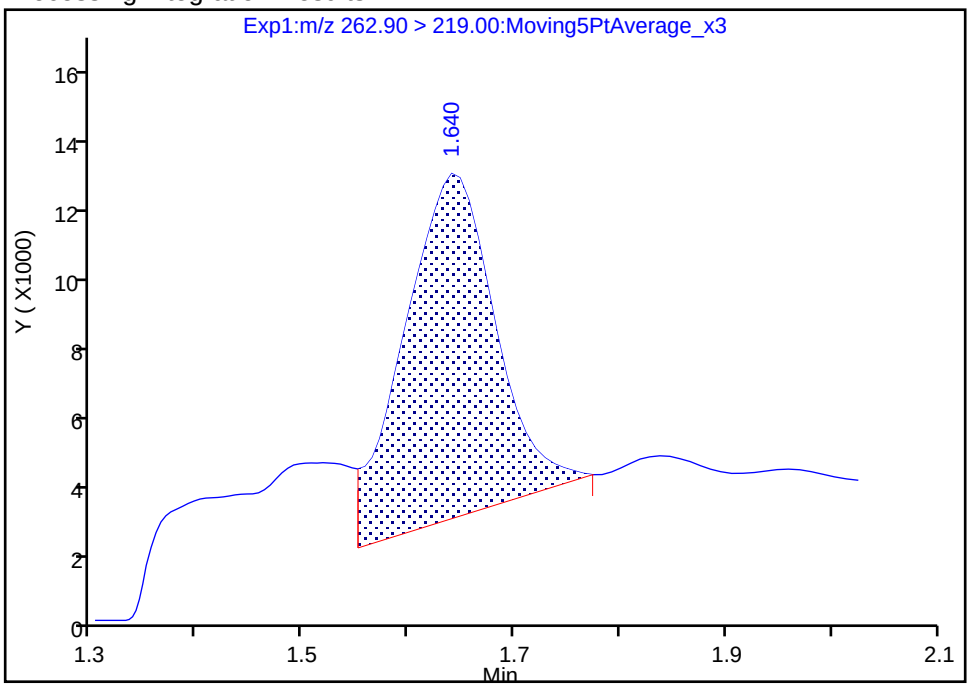
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

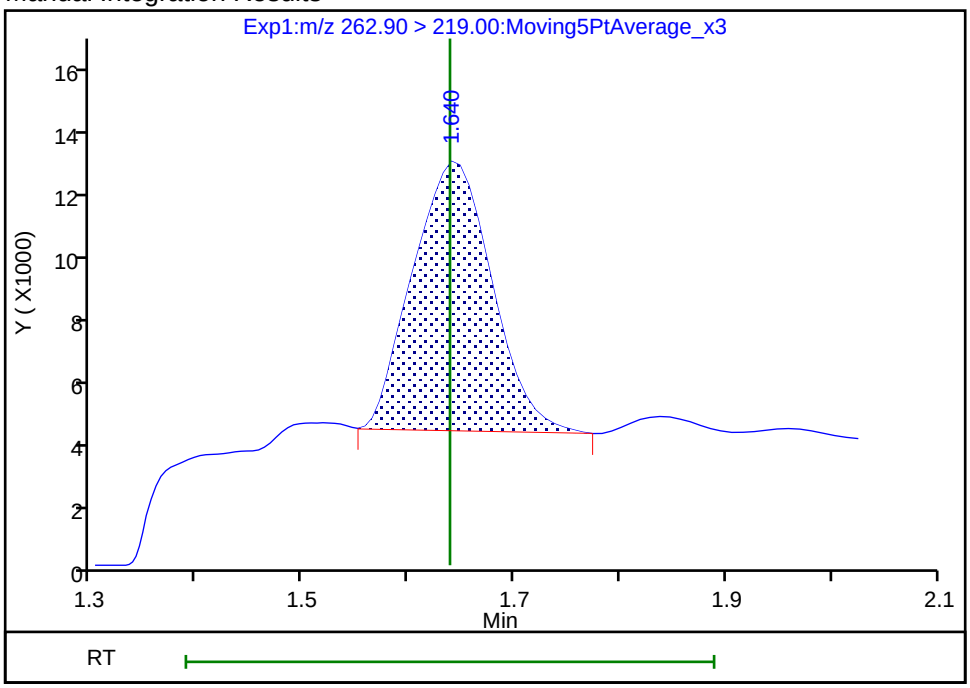
Processing Integration Results

RT: 1.64
Area: 60083
Amount: 0.029797
Amount Units: ng/ml



Manual Integration Results

RT: 1.64
Area: 44952
Amount: 0.025229
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:44:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

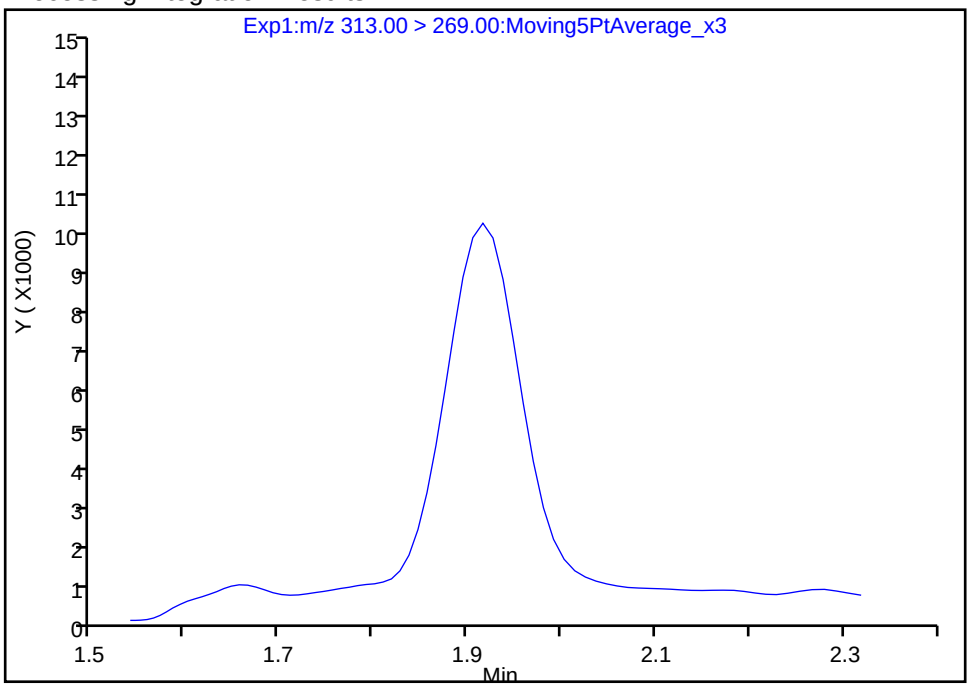
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

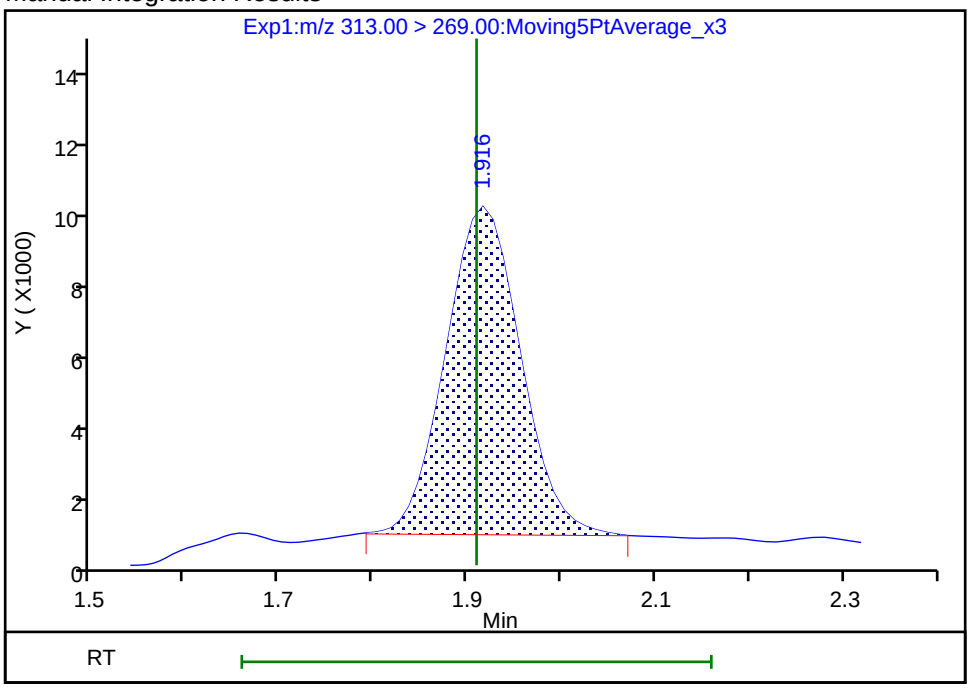
Processing Integration Results

Not Detected
Expected RT: 1.91



Manual Integration Results

RT: 1.92
Area: 48485
Amount: 0.025978
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:43:54
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

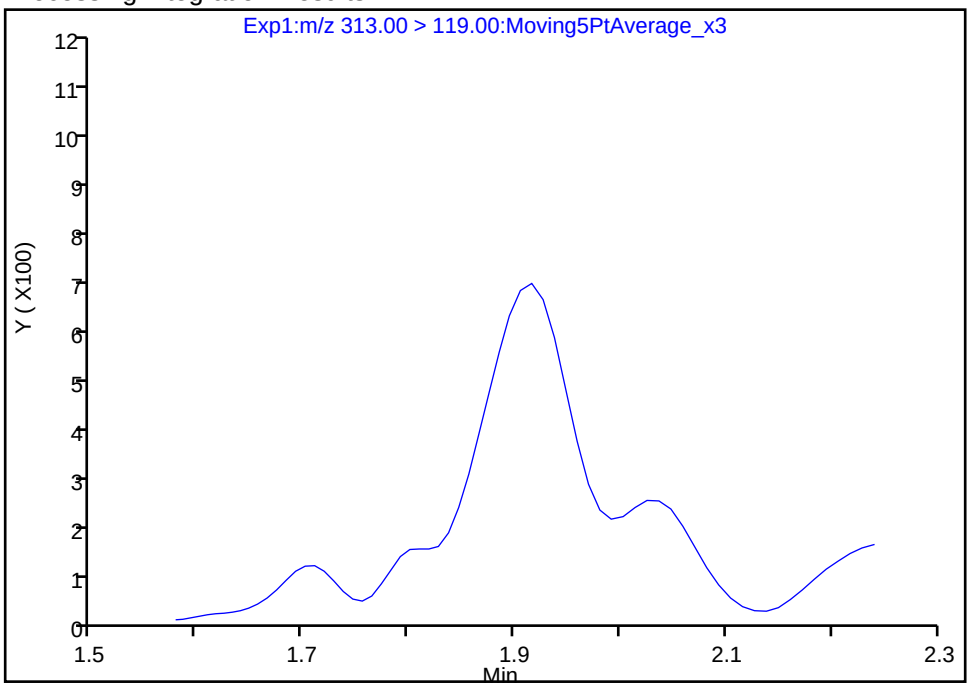
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

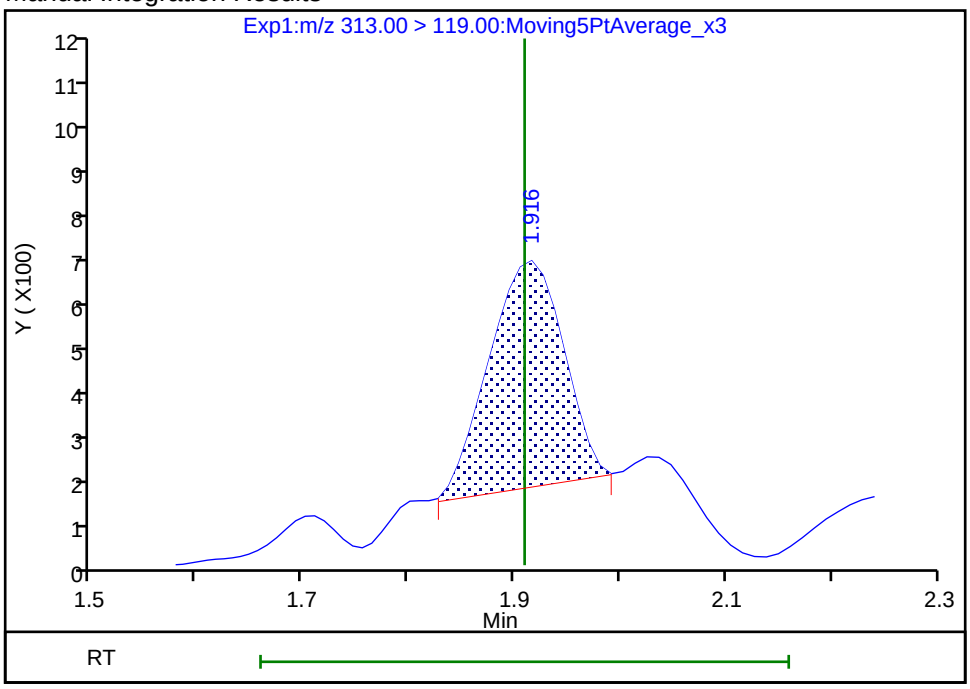
Processing Integration Results

Not Detected
Expected RT: 1.91



Manual Integration Results

RT: 1.92
Area: 2434
Amount: 0.025978
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:44:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

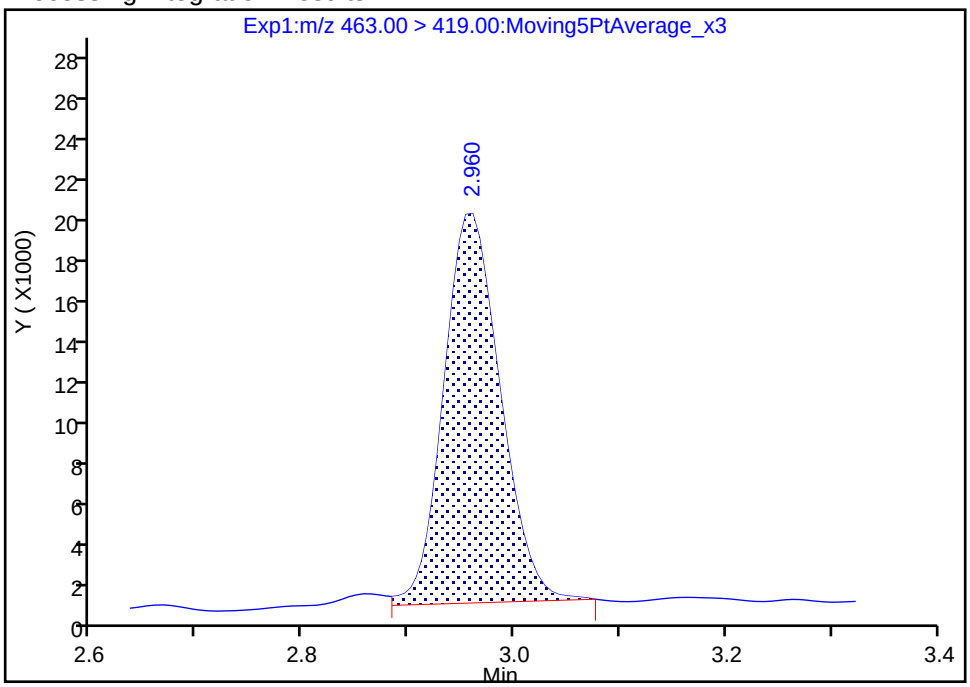
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

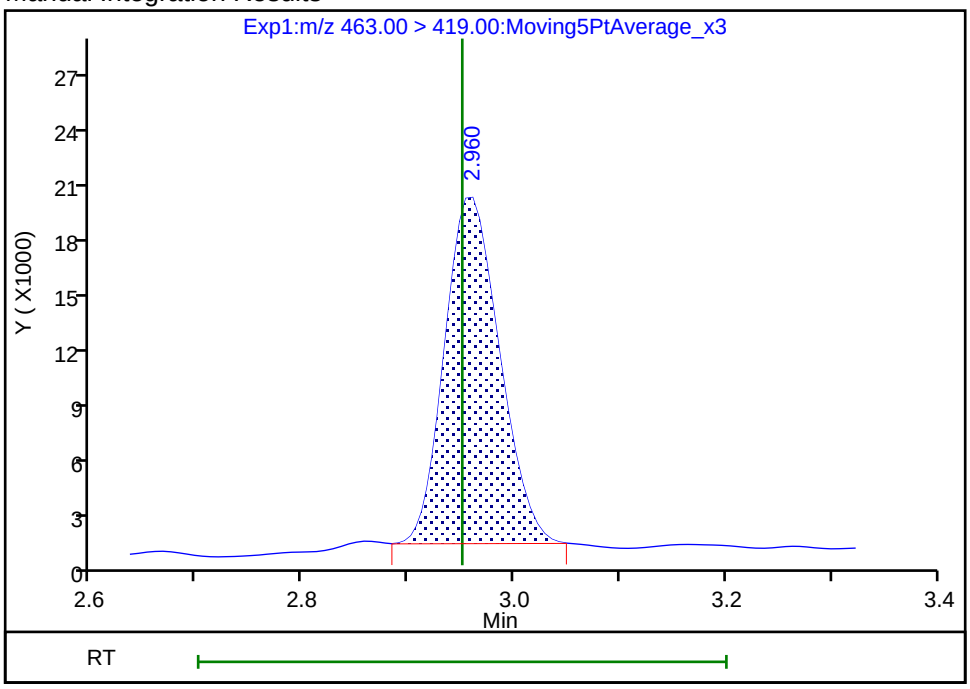
Processing Integration Results

RT: 2.96
Area: 70739
Amount: 0.037364
Amount Units: ng/ml



Manual Integration Results

RT: 2.96
Area: 67521
Amount: 0.038868
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 17:20:24

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

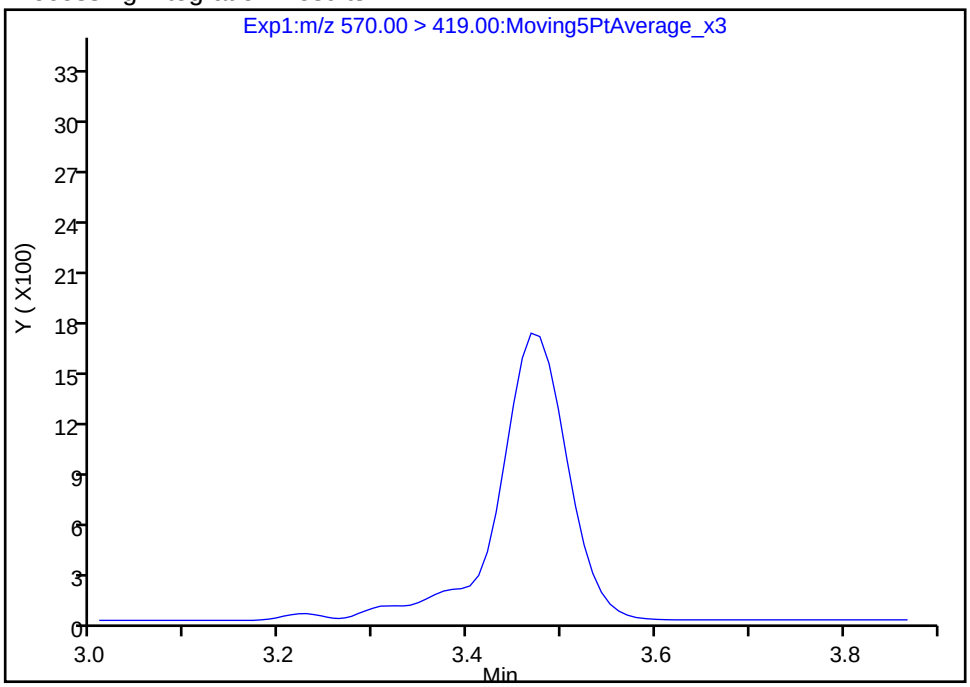
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_002.d				
Injection Date:	23-Jul-2018 16:11:19	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

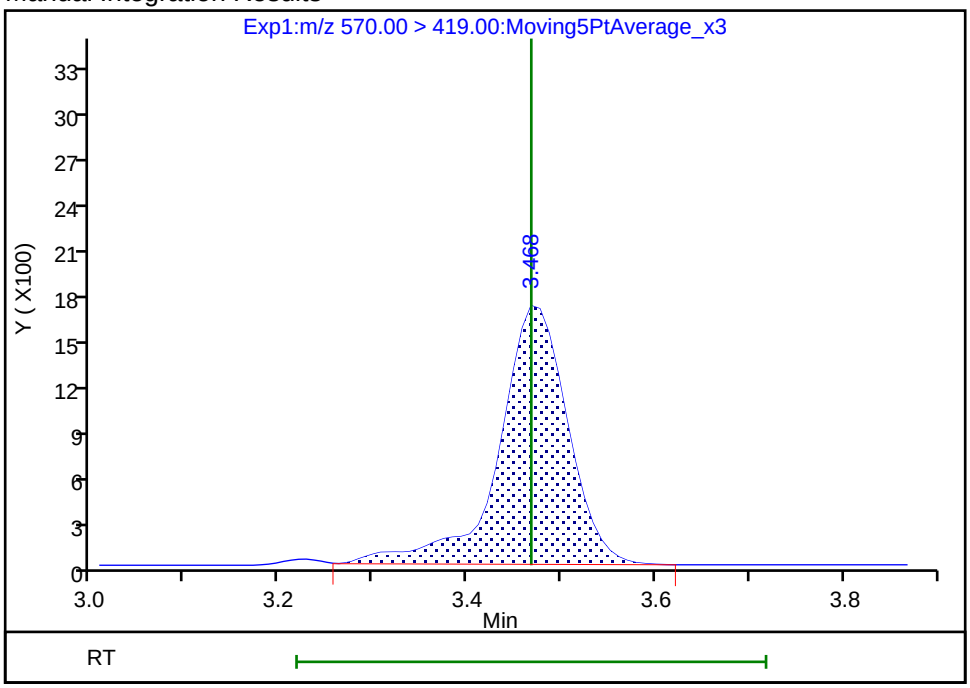
Not Detected
Expected RT: 3.47

Processing Integration Results



Manual Integration Results

RT: 3.47
Area: 8643
Amount: 0.023075
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:45:23
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 23-Jul-2018 16:19:08 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:23 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:49:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.392	1.398	-0.006	0.539	5106874	2.36		94.5	79559	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.004	100865	0.0502		100	48.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3669835	2.43		97.3	62735	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	87632	0.0499		99.8	39.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	84276	2.13		91.6	579	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	130817	0.0455		103	40.2	
298.90 > 99.00	1.667	1.672	-0.005	1.000	53793		2.43(1.25-3.74)	103	35.8	
D 60 M2-4:2FTS										
329.00 > 81.00	1.868	1.877	-0.009	0.724	617987	NC			6983	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.878	-0.001	1.126	29786	0.0481		103	1862	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.739	4299501	2.43		97.2	76346	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	91488	0.0502		100	210	
313.00 > 119.00	1.896	1.909	-0.013	0.995	8843		10.35(5.03-15.10)	100	177	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	123522	0.0478		102	1976	
349.00 > 99.00	1.928	1.931	-0.003	1.157	50778		2.43(1.36-4.07)	102	788	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.993	2.006	-0.013	0.994	19414	NC			70.7	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.777	227056	NC			9715	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.230	-0.011	0.860	4458677	2.45		97.9	68539	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.230	-0.011	1.000	93835	0.0477		95.4	114	
363.00 > 169.00	2.219	2.230	-0.011	1.000	42515		2.21(1.13-3.40)	95.4	436	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.231	2.243	-0.012	0.995	122912	0.0460		101	294	
399.00 > 99.00	2.231	2.243	-0.012	0.995	43227		2.84(1.50-4.49)	101	139	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.246	-0.003	0.869	5418231	2.31		97.9	56693	
65 ADONA										
377.00 > 251.00	2.269	2.272	-0.003	0.771	252213	NC			4681	
377.00 > 85.00	2.269	2.272	-0.003	0.771	149214		1.69(0.84-2.53)		873	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.559	-0.003	0.990	1176358	2.31		97.3	18317	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.559	-0.003	1.000	40852	0.0489		103	480	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.585	-0.004	1.000	4268865	2.39		95.8	63794	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.585	-0.004		4659586	2.50			47587	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.586	-0.005	1.000	110203	0.0532		106	97.6	
413.00 > 169.00	2.581	2.586	-0.005	1.000	63067		1.75(0.84-2.52)	106	370	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.591	-0.002	0.880	98701	0.0462		97.0	1316	
449.00 > 99.00	2.589	2.591	-0.002	0.880	26850		3.68(1.94-5.82)	97.0	666	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.949	-0.006	1.140	3693870	2.27		94.9	28519	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.943	2.949	-0.006	1.000	77331	0.0453		97.6	654	
499.00 > 99.00	2.948	2.949	-0.001	1.002	19792		3.91(2.31-6.93)	97.6	268	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.950	-0.002	1.142	3792873	2.47		98.7	73090	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.948	2.950	-0.002	1.000	105791	0.0611		122	254	M
463.00 > 169.00	2.948	2.950	-0.002	1.000	24590		4.30(1.90-5.69)	122	443	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.073	130612	NC			1504	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.296	-0.004	1.276	1289313	2.43		101	24297	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.297	-0.005	1.000	33518	0.0459		95.9	1595	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.299	-0.007	1.119	56605	0.0490		102	2035	
549.00 > 99.00	3.292	3.299	-0.007	1.119	21287		2.66(1.33-3.97)	102	342	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.282	3057920	2.50		100.0	46728	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	54779	0.0435		87.1	218	
513.00 > 169.00	3.308	3.309	-0.001	1.000	12406		4.42(2.36-7.09)	87.1	432	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.282	5758066	2.41		96.3	48814	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.314	-0.006	1.000	115476	0.0504		101	3111	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.459	3.462	-0.003	1.340	920862	2.28		91.1	18571	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.459	3.468	-0.009	1.000	20149	0.0555		111	282	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.625	-0.001	1.232	48680	0.0475		98.5	1129	
599.00 > 99.00	3.624	3.625	-0.001	1.232	16770		2.90(1.39-4.16)	98.5	588	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.634	3.635	-0.001	1.408	1105917	2.60		104	4062	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.408	2455718	2.49		99.7	43307	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	74289	0.0609		122	229	
563.00 > 169.00	3.634	3.638	-0.004	1.000	13147		5.65(2.12-6.36)	122	107	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.634	3.639	-0.005	1.000	18908	0.0458		91.6	310	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.799	3.800	-0.001	1.291	185856	NC			6412	
D 36 13C2 PFDoA										
615.00 > 570.00	3.924	3.934	-0.010	1.521	2256995	2.41		96.4	22431	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.924	3.934	-0.010	1.000	52266	0.0535		107	16.4	
613.00 > 169.00	3.924	3.934	-0.010	1.000	12156		4.30(2.13-6.40)	107	238	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.199	4.198	0.001	1.070	48345	0.0510		102	15.0	
663.00 > 169.00	4.189	4.198	-0.009	1.067	19530		2.48(1.25-3.76)	102	226	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.435	4.433	0.002	1.000	11951	0.0534		107	176	
713.00 > 219.00	4.424	4.433	-0.009	0.998	9870		1.21(0.71-2.13)	107	232	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.435	4.435	0.0	1.718	2232553	2.44		97.6	12087	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.840	4.840	0.0	1.876	3557979	2.56		102	11741	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.840	4.840	0.0	1.000	96987	NC			14.9	
813.00 > 169.00	4.840	4.840	0.0	1.000	16349		5.93(2.86-8.58)		217	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.188	5.184	0.004	1.072	73454	NC			16.4	
913.00 > 169.00	5.188	5.184	0.004	1.072	8823		8.33(3.83-11.48)		130	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_003.d

Injection Date: 23-Jul-2018 16:19:08 Instrument ID: A8_N

Lims ID: IC L2 Full

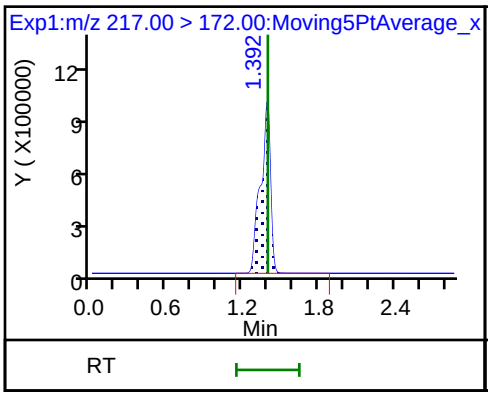
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

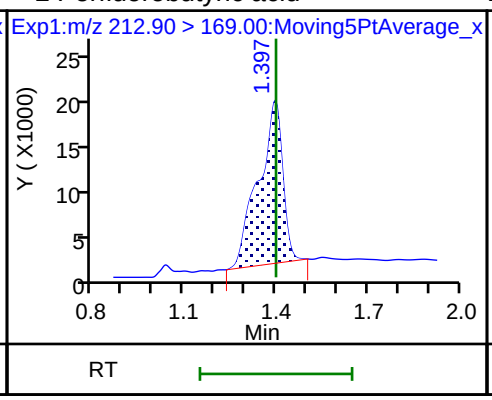
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

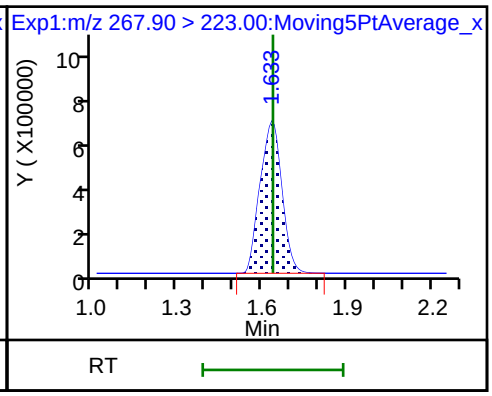
D 1 13C4 PFBA



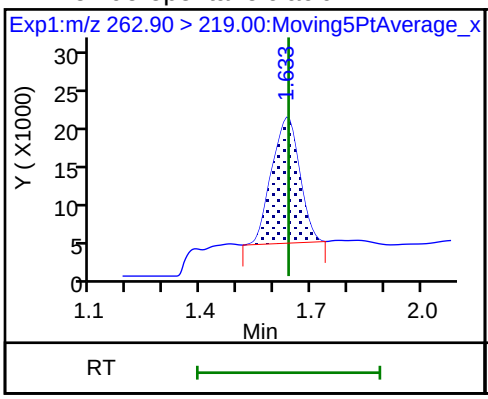
2 Perfluorobutyric acid



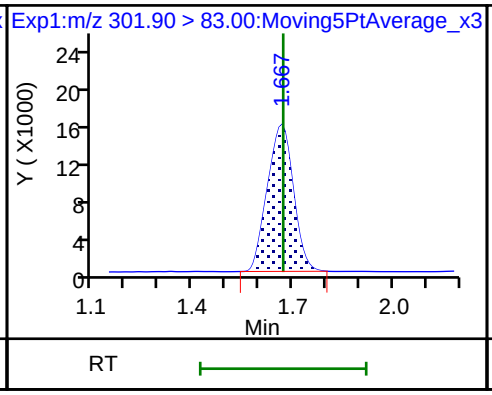
D 3 13C5-PFPeA



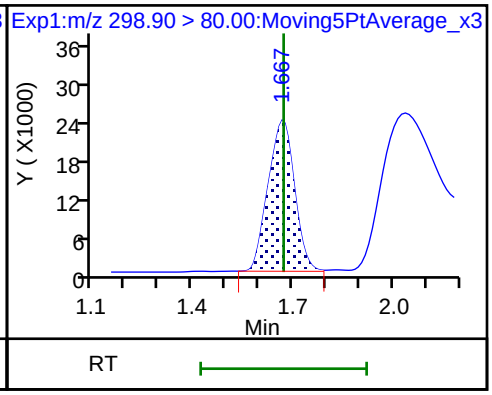
4 Perfluoropentanoic acid



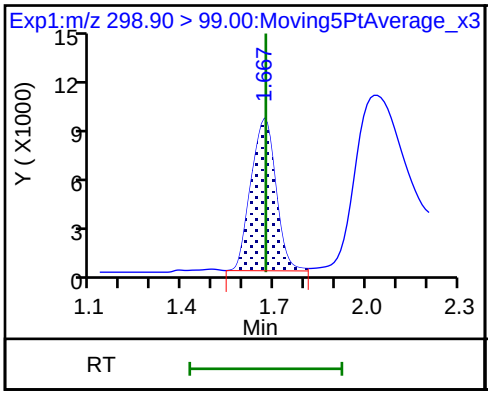
D 47 13C3-PFBS



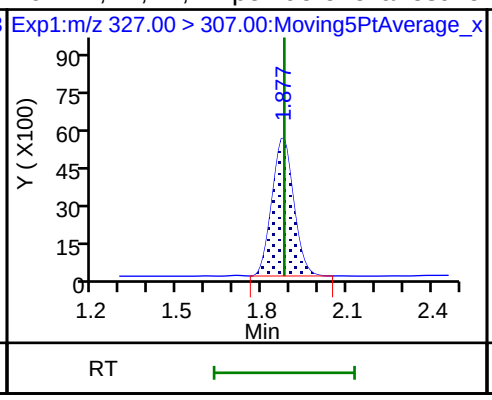
5 Perfluorobutanesulfonic acid



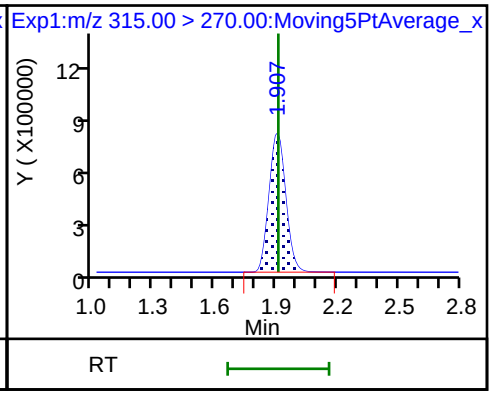
5 Perfluorobutanesulfonic acid



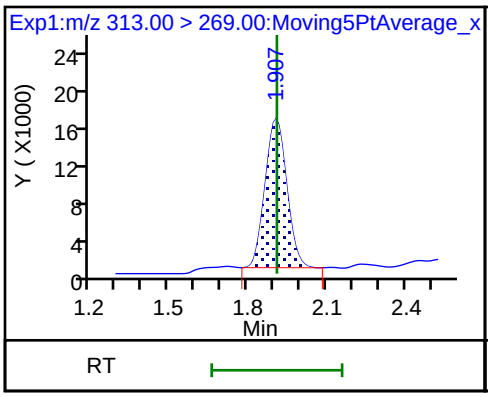
61 1H,1H,2H,2H-perfluorohexanesulfon



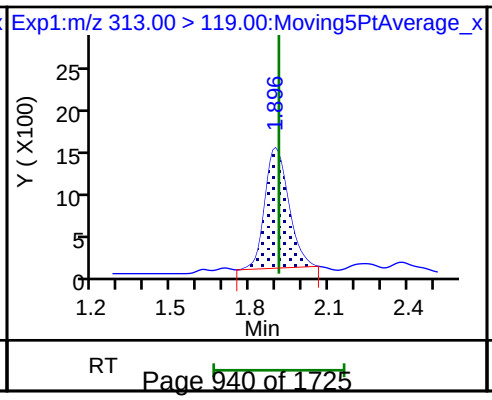
D 7 13C2 PFHxA



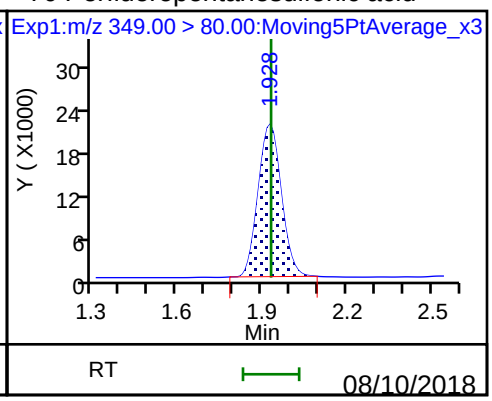
6 Perfluorohexanoic acid



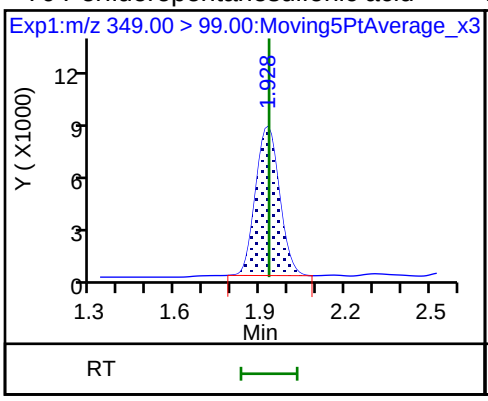
6 Perfluorohexanoic acid



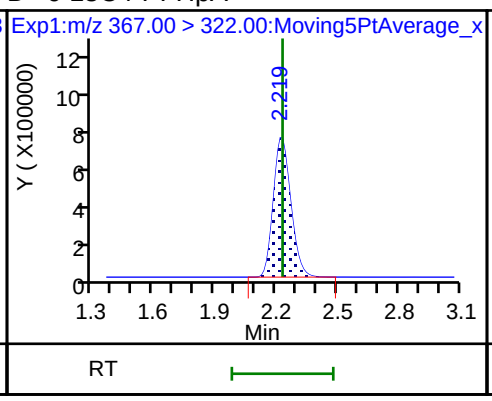
70 Perfluoropentanesulfonic acid



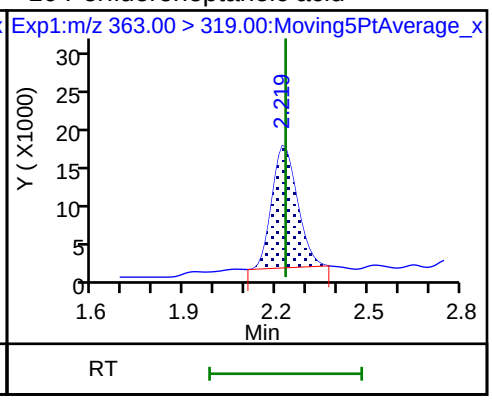
70 Perfluoropentanesulfonic acid



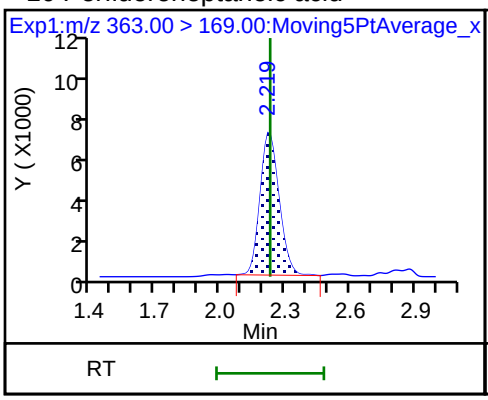
D 9 13C4-PFHpA



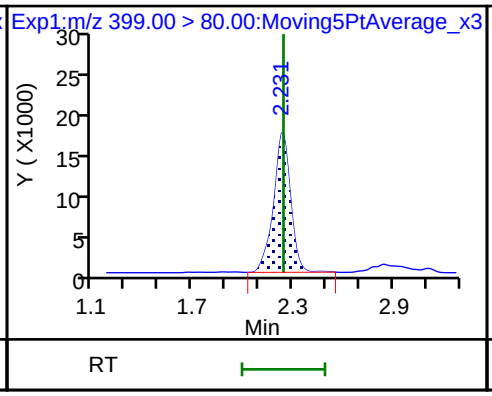
10 Perfluoroheptanoic acid



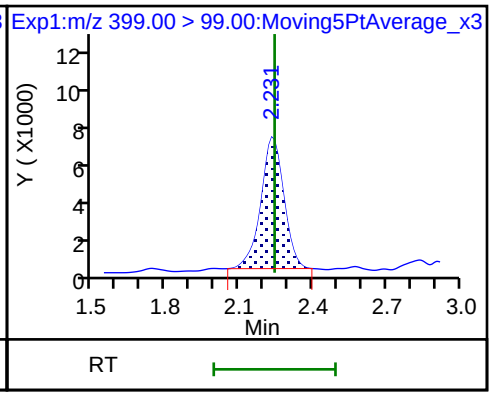
10 Perfluoroheptanoic acid



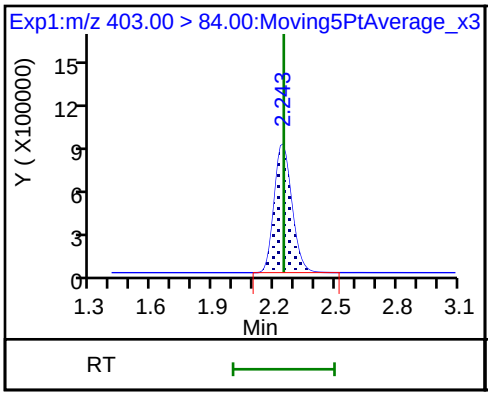
8 Perfluorohexanesulfonic acid



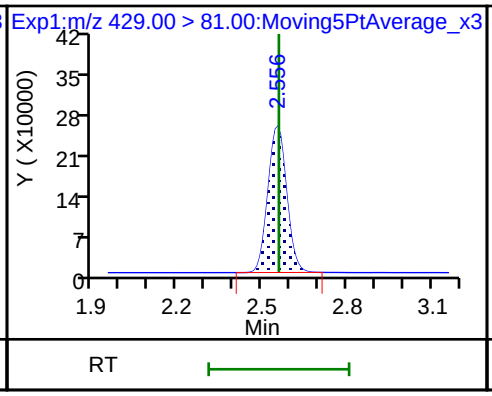
8 Perfluorohexanesulfonic acid



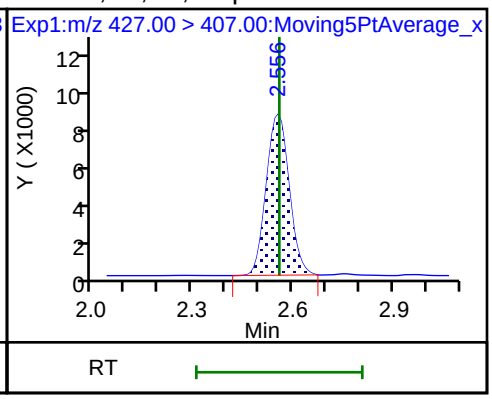
D 11 18O2 PFHxS



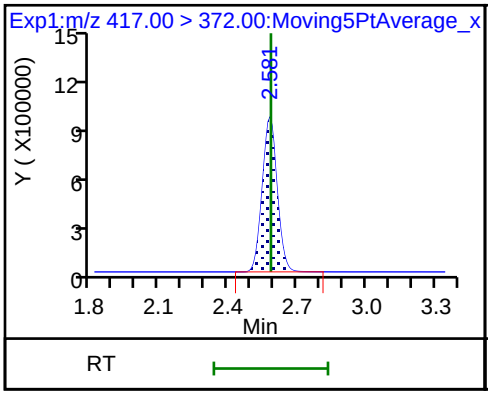
D 12 M2-6:2FTS



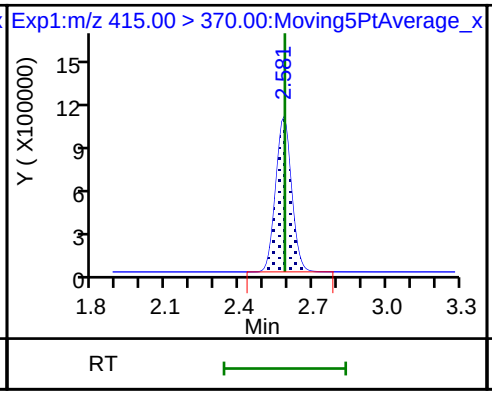
13 1H,1H,2H,2H-perfluorooctanesulfoni



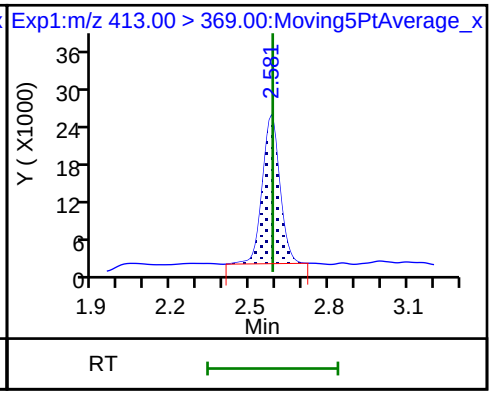
D 14 13C4 PFOA



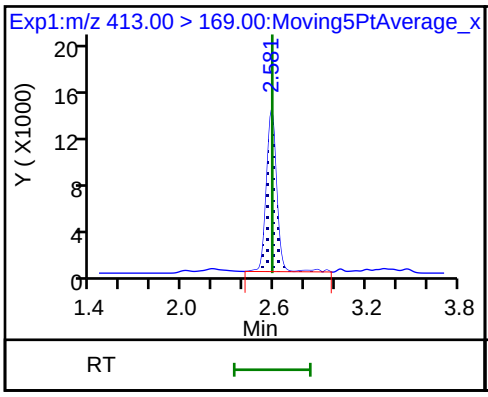
* 62 13C2-PFOA



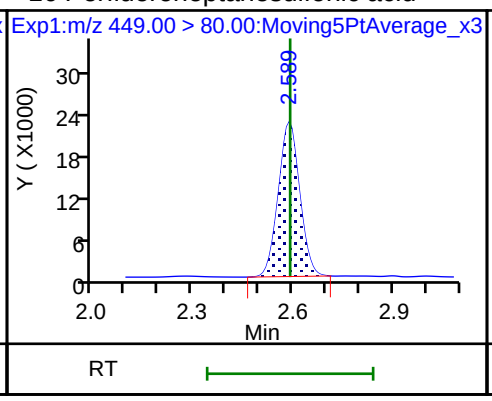
15 Perfluorooctanoic acid



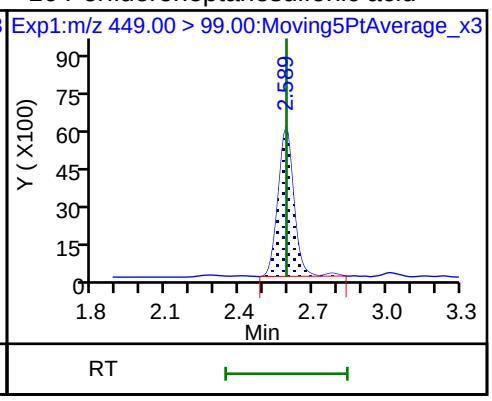
15 Perfluorooctanoic acid



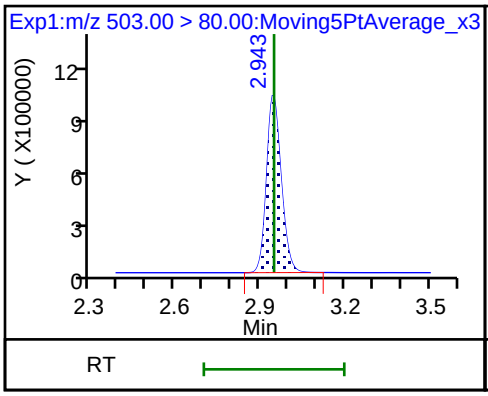
16 Perfluoroheptanesulfonic acid



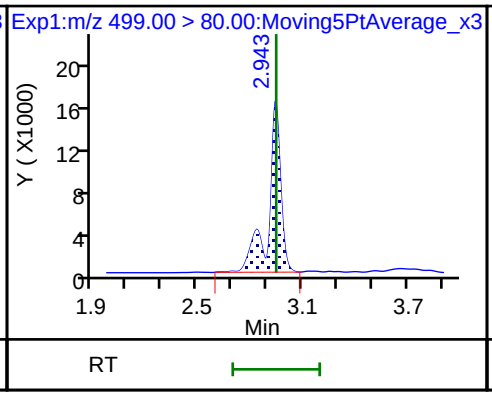
16 Perfluoroheptanesulfonic acid



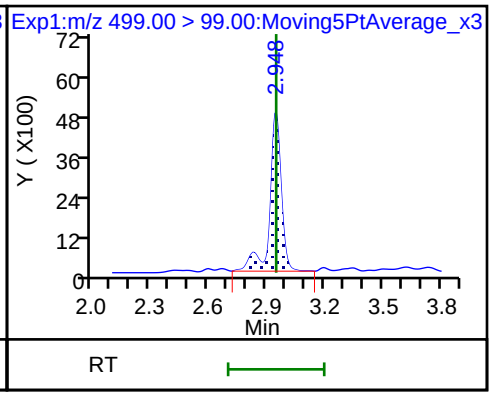
D 18 13C4 PFOS



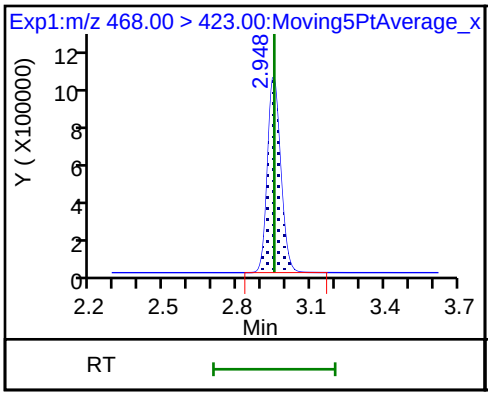
17 Perfluorooctane sulfonic acid



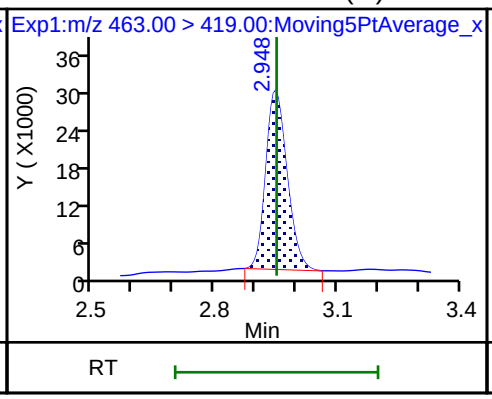
17 Perfluorooctane sulfonic acid



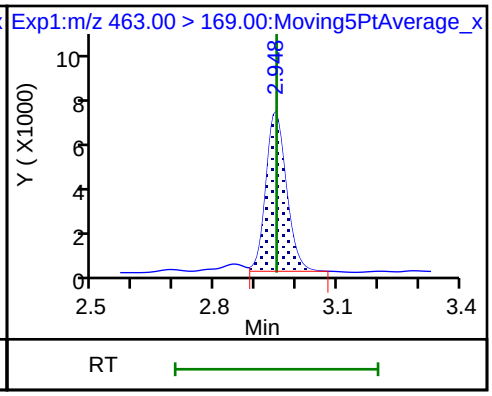
D 19 13C5 PFNA



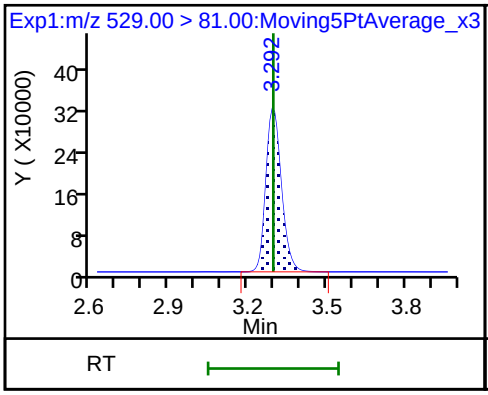
20 Perfluorononanoic acid (M)



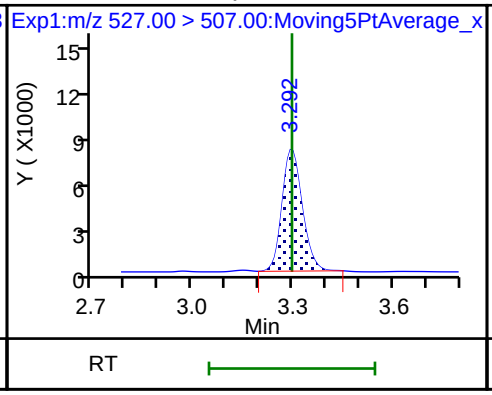
20 Perfluorononanoic acid



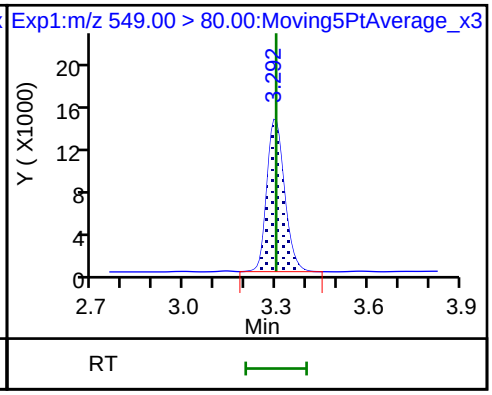
D 26 M2-8:2FTS



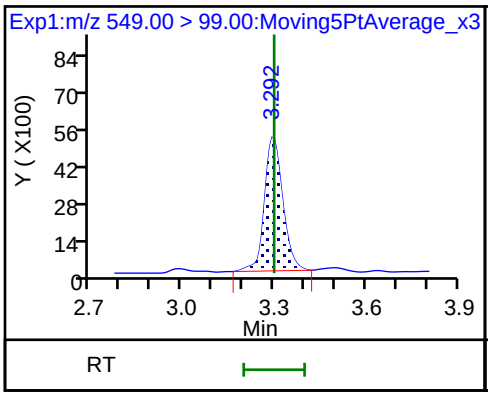
25 1H,1H,2H,2H-perfluorodecanesulfoni



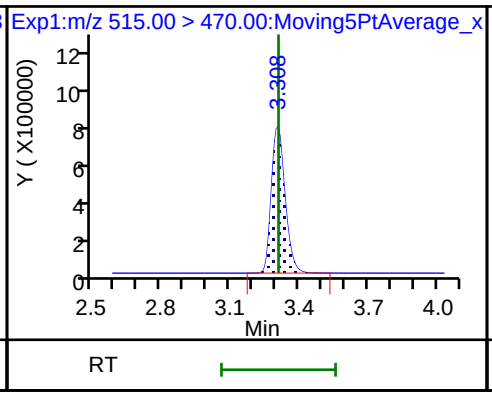
68 Perfluorononanesulfonic acid



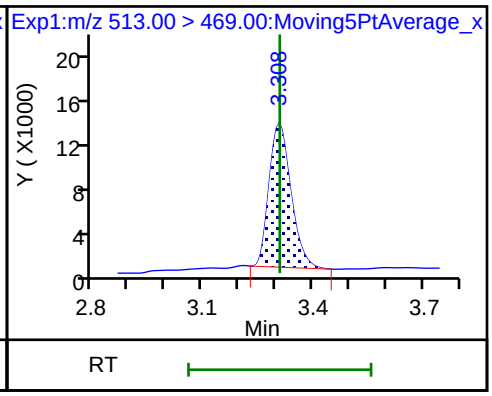
68 Perfluorononanesulfonic acid



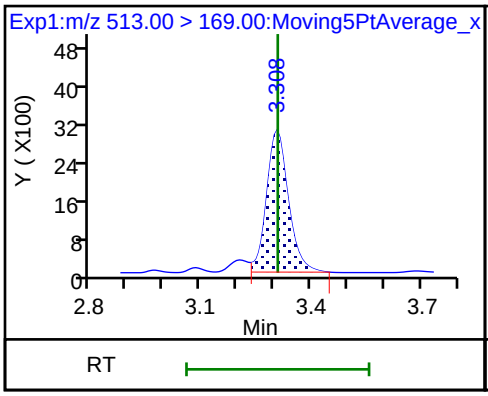
D 23 13C2 PFDA



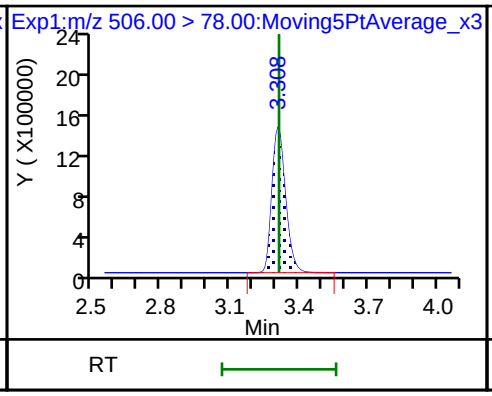
24 Perfluorodecanoic acid



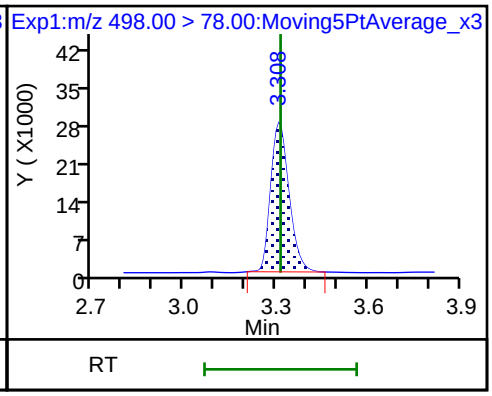
24 Perfluorodecanoic acid



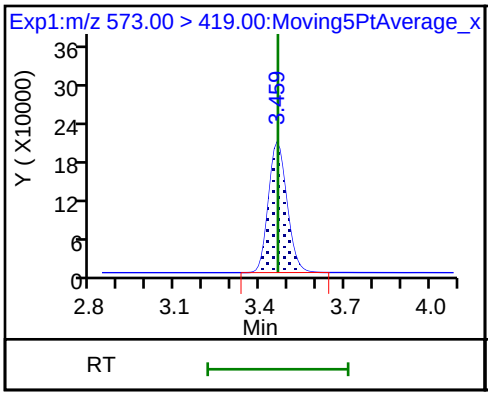
D 21 13C8 FOSA



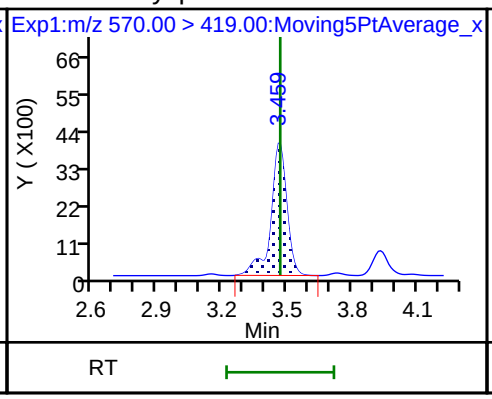
22 Perfluorooctane Sulfonamide



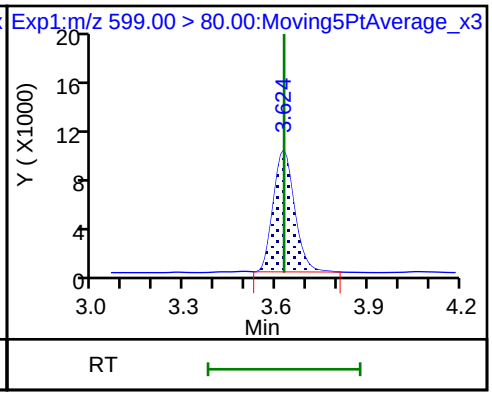
D 27 d3-NMeFOSAA



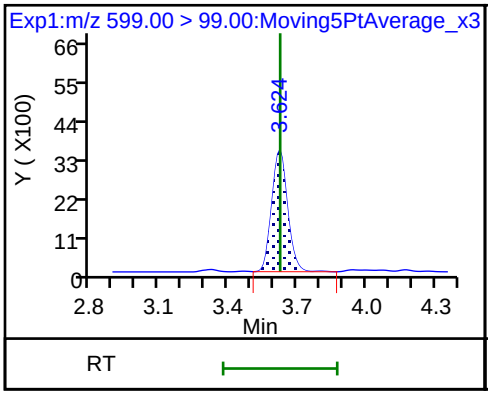
28 N-methyl perfluorooctane sulfonami



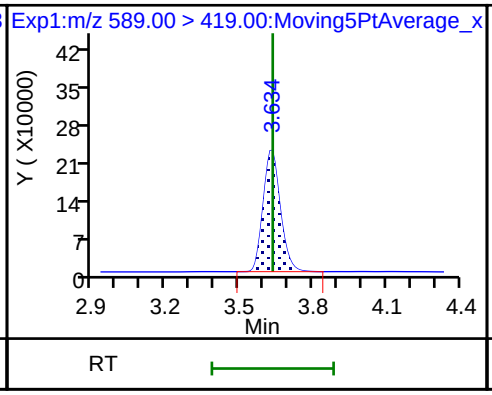
29 Perfluorodecane Sulfonic acid



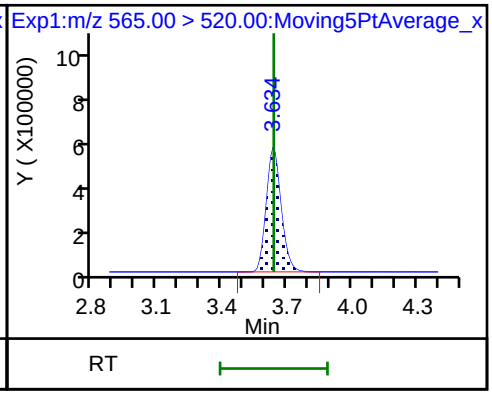
29 Perfluorodecane Sulfonic acid



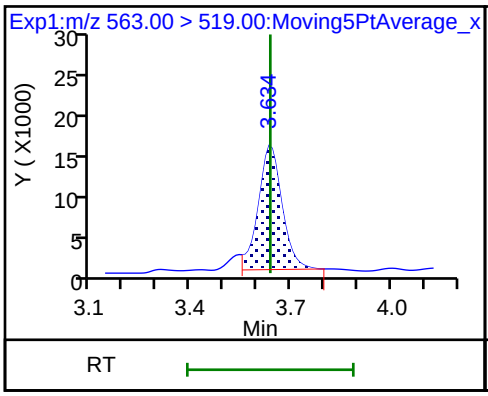
D 32 d5-NEtFOSAA



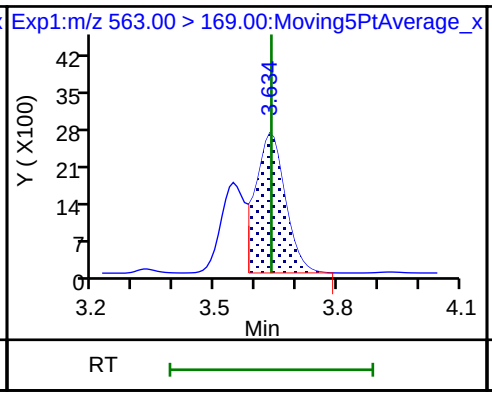
D 30 13C2 PFUnA



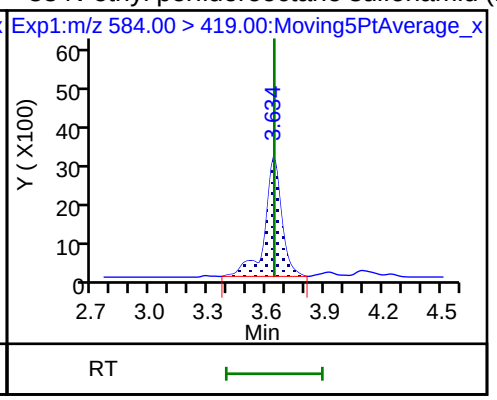
31 Perfluoroundecanoic acid



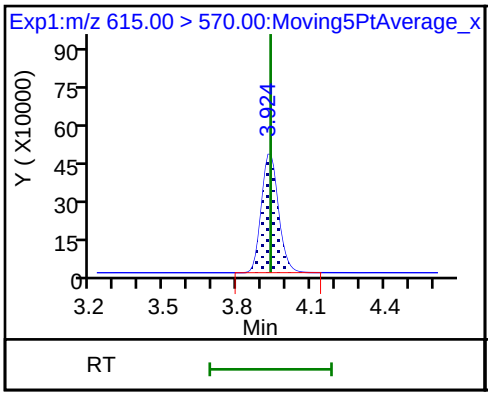
31 Perfluoroundecanoic acid



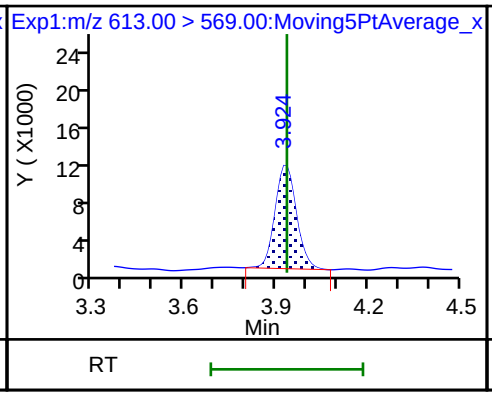
33 N-ethyl perfluorooctane sulfonamid (M)



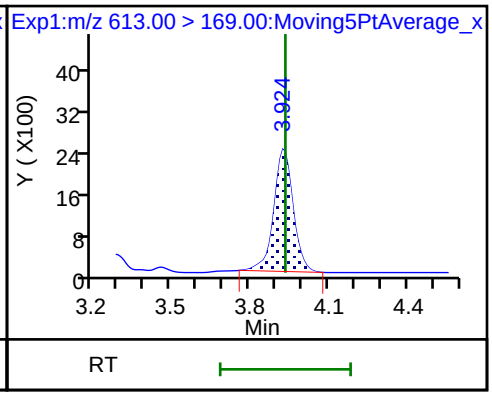
D 36 13C2 PFDoA



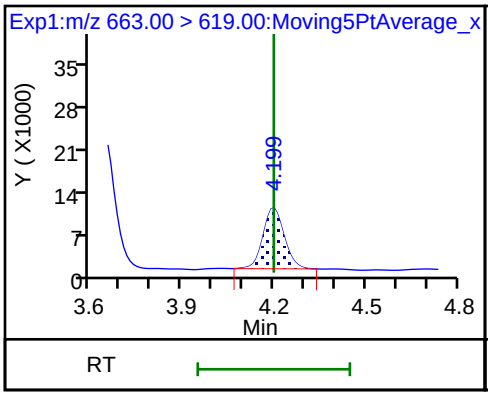
37 Perfluorododecanoic acid



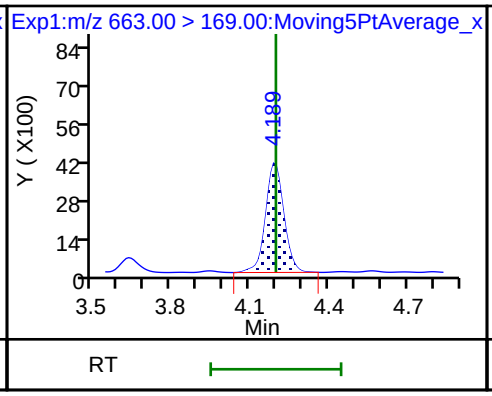
37 Perfluorododecanoic acid



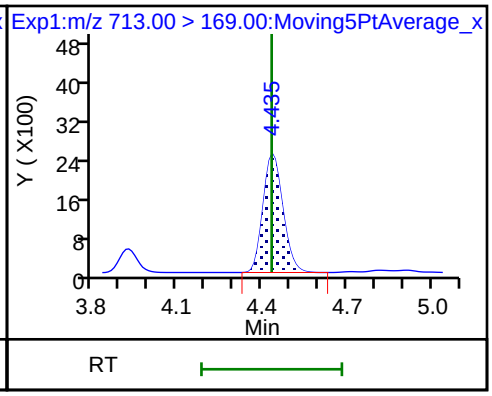
41 Perfluorotridecanoic acid



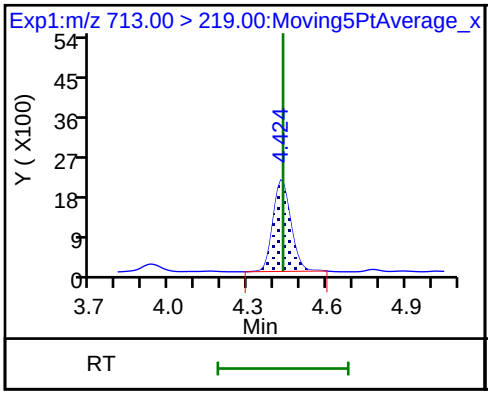
41 Perfluorotridecanoic acid



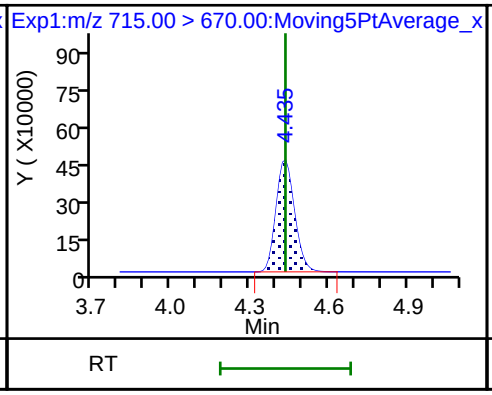
42 Perfluorotetradecanoic acid



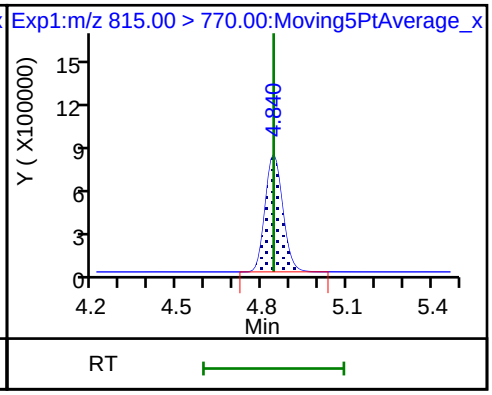
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

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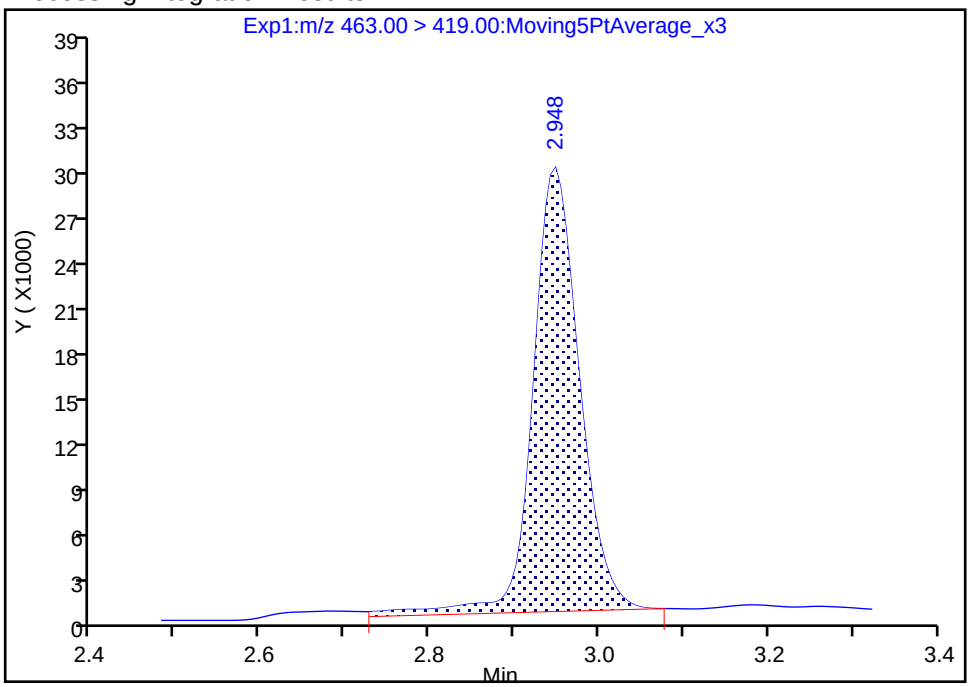
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

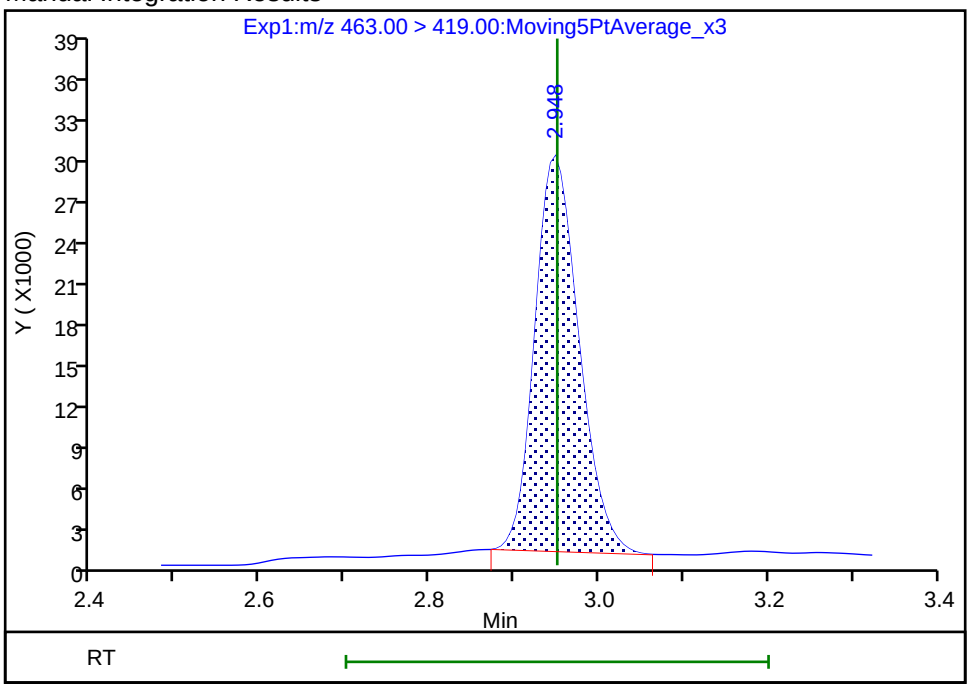
Processing Integration Results

RT: 2.95
Area: 113889
Amount: 0.050116
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 105791
Amount: 0.061074
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:48:28

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

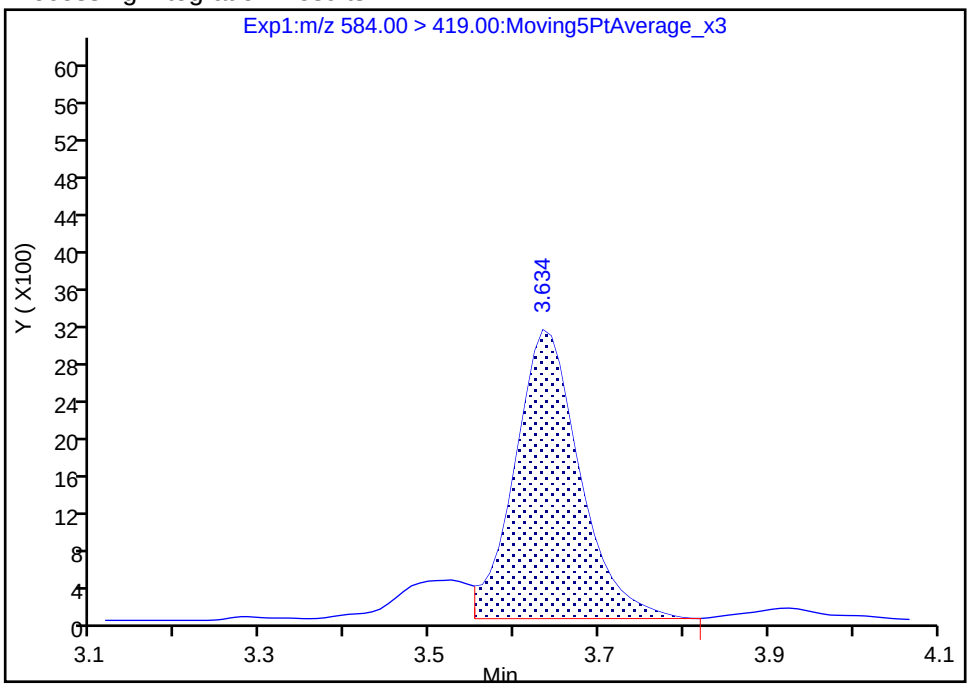
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_003.d				
Injection Date:	23-Jul-2018 16:19:08	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

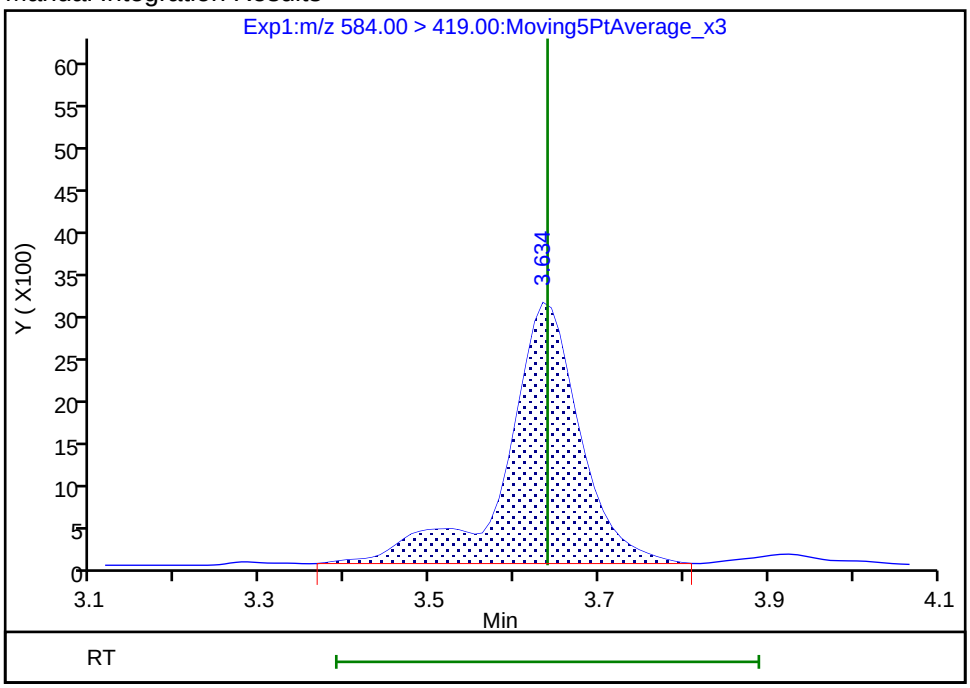
Processing Integration Results

RT: 3.63
Area: 16481
Amount: 0.039745
Amount Units: ng/ml



Manual Integration Results

RT: 3.63
Area: 18908
Amount: 0.045815
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:48:53

Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 23-Jul-2018 16:26:57 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:29 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:50:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.398	-0.002	0.541	5102046	2.39		95.4	63966	
2 Perfluorobutyric acid										
212.90 > 169.00	1.396	1.399	-0.003	1.000	486511	0.2426		97.0	251	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.638	0.002	0.636	3690862	2.47		98.9	62754	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.640	1.639	0.001	1.000	439647	0.2488		99.5	199	M
D 47 13C3-PFBS										
301.90 > 83.00	1.665	1.670	-0.005	0.645	84487	2.16		92.8	504	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.674	1.672	0.002	1.005	645045	0.2236		101	193	
298.90 > 99.00	1.674	1.672	0.002	1.005	262033		2.46(1.25-3.74)	101	179	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.877	-0.001	0.727	649507	NC			6462	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.878	-0.002	1.126	155620	0.2505		107	9331	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.909	-0.004	0.738	4267996	2.44		97.5	67497	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.909	-0.004	1.000	452104	0.2499		99.9	996	
313.00 > 119.00	1.905	1.909	-0.004	1.000	41188		10.98(5.03-15.10)	99.9	605	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.931	-0.004	1.157	626336	0.2420		103	9722	
349.00 > 99.00	1.927	1.931	-0.004	1.157	231252		2.71(1.36-4.07)	103	3337	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.002	2.006	-0.004	1.000	77470	NC			346	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.002	2.007	-0.005	0.776	241931	NC			10175	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.230	-0.002	0.864	4442605	2.46		98.5	68752	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.230	-0.002	1.000	471040	0.2404		96.2	675	
363.00 > 169.00	2.229	2.230	-0.002	1.000	188105		2.50(1.13-3.40)	96.2	2111	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.243	-0.003	1.000	543653	0.2118		93.1	1245	
399.00 > 99.00	2.240	2.243	-0.003	1.000	184590		2.95(1.50-4.49)	93.1	696	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.246	-0.006	0.868	5203959	2.25		95.0	57342	
65 ADONA										
377.00 > 251.00	2.267	2.272	-0.005	0.769	1248830	NC			20732	
377.00 > 85.00	2.267	2.272	-0.005	0.769	684874		1.82(0.84-2.53)		3872	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.559	-0.004	0.990	1177369	2.34		98.4	19673	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.559	-0.004	1.000	194902	0.2331		98.3	2037	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.585	-0.005	1.000	4472663	2.53		101	66159	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.585	-0.005		4611859	2.50			46778	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.586	0.002	1.003	492381	0.2268		90.6	466	
413.00 > 169.00	2.580	2.586	-0.006	1.000	256400		1.92(0.84-2.52)	90.6	1936	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.591	-0.003	0.878	500662	0.2404		101	6593	
449.00 > 99.00	2.588	2.591	-0.003	0.878	134113		3.73(1.94-5.82)	101	2466	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.949	-0.001	1.142	3598957	2.23		93.5	29961	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.949	-0.001	1.000	380417	0.2286		98.5	3341	
499.00 > 99.00	2.948	2.949	-0.001	1.000	87351		4.36(2.31-6.93)	98.5	1593	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.950	-0.002	1.142	3826960	2.51		101	65457	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.950	-0.002	1.000	433434	0.2480		99.2	1410	
463.00 > 169.00	2.948	2.950	-0.002	1.000	104763		4.14(1.90-5.69)	99.2	3129	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.161	0.003	1.073	643273	NC			6736	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.296	0.003	1.279	1348095	2.57		107	25461	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.297	0.002	1.000	184284	0.2415		101	6415	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.299	0.0	1.119	264461	0.2351		98.0	6695	
549.00 > 99.00	3.299	3.299	0.0	1.119	99972		2.65(1.33-3.97)	98.0	2109	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.309	-0.002	1.282	3095634	2.56		102	44382	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.309	-0.002	1.000	313494	0.2462		98.5	1204	
513.00 > 169.00	3.307	3.309	-0.002	1.000	56639		5.53(2.36-7.09)	98.5	1274	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.311	0.004	1.285	5990646	2.53		101	76449	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.314	0.001	1.000	593444	0.2490		99.6	9634	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.467	3.462	0.005	1.344	972395	2.43		97.2	26535	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.468	-0.001	1.000	100194	0.2614		105	925	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.625	-0.004	1.228	246002	0.2463		102	7445	
599.00 > 99.00	3.621	3.625	-0.004	1.228	82484		2.98(1.39-4.16)	102	1634	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.635	-0.004	1.407	1028200	2.44		97.8	3915	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.638	0.002	1.411	2455525	2.52		101	43525	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.640	3.638	0.002	1.000	307287	0.2521		101	1407	R
563.00 > 169.00	3.640	3.638	0.002	1.000	48217		6.37(2.12-6.36)	101	420	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.639	0.001	1.003	96639	0.2519		101	2322	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.800	-0.005	1.287	1000160	NC			18909	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.934	-0.003	1.523	2222244	2.40		95.9	19708	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.934	-0.003	1.000	244107	0.2538		102	82.0	
613.00 > 169.00	3.931	3.934	-0.003	1.000	59631		4.09(2.13-6.40)	102	1147	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.198	-0.005	1.067	226682	0.2428		97.1	74.6	
663.00 > 169.00	4.193	4.198	-0.005	1.067	71050		3.19(1.25-3.76)	97.1	1025	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.433	0.004	1.000	51758	0.2335		93.4	745	
713.00 > 219.00	4.427	4.433	-0.006	0.998	41061		1.26(0.71-2.13)	93.4	766	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.435	0.002	1.720	2210453	2.44		97.6	13344	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.840	0.002	1.877	3417814	2.49		99.4	12591	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.840	0.002	1.000	358215	NC			58.6	
813.00 > 169.00	4.842	4.840	0.002	1.000	59039		6.07(2.86-8.58)		656	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.182	5.184	-0.002	1.070	357314	NC			81.0	
913.00 > 169.00	5.182	5.184	-0.002	1.070	43056		8.30(3.83-11.48)		625	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL3_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_004.d

Injection Date: 23-Jul-2018 16:26:57 Instrument ID: A8_N

Lims ID: IC L3 Full

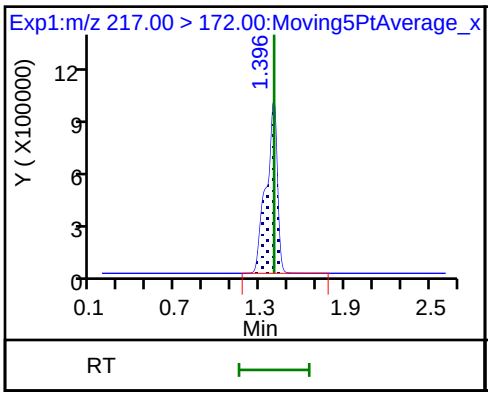
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4

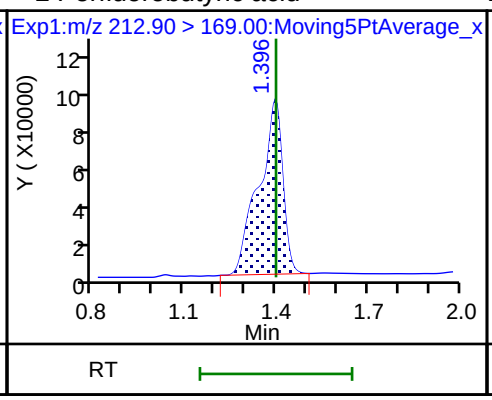
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

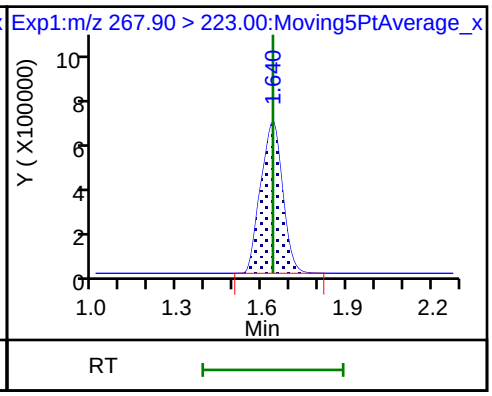
D 1 13C4 PFBA



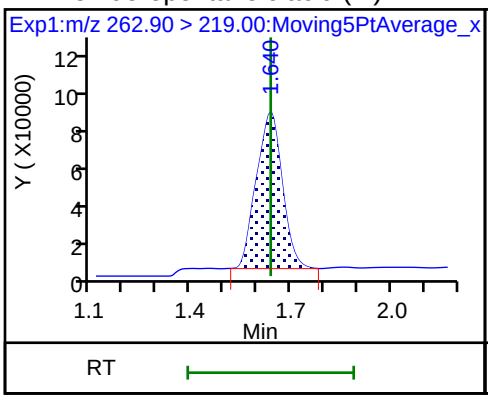
2 Perfluorobutyric acid



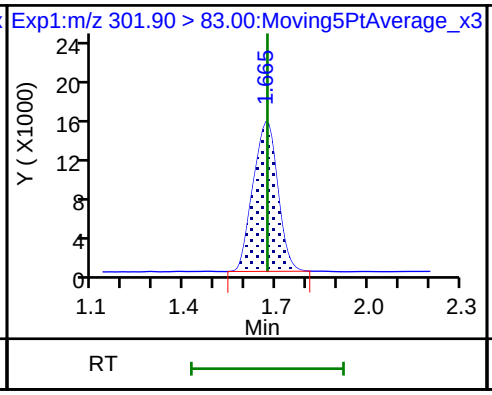
D 3 13C5-PFPeA



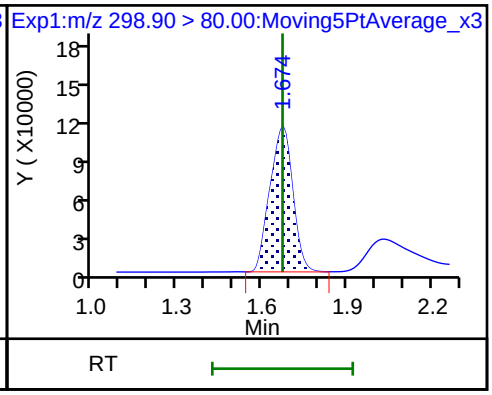
4 Perfluoropentanoic acid (M)



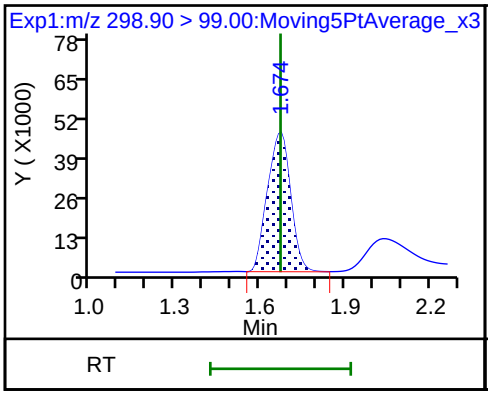
D 47 13C3-PFBS



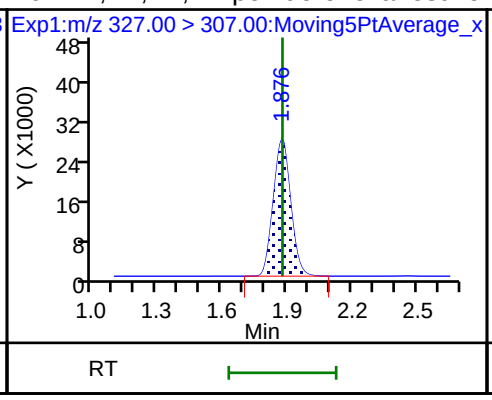
5 Perfluorobutanesulfonic acid



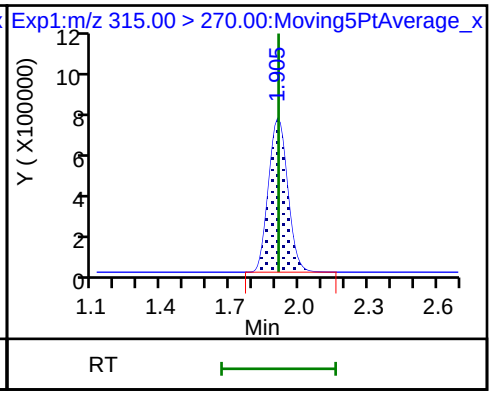
5 Perfluorobutanesulfonic acid



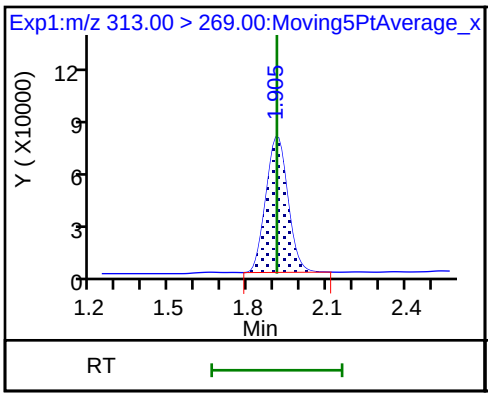
61 1H,1H,2H,2H-perfluorohexanesulfon



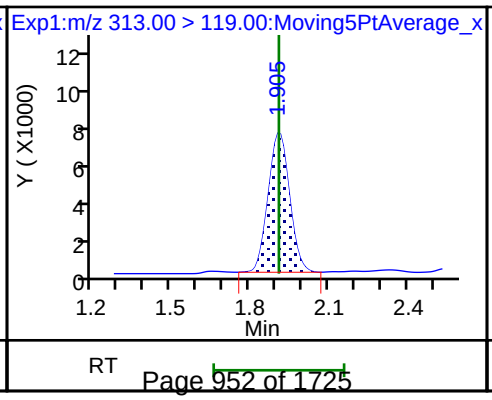
D 7 13C2 PFHxA



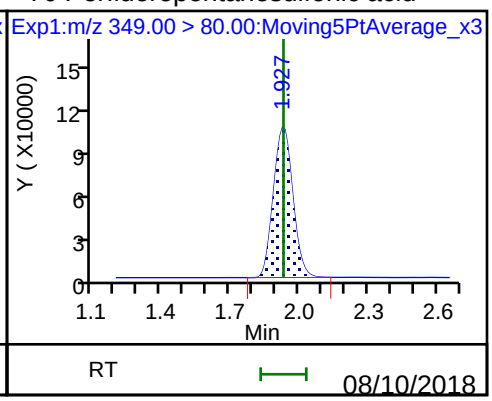
6 Perfluorohexanoic acid



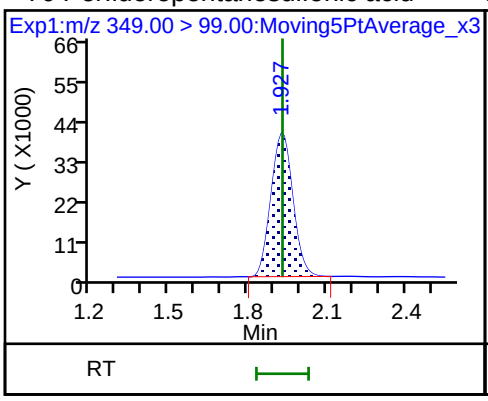
6 Perfluorohexanoic acid



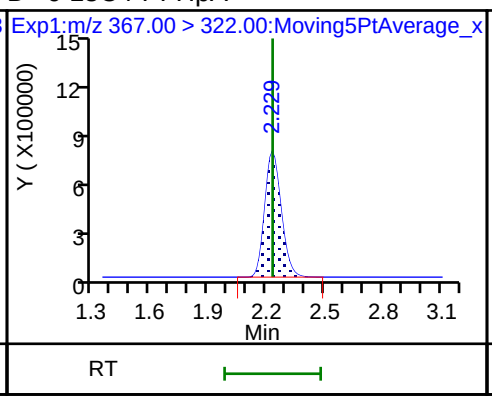
70 Perfluoropentanesulfonic acid



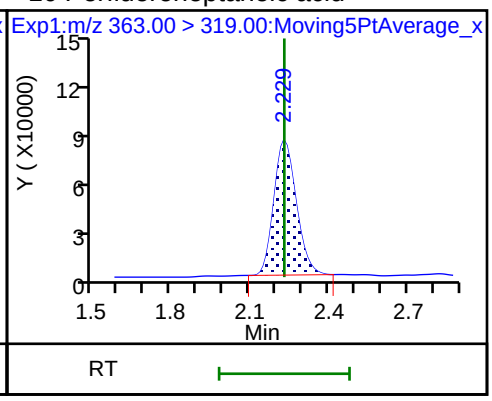
70 Perfluoropentanesulfonic acid



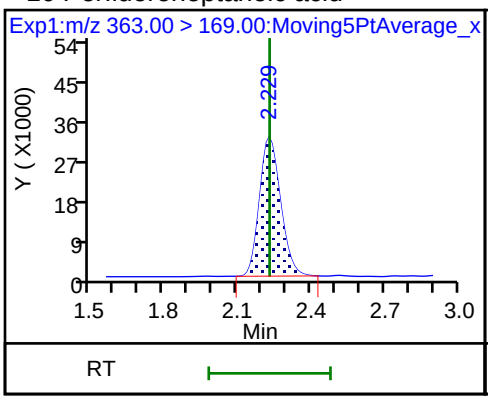
D 9 13C4-PFHpA



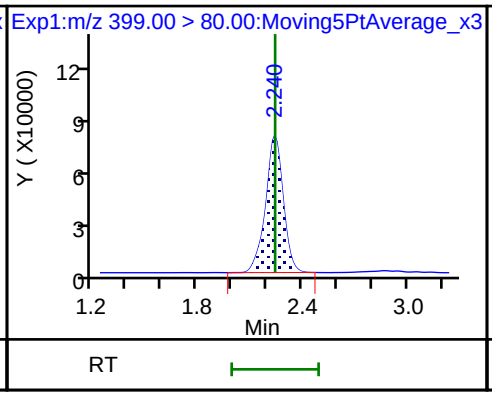
10 Perfluoroheptanoic acid



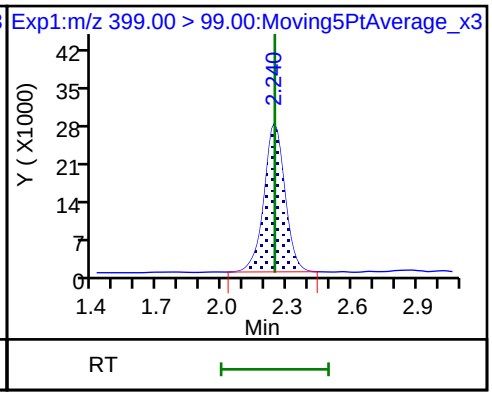
10 Perfluoroheptanoic acid



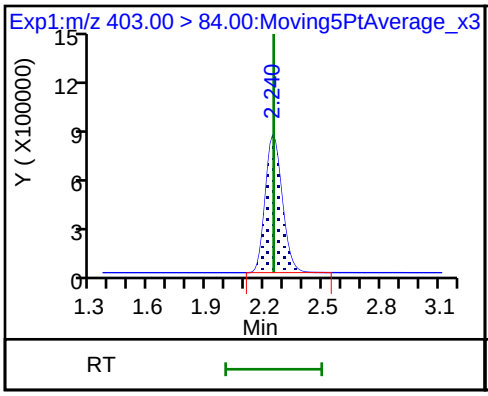
8 Perfluorohexanesulfonic acid



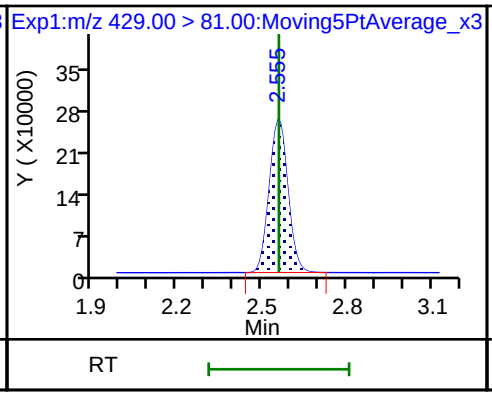
8 Perfluorohexanesulfonic acid



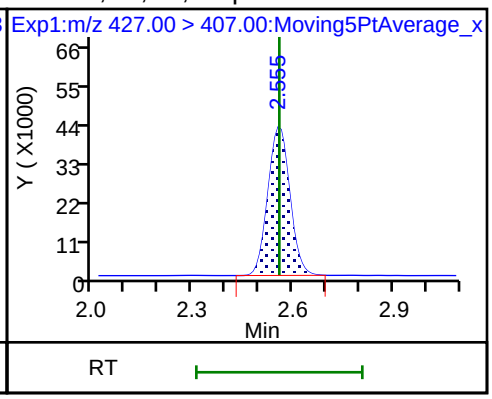
D 11 18O2 PFHxS



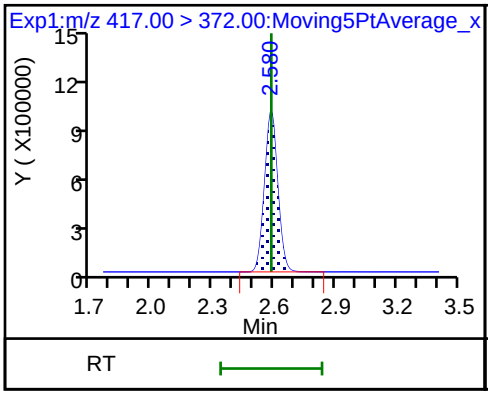
D 12 M2-6:2FTS



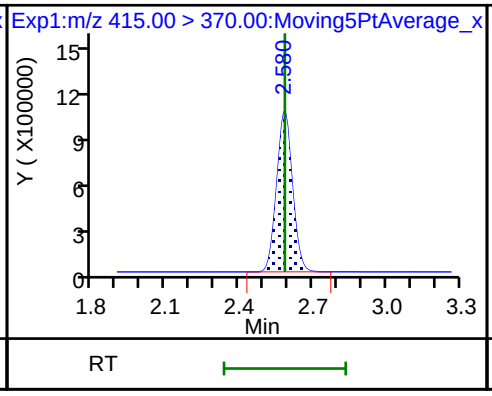
13 1H,1H,2H,2H-perfluorooctanesulfoni



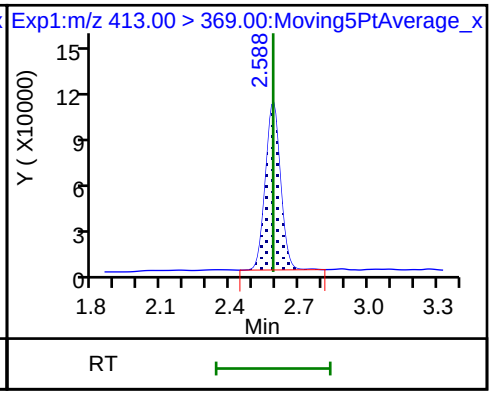
D 14 13C4 PFOA



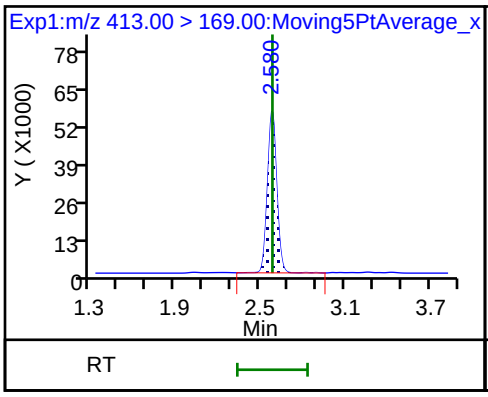
* 62 13C2-PFOA



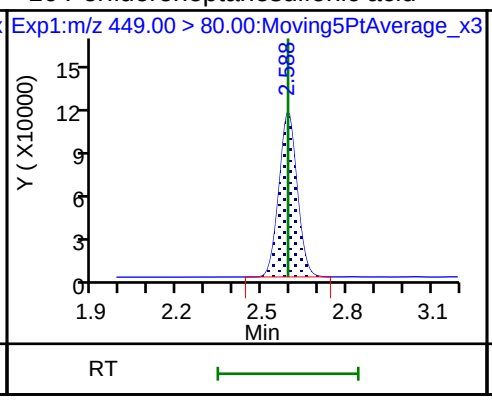
15 Perfluorooctanoic acid



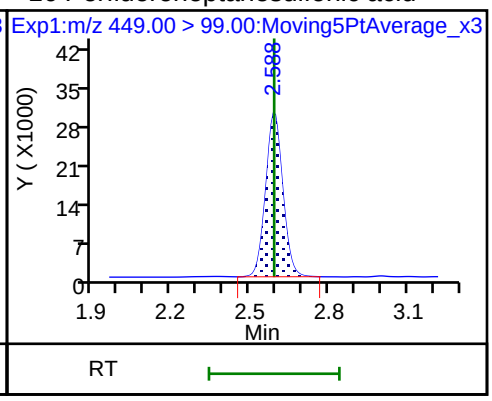
15 Perfluorooctanoic acid



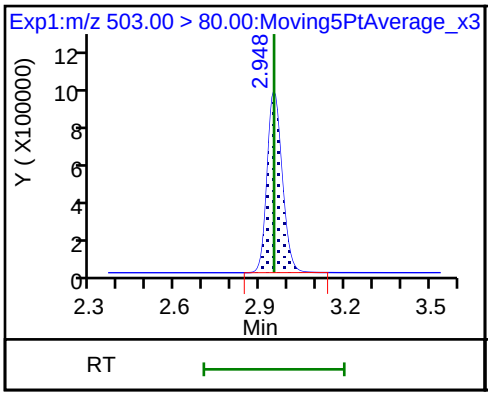
16 Perfluoroheptanesulfonic acid



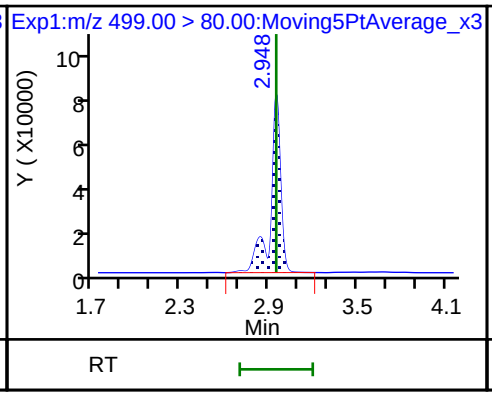
16 Perfluoroheptanesulfonic acid



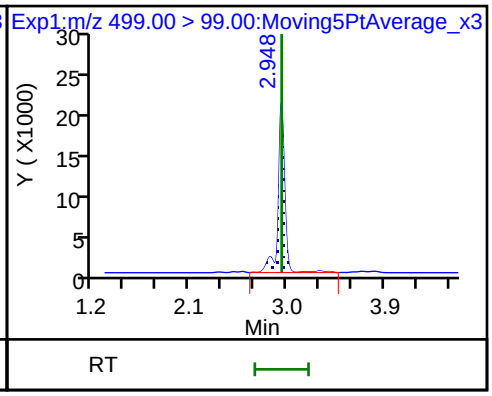
D 18 13C4 PFOS



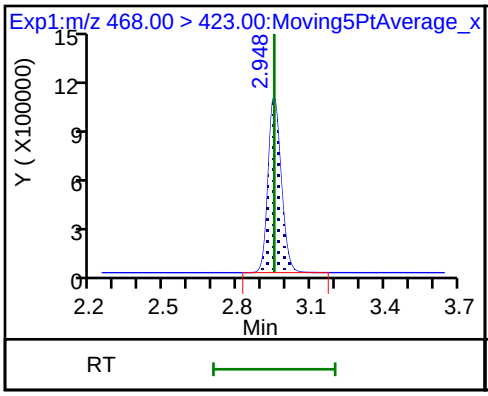
17 Perfluorooctane sulfonic acid



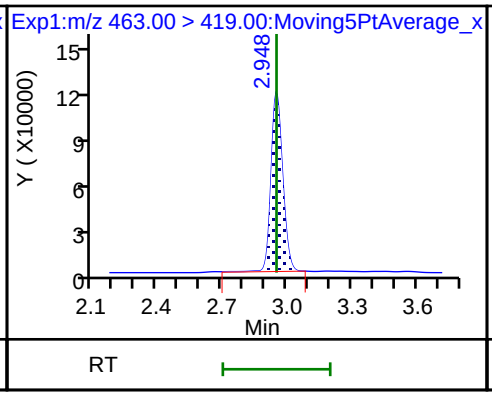
17 Perfluorooctane sulfonic acid



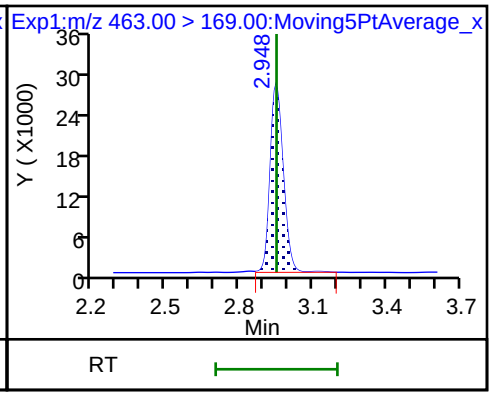
D 19 13C5 PFNA



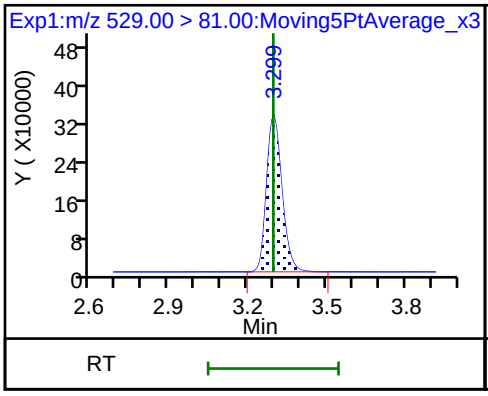
20 Perfluorononanoic acid



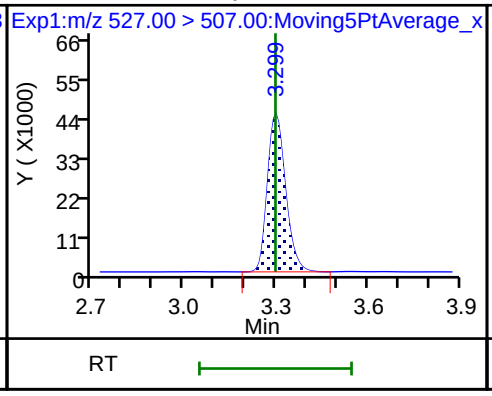
20 Perfluorononanoic acid



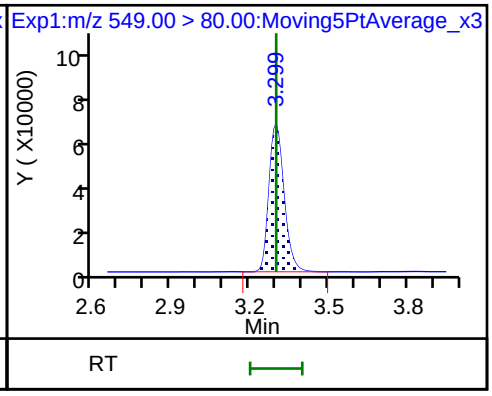
D 26 M2-8:2FTS



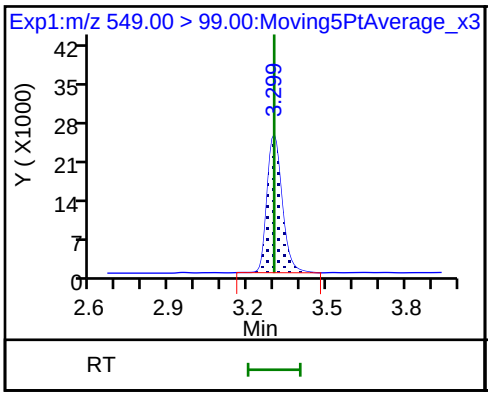
25 1H,1H,2H,2H-perfluorodecanesulfoni



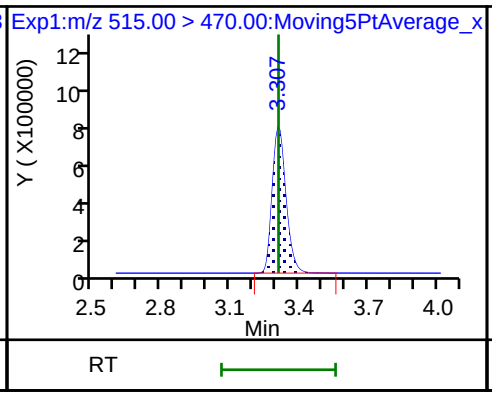
68 Perfluorononanesulfonic acid



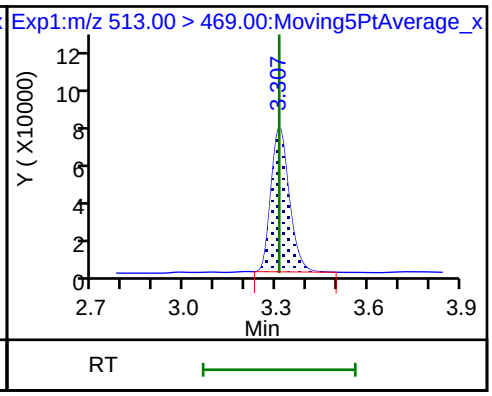
68 Perfluorononanesulfonic acid



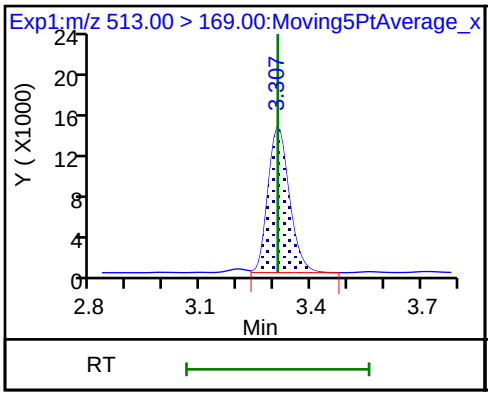
D 23 13C2 PFDA



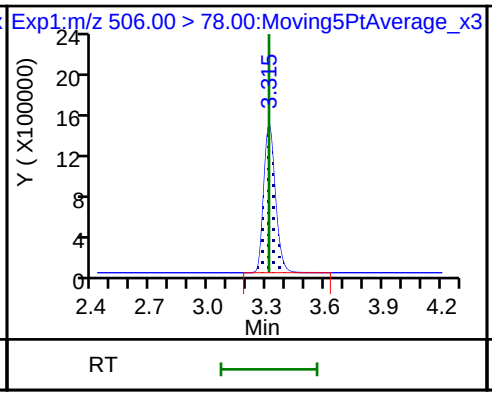
24 Perfluorodecanoic acid



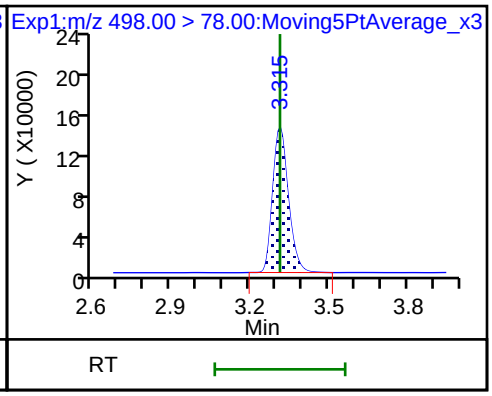
24 Perfluorodecanoic acid



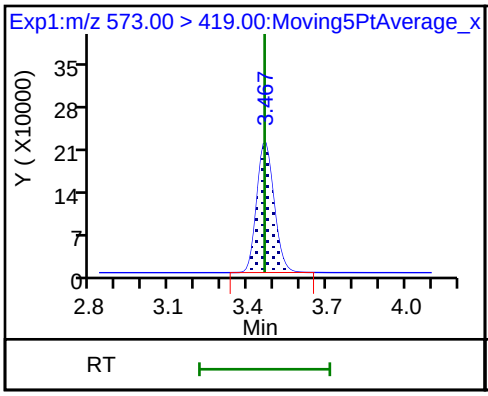
D 21 13C8 FOSA



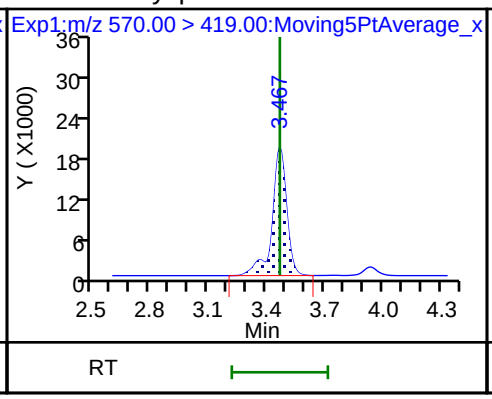
22 Perfluorooctane Sulfonamide



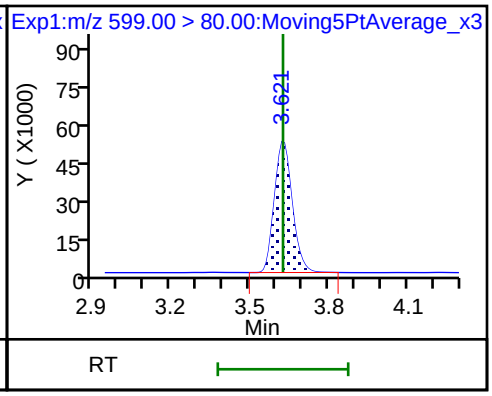
D 27 d3-NMeFOSAA



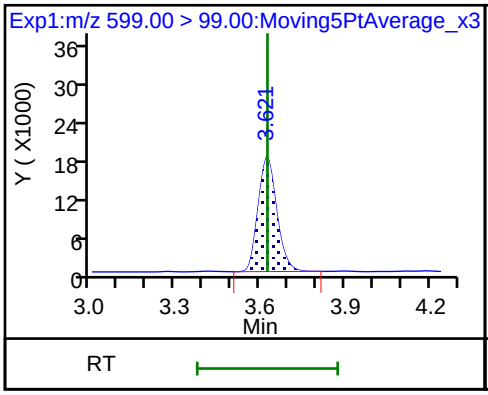
28 N-methyl perfluorooctane sulfonami



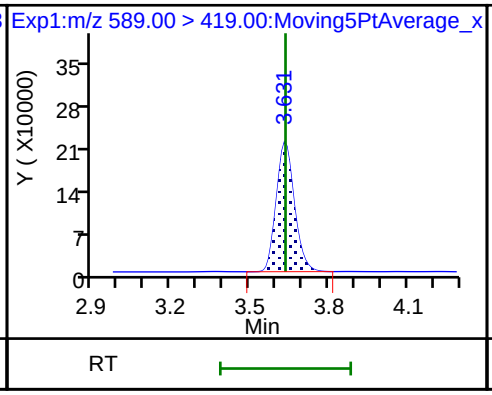
29 Perfluorodecane Sulfonic acid



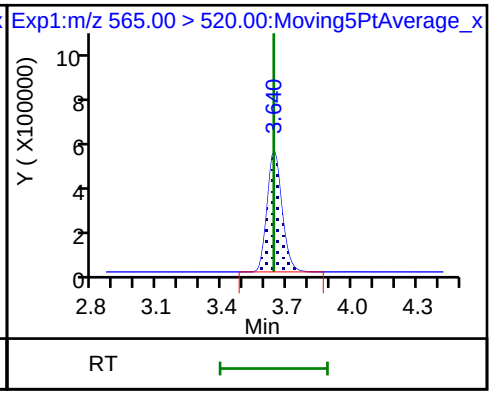
29 Perfluorodecane Sulfonic acid



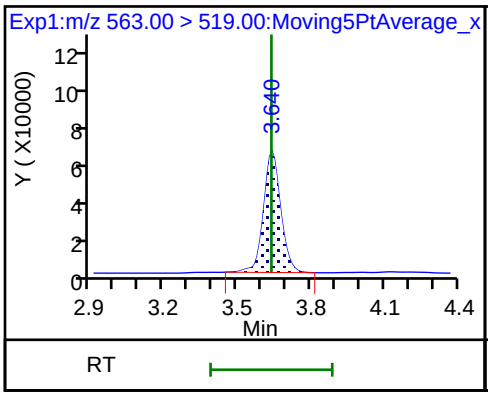
D 32 d5-NEtFOSAA



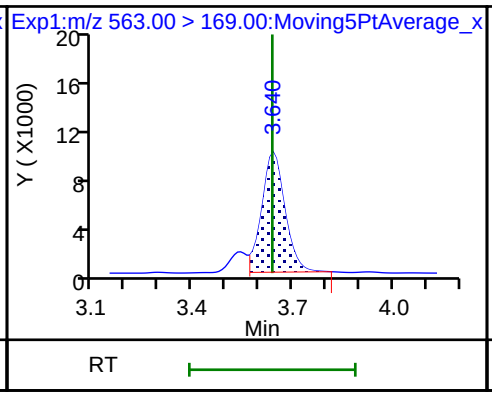
D 30 13C2 PFUnA



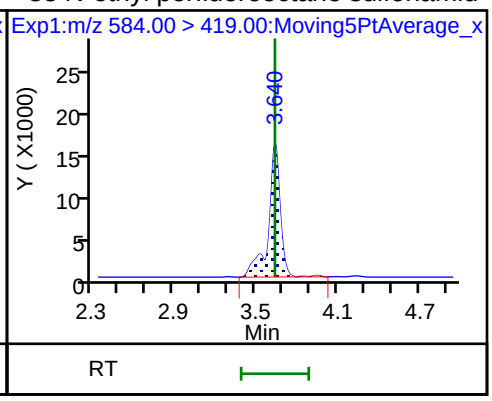
31 Perfluoroundecanoic acid



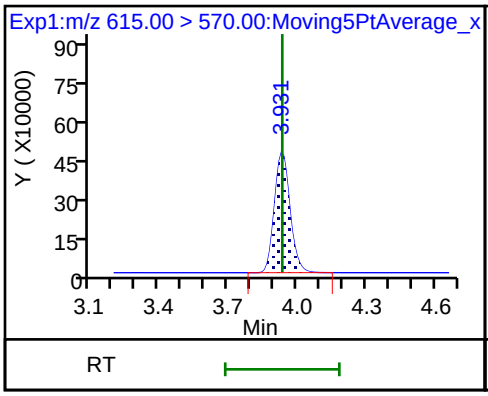
31 Perfluoroundecanoic acid



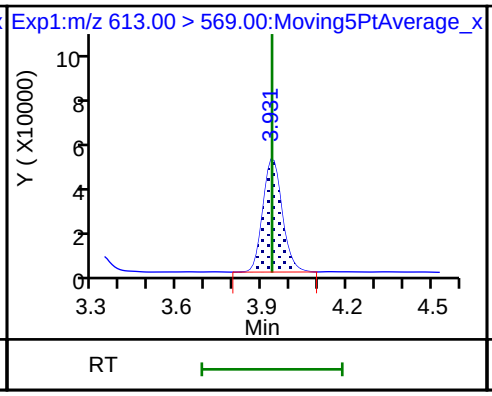
33 N-ethyl perfluorooctane sulfonamid



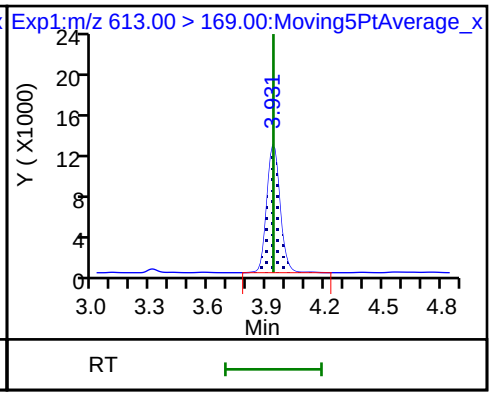
D 36 13C2 PFDoA



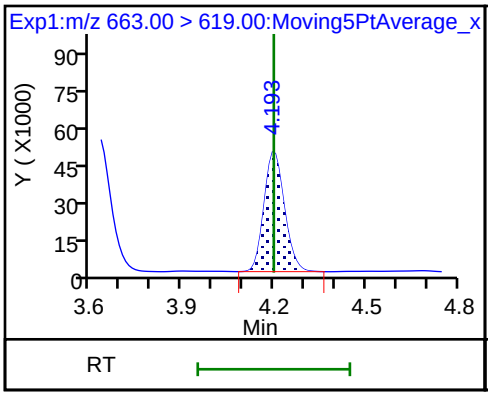
37 Perfluorododecanoic acid



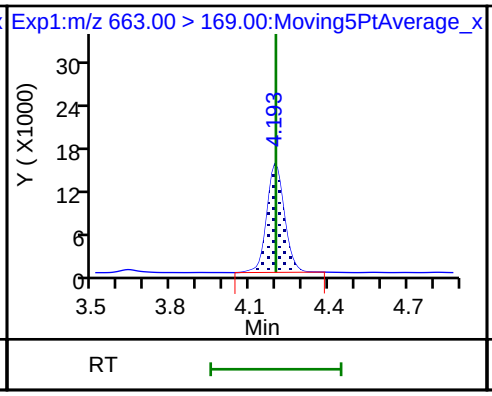
37 Perfluorododecanoic acid



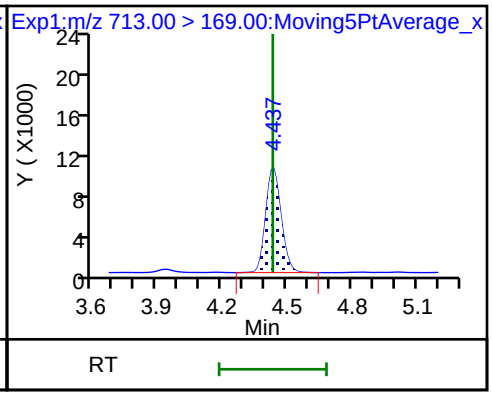
41 Perfluorotridecanoic acid



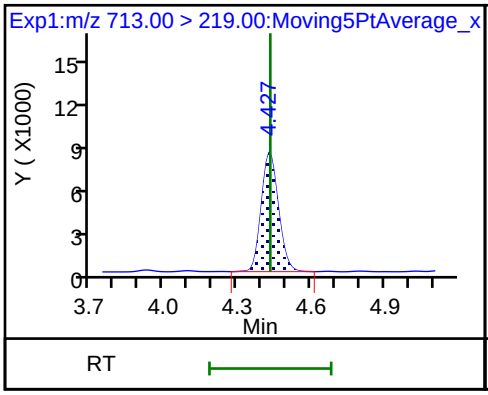
41 Perfluorotridecanoic acid



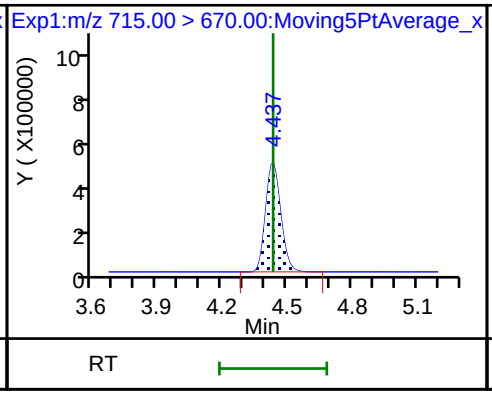
42 Perfluorotetradecanoic acid



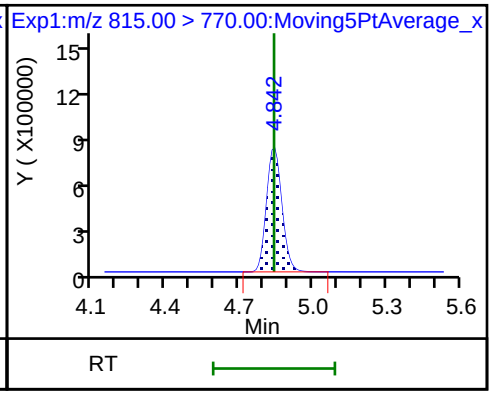
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

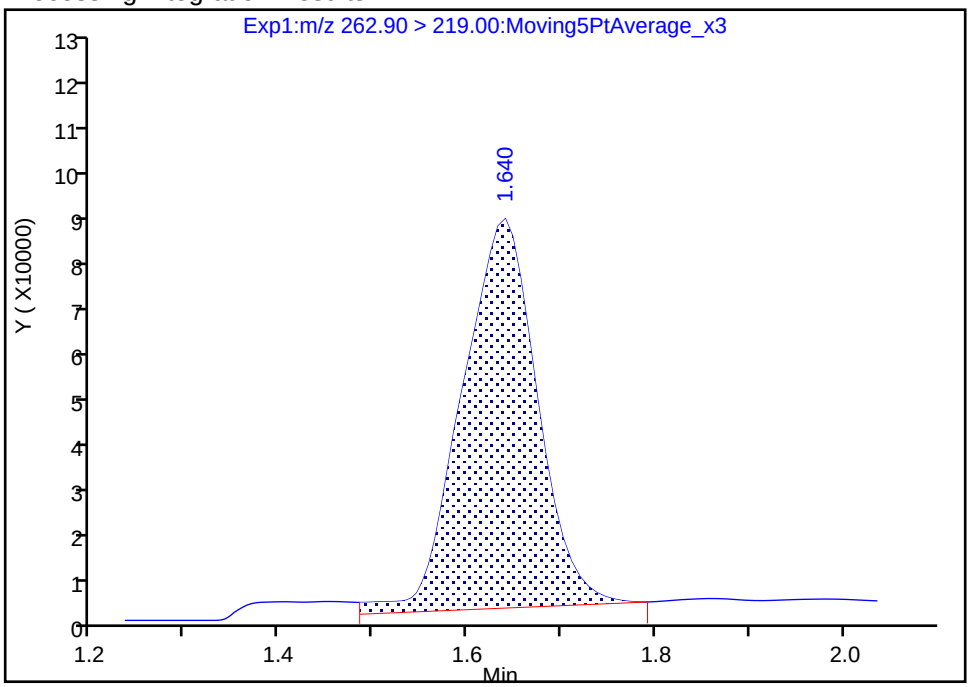
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_004.d				
Injection Date:	23-Jul-2018 16:26:57	Instrument ID:	A8_N		
Lims ID:	IC L3 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

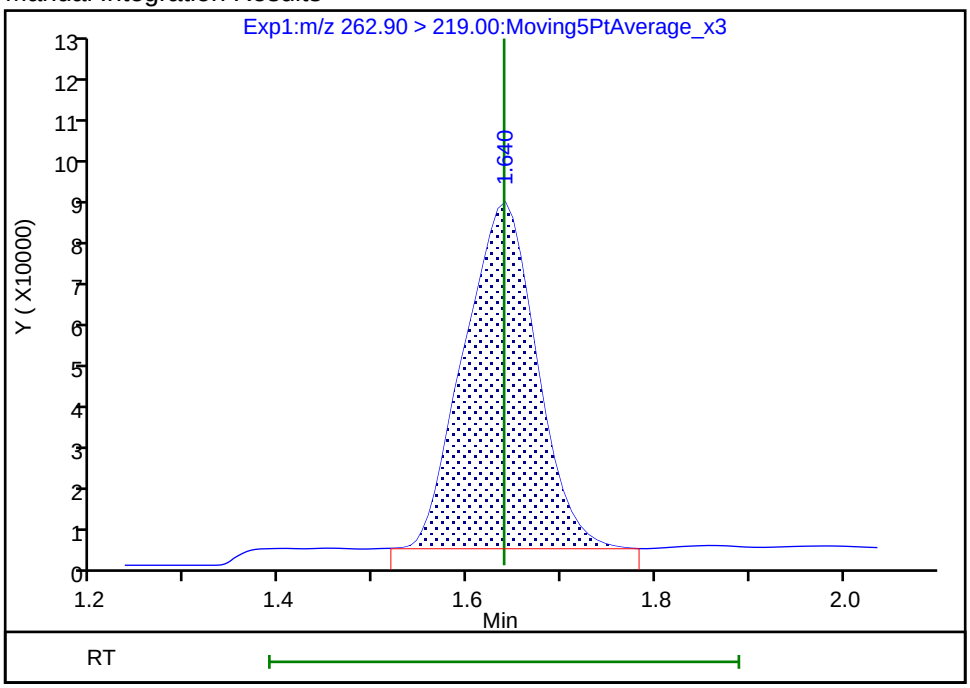
Processing Integration Results

RT: 1.64
Area: 463294
Amount: 0.257426
Amount Units: ng/ml



Manual Integration Results

RT: 1.64
Area: 439647
Amount: 0.248800
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 16:49:42

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 23-Jul-2018 16:34:44 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:05 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:39:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.540	5085441	2.46		98.2	68029	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	1945262	0.9731		97.3	983	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.638	0.003	0.634	3595441	2.49		99.5	67038	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.639	0.002	1.000	1731603	1.01		101	814	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.670	0.006	0.647	87401	2.30		99.1	637	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.672	0.004	1.000	2656453	0.8901		101	792	
298.90 > 99.00	1.676	1.672	0.004	1.000	1073612		2.47(1.25-3.74)	101	712	
D 60 M2-4:2FTS										
329.00 > 81.00	1.877	1.877	0.0	0.725	665117	NC			8579	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.878	-0.001	1.120	625017	0.9726		104	28310	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.736	4274151	2.52		101	106286	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	1791310	0.9885		98.9	4006	
313.00 > 119.00	1.907	1.909	-0.002	1.000	159080		11.26(5.03-15.10)	98.9	2771	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.929	1.931	-0.002	1.151	2555539	0.9543		102	33712	
349.00 > 99.00	1.929	1.931	-0.002	1.151	940495		2.72(1.36-4.07)	102	11586	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.005	2.006	-0.001	1.000	312243	NC			1472	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.774	232310	NC			8128	
D 9 13C4-PFHpA										
367.00 > 322.00	2.231	2.230	0.001	0.861	4501447	2.58		103	68803	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.231	2.230	0.001	1.000	1987683	1.00		100	2735	
363.00 > 169.00	2.231	2.230	0.001	1.000	744280		2.67(1.13-3.40)	100	6602	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.244	2.243	0.001	1.000	2203602	0.8628		94.8	4177	
399.00 > 99.00	2.244	2.243	0.001	1.000	730552		3.02(1.50-4.49)	94.8	2338	
D 11 18O2 PFHxS										
403.00 > 84.00	2.244	2.246	-0.002	0.866	5177221	2.31		97.5	56870	
65 ADONA										
377.00 > 251.00	2.270	2.272	-0.002	0.770	5267276	NC			51090	
377.00 > 85.00	2.270	2.272	-0.002	0.770	2972862		1.77(0.84-2.53)		14828	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.559	-0.002	0.987	1248833	2.56		108	19450	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.559	-0.002	1.000	768241	0.8661		91.4	6619	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.585	0.005	1.000	4231778	2.48		99.0	47085	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.585	0.005		4466345	2.50			45525	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.590	2.586	0.004	1.000	2041845	0.99		99.3	1598	
413.00 > 169.00	2.590	2.586	0.004	1.000	1027970		1.99(0.84-2.52)	99.3	5148	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.590	2.591	-0.001	0.878	2083941	0.9429		99.0	18462	
449.00 > 99.00	2.590	2.591	-0.001	0.878	547158		3.81(1.94-5.82)	99.0	8852	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.949	0.0	1.139	3818414	2.45		102	35440	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.949	2.949	0.0	1.000	1548724	0.8773		94.5	10880	
499.00 > 99.00	2.949	2.949	0.0	1.000	359665		4.31(2.31-6.93)	94.5	6596	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.950	-0.001	1.139	3768250	2.56		102	79540	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.950	-0.001	1.000	1616264	0.9392		93.9	4351	
463.00 > 169.00	2.949	2.950	-0.001	1.000	381603		4.24(1.90-5.69)	93.9	8572	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.165	3.161	0.004	1.073	2603350	NC			21207	
D 26 M2-8:2FTS										
529.00 > 81.00	3.300	3.296	0.004	1.274	1264179	2.48		104	17938	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.300	3.297	0.003	1.000	712803	1.00		104	21774	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.300	3.299	0.001	1.119	1134203	0.9505		99.0	28672	
549.00 > 99.00	3.300	3.299	0.001	1.119	436139		2.60(1.33-3.97)	99.0	6446	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.277	3062260	2.61		104	49773	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	1267791	1.01		101	5283	
513.00 > 169.00	3.308	3.309	-0.001	1.000	221574		5.72(2.36-7.09)	101	7706	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.277	5853618	2.55		102	70810	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.316	3.314	0.002	1.002	2328173	1.00		100.0	35092	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.462	-0.002	1.336	963774	2.49		99.5	30385	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.469	3.468	0.001	1.003	362883	0.9551		95.5	3626	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.625	3.625	0.0	1.229	975593	0.9208		95.5	20714	
599.00 > 99.00	3.625	3.625	0.0	1.229	344747		2.83(1.39-4.16)	95.5	6661	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.634	3.635	-0.001	1.403	1057814	2.60		104	4282	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.403	2420418	2.56		102	36289	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	1123256	0.9350		93.5	5099	
563.00 > 169.00	3.634	3.638	-0.004	1.000	203840		5.51(2.12-6.36)	93.5	6982	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.639	-0.005	1.000	356256	0.9025		90.2	8786	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.800	3.800	0.0	1.288	4070275	NC			53357	
D 36 13C2 PFDoA										
615.00 > 570.00	3.936	3.934	0.002	1.519	2243127	2.50		99.9	18184	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.936	3.934	0.002	1.000	907939	0.9353		93.5	254	
613.00 > 169.00	3.936	3.934	0.002	1.000	229611		3.95(2.13-6.40)	93.5	6005	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.200	4.198	0.002	1.067	904085	0.9593		95.9	294	
663.00 > 169.00	4.200	4.198	0.002	1.067	289645		3.12(1.25-3.76)	95.9	3462	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.436	4.433	0.003	1.000	215092	1.01		101	2755	
713.00 > 219.00	4.425	4.433	-0.008	0.998	152064		1.41(0.71-2.13)	101	3925	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.435	0.001	1.712	2124401	2.42		96.9	12187	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.841	4.840	0.001	1.869	3329175	2.50		100	11167	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.841	4.840	0.001	1.000	1217231	NC			189	
813.00 > 169.00	4.841	4.840	0.001	1.000	204580		5.95(2.86-8.58)		2497	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.184	-0.003	1.070	1302558	NC			282	
913.00 > 169.00	5.181	5.184	-0.003	1.070	156715		8.31(3.83-11.48)		2177	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_005.d

Injection Date: 23-Jul-2018 16:34:44 Instrument ID: A8_N

Lims ID: IC L4 Full

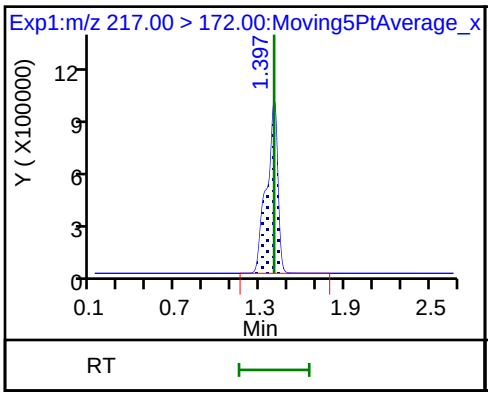
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 5

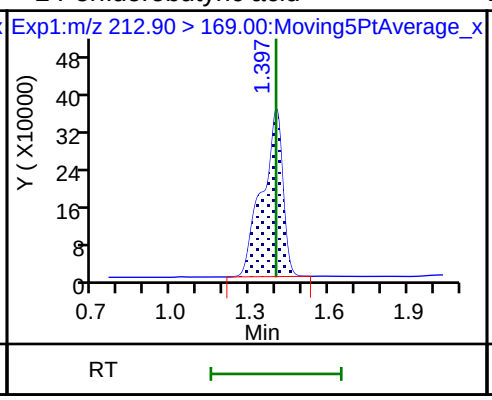
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

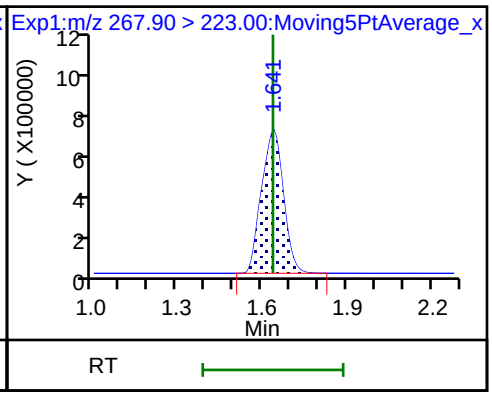
D 1 13C4 PFBA



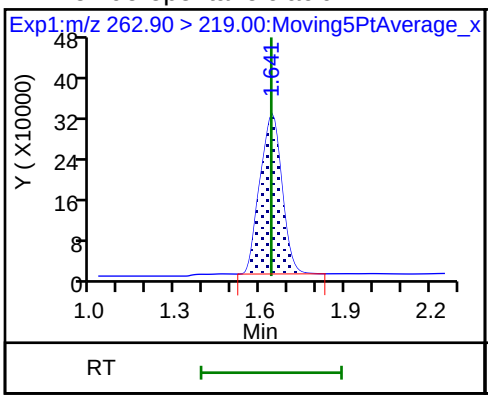
2 Perfluorobutyric acid



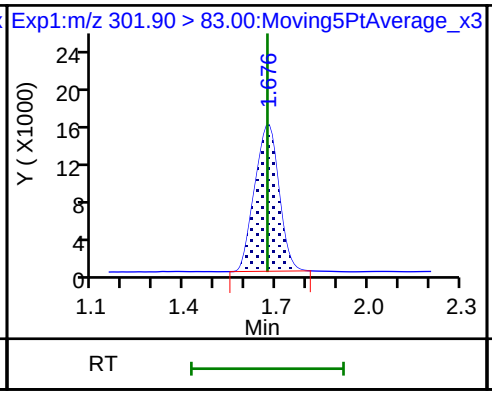
D 3 13C5-PFPeA



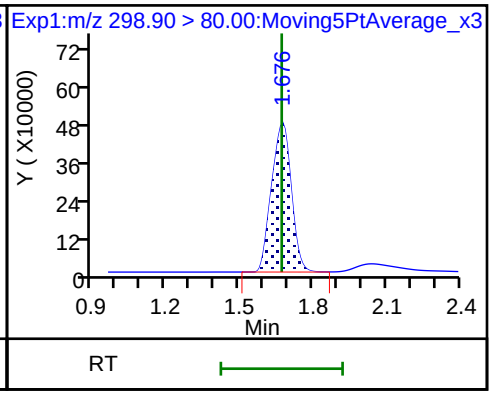
4 Perfluoropentanoic acid



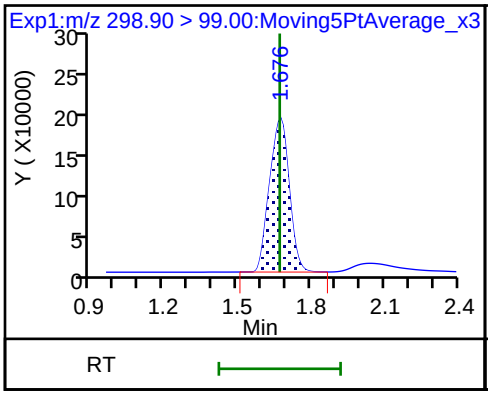
D 47 13C3-PFBS



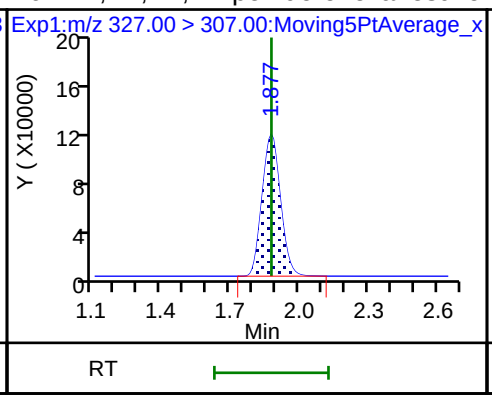
5 Perfluorobutanesulfonic acid



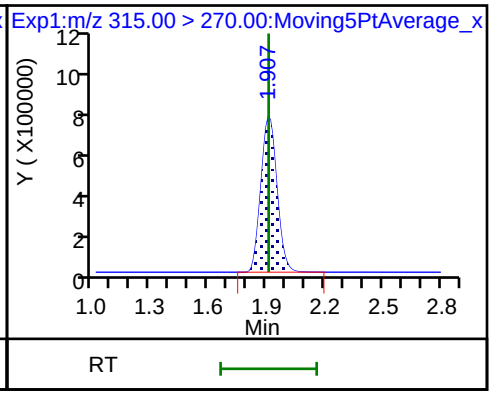
5 Perfluorobutanesulfonic acid



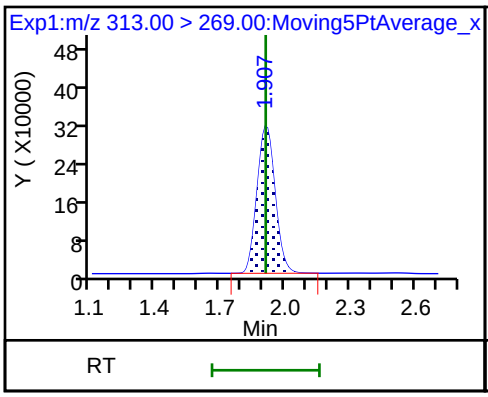
61 1H,1H,2H,2H-perfluorohexanesulfon



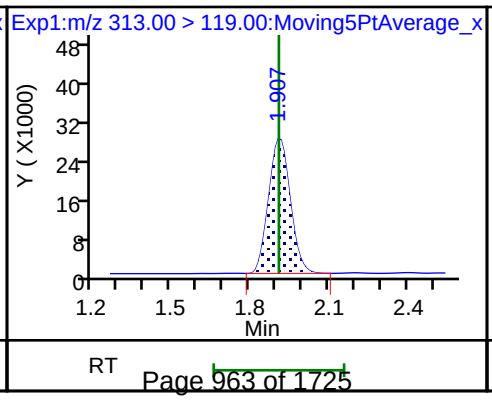
D 7 13C2 PFHxA



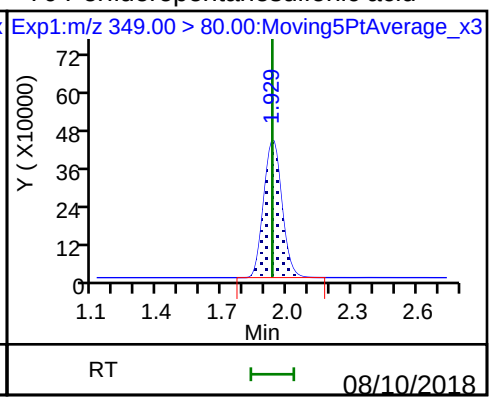
6 Perfluorohexanoic acid



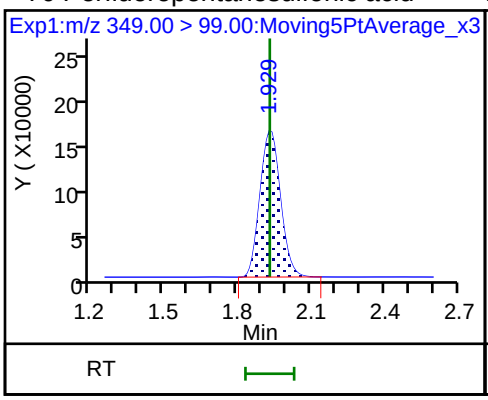
6 Perfluorohexanoic acid



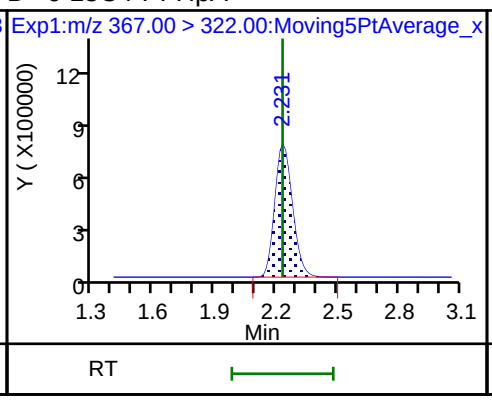
70 Perfluoropentanesulfonic acid



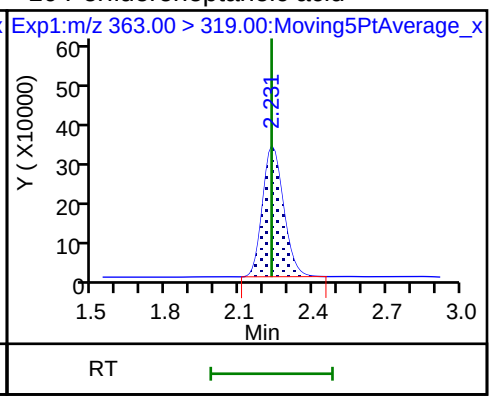
70 Perfluoropentanesulfonic acid



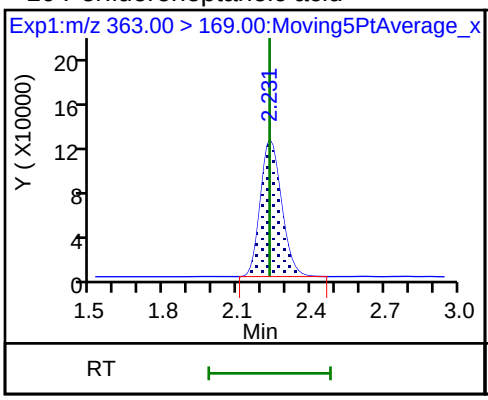
D 9 13C4-PFHpA



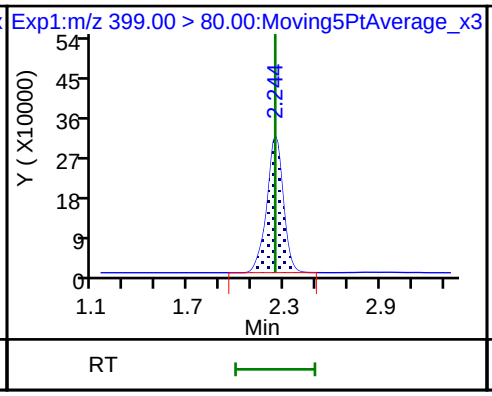
10 Perfluoroheptanoic acid



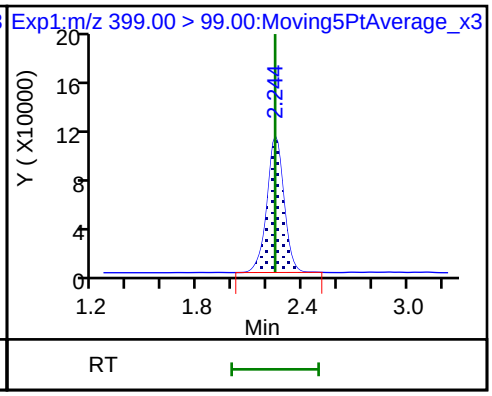
10 Perfluoroheptanoic acid



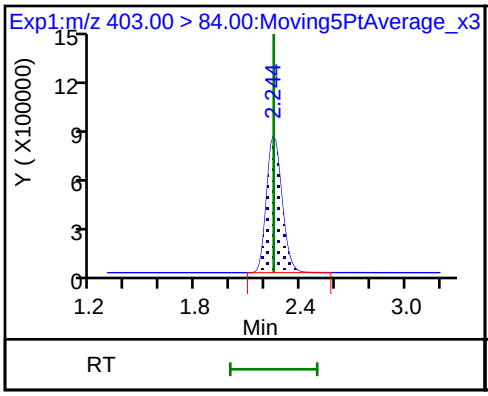
8 Perfluorohexanesulfonic acid



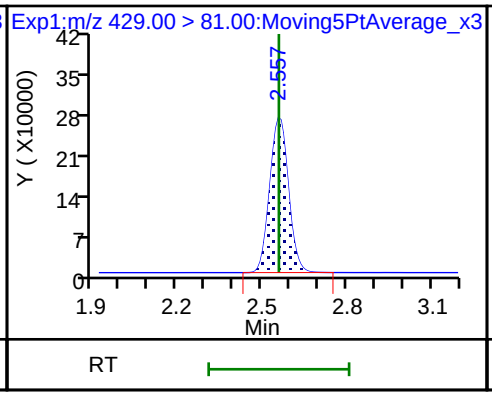
8 Perfluorohexanesulfonic acid



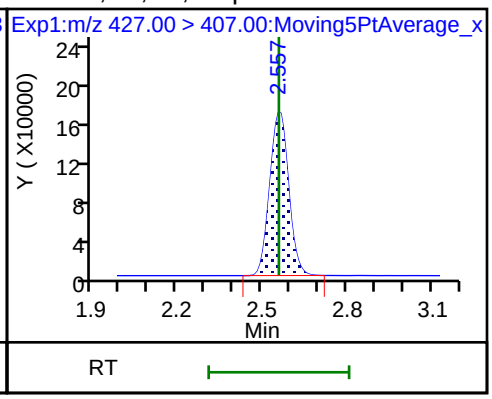
D 11 18O2 PFHxS



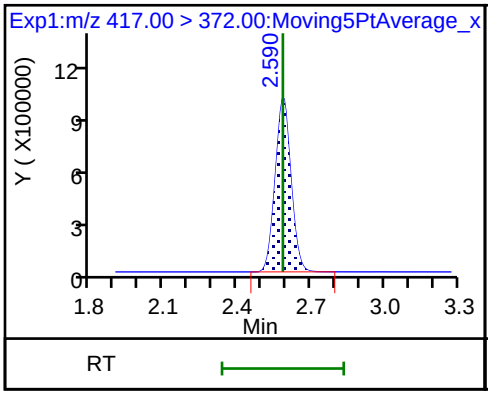
D 12 M2-6:2FTS



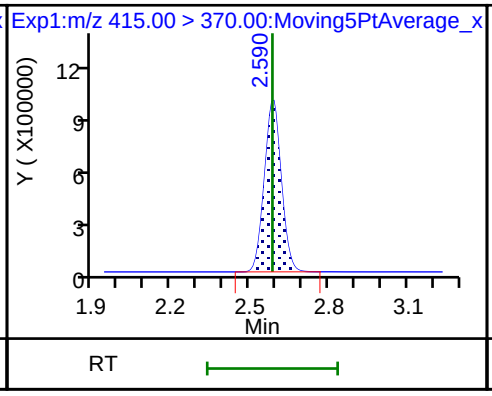
13 1H,1H,2H,2H-perfluorooctanesulfoni



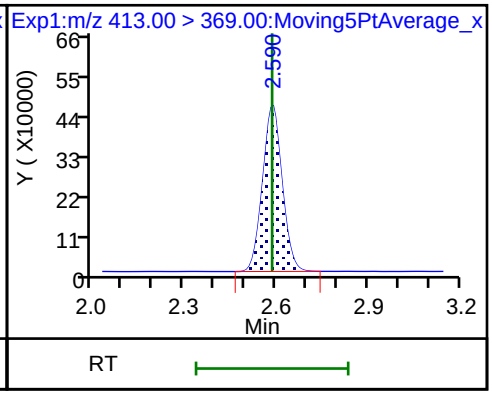
D 14 13C4 PFOA



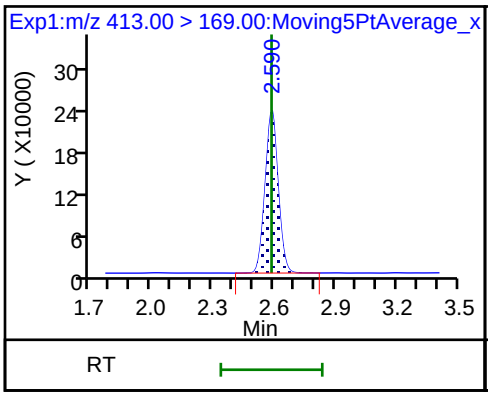
* 62 13C2-PFOA



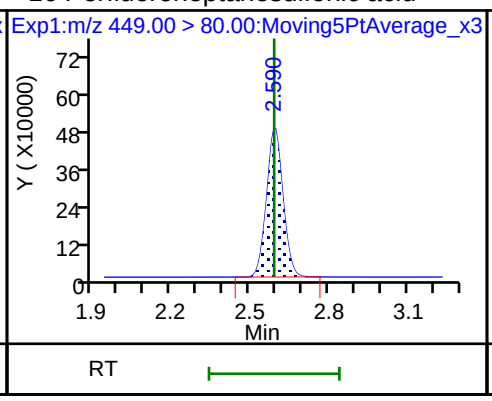
15 Perfluorooctanoic acid



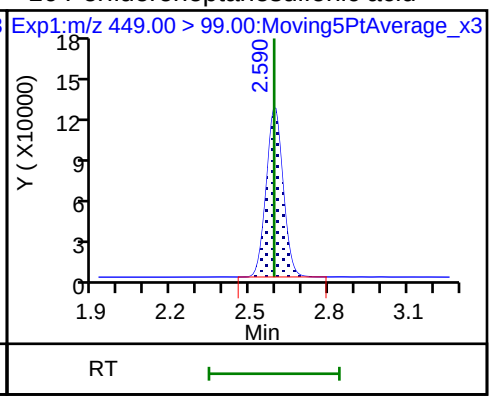
15 Perfluorooctanoic acid



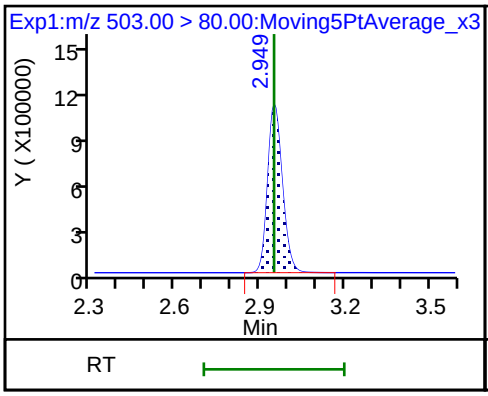
16 Perfluoroheptanesulfonic acid



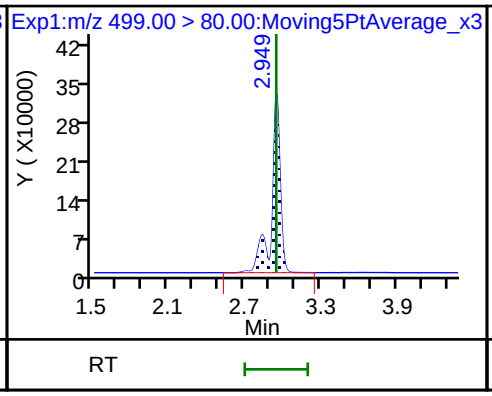
16 Perfluoroheptanesulfonic acid



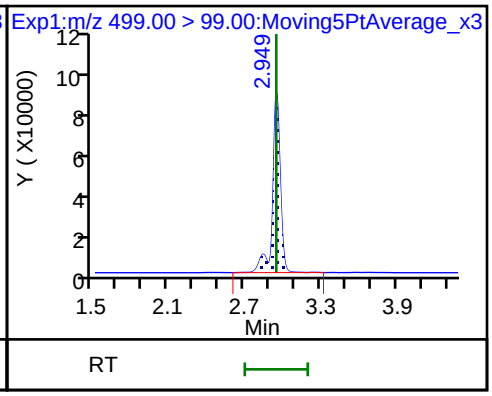
D 18 13C4 PFOS



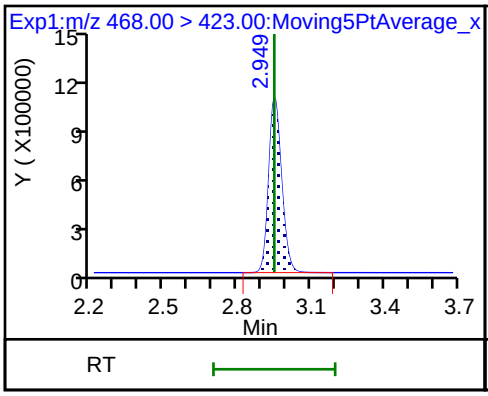
17 Perfluorooctane sulfonic acid



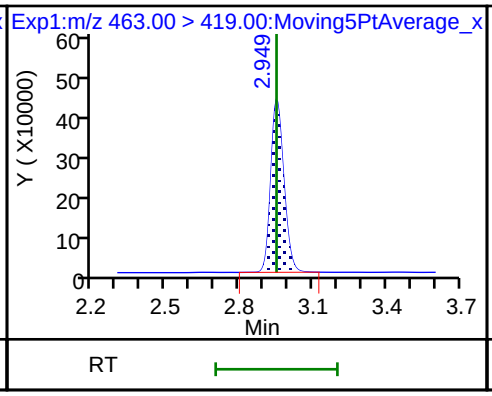
17 Perfluorooctane sulfonic acid



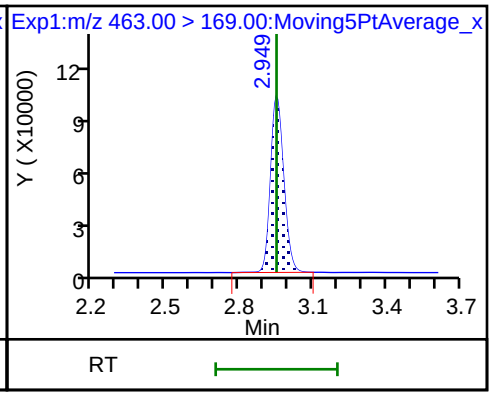
D 19 13C5 PFNA



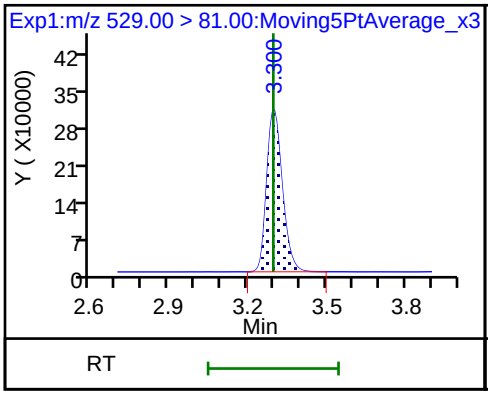
20 Perfluorononanoic acid



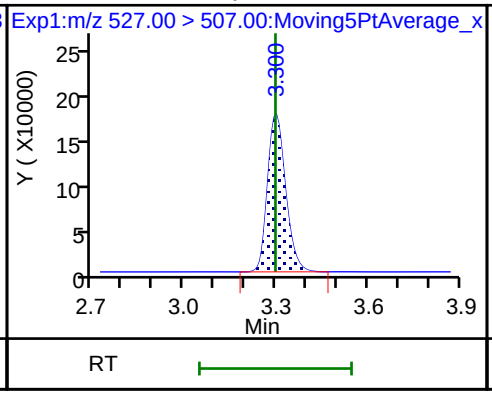
20 Perfluorononanoic acid



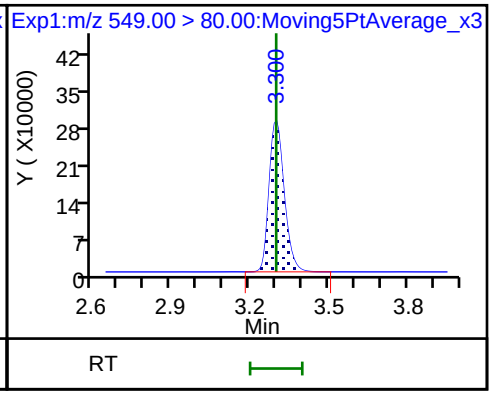
D 26 M2-8:2FTS



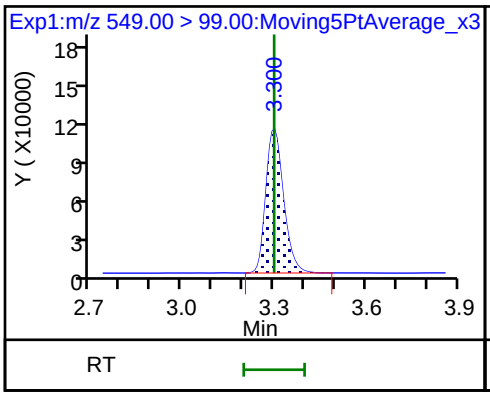
25 1H,1H,2H,2H-perfluorodecanesulfoni



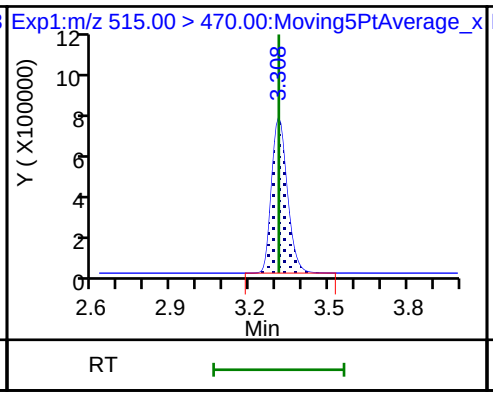
68 Perfluorononanesulfonic acid



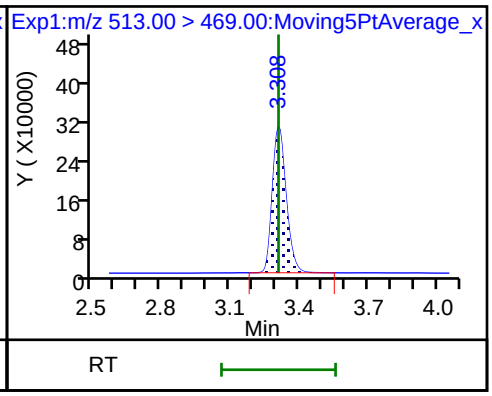
68 Perfluorononanesulfonic acid



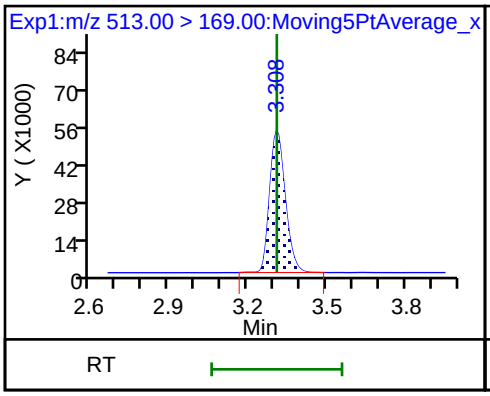
D 23 13C2 PFDA



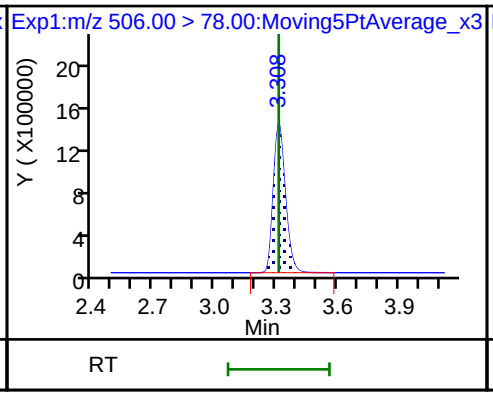
24 Perfluorodecanoic acid



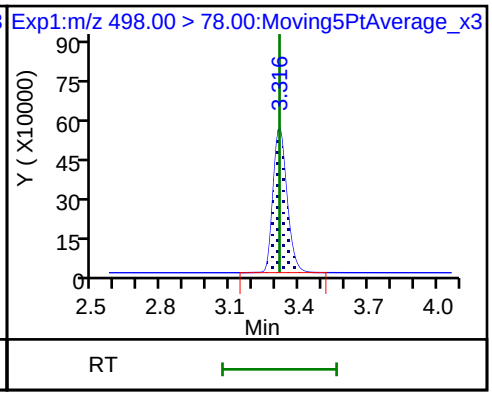
24 Perfluorodecanoic acid



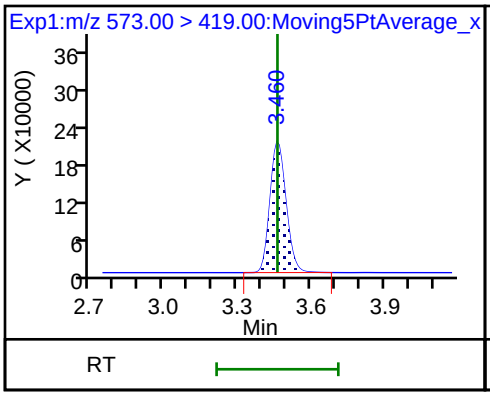
D 21 13C8 FOSA



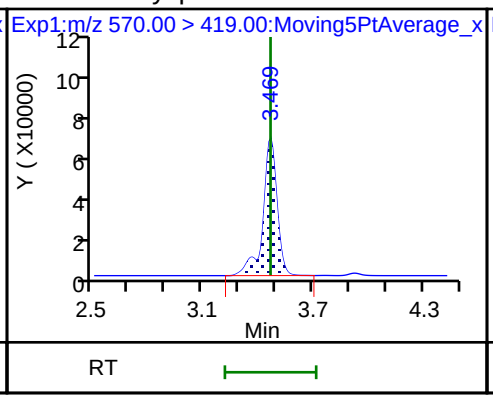
22 Perfluorooctane Sulfonamide



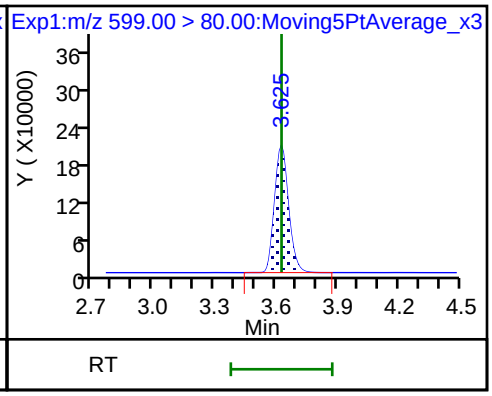
D 27 d3-NMeFOSAA



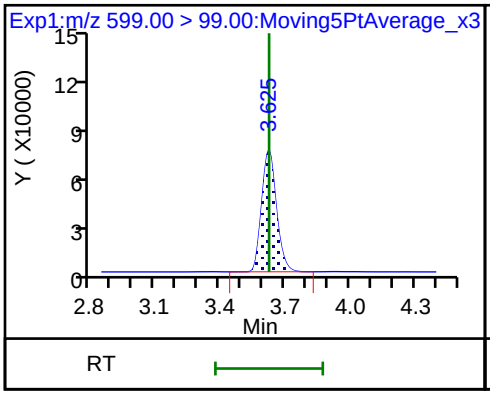
28 N-methyl perfluorooctane sulfonami



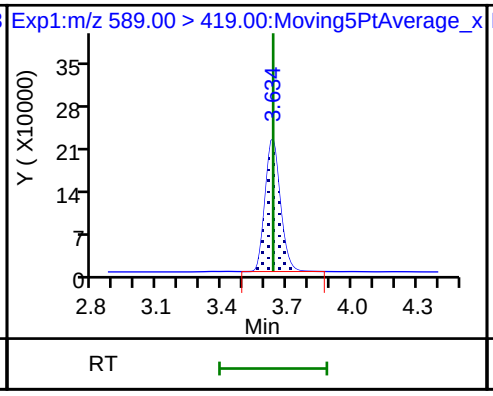
29 Perfluorodecane Sulfonic acid



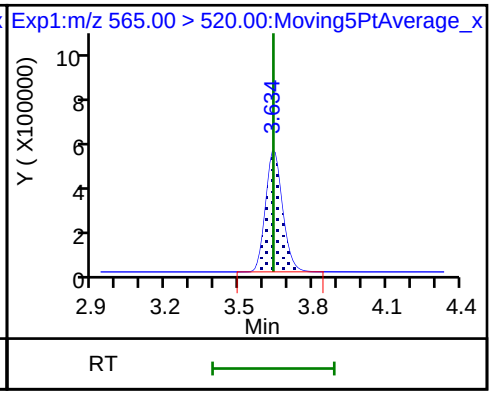
29 Perfluorodecane Sulfonic acid



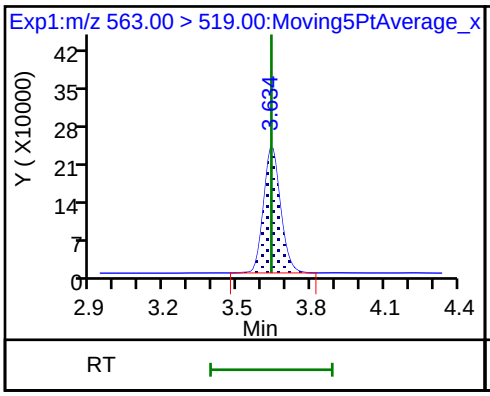
D 32 d5-NEtFOSAA



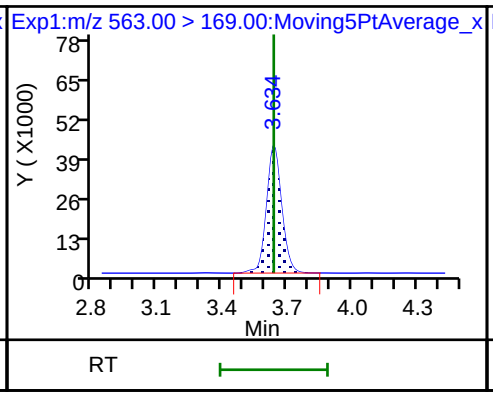
D 30 13C2 PFUnA



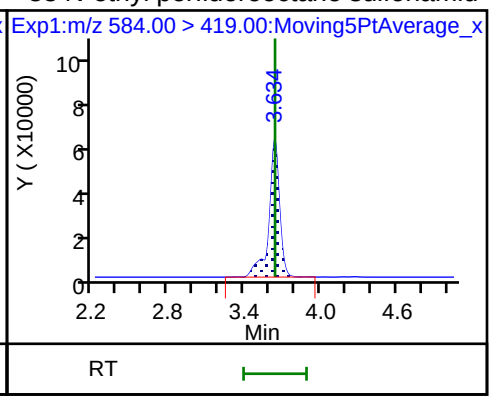
31 Perfluoroundecanoic acid



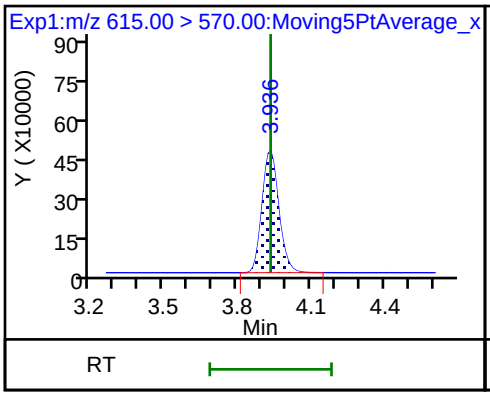
31 Perfluoroundecanoic acid



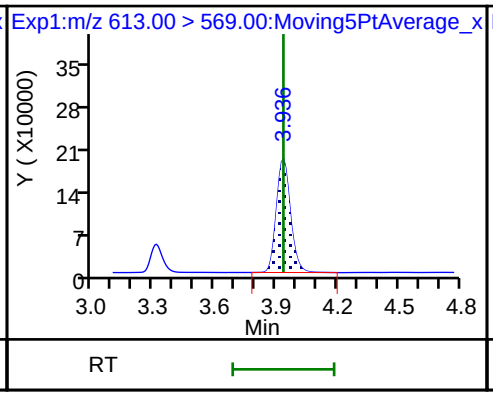
33 N-ethyl perfluorooctane sulfonamid



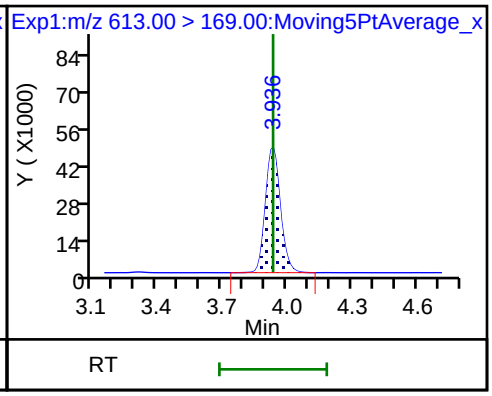
D 36 13C2 PFDoA



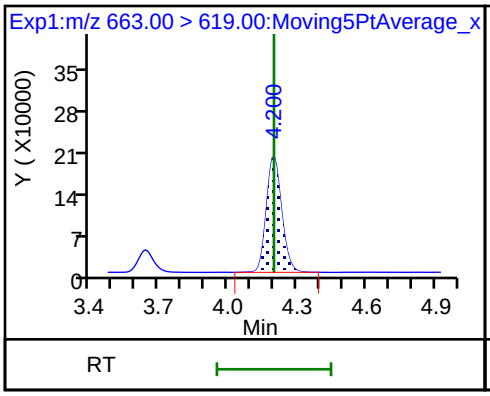
37 Perfluorododecanoic acid



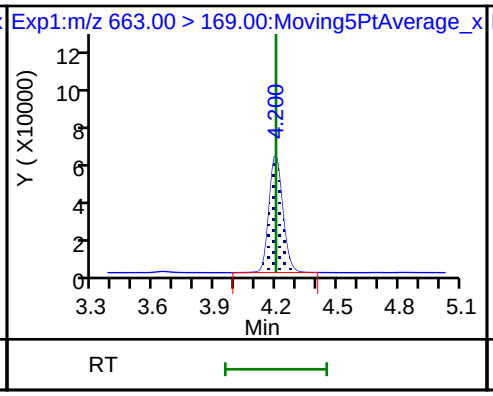
37 Perfluorododecanoic acid



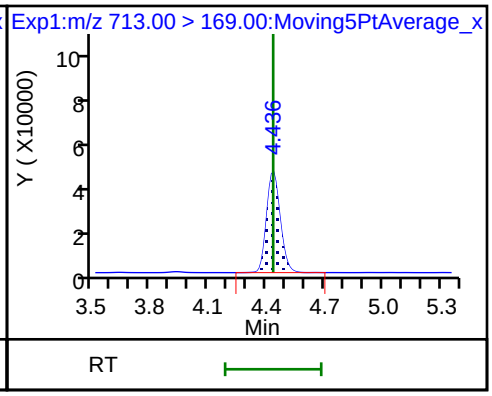
41 Perfluorotridecanoic acid



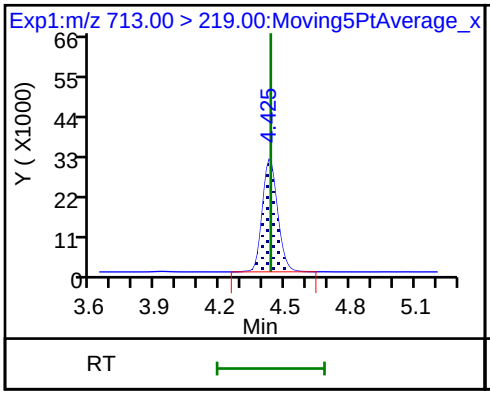
41 Perfluorotridecanoic acid



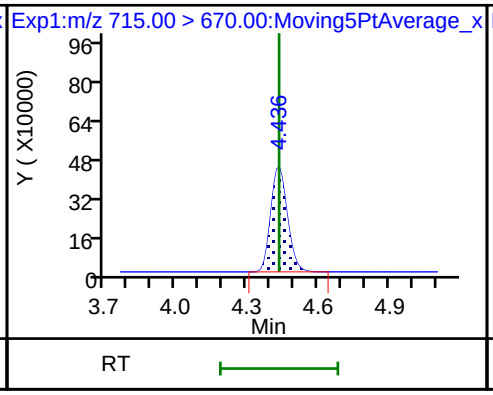
42 Perfluorotetradecanoic acid



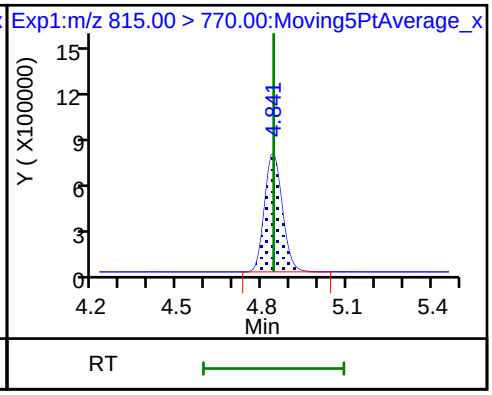
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 23-Jul-2018 16:42:32 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:36 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 16:55:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.403	1.398	0.005	0.542	5130909	2.48		99.3	74361	
2 Perfluorobutyric acid										
212.90 > 169.00	1.403	1.399	0.004	1.000	4994634	2.48		99.1	2425	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.638	0.003	0.634	3531229	2.45		97.9	55233	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.650	1.639	0.011	1.005	4270245	2.53		101	2374	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.670	0.006	0.647	87641	2.32		99.6	639	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.672	0.004	1.000	6706119	2.24		101	2009	
298.90 > 99.00	1.676	1.672	0.004	1.000	2695645		2.49(1.25-3.74)	101	1797	
D 60 M2-4:2FTS										
329.00 > 81.00	1.887	1.877	0.010	0.728	595819	NC			6688	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.887	1.878	0.009	1.126	1475833	2.29		98.1	65449	
D 7 13C2 PFHxA										
315.00 > 270.00	1.918	1.909	0.009	0.740	4182069	2.47		98.9	73706	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.918	1.909	0.009	1.000	4411390	2.49		99.5	10722	
313.00 > 119.00	1.918	1.909	0.009	1.000	387709		11.38(5.03-15.10)	99.5	6820	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.939	1.931	0.008	1.157	6406319	2.39		102	69733	
349.00 > 99.00	1.939	1.931	0.008	1.157	2336906		2.74(1.36-4.07)	102	29097	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.016	2.006	0.010	1.000	735954	NC			3477	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.016	2.007	0.009	0.778	240893	NC			7135	
D 9 13C4-PFHpA										
367.00 > 322.00	2.231	2.230	0.001	0.861	4150778	2.38		95.2	98495	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.231	2.230	0.001	1.000	4691766	2.56		103	5991	
363.00 > 169.00	2.231	2.230	0.001	1.000	1757045		2.67(1.13-3.40)	103	19497	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.244	2.243	0.001	0.994	5486367	2.16		94.9	9632	
399.00 > 99.00	2.244	2.243	0.001	0.994	1813604		3.03(1.50-4.49)	94.9	5265	
D 11 18O2 PFHxS										
403.00 > 84.00	2.257	2.246	0.011	0.871	5148729	2.30		97.2	42580	
65 ADONA										
377.00 > 251.00	2.283	2.272	0.011	0.774	12440903	NC			90044	
377.00 > 85.00	2.283	2.272	0.011	0.774	7322775		1.70(0.84-2.53)		30494	
D 12 M2-6:2FTS										
429.00 > 81.00	2.566	2.559	0.007	0.991	1164838	2.39		101	16202	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.566	2.559	0.007	1.000	1989042	2.40		101	19293	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.585	0.005	1.000	4232198	2.48		99.3	41947	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.585	0.005		4456546	2.50			67612	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.590	2.586	0.004	1.000	5069253	2.47		98.6	4915	
413.00 > 169.00	2.590	2.586	0.004	1.000	2618876		1.94(0.84-2.52)	98.6	12192	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.597	2.591	0.006	0.881	5268243	2.47		104	38243	
449.00 > 99.00	2.597	2.591	0.006	0.881	1347649		3.91(1.94-5.82)	104	14616	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.949	0.0	1.139	3686425	2.37		99.1	31954	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.949	2.949	0.0	1.000	3988913	2.34		101	30261	
499.00 > 99.00	2.949	2.949	0.0	1.000	901460		4.42(2.31-6.93)	101	14674	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.950	-0.001	1.139	3524069	2.40		95.8	55948	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.950	-0.001	1.000	3988453	2.48		99.1	9420	
463.00 > 169.00	2.949	2.950	-0.001	1.000	924470		4.31(1.90-5.69)	99.1	19208	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.158	3.161	-0.003	1.071	6588570	NC			79926	
D 26 M2-8:2FTS										
529.00 > 81.00	3.293	3.296	-0.003	1.271	1173584	2.31		96.5	18656	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.293	3.297	-0.004	1.000	1558921	2.35		98.0	37398	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.301	3.299	0.002	1.119	2765045	2.40		100	40764	
549.00 > 99.00	3.301	3.299	0.002	1.119	1072679		2.58(1.33-3.97)	100	12753	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.309	3.309	0.0	1.278	2774374	2.37		94.8	41656	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.309	3.309	0.0	1.000	2908266	2.55		102	13736	
513.00 > 169.00	3.309	3.309	0.0	1.000	517715		5.62(2.36-7.09)	102	25024	
D 21 13C8 FOSA										
506.00 > 78.00	3.309	3.311	-0.002	1.278	5745909	2.51		101	65966	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.317	3.314	0.003	1.002	5920977	2.59		104	40772	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.461	3.462	-0.001	1.336	966156	2.50		99.9	30308	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.470	3.468	0.002	1.003	928849	2.44		97.6	8936	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.626	3.625	0.001	1.229	2513855	2.46		102	48542	
599.00 > 99.00	3.626	3.625	0.001	1.229	835109		3.01(1.39-4.16)	102	19566	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.635	3.635	0.0	1.403	982550	2.42		96.7	3441	
D 30 13C2 PFUnA										
565.00 > 520.00	3.635	3.638	-0.003	1.403	2295730	2.44		97.4	48126	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.635	3.638	-0.003	1.000	2735087	2.40		96.0	11023	
563.00 > 169.00	3.635	3.638	-0.003	1.000	497203		5.50(2.12-6.36)	96.0	20766	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.635	3.639	-0.004	1.000	875971	2.39		95.6	29622	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.801	3.800	0.001	1.289	9902491	NC			70925	
D 36 13C2 PFDoA										
615.00 > 570.00	3.937	3.934	0.003	1.520	2159403	2.41		96.4	19647	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.937	3.934	0.003	1.000	2342729	2.51		100	793	
613.00 > 169.00	3.937	3.934	0.003	1.000	563987		4.15(2.13-6.40)	100	9813	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.200	4.198	0.002	1.067	2356193	2.60		104	748	
663.00 > 169.00	4.200	4.198	0.002	1.067	718905		3.28(1.25-3.76)	104	7361	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.436	4.433	0.003	1.000	530481	2.59		104	5161	
713.00 > 219.00	4.425	4.433	-0.008	0.998	372557		1.42(0.71-2.13)	104	6347	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.435	0.001	1.713	2042126	2.33		93.3	11368	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.840	0.002	1.869	3106916	2.34		93.5	11772	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.840	0.002	1.000	3049314	NC			494	
813.00 > 169.00	4.842	4.840	0.002	1.000	494179		6.17(2.86-8.58)		4991	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.188	5.184	0.004	1.072	3231497	NC			690	
913.00 > 169.00	5.181	5.184	-0.003	1.070	391309		8.26(3.83-11.48)		4228	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_006.d

Injection Date: 23-Jul-2018 16:42:32 Instrument ID: A8_N

Lims ID: IC L5 Full

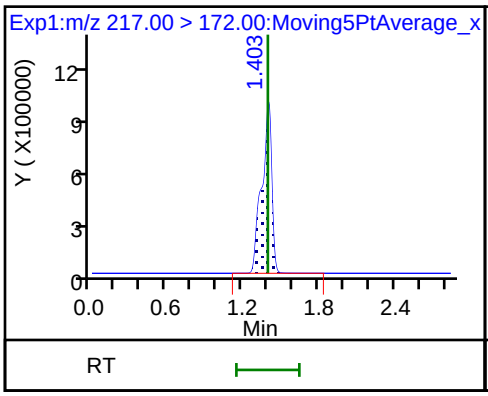
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 6

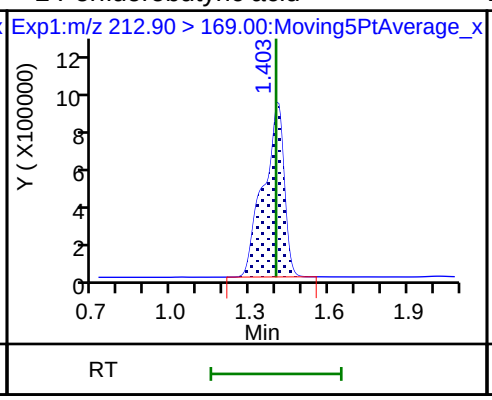
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

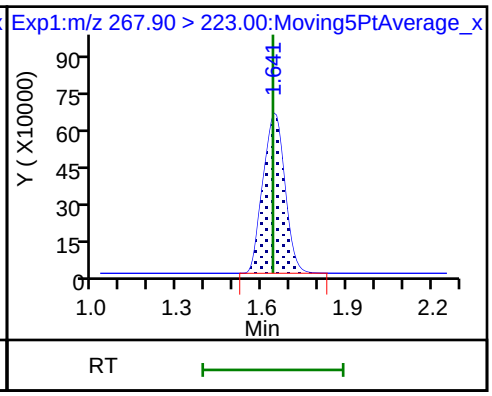
D 1 13C4 PFBA



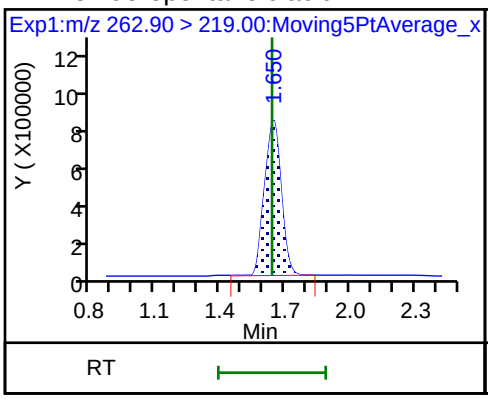
2 Perfluorobutyric acid



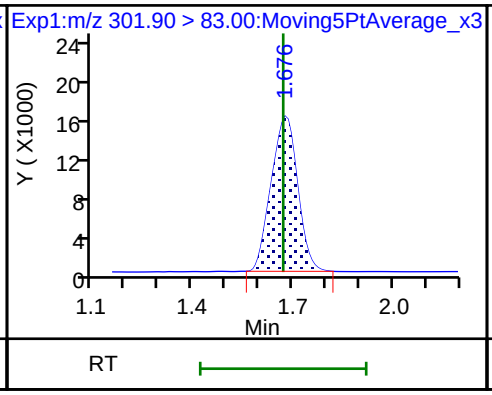
D 3 13C5-PFPeA



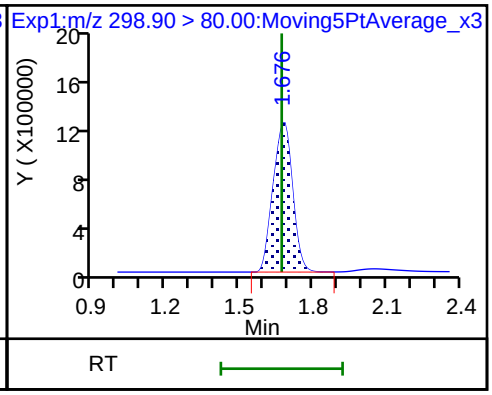
4 Perfluoropentanoic acid



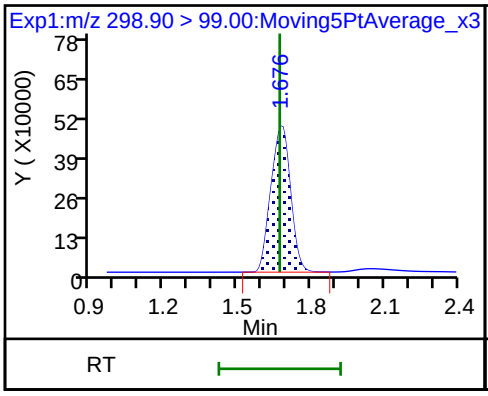
D 47 13C3-PFBS



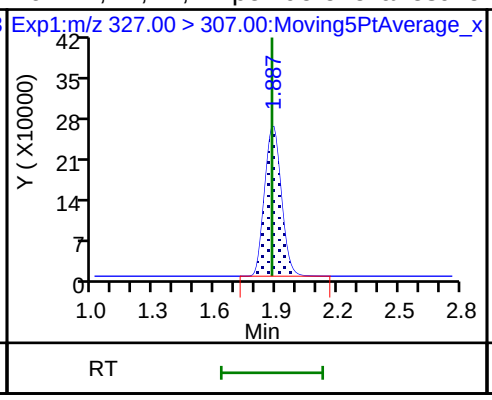
5 Perfluorobutanesulfonic acid



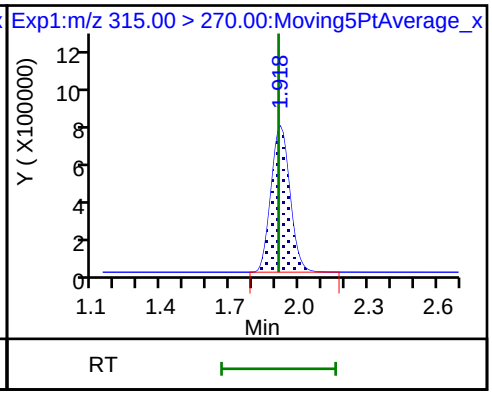
5 Perfluorobutanesulfonic acid



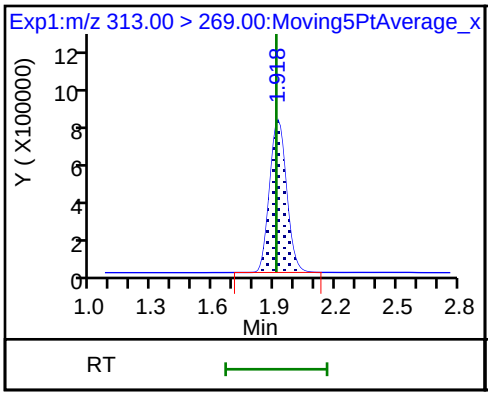
61 1H,1H,2H,2H-perfluorohexanesulfon



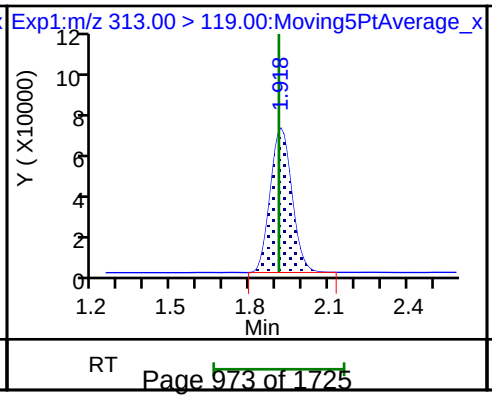
D 7 13C2 PFHxA



6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



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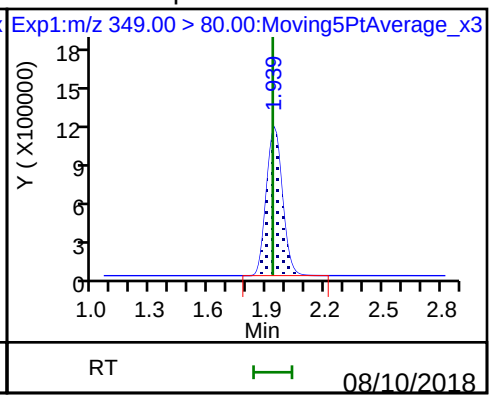

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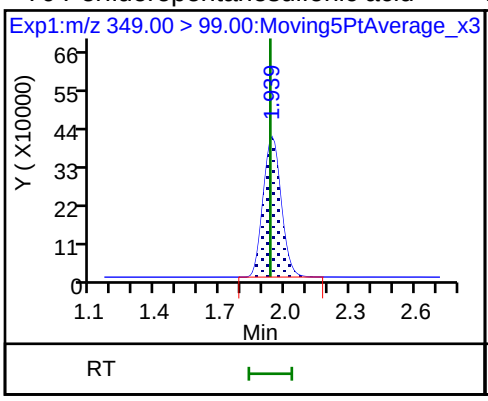
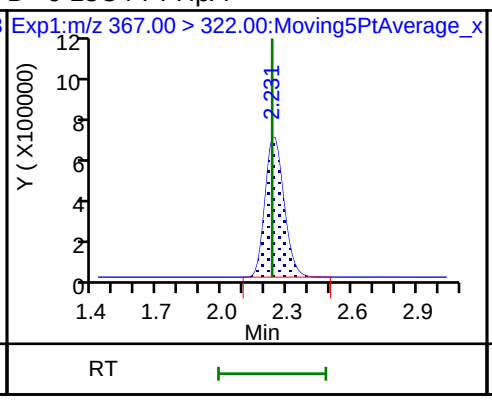


D 9 13C4-PFHpA



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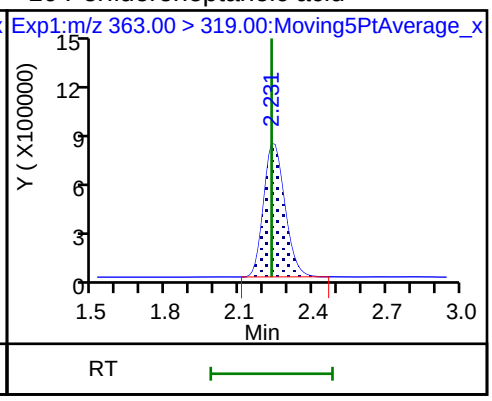

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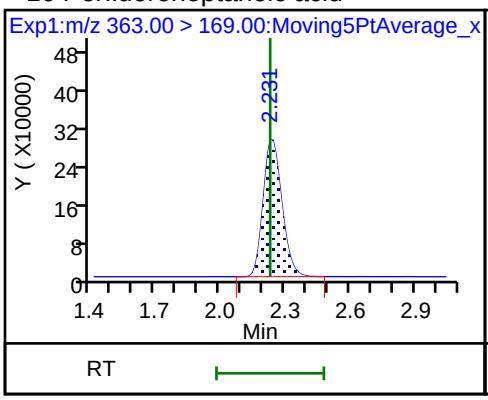

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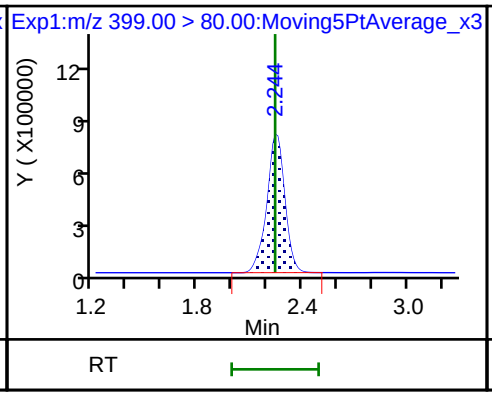

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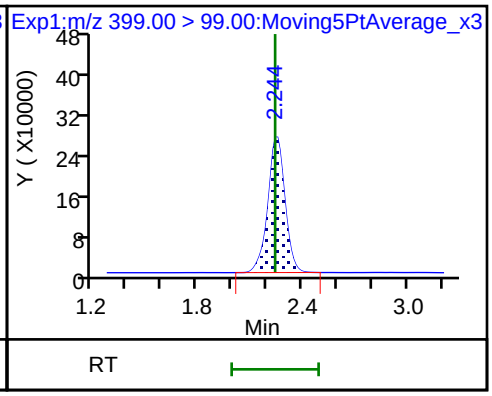

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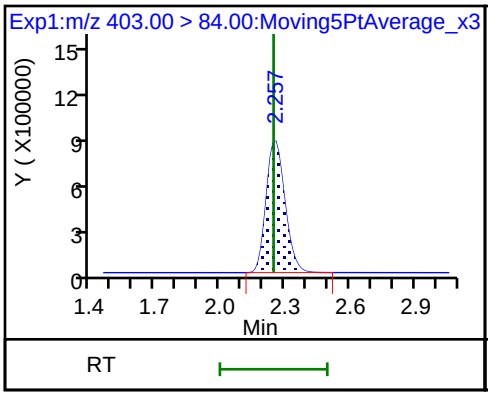
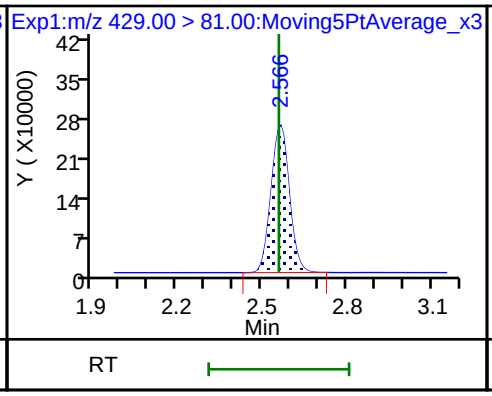
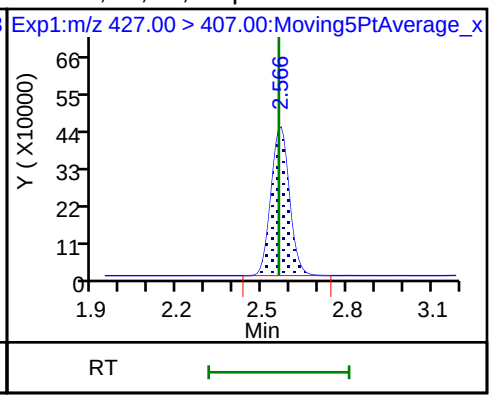


D 12 M2-6:2FTS



13 1H,1H,2H,2H-perfluorooctanesulfoni



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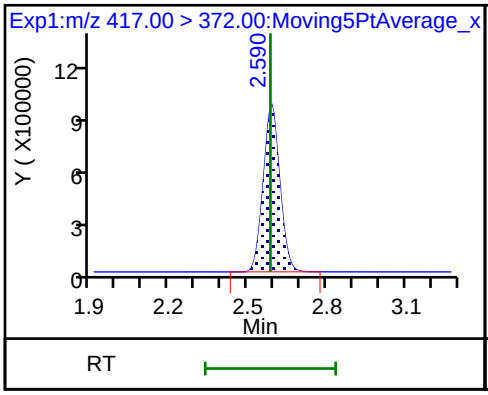
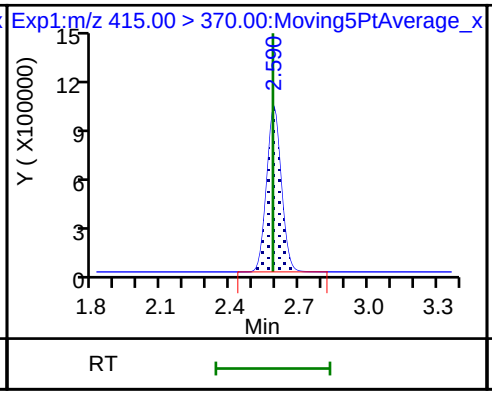
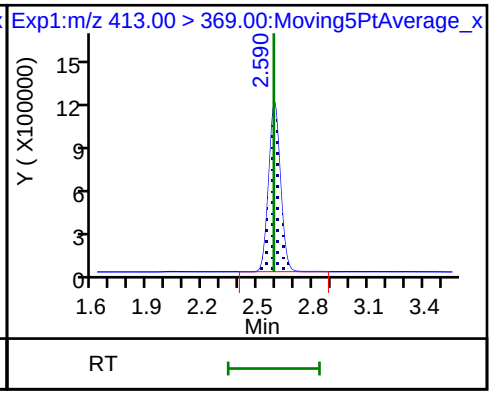


* 62 13C2-PFOA



15 Perfluorooctanoic acid



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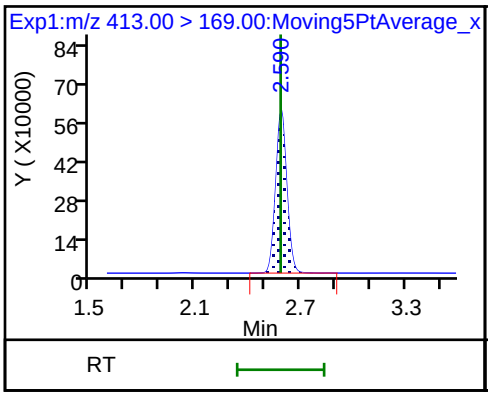
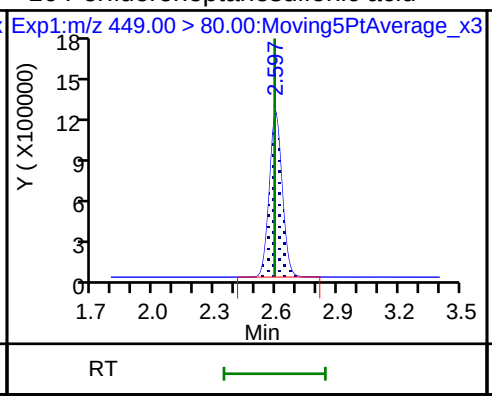
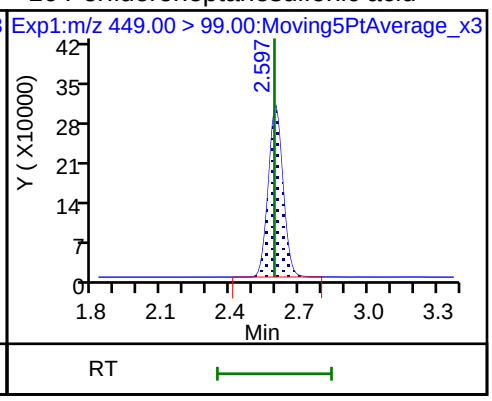


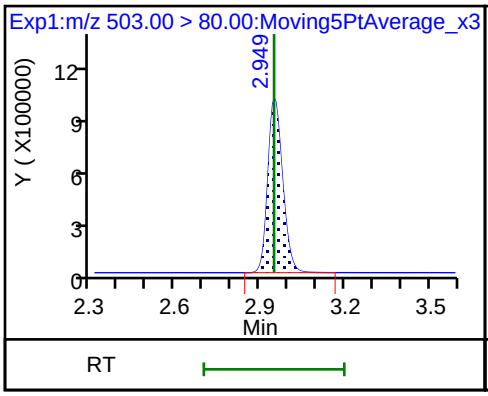
16 Perfluoroheptanesulfonic acid



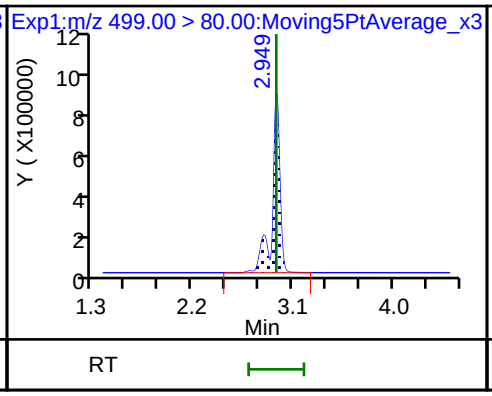
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS



17 Perfluorooctane sulfonic acid



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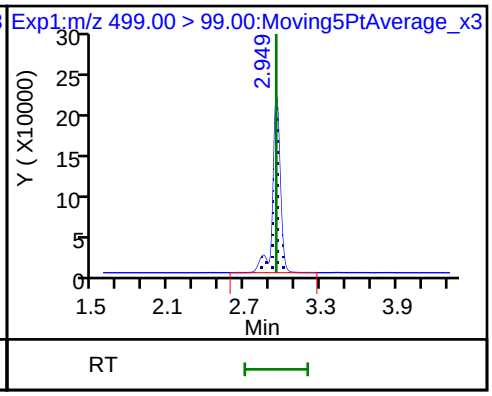
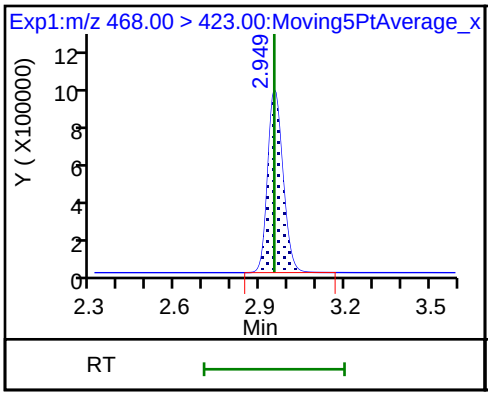
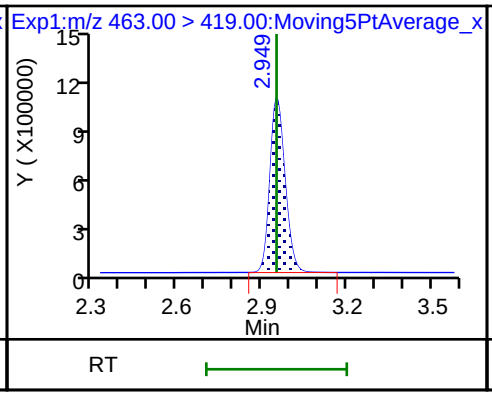


D 19 13C5 PFNA



20 Perfluorononanoic acid



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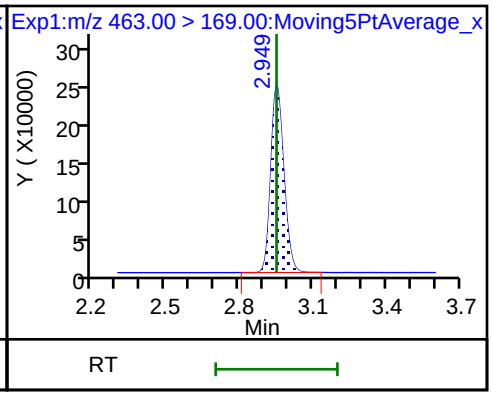
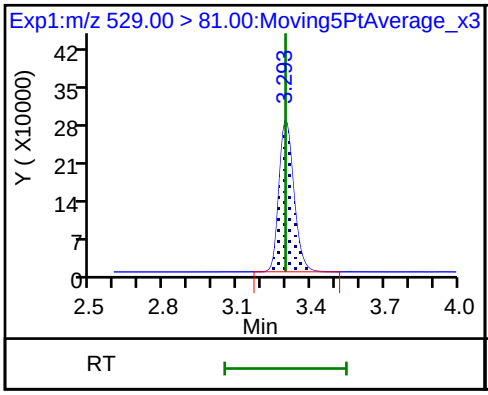
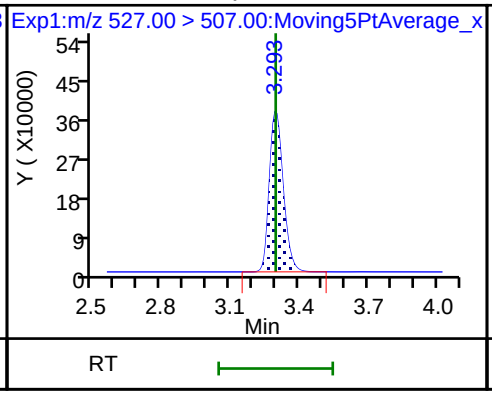


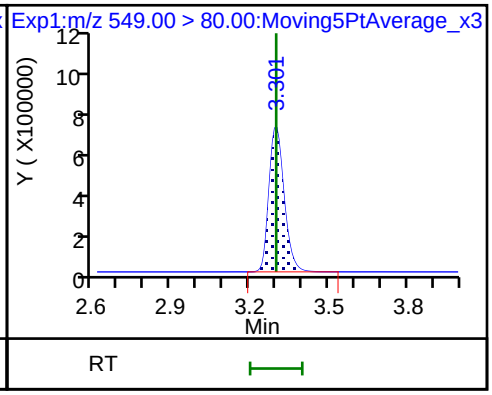
D 26 M2-8:2FTS



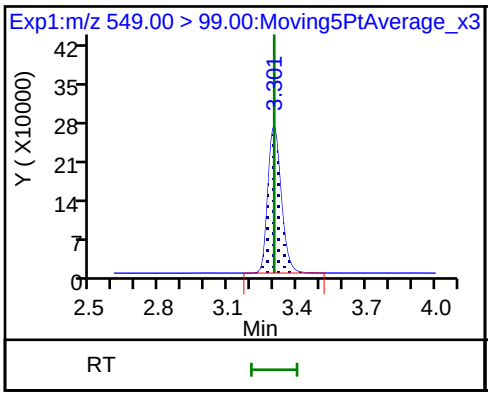
25 1H,1H,2H,2H-perfluorodecanesulfoni



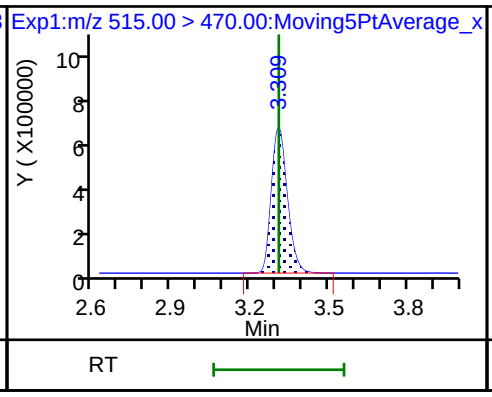
68 Perfluorononanesulfonic acid



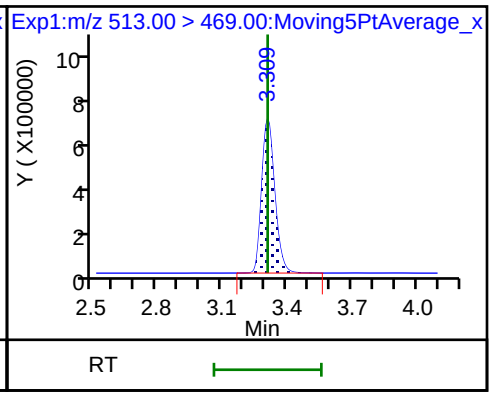
68 Perfluorononanesulfonic acid



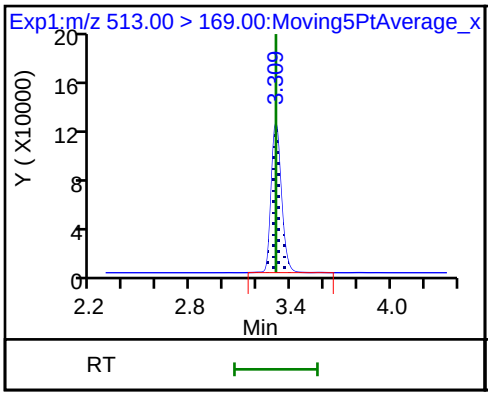
D 23 13C2 PFDA



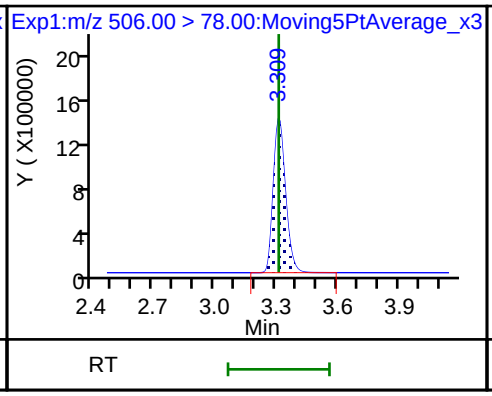
24 Perfluorodecanoic acid



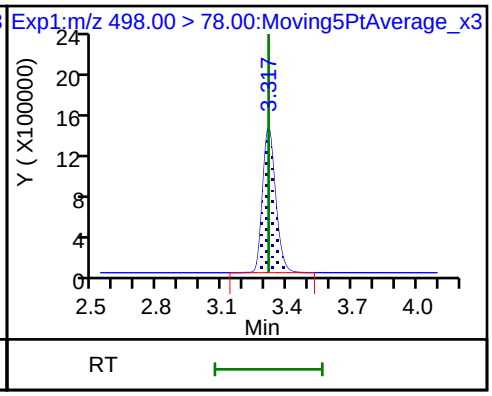
24 Perfluorodecanoic acid



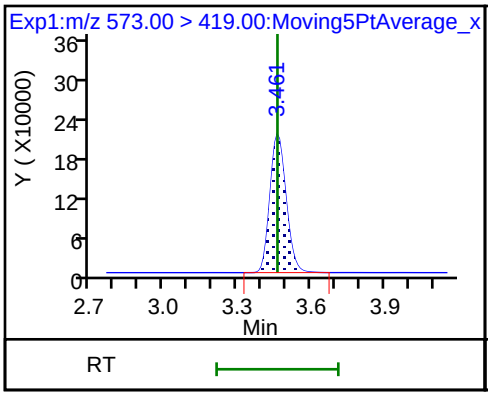
D 21 13C8 FOSA



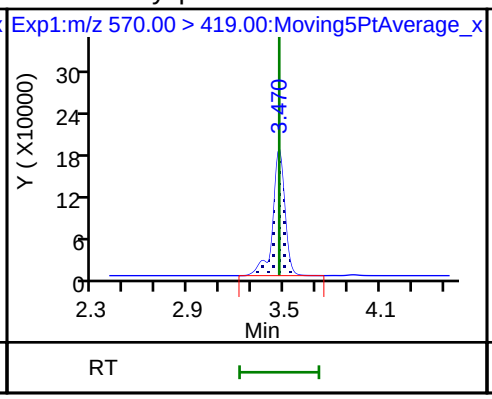
22 Perfluorooctane Sulfonamide



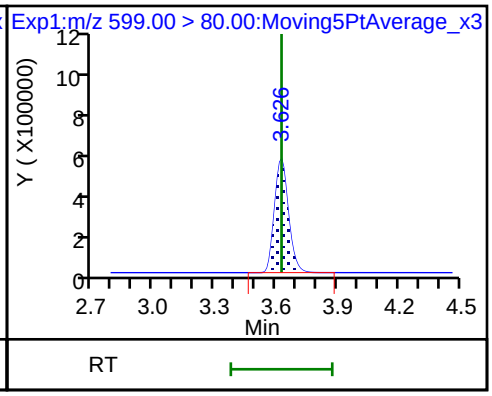
D 27 d3-NMeFOSAA



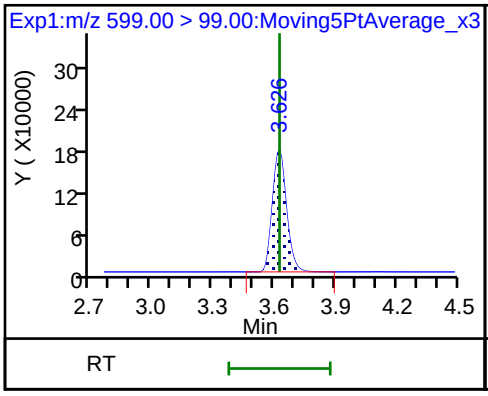
28 N-methyl perfluorooctane sulfonami



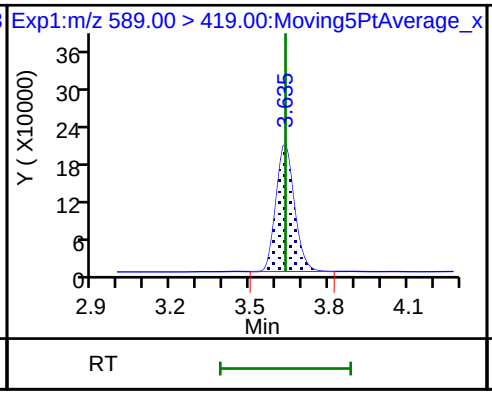
29 Perfluorodecane Sulfonic acid



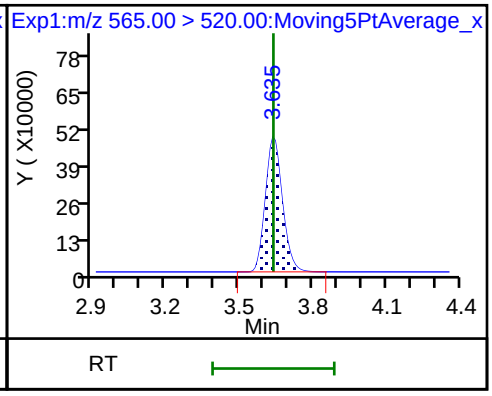
29 Perfluorodecane Sulfonic acid



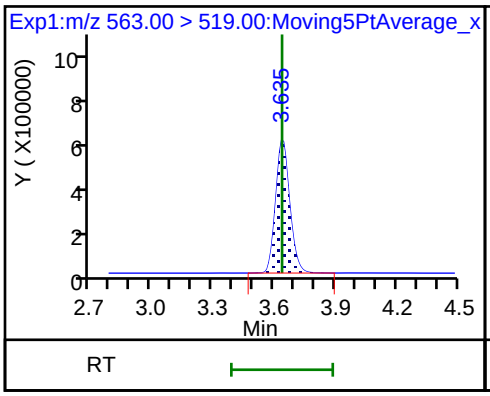
D 32 d5-NEtFOSAA



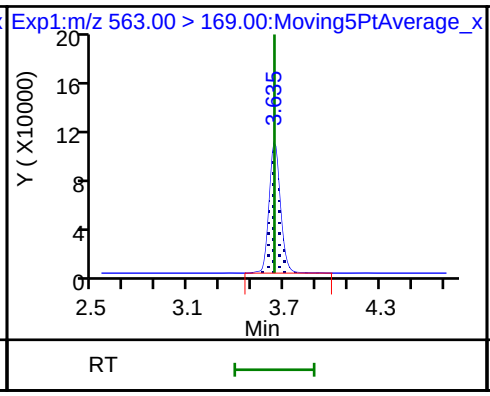
D 30 13C2 PFUnA



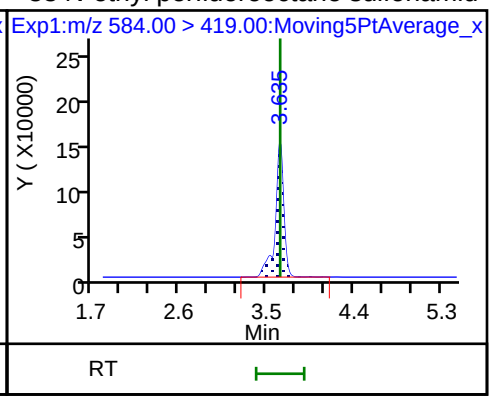
31 Perfluoroundecanoic acid



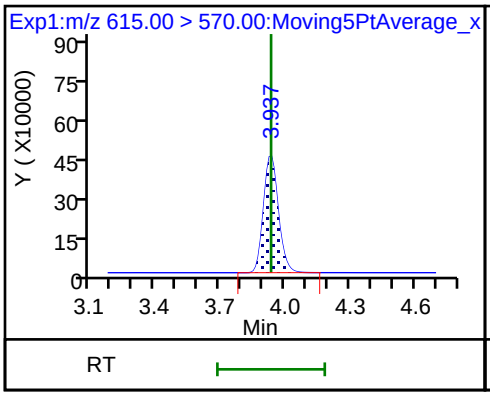
31 Perfluoroundecanoic acid



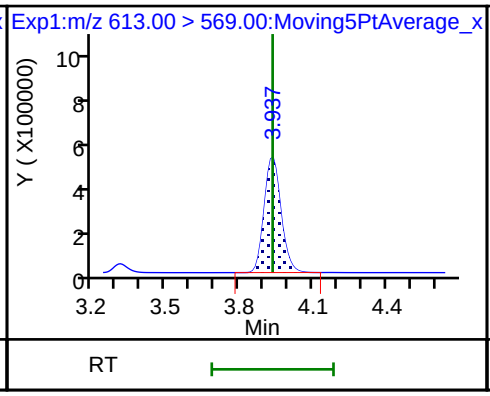
33 N-ethyl perfluorooctane sulfonamid



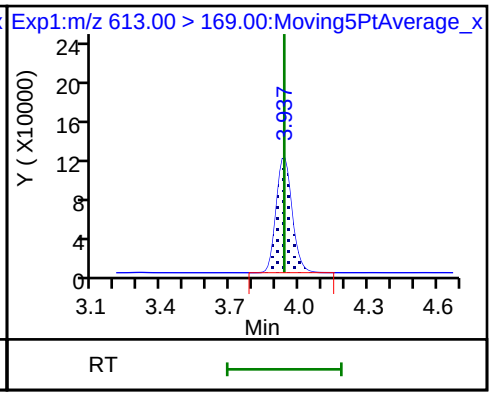
D 36 13C2 PFDoA



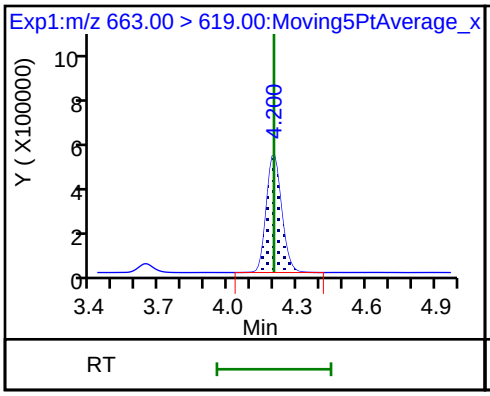
37 Perfluorododecanoic acid



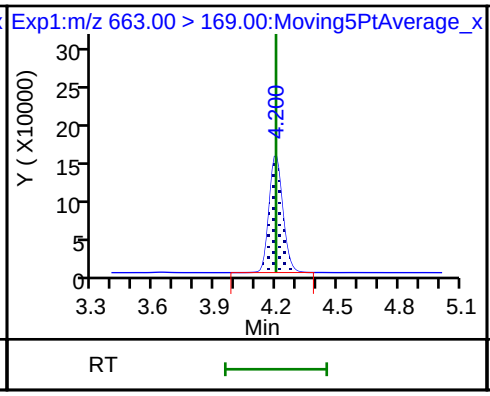
37 Perfluorododecanoic acid



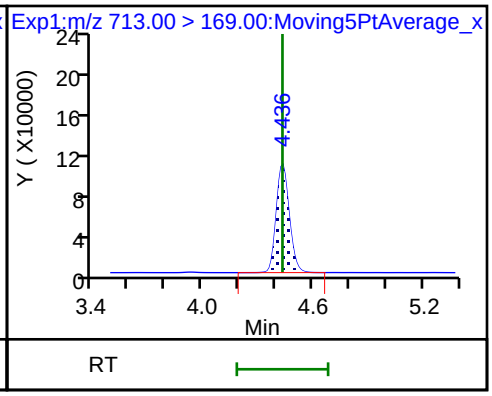
41 Perfluorotridecanoic acid



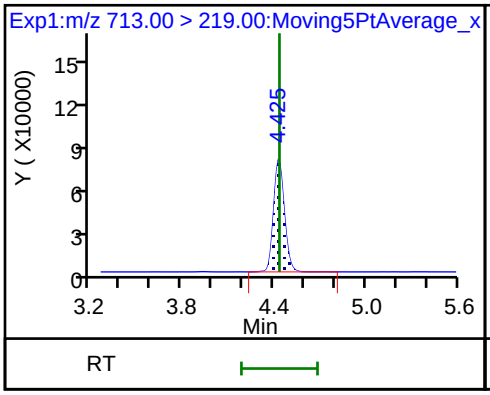
41 Perfluorotridecanoic acid



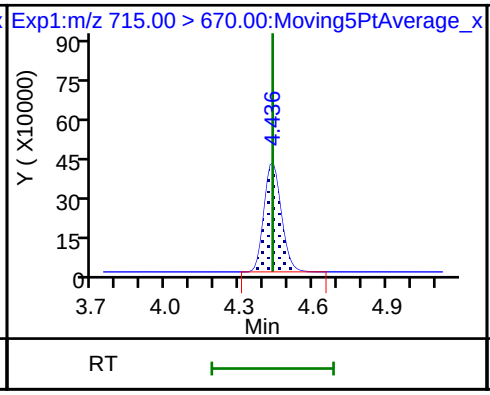
42 Perfluorotetradecanoic acid



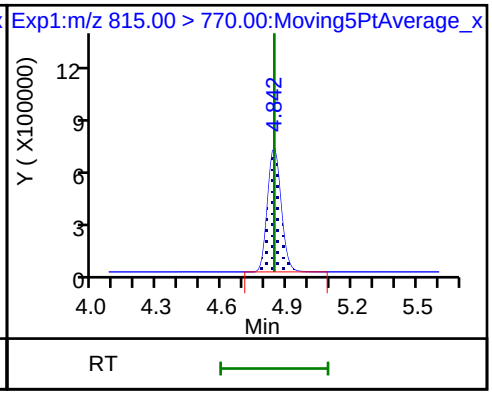
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 23-Jul-2018 16:50:19 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:41 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:09:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.541	4957611	2.64		106	76405	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	9835771	5.05		101	5225	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3369200	2.57		103	48068	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	7944127	4.92		98.5	4880	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	86122	2.50		108	607	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	12610058	4.29		97.0	3702	
298.90 > 99.00	1.667	1.672	-0.005	1.000	5300189		2.38(1.25-3.74)	97.0	3539	
D 60 M2-4:2FTS										
329.00 > 81.00	1.877	1.877	0.0	0.727	553766	NC			6060	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.878	-0.001	1.126	2898055	4.58		98.0	102101	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.739	3960776	2.57		103	76847	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	8348472	4.97		99.4	20245	
313.00 > 119.00	1.907	1.909	-0.002	1.000	750361		11.13(5.03-15.10)	99.4	11852	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	12590452	4.77		102	98455	
349.00 > 99.00	1.928	1.931	-0.003	1.157	4621188		2.72(1.36-4.07)	102	52740	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.005	2.006	-0.001	1.000	1519446	NC			8408	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.777	218817	NC			6237	
D 9 13C4-PFHpA										
367.00 > 322.00	2.231	2.230	0.001	0.864	4059821	2.56		102	62151	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.231	2.230	0.001	1.000	9133436	5.10		102	11941	
363.00 > 169.00	2.231	2.230	0.001	1.000	3500850		2.61(1.13-3.40)	102	28241	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	10907663	4.27		93.9	16395	
399.00 > 99.00	2.243	2.243	0.0	1.000	3633033		3.00(1.50-4.49)	93.9	10735	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.246	-0.003	0.869	5175462	2.54		107	50760	
65 ADONA										
377.00 > 251.00	2.269	2.272	-0.003	0.769	22372425	NC			131517	
377.00 > 85.00	2.269	2.272	-0.003	0.769	13665635		1.64(0.84-2.53)		51583	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.559	-0.003	0.990	1061423	2.40		101	17797	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.559	-0.003	1.000	3478669	4.61		97.3	25045	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.585	-0.004	1.000	3884099	2.50		100	65946	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.585	-0.004		4053358	2.50			35679	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.586	-0.005	1.000	9261268	4.91		98.1	7655	
413.00 > 169.00	2.581	2.586	-0.005	1.000	4822396		1.92(0.84-2.52)	98.1	20925	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.591	-0.002	0.878	10191534	4.96		104	61856	
449.00 > 99.00	2.589	2.591	-0.002	0.878	2685831		3.79(1.94-5.82)	104	26454	
D 18 13C4 PFOS										
503.00 > 80.00	2.949	2.949	0.0	1.142	3550779	2.51		105	36252	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.949	2.949	0.0	1.000	7714043	4.70		101	35396	
499.00 > 99.00	2.949	2.949	0.0	1.000	1770065		4.36(2.31-6.93)	101	33206	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.950	-0.001	1.142	3450868	2.58		103	83580	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.950	-0.001	1.000	7406073	4.70		94.0	18582	
463.00 > 169.00	2.949	2.950	-0.001	1.000	1803538		4.11(1.90-5.69)	94.0	52899	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.070	12813896	NC			90944	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.296	-0.004	1.276	1043782	2.26		94.4	16607	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.297	-0.005	1.000	2829685	4.79		100.0	167430	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.299	-0.007	1.117	5579385	5.03		105	57924	
549.00 > 99.00	3.292	3.299	-0.007	1.117	2042554		2.73(1.33-3.97)	105	28097	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.282	2729607	2.56		103	50384	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	5521565	4.92		98.3	22336	
513.00 > 169.00	3.308	3.309	-0.001	1.000	960446		5.75(2.36-7.09)	98.3	38234	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.282	5225954	2.51		100	40495	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.314	-0.006	1.000	10636117	5.12		102	78258	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.462	-0.002	1.340	952316	2.71		108	19093	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.469	3.468	0.001	1.003	1804771	4.81		96.1	12856	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.625	-0.001	1.229	4831368	4.90		102	63953	
599.00 > 99.00	3.624	3.625	-0.001	1.229	1680170		2.88(1.39-4.16)	102	32260	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.634	3.635	-0.001	1.408	934717	2.53		101	3132	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.408	2176487	2.54		102	57027	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	5089468	4.71		94.2	20533	
563.00 > 169.00	3.634	3.638	-0.004	1.000	904751		5.63(2.12-6.36)	94.2	26960	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.639	-0.005	1.000	1715766	4.92		98.4	32422	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.799	3.800	-0.001	1.289	18579159	NC			116101	
D 36 13C2 PFDoA										
615.00 > 570.00	3.935	3.934	0.001	1.525	2185359	2.68		107	19987	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.935	3.934	0.001	1.000	4706732	4.98		99.5	1690	
613.00 > 169.00	3.935	3.934	0.001	1.000	1127628		4.17(2.13-6.40)	99.5	14695	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.198	-0.009	1.065	4322525	4.71		94.2	1444	
663.00 > 169.00	4.189	4.198	-0.009	1.065	1311471		3.30(1.25-3.76)	94.2	12817	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.433	-0.009	1.000	995775	4.78		95.6	9620	
713.00 > 219.00	4.424	4.433	-0.009	1.000	737039		1.35(0.71-2.13)	95.6	10063	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.435	-0.011	1.714	2077317	2.61		104	10634	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.831	4.840	-0.009	1.872	3092486	2.56		102	9832	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.831	4.840	-0.009	1.000	6124818	NC			930	
813.00 > 169.00	4.831	4.840	-0.009	1.000	989278		6.19(2.86-8.58)		8403	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.180	5.184	-0.004	1.072	6508688	NC			1305	
913.00 > 169.00	5.180	5.184	-0.004	1.072	768143		8.47(3.83-11.48)		6618	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00006 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_007.d

Injection Date: 23-Jul-2018 16:50:19 Instrument ID: A8_N

Lims ID: IC L6 Full

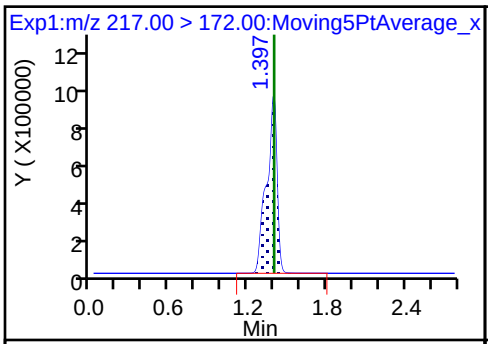
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 7

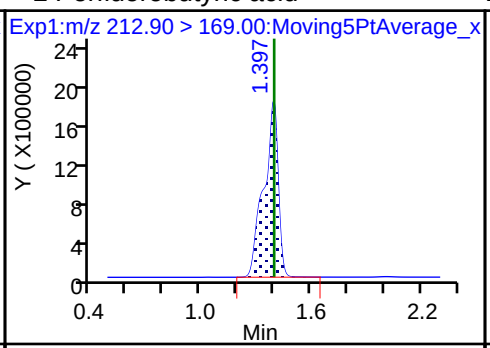
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

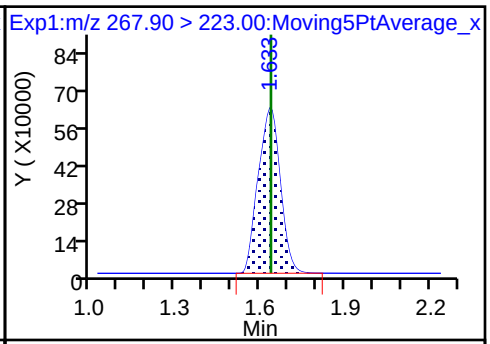
D 1 13C4 PFBA



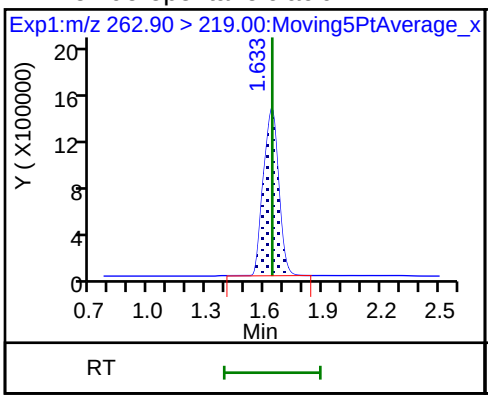
2 Perfluorobutyric acid



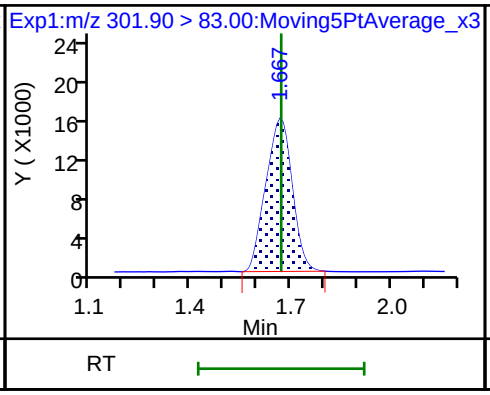
D 3 13C5-PFPeA



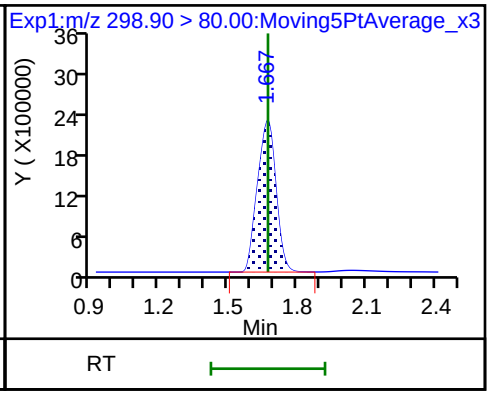
4 Perfluoropentanoic acid



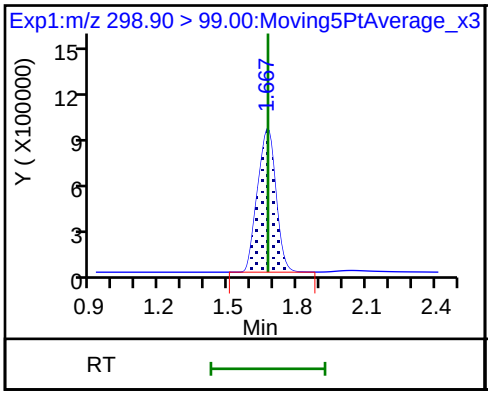
D 47 13C3-PFBS



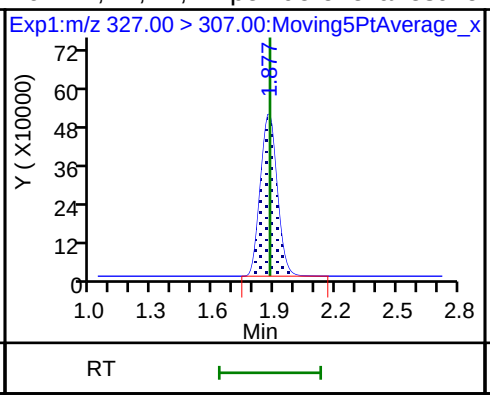
5 Perfluorobutanesulfonic acid



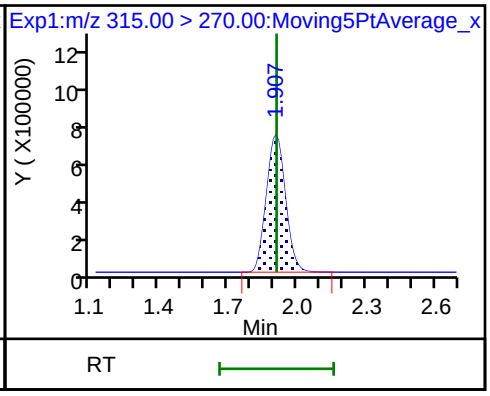
5 Perfluorobutanesulfonic acid



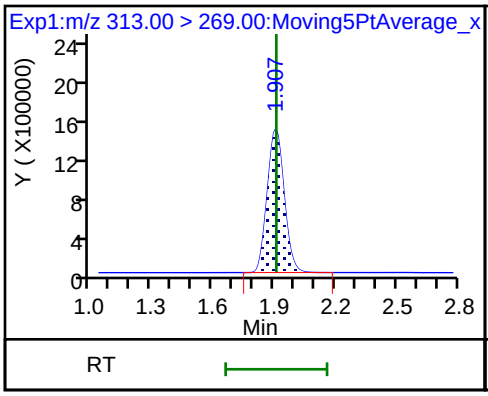
61 1H,1H,2H,2H-perfluorohexanesulfon



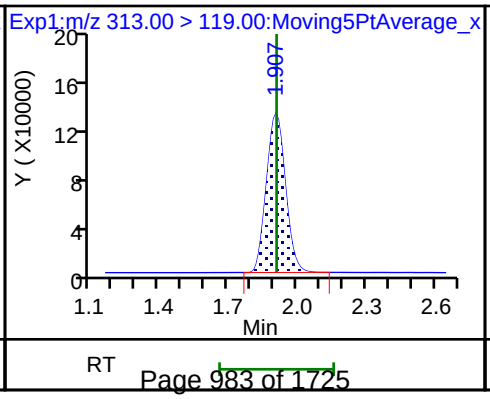
D 7 13C2 PFHxA



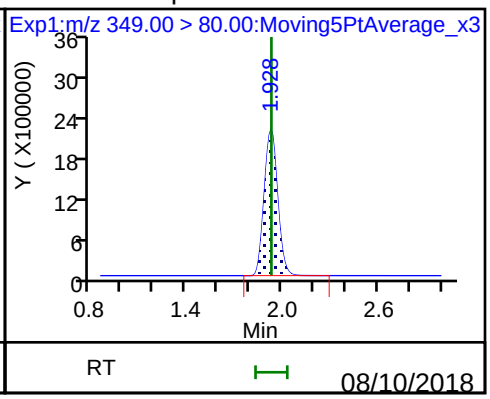
6 Perfluorohexanoic acid



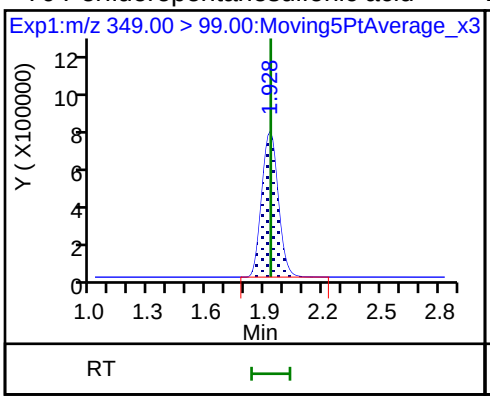
6 Perfluorohexanoic acid



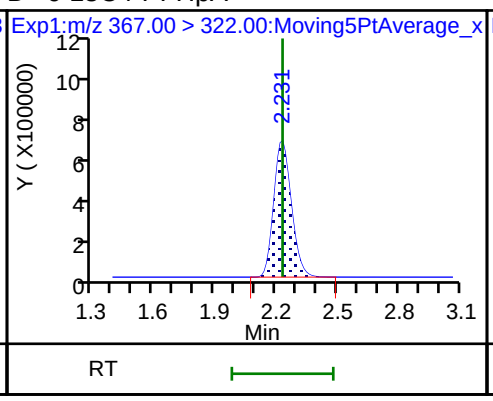
70 Perfluoropentanesulfonic acid



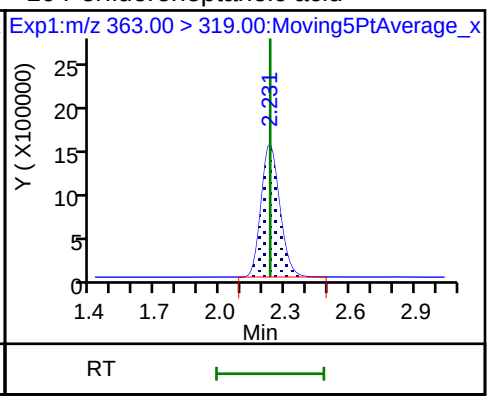
70 Perfluoropentanesulfonic acid



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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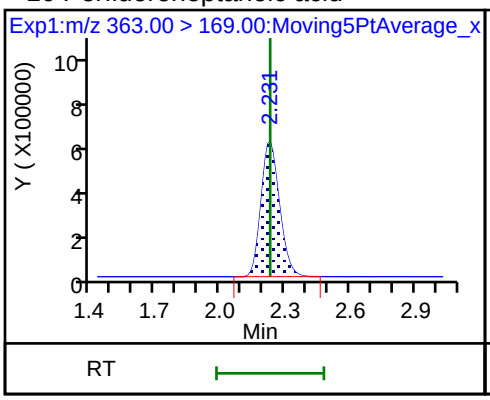
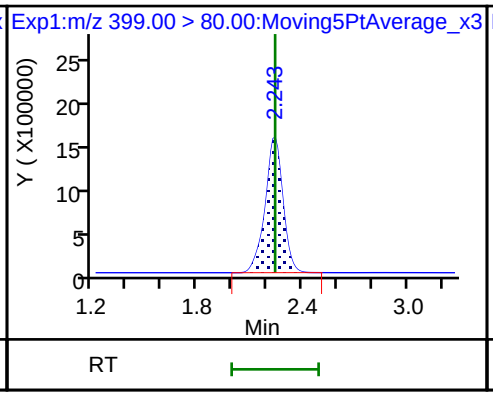
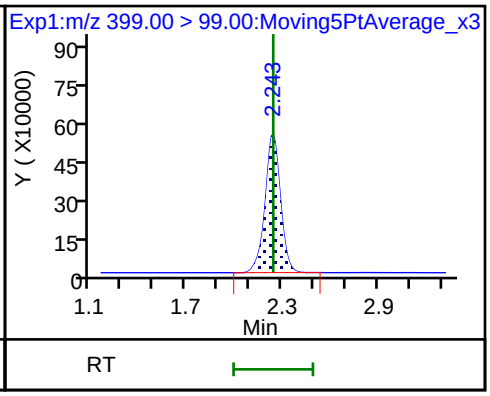


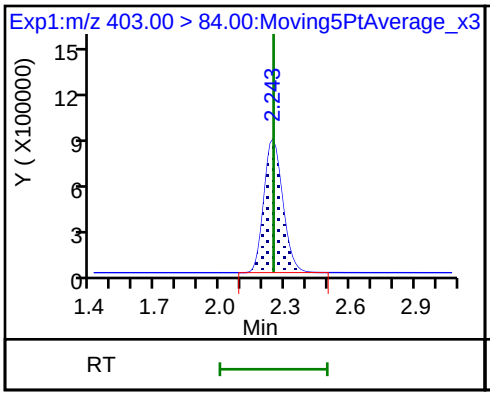
8 Perfluorohexanesulfonic acid



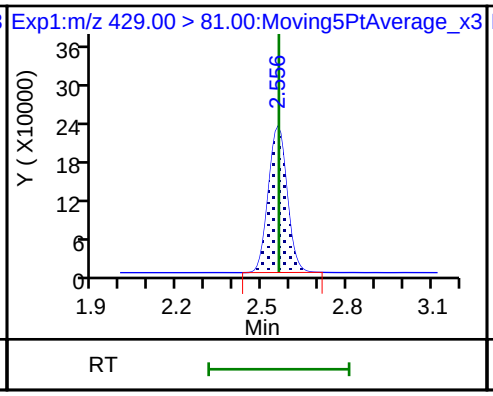
8 Perfluorohexanesulfonic acid



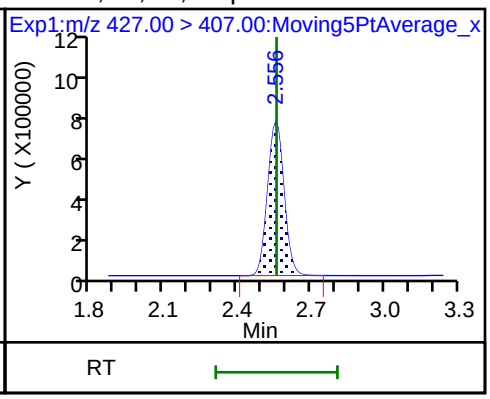
D 11 18O2 PFHxS



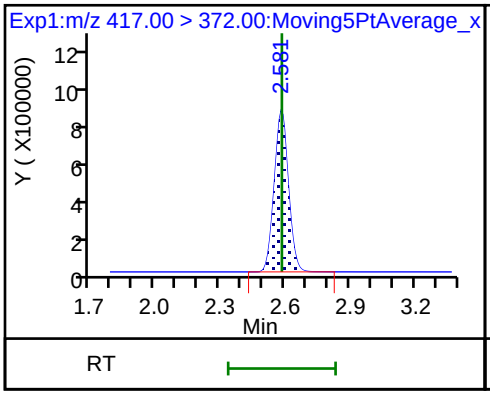
D 12 M2-6:2FTS



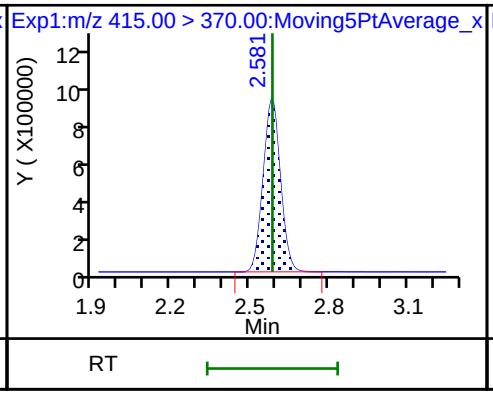
13 1H,1H,2H,2H-perfluorooctanesulfoni



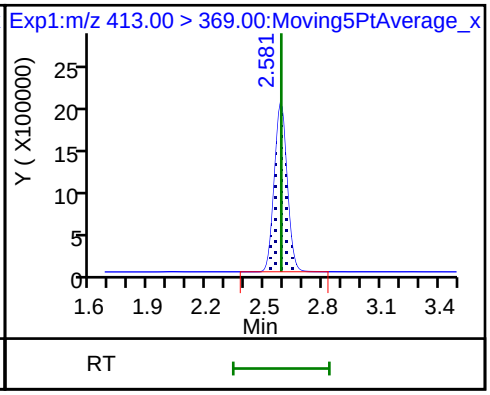
D 14 13C4 PFOA



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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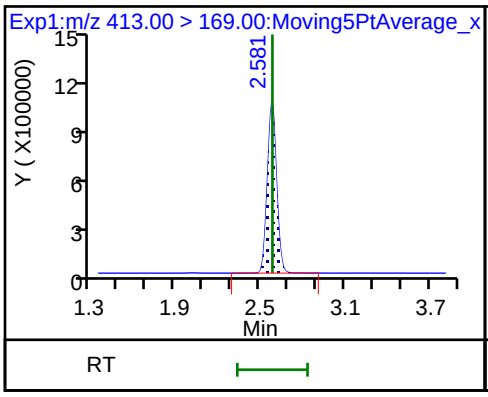
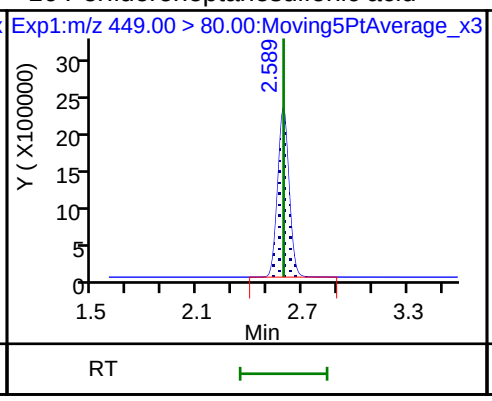
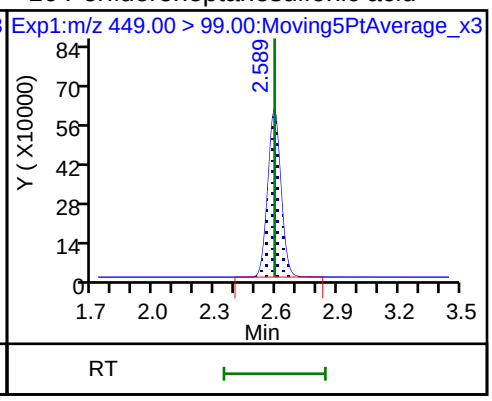


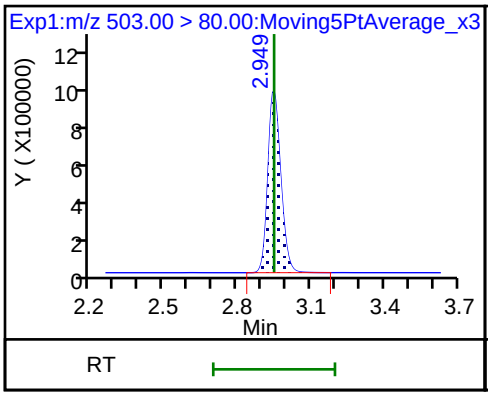
16 Perfluoroheptanesulfonic acid



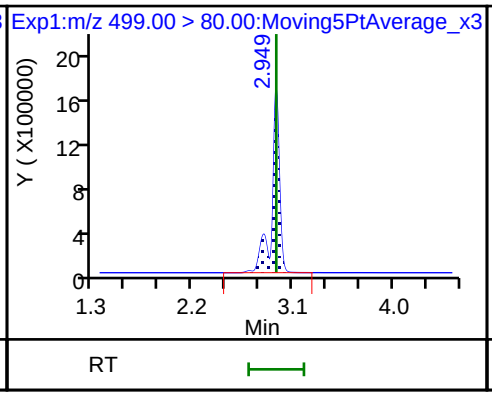
16 Perfluoroheptanesulfonic acid



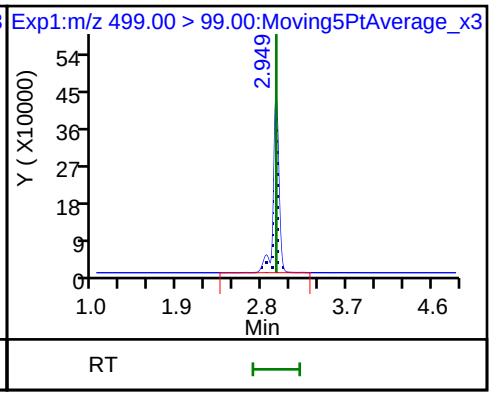
D 18 13C4 PFOS



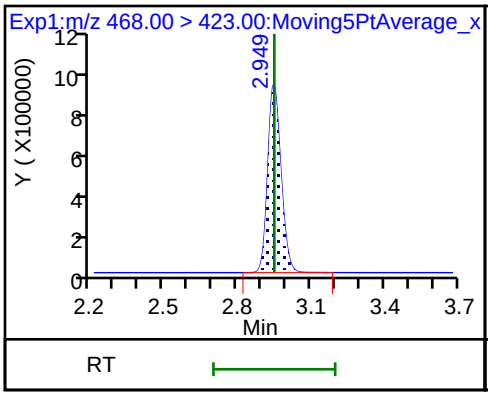
17 Perfluorooctane sulfonic acid



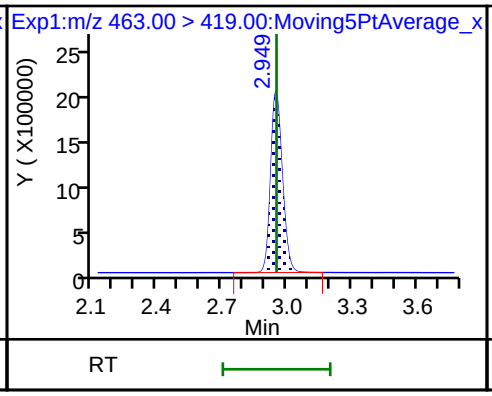
17 Perfluorooctane sulfonic acid



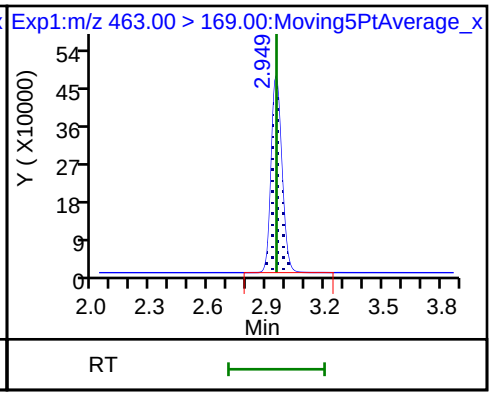
D 19 13C5 PFNA



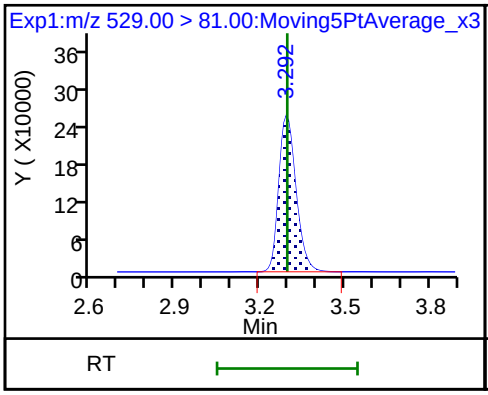
20 Perfluorononanoic acid



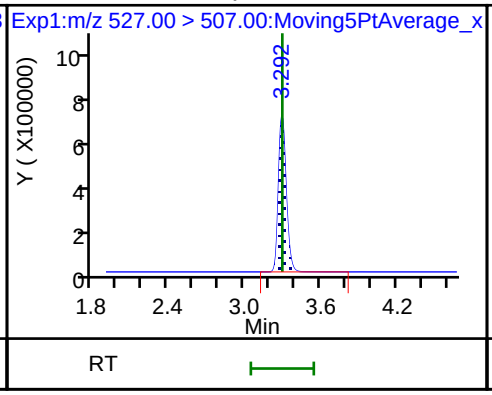
20 Perfluorononanoic acid



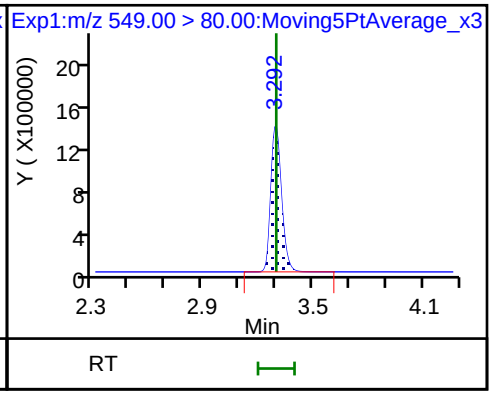
D 26 M2-8:2FTS



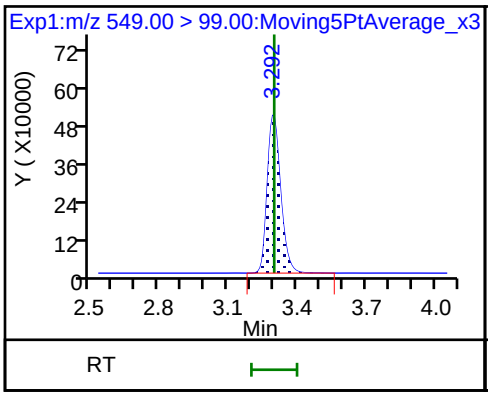
25 1H,1H,2H,2H-perfluorodecanesulfoni



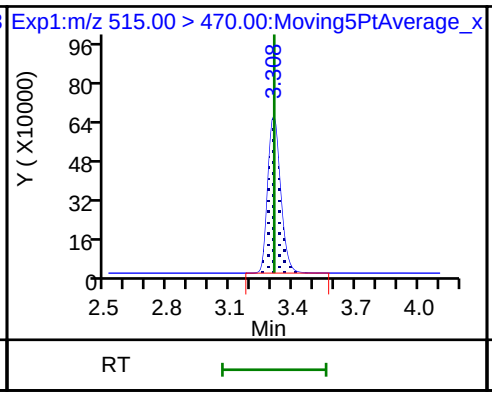
68 Perfluorononanesulfonic acid



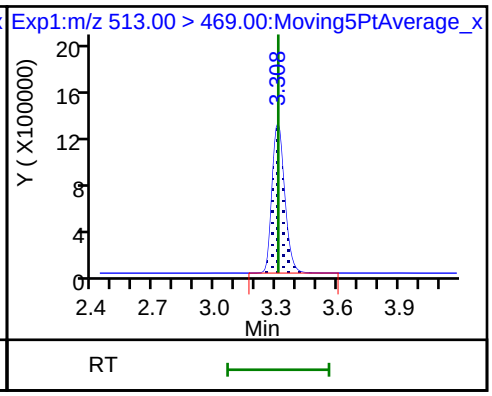
68 Perfluorononanesulfonic acid



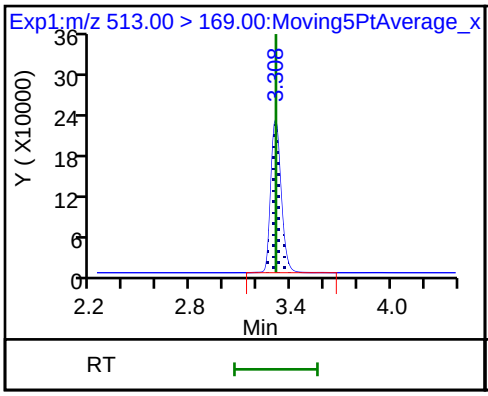
D 23 13C2 PFDA



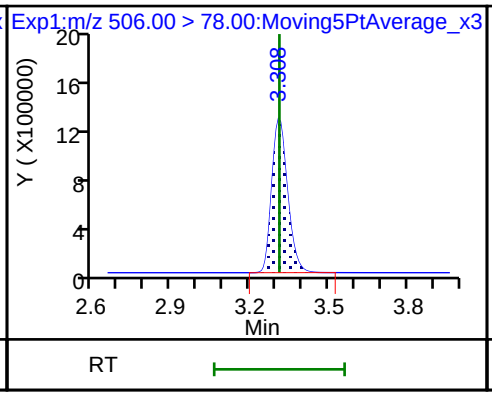
24 Perfluorodecanoic acid



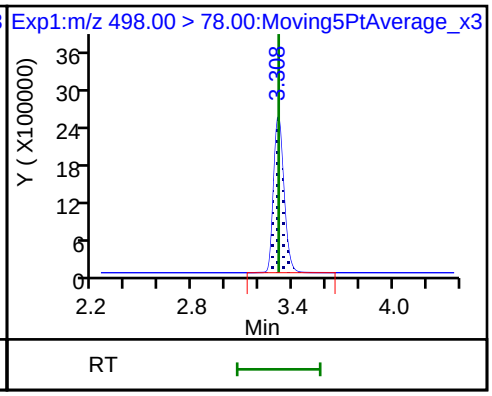
24 Perfluorodecanoic acid



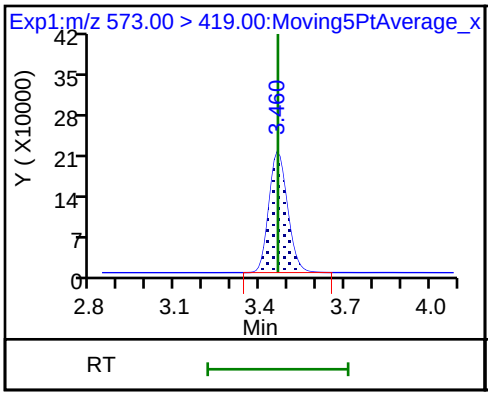
D 21 13C8 FOSA



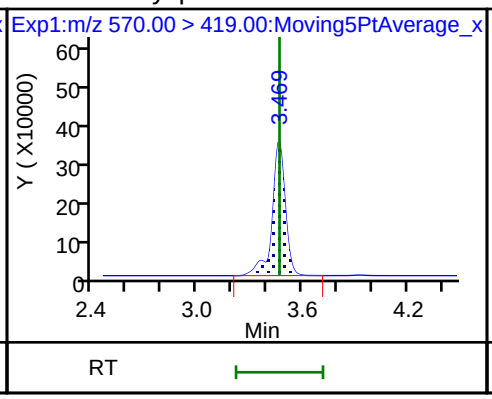
22 Perfluorooctane Sulfonamide



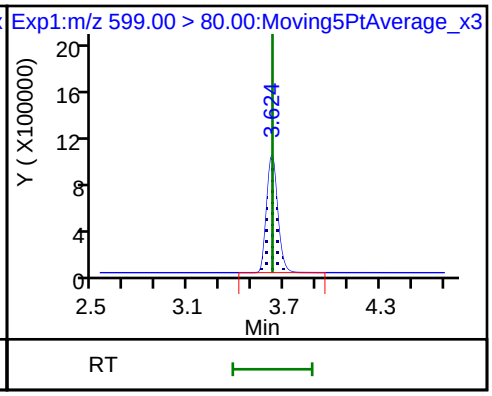
D 27 d3-NMeFOSAA



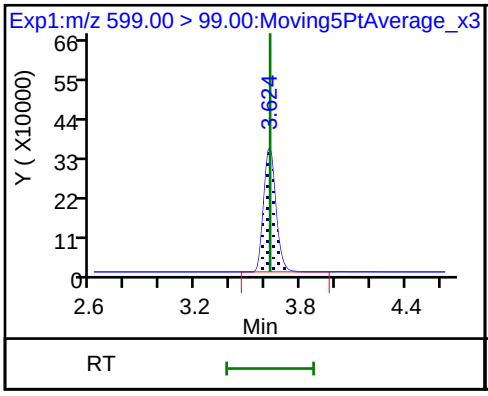
28 N-methyl perfluorooctane sulfonami



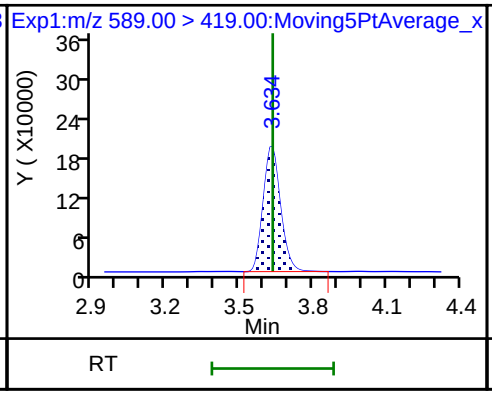
29 Perfluorodecane Sulfonic acid



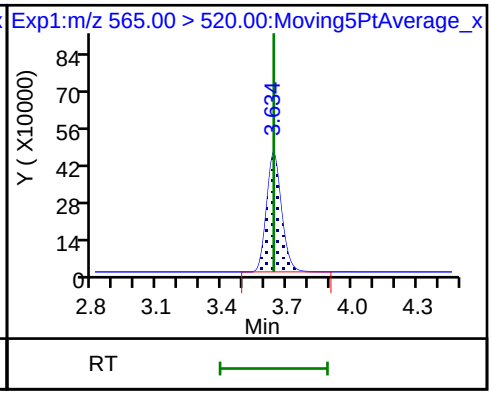
29 Perfluorodecane Sulfonic acid



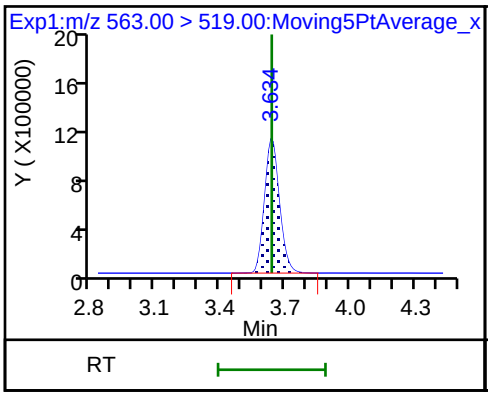
D 32 d5-NEtFOSAA



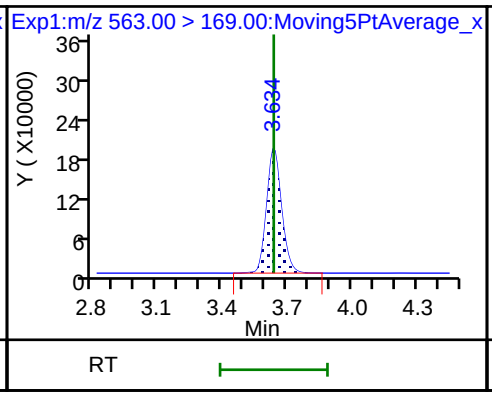
D 30 13C2 PFUnA



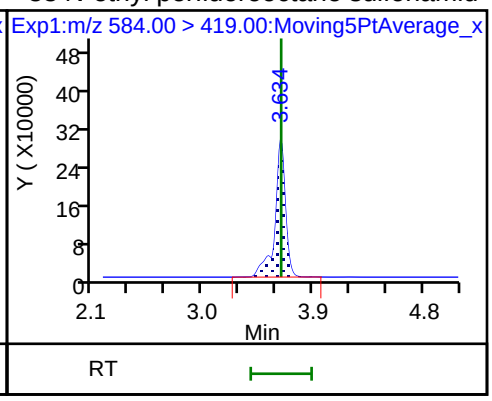
31 Perfluoroundecanoic acid



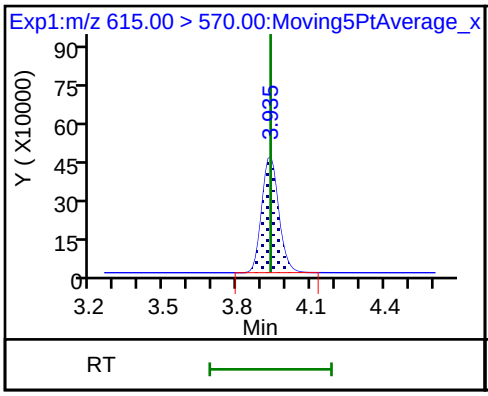
31 Perfluoroundecanoic acid



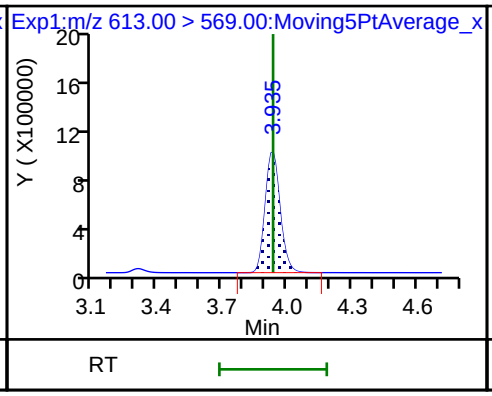
33 N-ethyl perfluorooctane sulfonamid



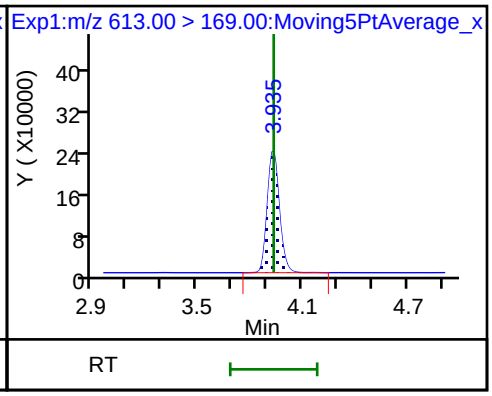
D 36 13C2 PFDoA



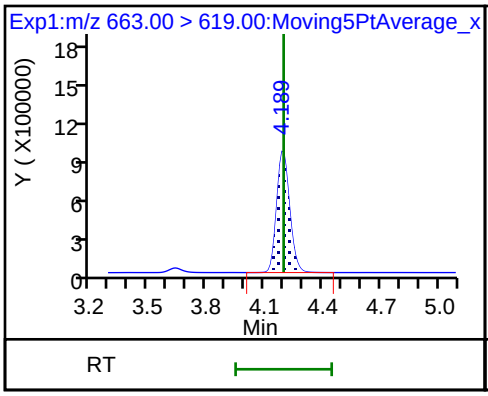
37 Perfluorododecanoic acid



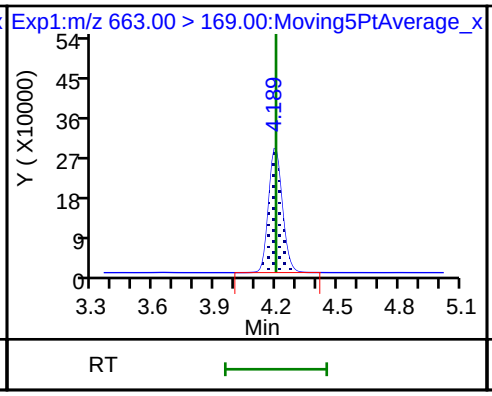
37 Perfluorododecanoic acid



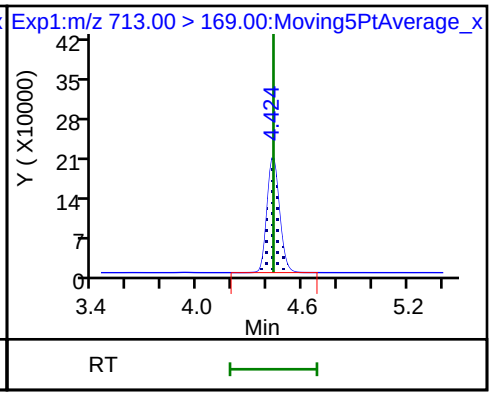
41 Perfluorotridecanoic acid



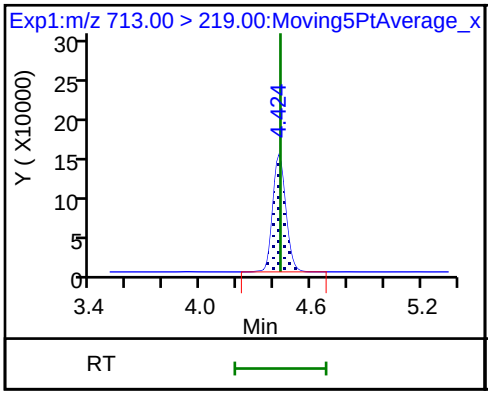
41 Perfluorotridecanoic acid



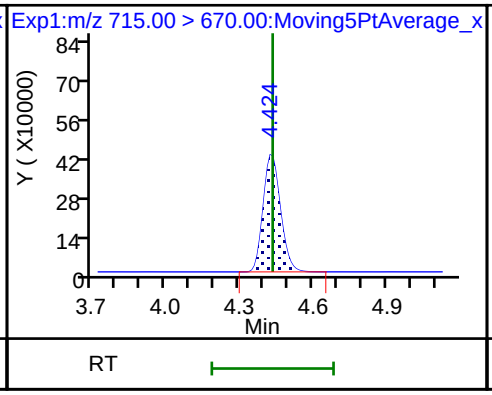
42 Perfluorotetradecanoic acid



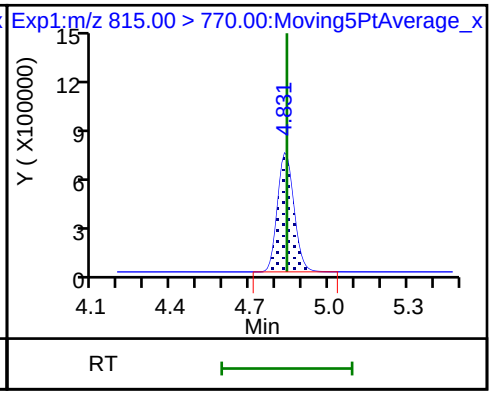
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 23-Jul-2018 16:58:07 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:48 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:10:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.541	4883197	2.79		112	74117	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	19339074	10.1		101	8639	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3306163	2.71		108	55915	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	15779261	9.97		99.7	7819	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	85519	2.67		115	606	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	23700645	8.12		91.8	6613	
298.90 > 99.00	1.667	1.672	-0.005	1.000	10527824		2.25(1.25-3.74)	91.8	6902	
D 60 M2-4:2FTS										
329.00 > 81.00	1.867	1.877	-0.010	0.723	543308	NC			6915	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.867	1.878	-0.011	1.120	5322216	8.46		90.6	135373	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.738	3805574	2.66		106	82676	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	15806374	9.80		98.0	39161	
313.00 > 119.00	1.907	1.909	-0.002	1.000	1445896		10.93(5.03-15.10)	98.0	25016	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	23253305	8.87		94.6	120505	
349.00 > 99.00	1.928	1.931	-0.003	1.157	9049105		2.57(1.36-4.07)	94.6	81619	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.004	2.006	-0.002	1.000	3047754	NC			14235	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.004	2.007	-0.003	0.776	216599	NC			7331	
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.230	0.0	0.864	3852411	2.61		104	64708	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	16928139	9.96		99.6	22205	
363.00 > 169.00	2.230	2.230	0.0	1.000	6609675		2.56(1.13-3.40)	99.6	40995	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.243	-0.001	1.000	21540736	8.70		95.6	27484	
399.00 > 99.00	2.242	2.243	-0.001	1.000	7460836		2.89(1.50-4.49)	95.6	19105	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.246	-0.004	0.868	5017633	2.65		112	59912	
65 ADONA										
377.00 > 251.00	2.268	2.272	-0.004	0.769	37856961	NC			120099	
377.00 > 85.00	2.268	2.272	-0.004	0.769	24058488		1.57(0.84-2.53)		98571	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.559	-0.002	0.990	931806	2.26		95.2	15530	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.559	-0.002	1.000	6471554	9.78		103	39315	
D 14 13C4 PFOA										
417.00 > 372.00	2.582	2.585	-0.003	1.000	3691370	2.56		102	62435	
* 62 13C2-PFOA										
415.00 > 370.00	2.582	2.585	-0.003		3773243	2.50			43682	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.582	2.586	-0.004	1.000	16840284	9.40		93.9	15773	
413.00 > 169.00	2.582	2.586	-0.004	1.000	8873683		1.90(0.84-2.52)	93.9	26145	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.590	2.591	-0.001	0.878	19142608	9.49		99.7	68445	
449.00 > 99.00	2.590	2.591	-0.001	0.878	5384787		3.55(1.94-5.82)	99.7	57339	
D 18 13C4 PFOS										
503.00 > 80.00	2.950	2.949	0.001	1.142	3486265	2.64		111	21820	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.950	2.949	0.001	1.000	15645792	9.71		105	34426	M
499.00 > 99.00	2.950	2.949	0.001	1.000	3521850		4.44(2.31-6.93)	105	46803	
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.950	0.0	1.142	3229889	2.59		104	53567	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.950	0.0	1.000	13514816	9.16		91.6	28592	
463.00 > 169.00	2.950	2.950	0.0	1.000	3446513		3.92(1.90-5.69)	91.6	50824	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.167	3.161	0.006	1.074	23659481	NC			133174	
D 26 M2-8:2FTS										
529.00 > 81.00	3.294	3.296	-0.002	1.276	937942	2.18		91.1	13574	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.294	3.297	-0.003	1.000	5115198	9.63		101	91326	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.302	3.299	0.003	1.119	11005221	10.1		105	87745	
549.00 > 99.00	3.302	3.299	0.003	1.119	3984151		2.76(1.33-3.97)	105	32796	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.310	3.309	0.001	1.282	2361487	2.38		95.3	42924	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.310	3.309	0.001	1.000	10269789	10.6		106	29870	
513.00 > 169.00	3.310	3.309	0.001	1.000	1743088		5.89(2.36-7.09)	106	40828	
D 21 13C8 FOSA										
506.00 > 78.00	3.318	3.311	0.007	1.285	4984298	2.57		103	53760	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.318	3.314	0.004	1.000	18761965	9.46		94.6	91120	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.462	3.462	0.0	1.341	925765	2.83		113	20240	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.471	3.468	0.003	1.003	3756042	10.3		103	29997	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.626	3.625	0.001	1.229	9597480	9.92		103	252971	
599.00 > 99.00	3.626	3.625	0.001	1.229	3379796		2.84(1.39-4.16)	103	64746	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.636	3.635	0.001	1.408	863349	2.51		100	3181	
D 30 13C2 PFUnA										
565.00 > 520.00	3.645	3.638	0.007	1.412	1966864	2.46		98.6	33851	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.645	3.638	0.007	1.000	9129849	9.35		93.5	42074	
563.00 > 169.00	3.645	3.638	0.007	1.000	1642596		5.56(2.12-6.36)	93.5	30551	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.645	3.639	0.006	1.003	3306623	10.3		103	23838	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.801	3.800	0.001	1.289	31515141	NC			102018	
D 36 13C2 PFDoA										
615.00 > 570.00	3.937	3.934	0.003	1.525	2040247	2.69		108	16383	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.937	3.934	0.003	1.000	8523366	9.65		96.5	3349	
613.00 > 169.00	3.937	3.934	0.003	1.000	2187217		3.90(2.13-6.40)	96.5	26960	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.201	4.198	0.003	1.067	8285433	9.67		96.7	3071	
663.00 > 169.00	4.201	4.198	0.003	1.067	2580205		3.21(1.25-3.76)	96.7	20537	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.436	4.433	0.003	1.000	2071202	9.97		99.7	21230	
713.00 > 219.00	4.426	4.433	-0.007	0.998	1466098		1.41(0.71-2.13)	99.7	15704	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.435	0.001	1.718	2071078	2.79		112	11010	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.840	0.002	1.875	3019605	2.68		107	11551	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.840	0.002	1.000	11414316	NC			1711	
813.00 > 169.00	4.842	4.840	0.002	1.000	1927769		5.92(2.86-8.58)		14501	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.188	5.184	0.004	1.072	11894774	NC			2277	
913.00 > 169.00	5.181	5.184	-0.003	1.070	1498604		7.94(3.83-11.48)		10703	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL7_00005 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:39:50 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Injection Date: 23-Jul-2018 16:58:07 Instrument ID: A8_N

Lims ID: IC L7 Full

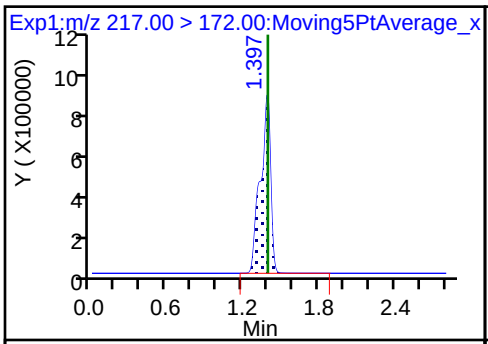
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

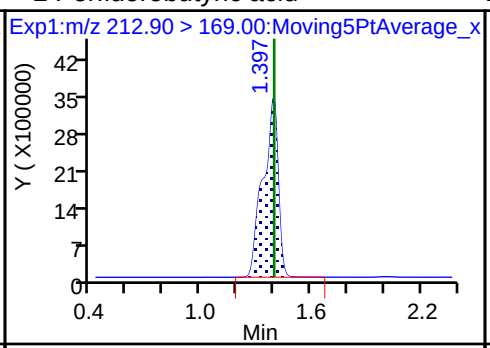
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



RT

2 Perfluorobutyric acid



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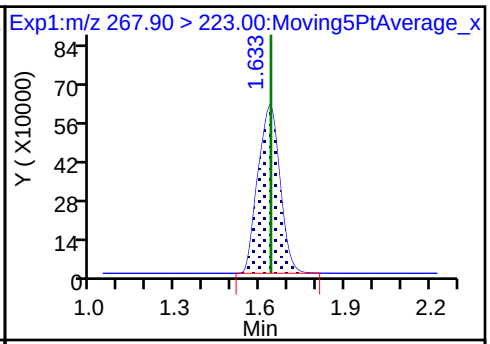
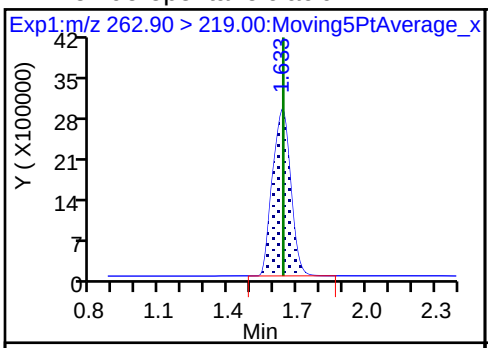
D 3 13C5-PFPeA



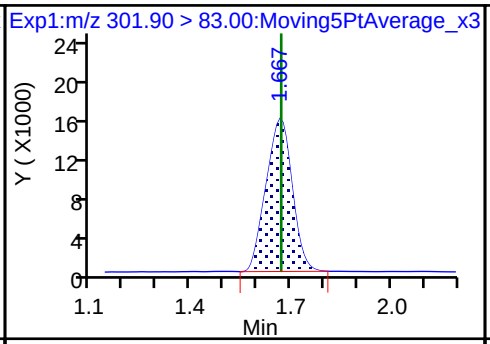
RT

4 Perfluoropentanoic acid



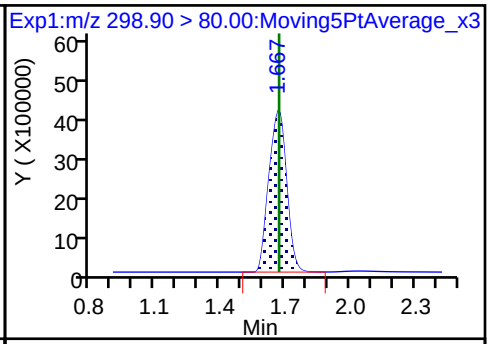
RT

D 47 13C3-PFBS



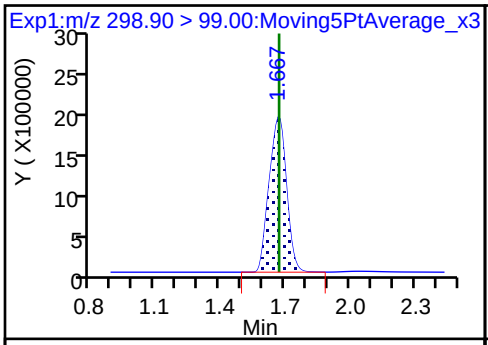
RT

5 Perfluorobutanesulfonic acid



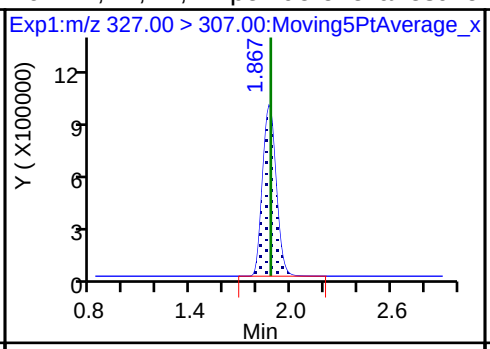
RT

5 Perfluorobutanesulfonic acid



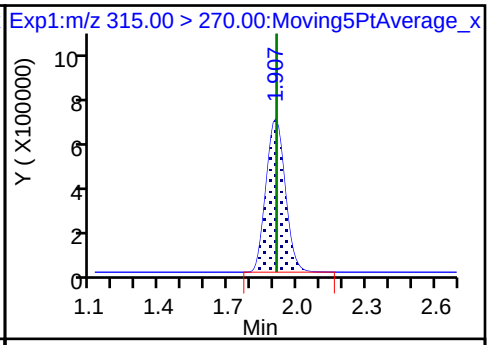
RT

61 1H,1H,2H,2H-perfluorohexanesulfon



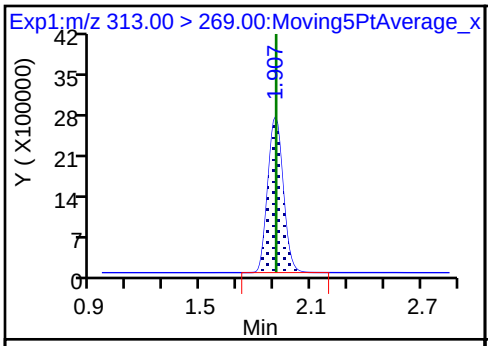
RT

D 7 13C2 PFHxA



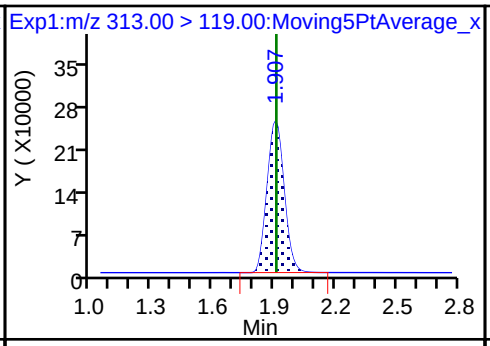
RT

6 Perfluorohexanoic acid



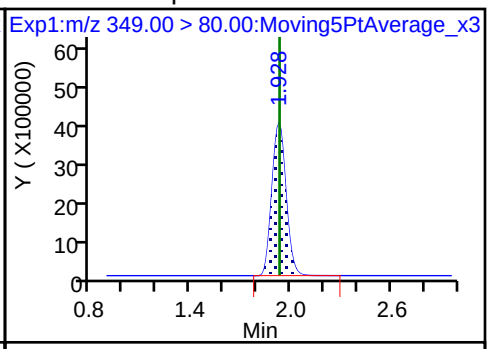
RT

6 Perfluorohexanoic acid



RT

70 Perfluoropentanesulfonic acid



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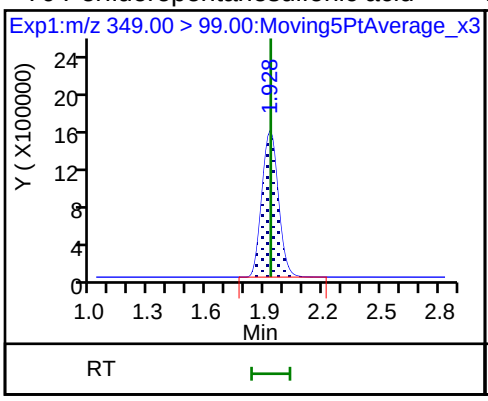
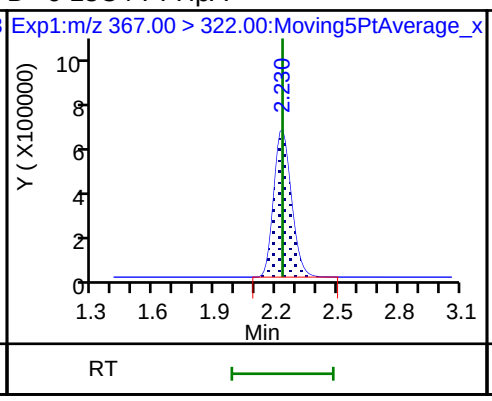
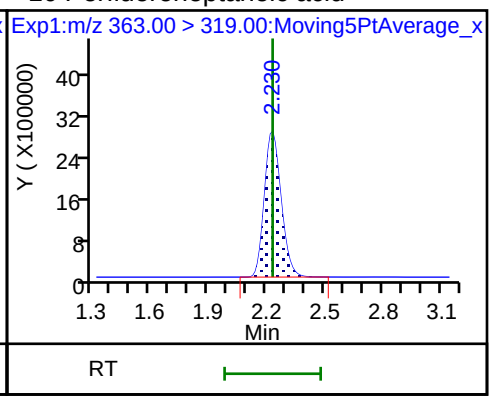
70 Perfluoropentanesulfonic acid



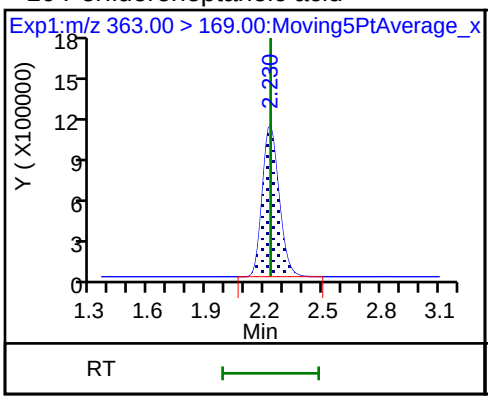
D 9 13C4-PFHpA



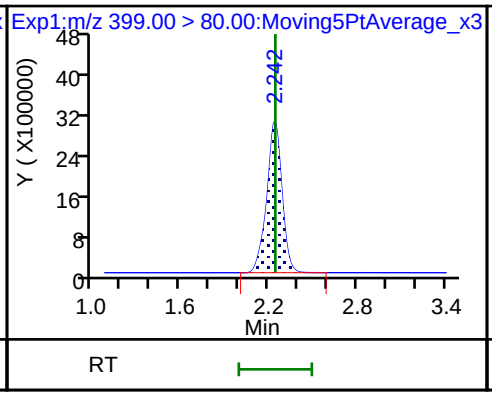
10 Perfluoroheptanoic acid



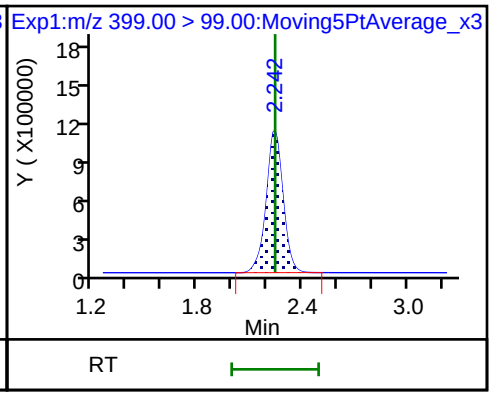
10 Perfluoroheptanoic acid



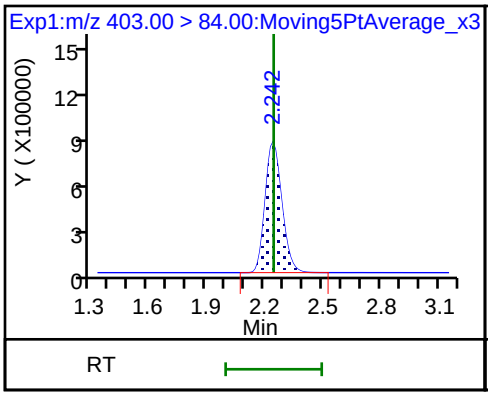
8 Perfluorohexanesulfonic acid



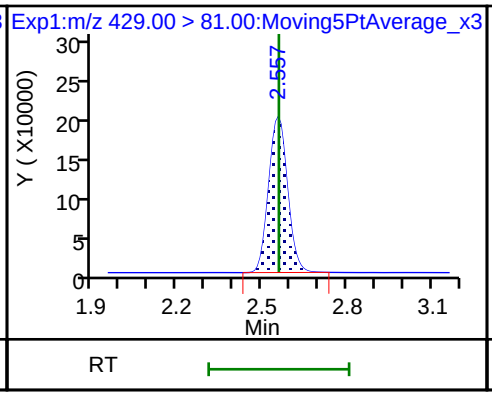
8 Perfluorohexanesulfonic acid



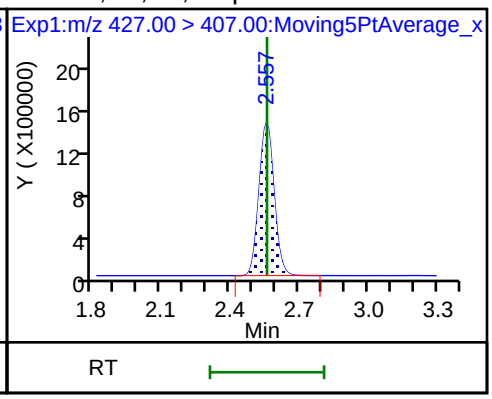
D 11 18O2 PFHxS



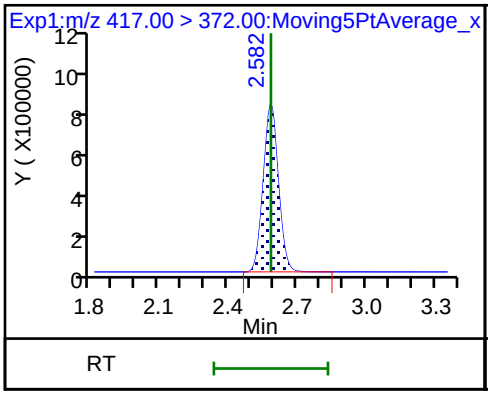
D 12 M2-6:2FTS



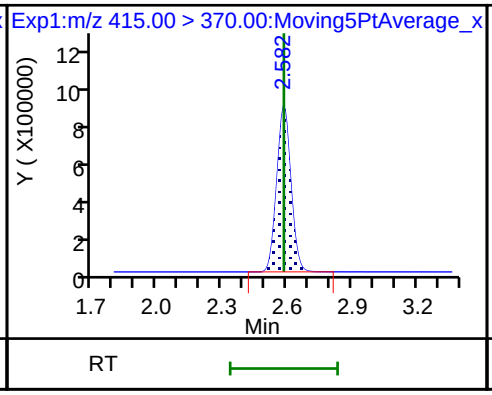
13 1H,1H,2H,2H-perfluorooctanesulfoni



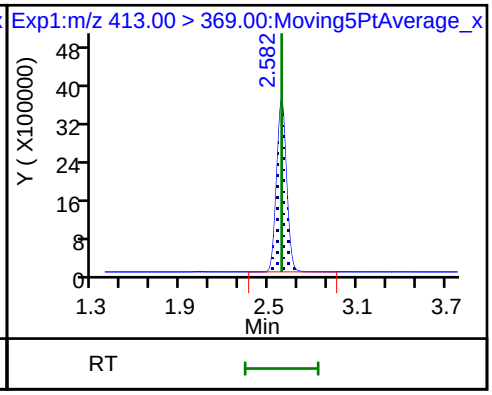
D 14 13C4 PFOA



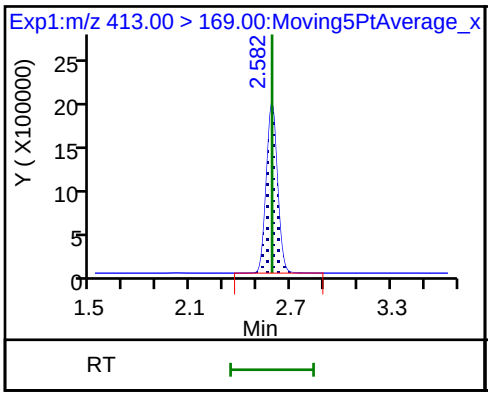
* 62 13C2-PFOA



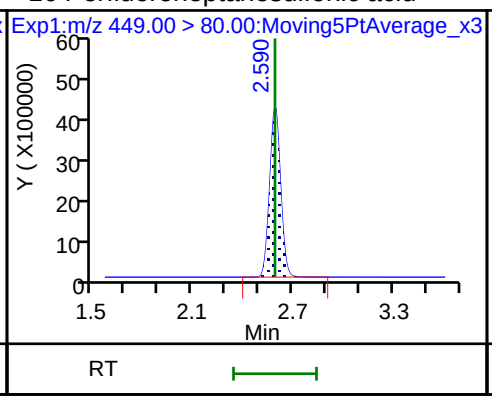
15 Perfluorooctanoic acid



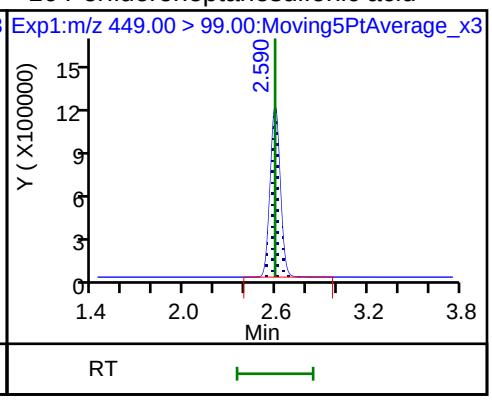
15 Perfluorooctanoic acid



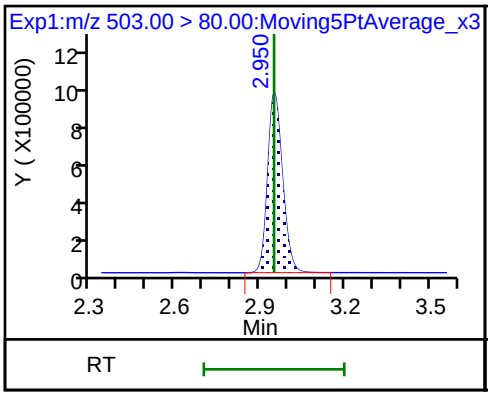
16 Perfluoroheptanesulfonic acid



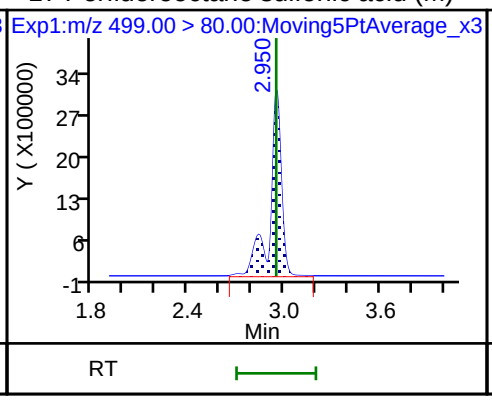
16 Perfluoroheptanesulfonic acid



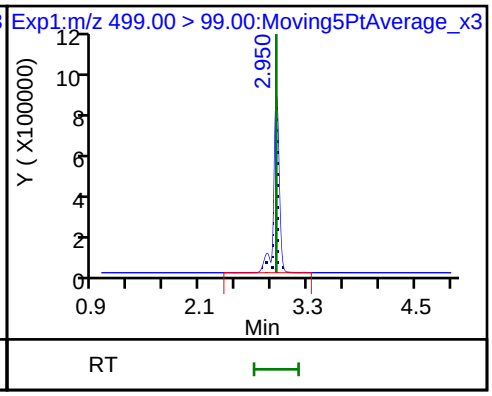
D 18 13C4 PFOS



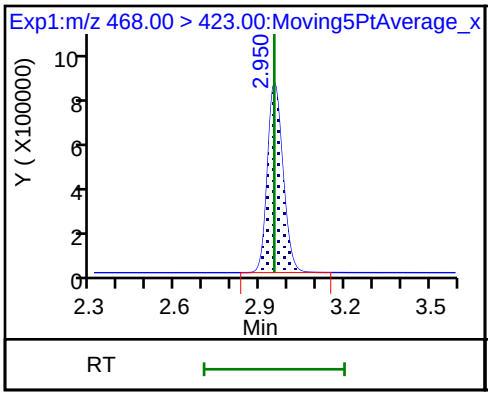
17 Perfluorooctane sulfonic acid (M)



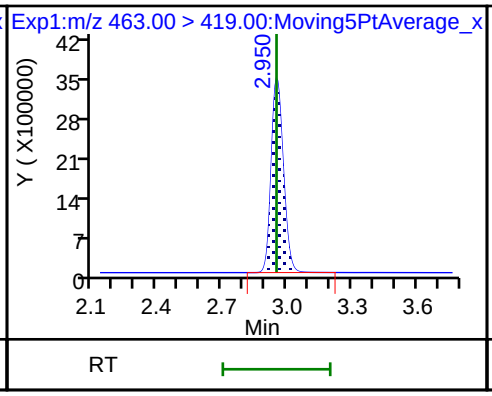
17 Perfluorooctane sulfonic acid



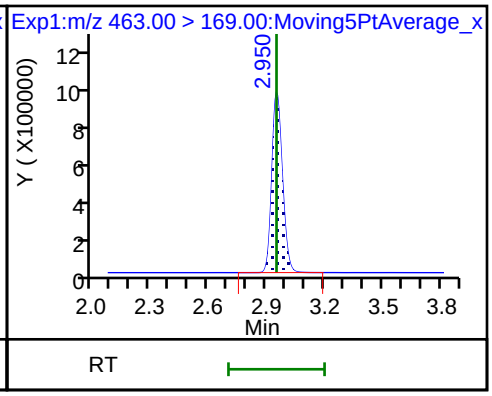
D 19 13C5 PFNA



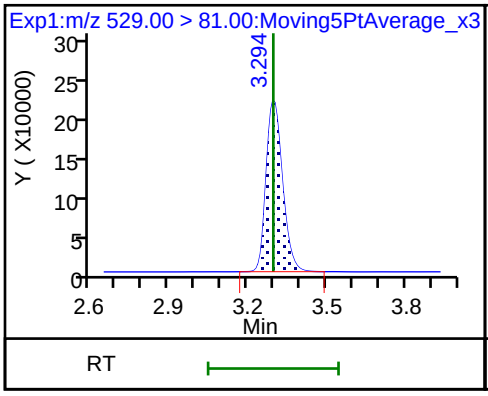
20 Perfluorononanoic acid



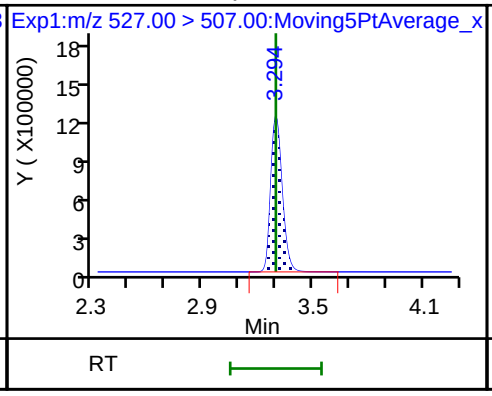
20 Perfluorononanoic acid



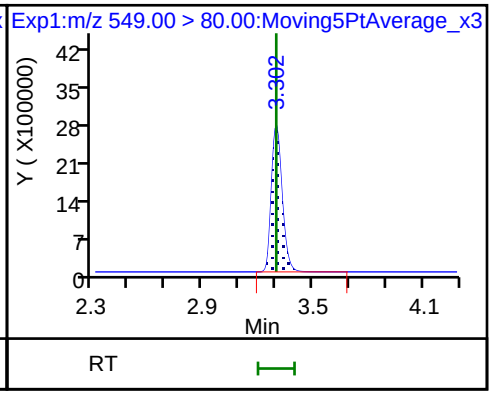
D 26 M2-8:2FTS



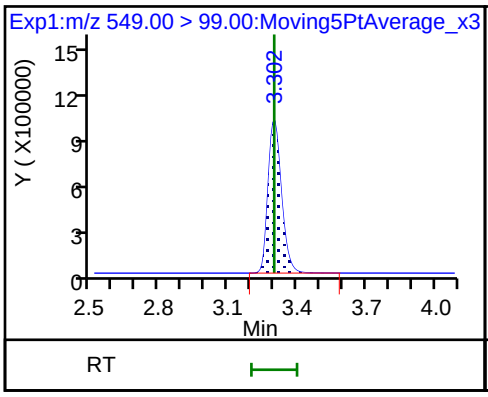
25 1H,1H,2H,2H-perfluorodecanesulfoni



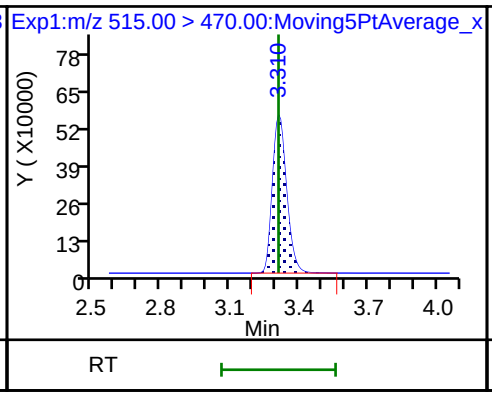
68 Perfluorononanesulfonic acid



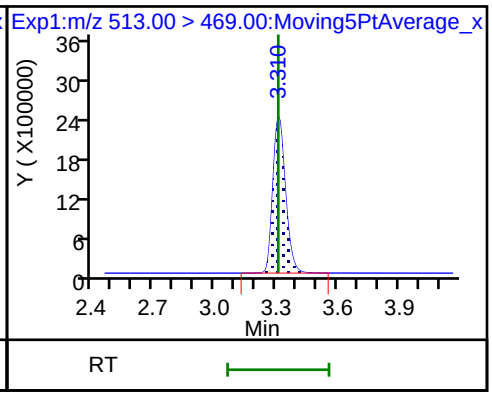
68 Perfluorononanesulfonic acid



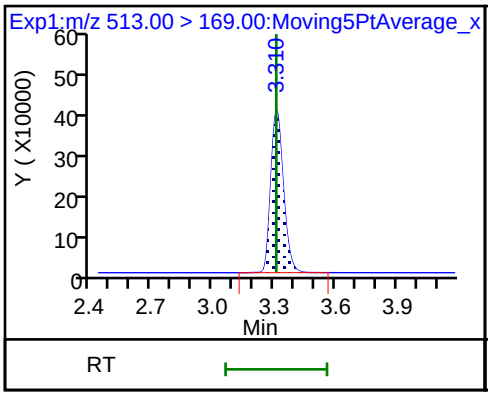
D 23 13C2 PFDA



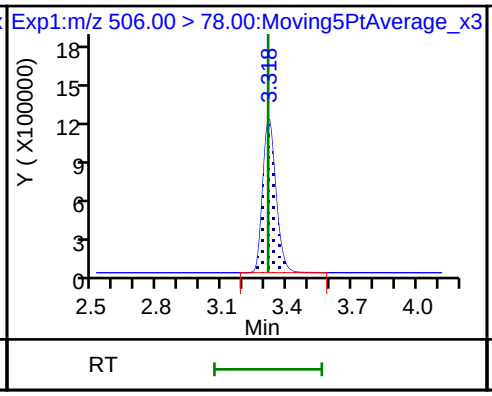
24 Perfluorodecanoic acid



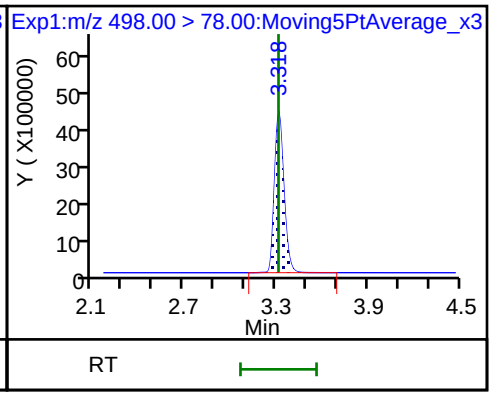
24 Perfluorodecanoic acid



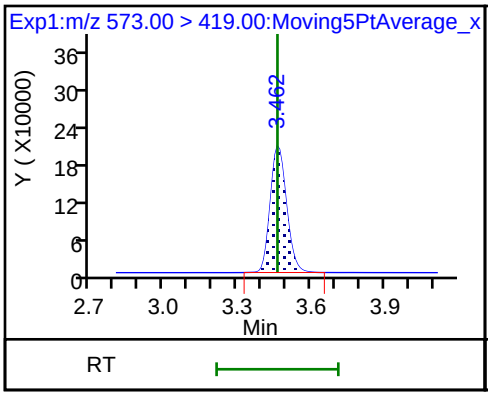
D 21 13C8 FOSA



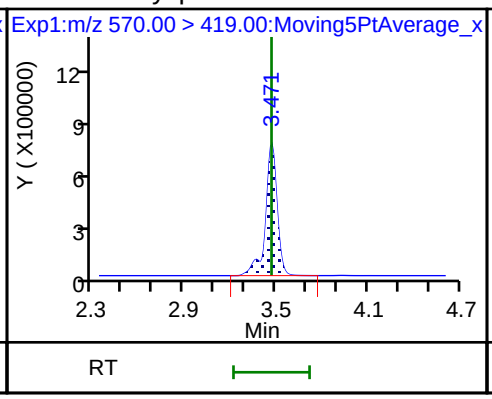
22 Perfluorooctane Sulfonamide



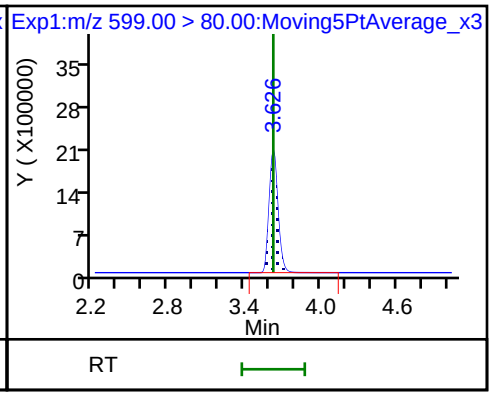
D 27 d3-NMeFOSAA



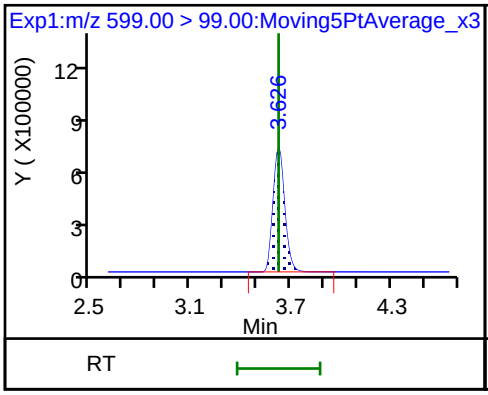
28 N-methyl perfluorooctane sulfonami



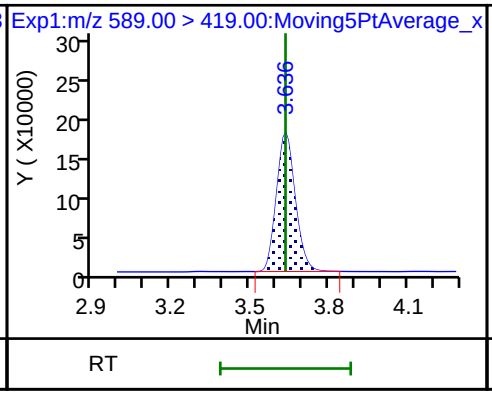
29 Perfluorodecane Sulfonic acid



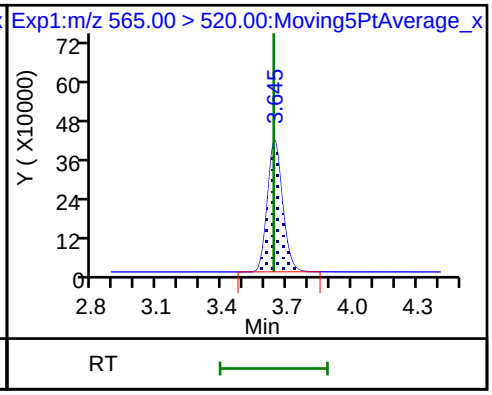
29 Perfluorodecane Sulfonic acid



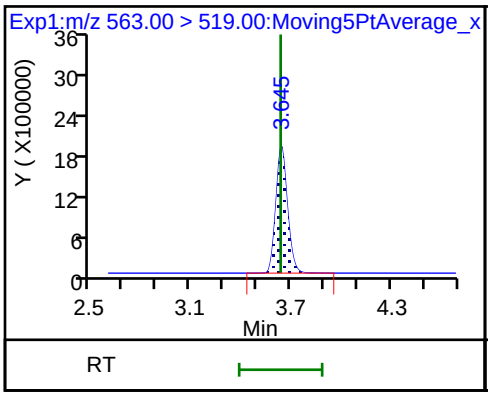
D 32 d5-NEtFOSAA



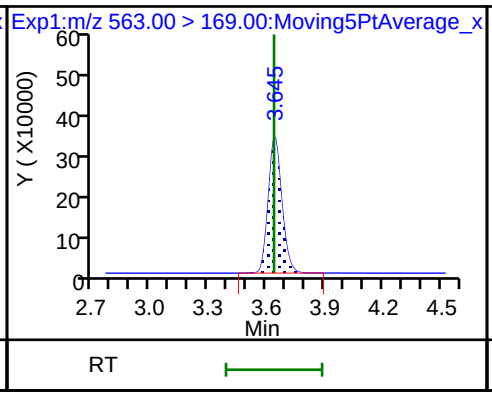
D 30 13C2 PFUnA



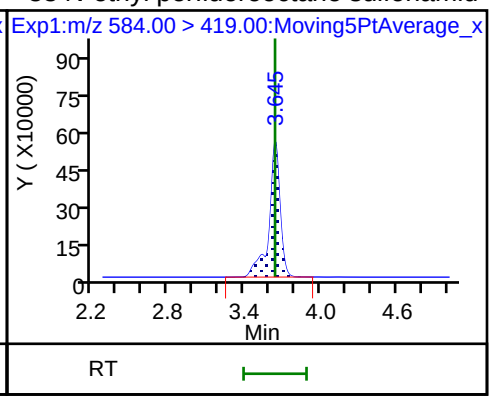
31 Perfluoroundecanoic acid



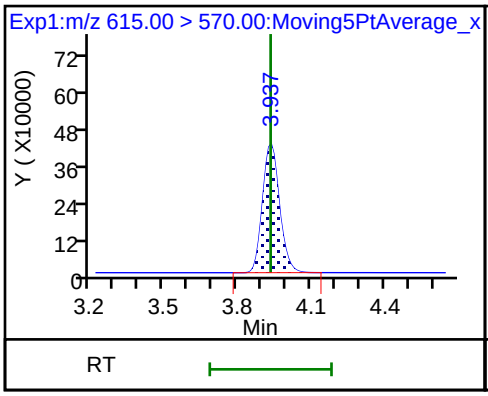
31 Perfluoroundecanoic acid



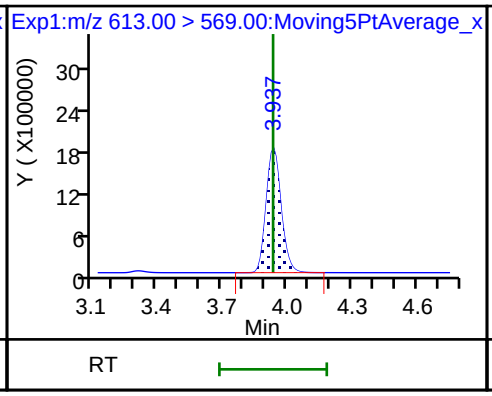
33 N-ethyl perfluorooctane sulfonamid



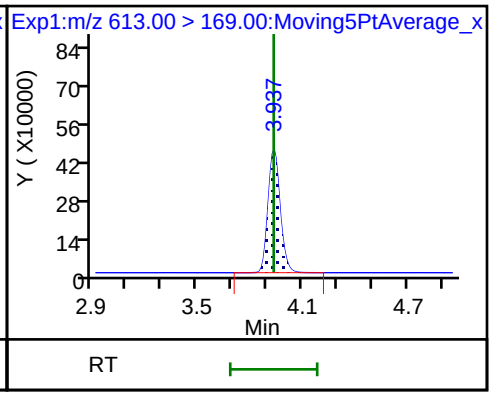
D 36 13C2 PFDoA



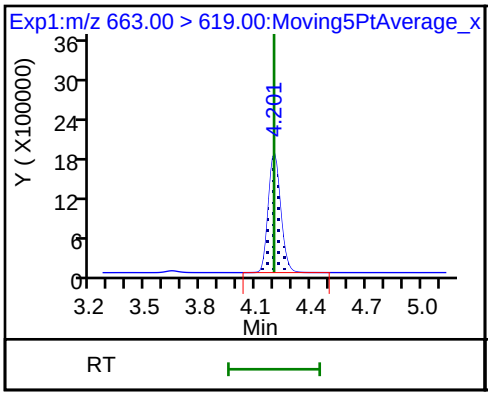
37 Perfluorododecanoic acid



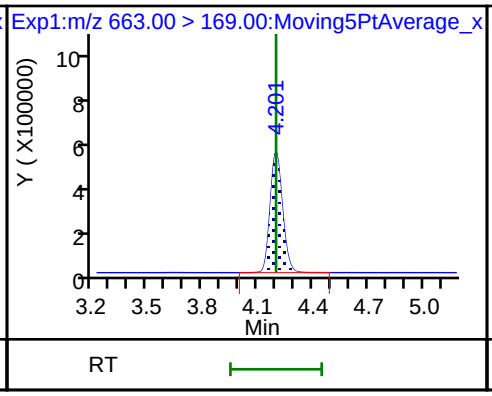
37 Perfluorododecanoic acid



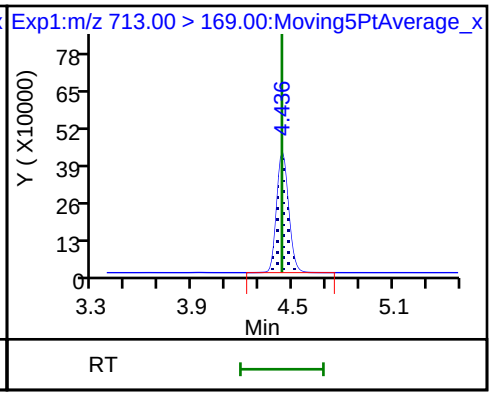
41 Perfluorotridecanoic acid



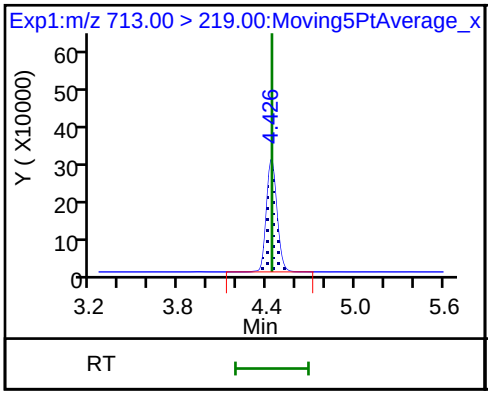
41 Perfluorotridecanoic acid



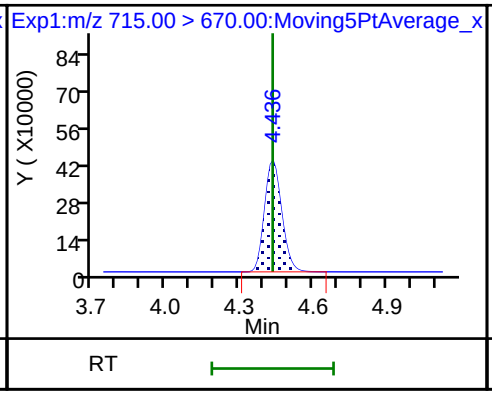
42 Perfluorotetradecanoic acid



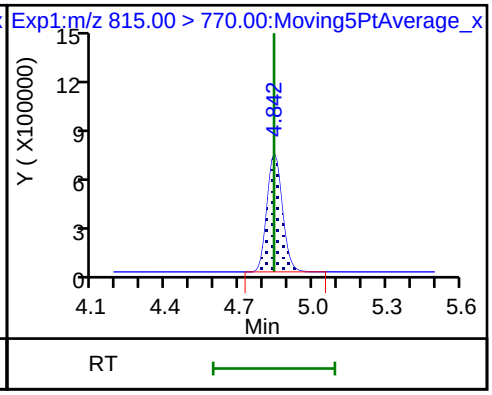
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

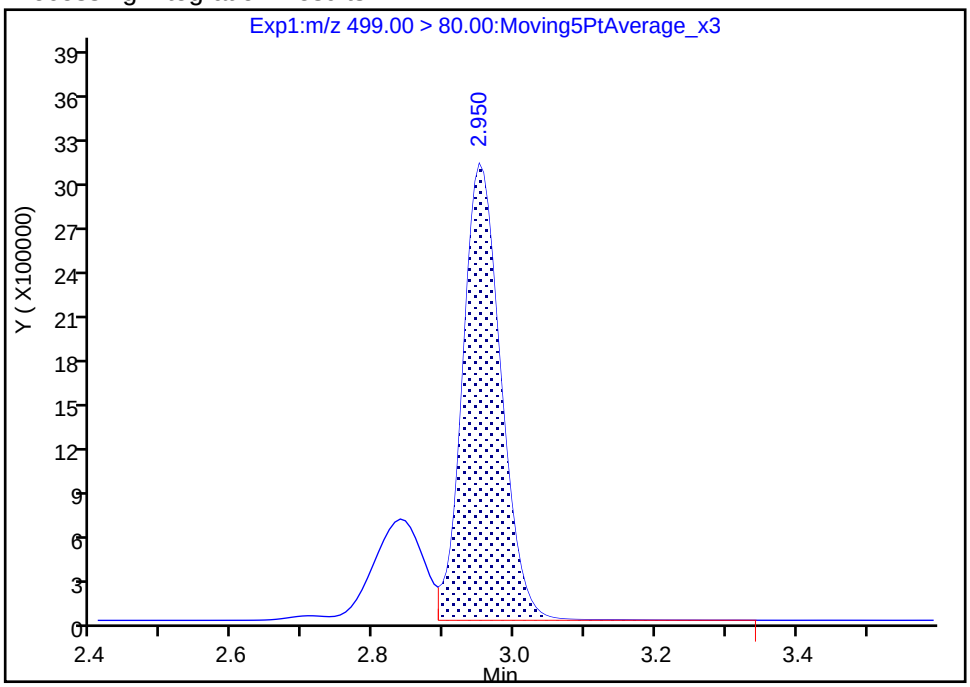
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d				
Injection Date:	23-Jul-2018 16:58:07	Instrument ID:	A8_N		
Lims ID:	IC L7 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	16	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

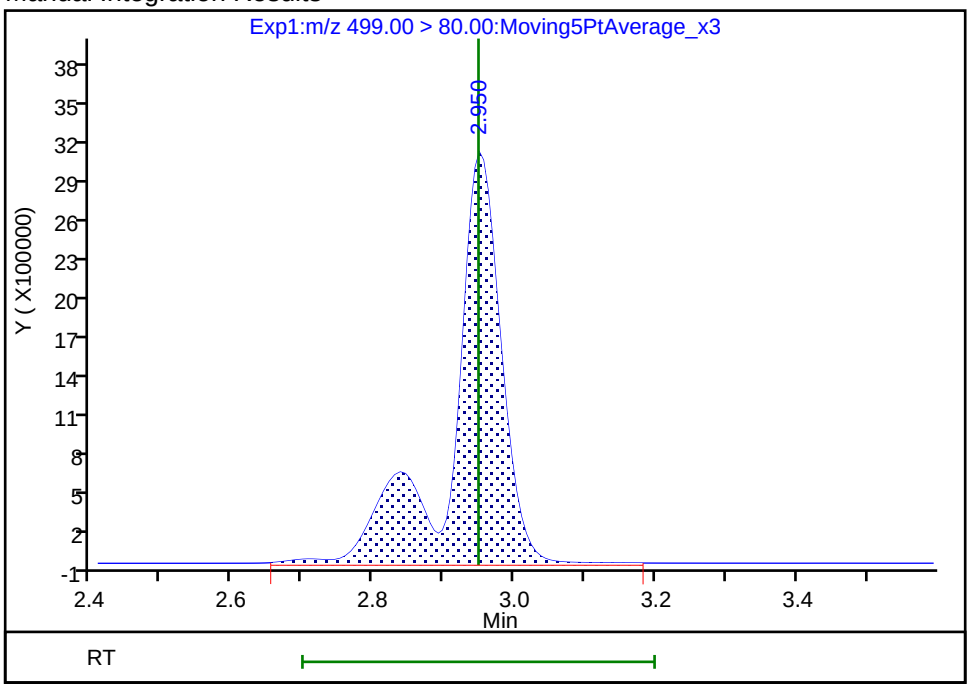
Processing Integration Results

RT: 2.95
Area: 11689609
Amount: 7.537173
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 15645792
Amount: 9.706854
Amount Units: ng/ml



Reviewer: hannigana, 23-Jul-2018 17:10:20

Audit Action: Manually Integrated Audit Reason: Isomers

Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

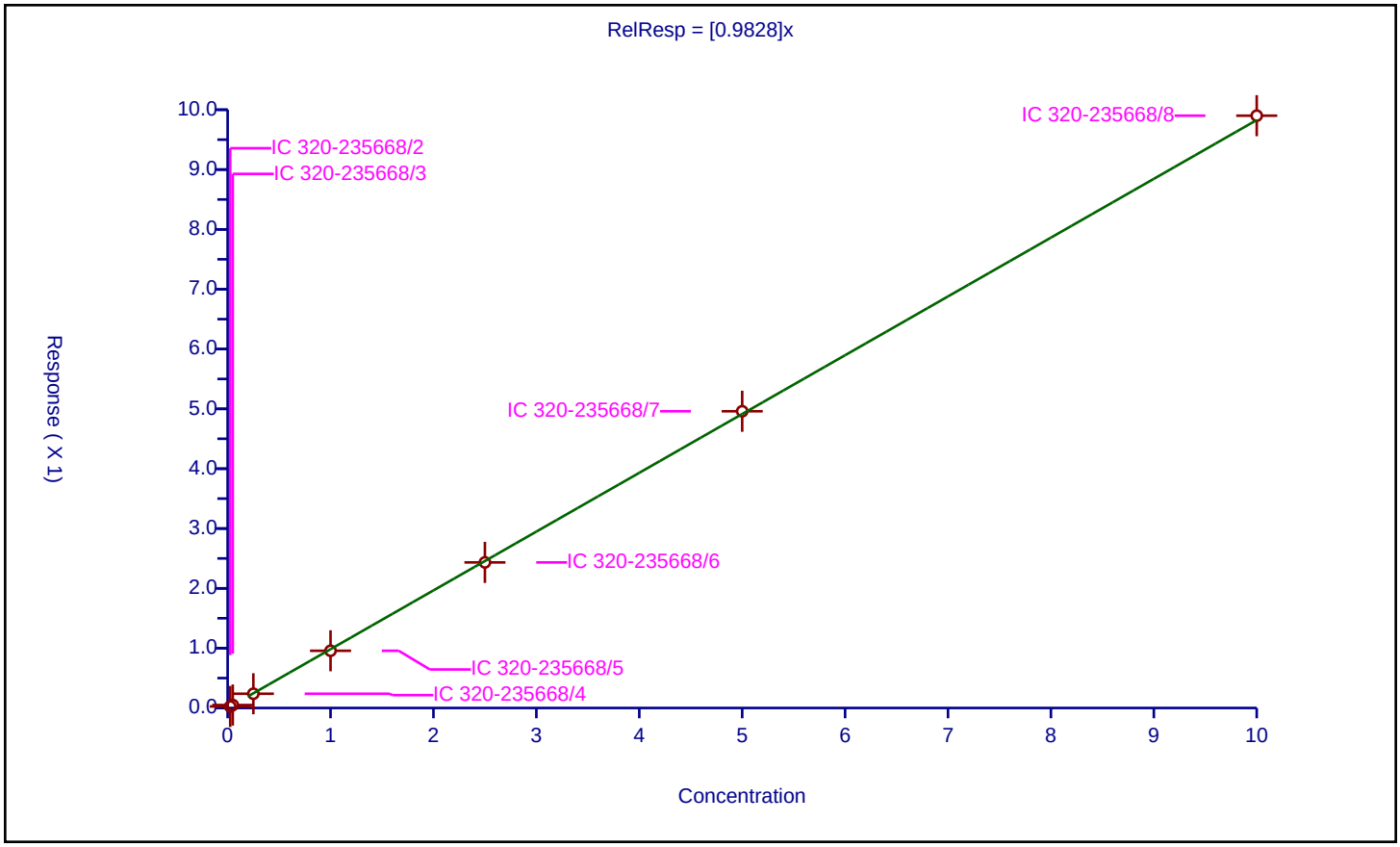
Curve Coefficients

Intercept:	0
Slope:	0.9828

Error Coefficients

Standard Error:	9130000
Relative Standard Error:	2.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.025663	2.5	5325082.0	1.026501	Y
2	IC 320-235668/3	0.05	0.049377	2.5	5106874.0	0.987541	Y
3	IC 320-235668/4	0.25	0.23839	2.5	5102046.0	0.953561	Y
4	IC 320-235668/5	1.0	0.95629	2.5	5085441.0	0.95629	Y
5	IC 320-235668/6	2.5	2.433601	2.5	5130909.0	0.97344	Y
6	IC 320-235668/7	5.0	4.959935	2.5	4957611.0	0.991987	Y
7	IC 320-235668/8	10.0	9.900826	2.5	4883197.0	0.990083	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

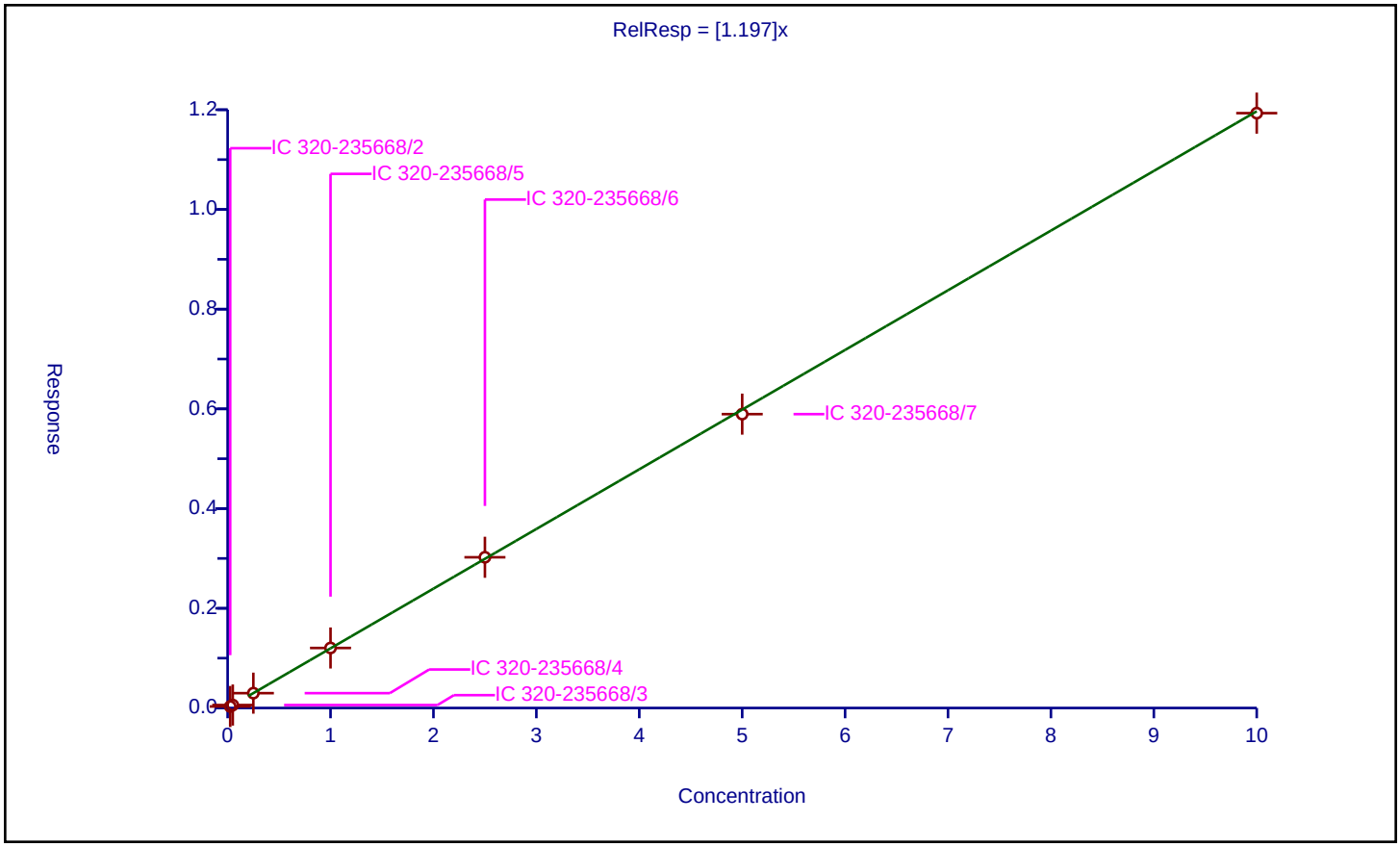
Curve Coefficients

Intercept:	0
Slope:	1.197

Error Coefficients

Standard Error:	7460000
Relative Standard Error:	0.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.030198	2.5	3721474.0	1.207908	Y
2	IC 320-235668/3	0.05	0.059698	2.5	3669835.0	1.19395	Y
3	IC 320-235668/4	0.25	0.297794	2.5	3690862.0	1.191177	Y
4	IC 320-235668/5	1.0	1.204027	2.5	3595441.0	1.204027	Y
5	IC 320-235668/6	2.5	3.0232	2.5	3531229.0	1.20928	Y
6	IC 320-235668/7	5.0	5.894669	2.5	3369200.0	1.178934	Y
7	IC 320-235668/8	10.0	11.931702	2.5	3306163.0	1.19317	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

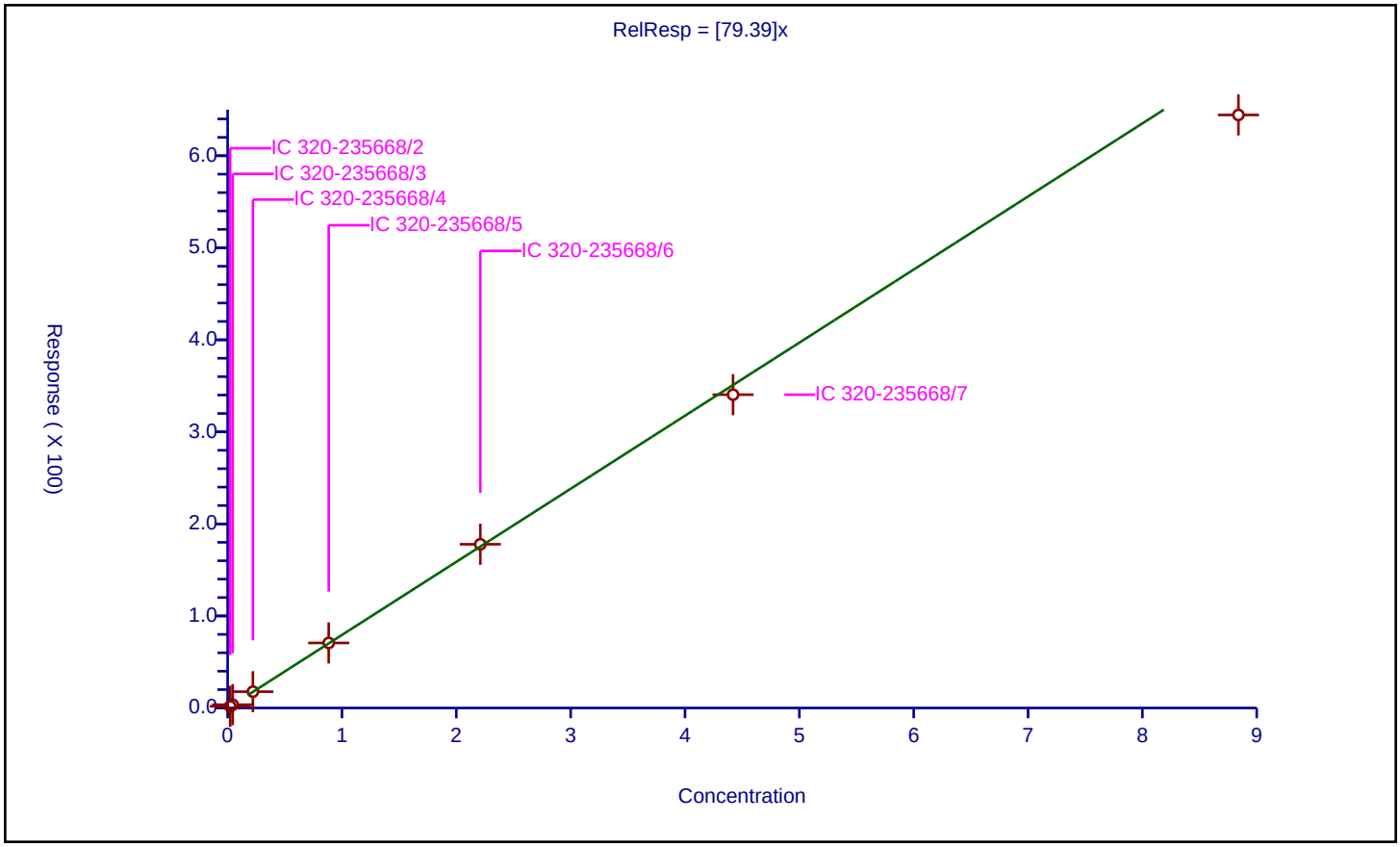
Curve Coefficients

Intercept:	0
Slope:	79.39

Error Coefficients

Standard Error:	11400000
Relative Standard Error:	4.4
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0221	1.843832	2.325	89735.0	83.43133	Y
2	IC 320-235668/3	0.0442	3.60897	2.325	84276.0	81.650897	Y
3	IC 320-235668/4	0.221	17.751011	2.325	84487.0	80.321315	Y
4	IC 320-235668/5	0.884	70.665704	2.325	87401.0	79.93858	Y
5	IC 320-235668/6	2.21	177.904482	2.325	87641.0	80.499765	Y
6	IC 320-235668/7	4.42	340.428518	2.325	86122.0	77.020027	Y
7	IC 320-235668/8	8.84	644.348035	2.325	85519.0	72.890049	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

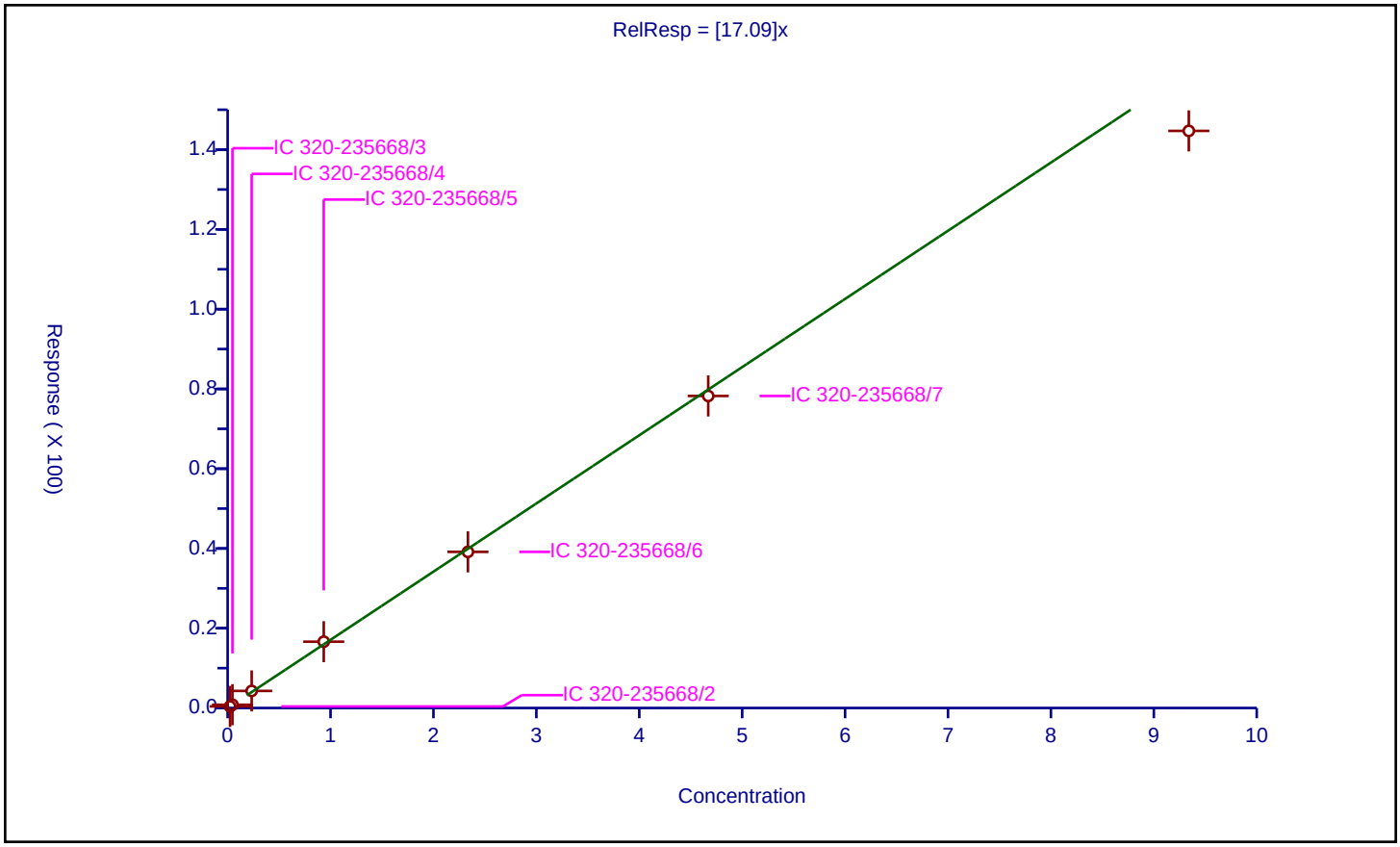
Curve Coefficients

Intercept:	0
Slope:	17.09

Error Coefficients

Standard Error:	2560000
Relative Standard Error:	5.4
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02335	0.394863	2.325	89735.0	16.910606	Y
2	IC 320-235668/3	0.0467	0.821734	2.325	84276.0	17.596016	Y
3	IC 320-235668/4	0.2335	4.282511	2.325	84487.0	18.340518	Y
4	IC 320-235668/5	0.934	16.626406	2.325	87401.0	17.801291	Y
5	IC 320-235668/6	2.335	39.151901	2.325	87641.0	16.767409	Y
6	IC 320-235668/7	4.67	78.237592	2.325	86122.0	16.753232	Y
7	IC 320-235668/8	9.34	144.694772	2.325	85519.0	15.491946	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

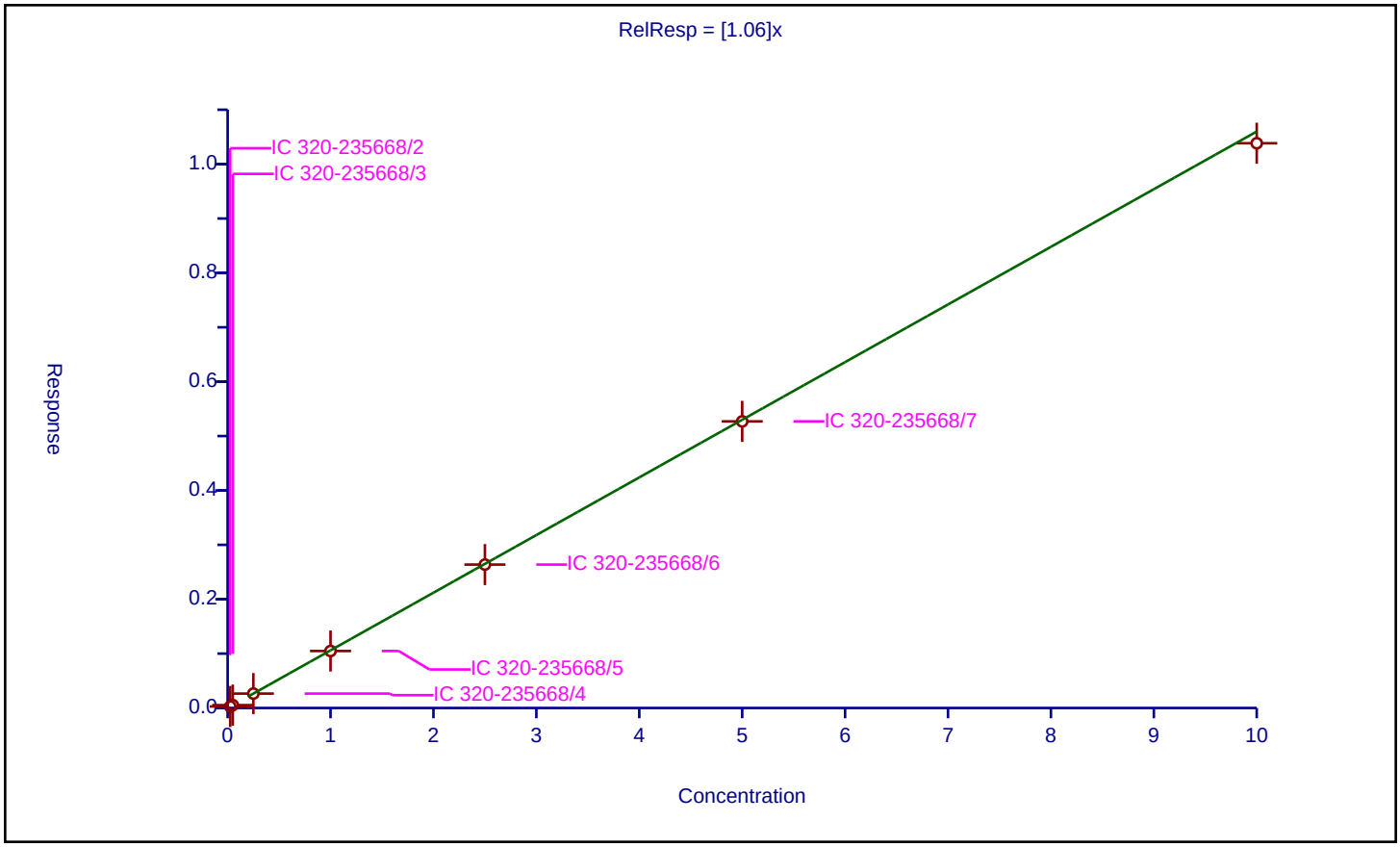
Curve Coefficients

Intercept:	0
Slope:	1.06

Error Coefficients

Standard Error:	7550000
Relative Standard Error:	1.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.027535	2.5	4402181.0	1.101386	Y
2	IC 320-235668/3	0.05	0.053197	2.5	4299501.0	1.063937	Y
3	IC 320-235668/4	0.25	0.264822	2.5	4267996.0	1.059289	Y
4	IC 320-235668/5	1.0	1.047758	2.5	4274151.0	1.047758	Y
5	IC 320-235668/6	2.5	2.637086	2.5	4182069.0	1.054834	Y
6	IC 320-235668/7	5.0	5.269467	2.5	3960776.0	1.053893	Y
7	IC 320-235668/8	10.0	10.383699	2.5	3805574.0	1.03837	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

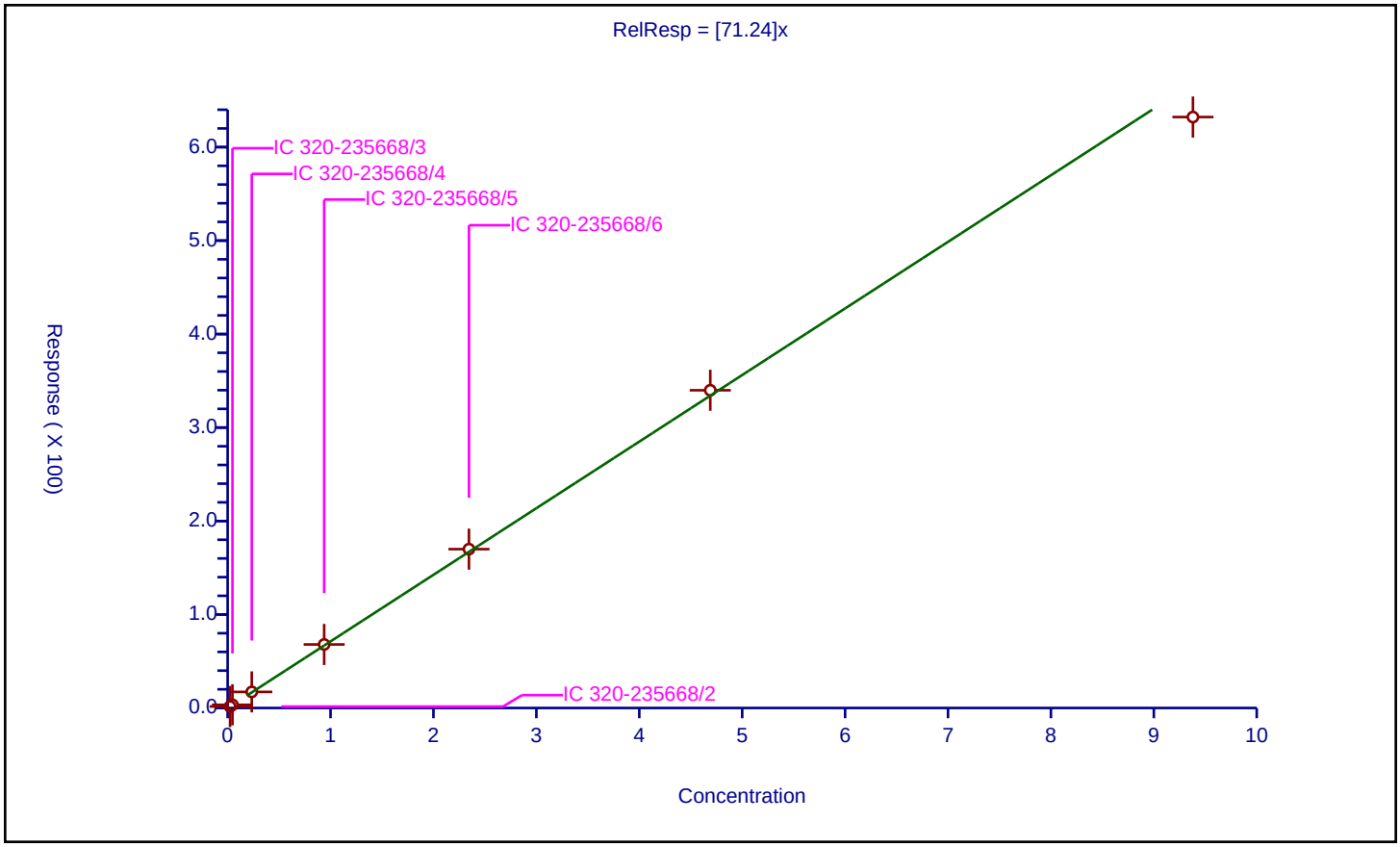
Curve Coefficients

Intercept:	0
Slope:	71.24

Error Coefficients

Standard Error:	11200000
Relative Standard Error:	3.6
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02345	1.58712	2.325	89735.0	67.681017	Y
2	IC 320-235668/3	0.0469	3.407716	2.325	84276.0	72.659184	Y
3	IC 320-235668/4	0.2345	17.236157	2.325	84487.0	73.501736	Y
4	IC 320-235668/5	0.938	67.981238	2.325	87401.0	72.474667	Y
5	IC 320-235668/6	2.345	169.951184	2.325	87641.0	72.473852	Y
6	IC 320-235668/7	4.69	339.899223	2.325	86122.0	72.473182	Y
7	IC 320-235668/8	9.38	632.186229	2.325	85519.0	67.397253	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

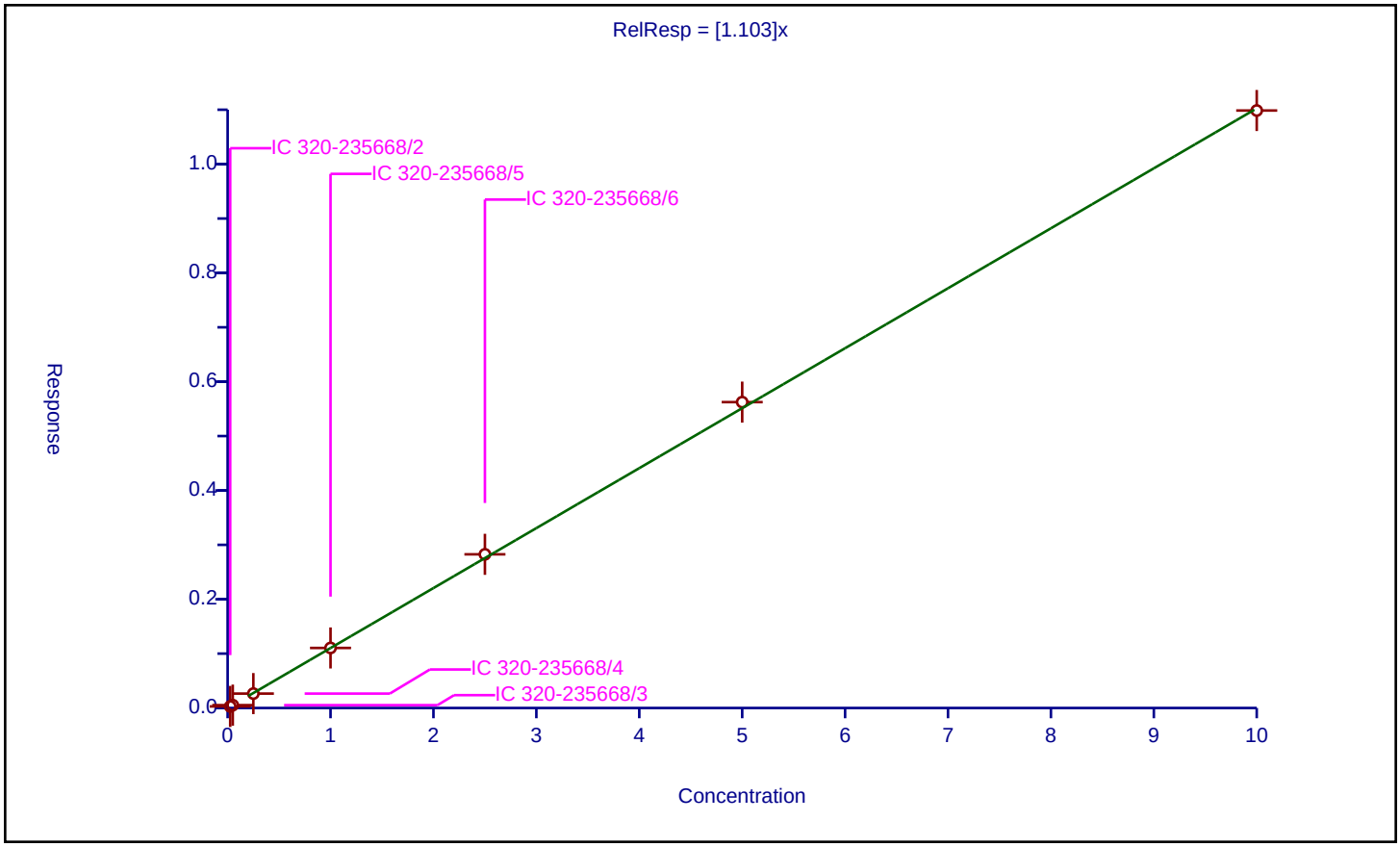
Curve Coefficients

Intercept:	0
Slope:	1.103

Error Coefficients

Standard Error:	8130000
Relative Standard Error:	3.2
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.028686	2.5	4640614.0	1.147456	Y
2	IC 320-235668/3	0.05	0.052614	2.5	4458677.0	1.052274	Y
3	IC 320-235668/4	0.25	0.26507	2.5	4442605.0	1.060279	Y
4	IC 320-235668/5	1.0	1.103913	2.5	4501447.0	1.103913	Y
5	IC 320-235668/6	2.5	2.825835	2.5	4150778.0	1.130334	Y
6	IC 320-235668/7	5.0	5.624285	2.5	4059821.0	1.124857	Y
7	IC 320-235668/8	10.0	10.985419	2.5	3852411.0	1.098542	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

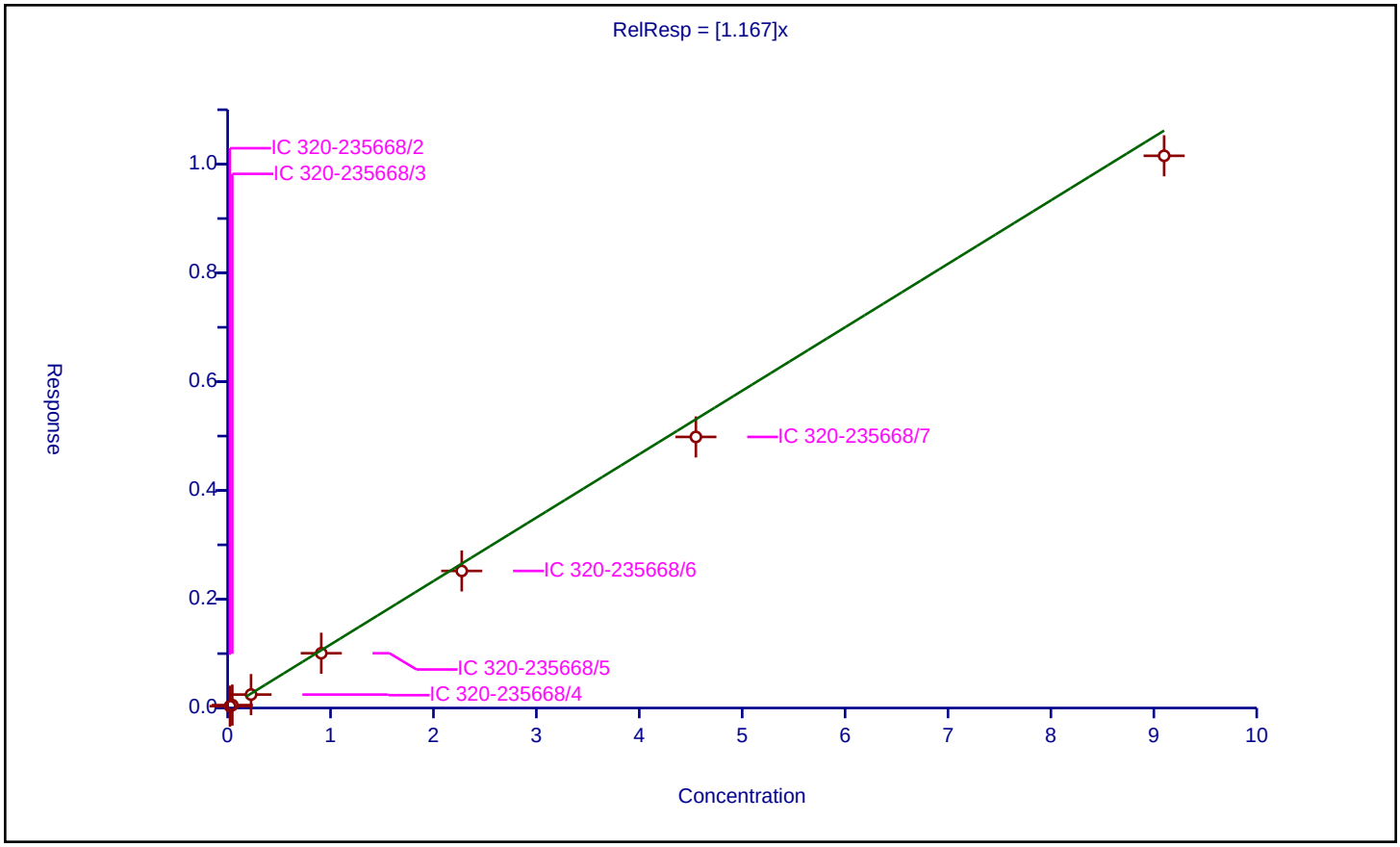
Curve Coefficients

Intercept:	0
Slope:	1.167

Error Coefficients

Standard Error:	10200000
Relative Standard Error:	12.0
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.980

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02275	0.033591	2.365	5328016.0	1.476511	Y
2	IC 320-235668/3	0.0455	0.05365	2.365	5418231.0	1.179116	Y
3	IC 320-235668/4	0.2275	0.247069	2.365	5203959.0	1.08602	Y
4	IC 320-235668/5	0.91	1.006625	2.365	5177221.0	1.106181	Y
5	IC 320-235668/6	2.275	2.52009	2.365	5148729.0	1.107732	Y
6	IC 320-235668/7	4.55	4.98441	2.365	5175462.0	1.095475	Y
7	IC 320-235668/8	9.1	10.152963	2.365	5017633.0	1.11571	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

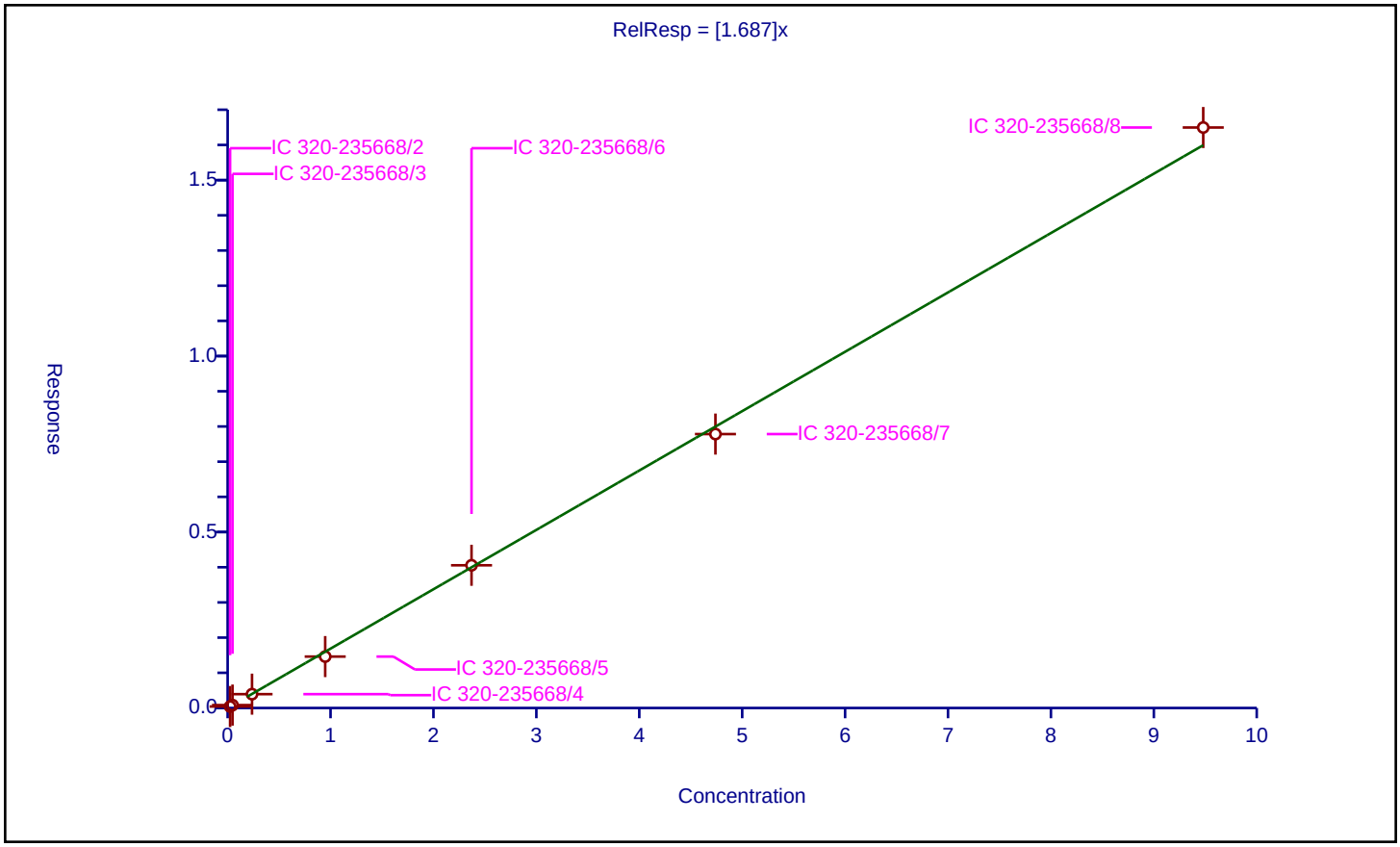
Curve Coefficients

Intercept:	0
Slope:	1.687

Error Coefficients

Standard Error:	3120000
Relative Standard Error:	4.7
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0237	0.04208	2.375	1244953.0	1.775532	Y
2	IC 320-235668/3	0.0474	0.082478	2.375	1176358.0	1.740039	Y
3	IC 320-235668/4	0.237	0.393158	2.375	1177369.0	1.658895	Y
4	IC 320-235668/5	0.948	1.461022	2.375	1248833.0	1.541162	Y
5	IC 320-235668/6	2.37	4.055478	2.375	1164838.0	1.711172	Y
6	IC 320-235668/7	4.74	7.783738	2.375	1061423.0	1.642139	Y
7	IC 320-235668/8	9.48	16.494786	2.375	931806.0	1.739956	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

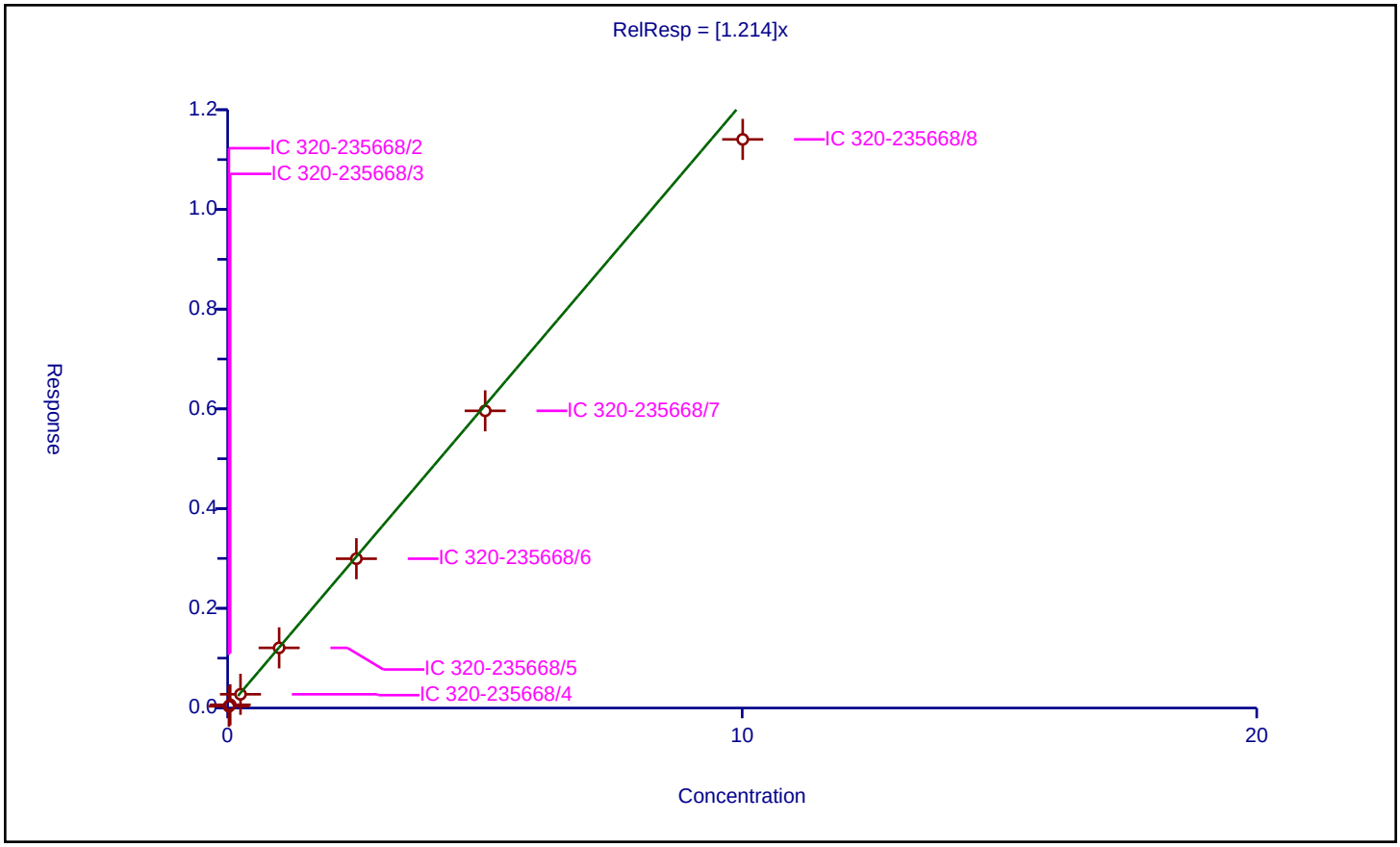
Curve Coefficients

Intercept:	0
Slope:	1.214

Error Coefficients

Standard Error:	8160000
Relative Standard Error:	7.6
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025025	0.034386	2.5	4706753.0	1.374054	Y
2	IC 320-235668/3	0.05005	0.064539	2.5	4268865.0	1.289487	Y
3	IC 320-235668/4	0.25025	0.275217	2.5	4472663.0	1.099768	Y
4	IC 320-235668/5	1.001	1.206257	2.5	4231778.0	1.205052	Y
5	IC 320-235668/6	2.5025	2.994456	2.5	4232198.0	1.196586	Y
6	IC 320-235668/7	5.005	5.961014	2.5	3884099.0	1.191012	Y
7	IC 320-235668/8	10.01	11.405172	2.5	3691370.0	1.139378	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

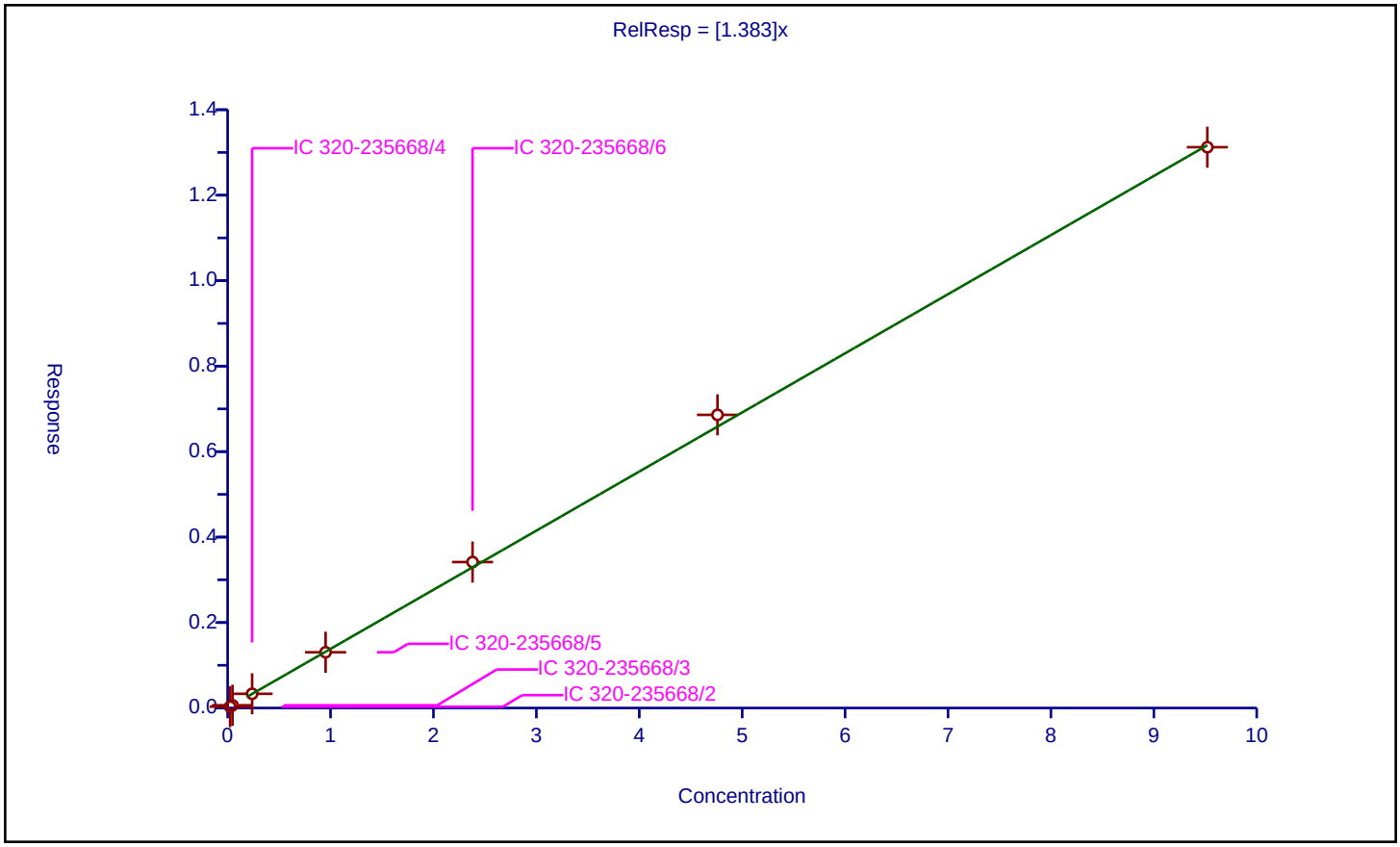
Curve Coefficients

Intercept:	0
Slope:	1.383

Error Coefficients

Standard Error:	9150000
Relative Standard Error:	3.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0238	0.031408	2.39	3806094.0	1.319677	Y
2	IC 320-235668/3	0.0476	0.063861	2.39	3693870.0	1.341624	Y
3	IC 320-235668/4	0.238	0.33248	2.39	3598957.0	1.396976	Y
4	IC 320-235668/5	0.952	1.304369	2.39	3818414.0	1.370135	Y
5	IC 320-235668/6	2.38	3.415532	2.39	3686425.0	1.435097	Y
6	IC 320-235668/7	4.76	6.859837	2.39	3550779.0	1.441142	Y
7	IC 320-235668/8	9.52	13.123166	2.39	3486265.0	1.378484	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

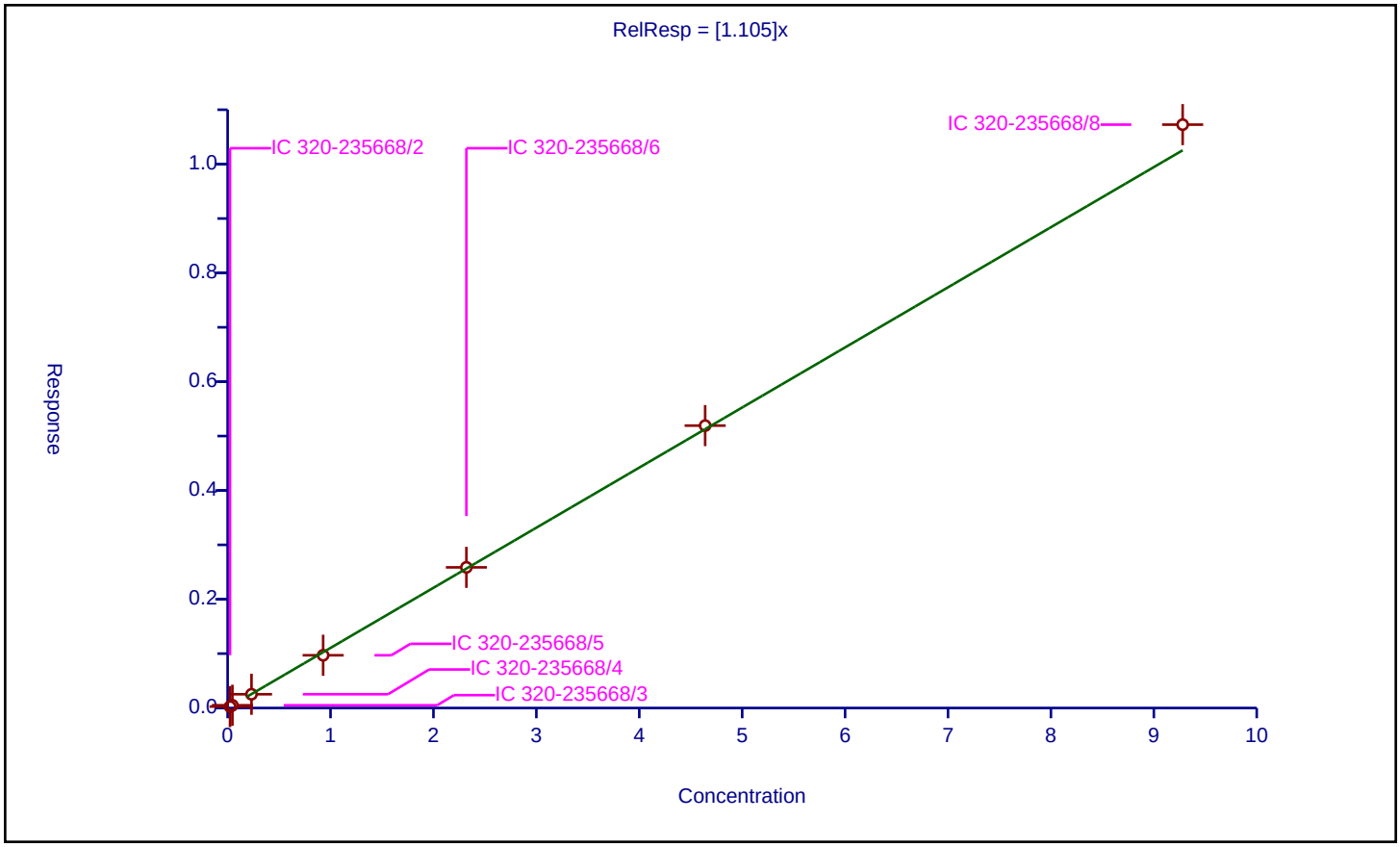
Curve Coefficients

Intercept:	0
Slope:	1.105

Error Coefficients

Standard Error:	7330000
Relative Standard Error:	3.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0232	0.026298	2.39	3806094.0	1.133541	Y
2	IC 320-235668/3	0.0464	0.050035	2.39	3693870.0	1.078331	Y
3	IC 320-235668/4	0.232	0.252628	2.39	3598957.0	1.088913	Y
4	IC 320-235668/5	0.928	0.969369	2.39	3818414.0	1.044578	Y
5	IC 320-235668/6	2.32	2.58611	2.39	3686425.0	1.114703	Y
6	IC 320-235668/7	4.64	5.192259	2.39	3550779.0	1.119021	Y
7	IC 320-235668/8	9.28	10.725932	2.39	3486265.0	1.155812	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

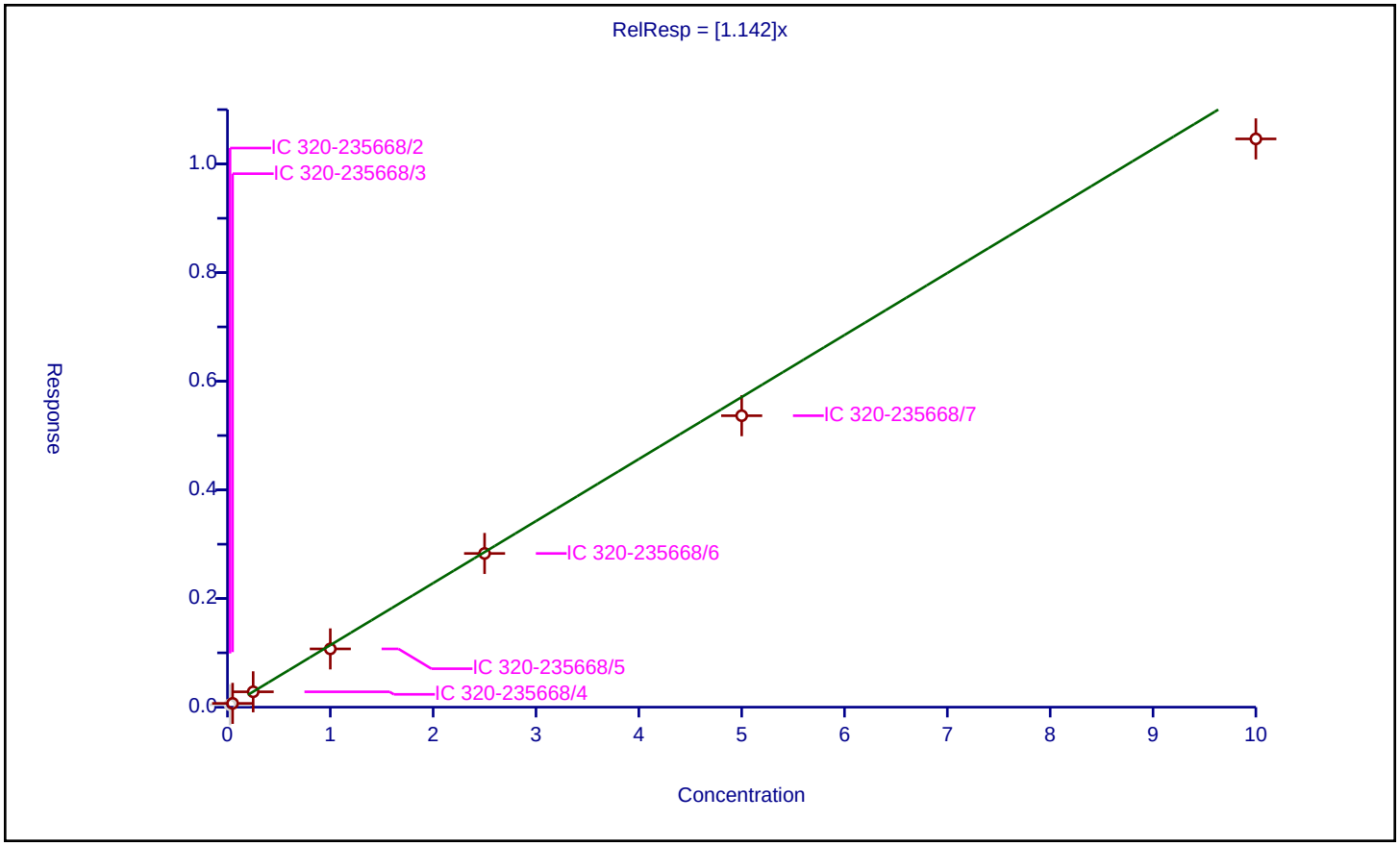
Curve Coefficients

Intercept:	0
Slope:	1.142

Error Coefficients

Standard Error:	7160000
Relative Standard Error:	11.3
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.044377	2.5	3803819.0	1.775084	N
2	IC 320-235668/3	0.05	0.06973	2.5	3792873.0	1.394602	Y
3	IC 320-235668/4	0.25	0.283145	2.5	3826960.0	1.13258	Y
4	IC 320-235668/5	1.0	1.072291	2.5	3768250.0	1.072291	Y
5	IC 320-235668/6	2.5	2.829437	2.5	3524069.0	1.131775	Y
6	IC 320-235668/7	5.0	5.36537	2.5	3450868.0	1.073074	Y
7	IC 320-235668/8	10.0	10.460743	2.5	3229889.0	1.046074	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

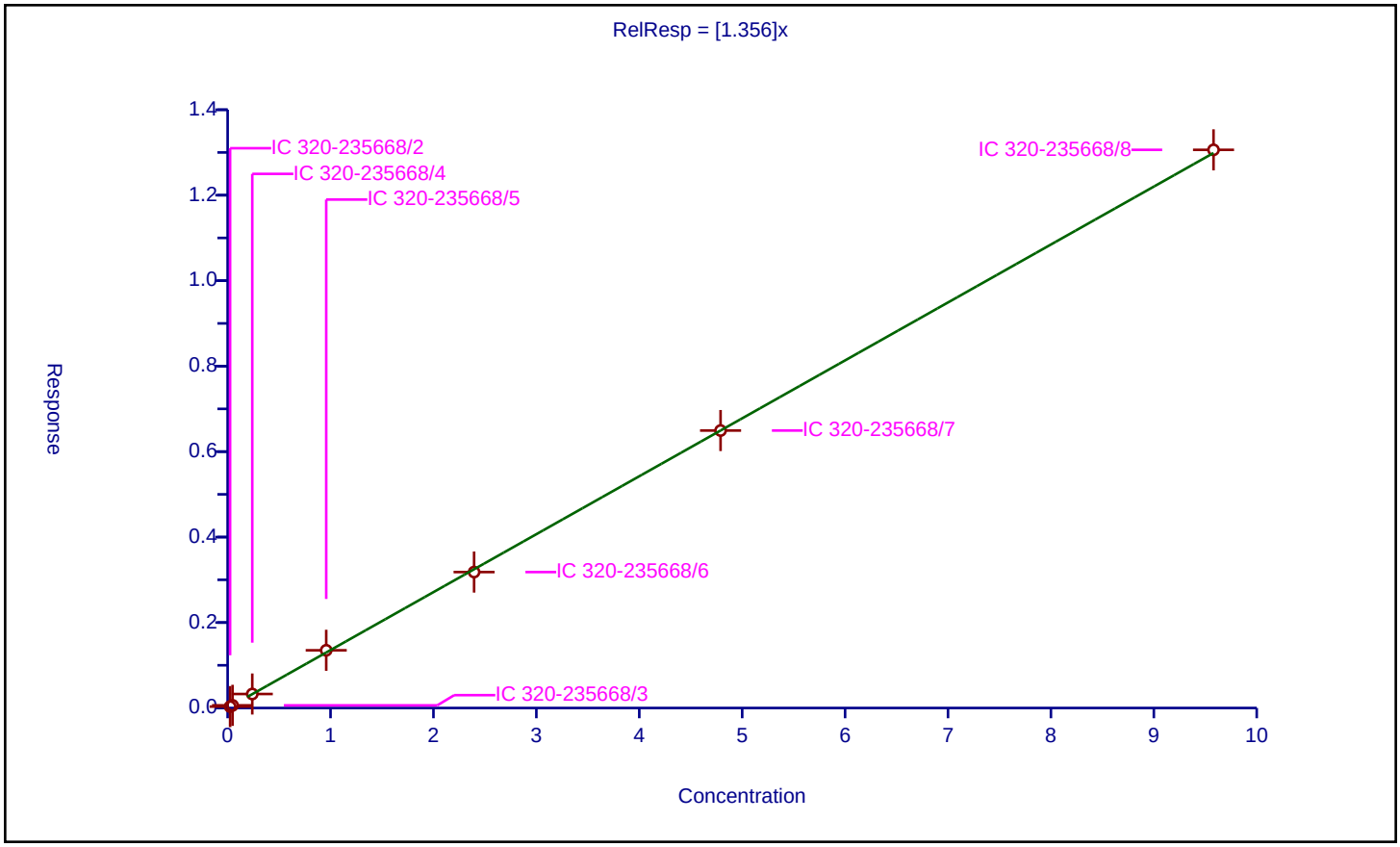
Curve Coefficients

Intercept:	0
Slope:	1.356

Error Coefficients

Standard Error:	2490000
Relative Standard Error:	2.5
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.02395	0.032725	2.395	1388549.0	1.36639	Y
2	IC 320-235668/3	0.0479	0.062262	2.395	1289313.0	1.29984	Y
3	IC 320-235668/4	0.2395	0.327395	2.395	1348095.0	1.366996	Y
4	IC 320-235668/5	0.958	1.350413	2.395	1264179.0	1.409616	Y
5	IC 320-235668/6	2.395	3.181379	2.395	1173584.0	1.328342	Y
6	IC 320-235668/7	4.79	6.492827	2.395	1043782.0	1.355496	Y
7	IC 320-235668/8	9.58	13.061468	2.395	937942.0	1.36341	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

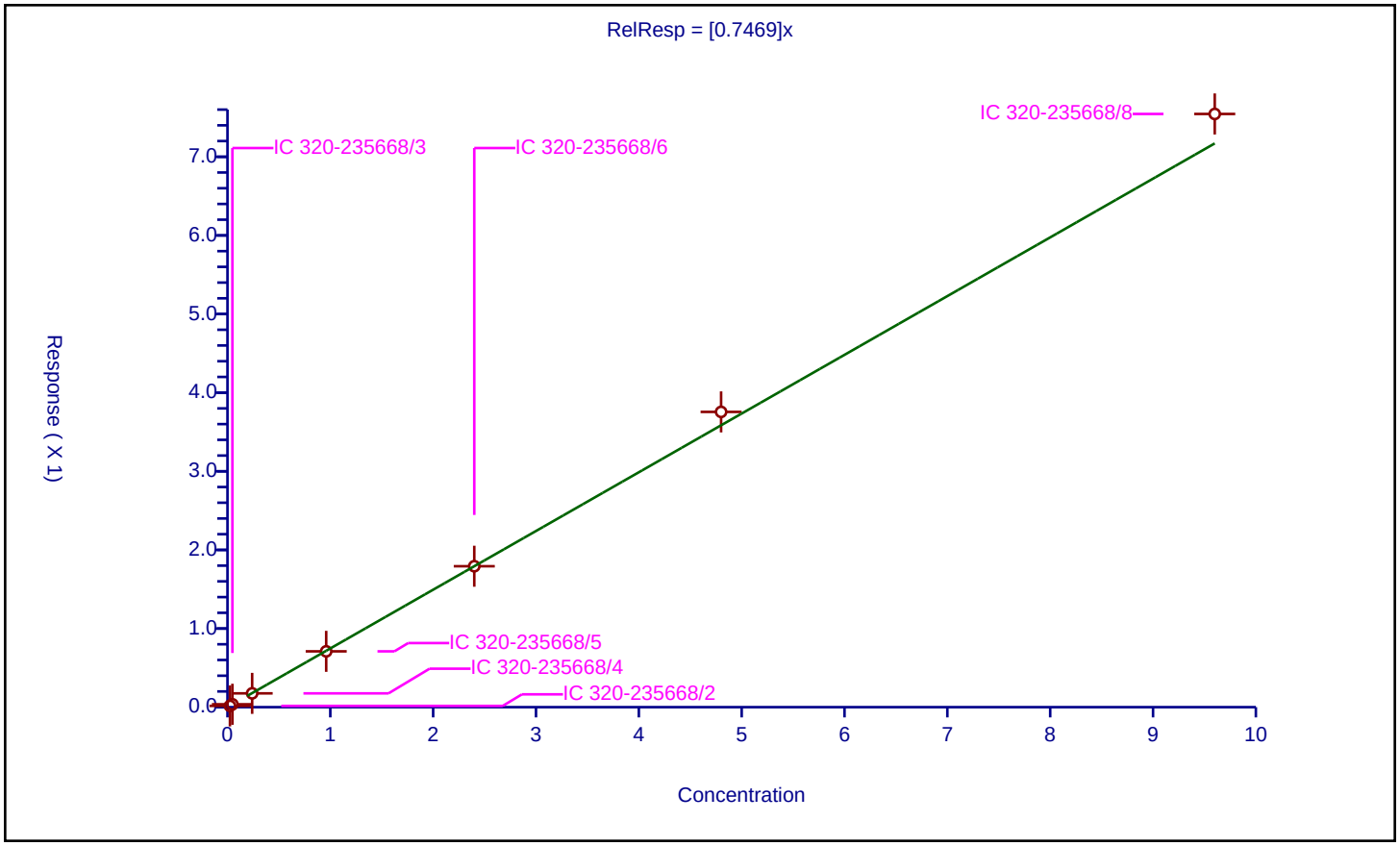
Curve Coefficients

Intercept:	0
Slope:	0.7469

Error Coefficients

Standard Error:	5180000
Relative Standard Error:	4.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.024	0.016287	2.39	3806094.0	0.67862	Y
2	IC 320-235668/3	0.048	0.036624	2.39	3693870.0	0.763009	Y
3	IC 320-235668/4	0.24	0.175624	2.39	3598957.0	0.731765	Y
4	IC 320-235668/5	0.96	0.709914	2.39	3818414.0	0.739494	Y
5	IC 320-235668/6	2.4	1.792647	2.39	3686425.0	0.746936	Y
6	IC 320-235668/7	4.8	3.755438	2.39	3550779.0	0.782383	Y
7	IC 320-235668/8	9.6	7.544601	2.39	3486265.0	0.785896	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

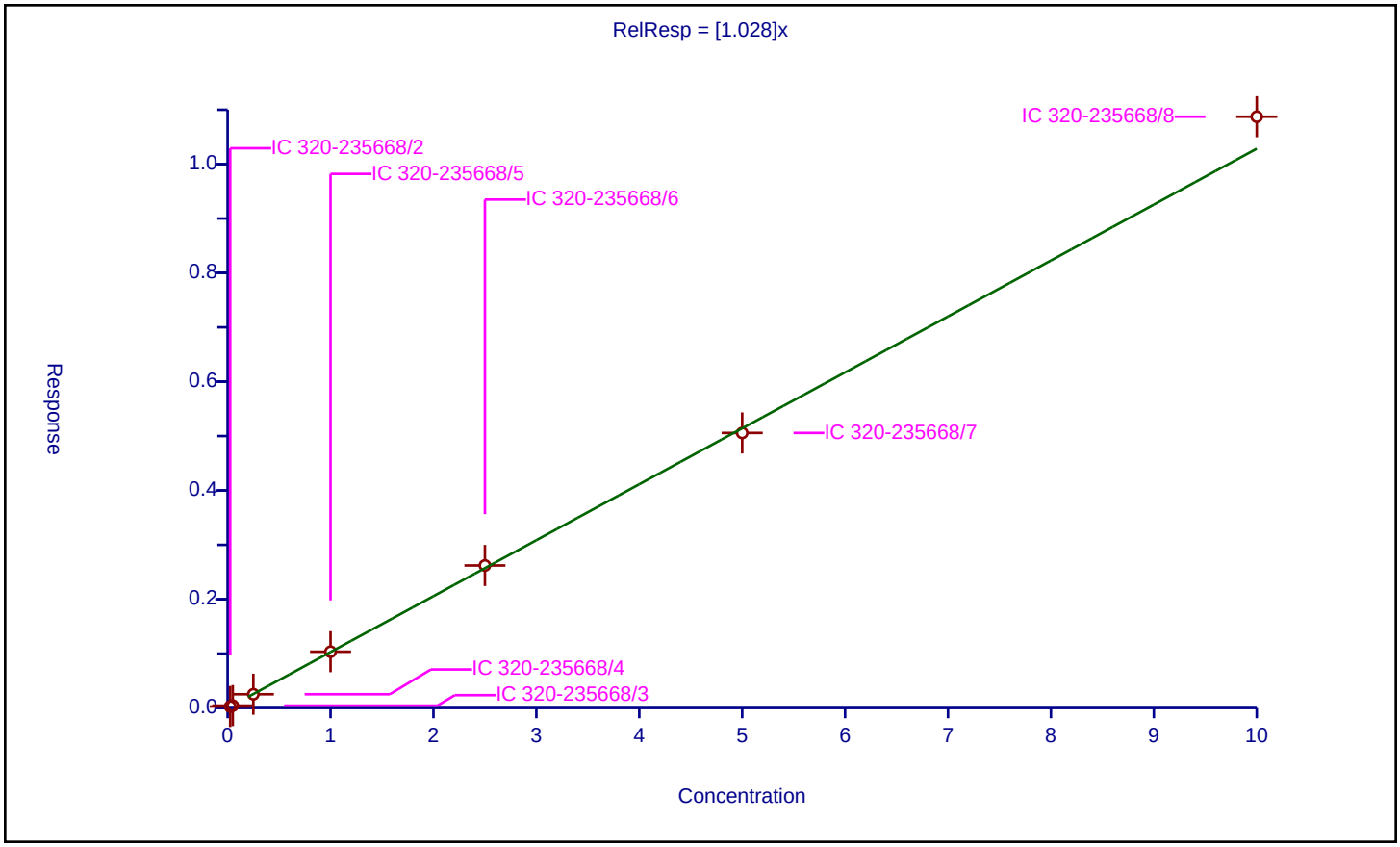
Curve Coefficients

Intercept:	0
Slope:	1.028

Error Coefficients

Standard Error:	4930000
Relative Standard Error:	6.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.02772	2.5	3182411.0	1.108813	Y
2	IC 320-235668/3	0.05	0.044785	2.5	3057920.0	0.895691	Y
3	IC 320-235668/4	0.25	0.253174	2.5	3095634.0	1.012697	Y
4	IC 320-235668/5	1.0	1.035013	2.5	3062260.0	1.035013	Y
5	IC 320-235668/6	2.5	2.620651	2.5	2774374.0	1.04826	Y
6	IC 320-235668/7	5.0	5.057106	2.5	2729607.0	1.011421	Y
7	IC 320-235668/8	10.0	10.872163	2.5	2361487.0	1.087216	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

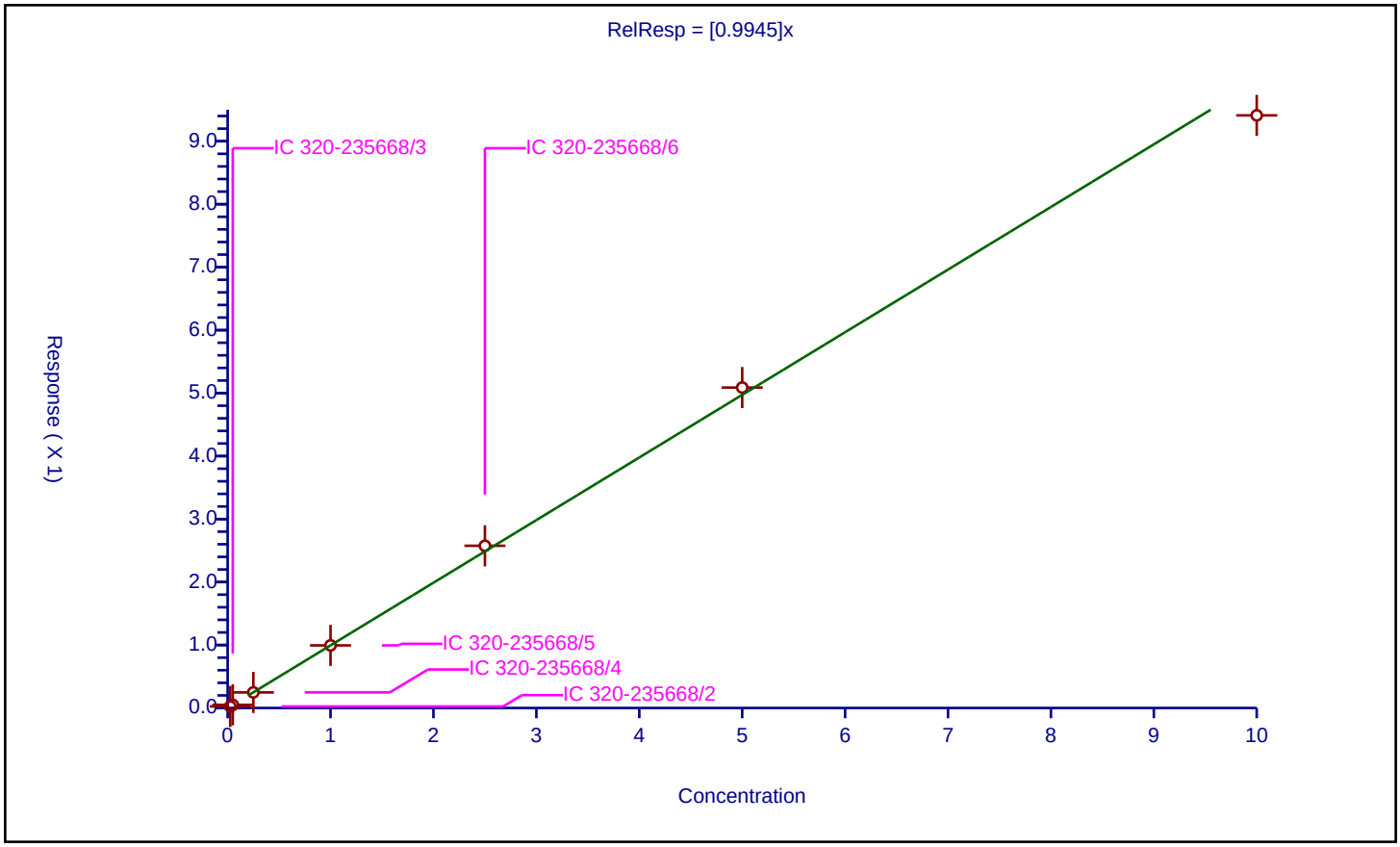
Curve Coefficients

Intercept:	0
Slope:	0.9945

Error Coefficients

Standard Error:	9180000
Relative Standard Error:	2.9
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.024618	2.5	5952607.0	0.984728	Y
2	IC 320-235668/3	0.05	0.050137	2.5	5758066.0	1.002733	Y
3	IC 320-235668/4	0.25	0.247654	2.5	5990646.0	0.990618	Y
4	IC 320-235668/5	1.0	0.994331	2.5	5853618.0	0.994331	Y
5	IC 320-235668/6	2.5	2.576171	2.5	5745909.0	1.030468	Y
6	IC 320-235668/7	5.0	5.088122	2.5	5225954.0	1.017624	Y
7	IC 320-235668/8	10.0	9.410535	2.5	4984298.0	0.941054	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

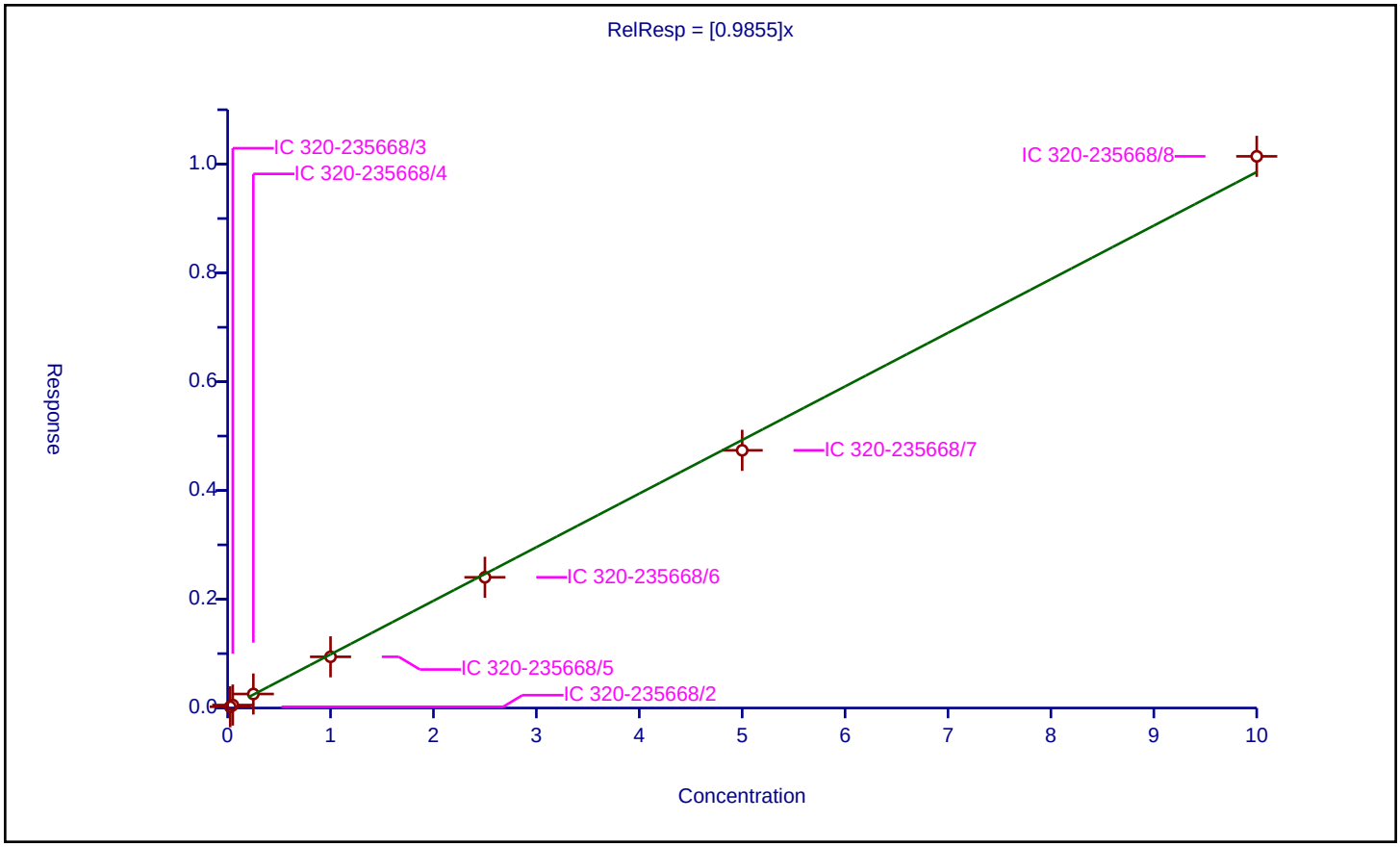
Curve Coefficients

Intercept:	0
Slope:	0.9855

Error Coefficients

Standard Error:	1750000
Relative Standard Error:	6.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.022741	2.5	950145.0	0.909651	Y
2	IC 320-235668/3	0.05	0.054701	2.5	920862.0	1.094029	Y
3	IC 320-235668/4	0.25	0.257596	2.5	972395.0	1.030384	Y
4	IC 320-235668/5	1.0	0.941307	2.5	963774.0	0.941307	Y
5	IC 320-235668/6	2.5	2.403465	2.5	966156.0	0.961386	Y
6	IC 320-235668/7	5.0	4.737847	2.5	952316.0	0.947569	Y
7	IC 320-235668/8	10.0	10.143076	2.5	925765.0	1.014308	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

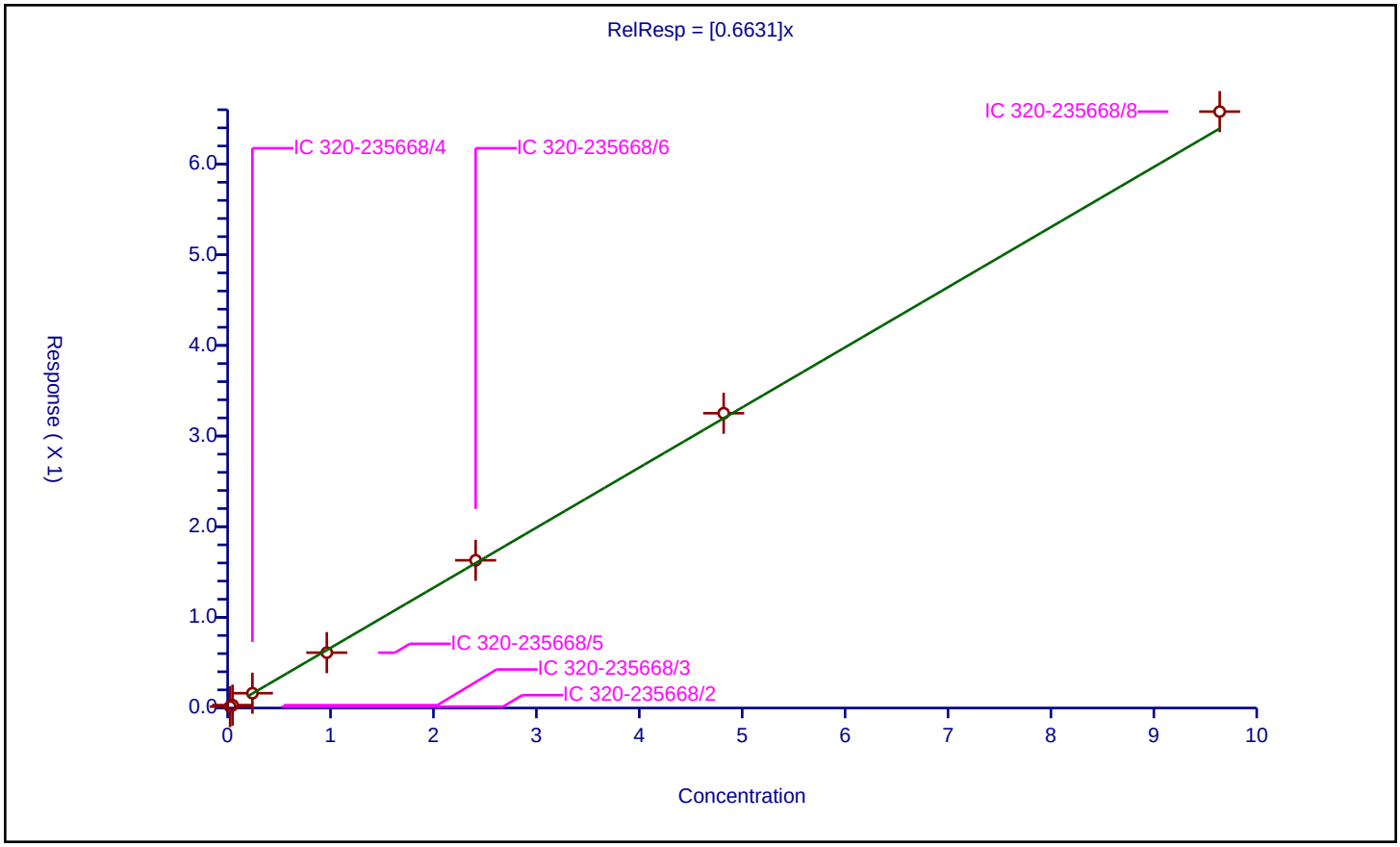
Curve Coefficients

Intercept:	0
Slope:	0.6631

Error Coefficients

Standard Error:	4520000
Relative Standard Error:	2.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.0241	0.015516	2.39	3806094.0	0.643808	Y
2	IC 320-235668/3	0.0482	0.031497	2.39	3693870.0	0.653461	Y
3	IC 320-235668/4	0.241	0.163365	2.39	3598957.0	0.677864	Y
4	IC 320-235668/5	0.964	0.610638	2.39	3818414.0	0.633442	Y
5	IC 320-235668/6	2.41	1.629794	2.39	3686425.0	0.676263	Y
6	IC 320-235668/7	4.82	3.251954	2.39	3550779.0	0.674679	Y
7	IC 320-235668/8	9.64	6.579528	2.39	3486265.0	0.682524	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

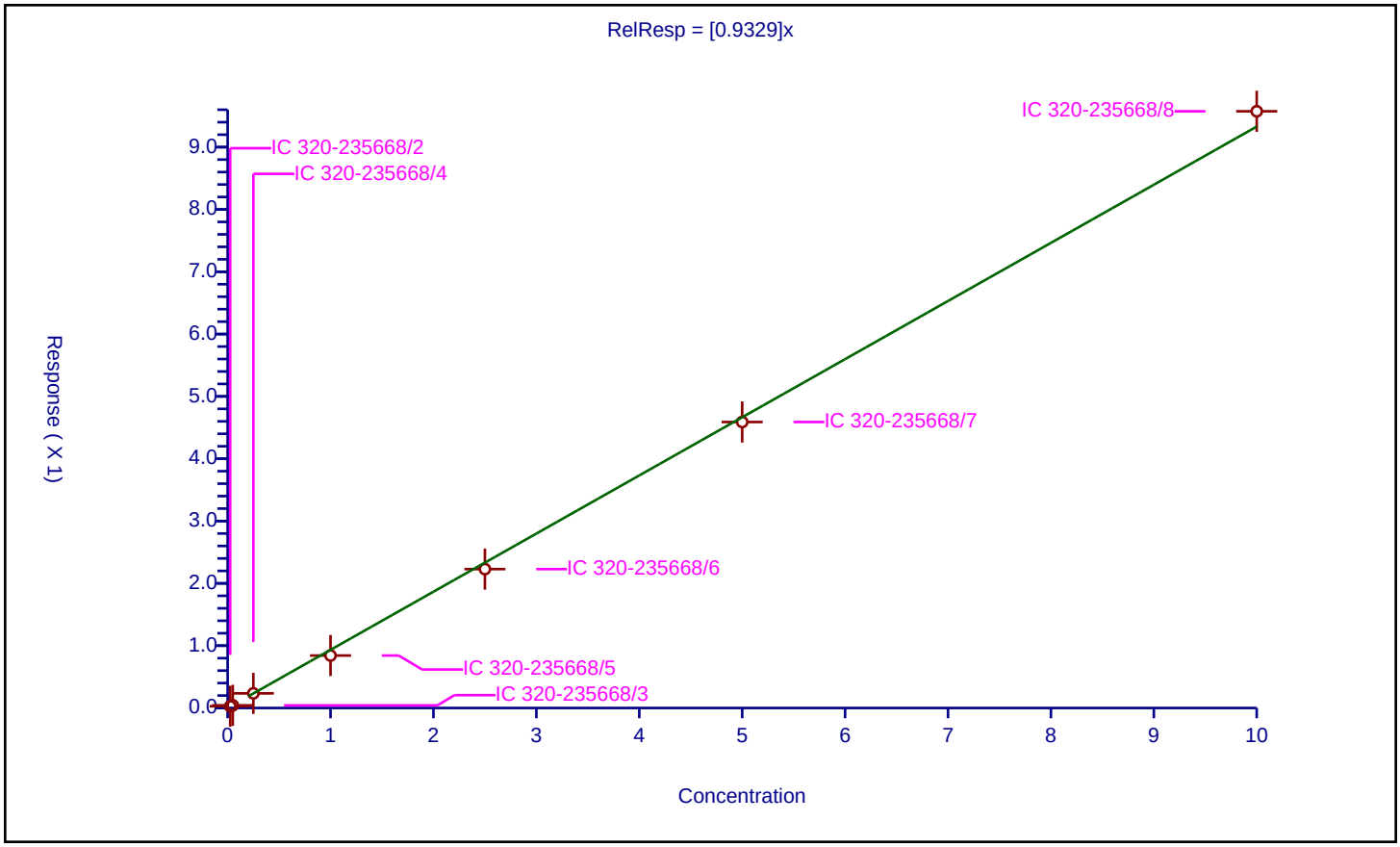
Curve Coefficients

Intercept:	0
Slope:	0.9329

Error Coefficients

Standard Error:	1570000
Relative Standard Error:	10.2
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.986

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.028178	2.5	1054820.0	1.127112	Y
2	IC 320-235668/3	0.05	0.042743	2.5	1105917.0	0.854856	Y
3	IC 320-235668/4	0.25	0.234971	2.5	1028200.0	0.939885	Y
4	IC 320-235668/5	1.0	0.841963	2.5	1057814.0	0.841963	Y
5	IC 320-235668/6	2.5	2.22882	2.5	982550.0	0.891528	Y
6	IC 320-235668/7	5.0	4.588999	2.5	934717.0	0.9178	Y
7	IC 320-235668/8	10.0	9.574989	2.5	863349.0	0.957499	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

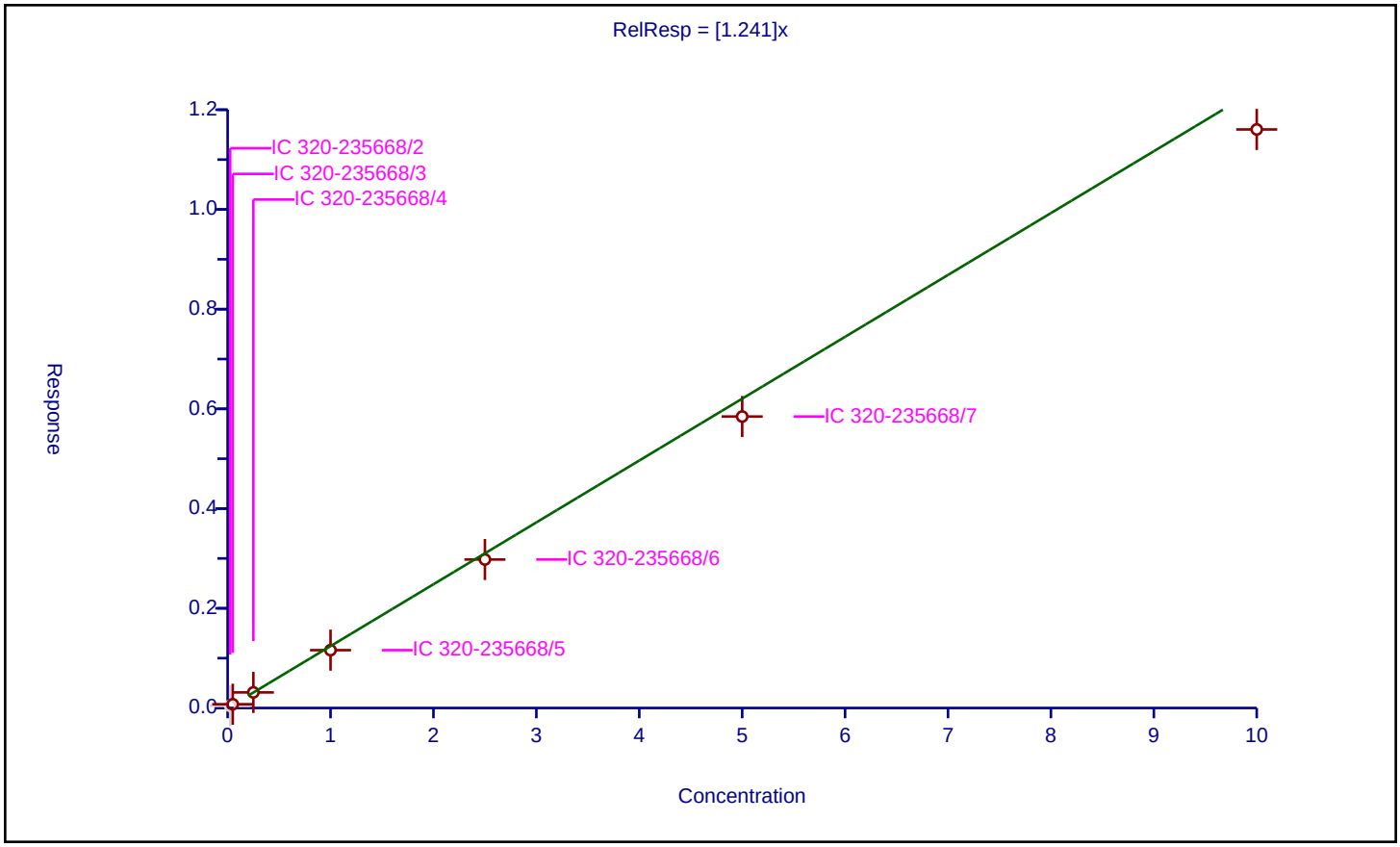
Curve Coefficients

Intercept:	0
Slope:	1.241

Error Coefficients

Standard Error:	4860000
Relative Standard Error:	11.1
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.043725	2.5	2536362.0	1.749001	N
2	IC 320-235668/3	0.05	0.075629	2.5	2455718.0	1.512572	Y
3	IC 320-235668/4	0.25	0.312853	2.5	2455525.0	1.251411	Y
4	IC 320-235668/5	1.0	1.160188	2.5	2420418.0	1.160188	Y
5	IC 320-235668/6	2.5	2.97845	2.5	2295730.0	1.19138	Y
6	IC 320-235668/7	5.0	5.845966	2.5	2176487.0	1.169193	Y
7	IC 320-235668/8	10.0	11.604576	2.5	1966864.0	1.160458	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

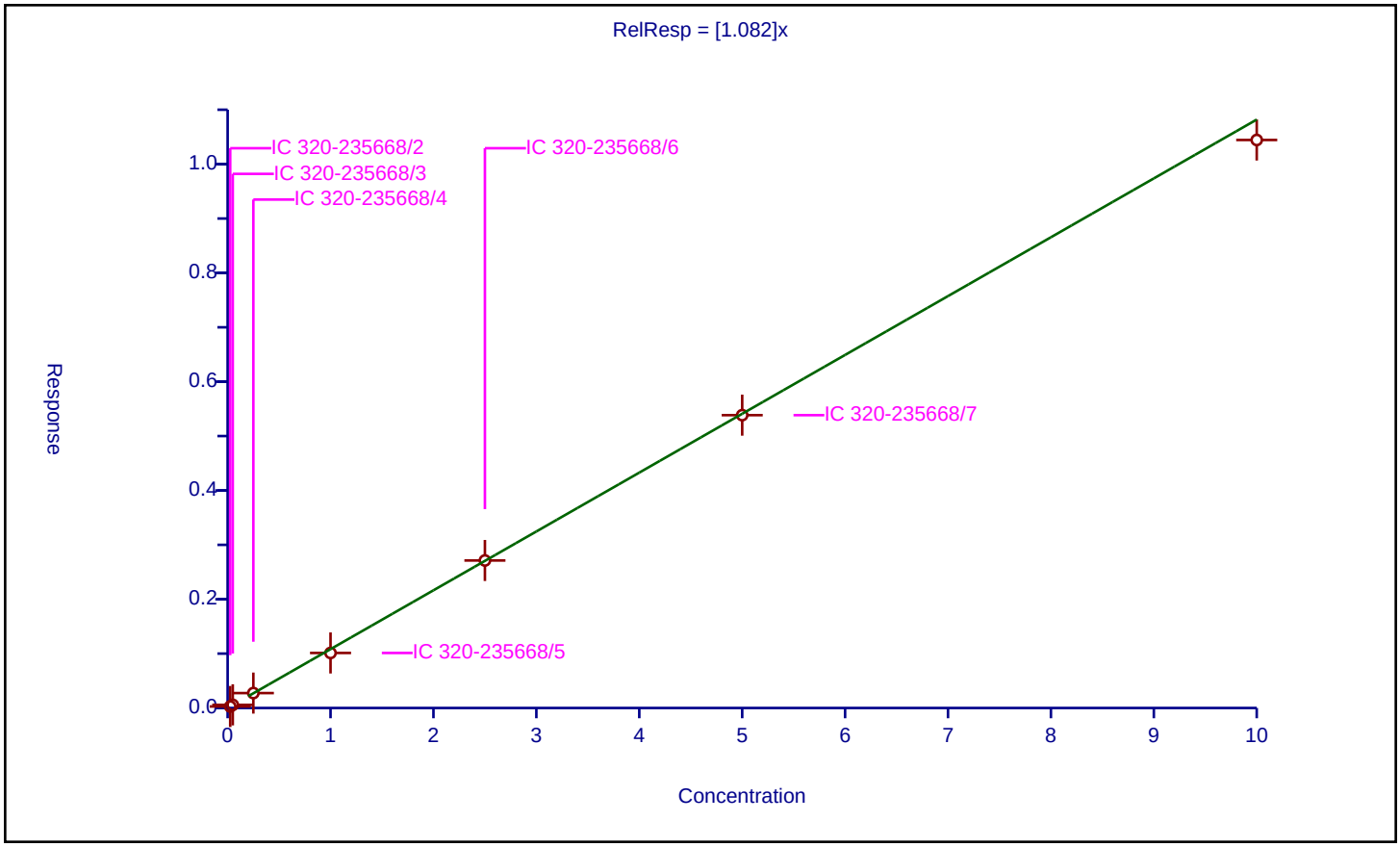
Curve Coefficients

Intercept:	0
Slope:	1.082

Error Coefficients

Standard Error:	4110000
Relative Standard Error:	4.2
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.027478	2.5	2339777.0	1.099122	Y
2	IC 320-235668/3	0.05	0.057893	2.5	2256995.0	1.157867	Y
3	IC 320-235668/4	0.25	0.274618	2.5	2222244.0	1.098471	Y
4	IC 320-235668/5	1.0	1.011912	2.5	2243127.0	1.011912	Y
5	IC 320-235668/6	2.5	2.712242	2.5	2159403.0	1.084897	Y
6	IC 320-235668/7	5.0	5.384392	2.5	2185359.0	1.076878	Y
7	IC 320-235668/8	10.0	10.444037	2.5	2040247.0	1.044404	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

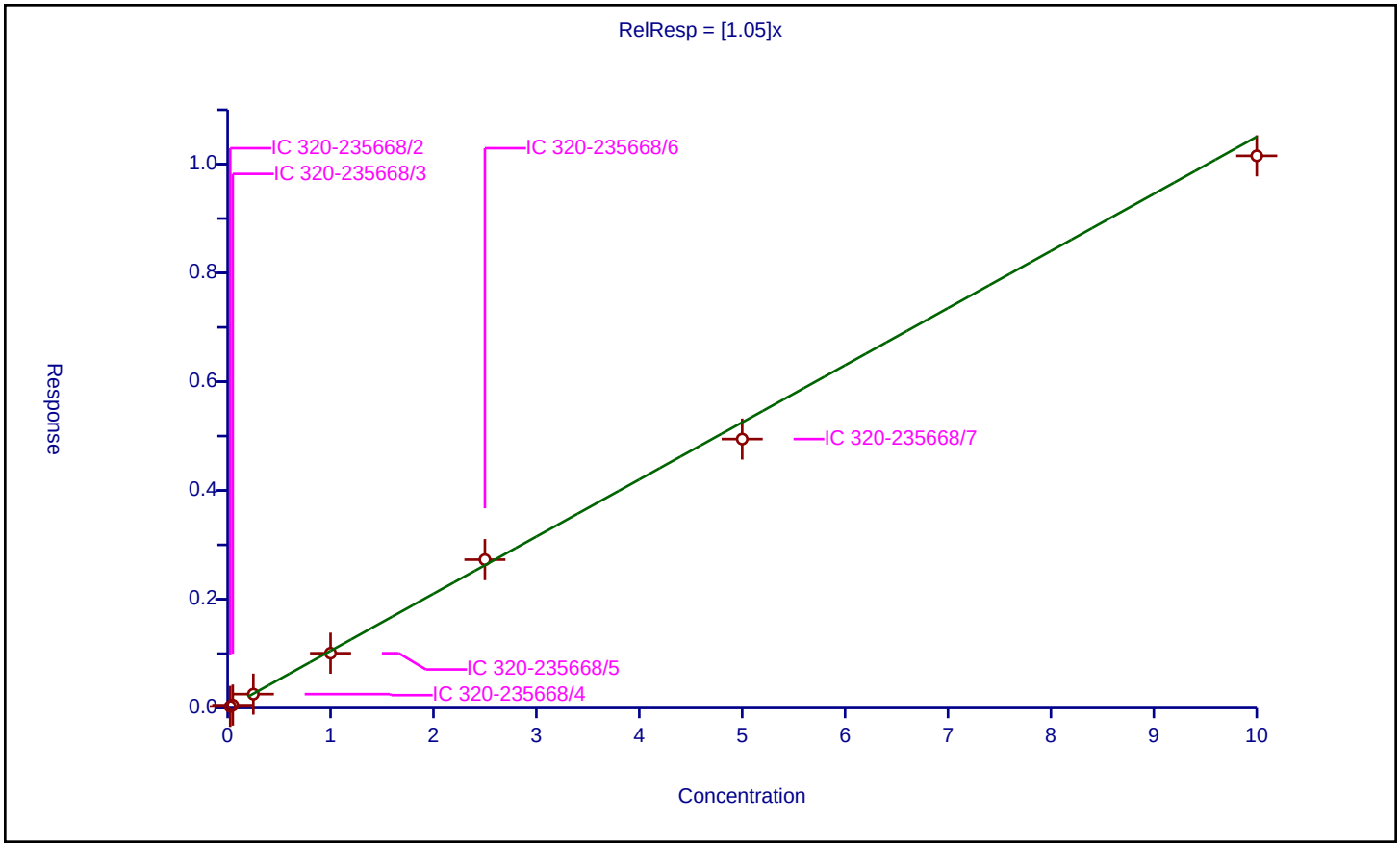
Curve Coefficients

Intercept:	0
Slope:	1.05

Error Coefficients

Standard Error:	3950000
Relative Standard Error:	5.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.028963	2.5	2339777.0	1.158529	Y
2	IC 320-235668/3	0.05	0.05355	2.5	2256995.0	1.071004	Y
3	IC 320-235668/4	0.25	0.255015	2.5	2222244.0	1.020059	Y
4	IC 320-235668/5	1.0	1.007617	2.5	2243127.0	1.007617	Y
5	IC 320-235668/6	2.5	2.727829	2.5	2159403.0	1.091132	Y
6	IC 320-235668/7	5.0	4.944868	2.5	2185359.0	0.988974	Y
7	IC 320-235668/8	10.0	10.152488	2.5	2040247.0	1.015249	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

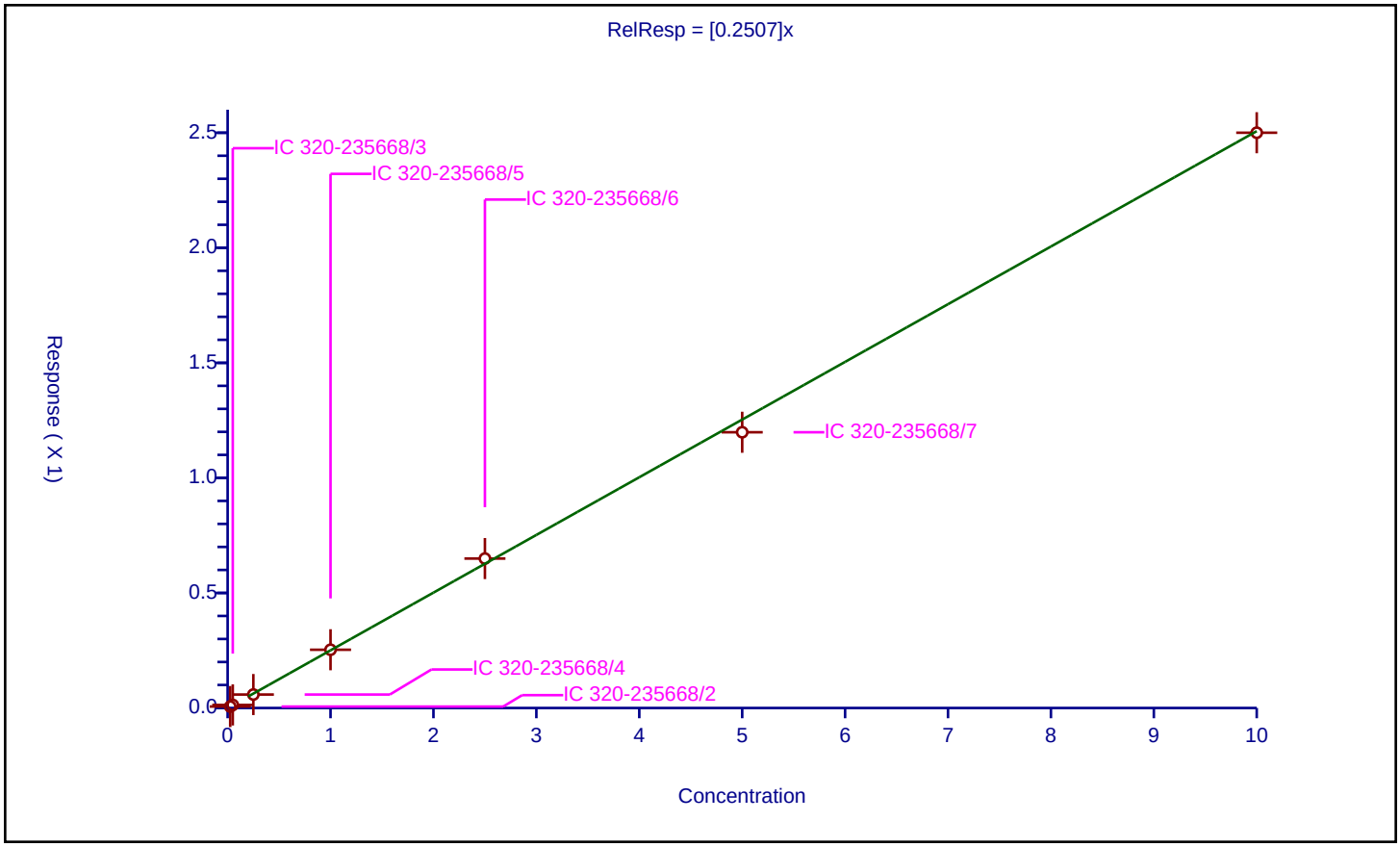
Curve Coefficients

Intercept:	0
Slope:	0.2507

Error Coefficients

Standard Error:	967000
Relative Standard Error:	4.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-235668/2	0.025	0.006262	2.5	2327660.0	0.250466	Y
2	IC 320-235668/3	0.05	0.013383	2.5	2232553.0	0.267653	Y
3	IC 320-235668/4	0.25	0.058538	2.5	2210453.0	0.234151	Y
4	IC 320-235668/5	1.0	0.253121	2.5	2124401.0	0.253121	Y
5	IC 320-235668/6	2.5	0.649422	2.5	2042126.0	0.259769	Y
6	IC 320-235668/7	5.0	1.198391	2.5	2077317.0	0.239678	Y
7	IC 320-235668/8	10.0	2.50015	2.5	2071078.0	0.250015	Y



FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237402/2	2018.08.01LLICAL_002.d
Level 2	IC 320-237402/3	2018.08.01LLICAL_003.d
Level 3	IC 320-237402/4	2018.08.01LLICAL_004.d
Level 4	IC 320-237402/5	2018.08.01LLICAL_005.d
Level 5	IC 320-237402/6	2018.08.01LLICAL_006.d
Level 6	IC 320-237402/7	2018.08.01LLICAL_007.d
Level 7	IC 320-237402/8	2018.08.01LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.0341 0.9972	0.9799 0.9834	0.9577	0.9623	0.9835	AveID		0.9855				2.6		20.0			
Perfluoropentanoic acid (PFPeA)	1.2135 1.1977	1.2772 1.1997	1.1732	1.1396	1.1803	AveID		1.1973				3.6		20.0			
Perfluorobutanesulfonic acid (PFBS)	77.861 76.922	76.347 73.670	75.500	78.075	78.162	AveID		76.648				2.1		20.0			
4:2 FTS	17.009 16.910	17.314 16.211	17.766	18.555	16.706	AveID		17.210				4.4		20.0			
Perfluorohexanoic acid (PFHxA)	1.0349 1.0545	1.1276 1.0819	1.0073	1.0407	1.0350	AveID		1.0546				3.7		20.0			
Perfluoropentanesulfonic acid	66.118 68.869	66.515 66.804	66.603	69.820	68.852	AveID		67.654				2.2		20.0			
Perfluoroheptanoic acid (PFHpA)	1.2256 1.1650	1.1159 1.1495	1.1723	1.1813	1.1078	AveID		1.1596				3.5		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3789 1.1090	1.2306 1.0783	1.0904	1.0665	1.1383	AveID		1.1560				9.7		20.0			
6:2 FTS	1.6086 1.6432	1.6820 1.7048	1.6109	1.7076	1.6188	AveID		1.6537				2.6		20.0			
Perfluorooctanoic acid (PFOA)	1.1936 1.1841	1.1205 1.1606	1.1342	1.1315	1.1689	AveID		1.1562				2.4		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.4367 1.4256	1.4491 1.3190	1.2931	1.3270	1.4260	AveID		1.3824				4.8		20.0			
Perfluorononanoic acid (PFNA)	1.0260 1.1092	1.1173 1.1233	1.0184	1.0806	1.0842	AveID		1.0799				3.9		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.2316 1.1195	1.1413 1.1217	1.0371	1.0748	1.1325	AveID		1.1226				5.4		20.0			
8:2 FTS	1.3856 1.3517	1.4103 1.3057	1.3830	1.3210	1.3008	AveID		1.3511				3.2		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorononanesulfonic acid	0.6692 0.7668	0.7515 0.7224	0.6529	0.7198	0.7484	AveID		0.7187				6.0		20.0			
Perfluorodecanoic acid (PFDA)	1.1200 1.0213	1.0789 1.0702	1.0909	1.0386	1.0518	AveID		1.0674				3.1		20.0			
Perfluorooctane Sulfonamide (PFOSA)	0.9853 0.9975	0.9675 0.9764	0.9700	1.0090	1.0037	AveID		0.9871				1.7		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.0296 0.9833	1.1040 1.0283	0.9606	1.0149	0.9958	AveID		1.0166				4.5		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6182 0.6700	0.6918 0.6365	0.6465	0.6174	0.6724	AveID		0.6504				4.4		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9092 0.9063	0.7809 0.9307	0.9039	0.9216	0.8860	AveID		0.8912				5.7		20.0			
Perfluoroundecanoic acid (PFUnA)	1.5332 1.1610	1.2751 1.1866	1.1085	1.1713	1.1901	AveID		1.2323				11.5		20.0			
Perfluorododecanoic acid (PFDoA)	1.1314 1.0953	1.0778 1.0496	1.0444	1.0390	1.1416	AveID		1.0827				3.9		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.0526 1.0082	0.8009 0.9105	0.9230	0.9030	0.9986	AveID		0.9424				8.9		20.0			
Perfluorotetradecanoic acid (PFTeA)	+++++ 0.2617	0.2978 0.2668	0.2613	0.2576	0.2710	AveID		0.2694				5.5		20.0			
13C4 PFBA	1.3860 1.5038	1.4125 1.5694	1.3776	1.4016	1.4257	Ave		1.4395				4.9		20.0			
13C5-PFPeA	0.9305 0.9725	0.9291 0.9956	0.9358	0.9353	0.9377	Ave		0.9481				2.7		20.0			
13C3-PFBS	0.0253 0.0289	0.0266 0.0304	0.0261	0.0260	0.0276	Ave		0.0273				6.7		20.0			
13C2 PFHxA	1.0134 1.0568	0.9986 1.0567	0.9968	1.0136	1.0448	Ave		1.0258				2.6		20.0			
13C4-PFHpA	0.9934 1.0191	0.9760 1.0169	0.9730	0.9740	1.0074	Ave		0.9943				2.1		20.0			
18O2 PFHxS	1.4304 1.5738	1.4538 1.6700	1.4140	1.4586	1.4573	Ave		1.4940				6.2		20.0			
M2-6:2FTS	0.2961 0.2939	0.2996 0.2881	0.2885	0.2821	0.2907	Ave		0.2913				2.0		20.0			
13C4 PFOA	0.9546 0.9624	0.9775 0.9545	0.9507	0.9545	0.9655	Ave		0.9600				1.0		20.0			
13C4 PFOS	0.9886 1.0700	0.9821 1.1500	1.0111	1.0083	1.0143	Ave		1.0320				5.7		20.0			
13C5 PFNA	0.8370 0.8467	0.8476 0.8370	0.8256	0.8317	0.8297	Ave		0.8365				1.0		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.2896 0.2827	0.2927 0.2716	0.2809	0.2878	0.2823	Ave		0.2839				2.4		20.0			
13C2 PFDA	0.6339 0.6420	0.6249 0.6255	0.6020	0.6324	0.6188	Ave		0.6256				2.0		20.0			
13C8 FOSA	1.4347 1.5785	1.4590 1.6106	1.4918	1.4859	1.5520	Ave		1.5161				4.3		20.0			
d3-NMeFOSAA	0.1450 0.1640	0.1468 0.1633	0.1486	0.1434	0.1515	Ave		0.1518				5.6		20.0			
d5-NEtFOSAA	0.1576 0.1621	0.1676 0.1655	0.1629	0.1634	0.1602	Ave		0.1627				2.0		20.0			
13C2 PFUnA	0.4758 0.4899	0.4889 0.5032	0.4795	0.4765	0.4588	Ave		0.4818				2.9		20.0			
13C2 PFDoA	0.3873 0.4184	0.4188 0.4727	0.3980	0.4174	0.4079	Ave		0.4172				6.5		20.0			
13C2-PFTeDA	0.3367 0.3657	0.3424 0.3736	0.3450	0.3395	0.3487	Ave		0.3502				4.0		20.0			
13C2-PFHxDA	0.5978 0.6133	0.5840 0.6631	0.5991	0.5347	0.6310	Ave		0.6033				6.6		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237402/2	2018.08.01LLICAL_002.d
Level 2	IC 320-237402/3	2018.08.01LLICAL_003.d
Level 3	IC 320-237402/4	2018.08.01LLICAL_004.d
Level 4	IC 320-237402/5	2018.08.01LLICAL_005.d
Level 5	IC 320-237402/6	2018.08.01LLICAL_006.d
Level 6	IC 320-237402/7	2018.08.01LLICAL_007.d
Level 7	IC 320-237402/8	2018.08.01LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	49584 9171174	100773 17657065	462891	1847519	4662124	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	39061 7124053	86389 13665143	385176	1460012	3679899	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	60262 12002466	130464 22654929	611203	2456709	6345476	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	13909 2787781	31260 5267139	151962	616866	1432956	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	36283 6816050	81976 13079443	352293	1444908	3595187	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	54299 11402360	120606 21798270	572115	2331146	5931128	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	42120 7260990	79296 13373710	400178	1576104	3710400	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	62092 9713740	118530 18747407	492246	1939177	5019141	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	15623 2799930	34779 5327073	154602	625589	1483178	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	39458 6976550	79819 12686108	378678	1480871	3755999	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	46773 8881601	98640 16519531	436716	1744730	4578297	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	29706 5744475	68954 10755568	295007	1231102	2990574	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	39085 6798798	75727 13695202	341410	1377557	3544232	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
8:2 FTS		AveID	13298 2239081	28792 3886014	130586	498832	1169399	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorononanesulfonic acid		AveID	21970 4817452	51583 9124121	222331	954403	2423026	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorodecanoic acid (PFDA)		AveID	24561 4009985	49086 7657634	230406	899636	2163881	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (PFOSA)		AveID	48904 9630397	102774 17992319	507693	2053736	5178982	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	5163 986536	11798 1921554	50086	199395	501591	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	20381 4226499	47682 8073020	221097	822043	2185833	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	4957 898298	9530 1761697	51670	206227	471804	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	25237 3479056	45391 6830755	186462	764538	1815476	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	15157 2802983	32864 5676012	145817	594065	1548416	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	14102 2580030	24421 4923814	128866	516294	1354496	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	+++++ 585419	7424 1140306	31626	119786	314195	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	4794702 4598618	5141928 4488667	4833356	4799715	4740211	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	3218796 2974004	3382043 2847672	3283004	3202919	3117638	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	81424 82077	89887 80880	85167	82758	85408	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	3505828 3231846	3635013 3022362	3497268	3471025	3473699	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	3436629 3116337	3553062 2908549	3413685	3335466	3349409	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4681014 4552896	5006593 4518625	4692968	4725288	4583643	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	973239 853793	1036033 782824	961732	917820	918152	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3302357 2942955	3558329 2730006	3335341	3268736	3210040	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3269307 3128101	3417703 3144316	3391354	3300872	3224053	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	2895444 2589352	3085644 2393820	2896674	2848081	2758407	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	959713 828227	1020788 744064	944227	944062	899004	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C2 PFDA	13PF OA	Ave	2192940 1963135	2274867 1788913	2112120	2165508	2057230	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C8 FOSA	13PF OA	Ave	4963170 4827094	5311185 4606616	5234016	5088363	5160037	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	501437 501663	534311 467155	521422	491188	503700	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	545218 495602	610182 473237	571651	559410	532526	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	1645990 1498263	1779877 1439097	1682161	1631762	1525487	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	1339683 1279511	1524607 1351987	1396187	1429399	1356329	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	1164683 1118375	1246501 1068686	1210263	1162431	1159368	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	2067843 1875506	2126007 1896531	2101845	1831086	2097837	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237402/2	2018.08.01LLICAL_002.d
Level 2	IC 320-237402/3	2018.08.01LLICAL_003.d
Level 3	IC 320-237402/4	2018.08.01LLICAL_004.d
Level 4	IC 320-237402/5	2018.08.01LLICAL_005.d
Level 5	IC 320-237402/6	2018.08.01LLICAL_006.d
Level 6	IC 320-237402/7	2018.08.01LLICAL_007.d
Level 7	IC 320-237402/8	2018.08.01LLICAL_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	4.9 -0.2	-0.6	-2.8	-2.3	-0.2	1.2	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	1.4 0.2	6.7	-2.0	-4.8	-1.4	0.0	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	1.6 -3.9	-0.4	-1.5	1.9	2.0	0.4	30 30	30	30	30	30	30
4:2 FTS	-1.2 -5.8	0.6	3.2	7.8	-2.9	-1.7	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-1.9 2.6	6.9	-4.5	-1.3	-1.9	0.0	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-2.3 -1.3	-1.7	-1.6	3.2	1.8	1.8	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	5.7 -0.9	-3.8	1.1	1.9	-4.5	0.5	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	19.3 -6.7	6.5	-5.7	-7.7	-1.5	-4.1	30 30	30	30	30	30	30
6:2 FTS	-2.7 3.1	1.7	-2.6	3.3	-2.1	-0.6	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	3.2 0.4	-3.1	-1.9	-2.1	1.1	2.4	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	3.9 -4.6	4.8	-6.5	-4.0	3.2	3.1	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-5.0 4.0	3.5	-5.7	0.1	0.4	2.7	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	9.7 -0.1	1.7	-7.6	-4.3	0.9	-0.3	30 30	30	30	30	30	30
8:2 FTS	2.6 -3.4	4.4	2.4	-2.2	-3.7	0.0	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-6.9 0.5	4.6	-9.2	0.2	4.1	6.7	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 237402

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/01/2018 12:59 Calibration End Date: 08/01/2018 13:46 Calibration ID: 40449

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorodecanoic acid (PFDA)	4.9 0.3	1.1	2.2	-2.7	-1.5	-4.3	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (PFOSA)	-0.2 -1.1	-2.0	-1.7	2.2	1.7	1.1	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.3 1.1	8.6	-5.5	-0.2	-2.0	-3.3	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-4.9 -2.1	6.4	-0.6	-5.1	3.4	3.0	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2.0 4.4	-12.4	1.4	3.4	-0.6	1.7	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	24.4 -3.7	3.5	-10.0	-4.9	-3.4	-5.8	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	4.5 -3.1	-0.5	-3.5	-4.0	5.4	1.2	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	11.7 -3.4	-15.0	-2.1	-4.2	6.0	7.0	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	+++++ -1.0	10.6	-3.0	-4.4	0.6	-2.8	 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 01-Aug-2018 12:59:04 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:33 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:28:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.395	0.001	0.541	4794702	2.41		96.3	64287	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.395	1.396	-0.001	1.000	49584	0.0262		105	11.2	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.636	0.001	0.635	3218796	2.45		98.1	51402	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.636	0.001	1.000	39061	0.0253		101	14.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.672	1.669	0.003	0.648	81424	2.16		92.8	391	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.672	1.671	0.001	1.000	60262	0.0224		102	287	
298.90 > 99.00	1.681	1.671	0.010	1.005	25278		2.38(1.25-3.74)	102	110	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.872	0.001	0.726	628423	NC			7484	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.873	1.872	0.001	1.120	13909	0.0231		98.8	820	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.903	-0.001	0.738	3505828	2.47		98.8	68035	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.902	1.903	-0.001	1.000	36283	0.0245		98.1	51.6	M
313.00 > 119.00	1.902	1.903	-0.001	1.000	3247		11.17(5.03-15.10)	98.1	20.3	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.935	1.928	0.007	1.157	54299	0.0229		97.7	1145	
349.00 > 99.00	1.924	1.928	-0.004	1.151	19898		2.73(1.36-4.07)	97.7	101	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.000	2.000	0.0	0.775	159667	NC			4614	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.011	2.002	0.009	1.006	7432	NC			23.6	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.225	0.001	0.863	3436629	2.50		99.9	63835	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.226	2.226	0.0	1.000	42120	0.0264		106	16.7	M
363.00 > 169.00	2.226	2.226	0.0	1.000	18218		2.31(1.13-3.40)	106	143	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.238	2.237	0.001	1.000	62092	0.0271		119	363	
399.00 > 99.00	2.238	2.237	0.001	1.000	21302		2.91(1.50-4.49)	119	33.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.238	2.238	0.0	0.868	4681014	2.26		95.7	45481	
65 ADONA										
377.00 > 251.00	2.277	2.270	0.007	0.773	92157	NC			803	
377.00 > 85.00	2.277	2.270	0.007	0.773	58106		1.59(0.84-2.53)		198	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	15623	0.0231		97.3	375	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.556	-0.002	0.990	973239	2.41		102	11040	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.580	-0.001	1.000	3302357	2.49		99.4	40075	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.579	2.581	-0.002	1.000	39458	0.0258		103	21.0	
413.00 > 169.00	2.579	2.581	-0.002	1.000	25449		1.55(0.84-2.52)	103	130	M
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.581	-0.002		3459352	2.50			50770	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	46773	0.0247		104	734	
449.00 > 99.00	2.587	2.587	0.0	0.878	12280		3.81(1.94-5.82)	104	118	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.946	0.0	1.142	3269307	2.29		95.8	33518	
D 19 13C5 PFNA										
468.00 > 423.00	2.952	2.948	0.004	1.144	2895444	2.50		100	58511	
20 Perfluorononanoic acid										M
463.00 > 419.00	2.952	2.949	0.003	1.000	29706	0.0238		95.0	45.7	M
463.00 > 169.00	2.952	2.949	0.003	1.000	7031		4.23(1.90-5.69)	95.0	266	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.952	2.949	0.003	1.002	39085	0.0255		110	318	
499.00 > 99.00	2.952	2.949	0.003	1.002	8733		4.48(2.31-6.93)	110	42.9	M
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.162	3.158	0.004	1.073	60566	NC			868	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.292	0.003	1.000	13298	0.0246		103	1113	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.292	0.003	1.278	959713	2.44		102	16553	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.295	0.0	1.119	21970	0.0223		93.1	920	
549.00 > 99.00	3.295	3.295	0.0	1.119	9963		2.21(1.33-3.97)	93.1	56.3	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.311	3.306	0.005	1.284	2192940	2.53		101	75042	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.311	3.308	0.003	1.000	24561	0.0262		105	33.2	
513.00 > 169.00	3.303	3.308	-0.005	0.998	4748		5.17(2.36-7.09)	105	64.5	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.312	-0.001	1.284	4963170	2.37		94.6	48844	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.313	-0.002	1.000	48904	0.0250		99.8	1474	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.464	3.459	0.005	1.343	501437	2.39		95.5	11078	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.473	3.465	0.008	1.003	5163	0.0253		101	63.6	M
29 Perfluorodecane Sulfonic acid										M
599.00 > 80.00	3.628	3.620	0.008	1.232	20381	0.0229		95.1	533	
599.00 > 99.00	3.618	3.620	-0.002	1.228	6067		3.36(1.39-4.16)	95.1	52.2	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.627	0.001	1.407	545218	2.42		96.8	4334	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.647	3.633	0.014	1.005	4957	0.0255		102	116	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.638	3.634	0.004	1.410	1645990	2.47		98.8	31735	
31 Perfluoroundecanoic acid										RM
563.00 > 519.00	3.638	3.634	0.004	1.000	25237	0.0311		124	51.2	R
563.00 > 169.00	3.647	3.634	0.013	1.003	3299		7.65(2.12-6.36)	124	108	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.793	3.792	0.001	1.287	73728	NC			1970	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.925	0.003	1.523	1339683	2.32		92.8	19954	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.927	0.001	1.000	15157	0.0261		104	4.4	
613.00 > 169.00	3.928	3.927	0.001	1.000	4103		3.69(2.13-6.40)	104	70.2	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.193	4.188	0.005	1.067	14102	0.0279		112	4.5	R
663.00 > 169.00	4.193	4.188	0.005	1.067	3483		4.05(1.25-3.76)	112	29.0	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.423	0.003	1.000	4297	0.0342		137	56.7	
713.00 > 219.00	4.426	4.423	0.003	1.000	2855		1.51(0.71-2.13)	137	37.3	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.423	0.003	1.716	1164683	2.40		96.1	5463	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.826	0.007	1.874	2067843	2.48		99.1	3018	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.827	0.006	1.000	41372	NC			2.5	
813.00 > 169.00	4.833	4.827	0.006	1.000	6431		6.43(2.86-8.58)		67.5	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.166	0.007	1.070	21294	NC			6.9	
913.00 > 169.00	5.173	5.166	0.007	1.070	3017		7.06(3.83-11.48)		29.4	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d

Injection Date: 01-Aug-2018 12:59:04 Instrument ID: A8_N

Lims ID: IC L1 Full

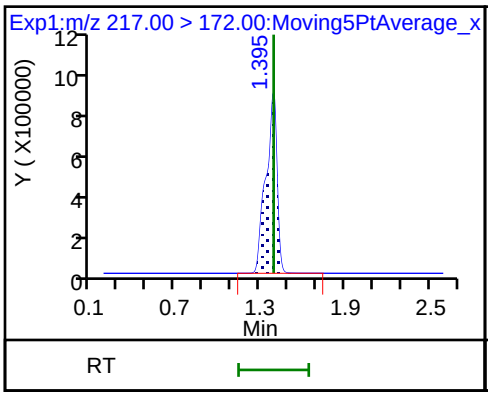
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 10 Worklist Smp#: 2

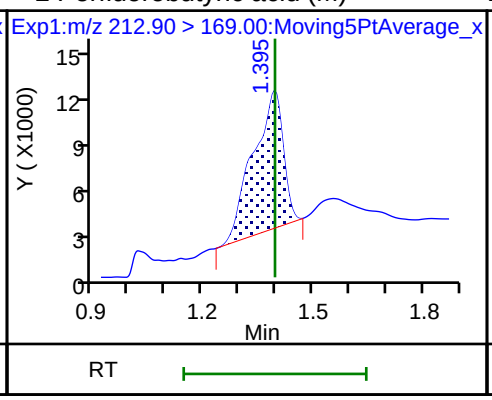
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

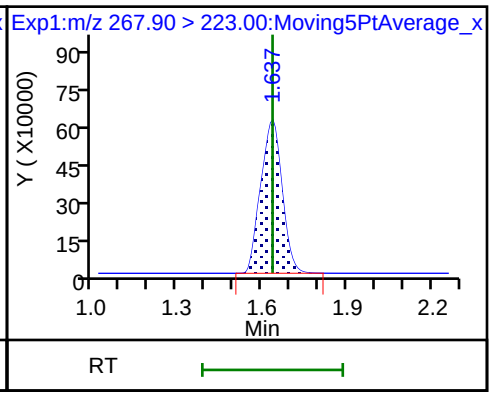
D 1 13C4 PFBA



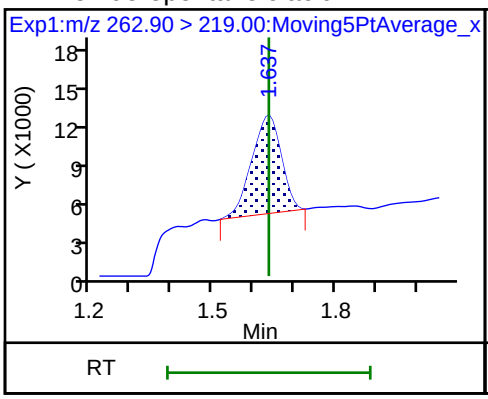
2 Perfluorobutyric acid (M)



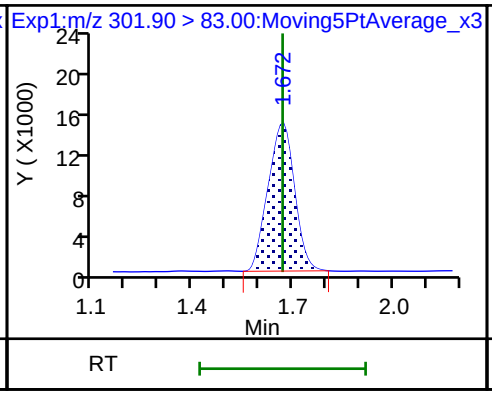
D 3 13C5-PFPeA



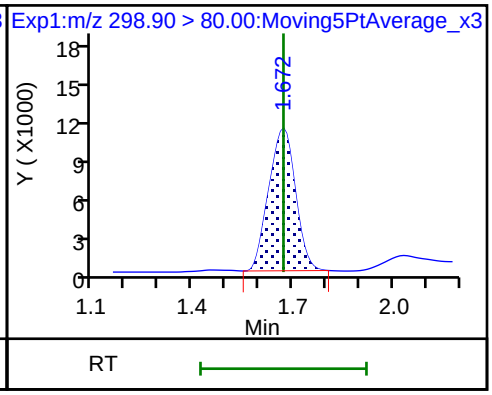
4 Perfluoropentanoic acid



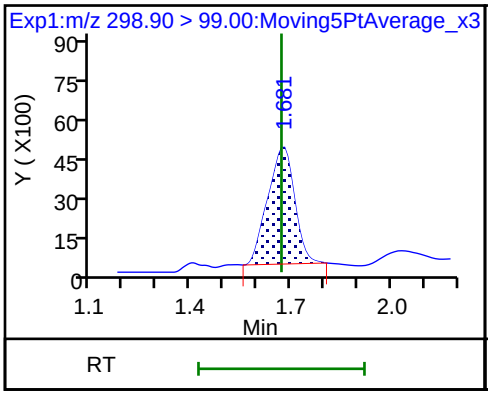
D 47 13C3-PFBS



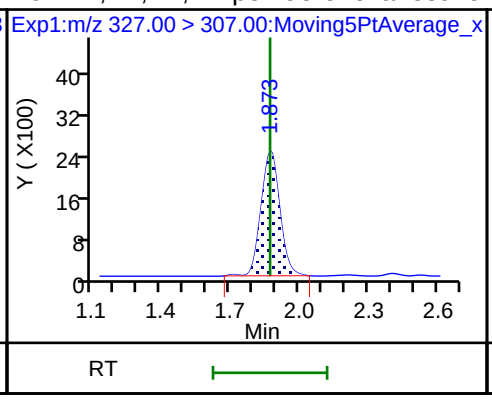
5 Perfluorobutanesulfonic acid



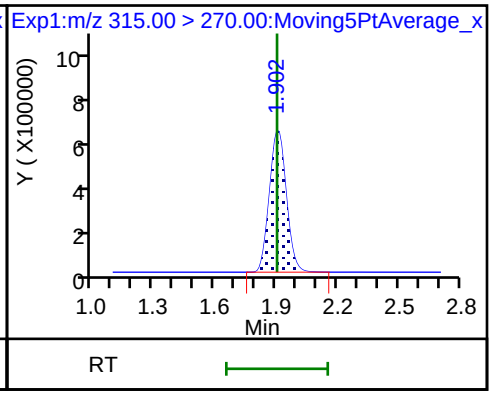
5 Perfluorobutanesulfonic acid



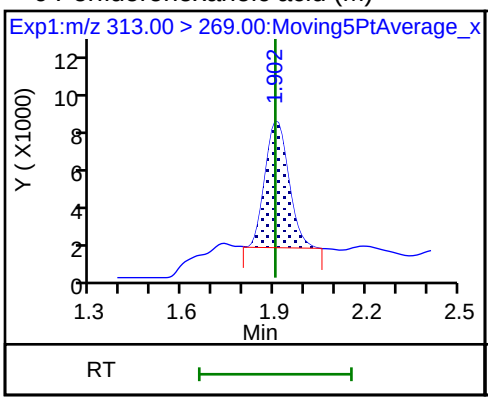
61 1H,1H,2H,2H-perfluorohexanesulfon



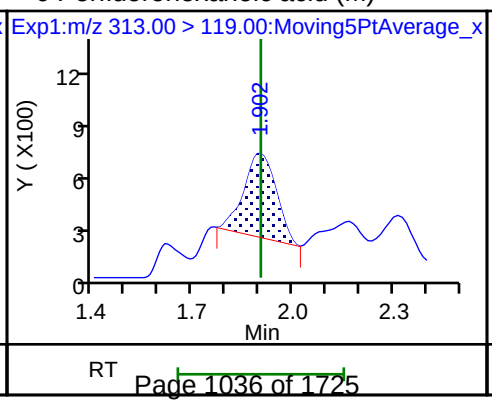
D 7 13C2 PFHxA



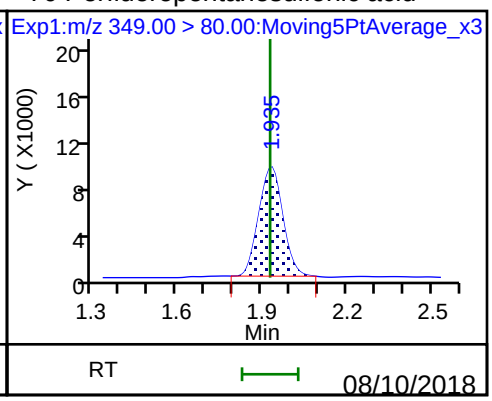
6 Perfluorohexanoic acid (M)



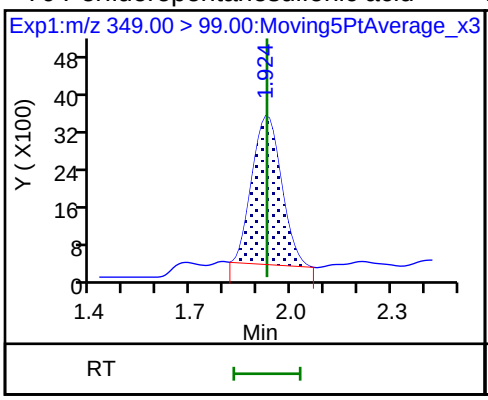
6 Perfluorohexanoic acid (M)



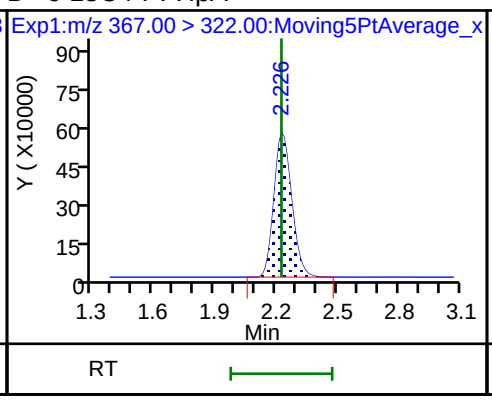
70 Perfluoropentanesulfonic acid



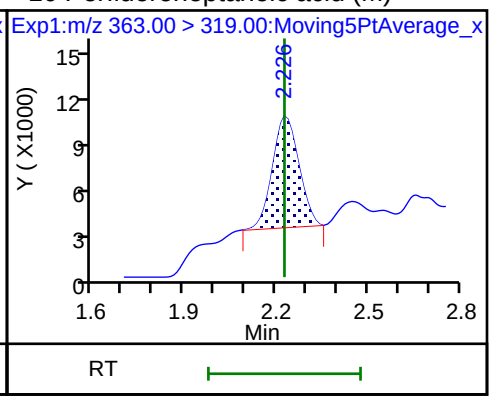
70 Perfluoropentanesulfonic acid



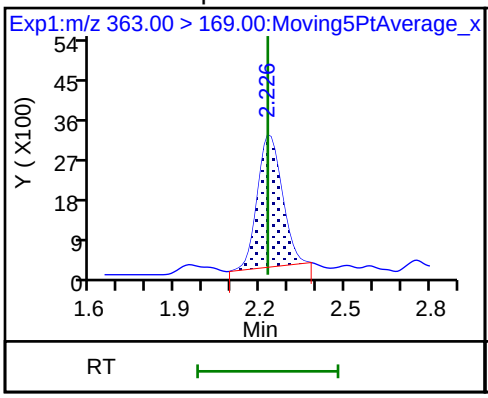
D 9 13C4-PFHpA



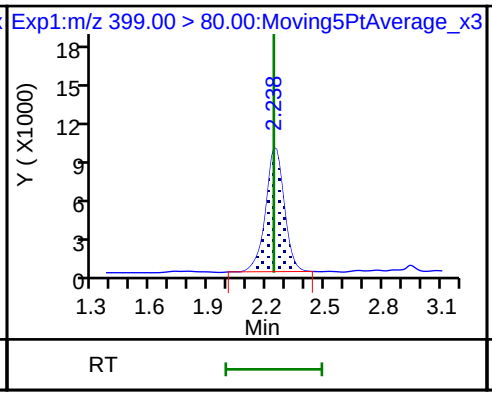
10 Perfluoroheptanoic acid (M)



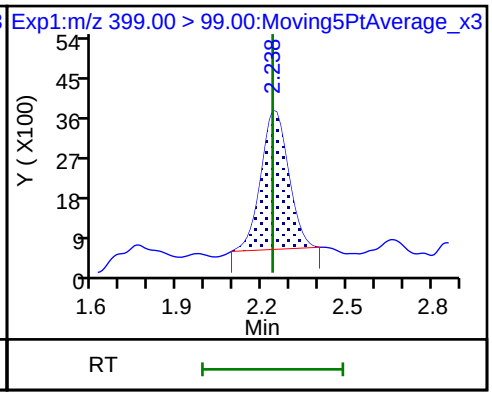
10 Perfluoroheptanoic acid



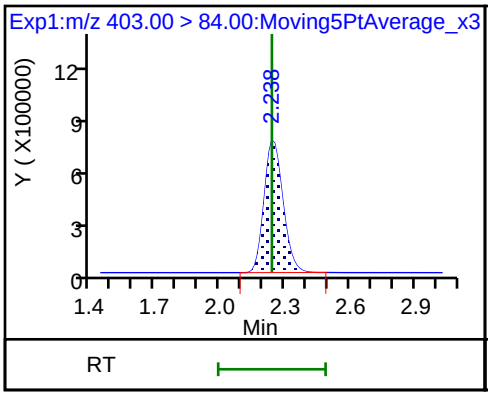
8 Perfluorohexanesulfonic acid



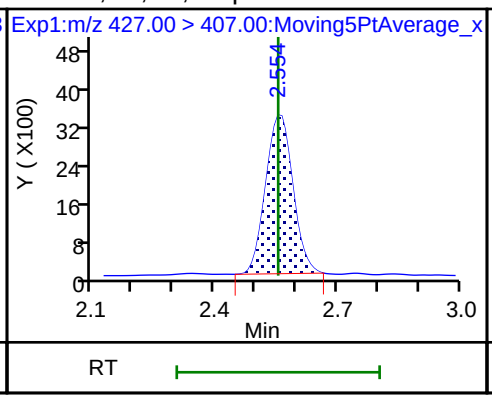
8 Perfluorohexanesulfonic acid



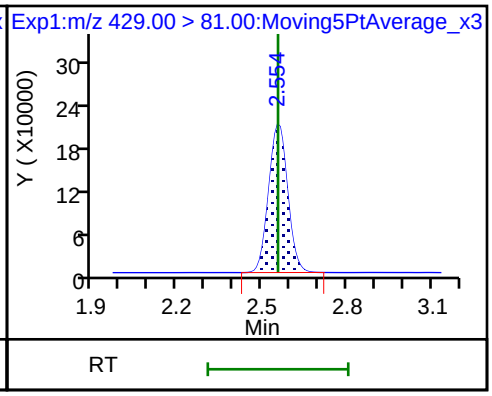
D 11 18O2 PFHxS



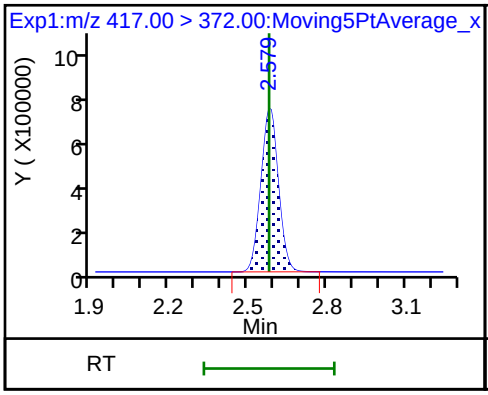
13 1H,1H,2H,2H-perfluorooctanesulfon



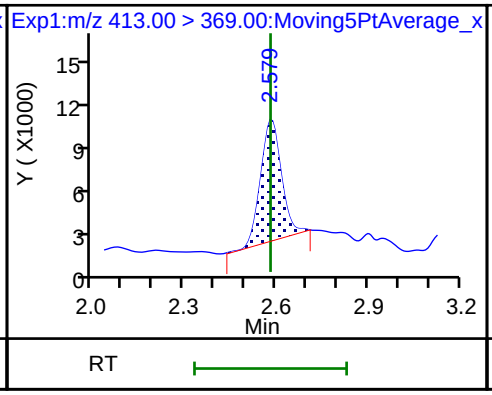
D 12 M2-6:2FTS



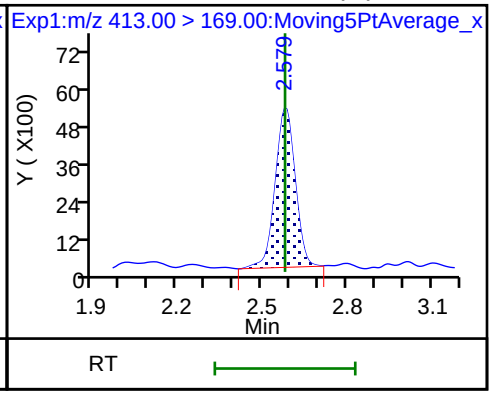
D 14 13C4 PFOA



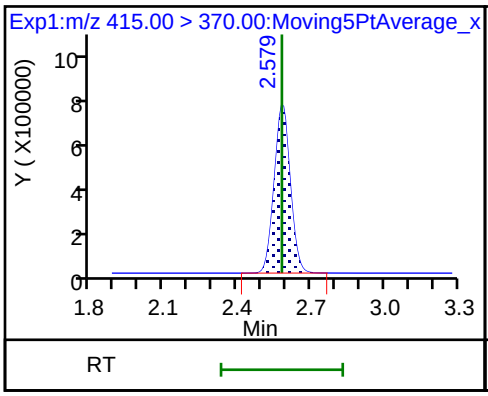
15 Perfluorooctanoic acid



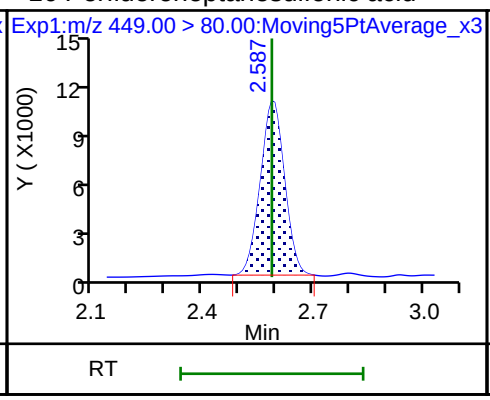
15 Perfluorooctanoic acid (M)



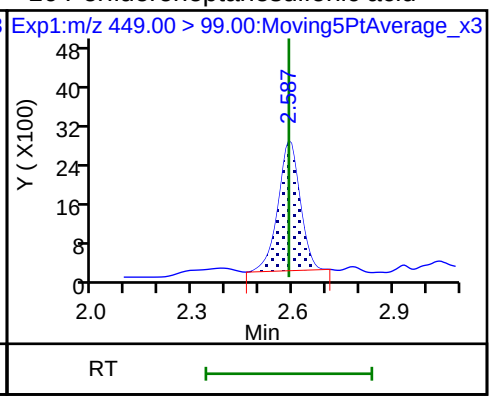
* 62 13C2-PFOA



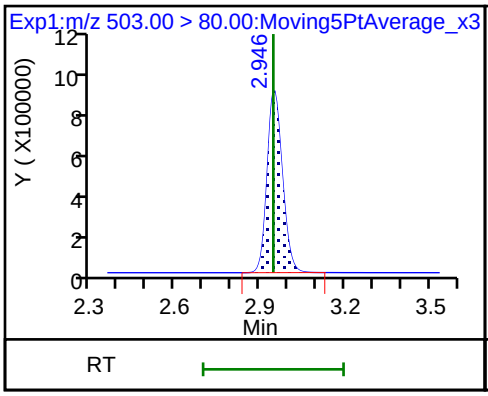
16 Perfluoroheptanesulfonic acid



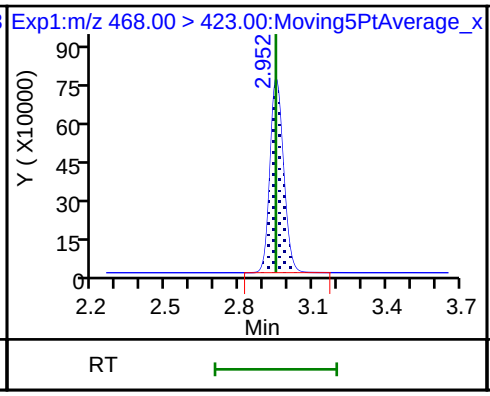
16 Perfluoroheptanesulfonic acid



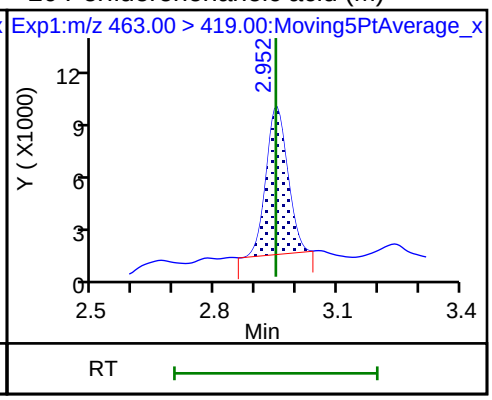
D 18 13C4 PFOS



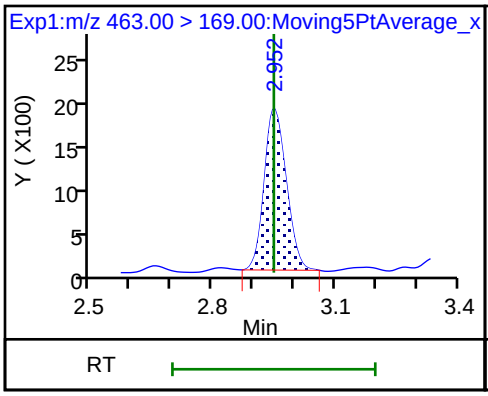
D 19 13C5 PFNA



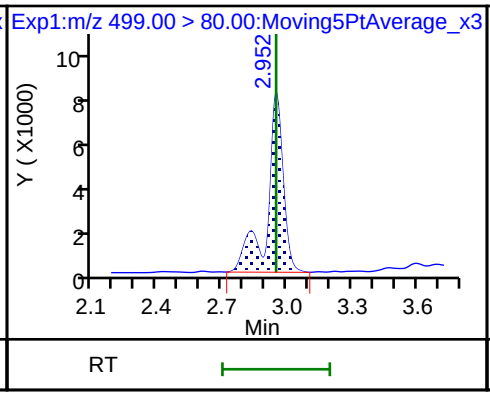
20 Perfluorononanoic acid (M)



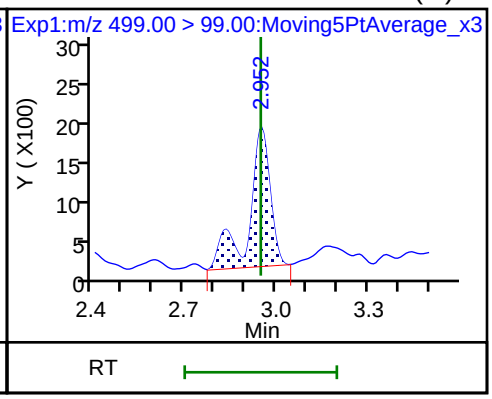
20 Perfluorononanoic acid



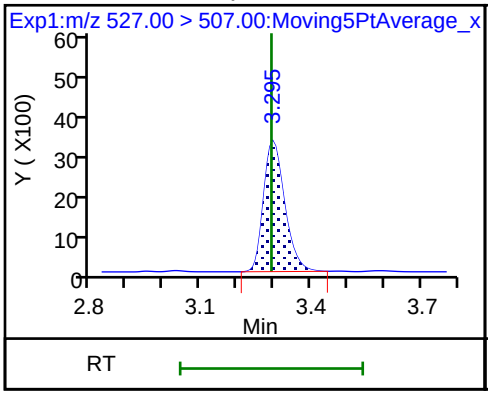
17 Perfluorooctane sulfonic acid



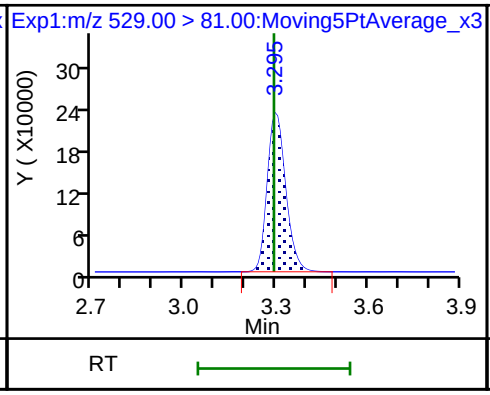
17 Perfluorooctane sulfonic acid (M)



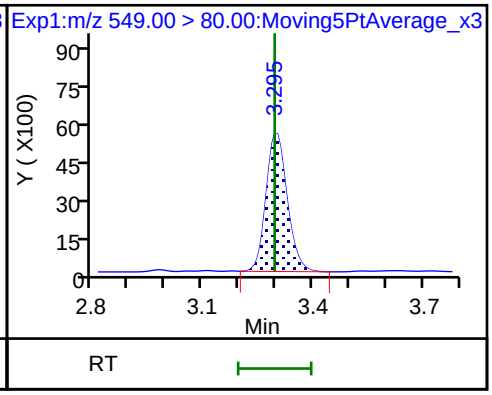
25 1H,1H,2H,2H-perfluorodecanesulfon



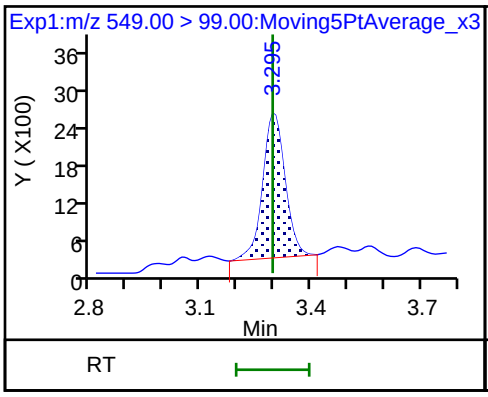
D 26 M2-8:2FTS



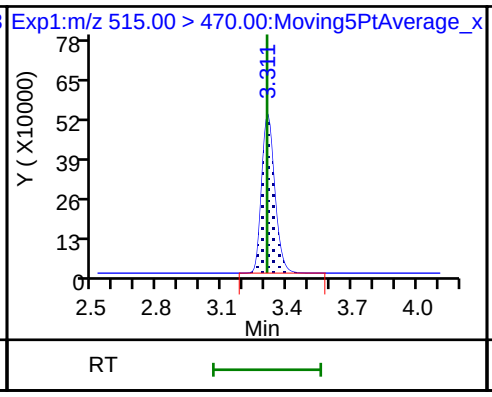
68 Perfluorononanesulfonic acid



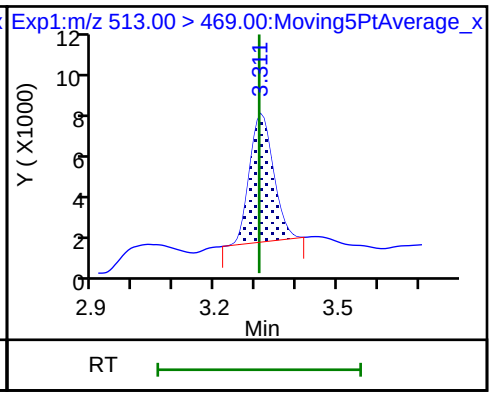
68 Perfluorononanesulfonic acid



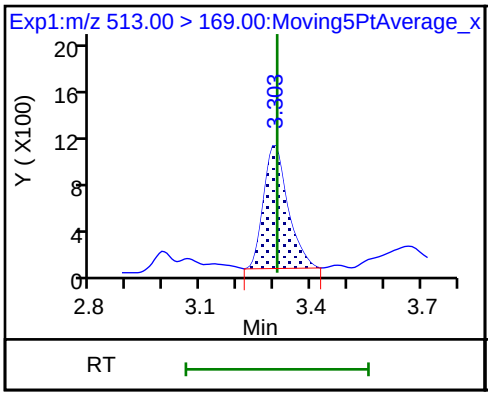
D 23 13C2 PFDA



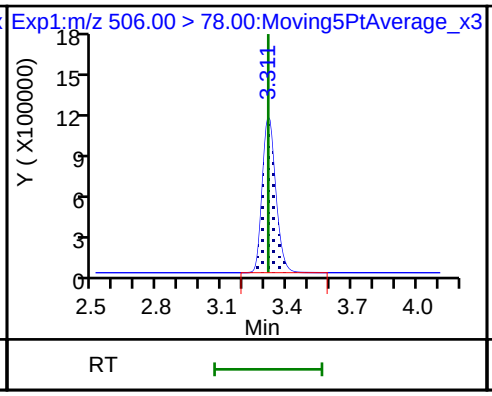
24 Perfluorodecanoic acid



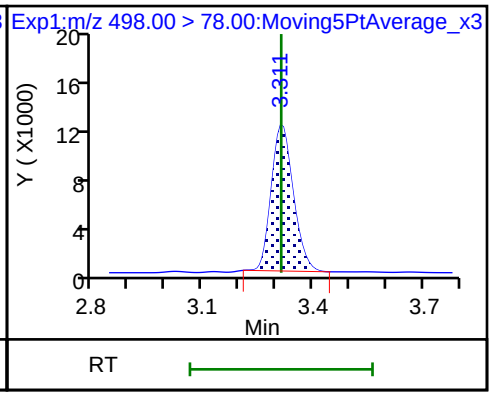
24 Perfluorodecanoic acid



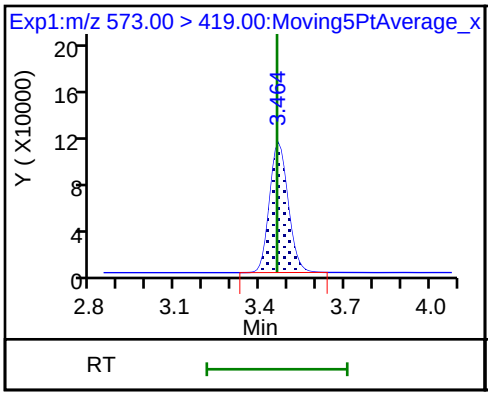
D 21 13C8 FOSA



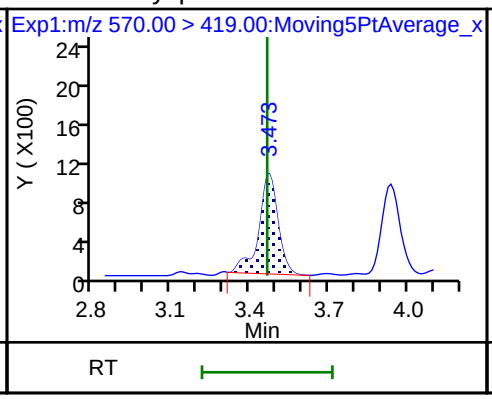
22 Perfluorooctane Sulfonamide



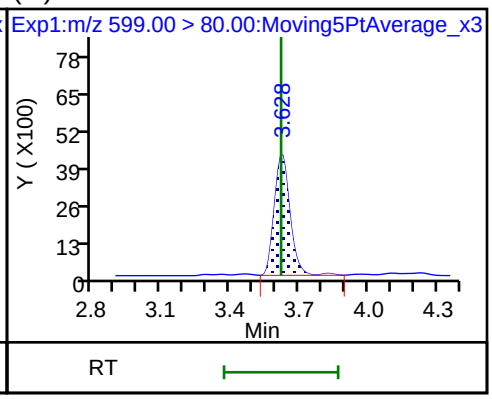
D 27 d3-NMeFOSAA



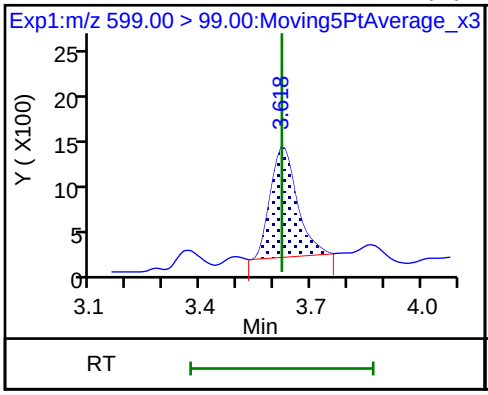
28 N-methyl perfluorooctane sulfonami (M)



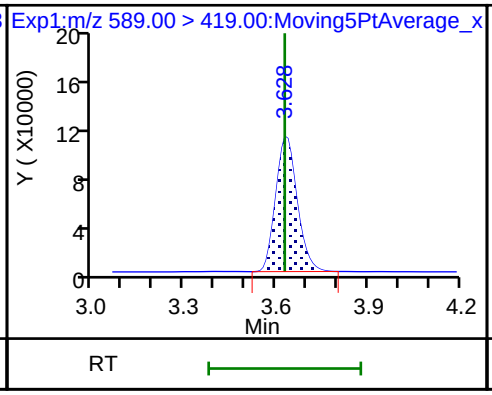
29 Perfluorodecane Sulfonic acid



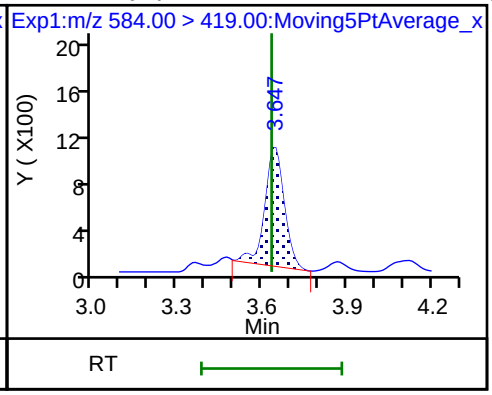
29 Perfluorodecane Sulfonic acid (M)



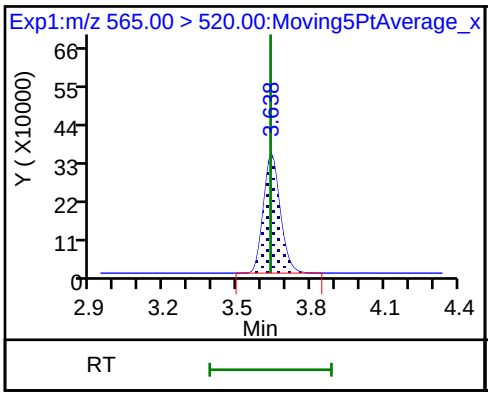
D 32 d5-NEtFOSAA



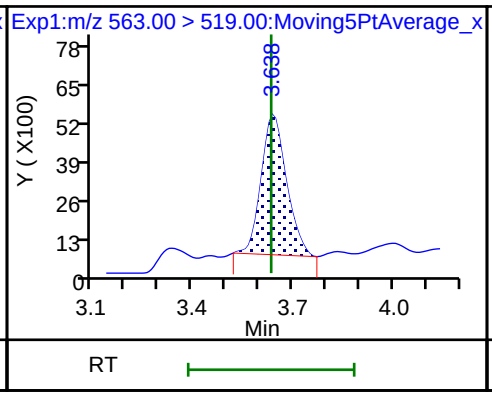
33 N-ethyl perfluorooctane sulfonamid (M)



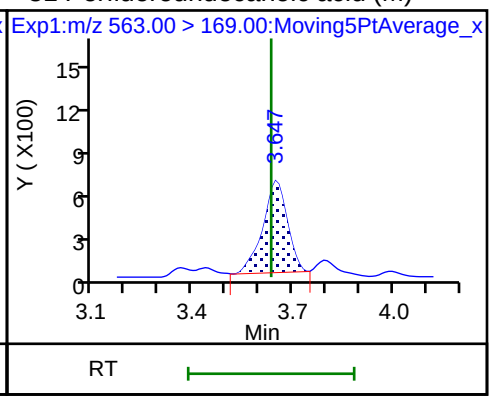
D 30 13C2 PFUnA



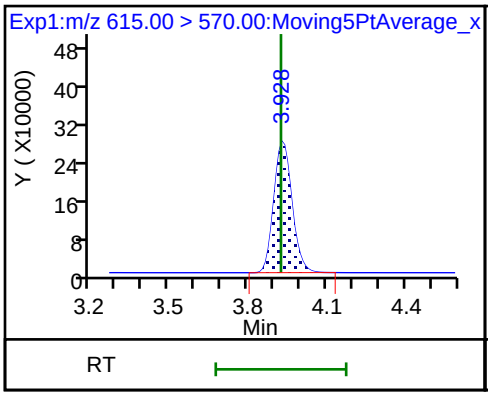
31 Perfluoroundecanoic acid



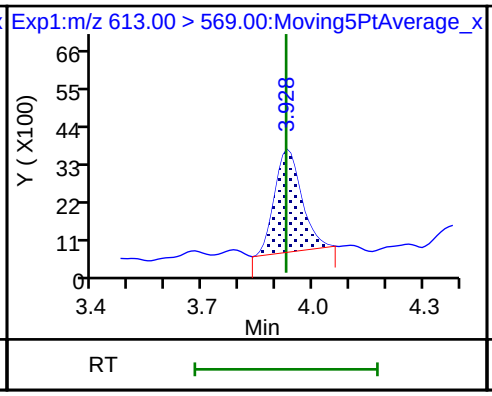
31 Perfluoroundecanoic acid (M)



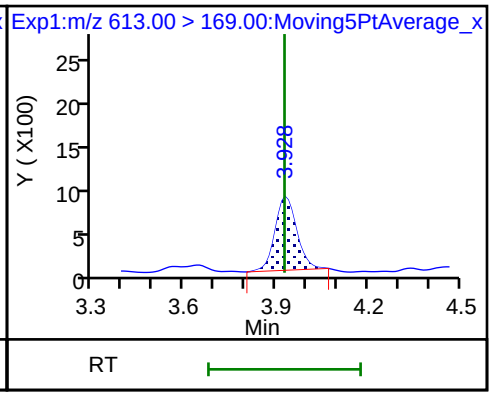
D 36 13C2 PFDoA



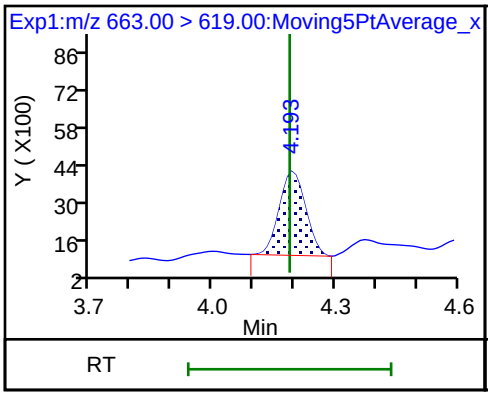
37 Perfluorododecanoic acid



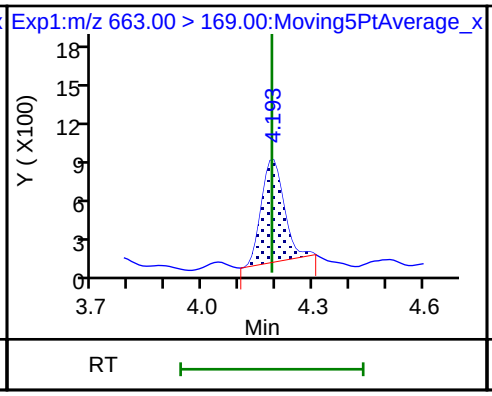
37 Perfluorododecanoic acid



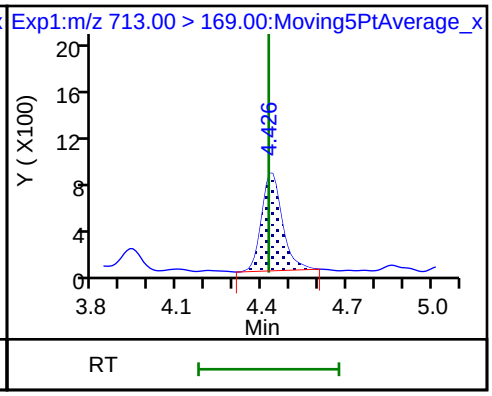
41 Perfluorotridecanoic acid



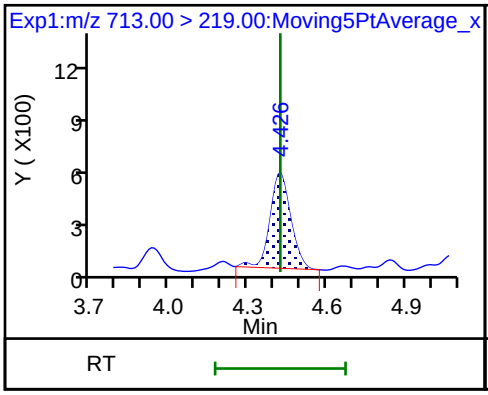
41 Perfluorotridecanoic acid



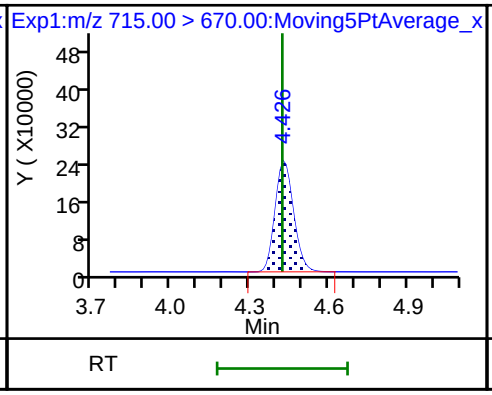
42 Perfluorotetradecanoic acid



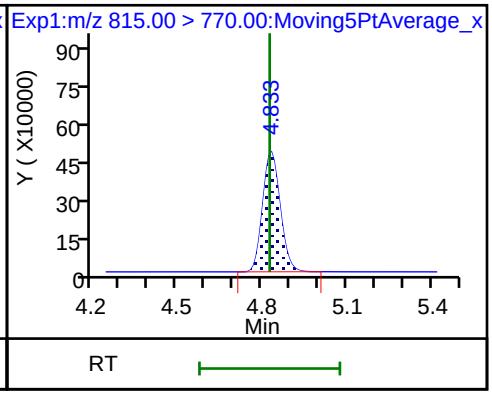
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

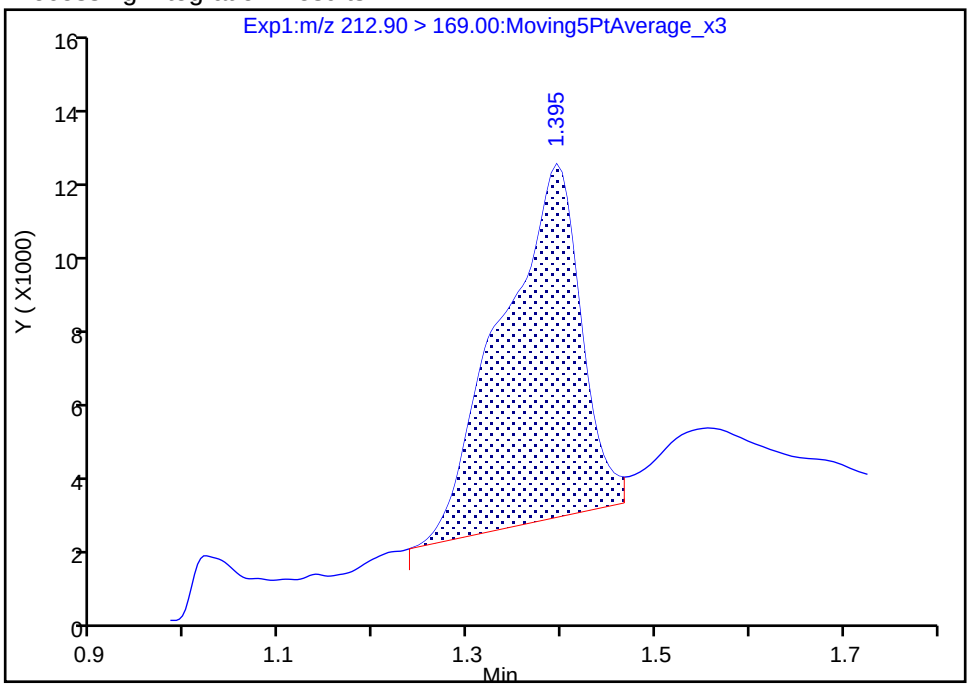
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

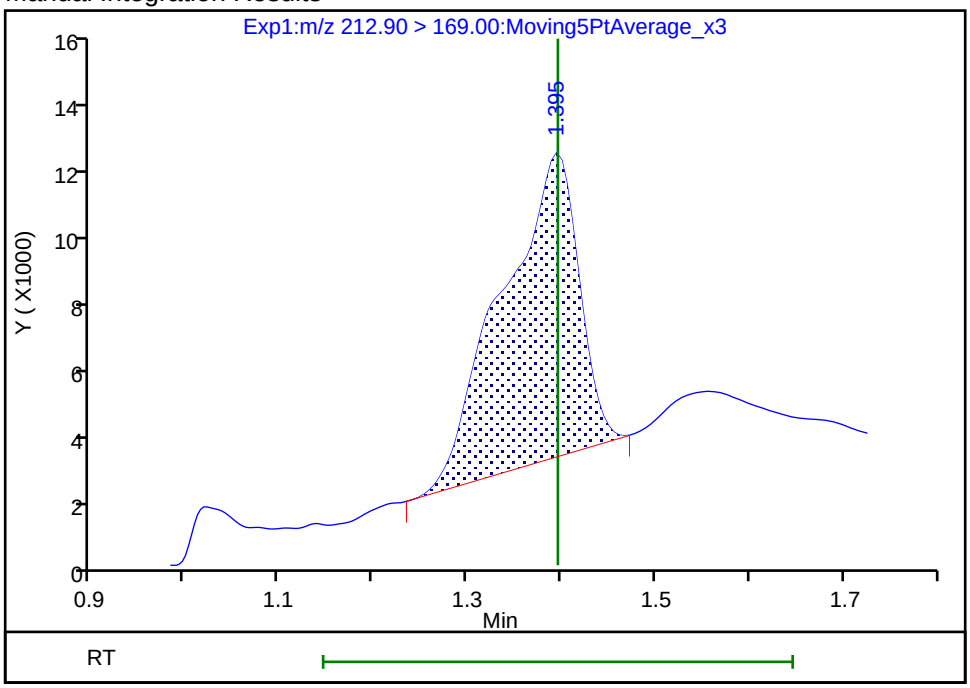
Processing Integration Results

RT: 1.39
Area: 53947
Amount: 0.028172
Amount Units: ng/ml



Manual Integration Results

RT: 1.39
Area: 49584
Amount: 0.026235
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:23:50

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

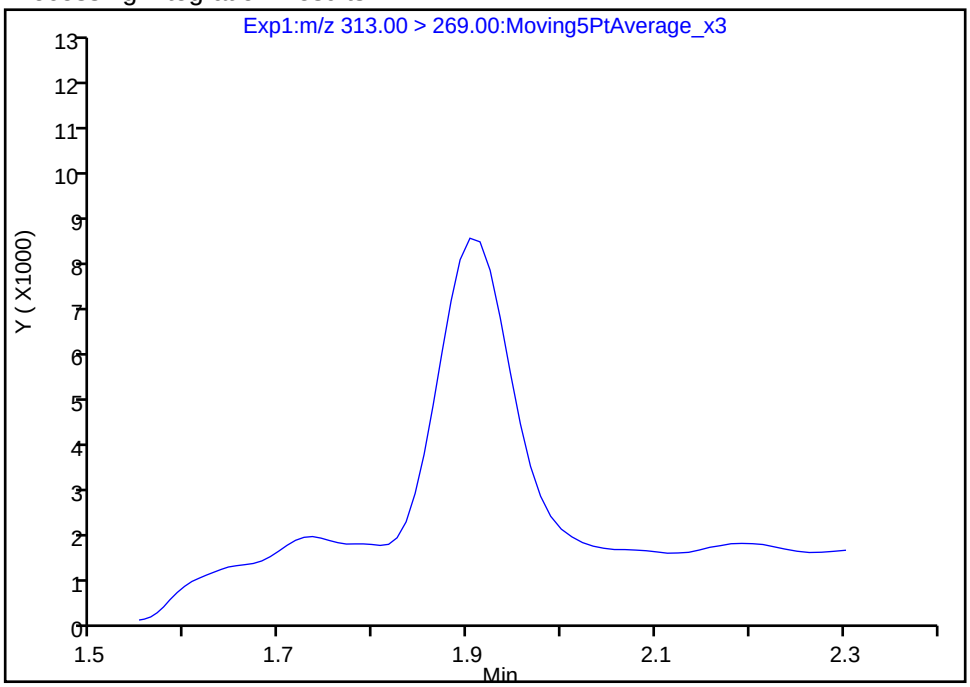
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

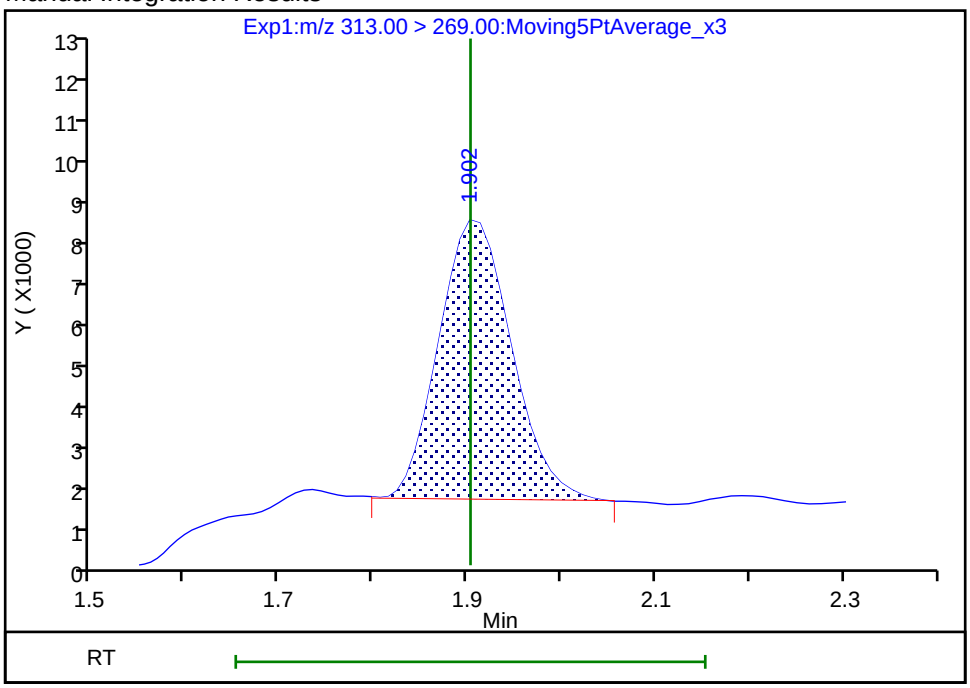
Not Detected
Expected RT: 1.90

Processing Integration Results



Manual Integration Results

RT:	1.90
Area:	36283
Amount:	0.024535
Amount Units:	ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:03
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

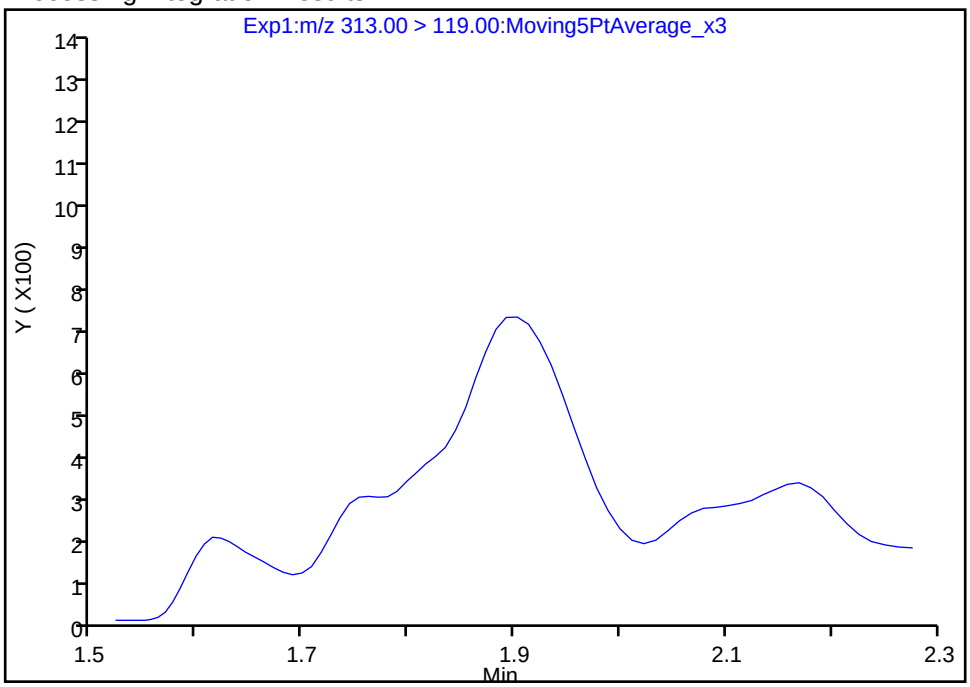
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

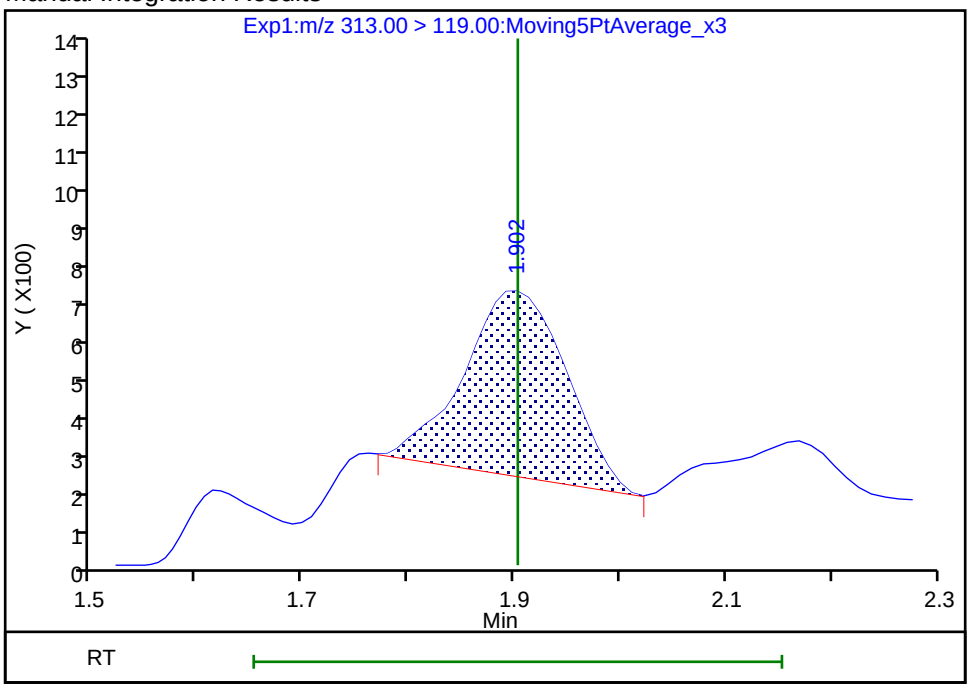
Processing Integration Results

Not Detected
Expected RT: 1.90



Manual Integration Results

RT: 1.90
Area: 3247
Amount: 0.024535
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:09
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

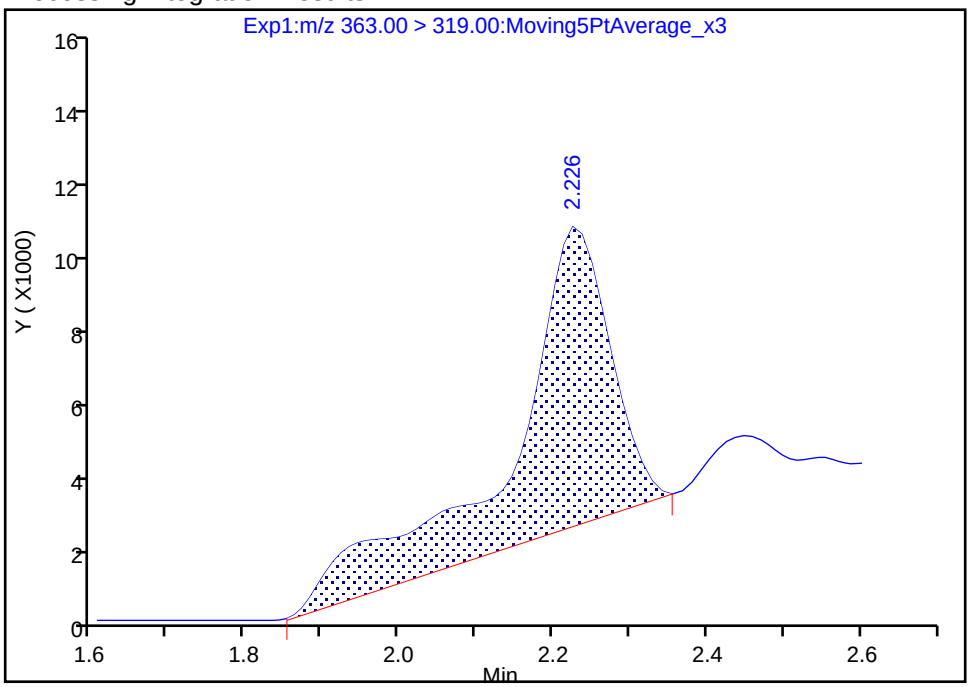
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

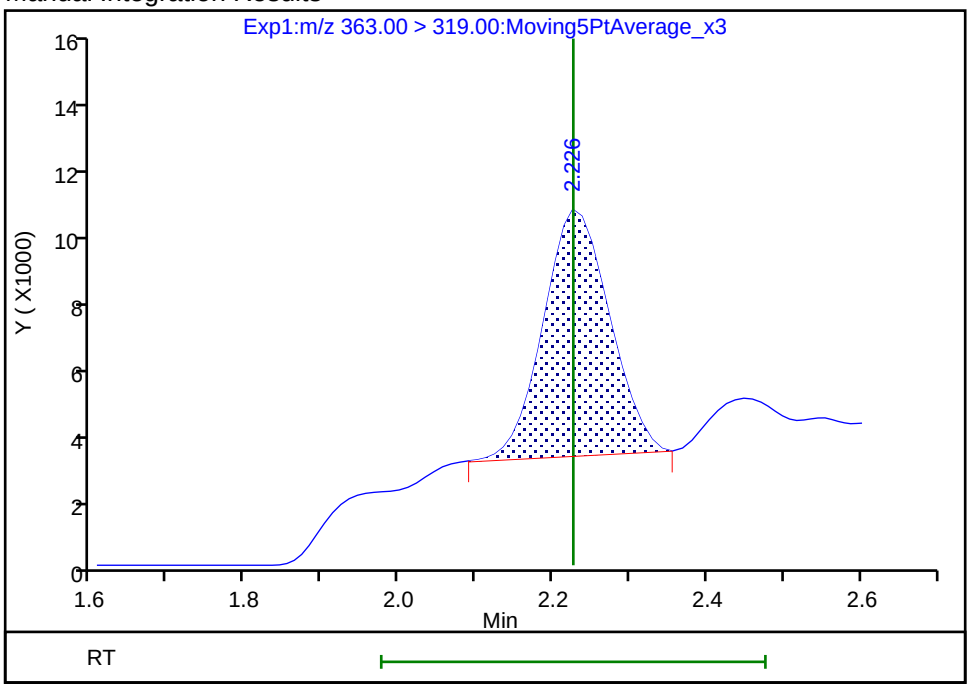
Processing Integration Results

RT: 2.23
Area: 69199
Amount: 0.039009
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 42120
Amount: 0.026423
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:21
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

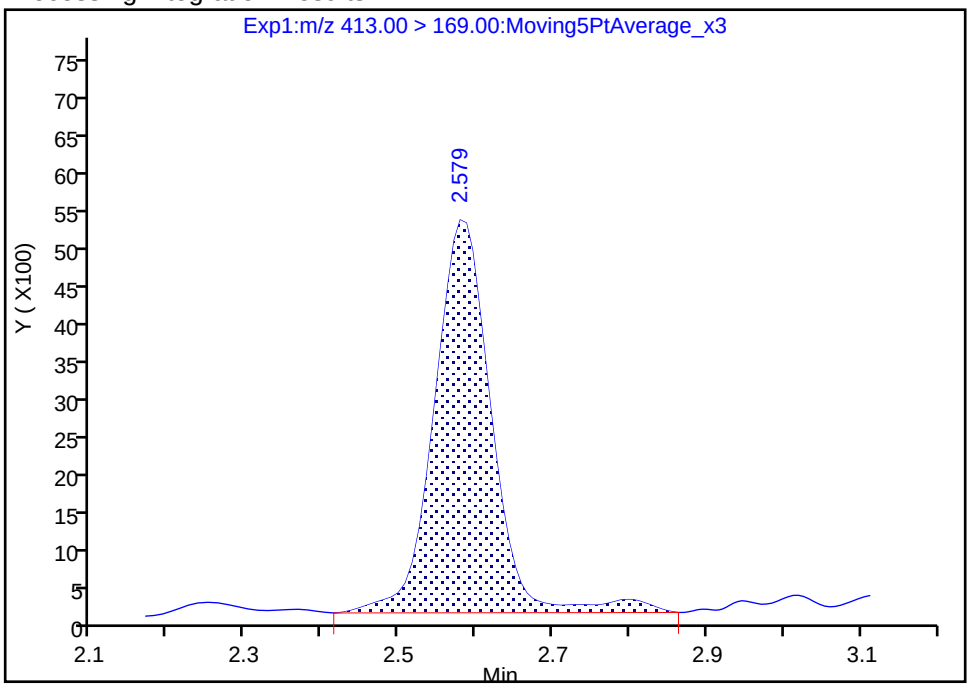
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

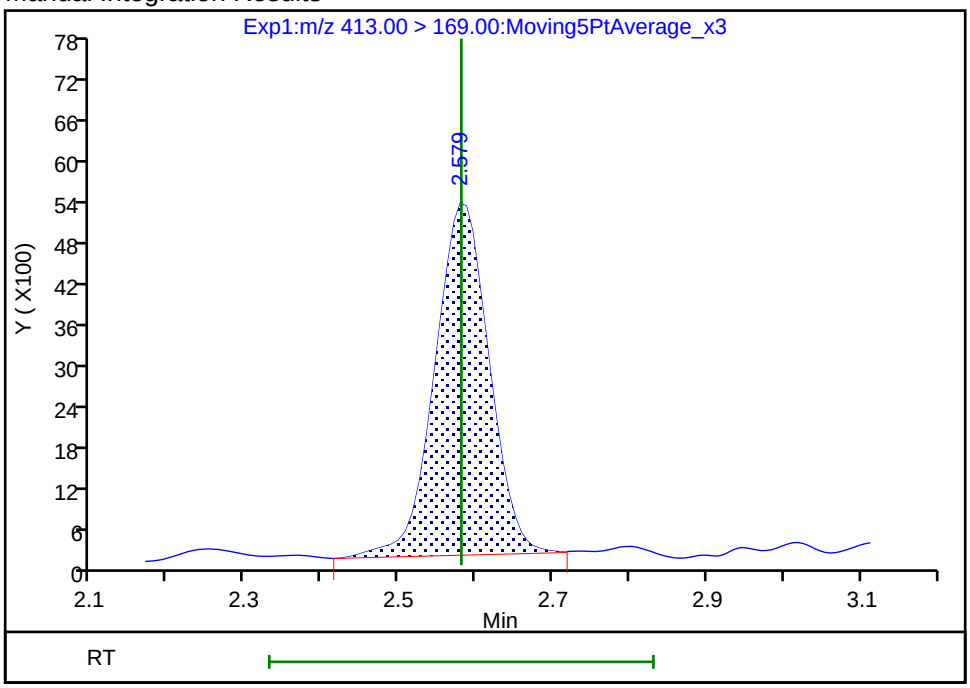
Processing Integration Results

RT: 2.58
Area: 27152
Amount: 0.025387
Amount Units: ng/ml



Manual Integration Results

RT: 2.58
Area: 25449
Amount: 0.025836
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:23:41

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
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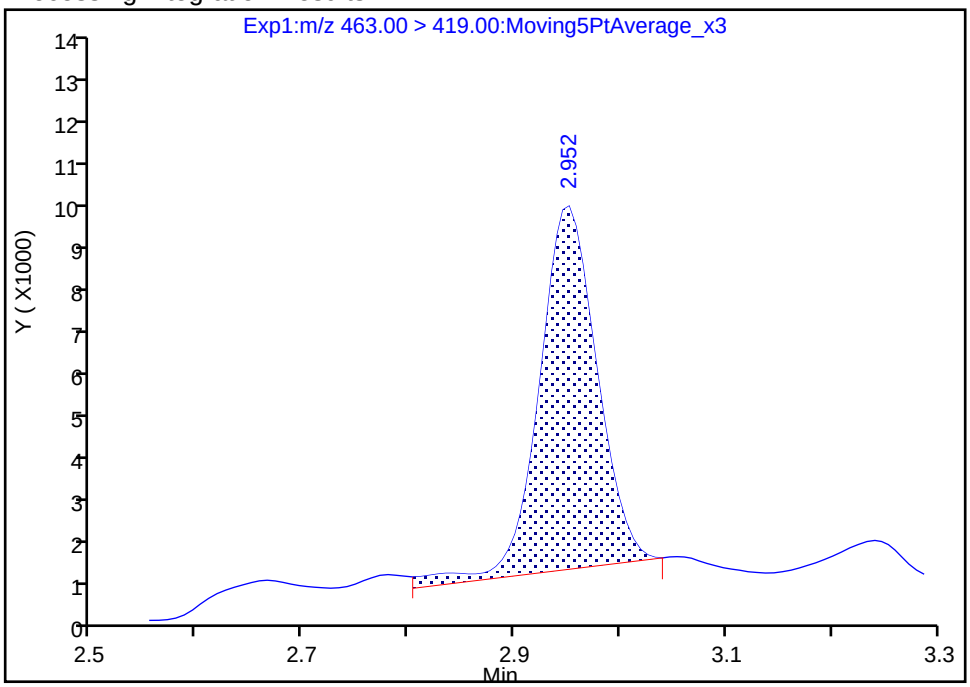
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

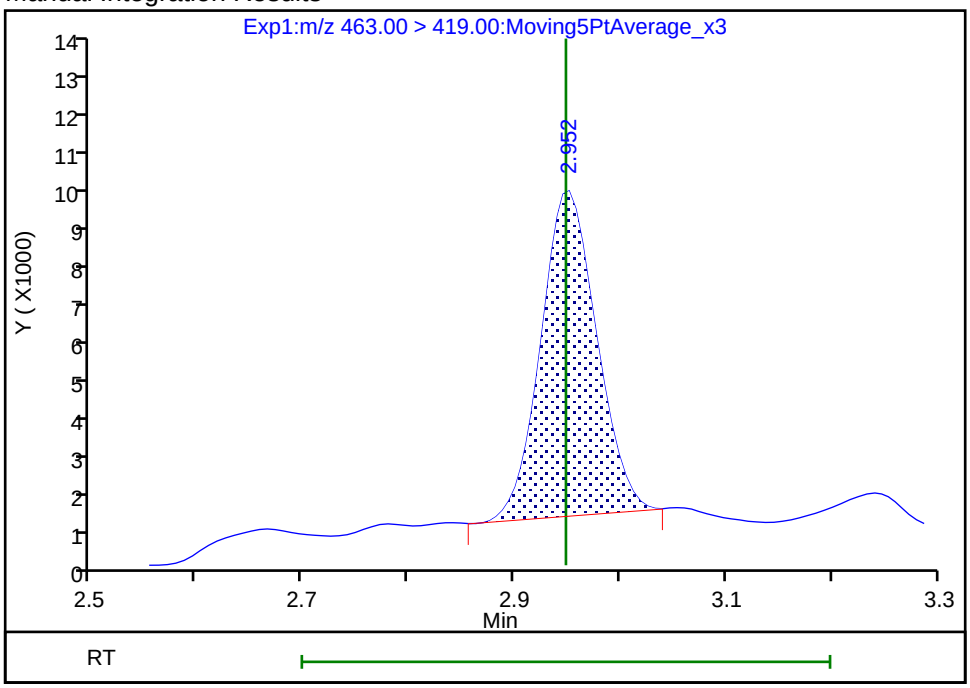
Processing Integration Results

RT: 2.95
Area: 31262
Amount: 0.024820
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 29706
Amount: 0.023752
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:25:05
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

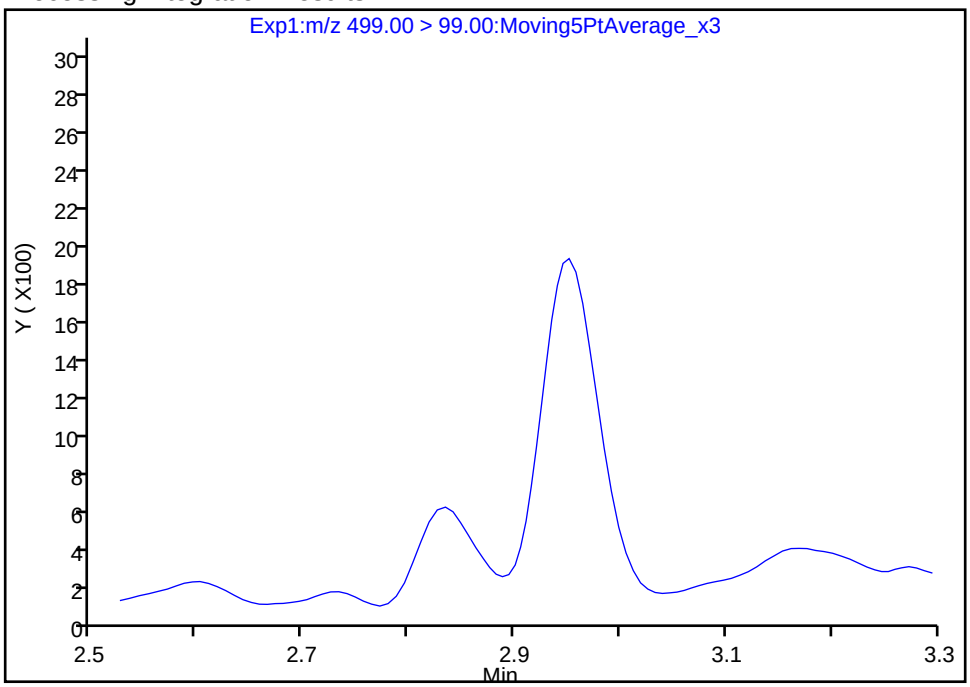
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

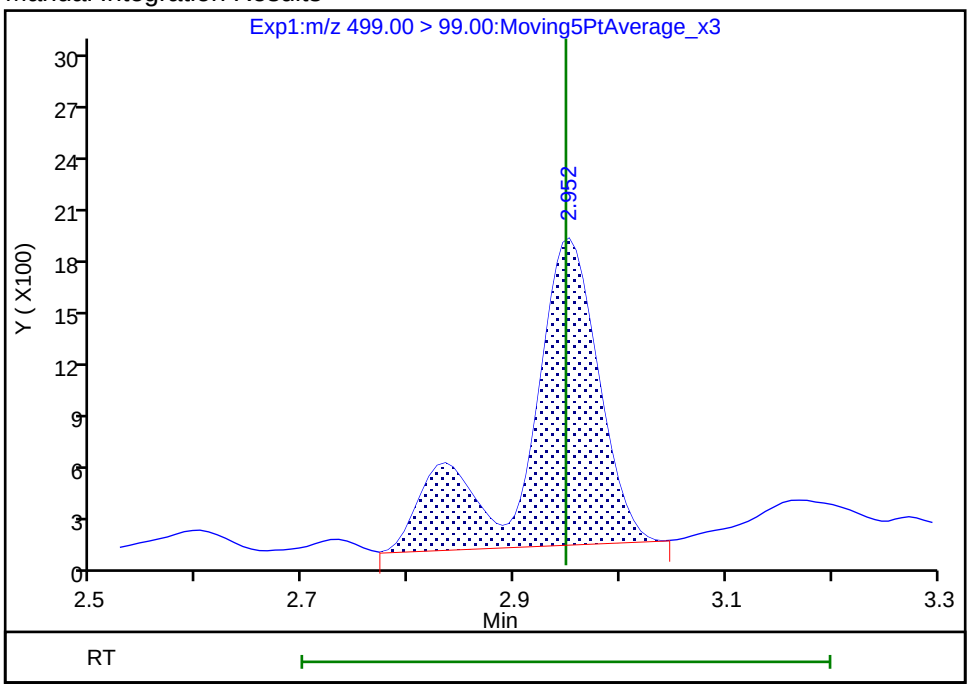
Processing Integration Results

RT: 2.95
Area: 0
Amount: 0.026262
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 8733
Amount: 0.025451
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:24:45

Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

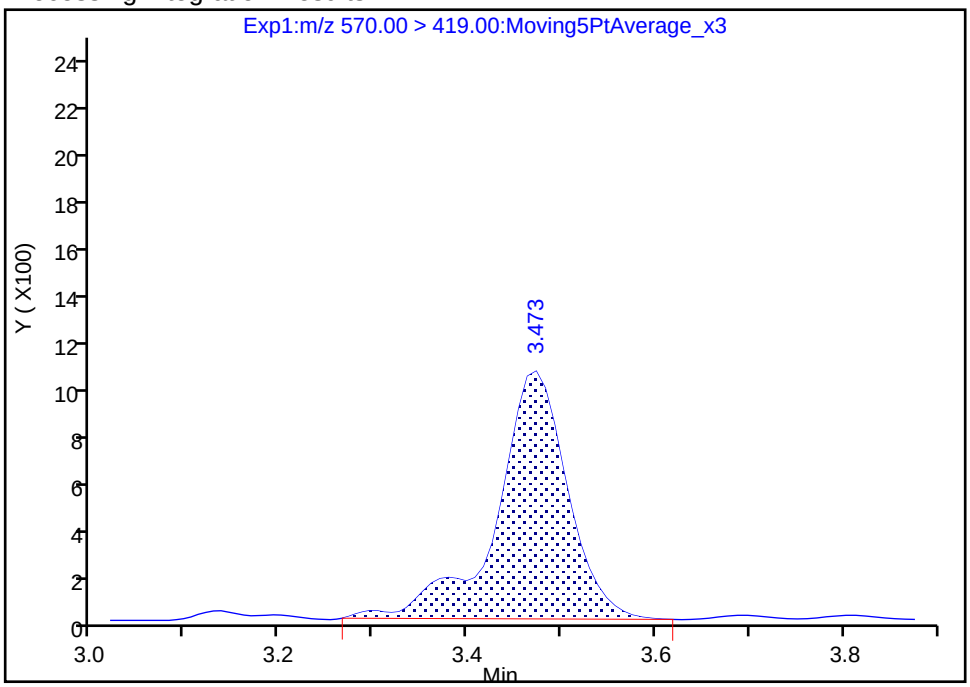
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

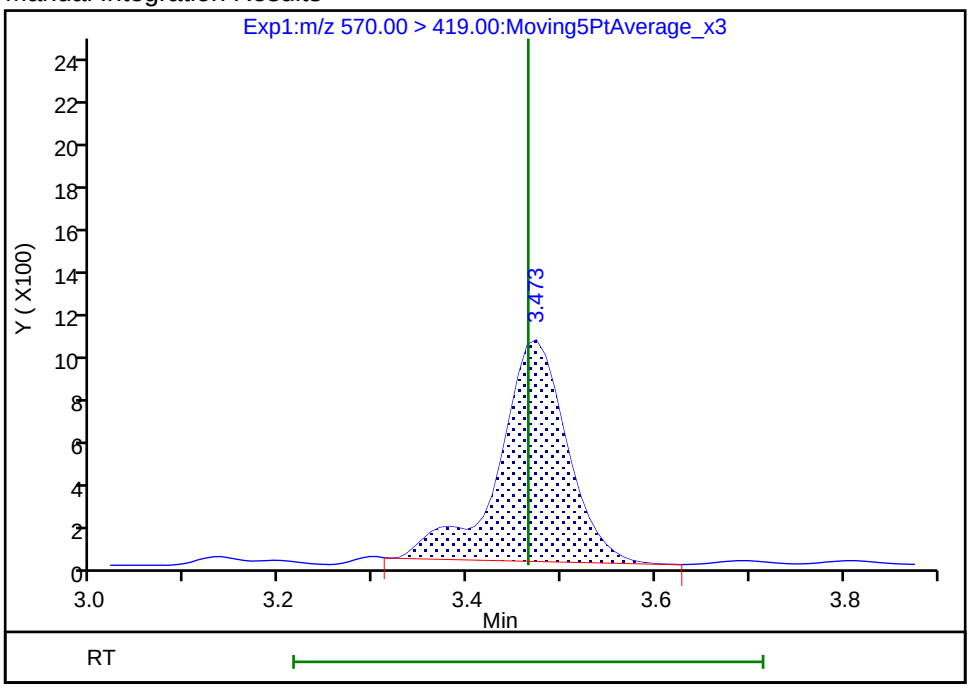
Processing Integration Results

RT: 3.47
Area: 5437
Amount: 0.026807
Amount Units: ng/ml



Manual Integration Results

RT: 3.47
Area: 5163
Amount: 0.025320
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:25:26

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

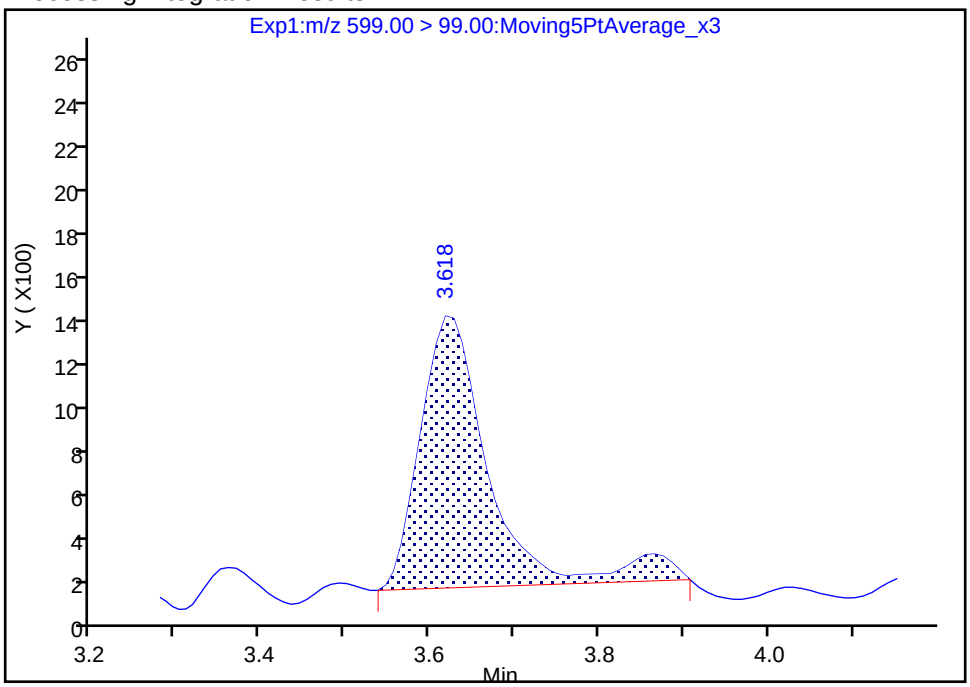
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

29 Perfluorodecane Sulfonic acid, CAS: 335-77-3

Signal: 2

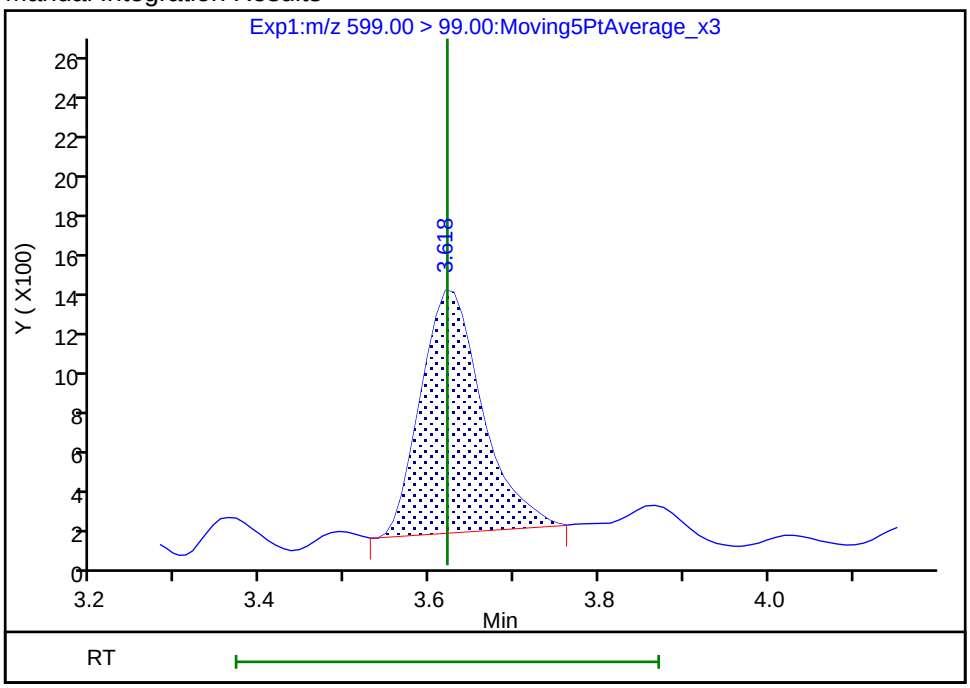
Processing Integration Results

RT: 3.62
Area: 6867
Amount: 0.022908
Amount Units: ng/ml



Manual Integration Results

RT: 3.62
Area: 6067
Amount: 0.022908
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:26:44

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

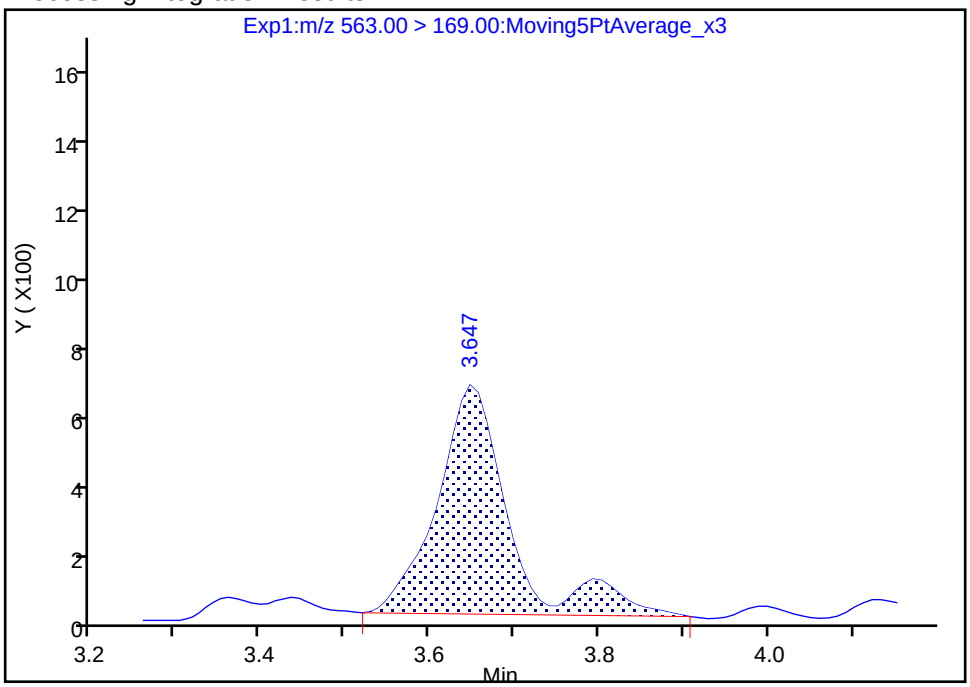
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

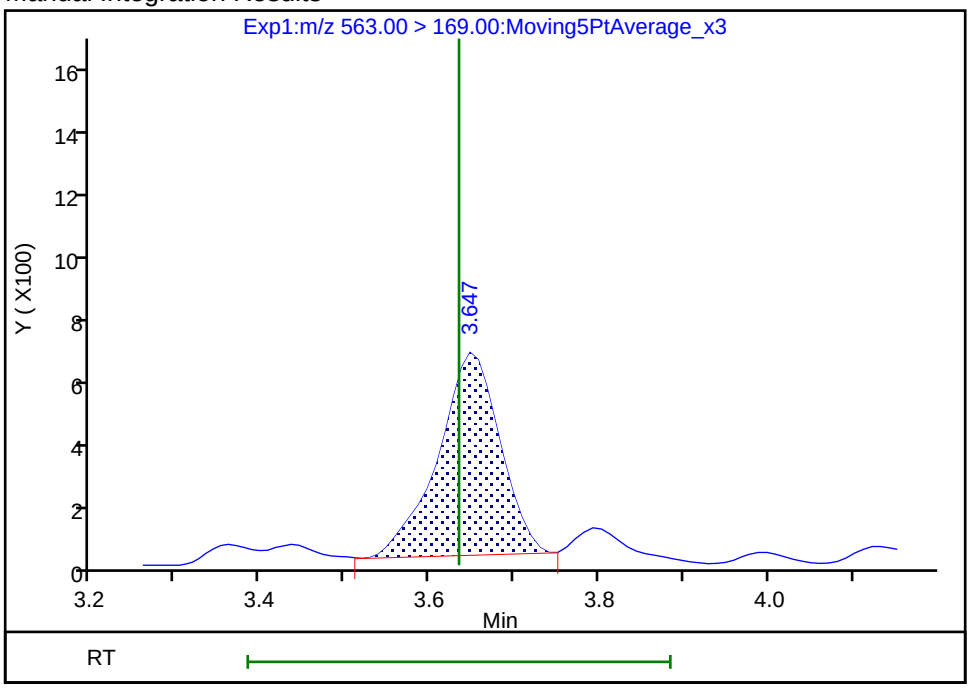
Processing Integration Results

RT: 3.65
Area: 3919
Amount: 0.031106
Amount Units: ng/ml



Manual Integration Results

RT: 3.65
Area: 3299
Amount: 0.031106
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:27:05

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

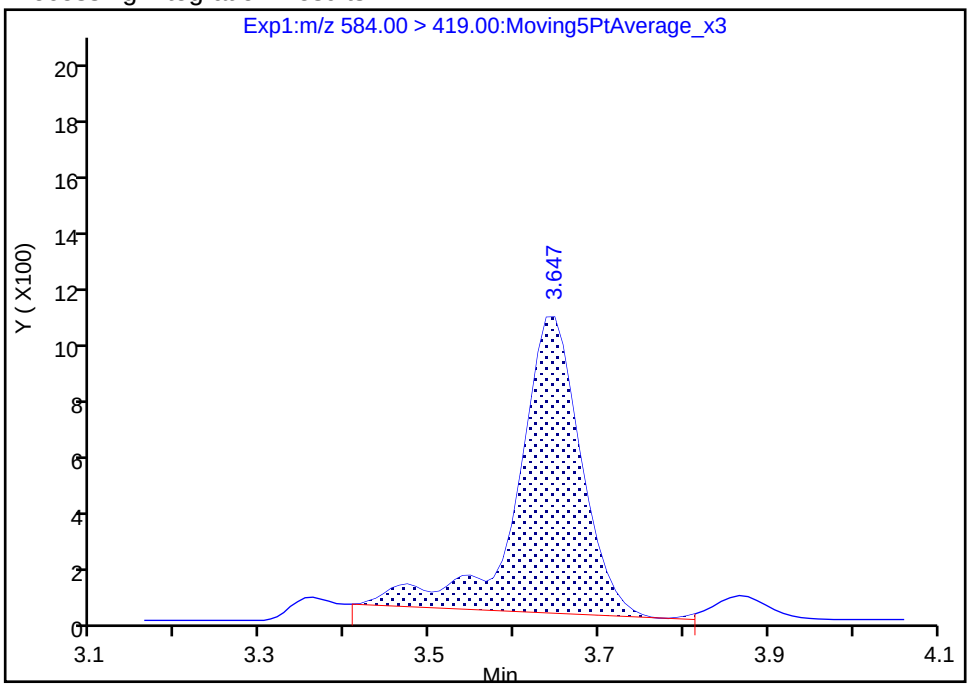
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_002.d				
Injection Date:	01-Aug-2018 12:59:04	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

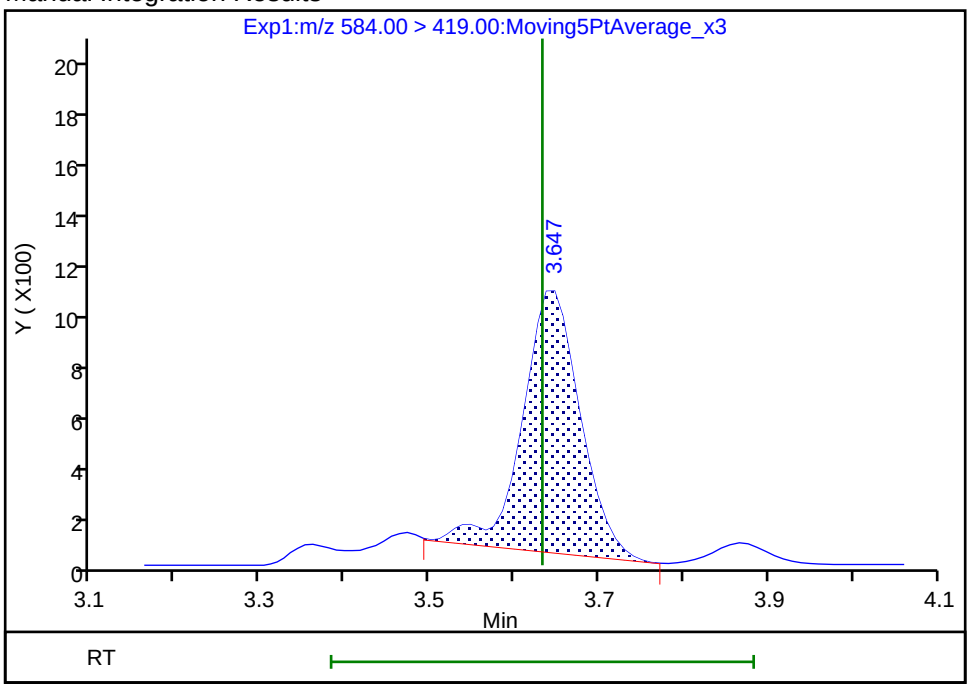
Processing Integration Results

RT: 3.65
Area: 5628
Amount: 0.028396
Amount Units: ng/ml



Manual Integration Results

RT: 3.65
Area: 4957
Amount: 0.025504
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:26:54

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 01-Aug-2018 13:06:53 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:39 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:31:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.395	0.002	0.540	5141928	2.45		98.1	74945	
2 Perfluorobutyric acid										
212.90 > 169.00	1.402	1.396	0.006	1.004	100773	0.0497		99.4	23.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.636	0.004	0.634	3382043	2.45		98.0	54096	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.636	0.004	1.000	86389	0.0533		107	31.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.669	0.006	0.647	89887	2.26		97.4	348	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.671	0.004	1.000	130464	0.0440		99.6	734	
298.90 > 99.00	1.675	1.671	0.004	1.000	56499		2.31(1.25-3.74)	99.6	234	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.872	0.004	0.725	632383	NC			6856	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.872	0.004	1.120	31260	0.0470		101	1851	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.903	0.002	0.736	3635013	2.43		97.3	79582	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.905	1.903	0.002	1.000	81976	0.0535		107	123	M
313.00 > 119.00	1.916	1.903	0.013	1.006	8717		9.40(5.03-15.10)	107	61.8	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.151	120606	0.0461		98.3	1899	
349.00 > 99.00	1.927	1.928	-0.001	1.151	46184		2.61(1.36-4.07)	98.3	266	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.000	0.014	0.778	179442	NC			4453	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	0.994	10701	NC			36.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.225	0.004	0.861	3553062	2.45		98.2	66788	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.229	2.226	0.003	1.000	79296	0.0481		96.2	32.7	M
363.00 > 169.00	2.229	2.226	0.003	1.000	37217		2.13(1.13-3.40)	96.2	328	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.237	0.003	1.000	118530	0.0484		106	688	
399.00 > 99.00	2.240	2.237	0.003	1.000	41157		2.88(1.50-4.49)	106	67.6	
D 11 18O2 PFHxS										
403.00 > 84.00	2.240	2.238	0.002	0.866	5006593	2.30		97.3	55144	
65 ADONA										
377.00 > 251.00	2.280	2.270	0.010	0.773	194813	NC			1691	
377.00 > 85.00	2.280	2.270	0.010	0.773	113714		1.71(0.84-2.53)		456	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.564	2.554	0.010	1.000	34779	0.0482		102	936	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.556	0.008	0.991	1036033	2.44		103	15008	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.580	0.0	0.997	3558329	2.55		102	52579	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.588	2.581	0.007	1.003	79819	0.0485		96.9	40.0	M
413.00 > 169.00	2.588	2.581	0.007	1.003	46881		1.70(0.84-2.52)	96.9	302	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.581	0.007		3640262	2.50			47450	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.587	0.001	0.878	98640	0.0499		105	1833	
449.00 > 99.00	2.588	2.587	0.001	0.878	26853		3.67(1.94-5.82)	105	226	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.946	0.002	1.139	3417703	2.27		95.2	45596	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.948	0.0	1.139	3085644	2.53		101	63218	
20 Perfluorononanoic acid										
463.00 > 419.00	2.953	2.949	0.004	1.002	68954	0.0517		103	105	
463.00 > 169.00	2.948	2.949	-0.001	1.000	16456		4.19(1.90-5.69)	103	876	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.953	2.949	0.004	1.002	75727	0.0472		102	600	
499.00 > 99.00	2.953	2.949	0.004	1.002	17304		4.38(2.31-6.93)	102	99.6	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.158	0.006	1.073	119615	NC			1581	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.292	0.007	1.000	28792	0.0500		104	1757	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.292	0.007	1.275	1020788	2.47		103	19201	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.295	0.004	1.119	51583	0.0502		105	1797	
549.00 > 99.00	3.299	3.295	0.004	1.119	19964		2.58(1.33-3.97)	105	132	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.306	0.001	1.278	2274867	2.50		99.9	36263	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.315	3.308	0.007	1.002	49086	0.0505		101	62.1	
513.00 > 169.00	3.307	3.308	-0.001	1.000	9842		4.99(2.36-7.09)	101	159	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.312	0.003	1.281	5311185	2.41		96.2	47157	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.313	0.002	1.000	102774	0.0490		98.0	1888	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.467	3.459	0.008	1.340	534311	2.42		96.7	11634	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.467	3.465	0.002	1.000	11798	0.0543		109	127	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.620	0.001	1.228	47682	0.0513		106	1719	
599.00 > 99.00	3.621	3.620	0.001	1.228	15861		3.01(1.39-4.16)	106	145	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.630	3.627	0.003	1.403	610182	2.57		103	9078	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.630	3.633	-0.003	1.000	9530	0.0438		87.6	216	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.634	0.006	1.406	1779877	2.54		101	31430	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.640	3.634	0.006	1.000	45391	0.0517		103	94.2	
563.00 > 169.00	3.640	3.634	0.006	1.000	9346		4.86(2.12-6.36)	103	385	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.792	0.003	1.287	168004	NC			5028	
D 36 13C2 PFDoA										
615.00 > 570.00	3.930	3.925	0.005	1.519	1524607	2.51		100	17103	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.930	3.927	0.003	1.000	32864	0.0498		99.5	9.8	
613.00 > 169.00	3.930	3.927	0.003	1.000	8696		3.78(2.13-6.40)	99.5	180	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.188	0.005	1.067	24421	0.0425		85.0	7.3	
663.00 > 169.00	4.193	4.188	0.005	1.067	7586		3.22(1.25-3.76)	85.0	76.7	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.423	0.003	1.000	7424	0.0553		111	107	
713.00 > 219.00	4.416	4.423	-0.007	0.998	4052		1.83(0.71-2.13)	111	64.9	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.423	0.003	1.710	1246501	2.44		97.8	5991	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.826	0.007	1.868	2126007	2.42		96.8	3087	
45 Perfluorohexadecanoic acid										M
813.00 > 769.00	4.833	4.827	0.006	1.000	56565	NC			3.7	M
813.00 > 169.00	4.833	4.827	0.006	1.000	9667		5.85(2.86-8.58)		103	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.167	5.166	0.001	1.069	44038	NC			13.9	
913.00 > 169.00	5.167	5.166	0.001	1.069	5315		8.29(3.83-11.48)		50.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:41 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d

Injection Date: 01-Aug-2018 13:06:53 Instrument ID: A8_N

Lims ID: IC L2 Full

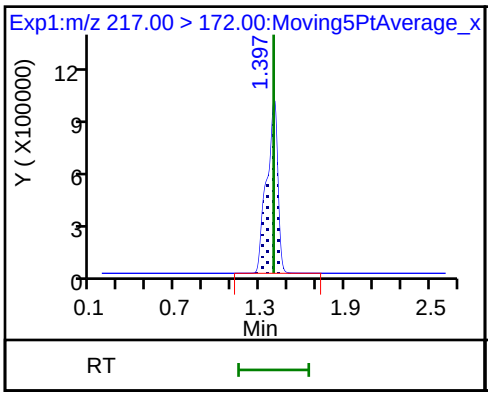
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 11 Worklist Smp#: 3

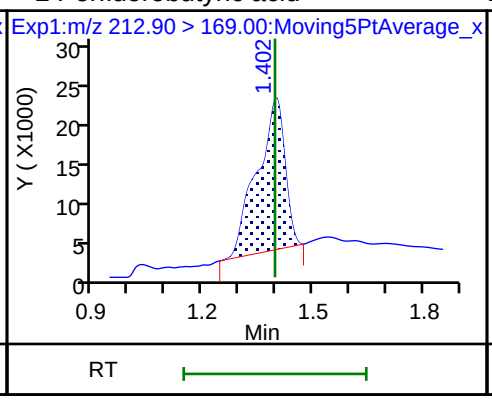
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

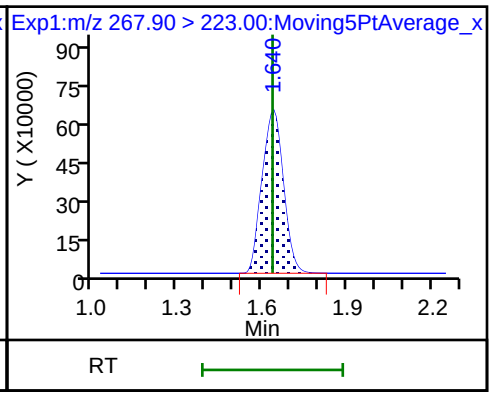
D 1 13C4 PFBA



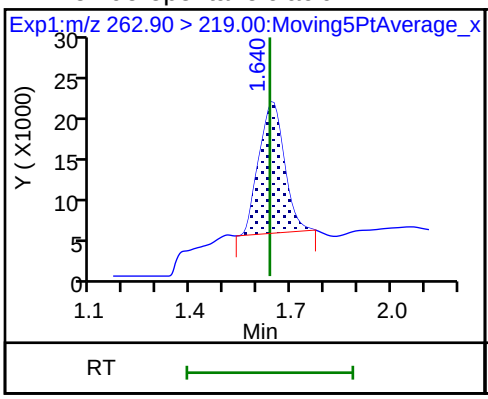
2 Perfluorobutyric acid



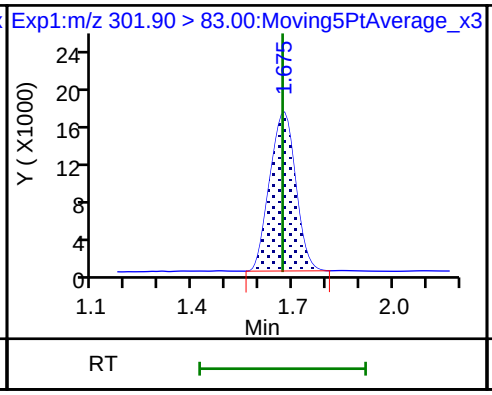
D 3 13C5-PFPeA



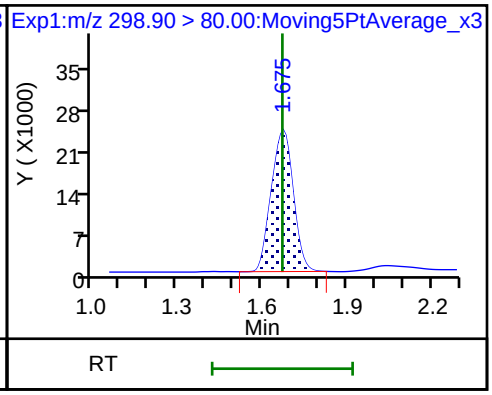
4 Perfluoropentanoic acid



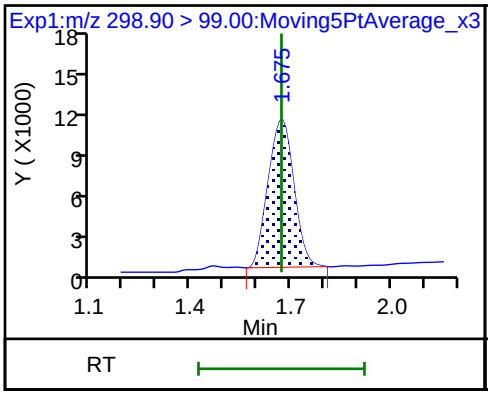
D 47 13C3-PFBS



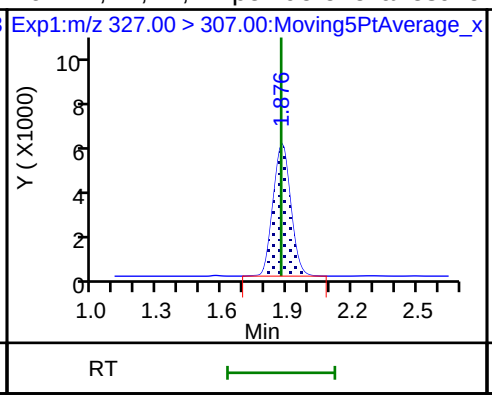
5 Perfluorobutanesulfonic acid



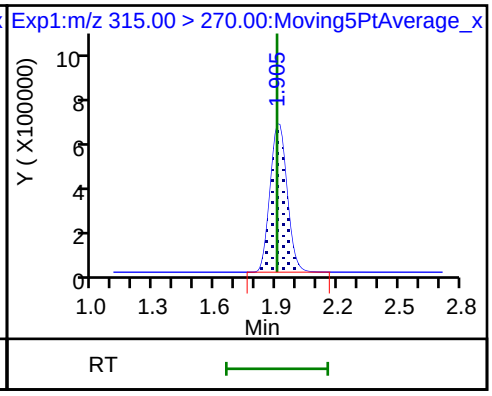
5 Perfluorobutanesulfonic acid



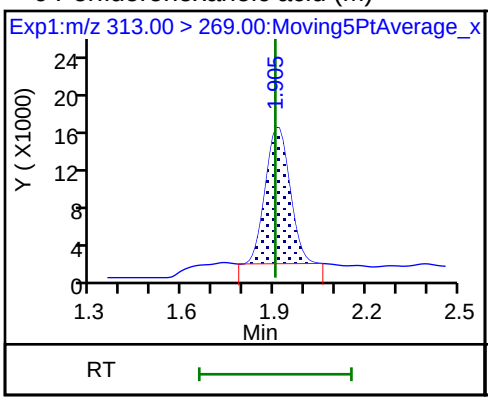
61 1H,1H,2H,2H-perfluorohexanesulfon



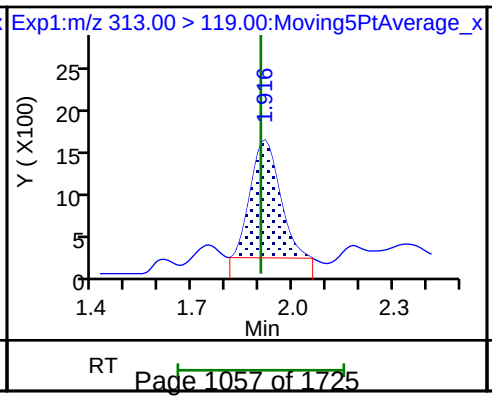
D 7 13C2 PFHxA



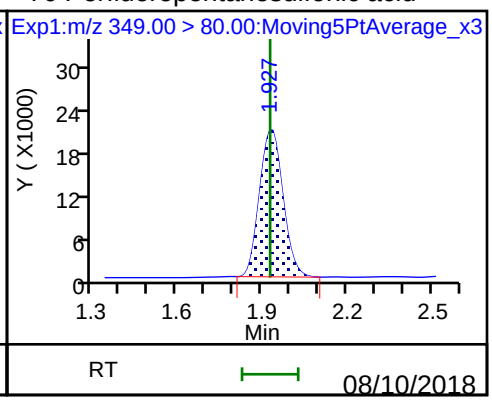
6 Perfluorohexanoic acid (M)



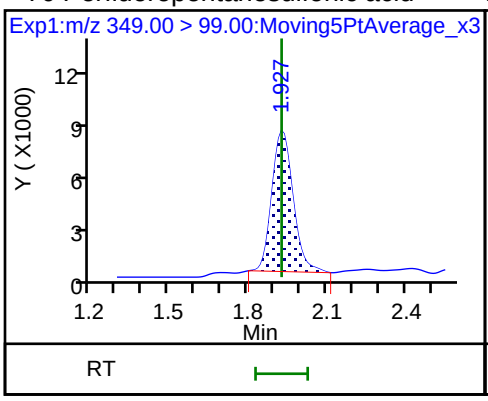
6 Perfluorohexanoic acid



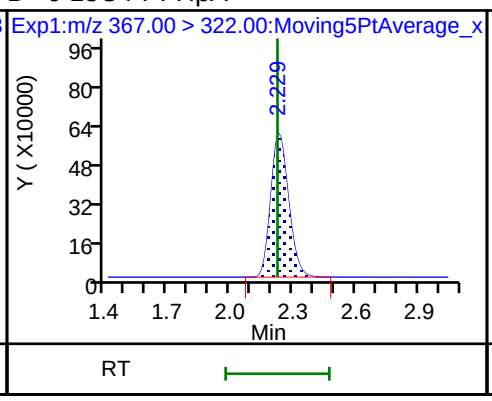
70 Perfluoropentanesulfonic acid



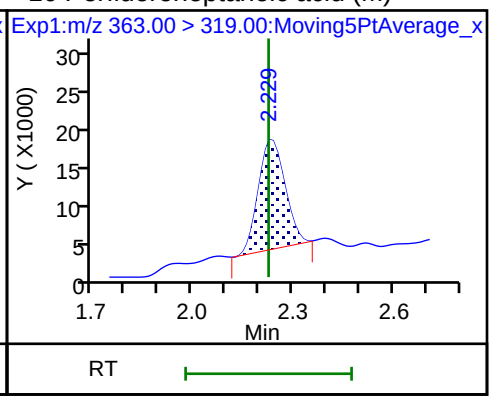
70 Perfluoropentanesulfonic acid



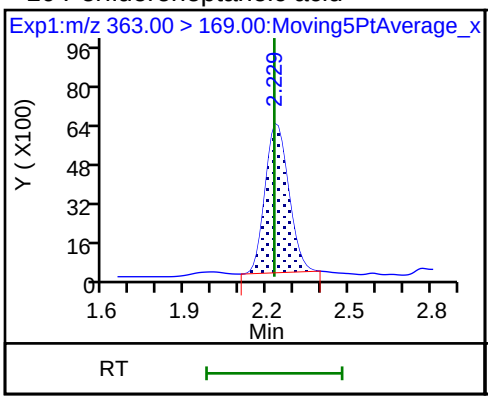
D 9 13C4-PFHpA



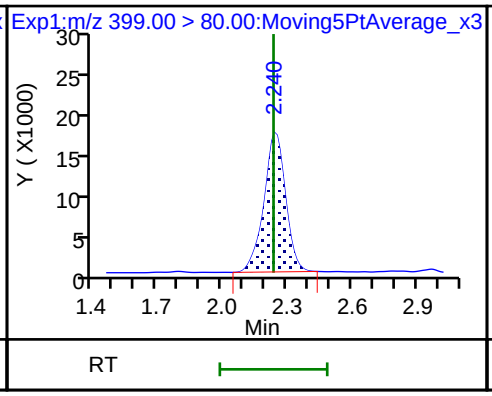
10 Perfluoroheptanoic acid (M)



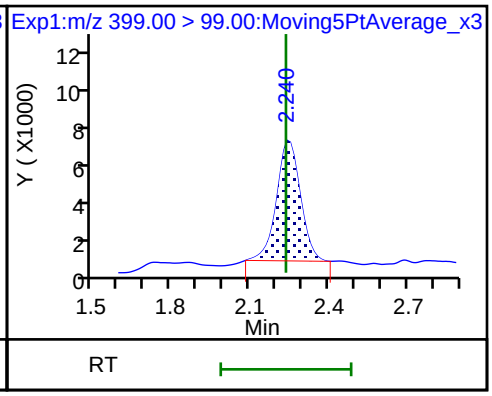
10 Perfluoroheptanoic acid



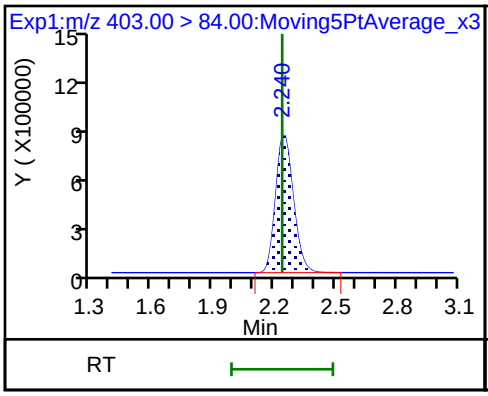
8 Perfluorohexanesulfonic acid



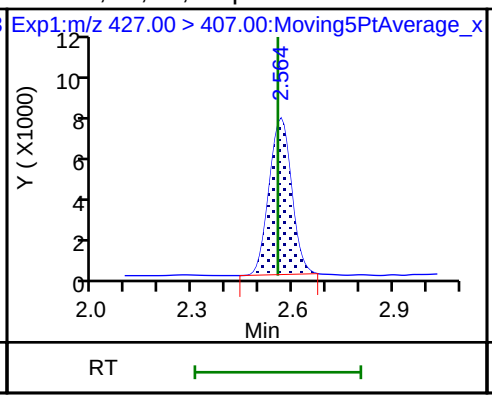
8 Perfluorohexanesulfonic acid



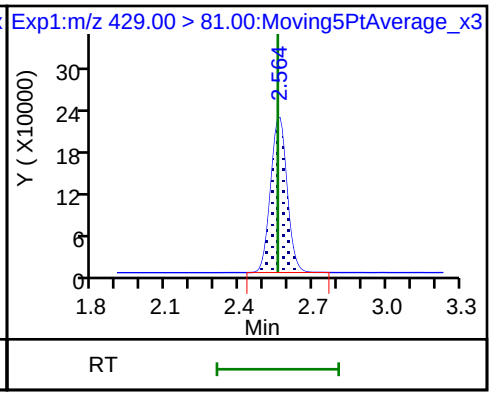
D 11 18O2 PFHxS



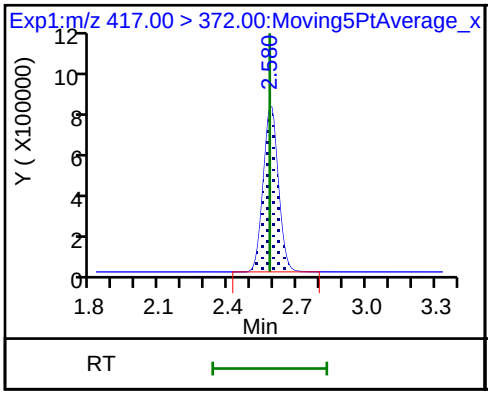
13 1H,1H,2H,2H-perfluorooctanesulfon



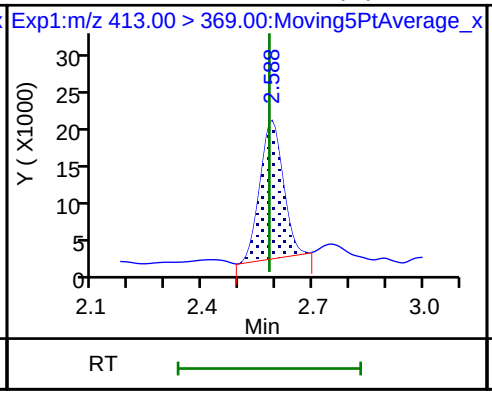
D 12 M2-6:2FTS



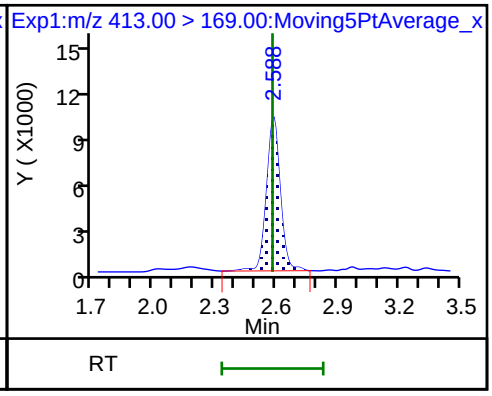
D 14 13C4 PFOA



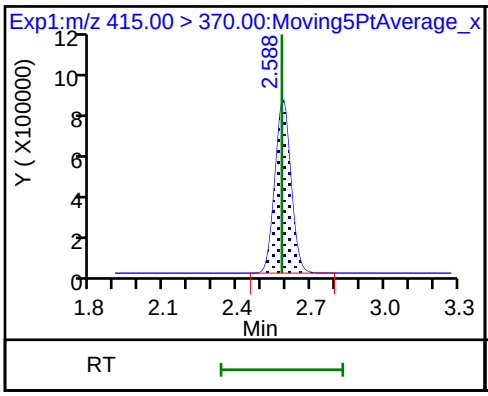
15 Perfluorooctanoic acid (M)



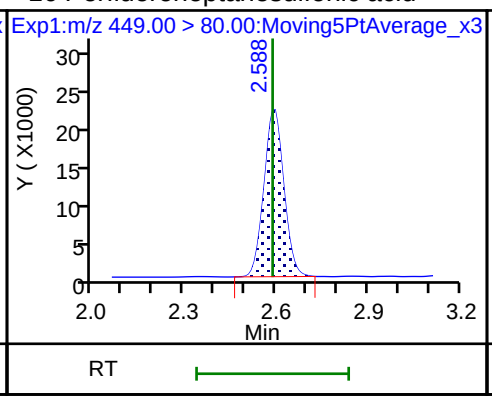
15 Perfluorooctanoic acid



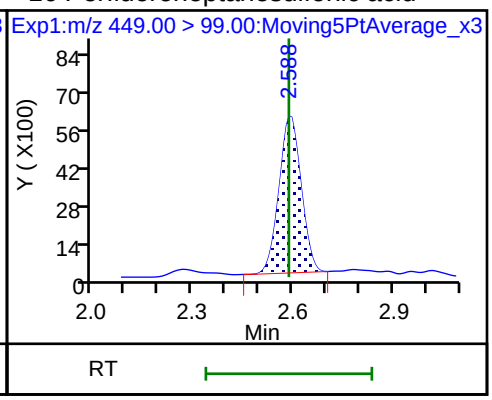
* 62 13C2-PFOA



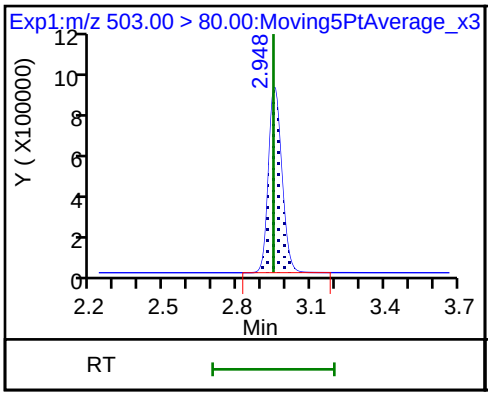
16 Perfluoroheptanesulfonic acid



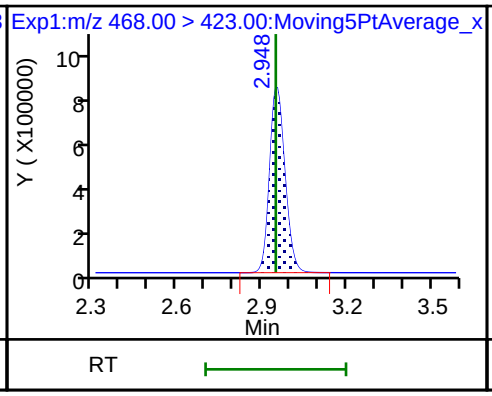
16 Perfluoroheptanesulfonic acid



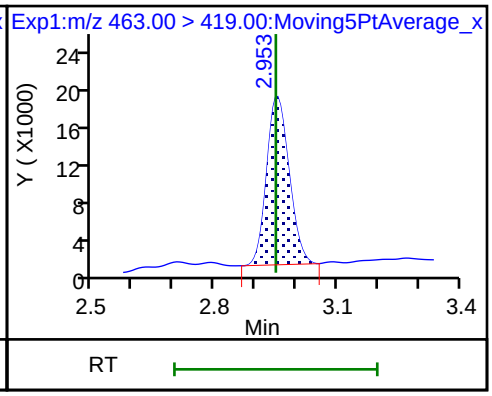
D 18 13C4 PFOS



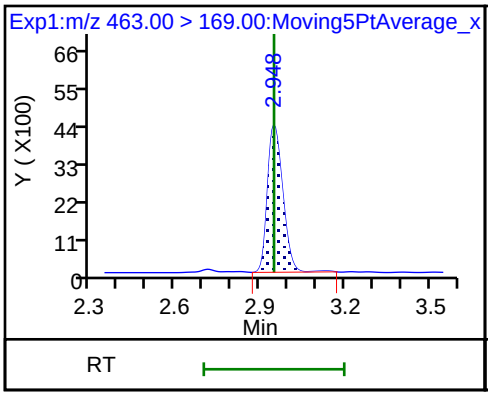
D 19 13C5 PFNA



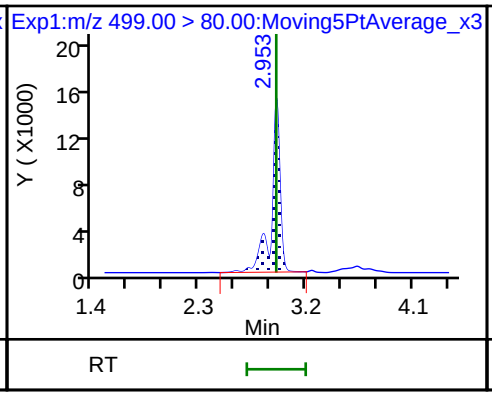
20 Perfluorononanoic acid



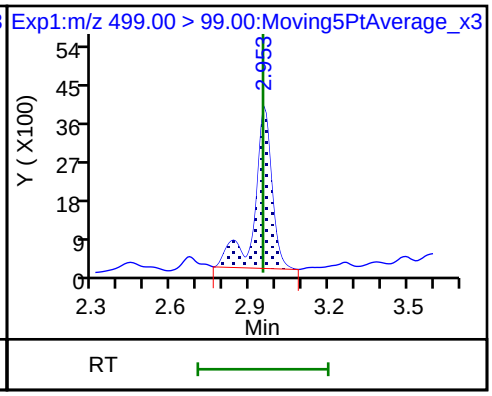
20 Perfluorononanoic acid



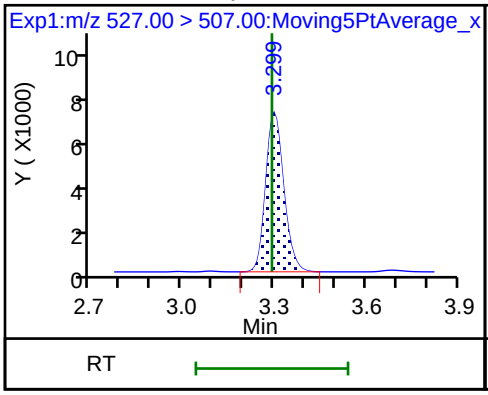
17 Perfluorooctane sulfonic acid



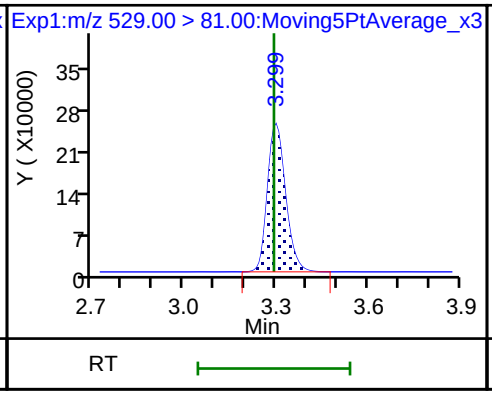
17 Perfluorooctane sulfonic acid



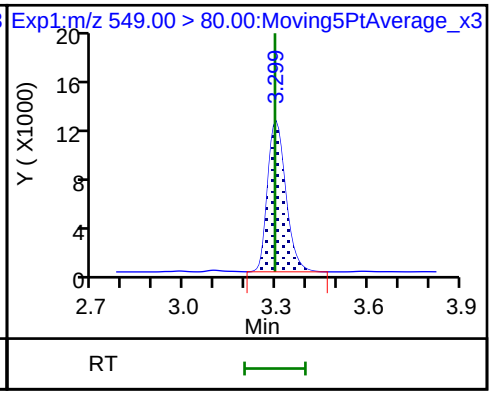
25 1H,1H,2H,2H-perfluorodecanesulfon



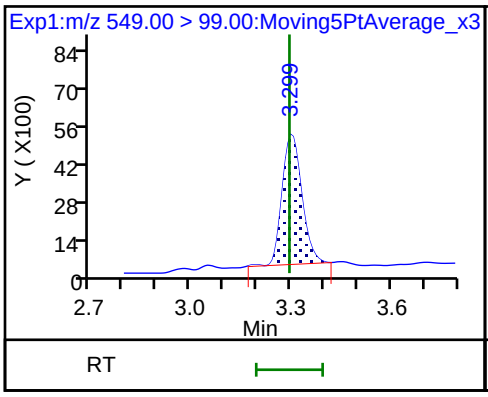
D 26 M2-8:2FTS



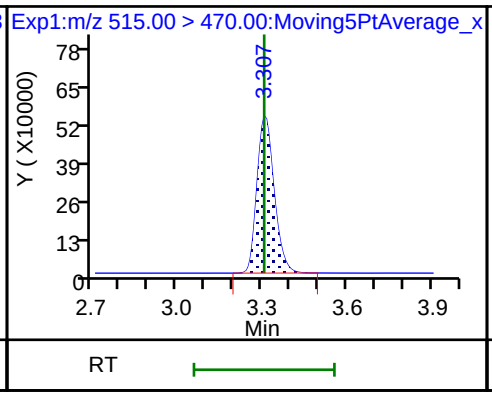
68 Perfluorononanesulfonic acid



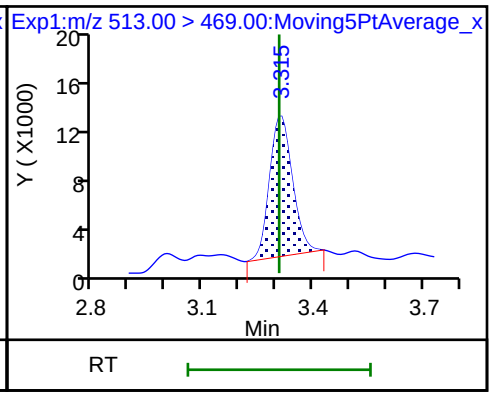
68 Perfluorononanesulfonic acid



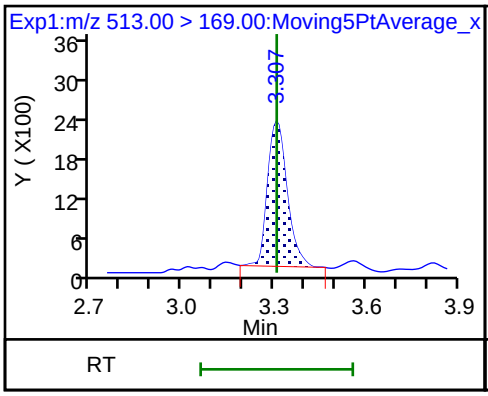
D 23 13C2 PFDA



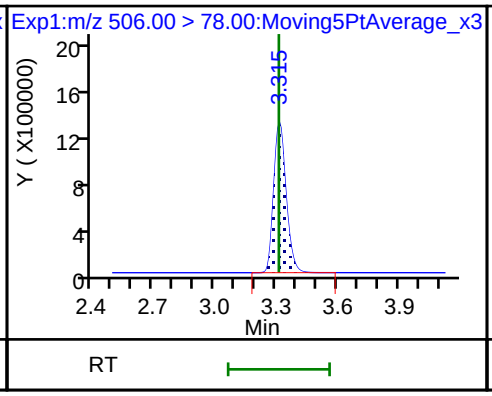
24 Perfluorodecanoic acid



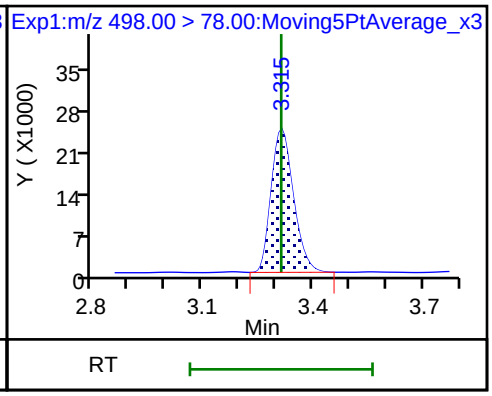
24 Perfluorodecanoic acid



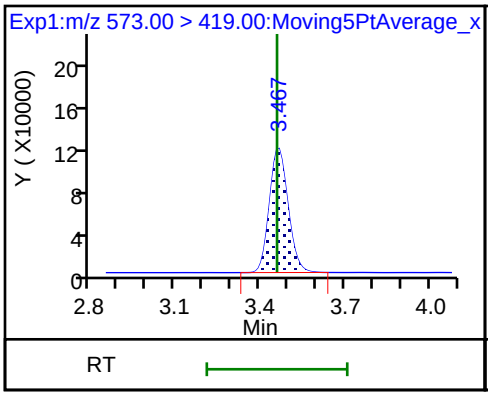
D 21 13C8 FOSA



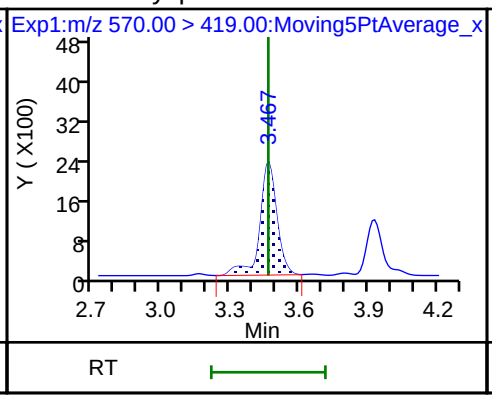
22 Perfluorooctane Sulfonamide



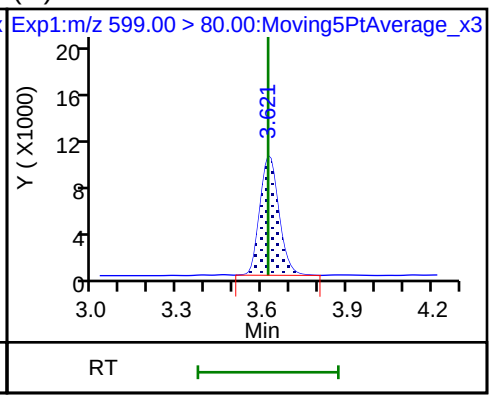
D 27 d3-NMeFOSAA



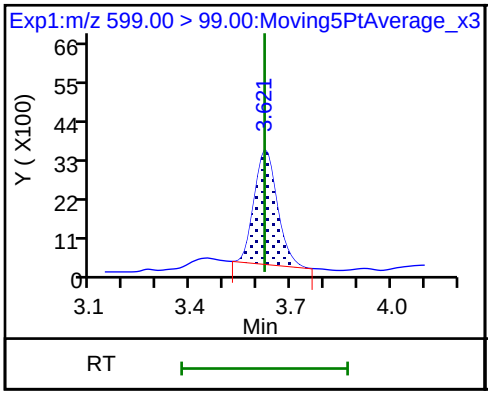
28 N-methyl perfluorooctane sulfonami (M)



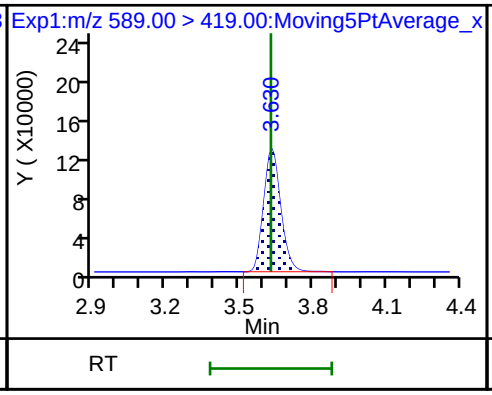
29 Perfluorodecane Sulfonic acid



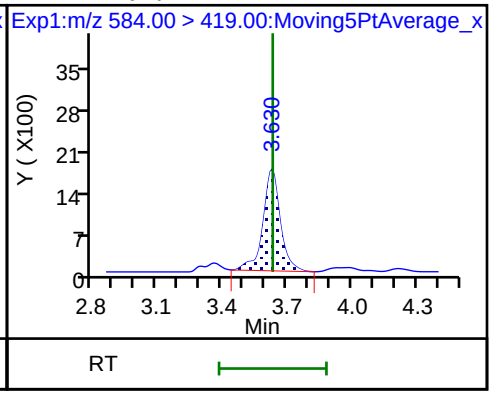
29 Perfluorodecane Sulfonic acid



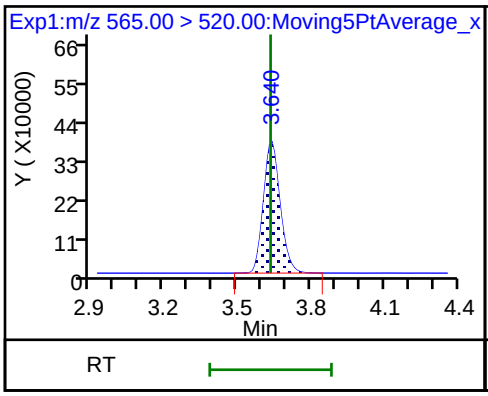
D 32 d5-NEtFOSAA



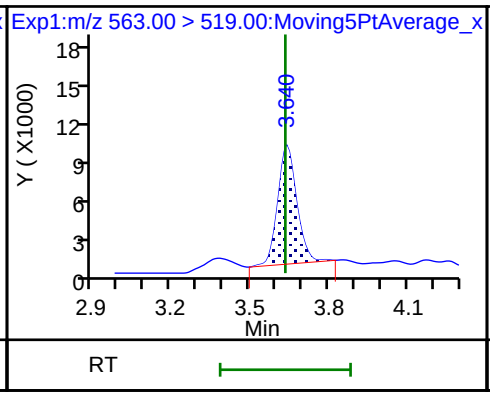
33 N-ethyl perfluorooctane sulfonamid



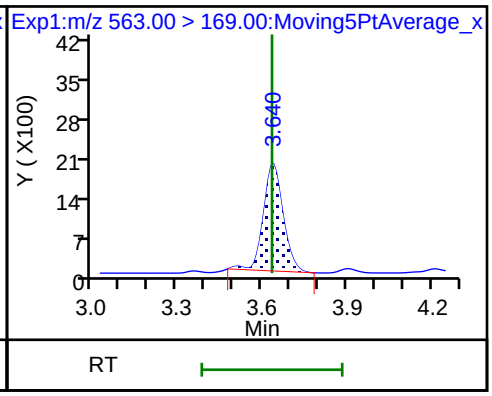
D 30 13C2 PFUnA



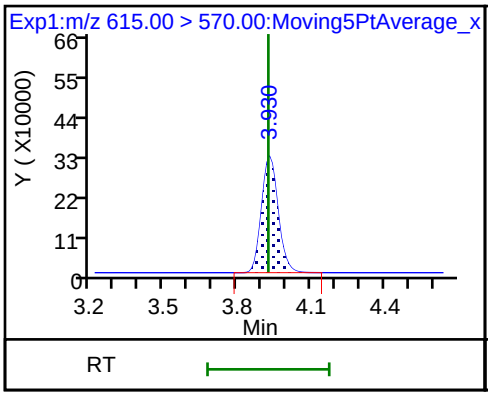
31 Perfluoroundecanoic acid



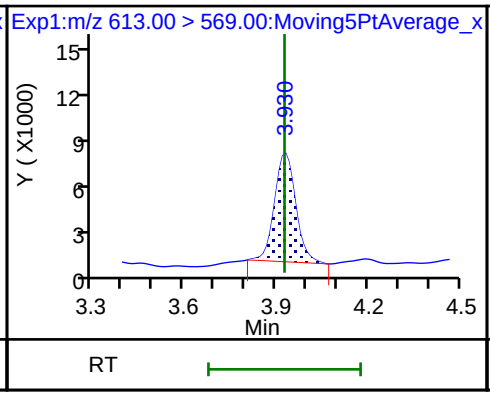
31 Perfluoroundecanoic acid



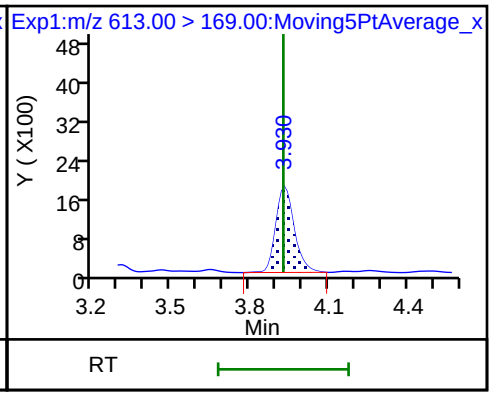
D 36 13C2 PFDoA



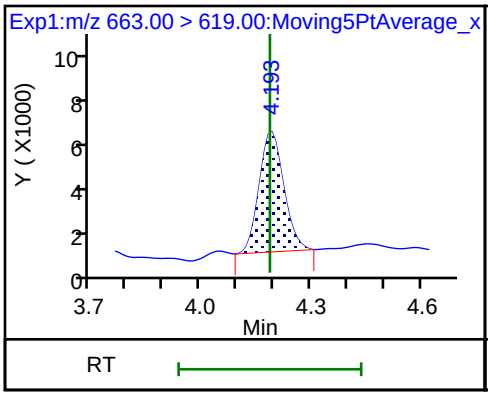
37 Perfluorododecanoic acid



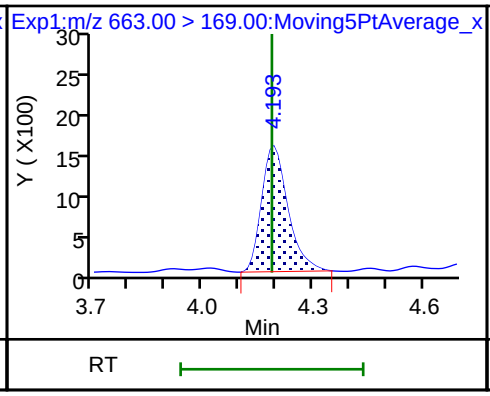
37 Perfluorododecanoic acid



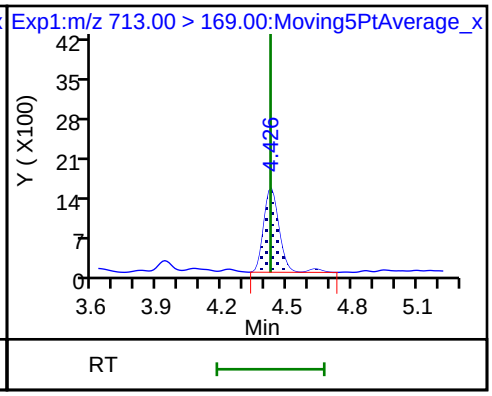
41 Perfluorotridecanoic acid



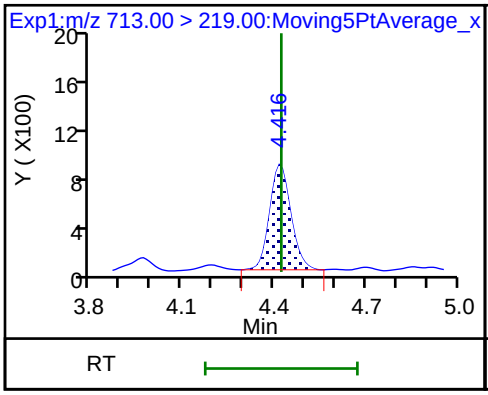
41 Perfluorotridecanoic acid



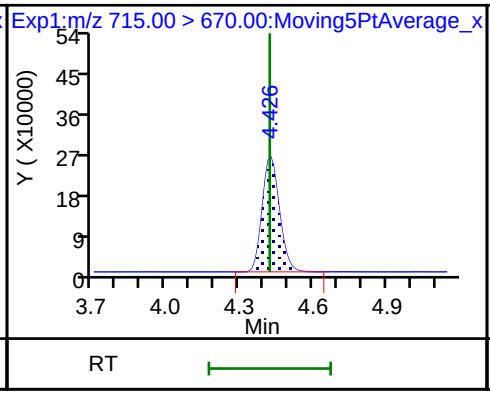
42 Perfluorotetradecanoic acid



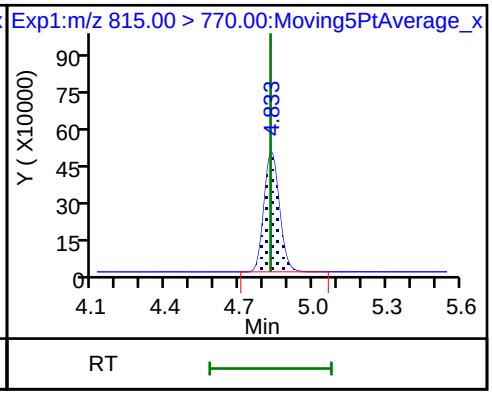
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

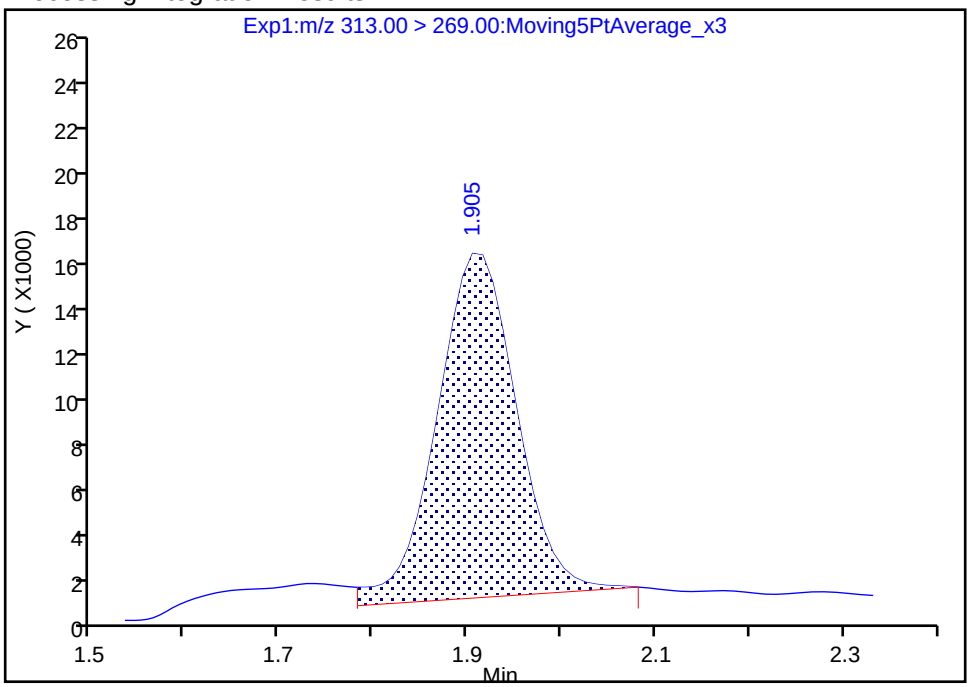
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

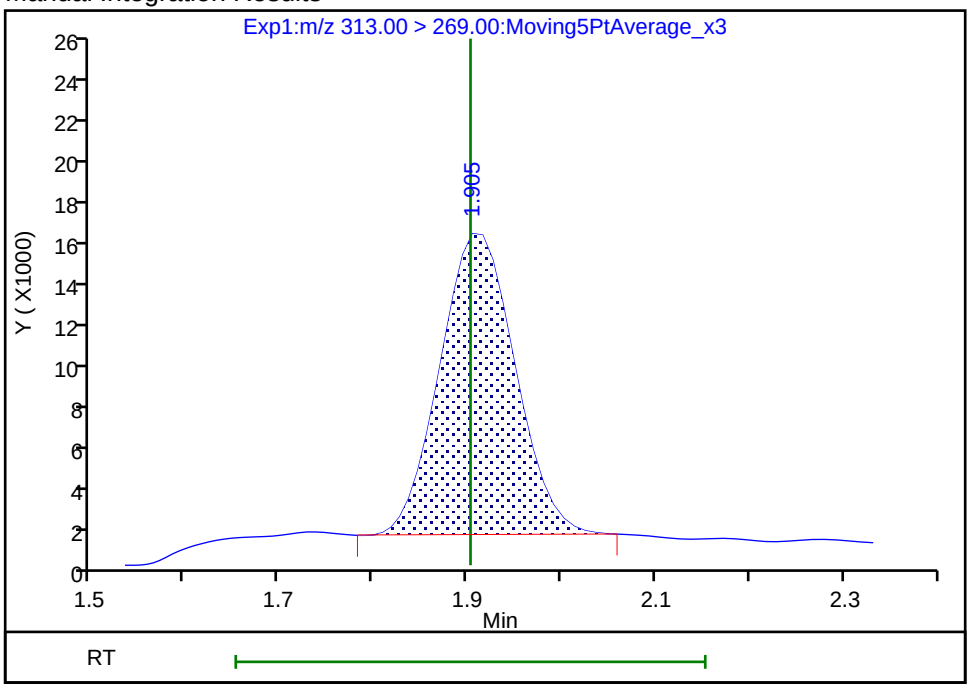
Processing Integration Results

RT: 1.91
Area: 89995
Amount: 0.057828
Amount Units: ng/ml



Manual Integration Results

RT: 1.91
Area: 81976
Amount: 0.053462
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:29:08

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

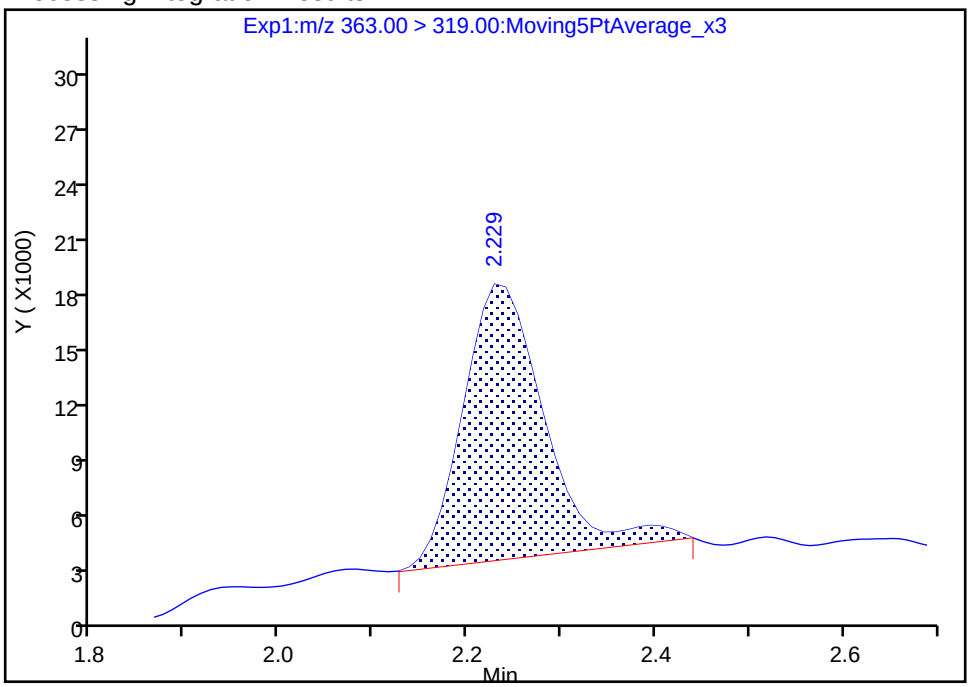
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

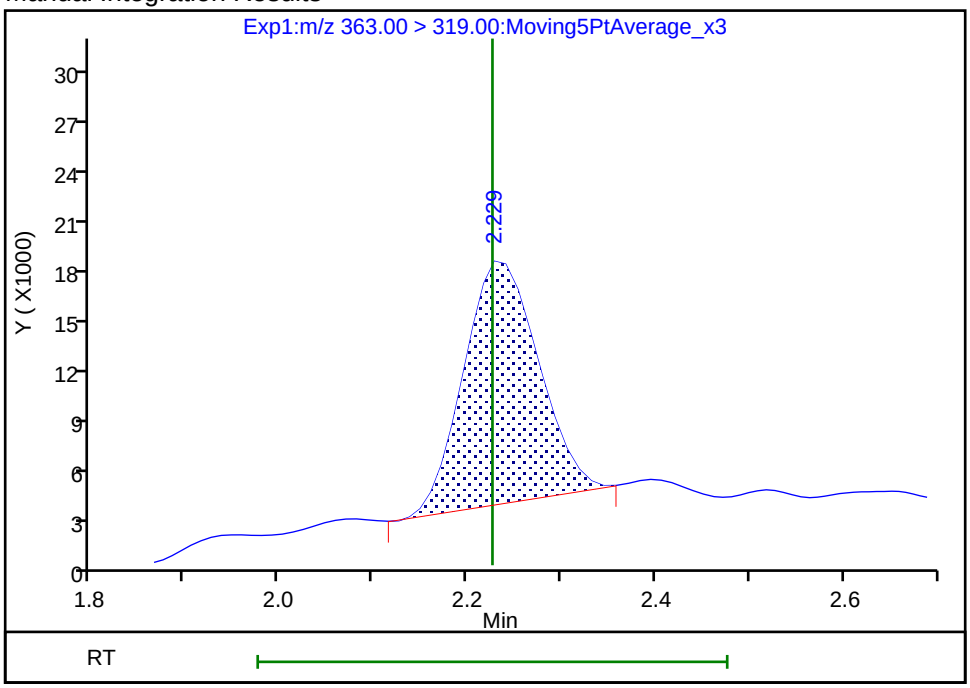
Processing Integration Results

RT: 2.23
Area: 88379
Amount: 0.052794
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 79296
Amount: 0.048114
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:29:25

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

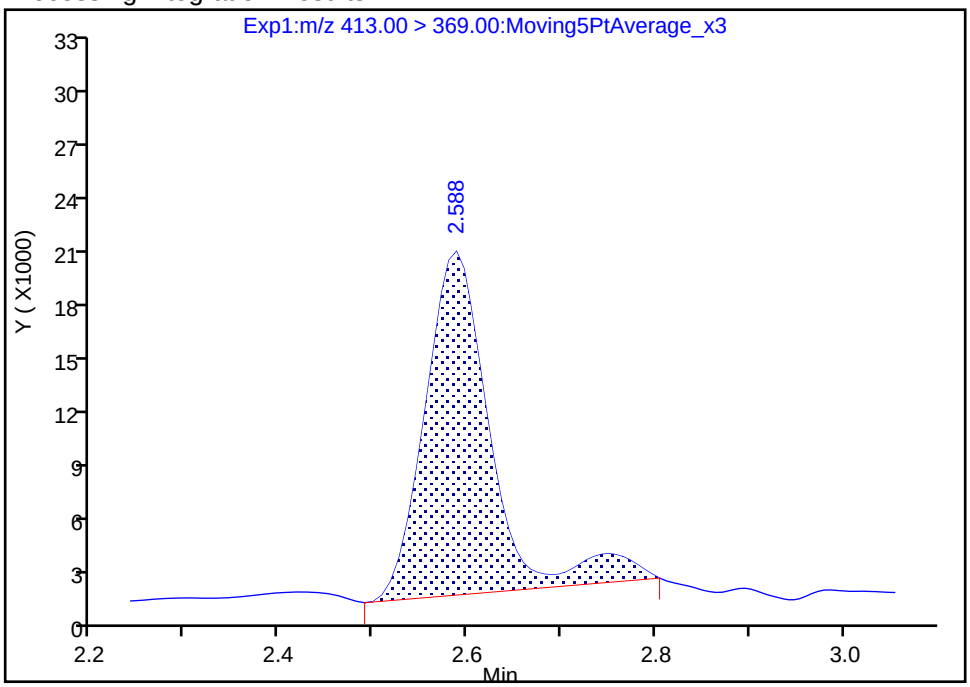
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

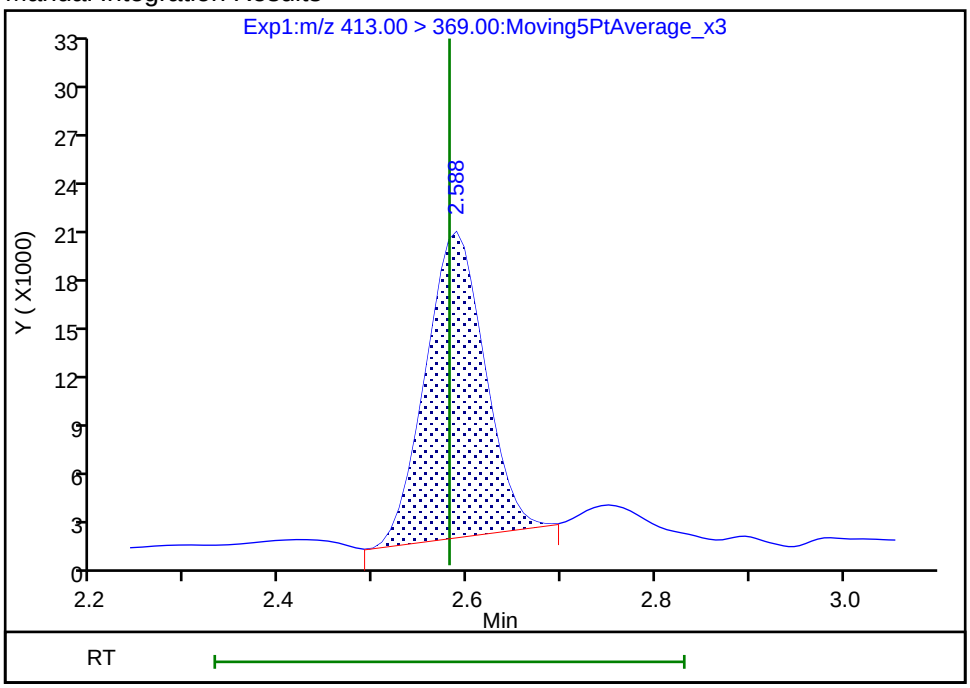
Processing Integration Results

RT: 2.59
Area: 90013
Amount: 0.053747
Amount Units: ng/ml



Manual Integration Results

RT: 2.59
Area: 79819
Amount: 0.048503
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:28:37

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

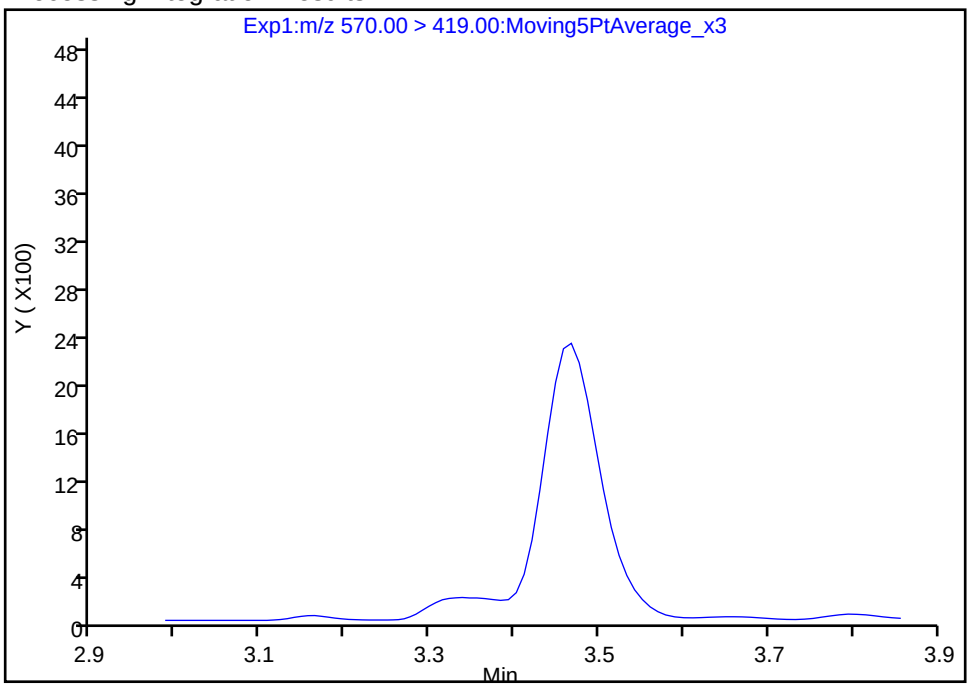
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_003.d				
Injection Date:	01-Aug-2018 13:06:53	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

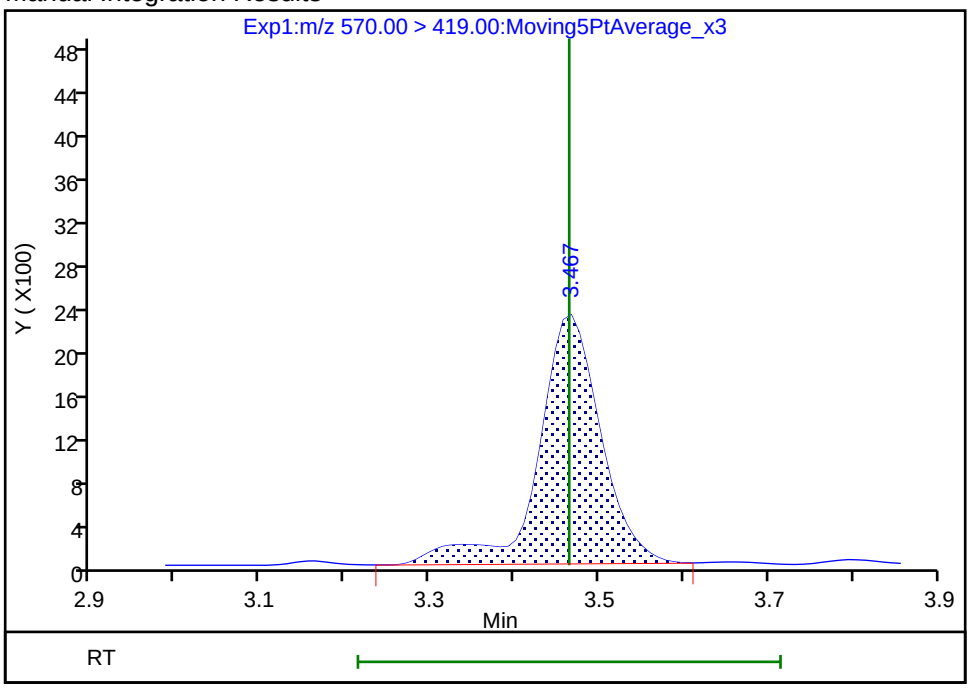
Not Detected
Expected RT: 3.46

Processing Integration Results



Manual Integration Results

RT: 3.47
Area: 11798
Amount: 0.054298
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:29:42
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 01-Aug-2018 13:14:43 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:43 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:32:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.395	0.003	0.540	4833356	2.39		95.7	89658	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.396	0.001	1.000	462891	0.2430		97.2	104	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.636	0.004	0.635	3283004	2.47		98.7	56857	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.636	0.004	1.000	385176	0.2450		98.0	143	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.645	85167	2.23		95.7	327	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.671	0.004	1.005	611203	0.2177		98.5	3163	
298.90 > 99.00	1.675	1.671	0.004	1.005	265854		2.30(1.25-3.74)	98.5	1104	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.872	0.004	0.726	612244	NC			5766	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.872	0.004	1.126	151962	0.2410		103	9089	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.903	0.002	0.737	3497268	2.43		97.2	101113	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.903	0.002	1.000	352293	0.2388		95.5	530	
313.00 > 119.00	1.905	1.903	0.002	1.000	35057		10.05(5.03-15.10)	95.5	338	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	572115	0.2309		98.4	10772	
349.00 > 99.00	1.927	1.928	-0.001	1.157	211889		2.70(1.36-4.07)	98.4	1247	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.000	0.003	0.775	165918	NC			5657	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	1.000	69749	NC			261	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.225	0.004	0.862	3413685	2.45		97.9	57432	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.226	0.003	1.000	400178	0.2527		101	165	
363.00 > 169.00	2.229	2.226	0.003	1.000	144272		2.77(1.13-3.40)	101	1607	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.237	0.004	1.000	492246	0.2146		94.3	2563	
399.00 > 99.00	2.241	2.237	0.004	1.000	176898		2.78(1.50-4.49)	94.3	290	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.867	4692968	2.24		94.6	40809	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.768	912723	NC			6763	
377.00 > 85.00	2.267	2.270	-0.003	0.768	516047		1.77(0.84-2.53)		1961	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.560	2.554	0.006	1.000	154602	0.2309		97.4	4116	
D 12 M2-6:2FTS										
429.00 > 81.00	2.560	2.556	0.004	0.991	961732	2.35		99.1	13733	
D 14 13C4 PFOA										
417.00 > 372.00	2.584	2.580	0.004	1.000	3335341	2.48		99.0	46480	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.584	2.581	0.003	1.000	378678	0.2455		98.1	236	
413.00 > 169.00	2.584	2.581	0.003	1.000	188937		2.00(0.84-2.52)	98.1	1155	
* 62 13C2-PFOA										
415.00 > 370.00	2.584	2.581	0.003		3508409	2.50			48346	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.592	2.587	0.005	0.879	436716	0.2226		93.5	7361	
449.00 > 99.00	2.592	2.587	0.005	0.879	122110		3.58(1.94-5.82)	93.5	1406	
D 18 13C4 PFOS										
503.00 > 80.00	2.951	2.946	0.005	1.142	3391354	2.34		98.0	33814	
D 19 13C5 PFNA										
468.00 > 423.00	2.951	2.948	0.003	1.142	2896674	2.47		98.7	59571	
20 Perfluorononanoic acid										
463.00 > 419.00	2.951	2.949	0.002	1.000	295007	0.2358		94.3	549	
463.00 > 169.00	2.951	2.949	0.002	1.000	74494		3.96(1.90-5.69)	94.3	1695	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.951	2.949	0.002	1.000	341410	0.2143		92.4	3442	
499.00 > 99.00	2.951	2.949	0.002	1.000	82300		4.15(2.31-6.93)	92.4	432	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.159	3.158	0.001	1.071	569724	NC			7887	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.292	0.003	1.000	130586	0.2451		102	7867	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.292	0.003	1.275	944227	2.37		98.9	14150	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.302	3.295	0.007	1.119	222331	0.2180		90.8	9052	
549.00 > 99.00	3.295	3.295	0.0	1.117	100259		2.22(1.33-3.97)	90.8	845	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.310	3.306	0.004	1.281	2112120	2.41		96.2	46081	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.310	3.308	0.002	1.000	230406	0.2555		102	324	
513.00 > 169.00	3.310	3.308	0.002	1.000	36327		6.34(2.36-7.09)	102	583	
D 21 13C8 FOSA										
506.00 > 78.00	3.318	3.312	0.006	1.284	5234016	2.46		98.4	65059	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.318	3.313	0.005	1.000	507693	0.2457		98.3	9280	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.463	3.459	0.004	1.340	521422	2.45		97.9	10409	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.465	-0.002	1.000	50086	0.2362		94.5	1029	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.618	3.620	-0.002	1.226	221097	0.2396		99.4	5766	
599.00 > 99.00	3.618	3.620	-0.002	1.226	66539		3.32(1.39-4.16)	99.4	626	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.627	0.0	1.404	571651	2.50		100	5691	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.637	3.633	0.004	1.003	51670	0.2536		101	1206	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.634	0.003	1.407	1682161	2.49		99.5	32258	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.637	3.634	0.003	1.000	186462	0.2249		90.0	400	
563.00 > 169.00	3.637	3.634	0.003	1.000	38148		4.89(2.12-6.36)	90.0	1315	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.285	804413	NC			13958	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.925	0.003	1.520	1396187	2.38		95.4	17277	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.927	0.001	1.000	145817	0.2411		96.5	45.4	
613.00 > 169.00	3.928	3.927	0.001	1.000	37372		3.90(2.13-6.40)	96.5	608	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.188	0.004	1.067	128866	0.2448		97.9	41.7	
663.00 > 169.00	4.192	4.188	0.004	1.067	39055		3.30(1.25-3.76)	97.9	312	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.425	4.423	0.002	1.000	31626	0.2425		97.0	380	
713.00 > 219.00	4.415	4.423	-0.008	0.998	22264		1.42(0.71-2.13)	97.0	338	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.423	0.002	1.713	1210263	2.46		98.5	5695	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.826	-0.003	1.866	2101845	2.48		99.3	2996	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.832	4.827	0.005	1.002	213563	NC			13.7	
813.00 > 169.00	4.832	4.827	0.005	1.002	37996		5.62(2.86-8.58)		459	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.165	5.166	-0.001	1.071	215624	NC			69.1	
913.00 > 169.00	5.165	5.166	-0.001	1.071	26376		8.18(3.83-11.48)		263	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_004.d

Injection Date: 01-Aug-2018 13:14:43 Instrument ID: A8_N

Lims ID: IC L3 Full

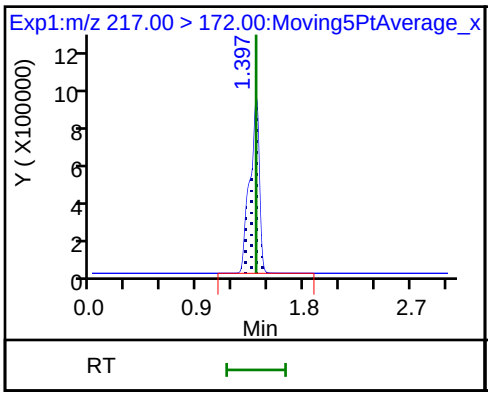
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 12 Worklist Smp#: 4

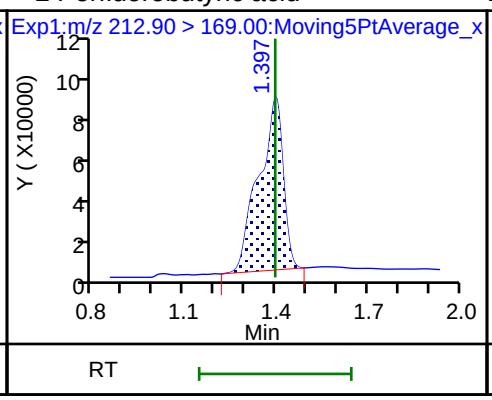
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

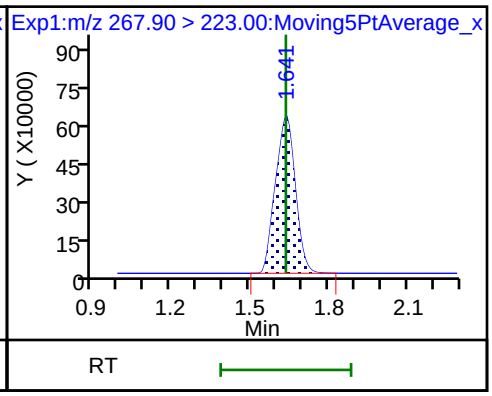
D 1 13C4 PFBA



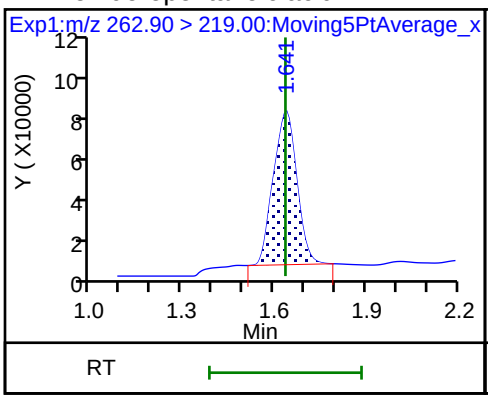
2 Perfluorobutyric acid



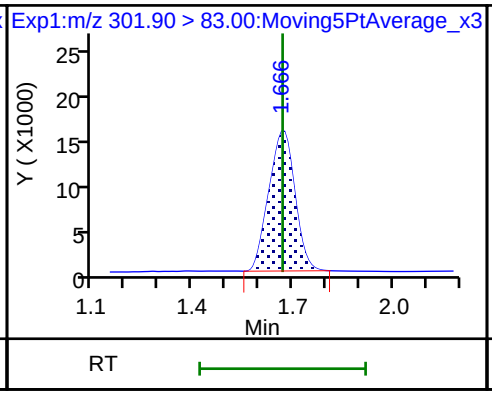
D 3 13C5-PFPeA



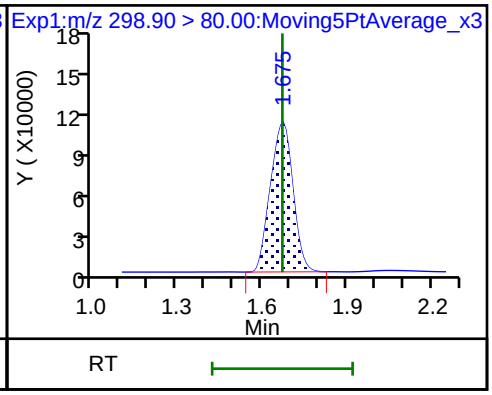
4 Perfluoropentanoic acid



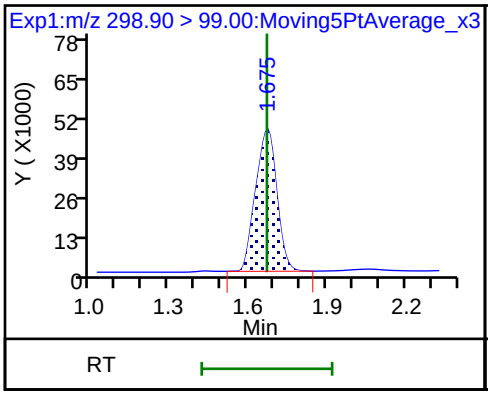
D 47 13C3-PFBS



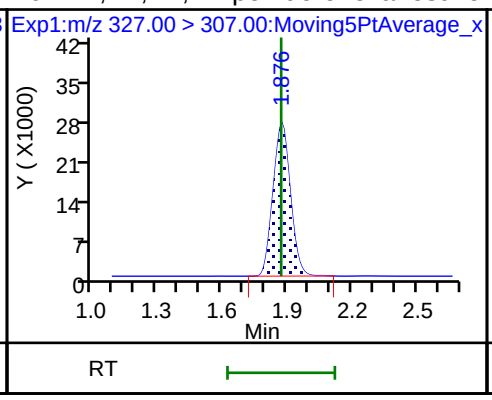
5 Perfluorobutanesulfonic acid



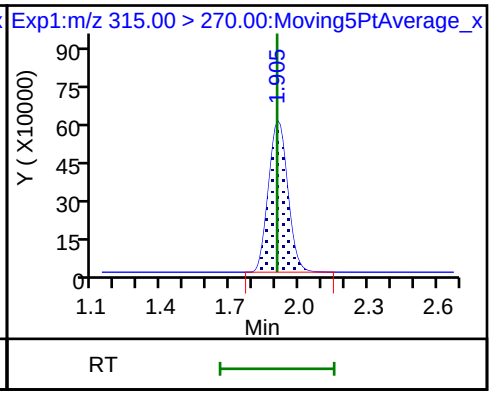
5 Perfluorobutanesulfonic acid



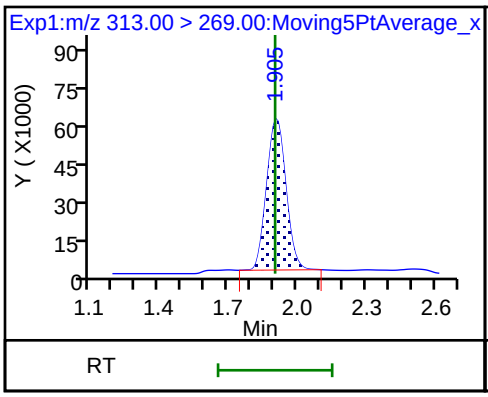
61 1H,1H,2H,2H-perfluorohexanesulfon



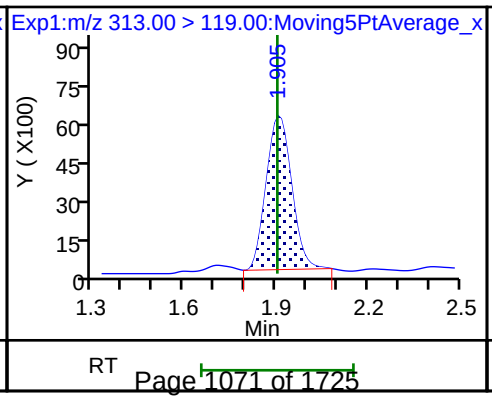
D 7 13C2 PFHxA



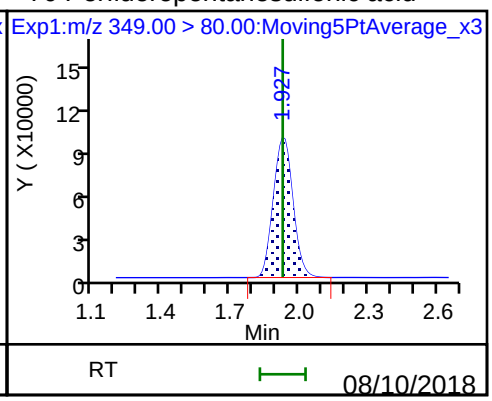
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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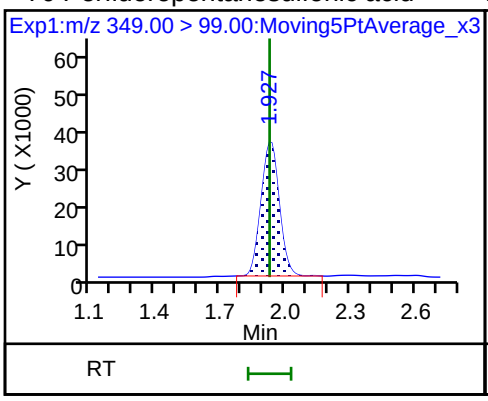
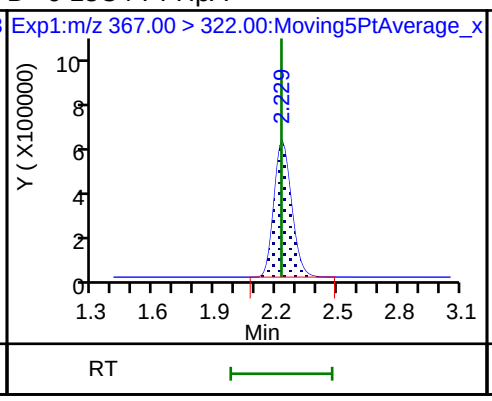
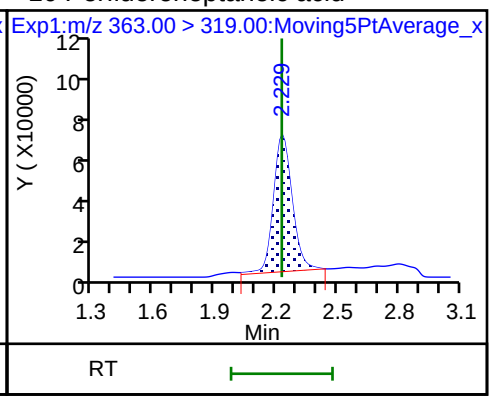


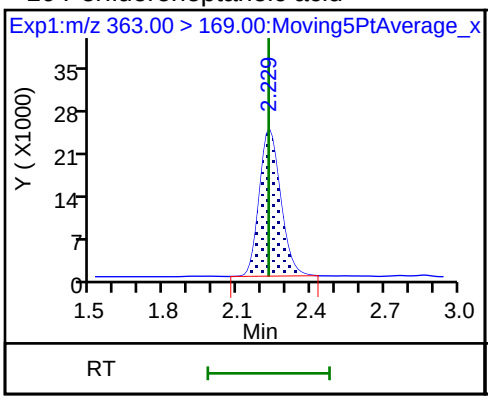
D 9 13C4-PFHpA



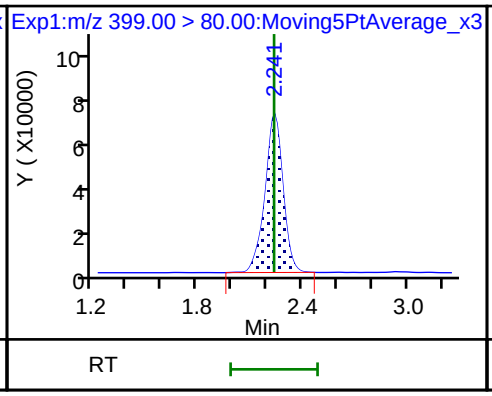
10 Perfluoroheptanoic acid



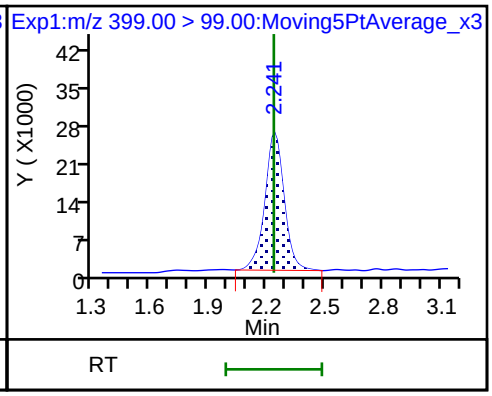
10 Perfluoroheptanoic acid



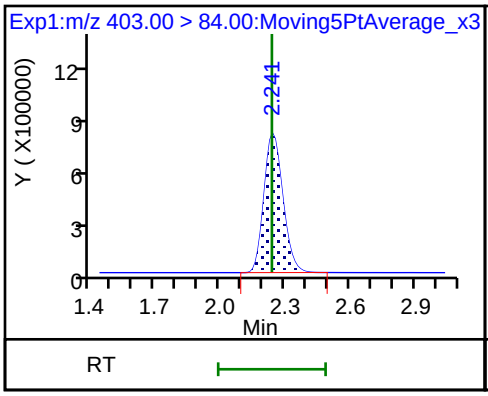
8 Perfluorohexanesulfonic acid



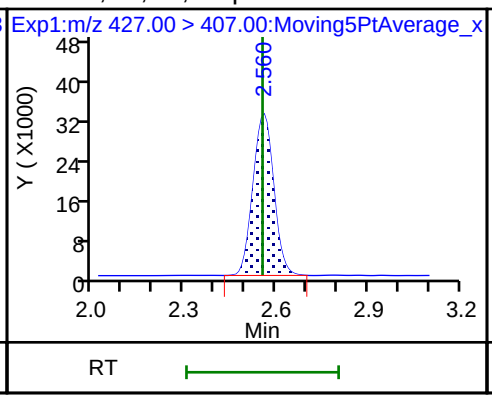
8 Perfluorohexanesulfonic acid



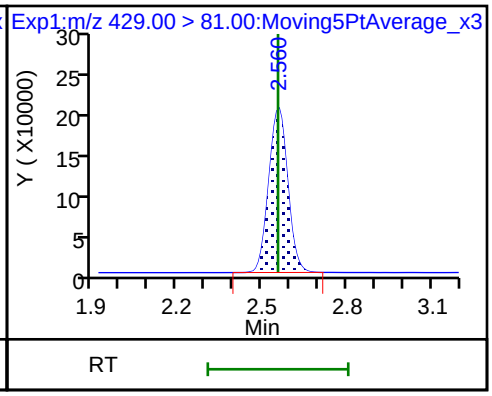
D 11 18O2 PFHxS



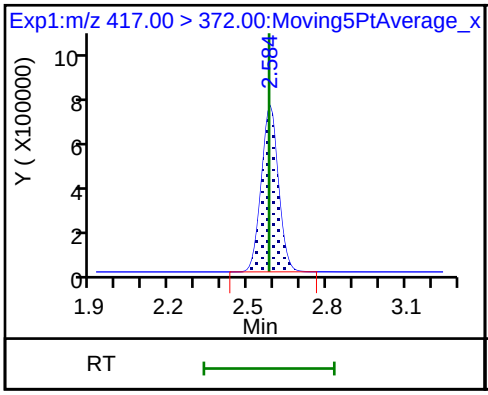
13 1H,1H,2H,2H-perfluorooctanesulfon



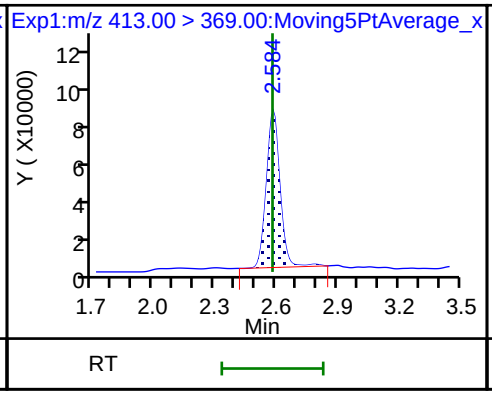
D 12 M2-6:2FTS



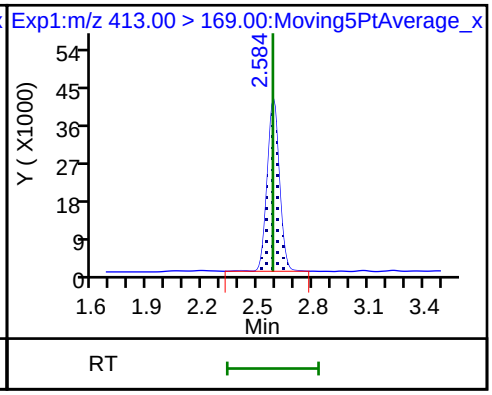
D 14 13C4 PFOA



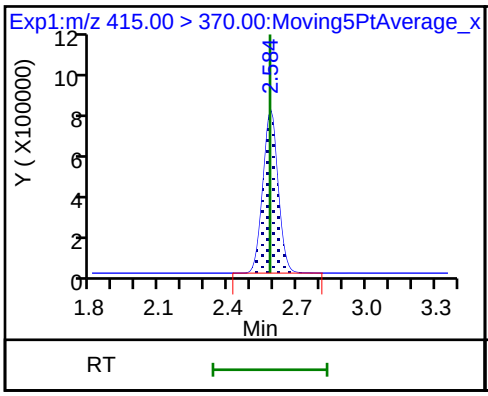
15 Perfluorooctanoic acid



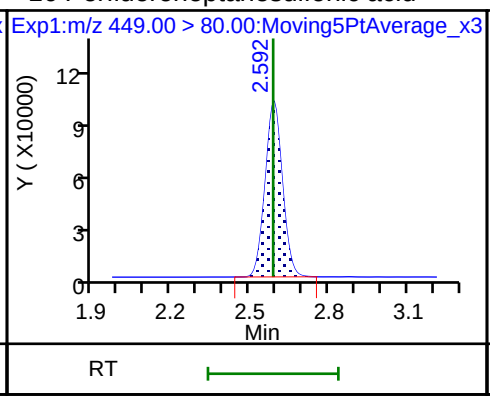
15 Perfluorooctanoic acid



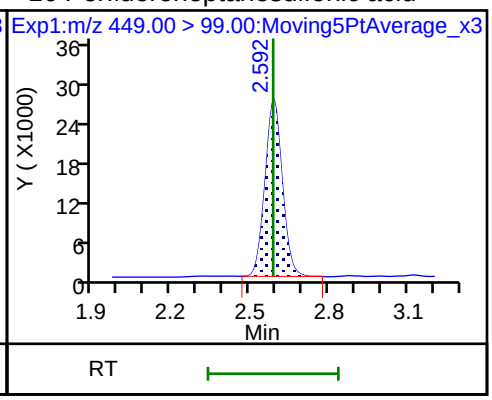
* 62 13C2-PFOA



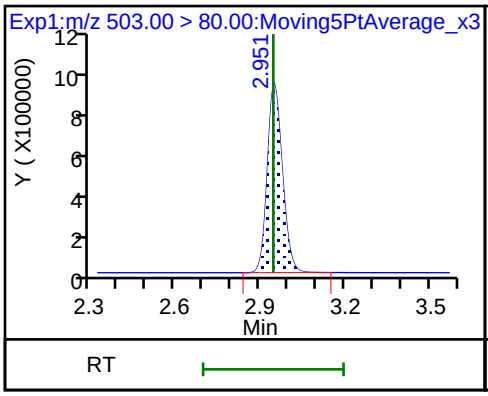
16 Perfluoroheptanesulfonic acid



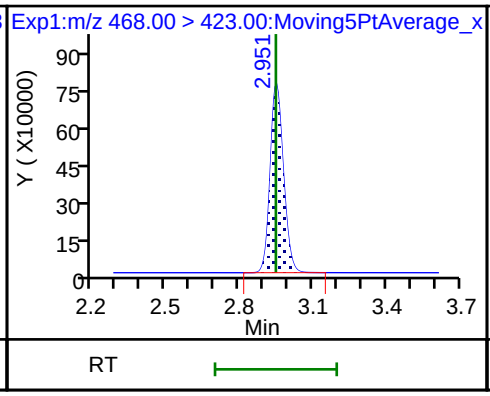
16 Perfluoroheptanesulfonic acid



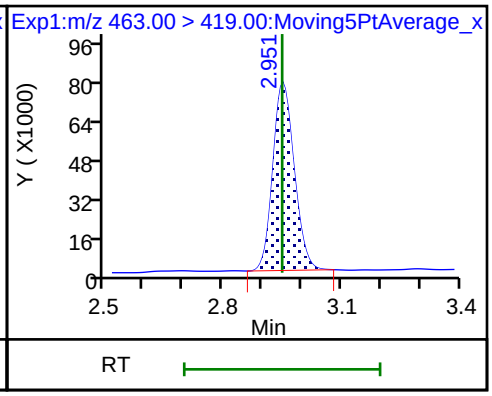
D 18 13C4 PFOS



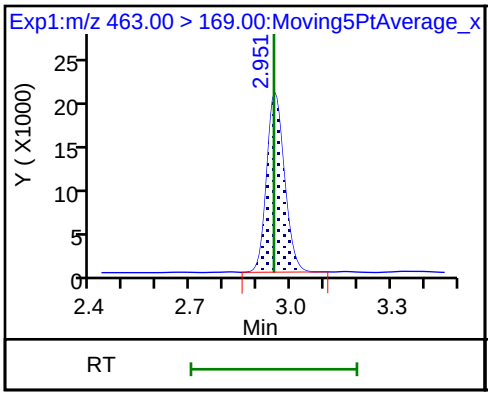
D 19 13C5 PFNA



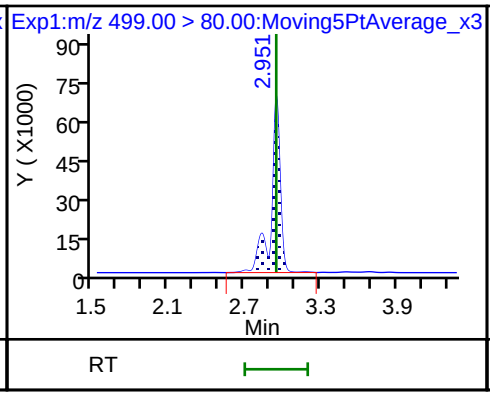
20 Perfluorononanoic acid



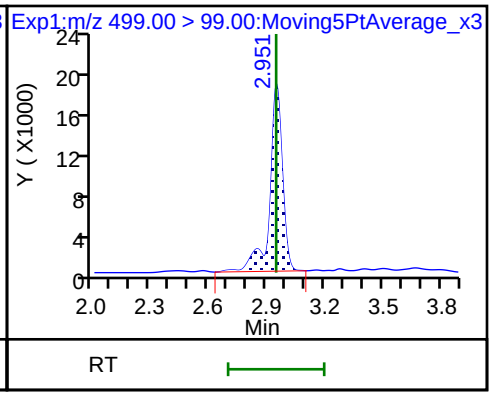
20 Perfluorononanoic acid



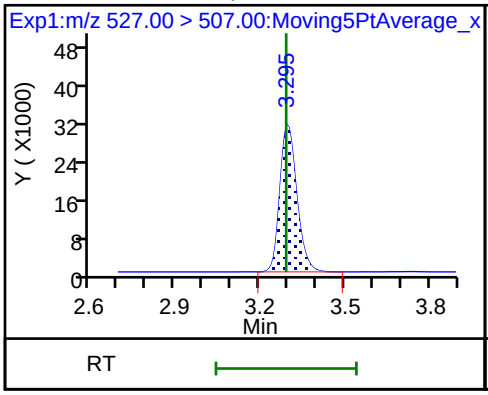
17 Perfluorooctane sulfonic acid



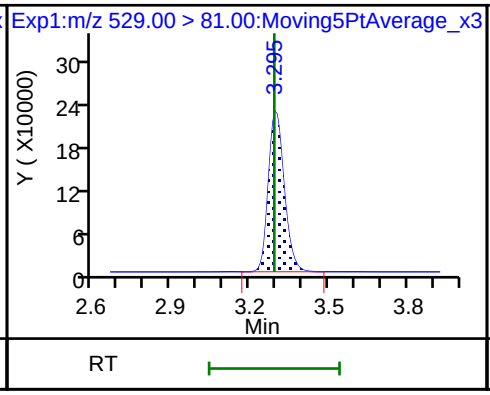
17 Perfluorooctane sulfonic acid



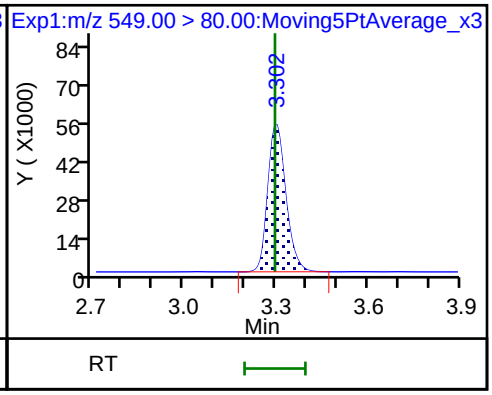
25 1H,1H,2H,2H-perfluorodecanesulfon



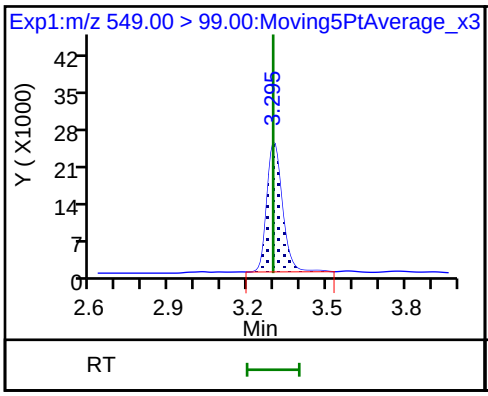
D 26 M2-8:2FTS



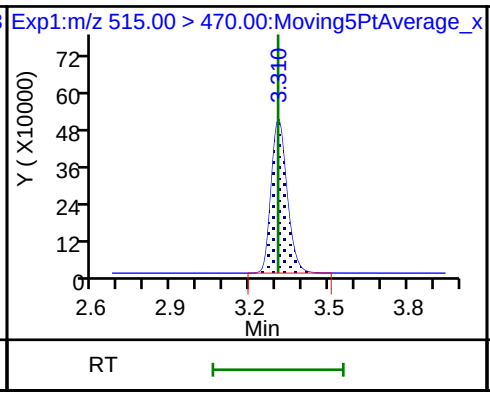
68 Perfluorononanesulfonic acid



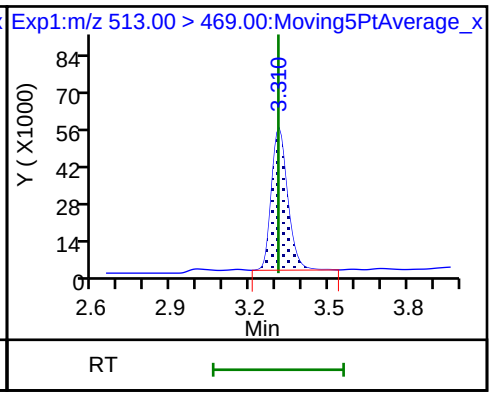
68 Perfluorononanesulfonic acid



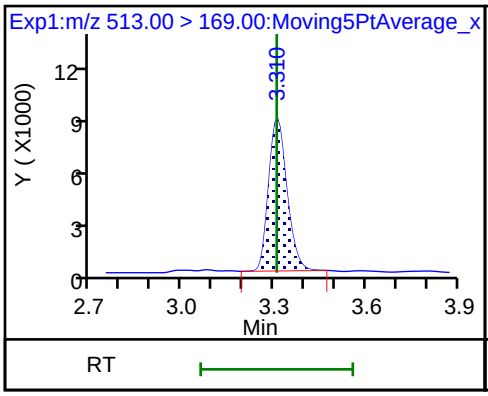
D 23 13C2 PFDA



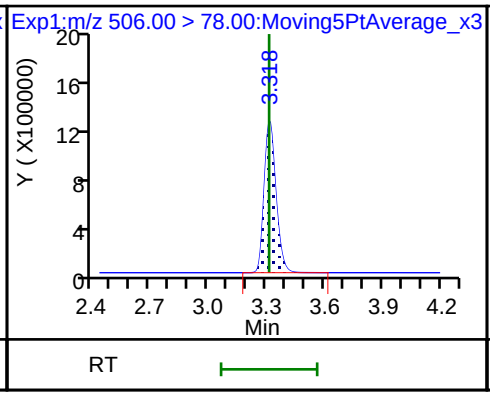
24 Perfluorodecanoic acid



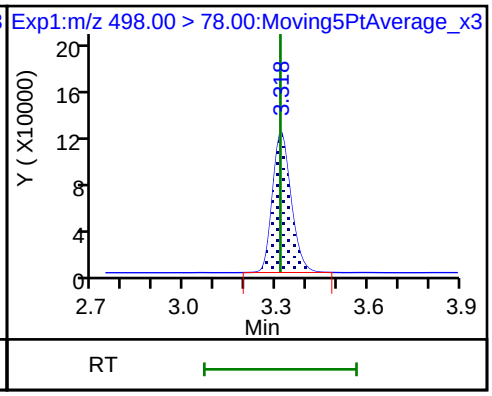
24 Perfluorodecanoic acid



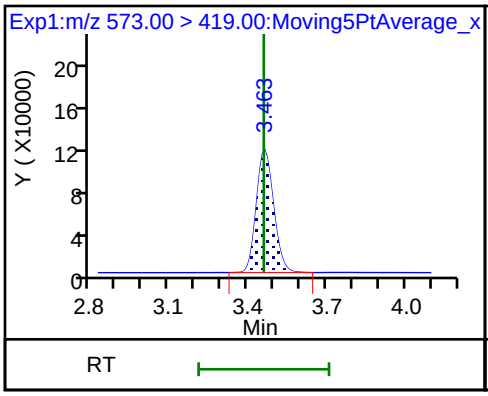
D 21 13C8 FOSA



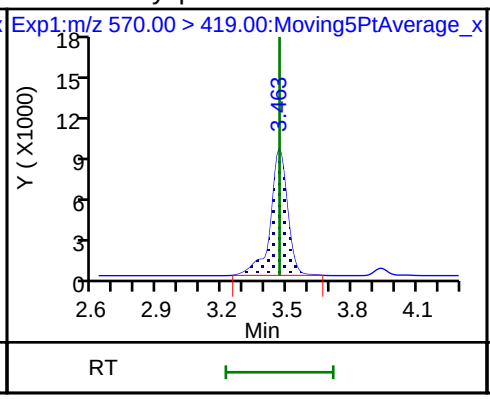
22 Perfluorooctane Sulfonamide



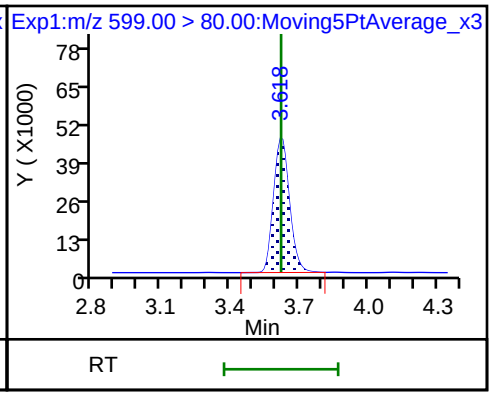
D 27 d3-NMeFOSAA



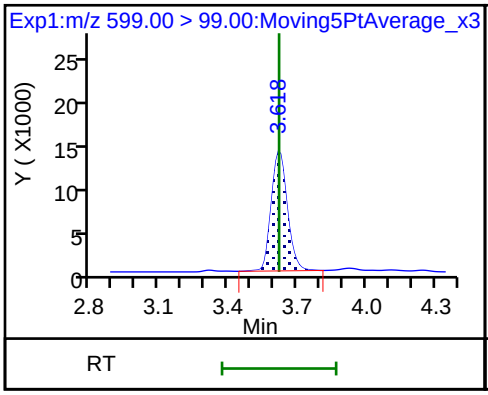
28 N-methyl perfluorooctane sulfonami



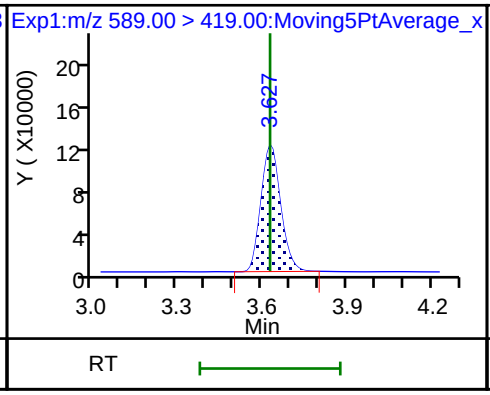
29 Perfluorodecane Sulfonic acid



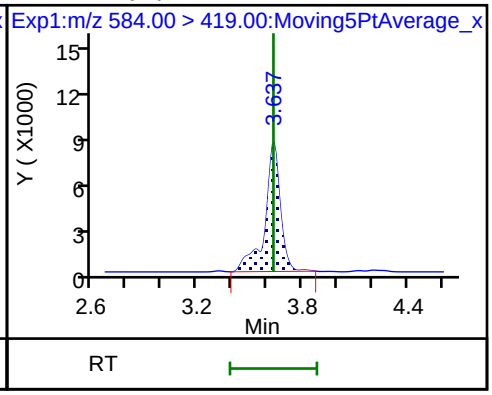
29 Perfluorodecane Sulfonic acid



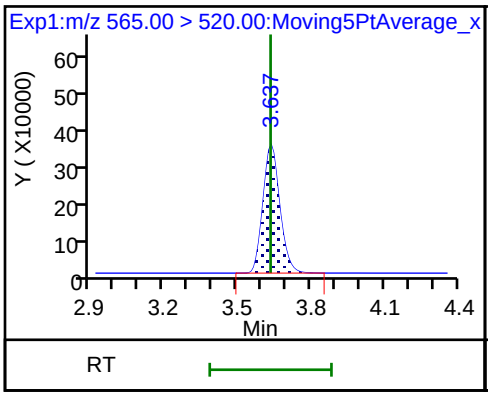
D 32 d5-NEtFOSAA



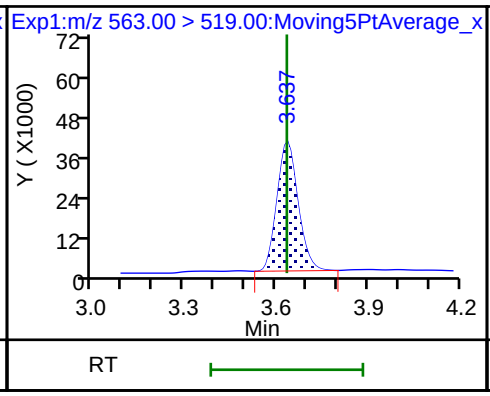
33 N-ethyl perfluorooctane sulfonamid



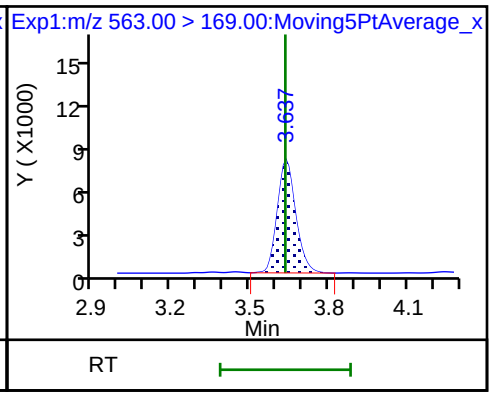
D 30 13C2 PFUnA



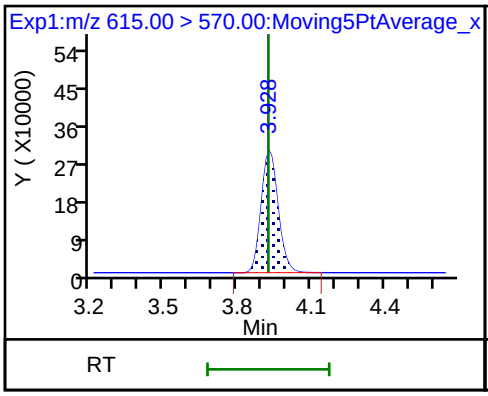
31 Perfluoroundecanoic acid



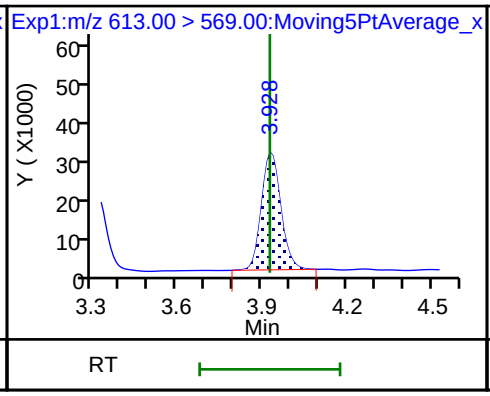
31 Perfluoroundecanoic acid



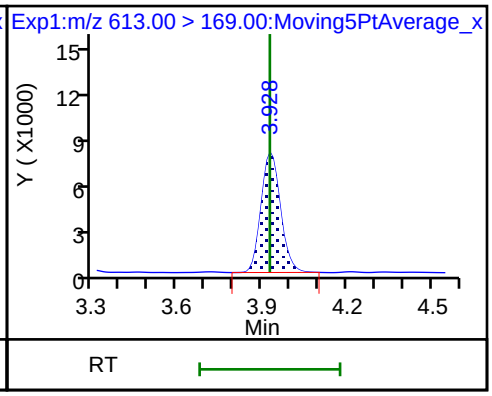
D 36 13C2 PFDoA



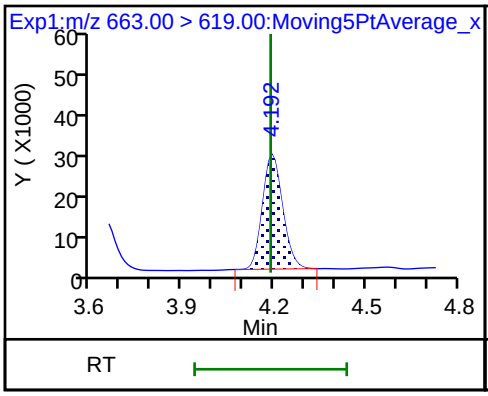
37 Perfluorododecanoic acid



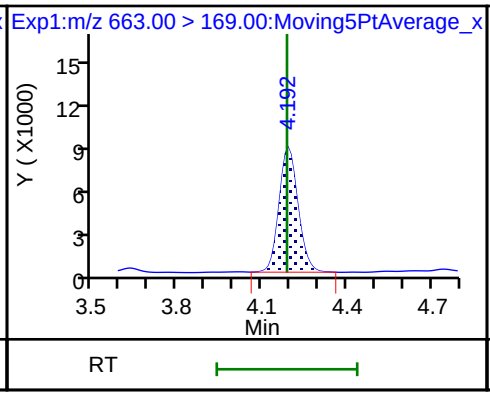
37 Perfluorododecanoic acid



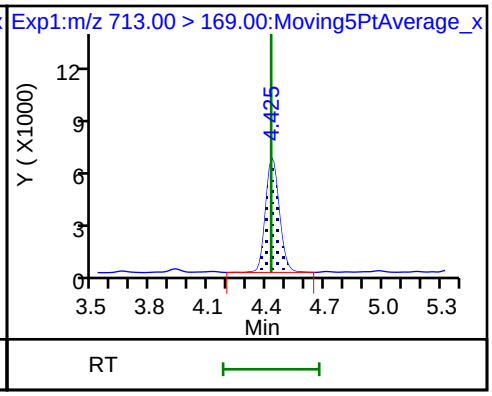
41 Perfluorotridecanoic acid



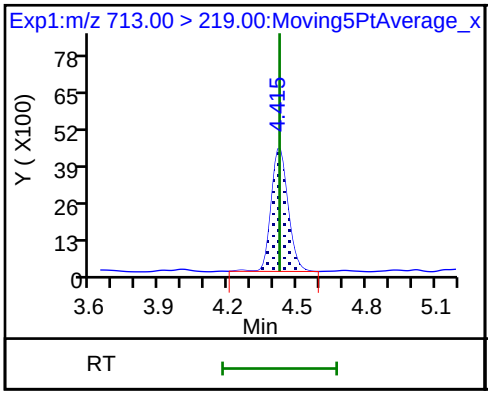
41 Perfluorotridecanoic acid



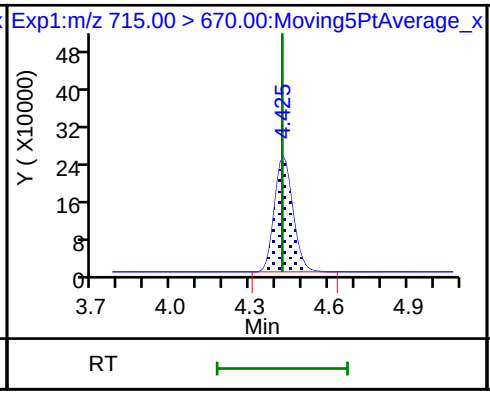
42 Perfluorotetradecanoic acid



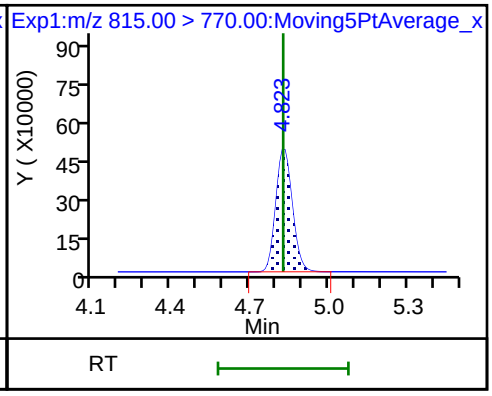
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 01-Aug-2018 13:22:33 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:47 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:33:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.003	0.539	4799715	2.43		97.4	74573	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.396	-0.005	1.000	1847519	0.9765		97.7	458	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.633	3202919	2.47		98.7	50580	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	1460012	0.9518		95.2	576	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.645	82758	2.22		95.3	322	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.671	-0.005	1.000	2456709	0.9005		102	11704	
298.90 > 99.00	1.666	1.671	-0.005	1.000	1020887		2.41(1.25-3.74)	102	4237	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.872	-0.006	0.723	609520	NC			7261	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.872	-0.006	1.120	616866	1.01		108	27741	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.903	0.002	0.738	3471025	2.47		98.8	74585	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.903	0.002	1.000	1444908	0.9868		98.7	2675	
313.00 > 119.00	1.905	1.903	0.002	1.000	130079		11.11(5.03-15.10)	98.7	1229	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	2331146	0.9680		103	28507	
349.00 > 99.00	1.927	1.928	-0.001	1.157	858927		2.71(1.36-4.07)	103	3854	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.992	2.000	-0.008	0.772	146564	NC			4135	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	1.006	252051	NC			970	
D 9 13C4-PFHpA										
367.00 > 322.00	2.218	2.225	-0.007	0.859	3335466	2.45		98.0	92739	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.226	0.003	1.005	1576104	1.02		102	710	
363.00 > 169.00	2.218	2.226	-0.008	1.000	581246		2.71(1.13-3.40)	102	4223	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.237	-0.008	0.995	1939177	0.8396		92.3	8693	
399.00 > 99.00	2.229	2.237	-0.008	0.995	684304		2.83(1.50-4.49)	92.3	1083	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.868	4725288	2.31		97.6	51826	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.771	3740044	NC			26879	
377.00 > 85.00	2.267	2.270	-0.003	0.771	2140747		1.75(0.84-2.53)		8829	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.547	2.554	-0.007	0.996	625589	0.9789		103	10144	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.556	0.0	0.990	917820	2.30		96.9	11454	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.580	0.001	1.000	3268736	2.49		99.4	58647	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.581	0.0	1.000	1480871	0.9796		97.9	834	
413.00 > 169.00	2.581	2.581	0.0	1.000	778244		1.90(0.84-2.52)	97.9	4099	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.581	0.0		3424441	2.50			49930	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.587	0.002	0.880	1744730	0.9139		96.0	21103	
449.00 > 99.00	2.589	2.587	0.002	0.880	476758		3.66(1.94-5.82)	96.0	5417	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.946	-0.003	1.140	3300872	2.33		97.7	52168	
D 19 13C5 PFNA										
468.00 > 423.00	2.949	2.948	0.001	1.142	2848081	2.49		99.4	53985	
20 Perfluorononanoic acid										
463.00 > 419.00	2.949	2.949	0.0	1.000	1231102	1.00		100	2303	
463.00 > 169.00	2.949	2.949	0.0	1.000	308292		3.99(1.90-5.69)	100	10022	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.949	2.949	0.0	1.002	1377557	0.8885		95.7	9043	M
499.00 > 99.00	2.943	2.949	-0.006	1.000	324464		4.25(2.31-6.93)	95.7	1831	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.158	-0.002	1.073	2289912	NC			22851	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.292	0.0	1.000	498832	0.9366		97.8	30068	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.292	0.0	1.275	944062	2.43		101	16371	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.295	-0.003	1.119	954403	0.9615		100	23863	
549.00 > 99.00	3.292	3.295	-0.003	1.119	369759		2.58(1.33-3.97)	100	2430	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.306	0.002	1.282	2165508	2.53		101	52188	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.308	0.0	1.000	899636	0.9730		97.3	1260	
513.00 > 169.00	3.308	3.308	0.0	1.000	160313		5.61(2.36-7.09)	97.3	2251	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.312	-0.004	1.282	5088363	2.45		98.0	41666	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.313	0.002	1.002	2053736	1.02		102	25672	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.459	0.001	1.340	491188	2.36		94.5	21413	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.465	-0.005	1.000	199395	1.00		99.8	2768	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.620	0.004	1.232	822043	0.9151		94.9	24438	
599.00 > 99.00	3.614	3.620	-0.006	1.228	292040		2.81(1.39-4.16)	94.9	2192	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.627	-0.003	1.404	559410	2.51		100	6051	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.633	0.001	1.003	206227	1.03		103	3971	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.634	0.0	1.408	1631762	2.47		98.9	42516	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.634	0.0	1.000	764538	0.9505		95.1	1912	
563.00 > 169.00	3.634	3.634	0.0	1.000	135245		5.65(2.12-6.36)	95.1	4704	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.789	3.792	-0.003	1.287	3369008	NC			63395	
D 36 13C2 PFDoA										
615.00 > 570.00	3.924	3.925	-0.001	1.520	1429399	2.50		100	18712	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.924	3.927	-0.003	1.000	594065	0.9596		96.0	186	
613.00 > 169.00	3.924	3.927	-0.003	1.000	139893		4.25(2.13-6.40)	96.0	1975	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.188	0.001	1.067	516294	0.9582		95.8	170	
663.00 > 169.00	4.189	4.188	0.001	1.067	156240		3.30(1.25-3.76)	95.8	1002	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.423	0.001	1.000	119786	0.9564		95.6	1904	
713.00 > 219.00	4.424	4.423	0.001	1.000	84842		1.41(0.71-2.13)	95.6	1434	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.423	0.001	1.714	1162431	2.42		96.9	6005	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.822	4.826	-0.004	1.868	1831086	2.22		88.6	2796	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.822	4.827	-0.005	1.000	733744	NC			46.2	
813.00 > 169.00	4.822	4.827	-0.005	1.000	117618		6.24(2.86-8.58)		1277	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.164	5.166	-0.002	1.071	751756	NC			248	
913.00 > 169.00	5.164	5.166	-0.002	1.071	91329		8.23(3.83-11.48)		984	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:49 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_005.d

Injection Date: 01-Aug-2018 13:22:33 Instrument ID: A8_N

Lims ID: IC L4 Full

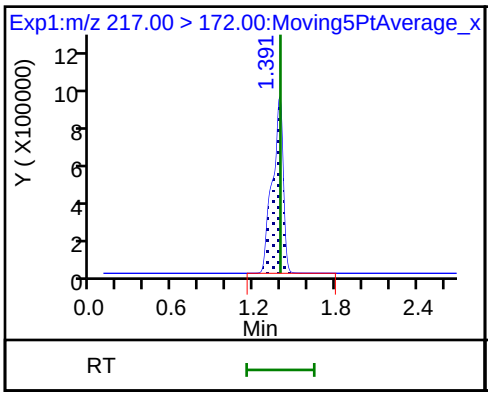
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 5

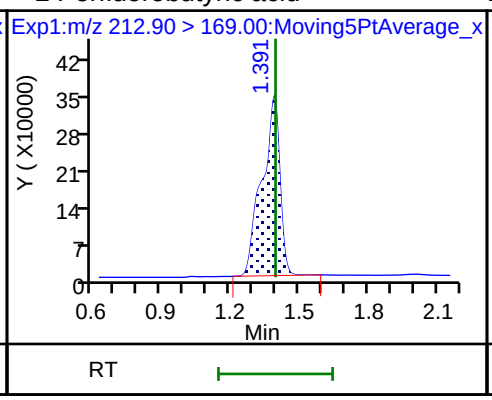
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



2 Perfluorobutyric acid



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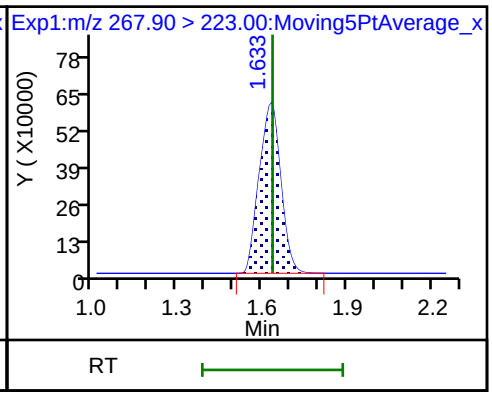
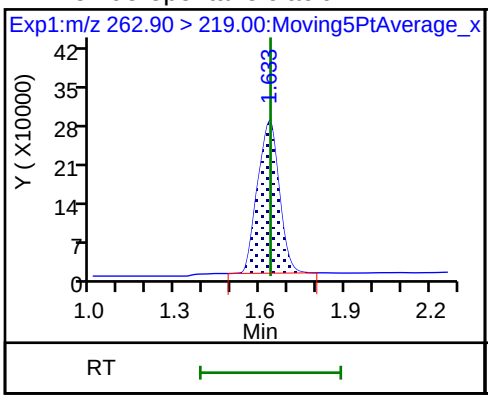


4 Perfluoropentanoic acid



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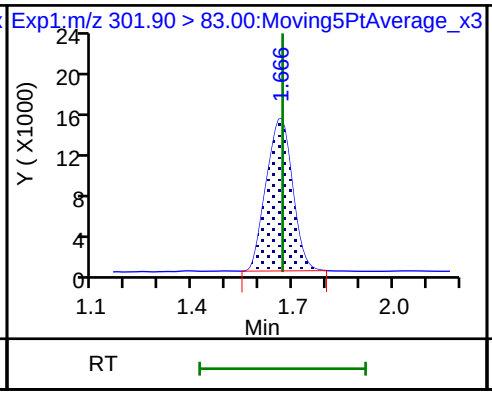
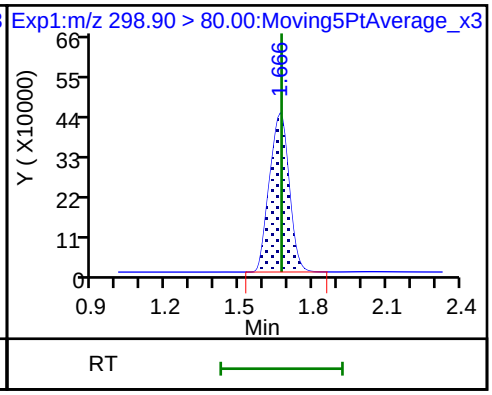
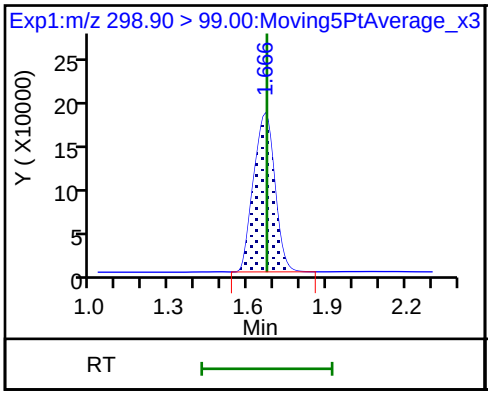


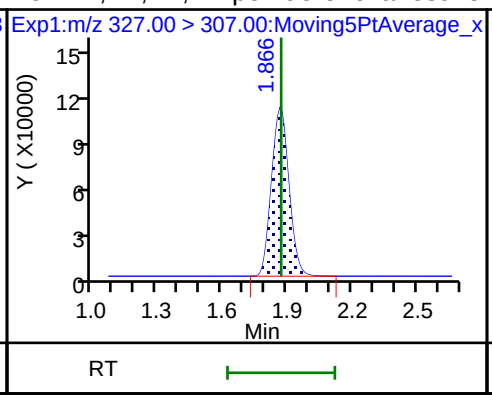
5 Perfluorobutanesulfonic acid



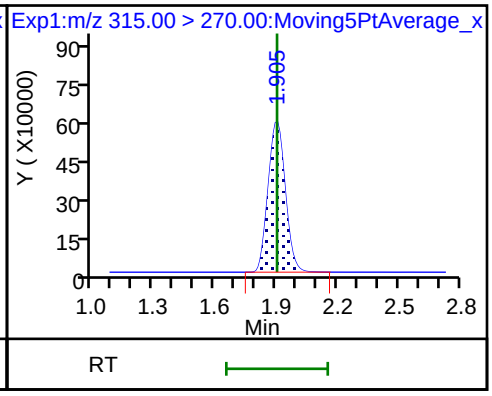
5 Perfluorobutanesulfonic acid



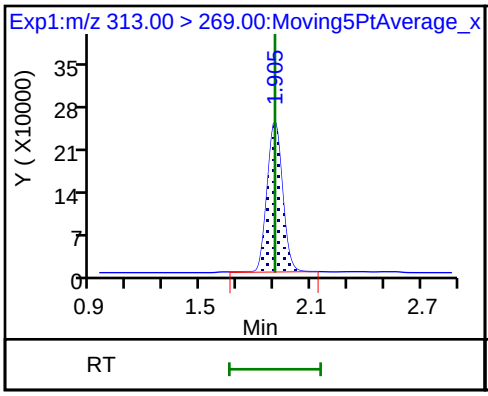
61 1H,1H,2H,2H-perfluorohexanesulfon



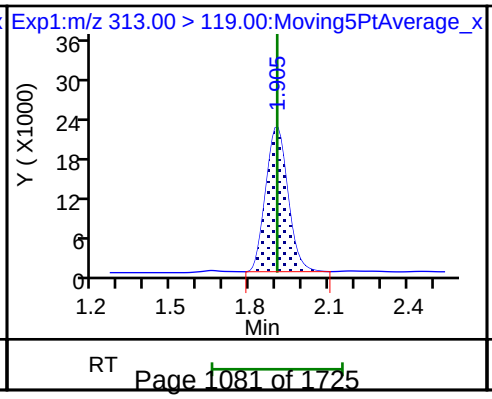
D 7 13C2 PFHxA



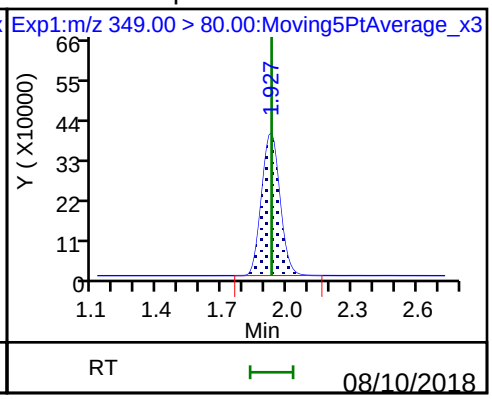
6 Perfluorohexanoic acid



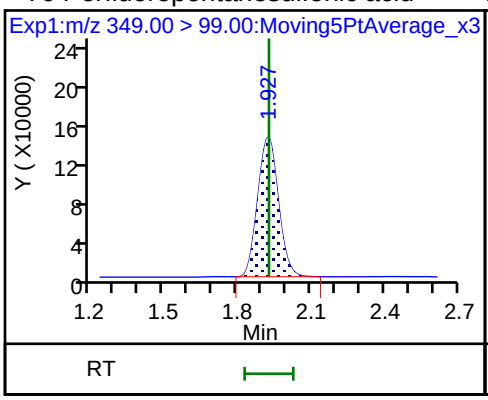
6 Perfluorohexanoic acid



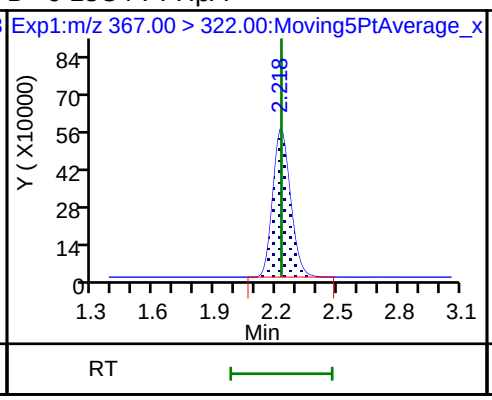
70 Perfluoropentanesulfonic acid



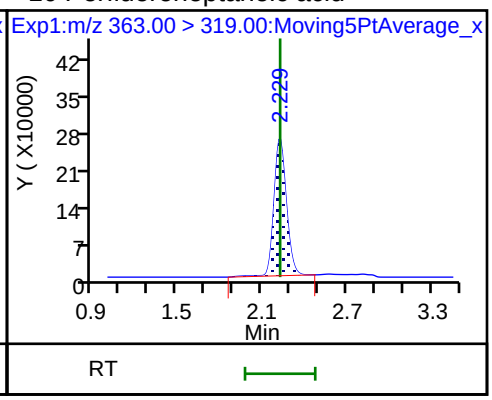
70 Perfluoropentanesulfonic acid



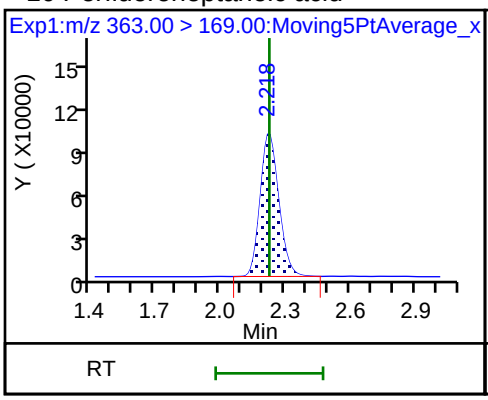
D 9 13C4-PFHpA



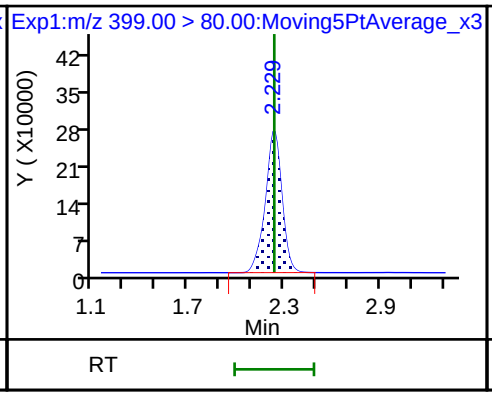
10 Perfluoroheptanoic acid



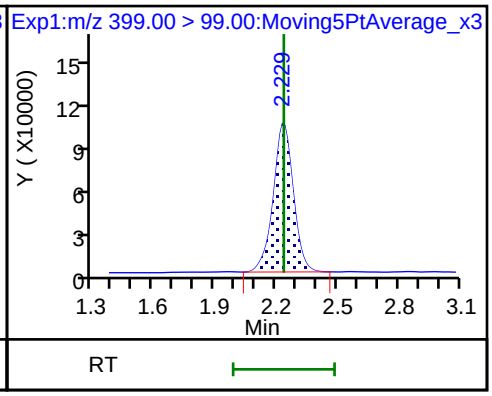
10 Perfluoroheptanoic acid



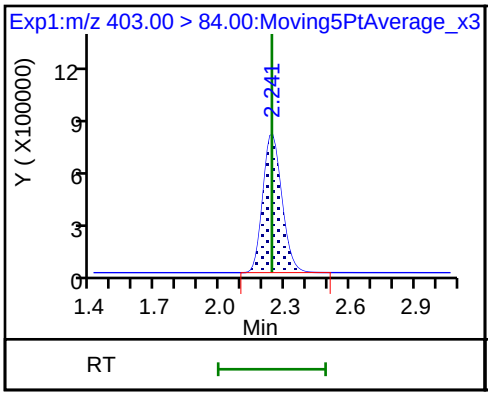
8 Perfluorohexanesulfonic acid



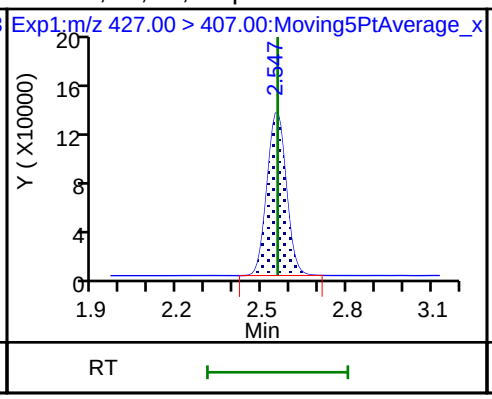
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS



13 1H,1H,2H,2H-perfluorooctanesulfon



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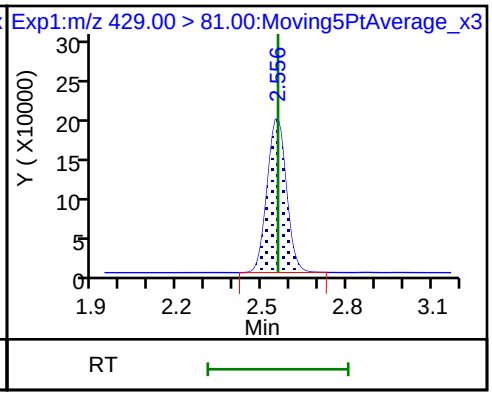
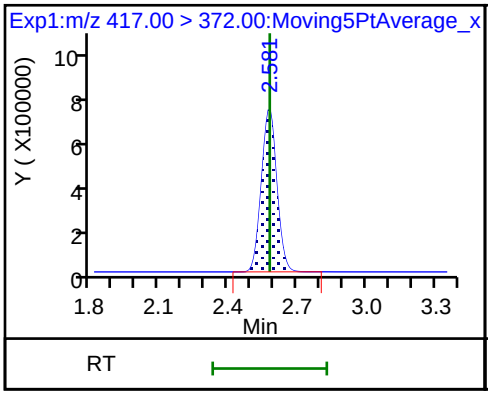
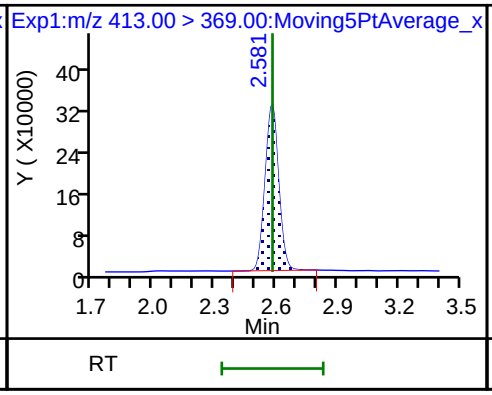


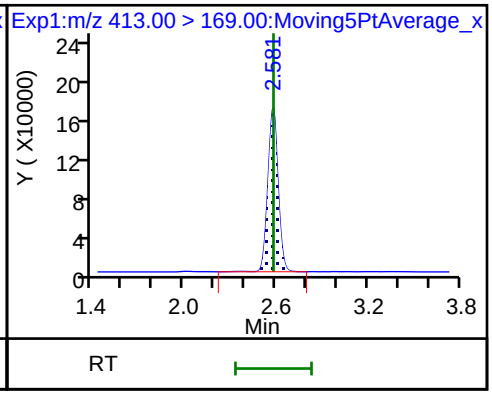
D 14 13C4 PFOA



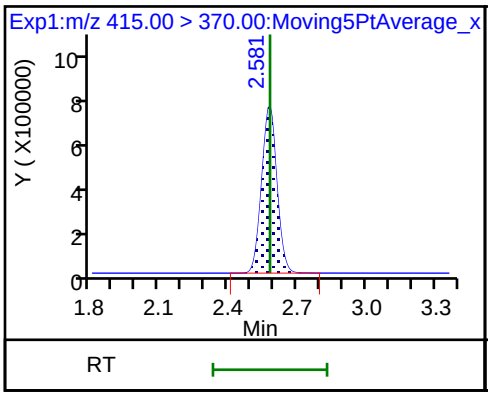
15 Perfluorooctanoic acid



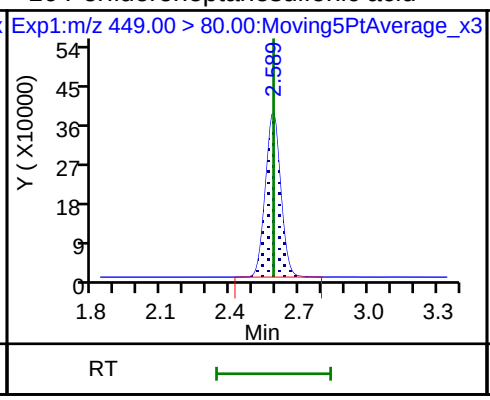
15 Perfluorooctanoic acid



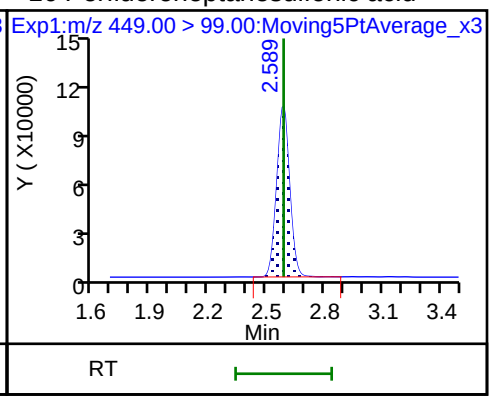
* 62 13C2-PFOA



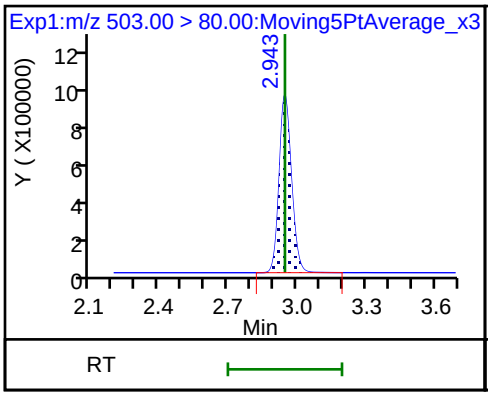
16 Perfluoroheptanesulfonic acid



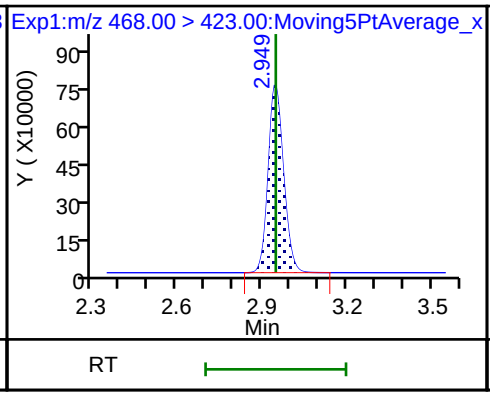
16 Perfluoroheptanesulfonic acid



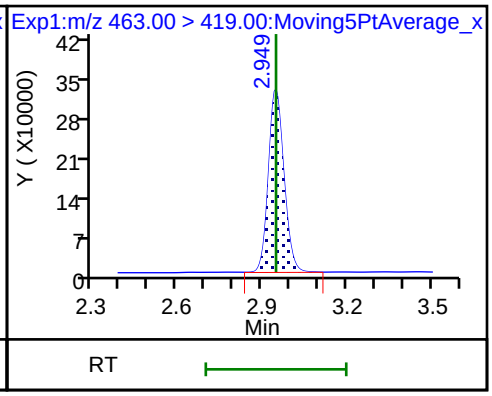
D 18 13C4 PFOS



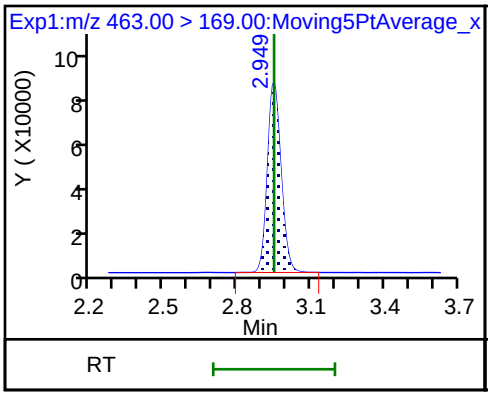
D 19 13C5 PFNA



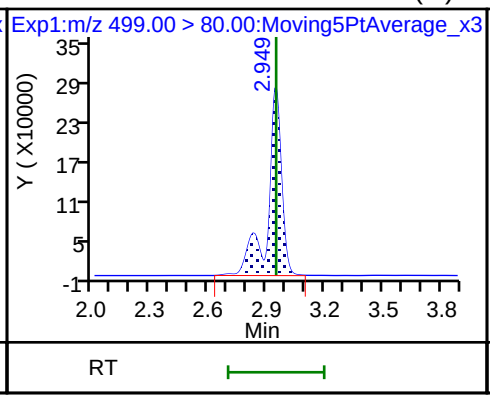
20 Perfluorononanoic acid



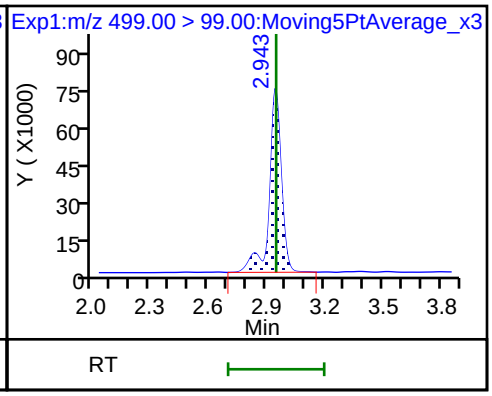
20 Perfluorononanoic acid



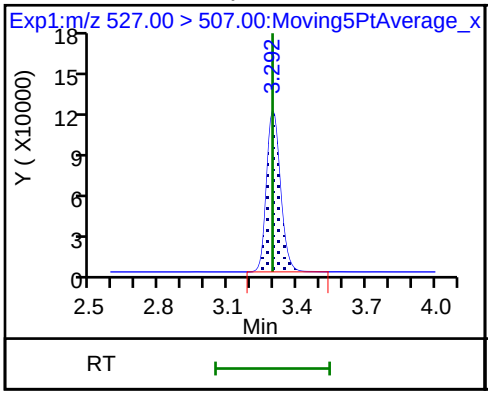
17 Perfluorooctane sulfonic acid (M)



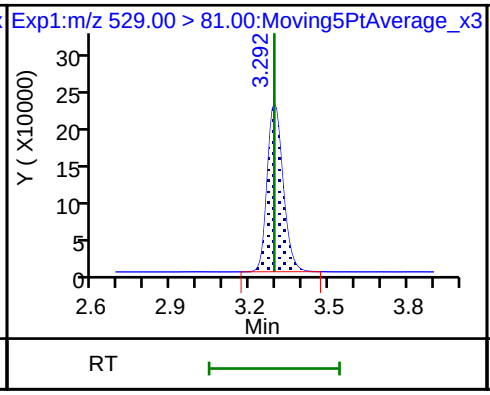
17 Perfluorooctane sulfonic acid



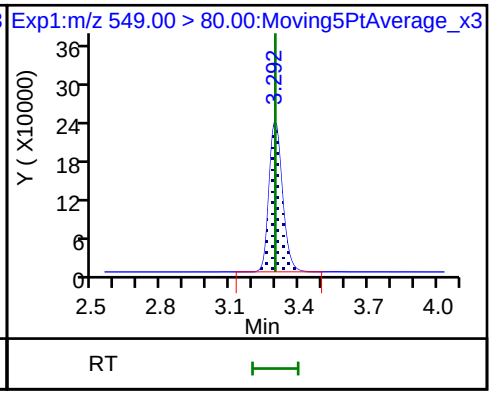
25 1H,1H,2H,2H-perfluorodecanesulfon



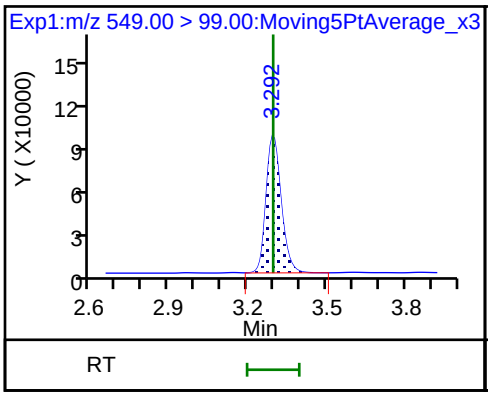
D 26 M2-8:2FTS



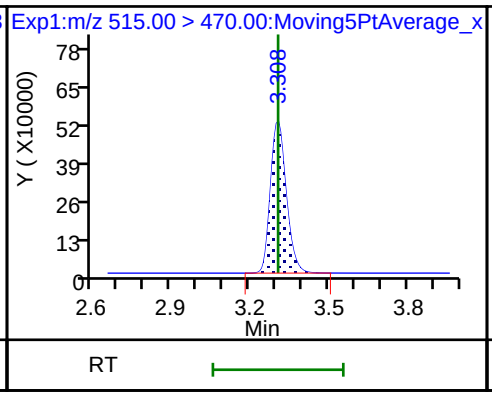
68 Perfluorononanesulfonic acid



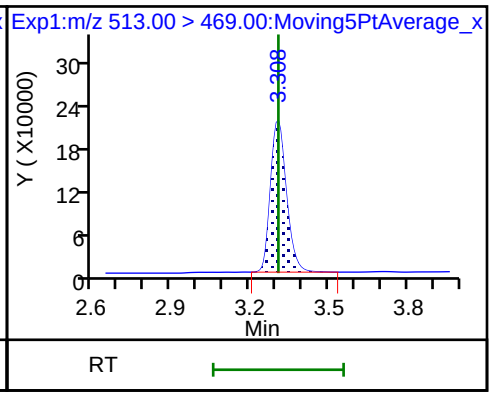
68 Perfluorononanesulfonic acid



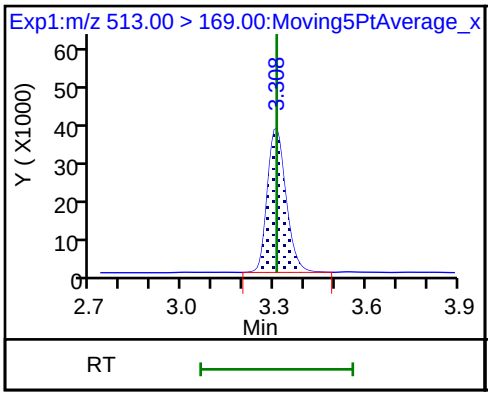
D 23 13C2 PFDA



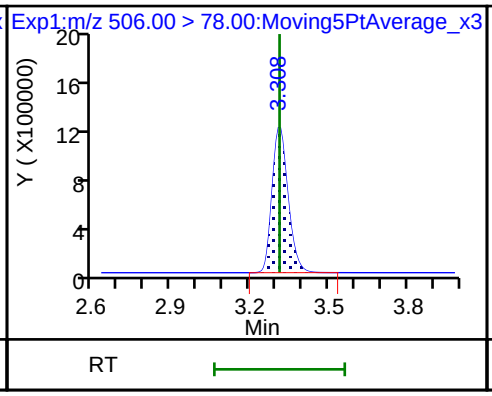
24 Perfluorodecanoic acid



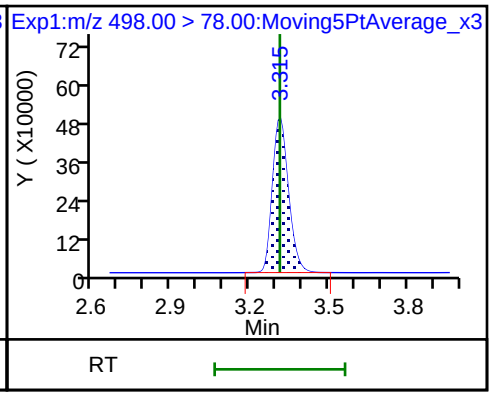
24 Perfluorodecanoic acid



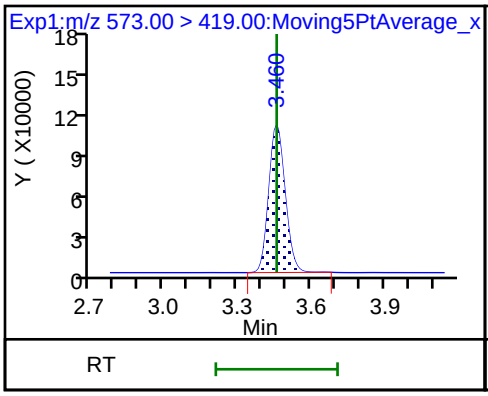
D 21 13C8 FOSA



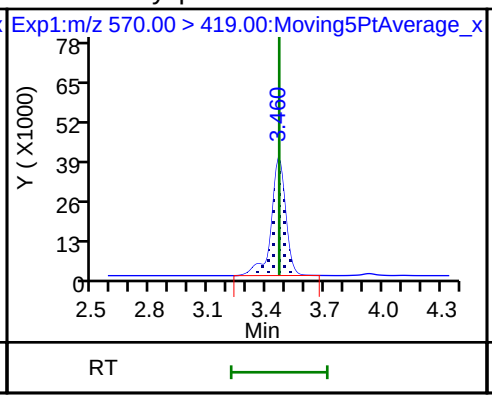
22 Perfluorooctane Sulfonamide



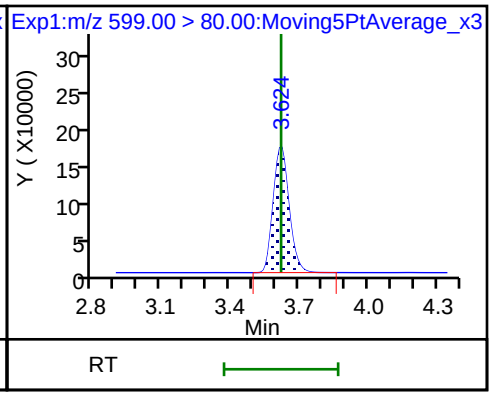
D 27 d3-NMeFOSAA



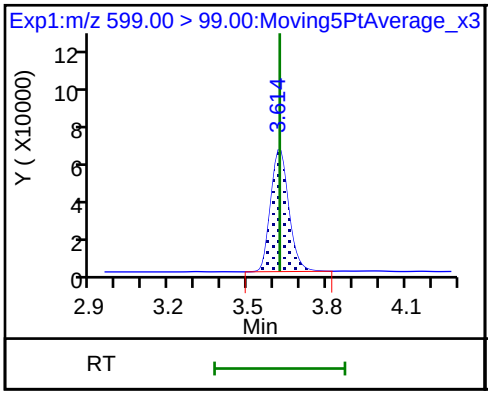
28 N-methyl perfluorooctane sulfonami



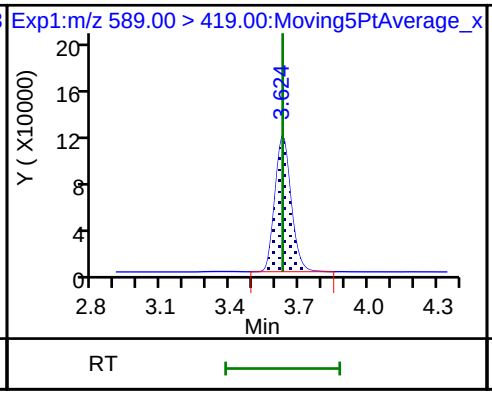
29 Perfluorodecane Sulfonic acid



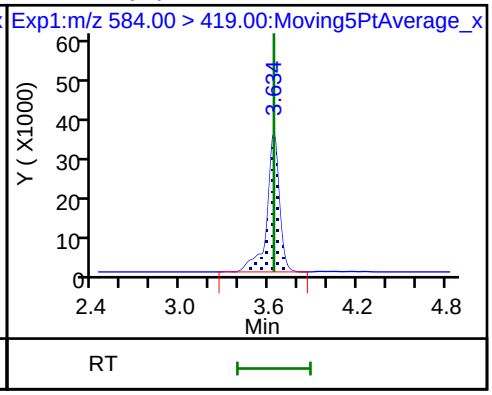
29 Perfluorodecane Sulfonic acid



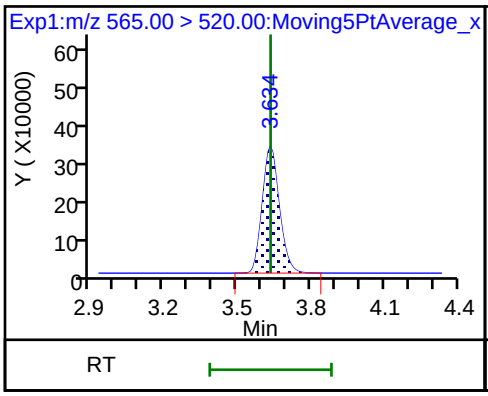
D 32 d5-NEtFOSAA



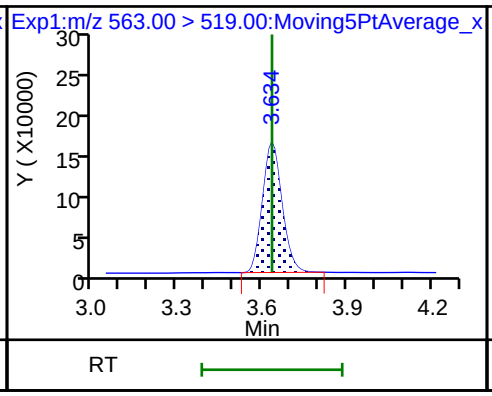
33 N-ethyl perfluorooctane sulfonamid



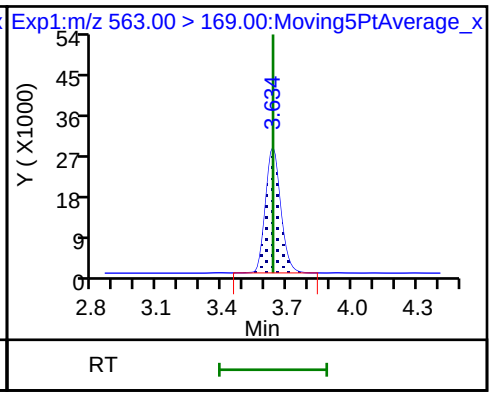
D 30 13C2 PFUnA



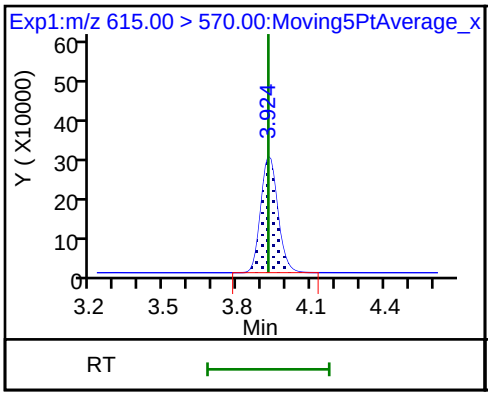
31 Perfluoroundecanoic acid



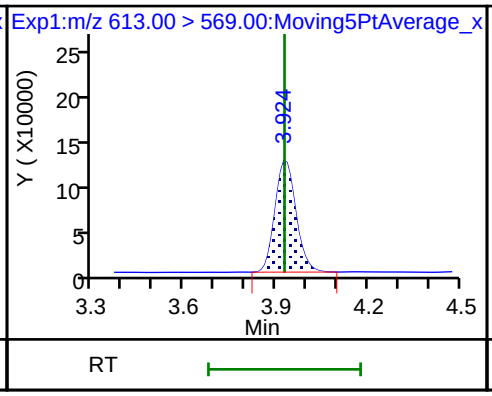
31 Perfluoroundecanoic acid



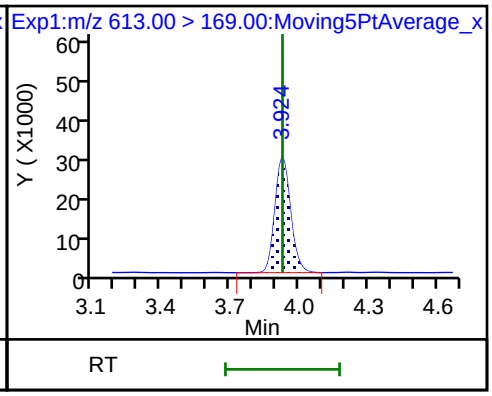
D 36 13C2 PFDoA



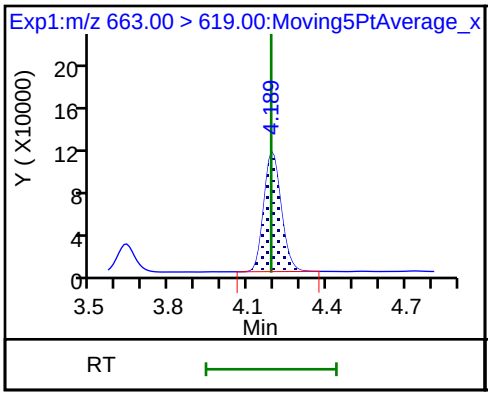
37 Perfluorododecanoic acid



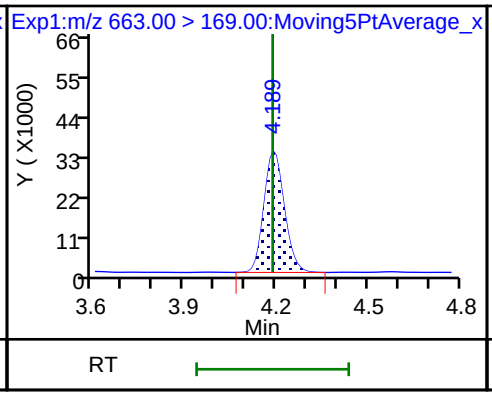
37 Perfluorododecanoic acid



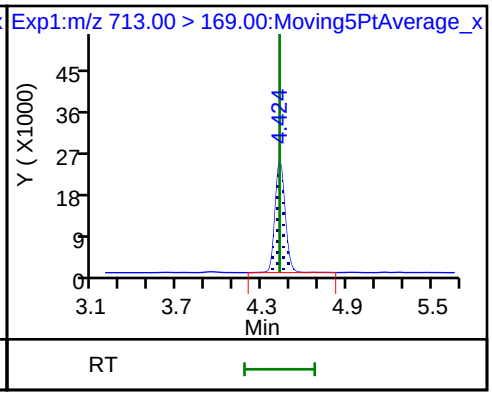
41 Perfluorotridecanoic acid



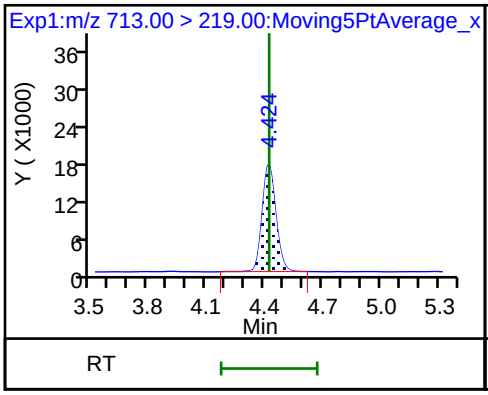
41 Perfluorotridecanoic acid



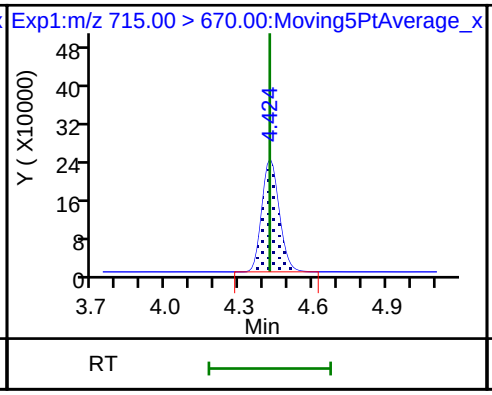
42 Perfluorotetradecanoic acid



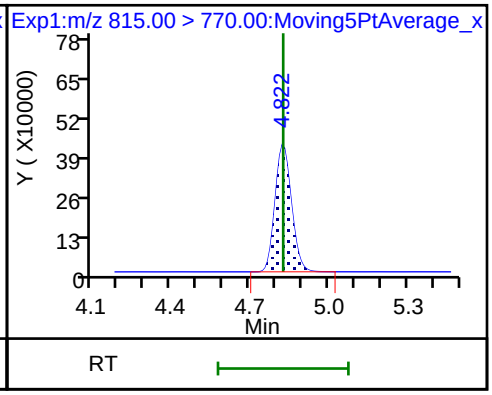
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

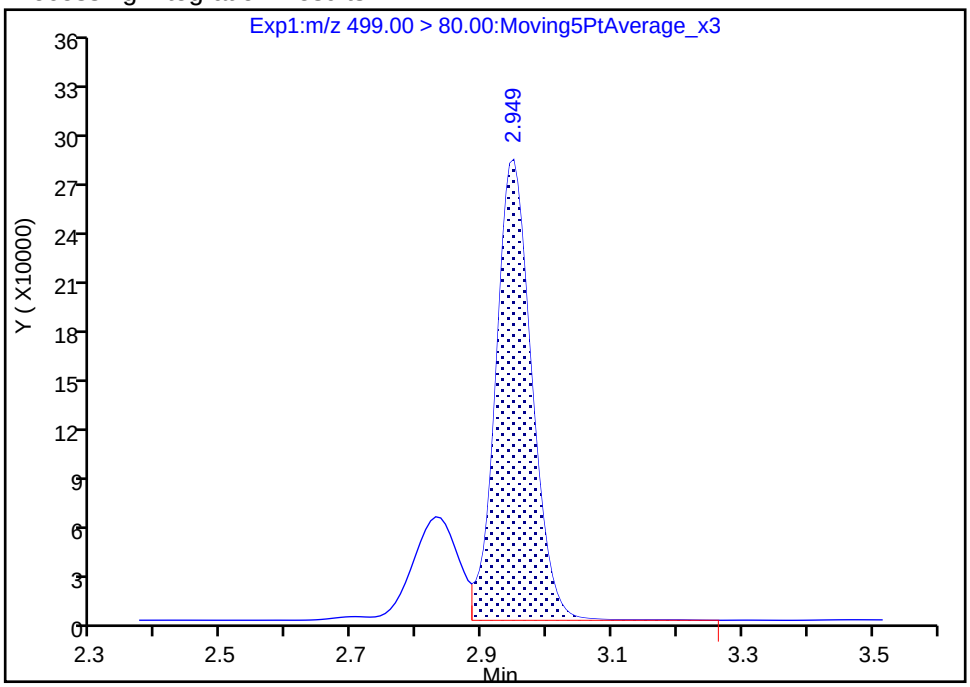
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_005.d				
Injection Date:	01-Aug-2018 13:22:33	Instrument ID:	A8_N		
Lims ID:	IC L4 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	13	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

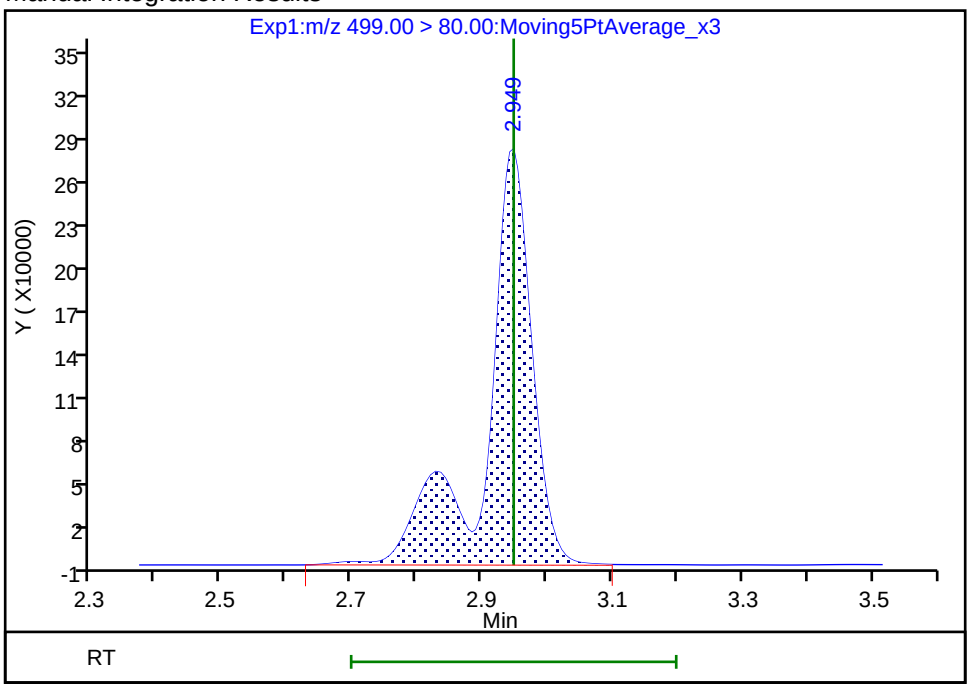
Processing Integration Results

RT: 2.95
Area: 1066714
Amount: 0.709888
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 1377557
Amount: 0.888458
Amount Units: ng/ml



Reviewer: roycea, 01-Aug-2018 14:33:07

Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 01-Aug-2018 13:30:23 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:50 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:34:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.394	1.395	0.0	0.541	4740211	2.48		99.0	79259	
2 Perfluorobutyric acid										
212.90 > 169.00	1.400	1.396	0.004	1.004	4662124	2.50		99.8	1176	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.636	0.001	0.635	3117638	2.47		98.9	49305	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.636	0.001	1.000	3679899	2.46		98.6	1471	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.669	0.002	0.648	85408	2.36		101	403	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.000	6345476	2.25		102	29623	
298.90 > 99.00	1.671	1.671	0.0	1.000	2536780		2.50(1.25-3.74)	102	10495	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.872	0.0	0.726	603368	NC			6037	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.872	0.0	1.120	1432956	2.27		97.1	64785	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.903	-0.001	0.738	3473699	2.55		102	76225	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.903	-0.001	1.000	3595187	2.45		98.1	5255	
313.00 > 119.00	1.902	1.903	-0.001	1.000	338806		10.61(5.03-15.10)	98.1	2550	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.923	1.928	-0.005	1.151	5931128	2.39		102	59589	
349.00 > 99.00	1.923	1.928	-0.005	1.151	2210145		2.68(1.36-4.07)	102	10516	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.000	-0.001	0.775	148535	NC			4245	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	2.002	-0.003	1.000	622158	NC			2808	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.225	0.0	0.863	3349409	2.53		101	56764	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.226	-0.001	1.000	3710400	2.39		95.5	1604	
363.00 > 169.00	2.225	2.226	-0.001	1.000	1418167		2.62(1.13-3.40)	95.5	12553	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	5019141	2.24		98.5	18548	
399.00 > 99.00	2.237	2.237	0.0	1.000	1661270		3.02(1.50-4.49)	98.5	2637	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.238	-0.001	0.867	4583643	2.31		97.5	40055	
65 ADONA										
377.00 > 251.00	2.263	2.270	-0.007	0.768	9407416	NC			67386	
377.00 > 85.00	2.263	2.270	-0.007	0.768	5469113		1.72(0.84-2.53)		21080	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.554	2.554	0.0	1.000	1483178	2.32		97.9	29041	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.556	-0.002	0.990	918152	2.37		99.8	13169	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.580	-0.001	1.000	3210040	2.51		101	37275	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.581	-0.002	1.000	3755999	2.53		101	2236	
413.00 > 169.00	2.579	2.581	-0.002	1.000	1895218		1.98(0.84-2.52)	101	9580	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.581	-0.002		3324756	2.50			48783	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.587	2.587	0.0	0.878	4578297	2.46		103	35137	
449.00 > 99.00	2.587	2.587	0.0	0.878	1227668		3.73(1.94-5.82)	103	13514	
D 18 13C4 PFOS										
503.00 > 80.00	2.945	2.946	-0.001	1.142	3224053	2.35		98.3	33751	
D 19 13C5 PFNA										
468.00 > 423.00	2.945	2.948	-0.003	1.142	2758407	2.48		99.2	52925	
20 Perfluorononanoic acid										
463.00 > 419.00	2.945	2.949	-0.004	1.000	2990574	2.51		100	5749	
463.00 > 169.00	2.945	2.949	-0.004	1.000	730894		4.09(1.90-5.69)	100	24495	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.945	2.949	-0.004	1.000	3544232	2.34		101	21346	
499.00 > 99.00	2.945	2.949	-0.004	1.000	827927		4.28(2.31-6.93)	101	4643	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.153	3.158	-0.005	1.070	5759920	NC			40362	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.287	3.292	-0.005	1.000	1169399	2.31		96.3	40497	
D 26 M2-8:2FTS										
529.00 > 81.00	3.287	3.292	-0.005	1.275	899004	2.38		99.4	12948	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.294	3.295	-0.001	1.119	2423026	2.50		104	43353	
549.00 > 99.00	3.287	3.295	-0.008	1.116	908376		2.67(1.33-3.97)	104	5660	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.302	3.306	-0.004	1.281	2057230	2.47		98.9	55312	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.302	3.308	-0.006	1.000	2163881	2.46		98.5	3036	
513.00 > 169.00	3.302	3.308	-0.006	1.000	394458		5.49(2.36-7.09)	98.5	6847	
D 21 13C8 FOSA										
506.00 > 78.00	3.310	3.312	-0.002	1.284	5160037	2.56		102	35436	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.310	3.313	-0.003	1.000	5178982	2.54		102	47592	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.453	3.459	-0.006	1.339	503700	2.49		99.8	13758	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.465	-0.002	1.003	501591	2.45		98.0	5074	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.617	3.620	-0.003	1.228	2185833	2.49		103	51377	
599.00 > 99.00	3.617	3.620	-0.003	1.228	696558		3.14(1.39-4.16)	103	7270	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.627	0.0	1.407	532526	2.46		98.4	3898	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.627	3.633	-0.006	1.000	471804	2.49		99.4	13060	
D 30 13C2 PFUnA										
565.00 > 520.00	3.627	3.634	-0.007	1.407	1525487	2.38		95.2	44993	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.627	3.634	-0.007	1.000	1815476	2.41		96.6	4055	
563.00 > 169.00	3.627	3.634	-0.007	1.000	313726		5.79(2.12-6.36)	96.6	13018	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.287	8214135	NC			94573	
D 36 13C2 PFDoA										
615.00 > 570.00	3.927	3.925	0.002	1.523	1356329	2.44		97.8	13416	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.927	3.927	0.0	1.000	1548416	2.64		105	525	
613.00 > 169.00	3.927	3.927	0.0	1.000	358786		4.32(2.13-6.40)	105	6196	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.182	4.188	-0.006	1.065	1354496	2.65		106	484	
663.00 > 169.00	4.182	4.188	-0.006	1.065	411754		3.29(1.25-3.76)	106	3297	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.415	4.423	-0.008	1.000	314195	2.52		101	3555	
713.00 > 219.00	4.415	4.423	-0.008	1.000	226756		1.39(0.71-2.13)	101	2914	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.423	-0.008	1.712	1159368	2.49		99.6	5921	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.826	-0.003	1.870	2097837	2.61		105	3110	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.827	-0.004	1.000	2002321	NC			133	
813.00 > 169.00	4.823	4.827	-0.004	1.000	339061		5.91(2.86-8.58)		3586	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.165	5.166	-0.001	1.071	2186416	NC			704	
913.00 > 169.00	5.157	5.166	-0.009	1.069	268198		8.15(3.83-11.48)		2448	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_006.d

Injection Date: 01-Aug-2018 13:30:23 Instrument ID: A8_N

Lims ID: IC L5 Full

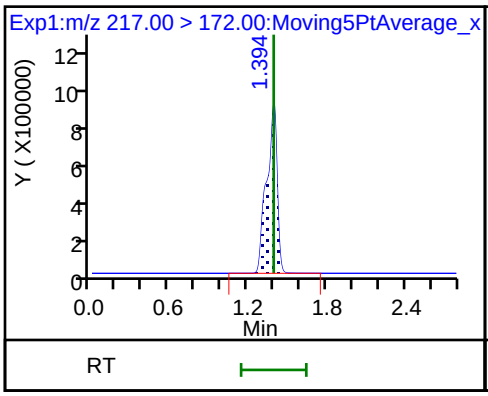
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 6

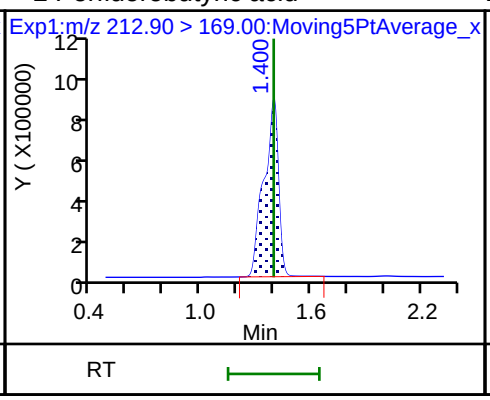
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

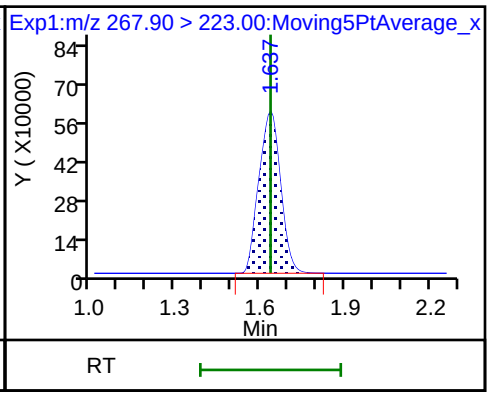
D 1 13C4 PFBA



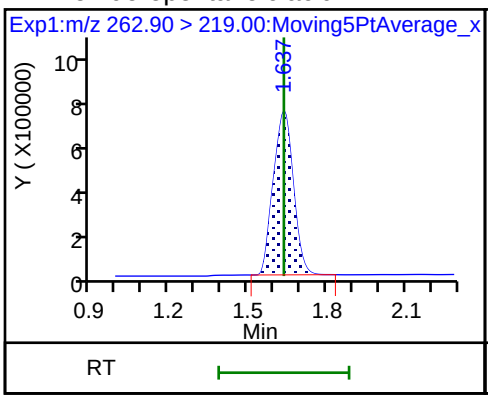
2 Perfluorobutyric acid



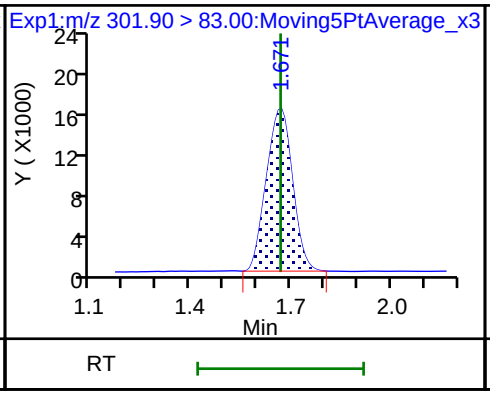
D 3 13C5-PFPeA



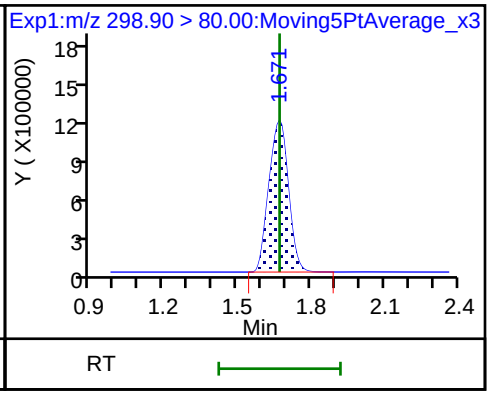
4 Perfluoropentanoic acid



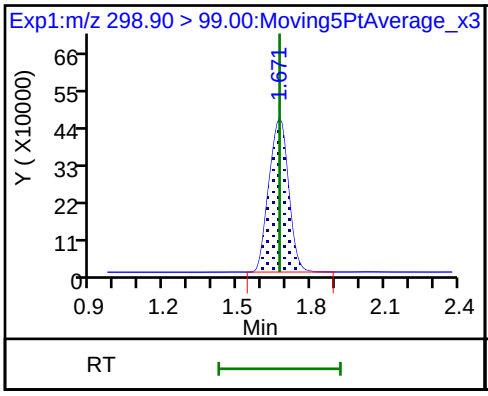
D 47 13C3-PFBS



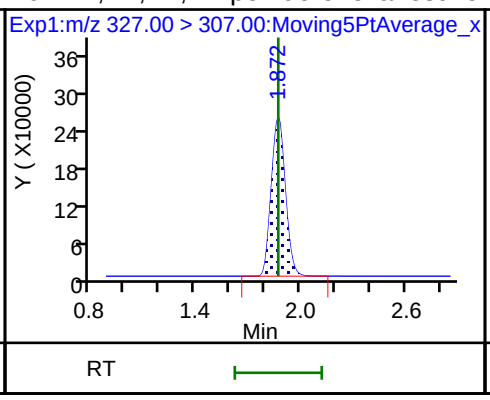
5 Perfluorobutanesulfonic acid



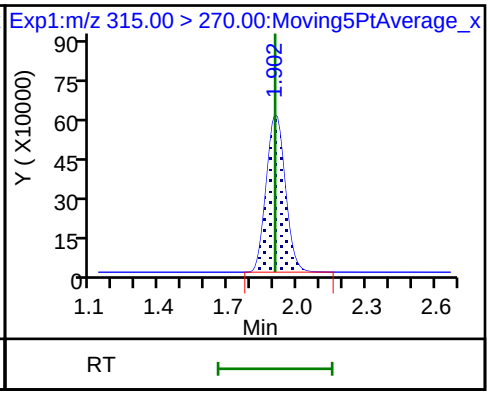
5 Perfluorobutanesulfonic acid



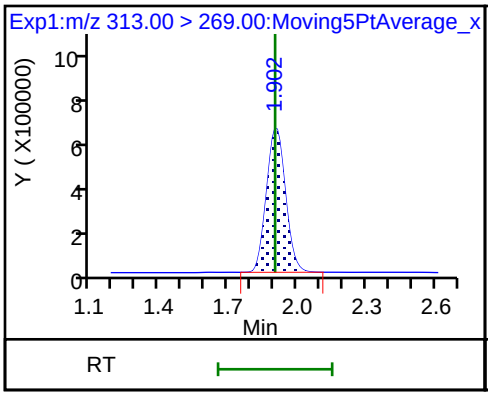
61 1H,1H,2H,2H-perfluorohexanesulfon



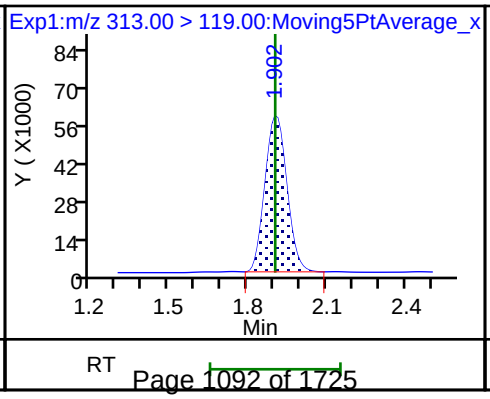
D 7 13C2 PFHxA



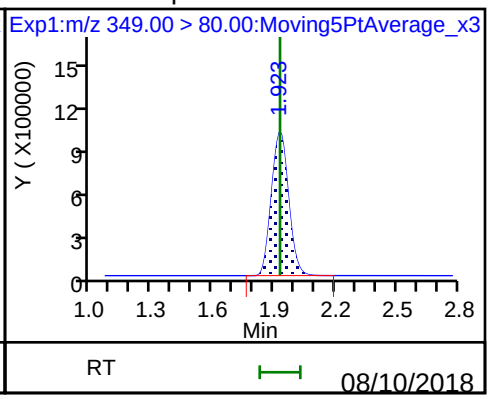
6 Perfluorohexanoic acid



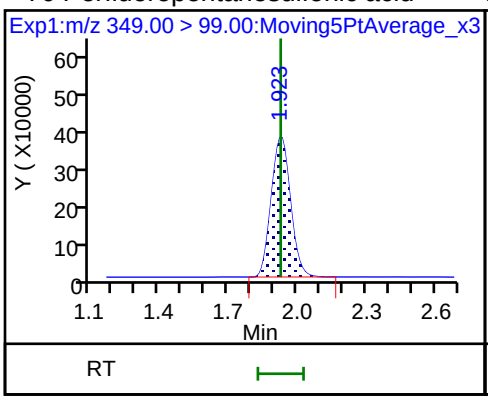
6 Perfluorohexanoic acid



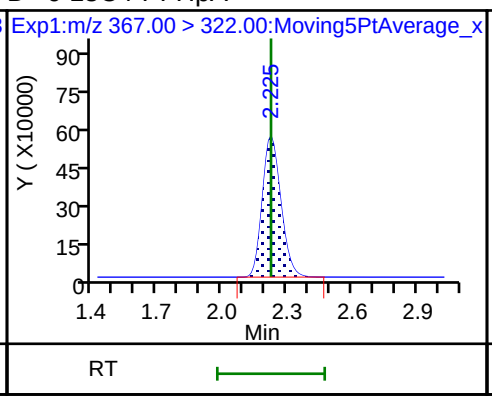
70 Perfluoropentanesulfonic acid



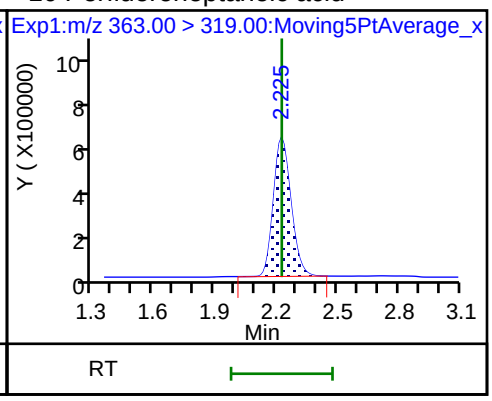
70 Perfluoropentanesulfonic acid



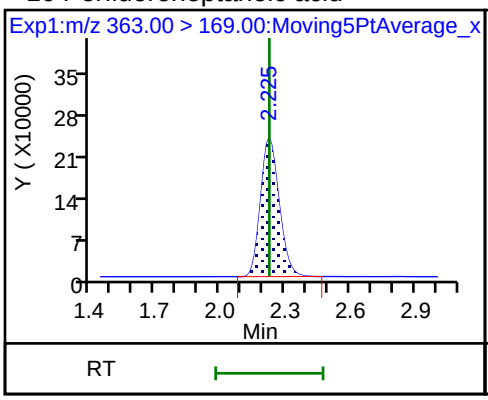
D 9 13C4-PFHpA



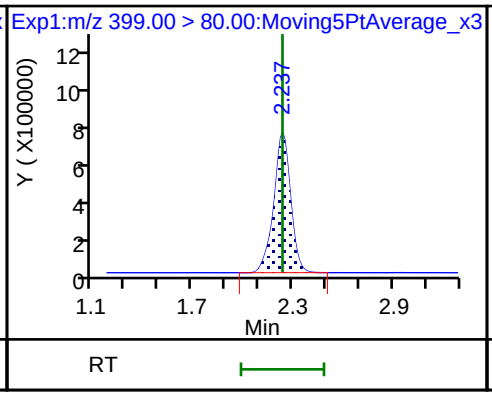
10 Perfluoroheptanoic acid



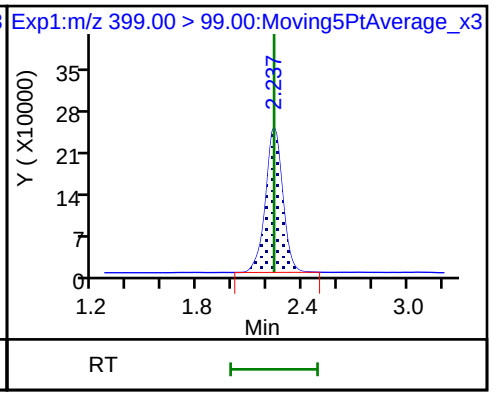
10 Perfluoroheptanoic acid



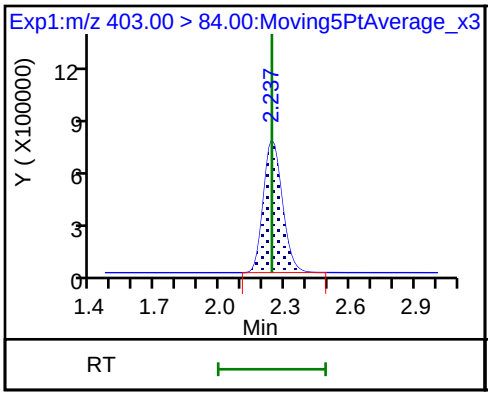
8 Perfluorohexanesulfonic acid



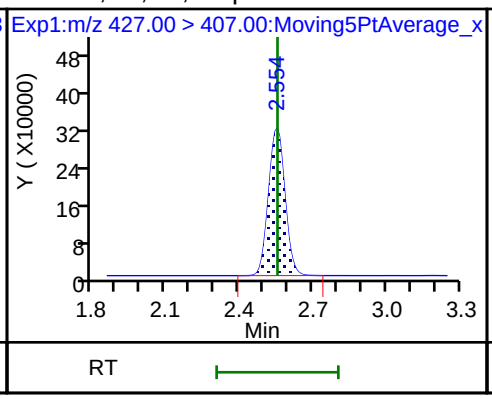
8 Perfluorohexanesulfonic acid



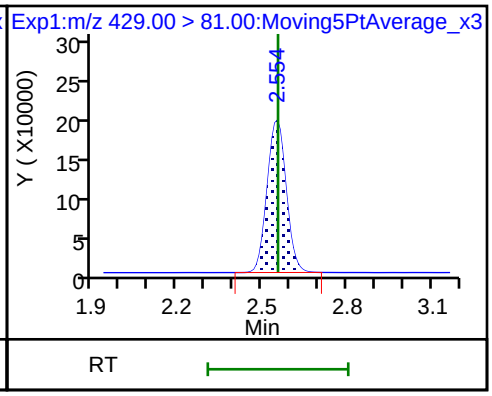
D 11 18O2 PFHxS



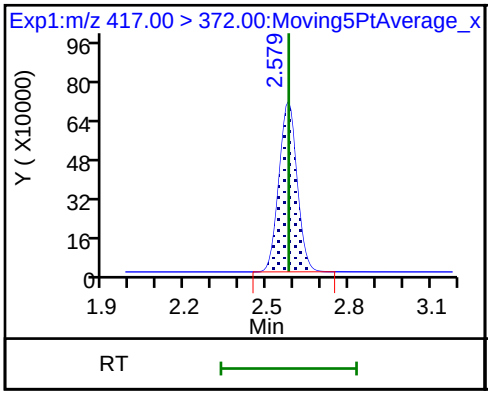
13 1H,1H,2H,2H-perfluorooctanesulfon



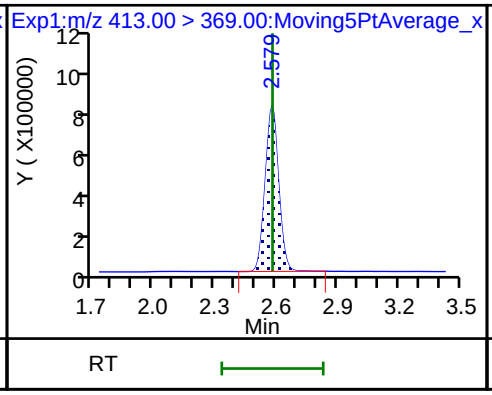
D 12 M2-6:2FTS



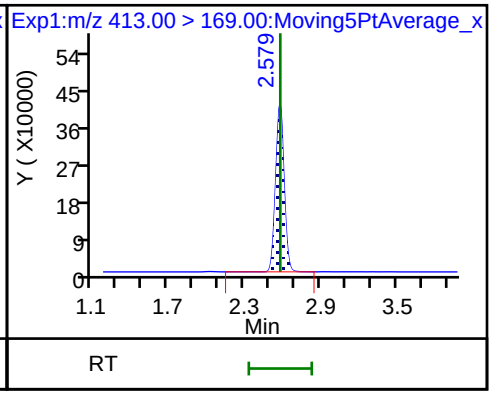
D 14 13C4 PFOA



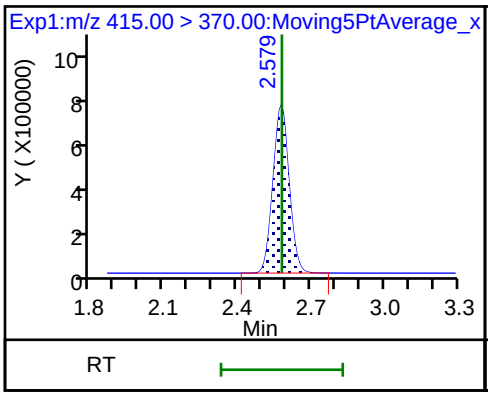
15 Perfluorooctanoic acid



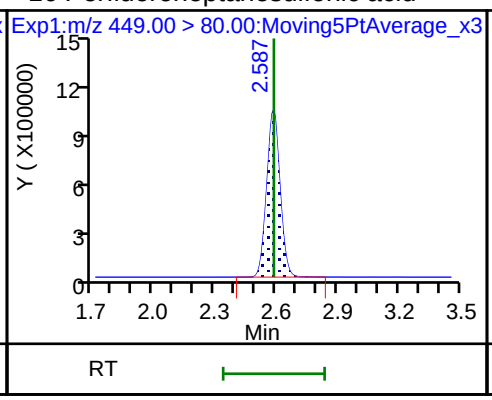
15 Perfluorooctanoic acid



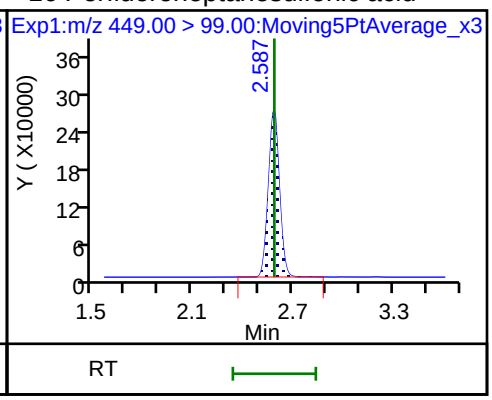
* 62 13C2-PFOA



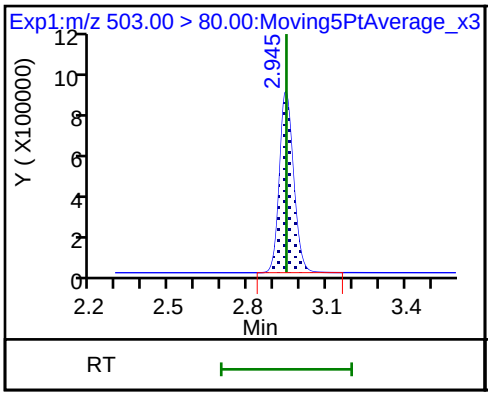
16 Perfluoroheptanesulfonic acid



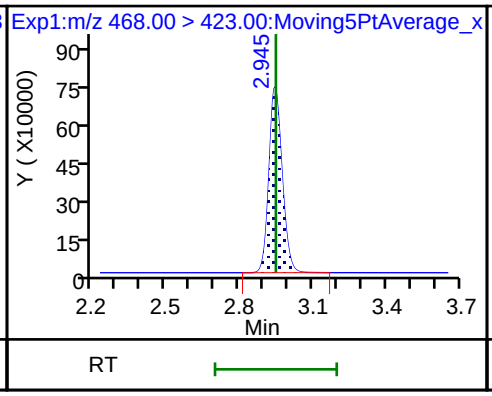
16 Perfluoroheptanesulfonic acid



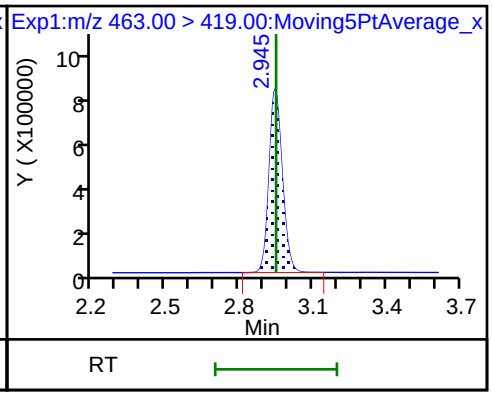
D 18 13C4 PFOS



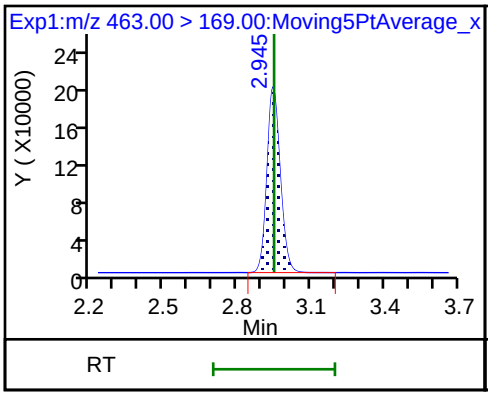
D 19 13C5 PFNA



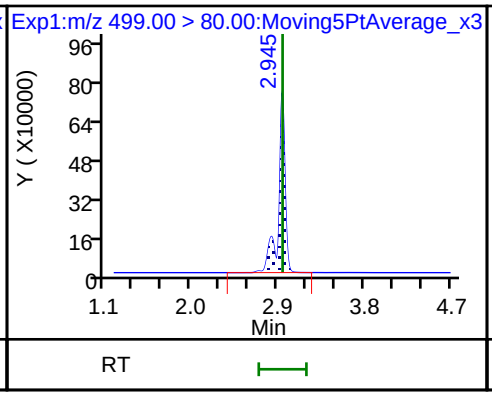
20 Perfluorononanoic acid



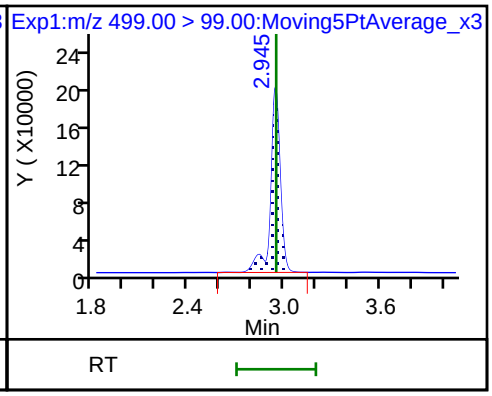
20 Perfluorononanoic acid



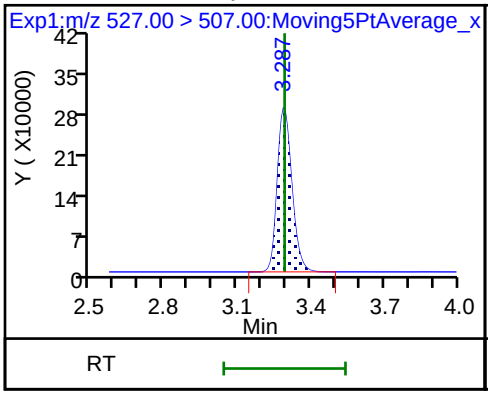
17 Perfluorooctane sulfonic acid



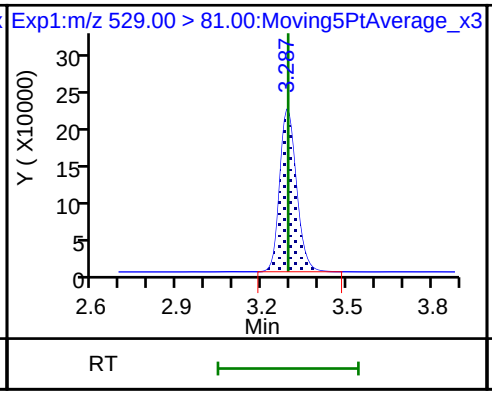
17 Perfluorooctane sulfonic acid



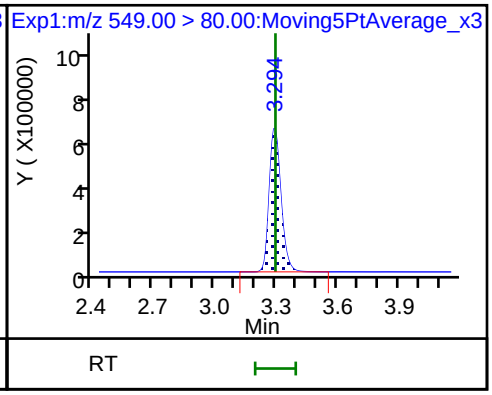
25 1H,1H,2H,2H-perfluorodecanesulfon



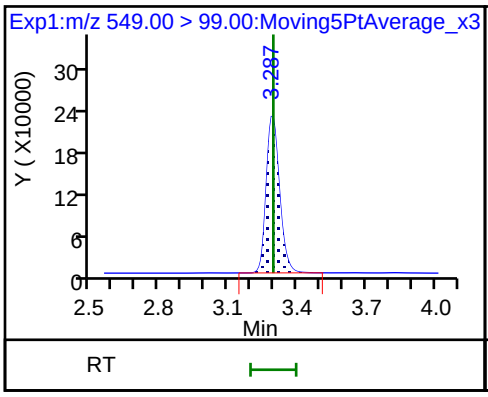
D 26 M2-8:2FTS



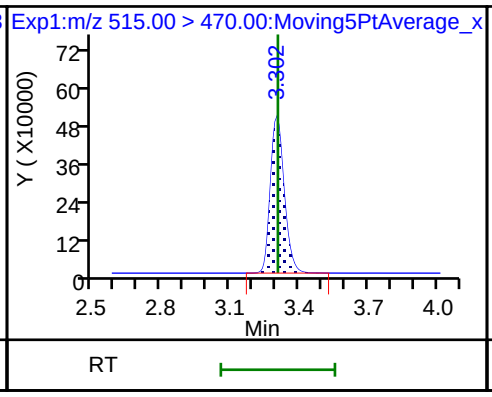
68 Perfluorononanesulfonic acid



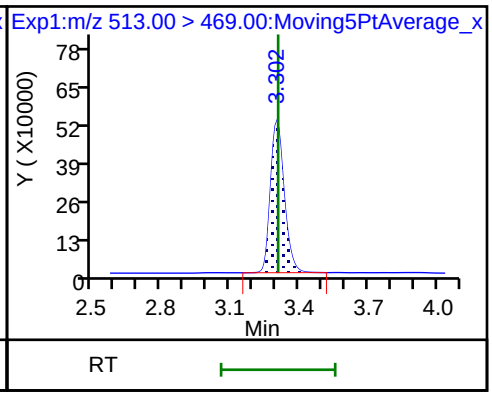
68 Perfluorononanesulfonic acid



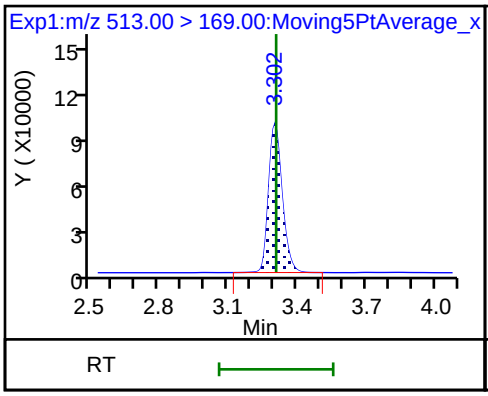
D 23 13C2 PFDA



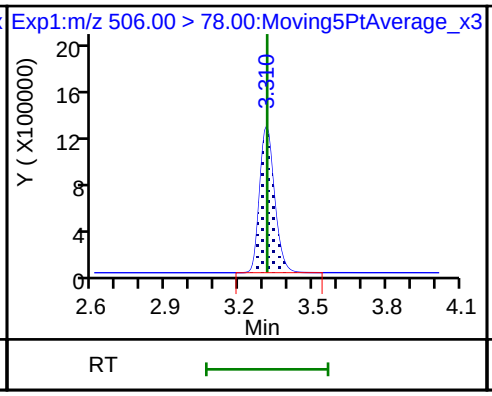
24 Perfluorodecanoic acid



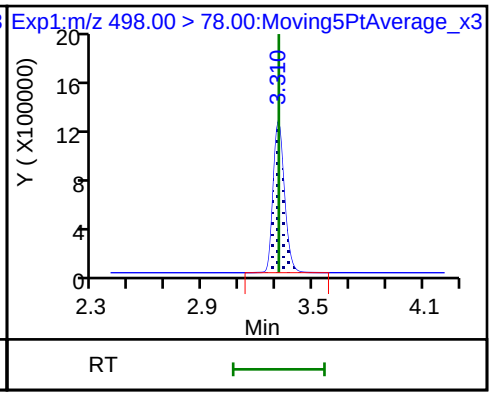
24 Perfluorodecanoic acid



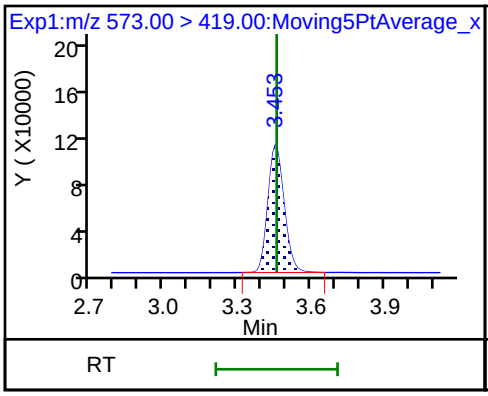
D 21 13C8 FOSA



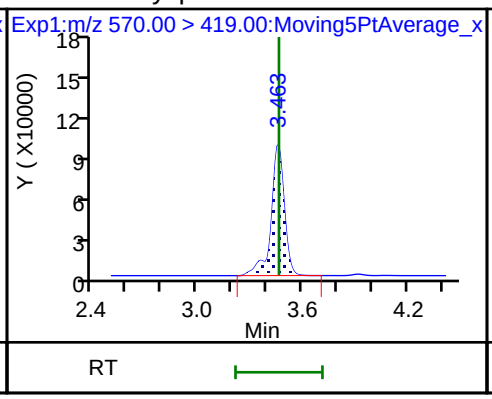
22 Perfluorooctane Sulfonamide



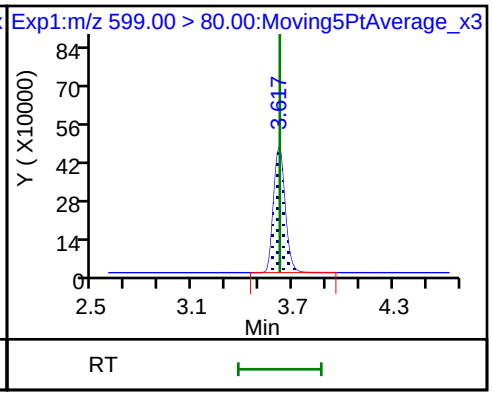
D 27 d3-NMeFOSAA



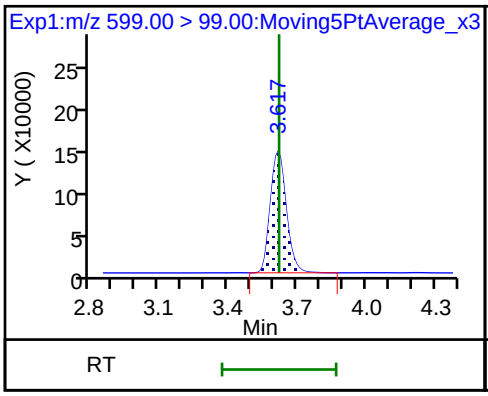
28 N-methyl perfluorooctane sulfonami



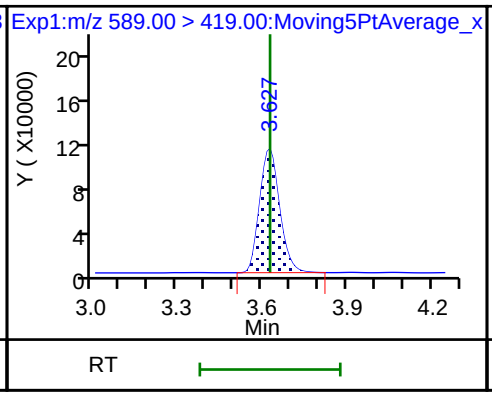
29 Perfluorodecane Sulfonic acid



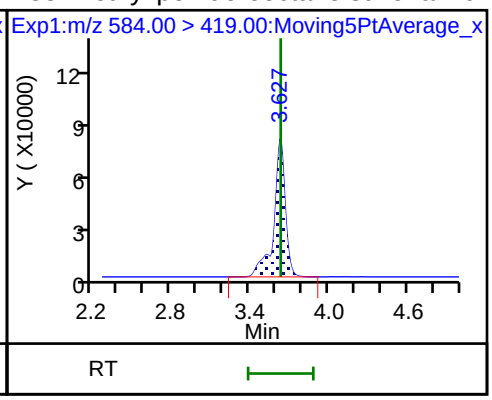
29 Perfluorodecane Sulfonic acid



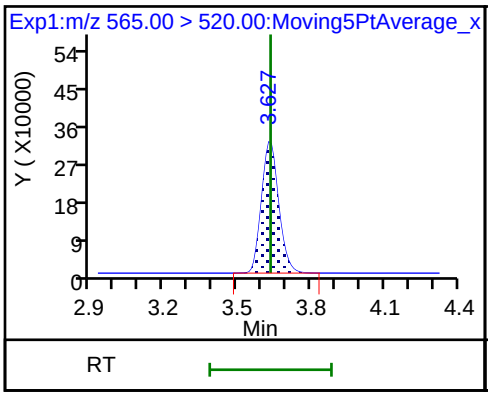
D 32 d5-NEtFOSAA



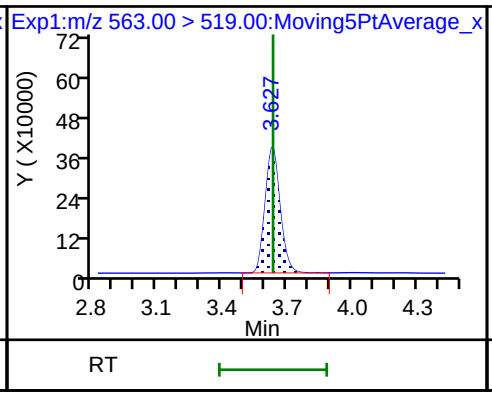
33 N-ethyl perfluorooctane sulfonamid



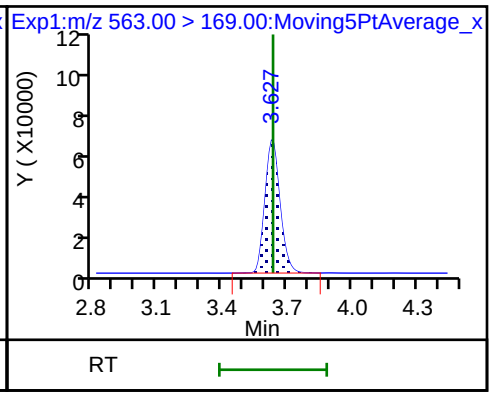
D 30 13C2 PFUnA



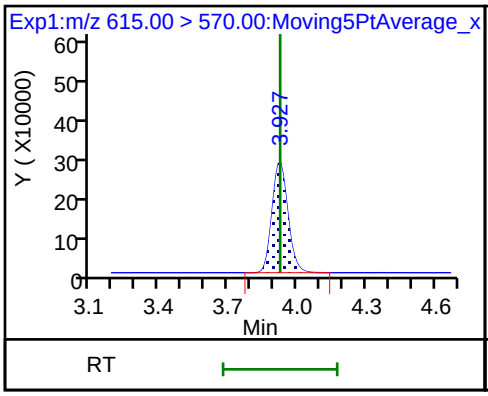
31 Perfluoroundecanoic acid



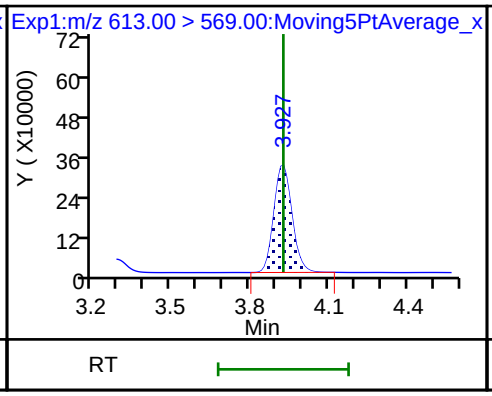
31 Perfluoroundecanoic acid



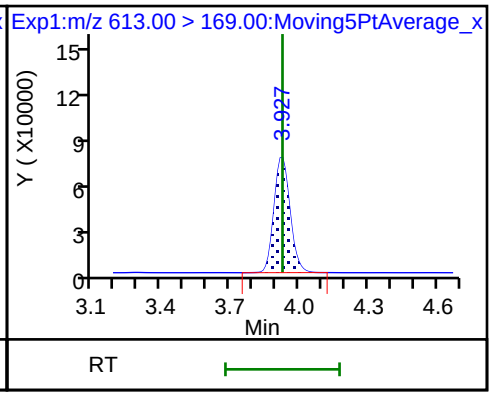
D 36 13C2 PFDoA



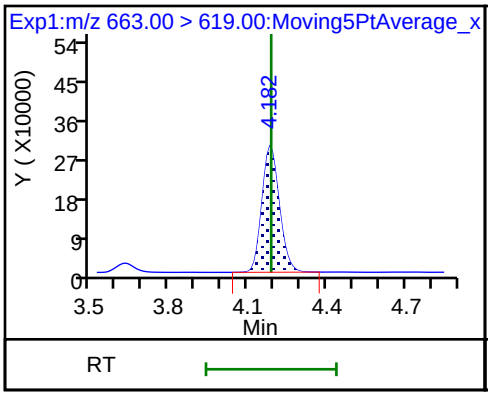
37 Perfluorododecanoic acid



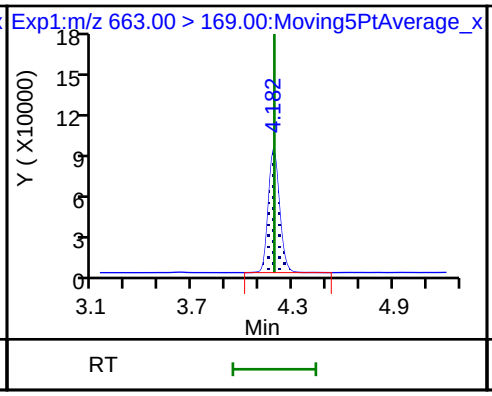
37 Perfluorododecanoic acid



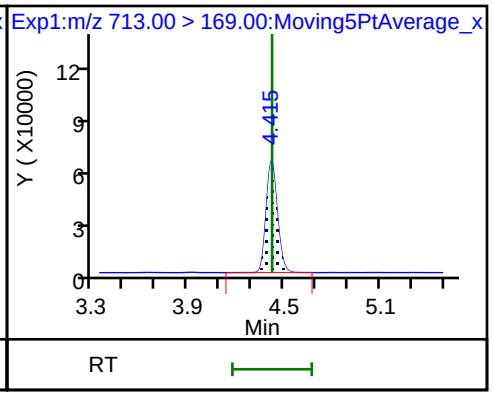
41 Perfluorotridecanoic acid



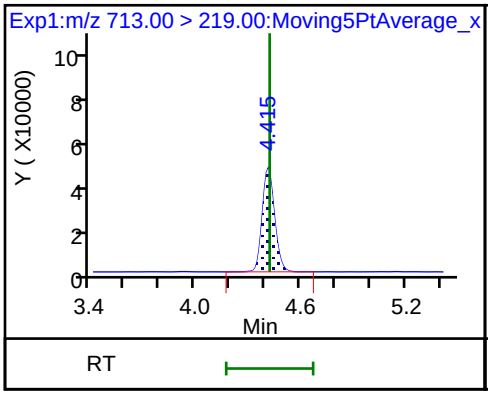
41 Perfluorotridecanoic acid



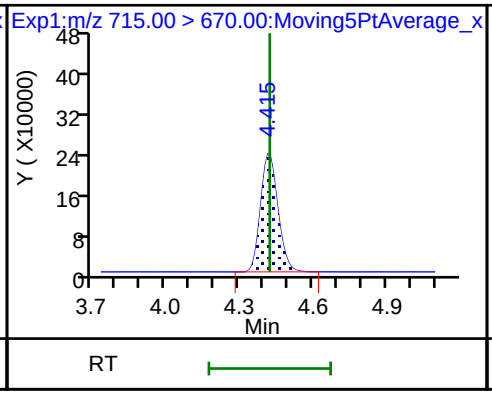
42 Perfluorotetradecanoic acid



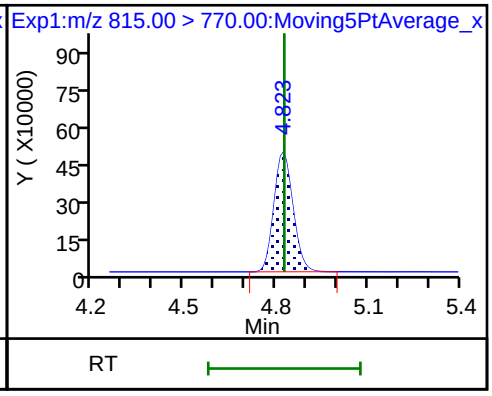
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 01-Aug-2018 13:38:11 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:29 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:59:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.395	0.003	0.541	4598618	2.61		104	69966	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.396	0.001	1.000	9171174	5.06		101	2117	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	7124053	5.00		100	3043	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.633	2974004	2.56		103	42918	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.646	82077	2.46		106	326	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.671	0.004	1.005	12002466	4.44		100	49723	
298.90 > 99.00	1.666	1.671	-0.005	1.000	5088225		2.36(1.25-3.74)	100	22853	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.872	0.004	1.126	2787781	4.59		98.3	122401	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.872	0.004	0.727	567443	NC			6287	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.906	1.903	0.003	1.000	6816050	5.00		100	10692	
313.00 > 119.00	1.906	1.903	0.003	1.000	607403		11.22(5.03-15.10)	100	6084	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.903	0.003	0.738	3231846	2.58		103	69974	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	11402360	4.77		102	91517	
349.00 > 99.00	1.927	1.928	-0.001	1.157	4322819		2.64(1.36-4.07)	102	21604	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.000	0.003	0.776	153939	NC			4397	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.002	0.001	1.000	1171510	NC			4626	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.225	0.004	0.864	3116337	2.56		102	57492	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.226	0.003	1.000	7260990	5.02		100	3272	
363.00 > 169.00	2.229	2.226	0.003	1.000	2743085		2.65(1.13-3.40)	100	22895	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.237	0.004	1.000	9713740	4.36		95.9	29626	
399.00 > 99.00	2.241	2.237	0.004	1.000	3229342		3.01(1.50-4.49)	95.9	4983	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.238	0.003	0.868	4552896	2.49		105	41500	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.769	17310053	NC			97371	
377.00 > 85.00	2.267	2.270	-0.003	0.769	10635588		1.63(0.84-2.53)		37926	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.555	2.554	0.001	1.000	2799930	4.71		99.4	29558	
D 12 M2-6:2FTS										
429.00 > 81.00	2.555	2.556	-0.001	0.990	853793	2.40		101	10018	
D 14 13C4 PFOA										
417.00 > 372.00	2.580	2.580	0.0	1.000	2942955	2.51		100	37513	
* 62 13C2-PFOA										
415.00 > 370.00	2.580	2.581	-0.001		3058012	2.50			46964	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.580	2.581	-0.001	1.000	6976550	5.13		102	5295	
413.00 > 169.00	2.580	2.581	-0.001	1.000	3689319		1.89(0.84-2.52)	102	12958	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.587	0.001	0.878	8881601	4.91		103	41144	
449.00 > 99.00	2.588	2.587	0.001	0.878	2392742		3.71(1.94-5.82)	103	21710	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.946	0.002	1.142	3128101	2.48		104	34966	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.948	0.0	1.142	2589352	2.53		101	48232	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.949	-0.001	1.000	6798798	4.63		99.7	37617	
499.00 > 99.00	2.948	2.949	-0.001	1.000	1556808		4.37(2.31-6.93)	99.7	8559	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.949	-0.001	1.000	5744475	5.14		103	11587	
463.00 > 169.00	2.948	2.949	-0.001	1.000	1399812		4.10(1.90-5.69)	103	26388	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.158	-0.002	1.070	11077192	NC			84001	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.292	-0.001	1.275	828227	2.38		99.6	14255	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.291	3.292	-0.001	1.000	2239081	4.79		100	67668	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.291	3.295	-0.004	1.116	4817452	5.12		107	47993	
549.00 > 99.00	3.291	3.295	-0.004	1.116	1750190		2.75(1.33-3.97)	107	10655	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.306	0.001	1.282	1963135	2.57		103	42394	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.307	3.308	-0.001	1.000	4009985	4.78		95.7	4974	
513.00 > 169.00	3.307	3.308	-0.001	1.000	708571		5.66(2.36-7.09)	95.7	8379	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.312	0.003	1.285	4827094	2.60		104	47868	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.315	3.313	0.002	1.000	9630397	5.05		101	44465	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.459	-0.001	1.340	501663	2.70		108	13710	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.465	0.002	1.003	986536	4.84		96.7	11800	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.621	3.620	0.001	1.228	4226499	4.96		103	128198	
599.00 > 99.00	3.621	3.620	0.001	1.228	1369923		3.09(1.39-4.16)	103	18062	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.627	0.004	1.407	495602	2.49		99.6	4442	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.631	3.633	-0.002	1.000	898298	5.08		102	17316	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.631	3.634	-0.003	1.000	3479056	4.71		94.2	7241	
563.00 > 169.00	3.631	3.634	-0.003	1.000	615392		5.65(2.12-6.36)	94.2	25449	
D 30 13C2 PFUnA										
565.00 > 520.00	3.631	3.634	-0.003	1.407	1498263	2.54		102	35012	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.792	0.003	1.287	15311015	NC			98644	
D 36 13C2 PFDoA										
615.00 > 570.00	3.920	3.925	-0.005	1.519	1279511	2.51		100	16773	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.931	3.927	0.004	1.003	2802983	5.06		101	1051	
613.00 > 169.00	3.920	3.927	-0.007	1.000	716512		3.91(2.13-6.40)	101	12519	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.184	4.188	-0.004	1.067	2580030	5.35		107	886	
663.00 > 169.00	4.184	4.188	-0.004	1.067	776811		3.32(1.25-3.76)	107	6166	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.423	0.004	1.716	1118375	2.61		104	5580	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.427	4.423	0.004	1.000	585419	4.86		97.2	5924	
713.00 > 219.00	4.416	4.423	-0.007	0.998	418173		1.40(0.71-2.13)	97.2	5362	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.826	-0.002	1.869	1875506	2.54		102	2831	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.824	4.827	-0.003	1.000	3739164	NC			237	
813.00 > 169.00	4.824	4.827	-0.003	1.000	606682		6.16(2.86-8.58)		4826	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.166	5.166	0.0	1.071	3935966	NC			1173	
913.00 > 169.00	5.158	5.166	-0.008	1.069	487622		8.07(3.83-11.48)		4062	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00006 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:31 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_007.d

Injection Date: 01-Aug-2018 13:38:11 Instrument ID: A8_N

Lims ID: IC L6 Full

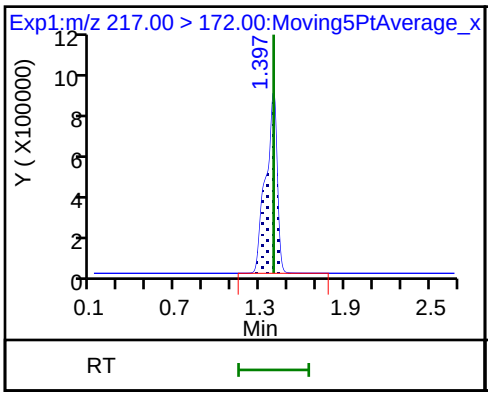
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 15 Worklist Smp#: 7

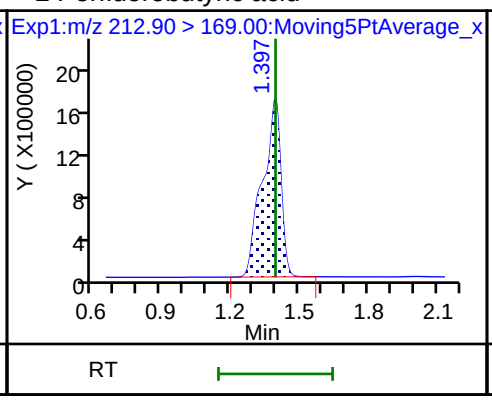
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

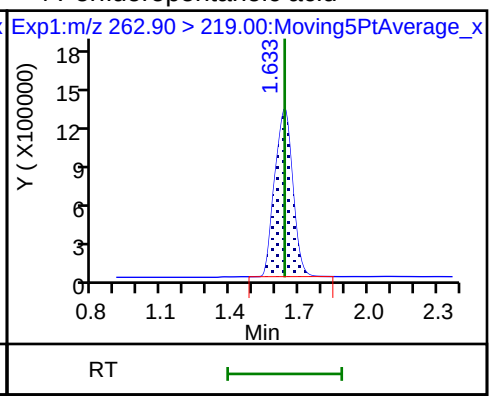
D 1 13C4 PFBA



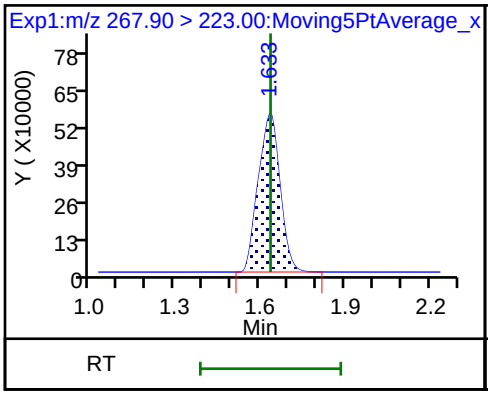
2 Perfluorobutyric acid



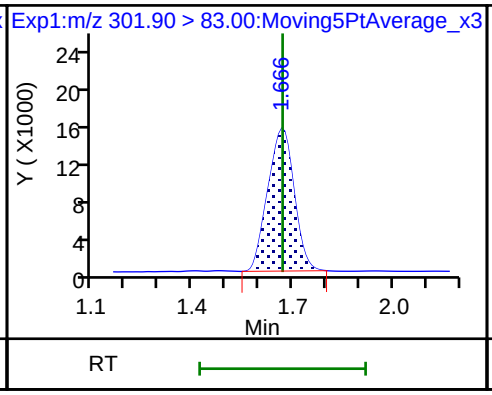
4 Perfluoropentanoic acid



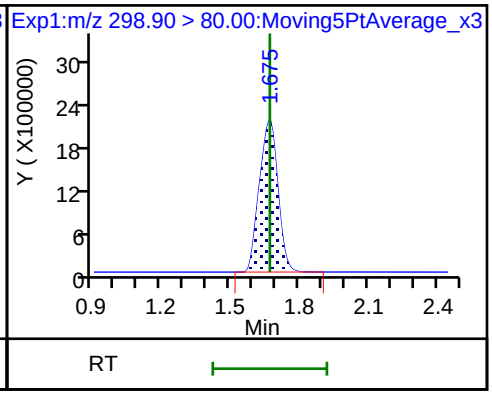
D 3 13C5-PFPeA



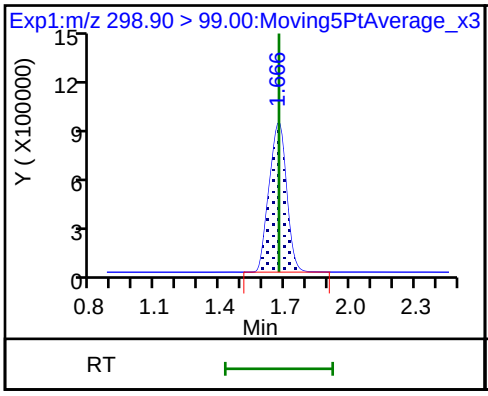
D 47 13C3-PFBS



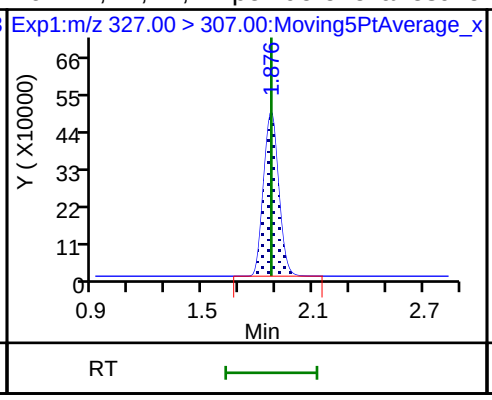
5 Perfluorobutanesulfonic acid



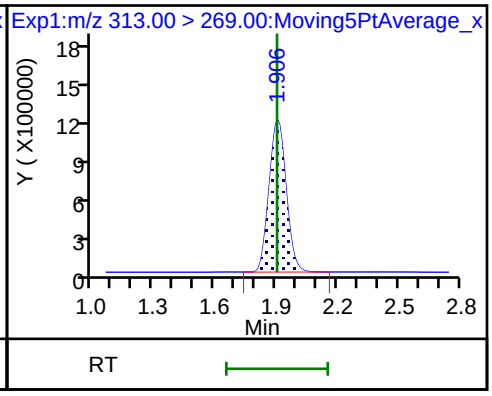
5 Perfluorobutanesulfonic acid



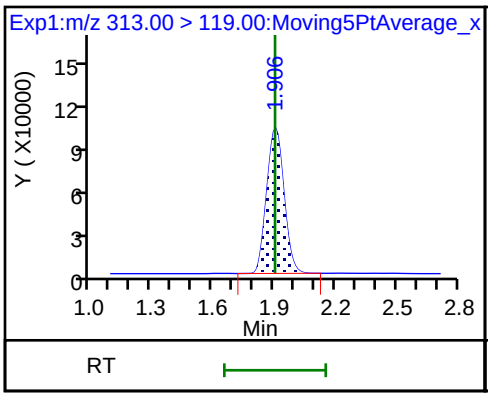
61 1H,1H,2H,2H-perfluorohexanesulfoni



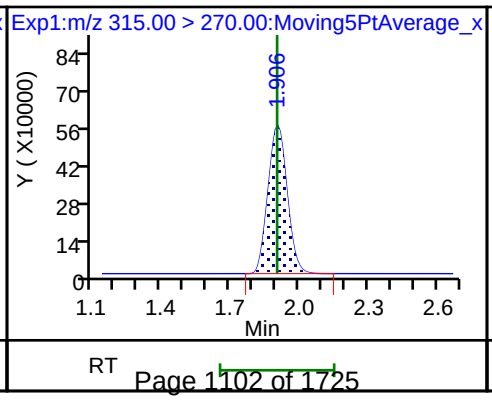
6 Perfluorohexanoic acid



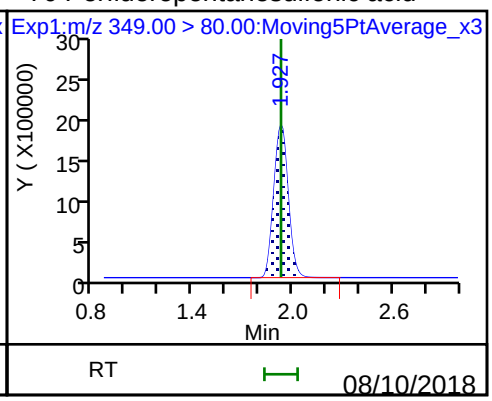
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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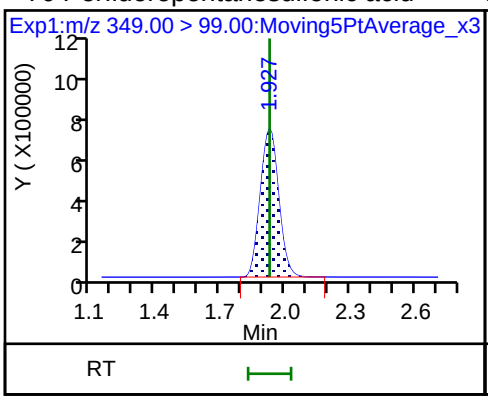
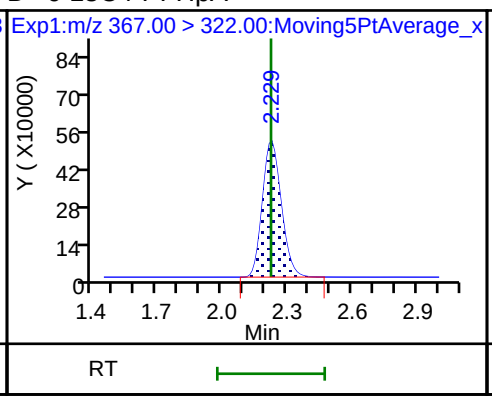
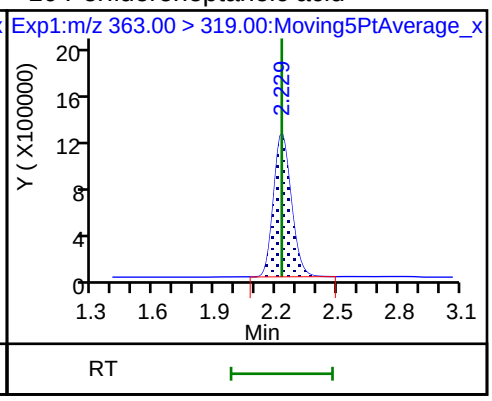


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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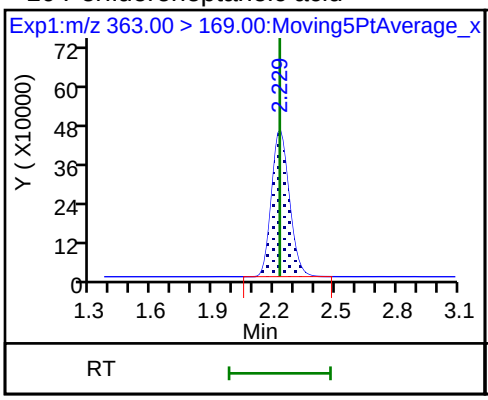
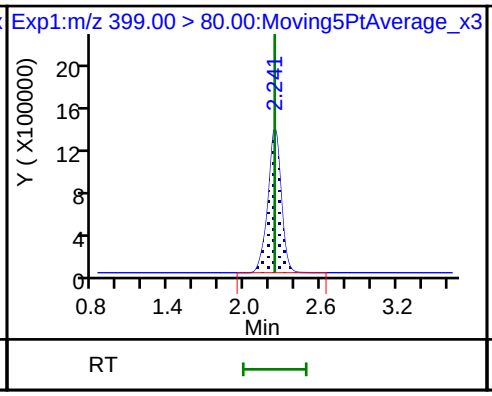
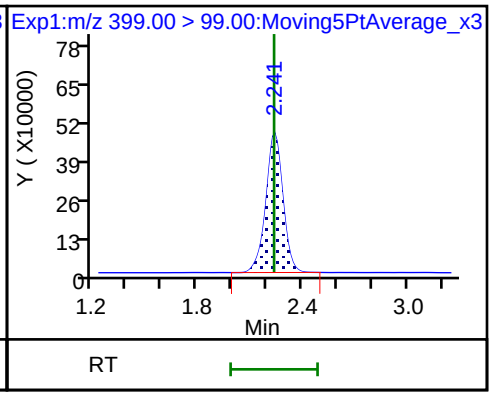


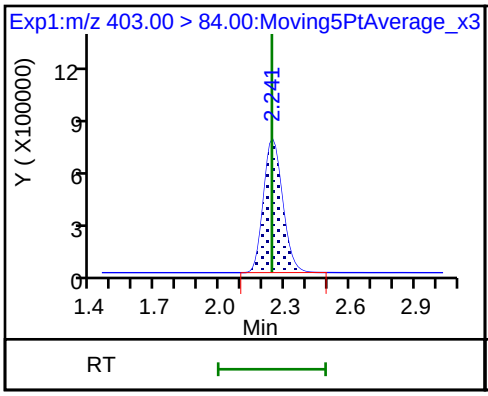
8 Perfluorohexanesulfonic acid



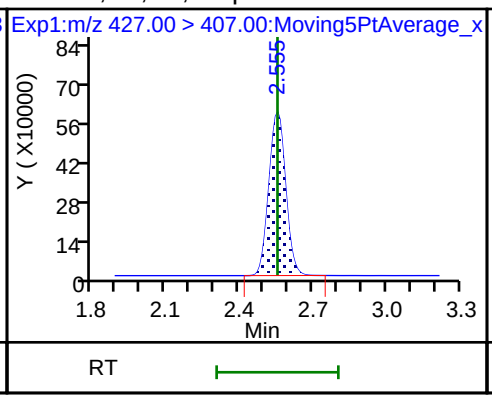
8 Perfluorohexanesulfonic acid



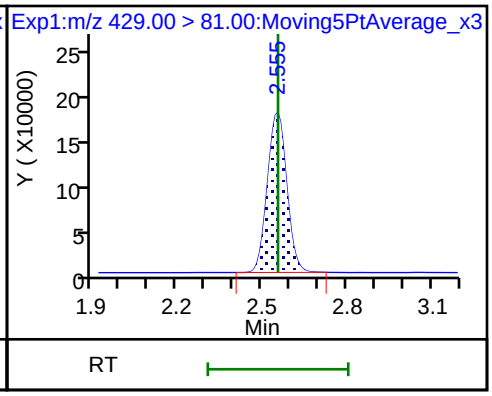
D 11 18O2 PFHxS



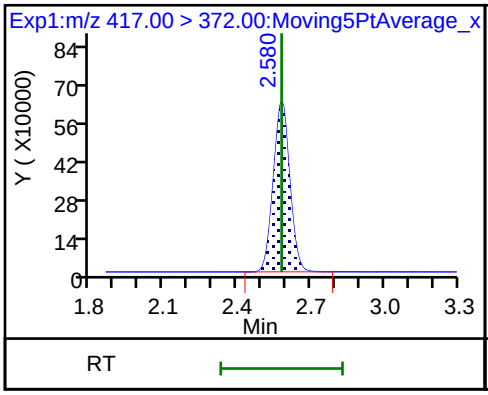
13 1H,1H,2H,2H-perfluorooctanesulfon



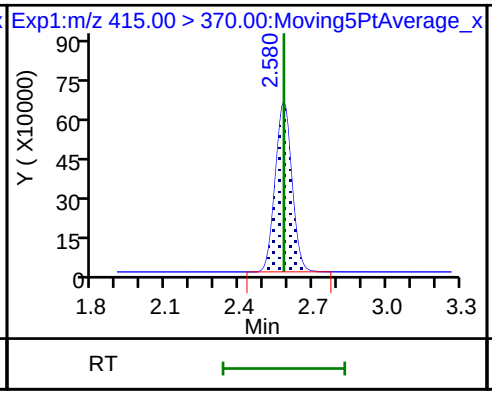
D 12 M2-6:2FTS



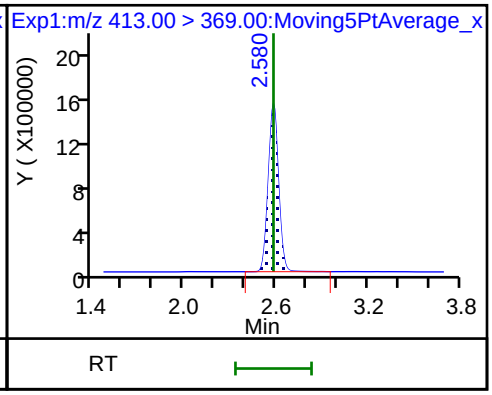
D 14 13C4 PFOA



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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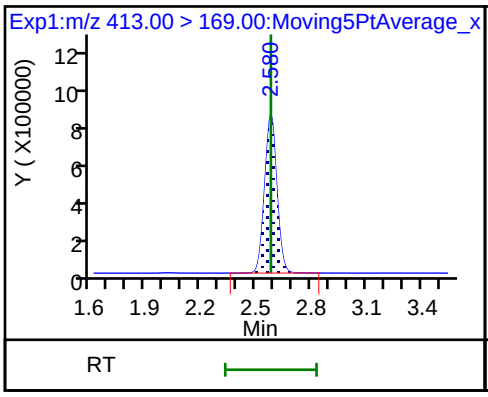
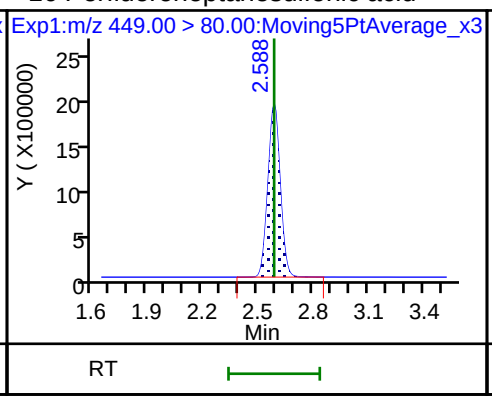
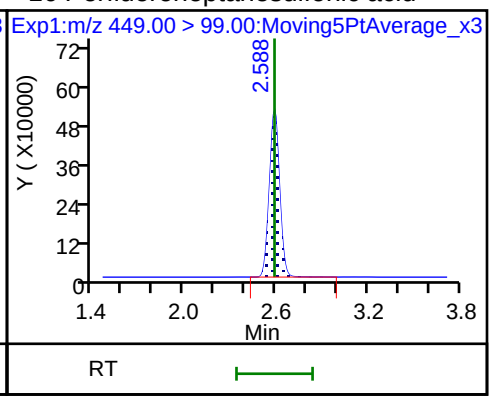


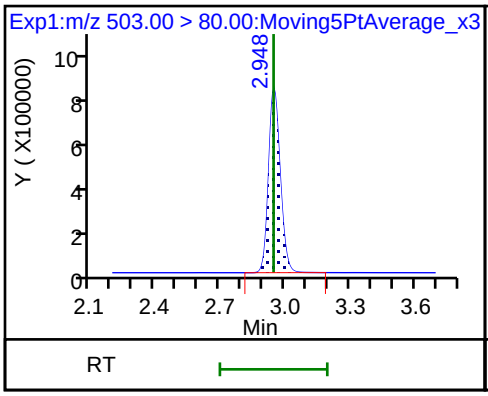
16 Perfluoroheptanesulfonic acid



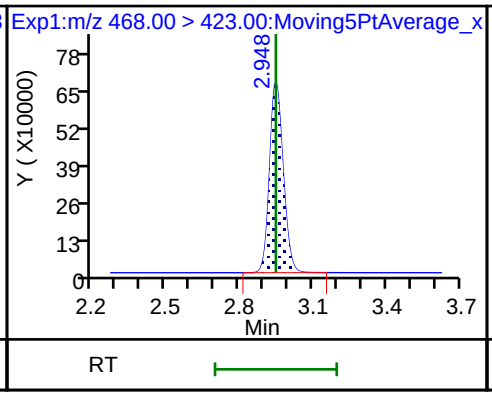
16 Perfluoroheptanesulfonic acid



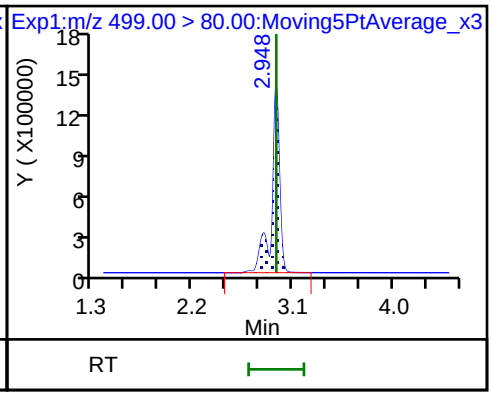
D 18 13C4 PFOS



D 19 13C5 PFNA



17 Perfluorooctane sulfonic acid



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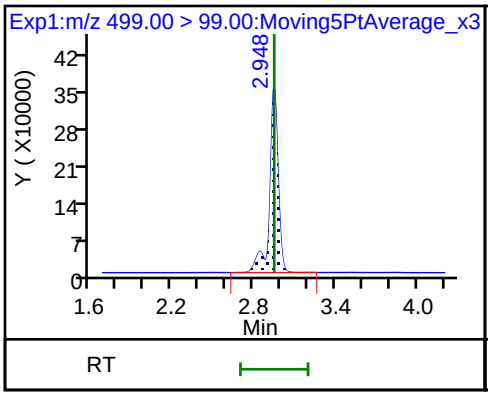
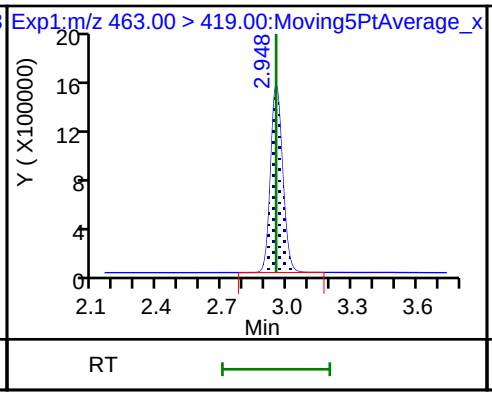


20 Perfluorononanoic acid



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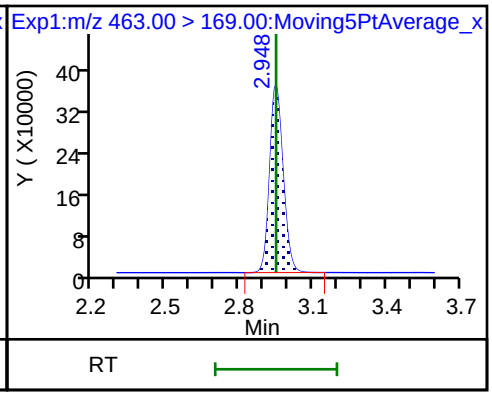
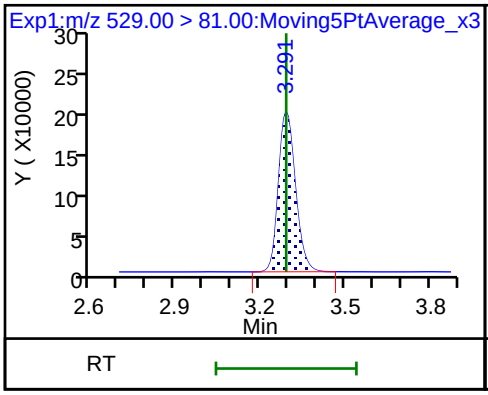
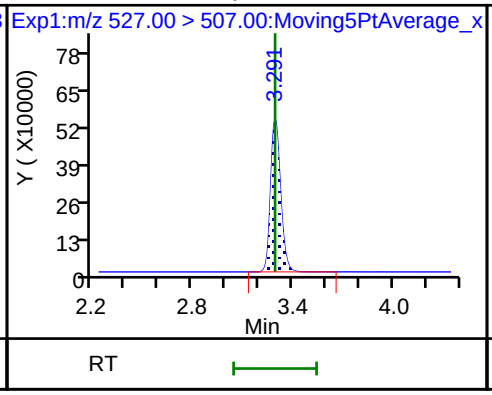


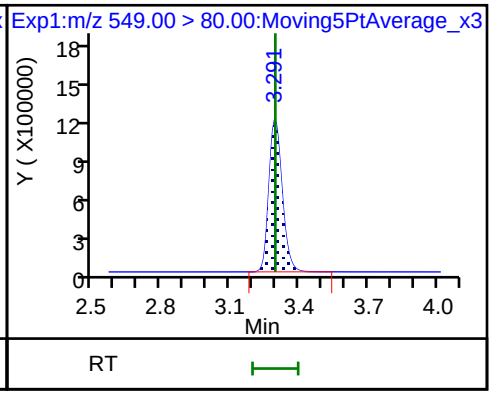
D 26 M2-8:2FTS



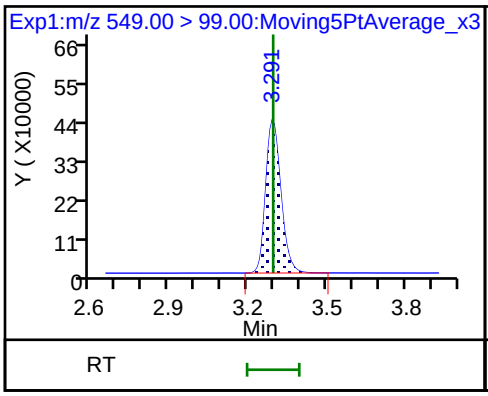
25 1H,1H,2H,2H-perfluorodecanesulfoni



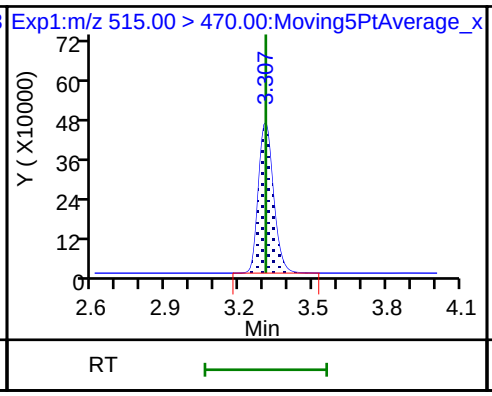
68 Perfluorononanesulfonic acid



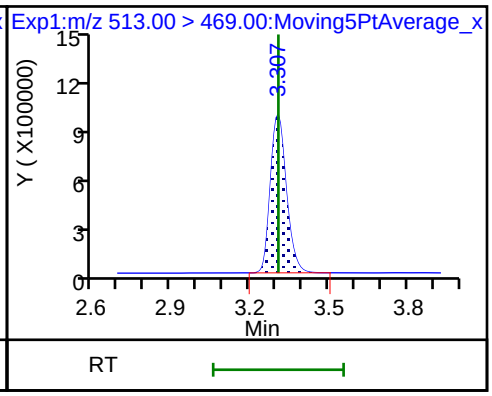
68 Perfluorononanesulfonic acid



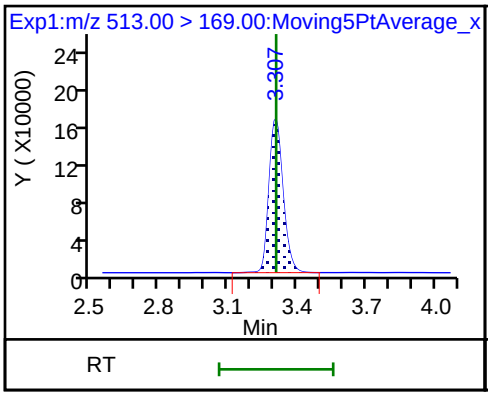
D 23 13C2 PFDA



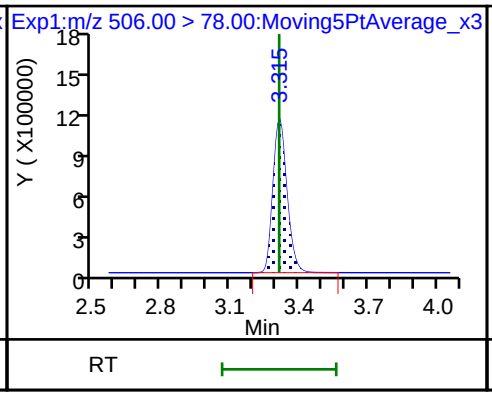
24 Perfluorodecanoic acid



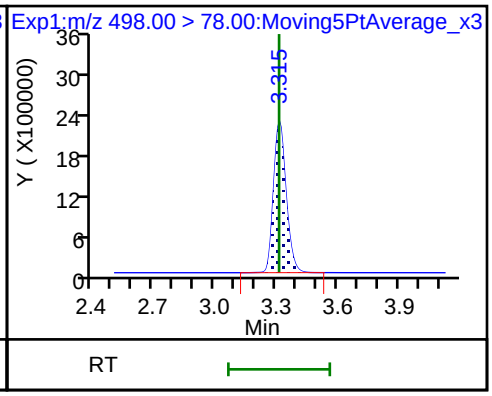
24 Perfluorodecanoic acid



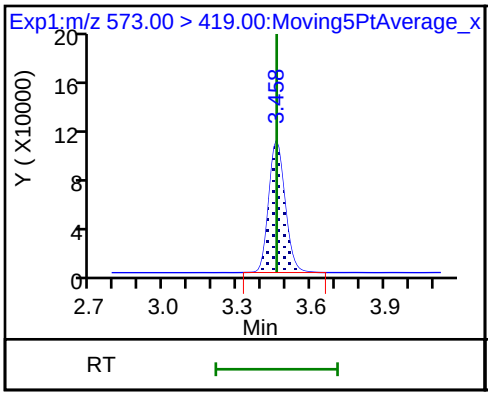
D 21 13C8 FOSA



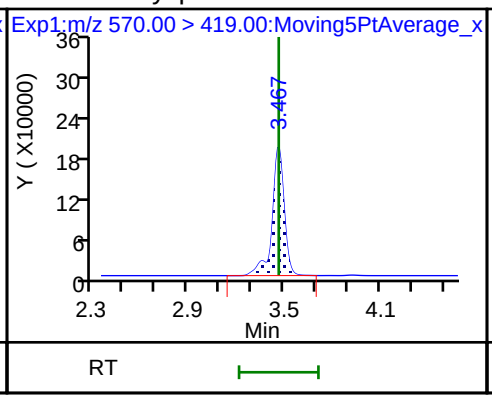
22 Perfluorooctane Sulfonamide



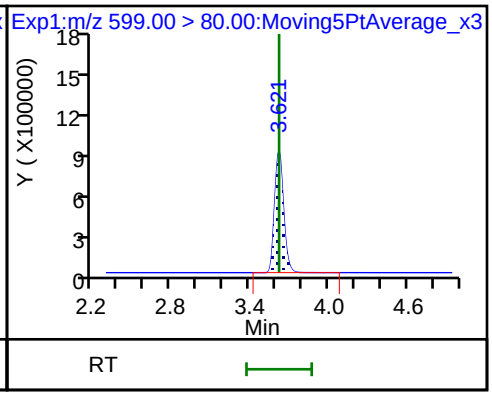
D 27 d3-NMeFOSAA



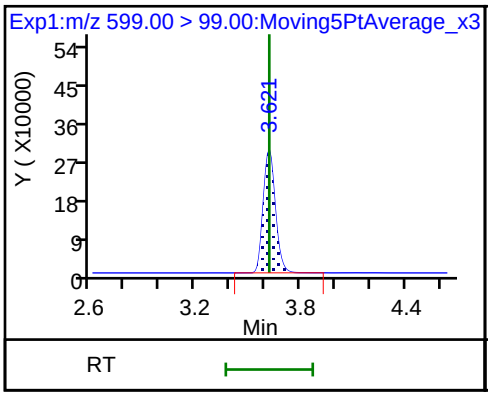
28 N-methyl perfluorooctane sulfonami



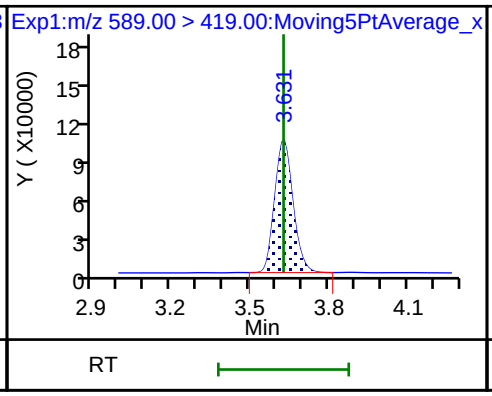
29 Perfluorodecane Sulfonic acid



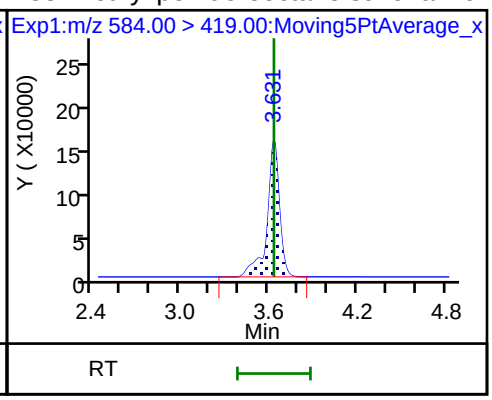
29 Perfluorodecane Sulfonic acid



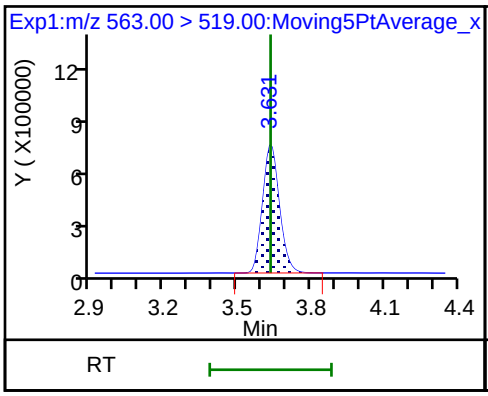
D 32 d5-NEtFOSAA



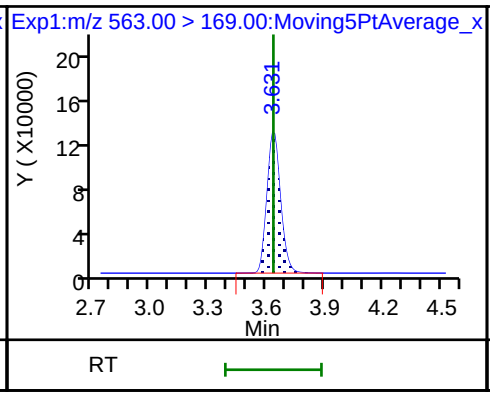
33 N-ethyl perfluorooctane sulfonamid



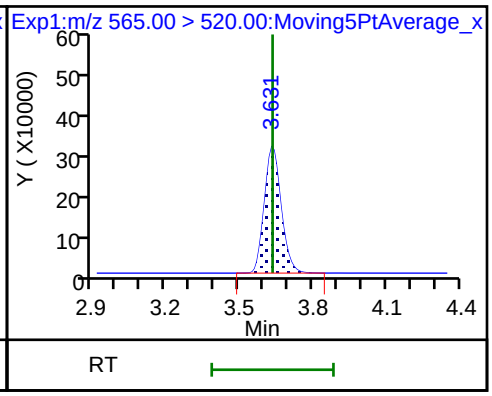
31 Perfluoroundecanoic acid



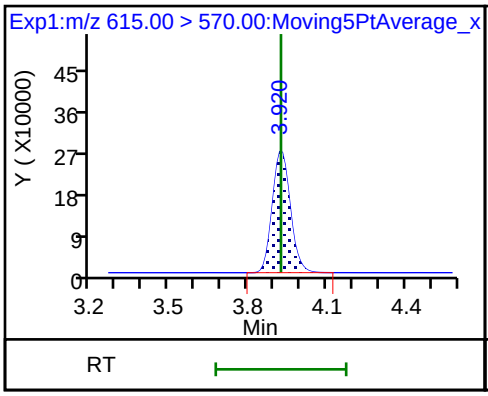
31 Perfluoroundecanoic acid



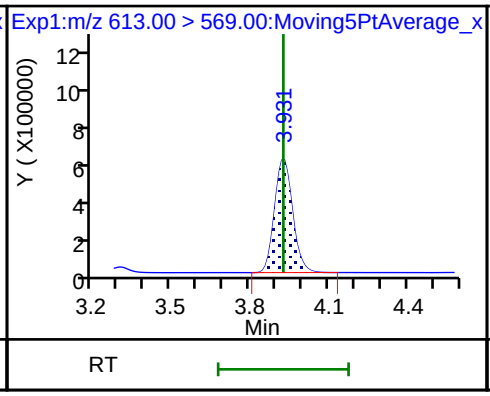
D 30 13C2 PFUnA



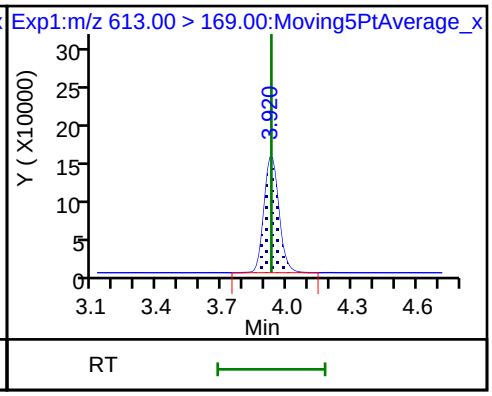
D 36 13C2 PFDoA



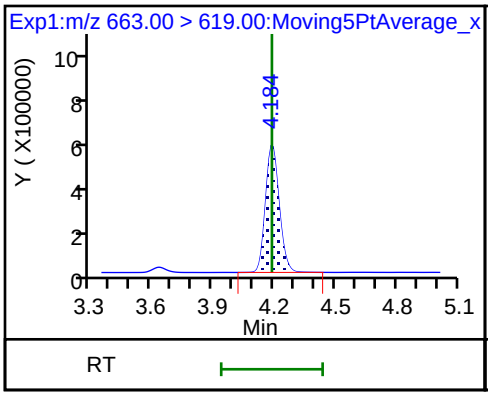
37 Perfluorododecanoic acid



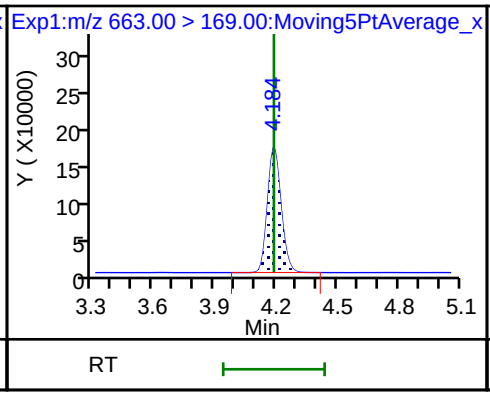
37 Perfluorododecanoic acid



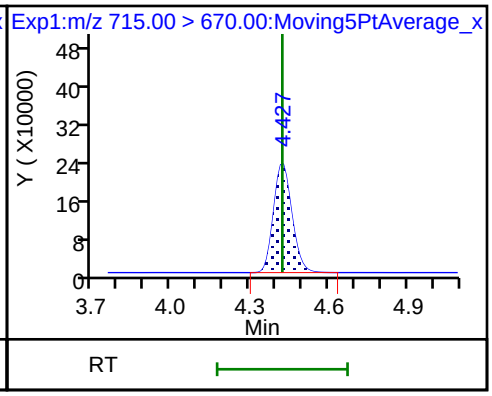
41 Perfluorotridecanoic acid



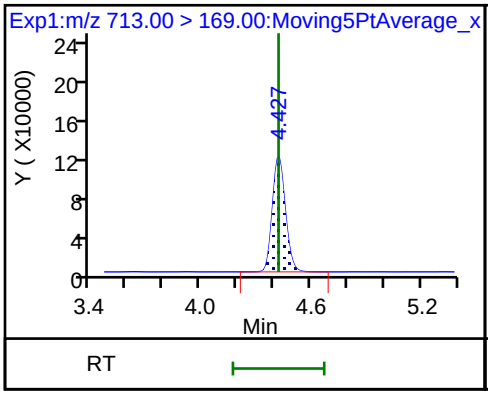
41 Perfluorotridecanoic acid



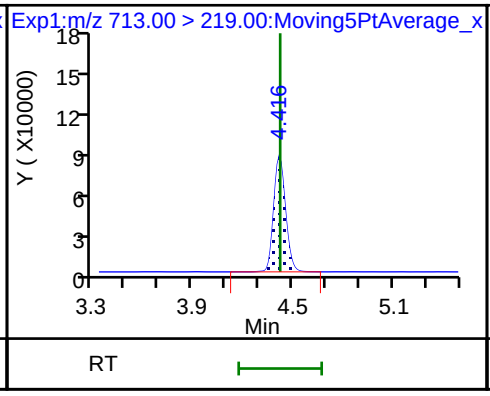
D 43 13C2-PFTeDA



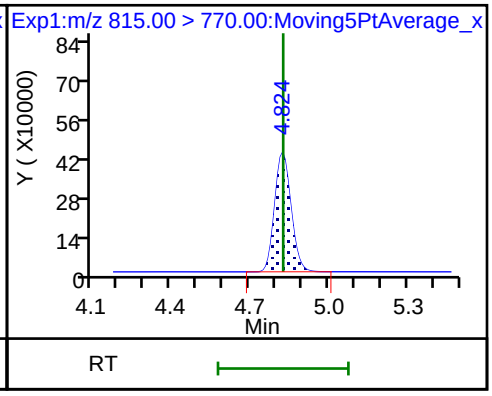
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 01-Aug-2018 13:46:01 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:59:54 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:35:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.003	0.541	4488667	2.73		109	73989	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.396	-0.005	1.000	17657065	9.98		99.8	4339	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.635	2847672	2.63		105	44006	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	13665143	10.0		100	5702	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.669	-0.003	0.647	80880	2.59		112	321	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.671	-0.005	1.000	22654929	8.50		96.1	77149	
298.90 > 99.00	1.666	1.671	-0.005	1.000	10018644		2.26(1.25-3.74)	96.1	64080	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.872	-0.006	0.725	526933	NC			5548	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.872	-0.006	1.120	5267139	8.80		94.2	185327	
D 7 13C2 PFHxA										
315.00 > 270.00	1.895	1.903	-0.008	0.737	3022362	2.58		103	64725	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.895	1.903	-0.008	1.000	13079443	10.3		103	23297	
313.00 > 119.00	1.895	1.903	-0.008	1.000	1166130		11.22(5.03-15.10)	103	13276	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.157	21798270	9.26		98.7	139676	
349.00 > 99.00	1.927	1.928	-0.001	1.157	8606195		2.53(1.36-4.07)	98.7	42784	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.992	2.000	-0.008	0.774	159356	NC			3961	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.992	2.002	-0.010	1.000	2476711	NC			10791	
D 9 13C4-PFHpA										
367.00 > 322.00	2.218	2.225	-0.007	0.862	2908549	2.56		102	60437	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.218	2.226	-0.008	1.000	13373710	9.91		99.1	5700	
363.00 > 169.00	2.218	2.226	-0.008	1.000	5233691		2.56(1.13-3.40)	99.1	41791	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.237	-0.008	1.000	18747407	8.49		93.3	37401	
399.00 > 99.00	2.229	2.237	-0.008	1.000	6489057		2.89(1.50-4.49)	93.3	8896	
D 11 18O2 PFHxS										
403.00 > 84.00	2.229	2.238	-0.009	0.866	4518625	2.64		112	52710	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.771	30025263	NC			138977	
377.00 > 85.00	2.267	2.270	-0.003	0.771	18863315		1.59(0.84-2.53)		55929	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.547	2.554	-0.007	1.000	5327073	9.77		103	41841	
D 12 M2-6:2FTS										
429.00 > 81.00	2.547	2.556	-0.009	0.990	782824	2.35		98.9	10988	
D 14 13C4 PFOA										
417.00 > 372.00	2.573	2.580	-0.007	1.000	2730006	2.49		99.4	48269	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.573	2.581	-0.008	1.000	12686108	10.0		100	9244	
413.00 > 169.00	2.573	2.581	-0.008	1.000	7050018		1.80(0.84-2.52)	100	18721	
* 62 13C2-PFOA										
415.00 > 370.00	2.573	2.581	-0.008		2860140	2.50			30580	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.587	-0.006	0.877	16519531	9.08		95.4	40839	
449.00 > 99.00	2.581	2.587	-0.006	0.877	4738121		3.49(1.94-5.82)	95.4	36870	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.946	-0.003	1.144	3144316	2.66		111	42087	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.948	-0.005	1.144	2393820	2.50		100	51513	
20 Perfluorononanoic acid										
463.00 > 419.00	2.943	2.949	-0.006	1.000	10755568	10.4		104	21010	
463.00 > 169.00	2.943	2.949	-0.006	1.000	2576235		4.17(1.90-5.69)	104	41900	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.943	2.949	-0.006	1.000	13695202	9.27		99.9	54151	
499.00 > 99.00	2.943	2.949	-0.006	1.000	3178976		4.31(2.31-6.93)	99.9	18790	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.158	-0.002	1.073	20317968	NC			84817	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.284	3.292	-0.008	1.000	3886014	9.26		96.6	84560	
D 26 M2-8:2FTS										
529.00 > 81.00	3.284	3.292	-0.008	1.276	744064	2.29		95.6	12722	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.295	-0.003	1.119	9124121	9.65		101	51248	
549.00 > 99.00	3.292	3.295	-0.003	1.119	3638243		2.51(1.33-3.97)	101	19247	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.300	3.306	-0.006	1.282	1788913	2.50		100.0	32934	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.300	3.308	-0.008	1.000	7657634	10.0		100	9199	
513.00 > 169.00	3.300	3.308	-0.008	1.000	1309103		5.85(2.36-7.09)	100	14855	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.312	-0.004	1.285	4606616	2.66		106	37706	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.313	-0.005	1.000	17992319	9.89		98.9	109874	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.450	3.459	-0.009	1.341	467155	2.69		108	14408	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.465	-0.005	1.003	1921554	10.1		101	14086	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.614	3.620	-0.006	1.228	8073020	9.43		97.9	120699	
599.00 > 99.00	3.614	3.620	-0.006	1.228	2617387		3.08(1.39-4.16)	97.9	42044	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.627	-0.003	1.408	473237	2.54		102	5165	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.624	3.633	-0.009	1.000	1761697	10.4		104	24833	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.634	0.0	1.412	1439097	2.61		104	42272	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.634	0.0	1.000	6830755	9.63		96.3	15533	
563.00 > 169.00	3.624	3.634	-0.010	0.997	1198536		5.70(2.12-6.36)	96.3	24762	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.288	27013913	NC			65696	
D 36 13C2 PFDoA										
615.00 > 570.00	3.917	3.925	-0.008	1.522	1351987	2.83		113	20224	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.917	3.927	-0.010	1.000	5676012	9.69		96.9	2244	
613.00 > 169.00	3.917	3.927	-0.010	1.000	1385417		4.10(2.13-6.40)	96.9	19252	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.182	4.188	-0.006	1.068	4923814	9.66		96.6	1723	
663.00 > 169.00	4.182	4.188	-0.006	1.068	1575534		3.13(1.25-3.76)	96.6	13165	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.415	4.423	-0.008	1.000	1140306	9.90		99.0	9729	
713.00 > 219.00	4.415	4.423	-0.008	1.000	831907		1.37(0.71-2.13)	99.0	9444	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.423	-0.008	1.716	1068686	2.67		107	5212	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.826	-0.002	1.875	1896531	2.75		110	2774	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.824	4.827	-0.003	1.000	7317162	NC			476	
813.00 > 169.00	4.824	4.827	-0.003	1.000	1186172		6.17(2.86-8.58)		7540	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.158	5.166	-0.008	1.069	7502047	NC			2210	
913.00 > 169.00	5.158	5.166	-0.008	1.069	918043		8.17(3.83-11.48)		6030	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00005 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:59:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Injection Date: 01-Aug-2018 13:46:01 Instrument ID: A8_N

Lims ID: IC L7 Full

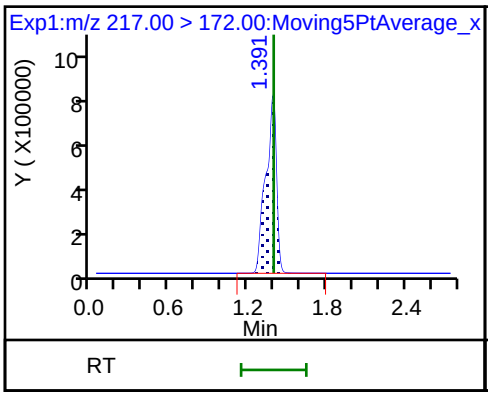
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 16 Worklist Smp#: 8

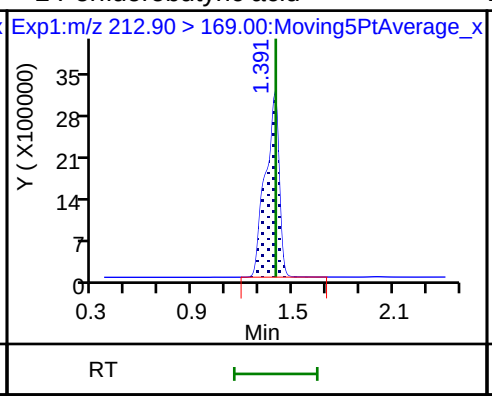
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

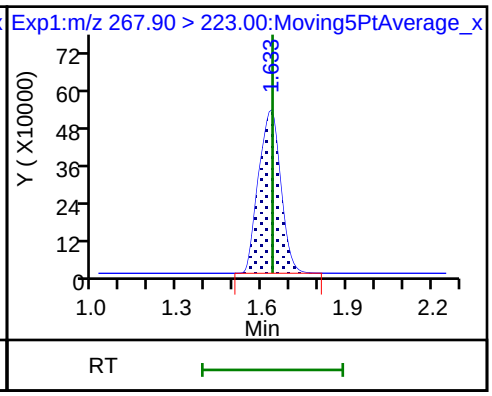
D 1 13C4 PFBA



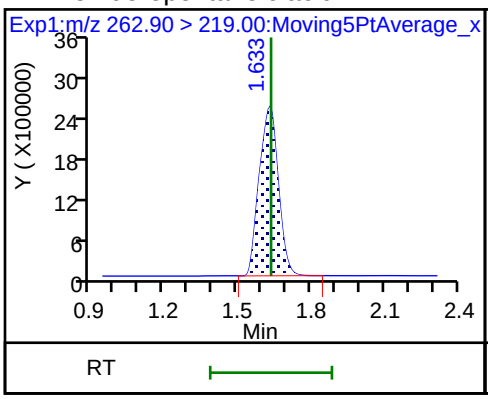
2 Perfluorobutyric acid



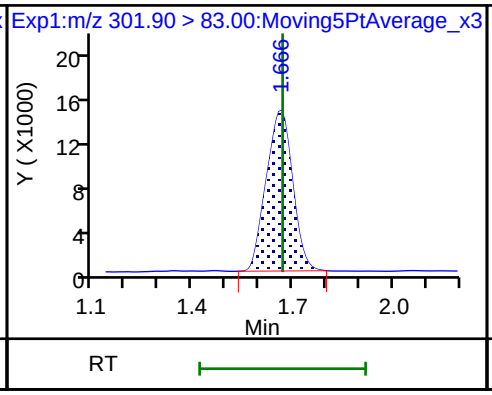
D 3 13C5-PFPeA



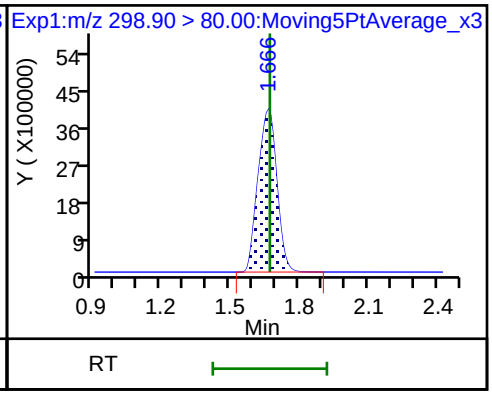
4 Perfluoropentanoic acid



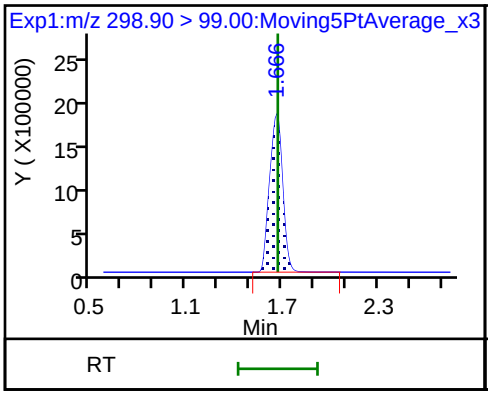
D 47 13C3-PFBS



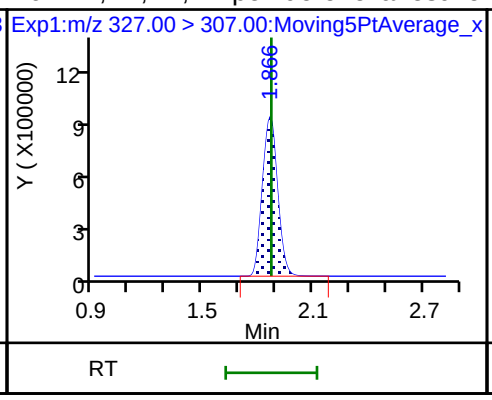
5 Perfluorobutanesulfonic acid



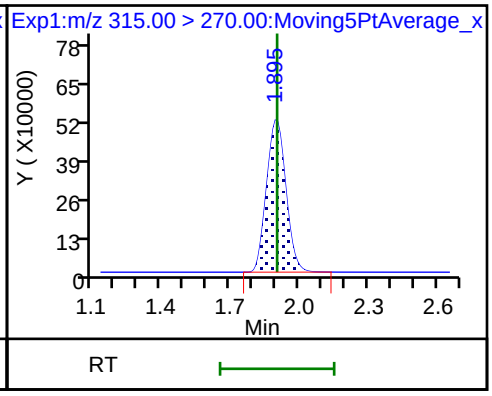
5 Perfluorobutanesulfonic acid



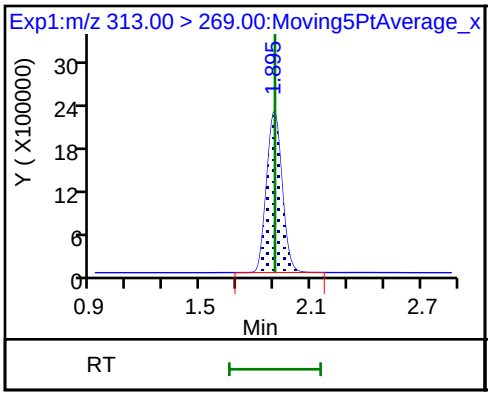
61 1H,1H,2H,2H-perfluorohexanesulfon



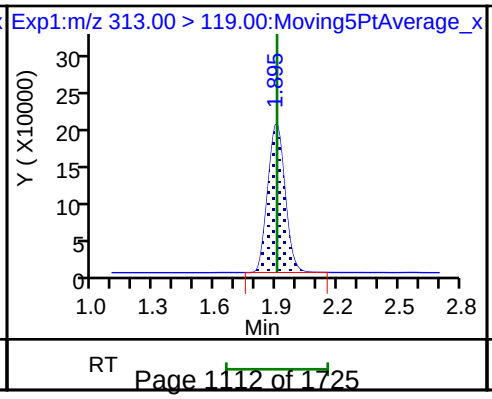
D 7 13C2 PFHxA



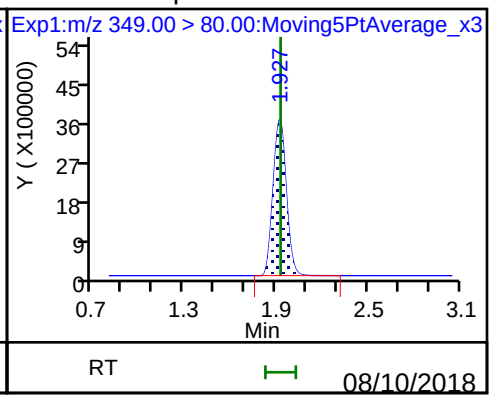
6 Perfluorohexanoic acid



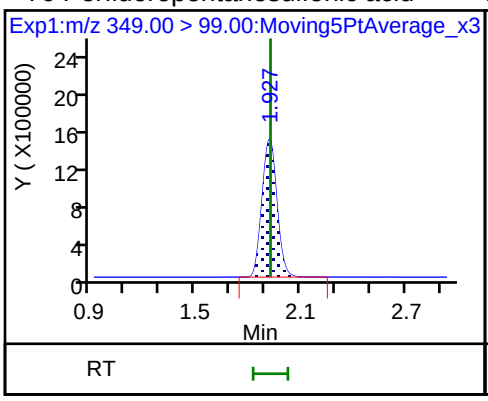
6 Perfluorohexanoic acid



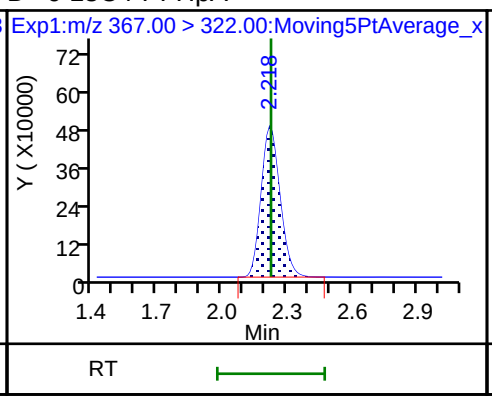
70 Perfluoropentanesulfonic acid



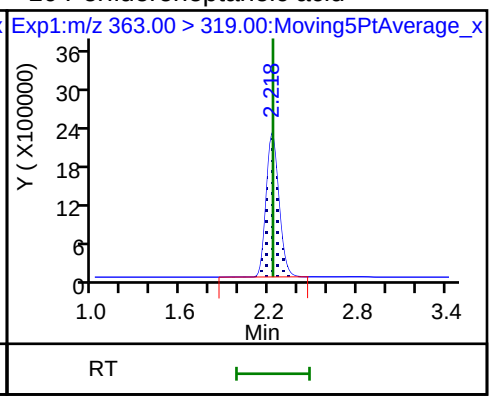
70 Perfluoropentanesulfonic acid



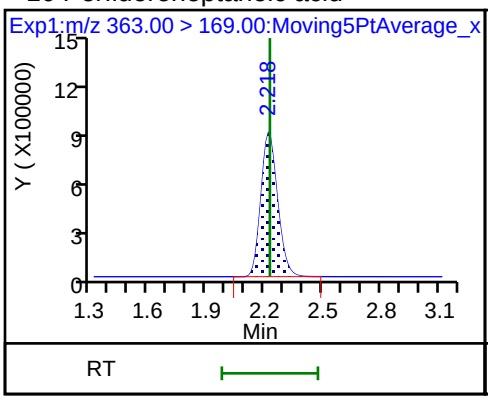
D 9 13C4-PFHpA



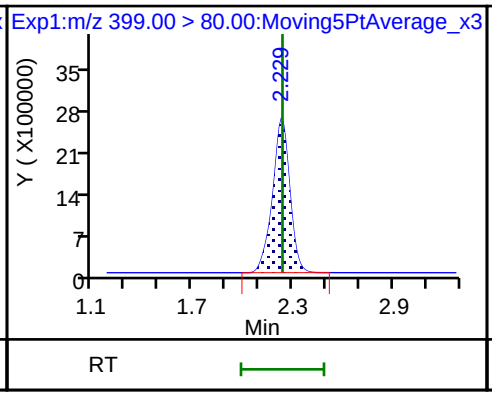
10 Perfluoroheptanoic acid



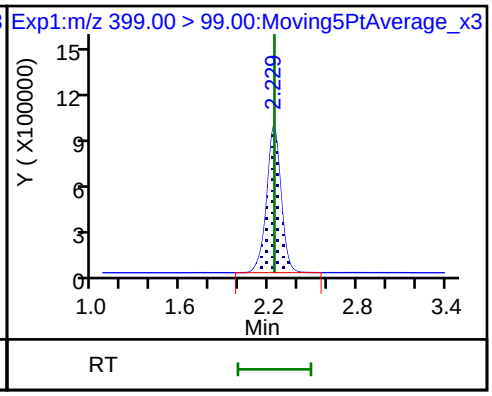
10 Perfluoroheptanoic acid



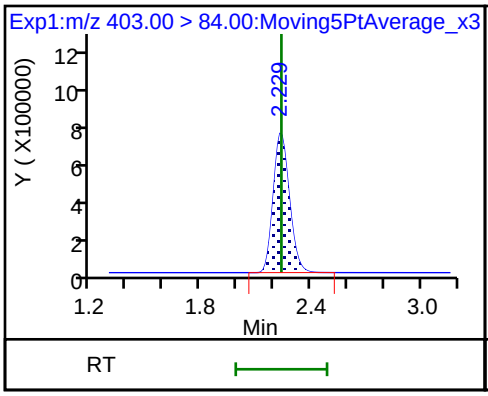
8 Perfluorohexanesulfonic acid



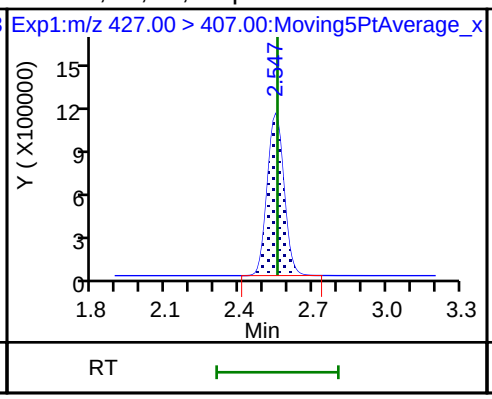
8 Perfluorohexanesulfonic acid



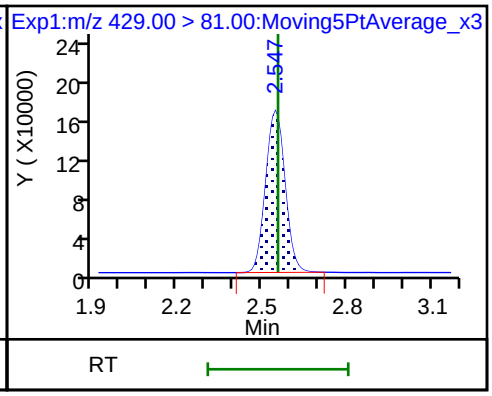
D 11 18O2 PFHxS



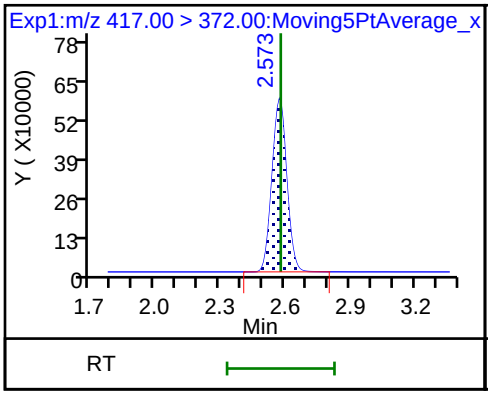
13 1H,1H,2H,2H-perfluorooctanesulfon



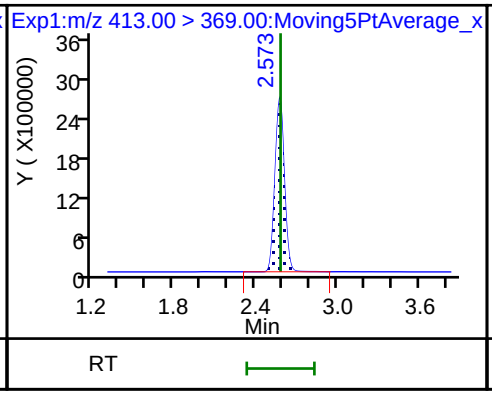
D 12 M2-6:2FTS



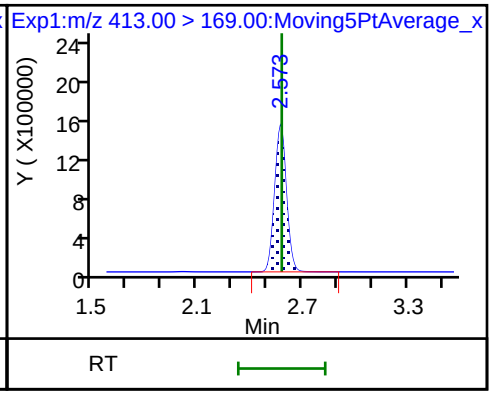
D 14 13C4 PFOA



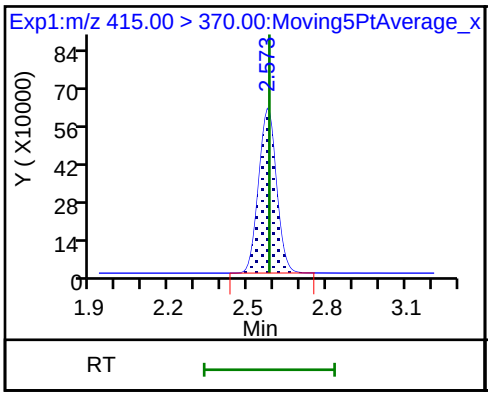
15 Perfluorooctanoic acid



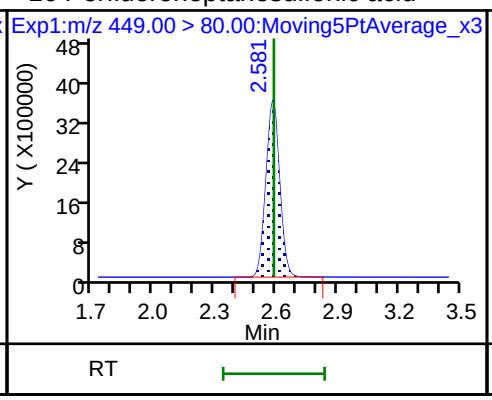
15 Perfluorooctanoic acid



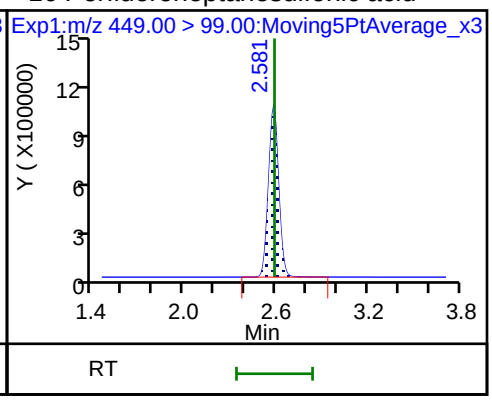
* 62 13C2-PFOA



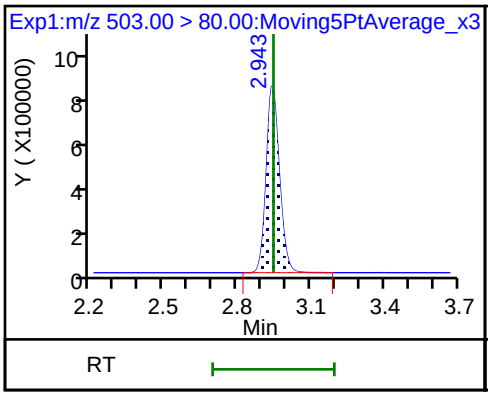
16 Perfluoroheptanesulfonic acid



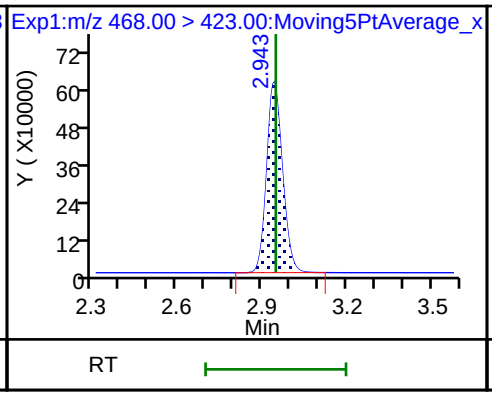
16 Perfluoroheptanesulfonic acid



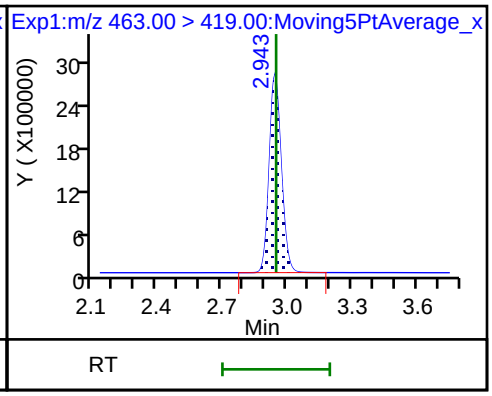
D 18 13C4 PFOS



D 19 13C5 PFNA



20 Perfluorononanoic acid



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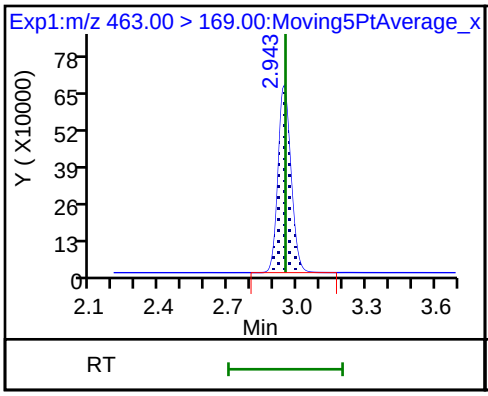
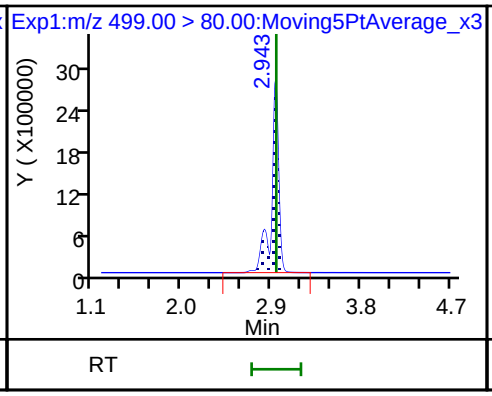
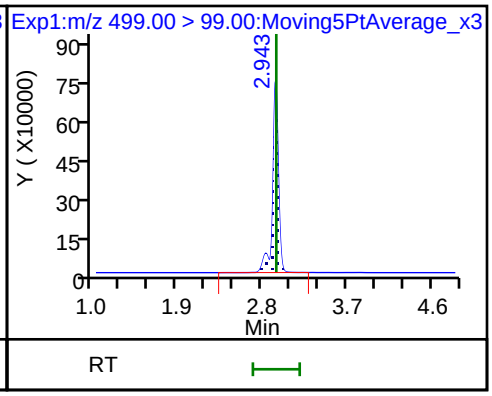


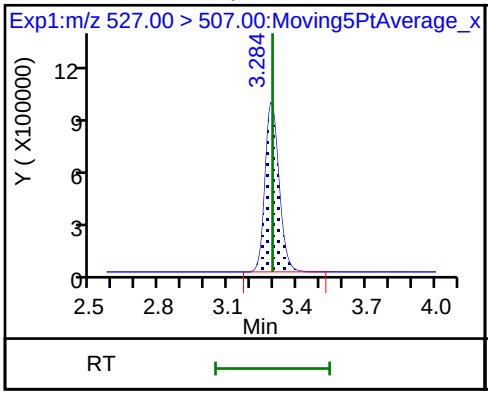
17 Perfluorooctane sulfonic acid



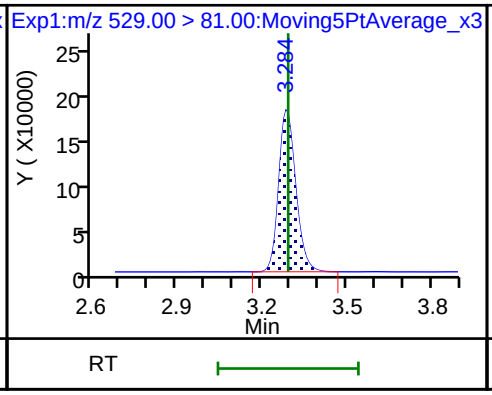
17 Perfluorooctane sulfonic acid



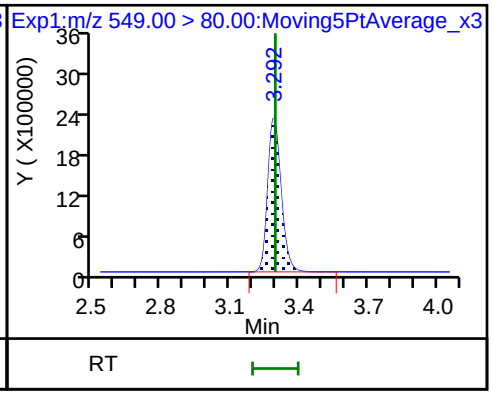
25 1H,1H,2H,2H-perfluorodecanesulfon



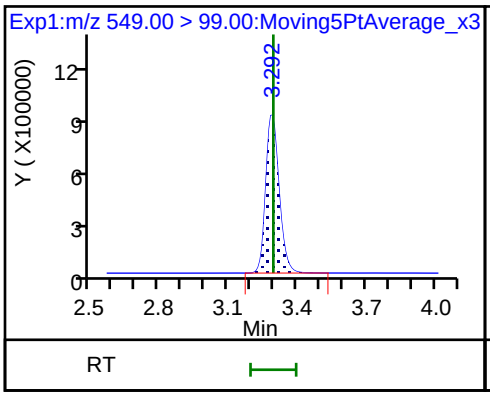
D 26 M2-8:2FTS



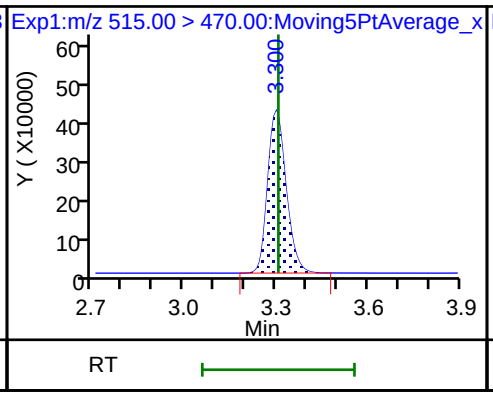
68 Perfluorononanesulfonic acid



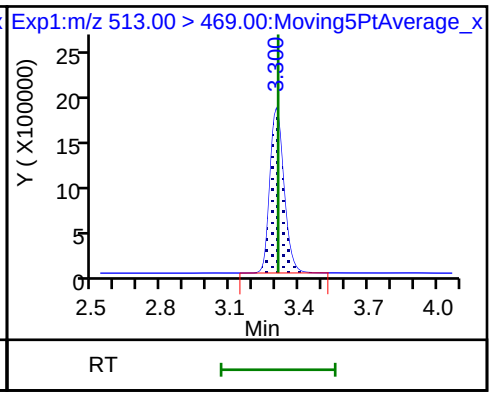
68 Perfluorononanesulfonic acid



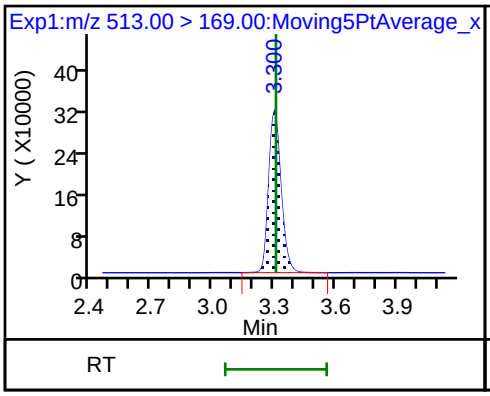
D 23 13C2 PFDA



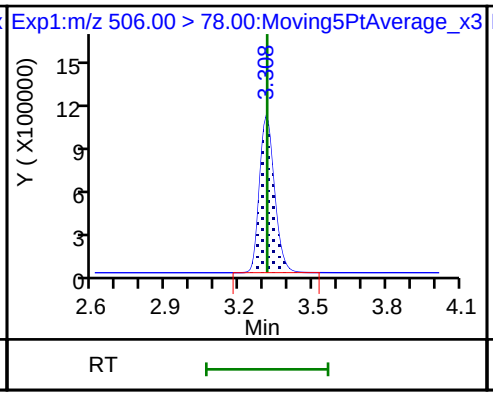
24 Perfluorodecanoic acid



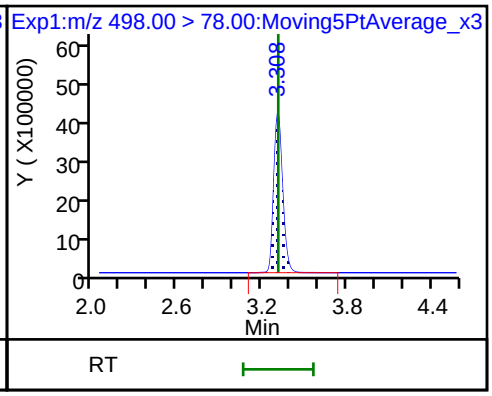
24 Perfluorodecanoic acid



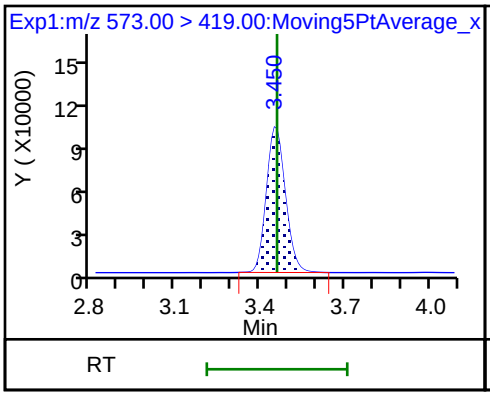
D 21 13C8 FOSA



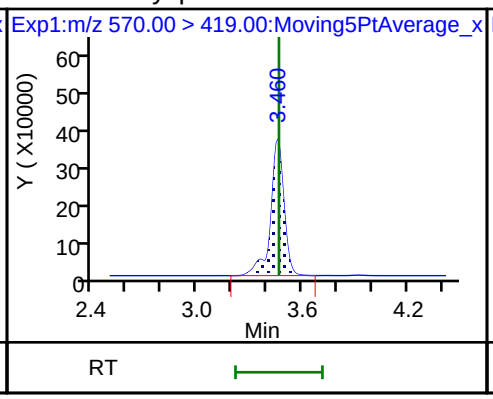
22 Perfluorooctane Sulfonamide



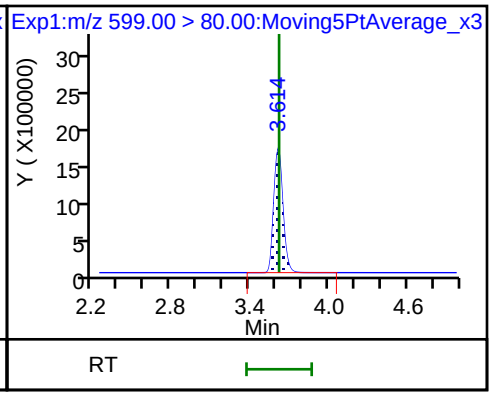
D 27 d3-NMeFOSAA



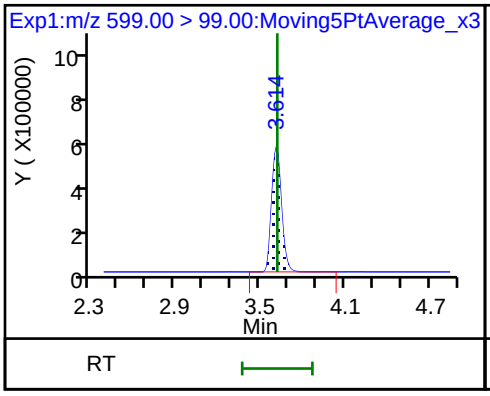
28 N-methyl perfluorooctane sulfonami



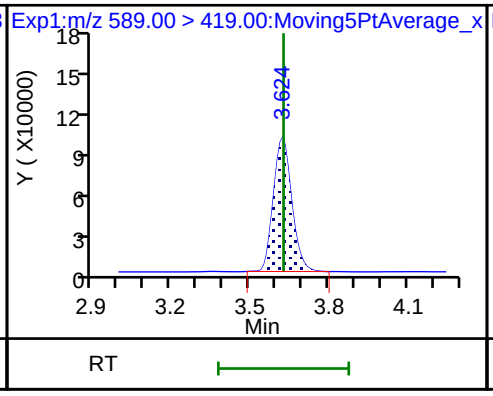
29 Perfluorodecane Sulfonic acid



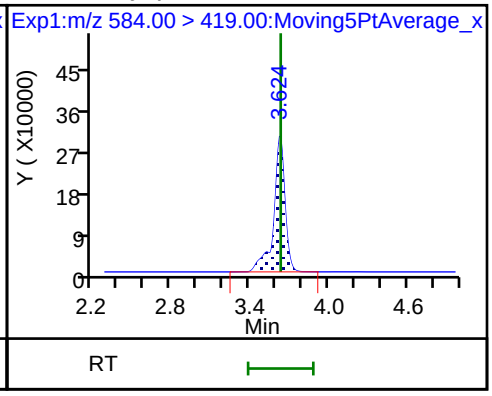
29 Perfluorodecane Sulfonic acid



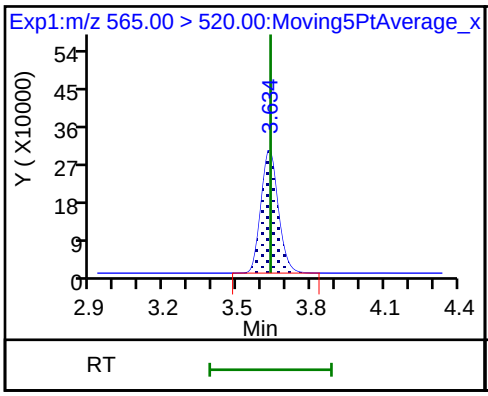
D 32 d5-NEtFOSAA



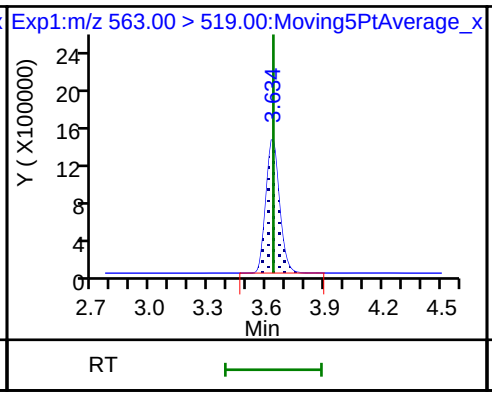
33 N-ethyl perfluorooctane sulfonamid



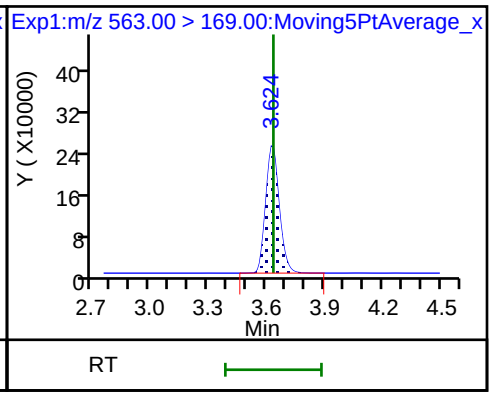
D 30 13C2 PFUnA



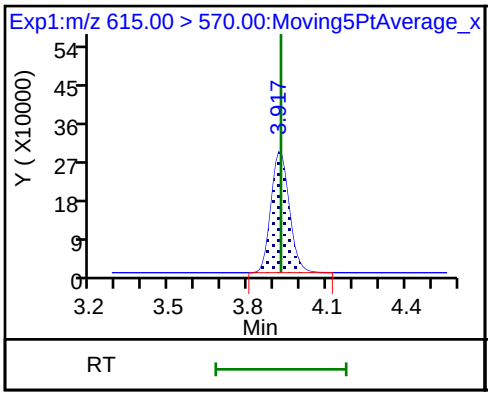
31 Perfluoroundecanoic acid



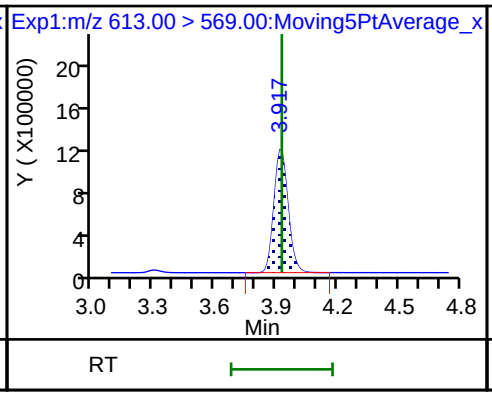
31 Perfluoroundecanoic acid



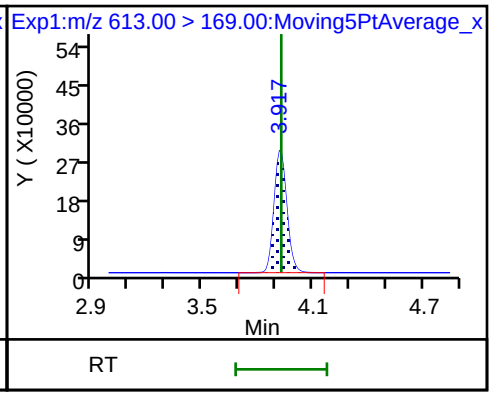
D 36 13C2 PFDoA



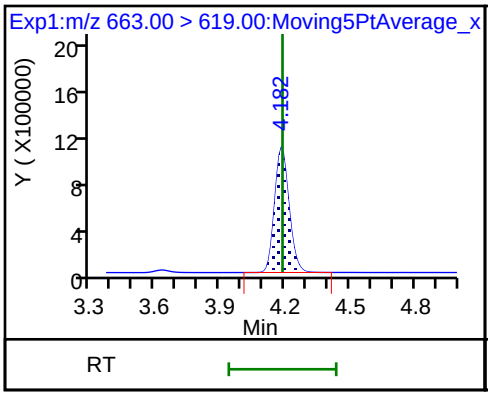
37 Perfluorododecanoic acid



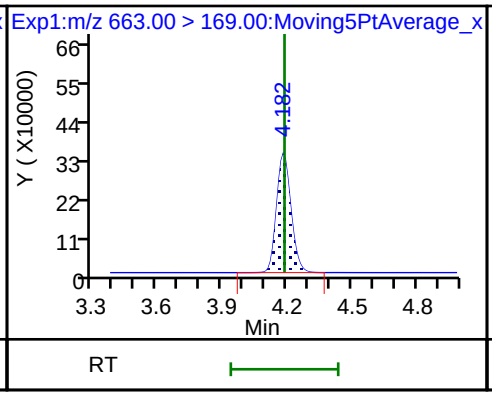
37 Perfluorododecanoic acid



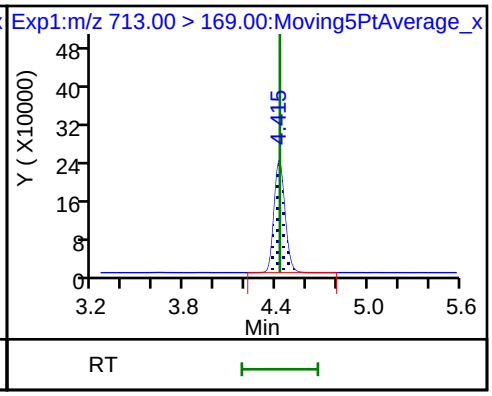
41 Perfluorotridecanoic acid



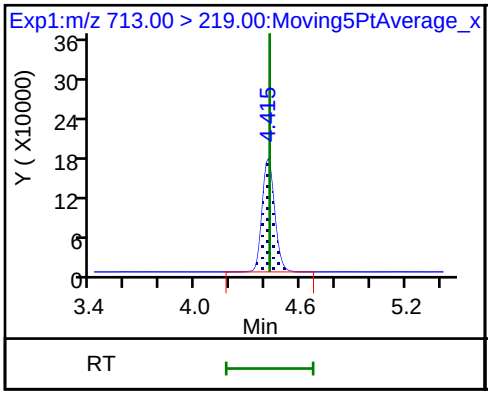
41 Perfluorotridecanoic acid



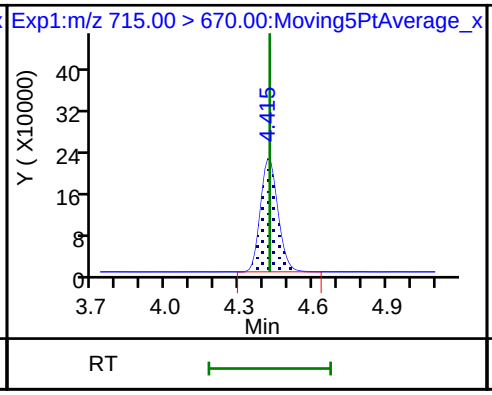
42 Perfluorotetradecanoic acid



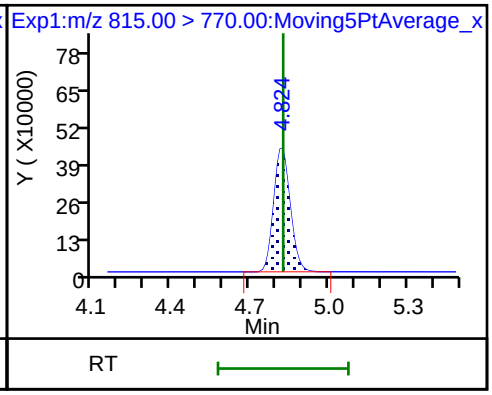
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

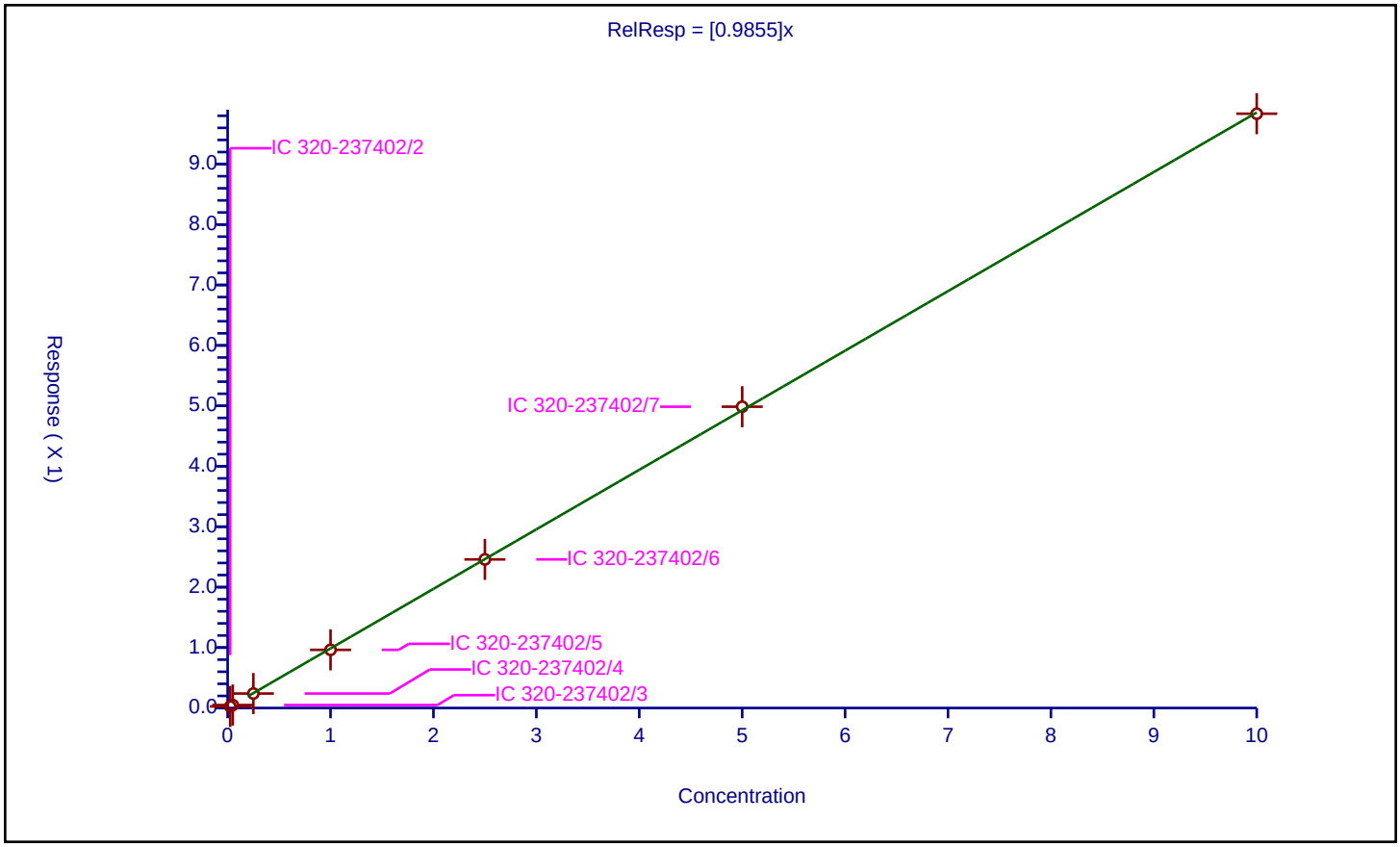
Curve Coefficients

Intercept:	0
Slope:	0.9855

Error Coefficients

Standard Error:	8380000
Relative Standard Error:	2.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025854	2.5	4794702.0	1.034141	Y
2	IC 320-237402/3	0.05	0.048996	2.5	5141928.0	0.979915	Y
3	IC 320-237402/4	0.25	0.239425	2.5	4833356.0	0.957701	Y
4	IC 320-237402/5	1.0	0.962307	2.5	4799715.0	0.962307	Y
5	IC 320-237402/6	2.5	2.458817	2.5	4740211.0	0.983527	Y
6	IC 320-237402/7	5.0	4.985832	2.5	4598618.0	0.997166	Y
7	IC 320-237402/8	10.0	9.834248	2.5	4488667.0	0.983425	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

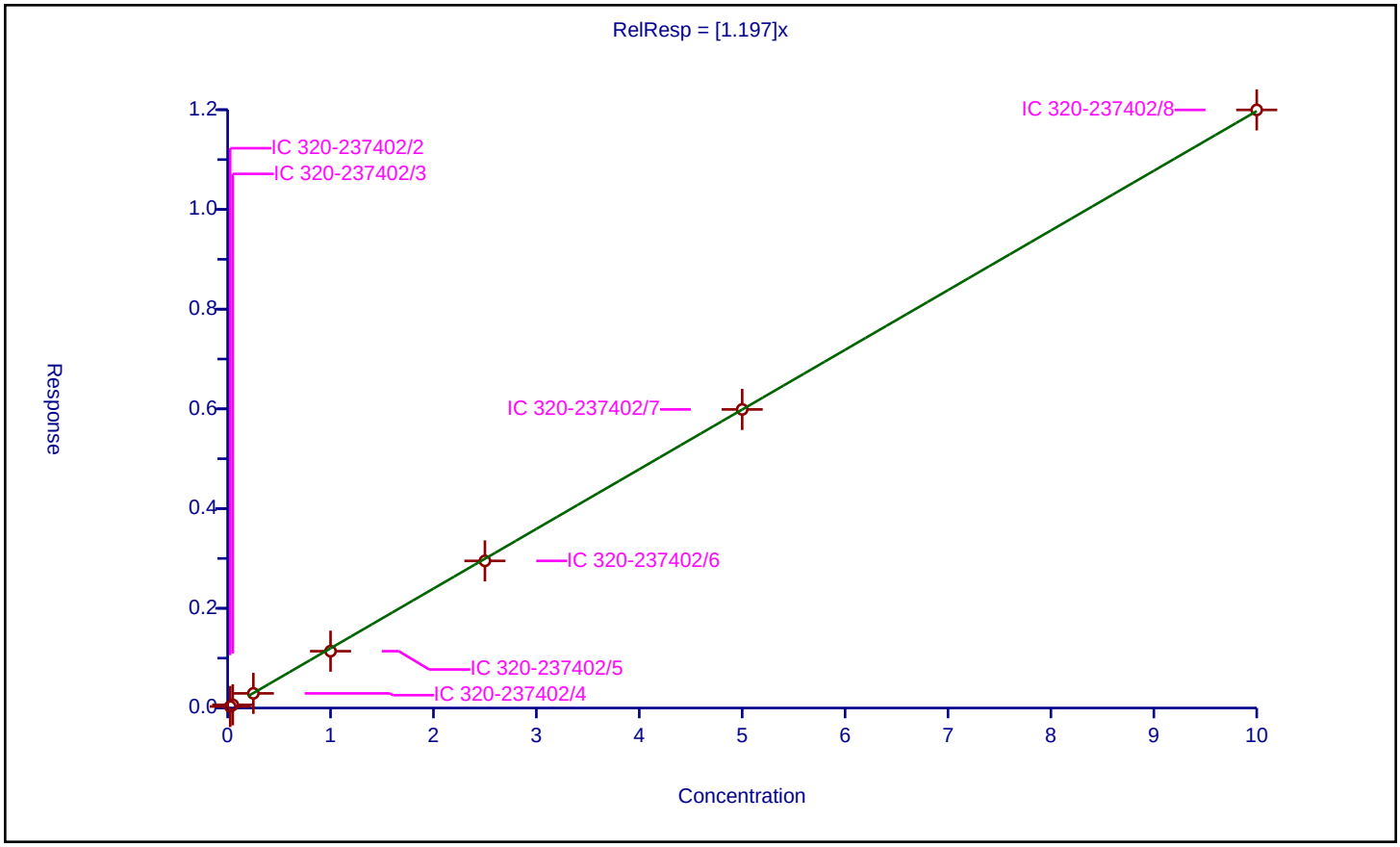
Curve Coefficients

Intercept:	0
Slope:	1.197

Error Coefficients

Standard Error:	6500000
Relative Standard Error:	3.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.030338	2.5	3218796.0	1.213528	Y
2	IC 320-237402/3	0.05	0.063859	2.5	3382043.0	1.277172	Y
3	IC 320-237402/4	0.25	0.293311	2.5	3283004.0	1.173243	Y
4	IC 320-237402/5	1.0	1.139595	2.5	3202919.0	1.139595	Y
5	IC 320-237402/6	2.5	2.950871	2.5	3117638.0	1.180348	Y
6	IC 320-237402/7	5.0	5.988604	2.5	2974004.0	1.197721	Y
7	IC 320-237402/8	10.0	11.996767	2.5	2847672.0	1.199677	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

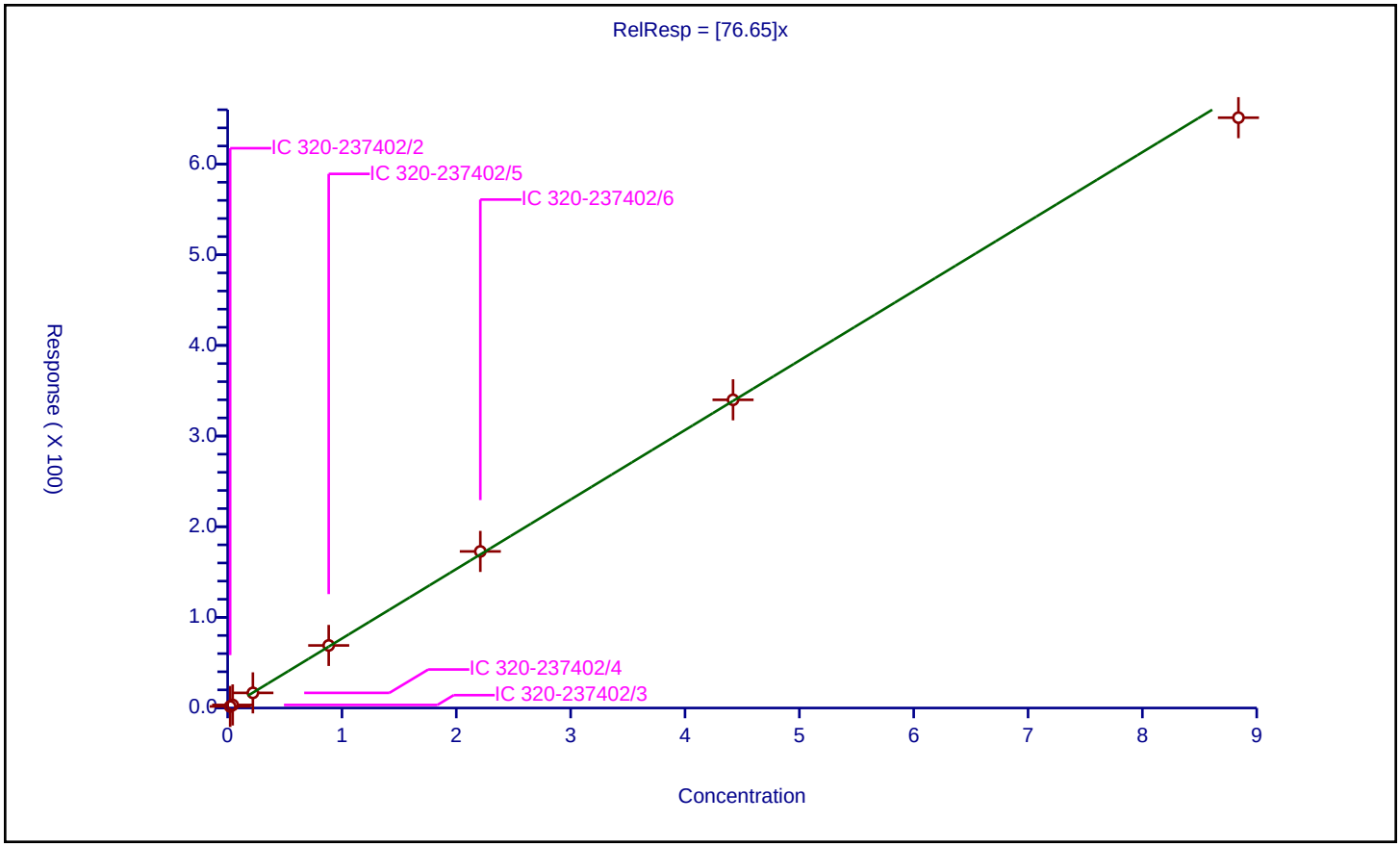
Curve Coefficients

Intercept:	0
Slope:	76.65

Error Coefficients

Standard Error:	10800000
Relative Standard Error:	2.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0221	1.720735	2.325	81424.0	77.861325	Y
2	IC 320-237402/3	0.0442	3.374557	2.325	89887.0	76.347442	Y
3	IC 320-237402/4	0.221	16.685418	2.325	85167.0	75.499628	Y
4	IC 320-237402/5	0.884	69.018686	2.325	82758.0	78.075437	Y
5	IC 320-237402/6	2.21	172.738288	2.325	85408.0	78.162121	Y
6	IC 320-237402/7	4.42	339.994559	2.325	82077.0	76.921846	Y
7	IC 320-237402/8	8.84	651.245177	2.325	80880.0	73.670269	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

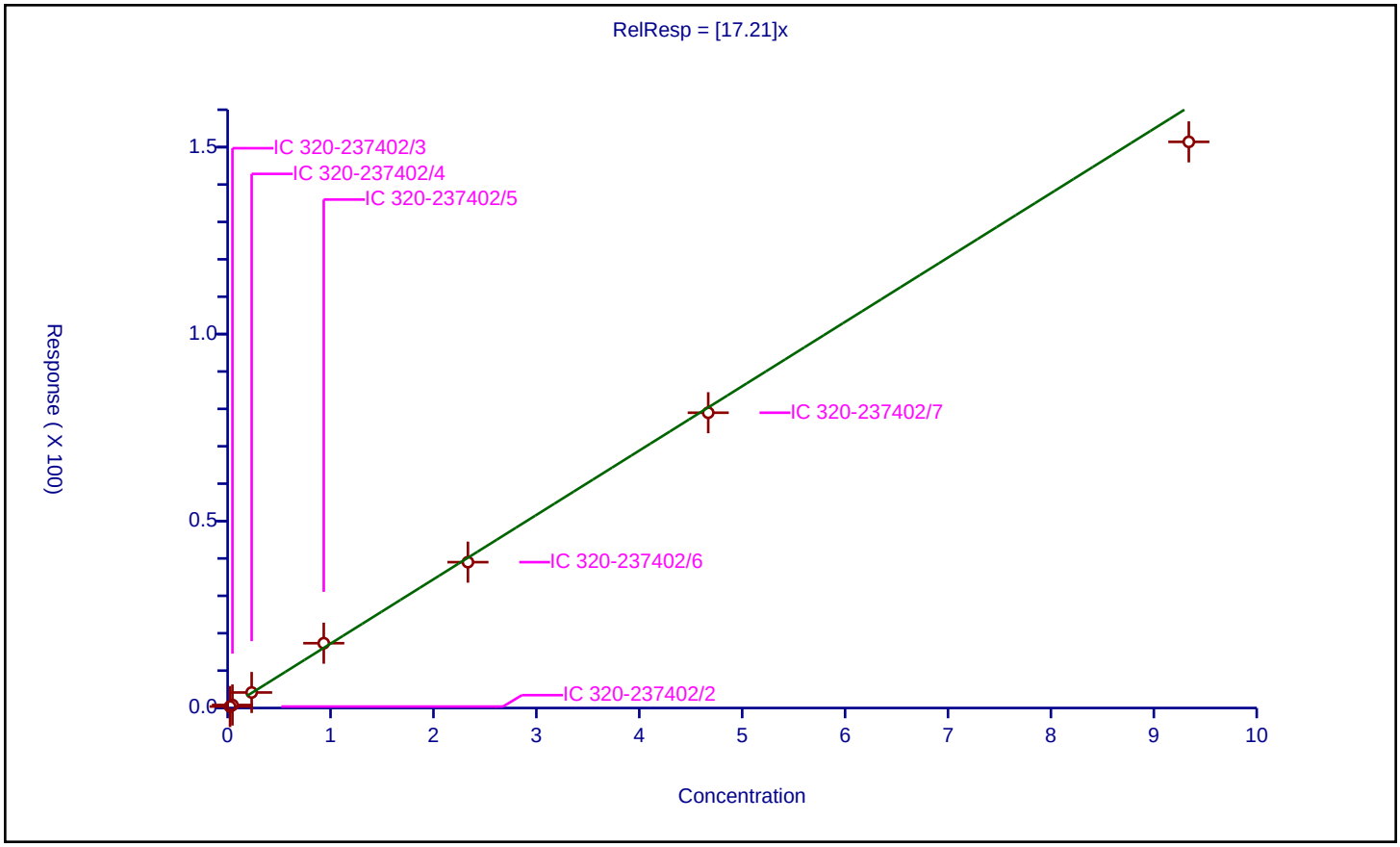
Curve Coefficients

Intercept:	0
Slope:	17.21

Error Coefficients

Standard Error:	2520000
Relative Standard Error:	4.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02335	0.397161	2.325	81424.0	17.00903	Y
2	IC 320-237402/3	0.0467	0.808565	2.325	89887.0	17.31403	Y
3	IC 320-237402/4	0.2335	4.148457	2.325	85167.0	17.766412	Y
4	IC 320-237402/5	0.934	17.330209	2.325	82758.0	18.554828	Y
5	IC 320-237402/6	2.335	39.008321	2.325	85408.0	16.705919	Y
6	IC 320-237402/7	4.67	78.969636	2.325	82077.0	16.909986	Y
7	IC 320-237402/8	9.34	151.410709	2.325	80880.0	16.210997	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

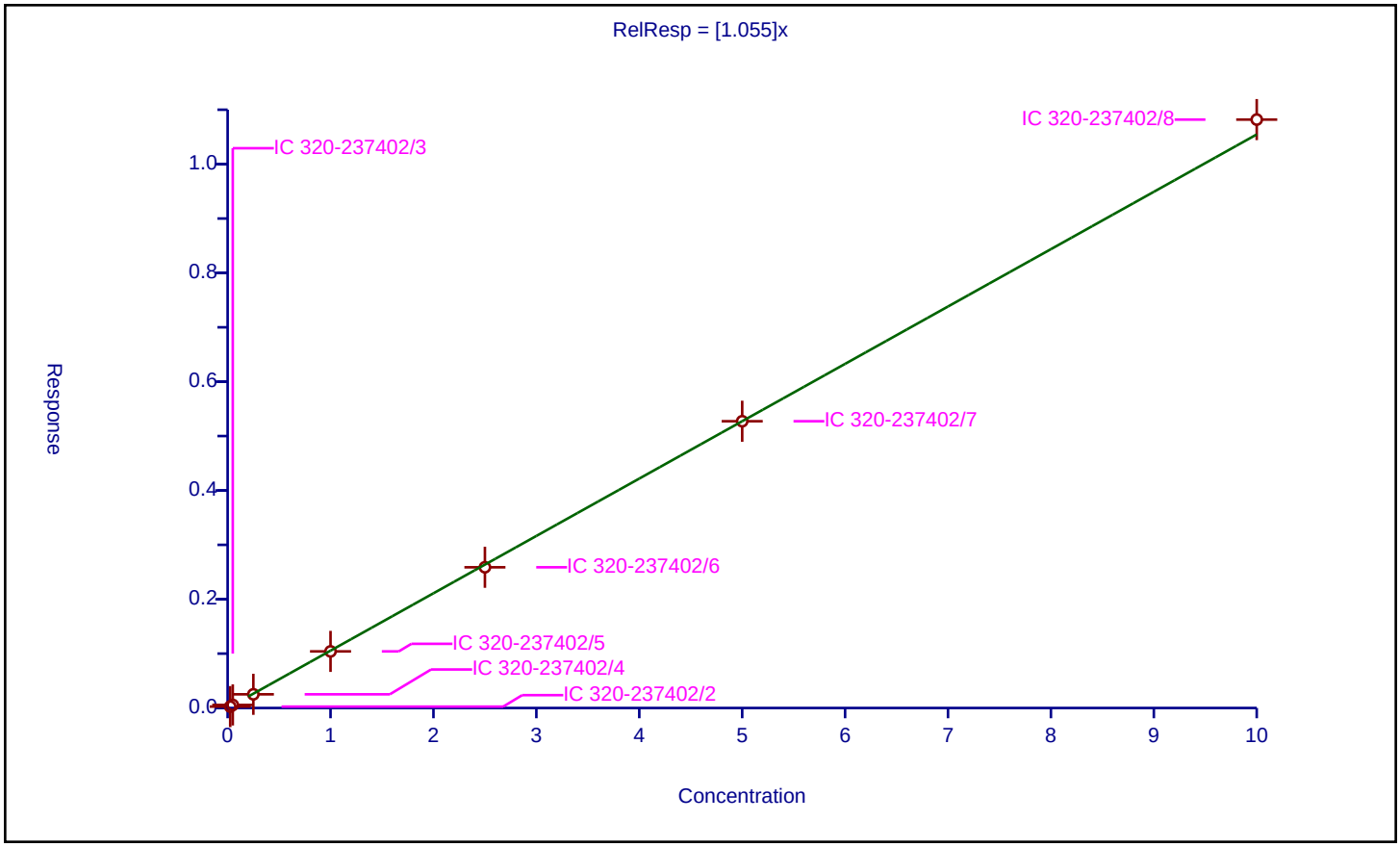
Curve Coefficients

Intercept:	0
Slope:	1.055

Error Coefficients

Standard Error:	6230000
Relative Standard Error:	3.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025873	2.5	3505828.0	1.034934	Y
2	IC 320-237402/3	0.05	0.056379	2.5	3635013.0	1.127589	Y
3	IC 320-237402/4	0.25	0.251834	2.5	3497268.0	1.007338	Y
4	IC 320-237402/5	1.0	1.040693	2.5	3471025.0	1.040693	Y
5	IC 320-237402/6	2.5	2.587434	2.5	3473699.0	1.034974	Y
6	IC 320-237402/7	5.0	5.272567	2.5	3231846.0	1.054513	Y
7	IC 320-237402/8	10.0	10.818892	2.5	3022362.0	1.081889	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

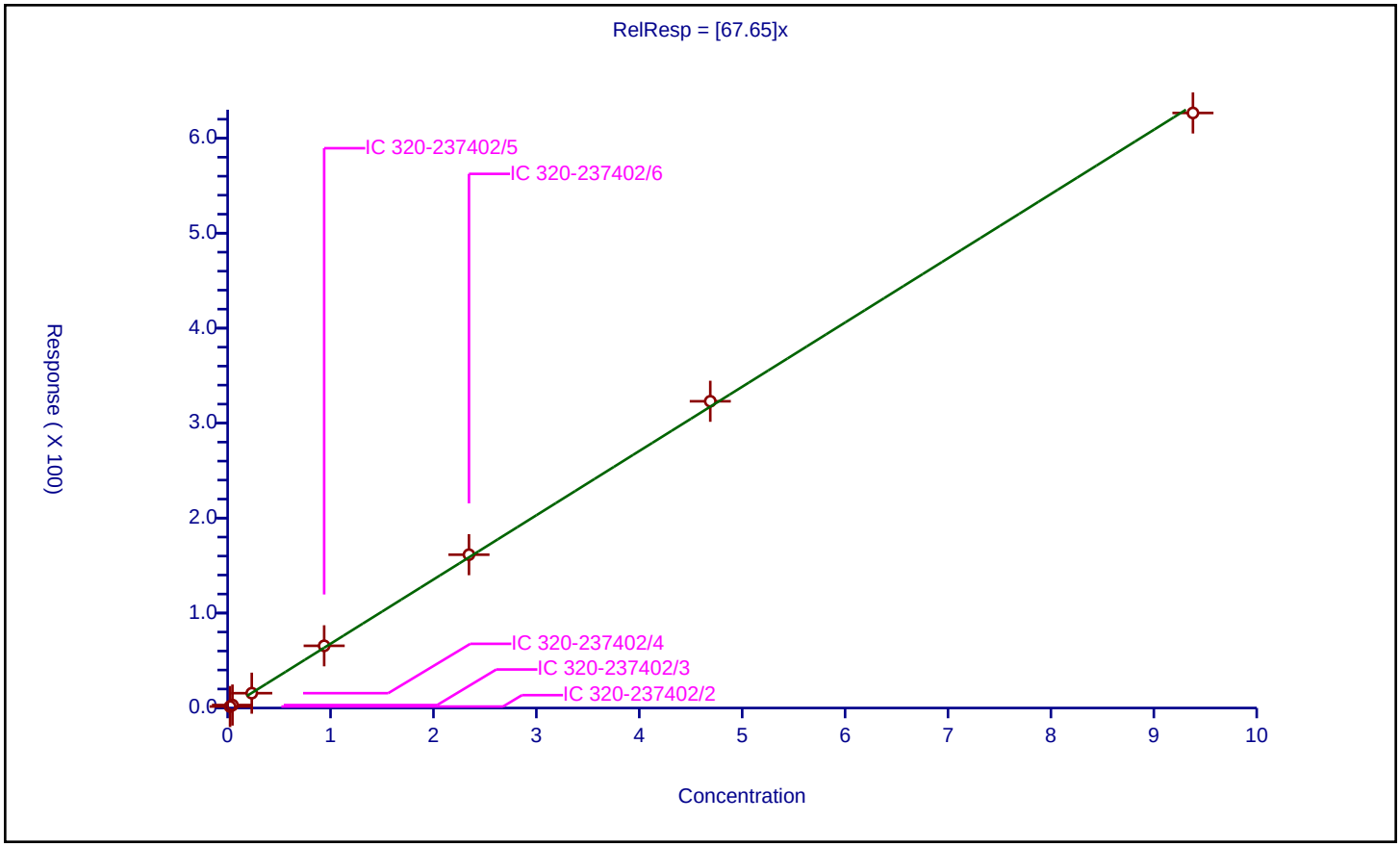
Curve Coefficients

Intercept:	0
Slope:	67.65

Error Coefficients

Standard Error:	10400000
Relative Standard Error:	2.2
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02345	1.550466	2.325	81424.0	66.11797	Y
2	IC 320-237402/3	0.0469	3.119572	2.325	89887.0	66.51539	Y
3	IC 320-237402/4	0.2345	15.618342	2.325	85167.0	66.60274	Y
4	IC 320-237402/5	0.938	65.491124	2.325	82758.0	69.819962	Y
5	IC 320-237402/6	2.345	161.458793	2.325	85408.0	68.852364	Y
6	IC 320-237402/7	4.69	322.995321	2.325	82077.0	68.868938	Y
7	IC 320-237402/8	9.38	626.619408	2.325	80880.0	66.803775	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

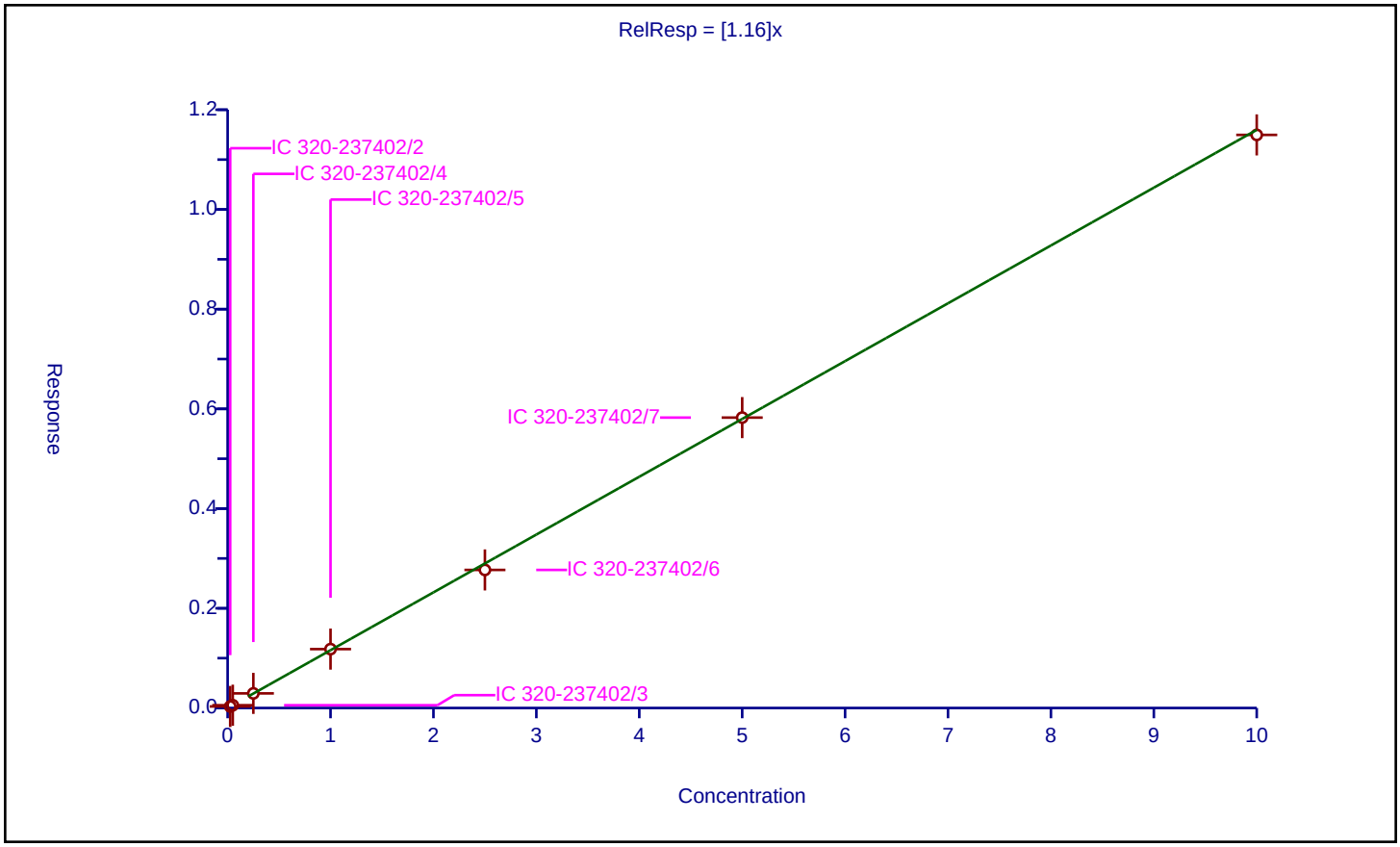
Curve Coefficients

Intercept:	0
Slope:	1.16

Error Coefficients

Standard Error:	6430000
Relative Standard Error:	3.5
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.03064	2.5	3436629.0	1.22562	Y
2	IC 320-237402/3	0.05	0.055794	2.5	3553062.0	1.115883	Y
3	IC 320-237402/4	0.25	0.293069	2.5	3413685.0	1.172276	Y
4	IC 320-237402/5	1.0	1.181322	2.5	3335466.0	1.181322	Y
5	IC 320-237402/6	2.5	2.769444	2.5	3349409.0	1.107778	Y
6	IC 320-237402/7	5.0	5.82494	2.5	3116337.0	1.164988	Y
7	IC 320-237402/8	10.0	11.495173	2.5	2908549.0	1.149517	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

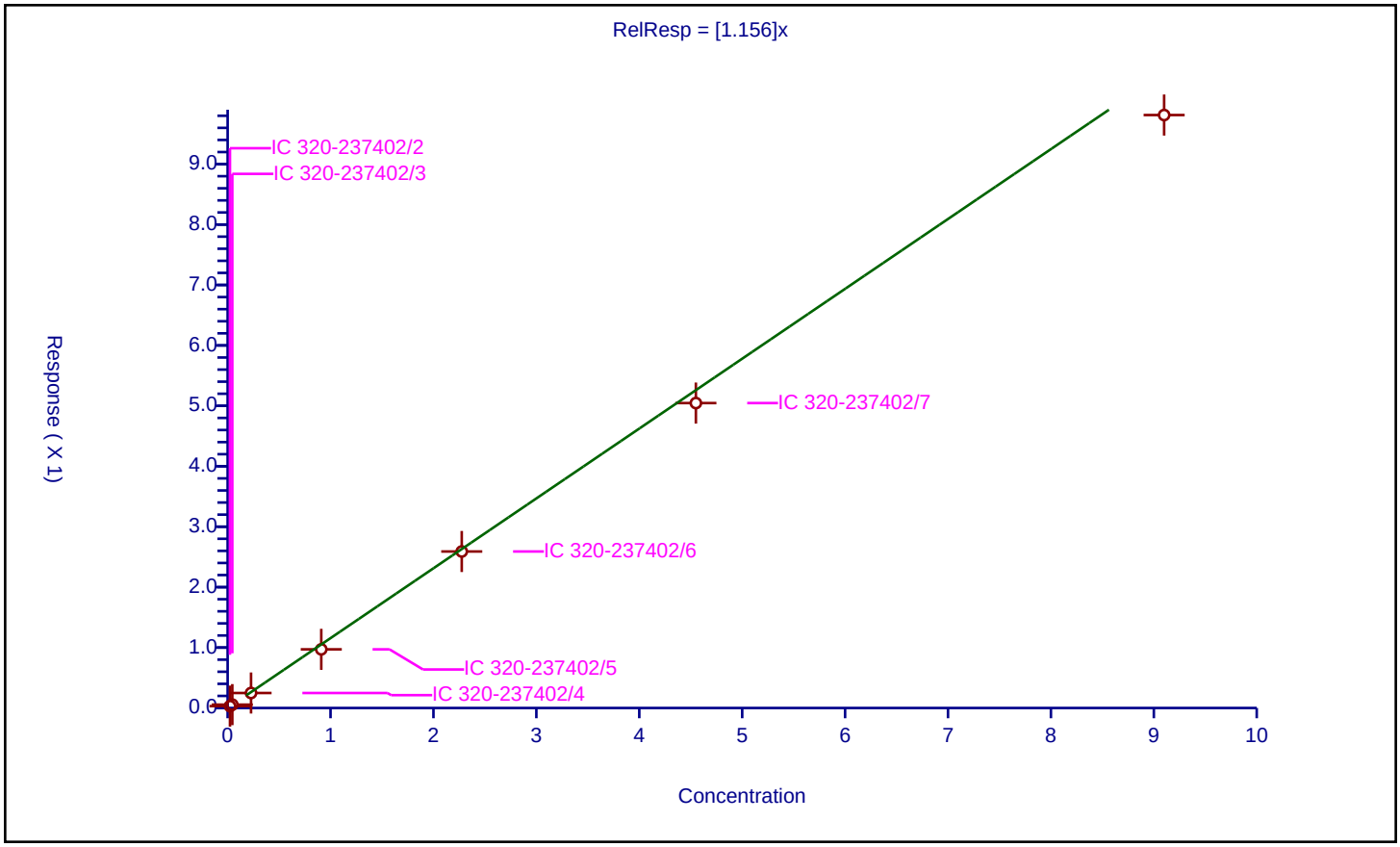
Curve Coefficients

Intercept:	0
Slope:	1.156

Error Coefficients

Standard Error:	8900000
Relative Standard Error:	9.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02275	0.031371	2.365	4681014.0	1.37894	Y
2	IC 320-237402/3	0.0455	0.055991	2.365	5006593.0	1.230568	Y
3	IC 320-237402/4	0.2275	0.248065	2.365	4692968.0	1.090396	Y
4	IC 320-237402/5	0.91	0.970555	2.365	4725288.0	1.066544	Y
5	IC 320-237402/6	2.275	2.589702	2.365	4583643.0	1.13833	Y
6	IC 320-237402/7	4.55	5.045798	2.365	4552896.0	1.108967	Y
7	IC 320-237402/8	9.1	9.812192	2.365	4518625.0	1.078263	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

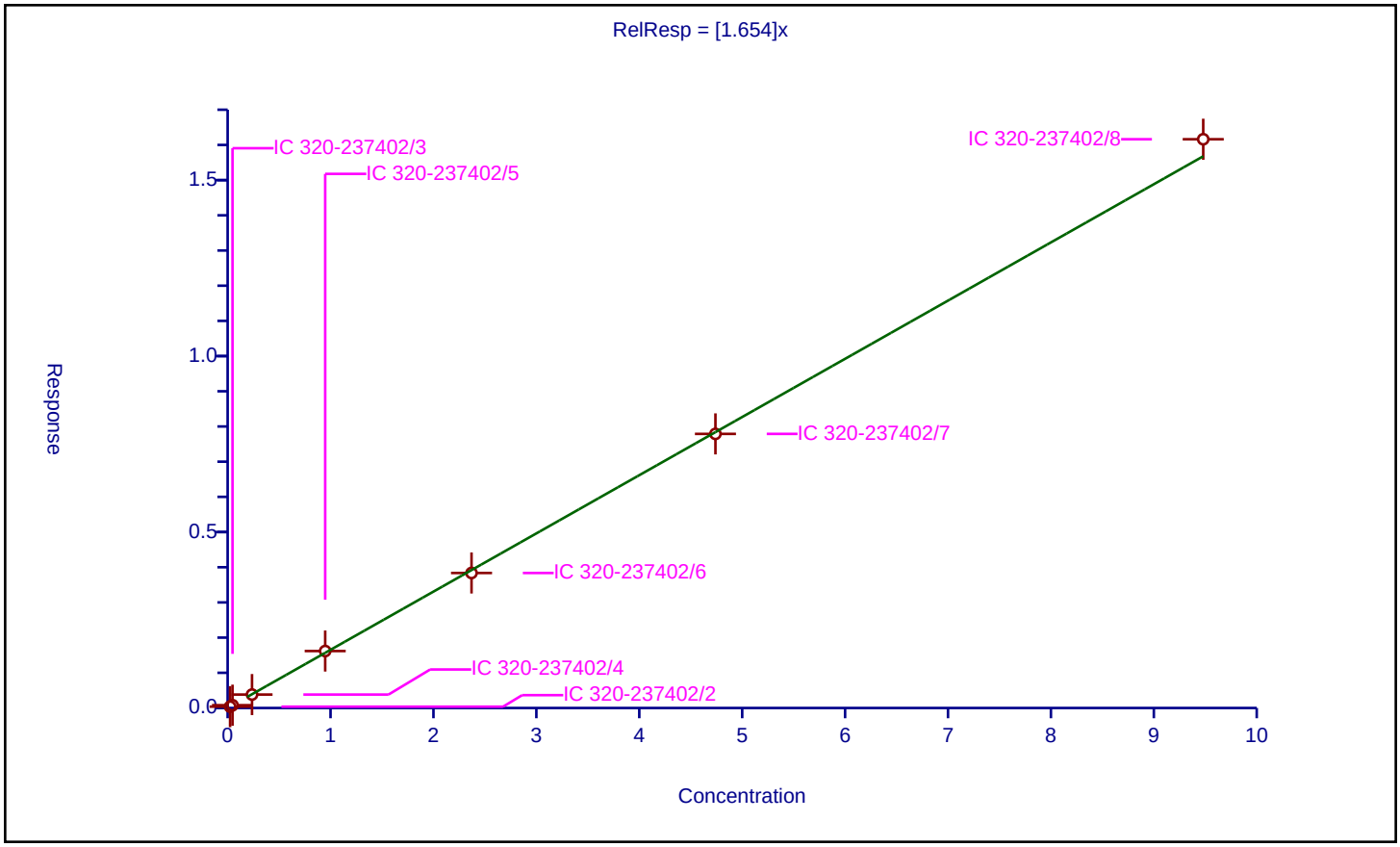
Curve Coefficients

Intercept:	0
Slope:	1.654

Error Coefficients

Standard Error:	2540000
Relative Standard Error:	2.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0237	0.038125	2.375	973239.0	1.608645	Y
2	IC 320-237402/3	0.0474	0.079727	2.375	1036033.0	1.682011	Y
3	IC 320-237402/4	0.237	0.38179	2.375	961732.0	1.610929	Y
4	IC 320-237402/5	0.948	1.618807	2.375	917820.0	1.707603	Y
5	IC 320-237402/6	2.37	3.836563	2.375	918152.0	1.618803	Y
6	IC 320-237402/7	4.74	7.788578	2.375	853793.0	1.64316	Y
7	IC 320-237402/8	9.48	16.161741	2.375	782824.0	1.704825	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

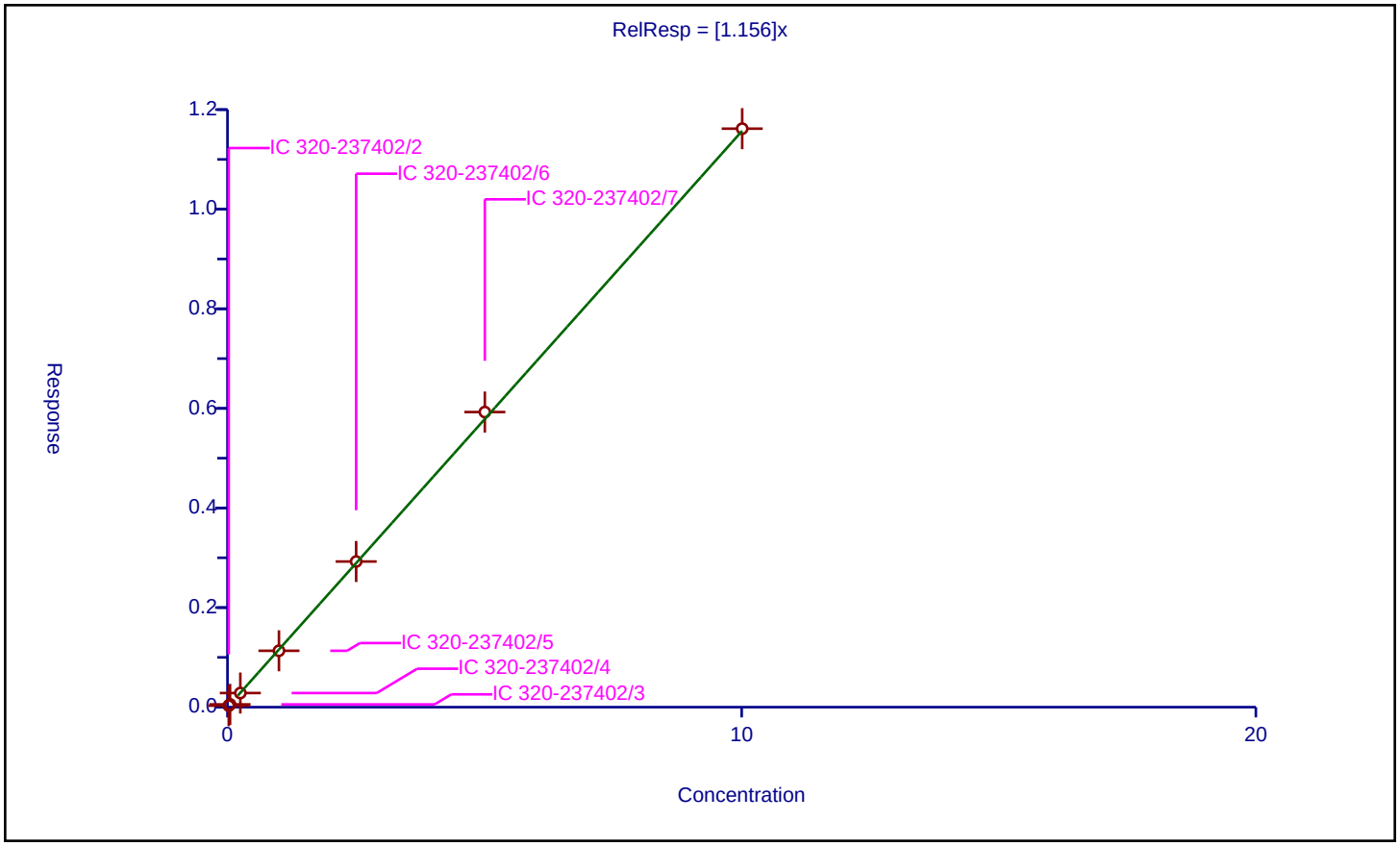
Curve Coefficients

Intercept:	0
Slope:	1.156

Error Coefficients

Standard Error:	6140000
Relative Standard Error:	2.4
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025025	0.029871	2.5	3302357.0	1.19365	Y
2	IC 320-237402/3	0.05005	0.056079	2.5	3558329.0	1.120459	Y
3	IC 320-237402/4	0.25025	0.283838	2.5	3335341.0	1.134216	Y
4	IC 320-237402/5	1.001	1.132602	2.5	3268736.0	1.131471	Y
5	IC 320-237402/6	2.5025	2.925196	2.5	3210040.0	1.16891	Y
6	IC 320-237402/7	5.005	5.926484	2.5	2942955.0	1.184113	Y
7	IC 320-237402/8	10.01	11.617289	2.5	2730006.0	1.160568	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

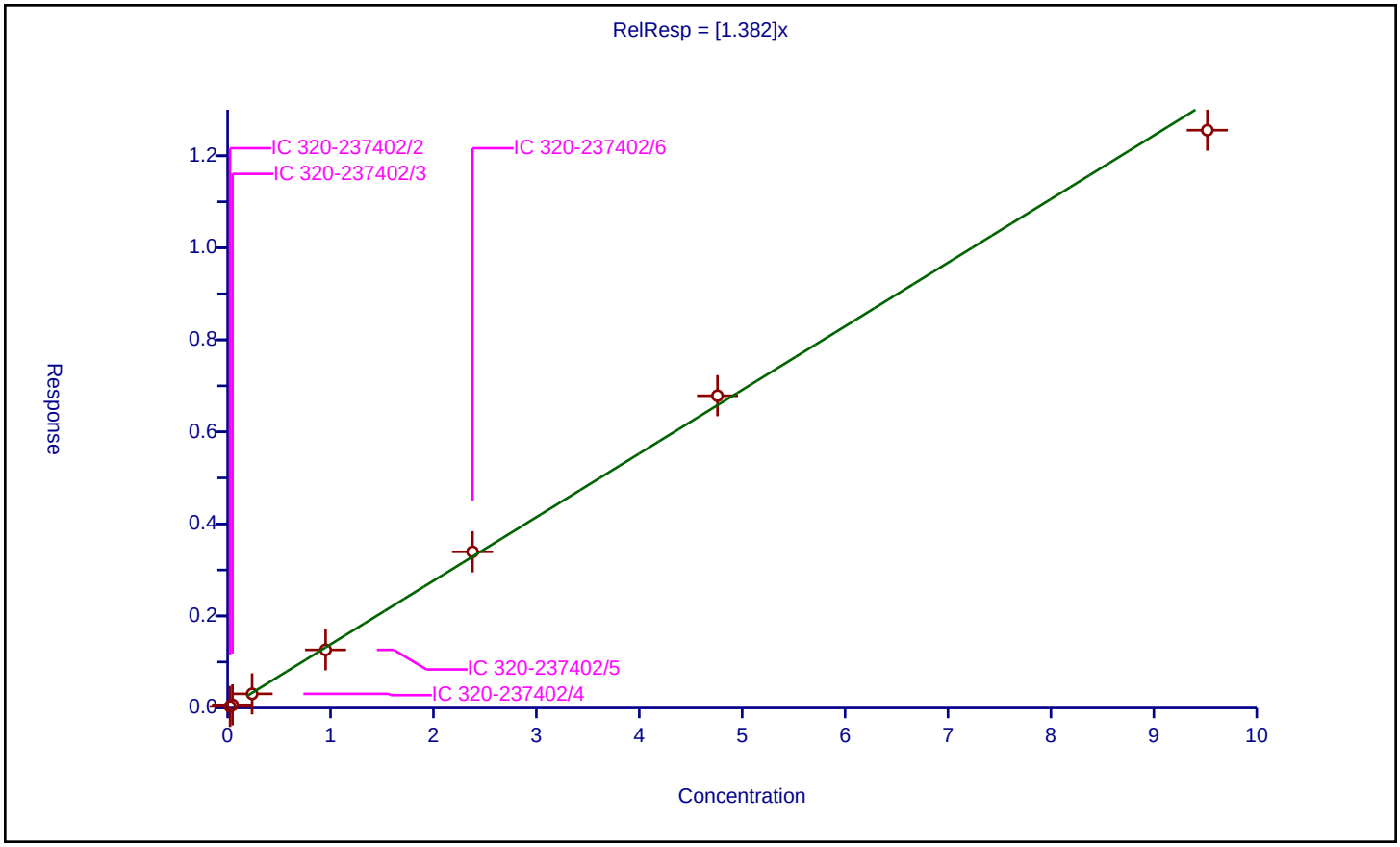
Curve Coefficients

Intercept:	0
Slope:	1.382

Error Coefficients

Standard Error:	7920000
Relative Standard Error:	4.8
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0238	0.034193	2.39	3269307.0	1.436681	Y
2	IC 320-237402/3	0.0476	0.068979	2.39	3417703.0	1.449138	Y
3	IC 320-237402/4	0.238	0.307768	2.39	3391354.0	1.293144	Y
4	IC 320-237402/5	0.952	1.263274	2.39	3300872.0	1.326968	Y
5	IC 320-237402/6	2.38	3.393905	2.39	3224053.0	1.426011	Y
6	IC 320-237402/7	4.76	6.785915	2.39	3128101.0	1.425612	Y
7	IC 320-237402/8	9.52	12.556524	2.39	3144316.0	1.318963	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

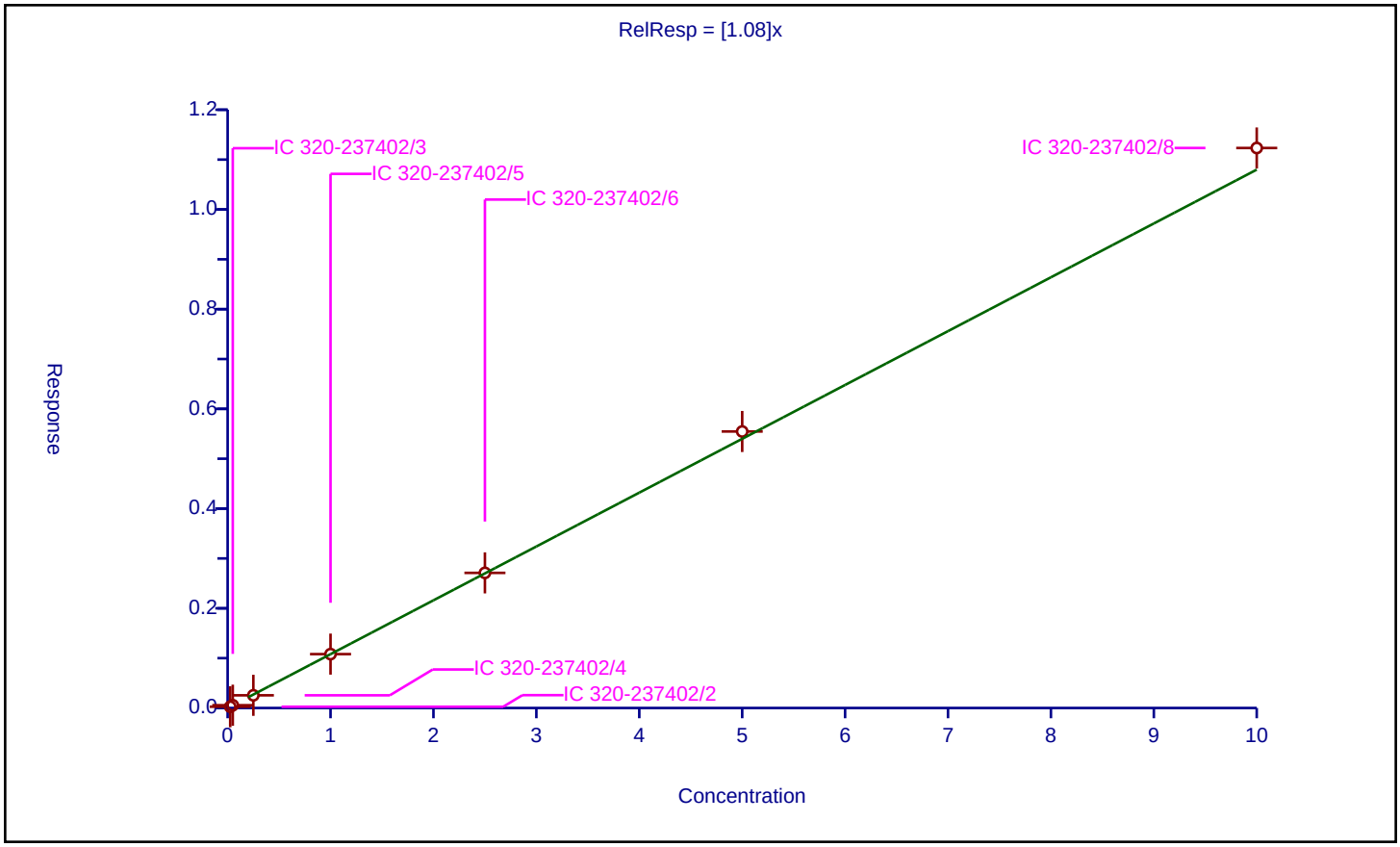
Curve Coefficients

Intercept:	0
Slope:	1.08

Error Coefficients

Standard Error:	5150000
Relative Standard Error:	3.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025649	2.5	2895444.0	1.025957	Y
2	IC 320-237402/3	0.05	0.055867	2.5	3085644.0	1.117336	Y
3	IC 320-237402/4	0.25	0.254608	2.5	2896674.0	1.018434	Y
4	IC 320-237402/5	1.0	1.080642	2.5	2848081.0	1.080642	Y
5	IC 320-237402/6	2.5	2.710418	2.5	2758407.0	1.084167	Y
6	IC 320-237402/7	5.0	5.546248	2.5	2589352.0	1.10925	Y
7	IC 320-237402/8	10.0	11.232641	2.5	2393820.0	1.123264	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

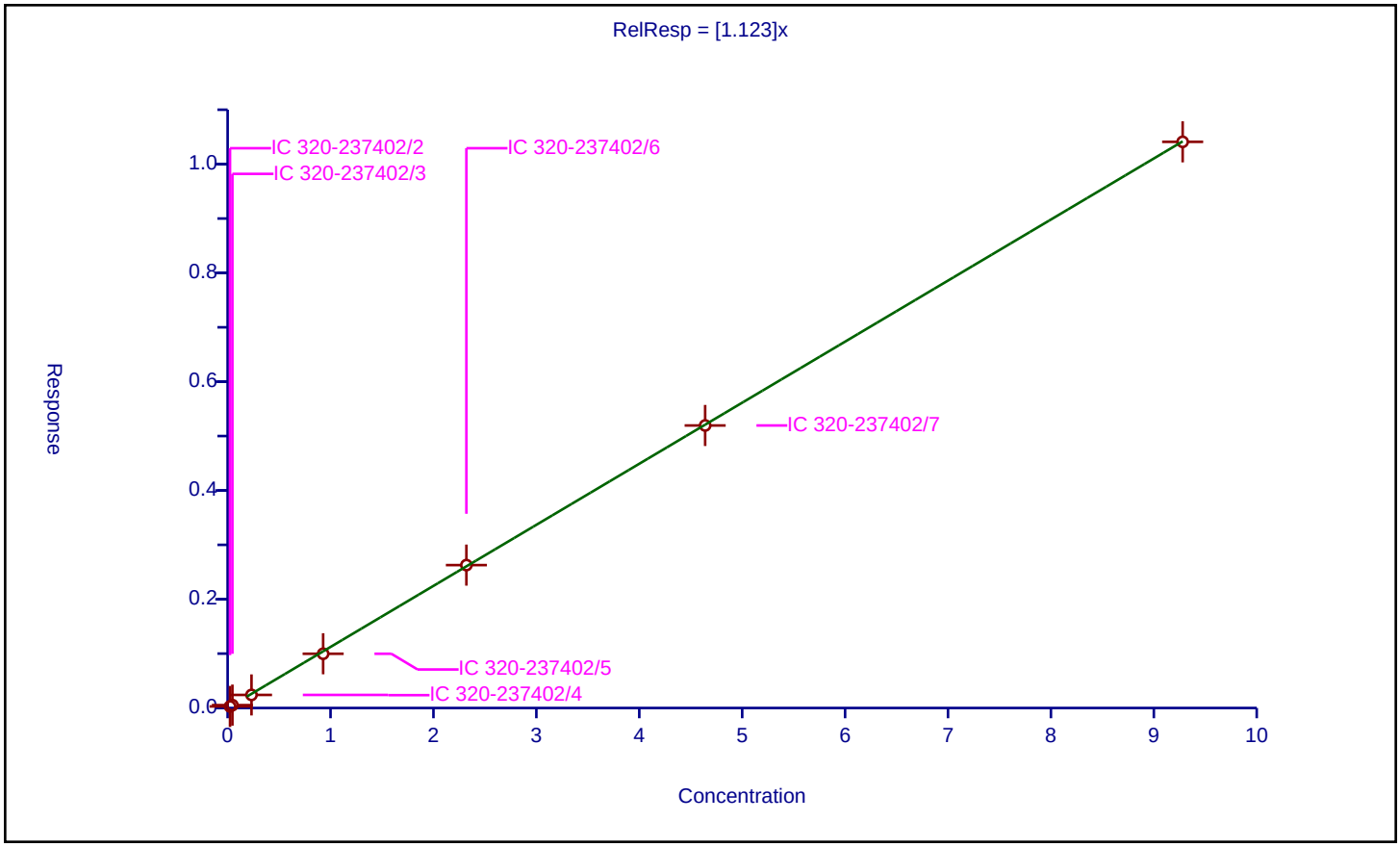
Curve Coefficients

Intercept:	0
Slope:	1.123

Error Coefficients

Standard Error:	6430000
Relative Standard Error:	5.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0232	0.028573	2.39	3269307.0	1.231585	Y
2	IC 320-237402/3	0.0464	0.052956	2.39	3417703.0	1.141291	Y
3	IC 320-237402/4	0.232	0.240603	2.39	3391354.0	1.037082	Y
4	IC 320-237402/5	0.928	0.997422	2.39	3300872.0	1.074808	Y
5	IC 320-237402/6	2.32	2.62735	2.39	3224053.0	1.132478	Y
6	IC 320-237402/7	4.64	5.194566	2.39	3128101.0	1.119519	Y
7	IC 320-237402/8	9.28	10.409747	2.39	3144316.0	1.12174	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

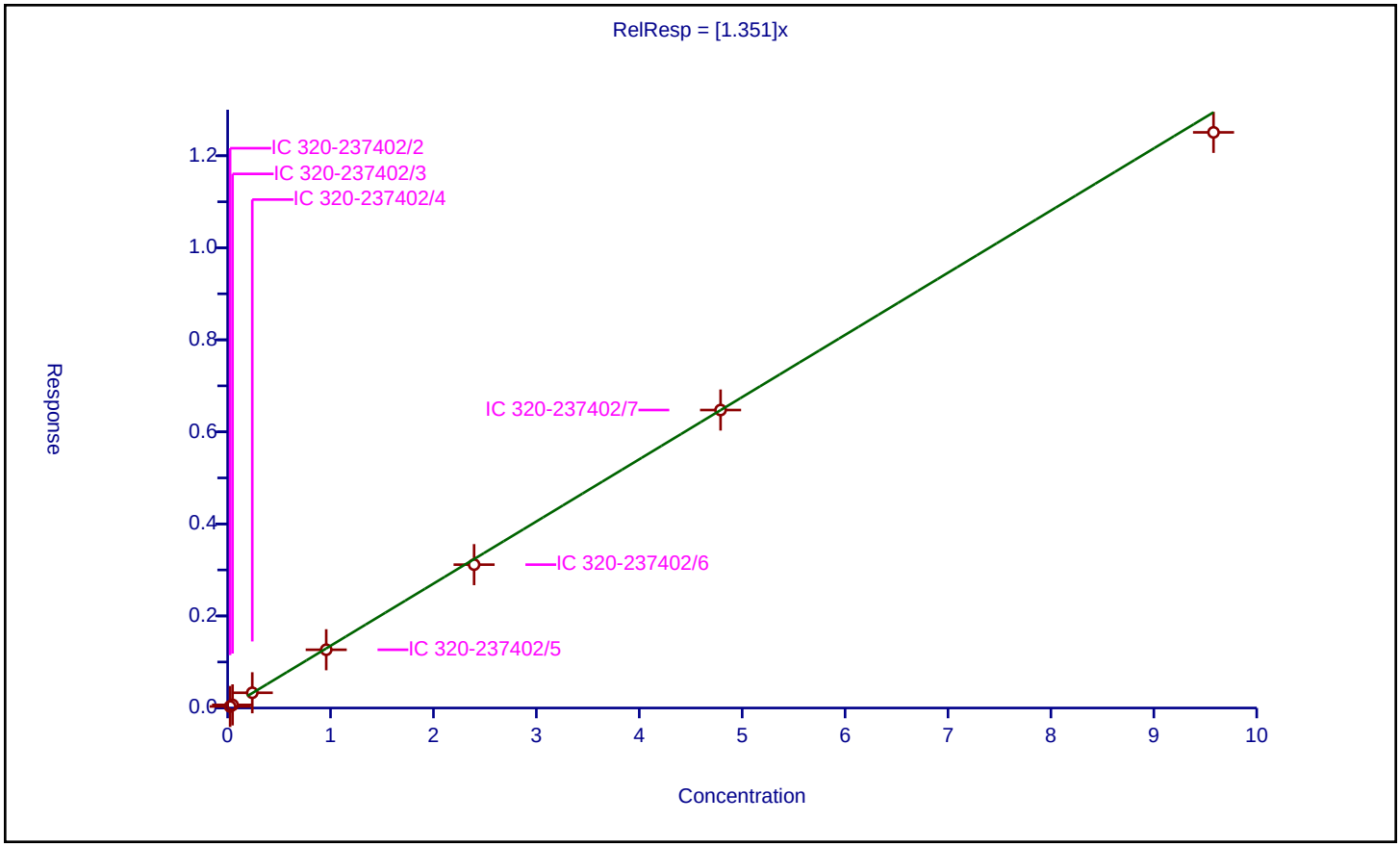
Curve Coefficients

Intercept:	0
Slope:	1.351

Error Coefficients

Standard Error:	1900000
Relative Standard Error:	3.2
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.02395	0.033186	2.395	959713.0	1.385623	Y
2	IC 320-237402/3	0.0479	0.067553	2.395	1020788.0	1.410283	Y
3	IC 320-237402/4	0.2395	0.331227	2.395	944227.0	1.382994	Y
4	IC 320-237402/5	0.958	1.265492	2.395	944062.0	1.320973	Y
5	IC 320-237402/6	2.395	3.115348	2.395	899004.0	1.300772	Y
6	IC 320-237402/7	4.79	6.474794	2.395	828227.0	1.351731	Y
7	IC 320-237402/8	9.58	12.508337	2.395	744064.0	1.305672	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

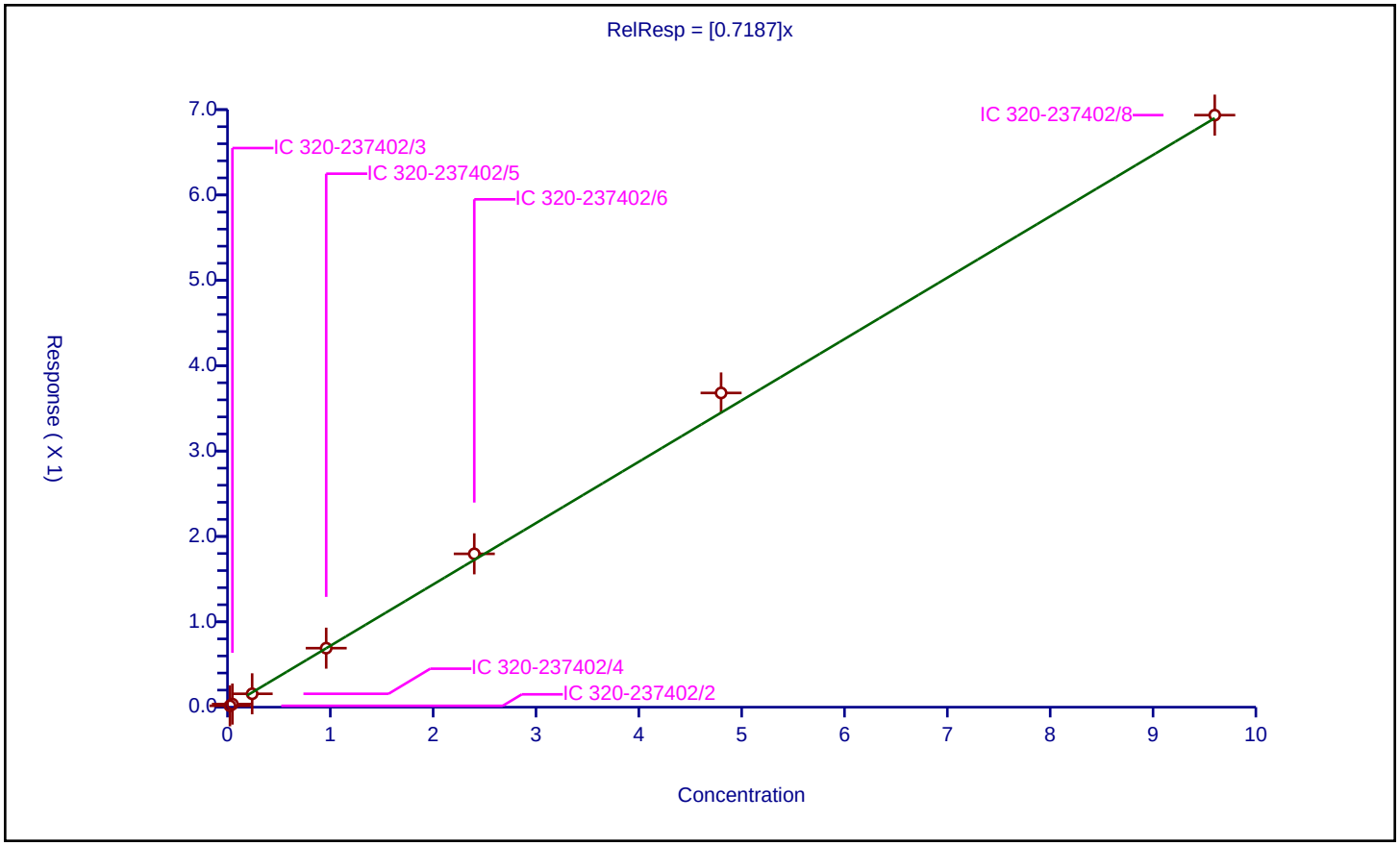
Curve Coefficients

Intercept:	0
Slope:	0.7187

Error Coefficients

Standard Error:	4350000
Relative Standard Error:	6.0
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.024	0.016061	2.39	3269307.0	0.669208	Y
2	IC 320-237402/3	0.048	0.036072	2.39	3417703.0	0.7515	Y
3	IC 320-237402/4	0.24	0.156684	2.39	3391354.0	0.65285	Y
4	IC 320-237402/5	0.96	0.691037	2.39	3300872.0	0.71983	Y
5	IC 320-237402/6	2.4	1.796196	2.39	3224053.0	0.748415	Y
6	IC 320-237402/7	4.8	3.680735	2.39	3128101.0	0.76682	Y
7	IC 320-237402/8	9.6	6.93526	2.39	3144316.0	0.722423	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

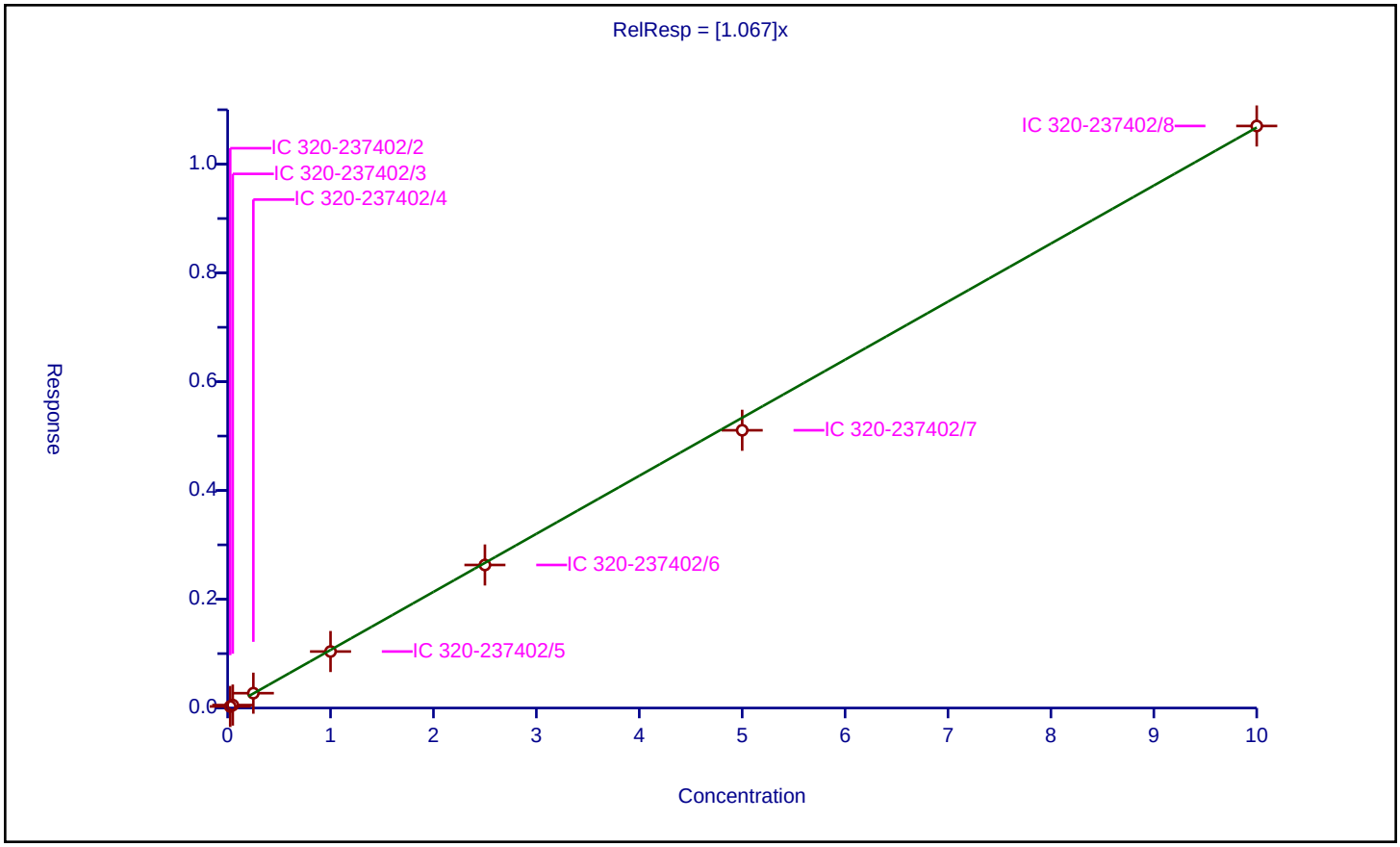
Curve Coefficients

Intercept:	0
Slope:	1.067

Error Coefficients

Standard Error:	3660000
Relative Standard Error:	3.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.028	2.5	2192940.0	1.120003	Y
2	IC 320-237402/3	0.05	0.053944	2.5	2274867.0	1.078876	Y
3	IC 320-237402/4	0.25	0.272719	2.5	2112120.0	1.090876	Y
4	IC 320-237402/5	1.0	1.038597	2.5	2165508.0	1.038597	Y
5	IC 320-237402/6	2.5	2.629605	2.5	2057230.0	1.051842	Y
6	IC 320-237402/7	5.0	5.106609	2.5	1963135.0	1.021322	Y
7	IC 320-237402/8	10.0	10.701518	2.5	1788913.0	1.070152	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

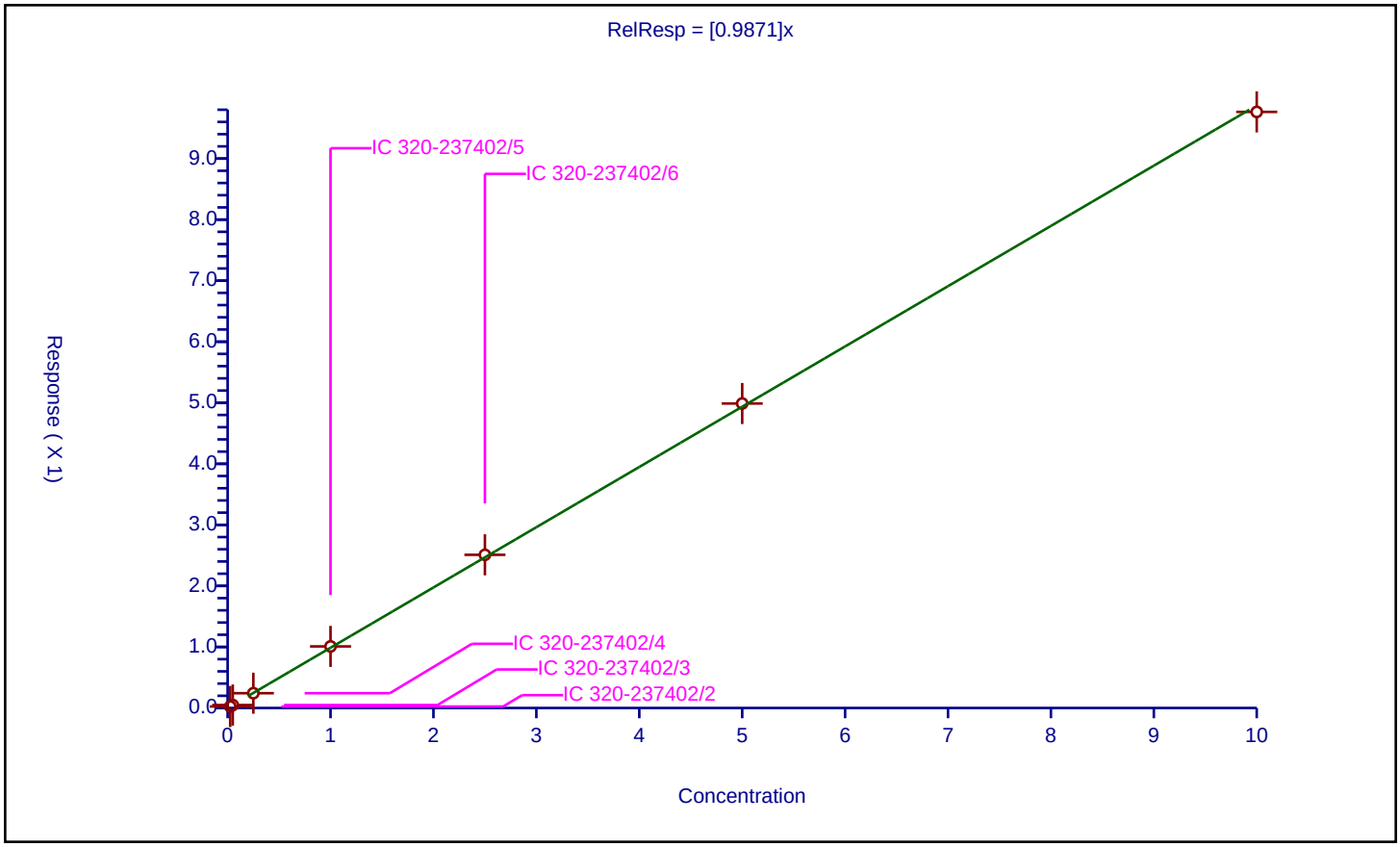
Curve Coefficients

Intercept:	0
Slope:	0.9871

Error Coefficients

Standard Error:	8640000
Relative Standard Error:	1.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.024633	2.5	4963170.0	0.985338	Y
2	IC 320-237402/3	0.05	0.048376	2.5	5311185.0	0.967524	Y
3	IC 320-237402/4	0.25	0.242497	2.5	5234016.0	0.969987	Y
4	IC 320-237402/5	1.0	1.009036	2.5	5088363.0	1.009036	Y
5	IC 320-237402/6	2.5	2.509179	2.5	5160037.0	1.003671	Y
6	IC 320-237402/7	5.0	4.987678	2.5	4827094.0	0.997536	Y
7	IC 320-237402/8	10.0	9.76439	2.5	4606616.0	0.976439	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

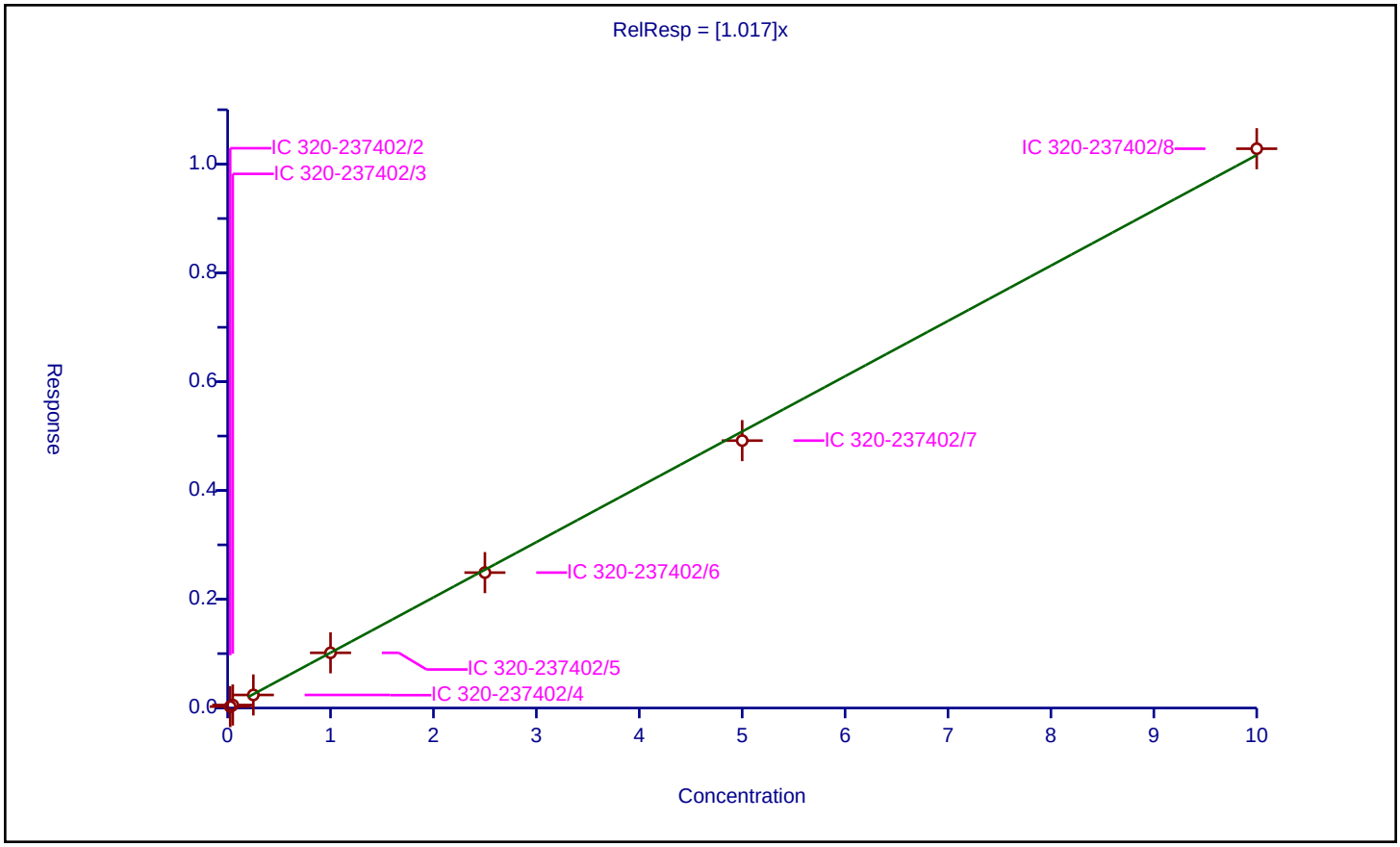
Curve Coefficients

Intercept:	0
Slope:	1.017

Error Coefficients

Standard Error:	909000
Relative Standard Error:	4.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.025741	2.5	501437.0	1.029641	Y
2	IC 320-237402/3	0.05	0.055202	2.5	534311.0	1.104039	Y
3	IC 320-237402/4	0.25	0.240141	2.5	521422.0	0.960566	Y
4	IC 320-237402/5	1.0	1.014861	2.5	491188.0	1.014861	Y
5	IC 320-237402/6	2.5	2.489532	2.5	503700.0	0.995813	Y
6	IC 320-237402/7	5.0	4.916328	2.5	501663.0	0.983266	Y
7	IC 320-237402/8	10.0	10.283279	2.5	467155.0	1.028328	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

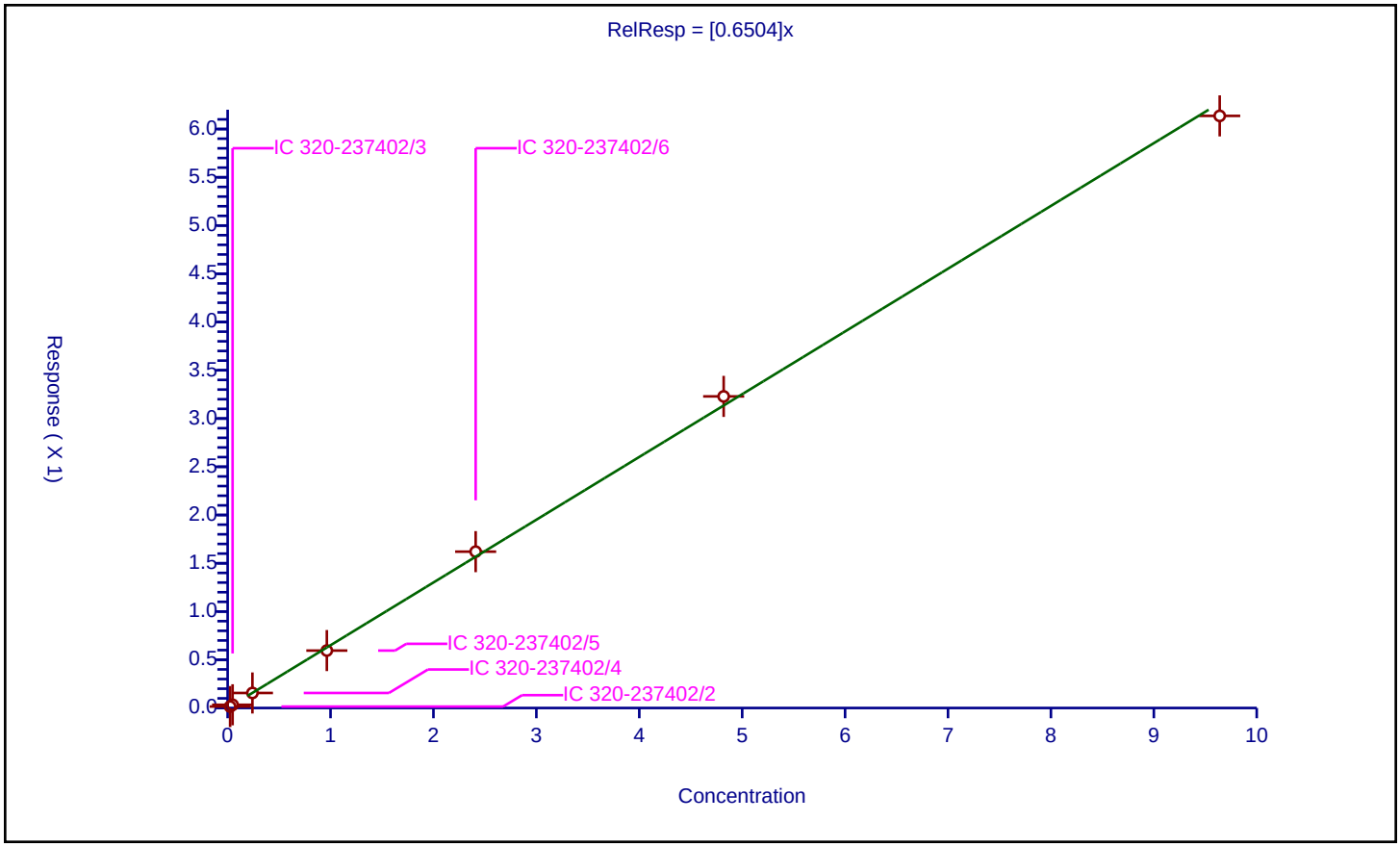
Curve Coefficients

Intercept:	0
Slope:	0.6504

Error Coefficients

Standard Error:	3840000
Relative Standard Error:	4.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.0241	0.014899	2.39	3269307.0	0.618231	Y
2	IC 320-237402/3	0.0482	0.033344	2.39	3417703.0	0.691785	Y
3	IC 320-237402/4	0.241	0.155814	2.39	3391354.0	0.646533	Y
4	IC 320-237402/5	0.964	0.595201	2.39	3300872.0	0.617429	Y
5	IC 320-237402/6	2.41	1.620364	2.39	3224053.0	0.67235	Y
6	IC 320-237402/7	4.82	3.229222	2.39	3128101.0	0.669963	Y
7	IC 320-237402/8	9.64	6.136316	2.39	3144316.0	0.636547	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

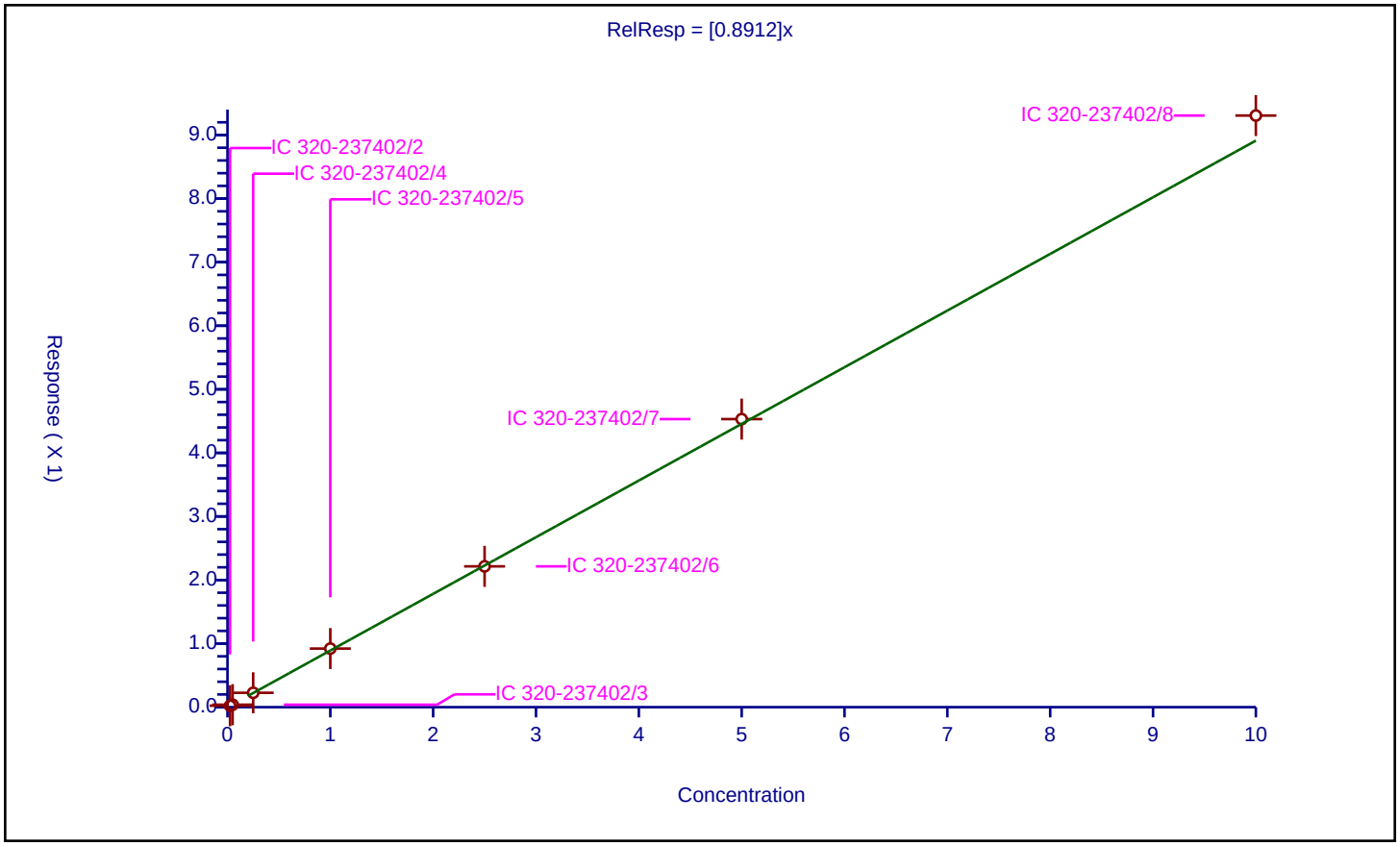
Curve Coefficients

Intercept:	0
Slope:	0.8912

Error Coefficients

Standard Error:	835000
Relative Standard Error:	5.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.022729	2.5	545218.0	0.909178	Y
2	IC 320-237402/3	0.05	0.039046	2.5	610182.0	0.780915	Y
3	IC 320-237402/4	0.25	0.225968	2.5	571651.0	0.903873	Y
4	IC 320-237402/5	1.0	0.921627	2.5	559410.0	0.921627	Y
5	IC 320-237402/6	2.5	2.214934	2.5	532526.0	0.885974	Y
6	IC 320-237402/7	5.0	4.531348	2.5	495602.0	0.90627	Y
7	IC 320-237402/8	10.0	9.306632	2.5	473237.0	0.930663	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

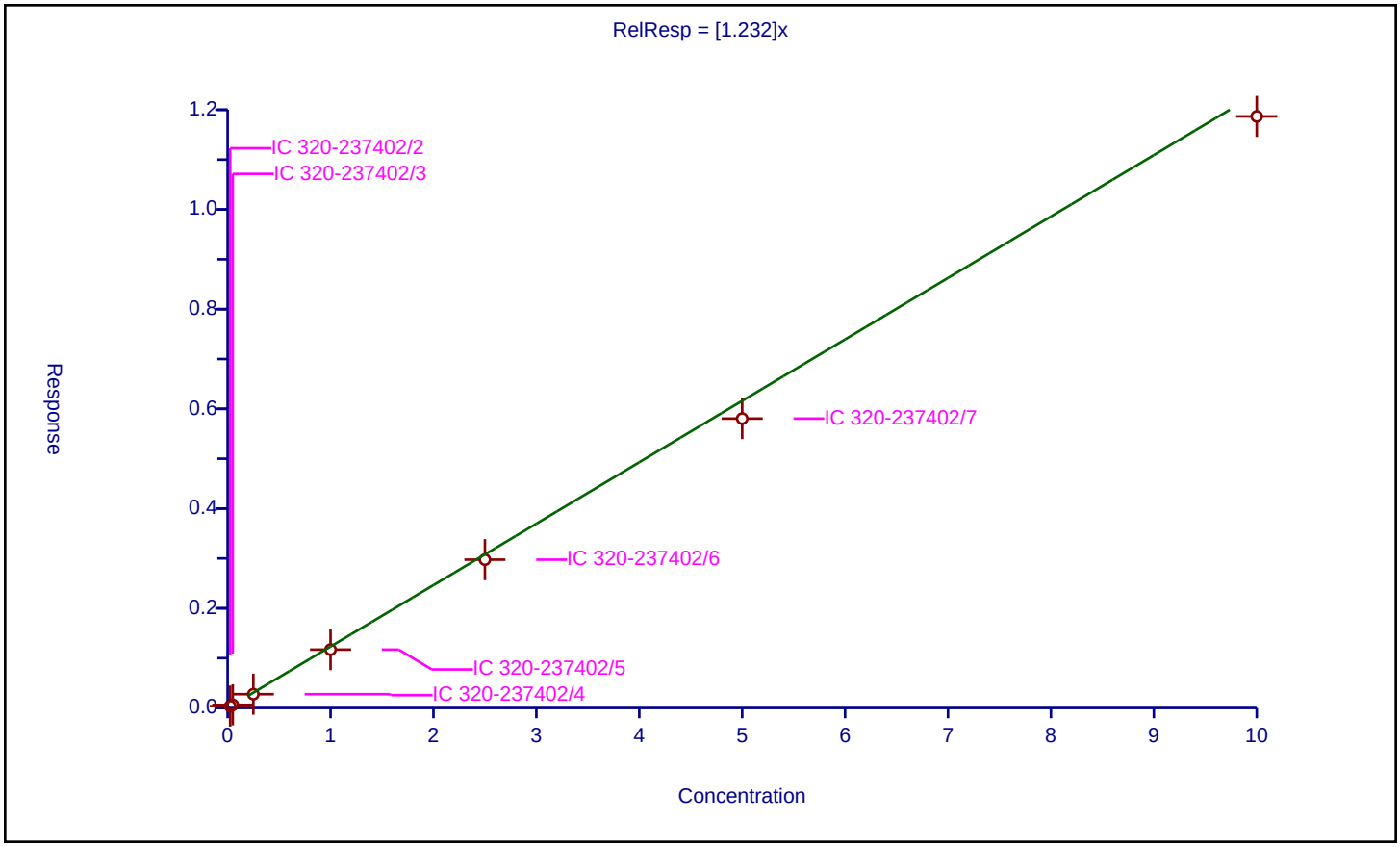
Curve Coefficients

Intercept:	0
Slope:	1.232

Error Coefficients

Standard Error:	3230000
Relative Standard Error:	11.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.981

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.038331	2.5	1645990.0	1.533241	Y
2	IC 320-237402/3	0.05	0.063756	2.5	1779877.0	1.275116	Y
3	IC 320-237402/4	0.25	0.277117	2.5	1682161.0	1.108467	Y
4	IC 320-237402/5	1.0	1.171338	2.5	1631762.0	1.171338	Y
5	IC 320-237402/6	2.5	2.97524	2.5	1525487.0	1.190096	Y
6	IC 320-237402/7	5.0	5.805149	2.5	1498263.0	1.16103	Y
7	IC 320-237402/8	10.0	11.866391	2.5	1439097.0	1.186639	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

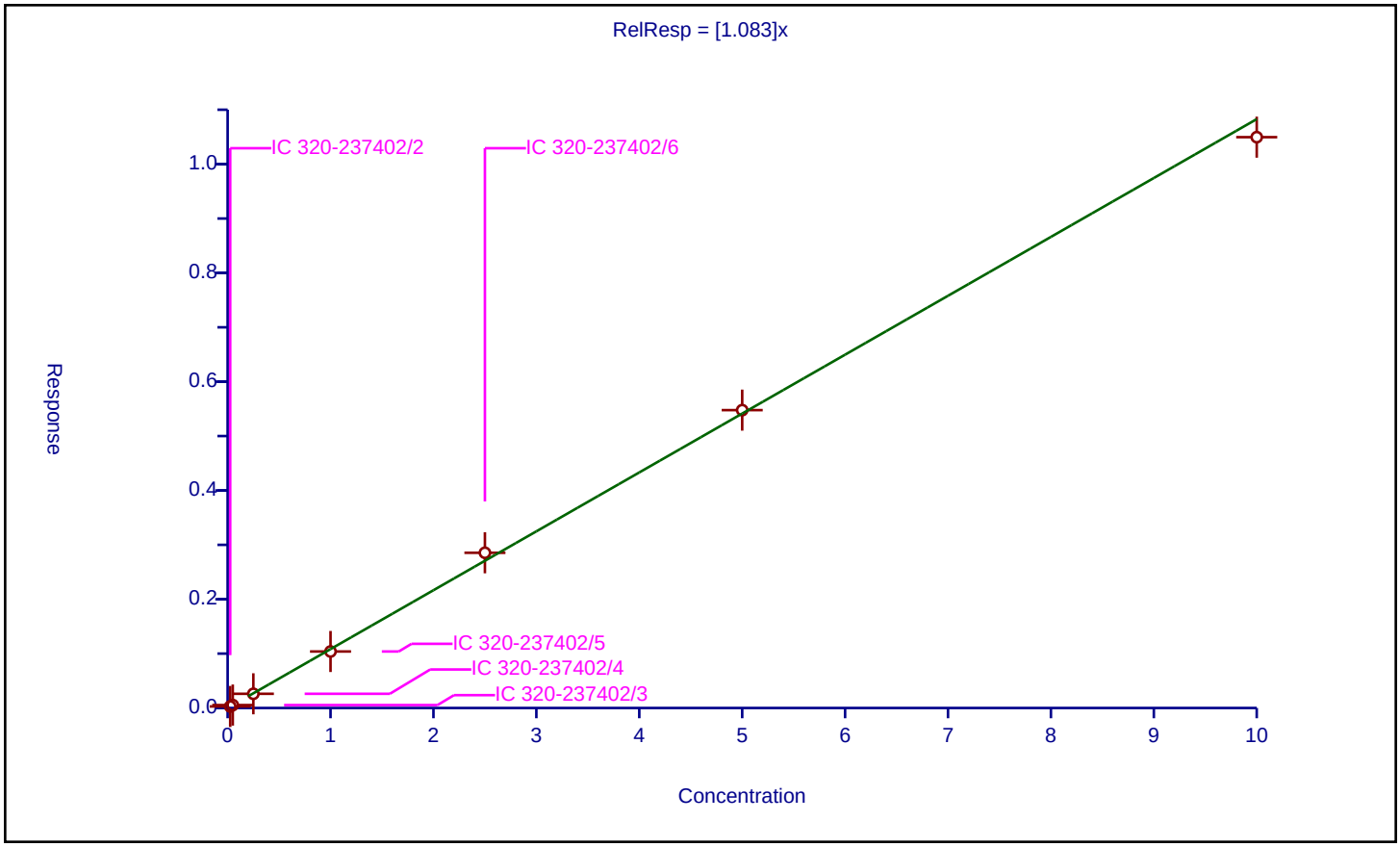
Curve Coefficients

Intercept:	0
Slope:	1.083

Error Coefficients

Standard Error:	2670000
Relative Standard Error:	3.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.028285	2.5	1339683.0	1.131387	Y
2	IC 320-237402/3	0.05	0.053889	2.5	1524607.0	1.077786	Y
3	IC 320-237402/4	0.25	0.261099	2.5	1396187.0	1.044394	Y
4	IC 320-237402/5	1.0	1.039012	2.5	1429399.0	1.039012	Y
5	IC 320-237402/6	2.5	2.854057	2.5	1356329.0	1.141623	Y
6	IC 320-237402/7	5.0	5.476668	2.5	1279511.0	1.095334	Y
7	IC 320-237402/8	10.0	10.495685	2.5	1351987.0	1.049569	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

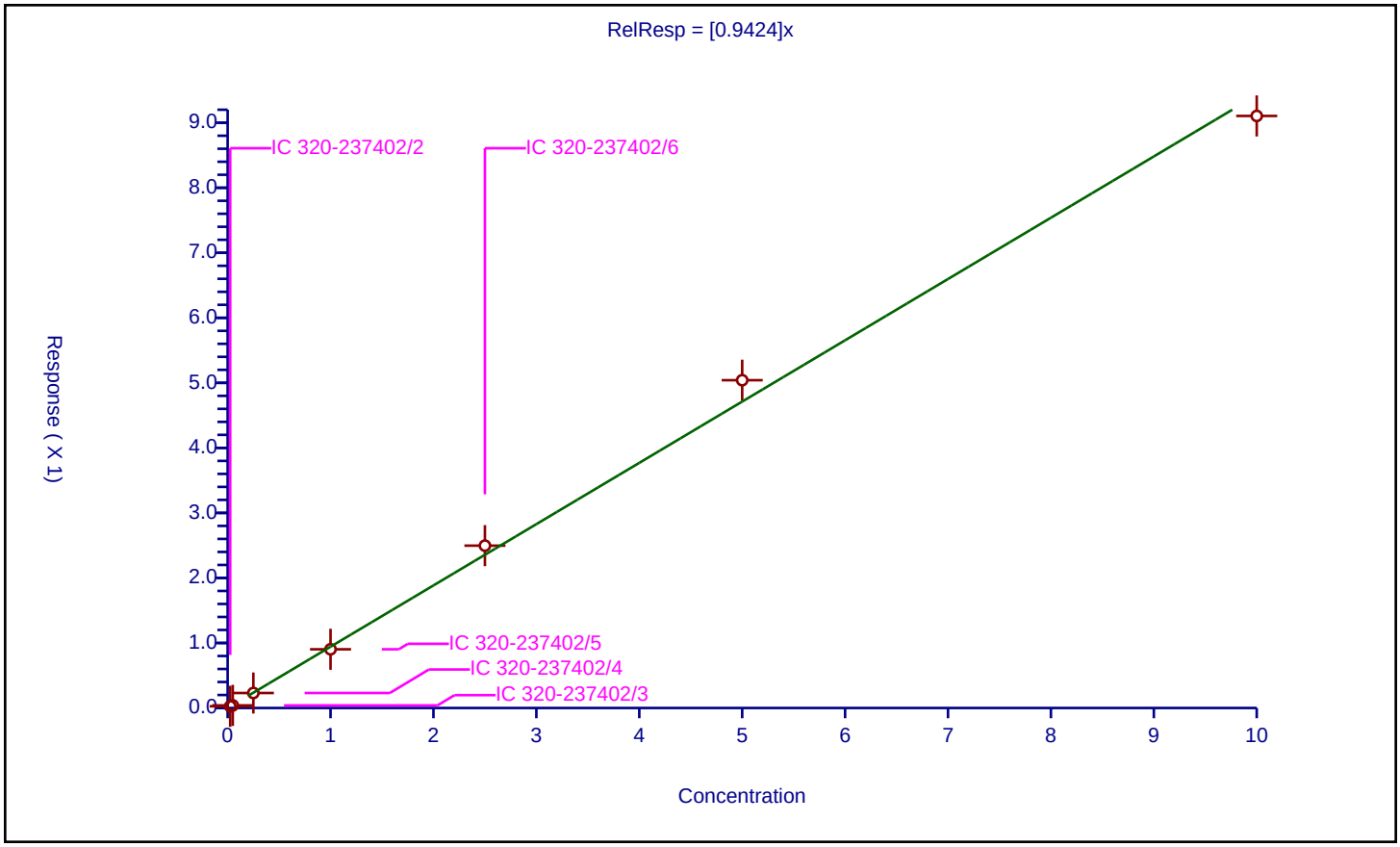
Curve Coefficients

Intercept:	0
Slope:	0.9424

Error Coefficients

Standard Error:	2350000
Relative Standard Error:	8.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.026316	2.5	1339683.0	1.052637	Y
2	IC 320-237402/3	0.05	0.040045	2.5	1524607.0	0.800895	Y
3	IC 320-237402/4	0.25	0.230746	2.5	1396187.0	0.922985	Y
4	IC 320-237402/5	1.0	0.902991	2.5	1429399.0	0.902991	Y
5	IC 320-237402/6	2.5	2.496621	2.5	1356329.0	0.998649	Y
6	IC 320-237402/7	5.0	5.041047	2.5	1279511.0	1.008209	Y
7	IC 320-237402/8	10.0	9.104773	2.5	1351987.0	0.910477	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

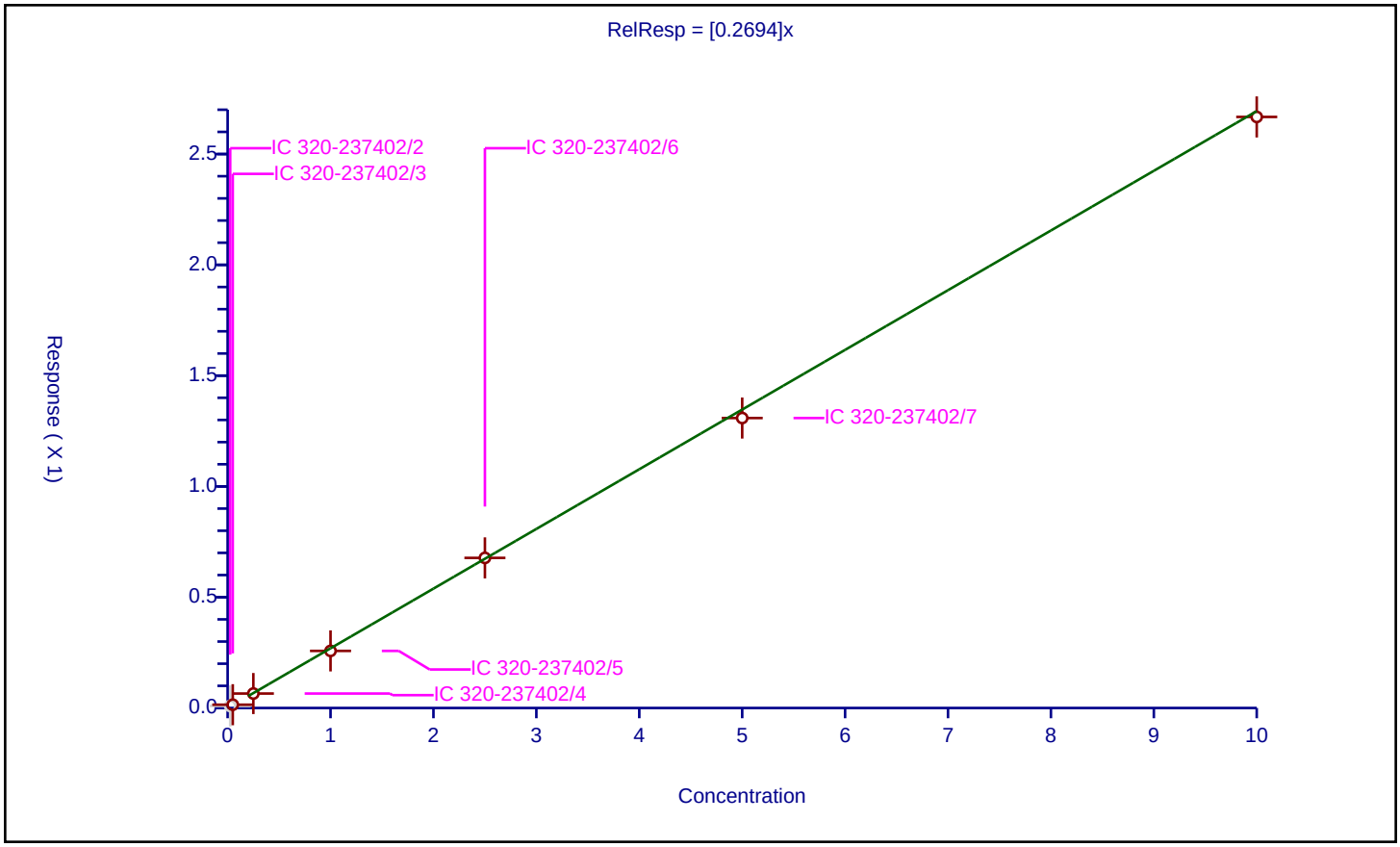
Curve Coefficients

Intercept:	0
Slope:	0.2694

Error Coefficients

Standard Error:	593000
Relative Standard Error:	5.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237402/2	0.025	0.009224	2.5	1164683.0	0.368942	N
2	IC 320-237402/3	0.05	0.01489	2.5	1246501.0	0.297794	Y
3	IC 320-237402/4	0.25	0.065329	2.5	1210263.0	0.261315	Y
4	IC 320-237402/5	1.0	0.25762	2.5	1162431.0	0.25762	Y
5	IC 320-237402/6	2.5	0.677514	2.5	1159368.0	0.271005	Y
6	IC 320-237402/7	5.0	1.308638	2.5	1118375.0	0.261728	Y
7	IC 320-237402/8	10.0	2.667542	2.5	1068686.0	0.266754	Y



FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.0356 0.9385	0.9092 0.9295	0.9181	0.9138	0.9275	AveID		0.9389				4.7		20.0			
Perfluoropentanoic acid (PFPeA)	1.3867 1.1127	1.0717 1.1007	1.0769	1.1120	1.1037	AveID		1.1378				9.8		20.0			
Perfluorobutanesulfonic acid (PFBS)	76.063 79.702	72.042 71.920	75.499	79.131	77.346	AveID		75.957				4.1		20.0			
4:2 FTS	16.899 16.409	15.948 15.581	16.354	17.979	16.820	AveID		16.570				4.7		20.0			
Perfluorohexanoic acid (PFHxA)	1.1713 1.0157	0.9838 0.9930	0.9663	1.0078	1.0064	AveID		1.0206				6.7		20.0			
Perfluoropentanesulfonic acid	68.597 72.591	70.149 63.027	67.160	70.677	70.259	AveID		68.923				4.5		20.0			
Perfluoroheptanoic acid (PFHpA)	+++++ 1.0462	1.0598 1.0766	1.0410	1.0735	1.0740	AveID		1.0619				1.4		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2251 1.0319	1.1827 1.0319	1.0717	1.0213	1.0237	AveID		1.0841				7.8		20.0			
6:2 FTS	1.7499 1.5710	1.5746 1.6133	1.4237	1.5556	1.5255	AveID		1.5734				6.2		20.0			
Perfluorooctanoic acid (PFOA)	1.2008 1.0886	1.2853 1.0557	1.0978	1.0896	1.0969	AveID		1.1307				7.2		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2610 1.2616	1.2442 1.2011	1.1885	1.2551	1.2619	AveID		1.2391				2.5		20.0			
Perfluorononanoic acid (PFNA)	1.1473 1.0799	1.0748 1.0323	1.0182	0.9962	1.0249	AveID		1.0534				4.9		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.1452 1.0892	1.0806 1.0719	1.0331	1.0486	1.0477	AveID		1.0738				3.5		20.0			
Perfluorononanesulfonic acid	0.7326 0.7691	0.7576 0.7460	0.7565	0.7459	0.7575	AveID		0.7522				1.6		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
8:2 FTS	1.3250 1.2730	1.4395 1.3051	1.2793	1.2063	1.2657	AveID		1.2991				5.6		20.0			
Perfluorodecanoic acid (PFDA)	1.0978 0.9968	1.0000 0.9777	1.0353	0.9399	0.9748	AveID		1.0032				5.1		20.0			
Perfluorooctane Sulfonamide (PFOSA)	0.9400 1.0032	0.9765 0.9376	0.9545	0.9847	1.0189	AveID		0.9736				3.2		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9510 0.9835	1.0084 0.9888	0.9336	0.9540	0.9328	AveID		0.9646				3.0		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6051 0.6390	0.6643 0.6091	0.6429	0.6182	0.6451	AveID		0.6320				3.4		20.0			
Perfluoroundecanoic acid (PFUnA)	+++++ 1.0924	1.2343 1.0863	1.0961	1.1589	1.0738	AveID		1.1236				5.5		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9845 0.8814	0.9491 0.9072	0.8112	0.8526	0.8566	AveID		0.8918				6.7		20.0			
Perfluorododecanoic acid (PFDoA)	1.1896 1.0745	1.1772 1.0999	1.0449	1.1145	1.0884	AveID		1.1127				4.8		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.0415 1.1188	1.0997 1.0389	1.0944	1.0656	1.0680	AveID		1.0753				2.8		20.0			
Perfluorotetradecanoic acid (PFTeA)	+++++ 0.2376	0.2550 0.2466	0.2390	0.2330	0.2410	AveID		0.2420				3.2		20.0			
13C4 PFBA	1.3454 1.4071	1.3544 1.4354	1.3670	1.3767	1.4083	Ave		1.3849				2.4		20.0			
13C5-PFPeA	0.9142 0.9681	0.9515 0.9792	0.9416	0.9284	0.9928	Ave		0.9537				2.9		20.0			
13C3-PFBS	0.0217 0.0217	0.0221 0.0231	0.0222	0.0212	0.0224	Ave		0.0221				2.7		20.0			
13C2 PFHxA	1.0908 1.0709	1.0832 1.0771	1.0664	1.0648	1.1220	Ave		1.0822				1.8		20.0			
13C4-PFHpA	1.0528 1.0755	1.0748 1.0417	1.0614	1.0647	1.0848	Ave		1.0651				1.4		20.0			
18O2 PFHxS	1.3540 1.3675	1.4005 1.3474	1.3411	1.3518	1.3975	Ave		1.3657				1.8		20.0			
M2-6:2FTS	0.2197 0.2237	0.2210 0.2189	0.2309	0.2274	0.2275	Ave		0.2242				2.0		20.0			
13C4 PFOA	0.9700 0.9794	0.9570 0.9943	0.9864	0.9624	0.9914	Ave		0.9773				1.5		20.0			
13C4 PFOS	0.8675 0.8973	0.8804 0.9183	0.9045	0.8918	0.9213	Ave		0.8973				2.2		20.0			
13C5 PFNA	0.8612 0.8554	0.8748 0.8585	0.8921	0.8848	0.9123	Ave		0.8770				2.4		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.2727 0.2715	0.2729 0.2567	0.2676	0.2731	0.2806	Ave		0.2707				2.7		20.0			
13C2 PFDA	0.7423 0.7808	0.7526 0.7805	0.7387	0.7911	0.8001	Ave		0.7695				3.2		20.0			
13C8 FOSA	1.1730 1.1817	1.1961 1.2106	1.1997	1.1702	1.1882	Ave		1.1885				1.2		20.0			
d3-NMeFOSAA	0.3925 0.3861	0.3877 0.3984	0.3885	0.3872	0.4143	Ave		0.3935				2.6		20.0			
d5-NEtFOSAA	0.4192 0.3947	0.4132 0.3750	0.4229	0.4161	0.4128	Ave		0.4077				4.2		20.0			
13C2 PFUnA	0.6182 0.6069	0.6026 0.6096	0.6343	0.6068	0.6538	Ave		0.6189				3.0		20.0			
13C2 PFDoA	0.6320 0.6494	0.6378 0.6472	0.6693	0.6531	0.6902	Ave		0.6541				3.0		20.0			
13C2-PFTeDA	0.8409 0.8358	0.8205 0.8213	0.8511	0.8289	0.8364	Ave		0.8335				1.3		20.0			
13C2-PFHxDA	1.6553 1.6633	1.6811 1.6556	1.6239	1.6406	1.6546	Ave		1.6535				1.1		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	57127 10686384	100389 19976933	522272	2011540	5049773	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	51978 8717868	83129 16137329	421991	1650773	4235935	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	59862 12353528	114549 21980500	616670	2375205	5929736	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	14052 2687262	26792 5031154	141135	570176	1362407	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	52384 8802526	86871 16015982	428854	1715767	4365425	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	57284 11938702	118353 20439230	582073	2251038	5715419	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	+++++ 9106263	92858 16791846	459833	1827459	4504362	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	61896 10391537	122877 18945578	544267	2008773	5033358	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	14940 2696182	26890 5013052	129666	536262	1272183	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	47808 8637324	100379 15733520	451059	1678386	4208258	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	42699 8721667	85012 15722427	425894	1703787	4278634	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	40510 7475851	76644 13269892	377996	1409363	3614991	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	37801 7339820	71970 13677354	360873	1387650	3462772	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanesulfonic acid		AveID	25016 5361178	52199 9847776	273347	1021056	2589883	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
8:2 FTS		AveID	14190 2679186	30677 4806399	136487	504558	1315230	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorodecanoic acid (PFDA)		AveID	33414 6298810	61353 11426488	318256	1188927	3015215	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (PFOSA)		AveID	45210 9594151	95215 16995473	476525	1842464	4680280	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	15304 3073336	31870 5898014	150940	590682	1493989	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	20747 4472904	45962 8074266	233277	849835	2214864	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	+++++ 5365541	60636 9915678	289310	1124406	2714159	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16923 2815576	31965 5094367	142770	567205	1366918	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	30826 5646629	61213 10658790	291016	1163733	2903966	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	26989 5879570	57183 10067689	304796	1112653	2849697	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	+++++ 1606848	17056 3032661	84652	308839	779223	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5516377 5693569	5520570 5373122	5688815	5503224	5444583	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	3748386 3917323	3878229 3665379	3918495	3711287	3838069	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	82796 81531	83639 80382	85930	78945	80654	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4472467 4333101	4415087 4032113	4437948	4256324	4337626	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4316698 4351928	4381099 3899256	4417214	4255889	4193874	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5251983 5234562	5400125 4771422	5279483	5111728	5111206	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	855574 859900	855666 778460	912690	863649	835688	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3977347 3963063	3900845 3722009	4104790	3847208	3832692	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3400422 3471061	3430647 3286355	3598367	3408113	3404908	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3530907 3461355	3565521 3213782	3712571	3536917	3527035	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1070959 1052330	1065531 920670	1066887	1045687	1039099	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C2 PFDA	13PF OA	Ave	3043654 3159574	3067735 2921735	3074087	3162481	3093053	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C8 FOSA	13PF OA	Ave	4809407 4781606	4875140 4531636	4992636	4677735	4593505	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1609182 1562466	1580220 1491160	1616798	1547904	1601576	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1718969 1597197	1684036 1403844	1760050	1663128	1595779	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2534521 2455806	2456263 2281933	2639555	2425508	2527555	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2591339 2627551	2599869 2422707	2785129	2610480	2668181	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3447891 3382019	3344339 3074334	3541707	3313318	3233399	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6786819 6730439	6852227 6197635	6757749	6558204	6396595	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	10.3 -1.0	-3.2	-2.2	-2.7	-1.2	0.0	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	21.9 -3.3	-5.8	-5.3	-2.3	-3.0	-2.2	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	0.1 -5.3	-5.2	-0.6	4.2	1.8	4.9	30 30	30	30	30	30	30
4:2 FTS	2.0 -6.0	-3.8	-1.3	8.5	1.5	-1.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	14.8 -2.7	-3.6	-5.3	-1.3	-1.4	-0.5	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-0.5 -8.6	1.8	-2.6	2.5	1.9	5.3	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	+++++ 1.4	-0.2	-2.0	1.1	1.1	-1.5	 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	13.0 -4.8	9.1	-1.1	-5.8	-5.6	-4.8	30 30	30	30	30	30	30
6:2 FTS	11.2 2.5	0.1	-9.5	-1.1	-3.0	-0.1	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	6.2 -6.6	13.7	-2.9	-3.6	-3.0	-3.7	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	1.8 -3.1	0.4	-4.1	1.3	1.8	1.8	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	8.9 -2.0	2.0	-3.3	-5.4	-2.7	2.5	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	6.7 -0.2	0.6	-3.8	-2.3	-2.4	1.4	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-2.6 -0.8	0.7	0.6	-0.8	0.7	2.2	30 30	30	30	30	30	30
8:2 FTS	2.0 0.5	10.8	-1.5	-7.1	-2.6	-2.0	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1 Analy Batch No.: 238193

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorodecanoic acid (PFDA)	9.4 -2.5	-0.3	3.2	-6.3	-2.8	-0.6	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (PFOSA)	-3.5 -3.7	0.3	-2.0	1.1	4.6	3.0	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-1.4 2.5	4.5	-3.2	-1.1	-3.3	2.0	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-4.3 -3.6	5.1	1.7	-2.2	2.1	1.1	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	+++++ -3.3	9.8	-2.5	3.1	-4.4	-2.8	 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	10.4 1.7	6.4	-9.0	-4.4	-3.9	-1.2	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	6.9 -1.2	5.8	-6.1	0.2	-2.2	-3.4	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	-3.1 -3.4	2.3	1.8	-0.9	-0.7	4.1	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	+++++ 1.9	5.4	-1.2	-3.7	-0.4	-1.8	 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 06-Aug-2018 11:10:09 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:16:53 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:22:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.401	1.395	0.006	0.543	5516377	2.43		97.1	8663	
2 Perfluorobutyric acid										
212.90 > 169.00	1.401	1.397	0.004	1.000	57127	0.0276		110	6.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.646	1.639	0.007	0.638	3748386	2.40		95.9	8167	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.646	1.643	0.003	1.000	51978	0.0305		122	3.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.678	1.675	0.003	0.651	82796	2.29		98.4	394	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.678	1.676	0.002	1.000	59862	0.0221		100	27.4	
298.90 > 99.00	1.686	1.676	0.010	1.005	26611		2.25(1.25-3.74)	100	16.7	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.875	1.875	0.0	1.117	14052	0.0238		102	121	
D 60 M2-4:2FTS										
329.00 > 81.00	1.883	1.875	0.008	0.730	605486	NC			831	
D 7 13C2 PFHxA										
315.00 > 270.00	1.912	1.908	0.004	0.741	4472467	2.52		101	8390	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.912	1.908	0.004	1.000	52384	0.0287		115	14.5	
313.00 > 119.00	1.923	1.908	0.015	1.005	4815		10.88(5.03-15.10)	115	12.0	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.933	1.930	0.003	1.152	57284	0.0233		99.5	135	
349.00 > 99.00	1.933	1.930	0.003	1.152	21167		2.71(1.36-4.07)	99.5	28.8	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.006	2.003	0.003	1.000	9494	NC			3.9	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.006	2.003	0.003	0.778	326098	NC			976	
D 9 13C4-PFHpA										
367.00 > 322.00	2.233	2.227	0.006	0.866	4316698	2.47		98.8	9522	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.233	2.228	0.005	1.000	70955	0.0387		155	13.9	
363.00 > 169.00	2.233	2.228	0.005	1.000	28093		2.53(1.13-3.40)	155	60.1	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.239	0.004	1.000	61896	0.0257		113	144	
399.00 > 99.00	2.243	2.239	0.004	1.000	21470		2.88(1.50-4.49)	113	24.0	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.239	0.004	0.870	5251983	2.34		99.1	5490	
65 ADONA										
377.00 > 251.00	2.277	2.271	0.006	0.773	119095	NC			369	
377.00 > 85.00	2.277	2.271	0.006	0.773	70717		1.68(0.84-2.53)		160	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.548	0.009	1.000	14940	0.0264		111	29.3	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.549	0.008	0.992	855574	2.33		98.0	2284	
D 73 13C8 PFOA										
421.00 > 376.00	2.579	2.571	0.008	1.000	7829980	NC			11714	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.573	0.006	1.000	3977347	2.48		99.3	6149	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.574	0.005	1.000	47808	0.0266		106	5.0	
413.00 > 169.00	2.579	2.574	0.005	1.000	27163		1.76(0.84-2.52)	106	59.5	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.575	0.004		4100164	2.50			7067	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.586	2.583	0.003	0.878	42699	0.0242		102	133	
449.00 > 99.00	2.586	2.583	0.003	0.878	10587		4.03(1.94-5.82)	102	22.5	
D 72 13C8 PFOS										
507.00 > 99.00	2.944	2.938	0.006	1.141	1668266	NC			5837	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.939	0.005	1.141	3400422	2.31		96.7	4592	
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.939	0.005	1.141	3530907	2.45		98.2	7876	
20 Perfluorononanoic acid										
463.00 > 419.00	2.944	2.939	0.005	1.000	40510	0.0272		109	12.3	
463.00 > 169.00	2.944	2.939	0.005	1.000	8595		4.71(1.90-5.69)	109	72.2	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.950	2.940	0.010	1.002	37801	0.0247		107	105	
499.00 > 99.00	2.950	2.940	0.010	1.002	10855		3.48(2.31-6.93)	107	29.5	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.154	3.150	0.004	1.071	61193	NC			259	
D 26 M2-8:2FTS										
529.00 > 81.00	3.284	3.284	0.0	1.273	1070959	2.41		101	2863	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.284	3.285	0.0	1.115	25016	0.0234		97.4	162	
549.00 > 99.00	3.291	3.285	0.007	1.118	10319		2.42(1.33-3.97)	97.4	44.8	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.298	3.286	0.012	1.004	14190	0.0244		102	42.6	
D 23 13C2 PFDA										
515.00 > 470.00	3.298	3.294	0.004	1.279	3043654	2.41		96.5	5778	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.298	3.296	0.002	1.000	33414	0.0274		109	26.5	
513.00 > 169.00	3.298	3.296	0.002	1.000	4888		6.84(2.36-7.09)	109	34.8	
D 21 13C8 FOSA										
506.00 > 78.00	3.320	3.317	0.003	1.287	4809407	2.47		98.7	5689	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.320	3.319	0.001	1.000	45210	0.0241		96.5	291	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.453	3.448	0.005	1.339	1609182	2.49		99.7	4803	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.453	0.007	1.002	15304	0.0246		98.6	9.3	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.613	3.608	0.005	1.227	20747	0.0231		95.7	187	
599.00 > 99.00	3.620	3.608	0.012	1.230	9035		2.30(1.39-4.16)	95.7	58.0	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.620	3.616	0.004	1.404	1718969	2.57		103	1292	
D 30 13C2 PFUnA										
565.00 > 520.00	3.620	3.620	0.0	1.404	2534521	2.50		99.9	7331	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.627	3.622	0.005	1.002	39159	0.0344		138	28.2	R
563.00 > 169.00	3.620	3.622	-0.002	1.000	5282		7.41(2.12-6.36)	138	39.3	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.627	3.623	0.004	1.002	16923	0.0276		110	56.6	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.783	3.781	0.002	1.285	85084	NC			354	
35 MeFOSA										
512.00 > 169.00	3.824	3.826	-0.002		15364	NC			107	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.919	3.913	0.006	1.000	30826	0.0267		107	19.8	
613.00 > 169.00	3.919	3.913	0.006	1.000	5801		5.31(2.13-6.40)	107	54.6	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.919	3.913	0.006	1.194	9310	NC			66.5	
D 36 13C2 PFDoA										
615.00 > 570.00	3.919	3.913	0.006	1.520	2591339	2.42		96.6	4078	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.148	4.148	0.0	1.409	8457	NC			56.6	
699.00 > 99.00	4.148	4.148	0.0	1.409	12505		0.68(0.00-0.00)		138	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.177	4.173	0.004	1.066	26989	0.0242		96.9	12.7	
663.00 > 169.00	4.177	4.173	0.004	1.066	9362		2.88(1.25-3.76)	96.9	74.8	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.405	4.399	0.006	1.708	3447891	2.52		101	9514	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.405	4.400	0.005	1.000	8064	0.0242		96.6	88.6	
713.00 > 219.00	4.413	4.400	0.013	1.002	5513		1.46(0.71-2.13)	96.6	97.0	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.803	4.799	0.004	1.862	6786819	2.50		100	7400	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.814	4.801	0.013	1.002	117463	NC			50.8	
813.00 > 169.00	4.803	4.801	0.002	1.000	21885		5.37(2.86-8.58)		197	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.147	5.136	0.011	1.072	61329	NC			14.1	
913.00 > 169.00	5.140	5.136	0.004	1.070	7812		7.85(3.83-11.48)		103	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL1_00007 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:16:57 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_002.d

Injection Date: 06-Aug-2018 11:10:09 Instrument ID: A8_N

Lims ID: IC L1 Full

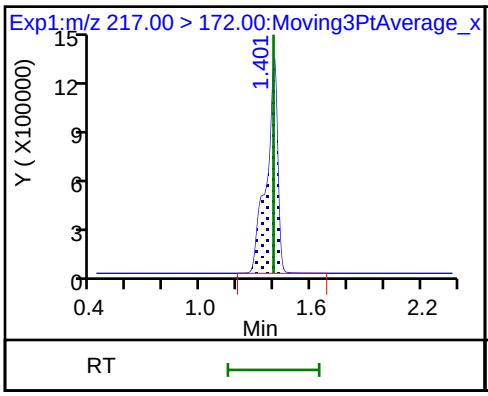
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 10 Worklist Smp#: 2

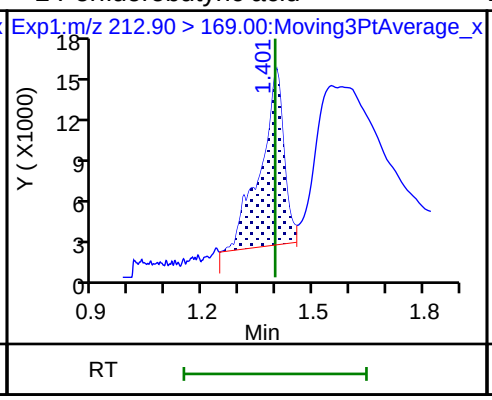
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

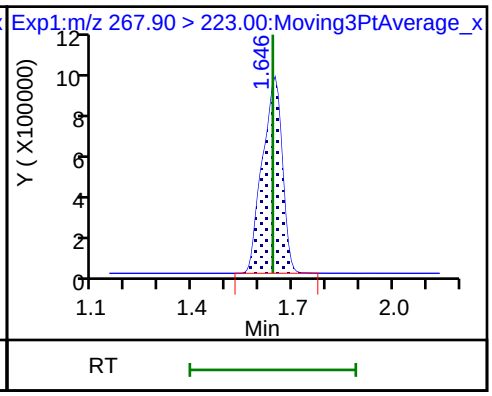
D 1 13C4 PFBA



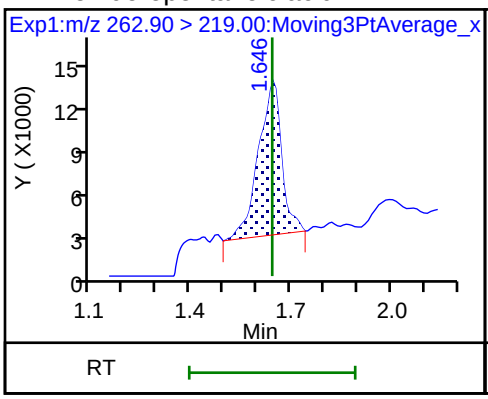
2 Perfluorobutyric acid



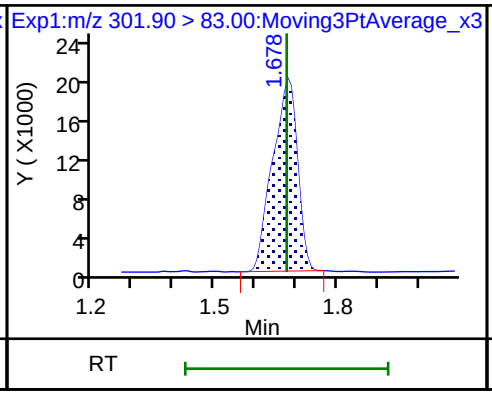
D 3 13C5-PFPeA



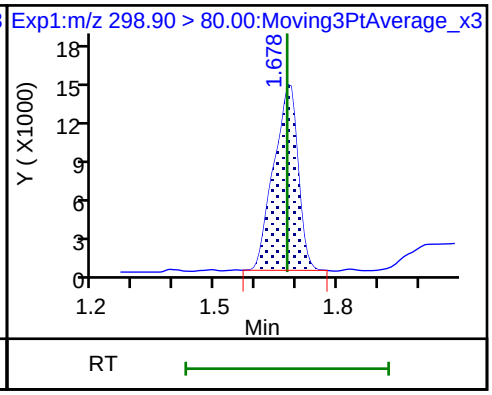
4 Perfluoropentanoic acid



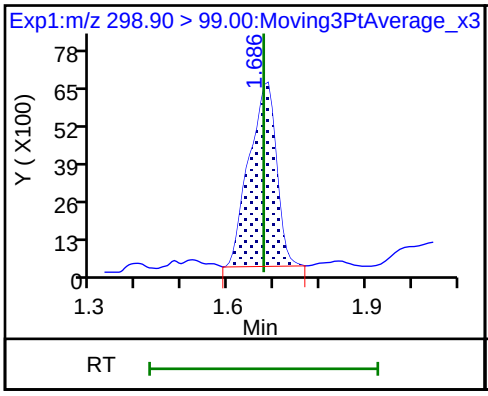
D 47 13C3-PFBS



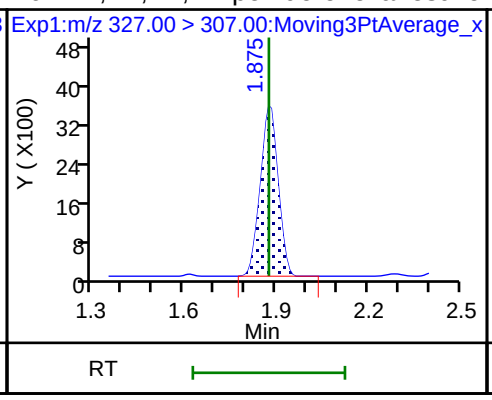
5 Perfluorobutanesulfonic acid



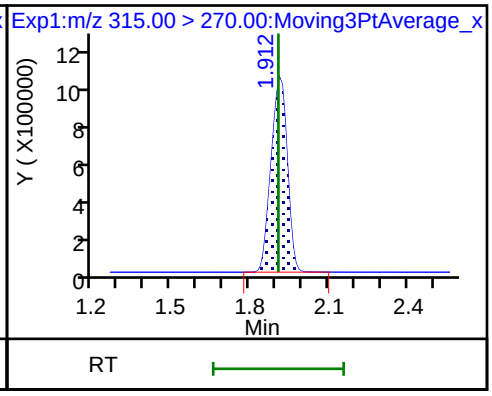
5 Perfluorobutanesulfonic acid



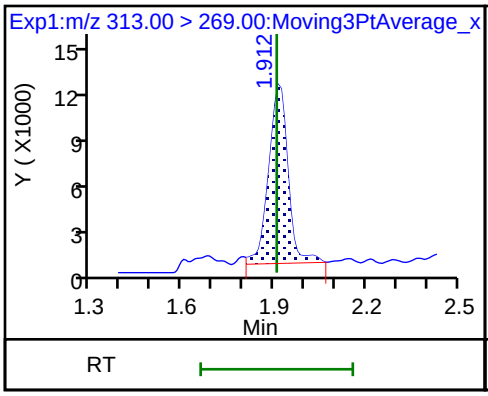
61 1H,1H,2H,2H-perfluorohexanesulfon



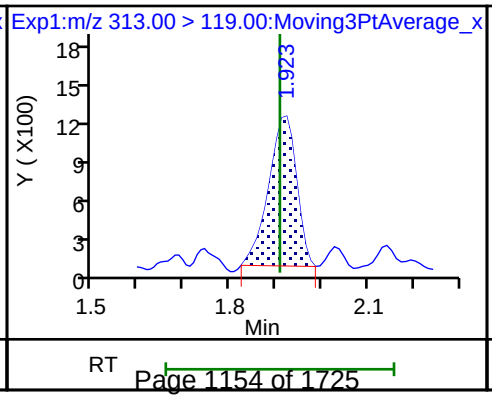
D 7 13C2 PFHxA



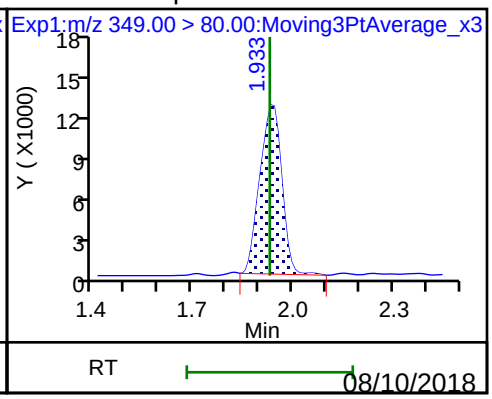
6 Perfluorohexanoic acid



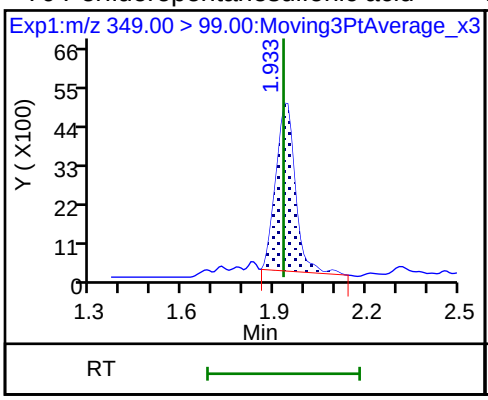
6 Perfluorohexanoic acid



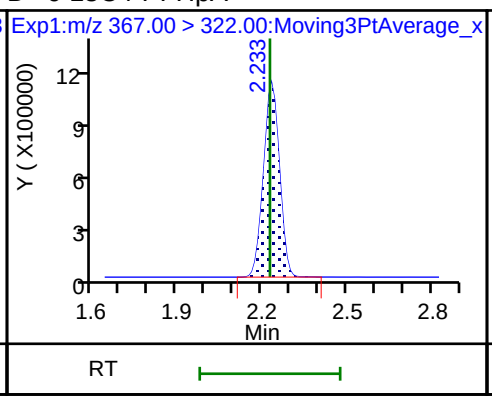
70 Perfluoropentanesulfonic acid



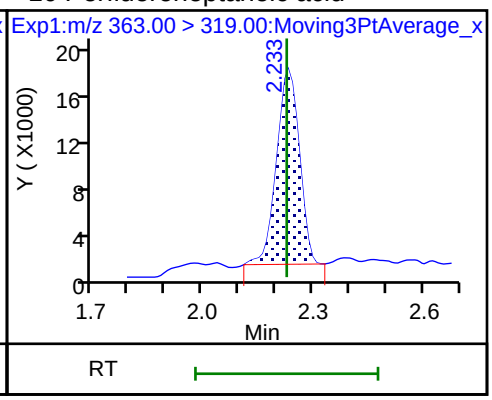
70 Perfluoropentanesulfonic acid



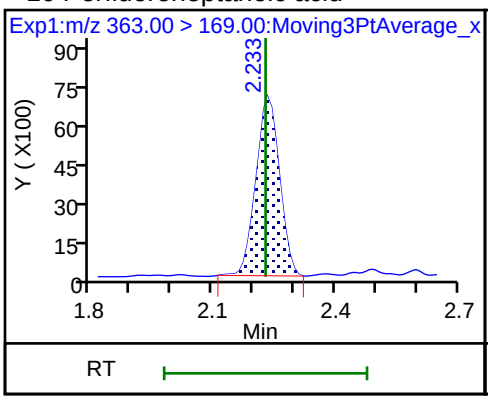
D 9 13C4-PFHpA



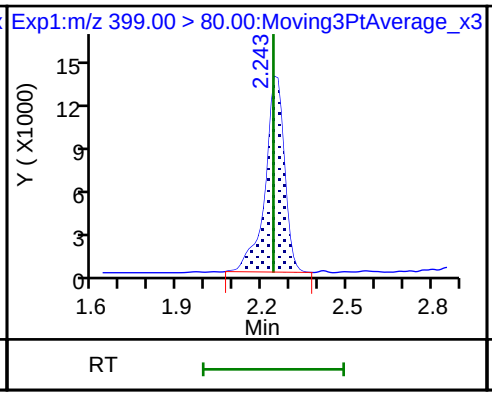
10 Perfluoroheptanoic acid



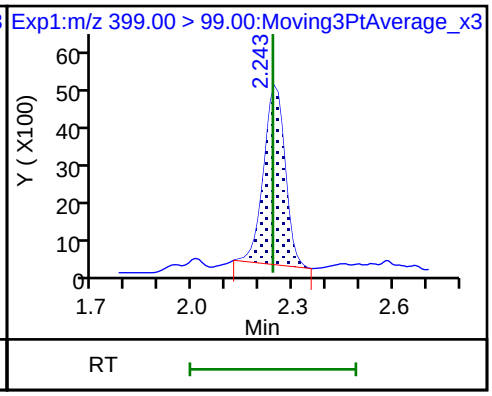
10 Perfluoroheptanoic acid



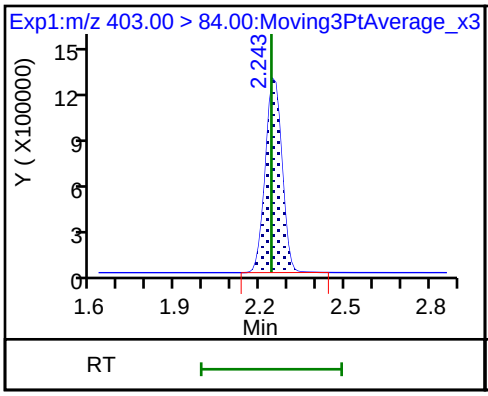
8 Perfluorohexanesulfonic acid



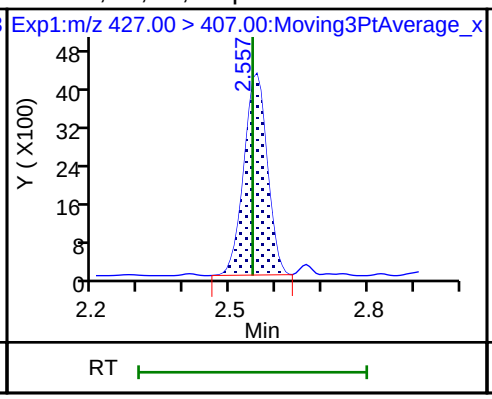
8 Perfluorohexanesulfonic acid



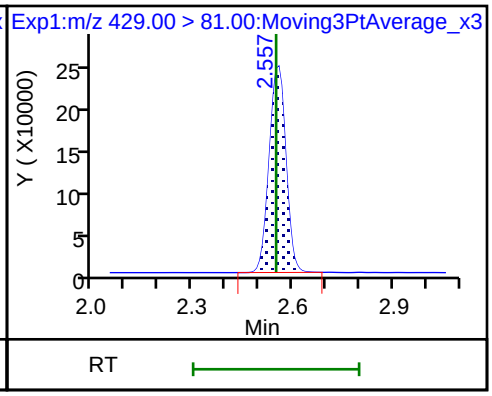
D 11 18O2 PFHxS



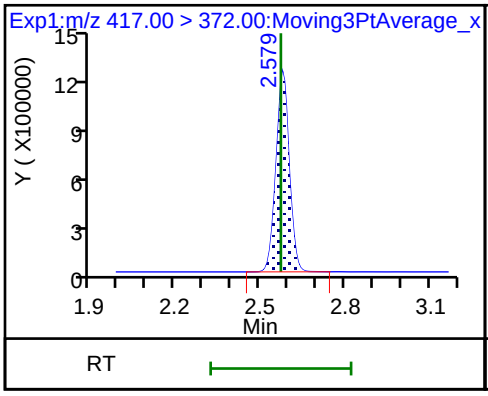
13 1H,1H,2H,2H-perfluorooctanesulfon



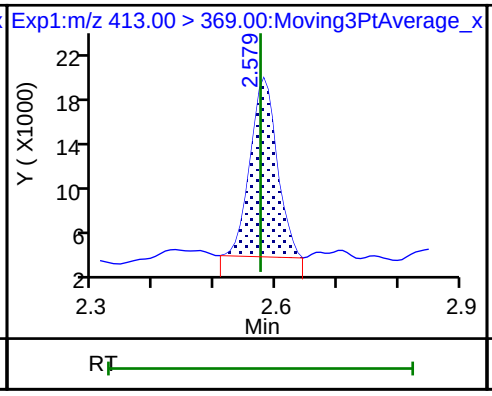
D 12 M2-6:2FTS



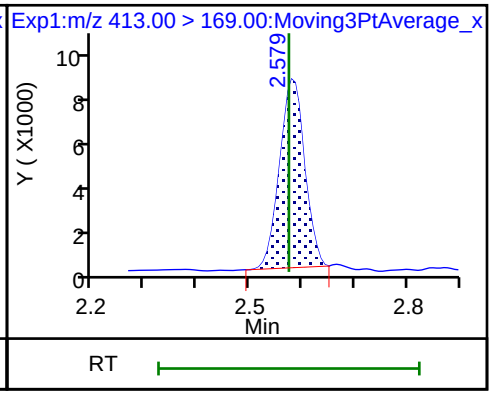
D 14 13C4 PFOA



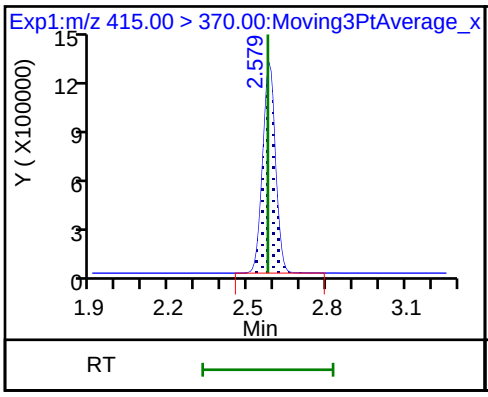
15 Perfluorooctanoic acid



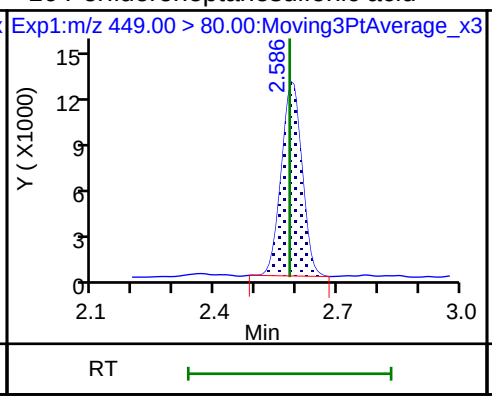
15 Perfluorooctanoic acid



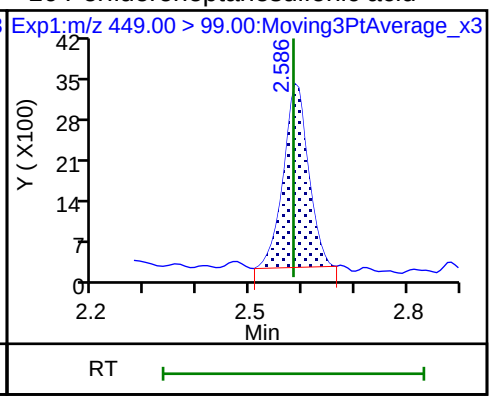
* 62 13C2-PFOA



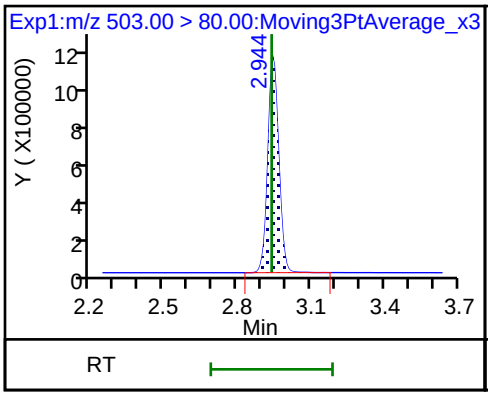
16 Perfluoroheptanesulfonic acid



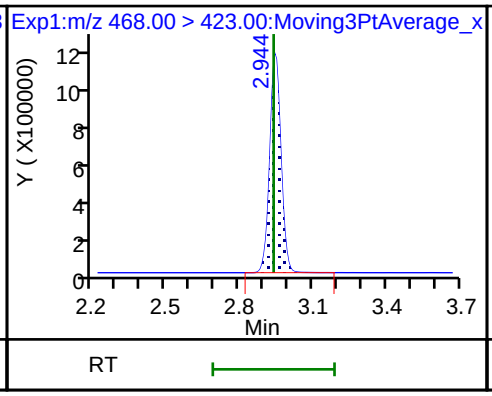
16 Perfluoroheptanesulfonic acid



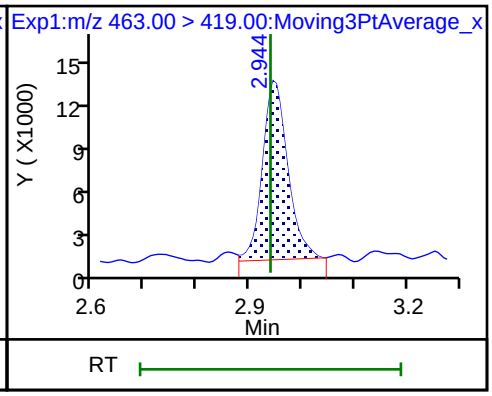
D 18 13C4 PFOS



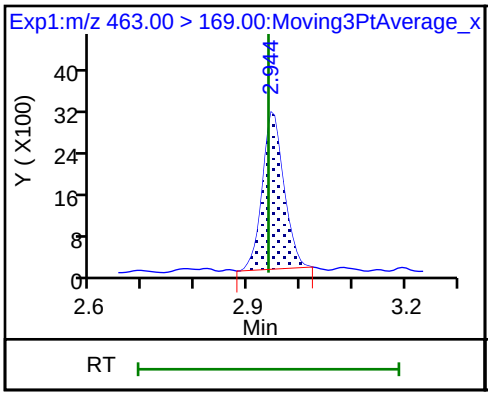
D 19 13C5 PFNA



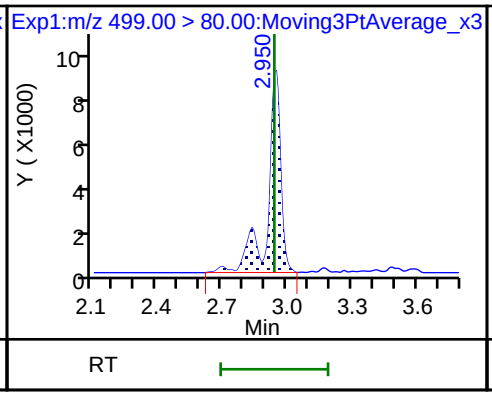
20 Perfluorononanoic acid



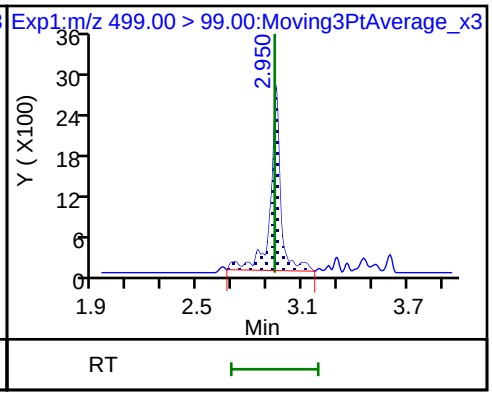
20 Perfluorononanoic acid



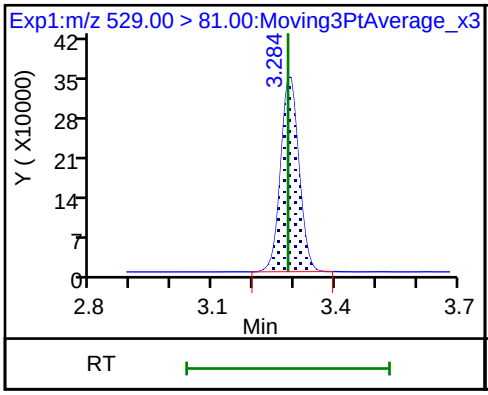
17 Perfluorooctane sulfonic acid



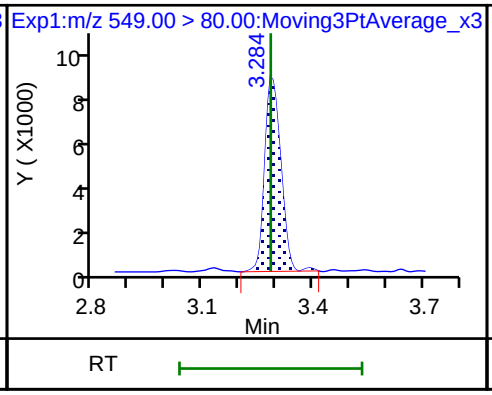
17 Perfluorooctane sulfonic acid



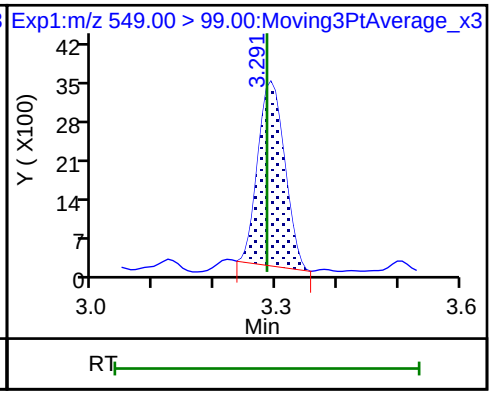
D 26 M2-8:2FTS



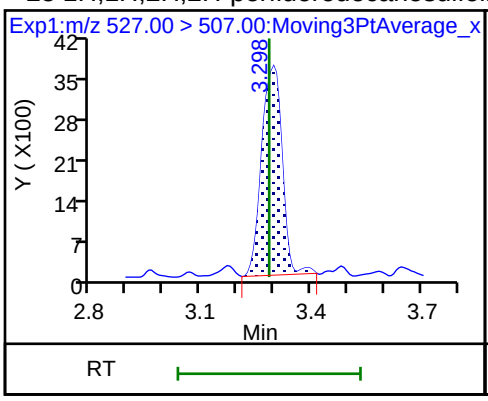
68 Perfluorononanesulfonic acid



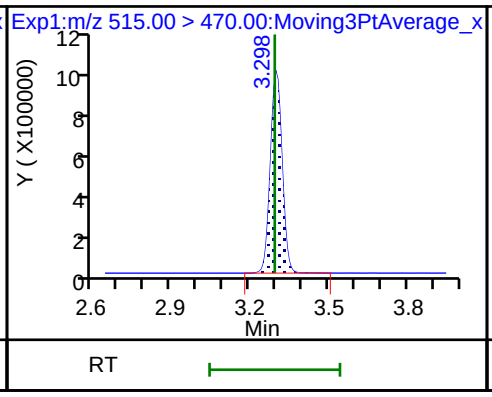
68 Perfluorononanesulfonic acid



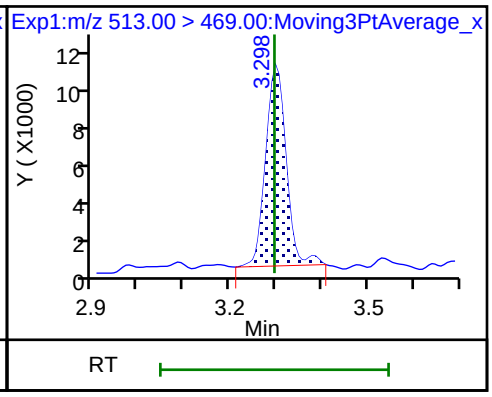
25 1H,1H,2H,2H-perfluorodecanesulfon



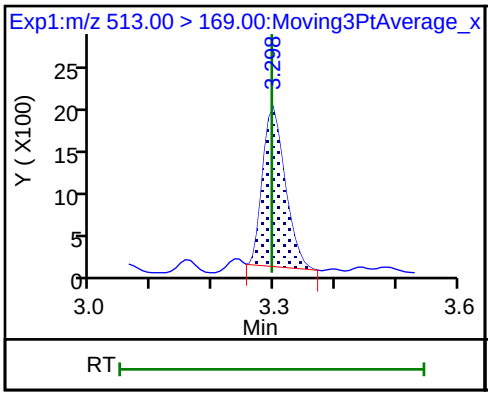
D 23 13C2 PFDA



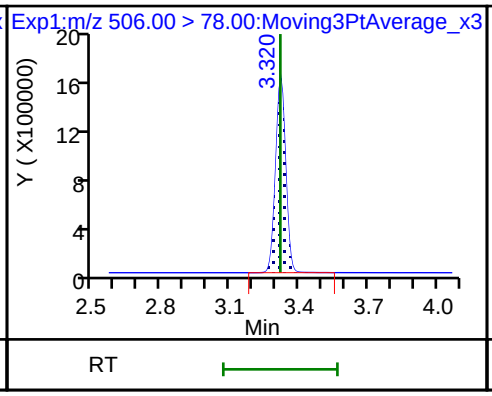
24 Perfluorodecanoic acid



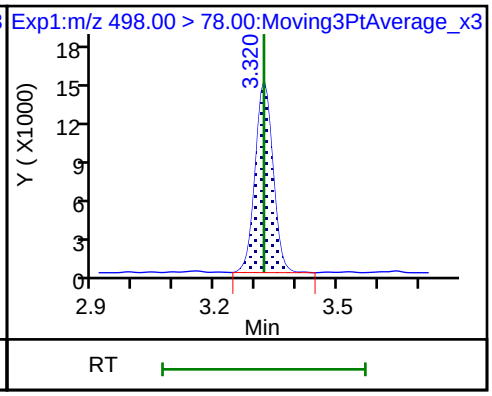
24 Perfluorodecanoic acid



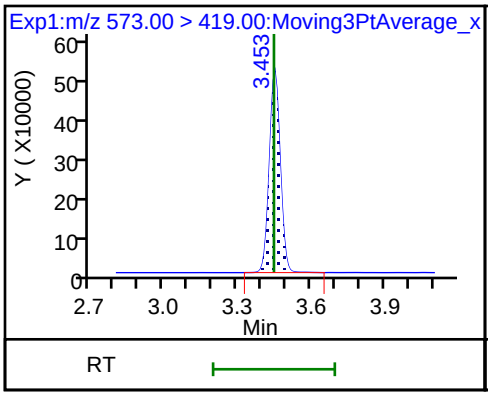
D 21 13C8 FOSA



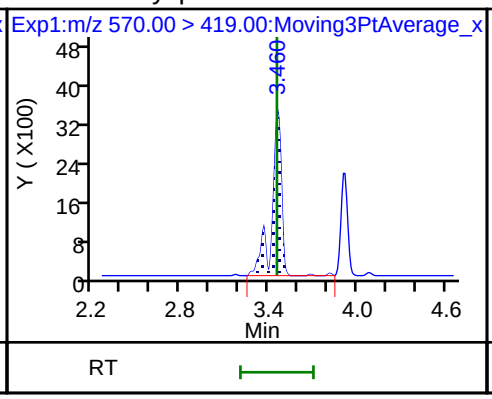
22 Perfluorooctane Sulfonamide



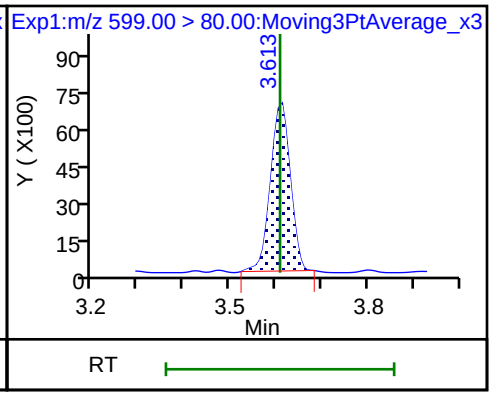
D 27 d3-NMeFOSAA



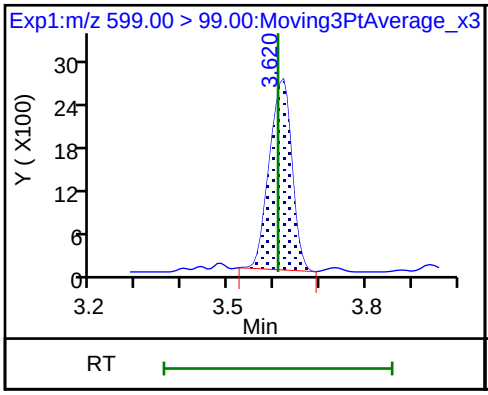
28 N-methyl perfluorooctane sulfonami



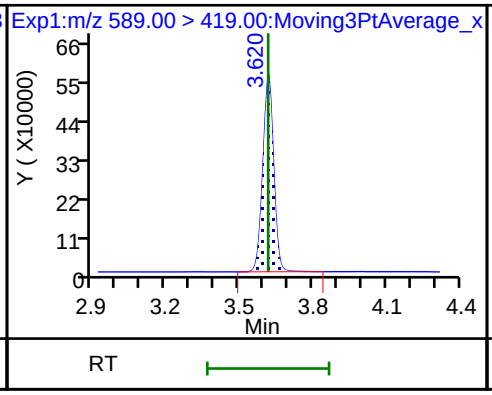
29 Perfluorodecane Sulfonic acid



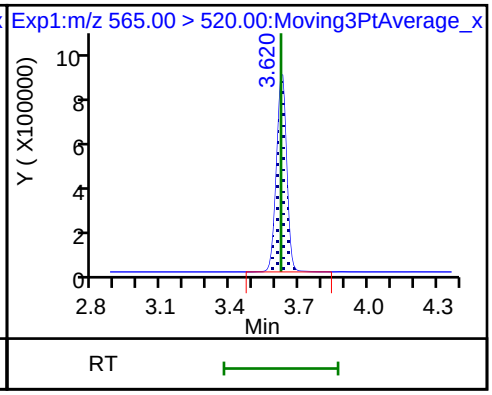
29 Perfluorodecane Sulfonic acid



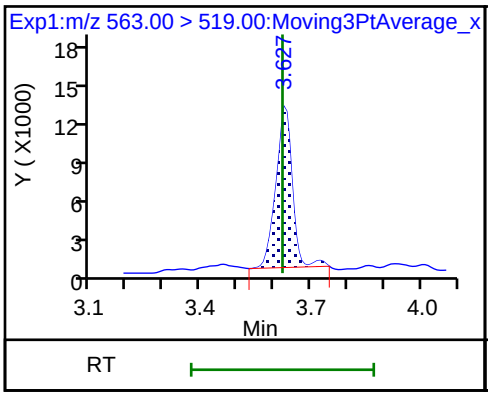
D 32 d5-NEtFOSAA



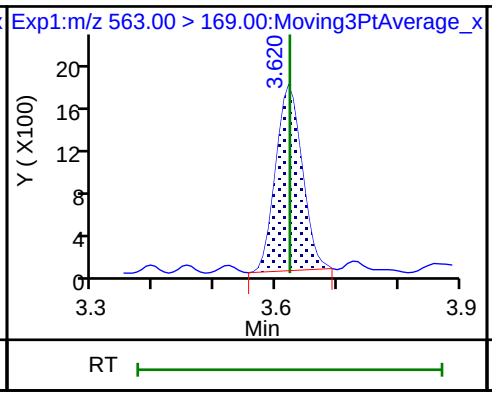
D 30 13C2 PFUnA



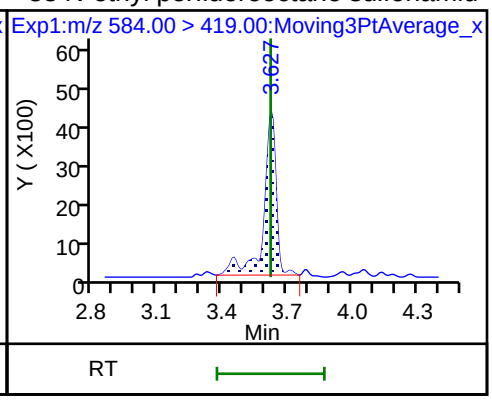
31 Perfluoroundecanoic acid



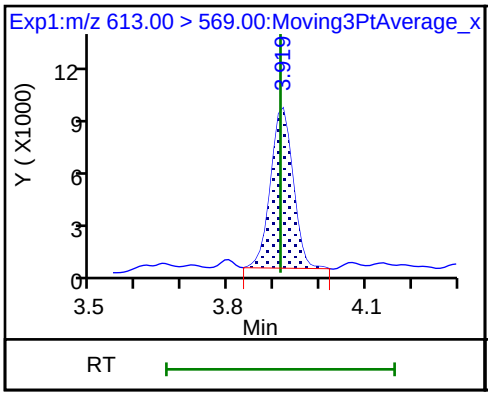
31 Perfluoroundecanoic acid



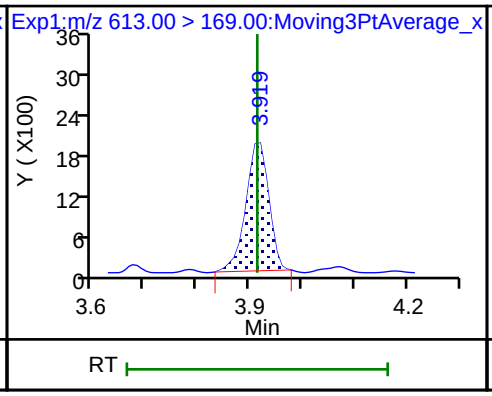
33 N-ethyl perfluorooctane sulfonamid



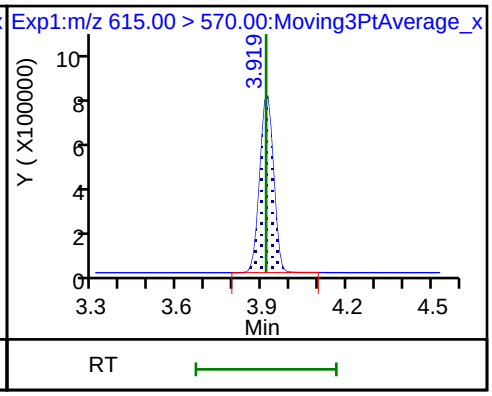
37 Perfluorododecanoic acid



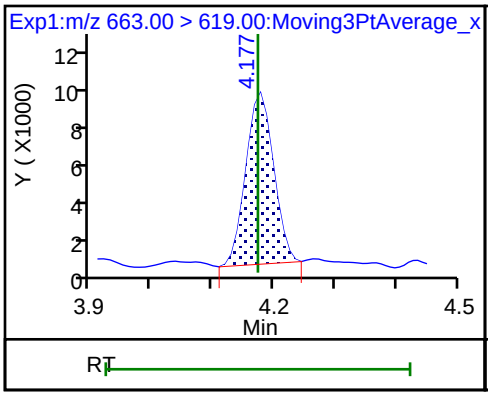
37 Perfluorododecanoic acid



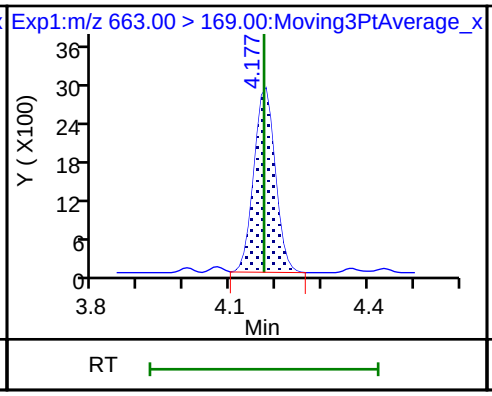
D 36 13C2 PFDoA



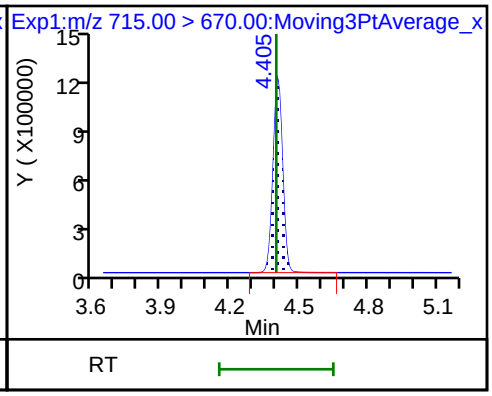
41 Perfluorotridecanoic acid



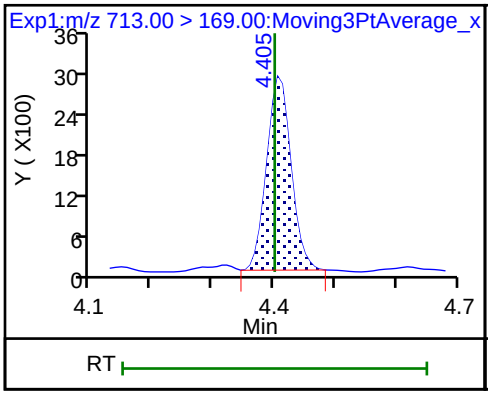
41 Perfluorotridecanoic acid



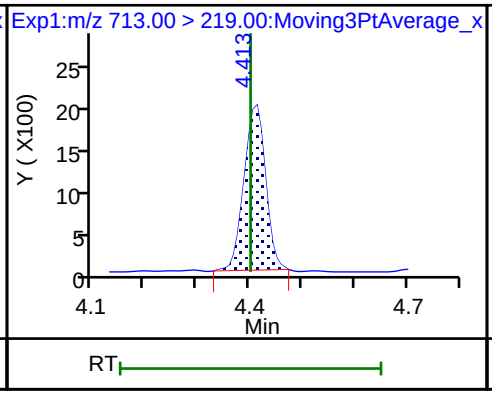
D 43 13C2-PFTeDA



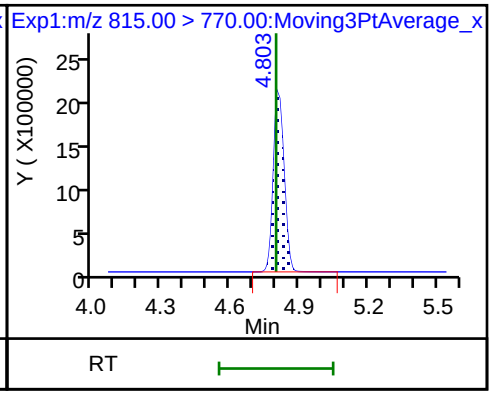
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 06-Aug-2018 11:17:57 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:16:59 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:29:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.394	1.395	-0.001	0.541	5520570	2.44		97.8	9922	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.394	1.397	-0.003	1.000	100389	0.0484		96.8	10.2	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.644	1.639	0.005	0.638	3878229	2.49		99.8	8401	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.644	1.643	0.001	1.000	83129	0.0471		94.2	5.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.651	83639	2.33		100	351	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.676	0.0	1.000	114549	0.0419		94.8	51.2	
298.90 > 99.00	1.676	1.676	0.0	1.000	46700		2.45(1.25-3.74)	94.8	30.6	
D 60 M2-4:2FTS										
329.00 > 81.00	1.880	1.875	0.005	0.730	589543	NC			1139	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.880	1.875	0.005	1.122	26792	0.0449		96.2	390	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	86871	0.0482		96.4	22.2	
313.00 > 119.00	1.898	1.908	-0.010	0.995	8895		9.77(5.03-15.10)	96.4	23.2	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.741	4415087	2.50		100	10413	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.930	-0.002	1.151	118353	0.0477		102	348	
349.00 > 99.00	1.939	1.930	0.009	1.157	42210		2.80(1.36-4.07)	102	57.1	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.777	334230	NC			816	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.001	2.003	-0.002	1.000	15610	NC			6.2	
D 9 13C4-PFHpA										
367.00 > 322.00	2.227	2.227	0.0	0.865	4381099	2.52		101	6167	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.000	92858	0.0499		99.8	18.9	
363.00 > 169.00	2.227	2.228	-0.001	1.000	37320		2.49(1.13-3.40)	99.8	83.7	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.869	5400125	2.43		103	4645	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	122877	0.0496		109	251	
399.00 > 99.00	2.236	2.239	-0.003	1.000	41779		2.94(1.50-4.49)	109	38.1	
65 ADONA										
377.00 > 251.00	2.269	2.271	-0.002	0.772	237055	NC			440	
377.00 > 85.00	2.269	2.271	-0.002	0.772	142844		1.66(0.84-2.53)		244	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.548	-0.004	0.997	26890	0.0474		100	38.6	
D 12 M2-6:2FTS										
429.00 > 81.00	2.553	2.549	0.004	0.991	855666	2.34		98.6	2444	
D 73 13C8 PFOA										
421.00 > 376.00	2.568	2.571	-0.003	0.997	7724966	NC			14507	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.573	0.001	1.000	3900845	2.45		97.9	7238	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.000	100379	0.0569		114	9.5	
413.00 > 169.00	2.574	2.574	0.0	1.000	49130		2.04(0.84-2.52)	114	101	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		4076020	2.50			7362	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.878	85012	0.0478		100	401	
449.00 > 99.00	2.581	2.583	-0.002	0.878	21336		3.98(1.94-5.82)	100	49.1	
D 72 13C8 PFOS										
507.00 > 99.00	2.933	2.938	-0.005	1.139	1726052	NC			3374	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.939	0.0	1.000	76644	0.0510		102	24.0	
463.00 > 169.00	2.933	2.939	-0.006	0.998	17838		4.30(1.90-5.69)	102	95.9	
D 19 13C5 PFNA										
468.00 > 423.00	2.939	2.939	0.0	1.141	3565521	2.49		99.7	4849	
D 18 13C4 PFOS										
503.00 > 80.00	2.939	2.939	0.0	1.141	3430647	2.34		98.1	4945	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.000	71970	0.0467		101	155	
499.00 > 99.00	2.939	2.940	-0.001	1.000	19079		3.77(2.31-6.93)	101	32.7	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.147	3.150	-0.003	1.071	113277	NC			601	
D 26 M2-8:2FTS										
529.00 > 81.00	3.285	3.284	0.001	1.276	1065531	2.41		101	3535	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.285	3.285	0.001	1.118	52199	0.0483		101	318	
549.00 > 99.00	3.285	3.285	0.001	1.118	19699		2.65(1.33-3.97)	101	87.3	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.285	3.286	-0.001	1.000	30677	0.0531		111	130	
D 23 13C2 PFDA										
515.00 > 470.00	3.292	3.294	-0.002	1.279	3067735	2.45		97.8	7563	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.296	0.003	1.002	61353	0.0498		99.7	43.1	
513.00 > 169.00	3.299	3.296	0.003	1.002	12066		5.08(2.36-7.09)	99.7	64.7	
D 21 13C8 FOSA										
506.00 > 78.00	3.313	3.317	-0.004	1.287	4875140	2.52		101	5256	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.002	95215	0.0501		100	663	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.339	1580220	2.46		98.5	3859	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.453	0.001	1.002	31870	0.0523		105	38.4	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.606	3.608	-0.002	1.227	45962	0.0507		105	238	
599.00 > 99.00	3.606	3.608	-0.002	1.227	14657		3.14(1.39-4.16)	105	83.7	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.615	3.616	-0.001	1.404	1684036	2.53		101	1215	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.407	2456263	2.43		97.4	5363	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	60636	0.0549		110	38.2	
563.00 > 169.00	3.629	3.622	0.007	1.002	11793		5.14(2.12-6.36)	110	69.7	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.622	3.623	-0.001	1.002	31965	0.0532		106	133	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.785	3.781	0.004	1.288	186244	NC			799	
35 MeFOSA										
512.00 > 169.00	3.826	3.826	0.0		27155	NC			156	
D 36 13C2 PFDoA										
615.00 > 570.00	3.913	3.913	0.0	1.520	2599869	2.44		97.5	4097	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.191	18880	NC			179	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	61213	0.0529		106	37.0	
613.00 > 169.00	3.913	3.913	0.0	1.000	13716		4.46(2.13-6.40)	106	77.9	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.153	4.148	0.005	1.413	18872	NC			117	
699.00 > 99.00	4.153	4.148	0.005	1.413	25750		0.73(0.00-0.00)		251	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.173	4.173	0.0	1.066	57183	0.0511		102	26.7	
663.00 > 169.00	4.173	4.173	0.0	1.066	17627		3.24(1.25-3.76)	102	142	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.403	4.399	0.004	1.710	3344339	2.46		98.4	7399	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.403	4.400	0.003	1.000	17056	0.0527		105	165	
713.00 > 219.00	4.403	4.400	0.003	1.000	14716		1.16(0.71-2.13)	105	310	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.801	4.799	0.002	1.865	6852227	2.54		102	6967	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.801	4.801	0.0	1.000	174341	NC			76.1	
813.00 > 169.00	4.801	4.801	0.0	1.000	29566		5.90(2.86-8.58)		282	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.136	5.136	0.0	1.070	124240	NC			40.2	
913.00 > 169.00	5.136	5.136	0.0	1.070	15061		8.25(3.83-11.48)		225	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_003.d

Injection Date: 06-Aug-2018 11:17:57 Instrument ID: A8_N

Lims ID: IC L2 Full

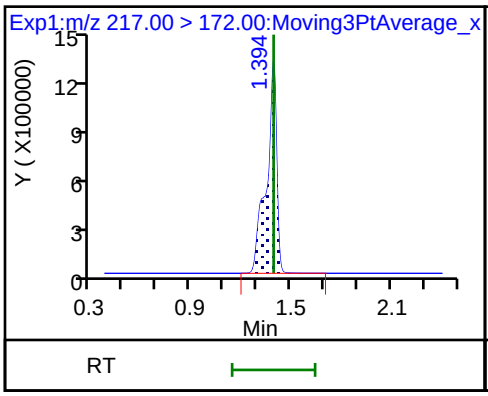
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 11 Worklist Smp#: 3

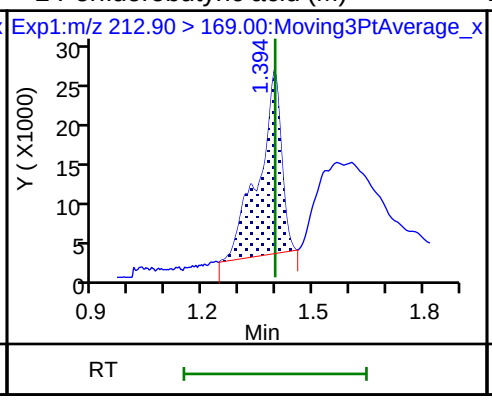
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

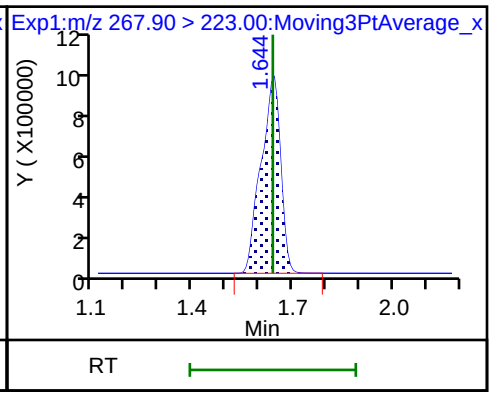
D 1 13C4 PFBA



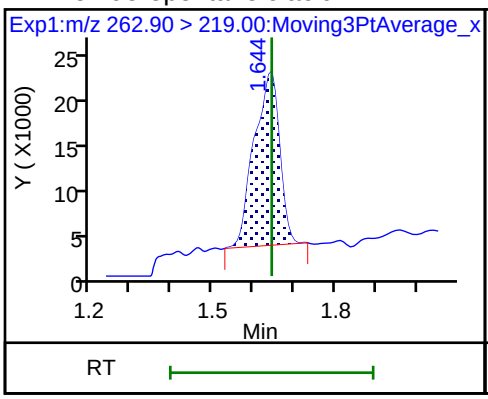
2 Perfluorobutyric acid (M)



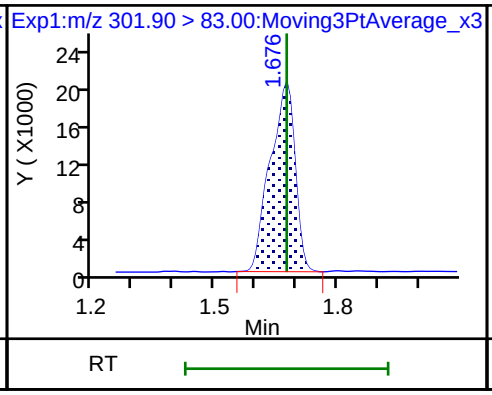
D 3 13C5-PFPeA



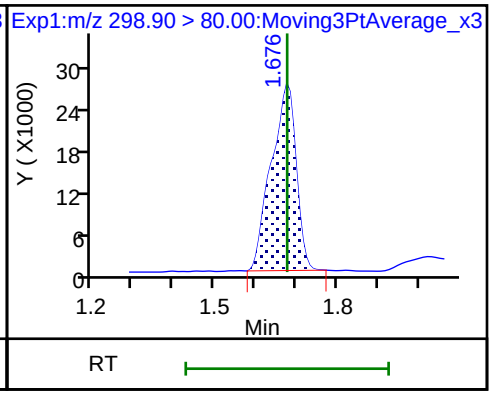
4 Perfluoropentanoic acid



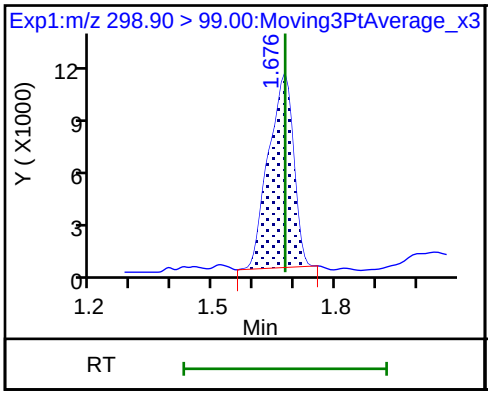
D 47 13C3-PFBS



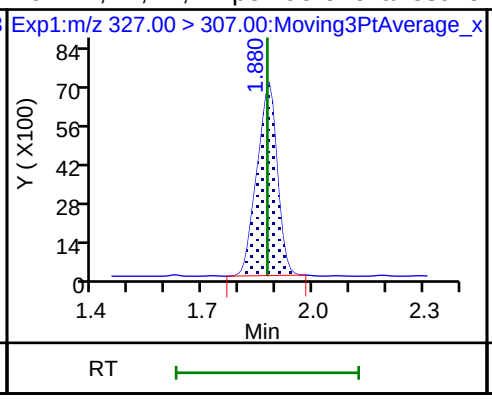
5 Perfluorobutanesulfonic acid



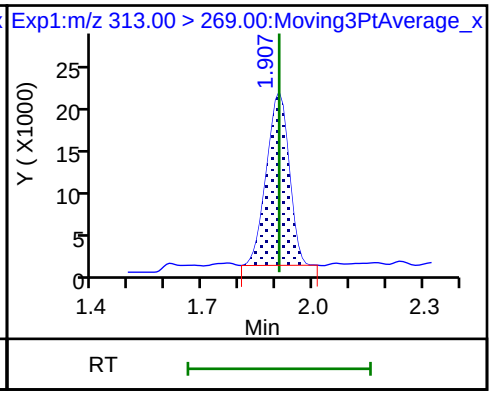
5 Perfluorobutanesulfonic acid



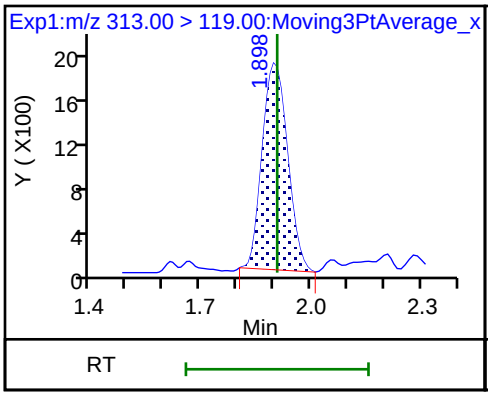
61 1H,1H,2H,2H-perfluorohexanesulfoni



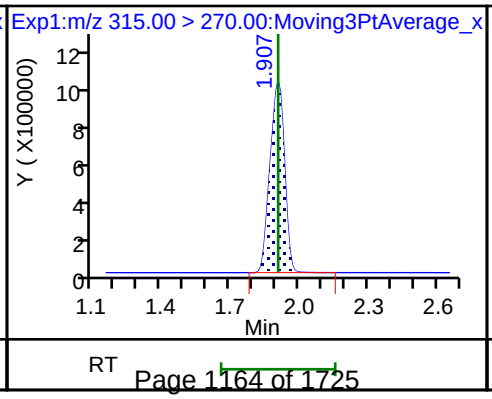
6 Perfluorohexanoic acid



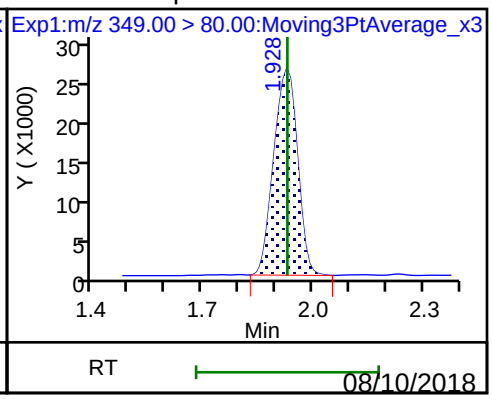
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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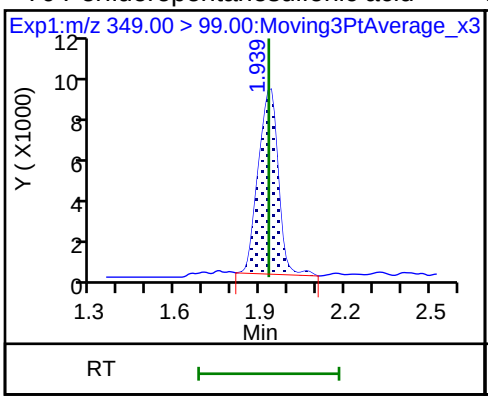
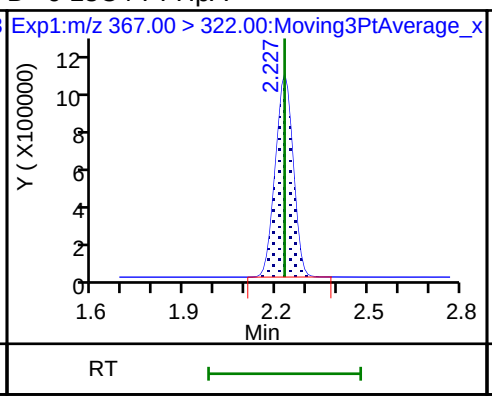
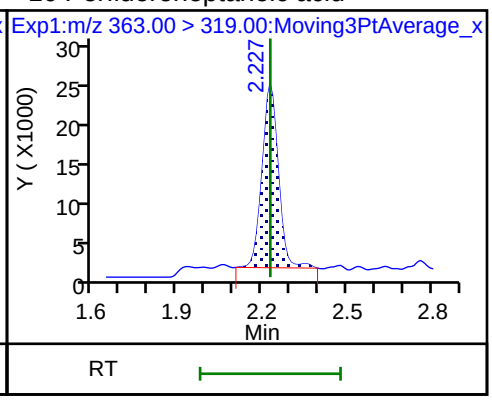


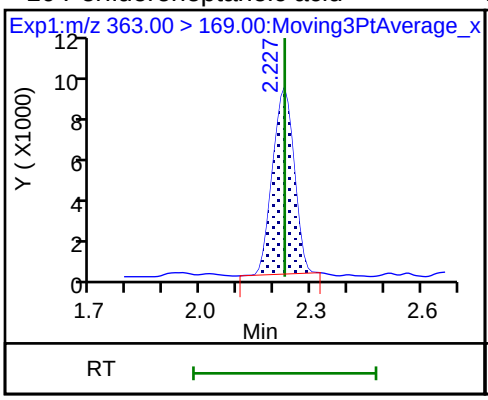
D 9 13C4-PFHpA



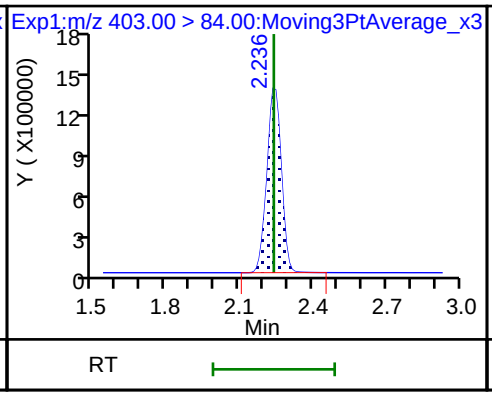
10 Perfluoroheptanoic acid



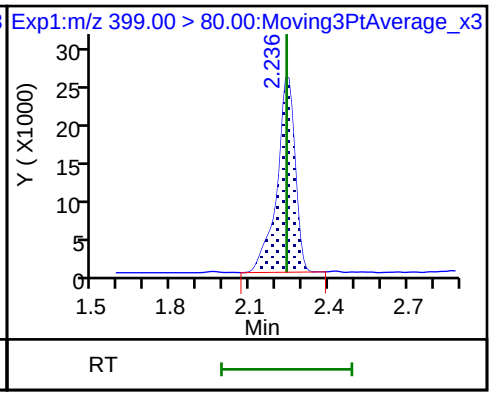
10 Perfluoroheptanoic acid



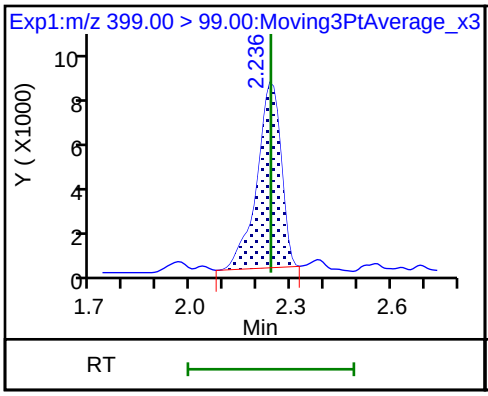
D 11 18O2 PFHxS



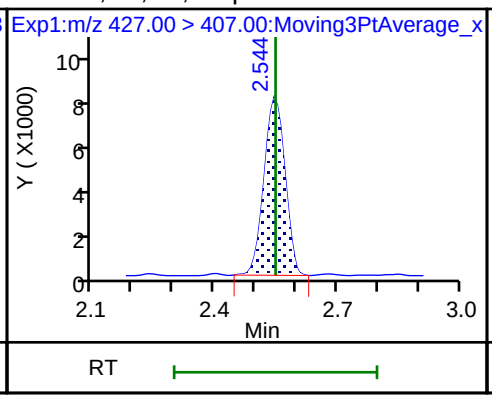
8 Perfluorohexanesulfonic acid



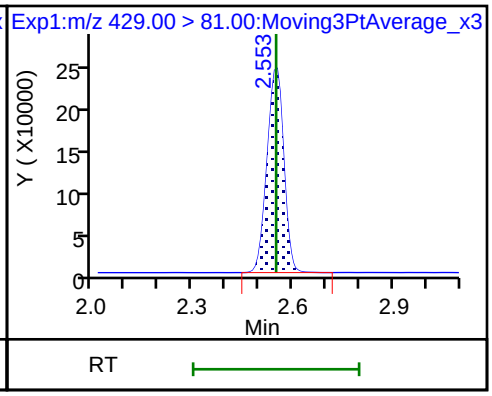
8 Perfluorohexanesulfonic acid



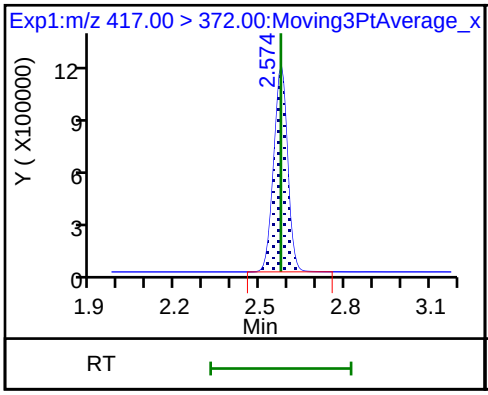
13 1H,1H,2H,2H-perfluorooctanesulfon



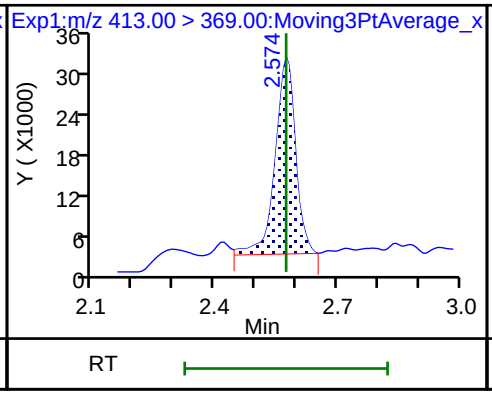
D 12 M2-6:2FTS



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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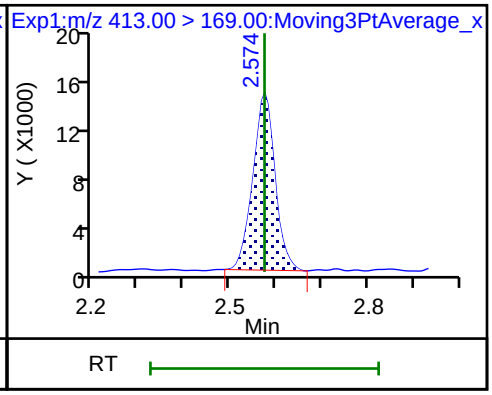
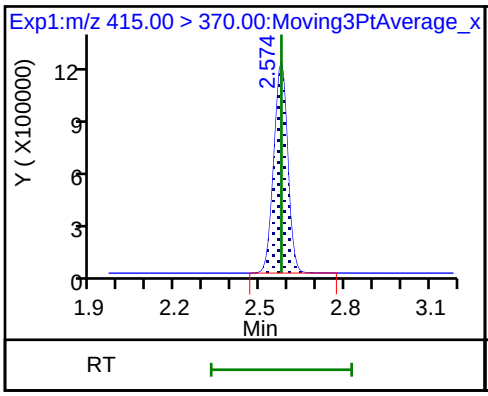
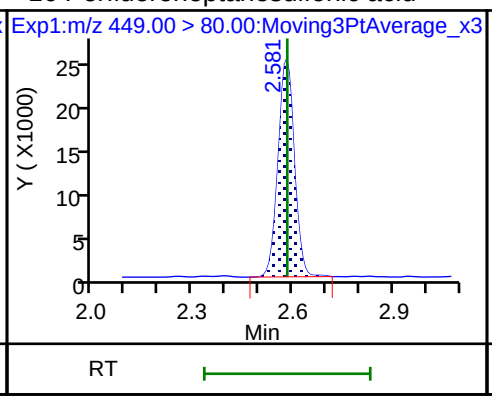


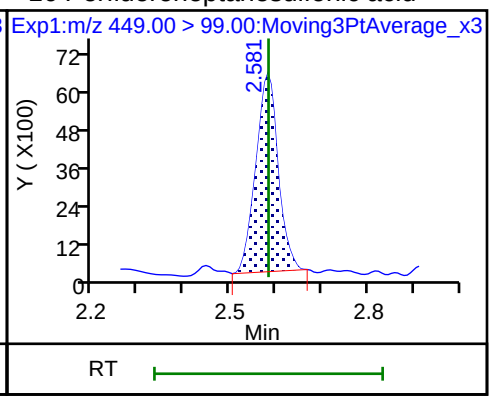
* 62 13C2-PFOA



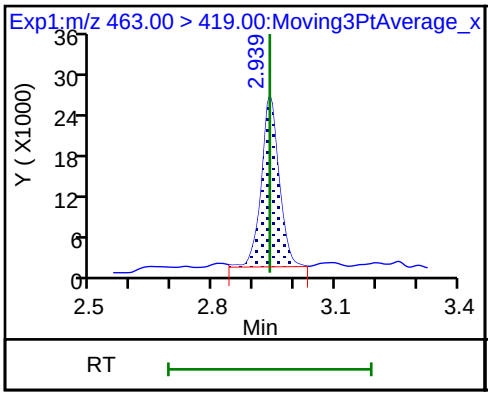
16 Perfluoroheptanesulfonic acid



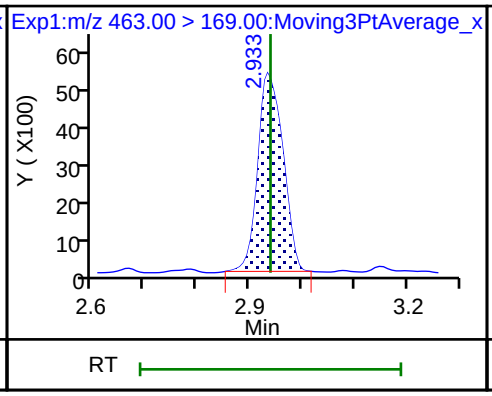
16 Perfluoroheptanesulfonic acid



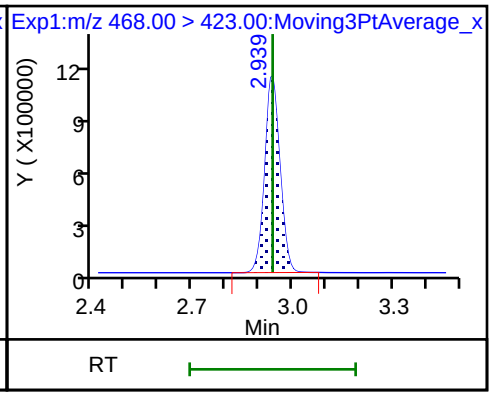
20 Perfluorononanoic acid



20 Perfluorononanoic acid



D 19 13C5 PFNA



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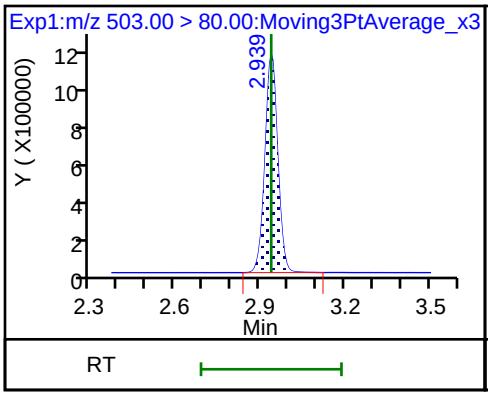
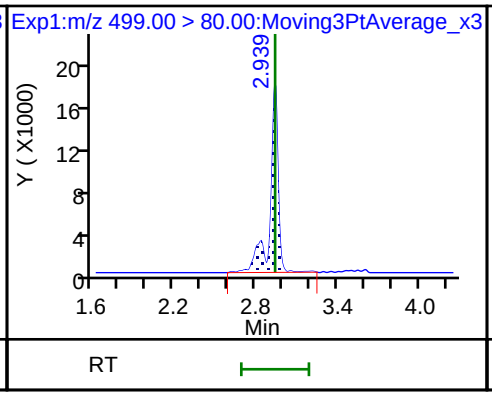
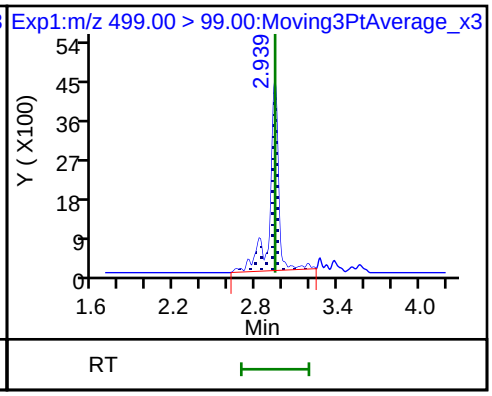


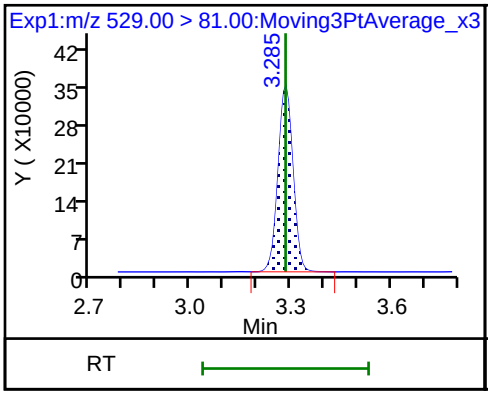
17 Perfluorooctane sulfonic acid



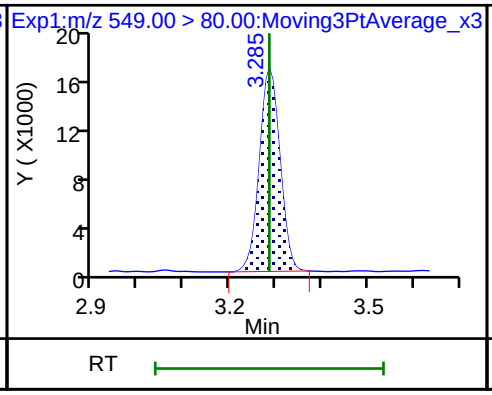
17 Perfluorooctane sulfonic acid



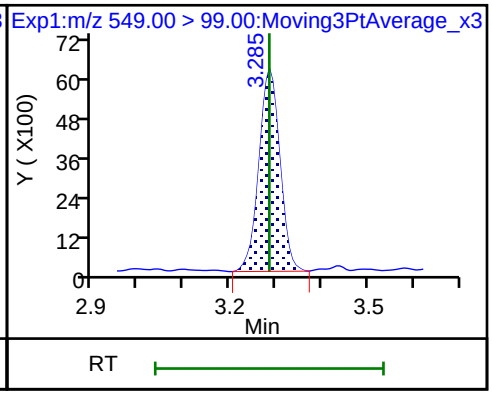
D 26 M2-8:2FTS



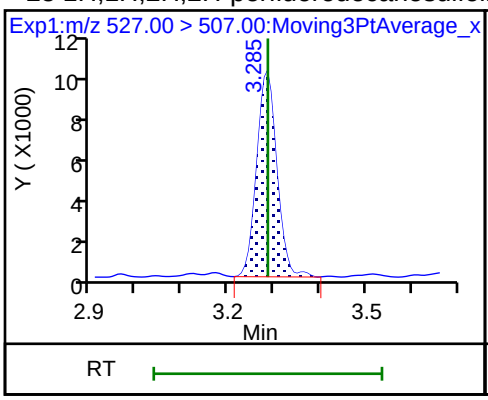
68 Perfluorononanesulfonic acid



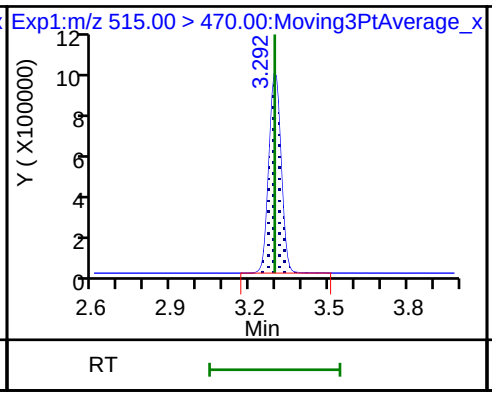
68 Perfluorononanesulfonic acid



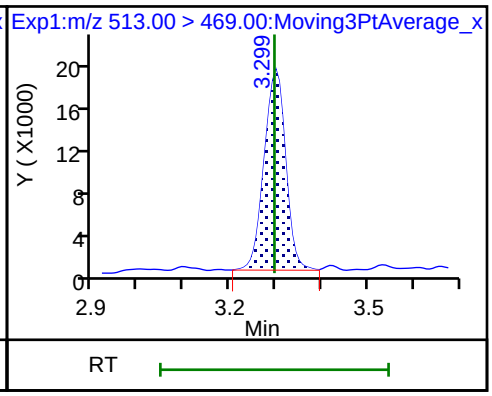
25 1H,1H,2H,2H-perfluorodecanesulfon



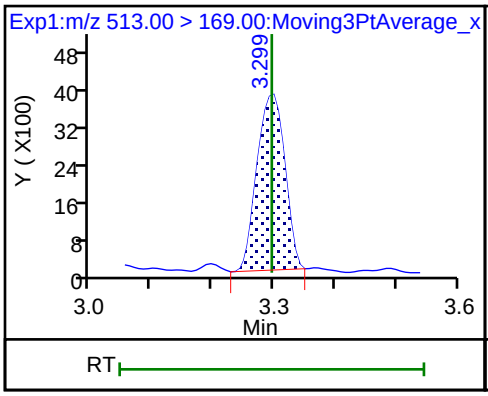
D 23 13C2 PFDA



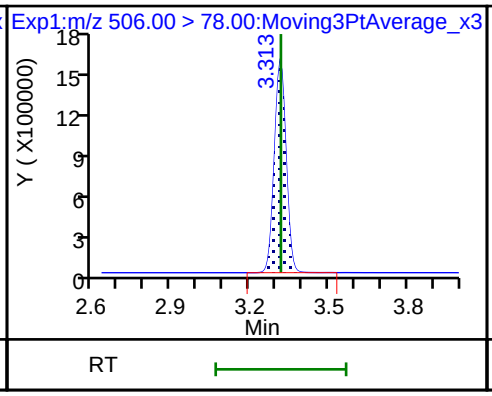
24 Perfluorodecanoic acid



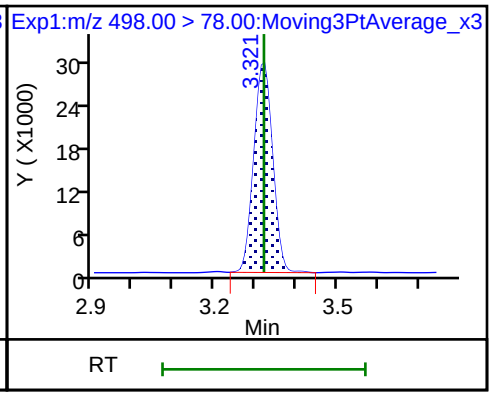
24 Perfluorodecanoic acid



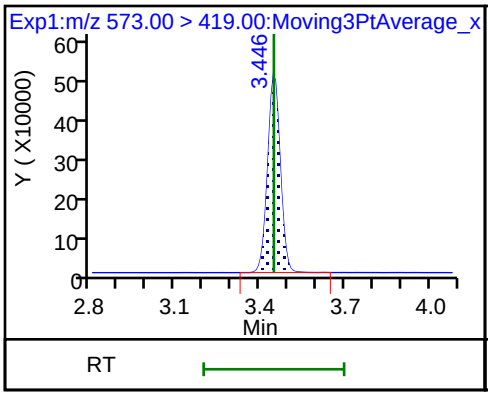
D 21 13C8 FOSA



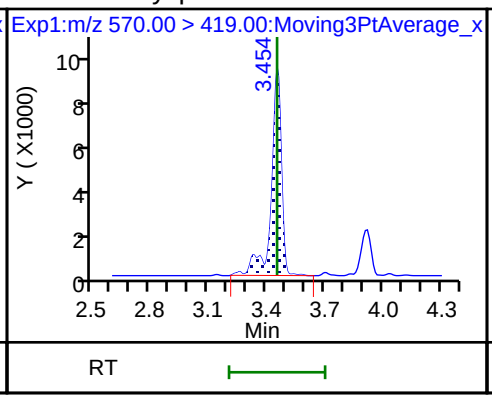
22 Perfluorooctane Sulfonamide



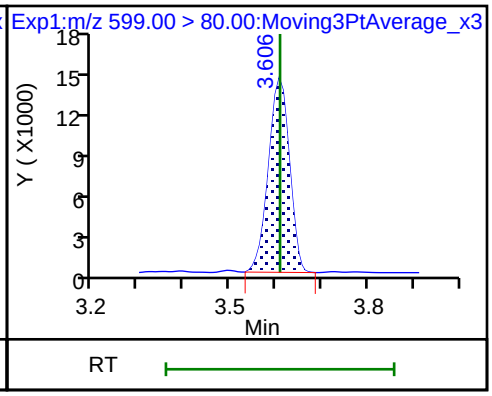
D 27 d3-NMeFOSAA



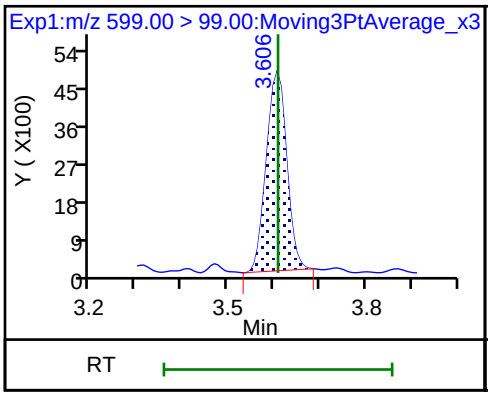
28 N-methyl perfluorooctane sulfonami



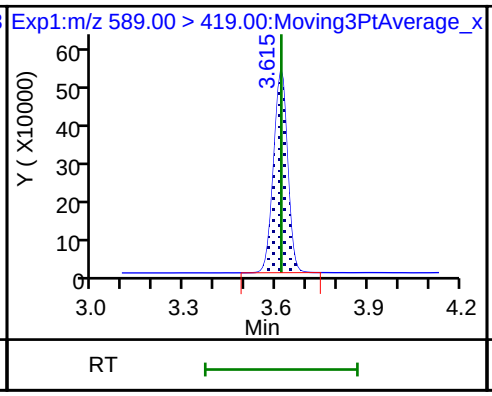
29 Perfluorodecane Sulfonic acid



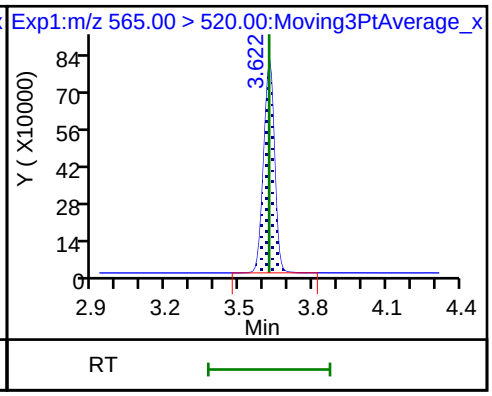
29 Perfluorodecane Sulfonic acid



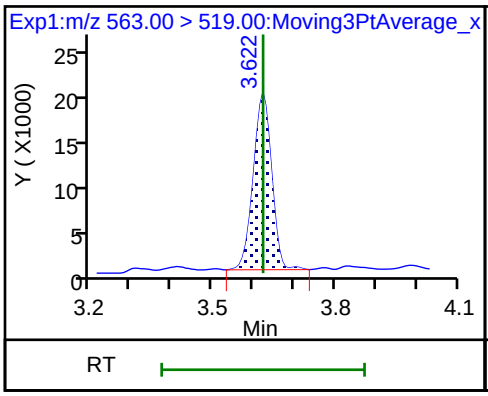
D 32 d5-NEtFOSAA



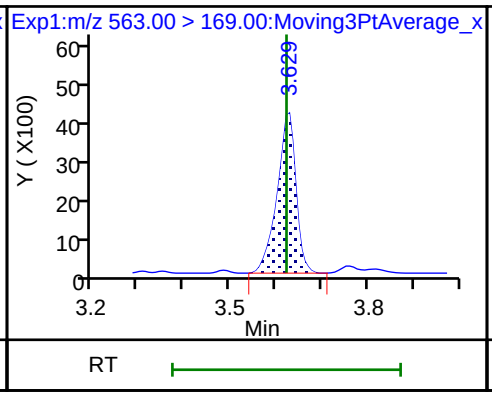
D 30 13C2 PFUnA



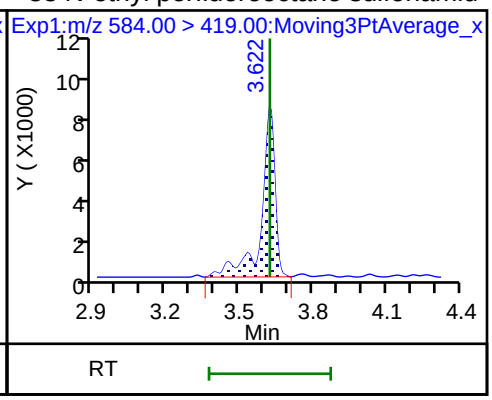
31 Perfluoroundecanoic acid



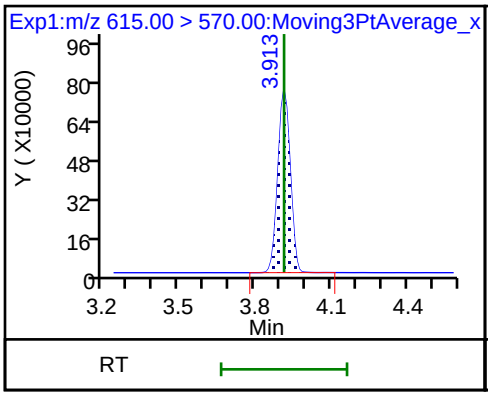
31 Perfluoroundecanoic acid



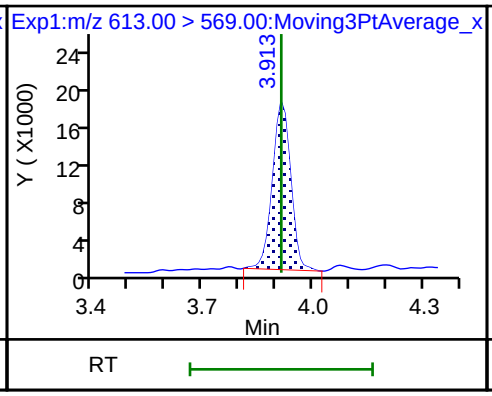
33 N-ethyl perfluorooctane sulfonamid



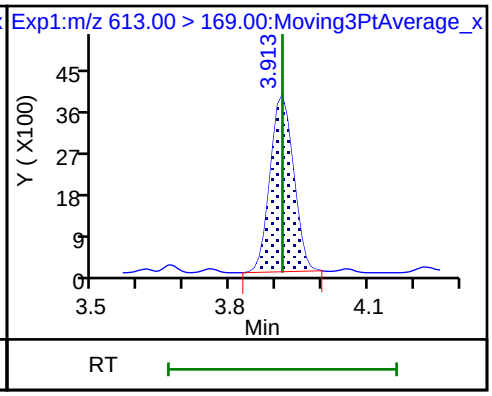
D 36 13C2 PFDoA



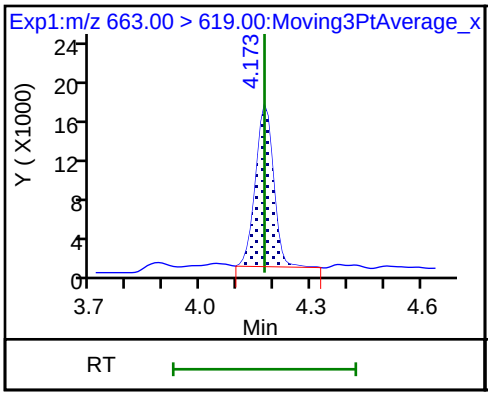
37 Perfluorododecanoic acid



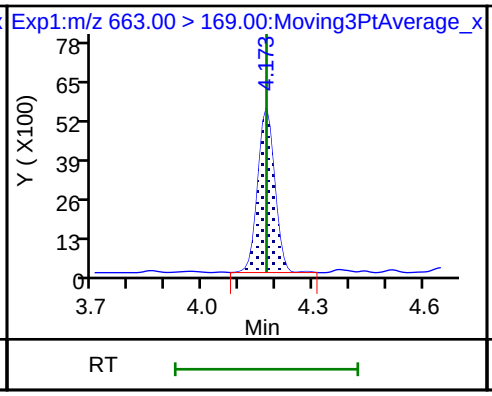
37 Perfluorododecanoic acid



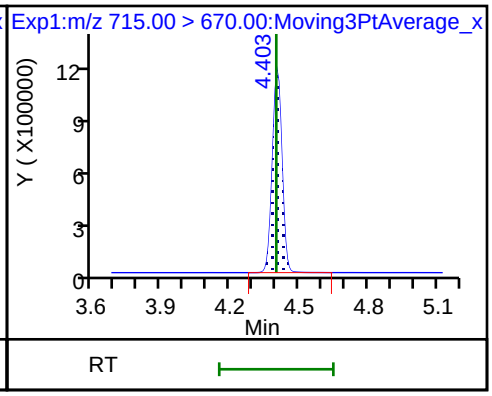
41 Perfluorotridecanoic acid



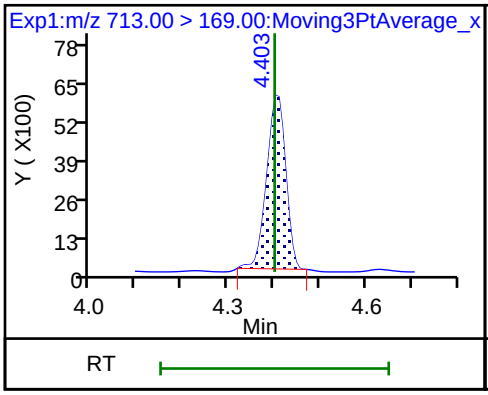
41 Perfluorotridecanoic acid



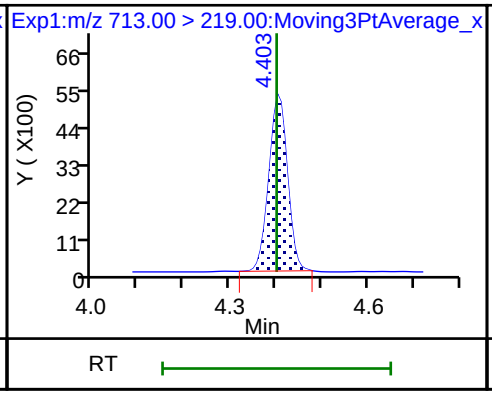
D 43 13C2-PFTeDA



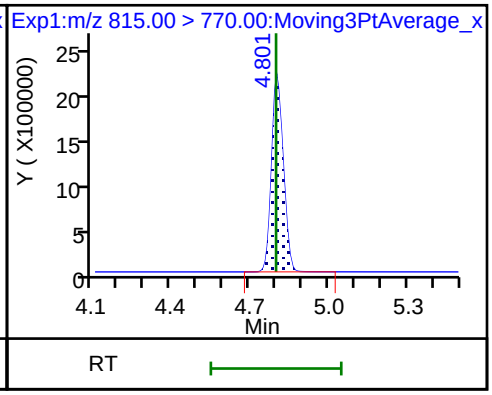
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

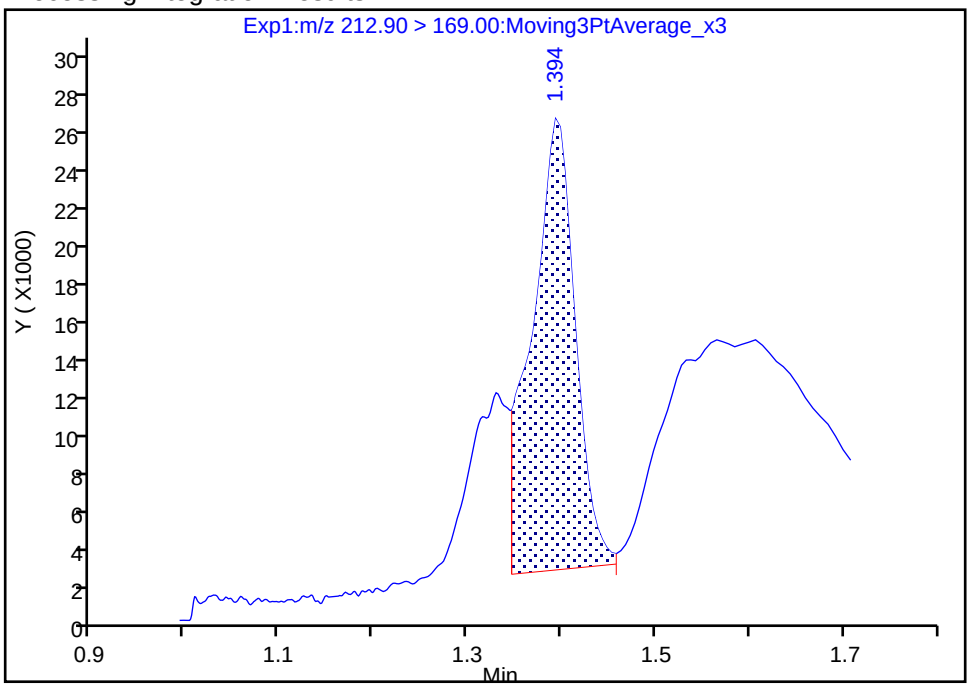
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_003.d				
Injection Date:	06-Aug-2018 11:17:57	Instrument ID:	A8_N		
Lims ID:	IC L2 Full				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	11	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

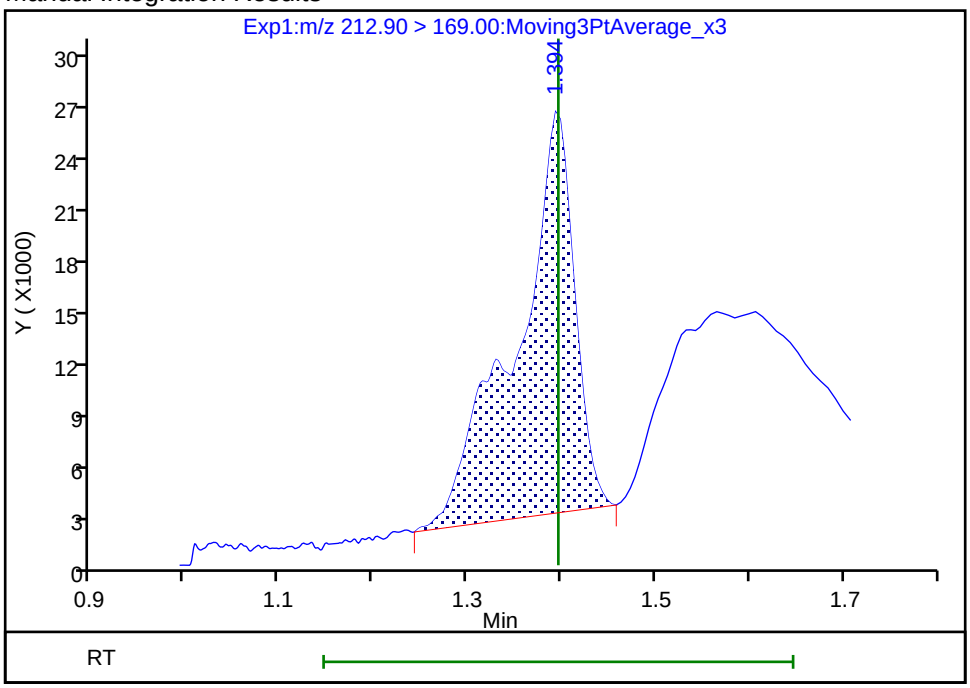
Processing Integration Results

RT:	1.39
Area:	75241
Amount:	0.037594
Amount Units:	ng/ml



Manual Integration Results

RT:	1.39
Area:	100389
Amount:	0.048421
Amount Units:	ng/ml



Reviewer: westendorfc, 06-Aug-2018 15:52:40

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 06-Aug-2018 11:25:44 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:17:05 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:28:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.395	0.001	0.541	5688815	2.47		98.7	8052	
2 Perfluorobutyric acid										
212.90 > 169.00	1.401	1.397	0.004	1.004	522272	0.2445		97.8	52.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.639	0.001	0.635	3918495	2.47		98.7	11150	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.643	0.004	1.005	421991	0.2366		94.7	28.3	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.675	0.004	0.651	85930	2.34		101	402	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.679	1.676	0.003	1.000	616670	0.2197		99.4	231	
298.90 > 99.00	1.679	1.676	0.003	1.000	251343		2.45(1.25-3.74)	99.4	142	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.885	1.875	0.010	1.122	141135	0.2305		98.7	1346	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.875	0.001	0.727	601195	NC			964	
D 7 13C2 PFHxA										
315.00 > 270.00	1.913	1.908	0.005	0.741	4437948	2.46		98.5	14259	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.913	1.908	0.005	1.000	428854	0.2367		94.7	119	
313.00 > 119.00	1.913	1.908	0.005	1.000	41462		10.34(5.03-15.10)	94.7	91.4	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.934	1.930	0.004	1.152	582073	0.2285		97.4	1268	
349.00 > 99.00	1.934	1.930	0.004	1.152	218098		2.67(1.36-4.07)	97.4	288	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.007	2.003	0.004	1.000	81354	NC			37.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.007	2.003	0.004	0.778	346469	NC			940	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.227	-0.002	0.862	4417214	2.49		99.7	7046	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.234	2.228	0.006	1.004	459833	0.2451		98.0	94.8	
363.00 > 169.00	2.225	2.228	-0.003	1.000	172415		2.67(1.13-3.40)	98.0	347	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.239	0.006	1.000	544267	0.2249		98.9	1144	
399.00 > 99.00	2.245	2.239	0.006	1.000	172368		3.16(1.50-4.49)	98.9	186	
D 11 18O2 PFHxS										
403.00 > 84.00	2.245	2.239	0.006	0.870	5279483	2.32		98.2	5983	
65 ADONA										
377.00 > 251.00	2.278	2.271	0.007	0.774	1256630	NC			3231	
377.00 > 85.00	2.278	2.271	0.007	0.774	754513		1.67(0.84-2.53)		1041	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.553	2.548	0.005	1.000	129666	0.2145		90.5	183	
D 12 M2-6:2FTS										
429.00 > 81.00	2.553	2.549	0.004	0.989	912690	2.45		103	2504	
D 73 13C8 PFOA										
421.00 > 376.00	2.575	2.571	0.004	0.997	7698803	NC			11913	
D 14 13C4 PFOA										
417.00 > 372.00	2.575	2.573	0.002	0.997	4104790	2.52		101	6871	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.575	2.574	0.001	1.000	451059	0.2430		97.1	42.9	
413.00 > 169.00	2.581	2.574	0.007	1.003	229069		1.97(0.84-2.52)	97.1	434	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.575	0.006		4161520	2.50			6277	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.583	0.005	0.879	425894	0.2283		95.9	1142	
449.00 > 99.00	2.588	2.583	0.005	0.879	119281		3.57(1.94-5.82)	95.9	308	
D 72 13C8 PFOS										
507.00 > 99.00	2.945	2.938	0.007	1.141	1729501	NC			4106	
D 18 13C4 PFOS										
503.00 > 80.00	2.945	2.939	0.006	1.141	3598367	2.41		101	4581	
D 19 13C5 PFNA										
468.00 > 423.00	2.945	2.939	0.006	1.141	3712571	2.54		102	9104	
20 Perfluorononanoic acid										
463.00 > 419.00	2.945	2.939	0.006	1.000	377996	0.2416		96.7	111	
463.00 > 169.00	2.945	2.939	0.006	1.000	90259		4.19(1.90-5.69)	96.7	548	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.945	2.940	0.005	1.000	360873	0.2232		96.2	732	
499.00 > 99.00	2.945	2.940	0.005	1.000	85319		4.23(2.31-6.93)	96.2	158	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.155	3.150	0.005	1.072	586624	NC			2466	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.284	0.008	1.275	1066887	2.37		98.9	2644	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.285	0.008	1.118	273347	0.2414		101	1085	
549.00 > 99.00	3.292	3.285	0.008	1.118	98712		2.77(1.33-3.97)	101	413	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.286	0.006	1.000	136487	0.2358		98.5	563	
D 23 13C2 PFDA										
515.00 > 470.00	3.299	3.294	0.005	1.278	3074087	2.40		96.0	5313	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.296	0.003	1.000	318256	0.2580		103	203	
513.00 > 169.00	3.299	3.296	0.003	1.000	54367		5.85(2.36-7.09)	103	170	
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.317	0.004	1.286	4992636	2.52		101	5246	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.000	476525	0.2451		98.0	1873	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.448	0.006	1.338	1616798	2.47		98.7	4005	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.461	3.453	0.008	1.002	150940	0.2420		96.8	179	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.615	3.608	0.007	1.228	233277	0.2452		102	968	
599.00 > 99.00	3.606	3.608	-0.002	1.225	79055		2.95(1.39-4.16)	102	375	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.622	3.616	0.006	1.403	1760050	2.59		104	1377	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.403	2639555	2.56		102	7745	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	289310	0.2439		97.5	194	
563.00 > 169.00	3.629	3.622	0.007	1.002	49327		5.87(2.12-6.36)	97.5	296	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.629	3.623	0.006	1.002	142770	0.2274		91.0	559	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.786	3.781	0.005	1.286	948354	NC			2037	
35 MeFOSA										
512.00 > 169.00	3.827	3.826	0.001		147856	NC			551	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	291016	0.2348		93.9	163	
613.00 > 169.00	3.913	3.913	0.0	1.000	60342		4.82(2.13-6.40)	93.9	418	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.189	99141	NC			902	
D 36 13C2 PFDoA										
615.00 > 570.00	3.913	3.913	0.0	1.516	2785129	2.56		102	5994	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.154	4.148	0.006	1.411	111497	NC			728	
699.00 > 99.00	4.154	4.148	0.006	1.411	133931		0.83(0.00-0.00)		1049	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.173	4.173	0.0	1.066	304796	0.2544		102	138	
663.00 > 169.00	4.173	4.173	0.0	1.066	95463		3.19(1.25-3.76)	102	719	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.403	4.399	0.004	1.706	3541707	2.55		102	7360	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.403	4.400	0.003	1.000	84652	0.2469		98.8	893	
713.00 > 219.00	4.403	4.400	0.003	1.000	58906		1.44(0.71-2.13)	98.8	634	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.801	4.799	0.002	1.860	6757749	2.46		98.2	5754	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.808	4.801	0.007	1.001	661220	NC			299	
813.00 > 169.00	4.801	4.801	0.0	1.000	112805		5.86(2.86-8.58)		1161	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.142	5.136	0.006	1.071	644655	NC			182	
913.00 > 169.00	5.135	5.136	-0.001	1.070	77077		8.36(3.83-11.48)		768	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00006 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_004.d

Injection Date: 06-Aug-2018 11:25:44 Instrument ID: A8_N

Lims ID: IC L3 Full

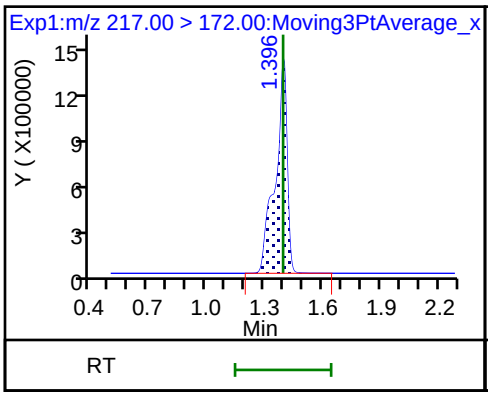
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 12 Worklist Smp#: 4

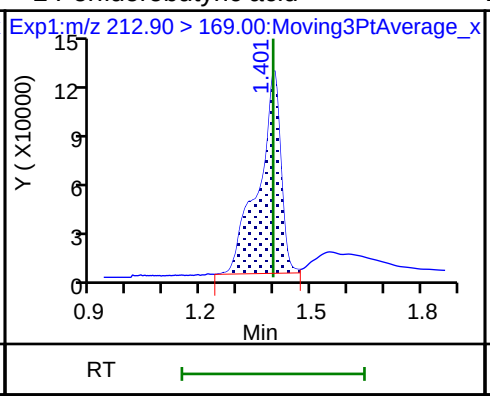
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

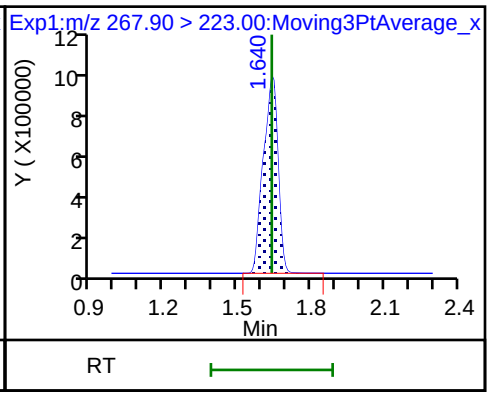
D 1 13C4 PFBA



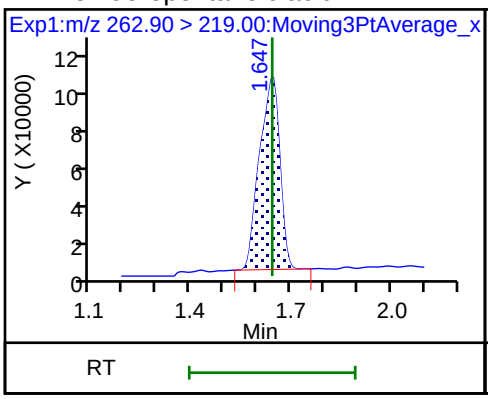
2 Perfluorobutyric acid



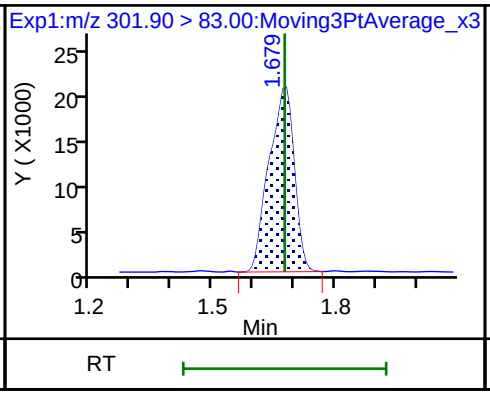
D 3 13C5-PFPeA



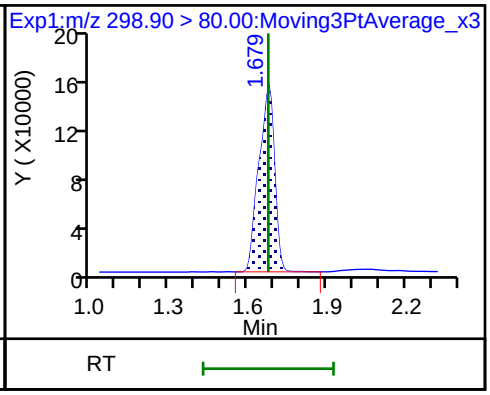
4 Perfluoropentanoic acid



D 47 13C3-PFBS



5 Perfluorobutanesulfonic acid



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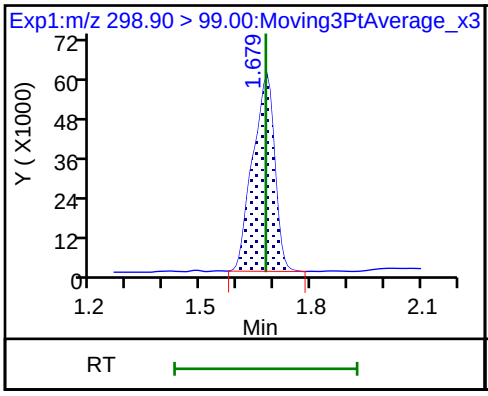
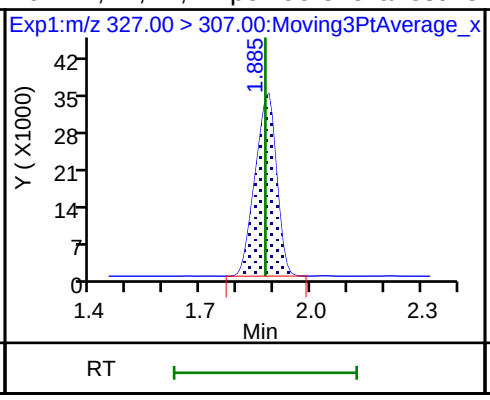
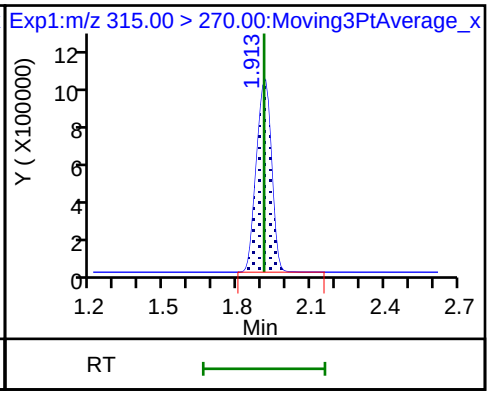


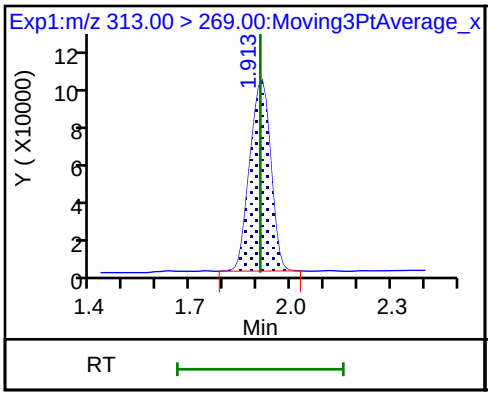
61 1H,1H,2H,2H-perfluorohexanesulfon



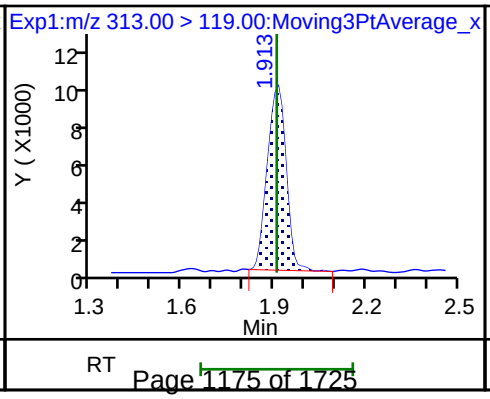
D 7 13C2 PFHxA



6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



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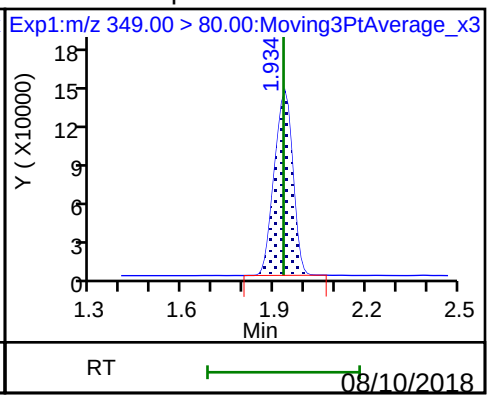

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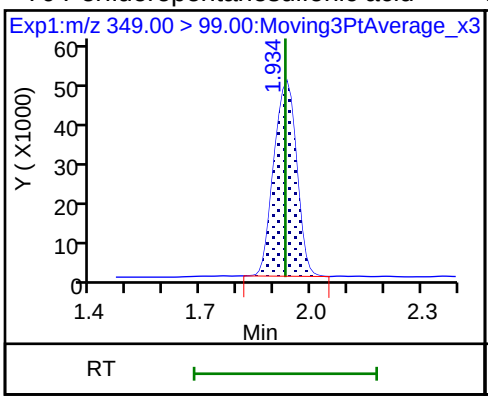
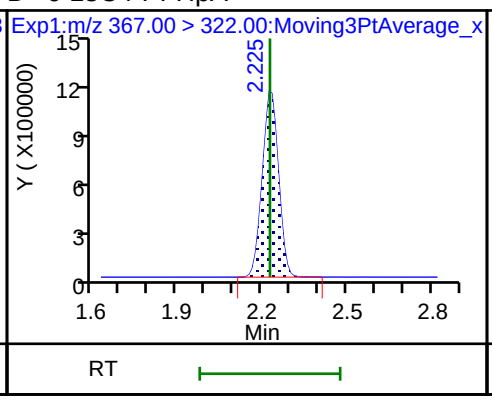
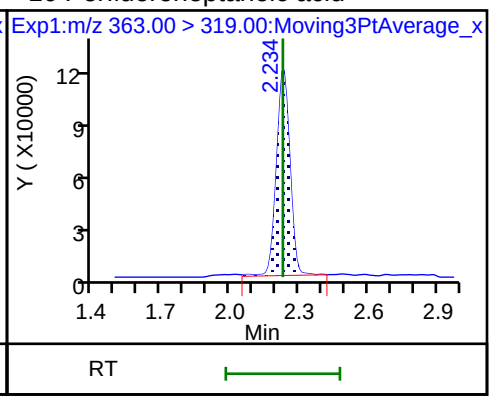


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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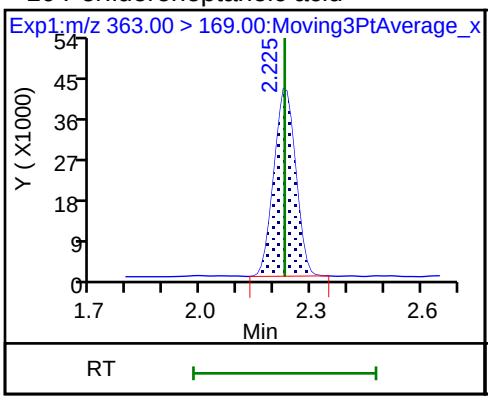

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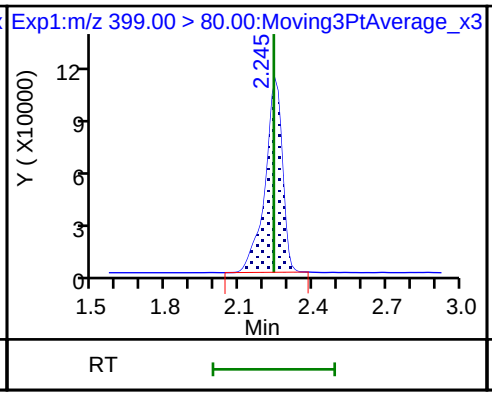

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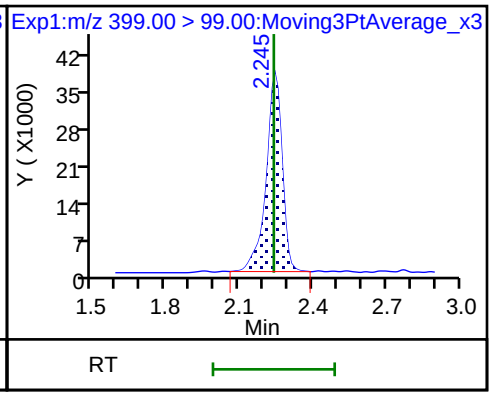
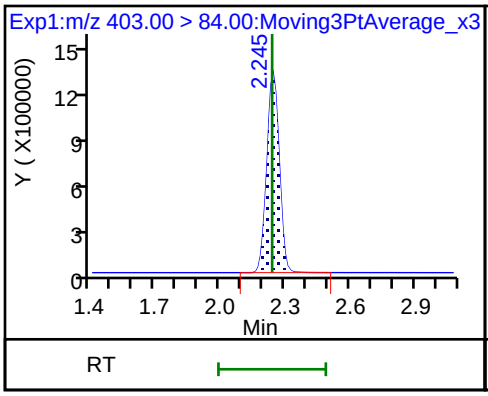
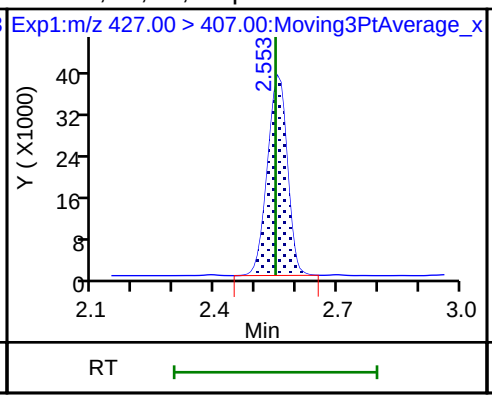


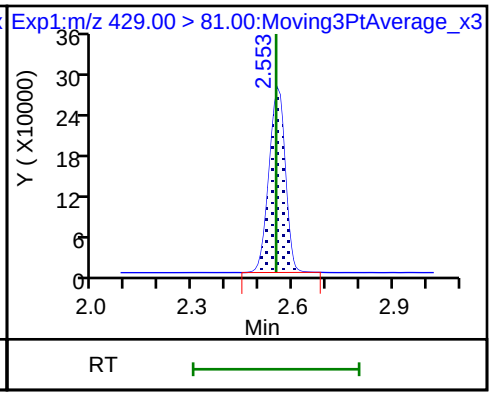
D 11 18O2 PFHxS



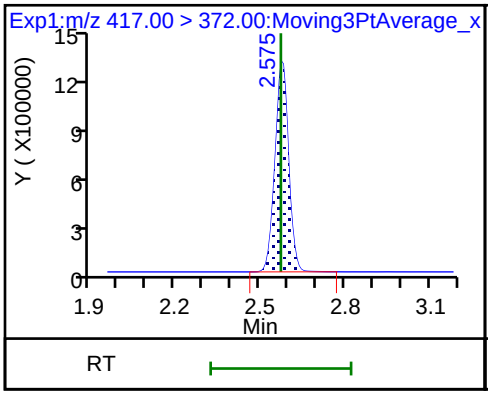
13 1H,1H,2H,2H-perfluorooctanesulfon



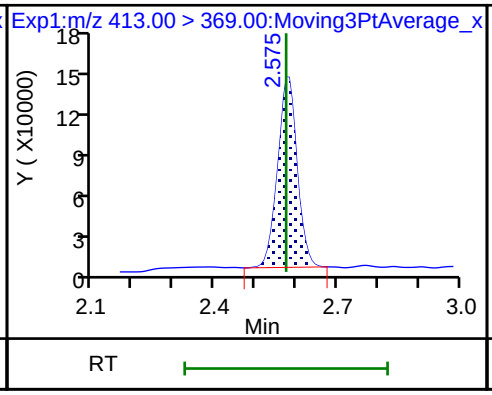
D 12 M2-6:2FTS



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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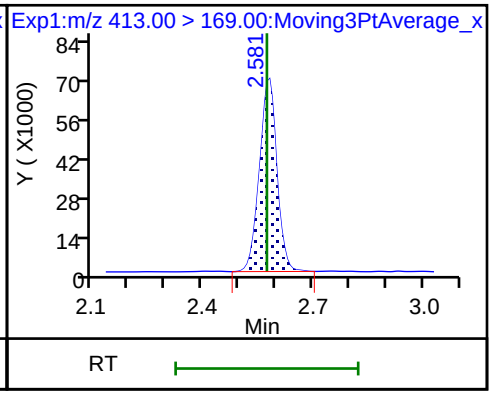
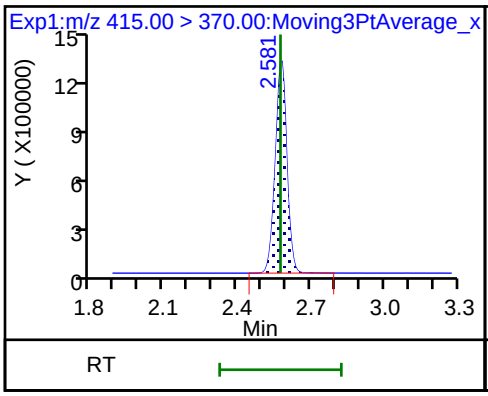
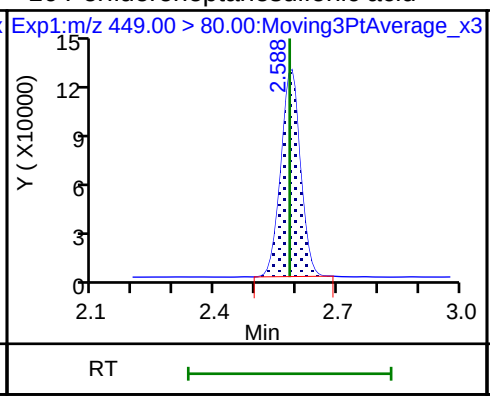


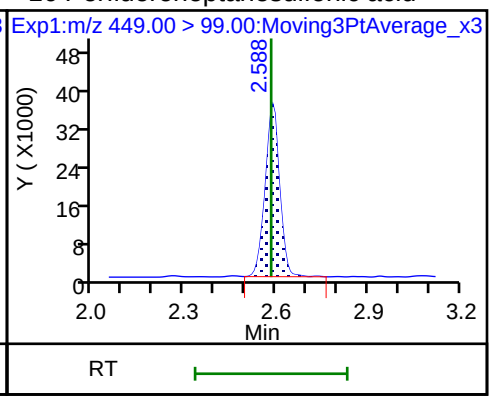
* 62 13C2-PFOA



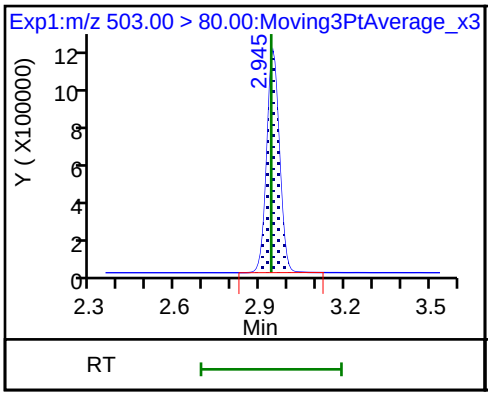
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS



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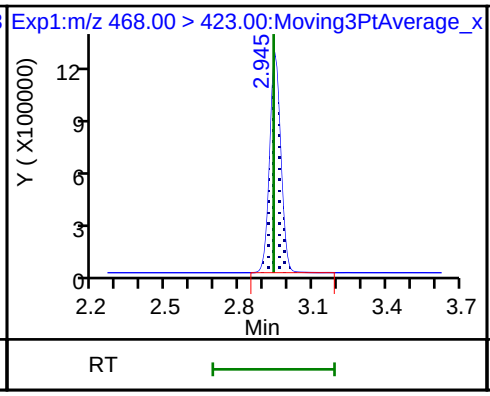
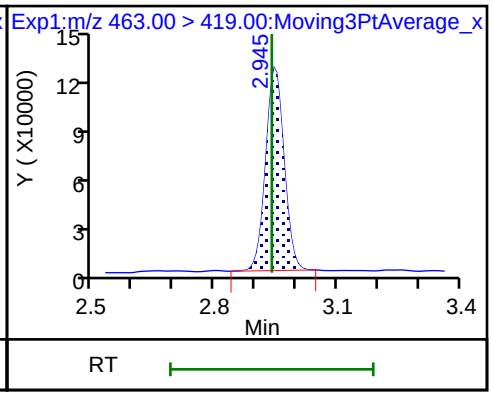


20 Perfluorononanoic acid



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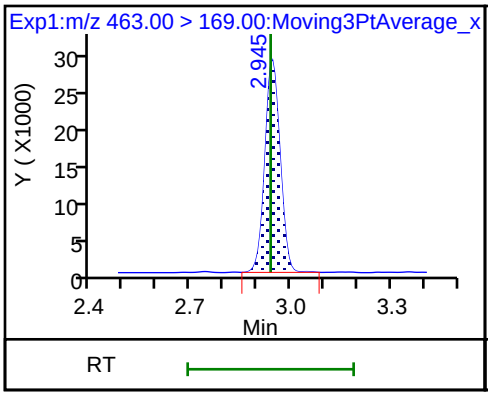
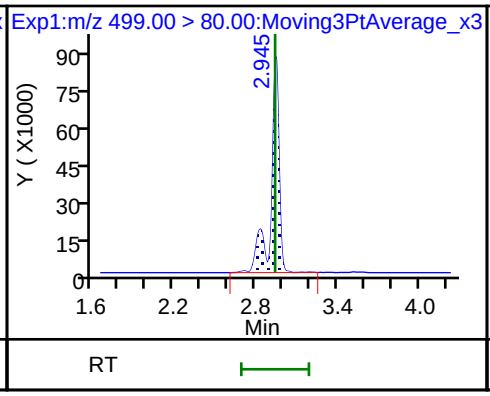


17 Perfluorooctane sulfonic acid



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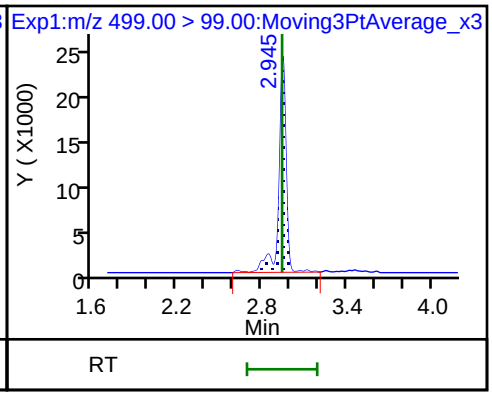
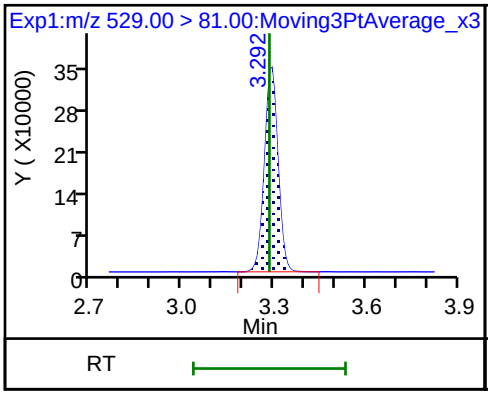
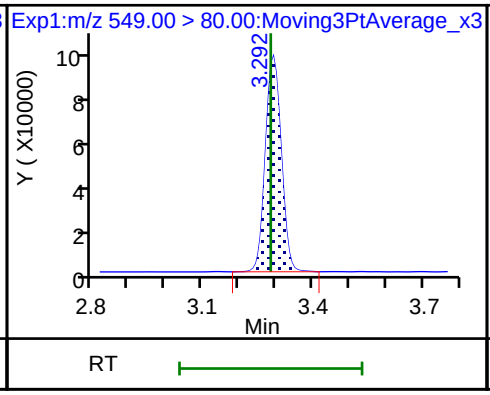


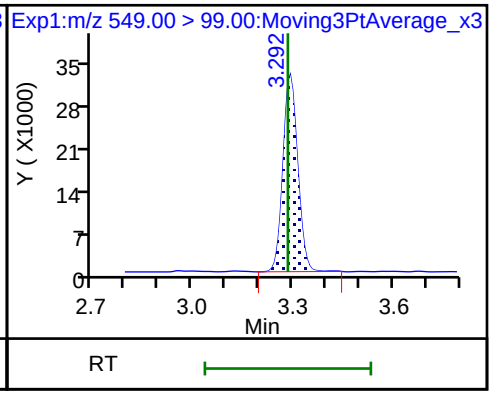
D 26 M2-8:2FTS



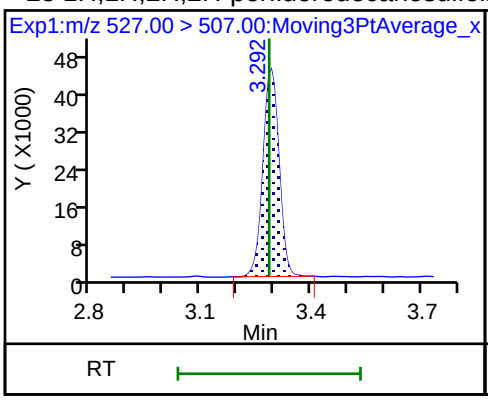
68 Perfluorononanesulfonic acid



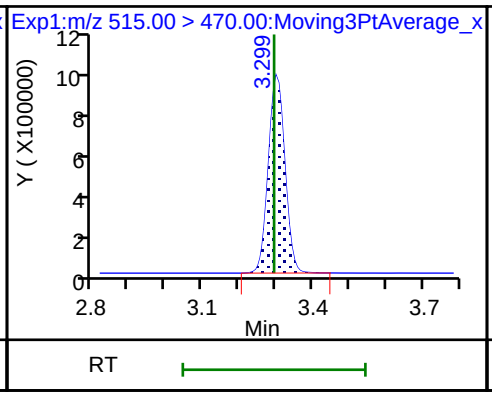
68 Perfluorononanesulfonic acid



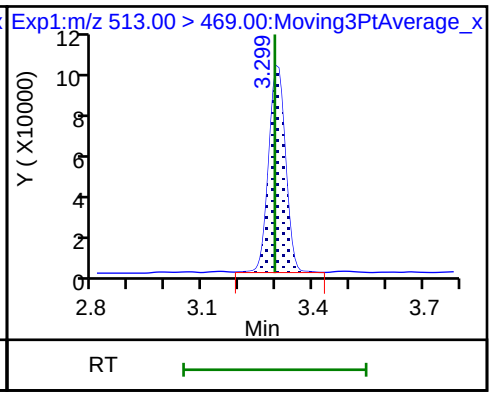
25 1H,1H,2H,2H-perfluorodecanesulfon



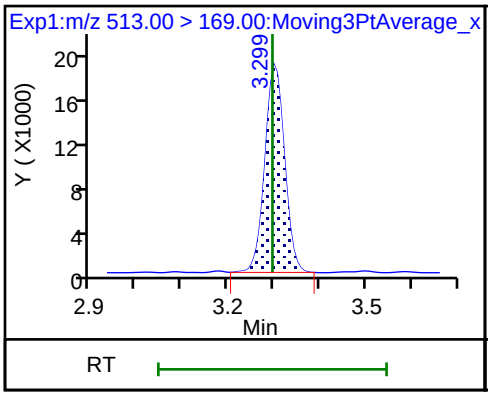
D 23 13C2 PFDA



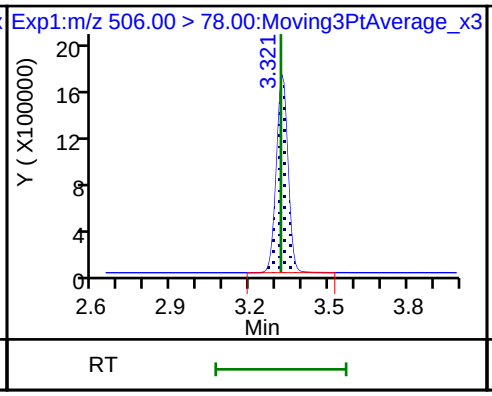
24 Perfluorodecanoic acid



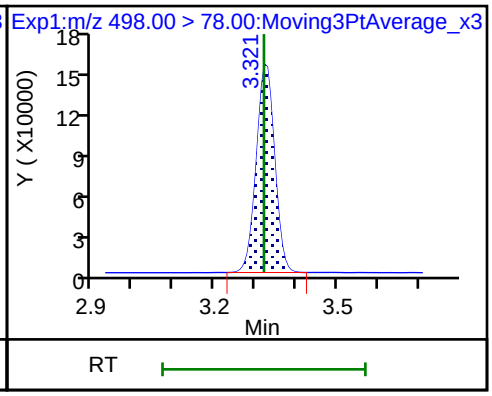
24 Perfluorodecanoic acid



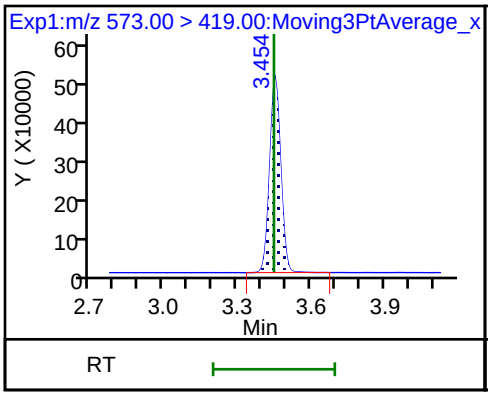
D 21 13C8 FOSA



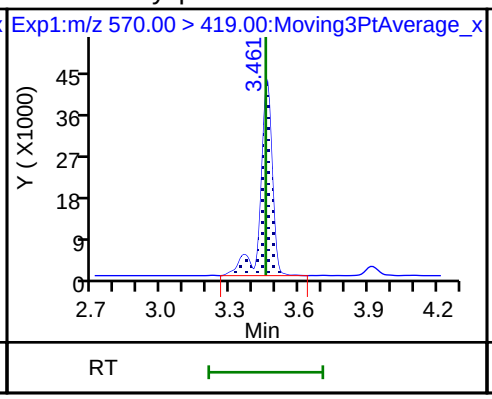
22 Perfluorooctane Sulfonamide



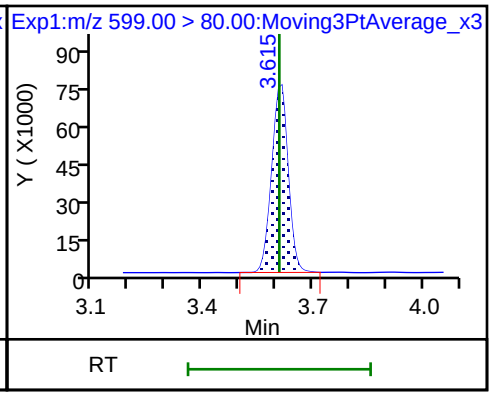
D 27 d3-NMeFOSAA



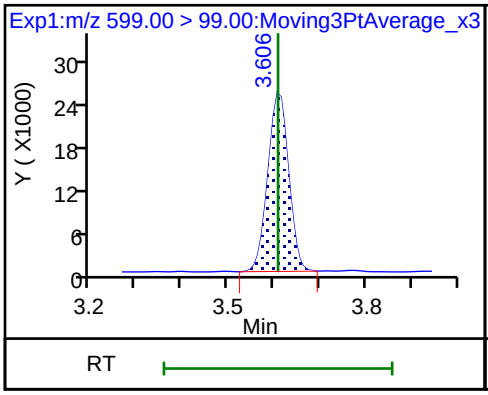
28 N-methyl perfluorooctane sulfonami



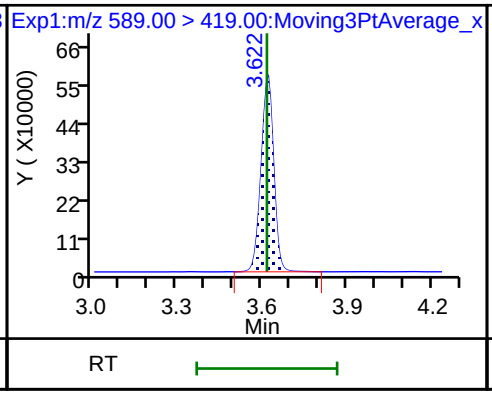
29 Perfluorodecane Sulfonic acid



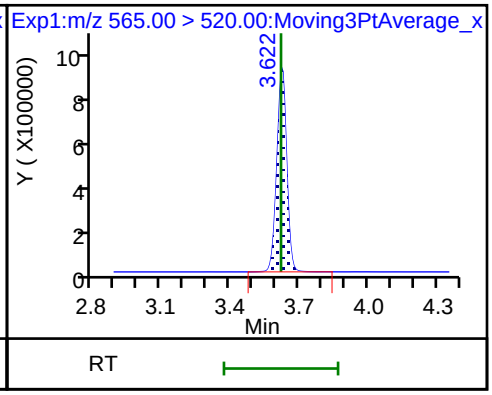
29 Perfluorodecane Sulfonic acid



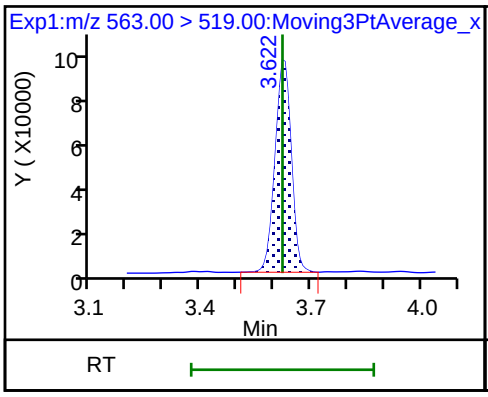
D 32 d5-NEtFOSAA



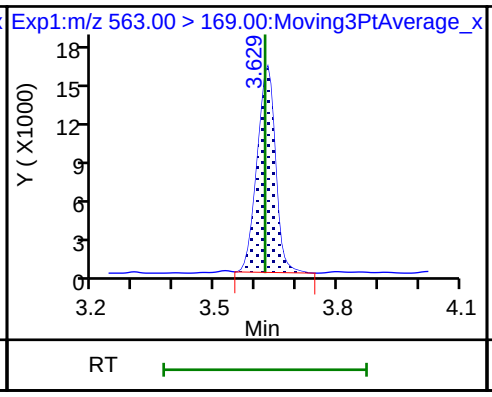
D 30 13C2 PFUnA



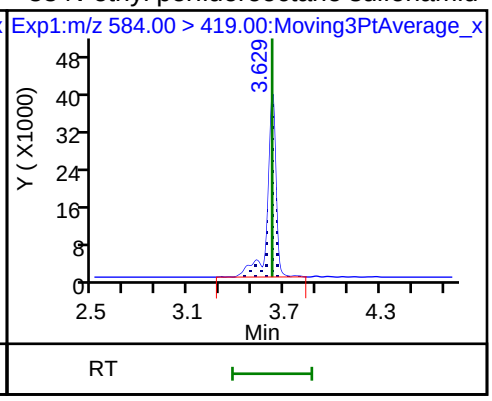
31 Perfluoroundecanoic acid



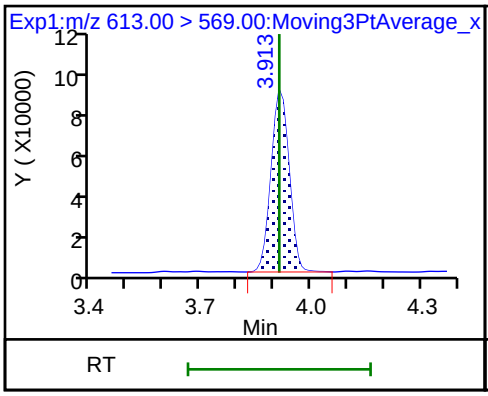
31 Perfluoroundecanoic acid



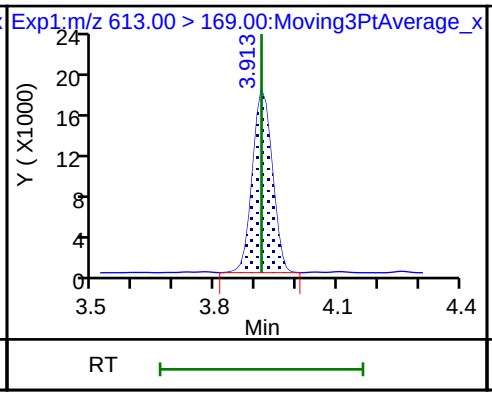
33 N-ethyl perfluorooctane sulfonamid



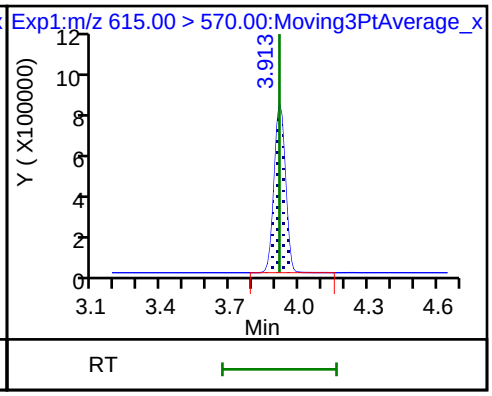
37 Perfluorododecanoic acid



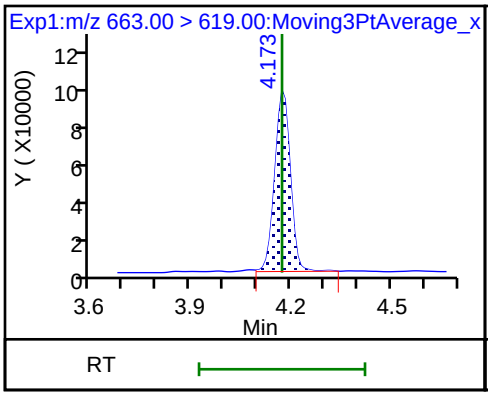
37 Perfluorododecanoic acid



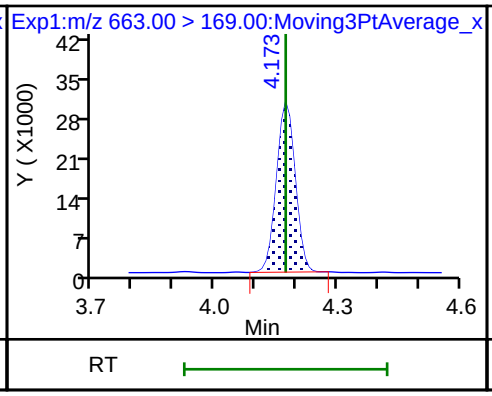
D 36 13C2 PFDoA



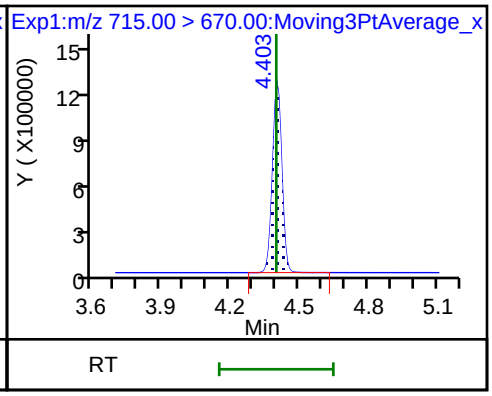
41 Perfluorotridecanoic acid



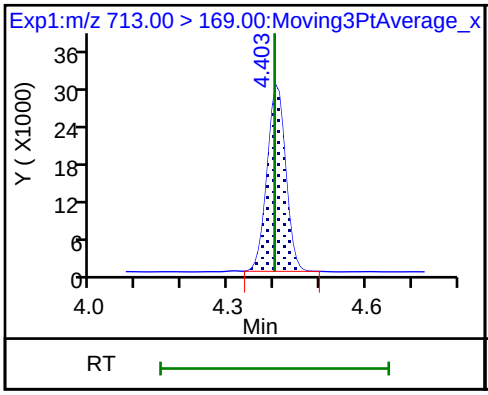
41 Perfluorotridecanoic acid



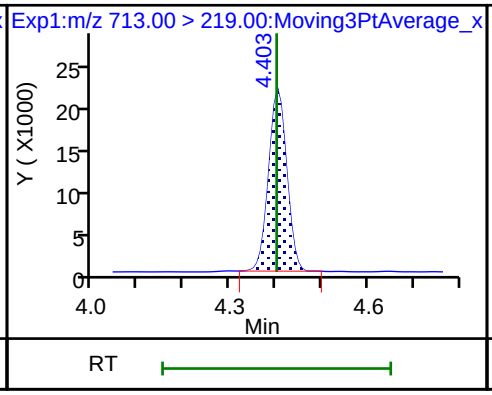
D 43 13C2-PFTeDA



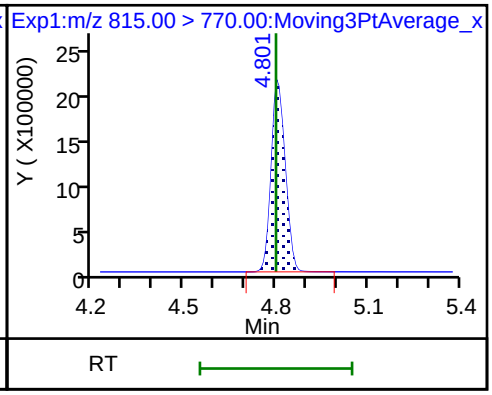
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 06-Aug-2018 11:33:34 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:17:10 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:00:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.395	0.002	0.543	5503224	2.49		99.4	10421	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.397	0.0	1.000	2011540	0.9733		97.3	198	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.639	0.001	0.637	3711287	2.43		97.4	9635	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.643	-0.003	1.000	1650773	0.9773		97.7	114	
D 47 13C3-PFBS										
301.90 > 83.00	1.672	1.675	-0.003	0.649	78945	2.24		96.3	323	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.680	1.676	0.004	1.005	2375205	0.9209		104	901	
298.90 > 99.00	1.680	1.676	0.004	1.005	1015406		2.34(1.25-3.74)	104	513	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.875	0.001	0.729	592717	NC			872	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.875	0.001	1.122	570176	1.01		109	3930	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.903	1.908	-0.005	1.000	1715767	0.9874		98.7	433	
313.00 > 119.00	1.903	1.908	-0.005	1.000	156736		10.95(5.03-15.10)	98.7	462	
D 7 13C2 PFHxA										
315.00 > 270.00	1.903	1.908	-0.005	0.739	4256324	2.46		98.4	8880	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.934	1.930	0.004	1.157	2251038	0.9619		103	2681	
349.00 > 99.00	1.934	1.930	0.004	1.157	845080		2.66(1.36-4.07)	103	824	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.008	2.003	0.005	0.780	332511	NC			1022	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.008	2.003	0.005	1.000	308918	NC			152	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.227	-0.002	0.864	4255889	2.50		100.0	6181	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.228	-0.003	1.000	1827459	1.01		101	379	
363.00 > 169.00	2.225	2.228	-0.003	1.000	719613		2.54(1.13-3.40)	101	1239	
D 11 18O2 PFHxS										
403.00 > 84.00	2.245	2.239	0.006	0.872	5111728	2.34		99.0	4756	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.239	0.006	1.000	2008773	0.8573		94.2	1987	
399.00 > 99.00	2.245	2.239	0.006	1.000	689420		2.91(1.50-4.49)	94.2	645	
65 ADONA										
377.00 > 251.00	2.267	2.271	-0.004	0.771	4950939	NC			7395	
377.00 > 85.00	2.267	2.271	-0.004	0.771	2850758		1.74(0.84-2.53)		3276	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.550	2.548	0.002	1.000	536262	0.9373		98.9	1106	
D 12 M2-6:2FTS										
429.00 > 81.00	2.550	2.549	0.001	0.991	863649	2.41		101	2238	
D 73 13C8 PFOA										
421.00 > 376.00	2.574	2.571	0.003	1.000	7724133	NC			11158	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.573	0.001	1.000	3847208	2.46		98.5	6637	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.000	1678386	0.9646		96.4	158	
413.00 > 169.00	2.574	2.574	0.0	1.000	874632		1.92(0.84-2.52)	96.4	1551	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		3997336	2.50			9177	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.003	0.878	1703787	0.9643		101	2000	
449.00 > 99.00	2.581	2.583	-0.003	0.878	442374		3.85(1.94-5.82)	101	761	
D 72 13C8 PFOS										
507.00 > 99.00	2.939	2.938	0.001	1.142	1640677	NC			3589	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.939	0.0	1.000	1409363	0.9457		94.6	412	
463.00 > 169.00	2.939	2.939	0.0	1.000	338359		4.17(1.90-5.69)	94.6	1435	
D 19 13C5 PFNA										
468.00 > 423.00	2.939	2.939	0.0	1.142	3536917	2.52		101	6788	
D 18 13C4 PFOS										
503.00 > 80.00	2.939	2.939	0.0	1.142	3408113	2.38		99.4	4275	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.000	1387650	0.9063		97.7	2200	
499.00 > 99.00	2.939	2.940	-0.001	1.000	324621		4.27(2.31-6.93)	97.7	823	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.155	3.150	0.005	1.074	2339008	NC			3500	
D 26 M2-8:2FTS										
529.00 > 81.00	3.285	3.284	0.001	1.276	1045687	2.42		101	3279	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.285	3.285	0.001	1.118	1021056	0.9520		99.2	2447	
549.00 > 99.00	3.285	3.285	0.001	1.118	375050		2.72(1.33-3.97)	99.2	1043	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.285	3.286	-0.001	1.000	504558	0.8895		92.9	1402	
D 23 13C2 PFDA										
515.00 > 470.00	3.292	3.294	-0.002	1.279	3162481	2.57		103	5418	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.296	0.003	1.002	1188927	0.9369		93.7	777	
513.00 > 169.00	3.299	3.296	0.003	1.002	213587		5.57(2.36-7.09)	93.7	390	
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.317	0.004	1.290	4677735	2.46		98.5	7100	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.000	1842464	1.01		101	3243	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.339	1547904	2.46		98.4	3369	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.453	0.001	1.002	590682	0.9890		98.9	742	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.606	3.608	-0.002	1.227	849835	0.9430		97.8	3617	
599.00 > 99.00	3.606	3.608	-0.002	1.227	299784		2.83(1.39-4.16)	97.8	2220	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.615	3.616	-0.001	1.405	1663128	2.55		102	1489	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.407	2425508	2.45		98.0	5922	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	1124406	1.03		103	798	
563.00 > 169.00	3.622	3.622	0.0	1.000	177923		6.32(2.12-6.36)	103	940	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.622	3.623	-0.001	1.002	567205	0.9561		95.6	1327	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.785	3.781	0.004	1.288	3752452	NC			5976	
35 MeFOSA										
512.00 > 169.00	3.826	3.826	0.0		540488	NC			861	
D 36 13C2 PFDoA										
615.00 > 570.00	3.913	3.913	0.0	1.520	2610480	2.50		99.8	3794	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.191	366950	NC			2916	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	1163733	1.00		100	624	
613.00 > 169.00	3.913	3.913	0.0	1.000	259339		4.49(2.13-6.40)	100	1676	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.153	4.148	0.005	1.413	393708	NC			1564	
699.00 > 99.00	4.153	4.148	0.005	1.413	556205		0.71(0.00-0.00)		3372	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.172	4.173	-0.001	1.066	1112653	0.99		99.1	487	
663.00 > 169.00	4.172	4.173	-0.001	1.066	335552		3.32(1.25-3.76)	99.1	2095	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.402	4.399	0.003	1.711	3313318	2.49		99.4	6184	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.402	4.400	0.002	1.000	308839	0.9628		96.3	3431	
713.00 > 219.00	4.402	4.400	0.002	1.000	221323		1.40(0.71-2.13)	96.3	1043	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.800	4.799	0.001	1.865	6558204	2.48		99.2	7387	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.800	4.801	-0.001	1.000	2363491	NC			902	
813.00 > 169.00	4.800	4.801	-0.001	1.000	402071		5.88(2.86-8.58)		2430	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.135	5.136	-0.001	1.070	2459730	NC			668	
913.00 > 169.00	5.135	5.136	-0.001	1.070	301046		8.17(3.83-11.48)		2004	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_005.d

Injection Date: 06-Aug-2018 11:33:34 Instrument ID: A8_N

Lims ID: IC L4 Full

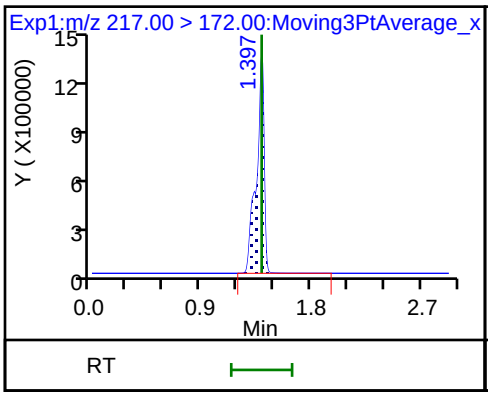
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 5

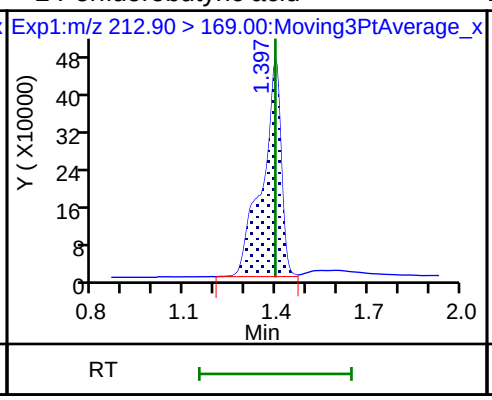
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

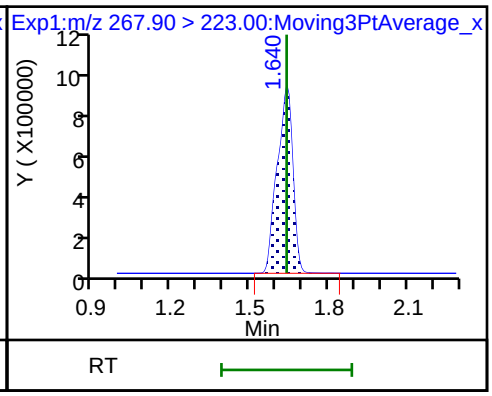
D 1 13C4 PFBA



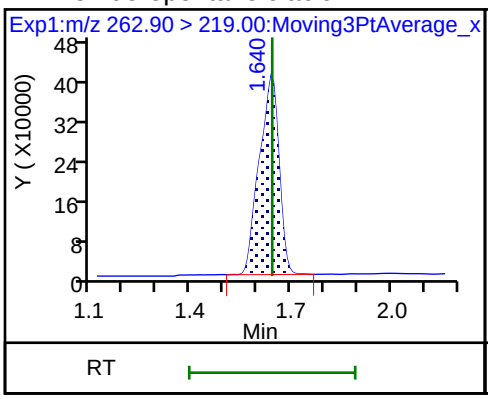
2 Perfluorobutyric acid



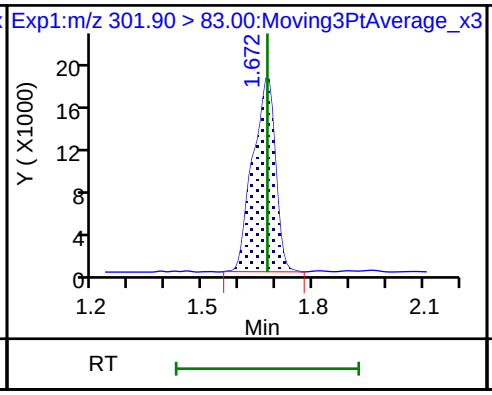
D 3 13C5-PFPeA



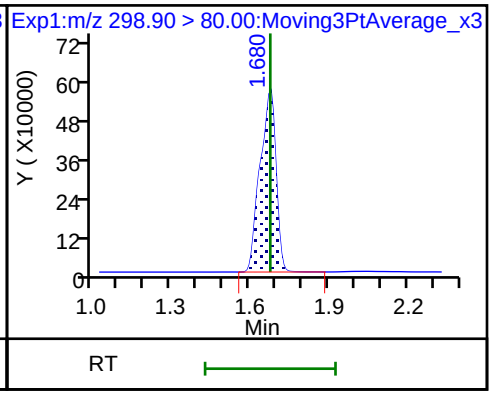
4 Perfluoropentanoic acid



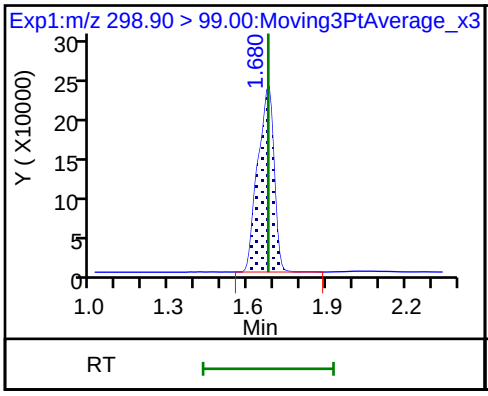
D 47 13C3-PFBS



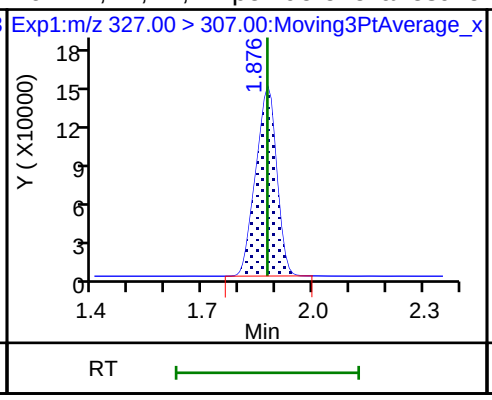
5 Perfluorobutanesulfonic acid



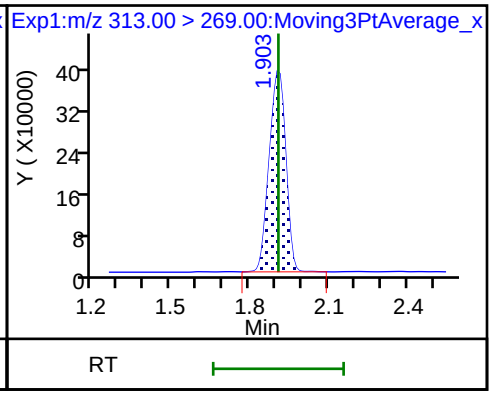
5 Perfluorobutanesulfonic acid



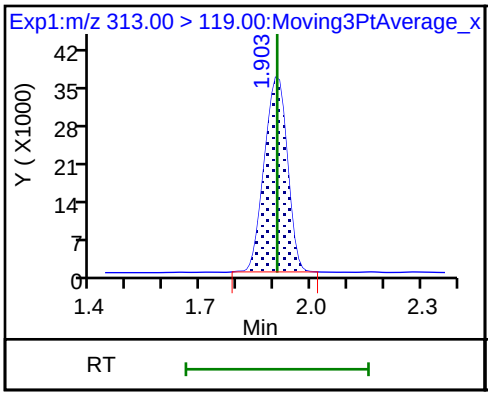
61 1H,1H,2H,2H-perfluorohexanesulfoni



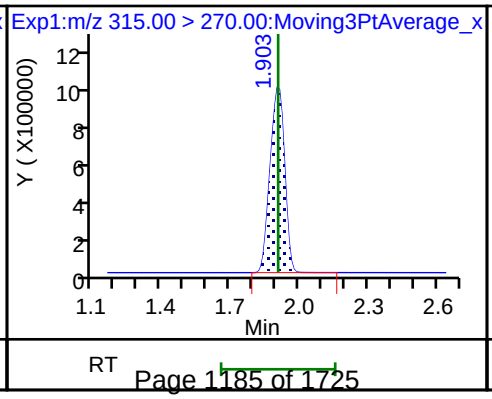
6 Perfluorohexanoic acid



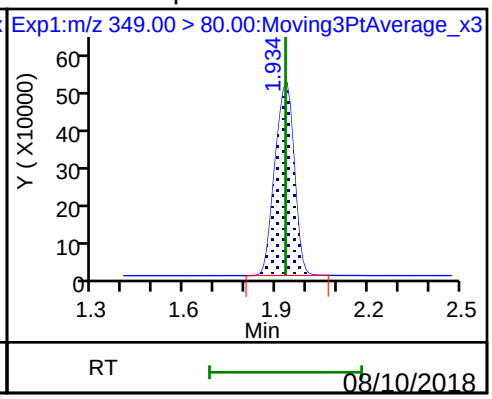
6 Perfluorohexanoic acid



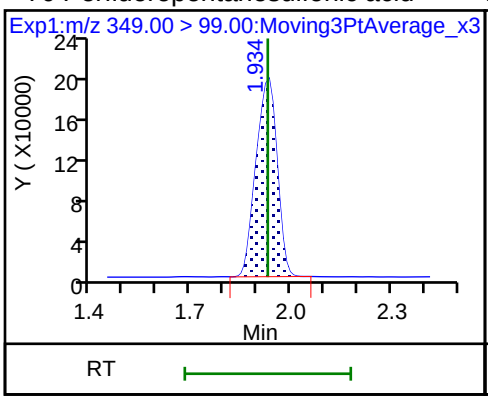
D 7 13C2 PFHxA



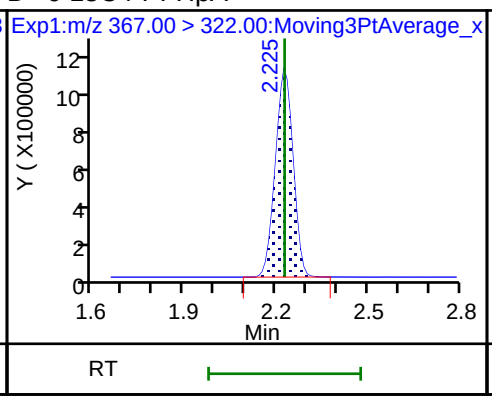
70 Perfluoropentanesulfonic acid



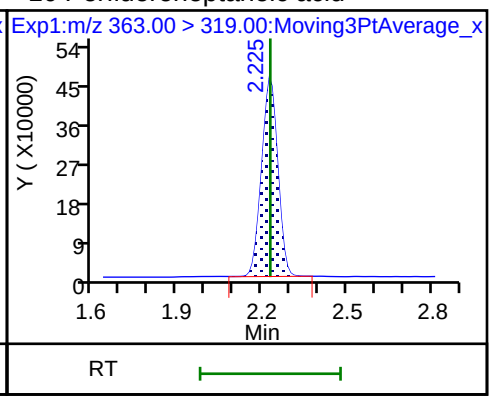
70 Perfluoropentanesulfonic acid



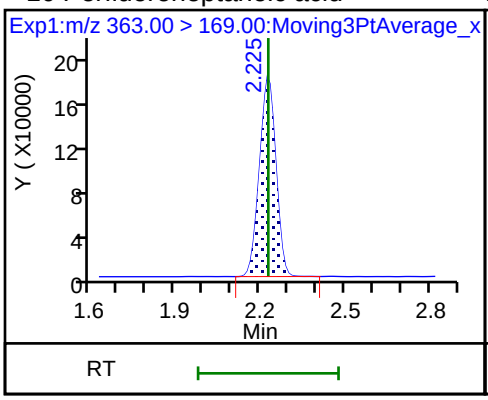
D 9 13C4-PFHpA



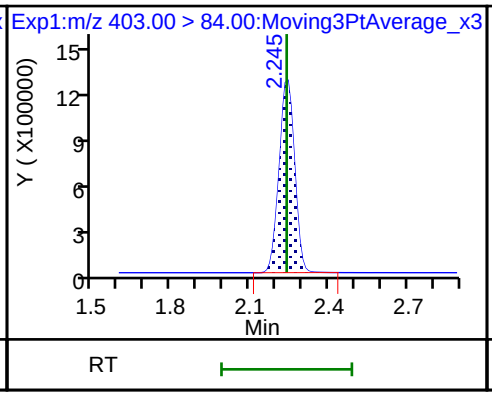
10 Perfluoroheptanoic acid



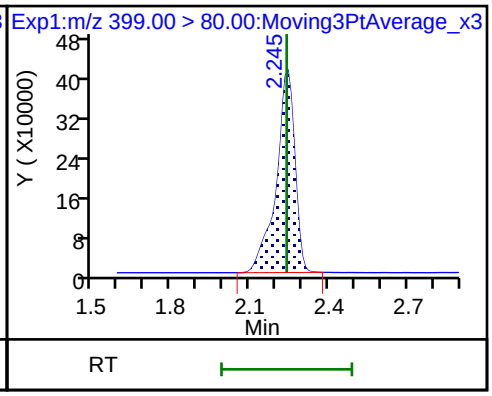
10 Perfluoroheptanoic acid



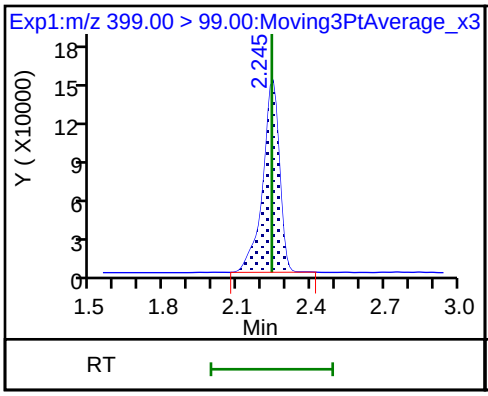
D 11 18O2 PFHxS



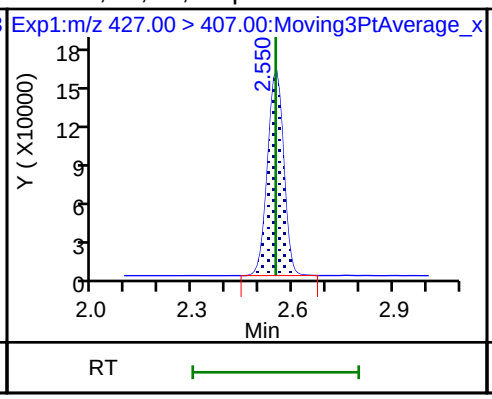
8 Perfluorohexanesulfonic acid



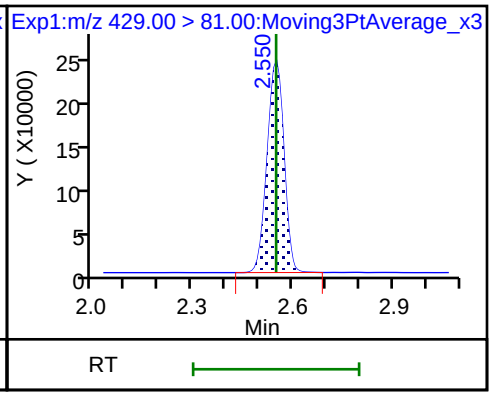
8 Perfluorohexanesulfonic acid



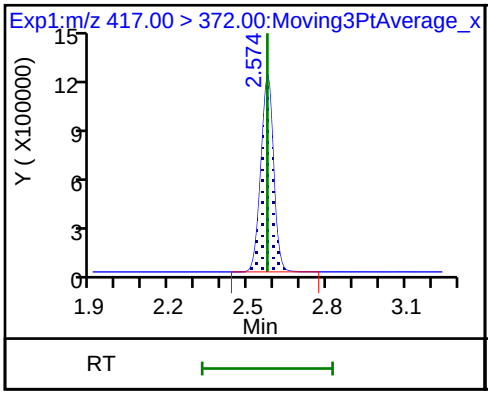
13 1H,1H,2H,2H-perfluorooctanesulfon



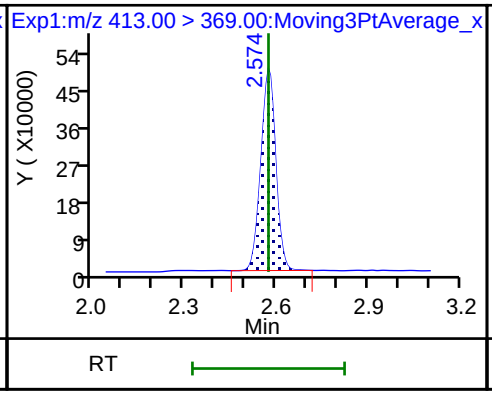
D 12 M2-6:2FTS



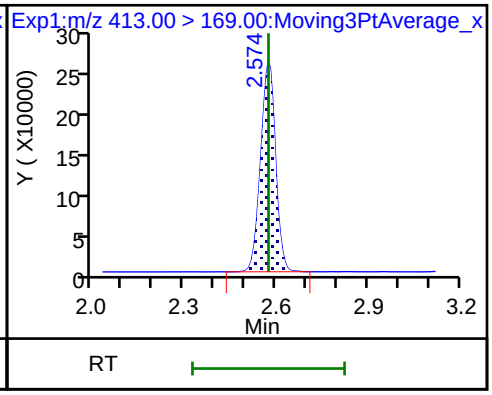
D 14 13C4 PFOA



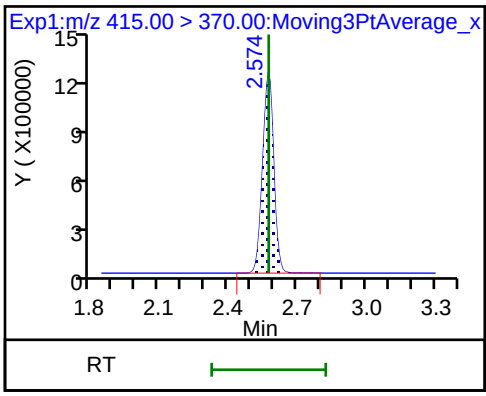
15 Perfluorooctanoic acid



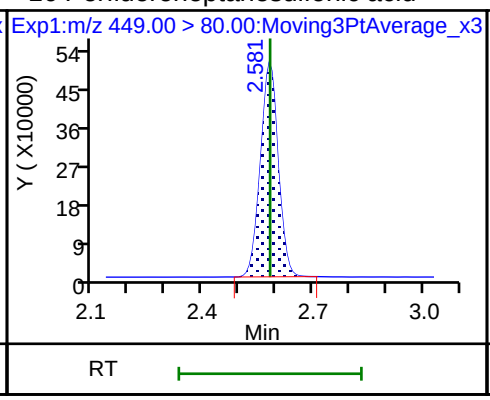
15 Perfluorooctanoic acid



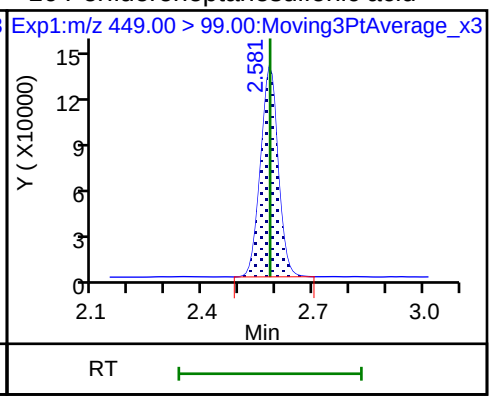
* 62 13C2-PFOA



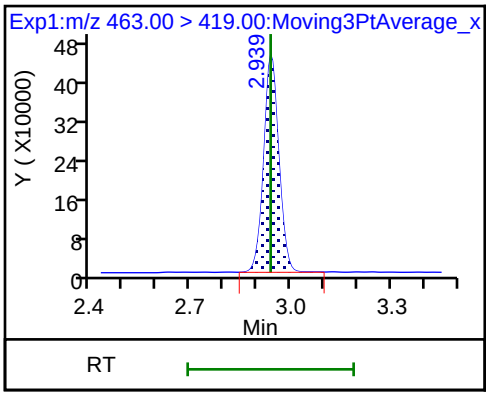
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid



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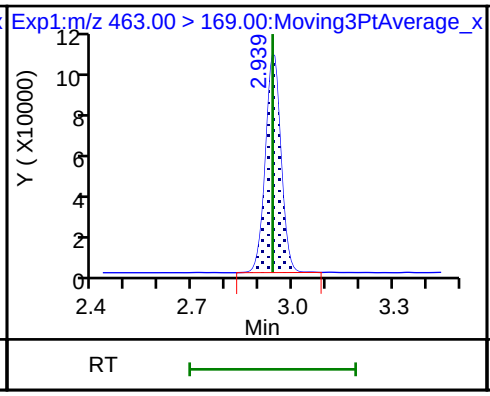
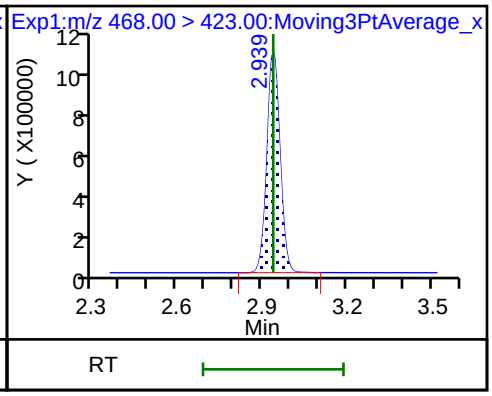
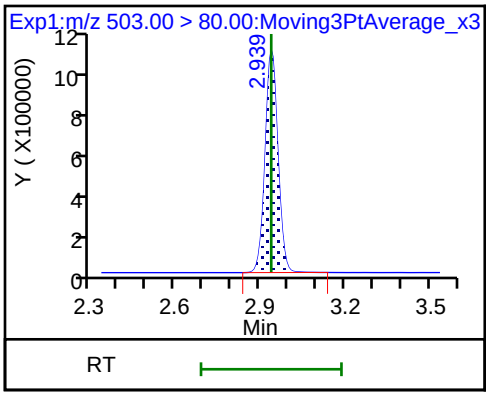


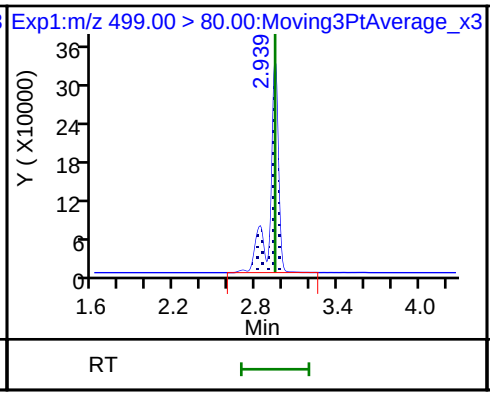
D 19 13C5 PFNA



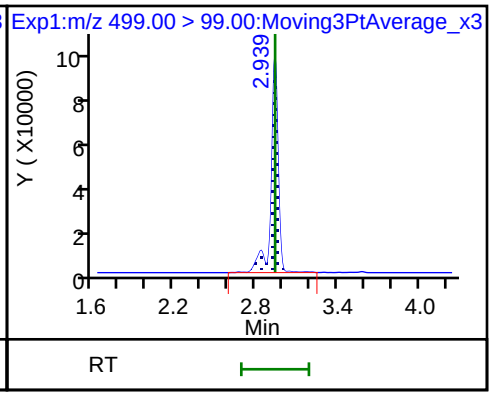
D 18 13C4 PFOS



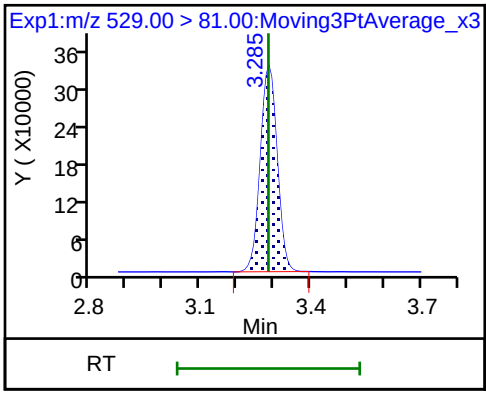
17 Perfluorooctane sulfonic acid



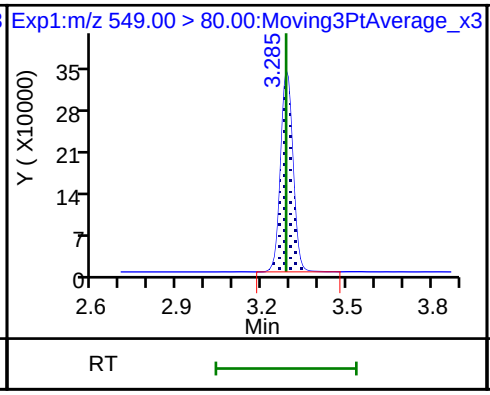
17 Perfluorooctane sulfonic acid



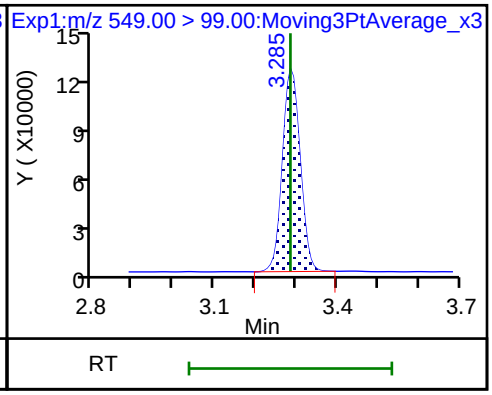
D 26 M2-8:2FTS



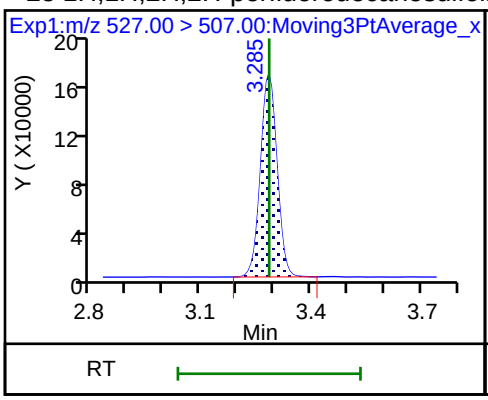
68 Perfluorononanesulfonic acid



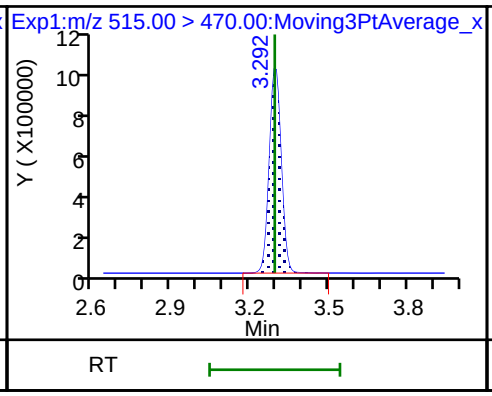
68 Perfluorononanesulfonic acid



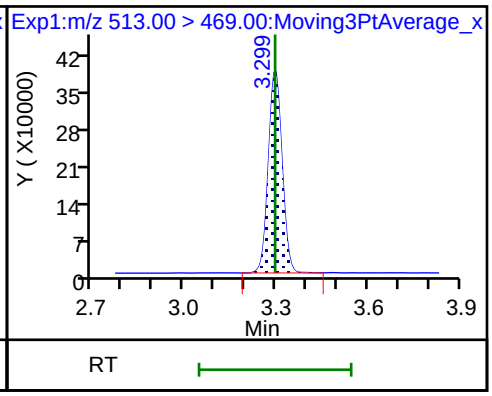
25 1H,1H,2H,2H-perfluorodecanesulfon



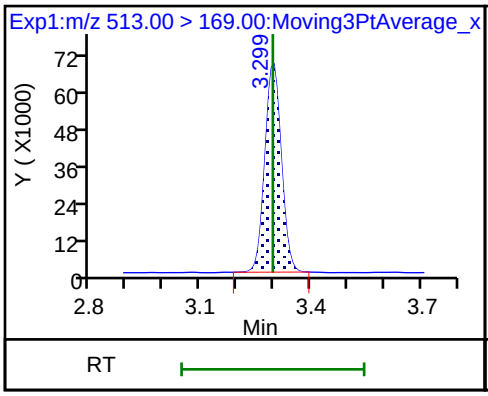
D 23 13C2 PFDA



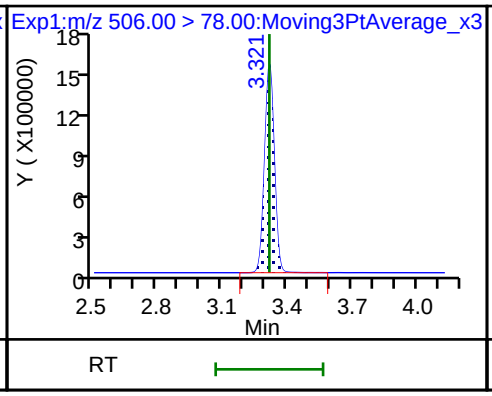
24 Perfluorodecanoic acid



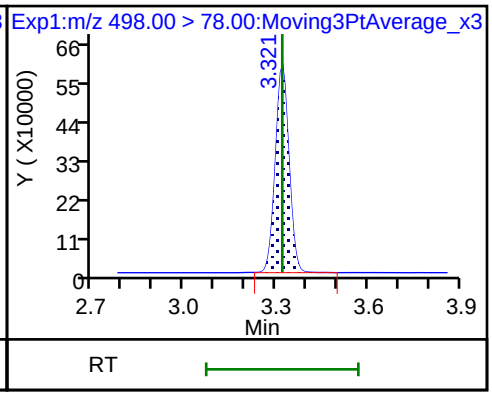
24 Perfluorodecanoic acid



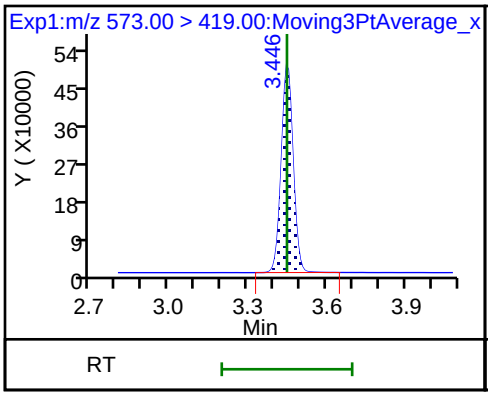
D 21 13C8 FOSA



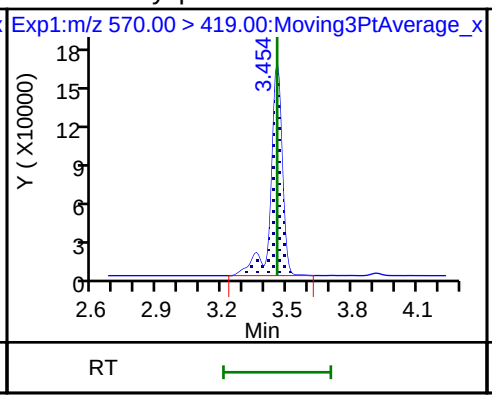
22 Perfluorooctane Sulfonamide



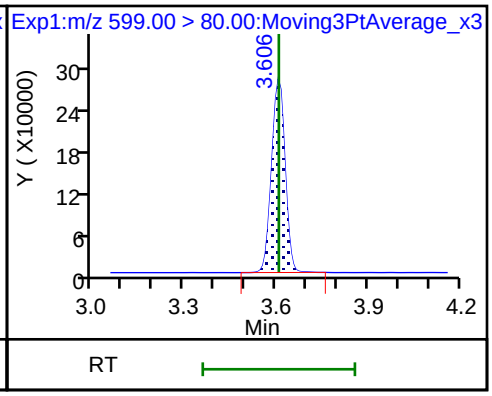
D 27 d3-NMeFOSAA



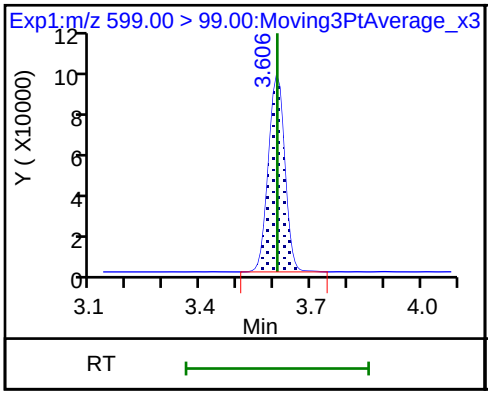
28 N-methyl perfluorooctane sulfonami



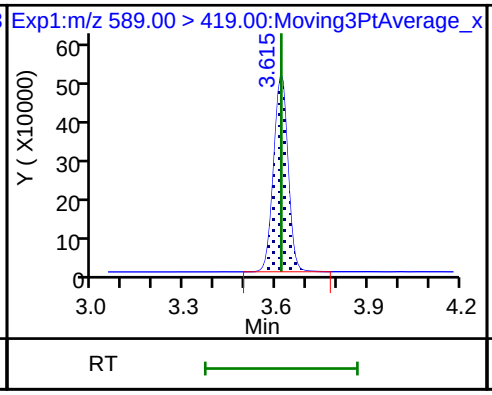
29 Perfluorodecane Sulfonic acid



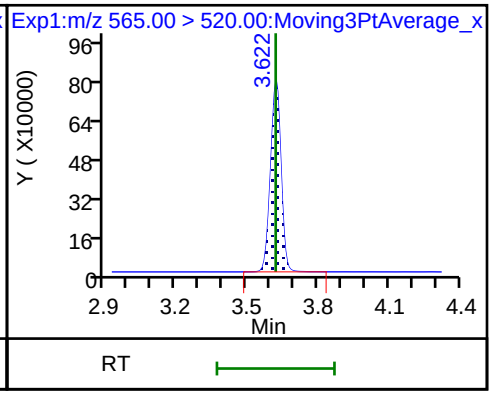
29 Perfluorodecane Sulfonic acid



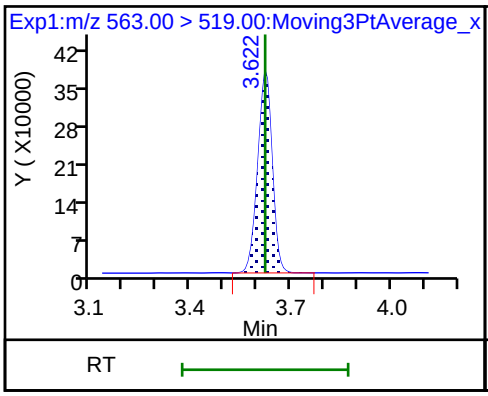
D 32 d5-NEtFOSAA



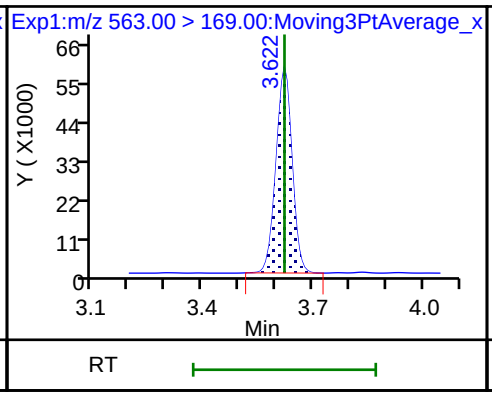
D 30 13C2 PFUnA



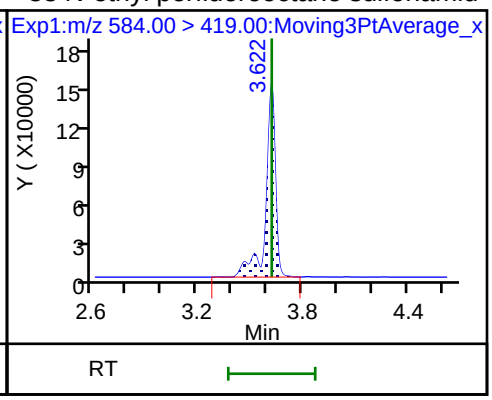
31 Perfluoroundecanoic acid



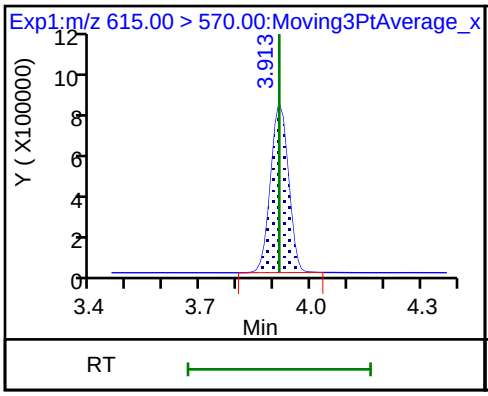
31 Perfluoroundecanoic acid



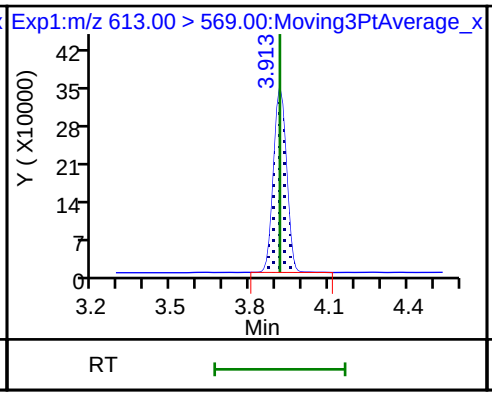
33 N-ethyl perfluorooctane sulfonamid



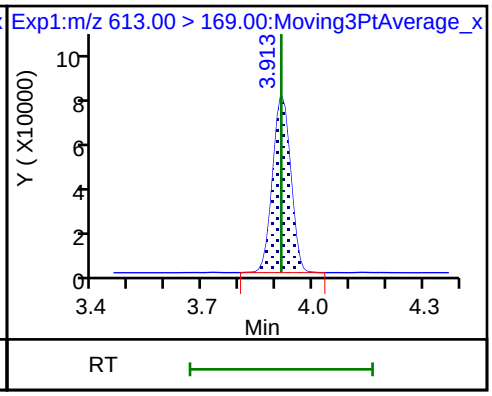
D 36 13C2 PFDoA



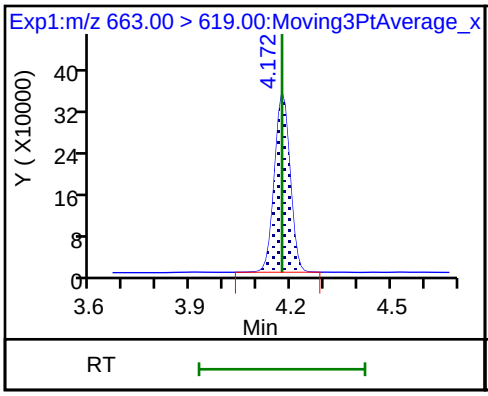
37 Perfluorododecanoic acid



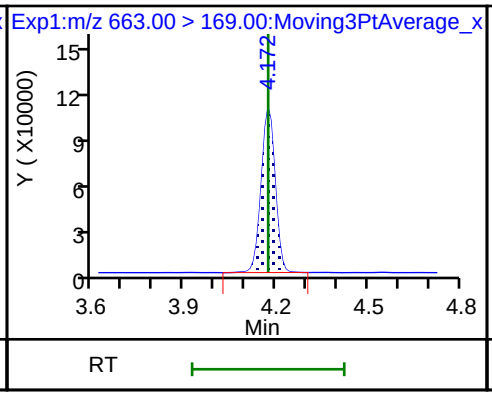
37 Perfluorododecanoic acid



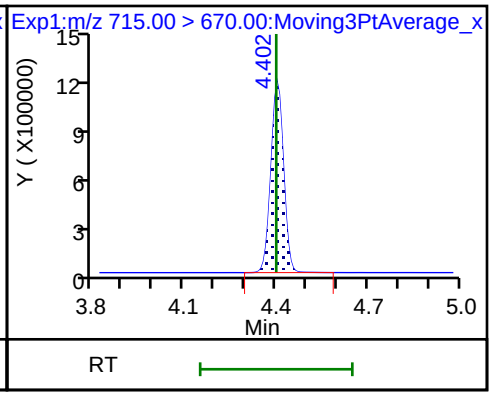
41 Perfluorotridecanoic acid



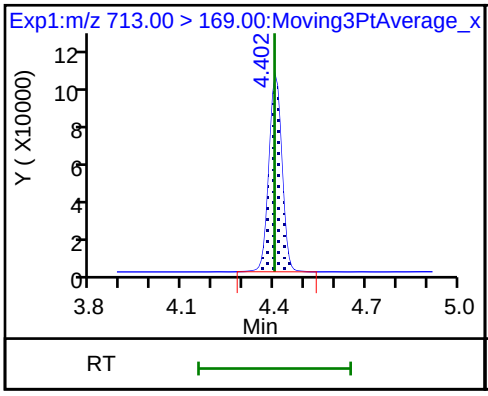
41 Perfluorotridecanoic acid



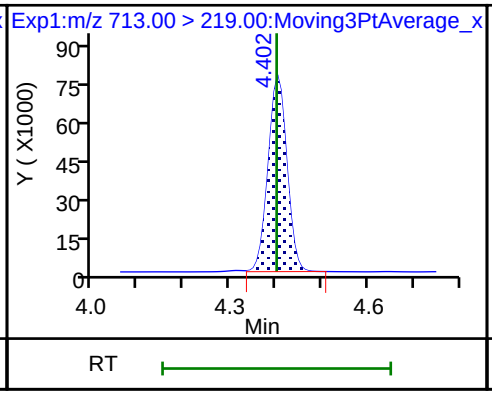
D 43 13C2-PFTeDA



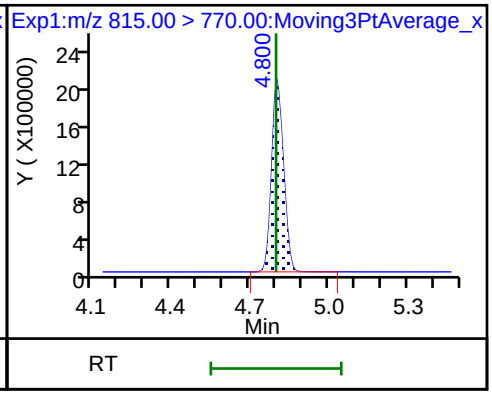
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

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Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 06-Aug-2018 11:41:23 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:17:16 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:07:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.392	1.395	-0.003	0.541	5444583	2.54		102	8249	
2 Perfluorobutyric acid										
212.90 > 169.00	1.392	1.397	-0.005	1.000	5049773	2.47		98.8	508	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.639	-0.006	0.634	3838069	2.60		104	8427	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.643	-0.003	1.005	4235935	2.43		97.0	293	
D 47 13C3-PFBS										
301.90 > 83.00	1.672	1.675	-0.003	0.649	80654	2.36		102	261	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.672	1.676	-0.004	1.000	5929736	2.25		102	2174	
298.90 > 99.00	1.672	1.676	-0.004	1.000	2454638		2.42(1.25-3.74)	102	1269	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.868	1.875	-0.007	1.117	1362407	2.37		102	7811	
D 60 M2-4:2FTS										
329.00 > 81.00	1.868	1.875	-0.007	0.726	585341	NC			782	
D 7 13C2 PFHxA										
315.00 > 270.00	1.903	1.908	-0.005	0.739	4337626	2.59		104	12580	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.903	1.908	-0.005	1.000	4365425	2.47		98.6	1122	
313.00 > 119.00	1.903	1.908	-0.005	1.000	395592		11.04(5.03-15.10)	98.6	758	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.930	-0.006	1.151	5715419	2.39		102	6693	
349.00 > 99.00	1.924	1.930	-0.006	1.151	2110213		2.71(1.36-4.07)	102	2084	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.997	2.003	-0.006	1.000	779751	NC			346	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.997	2.003	-0.006	0.776	352025	NC			762	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.227	-0.002	0.865	4193874	2.55		102	5912	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.228	-0.003	1.000	4504362	2.53		101	823	
363.00 > 169.00	2.225	2.228	-0.003	1.000	1708808		2.64(1.13-3.40)	101	2518	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.234	2.239	-0.005	1.000	5033358	2.15		94.4	2983	
399.00 > 99.00	2.234	2.239	-0.005	1.000	1700813		2.96(1.50-4.49)	94.4	1217	
D 11 18O2 PFHxS										
403.00 > 84.00	2.234	2.239	-0.005	0.868	5111206	2.42		102	4580	
65 ADONA										
377.00 > 251.00	2.267	2.271	-0.004	0.771	11980639	NC			8272	
377.00 > 85.00	2.267	2.271	-0.004	0.771	7225332		1.66(0.84-2.53)		5651	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.542	2.548	-0.006	1.000	1272183	2.30		97.0	1798	
D 12 M2-6:2FTS										
429.00 > 81.00	2.542	2.549	-0.007	0.988	835688	2.41		102	2359	
D 73 13C8 PFOA										
421.00 > 376.00	2.567	2.571	-0.004	0.997	7486707	NC			12368	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.573	0.001	1.000	3832692	2.54		101	8027	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.000	4208258	2.43		97.0	382	
413.00 > 169.00	2.574	2.574	0.0	1.000	2127673		1.98(0.84-2.52)	97.0	2867	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		3866051	2.50			7379	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.878	4278634	2.42		102	4054	
449.00 > 99.00	2.581	2.583	-0.002	0.878	1138164		3.76(1.94-5.82)	102	1763	
D 72 13C8 PFOS										
507.00 > 99.00	2.939	2.938	0.001	1.142	1644552	NC			3344	
D 18 13C4 PFOS										
503.00 > 80.00	2.939	2.939	0.0	1.142	3404908	2.45		103	4842	
D 19 13C5 PFNA										
468.00 > 423.00	2.939	2.939	0.0	1.142	3527035	2.60		104	6184	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.939	0.0	1.000	3614991	2.43		97.3	1002	
463.00 > 169.00	2.939	2.939	0.0	1.000	865774		4.18(1.90-5.69)	97.3	3370	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.000	3462772	2.26		97.6	2634	
499.00 > 99.00	2.939	2.940	-0.001	1.000	797490		4.34(2.31-6.93)	97.6	1200	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.147	3.150	-0.003	1.071	5895997	NC			4521	
D 26 M2-8:2FTS										
529.00 > 81.00	3.285	3.284	0.001	1.276	1039099	2.48		104	4478	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.285	3.285	0.001	1.118	2589883	2.42		101	3256	
549.00 > 99.00	3.285	3.285	0.001	1.118	921596		2.81(1.33-3.97)	101	2355	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.285	3.286	-0.001	1.000	1315230	2.33		97.4	3552	
D 23 13C2 PFDA										
515.00 > 470.00	3.292	3.294	-0.002	1.279	3093053	2.60		104	7014	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.292	3.296	-0.004	1.000	3015215	2.43		97.2	1428	
513.00 > 169.00	3.299	3.296	0.003	1.002	521331		5.78(2.36-7.09)	97.2	351	
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.317	0.004	1.290	4593505	2.50		100.0	4893	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.000	4680280	2.62		105	6720	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.339	1601576	2.63		105	3113	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.453	0.001	1.002	1493989	2.42		96.7	1186	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.606	3.608	-0.002	1.227	2214864	2.46		102	4654	
599.00 > 99.00	3.606	3.608	-0.002	1.227	732667		3.02(1.39-4.16)	102	3079	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.615	3.616	-0.001	1.405	1595779	2.53		101	1266	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.407	2527555	2.64		106	4544	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	2714159	2.39		95.6	1491	
563.00 > 169.00	3.622	3.622	0.0	1.000	457550		5.93(2.12-6.36)	95.6	2345	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.622	3.623	-0.001	1.002	1366918	2.40		96.1	2485	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.777	3.781	-0.004	1.285	9579999	NC			13064	
35 MeFOSA										
512.00 > 169.00	3.827	3.826	0.001		1352810	NC			1222	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	2903966	2.45		97.8	1268	
613.00 > 169.00	3.913	3.913	0.0	1.000	683851		4.25(2.13-6.40)	97.8	2694	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.191	940315	NC			5393	
D 36 13C2 PFDoA										
615.00 > 570.00	3.913	3.913	0.0	1.520	2668181	2.64		106	5732	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.144	4.148	-0.004	1.410	961771	NC			3921	
699.00 > 99.00	4.144	4.148	-0.004	1.410	1365105		0.70(0.00-0.00)		3564	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.173	4.173	0.0	1.066	2849697	2.48		99.3	1172	
663.00 > 169.00	4.173	4.173	0.0	1.066	828238		3.44(1.25-3.76)	99.3	3194	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.395	4.399	-0.004	1.708	3233399	2.51		100	5729	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.395	4.400	-0.005	1.000	779223	2.49		99.6	2925	
713.00 > 219.00	4.395	4.400	-0.005	1.000	544891		1.43(0.71-2.13)	99.6	5524	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.794	4.799	-0.005	1.863	6396595	2.50		100	7999	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.794	4.801	-0.007	1.000	5763175	NC			2066	
813.00 > 169.00	4.794	4.801	-0.007	1.000	944162		6.10(2.86-8.58)		4213	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.131	5.136	-0.005	1.070	6077489	NC			1462	
913.00 > 169.00	5.131	5.136	-0.005	1.070	729623		8.33(3.83-11.48)		3111	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00006 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:20 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_006.d

Injection Date: 06-Aug-2018 11:41:23 Instrument ID: A8_N

Lims ID: IC L5 Full

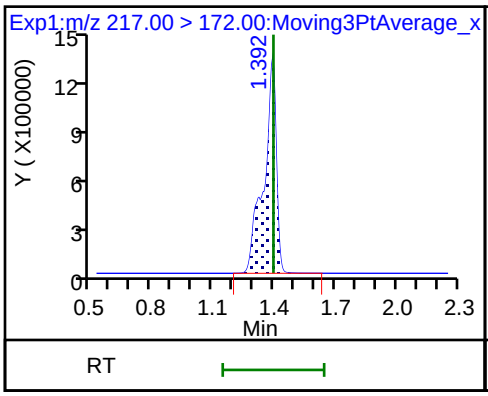
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 6

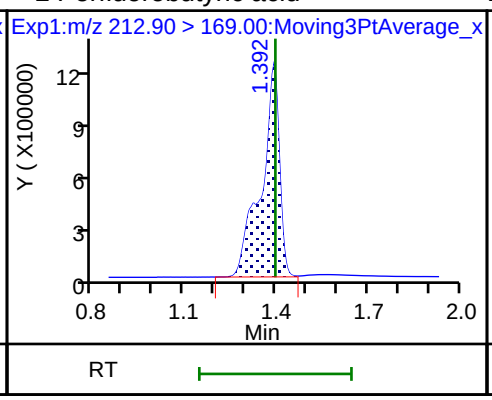
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

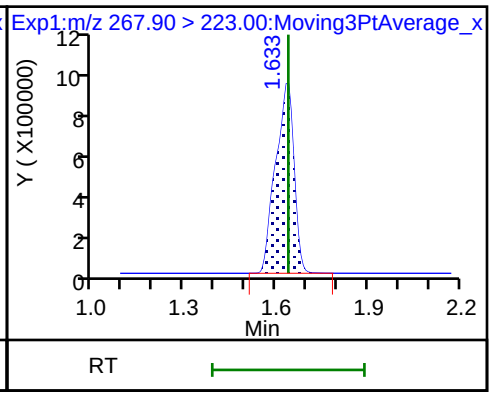
D 1 13C4 PFBA



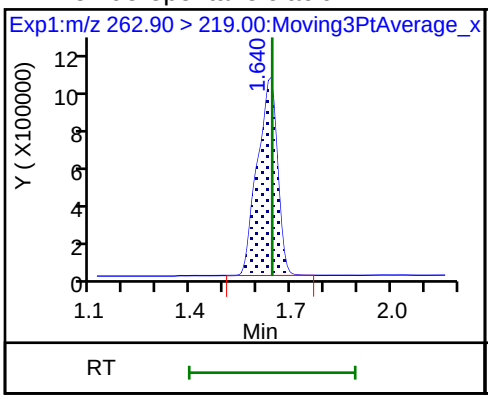
2 Perfluorobutyric acid



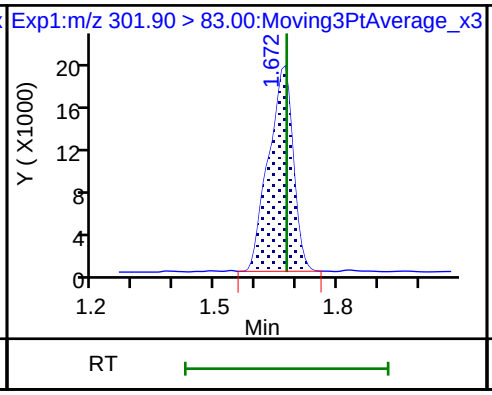
D 3 13C5-PFPeA



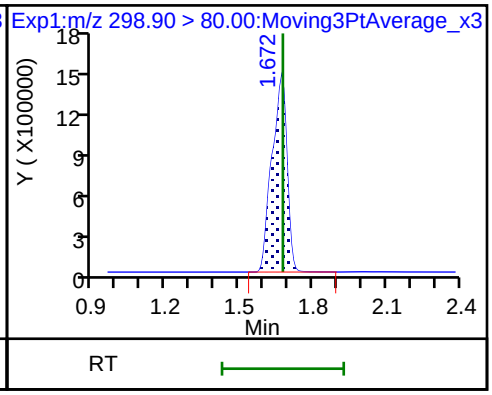
4 Perfluoropentanoic acid



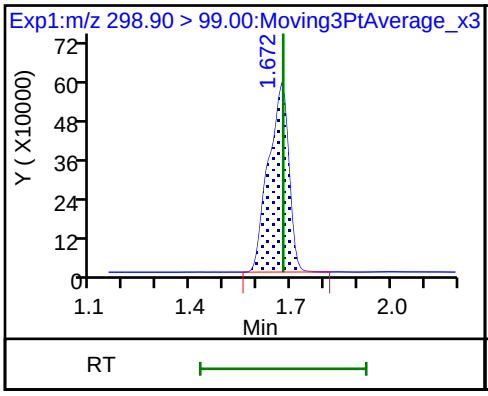
D 47 13C3-PFBS



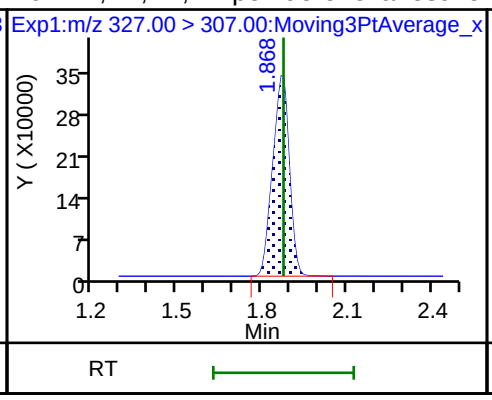
5 Perfluorobutanesulfonic acid



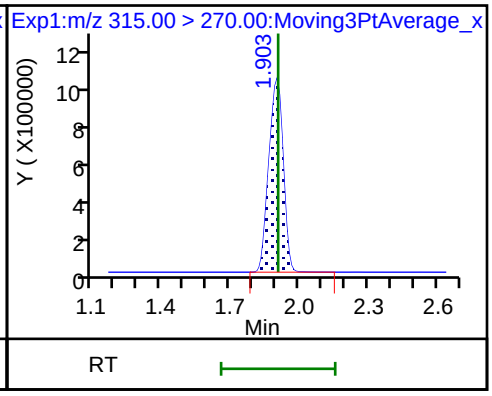
5 Perfluorobutanesulfonic acid



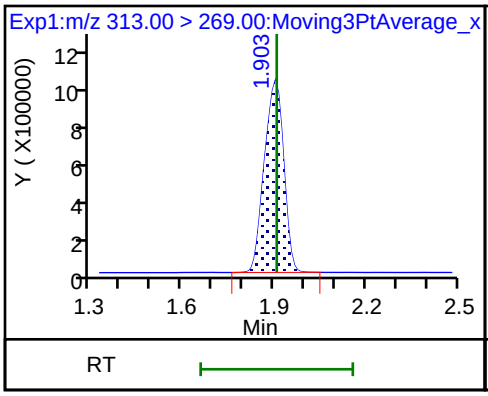
61 1H,1H,2H,2H-perfluorohexanesulfon



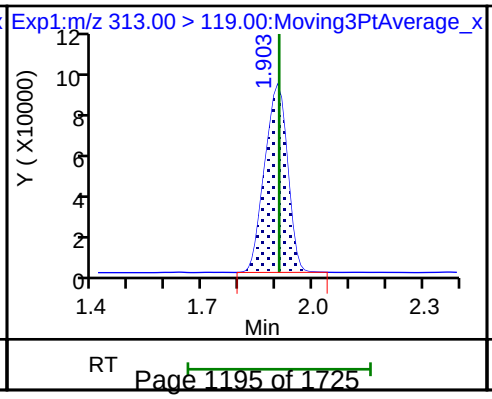
D 7 13C2 PFHxA



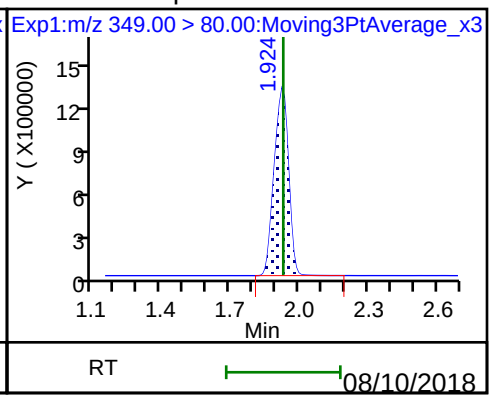
6 Perfluorohexanoic acid



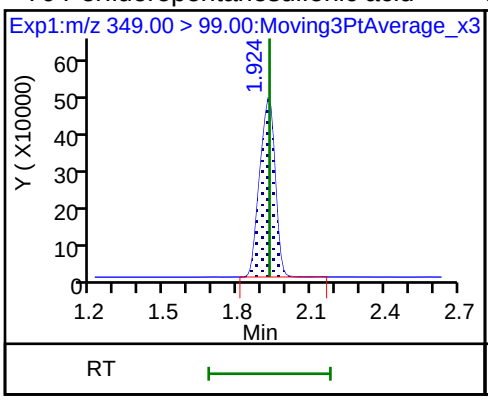
6 Perfluorohexanoic acid



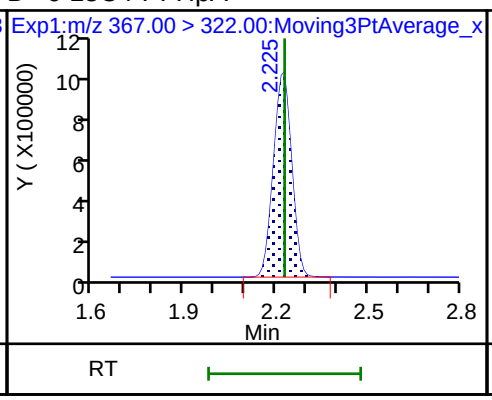
70 Perfluoropentanesulfonic acid



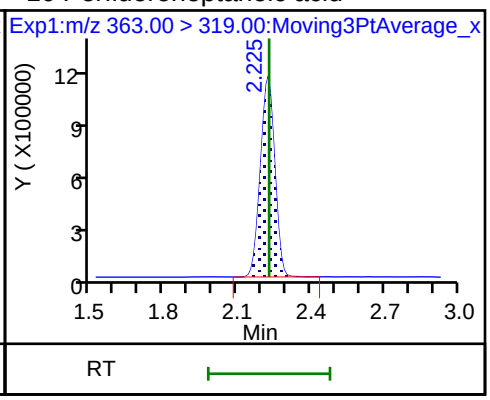
70 Perfluoropentanesulfonic acid



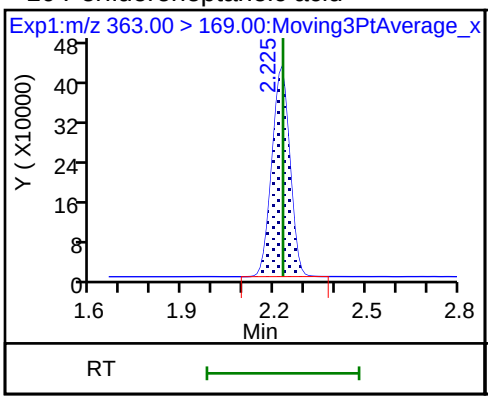
D 9 13C4-PFHpA



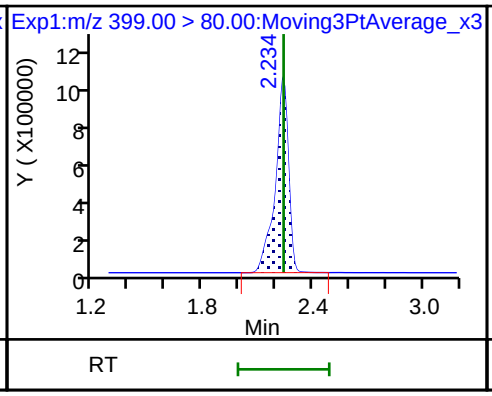
10 Perfluoroheptanoic acid



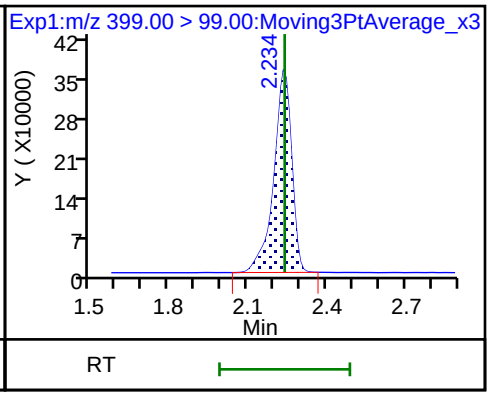
10 Perfluoroheptanoic acid



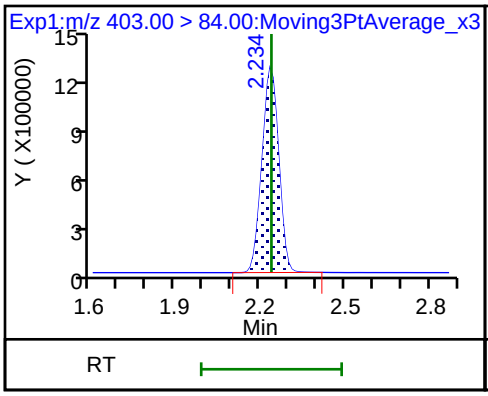
8 Perfluorohexanesulfonic acid



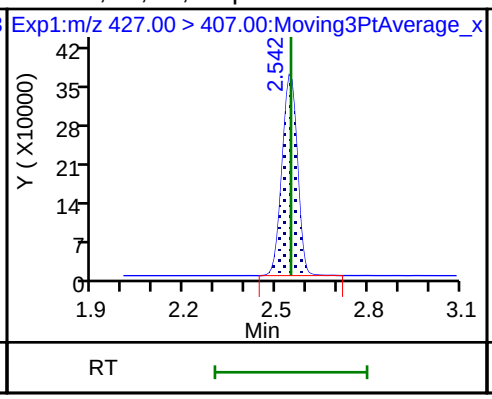
8 Perfluorohexanesulfonic acid



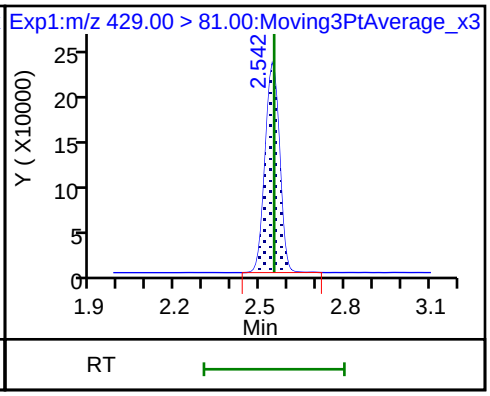
D 11 18O2 PFHxS



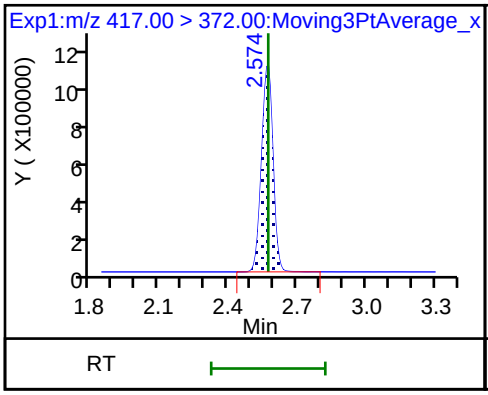
13 1H,1H,2H,2H-perfluorooctanesulfon



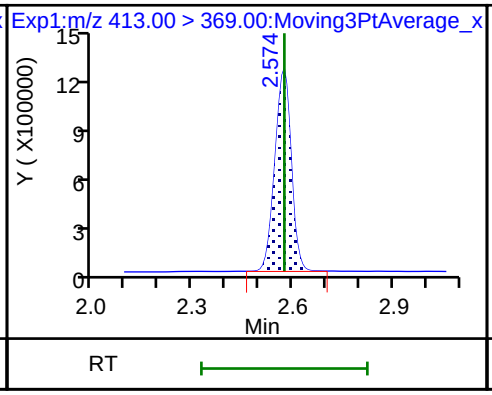
D 12 M2-6:2FTS



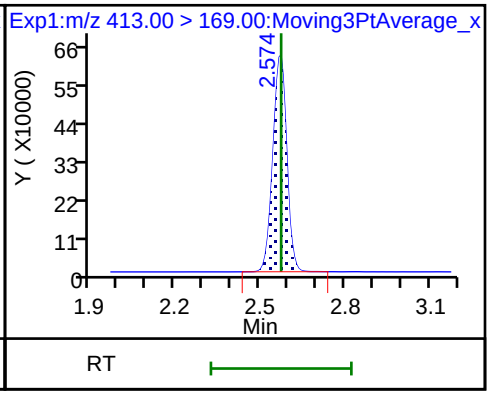
D 14 13C4 PFOA



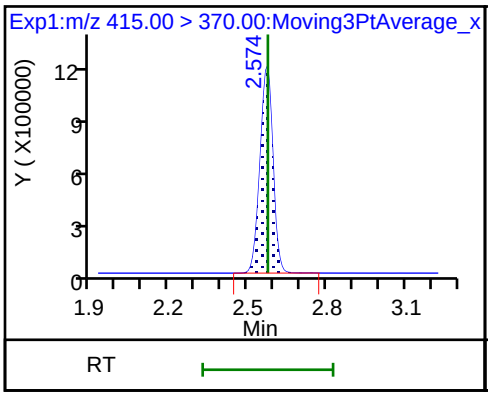
15 Perfluorooctanoic acid



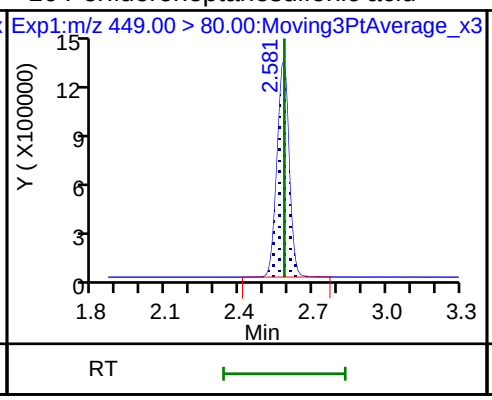
15 Perfluorooctanoic acid



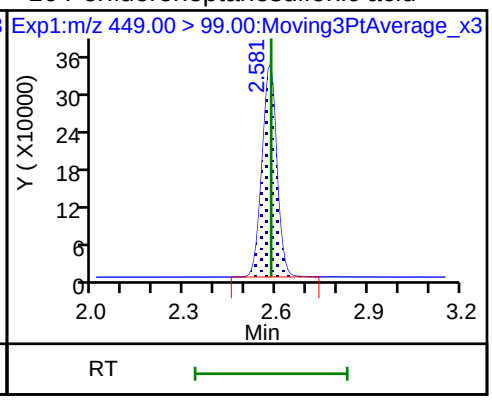
* 62 13C2-PFOA



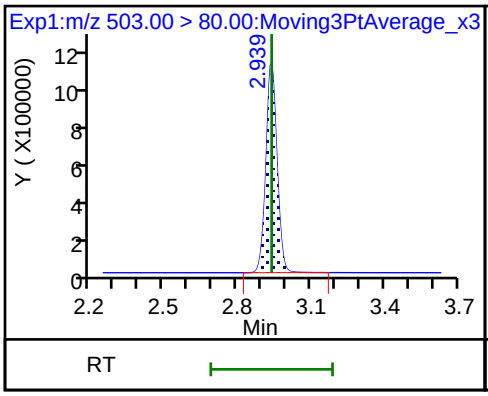
16 Perfluoroheptanesulfonic acid



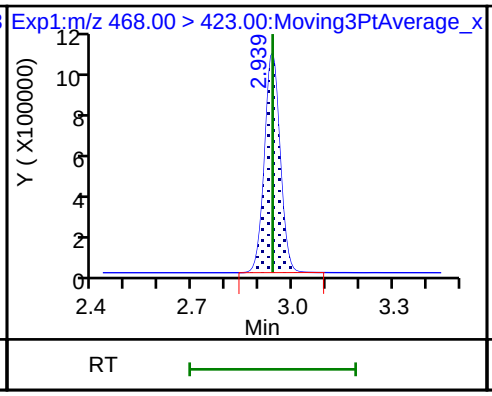
16 Perfluoroheptanesulfonic acid



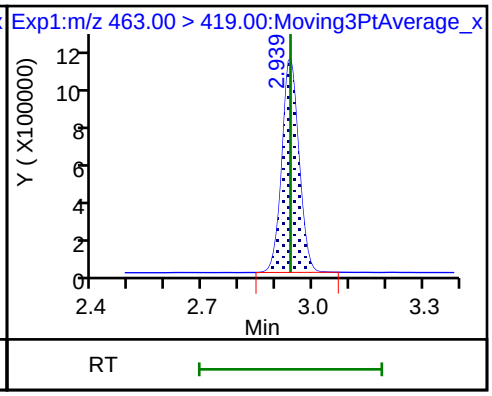
D 18 13C4 PFOS



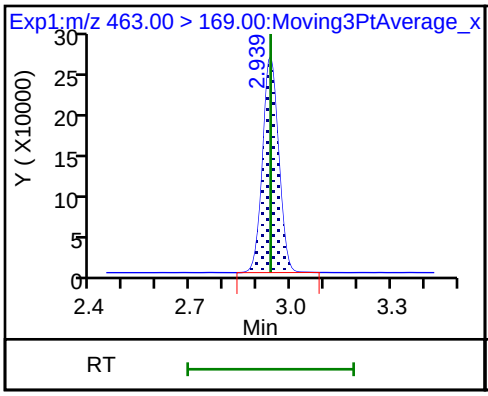
D 19 13C5 PFNA



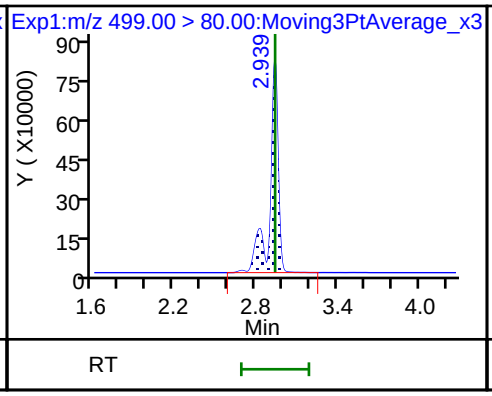
20 Perfluorononanoic acid



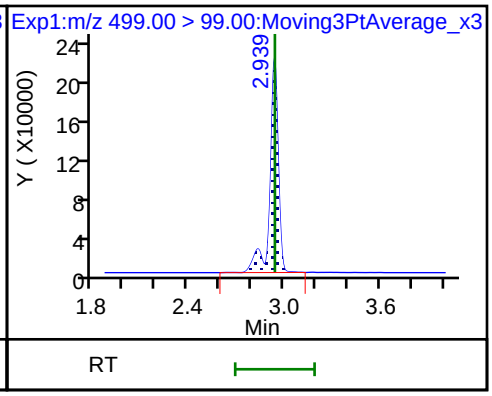
20 Perfluorononanoic acid



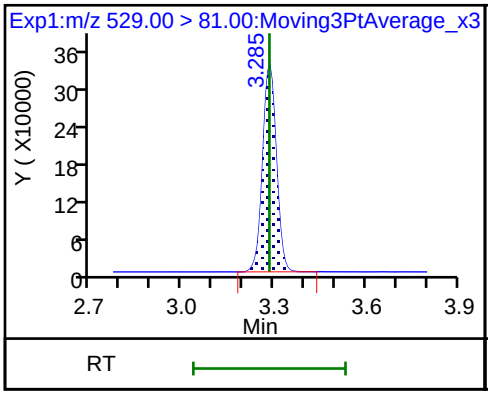
17 Perfluorooctane sulfonic acid



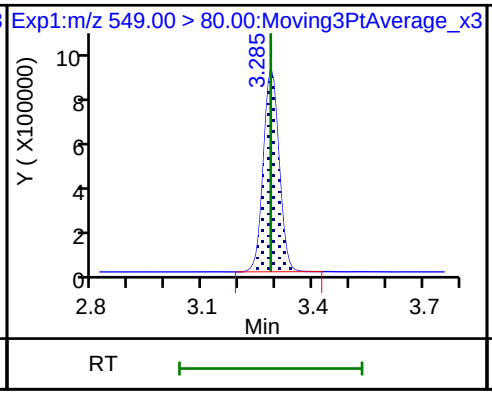
17 Perfluorooctane sulfonic acid



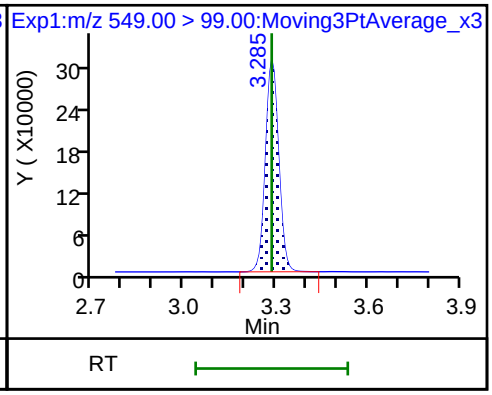
D 26 M2-8:2FTS



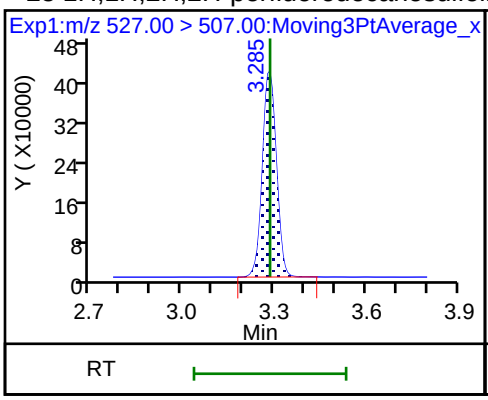
68 Perfluorononanesulfonic acid



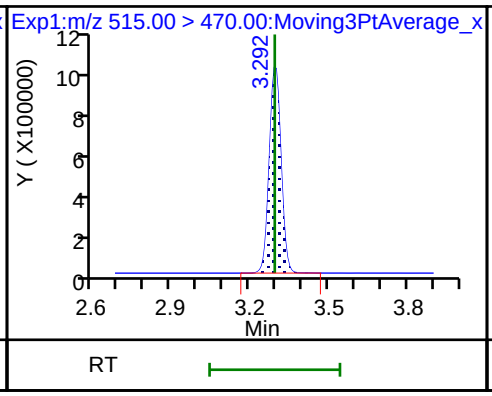
68 Perfluorononanesulfonic acid



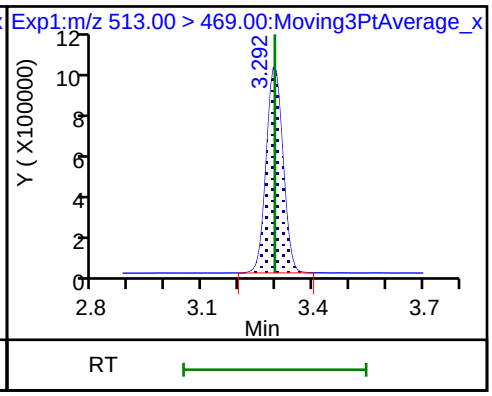
25 1H,1H,2H,2H-perfluorodecanesulfon



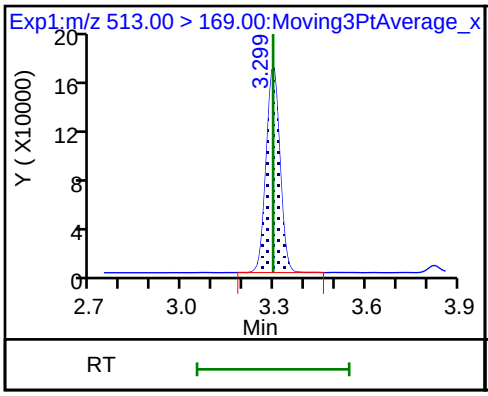
D 23 13C2 PFDA



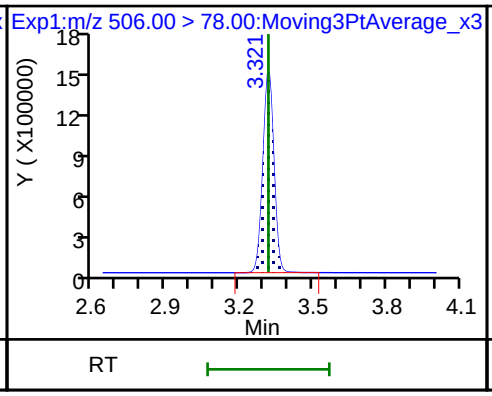
24 Perfluorodecanoic acid



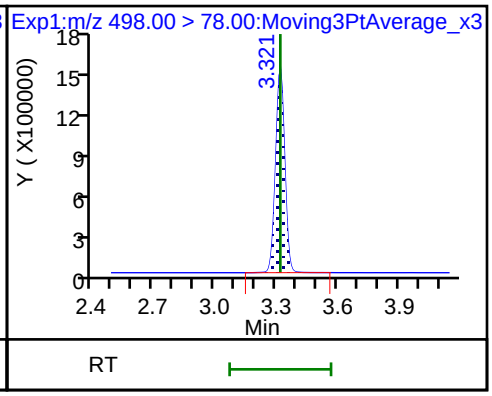
24 Perfluorodecanoic acid



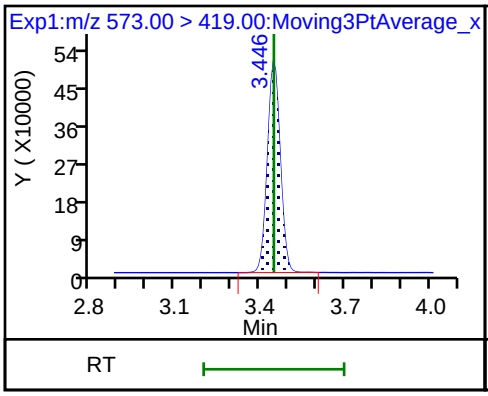
D 21 13C8 FOSA



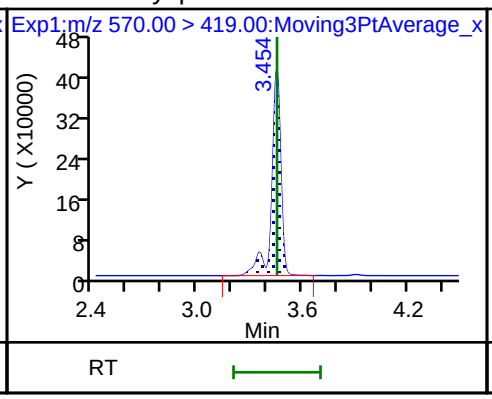
22 Perfluorooctane Sulfonamide



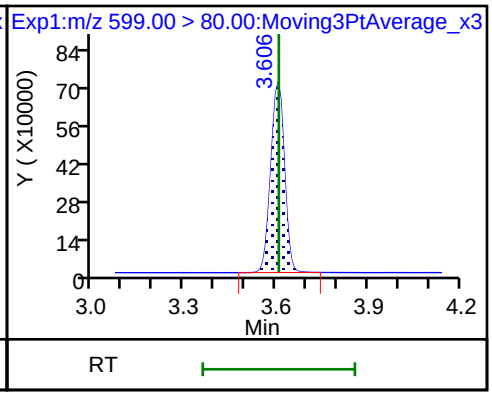
D 27 d3-NMeFOSAA



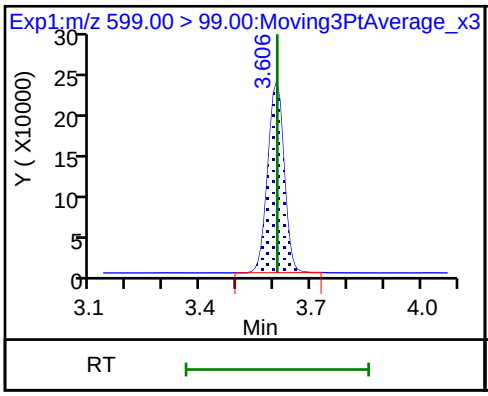
28 N-methyl perfluorooctane sulfonami



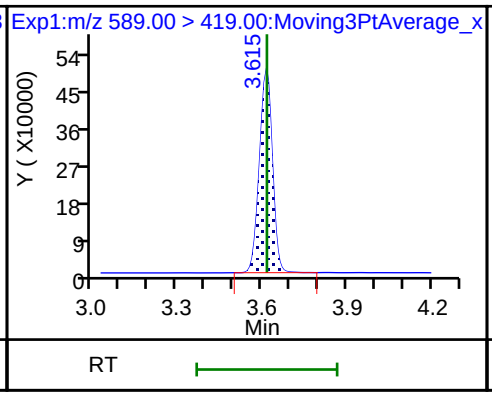
29 Perfluorodecane Sulfonic acid



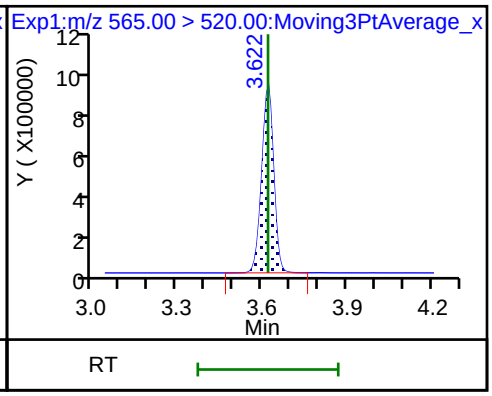
29 Perfluorodecane Sulfonic acid



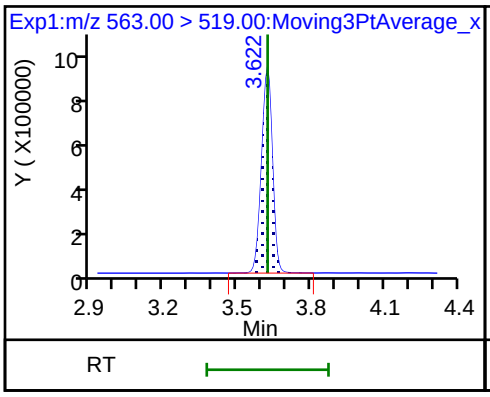
D 32 d5-NEtFOSAA



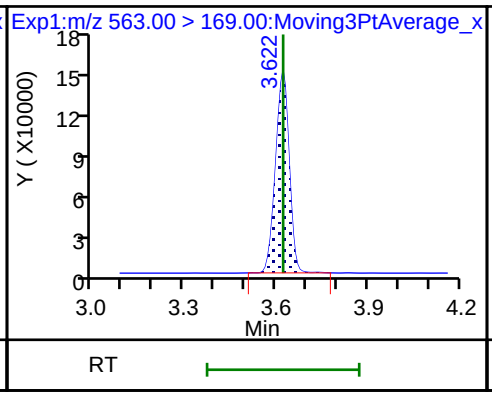
D 30 13C2 PFUnA



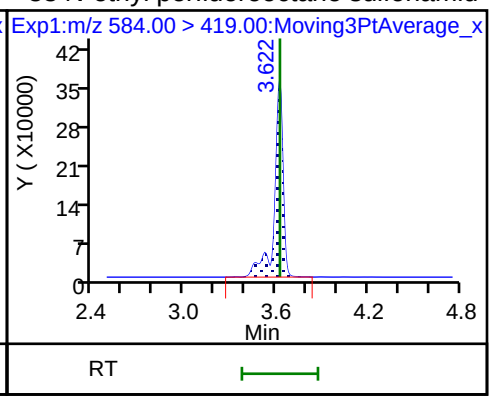
31 Perfluoroundecanoic acid



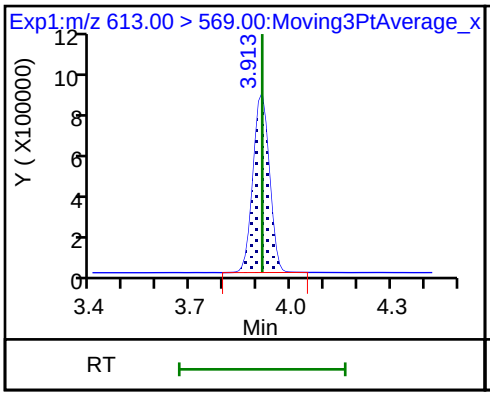
31 Perfluoroundecanoic acid



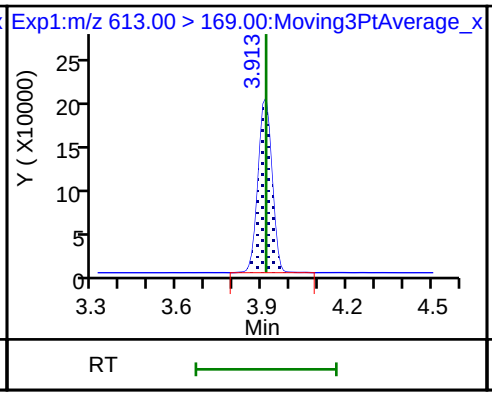
33 N-ethyl perfluorooctane sulfonamid



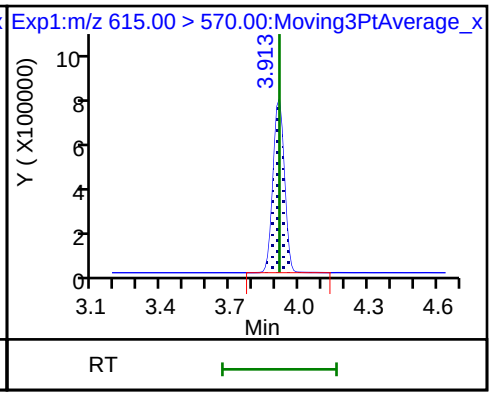
37 Perfluorododecanoic acid



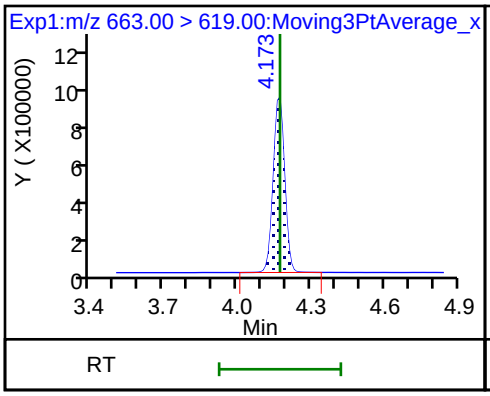
37 Perfluorododecanoic acid



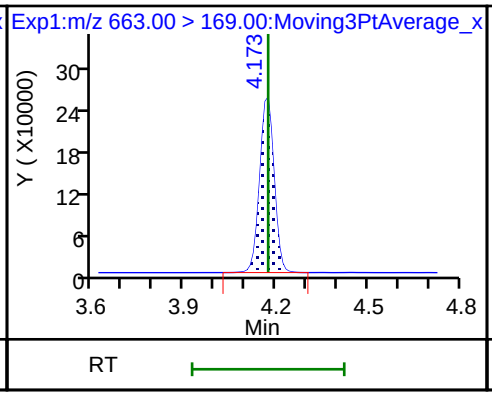
D 36 13C2 PFDoA



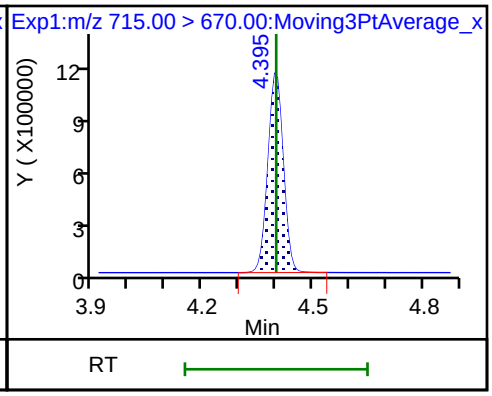
41 Perfluorotridecanoic acid



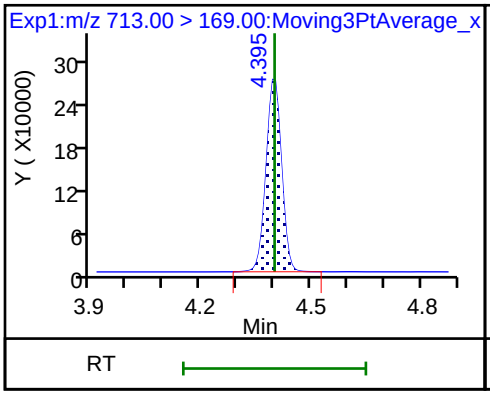
41 Perfluorotridecanoic acid



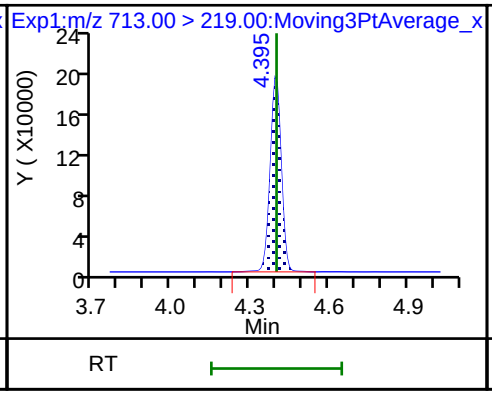
D 43 13C2-PFTeDA



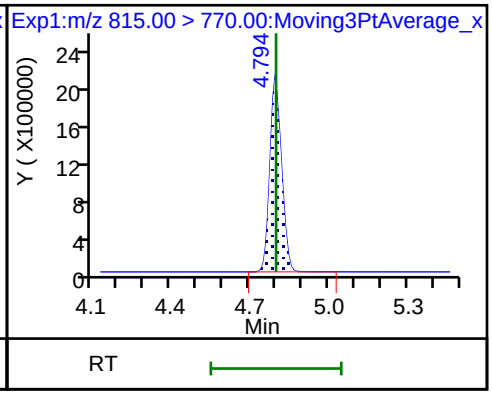
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 06-Aug-2018 11:49:11 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:17:22 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:40:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.394	1.395	-0.001	0.541	5693569	2.54		102	7704	
2 Perfluorobutyric acid										
212.90 > 169.00	1.394	1.397	-0.003	1.000	10686384	5.00		100.0	1220	
D 3 13C5-PFPeA										
267.90 > 223.00	1.636	1.639	-0.003	0.636	3917323	2.54		102	8427	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.643	1.643	0.0	1.005	8717868	4.89		97.8	602	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.651	81531	2.28		98.2	279	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.676	0.0	1.000	12353528	4.64		105	4081	
298.90 > 99.00	1.676	1.676	0.0	1.000	5231288		2.36(1.25-3.74)	105	2506	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.875	-0.003	0.727	609022	NC			998	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.875	-0.003	1.117	2687262	4.62		99.0	10818	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	8802526	4.98		99.5	1994	
313.00 > 119.00	1.907	1.908	-0.001	1.000	793855		11.09(5.03-15.10)	99.5	1839	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.741	4333101	2.47		99.0	9810	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.930	-0.002	1.151	11938702	4.94		105	10425	
349.00 > 99.00	1.928	1.930	-0.002	1.151	4318494		2.76(1.36-4.07)	105	3576	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.777	336215	NC			800	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.001	2.003	-0.002	1.000	1620535	NC			795	
D 9 13C4-PFHpA										
367.00 > 322.00	2.227	2.227	0.0	0.865	4351928	2.52		101	6506	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.000	9106263	4.93		98.5	1787	
363.00 > 169.00	2.227	2.228	-0.001	1.000	3813206		2.39(1.13-3.40)	98.5	5503	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.869	5234562	2.37		100	5690	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	10391537	4.33		95.2	4424	
399.00 > 99.00	2.236	2.239	-0.003	1.000	3502068		2.97(1.50-4.49)	95.2	2351	
65 ADONA										
377.00 > 251.00	2.269	2.271	-0.002	0.774	22851214	NC			14304	
377.00 > 85.00	2.269	2.271	-0.002	0.774	14239580		1.60(0.84-2.53)		11126	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.548	-0.004	1.000	2696182	4.73		99.9	2996	
D 12 M2-6:2FTS										
429.00 > 81.00	2.544	2.549	-0.005	0.988	859900	2.37		99.8	3069	
D 73 13C8 PFOA										
421.00 > 376.00	2.568	2.571	-0.003	0.997	7461246	NC			9011	
D 14 13C4 PFOA										
417.00 > 372.00	2.568	2.573	-0.005	0.997	3963063	2.51		100	5629	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.568	2.574	-0.006	1.000	8637324	4.82		96.3	834	
413.00 > 169.00	2.574	2.574	0.0	1.003	4333301		1.99(0.84-2.52)	96.3	3910	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		4046341	2.50			5779	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.880	8721667	4.85		102	5365	
449.00 > 99.00	2.581	2.583	-0.002	0.880	2296888		3.80(1.94-5.82)	102	2733	
D 72 13C8 PFOS										
507.00 > 99.00	2.933	2.938	-0.005	1.139	1714648	NC			3239	
20 Perfluorononanoic acid										
463.00 > 419.00	2.933	2.939	-0.006	1.000	7475851	5.13		103	1834	
463.00 > 169.00	2.933	2.939	-0.006	1.000	1732734		4.31(1.90-5.69)	103	4946	
D 19 13C5 PFNA										
468.00 > 423.00	2.933	2.939	-0.006	1.139	3461355	2.44		97.5	7405	
D 18 13C4 PFOS										
503.00 > 80.00	2.933	2.939	-0.006	1.139	3471061	2.39		100	4088	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.933	2.940	-0.007	1.000	7339820	4.71		101	4397	
499.00 > 99.00	2.933	2.940	-0.007	1.000	1648492		4.45(2.31-6.93)	101	2215	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.147	3.150	-0.003	1.073	11940295	NC			9089	
D 26 M2-8:2FTS										
529.00 > 81.00	3.278	3.284	-0.006	1.273	1052330	2.40		100	2990	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.278	3.285	-0.006	1.118	5361178	4.91		102	6489	
549.00 > 99.00	3.278	3.285	-0.006	1.118	1913317		2.80(1.33-3.97)	102	4125	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.278	3.286	-0.008	1.000	2679186	4.69		98.0	7666	
D 23 13C2 PFDA										
515.00 > 470.00	3.291	3.294	-0.003	1.279	3159574	2.54		101	5723	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.291	3.296	-0.005	1.000	6298810	4.97		99.4	3082	
513.00 > 169.00	3.291	3.296	-0.005	1.000	1066541		5.91(2.36-7.09)	99.4	375	
D 21 13C8 FOSA										
506.00 > 78.00	3.313	3.317	-0.004	1.287	4781606	2.49		99.4	7259	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.313	3.319	-0.006	1.000	9594151	5.15		103	5632	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.338	1562466	2.45		98.1	3298	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.446	3.453	-0.007	1.000	3073336	5.10		102	1851	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.605	3.608	-0.003	1.229	4472904	4.87		101	6207	
599.00 > 99.00	3.605	3.608	-0.003	1.229	1485053		3.01(1.39-4.16)	101	3079	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.614	3.616	-0.002	1.404	1597197	2.42		96.8	1213	
D 30 13C2 PFUnA										
565.00 > 520.00	3.620	3.620	0.0	1.406	2455806	2.45		98.1	4433	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.620	3.622	-0.002	1.000	5365541	4.86		97.2	2645	
563.00 > 169.00	3.620	3.622	-0.002	1.000	966969		5.55(2.12-6.36)	97.2	3828	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.620	3.623	-0.003	1.002	2815576	4.94		98.8	3781	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.776	3.781	-0.005	1.287	18718037	NC			15847	
35 MeFOSA										
512.00 > 169.00	3.825	3.826	-0.001		2815632	NC			1284	
D 36 13C2 PFDoA										
615.00 > 570.00	3.912	3.913	-0.001	1.519	2627551	2.48		99.3	5544	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.912	3.913	-0.001	1.193	1978025	NC			5592	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.912	3.913	-0.001	1.000	5646629	4.83		96.6	2368	
613.00 > 169.00	3.912	3.913	-0.001	1.000	1341283		4.21(2.13-6.40)	96.6	4604	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.143	4.148	-0.005	1.413	1963594	NC			4220	
699.00 > 99.00	4.143	4.148	-0.005	1.413	2852468		0.69(0.00-0.00)		6658	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.172	4.173	-0.001	1.066	5879570	5.20		104	1968	
663.00 > 169.00	4.172	4.173	-0.001	1.066	1735255		3.39(1.25-3.76)	104	3374	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.394	4.399	-0.005	1.707	3382019	2.51		100	6979	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.402	4.400	0.002	1.002	1606848	4.91		98.2	5145	
713.00 > 219.00	4.394	4.400	-0.006	1.000	1111841		1.45(0.71-2.13)	98.2	2346	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.800	4.799	0.001	1.864	6730439	2.51		101	7597	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.800	4.801	-0.001	1.000	11833130	NC			3519	
813.00 > 169.00	4.800	4.801	-0.001	1.000	2057982		5.75(2.86-8.58)		6089	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.135	5.136	-0.001	1.070	12433827	NC			2663	
913.00 > 169.00	5.128	5.136	-0.008	1.068	1501219		8.28(3.83-11.48)		4432	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00007 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_007.d

Injection Date: 06-Aug-2018 11:49:11 Instrument ID: A8_N

Lims ID: IC L6 Full

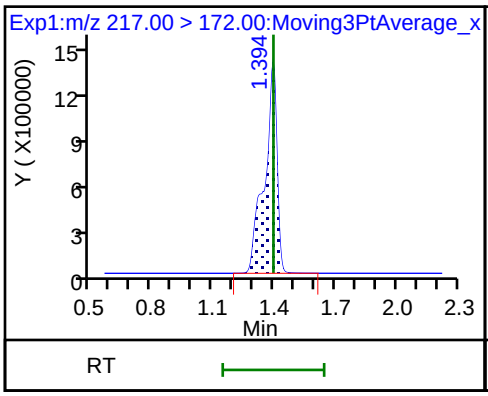
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 15 Worklist Smp#: 7

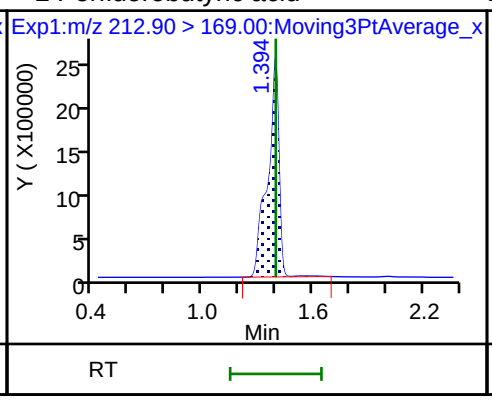
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

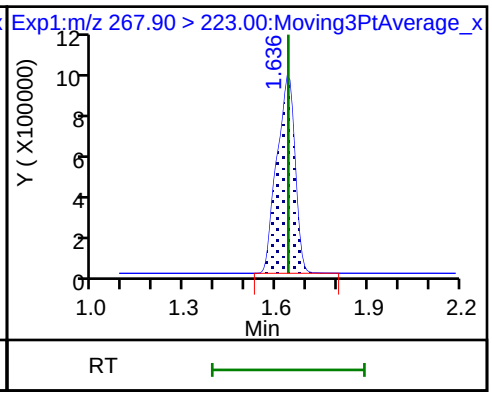
D 1 13C4 PFBA



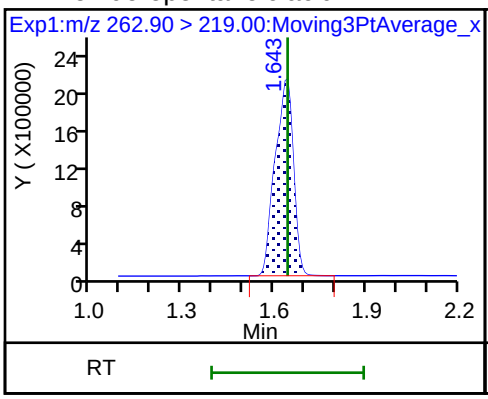
2 Perfluorobutyric acid



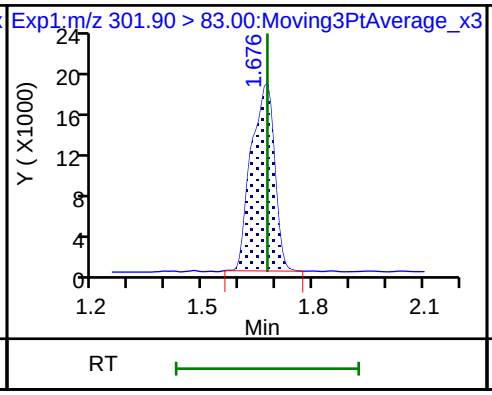
D 3 13C5-PFPeA



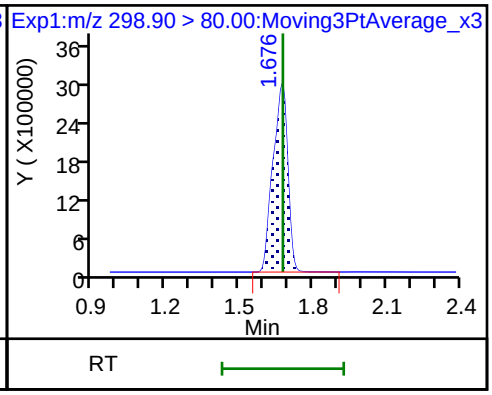
4 Perfluoropentanoic acid



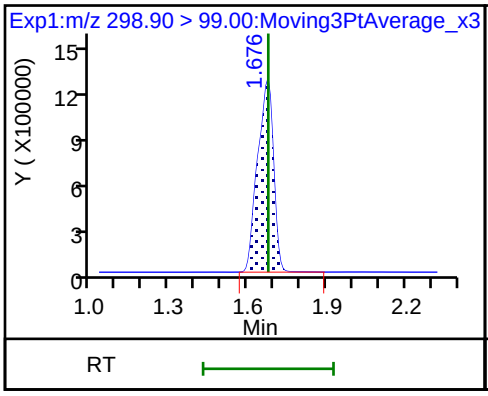
D 47 13C3-PFBS



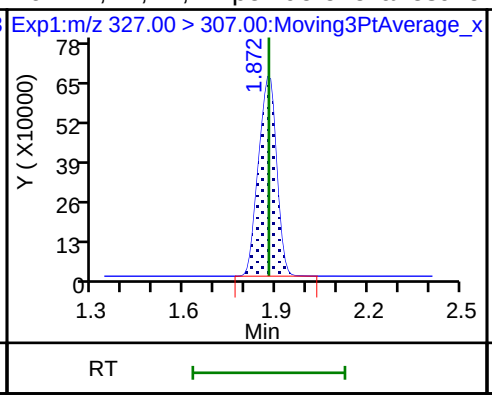
5 Perfluorobutanesulfonic acid



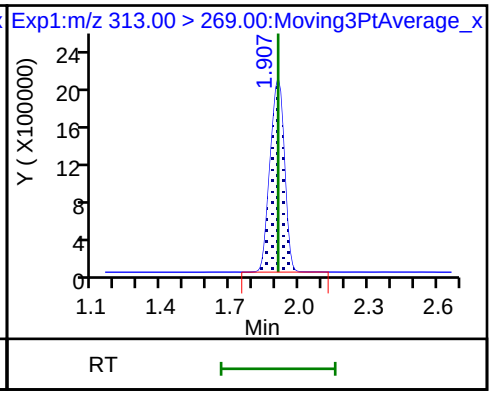
5 Perfluorobutanesulfonic acid



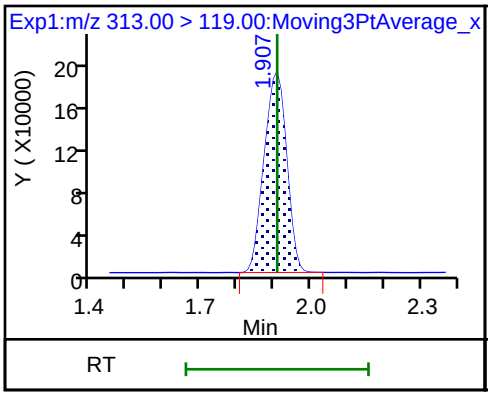
61 1H,1H,2H,2H-perfluorohexanesulfoni



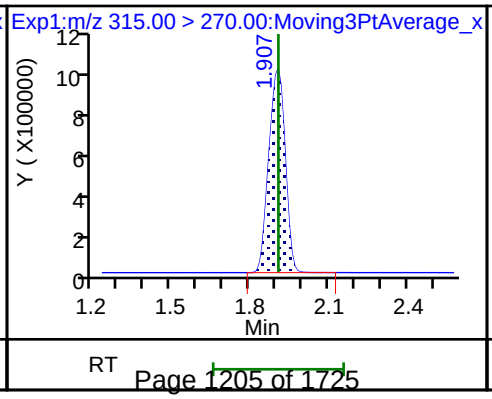
6 Perfluorohexanoic acid



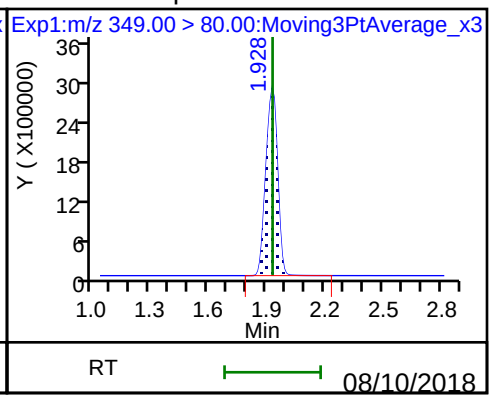
6 Perfluorohexanoic acid



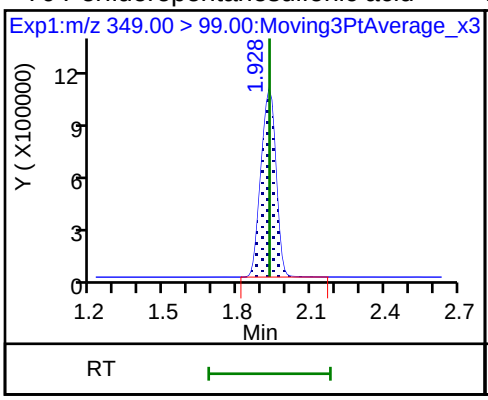
D 7 13C2 PFHxA



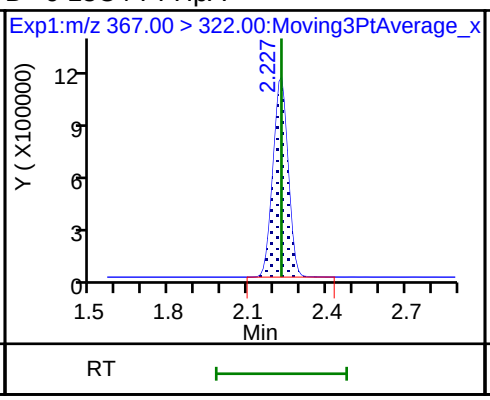
70 Perfluoropentanesulfonic acid



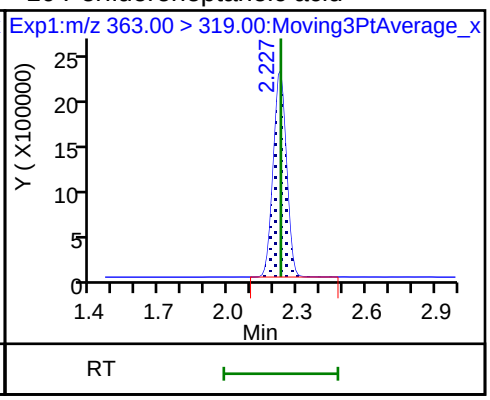
70 Perfluoropentanesulfonic acid



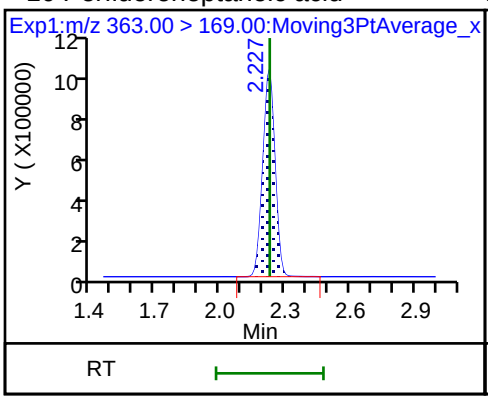
D 9 13C4-PFHpA



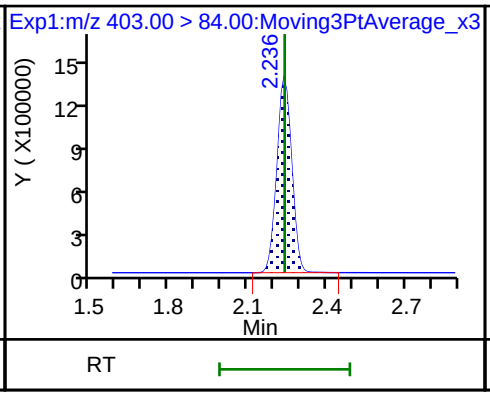
10 Perfluoroheptanoic acid



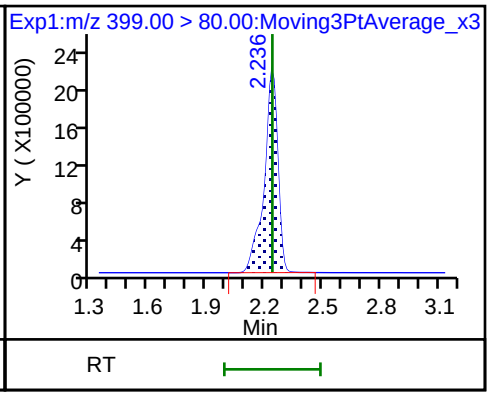
10 Perfluoroheptanoic acid



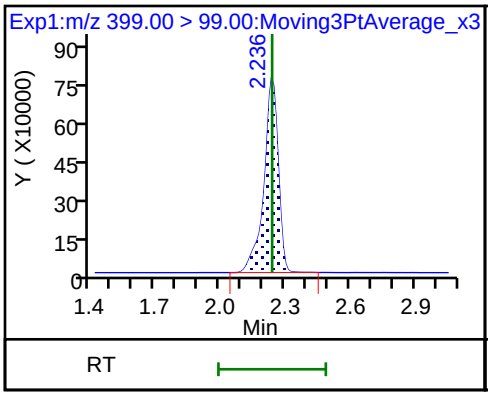
D 11 18O2 PFHxS



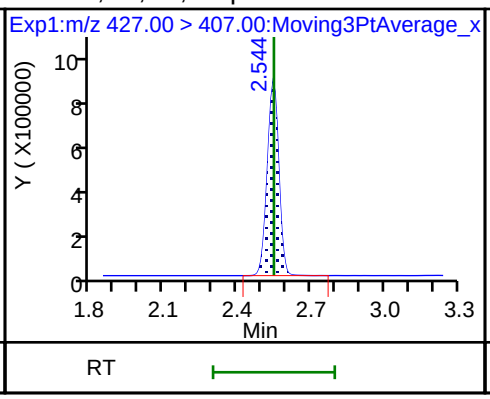
8 Perfluorohexanesulfonic acid



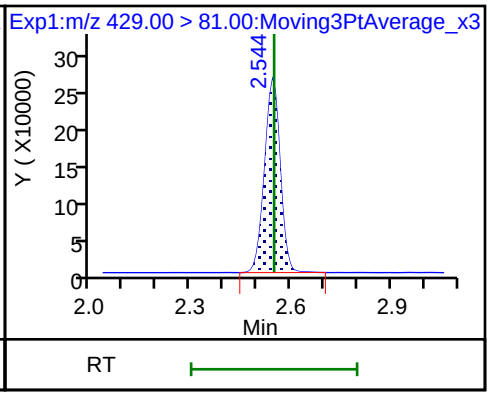
8 Perfluorohexanesulfonic acid



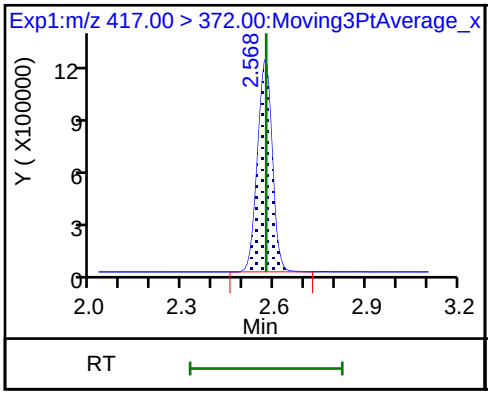
13 1H,1H,2H,2H-perfluorooctanesulfon



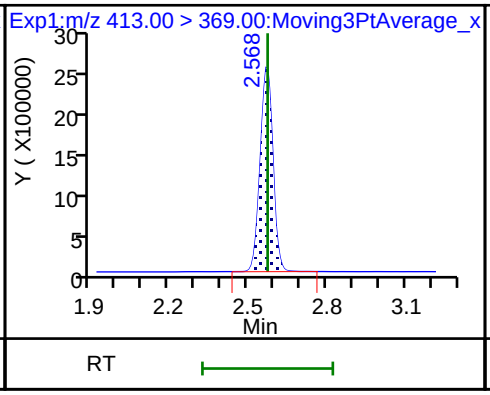
D 12 M2-6:2FTS



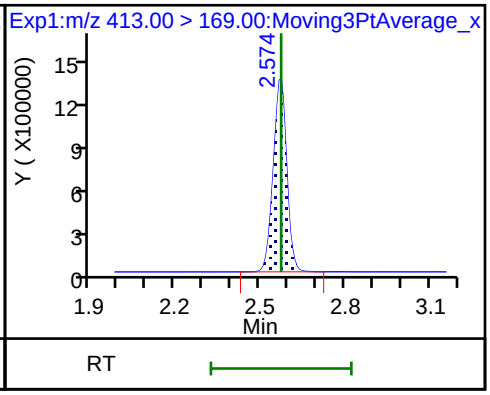
D 14 13C4 PFOA



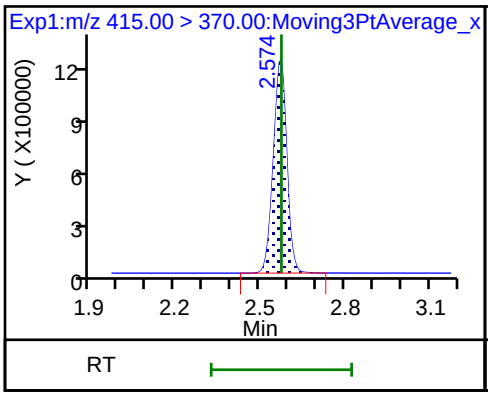
15 Perfluorooctanoic acid



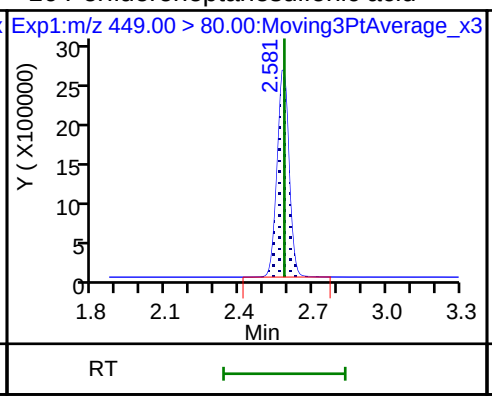
15 Perfluorooctanoic acid



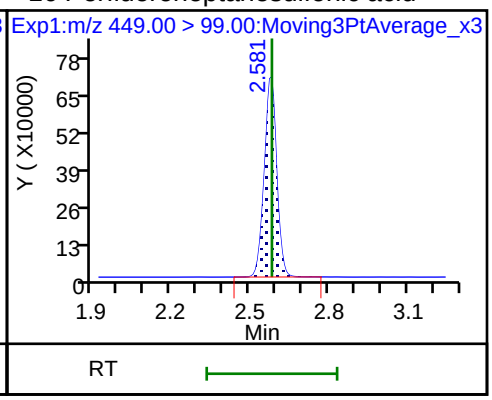
* 62 13C2-PFOA



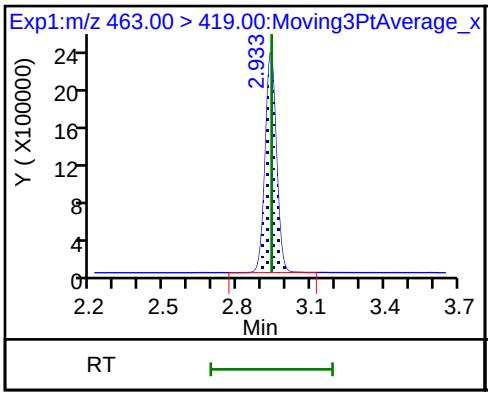
16 Perfluoroheptanesulfonic acid



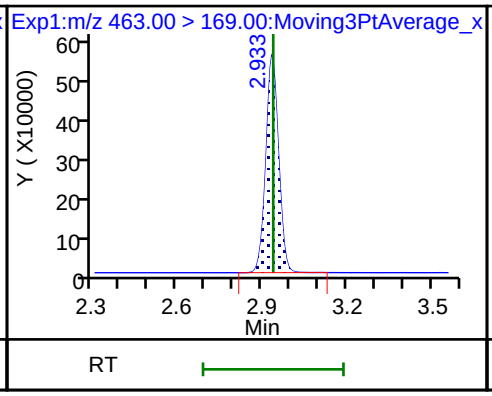
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid



20 Perfluorononanoic acid



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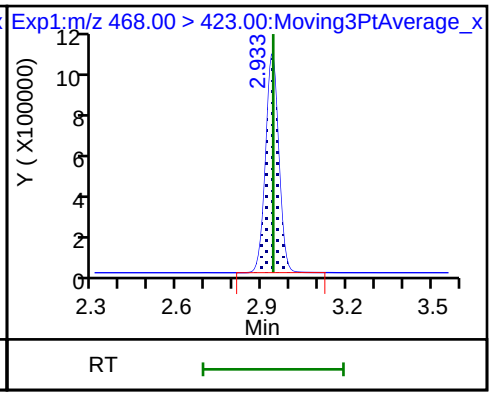

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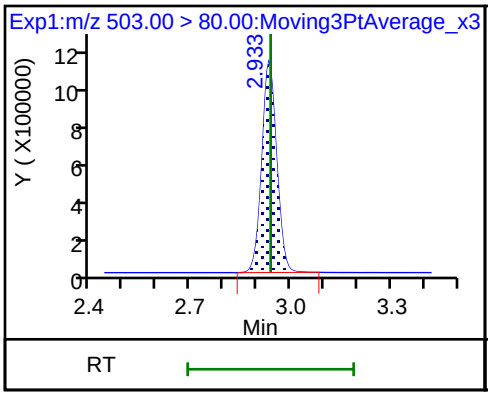
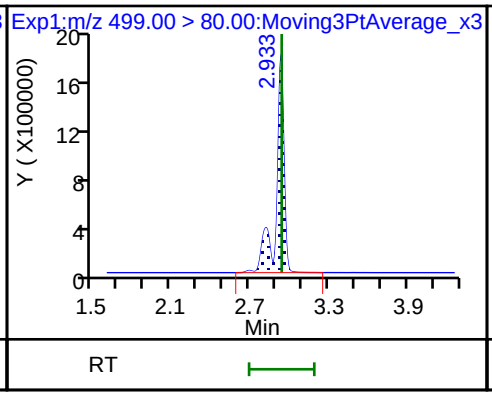
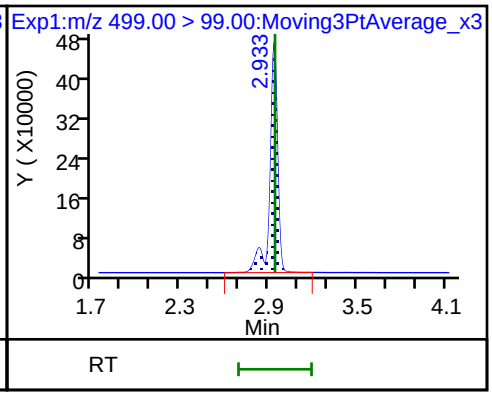


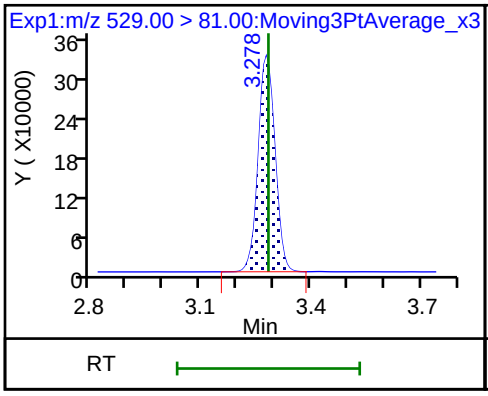
17 Perfluorooctane sulfonic acid



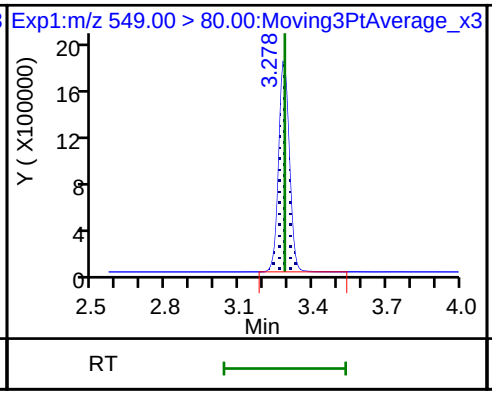
17 Perfluorooctane sulfonic acid



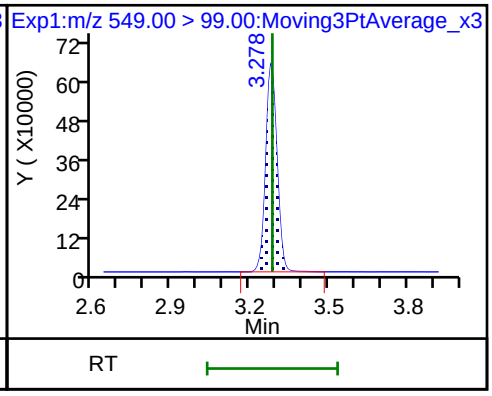
D 26 M2-8:2FTS



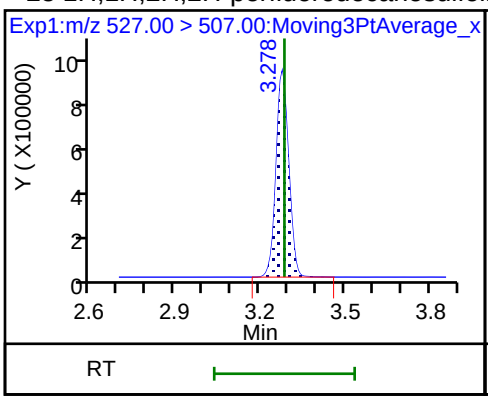
68 Perfluorononanesulfonic acid



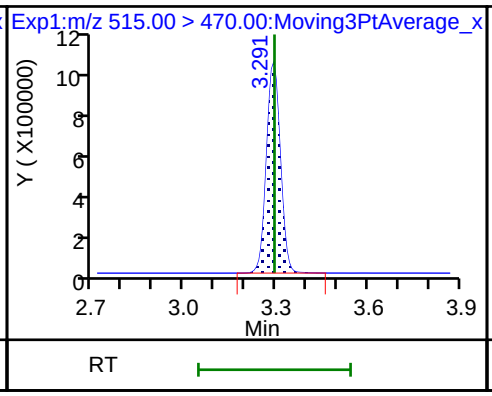
68 Perfluorononanesulfonic acid



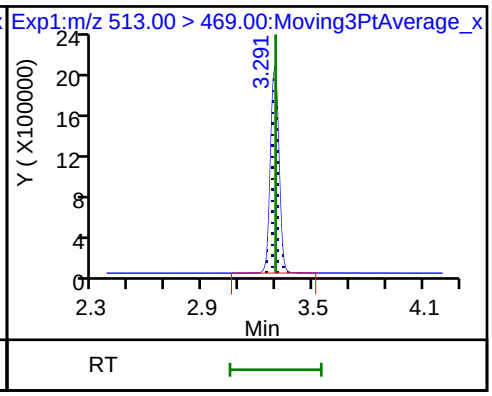
25 1H,1H,2H,2H-perfluorodecanesulfon



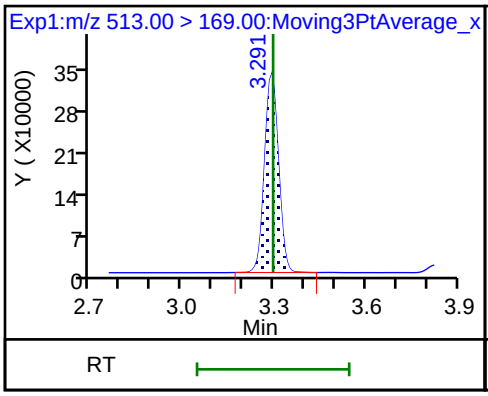
D 23 13C2 PFDA



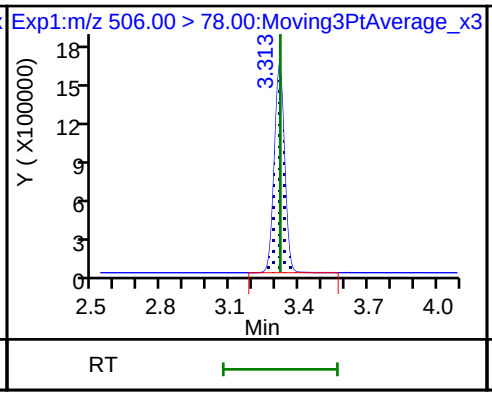
24 Perfluorodecanoic acid



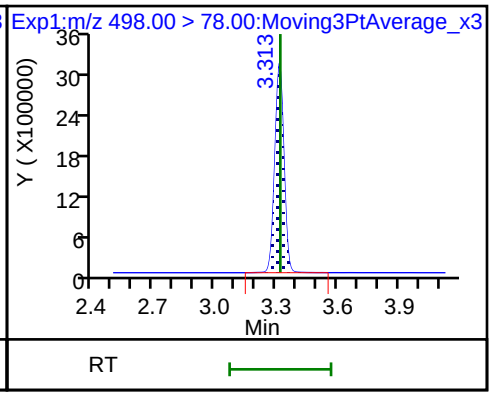
24 Perfluorodecanoic acid



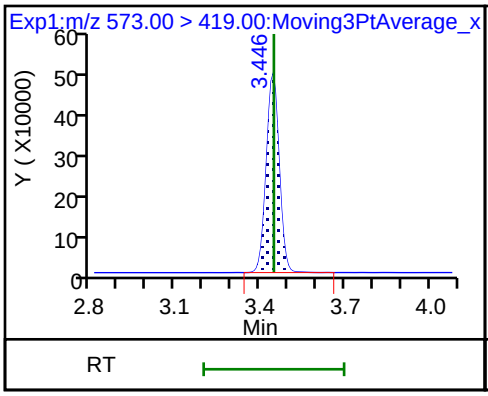
D 21 13C8 FOSA



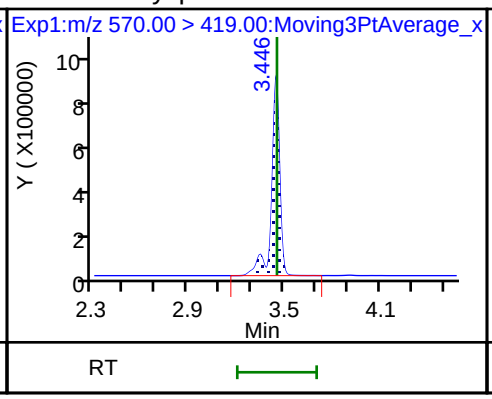
22 Perfluorooctane Sulfonamide



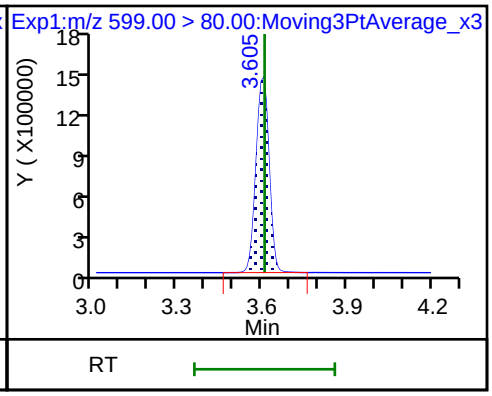
D 27 d3-NMeFOSAA



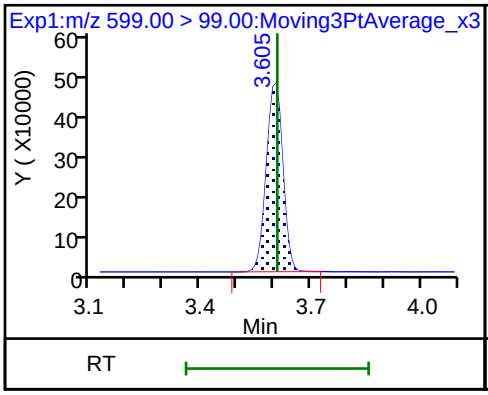
28 N-methyl perfluorooctane sulfonami



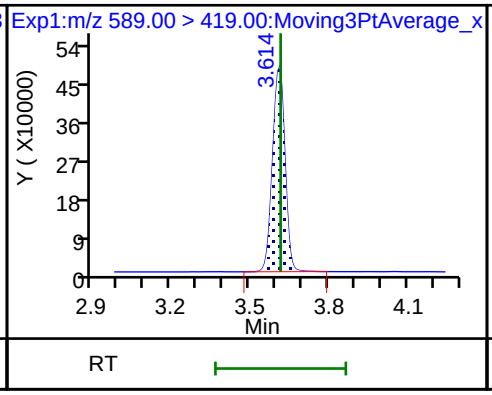
29 Perfluorodecane Sulfonic acid



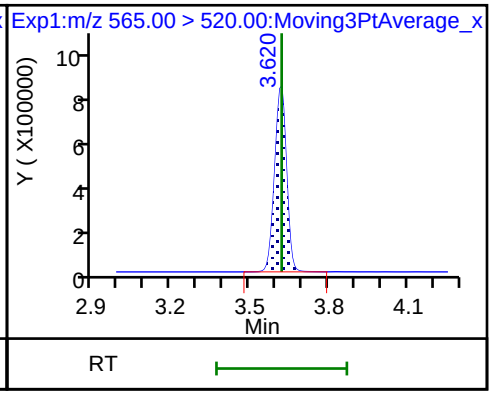
29 Perfluorodecane Sulfonic acid



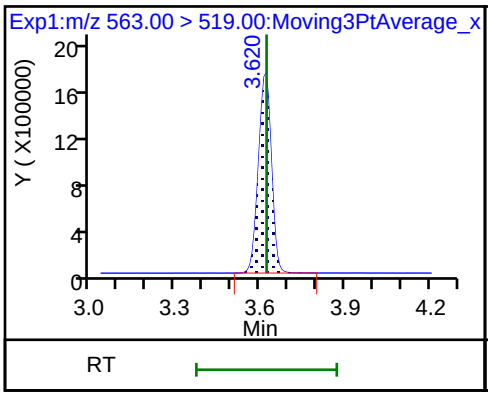
D 32 d5-NEtFOSAA



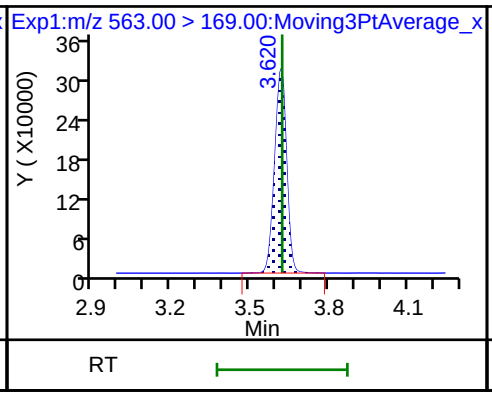
D 30 13C2 PFUnA



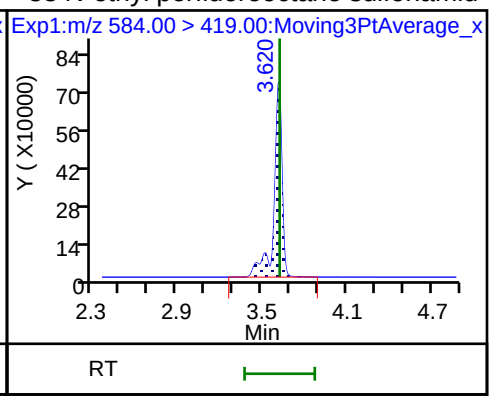
31 Perfluoroundecanoic acid



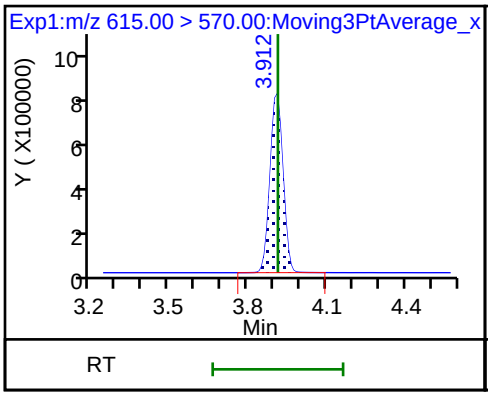
31 Perfluoroundecanoic acid



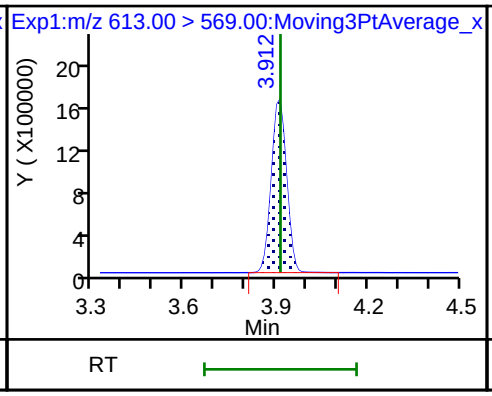
33 N-ethyl perfluorooctane sulfonamid



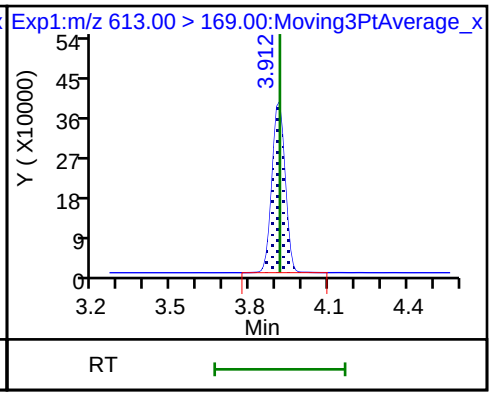
D 36 13C2 PFDoA



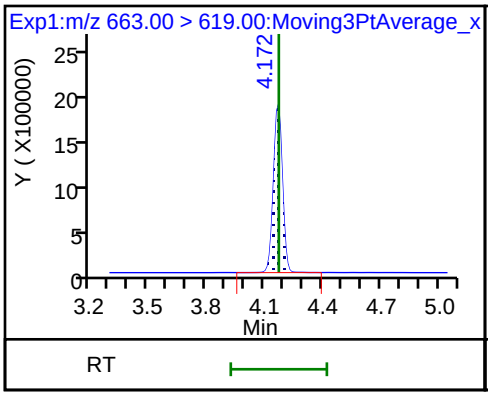
37 Perfluorododecanoic acid



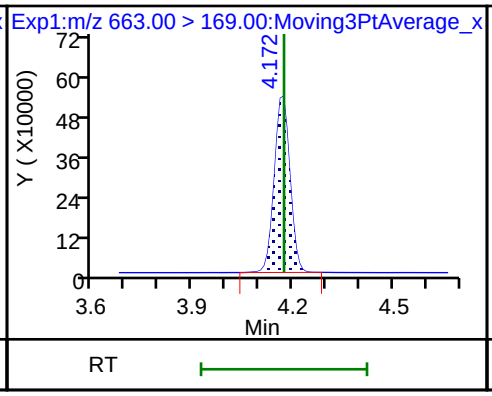
37 Perfluorododecanoic acid



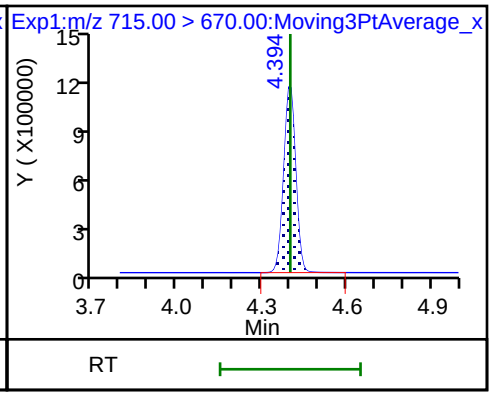
41 Perfluorotridecanoic acid



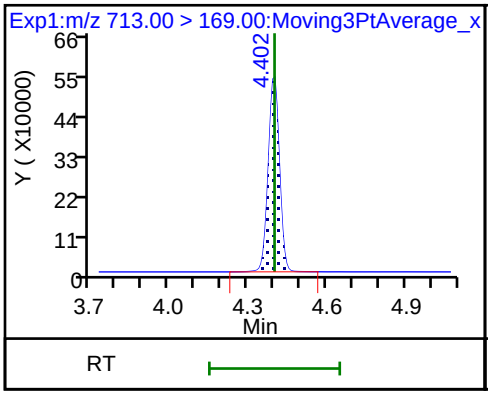
41 Perfluorotridecanoic acid



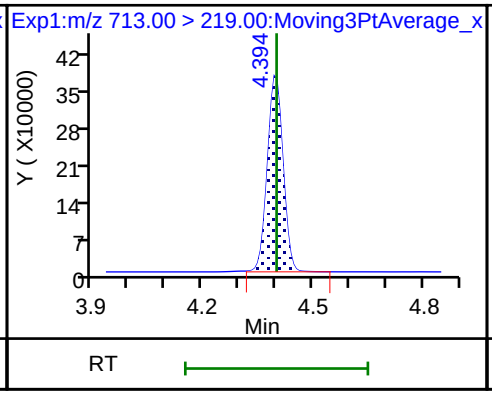
D 43 13C2-PFTeDA



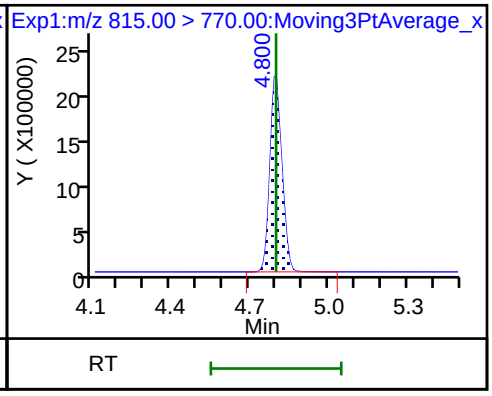
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 06-Aug-2018 11:56:59 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:17:27 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:40:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.393	1.395	-0.002	0.543	5373122	2.59		104	8955	
2 Perfluorobutyric acid										
212.90 > 169.00	1.398	1.397	0.001	1.004	19976933	9.90		99.0	2232	
D 3 13C5-PFPeA										
267.90 > 223.00	1.636	1.639	-0.003	0.637	3665379	2.57		103	10131	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.643	1.643	0.0	1.005	16137329	9.67		96.7	1088	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.675	0.0	0.653	80382	2.43		105	383	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.676	-0.001	1.000	21980500	8.37		94.7	5584	
298.90 > 99.00	1.675	1.676	-0.001	1.000	9699800		2.27(1.25-3.74)	94.7	4353	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.875	-0.003	1.117	5031154	8.78		94.0	19015	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.875	-0.003	0.729	526817	NC			662	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.743	4032113	2.49		99.5	6971	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	16015982	9.73		97.3	3097	
313.00 > 119.00	1.907	1.908	-0.001	1.000	1512000		10.59(5.03-15.10)	97.3	4252	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.930	-0.002	1.151	20439230	8.58		91.4	14928	
349.00 > 99.00	1.928	1.930	-0.002	1.151	8089990		2.53(1.36-4.07)	91.4	6469	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.001	2.003	-0.002	1.000	3129271	NC			1411	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.779	325849	NC			928	
D 9 13C4-PFHpA										
367.00 > 322.00	2.227	2.227	0.0	0.867	3899256	2.44		97.8	10839	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.000	16791846	10.1		101	2753	
363.00 > 169.00	2.227	2.228	-0.001	1.000	6618023		2.54(1.13-3.40)	101	6159	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	18945578	8.66		95.2	5842	
399.00 > 99.00	2.236	2.239	-0.003	1.000	6725945		2.82(1.50-4.49)	95.2	3280	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.871	4771422	2.33		98.7	7147	
65 ADONA										
377.00 > 251.00	2.269	2.271	-0.002	0.774	37729670	NC			19741	
377.00 > 85.00	2.269	2.271	-0.002	0.774	24564041		1.54(0.84-2.53)		8345	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.548	-0.004	1.000	5013052	9.72		103	5460	
D 12 M2-6:2FTS										
429.00 > 81.00	2.544	2.549	-0.005	0.991	778460	2.32		97.7	2269	
D 73 13C8 PFOA										
421.00 > 376.00	2.567	2.571	-0.004	1.000	6892356	NC			15661	
D 14 13C4 PFOA										
417.00 > 372.00	2.567	2.573	-0.006	1.000	3722009	2.54		102	8195	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.003	15733520	9.35		93.4	1426	
413.00 > 169.00	2.567	2.574	-0.007	1.000	8441832		1.86(0.84-2.52)	93.4	6654	
* 62 13C2-PFOA										
415.00 > 370.00	2.567	2.575	-0.008		3743332	2.50			5893	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.880	15722427	9.23		96.9	5659	
449.00 > 99.00	2.581	2.583	-0.002	0.880	4425328		3.55(1.94-5.82)	96.9	3345	
D 72 13C8 PFOS										
507.00 > 99.00	2.933	2.938	-0.005	1.142	1541520	NC			4287	
D 18 13C4 PFOS										
503.00 > 80.00	2.933	2.939	-0.006	1.142	3286355	2.45		102	3679	
D 19 13C5 PFNA										
468.00 > 423.00	2.933	2.939	-0.006	1.142	3213782	2.45		97.9	5714	
20 Perfluorononanoic acid										
463.00 > 419.00	2.933	2.939	-0.006	1.000	13269892	9.80		98.0	3367	
463.00 > 169.00	2.939	2.939	0.0	1.002	3365018		3.94(1.90-5.69)	98.0	6693	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.002	13677354	9.26		99.8	4268	
499.00 > 99.00	2.939	2.940	-0.001	1.002	3143905		4.35(2.31-6.93)	99.8	4772	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.146	3.150	-0.004	1.073	21558959	NC			9734	
D 26 M2-8:2FTS										
529.00 > 81.00	3.278	3.284	-0.006	1.277	920670	2.27		94.8	3125	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.284	3.285	0.0	1.120	9847776	9.52		99.2	6966	
549.00 > 99.00	3.278	3.285	-0.006	1.118	3544459		2.78(1.33-3.97)	99.2	4072	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.278	3.286	-0.008	1.000	4806399	9.62		100	8267	
D 23 13C2 PFDA										
515.00 > 470.00	3.291	3.294	-0.003	1.282	2921735	2.54		101	4151	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.291	3.296	-0.005	1.000	11426488	9.75		97.5	5078	
513.00 > 169.00	3.291	3.296	-0.005	1.000	1895278		6.03(2.36-7.09)	97.5	380	
D 21 13C8 FOSA										
506.00 > 78.00	3.313	3.317	-0.004	1.290	4531636	2.55		102	5690	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.320	3.319	0.001	1.002	16995473	9.63		96.3	5922	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.342	1491160	2.53		101	3267	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.446	3.453	-0.007	1.000	5898014	10.3		103	2718	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.605	3.608	-0.003	1.229	8074266	9.29		96.4	7721	
599.00 > 99.00	3.605	3.608	-0.003	1.229	2686974		3.00(1.39-4.16)	96.4	3936	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.613	3.616	-0.003	1.407	1403844	2.30		92.0	1026	
D 30 13C2 PFUnA										
565.00 > 520.00	3.613	3.620	-0.007	1.407	2281933	2.46		98.5	3233	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.620	3.622	-0.002	1.002	9915678	9.67		96.7	4400	
563.00 > 169.00	3.613	3.622	-0.009	1.000	1720527		5.76(2.12-6.36)	96.7	3803	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.620	3.623	-0.003	1.002	5094367	10.2		102	3513	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.776	3.781	-0.005	1.287	30579411	NC			12956	
35 MeFOSA										
512.00 > 169.00	3.825	3.826	-0.001		5720935	NC			1392	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.911	3.913	-0.002	1.000	10658790	9.88		98.8	3649	
613.00 > 169.00	3.911	3.913	-0.002	1.000	2518515		4.23(2.13-6.40)	98.8	5134	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.911	3.913	-0.002	1.193	3456093	NC			4921	
D 36 13C2 PFDoA										
615.00 > 570.00	3.911	3.913	-0.002	1.523	2422707	2.47		98.9	3347	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.142	4.148	-0.006	1.412	3692356	NC			8127	
699.00 > 99.00	4.142	4.148	-0.006	1.412	5250911		0.70(0.00-0.00)		7654	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.171	4.173	-0.002	1.066	10067689	9.66		96.6	2777	
663.00 > 169.00	4.171	4.173	-0.002	1.066	3084095		3.26(1.25-3.76)	96.6	5037	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.394	4.399	-0.005	1.711	3074334	2.46		98.5	5617	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.394	4.400	-0.006	1.000	3032661	10.2		102	6149	
713.00 > 219.00	4.394	4.400	-0.006	1.000	2077180		1.46(0.71-2.13)	102	5141	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.792	4.799	-0.007	1.866	6197635	2.50		100	8201	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.792	4.801	-0.009	1.000	20527532	NC			4806	
813.00 > 169.00	4.792	4.801	-0.009	1.000	3783975		5.42(2.86-8.58)		8314	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.127	5.136	-0.009	1.070	21448602	NC			3703	
913.00 > 169.00	5.127	5.136	-0.009	1.070	2812581		7.63(3.83-11.48)		4640	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00006 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Injection Date: 06-Aug-2018 11:56:59 Instrument ID: A8_N

Lims ID: IC L7 Full

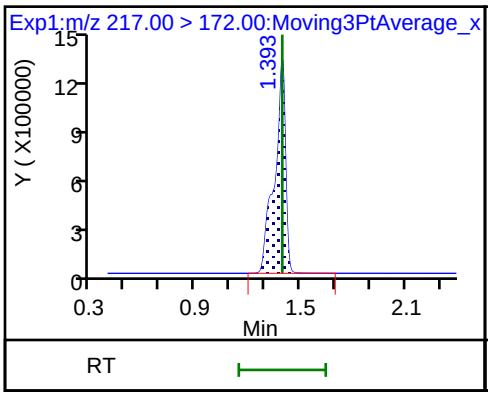
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 16 Worklist Smp#: 8

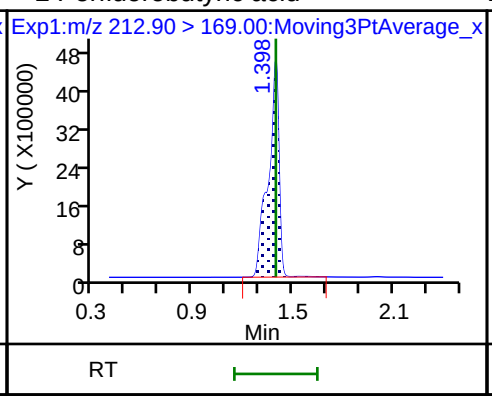
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

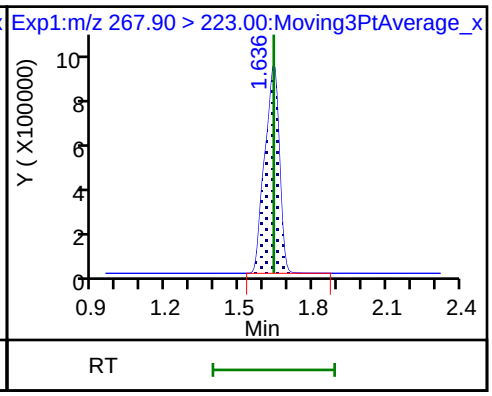
D 1 13C4 PFBA



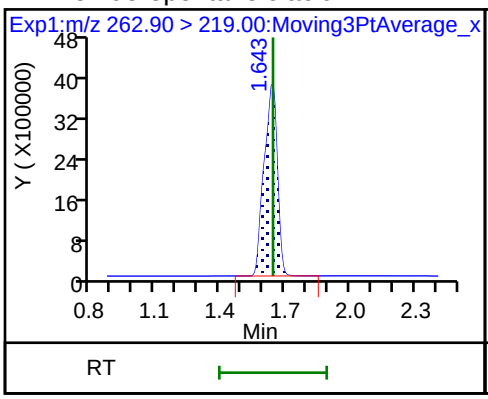
2 Perfluorobutyric acid



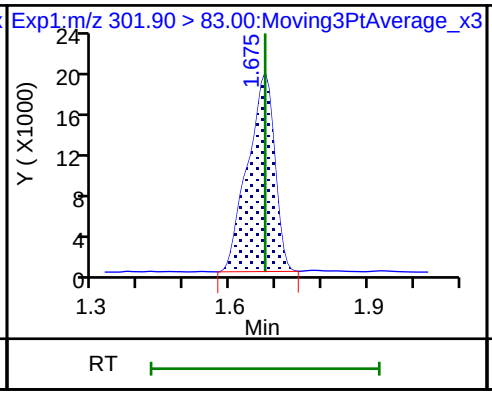
D 3 13C5-PFPeA



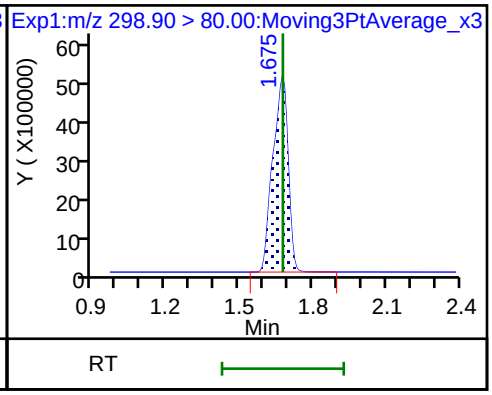
4 Perfluoropentanoic acid



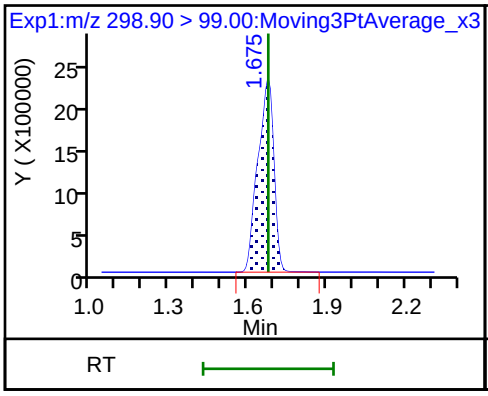
D 47 13C3-PFBS



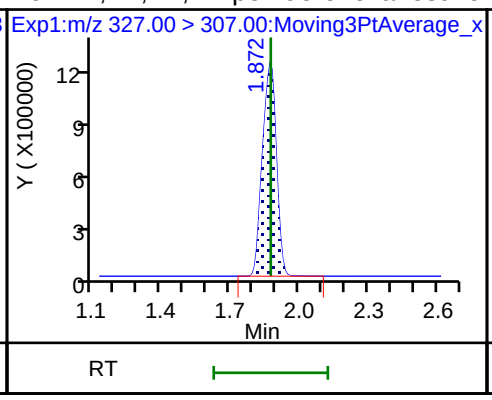
5 Perfluorobutanesulfonic acid



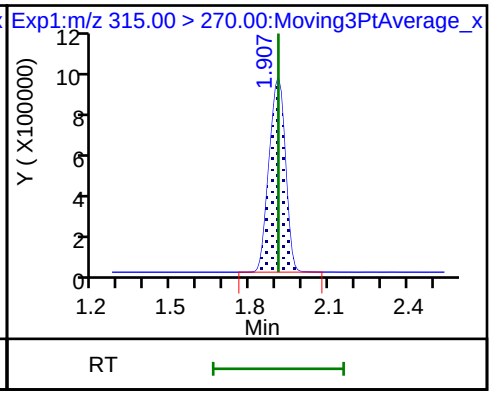
5 Perfluorobutanesulfonic acid



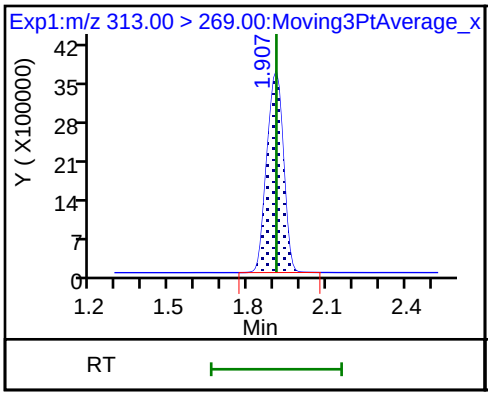
61 1H,1H,2H,2H-perfluorohexanesulfon



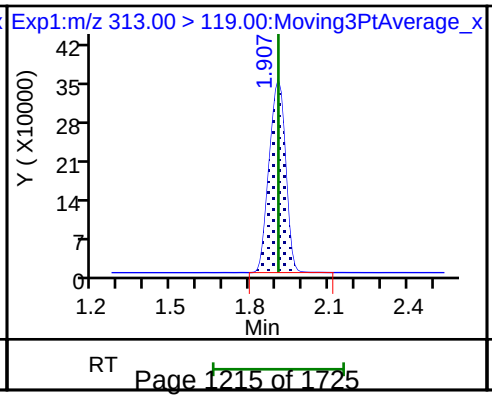
D 7 13C2 PFHxA



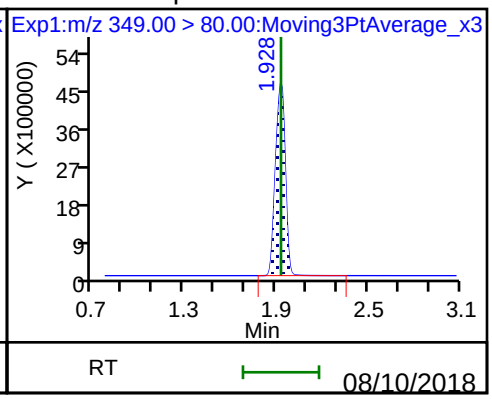
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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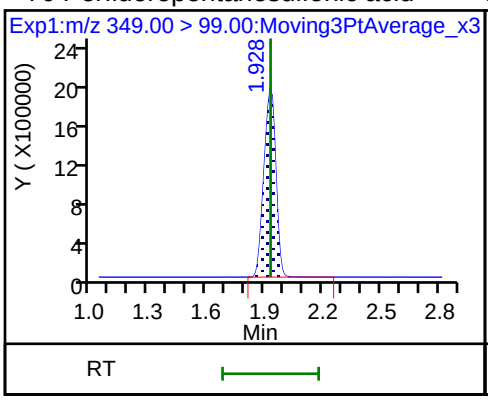
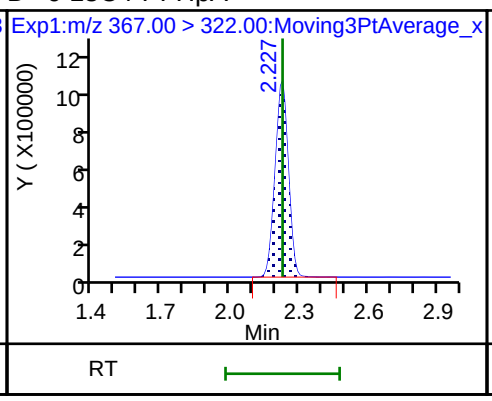
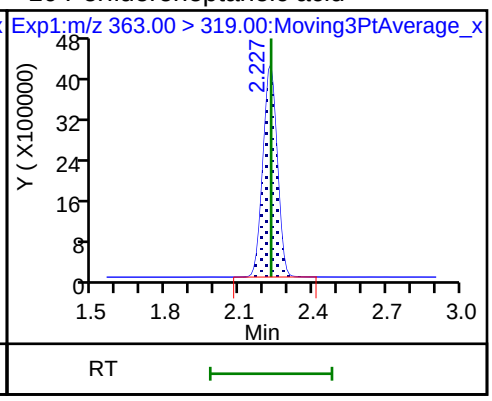


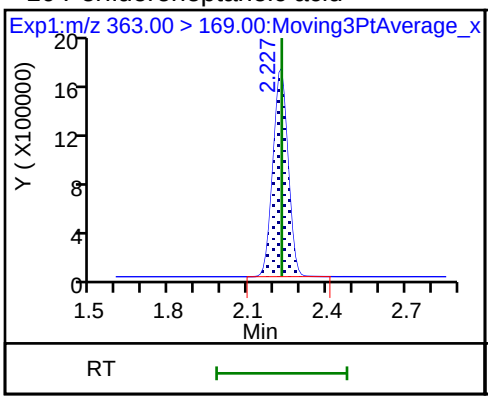
D 9 13C4-PFHpA



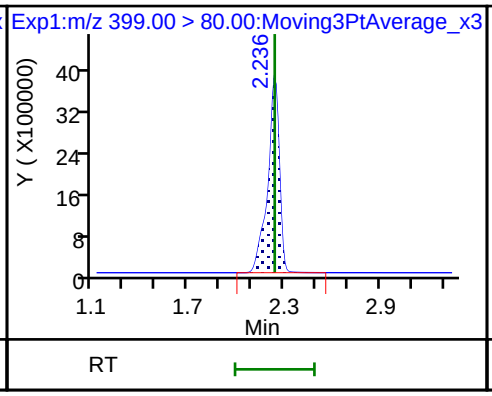
10 Perfluoroheptanoic acid



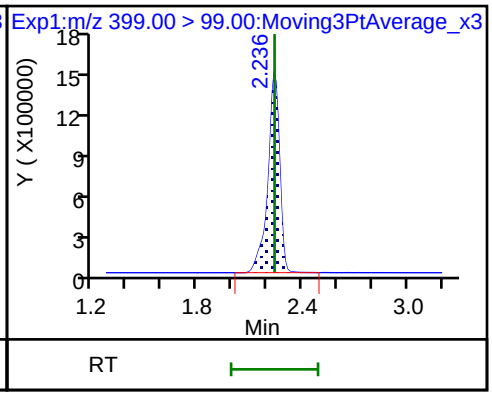
10 Perfluoroheptanoic acid



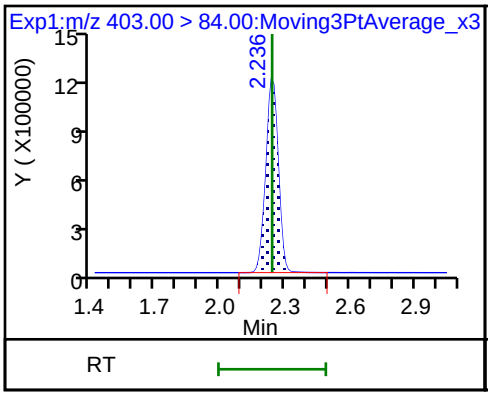
8 Perfluorohexanesulfonic acid



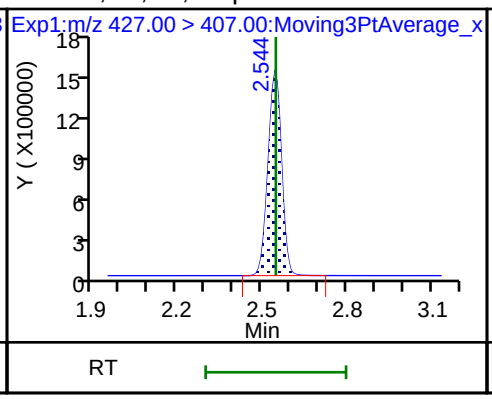
8 Perfluorohexanesulfonic acid



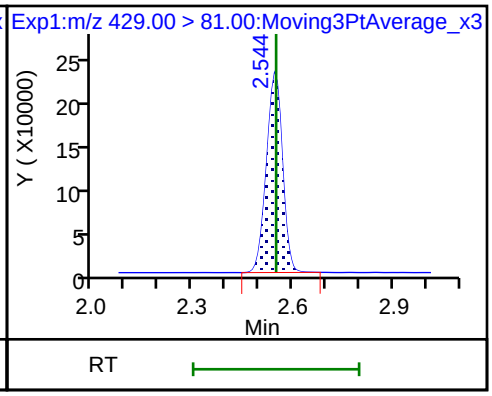
D 11 18O2 PFHxS



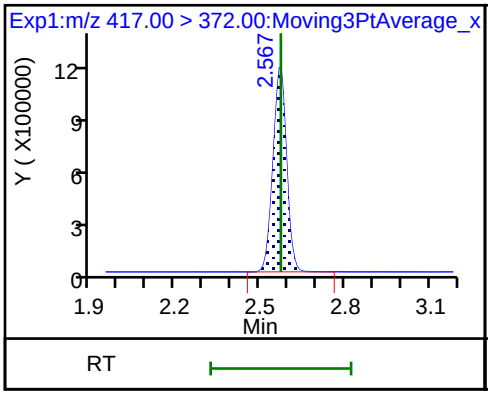
13 1H,1H,2H,2H-perfluorooctanesulfon



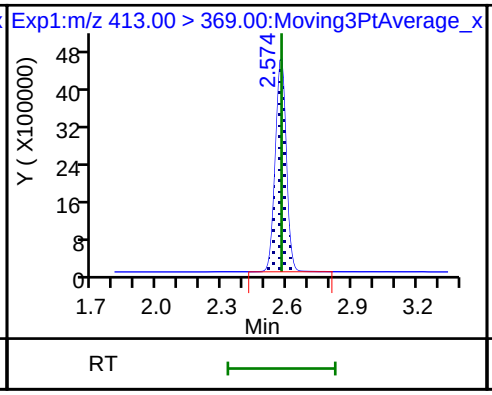
D 12 M2-6:2FTS



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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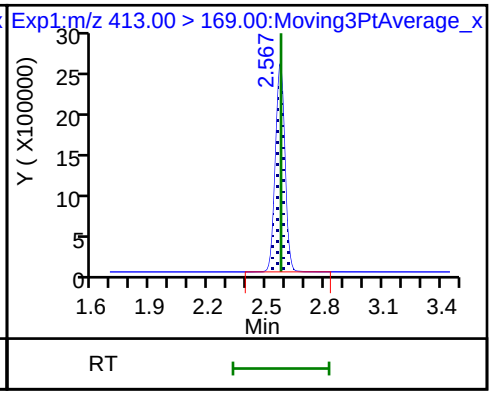
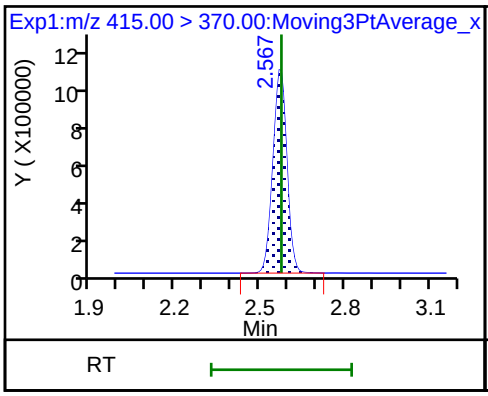
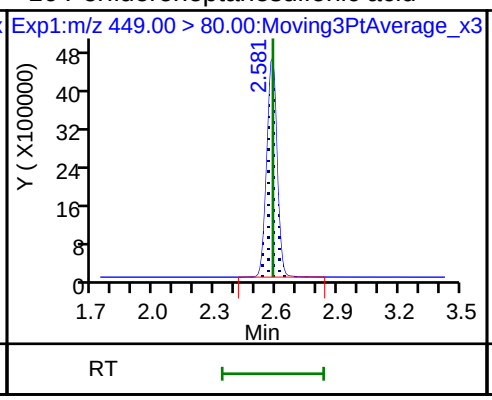


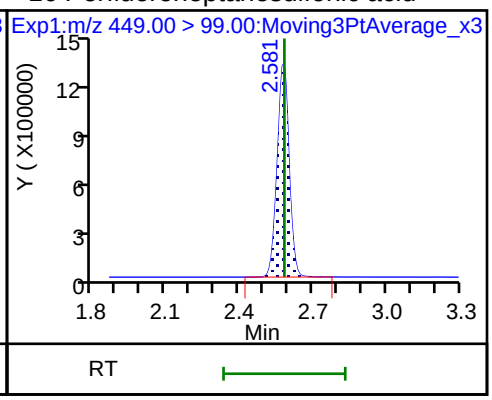
* 62 13C2-PFOA



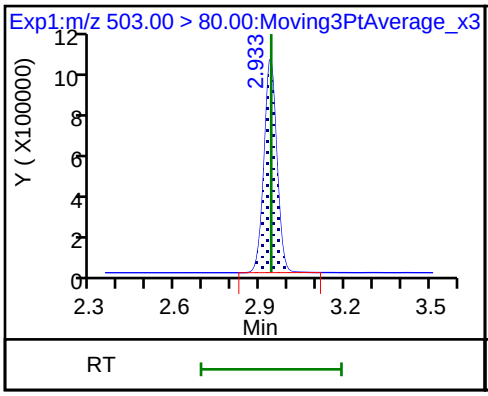
16 Perfluoroheptanesulfonic acid



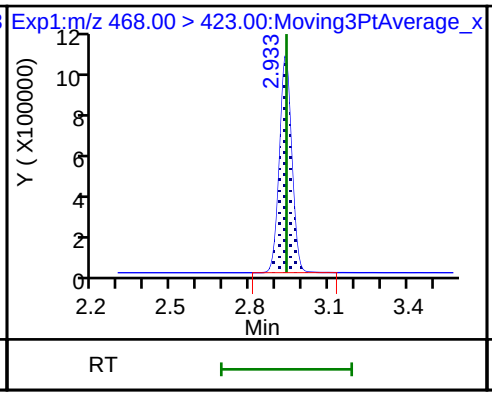
16 Perfluoroheptanesulfonic acid



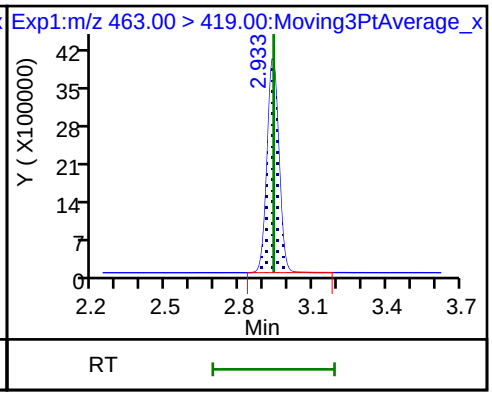
D 18 13C4 PFOS



D 19 13C5 PFNA



20 Perfluorononanoic acid



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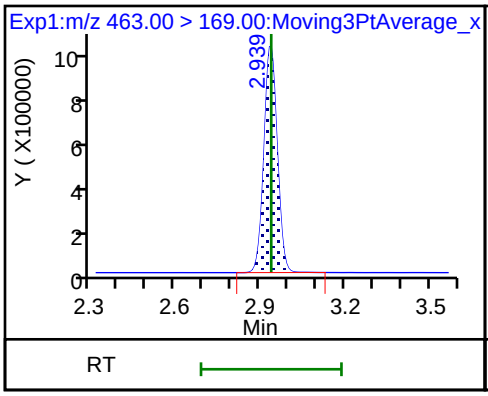
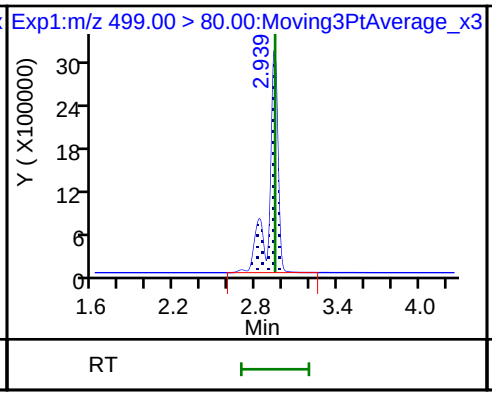
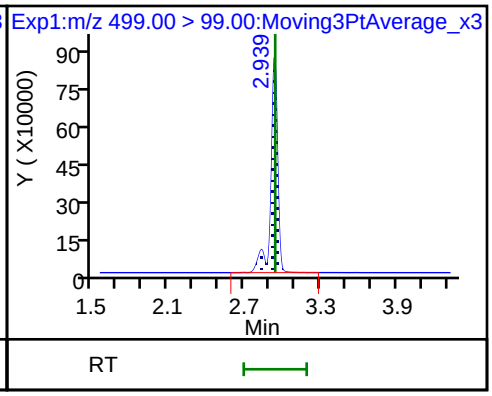


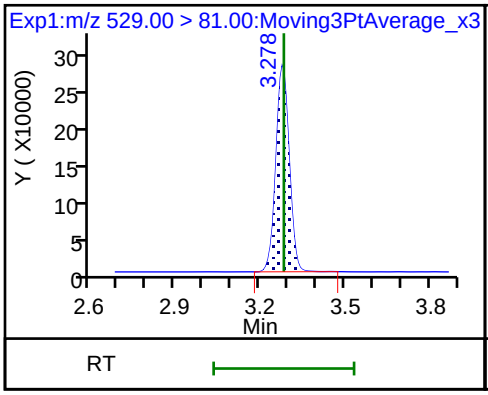
17 Perfluorooctane sulfonic acid



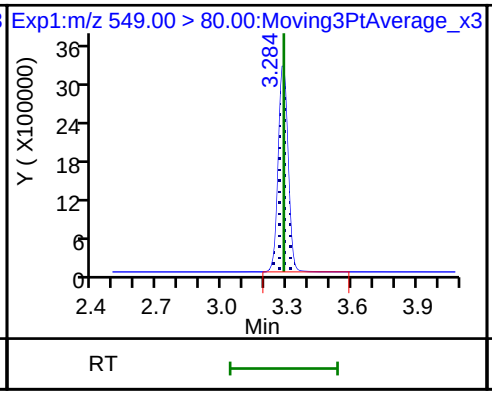
17 Perfluorooctane sulfonic acid



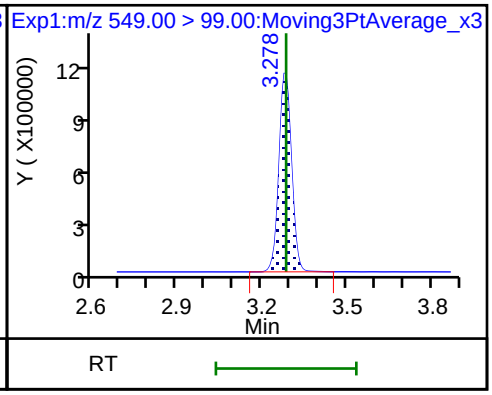
D 26 M2-8:2FTS



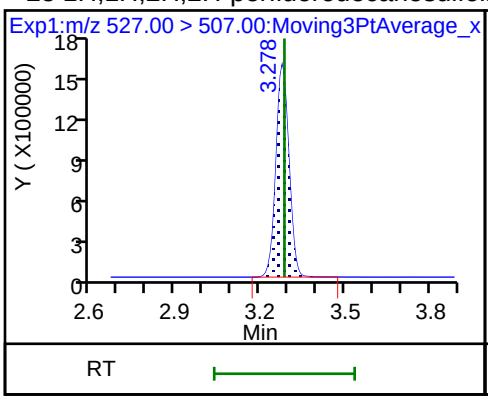
68 Perfluorononanesulfonic acid



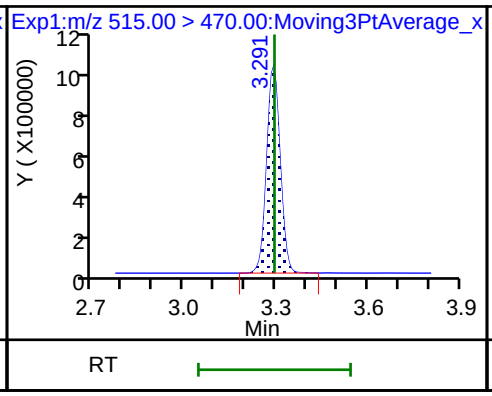
68 Perfluorononanesulfonic acid



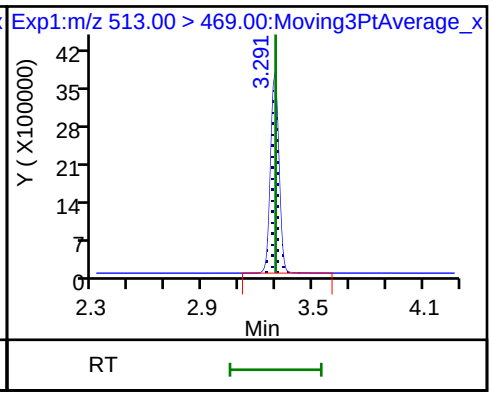
25 1H,1H,2H,2H-perfluorodecanesulfon



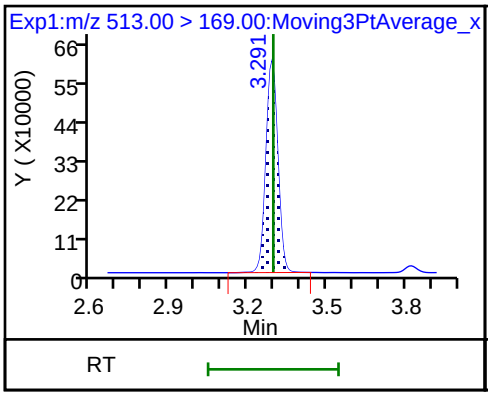
D 23 13C2 PFDA



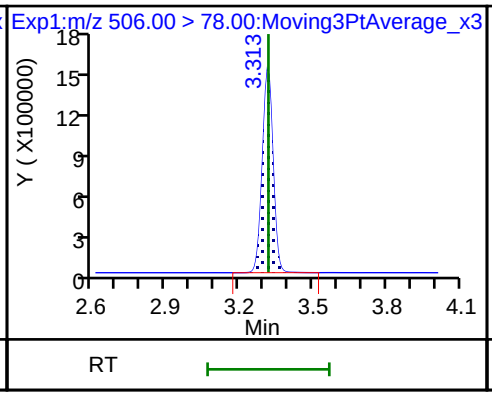
24 Perfluorodecanoic acid



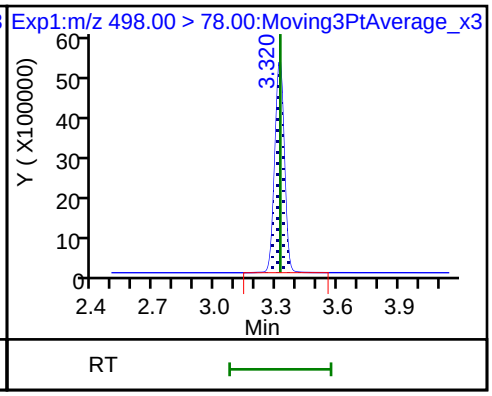
24 Perfluorodecanoic acid



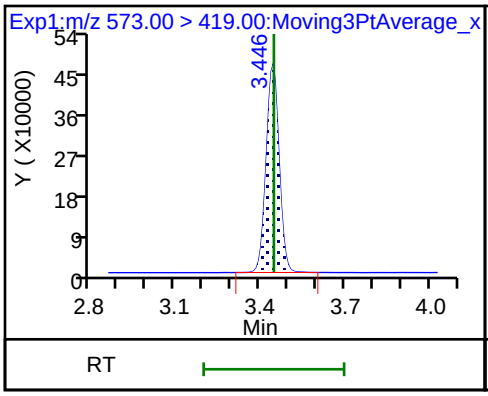
D 21 13C8 FOSA



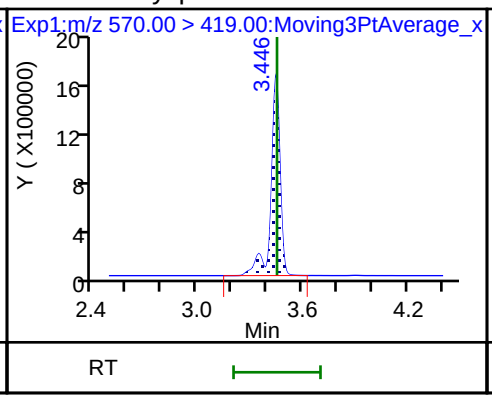
22 Perfluorooctane Sulfonamide



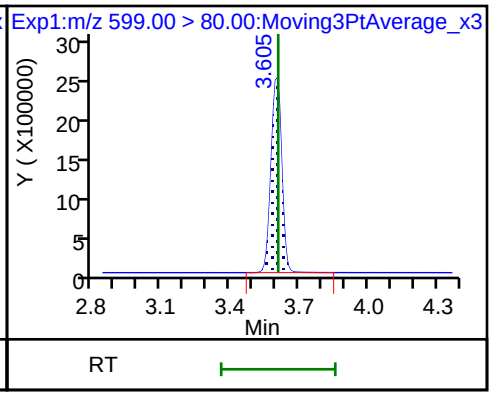
D 27 d3-NMeFOSAA



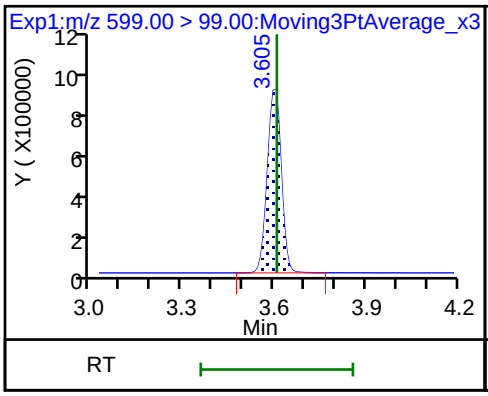
28 N-methyl perfluorooctane sulfonami



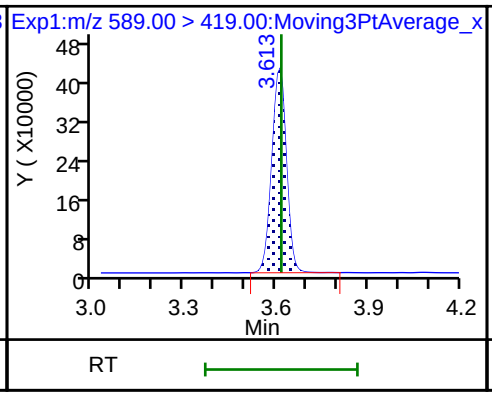
29 Perfluorodecane Sulfonic acid



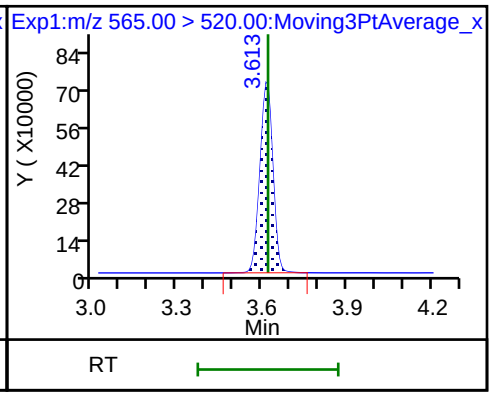
29 Perfluorodecane Sulfonic acid



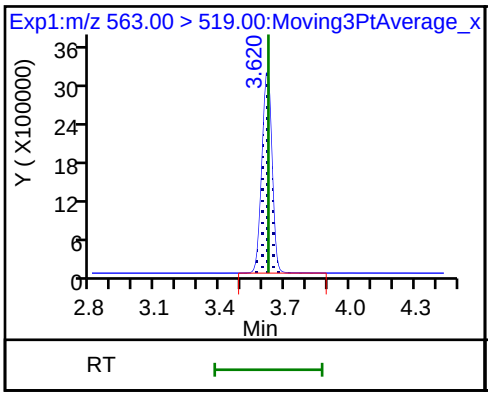
D 32 d5-NEtFOSAA



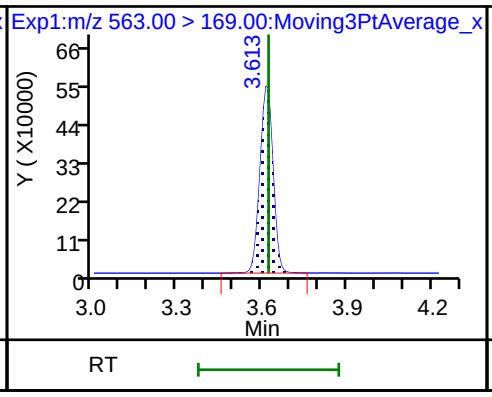
D 30 13C2 PFUnA



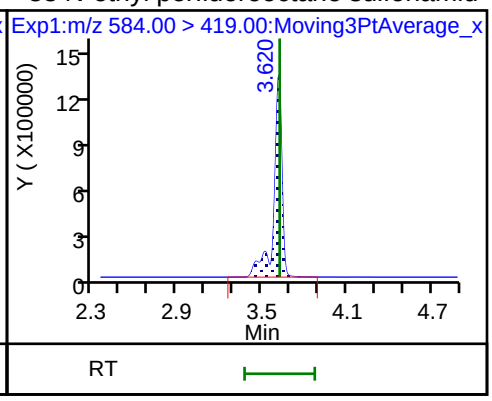
31 Perfluoroundecanoic acid



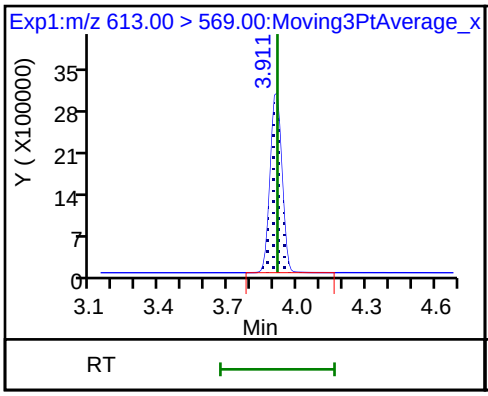
31 Perfluoroundecanoic acid



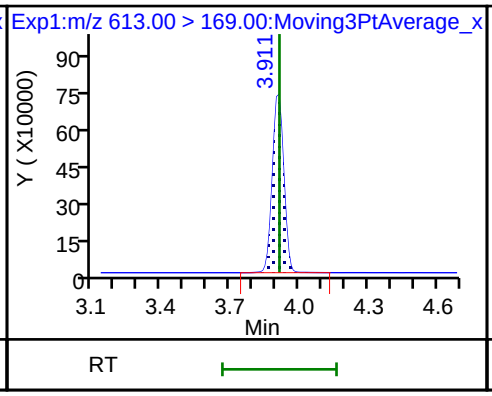
33 N-ethyl perfluorooctane sulfonamid



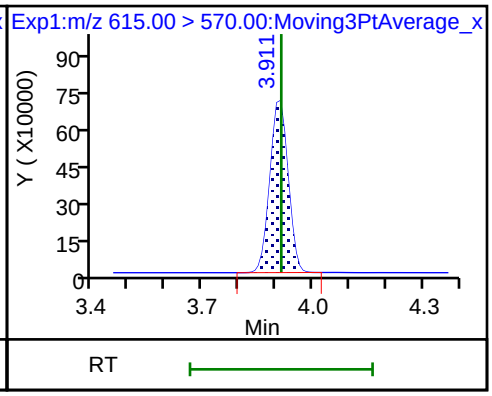
37 Perfluorododecanoic acid



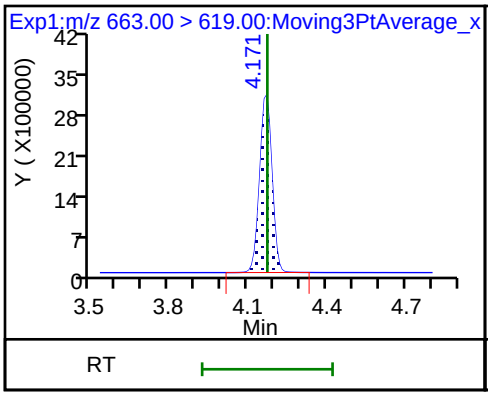
37 Perfluorododecanoic acid



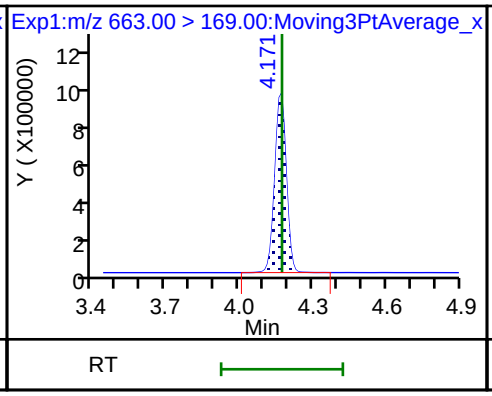
D 36 13C2 PFDoA



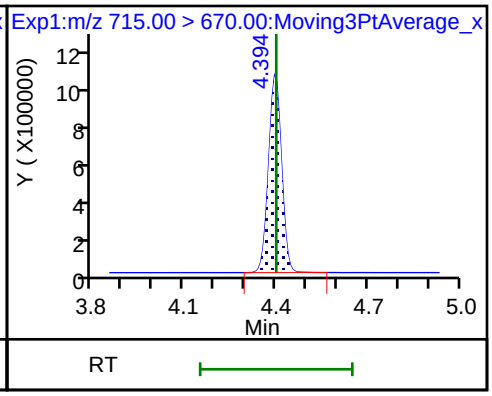
41 Perfluorotridecanoic acid



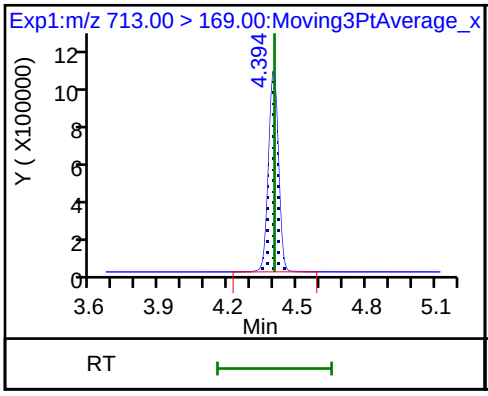
41 Perfluorotridecanoic acid



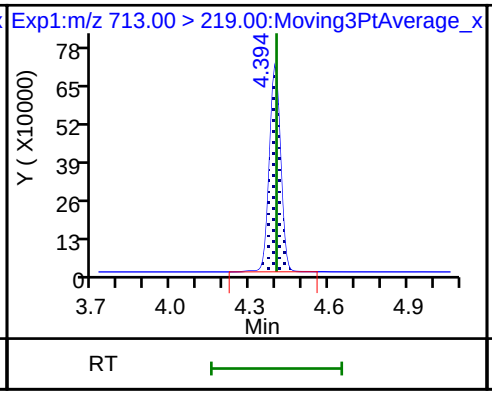
D 43 13C2-PFTeDA



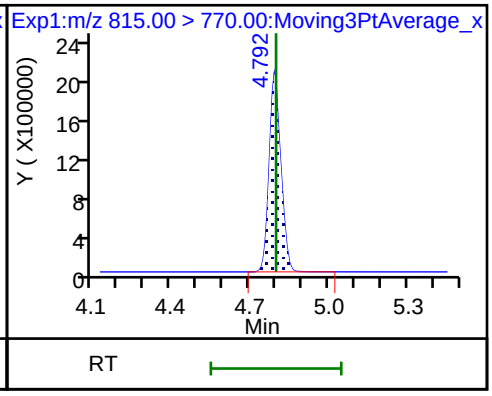
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

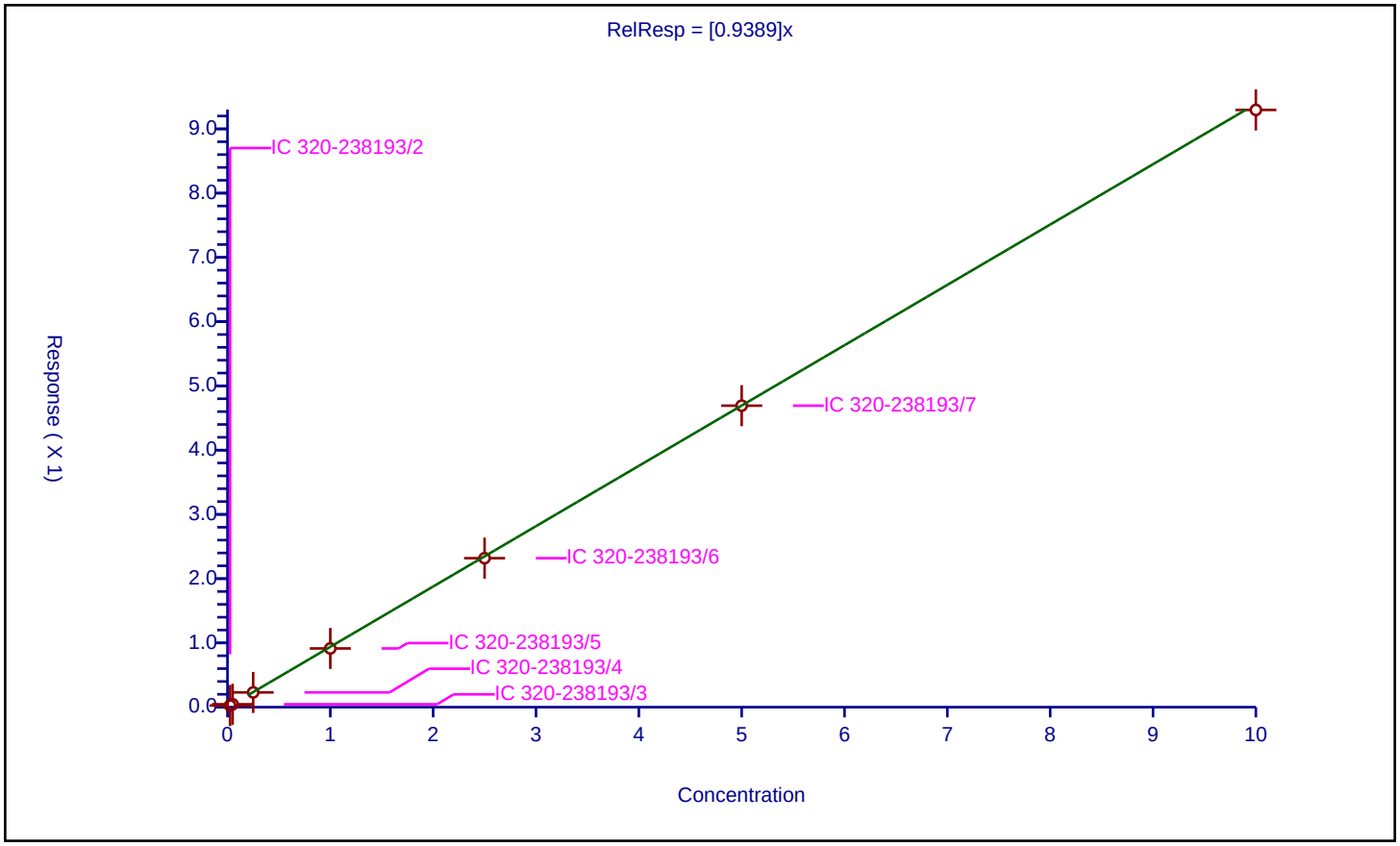
Curve Coefficients

Intercept:	0
Slope:	0.9389

Error Coefficients

Standard Error:	9510000
Relative Standard Error:	4.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.02589	2.5	5516377.0	1.035589	Y
2	IC 320-238193/3	0.05	0.045461	2.5	5520570.0	0.909227	Y
3	IC 320-238193/4	0.25	0.229517	2.5	5688815.0	0.918068	Y
4	IC 320-238193/5	1.0	0.913801	2.5	5503224.0	0.913801	Y
5	IC 320-238193/6	2.5	2.318714	2.5	5444583.0	0.927486	Y
6	IC 320-238193/7	5.0	4.692305	2.5	5693569.0	0.938461	Y
7	IC 320-238193/8	10.0	9.294844	2.5	5373122.0	0.929484	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

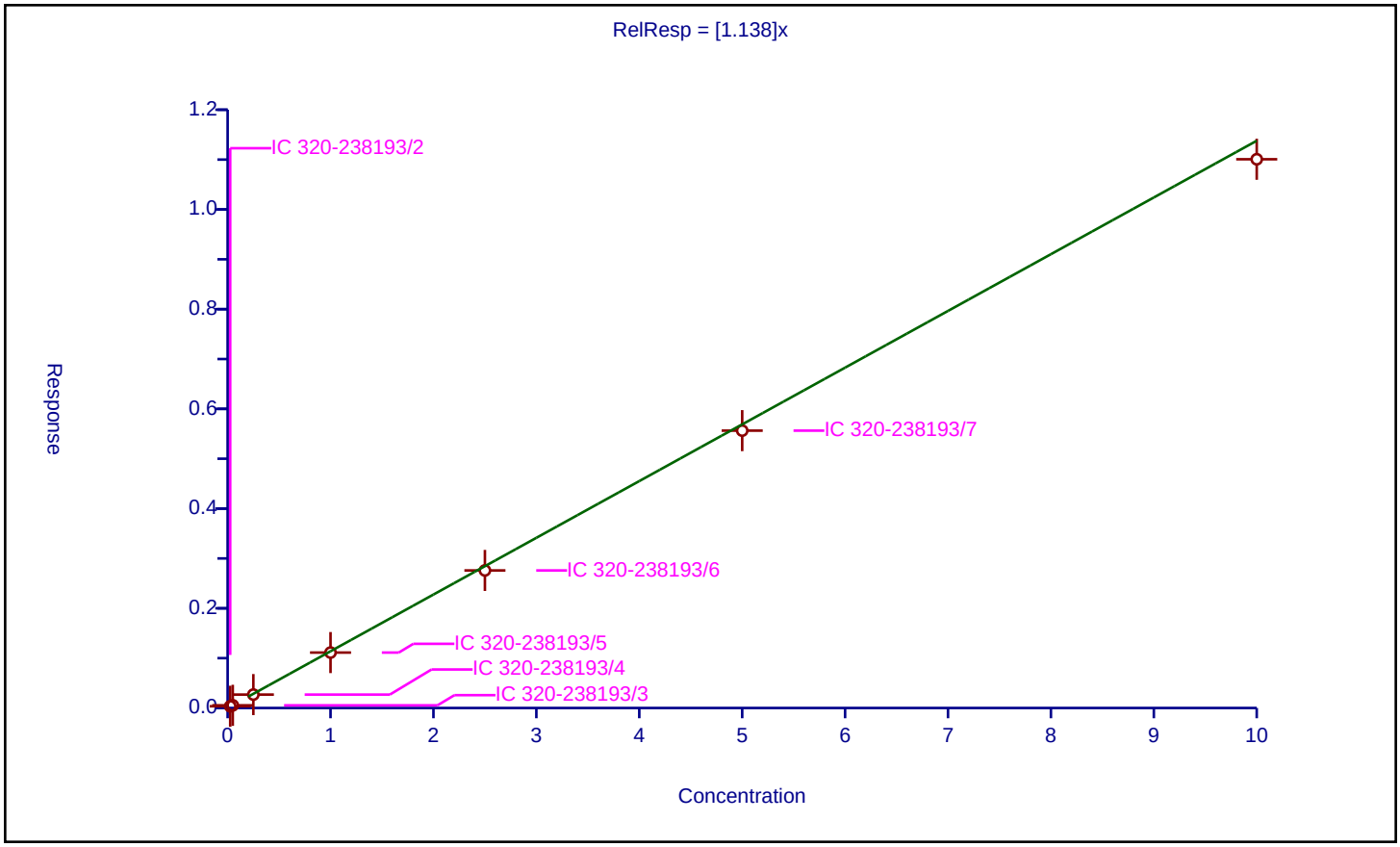
Curve Coefficients

Intercept:	0
Slope:	1.138

Error Coefficients

Standard Error:	7720000
Relative Standard Error:	9.8
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.034667	2.5	3748386.0	1.386677	Y
2	IC 320-238193/3	0.05	0.053587	2.5	3878229.0	1.071739	Y
3	IC 320-238193/4	0.25	0.26923	2.5	3918495.0	1.076921	Y
4	IC 320-238193/5	1.0	1.111995	2.5	3711287.0	1.111995	Y
5	IC 320-238193/6	2.5	2.759158	2.5	3838069.0	1.103663	Y
6	IC 320-238193/7	5.0	5.563664	2.5	3917323.0	1.112733	Y
7	IC 320-238193/8	10.0	11.00659	2.5	3665379.0	1.100659	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

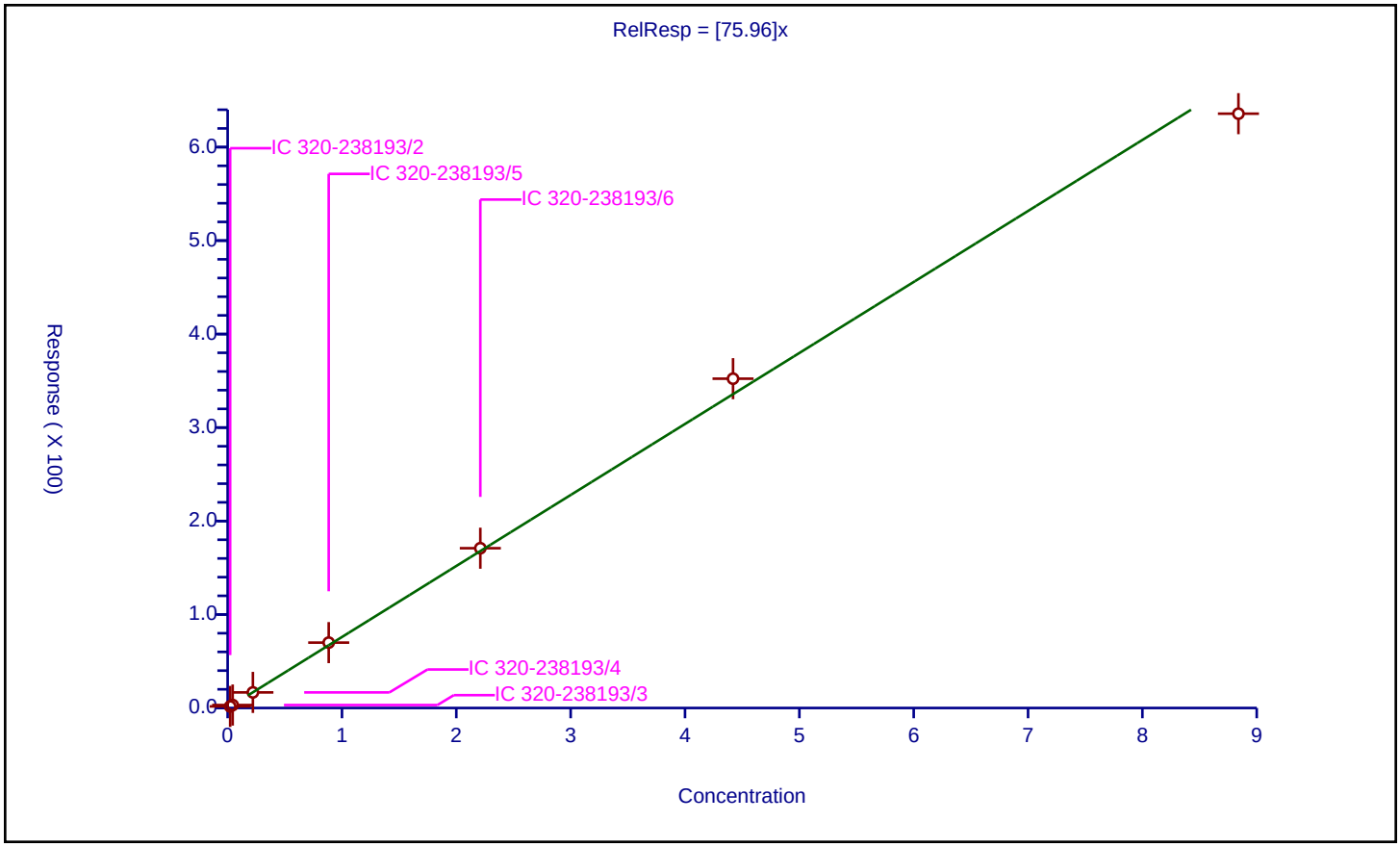
Curve Coefficients

Intercept:	0
Slope:	75.96

Error Coefficients

Standard Error:	10600000
Relative Standard Error:	4.1
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0221	1.680989	2.325	82796.0	76.062842	Y
2	IC 320-238193/3	0.0442	3.184237	2.325	83639.0	72.041568	Y
3	IC 320-238193/4	0.221	16.685183	2.325	85930.0	75.498564	Y
4	IC 320-238193/5	0.884	69.951886	2.325	78945.0	79.131093	Y
5	IC 320-238193/6	2.21	170.935554	2.325	80654.0	77.346405	Y
6	IC 320-238193/7	4.42	352.282599	2.325	81531.0	79.701946	Y
7	IC 320-238193/8	8.84	635.772468	2.325	80382.0	71.919962	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

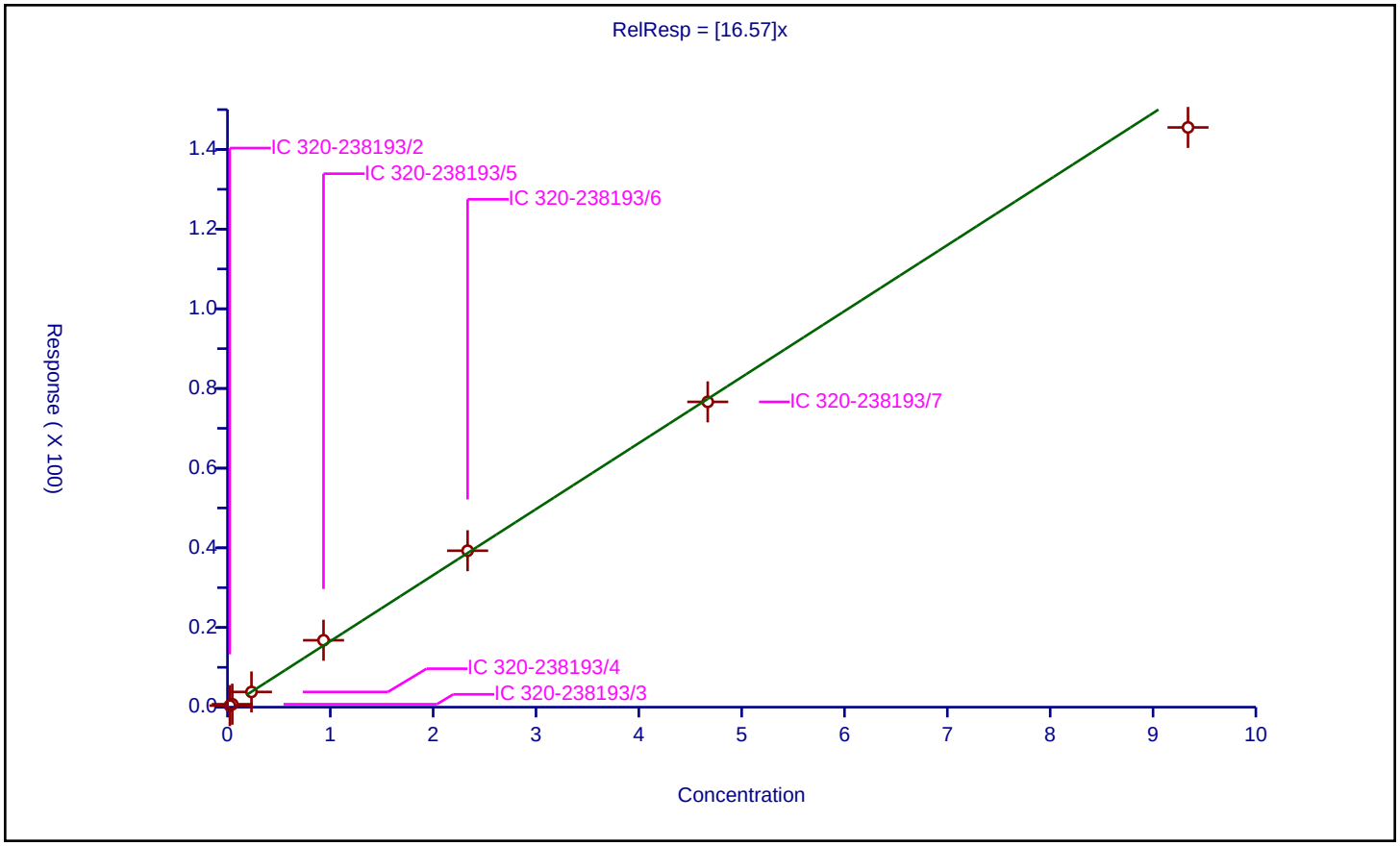
Curve Coefficients

Intercept:	0
Slope:	16.57

Error Coefficients

Standard Error:	2410000
Relative Standard Error:	4.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02335	0.394595	2.325	82796.0	16.89915	Y
2	IC 320-238193/3	0.0467	0.744765	2.325	83639.0	15.947859	Y
3	IC 320-238193/4	0.2335	3.818677	2.325	85930.0	16.354075	Y
4	IC 320-238193/5	0.934	16.792187	2.325	78945.0	17.978787	Y
5	IC 320-238193/6	2.335	39.273889	2.325	80654.0	16.819653	Y
6	IC 320-238193/7	4.67	76.632007	2.325	81531.0	16.409423	Y
7	IC 320-238193/8	9.34	145.523041	2.325	80382.0	15.580625	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

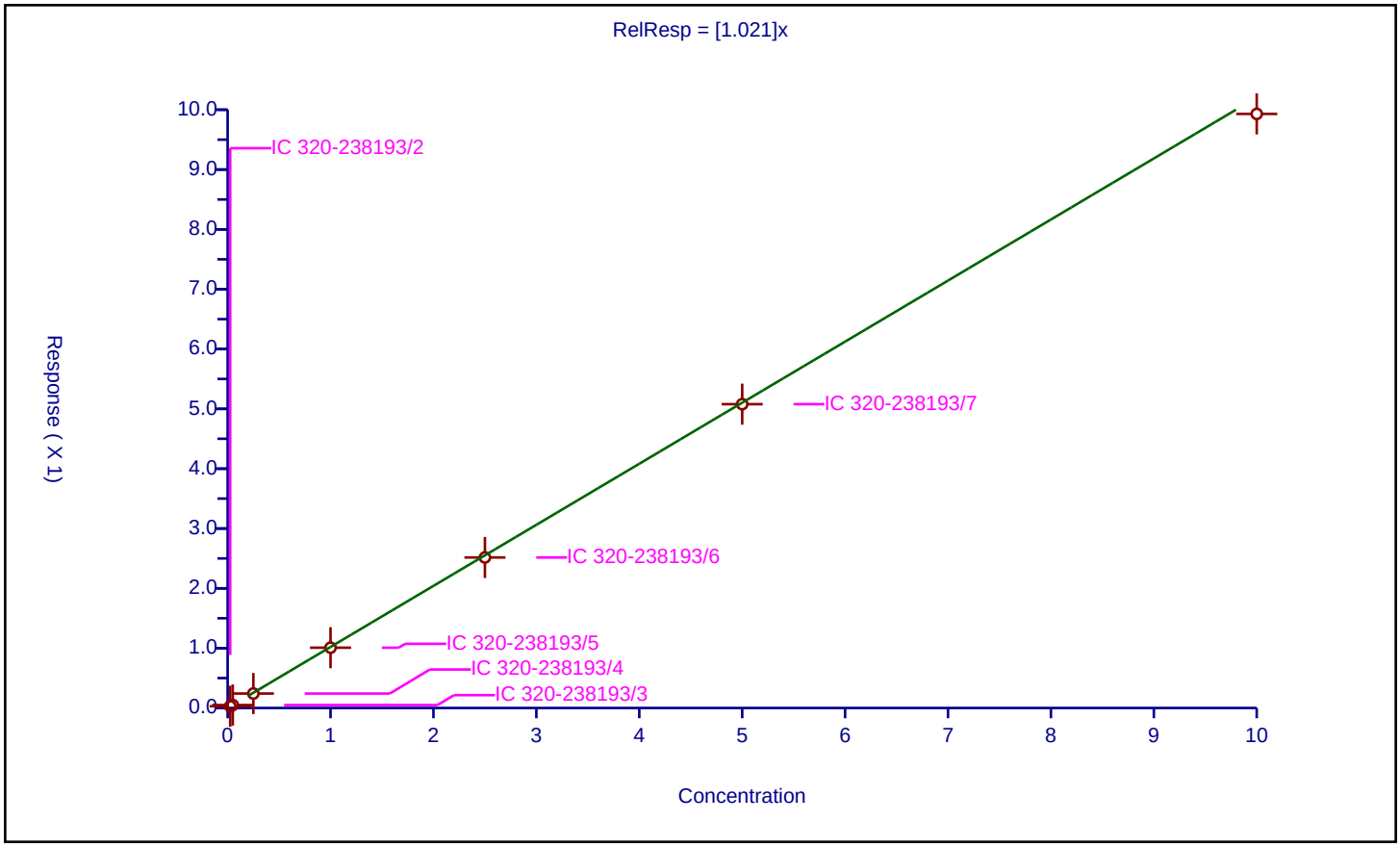
Curve Coefficients

Intercept:	0
Slope:	1.021

Error Coefficients

Standard Error:	7700000
Relative Standard Error:	6.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.029281	2.5	4472467.0	1.171255	Y
2	IC 320-238193/3	0.05	0.04919	2.5	4415087.0	0.983797	Y
3	IC 320-238193/4	0.25	0.241583	2.5	4437948.0	0.966334	Y
4	IC 320-238193/5	1.0	1.007775	2.5	4256324.0	1.007775	Y
5	IC 320-238193/6	2.5	2.516022	2.5	4337626.0	1.006409	Y
6	IC 320-238193/7	5.0	5.078653	2.5	4333101.0	1.015731	Y
7	IC 320-238193/8	10.0	9.930266	2.5	4032113.0	0.993027	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

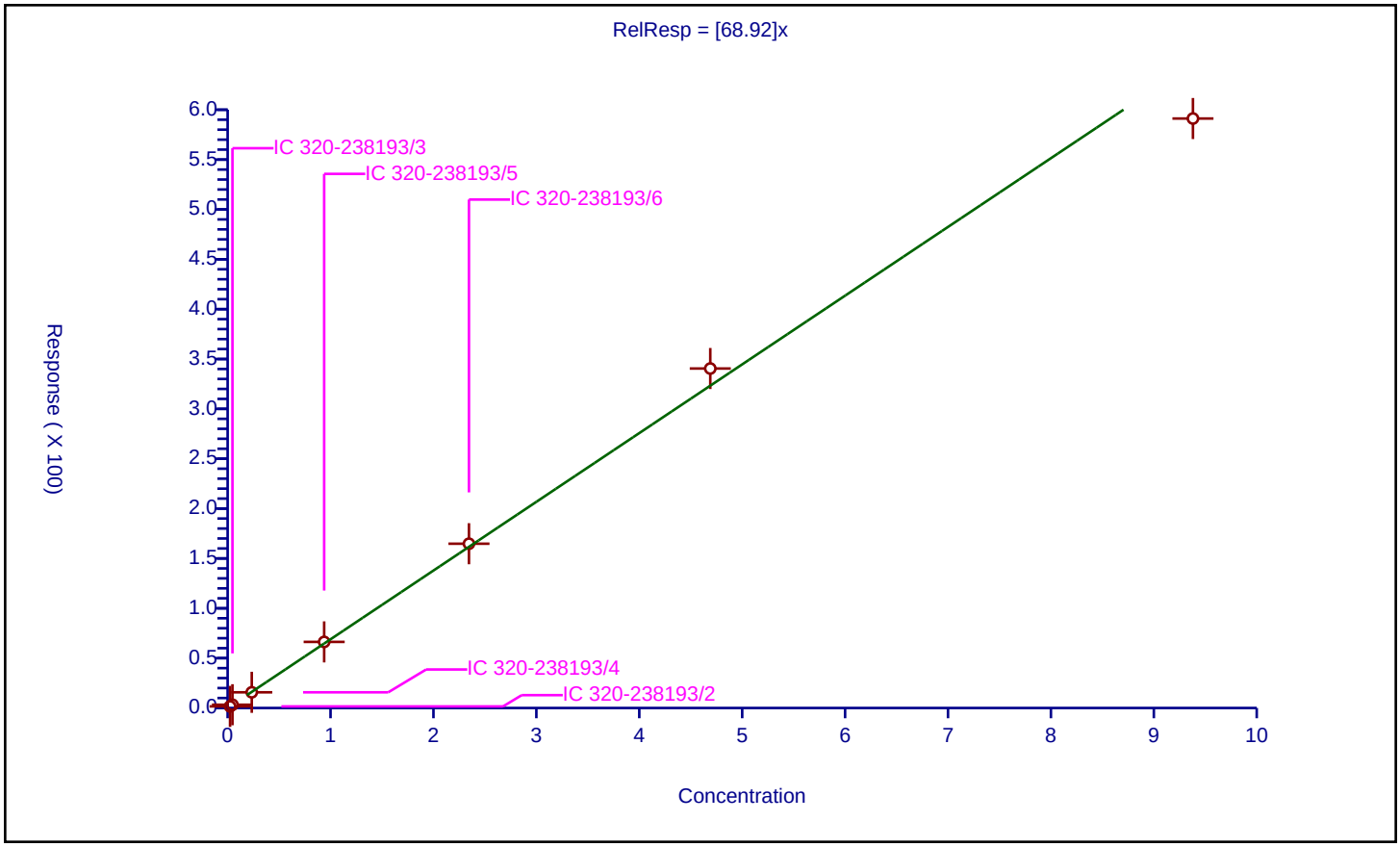
Curve Coefficients

Intercept:	0
Slope:	68.92

Error Coefficients

Standard Error:	9990000
Relative Standard Error:	4.5
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02345	1.608596	2.325	82796.0	68.596837	Y
2	IC 320-238193/3	0.0469	3.289981	2.325	83639.0	70.14885	Y
3	IC 320-238193/4	0.2345	15.749095	2.325	85930.0	67.160319	Y
4	IC 320-238193/5	0.938	66.295058	2.325	78945.0	70.677034	Y
5	IC 320-238193/6	2.345	164.757472	2.325	80654.0	70.25905	Y
6	IC 320-238193/7	4.69	340.453106	2.325	81531.0	72.591281	Y
7	IC 320-238193/8	9.38	591.192179	2.325	80382.0	63.026885	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

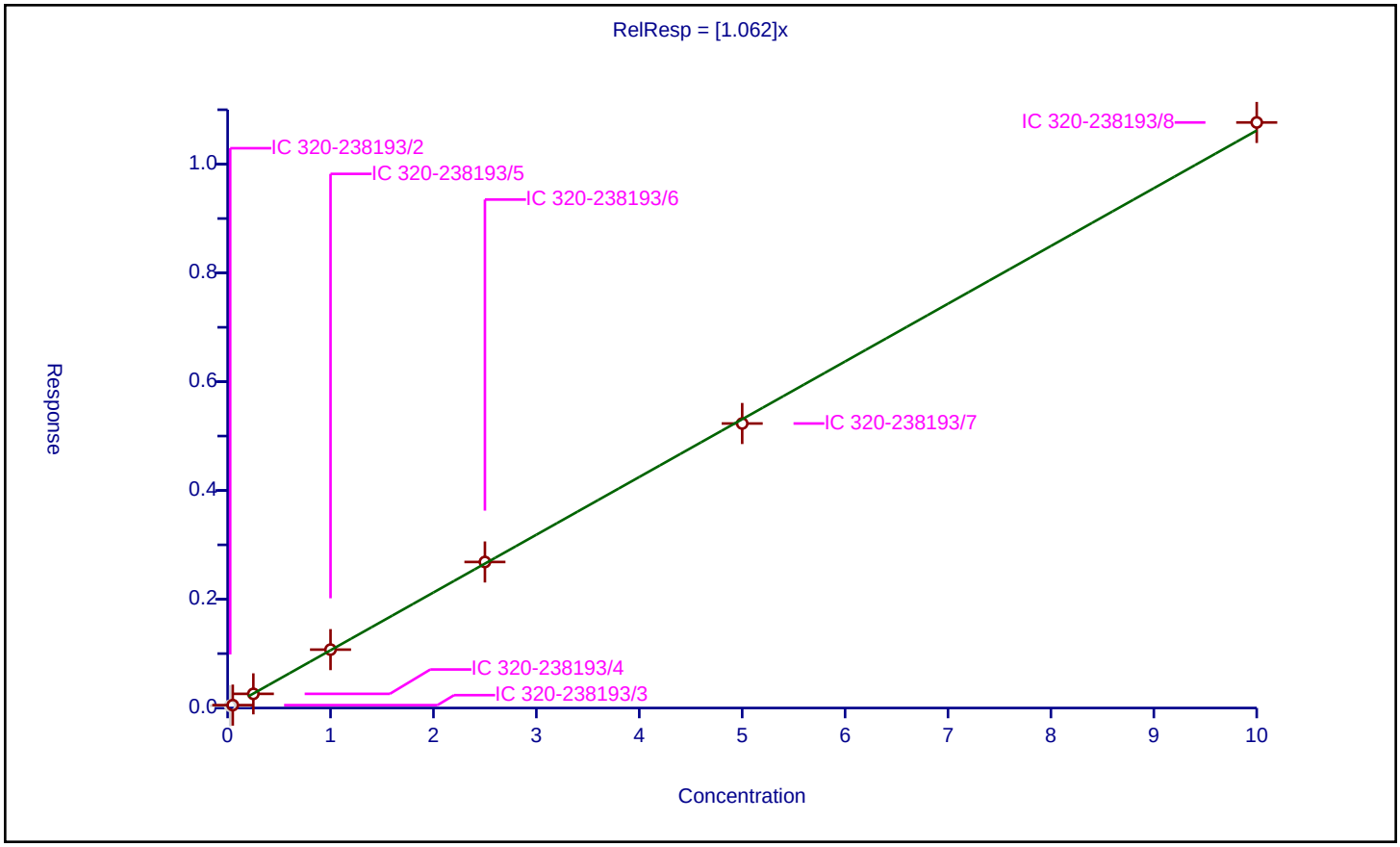
Curve Coefficients

Intercept:	0
Slope:	1.062

Error Coefficients

Standard Error:	8820000
Relative Standard Error:	1.4
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.041093	2.5	4316698.0	1.643733	N
2	IC 320-238193/3	0.05	0.052988	2.5	4381099.0	1.059757	Y
3	IC 320-238193/4	0.25	0.260251	2.5	4417214.0	1.041002	Y
4	IC 320-238193/5	1.0	1.073488	2.5	4255889.0	1.073488	Y
5	IC 320-238193/6	2.5	2.685084	2.5	4193874.0	1.074034	Y
6	IC 320-238193/7	5.0	5.231166	2.5	4351928.0	1.046233	Y
7	IC 320-238193/8	10.0	10.766058	2.5	3899256.0	1.076606	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

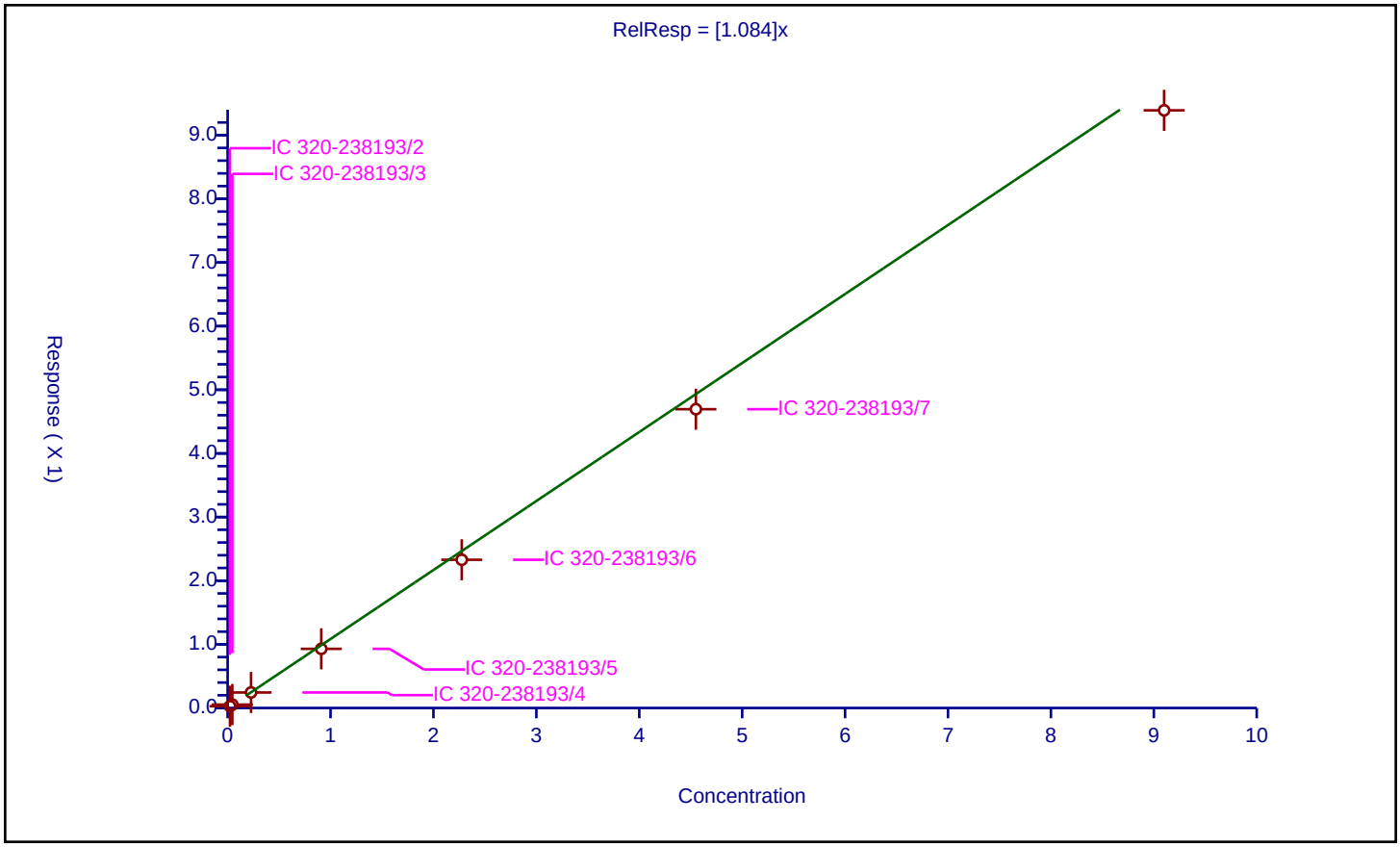
Curve Coefficients

Intercept:	0
Slope:	1.084

Error Coefficients

Standard Error:	9100000
Relative Standard Error:	7.8
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02275	0.027872	2.365	5251983.0	1.225149	Y
2	IC 320-238193/3	0.0455	0.053814	2.365	5400125.0	1.182733	Y
3	IC 320-238193/4	0.2275	0.24381	2.365	5279483.0	1.071693	Y
4	IC 320-238193/5	0.91	0.929382	2.365	5111728.0	1.021299	Y
5	IC 320-238193/6	2.275	2.328979	2.365	5111206.0	1.023727	Y
6	IC 320-238193/7	4.55	4.694946	2.365	5234562.0	1.031856	Y
7	IC 320-238193/8	9.1	9.390553	2.365	4771422.0	1.031929	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

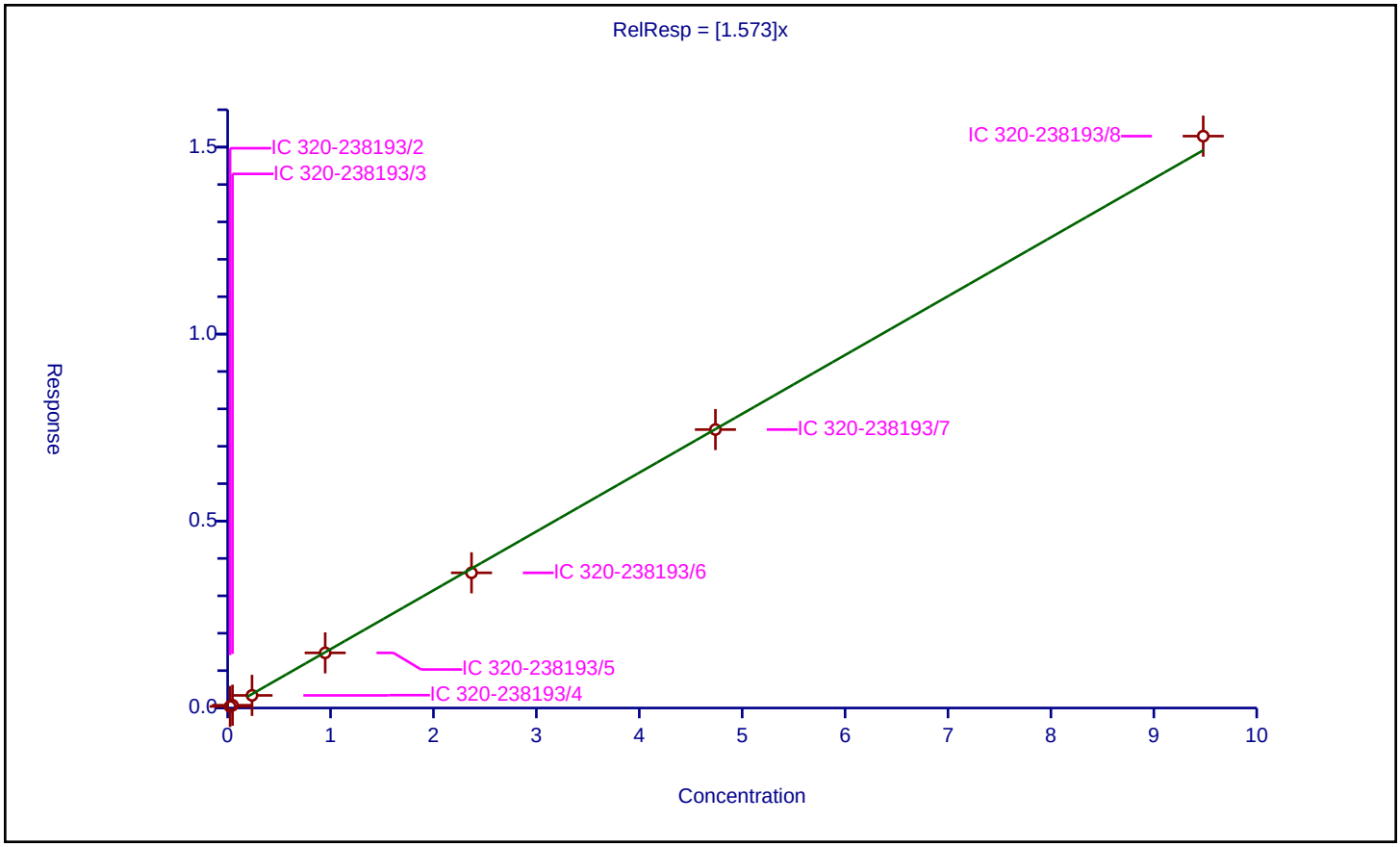
Curve Coefficients

Intercept:	0
Slope:	1.573

Error Coefficients

Standard Error:	2390000
Relative Standard Error:	6.2
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0237	0.041472	2.375	855574.0	1.74988	Y
2	IC 320-238193/3	0.0474	0.074636	2.375	855666.0	1.574606	Y
3	IC 320-238193/4	0.237	0.337417	2.375	912690.0	1.423699	Y
4	IC 320-238193/5	0.948	1.474699	2.375	863649.0	1.55559	Y
5	IC 320-238193/6	2.37	3.615506	2.375	835688.0	1.52553	Y
6	IC 320-238193/7	4.74	7.446717	2.375	859900.0	1.571037	Y
7	IC 320-238193/8	9.48	15.294297	2.375	778460.0	1.613322	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

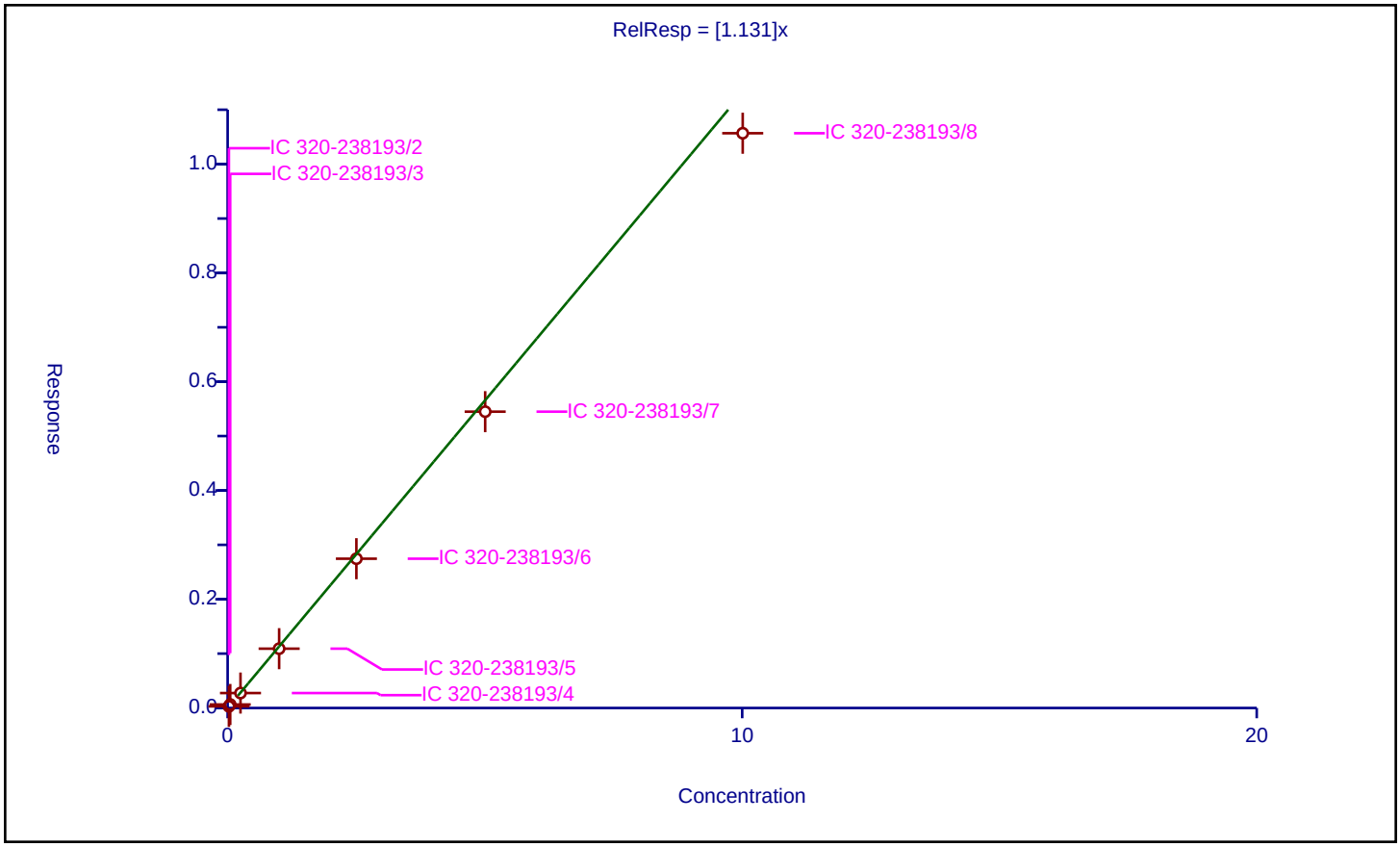
Curve Coefficients

Intercept:	0
Slope:	1.131

Error Coefficients

Standard Error:	7560000
Relative Standard Error:	7.2
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025025	0.03005	2.5	3977347.0	1.200806	Y
2	IC 320-238193/3	0.05005	0.064332	2.5	3900845.0	1.285346	Y
3	IC 320-238193/4	0.25025	0.274715	2.5	4104790.0	1.097762	Y
4	IC 320-238193/5	1.001	1.090652	2.5	3847208.0	1.089562	Y
5	IC 320-238193/6	2.5025	2.744975	2.5	3832692.0	1.096893	Y
6	IC 320-238193/7	5.005	5.448642	2.5	3963063.0	1.08864	Y
7	IC 320-238193/8	10.01	10.567895	2.5	3722009.0	1.055734	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

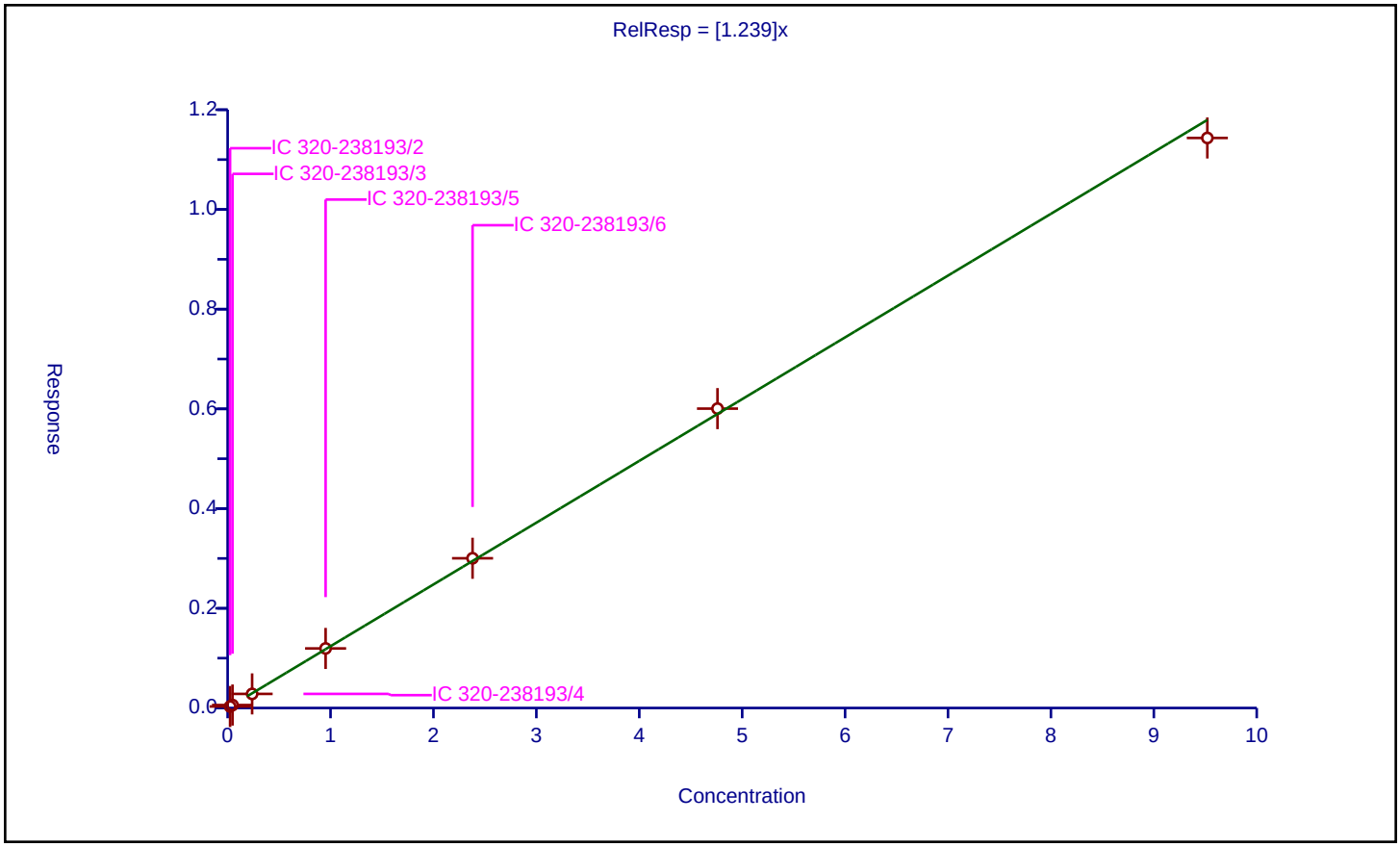
Curve Coefficients

Intercept:	0
Slope:	1.239

Error Coefficients

Standard Error:	7580000
Relative Standard Error:	2.5
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0238	0.030011	2.39	3400422.0	1.260973	Y
2	IC 320-238193/3	0.0476	0.059225	2.39	3430647.0	1.244214	Y
3	IC 320-238193/4	0.238	0.282875	2.39	3598367.0	1.188549	Y
4	IC 320-238193/5	0.952	1.194811	2.39	3408113.0	1.255054	Y
5	IC 320-238193/6	2.38	3.003293	2.39	3404908.0	1.261888	Y
6	IC 320-238193/7	4.76	6.005306	2.39	3471061.0	1.261619	Y
7	IC 320-238193/8	9.52	11.434127	2.39	3286355.0	1.201064	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

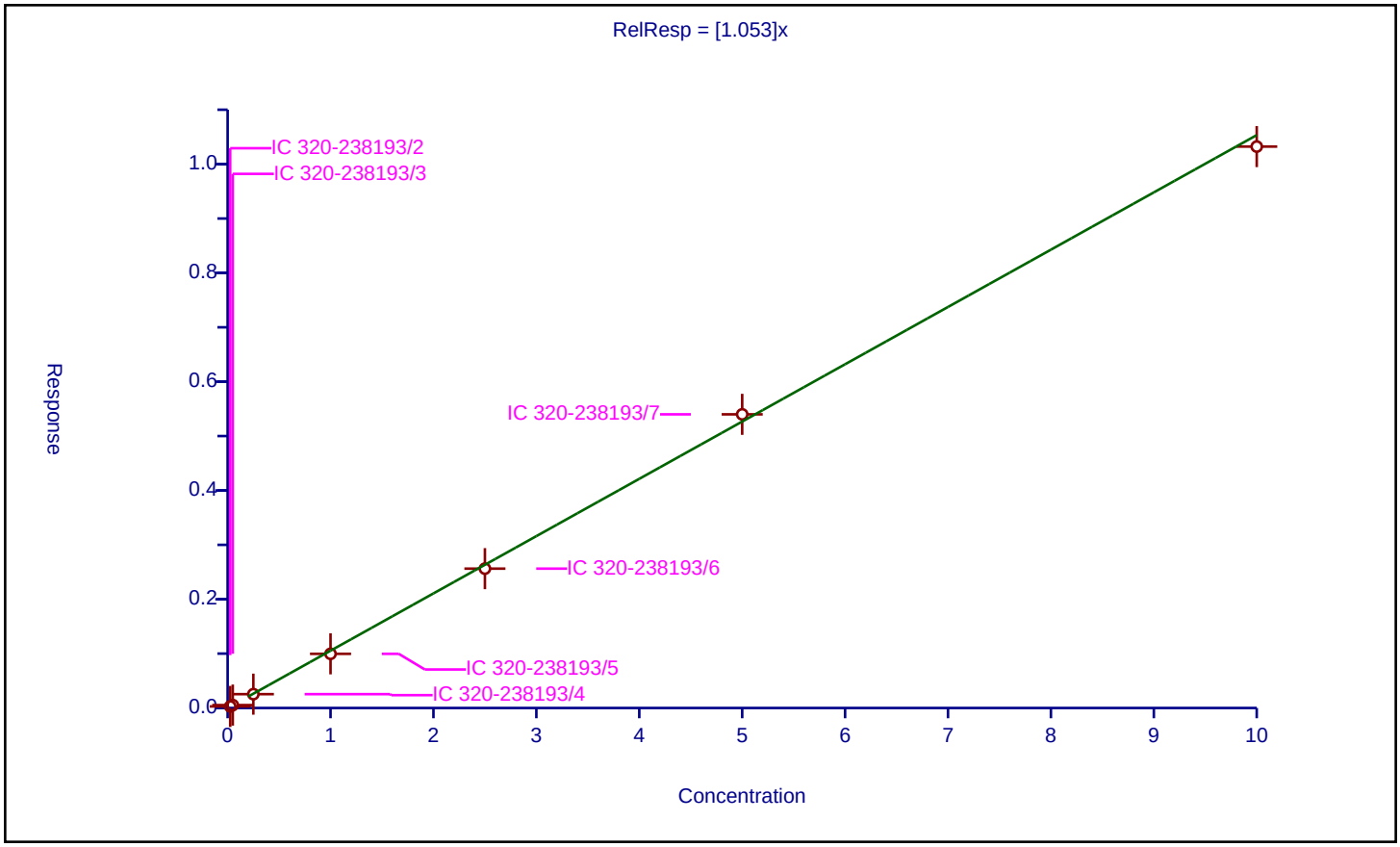
Curve Coefficients

Intercept:	0
Slope:	1.053

Error Coefficients

Standard Error:	6420000
Relative Standard Error:	4.9
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.028682	2.5	3530907.0	1.147297	Y
2	IC 320-238193/3	0.05	0.05374	2.5	3565521.0	1.074794	Y
3	IC 320-238193/4	0.25	0.254538	2.5	3712571.0	1.018152	Y
4	IC 320-238193/5	1.0	0.99618	2.5	3536917.0	0.99618	Y
5	IC 320-238193/6	2.5	2.562344	2.5	3527035.0	1.024938	Y
6	IC 320-238193/7	5.0	5.399512	2.5	3461355.0	1.079902	Y
7	IC 320-238193/8	10.0	10.322645	2.5	3213782.0	1.032264	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

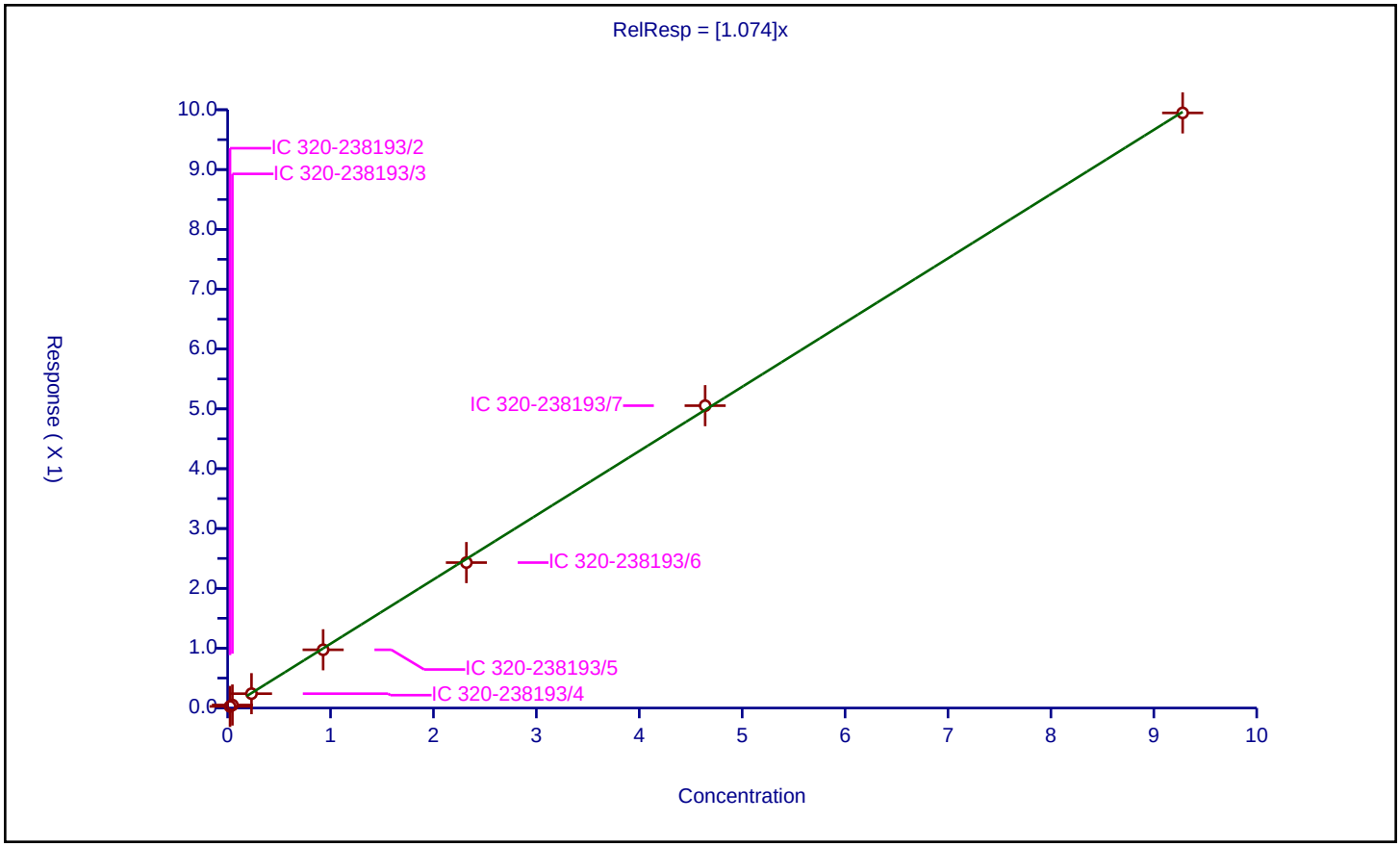
Curve Coefficients

Intercept:	0
Slope:	1.074

Error Coefficients

Standard Error:	6520000
Relative Standard Error:	3.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0232	0.026569	2.39	3400422.0	1.145197	Y
2	IC 320-238193/3	0.0464	0.050139	2.39	3430647.0	1.080576	Y
3	IC 320-238193/4	0.232	0.239688	2.39	3598367.0	1.033139	Y
4	IC 320-238193/5	0.928	0.973114	2.39	3408113.0	1.048615	Y
5	IC 320-238193/6	2.32	2.430616	2.39	3404908.0	1.047679	Y
6	IC 320-238193/7	4.64	5.053835	2.39	3471061.0	1.089189	Y
7	IC 320-238193/8	9.28	9.946849	2.39	3286355.0	1.071859	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

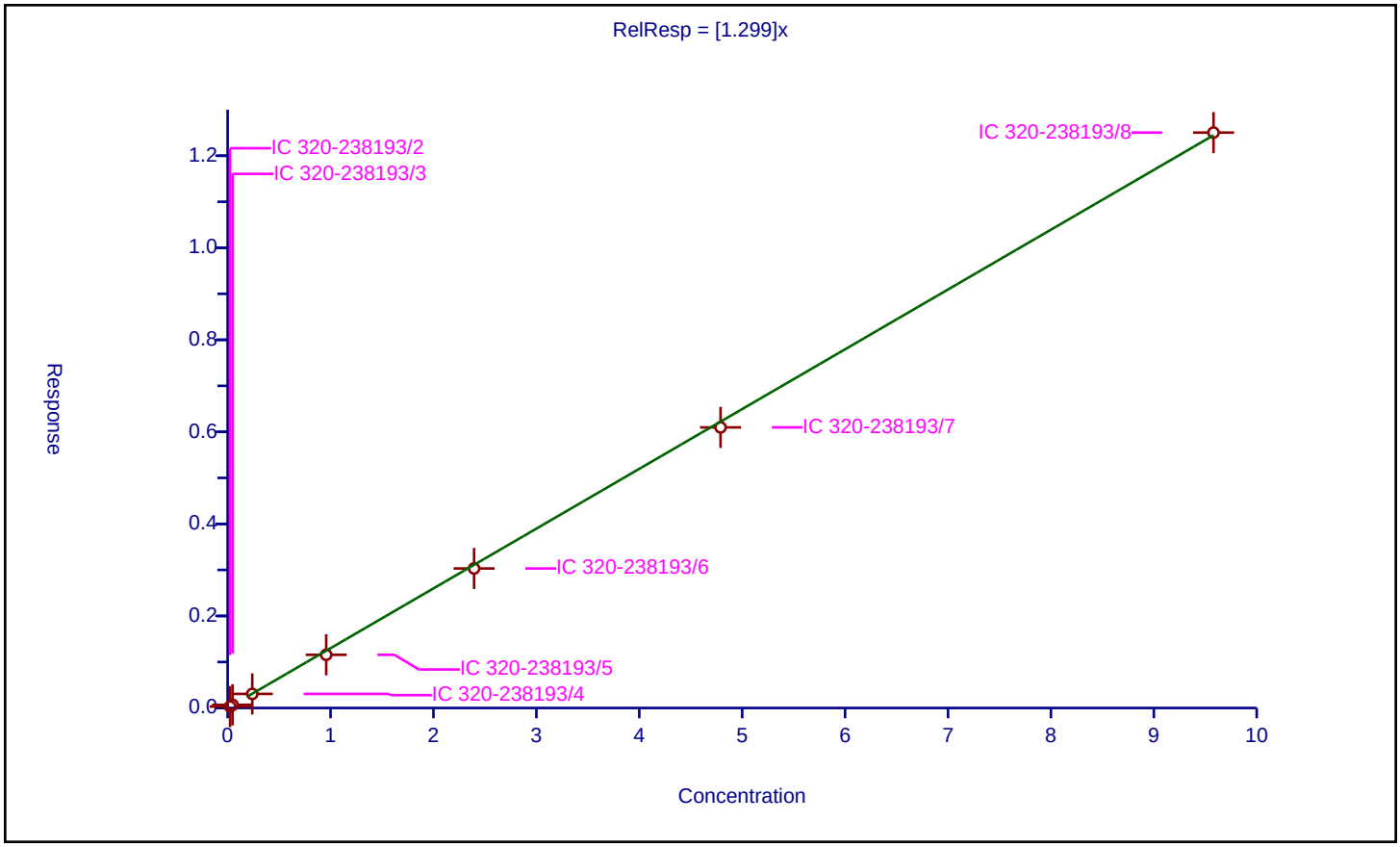
Curve Coefficients

Intercept:	0
Slope:	1.299

Error Coefficients

Standard Error:	2320000
Relative Standard Error:	5.6
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02395	0.031733	2.395	1070959.0	1.324981	Y
2	IC 320-238193/3	0.0479	0.068953	2.395	1065531.0	1.439517	Y
3	IC 320-238193/4	0.2395	0.306393	2.395	1066887.0	1.279301	Y
4	IC 320-238193/5	0.958	1.15562	2.395	1045687.0	1.206284	Y
5	IC 320-238193/6	2.395	3.031449	2.395	1039099.0	1.265741	Y
6	IC 320-238193/7	4.79	6.097565	2.395	1052330.0	1.272978	Y
7	IC 320-238193/8	9.58	12.503205	2.395	920670.0	1.305136	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

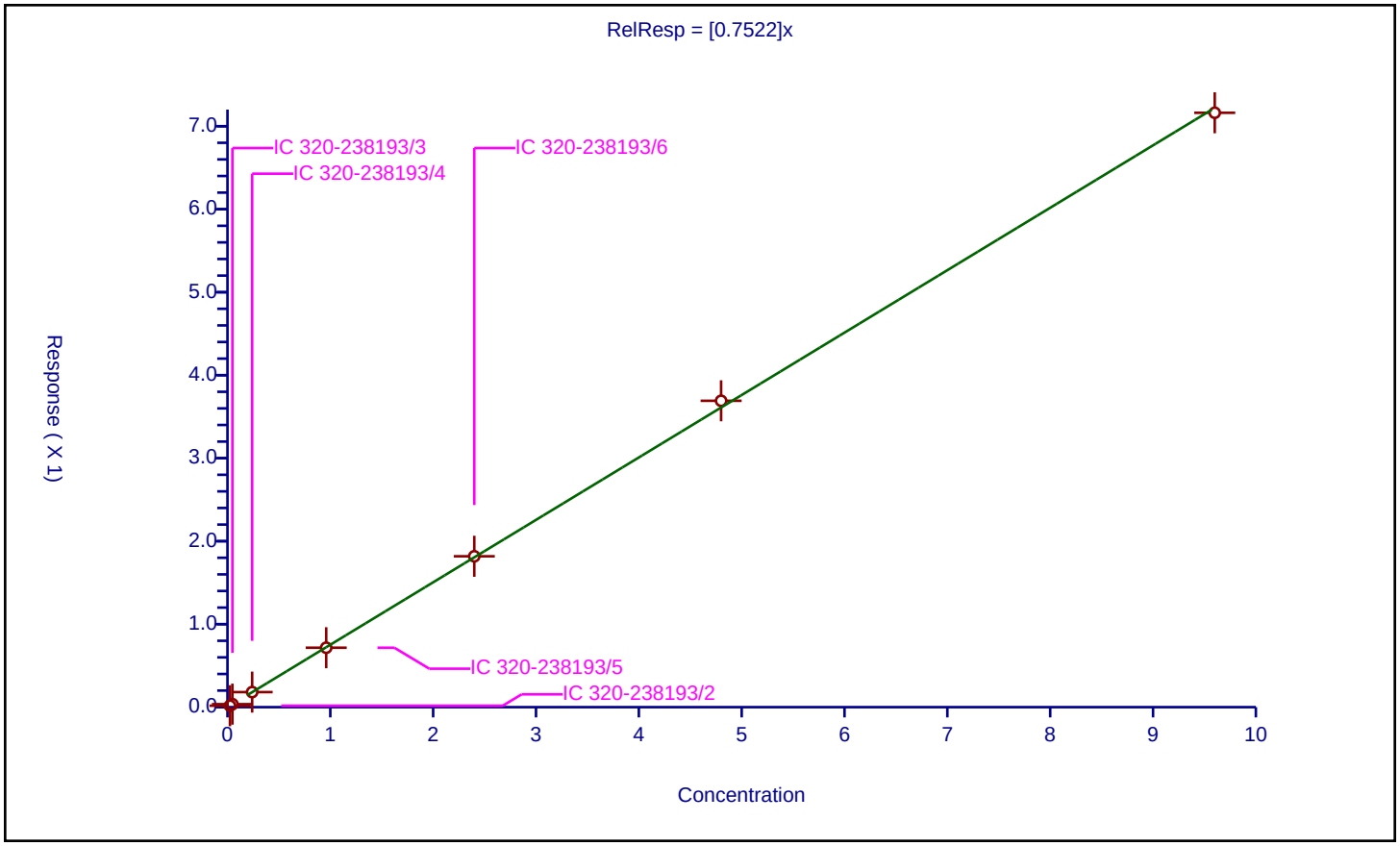
Curve Coefficients

Intercept:	0
Slope:	0.7522

Error Coefficients

Standard Error:	4720000
Relative Standard Error:	1.6
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.024	0.017583	2.39	3400422.0	0.732608	Y
2	IC 320-238193/3	0.048	0.036365	2.39	3430647.0	0.757605	Y
3	IC 320-238193/4	0.24	0.181554	2.39	3598367.0	0.756477	Y
4	IC 320-238193/5	0.96	0.716034	2.39	3408113.0	0.745868	Y
5	IC 320-238193/6	2.4	1.817911	2.39	3404908.0	0.757463	Y
6	IC 320-238193/7	4.8	3.691441	2.39	3471061.0	0.76905	Y
7	IC 320-238193/8	9.6	7.16179	2.39	3286355.0	0.74602	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

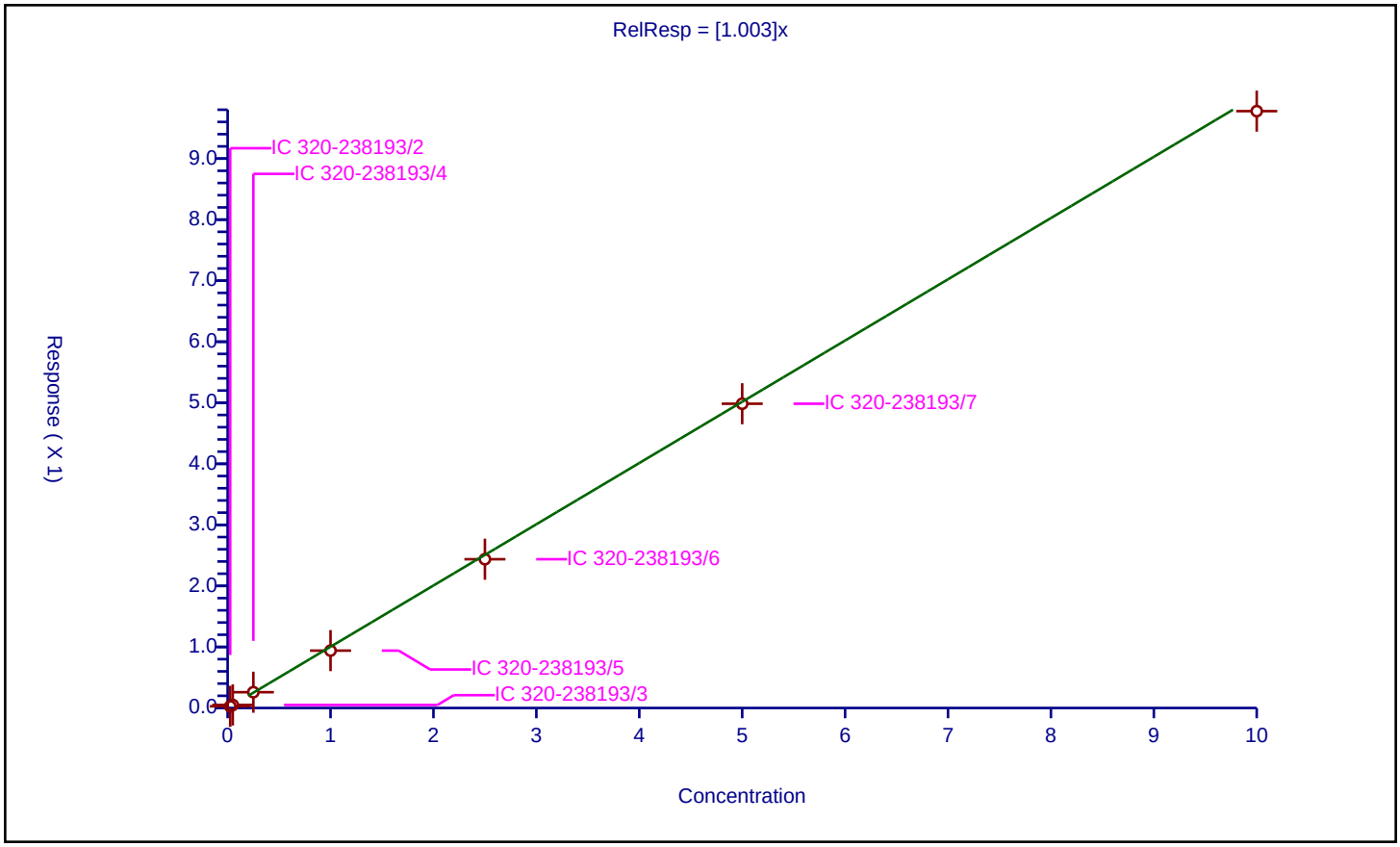
Curve Coefficients

Intercept:	0
Slope:	1.003

Error Coefficients

Standard Error:	5490000
Relative Standard Error:	5.1
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.027446	2.5	3043654.0	1.097825	Y
2	IC 320-238193/3	0.05	0.049999	2.5	3067735.0	0.999972	Y
3	IC 320-238193/4	0.25	0.258822	2.5	3074087.0	1.035286	Y
4	IC 320-238193/5	1.0	0.939869	2.5	3162481.0	0.939869	Y
5	IC 320-238193/6	2.5	2.437086	2.5	3093053.0	0.974835	Y
6	IC 320-238193/7	5.0	4.983908	2.5	3159574.0	0.996782	Y
7	IC 320-238193/8	10.0	9.777143	2.5	2921735.0	0.977714	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

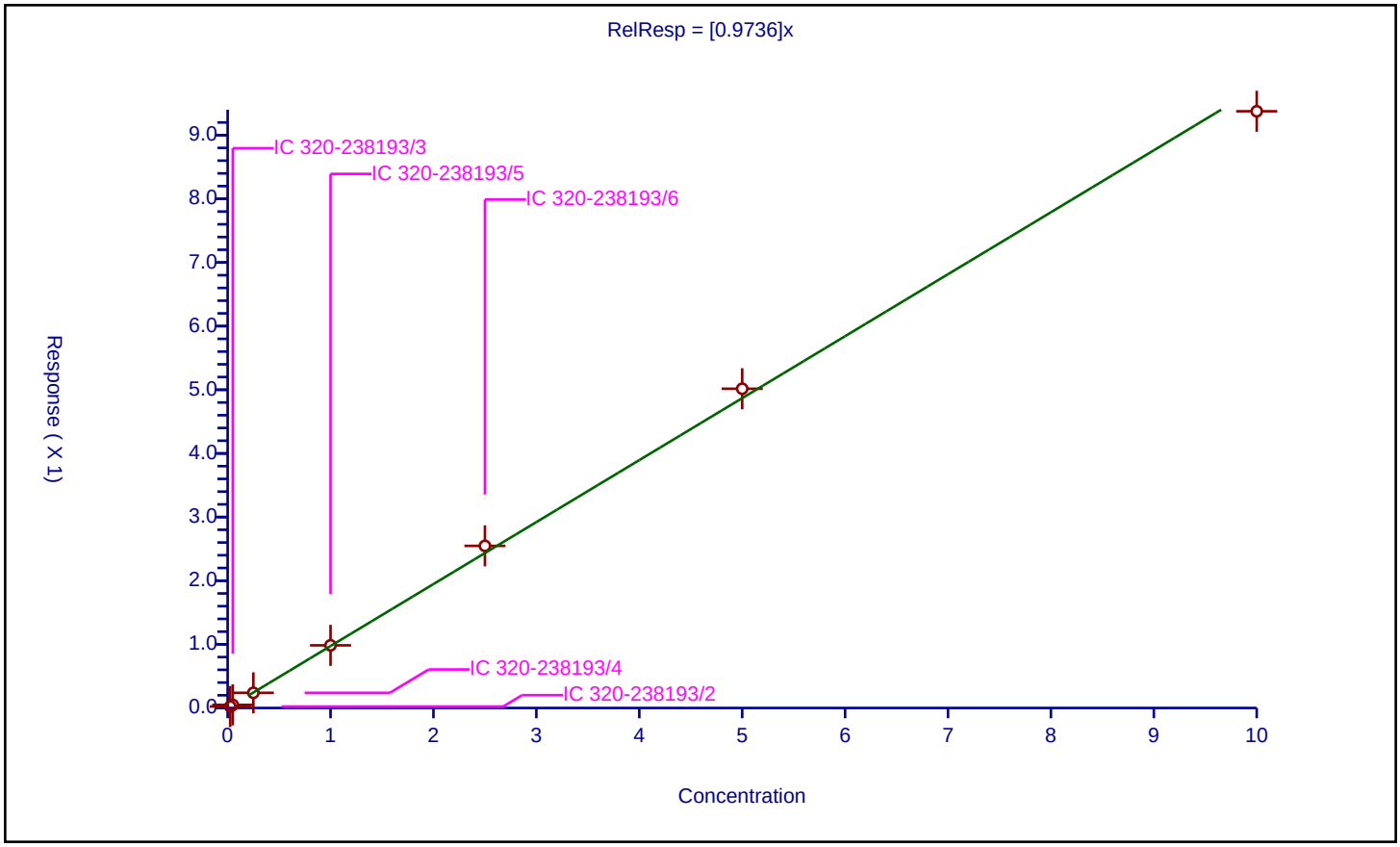
Curve Coefficients

Intercept:	0
Slope:	0.9736

Error Coefficients

Standard Error:	8230000
Relative Standard Error:	3.2
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.023501	2.5	4809407.0	0.940033	Y
2	IC 320-238193/3	0.05	0.048827	2.5	4875140.0	0.976536	Y
3	IC 320-238193/4	0.25	0.238614	2.5	4992636.0	0.954456	Y
4	IC 320-238193/5	1.0	0.984699	2.5	4677735.0	0.984699	Y
5	IC 320-238193/6	2.5	2.547227	2.5	4593505.0	1.018891	Y
6	IC 320-238193/7	5.0	5.016176	2.5	4781606.0	1.003235	Y
7	IC 320-238193/8	10.0	9.376014	2.5	4531636.0	0.937601	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

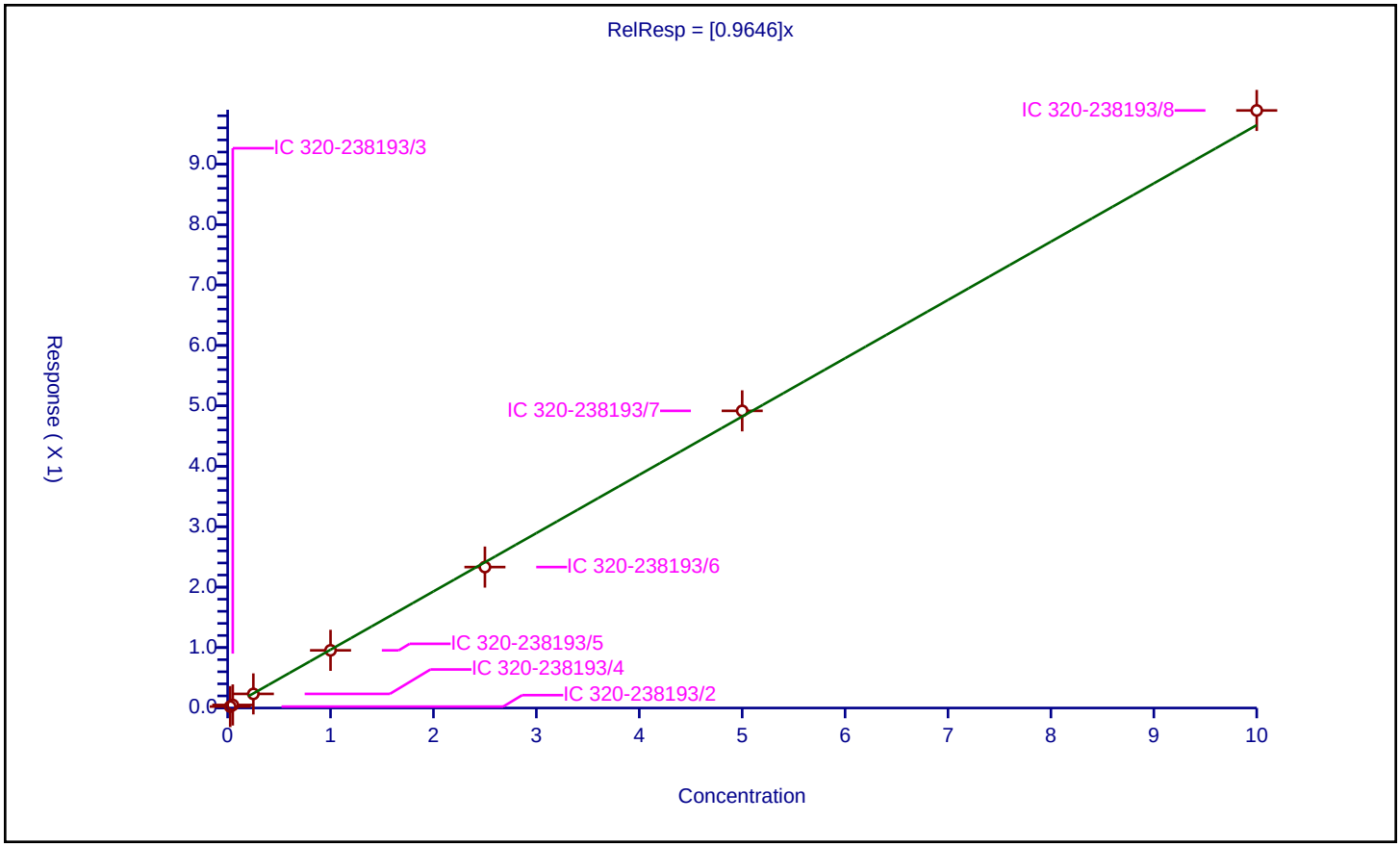
Curve Coefficients

Intercept:	0
Slope:	0.9646

Error Coefficients

Standard Error:	2790000
Relative Standard Error:	3.0
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.023776	2.5	1609182.0	0.951042	Y
2	IC 320-238193/3	0.05	0.05042	2.5	1580220.0	1.008404	Y
3	IC 320-238193/4	0.25	0.233393	2.5	1616798.0	0.933574	Y
4	IC 320-238193/5	1.0	0.954003	2.5	1547904.0	0.954003	Y
5	IC 320-238193/6	2.5	2.332061	2.5	1601576.0	0.932824	Y
6	IC 320-238193/7	5.0	4.917445	2.5	1562466.0	0.983489	Y
7	IC 320-238193/8	10.0	9.888298	2.5	1491160.0	0.98883	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

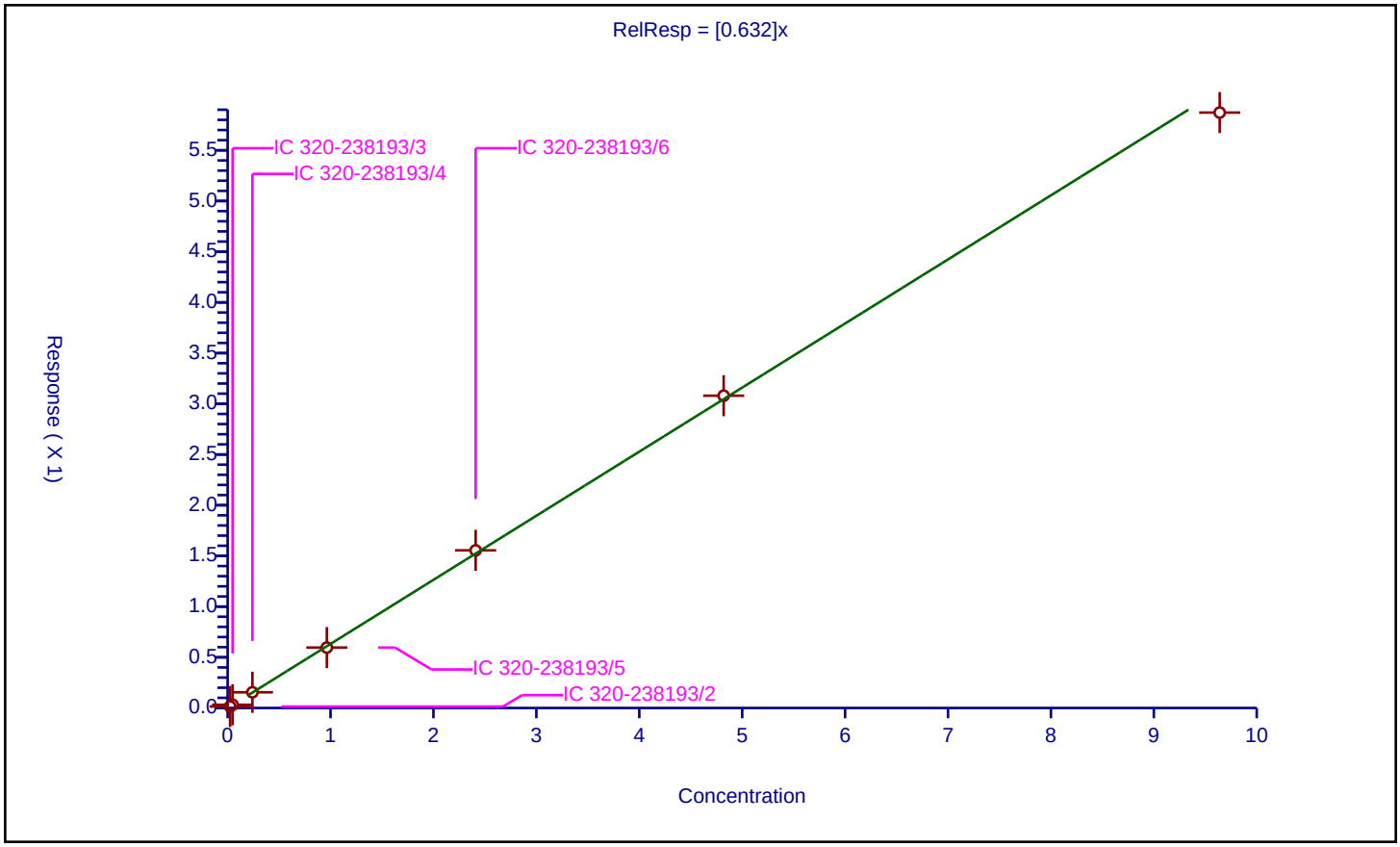
Curve Coefficients

Intercept:	0
Slope:	0.632

Error Coefficients

Standard Error:	3890000
Relative Standard Error:	3.4
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0241	0.014582	2.39	3400422.0	0.605067	Y
2	IC 320-238193/3	0.0482	0.03202	2.39	3430647.0	0.664315	Y
3	IC 320-238193/4	0.241	0.15494	2.39	3598367.0	0.642906	Y
4	IC 320-238193/5	0.964	0.595962	2.39	3408113.0	0.618218	Y
5	IC 320-238193/6	2.41	1.554675	2.39	3404908.0	0.645093	Y
6	IC 320-238193/7	4.82	3.079819	2.39	3471061.0	0.638967	Y
7	IC 320-238193/8	9.64	5.872006	2.39	3286355.0	0.609129	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

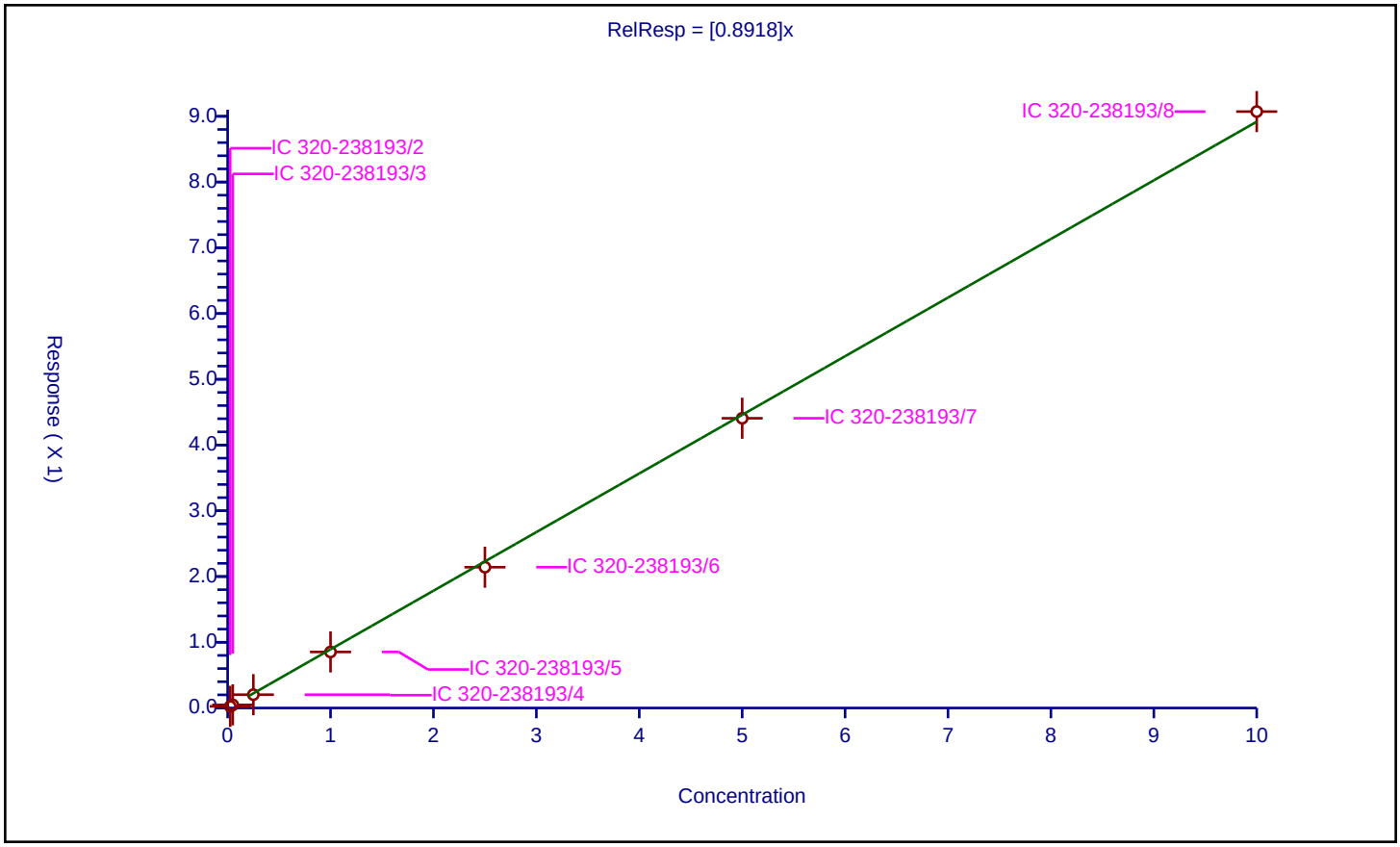
Curve Coefficients

Intercept:	0
Slope:	0.8918

Error Coefficients

Standard Error:	2450000
Relative Standard Error:	6.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.024612	2.5	1718969.0	0.984485	Y
2	IC 320-238193/3	0.05	0.047453	2.5	1684036.0	0.949059	Y
3	IC 320-238193/4	0.25	0.202793	2.5	1760050.0	0.81117	Y
4	IC 320-238193/5	1.0	0.852618	2.5	1663128.0	0.852618	Y
5	IC 320-238193/6	2.5	2.141459	2.5	1595779.0	0.856584	Y
6	IC 320-238193/7	5.0	4.407058	2.5	1597197.0	0.881412	Y
7	IC 320-238193/8	10.0	9.072174	2.5	1403844.0	0.907217	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

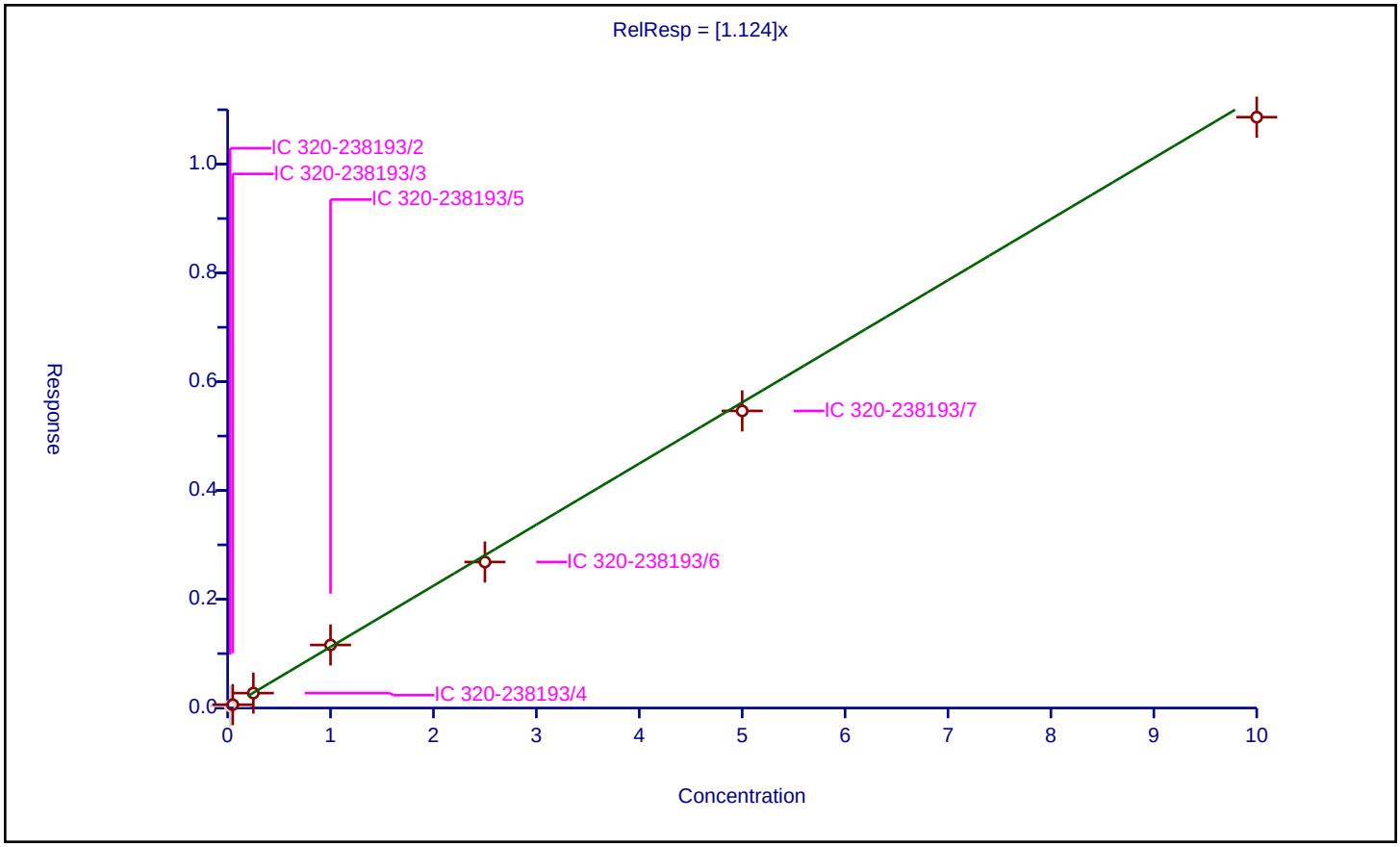
Curve Coefficients

Intercept:	0
Slope:	1.124

Error Coefficients

Standard Error:	5210000
Relative Standard Error:	5.5
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.038626	2.5	2534521.0	1.545026	N
2	IC 320-238193/3	0.05	0.061716	2.5	2456263.0	1.234314	Y
3	IC 320-238193/4	0.25	0.274014	2.5	2639555.0	1.096056	Y
4	IC 320-238193/5	1.0	1.158939	2.5	2425508.0	1.158939	Y
5	IC 320-238193/6	2.5	2.68457	2.5	2527555.0	1.073828	Y
6	IC 320-238193/7	5.0	5.462098	2.5	2455806.0	1.09242	Y
7	IC 320-238193/8	10.0	10.863244	2.5	2281933.0	1.086324	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

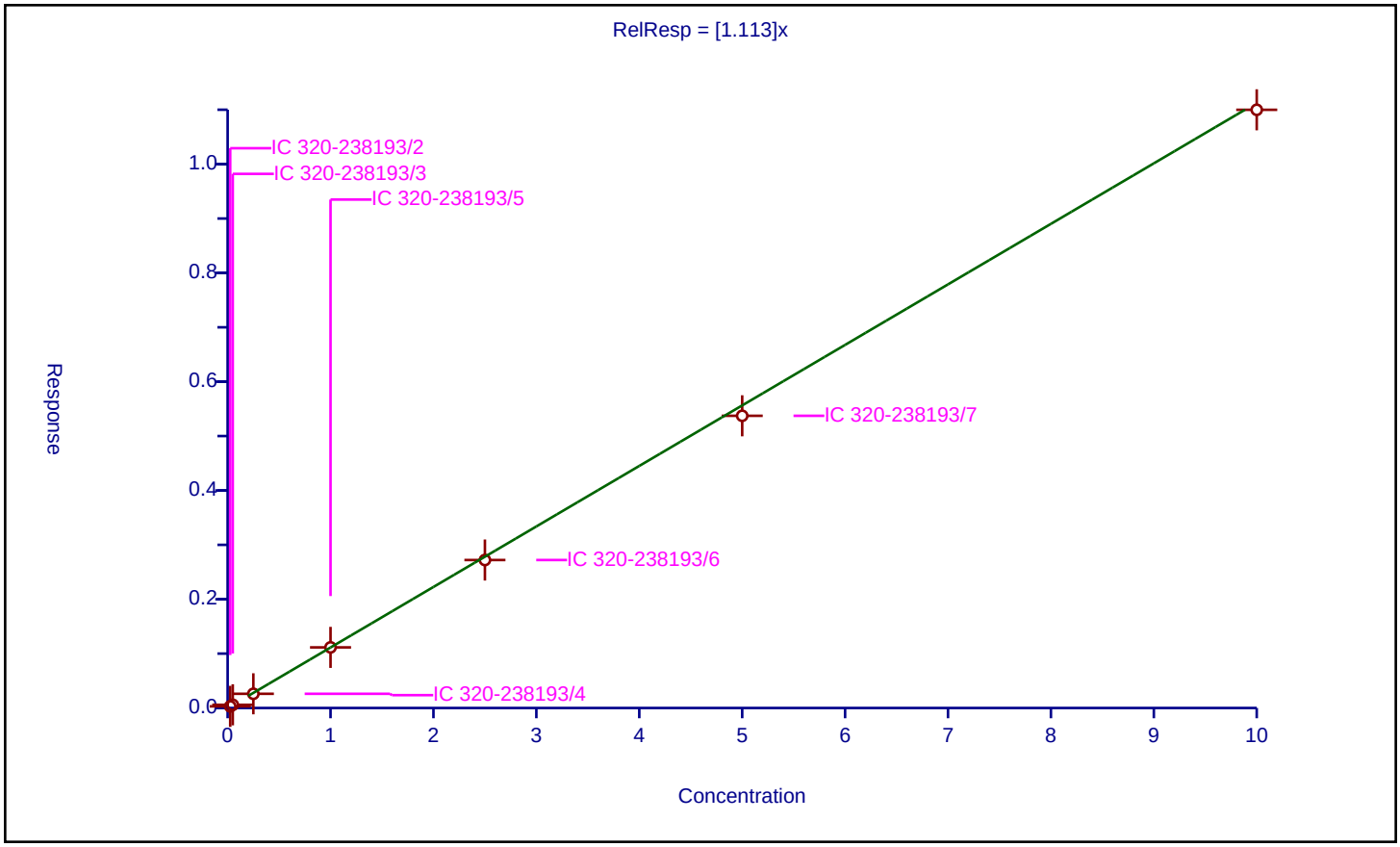
Curve Coefficients

Intercept:	0
Slope:	1.113

Error Coefficients

Standard Error:	5090000
Relative Standard Error:	4.8
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.029739	2.5	2591339.0	1.189578	Y
2	IC 320-238193/3	0.05	0.058862	2.5	2599869.0	1.177232	Y
3	IC 320-238193/4	0.25	0.261223	2.5	2785129.0	1.044892	Y
4	IC 320-238193/5	1.0	1.114482	2.5	2610480.0	1.114482	Y
5	IC 320-238193/6	2.5	2.720923	2.5	2668181.0	1.088369	Y
6	IC 320-238193/7	5.0	5.372521	2.5	2627551.0	1.074504	Y
7	IC 320-238193/8	10.0	10.998843	2.5	2422707.0	1.099884	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

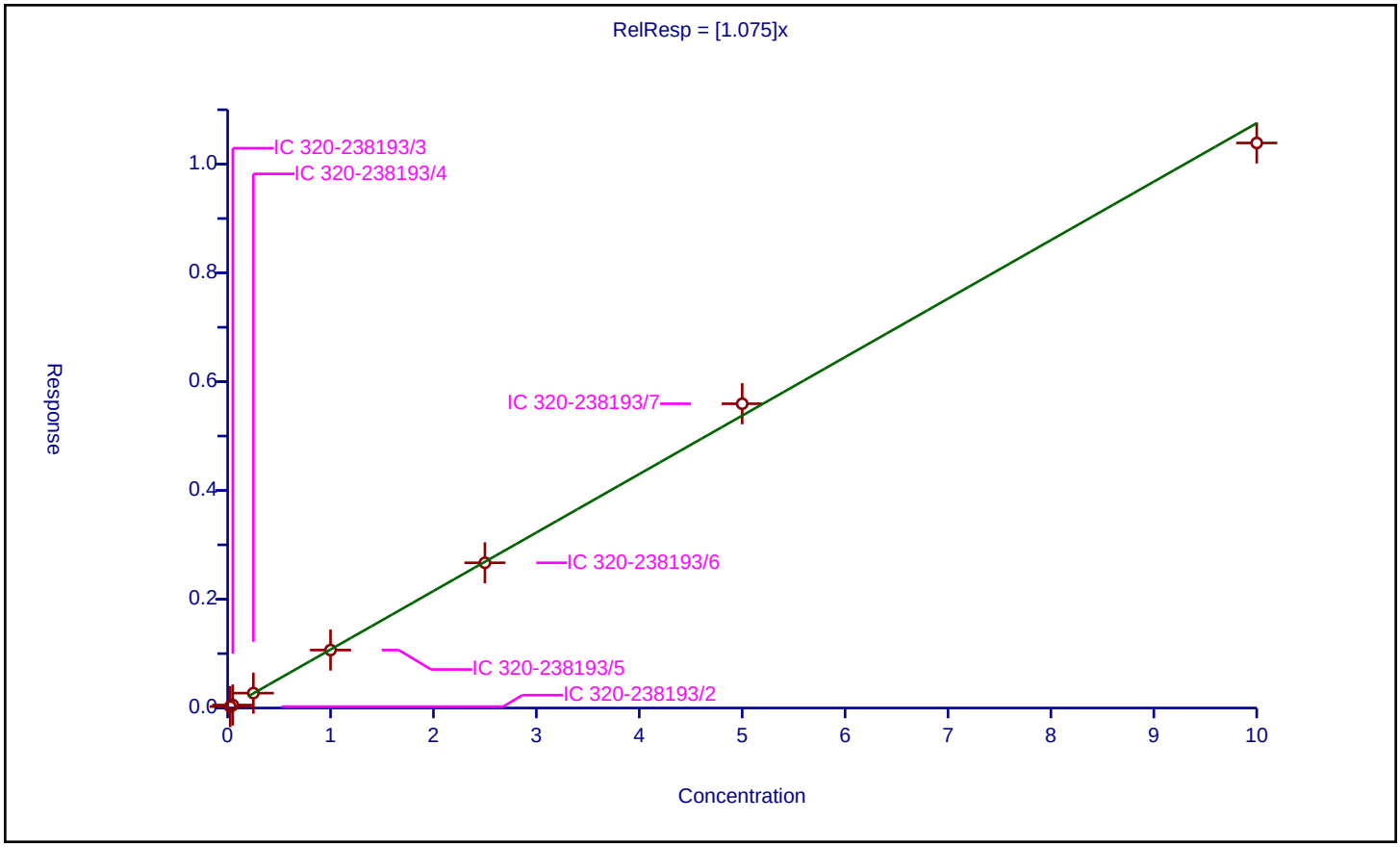
Curve Coefficients

Intercept:	0
Slope:	1.075

Error Coefficients

Standard Error:	4920000
Relative Standard Error:	2.8
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.026038	2.5	2591339.0	1.041508	Y
2	IC 320-238193/3	0.05	0.054986	2.5	2599869.0	1.099728	Y
3	IC 320-238193/4	0.25	0.273592	2.5	2785129.0	1.094369	Y
4	IC 320-238193/5	1.0	1.065564	2.5	2610480.0	1.065564	Y
5	IC 320-238193/6	2.5	2.670075	2.5	2668181.0	1.06803	Y
6	IC 320-238193/7	5.0	5.594154	2.5	2627551.0	1.118831	Y
7	IC 320-238193/8	10.0	10.388884	2.5	2422707.0	1.038888	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

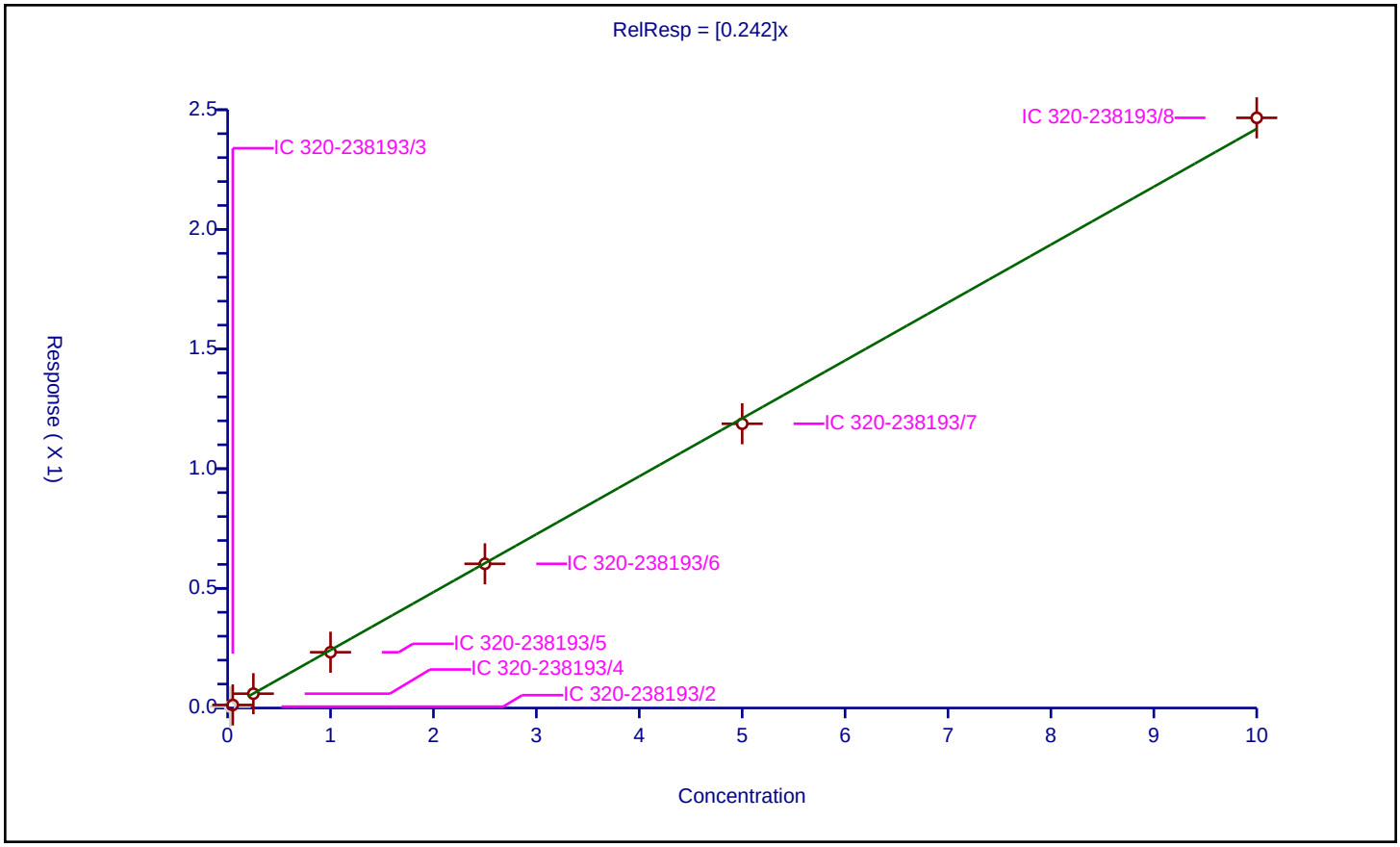
Curve Coefficients

Intercept:	0
Slope:	0.242

Error Coefficients

Standard Error:	1580000
Relative Standard Error:	3.2
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.005847	2.5	3447891.0	0.233882	N
2	IC 320-238193/3	0.05	0.01275	2.5	3344339.0	0.254998	Y
3	IC 320-238193/4	0.25	0.059754	2.5	3541707.0	0.239015	Y
4	IC 320-238193/5	1.0	0.233028	2.5	3313318.0	0.233028	Y
5	IC 320-238193/6	2.5	0.60248	2.5	3233399.0	0.240992	Y
6	IC 320-238193/7	5.0	1.187788	2.5	3382019.0	0.237558	Y
7	IC 320-238193/8	10.0	2.466112	2.5	3074334.0	0.246611	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 320-235668/10 Calibration Date: 07/23/2018 17:13

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.23LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9357		2.38	2.50	-4.8	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.163		2.43	2.50	-2.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	82.20		2.29	2.21	3.5	30.0
4:2 FTS	AveID	17.09	17.09		2.33	2.34	-0.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.004		2.37	2.50	-5.2	30.0
Perfluoropentanesulfonic acid	AveID	71.24	75.65		2.49	2.35	6.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.062		2.41	2.50	-3.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.094		2.13	2.28	-6.2	30.0
6:2 FTS	AveID	1.687	1.669		2.34	2.37	-1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.151		2.37	2.50	-5.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.340		2.31	2.38	-3.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.042		2.28	2.50	-8.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.060		2.22	2.32	-4.1	30.0
8:2 FTS	AveID	1.356	1.257		2.22	2.40	-7.3	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7493		2.41	2.40	0.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	0.9694		2.36	2.50	-5.7	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.023		2.57	2.50	2.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.036		2.63	2.50	5.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6454		2.35	2.41	-2.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8995		2.41	2.50	-3.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.173		2.36	2.50	-5.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.040		2.40	2.50	-3.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	0.9501		2.26	2.50	-9.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2467		2.46	2.50	-1.6	30.0
13C4 PFBA	Ave	1.159	1.165		2.51	2.50	0.5	30.0
13C5-PFPeA	Ave	0.8093	0.7939		2.45	2.50	-1.9	30.0
13C3-PFBS	Ave	0.0212	0.0201		2.20	2.33	-5.3	30.0
13C2 PFHxA	Ave	0.9490	0.9447		2.49	2.50	-0.5	30.0
13C4-PFHpA	Ave	0.9779	0.9729		2.49	2.50	-0.5	30.0
18O2 PFHxS	Ave	1.256	1.257		2.37	2.37	0.0	30.0
M2-6:2FTS	Ave	0.2731	0.2686		2.34	2.38	-1.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 320-235668/10 Calibration Date: 07/23/2018 17:13

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.23LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9474		2.48	2.50	-1.0	30.0
13C4 PFOS	Ave	0.8734	0.8764		2.40	2.39	0.3	30.0
13C5 PFNA	Ave	0.8250	0.8143		2.47	2.50	-1.3	30.0
M2-8:2FTS	Ave	0.2848	0.2964		2.49	2.40	4.1	30.0
13C2 PFDA	Ave	0.6565	0.6741		2.57	2.50	2.7	30.0
13C8 FOSA	Ave	1.283	1.241		2.42	2.50	-3.2	30.0
d3-NMeFOSAA	Ave	0.2169	0.2203		2.54	2.50	1.6	30.0
d5-NEtFOSAA	Ave	0.2280	0.2394		2.63	2.50	5.0	30.0
13C2 PFUnA	Ave	0.5287	0.5192		2.46	2.50	-1.8	30.0
13C2 PFDoA	Ave	0.5026	0.5036		2.50	2.50	0.2	30.0
13C2-PFTeDA	Ave	0.4910	0.4703		2.39	2.50	-4.2	30.0
13C2-PFHxDA	Ave	0.7454	0.7291		2.45	2.50	-2.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 23-Jul-2018 17:13:43 ALS Bottle#: 17 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:42:02 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:30:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.541	5310235	2.51		100	80667	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.399	-0.002	1.000	4969012	2.38			2613	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.638	-0.005	0.633	3618535	2.45		98.1	60889	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.639	-0.006	1.000	4206698	2.43			2290	
D 47 13C3-PFBS										
301.90 > 83.00	1.667	1.670	-0.003	0.646	85192	2.20		94.7	638	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.667	1.672	-0.005	1.000	6656174	2.29			1903	
298.90 > 99.00	1.667	1.672	-0.005	1.000	2724951		2.44(1.25-3.74)		1751	
D 60 M2-4:2FTS										
329.00 > 81.00	1.868	1.877	-0.009	0.724	639924	NC			6615	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.868	1.878	-0.010	1.120	1462273	2.33			64593	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.909	-0.002	0.739	4305938	2.49		99.5	67449	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.909	-0.002	1.000	4325035	2.37			10794	
313.00 > 119.00	1.907	1.909	-0.002	1.000	402182		10.75(5.03-15.10)		8711	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.931	-0.003	1.157	6500053	2.49			74329	
349.00 > 99.00	1.928	1.931	-0.003	1.157	2349760		2.77(1.36-4.07)		28528	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.005	2.006	-0.001	1.000	672980	NC			2733	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.005	2.007	-0.002	0.777	250648	NC			8516	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.230	-0.011	0.860	4434685	2.49		99.5	92162	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.219	2.230	-0.011	1.000	4710583	2.41			6336	
363.00 > 169.00	2.219	2.230	-0.011	1.000	1802407		2.61(1.13-3.40)		16742	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	5706415	2.13			9758	
399.00 > 99.00	2.243	2.243	0.0	1.000	1785556		3.20(1.50-4.49)		4831	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.246	-0.003	0.869	5421355	2.37		100	59735	
65 ADONA										
377.00 > 251.00	2.269	2.272	-0.003	0.771	11918471	NC			93843	
377.00 > 85.00	2.269	2.272	-0.003	0.771	6946675		1.72(0.84-2.53)		34847	
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.559	-0.003	0.990	1163099	2.34		98.4	19368	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.556	2.559	-0.003	1.000	1936819	2.34			16012	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.585	-0.004	1.000	4318338	2.48		99.0	59731	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.585	-0.004		4558188	2.50			50491	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.581	2.586	-0.005	1.000	4976092	2.37			4944	
413.00 > 169.00	2.581	2.586	-0.005	1.000	2555267		1.95(0.84-2.52)		11988	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.591	-0.002	0.880	5096681	2.31			39227	
449.00 > 99.00	2.589	2.591	-0.002	0.880	1370999		3.72(1.94-5.82)		21993	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.949	-0.006	1.140	3818968	2.40		100	35882	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.948	2.949	-0.001	1.002	3928441	2.22			25831	
499.00 > 99.00	2.948	2.949	-0.001	1.002	901039		4.36(2.31-6.93)		10821	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.950	-0.007	1.140	3711737	2.47		98.7	61465	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.950	-0.002	1.002	3866317	2.28			9545	
463.00 > 169.00	2.948	2.950	-0.002	1.002	949818		4.07(1.90-5.69)		21333	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.161	-0.005	1.073	6190387	NC			41409	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.296	-0.004	1.276	1294487	2.49		104	26283	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.297	-0.005	1.000	1626949	2.22			79155	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.299	-0.007	1.119	2873640	2.41			45215	
549.00 > 99.00	3.292	3.299	-0.007	1.119	1081670		2.66(1.33-3.97)		18094	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.308	3.309	-0.001	1.282	3072706	2.57		103	53545	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.309	-0.001	1.000	2978682	2.36			12182	
513.00 > 169.00	3.308	3.309	-0.001	1.000	520808		5.72(2.36-7.09)		20886	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.311	-0.003	1.282	5658602	2.42		96.8	68731	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.314	-0.006	1.000	5786785	2.57			35912	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.460	3.462	-0.002	1.340	1004225	2.54		102	24450	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.468	-0.008	1.000	1039903	2.63			8383	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.625	-0.001	1.232	2485244	2.35			52207	
599.00 > 99.00	3.624	3.625	-0.001	1.232	858834		2.89(1.39-4.16)		16441	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.635	-0.011	1.404	1091378	2.63		105	3536	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.638	-0.004	1.408	2366775	2.46		98.2	45109	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.638	-0.004	1.000	2775891	2.36			15113	
563.00 > 169.00	3.634	3.638	-0.004	1.000	465993		5.96(2.12-6.36)		16104	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.639	-0.005	1.003	981670	2.41			17029	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.789	3.800	-0.011	1.287	9575256	NC			58331	
D 36 13C2 PFDoA										
615.00 > 570.00	3.925	3.934	-0.009	1.521	2295591	2.50		100	24113	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.925	3.934	-0.009	1.000	2388363	2.40			782	
613.00 > 169.00	3.925	3.934	-0.009	1.000	584421		4.09(2.13-6.40)		9427	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.198	-0.009	1.067	2181083	2.26			704	
663.00 > 169.00	4.189	4.198	-0.009	1.067	683553		3.19(1.25-3.76)		9170	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.433	-0.009	1.000	528837	2.46			6682	
713.00 > 219.00	4.424	4.433	-0.009	1.000	383227		1.38(0.71-2.13)		5629	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.435	-0.011	1.714	2143869	2.39		95.8	11513	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.841	4.840	0.001	1.876	3323460	2.45		97.8	10477	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.841	4.840	0.001	1.000	3079685	NC			478	
813.00 > 169.00	4.841	4.840	0.001	1.000	500120		6.16(2.86-8.58)		5013	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.184	-0.003	1.070	3299974	NC			683	
913.00 > 169.00	5.181	5.184	-0.003	1.070	411500		8.02(3.83-11.48)		3986	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00012 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:42:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_010.d

Injection Date: 23-Jul-2018 17:13:43 Instrument ID: A8_N

Lims ID: ICV Full

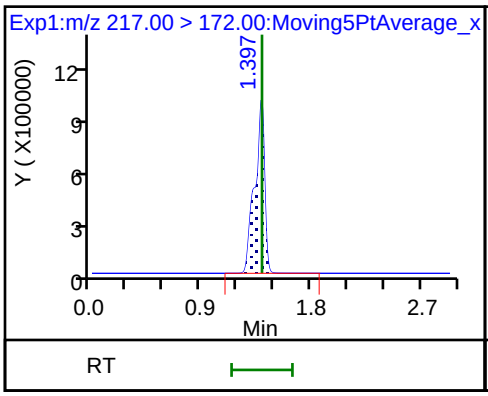
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 17 Worklist Smp#: 10

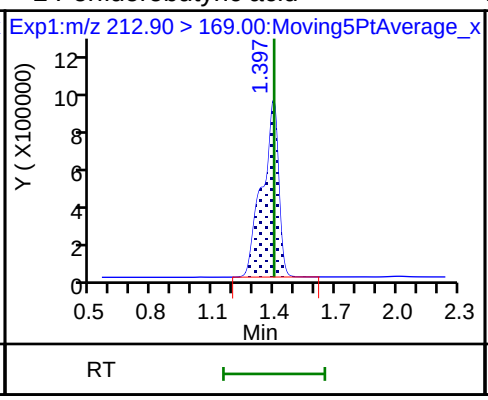
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

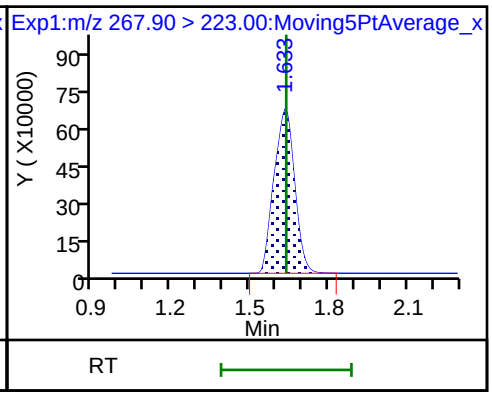
D 1 13C4 PFBA



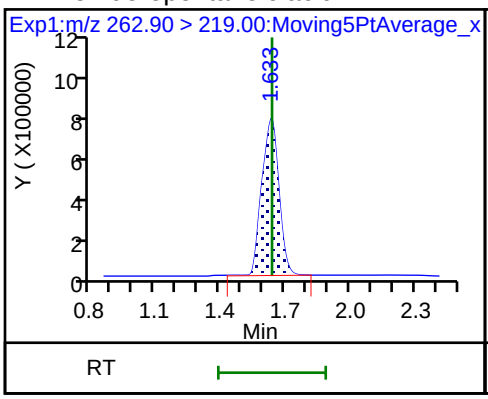
2 Perfluorobutyric acid



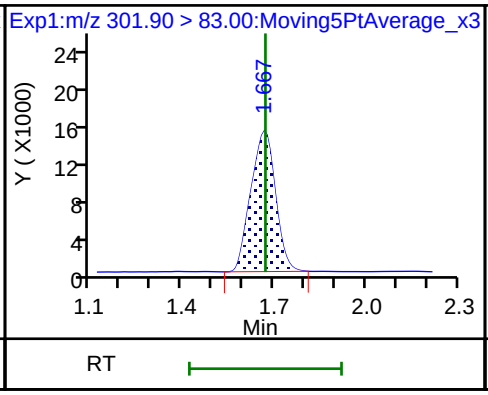
D 3 13C5-PFPeA



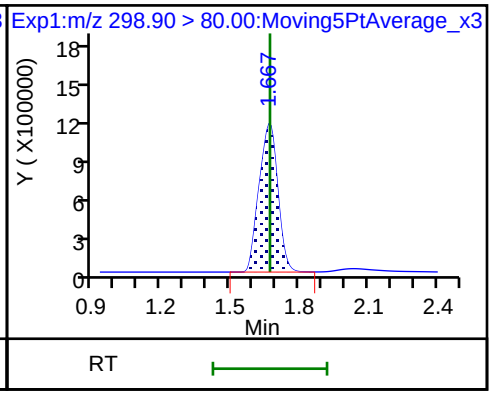
4 Perfluoropentanoic acid



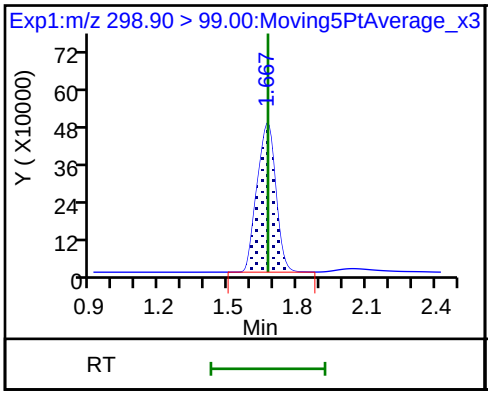
D 47 13C3-PFBS



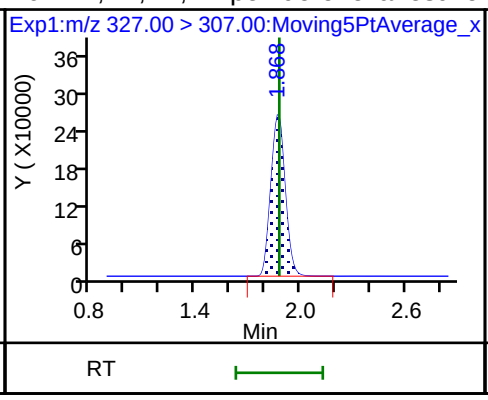
5 Perfluorobutanesulfonic acid



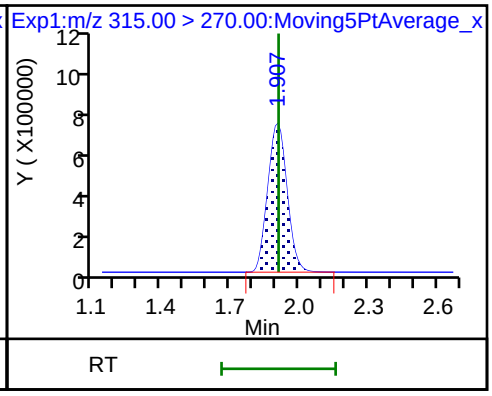
5 Perfluorobutanesulfonic acid



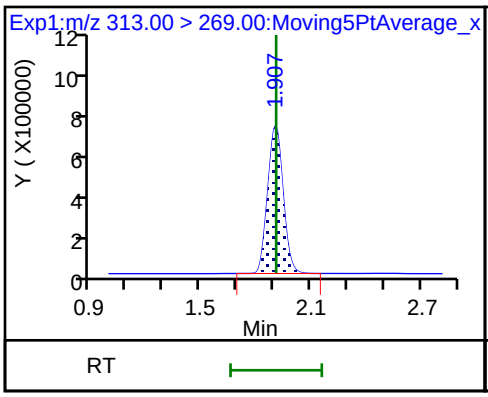
61 1H,1H,2H,2H-perfluorohexanesulfon



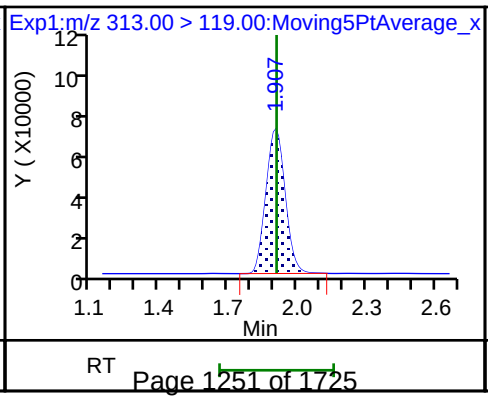
D 7 13C2 PFHxA



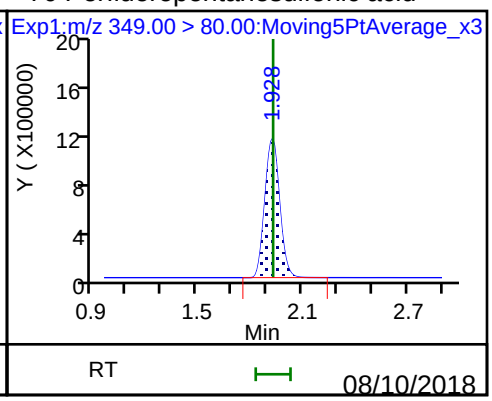
6 Perfluorohexanoic acid



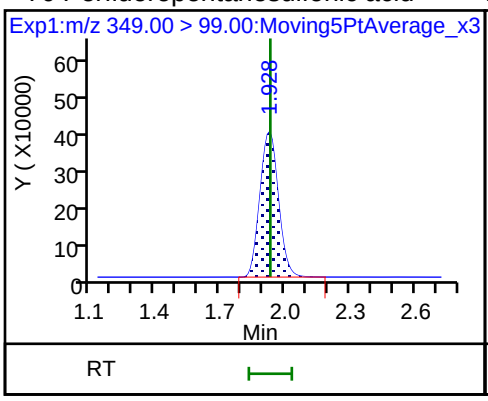
6 Perfluorohexanoic acid



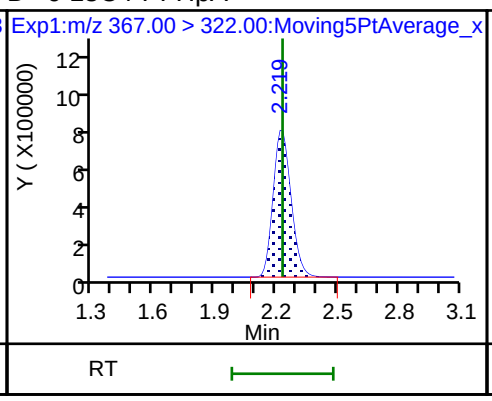
70 Perfluoropentanesulfonic acid



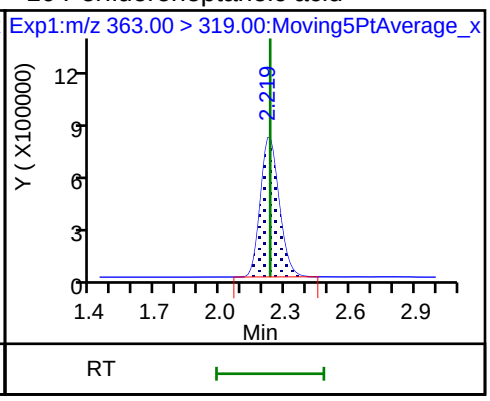
70 Perfluoropentanesulfonic acid



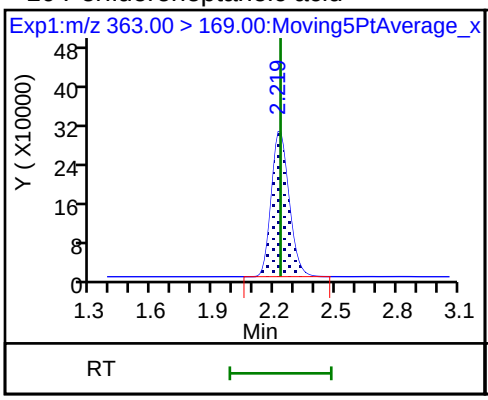
D 9 13C4-PFHpA



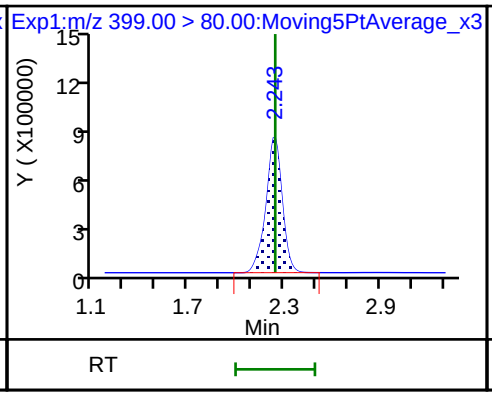
10 Perfluoroheptanoic acid



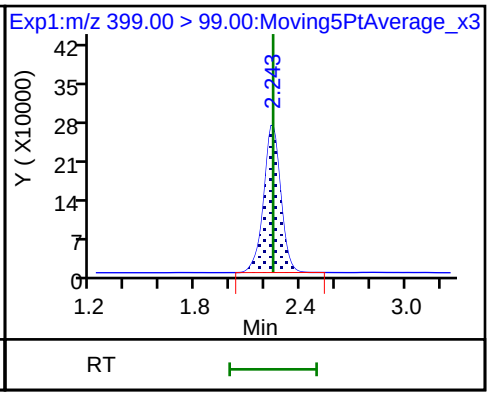
10 Perfluoroheptanoic acid



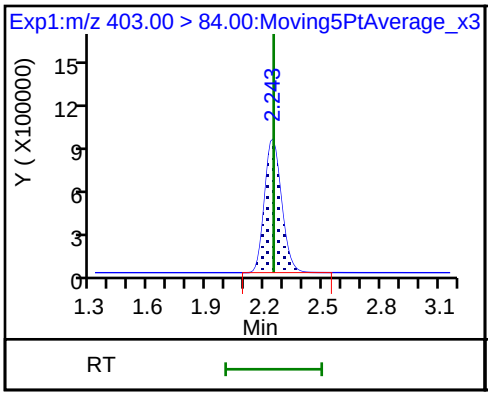
8 Perfluorohexanesulfonic acid



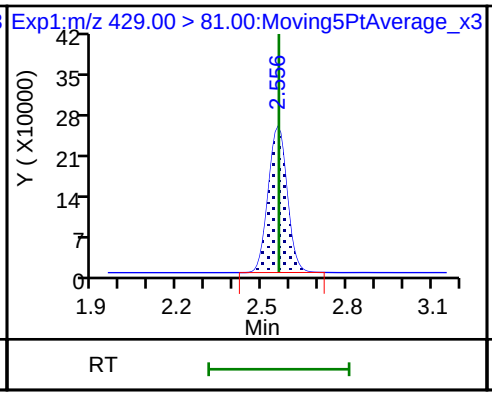
8 Perfluorohexanesulfonic acid



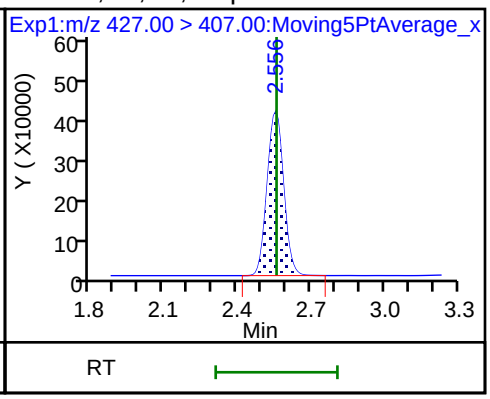
D 11 18O2 PFHxS



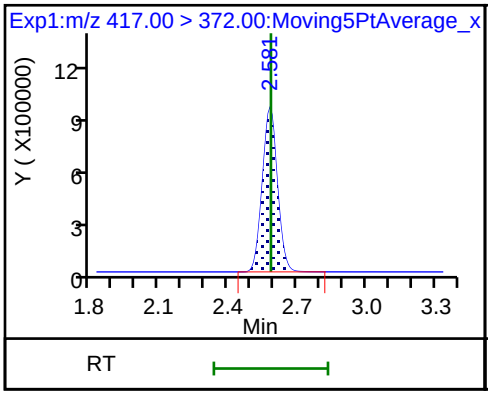
D 12 M2-6:2FTS



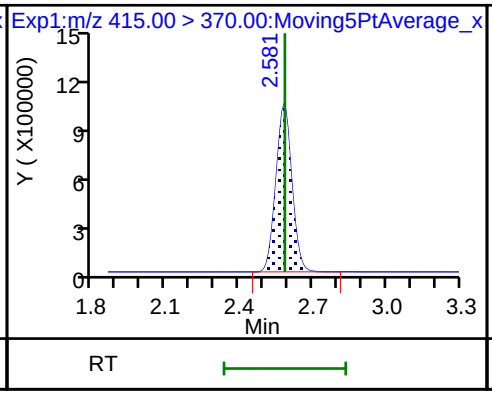
13 1H,1H,2H,2H-perfluorooctanesulfoni



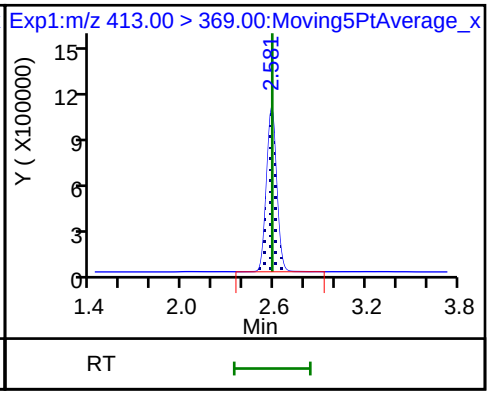
D 14 13C4 PFOA



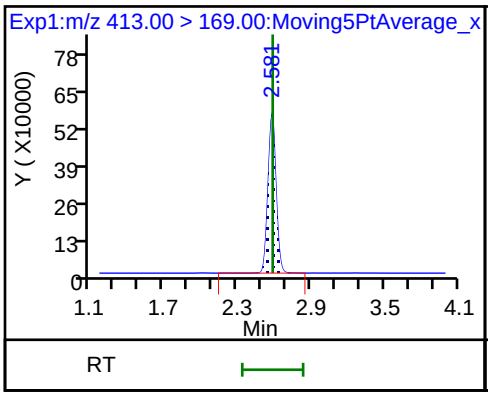
* 62 13C2-PFOA



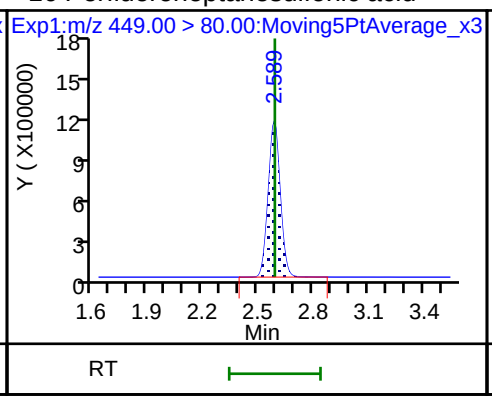
15 Perfluorooctanoic acid



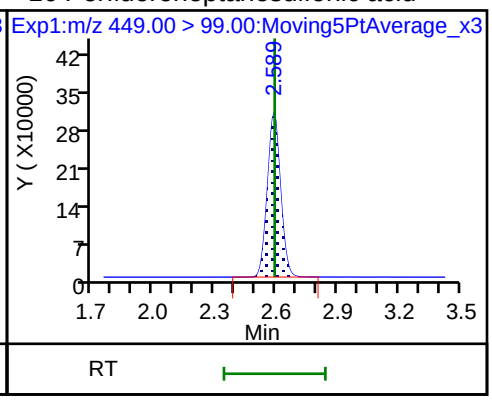
15 Perfluorooctanoic acid



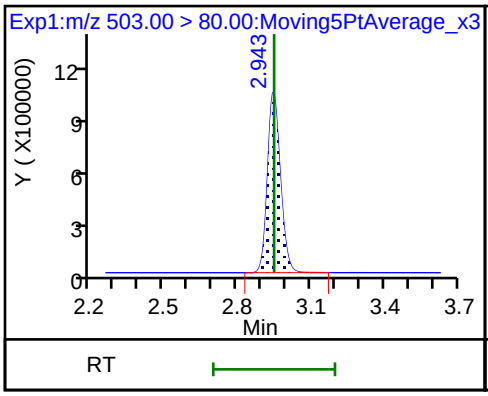
16 Perfluoroheptanesulfonic acid



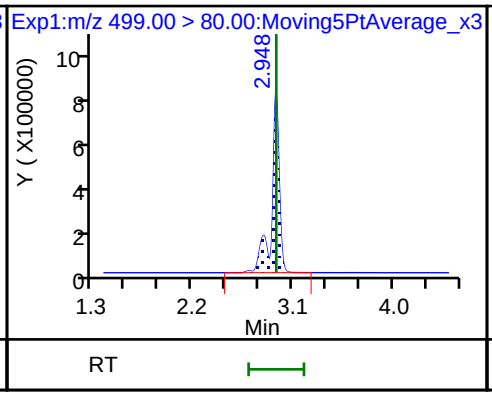
16 Perfluoroheptanesulfonic acid



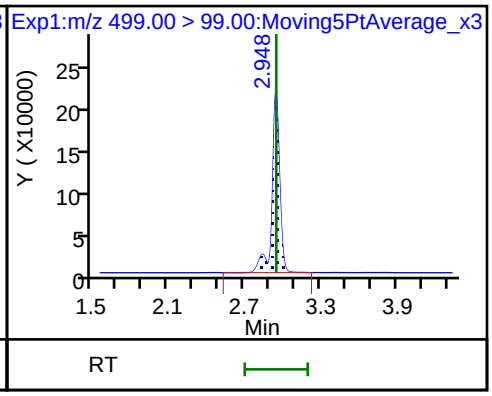
D 18 13C4 PFOS



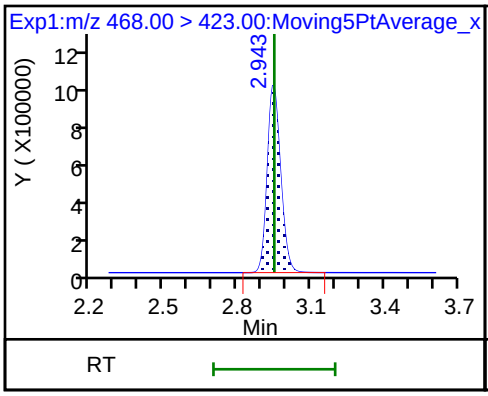
17 Perfluorooctane sulfonic acid



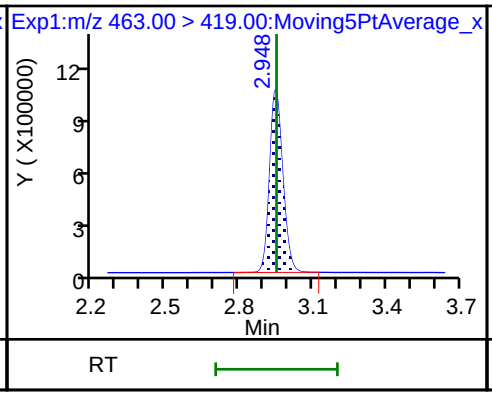
17 Perfluorooctane sulfonic acid



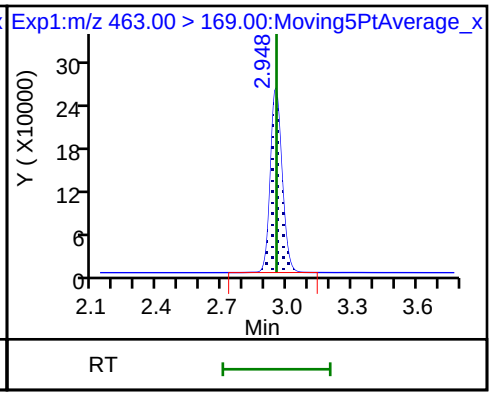
D 19 13C5 PFNA



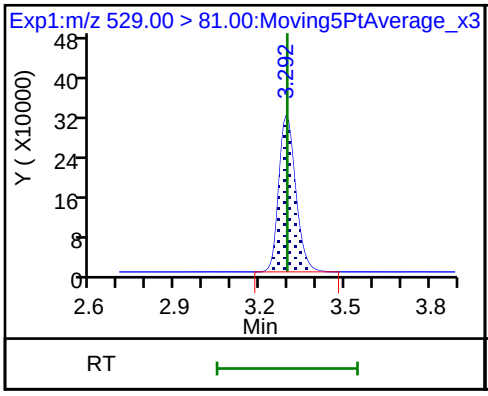
20 Perfluorononanoic acid



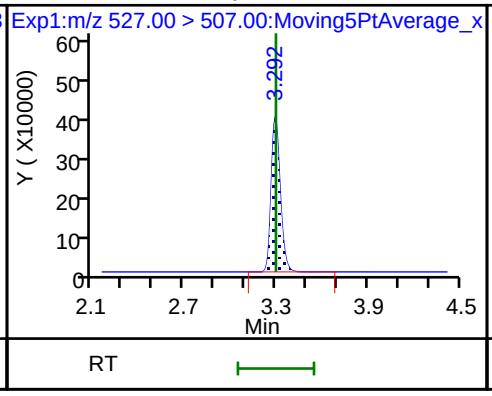
20 Perfluorononanoic acid



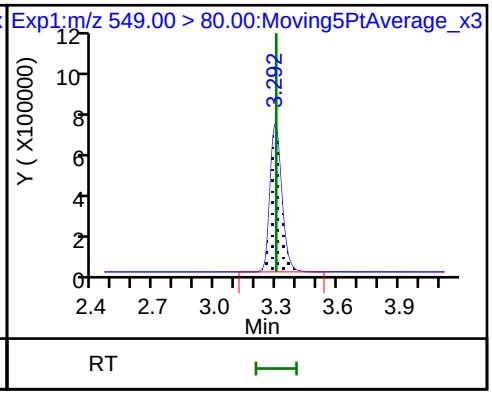
D 26 M2-8:2FTS



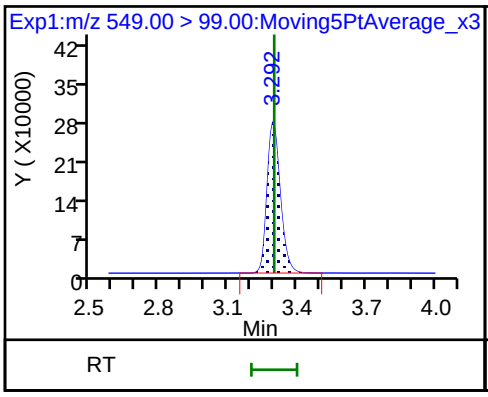
25 1H,1H,2H,2H-perfluorodecanesulfoni



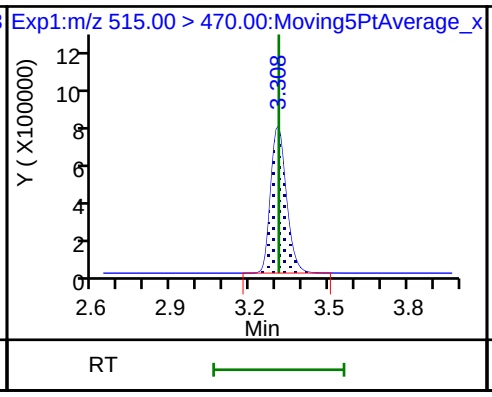
68 Perfluorononanesulfonic acid



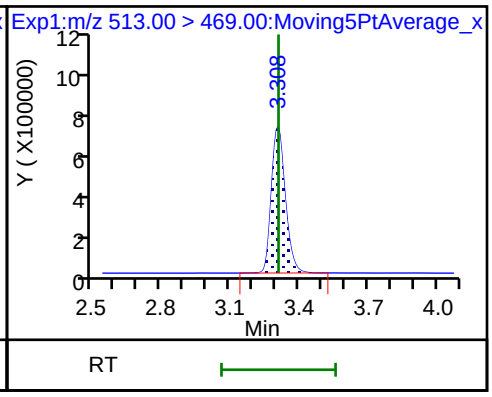
68 Perfluorononanesulfonic acid



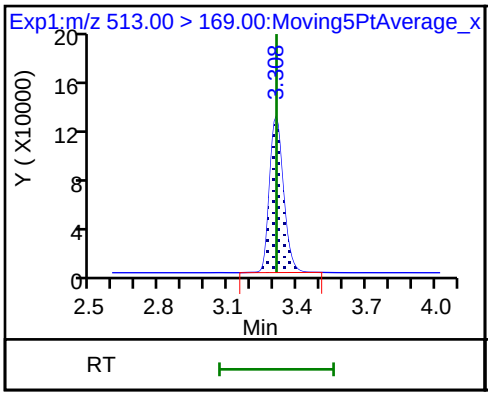
D 23 13C2 PFDA



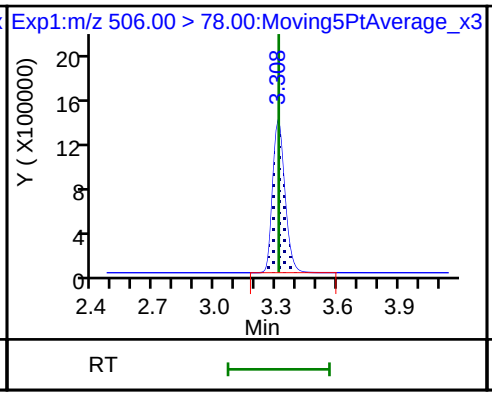
24 Perfluorodecanoic acid



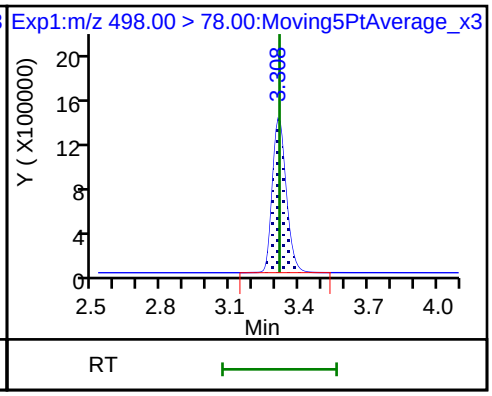
24 Perfluorodecanoic acid



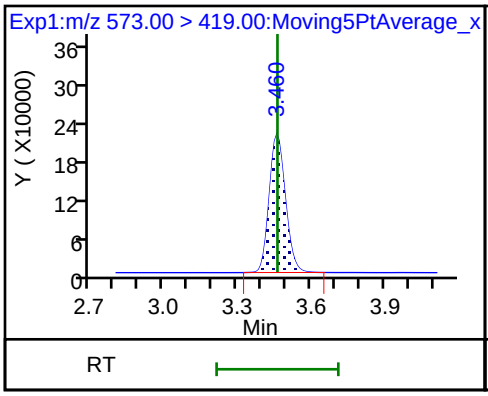
D 21 13C8 FOSA



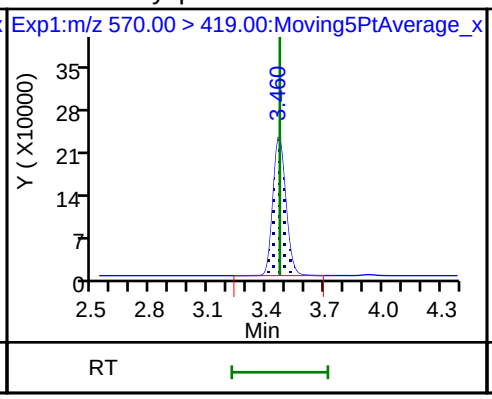
22 Perfluorooctane Sulfonamide



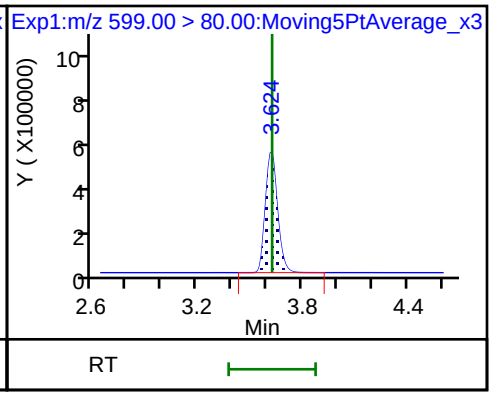
D 27 d3-NMeFOSAA



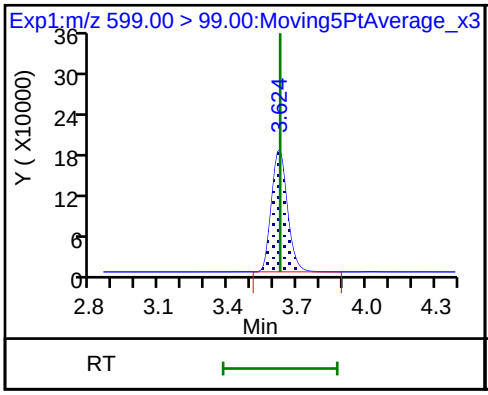
28 N-methyl perfluorooctane sulfonami



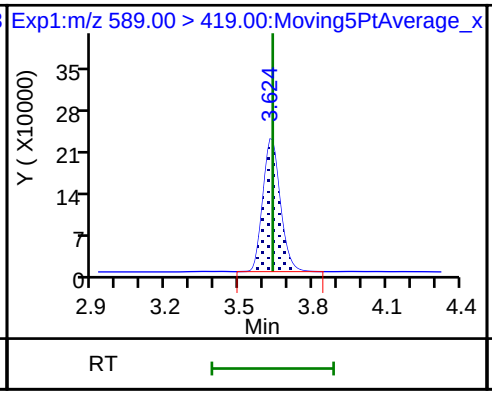
29 Perfluorodecane Sulfonic acid



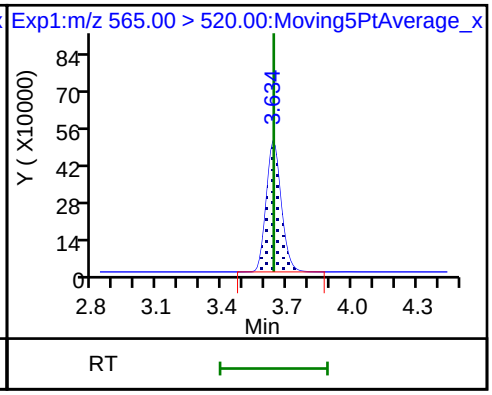
29 Perfluorodecane Sulfonic acid



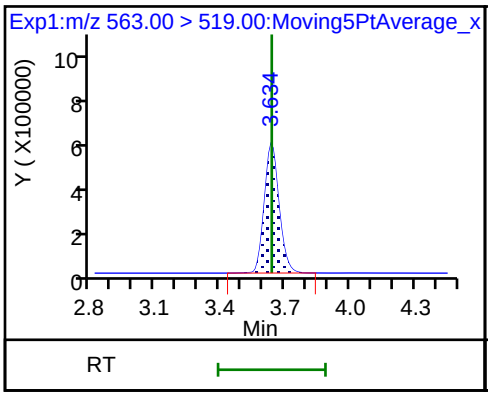
D 32 d5-NEtFOSAA



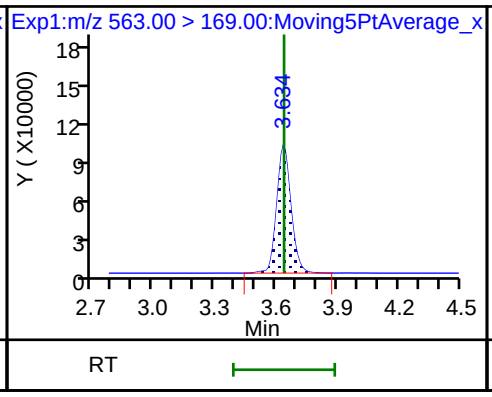
D 30 13C2 PFUnA



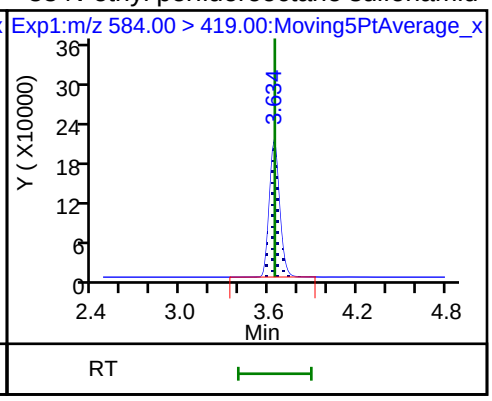
31 Perfluoroundecanoic acid



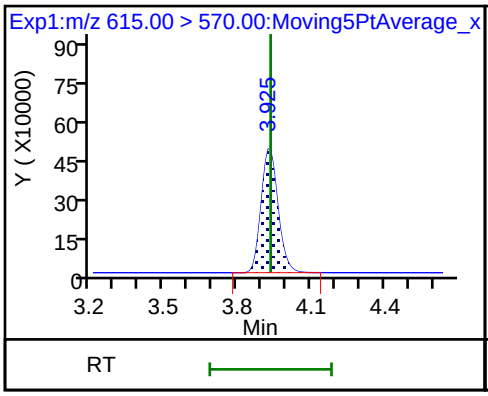
31 Perfluoroundecanoic acid



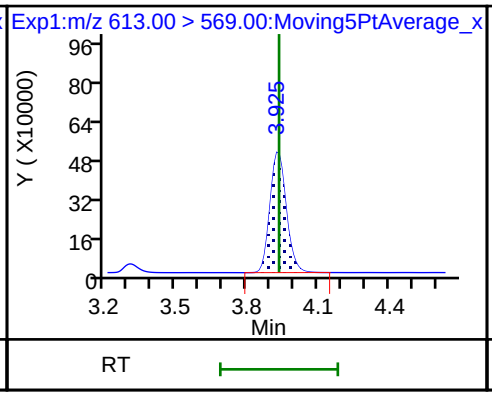
33 N-ethyl perfluorooctane sulfonamid



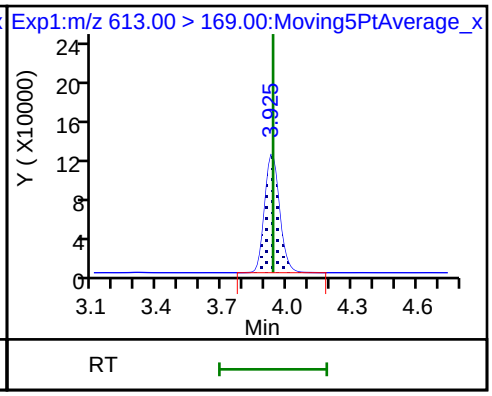
D 36 13C2 PFDoA



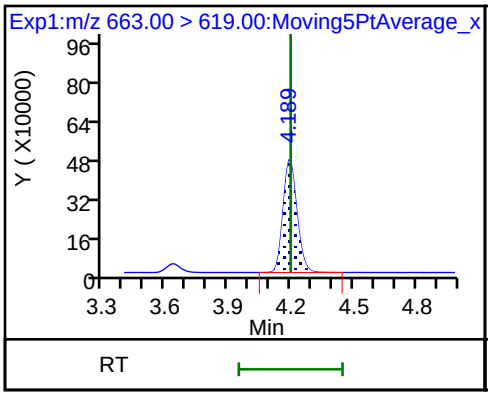
37 Perfluorododecanoic acid



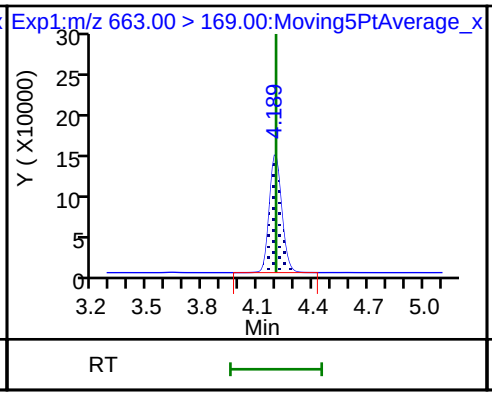
37 Perfluorododecanoic acid



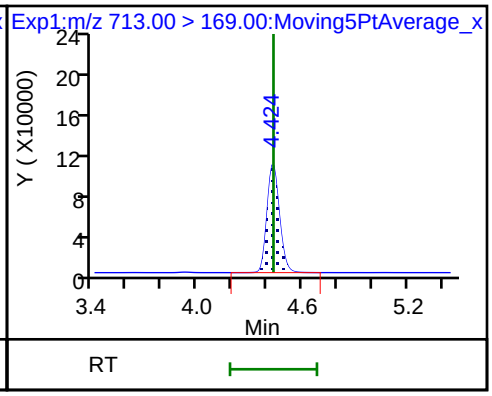
41 Perfluorotridecanoic acid



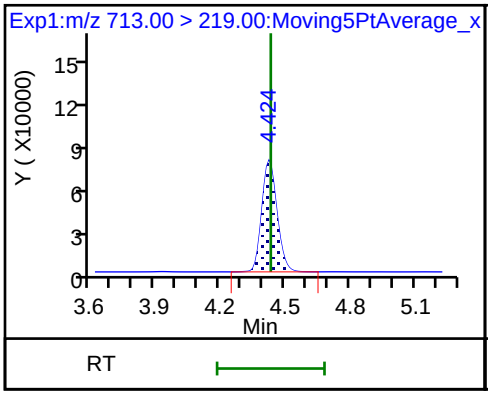
41 Perfluorotridecanoic acid



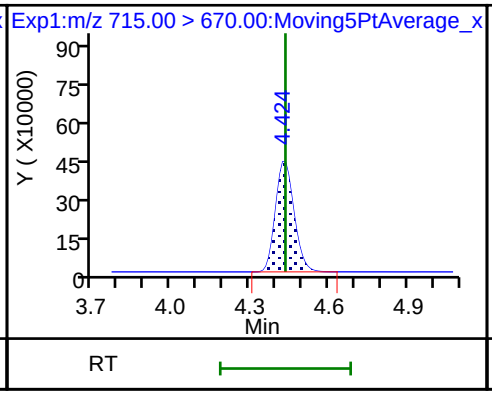
42 Perfluorotetradecanoic acid



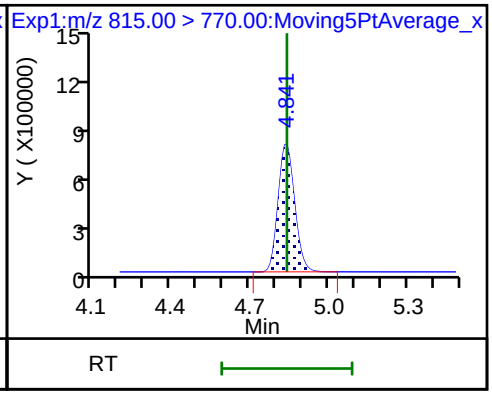
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-236782/2 Calibration Date: 07/29/2018 05:03

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9938		0.0506	0.0500	1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.289		0.0539	0.0500	7.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	78.97		0.0440	0.0442	-0.5	30.0
4:2 FTS	AveID	17.09	11.39		0.400	0.0467	-33.4*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.044		0.0493	0.0500	-1.5	30.0
Perfluoropentanesulfonic acid	AveID	71.24	70.37		0.0463	0.0469	-1.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.284		0.0582	0.0500	16.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.197		0.0467	0.0455	2.6	30.0
6:2 FTS	AveID	1.687	1.804		0.0507	0.0474	6.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.225		0.0505	0.0501	0.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.274		0.0438	0.0476	-7.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.167		0.0511	0.0500	2.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.148		0.0482	0.0464	3.9	30.0
8:2 FTS	AveID	1.356	1.541		0.0544	0.0479	13.7	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7653		0.0492	0.0480	2.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.005		0.0489	0.0500	-2.3	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	0.9482		0.0477	0.0500	-4.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.9478		0.400	0.0500	-3.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6644		0.0483	0.0482	0.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.9545		0.0512	0.0500	2.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.125		0.0453	0.0500	-9.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.109		0.0512	0.0500	2.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	0.9692		0.0461	0.0500	-7.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2684		0.0535	0.0500	7.0	30.0
13C4 PFBA	Ave	1.159	1.236		2.67	2.50	6.7	30.0
13C5-PFPeA	Ave	0.8093	0.8945		2.76	2.50	10.5	30.0
13C3-PFBS	Ave	0.0212	0.0218		2.39	2.33	2.9	30.0
13C2 PFHxA	Ave	0.9490	0.9865		2.60	2.50	3.9	30.0
13C4-PFHpA	Ave	0.9779	0.9496		2.43	2.50	-2.9	30.0
18O2 PFHxS	Ave	1.256	1.262		2.38	2.37	0.4	30.0
M2-6:2FTS	Ave	0.2731	0.1785		1.55	2.38	-34.6*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-236782/2 Calibration Date: 07/29/2018 05:03

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9724		2.54	2.50	1.6	30.0
13C4 PFOS	Ave	0.8734	0.9134		2.50	2.39	4.6	30.0
13C5 PFNA	Ave	0.8250	0.8537		2.59	2.50	3.5	30.0
M2-8:2FTS	Ave	0.2848	0.2785		2.34	2.40	-2.2	30.0
13C2 PFDA	Ave	0.6565	0.7484		2.85	2.50	14.0	30.0
13C8 FOSA	Ave	1.283	1.363		2.66	2.50	6.3	30.0
d3-NMeFOSAA	Ave	0.2169	0.2650		3.05	2.50	22.2	30.0
d5-NEtFOSAA	Ave	0.2280	0.2966		3.25	2.50	30.1*	30.0
13C2 PFUnA	Ave	0.5287	0.6103		2.89	2.50	15.4	30.0
13C2 PFDoA	Ave	0.5026	0.5845		2.91	2.50	16.3	30.0
13C2-PFTeDA	Ave	0.4910	0.5632		2.87	2.50	14.7	30.0
13C2-PFHxDA	Ave	0.7454	0.8342		2.80	2.50	11.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 29-Jul-2018 05:03:46 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 10:34:38 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj Date: 30-Jul-2018 10:33:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.397	-0.008	0.537	4904539	2.67		107	83033	
2 Perfluorobutyric acid										
212.90 > 169.00	1.394	1.397	-0.003	1.004	97487	0.0506		101	44.7	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.640	-0.003	0.633	3548259	2.76		111	61933	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.641	-0.004	1.000	91488	0.0539		108	42.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.675	-0.013	0.643	80543	2.39		103	617	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.662	1.676	-0.014	1.000	120913	0.0440		99.5	403	
298.90 > 99.00	1.671	1.676	-0.005	1.005	54468		2.22(1.25-3.74)		268	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.876	-0.004	0.724	388350	NC			5451	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.877	-0.005	1.126	18432	0.0311		66.6	1088	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.905	-0.003	0.735	3912940	2.60		104	77174	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.917	-0.015	1.000	81722	0.0493		98.5	305	
313.00 > 119.00	1.902	1.917	-0.015	1.000	8169		10.00(5.03-15.10)		241	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.923	1.939	-0.016	1.157	114336	0.0463		98.8	3308	
349.00 > 99.00	1.923	1.939	-0.016	1.157	43946		2.60(1.36-4.07)		394	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.999	2.003	-0.004	0.773	327007	NC			14083	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.999	2.004	-0.005	1.000	15822	NC			80.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.229	-0.004	0.860	3766817	2.43		97.1	53158	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.230	-0.005	1.000	96706	0.0582		116	216	
363.00 > 169.00	2.225	2.230	-0.005	1.000	33477		2.89(1.13-3.40)		483	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.241	-0.004	0.865	4734527	2.38		100	39216	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.242	-0.005	1.000	109029	0.0467		103	1328	
399.00 > 99.00	2.237	2.242	-0.005	1.000	41171		2.65(1.50-4.49)		147	
65 ADONA										
377.00 > 251.00	2.276	2.282	-0.006	0.771	226925	NC			3778	
377.00 > 85.00	2.276	2.282	-0.006	0.771	126343		1.80(0.84-2.53)		558	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.563	2.557	0.006	1.000	24226	0.0507		107	543	
D 12 M2-6:2FTS										
429.00 > 81.00	2.563	2.564	-0.001	0.991	672786	1.55		65.4	11092	
D 14 13C4 PFOA										
417.00 > 372.00	2.587	2.588	-0.001	1.000	3857190	2.54		102	41255	
* 62 13C2-PFOA										
415.00 > 370.00	2.587	2.590	-0.003		3966670	2.50			46961	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.587	2.590	-0.003	1.000	94587	0.0505		101	117	
413.00 > 169.00	2.587	2.590	-0.003	1.000	52305		1.81(0.84-2.52)		321	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.595	2.598	-0.003	0.879	87878	0.0438		92.1	3342	
449.00 > 99.00	2.595	2.598	-0.003	0.879	27629		3.18(1.94-5.82)		218	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.951	2.950	0.001	1.000	77183	0.0482		104	1900	
499.00 > 99.00	2.946	2.950	-0.004	0.998	20870		3.70(2.31-6.93)		185	
20 Perfluorononanoic acid										
463.00 > 419.00	2.951	2.950	0.001	1.000	79055	0.0511		102	255	
463.00 > 169.00	2.951	2.950	0.001	1.000	17694		4.47(1.90-5.69)		813	
D 19 13C5 PFNA										
468.00 > 423.00	2.951	2.953	-0.002	1.141	3386497	2.59		103	70727	
D 18 13C4 PFOS										
503.00 > 80.00	2.951	2.953	-0.002	1.141	3463766	2.50		105	39758	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.162	3.158	0.004	1.071	120329	NC			943	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.294	0.001	1.000	32614	0.0544		114	1158	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.294	0.001	1.117	53240	0.0492		102	3279	
549.00 > 99.00	3.295	3.294	0.001	1.117	21746		2.45(1.33-3.97)		239	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.299	-0.004	1.274	1058276	2.34		97.8	16503	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.311	3.310	0.001	1.000	59663	0.0489		97.7	388	
513.00 > 169.00	3.303	3.310	-0.007	0.998	14044		4.25(2.36-7.09)		507	
D 23 13C2 PFDA										
515.00 > 470.00	3.311	3.315	-0.004	1.280	2968573	2.85		114	41792	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.317	-0.006	1.000	102546	0.0477		95.3	2663	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.322	-0.011	1.280	5407619	2.66		106	41685	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.464	3.467	-0.003	1.339	1051131	3.05		122	28687	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.464	3.471	-0.007	1.000	19925	0.0481		96.2	225	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.628	3.626	0.002	1.229	46409	0.0483		100	2485	
599.00 > 99.00	3.618	3.626	-0.008	1.226	16803		2.76(1.39-4.16)		357	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.638	3.636	0.002	1.000	54489	0.0453		90.7	257	
563.00 > 169.00	3.638	3.636	0.002	1.000	8631		6.31(2.12-6.36)		263	M
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.638	3.636	0.002	1.003	22461	0.0512		102	709	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.640	-0.012	1.402	1176581	3.25		130	4217	
D 30 13C2 PFUnA										
565.00 > 520.00	3.638	3.640	-0.002	1.406	2420875	2.89		115	42584	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.801	-0.009	1.285	196361	NC			5056	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.937	-0.009	1.000	51416	0.0512		102	15.2	
613.00 > 169.00	3.928	3.937	-0.009	1.000	11757		4.37(2.13-6.40)		228	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.941	-0.013	1.519	2318503	2.91		116	20247	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.200	-0.008	1.067	44941	0.0461		92.3	14.1	
663.00 > 169.00	4.192	4.200	-0.008	1.067	15444		2.91(1.25-3.76)		250	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.436	-0.010	1.000	11990	0.0535		107	227	
713.00 > 219.00	4.426	4.436	-0.010	1.000	10699		1.12(0.71-2.13)		198	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.437	-0.011	1.711	2234012	2.87		115	18324	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.837	0.005	1.002	94440	NC			15.3	
813.00 > 169.00	4.842	4.837	0.005	1.002	16152		5.85(2.86-8.58)		185	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.868	3308931	2.80		112	9822	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.184	-0.003	1.072	73897	NC			14.3	
913.00 > 169.00	5.181	5.184	-0.003	1.072	8797		8.40(3.83-11.48)		134	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 10:34:42 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_004.d

Injection Date: 29-Jul-2018 05:03:46 Instrument ID: A8_N

Lims ID: CCVL

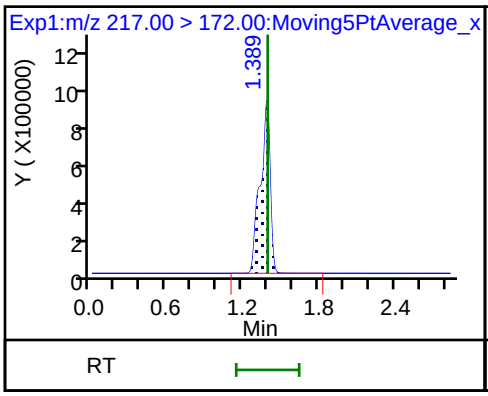
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2

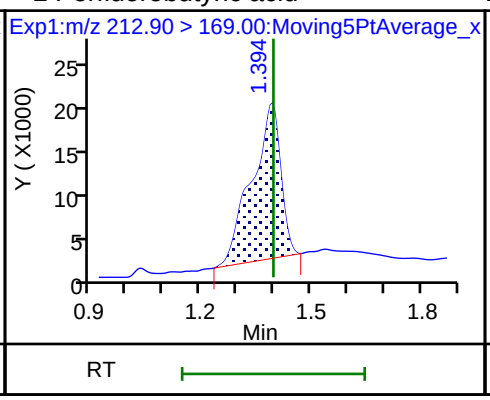
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

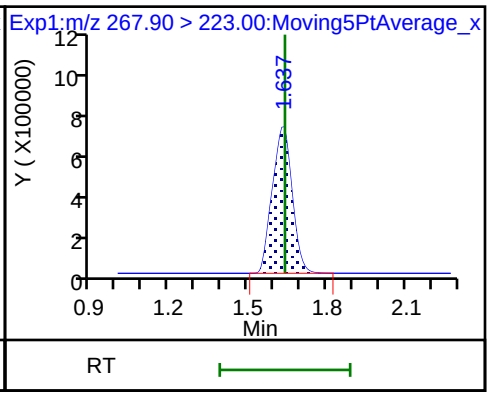
D 1 13C4 PFBA



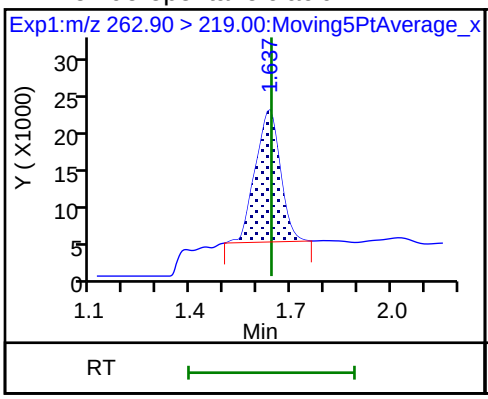
2 Perfluorobutyric acid



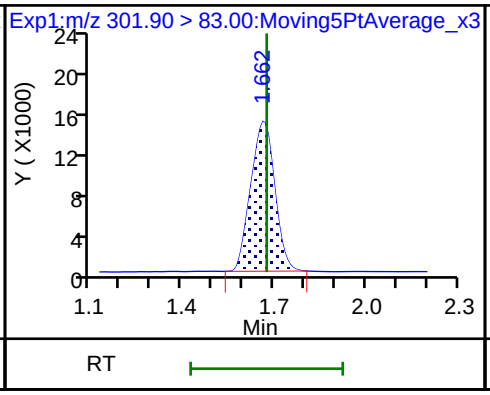
D 3 13C5-PFPeA



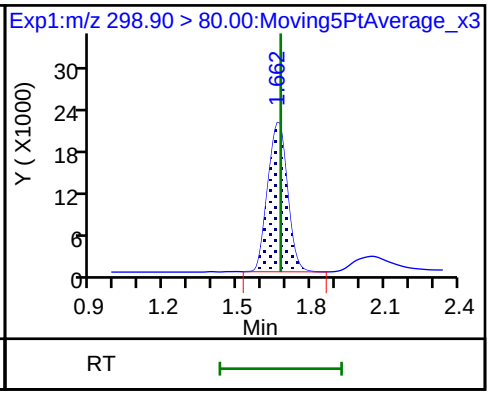
4 Perfluoropentanoic acid



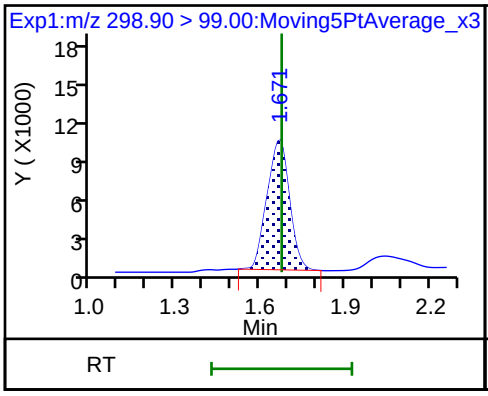
D 47 13C3-PFBS



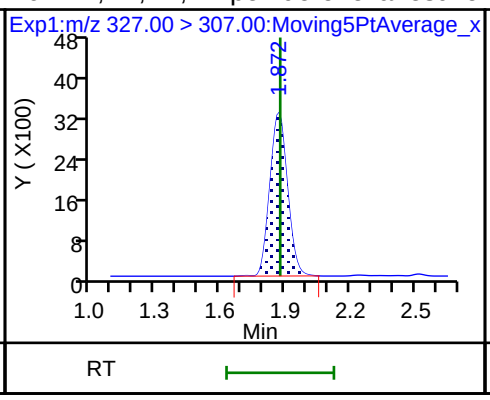
5 Perfluorobutanesulfonic acid



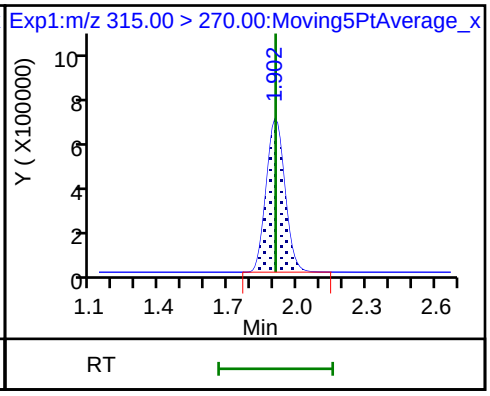
5 Perfluorobutanesulfonic acid



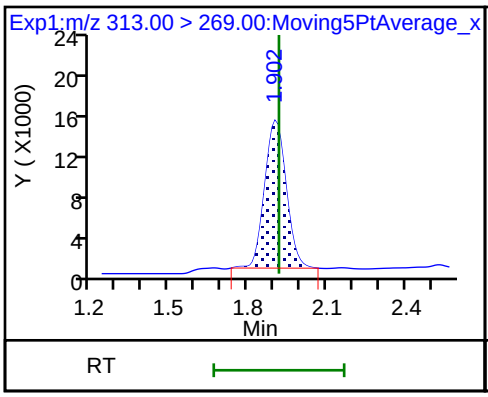
61 1H,1H,2H,2H-perfluorohexanesulfon



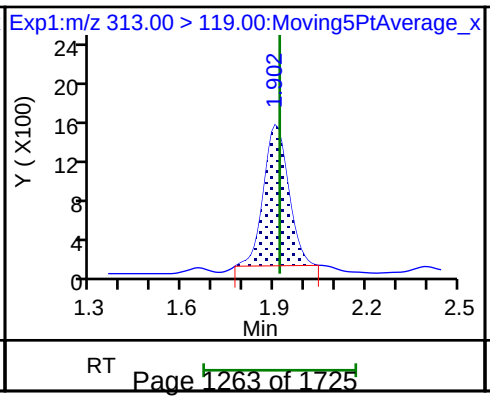
D 7 13C2 PFHxA



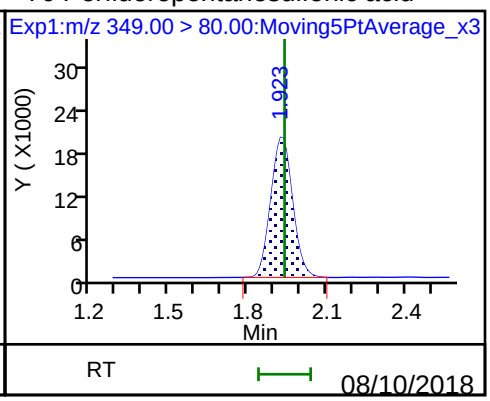
6 Perfluorohexanoic acid



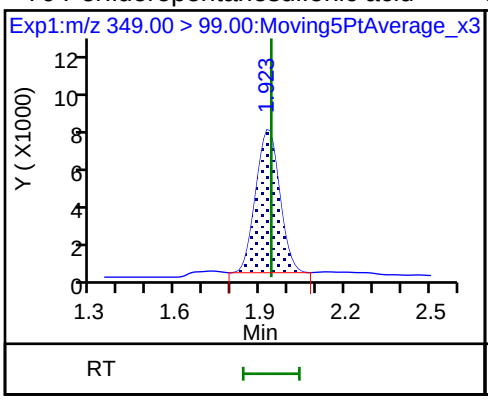
6 Perfluorohexanoic acid



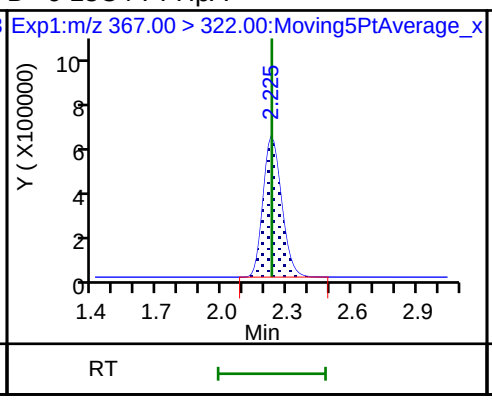
70 Perfluoropentanesulfonic acid



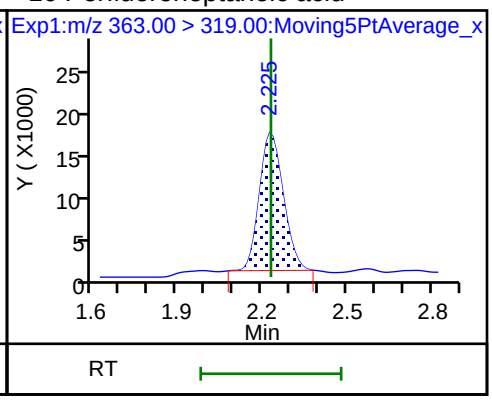
70 Perfluoropentanesulfonic acid



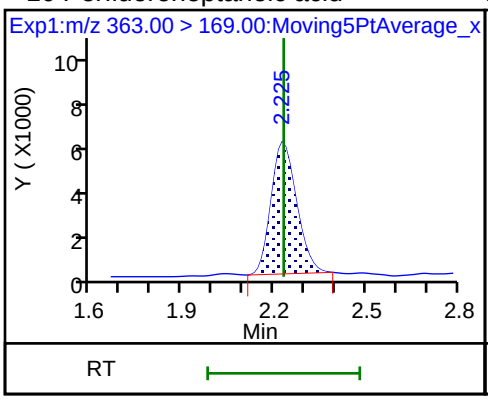
D 9 13C4-PFHpA



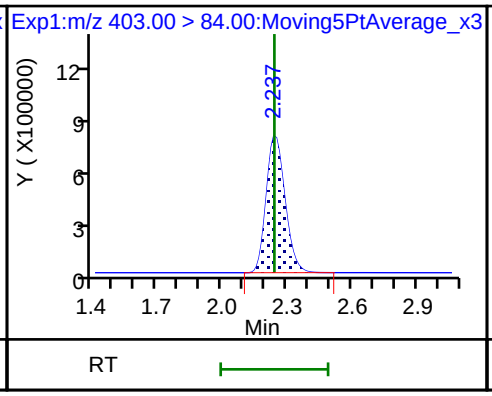
10 Perfluoroheptanoic acid



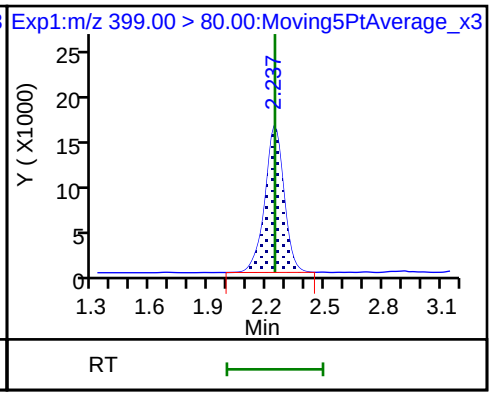
10 Perfluoroheptanoic acid



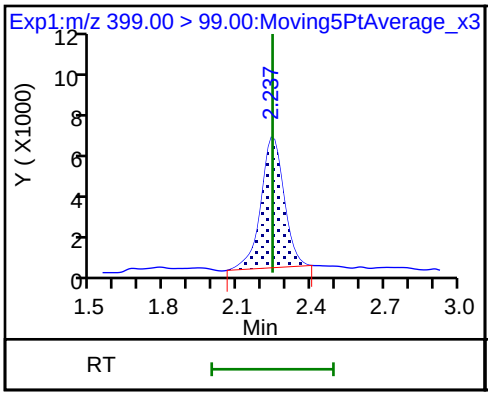
D 11 18O2 PFHxS



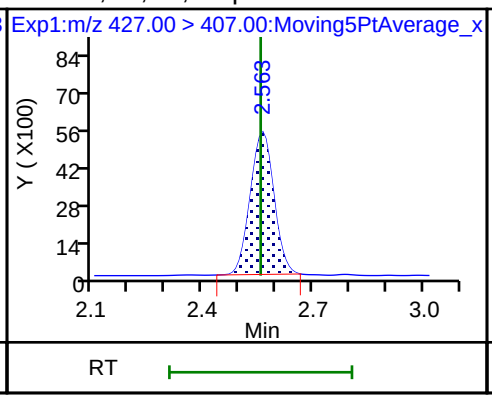
8 Perfluorohexanesulfonic acid



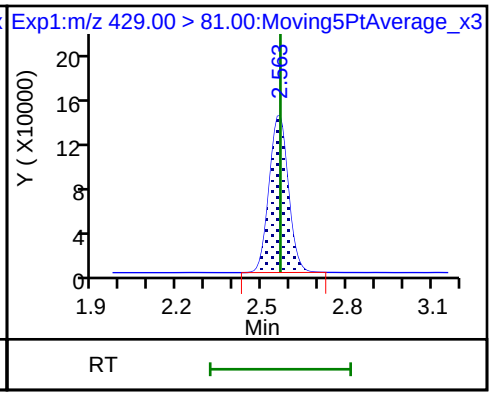
8 Perfluorohexanesulfonic acid



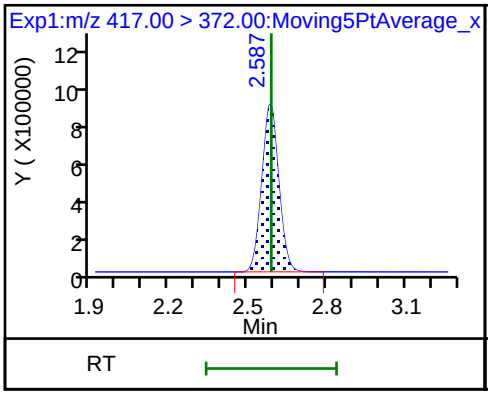
13 1H,1H,2H,2H-perfluorooctanesulfon



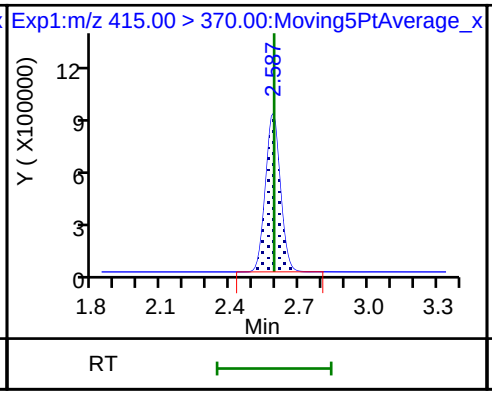
D 12 M2-6:2FTS



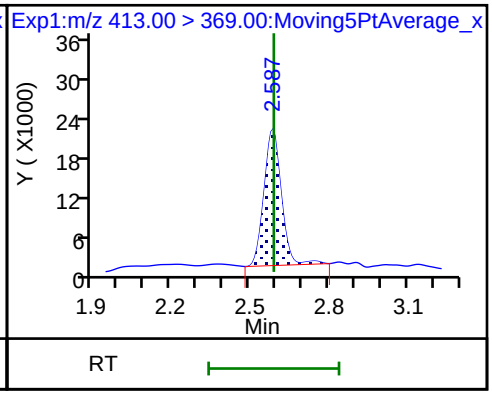
D 14 13C4 PFOA



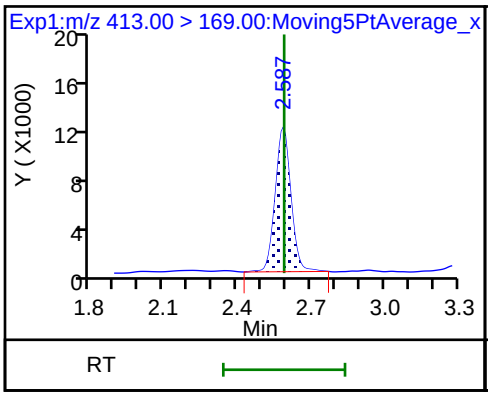
* 62 13C2-PFOA



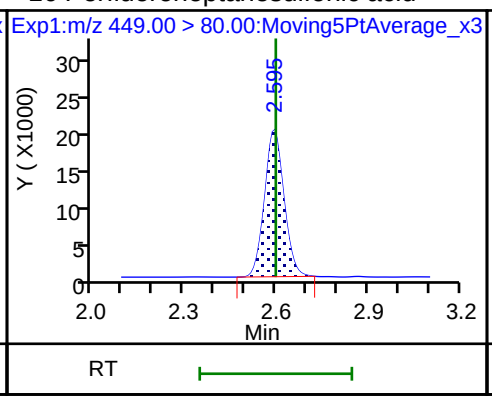
15 Perfluorooctanoic acid



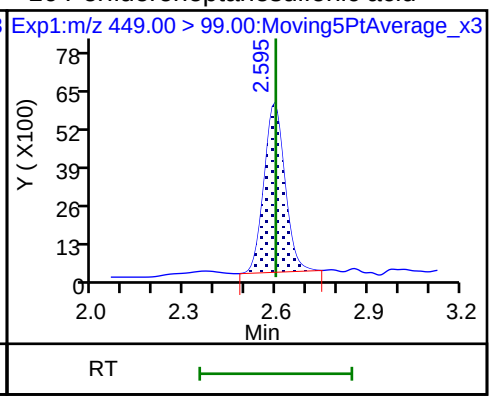
15 Perfluorooctanoic acid



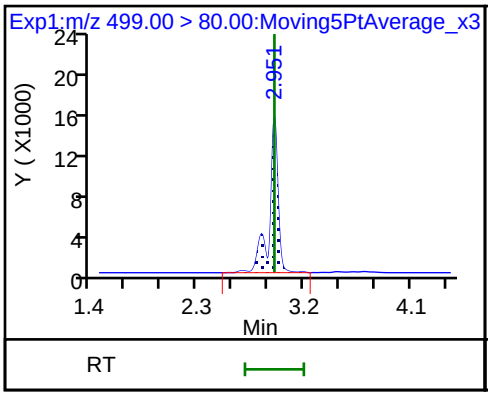
16 Perfluoroheptanesulfonic acid



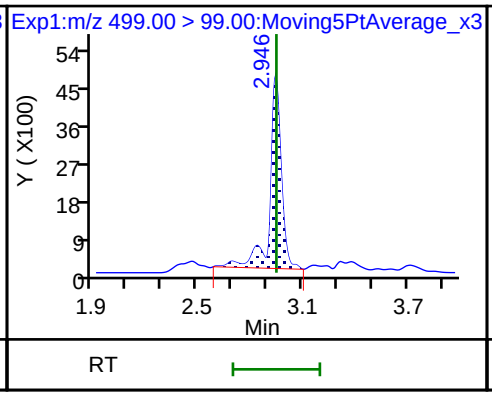
16 Perfluoroheptanesulfonic acid



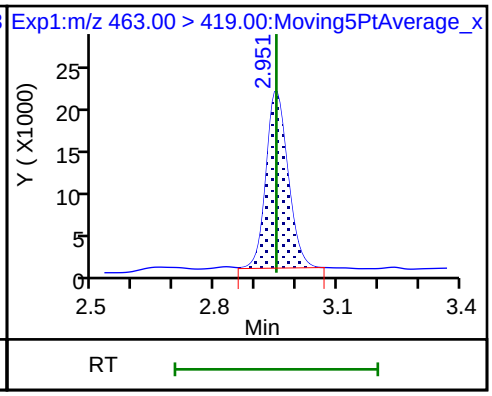
17 Perfluorooctane sulfonic acid



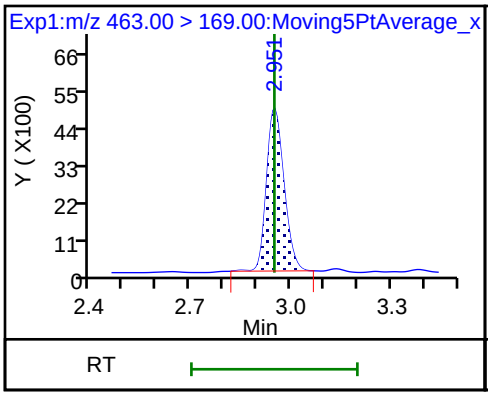
17 Perfluorooctane sulfonic acid



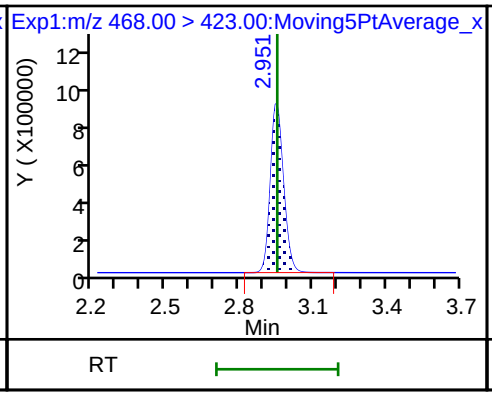
20 Perfluorononanoic acid



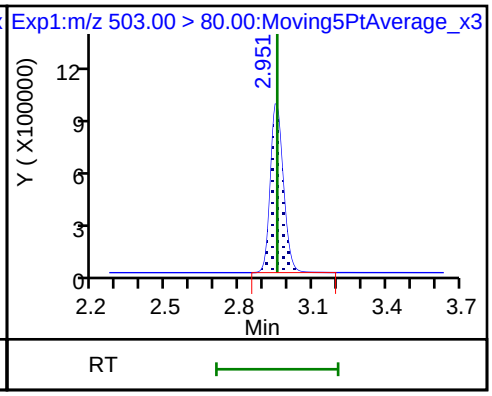
20 Perfluorononanoic acid



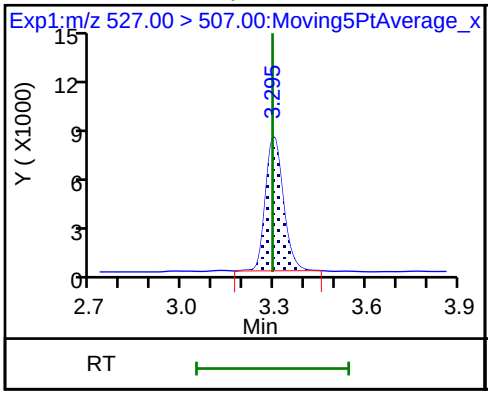
D 19 13C5 PFNA



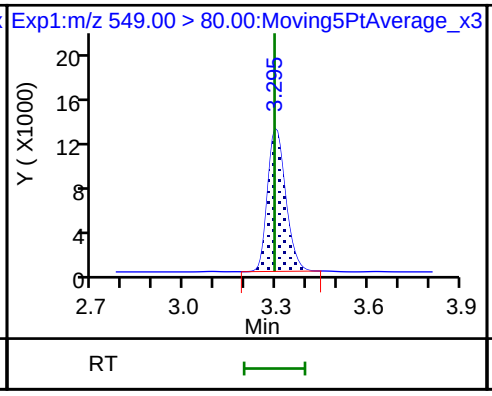
D 18 13C4 PFOS



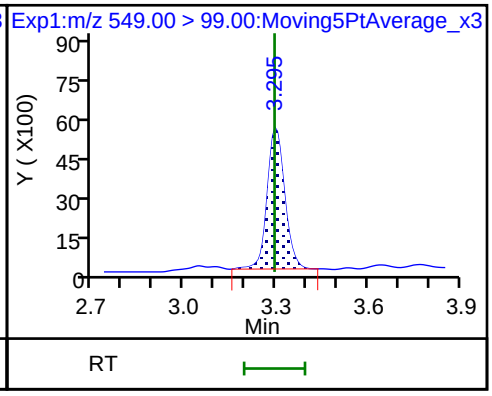
25 1H,1H,2H,2H-perfluorodecanesulfoni



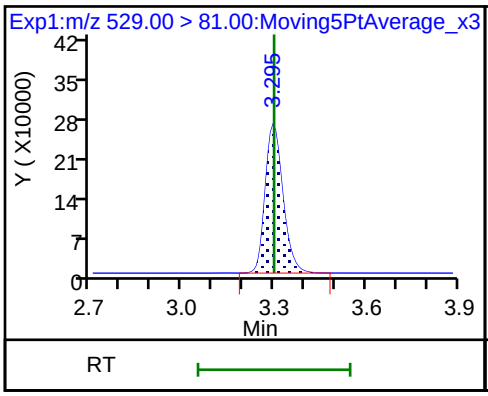
68 Perfluorononanesulfonic acid



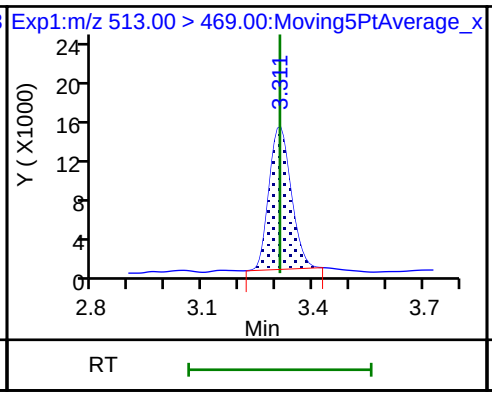
68 Perfluorononanesulfonic acid



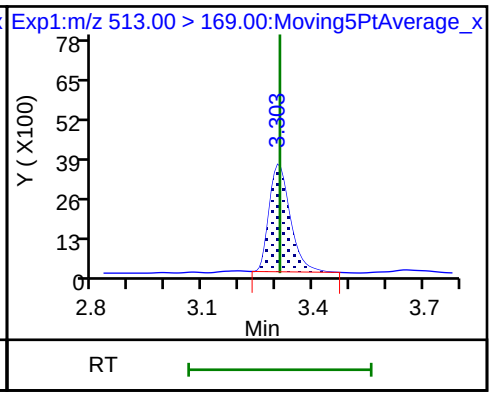
D 26 M2-8:2FTS



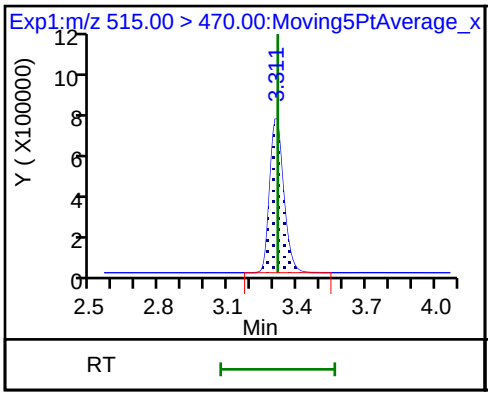
24 Perfluorodecanoic acid



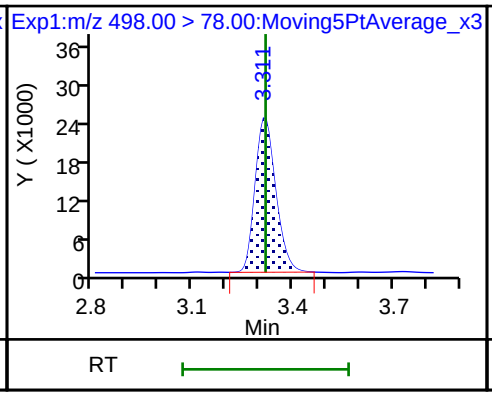
24 Perfluorodecanoic acid



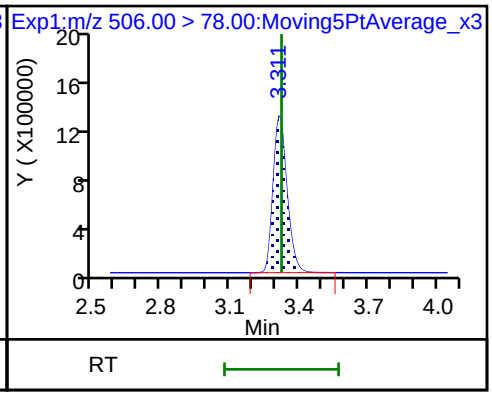
D 23 13C2 PFDA



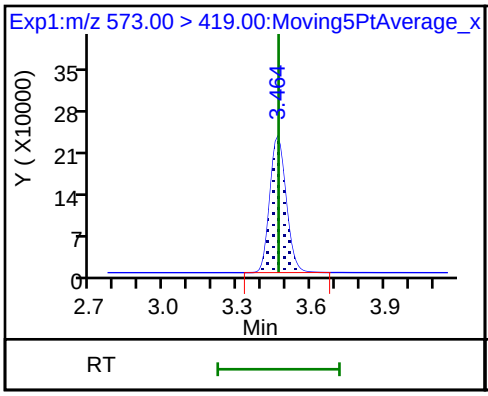
22 Perfluorooctane Sulfonamide



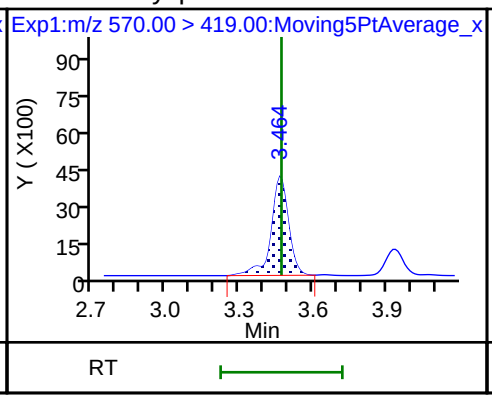
D 21 13C8 FOSA



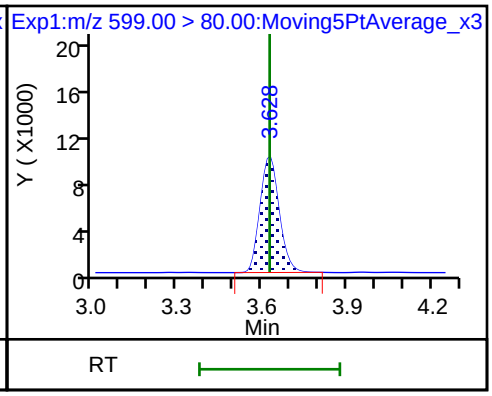
D 27 d3-NMeFOSAA



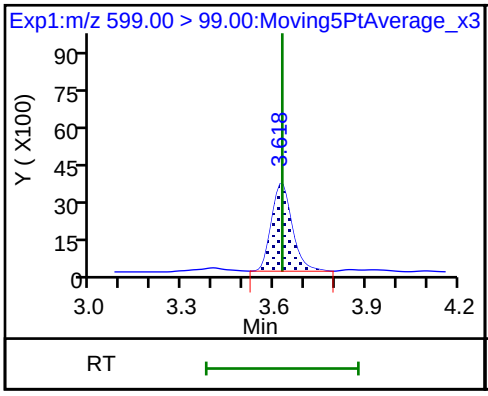
28 N-methyl perfluorooctane sulfonami



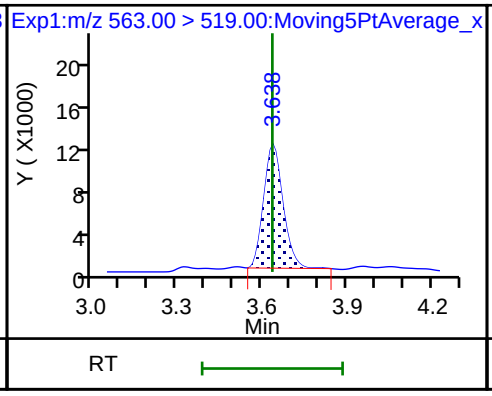
29 Perfluorodecane Sulfonic acid



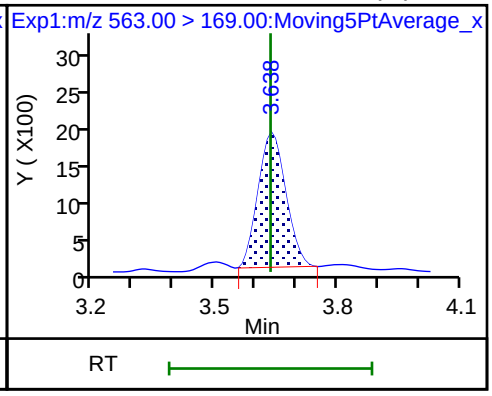
29 Perfluorodecane Sulfonic acid



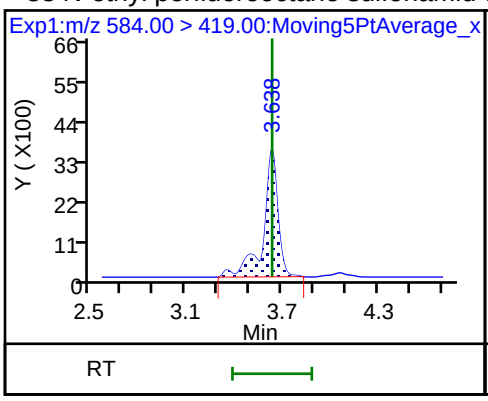
31 Perfluoroundecanoic acid



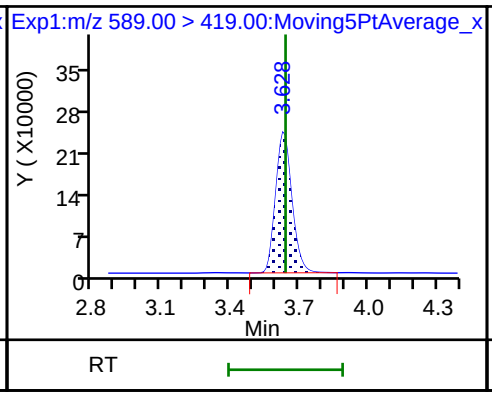
31 Perfluoroundecanoic acid (M)



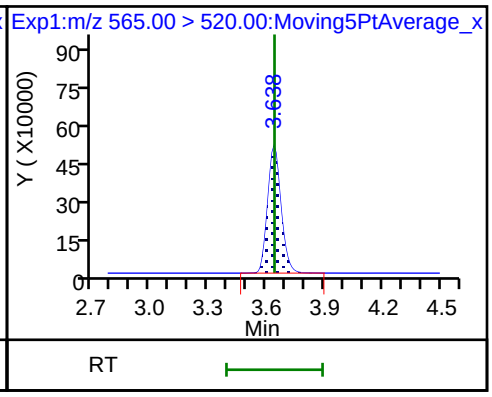
33 N-ethyl perfluorooctane sulfonamid



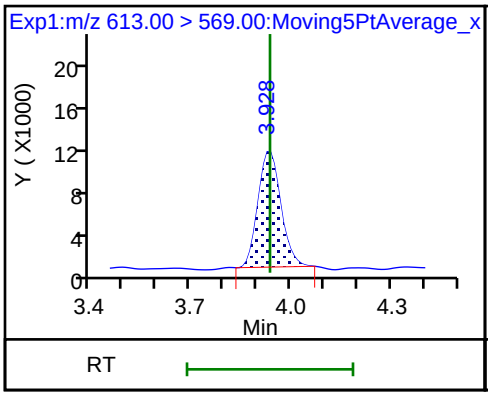
D 32 d5-NEtFOSAA



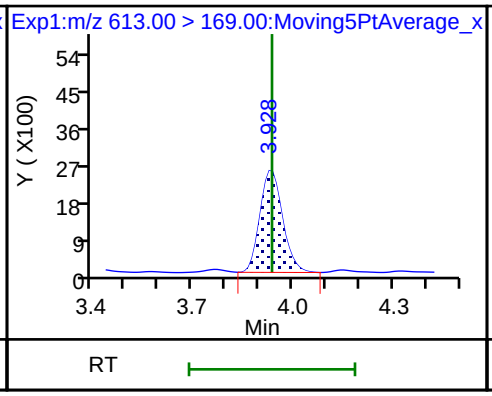
D 30 13C2 PFUnA



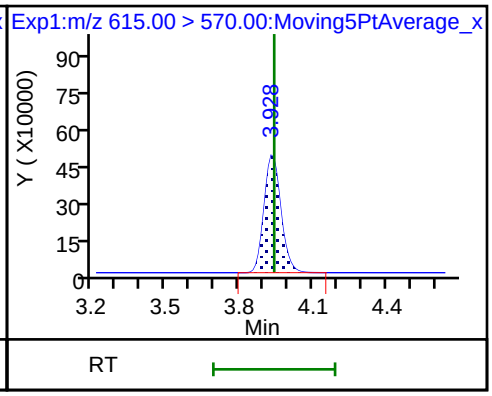
37 Perfluorododecanoic acid



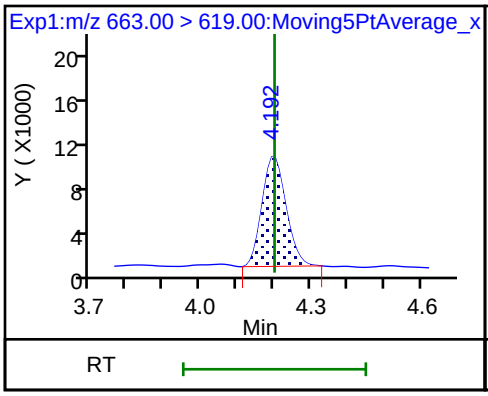
37 Perfluorododecanoic acid



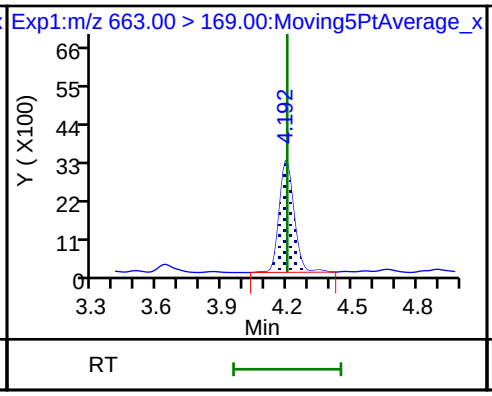
D 36 13C2 PFDoA



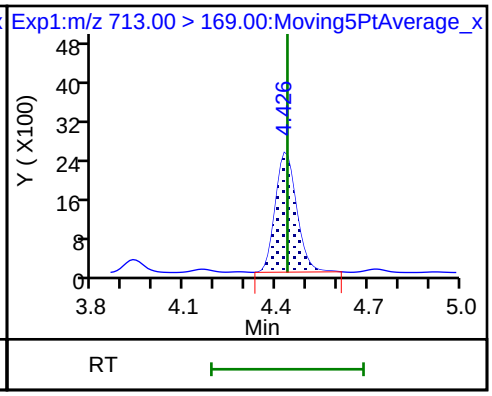
41 Perfluorotridecanoic acid



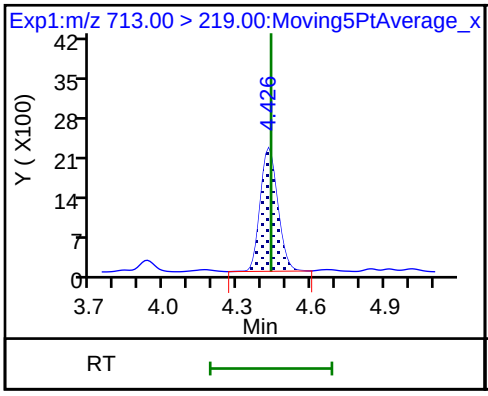
41 Perfluorotridecanoic acid



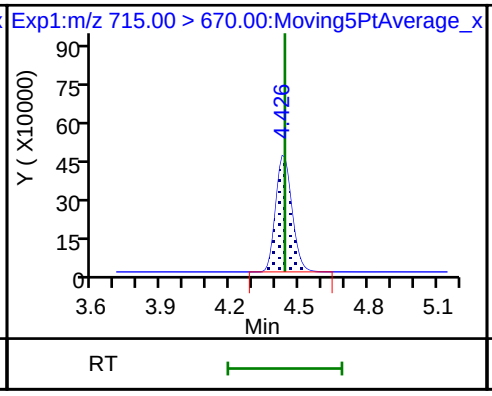
42 Perfluorotetradecanoic acid



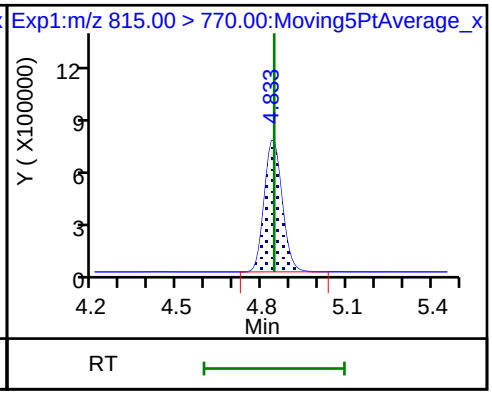
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

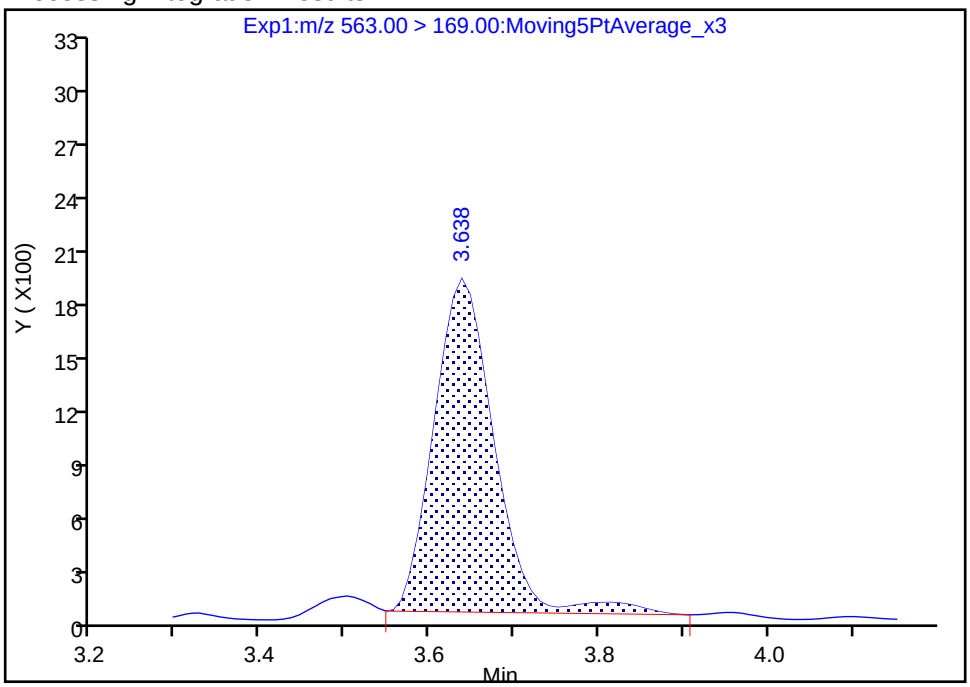
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_004.d				
Injection Date:	29-Jul-2018 05:03:46	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

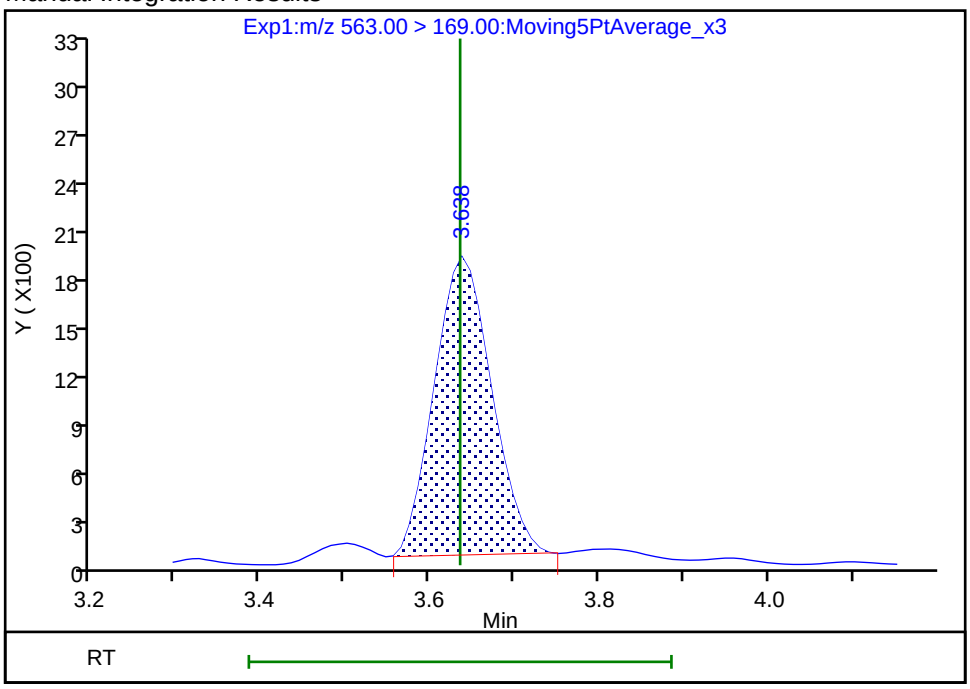
Processing Integration Results

RT: 3.64
Area: 9211
Amount: 0.045347
Amount Units: ng/ml



Manual Integration Results

RT: 3.64
Area: 8631
Amount: 0.045347
Amount Units: ng/ml



Reviewer: barnettj, 30-Jul-2018 10:33:04

Audit Action: Manually Integrated Audit Reason: Split Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-236782/3 Calibration Date: 07/29/2018 05:11

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_042.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9763		0.993	1.00	-0.7	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.145		0.956	1.00	-4.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	77.60		0.864	0.884	-2.3	30.0
4:2 FTS	AveID	17.09	12.01		0.656	0.934	-29.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.039		0.980	1.00	-2.0	30.0
Perfluoropentanesulfonic acid	AveID	71.24	70.63		0.930	0.938	-0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.058		0.959	1.00	-4.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.095		0.854	0.910	-6.1	30.0
6:2 FTS	AveID	1.687	1.605		0.902	0.948	-4.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.190		0.981	1.00	-2.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.384		0.953	0.952	0.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.056		0.924	1.00	-7.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.120		0.940	0.928	1.3	30.0
8:2 FTS	AveID	1.356	1.334		0.942	0.958	-1.6	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7779		1.00	0.960	4.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.026		0.998	1.00	-0.2	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.010		1.02	1.00	1.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.999		1.01	1.00	1.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6918		1.01	0.964	4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.9212		0.987	1.00	-1.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.086		0.875	1.00	-12.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.082		1.00	1.00	0.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.062		1.01	1.00	1.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2489		0.993	1.00	-0.7	30.0
13C4 PFBA	Ave	1.159	1.218		2.63	2.50	5.1	30.0
13C5-PFPeA	Ave	0.8093	0.8671		2.68	2.50	7.1	30.0
13C3-PFBS	Ave	0.0212	0.0221		2.42	2.33	4.2	30.0
13C2 PFHxA	Ave	0.9490	0.9368		2.47	2.50	-1.3	30.0
13C4-PFHpA	Ave	0.9779	0.9484		2.42	2.50	-3.0	30.0
18O2 PFHxS	Ave	1.256	1.237		2.33	2.37	-1.5	30.0
M2-6:2FTS	Ave	0.2731	0.1828		1.59	2.38	-33.1*	30.0

FORM VII EPA 537 (Mod)

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Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-236782/3 Calibration Date: 07/29/2018 05:11

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_042.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9345		2.44	2.50	-2.3	30.0
13C4 PFOS	Ave	0.8734	0.8726		2.39	2.39	-0.1	30.0
13C5 PFNA	Ave	0.8250	0.8456		2.56	2.50	2.5	30.0
M2-8:2FTS	Ave	0.2848	0.2678		2.25	2.40	-6.0	30.0
13C2 PFDA	Ave	0.6565	0.7261		2.76	2.50	10.6	30.0
13C8 FOSA	Ave	1.283	1.304		2.54	2.50	1.6	30.0
d3-NMeFOSAA	Ave	0.2169	0.2547		2.94	2.50	17.4	30.0
13C2 PFUnA	Ave	0.5287	0.6199		2.93	2.50	17.2	30.0
d5-NEtFOSAA	Ave	0.2280	0.2705		2.97	2.50	18.6	30.0
13C2 PFDoA	Ave	0.5026	0.5265		2.62	2.50	4.7	30.0
13C2-PFTeDA	Ave	0.4910	0.5048		2.57	2.50	2.8	30.0
13C2-PFHxDA	Ave	0.7454	0.6760		2.27	2.50	-9.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_042.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 29-Jul-2018 05:11:38 ALS Bottle#: 30 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 10:34:45 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.397	0.0	0.539	4688369	2.63		105	83261	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.397	0.0	1.000	1830799	0.99		99.3	1043	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.640	0.001	0.634	3337537	2.68		107	57171	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.641	0.0	1.000	1528302	0.9564		95.6	661	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.647	79151	2.42		104	503	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.676	0.0	1.000	2335401	0.8641		97.7	6307	
298.90 > 99.00	1.676	1.676	0.0	1.000	970654		2.41(1.25-3.74)		4288	
D 60 M2-4:2FTS										
329.00 > 81.00	1.877	1.876	0.001	0.725	374710	NC			5177	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.877	0.0	1.120	381879	0.6562		70.3	17158	
D 7 13C2 PFHxA										
315.00 > 270.00	1.917	1.905	0.012	0.740	3605577	2.47		98.7	52247	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.917	1.917	0.0	1.000	1498194	0.9801		98.0	4988	
313.00 > 119.00	1.917	1.917	0.0	1.000	140099		10.69(5.03-15.10)		4922	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.939	1.939	0.0	1.157	2255388	0.9300		99.1	42667	
349.00 > 99.00	1.939	1.939	0.0	1.157	833739		2.71(1.36-4.07)		6787	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.004	2.003	0.001	0.774	317644	NC			10623	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.004	2.004	0.0	1.000	308154	NC			1519	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.229	0.001	0.861	3650319	2.42		97.0	55568	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.230	0.0	1.000	1544557	0.9595		95.9	3357	
363.00 > 169.00	2.230	2.230	0.0	1.000	622558		2.48(1.13-3.40)		7426	
D 11 18O2 PFHxS										
403.00 > 84.00	2.242	2.241	0.001	0.866	4503387	2.33		98.5	37087	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.242	2.242	0.0	1.000	1897768	0.8542		93.9	16873	
399.00 > 99.00	2.242	2.242	0.0	1.000	668836		2.84(1.50-4.49)		2266	
65 ADONA										
377.00 > 251.00	2.282	2.282	0.0	0.773	4293729	NC			50041	
377.00 > 85.00	2.282	2.282	0.0	0.773	2469931		1.74(0.84-2.53)		10911	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.557	0.0	0.996	428242	0.9022		95.2	8283	
D 12 M2-6:2FTS										
429.00 > 81.00	2.566	2.564	0.002	0.991	668254	1.59		66.9	14379	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.588	0.002	1.000	3596699	2.44		97.7	65773	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.590	0.0		3848995	2.50			49904	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.590	2.590	0.0	1.000	1713611	0.9814		98.0	2534	
413.00 > 169.00	2.590	2.590	0.0	1.000	844867		2.03(0.84-2.52)		6128	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.598	2.598	0.0	0.881	1770453	0.9527		100	24432	
449.00 > 99.00	2.598	2.598	0.0	0.881	477951		3.70(1.94-5.82)		5043	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.950	2.950	0.0	1.000	1395989	0.9404		101	16814	
499.00 > 99.00	2.950	2.950	0.0	1.000	319652		4.37(2.31-6.93)		2915	
20 Perfluorononanoic acid										
463.00 > 419.00	2.950	2.950	0.0	1.000	1374128	0.9245		92.4	5075	
463.00 > 169.00	2.950	2.950	0.0	1.000	327754		4.19(1.90-5.69)		10906	
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.953	-0.003	1.139	3254658	2.56		102	54694	
D 18 13C4 PFOS										
503.00 > 80.00	2.950	2.953	-0.003	1.139	3210762	2.39		99.9	37501	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.158	3.158	0.0	1.071	2292372	NC			14028	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.294	3.294	0.0	1.000	526791	0.9424		98.4	12532	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.294	3.294	0.0	1.117	1003177	1.00		104	20559	
549.00 > 99.00	3.294	3.294	0.0	1.117	386136		2.60(1.33-3.97)		4065	
D 26 M2-8:2FTS										
529.00 > 81.00	3.294	3.299	-0.005	1.272	987510	2.25		94.0	21433	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.310	3.310	0.0	1.000	1146916	1.00		99.8	7454	
513.00 > 169.00	3.310	3.310	0.0	1.000	200691		5.71(2.36-7.09)		8143	
D 23 13C2 PFDA										
515.00 > 470.00	3.310	3.315	-0.005	1.278	2794607	2.76		111	42123	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.317	3.317	0.0	1.002	2027494	1.02		102	26799	
D 21 13C8 FOSA										
506.00 > 78.00	3.310	3.322	-0.012	1.278	5017826	2.54		102	37037	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.461	3.467	-0.006	1.336	980384	2.94		117	23546	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.471	3.471	0.0	1.003	391616	1.01		101	4948	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.626	3.626	0.0	1.229	895880	1.01		104	47150	
599.00 > 99.00	3.626	3.626	0.0	1.229	301551		2.97(1.39-4.16)		5294	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.636	3.636	0.0	1.000	1036638	0.8754		87.5	5178	
563.00 > 169.00	3.636	3.636	0.0	1.000	177005		5.86(2.12-6.36)		7290	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.636	3.636	0.0	1.000	383643	0.9874		98.7	13060	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.636	3.640	-0.004	1.404	1041130	2.97		119	2960	
D 30 13C2 PFUnA										
565.00 > 520.00	3.636	3.640	-0.004	1.404	2385893	2.93		117	45288	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.801	3.801	0.0	1.288	3483417	NC			51486	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.937	3.937	0.0	1.000	877091	1.00		100	293	
613.00 > 169.00	3.937	3.937	0.0	1.000	205810		4.26(2.13-6.40)		4757	
D 36 13C2 PFDoA										
615.00 > 570.00	3.937	3.941	-0.004	1.520	2026484	2.62		105	18350	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.200	4.200	0.0	1.067	861218	1.01		101	273	
663.00 > 169.00	4.200	4.200	0.0	1.067	254572		3.38(1.25-3.76)		4479	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.436	4.436	0.0	1.000	193410	0.99		99.3	2644	
713.00 > 219.00	4.425	4.436	-0.011	0.998	140408		1.38(0.71-2.13)		2381	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.437	-0.001	1.713	1943046	2.57		103	12040	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.837	4.837	0.0	1.000	1032765	NC			182	
813.00 > 169.00	4.837	4.837	0.0	1.000	171816		6.01(2.86-8.58)		1894	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.837	4.842	-0.005	1.867	2601855	2.27		90.7	7686	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.184	5.184	0.0	1.072	1005832	NC			235	
913.00 > 169.00	5.184	5.184	0.0	1.072	124383		8.09(3.83-11.48)		1285	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 10:34:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_042.d

Injection Date: 29-Jul-2018 05:11:38 Instrument ID: A8_N

Lims ID: CCV L4

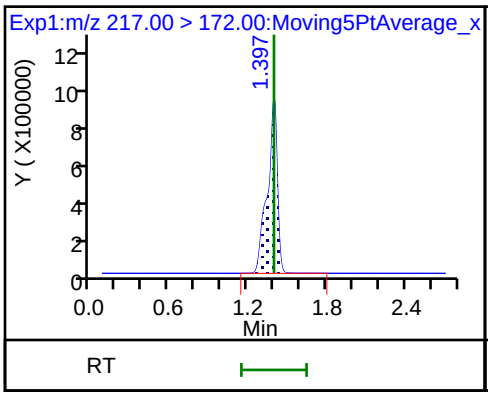
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 30 Worklist Smp#: 3

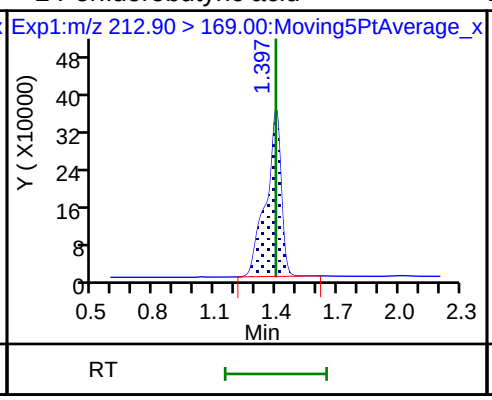
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

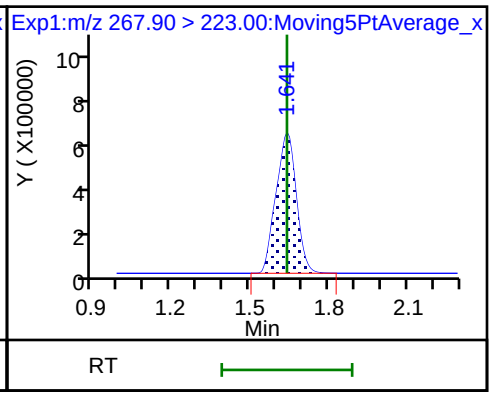
D 1 13C4 PFBA



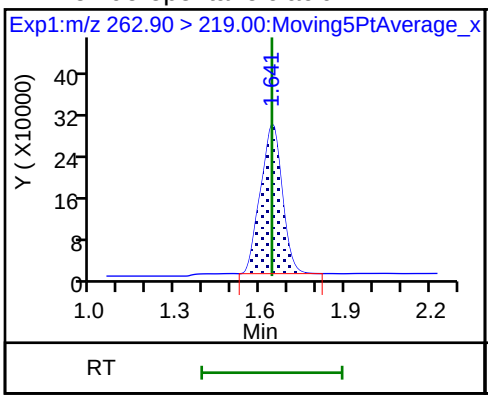
2 Perfluorobutyric acid



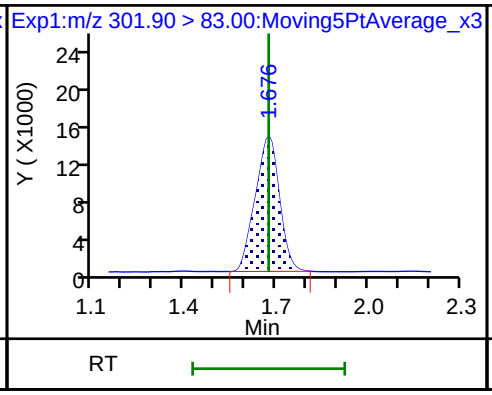
D 3 13C5-PFPeA



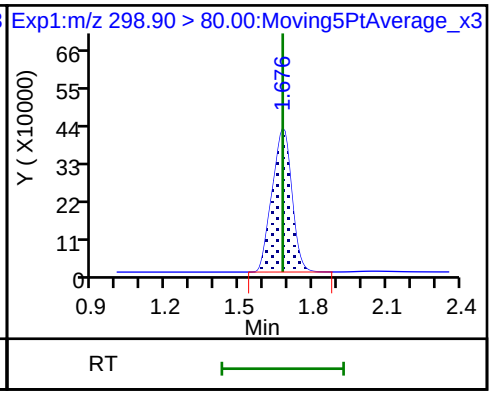
4 Perfluoropentanoic acid



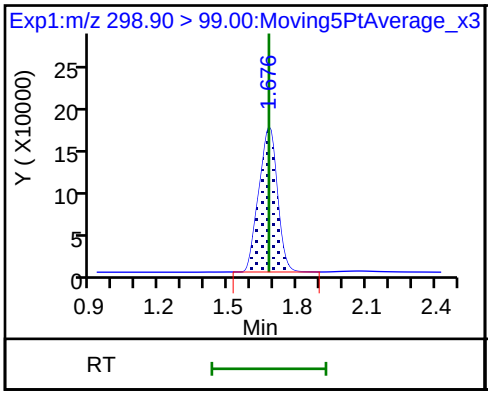
D 47 13C3-PFBS



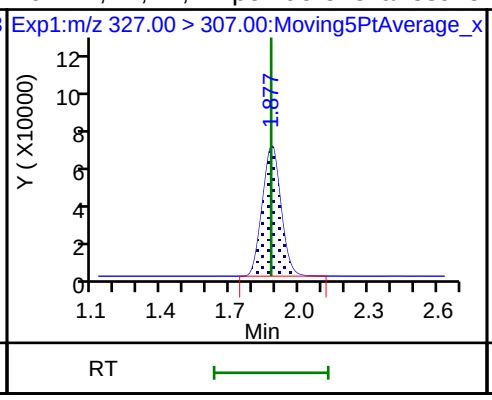
5 Perfluorobutanesulfonic acid



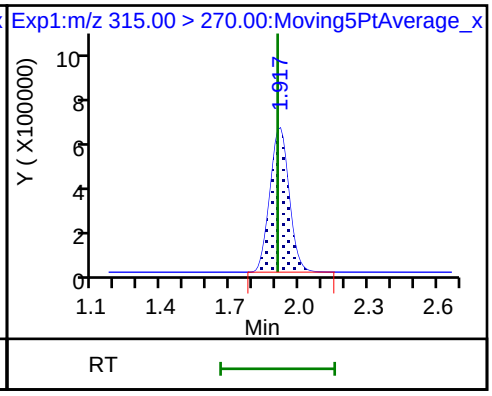
5 Perfluorobutanesulfonic acid



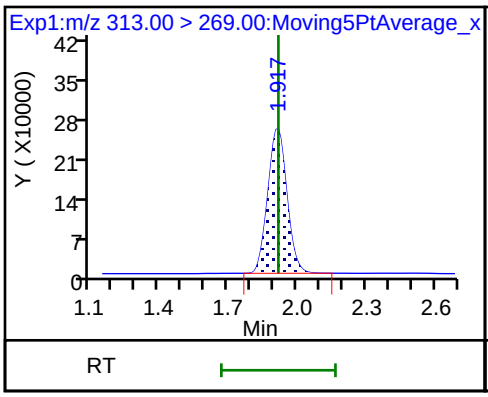
61 1H,1H,2H,2H-perfluorohexanesulfon



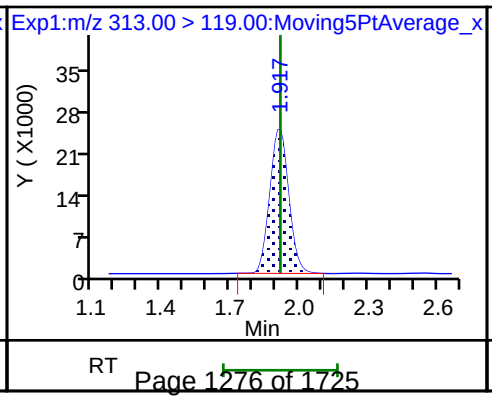
D 7 13C2 PFHxA



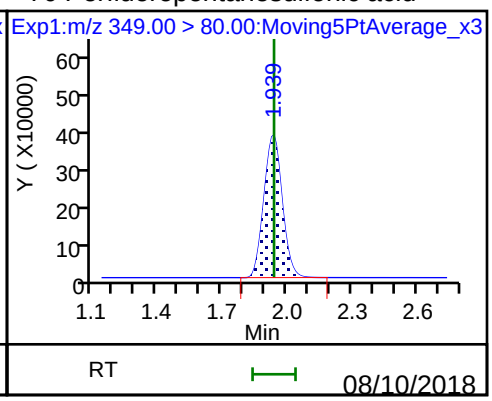
6 Perfluorohexanoic acid



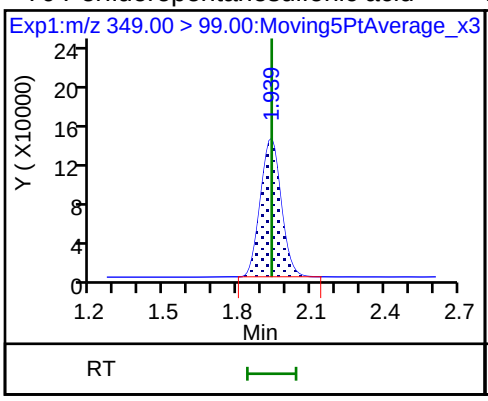
6 Perfluorohexanoic acid



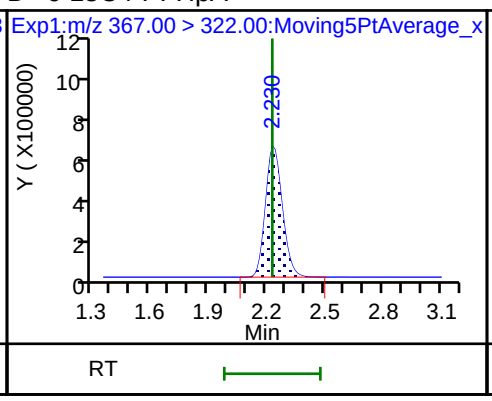
70 Perfluoropentanesulfonic acid



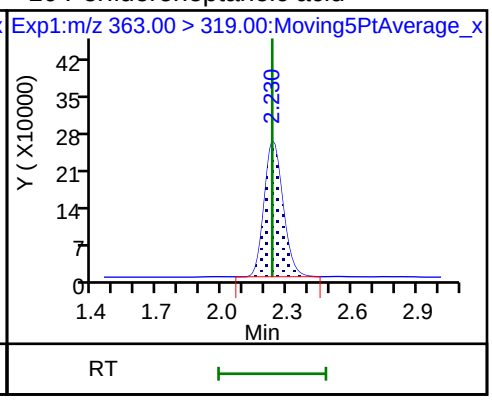
70 Perfluoropentanesulfonic acid



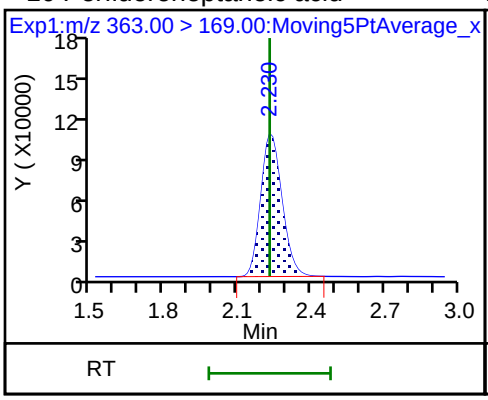
D 9 13C4-PFHpA



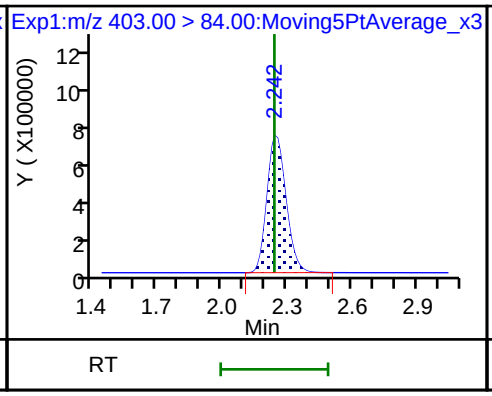
10 Perfluoroheptanoic acid



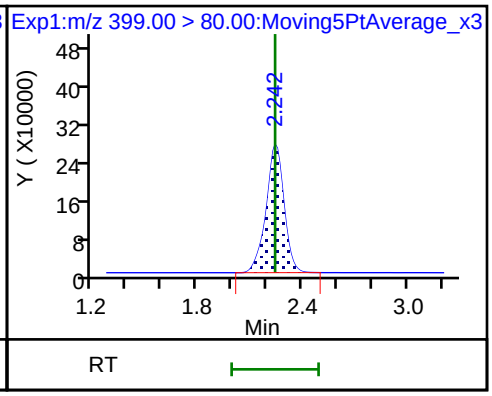
10 Perfluoroheptanoic acid



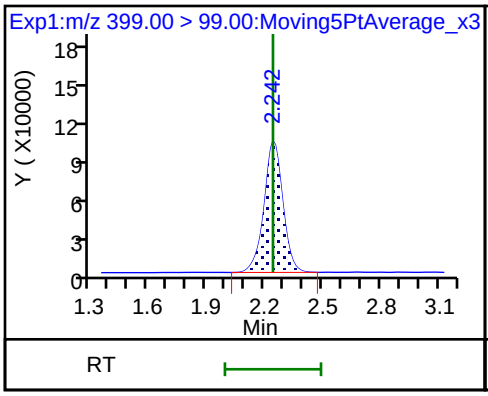
D 11 18O2 PFHxS



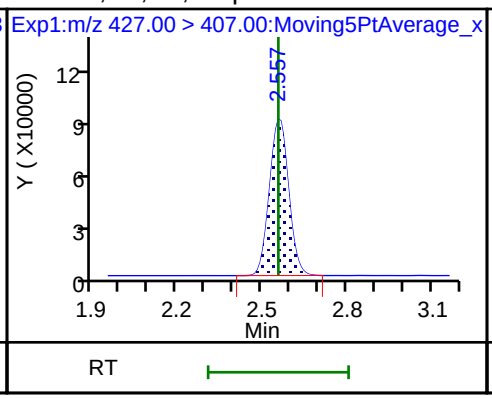
8 Perfluorohexanesulfonic acid



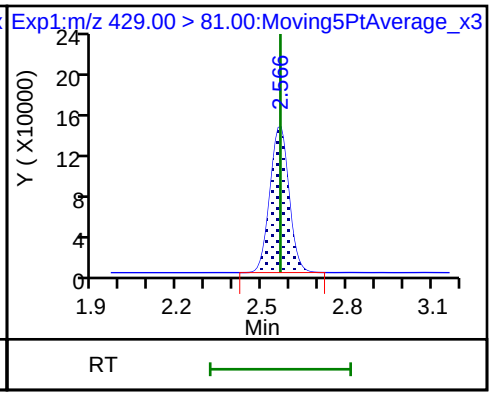
8 Perfluorohexanesulfonic acid



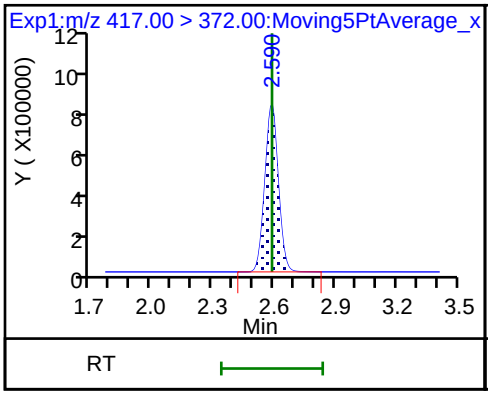
13 1H,1H,2H,2H-perfluorooctanesulfon



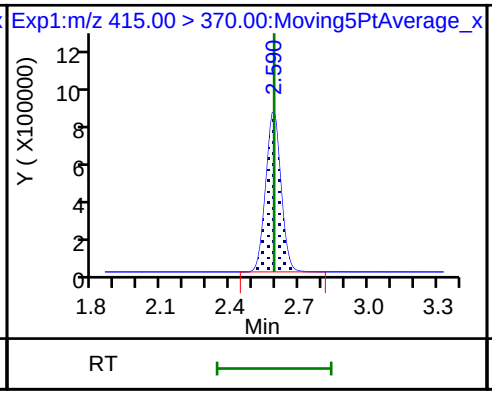
D 12 M2-6:2FTS



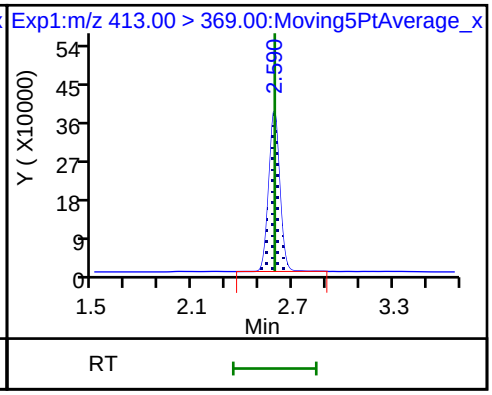
D 14 13C4 PFOA



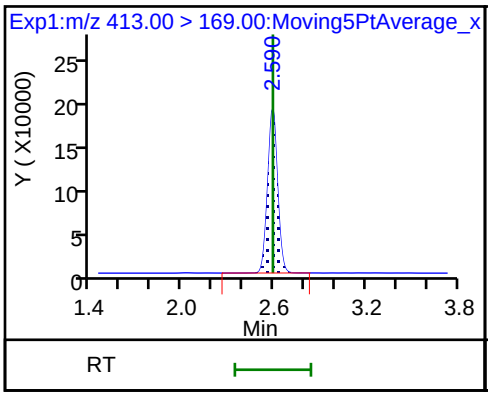
* 62 13C2-PFOA



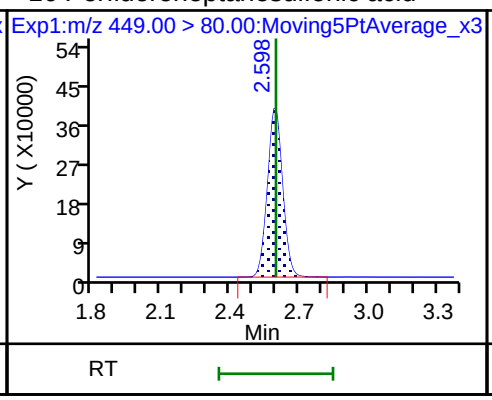
15 Perfluorooctanoic acid



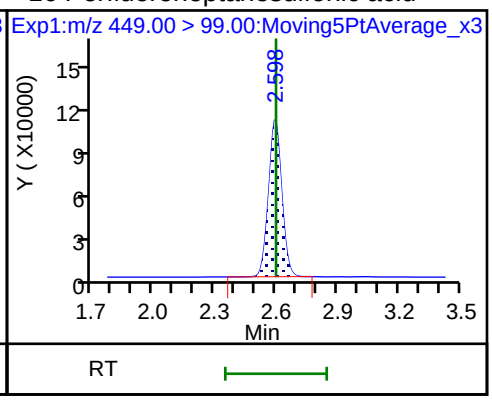
15 Perfluorooctanoic acid



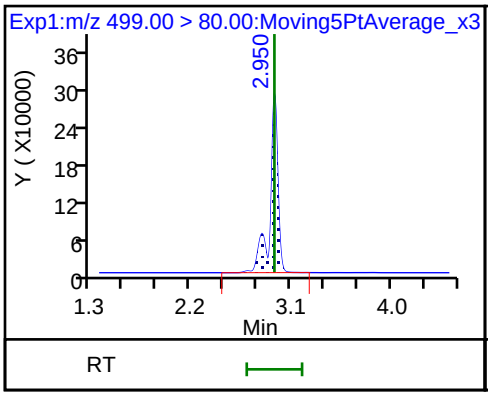
16 Perfluoroheptanesulfonic acid



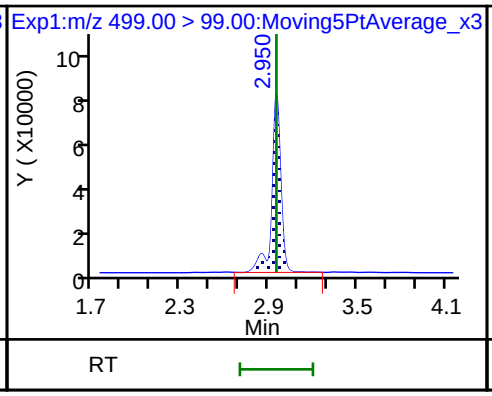
16 Perfluoroheptanesulfonic acid



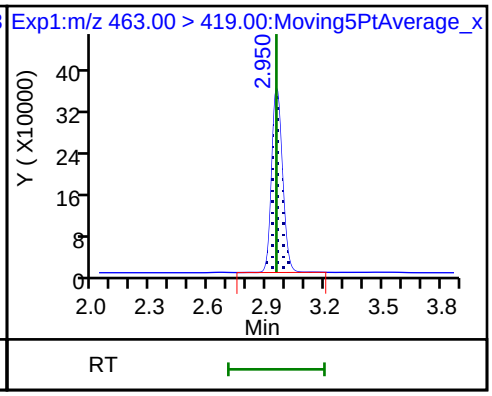
17 Perfluorooctane sulfonic acid



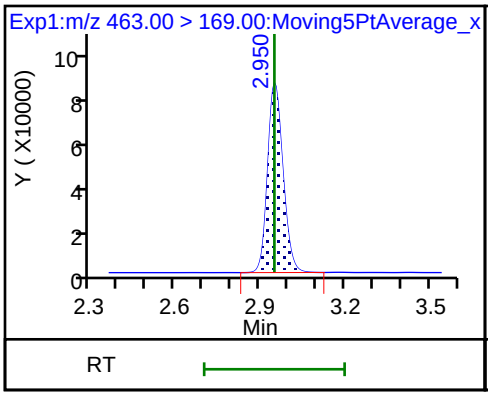
17 Perfluorooctane sulfonic acid



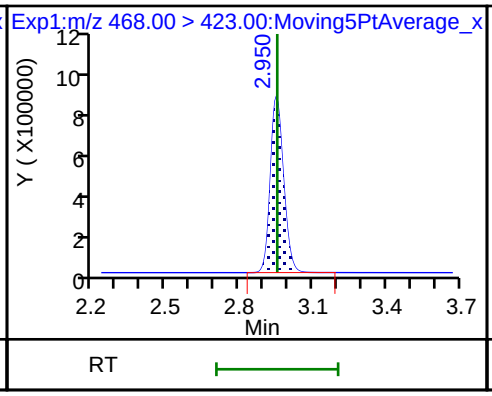
20 Perfluorononanoic acid



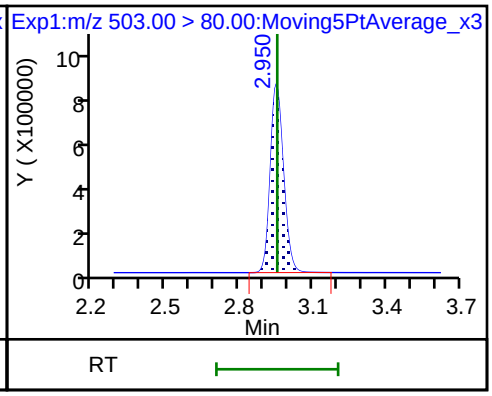
20 Perfluorononanoic acid



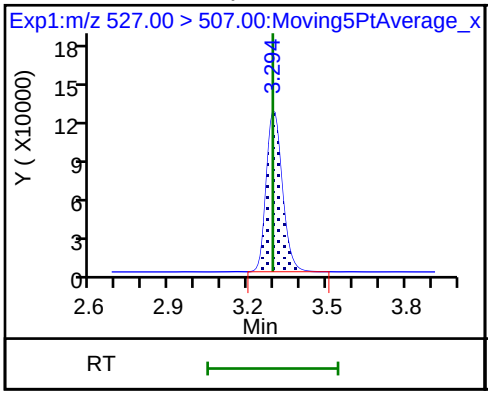
D 19 13C5 PFNA



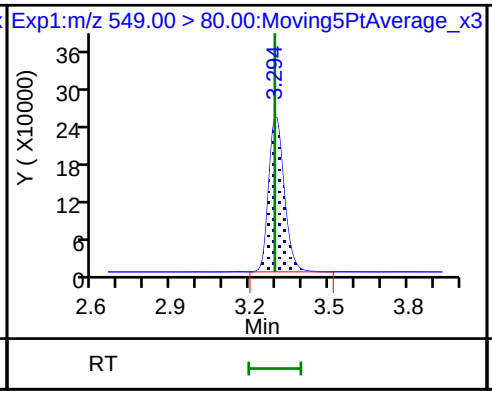
D 18 13C4 PFOS



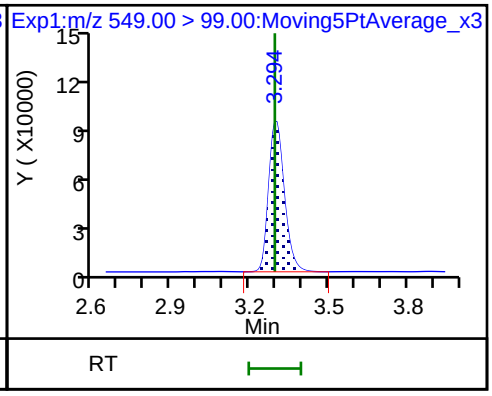
25 1H,1H,2H,2H-perfluorodecanesulfoni



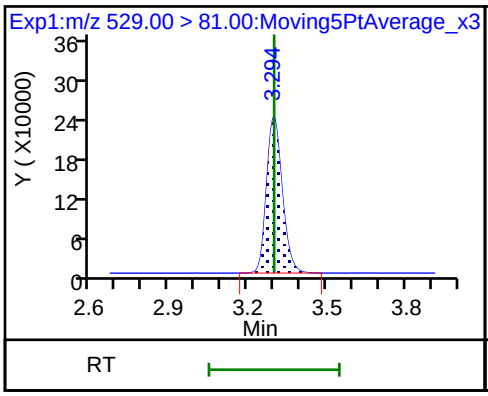
68 Perfluorononanesulfonic acid



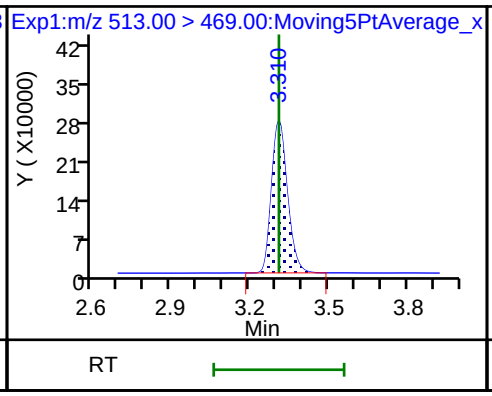
68 Perfluorononanesulfonic acid



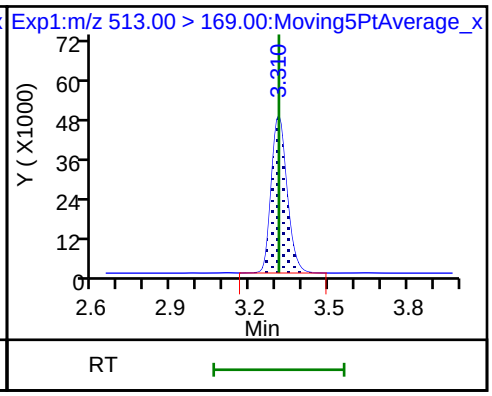
D 26 M2-8:2FTS



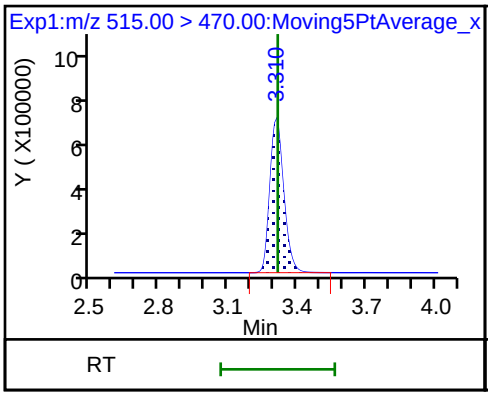
24 Perfluorodecanoic acid



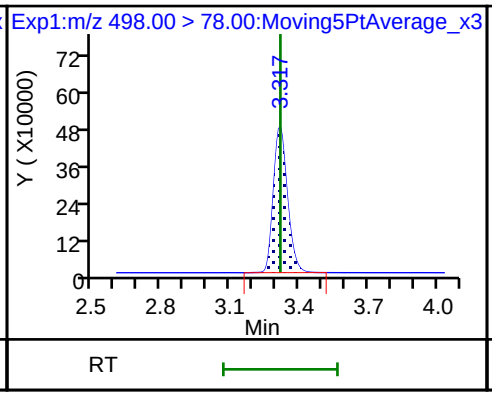
24 Perfluorodecanoic acid



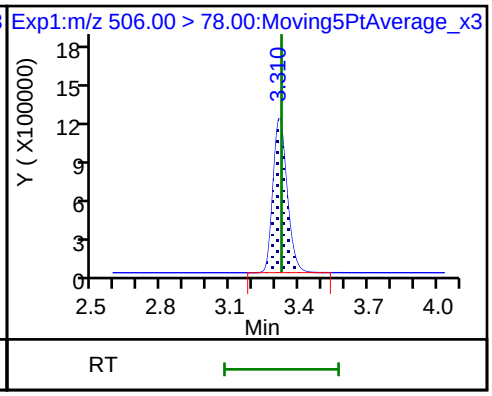
D 23 13C2 PFDA



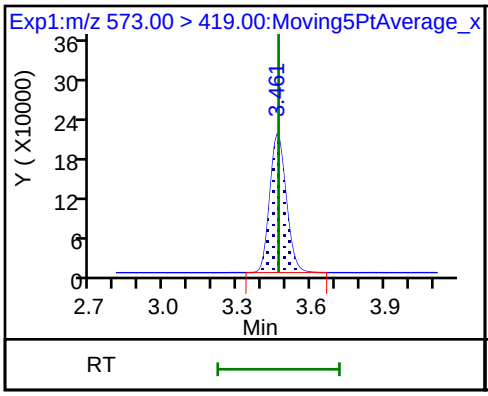
22 Perfluorooctane Sulfonamide



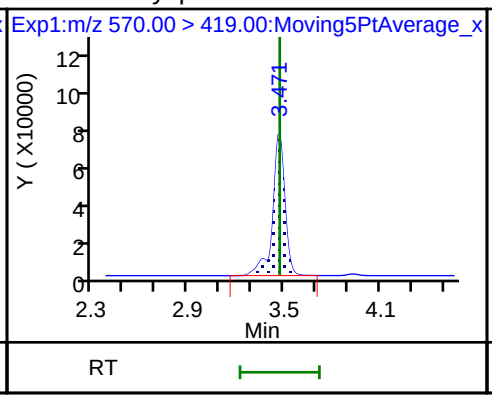
D 21 13C8 FOSA



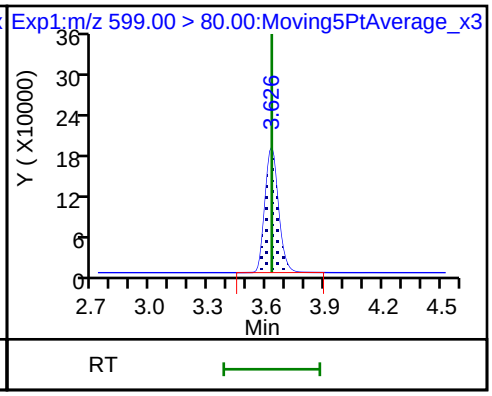
D 27 d3-NMeFOSAA



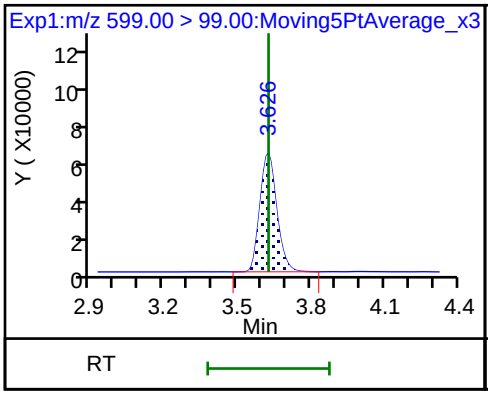
28 N-methyl perfluorooctane sulfonami



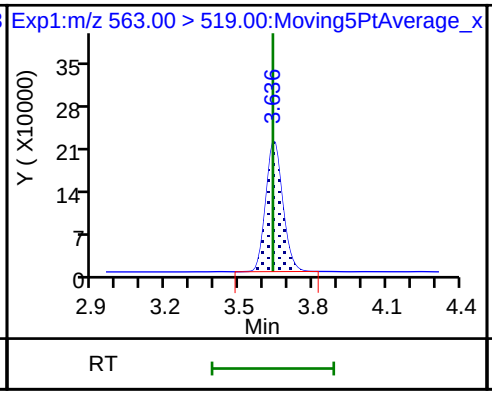
29 Perfluorodecane Sulfonic acid



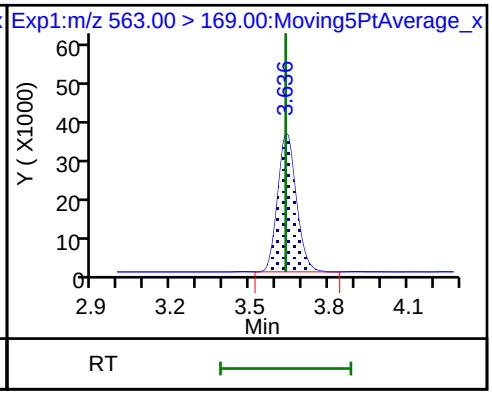
29 Perfluorodecane Sulfonic acid



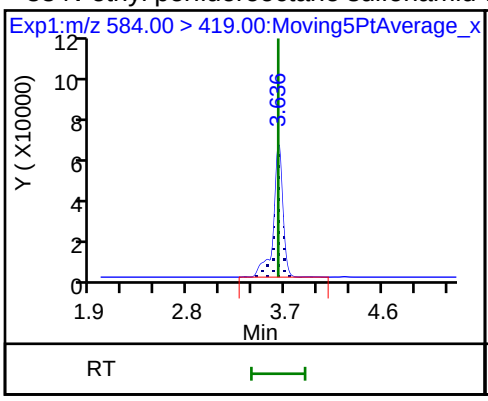
31 Perfluoroundecanoic acid



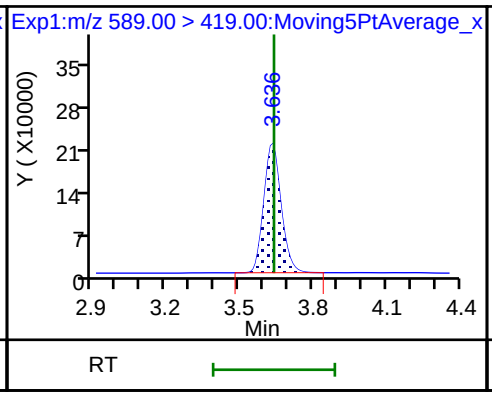
31 Perfluoroundecanoic acid



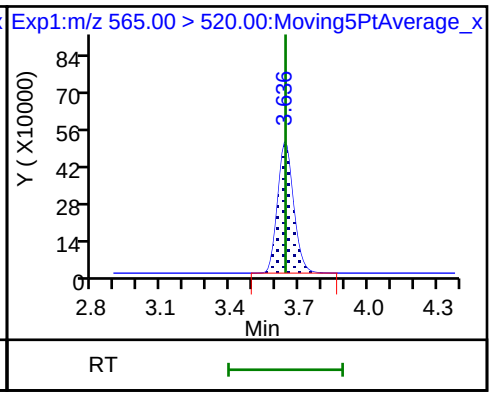
33 N-ethyl perfluorooctane sulfonamid



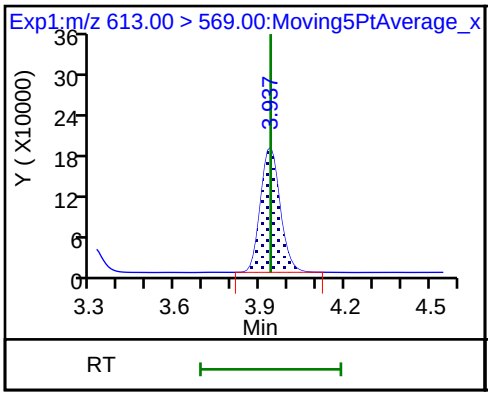
D 32 d5-NEtFOSAA



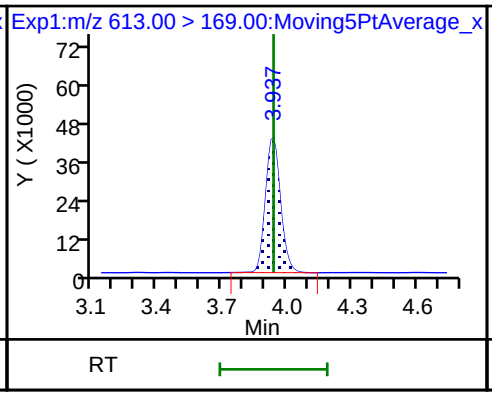
D 30 13C2 PFUnA



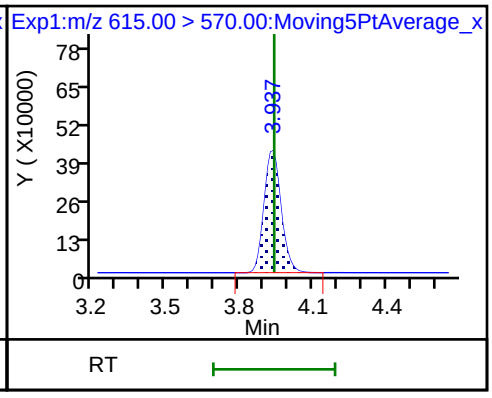
37 Perfluorododecanoic acid



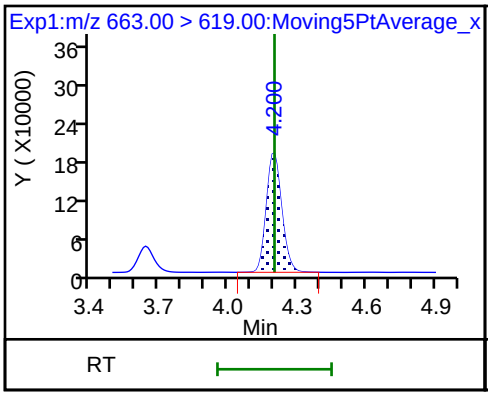
37 Perfluorododecanoic acid



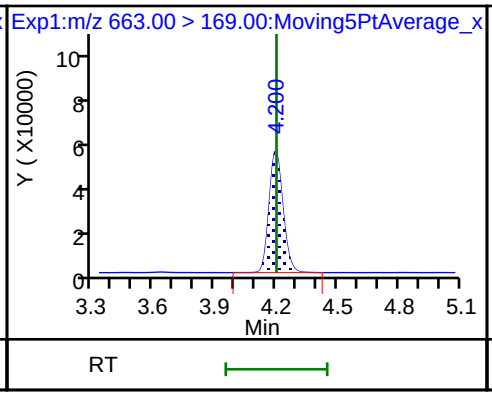
D 36 13C2 PFDoA



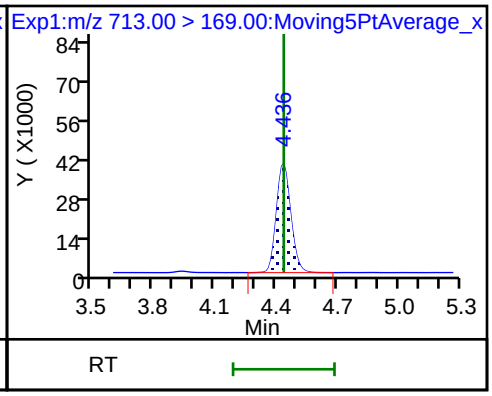
41 Perfluorotridecanoic acid



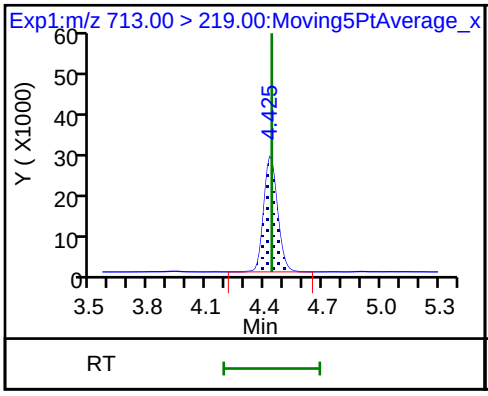
41 Perfluorotridecanoic acid



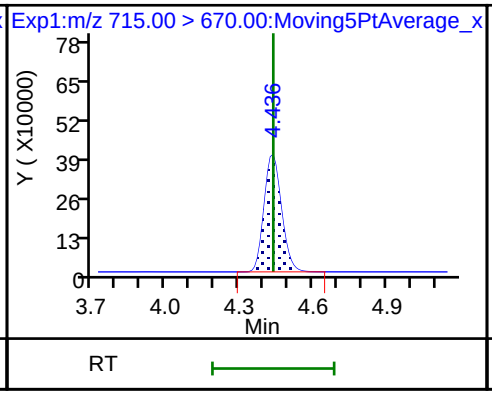
42 Perfluorotetradecanoic acid



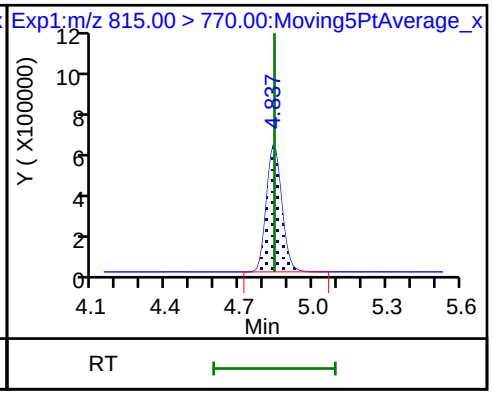
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-236782/14 Calibration Date: 07/29/2018 06:37

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_053.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.996		2.53	2.50	1.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.187		2.48	2.50	-0.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	79.97		2.23	2.21	0.7	30.0
4:2 FTS	AveID	17.09	11.67		1.59	2.34	-31.7*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.028		2.42	2.50	-3.1	30.0
Perfluoropentanesulfonic acid	AveID	71.24	70.89		2.33	2.35	-0.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.131		2.57	2.50	2.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.103		2.15	2.28	-5.4	30.0
6:2 FTS	AveID	1.687	1.651		2.32	2.37	-2.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.193		2.46	2.50	-1.7	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.401		2.41	2.38	1.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.073		2.35	2.50	-6.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.096		2.30	2.32	-0.8	30.0
8:2 FTS	AveID	1.356	1.409		2.49	2.40	3.9	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.8017		2.58	2.40	7.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.053		2.56	2.50	2.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	1.050		2.64	2.50	5.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	1.051		2.67	2.50	6.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.7420		2.70	2.41	11.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8661		2.32	2.50	-7.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.159		2.34	2.50	-6.6	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.063		2.46	2.50	-1.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.038		2.47	2.50	-1.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2530		2.52	2.50	0.9	30.0
13C4 PFBA	Ave	1.159	1.260		2.72	2.50	8.7	30.0
13C5-PFPeA	Ave	0.8093	0.8777		2.71	2.50	8.5	30.0
13C3-PFBS	Ave	0.0212	0.0229		2.50	2.33	7.7	30.0
13C2 PFHxA	Ave	0.9490	0.9801		2.58	2.50	3.3	30.0
13C4-PFHpA	Ave	0.9779	0.9577		2.45	2.50	-2.1	30.0
18O2 PFHxS	Ave	1.256	1.268		2.39	2.37	1.0	30.0
M2-6:2FTS	Ave	0.2731	0.1803		1.57	2.38	-34.0*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-236782/14 Calibration Date: 07/29/2018 06:37

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_053.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9337		2.44	2.50	-2.4	30.0
13C4 PFOS	Ave	0.8734	0.9110		2.49	2.39	4.3	30.0
13C5 PFNA	Ave	0.8250	0.8399		2.55	2.50	1.8	30.0
M2-8:2FTS	Ave	0.2848	0.2549		2.14	2.40	-10.5	30.0
13C2 PFDA	Ave	0.6565	0.7260		2.76	2.50	10.6	30.0
13C8 FOSA	Ave	1.283	1.329		2.59	2.50	3.6	30.0
d3-NMeFOSAA	Ave	0.2169	0.2617		3.02	2.50	20.7	30.0
d5-NEtFOSAA	Ave	0.2280	0.2811		3.08	2.50	23.3	30.0
13C2 PFUnA	Ave	0.5287	0.6152		2.91	2.50	16.3	30.0
13C2 PFDoA	Ave	0.5026	0.5708		2.84	2.50	13.6	30.0
13C2-PFTeDA	Ave	0.4910	0.5472		2.79	2.50	11.5	30.0
13C2-PFHxDA	Ave	0.7454	0.7589		2.55	2.50	1.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_053.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 29-Jul-2018 06:37:52 ALS Bottle#: 31 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:31:55 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:31:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.397	0.0	0.540	4580404	2.72		109	87800	
2 Perfluorobutyric acid										
212.90 > 169.00	1.402	1.397	0.005	1.004	4562350	2.53		101	2067	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.640	0.001	0.634	3190364	2.71		108	61008	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.641	0.0	1.000	3787409	2.48		99.2	1737	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.675	0.0	0.647	77246	2.50		108	587	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.676	-0.001	1.000	5871768	2.23		101	16735	
298.90 > 99.00	1.675	1.676	-0.001	1.000	2404031		2.44(1.25-3.74)		10343	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.876	0.0	0.725	382995	NC			5795	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.885	1.877	0.008	1.126	905197	1.59		68.3	54516	
D 7 13C2 PFHxA										
315.00 > 270.00	1.916	1.905	0.011	0.740	3562523	2.58		103	77433	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.916	1.917	-0.001	1.000	3660835	2.42		96.9	10134	
313.00 > 119.00	1.916	1.917	-0.001	1.000	326434		11.21(5.03-15.10)		7113	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.938	1.939	-0.001	1.157	5523304	2.33		99.5	73182	
349.00 > 99.00	1.938	1.939	-0.001	1.157	2082673		2.65(1.36-4.07)		19955	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.003	0.011	0.778	263761	NC			8891	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.014	2.004	0.010	1.000	762254	NC			4231	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.229	0.0	0.861	3481175	2.45		97.9	58153	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.229	2.230	-0.001	1.000	3938382	2.57		103	7993	
363.00 > 169.00	2.229	2.230	-0.001	1.000	1472470		2.67(1.13-3.40)		15497	
D 11 18O2 PFHxS										
403.00 > 84.00	2.254	2.241	0.013	0.871	4361596	2.39		101	39717	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.242	-0.001	0.994	4629703	2.15		94.6	19923	
399.00 > 99.00	2.241	2.242	-0.001	0.994	1590134		2.91(1.50-4.49)		4642	
65 ADONA										
377.00 > 251.00	2.280	2.282	-0.002	0.772	10241804	NC			99299	
377.00 > 85.00	2.280	2.282	-0.002	0.772	6170250		1.66(0.84-2.53)		30048	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.564	2.557	0.007	1.000	1025399	2.32		97.8	14897	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.564	0.0	0.991	622567	1.57		66.0	8965	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.588	0.0	1.000	3393758	2.44		97.6	35884	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.590	-0.002		3634952	2.50			50786	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.590	-0.002	1.000	4054086	2.46		98.3	4195	
413.00 > 169.00	2.588	2.590	-0.002	1.000	2132899		1.90(0.84-2.52)		12099	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.596	2.598	-0.002	0.879	4417066	2.41		101	35437	
449.00 > 99.00	2.596	2.598	-0.002	0.879	1183095		3.73(1.94-5.82)		7837	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.954	2.950	0.004	1.000	3366910	2.30		99.2	23882	
499.00 > 99.00	2.954	2.950	0.004	1.000	787487		4.28(2.31-6.93)		18822	
20 Perfluorononanoic acid										
463.00 > 419.00	2.954	2.950	0.004	1.000	3275707	2.35		94.0	10058	
463.00 > 169.00	2.954	2.950	0.004	1.000	791550		4.14(1.90-5.69)		35102	
D 19 13C5 PFNA										
468.00 > 423.00	2.954	2.953	0.001	1.141	3052838	2.55		102	35306	
D 18 13C4 PFOS										
503.00 > 80.00	2.954	2.953	0.001	1.141	3165574	2.49		104	34173	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.158	0.006	1.071	5767931	NC			34003	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.299	3.294	0.005	1.000	1250622	2.49		104	29942	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.299	3.294	0.005	1.117	2548438	2.58		107	37365	
549.00 > 99.00	3.299	3.294	0.005	1.117	940307		2.71(1.33-3.97)		8317	
D 26 M2-8:2FTS										
529.00 > 81.00	3.299	3.299	0.0	1.275	887566	2.14		89.5	16454	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.315	3.310	0.005	1.000	2779926	2.56		102	13076	
513.00 > 169.00	3.315	3.310	0.005	1.000	489065		5.68(2.36-7.09)		23171	
D 23 13C2 PFDA										
515.00 > 470.00	3.315	3.315	0.0	1.281	2638927	2.76		111	57310	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.323	3.317	0.006	1.002	5071708	2.64		106	52096	
D 21 13C8 FOSA										
506.00 > 78.00	3.315	3.322	-0.007	1.281	4830580	2.59		104	35702	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.467	3.467	0.0	1.340	951378	3.02		121	13925	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.467	3.471	-0.004	1.000	999599	2.67		107	10646	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.631	3.626	0.005	1.229	2368372	2.70		112	31511	
599.00 > 99.00	3.631	3.626	0.005	1.229	788394		3.00(1.39-4.16)		12753	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.640	3.636	0.004	1.000	2592368	2.34		93.4	11674	
563.00 > 169.00	3.640	3.636	0.004	1.000	454577		5.70(2.12-6.36)		13665	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.640	3.636	0.004	1.003	884891	2.32		92.8	21613	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.640	-0.009	1.403	1021690	3.08		123	2721	
D 30 13C2 PFUnA										
565.00 > 520.00	3.640	3.640	0.0	1.406	2236126	2.91		116	42976	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.805	3.801	0.004	1.288	9044205	NC			69338	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.941	3.937	0.004	1.000	2205614	2.46		98.2	778	
613.00 > 169.00	3.941	3.937	0.004	1.000	511144		4.32(2.13-6.40)		11864	
D 36 13C2 PFDoA										
615.00 > 570.00	3.941	3.941	0.0	1.523	2074954	2.84		114	18939	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.203	4.200	0.003	1.066	2153936	2.47		98.8	774	
663.00 > 169.00	4.203	4.200	0.003	1.066	632414		3.41(1.25-3.76)		8523	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.436	0.001	1.000	503211	2.52		101	7948	
713.00 > 219.00	4.437	4.436	0.001	1.000	357956		1.41(0.71-2.13)		6002	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.437	0.0	1.714	1989187	2.79		111	14727	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.837	0.005	1.000	2686744	NC			479	
813.00 > 169.00	4.842	4.837	0.005	1.000	441627		6.08(2.86-8.58)		4623	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.842	4.842	0.0	1.871	2758383	2.55		102	10121	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.189	5.184	0.005	1.072	2798693	NC			502	
913.00 > 169.00	5.189	5.184	0.005	1.072	337909		8.28(3.83-11.48)		1891	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 31-Jul-2018 12:31:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_053.d

Injection Date: 29-Jul-2018 06:37:52 Instrument ID: A8_N

Lims ID: CCV L5

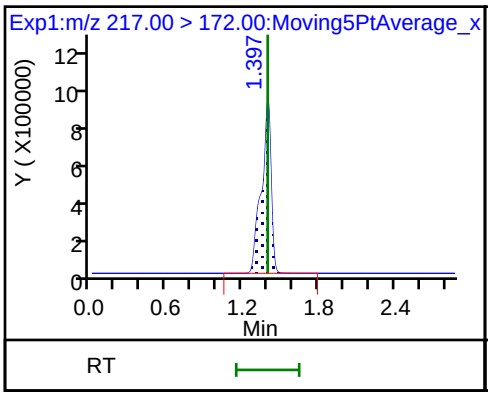
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 31 Worklist Smp#: 14

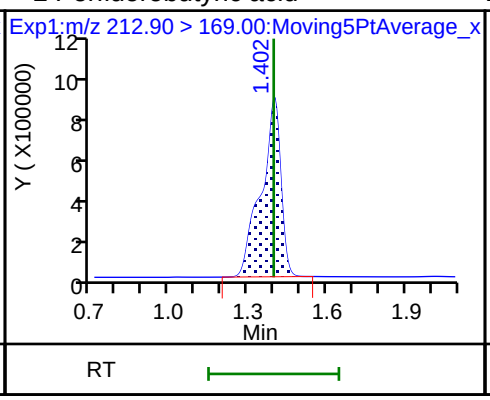
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

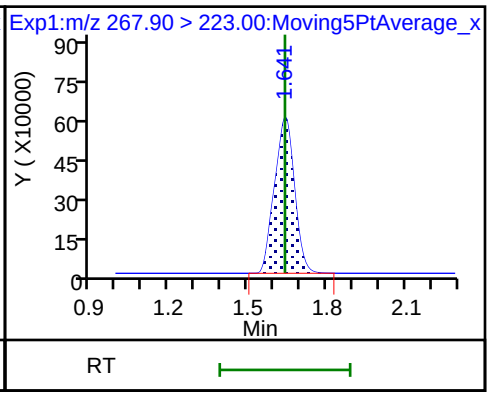
D 1 13C4 PFBA



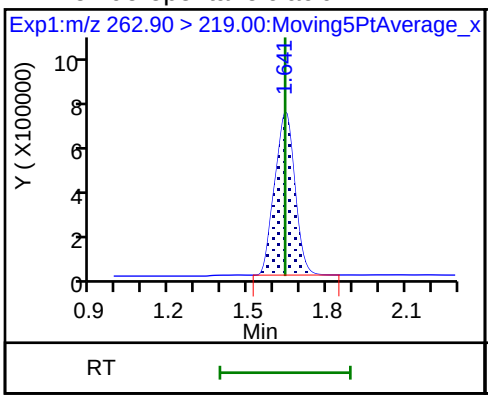
2 Perfluorobutyric acid



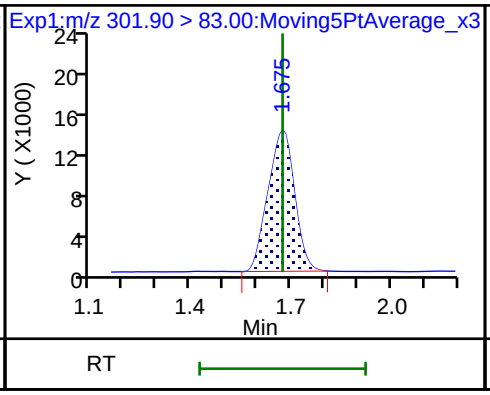
D 3 13C5-PFPeA



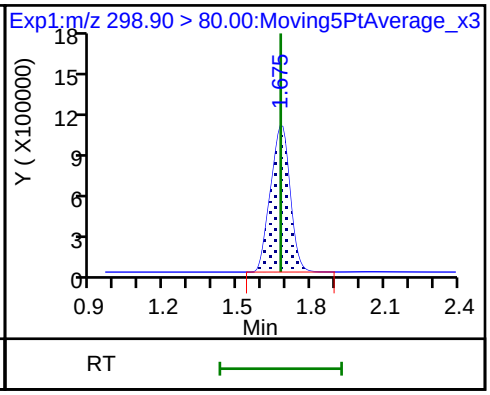
4 Perfluoropentanoic acid



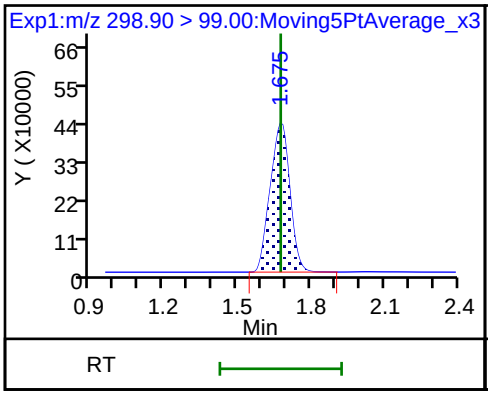
D 47 13C3-PFBS



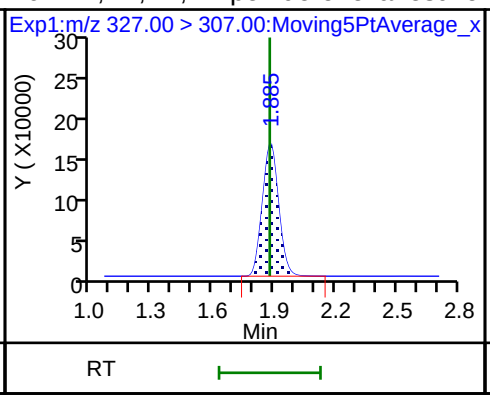
5 Perfluorobutanesulfonic acid



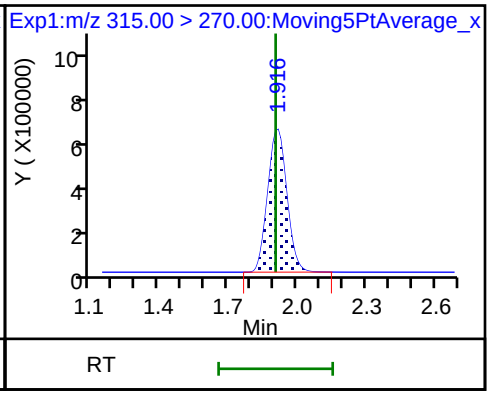
5 Perfluorobutanesulfonic acid



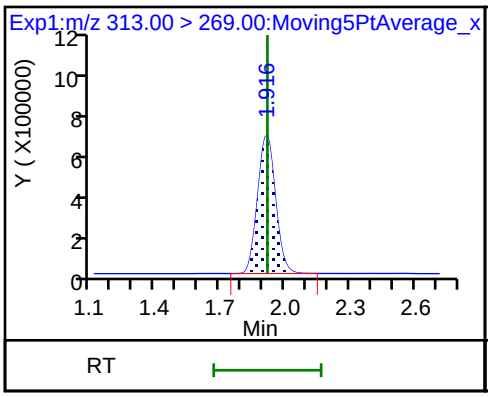
61 1H,1H,2H,2H-perfluorohexanesulfon



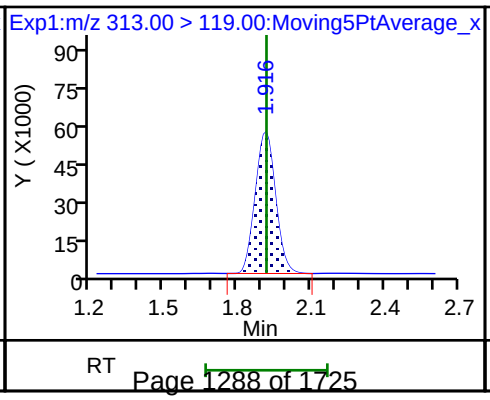
D 7 13C2 PFHxA



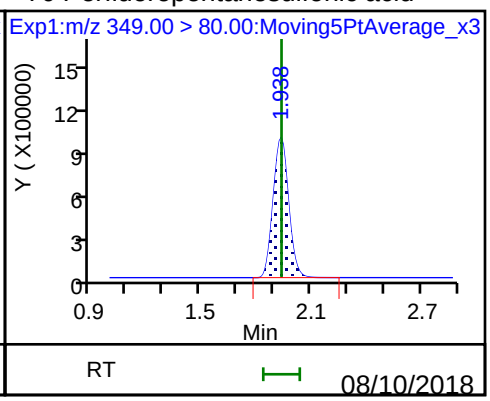
6 Perfluorohexanoic acid



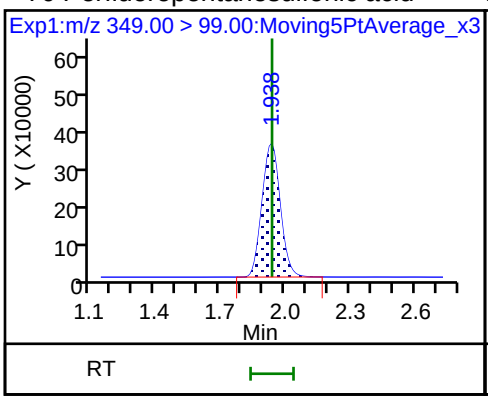
6 Perfluorohexanoic acid



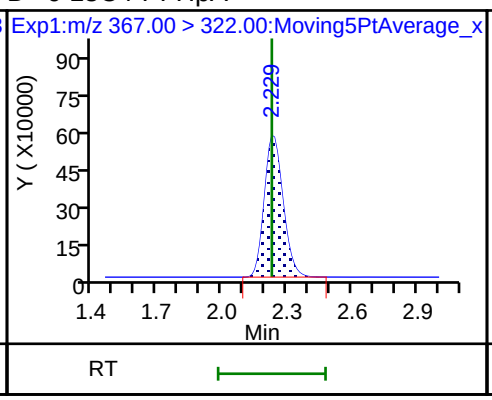
70 Perfluoropentanesulfonic acid



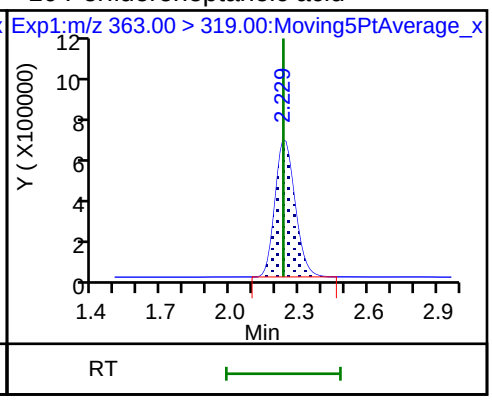
70 Perfluoropentanesulfonic acid



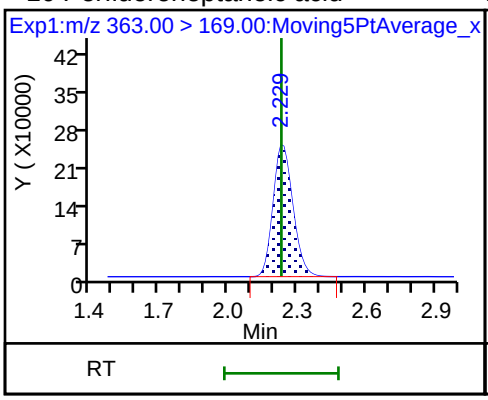
D 9 13C4-PFHpA



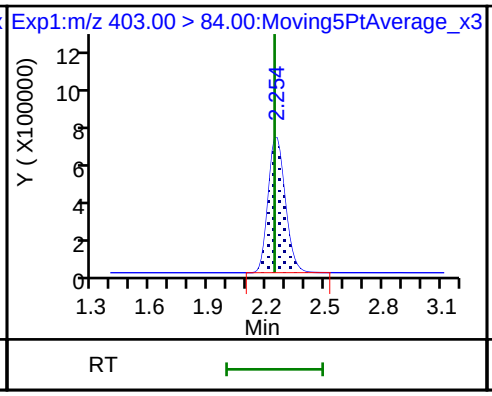
10 Perfluoroheptanoic acid



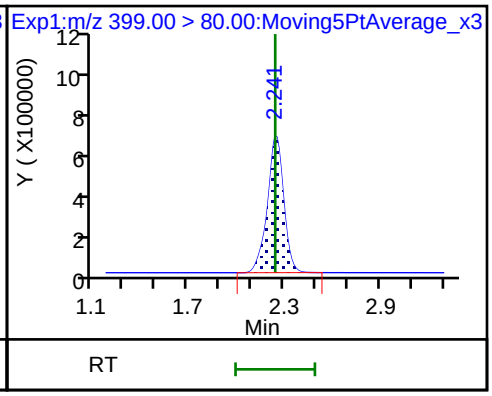
10 Perfluoroheptanoic acid



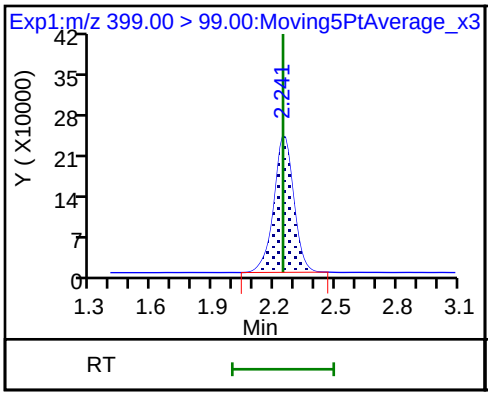
D 11 18O2 PFHxS



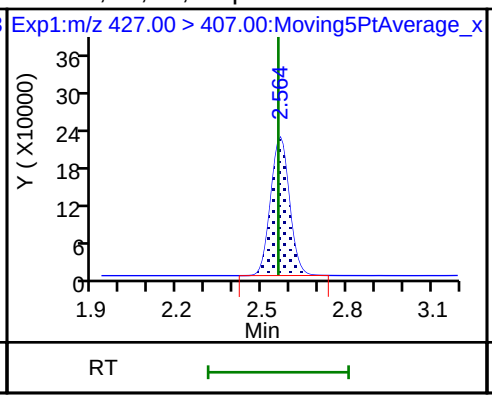
8 Perfluorohexanesulfonic acid



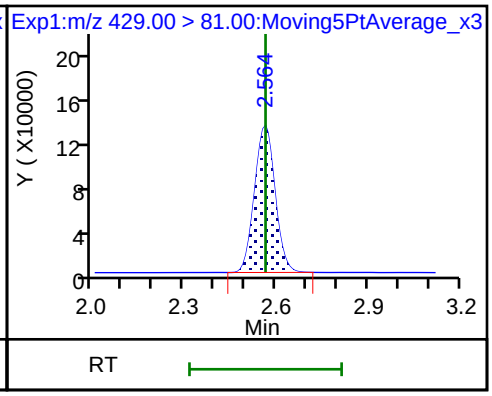
8 Perfluorohexanesulfonic acid



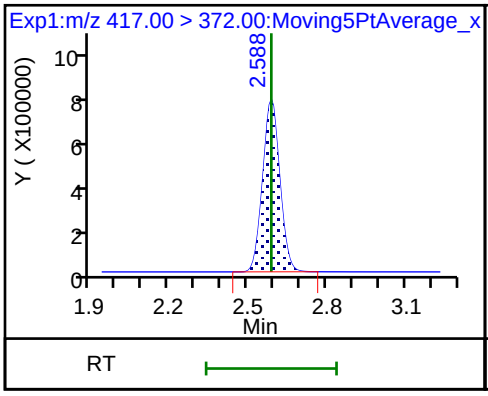
13 1H,1H,2H,2H-perfluorooctanesulfon



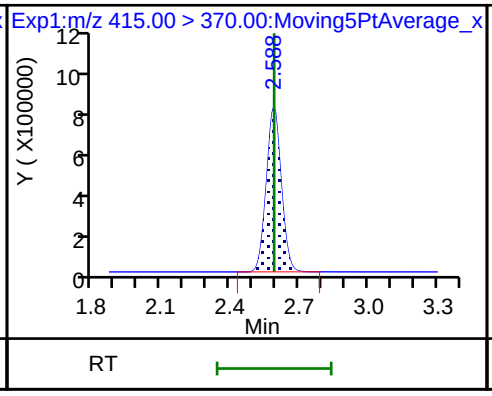
D 12 M2-6:2FTS



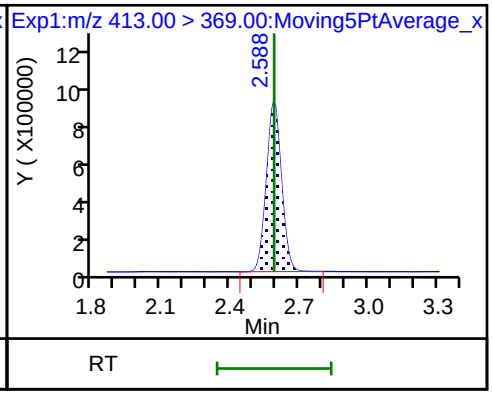
D 14 13C4 PFOA



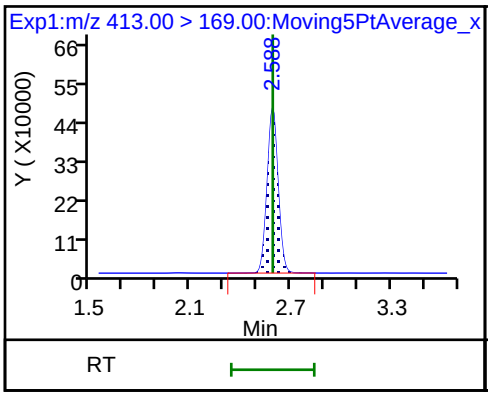
* 62 13C2-PFOA



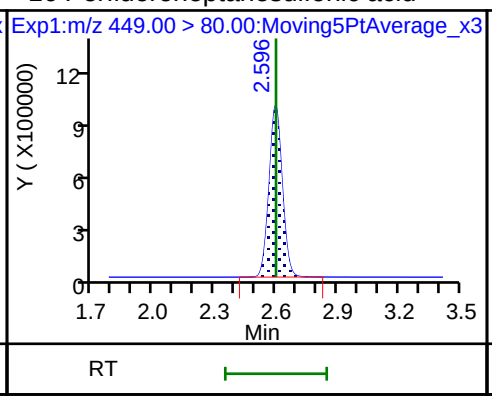
15 Perfluorooctanoic acid



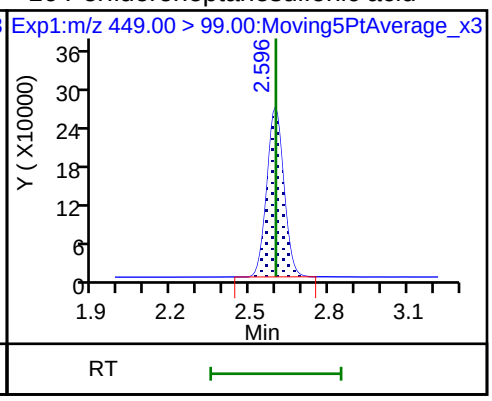
15 Perfluorooctanoic acid



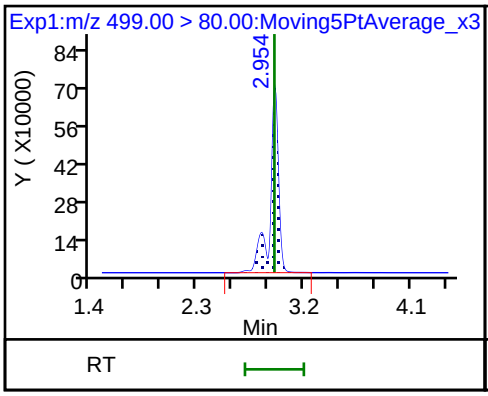
16 Perfluoroheptanesulfonic acid



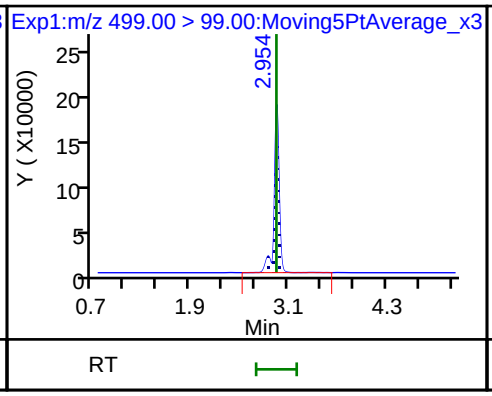
16 Perfluoroheptanesulfonic acid



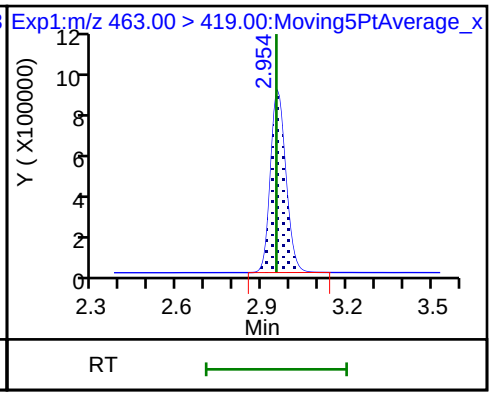
17 Perfluorooctane sulfonic acid



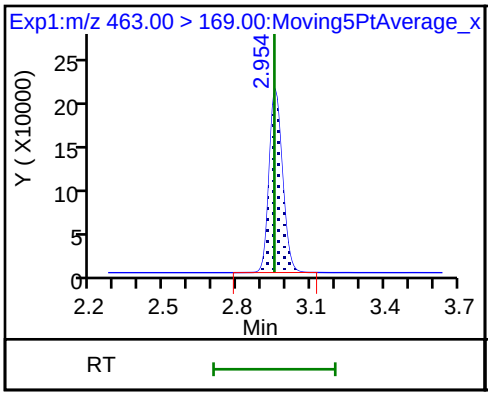
17 Perfluorooctane sulfonic acid



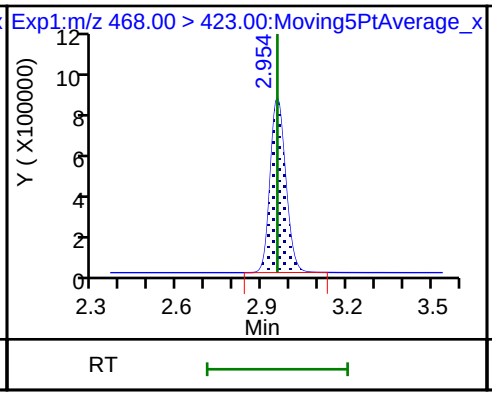
20 Perfluorononanoic acid



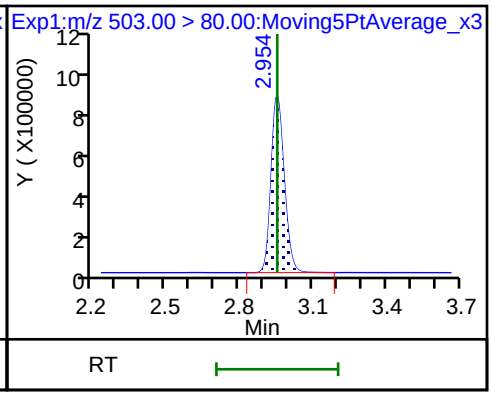
20 Perfluorononanoic acid



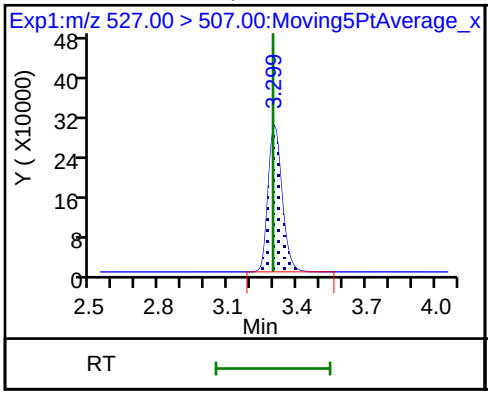
D 19 13C5 PFNA



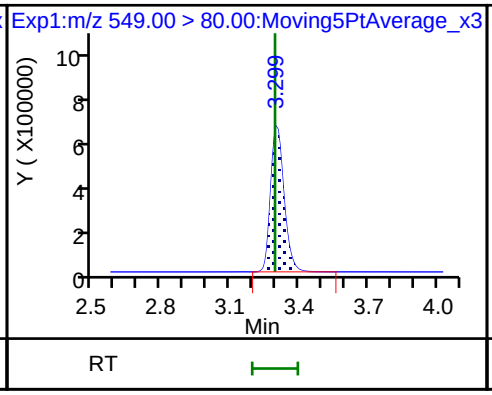
D 18 13C4 PFOS



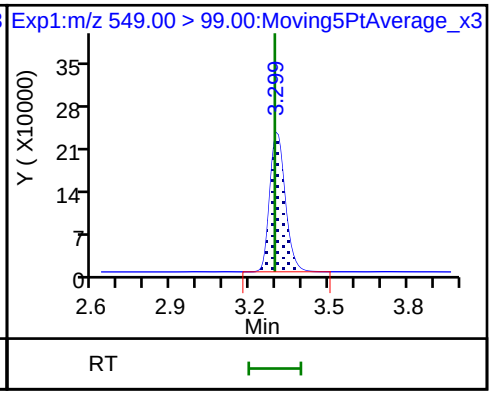
25 1H,1H,2H,2H-perfluorodecanesulfoni



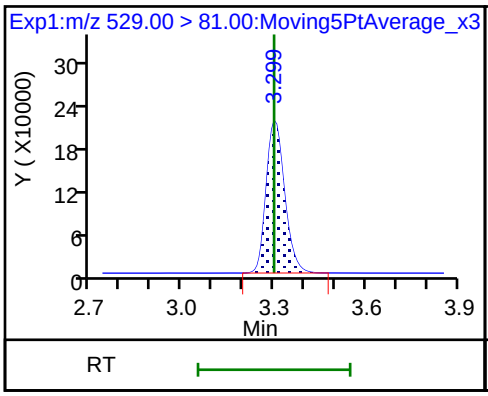
68 Perfluorononanesulfonic acid



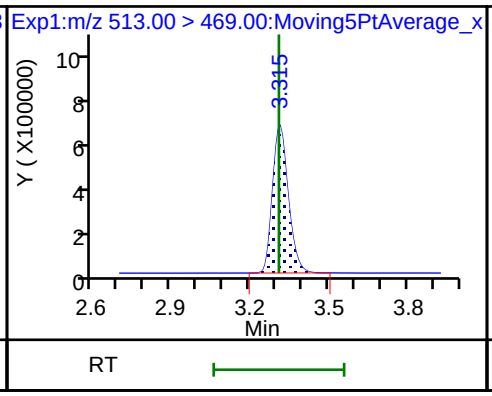
68 Perfluorononanesulfonic acid



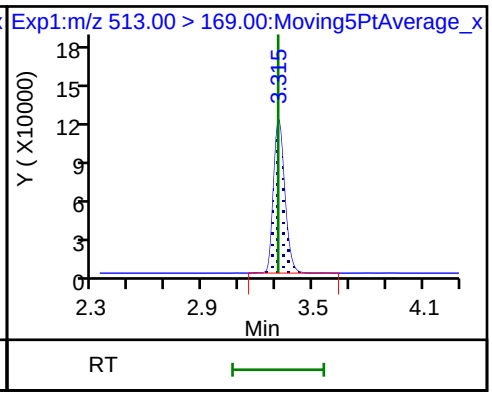
D 26 M2-8:2FTS



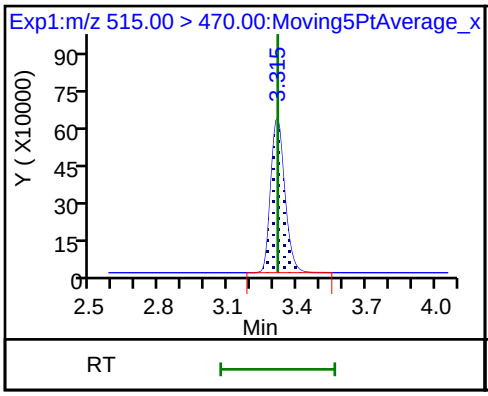
24 Perfluorodecanoic acid



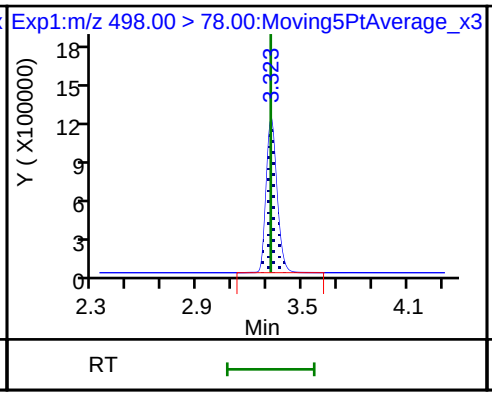
24 Perfluorodecanoic acid



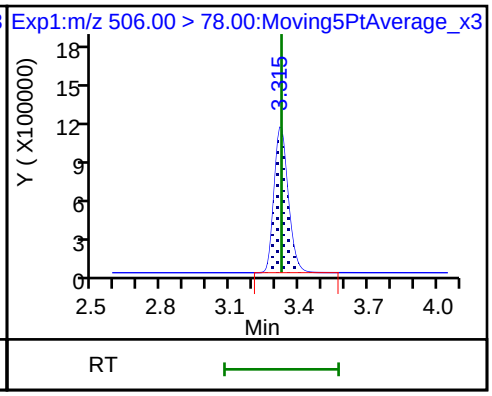
D 23 13C2 PFDA



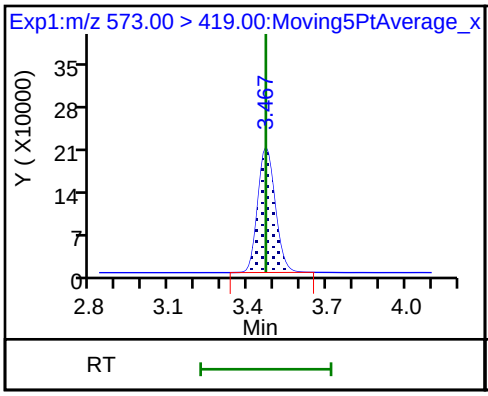
22 Perfluorooctane Sulfonamide



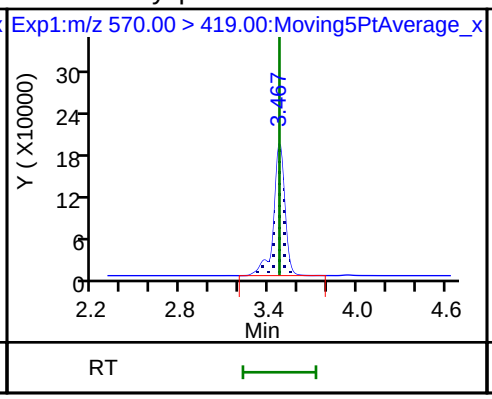
D 21 13C8 FOSA



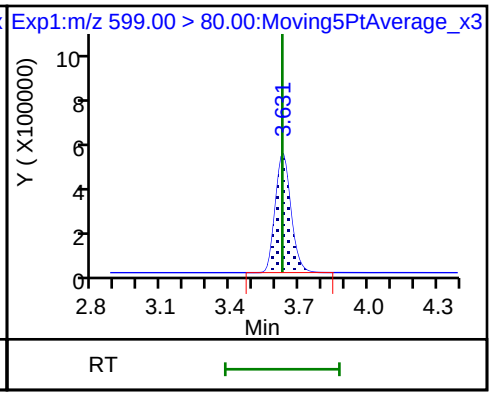
D 27 d3-NMeFOSAA



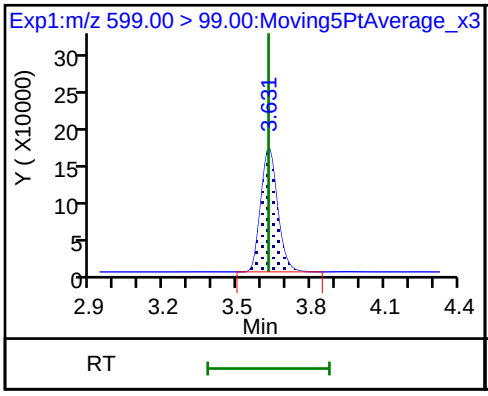
28 N-methyl perfluorooctane sulfonami



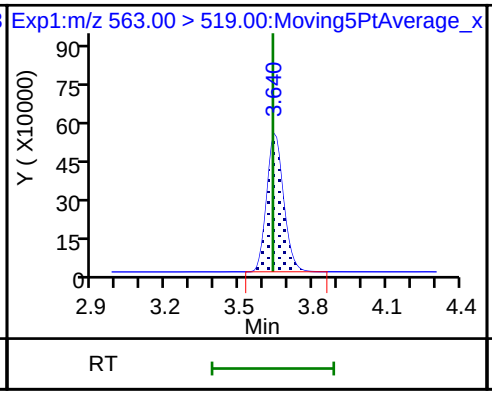
29 Perfluorodecane Sulfonic acid



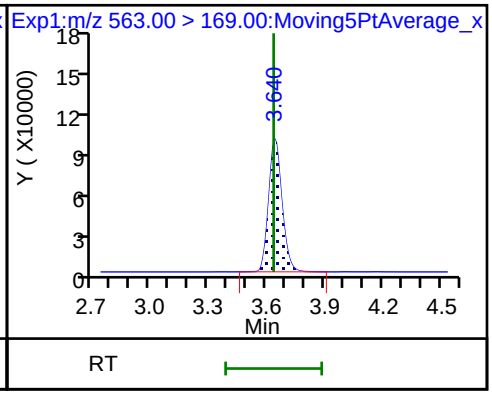
29 Perfluorodecane Sulfonic acid



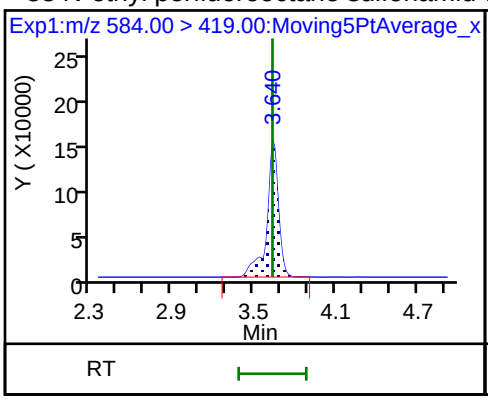
31 Perfluoroundecanoic acid



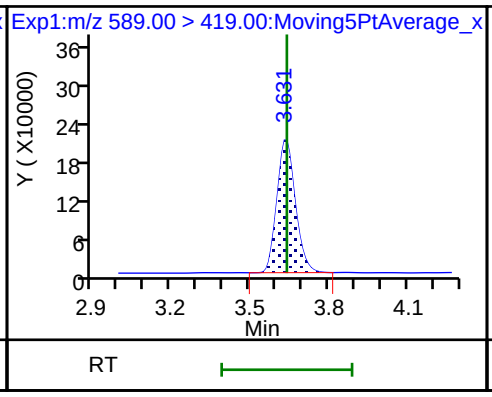
31 Perfluoroundecanoic acid



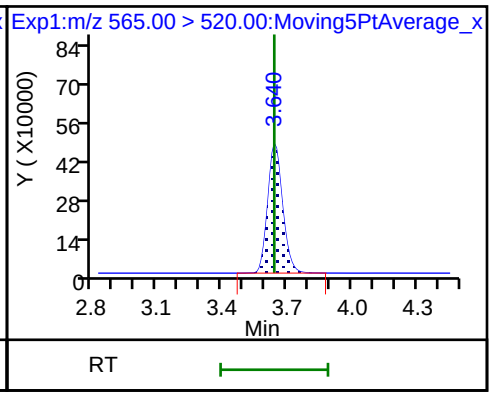
33 N-ethyl perfluorooctane sulfonamid



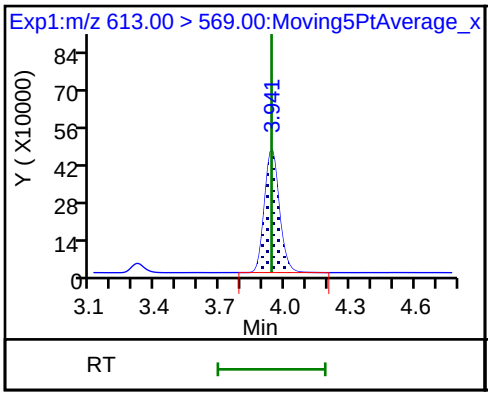
D 32 d5-NEtFOSAA



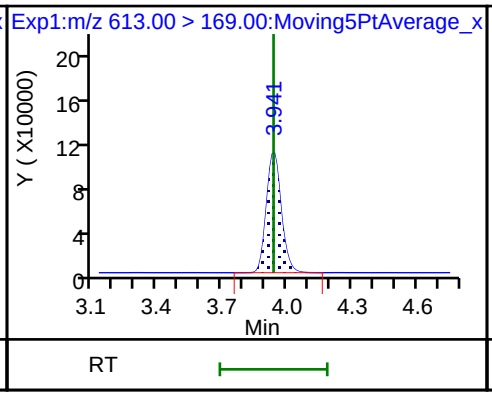
D 30 13C2 PFUnA



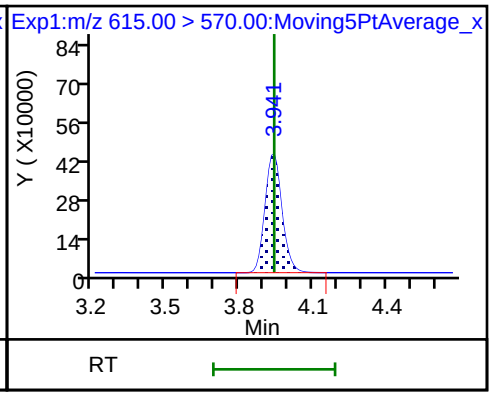
37 Perfluorododecanoic acid



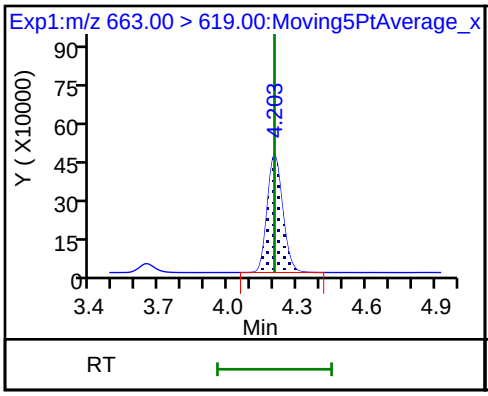
37 Perfluorododecanoic acid



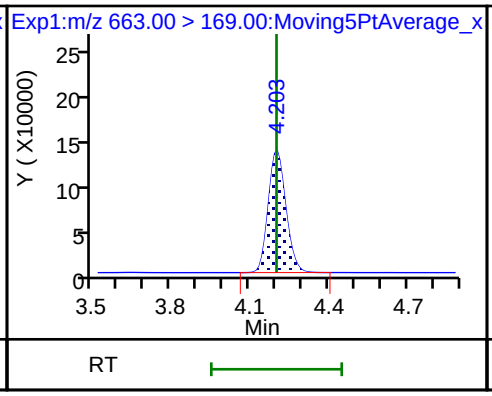
D 36 13C2 PFDoA



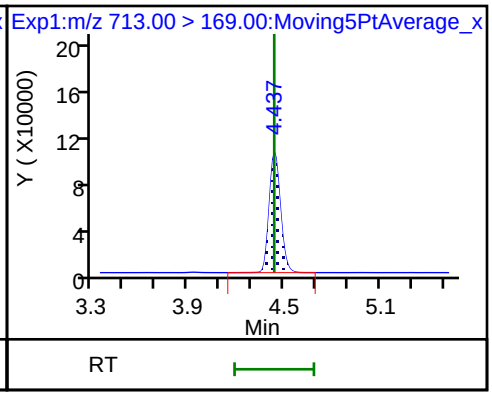
41 Perfluorotridecanoic acid



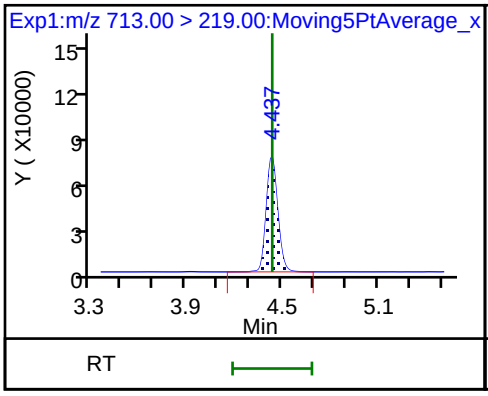
41 Perfluorotridecanoic acid



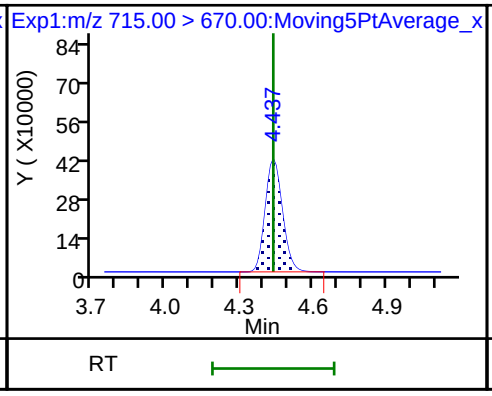
42 Perfluorotetradecanoic acid



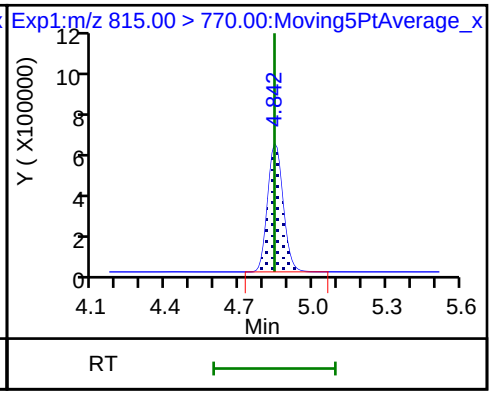
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-236782/24 Calibration Date: 07/29/2018 07:56

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_063.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9828	0.9783		0.995	1.00	-0.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.168		0.976	1.00	-2.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	79.39	78.06		0.869	0.884	-1.7	30.0
4:2 FTS	AveID	17.09	11.14		0.609	0.934	-34.8*	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.060	1.014		0.957	1.00	-4.3	30.0
Perfluoropentanesulfonic acid	AveID	71.24	69.04		0.909	0.938	-3.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.103	1.132		1.03	1.00	2.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.167	1.079		0.842	0.910	-7.5	30.0
6:2 FTS	AveID	1.687	1.665		0.936	0.948	-1.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.214	1.161		0.958	1.00	-4.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.383	1.337		0.920	0.952	-3.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.105	1.070		0.898	0.928	-3.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.142	1.065		0.933	1.00	-6.7	30.0
8:2 FTS	AveID	1.356	1.331		0.940	0.958	-1.8	30.0
Perfluorononanesulfonic acid	AveID	0.7469	0.7708		0.991	0.960	3.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.028	1.045		1.02	1.00	1.6	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9945	0.999		1.00	1.00	0.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9855	0.9690		0.983	1.00	-1.7	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6631	0.6837		0.994	0.964	3.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9329	0.8198		0.879	1.00	-12.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.241	1.147		0.925	1.00	-7.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.044		0.965	1.00	-3.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.050	1.075		1.02	1.00	2.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2507	0.2581		1.03	1.00	3.0	30.0
13C4 PFBA	Ave	1.159	1.243		2.68	2.50	7.2	30.0
13C5-PFPeA	Ave	0.8093	0.8632		2.67	2.50	6.7	30.0
13C3-PFBS	Ave	0.0212	0.0223		2.44	2.33	5.0	30.0
13C2 PFHxA	Ave	0.9490	0.9470		2.49	2.50	-0.2	30.0
13C4-PFHpA	Ave	0.9779	0.9090		2.32	2.50	-7.0	30.0
18O2 PFHxS	Ave	1.256	1.272		2.39	2.37	1.3	30.0
M2-6:2FTS	Ave	0.2731	0.1782		1.55	2.38	-34.7*	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-236782/24 Calibration Date: 07/29/2018 07:56

Instrument ID: A8_N Calib Start Date: 07/23/2018 16:11

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/23/2018 16:58

Lab File ID: 2018.07.28LLB_063.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9566	0.9327		2.44	2.50	-2.5	30.0
13C4 PFOS	Ave	0.8734	0.8944		2.45	2.39	2.4	30.0
13C5 PFNA	Ave	0.8250	0.8304		2.52	2.50	0.6	30.0
M2-8:2FTS	Ave	0.2848	0.2582		2.17	2.40	-9.3	30.0
13C2 PFDA	Ave	0.6565	0.7443		2.83	2.50	13.4	30.0
13C8 FOSA	Ave	1.283	1.337		2.60	2.50	4.2	30.0
d3-NMeFOSAA	Ave	0.2169	0.2634		3.04	2.50	21.4	30.0
d5-NEtFOSAA	Ave	0.2280	0.2836		3.11	2.50	24.4	30.0
13C2 PFUnA	Ave	0.5287	0.5827		2.76	2.50	10.2	30.0
13C2 PFDoA	Ave	0.5026	0.5509		2.74	2.50	9.6	30.0
13C2-PFTeDA	Ave	0.4910	0.5050		2.57	2.50	2.9	30.0
13C2-PFHxDA	Ave	0.7454	0.7029		2.36	2.50	-5.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_063.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 29-Jul-2018 07:56:14 ALS Bottle#: 30 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:38:17 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:38:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.397	-0.002	0.539	4712864	2.68		107	65309	
2 Perfluorobutyric acid										
212.90 > 169.00	1.395	1.395	0.0	1.000	1844171	1.00		99.5	948	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.640	-0.003	0.633	3272029	2.67		107	56605	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.637	0.0	1.000	1528965	0.9760		97.6	699	
D 47 13C3-PFBS										
301.90 > 83.00	1.671	1.675	-0.004	0.646	78548	2.44		105	652	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.000	2331416	0.8692		98.3	7401	
298.90 > 99.00	1.671	1.671	0.0	1.000	960050		2.43(1.25-3.74)		4447	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.876	-0.003	0.724	351364	NC			4830	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.873	1.873	0.0	1.120	351489	0.6086		65.2	20622	
D 7 13C2 PFHxA										
315.00 > 270.00	1.913	1.905	0.008	0.739	3589727	2.49		99.8	69560	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.913	1.913	0.0	1.000	1456263	0.9568		95.7	4950	
313.00 > 119.00	1.913	1.913	0.0	1.000	129178		11.27(5.03-15.10)		3105	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.934	1.934	0.0	1.157	2187717	0.9090		96.9	33876	
349.00 > 99.00	1.934	1.934	0.0	1.157	836329		2.62(1.36-4.07)		6815	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.011	2.003	0.008	0.777	335488	NC			11719	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.011	2.011	0.0	1.000	306062	NC			1423	
D 9 13C4-PFHpA										
367.00 > 322.00	2.237	2.229	0.008	0.865	3445735	2.32		93.0	31696	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.237	2.237	0.0	1.000	1560428	1.03		103	3359	
363.00 > 169.00	2.237	2.237	0.0	1.000	626642		2.49(1.13-3.40)		9539	
D 11 18O2 PFHxS										
403.00 > 84.00	2.251	2.241	0.009	0.870	4561532	2.39		101	44039	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.251	2.251	0.0	1.000	1894558	0.8419		92.5	11105	
399.00 > 99.00	2.251	2.251	0.0	1.000	643805		2.94(1.50-4.49)		2264	
65 ADONA										
377.00 > 251.00	2.277	2.277	0.0	0.773	4310847	NC			59301	
377.00 > 85.00	2.277	2.277	0.0	0.773	2415579		1.78(0.84-2.53)		11411	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.563	2.563	0.0	1.000	426405	0.9355		98.7	6155	
D 12 M2-6:2FTS										
429.00 > 81.00	2.563	2.564	-0.001	0.991	641695	1.55		65.3	12653	
D 14 13C4 PFOA										
417.00 > 372.00	2.587	2.588	-0.001	1.000	3535593	2.44		97.5	49214	
* 62 13C2-PFOA										
415.00 > 370.00	2.587	2.587	0.0		3790816	2.50			56554	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.587	2.587	0.0	1.000	1643811	0.9577		95.7	2210	
413.00 > 169.00	2.587	2.587	0.0	1.000	847072		1.94(0.84-2.52)		4915	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.595	2.595	0.0	0.881	1726003	0.9200		96.6	20119	
449.00 > 99.00	2.595	2.595	0.0	0.881	480337		3.59(1.94-5.82)		5986	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.946	2.946	0.0	1.000	1346227	0.8984		96.8	12450	
499.00 > 99.00	2.946	2.946	0.0	1.000	330413		4.07(2.31-6.93)		3838	
20 Perfluorononanoic acid										
463.00 > 419.00	2.951	2.951	0.0	1.002	1341248	0.9330		93.3	3797	
463.00 > 169.00	2.951	2.951	0.0	1.002	330878		4.05(1.90-5.69)		11081	
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.953	-0.007	1.139	3147688	2.52		101	52678	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.953	-0.007	1.139	3241260	2.45		102	41898	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.161	3.161	0.0	1.073	2290353	NC			14516	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.295	3.295	0.0	1.000	499201	0.9404		98.2	11048	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.295	3.295	0.0	1.119	1003498	0.99		103	20812	
549.00 > 99.00	3.295	3.295	0.0	1.119	371227		2.70(1.33-3.97)		4415	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.299	-0.004	1.274	937801	2.17		90.7	16149	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.303	3.303	0.0	1.000	1179092	1.02		102	7638	
513.00 > 169.00	3.303	3.303	0.0	1.000	196632		6.00(2.36-7.09)		6615	
D 23 13C2 PFDA										
515.00 > 470.00	3.303	3.315	-0.012	1.277	2821432	2.83		113	35772	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.311	0.0	1.000	2025459	1.00		100	25482	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.322	-0.012	1.280	5067275	2.60		104	35713	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.463	3.467	-0.004	1.339	998616	3.04		121	21586	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.463	3.463	0.0	1.000	387080	0.9833		98.3	4933	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.618	3.618	0.0	1.228	893889	0.99		103	27131	
599.00 > 99.00	3.618	3.618	0.0	1.228	320474		2.79(1.39-4.16)		6101	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.637	3.637	0.0	1.000	1013712	0.9246		92.5	5076	
563.00 > 169.00	3.637	3.637	0.0	1.000	175560		5.77(2.12-6.36)		6037	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.637	3.637	0.0	1.003	352510	0.8787		87.9	7460	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.640	-0.013	1.402	1074991	3.11		124	3629	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.640	-0.003	1.406	2208975	2.76		110	30713	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.792	3.792	0.0	1.287	3658096	NC			50960	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.928	3.928	0.0	1.000	872100	0.9649		96.5	298	
613.00 > 169.00	3.928	3.928	0.0	1.000	201930		4.32(2.13-6.40)		4236	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.941	-0.013	1.518	2088409	2.74		110	20926	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.182	4.182	0.0	1.065	897992	1.02		102	315	
663.00 > 169.00	4.192	4.182	0.010	1.067	276536		3.25(1.25-3.76)		4554	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.426	0.0	1.000	197636	1.03		103	3375	
713.00 > 219.00	4.415	4.426	-0.011	0.998	135663		1.46(0.71-2.13)		2516	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.437	-0.011	1.711	1914403	2.57		103	17926	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	994639	NC			192	
813.00 > 169.00	4.833	4.833	0.0	1.000	167623		5.93(2.86-8.58)		2030	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.868	2664436	2.36		94.3	9726	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.173	5.173	0.0	1.070	1020528	NC			227	
913.00 > 169.00	5.173	5.173	0.0	1.070	127355		8.01(3.83-11.48)		2168	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 31-Jul-2018 12:38:20 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_063.d

Injection Date: 29-Jul-2018 07:56:14 Instrument ID: A8_N

Lims ID: CCV L4

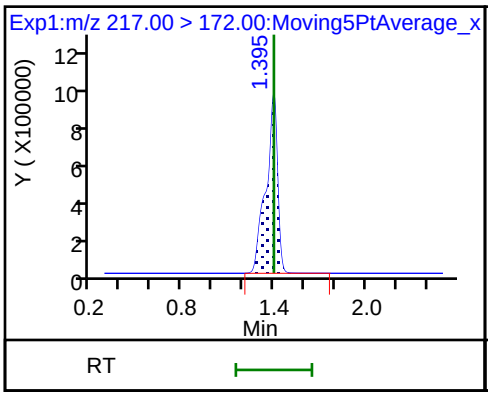
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 30 Worklist Smp#: 24

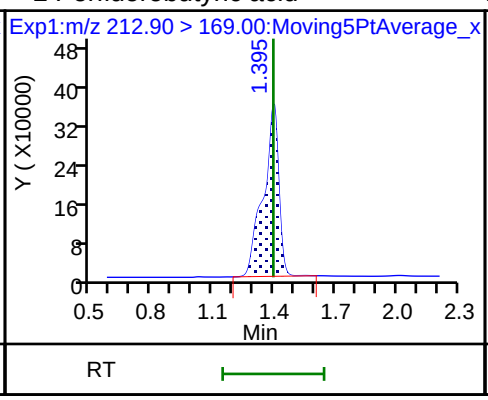
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

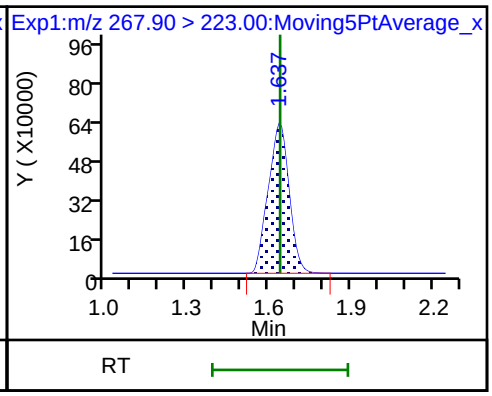
D 1 13C4 PFBA



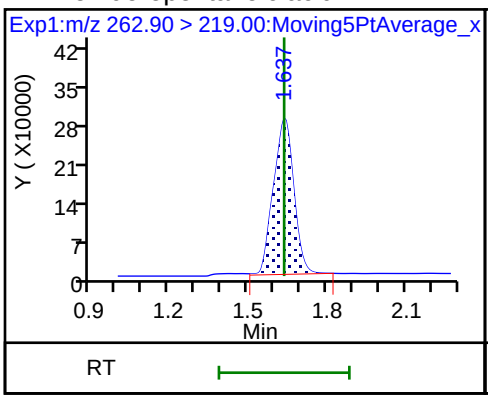
2 Perfluorobutyric acid



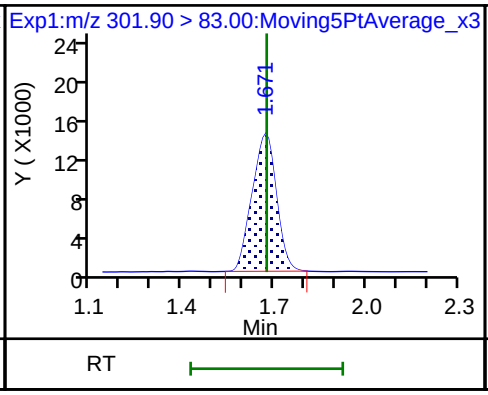
D 3 13C5-PFPeA



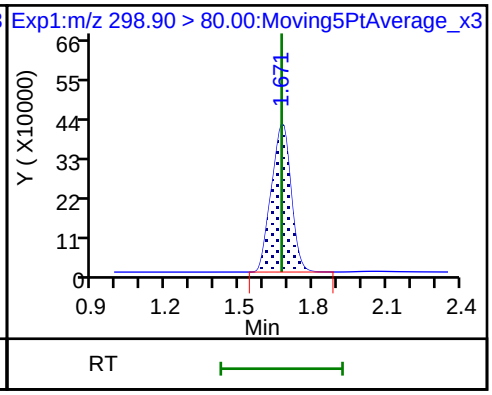
4 Perfluoropentanoic acid



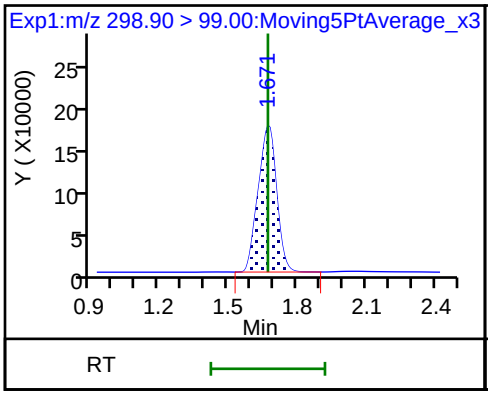
D 47 13C3-PFBS



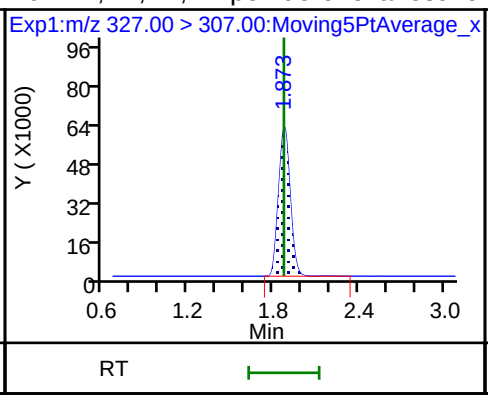
5 Perfluorobutanesulfonic acid



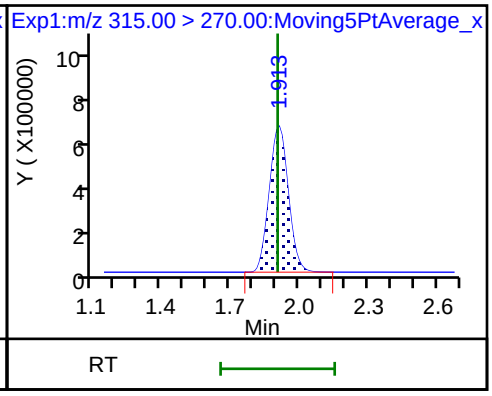
5 Perfluorobutanesulfonic acid



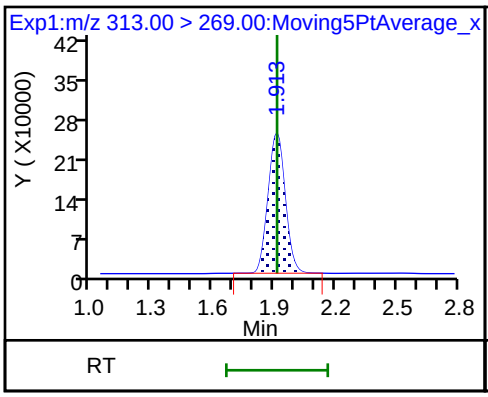
61 1H,1H,2H,2H-perfluorohexanesulfon



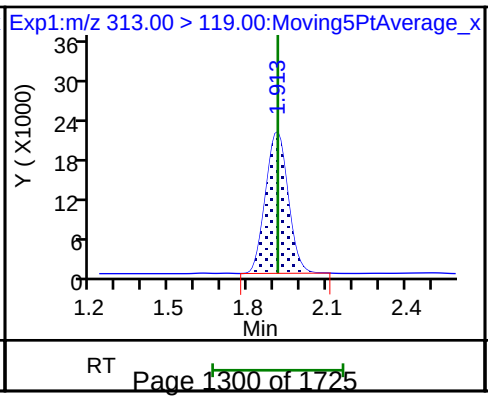
D 7 13C2 PFHxA



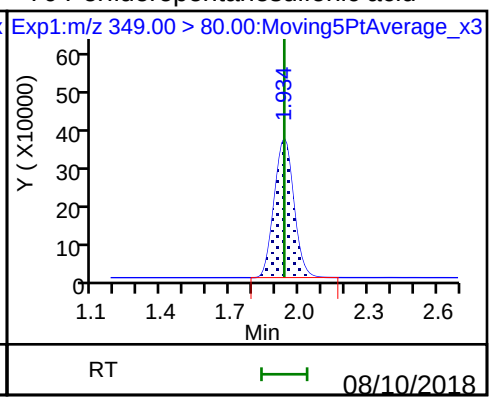
6 Perfluorohexanoic acid



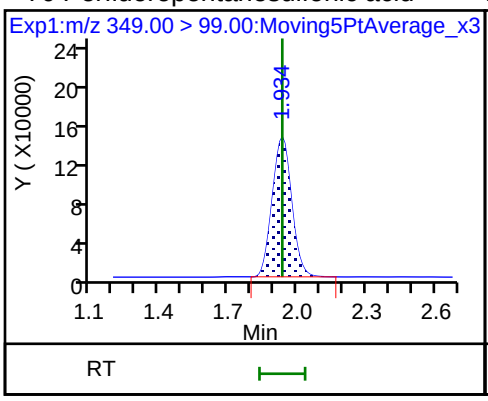
6 Perfluorohexanoic acid



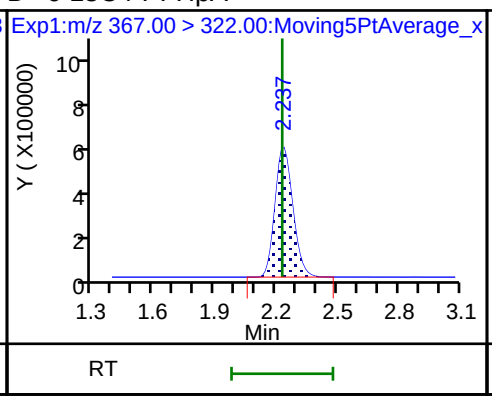
70 Perfluoropentanesulfonic acid



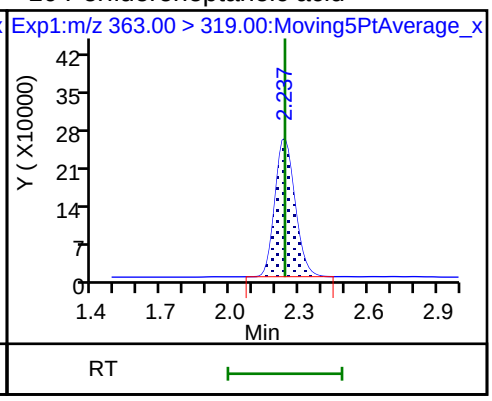
70 Perfluoropentanesulfonic acid



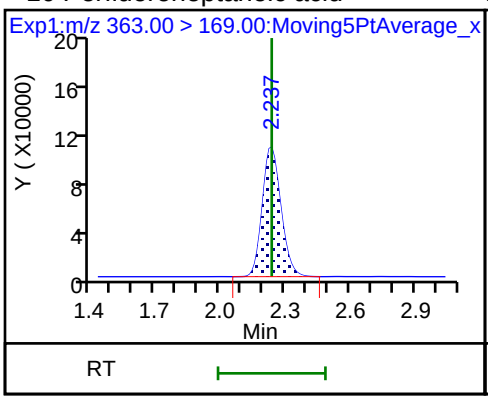
D 9 13C4-PFHpA



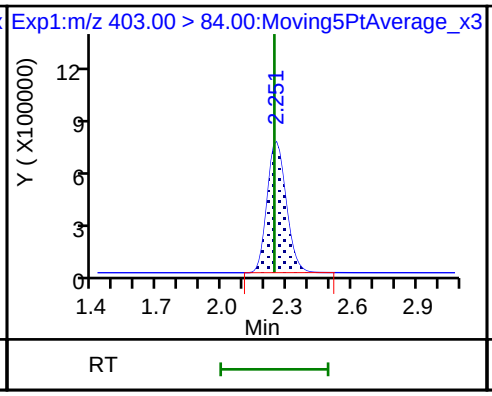
10 Perfluoroheptanoic acid



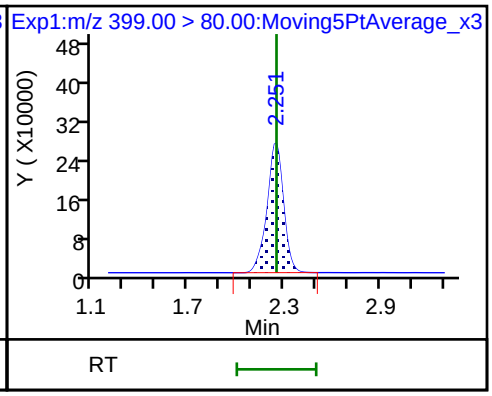
10 Perfluoroheptanoic acid



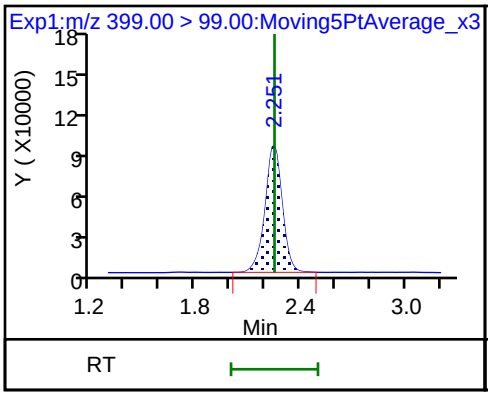
D 11 18O2 PFHxS



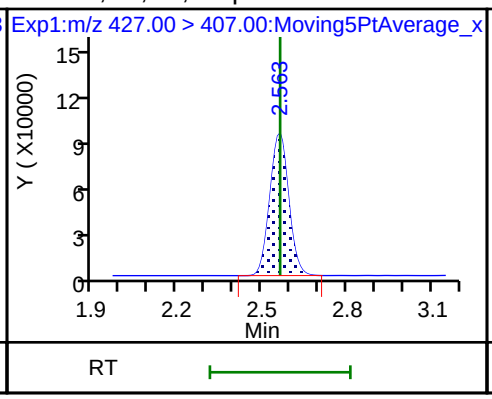
8 Perfluorohexanesulfonic acid



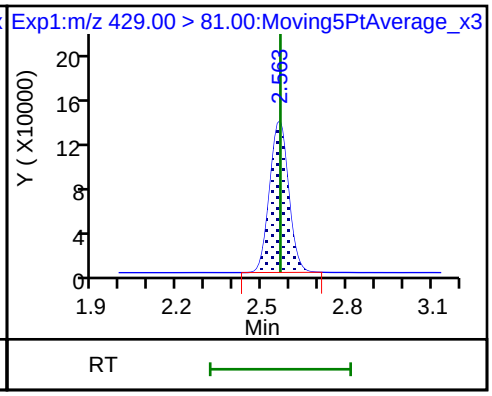
8 Perfluorohexanesulfonic acid



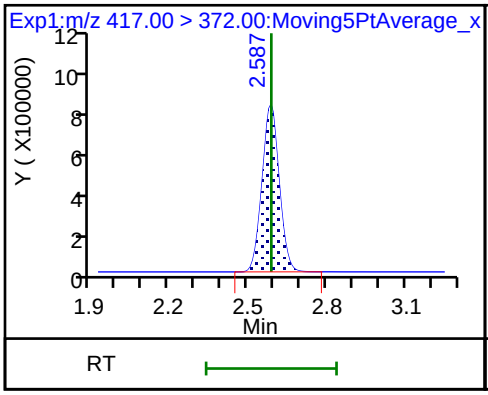
13 1H,1H,2H,2H-perfluorooctanesulfon



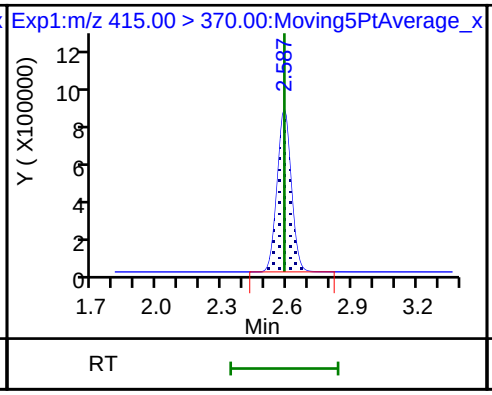
D 12 M2-6:2FTS



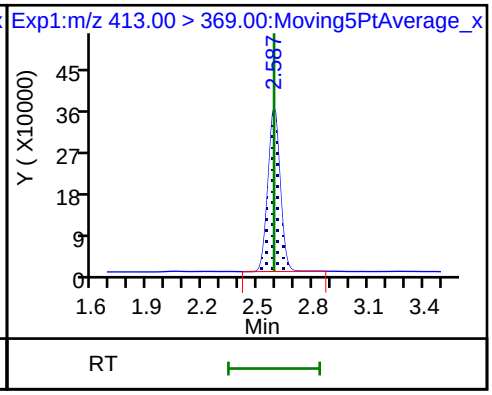
D 14 13C4 PFOA



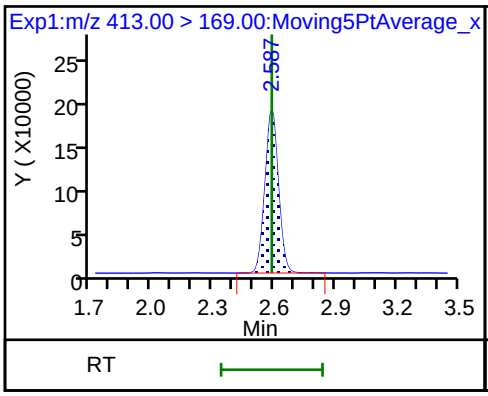
* 62 13C2-PFOA



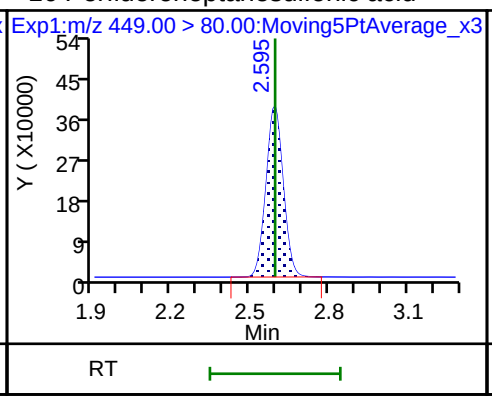
15 Perfluorooctanoic acid



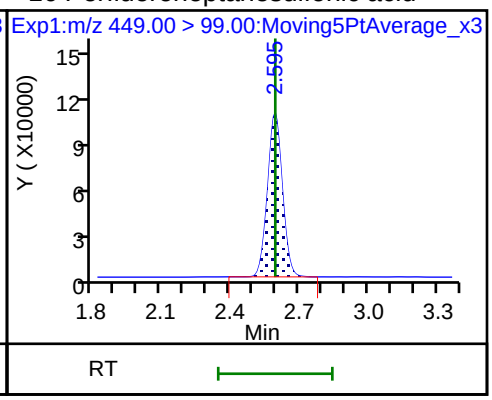
15 Perfluorooctanoic acid



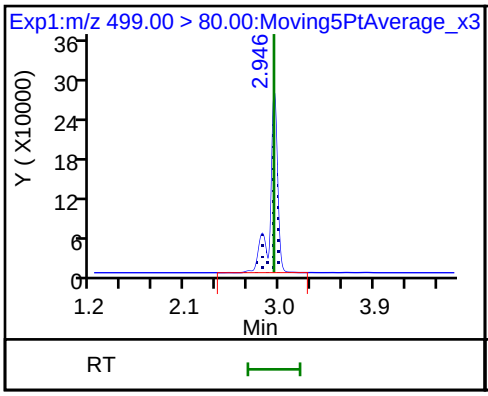
16 Perfluoroheptanesulfonic acid



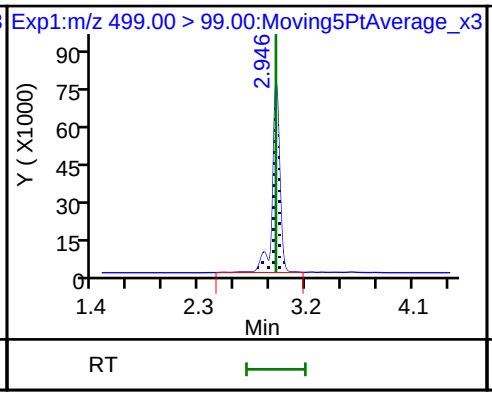
16 Perfluoroheptanesulfonic acid



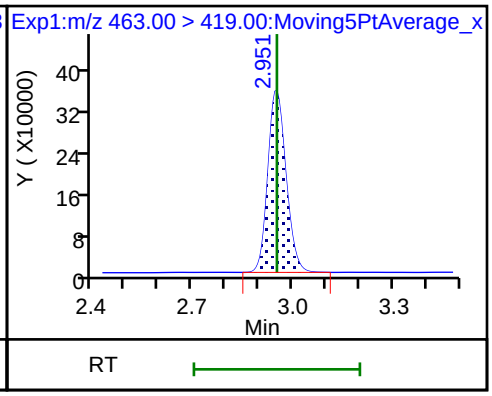
17 Perfluorooctane sulfonic acid



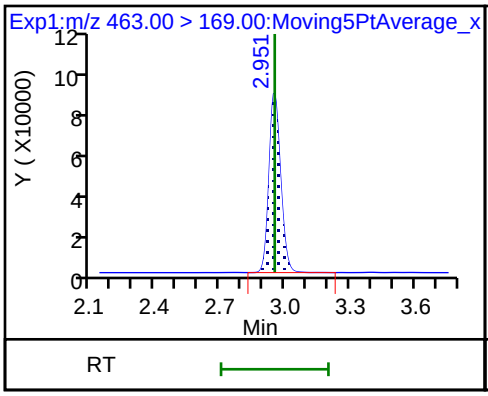
17 Perfluorooctane sulfonic acid



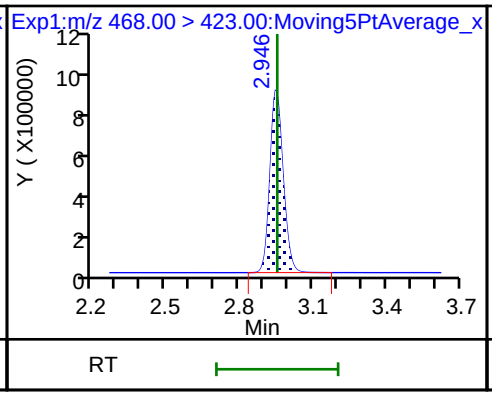
20 Perfluorononanoic acid



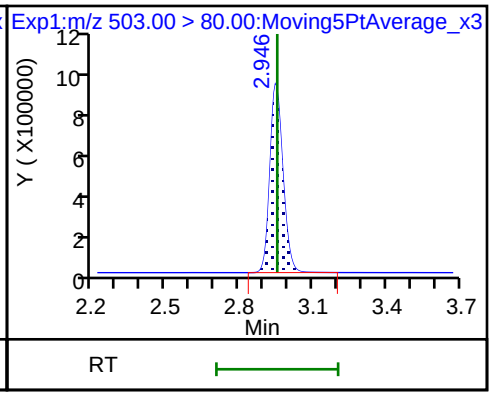
20 Perfluorononanoic acid



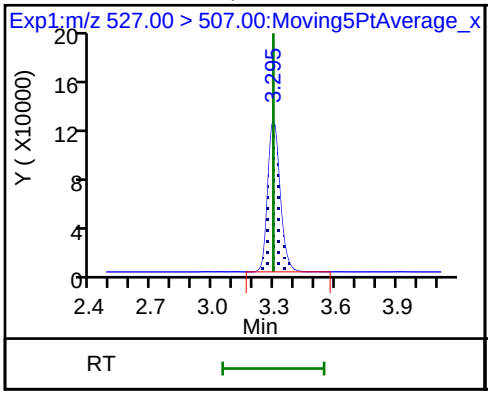
D 19 13C5 PFNA



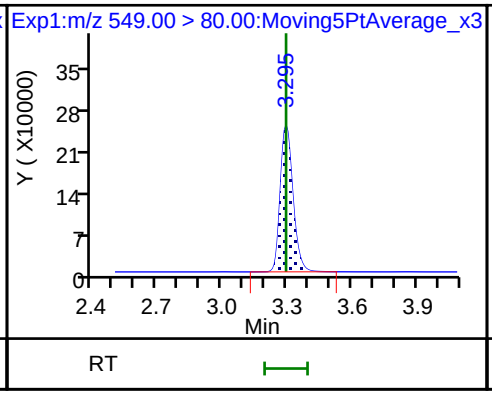
D 18 13C4 PFOS



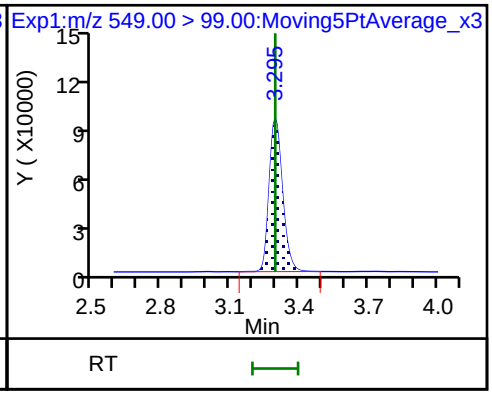
25 1H,1H,2H,2H-perfluorodecanesulfoni



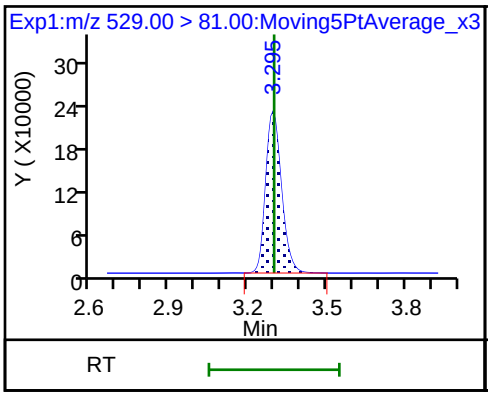
68 Perfluorononanesulfonic acid



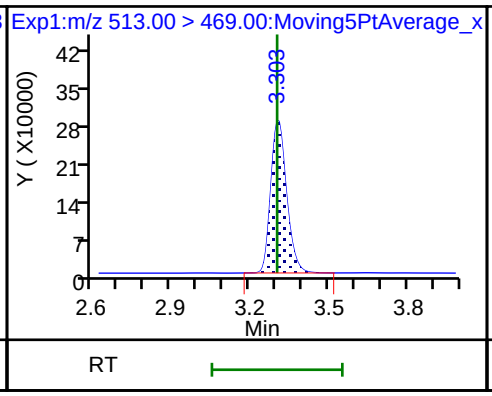
68 Perfluorononanesulfonic acid



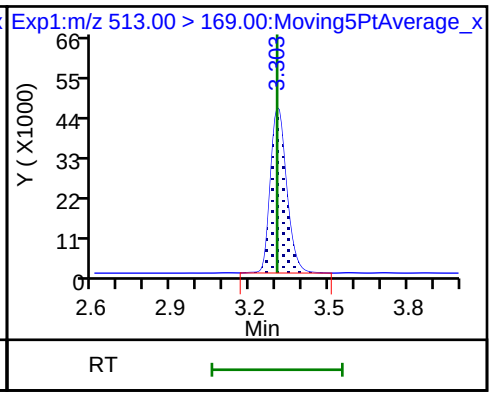
D 26 M2-8:2FTS



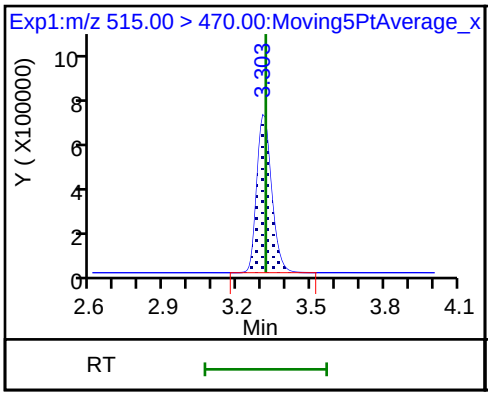
24 Perfluorodecanoic acid



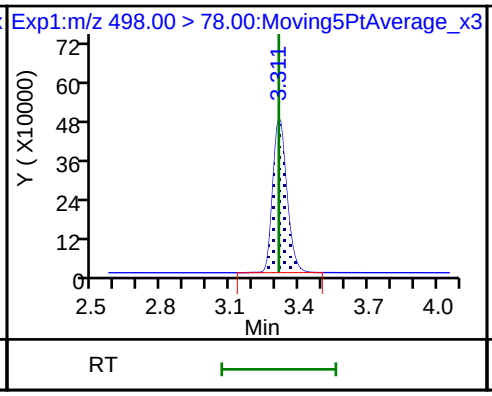
24 Perfluorodecanoic acid



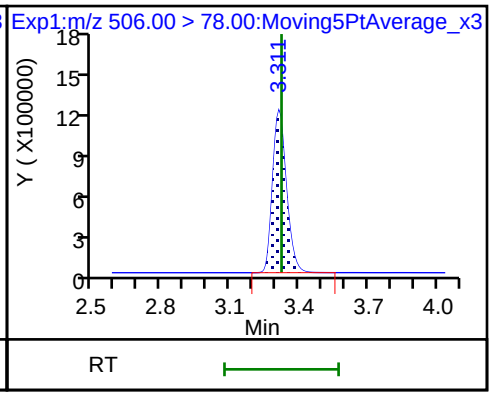
D 23 13C2 PFDA



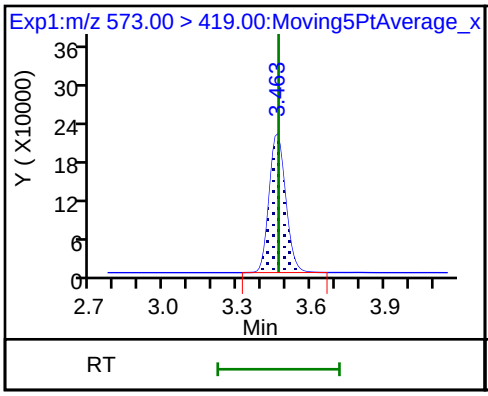
22 Perfluorooctane Sulfonamide



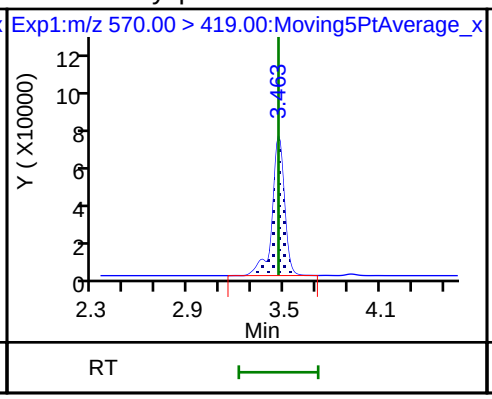
D 21 13C8 FOSA



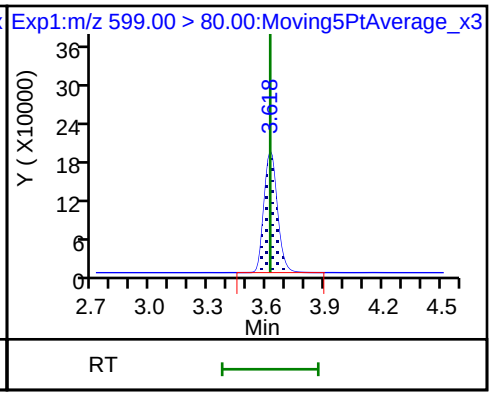
D 27 d3-NMeFOSAA



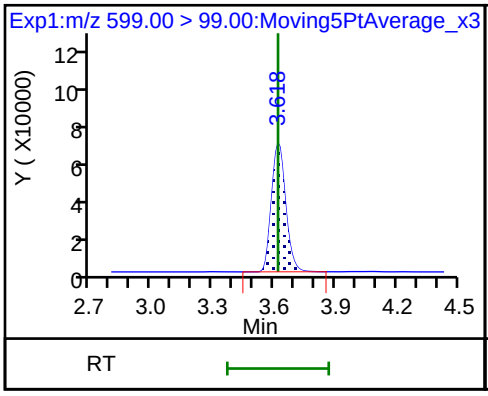
28 N-methyl perfluorooctane sulfonami



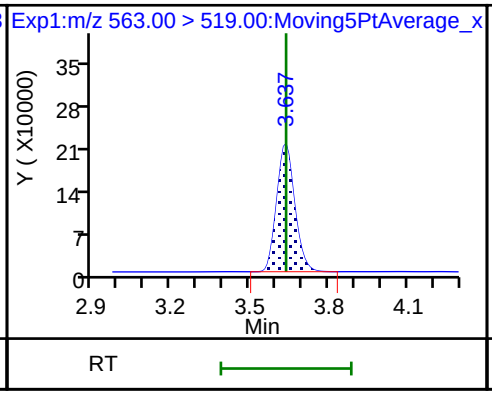
29 Perfluorodecane Sulfonic acid



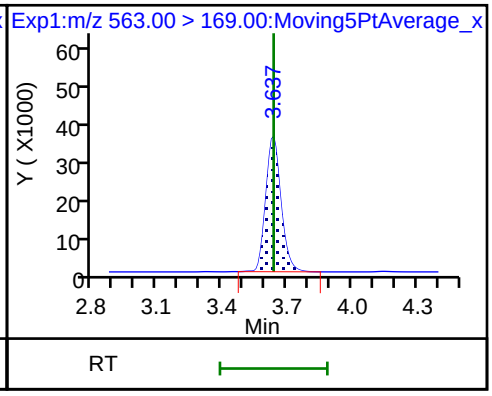
29 Perfluorodecane Sulfonic acid



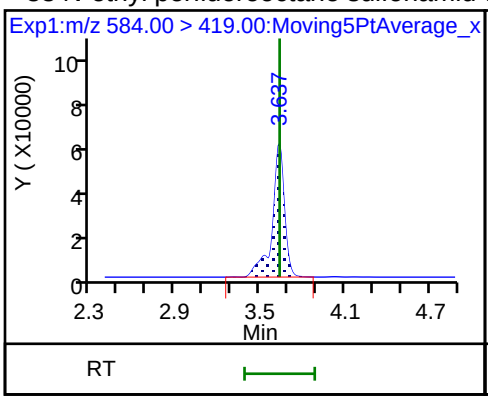
31 Perfluoroundecanoic acid



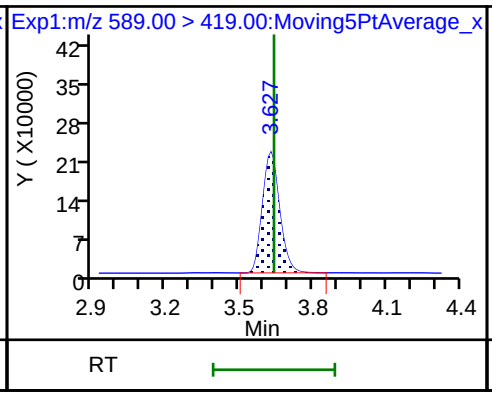
31 Perfluoroundecanoic acid



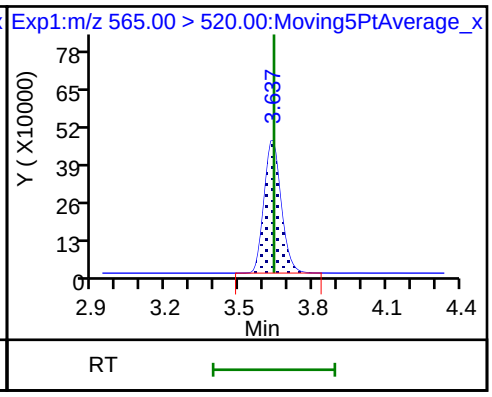
33 N-ethyl perfluorooctane sulfonamid



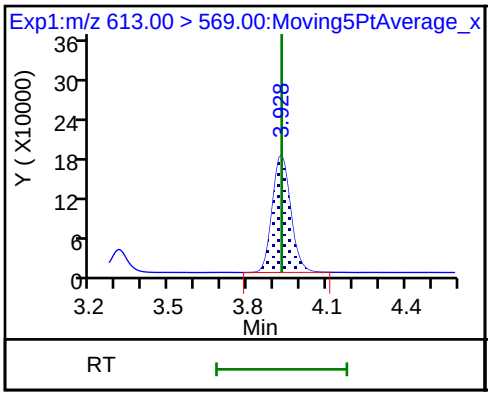
D 32 d5-NEtFOSAA



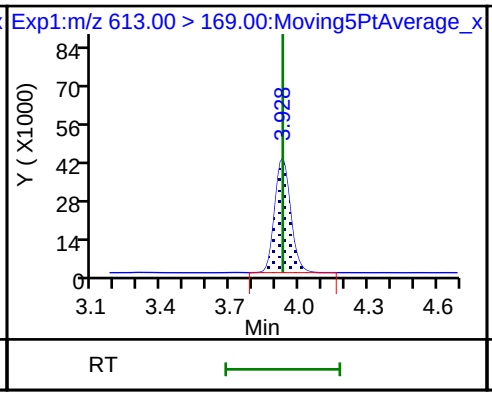
D 30 13C2 PFUnA



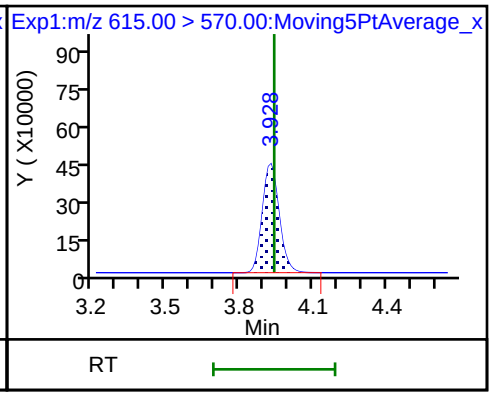
37 Perfluorododecanoic acid



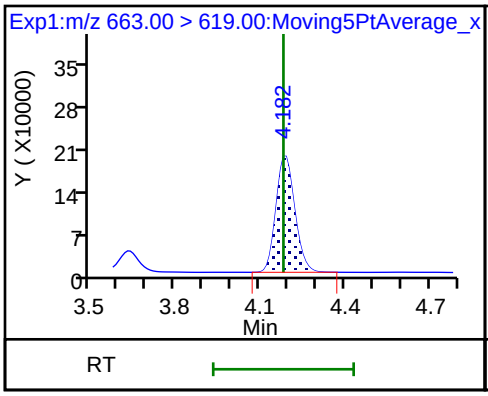
37 Perfluorododecanoic acid



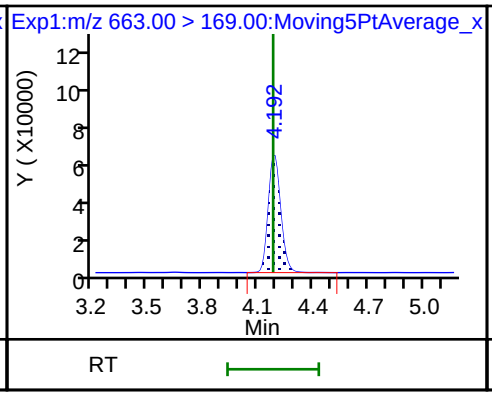
D 36 13C2 PFDoA



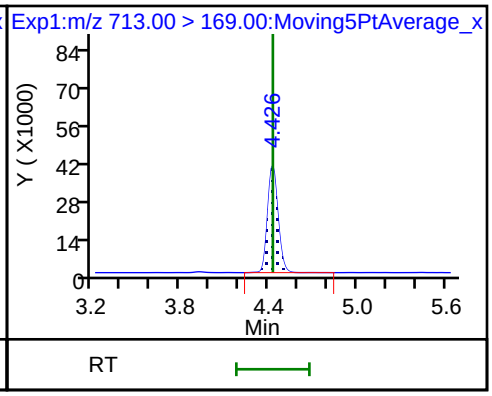
41 Perfluorotridecanoic acid



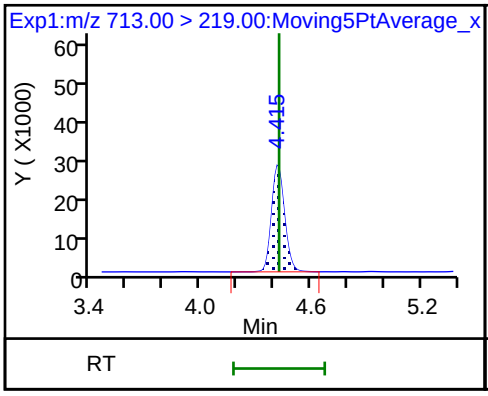
41 Perfluorotridecanoic acid



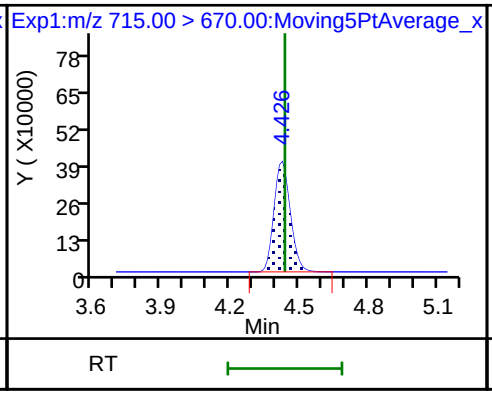
42 Perfluorotetradecanoic acid



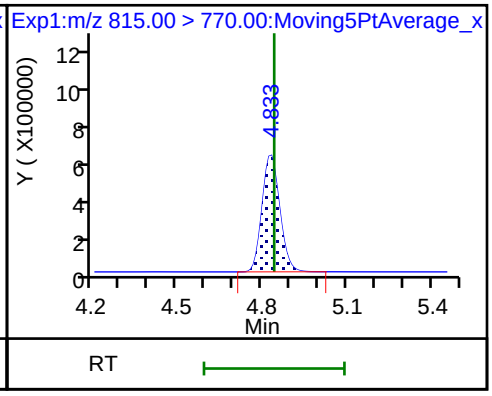
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 320-237402/10 Calibration Date: 08/01/2018 14:01

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.996		2.53	2.50	1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.141		2.38	2.50	-4.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	78.28		2.26	2.21	2.1	30.0
4:2 FTS	AveID	17.21	18.09		2.45	2.34	5.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.073		2.54	2.50	1.7	30.0
Perfluoropentanesulfonic acid	AveID	67.65	71.70		2.49	2.35	6.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.180		2.54	2.50	1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.098		2.16	2.28	-5.0	30.0
6:2 FTS	AveID	1.654	1.634		2.34	2.37	-1.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.173		2.54	2.50	1.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.361		2.34	2.38	-1.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.076		2.49	2.50	-0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.120		2.32	2.32	-0.2	30.0
8:2 FTS	AveID	1.351	1.284		2.28	2.40	-4.9	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7689		2.57	2.40	7.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.063		2.49	2.50	-0.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.010		2.56	2.50	2.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	0.9942		2.44	2.50	-2.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6058		2.24	2.41	-6.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.9063		2.54	2.50	1.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.219		2.47	2.50	-1.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.124		2.59	2.50	3.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9558		2.54	2.50	1.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2709		2.51	2.50	0.6	30.0
13C4 PFBA	Ave	1.440	1.501		2.61	2.50	4.3	30.0
13C5-PFPeA	Ave	0.9481	0.999		2.63	2.50	5.4	30.0
13C3-PFBS	Ave	0.0273	0.0284		2.42	2.33	4.2	30.0
13C2 PFHxA	Ave	1.026	1.058		2.58	2.50	3.2	30.0
13C4-PFHpA	Ave	0.9943	1.027		2.58	2.50	3.3	30.0
18O2 PFHxS	Ave	1.494	1.570		2.49	2.37	5.1	30.0
M2-6:2FTS	Ave	0.2913	0.3055		2.49	2.38	4.9	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 320-237402/10 Calibration Date: 08/01/2018 14:01

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.01LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9713		2.53	2.50	1.2	30.0
13C4 PFOS	Ave	1.032	1.079		2.50	2.39	4.6	30.0
13C5 PFNA	Ave	0.8365	0.8635		2.58	2.50	3.2	30.0
M2-8:2FTS	Ave	0.2839	0.2881		2.43	2.40	1.5	30.0
13C2 PFDA	Ave	0.6256	0.6373		2.55	2.50	1.9	30.0
13C8 FOSA	Ave	1.516	1.575		2.60	2.50	3.9	30.0
d3-NMeFOSAA	Ave	0.1518	0.1582		2.61	2.50	4.2	30.0
13C2 PFUnA	Ave	0.4818	0.4684		2.43	2.50	-2.8	30.0
d5-NEtFOSAA	Ave	0.1627	0.1659		2.55	2.50	2.0	30.0
13C2 PFDoA	Ave	0.4172	0.4308		2.58	2.50	3.3	30.0
13C2-PFTeDA	Ave	0.3502	0.3637		2.60	2.50	3.8	30.0
13C2-PFHxDA	Ave	0.6033	0.6229		2.58	2.50	3.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 01-Aug-2018 14:01:42 ALS Bottle#: 17 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:58:55 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:39:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.003	0.541	5158997	2.61		104	85495	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.396	-0.005	1.000	5138118	2.53			1232	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.636	-0.003	1.000	3919947	2.38			1698	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.636	-0.003	0.635	3434840	2.63		105	55728	
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.669	-0.012	0.644	90781	2.42		104	426	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.671	-0.005	1.005	6754766	2.26			41131	
298.90 > 99.00	1.666	1.671	-0.005	1.005	2808886		2.40(1.25-3.74)		13438	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.872	-0.006	1.126	1649631	2.45			61313	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.872	-0.006	0.725	670160	NC			7799	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.895	1.903	-0.008	1.000	3902411	2.54			7245	
313.00 > 119.00	1.895	1.903	-0.008	1.000	347547		11.23(5.03-15.10)		4820	
D 7 13C2 PFHxA										
315.00 > 270.00	1.895	1.903	-0.008	0.737	3637776	2.58		103	72472	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.928	-0.001	1.163	6564767	2.49			72476	
349.00 > 99.00	1.916	1.928	-0.012	1.157	2371753		2.77(1.36-4.07)		12317	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.000	0.003	0.779	169507	NC			4270	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.991	2.002	-0.011	0.994	634603	NC			2525	
D 9 13C4-PFHpA										
367.00 > 322.00	2.217	2.225	-0.008	0.862	3531170	2.58		103	61136	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.217	2.226	-0.009	1.000	4167871	2.54			1936	
363.00 > 169.00	2.217	2.226	-0.009	1.000	1563964		2.66(1.13-3.40)		15045	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.229	2.237	-0.008	1.000	5395477	2.16			20268	
399.00 > 99.00	2.229	2.237	-0.008	1.000	1851466		2.91(1.50-4.49)		2832	
D 11 18O2 PFHxS										
403.00 > 84.00	2.229	2.238	-0.009	0.866	5106773	2.49		105	57818	
65 ADONA										
377.00 > 251.00	2.267	2.270	-0.003	0.772	9836221	NC			61243	
377.00 > 85.00	2.267	2.270	-0.003	0.772	5856972		1.68(0.84-2.53)		25221	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.546	2.554	-0.008	1.000	1627073	2.34			23474	
D 12 M2-6:2FTS										
429.00 > 81.00	2.546	2.556	-0.010	0.990	997741	2.49		105	14512	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.580	-0.008	1.000	3338986	2.53		101	48960	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.581	-0.009		3437702	2.50			58528	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.581	-0.009	1.000	3920928	2.54			2215	
413.00 > 169.00	2.572	2.581	-0.009	1.000	2042358		1.92(0.84-2.52)		8644	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.580	2.587	-0.007	0.879	4806506	2.34			33495	
449.00 > 99.00	2.580	2.587	-0.007	0.879	1302594		3.69(1.94-5.82)		13848	
D 18 13C4 PFOS										
503.00 > 80.00	2.937	2.946	-0.009	1.142	3546365	2.50		105	38150	
D 19 13C5 PFNA										
468.00 > 423.00	2.937	2.948	-0.011	1.142	2968342	2.58		103	47853	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.937	2.949	-0.012	1.000	3856513	2.32			36179	
499.00 > 99.00	2.937	2.949	-0.012	1.000	885014		4.36(2.31-6.93)		8338	
20 Perfluorononanoic acid										
463.00 > 419.00	2.937	2.949	-0.012	1.000	3194149	2.49			7264	
463.00 > 169.00	2.937	2.949	-0.012	1.000	778384		4.10(1.90-5.69)		21558	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.148	3.158	-0.010	1.072	6018978	NC			38345	
D 26 M2-8:2FTS										
529.00 > 81.00	3.283	3.292	-0.009	1.276	948689	2.43		101	16643	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.283	3.292	-0.009	1.000	1218401	2.28			43042	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.283	3.295	-0.012	1.118	2738195	2.57			47146	
549.00 > 99.00	3.283	3.295	-0.012	1.118	986495		2.78(1.33-3.97)		6451	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.291	3.306	-0.015	1.279	2190677	2.55		102	41149	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.291	3.308	-0.017	1.000	2329283	2.49			3298	
513.00 > 169.00	3.291	3.308	-0.017	1.000	408402		5.70(2.36-7.09)		8194	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.312	-0.005	1.286	5414039	2.60		104	48450	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.307	3.313	-0.006	1.000	5468758	2.56			38250	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.449	3.459	-0.010	1.341	543823	2.61		104	12011	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.458	3.465	-0.007	1.003	540665	2.44			5417	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.611	3.620	-0.009	1.230	2166453	2.24			41917	
599.00 > 99.00	3.611	3.620	-0.009	1.230	731739		2.96(1.39-4.16)		7029	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.621	3.627	-0.006	1.408	570452	2.55		102	5372	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.621	3.633	-0.012	1.000	516993	2.54			14918	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.621	3.634	-0.013	1.000	1962447	2.47			4374	
563.00 > 169.00	3.621	3.634	-0.013	1.000	347507		5.65(2.12-6.36)		10450	
D 30 13C2 PFUnA										
565.00 > 520.00	3.621	3.634	-0.013	1.408	1610245	2.43		97.2	42028	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.785	3.792	-0.007	1.289	9090381	NC			82214	
D 36 13C2 PFDoA										
615.00 > 570.00	3.920	3.925	-0.005	1.524	1481030	2.58		103	18241	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.920	3.927	-0.007	1.000	1664007	2.59			514	
613.00 > 169.00	3.920	3.927	-0.007	1.000	388004		4.29(2.13-6.40)		8144	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.174	4.188	-0.014	1.065	1415575	2.54			433	
663.00 > 169.00	4.174	4.188	-0.014	1.065	436616		3.24(1.25-3.76)		3223	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.416	4.423	-0.007	1.717	1250322	2.60		104	5684	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.416	4.423	-0.007	1.000	338703	2.51			4600	
713.00 > 219.00	4.405	4.423	-0.018	0.998	238055		1.42(0.71-2.13)		3041	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.815	4.826	-0.011	1.872	2141386	2.58		103	3112	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.815	4.827	-0.012	1.000	1974016	NC			123	
813.00 > 169.00	4.815	4.827	-0.012	1.000	324992		6.07(2.86-8.58)		3024	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.150	5.166	-0.016	1.070	1860264	NC			569	
913.00 > 169.00	5.150	5.166	-0.016	1.070	229133		8.12(3.83-11.48)		2098	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00012 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:58:57 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_010.d

Injection Date: 01-Aug-2018 14:01:42 Instrument ID: A8_N

Lims ID: ICV Full

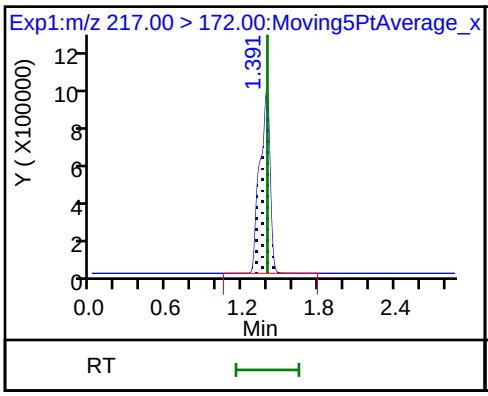
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 17 Worklist Smp#: 10

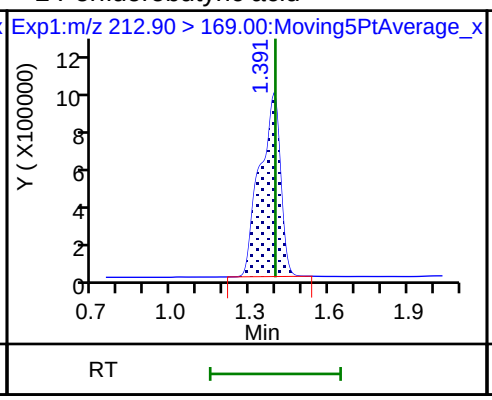
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

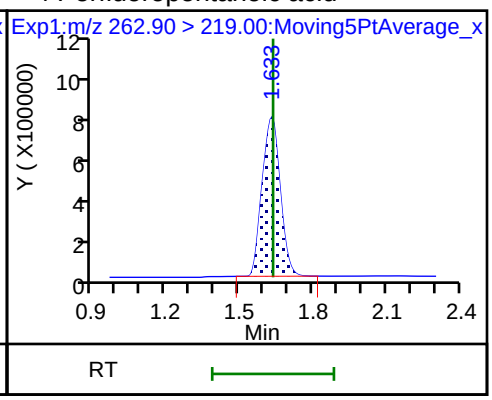
D 1 13C4 PFBA



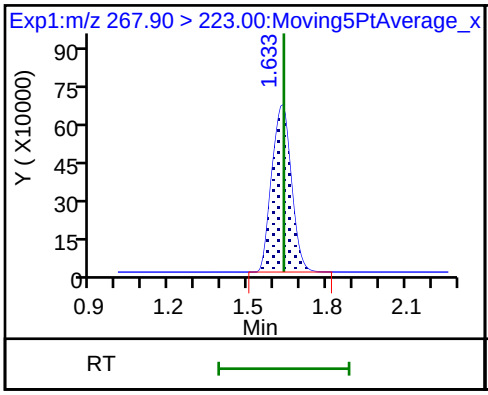
2 Perfluorobutyric acid



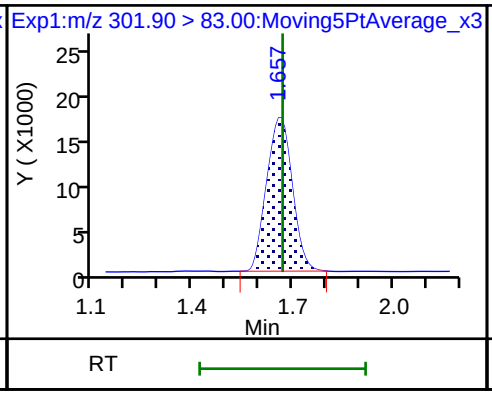
4 Perfluoropentanoic acid



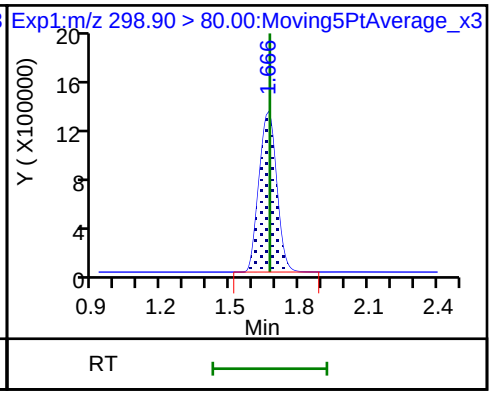
D 3 13C5-PFPeA



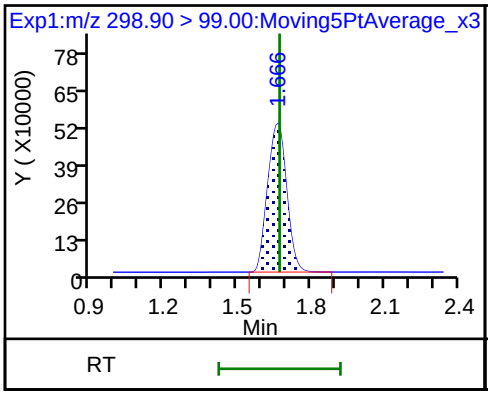
D 47 13C3-PFBS



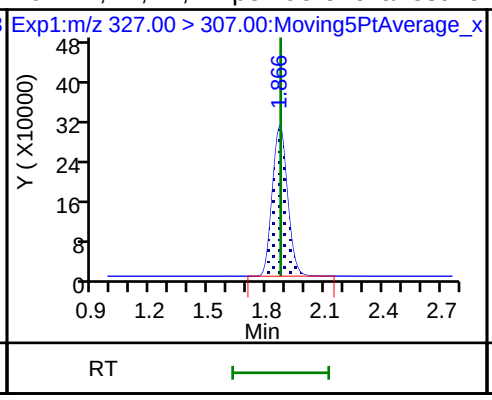
5 Perfluorobutanesulfonic acid



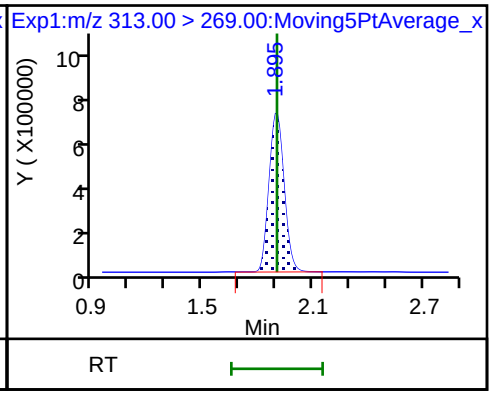
5 Perfluorobutanesulfonic acid



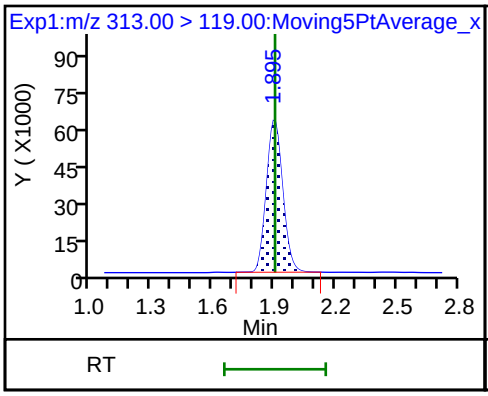
61 1H,1H,2H,2H-perfluorohexanesulfoni



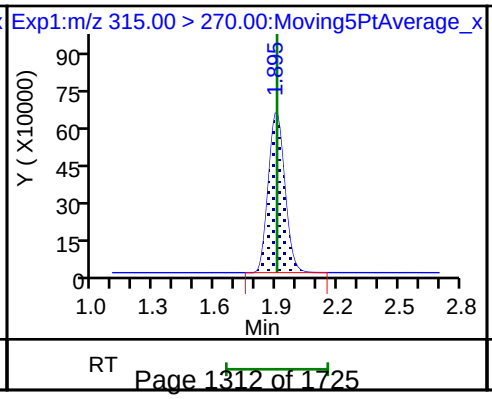
6 Perfluorohexanoic acid



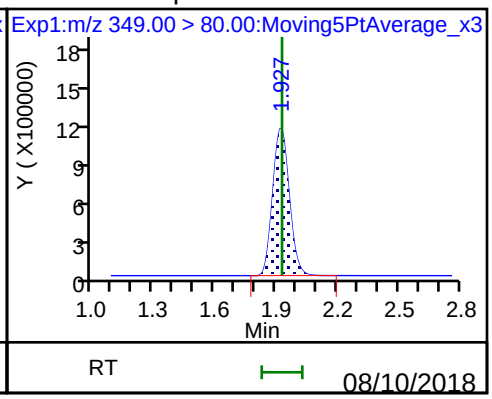
6 Perfluorohexanoic acid



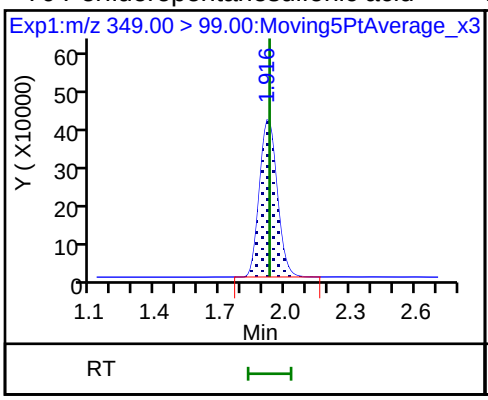
D 7 13C2 PFHxA



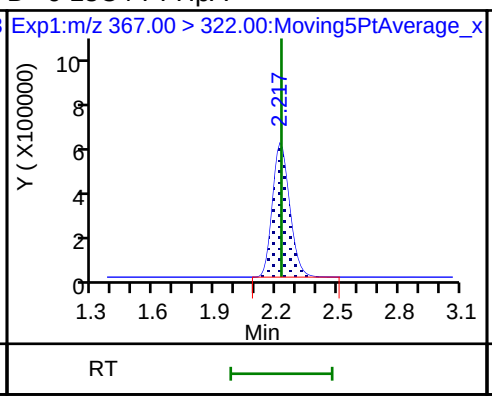
70 Perfluoropentanesulfonic acid



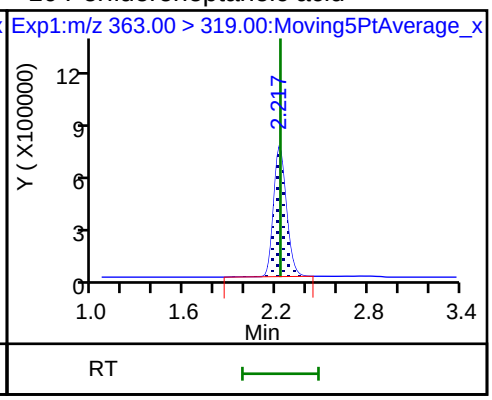
70 Perfluoropentanesulfonic acid



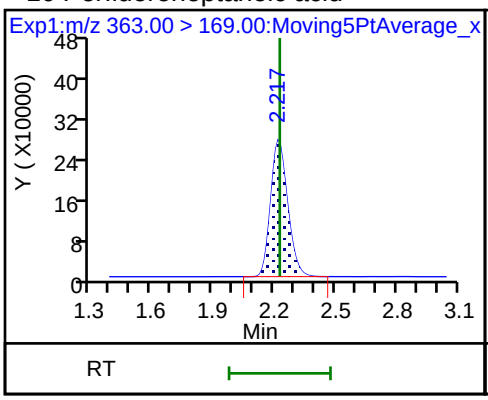
D 9 13C4-PFHpA



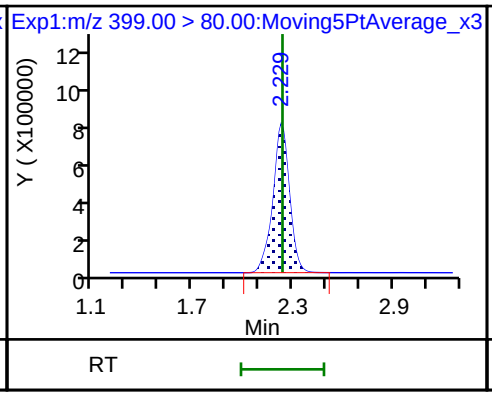
10 Perfluoroheptanoic acid



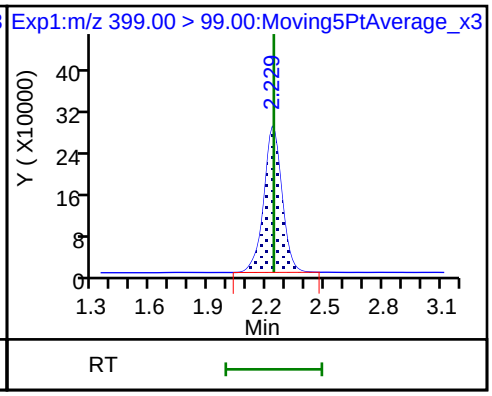
10 Perfluoroheptanoic acid



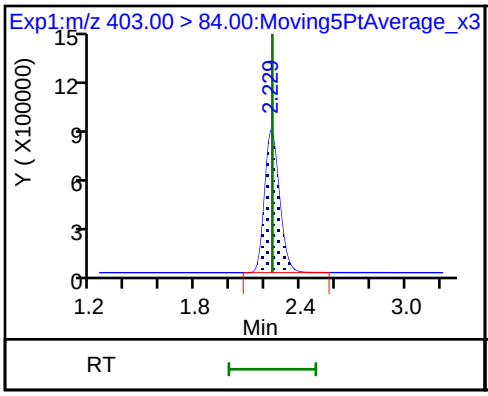
8 Perfluorohexanesulfonic acid



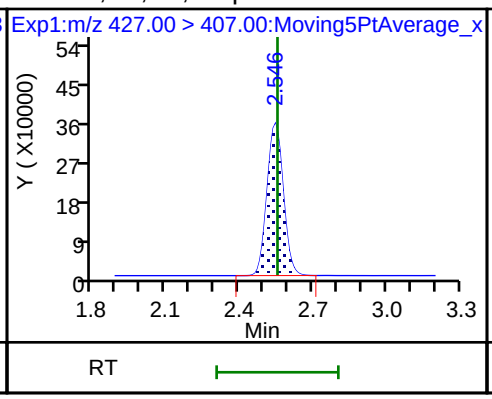
8 Perfluorohexanesulfonic acid



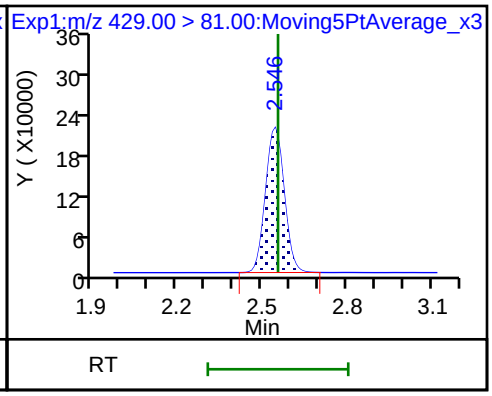
D 11 18O2 PFHxS



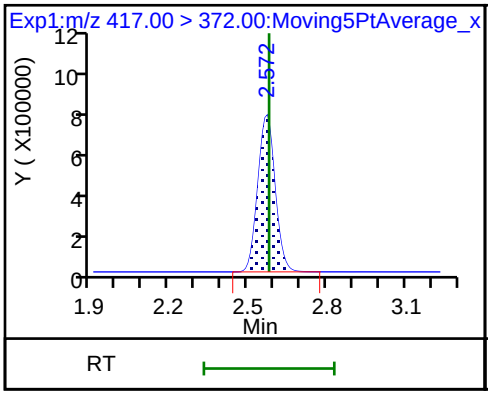
13 1H,1H,2H,2H-perfluorooctanesulfon



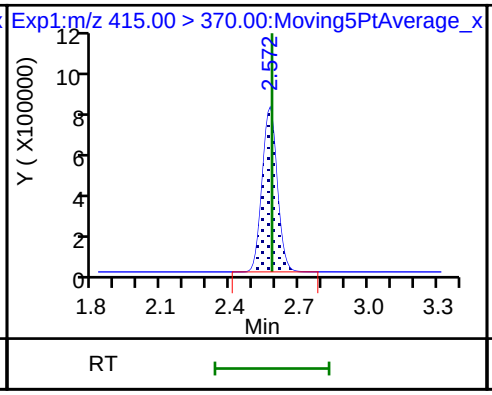
D 12 M2-6:2FTS



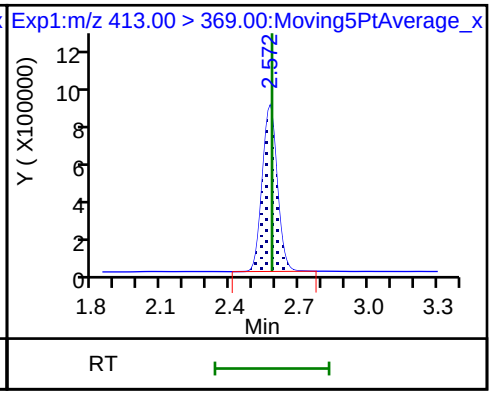
D 14 13C4 PFOA



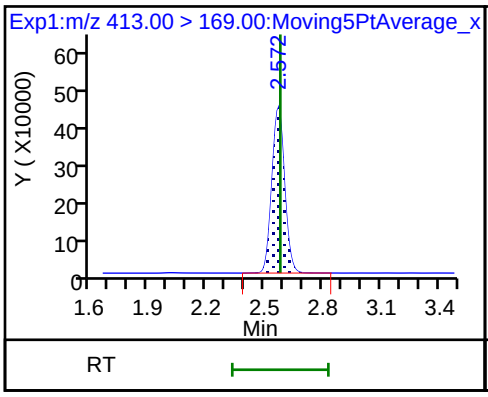
* 62 13C2-PFOA



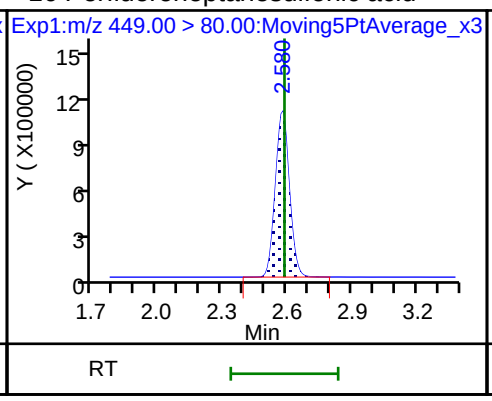
15 Perfluorooctanoic acid



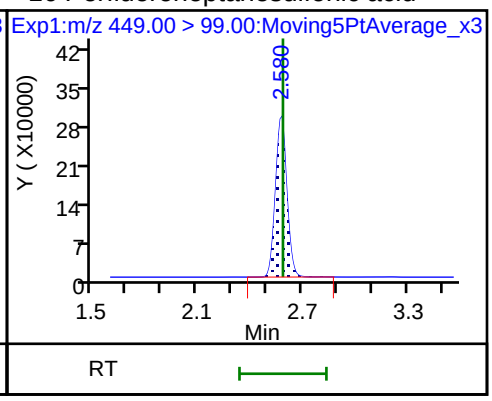
15 Perfluorooctanoic acid



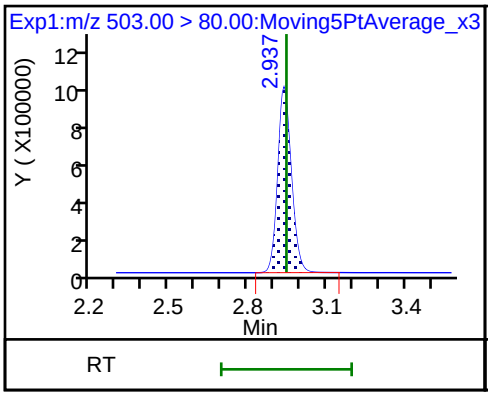
16 Perfluoroheptanesulfonic acid



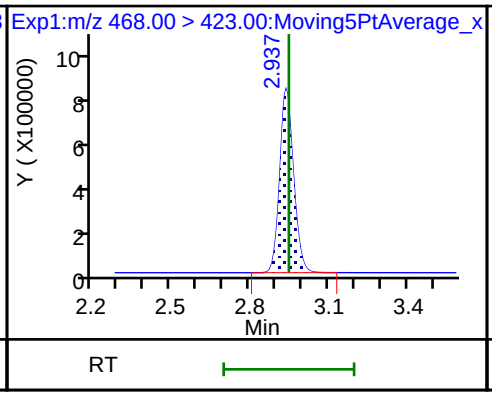
16 Perfluoroheptanesulfonic acid



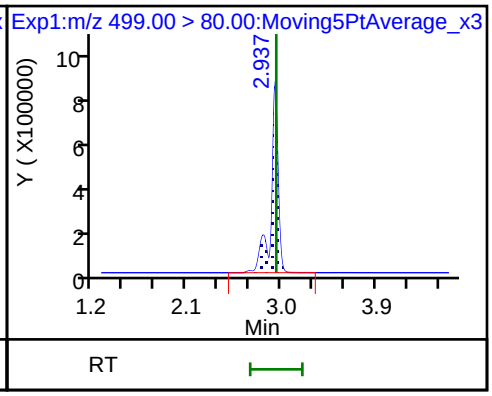
D 18 13C4 PFOS



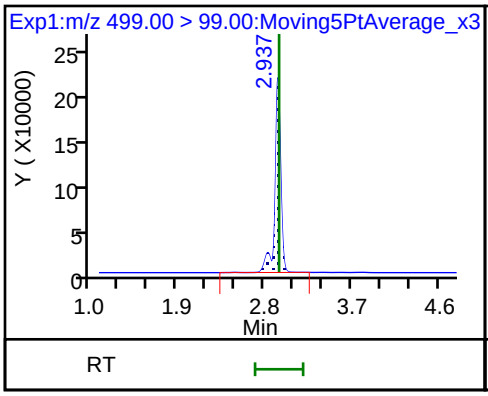
D 19 13C5 PFNA



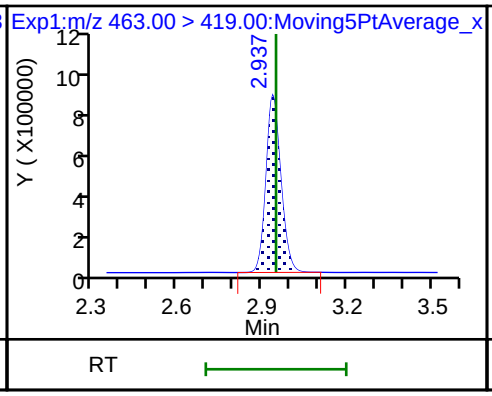
17 Perfluorooctane sulfonic acid



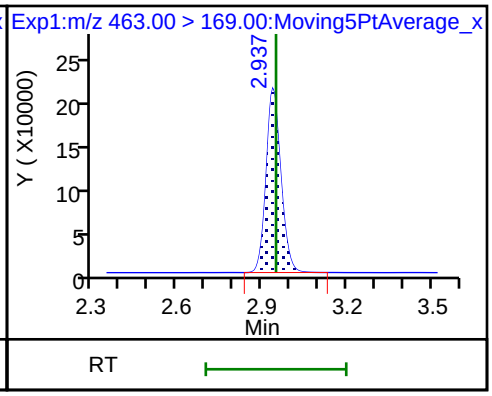
17 Perfluorooctane sulfonic acid



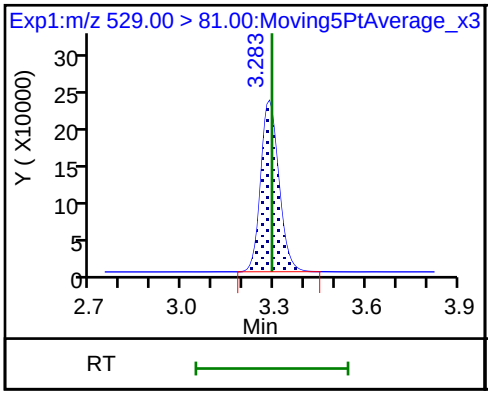
20 Perfluorononanoic acid



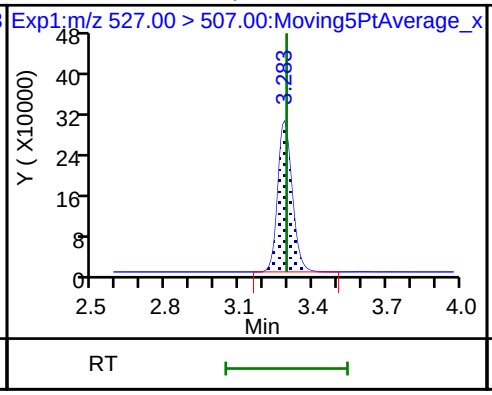
20 Perfluorononanoic acid



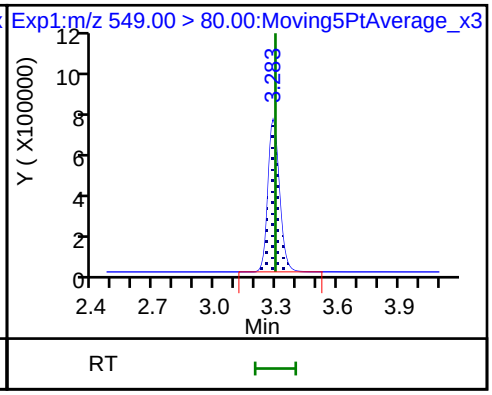
D 26 M2-8:2FTS



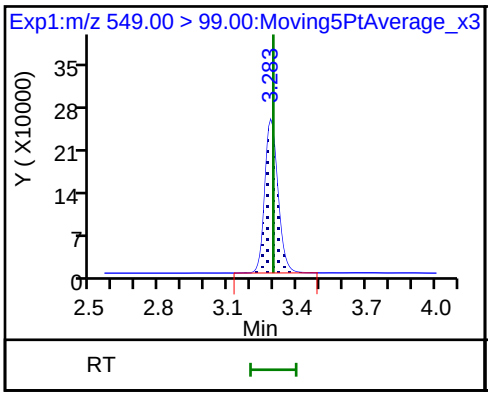
25 1H,1H,2H,2H-perfluorodecanesulfoni



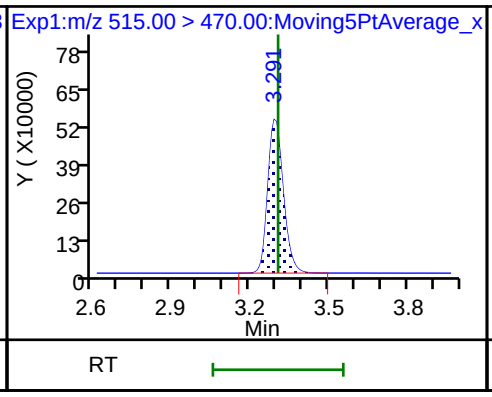
68 Perfluorononanesulfonic acid



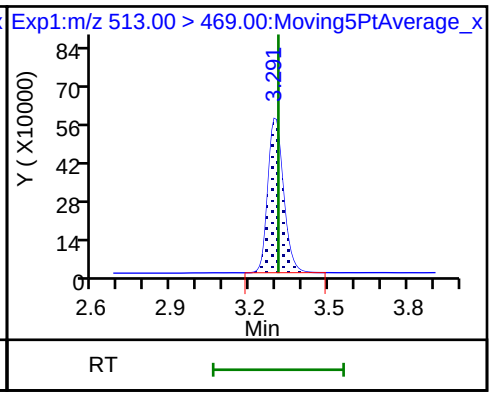
68 Perfluorononanesulfonic acid



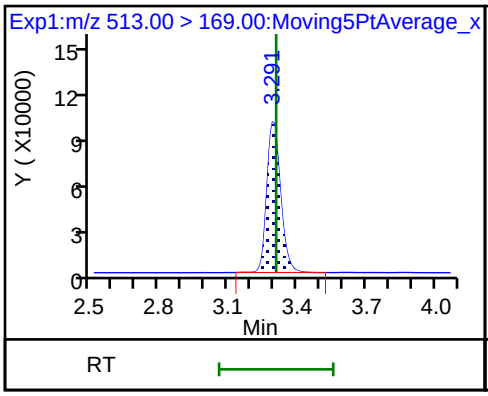
D 23 13C2 PFDA



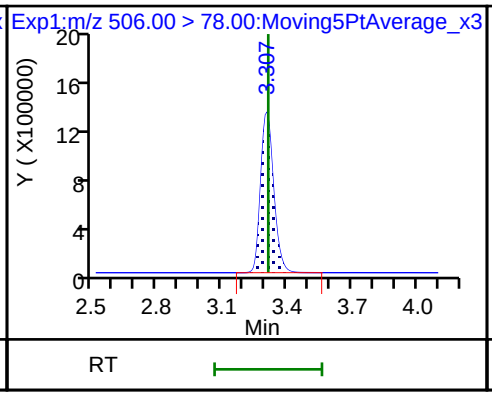
24 Perfluorodecanoic acid



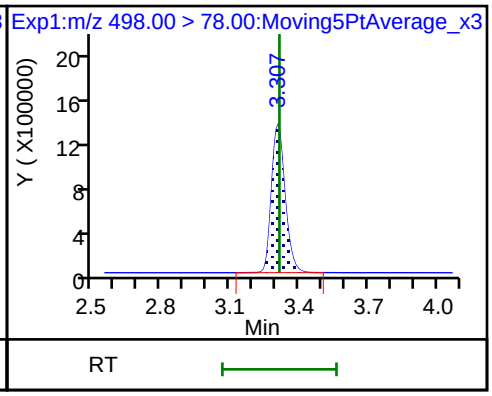
24 Perfluorodecanoic acid



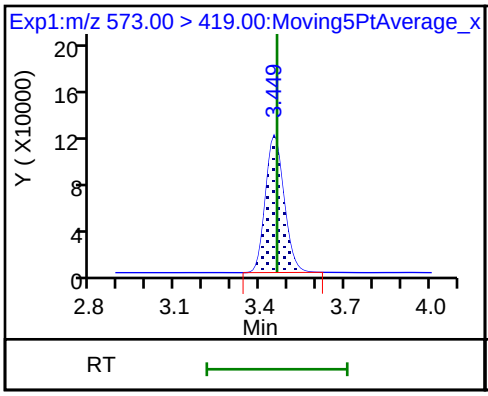
D 21 13C8 FOSA



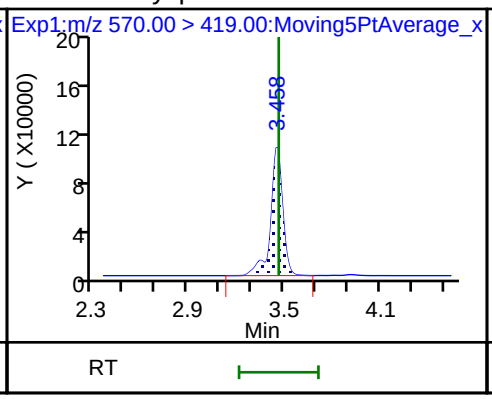
22 Perfluorooctane Sulfonamide



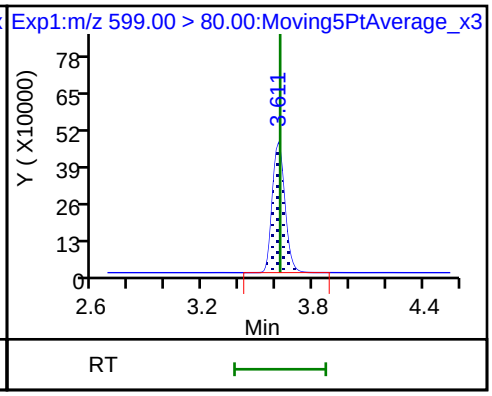
D 27 d3-NMeFOSAA



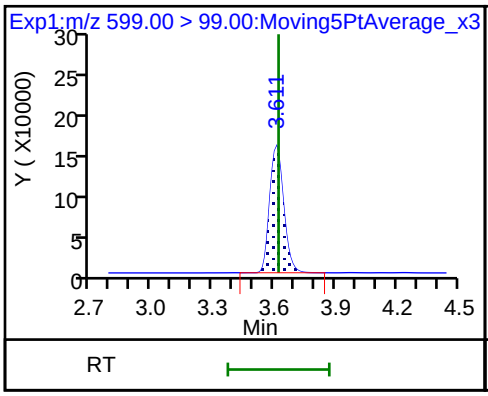
28 N-methyl perfluorooctane sulfonami



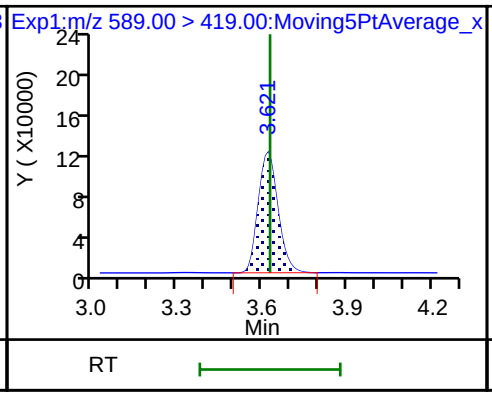
29 Perfluorodecane Sulfonic acid



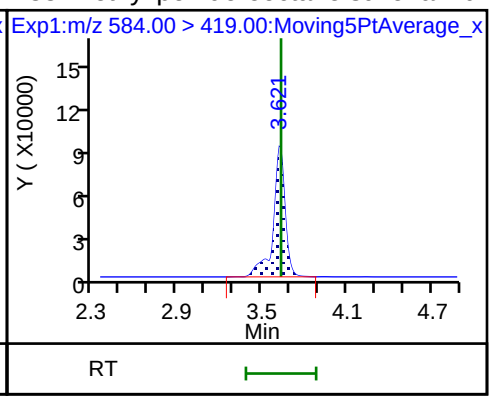
29 Perfluorodecane Sulfonic acid



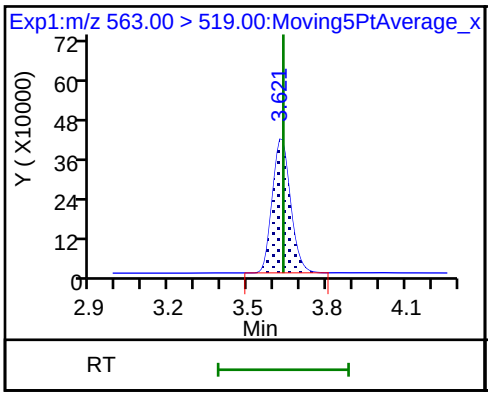
D 32 d5-NEtFOSAA



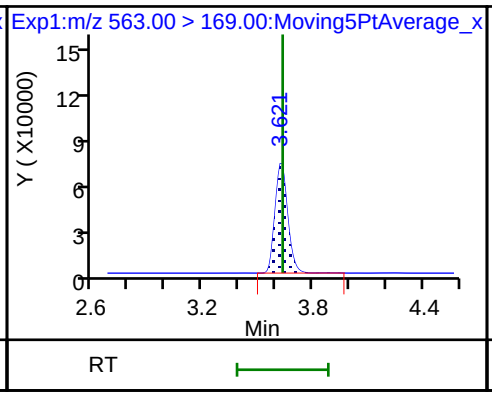
33 N-ethyl perfluorooctane sulfonamid



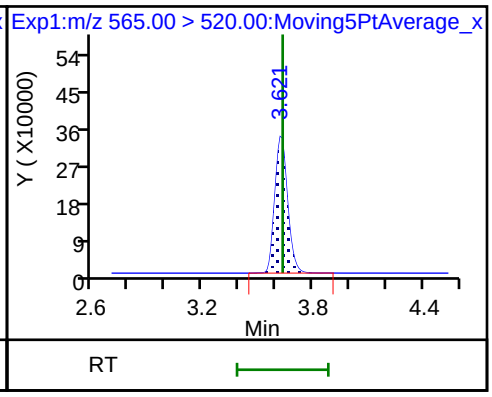
31 Perfluoroundecanoic acid



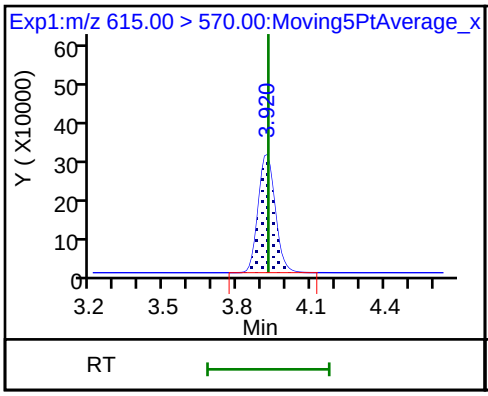
31 Perfluoroundecanoic acid



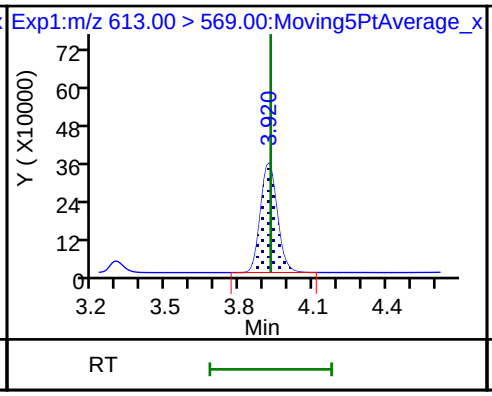
D 30 13C2 PFUnA



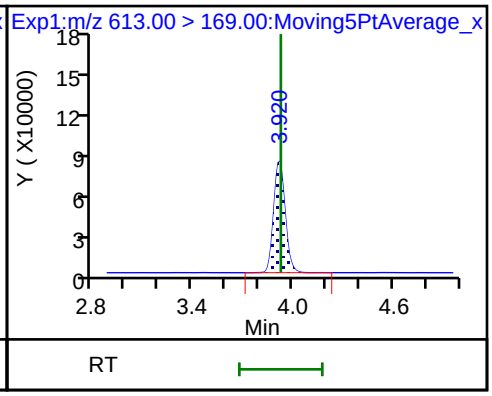
D 36 13C2 PFDoA



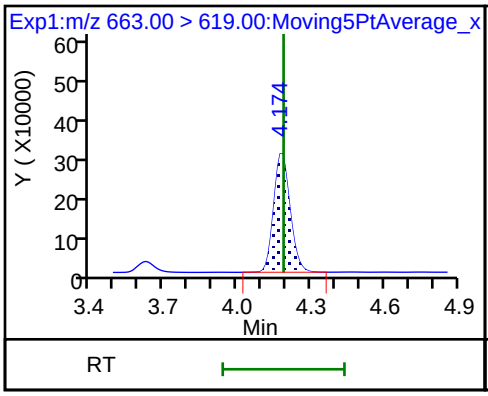
37 Perfluorododecanoic acid



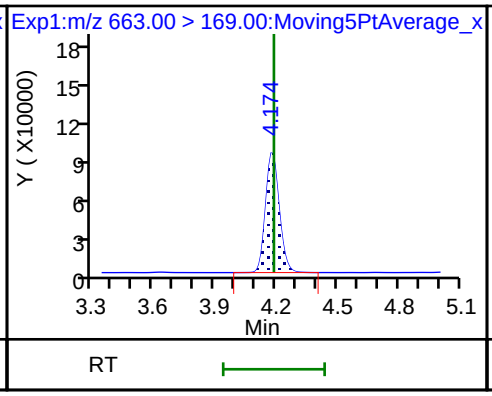
37 Perfluorododecanoic acid



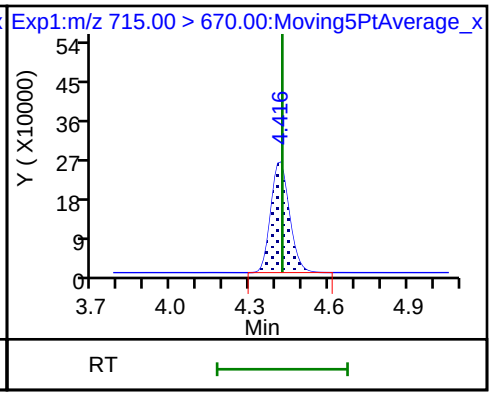
41 Perfluorotridecanoic acid



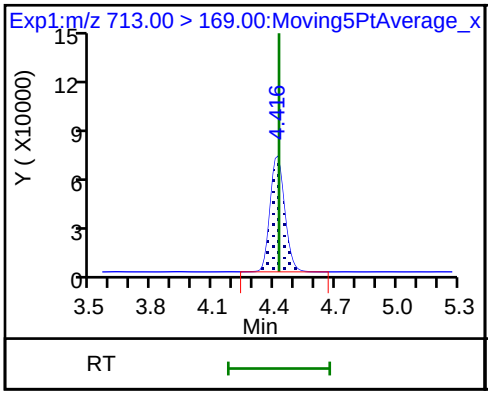
41 Perfluorotridecanoic acid



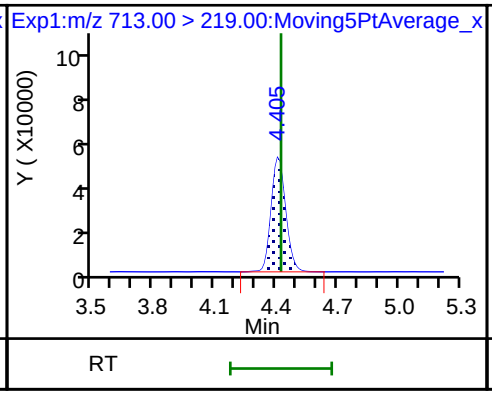
D 43 13C2-PFTeDA



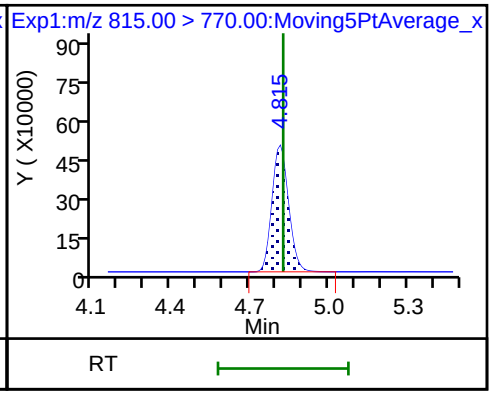
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-237767/2 Calibration Date: 08/03/2018 05:22

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	1.006		0.0510	0.0500	2.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.252		0.0523	0.0500	4.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	79.96		0.0461	0.0442	4.3	30.0
4:2 FTS	AveID	17.21	19.70		0.400	0.0467	14.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.127		0.0534	0.0500	6.9	30.0
Perfluoropentanesulfonic acid	AveID	67.65	70.45		0.0488	0.0469	4.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.214		0.0523	0.0500	4.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.187		0.0467	0.0455	2.7	30.0
6:2 FTS	AveID	1.654	1.845		0.0529	0.0474	11.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.180		0.0511	0.0501	2.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.379		0.0475	0.0476	-0.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.068		0.0494	0.0500	-1.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.162		0.0480	0.0464	3.5	30.0
8:2 FTS	AveID	1.351	1.444		0.0512	0.0479	6.9	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.8516		0.0569	0.0480	18.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.030		0.0483	0.0500	-3.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	0.9006		0.0456	0.0500	-8.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.014		0.400	0.0500	-0.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6811		0.0505	0.0482	4.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	1.049		0.0588	0.0500	17.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.080		0.0438	0.0500	-12.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.255		0.0579	0.0500	15.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.8485		0.0450	0.0500	-10.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2766		0.0513	0.0500	2.7	30.0
13C4 PFBA	Ave	1.440	1.310		2.28	2.50	-9.0	30.0
13C5-PFPeA	Ave	0.9481	0.8966		2.36	2.50	-5.4	30.0
13C3-PFBS	Ave	0.0273	0.0253		2.15	2.33	-7.3	30.0
13C2 PFHxA	Ave	1.026	0.9858		2.40	2.50	-3.9	30.0
13C4-PFHpA	Ave	0.9943	0.9500		2.39	2.50	-4.5	30.0
18O2 PFHxS	Ave	1.494	1.366		2.16	2.37	-8.6	30.0
M2-6:2FTS	Ave	0.2913	0.2892		2.36	2.38	-0.7	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-237767/2 Calibration Date: 08/03/2018 05:22

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9453		2.46	2.50	-1.5	30.0
13C4 PFOS	Ave	1.032	0.8970		2.08	2.39	-13.1	30.0
13C5 PFNA	Ave	0.8365	0.7937		2.37	2.50	-5.1	30.0
M2-8:2FTS	Ave	0.2839	0.2825		2.38	2.40	-0.5	30.0
13C2 PFDA	Ave	0.6256	0.6321		2.53	2.50	1.0	30.0
13C8 FOSA	Ave	1.516	1.412		2.33	2.50	-6.9	30.0
d3-NMeFOSAA	Ave	0.1518	0.1568		2.58	2.50	3.3	30.0
d5-NEtFOSAA	Ave	0.1627	0.1653		2.54	2.50	1.6	30.0
13C2 PFUnA	Ave	0.4818	0.4836		2.51	2.50	0.4	30.0
13C2 PFDoA	Ave	0.4172	0.3936		2.36	2.50	-5.7	30.0
13C2-PFTeDA	Ave	0.3502	0.3267		2.33	2.50	-6.7	30.0
13C2-PFHxDA	Ave	0.6033	0.4594		1.90	2.50	-23.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\2018.08.03LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 03-Aug-2018 05:22:03 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 09:24:03 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: westendorfc Date: 03-Aug-2018 09:21:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.409	1.403	0.006	0.541	5134219	2.28		91.0	121457	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.411	0.003	1.004	103256	0.0510		102	54.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.650	0.008	0.637	3513678	2.36		94.6	59668	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.658	1.653	0.005	1.000	87997	0.0523		105	36.9	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.685	0.009	0.651	92071	2.15		92.7	407	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.690	0.004	1.000	139963	0.0461		104	387	
298.90 > 99.00	1.694	1.690	0.004	1.000	56782		2.46(1.25-3.74)		287	
D 60 M2-4:2FTS										
329.00 > 81.00	1.897	1.887	0.010	0.728	665478	NC			10158	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.897	1.892	0.005	1.119	36432	0.0535		114	2191	
D 7 13C2 PFHxA										
315.00 > 270.00	1.929	1.917	0.012	0.741	3863379	2.40		96.1	96490	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.929	1.935	-0.005	1.000	87076	0.0534		107	292	
313.00 > 119.00	1.929	1.935	-0.005	1.000	9044		9.63(5.03-15.10)		130	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.950	1.956	-0.006	1.151	130837	0.0488		104	2474	
349.00 > 99.00	1.950	1.956	-0.006	1.151	49246		2.66(1.36-4.07)		564	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.028	2.016	0.012	0.779	213478	NC			7368	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.039	2.033	0.006	1.006	18109	NC			135	
D 9 13C4-PFHpA										
367.00 > 322.00	2.256	2.242	0.014	0.866	3723096	2.39		95.5	56493	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.256	2.251	0.005	1.000	90366	0.0523		105	47.3	
363.00 > 169.00	2.256	2.251	0.005	1.000	38318		2.36(1.13-3.40)		541	
D 11 18O2 PFHxS										
403.00 > 84.00	2.269	2.256	0.013	0.871	5063107	2.16		91.4	38397	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.269	2.264	0.005	1.000	115655	0.0467		103	529	
399.00 > 99.00	2.269	2.264	0.005	1.000	32553		3.55(1.50-4.49)		79.5	
65 ADONA										
377.00 > 251.00	2.295	2.303	-0.008	0.773	219829	NC			2822	
377.00 > 85.00	2.295	2.303	-0.008	0.773	124318		1.77(0.84-2.53)		452	
D 12 M2-6:2FTS										
429.00 > 81.00	2.581	2.566	0.015	0.991	1076555	2.36		99.3	22055	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.581	2.579	0.002	1.000	39631	0.0529		112	1462	
D 14 13C4 PFOA										
417.00 > 372.00	2.604	2.597	0.007	1.000	3704650	2.46		98.5	42071	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.604	2.602	0.002	1.000	87490	0.0511		102	60.1	
413.00 > 169.00	2.604	2.602	0.002	1.000	48532		1.80(0.84-2.52)		456	
* 62 13C2-PFOA										
415.00 > 370.00	2.604	2.602	0.002		3919106	2.50			59904	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.612	2.610	0.002	0.880	92334	0.0475		99.8	2062	
449.00 > 99.00	2.612	2.610	0.002	0.880	22489		4.11(1.94-5.82)		573	
D 19 13C5 PFNA										
468.00 > 423.00	2.968	2.955	0.013	1.140	3110481	2.37		94.9	54085	
D 18 13C4 PFOS										
503.00 > 80.00	2.968	2.955	0.013	1.140	3360836	2.08		86.9	42006	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.968	2.964	0.004	1.000	75834	0.0480		104	997	
499.00 > 99.00	2.968	2.964	0.004	1.000	17761		4.27(2.31-6.93)		197	
20 Perfluorononanoic acid										
463.00 > 419.00	2.968	2.971	-0.003	1.000	66425	0.0494		98.9	262	
463.00 > 169.00	2.968	2.971	-0.003	1.000	16941		3.92(1.90-5.69)		787	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.180	3.177	0.003	1.072	116479	NC			2311	
D 26 M2-8:2FTS										
529.00 > 81.00	3.316	3.300	0.016	1.273	1060810	2.38		99.5	25264	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.316	3.311	0.005	1.000	30640	0.0512		107	1459	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.316	3.311	0.005	1.117	57481	0.0569		118	1993	
549.00 > 99.00	3.316	3.311	0.005	1.117	23099		2.49(1.33-3.97)		155	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.324	3.316	0.008	1.276	2477352	2.53		101	52975	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.332	3.327	0.005	1.002	51046	0.0483		96.5	94.6	R
513.00 > 169.00	3.324	3.327	-0.003	1.000	6528		7.82(2.36-7.09)		193	
D 21 13C8 FOSA										
506.00 > 78.00	3.349	3.331	0.018	1.286	5534514	2.33		93.1	47076	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.349	3.343	0.006	1.000	99683	0.0456		91.2	2568	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.479	3.469	0.010	1.336	614538	2.58		103	27075	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.488	3.483	0.005	1.003	12461	0.0499		99.7	196	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.644	3.634	0.010	1.399	647891	2.54		102	6118	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.644	3.638	0.006	1.228	46165	0.0505		105	2376	
599.00 > 99.00	3.644	3.638	0.006	1.228	14227		3.24(1.39-4.16)		166	
D 30 13C2 PFUnA										
565.00 > 520.00	3.653	3.644	0.009	1.403	1895407	2.51		100	44397	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.653	3.647	0.006	1.003	13589	0.0588		118	486	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.653	3.647	0.006	1.000	40935	0.0438		87.6	99.6	
563.00 > 169.00	3.653	3.647	0.006	1.000	8347		4.90(2.12-6.36)		434	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.810	3.803	0.007	1.284	176876	NC			6083	
D 36 13C2 PFDoA										
615.00 > 570.00	3.946	3.935	0.011	1.515	1542384	2.36		94.3	18861	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.935	3.943	-0.008	0.997	38701	0.0579		116	11.0	
613.00 > 169.00	3.946	3.943	0.003	1.000	8819		4.39(2.13-6.40)		215	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.199	4.197	0.002	1.064	26175	0.0450		90.0	6.7	
663.00 > 169.00	4.199	4.197	0.002	1.064	11464		2.28(1.25-3.76)		123	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.424	0.001	1.699	1280356	2.33		93.3	5737	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.425	4.433	-0.008	1.000	7084	0.0513		103	120	
713.00 > 219.00	4.425	4.433	-0.008	1.000	5926		1.20(0.71-2.13)		114	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.822	4.817	0.005	1.852	1800471	1.90		76.2	2469	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.822	4.829	-0.007	1.000	62183	NC			2.7	
813.00 > 169.00	4.822	4.829	-0.007	1.000	10447		5.95(2.86-8.58)		136	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.157	5.163	-0.005	1.069	47904	NC			17.3	
913.00 > 169.00	5.157	5.163	-0.005	1.069	5573		8.60(3.83-11.48)		71.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 09:24:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\2018.08.03LLA_005.d

Injection Date: 03-Aug-2018 05:22:03 Instrument ID: A8_N

Lims ID: CCVL

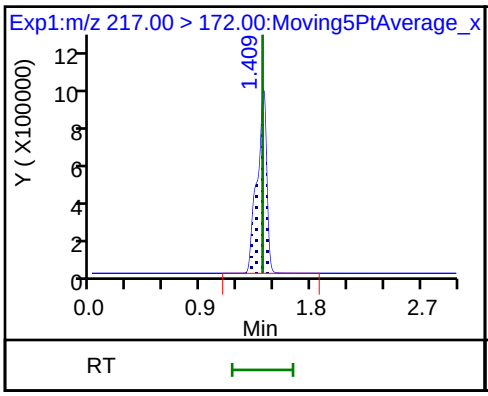
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2

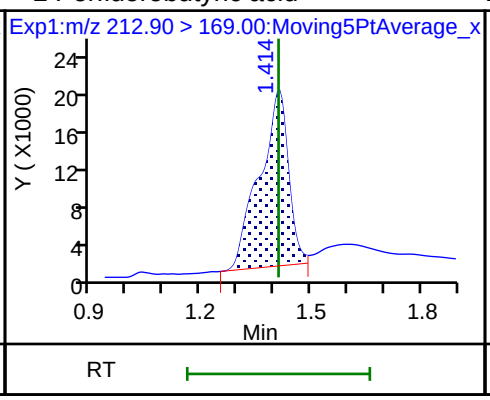
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

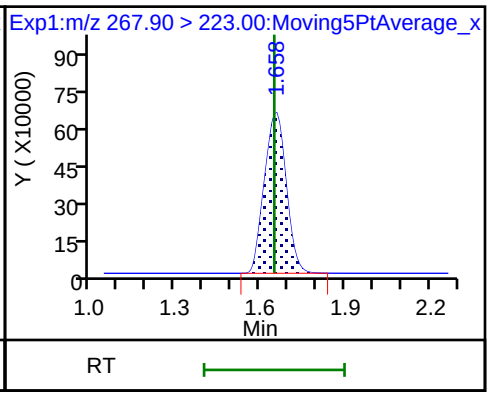
D 1 13C4 PFBA



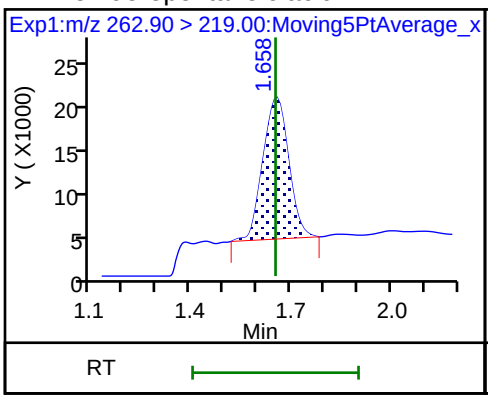
2 Perfluorobutyric acid



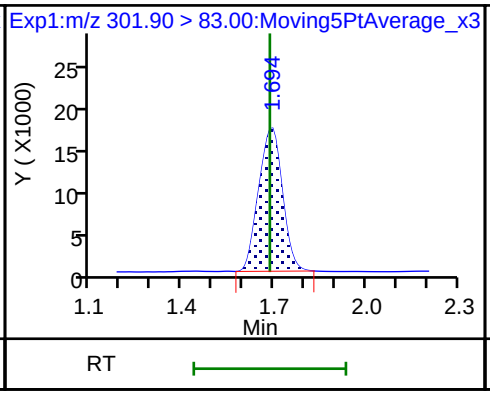
D 3 13C5-PFPeA



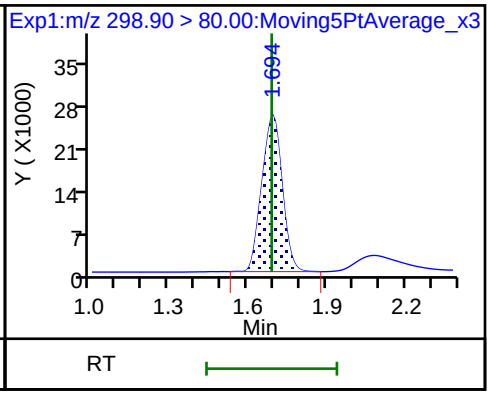
4 Perfluoropentanoic acid



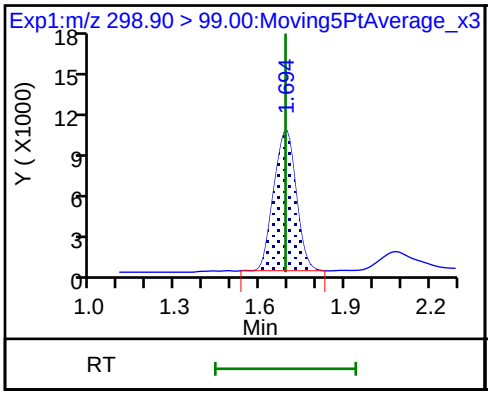
D 47 13C3-PFBS



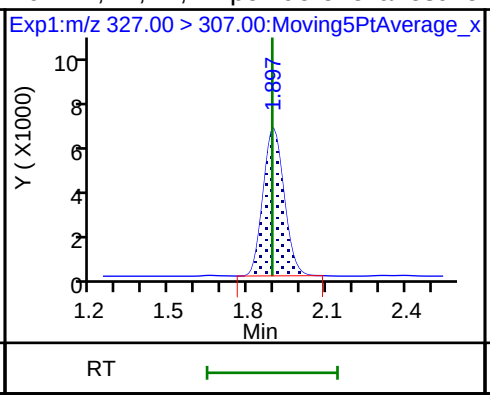
5 Perfluorobutanesulfonic acid



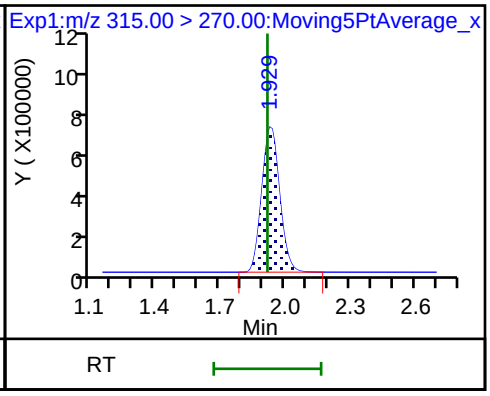
5 Perfluorobutanesulfonic acid



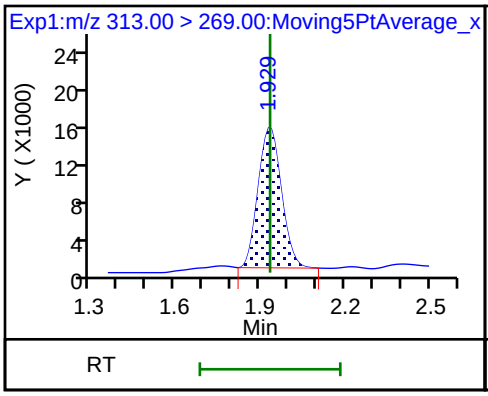
61 1H,1H,2H,2H-perfluorohexanesulfon



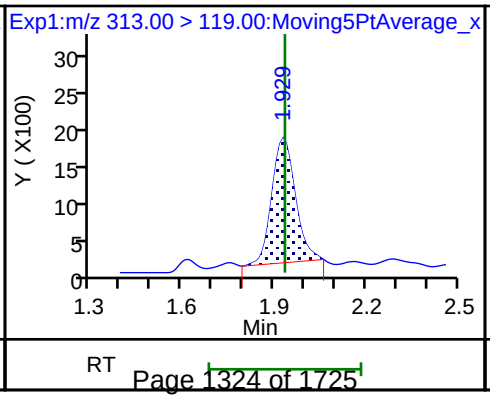
D 7 13C2 PFHxA



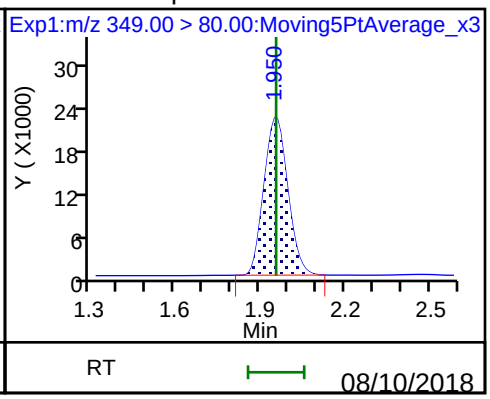
6 Perfluorohexanoic acid



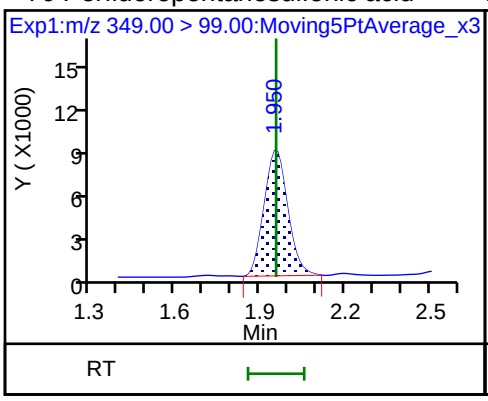
6 Perfluorohexanoic acid



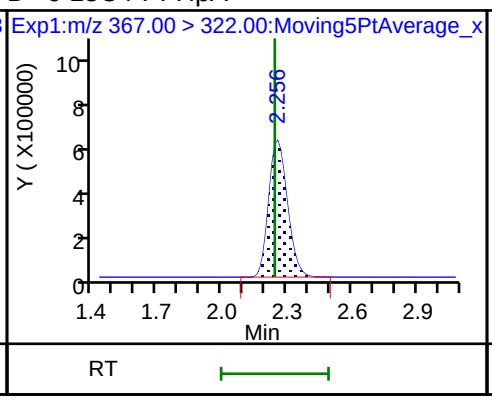
70 Perfluoropentanesulfonic acid



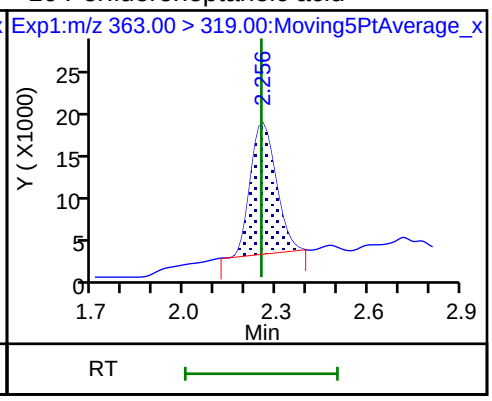
70 Perfluoropentanesulfonic acid



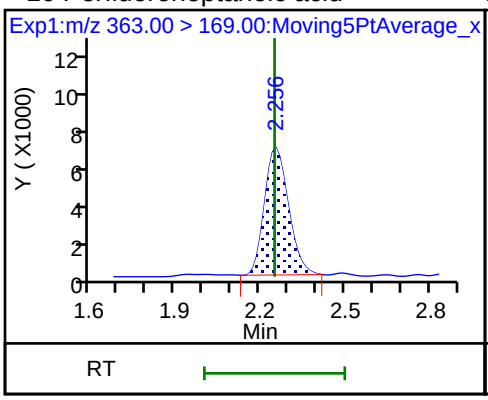
D 9 13C4-PFHpA



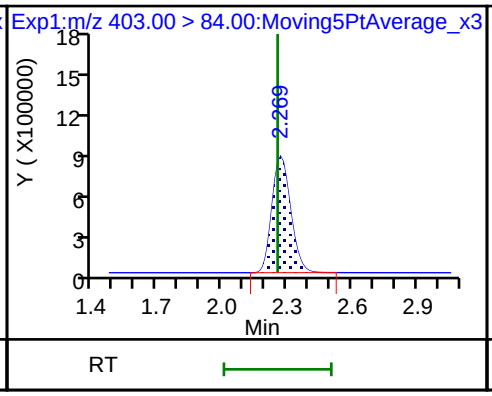
10 Perfluoroheptanoic acid



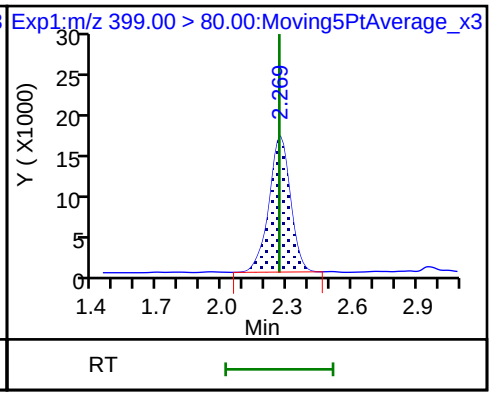
10 Perfluoroheptanoic acid



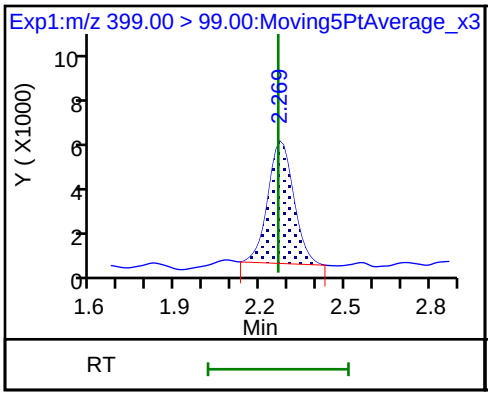
D 11 18O2 PFHxS



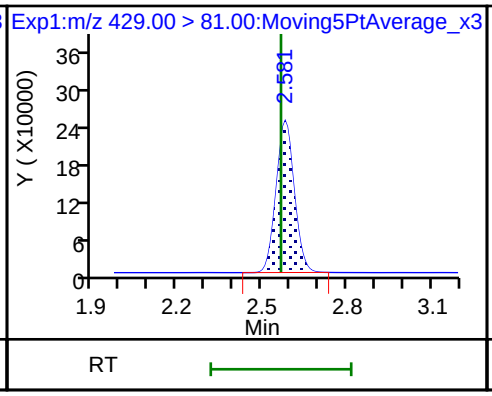
8 Perfluorohexanesulfonic acid



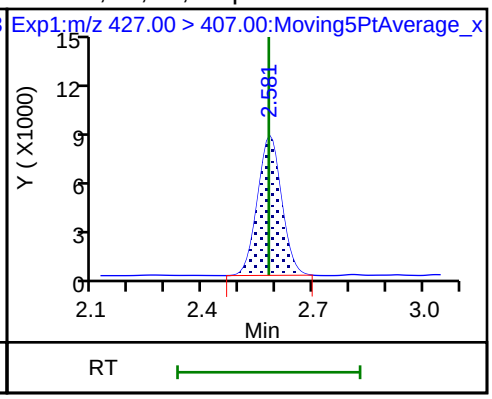
8 Perfluorohexanesulfonic acid



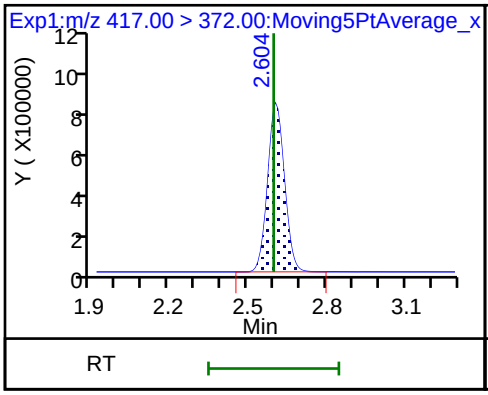
D 12 M2-6:2FTS



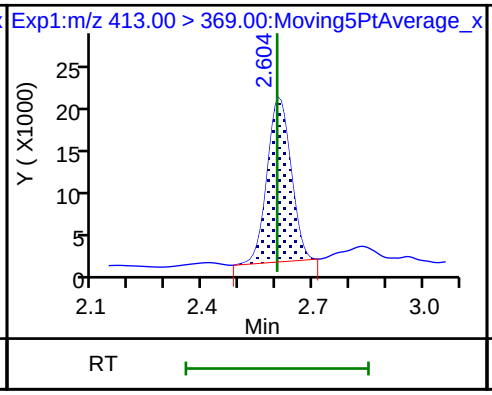
13 1H,1H,2H,2H-perfluorooctanesulfoni



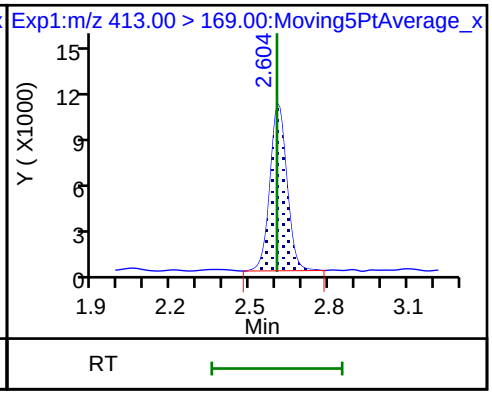
D 14 13C4 PFOA



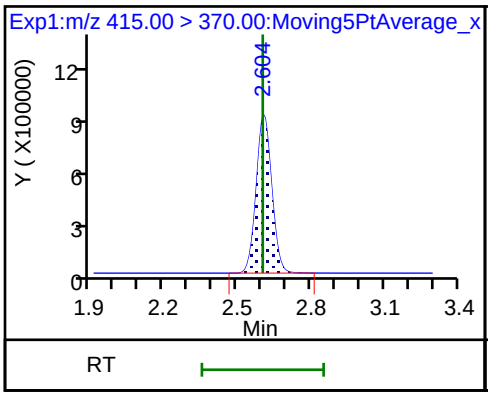
15 Perfluorooctanoic acid



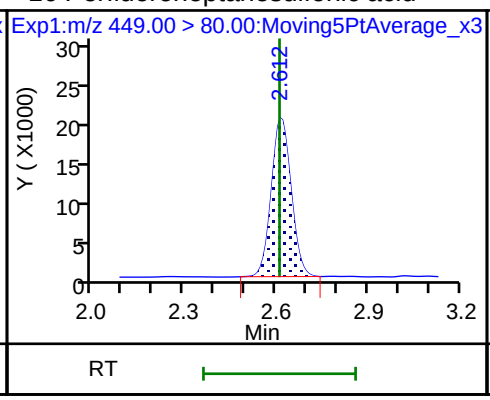
15 Perfluorooctanoic acid



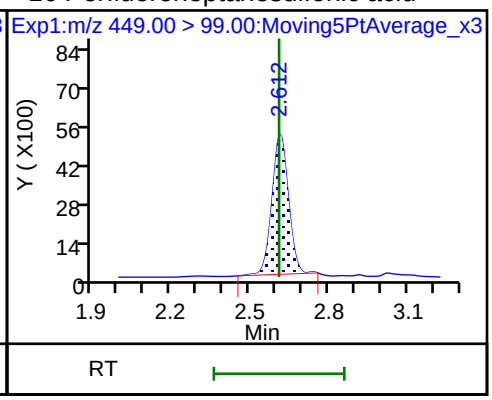
* 62 13C2-PFOA



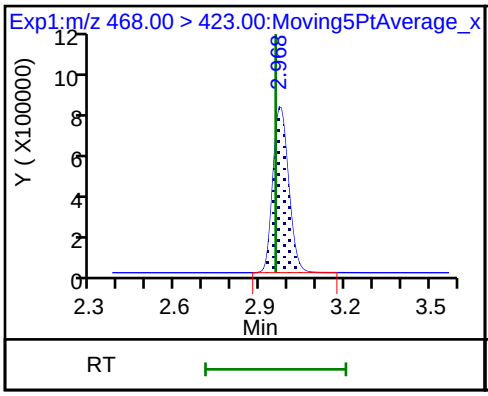
16 Perfluoroheptanesulfonic acid



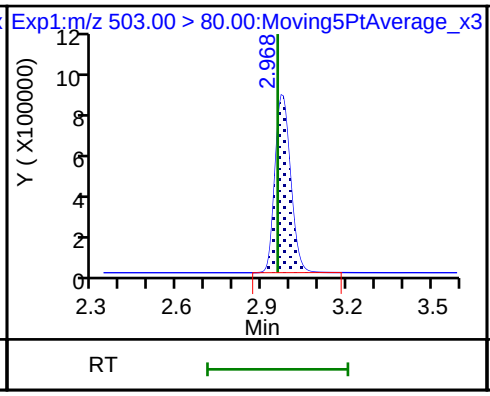
16 Perfluoroheptanesulfonic acid



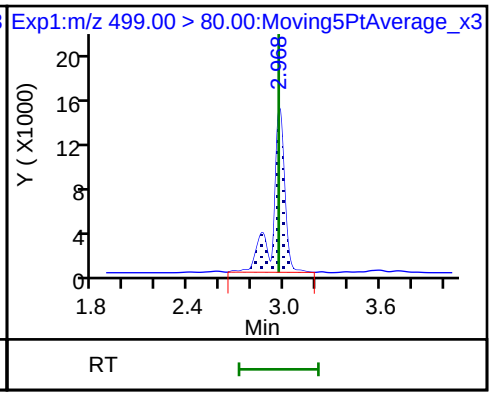
D 19 13C5 PFNA



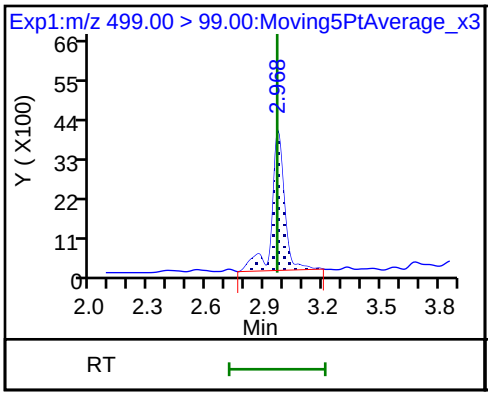
D 18 13C4 PFOS



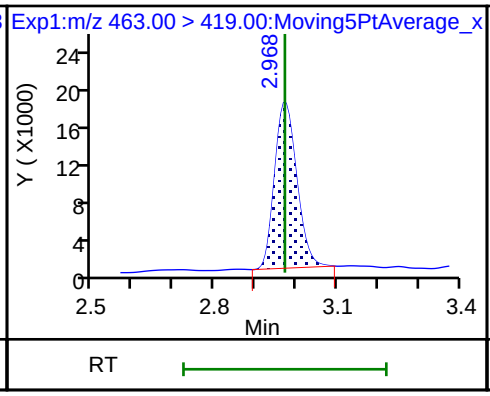
17 Perfluorooctane sulfonic acid



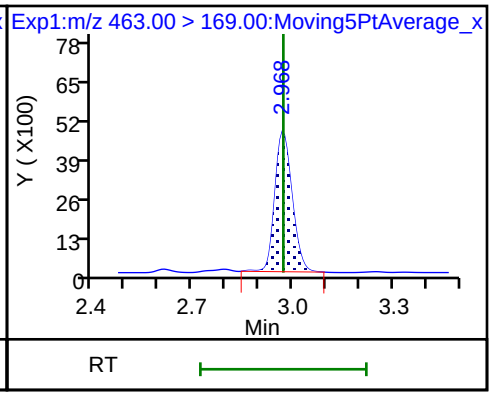
17 Perfluorooctane sulfonic acid



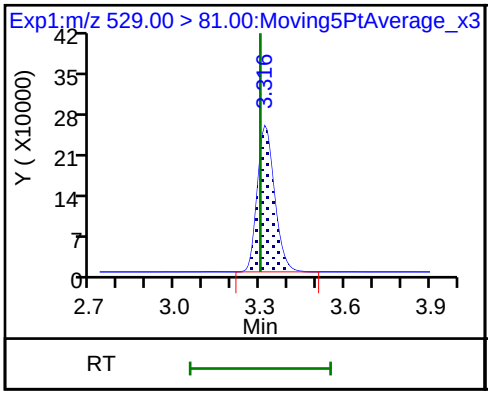
20 Perfluorononanoic acid



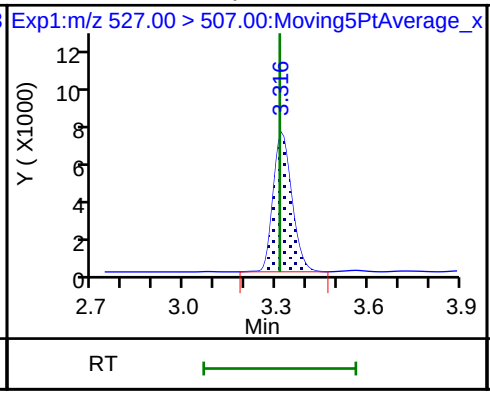
20 Perfluorononanoic acid



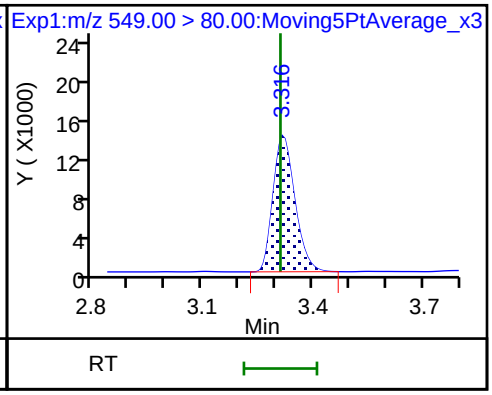
D 26 M2-8:2FTS



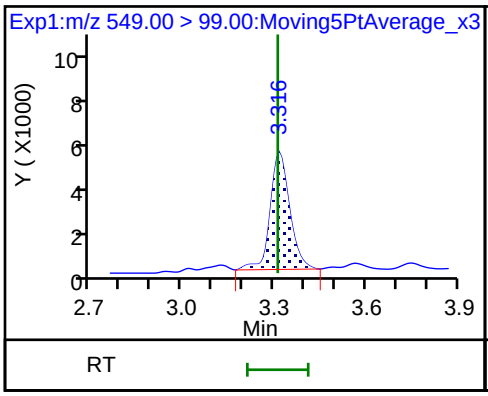
25 1H,1H,2H,2H-perfluorodecanesulfoni



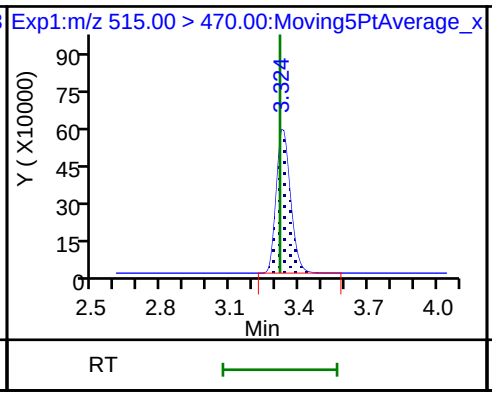
68 Perfluorononanesulfonic acid



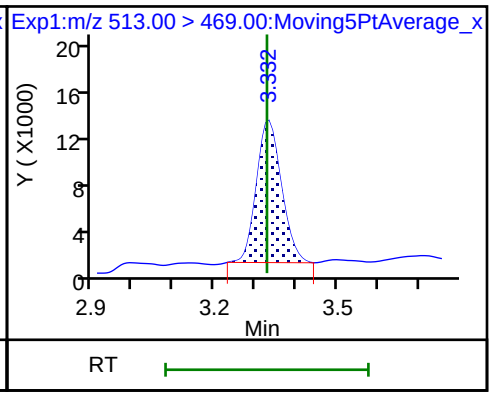
68 Perfluorononanesulfonic acid



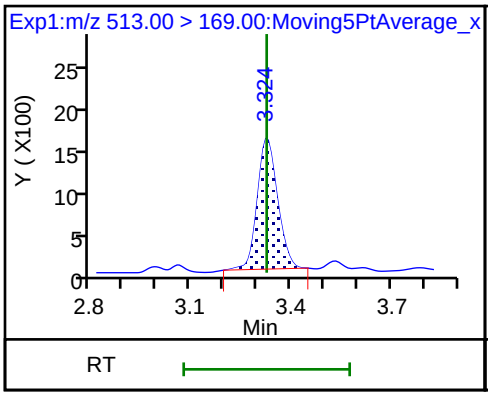
D 23 13C2 PFDA



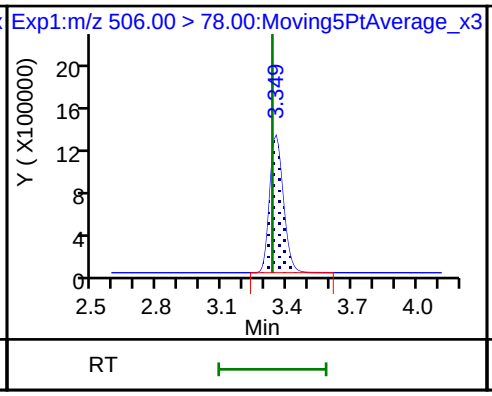
24 Perfluorodecanoic acid



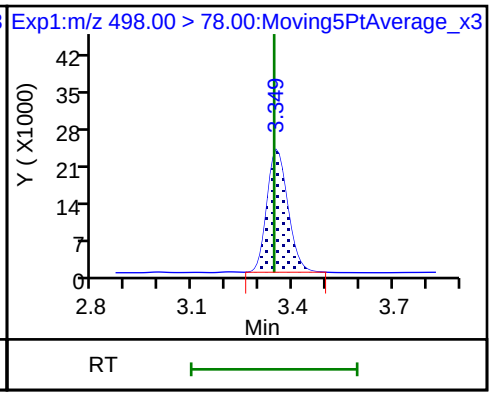
24 Perfluorodecanoic acid



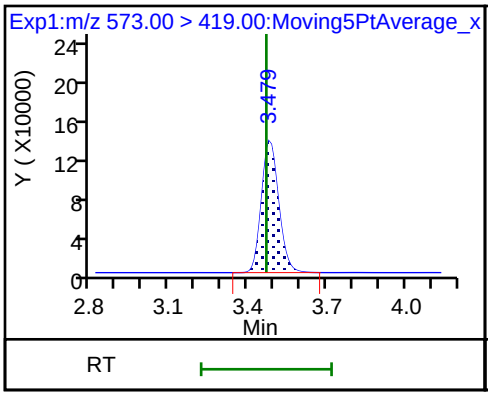
D 21 13C8 FOSA



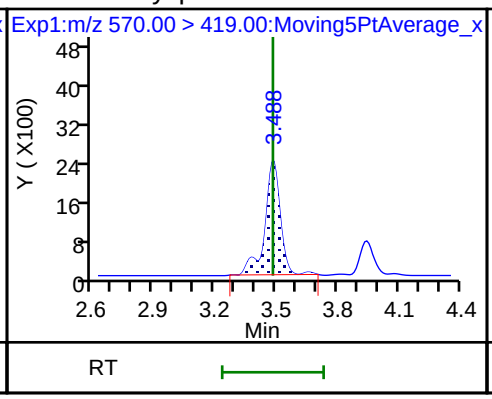
22 Perfluorooctane Sulfonamide



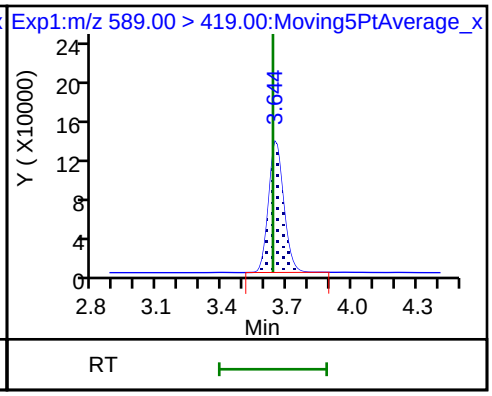
D 27 d3-NMeFOSAA



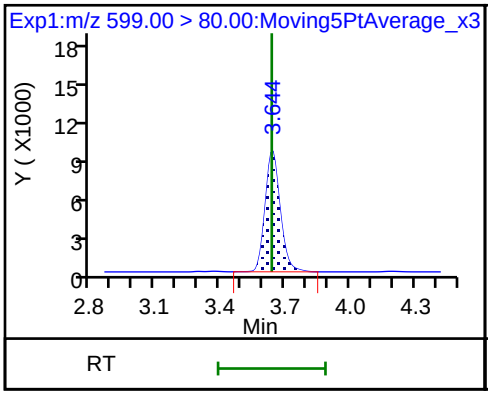
28 N-methyl perfluorooctane sulfonami



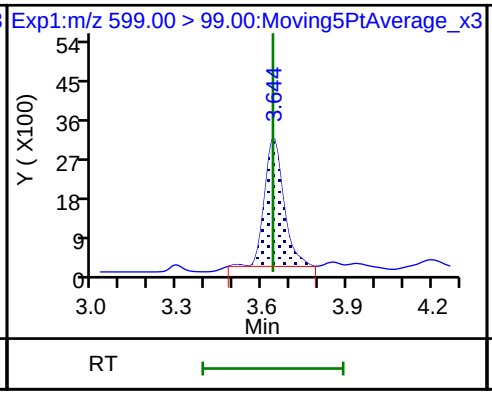
D 32 d5-NEtFOSAA



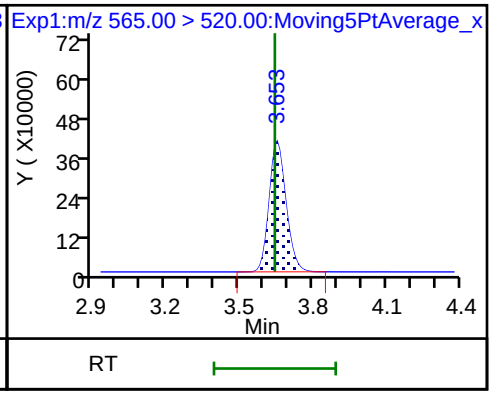
29 Perfluorodecane Sulfonic acid



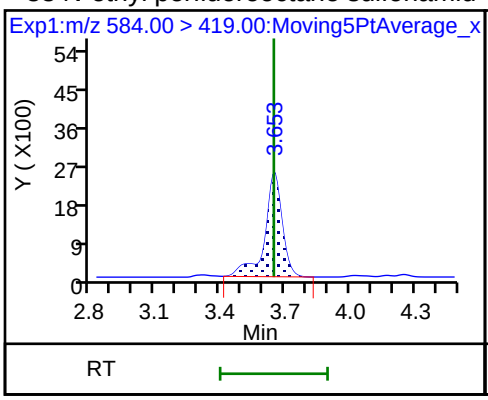
29 Perfluorodecane Sulfonic acid



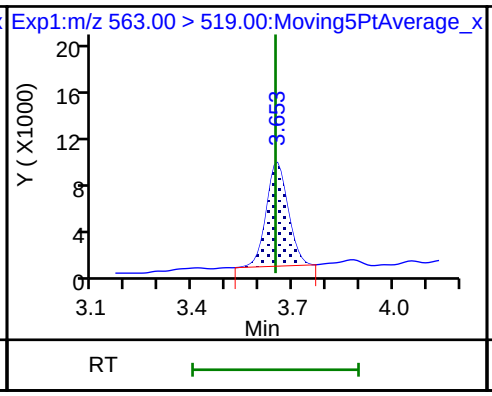
D 30 13C2 PFUnA



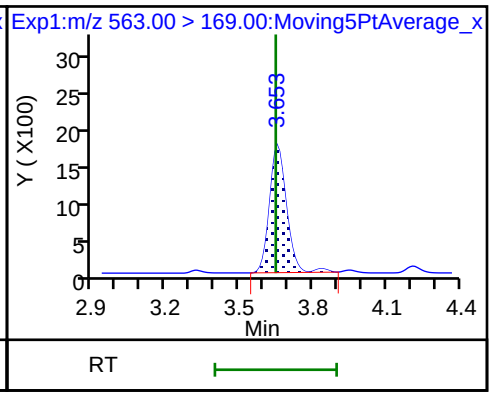
33 N-ethyl perfluorooctane sulfonamid



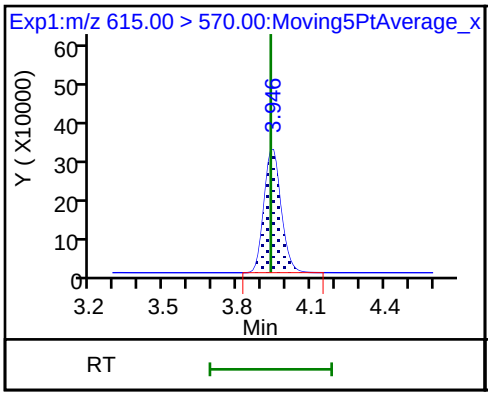
31 Perfluoroundecanoic acid



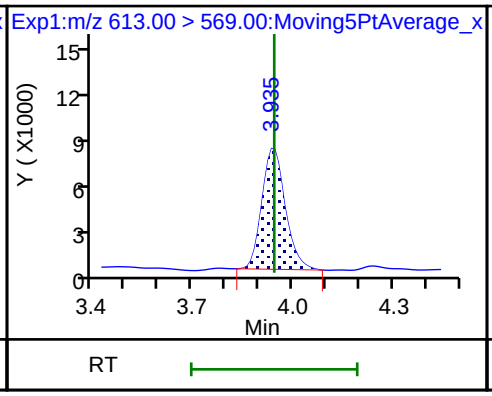
31 Perfluoroundecanoic acid



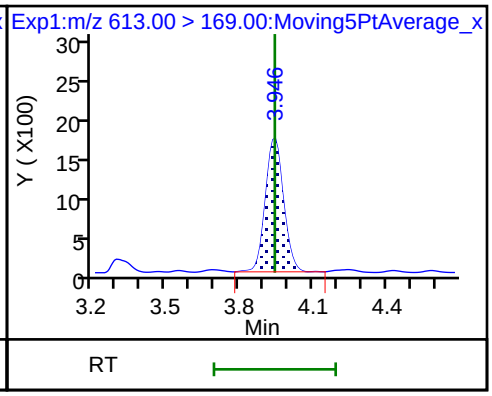
D 36 13C2 PFDoA



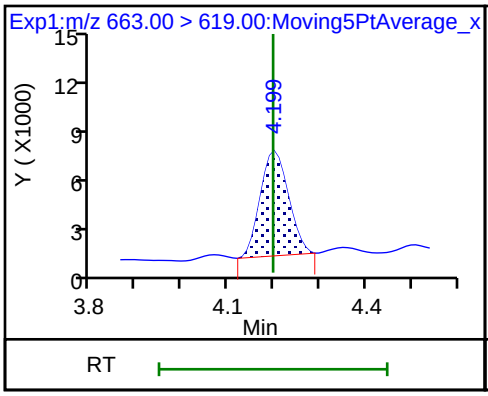
37 Perfluorododecanoic acid



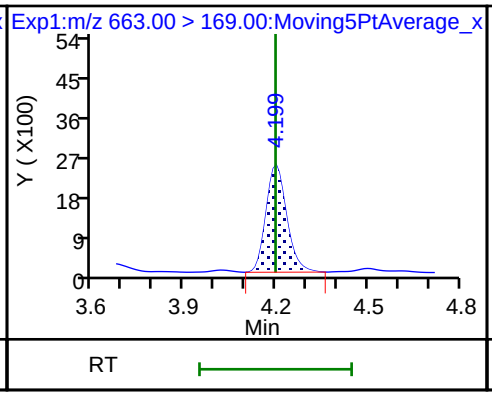
37 Perfluorododecanoic acid



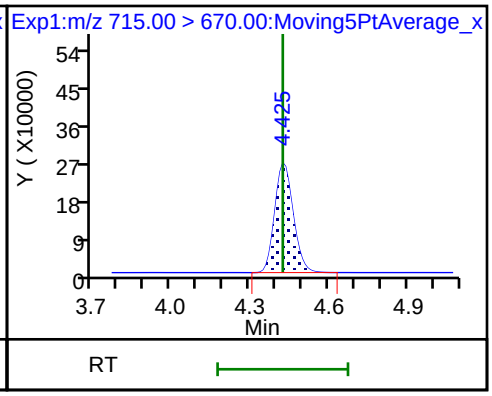
41 Perfluorotridecanoic acid



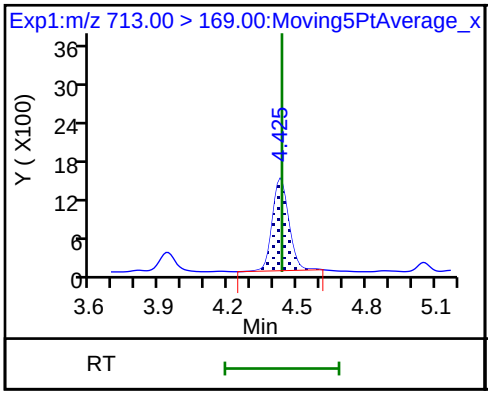
41 Perfluorotridecanoic acid



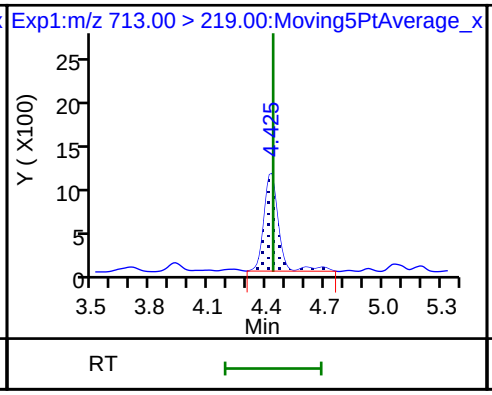
D 43 13C2-PFTeDA



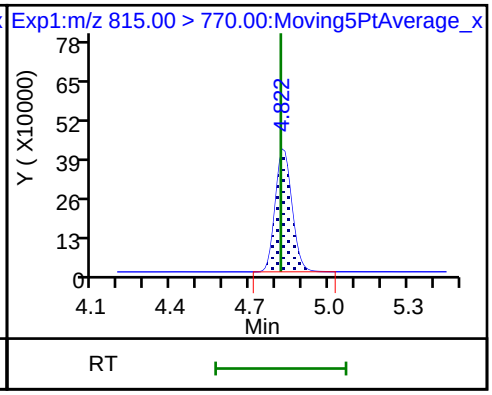
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237767/3 Calibration Date: 08/03/2018 05:29

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9524		0.966	1.00	-3.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.153		0.963	1.00	-3.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	75.84		0.875	0.884	-1.1	30.0
4:2 FTS	AveID	17.21	17.95		0.974	0.934	4.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.014		0.961	1.00	-3.9	30.0
Perfluoropentanesulfonic acid	AveID	67.65	66.94		0.928	0.938	-1.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.142		0.985	1.00	-1.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.088		0.857	0.910	-5.9	30.0
6:2 FTS	AveID	1.654	1.666		0.955	0.948	0.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.180		1.02	1.00	2.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.358		0.935	0.952	-1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.086		0.898	0.928	-3.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.066		0.987	1.00	-1.3	30.0
8:2 FTS	AveID	1.351	1.369		0.970	0.958	1.3	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7532		1.01	0.960	4.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.036		0.971	1.00	-2.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.009		1.02	1.00	2.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	0.9478		0.932	1.00	-6.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6399		0.948	0.964	-1.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8980		1.01	1.00	0.8	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.143		0.928	1.00	-7.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.115		1.03	1.00	3.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9271		0.984	1.00	-1.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2566		0.953	1.00	-4.7	30.0
13C4 PFBA	Ave	1.440	1.323		2.30	2.50	-8.1	30.0
13C5-PFPeA	Ave	0.9481	0.9437		2.49	2.50	-0.5	30.0
13C3-PFBS	Ave	0.0273	0.0257		2.19	2.33	-5.6	30.0
13C2 PFHxA	Ave	1.026	1.041		2.54	2.50	1.5	30.0
13C4-PFHpA	Ave	0.9943	0.9606		2.42	2.50	-3.4	30.0
18O2 PFHxS	Ave	1.494	1.369		2.17	2.37	-8.4	30.0
M2-6:2FTS	Ave	0.2913	0.2879		2.35	2.38	-1.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237767/3 Calibration Date: 08/03/2018 05:29

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9556		2.49	2.50	-0.5	30.0
13C4 PFOS	Ave	1.032	0.9313		2.16	2.39	-9.8	30.0
13C5 PFNA	Ave	0.8365	0.7943		2.37	2.50	-5.0	30.0
M2-8:2FTS	Ave	0.2839	0.2819		2.38	2.40	-0.7	30.0
13C2 PFDA	Ave	0.6256	0.6438		2.57	2.50	2.9	30.0
13C8 FOSA	Ave	1.516	1.420		2.34	2.50	-6.3	30.0
d3-NMeFOSAA	Ave	0.1518	0.1509		2.48	2.50	-0.6	30.0
13C2 PFUnA	Ave	0.4818	0.4844		2.51	2.50	0.5	30.0
d5-NEtFOSAA	Ave	0.1627	0.1668		2.56	2.50	2.5	30.0
13C2 PFDoA	Ave	0.4172	0.4045		2.42	2.50	-3.0	30.0
13C2-PFTeDA	Ave	0.3502	0.3242		2.31	2.50	-7.4	30.0
13C2-PFHxDA	Ave	0.6033	0.4601		1.91	2.50	-23.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\2018.08.03LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 03-Aug-2018 05:29:54 ALS Bottle#: 28 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 09:24:06 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: westendorfc Date: 03-Aug-2018 09:21:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.411	1.403	0.008	0.542	4632003	2.30		91.9	95584	
2 Perfluorobutyric acid										
212.90 > 169.00	1.411	1.411	0.0	1.000	1764646	0.9665		96.6	909	
D 3 13C5-PFPeA										
267.90 > 223.00	1.653	1.650	0.003	0.635	3304154	2.49		99.5	60167	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.653	1.653	0.0	1.000	1523915	0.9630		96.3	628	
D 47 13C3-PFBS										
301.90 > 83.00	1.690	1.685	0.005	0.649	83800	2.19		94.4	482	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.690	1.690	0.0	1.000	2416497	0.8747		98.9	5598	
298.90 > 99.00	1.690	1.690	0.0	1.000	1010485		2.39(1.25-3.74)		4586	
D 60 M2-4:2FTS										
329.00 > 81.00	1.892	1.887	0.005	0.727	629780	NC			8410	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.892	1.892	0.0	1.120	604185	0.9740		104	35435	
D 7 13C2 PFHxA										
315.00 > 270.00	1.935	1.917	0.017	0.743	3645327	2.54		101	88392	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.935	1.935	0.0	1.000	1478427	0.9615		96.1	5837	
313.00 > 119.00	1.935	1.935	0.0	1.000	134812		10.97(5.03-15.10)		1938	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.956	1.956	0.0	1.158	2262989	0.9280		98.9	31865	
349.00 > 99.00	1.956	1.956	0.0	1.158	851026		2.66(1.36-4.07)		8459	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.016	0.017	0.781	225012	NC			7620	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.033	2.033	0.0	1.000	300325	NC			2058	
D 9 13C4-PFHpA										
367.00 > 322.00	2.251	2.242	0.009	0.865	3363196	2.42		96.6	61430	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.251	2.251	0.0	1.000	1535846	0.9845		98.5	867	
363.00 > 169.00	2.251	2.251	0.0	1.000	591029		2.60(1.13-3.40)		10776	
D 11 18O2 PFHxS										
403.00 > 84.00	2.264	2.256	0.008	0.870	4534963	2.17		91.6	34854	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.264	2.264	0.0	1.000	1898764	0.8566		94.1	7749	
399.00 > 99.00	2.264	2.264	0.0	1.000	633029		3.00(1.50-4.49)		1612	
65 ADONA										
377.00 > 251.00	2.303	2.303	0.0	0.777	3851325	NC			38854	
377.00 > 85.00	2.290	2.303	-0.013	0.772	2250765		1.71(0.84-2.53)		8874	
D 12 M2-6:2FTS										
429.00 > 81.00	2.579	2.566	0.013	0.991	957519	2.35		98.8	17640	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.579	2.579	0.0	1.000	636575	0.9548		101	17444	
D 14 13C4 PFOA										
417.00 > 372.00	2.602	2.597	0.005	1.000	3345915	2.49		99.5	53306	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.602	2.602	0.0	1.000	1581312	1.02		102	1344	
413.00 > 169.00	2.602	2.602	0.0	1.000	787617		2.01(0.84-2.52)		6026	
* 62 13C2-PFOA										
415.00 > 370.00	2.602	2.602	0.0		3501317	2.50			45475	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.610	2.610	0.0	0.881	1686514	0.9354		98.3	18765	
449.00 > 99.00	2.610	2.610	0.0	0.881	475073		3.55(1.94-5.82)		9542	
D 19 13C5 PFNA										
468.00 > 423.00	2.964	2.955	0.009	1.139	2781080	2.37		95.0	48063	
D 18 13C4 PFOS										
503.00 > 80.00	2.964	2.955	0.009	1.139	3117371	2.16		90.2	27227	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.964	2.964	0.0	1.000	1314282	0.8975		96.7	13597	
499.00 > 99.00	2.964	2.964	0.0	1.000	303225		4.33(2.31-6.93)		3253	
20 Perfluorononanoic acid										
463.00 > 419.00	2.971	2.971	0.0	1.002	1185614	0.9870		98.7	5147	
463.00 > 169.00	2.964	2.971	-0.007	1.000	281774		4.21(1.90-5.69)		14585	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.177	3.177	0.0	1.072	2110042	NC			33833	
D 26 M2-8:2FTS										
529.00 > 81.00	3.311	3.300	0.011	1.272	945490	2.38		99.3	24715	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.311	3.311	0.0	1.000	517595	0.9704		101	30871	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.311	3.311	0.0	1.117	943142	1.01		105	22755	
549.00 > 99.00	3.311	3.311	0.0	1.117	355544		2.65(1.33-3.97)		2852	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.327	3.316	0.011	1.278	2254143	2.57		103	33254	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.327	3.327	0.0	1.000	934277	0.9708		97.1	1672	
513.00 > 169.00	3.327	3.327	0.0	1.000	169663		5.51(2.36-7.09)		3961	
D 21 13C8 FOSA										
506.00 > 78.00	3.343	3.331	0.012	1.285	4972306	2.34		93.7	42247	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.343	3.343	0.0	1.000	2006766	1.02		102	30802	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.473	3.469	0.004	1.335	528333	2.48		99.4	22261	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.483	3.483	0.0	1.003	200294	0.9322		93.2	2934	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.647	3.634	0.013	1.402	584138	2.56		103	5679	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.638	3.638	0.0	1.227	804587	0.9484		98.4	24153	
599.00 > 99.00	3.638	3.638	0.0	1.227	268180		3.00(1.39-4.16)		3502	
D 30 13C2 PFUnA										
565.00 > 520.00	3.647	3.644	0.003	1.402	1696005	2.51		101	44391	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.647	3.647	0.0	1.000	209813	1.01		101	7039	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.647	3.647	0.0	1.000	775388	0.9275		92.8	2003	
563.00 > 169.00	3.647	3.647	0.0	1.000	139335		5.56(2.12-6.36)		7329	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.803	3.803	0.0	1.283	2958886	NC			34359	
D 36 13C2 PFDoA										
615.00 > 570.00	3.943	3.935	0.008	1.516	1416341	2.42		97.0	16544	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.943	3.943	0.0	1.000	631746	1.03		103	198	
613.00 > 169.00	3.943	3.943	0.0	1.000	155026		4.08(2.13-6.40)		4060	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.197	4.197	0.0	1.064	525261	0.9838		98.4	139	
663.00 > 169.00	4.197	4.197	0.0	1.064	164959		3.18(1.25-3.76)		2539	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.433	4.424	0.009	1.704	1135029	2.31		92.6	4878	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.433	4.433	0.0	1.000	116509	0.9527		95.3	2177	
713.00 > 219.00	4.422	4.433	-0.011	0.998	82167		1.42(0.71-2.13)		1280	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.829	4.817	0.012	1.856	1610911	1.91		76.3	2174	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.829	4.829	0.0	1.000	665560	NC			33.7	
813.00 > 169.00	4.829	4.829	0.0	1.000	106050		6.28(2.86-8.58)		1353	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.163	5.163	0.0	1.069	846358	NC			335	
913.00 > 169.00	5.163	5.163	0.0	1.069	106770		7.93(3.83-11.48)		1334	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 09:24:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\2018.08.03LLA_006.d

Injection Date: 03-Aug-2018 05:29:54 Instrument ID: A8_N

Lims ID: CCV L4

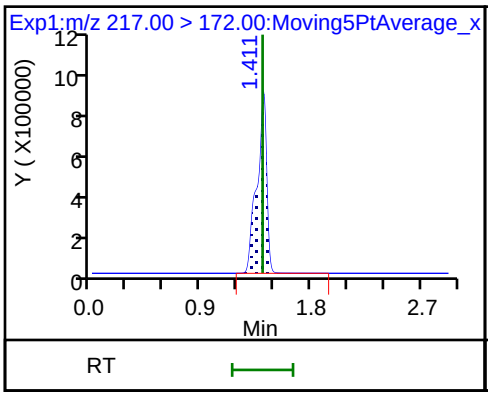
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 3

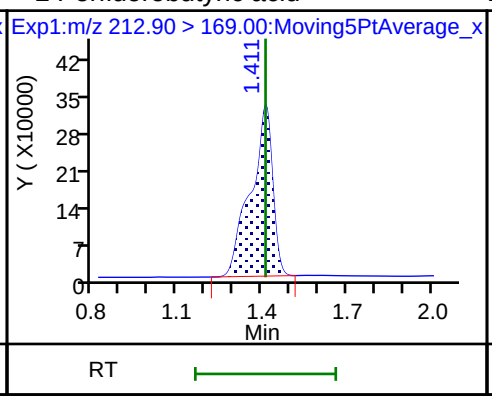
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

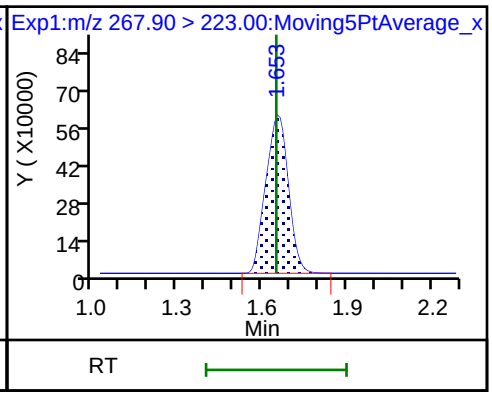
D 1 13C4 PFBA



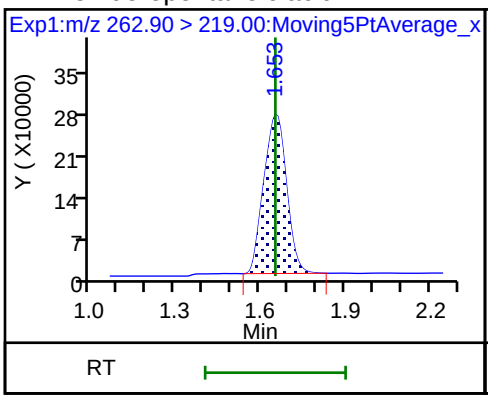
2 Perfluorobutyric acid



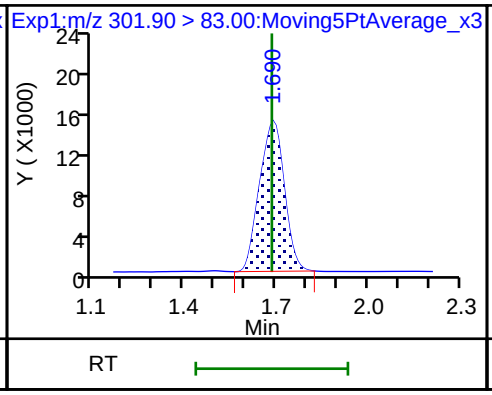
D 3 13C5-PFPeA



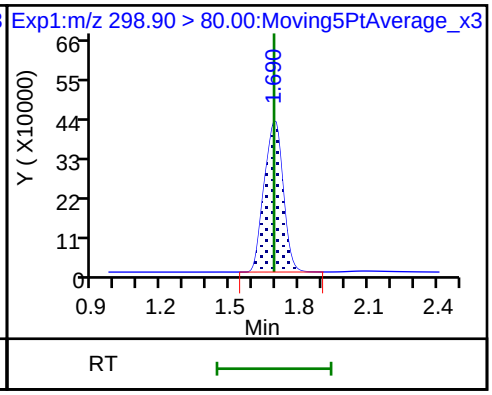
4 Perfluoropentanoic acid



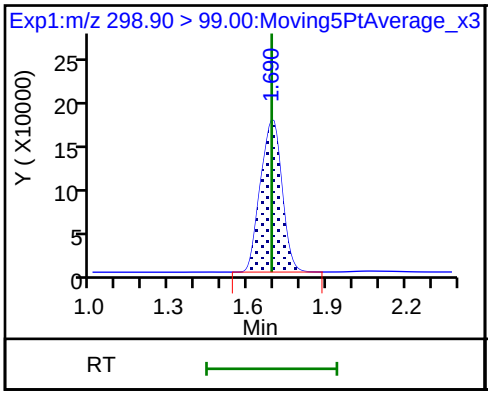
D 47 13C3-PFBS



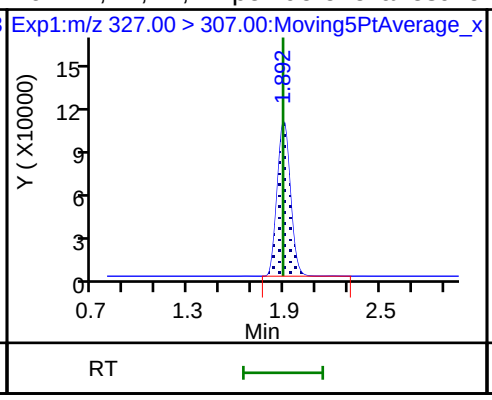
5 Perfluorobutanesulfonic acid



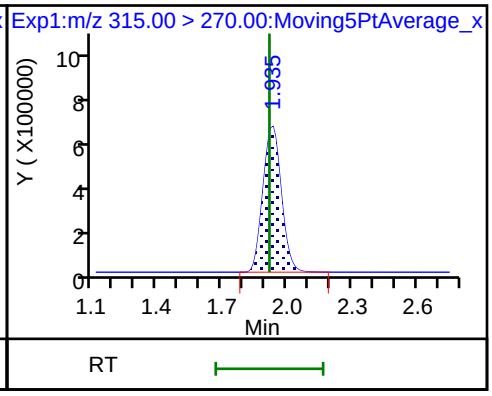
5 Perfluorobutanesulfonic acid



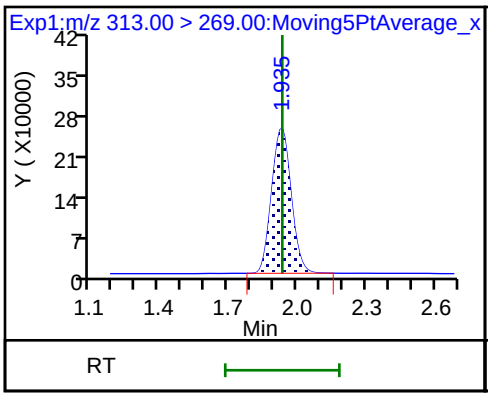
61 1H,1H,2H,2H-perfluorohexanesulfon



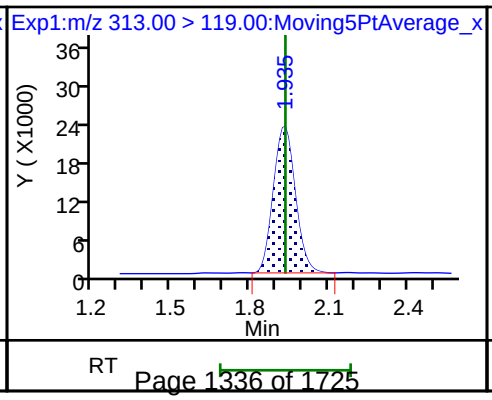
D 7 13C2 PFHxA



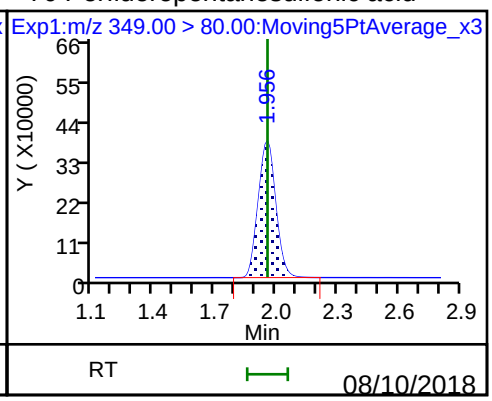
6 Perfluorohexanoic acid



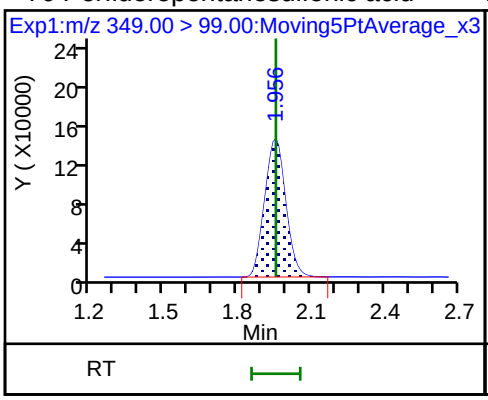
6 Perfluorohexanoic acid



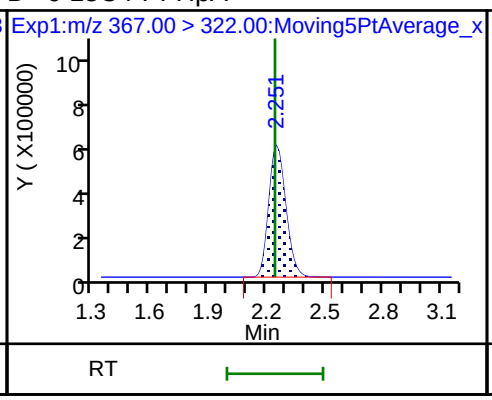
70 Perfluoropentanesulfonic acid



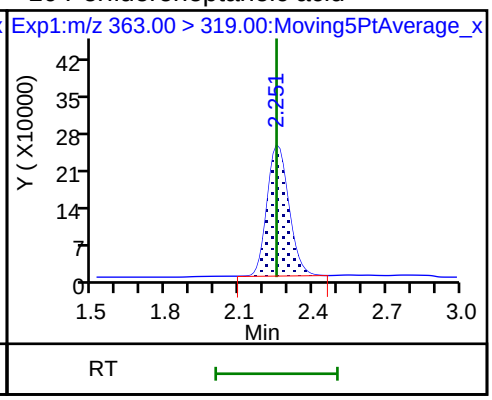
70 Perfluoropentanesulfonic acid



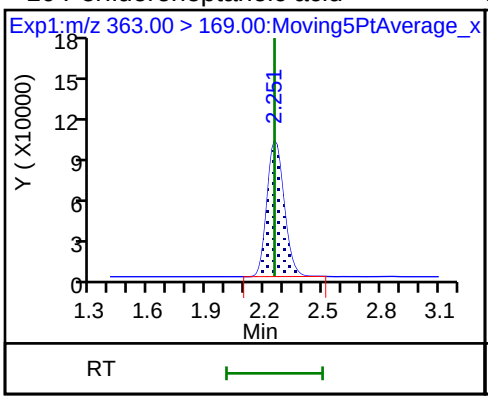
D 9 13C4-PFHpA



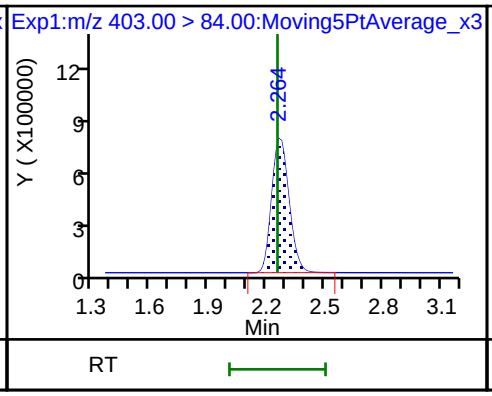
10 Perfluoroheptanoic acid



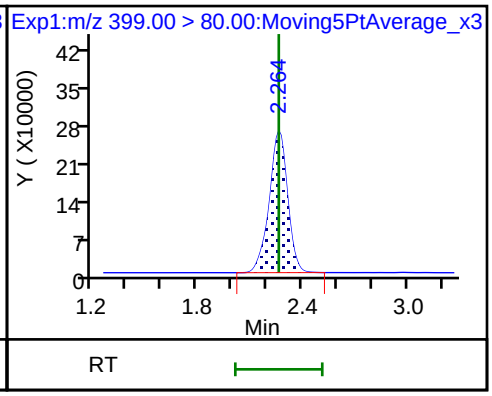
10 Perfluoroheptanoic acid



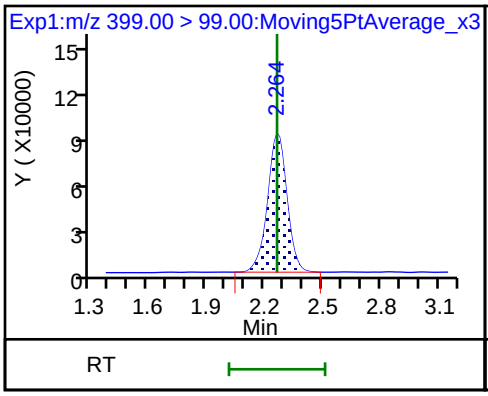
D 11 18O2 PFHxS



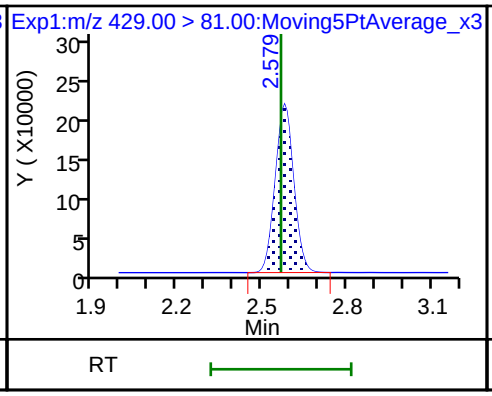
8 Perfluorohexanesulfonic acid



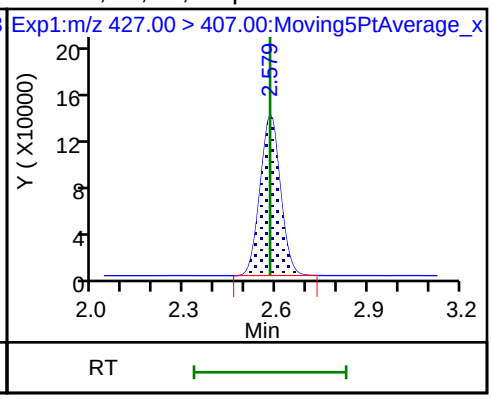
8 Perfluorohexanesulfonic acid



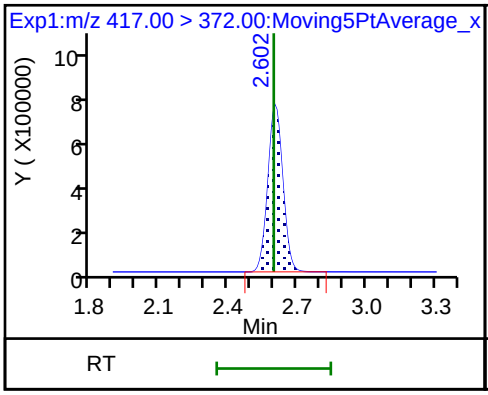
D 12 M2-6:2FTS



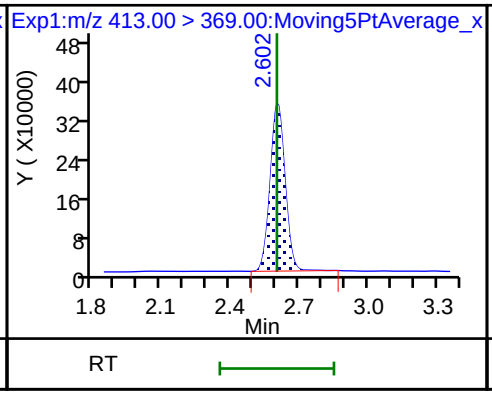
13 1H,1H,2H,2H-perfluorooctanesulfoni



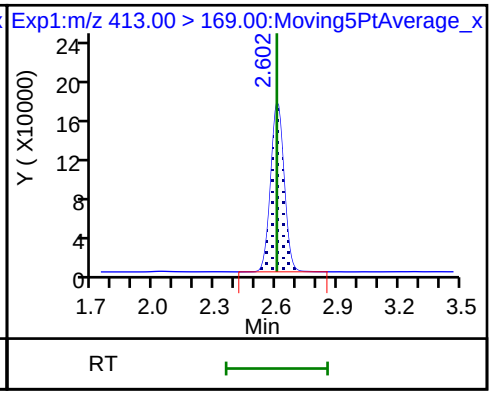
D 14 13C4 PFOA



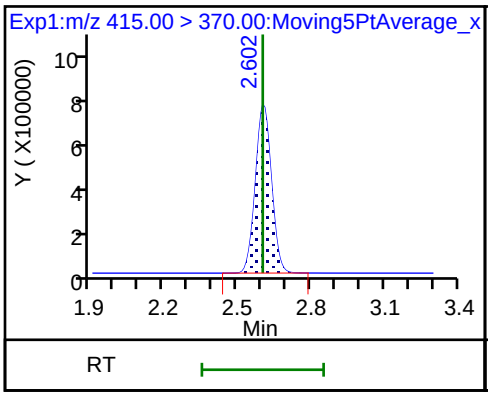
15 Perfluorooctanoic acid



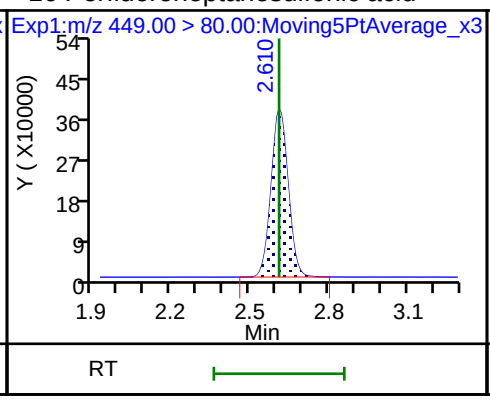
15 Perfluorooctanoic acid



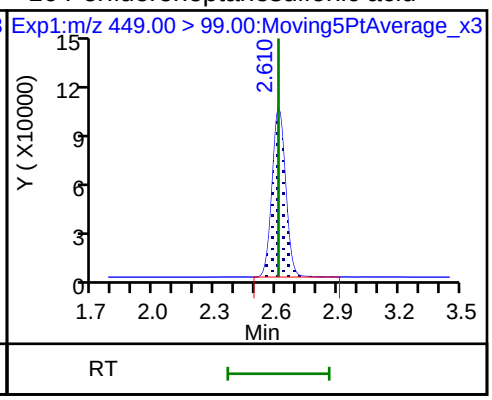
* 62 13C2-PFOA



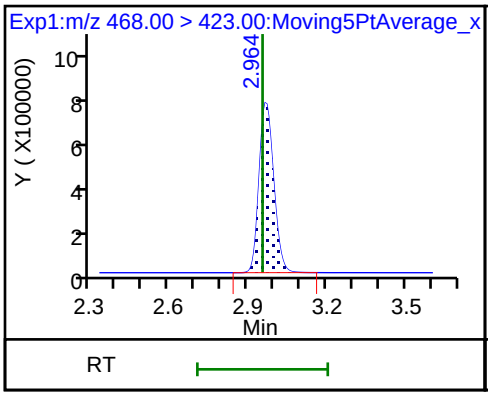
16 Perfluoroheptanesulfonic acid



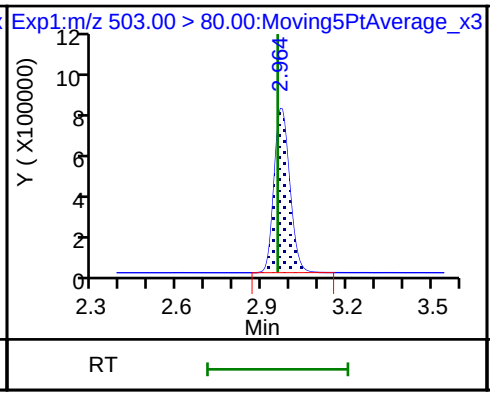
16 Perfluoroheptanesulfonic acid



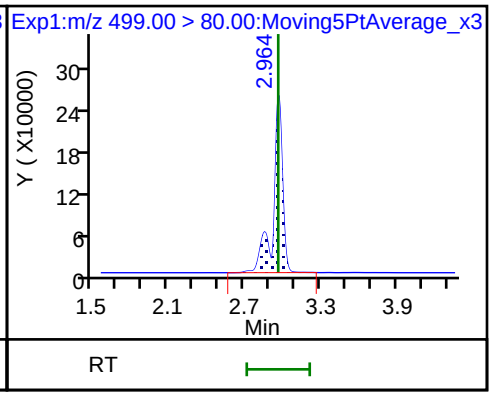
D 19 13C5 PFNA



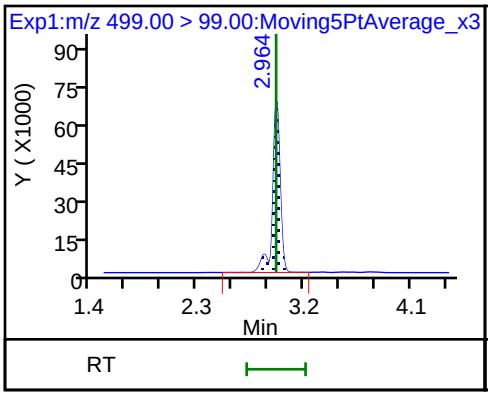
D 18 13C4 PFOS



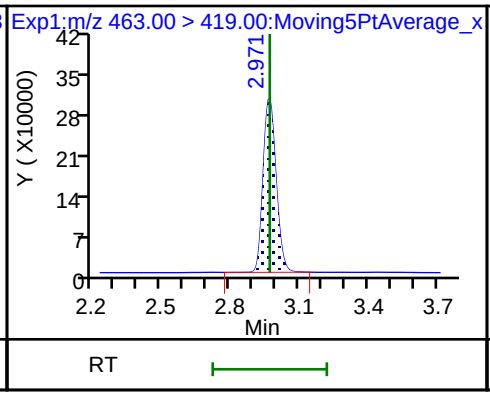
17 Perfluorooctane sulfonic acid



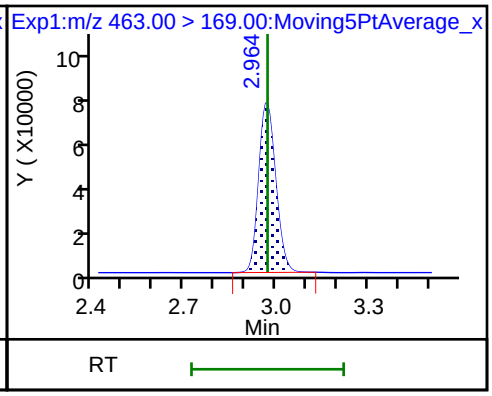
17 Perfluorooctane sulfonic acid



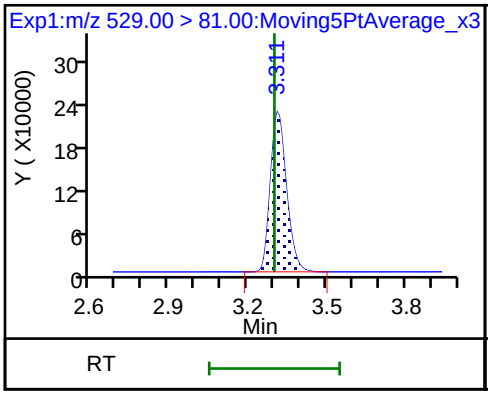
20 Perfluorononanoic acid



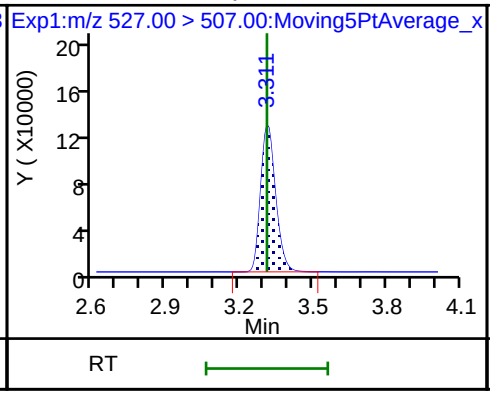
20 Perfluorononanoic acid



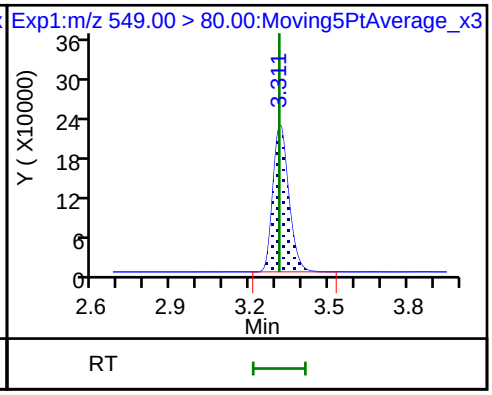
D 26 M2-8:2FTS



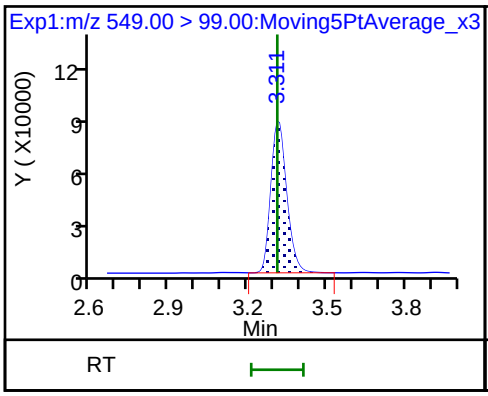
25 1H,1H,2H,2H-perfluorodecanesulfoni



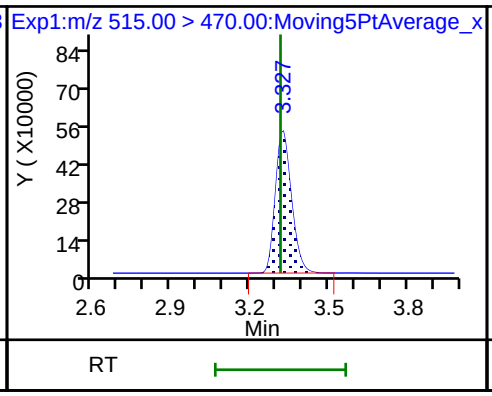
68 Perfluorononanesulfonic acid



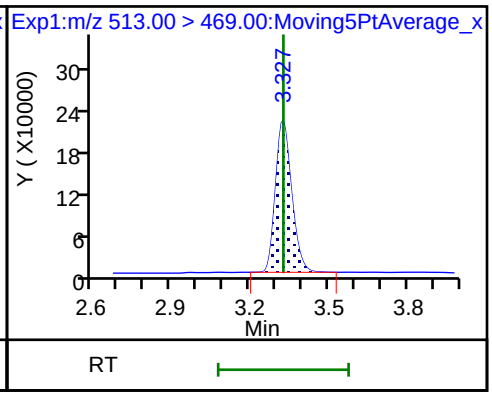
68 Perfluorononanesulfonic acid



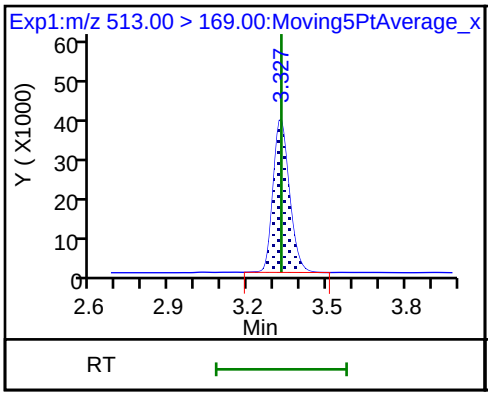
D 23 13C2 PFDA



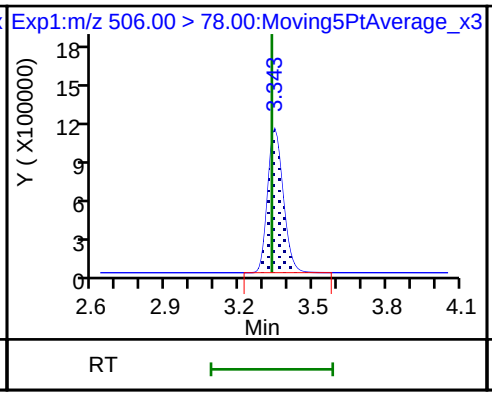
24 Perfluorodecanoic acid



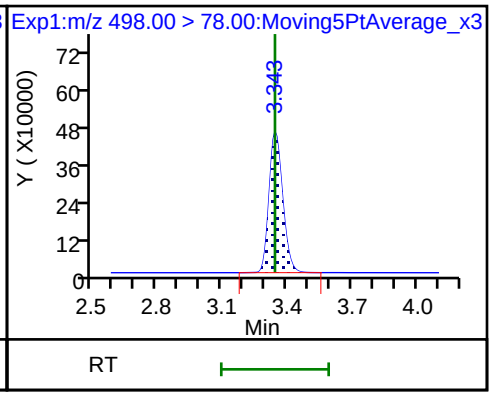
24 Perfluorodecanoic acid



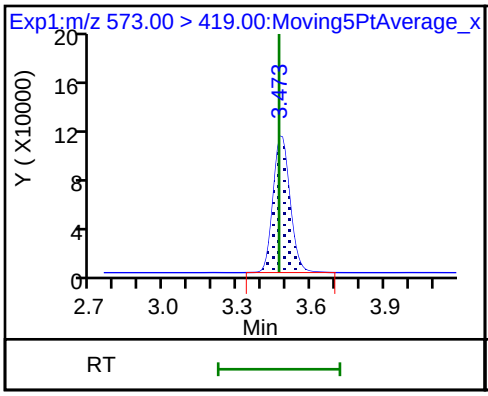
D 21 13C8 FOSA



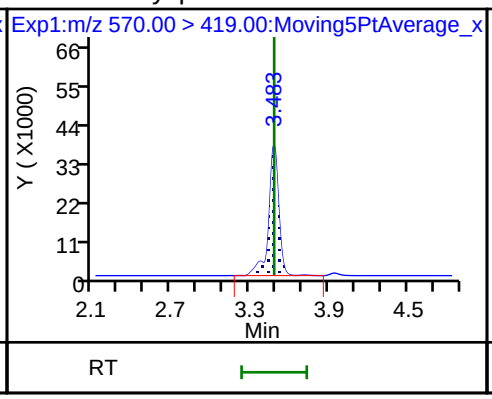
22 Perfluorooctane Sulfonamide



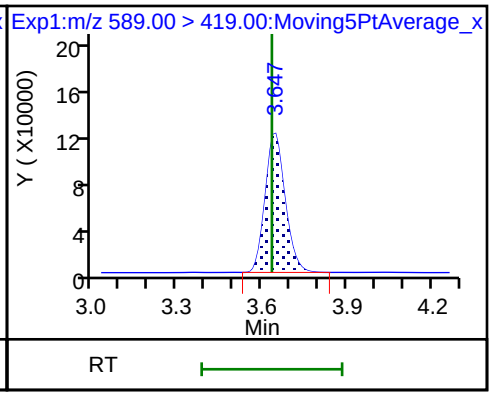
D 27 d3-NMeFOSAA



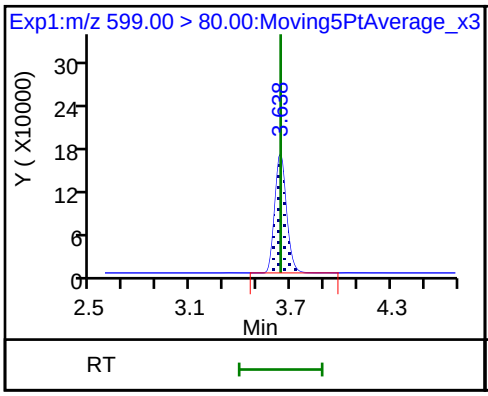
28 N-methyl perfluorooctane sulfonami



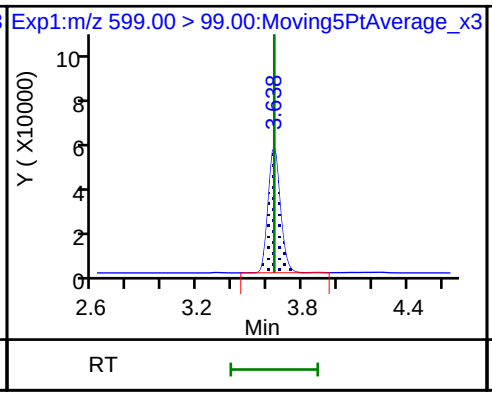
D 32 d5-NEtFOSAA



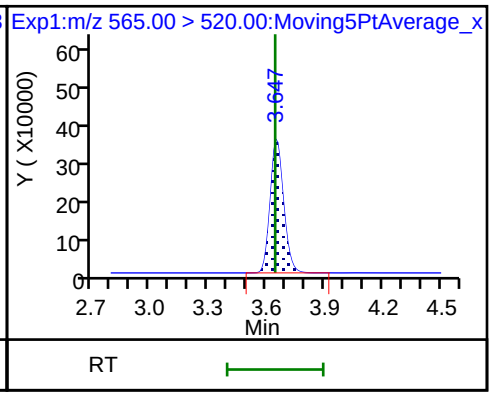
29 Perfluorodecane Sulfonic acid



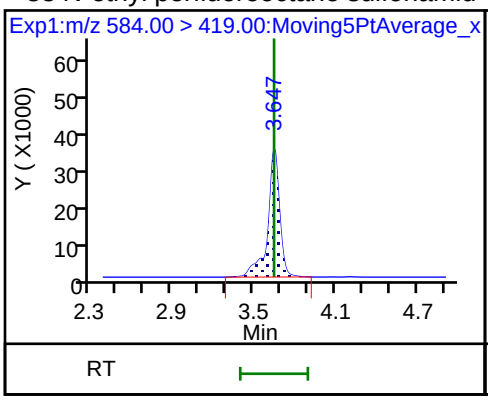
29 Perfluorodecane Sulfonic acid



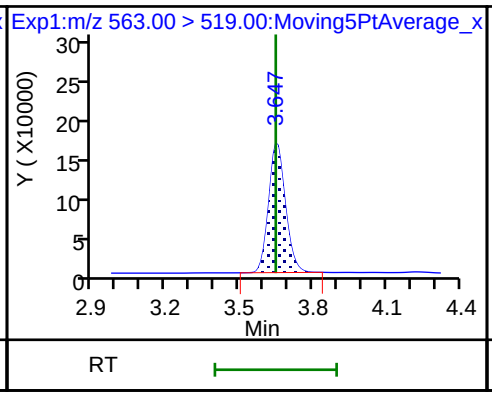
D 30 13C2 PFUnA



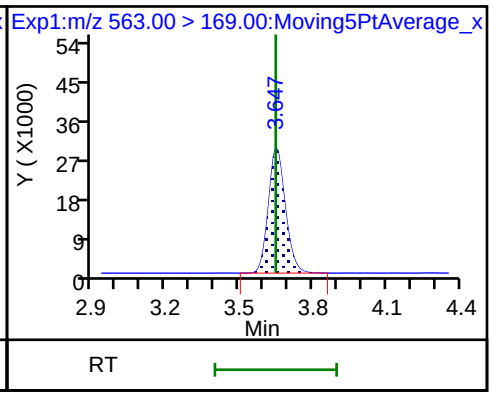
33 N-ethyl perfluorooctane sulfonamid



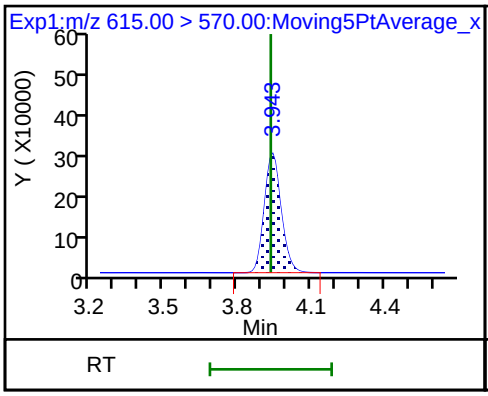
31 Perfluoroundecanoic acid



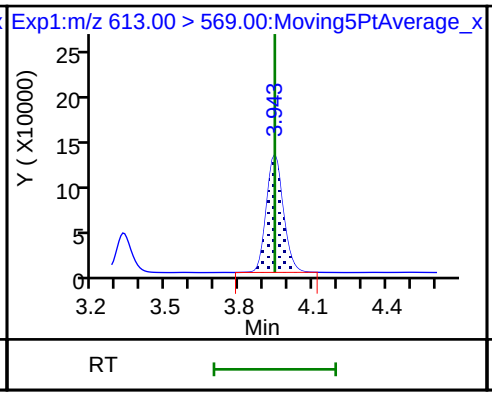
31 Perfluoroundecanoic acid



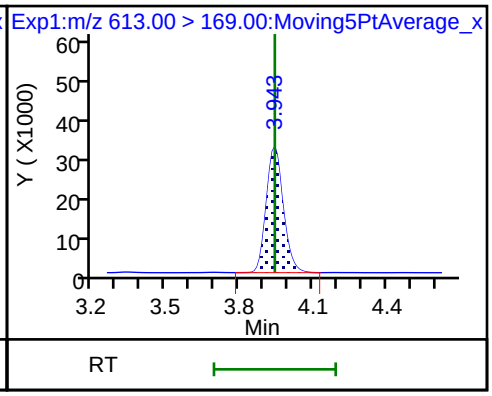
D 36 13C2 PFDoA



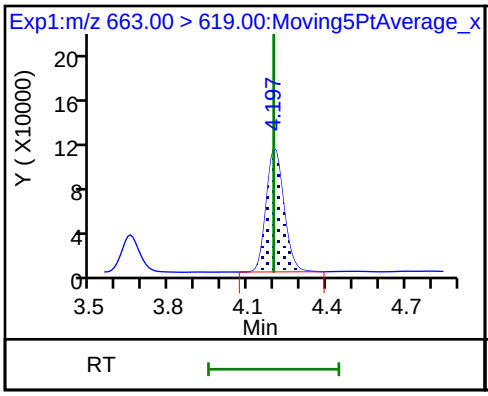
37 Perfluorododecanoic acid



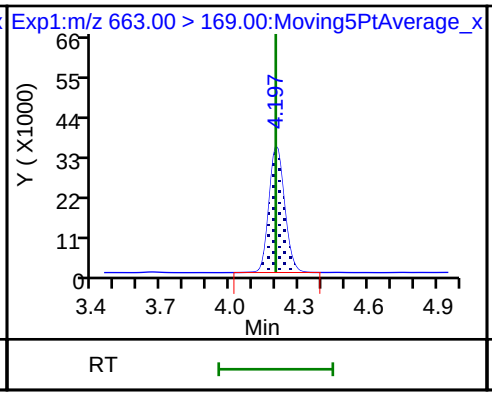
37 Perfluorododecanoic acid



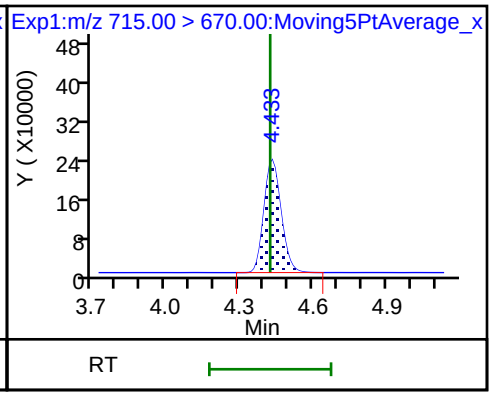
41 Perfluorotridecanoic acid



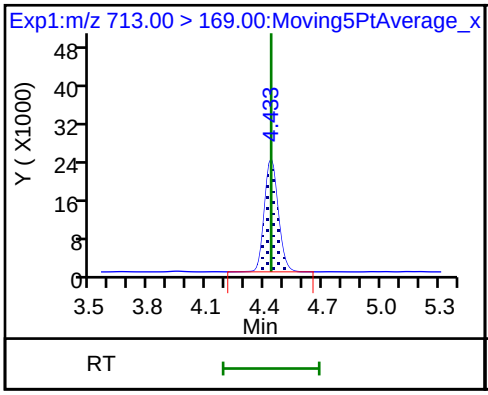
41 Perfluorotridecanoic acid



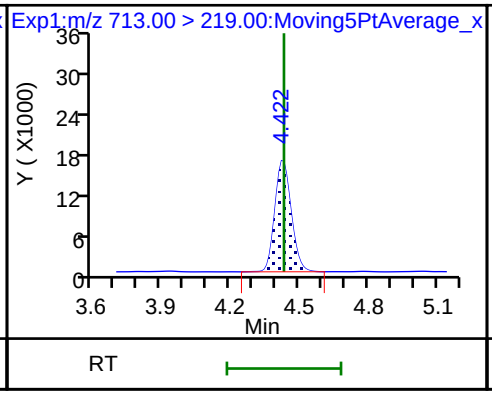
D 43 13C2-PFTeDA



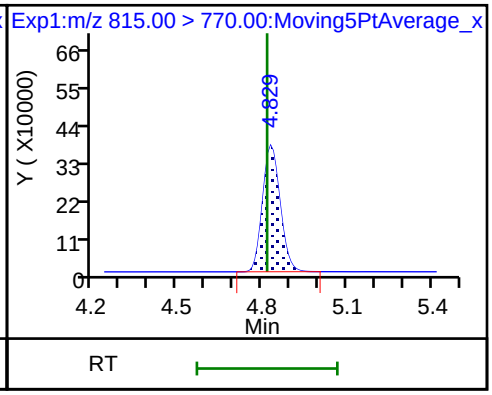
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/1 Calibration Date: 08/03/2018 06:16

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9808		2.49	2.50	-0.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.172		2.45	2.50	-2.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	80.19		2.31	2.21	4.6	30.0
4:2 FTS	AveID	17.21	18.35		2.49	2.34	6.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.050		2.49	2.50	-0.4	30.0
Perfluoropentanesulfonic acid	AveID	67.65	72.26		2.50	2.35	6.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.085		2.34	2.50	-6.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.098		2.16	2.28	-5.0	30.0
6:2 FTS	AveID	1.654	1.652		2.37	2.37	-0.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.177		2.55	2.50	1.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.506		2.59	2.38	8.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.104		2.56	2.50	2.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.169		2.42	2.32	4.2	30.0
8:2 FTS	AveID	1.351	1.431		2.54	2.40	5.9	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7916		2.64	2.40	10.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.091		2.55	2.50	2.2	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.021		2.59	2.50	3.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	0.9546		2.35	2.50	-6.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6892		2.55	2.41	6.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8897		2.50	2.50	-0.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.222		2.48	2.50	-0.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.047		2.42	2.50	-3.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.8761		2.32	2.50	-7.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2629		2.44	2.50	-2.4	30.0
13C4 PFBA	Ave	1.440	1.333		2.32	2.50	-7.4	30.0
13C5-PFPeA	Ave	0.9481	0.9378		2.47	2.50	-1.1	30.0
13C3-PFBS	Ave	0.0273	0.0256		2.18	2.33	-6.3	30.0
13C2 PFHxA	Ave	1.026	1.039		2.53	2.50	1.3	30.0
13C4-PFHpA	Ave	0.9943	0.998		2.51	2.50	0.3	30.0
18O2 PFHxS	Ave	1.494	1.389		2.20	2.37	-7.0	30.0
M2-6:2FTS	Ave	0.2913	0.2780		2.27	2.38	-4.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/1 Calibration Date: 08/03/2018 06:16

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9611		2.50	2.50	0.1	30.0
13C4 PFOS	Ave	1.032	0.8924		2.07	2.39	-13.5	30.0
13C5 PFNA	Ave	0.8365	0.8004		2.39	2.50	-4.3	30.0
M2-8:2FTS	Ave	0.2839	0.2617		2.21	2.40	-7.8	30.0
13C2 PFDA	Ave	0.6256	0.6362		2.54	2.50	1.7	30.0
13C8 FOSA	Ave	1.516	1.392		2.30	2.50	-8.2	30.0
d3-NMeFOSAA	Ave	0.1518	0.1572		2.59	2.50	3.5	30.0
d5-NEtFOSAA	Ave	0.1627	0.1641		2.52	2.50	0.8	30.0
13C2 PFUnA	Ave	0.4818	0.4658		2.42	2.50	-3.3	30.0
13C2 PFDoA	Ave	0.4172	0.4310		2.58	2.50	3.3	30.0
13C2-PFTeDA	Ave	0.3502	0.3340		2.38	2.50	-4.6	30.0
13C2-PFHxDA	Ave	0.6033	0.4776		1.98	2.50	-20.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_012.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 06:16:45 ALS Bottle#: 29 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:15:27 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:15:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.411	1.407	0.004	1.004	4776616	2.49		99.5	2421	
D 1 13C4 PFBA										
217.00 > 172.00	1.406	1.411	-0.005	0.540	4869932	2.32		92.6	112674	
D 3 13C5-PFPeA										
267.90 > 223.00	1.653	1.653	0.0	0.635	3425174	2.47		98.9	61920	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.653	1.656	-0.003	1.000	4013311	2.45		97.9	1716	
D 47 13C3-PFBS										
301.90 > 83.00	1.690	1.690	0.0	0.649	86775	2.18		93.7	477	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.690	1.692	-0.002	1.000	6614466	2.31		105	14294	
298.90 > 99.00	1.690	1.692	-0.002	1.000	2682277		2.47(1.25-3.74)		10838	
D 60 M2-4:2FTS										
329.00 > 81.00	1.892	1.892	0.0	0.727	658131	NC			8819	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.892	1.894	-0.002	1.120	1598922	2.49		107	68931	
D 7 13C2 PFHxA										
315.00 > 270.00	1.924	1.935	-0.010	0.739	3793821	2.53		101	91822	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.935	1.937	-0.002	1.006	3982942	2.49		99.6	14305	
313.00 > 119.00	1.935	1.937	-0.002	1.006	356246		11.18(5.03-15.10)		4975	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.956	1.959	-0.003	1.158	6324271	2.50		107	56047	
349.00 > 99.00	1.956	1.959	-0.003	1.158	2305716		2.74(1.36-4.07)		19397	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.022	2.025	-0.003	0.994	787140	NC			5268	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.033	0.0	0.781	230412	NC			12916	
D 9 13C4-PFHpA										
367.00 > 322.00	2.251	2.251	0.0	0.865	3644272	2.51		100	59500	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.251	2.253	-0.002	1.000	3954130	2.34		93.6	2333	
363.00 > 169.00	2.251	2.253	-0.002	1.000	1540138		2.57(1.13-3.40)		20902	
D 11 18O2 PFHxS										
403.00 > 84.00	2.264	2.264	0.0	0.870	4798302	2.20		93.0	55385	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.264	2.266	-0.002	1.000	5069851	2.16		95.0	16553	
399.00 > 99.00	2.264	2.266	-0.002	1.000	1712045		2.96(1.50-4.49)		3986	
65 ADONA										
377.00 > 251.00	2.290	2.305	-0.015	0.772	10155547	NC			86652	
377.00 > 85.00	2.290	2.305	-0.015	0.772	6119454		1.66(0.84-2.53)		21235	
D 12 M2-6:2FTS										
429.00 > 81.00	2.579	2.579	0.0	0.991	964699	2.27		95.4	18991	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.579	2.588	-0.009	1.000	1590348	2.37		99.9	34265	
D 14 13C4 PFOA										
417.00 > 372.00	2.602	2.602	0.0	1.000	3510534	2.50		100	65111	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.602	2.611	-0.009	1.000	4134856	2.55		102	3072	
413.00 > 169.00	2.602	2.611	-0.009	1.000	2113183		1.96(0.84-2.52)		11958	
* 62 13C2-PFOA										
415.00 > 370.00	2.602	2.611	-0.009		3652495	2.50			42622	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.610	2.619	-0.009	0.881	4672569	2.59		109	29580	
449.00 > 99.00	2.610	2.619	-0.009	0.881	1218199		3.84(1.94-5.82)		14889	
D 19 13C5 PFNA										
468.00 > 423.00	2.964	2.964	0.0	1.139	2923359	2.39		95.7	58120	
D 18 13C4 PFOS										
503.00 > 80.00	2.964	2.964	0.0	1.139	3116149	2.07		86.5	33494	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.964	2.973	-0.009	1.000	3537138	2.42		104	21562	
499.00 > 99.00	2.964	2.973	-0.009	1.000	797841		4.43(2.31-6.93)		6296	
20 Perfluorononanoic acid										
463.00 > 419.00	2.964	2.979	-0.015	1.000	3227958	2.56		102	11875	
463.00 > 169.00	2.964	2.979	-0.015	1.000	751118		4.30(1.90-5.69)		32401	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.176	3.187	-0.011	1.071	6005646	NC			66033	
D 26 M2-8:2FTS										
529.00 > 81.00	3.311	3.311	0.0	1.272	915758	2.21		92.2	19411	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.311	3.322	-0.011	1.000	1310651	2.54		106	61909	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.311	3.322	-0.011	1.117	2477112	2.64		110	34953	
549.00 > 99.00	3.311	3.322	-0.011	1.117	943233		2.63(1.33-3.97)		7351	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.326	3.327	-0.001	1.278	2323565	2.54		102	41440	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.326	3.330	-0.004	1.000	2534570	2.55		102	5281	
513.00 > 169.00	3.326	3.330	-0.004	1.000	437324		5.80(2.36-7.09)		10077	
D 21 13C8 FOSA										
506.00 > 78.00	3.343	3.343	0.0	1.285	5085126	2.30		91.8	41507	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.343	3.355	-0.012	1.000	5191578	2.59		103	44022	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.473	3.473	0.0	1.335	574110	2.59		104	13777	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.482	3.486	-0.004	1.003	548056	2.35		93.9	5232	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.637	3.647	-0.010	1.398	599306	2.52		101	5844	
D 30 13C2 PFUnA										
565.00 > 520.00	3.647	3.647	0.0	1.402	1701459	2.42		96.7	35683	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.637	3.650	-0.013	1.227	2165752	2.55		106	50297	
599.00 > 99.00	3.637	3.650	-0.013	1.227	716144		3.02(1.39-4.16)		8254	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.647	3.659	-0.012	1.003	533227	2.50		99.8	15297	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.647	3.659	-0.012	1.000	2078711	2.48		99.1	5210	
563.00 > 169.00	3.647	3.659	-0.012	1.000	381646		5.45(2.12-6.36)		20283	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.803	3.815	-0.012	1.283	8706098	NC			100460	
D 36 13C2 PFDoA										
615.00 > 570.00	3.939	3.943	-0.004	1.514	1574134	2.58		103	25488	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.939	3.951	-0.012	1.000	1648698	2.42		96.7	492	
613.00 > 169.00	3.939	3.951	-0.012	1.000	395494		4.17(2.13-6.40)		6937	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.203	-0.011	1.064	1379028	2.32		93.0	380	
663.00 > 169.00	4.192	4.203	-0.011	1.064	450159		3.06(1.25-3.76)		5758	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.433	-0.007	1.701	1219754	2.38		95.4	5731	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.437	-0.011	1.000	320629	2.44		97.6	4725	
713.00 > 219.00	4.426	4.437	-0.011	1.000	225254		1.42(0.71-2.13)		3800	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.829	-0.005	1.854	1744254	1.98		79.2	2378	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.824	4.833	-0.009	1.000	1746525	NC			90.4	
813.00 > 169.00	4.824	4.833	-0.009	1.000	286407		6.10(2.86-8.58)		3129	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.166	5.166	0.0	1.071	2255973	NC			832	
913.00 > 169.00	5.158	5.166	-0.008	1.069	280675		8.04(3.83-11.48)		2916	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 11:15:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_012.d

Injection Date: 03-Aug-2018 06:16:45 Instrument ID: A8_N

Lims ID: CCV L5

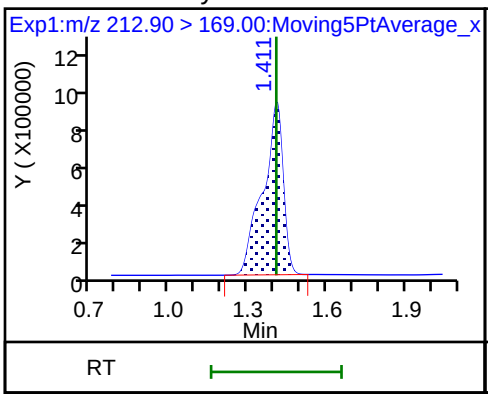
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 29 Worklist Smp#: 1

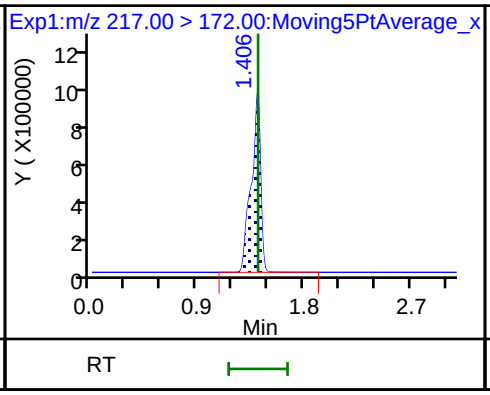
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

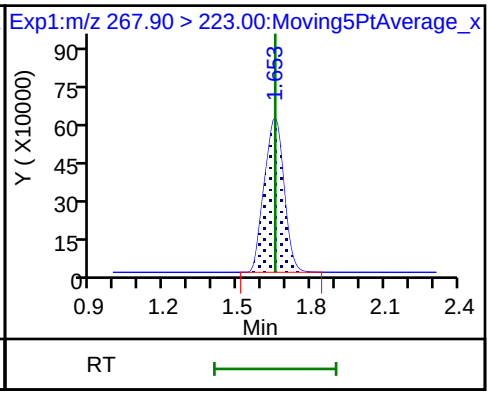
2 Perfluorobutyric acid



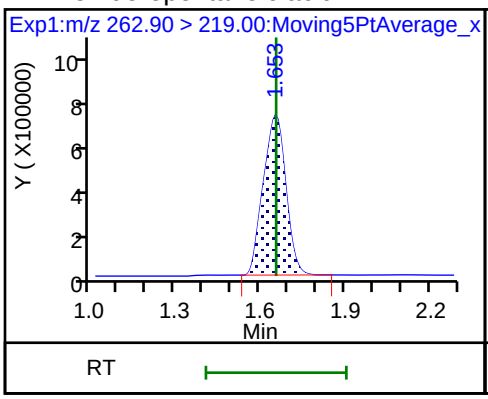
D 1 13C4 PFBA



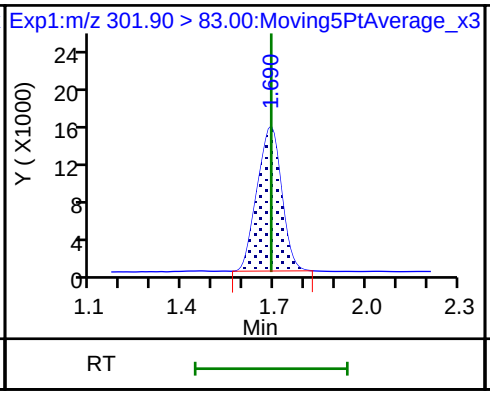
D 3 13C5-PFPeA



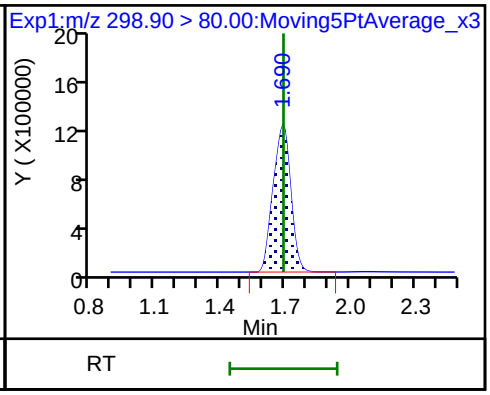
4 Perfluoropentanoic acid



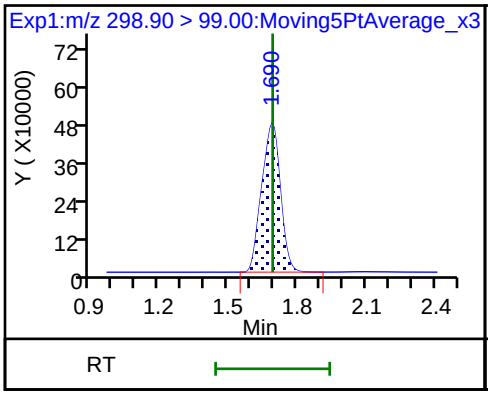
D 47 13C3-PFBS



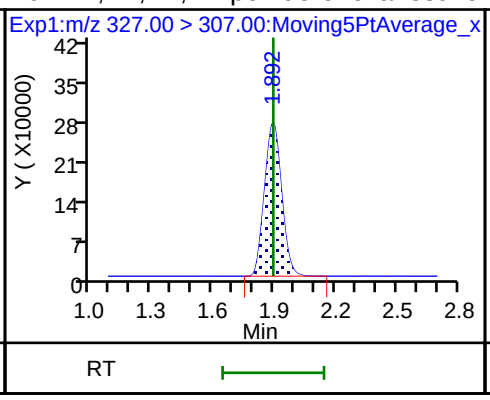
5 Perfluorobutanesulfonic acid



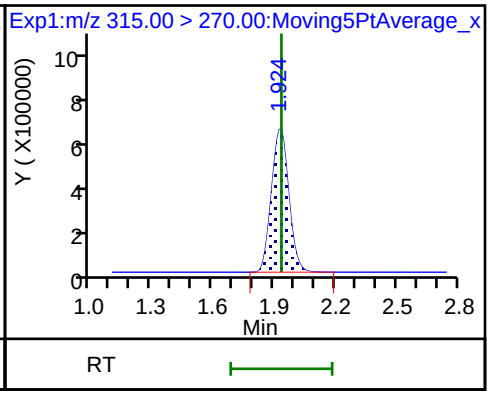
5 Perfluorobutanesulfonic acid



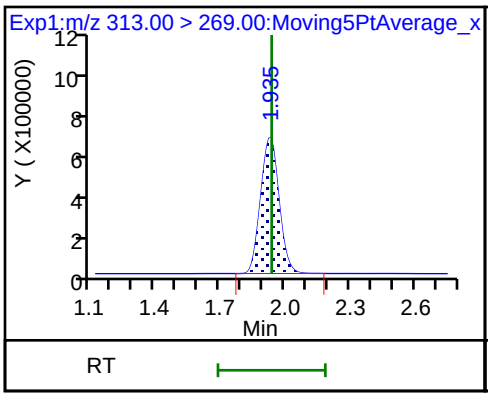
61 1H,1H,2H,2H-perfluorohexanesulfon



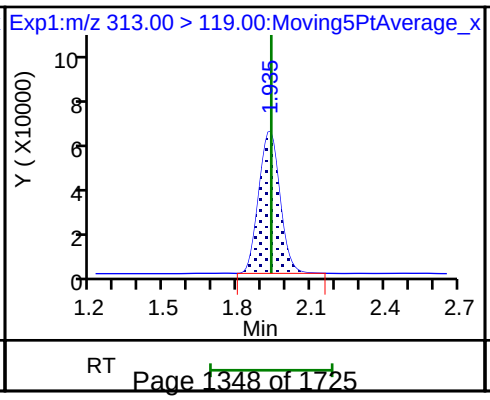
D 7 13C2 PFHxA



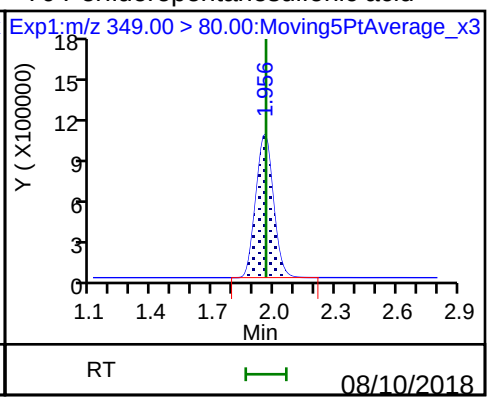
6 Perfluorohexanoic acid



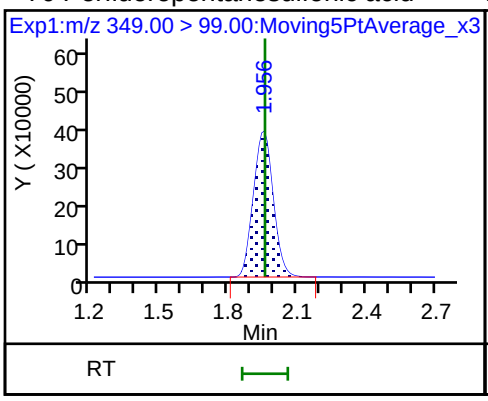
6 Perfluorohexanoic acid



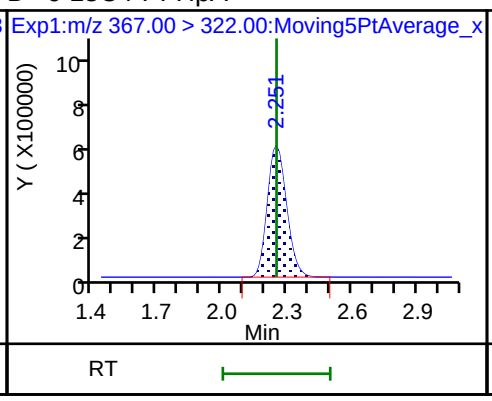
70 Perfluoropentanesulfonic acid



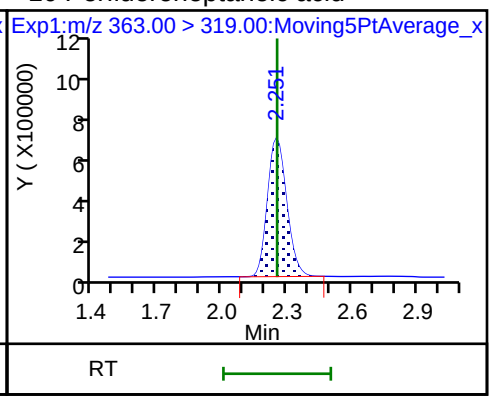
70 Perfluoropentanesulfonic acid



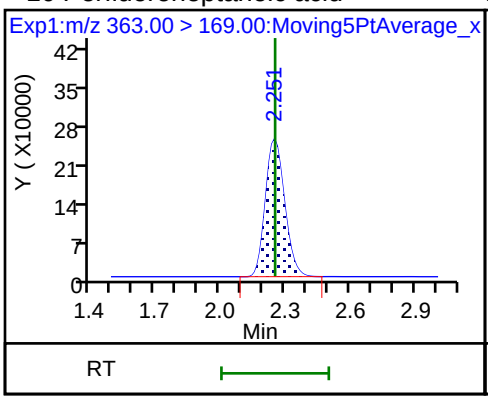
D 9 13C4-PFHpA



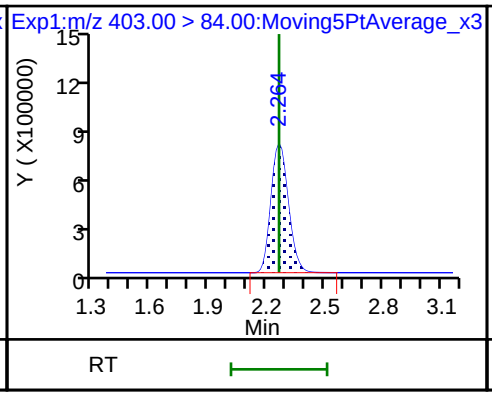
10 Perfluoroheptanoic acid



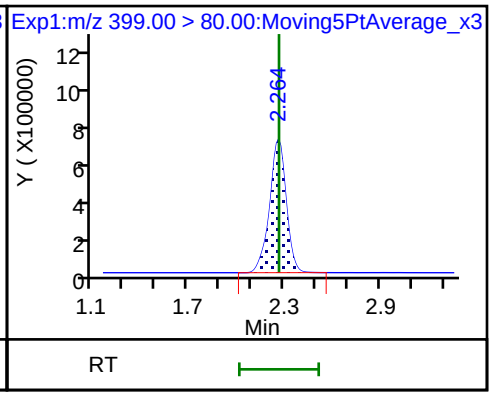
10 Perfluoroheptanoic acid



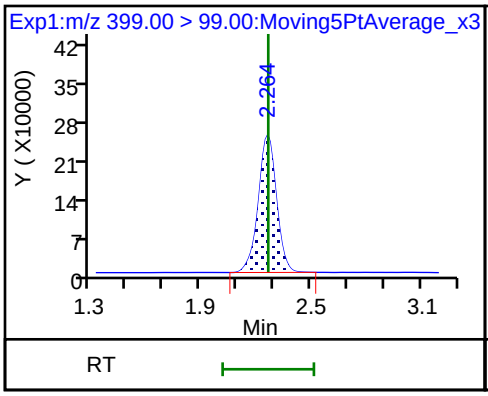
D 11 18O2 PFHxS



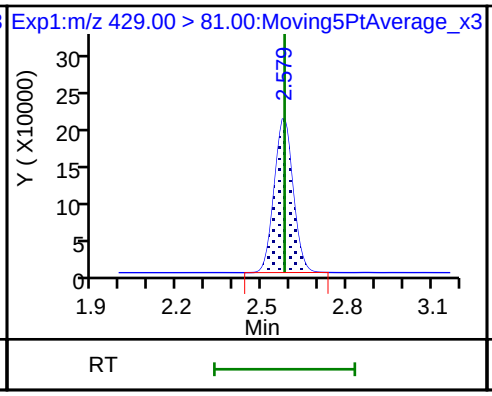
8 Perfluorohexanesulfonic acid



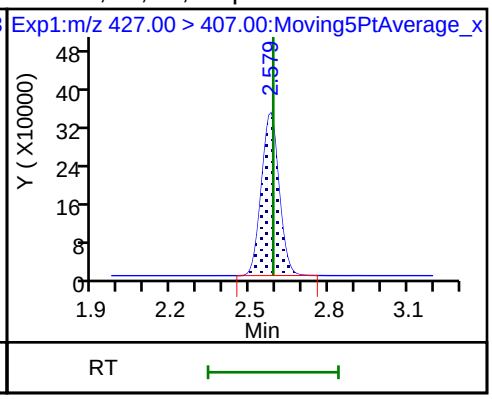
8 Perfluorohexanesulfonic acid



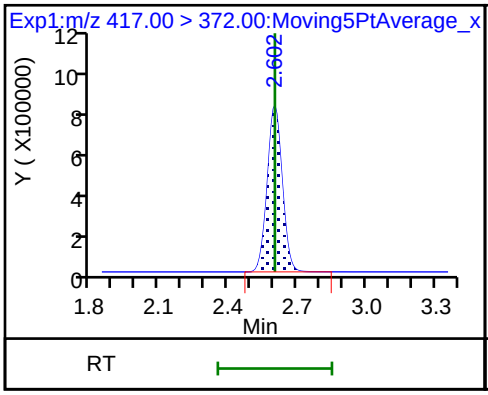
D 12 M2-6:2FTS



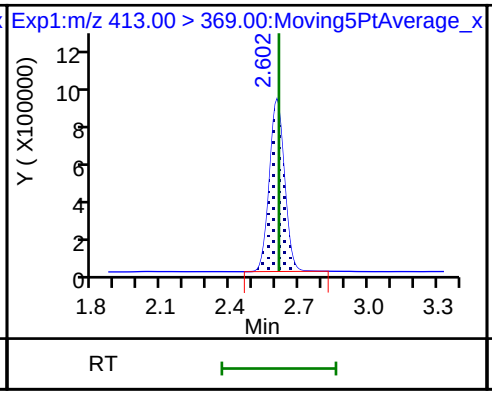
13 1H,1H,2H,2H-perfluorooctanesulfoni



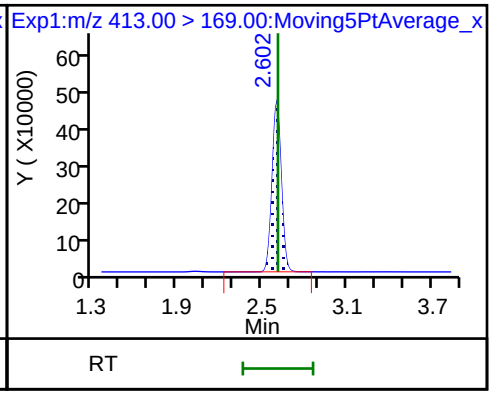
D 14 13C4 PFOA



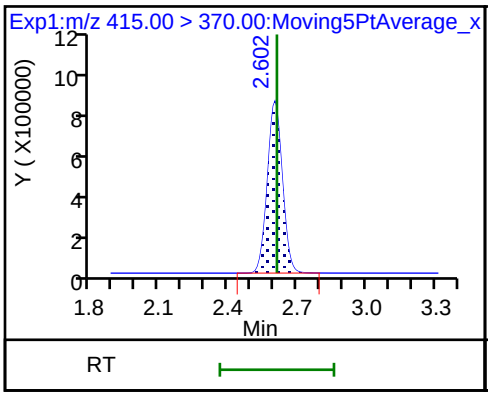
15 Perfluorooctanoic acid



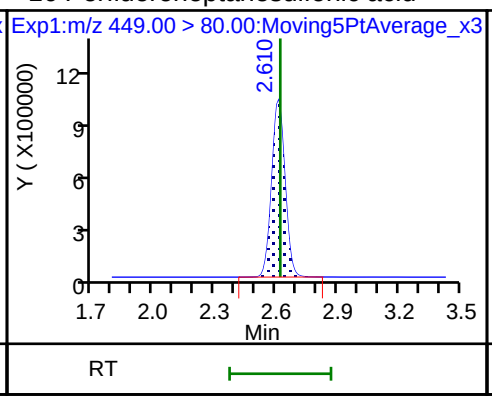
15 Perfluorooctanoic acid



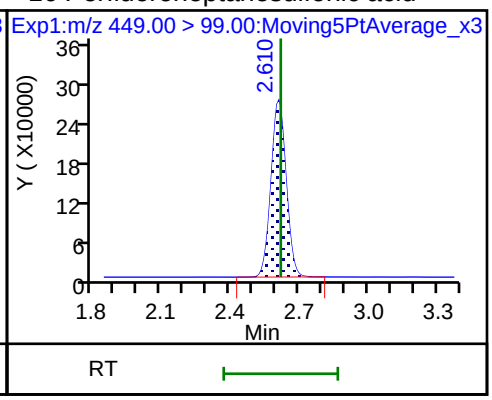
* 62 13C2-PFOA



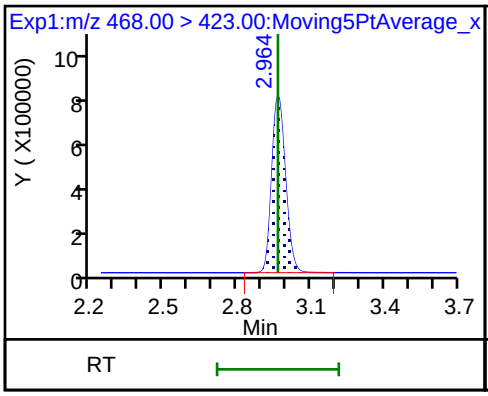
16 Perfluoroheptanesulfonic acid



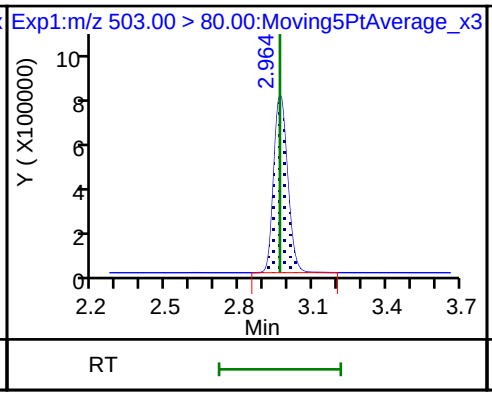
16 Perfluoroheptanesulfonic acid



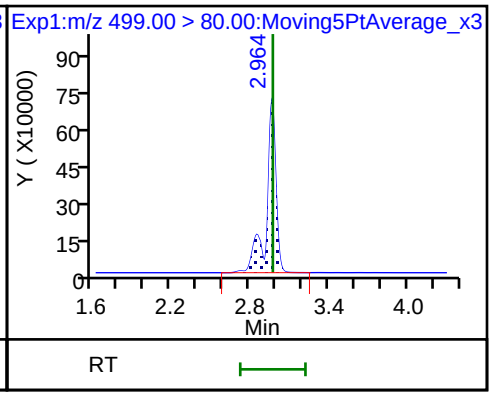
D 19 13C5 PFNA



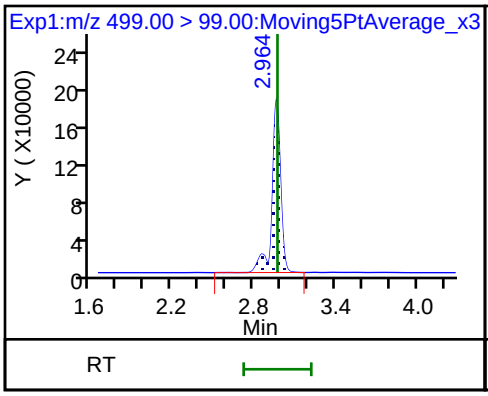
D 18 13C4 PFOS



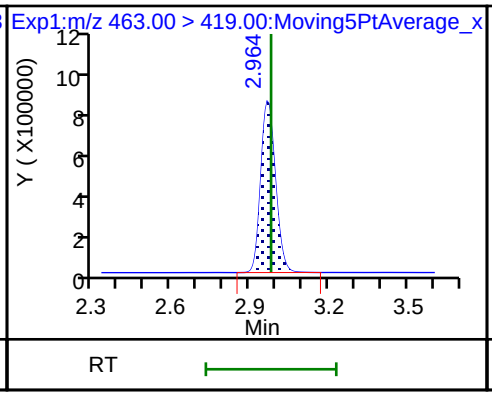
17 Perfluorooctane sulfonic acid



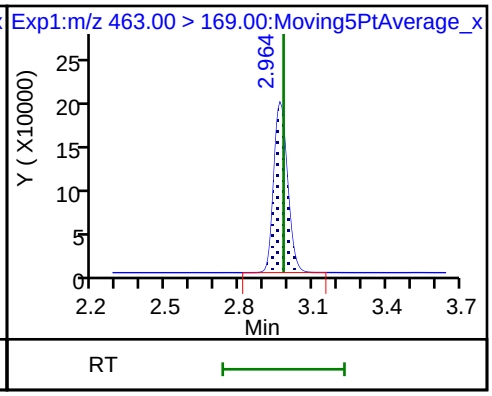
17 Perfluorooctane sulfonic acid



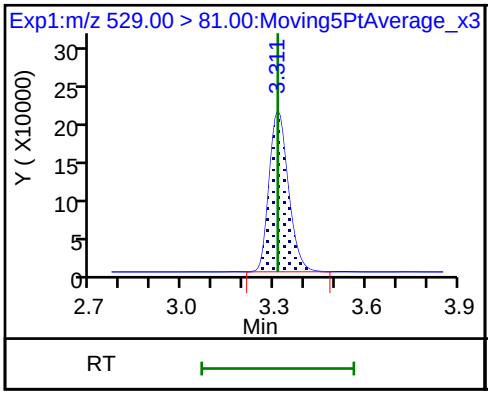
20 Perfluorononanoic acid



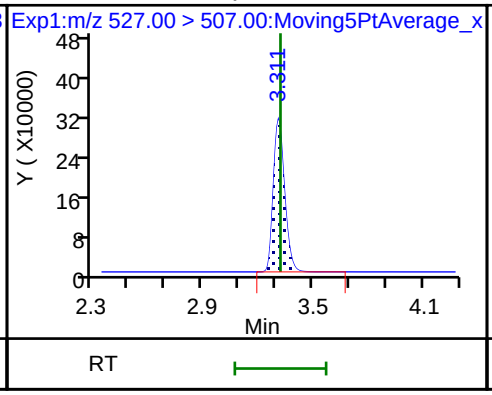
20 Perfluorononanoic acid



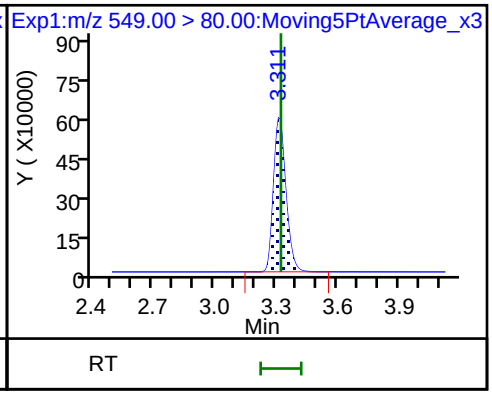
D 26 M2-8:2FTS



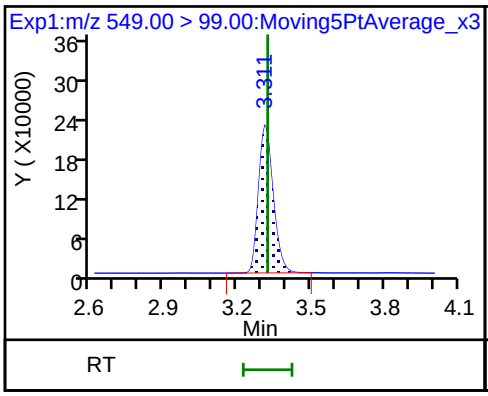
25 1H,1H,2H,2H-perfluorodecanesulfoni



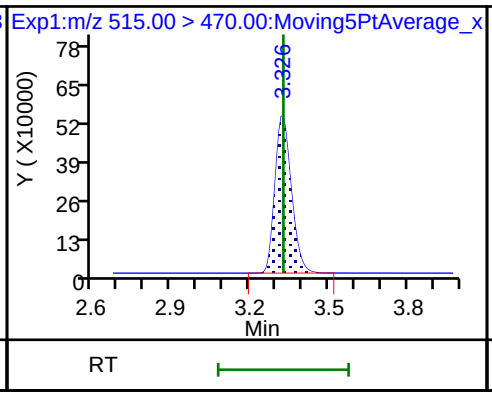
68 Perfluorononanesulfonic acid



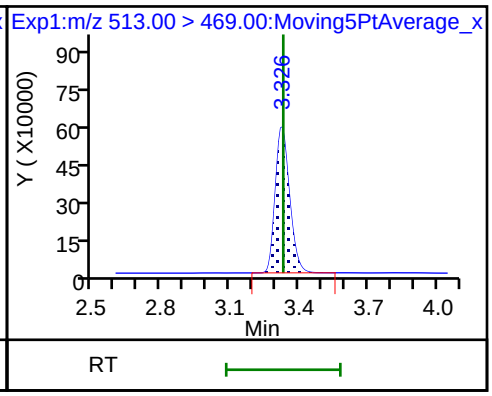
68 Perfluorononanesulfonic acid



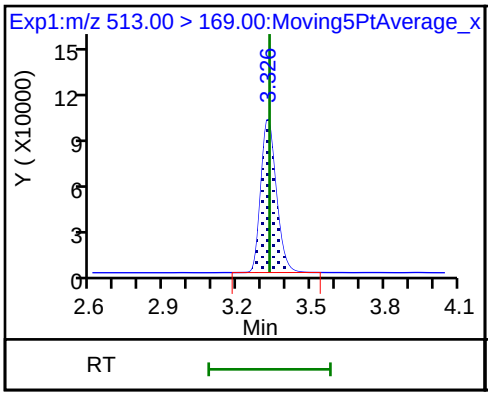
D 23 13C2 PFDA



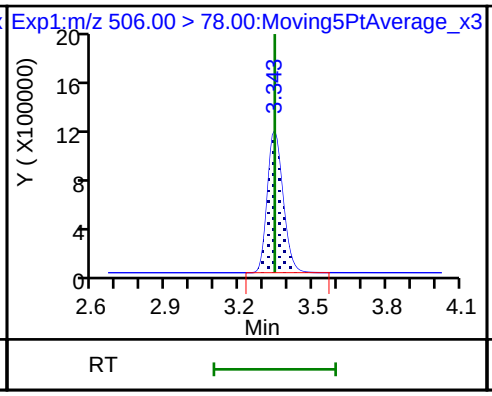
24 Perfluorodecanoic acid



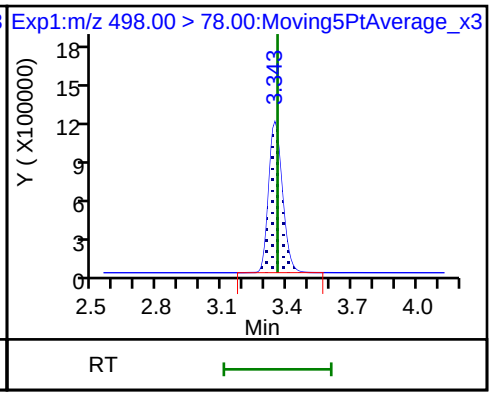
24 Perfluorodecanoic acid



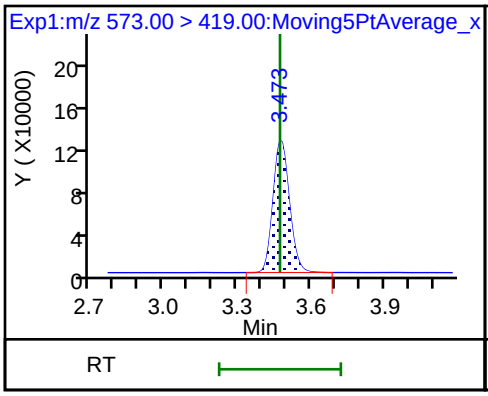
D 21 13C8 FOSA



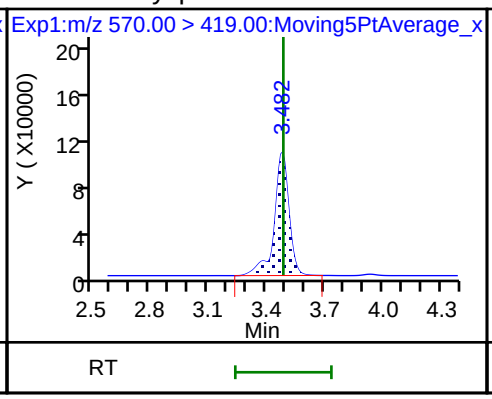
22 Perfluorooctane Sulfonamide



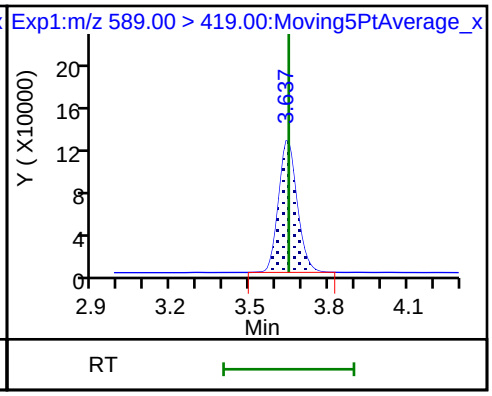
D 27 d3-NMeFOSAA



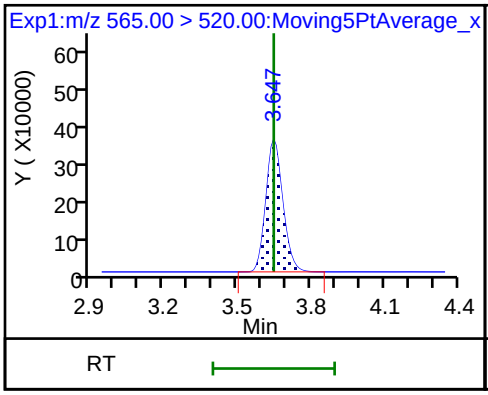
28 N-methyl perfluorooctane sulfonami



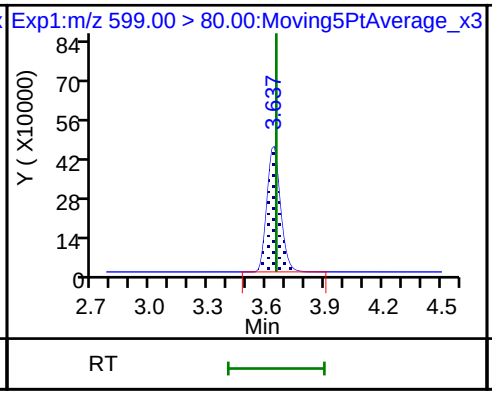
D 32 d5-NEtFOSAA



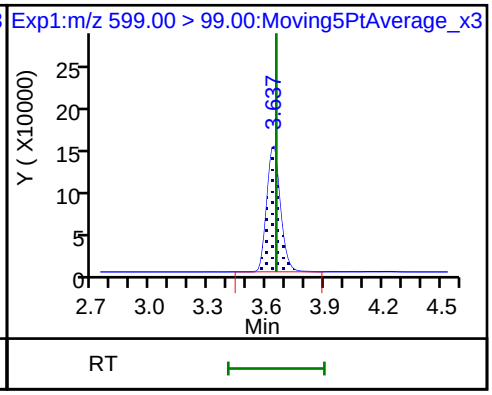
D 30 13C2 PFUnA



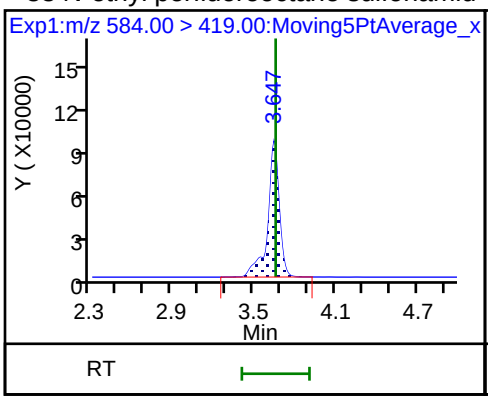
29 Perfluorodecane Sulfonic acid



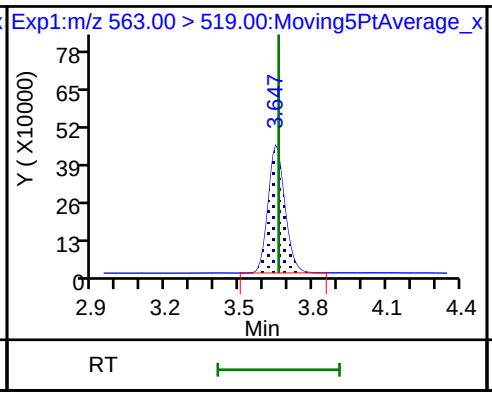
29 Perfluorodecane Sulfonic acid



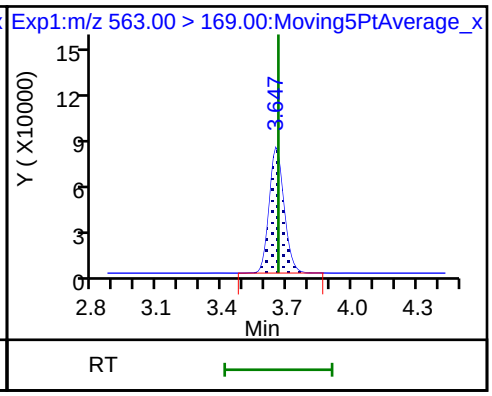
33 N-ethyl perfluorooctane sulfonamid



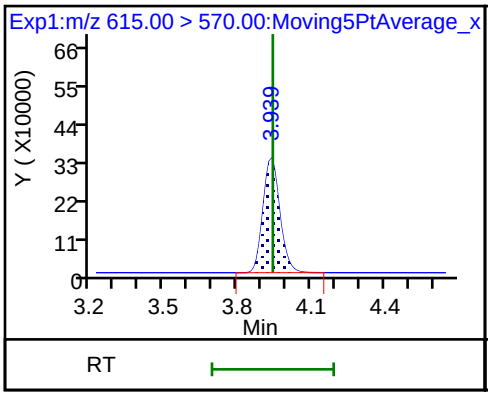
31 Perfluoroundecanoic acid



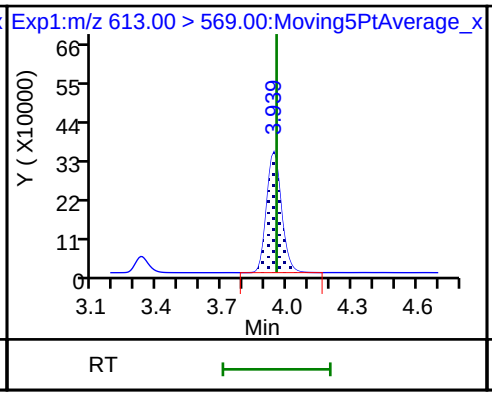
31 Perfluoroundecanoic acid



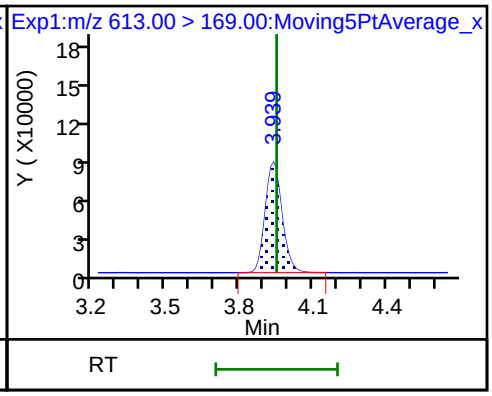
D 36 13C2 PFDoA



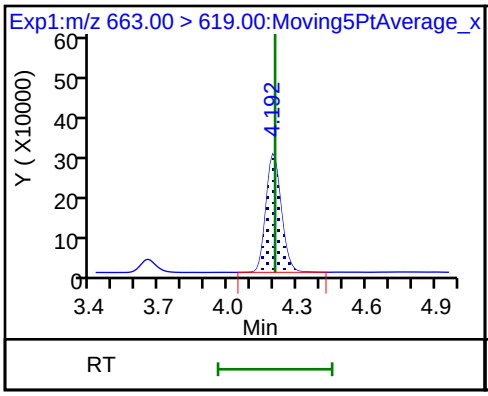
37 Perfluorododecanoic acid



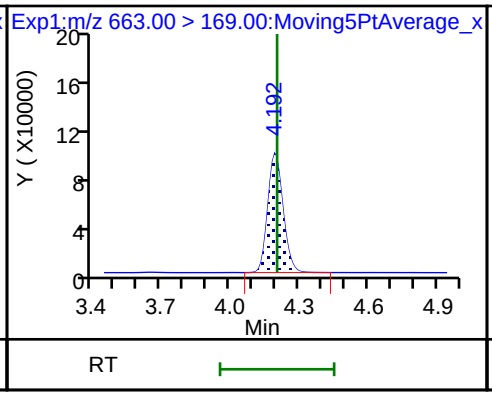
37 Perfluorododecanoic acid



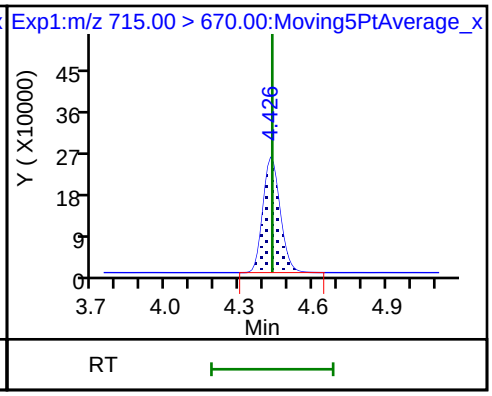
41 Perfluorotridecanoic acid



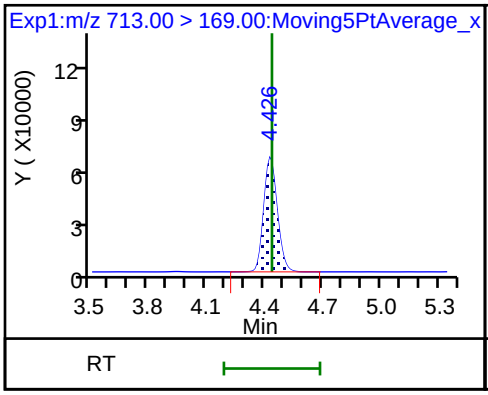
41 Perfluorotridecanoic acid



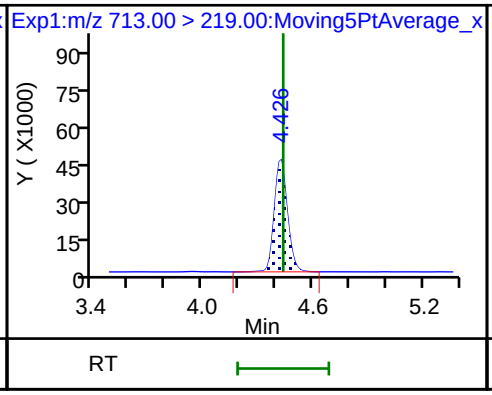
D 43 13C2-PFTeDA



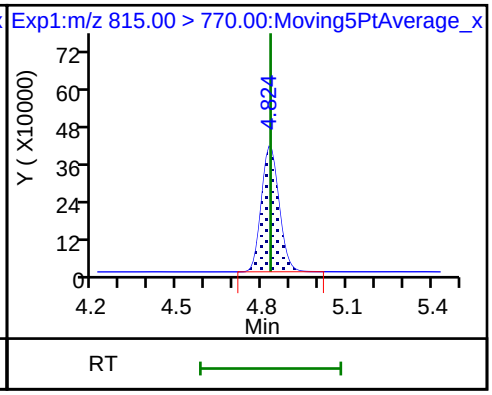
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/12 Calibration Date: 08/03/2018 07:42

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9524		0.966	1.00	-3.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.133		0.946	1.00	-5.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	76.44		0.882	0.884	-0.3	30.0
4:2 FTS	AveID	17.21	18.39		0.998	0.934	6.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	0.9906		0.939	1.00	-6.1	30.0
Perfluoropentanesulfonic acid	AveID	67.65	69.25		0.960	0.938	2.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.096		0.945	1.00	-5.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.079		0.850	0.910	-6.6	30.0
6:2 FTS	AveID	1.654	1.605		0.920	0.948	-2.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.136		0.984	1.00	-1.7	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.427		0.983	0.952	3.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.129		0.934	0.928	0.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.062		0.984	1.00	-1.6	30.0
8:2 FTS	AveID	1.351	1.237		0.877	0.958	-8.4	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7778		1.04	0.960	8.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.023		0.958	1.00	-4.2	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.003		1.02	1.00	1.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.056		1.04	1.00	3.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6710		0.995	0.964	3.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.9092		1.02	1.00	2.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.090		0.885	1.00	-11.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.047		0.967	1.00	-3.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.8923		0.947	1.00	-5.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2516		0.934	1.00	-6.6	30.0
13C4 PFBA	Ave	1.440	1.327		2.30	2.50	-7.8	30.0
13C5-PFPeA	Ave	0.9481	0.9430		2.49	2.50	-0.5	30.0
13C3-PFBS	Ave	0.0273	0.0254		2.17	2.33	-6.7	30.0
13C2 PFHxA	Ave	1.026	1.052		2.56	2.50	2.5	30.0
13C4-PFHpA	Ave	0.9943	0.9903		2.49	2.50	-0.4	30.0
18O2 PFHxS	Ave	1.494	1.403		2.22	2.37	-6.1	30.0
M2-6:2FTS	Ave	0.2913	0.2881		2.35	2.38	-1.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/12 Calibration Date: 08/03/2018 07:42

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9578		2.49	2.50	-0.2	30.0
13C4 PFOS	Ave	1.032	0.9196		2.13	2.39	-10.9	30.0
13C5 PFNA	Ave	0.8365	0.8289		2.48	2.50	-0.9	30.0
M2-8:2FTS	Ave	0.2839	0.2932		2.47	2.40	3.3	30.0
13C2 PFDA	Ave	0.6256	0.6683		2.67	2.50	6.8	30.0
13C8 FOSA	Ave	1.516	1.432		2.36	2.50	-5.5	30.0
d3-NMeFOSAA	Ave	0.1518	0.1528		2.52	2.50	0.6	30.0
d5-NEtFOSAA	Ave	0.1627	0.1670		2.56	2.50	2.6	30.0
13C2 PFUnA	Ave	0.4818	0.4809		2.50	2.50	-0.2	30.0
13C2 PFDoA	Ave	0.4172	0.4180		2.50	2.50	0.2	30.0
13C2-PFTeDA	Ave	0.3502	0.3330		2.38	2.50	-4.9	30.0
13C2-PFHxDA	Ave	0.6033	0.4944		2.05	2.50	-18.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_023.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 07:42:57 ALS Bottle#: 28 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:24:13 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:24:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.407	1.407	0.0	1.000	1717774	0.9664		96.6	773	
D 1 13C4 PFBA										
217.00 > 172.00	1.407	1.411	-0.004	0.539	4509244	2.30		92.2	92826	
D 3 13C5-PFPeA										
267.90 > 223.00	1.656	1.653	0.003	0.634	3205375	2.49		99.5	52677	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.656	1.656	0.0	1.000	1452476	0.9461		94.6	556	M
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.690	0.002	0.648	80375	2.17		93.3	421	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.692	1.692	0.0	1.000	2336086	0.8816		99.7	5616	
298.90 > 99.00	1.692	1.692	0.0	1.000	965717		2.42(1.25-3.74)		4415	
D 60 M2-4:2FTS										
329.00 > 81.00	1.894	1.892	0.002	0.726	620216	NC			7163	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.894	1.894	0.0	1.120	593847	1.00		107	33919	
D 7 13C2 PFHxA										
315.00 > 270.00	1.937	1.935	0.003	0.742	3575377	2.56		103	100152	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.937	1.937	0.0	1.000	1416674	0.9393		93.9	5100	
313.00 > 119.00	1.937	1.937	0.0	1.000	143004		9.91(5.03-15.10)		2192	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.959	1.959	0.0	1.157	2245565	0.9601		102	28754	
349.00 > 99.00	1.959	1.959	0.0	1.157	839842		2.67(1.36-4.07)		9908	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.025	2.025	0.0	1.000	274729	NC			2338	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.025	2.033	-0.008	0.776	186730	NC			5137	
D 9 13C4-PFHpA										
367.00 > 322.00	2.253	2.251	0.002	0.863	3366282	2.49		99.6	54583	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.253	2.253	0.0	1.000	1476330	0.9455		94.5	865	
363.00 > 169.00	2.253	2.253	0.0	1.000	534868		2.76(1.13-3.40)		9617	
D 11 18O2 PFHxS										
403.00 > 84.00	2.266	2.264	0.002	0.868	4511210	2.22		93.9	45059	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.266	2.266	0.0	1.000	1873609	0.8497		93.4	7304	
399.00 > 99.00	2.266	2.266	0.0	1.000	616742		3.04(1.50-4.49)		1546	
65 ADONA										
377.00 > 251.00	2.305	2.305	0.0	0.776	3796249	NC			40672	
377.00 > 85.00	2.305	2.305	0.0	0.776	2237347		1.70(0.84-2.53)		8389	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.579	0.009	0.991	930448	2.35		98.9	22512	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.588	2.588	0.0	1.000	596260	0.9203		97.1	14216	
D 14 13C4 PFOA										
417.00 > 372.00	2.611	2.602	0.009	1.000	3255637	2.49		99.8	44784	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.611	2.611	0.0	1.000	1481017	0.9836		98.3	989	
413.00 > 169.00	2.611	2.611	0.0	1.000	773528		1.91(0.84-2.52)		5630	
* 62 13C2-PFOA										
415.00 > 370.00	2.611	2.611	0.0		3399258	2.50			53375	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.619	2.619	0.0	0.881	1698587	0.9827		103	17752	
449.00 > 99.00	2.619	2.619	0.0	0.881	464339		3.66(1.94-5.82)		7830	
D 19 13C5 PFNA										
468.00 > 423.00	2.973	2.964	0.009	1.139	2817763	2.48		99.1	48197	
D 18 13C4 PFOS										
503.00 > 80.00	2.973	2.964	0.009	1.139	2988449	2.13		89.1	39951	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.973	2.973	0.0	1.000	1310456	0.9335		101	12276	
499.00 > 99.00	2.973	2.973	0.0	1.000	301171		4.35(2.31-6.93)		3370	
20 Perfluorononanoic acid										
463.00 > 419.00	2.979	2.979	0.0	1.002	1197146	0.9836		98.4	4140	
463.00 > 169.00	2.973	2.979	-0.006	1.000	269235		4.45(1.90-5.69)		9668	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.187	3.187	0.0	1.072	2147845	NC			22584	
D 26 M2-8:2FTS										
529.00 > 81.00	3.322	3.311	0.011	1.272	954941	2.47		103	18361	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.322	3.322	0.0	1.000	472680	0.8774		91.6	15739	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.322	3.322	0.0	1.118	933682	1.04		108	22210	
549.00 > 99.00	3.322	3.322	0.0	1.118	352197		2.65(1.33-3.97)		3223	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.330	3.327	0.003	1.275	2271707	2.67		107	88459	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.330	3.330	0.0	1.000	929559	0.9584		95.8	1794	
513.00 > 169.00	3.330	3.330	0.0	1.000	162786		5.71(2.36-7.09)		4274	
D 21 13C8 FOSA										
506.00 > 78.00	3.347	3.343	0.004	1.282	4868882	2.36		94.5	32970	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.355	3.355	0.0	1.003	1953038	1.02		102	24386	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.486	3.473	0.013	1.335	519361	2.52		101	16219	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.486	3.486	0.0	1.000	219322	1.04		104	2596	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.650	3.647	0.003	1.398	567569	2.56		103	5147	
D 30 13C2 PFUnA										
565.00 > 520.00	3.659	3.647	0.012	1.401	1634532	2.50		99.8	57226	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.650	3.650	0.0	1.228	808830	0.99		103	24477	
599.00 > 99.00	3.650	3.650	0.0	1.228	288200		2.81(1.39-4.16)		2880	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.659	3.659	0.0	1.003	206413	1.02		102	4544	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.659	3.659	0.0	1.000	712651	0.8845		88.5	1599	
563.00 > 169.00	3.659	3.659	0.0	1.000	137258		5.19(2.12-6.36)		7177	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.815	3.815	0.0	1.284	3116446	NC			43269	
D 36 13C2 PFDoA										
615.00 > 570.00	3.951	3.943	0.008	1.513	1420850	2.50		100	21573	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.951	3.951	0.0	1.000	595050	0.9670		96.7	181	
613.00 > 169.00	3.951	3.951	0.0	1.000	160268		3.71(2.13-6.40)		3388	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.203	4.203	0.0	1.064	507120	0.9468		94.7	146	
663.00 > 169.00	4.203	4.203	0.0	1.064	167694		3.02(1.25-3.76)		1921	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.433	0.004	1.699	1131855	2.38		95.1	5852	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.437	0.0	1.000	113896	0.9339		93.4	2139	
713.00 > 219.00	4.437	4.437	0.0	1.000	86123		1.32(0.71-2.13)		1344	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.829	0.004	1.851	1680649	2.05		82.0	2355	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.833	0.0	1.000	646673	NC			34.4	
813.00 > 169.00	4.833	4.833	0.0	1.000	109397		5.91(2.86-8.58)		1585	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.166	5.166	0.0	1.069	871871	NC			353	
913.00 > 169.00	5.166	5.166	0.0	1.069	106833		8.16(3.83-11.48)		1402	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 11:24:15 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_023.d

Injection Date: 03-Aug-2018 07:42:57 Instrument ID: A8_N

Lims ID: CCV L4

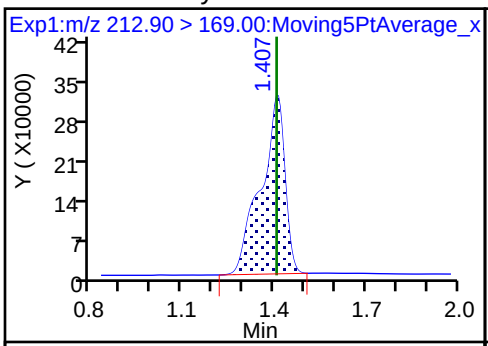
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 12

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid



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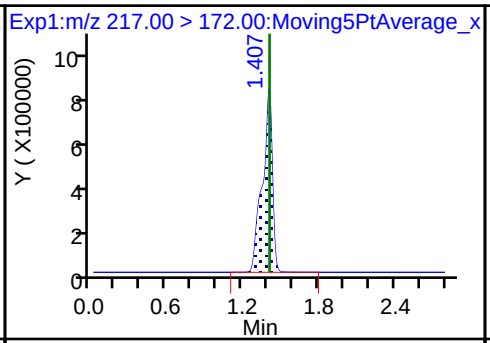
D 1 13C4 PFBA



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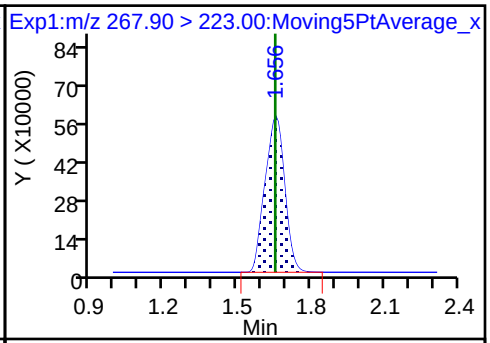
D 3 13C5-PFPeA



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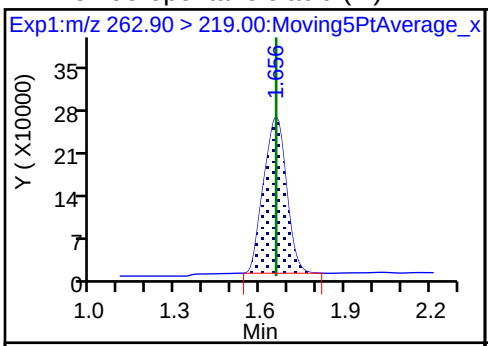
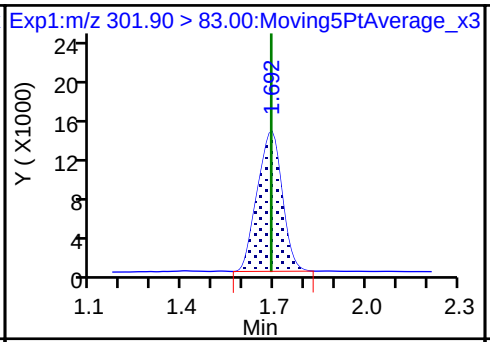
4 Perfluoropentanoic acid (M)



RT

D 47 13C3-PFBS



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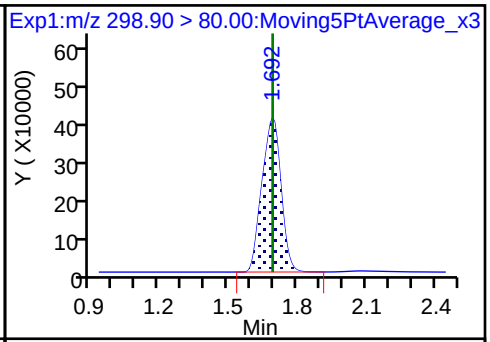
5 Perfluorobutanesulfonic acid



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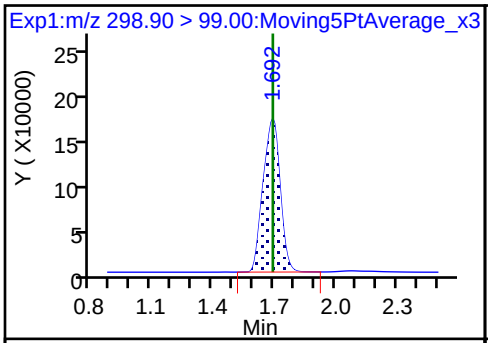
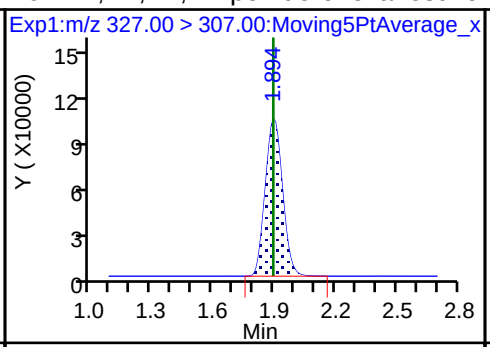
5 Perfluorobutanesulfonic acid



RT

61 1H,1H,2H,2H-perfluorohexanesulfon



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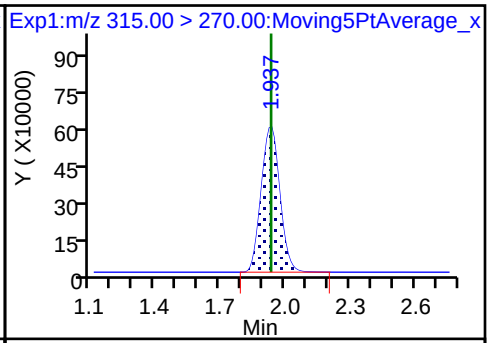
D 7 13C2 PFHxA



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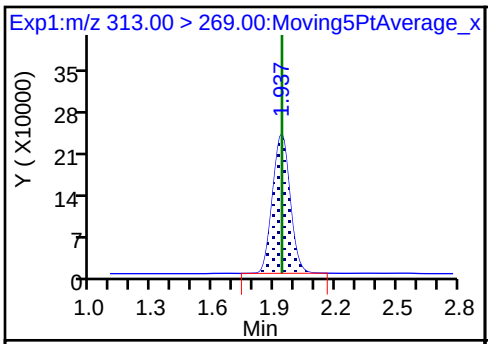
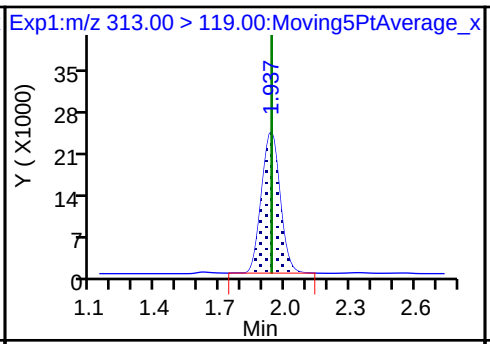
6 Perfluorohexanoic acid



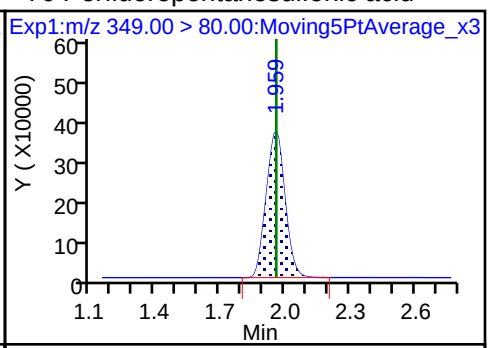
RT

6 Perfluorohexanoic acid



RT

70 Perfluoropentanesulfonic acid



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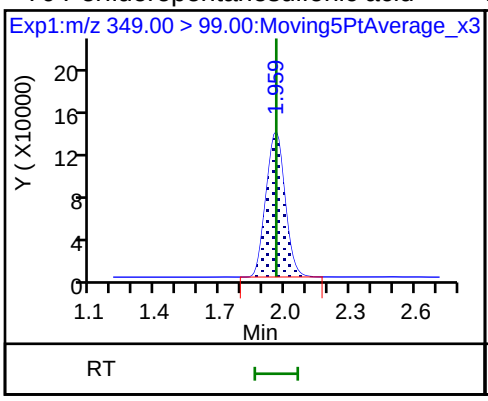
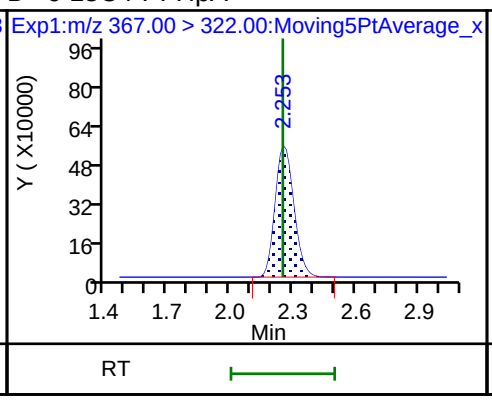
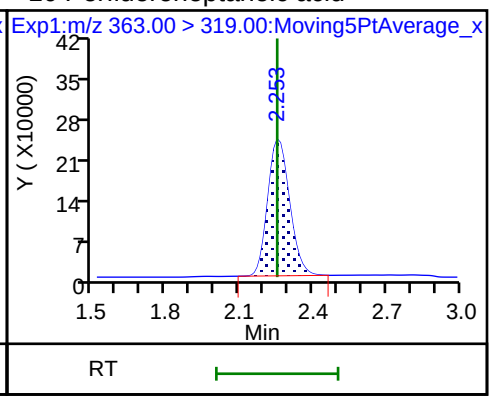
70 Perfluoropentanesulfonic acid



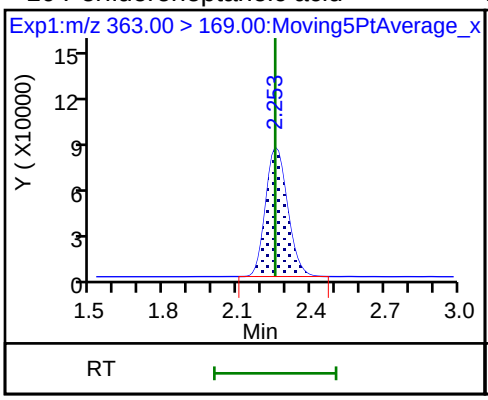
D 9 13C4-PFHpA



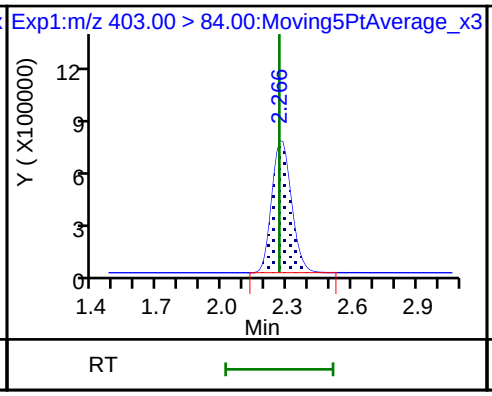
10 Perfluoroheptanoic acid



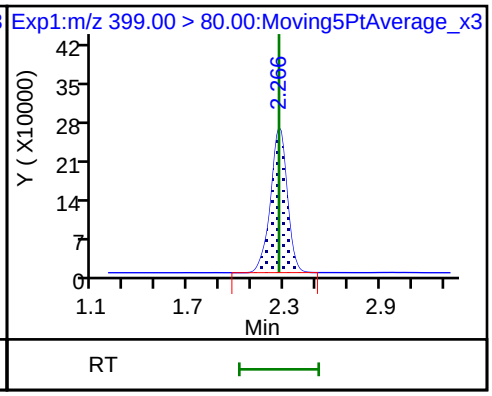
10 Perfluoroheptanoic acid



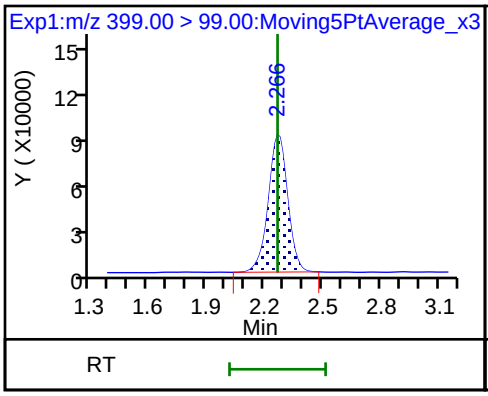
D 11 18O2 PFHxS



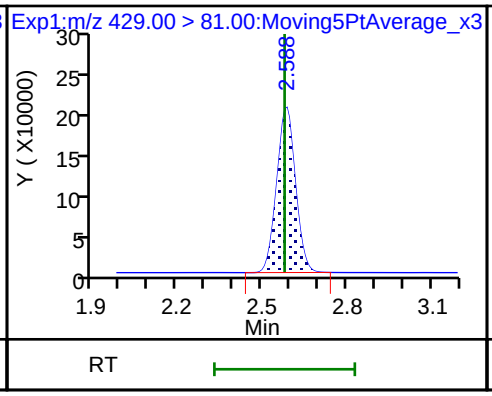
8 Perfluorohexanesulfonic acid



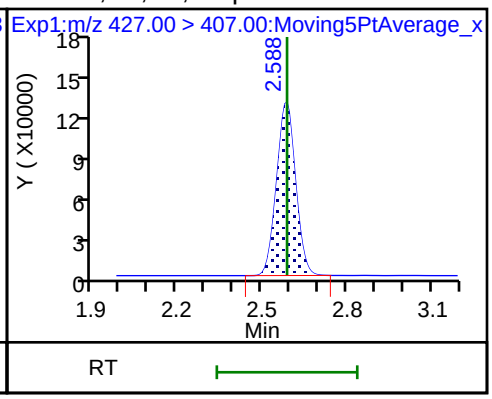
8 Perfluorohexanesulfonic acid



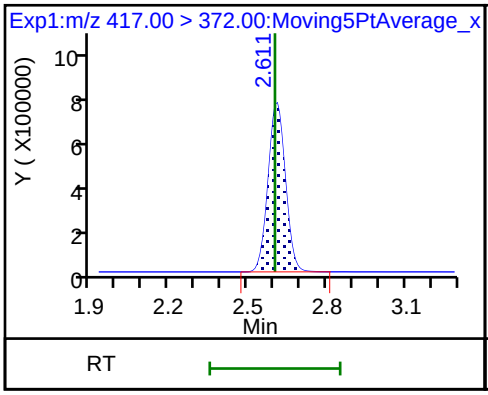
D 12 M2-6:2FTS



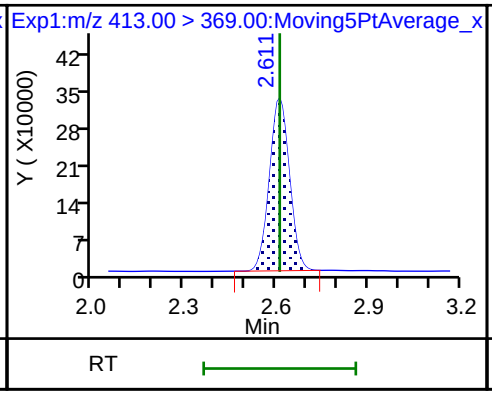
13 1H,1H,2H,2H-perfluorooctanesulfoni



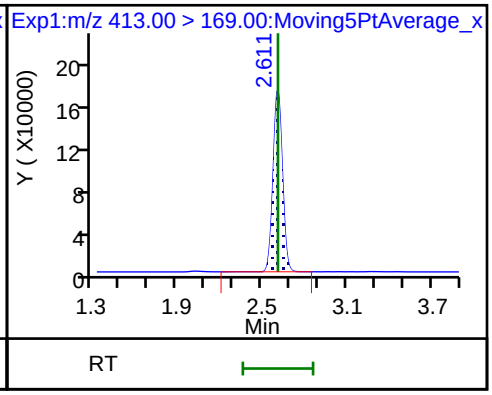
D 14 13C4 PFOA



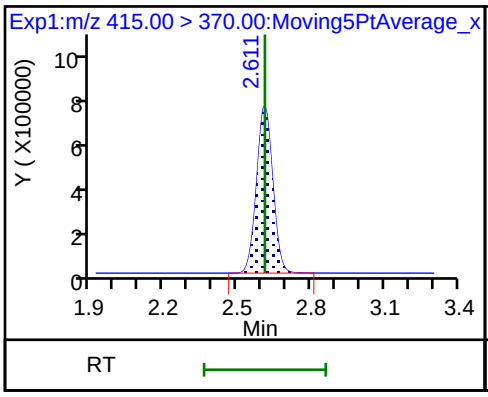
15 Perfluorooctanoic acid



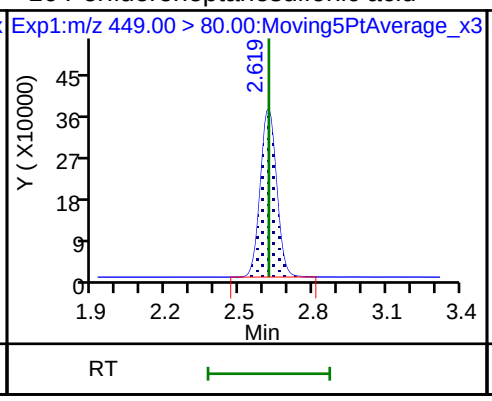
15 Perfluorooctanoic acid



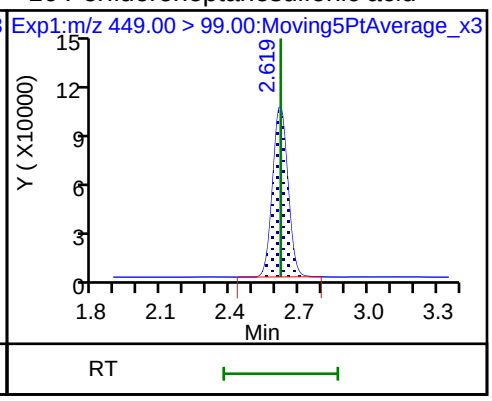
* 62 13C2-PFOA



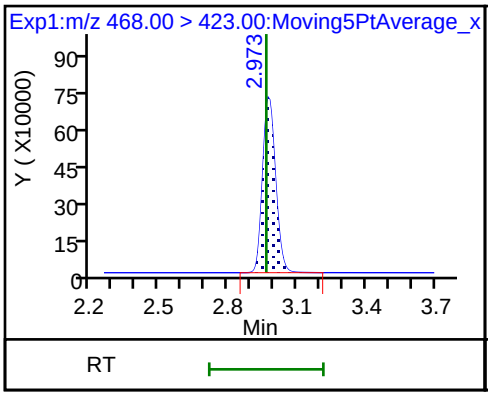
16 Perfluoroheptanesulfonic acid



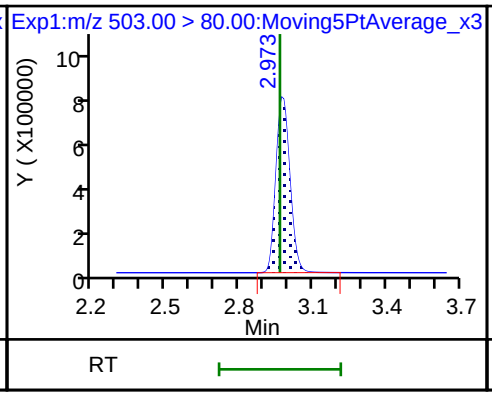
16 Perfluoroheptanesulfonic acid



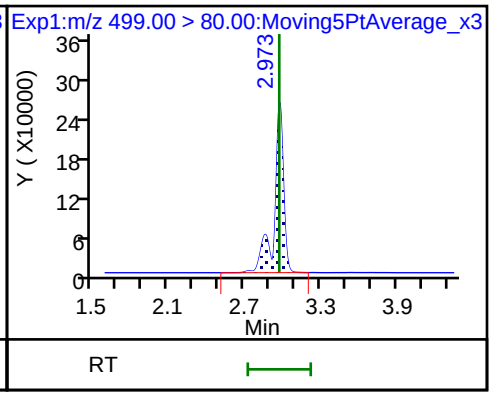
D 19 13C5 PFNA



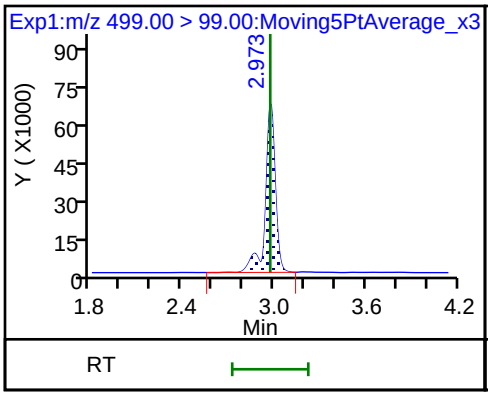
D 18 13C4 PFOS



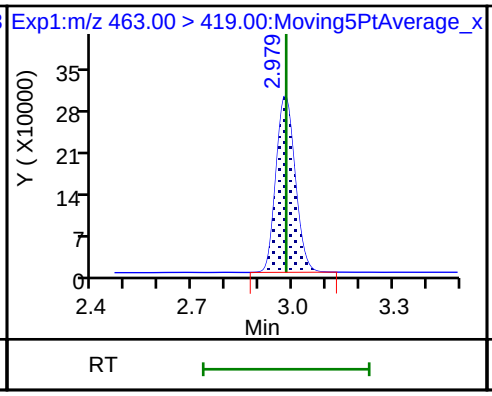
17 Perfluorooctane sulfonic acid



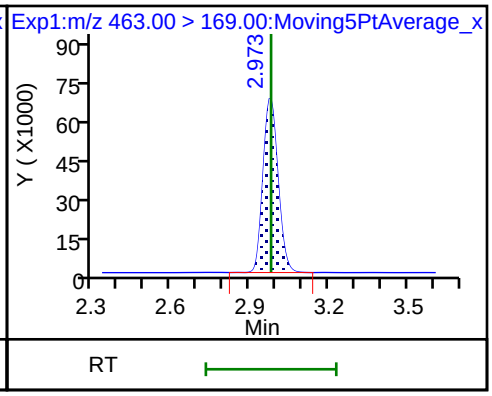
17 Perfluorooctane sulfonic acid



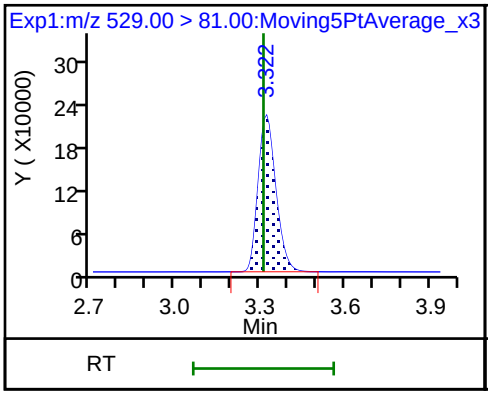
20 Perfluorononanoic acid



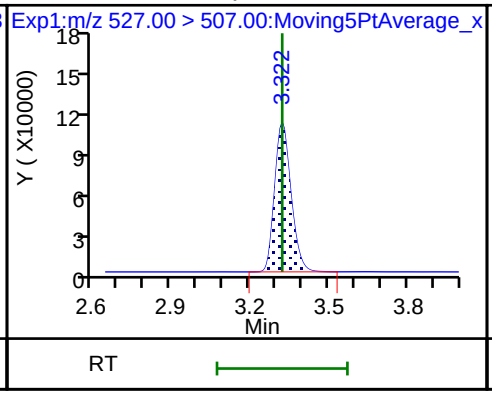
20 Perfluorononanoic acid



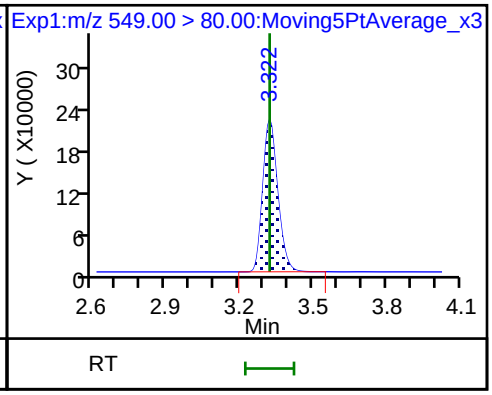
D 26 M2-8:2FTS



25 1H,1H,2H,2H-perfluorodecanesulfoni

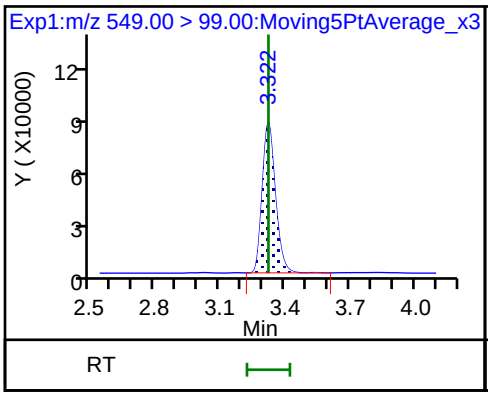


68 Perfluorononanesulfonic acid

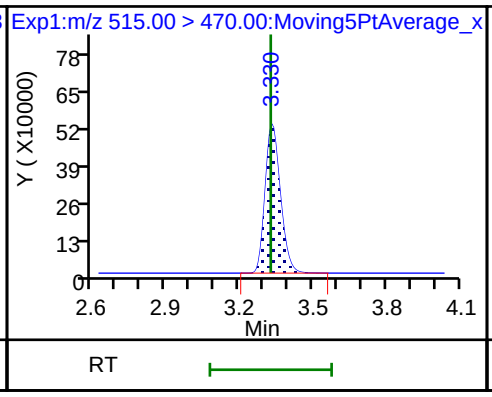


Report Date: 06-Aug-2018 11:24:15 Chrom Revision: 2.3 19-Jul-2018 15:14:50
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_023.d

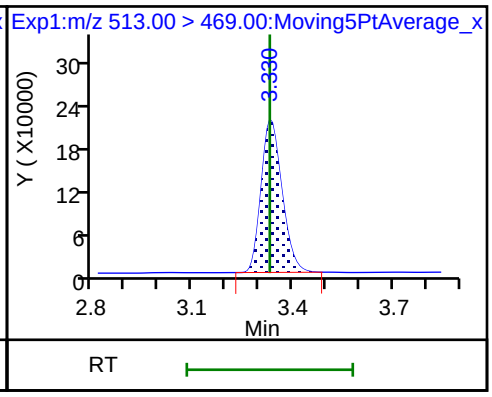
68 Perfluorononanesulfonic acid



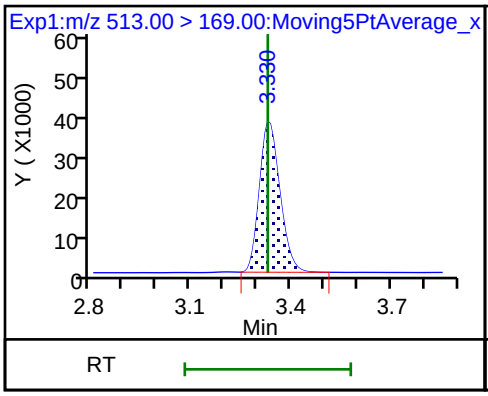
D 23 13C2 PFDA



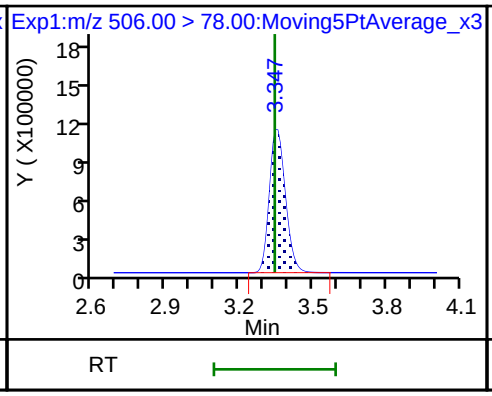
24 Perfluorodecanoic acid



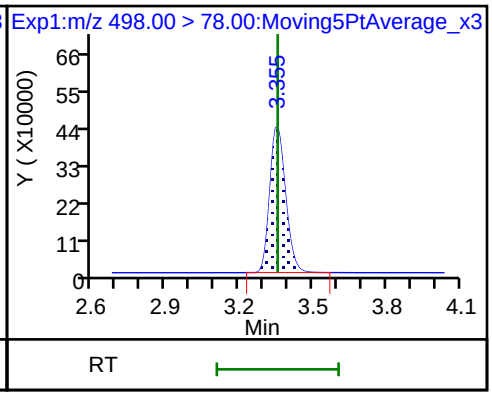
24 Perfluorodecanoic acid



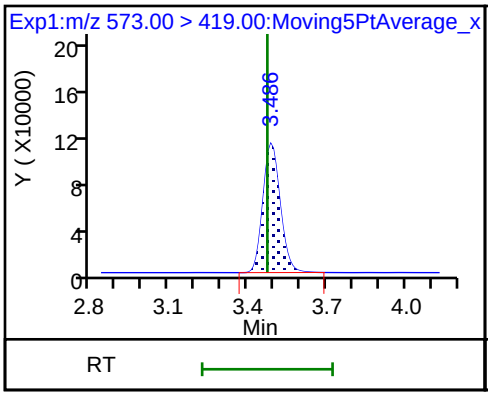
D 21 13C8 FOSA



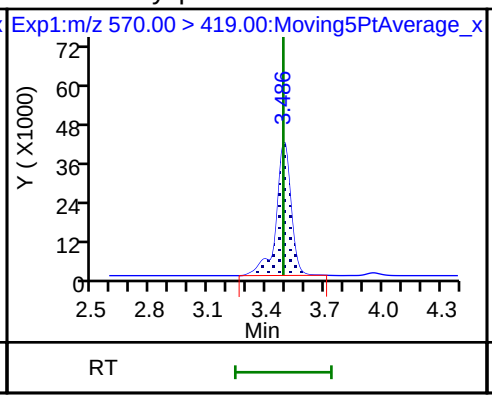
22 Perfluorooctane Sulfonamide



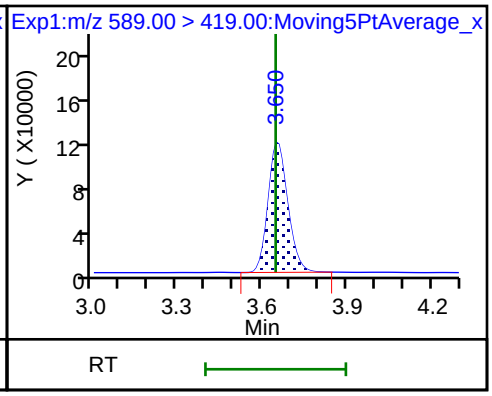
D 27 d3-NMeFOSAA



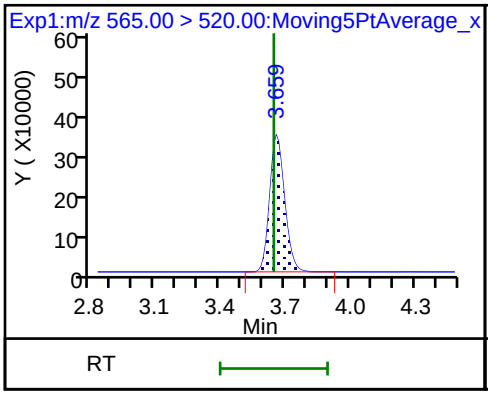
28 N-methyl perfluorooctane sulfonami



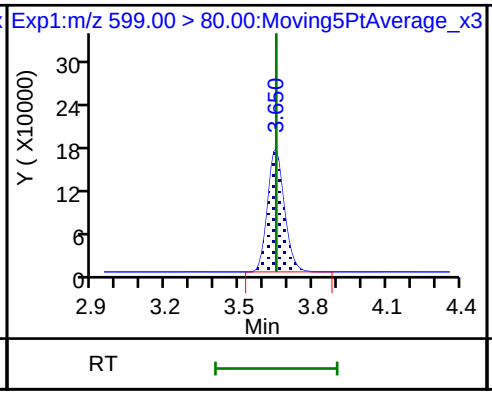
D 32 d5-NEtFOSAA



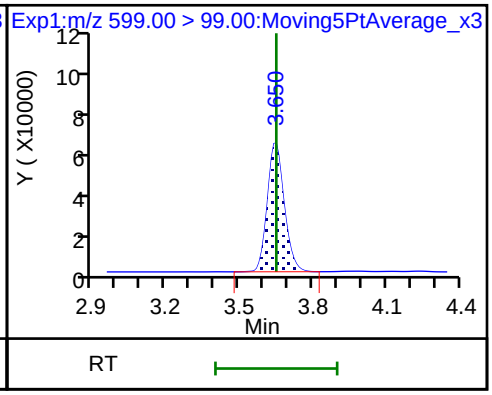
D 30 13C2 PFUnA



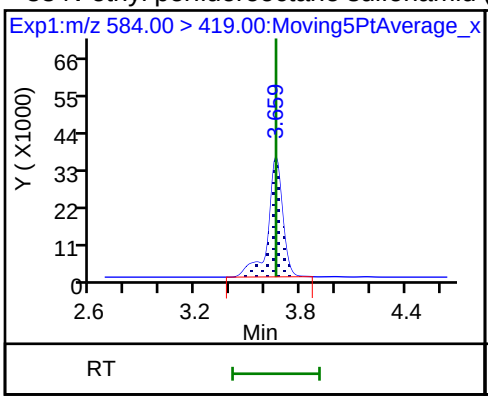
29 Perfluorodecane Sulfonic acid



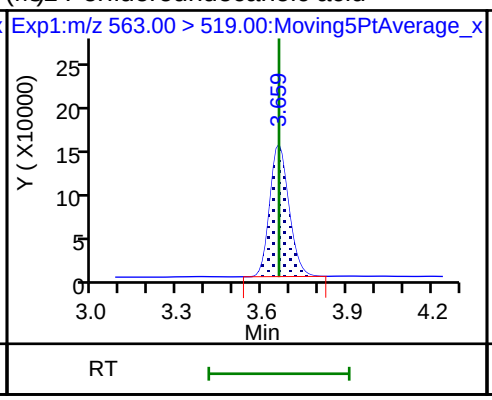
29 Perfluorodecane Sulfonic acid



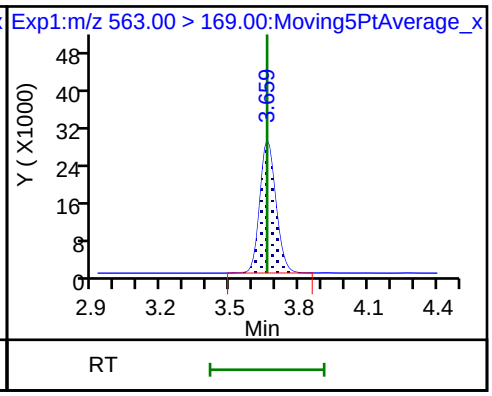
33 N-ethyl perfluorooctane sulfonamid (M)



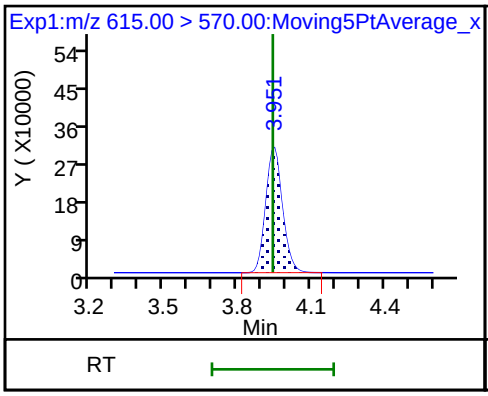
31 Perfluoroundecanoic acid



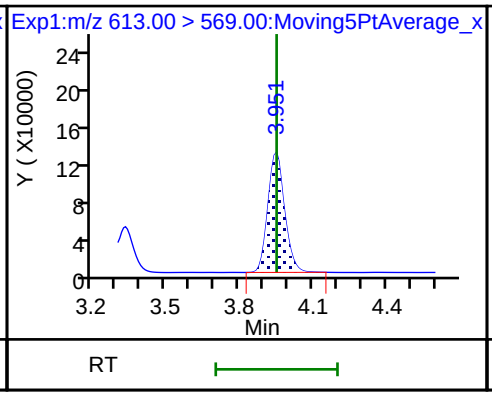
31 Perfluoroundecanoic acid



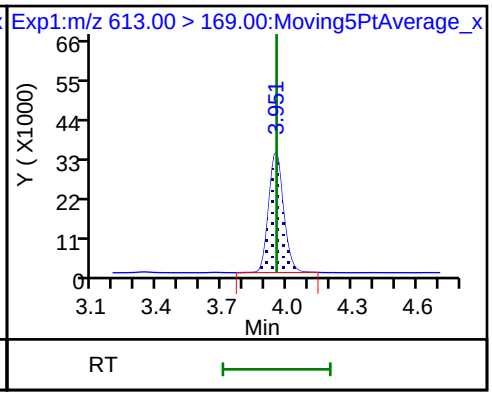
D 36 13C2 PFDoA



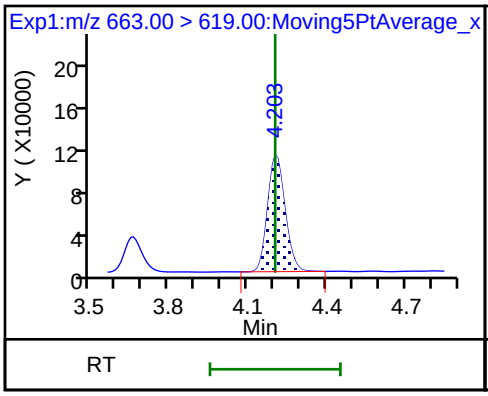
37 Perfluorododecanoic acid



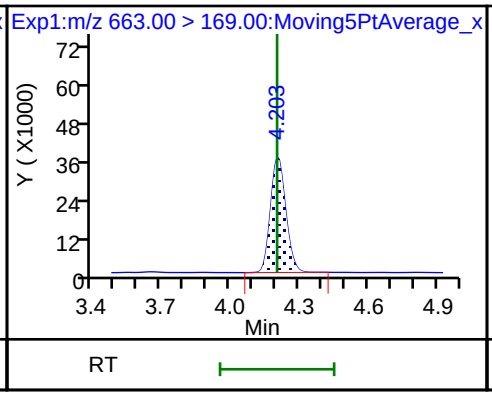
37 Perfluorododecanoic acid



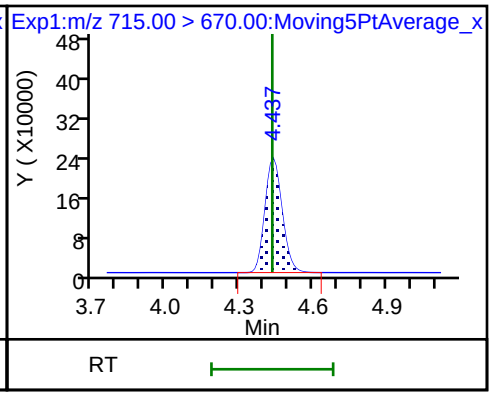
41 Perfluorotridecanoic acid



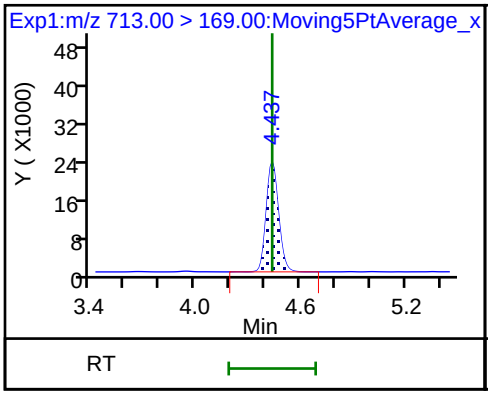
41 Perfluorotridecanoic acid



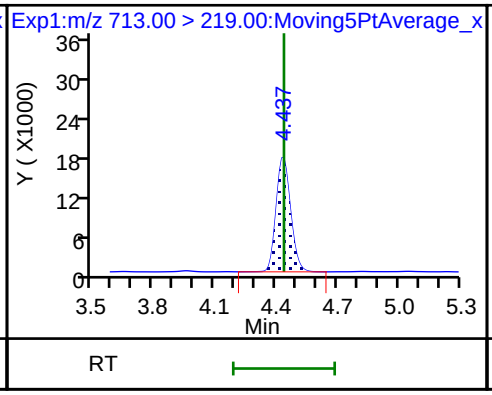
D 43 13C2-PFTeDA



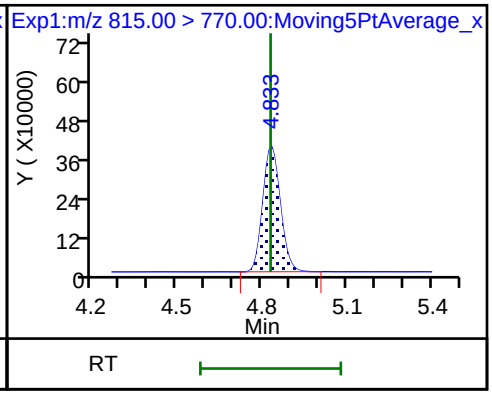
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

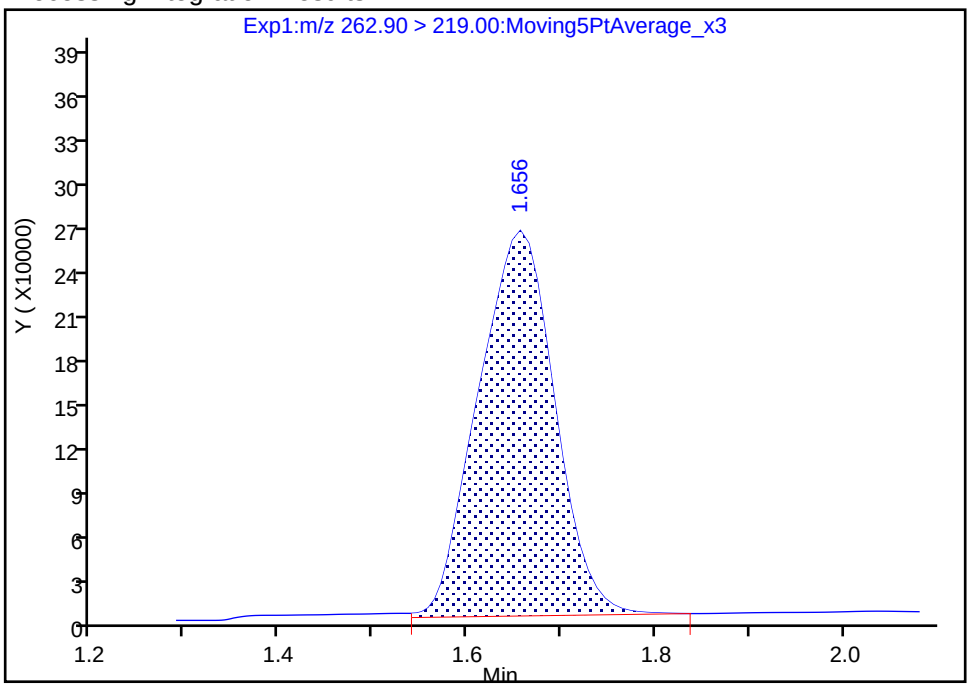
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_023.d				
Injection Date:	03-Aug-2018 07:42:57	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

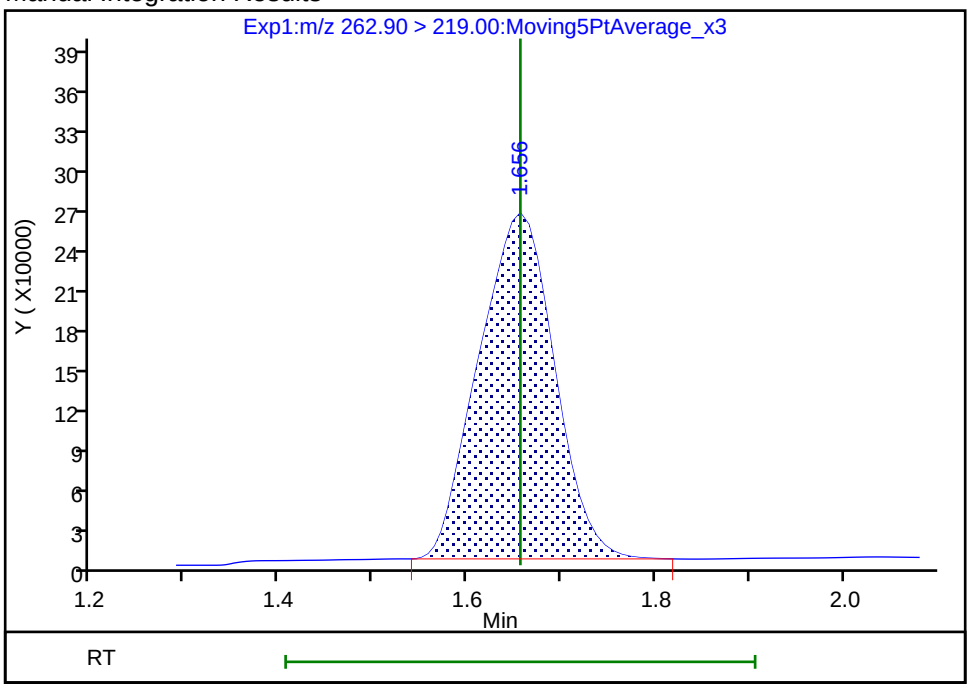
Processing Integration Results

RT: 1.66
Area: 1479202
Amount: 0.963554
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 1452476
Amount: 0.946145
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:23:53

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

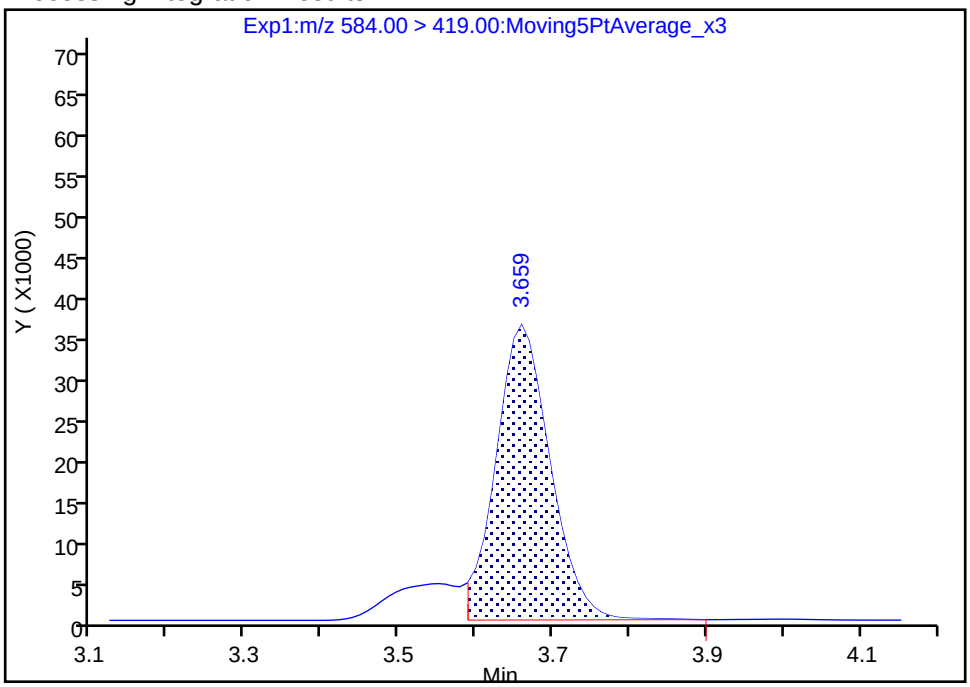
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_023.d				
Injection Date:	03-Aug-2018 07:42:57	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

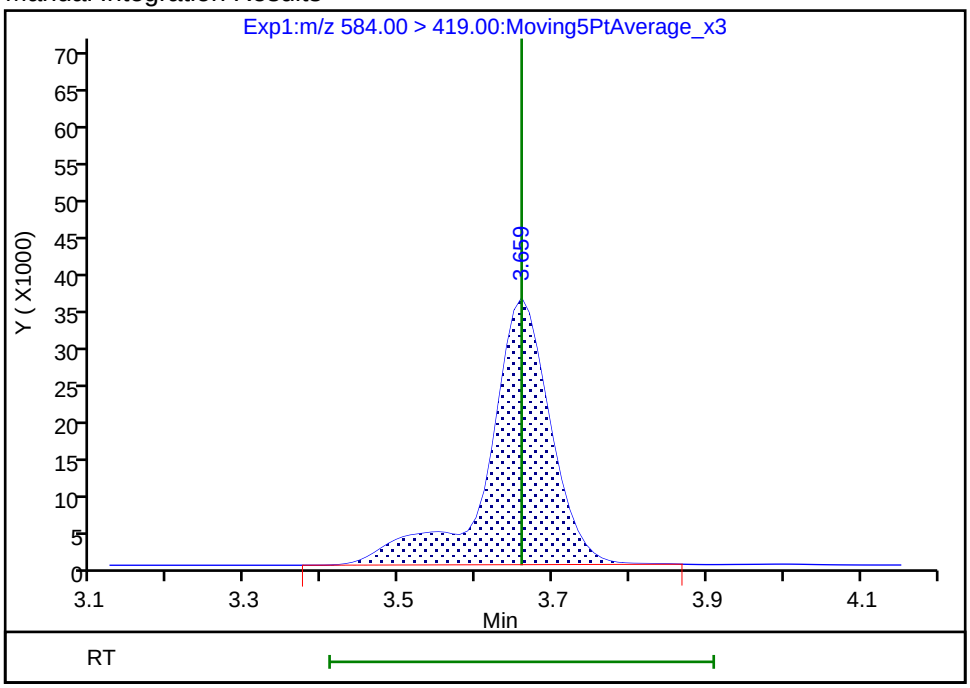
Processing Integration Results

RT: 3.66
Area: 177254
Amount: 0.876063
Amount Units: ng/ml



Manual Integration Results

RT: 3.66
Area: 206413
Amount: 1.020179
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:24:08

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/13 Calibration Date: 08/03/2018 07:50

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9540		0.968	1.00	-3.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.148		0.959	1.00	-4.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	76.10		0.878	0.884	-0.7	30.0
4:2 FTS	AveID	17.21	17.65		0.958	0.934	2.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.026		0.973	1.00	-2.7	30.0
Perfluoropentanesulfonic acid	AveID	67.65	68.20		0.946	0.938	0.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.153		0.994	1.00	-0.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.072		0.844	0.910	-7.3	30.0
6:2 FTS	AveID	1.654	1.582		0.907	0.948	-4.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.351		0.930	0.952	-2.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.116		0.966	1.00	-3.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.054		0.976	1.00	-2.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.091		0.902	0.928	-2.8	30.0
8:2 FTS	AveID	1.351	1.371		0.972	0.958	1.5	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7660		1.02	0.960	6.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.042		0.976	1.00	-2.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.005		1.02	1.00	1.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	0.9861		0.970	1.00	-3.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6762		1.00	0.964	4.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8483		0.952	1.00	-4.8	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.143		0.928	1.00	-7.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.121		1.03	1.00	3.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9060		0.961	1.00	-3.9	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2501		0.928	1.00	-7.2	30.0
13C4 PFBA	Ave	1.440	1.322		2.30	2.50	-8.2	30.0
13C5-PFPeA	Ave	0.9481	0.9263		2.44	2.50	-2.3	30.0
13C3-PFBS	Ave	0.0273	0.0257		2.19	2.33	-5.7	30.0
13C2 PFHxA	Ave	1.026	1.054		2.57	2.50	2.7	30.0
13C4-PFHpA	Ave	0.9943	0.9654		2.43	2.50	-2.9	30.0
18O2 PFHxS	Ave	1.494	1.363		2.16	2.37	-8.8	30.0
M2-6:2FTS	Ave	0.2913	0.2988		2.44	2.38	2.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/13 Calibration Date: 08/03/2018 07:50

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9544		2.49	2.50	-0.6	30.0
13C4 PFOS	Ave	1.032	0.9358		2.17	2.39	-9.3	30.0
13C5 PFNA	Ave	0.8365	0.7991		2.39	2.50	-4.5	30.0
M2-8:2FTS	Ave	0.2839	0.2881		2.43	2.40	1.5	30.0
13C2 PFDA	Ave	0.6256	0.6500		2.60	2.50	3.9	30.0
13C8 FOSA	Ave	1.516	1.429		2.36	2.50	-5.8	30.0
d3-NMeFOSAA	Ave	0.1518	0.1557		2.56	2.50	2.6	30.0
d5-NEtFOSAA	Ave	0.1627	0.1577		2.42	2.50	-3.1	30.0
13C2 PFUnA	Ave	0.4818	0.4629		2.40	2.50	-3.9	30.0
13C2 PFDoA	Ave	0.4172	0.4184		2.51	2.50	0.3	30.0
13C2-PFTeDA	Ave	0.3502	0.3316		2.37	2.50	-5.3	30.0
13C2-PFHxDA	Ave	0.6033	0.4900		2.03	2.50	-18.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_024.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 07:50:45 ALS Bottle#: 28 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:25:10 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:25:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.413	1.413	0.0	1.000	1726238	0.9681		96.8	844	
D 1 13C4 PFBA										
217.00 > 172.00	1.413	1.411	0.002	0.539	4523504	2.30		91.8	106788	
D 3 13C5-PFPeA										
267.90 > 223.00	1.666	1.653	0.013	0.636	3169269	2.44		97.7	62729	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.666	1.666	0.0	1.000	1455845	0.9591		95.9	554	M
D 47 13C3-PFBS										
301.90 > 83.00	1.693	1.690	0.003	0.646	81774	2.19		94.3	446	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.702	1.702	0.0	1.005	2366008	0.8777		99.3	5513	
298.90 > 99.00	1.702	1.702	0.0	1.005	989279		2.39(1.25-3.74)		4172	
D 60 M2-4:2FTS										
329.00 > 81.00	1.905	1.892	0.013	0.727	594920	NC			8569	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.905	1.905	0.0	1.126	579846	0.9579		103	24754	
D 7 13C2 PFHxA										
315.00 > 270.00	1.938	1.935	0.004	0.740	3605497	2.57		103	67448	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.938	1.938	0.0	1.000	1479857	0.9730		97.3	7255	
313.00 > 119.00	1.938	1.938	0.0	1.000	136596		10.83(5.03-15.10)		1945	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.959	1.959	0.0	1.157	2249878	0.9455		101	37235	
349.00 > 99.00	1.959	1.959	0.0	1.157	837408		2.69(1.36-4.07)		8684	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.037	2.037	0.0	1.000	264678	NC			1603	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.037	2.033	0.004	0.777	206537	NC			7118	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.251	0.016	0.865	3303227	2.43		97.1	59183	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.267	2.267	0.0	1.000	1523591	0.99		99.4	880	
363.00 > 169.00	2.267	2.267	0.0	1.000	586397		2.60(1.13-3.40)		9534	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.264	0.016	0.870	4412525	2.16		91.2	44235	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.280	0.0	1.000	1819873	0.8438		92.7	8625	
399.00 > 99.00	2.280	2.280	0.0	1.000	638135		2.85(1.50-4.49)		1492	
65 ADONA										
377.00 > 251.00	2.306	2.306	0.0	0.774	3826925	NC			34636	
377.00 > 85.00	2.306	2.306	0.0	0.774	2178020		1.76(0.84-2.53)		8870	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.579	0.009	0.988	971410	2.44		103	17886	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.588	2.588	0.0	1.000	613459	0.9070		95.7	16931	
D 14 13C4 PFOA										
417.00 > 372.00	2.611	2.602	0.009	0.997	3265590	2.49		99.4	44764	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.619	2.619	0.0	1.003	1459461	0.9664		96.5	1249	
413.00 > 169.00	2.619	2.619	0.0	1.003	782393		1.87(0.84-2.52)		5007	
* 62 13C2-PFOA										
415.00 > 370.00	2.619	2.619	0.0		3421631	2.50			41590	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.619	2.619	0.0	0.879	1647335	0.9304		97.7	18857	
449.00 > 99.00	2.619	2.619	0.0	0.879	451052		3.65(1.94-5.82)		7556	
D 19 13C5 PFNA										
468.00 > 423.00	2.980	2.964	0.016	1.138	2734206	2.39		95.5	41359	
D 18 13C4 PFOS										
503.00 > 80.00	2.980	2.964	0.016	1.138	3061220	2.17		90.7	37542	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.980	2.980	0.0	1.000	1296904	0.9019		97.2	10189	M
499.00 > 99.00	2.980	2.980	0.0	1.000	296221		4.38(2.31-6.93)		2470	M
20 Perfluorononanoic acid										
463.00 > 419.00	2.980	2.980	0.0	1.000	1152230	0.9756		97.6	4033	
463.00 > 169.00	2.980	2.980	0.0	1.000	285972		4.03(1.90-5.69)		14639	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.196	3.196	0.0	1.072	2153488	NC			25611	
D 26 M2-8:2FTS										
529.00 > 81.00	3.330	3.311	0.019	1.271	944376	2.43		101	21840	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.330	3.330	0.0	1.000	518048	0.9724		101	19968	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.330	3.330	0.0	1.118	941865	1.02		107	20135	
549.00 > 99.00	3.330	3.330	0.0	1.118	363344		2.59(1.33-3.97)		2916	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.338	3.327	0.011	1.274	2223966	2.60		104	51139	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.338	3.338	0.0	1.000	926934	0.9762		97.6	1730	
513.00 > 169.00	3.338	3.338	0.0	1.000	161490		5.74(2.36-7.09)		4141	
D 21 13C8 FOSA										
506.00 > 78.00	3.356	3.343	0.013	1.281	4888949	2.36		94.2	58001	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.356	3.356	0.0	1.000	1965333	1.02		102	25903	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.496	3.473	0.023	1.335	532856	2.56		103	16499	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.496	3.496	0.0	1.000	210182	0.9700		97.0	2598	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.660	3.647	0.013	1.397	539445	2.42		96.9	5575	
D 30 13C2 PFUnA										
565.00 > 520.00	3.669	3.647	0.022	1.401	1583839	2.40		96.1	25142	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.650	3.650	0.0	1.225	834927	1.00		104	22187	
599.00 > 99.00	3.650	3.650	0.0	1.225	278914		2.99(1.39-4.16)		3990	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.660	3.660	0.0	1.000	183046	0.9519		95.2	5204	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.660	3.660	0.0	0.997	724283	0.9277		92.8	1972	
563.00 > 169.00	3.660	3.660	0.0	0.997	126737		5.71(2.12-6.36)		8856	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.826	3.826	0.0	1.284	3173948	NC			46956	
D 36 13C2 PFDoA										
615.00 > 570.00	3.951	3.943	0.008	1.508	1431569	2.51		100	17964	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.951	3.951	0.0	1.000	641683	1.03		103	209	
613.00 > 169.00	3.951	3.951	0.0	1.000	151156		4.25(2.13-6.40)		5331	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.213	4.213	0.0	1.066	518775	0.9613		96.1	142	
663.00 > 169.00	4.213	4.213	0.0	1.066	156041		3.32(1.25-3.76)		1984	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.437	4.433	0.004	1.694	1134736	2.37		94.7	4760	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.437	0.0	1.000	113502	0.9283		92.8	1935	
713.00 > 219.00	4.437	4.437	0.0	1.000	78176		1.45(0.71-2.13)		1598	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.829	0.004	1.845	1676582	2.03		81.2	2435	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.842	0.0	1.002	656110	NC			34.4	
813.00 > 169.00	4.833	4.842	-0.009	1.000	110336		5.95(2.86-8.58)		1579	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.174	5.174	0.0	1.070	870490	NC			353	
913.00 > 169.00	5.174	5.174	0.0	1.070	107101		8.13(3.83-11.48)		1264	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 11:25:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_024.d

Injection Date: 03-Aug-2018 07:50:45 Instrument ID: A8_N

Lims ID: CCV L4

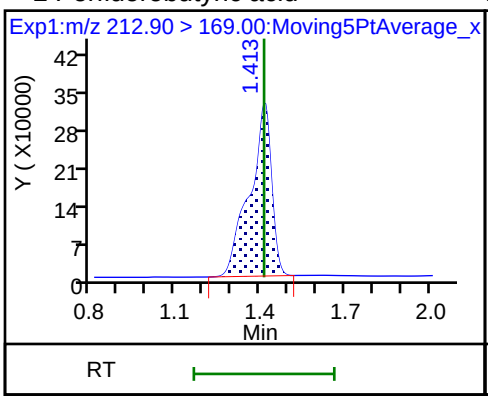
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 13

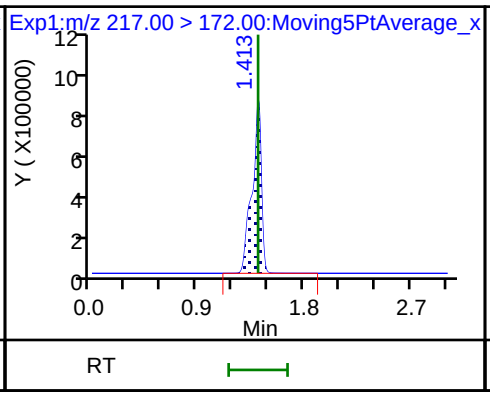
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

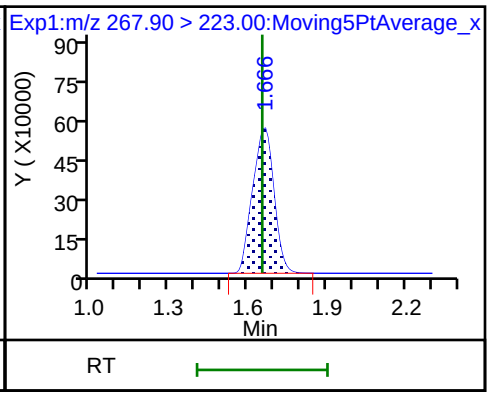
2 Perfluorobutyric acid



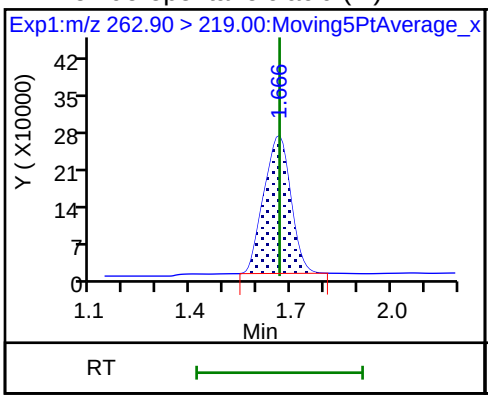
D 1 13C4 PFBA



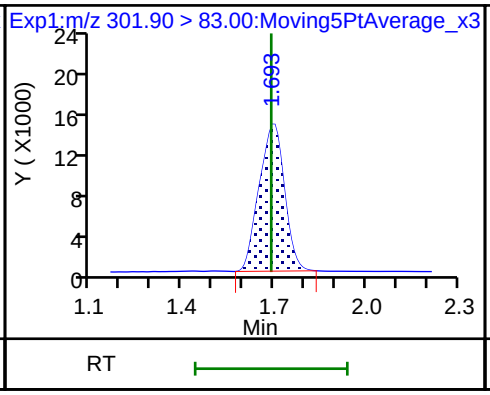
D 3 13C5-PFPeA



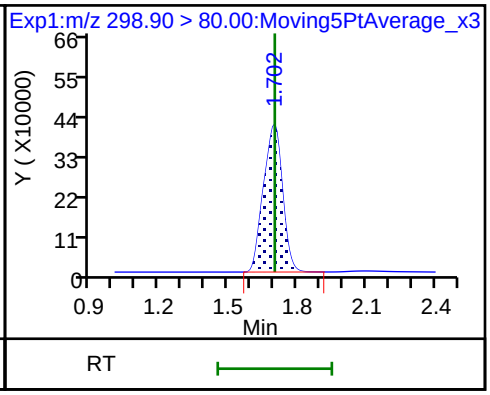
4 Perfluoropentanoic acid (M)



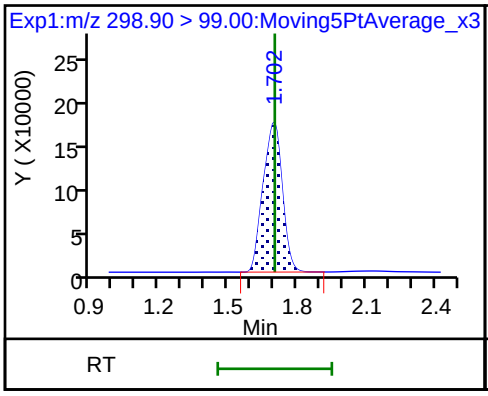
D 47 13C3-PFBS



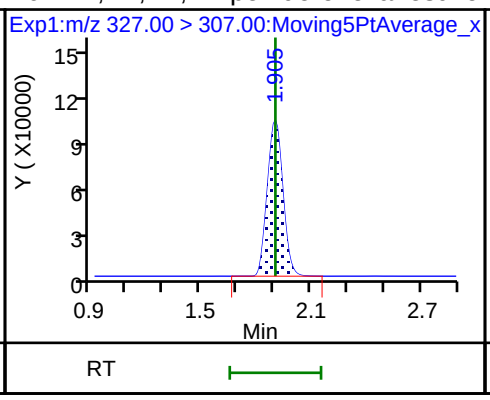
5 Perfluorobutanesulfonic acid



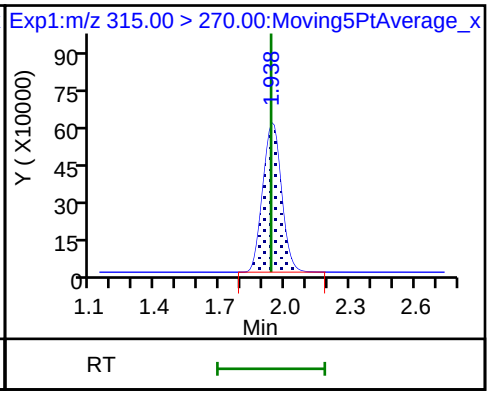
5 Perfluorobutanesulfonic acid



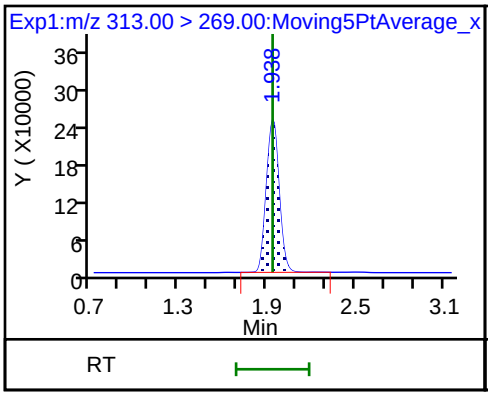
61 1H,1H,2H,2H-perfluorohexanesulfon



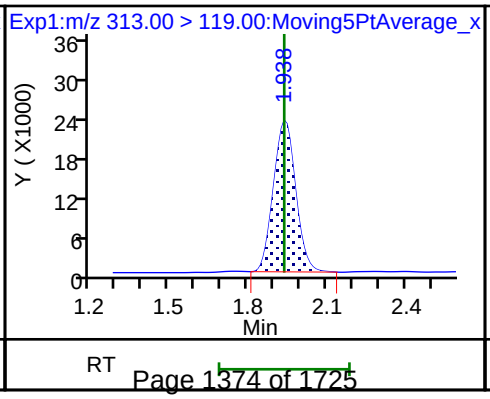
D 7 13C2 PFHxA



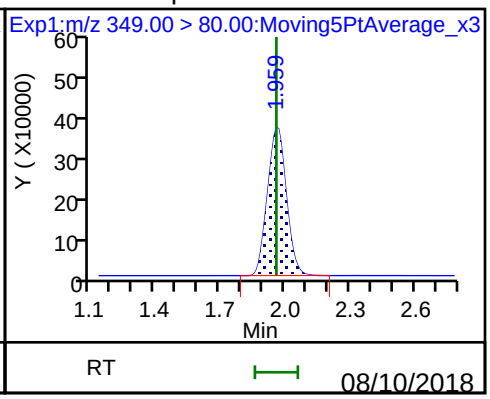
6 Perfluorohexanoic acid



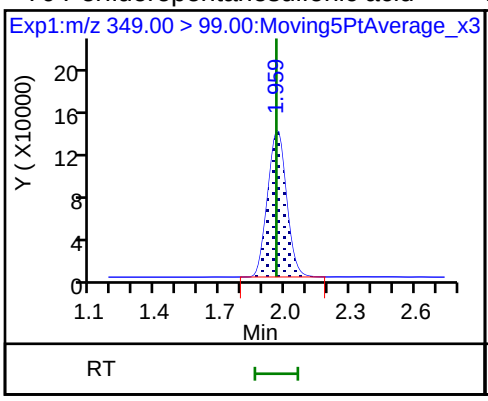
6 Perfluorohexanoic acid



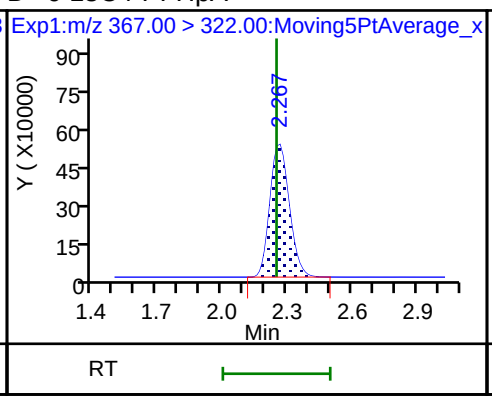
70 Perfluoropentanesulfonic acid



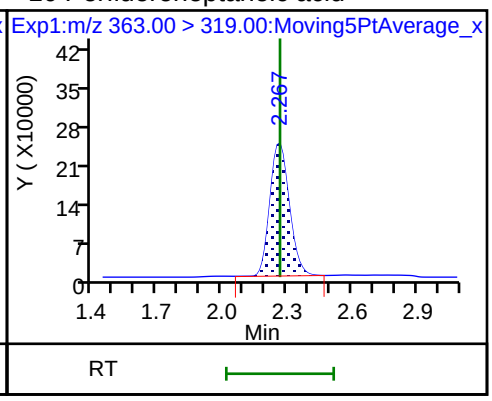
70 Perfluoropentanesulfonic acid



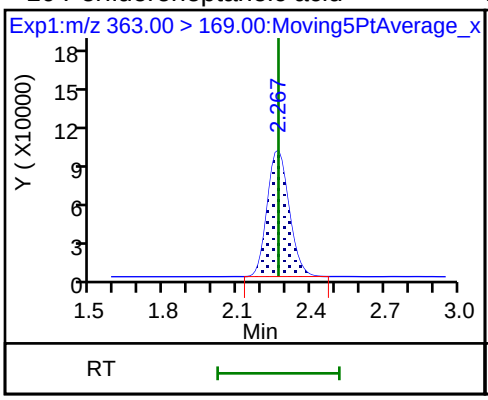
D 9 13C4-PFHpA



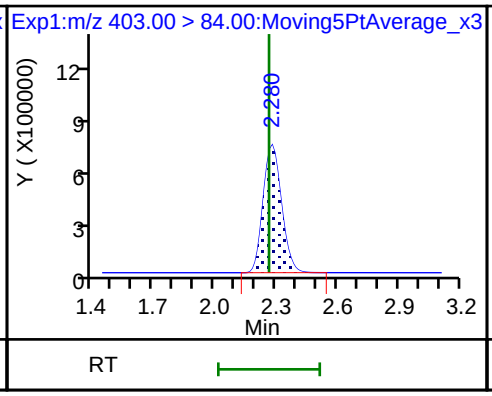
10 Perfluoroheptanoic acid



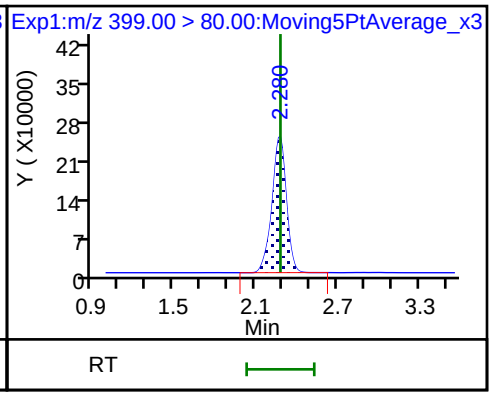
10 Perfluoroheptanoic acid



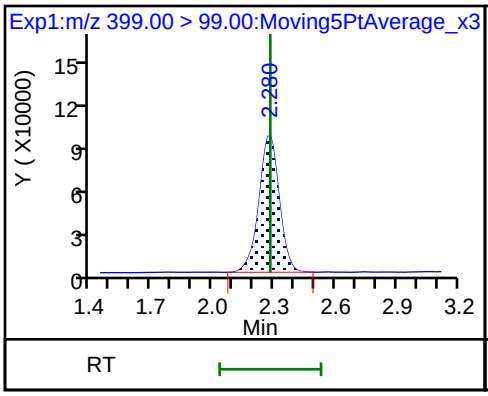
D 11 18O2 PFHxS



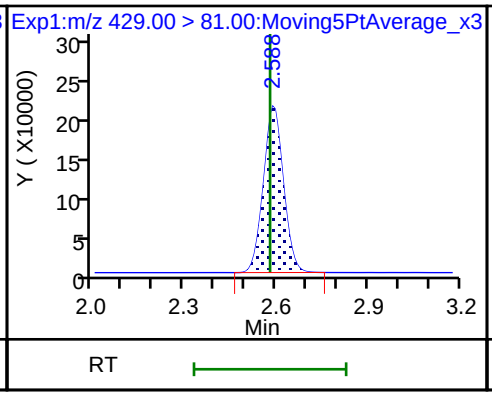
8 Perfluorohexanesulfonic acid



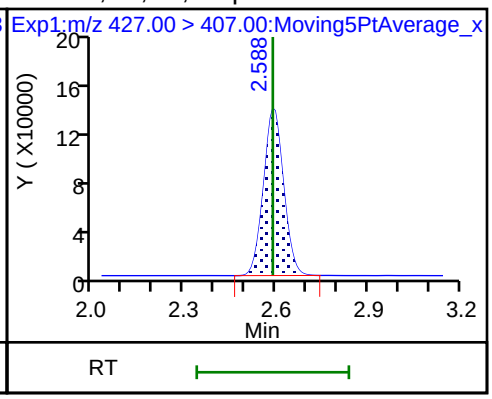
8 Perfluorohexanesulfonic acid



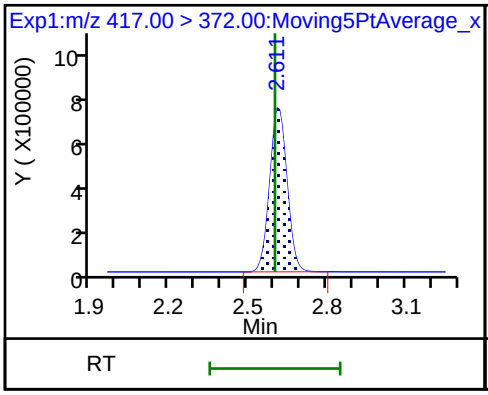
D 12 M2-6:2FTS



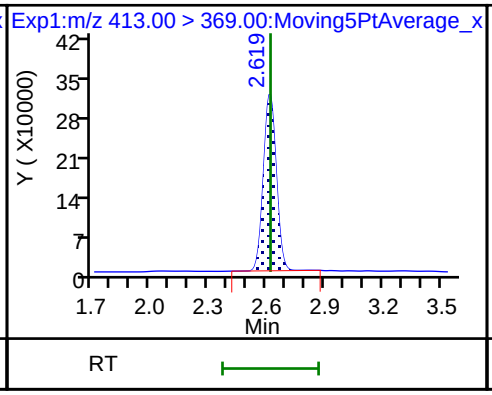
13 1H,1H,2H,2H-perfluorooctanesulfoni



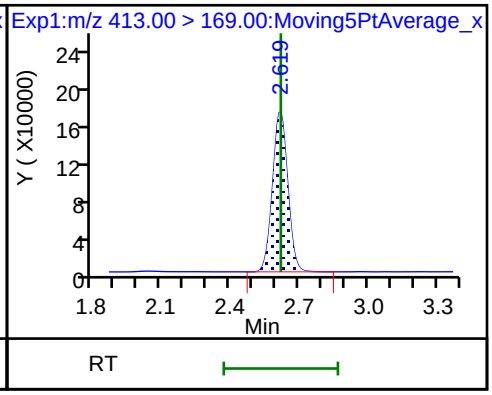
D 14 13C4 PFOA



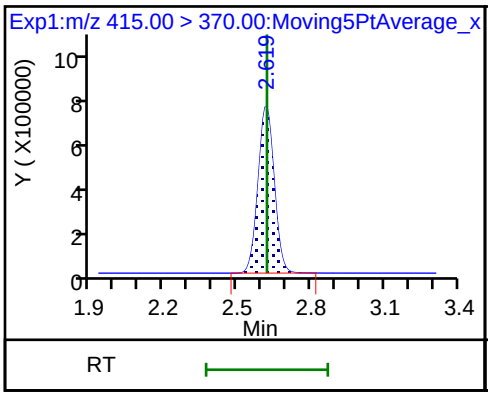
15 Perfluorooctanoic acid



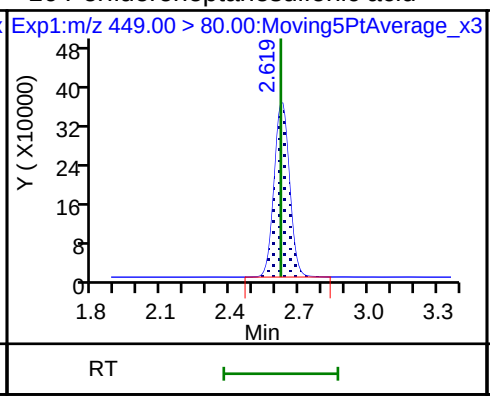
15 Perfluorooctanoic acid



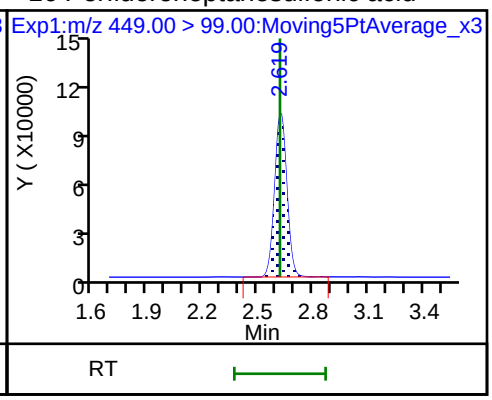
* 62 13C2-PFOA



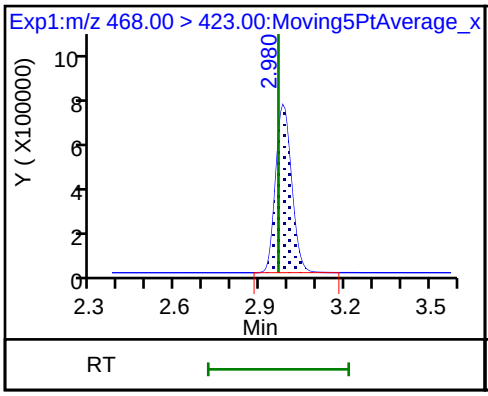
16 Perfluoroheptanesulfonic acid



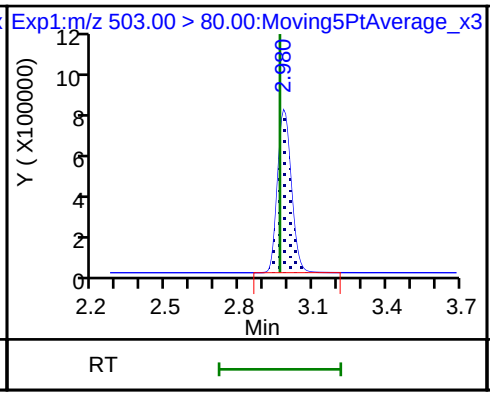
16 Perfluoroheptanesulfonic acid



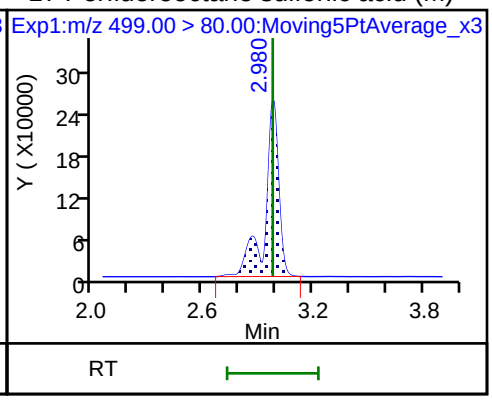
D 19 13C5 PFNA



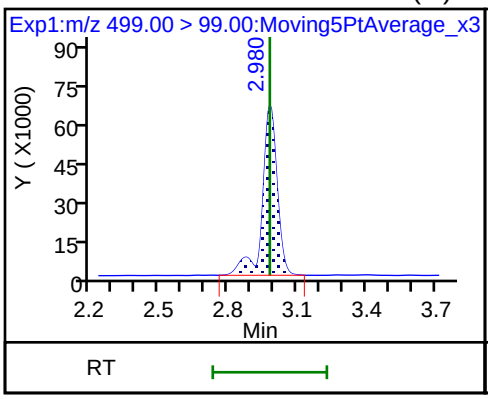
D 18 13C4 PFOS



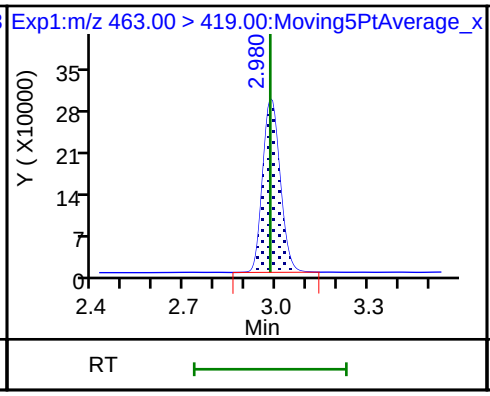
17 Perfluorooctane sulfonic acid (M)



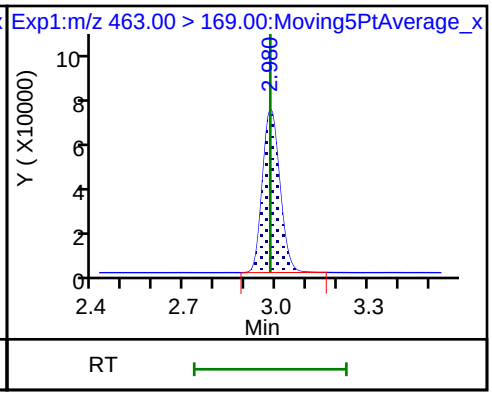
17 Perfluorooctane sulfonic acid (M)



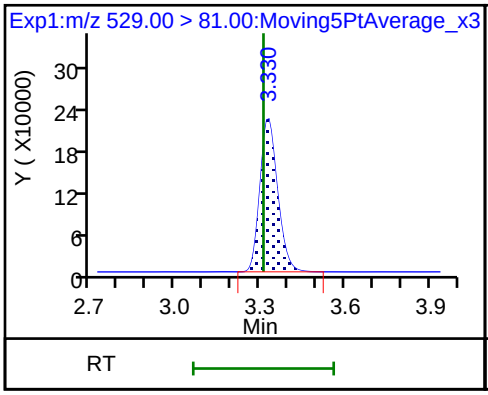
20 Perfluorononanoic acid



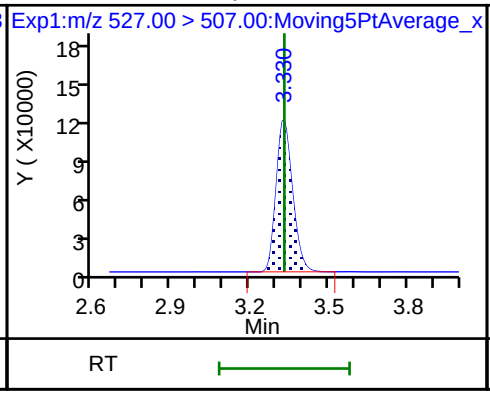
20 Perfluorononanoic acid



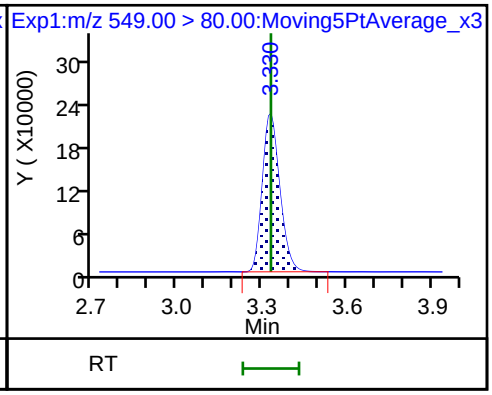
D 26 M2-8:2FTS



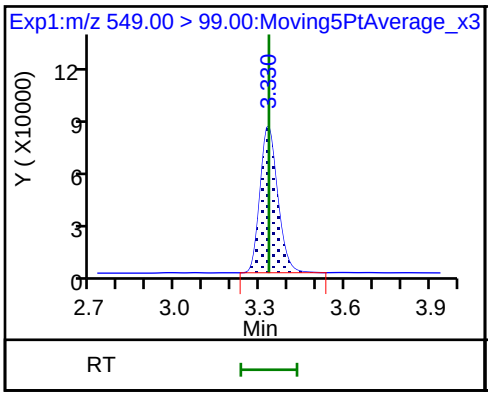
25 1H,1H,2H,2H-perfluorodecanesulfoni



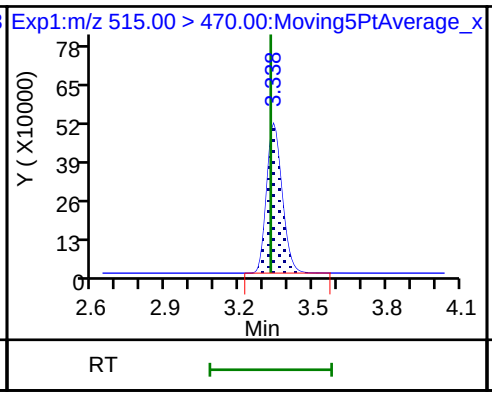
68 Perfluorononanesulfonic acid



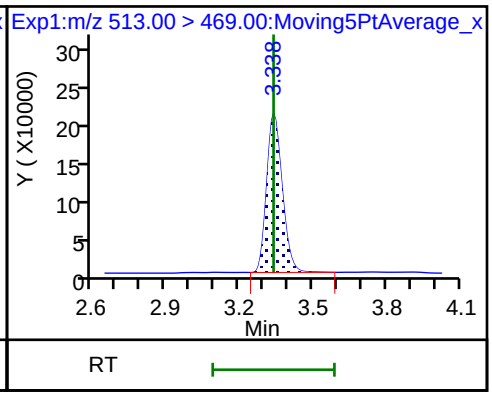
68 Perfluorononanesulfonic acid



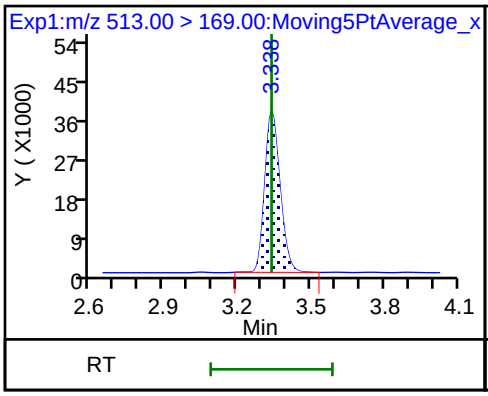
D 23 13C2 PFDA



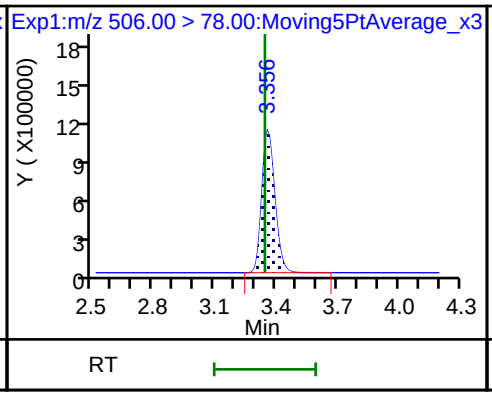
24 Perfluorodecanoic acid



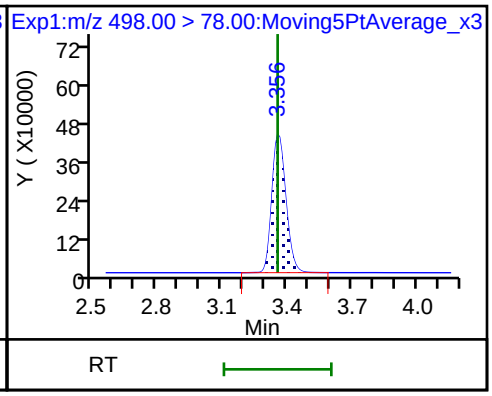
24 Perfluorodecanoic acid



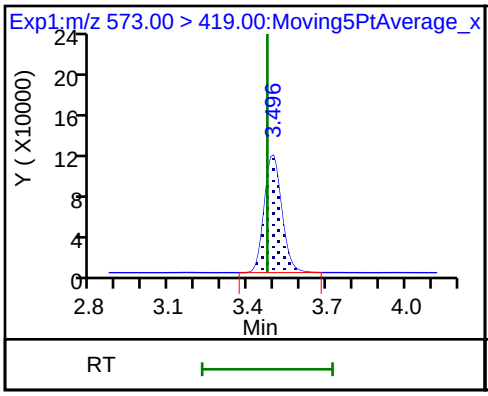
D 21 13C8 FOSA



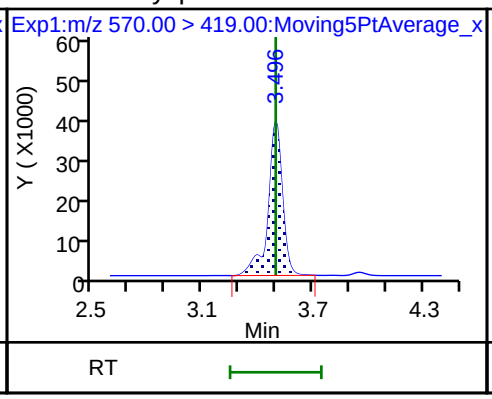
22 Perfluorooctane Sulfonamide



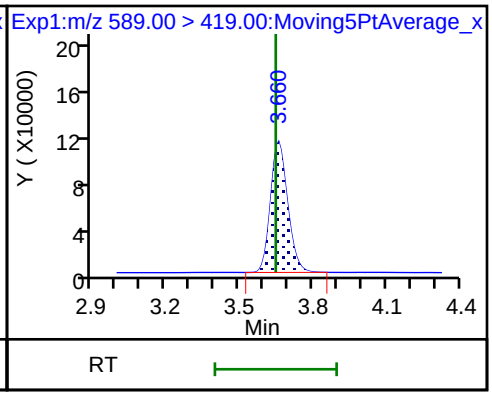
D 27 d3-NMeFOSAA



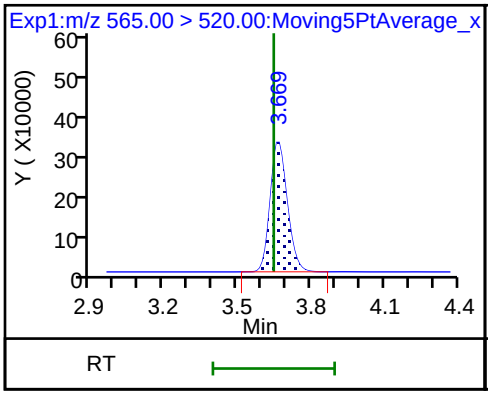
28 N-methyl perfluorooctane sulfonami



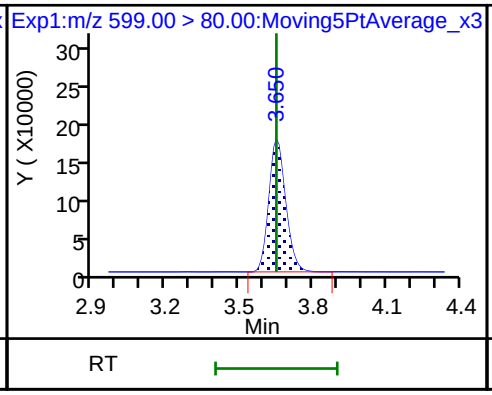
D 32 d5-NEtFOSAA



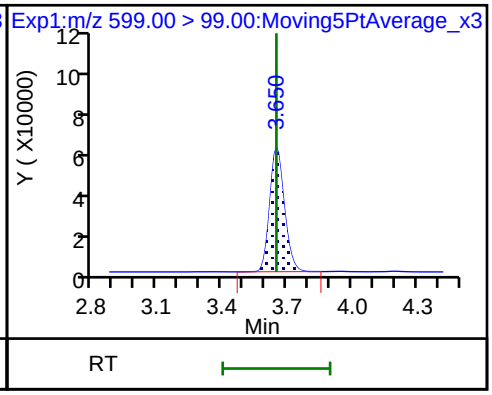
D 30 13C2 PFUnA



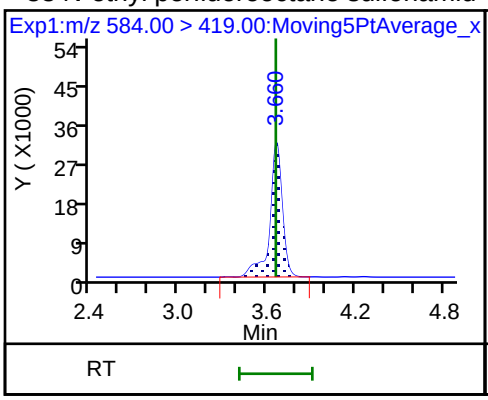
29 Perfluorodecane Sulfonic acid



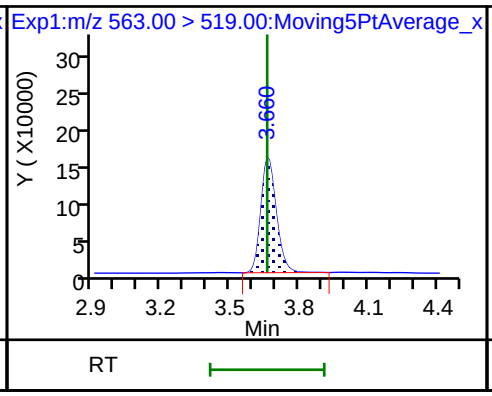
29 Perfluorodecane Sulfonic acid



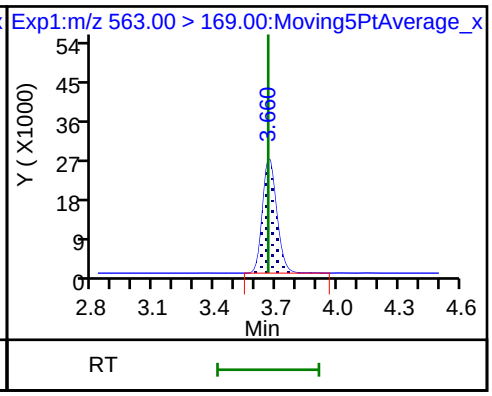
33 N-ethyl perfluorooctane sulfonamid



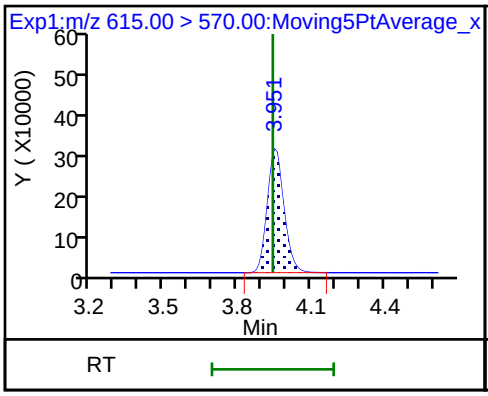
31 Perfluoroundecanoic acid



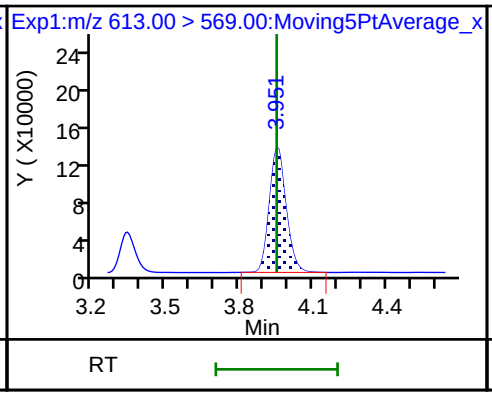
31 Perfluoroundecanoic acid



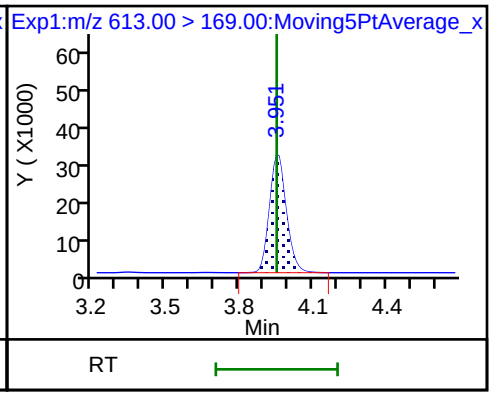
D 36 13C2 PFDoA



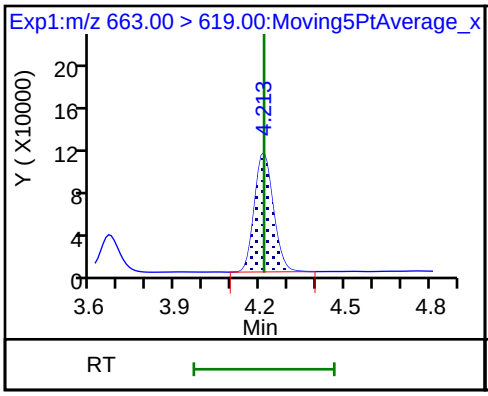
37 Perfluorododecanoic acid



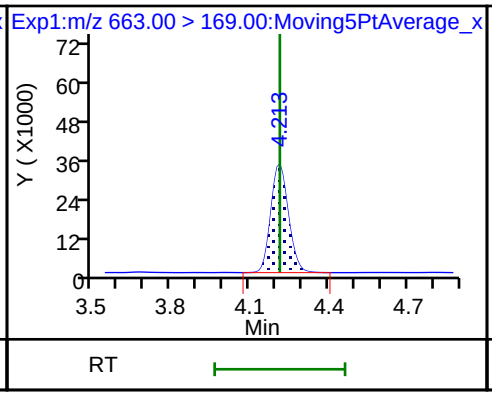
37 Perfluorododecanoic acid



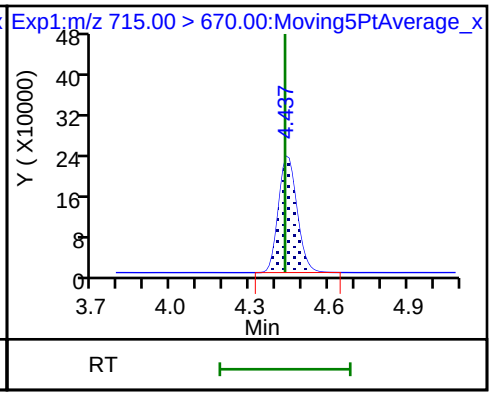
41 Perfluorotridecanoic acid



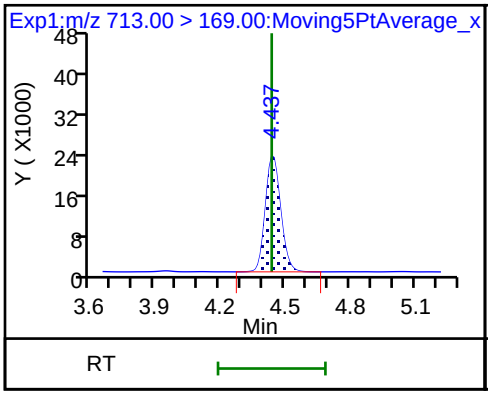
41 Perfluorotridecanoic acid



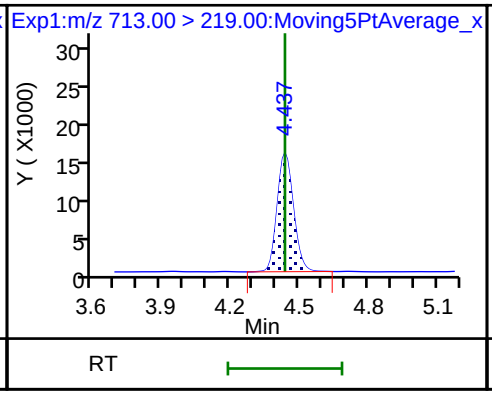
D 43 13C2-PFTeDA



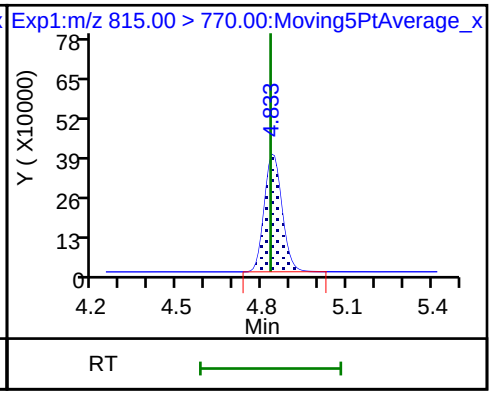
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

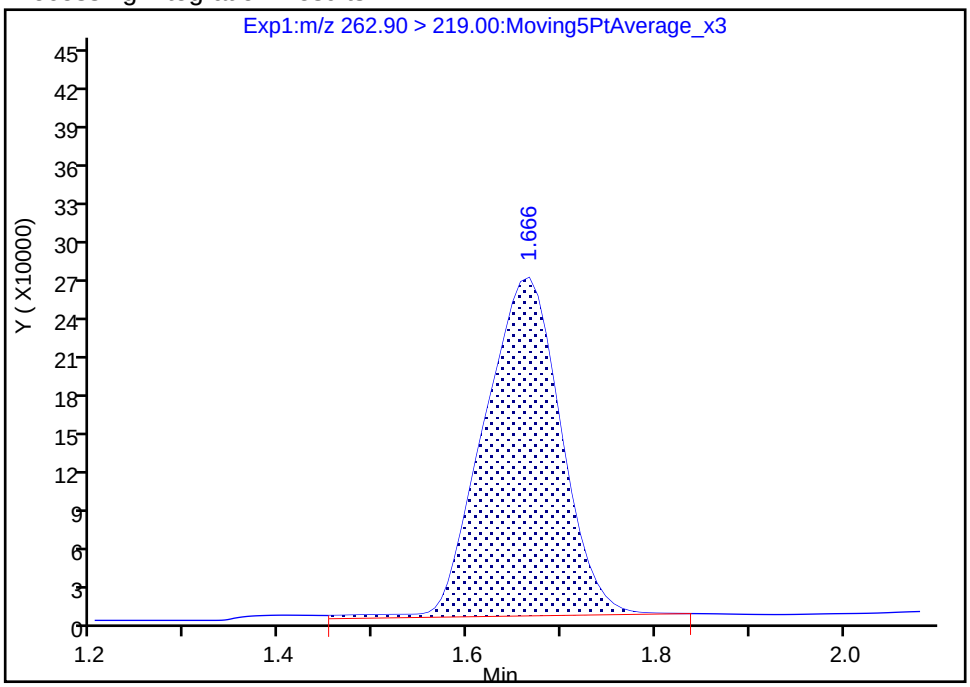
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_024.d				
Injection Date:	03-Aug-2018 07:50:45	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

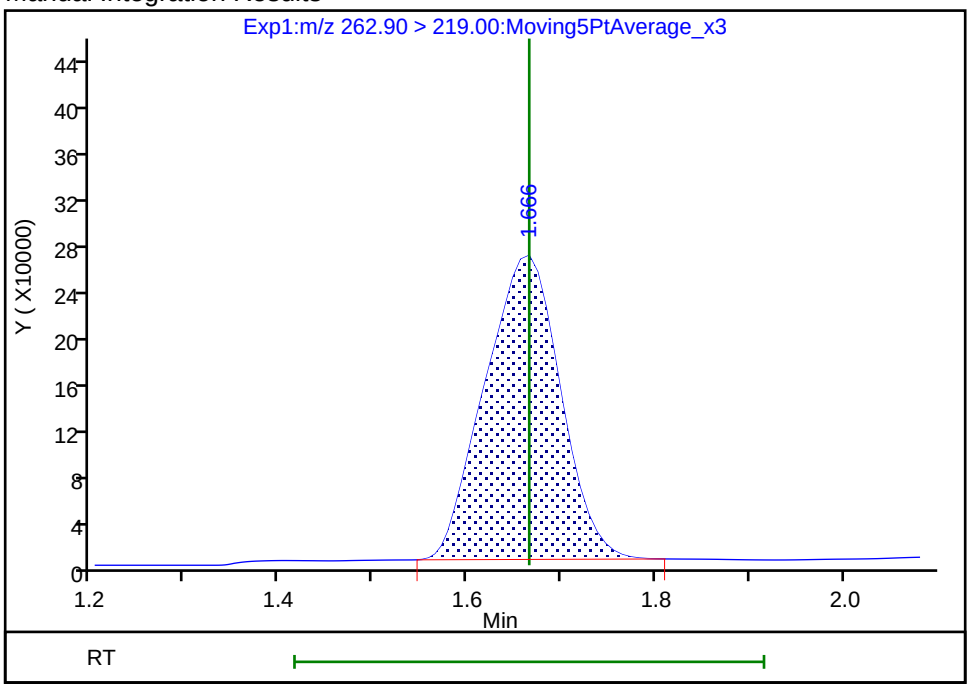
Processing Integration Results

RT: 1.67
Area: 1492804
Amount: 0.983493
Amount Units: ng/ml



Manual Integration Results

RT: 1.67
Area: 1455845
Amount: 0.959143
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:24:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

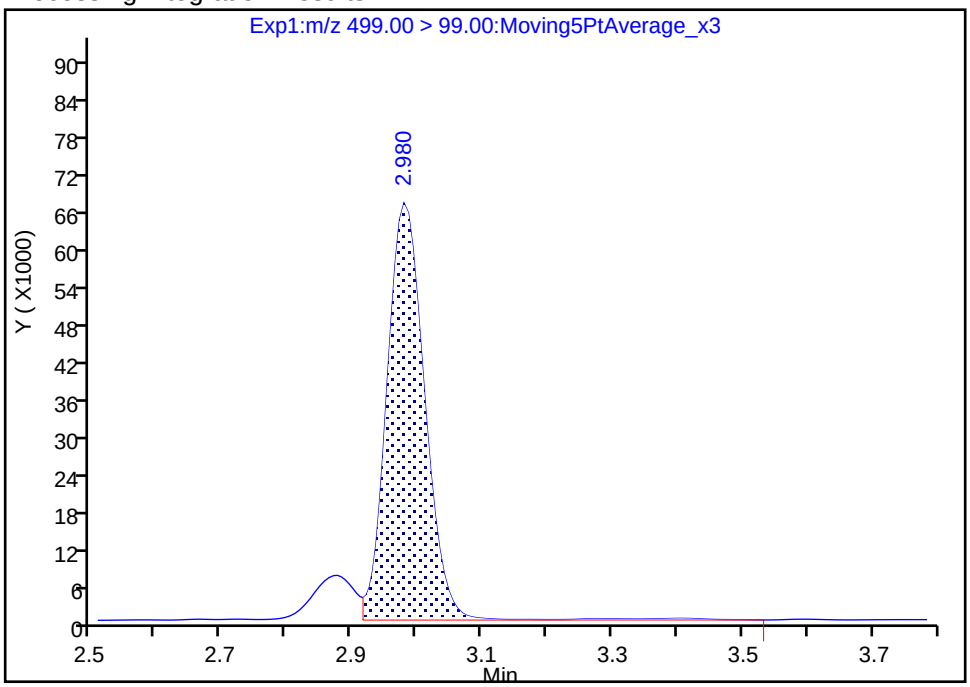
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_024.d				
Injection Date:	03-Aug-2018 07:50:45	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

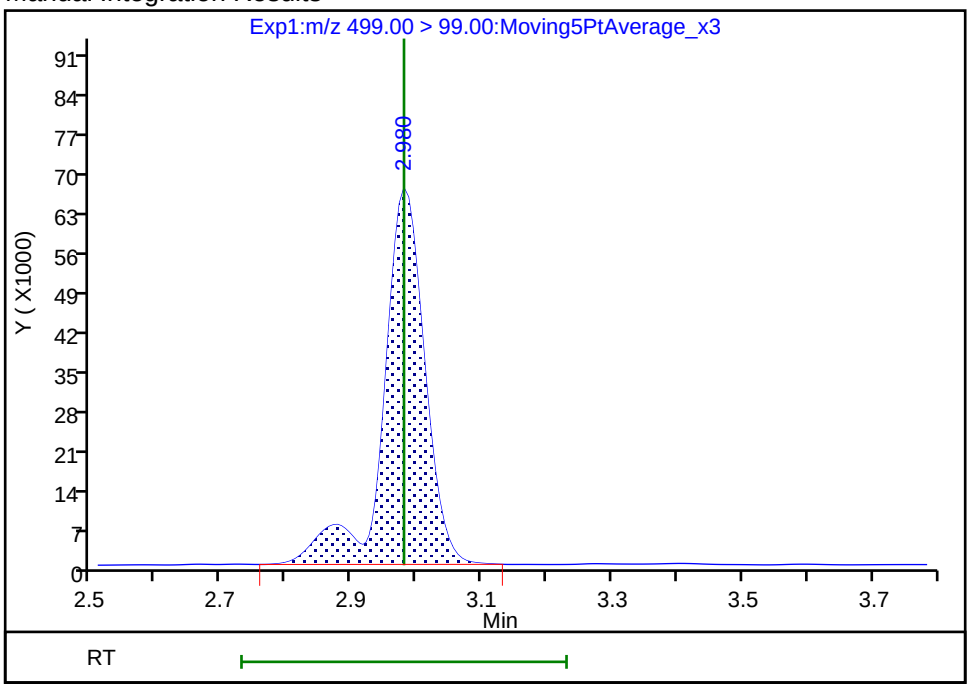
Processing Integration Results

RT: 2.98
Area: 269851
Amount: 0.701566
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 296221
Amount: 0.901923
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:24:57

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

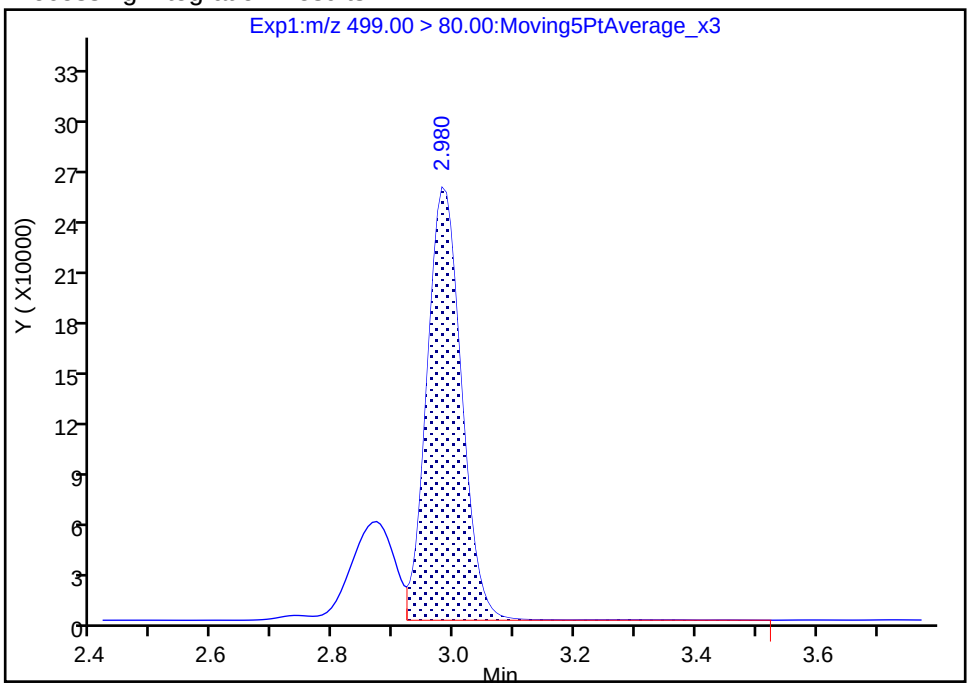
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_024.d				
Injection Date:	03-Aug-2018 07:50:45	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

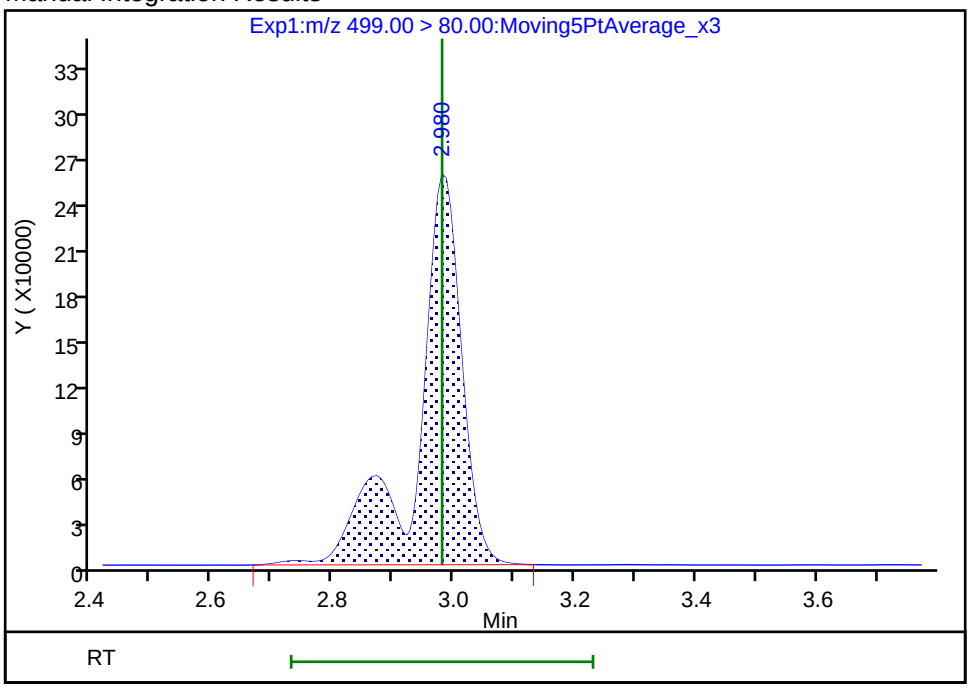
Processing Integration Results

RT: 2.98
Area: 1008804
Amount: 0.701566
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 1296904
Amount: 0.901923
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:25:00

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/22 Calibration Date: 08/03/2018 09:00

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_033.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9938		2.52	2.50	0.8	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.158		2.42	2.50	-3.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	81.76		2.36	2.21	6.7	30.0
4:2 FTS	AveID	17.21	18.77		2.55	2.34	9.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.048		2.48	2.50	-0.6	30.0
Perfluoropentanesulfonic acid	AveID	67.65	70.53		2.44	2.35	4.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.127		2.43	2.50	-2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.103		2.17	2.28	-4.5	30.0
6:2 FTS	AveID	1.654	1.708		2.45	2.37	3.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.143		2.47	2.50	-1.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.408		2.42	2.38	1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.106		2.56	2.50	2.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.117		2.31	2.32	-0.5	30.0
8:2 FTS	AveID	1.351	1.307		2.32	2.40	-3.2	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7894		2.64	2.40	9.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.071		2.51	2.50	0.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.028		2.60	2.50	4.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.022		2.51	2.50	0.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6581		2.44	2.41	1.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8074		2.27	2.50	-9.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	0.9545		1.94	2.50	-22.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.082		2.50	2.50	-0.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.8592		2.28	2.50	-8.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2577		2.39	2.50	-4.3	30.0
13C4 PFBA	Ave	1.440	1.380		2.40	2.50	-4.1	30.0
13C5-PFPeA	Ave	0.9481	0.9508		2.51	2.50	0.3	30.0
13C3-PFBS	Ave	0.0273	0.0261		2.22	2.33	-4.3	30.0
13C2 PFHxA	Ave	1.026	1.053		2.57	2.50	2.6	30.0
13C4-PFHpA	Ave	0.9943	0.9821		2.47	2.50	-1.2	30.0
18O2 PFHxS	Ave	1.494	1.443		2.28	2.37	-3.4	30.0
M2-6:2FTS	Ave	0.2913	0.2836		2.31	2.38	-2.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-237784/22 Calibration Date: 08/03/2018 09:00

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.03LLA_033.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9728		2.53	2.50	1.3	30.0
13C4 PFOS	Ave	1.032	0.9653		2.24	2.39	-6.5	30.0
13C5 PFNA	Ave	0.8365	0.7998		2.39	2.50	-4.4	30.0
M2-8:2FTS	Ave	0.2839	0.2869		2.42	2.40	1.0	30.0
13C2 PFDA	Ave	0.6256	0.6161		2.46	2.50	-1.5	30.0
13C8 FOSA	Ave	1.516	1.404		2.31	2.50	-7.4	30.0
d3-NMeFOSAA	Ave	0.1518	0.1575		2.59	2.50	3.8	30.0
13C2 PFUnA	Ave	0.4818	0.4394		2.28	2.50	-8.8	30.0
d5-NEtFOSAA	Ave	0.1627	0.1630		2.50	2.50	0.1	30.0
13C2 PFDoA	Ave	0.4172	0.4570		2.74	2.50	9.5	30.0
13C2-PFTeDA	Ave	0.3502	0.3394		2.42	2.50	-3.1	30.0
13C2-PFHxDA	Ave	0.6033	0.5009		2.08	2.50	-17.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_033.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 09:00:59 ALS Bottle#: 29 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:30:38 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:30:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.419	1.411	0.008	0.540	4772072	2.40		95.9	89332	
2 Perfluorobutyric acid										
212.90 > 169.00	1.425	1.413	0.012	1.004	4742575	2.52		101	2291	
D 3 13C5-PFPeA										
267.90 > 223.00	1.667	1.653	0.014	0.634	3286799	2.51		100	59192	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.676	1.666	0.010	1.005	3805317	2.42		96.7	1604	
D 47 13C3-PFBS										
301.90 > 83.00	1.703	1.690	0.013	0.648	83872	2.22		95.7	491	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.712	1.702	0.010	1.005	6517831	2.36		107	15164	
298.90 > 99.00	1.712	1.702	0.010	1.005	2609419		2.50(1.25-3.74)		10775	
D 60 M2-4:2FTS										
329.00 > 81.00	1.917	1.892	0.025	0.729	610600	NC			6302	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.917	1.905	0.012	1.126	1581190	2.55		109	69739	
D 7 13C2 PFHxA										
315.00 > 270.00	1.949	1.935	0.015	0.741	3638687	2.57		103	103537	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.949	1.938	0.011	1.000	3812343	2.48		99.4	13577	
313.00 > 119.00	1.949	1.938	0.011	1.000	350030		10.89(5.03-15.10)		4310	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.971	1.959	0.012	1.157	5966335	2.44		104	62910	
349.00 > 99.00	1.971	1.959	0.012	1.157	2212836		2.70(1.36-4.07)		22055	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.049	2.033	0.016	0.780	203446	NC			8869	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.049	2.037	0.012	1.000	767493	NC			5502	
D 9 13C4-PFHpA										
367.00 > 322.00	2.268	2.251	0.017	0.863	3395298	2.47		98.8	61028	
D 11 18O2 PFHxS										
403.00 > 84.00	2.294	2.264	0.030	0.873	4717717	2.28		96.6	40187	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.281	2.267	0.014	1.006	3826511	2.43		97.2	2294	
363.00 > 169.00	2.281	2.267	0.014	1.006	1501762		2.55(1.13-3.40)		17365	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.280	0.001	0.994	5007774	2.17		95.5	15157	
399.00 > 99.00	2.281	2.280	0.001	0.994	1710604		2.93(1.50-4.49)		4090	
65 ADONA										
377.00 > 251.00	2.320	2.306	0.014	0.774	9853024	NC			57832	
377.00 > 85.00	2.320	2.306	0.014	0.774	5781310		1.70(0.84-2.53)		19774	
D 12 M2-6:2FTS										
429.00 > 81.00	2.605	2.579	0.026	0.991	931418	2.31		97.4	17139	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.605	2.588	0.017	1.000	1587049	2.45		103	29242	
D 14 13C4 PFOA										
417.00 > 372.00	2.629	2.602	0.027	1.000	3362878	2.53		101	50428	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.629	2.619	0.010	1.000	3848079	2.47		98.9	3106	
413.00 > 169.00	2.629	2.619	0.010	1.000	1960177		1.96(0.84-2.52)		10044	
* 62 13C2-PFOA										
415.00 > 370.00	2.629	2.619	0.010		3457069	2.50			48729	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.637	2.619	0.018	0.880	4472229	2.42		102	40644	
449.00 > 99.00	2.637	2.619	0.018	0.880	1212919		3.69(1.94-5.82)		17173	
D 19 13C5 PFNA										
468.00 > 423.00	2.997	2.964	0.033	1.140	2764960	2.39		95.6	41123	
D 18 13C4 PFOS										
503.00 > 80.00	2.997	2.964	0.033	1.140	3190120	2.24		93.5	26535	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.997	2.980	0.017	1.000	3457777	2.31		99.5	27793	
499.00 > 99.00	2.997	2.980	0.017	1.000	807633		4.28(2.31-6.93)		8190	
20 Perfluorononanoic acid										
463.00 > 419.00	2.997	2.980	0.017	1.000	3058646	2.56		102	10185	
463.00 > 169.00	2.997	2.980	0.017	1.000	729130		4.19(1.90-5.69)		26282	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.208	3.196	0.012	1.071	5913053	NC			51322	
D 26 M2-8:2FTS										
529.00 > 81.00	3.343	3.311	0.032	1.272	950086	2.42		101	17970	
D 23 13C2 PFDA										
515.00 > 470.00	3.352	3.327	0.025	1.275	2129933	2.46		98.5	52672	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.343	3.330	0.013	1.116	2528883	2.64		110	39155	
549.00 > 99.00	3.343	3.330	0.013	1.116	943138		2.68(1.33-3.97)		7517	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.343	3.330	0.013	1.000	1242027	2.32		96.8	46353	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.361	3.338	0.023	1.003	2281866	2.51		100	4843	
513.00 > 169.00	3.361	3.338	0.023	1.003	408636		5.58(2.36-7.09)		8975	
D 21 13C8 FOSA										
506.00 > 78.00	3.380	3.343	0.037	1.286	4852839	2.31		92.6	56165	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.380	3.356	0.024	1.000	4987927	2.60		104	45804	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.511	3.473	0.038	1.335	544586	2.59		104	19743	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.511	3.496	0.015	1.000	556729	2.51		101	6599	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.677	3.647	0.030	1.398	563340	2.50		100	3659	
D 30 13C2 PFUnA										
565.00 > 520.00	3.677	3.647	0.030	1.398	1519076	2.28		91.2	28776	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.667	3.650	0.017	1.224	2117125	2.44		101	29865	
599.00 > 99.00	3.667	3.650	0.017	1.224	716335		2.96(1.39-4.16)		10025	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.677	3.660	0.017	1.000	454864	2.27		90.6	10778	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.677	3.660	0.017	1.000	1449907	1.94		77.5	4219	
563.00 > 169.00	3.677	3.660	0.017	1.000	336265		4.31(2.12-6.36)		13955	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.834	3.826	0.008	1.279	8213502	NC			89877	
D 36 13C2 PFDoA										
615.00 > 570.00	3.969	3.943	0.026	1.510	1579702	2.74		110	22330	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.969	3.951	0.018	1.000	1709204	2.50		99.9	623	
613.00 > 169.00	3.969	3.951	0.018	1.000	411878		4.15(2.13-6.40)		9647	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.222	4.213	0.009	1.064	1357223	2.28		91.2	407	
663.00 > 169.00	4.222	4.213	0.009	1.064	400798		3.39(1.25-3.76)		4832	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.459	4.433	0.026	1.696	1173299	2.42		96.9	6049	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.459	4.437	0.022	1.000	302305	2.39		95.7	4446	
713.00 > 219.00	4.448	4.437	0.011	0.998	217716		1.39(0.71-2.13)		4475	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.851	4.829	0.022	1.845	1731736	2.08		83.0	2722	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.851	4.842	0.009	1.000	1717650	NC			91.5	
813.00 > 169.00	4.851	4.842	0.009	1.000	282293		6.08(2.86-8.58)		3291	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.189	5.174	0.015	1.070	2254424	NC			862	
913.00 > 169.00	5.181	5.174	0.007	1.068	283369		7.96(3.83-11.48)		3412	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 11:30:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_033.d

Injection Date: 03-Aug-2018 09:00:59 Instrument ID: A8_N

Lims ID: CCV L5

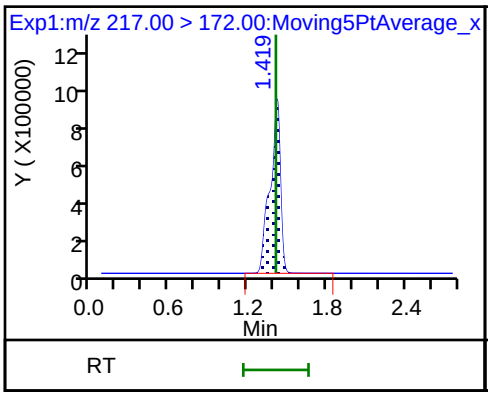
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 29 Worklist Smp#: 22

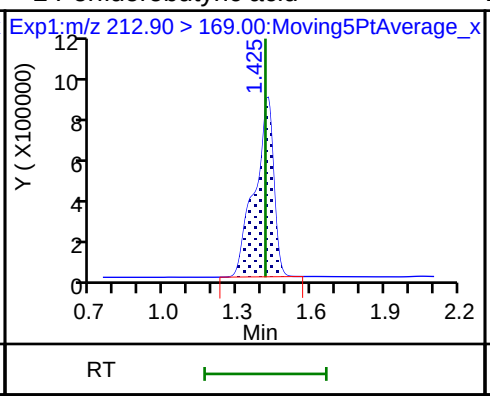
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

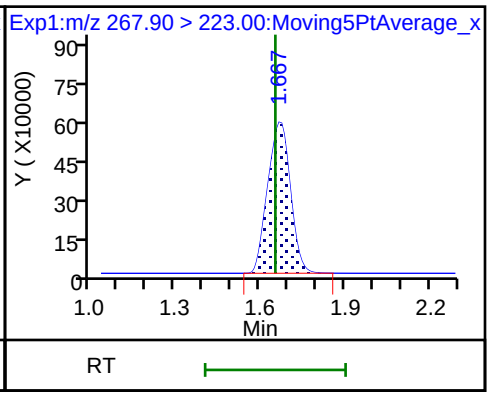
D 1 13C4 PFBA



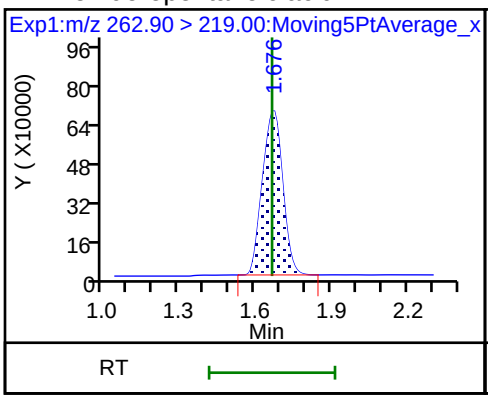
2 Perfluorobutyric acid



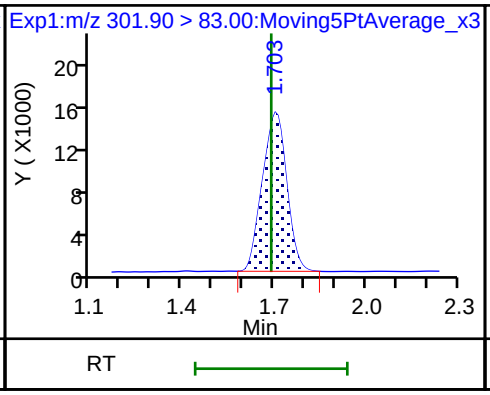
D 3 13C5-PFPeA



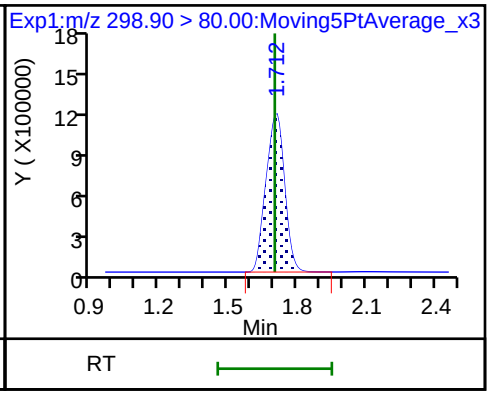
4 Perfluoropentanoic acid



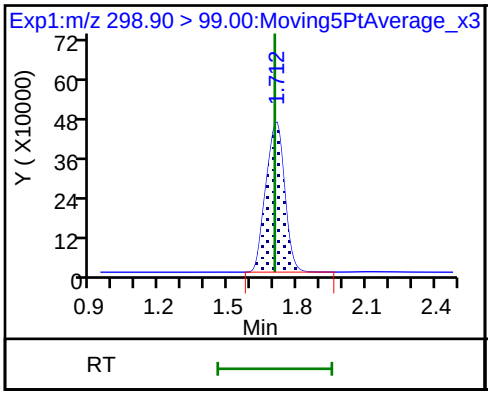
D 47 13C3-PFBS



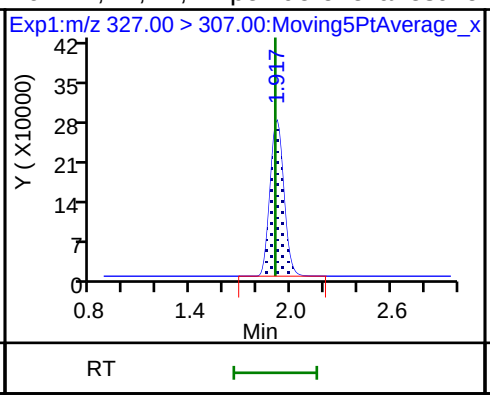
5 Perfluorobutanesulfonic acid



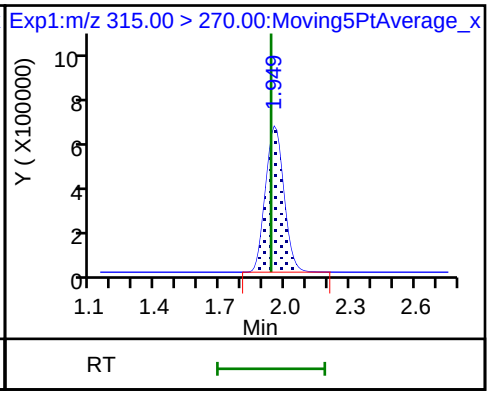
5 Perfluorobutanesulfonic acid



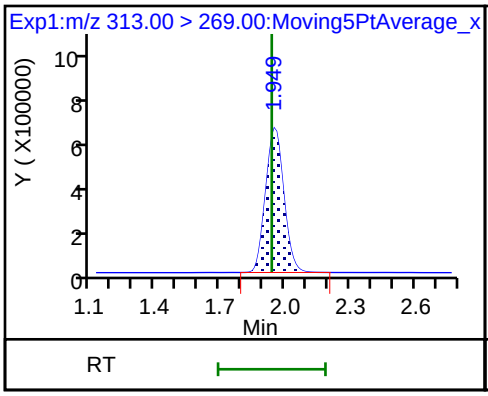
61 1H,1H,2H,2H-perfluorohexanesulfon



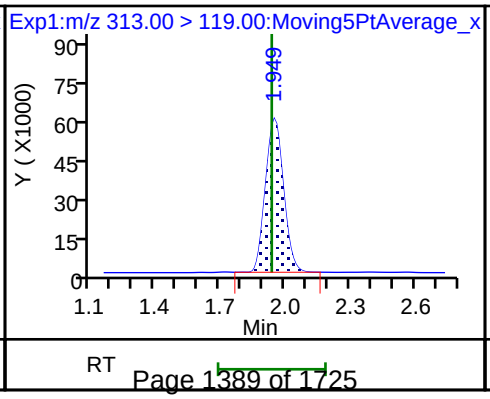
D 7 13C2 PFHxA



6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



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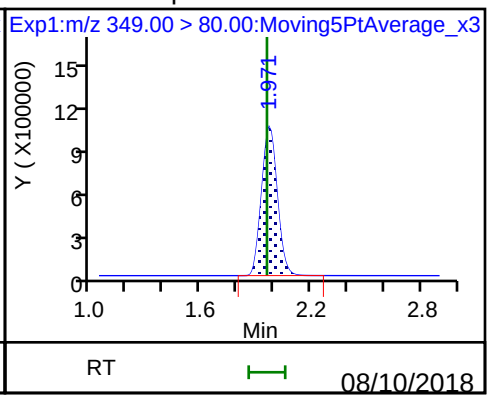

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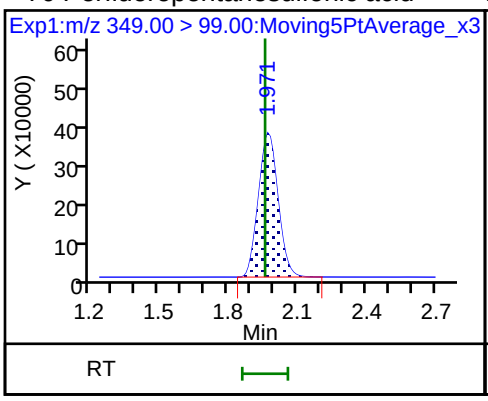
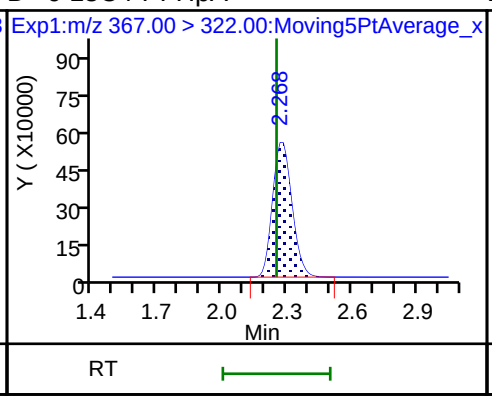
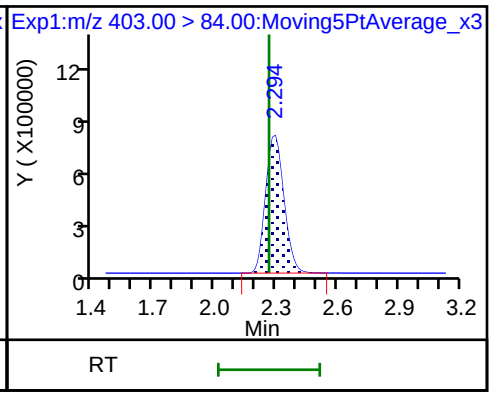


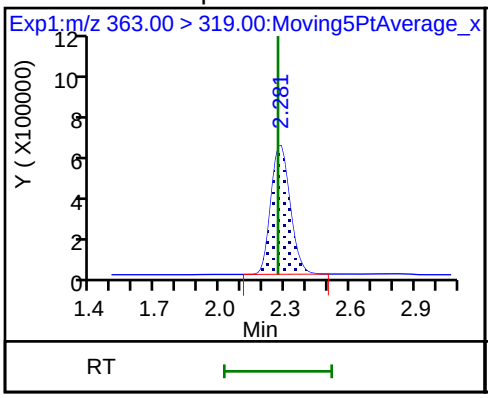
D 9 13C4-PFHpA



D 11 18O2 PFHxS



10 Perfluoroheptanoic acid



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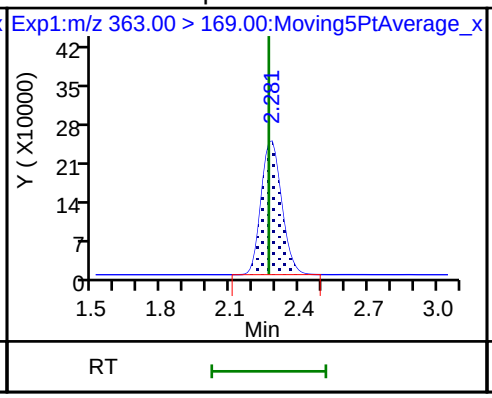
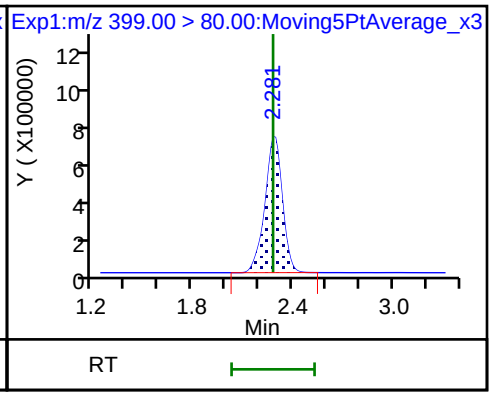


8 Perfluorohexanesulfonic acid



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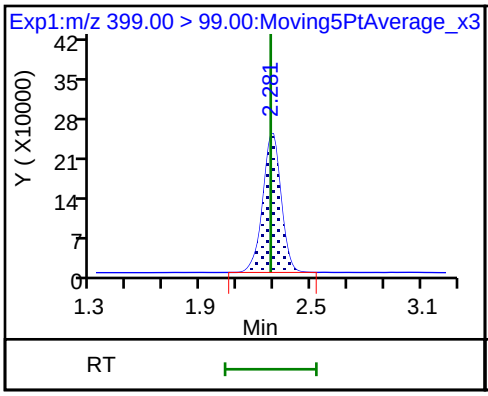
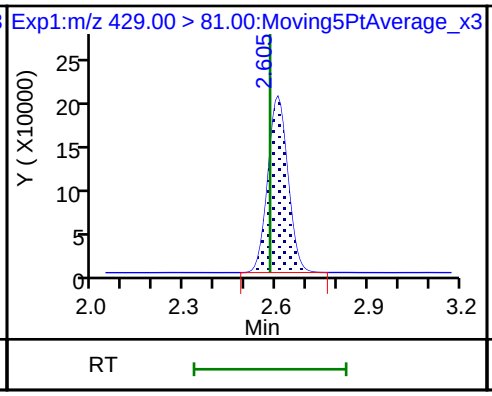
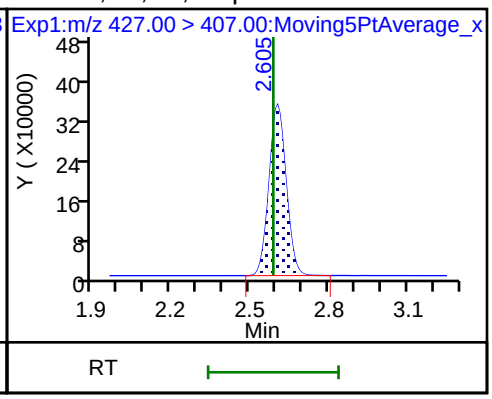


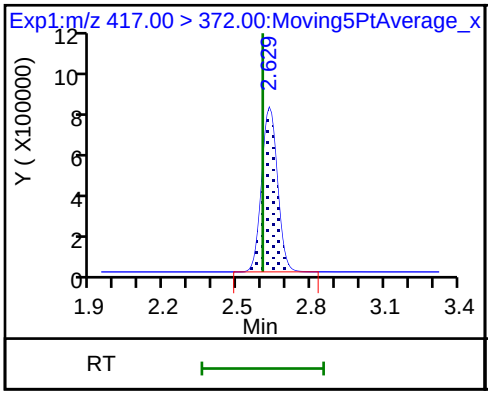
D 12 M2-6:2FTS



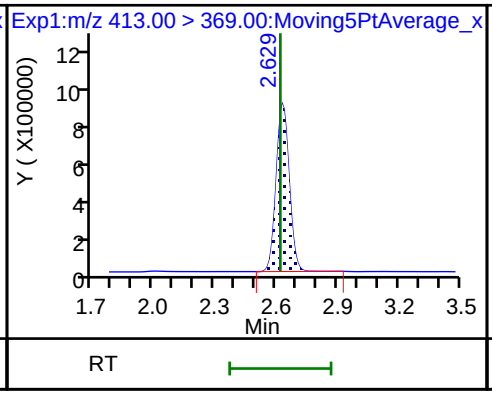
13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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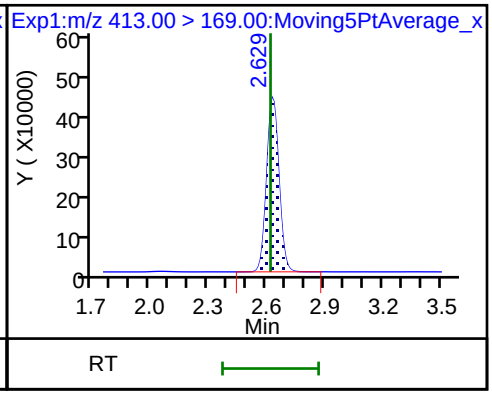
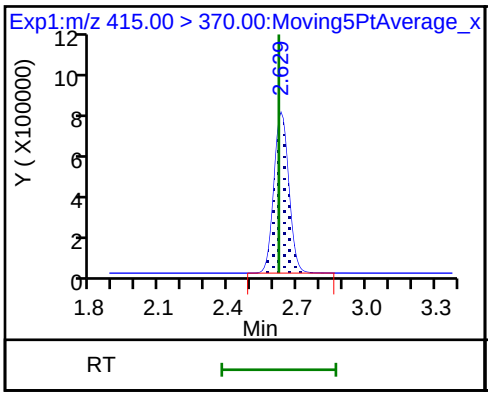
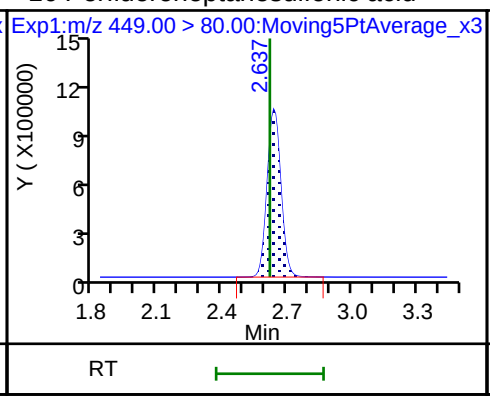


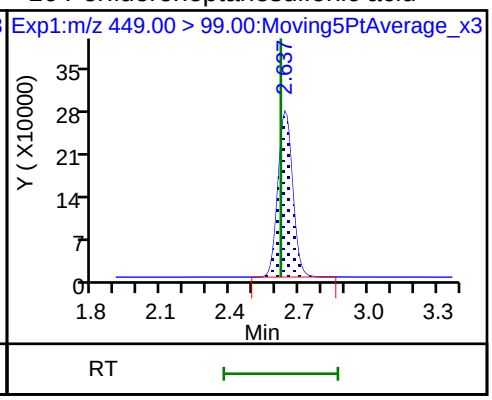
* 62 13C2-PFOA



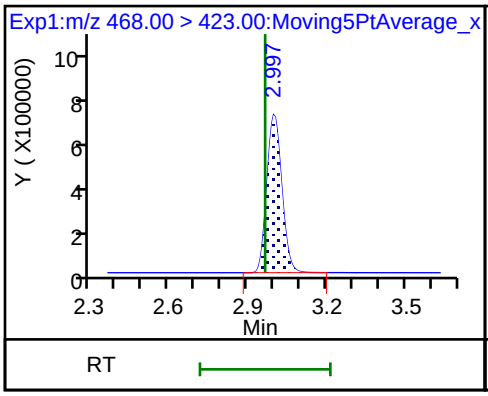
16 Perfluoroheptanesulfonic acid



16 Perfluoroheptanesulfonic acid



D 19 13C5 PFNA



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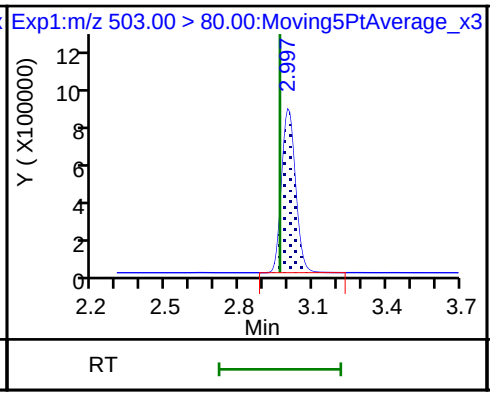
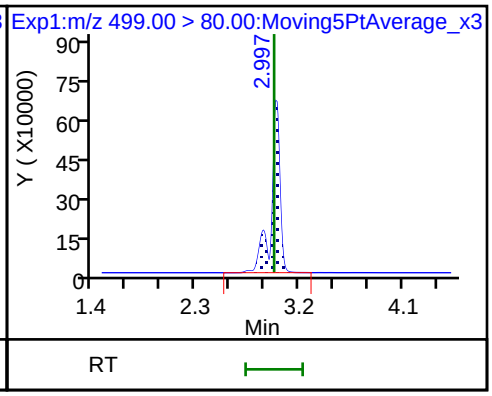


17 Perfluorooctane sulfonic acid



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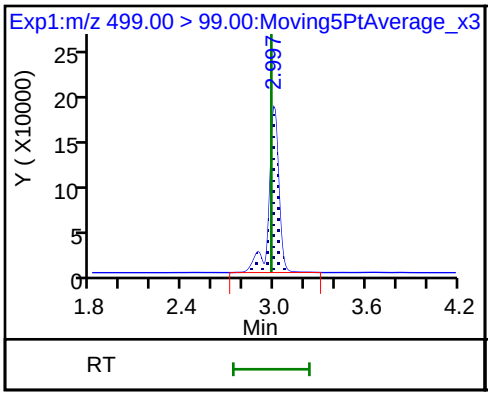
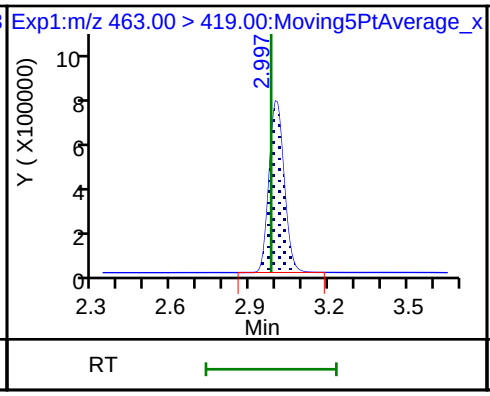


20 Perfluorononanoic acid



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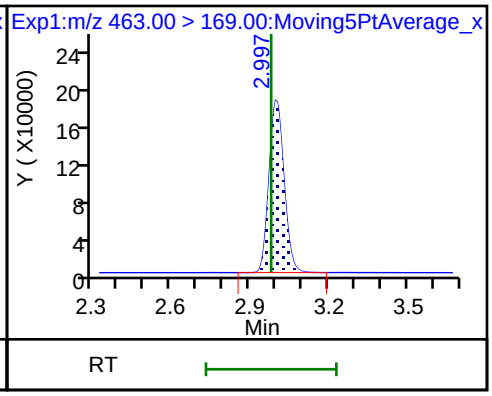
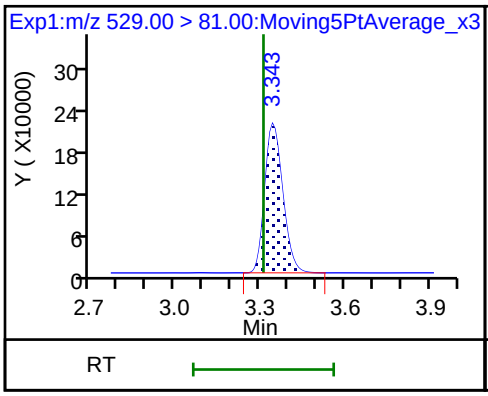
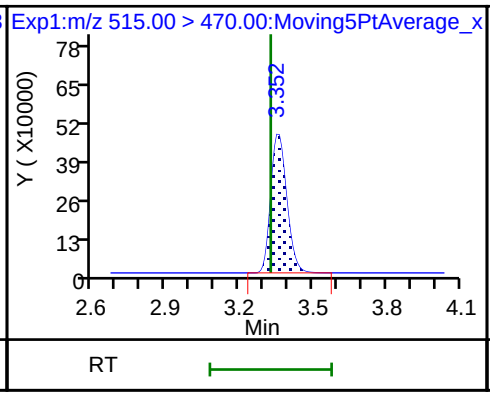


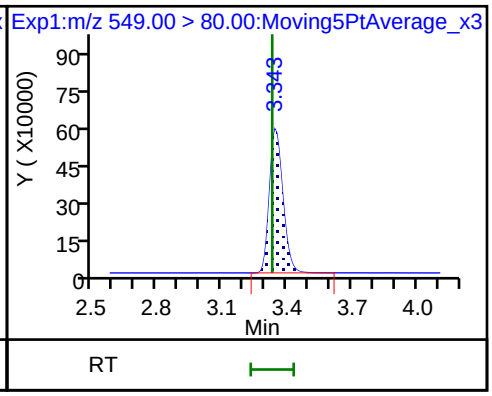
D 26 M2-8:2FTS



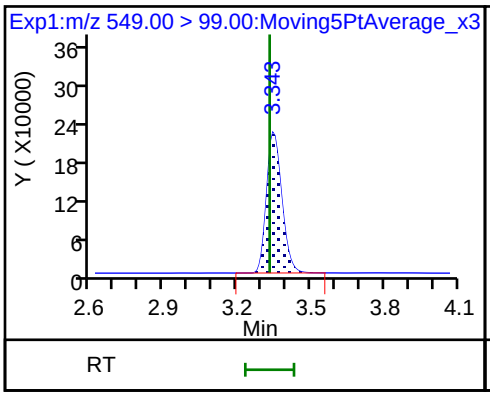
D 23 13C2 PFDA



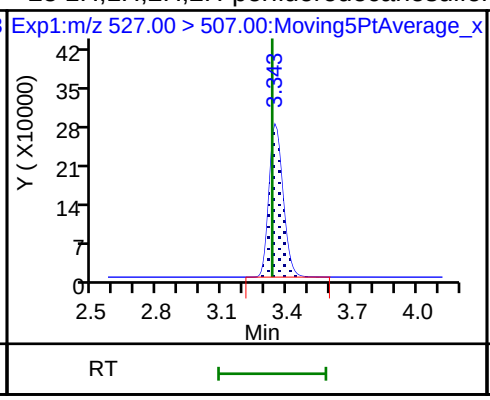
68 Perfluorononanesulfonic acid



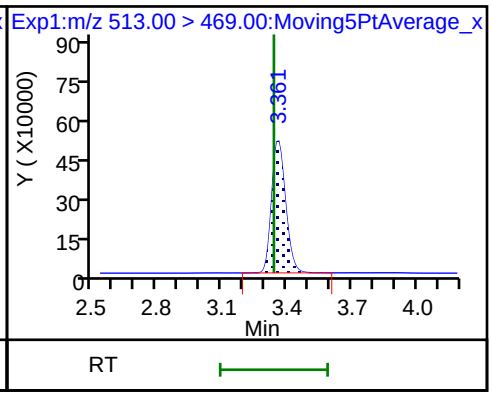
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfoni



24 Perfluorodecanoic acid



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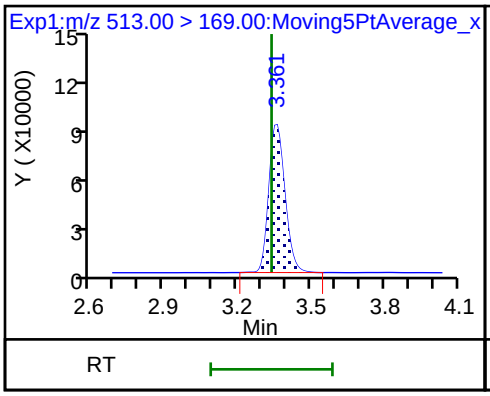
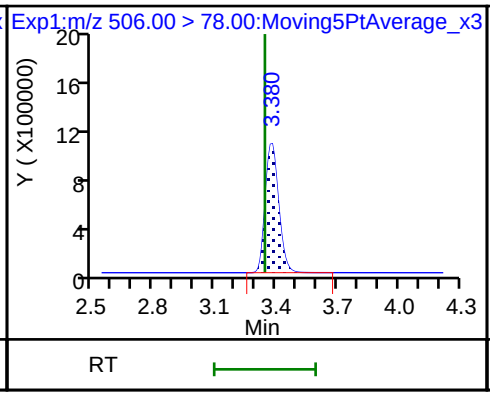
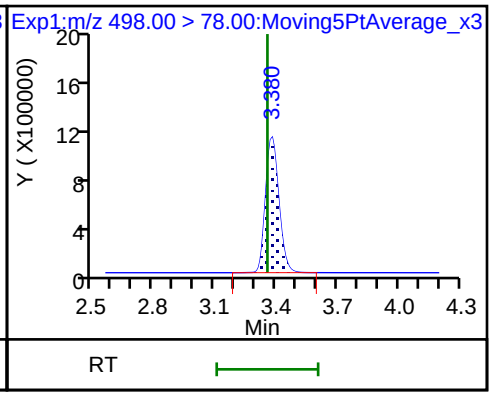


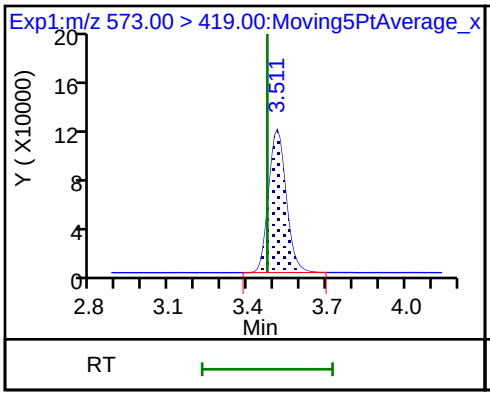
D 21 13C8 FOSA



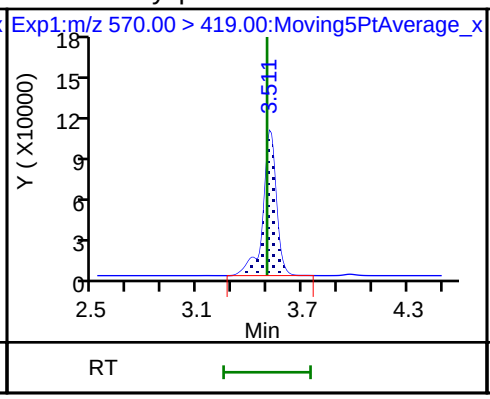
22 Perfluorooctane Sulfonamide



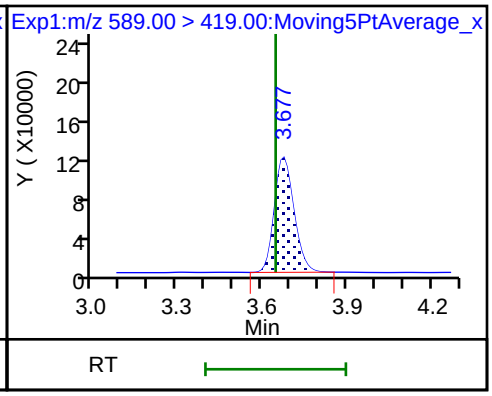
D 27 d3-NMeFOSAA



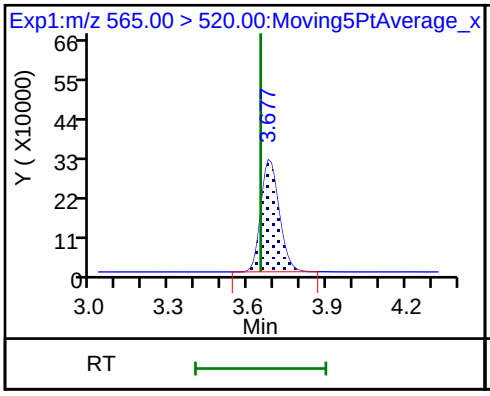
28 N-methyl perfluorooctane sulfonami



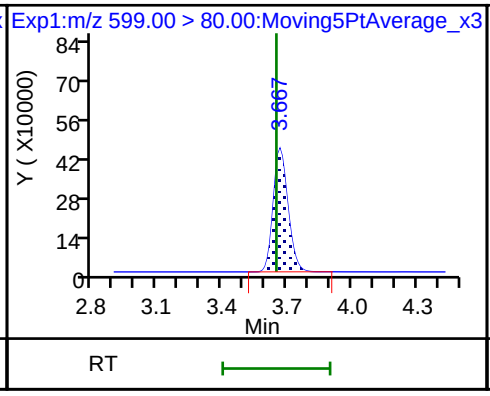
D 32 d5-NEtFOSAA



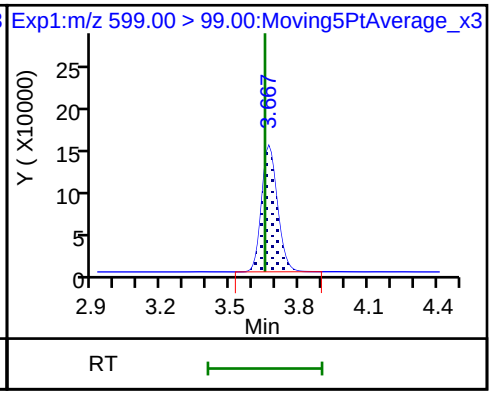
D 30 13C2 PFUnA



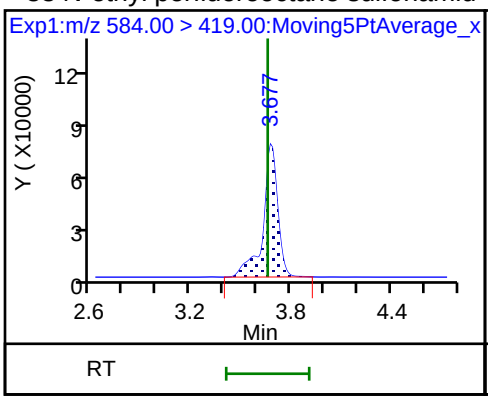
29 Perfluorodecane Sulfonic acid



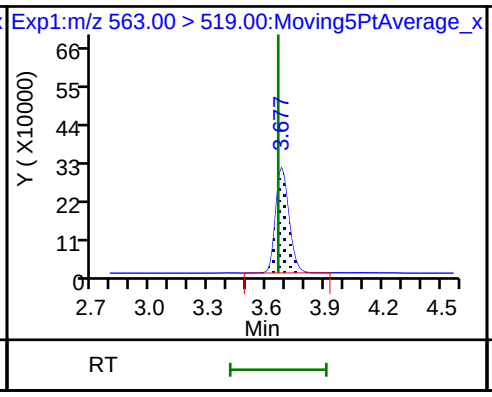
29 Perfluorodecane Sulfonic acid



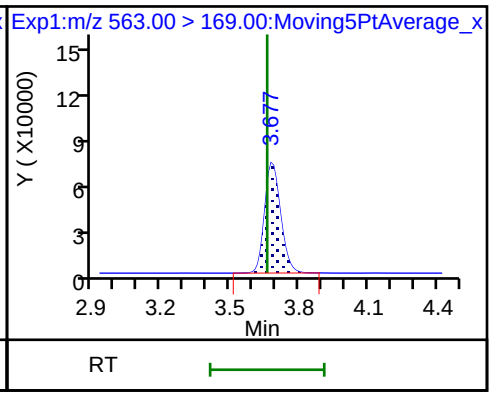
33 N-ethyl perfluorooctane sulfonamid



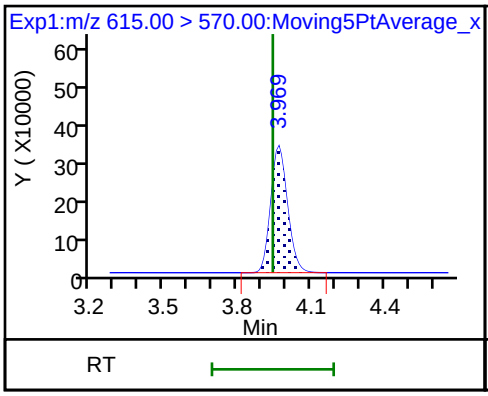
31 Perfluoroundecanoic acid



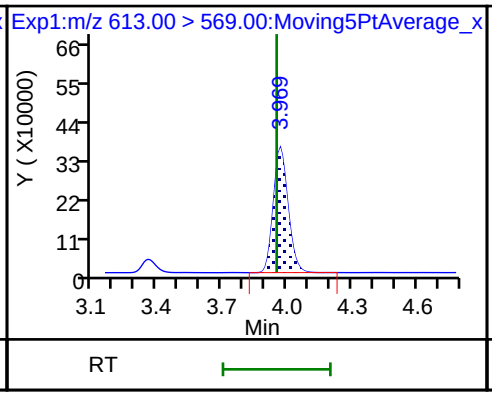
31 Perfluoroundecanoic acid



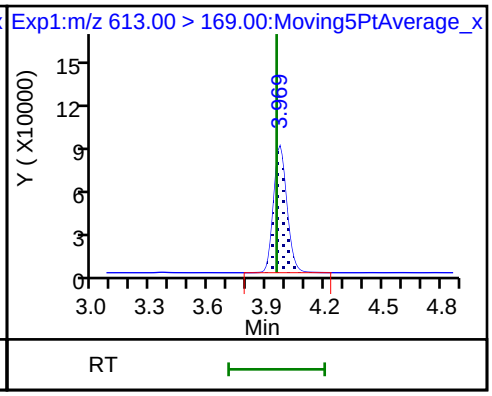
D 36 13C2 PFDoA



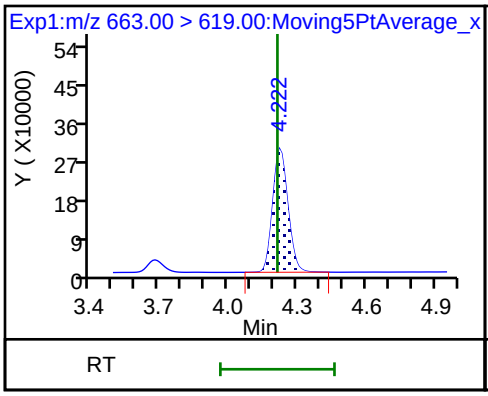
37 Perfluorododecanoic acid



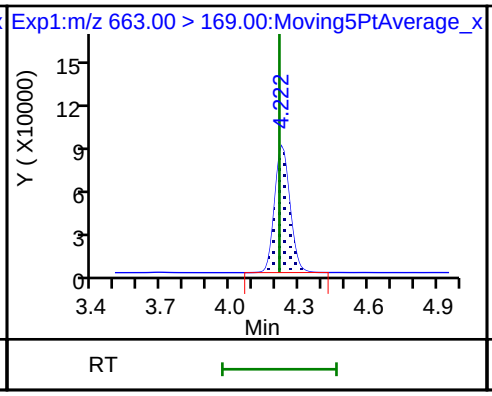
37 Perfluorododecanoic acid



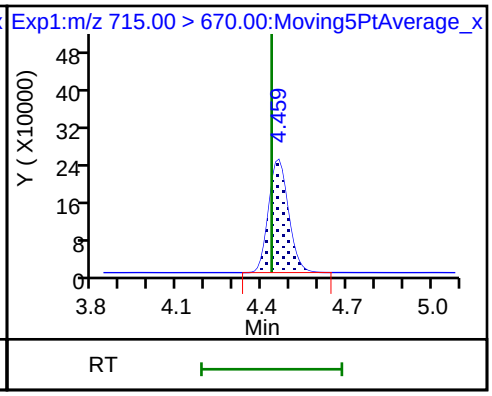
41 Perfluorotridecanoic acid



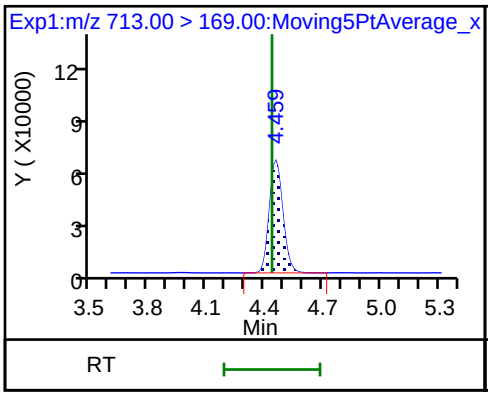
41 Perfluorotridecanoic acid



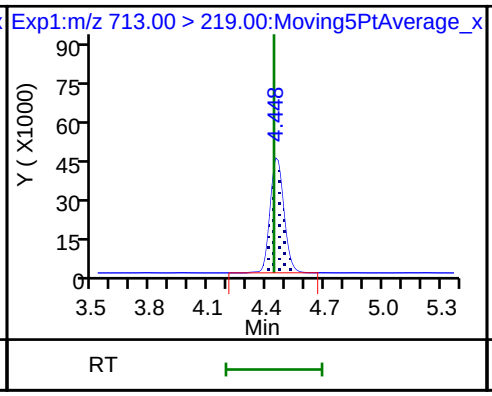
D 43 13C2-PFTeDA



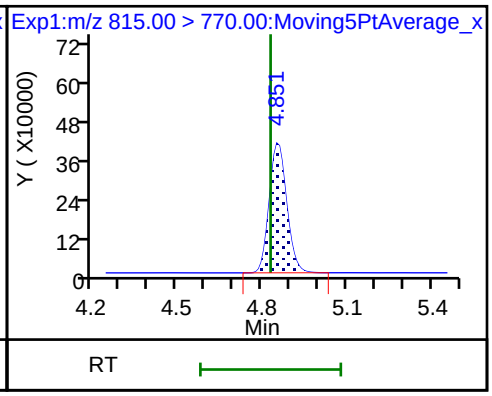
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-238089/2 Calibration Date: 08/06/2018 00:04

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9849		0.0500	0.0500	-0.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.189		0.0497	0.0500	-0.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	80.40		0.0464	0.0442	4.9	30.0
4:2 FTS	AveID	17.21	18.73		0.400	0.0467	8.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.100		0.0521	0.0500	4.3	30.0
Perfluoropentanesulfonic acid	AveID	67.65	70.75		0.0490	0.0469	4.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.181		0.0509	0.0500	1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.194		0.0470	0.0455	3.3	30.0
6:2 FTS	AveID	1.654	1.703		0.400	0.0474	3.0	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.122		0.0486	0.0501	-3.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.278		0.0440	0.0476	-7.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.125		0.0521	0.0500	4.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.085		0.0449	0.0464	-3.3	30.0
8:2 FTS	AveID	1.351	1.449		0.0514	0.0479	7.3	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7591		0.0507	0.0480	5.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.158		0.0542	0.0500	8.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	0.998		0.0506	0.0500	1.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.129		0.400	0.0500	11.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6534		0.0484	0.0482	0.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.9203		0.0516	0.0500	3.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.471		0.0597	0.0500	19.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.228		0.0567	0.0500	13.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9854		0.0523	0.0500	4.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2900		0.0538	0.0500	7.7	30.0
13C4 PFBA	Ave	1.440	1.275		2.21	2.50	-11.5	30.0
13C5-PFPeA	Ave	0.9481	0.9616		2.54	2.50	1.4	30.0
13C3-PFBS	Ave	0.0273	0.0257		2.20	2.33	-5.6	30.0
13C2 PFHxA	Ave	1.026	1.070		2.61	2.50	4.3	30.0
13C4-PFHpA	Ave	0.9943	1.002		2.52	2.50	0.7	30.0
18O2 PFHxS	Ave	1.494	1.475		2.34	2.37	-1.3	30.0
M2-6:2FTS	Ave	0.2913	0.2776		2.26	2.38	-4.7	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-238089/2 Calibration Date: 08/06/2018 00:04

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9733		2.53	2.50	1.4	30.0
13C4 PFOS	Ave	1.032	1.007		2.33	2.39	-2.4	30.0
13C5 PFNA	Ave	0.8365	0.8496		2.54	2.50	1.6	30.0
M2-8:2FTS	Ave	0.2839	0.3081		2.60	2.40	8.5	30.0
13C2 PFDA	Ave	0.6256	0.6900		2.76	2.50	10.3	30.0
13C8 FOSA	Ave	1.516	1.536		2.53	2.50	1.3	30.0
d3-NMeFOSAA	Ave	0.1518	0.1512		2.49	2.50	-0.4	30.0
d5-NEtFOSAA	Ave	0.1627	0.1684		2.59	2.50	3.5	30.0
13C2 PFUnA	Ave	0.4818	0.4881		2.53	2.50	1.3	30.0
13C2 PFDoA	Ave	0.4172	0.4267		2.56	2.50	2.3	30.0
13C2-PFTeDA	Ave	0.3502	0.3643		2.60	2.50	4.0	30.0
13C2-PFHxDA	Ave	0.6033	0.5657		2.34	2.50	-6.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\2018.08.05LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 06-Aug-2018 00:04:15 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 17:05:27 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 17:04:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.391	0.0	0.546	4471642	2.21		88.5	108090	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.391	0.0	1.000	88086	0.0500		99.9	22.5	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.625	1.625	0.0	1.000	80243	0.0497		99.3	30.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.625	1.632	-0.007	0.638	3373369	2.54		101	82989	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.656	1.657	-0.001	1.000	128383	0.0464		105	386	
298.90 > 99.00	1.656	1.657	-0.001	1.000	53531		2.40(1.25-3.74)		280	
D 47 13C3-PFBS										
301.90 > 83.00	1.656	1.665	-0.009	0.651	83992	2.20		94.4	590	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.856	1.857	-0.001	1.121	31600	0.0508		109	1508	
D 60 M2-4:2FTS										
329.00 > 81.00	1.856	1.866	-0.010	0.729	634757	NC			9976	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.885	1.885	0.0	1.000	82551	0.0521		104	379	
313.00 > 119.00	1.875	1.885	-0.010	0.995	8077		10.22(5.03-15.10)		107	
D 7 13C2 PFHxA										
315.00 > 270.00	1.885	1.895	-0.010	0.741	3753712	2.61		104	86765	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.905	1.905	0.0	1.150	119876	0.0490		105	3102	
349.00 > 99.00	1.905	1.905	0.0	1.150	44228		2.71(1.36-4.07)		607	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.980	1.981	-0.001	1.000	16645	NC			113	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.980	1.991	-0.011	0.778	235693	NC			8467	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.206	2.206	0.0	1.000	83007	0.0509		102	83.7	
363.00 > 169.00	2.206	2.206	0.0	1.000	30525		2.72(1.13-3.40)		449	
D 9 13C4-PFHpA										
367.00 > 322.00	2.206	2.217	-0.011	0.867	3514116	2.52		101	61176	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.217	2.217	0.0	1.000	112472	0.0470		103	585	
399.00 > 99.00	2.217	2.217	0.0	1.000	43921		2.56(1.50-4.49)		126	
D 11 18O2 PFHxS										
403.00 > 84.00	2.217	2.229	-0.012	0.871	4895872	2.34		98.7	57076	
65 ADONA										
377.00 > 251.00	2.240	2.241	-0.001	0.769	205472	NC			2706	
377.00 > 85.00	2.240	2.241	-0.001	0.769	121970		1.68(0.84-2.53)		500	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.527	2.518	0.009	1.000	31445	0.0488		103	756	
D 12 M2-6:2FTS										
429.00 > 81.00	2.527	2.546	-0.019	0.993	925166	2.26		95.3	14069	
* 62 13C2-PFOA										
415.00 > 370.00	2.546	2.546	0.0		3508216	2.50			45115	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.546	2.546	0.0	1.000	76693	0.0486		97.0	55.4	
413.00 > 169.00	2.546	2.546	0.0	1.000	44598		1.72(0.84-2.52)		494	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.555	2.555	0.0	0.877	85989	0.0440		92.4	1373	
449.00 > 99.00	2.555	2.555	0.0	0.877	22684		3.79(1.94-5.82)		549	
D 14 13C4 PFOA										
417.00 > 372.00	2.546	2.564	-0.018	1.000	3414621	2.53		101	53499	
20 Perfluorononanoic acid										
463.00 > 419.00	2.912	2.907	0.005	1.000	67057	0.0521		104	363	
463.00 > 169.00	2.912	2.907	0.005	1.000	17147		3.91(1.90-5.69)		1175	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.912	2.912	0.0	1.000	71186	0.0449		96.7	937	
499.00 > 99.00	2.912	2.912	0.0	1.000	17737		4.01(2.31-6.93)		180	
D 19 13C5 PFNA										
468.00 > 423.00	2.912	2.931	-0.019	1.144	2980476	2.54		102	59161	
D 18 13C4 PFOS										
503.00 > 80.00	2.912	2.931	-0.019	1.144	3378611	2.33		97.6	36902	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.123	3.115	0.008	1.073	112146	NC			1704	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.256	3.250	0.006	1.118	51508	0.0507		106	2163	
549.00 > 99.00	3.256	3.250	0.006	1.118	22245		2.32(1.33-3.97)		166	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.256	3.250	0.006	1.002	30016	0.0514		107	1844	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.262	3.263	-0.001	1.000	56044	0.0542		108	174	
513.00 > 169.00	3.262	3.263	-0.001	1.000	9822		5.71(2.36-7.09)		204	
D 26 M2-8:2FTS										
529.00 > 81.00	3.250	3.269	-0.019	1.277	1035555	2.60		109	20120	
D 23 13C2 PFDA										
515.00 > 470.00	3.262	3.283	-0.021	1.282	2420687	2.76		110	43751	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.307	3.307	0.0	1.000	107566	0.0506		101	6230	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.315	-0.008	1.299	5387915	2.53		101	38155	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.421	3.421	0.0	1.000	11979	0.0555		111	213	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.421	3.439	-0.018	1.344	530480	2.49		99.6	16381	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.570	3.570	0.0	1.226	44524	0.0484		100	1939	
599.00 > 99.00	3.570	3.570	0.0	1.226	17611		2.53(1.39-4.16)		140	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.590	3.579	0.011	1.003	10873	0.0516		103	253	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.590	3.579	0.011	1.000	50366	0.0597		119	90.7	R
563.00 > 169.00	3.590	3.579	0.011	1.000	6862		7.34(2.12-6.36)		372	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.579	3.600	-0.021	1.406	590738	2.59		103	3676	
D 30 13C2 PFUnA										
565.00 > 520.00	3.590	3.611	-0.021	1.410	1712459	2.53		101	36154	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.743	3.743	0.0	1.285	171303	NC			5046	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.878	3.868	0.010	1.000	36751	0.0567		113	8.6	
613.00 > 169.00	3.878	3.868	0.010	1.000	9418		3.90(2.13-6.40)		157	
D 36 13C2 PFDoA										
615.00 > 570.00	3.878	3.899	-0.021	1.524	1496862	2.56		102	16007	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.134	4.134	0.0	1.066	29499	0.0523		105	8.3	R
663.00 > 169.00	4.134	4.134	0.0	1.066	7648		3.86(1.25-3.76)		95.5	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.362	4.363	-0.001	1.000	7413	0.0538		108	122	
713.00 > 219.00	4.352	4.363	-0.011	0.998	3902		1.90(0.71-2.13)		53.0	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.362	4.384	-0.022	1.714	1277947	2.60		104	5359	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.750	4.750	0.0	1.000	63147	NC			2.6	
813.00 > 169.00	4.750	4.750	0.0	1.000	9925		6.36(2.86-8.58)		152	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.750	4.778	-0.028	1.866	1984578	2.34		93.8	3495	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.078	5.070	0.008	1.069	53828	NC			17.8	
913.00 > 169.00	5.070	5.070	0.0	1.067	6909		7.79(3.83-11.48)		99.4	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 17:05:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\2018.08.05LLA_005.d

Injection Date: 06-Aug-2018 00:04:15 Instrument ID: A8_N

Lims ID: CCVL

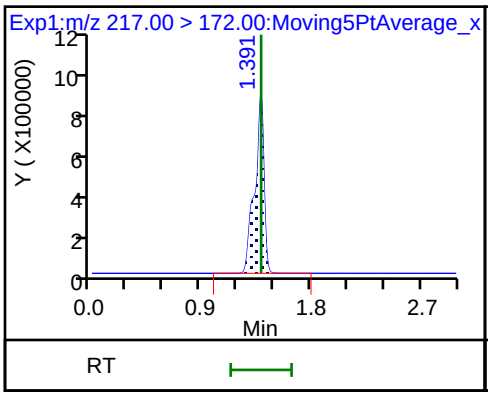
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2

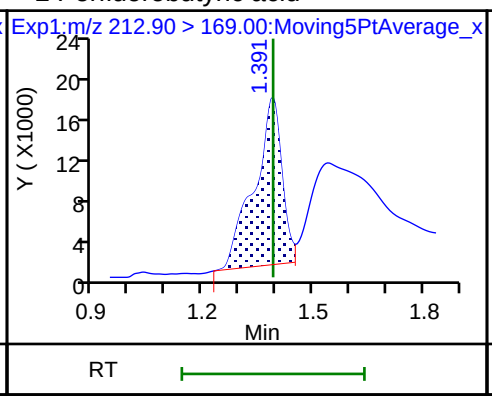
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

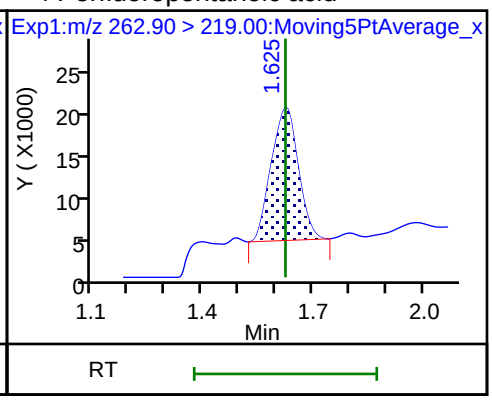
D 1 13C4 PFBA



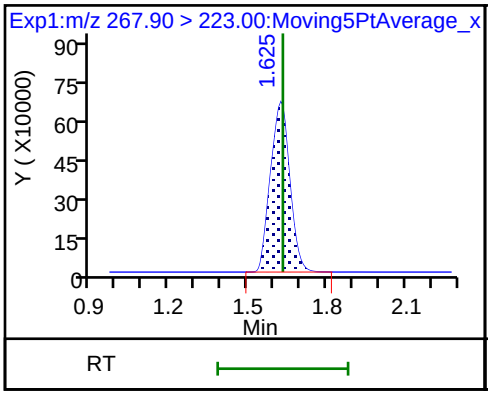
2 Perfluorobutyric acid



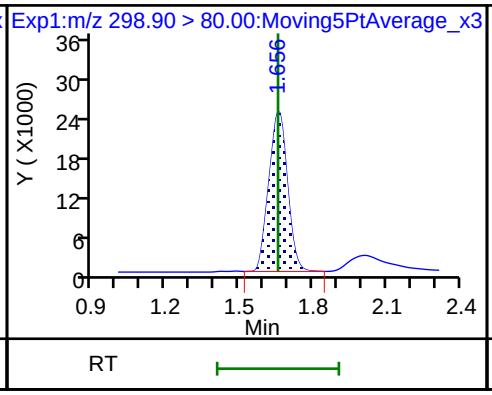
4 Perfluoropentanoic acid



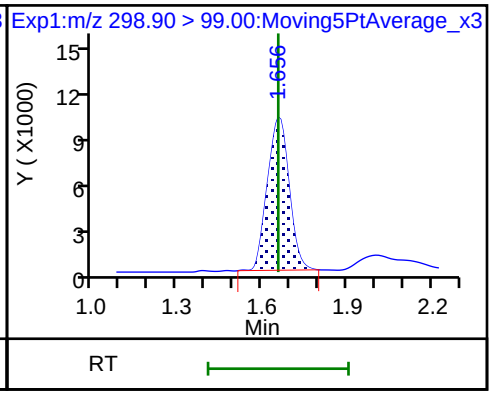
D 3 13C5-PFPeA



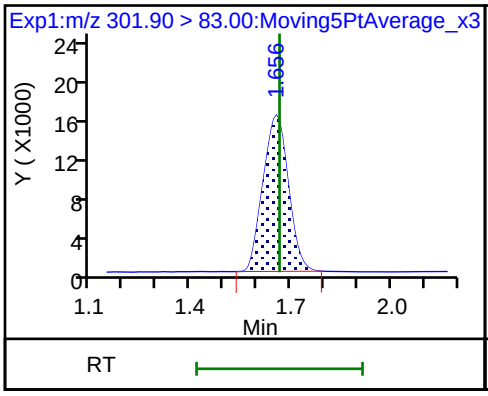
5 Perfluorobutanesulfonic acid



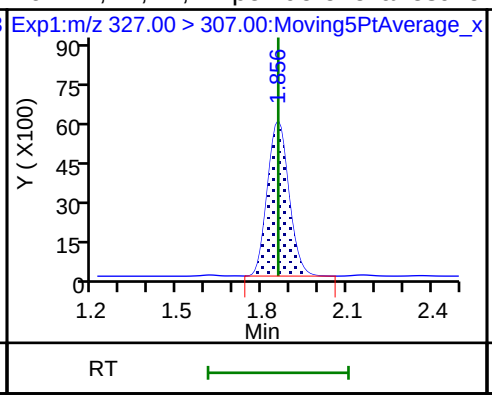
5 Perfluorobutanesulfonic acid



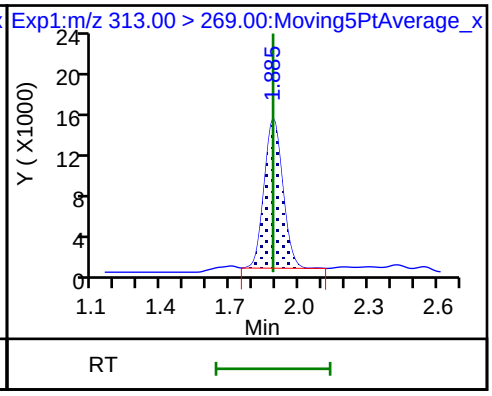
D 47 13C3-PFBS



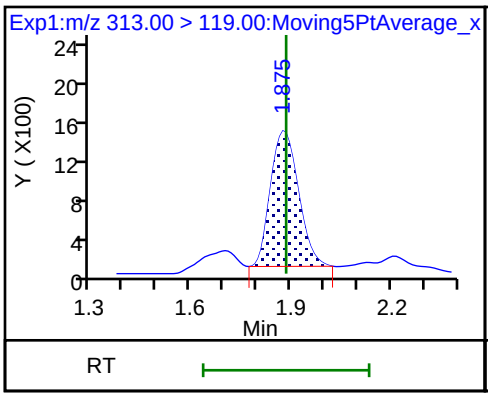
61 1H,1H,2H,2H-perfluorohexanesulfoni



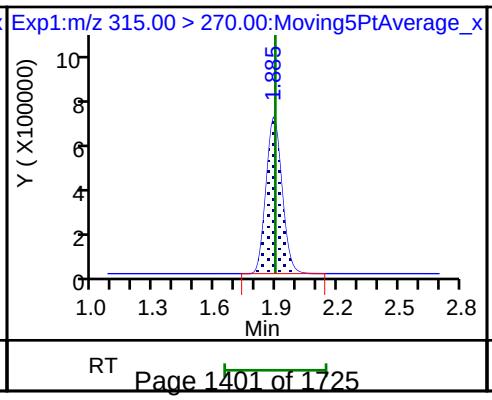
6 Perfluorohexanoic acid



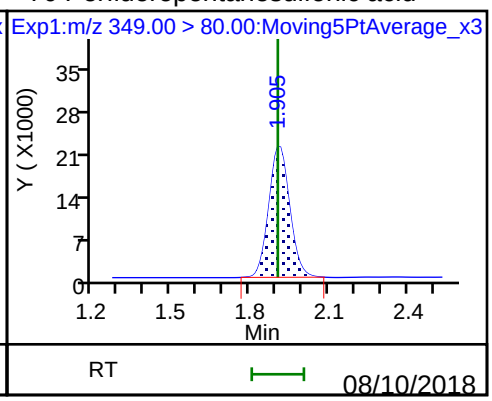
6 Perfluorohexanoic acid



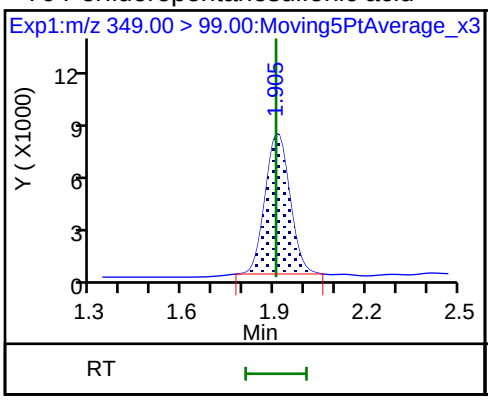
D 7 13C2 PFHxA



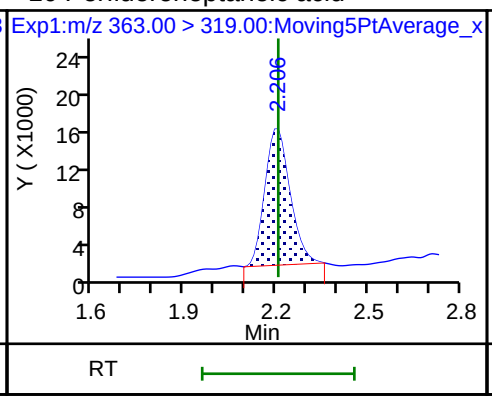
70 Perfluoropentanesulfonic acid



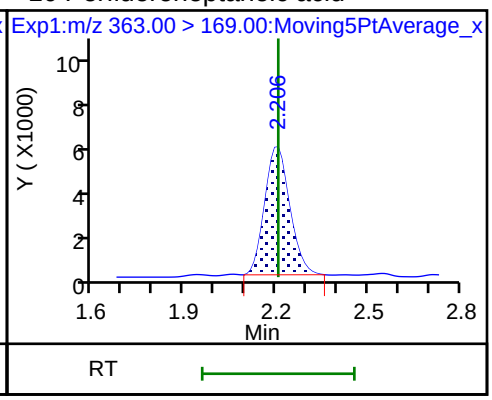
70 Perfluoropentanesulfonic acid



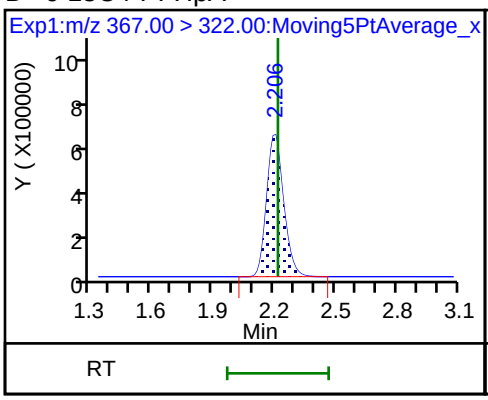
10 Perfluoroheptanoic acid



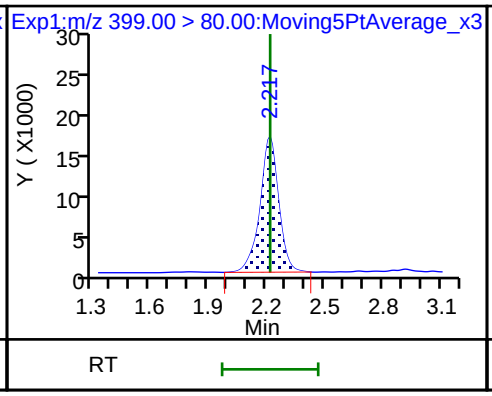
10 Perfluoroheptanoic acid



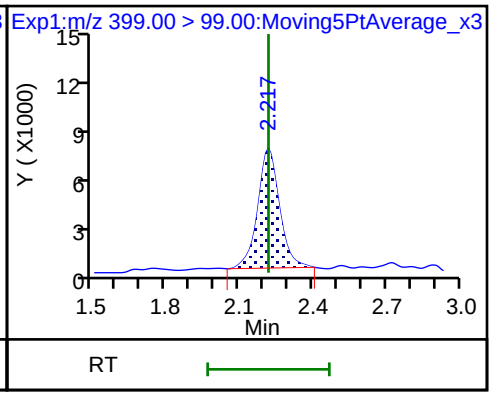
D 9 13C4-PFHpA



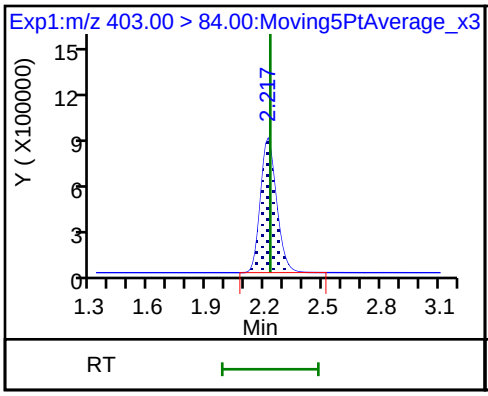
8 Perfluorohexanesulfonic acid



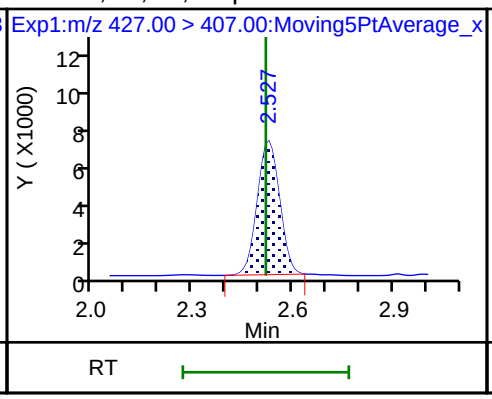
8 Perfluorohexanesulfonic acid



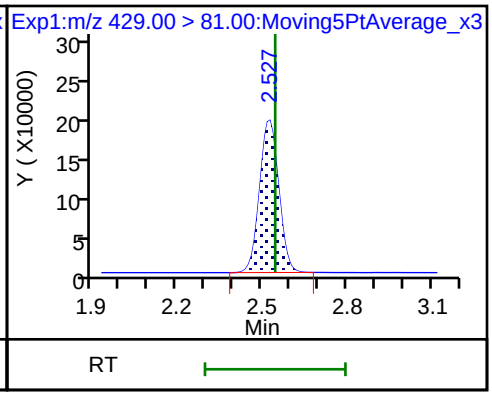
D 11 18O2 PFHxS



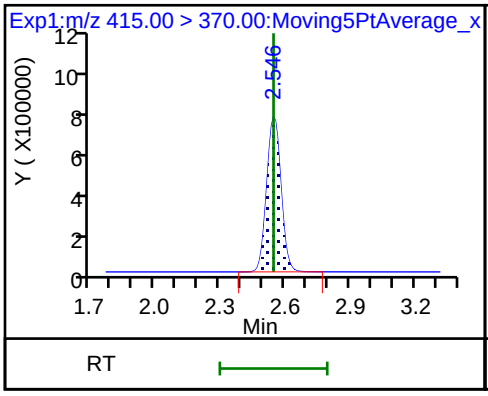
13 1H,1H,2H,2H-perfluorooctanesulfon



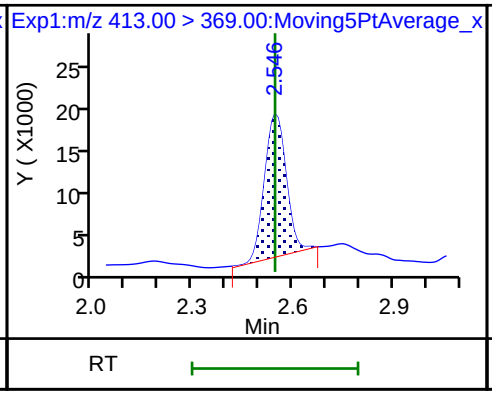
D 12 M2-6:2FTS



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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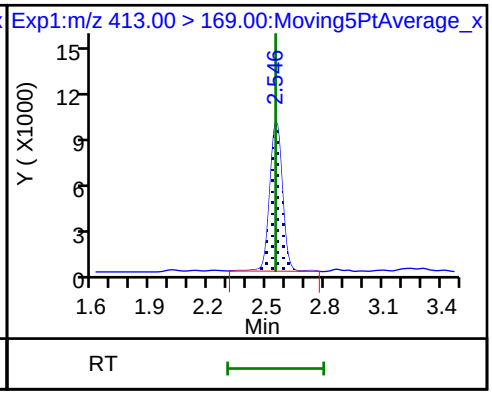
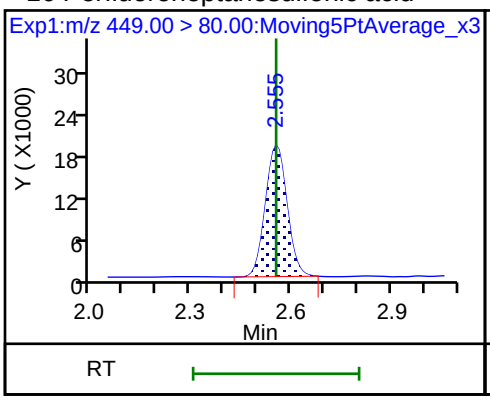
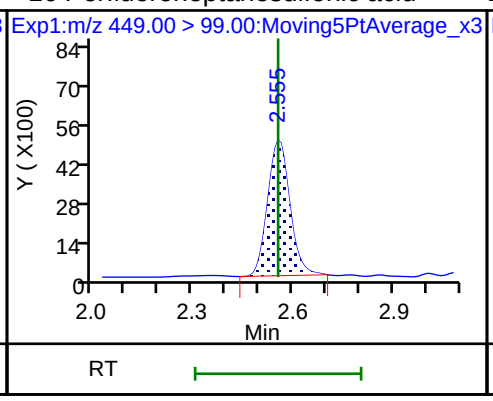


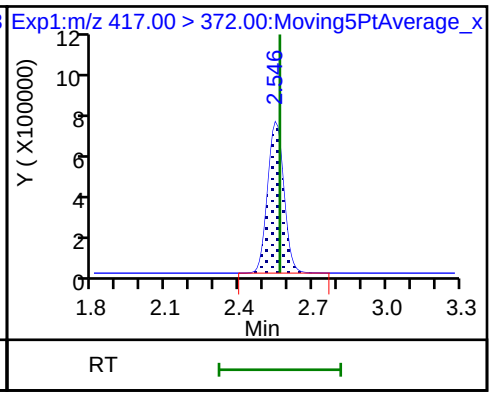
16 Perfluoroheptanesulfonic acid



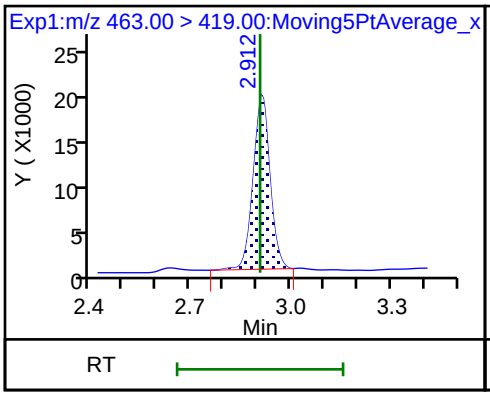
16 Perfluoroheptanesulfonic acid



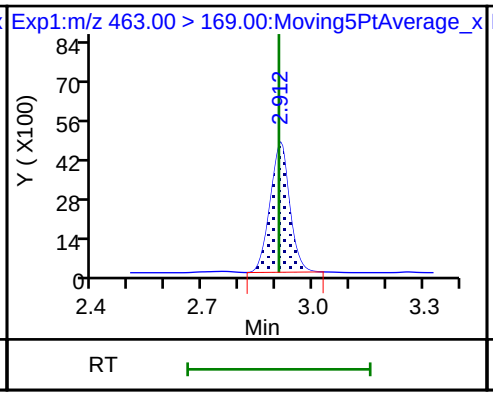
D 14 13C4 PFOA



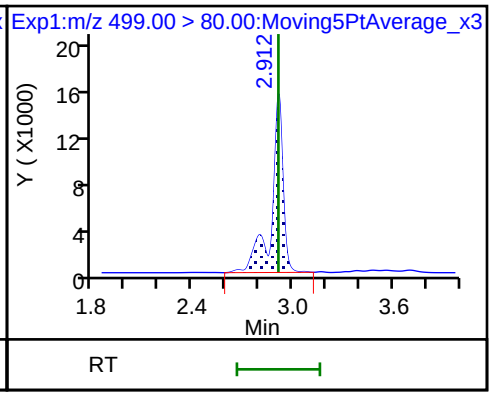
20 Perfluorononanoic acid



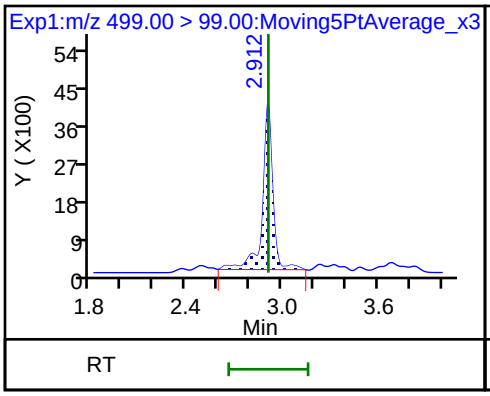
20 Perfluorononanoic acid



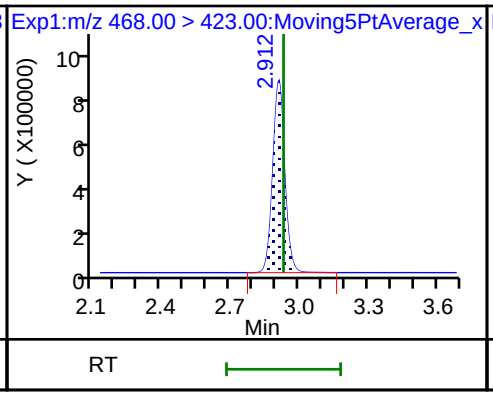
17 Perfluorooctane sulfonic acid



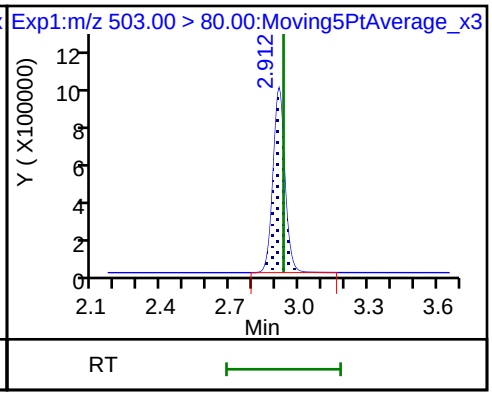
17 Perfluorooctane sulfonic acid



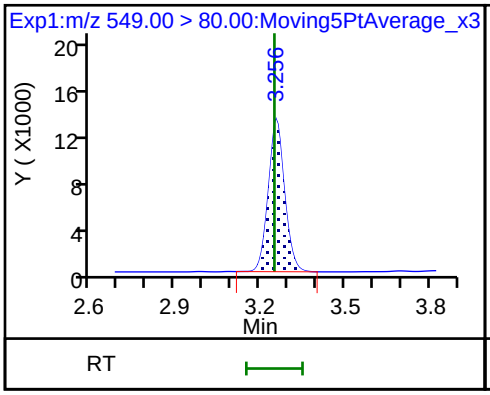
D 19 13C5 PFNA



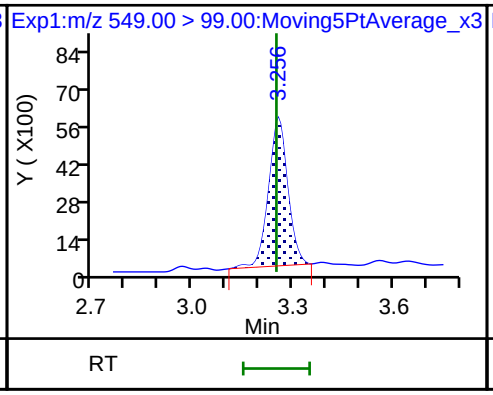
D 18 13C4 PFOS



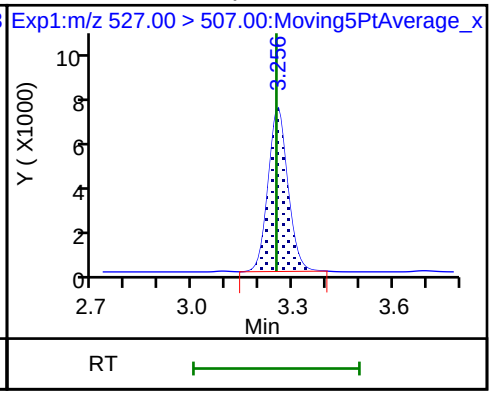
68 Perfluorononanesulfonic acid



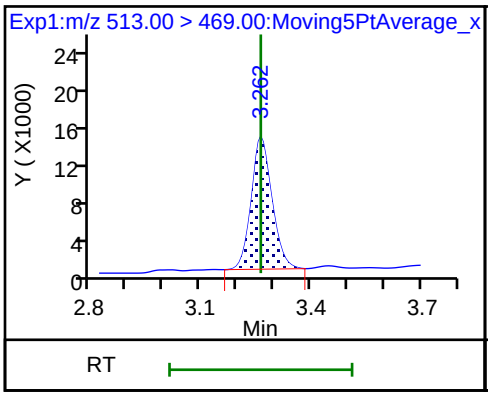
68 Perfluorononanesulfonic acid



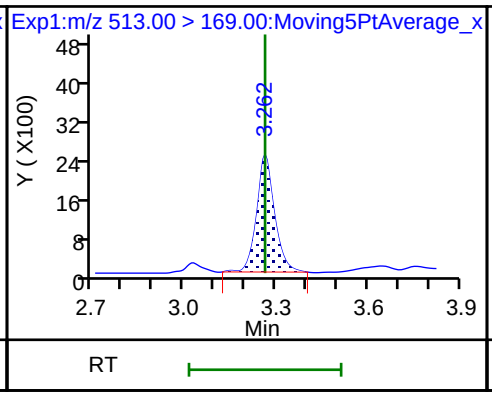
25 1H,1H,2H,2H-perfluorodecanesulfoni



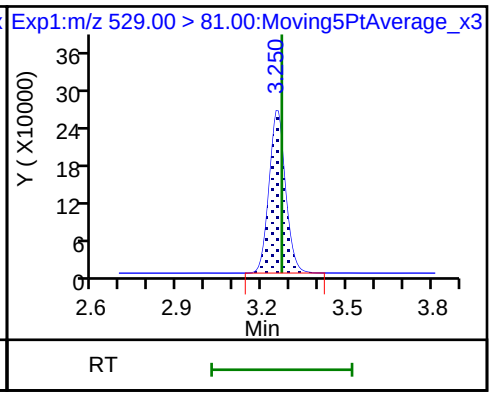
24 Perfluorodecanoic acid



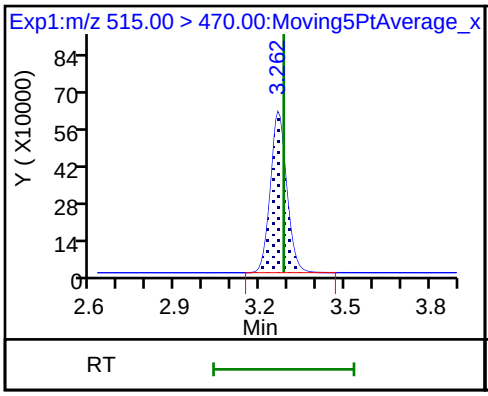
24 Perfluorodecanoic acid



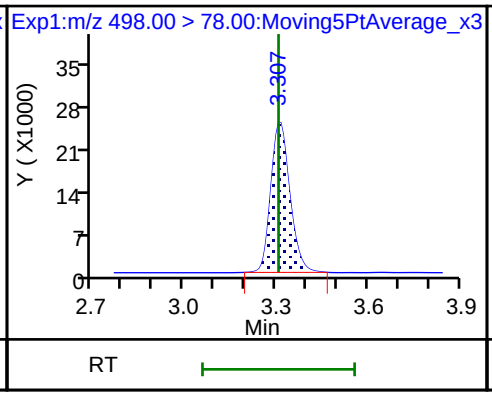
D 26 M2-8:2FTS



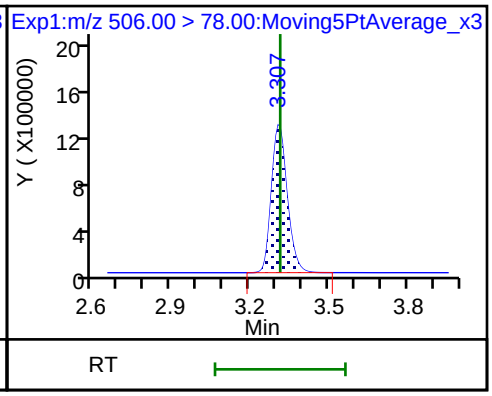
D 23 13C2 PFDA



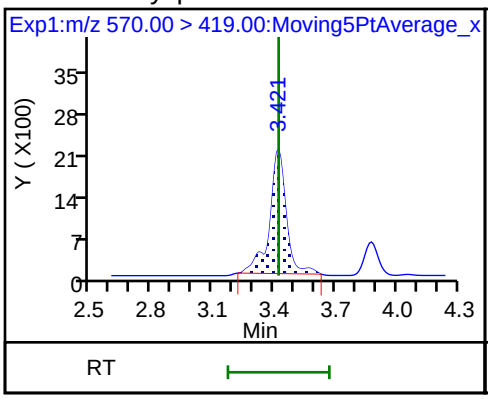
22 Perfluorooctane Sulfonamide



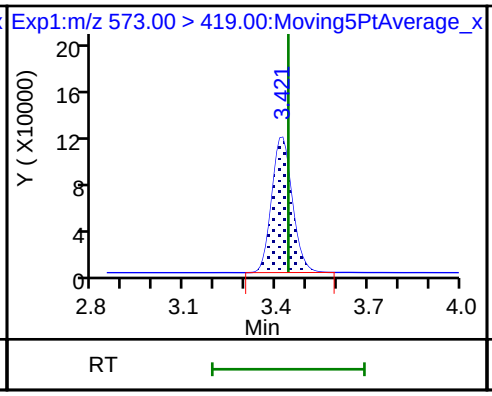
D 21 13C8 FOSA



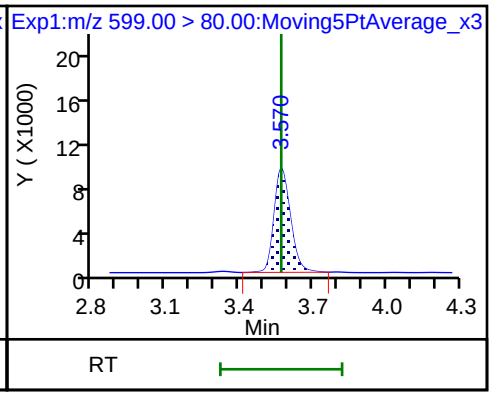
28 N-methyl perfluorooctane sulfonami



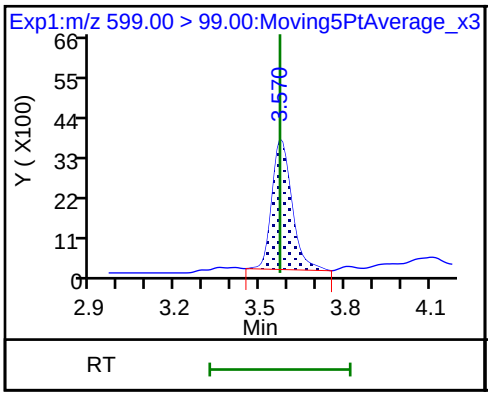
D 27 d3-NMeFOSAA



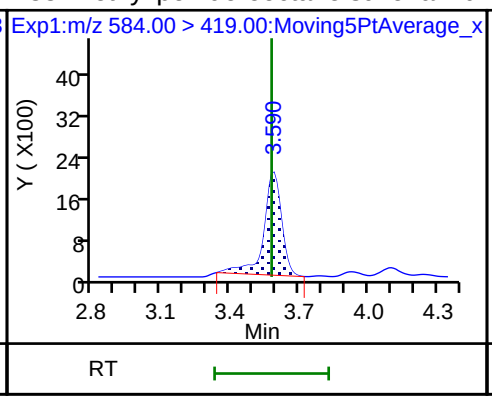
29 Perfluorodecane Sulfonic acid



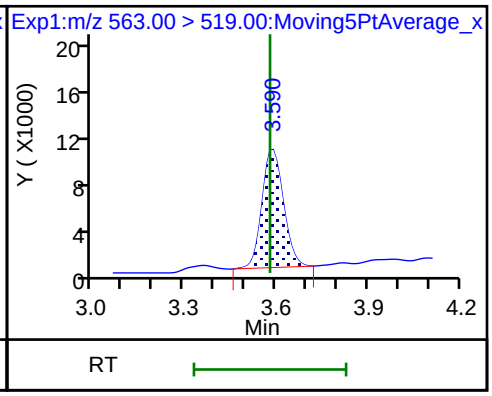
29 Perfluorodecane Sulfonic acid



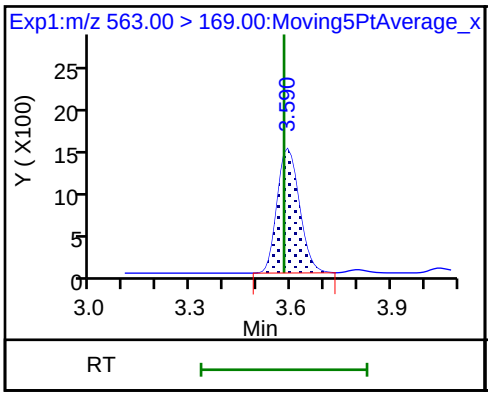
33 N-ethyl perfluorooctane sulfonamid



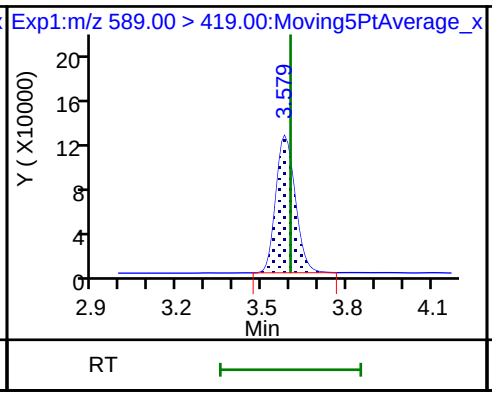
31 Perfluoroundecanoic acid



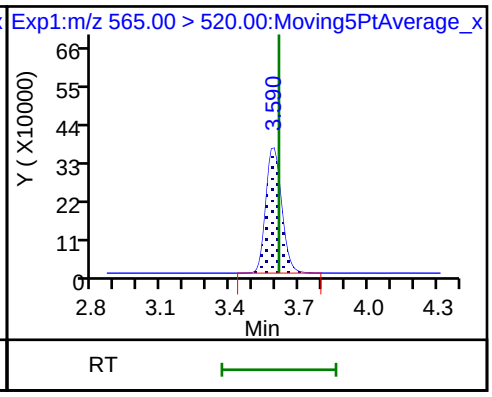
31 Perfluoroundecanoic acid



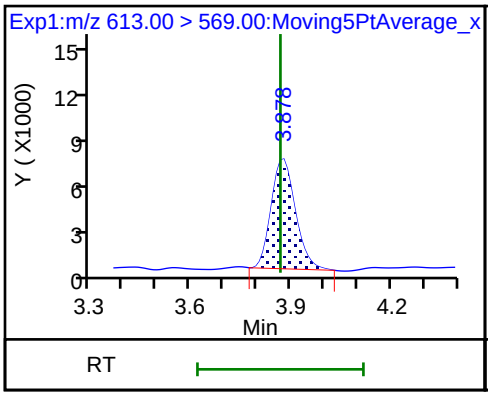
D 32 d5-NEtFOSAA



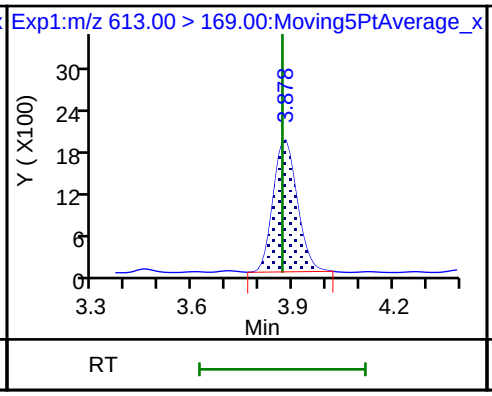
D 30 13C2 PFUnA



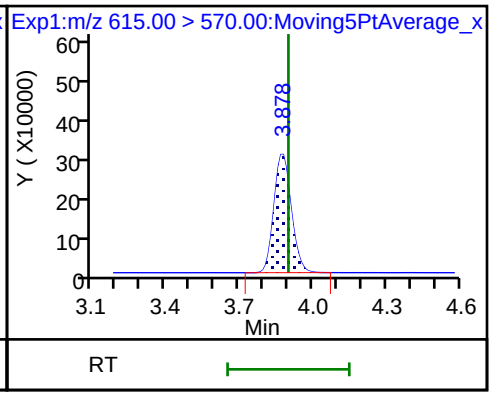
37 Perfluorododecanoic acid



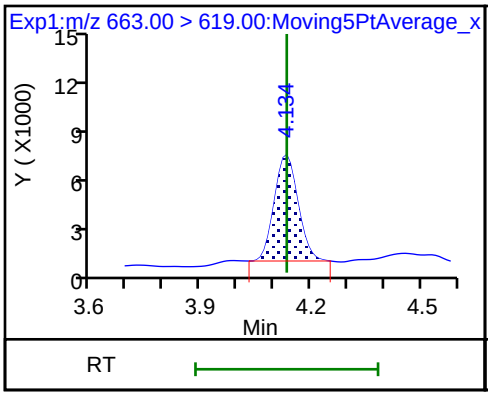
37 Perfluorododecanoic acid



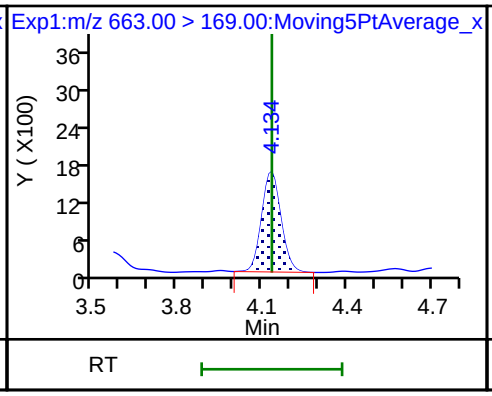
D 36 13C2 PFDoA



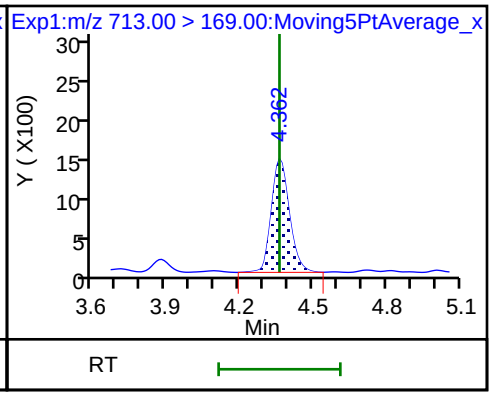
41 Perfluorotridecanoic acid



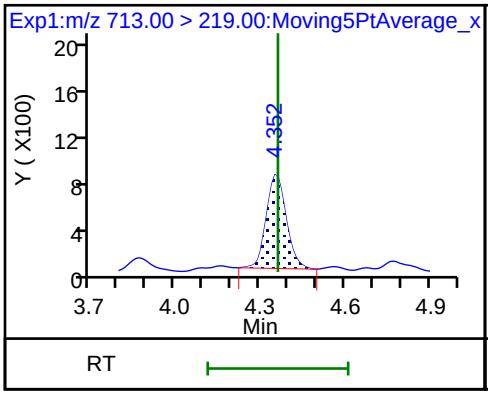
41 Perfluorotridecanoic acid



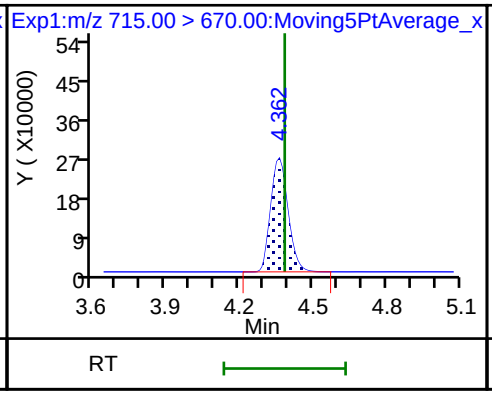
42 Perfluorotetradecanoic acid



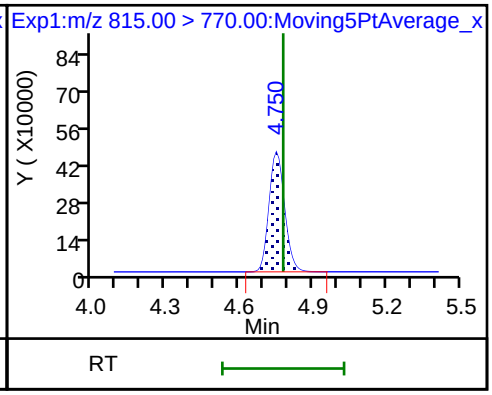
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238089/3 Calibration Date: 08/06/2018 00:12

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9610		0.975	1.00	-2.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.175		0.981	1.00	-1.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	92.38		1.07	0.884	20.5	30.0
4:2 FTS	AveID	17.21	19.34		1.05	0.934	12.4	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.013		0.960	1.00	-4.0	30.0
Perfluoropentanesulfonic acid	AveID	67.65	71.94		0.997	0.938	6.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.128		0.973	1.00	-2.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.063		0.837	0.910	-8.0	30.0
6:2 FTS	AveID	1.654	1.615		0.926	0.948	-2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.118		0.968	1.00	-3.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.310		0.902	0.952	-5.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.069		0.990	1.00	-1.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.064		0.879	0.928	-5.2	30.0
8:2 FTS	AveID	1.351	1.355		0.961	0.958	0.3	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7848		1.05	0.960	9.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.051		0.985	1.00	-1.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.006		1.02	1.00	1.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.030		1.01	1.00	1.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6424		0.952	0.964	-1.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8655		0.971	1.00	-2.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.151		0.934	1.00	-6.6	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.121		1.03	1.00	3.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9038		0.959	1.00	-4.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2589		0.961	1.00	-3.9	30.0
13C4 PFBA	Ave	1.440	1.328		2.31	2.50	-7.8	30.0
13C5-PFPeA	Ave	0.9481	1.025		2.70	2.50	8.1	30.0
13C3-PFBS	Ave	0.0273	0.0262		2.24	2.33	-3.8	30.0
13C2 PFHxA	Ave	1.026	1.141		2.78	2.50	11.2	30.0
13C4-PFHpA	Ave	0.9943	1.107		2.78	2.50	11.3	30.0
18O2 PFHxS	Ave	1.494	1.573		2.49	2.37	5.3	30.0
M2-6:2FTS	Ave	0.2913	0.2988		2.44	2.38	2.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238089/3 Calibration Date: 08/06/2018 00:12

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9656		2.51	2.50	0.6	30.0
13C4 PFOS	Ave	1.032	1.031		2.39	2.39	-0.1	30.0
13C5 PFNA	Ave	0.8365	0.8521		2.55	2.50	1.9	30.0
M2-8:2FTS	Ave	0.2839	0.2925		2.47	2.40	3.0	30.0
13C2 PFDA	Ave	0.6256	0.7156		2.86	2.50	14.4	30.0
13C8 FOSA	Ave	1.516	1.483		2.45	2.50	-2.2	30.0
d3-NMeFOSAA	Ave	0.1518	0.1605		2.64	2.50	5.7	30.0
13C2 PFUnA	Ave	0.4818	0.5179		2.69	2.50	7.5	30.0
d5-NEtFOSAA	Ave	0.1627	0.1723		2.65	2.50	5.9	30.0
13C2 PFDoA	Ave	0.4172	0.4411		2.64	2.50	5.7	30.0
13C2-PFTeDA	Ave	0.3502	0.3632		2.59	2.50	3.7	30.0
13C2-PFHxDA	Ave	0.6033	0.5225		2.17	2.50	-13.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\2018.08.05LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 06-Aug-2018 00:12:06 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 17:05:34 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 17:04:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.391	0.0	0.546	4565990	2.31		92.2	97625	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.391	0.0	1.000	1755240	0.9752		97.5	439	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.625	1.625	0.0	1.000	1657335	0.9813		98.1	769	
D 3 13C5-PFPeA										
267.90 > 223.00	1.625	1.632	-0.007	0.638	3526377	2.70		108	68662	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.657	1.657	0.0	1.000	2947716	1.07		121	8077	
298.90 > 99.00	1.657	1.657	0.0	1.000	1193651		2.47(1.25-3.74)		6007	
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.665	-0.008	0.651	83926	2.24		96.2	493	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.857	1.857	0.0	1.121	652065	1.05		112	40828	
D 60 M2-4:2FTS										
329.00 > 81.00	1.857	1.866	-0.009	0.729	663079	NC			7800	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.885	1.885	0.0	1.000	1588858	0.9602		96.0	7681	
313.00 > 119.00	1.885	1.885	0.0	1.000	146466		10.85(5.03-15.10)		2692	
D 7 13C2 PFHxA										
315.00 > 270.00	1.885	1.895	-0.010	0.741	3922559	2.78		111	89686	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.905	1.905	0.0	1.150	2435662	1.00		106	36159	
349.00 > 99.00	1.905	1.905	0.0	1.150	902859		2.70(1.36-4.07)		10674	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.981	1.981	0.0	1.000	319400	NC			2175	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.981	1.991	-0.010	0.778	228213	NC			10155	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.206	2.206	0.0	1.000	1718032	0.9728		97.3	1647	
363.00 > 169.00	2.206	2.206	0.0	1.000	693872		2.48(1.13-3.40)		11995	
D 9 13C4-PFHpA										
367.00 > 322.00	2.206	2.217	-0.011	0.867	3807389	2.78		111	73686	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.217	2.217	0.0	1.000	2094306	0.8371		92.0	9727	
399.00 > 99.00	2.217	2.217	0.0	1.000	699764		2.99(1.50-4.49)		2078	
D 11 18O2 PFHxS										
403.00 > 84.00	2.217	2.229	-0.012	0.871	5118620	2.49		105	55348	
65 ADONA										
377.00 > 251.00	2.241	2.241	0.0	0.771	4113233	NC			41288	
377.00 > 85.00	2.241	2.241	0.0	0.771	2440845		1.69(0.84-2.53)		8715	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.518	2.518	0.0	1.000	629329	0.9257		97.6	13286	
D 12 M2-6:2FTS										
429.00 > 81.00	2.518	2.546	-0.028	0.989	976409	2.44		103	17279	
* 62 13C2-PFOA										
415.00 > 370.00	2.546	2.546	0.0		3439312	2.50			34106	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.546	2.546	0.0	1.000	1486926	0.9682		96.7	1102	
413.00 > 169.00	2.546	2.546	0.0	1.000	796852		1.87(0.84-2.52)		6875	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.555	2.555	0.0	0.879	1768917	0.9024		94.8	17627	
449.00 > 99.00	2.555	2.555	0.0	0.879	485635		3.64(1.94-5.82)		11930	
D 14 13C4 PFOA										
417.00 > 372.00	2.546	2.564	-0.018	1.000	3320833	2.51		101	42311	
20 Perfluorononanoic acid										
463.00 > 419.00	2.907	2.907	0.0	1.000	1253444	0.99		99.0	6175	
463.00 > 169.00	2.907	2.907	0.0	1.000	304586		4.12(1.90-5.69)		20880	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.912	2.912	0.0	1.002	1399825	0.8793		94.8	14084	
499.00 > 99.00	2.907	2.912	-0.005	1.000	323653		4.33(2.31-6.93)		4314	
D 19 13C5 PFNA										
468.00 > 423.00	2.907	2.931	-0.024	1.142	2930660	2.55		102	49973	
D 18 13C4 PFOS										
503.00 > 80.00	2.907	2.931	-0.024	1.142	3389093	2.39		99.9	43269	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.115	3.115	0.0	1.072	2355467	NC			24962	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.250	3.250	0.0	1.118	1068289	1.05		109	27632	
549.00 > 99.00	3.250	3.250	0.0	1.118	400628		2.67(1.33-3.97)		2894	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.250	3.250	0.0	1.000	522451	0.9609		100	16128	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.263	3.263	0.0	1.000	1034515	0.9845		98.5	3289	
513.00 > 169.00	3.256	3.263	-0.007	0.998	177840		5.82(2.36-7.09)		5573	
D 26 M2-8:2FTS										
529.00 > 81.00	3.250	3.269	-0.019	1.277	963726	2.47		103	20104	
D 23 13C2 PFDA										
515.00 > 470.00	3.263	3.283	-0.020	1.282	2461111	2.86		114	34690	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.307	3.307	0.0	1.000	2052232	1.02		102	44867	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.315	-0.008	1.299	5102114	2.45		97.8	49353	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.421	3.421	0.0	1.003	227508	1.01		101	4723	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.411	3.439	-0.028	1.340	552021	2.64		106	20261	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.570	3.570	0.0	1.228	878090	0.9521		98.8	31760	
599.00 > 99.00	3.570	3.570	0.0	1.228	297173		2.95(1.39-4.16)		2661	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.579	3.579	0.0	1.000	205158	0.9712		97.1	6121	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.579	3.579	0.0	1.000	820050	0.9339		93.4	1712	R
563.00 > 169.00	3.579	3.579	0.0	1.000	126050		6.51(2.12-6.36)		5347	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.579	3.600	-0.021	1.406	592580	2.65		106	3550	
D 30 13C2 PFUnA										
565.00 > 520.00	3.579	3.611	-0.032	1.406	1781371	2.69		108	27165	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.743	3.743	0.0	1.288	3543032	NC			40743	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.868	3.868	0.0	1.000	679999	1.03		103	163	
613.00 > 169.00	3.868	3.868	0.0	1.000	160967		4.22(2.13-6.40)		3284	
D 36 13C2 PFDoA										
615.00 > 570.00	3.868	3.899	-0.031	1.519	1517043	2.64		106	16436	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.134	4.134	0.0	1.069	548452	0.9591		95.9	155	
663.00 > 169.00	4.134	4.134	0.0	1.069	170624		3.21(1.25-3.76)		1905	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.363	4.363	0.0	1.000	129383	0.9613		96.1	1474	
713.00 > 219.00	4.352	4.363	-0.011	0.998	95771		1.35(0.71-2.13)		1227	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.363	4.384	-0.021	1.714	1249199	2.59		104	5696	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.750	4.750	0.0	1.000	709200	NC			31.3	
813.00 > 169.00	4.750	4.750	0.0	1.000	120134		5.90(2.86-8.58)		1725	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.750	4.778	-0.028	1.866	1797134	2.17		86.6	3524	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.070	5.070	0.0	1.067	861733	NC			292	
913.00 > 169.00	5.070	5.070	0.0	1.067	111924		7.70(3.83-11.48)		1268	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 17:05:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\2018.08.05LLA_006.d

Injection Date: 06-Aug-2018 00:12:06 Instrument ID: A8_N

Lims ID: CCV L4

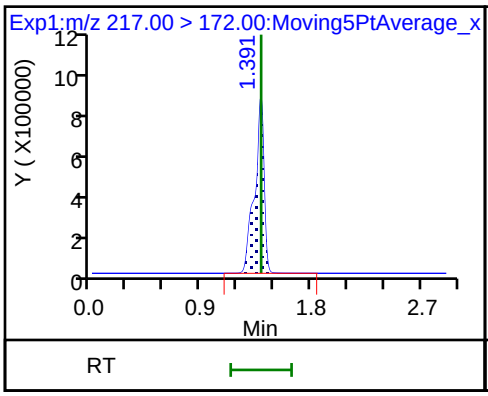
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 3

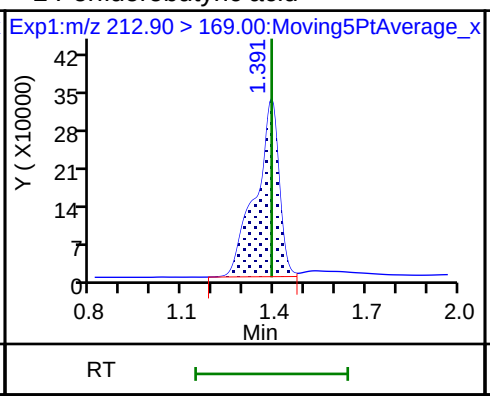
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

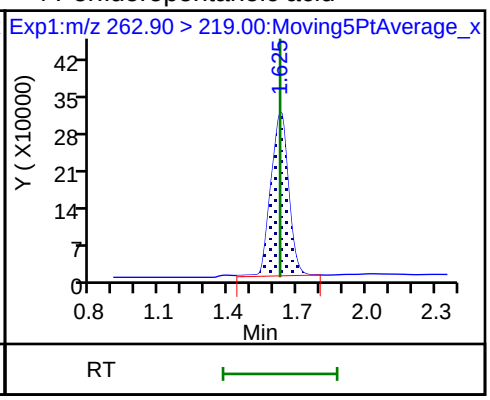
D 1 13C4 PFBA



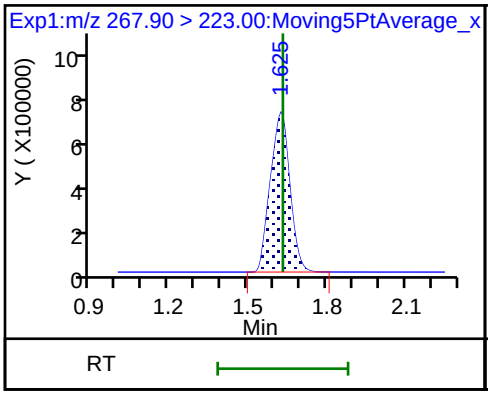
2 Perfluorobutyric acid



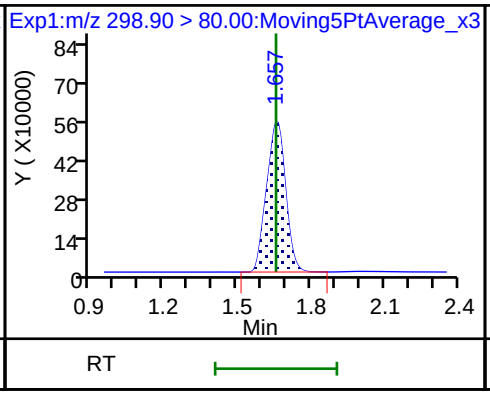
4 Perfluoropentanoic acid



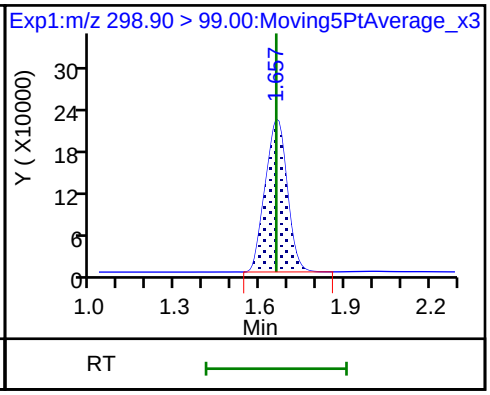
D 3 13C5-PFPeA



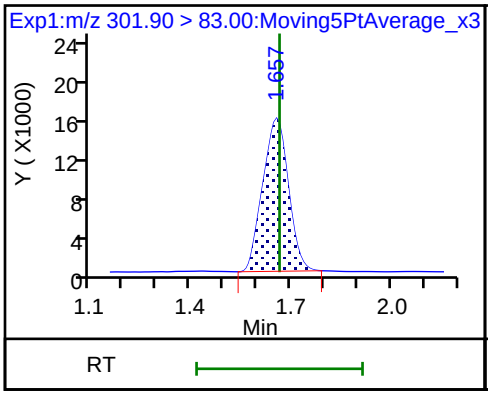
5 Perfluorobutanesulfonic acid



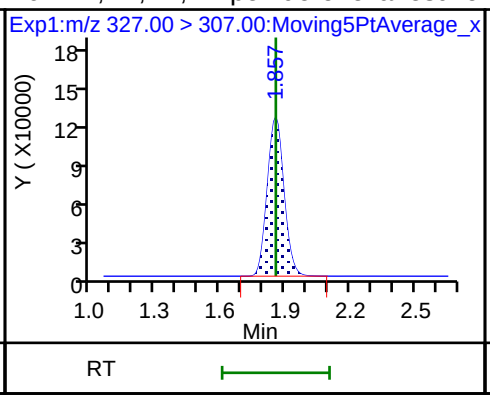
5 Perfluorobutanesulfonic acid



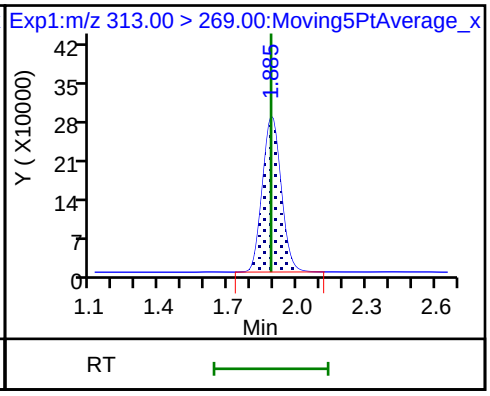
D 47 13C3-PFBS



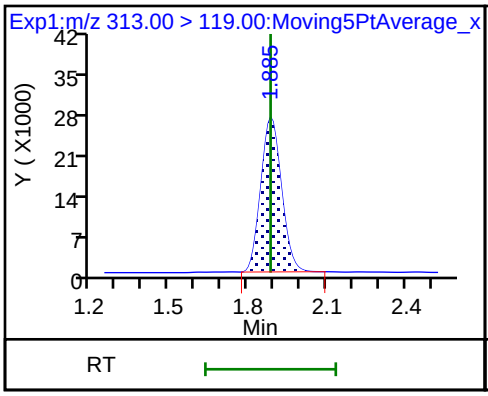
61 1H,1H,2H,2H-perfluorohexanesulfoni



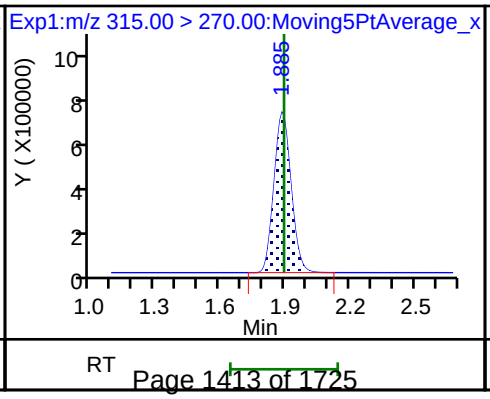
6 Perfluorohexanoic acid



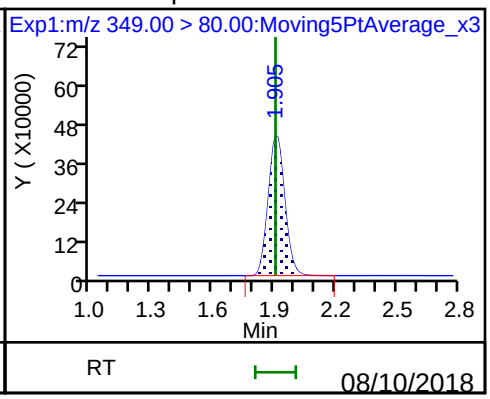
6 Perfluorohexanoic acid



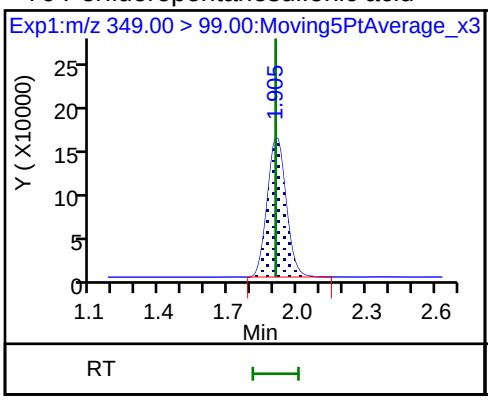
D 7 13C2 PFHxA



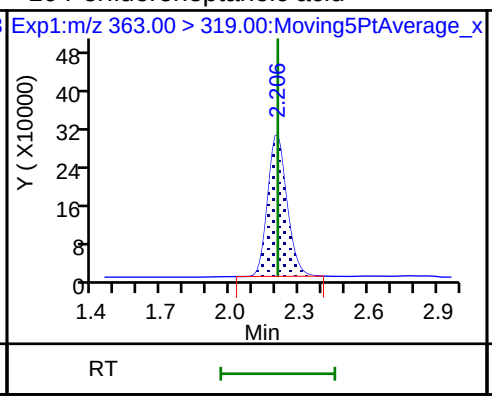
70 Perfluoropentanesulfonic acid



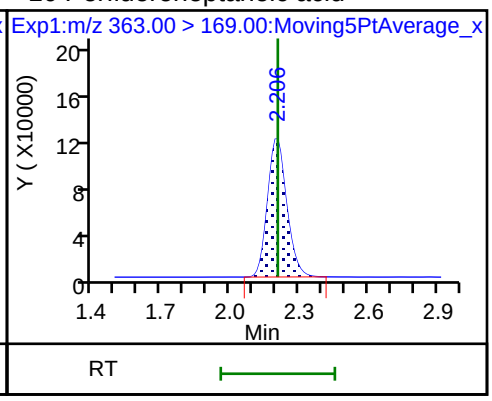
70 Perfluoropentanesulfonic acid



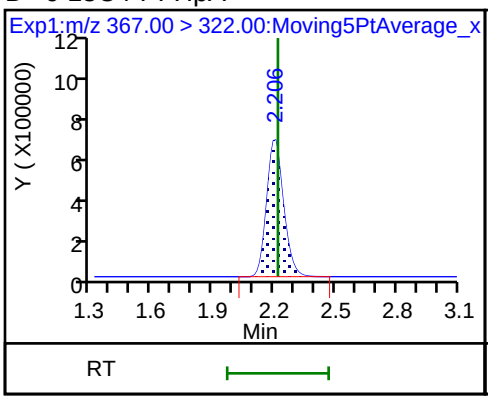
10 Perfluoroheptanoic acid



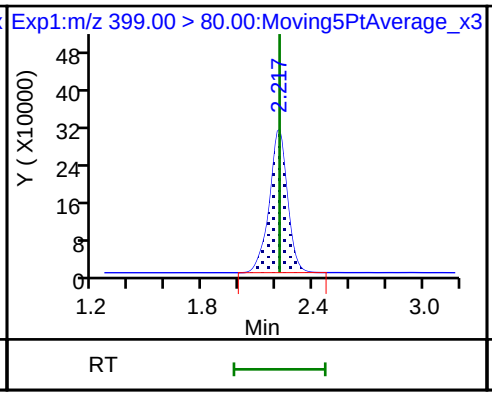
10 Perfluoroheptanoic acid



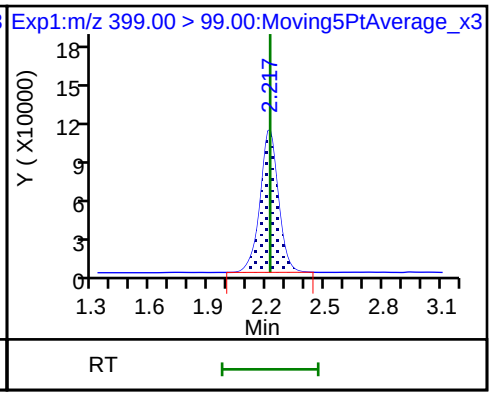
D 9 13C4-PFHpA



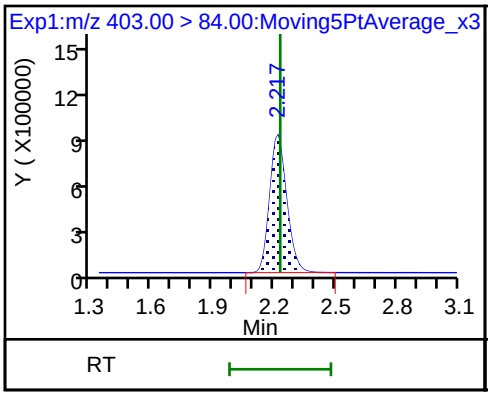
8 Perfluorohexanesulfonic acid



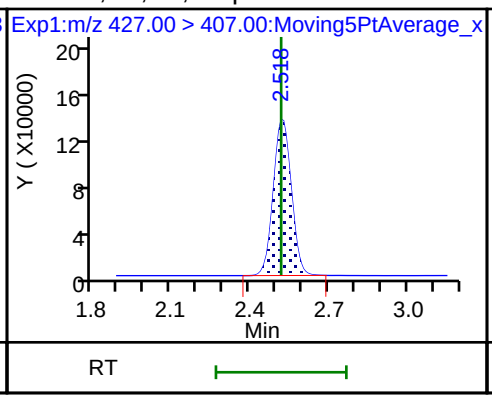
8 Perfluorohexanesulfonic acid



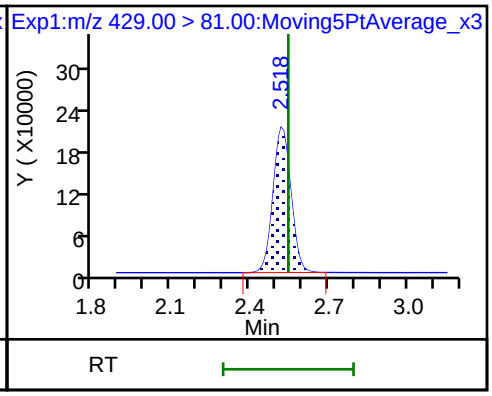
D 11 18O2 PFHxS



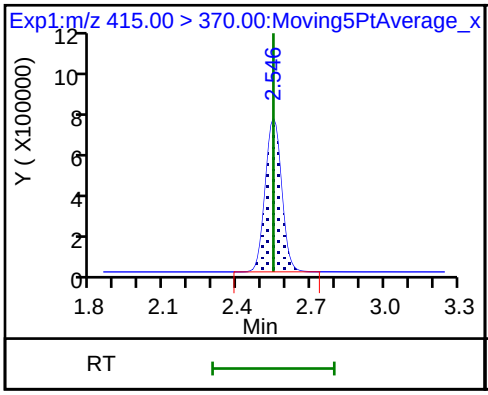
13 1H,1H,2H,2H-perfluorooctanesulfon



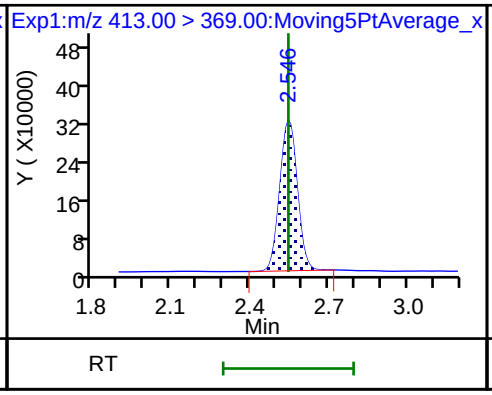
D 12 M2-6:2FTS



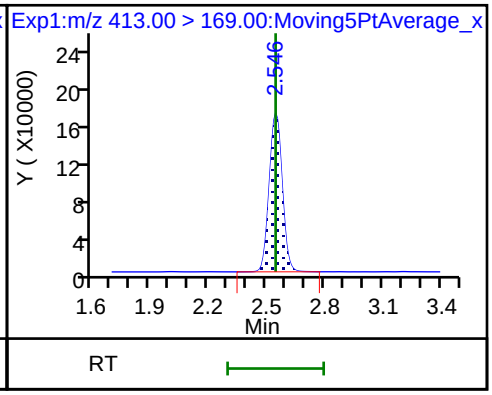
* 62 13C2-PFOA



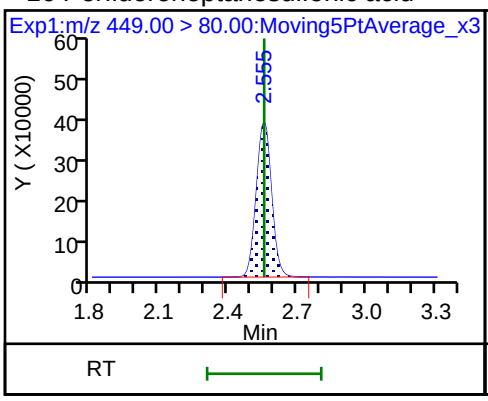
15 Perfluorooctanoic acid



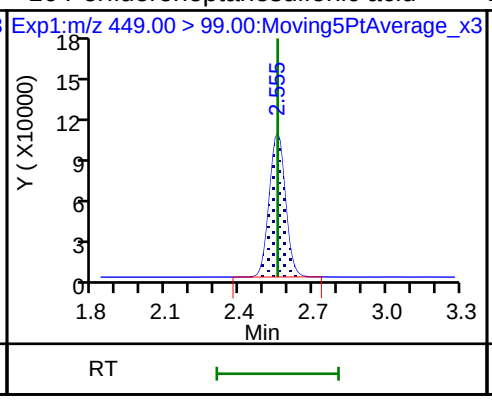
15 Perfluorooctanoic acid



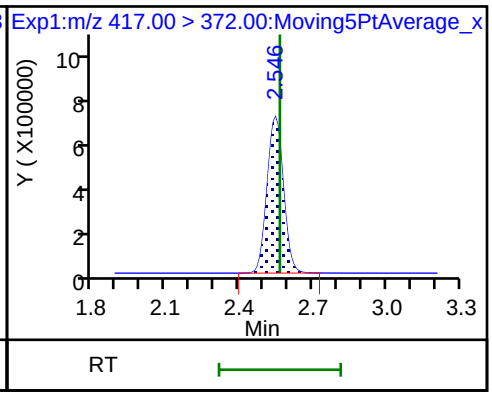
16 Perfluoroheptanesulfonic acid



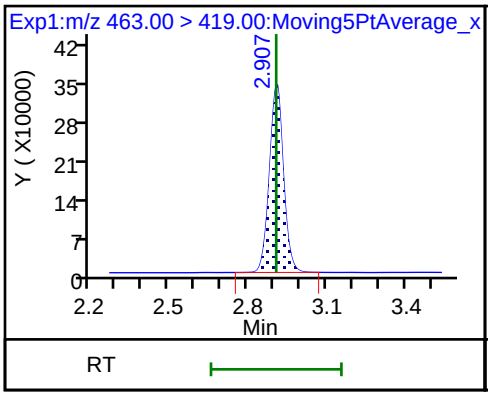
16 Perfluoroheptanesulfonic acid



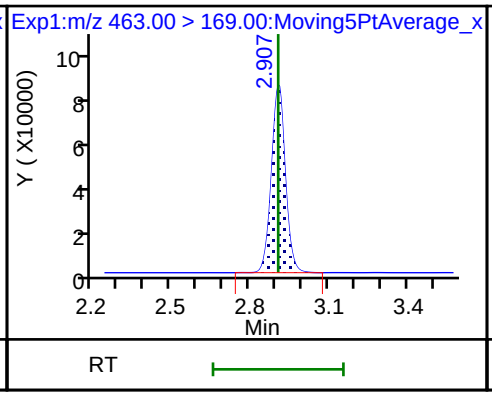
D 14 13C4 PFOA



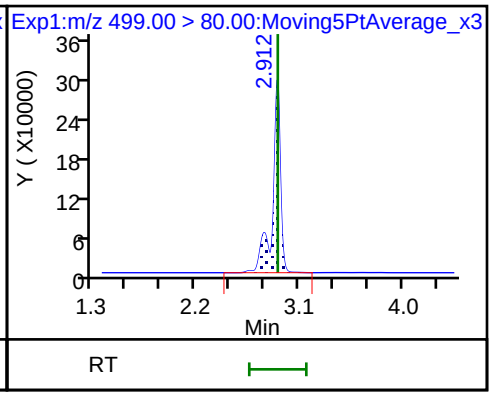
20 Perfluorononanoic acid



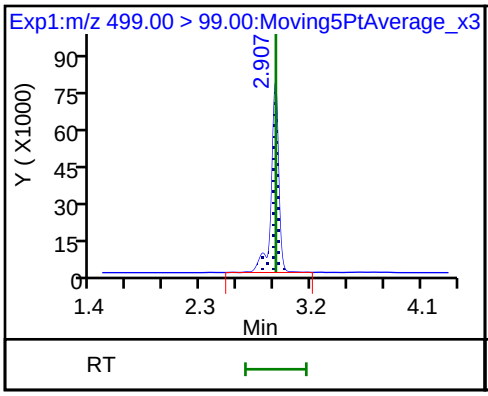
20 Perfluorononanoic acid



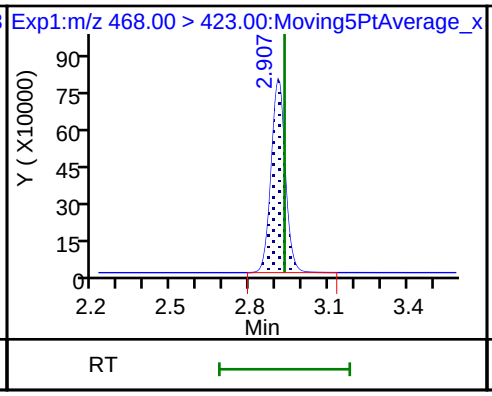
17 Perfluorooctane sulfonic acid



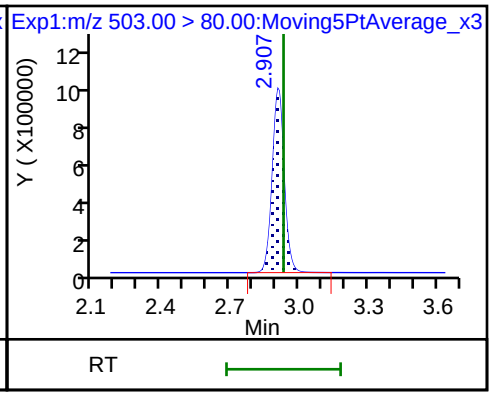
17 Perfluorooctane sulfonic acid



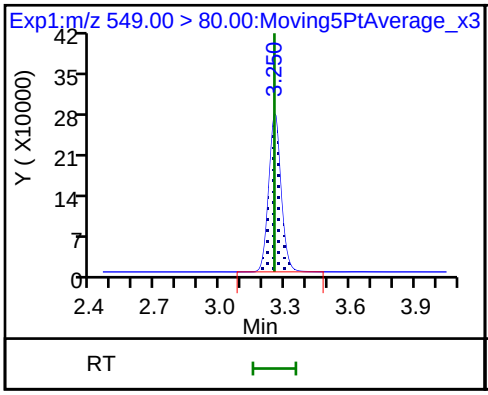
D 19 13C5 PFNA



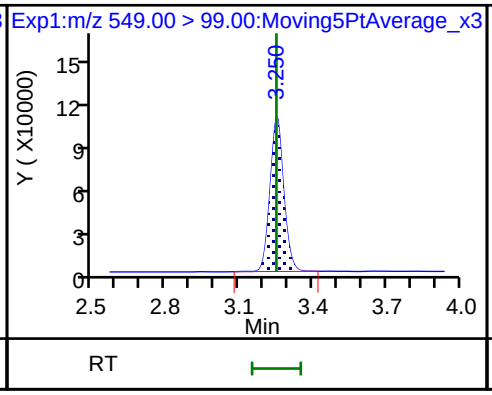
D 18 13C4 PFOS



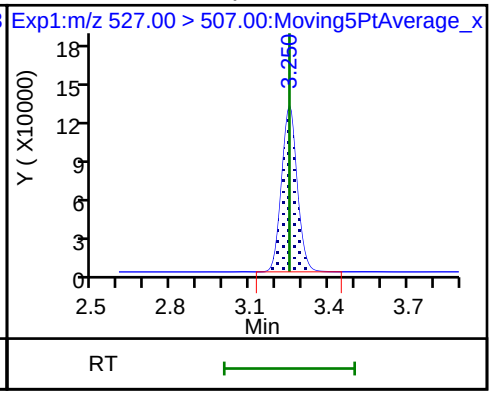
68 Perfluorononanesulfonic acid



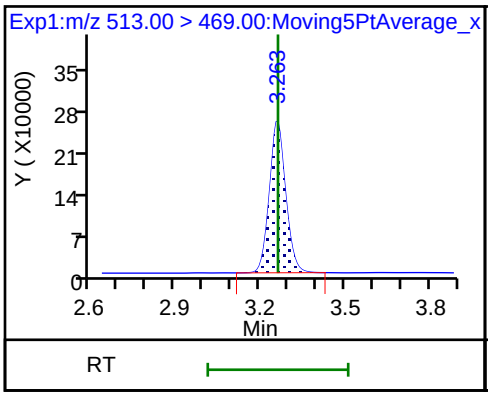
68 Perfluorononanesulfonic acid



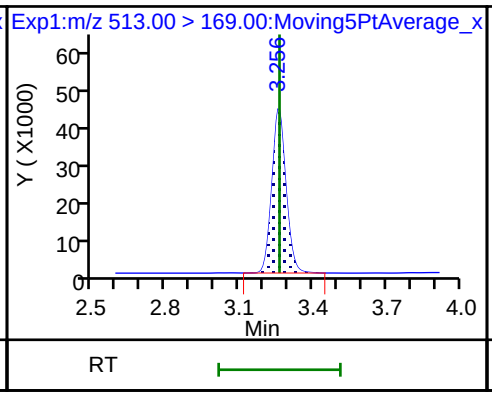
25 1H,1H,2H,2H-perfluorodecanesulfoni



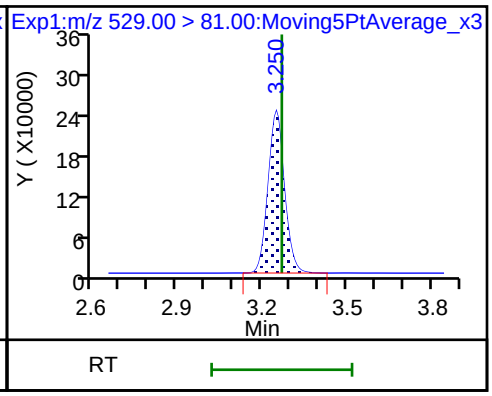
24 Perfluorodecanoic acid



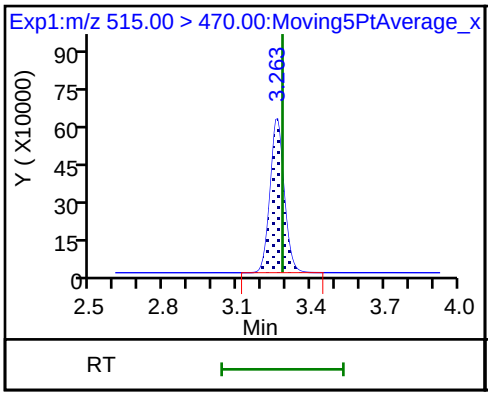
24 Perfluorodecanoic acid



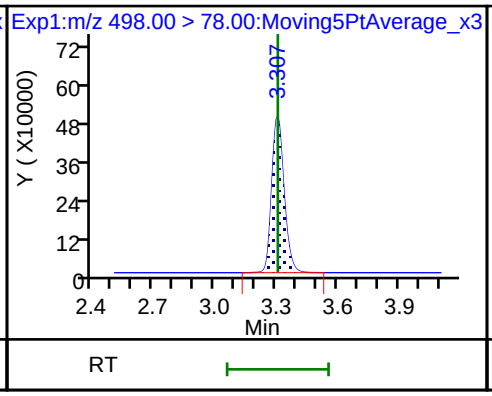
D 26 M2-8:2FTS



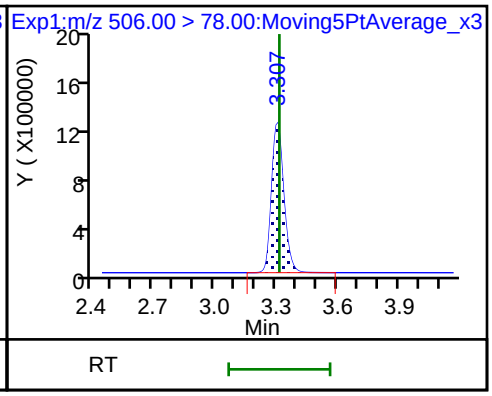
D 23 13C2 PFDA



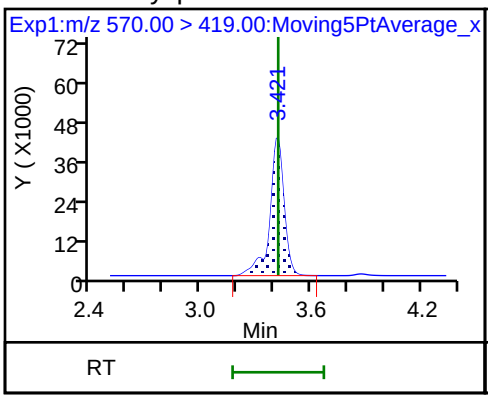
22 Perfluorooctane Sulfonamide



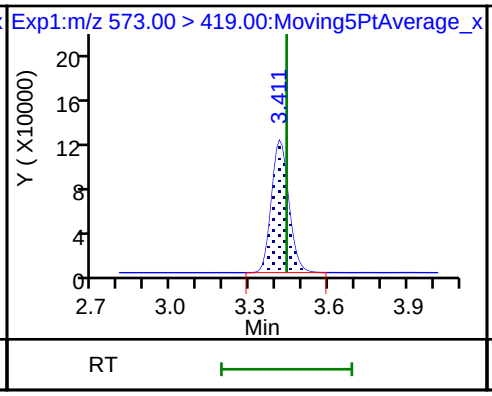
D 21 13C8 FOSA



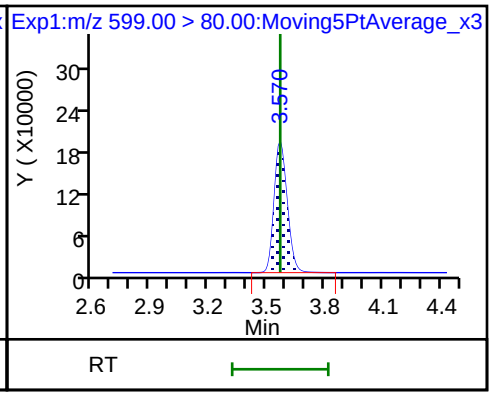
28 N-methyl perfluorooctane sulfonami



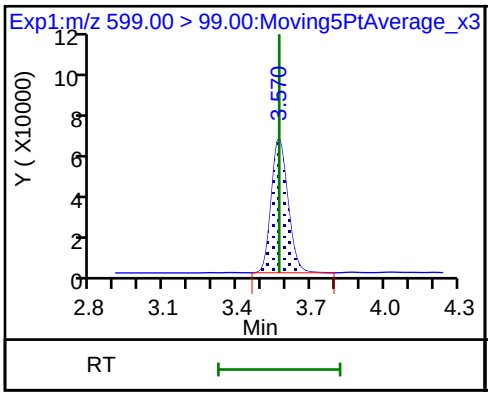
D 27 d3-NMeFOSAA



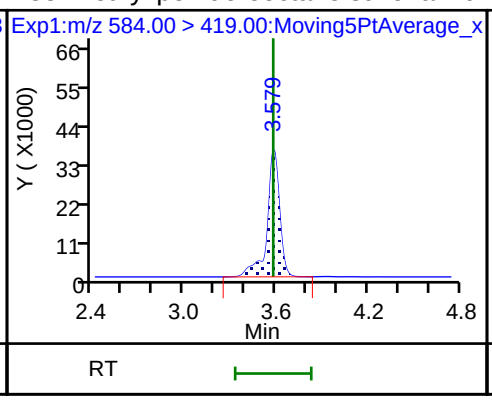
29 Perfluorodecane Sulfonic acid



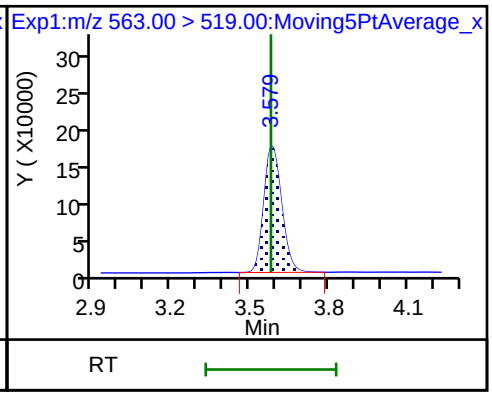
29 Perfluorodecane Sulfonic acid



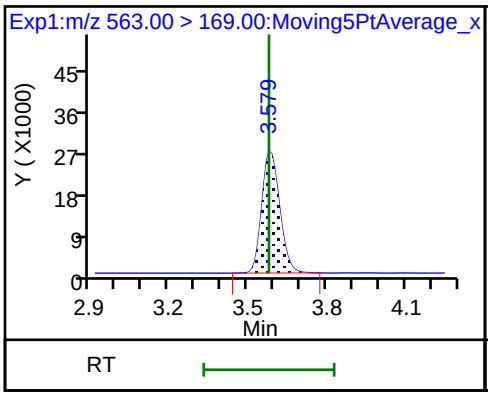
33 N-ethyl perfluorooctane sulfonamid



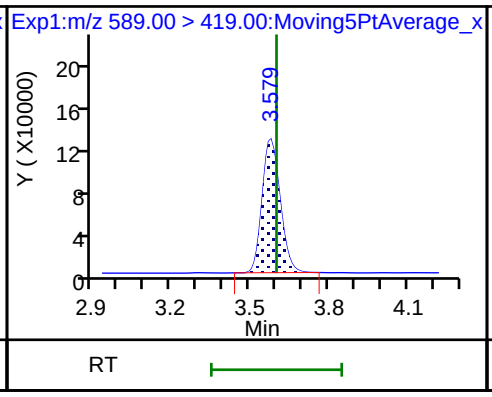
31 Perfluoroundecanoic acid



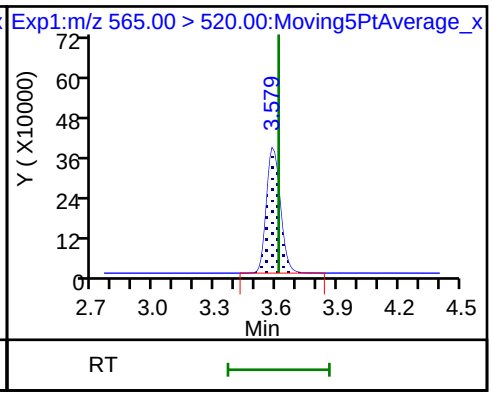
31 Perfluoroundecanoic acid



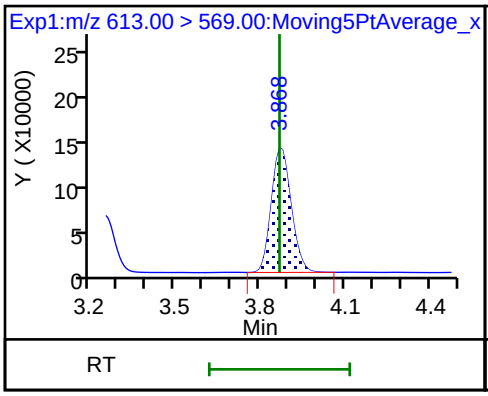
D 32 d5-NEtFOSAA



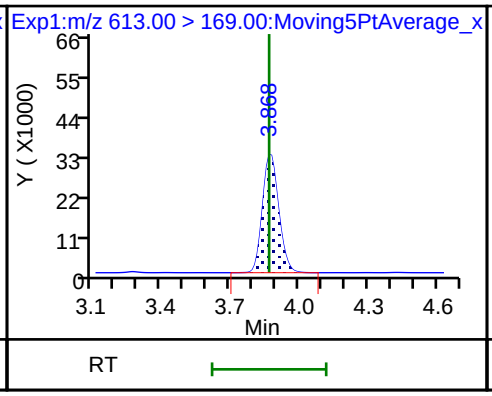
D 30 13C2 PFUnA



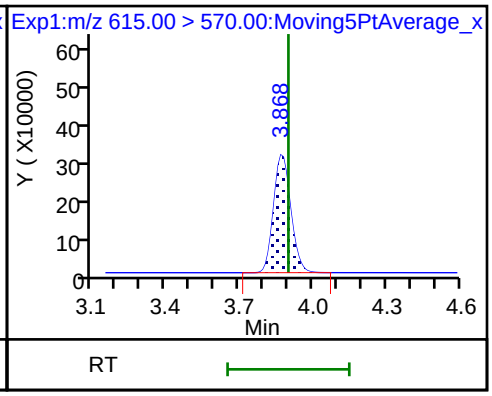
37 Perfluorododecanoic acid



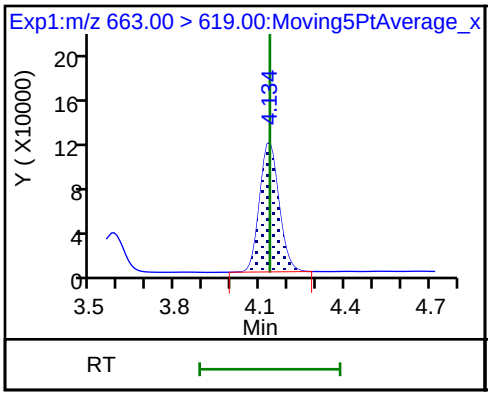
37 Perfluorododecanoic acid



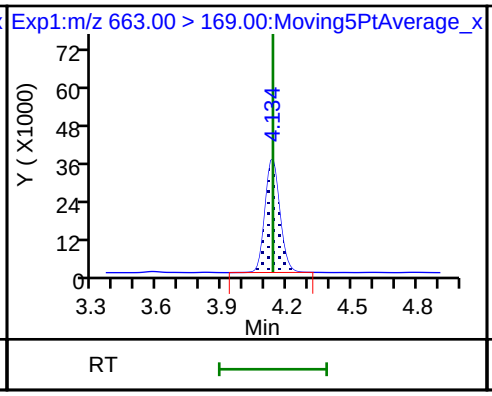
D 36 13C2 PFDoA



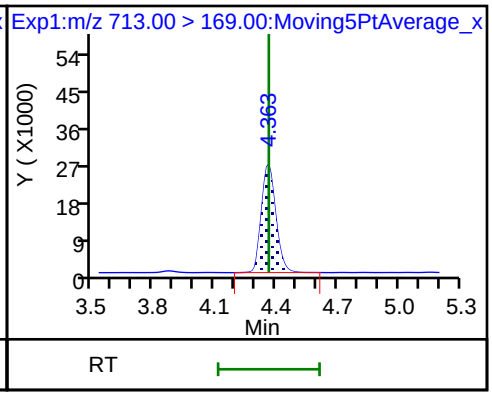
41 Perfluorotridecanoic acid



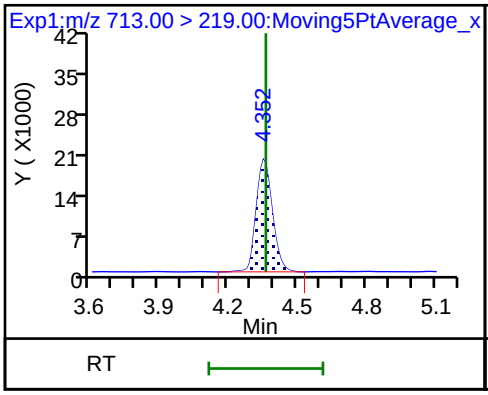
41 Perfluorotridecanoic acid



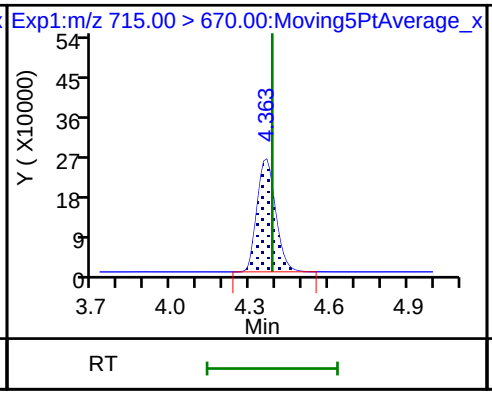
42 Perfluorotetradecanoic acid



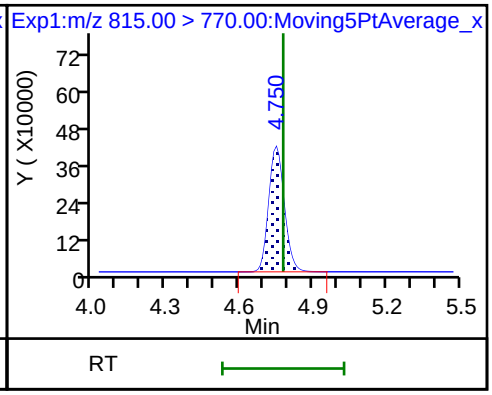
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238093/1 Calibration Date: 08/06/2018 03:19

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9629		0.977	1.00	-2.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.189		0.993	1.00	-0.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	93.05		1.07	0.884	21.4	30.0
4:2 FTS	AveID	17.21	19.12		1.04	0.934	11.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.026		0.973	1.00	-2.7	30.0
Perfluoropentanesulfonic acid	AveID	67.65	72.59		1.01	0.938	7.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.184		1.02	1.00	2.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.086		0.855	0.910	-6.1	30.0
6:2 FTS	AveID	1.654	1.565		0.897	0.948	-5.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.181		1.02	1.00	2.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.315		0.906	0.952	-4.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.079		0.999	1.00	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.120		0.926	0.928	-0.2	30.0
8:2 FTS	AveID	1.351	1.342		0.951	0.958	-0.7	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7803		1.04	0.960	8.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.039		0.973	1.00	-2.7	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	0.9859		0.999	1.00	-0.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	0.9837		0.968	1.00	-3.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6286		0.932	0.964	-3.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8736		0.980	1.00	-2.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.199		0.973	1.00	-2.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.060		0.979	1.00	-2.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9147		0.971	1.00	-2.9	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2685		0.997	1.00	-0.3	30.0
13C4 PFBA	Ave	1.440	1.336		2.32	2.50	-7.2	30.0
13C5-PFPeA	Ave	0.9481	0.9779		2.58	2.50	3.1	30.0
13C3-PFBS	Ave	0.0273	0.0253		2.16	2.33	-7.2	30.0
13C2 PFHxA	Ave	1.026	1.110		2.71	2.50	8.2	30.0
13C4-PFHpA	Ave	0.9943	1.080		2.72	2.50	8.7	30.0
18O2 PFHxS	Ave	1.494	1.516		2.40	2.37	1.5	30.0
M2-6:2FTS	Ave	0.2913	0.2819		2.30	2.38	-3.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238093/1 Calibration Date: 08/06/2018 03:19

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9647		2.51	2.50	0.5	30.0
13C4 PFOS	Ave	1.032	0.9885		2.29	2.39	-4.2	30.0
13C5 PFNA	Ave	0.8365	0.8541		2.55	2.50	2.1	30.0
M2-8:2FTS	Ave	0.2839	0.2955		2.49	2.40	4.1	30.0
13C2 PFDA	Ave	0.6256	0.7092		2.83	2.50	13.4	30.0
13C8 FOSA	Ave	1.516	1.462		2.41	2.50	-3.6	30.0
d3-NMeFOSAA	Ave	0.1518	0.1614		2.66	2.50	6.3	30.0
d5-NEtFOSAA	Ave	0.1627	0.1774		2.73	2.50	9.0	30.0
13C2 PFUnA	Ave	0.4818	0.5060		2.63	2.50	5.0	30.0
13C2 PFDoA	Ave	0.4172	0.4586		2.75	2.50	9.9	30.0
13C2-PFTeDA	Ave	0.3502	0.3696		2.64	2.50	5.5	30.0
13C2-PFHxDA	Ave	0.6033	0.5594		2.32	2.50	-7.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_030.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 06-Aug-2018 03:19:54 ALS Bottle#: 13 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 16:59:51 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 16:34:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.386	1.385	0.001	0.544	4525860	2.32		92.8	89413	
2 Perfluorobutyric acid										
212.90 > 169.00	1.386	1.386	0.0	1.000	1743189	0.9771		97.7	438	
D 3 13C5-PFPeA										
267.90 > 223.00	1.625	1.624	0.001	0.638	3313797	2.58		103	72009	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.625	1.625	0.0	1.000	1575427	0.99		99.3	727	
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.656	0.001	0.651	79739	2.16		92.8	556	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.657	1.657	0.0	1.000	2821133	1.07		121	7583	
298.90 > 99.00	1.657	1.657	0.0	1.000	1161044		2.43(1.25-3.74)		6168	
D 60 M2-4:2FTS										
329.00 > 81.00	1.857	1.856	0.001	0.729	617596	NC			8876	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.857	1.857	0.0	1.121	612612	1.04		111	38636	
D 7 13C2 PFHxA										
315.00 > 270.00	1.885	1.885	0.0	0.740	3762451	2.71		108	68093	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.885	1.885	0.0	1.000	1544263	0.9730		97.3	7418	
313.00 > 119.00	1.885	1.885	0.0	1.000	147173		10.49(5.03-15.10)		2445	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.906	1.906	0.0	1.150	2335099	1.01		107	37587	
349.00 > 99.00	1.916	1.906	0.010	1.157	871957		2.68(1.36-4.07)		10260	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.981	1.980	0.001	0.778	216985	NC			9501	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.981	1.981	0.0	1.000	305102	NC			1994	
D 9 13C4-PFHpA										
367.00 > 322.00	2.207	2.206	0.001	0.867	3661123	2.72		109	79926	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.207	2.207	0.0	1.000	1733307	1.02		102	1628	
363.00 > 169.00	2.207	2.207	0.0	1.000	655924		2.64(1.13-3.40)		10463	
D 11 18O2 PFHxS										
403.00 > 84.00	2.218	2.217	0.001	0.871	4860327	2.40		101	59801	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.218	2.218	0.0	1.000	2030930	0.8549		93.9	9389	
399.00 > 99.00	2.218	2.218	0.0	1.000	687342		2.95(1.50-4.49)		1947	
65 ADONA										
377.00 > 251.00	2.241	2.241	0.0	0.769	4001061	NC			48427	
377.00 > 85.00	2.241	2.241	0.0	0.769	2299932		1.74(0.84-2.53)		9738	
D 12 M2-6:2FTS										
429.00 > 81.00	2.528	2.527	0.001	0.993	907420	2.30		96.8	17209	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.528	2.528	0.0	1.000	566980	0.8974		94.7	10736	
* 62 13C2-PFOA										
415.00 > 370.00	2.547	2.547	0.0		3388818	2.50			52417	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.547	2.547	0.0	1.000	1545252	1.02		102	1600	
413.00 > 169.00	2.547	2.547	0.0	1.000	794127		1.95(0.84-2.52)		7089	
D 14 13C4 PFOA										
417.00 > 372.00	2.547	2.555	-0.008	1.000	3269101	2.51		100	50624	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.556	2.556	0.0	0.877	1677594	0.9057		95.1	16833	
449.00 > 99.00	2.556	2.556	0.0	0.877	463082		3.62(1.94-5.82)		7799	
20 Perfluorononanoic acid										
463.00 > 419.00	2.913	2.913	0.0	1.000	1249269	1.00		99.9	5474	
463.00 > 169.00	2.913	2.913	0.0	1.000	288998		4.32(1.90-5.69)		16097	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.913	2.913	0.0	1.000	1392508	0.9257		99.8	15644	
499.00 > 99.00	2.913	2.913	0.0	1.000	322541		4.32(2.31-6.93)		4158	
D 19 13C5 PFNA										
468.00 > 423.00	2.913	2.916	-0.003	1.144	2894307	2.55		102	50184	
D 18 13C4 PFOS										
503.00 > 80.00	2.913	2.916	-0.003	1.144	3202309	2.29		95.8	32487	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.124	3.124	0.0	1.072	2263390	NC			27257	
D 26 M2-8:2FTS										
529.00 > 81.00	3.257	3.256	0.001	1.279	959267	2.49		104	21517	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.257	3.257	0.0	1.000	514815	0.9513		99.3	31959	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.257	3.257	0.0	1.118	1003658	1.04		109	21462	
549.00 > 99.00	3.257	3.257	0.0	1.118	387212		2.59(1.33-3.97)		2797	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.263	3.263	0.0	1.000	998558	0.9731		97.3	2776	
513.00 > 169.00	3.270	3.263	0.007	1.002	178588		5.59(2.36-7.09)		5538	
D 23 13C2 PFDA										
515.00 > 470.00	3.263	3.269	-0.006	1.282	2403443	2.83		113	75343	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.300	3.300	0.0	1.000	1953960	1.00		99.9	22177	
D 21 13C8 FOSA										
506.00 > 78.00	3.300	3.307	-0.007	1.296	4954988	2.41		96.4	38554	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.422	3.420	0.002	1.344	547055	2.66		106	13236	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.422	3.422	0.0	1.000	215258	0.9676		96.8	2532	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.571	3.571	0.0	1.226	811939	0.9317		96.6	34014	
599.00 > 99.00	3.571	3.571	0.0	1.226	269314		3.01(1.39-4.16)		3118	
D 30 13C2 PFUnA										
565.00 > 520.00	3.593	3.589	0.004	1.411	1714726	2.63		105	32751	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.582	3.589	-0.007	1.407	601229	2.73		109	4149	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.593	3.593	0.0	1.000	822326	0.9729		97.3	1604	
563.00 > 169.00	3.593	3.593	0.0	1.000	136204		6.04(2.12-6.36)		7206	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.593	3.593	0.0	1.003	210103	0.9803		98.0	7173	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.747	3.747	0.0	1.286	3277293	NC			56207	
D 36 13C2 PFDoA										
615.00 > 570.00	3.883	3.878	0.005	1.525	1554235	2.75		110	14578	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.883	3.883	0.0	1.000	658908	0.9789		97.9	168	
613.00 > 169.00	3.883	3.883	0.0	1.000	152986		4.31(2.13-6.40)		2869	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.139	4.139	0.0	1.066	568684	0.9706		97.1	171	
663.00 > 169.00	4.139	4.139	0.0	1.066	176973		3.21(1.25-3.76)		1795	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.371	4.371	0.0	1.000	134491	1.00		99.7	1536	
713.00 > 219.00	4.371	4.371	0.0	1.000	93237		1.44(0.71-2.13)		1355	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.371	4.373	-0.002	1.716	1252366	2.64		106	5592	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.766	4.766	0.0	1.000	778757	NC			41.2	
813.00 > 169.00	4.766	4.766	0.0	1.000	126798		6.14(2.86-8.58)		1320	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.766	4.768	-0.002	1.872	1895653	2.32		92.7	3106	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.094	5.094	0.0	1.069	904124	NC			349	
913.00 > 169.00	5.094	5.094	0.0	1.069	115514		7.83(3.83-11.48)		906	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 16:59:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_030.d

Injection Date: 06-Aug-2018 03:19:54 Instrument ID: A8_N

Lims ID: CCV L4

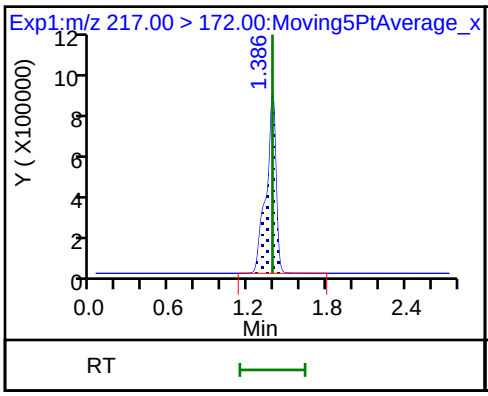
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 1

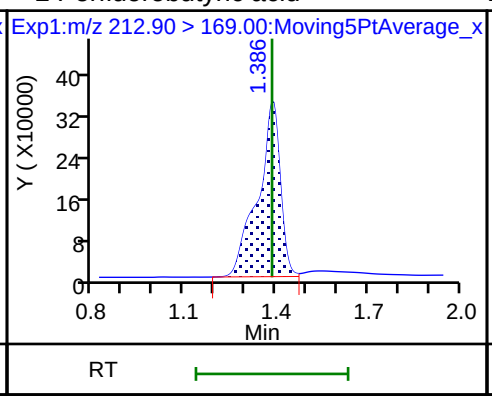
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

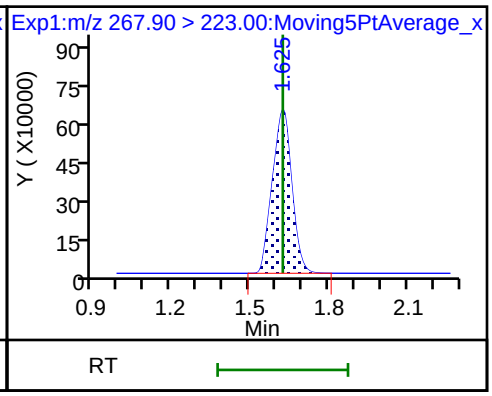
D 1 13C4 PFBA



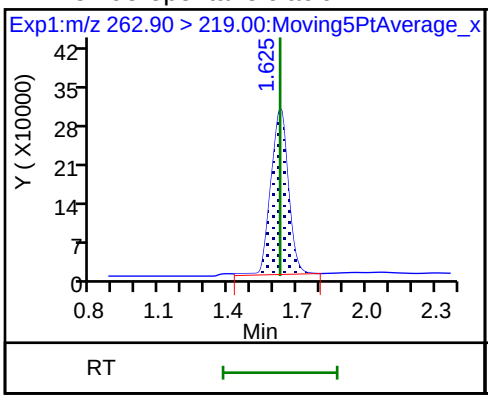
2 Perfluorobutyric acid



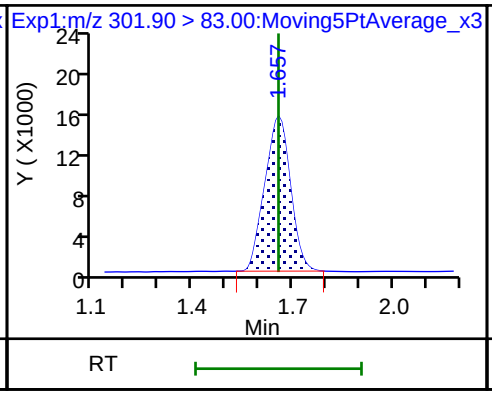
D 3 13C5-PFPeA



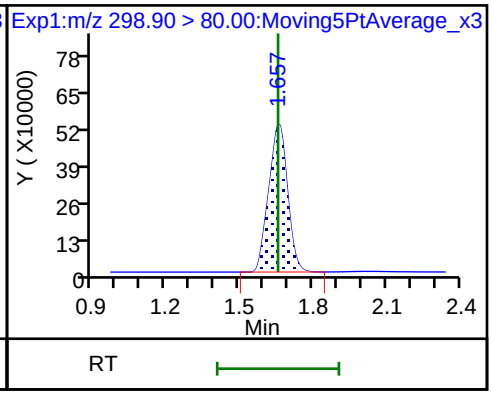
4 Perfluoropentanoic acid



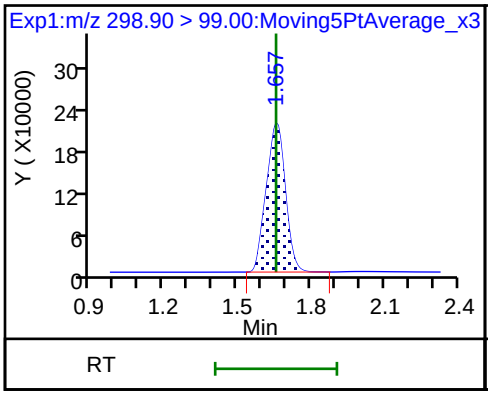
D 47 13C3-PFBS



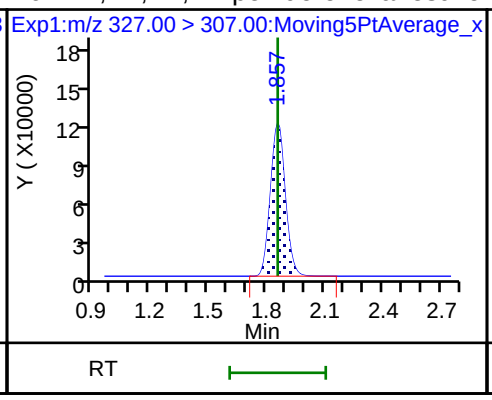
5 Perfluorobutanesulfonic acid



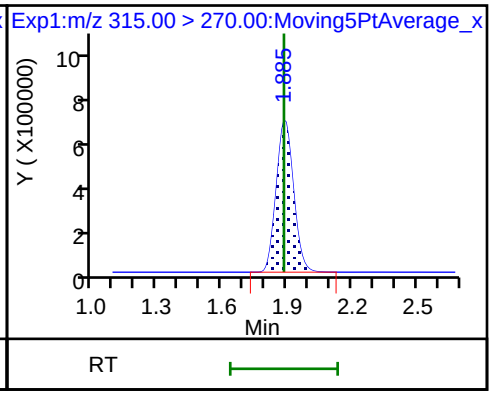
5 Perfluorobutanesulfonic acid



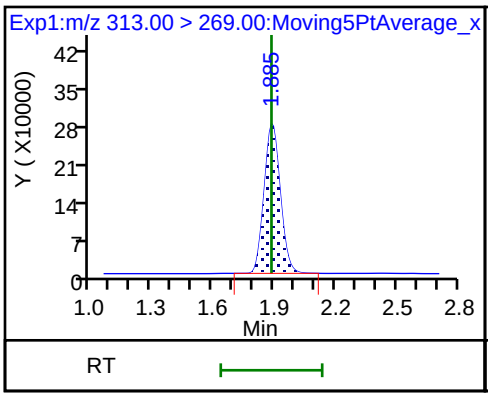
61 1H,1H,2H,2H-perfluorohexanesulfon



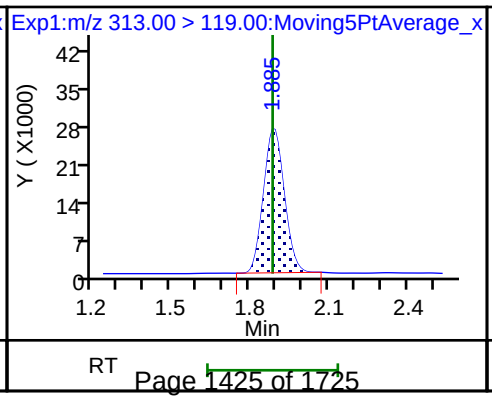
D 7 13C2 PFHxA



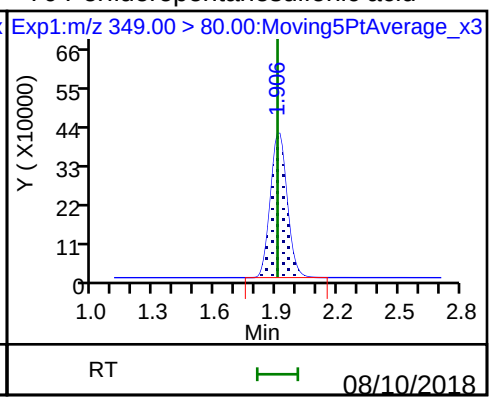
6 Perfluorohexanoic acid



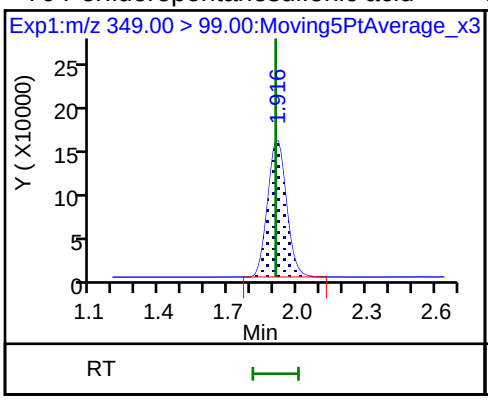
6 Perfluorohexanoic acid



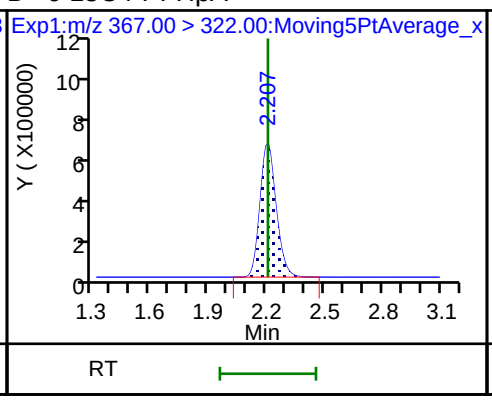
70 Perfluoropentanesulfonic acid



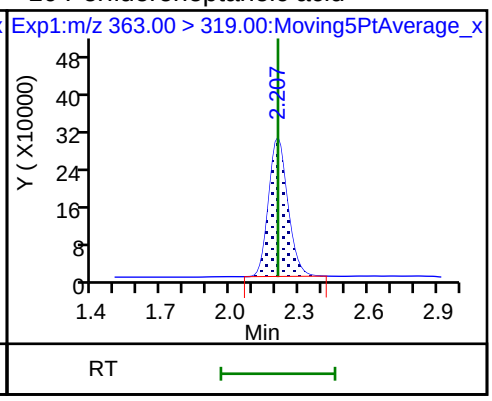
70 Perfluoropentanesulfonic acid



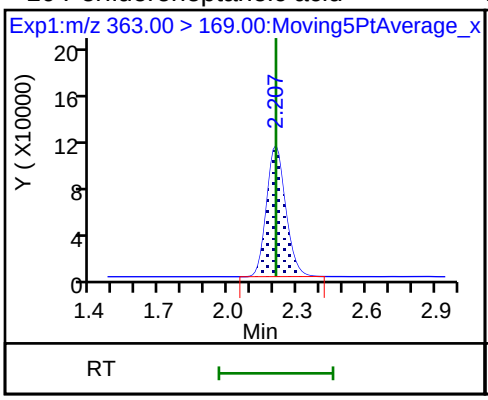
D 9 13C4-PFHpA



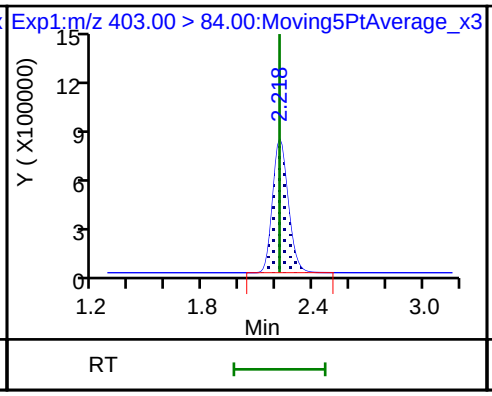
10 Perfluoroheptanoic acid



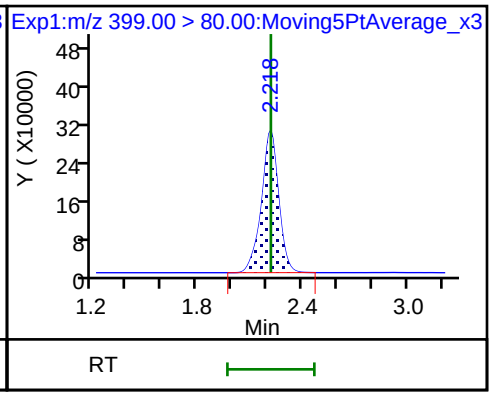
10 Perfluoroheptanoic acid



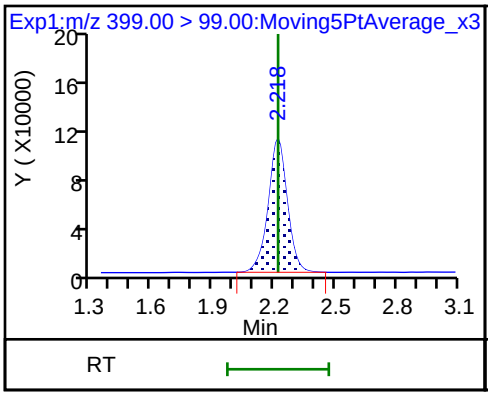
D 11 18O2 PFHxS



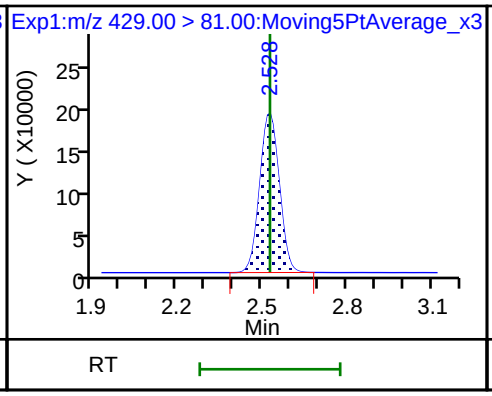
8 Perfluorohexanesulfonic acid



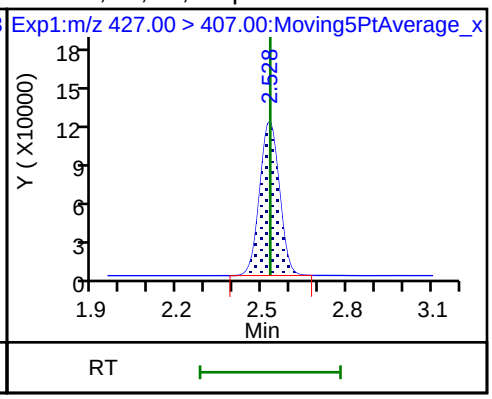
8 Perfluorohexanesulfonic acid



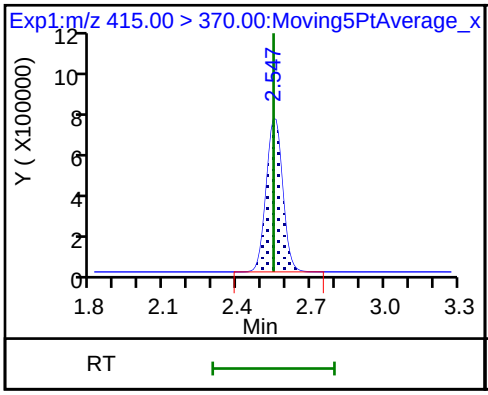
D 12 M2-6:2FTS



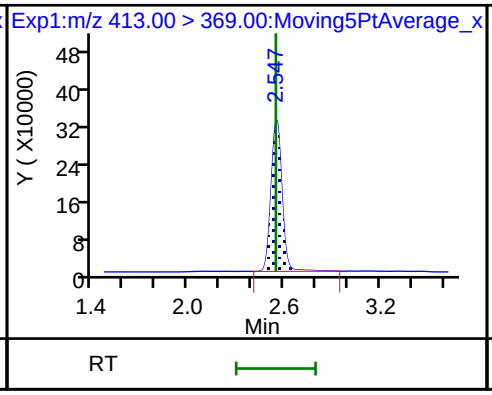
13 1H,1H,2H,2H-perfluorooctanesulfoni



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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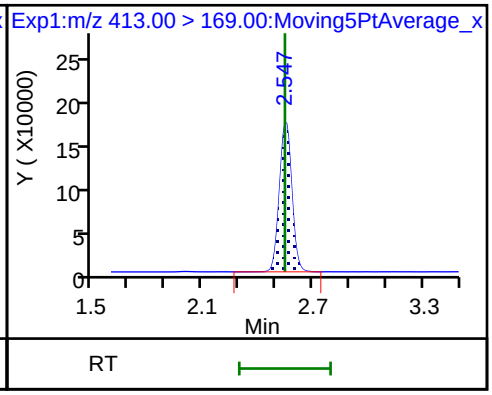
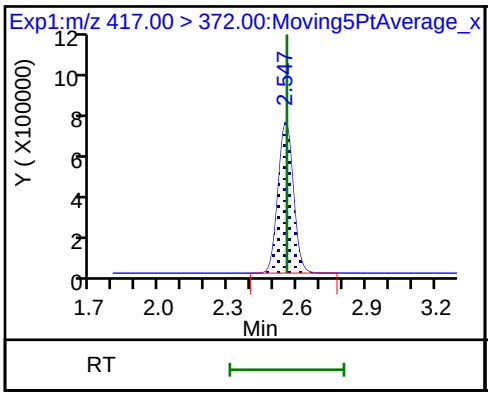
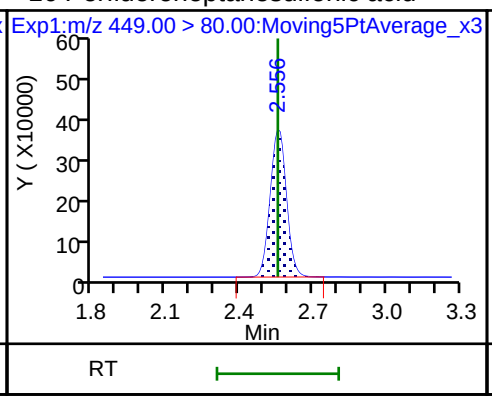


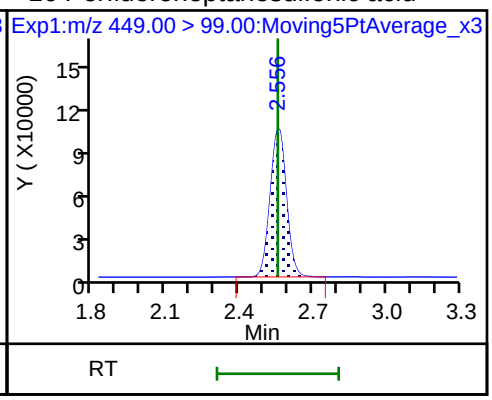
D 14 13C4 PFOA



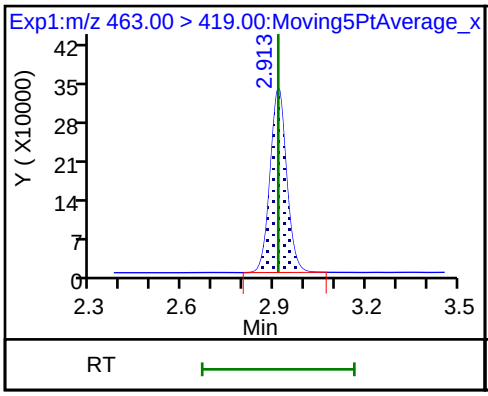
16 Perfluoroheptanesulfonic acid



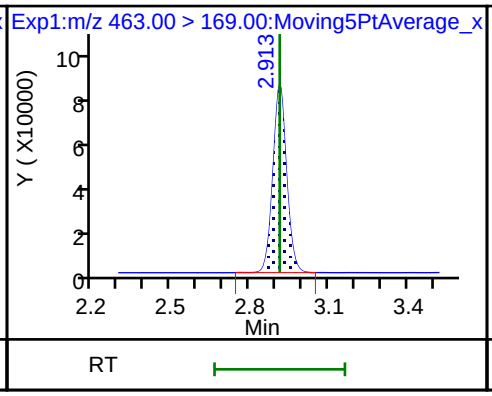
16 Perfluoroheptanesulfonic acid



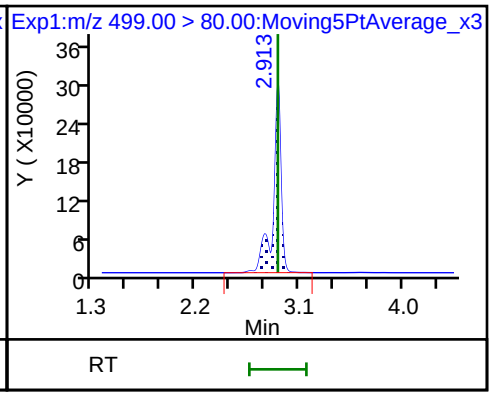
20 Perfluorononanoic acid



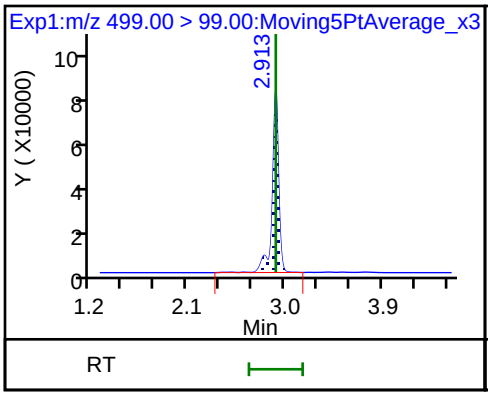
20 Perfluorononanoic acid



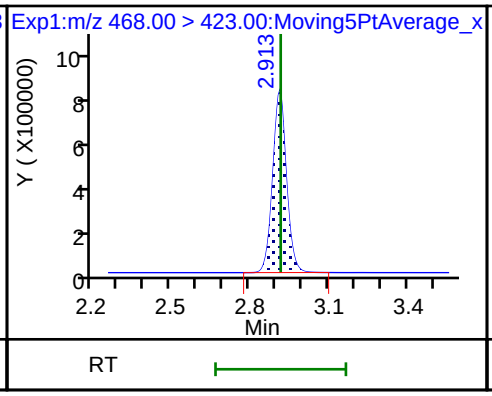
17 Perfluorooctane sulfonic acid



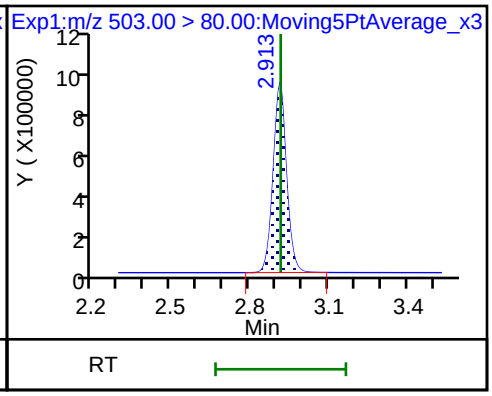
17 Perfluorooctane sulfonic acid



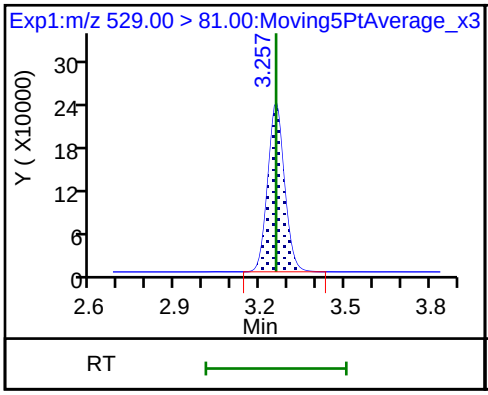
D 19 13C5 PFNA



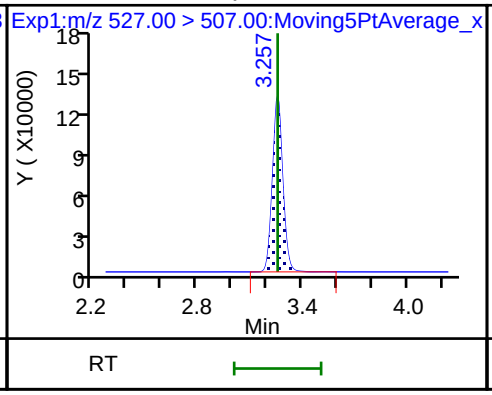
D 18 13C4 PFOS



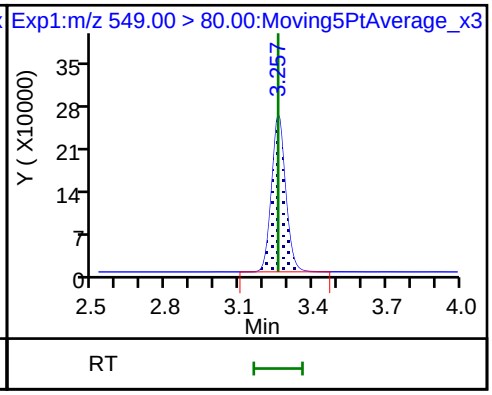
D 26 M2-8:2FTS



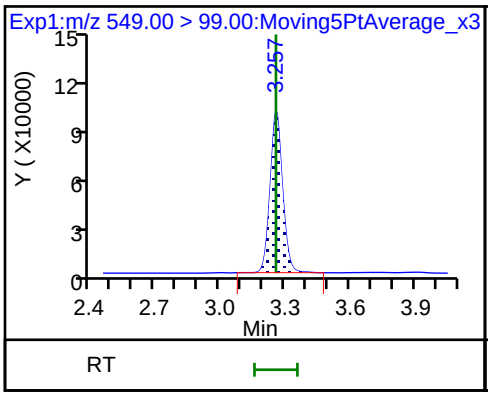
25 1H,1H,2H,2H-perfluorodecanesulfoni



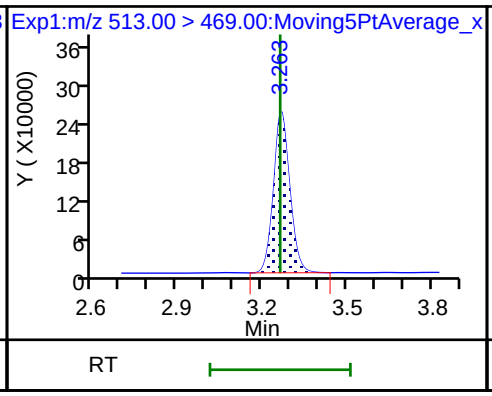
68 Perfluorononanesulfonic acid



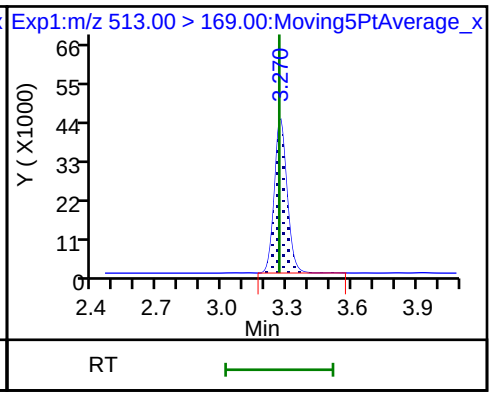
68 Perfluorononanesulfonic acid



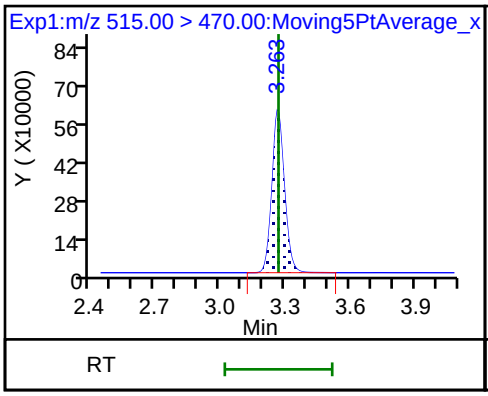
24 Perfluorodecanoic acid



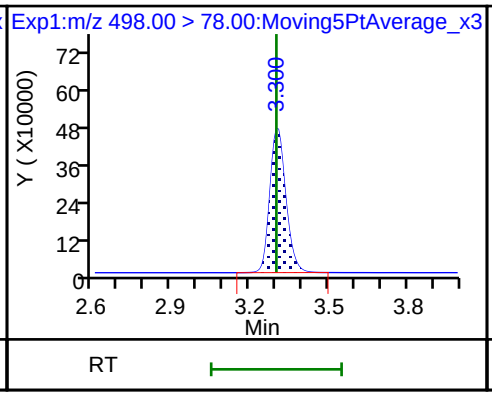
24 Perfluorodecanoic acid



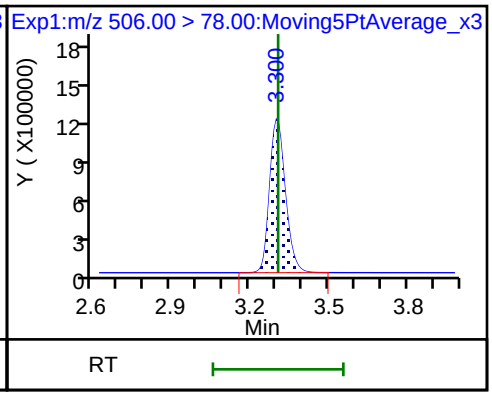
D 23 13C2 PFDA



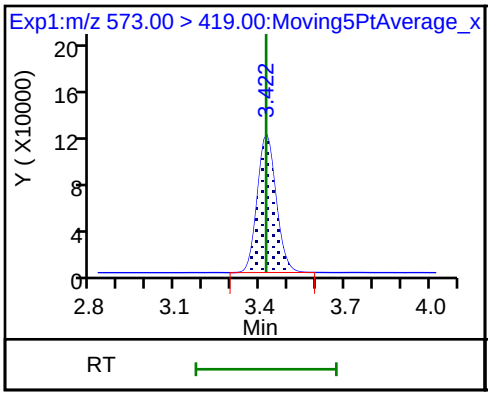
22 Perfluorooctane Sulfonamide



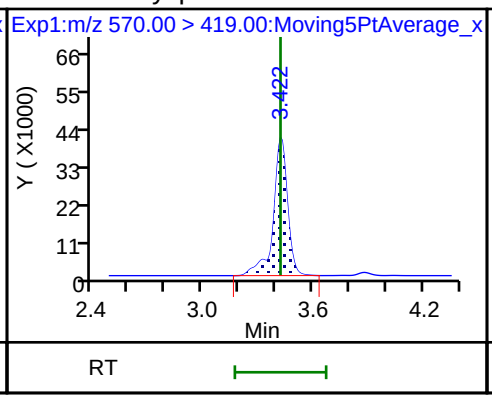
D 21 13C8 FOSA



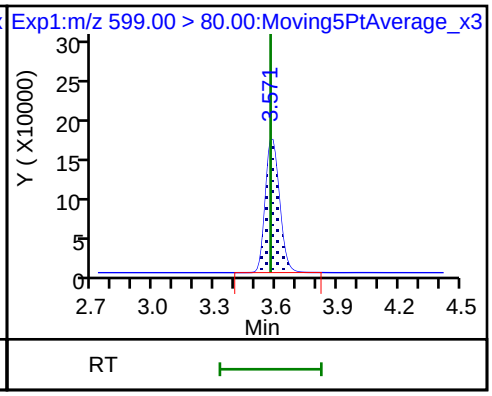
D 27 d3-NMeFOSAA



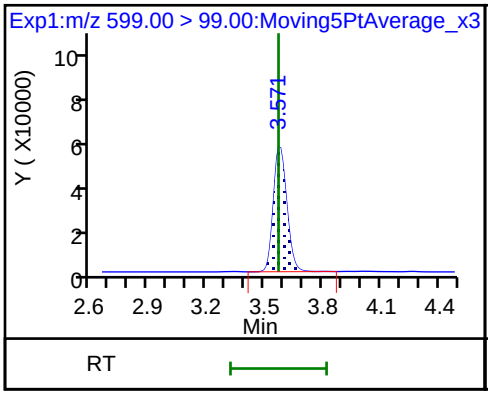
28 N-methyl perfluorooctane sulfonami



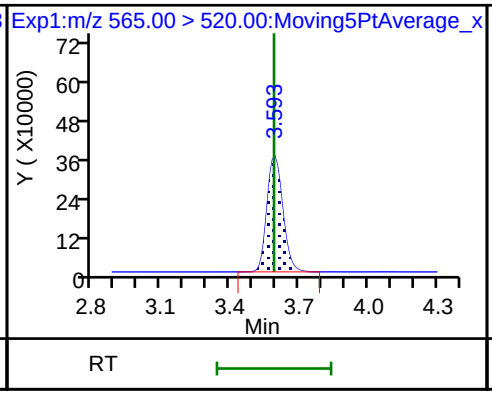
29 Perfluorodecane Sulfonic acid



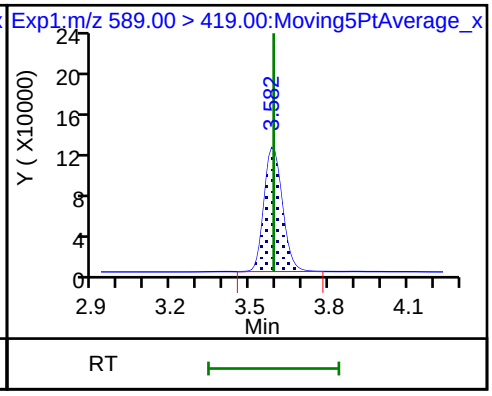
29 Perfluorodecane Sulfonic acid



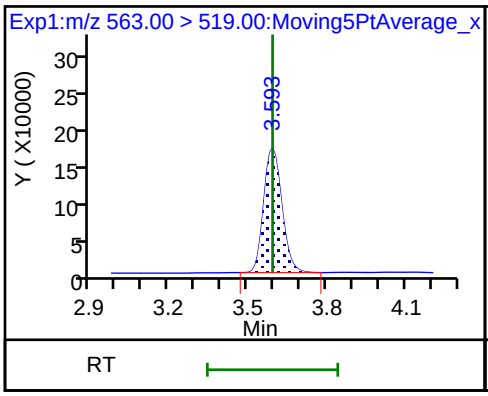
D 30 13C2 PFUnA



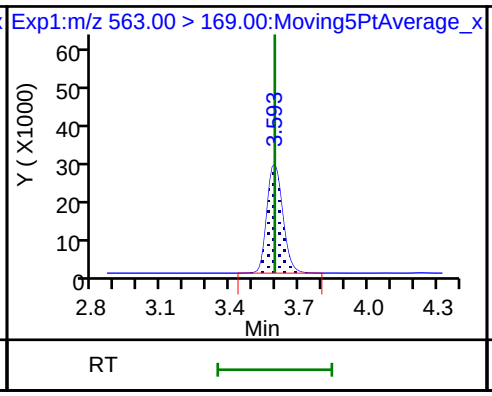
D 32 d5-NEtFOSAA



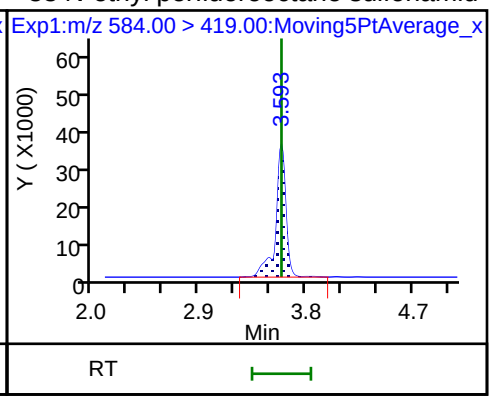
31 Perfluoroundecanoic acid



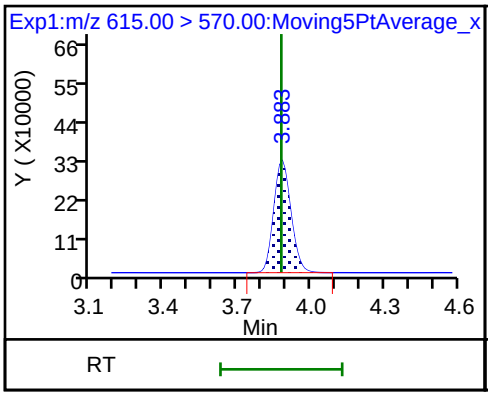
31 Perfluoroundecanoic acid



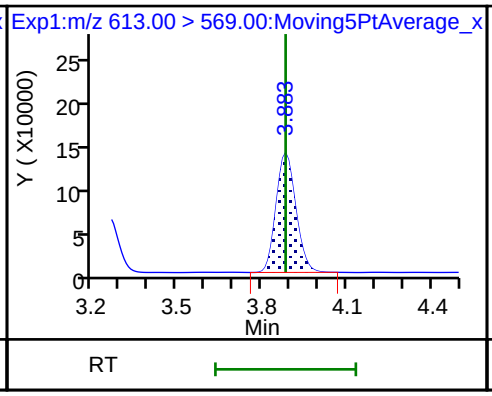
33 N-ethyl perfluorooctane sulfonamid



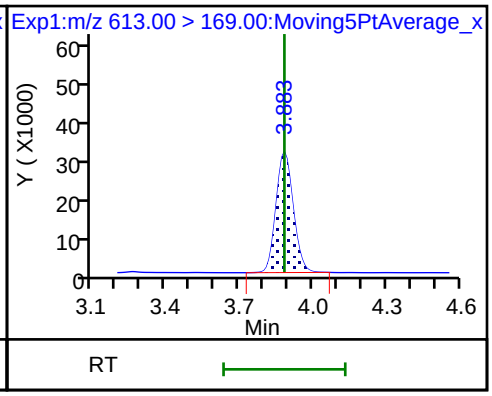
D 36 13C2 PFDoA



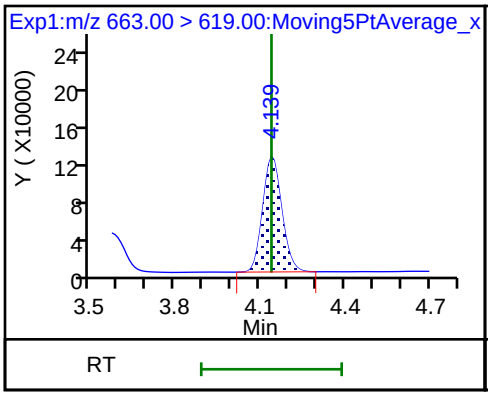
37 Perfluorododecanoic acid



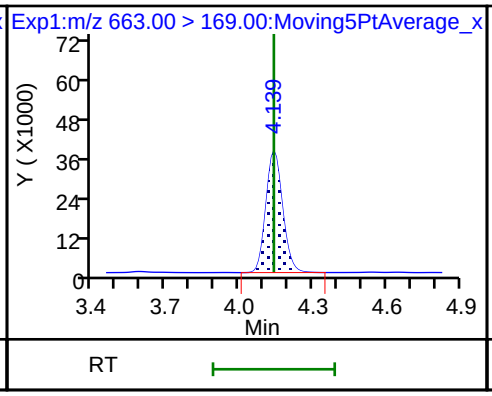
37 Perfluorododecanoic acid



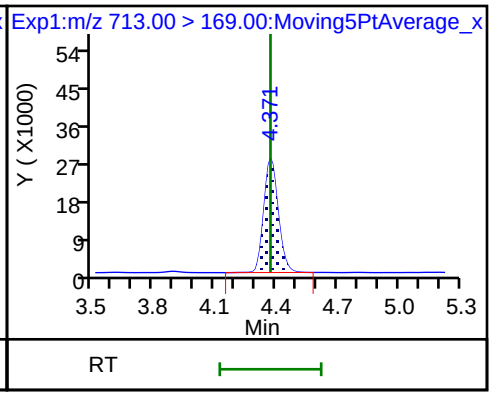
41 Perfluorotridecanoic acid



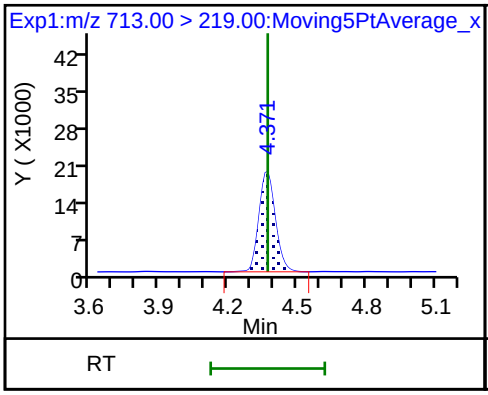
41 Perfluorotridecanoic acid



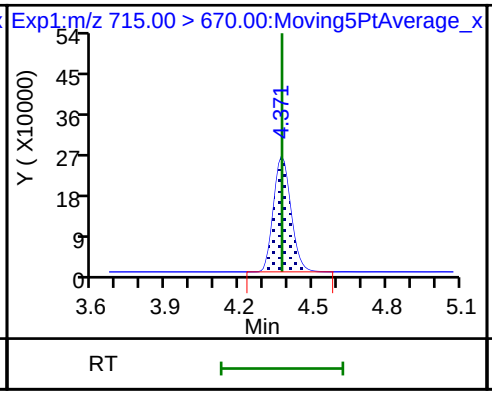
42 Perfluorotetradecanoic acid



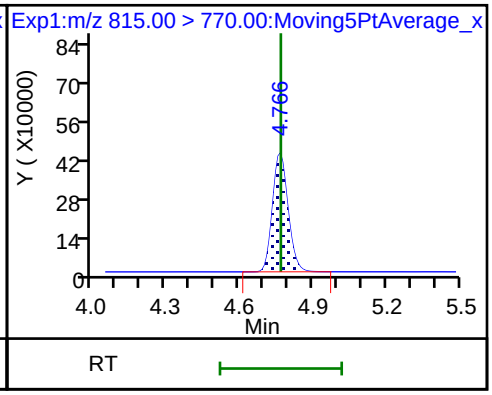
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238093/10 Calibration Date: 08/06/2018 04:30

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9787		2.48	2.50	-0.7	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.187		2.48	2.50	-0.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	79.07		2.28	2.21	3.2	30.0
4:2 FTS	AveID	17.21	17.77		2.41	2.34	3.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.022		2.42	2.50	-3.1	30.0
Perfluoropentanesulfonic acid	AveID	67.65	71.45		2.48	2.35	5.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.149		2.48	2.50	-0.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.066		2.10	2.28	-7.8	30.0
6:2 FTS	AveID	1.654	1.601		2.29	2.37	-3.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.219		2.64	2.50	5.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.321		2.27	2.38	-4.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.129		2.61	2.50	4.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.110		2.29	2.32	-1.1	30.0
8:2 FTS	AveID	1.351	1.296		2.30	2.40	-4.1	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7780		2.60	2.40	8.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.063		2.49	2.50	-0.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.011		2.56	2.50	2.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	1.024		2.52	2.50	0.7	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6435		2.38	2.41	-1.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.8809		2.47	2.50	-1.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.206		2.45	2.50	-2.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.045		2.41	2.50	-3.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.9109		2.42	2.50	-3.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2596		2.41	2.50	-3.6	30.0
13C4 PFBA	Ave	1.440	1.379		2.40	2.50	-4.2	30.0
13C5-PFPeA	Ave	0.9481	1.002		2.64	2.50	5.6	30.0
13C3-PFBS	Ave	0.0273	0.0273		2.32	2.33	-0.0	30.0
13C2 PFHxA	Ave	1.026	1.138		2.77	2.50	10.9	30.0
13C4-PFHpA	Ave	0.9943	1.083		2.72	2.50	8.9	30.0
18O2 PFHxS	Ave	1.494	1.576		2.50	2.37	5.5	30.0
M2-6:2FTS	Ave	0.2913	0.3056		2.49	2.38	4.9	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238093/10 Calibration Date: 08/06/2018 04:30

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9521		2.48	2.50	-0.8	30.0
13C4 PFOS	Ave	1.032	1.045		2.42	2.39	1.2	30.0
13C5 PFNA	Ave	0.8365	0.8647		2.58	2.50	3.4	30.0
M2-8:2FTS	Ave	0.2839	0.3174		2.68	2.40	11.8	30.0
13C2 PFDA	Ave	0.6256	0.7141		2.85	2.50	14.1	30.0
13C8 FOSA	Ave	1.516	1.536		2.53	2.50	1.3	30.0
d3-NMeFOSAA	Ave	0.1518	0.1731		2.85	2.50	14.0	30.0
13C2 PFUnA	Ave	0.4818	0.5136		2.66	2.50	6.6	30.0
d5-NEtFOSAA	Ave	0.1627	0.1790		2.75	2.50	10.0	30.0
13C2 PFDoA	Ave	0.4172	0.4883		2.93	2.50	17.0	30.0
13C2-PFTeDA	Ave	0.3502	0.3976		2.84	2.50	13.5	30.0
13C2-PFHxDA	Ave	0.6033	0.5928		2.46	2.50	-1.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_039.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 06-Aug-2018 04:30:21 ALS Bottle#: 14 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 17:00:43 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 16:32:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.385	1.385	0.0	0.542	4168899	2.40		95.8	82725	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.391	0.0	1.004	4080111	2.48		99.3	1009	
D 3 13C5-PFPeA										
267.90 > 223.00	1.624	1.624	0.0	0.636	3027245	2.64		106	74517	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.624	1.624	0.0	1.000	3592527	2.48		99.1	1489	
D 47 13C3-PFBS										
301.90 > 83.00	1.656	1.656	0.0	0.648	76616	2.32		100.0	500	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.656	1.656	0.0	1.000	5758067	2.28		103	16363	
298.90 > 99.00	1.656	1.656	0.0	1.000	2315172		2.49(1.25-3.74)		12038	
D 60 M2-4:2FTS										
329.00 > 81.00	1.856	1.856	0.0	0.727	558053	NC			9409	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.856	1.856	0.0	1.121	1367504	2.41		103	63467	
D 7 13C2 PFHxA										
315.00 > 270.00	1.885	1.885	0.0	0.738	3439201	2.77		111	69857	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.885	1.885	0.0	1.000	3513935	2.42		96.9	17097	
313.00 > 119.00	1.885	1.885	0.0	1.000	314334		11.18(5.03-15.10)		6391	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.916	1.916	0.0	1.157	5520956	2.48		106	66130	
349.00 > 99.00	1.916	1.916	0.0	1.157	2081378		2.65(1.36-4.07)		28696	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.980	1.980	0.0	0.775	245909	NC			8752	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.980	1.980	0.0	1.000	716265	NC			4888	
D 9 13C4-PFHpA										
367.00 > 322.00	2.206	2.206	0.0	0.863	3273266	2.72		109	51748	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.206	2.206	0.0	1.000	3761354	2.48		99.1	3341	
363.00 > 169.00	2.206	2.206	0.0	1.000	1439451		2.61(1.13-3.40)		22847	
D 11 18O2 PFHxS										
403.00 > 84.00	2.217	2.217	0.0	0.868	4506553	2.50		106	69945	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.217	2.217	0.0	1.000	4621664	2.10		92.2	18092	
399.00 > 99.00	2.217	2.217	0.0	1.000	1569999		2.94(1.50-4.49)		4139	
65 ADONA										
377.00 > 251.00	2.253	2.253	0.0	0.773	9284091	NC			74358	
377.00 > 85.00	2.253	2.253	0.0	0.773	5387965		1.72(0.84-2.53)		19344	
D 12 M2-6:2FTS										
429.00 > 81.00	2.527	2.527	0.0	0.989	877408	2.49		105	16878	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.527	2.527	0.0	1.000	1401565	2.29		96.8	29407	
* 62 13C2-PFOA										
415.00 > 370.00	2.555	2.555	0.0		3022318	2.50			34300	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.555	2.555	0.0	1.000	3510942	2.64		105	3685	
413.00 > 169.00	2.555	2.555	0.0	1.000	1826494		1.92(0.84-2.52)		13666	
D 14 13C4 PFOA										
417.00 > 372.00	2.555	2.555	0.0	1.000	2877591	2.48		99.2	41322	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.564	2.564	0.0	0.879	3970330	2.27		95.5	27194	
449.00 > 99.00	2.564	2.564	0.0	0.879	1074008		3.70(1.94-5.82)		17918	
20 Perfluorononanoic acid										
463.00 > 419.00	2.916	2.916	0.0	1.000	2949327	2.61		105	13004	
463.00 > 169.00	2.916	2.916	0.0	1.000	673176		4.38(1.90-5.69)		25996	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.916	2.916	0.0	1.000	3253085	2.29		98.9	26702	
499.00 > 99.00	2.916	2.916	0.0	1.000	744035		4.37(2.31-6.93)		8222	
D 19 13C5 PFNA										
468.00 > 423.00	2.916	2.916	0.0	1.142	2613435	2.58		103	39455	
D 18 13C4 PFOS										
503.00 > 80.00	2.916	2.916	0.0	1.142	3018881	2.42		101	40352	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.123	3.123	0.0	1.071	5266576	NC			45454	
D 26 M2-8:2FTS										
529.00 > 81.00	3.256	3.256	0.0	1.274	919105	2.68		112	16731	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.256	3.256	0.0	1.000	1190935	2.30		95.9	49284	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.256	3.256	0.0	1.116	2358652	2.60		108	66960	
549.00 > 99.00	3.256	3.256	0.0	1.116	885464		2.66(1.33-3.97)		6716	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.269	3.269	0.0	1.000	2293513	2.49		99.6	6553	
513.00 > 169.00	3.269	3.269	0.0	1.000	385501		5.95(2.36-7.09)		13647	
D 23 13C2 PFDA										
515.00 > 470.00	3.269	3.269	0.0	1.280	2158360	2.85		114	53731	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.306	3.306	0.0	1.002	4692742	2.56		102	46731	
D 21 13C8 FOSA										
506.00 > 78.00	3.299	3.307	-0.008	1.291	4643212	2.53		101	43053	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.420	3.420	0.0	1.339	523129	2.85		114	14293	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.430	3.430	0.0	1.003	535660	2.52		101	6332	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.578	3.578	0.0	1.227	1958758	2.38		98.9	34902	
599.00 > 99.00	3.578	3.578	0.0	1.227	656110		2.99(1.39-4.16)		7828	
D 30 13C2 PFUnA										
565.00 > 520.00	3.589	3.589	0.0	1.405	1552265	2.66		107	24983	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.589	3.589	0.0	1.405	541129	2.75		110	3510	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.589	3.589	0.0	1.000	1872186	2.45		97.9	4243	
563.00 > 169.00	3.589	3.589	0.0	1.000	318765		5.87(2.12-6.36)		22023	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.589	3.589	0.0	1.000	476688	2.47		98.8	9091	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.753	3.753	0.0	1.287	7819005	NC			88419	
D 36 13C2 PFDoA										
615.00 > 570.00	3.879	3.878	0.001	1.519	1475664	2.93		117	13290	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.879	3.879	0.0	1.000	1541638	2.41		96.5	423	
613.00 > 169.00	3.879	3.879	0.0	1.000	376844		4.09(2.13-6.40)		7764	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.144	4.144	0.0	1.068	1344181	2.42		96.7	388	
663.00 > 169.00	4.144	4.144	0.0	1.068	425508		3.16(1.25-3.76)		4533	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.374	4.374	0.0	1.000	311927	2.41		96.4	5292	
713.00 > 219.00	4.363	4.374	-0.011	0.998	229930		1.36(0.71-2.13)		3099	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.374	4.373	0.001	1.712	1201528	2.84		114	4821	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.769	4.769	0.0	1.000	1789559	NC			89.0	
813.00 > 169.00	4.769	4.769	0.0	1.000	294151		6.08(2.86-8.58)		2785	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.769	4.768	0.001	1.867	1791748	2.46		98.3	3175	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.096	5.096	0.0	1.069	2242414	NC			802	
913.00 > 169.00	5.096	5.096	0.0	1.069	282637		7.93(3.83-11.48)		2508	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 17:00:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_039.d

Injection Date: 06-Aug-2018 04:30:21 Instrument ID: A8_N

Lims ID: CCV L5

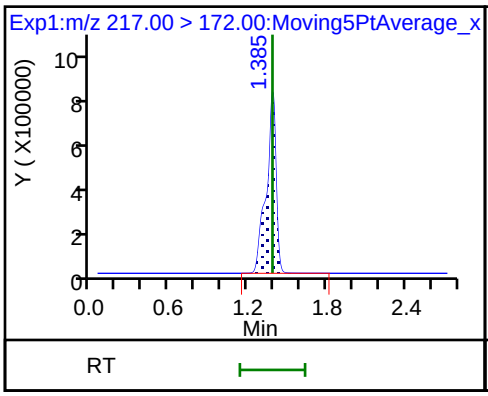
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 10

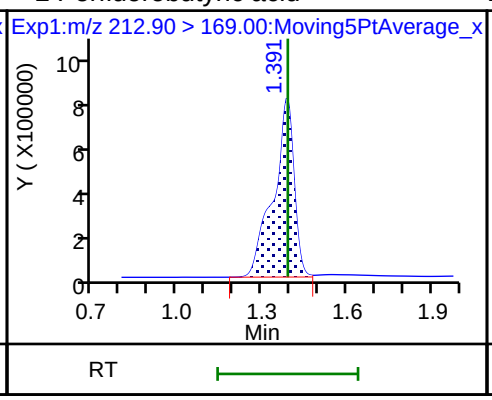
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

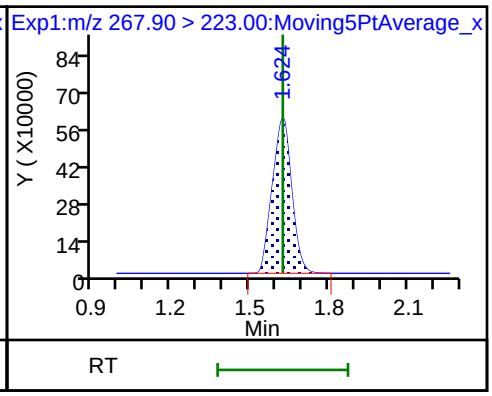
D 1 13C4 PFBA



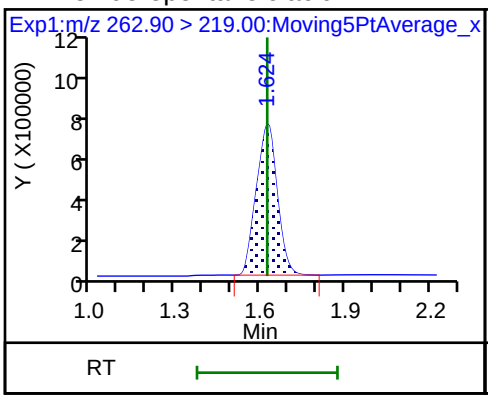
2 Perfluorobutyric acid



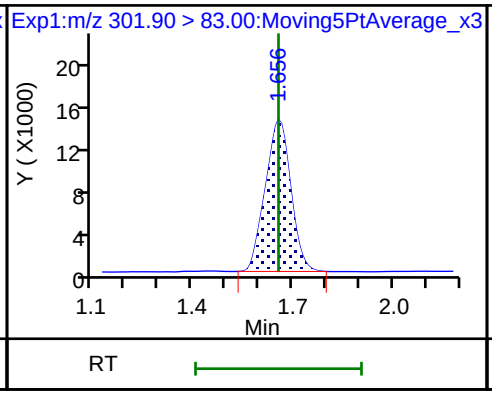
D 3 13C5-PFPeA



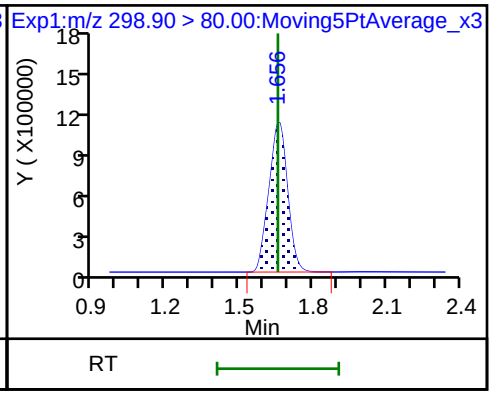
4 Perfluoropentanoic acid



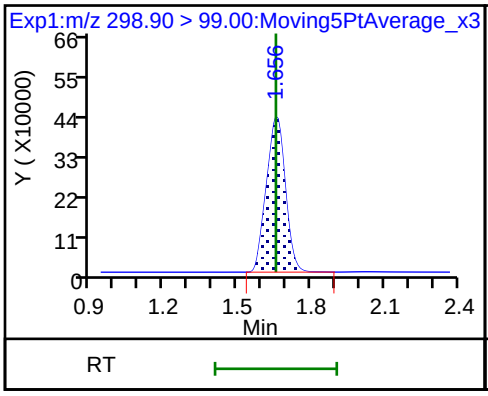
D 47 13C3-PFBS



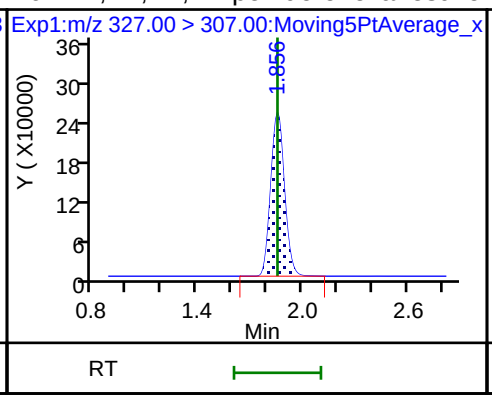
5 Perfluorobutanesulfonic acid



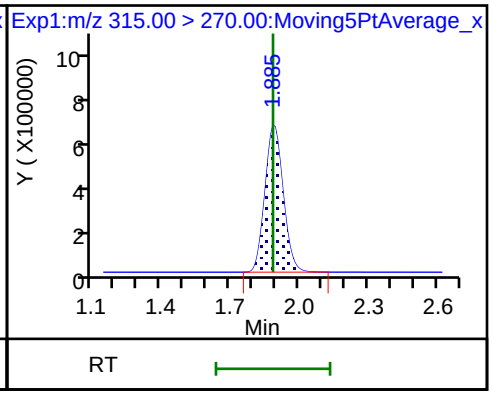
5 Perfluorobutanesulfonic acid



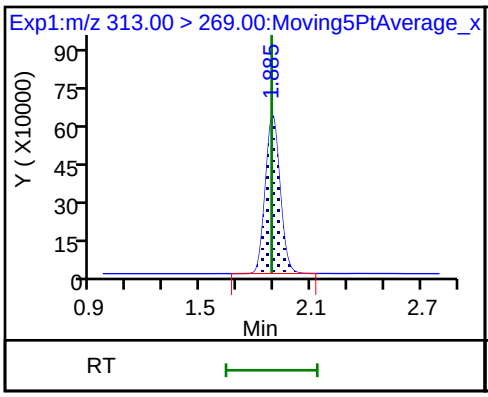
61 1H,1H,2H,2H-perfluorohexanesulfon



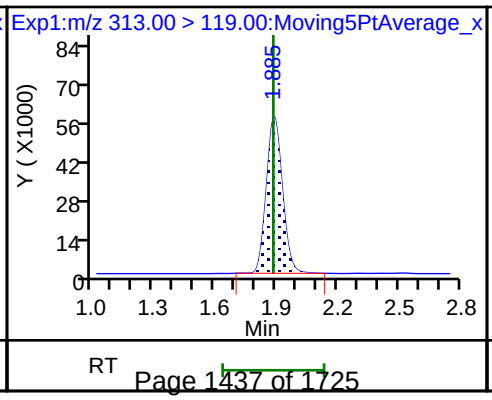
D 7 13C2 PFHxA



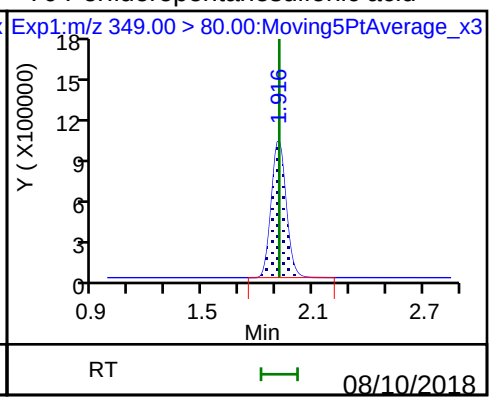
6 Perfluorohexanoic acid



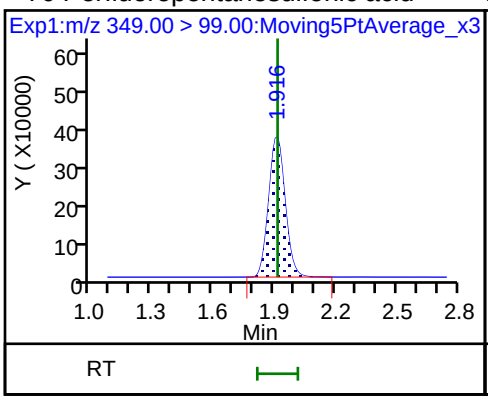
6 Perfluorohexanoic acid



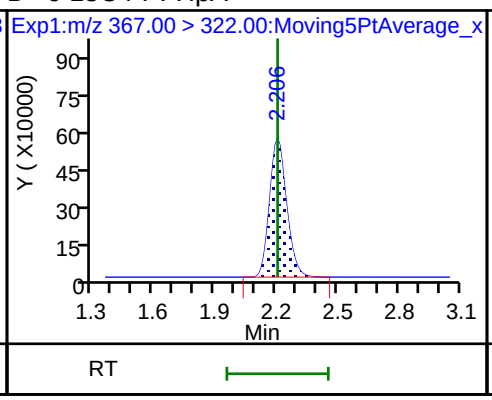
70 Perfluoropentanesulfonic acid



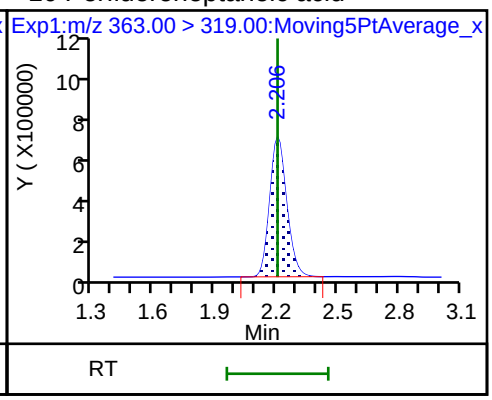
70 Perfluoropentanesulfonic acid



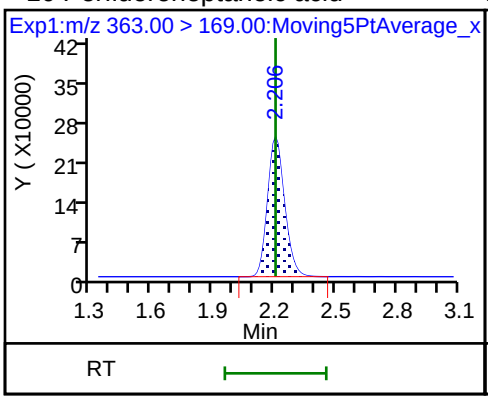
D 9 13C4-PFHpA



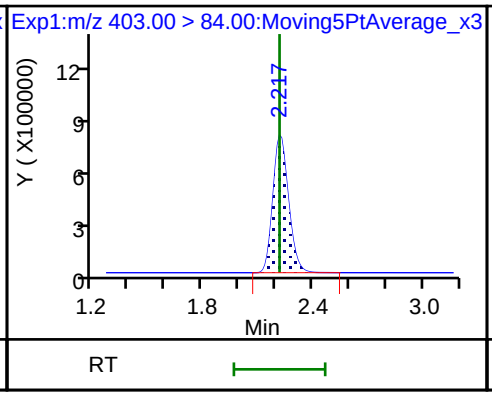
10 Perfluoroheptanoic acid



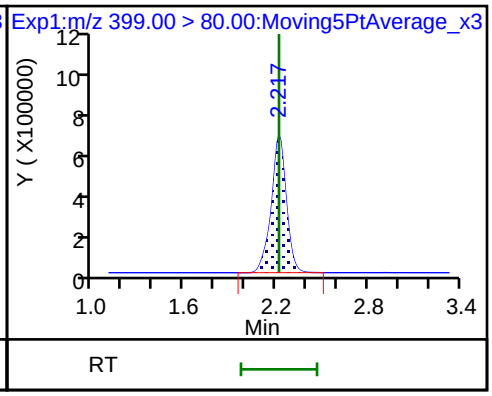
10 Perfluoroheptanoic acid



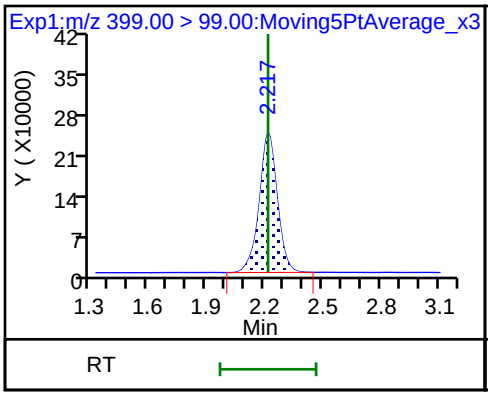
D 11 18O2 PFHxS



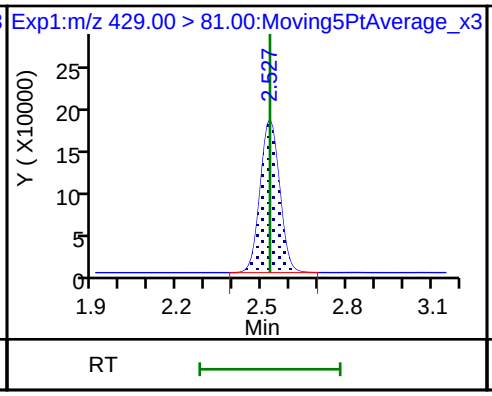
8 Perfluorohexanesulfonic acid



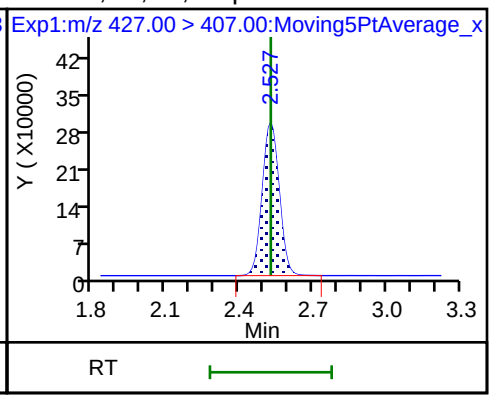
8 Perfluorohexanesulfonic acid



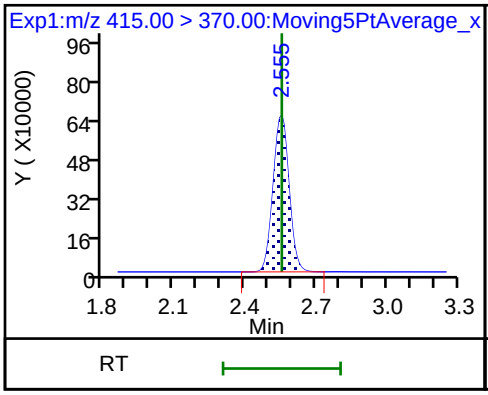
D 12 M2-6:2FTS



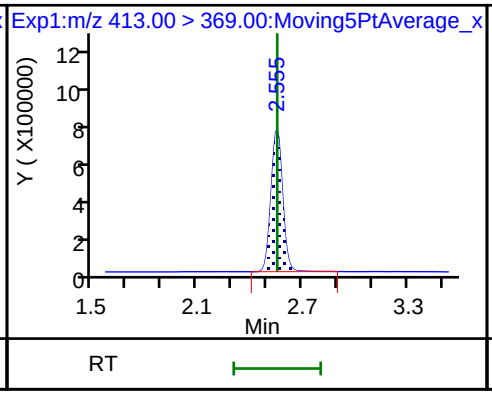
13 1H,1H,2H,2H-perfluorooctanesulfoni



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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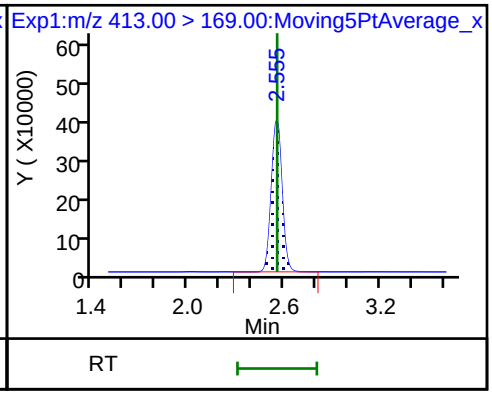
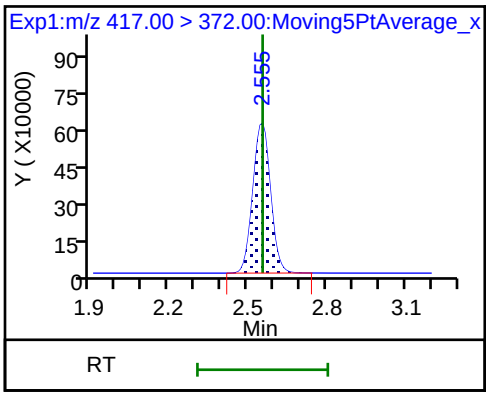
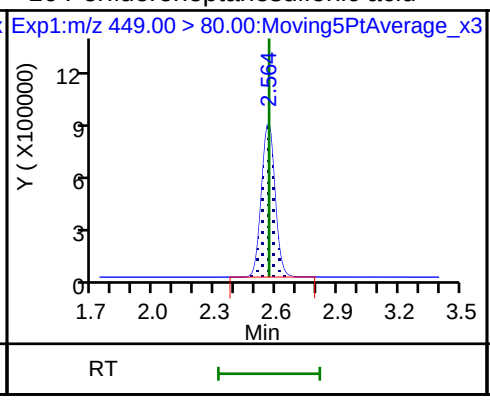


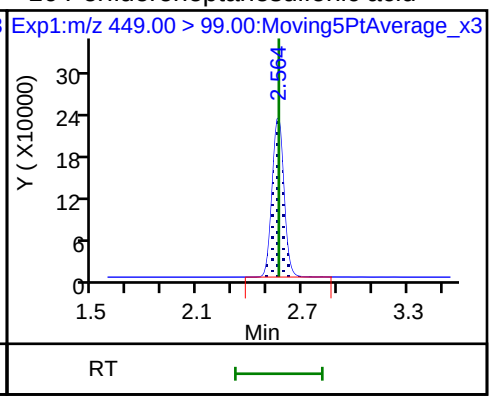
D 14 13C4 PFOA



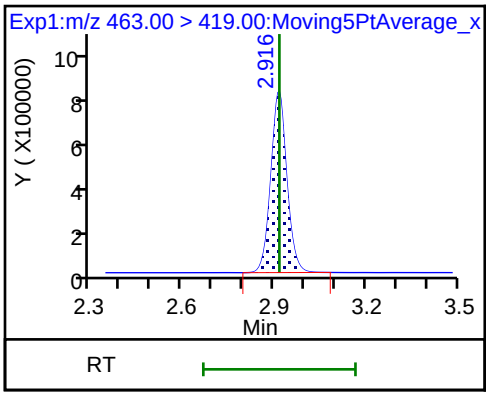
16 Perfluoroheptanesulfonic acid



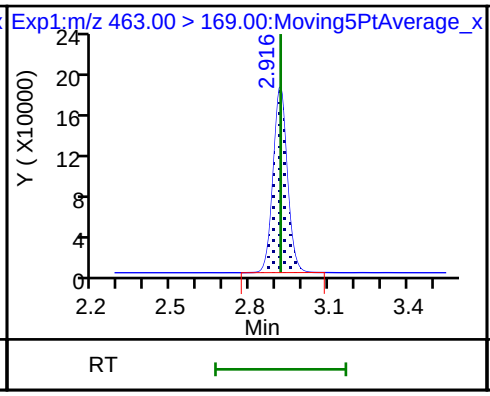
16 Perfluoroheptanesulfonic acid



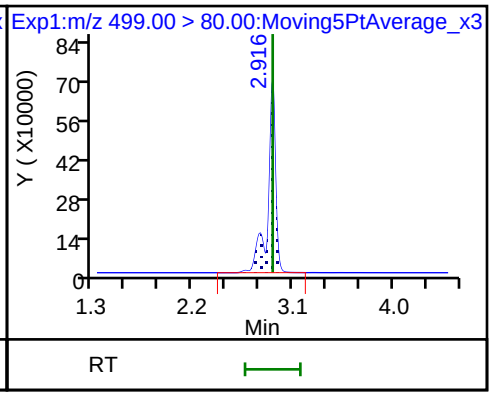
20 Perfluorononanoic acid



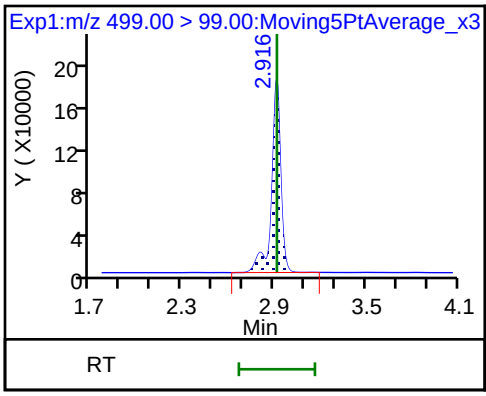
20 Perfluorononanoic acid



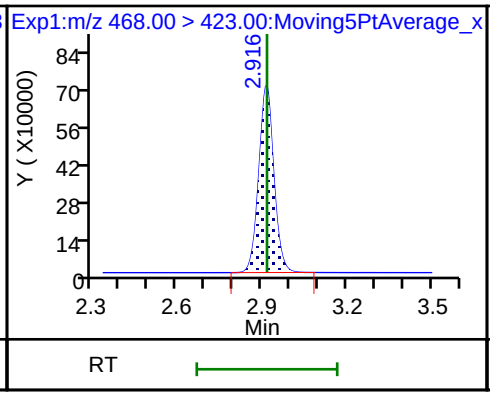
17 Perfluorooctane sulfonic acid



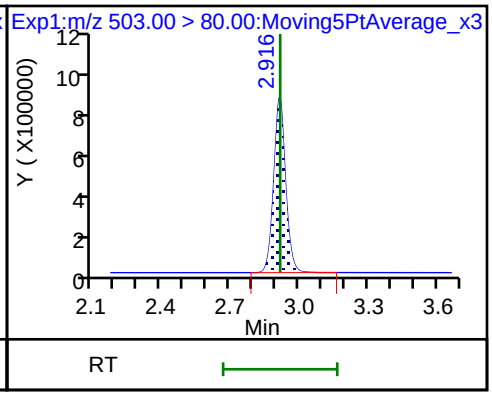
17 Perfluorooctane sulfonic acid



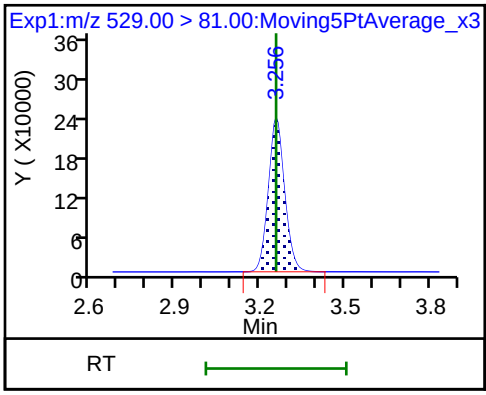
D 19 13C5 PFNA



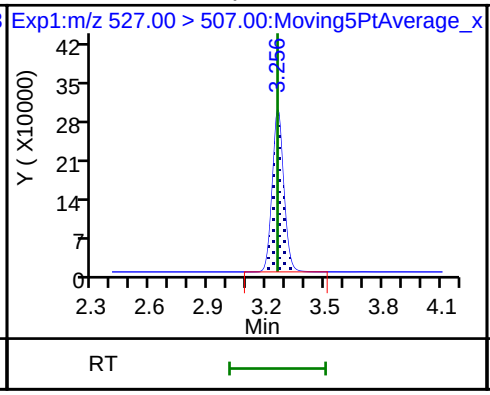
D 18 13C4 PFOS



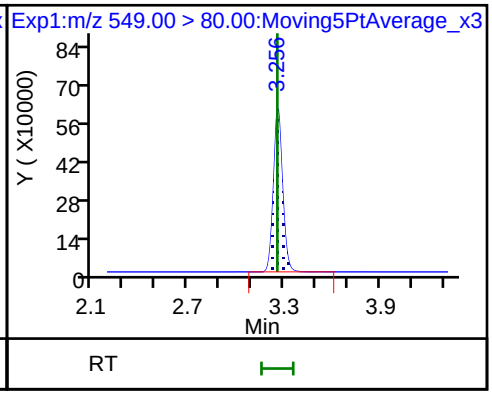
D 26 M2-8:2FTS



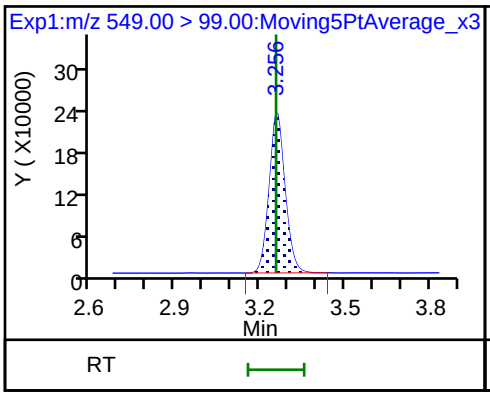
25 1H,1H,2H,2H-perfluorodecanesulfoni



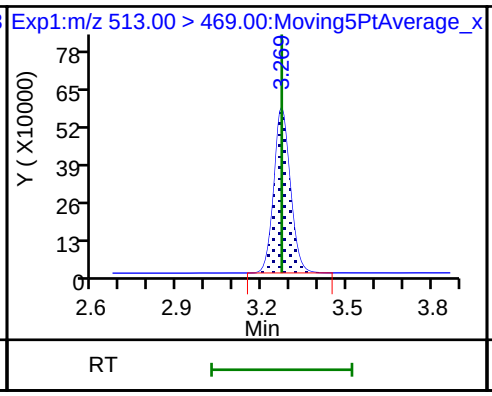
68 Perfluorononanesulfonic acid



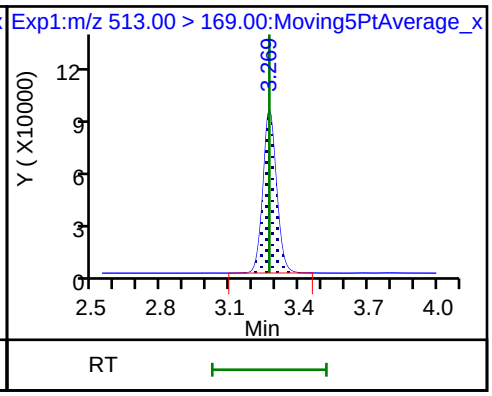
68 Perfluorononanesulfonic acid



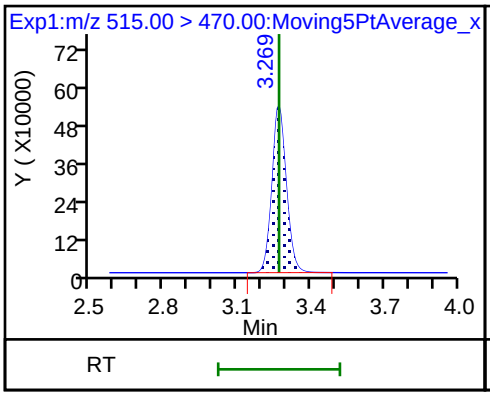
24 Perfluorodecanoic acid



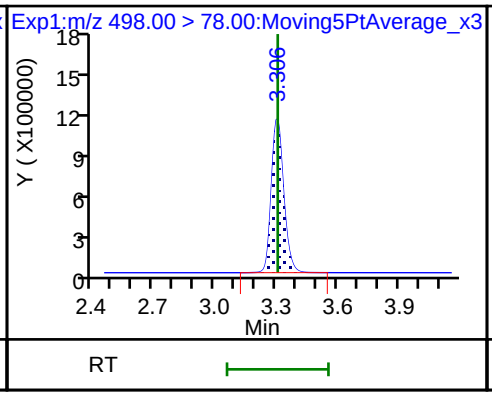
24 Perfluorodecanoic acid



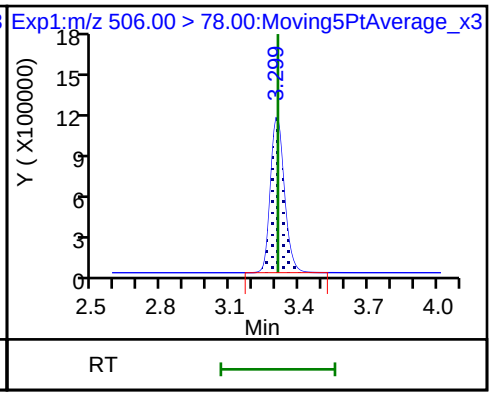
D 23 13C2 PFDA



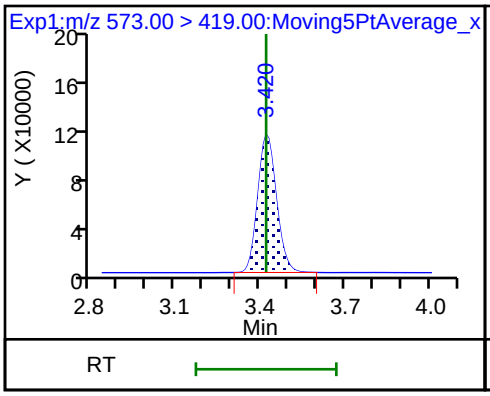
22 Perfluorooctane Sulfonamide



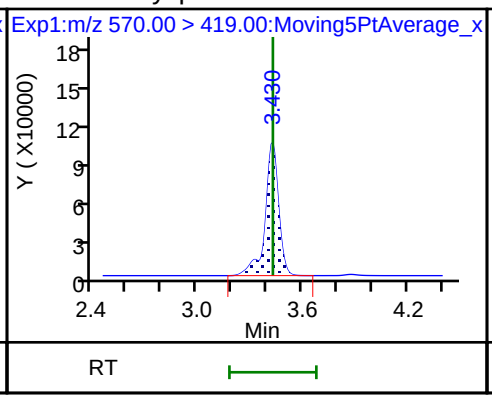
D 21 13C8 FOSA



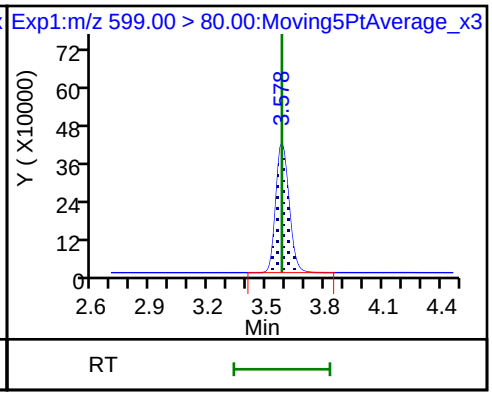
D 27 d3-NMeFOSAA



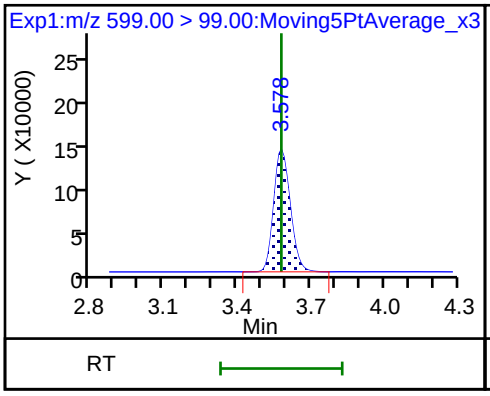
28 N-methyl perfluorooctane sulfonami



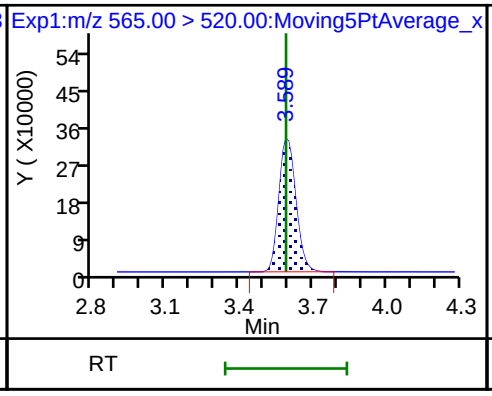
29 Perfluorodecane Sulfonic acid



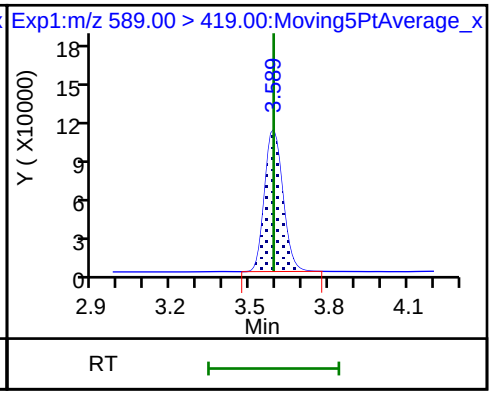
29 Perfluorodecane Sulfonic acid



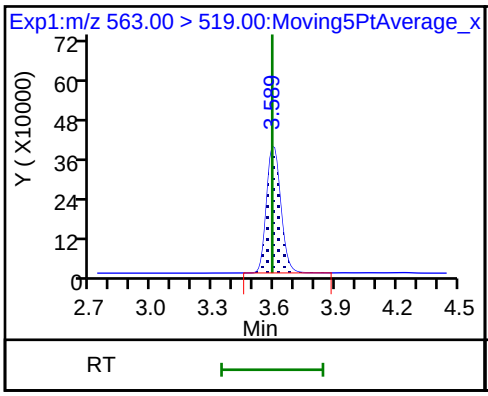
D 30 13C2 PFUnA



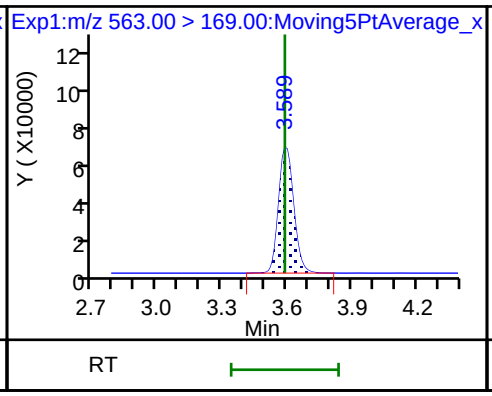
D 32 d5-NEtFOSAA



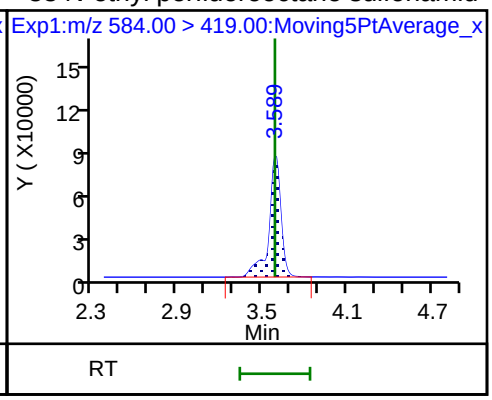
31 Perfluoroundecanoic acid



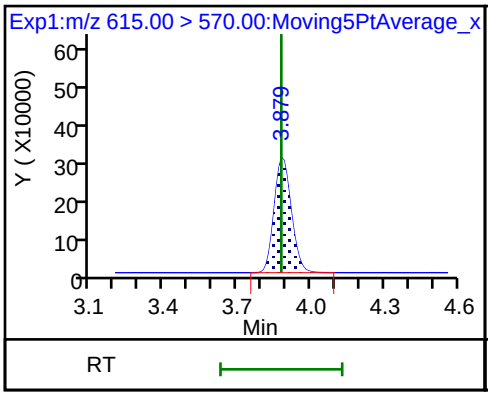
31 Perfluoroundecanoic acid



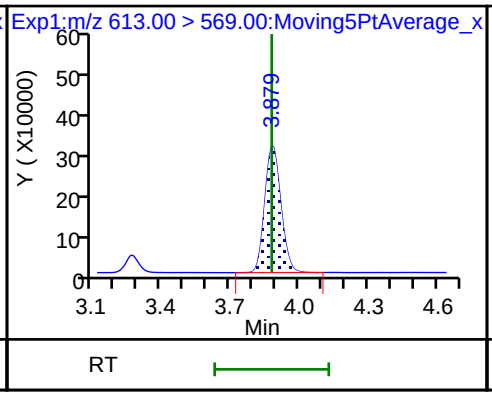
33 N-ethyl perfluorooctane sulfonamid



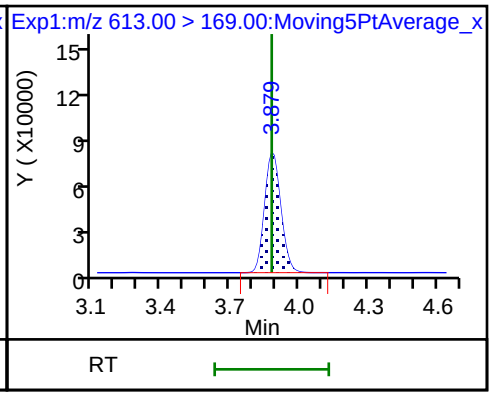
D 36 13C2 PFDoA



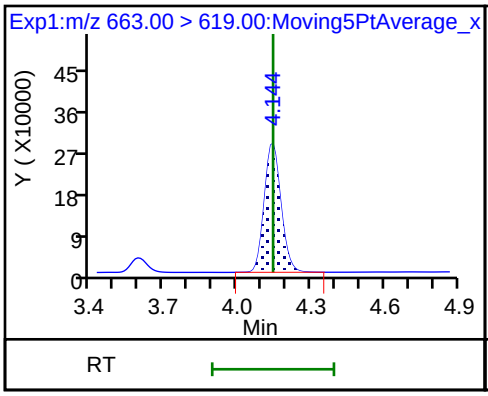
37 Perfluorododecanoic acid



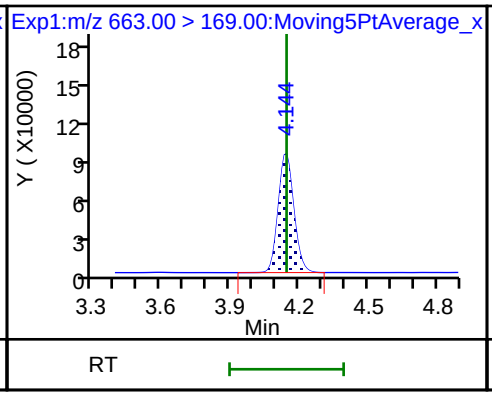
37 Perfluorododecanoic acid



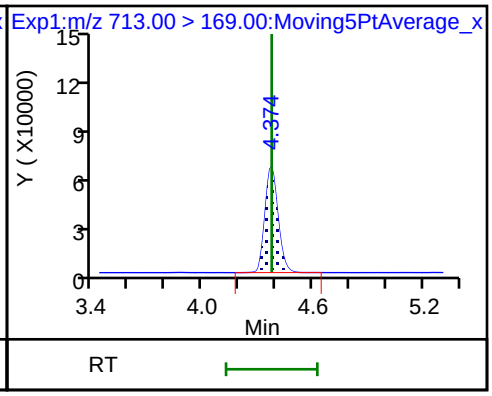
41 Perfluorotridecanoic acid



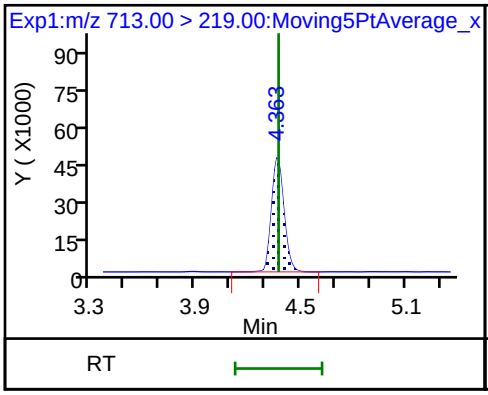
41 Perfluorotridecanoic acid



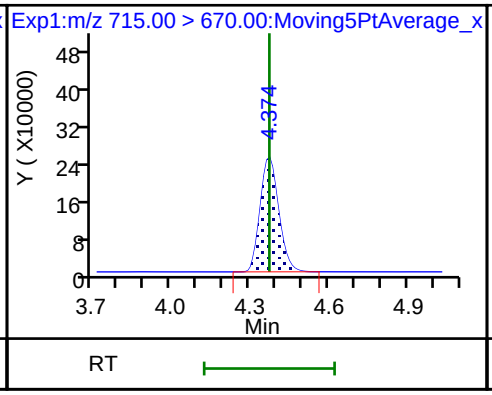
42 Perfluorotetradecanoic acid



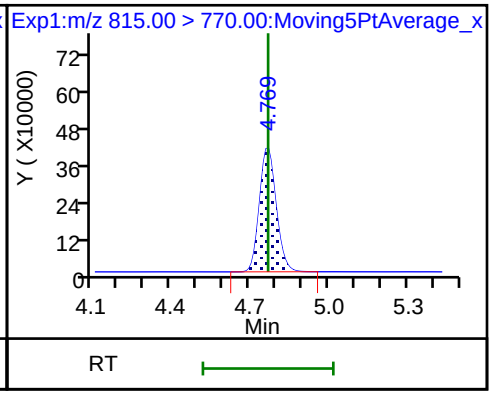
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238093/21 Calibration Date: 08/06/2018 05:56

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_050.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9855	0.9507		0.965	1.00	-3.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.197	1.203		1.00	1.00	0.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.65	88.27		1.02	0.884	15.2	30.0
4:2 FTS	AveID	17.21	18.53		1.01	0.934	7.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.055	1.070		1.02	1.00	1.5	30.0
Perfluoropentanesulfonic acid	AveID	67.65	67.85		0.941	0.938	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.160	1.182		1.02	1.00	1.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.156	1.072		0.844	0.910	-7.3	30.0
6:2 FTS	AveID	1.654	1.639		0.940	0.948	-0.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.156	1.171		1.01	1.00	1.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.382	1.292		0.890	0.952	-6.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.080	1.083		1.00	1.00	0.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.123	1.067		0.882	0.928	-4.9	30.0
8:2 FTS	AveID	1.351	1.326		0.940	0.958	-1.9	30.0
Perfluorononanesulfonic acid	AveID	0.7187	0.7752		1.04	0.960	7.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.067	1.032		0.967	1.00	-3.3	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9871	1.011		1.02	1.00	2.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.017	0.9877		0.972	1.00	-2.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6504	0.6133		0.909	0.964	-5.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8912	0.9163		1.03	1.00	2.8	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.232	1.201		0.975	1.00	-2.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.083	1.048		0.968	1.00	-3.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9424	0.8863		0.940	1.00	-6.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2694	0.2485		0.922	1.00	-7.8	30.0
13C4 PFBA	Ave	1.440	1.307		2.27	2.50	-9.2	30.0
13C5-PFPeA	Ave	0.9481	0.9741		2.57	2.50	2.7	30.0
13C3-PFBS	Ave	0.0273	0.0261		2.23	2.33	-4.3	30.0
13C2 PFHxA	Ave	1.026	1.077		2.62	2.50	5.0	30.0
13C4-PFHpA	Ave	0.9943	1.049		2.64	2.50	5.5	30.0
18O2 PFHxS	Ave	1.494	1.455		2.30	2.37	-2.6	30.0
M2-6:2FTS	Ave	0.2913	0.2882		2.35	2.38	-1.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238093/21 Calibration Date: 08/06/2018 05:56

Instrument ID: A8_N Calib Start Date: 08/01/2018 12:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/01/2018 13:46

Lab File ID: 2018.08.05LLA_050.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9600	0.9607		2.50	2.50	0.0	30.0
13C4 PFOS	Ave	1.032	1.015		2.35	2.39	-1.6	30.0
13C5 PFNA	Ave	0.8365	0.8612		2.57	2.50	3.0	30.0
M2-8:2FTS	Ave	0.2839	0.3065		2.59	2.40	7.9	30.0
13C2 PFDA	Ave	0.6256	0.6890		2.75	2.50	10.1	30.0
13C8 FOSA	Ave	1.516	1.442		2.38	2.50	-4.9	30.0
d3-NMeFOSAA	Ave	0.1518	0.1623		2.67	2.50	6.9	30.0
d5-NEtFOSAA	Ave	0.1627	0.1753		2.69	2.50	7.7	30.0
13C2 PFUnA	Ave	0.4818	0.4996		2.59	2.50	3.7	30.0
13C2 PFDoA	Ave	0.4172	0.4606		2.76	2.50	10.4	30.0
13C2-PFTeDA	Ave	0.3502	0.3735		2.67	2.50	6.6	30.0
13C2-PFHxDA	Ave	0.6033	0.5375		2.23	2.50	-10.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_050.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 06-Aug-2018 05:56:22 ALS Bottle#: 13 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 17:01:49 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 16:33:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.385	0.010	0.544	4469747	2.27		90.8	110079	
2 Perfluorobutyric acid										
212.90 > 169.00	1.395	1.395	0.0	1.000	1699769	0.9647		96.5	412	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.637	0.0	1.005	1602566	1.00		100	713	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.624	0.005	0.636	3331735	2.57		103	72338	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.005	2786252	1.02		115	8238	
298.90 > 99.00	1.662	1.671	-0.009	1.000	1149128		2.42(1.25-3.74)		6248	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.656	0.006	0.649	83016	2.23		95.7	467	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.863	1.863	0.0	1.121	618088	1.01		108	23137	
D 60 M2-4:2FTS										
329.00 > 81.00	1.863	1.856	0.007	0.727	623933	NC			9019	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.892	1.892	0.0	1.000	1577256	1.02		102	6740	
313.00 > 119.00	1.902	1.892	0.010	1.006	145158		10.87(5.03-15.10)		2346	
D 7 13C2 PFHxA										
315.00 > 270.00	1.892	1.885	0.007	0.738	3683768	2.62		105	94581	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.924	0.0	1.157	2272418	0.9407		100	30871	
349.00 > 99.00	1.924	1.924	0.0	1.157	860366		2.64(1.36-4.07)		12699	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.988	1.988	0.0	1.000	326508	NC			2425	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.988	1.980	0.008	0.776	275958	NC			10020	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.214	2.214	0.0	1.000	1695950	1.02		102	1488	
363.00 > 169.00	2.214	2.214	0.0	1.000	635287		2.67(1.13-3.40)		9902	
D 9 13C4-PFHpA										
367.00 > 322.00	2.214	2.206	0.008	0.864	3587744	2.64		106	68883	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.226	2.226	0.0	1.000	1940989	0.8437		92.7	8647	
399.00 > 99.00	2.226	2.226	0.0	1.000	672463		2.89(1.50-4.49)		2149	
D 11 18O2 PFHxS										
403.00 > 84.00	2.226	2.217	0.009	0.868	4706589	2.30		97.4	53735	
65 ADONA										
377.00 > 251.00	2.251	2.251	0.0	0.769	4037338	NC			48620	
377.00 > 85.00	2.251	2.251	0.0	0.769	2327029		1.73(0.84-2.53)		9794	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.536	2.536	0.0	1.000	612675	0.9395		99.1	16286	
D 12 M2-6:2FTS										
429.00 > 81.00	2.536	2.527	0.009	0.989	936560	2.35		98.9	19908	
* 62 13C2-PFOA										
415.00 > 370.00	2.563	2.563	0.0		3420273	2.50			43987	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.563	2.563	0.0	1.000	1540264	1.01		101	1082	
413.00 > 169.00	2.563	2.563	0.0	1.000	796166		1.93(0.84-2.52)		7859	
D 14 13C4 PFOA										
417.00 > 372.00	2.563	2.555	0.008	1.000	3285826	2.50		100	38017	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.571	2.571	0.0	0.879	1708611	0.8898		93.5	15895	
449.00 > 99.00	2.571	2.571	0.0	0.879	484601		3.53(1.94-5.82)		8249	
20 Perfluorononanoic acid										
463.00 > 419.00	2.925	2.925	0.0	1.000	1275694	1.00		100	6662	
463.00 > 169.00	2.925	2.925	0.0	1.000	301710		4.23(1.90-5.69)		13935	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.925	2.925	0.0	1.000	1375856	0.8822		95.1	12298	
499.00 > 99.00	2.925	2.925	0.0	1.000	316399		4.35(2.31-6.93)		4809	
D 19 13C5 PFNA										
468.00 > 423.00	2.925	2.916	0.009	1.141	2945589	2.57		103	57626	
D 18 13C4 PFOS										
503.00 > 80.00	2.925	2.916	0.009	1.141	3320059	2.35		98.4	57936	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.137	3.137	0.0	1.072	2174663	NC			19434	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.266	3.266	0.0	1.000	532524	0.9400		98.1	19050	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.273	3.273	0.0	1.119	1033733	1.04		108	22117	
549.00 > 99.00	3.273	3.273	0.0	1.119	378783		2.73(1.33-3.97)		3889	
D 26 M2-8:2FTS										
529.00 > 81.00	3.266	3.256	0.010	1.274	1004212	2.59		108	23052	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.280	3.280	0.0	1.000	973017	0.9671		96.7	3034	
513.00 > 169.00	3.280	3.280	0.0	1.000	176686		5.51(2.36-7.09)		5416	
D 23 13C2 PFDA										
515.00 > 470.00	3.280	3.269	0.011	1.280	2356391	2.75		110	48951	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.311	0.0	1.000	1993663	1.02		102	31658	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.307	0.004	1.292	4932271	2.38		95.1	73614	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.436	3.420	0.016	1.340	554960	2.67		107	20010	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.436	3.436	0.0	1.000	219250	0.9715		97.2	3125	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.586	3.586	0.0	1.226	821255	0.9090		94.3	28503	
599.00 > 99.00	3.586	3.586	0.0	1.226	267847		3.07(1.39-4.16)		3769	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.608	3.608	0.0	1.003	219799	1.03		103	4721	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.608	3.608	0.0	1.000	821104	0.9749		97.5	1641	R
563.00 > 169.00	3.608	3.608	0.0	1.000	128479		6.39(2.12-6.36)		5309	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.597	3.589	0.008	1.403	599712	2.69		108	4438	
D 30 13C2 PFUnA										
565.00 > 520.00	3.608	3.589	0.019	1.407	1708667	2.59		104	27498	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.761	3.761	0.0	1.286	3224761	NC			51285	
D 36 13C2 PFDoA										
615.00 > 570.00	3.897	3.878	0.019	1.520	1575379	2.76		110	17042	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.897	3.897	0.0	1.000	660631	0.9683		96.8	173	
613.00 > 169.00	3.897	3.897	0.0	1.000	156077		4.23(2.13-6.40)		3237	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.153	4.153	0.0	1.066	558487	0.9404		94.0	168	
663.00 > 169.00	4.153	4.153	0.0	1.066	176142		3.17(1.25-3.76)		2502	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.383	4.373	0.010	1.710	1277465	2.67		107	5977	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.383	4.383	0.0	1.000	126973	0.9225		92.2	2000	
713.00 > 219.00	4.383	4.383	0.0	1.000	85636		1.48(0.71-2.13)		1445	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.777	4.768	0.009	1.864	1838400	2.23		89.1	3275	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.777	4.777	0.0	1.000	749346	NC			37.9	
813.00 > 169.00	4.777	4.777	0.0	1.000	120623		6.21(2.86-8.58)		1448	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.103	5.103	0.0	1.068	860405	NC			320	
913.00 > 169.00	5.103	5.103	0.0	1.068	104989		8.20(3.83-11.48)		1062	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL4_00005 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 17:01:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_050.d

Injection Date: 06-Aug-2018 05:56:22 Instrument ID: A8_N

Lims ID: CCV L4

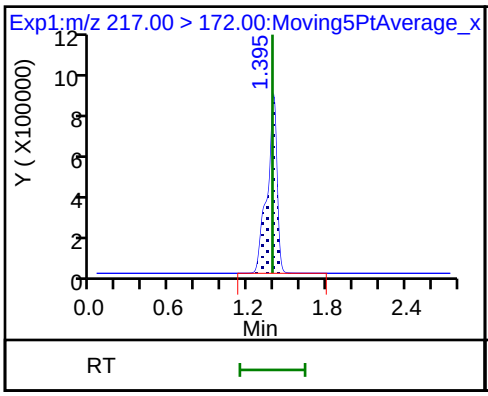
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 21

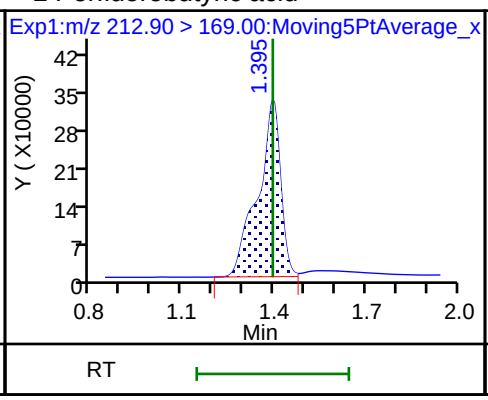
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

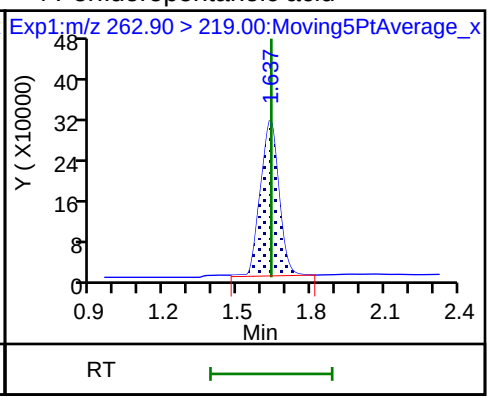
D 1 13C4 PFBA



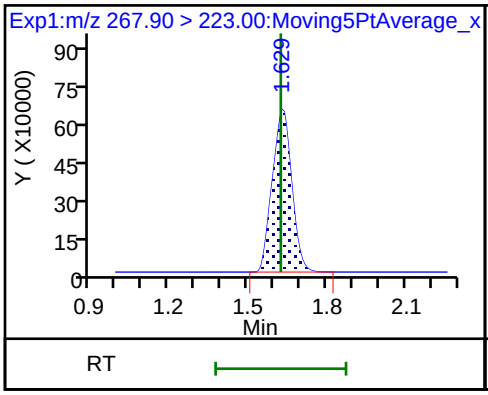
2 Perfluorobutyric acid



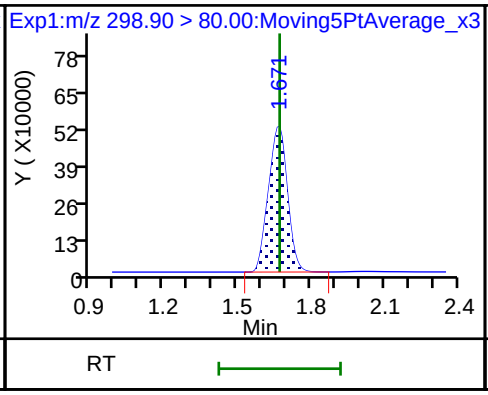
4 Perfluoropentanoic acid



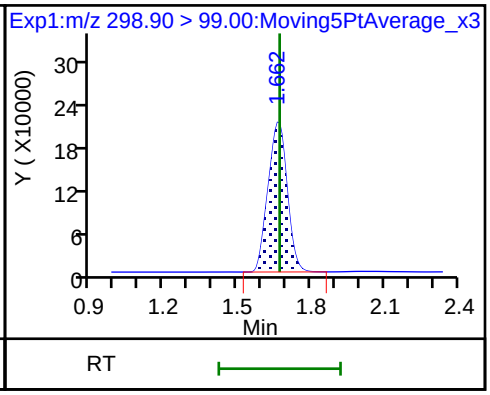
D 3 13C5-PFPeA



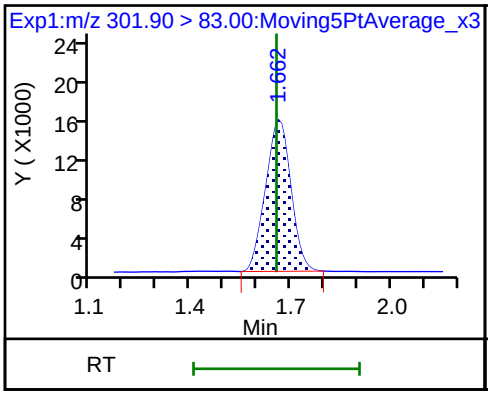
5 Perfluorobutanesulfonic acid



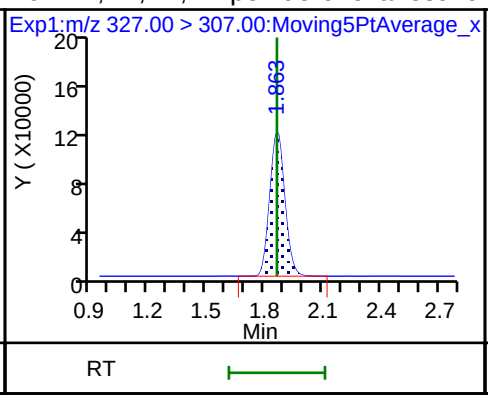
5 Perfluorobutanesulfonic acid



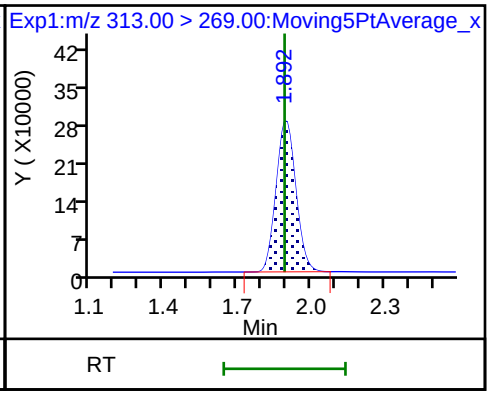
D 47 13C3-PFBS



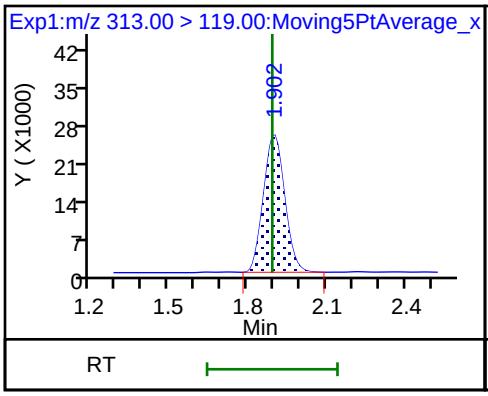
61 1H,1H,2H,2H-perfluorohexanesulfoni



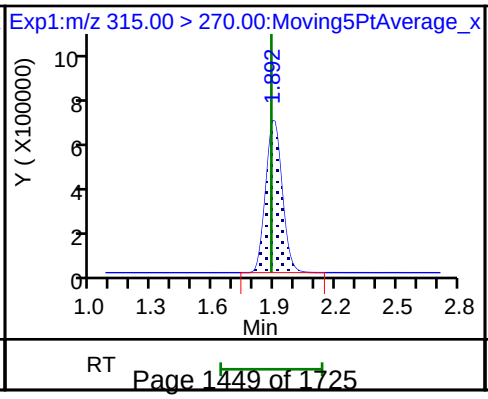
6 Perfluorohexanoic acid



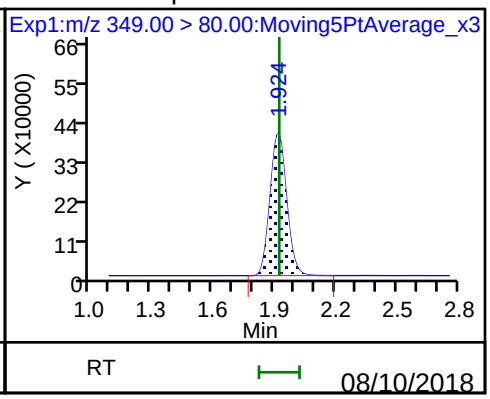
6 Perfluorohexanoic acid



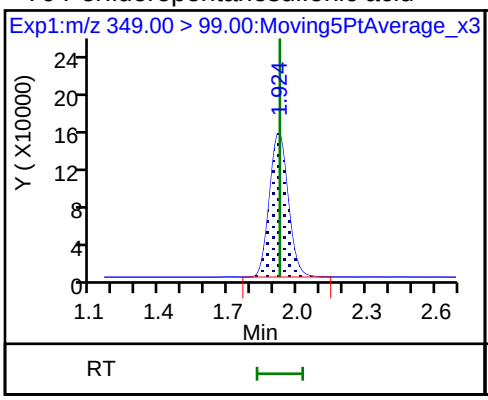
D 7 13C2 PFHxA



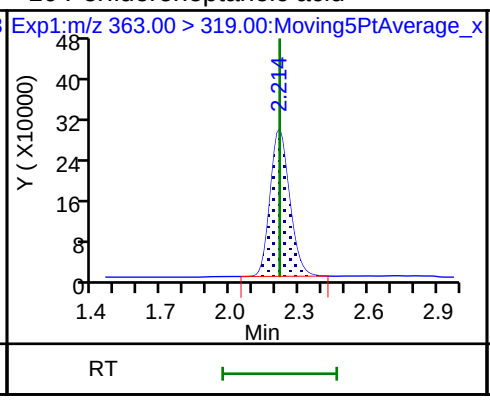
70 Perfluoropentanesulfonic acid



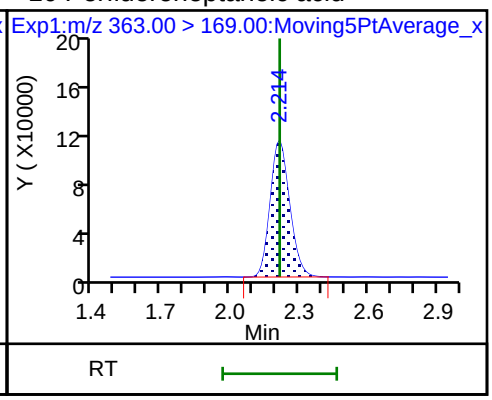
70 Perfluoropentanesulfonic acid



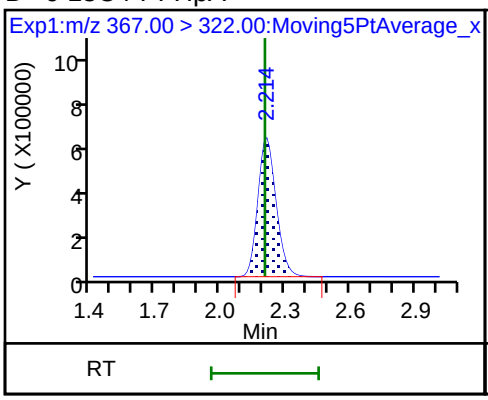
10 Perfluoroheptanoic acid



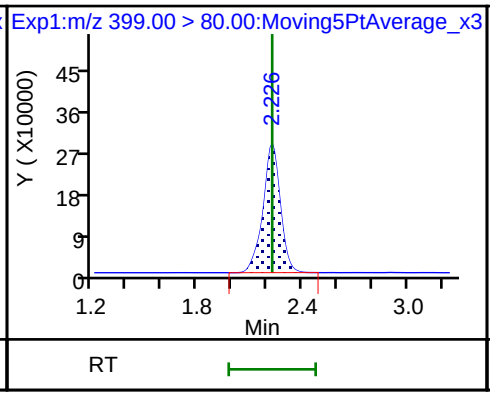
10 Perfluoroheptanoic acid



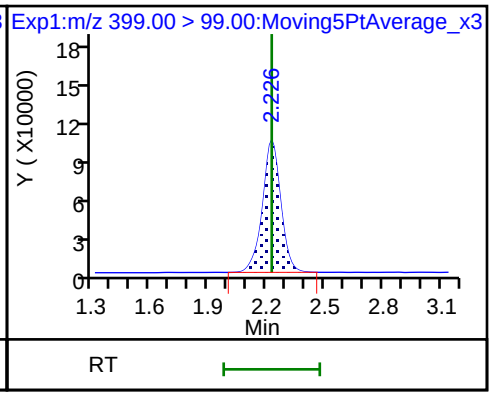
D 9 13C4-PFHpA



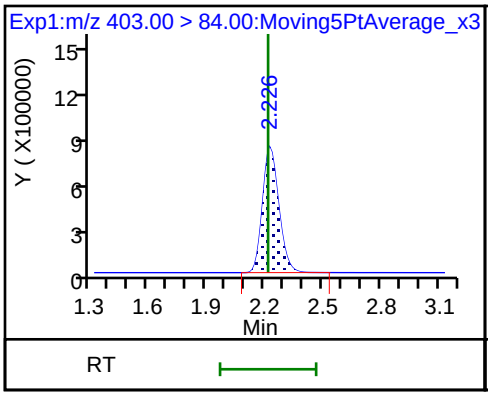
8 Perfluorohexanesulfonic acid



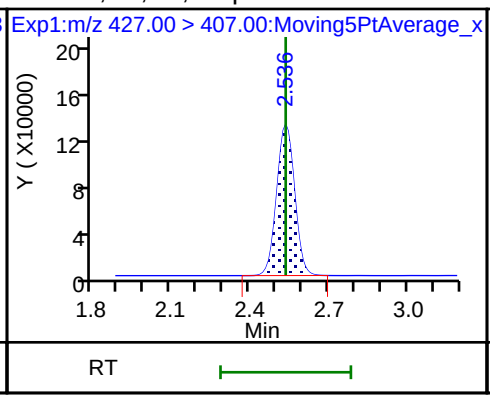
8 Perfluorohexanesulfonic acid



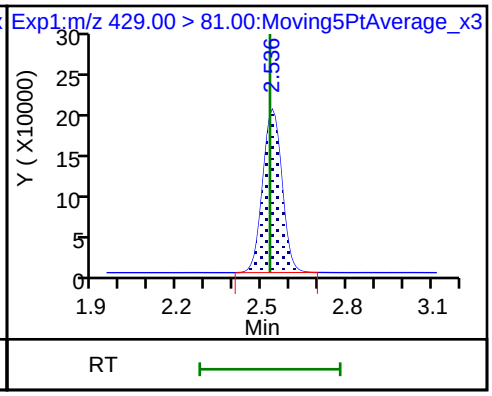
D 11 18O2 PFHxS



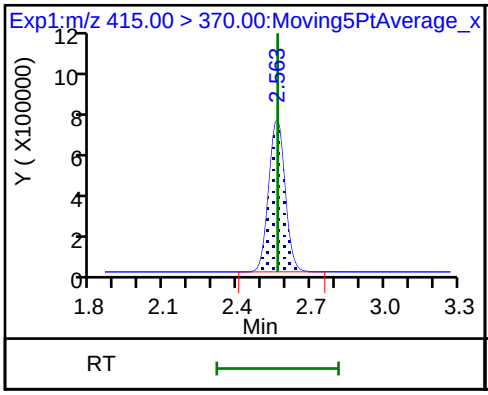
13 1H,1H,2H,2H-perfluorooctanesulfon



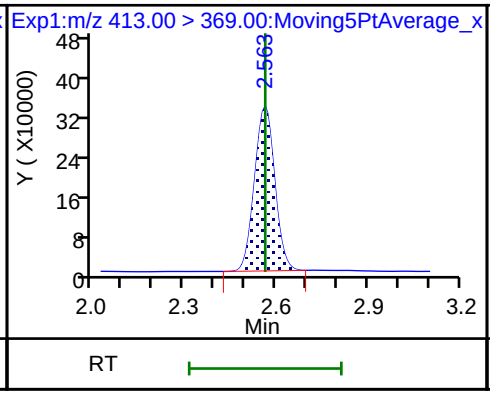
D 12 M2-6:2FTS



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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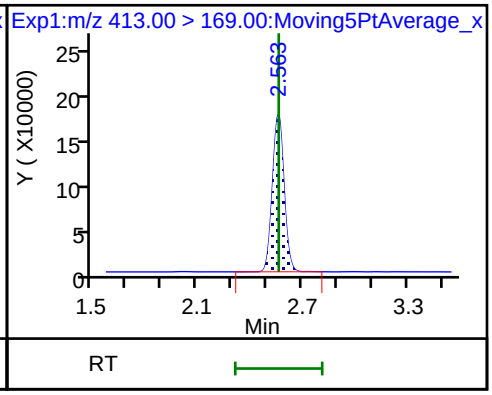
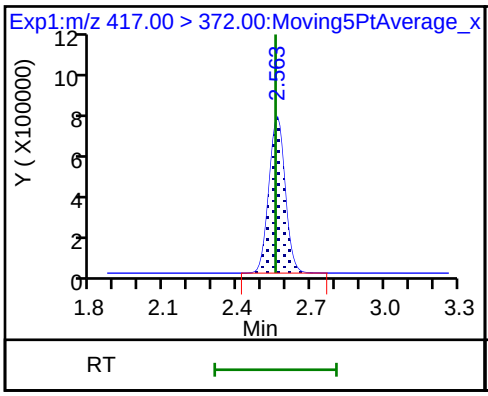
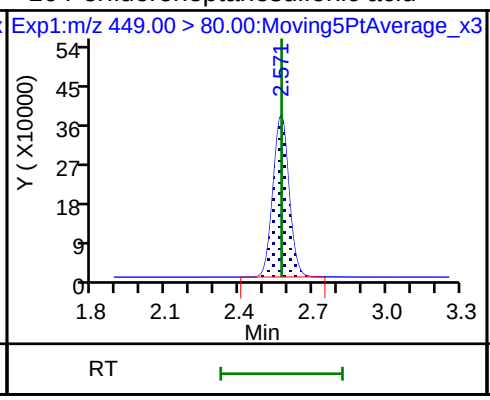


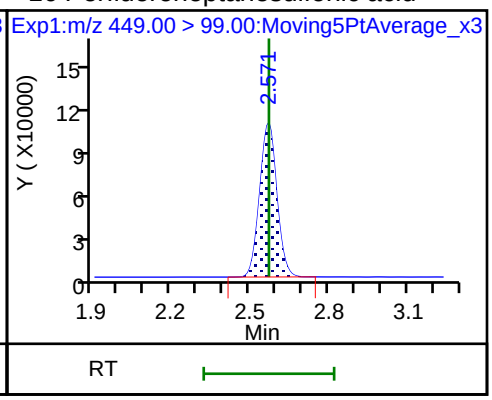
D 14 13C4 PFOA



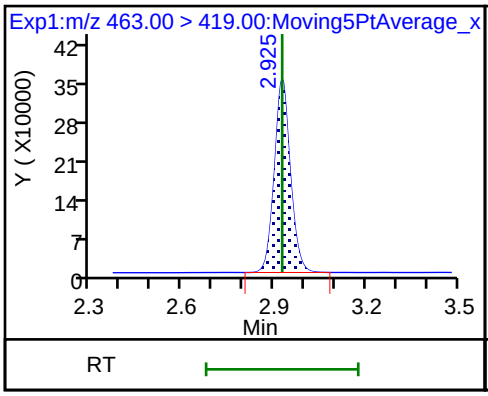
16 Perfluoroheptanesulfonic acid



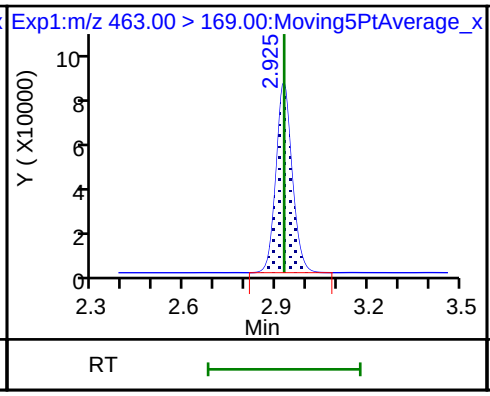
16 Perfluoroheptanesulfonic acid



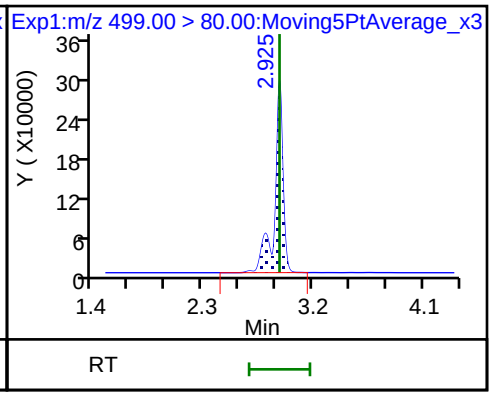
20 Perfluorononanoic acid



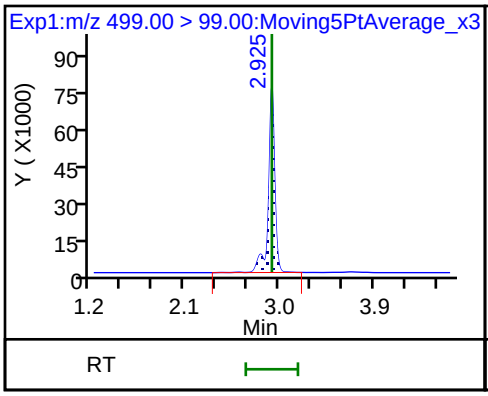
20 Perfluorononanoic acid



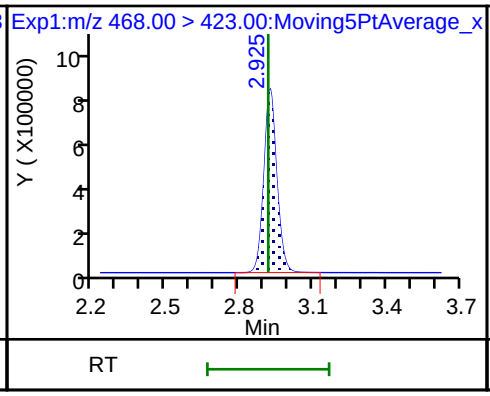
17 Perfluorooctane sulfonic acid



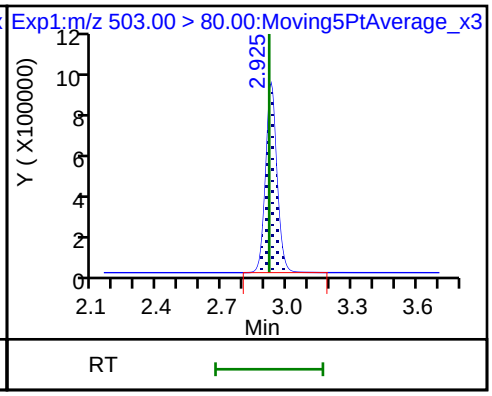
17 Perfluorooctane sulfonic acid



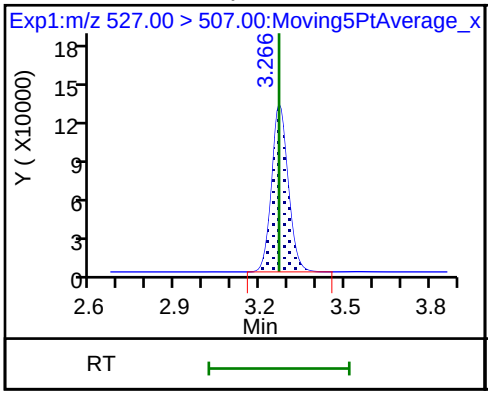
D 19 13C5 PFNA



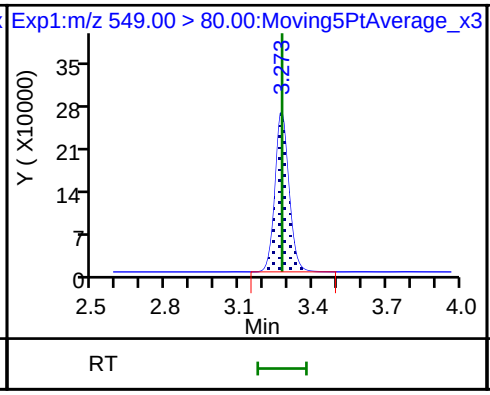
D 18 13C4 PFOS



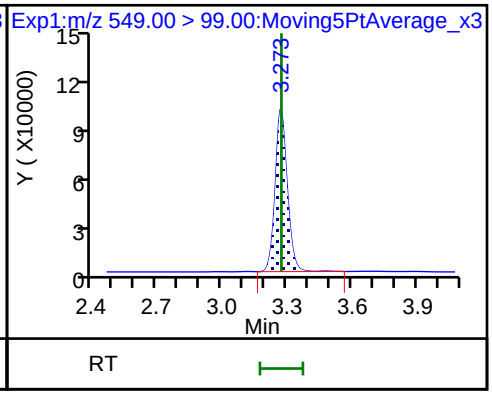
25 1H,1H,2H,2H-perfluorodecanesulfoni



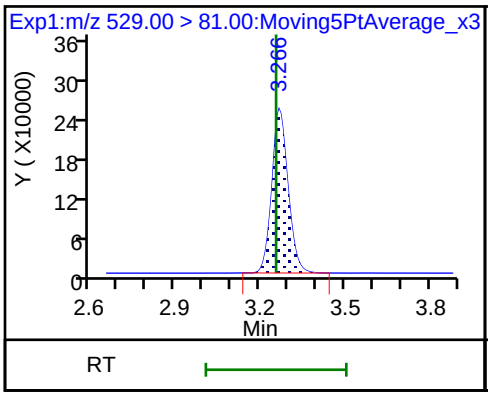
68 Perfluorononanesulfonic acid



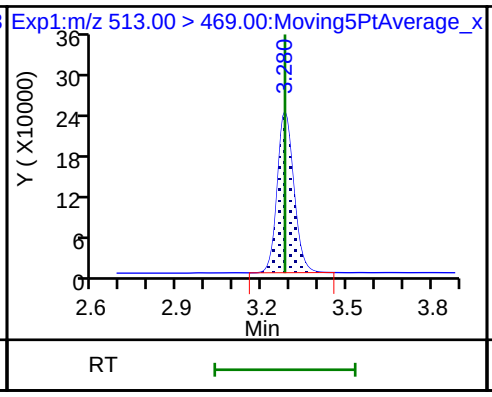
68 Perfluorononanesulfonic acid



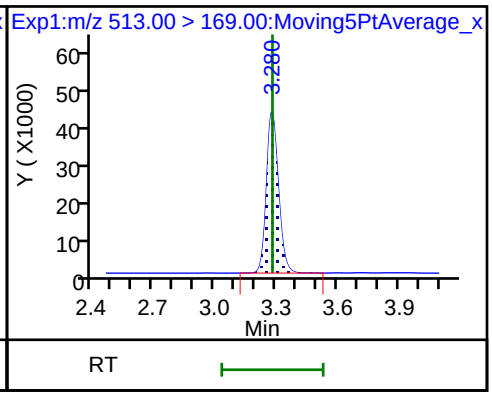
D 26 M2-8:2FTS



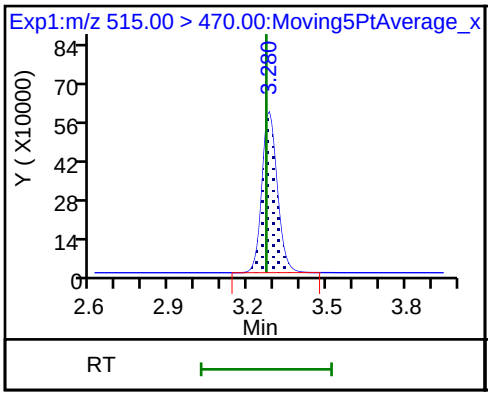
24 Perfluorodecanoic acid



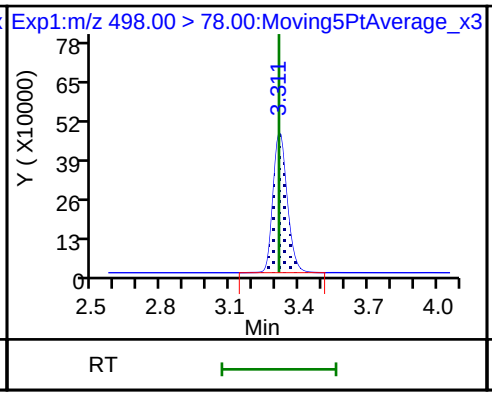
24 Perfluorodecanoic acid



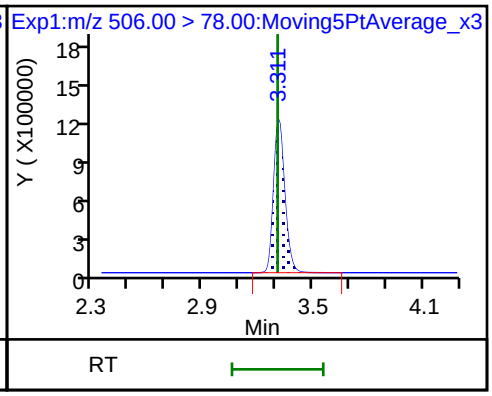
D 23 13C2 PFDA



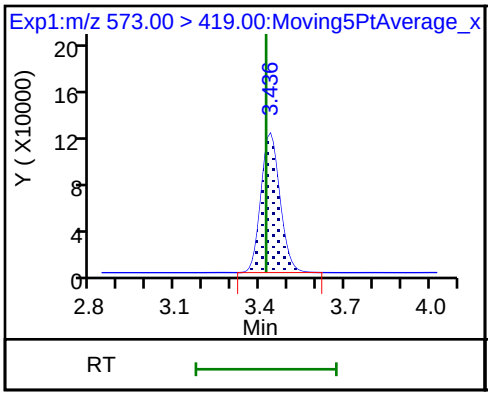
22 Perfluorooctane Sulfonamide



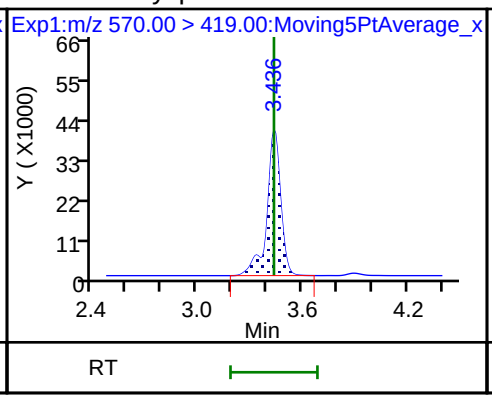
D 21 13C8 FOSA



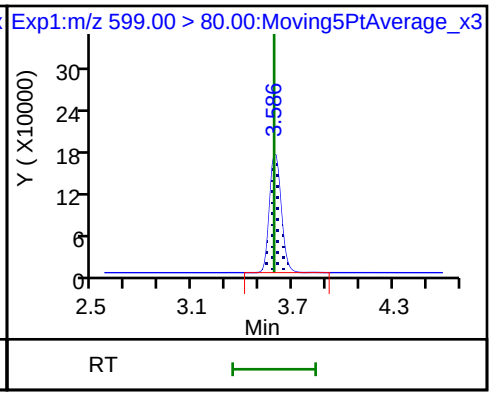
D 27 d3-NMeFOSAA



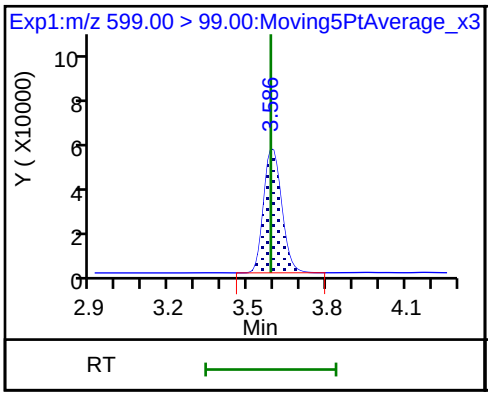
28 N-methyl perfluorooctane sulfonami



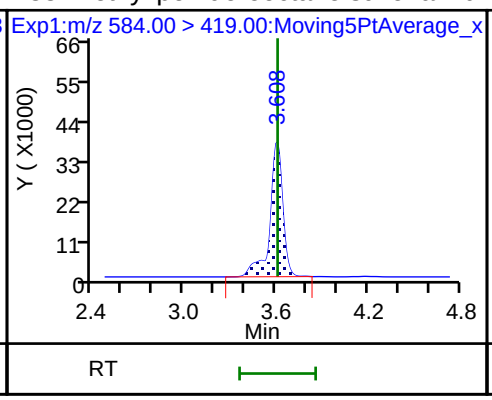
29 Perfluorodecane Sulfonic acid



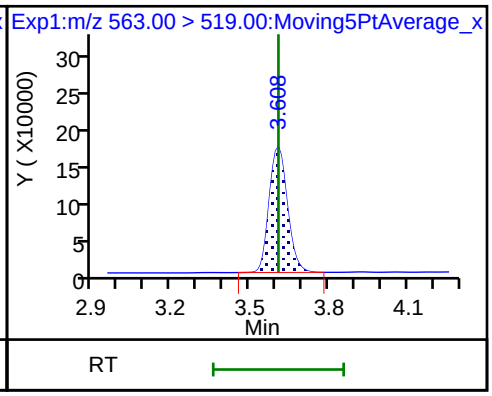
29 Perfluorodecane Sulfonic acid



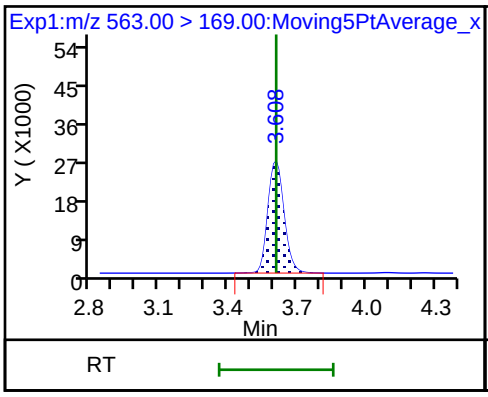
33 N-ethyl perfluorooctane sulfonamid



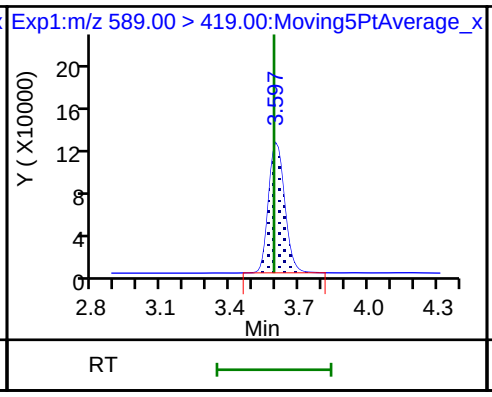
31 Perfluoroundecanoic acid



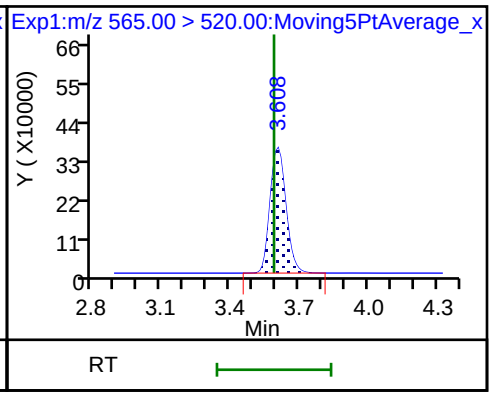
31 Perfluoroundecanoic acid



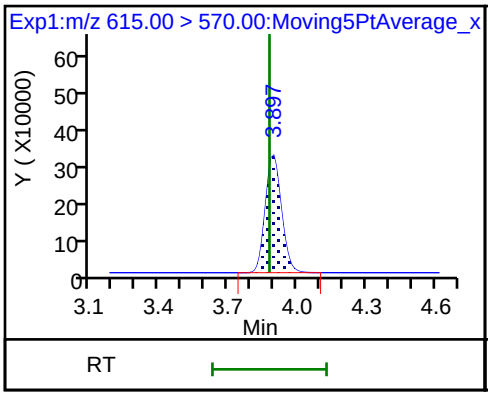
D 32 d5-NEtFOSAA



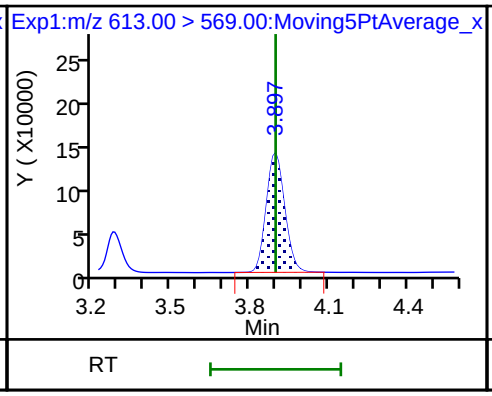
D 30 13C2 PFUnA



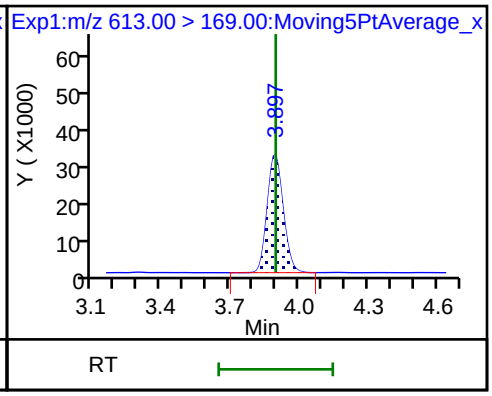
D 36 13C2 PFDoA



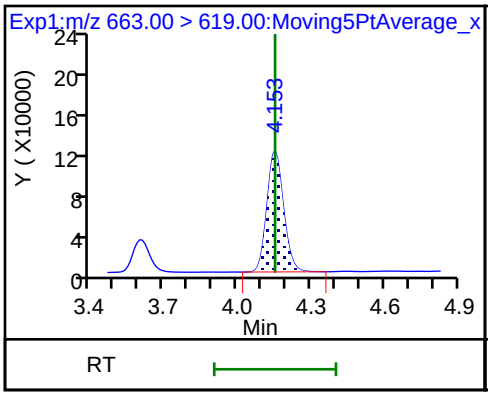
37 Perfluorododecanoic acid



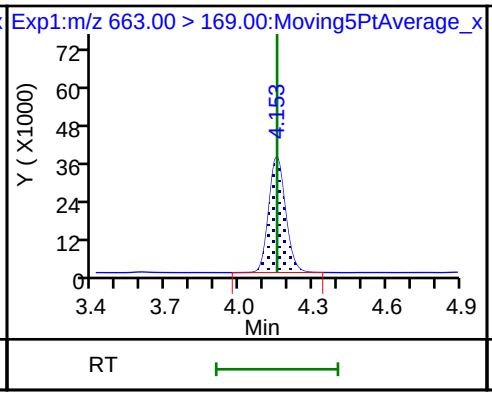
37 Perfluorododecanoic acid



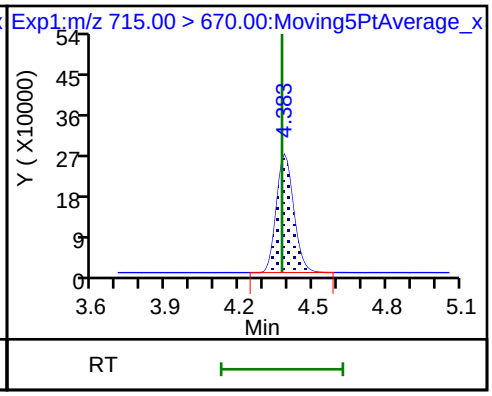
41 Perfluorotridecanoic acid



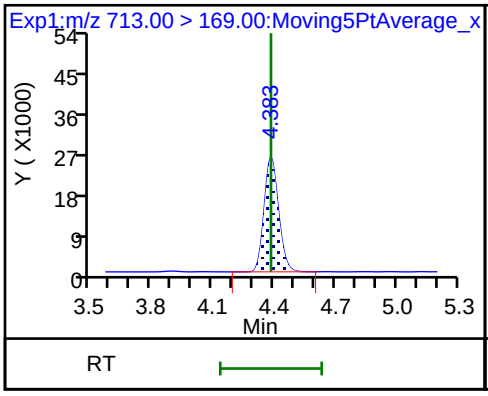
41 Perfluorotridecanoic acid



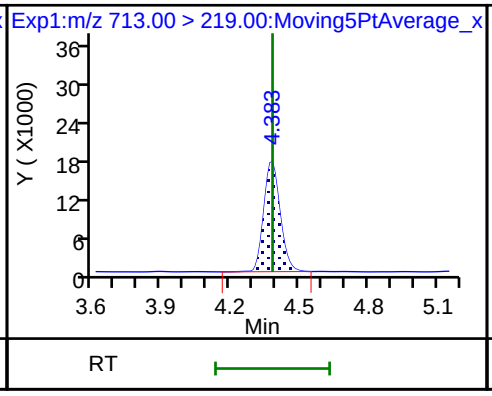
D 43 13C2-PFTeDA



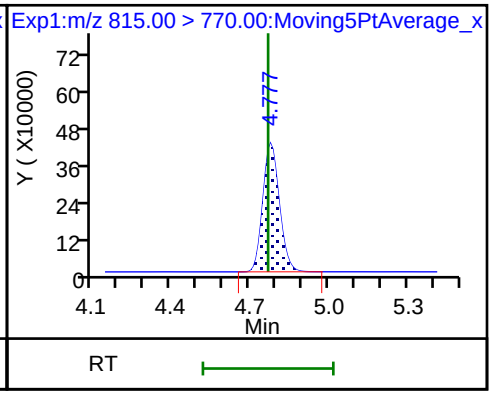
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 320-238193/10 Calibration Date: 08/06/2018 12:12

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.06LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9111		2.43	2.50	-3.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.131		2.49	2.50	-0.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	75.88		2.21	2.21	-0.1	30.0
4:2 FTS	AveID	16.57	16.30		2.30	2.34	-1.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9745		2.39	2.50	-4.5	30.0
Perfluoropentanesulfonic acid	AveID	68.92	67.78		2.31	2.35	-1.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.095		2.58	2.50	3.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.006		2.12	2.28	-7.2	30.0
6:2 FTS	AveID	1.573	1.480		2.23	2.38	-5.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.105		2.44	2.50	-2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.268		2.43	2.38	2.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.063		2.52	2.50	0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.062		2.29	2.31	-1.1	30.0
8:2 FTS	AveID	1.299	1.302		2.41	2.40	0.2	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7949		2.54	2.40	5.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9537		2.38	2.50	-4.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9736	1.033		2.65	2.50	6.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	1.046		2.71	2.50	8.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6548		2.50	2.41	3.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.9360		2.62	2.50	5.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.111		2.47	2.50	-1.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.112		2.50	2.50	-0.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.081		2.51	2.50	0.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2415		2.49	2.50	-0.2	30.0
13C4 PFBA	Ave	1.385	1.395		2.52	2.50	0.7	30.0
13C5-PFPeA	Ave	0.9537	0.9739		2.55	2.50	2.1	30.0
13C3-PFBS	Ave	0.0221	0.0228		2.41	2.33	3.5	30.0
13C2 PFHxA	Ave	1.082	1.136		2.62	2.50	5.0	30.0
13C4-PFHpA	Ave	1.065	1.049		2.46	2.50	-1.5	30.0
18O2 PFHxS	Ave	1.366	1.389		2.41	2.37	1.7	30.0
M2-6:2FTS	Ave	0.2242	0.2398		2.54	2.38	7.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: ICV 320-238193/10 Calibration Date: 08/06/2018 12:12

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.06LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	1.001		2.56	2.50	2.4	30.0
13C5 PFNA	Ave	0.8770	0.8835		2.52	2.50	0.7	30.0
13C4 PFOS	Ave	0.8973	0.9046		2.41	2.39	0.8	30.0
M2-8:2FTS	Ave	0.2707	0.2722		2.41	2.40	0.5	30.0
13C2 PFDA	Ave	0.7695	0.8085		2.63	2.50	5.1	30.0
13C8 FOSA	Ave	1.188	1.221		2.57	2.50	2.7	30.0
d3-NMeFOSAA	Ave	0.3935	0.4029		2.56	2.50	2.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.4067		2.49	2.50	-0.2	30.0
13C2 PFUnA	Ave	0.6189	0.6228		2.52	2.50	0.6	30.0
13C2 PFDoA	Ave	0.6541	0.6517		2.49	2.50	-0.4	30.0
13C2-PFTeDA	Ave	0.8335	0.8309		2.49	2.50	-0.3	30.0
13C2-PFHxDA	Ave	1.653	1.653		2.50	2.50	-0.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 06-Aug-2018 12:12:35 ALS Bottle#: 17 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:17:35 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: westendorfc Date: 06-Aug-2018 14:44:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.395	-0.004	0.542	5296521	2.52		101	7091	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.397	-0.006	1.000	4825878	2.43			504	
D 3 13C5-PFPeA										
267.90 > 223.00	1.639	1.639	0.0	0.639	3698626	2.55		102	7119	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.639	1.643	-0.004	1.000	4183399	2.49			284	
D 47 13C3-PFBS										
301.90 > 83.00	1.670	1.675	-0.005	0.651	80665	2.41		104	325	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.670	1.676	-0.006	1.000	5824451	2.21			1937	
298.90 > 99.00	1.670	1.676	-0.006	1.000	2407614		2.42(1.25-3.74)		1183	
D 60 M2-4:2FTS										
329.00 > 81.00	1.875	1.875	0.0	0.731	561057	NC			886	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.875	1.875	0.0	1.123	1321953	2.30			6725	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.908	-0.006	1.000	4205198	2.39			977	
313.00 > 119.00	1.902	1.908	-0.006	1.000	400387		10.50(5.03-15.10)		846	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.908	-0.006	0.741	4315219	2.62		105	15192	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.923	1.930	-0.007	1.151	5526564	2.31			5906	
349.00 > 99.00	1.923	1.930	-0.007	1.151	2095463		2.64(1.36-4.07)		2107	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.996	2.003	-0.007	0.778	322162	NC			933	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.996	2.003	-0.007	1.000	741324	NC			344	
D 9 13C4-PFHpA										
367.00 > 322.00	2.224	2.227	-0.003	0.867	3985248	2.46		98.5	13174	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.224	2.228	-0.004	1.000	4365036	2.58			796	
363.00 > 169.00	2.224	2.228	-0.004	1.000	1653058		2.64(1.13-3.40)		2332	
D 11 18O2 PFHxS										
403.00 > 84.00	2.233	2.239	-0.006	0.870	4991823	2.41		102	6129	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.233	2.239	-0.006	1.000	4839695	2.12			4067	
399.00 > 99.00	2.233	2.239	-0.006	1.000	1675306		2.89(1.50-4.49)		1317	
65 ADONA										
377.00 > 251.00	2.266	2.271	-0.005	0.773	11858483	NC			9196	
377.00 > 85.00	2.266	2.271	-0.005	0.773	7230959		1.64(0.84-2.53)		6790	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.541	2.548	-0.007	1.000	1280328	2.23			1590	
D 12 M2-6:2FTS										
429.00 > 81.00	2.541	2.549	-0.008	0.990	865191	2.54		107	2048	
D 73 13C8 PFOA										
421.00 > 376.00	2.565	2.571	-0.006	1.000	7338024	NC			10284	
D 14 13C4 PFOA										
417.00 > 372.00	2.565	2.573	-0.008	1.000	3800480	2.56		102	6853	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.565	2.574	-0.009	1.000	4200537	2.44			410	
413.00 > 169.00	2.565	2.574	-0.009	1.000	2114411		1.99(0.84-2.52)		2903	
* 62 13C2-PFOA										
415.00 > 370.00	2.565	2.575	-0.010		3797956	2.50			5989	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.572	2.583	-0.011	0.877	4137002	2.43			2987	
449.00 > 99.00	2.572	2.583	-0.011	0.877	1077824		3.84(1.94-5.82)		1432	
D 72 13C8 PFOS										
507.00 > 99.00	2.927	2.938	-0.011	1.141	1637179	NC			4240	
20 Perfluorononanoic acid										
463.00 > 419.00	2.932	2.939	-0.007	1.002	3565093	2.52			1099	
463.00 > 169.00	2.927	2.939	-0.012	1.000	836654		4.26(1.90-5.69)		3309	
D 19 13C5 PFNA										
468.00 > 423.00	2.927	2.939	-0.012	1.141	3355305	2.52		101	5903	
D 18 13C4 PFOS										
503.00 > 80.00	2.932	2.939	-0.007	1.143	3284321	2.41		101	4465	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.932	2.940	-0.008	1.000	3376348	2.29			2781	
499.00 > 99.00	2.932	2.940	-0.008	1.000	758026		4.45(2.31-6.93)		1161	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.138	3.150	-0.012	1.070	6059178	NC			6074	
D 26 M2-8:2FTS										
529.00 > 81.00	3.271	3.284	-0.013	1.275	990254	2.41		101	3137	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.277	3.285	-0.007	1.118	2621562	2.54			5053	
549.00 > 99.00	3.277	3.285	-0.007	1.118	925714		2.83(1.33-3.97)		2112	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.271	3.286	-0.015	1.000	1292056	2.41			2763	
D 23 13C2 PFDA										
515.00 > 470.00	3.283	3.294	-0.011	1.280	3070618	2.63		105	4701	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.283	3.296	-0.013	1.000	2928556	2.38			1743	
513.00 > 169.00	3.283	3.296	-0.013	1.000	492806		5.94(2.36-7.09)		1454	
D 21 13C8 FOSA										
506.00 > 78.00	3.305	3.317	-0.012	1.288	4636545	2.57		103	4566	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.312	3.319	-0.007	1.002	4790545	2.65			4274	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.438	3.448	-0.010	1.340	1530216	2.56		102	2513	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.445	3.453	-0.008	1.002	1600813	2.71			1423	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.595	3.608	-0.013	1.226	2170741	2.50			5861	
599.00 > 99.00	3.595	3.608	-0.013	1.226	719544		3.02(1.39-4.16)		2645	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.604	3.616	-0.012	1.405	1544621	2.49		99.8	1098	
D 30 13C2 PFUnA										
565.00 > 520.00	3.613	3.620	-0.007	1.408	2365503	2.52		101	5330	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.613	3.622	-0.009	1.000	2627473	2.47			1492	
563.00 > 169.00	3.613	3.622	-0.009	1.000	445341		5.90(2.12-6.36)		1665	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.613	3.623	-0.010	1.002	1445786	2.62			2945	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.766	3.781	-0.015	1.284	9482077	NC			7397	
D 36 13C2 PFDoA										
615.00 > 570.00	3.899	3.913	-0.014	1.520	2474996	2.49		99.6	5677	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.899	3.913	-0.014	1.192	962597	NC			4544	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.899	3.913	-0.014	1.000	2751158	2.50			1368	
613.00 > 169.00	3.899	3.913	-0.014	1.000	638644		4.31(2.13-6.40)		3219	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.139	4.148	-0.009	1.411	946435	NC			6010	
699.00 > 99.00	4.139	4.148	-0.009	1.411	1287773		0.73(0.00-0.00)		3741	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.158	4.173	-0.015	1.066	2676685	2.51			1031	
663.00 > 169.00	4.158	4.173	-0.015	1.066	835828		3.20(1.25-3.76)		3211	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.390	4.399	-0.009	1.711	3155599	2.49		99.7	7430	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.390	4.400	-0.010	1.000	762188	2.49			3740	
713.00 > 219.00	4.390	4.400	-0.010	1.000	546353		1.40(0.71-2.13)		2085	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.789	4.799	-0.010	1.867	6279185	2.50		100.0	7044	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.796	4.801	-0.005	1.001	5908591	NC			1969	
813.00 > 169.00	4.789	4.801	-0.012	1.000	999181		5.91(2.86-8.58)		4590	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.126	5.136	-0.010	1.070	6210892	NC			1785	
913.00 > 169.00	5.126	5.136	-0.010	1.070	740263		8.39(3.83-11.48)		2920	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00013 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_010.d

Injection Date: 06-Aug-2018 12:12:35 Instrument ID: A8_N

Lims ID: ICV Full

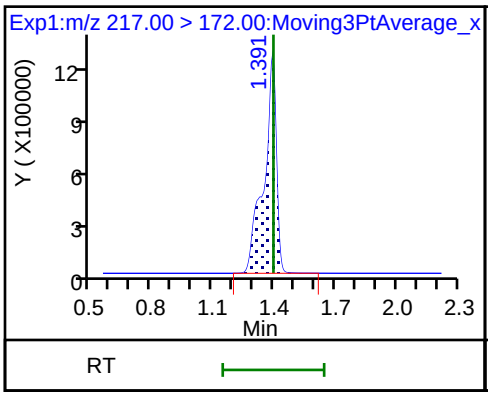
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 17 Worklist Smp#: 10

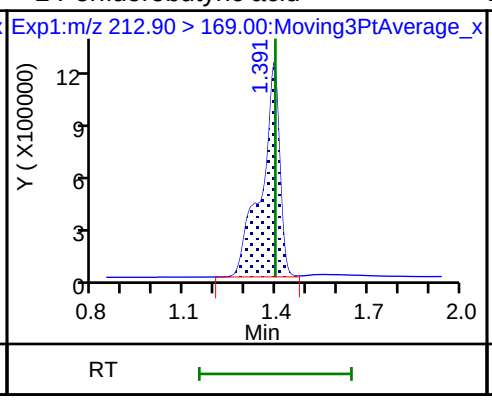
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

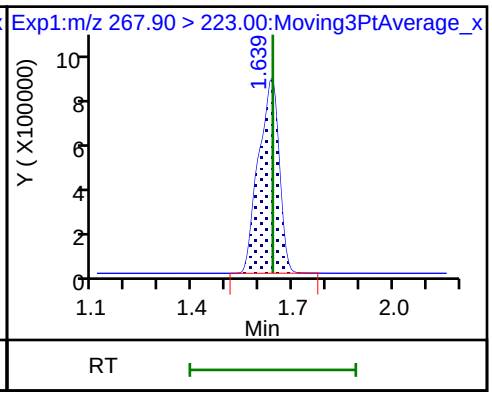
D 1 13C4 PFBA



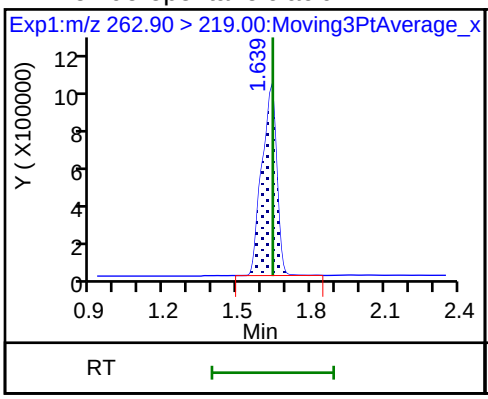
2 Perfluorobutyric acid



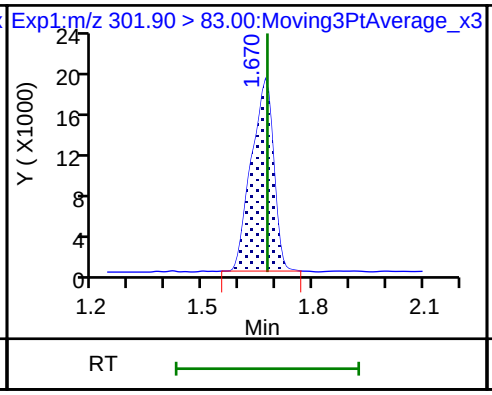
D 3 13C5-PFPeA



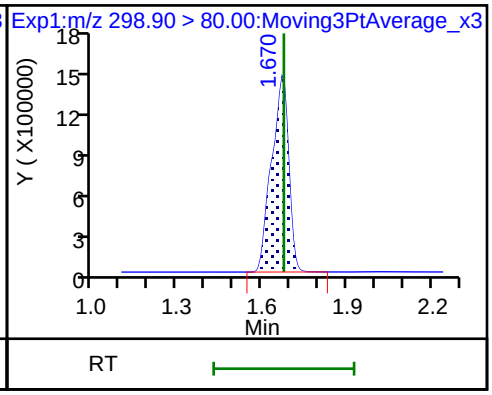
4 Perfluoropentanoic acid



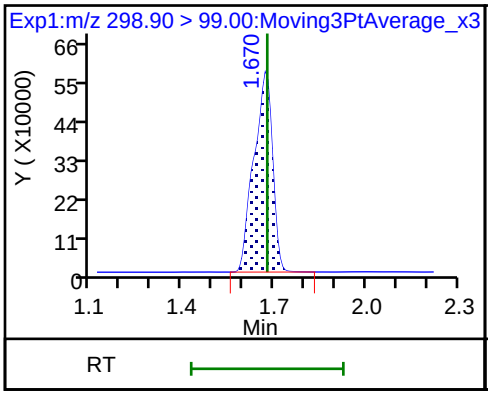
D 47 13C3-PFBS



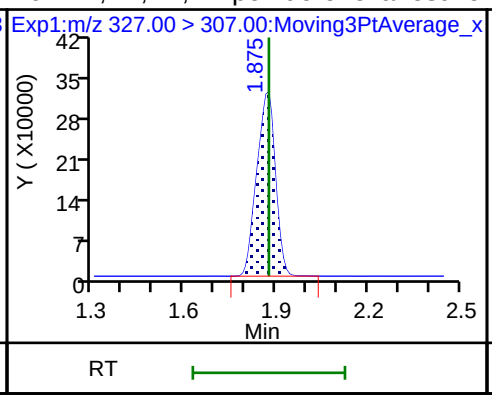
5 Perfluorobutanesulfonic acid



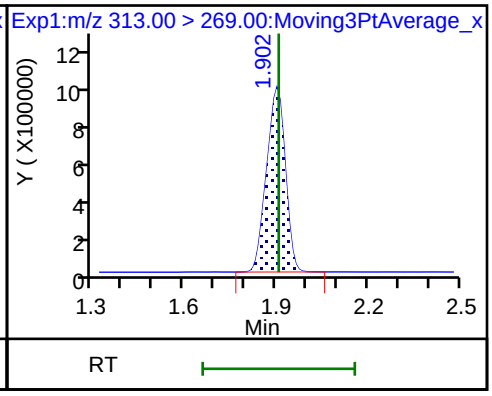
5 Perfluorobutanesulfonic acid



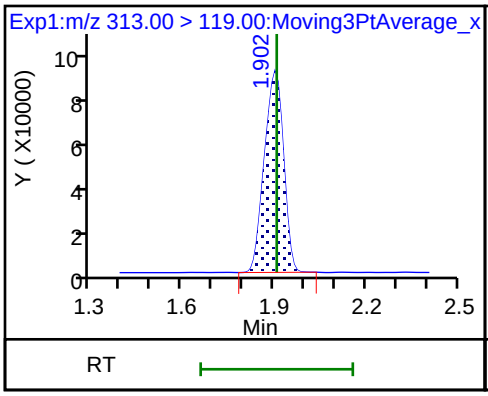
61 1H,1H,2H,2H-perfluorohexanesulfoni



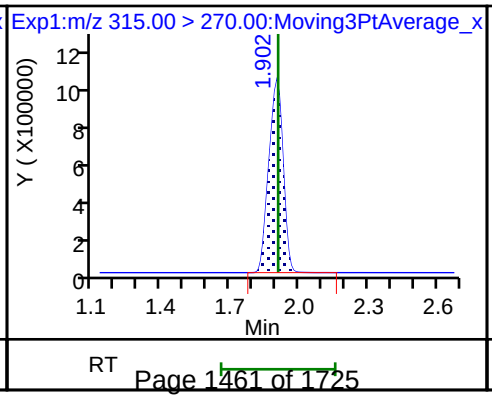
6 Perfluorohexanoic acid



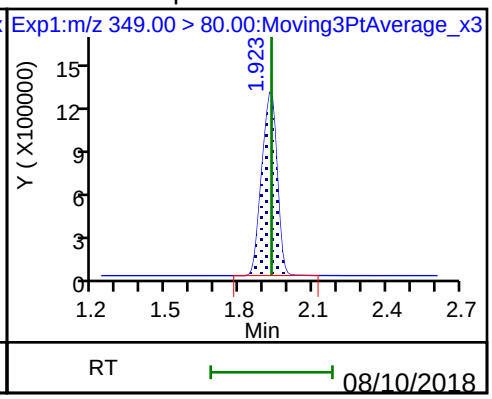
6 Perfluorohexanoic acid



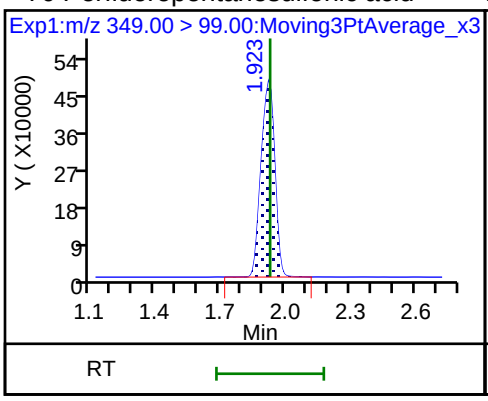
D 7 13C2 PFHxA



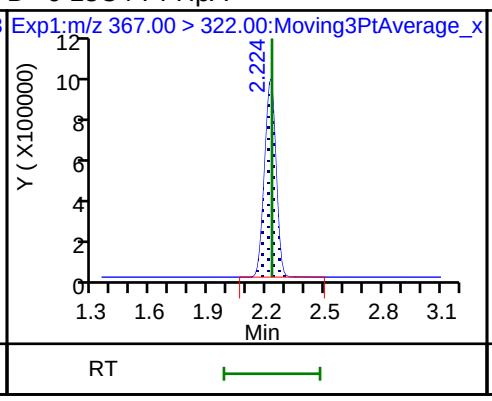
70 Perfluoropentanesulfonic acid



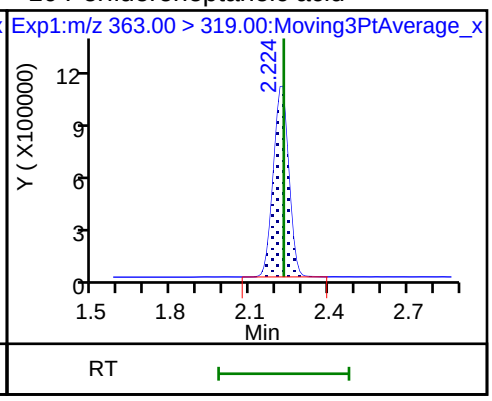
70 Perfluoropentanesulfonic acid



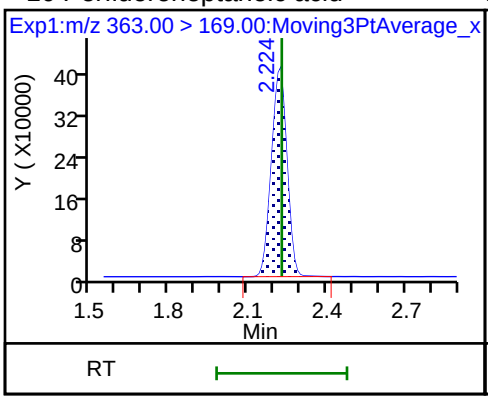
D 9 13C4-PFHpA



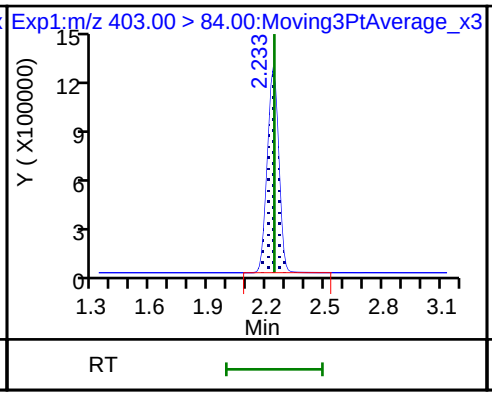
10 Perfluoroheptanoic acid



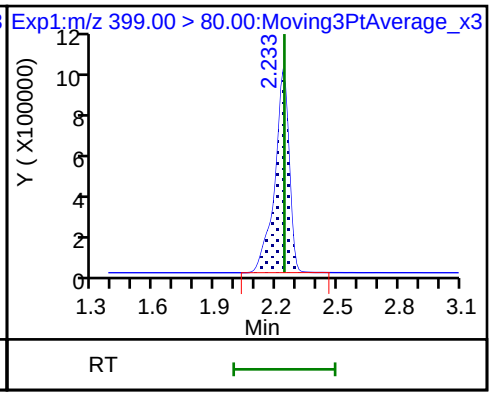
10 Perfluoroheptanoic acid



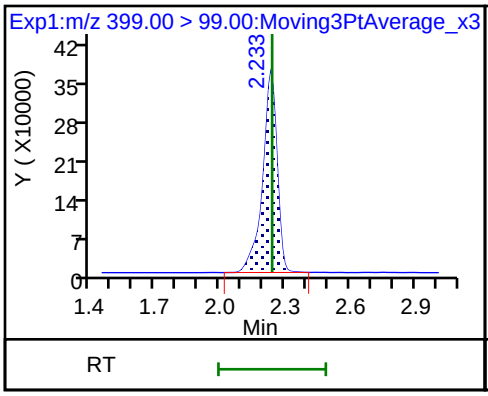
D 11 18O2 PFHxS



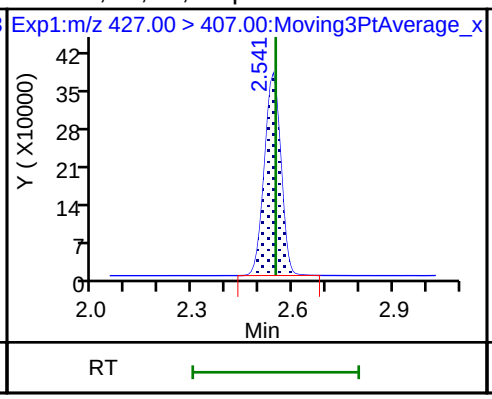
8 Perfluorohexanesulfonic acid



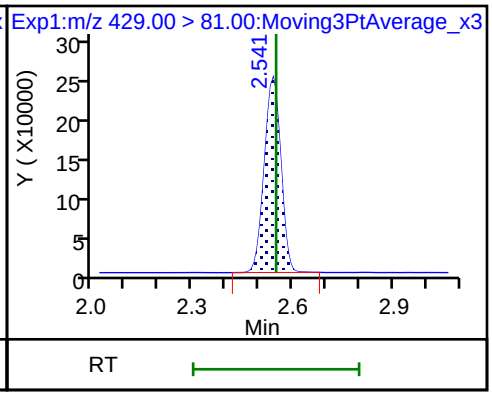
8 Perfluorohexanesulfonic acid



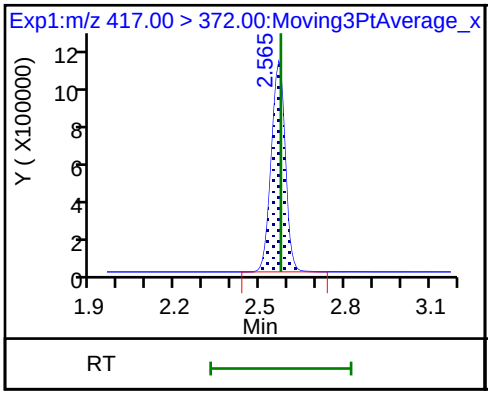
13 1H,1H,2H,2H-perfluorooctanesulfon



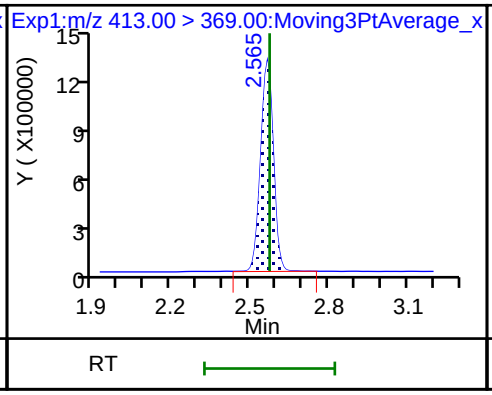
D 12 M2-6:2FTS



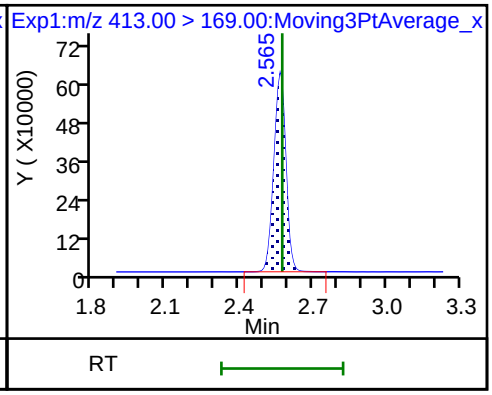
D 14 13C4 PFOA



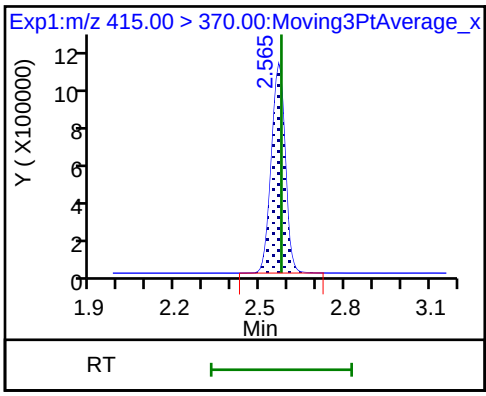
15 Perfluorooctanoic acid



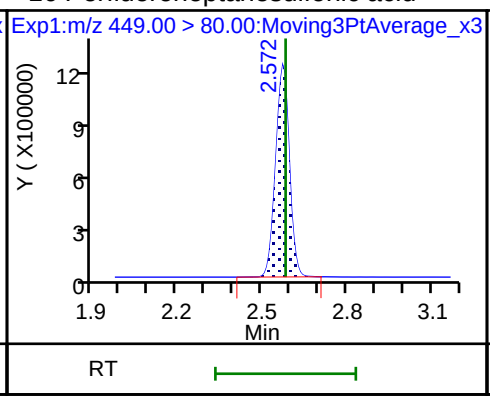
15 Perfluorooctanoic acid



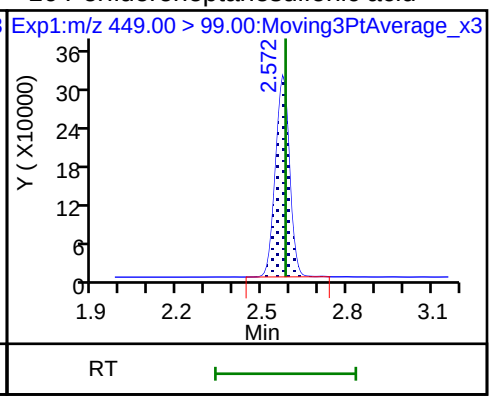
* 62 13C2-PFOA



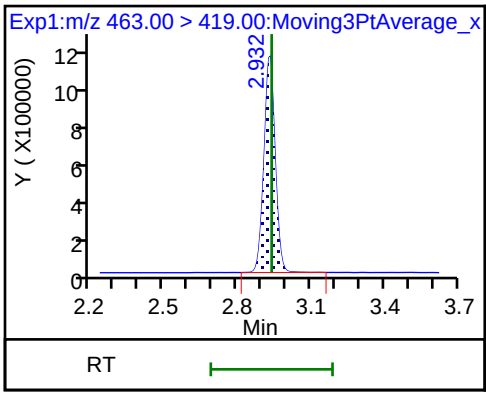
16 Perfluoroheptanesulfonic acid



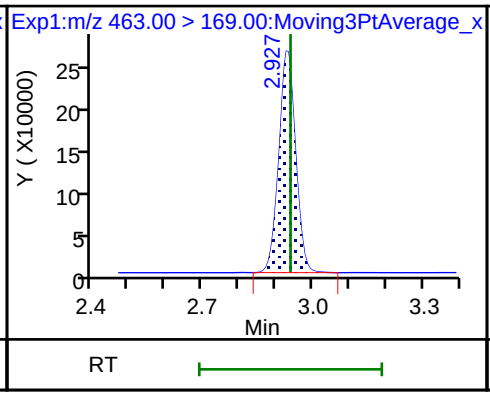
16 Perfluoroheptanesulfonic acid



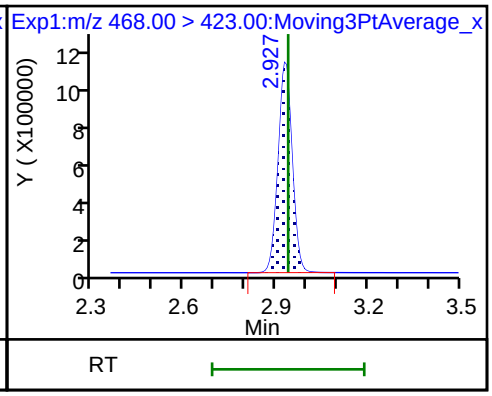
20 Perfluorononanoic acid



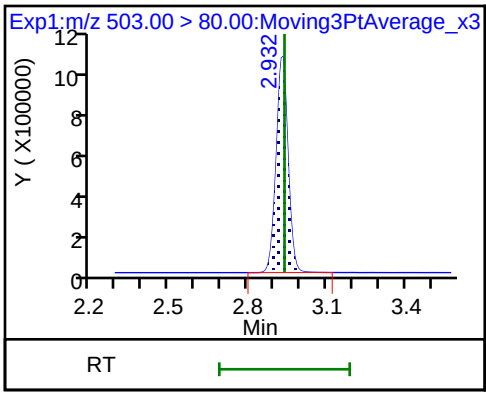
20 Perfluorononanoic acid



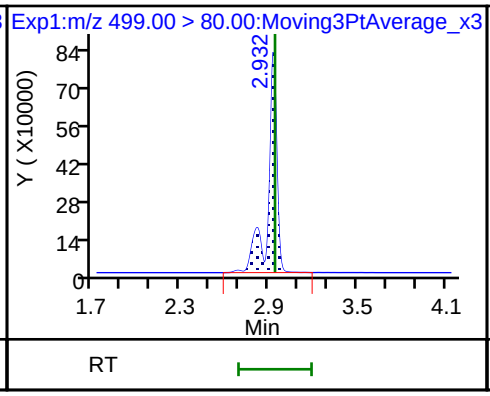
D 19 13C5 PFNA



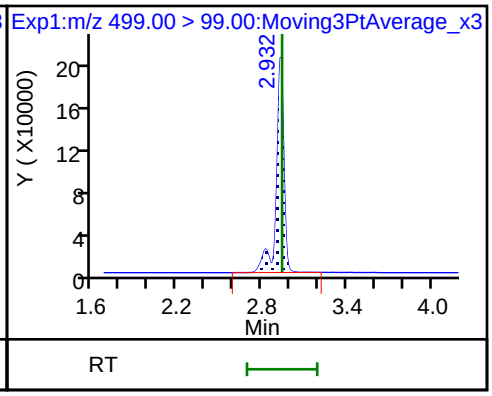
D 18 13C4 PFOS



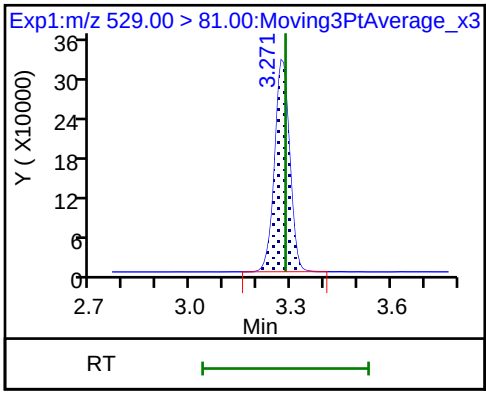
17 Perfluorooctane sulfonic acid



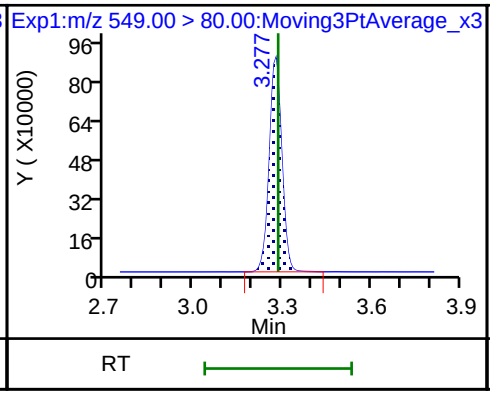
17 Perfluorooctane sulfonic acid



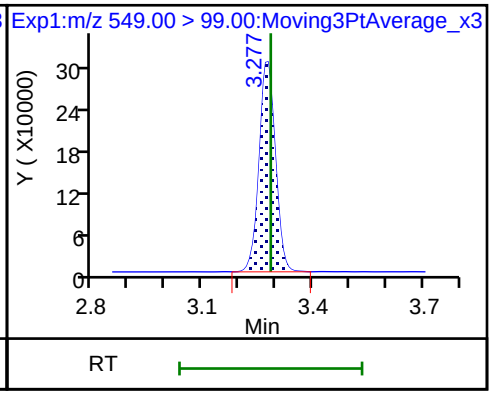
D 26 M2-8:2FTS



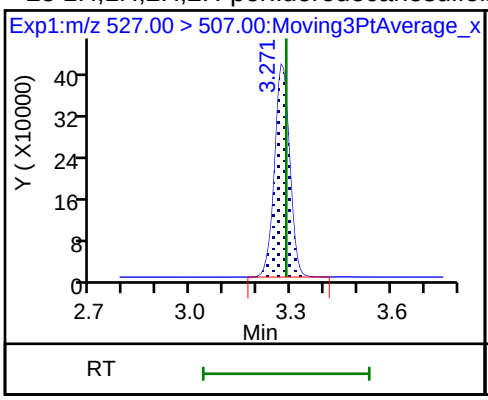
68 Perfluorononanesulfonic acid



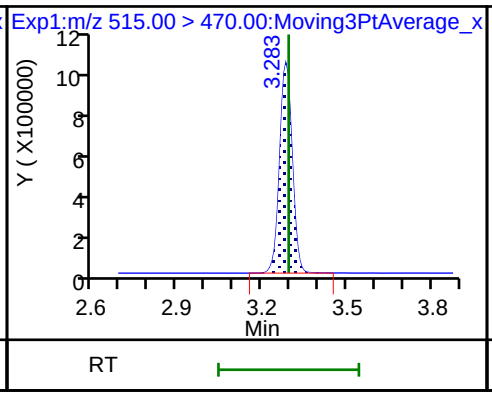
68 Perfluorononanesulfonic acid



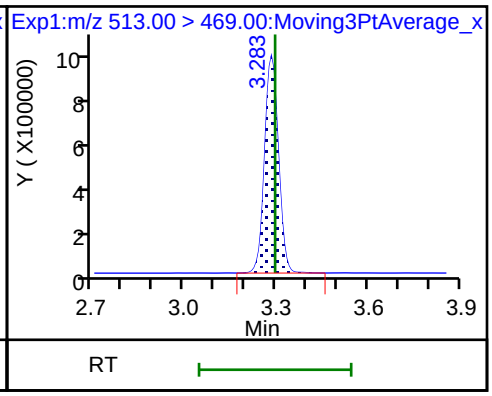
25 1H,1H,2H,2H-perfluorodecanesulfon



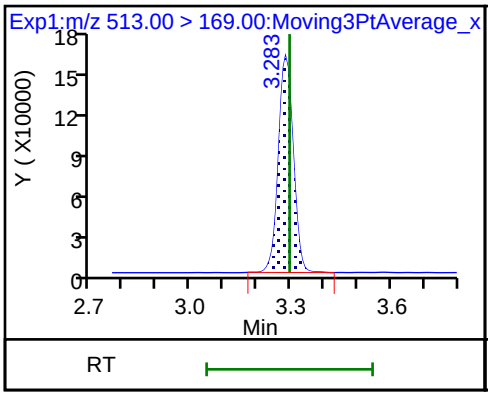
D 23 13C2 PFDA



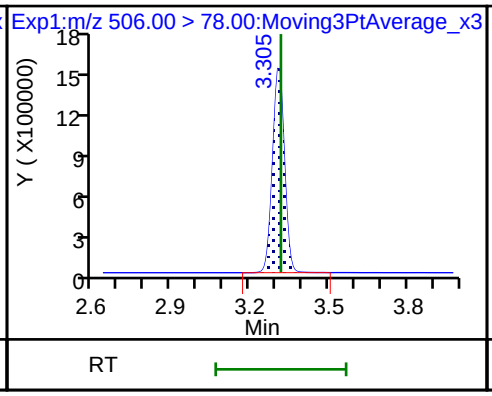
24 Perfluorodecanoic acid



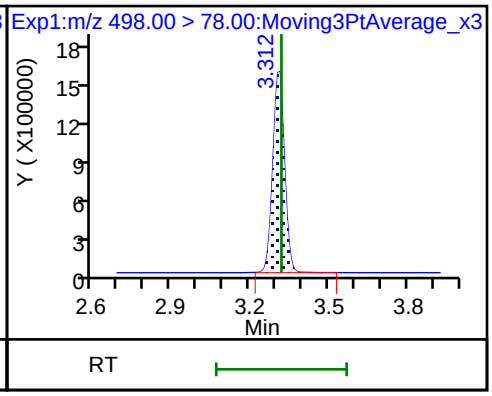
24 Perfluorodecanoic acid



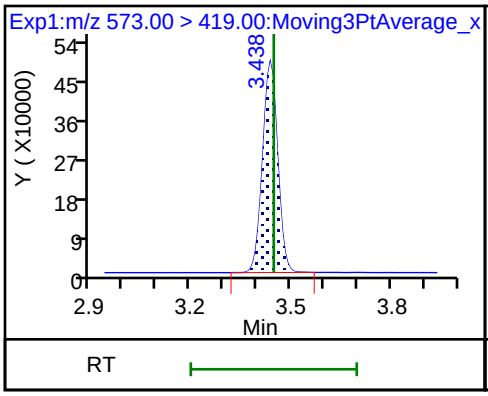
D 21 13C8 FOSA



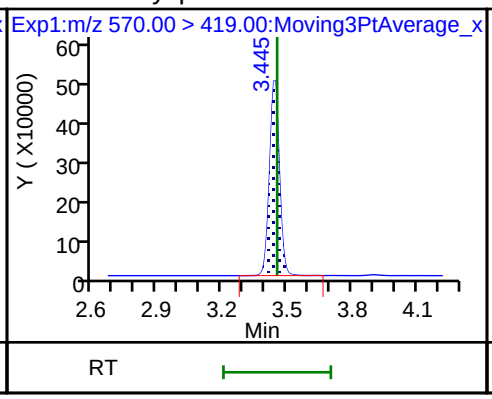
22 Perfluorooctane Sulfonamide



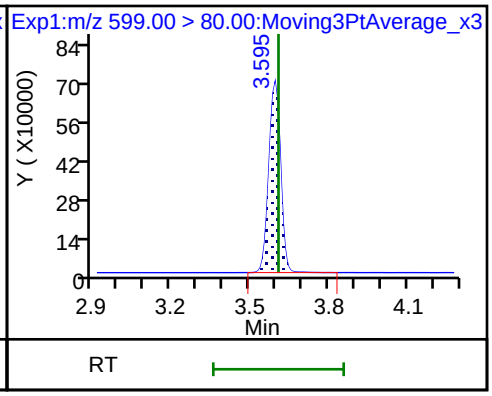
D 27 d3-NMeFOSAA



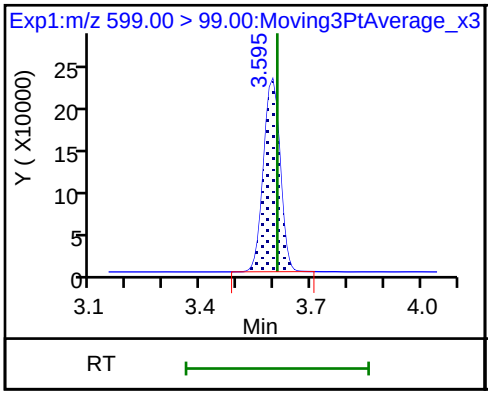
28 N-methyl perfluorooctane sulfonami



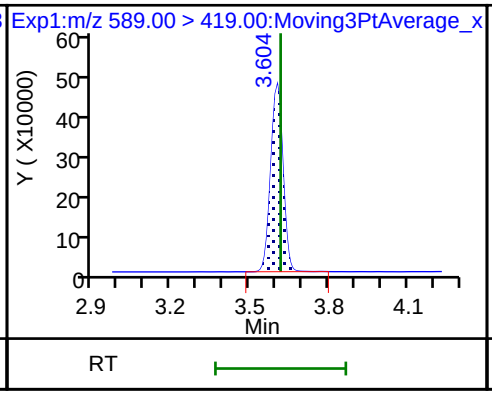
29 Perfluorodecane Sulfonic acid



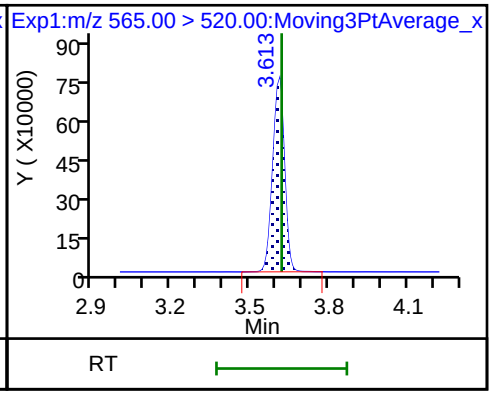
29 Perfluorodecane Sulfonic acid



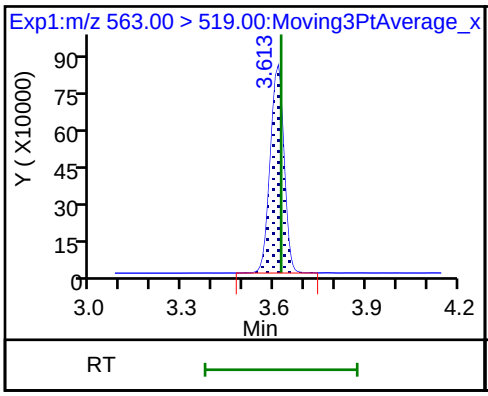
D 32 d5-NEtFOSAA



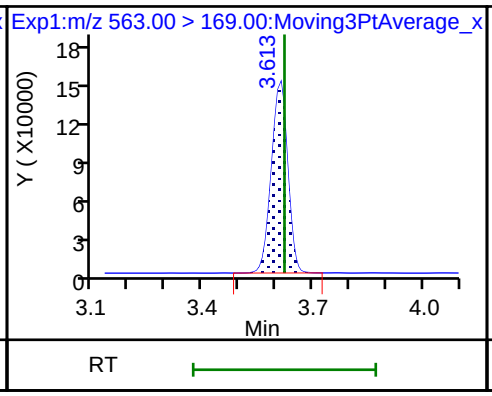
D 30 13C2 PFUnA



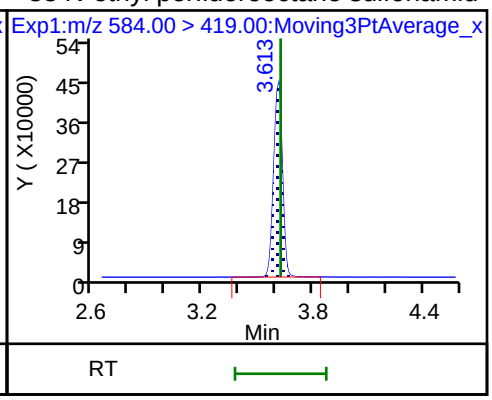
31 Perfluoroundecanoic acid



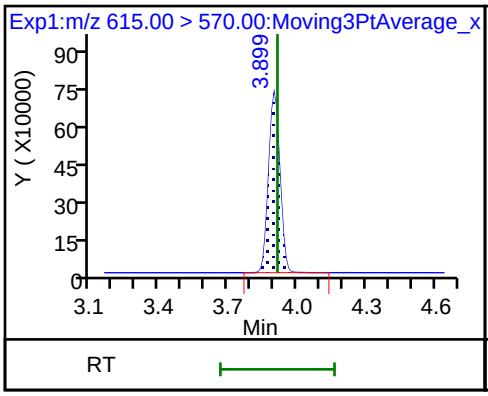
31 Perfluoroundecanoic acid



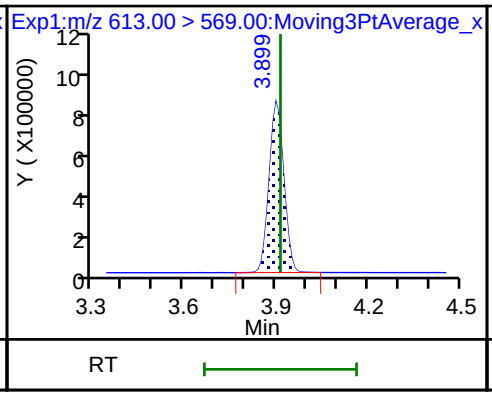
33 N-ethyl perfluorooctane sulfonamid



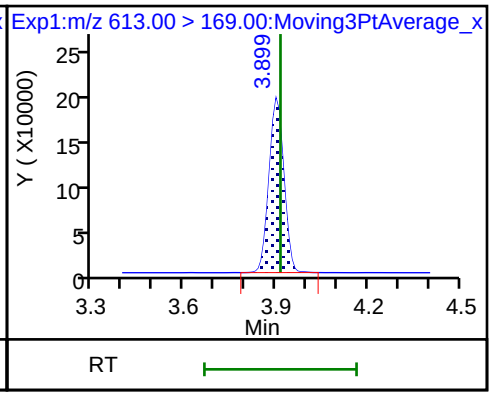
D 36 13C2 PFDoA



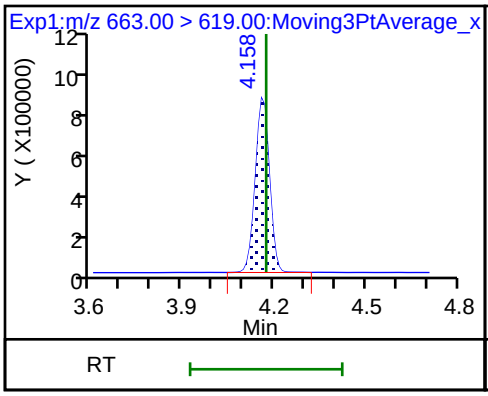
37 Perfluorododecanoic acid



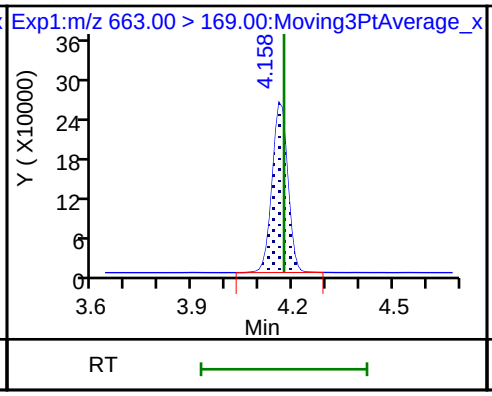
37 Perfluorododecanoic acid



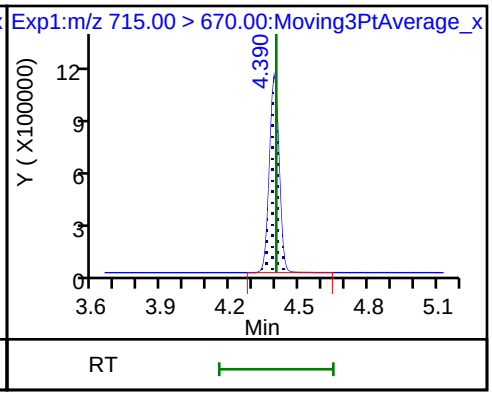
41 Perfluorotridecanoic acid



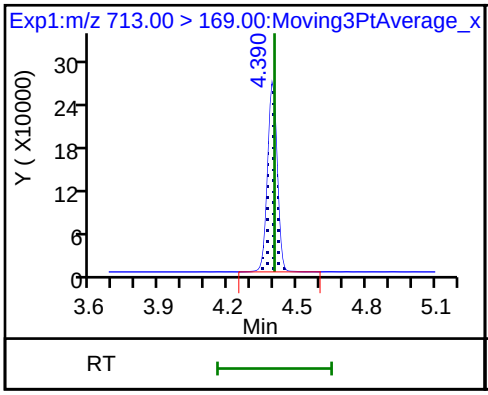
41 Perfluorotridecanoic acid



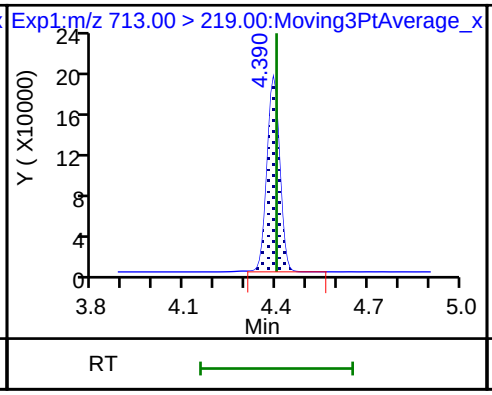
D 43 13C2-PFTeDA



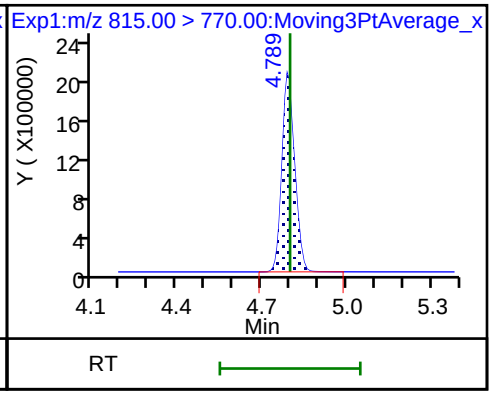
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-238519/2 Calibration Date: 08/07/2018 14:45

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLB_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	1.026		0.0546	0.0500	9.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.197		0.0526	0.0500	5.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	81.42		0.0474	0.0442	7.2	30.0
4:2 FTS	AveID	16.57	18.04		0.400	0.0467	8.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.117		0.0547	0.0500	9.4	30.0
Perfluoropentanesulfonic acid	AveID	68.92	70.51		0.0480	0.0469	2.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.082		0.0510	0.0500	1.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.175		0.0493	0.0455	8.4	30.0
6:2 FTS	AveID	1.573	1.522		0.400	0.0474	-3.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.214		0.0537	0.0501	7.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.166		0.0448	0.0476	-5.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.083		0.0514	0.0500	2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.071		0.0463	0.0464	-0.2	30.0
8:2 FTS	AveID	1.299	1.330		0.400	0.0479	2.4	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7010		0.0447	0.0480	-6.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9655		0.0481	0.0500	-3.8	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9736	1.032		0.0530	0.0500	6.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9759		0.400	0.0500	1.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6109		0.0466	0.0482	-3.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.267		0.0564	0.0500	12.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8051		0.400	0.0500	-9.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.178		0.0529	0.0500	5.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.183		0.0550	0.0500	10.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2668		0.0551	0.0500	10.2	30.0
13C4 PFBA	Ave	1.385	1.335		2.41	2.50	-3.6	30.0
13C5-PFPeA	Ave	0.9537	0.9543		2.50	2.50	0.0	30.0
13C3-PFBS	Ave	0.0221	0.0209		2.20	2.33	-5.5	30.0
13C2 PFHxA	Ave	1.082	1.073		2.48	2.50	-0.8	30.0
13C4-PFHpA	Ave	1.065	1.072		2.52	2.50	0.6	30.0
18O2 PFHxS	Ave	1.366	1.347		2.33	2.37	-1.4	30.0
M2-6:2FTS	Ave	0.2242	0.2291		2.43	2.38	2.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCVL 320-238519/2 Calibration Date: 08/07/2018 14:45

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLB_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9679		2.48	2.50	-1.0	30.0
13C4 PFOS	Ave	0.8973	0.8881		2.37	2.39	-1.0	30.0
13C5 PFNA	Ave	0.8770	0.8720		2.49	2.50	-0.6	30.0
M2-8:2FTS	Ave	0.2707	0.2697		2.39	2.40	-0.4	30.0
13C2 PFDA	Ave	0.7695	0.7862		2.55	2.50	2.2	30.0
13C8 FOSA	Ave	1.188	1.203		2.53	2.50	1.2	30.0
d3-NMeFOSAA	Ave	0.3935	0.3846		2.44	2.50	-2.3	30.0
13C2 PFUnA	Ave	0.6189	0.6324		2.55	2.50	2.2	30.0
d5-NEtFOSAA	Ave	0.4077	0.4154		2.55	2.50	1.9	30.0
13C2 PFDoA	Ave	0.6541	0.6364		2.43	2.50	-2.7	30.0
13C2-PFTeDA	Ave	0.8335	0.8074		2.42	2.50	-3.1	30.0
13C2-PFHxDA	Ave	1.653	1.502		2.27	2.50	-9.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\2018.08.07LLB_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 07-Aug-2018 14:45:30 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 08:32:19 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: phomsophat Date: 07-Aug-2018 20:36:30

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.395	1.396	-0.001	1.000	110373	0.0546		109	9.9	
D 1 13C4 PFBA										
217.00 > 172.00	1.395	1.398	-0.003	0.543	5378175	2.41		96.4	8370	
D 3 13C5-PFPeA										
267.90 > 223.00	1.637	1.643	-0.006	0.638	3843410	2.50		100	7966	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.637	1.646	-0.009	1.000	92007	0.0526		105	5.4	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.677	1.678	-0.001	1.000	120884	0.0474		107	47.9	
298.90 > 99.00	1.677	1.678	-0.001	1.000	51695		2.34(1.25-3.74)		25.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.677	1.684	-0.007	0.653	78099	2.20		94.5	252	
D 60 M2-4:2FTS										
329.00 > 81.00	1.874	1.880	-0.006	0.730	632498	NC			818	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.874	1.880	-0.006	1.117	28294	0.0508		109	295	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.900	1.907	-0.007	1.000	96549	0.0547		109	16.2	
313.00 > 119.00	1.910	1.907	0.003	1.005	7801		12.38(5.03-15.10)		17.5	
D 7 13C2 PFHxA										
315.00 > 270.00	1.900	1.918	-0.018	0.740	4322474	2.48		99.2	8298	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.931	1.928	0.003	1.151	111081	0.0480		102	245	
349.00 > 99.00	1.920	1.928	-0.008	1.145	43157		2.57(1.36-4.07)		43.9	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.994	2.001	-0.007	0.995	16119	NC			6.3	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.004	2.012	-0.008	0.780	327870	NC			905	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.221	2.227	-0.006	1.000	93459	0.0510		102	17.3	
363.00 > 169.00	2.221	2.227	-0.006	1.000	37851		2.47(1.13-3.40)		60.9	
D 9 13C4-PFHpA										
367.00 > 322.00	2.221	2.236	-0.015	0.865	4316892	2.52		101	8234	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.240	2.236	0.004	1.004	116044	0.0493		108	176	
399.00 > 99.00	2.240	2.236	0.004	1.004	40425		2.87(1.50-4.49)		34.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.231	2.247	-0.016	0.869	5132671	2.33		98.6	5939	
65 ADONA										
377.00 > 251.00	2.262	2.269	-0.007	0.773	236708	NC			562	
377.00 > 85.00	2.262	2.269	-0.007	0.773	135269		1.75(0.84-2.53)		221	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.537	2.544	-0.007	1.000	26623	0.0459		96.7	48.0	
D 12 M2-6:2FTS										
429.00 > 81.00	2.537	2.552	-0.015	0.988	876488	2.43		102	2281	
* 62 13C2-PFOA										
415.00 > 370.00	2.568	2.568	0.0		4027471	2.50			8536	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.568	2.568	0.0	1.000	94749	0.0537		107	7.9	
413.00 > 169.00	2.568	2.568	0.0	1.000	50301		1.88(0.84-2.52)		88.3	
D 73 13C8 PFOA										
421.00 > 376.00	2.561	2.574	-0.013	0.997	7710870	NC			8599	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.575	2.574	0.001	0.880	79422	0.0448		94.1	267	
449.00 > 99.00	2.575	2.574	0.001	0.880	21626		3.67(1.94-5.82)		42.3	
D 14 13C4 PFOA										
417.00 > 372.00	2.568	2.581	-0.013	1.000	3898338	2.48		99.0	8206	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.926	2.930	-0.004	1.000	71117	0.0463		99.8	154	
499.00 > 99.00	2.931	2.930	0.001	1.002	18985		3.75(2.31-6.93)		28.6	
20 Perfluorononanoic acid										
463.00 > 419.00	2.926	2.930	-0.004	1.000	76096	0.0514		103	20.7	
463.00 > 169.00	2.926	2.930	-0.004	1.000	17056		4.46(1.90-5.69)		105	
D 19 13C5 PFNA										
468.00 > 423.00	2.926	2.941	-0.015	1.139	3512034	2.49		99.4	7897	
D 72 13C8 PFOS										
507.00 > 99.00	2.926	2.941	-0.015	1.139	1695417	NC			4298	
D 18 13C4 PFOS										
503.00 > 80.00	2.926	2.941	-0.015	1.139	3419546	2.37		99.0	4493	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.137	3.143	-0.006	1.072	109896	NC			395	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.269	3.270	-0.001	1.000	27673	0.0490		102	173	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.275	3.275	0.0	1.119	48144	0.0447		93.2	233	
549.00 > 99.00	3.275	3.275	0.0	1.119	18589		2.59(1.33-3.97)		97.1	
D 26 M2-8:2FTS										
529.00 > 81.00	3.269	3.282	-0.013	1.273	1040561	2.39		99.6	2069	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.282	3.282	0.0	1.000	61142	0.0481		96.2	35.8	
513.00 > 169.00	3.282	3.282	0.0	1.000	12059		5.07(2.36-7.09)		60.8	
D 23 13C2 PFDA										
515.00 > 470.00	3.282	3.296	-0.014	1.278	3166396	2.55		102	6665	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.317	3.318	-0.001	1.002	100034	0.0530		106	675	
D 21 13C8 FOSA										
506.00 > 78.00	3.310	3.318	-0.008	1.289	4844408	2.53		101	5964	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.436	3.436	0.0	1.000	30233	0.0506		101	24.7	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.436	3.451	-0.015	1.338	1549058	2.44		97.7	3212	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.594	3.594	0.0	1.228	42127	0.0466		96.7	206	
599.00 > 99.00	3.594	3.594	0.0	1.228	14870		2.83(1.39-4.16)		107	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.611	3.611	0.0	1.002	26943	0.0451		90.3	136	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.602	3.611	-0.009	1.000	64513	0.0564		113	39.7	R
563.00 > 169.00	3.602	3.611	-0.009	1.000	9423		6.85(2.12-6.36)		44.2	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.602	3.611	-0.009	1.403	1673184	2.55		102	1641	
D 30 13C2 PFUnA										
565.00 > 520.00	3.602	3.618	-0.016	1.403	2546846	2.55		102	5552	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.765	3.765	0.0	1.287	195826	NC			631	
35 MeFOSA										
512.00 > 169.00	3.822	3.823	-0.001		28280	NC			183	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.897	3.898	-0.001	1.000	60389	0.0529		106	30.6	
613.00 > 169.00	3.897	3.898	-0.001	1.000	10939		5.52(2.13-6.40)		63.4	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.897	3.898	-0.001	1.192	19425	NC			375	
D 36 13C2 PFDoA										
615.00 > 570.00	3.897	3.908	-0.011	1.518	2563239	2.43		97.3	4422	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.129	4.138	-0.009	1.411	16657	NC			86.9	
699.00 > 99.00	4.129	4.138	-0.009	1.411	27906		0.60(0.00-0.00)		251	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.148	4.157	-0.009	1.064	60633	0.0550		110	27.2	
663.00 > 169.00	4.158	4.157	0.001	1.067	18335		3.31(1.25-3.76)		153	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.382	4.390	-0.008	1.000	17351	0.0551		110	177	
713.00 > 219.00	4.382	4.390	-0.008	1.000	12636		1.37(0.71-2.13)		192	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.382	4.397	-0.015	1.706	3251854	2.42		96.9	5691	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.781	4.789	-0.008	1.000	155566	NC			70.8	
813.00 > 169.00	4.781	4.789	-0.008	1.000	25844		6.02(2.86-8.58)		308	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.781	4.796	-0.015	1.862	6048034	2.27		90.8	6587	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.118	5.119	-0.001	1.071	116355	NC			58.4	
913.00 > 169.00	5.111	5.119	-0.008	1.069	15104		7.70(3.83-11.48)		255	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 08-Aug-2018 08:32:20 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\2018.08.07LLB_005.d

Injection Date: 07-Aug-2018 14:45:30 Instrument ID: A8_N

Lims ID: CCVL

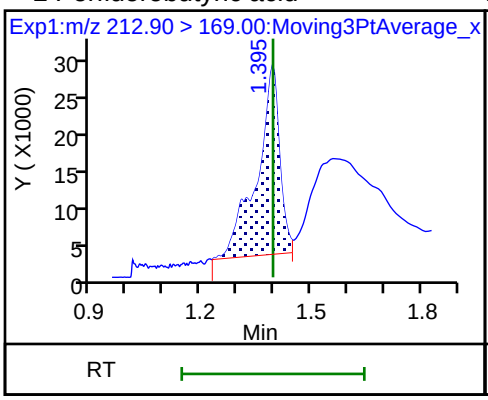
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2

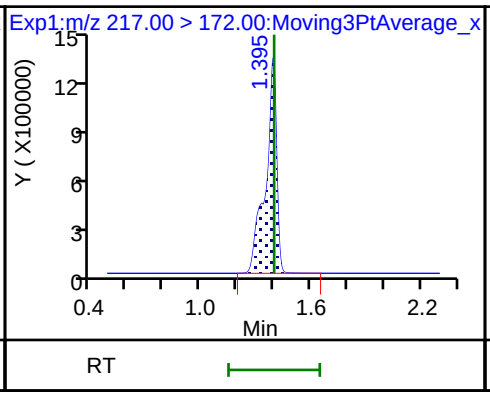
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

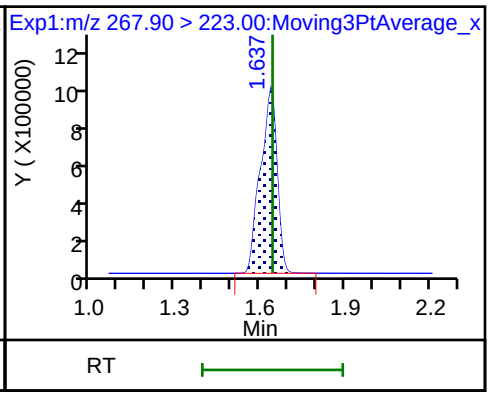
2 Perfluorobutyric acid



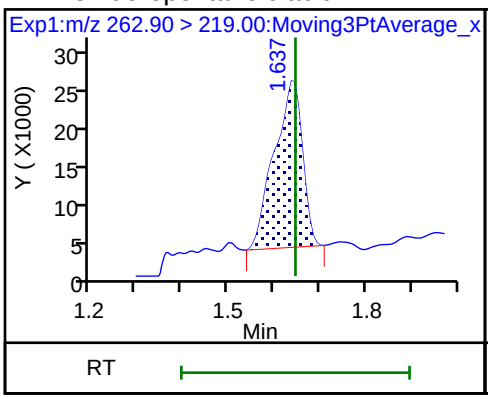
D 1 13C4 PFBA



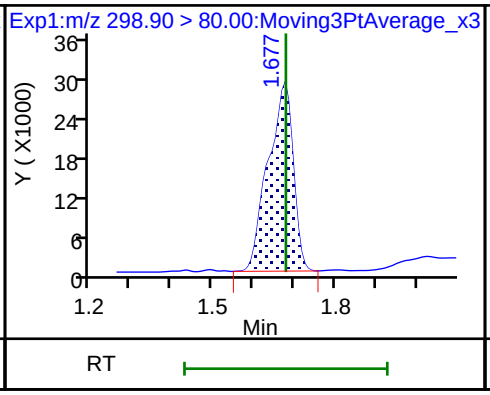
D 3 13C5-PFPeA



4 Perfluoropentanoic acid



5 Perfluorobutanesulfonic acid



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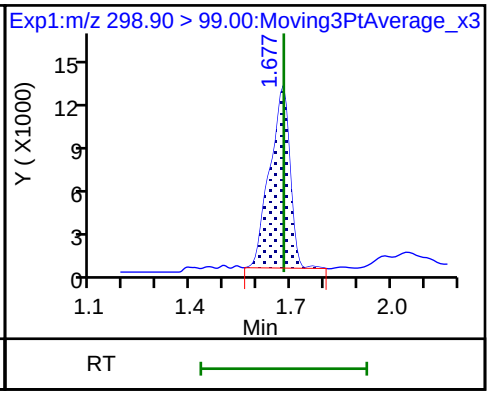
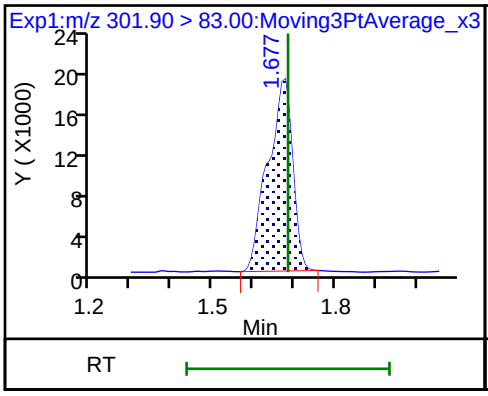
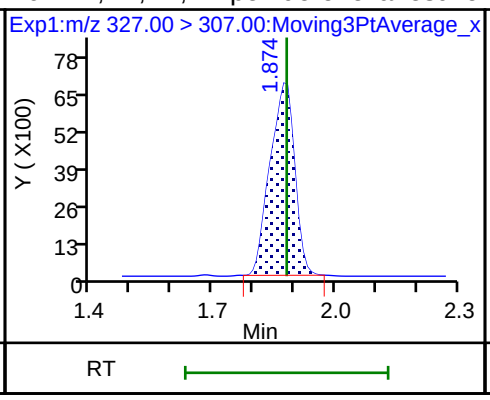


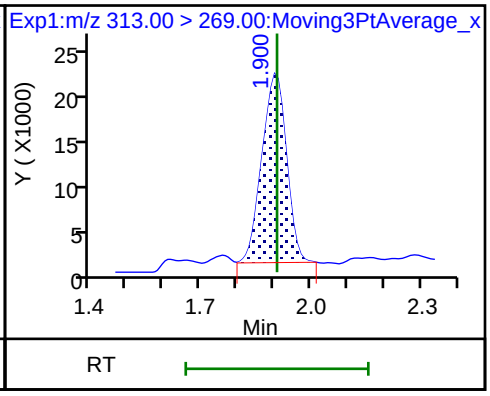
D 47 13C3-PFBS



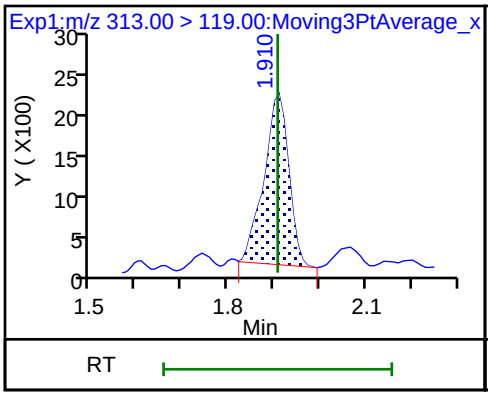
61 1H,1H,2H,2H-perfluorohexanesulfoni



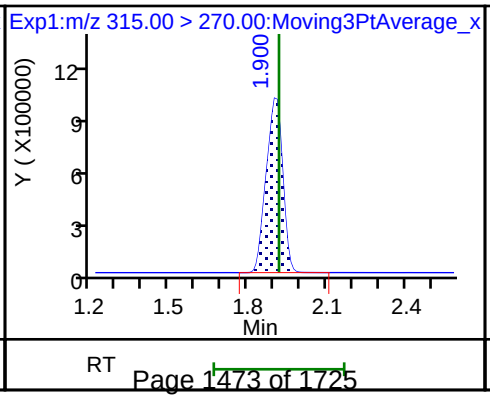
6 Perfluorohexanoic acid



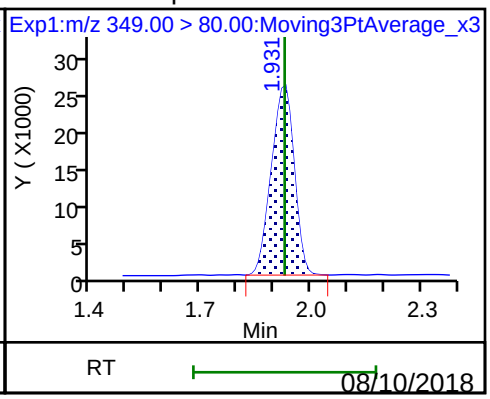
6 Perfluorohexanoic acid



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid



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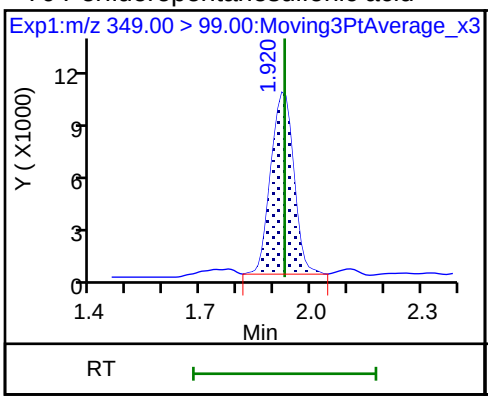
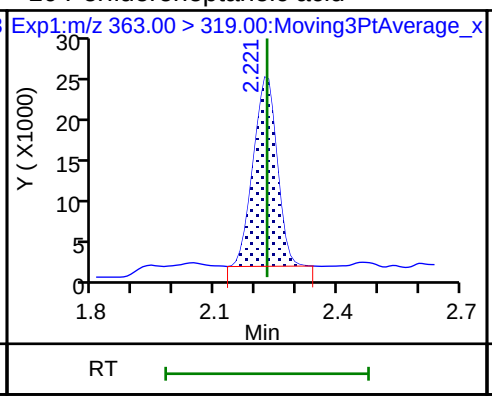


10 Perfluoroheptanoic acid



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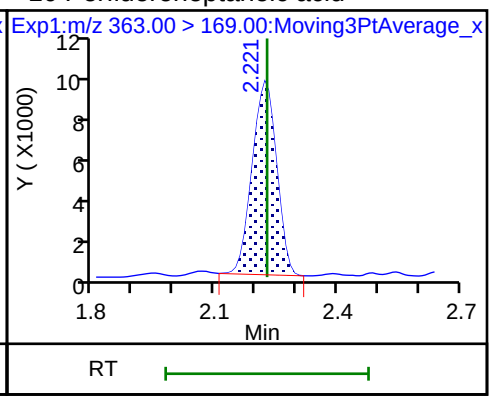
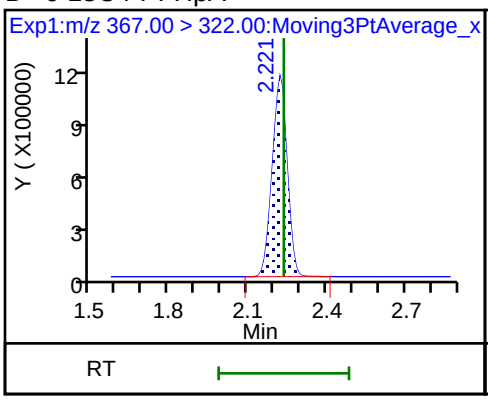
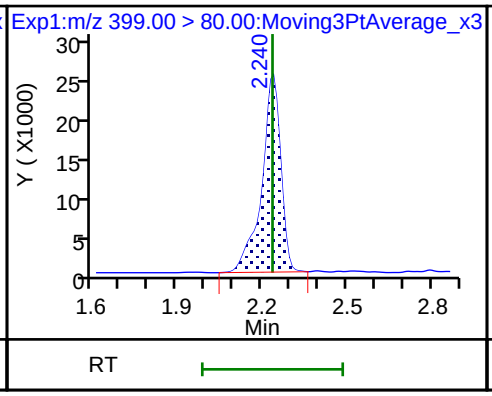


D 9 13C4-PFHpA



8 Perfluorohexanesulfonic acid



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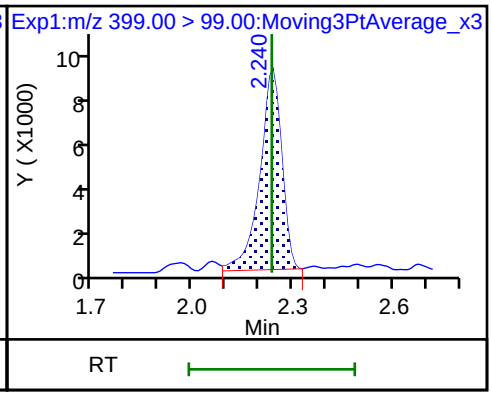
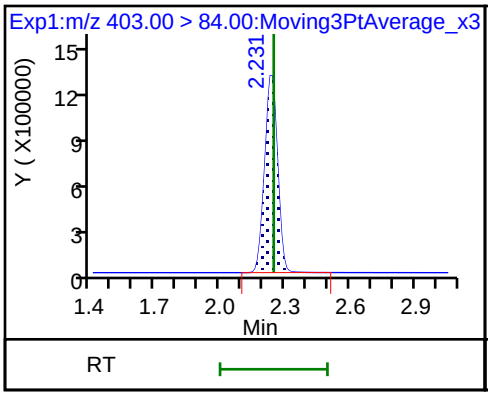
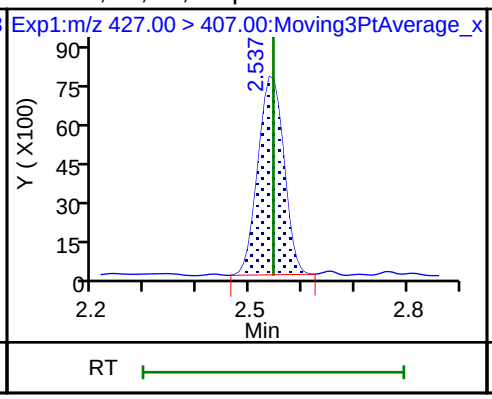


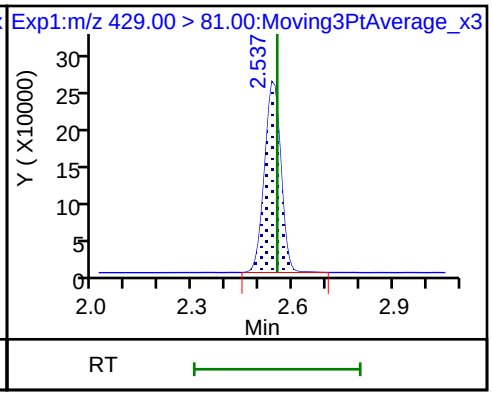
D 11 18O2 PFHxS



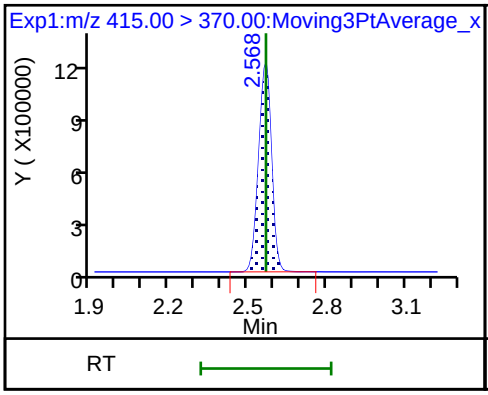
13 1H,1H,2H,2H-perfluorooctanesulfon



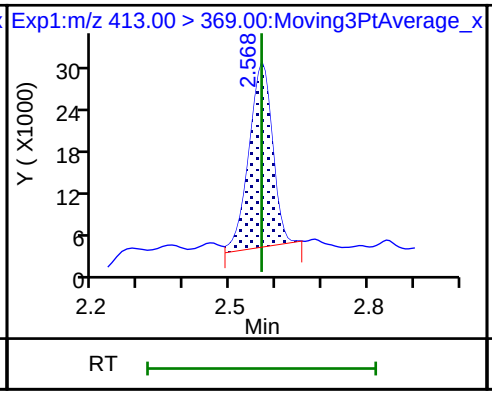
D 12 M2-6:2FTS



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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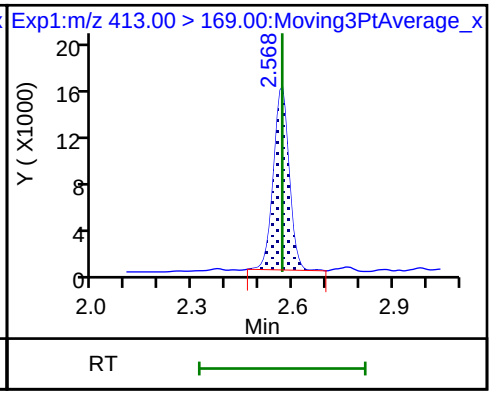
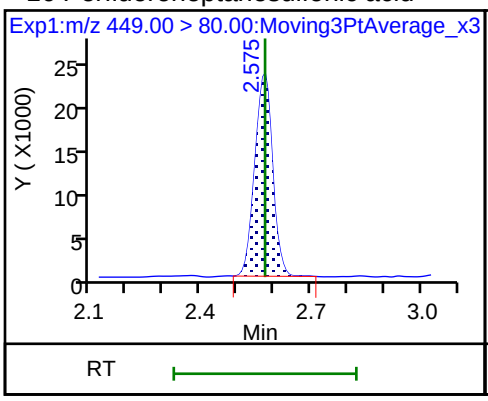
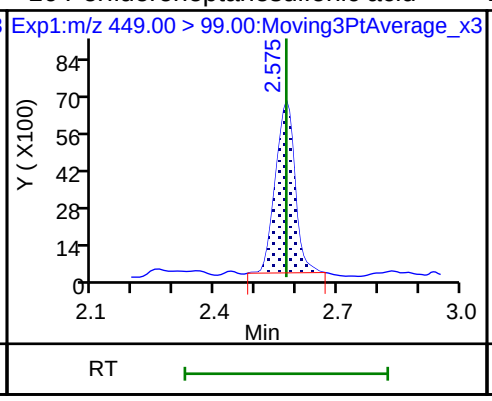


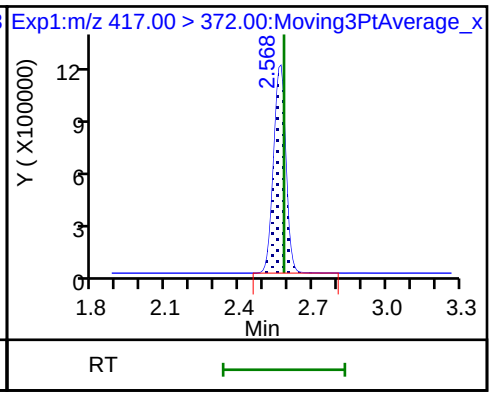
16 Perfluoroheptanesulfonic acid



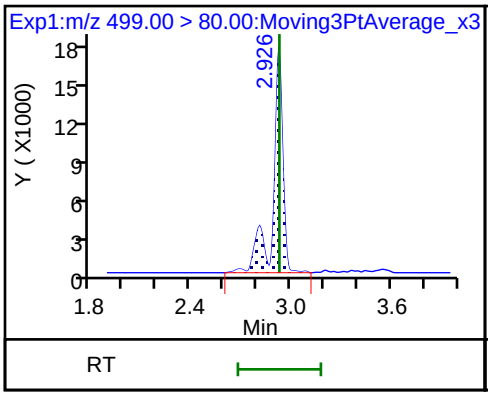
16 Perfluoroheptanesulfonic acid



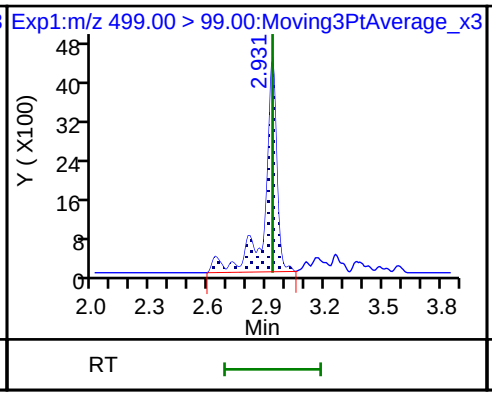
D 14 13C4 PFOA



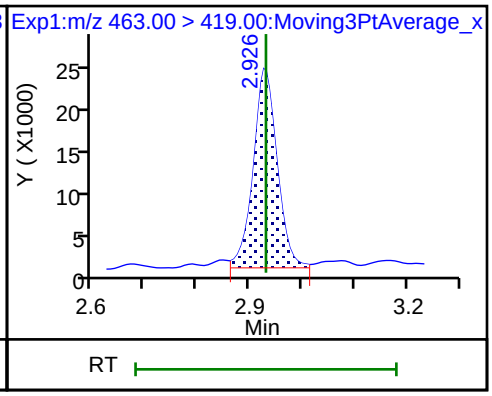
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



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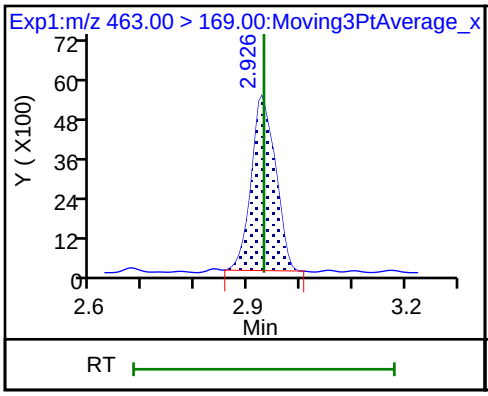
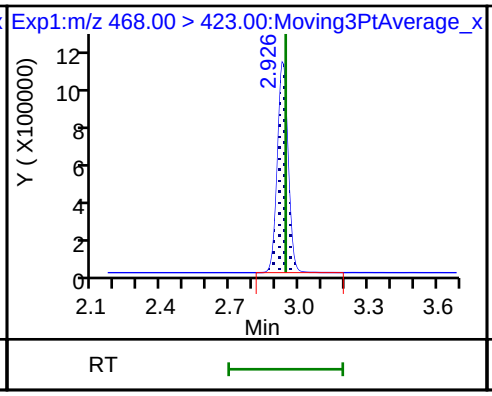
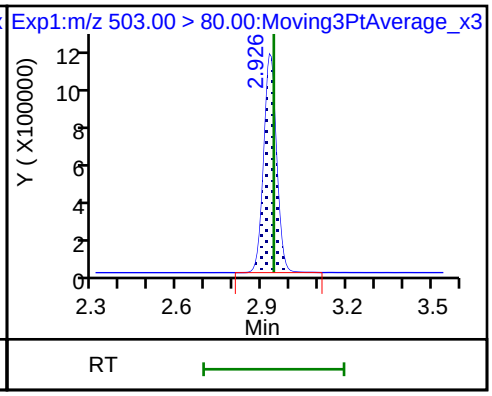


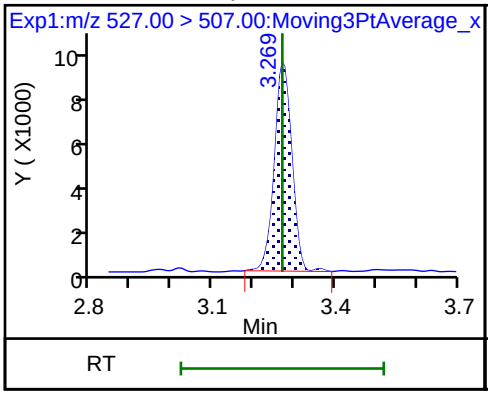
D 19 13C5 PFNA



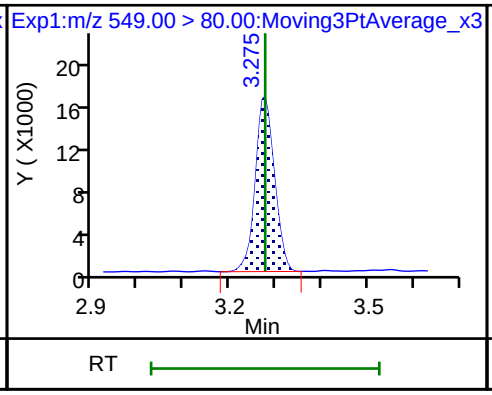
D 18 13C4 PFOS



25 1H,1H,2H,2H-perfluorodecanesulfoni



68 Perfluorononanesulfonic acid



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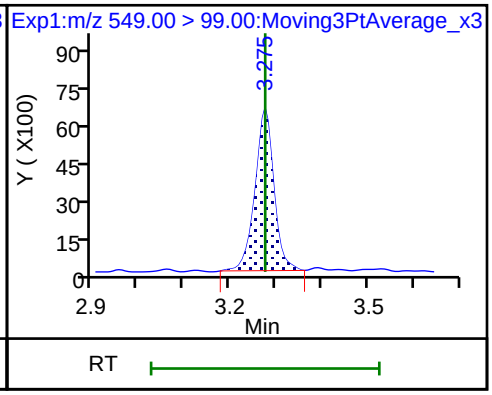
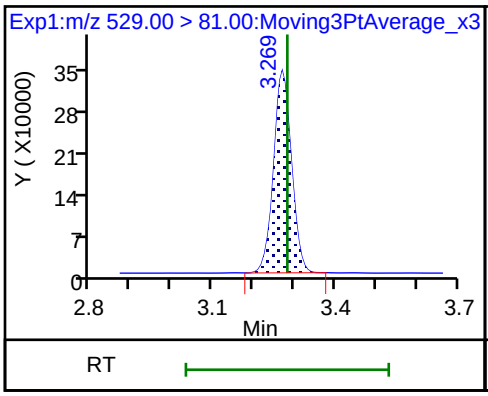
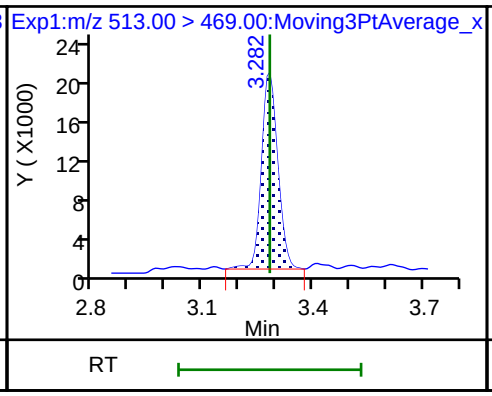


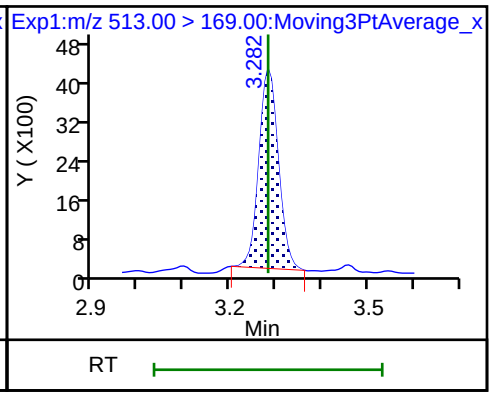
D 26 M2-8:2FTS



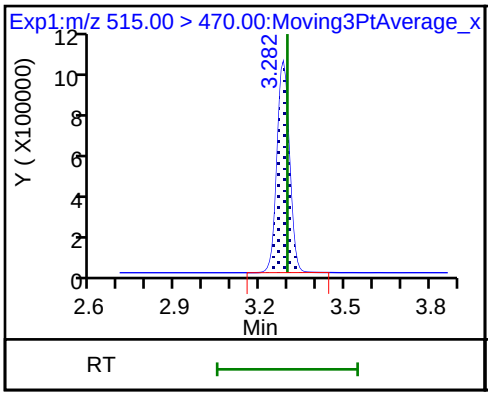
24 Perfluorodecanoic acid



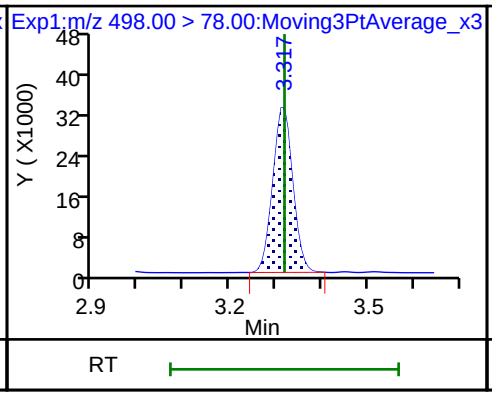
24 Perfluorodecanoic acid



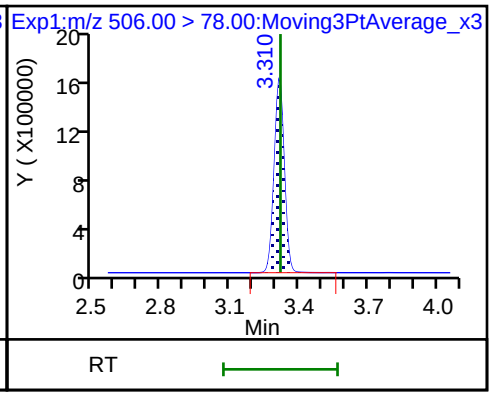
D 23 13C2 PFDA



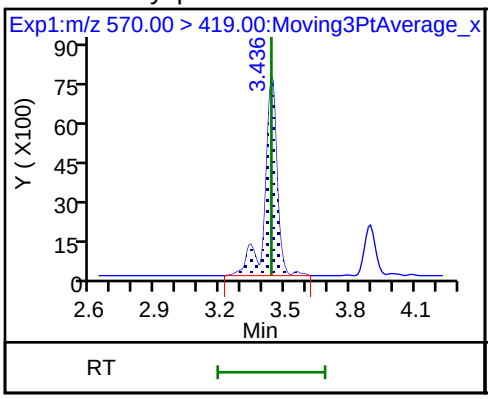
22 Perfluorooctane Sulfonamide



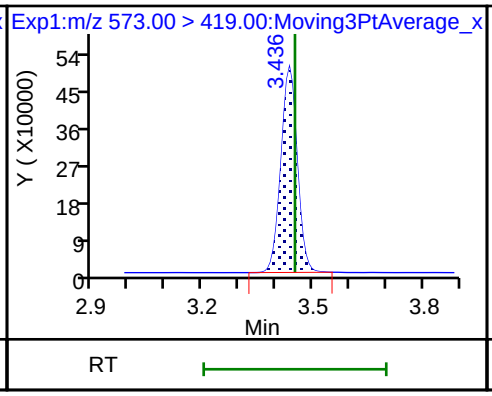
D 21 13C8 FOSA



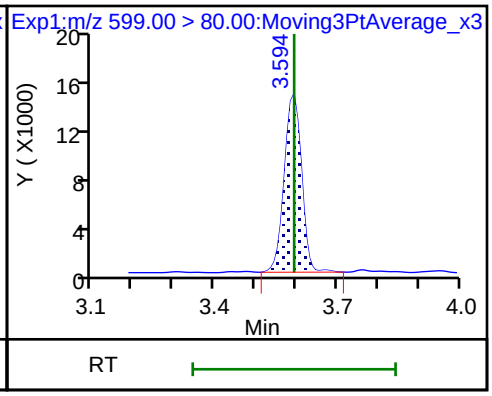
28 N-methyl perfluorooctane sulfonami



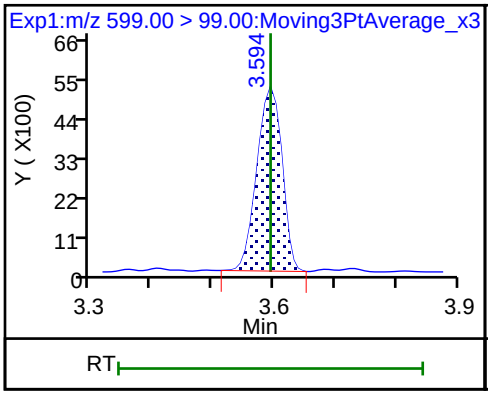
D 27 d3-NMeFOSAA



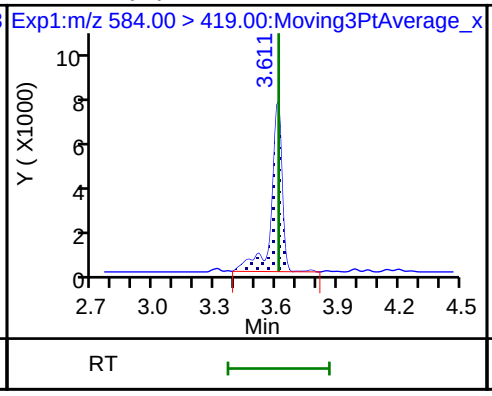
29 Perfluorodecane Sulfonic acid



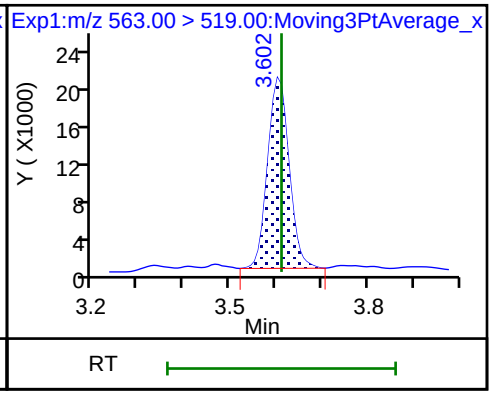
29 Perfluorodecane Sulfonic acid



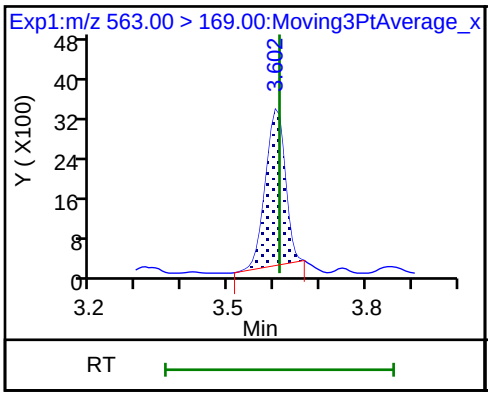
33 N-ethyl perfluorooctane sulfonamid



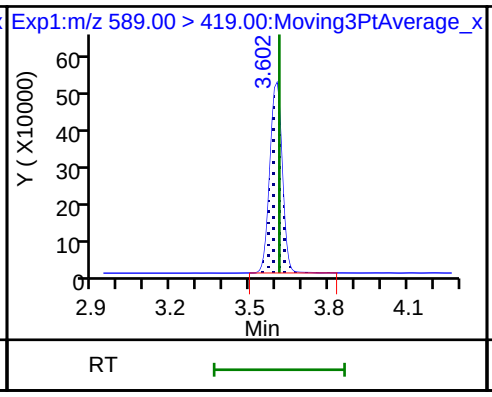
31 Perfluoroundecanoic acid



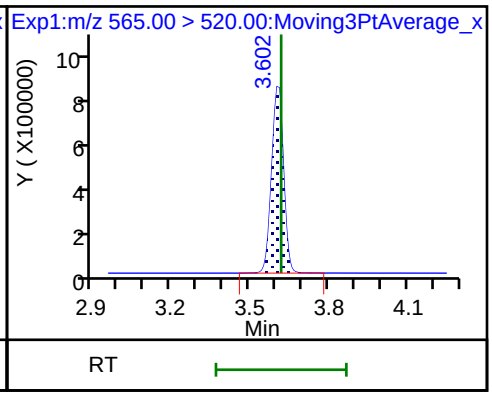
31 Perfluoroundecanoic acid



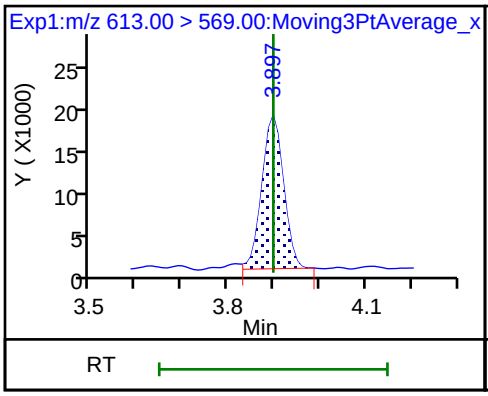
D 32 d5-NEtFOSAA



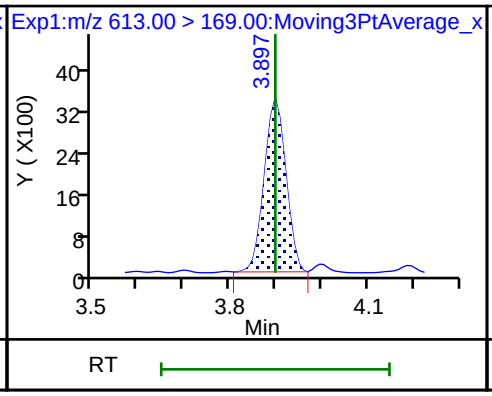
D 30 13C2 PFUnA



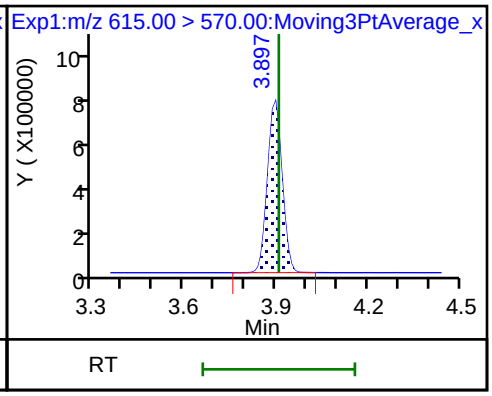
37 Perfluorododecanoic acid



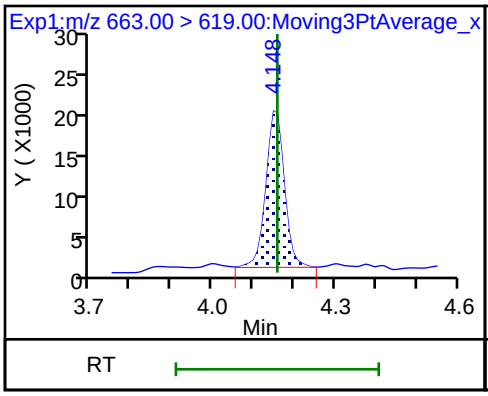
37 Perfluorododecanoic acid



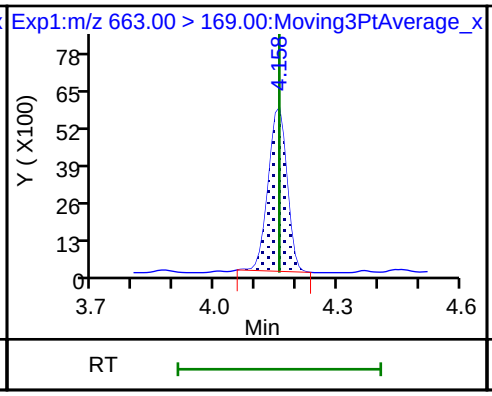
D 36 13C2 PFDoA



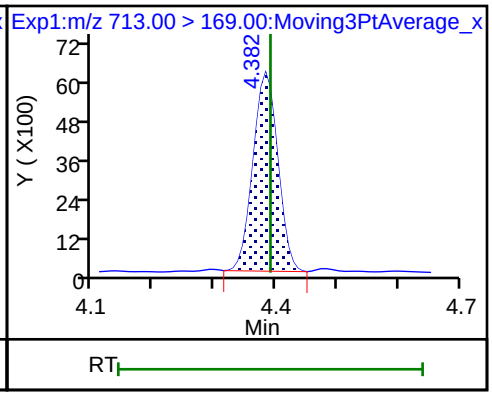
41 Perfluorotridecanoic acid



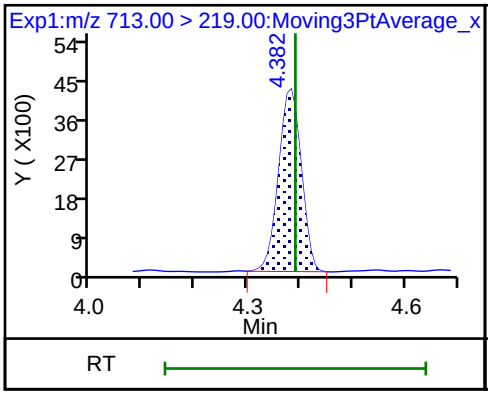
41 Perfluorotridecanoic acid



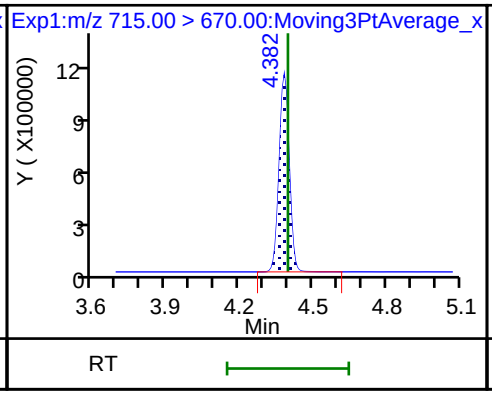
42 Perfluorotetradecanoic acid



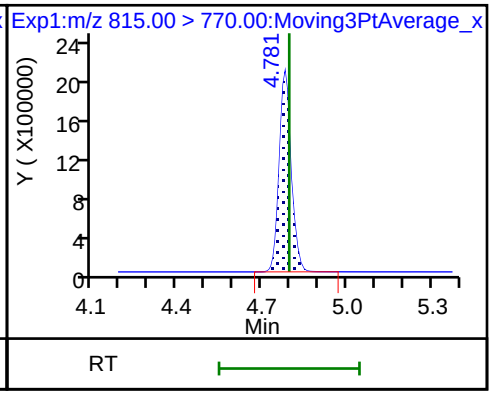
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238519/3 Calibration Date: 08/07/2018 14:53

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLB_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9093		0.968	1.00	-3.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.094		0.962	1.00	-3.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	74.33		0.865	0.884	-2.1	30.0
4:2 FTS	AveID	16.57	15.69		0.885	0.934	-5.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9449		0.926	1.00	-7.4	30.0
Perfluoropentanesulfonic acid	AveID	68.92	66.46		0.904	0.938	-3.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.069		1.01	1.00	0.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	0.9773		0.820	0.910	-9.8	30.0
6:2 FTS	AveID	1.573	1.491		0.898	0.948	-5.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.079		0.955	1.00	-4.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.235		0.949	0.952	-0.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.044		0.991	1.00	-0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.055		0.912	0.928	-1.7	30.0
8:2 FTS	AveID	1.299	1.239		0.914	0.958	-4.6	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7591		0.969	0.960	0.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.019		1.02	1.00	1.6	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9736	0.9617		0.988	1.00	-1.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9446		0.979	1.00	-2.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6475		0.988	0.964	2.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8160		0.915	1.00	-8.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.073		0.955	1.00	-4.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.055		0.948	1.00	-5.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.080		1.00	1.00	0.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2281		0.943	1.00	-5.7	30.0
13C4 PFBA	Ave	1.385	1.349		2.44	2.50	-2.6	30.0
13C5-PFPeA	Ave	0.9537	0.9546		2.50	2.50	0.1	30.0
13C3-PFBS	Ave	0.0221	0.0232		2.44	2.33	5.0	30.0
13C2 PFHxA	Ave	1.082	1.116		2.58	2.50	3.1	30.0
13C4-PFHpA	Ave	1.065	1.081		2.54	2.50	1.5	30.0
18O2 PFHxS	Ave	1.366	1.399		2.42	2.37	2.4	30.0
M2-6:2FTS	Ave	0.2242	0.2331		2.47	2.38	4.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238519/3 Calibration Date: 08/07/2018 14:53

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLB_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.997		2.55	2.50	2.0	30.0
13C4 PFOS	Ave	0.8973	0.9052		2.41	2.39	0.9	30.0
13C5 PFNA	Ave	0.8770	0.8795		2.51	2.50	0.3	30.0
M2-8:2FTS	Ave	0.2707	0.2788		2.47	2.40	3.0	30.0
13C2 PFDA	Ave	0.7695	0.7893		2.56	2.50	2.6	30.0
13C8 FOSA	Ave	1.188	1.194		2.51	2.50	0.5	30.0
d3-NMeFOSAA	Ave	0.3935	0.3950		2.51	2.50	0.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.4180		2.56	2.50	2.5	30.0
13C2 PFUnA	Ave	0.6189	0.6312		2.55	2.50	2.0	30.0
13C2 PFDoA	Ave	0.6541	0.6549		2.50	2.50	0.1	30.0
13C2-PFTeDA	Ave	0.8335	0.8354		2.51	2.50	0.2	30.0
13C2-PFHxDA	Ave	1.653	1.499		2.27	2.50	-9.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\2018.08.07LLB_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 07-Aug-2018 14:53:15 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 08:32:24 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: phomsophat Date: 07-Aug-2018 20:36:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.396	1.396	0.0	1.000	1970752	0.9685		96.8	170	
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.398	-0.002	0.544	5418413	2.44		97.4	7041	
D 3 13C5-PFPeA										
267.90 > 223.00	1.639	1.643	-0.004	0.638	3832838	2.50		100	8859	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.646	1.646	0.0	1.004	1677385	0.9616		96.2	96.6	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.678	1.678	0.0	1.000	2444344	0.8650		97.9	881	
298.90 > 99.00	1.678	1.678	0.0	1.000	1012142		2.42(1.25-3.74)		515	
D 47 13C3-PFBS										
301.90 > 83.00	1.678	1.684	-0.006	0.654	86494	2.44		105	313	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.880	-0.008	0.729	603827	NC			845	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.880	1.880	0.0	1.120	545240	0.8845		94.7	4760	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.907	0.0	1.000	1693458	0.9258		92.6	297	
313.00 > 119.00	1.907	1.907	0.0	1.000	158724		10.67(5.03-15.10)		309	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.918	-0.011	0.743	4480499	2.58		103	9790	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.928	0.0	1.149	2319119	0.9045		96.4	3153	
349.00 > 99.00	1.928	1.928	0.0	1.149	871350		2.66(1.36-4.07)		770	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.001	2.001	0.0	1.000	305413	NC			123	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.012	-0.011	0.779	318532	NC			773	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.227	0.0	1.000	1856132	1.01		101	361	
363.00 > 169.00	2.227	2.227	0.0	1.000	707031		2.63(1.13-3.40)		996	
D 9 13C4-PFHpA										
367.00 > 322.00	2.227	2.236	-0.009	0.867	4339225	2.54		101	10314	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.236	0.0	1.000	1997583	0.8204		90.2	1651	
399.00 > 99.00	2.236	2.236	0.0	1.000	679705		2.94(1.50-4.49)		490	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.247	-0.011	0.871	5312086	2.42		102	5156	
65 ADONA										
377.00 > 251.00	2.269	2.269	0.0	0.774	4919722	NC			6231	
377.00 > 85.00	2.269	2.269	0.0	0.774	2953738		1.67(0.84-2.53)		3434	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.544	0.0	1.000	529072	0.8984		94.8	726	
D 12 M2-6:2FTS										
429.00 > 81.00	2.544	2.552	-0.008	0.991	888964	2.47		104	1821	
* 62 13C2-PFOA										
415.00 > 370.00	2.568	2.568	0.0		4015152	2.50			5959	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.568	2.568	0.0	1.000	1728983	0.9550		95.4	156	
413.00 > 169.00	2.568	2.568	0.0	1.000	898213		1.92(0.84-2.52)		980	
D 73 13C8 PFOA										
421.00 > 376.00	2.561	2.574	-0.013	0.997	7512058	NC			11696	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.574	2.574	0.0	0.879	1709165	0.9489		99.7	2590	
449.00 > 99.00	2.574	2.574	0.0	0.879	456451		3.74(1.94-5.82)		927	
D 14 13C4 PFOA										
417.00 > 372.00	2.568	2.581	-0.013	1.000	4003110	2.55		102	6853	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.930	2.930	0.0	1.000	1423669	0.9121		98.3	1809	
499.00 > 99.00	2.930	2.930	0.0	1.000	326606		4.36(2.31-6.93)		628	
20 Perfluorononanoic acid										
463.00 > 419.00	2.930	2.930	0.0	1.000	1474822	0.99		99.1	390	
463.00 > 169.00	2.930	2.930	0.0	1.000	359081		4.11(1.90-5.69)		1728	
D 19 13C5 PFNA										
468.00 > 423.00	2.930	2.941	-0.011	1.141	3531435	2.51		100	8905	
D 72 13C8 PFOS										
507.00 > 99.00	2.930	2.941	-0.011	1.141	1711643	NC			4635	
D 18 13C4 PFOS										
503.00 > 80.00	2.930	2.941	-0.011	1.141	3474403	2.41		101	4401	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.143	3.143	0.0	1.073	2390410	NC			4894	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.270	3.270	0.0	1.000	531661	0.9140		95.4	2027	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.275	3.275	0.0	1.118	1059390	0.9689		101	2498	
549.00 > 99.00	3.275	3.275	0.0	1.118	393247		2.69(1.33-3.97)		1259	
D 26 M2-8:2FTS										
529.00 > 81.00	3.270	3.282	-0.012	1.273	1072395	2.47		103	3907	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.282	3.282	0.0	1.000	1292175	1.02		102	743	
513.00 > 169.00	3.282	3.282	0.0	1.000	221847		5.82(2.36-7.09)		369	
D 23 13C2 PFDA										
515.00 > 470.00	3.282	3.296	-0.014	1.278	3169120	2.56		103	4236	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.318	3.318	0.0	1.002	1844880	0.9877		98.8	4668	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.318	-0.007	1.289	4795839	2.51		101	3696	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.436	3.436	0.0	1.000	599213	0.9793		97.9	627	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.436	3.451	-0.015	1.338	1585892	2.51		100	2400	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.594	3.594	0.0	1.227	907344	0.9876		102	2580	
599.00 > 99.00	3.594	3.594	0.0	1.227	298049		3.04(1.39-4.16)		2003	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.611	3.611	0.0	1.002	547758	0.9150		91.5	1675	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.611	3.611	0.0	1.000	1087614	0.9548		95.5	635	
563.00 > 169.00	3.611	3.611	0.0	1.000	198304		5.48(2.12-6.36)		1055	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.602	3.611	-0.009	1.403	1678243	2.56		103	1506	
D 30 13C2 PFUnA										
565.00 > 520.00	3.611	3.618	-0.007	1.406	2534292	2.55		102	6817	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.765	3.765	0.0	1.285	3956044	NC			7227	
35 MeFOSA										
512.00 > 169.00	3.823	3.823	0.0		541759	NC			973	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.898	3.898	0.0	1.000	1109627	0.9481		94.8	540	
613.00 > 169.00	3.898	3.898	0.0	1.000	270589		4.10(2.13-6.40)		1830	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.898	3.898	0.0	1.192	395582	NC			2986	
D 36 13C2 PFDoA										
615.00 > 570.00	3.898	3.908	-0.010	1.518	2629647	2.50		100	4613	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.138	4.138	0.0	1.412	409935	NC			1759	
699.00 > 99.00	4.128	4.138	-0.010	1.409	553144		0.74(0.00-0.00)		3087	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.157	4.157	0.0	1.067	1135953	1.00		100	449	
663.00 > 169.00	4.157	4.157	0.0	1.067	358684		3.17(1.25-3.76)		2170	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.390	4.390	0.0	1.002	306107	0.9426		94.3	1955	
713.00 > 219.00	4.383	4.390	-0.007	1.000	211495		1.45(0.71-2.13)		1368	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.383	4.397	-0.014	1.707	3354407	2.51		100	6762	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.789	4.789	0.0	1.002	2196198	NC			898	
813.00 > 169.00	4.782	4.789	-0.007	1.000	365300		6.01(2.86-8.58)		2571	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.782	4.796	-0.014	1.862	6020074	2.27		90.7	8651	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.119	5.119	0.0	1.071	2345738	NC			926	
913.00 > 169.00	5.119	5.119	0.0	1.071	282174		8.31(3.83-11.48)		2382	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 08-Aug-2018 08:32:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\2018.08.07LLB_006.d

Injection Date: 07-Aug-2018 14:53:15 Instrument ID: A8_N

Lims ID: CCV L4

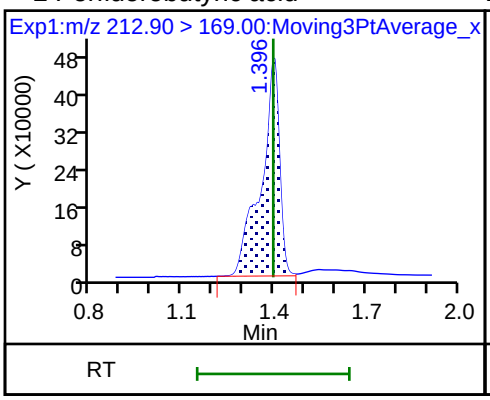
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 3

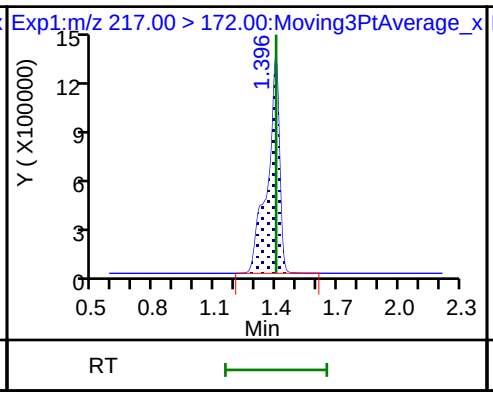
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

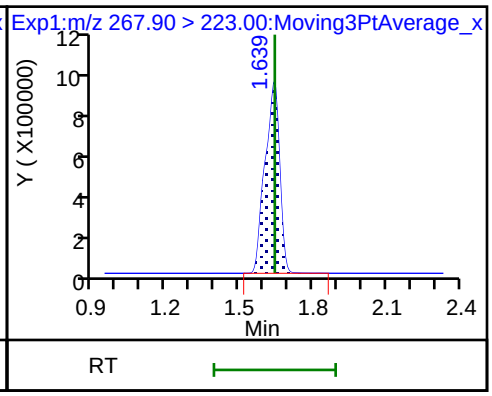
2 Perfluorobutyric acid



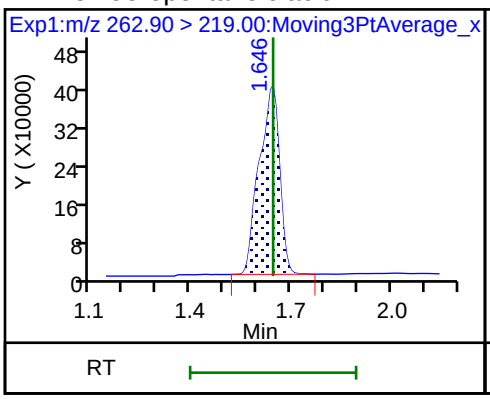
D 1 13C4 PFBA



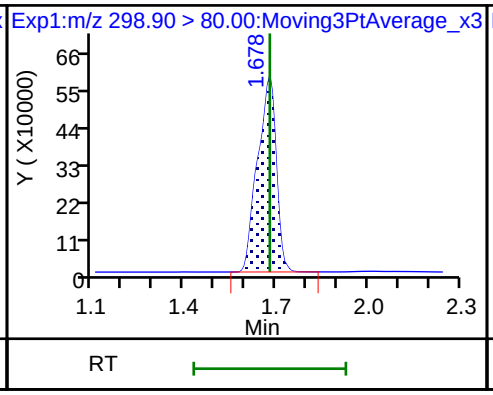
D 3 13C5-PFPeA



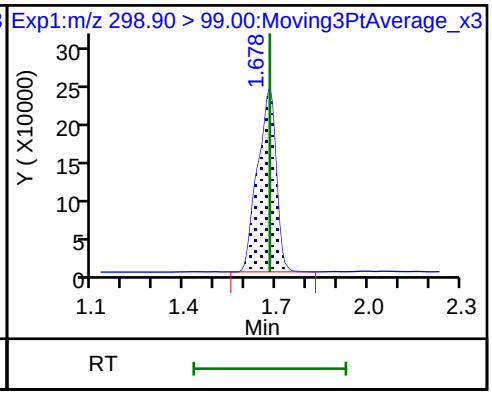
4 Perfluoropentanoic acid



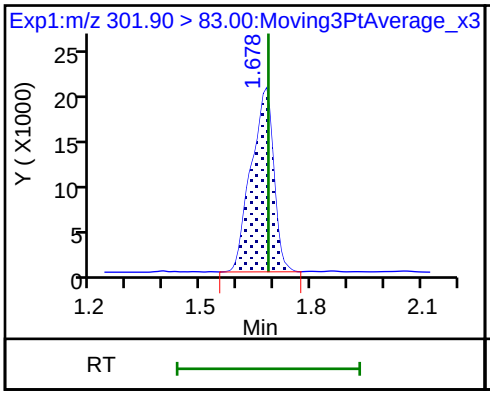
5 Perfluorobutanesulfonic acid



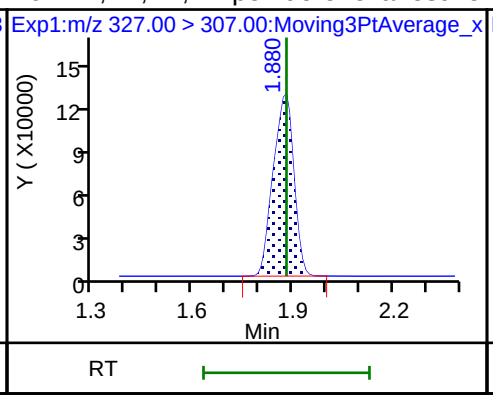
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS



61 1H,1H,2H,2H-perfluorohexanesulfoni



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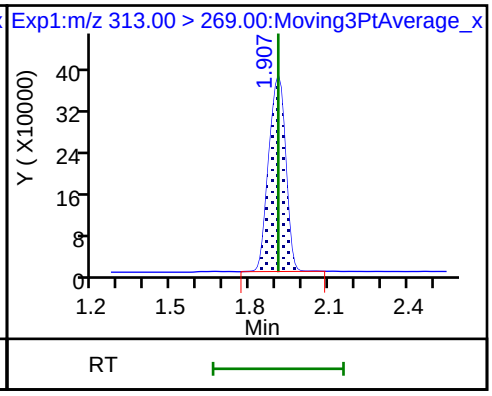
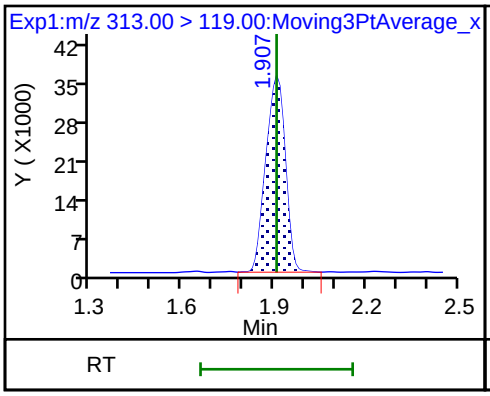
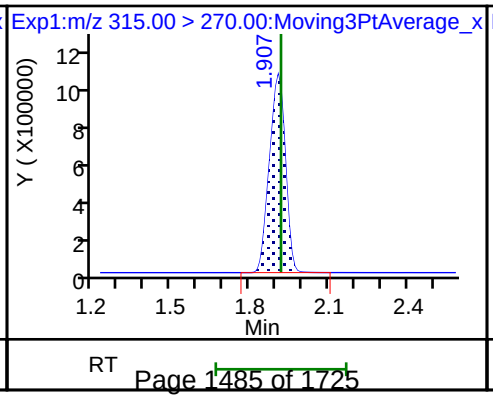


6 Perfluorohexanoic acid



D 7 13C2 PFHxA



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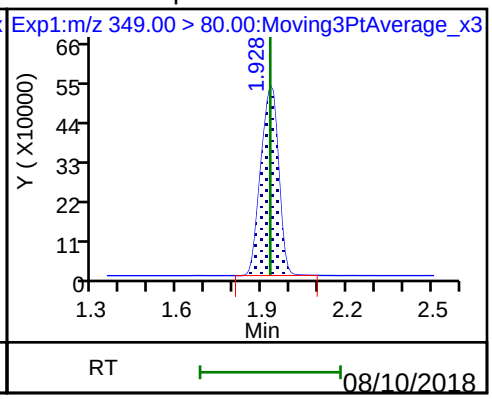

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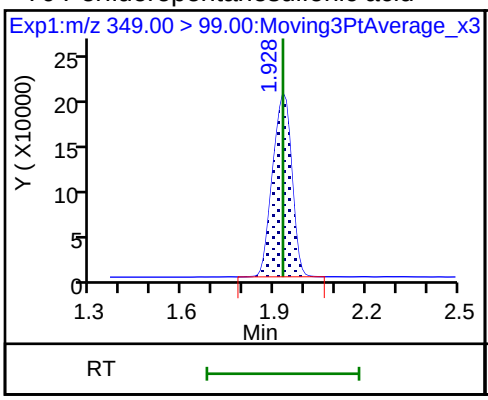
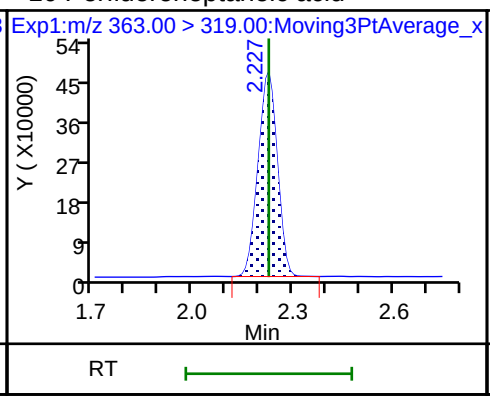


10 Perfluoroheptanoic acid



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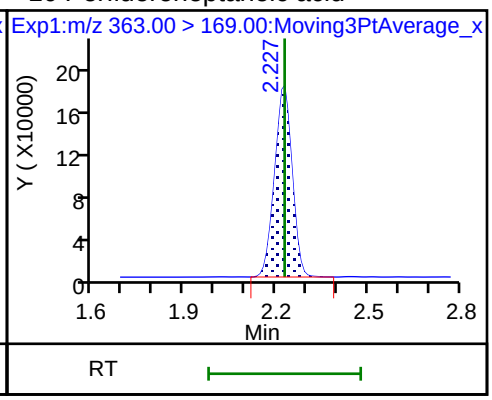
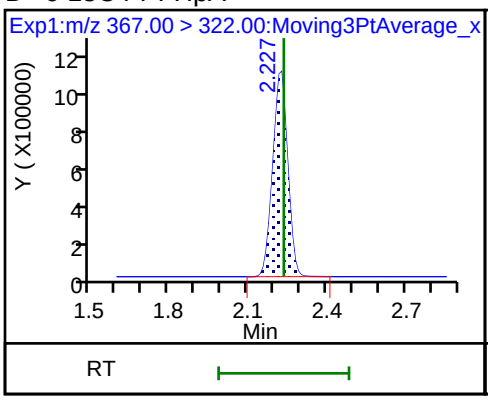
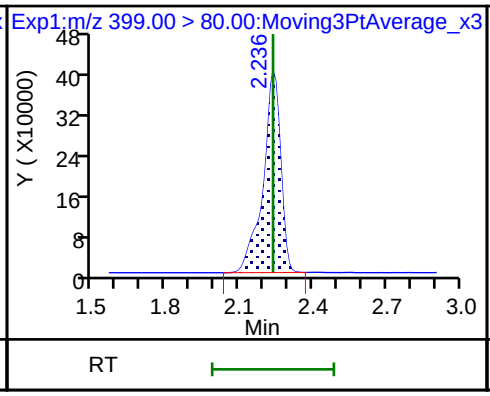


D 9 13C4-PFHpA



8 Perfluorohexanesulfonic acid



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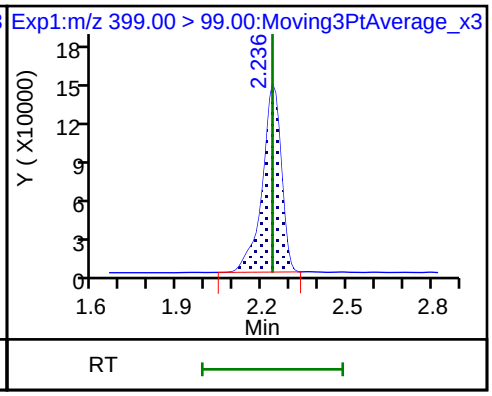
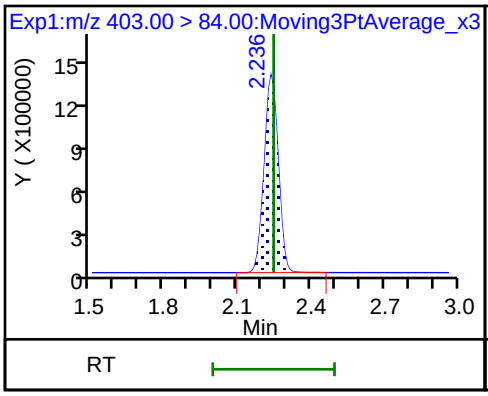
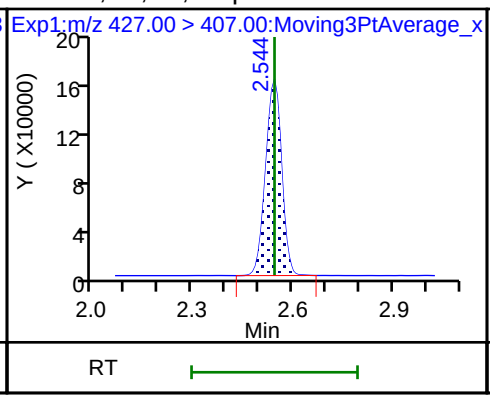


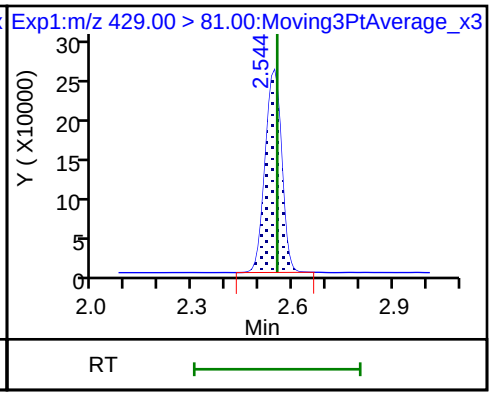
D 11 18O2 PFHxS



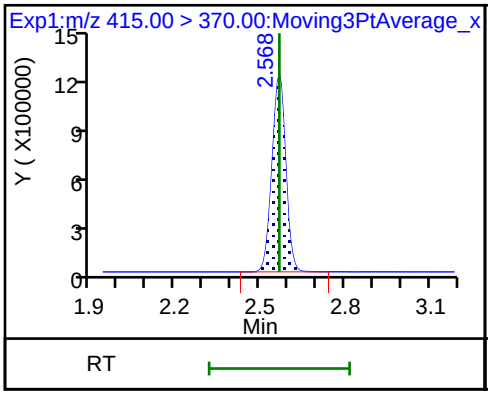
13 1H,1H,2H,2H-perfluorooctanesulfon



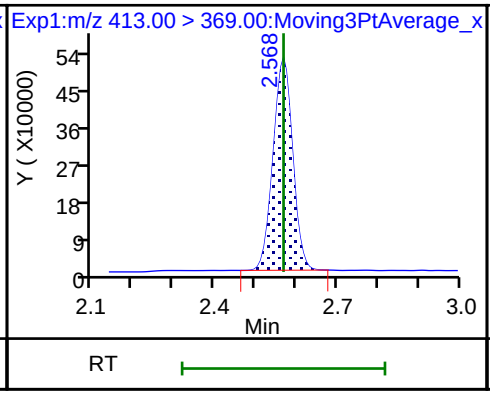
D 12 M2-6:2FTS



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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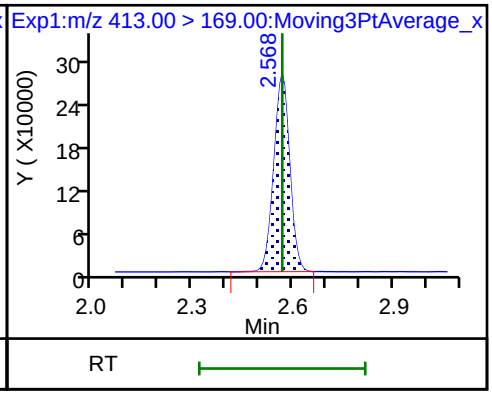
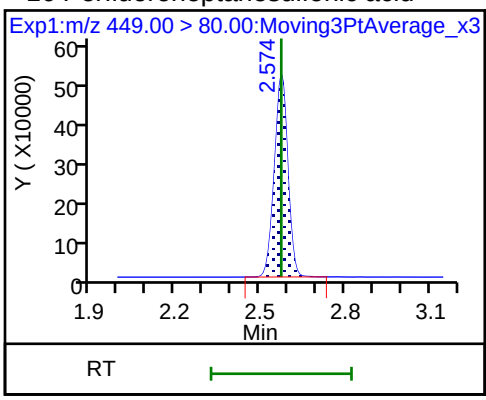


16 Perfluoroheptanesulfonic acid



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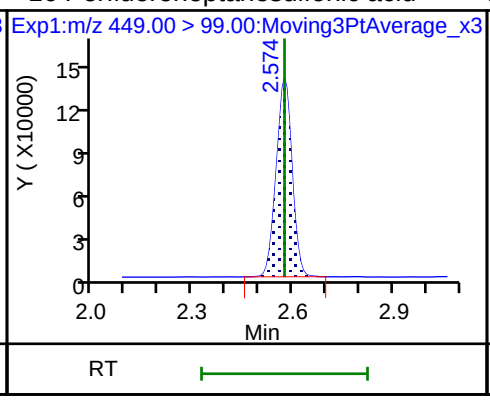
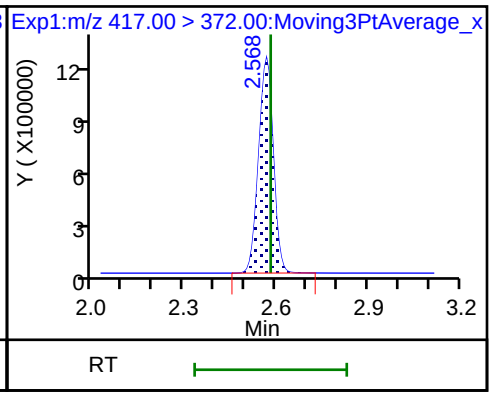
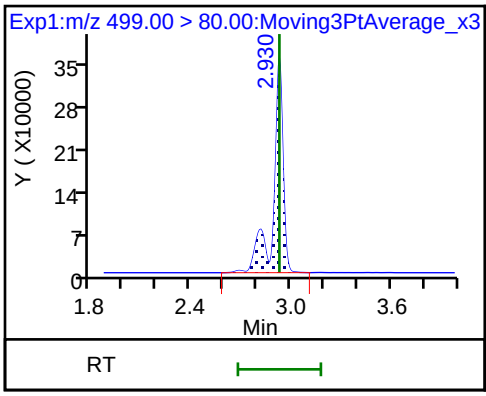


D 14 13C4 PFOA



17 Perfluorooctane sulfonic acid



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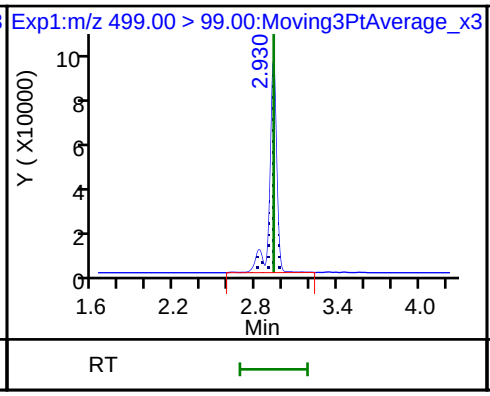
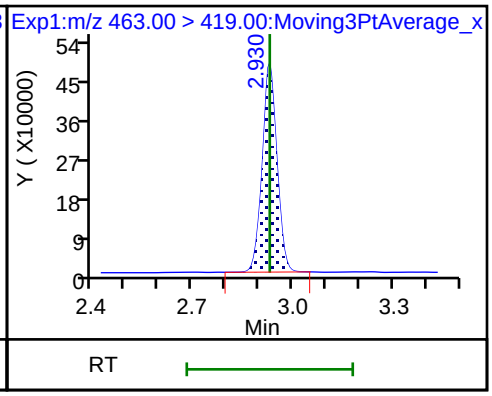


20 Perfluorononanoic acid



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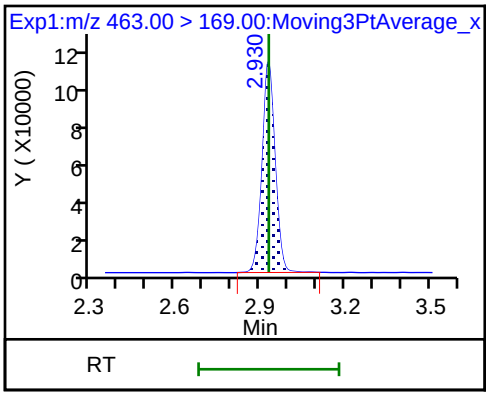
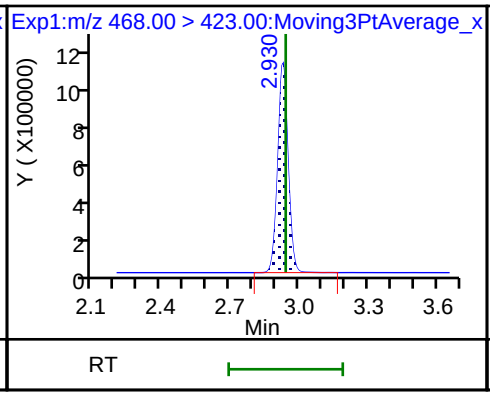
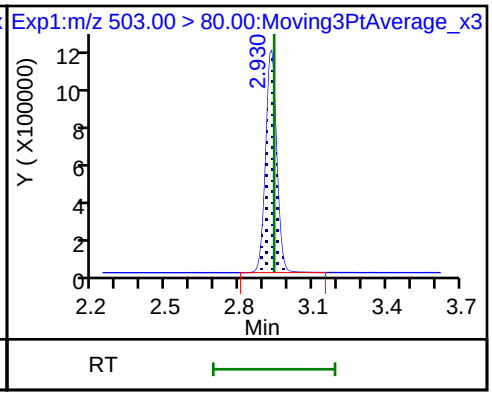


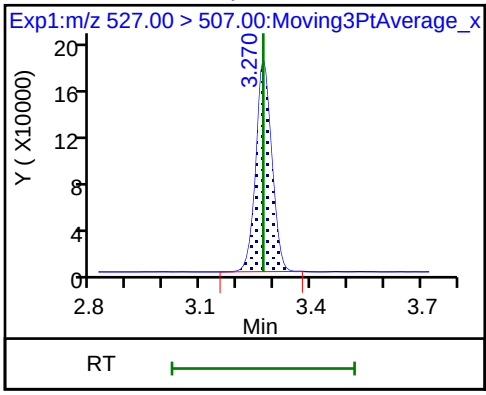
D 19 13C5 PFNA



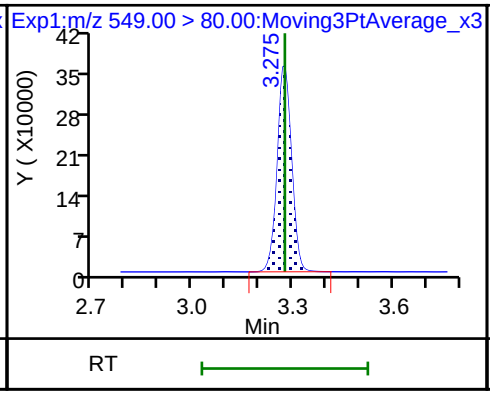
D 18 13C4 PFOS



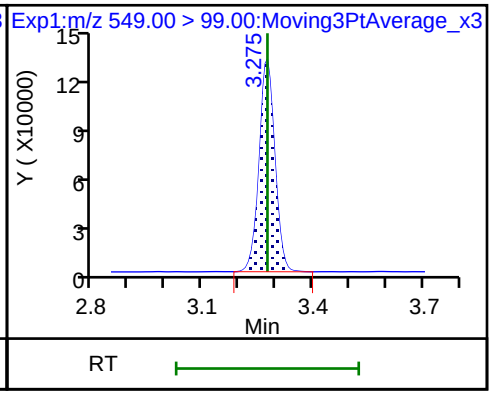
25 1H,1H,2H,2H-perfluorodecanesulfoni



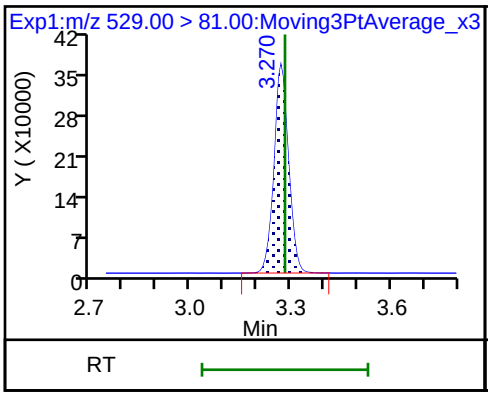
68 Perfluorononanesulfonic acid



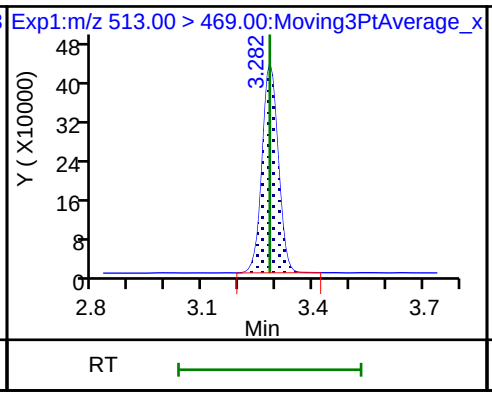
68 Perfluorononanesulfonic acid



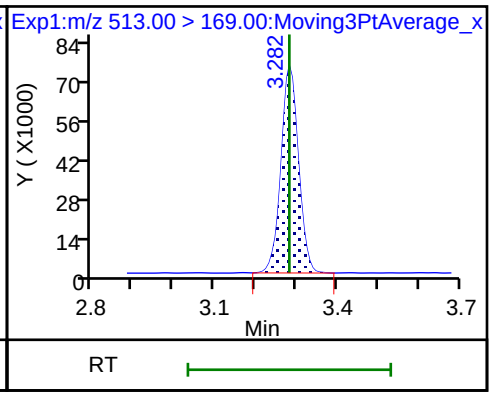
D 26 M2-8:2FTS



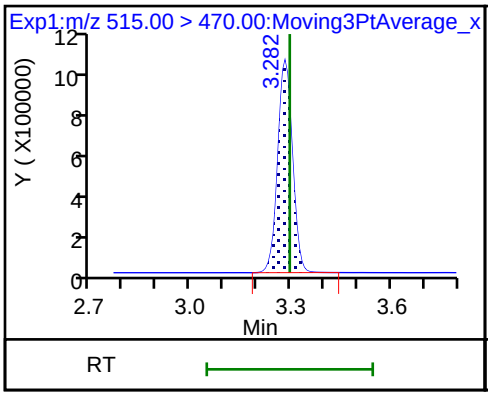
24 Perfluorodecanoic acid



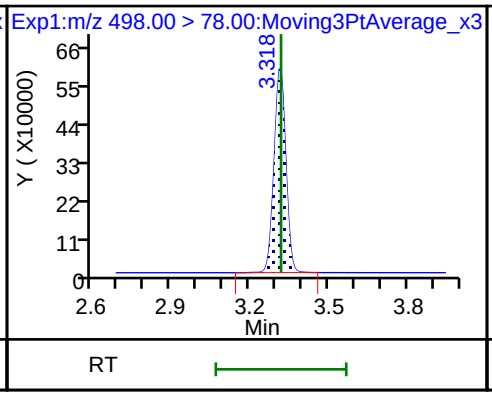
24 Perfluorodecanoic acid



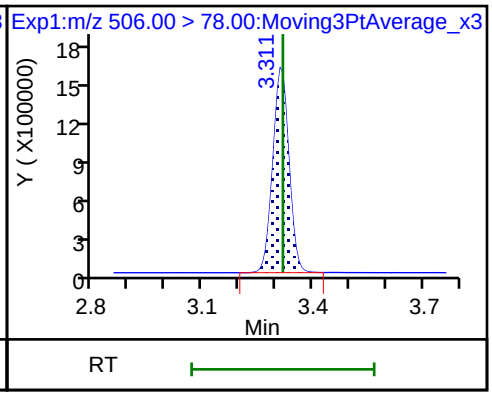
D 23 13C2 PFDA



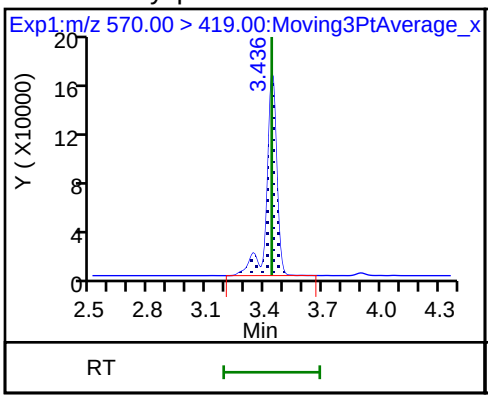
22 Perfluorooctane Sulfonamide



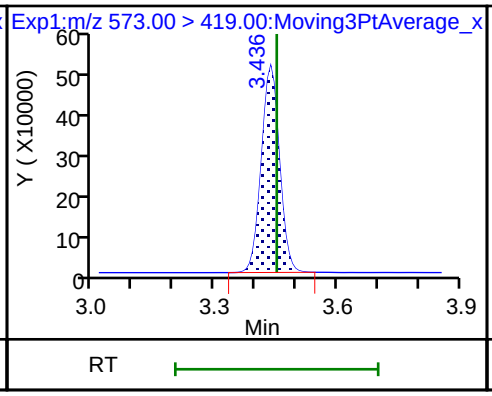
D 21 13C8 FOSA



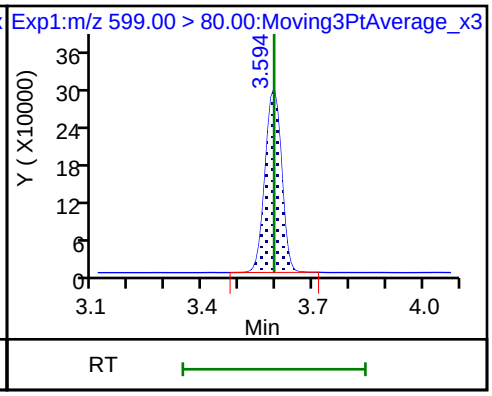
28 N-methyl perfluorooctane sulfonami



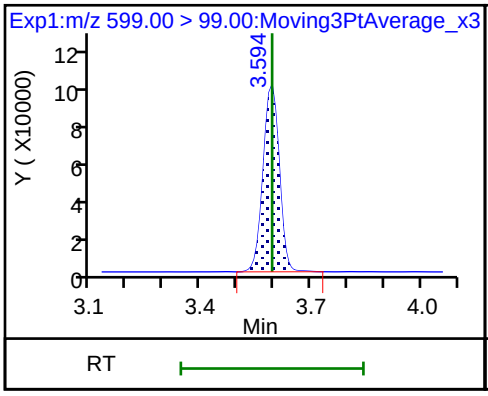
D 27 d3-NMeFOSAA



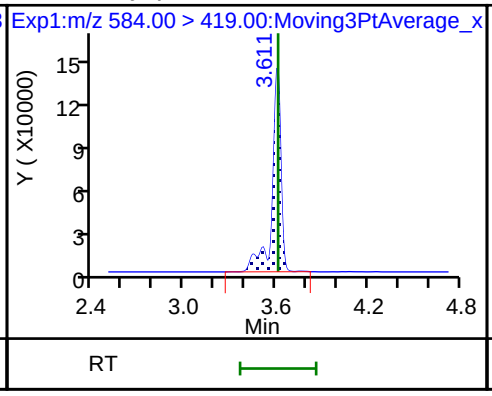
29 Perfluorodecane Sulfonic acid



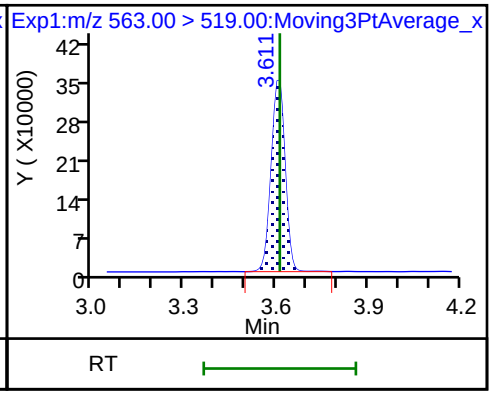
29 Perfluorodecane Sulfonic acid



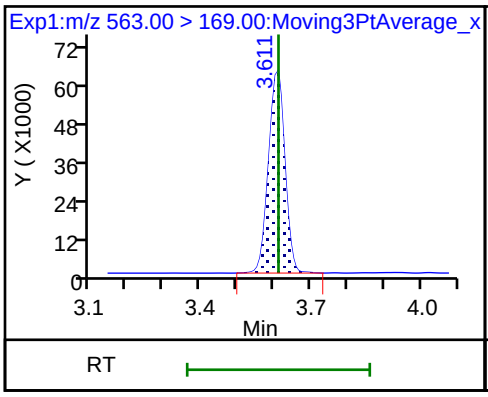
33 N-ethyl perfluorooctane sulfonamid



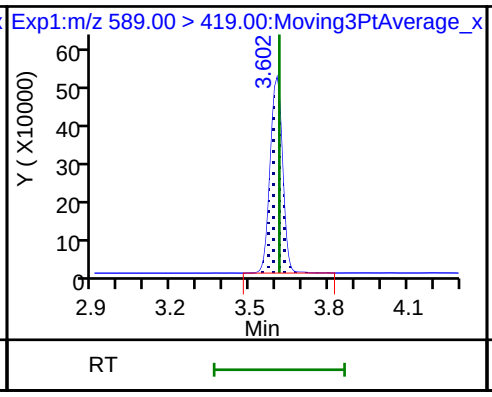
31 Perfluoroundecanoic acid



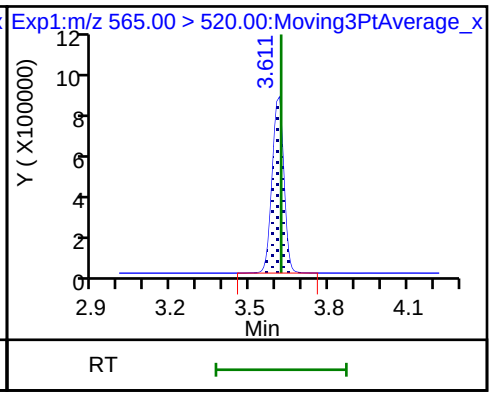
31 Perfluoroundecanoic acid



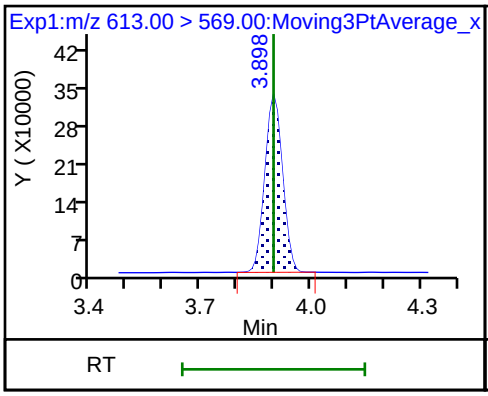
D 32 d5-NEtFOSAA



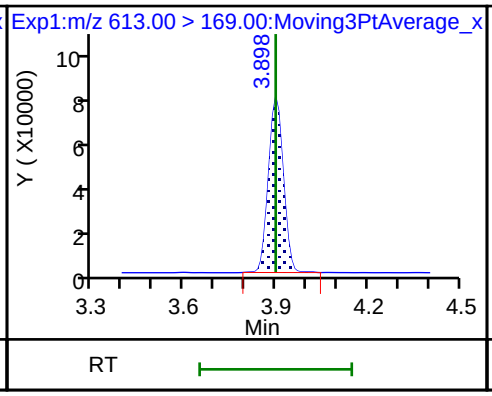
D 30 13C2 PFUnA



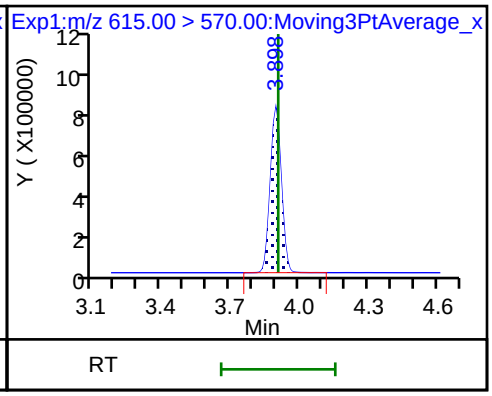
37 Perfluorododecanoic acid



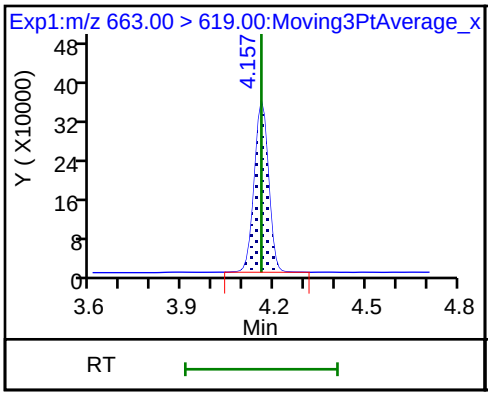
37 Perfluorododecanoic acid



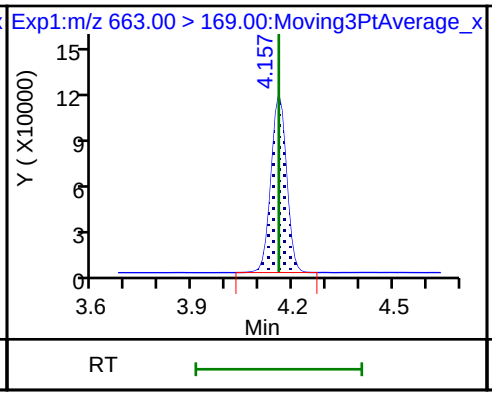
D 36 13C2 PFDoA



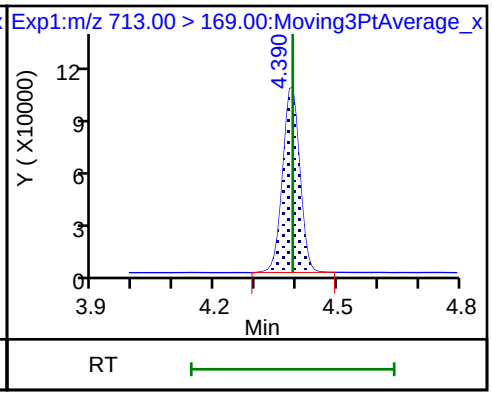
41 Perfluorotridecanoic acid



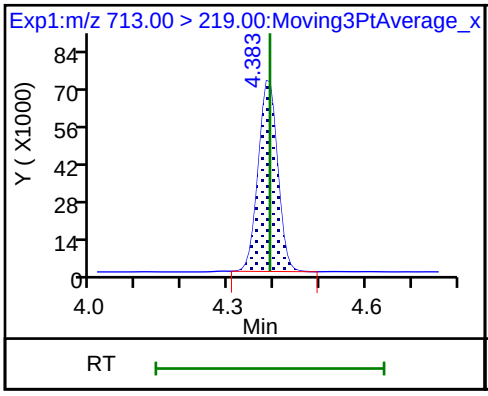
41 Perfluorotridecanoic acid



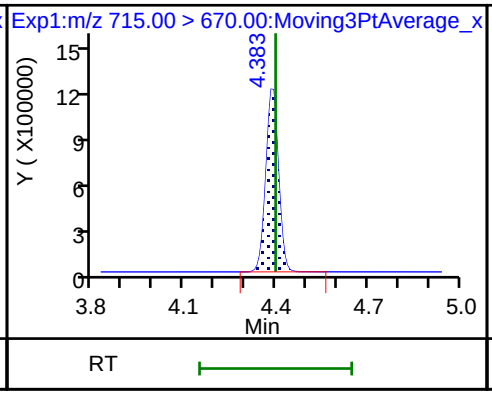
42 Perfluorotetradecanoic acid



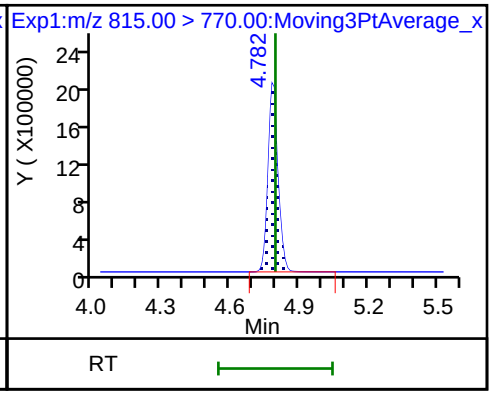
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238576/1 Calibration Date: 08/07/2018 16:26

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_018.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9115		0.971	1.00	-2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.096		0.963	1.00	-3.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	77.93		0.907	0.884	2.6	30.0
4:2 FTS	AveID	16.57	17.23		0.971	0.934	4.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9460		0.927	1.00	-7.3	30.0
Perfluoropentanesulfonic acid	AveID	68.92	69.03		0.939	0.938	0.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.074		1.01	1.00	1.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.026		0.861	0.910	-5.4	30.0
6:2 FTS	AveID	1.573	1.546		0.932	0.948	-1.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.059		0.937	1.00	-6.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.257		0.966	0.952	1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.011		0.960	1.00	-4.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.111		0.960	0.928	3.5	30.0
8:2 FTS	AveID	1.299	1.213		0.895	0.958	-6.6	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7601		0.970	0.960	1.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9931		0.990	1.00	-1.0	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9736	0.9546		0.980	1.00	-2.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9856		1.02	1.00	2.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6322		0.964	0.964	0.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8712		0.977	1.00	-2.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.127		1.00	1.00	0.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.004		0.902	1.00	-9.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.084		1.01	1.00	0.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2355		0.973	1.00	-2.7	30.0
13C4 PFBA	Ave	1.385	1.305		2.36	2.50	-5.8	30.0
13C5-PFPeA	Ave	0.9537	0.9089		2.38	2.50	-4.7	30.0
13C3-PFBS	Ave	0.0221	0.0208		2.19	2.33	-5.8	30.0
13C2 PFHxA	Ave	1.082	1.064		2.46	2.50	-1.7	30.0
13C4-PFHpA	Ave	1.065	1.021		2.40	2.50	-4.1	30.0
18O2 PFHxS	Ave	1.366	1.302		2.25	2.37	-4.7	30.0
M2-6:2FTS	Ave	0.2242	0.2211		2.34	2.38	-1.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238576/1 Calibration Date: 08/07/2018 16:26

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_018.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9699		2.48	2.50	-0.8	30.0
13C4 PFOS	Ave	0.8973	0.8444		2.25	2.39	-5.9	30.0
13C5 PFNA	Ave	0.8770	0.8606		2.45	2.50	-1.9	30.0
M2-8:2FTS	Ave	0.2707	0.2662		2.36	2.40	-1.7	30.0
13C2 PFDA	Ave	0.7695	0.7448		2.42	2.50	-3.2	30.0
13C8 FOSA	Ave	1.188	1.157		2.43	2.50	-2.7	30.0
d3-NMeFOSAA	Ave	0.3935	0.3880		2.47	2.50	-1.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.3990		2.45	2.50	-2.1	30.0
13C2 PFUnA	Ave	0.6189	0.6090		2.46	2.50	-1.6	30.0
13C2 PFDoA	Ave	0.6541	0.6599		2.52	2.50	0.9	30.0
13C2-PFTeDA	Ave	0.8335	0.8057		2.42	2.50	-3.3	30.0
13C2-PFHxDA	Ave	1.653	1.416		2.14	2.50	-14.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_018.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 07-Aug-2018 16:26:55 ALS Bottle#: 13 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 13:34:05 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: hannigana Date: 08-Aug-2018 13:31:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.401	1.398	0.003	0.545	5494784	2.36		94.2	7846	
2 Perfluorobutyric acid										
212.90 > 169.00	1.401	1.401	0.0	1.000	2003330	0.9708		97.1	191	
D 3 13C5-PFPeA										
267.90 > 223.00	1.646	1.643	0.003	0.640	3827274	2.38		95.3	8913	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.646	1.646	0.0	1.000	1677125	0.9629		96.3	106	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.678	1.678	0.0	1.000	2411480	0.9070		103	968	
298.90 > 99.00	1.678	1.678	0.0	1.000	986582		2.44(1.25-3.74)		535	
D 47 13C3-PFBS										
301.90 > 83.00	1.678	1.684	-0.006	0.652	81385	2.19		94.2	312	
D 60 M2-4:2FTS										
329.00 > 81.00	1.883	1.880	0.003	0.732	624616	NC			925	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.883	1.883	0.0	1.122	563258	0.9711		104	5704	
D 7 13C2 PFHxA										
315.00 > 270.00	1.912	1.907	0.005	0.743	4481308	2.46		98.3	9278	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.912	1.912	0.0	1.000	1695688	0.9269		92.7	344	
313.00 > 119.00	1.912	1.912	0.0	1.000	150551		11.26(5.03-15.10)		332	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.933	1.933	0.0	1.152	2266633	0.9395		100	3268	
349.00 > 99.00	1.933	1.933	0.0	1.152	845600		2.68(1.36-4.07)		923	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.006	2.006	0.0	1.000	299240	NC			124	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.006	2.012	-0.006	0.780	310689	NC			990	
D 9 13C4-PFHpA										
367.00 > 322.00	2.232	2.227	0.005	0.868	4301237	2.40		95.9	9120	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.232	2.232	0.0	1.000	1847495	1.01		101	367	
363.00 > 169.00	2.223	2.232	-0.009	0.996	722394		2.56(1.13-3.40)		1100	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	2046778	0.8612		94.6	2550	
399.00 > 99.00	2.243	2.243	0.0	1.000	680564		3.01(1.50-4.49)		742	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.247	-0.004	0.872	5185043	2.25		95.3	4502	
65 ADONA										
377.00 > 251.00	2.277	2.277	0.0	0.775	5034693	NC			7242	
377.00 > 85.00	2.277	2.277	0.0	0.775	2956999		1.70(0.84-2.53)		4051	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.549	2.549	0.0	1.000	545883	0.9316		98.3	890	
D 12 M2-6:2FTS										
429.00 > 81.00	2.549	2.552	-0.003	0.991	884464	2.34		98.6	2010	
D 73 13C8 PFOA										
421.00 > 376.00	2.572	2.568	0.004	1.000	7749953	NC			8795	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.572	2.572	0.0	1.000	1731724	0.9375		93.7	154	
413.00 > 169.00	2.572	2.572	0.0	1.000	889774		1.95(0.84-2.52)		1057	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.572	0.0		4211015	2.50			9344	
D 14 13C4 PFOA										
417.00 > 372.00	2.572	2.574	-0.002	1.000	4084303	2.48		99.2	9957	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.579	2.579	0.0	0.878	1701979	0.9658		101	3020	
449.00 > 99.00	2.579	2.579	0.0	0.878	459597		3.70(1.94-5.82)		732	
D 19 13C5 PFNA										
468.00 > 423.00	2.938	2.935	0.003	1.142	3624165	2.45		98.1	7445	
D 18 13C4 PFOS										
503.00 > 80.00	2.938	2.935	0.003	1.142	3399269	2.25		94.1	3994	
D 72 13C8 PFOS										
507.00 > 99.00	2.938	2.935	0.003	1.142	1693408	NC			5504	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.938	2.938	0.0	1.000	1466821	0.9605		103	2181	
499.00 > 99.00	2.938	2.938	0.0	1.000	327613		4.48(2.31-6.93)		623	
20 Perfluorononanoic acid										
463.00 > 419.00	2.938	2.938	0.0	1.000	1465178	0.9595		96.0	371	
463.00 > 169.00	2.938	2.938	0.0	1.000	357055		4.10(1.90-5.69)		1450	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.146	3.146	0.0	1.071	2414801	NC			4777	
D 26 M2-8:2FTS										
529.00 > 81.00	3.283	3.275	0.008	1.276	1073997	2.36		98.3	3170	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.283	3.283	0.0	1.000	521247	0.8947		93.4	1872	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.283	3.283	0.0	1.117	1037890	0.9702		101	3128	
549.00 > 99.00	3.283	3.283	0.0	1.117	393376		2.64(1.33-3.97)		1325	
D 23 13C2 PFDA										
515.00 > 470.00	3.290	3.289	0.001	1.279	3136454	2.42		96.8	6935	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.290	3.290	0.0	1.000	1245871	0.9899		99.0	742	
513.00 > 169.00	3.290	3.290	0.0	1.000	218242		5.71(2.36-7.09)		299	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.318	0.001	1.290	4870573	2.43		97.3	6014	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.319	0.0	1.000	1859745	0.9804		98.0	3106	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.445	3.443	0.002	1.339	1633977	2.47		98.6	4215	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.452	3.452	0.0	1.002	644162	1.02		102	666	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.604	3.604	0.0	1.227	866828	0.9644		100	2524	
599.00 > 99.00	3.604	3.604	0.0	1.227	300634		2.88(1.39-4.16)		1624	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.612	3.611	0.001	1.404	1680314	2.45		97.9	1194	
D 30 13C2 PFUnA										
565.00 > 520.00	3.619	3.618	0.001	1.407	2564350	2.46		98.4	6230	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.619	3.619	0.0	1.000	1156478	1.00		100	725	
563.00 > 169.00	3.619	3.619	0.0	1.000	193453		5.98(2.12-6.36)		973	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.619	3.619	0.0	1.002	585528	0.9769		97.7	2033	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.774	3.774	0.0	1.285	3865833	NC			9524	
35 MeFOSA										
512.00 > 169.00	3.823	3.823	0.0		529035	NC			998	
D 36 13C2 PFDoA										
615.00 > 570.00	3.909	3.908	0.001	1.520	2778994	2.52		101	4439	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.909	3.909	0.0	1.191	415491	NC			2845	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.909	3.909	0.0	1.000	1116169	0.9024		90.2	550	
613.00 > 169.00	3.909	3.909	0.0	1.000	271670		4.11(2.13-6.40)		1145	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.138	4.138	0.0	1.409	389742	NC			2346	
699.00 > 99.00	4.138	4.138	0.0	1.409	544702		0.72(0.00-0.00)		3034	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.167	4.167	0.0	1.066	1205414	1.01		101	479	
663.00 > 169.00	4.167	4.167	0.0	1.066	369947		3.26(1.25-3.76)		2374	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.397	4.397	0.0	1.000	319529	0.9728		97.3	2452	
713.00 > 219.00	4.397	4.397	0.0	1.000	228551		1.40(0.71-2.13)		1625	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.397	4.398	-0.001	1.710	3392592	2.42		96.7	7670	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.795	4.795	0.0	1.000	2166718	NC			770	
813.00 > 169.00	4.795	4.795	0.0	1.000	375521		5.77(2.86-8.58)		2840	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.795	4.796	-0.001	1.864	5962781	2.14		85.6	5918	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.132	5.132	0.0	1.070	2327356	NC			720	
913.00 > 169.00	5.132	5.132	0.0	1.070	281651		8.26(3.83-11.48)		1977	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 08-Aug-2018 13:34:09 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_018.d

Injection Date: 07-Aug-2018 16:26:55 Instrument ID: A8_N

Lims ID: CCV L4

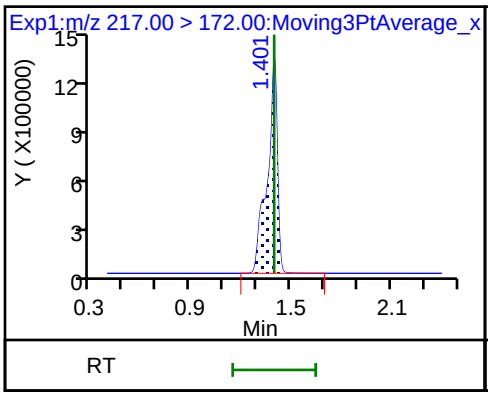
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 1

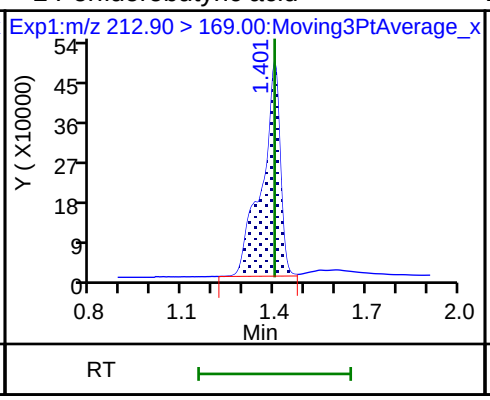
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

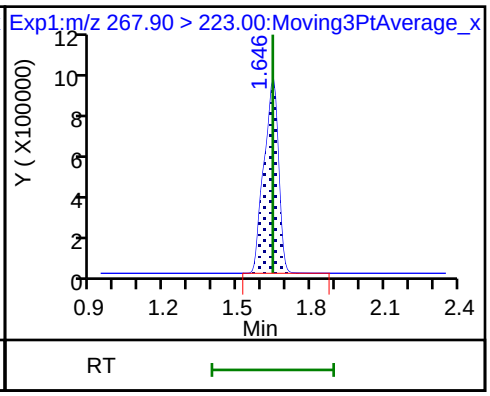
D 1 13C4 PFBA



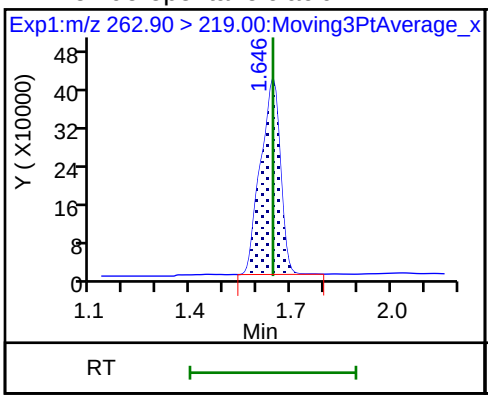
2 Perfluorobutyric acid



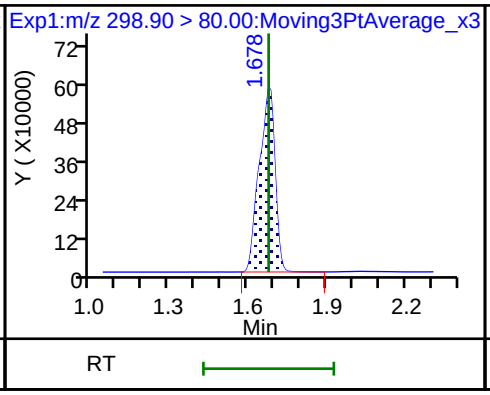
D 3 13C5-PFPeA



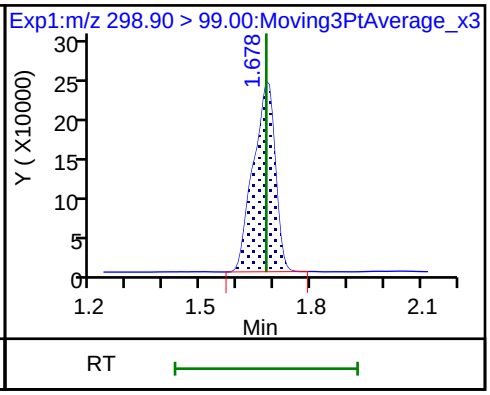
4 Perfluoropentanoic acid



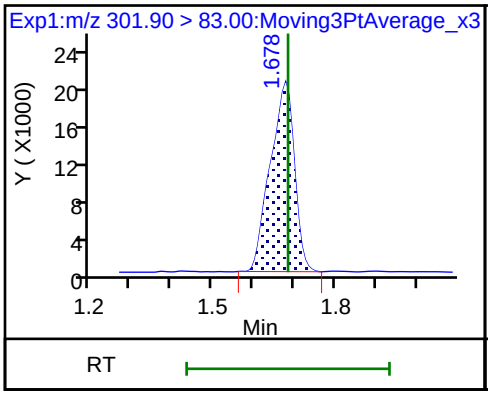
5 Perfluorobutanesulfonic acid



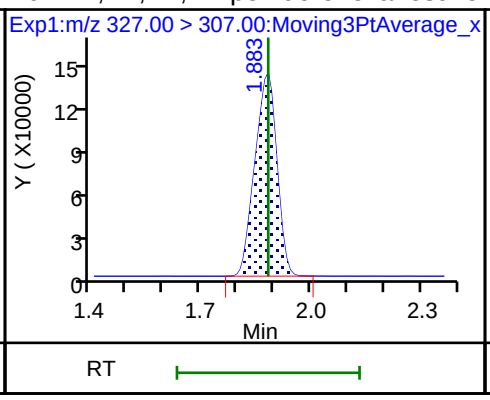
5 Perfluorobutanesulfonic acid



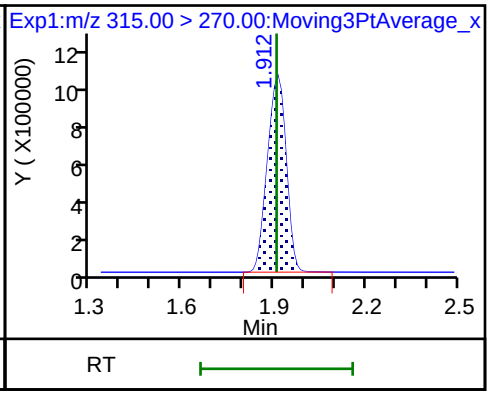
D 47 13C3-PFBS



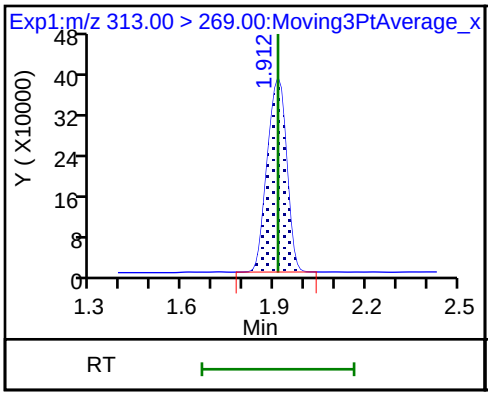
61 1H,1H,2H,2H-perfluorohexanesulfon



D 7 13C2 PFHxA



6 Perfluorohexanoic acid



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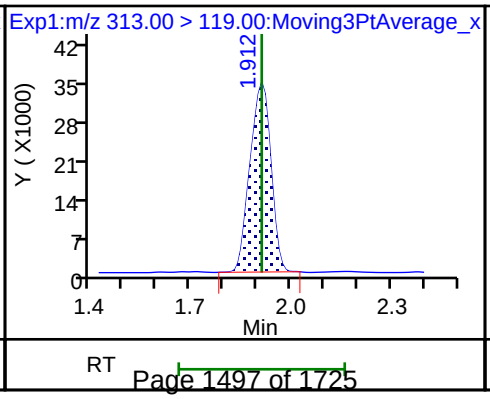
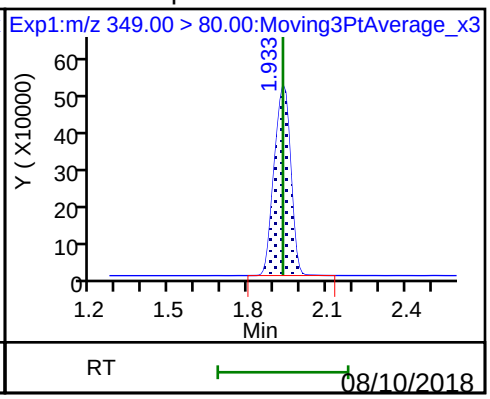


70 Perfluoropentanesulfonic acid



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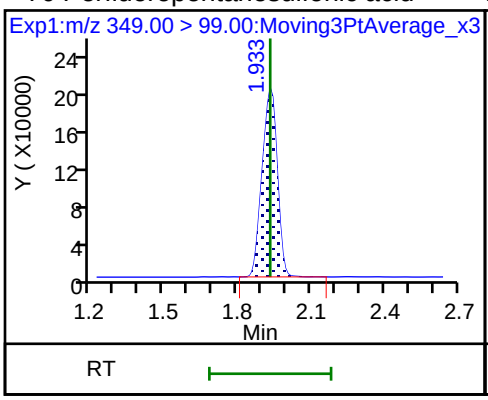
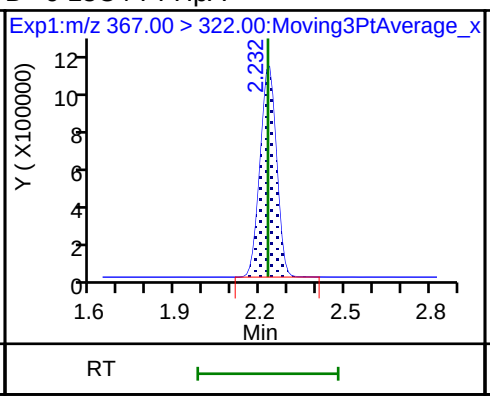
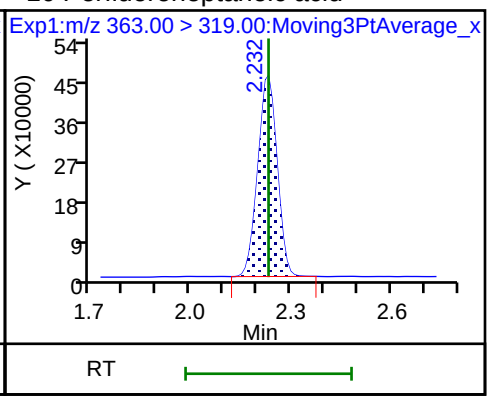


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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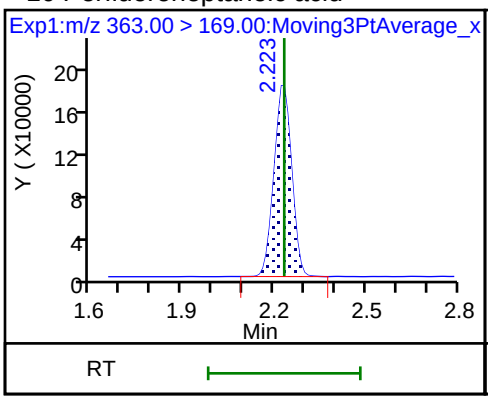
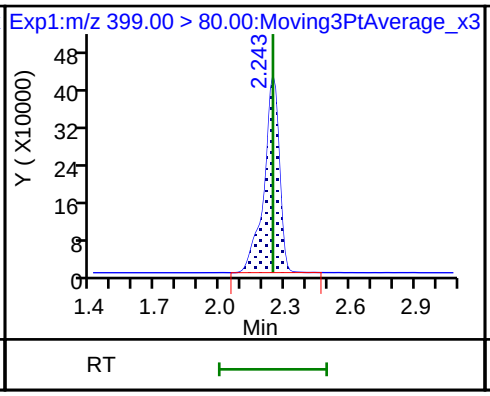


8 Perfluorohexanesulfonic acid



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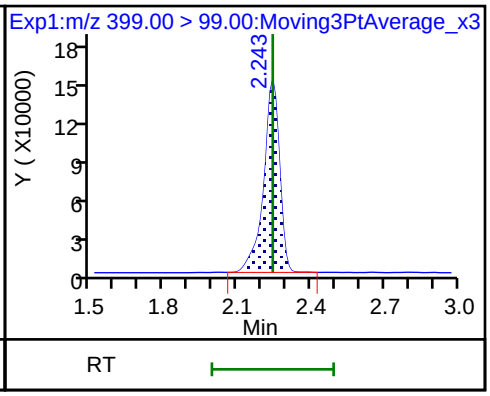
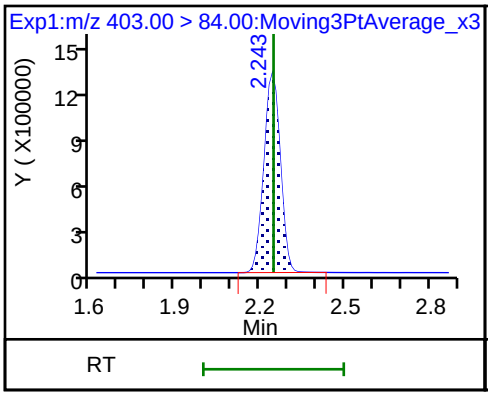
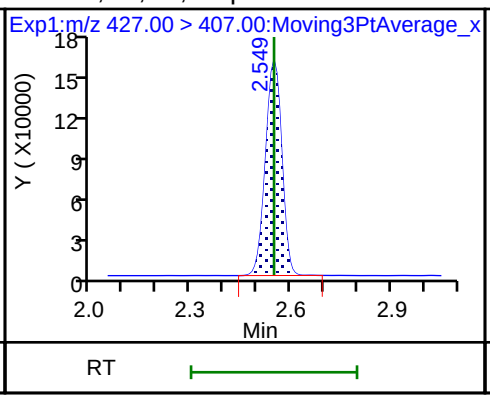


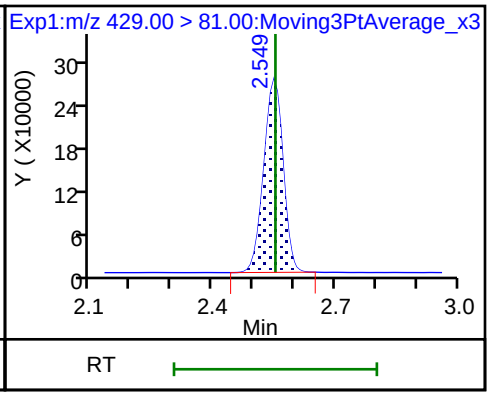
D 11 18O2 PFHxS



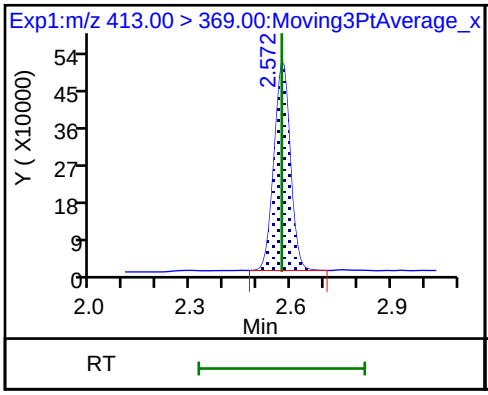
13 1H,1H,2H,2H-perfluorooctanesulfon



D 12 M2-6:2FTS



15 Perfluorooctanoic acid



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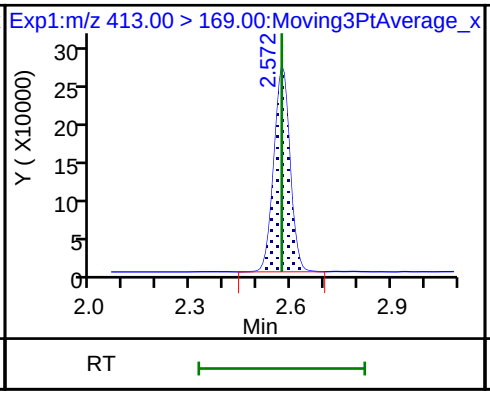
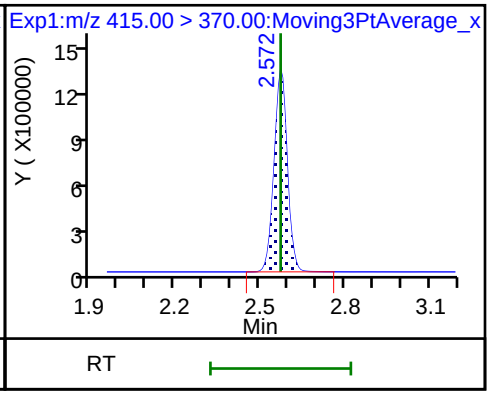
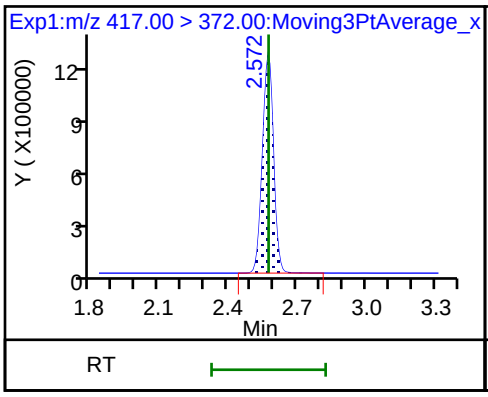


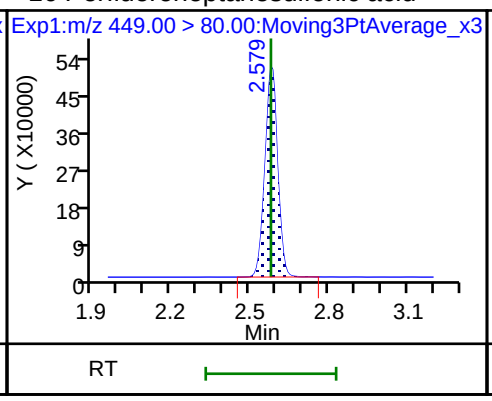
* 62 13C2-PFOA



D 14 13C4 PFOA



16 Perfluoroheptanesulfonic acid



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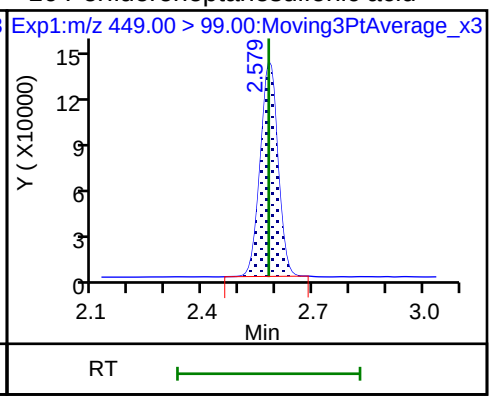
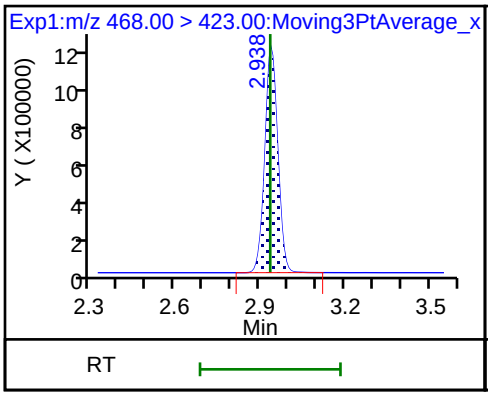


D 19 13C5 PFNA



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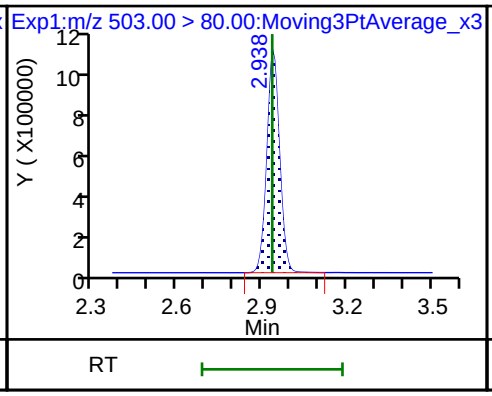
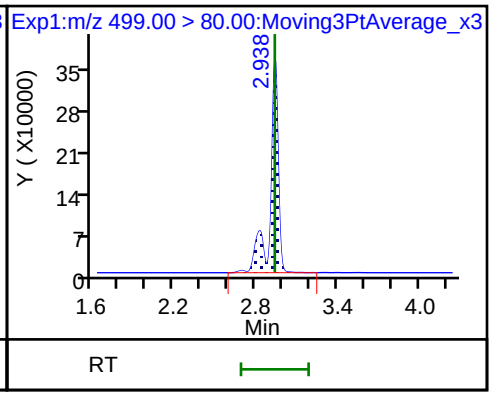


17 Perfluorooctane sulfonic acid



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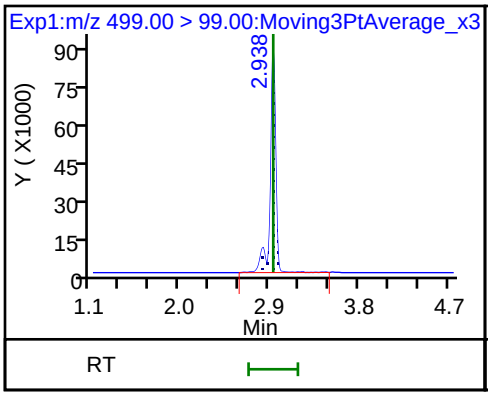
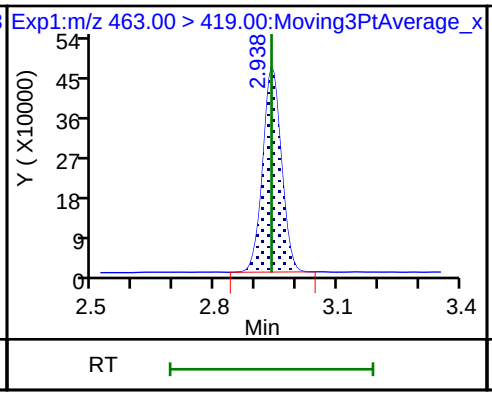


20 Perfluorononanoic acid



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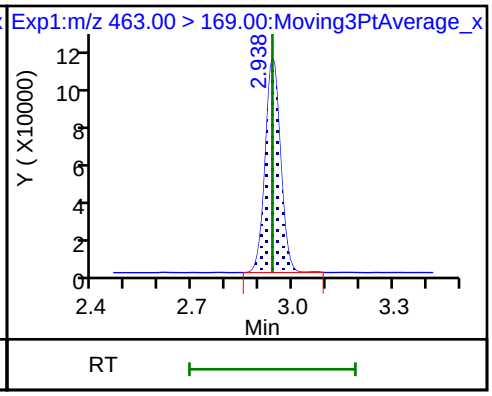
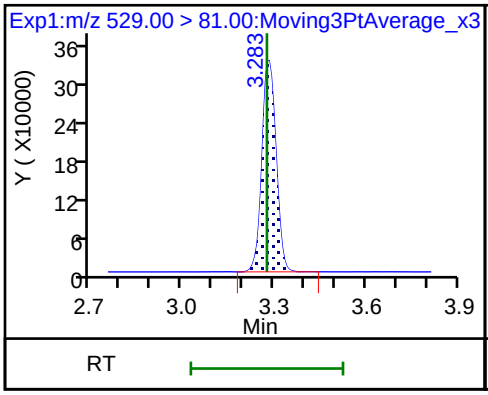
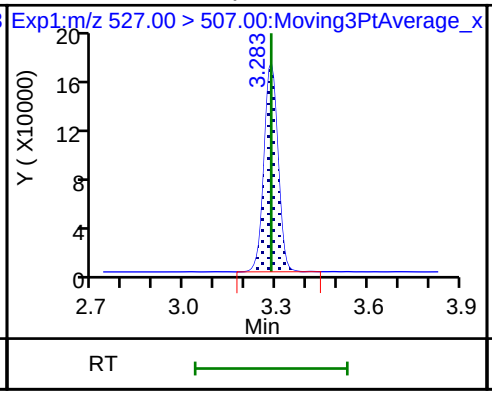


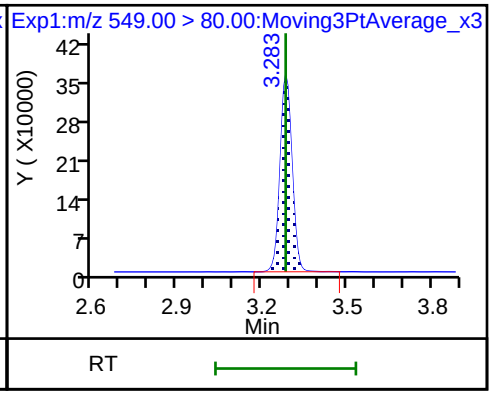
D 26 M2-8:2FTS



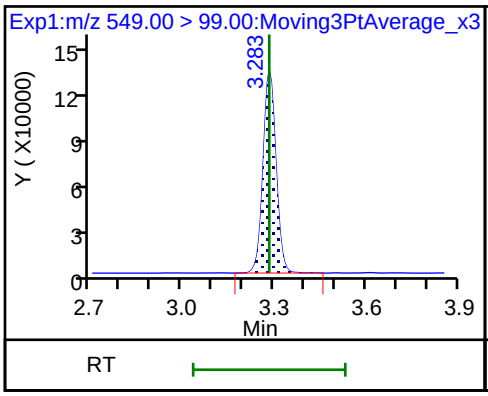
25 1H,1H,2H,2H-perfluorodecanesulfoni



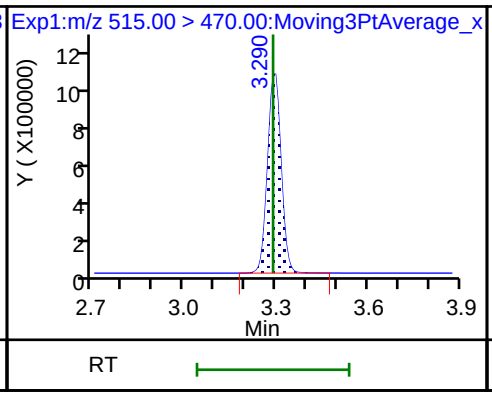
68 Perfluorononanesulfonic acid



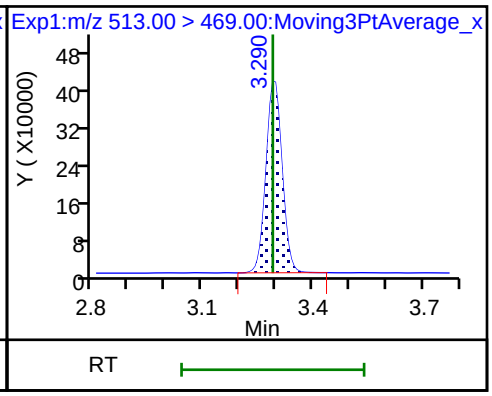
68 Perfluorononanesulfonic acid



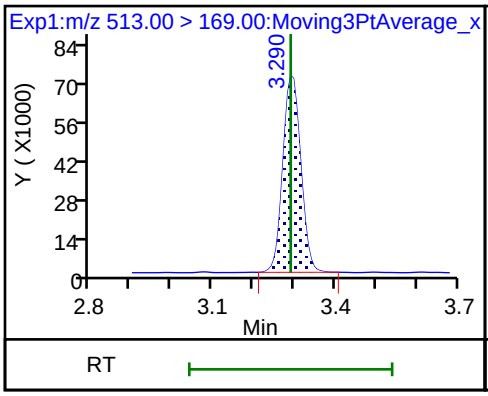
D 23 13C2 PFDA



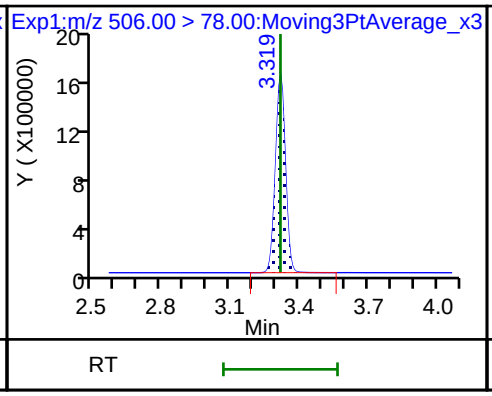
24 Perfluorodecanoic acid



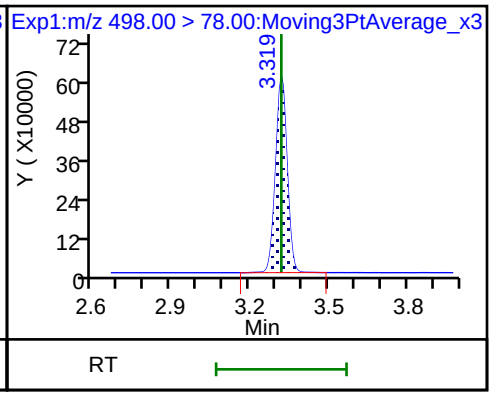
24 Perfluorodecanoic acid



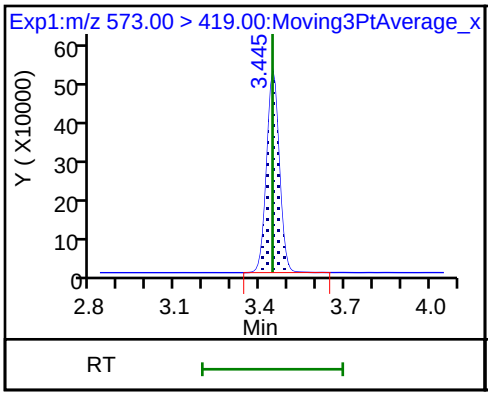
D 21 13C8 FOSA



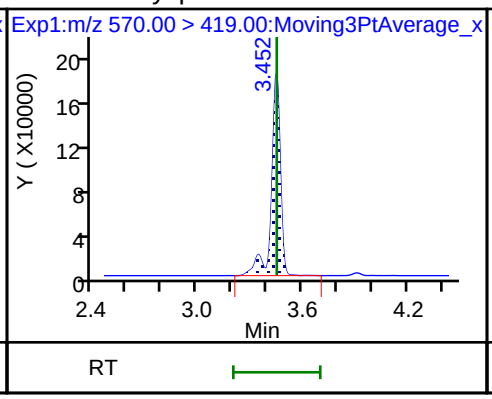
22 Perfluorooctane Sulfonamide



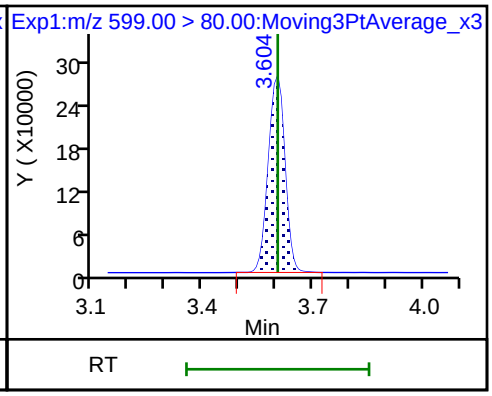
D 27 d3-NMeFOSAA



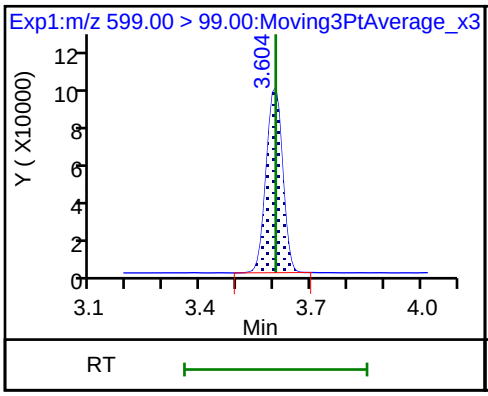
28 N-methyl perfluorooctane sulfonami



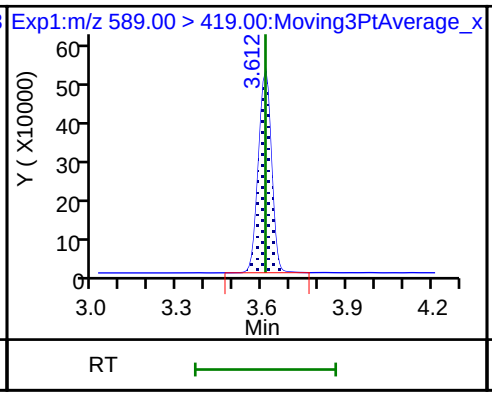
29 Perfluorodecane Sulfonic acid



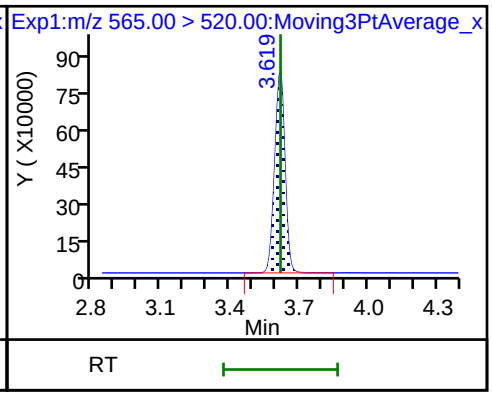
29 Perfluorodecane Sulfonic acid



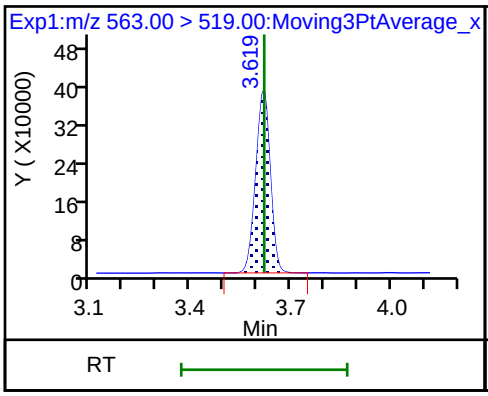
D 32 d5-NEtFOSAA



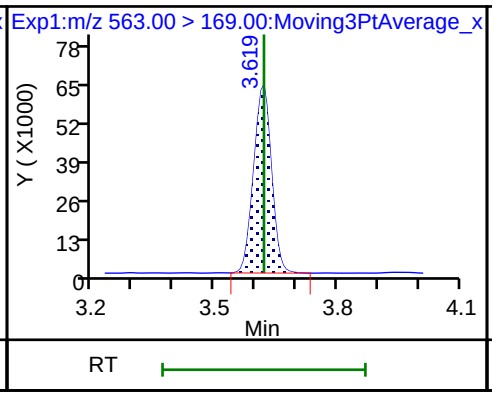
D 30 13C2 PFUnA



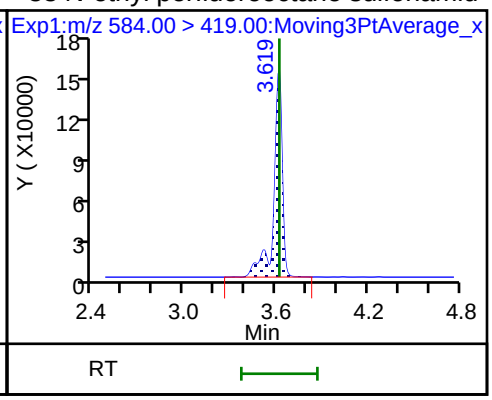
31 Perfluoroundecanoic acid



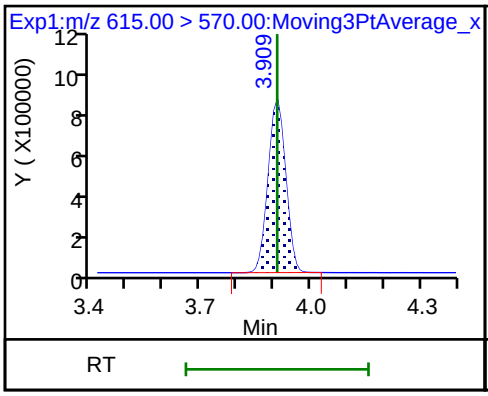
31 Perfluoroundecanoic acid



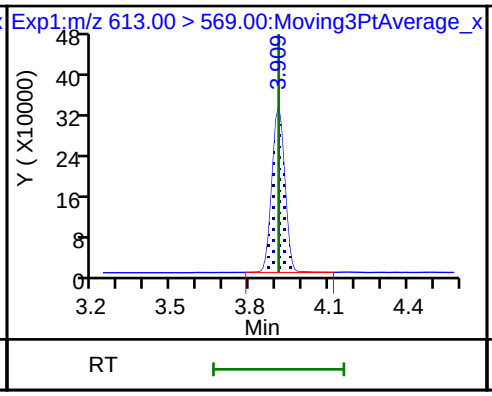
33 N-ethyl perfluorooctane sulfonamid



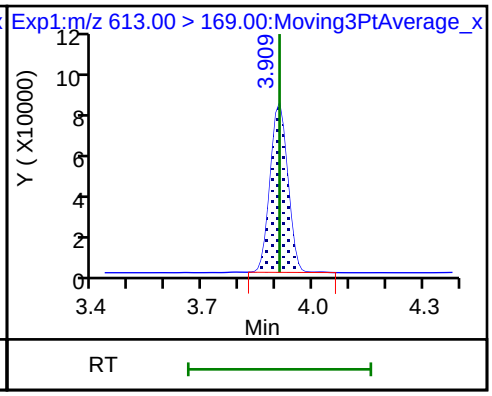
D 36 13C2 PFDoA



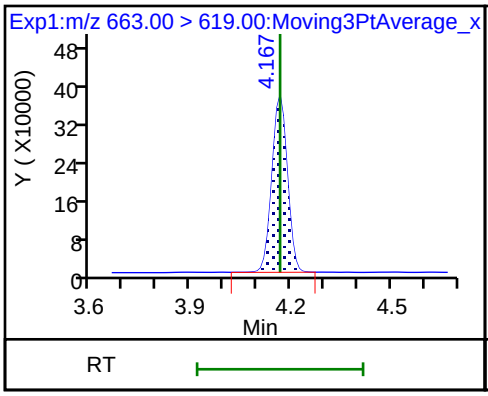
37 Perfluorododecanoic acid



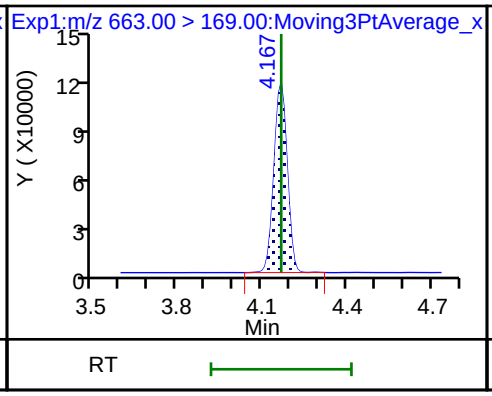
37 Perfluorododecanoic acid



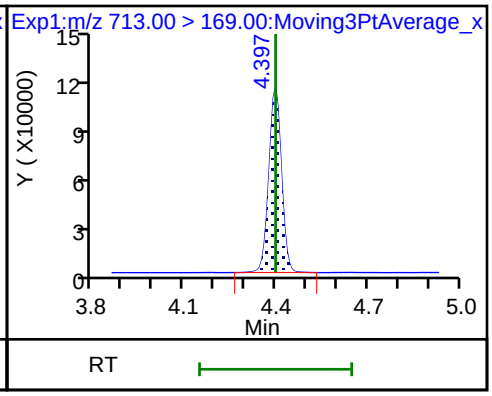
41 Perfluorotridecanoic acid



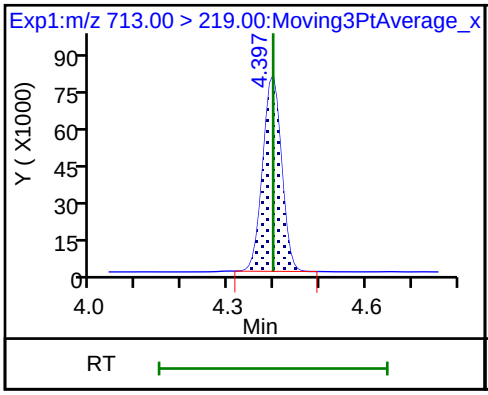
41 Perfluorotridecanoic acid



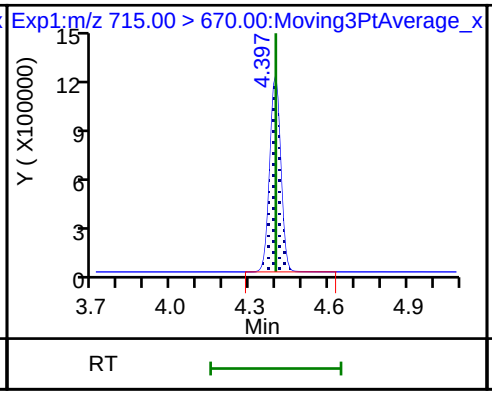
42 Perfluorotetradecanoic acid



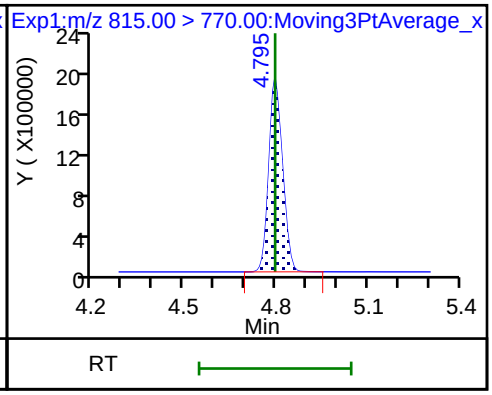
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238576/11 Calibration Date: 08/07/2018 17:45

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9206		2.45	2.50	-1.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.136		2.50	2.50	-0.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	78.53		2.28	2.21	3.4	30.0
4:2 FTS	AveID	16.57	16.87		2.38	2.34	1.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.014		2.48	2.50	-0.6	30.0
Perfluoropentanesulfonic acid	AveID	68.92	70.84		2.41	2.35	2.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.075		2.53	2.50	1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.016		2.13	2.28	-6.2	30.0
6:2 FTS	AveID	1.573	1.509		2.27	2.37	-4.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.083		2.40	2.50	-4.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.271		2.44	2.38	2.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.038		2.46	2.50	-1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.075		2.32	2.32	0.1	30.0
8:2 FTS	AveID	1.299	1.263		2.33	2.40	-2.8	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7750		2.47	2.40	3.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.005		2.50	2.50	0.1	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9736	0.9895		2.54	2.50	1.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9714		2.52	2.50	0.7	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6381		2.43	2.41	1.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8457		2.37	2.50	-5.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.160		2.58	2.50	3.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.063		2.39	2.50	-4.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.041		2.42	2.50	-3.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2409		2.49	2.50	-0.5	30.0
13C4 PFBA	Ave	1.385	1.400		2.53	2.50	1.1	30.0
13C5-PFPeA	Ave	0.9537	0.9614		2.52	2.50	0.8	30.0
13C3-PFBS	Ave	0.0221	0.0221		2.33	2.33	0.3	30.0
13C2 PFHxA	Ave	1.082	1.088		2.51	2.50	0.6	30.0
13C4-PFHpA	Ave	1.065	1.102		2.59	2.50	3.4	30.0
18O2 PFHxS	Ave	1.366	1.394		2.41	2.37	2.1	30.0
M2-6:2FTS	Ave	0.2242	0.2416		2.56	2.38	7.8	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238576/11 Calibration Date: 08/07/2018 17:45

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	1.015		2.60	2.50	3.9	30.0
13C4 PFOS	Ave	0.8973	0.9113		2.43	2.39	1.6	30.0
13C5 PFNA	Ave	0.8770	0.8969		2.56	2.50	2.3	30.0
M2-8:2FTS	Ave	0.2707	0.2850		2.52	2.40	5.3	30.0
13C2 PFDA	Ave	0.7695	0.7998		2.60	2.50	3.9	30.0
13C8 FOSA	Ave	1.188	1.192		2.51	2.50	0.3	30.0
d3-NMeFOSAA	Ave	0.3935	0.4115		2.61	2.50	4.6	30.0
d5-NEtFOSAA	Ave	0.4077	0.4162		2.55	2.50	2.1	30.0
13C2 PFUnA	Ave	0.6189	0.6010		2.43	2.50	-2.9	30.0
13C2 PFDoA	Ave	0.6541	0.6879		2.63	2.50	5.2	30.0
13C2-PFTeDA	Ave	0.8335	0.8325		2.50	2.50	-0.1	30.0
13C2-PFHxDA	Ave	1.653	1.675		2.53	2.50	1.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_028.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 07-Aug-2018 17:45:03 ALS Bottle#: 14 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 13:34:23 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: hannigana Date: 08-Aug-2018 13:33:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.398	-0.007	0.542	5384272	2.53		101	7886	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.401	-0.010	1.000	4956682	2.45		98.1	344	
D 3 13C5-PFPeA										
267.90 > 223.00	1.639	1.643	-0.004	0.639	3698250	2.52		101	8221	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.639	1.646	-0.007	1.000	4201725	2.50		99.9	266	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.670	1.678	-0.008	1.000	5909201	2.28		103	1817	
298.90 > 99.00	1.670	1.678	-0.008	1.000	2387250		2.48(1.25-3.74)		1409	
D 47 13C3-PFBS										
301.90 > 83.00	1.670	1.684	-0.014	0.651	79167	2.33		100	378	
D 60 M2-4:2FTS										
329.00 > 81.00	1.866	1.880	-0.014	0.727	586306	NC			1098	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.875	1.883	-0.008	1.123	1341114	2.38		102	7653	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.907	-0.005	0.741	4186055	2.51		101	11299	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.912	-0.010	1.000	4245377	2.48		99.4	994	
313.00 > 119.00	1.902	1.912	-0.010	1.000	379372		11.19(5.03-15.10)		922	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.923	1.933	-0.010	1.151	5656111	2.41		103	5987	
349.00 > 99.00	1.923	1.933	-0.010	1.151	2060280		2.75(1.36-4.07)		2406	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.996	2.006	-0.010	1.000	763711	NC			366	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.996	2.012	-0.016	0.778	315919	NC			1011	
D 9 13C4-PFHpA										
367.00 > 322.00	2.215	2.227	-0.012	0.863	4237729	2.59		103	8627	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.224	2.232	-0.008	1.004	4555950	2.53		101	893	
363.00 > 169.00	2.224	2.232	-0.008	1.004	1703723		2.67(1.13-3.40)		2105	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.233	2.243	-0.010	1.000	4960625	2.13		93.8	3513	
399.00 > 99.00	2.233	2.243	-0.010	1.000	1697191		2.92(1.50-4.49)		1526	
D 11 18O2 PFHxS										
403.00 > 84.00	2.233	2.247	-0.014	0.870	5073871	2.41		102	4141	
65 ADONA										
377.00 > 251.00	2.266	2.277	-0.010	0.774	11891189	NC			12425	
377.00 > 85.00	2.266	2.277	-0.010	0.774	7317416		1.63(0.84-2.53)		5465	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.541	2.549	-0.008	1.000	1329601	2.27		95.9	2130	
D 12 M2-6:2FTS										
429.00 > 81.00	2.541	2.552	-0.011	0.990	882851	2.56		108	2168	
D 73 13C8 PFOA										
421.00 > 376.00	2.557	2.568	-0.011	0.997	7319105	NC			11761	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.566	2.572	-0.006	1.000	4234344	2.40		95.8	368	
413.00 > 169.00	2.566	2.572	-0.006	1.000	2140735		1.98(0.84-2.52)		3248	
* 62 13C2-PFOA										
415.00 > 370.00	2.566	2.572	-0.006		3846870	2.50			5577	
D 14 13C4 PFOA										
417.00 > 372.00	2.566	2.574	-0.008	1.000	3904864	2.60		104	6030	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.572	2.579	-0.007	0.879	4242909	2.44		103	4140	
449.00 > 99.00	2.572	2.579	-0.007	0.879	1109932		3.82(1.94-5.82)		1695	
D 19 13C5 PFNA										
468.00 > 423.00	2.927	2.935	-0.008	1.141	3450336	2.56		102	6337	
D 18 13C4 PFOS										
503.00 > 80.00	2.927	2.935	-0.008	1.141	3351231	2.43		102	3959	
D 72 13C8 PFOS										
507.00 > 99.00	2.927	2.935	-0.008	1.141	1659135	NC			4172	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.927	2.938	-0.011	1.000	3497413	2.32		100	1840	
499.00 > 99.00	2.927	2.938	-0.011	1.000	781212		4.48(2.31-6.93)		1322	
20 Perfluorononanoic acid										
463.00 > 419.00	2.927	2.938	-0.011	1.000	3580487	2.46		98.5	1046	
463.00 > 169.00	2.927	2.938	-0.011	1.000	866418		4.13(1.90-5.69)		4297	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.138	3.146	-0.008	1.072	5850216	NC			4175	
D 26 M2-8:2FTS										
529.00 > 81.00	3.271	3.275	-0.004	1.275	1050325	2.52		105	3894	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.271	3.283	-0.012	1.000	1326757	2.33		97.2	3184	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.271	3.283	-0.012	1.117	2607887	2.47		103	4427	
549.00 > 99.00	3.271	3.283	-0.012	1.117	938764		2.78(1.33-3.97)		1877	
D 23 13C2 PFDA										
515.00 > 470.00	3.284	3.289	-0.005	1.280	3076840	2.60		104	5776	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.284	3.290	-0.006	1.000	3090880	2.50		100	1657	
513.00 > 169.00	3.284	3.290	-0.006	1.000	522757		5.91(2.36-7.09)		329	
D 21 13C8 FOSA										
506.00 > 78.00	3.305	3.318	-0.013	1.288	4585059	2.51		100	6100	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.312	3.319	-0.007	1.002	4537052	2.54		102	4461	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.438	3.443	-0.005	1.340	1582862	2.61		105	3137	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.445	3.452	-0.007	1.002	1537661	2.52		101	1272	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.596	3.604	-0.008	1.228	2156253	2.43		101	4445	
599.00 > 99.00	3.596	3.604	-0.008	1.228	722124		2.99(1.39-4.16)		4085	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.604	3.611	-0.007	1.405	1601044	2.55		102	1387	
D 30 13C2 PFUnA										
565.00 > 520.00	3.613	3.618	-0.005	1.408	2311819	2.43		97.1	4442	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.613	3.619	-0.006	1.000	2680983	2.58		103	1474	
563.00 > 169.00	3.613	3.619	-0.006	1.000	455610		5.88(2.12-6.36)		1762	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.613	3.619	-0.006	1.002	1354060	2.37		94.8	1930	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.767	3.774	-0.007	1.287	9374807	NC			8351	
35 MeFOSA										
512.00 > 169.00	3.816	3.823	-0.007		1310794	NC			1206	
D 36 13C2 PFDoA										
615.00 > 570.00	3.899	3.908	-0.009	1.520	2646365	2.63		105	4930	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.899	3.909	-0.010	1.192	1017551	NC			4491	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.899	3.909	-0.010	1.000	2813549	2.39		95.5	1409	
613.00 > 169.00	3.899	3.909	-0.010	1.000	651268		4.32(2.13-6.40)		2508	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.139	4.138	0.001	1.414	961448	NC			2882	
699.00 > 99.00	4.139	4.138	0.001	1.414	1359418		0.71(0.00-0.00)		3960	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.168	4.167	0.001	1.069	2753879	2.42		96.8	1009	
663.00 > 169.00	4.158	4.167	-0.009	1.066	824709		3.34(1.25-3.76)		2463	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.390	4.397	-0.007	1.000	771292	2.49		99.5	4999	
713.00 > 219.00	4.390	4.397	-0.007	1.000	557529		1.38(0.71-2.13)		2175	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.390	4.398	-0.008	1.711	3202341	2.50		99.9	5032	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.796	4.795	0.001	1.001	5808858	NC			1876	
813.00 > 169.00	4.796	4.795	0.001	1.001	1002379		5.80(2.86-8.58)		5209	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.789	4.796	-0.007	1.867	6444978	2.53		101	8611	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.126	5.132	-0.006	1.070	6330768	NC			1634	
913.00 > 169.00	5.126	5.132	-0.006	1.070	768574		8.24(3.83-11.48)		3301	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00006 Amount Added: 1.00 Units: mL

Report Date: 08-Aug-2018 13:34:24 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62308.b\2018.08.07LLBB_028.d

Injection Date: 07-Aug-2018 17:45:03 Instrument ID: A8_N

Lims ID: CCV L5

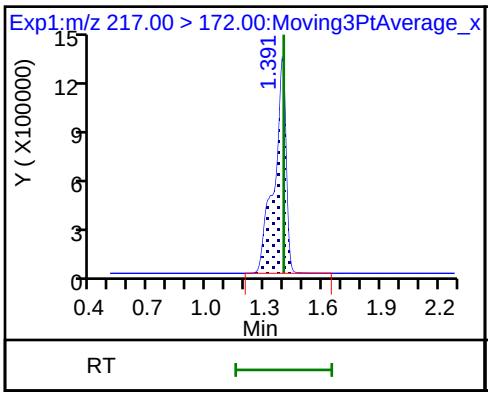
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 11

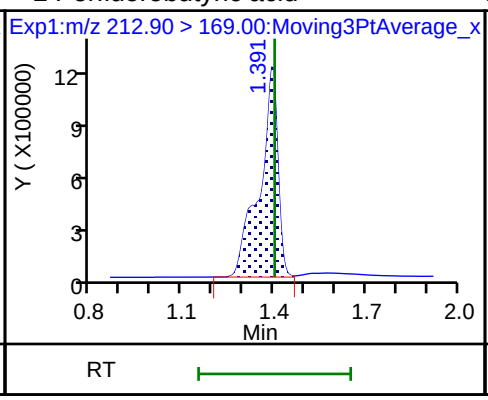
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

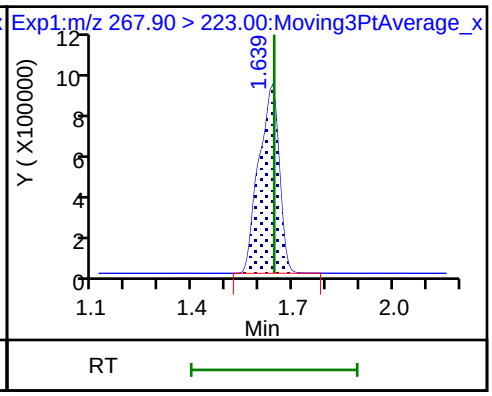
D 1 13C4 PFBA



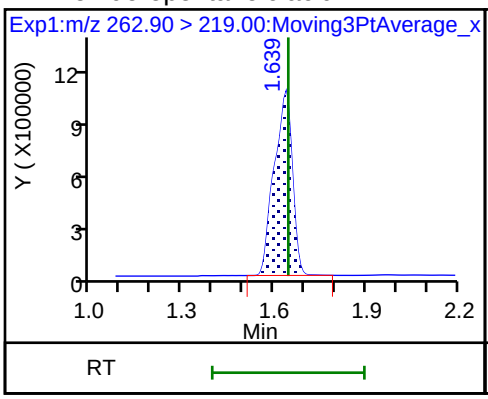
2 Perfluorobutyric acid



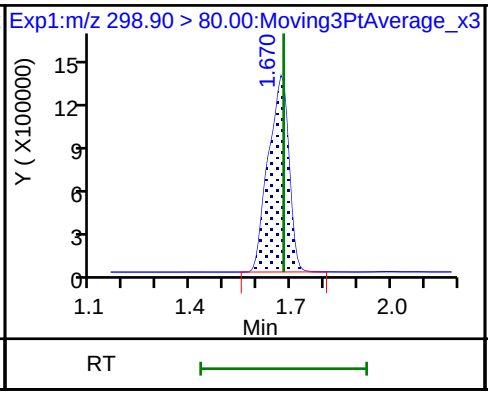
D 3 13C5-PFPeA



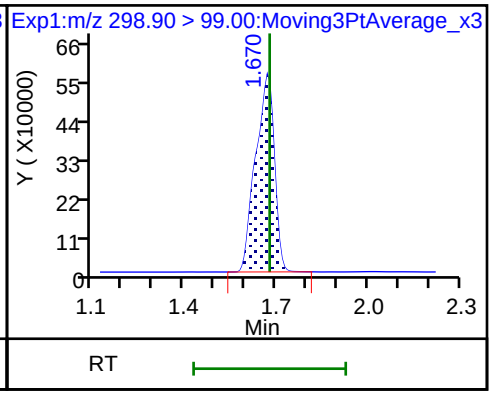
4 Perfluoropentanoic acid



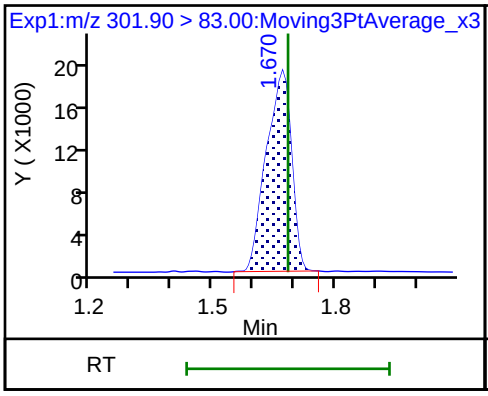
5 Perfluorobutanesulfonic acid



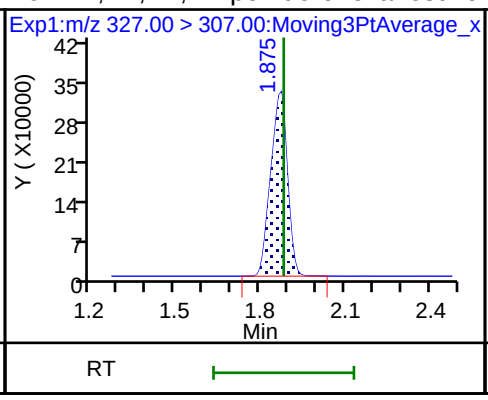
5 Perfluorobutanesulfonic acid



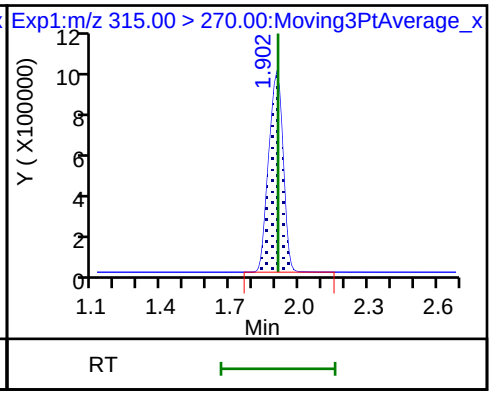
D 47 13C3-PFBS



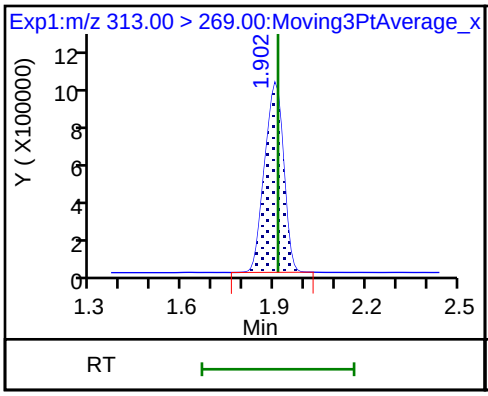
61 1H,1H,2H,2H-perfluorohexanesulfon



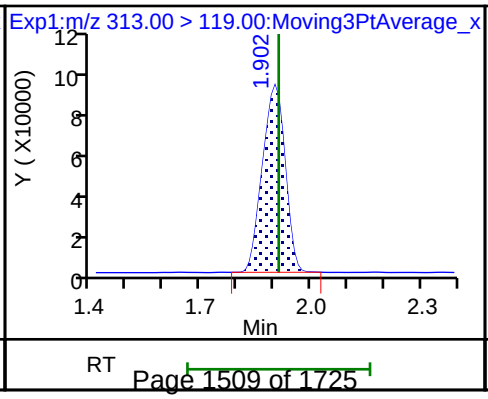
D 7 13C2 PFHxA



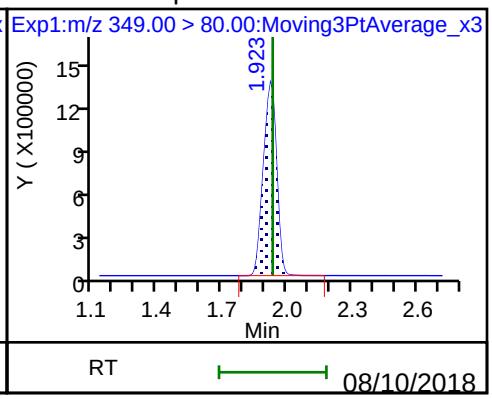
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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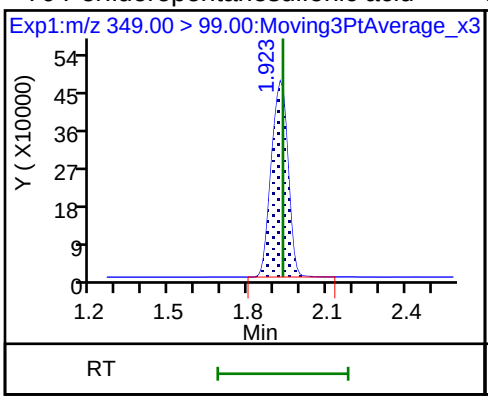
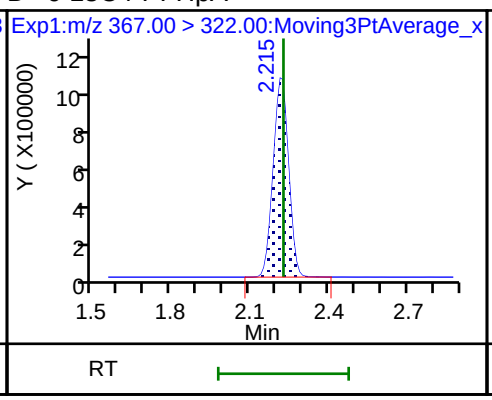
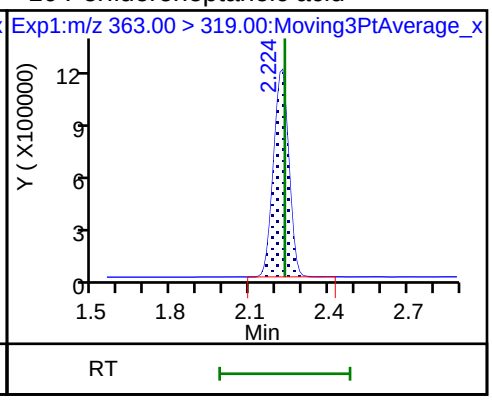


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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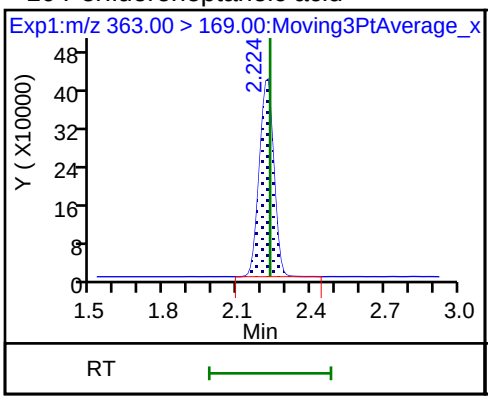
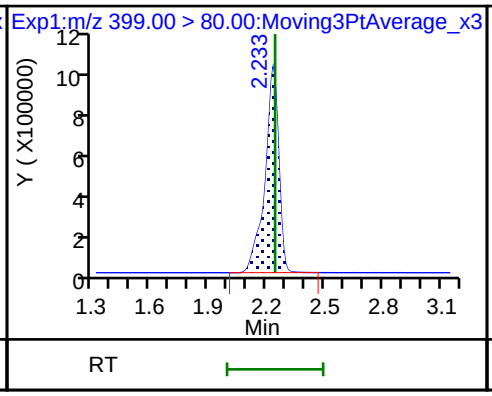


8 Perfluorohexanesulfonic acid



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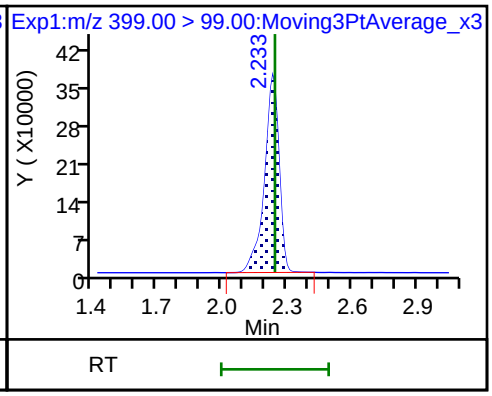
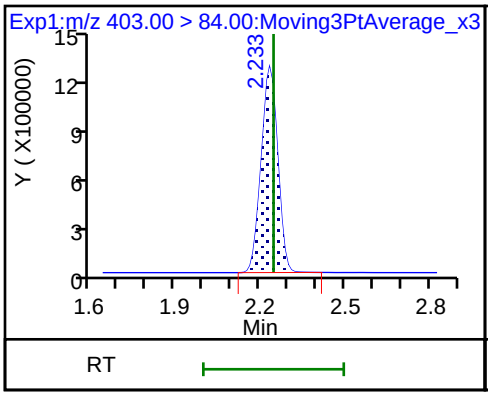
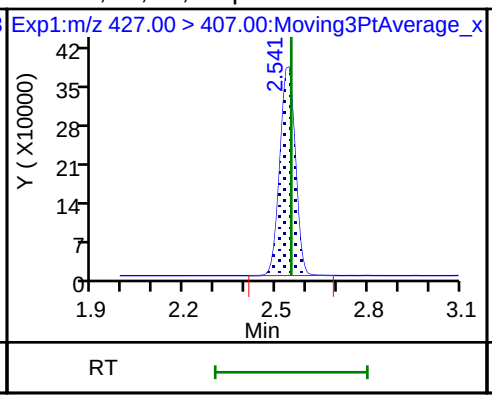


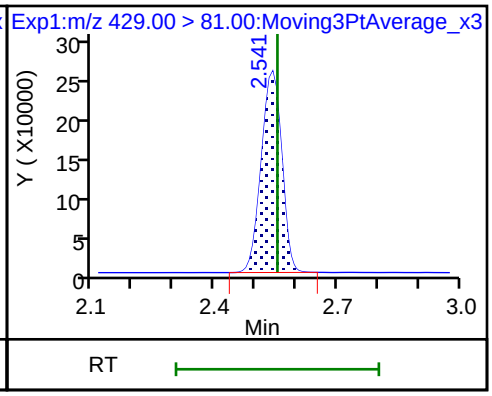
D 11 18O2 PFHxS



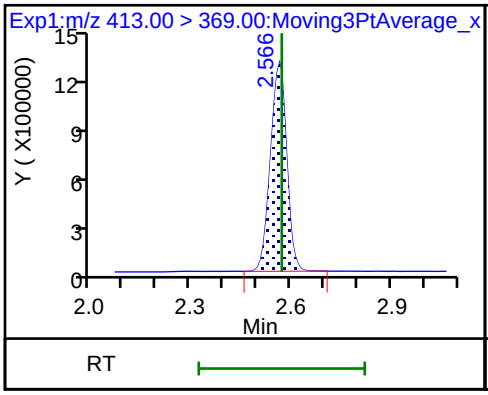
13 1H,1H,2H,2H-perfluorooctanesulfon



D 12 M2-6:2FTS



15 Perfluorooctanoic acid



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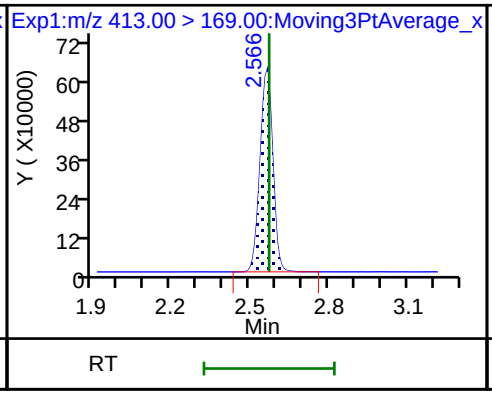
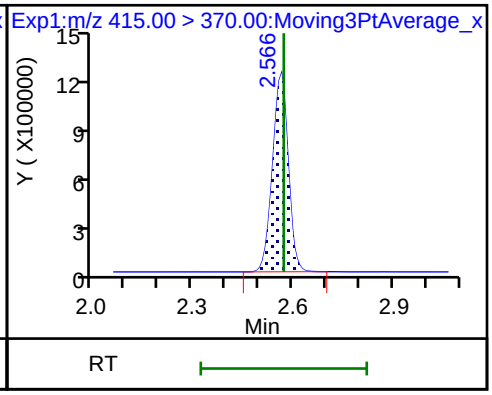
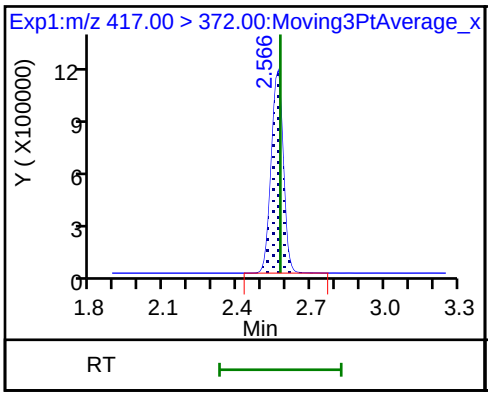


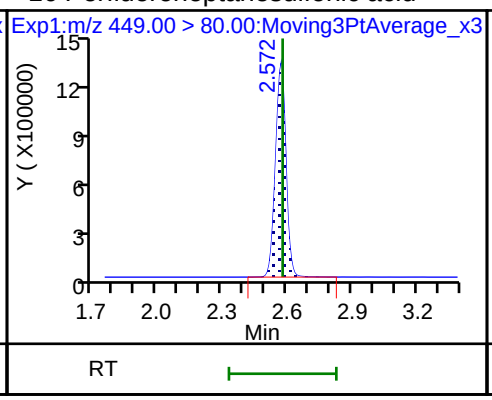
* 62 13C2-PFOA



D 14 13C4 PFOA



16 Perfluoroheptanesulfonic acid



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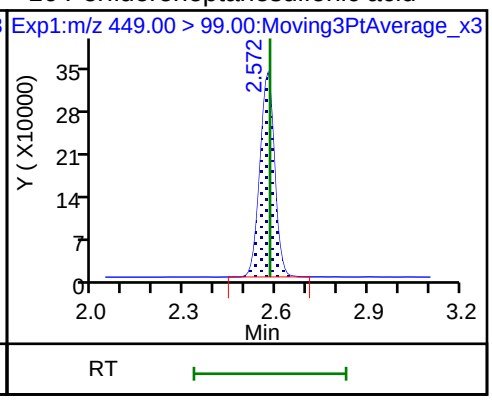
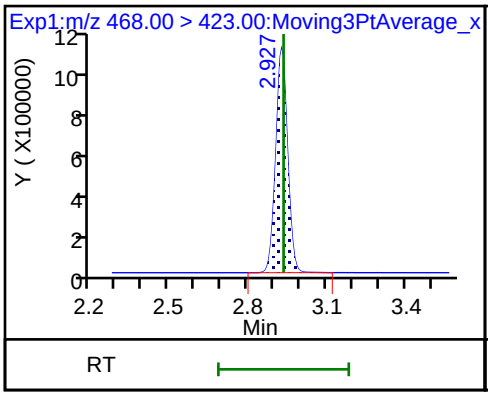
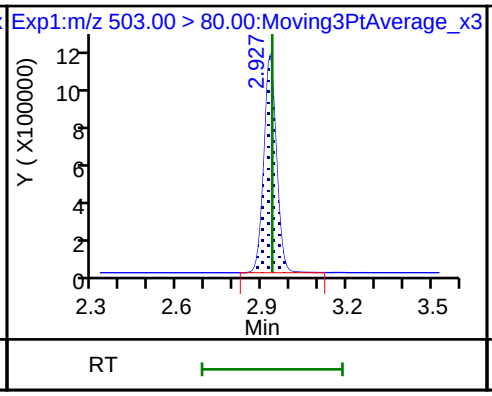


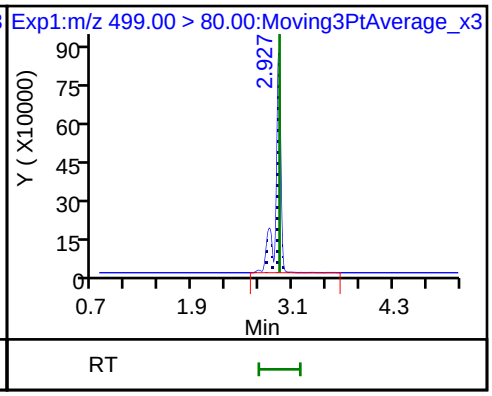
D 19 13C5 PFNA



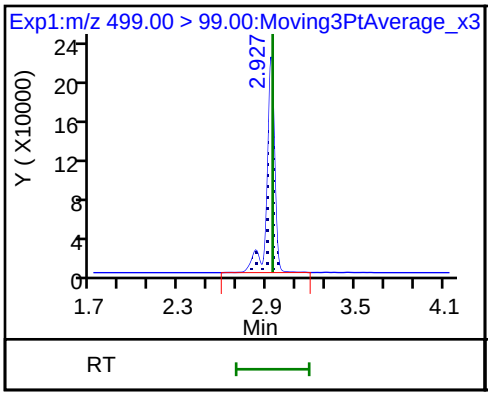
D 18 13C4 PFOS



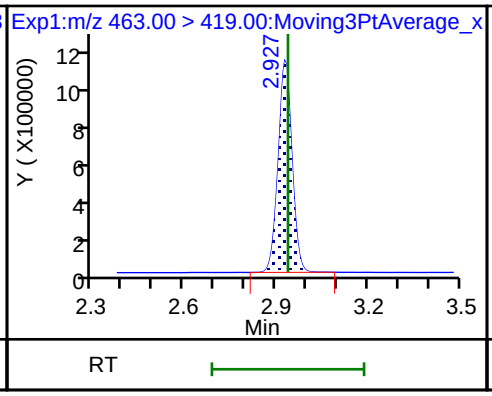
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid



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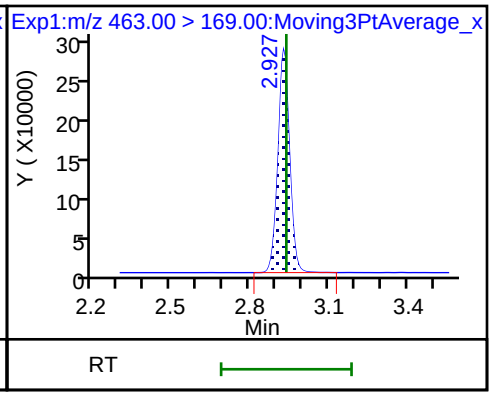
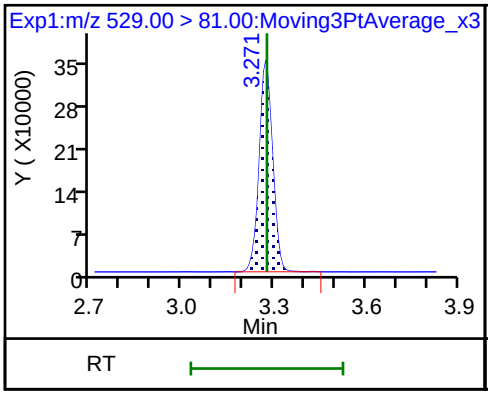
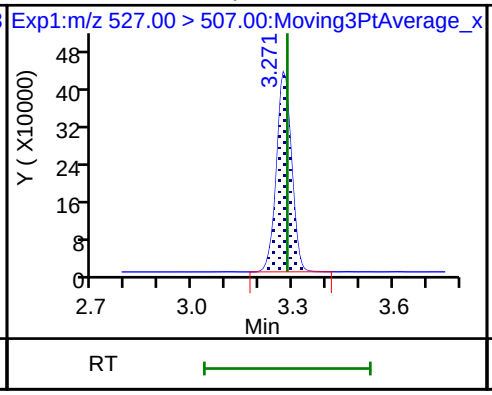


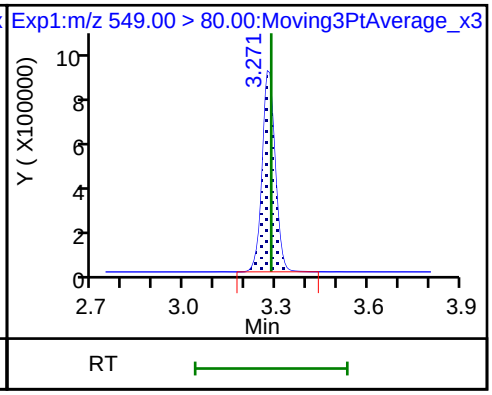
D 26 M2-8:2FTS



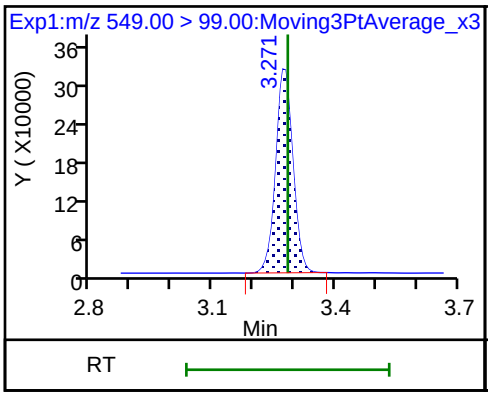
25 1H,1H,2H,2H-perfluorodecanesulfoni



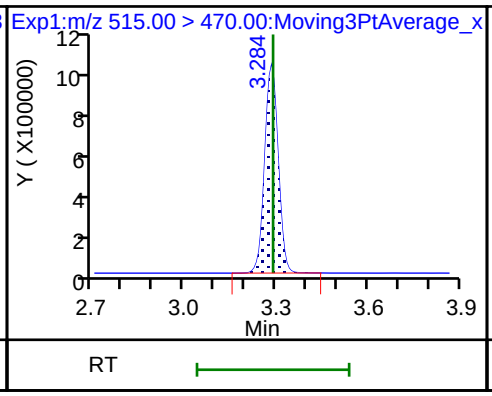
68 Perfluorononanesulfonic acid



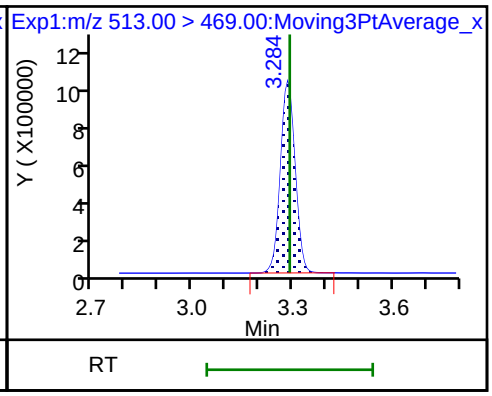
68 Perfluorononanesulfonic acid



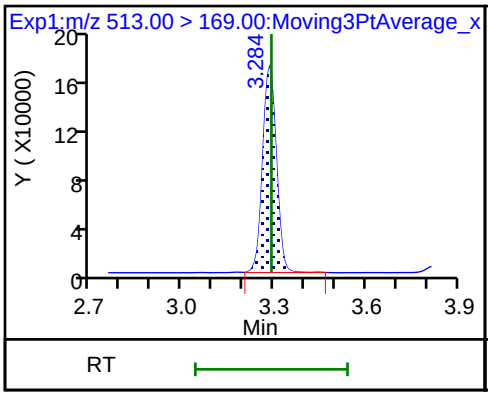
D 23 13C2 PFDA



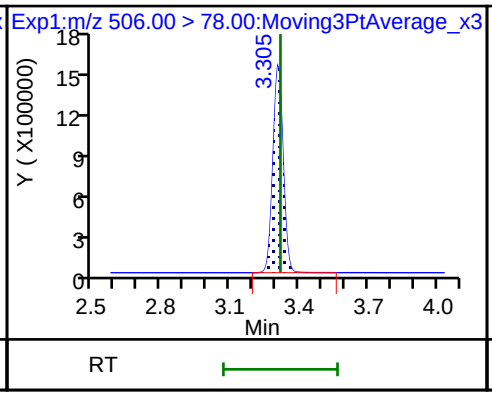
24 Perfluorodecanoic acid



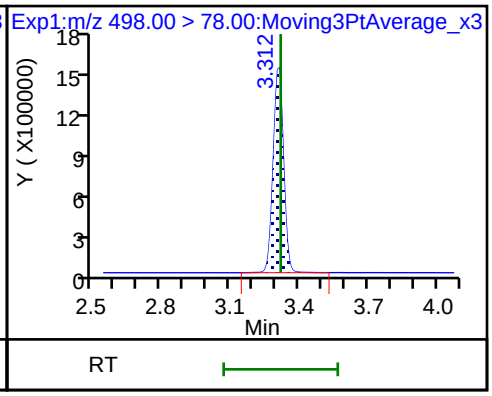
24 Perfluorodecanoic acid



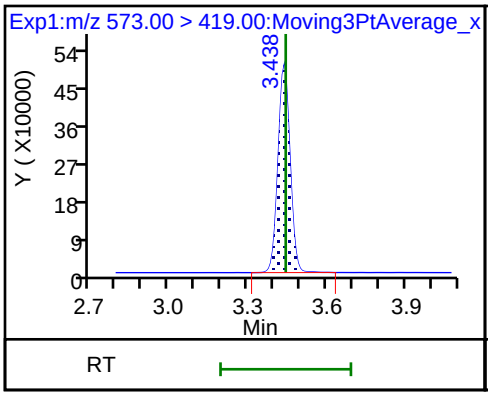
D 21 13C8 FOSA



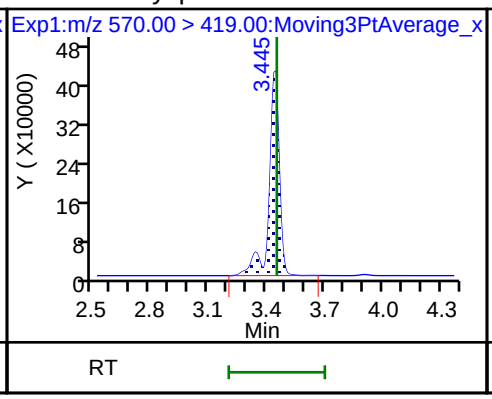
22 Perfluorooctane Sulfonamide



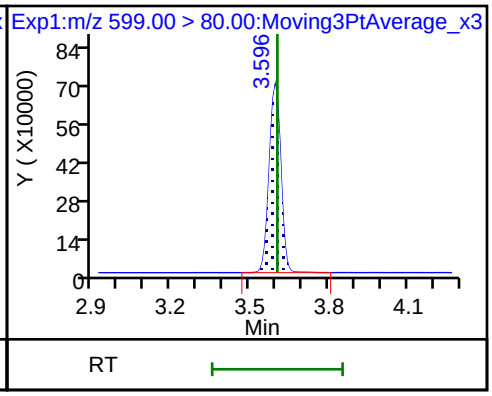
D 27 d3-NMeFOSAA



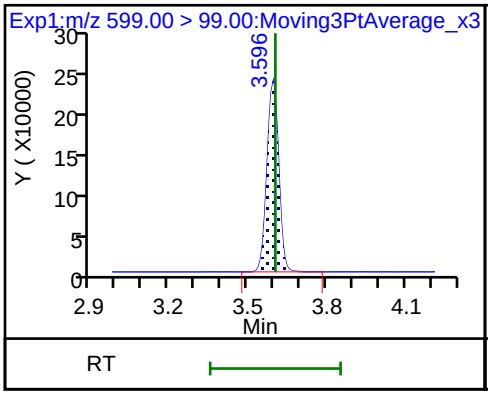
28 N-methyl perfluorooctane sulfonami



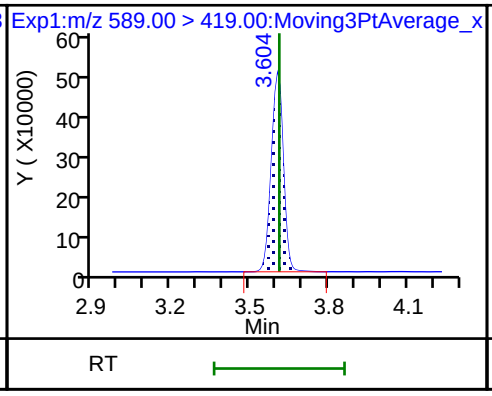
29 Perfluorodecane Sulfonic acid



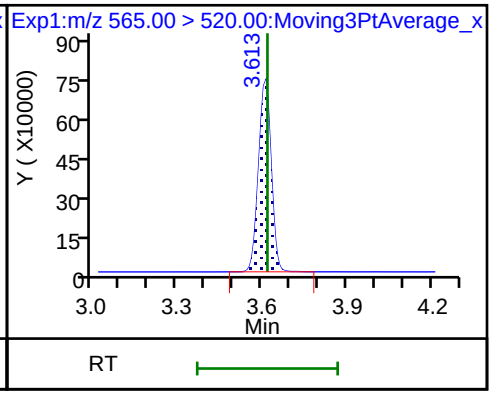
29 Perfluorodecane Sulfonic acid



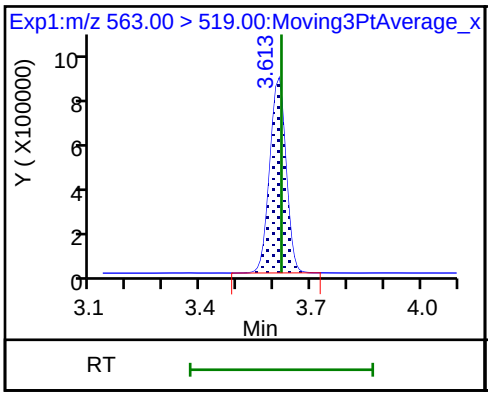
D 32 d5-NEtFOSAA



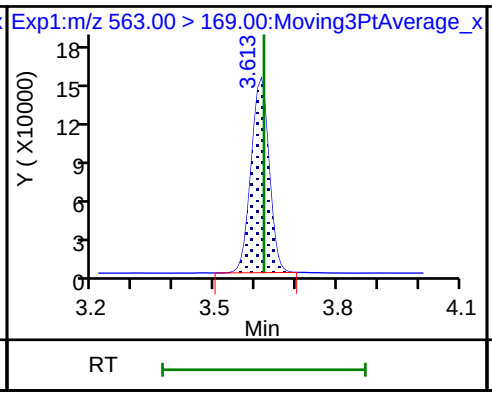
D 30 13C2 PFUnA



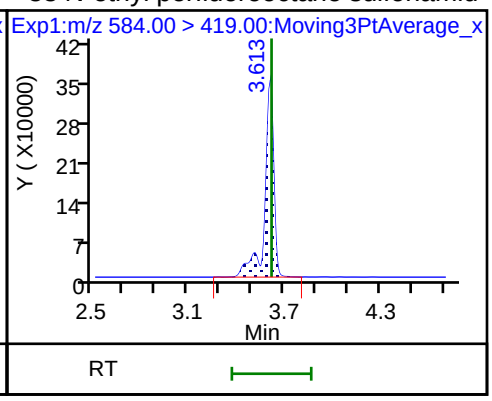
31 Perfluoroundecanoic acid



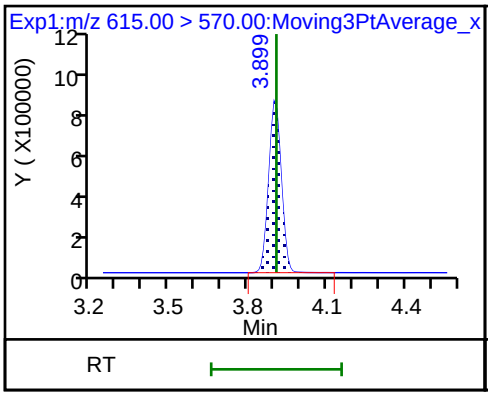
31 Perfluoroundecanoic acid



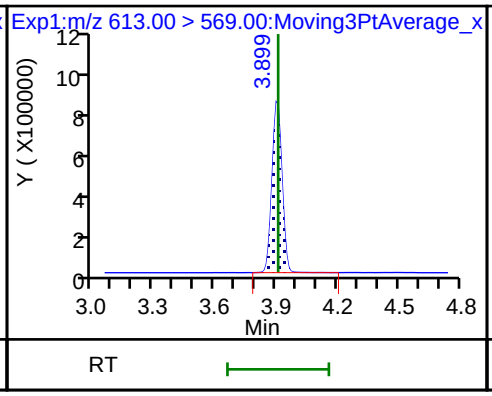
33 N-ethyl perfluorooctane sulfonamid



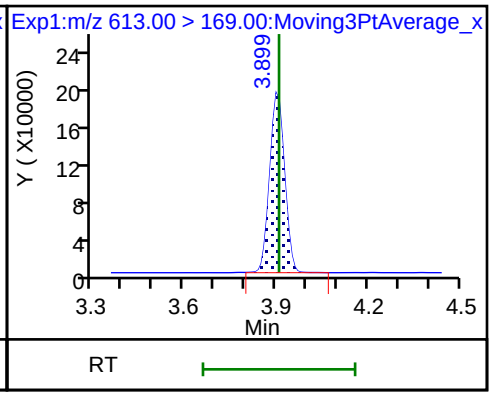
D 36 13C2 PFDoA



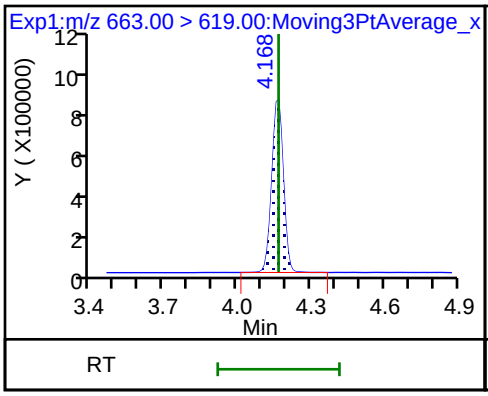
37 Perfluorododecanoic acid



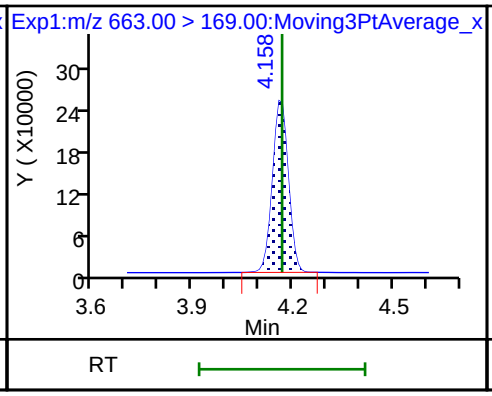
37 Perfluorododecanoic acid



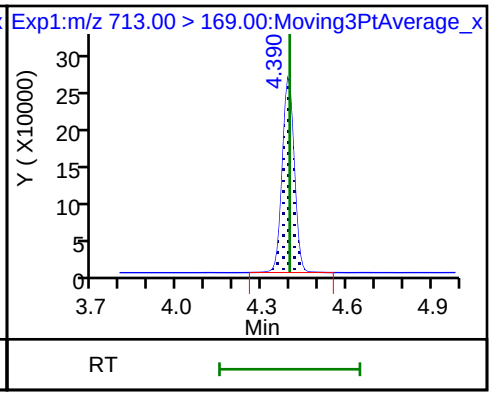
41 Perfluorotridecanoic acid



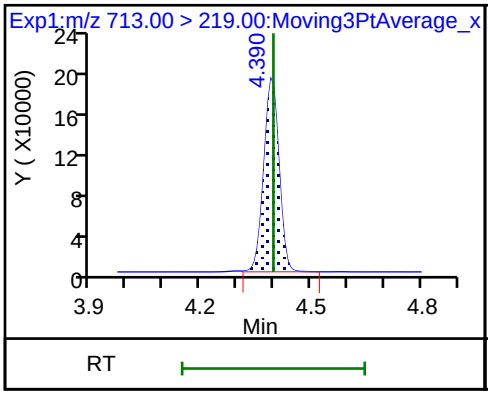
41 Perfluorotridecanoic acid



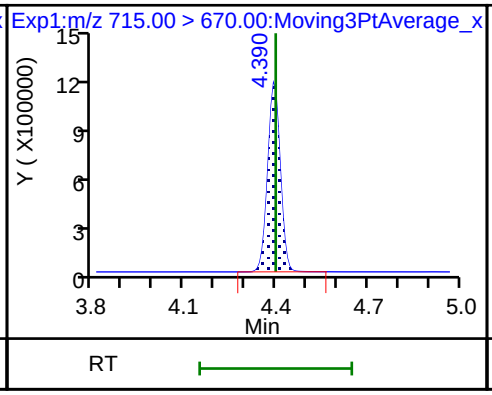
42 Perfluorotetradecanoic acid



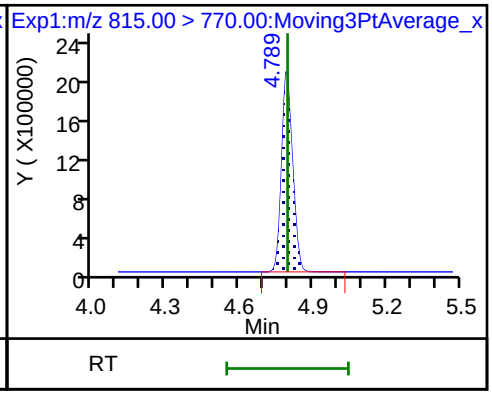
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238595/1 Calibration Date: 08/07/2018 22:42

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9322		2.48	2.50	-0.7	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.097		2.41	2.50	-3.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	80.92		2.35	2.21	6.5	30.0
4:2 FTS	AveID	16.57	17.77		2.50	2.34	7.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9578		2.35	2.50	-6.2	30.0
Perfluoropentanesulfonic acid	AveID	68.92	73.55		2.50	2.35	6.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.060		2.49	2.50	-0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.048		2.20	2.28	-3.3	30.0
6:2 FTS	AveID	1.573	1.525		2.30	2.37	-3.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.103		2.44	2.50	-2.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.324		2.54	2.38	6.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.094		2.60	2.50	3.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.074		2.32	2.32	-0.0	30.0
8:2 FTS	AveID	1.299	1.297		2.39	2.40	-0.2	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7444		2.38	2.40	-1.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9721		2.42	2.50	-3.1	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9736	1.021		2.62	2.50	4.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9681		2.51	2.50	0.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6632		2.53	2.41	4.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8324		2.33	2.50	-6.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.080		2.40	2.50	-3.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.044		2.35	2.50	-6.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.103		2.56	2.50	2.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2392		2.47	2.50	-1.2	30.0
13C4 PFBA	Ave	1.385	1.329		2.40	2.50	-4.0	30.0
13C5-PFPeA	Ave	0.9537	0.9637		2.53	2.50	1.1	30.0
13C3-PFBS	Ave	0.0221	0.0207		2.18	2.33	-6.2	30.0
13C2 PFHxA	Ave	1.082	1.101		2.54	2.50	1.7	30.0
13C4-PFHpA	Ave	1.065	1.060		2.49	2.50	-0.4	30.0
18O2 PFHxS	Ave	1.366	1.321		2.29	2.37	-3.3	30.0
M2-6:2FTS	Ave	0.2242	0.2362		2.50	2.38	5.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238595/1 Calibration Date: 08/07/2018 22:42

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9702		2.48	2.50	-0.7	30.0
13C4 PFOS	Ave	0.8973	0.8827		2.35	2.39	-1.6	30.0
13C5 PFNA	Ave	0.8770	0.8578		2.45	2.50	-2.2	30.0
M2-8:2FTS	Ave	0.2707	0.2672		2.36	2.40	-1.3	30.0
13C2 PFDA	Ave	0.7695	0.7763		2.52	2.50	0.9	30.0
13C8 FOSA	Ave	1.188	1.151		2.42	2.50	-3.2	30.0
d3-NMeFOSAA	Ave	0.3935	0.4032		2.56	2.50	2.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.4320		2.65	2.50	6.0	30.0
13C2 PFUnA	Ave	0.6189	0.6379		2.58	2.50	3.1	30.0
13C2 PFDoA	Ave	0.6541	0.6629		2.53	2.50	1.3	30.0
13C2-PFTeDA	Ave	0.8335	0.8649		2.59	2.50	3.8	30.0
13C2-PFHxDA	Ave	1.653	1.720		2.60	2.50	4.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_066.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 07-Aug-2018 22:42:38 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 12:26:14 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: hannigana Date: 08-Aug-2018 12:22:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.396	0.0	0.543	4844639	2.40		96.0	8549	
2 Perfluorobutyric acid										
212.90 > 169.00	1.396	1.396	0.0	1.000	4516186	2.48		99.3	337	
D 3 13C5-PFPeA										
267.90 > 223.00	1.638	1.638	0.0	0.637	3512900	2.53		101	8517	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.646	1.646	0.0	1.005	3853956	2.41		96.4	240	
D 47 13C3-PFBS										
301.90 > 83.00	1.678	1.678	0.0	0.652	70163	2.18		93.8	389	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.678	1.678	0.0	1.000	5397037	2.35		107	1703	
298.90 > 99.00	1.678	1.678	0.0	1.000	2256083		2.39(1.25-3.74)		1279	
D 60 M2-4:2FTS										
329.00 > 81.00	1.874	1.874	0.0	0.729	540299	NC			859	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.874	1.875	-0.001	1.117	1252354	2.50		107	10625	
D 7 13C2 PFHxA										
315.00 > 270.00	1.912	1.912	0.0	0.743	4012839	2.54		102	8824	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.912	1.912	0.0	1.000	3843585	2.35		93.8	917	
313.00 > 119.00	1.912	1.912	0.0	1.000	350495		10.97(5.03-15.10)		704	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.933	1.933	0.0	1.152	5204685	2.50		107	6380	
349.00 > 99.00	1.933	1.933	0.0	1.152	1917064		2.71(1.36-4.07)		2370	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.006	2.006	0.0	0.780	286996	NC			808	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.006	2.006	0.0	1.000	709041	NC			329	
D 9 13C4-PFHpA										
367.00 > 322.00	2.232	2.223	0.009	0.868	3865372	2.49		99.6	7749	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.232	2.223	0.009	1.000	4095682	2.49		99.8	776	
363.00 > 169.00	2.232	2.223	0.009	1.000	1607922		2.55(1.13-3.40)		2313	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.243	0.0	0.872	4555148	2.29		96.7	5864	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	4593412	2.20		96.7	3426	
399.00 > 99.00	2.243	2.243	0.0	1.000	1563500		2.94(1.50-4.49)		1418	
65 ADONA										
377.00 > 251.00	2.276	2.277	-0.001	0.773	11390208	NC			8786	
377.00 > 85.00	2.276	2.277	-0.001	0.773	6636038		1.72(0.84-2.53)		5924	
D 12 M2-6:2FTS										
429.00 > 81.00	2.549	2.549	0.0	0.991	817918	2.50		105	1905	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.549	2.549	0.0	1.000	1244908	2.30		96.9	2430	
D 73 13C8 PFOA										
421.00 > 376.00	2.572	2.572	0.0	1.000	6856547	NC			10945	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.572	0.007	1.003	3536381	2.48		99.3	7158	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.572	0.0		3645178	2.50			7573	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	3905977	2.44		97.6	362	
413.00 > 169.00	2.579	2.579	0.0	1.000	2028329		1.93(0.84-2.52)		2626	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.586	2.586	0.0	0.878	4054458	2.54		107	3187	
449.00 > 99.00	2.586	2.586	0.0	0.878	1060966		3.82(1.94-5.82)		1808	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.938	0.005	1.144	3126946	2.45		97.8	5312	
D 72 13C8 PFOS										
507.00 > 99.00	2.938	2.938	0.0	1.142	1533947	NC			3834	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.938	0.005	1.144	3076054	2.35		98.4	4083	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.943	2.944	-0.001	1.000	3205538	2.32		100.0	1855	
499.00 > 99.00	2.943	2.944	-0.001	1.000	730961		4.39(2.31-6.93)		1235	
20 Perfluorononanoic acid										
463.00 > 419.00	2.943	2.944	-0.001	1.000	3420004	2.60		104	1053	
463.00 > 169.00	2.943	2.944	-0.001	1.000	785429		4.35(1.90-5.69)		3205	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.154	3.154	0.0	1.071	5382140	NC			4751	
D 26 M2-8:2FTS										
529.00 > 81.00	3.283	3.283	0.0	1.276	933234	2.36		98.7	2764	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.283	3.290	-0.007	1.000	1210232	2.39		99.8	3259	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.290	3.290	0.0	1.118	2299491	2.38		99.0	2754	
549.00 > 99.00	3.290	3.290	0.0	1.118	842538		2.73(1.33-3.97)		2508	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.297	3.297	0.0	1.000	2750723	2.42		96.9	1593	
513.00 > 169.00	3.297	3.297	0.0	1.000	490161		5.61(2.36-7.09)		378	
D 23 13C2 PFDA										
515.00 > 470.00	3.297	3.298	-0.001	1.282	2829759	2.52		101	7171	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.319	0.0	1.000	4285470	2.62		105	5478	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.319	0.0	1.290	4195595	2.42		96.8	5622	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.452	3.452	0.0	1.342	1469563	2.56		102	3257	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.452	3.459	-0.007	1.000	1422749	2.51		100	1060	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.603	3.612	-0.009	1.224	2057212	2.53		105	4385	
599.00 > 99.00	3.603	3.612	-0.009	1.224	638243		3.22(1.39-4.16)		2849	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.612	3.620	-0.008	1.404	1574668	2.65		106	1464	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.619	3.626	-0.007	1.000	2511997	2.40		96.1	1482	
563.00 > 169.00	3.619	3.626	-0.007	1.000	441004		5.70(2.12-6.36)		2614	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.619	3.626	-0.007	1.002	1310734	2.33		93.3	2247	
D 30 13C2 PFUnA										
565.00 > 520.00	3.619	3.627	-0.007	1.407	2325377	2.58		103	4447	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.782	3.783	-0.001	1.285	8779453	NC			8765	
35 MeFOSA										
512.00 > 169.00	3.823	3.832	-0.009		1240958	NC			1185	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.908	3.919	-0.011	1.000	2523709	2.35		93.9	1086	
613.00 > 169.00	3.908	3.919	-0.011	1.000	587670		4.29(2.13-6.40)		2383	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.908	3.919	-0.011	1.191	926998	NC			3502	
D 36 13C2 PFDoA										
615.00 > 570.00	3.908	3.919	-0.011	1.520	2416481	2.53		101	3778	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.148	4.158	-0.010	1.409	879182	NC			1040	
699.00 > 99.00	4.148	4.158	-0.010	1.409	1231196		0.71(0.00-0.00)		3706	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.177	4.177	0.0	1.069	2665683	2.56		103	1129	
663.00 > 169.00	4.177	4.177	0.0	1.069	846432		3.15(1.25-3.76)		2857	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.405	4.405	0.0	1.713	3152640	2.59		104	5585	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.405	4.413	-0.008	1.000	754093	2.47		98.8	4518	
713.00 > 219.00	4.405	4.413	-0.008	1.000	542163		1.39(0.71-2.13)		3641	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.803	4.803	0.0	1.867	6269272	2.60		104	7585	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.803	4.814	-0.011	1.000	5586725	NC			1899	
813.00 > 169.00	4.803	4.814	-0.011	1.000	941473		5.93(2.86-8.58)		3478	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.139	5.146	-0.007	1.070	5908326	NC			1109	
913.00 > 169.00	5.139	5.146	-0.007	1.070	716657		8.24(3.83-11.48)		2771	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00006 Amount Added: 1.00 Units: mL

Report Date: 08-Aug-2018 12:26:15 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_066.d

Injection Date: 07-Aug-2018 22:42:38 Instrument ID: A8_N

Lims ID: CCV L5

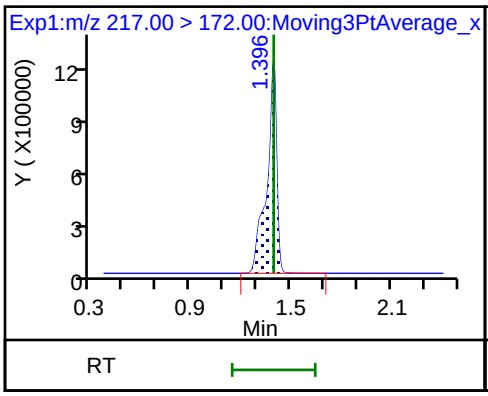
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 1

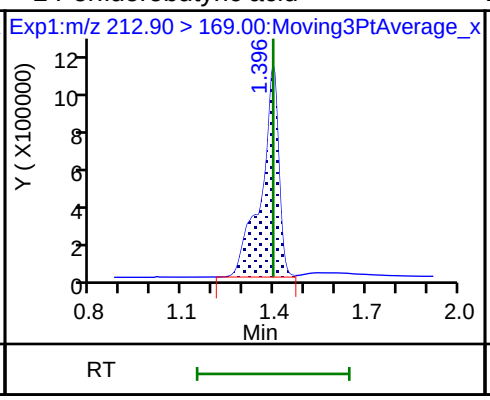
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

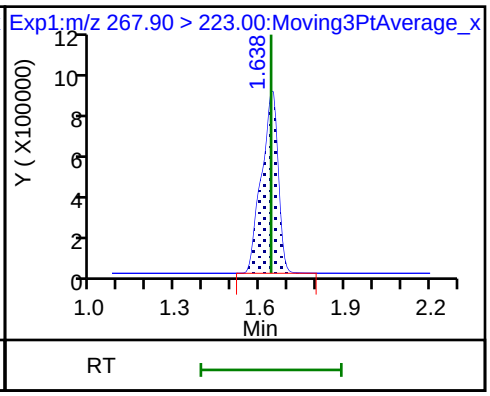
D 1 13C4 PFBA



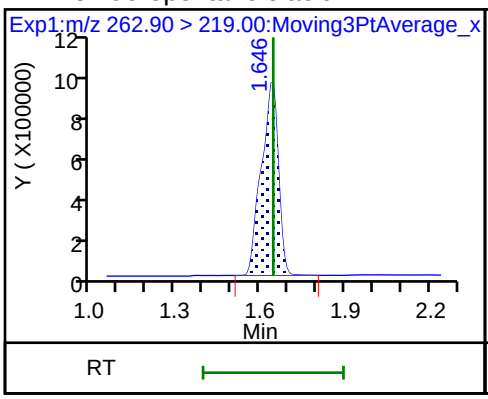
2 Perfluorobutyric acid



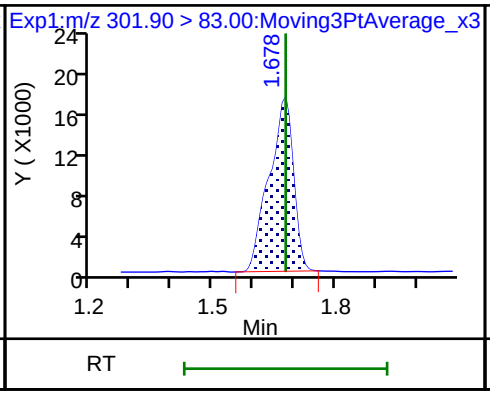
D 3 13C5-PFPeA



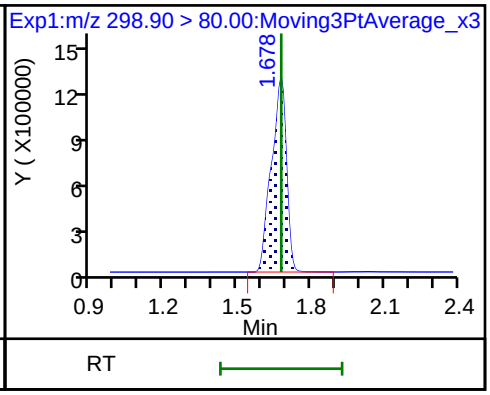
4 Perfluoropentanoic acid



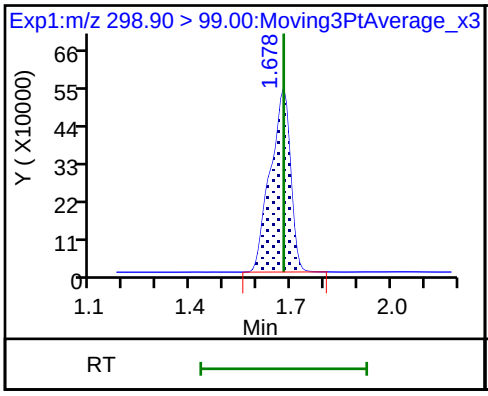
D 47 13C3-PFBS



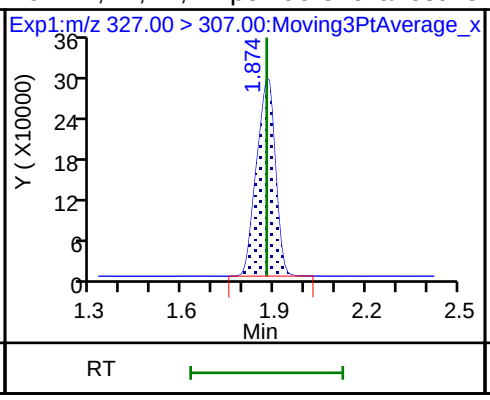
5 Perfluorobutanesulfonic acid



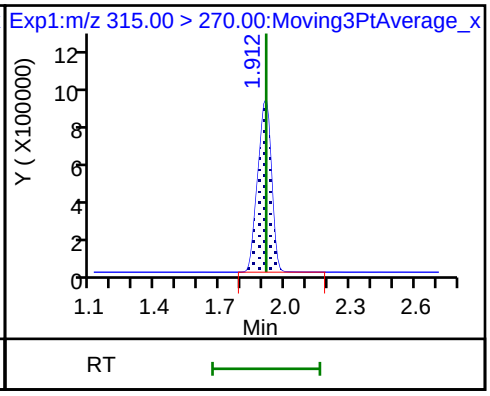
5 Perfluorobutanesulfonic acid



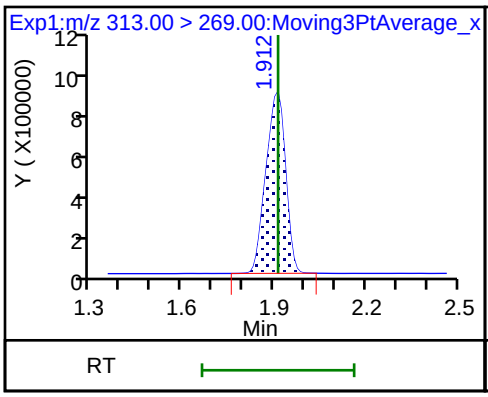
61 1H,1H,2H,2H-perfluorohexanesulfon



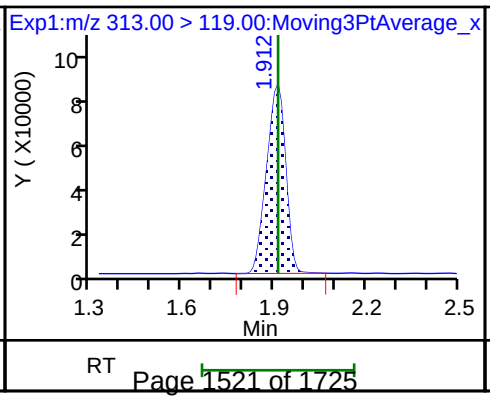
D 7 13C2 PFHxA



6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



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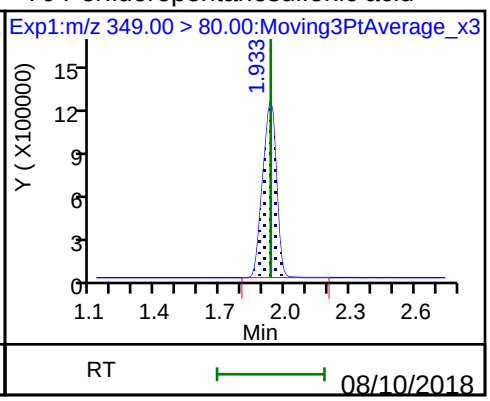

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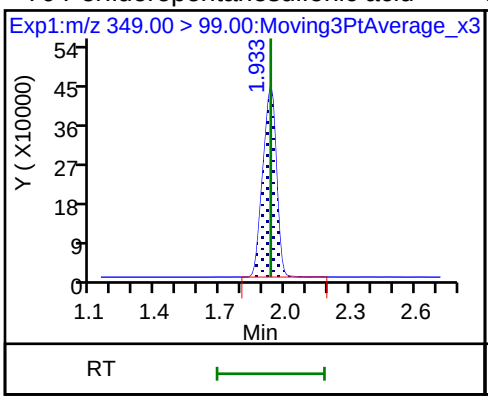
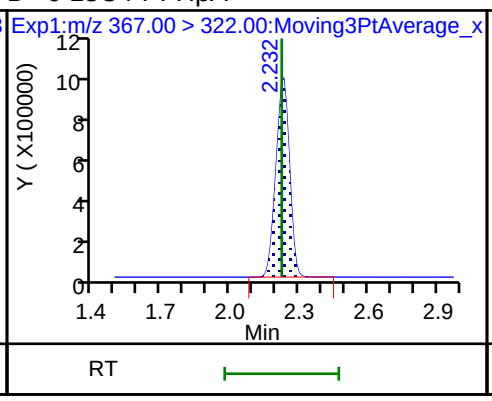
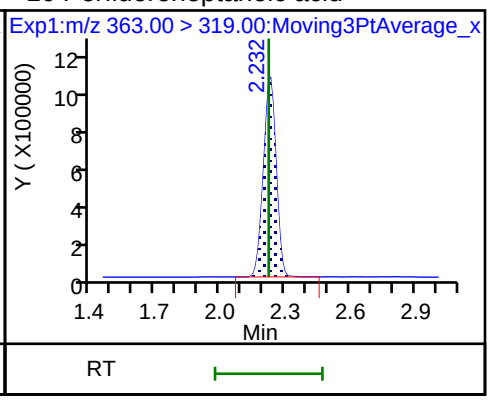


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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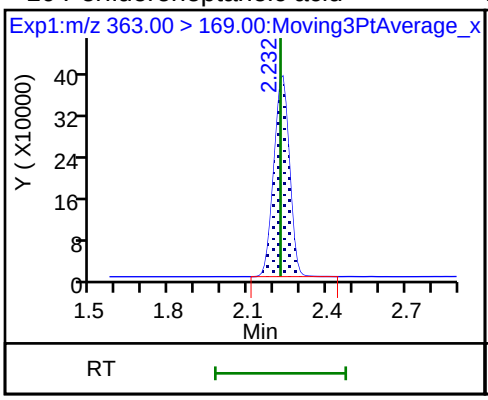
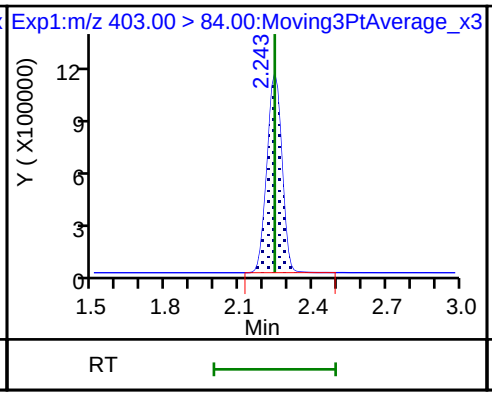
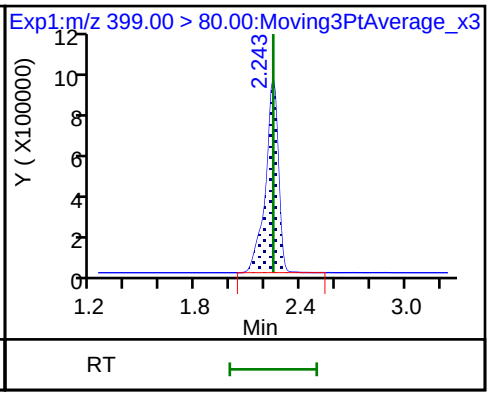


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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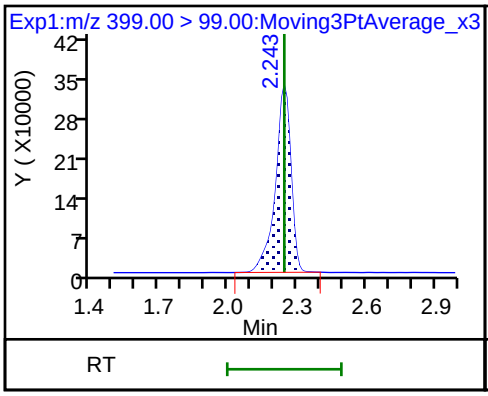
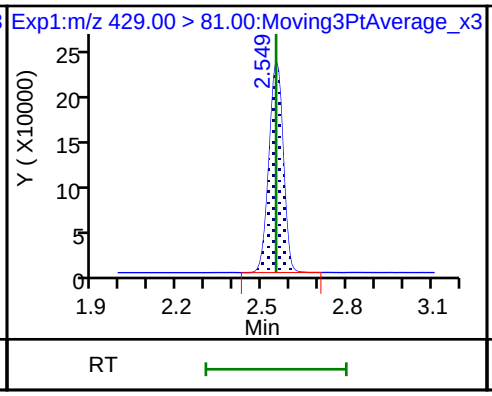
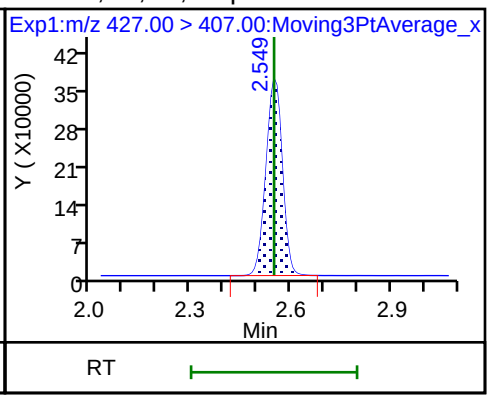


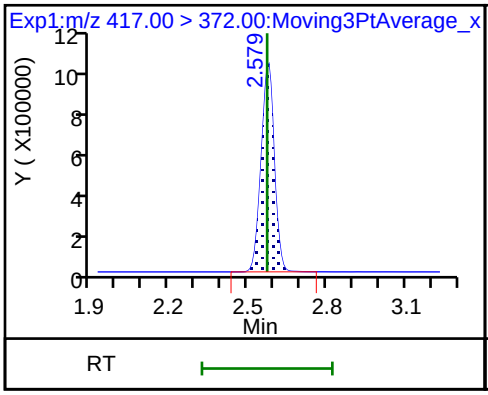
D 12 M2-6:2FTS



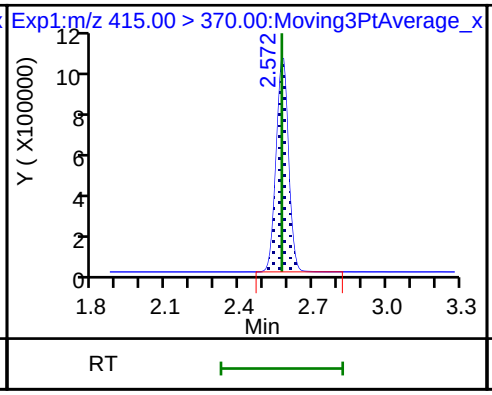
13 1H,1H,2H,2H-perfluorooctanesulfoni



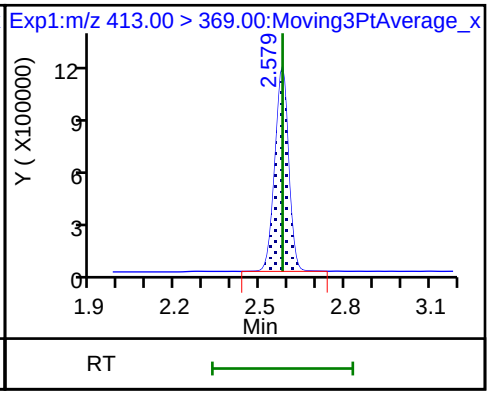
D 14 13C4 PFOA



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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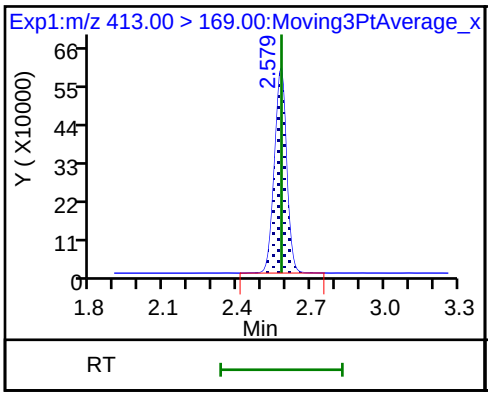
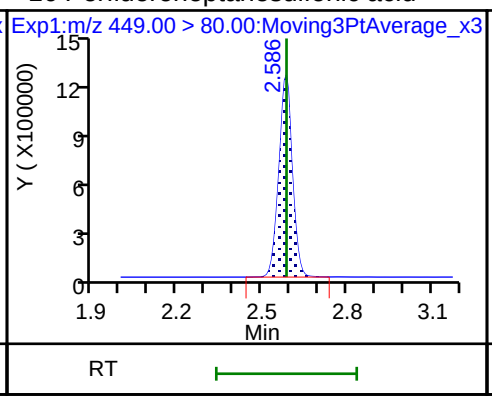
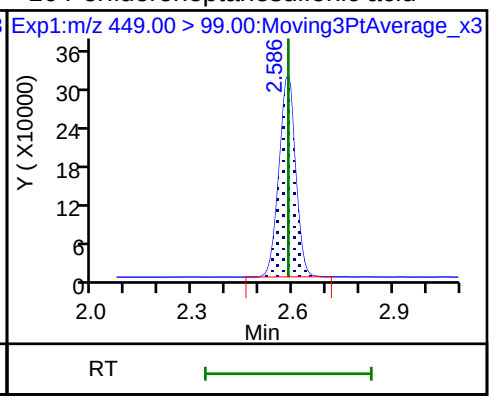


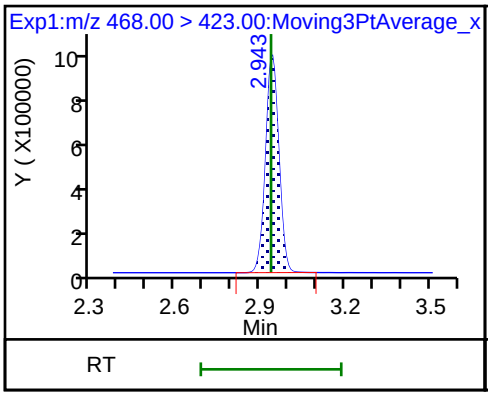
16 Perfluoroheptanesulfonic acid



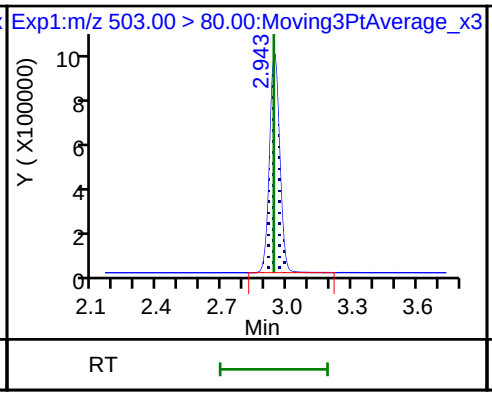
16 Perfluoroheptanesulfonic acid



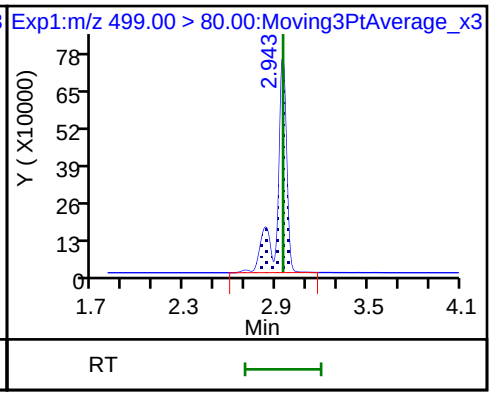
D 19 13C5 PFNA



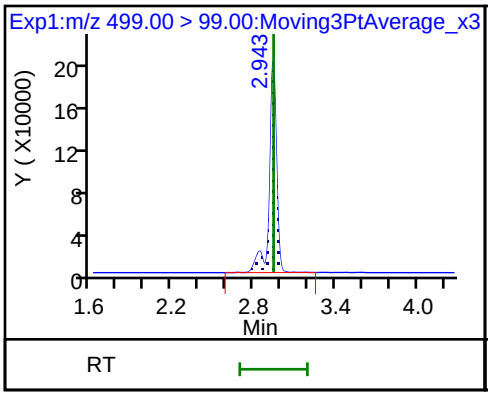
D 18 13C4 PFOS



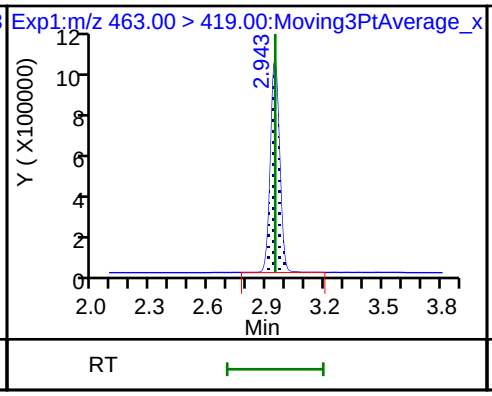
17 Perfluorooctane sulfonic acid



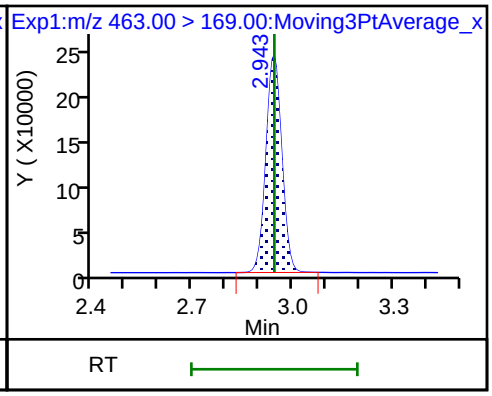
17 Perfluorooctane sulfonic acid



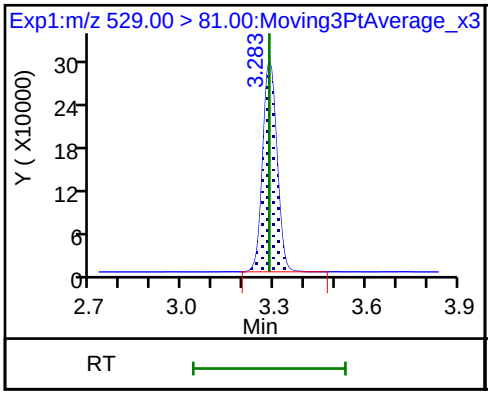
20 Perfluorononanoic acid



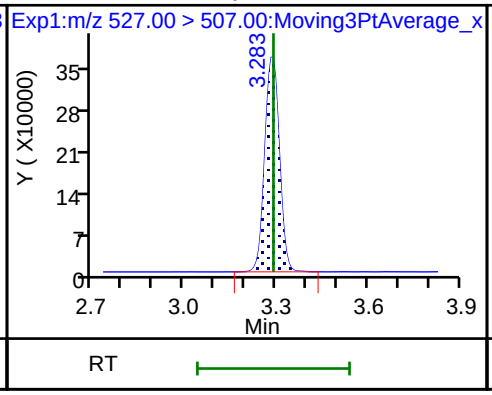
20 Perfluorononanoic acid



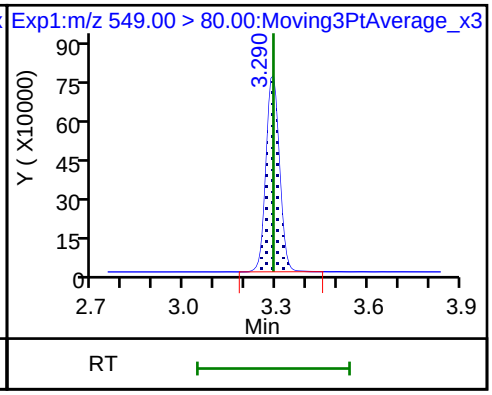
D 26 M2-8:2FTS



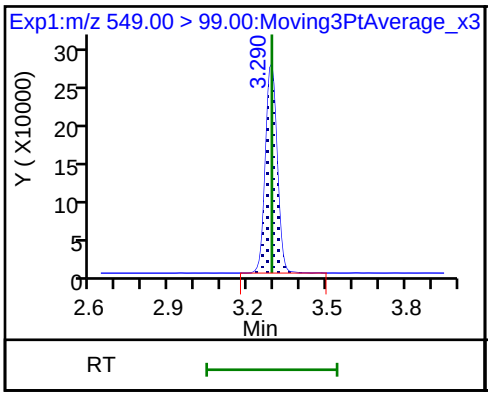
25 1H,1H,2H,2H-perfluorodecanesulfoni



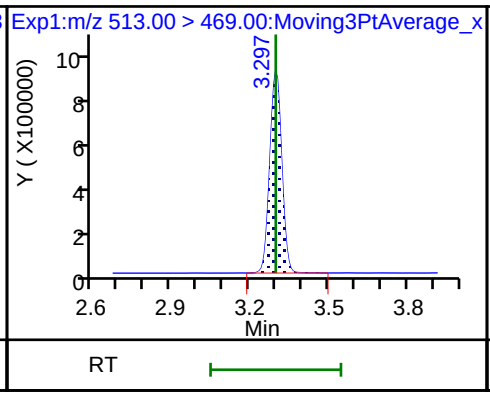
68 Perfluorononanesulfonic acid



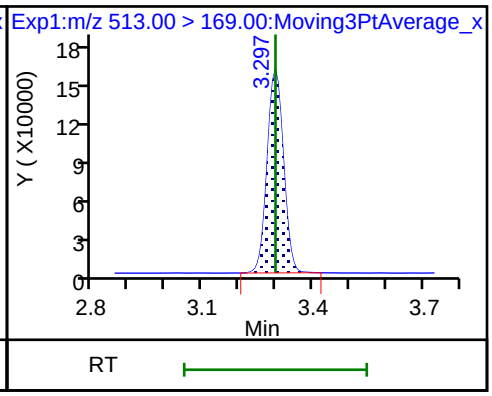
68 Perfluorononanesulfonic acid



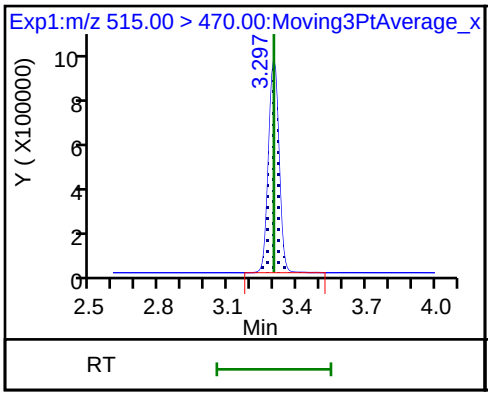
24 Perfluorodecanoic acid



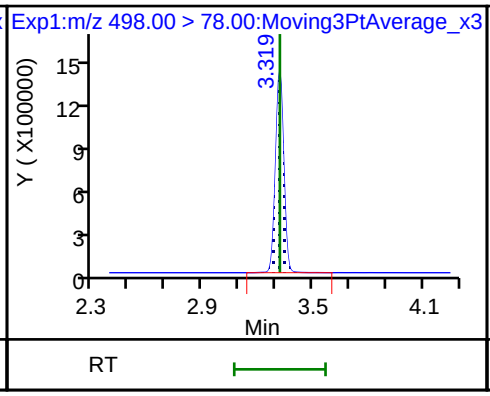
24 Perfluorodecanoic acid



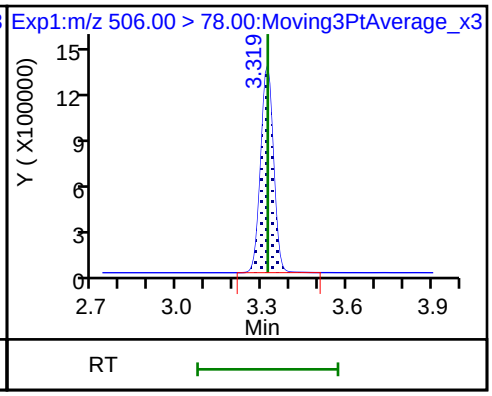
D 23 13C2 PFDA



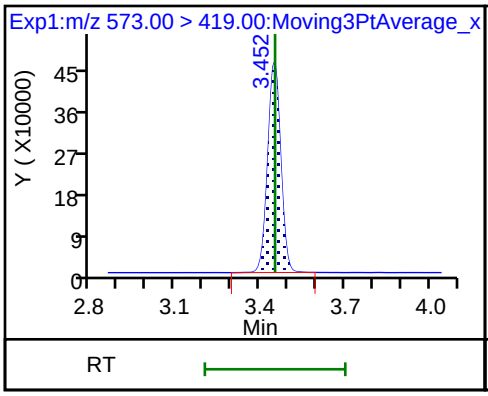
22 Perfluorooctane Sulfonamide



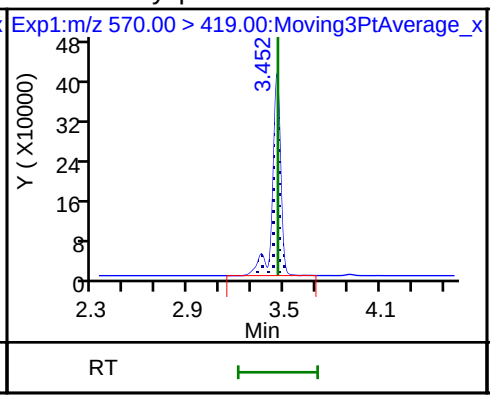
D 21 13C8 FOSA



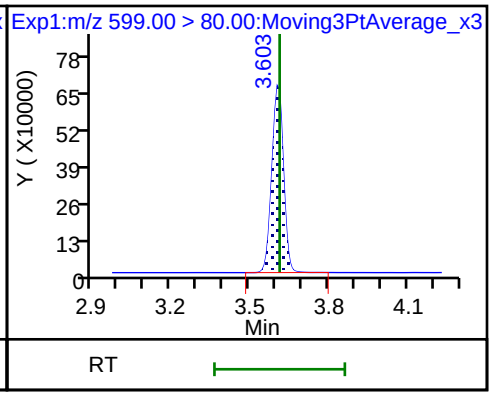
D 27 d3-NMeFOSAA



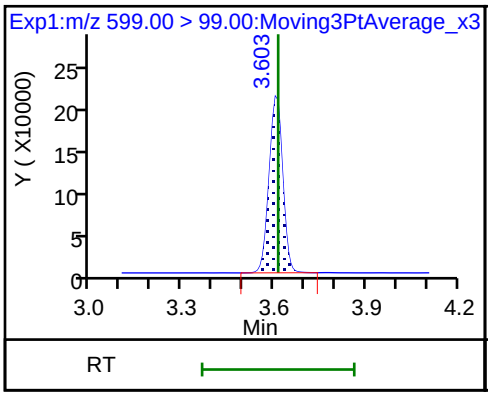
28 N-methyl perfluorooctane sulfonami



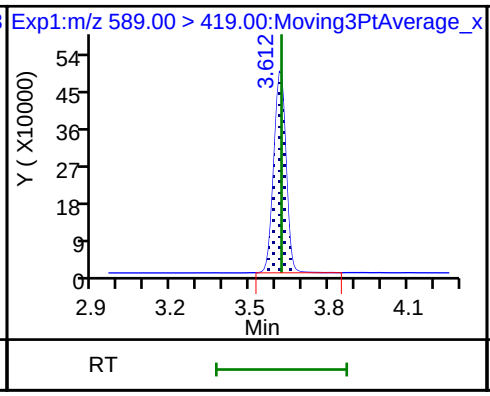
29 Perfluorodecane Sulfonic acid



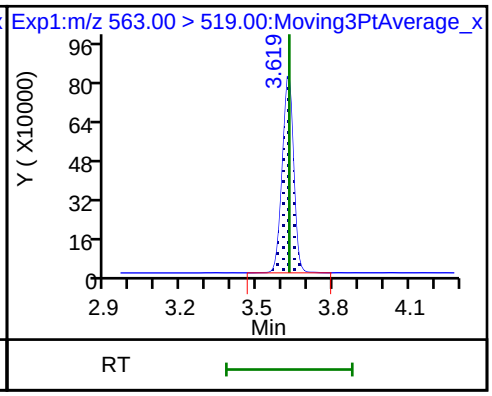
29 Perfluorodecane Sulfonic acid



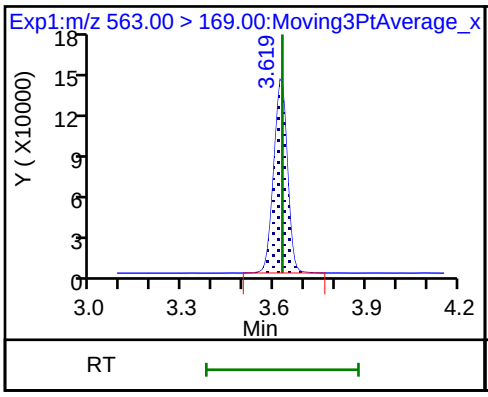
D 32 d5-NEtFOSAA



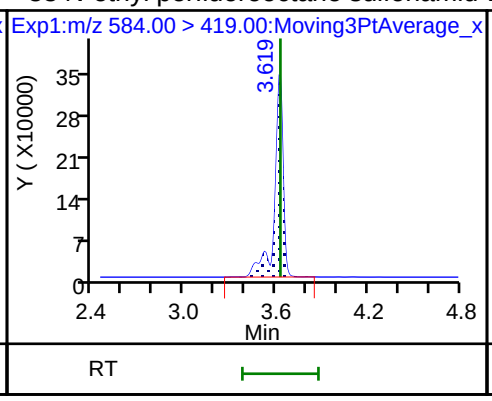
31 Perfluoroundecanoic acid



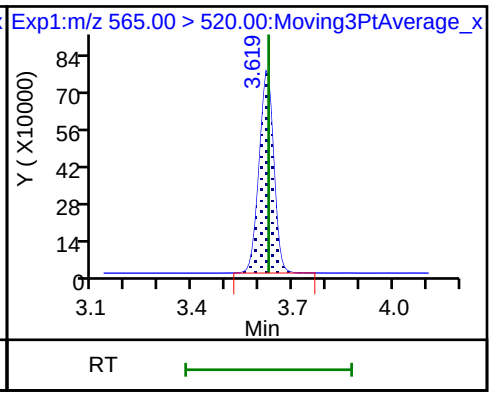
31 Perfluoroundecanoic acid



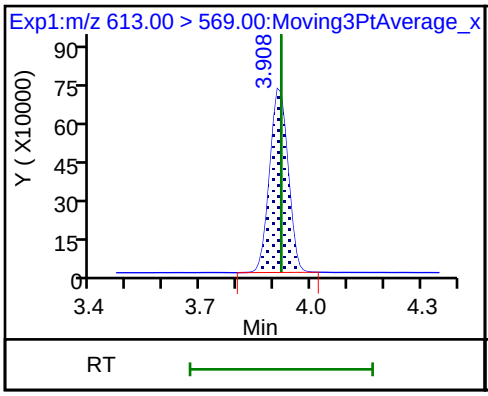
33 N-ethyl perfluorooctane sulfonamid



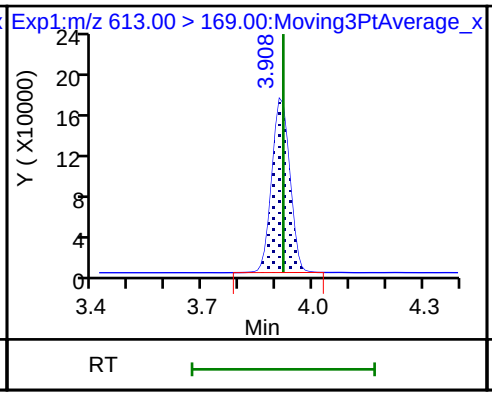
D 30 13C2 PFUnA



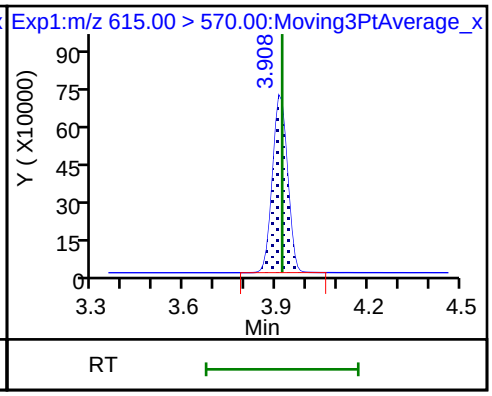
37 Perfluorododecanoic acid



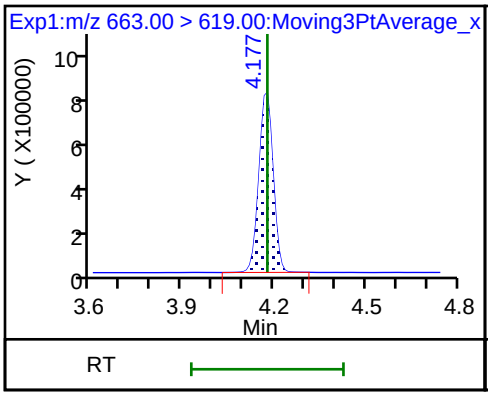
37 Perfluorododecanoic acid



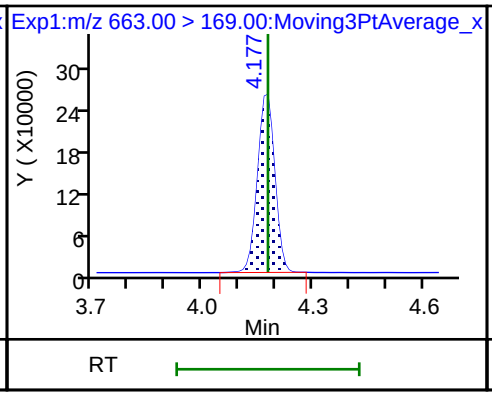
D 36 13C2 PFDoA



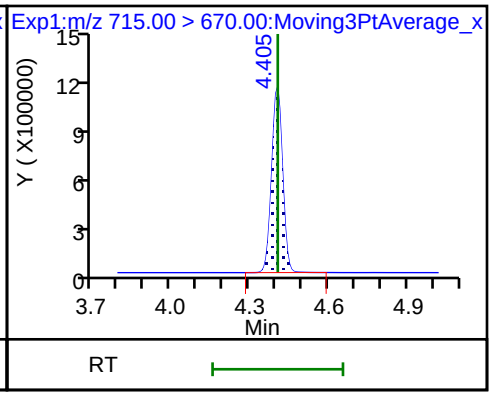
41 Perfluorotridecanoic acid



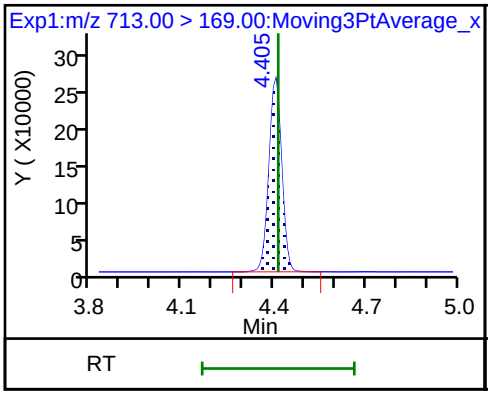
41 Perfluorotridecanoic acid



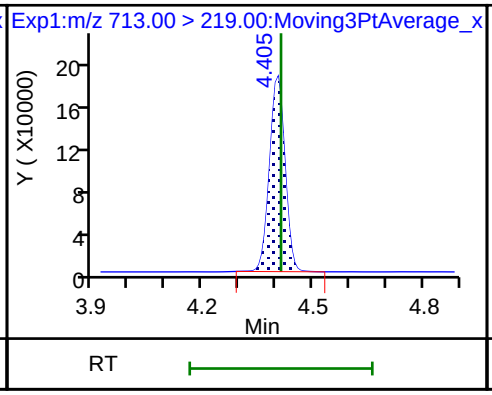
D 43 13C2-PFTeDA



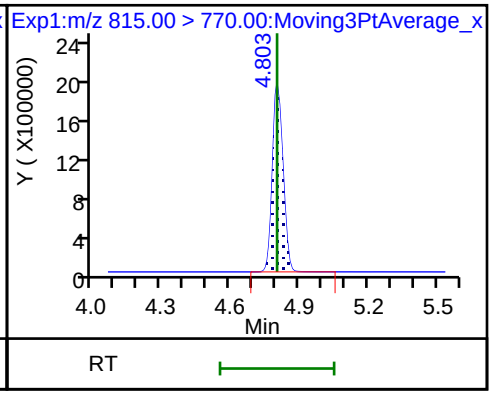
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238595/4 Calibration Date: 08/07/2018 23:06

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_069.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9094		0.969	1.00	-3.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.092		0.960	1.00	-4.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	82.01		0.954	0.884	8.0	30.0
4:2 FTS	AveID	16.57	18.05		1.02	0.934	8.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.996		0.976	1.00	-2.4	30.0
Perfluoropentanesulfonic acid	AveID	68.92	73.18		0.996	0.938	6.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.118		1.05	1.00	5.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.036		0.870	0.910	-4.4	30.0
6:2 FTS	AveID	1.573	1.611		0.970	0.948	2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.094		0.968	1.00	-3.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.299		0.998	0.952	4.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	0.9894		0.939	1.00	-6.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.075		0.929	0.928	0.0	30.0
8:2 FTS	AveID	1.299	1.223		0.902	0.958	-5.9	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7721		0.985	0.960	2.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9881		0.985	1.00	-1.5	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	0.9736	0.9602		0.986	1.00	-1.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9894		1.03	1.00	2.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6282		0.958	0.964	-0.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8200		0.919	1.00	-8.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.073		0.955	1.00	-4.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.109		0.997	1.00	-0.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.138		1.06	1.00	5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2268		0.937	1.00	-6.3	30.0
13C4 PFBA	Ave	1.385	1.392		2.51	2.50	0.5	30.0
13C5-PFPeA	Ave	0.9537	0.9620		2.52	2.50	0.9	30.0
13C3-PFBS	Ave	0.0221	0.0205		2.16	2.33	-6.9	30.0
13C2 PFHxA	Ave	1.082	1.093		2.53	2.50	1.0	30.0
13C4-PFHpA	Ave	1.065	1.059		2.49	2.50	-0.5	30.0
18O2 PFHxS	Ave	1.366	1.361		2.36	2.37	-0.3	30.0
M2-6:2FTS	Ave	0.2242	0.2275		2.41	2.38	1.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Lab Sample ID: CCV 320-238595/4 Calibration Date: 08/07/2018 23:06

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.07LLBB_069.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9823		2.51	2.50	0.5	30.0
13C4 PFOS	Ave	0.8973	0.8854		2.36	2.39	-1.3	30.0
13C5 PFNA	Ave	0.8770	0.8795		2.51	2.50	0.3	30.0
M2-8:2FTS	Ave	0.2707	0.2707		2.39	2.40	-0.0	30.0
13C2 PFDA	Ave	0.7695	0.7738		2.51	2.50	0.6	30.0
13C8 FOSA	Ave	1.188	1.175		2.47	2.50	-1.2	30.0
d3-NMeFOSAA	Ave	0.3935	0.3898		2.48	2.50	-0.9	30.0
d5-NEtFOSAA	Ave	0.4077	0.4391		2.69	2.50	7.7	30.0
13C2 PFUnA	Ave	0.6189	0.6511		2.63	2.50	5.2	30.0
13C2 PFDoA	Ave	0.6541	0.6584		2.52	2.50	0.7	30.0
13C2-PFTeDA	Ave	0.8335	0.8746		2.62	2.50	4.9	30.0
13C2-PFHxDA	Ave	1.653	1.664		2.52	2.50	0.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_069.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 07-Aug-2018 23:06:02 ALS Bottle#: 13 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
Sublist: chrom-A8_N*sub34

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 12:26:03 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: hannigana Date: 08-Aug-2018 12:25:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.396	0.0	0.543	5481699	2.51		100	8844	
2 Perfluorobutyric acid										
212.90 > 169.00	1.396	1.396	0.0	1.000	1994052	0.9686		96.9	139	
D 3 13C5-PFPeA										
267.90 > 223.00	1.638	1.638	0.0	0.637	3789217	2.52		101	8344	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.646	1.646	0.0	1.005	1655099	0.9598		96.0	104	
D 47 13C3-PFBS										
301.90 > 83.00	1.678	1.678	0.0	0.652	75218	2.16		93.1	392	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.678	1.678	0.0	1.000	2345263	0.9544		108	826	
298.90 > 99.00	1.678	1.678	0.0	1.000	971090		2.42(1.25-3.74)		625	
D 60 M2-4:2FTS										
329.00 > 81.00	1.875	1.874	0.001	0.729	601428	NC			1066	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.875	1.875	0.0	1.117	545384	1.02		109	3525	
D 7 13C2 PFHxA										
315.00 > 270.00	1.912	1.912	0.0	0.743	4305726	2.53		101	7188	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.912	1.912	0.0	1.000	1715781	0.9761		97.6	493	
313.00 > 119.00	1.912	1.912	0.0	1.000	155780		11.01(5.03-15.10)		346	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.933	1.933	0.0	1.152	2220779	1.00		106	3491	
349.00 > 99.00	1.933	1.933	0.0	1.152	817794		2.72(1.36-4.07)		1134	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.006	2.006	0.0	0.780	351673	NC			813	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.006	2.006	0.0	1.000	306252	NC			152	
D 9 13C4-PFHpA										
367.00 > 322.00	2.223	2.223	0.0	0.864	4173181	2.49		99.5	9012	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.223	2.223	0.0	1.000	1866345	1.05		105	380	
363.00 > 169.00	2.232	2.223	0.009	1.004	721359		2.59(1.13-3.40)		1091	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.243	0.0	0.872	5071067	2.36		99.7	4093	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.243	0.0	1.000	2022033	0.8699		95.6	2055	
399.00 > 99.00	2.243	2.243	0.0	1.000	666483		3.03(1.50-4.49)		712	
65 ADONA										
377.00 > 251.00	2.277	2.277	0.0	0.773	4990291	NC			8046	
377.00 > 85.00	2.277	2.277	0.0	0.773	2849941		1.75(0.84-2.53)		3324	
D 12 M2-6:2FTS										
429.00 > 81.00	2.549	2.549	0.0	0.991	851141	2.41		101	2115	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.549	2.549	0.0	1.000	547194	0.9704		102	1381	
D 73 13C8 PFOA										
421.00 > 376.00	2.572	2.572	0.0	1.000	7342835	NC			8679	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.572	0.007	1.003	3869183	2.51		101	7547	
* 62 13C2-PFOA										
415.00 > 370.00	2.572	2.572	0.0		3938886	2.50			7865	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.579	0.0	1.000	1694336	0.9682		96.7	157	
413.00 > 169.00	2.579	2.579	0.0	1.000	870110		1.95(0.84-2.52)		1651	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.586	2.586	0.0	0.878	1725685	1.00		105	2453	
449.00 > 99.00	2.586	2.586	0.0	0.878	446319		3.87(1.94-5.82)		883	
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.938	0.006	1.144	3464190	2.51		100	4391	
D 72 13C8 PFOS										
507.00 > 99.00	2.944	2.938	0.006	1.144	1653926	NC			3858	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.938	0.006	1.144	3333995	2.36		98.7	4330	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.944	2.944	0.0	1.000	1391062	0.9287		100	2001	
499.00 > 99.00	2.944	2.944	0.0	1.000	317414		4.38(2.31-6.93)		604	
20 Perfluorononanoic acid										
463.00 > 419.00	2.944	2.944	0.0	1.000	1371042	0.9393		93.9	405	
463.00 > 169.00	2.944	2.944	0.0	1.000	339602		4.04(1.90-5.69)		1806	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.154	3.154	0.0	1.071	2334283	NC			3568	
D 26 M2-8:2FTS										
529.00 > 81.00	3.290	3.283	0.007	1.279	1021431	2.39		100	3115	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.290	3.290	0.0	1.000	499728	0.9019		94.1	1580	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.290	3.290	0.0	1.118	1034019	0.9855		103	3471	
549.00 > 99.00	3.290	3.290	0.0	1.118	375442		2.75(1.33-3.97)		1268	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.297	3.297	0.0	1.000	1204603	0.9850		98.5	832	
513.00 > 169.00	3.297	3.297	0.0	1.000	207852		5.80(2.36-7.09)		276	
D 23 13C2 PFDA										
515.00 > 470.00	3.297	3.298	-0.001	1.282	3047739	2.51		101	4839	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.319	0.0	1.000	1777065	0.9862		98.6	2393	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.319	0.0	1.290	4626857	2.47		98.8	5708	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.452	3.452	0.0	1.342	1535489	2.48		99.1	3322	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.459	3.459	0.0	1.002	607678	1.03		103	663	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.612	3.612	0.0	1.227	844726	0.9582		99.4	2164	
599.00 > 99.00	3.612	3.612	0.0	1.227	286248		2.95(1.39-4.16)		1964	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.619	3.620	-0.001	1.407	1729398	2.69		108	1474	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.626	3.626	0.0	1.000	1100462	0.9548		95.5	922	
563.00 > 169.00	3.626	3.626	0.0	1.000	199318		5.52(2.12-6.36)		815	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.626	3.626	0.0	1.002	567237	0.9195		91.9	1204	
D 30 13C2 PFUnA										
565.00 > 520.00	3.626	3.627	0.0	1.410	2564418	2.63		105	5564	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.783	3.783	0.0	1.285	3689490	NC			7022	
35 MeFOSA										
512.00 > 169.00	3.832	3.832	0.0		553027	NC			1154	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.919	3.919	0.0	1.000	1150854	1.00		99.7	594	
613.00 > 169.00	3.919	3.919	0.0	1.000	256134		4.49(2.13-6.40)		1603	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.919	3.919	0.0	1.191	401466	NC			2594	
D 36 13C2 PFDoA										
615.00 > 570.00	3.919	3.919	0.0	1.524	2593289	2.52		101	4258	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.158	4.158	0.0	1.412	392999	NC			1936	
699.00 > 99.00	4.148	4.158	-0.010	1.409	548844		0.72(0.00-0.00)		3615	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.177	4.177	0.0	1.066	1180582	1.06		106	540	
663.00 > 169.00	4.177	4.177	0.0	1.066	356982		3.31(1.25-3.76)		1304	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.405	4.405	0.0	1.713	3444922	2.62		105	5836	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.413	4.413	0.0	1.002	312565	0.9372		93.7	2235	
713.00 > 219.00	4.405	4.413	-0.008	1.000	223849		1.40(0.71-2.13)		2764	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.814	4.803	0.011	1.872	6554945	2.52		101	6858	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.814	4.814	0.0	1.000	2303129	NC			745	
813.00 > 169.00	4.814	4.814	0.0	1.000	406072		5.67(2.86-8.58)		2463	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.146	5.146	0.0	1.069	2537735	NC			472	
913.00 > 169.00	5.146	5.146	0.0	1.069	310454		8.17(3.83-11.48)		1845	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 08-Aug-2018 12:26:06 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62316.b\2018.08.07LLBB_069.d

Injection Date: 07-Aug-2018 23:06:02 Instrument ID: A8_N

Lims ID: CCV L4

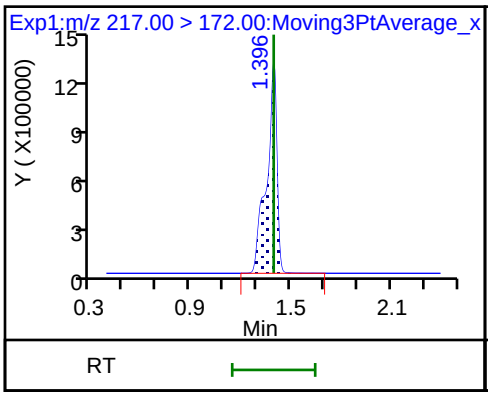
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 4

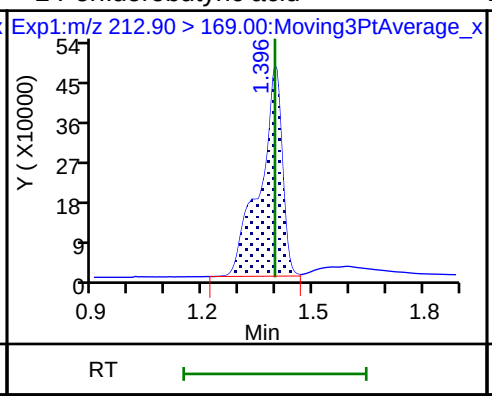
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

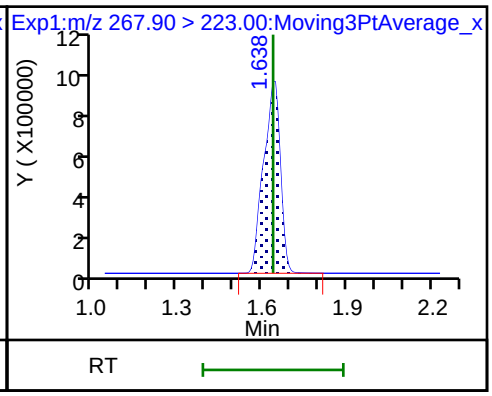
D 1 13C4 PFBA



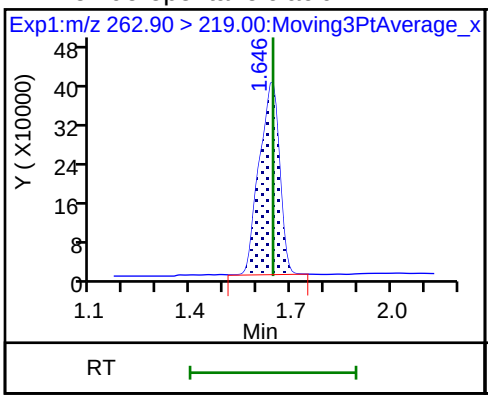
2 Perfluorobutyric acid



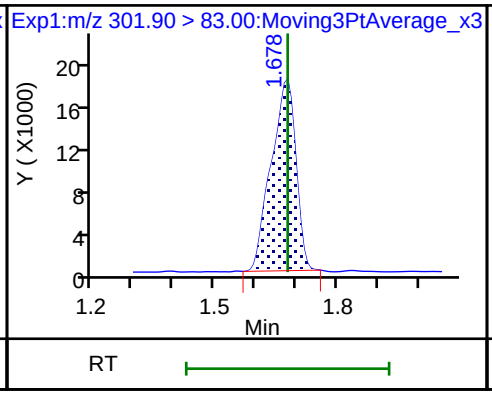
D 3 13C5-PFPeA



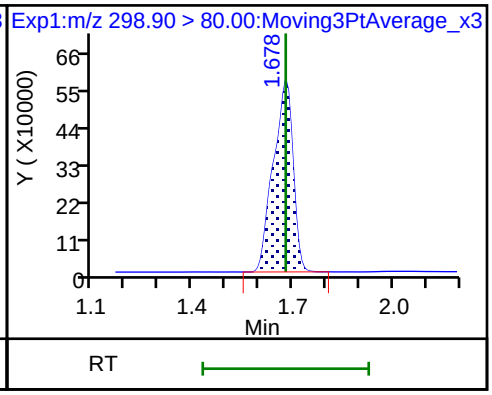
4 Perfluoropentanoic acid



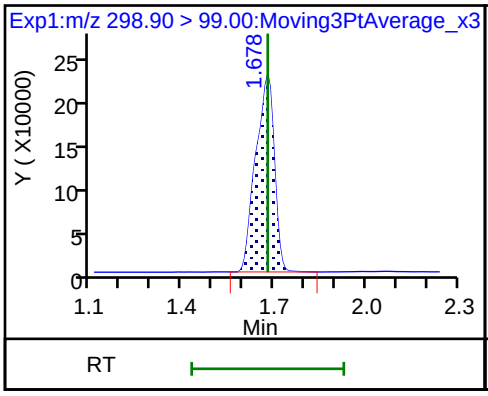
D 47 13C3-PFBS



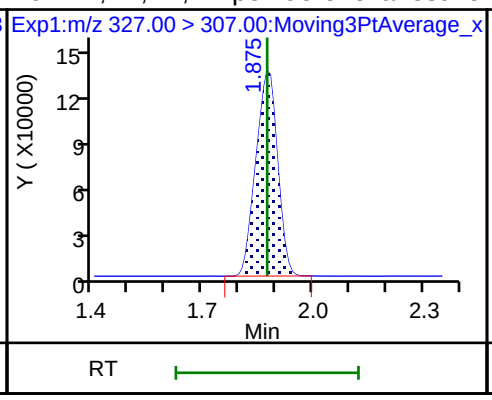
5 Perfluorobutanesulfonic acid



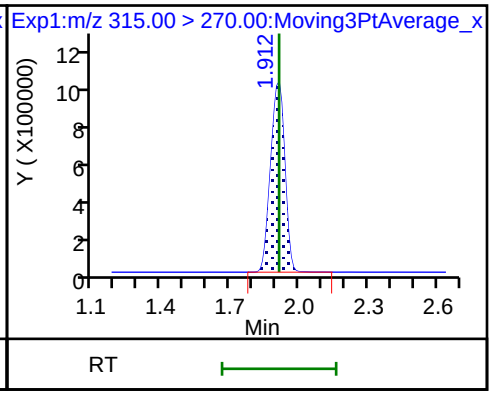
5 Perfluorobutanesulfonic acid



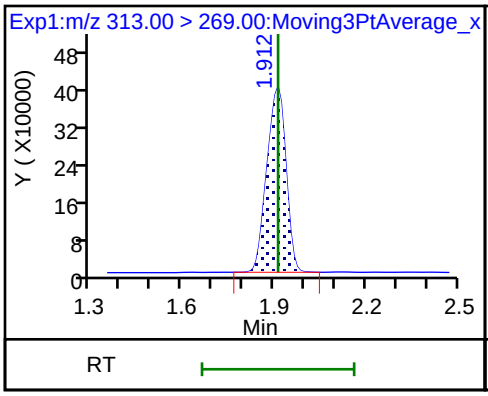
61 1H,1H,2H,2H-perfluorohexanesulfon



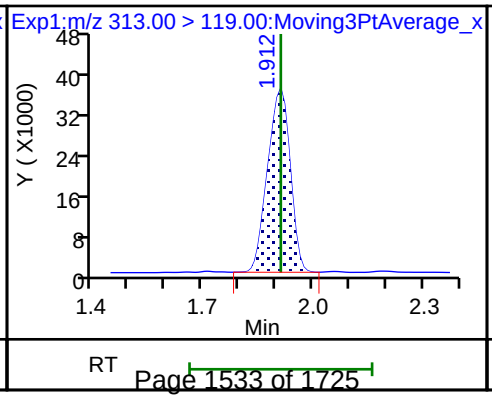
D 7 13C2 PFHxA



6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



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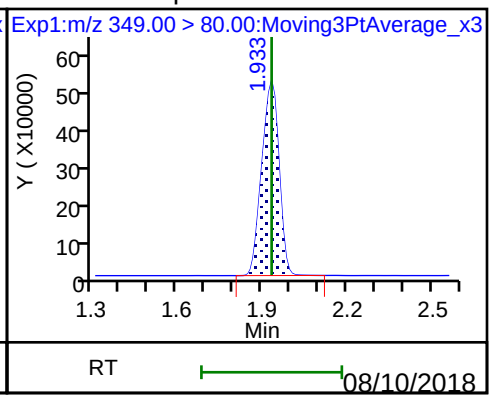

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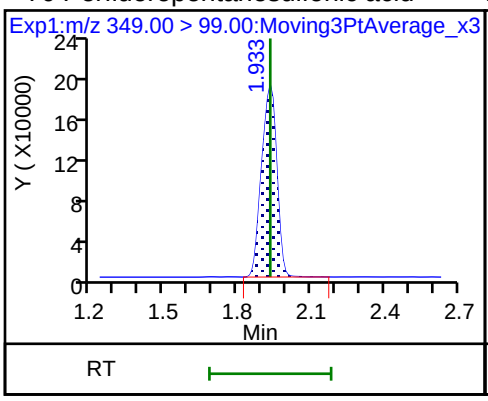
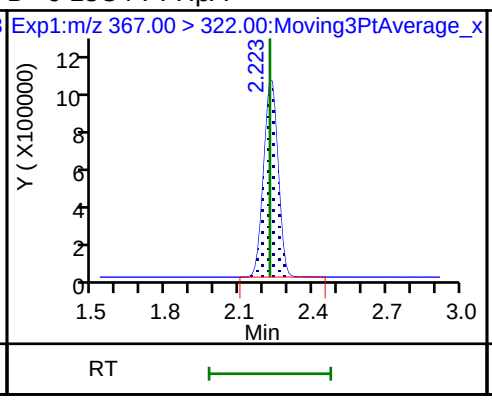


D 9 13C4-PFHpA



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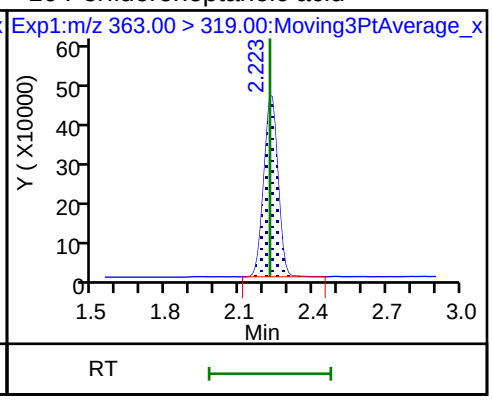

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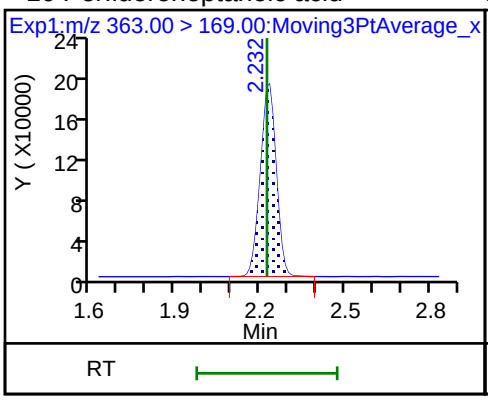
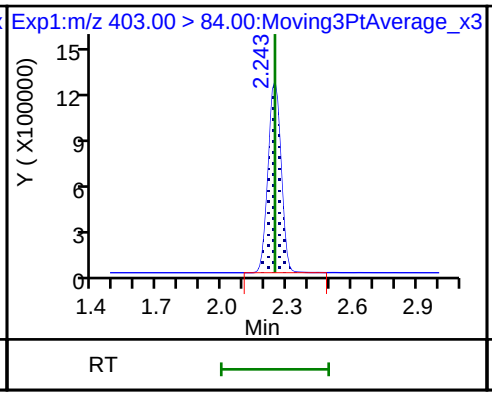
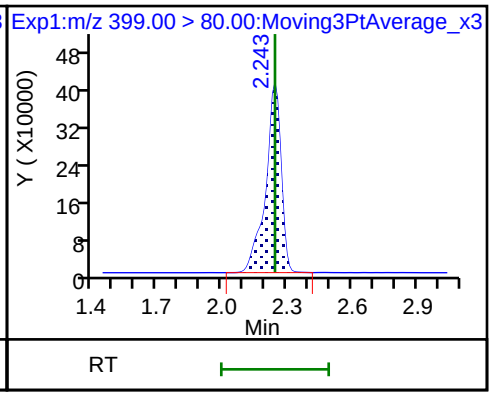


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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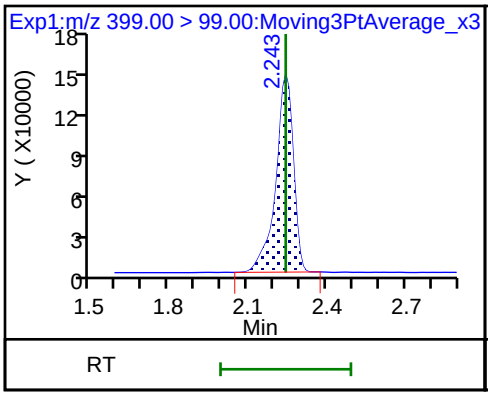
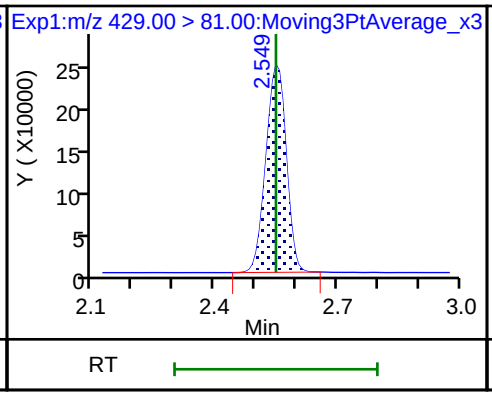
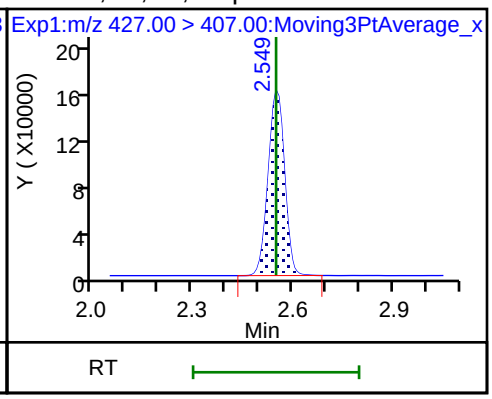


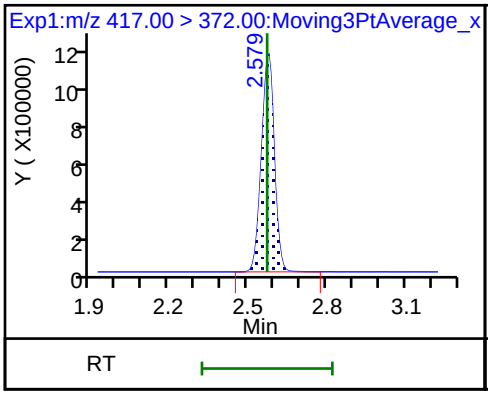
D 12 M2-6:2FTS



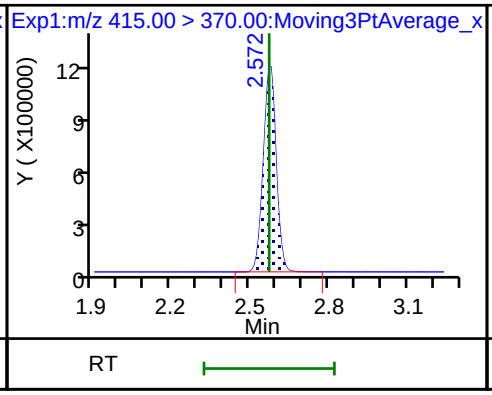
13 1H,1H,2H,2H-perfluorooctanesulfoni



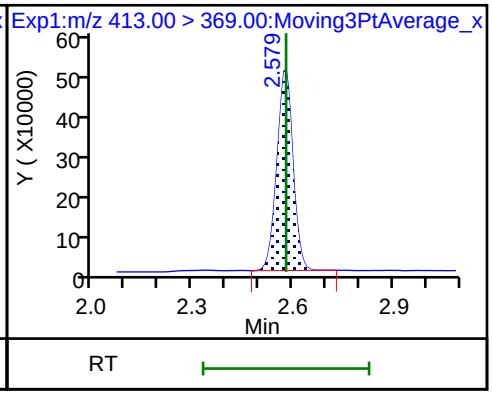
D 14 13C4 PFOA



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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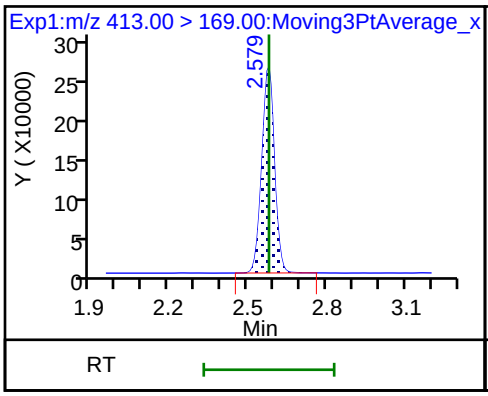
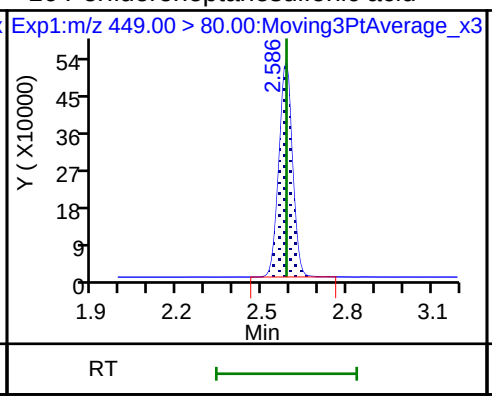
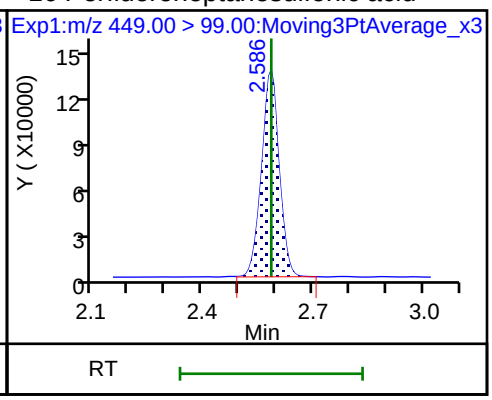


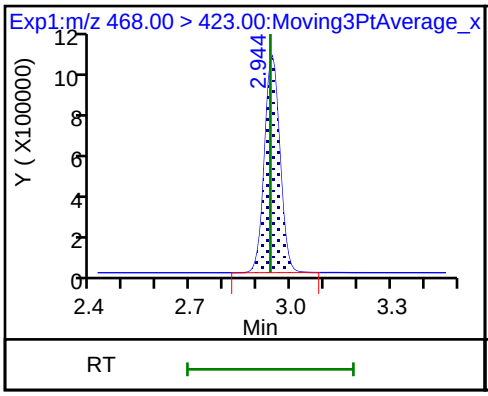
16 Perfluoroheptanesulfonic acid



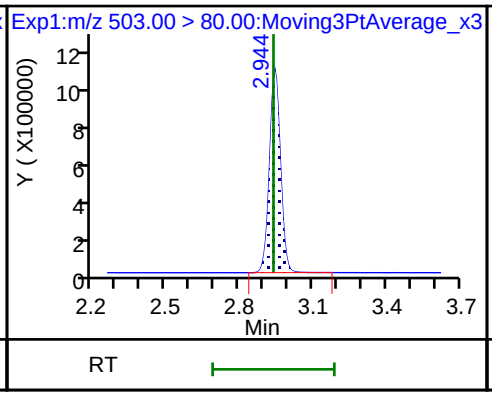
16 Perfluoroheptanesulfonic acid



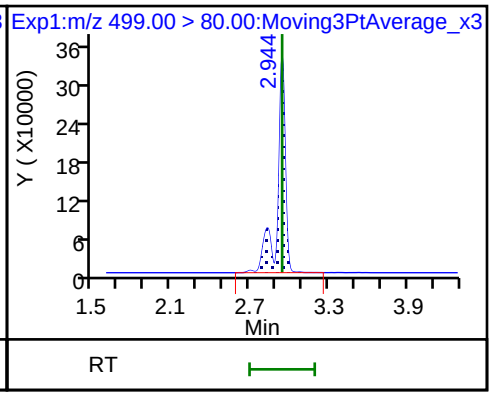
D 19 13C5 PFNA



D 18 13C4 PFOS



17 Perfluorooctane sulfonic acid



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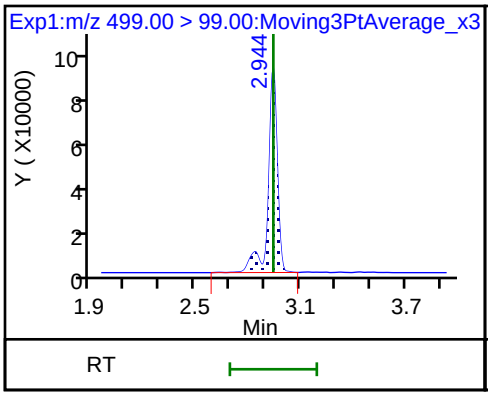
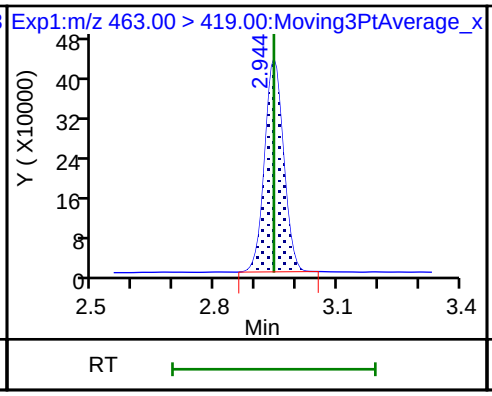


20 Perfluorononanoic acid



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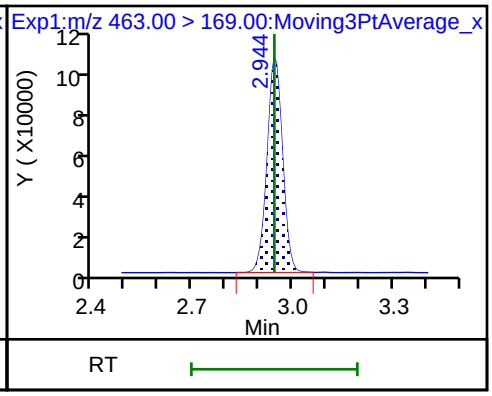
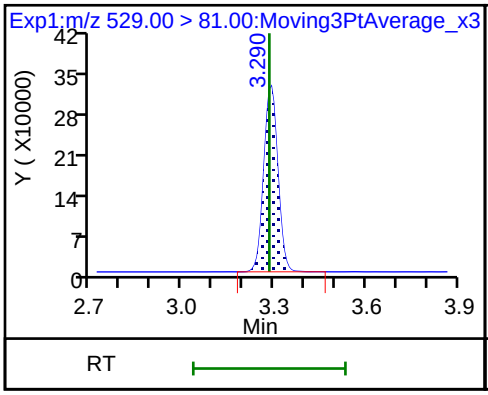
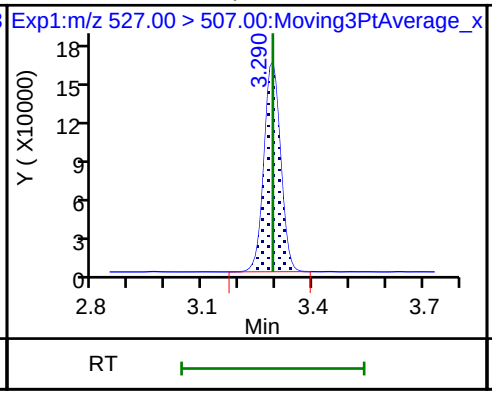


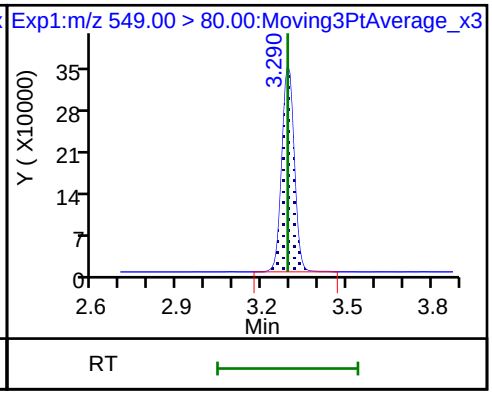
D 26 M2-8:2FTS



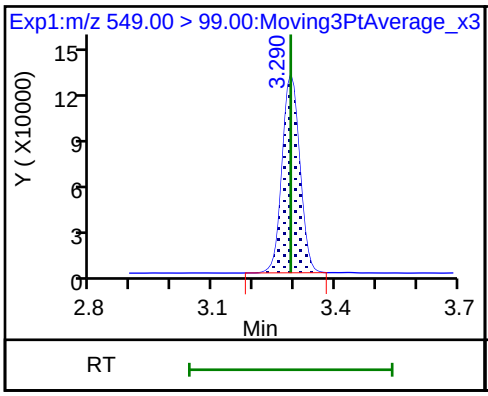
25 1H,1H,2H,2H-perfluorodecanesulfoni



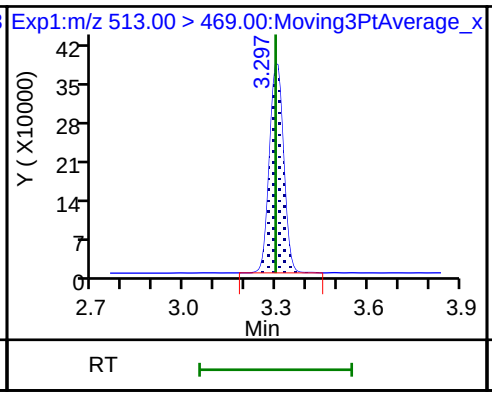
68 Perfluorononanesulfonic acid



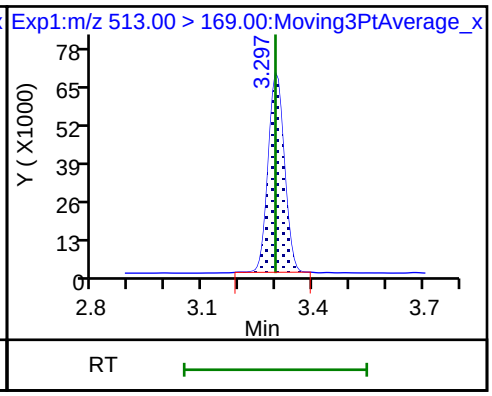
68 Perfluorononanesulfonic acid



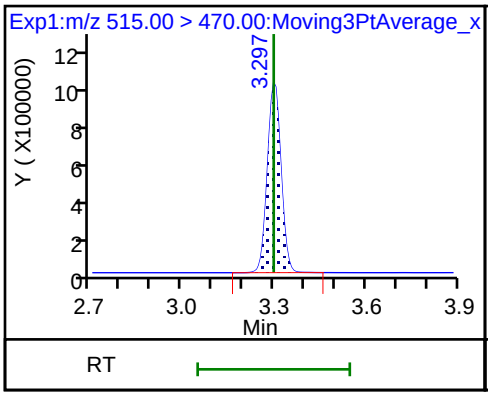
24 Perfluorodecanoic acid



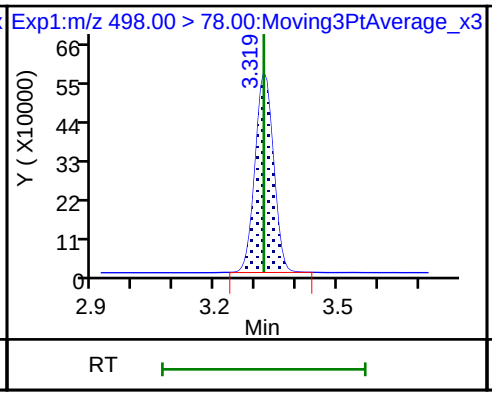
24 Perfluorodecanoic acid



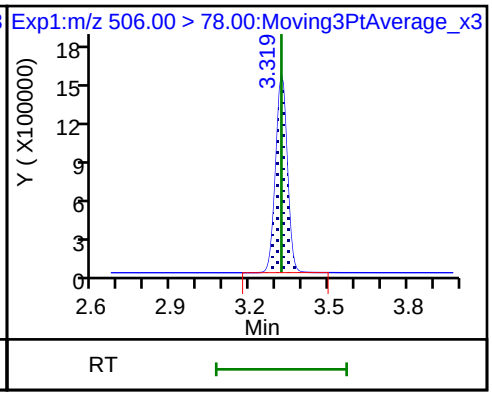
D 23 13C2 PFDA



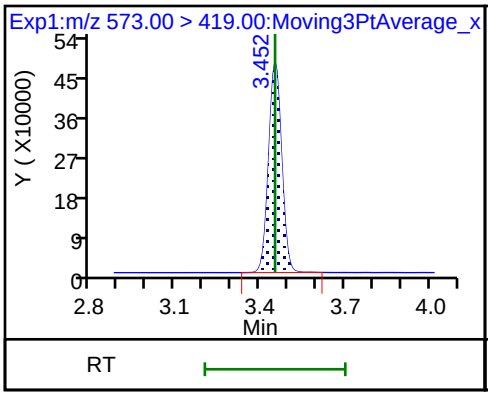
22 Perfluorooctane Sulfonamide



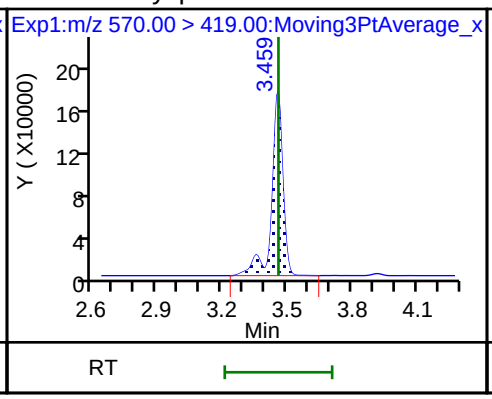
D 21 13C8 FOSA



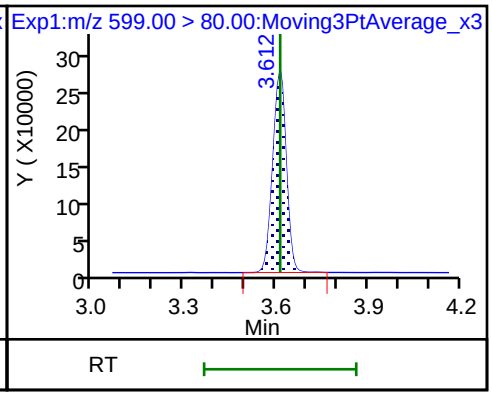
D 27 d3-NMeFOSAA



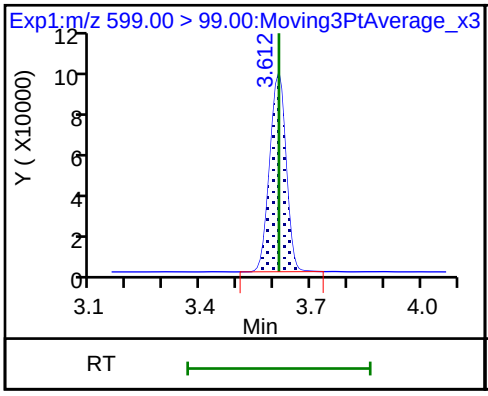
28 N-methyl perfluorooctane sulfonami



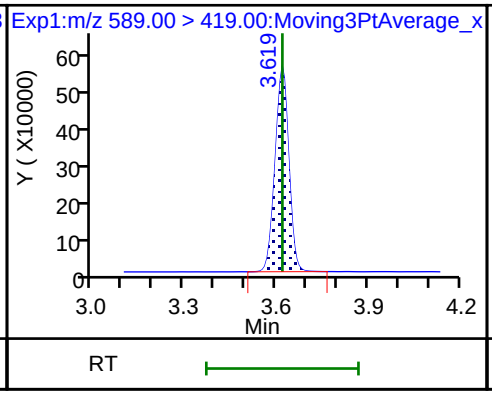
29 Perfluorodecane Sulfonic acid



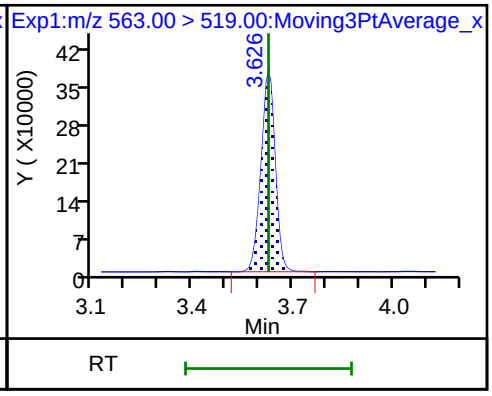
29 Perfluorodecane Sulfonic acid



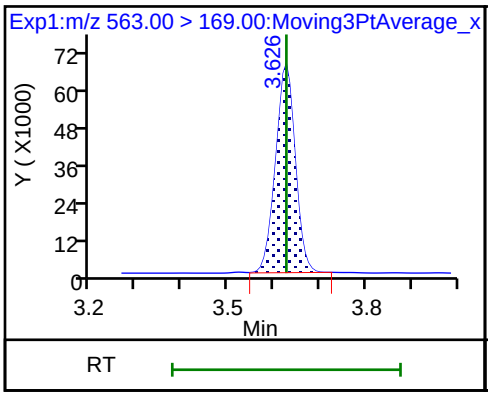
D 32 d5-NEtFOSAA



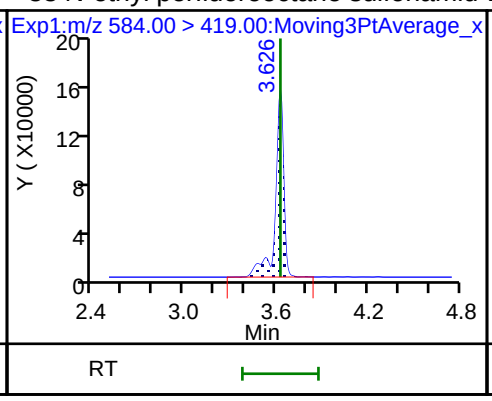
31 Perfluoroundecanoic acid



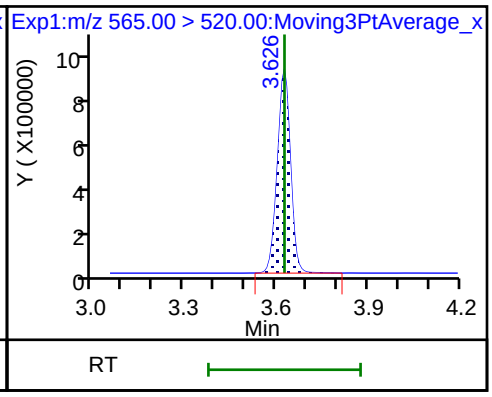
31 Perfluoroundecanoic acid



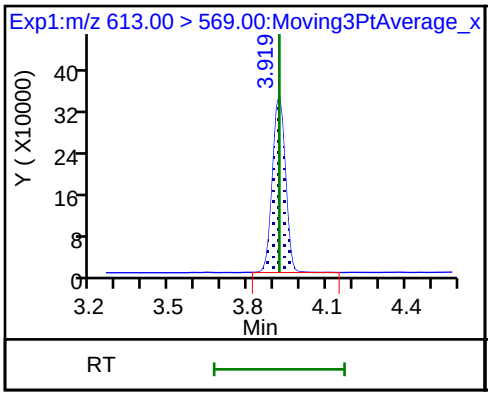
33 N-ethyl perfluorooctane sulfonamid



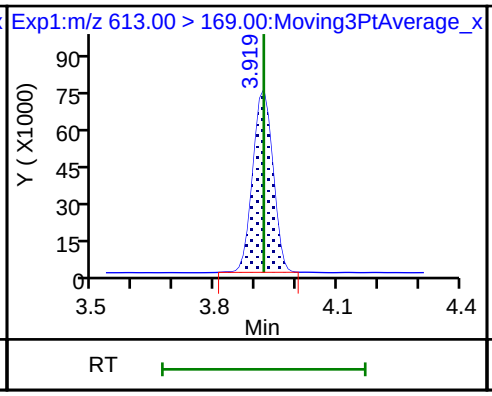
D 30 13C2 PFUnA



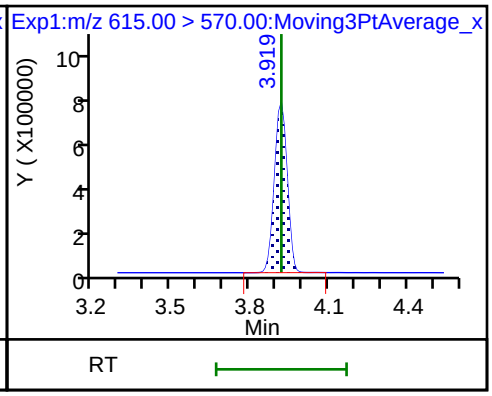
37 Perfluorododecanoic acid



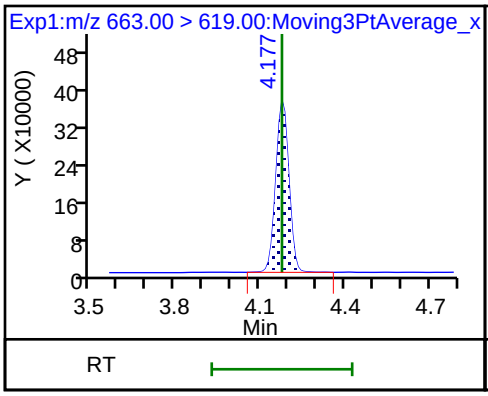
37 Perfluorododecanoic acid



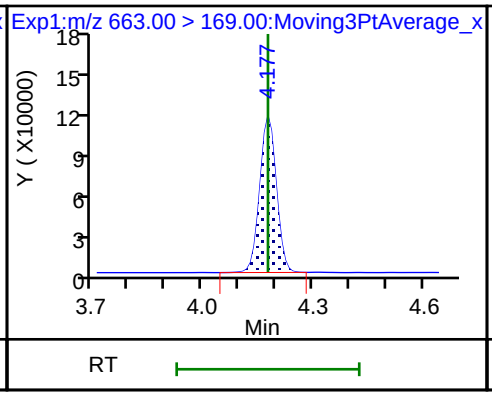
D 36 13C2 PFDoA



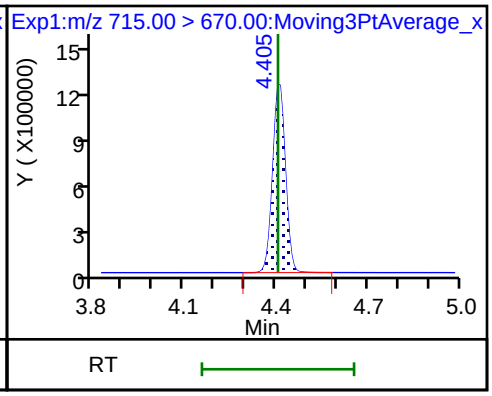
41 Perfluorotridecanoic acid



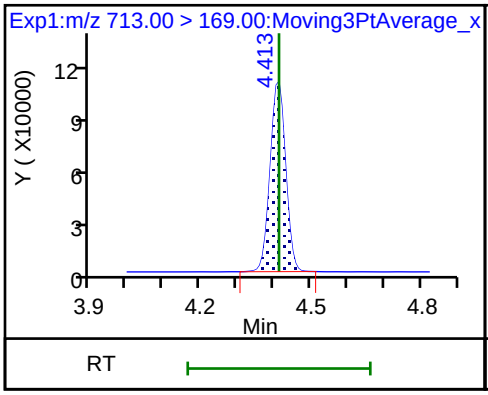
41 Perfluorotridecanoic acid



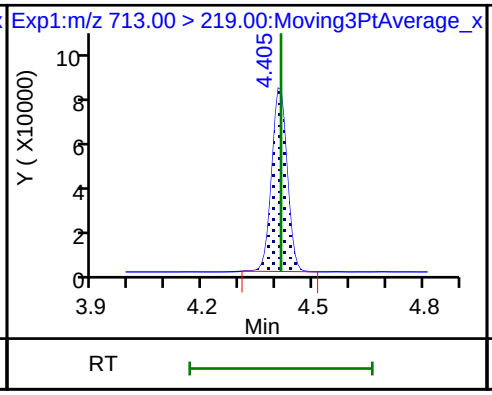
D 43 13C2-PFTeDA



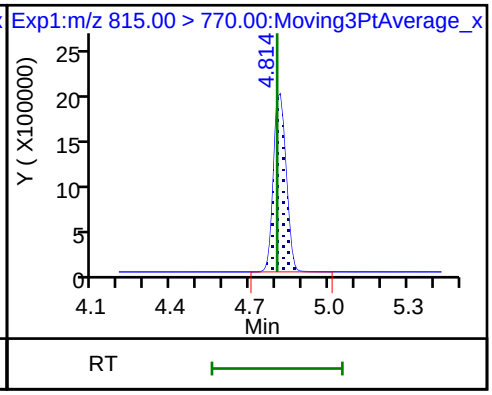
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-235966/1-A
Matrix: Water
Lab File ID: 2018.08.03LLA_013.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 250.00(mL)
Date Analyzed: 08/03/2018 06:24
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	70		50-150
STL01892	13C4-PFHpA	75		50-150
STL00990	13C4 PFOA	79		50-150
STL00995	13C5 PFNA	74		50-150
STL00994	18O2 PFHxS	70		50-150
STL00991	13C4 PFOS	68		50-150

Report Date: 06-Aug-2018 11:16:15 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_013.d
Lims ID: MB 320-235966/1-A
Client ID:
Sample Type: MB
Inject. Date: 03-Aug-2018 06:24:33 ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-235966/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:16:14 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:16:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.417	1.407	0.010	1.004	76339	0.0424			38.4	
D 1 13C4 PFBA										
217.00 > 172.00	1.411	1.411	0.0	0.542	4568028	1.85		73.9	82565	
D 3 13C5-PFPeA										
267.90 > 223.00	1.663	1.653	0.010	0.639	3054457	1.88		75.1	69434	
D 47 13C3-PFBS										
301.90 > 83.00	1.690	1.690	0.0	0.649	75910	1.62		69.8	500	
D 7 13C2 PFHxA										
315.00 > 270.00	1.935	1.935	0.001	0.743	3426579	1.95		77.8	93542	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.034	2.033	0.001	0.781	216698	NC			10094	
D 9 13C4-PFHpA										
367.00 > 322.00	2.264	2.251	0.013	0.870	3208017	1.88		75.2	69364	
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.264	0.013	0.875	4261684	1.66		70.3	61732	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.264	2.266	-0.002	0.994	15626	0.007501			85.4	
399.00 > 99.00	2.277	2.266	0.011	1.000	5669		2.76(1.50-4.49)		17.7	
D 12 M2-6:2FTS										
429.00 > 81.00	2.579	2.579	0.0	0.991	926571	1.85		78.0	17006	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.579	2.588	-0.009	1.000	549680	0.8520			21567	
D 14 13C4 PFOA										
417.00 > 372.00	2.602	2.602	0.0	1.000	3253289	1.97		79.0	52091	
* 62 13C2-PFOA										
415.00 > 370.00	2.602	2.611	-0.009		4292266	2.50			63928	
D 19 13C5 PFNA										
468.00 > 423.00	2.971	2.964	0.007	1.142	2658751	1.85		74.1	55463	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	2.971	2.964	0.007	1.142	2890244	1.63		68.2	36384	
D 26 M2-8:2FTS										
529.00 > 81.00	3.311	3.311	0.0	1.272	893350	1.83		76.5	16605	
D 23 13C2 PFDA										
515.00 > 470.00	3.327	3.327	0.0	1.279	2240633	2.09		83.4	76931	
D 21 13C8 FOSA										
506.00 > 78.00	3.343	3.343	0.0	1.285	4330687	1.66		66.5	41875	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.343	3.355	-0.012	1.000	3485	0.002038			76.5	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.473	3.473	0.0	1.335	465783	1.79		71.5	14531	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.638	3.647	-0.009	1.398	506207	1.81		72.5	6168	
D 30 13C2 PFUnA										
565.00 > 520.00	3.648	3.647	0.001	1.402	1615548	1.95		78.1	48763	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.648	3.659	-0.011	1.000	3162	0.003971			7.9	
563.00 > 169.00	3.648	3.659	-0.011	1.000	1389		2.28(2.12-6.36)		81.0	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.803	3.815	-0.012	1.280	3522	NC			77.7	
D 36 13C2 PFDoA										
615.00 > 570.00	3.939	3.943	-0.004	1.514	1302240	1.82		72.7	14474	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.428	4.433	-0.005	1.702	877944	1.46		58.4	4515	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.825	4.829	-0.004	1.854	819466	0.7912		31.6	1157	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.834	4.833	0.001	1.002	5939	NC			0.3	
813.00 > 169.00	4.825	4.833	-0.008	1.000	1552		3.83(2.86-8.58)		23.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 06-Aug-2018 11:16:15 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_013.d

Injection Date: 03-Aug-2018 06:24:33 Instrument ID: A8_N

Lims ID: MB 320-235966/1-A

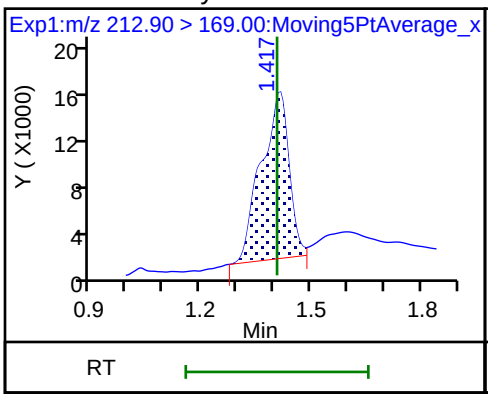
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 2

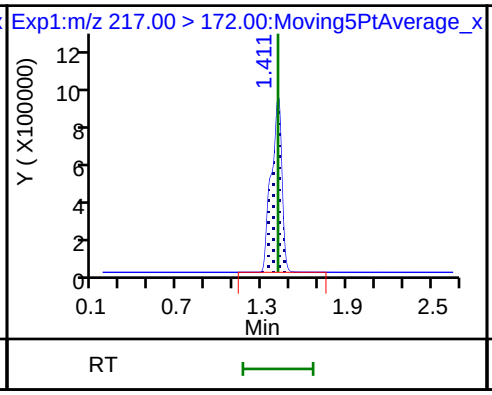
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

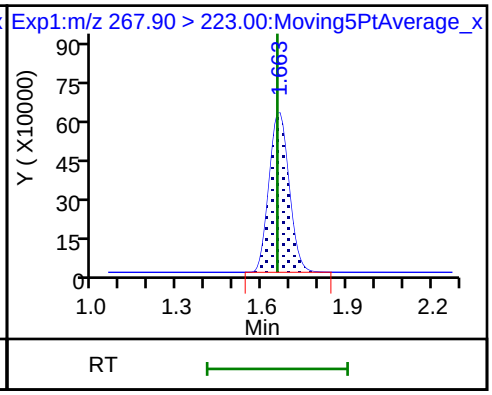
2 Perfluorobutyric acid



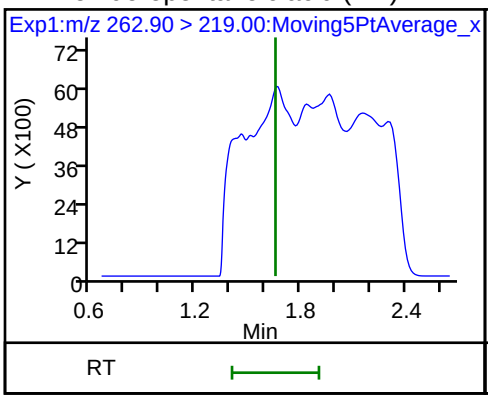
D 1 13C4 PFBA



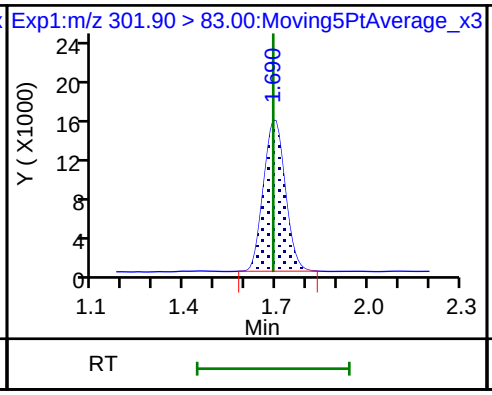
D 3 13C5-PFPeA



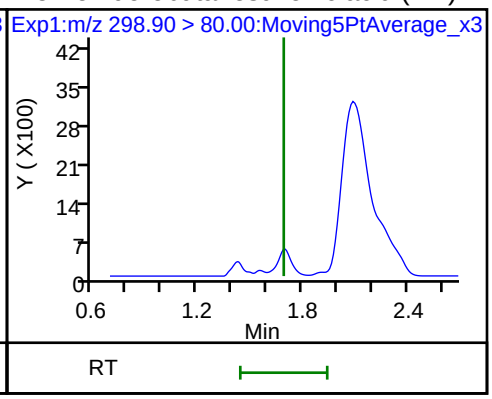
4 Perfluoropentanoic acid (ND)



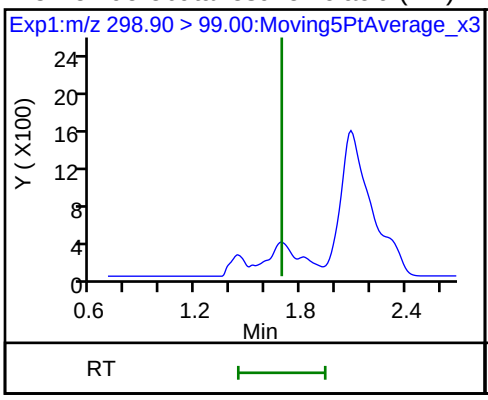
D 47 13C3-PFBS



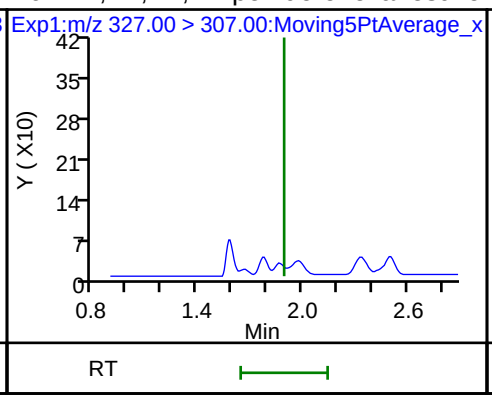
5 Perfluorobutanesulfonic acid (ND)



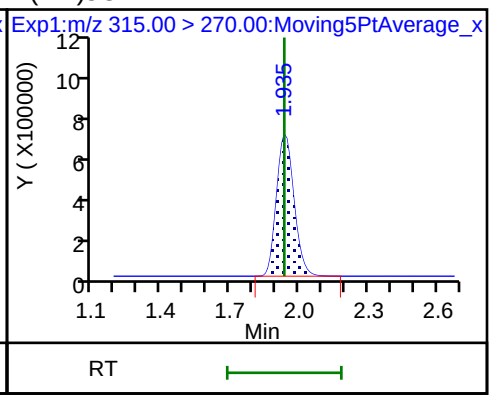
5 Perfluorobutanesulfonic acid (ND)



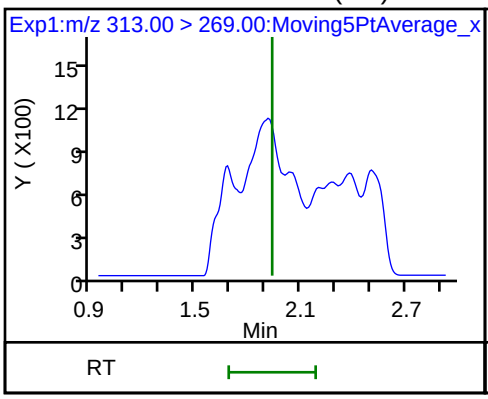
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



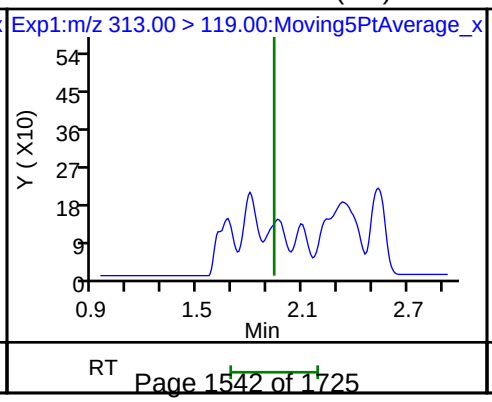
D 70 13C2 PFHxA



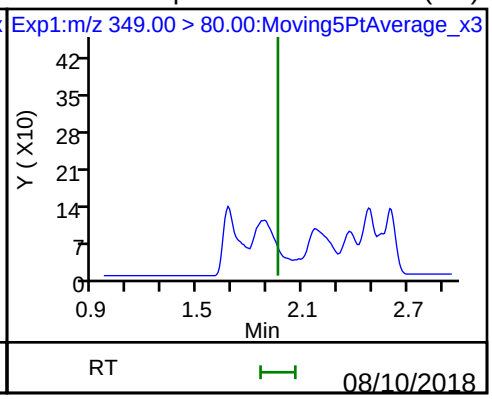
6 Perfluorohexanoic acid (ND)



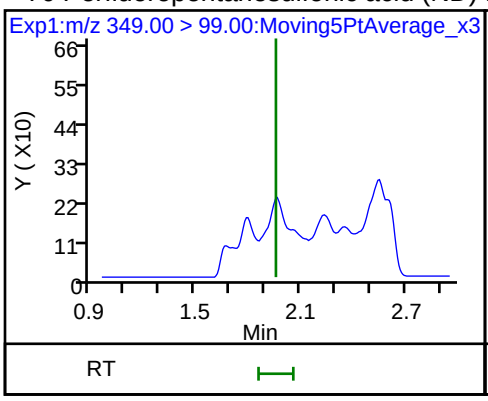
6 Perfluorohexanoic acid (ND)



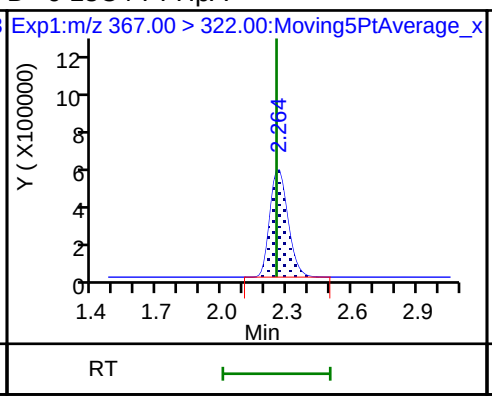
70 Perfluoropentanesulfonic acid (ND)



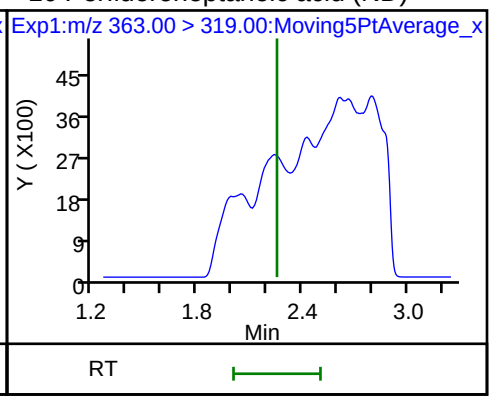
70 Perfluoropentanesulfonic acid (ND)



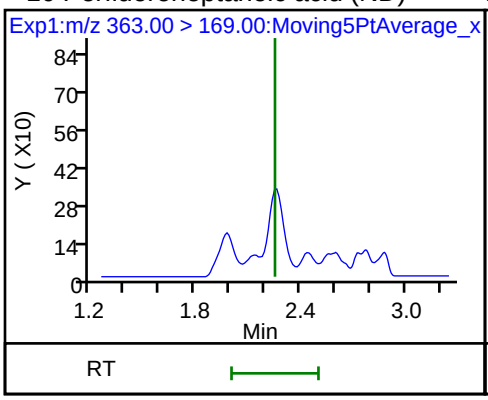
D 9 13C4-PFHpA



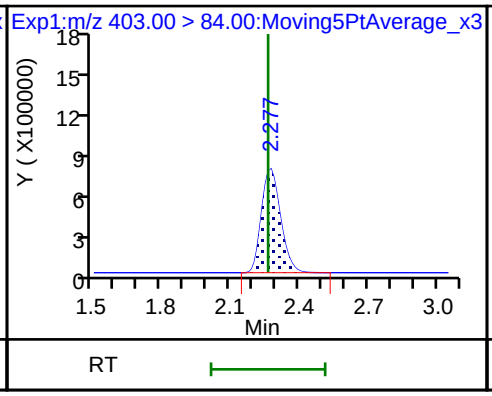
10 Perfluoroheptanoic acid (ND)



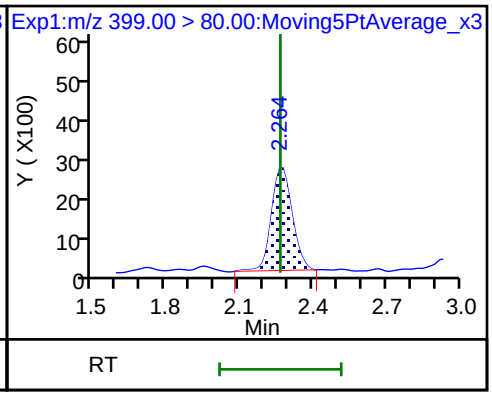
10 Perfluoroheptanoic acid (ND)



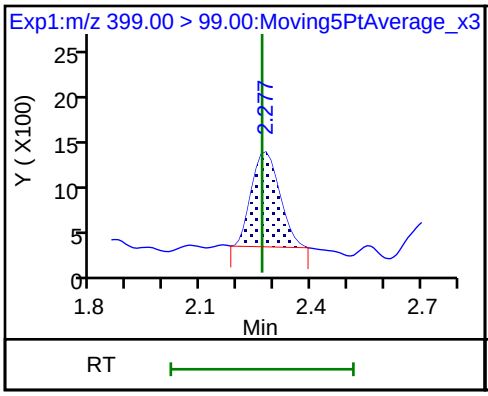
D 11 18O2 PFHxS



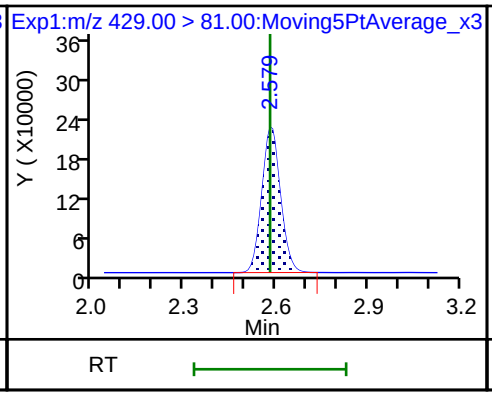
8 Perfluorohexanesulfonic acid



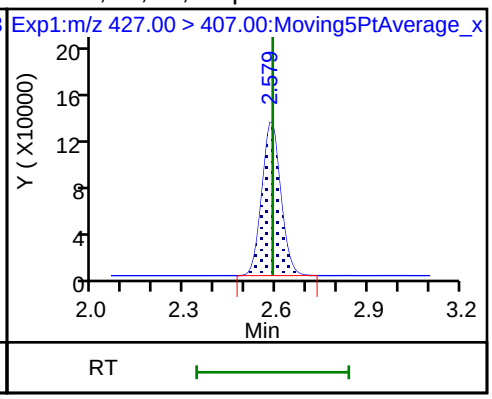
8 Perfluorohexanesulfonic acid



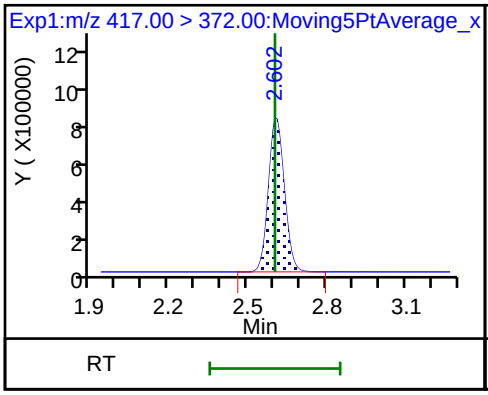
D 12 M2-6:2FTS



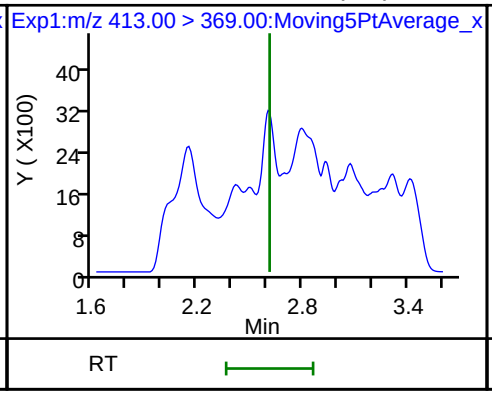
13 1H,1H,2H,2H-perfluorooctanesulfoni



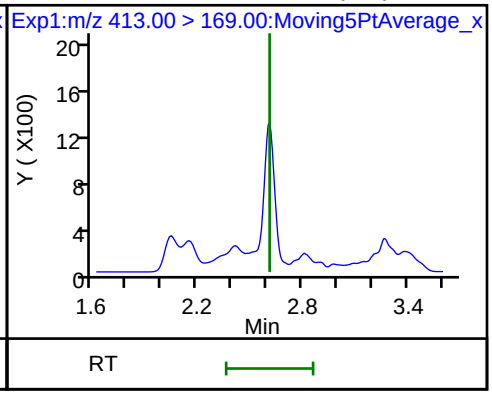
D 14 13C4 PFOA



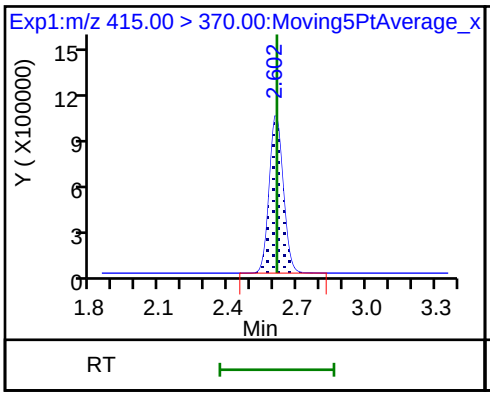
15 Perfluorooctanoic acid (ND)



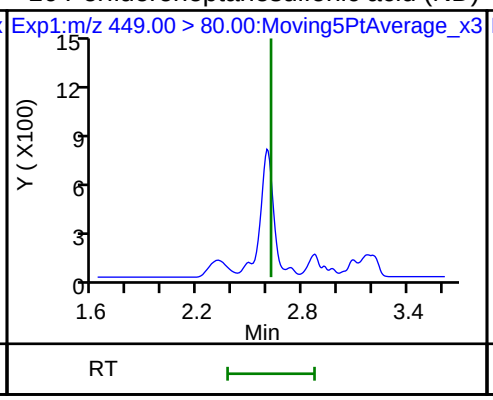
15 Perfluorooctanoic acid (ND)



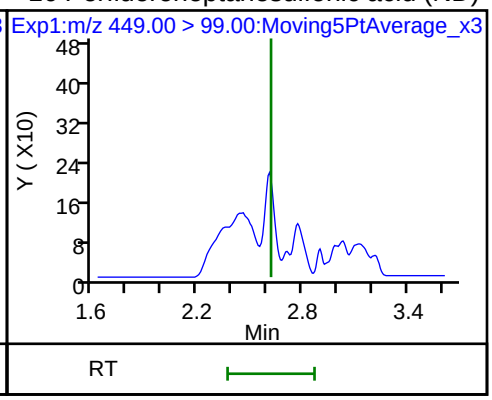
* 62 13C2-PFOA



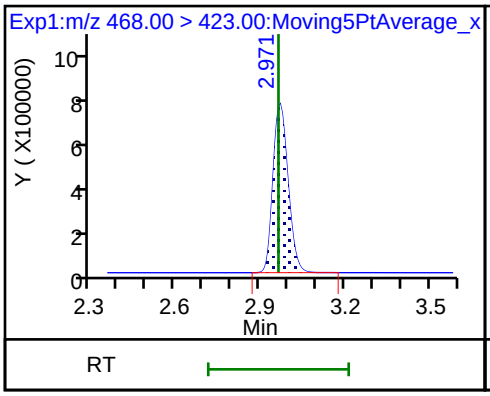
16 Perfluoroheptanesulfonic acid (ND)



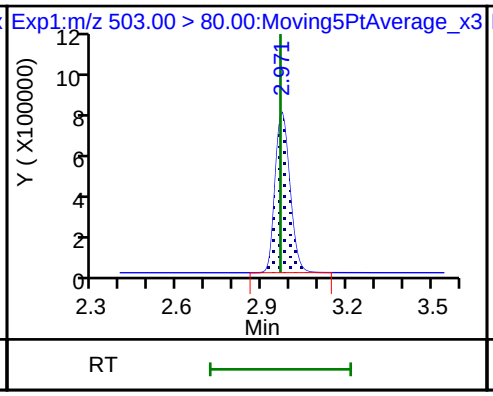
16 Perfluoroheptanesulfonic acid (ND)



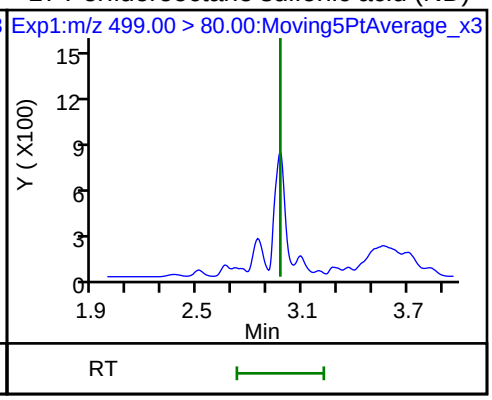
D 19 13C5 PFNA



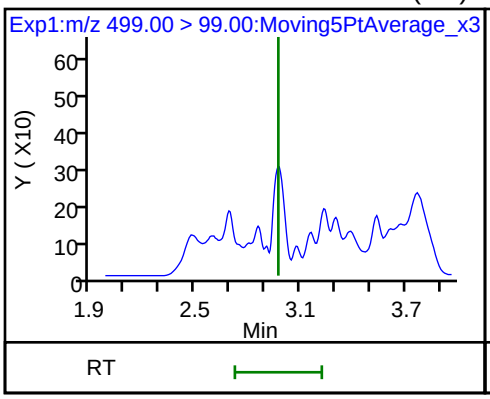
D 18 13C4 PFOS



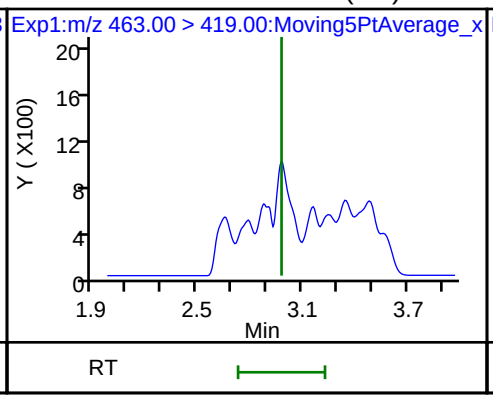
17 Perfluorooctane sulfonic acid (ND)



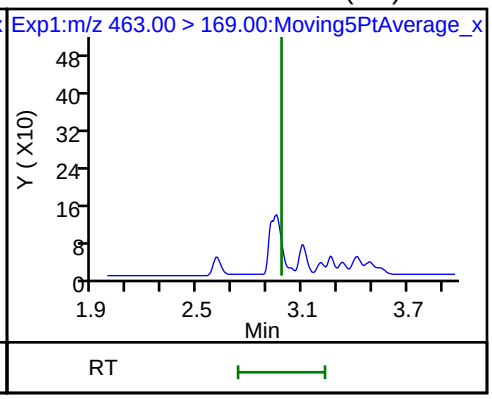
17 Perfluorooctane sulfonic acid (ND)



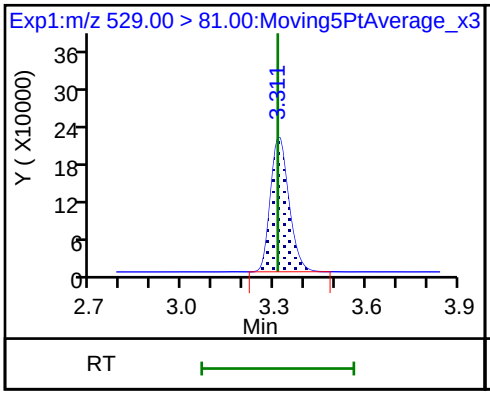
20 Perfluorononanoic acid (ND)



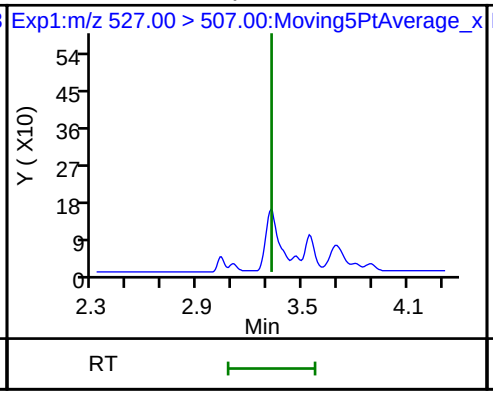
20 Perfluorononanoic acid (ND)



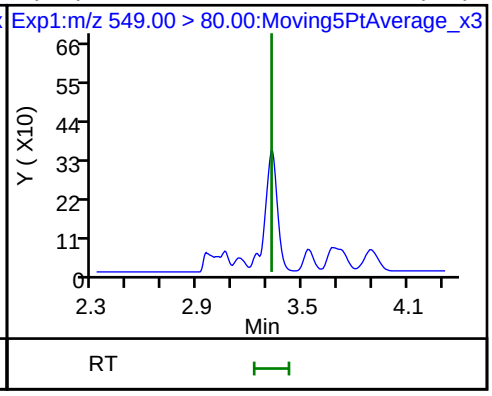
D 26 M2-8:2FTS



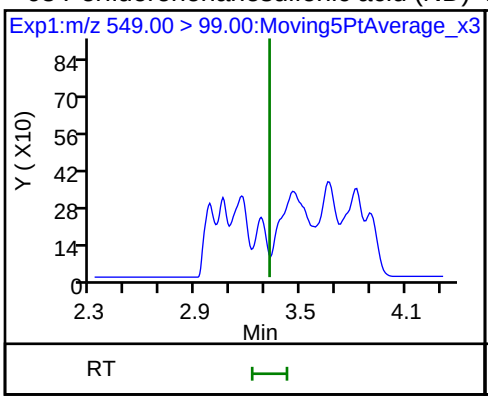
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



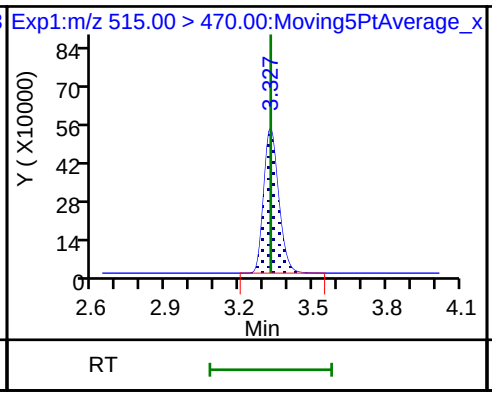
68 Perfluorononanesulfonic acid (ND)



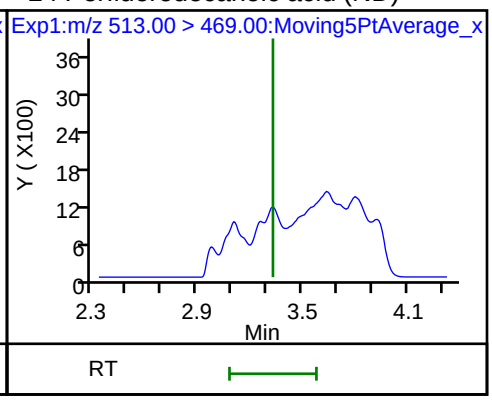
68 Perfluorononanesulfonic acid (ND)



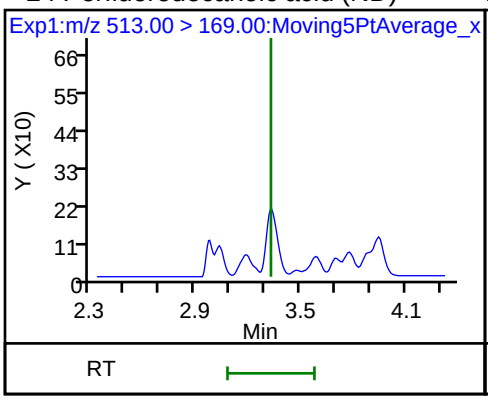
D 23 13C2 PFDA



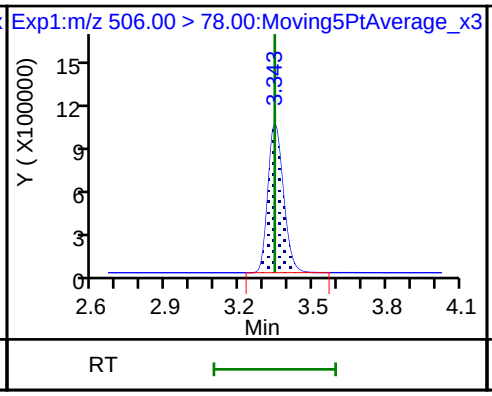
24 Perfluorodecanoic acid (ND)



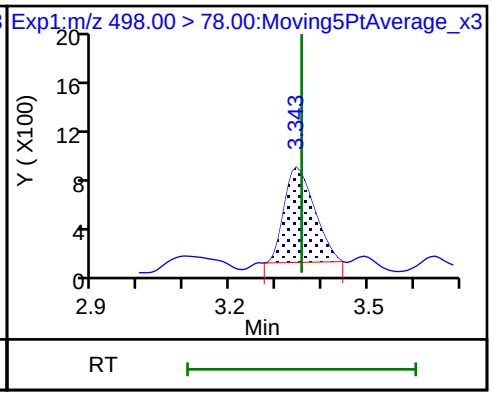
24 Perfluorodecanoic acid (ND)



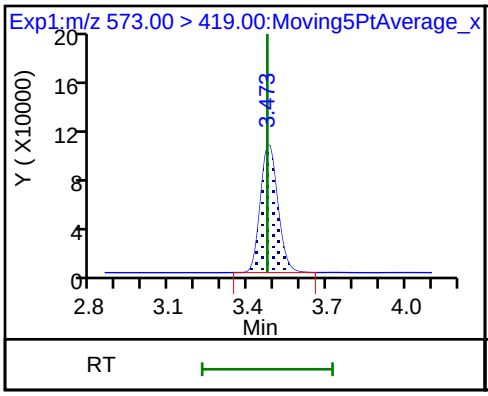
D 21 13C8 FOSA



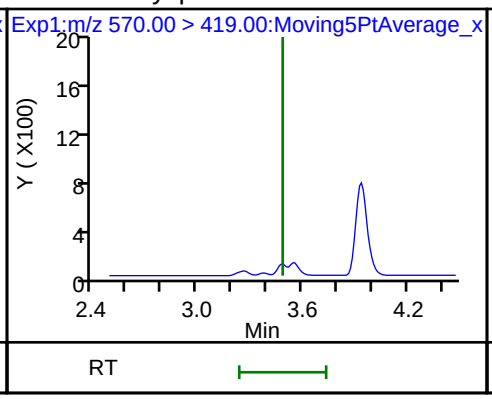
22 Perfluorooctane Sulfonamide



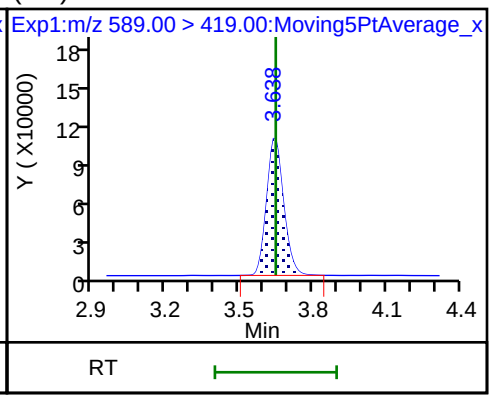
D 27 d3-NMeFOSAA



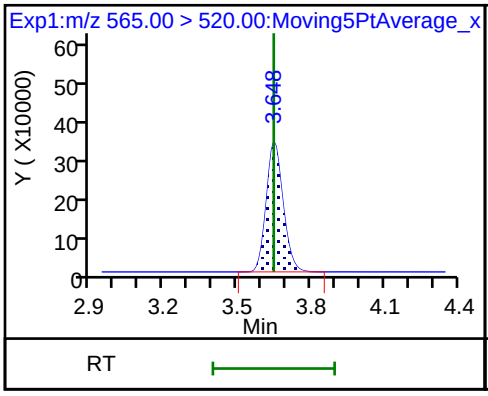
28 N-methyl perfluorooctane sulfonamid (ND)



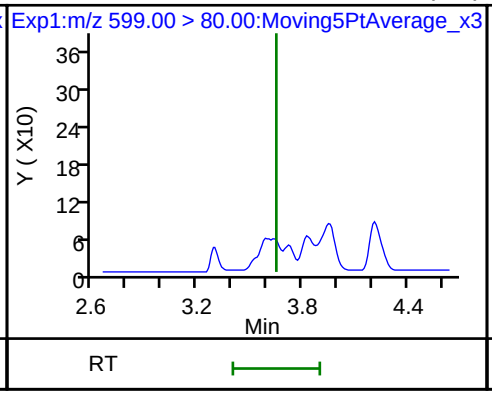
D 32 d5-NEtFOSAA



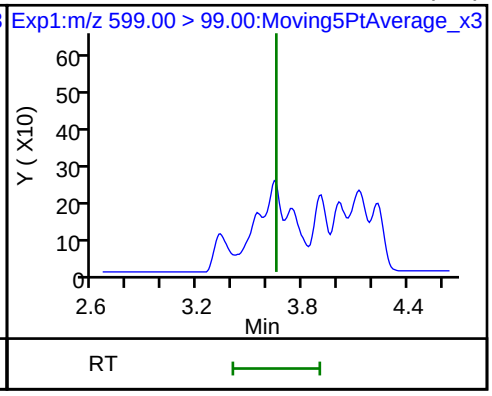
D 30 13C2 PFUnA



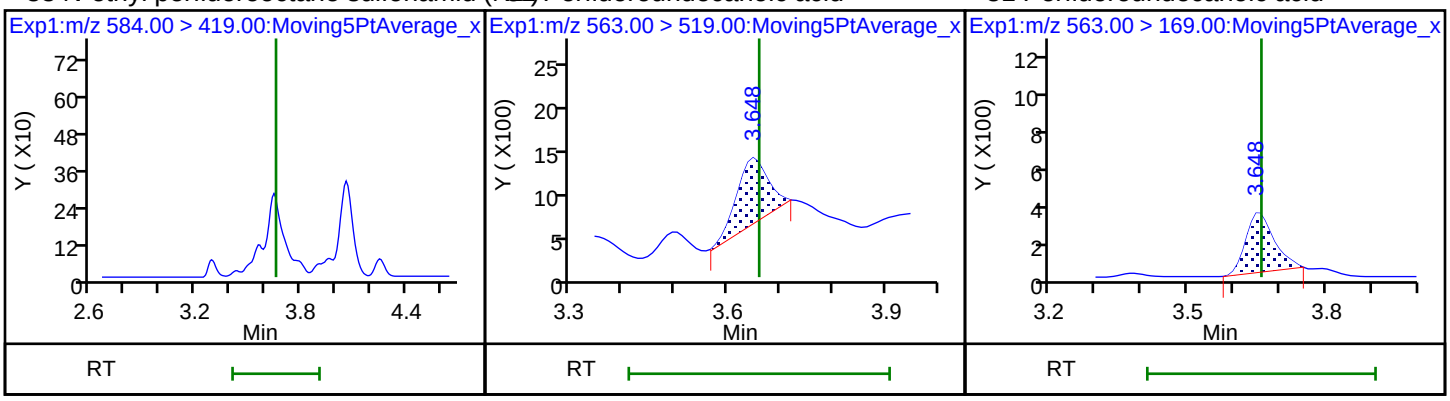
29 Perfluorodecane Sulfonic acid (ND)



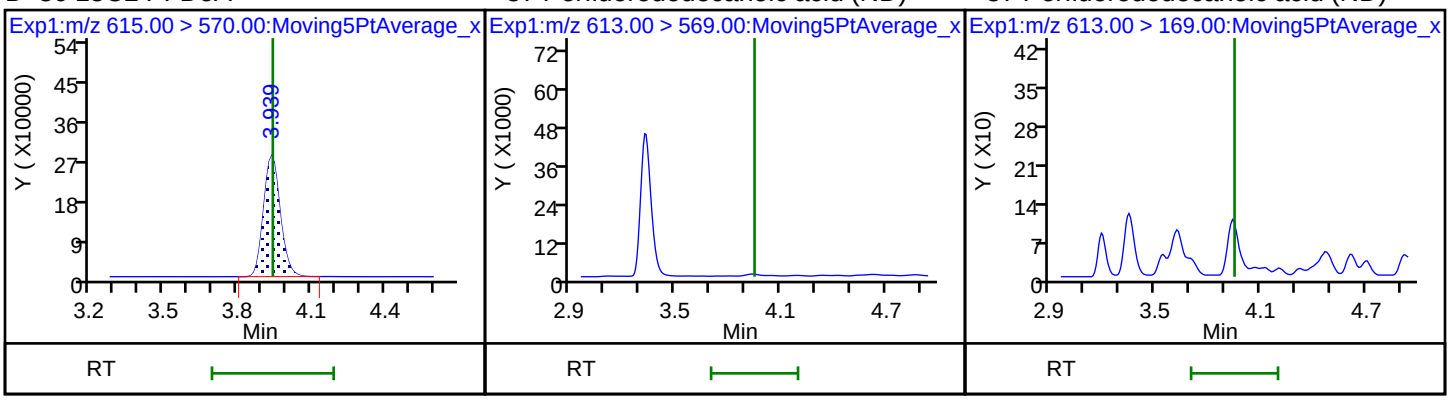
29 Perfluorodecane Sulfonic acid (ND)



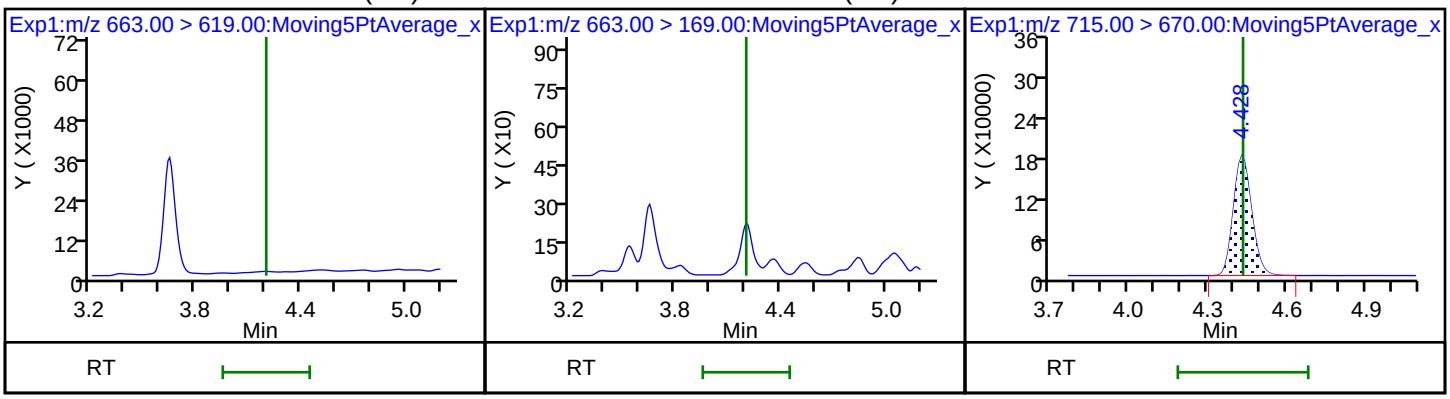
33 N-ethyl perfluorooctane sulfonamid (ND) 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid



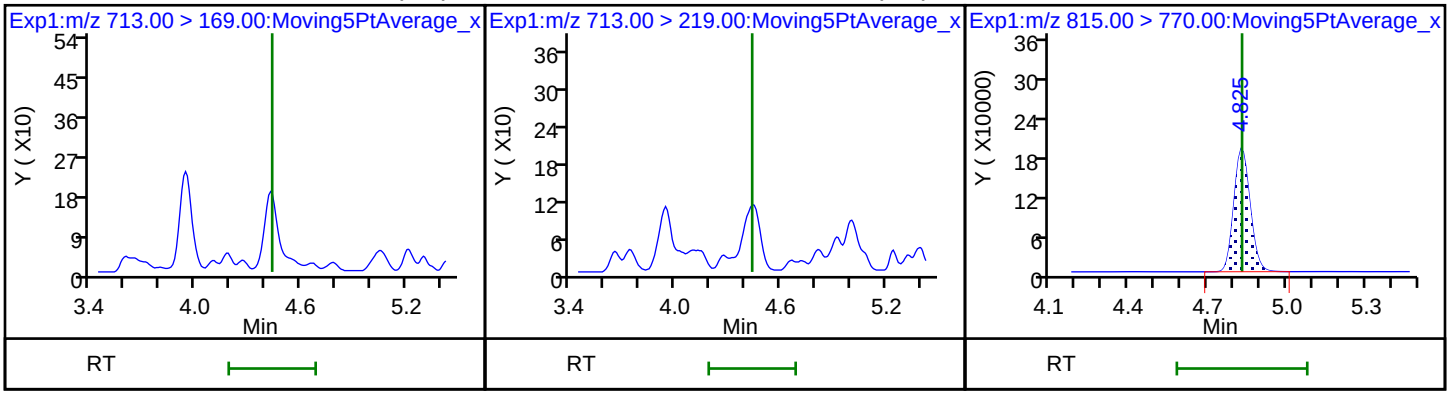
D 36 13C2 PFDoA 37 Perfluorododecanoic acid (ND) 37 Perfluorododecanoic acid (ND)



41 Perfluorotridecanoic acid (ND) 41 Perfluorotridecanoic acid (ND) D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND) 42 Perfluorotetradecanoic acid (ND) D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-236486/1-A
Matrix: Solid
Lab File ID: 2018.08.05LLA_031.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: SHAKE
Date Extracted: 07/27/2018 10:32
Sample wt/vol: 5.00(g)
Date Analyzed: 08/06/2018 03:27
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 238093
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.20	U	0.30	0.20	0.078
335-67-1	Perfluorooctanoic acid (PFOA)	0.20	U	0.30	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	0.20	U	0.30	0.20	0.081
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.18	U	0.40	0.18	0.059
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.20	U	0.30	0.20	0.062
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.50	U	1.0	0.50	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	79		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	82		50-150
STL00995	13C5 PFNA	83		50-150
STL00994	18O2 PFHxS	86		50-150
STL00991	13C4 PFOS	79		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_031.d
Lims ID: MB 320-236486/1-A
Client ID:
Sample Type: MB
Inject. Date: 06-Aug-2018 03:27:44 ALS Bottle#: 19 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-236486/1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 16:59:51 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 16:34:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.385	1.385	0.0	0.544	4181404	1.90		76.2	80331	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.386	0.005	1.004	38322	0.0233			7.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.625	1.624	0.001	0.638	3084797	2.13		85.3	61160	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.441	1.625	-0.184	0.887	13647	0.009237			2.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.656	0.0	0.651	76020	1.83		78.6	499	
D 7 13C2 PFHxA										
315.00 > 270.00	1.885	1.885	0.0	0.741	3621442	2.32		92.6	84650	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.980	1.980	0.0	0.778	230369	NC			8410	
D 9 13C4-PFHpA										
367.00 > 322.00	2.206	2.206	0.0	0.867	3176906	2.10		83.8	62941	
D 11 18O2 PFHxS										
403.00 > 84.00	2.217	2.217	0.0	0.871	4652666	2.04		86.3	82673	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.217	2.218	-0.001	1.000	16934	0.007446			91.1	
399.00 > 99.00	2.217	2.218	-0.001	1.000	3901		4.34(1.50-4.49)		12.2	
D 12 M2-6:2FTS										
429.00 > 81.00	2.527	2.527	0.0	0.993	900566	2.03		85.4	19609	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.527	2.528	-0.001	1.000	12195	0.0194			339	
* 62 13C2-PFOA										
415.00 > 370.00	2.546	2.547	-0.001		3812374	2.50			56358	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.555	2.547	0.008	1.004	5133	0.003679			4.1	
413.00 > 169.00	2.588	2.547	0.041	1.017	31365		0.16(0.84-2.52)		145	
D 14 13C4 PFOA										
417.00 > 372.00	2.546	2.555	-0.009	1.000	3016909	2.06		82.4	67311	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.912	2.913	-0.001	1.000	25364	0.0181			388	
499.00 > 99.00	2.913	2.913	0.0	1.000	0		0.00(2.31-6.93)			
D 19 13C5 PFNA										
468.00 > 423.00	2.912	2.916	-0.004	1.144	2650962	2.08		83.1	44345	
D 18 13C4 PFOS										
503.00 > 80.00	2.912	2.916	-0.004	1.144	2985803	1.90		79.4	37390	
D 26 M2-8:2FTS										
529.00 > 81.00	3.250	3.256	-0.006	1.277	963561	2.23		92.9	18859	
D 23 13C2 PFDA										
515.00 > 470.00	3.263	3.269	-0.006	1.282	2323375	2.44		97.4	74628	
D 21 13C8 FOSA										
506.00 > 78.00	3.299	3.307	-0.008	1.296	4033307	1.74		69.8	32677	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.421	3.420	0.001	1.344	453978	1.96		78.4	14011	
D 30 13C2 PFUnA										
565.00 > 520.00	3.590	3.589	0.001	1.410	1533637	2.09		83.5	64838	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.579	3.589	-0.010	1.406	473953	1.91		76.4	3045	
D 36 13C2 PFDoA										
615.00 > 570.00	3.879	3.878	0.001	1.524	1401508	2.20		88.1	16009	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.363	4.373	-0.010	1.714	1178071	2.21		88.2	5598	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.759	4.766	-0.007	1.000	22053	NC			0.9	
813.00 > 169.00	4.768	4.766	0.002	1.002	2876		7.67(2.86-8.58)		27.1	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.759	4.768	-0.009	1.869	1663755	1.81		72.3	3045	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 06-Aug-2018 16:59:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_031.d

Injection Date: 06-Aug-2018 03:27:44 Instrument ID: A8_N

Lims ID: MB 320-236486/1-A

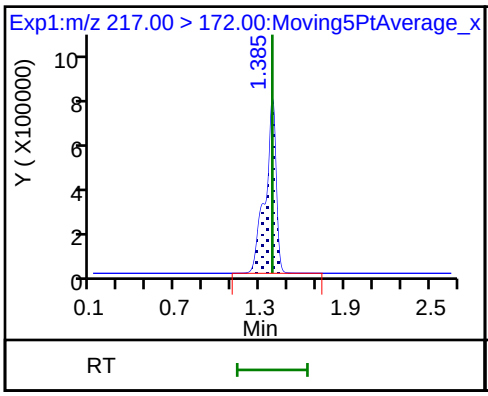
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 19 Worklist Smp#: 2

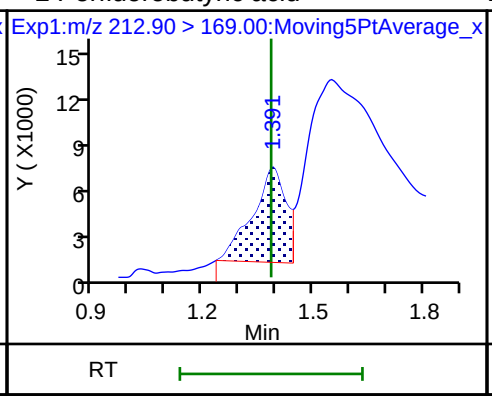
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

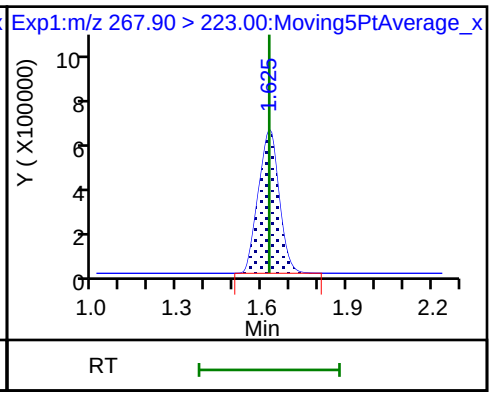
D 1 13C4 PFBA



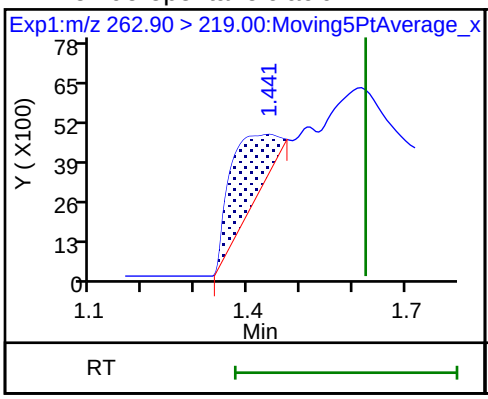
2 Perfluorobutyric acid



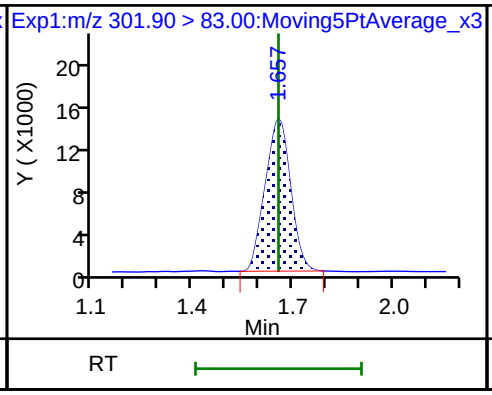
D 3 13C5-PFPeA



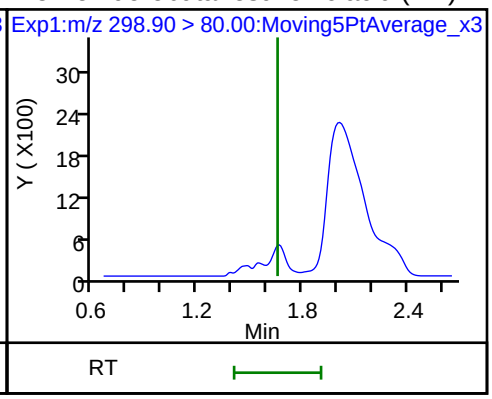
4 Perfluoropentanoic acid



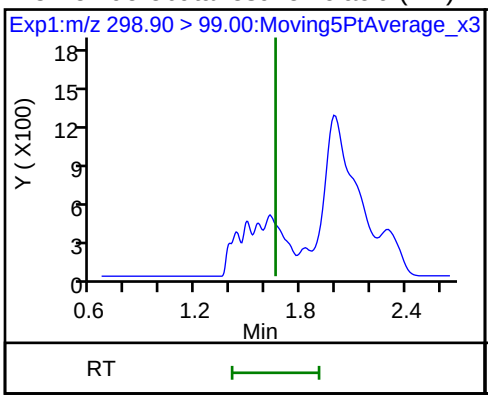
D 47 13C3-PFBS



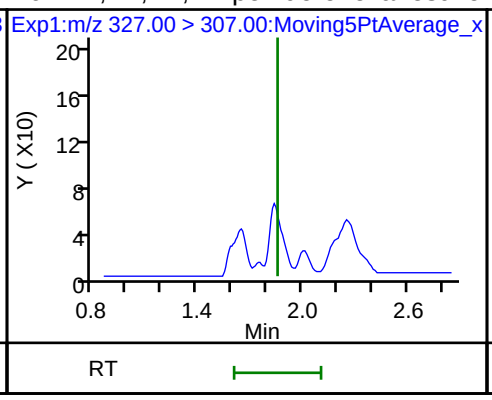
5 Perfluorobutanesulfonic acid (ND)



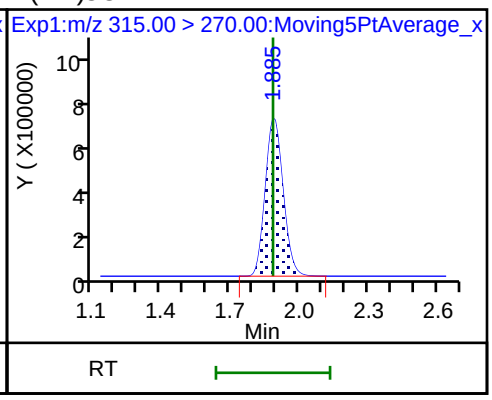
5 Perfluorobutanesulfonic acid (ND)



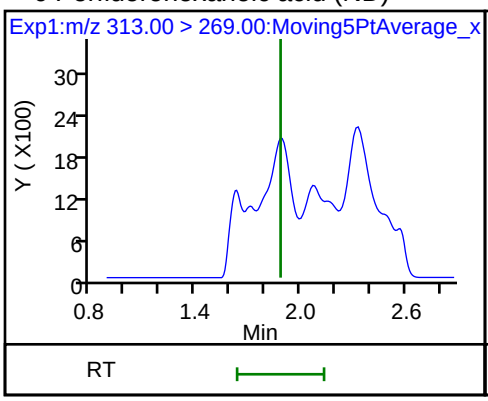
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



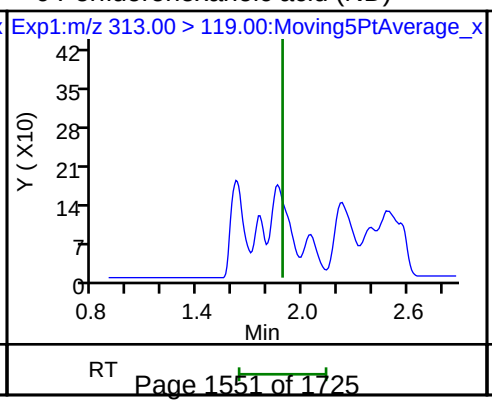
D 70 13C2 PFHxA



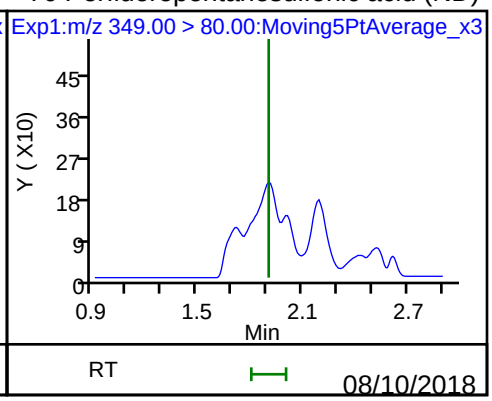
6 Perfluorohexanoic acid (ND)



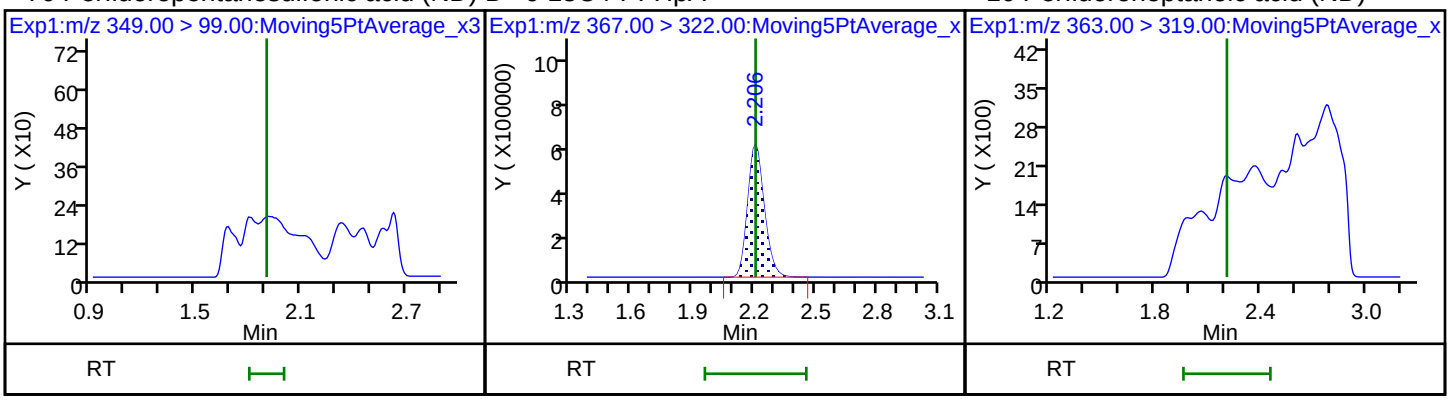
6 Perfluorohexanoic acid (ND)



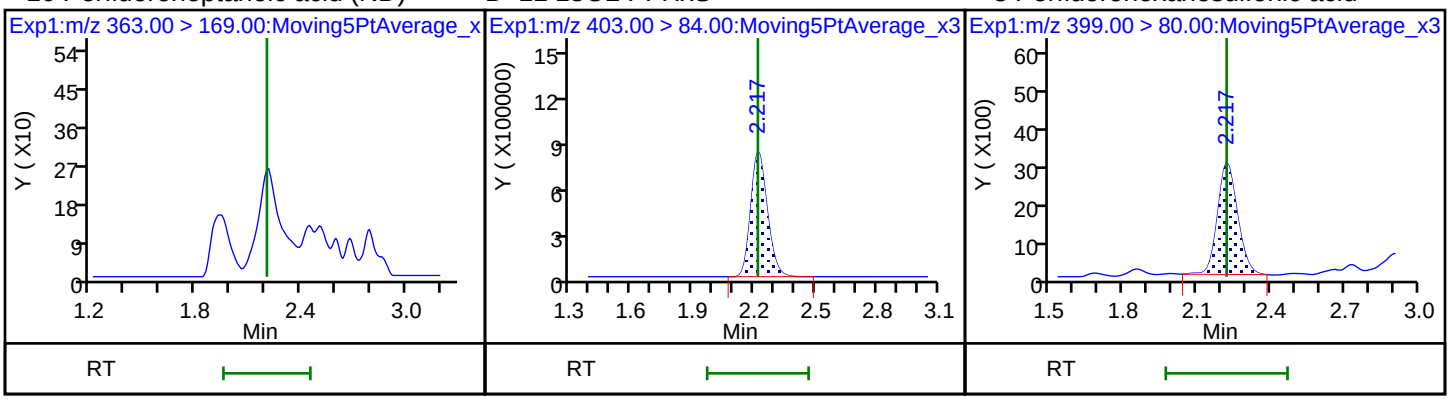
70 Perfluoropentanesulfonic acid (ND)



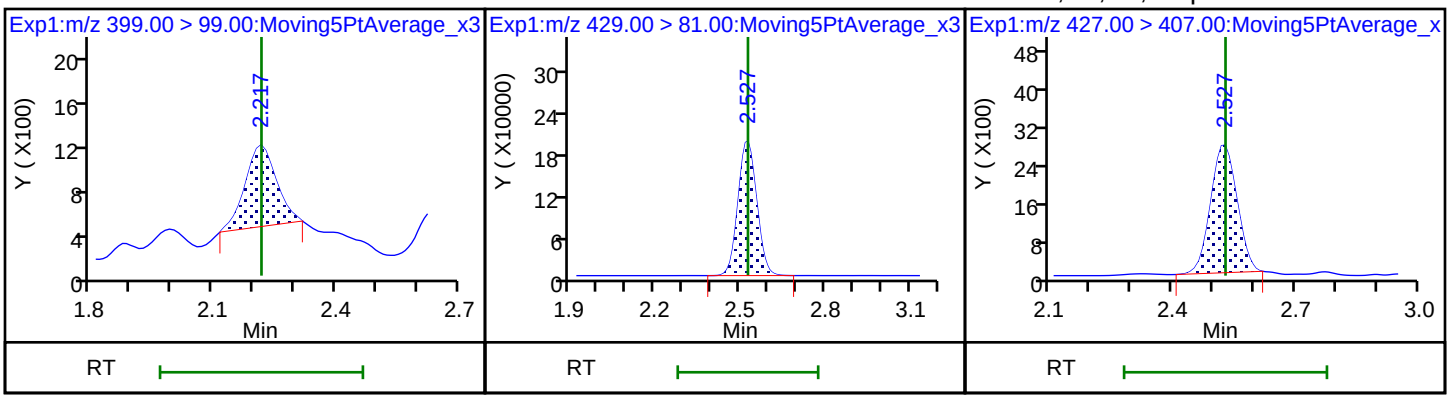
70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA 10 Perfluoroheptanoic acid (ND)



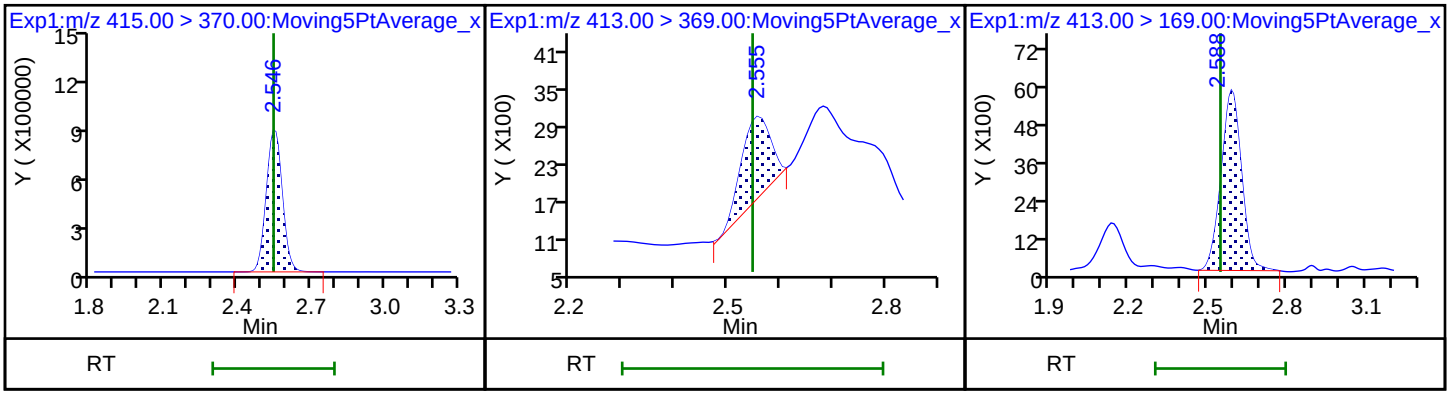
10 Perfluoroheptanoic acid (ND) D 11 18O2 PFHxS 8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid D 12 M2-6:2FTS 13 1H,1H,2H,2H-perfluorooctanesulfoni

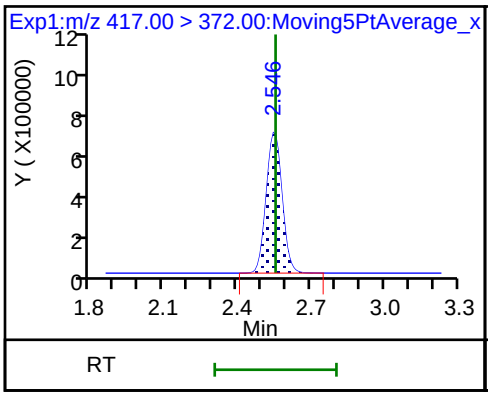


* 62 13C2-PFOA 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid

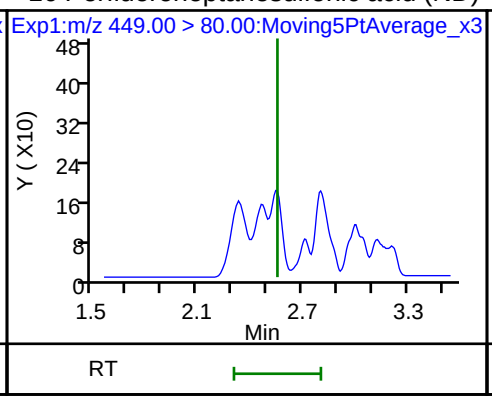


Report Date: 06-Aug-2018 16:59:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_031.d

D 14 13C4 PFOA



16 Perfluoroheptanesulfonic acid (ND)



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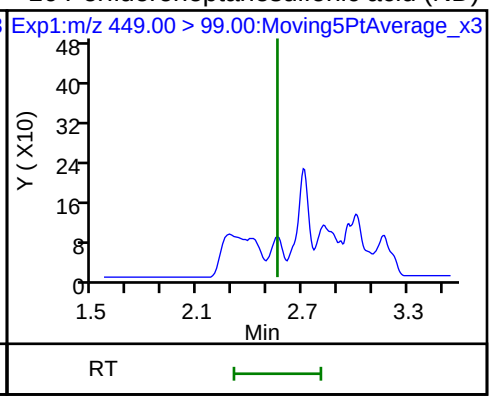
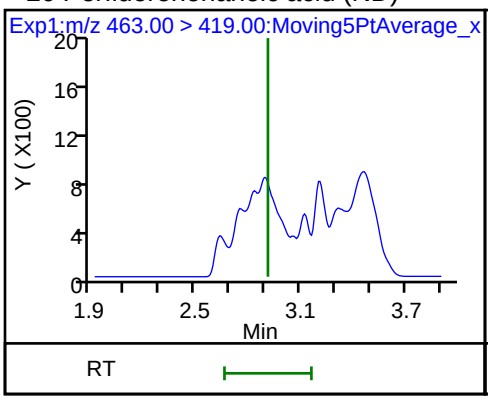


20 Perfluorononanoic acid (ND)



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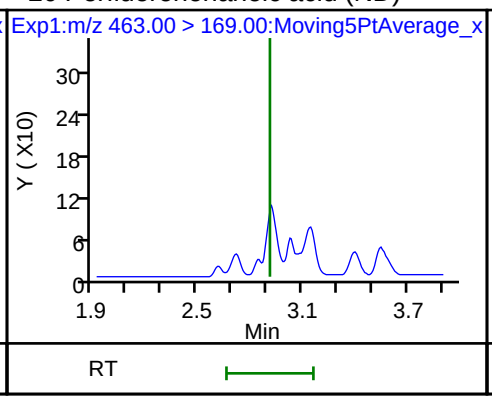
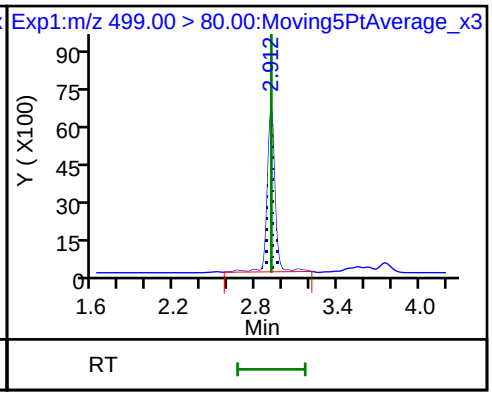


17 Perfluorooctane sulfonic acid



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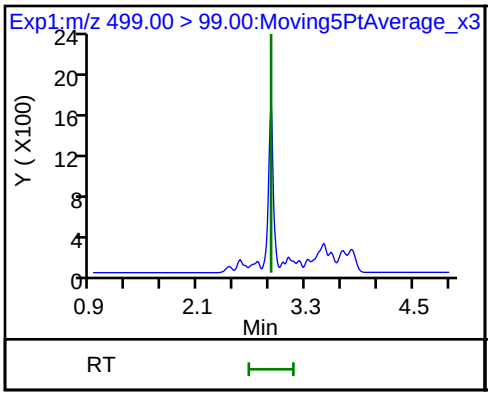
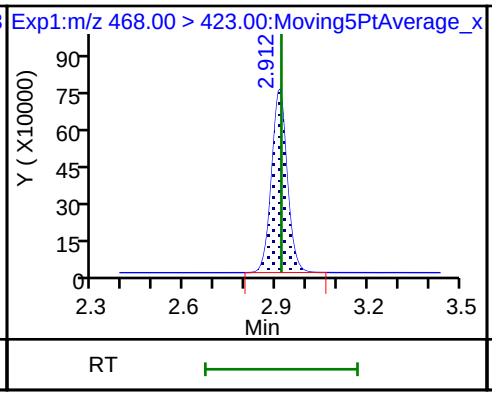


D 19 13C5 PFNA



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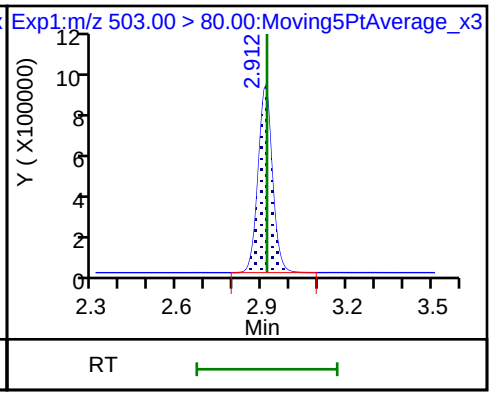
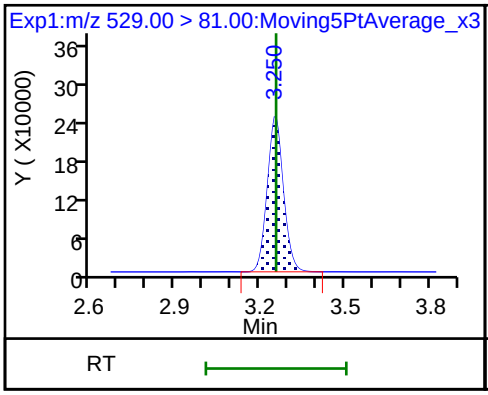
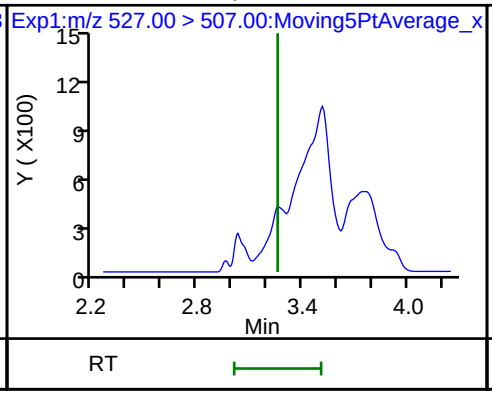


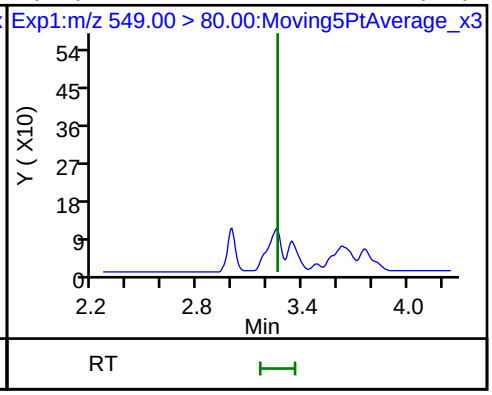
D 26 M2-8:2FTS



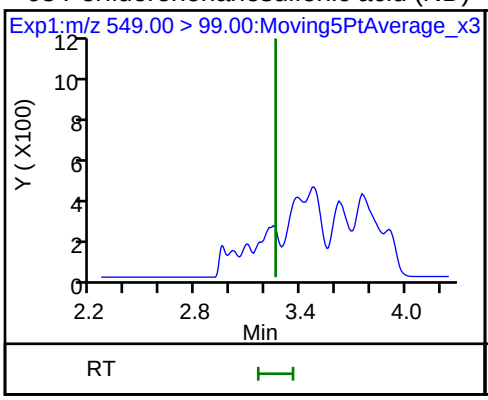
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



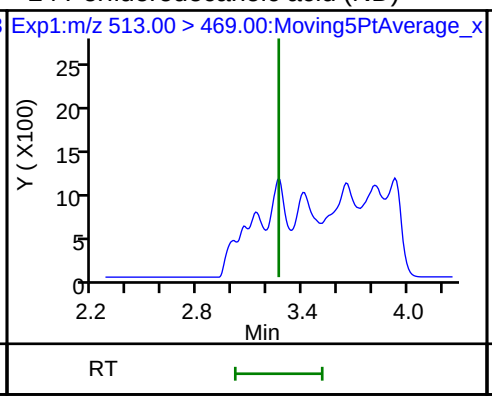
(ND) Perfluorononanesulfonic acid (ND)



68 Perfluorononanesulfonic acid (ND)



24 Perfluorodecanoic acid (ND)



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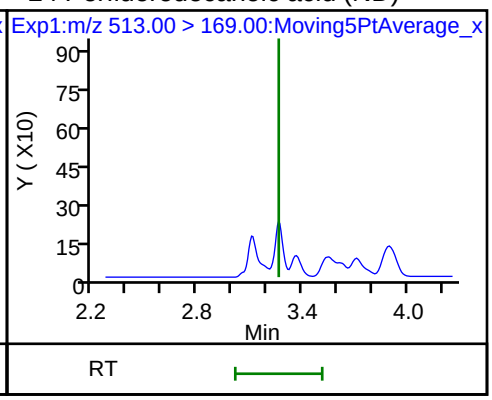
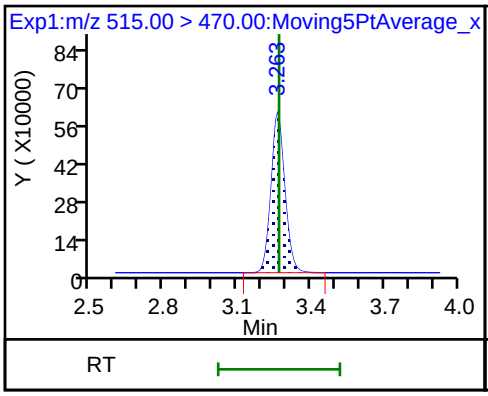
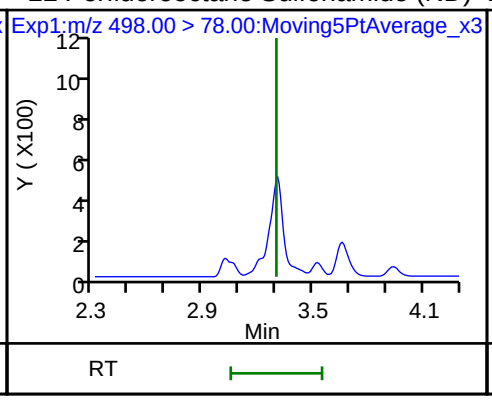


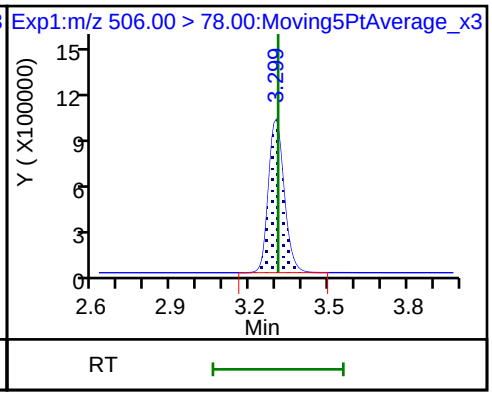
D 23 13C2 PFDA



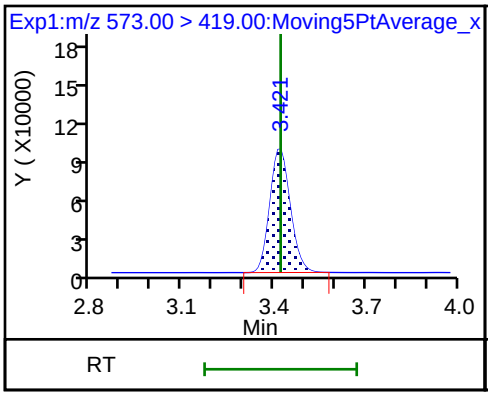
22 Perfluorooctane Sulfonamide (ND)



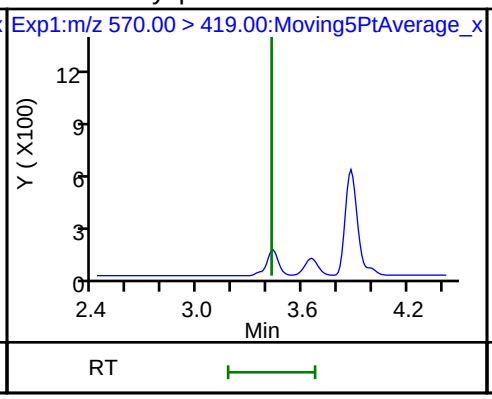
D 21 13C8 FOSA



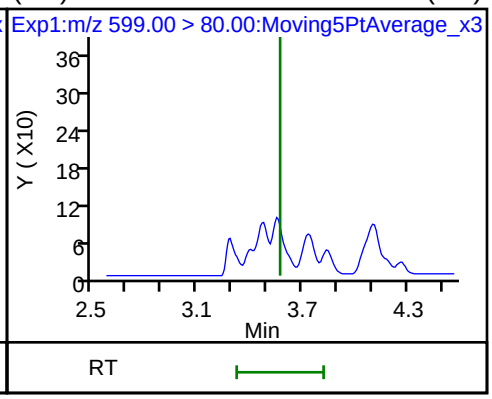
D 27 d3-NMeFOSAA



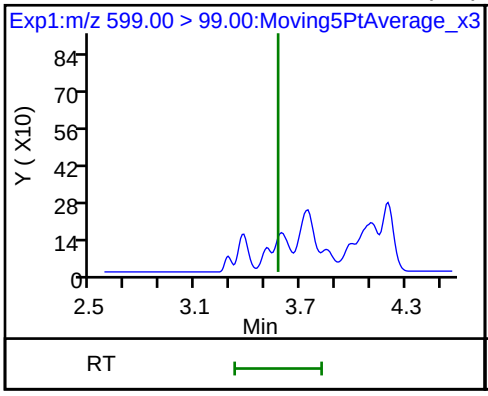
28 N-methyl perfluorooctane sulfonami (ND)



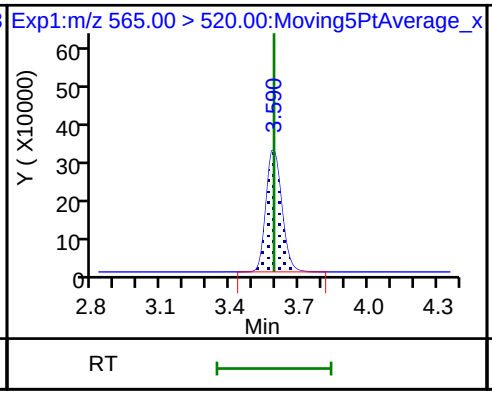
29 Perfluorodecane Sulfonic acid (ND)



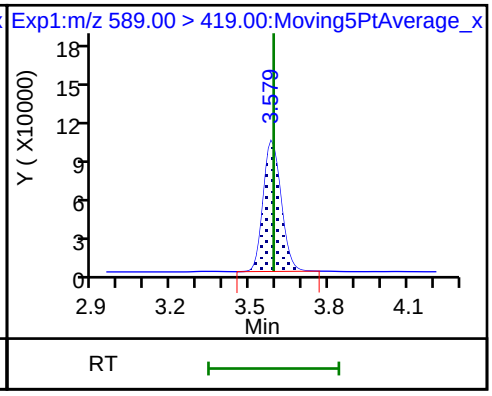
29 Perfluorodecane Sulfonic acid (ND)



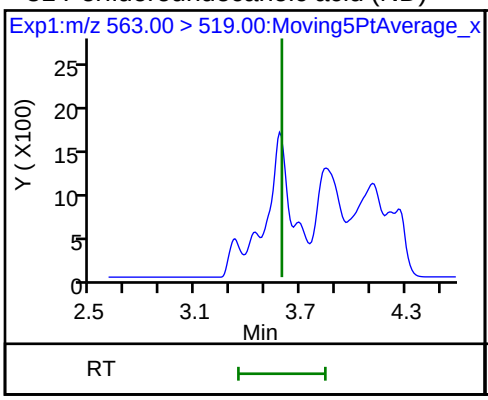
D 30 13C2 PFUnA



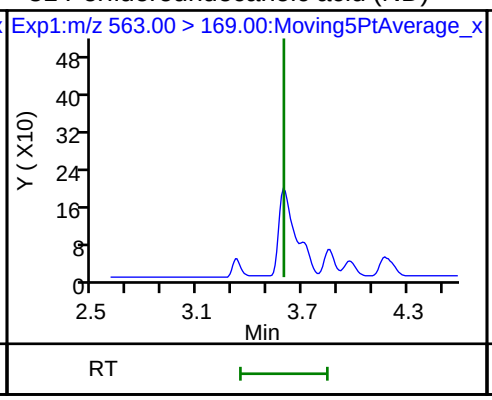
D 32 d5-NEtFOSAA



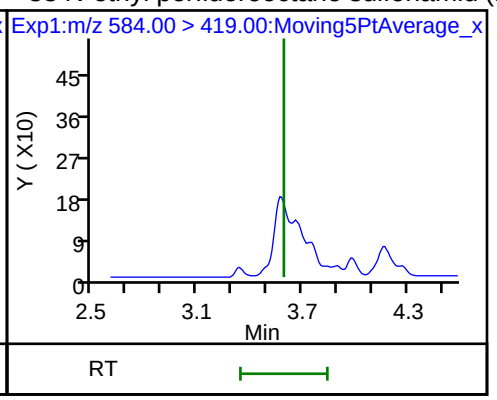
31 Perfluoroundecanoic acid (ND)



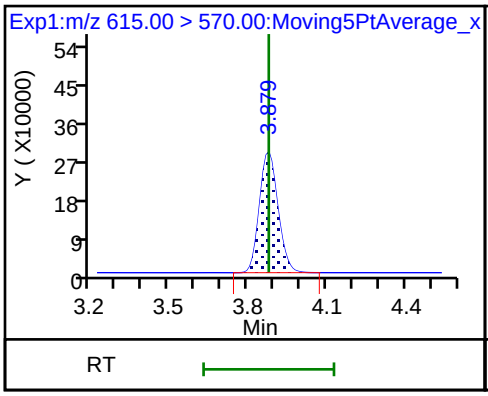
31 Perfluoroundecanoic acid (ND)



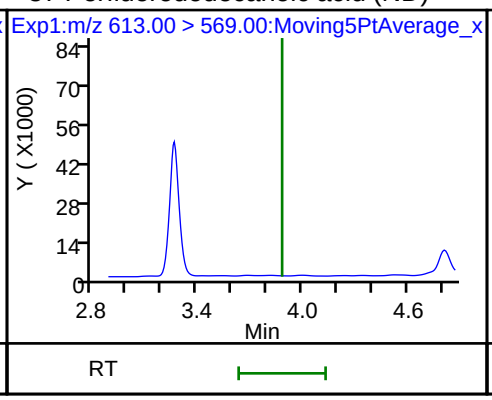
33 N-ethyl perfluorooctane sulfonamid (ND)



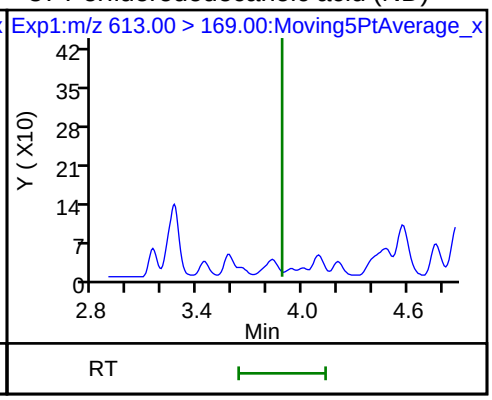
D 36 13C2 PFDoA



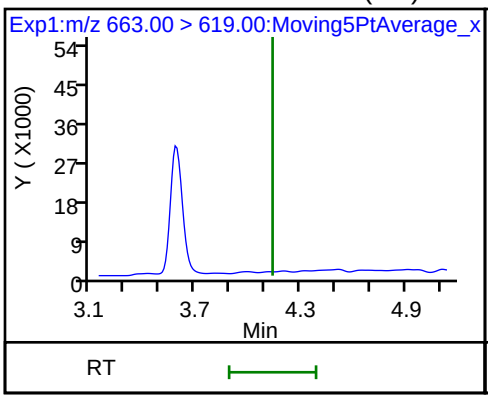
37 Perfluorododecanoic acid (ND)



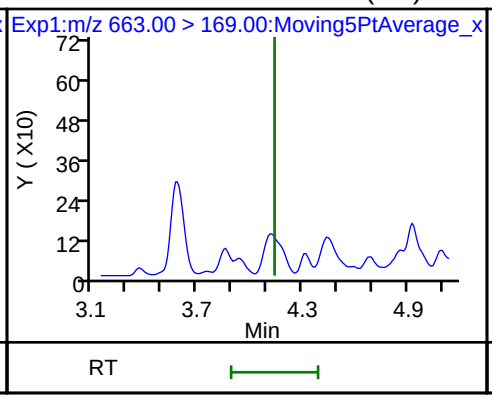
37 Perfluorododecanoic acid (ND)



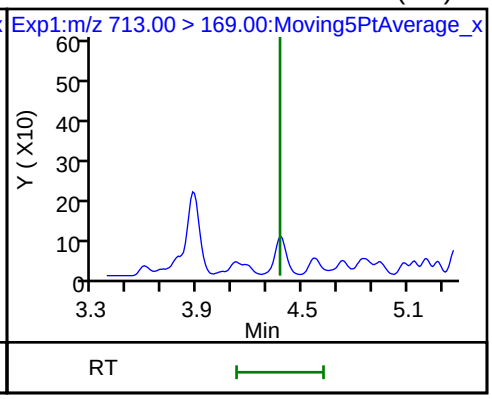
41 Perfluorotridecanoic acid (ND)



41 Perfluorotridecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



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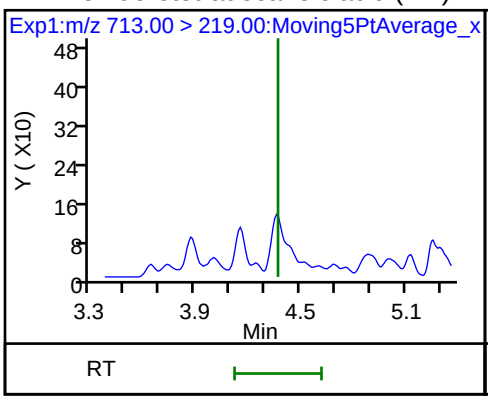
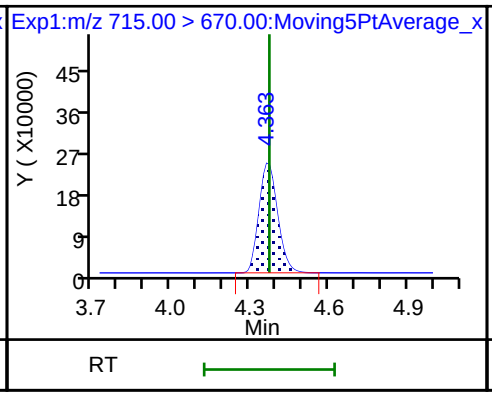
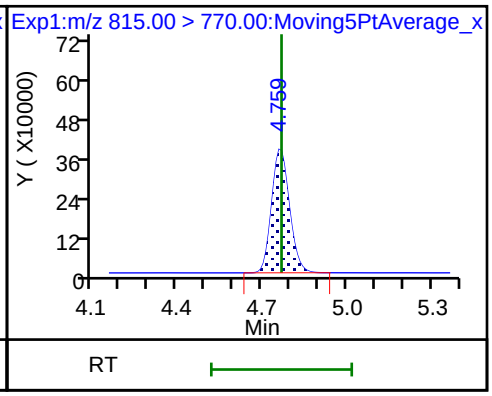


D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-236782/1
Matrix: Water
Lab File ID: 2018.07.28LLB_003.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/29/2018 04:55
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 236782
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00671	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	102		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	105		50-150
STL00994	18O2 PFHxS	103		50-150
STL00991	13C4 PFOS	103		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_003.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 29-Jul-2018 04:55:55 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-Jul-2018 10:33:36 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj Date: 30-Jul-2018 10:32:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.391	1.397	-0.006	0.538	4558832	2.65		106	80962	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.640	-0.007	0.632	3191290	2.66		106	55225	
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.675	-0.009	0.645	74422	2.37		102	519	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.876	0.0	0.726	366251	NC			5400	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.905	0.0	0.737	3503373	2.49		99.6	61573	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.003	0.0	0.775	317281	NC			8959	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.229	0.0	0.863	3581763	2.47		98.8	84948	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.241	0.0	0.867	4554967	2.45		103	40845	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.242	-0.001	1.000	15070	0.006707			147	
399.00 > 99.00	2.229	2.242	-0.013	0.995	4661		3.23(1.50-4.49)		18.0	
D 12 M2-6:2FTS										
429.00 > 81.00	2.560	2.564	-0.004	0.991	635372	1.57		66.1	9868	
D 14 13C4 PFOA										
417.00 > 372.00	2.584	2.588	-0.004	1.000	3483943	2.46		98.3	45865	
* 62 13C2-PFOA										
415.00 > 370.00	2.584	2.590	-0.006		3705730	2.50			39568	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.584	2.590	-0.006	1.000	7054	0.004171			7.7	
413.00 > 169.00	2.588	2.590	-0.002	1.002	0		0.00(0.84-2.52)			

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.950	2.953	-0.003	1.142	3221170	2.63		105	45629	
D 18 13C4 PFOS										
503.00 > 80.00	2.950	2.953	-0.003	1.142	3182837	2.46		103	37710	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.299	-0.004	1.275	998284	2.36		98.7	19976	
D 23 13C2 PFDA										
515.00 > 470.00	3.310	3.315	-0.005	1.281	2778816	2.86		114	37114	
D 21 13C8 FOSA										
506.00 > 78.00	3.318	3.322	-0.004	1.284	5128212	2.70		108	58166	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.463	3.467	-0.004	1.340	995080	3.09		124	27305	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.627	3.640	-0.013	1.404	998466	2.95		118	3958	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.640	-0.003	1.407	2230740	2.85		114	47251	
D 36 13C2 PFDoA										
615.00 > 570.00	3.927	3.941	-0.014	1.520	2146370	2.88		115	22690	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.436	4.437	-0.001	1.717	2008358	2.76		110	15222	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.842	4.837	0.005	1.002	27680	NC			5.0	
813.00 > 169.00	4.842	4.837	0.005	1.002	4564		6.06(2.86-8.58)		56.0	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.842	-0.009	1.870	3037731	2.75		110	11059	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 30-Jul-2018 10:34:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_003.d

Injection Date: 29-Jul-2018 04:55:55 Instrument ID: A8_N

Lims ID: CCB

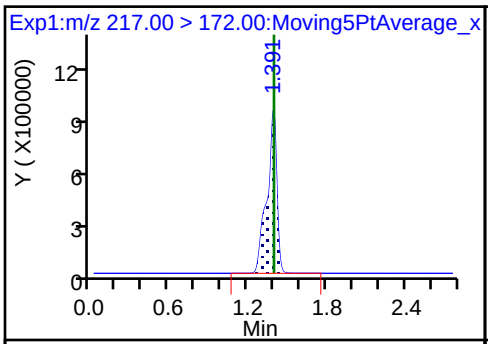
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

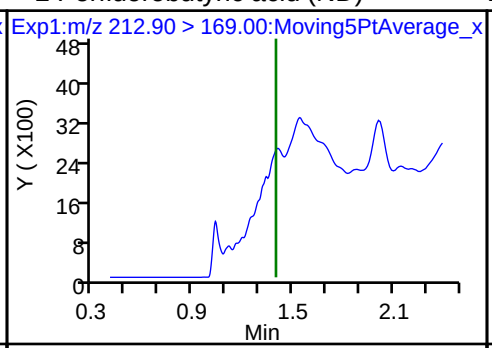
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



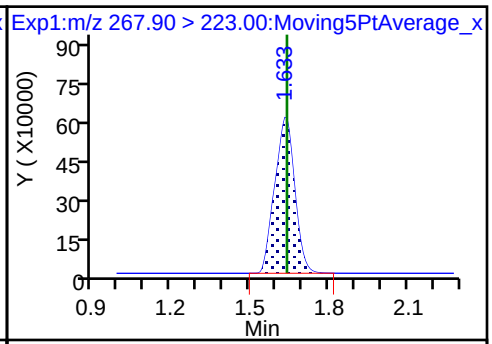
RT

2 Perfluorobutyric acid (ND)



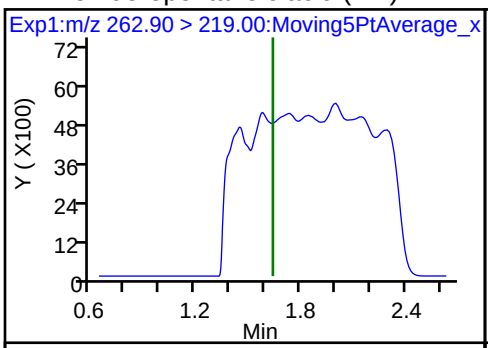
RT

D 3 13C5-PFPeA



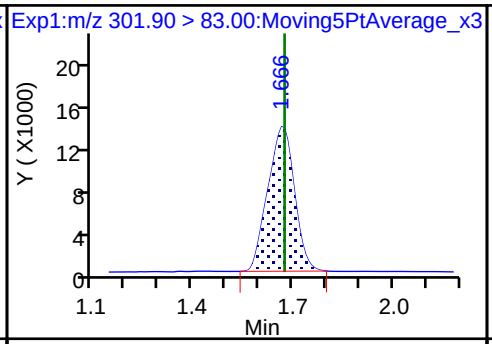
RT

4 Perfluoropentanoic acid (ND)



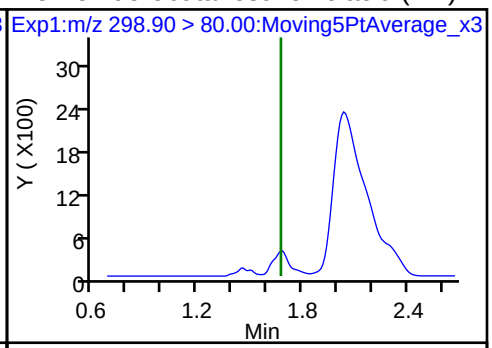
RT

D 47 13C3-PFBS



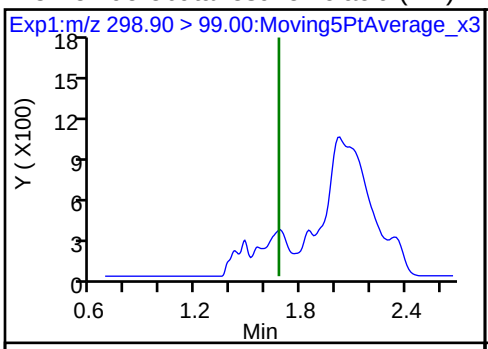
RT

5 Perfluorobutanesulfonic acid (ND)



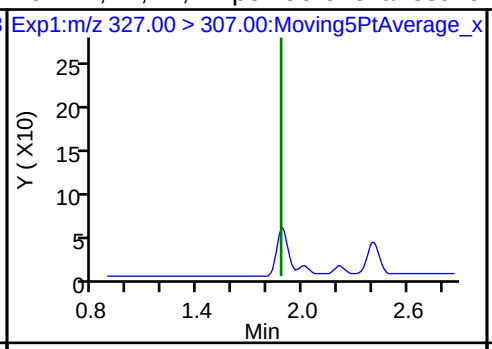
RT

5 Perfluorobutanesulfonic acid (ND)



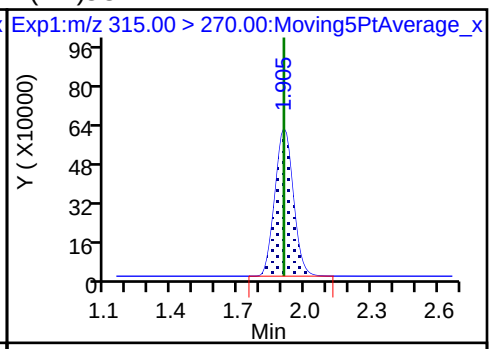
RT

61 1H,1H,2H,2H-perfluorohexanesulfonic (ND)



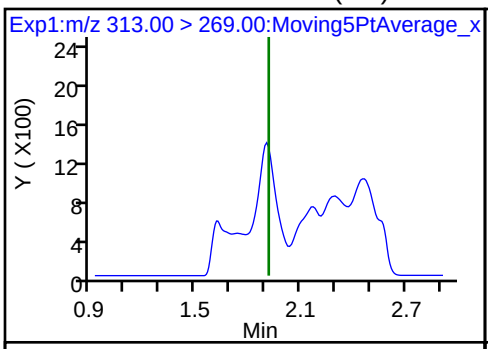
RT

D 71 13C2 PFHxA



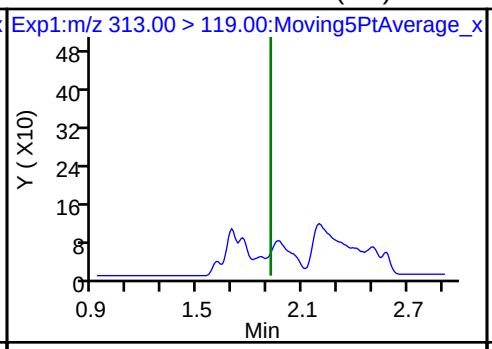
RT

6 Perfluorohexanoic acid (ND)



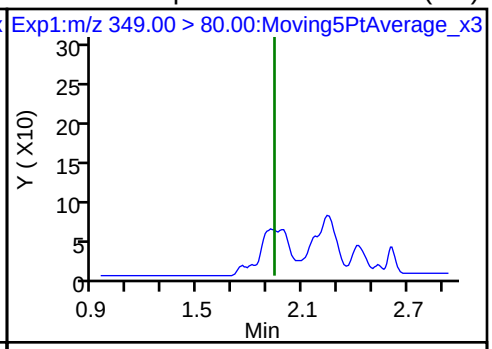
RT

6 Perfluorohexanoic acid (ND)



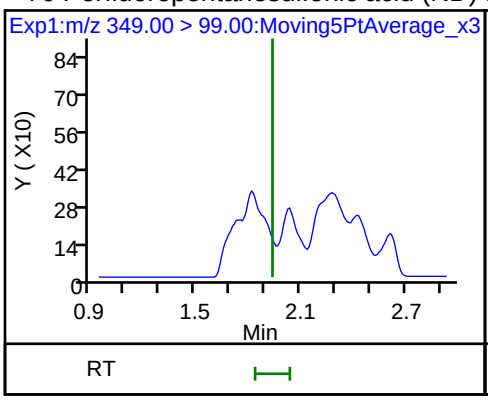
RT

70 Perfluoropentanesulfonic acid (ND)

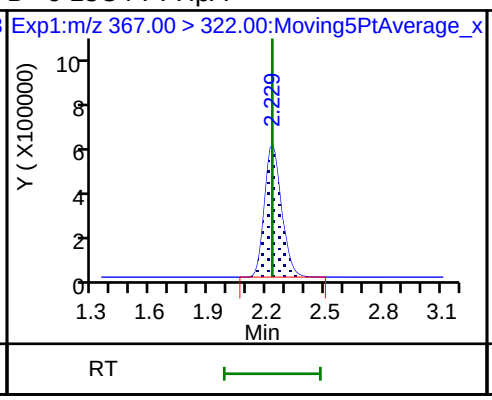


RT

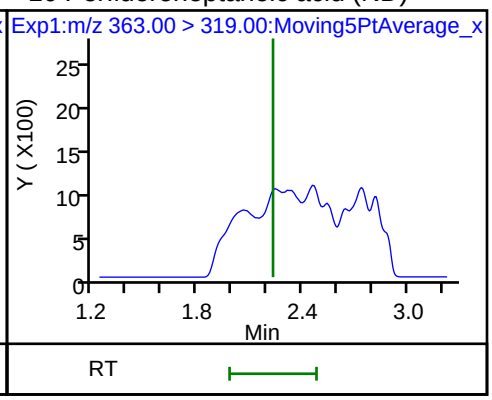
70 Perfluoropentanesulfonic acid (ND)



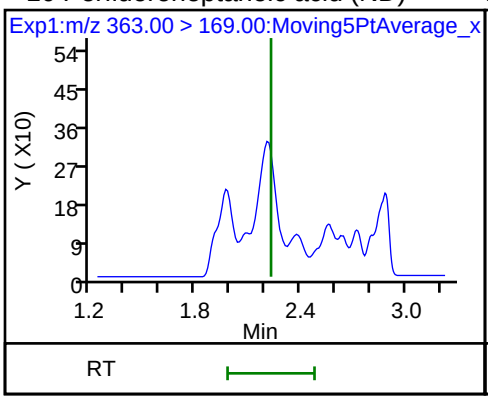
D 9 13C4-PFHpA



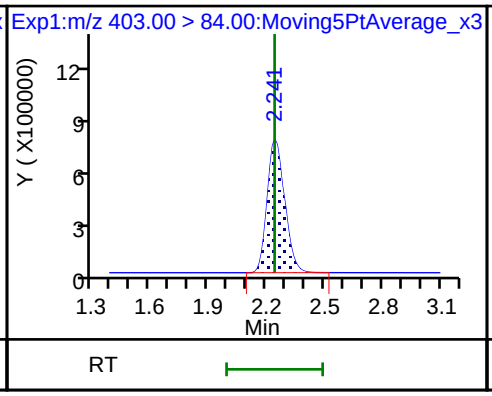
10 Perfluoroheptanoic acid (ND)



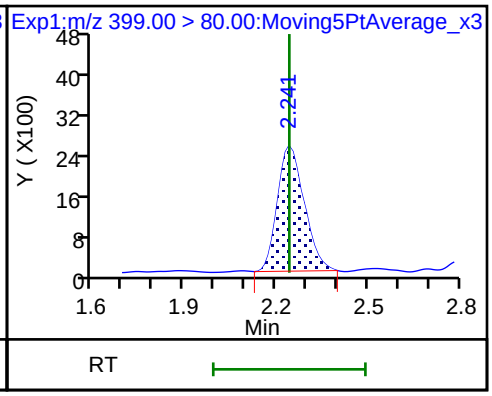
10 Perfluoroheptanoic acid (ND)



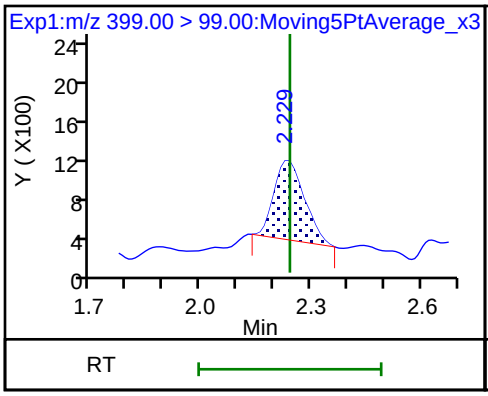
D 11 18O2 PFHxS



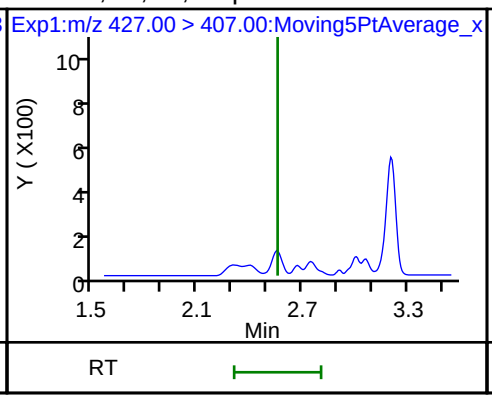
8 Perfluorohexanesulfonic acid



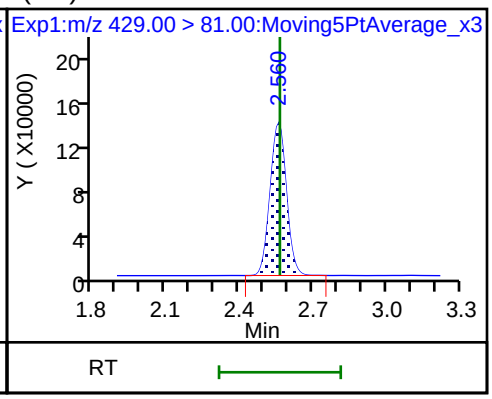
8 Perfluorohexanesulfonic acid



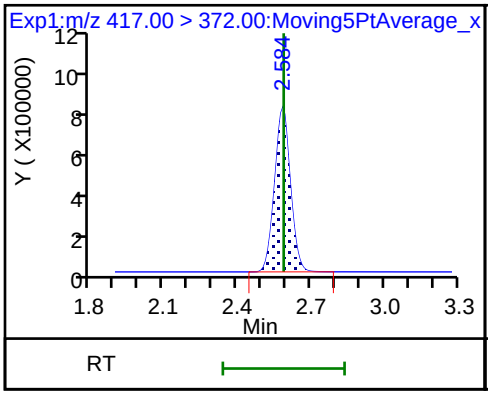
13 1H,1H,2H,2H-perfluorooctanesulfonic acid



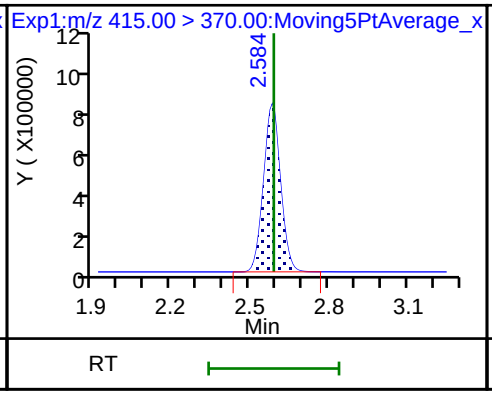
D (ND) 12 M2-6:2FTS



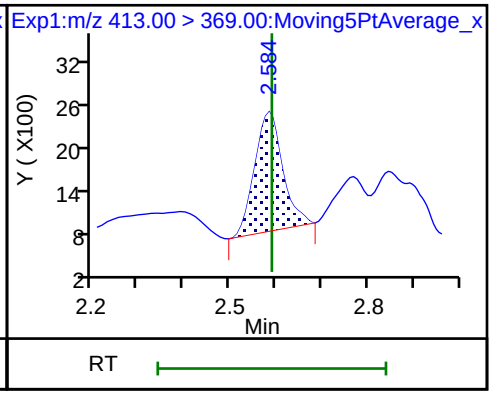
D 14 13C4 PFOA



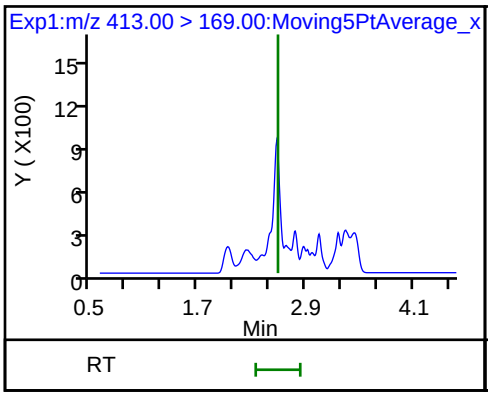
* 62 13C2-PFOA



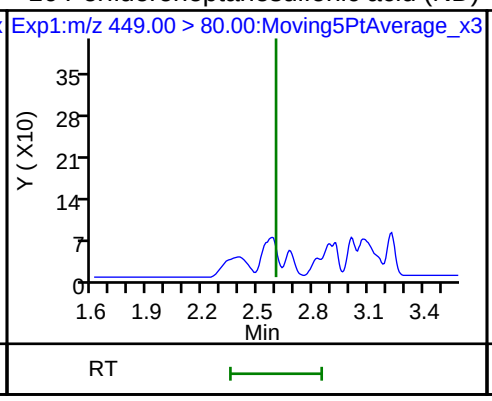
15 Perfluorooctanoic acid



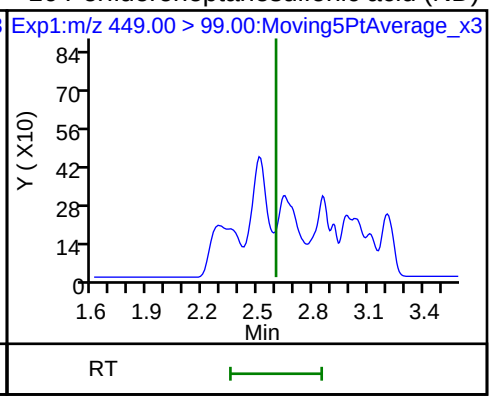
15 Perfluorooctanoic acid



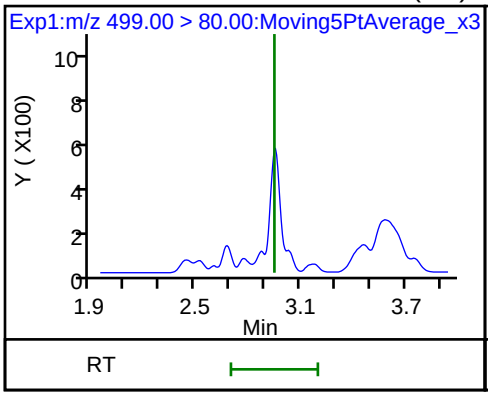
16 Perfluoroheptanesulfonic acid (ND)



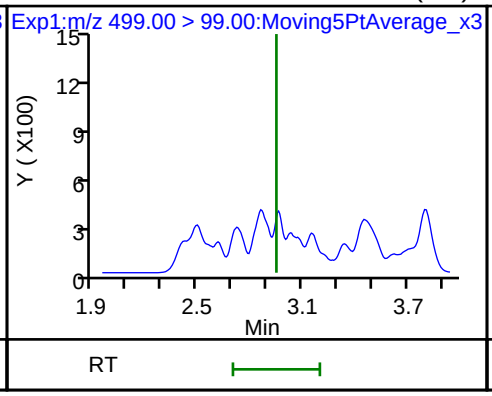
16 Perfluoroheptanesulfonic acid (ND)



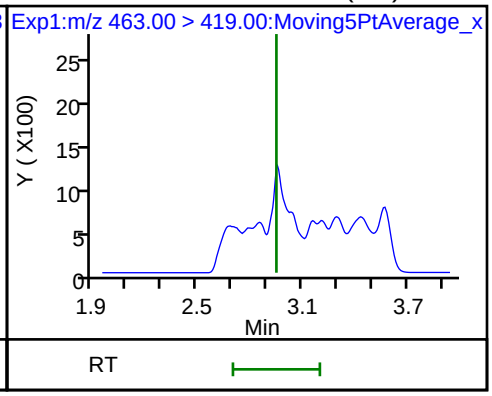
17 Perfluorooctane sulfonic acid (ND)



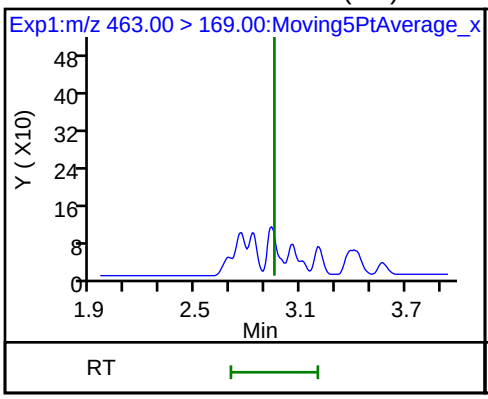
17 Perfluorooctane sulfonic acid (ND)



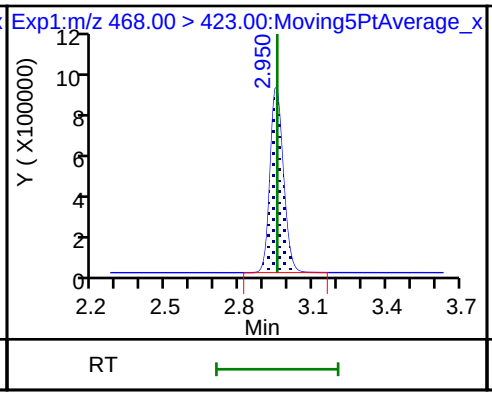
20 Perfluorononanoic acid (ND)



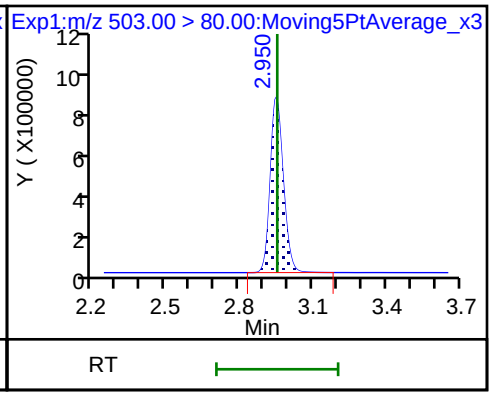
20 Perfluorononanoic acid (ND)



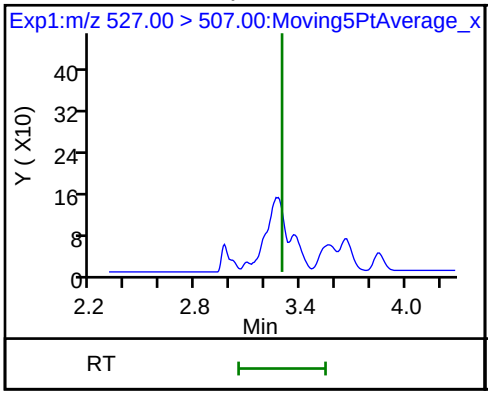
D 19 13C5 PFNA



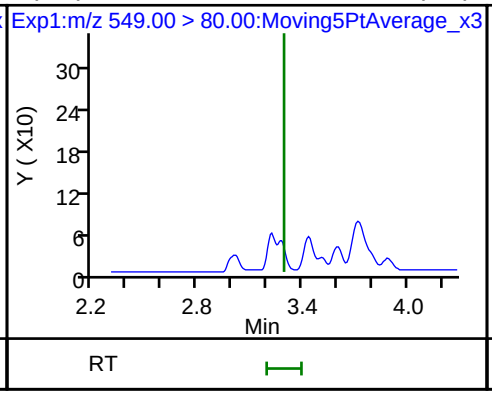
D 18 13C4 PFOS



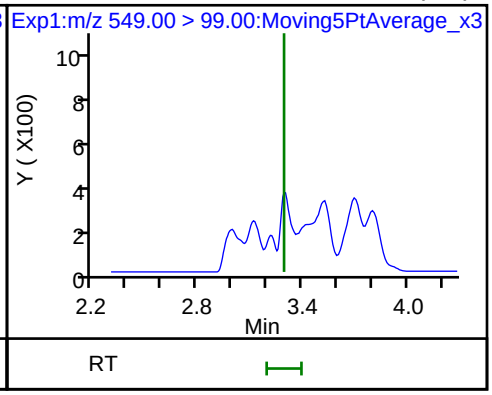
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



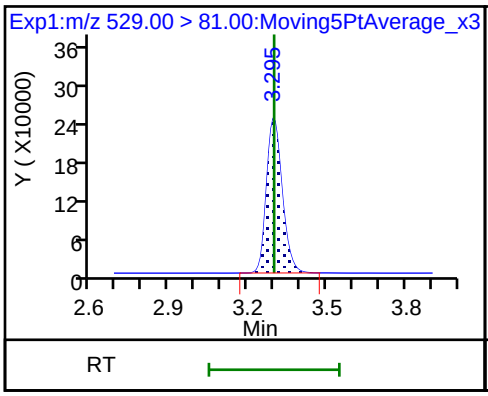
68 Perfluorononanesulfonic acid (ND)



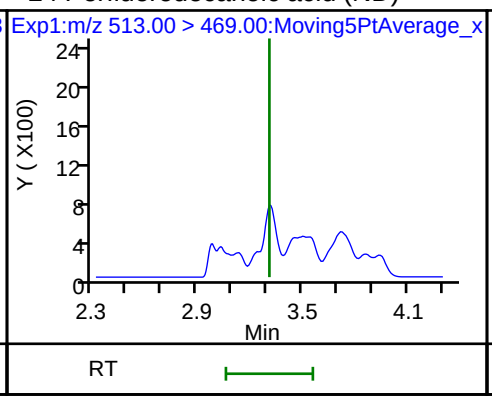
68 Perfluorononanesulfonic acid (ND)



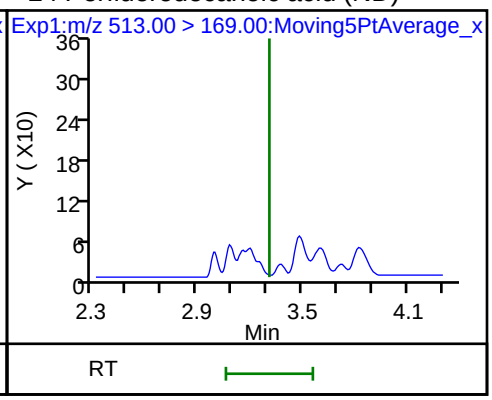
D 26 M2-8:2FTS



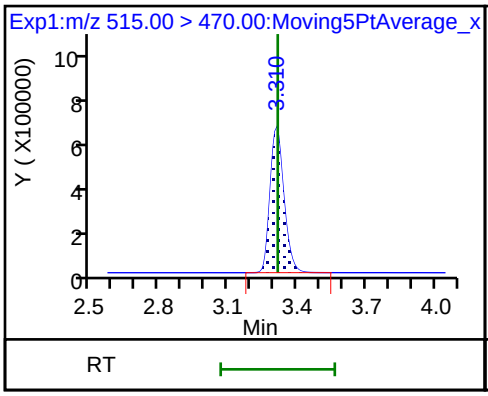
24 Perfluorodecanoic acid (ND)



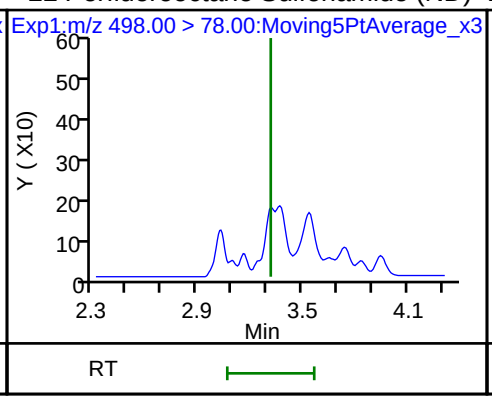
24 Perfluorodecanoic acid (ND)



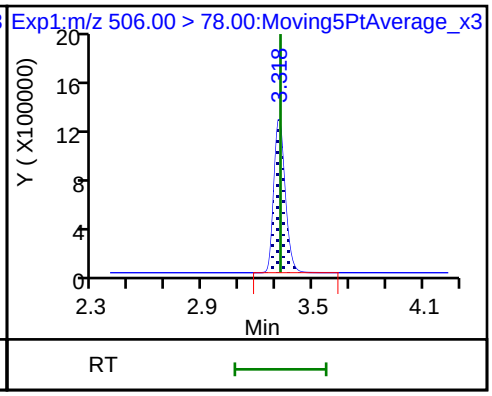
D 23 13C2 PFDA



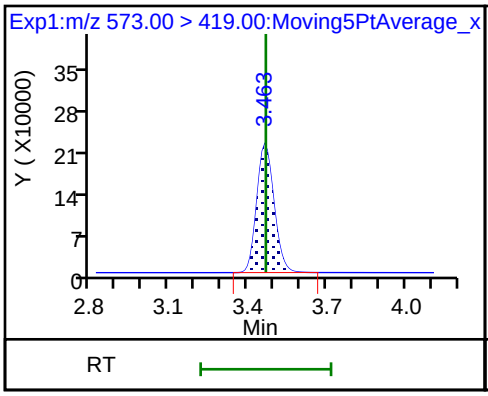
22 Perfluorooctane Sulfonamide (ND)



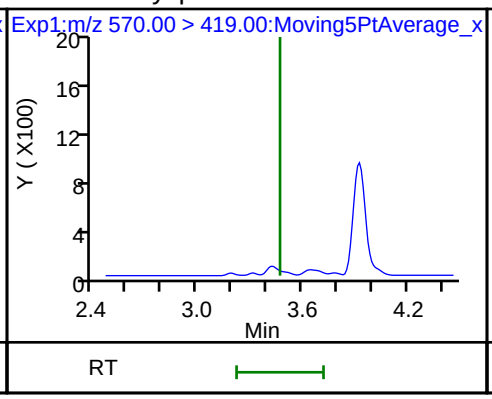
D 21 13C8 FOSA



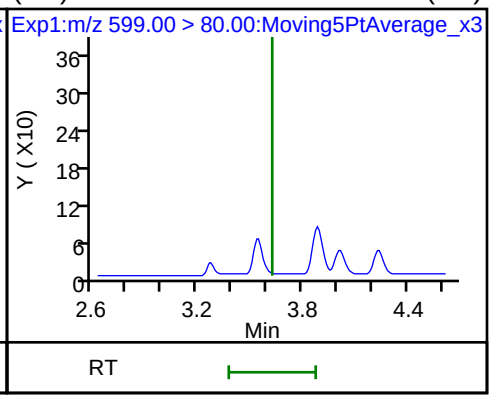
D 27 d3-NMeFOSAA



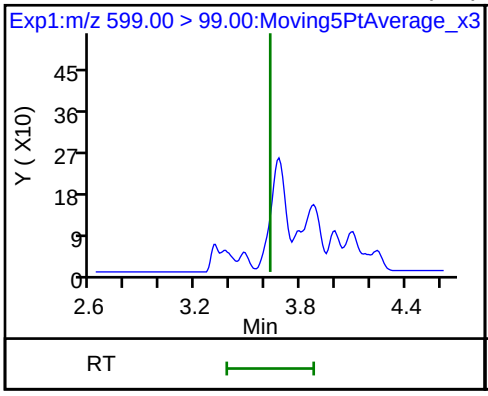
28 N-methyl perfluorooctane sulfonami (ND)



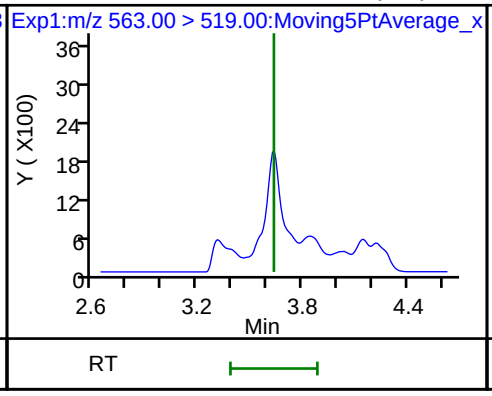
29 Perfluorodecane Sulfonic acid (ND)



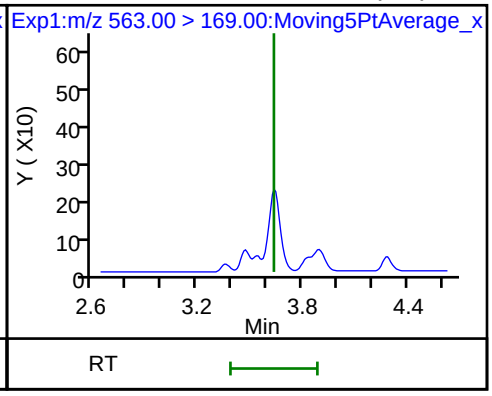
29 Perfluorodecane Sulfonic acid (ND)



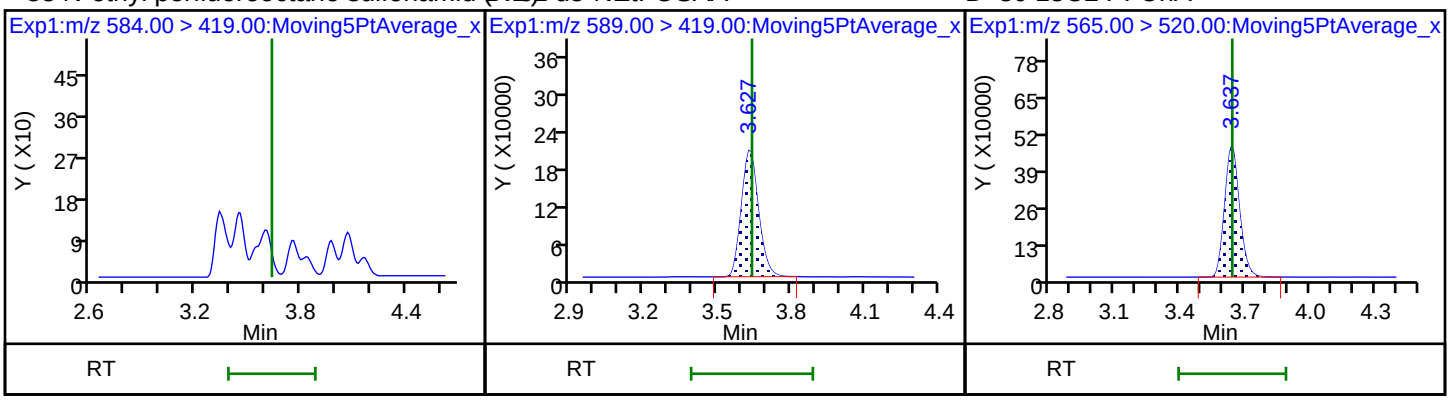
31 Perfluoroundecanoic acid (ND)



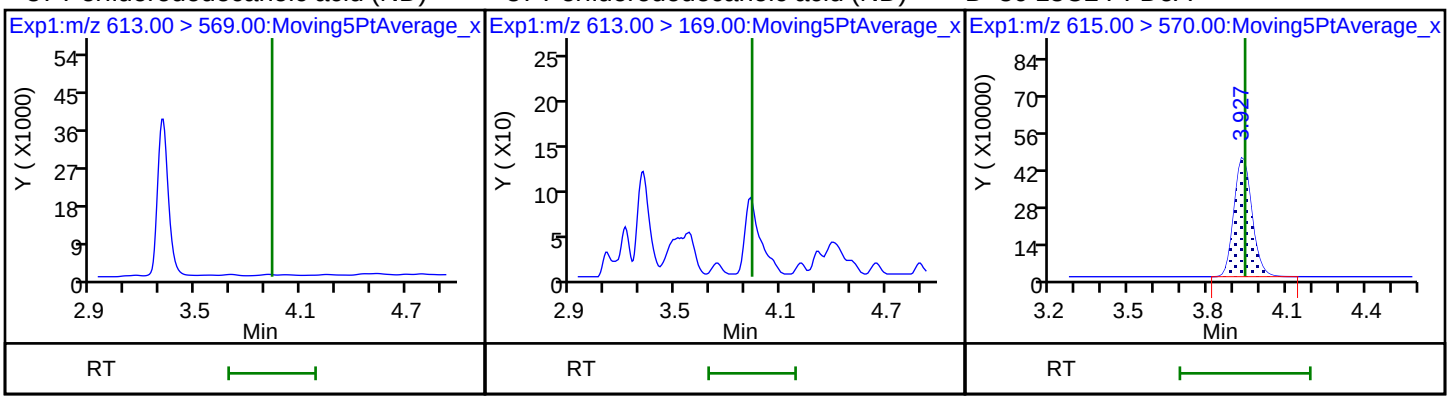
31 Perfluoroundecanoic acid (ND)



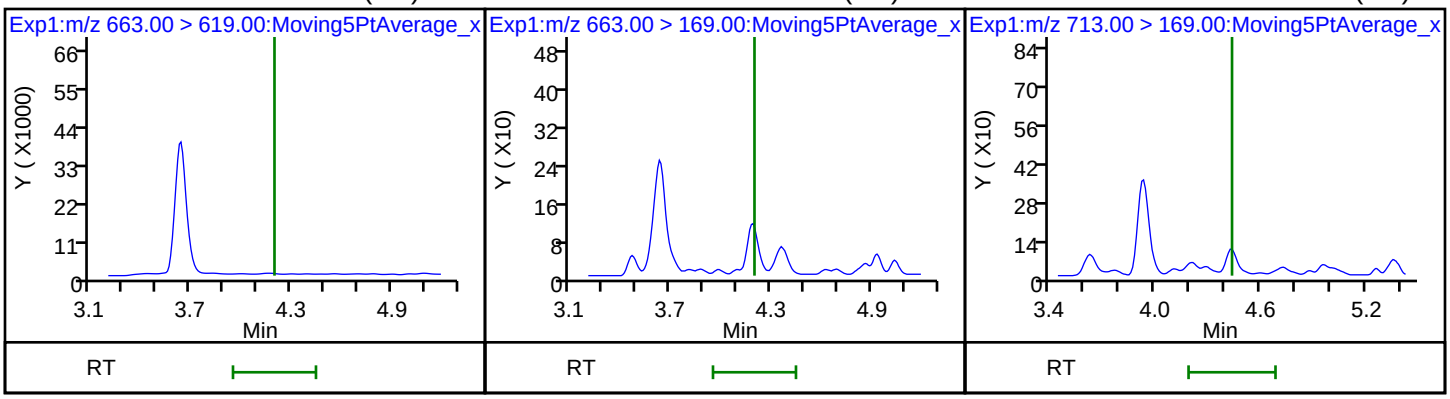
33 N-ethyl perfluorooctane sulfonamid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA



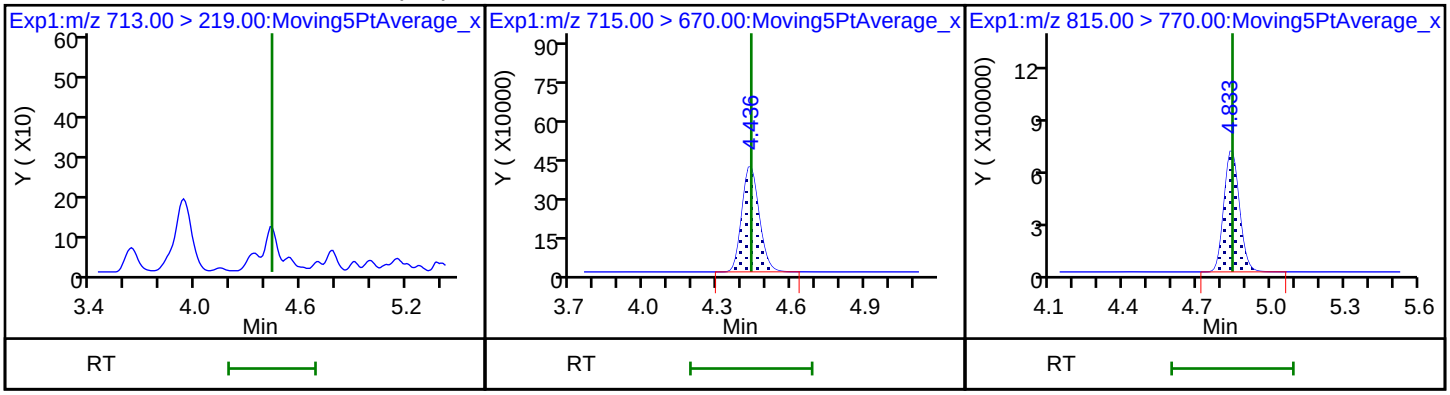
37 Perfluorododecanoic acid (ND) 37 Perfluorododecanoic acid (ND) D 36 13C2 PFDoA



41 Perfluorotridecanoic acid (ND) 41 Perfluorotridecanoic acid (ND) 42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND) D 43 13C2-PFTeDA D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-237767/1
Matrix: Water
Lab File ID: 2018.08.03LLA_004.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 08/03/2018 05:14
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237767
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0224	J	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00949	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	88		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	94		50-150
STL00994	18O2 PFHxS	89		50-150
STL00991	13C4 PFOS	89		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\2018.08.03LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 03-Aug-2018 05:14:12 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 09:24:14 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK049

First Level Reviewer: westendorfc Date: 03-Aug-2018 09:20:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.408	1.403	0.005	0.541	4274274	2.26		90.2	105337	
D 3 13C5-PFPeA										
267.90 > 223.00	1.657	1.650	0.006	0.637	2941820	2.36		94.3	59337	
D 47 13C3-PFBS										
301.90 > 83.00	1.693	1.685	0.008	0.651	73730	2.05		88.4	453	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.693	1.690	0.003	1.000	54550	0.0224			143	
298.90 > 99.00	1.693	1.690	0.003	1.000	23384		2.33(1.25-3.74)		104	
D 60 M2-4:2FTS										
329.00 > 81.00	1.895	1.887	0.008	0.728	574041	NC			9145	
D 7 13C2 PFHxA										
315.00 > 270.00	1.927	1.917	0.010	0.741	3267399	2.42		96.8	61408	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.025	2.016	0.009	0.778	176324	NC			7338	
D 9 13C4-PFHpA										
367.00 > 322.00	2.254	2.242	0.012	0.866	2967219	2.27		90.7	59332	
D 11 18O2 PFHxS										
403.00 > 84.00	2.267	2.256	0.011	0.871	4126010	2.10		88.7	44089	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.267	2.264	0.003	1.000	19139	0.009490			111	
399.00 > 99.00	2.267	2.264	0.003	1.000	7143		2.68(1.50-4.49)		20.2	
D 12 M2-6:2FTS										
429.00 > 81.00	2.579	2.566	0.013	0.991	915470	2.39		101	19562	
D 14 13C4 PFOA										
417.00 > 372.00	2.602	2.597	0.005	1.000	3104689	2.46		98.3	37607	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.595	2.602	-0.007	0.997	6422	0.004473			4.1	
413.00 > 169.00	2.597	2.602	-0.005	0.998	0		0.00(0.84-2.52)			
* 62 13C2-PFOA										
415.00 > 370.00	2.602	2.602	0.0		3290653	2.50			36347	
D 19 13C5 PFNA										
468.00 > 423.00	2.964	2.955	0.009	1.139	2600951	2.36		94.5	44815	
D 18 13C4 PFOS										
503.00 > 80.00	2.964	2.955	0.009	1.139	2888564	2.13		89.0	37907	
D 26 M2-8:2FTS										
529.00 > 81.00	3.310	3.300	0.010	1.272	831600	2.23		92.9	16511	
D 23 13C2 PFDA										
515.00 > 470.00	3.318	3.316	0.002	1.275	2103640	2.55		102	45088	
D 21 13C8 FOSA										
506.00 > 78.00	3.342	3.331	0.011	1.285	4561776	2.29		91.4	33525	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.472	3.469	0.003	1.335	458475	2.29		91.8	12554	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.637	3.634	0.003	1.398	484718	2.26		90.5	3266	
D 30 13C2 PFUnA										
565.00 > 520.00	3.646	3.644	0.002	1.402	1482613	2.34		93.5	34601	
D 36 13C2 PFDoA										
615.00 > 570.00	3.938	3.935	0.003	1.514	1298849	2.37		94.6	19395	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.424	0.001	1.701	1054058	2.29		91.5	5284	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.817	0.006	1.854	1269839	1.60		64.0	1806	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.832	4.829	0.003	1.002	8866	NC			0.5	
813.00 > 169.00	4.823	4.829	-0.006	1.000	1437		6.17(2.86-8.58)		19.9	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 15:31:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62075.b\2018.08.03LLA_004.d

Injection Date: 03-Aug-2018 05:14:12 Instrument ID: A8_N

Lims ID: CCB

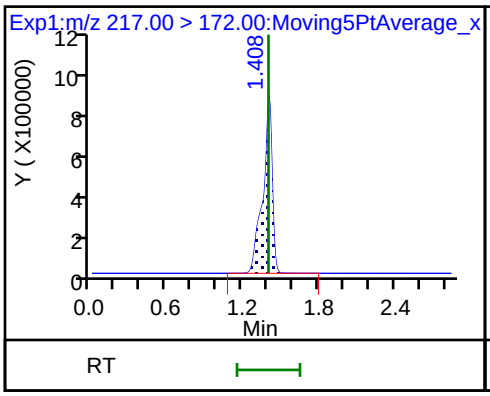
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 1

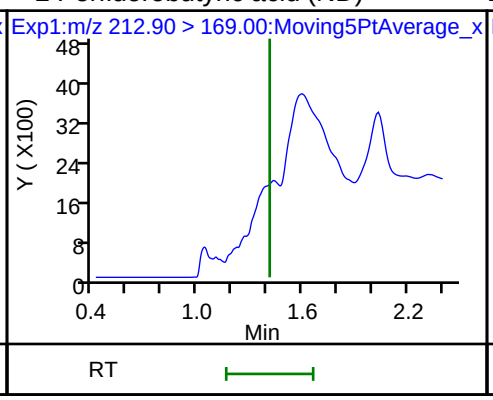
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

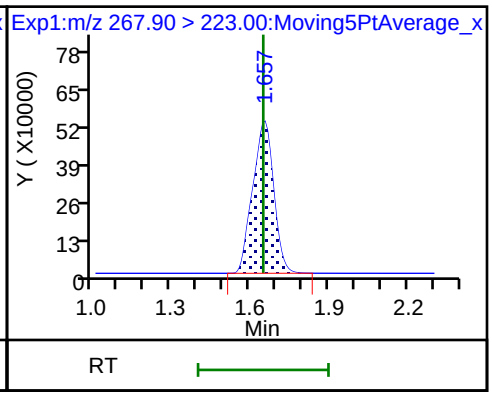
D 1 13C4 PFBA



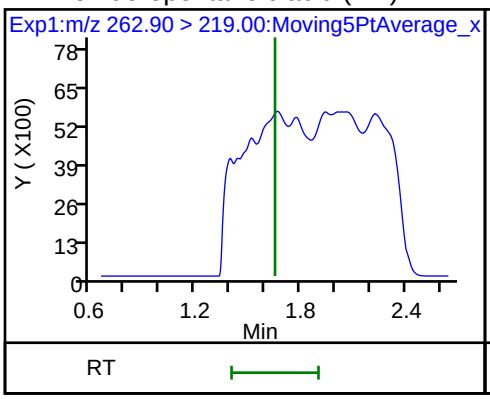
2 Perfluorobutyric acid (ND)



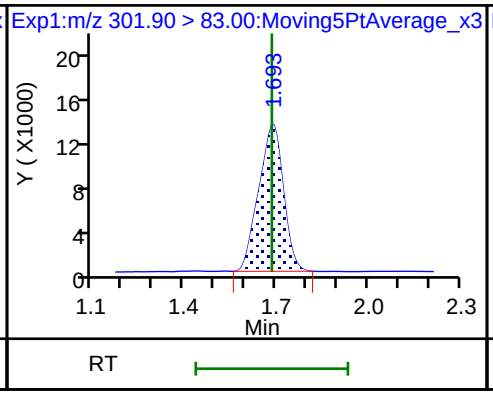
D 3 13C5-PFPeA



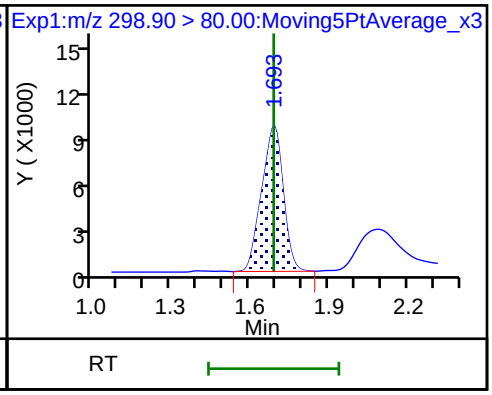
4 Perfluoropentanoic acid (ND)



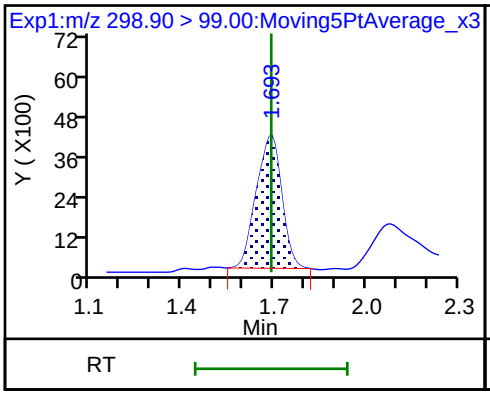
D 47 13C3-PFBS



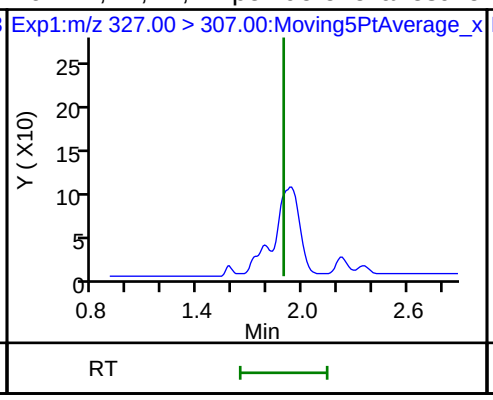
5 Perfluorobutanesulfonic acid



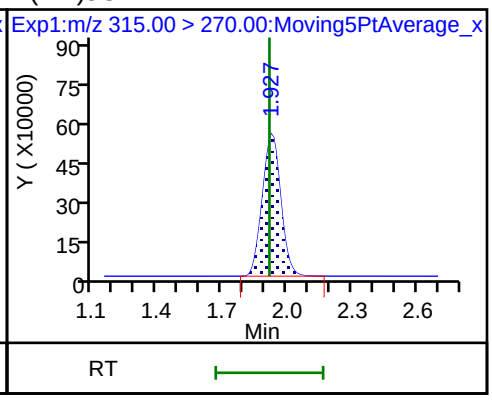
5 Perfluorobutanesulfonic acid



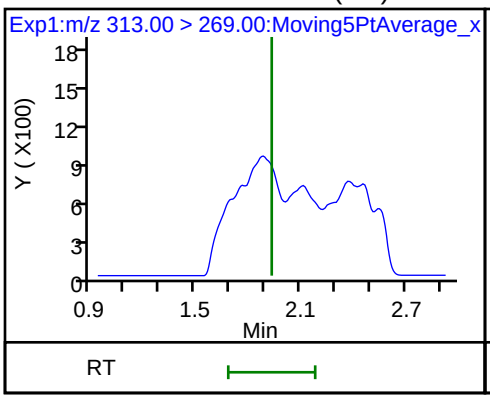
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



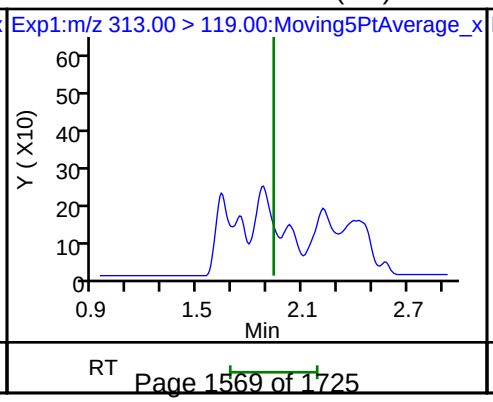
D 70 13C2 PFHxA



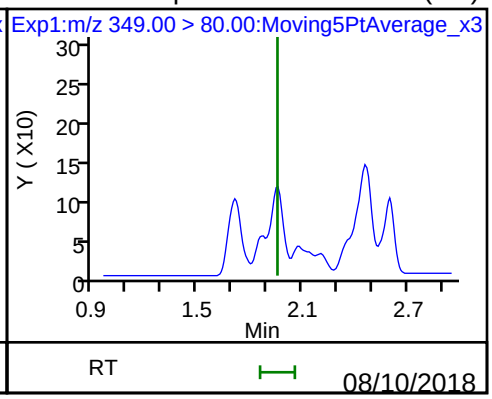
6 Perfluorohexanoic acid (ND)



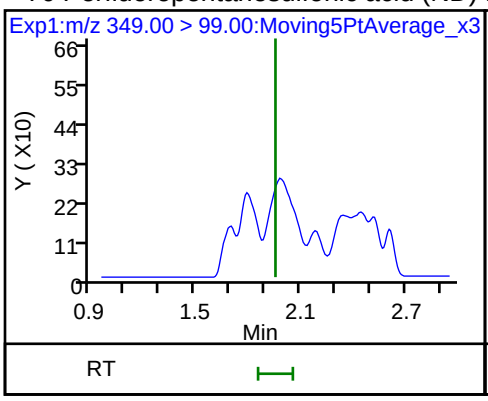
6 Perfluorohexanoic acid (ND)



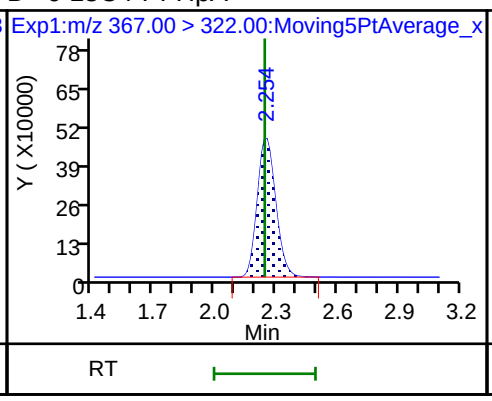
70 Perfluoropentanesulfonic acid (ND)



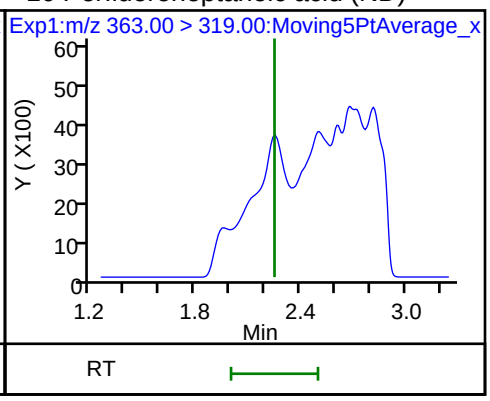
70 Perfluoropentanesulfonic acid (ND)



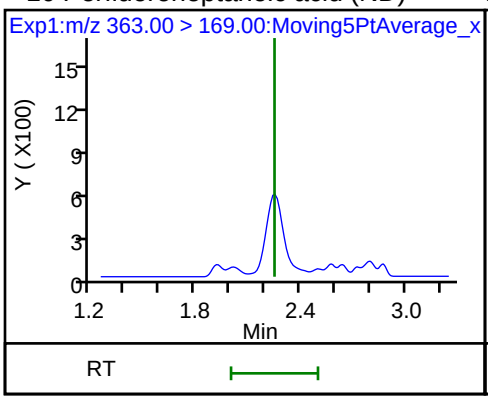
D 9 13C4-PFHpA



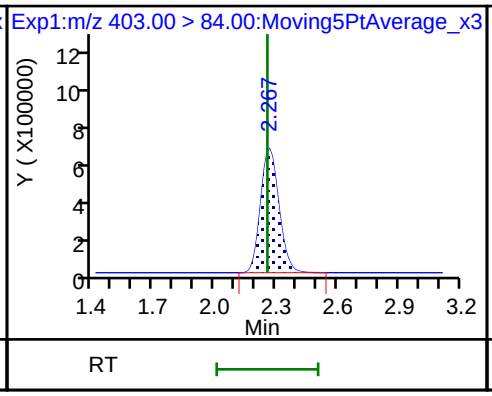
10 Perfluoroheptanoic acid (ND)



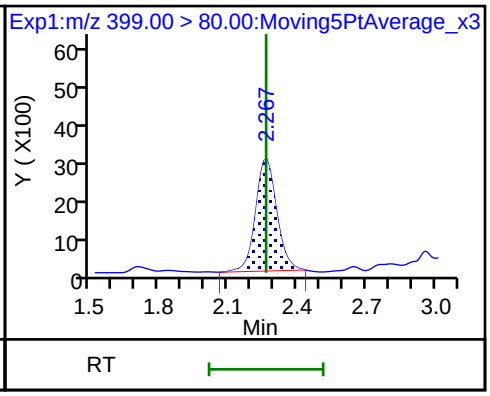
10 Perfluoroheptanoic acid (ND)



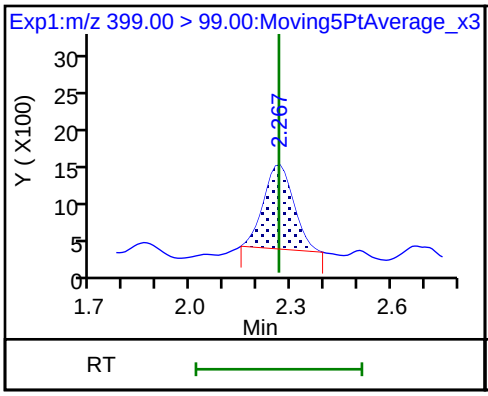
D 11 18O2 PFHxS



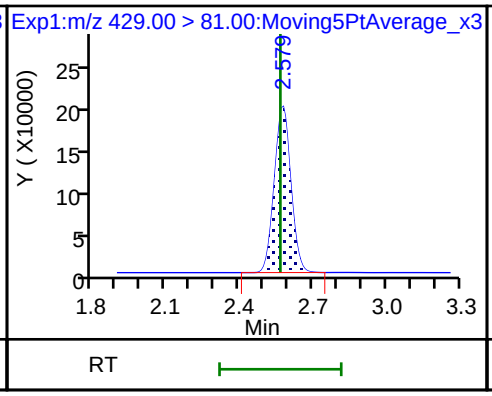
8 Perfluorohexanesulfonic acid



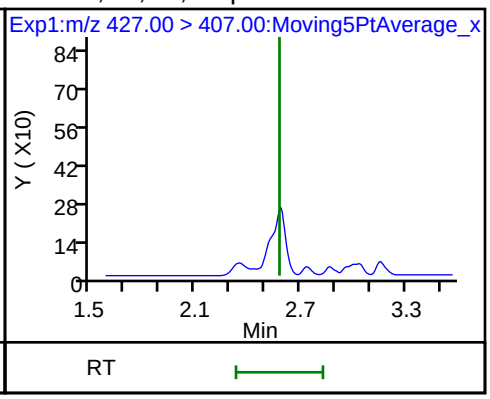
8 Perfluorohexanesulfonic acid



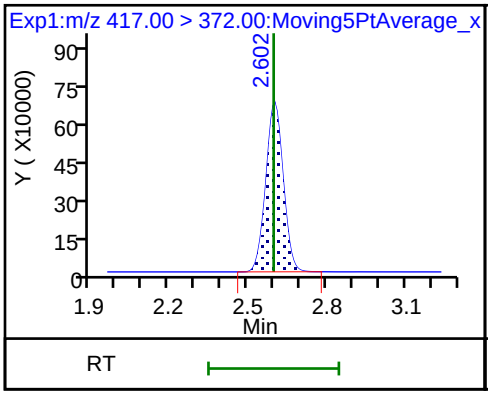
D 12 M2-6:2FTS



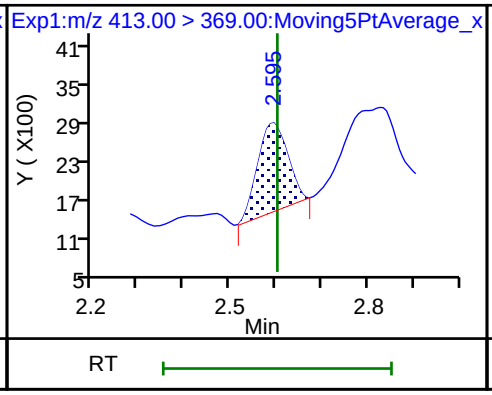
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



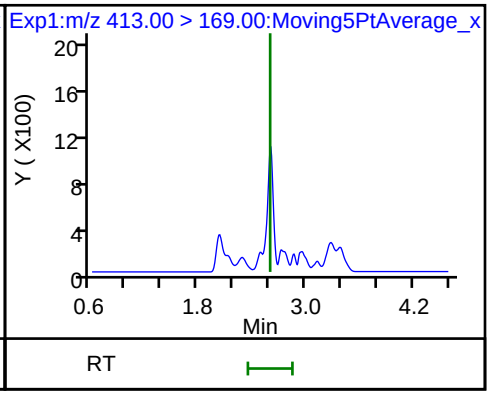
D 14 13C4 PFOA



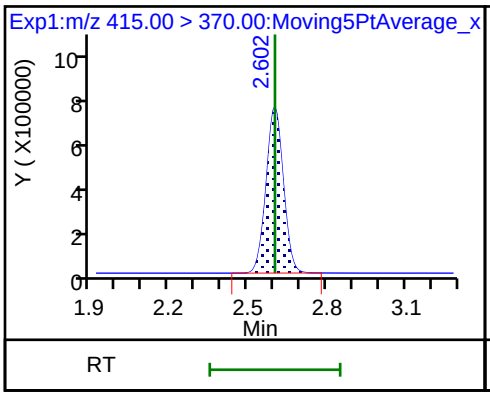
15 Perfluorooctanoic acid



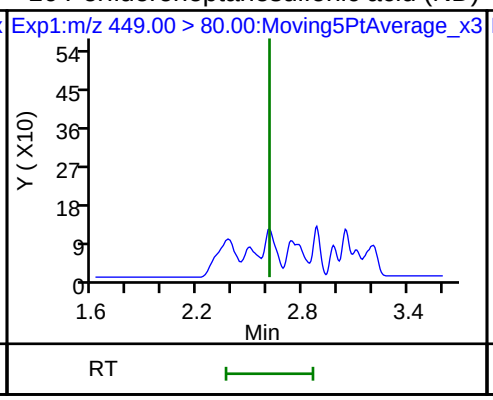
15 Perfluorooctanoic acid



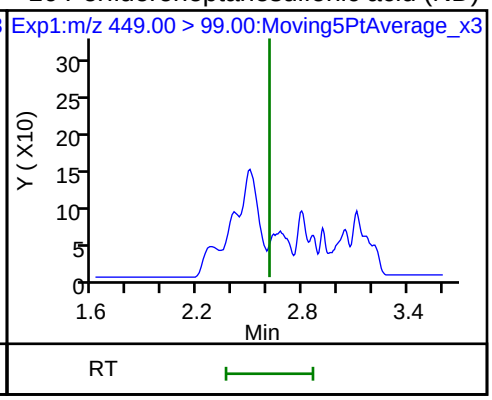
* 62 13C2-PFOA



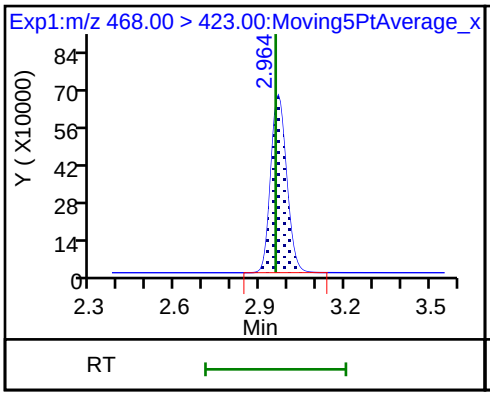
16 Perfluoroheptanesulfonic acid (ND)



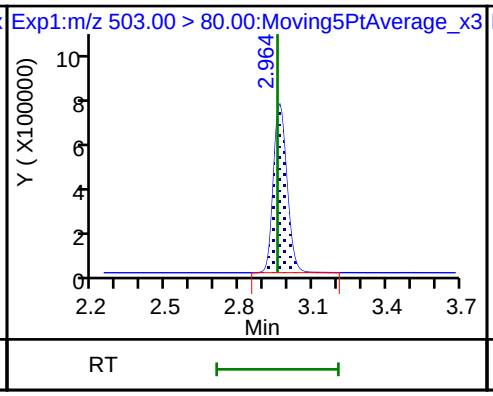
16 Perfluoroheptanesulfonic acid (ND)



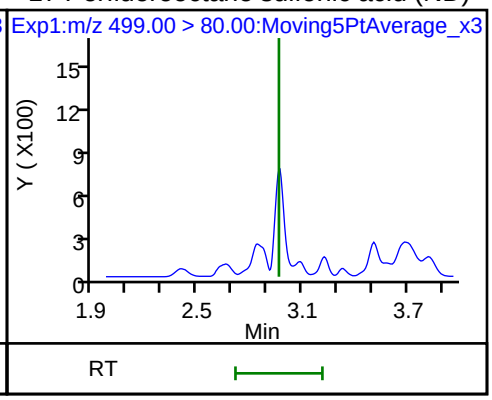
D 19 13C5 PFNA



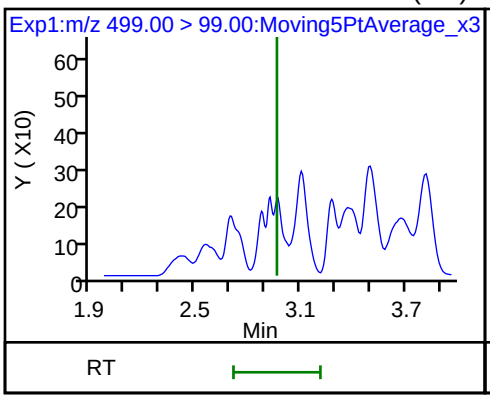
D 18 13C4 PFOS



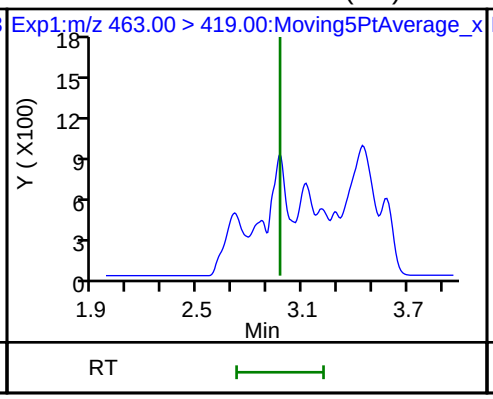
17 Perfluorooctane sulfonic acid (ND)



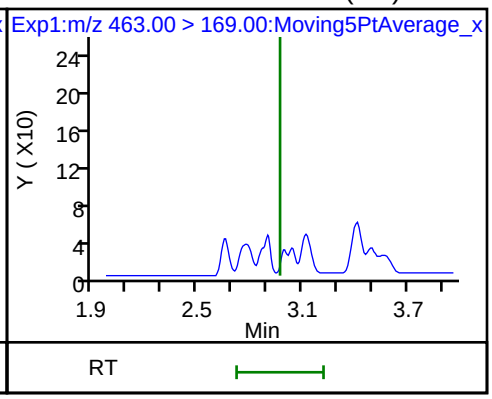
17 Perfluorooctane sulfonic acid (ND)



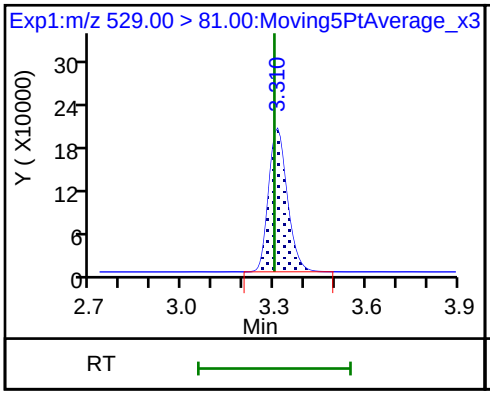
20 Perfluorononanoic acid (ND)



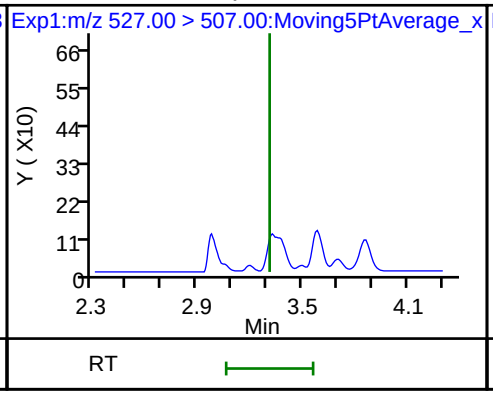
20 Perfluorononanoic acid (ND)



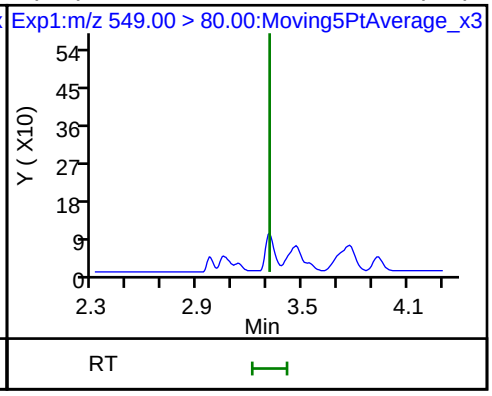
D 26 M2-8:2FTS



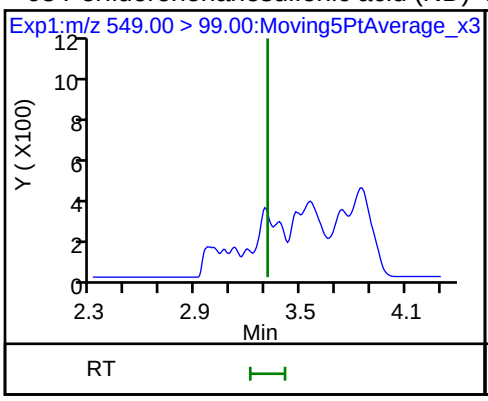
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



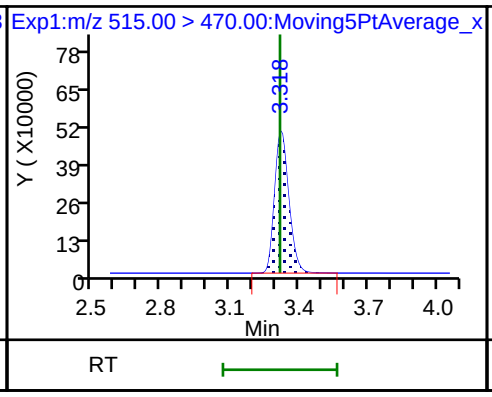
63 Perfluorononanesulfonic acid (ND)



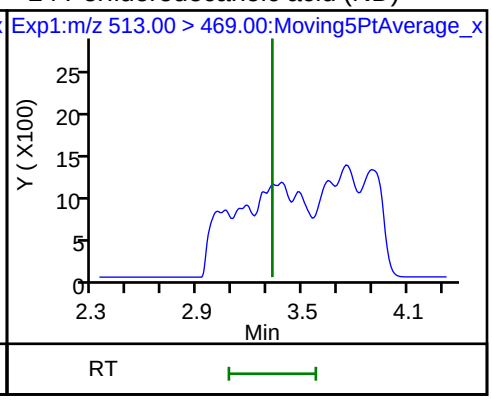
68 Perfluorononanesulfonic acid (ND)



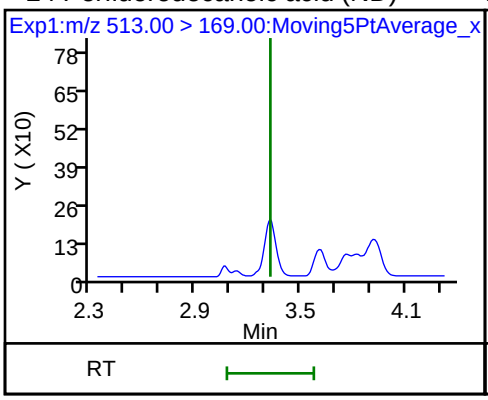
D 23 13C2 PFDA



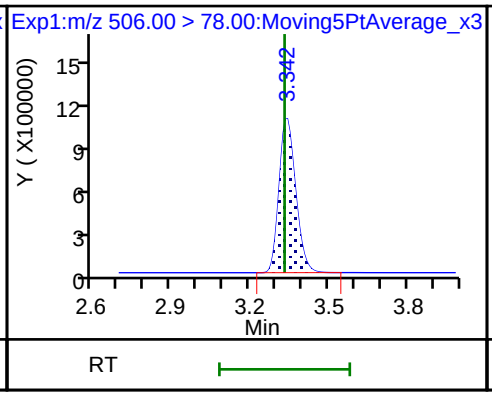
24 Perfluorodecanoic acid (ND)



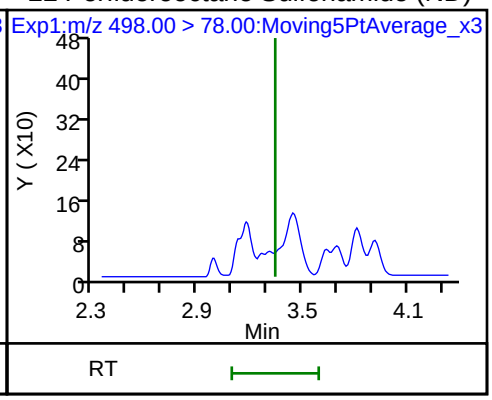
24 Perfluorodecanoic acid (ND)



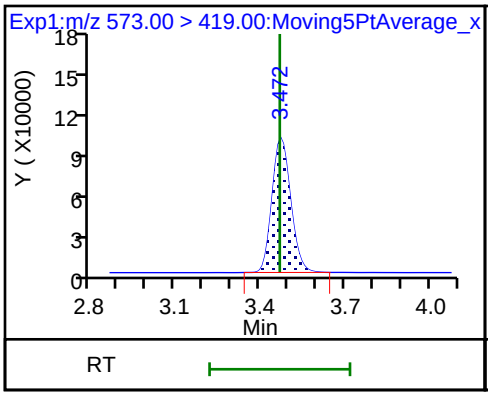
D 21 13C8 FOSA



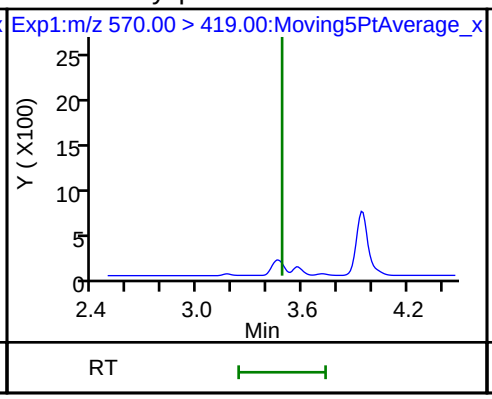
22 Perfluorooctane Sulfonamide (ND)



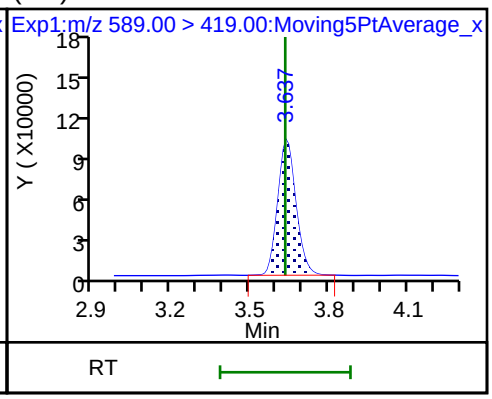
D 27 d3-NMeFOSAA



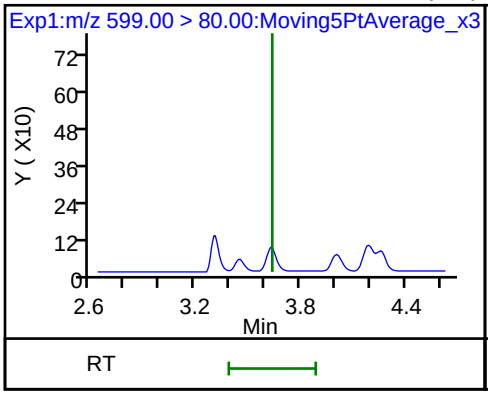
28 N-methyl perfluorooctane sulfonamide (ND)



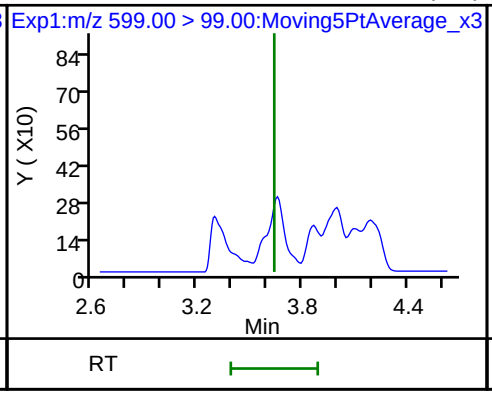
D 32 d5-NEtFOSAA



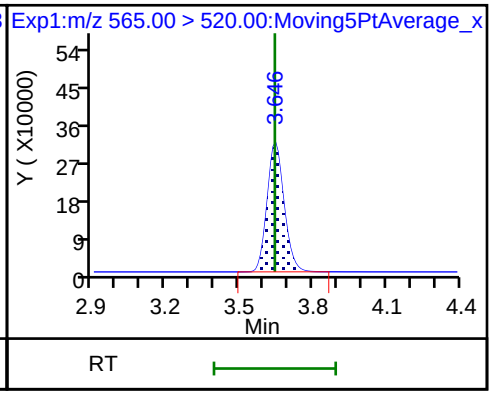
29 Perfluorodecane Sulfonic acid (ND)



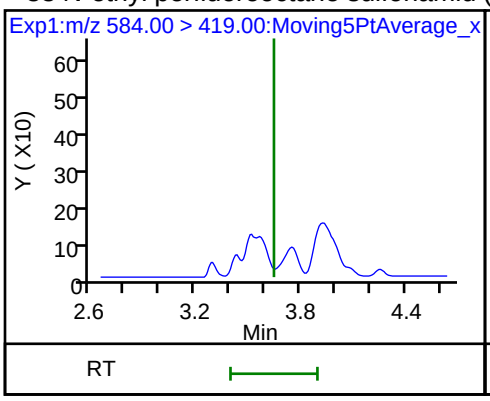
29 Perfluorodecane Sulfonic acid (ND)



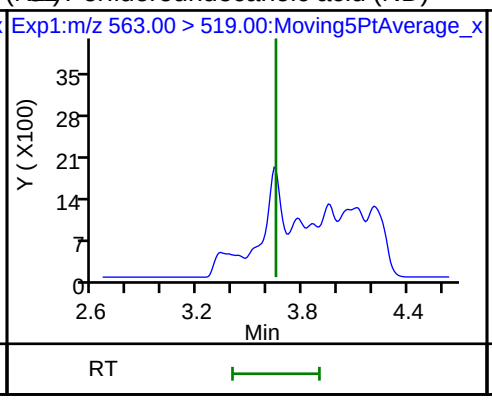
D 30 13C2 PFUnA



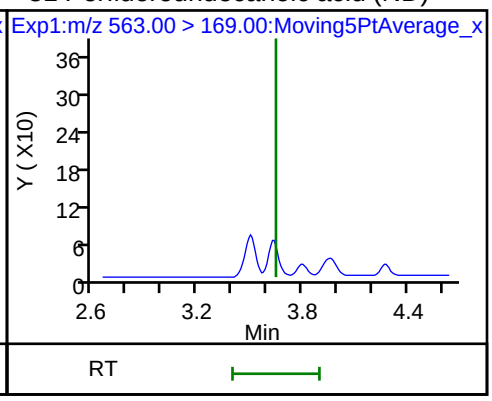
33 N-ethyl perfluorooctane sulfonamid (ND)



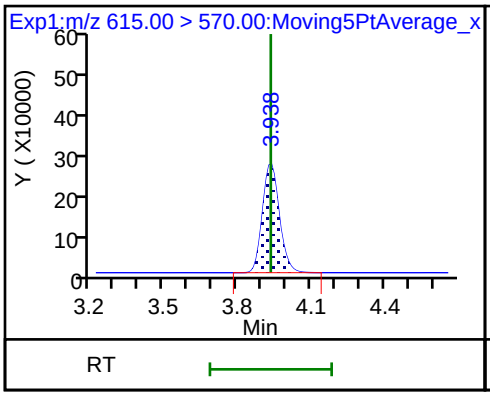
31 Perfluoroundecanoic acid (ND)



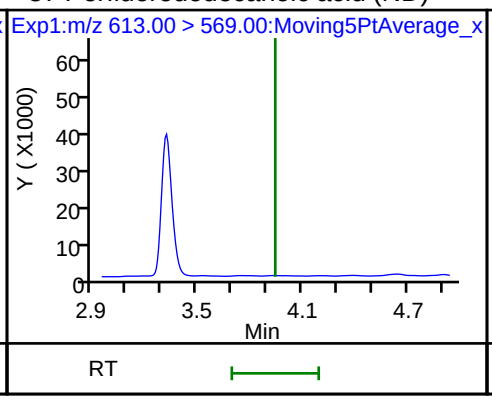
31 Perfluoroundecanoic acid (ND)



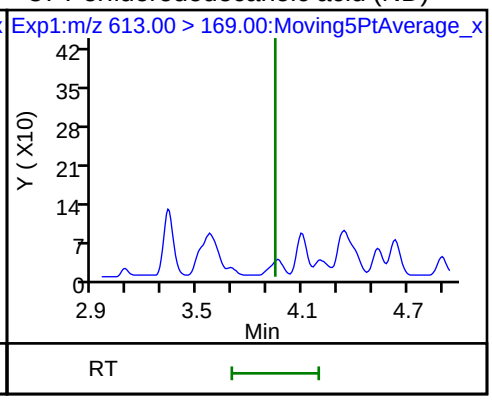
D 36 13C2 PFDoA



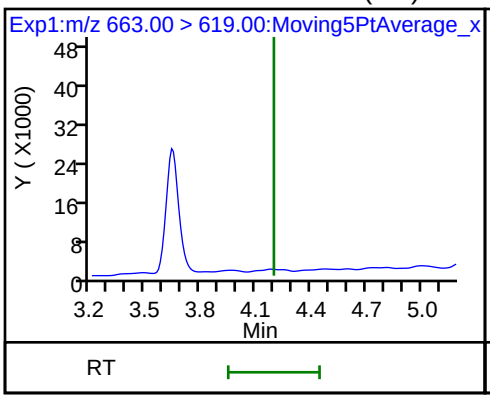
37 Perfluorododecanoic acid (ND)



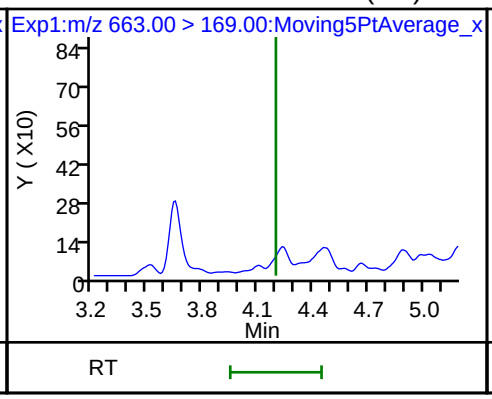
37 Perfluorododecanoic acid (ND)



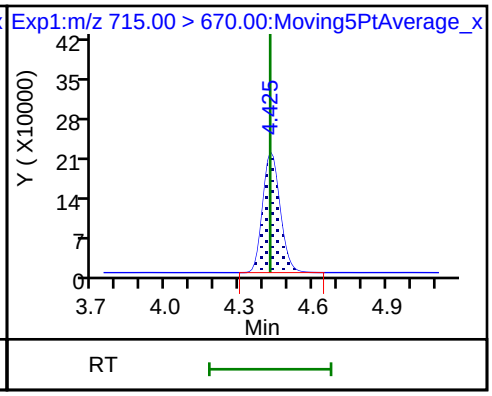
41 Perfluorotridecanoic acid (ND)



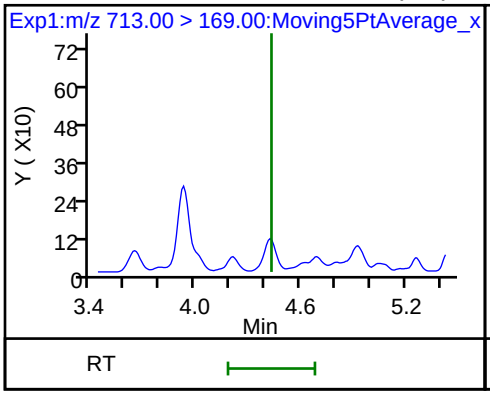
41 Perfluorotridecanoic acid (ND)



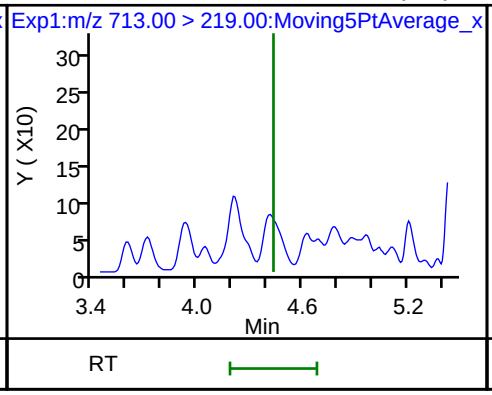
D 43 13C2-PFTeDA



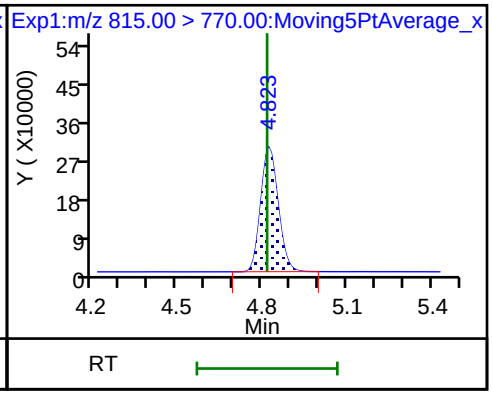
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-238089/1
Matrix: Solid
Lab File ID: 2018.08.05LLA_004.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 08/05/2018 23:56
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 238089
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00631	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	94		50-150
STL01892	13C4-PFHpA	107		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	100		50-150
STL00994	18O2 PFHxS	101		50-150
STL00991	13C4 PFOS	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\2018.08.05LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 05-Aug-2018 23:56:26 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 17:04:39 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 17:03:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.386	1.391	-0.005	0.544	4402657	2.28		91.0	85183	
D 3 13C5-PFPeA										
267.90 > 223.00	1.625	1.632	-0.007	0.638	3257895	2.56		102	80227	
D 47 13C3-PFBS										
301.90 > 83.00	1.657	1.665	-0.008	0.651	80423	2.19		94.4	495	
D 60 M2-4:2FTS										
329.00 > 81.00	1.857	1.866	-0.009	0.729	642313	NC			8491	
D 7 13C2 PFHxA										
315.00 > 270.00	1.886	1.895	-0.009	0.741	3723156	2.70		108	86057	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.981	1.991	-0.010	0.778	218976	NC			9692	
D 9 13C4-PFHpA										
367.00 > 322.00	2.195	2.217	-0.022	0.862	3573775	2.67		107	62941	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.218	2.217	0.001	1.000	14862	0.006314			105	
399.00 > 99.00	2.218	2.217	0.001	1.000	5566		2.67(1.50-4.49)		16.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.218	2.229	-0.011	0.871	4815897	2.40		101	59360	
D 12 M2-6:2FTS										
429.00 > 81.00	2.518	2.546	-0.028	0.989	940160	2.40		101	16731	
* 62 13C2-PFOA										
415.00 > 370.00	2.546	2.546	0.0		3360403	2.50			42745	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.546	2.546	0.0	1.000	4722	0.003188			3.5	
413.00 > 169.00	2.546	2.546	0.0	1.000	6252		0.76(0.84-2.52)		63.4	M
D 14 13C4 PFOA										
417.00 > 372.00	2.546	2.564	-0.018	1.000	3202394	2.48		99.3	53557	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	2.907	2.931	-0.024	1.142	2804028	2.49		99.8	38746	
D 18 13C4 PFOS										
503.00 > 80.00	2.907	2.931	-0.024	1.142	3155824	2.27		95.2	32765	
D 26 M2-8:2FTS										
529.00 > 81.00	3.250	3.269	-0.019	1.277	961470	2.52		105	19718	
D 23 13C2 PFDA										
515.00 > 470.00	3.257	3.283	-0.026	1.279	2433057	2.89		116	51604	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.315	-0.008	1.299	5140730	2.52		101	39640	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.413	3.439	-0.026	1.340	536309	2.63		105	16776	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.571	3.600	-0.029	1.403	613414	2.80		112	4914	
D 30 13C2 PFUnA										
565.00 > 520.00	3.582	3.611	-0.029	1.407	1656118	2.56		102	43523	
D 36 13C2 PFDoA										
615.00 > 570.00	3.871	3.899	-0.028	1.521	1531456	2.73		109	17641	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.359	4.384	-0.025	1.712	1225720	2.60		104	5235	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.747	4.750	-0.003	1.000	20096	NC			0.8	
813.00 > 169.00	4.747	4.750	-0.003	1.000	2471		8.13(2.86-8.58)		33.2	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.747	4.778	-0.031	1.864	1927266	2.38		95.1	3541	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 06-Aug-2018 17:05:21 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\2018.08.05LLA_004.d

Injection Date: 05-Aug-2018 23:56:26 Instrument ID: A8_N

Lims ID: CCB

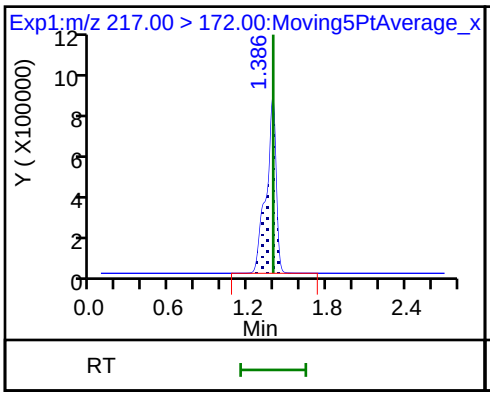
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 1

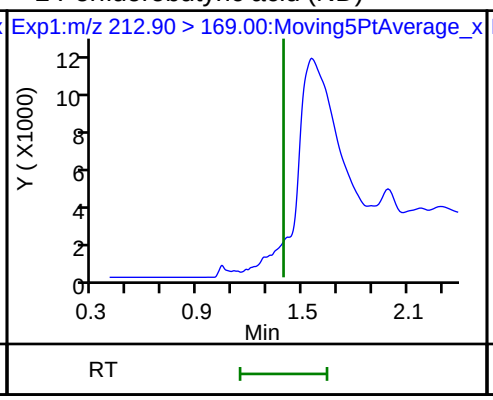
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

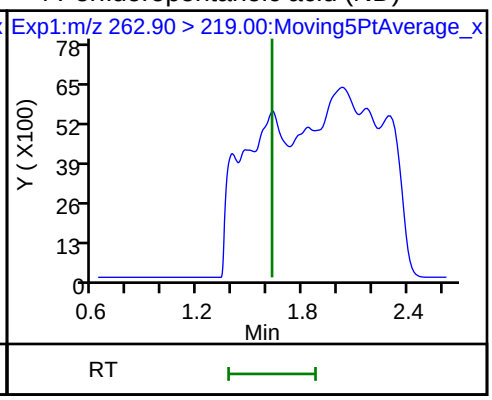
D 1 13C4 PFBA



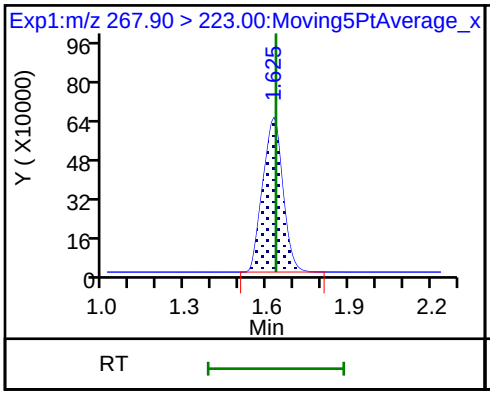
2 Perfluorobutyric acid (ND)



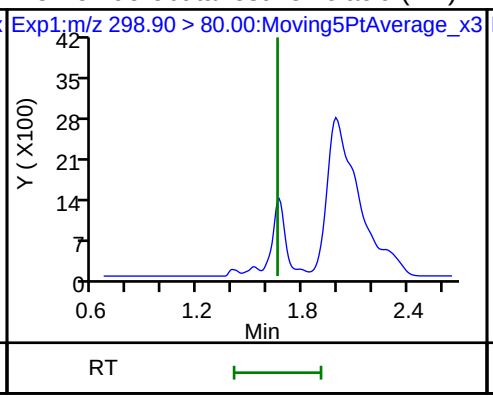
4 Perfluoropentanoic acid (ND)



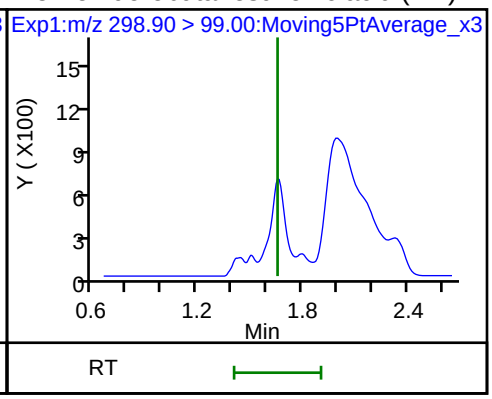
D 3 13C5-PFPeA



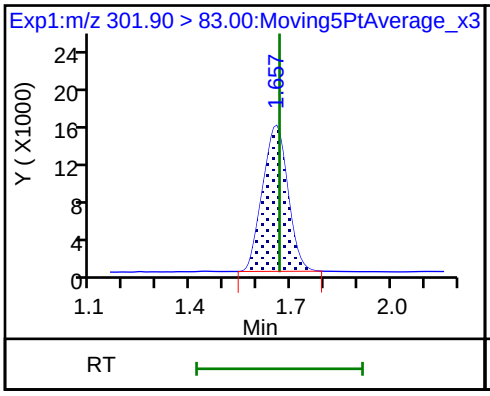
5 Perfluorobutanesulfonic acid (ND)



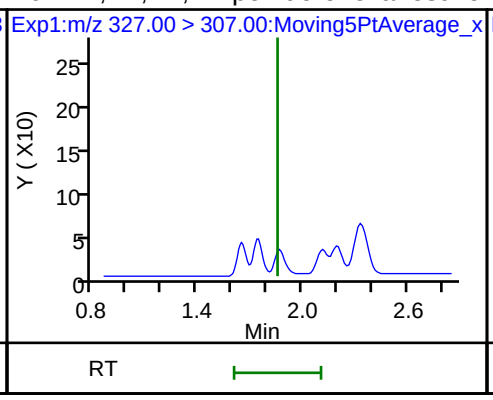
5 Perfluorobutanesulfonic acid (ND)



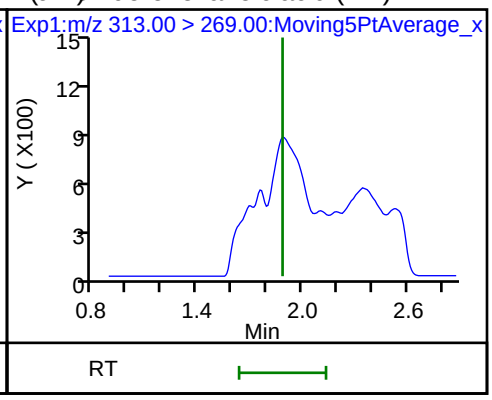
D 47 13C3-PFBS



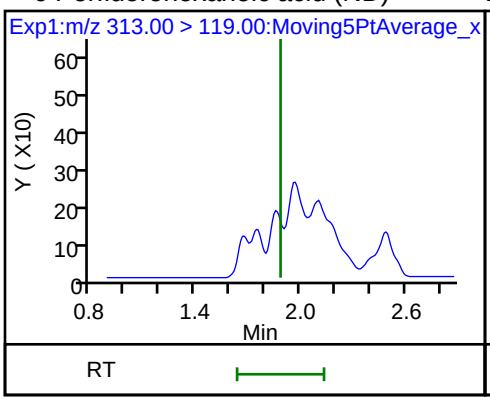
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



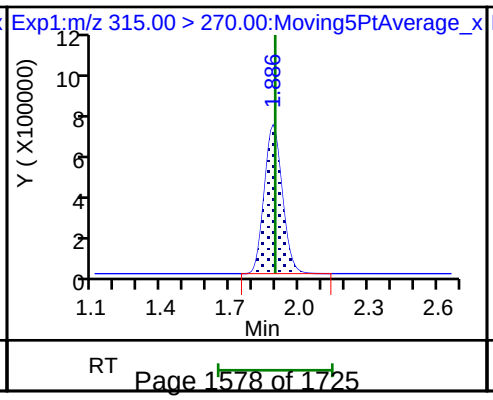
6 Perfluorohexanoic acid (ND)



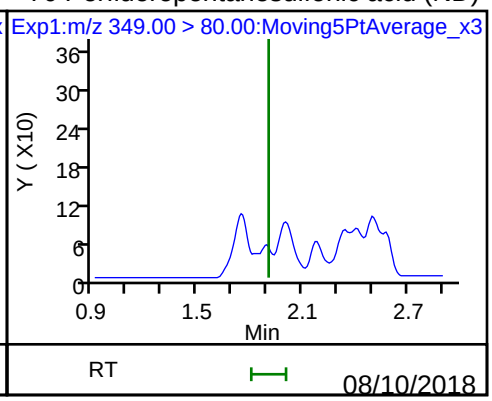
6 Perfluorohexanoic acid (ND)



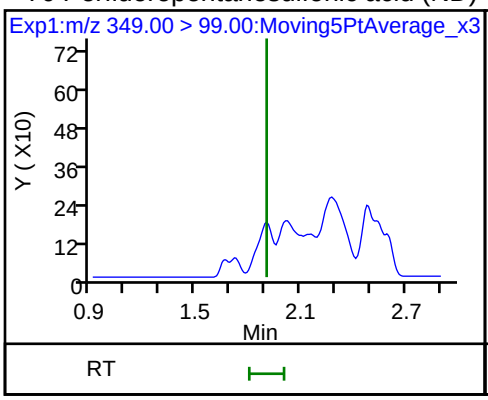
D 7 13C2 PFHxA



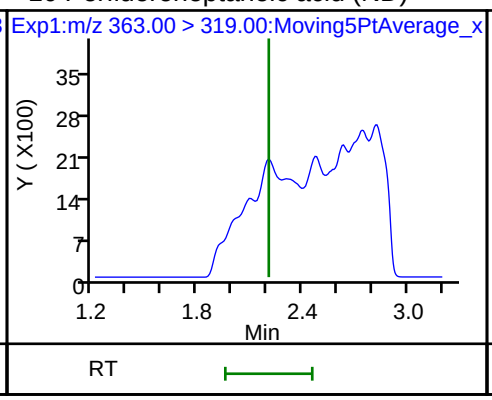
70 Perfluoropentanesulfonic acid (ND)



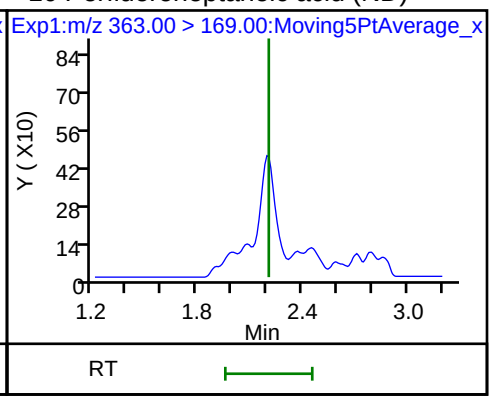
70 Perfluoropentanesulfonic acid (ND)



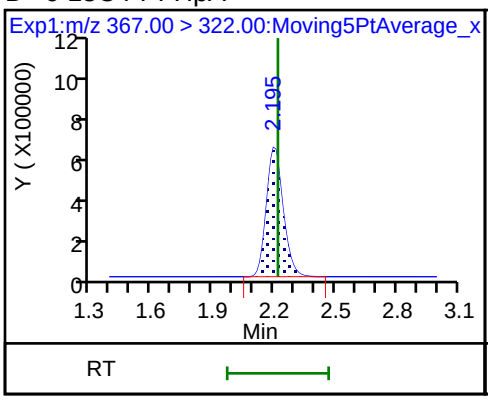
10 Perfluoroheptanoic acid (ND)



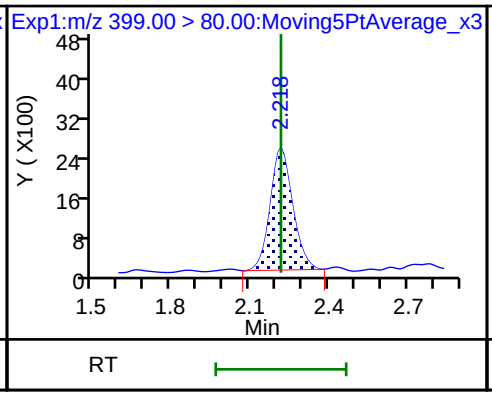
10 Perfluoroheptanoic acid (ND)



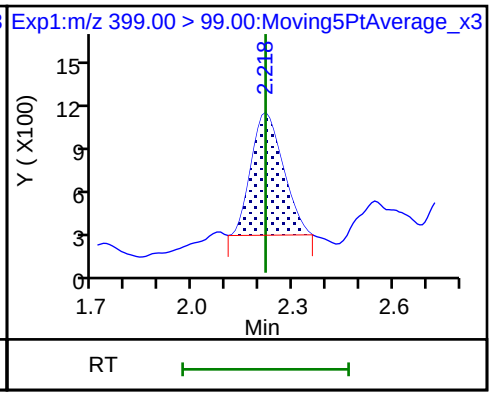
D 9 13C4-PFHpA



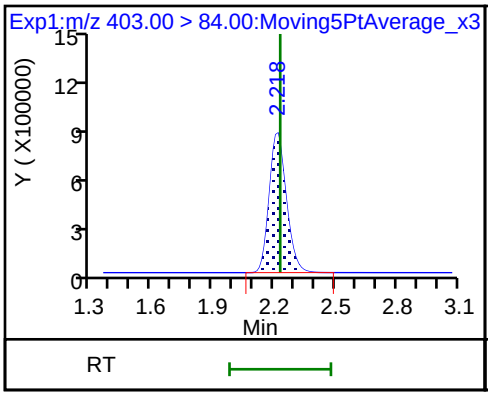
8 Perfluorohexanesulfonic acid



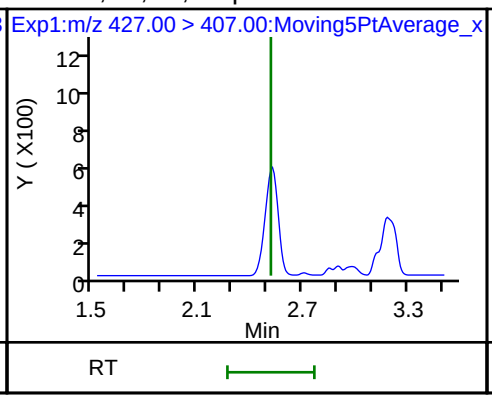
8 Perfluorohexanesulfonic acid



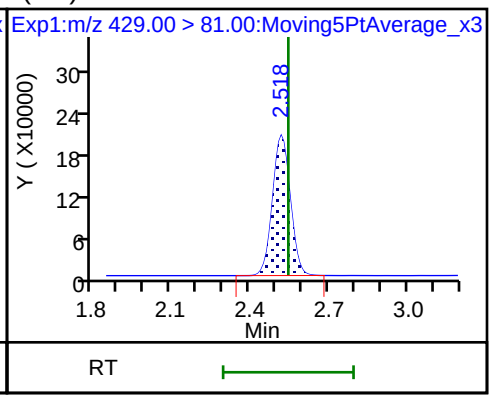
D 11 18O2 PFHxS



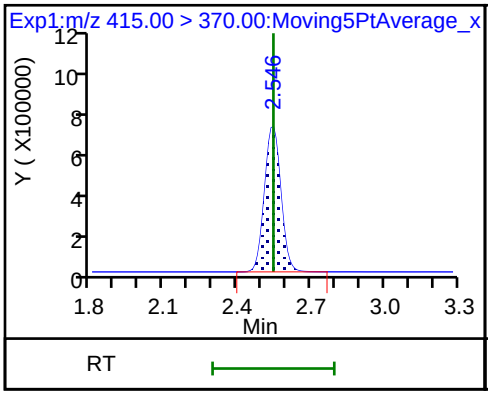
13 1H,1H,2H,2H-perfluorooctanesulfonic acid



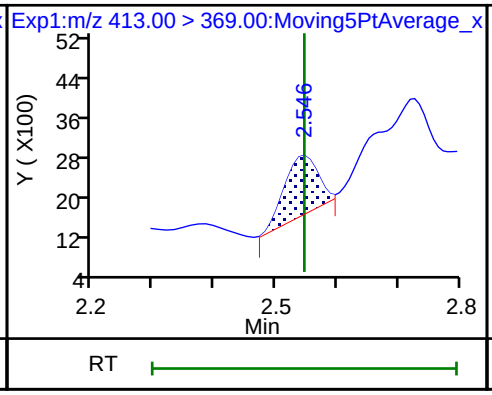
D (ND) 12 M2-6:2FTS



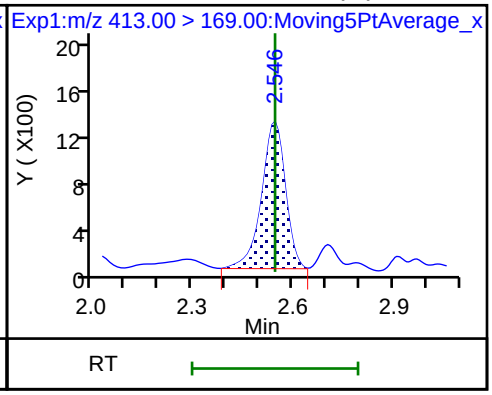
* 62 13C2-PFOA



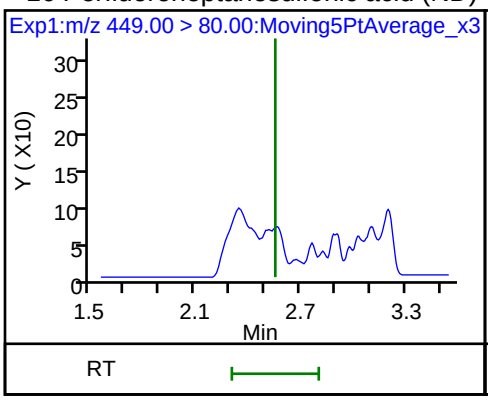
15 Perfluorooctanoic acid



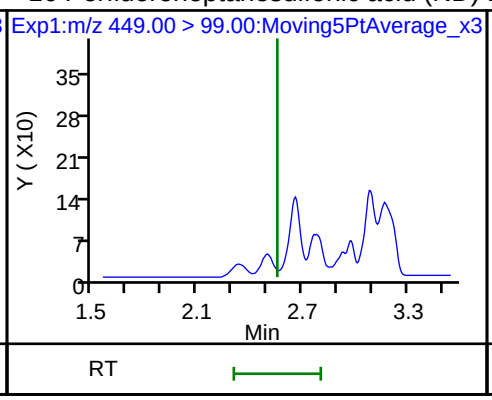
15 Perfluorooctanoic acid (M)



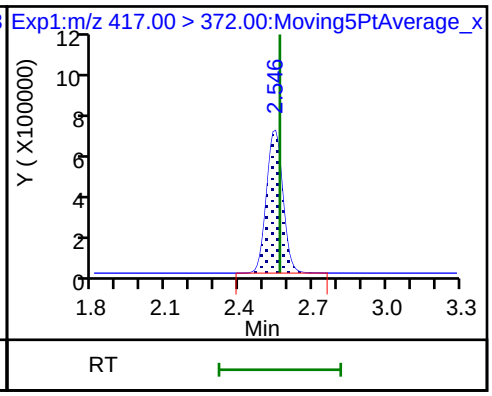
16 Perfluoroheptanesulfonic acid (ND)



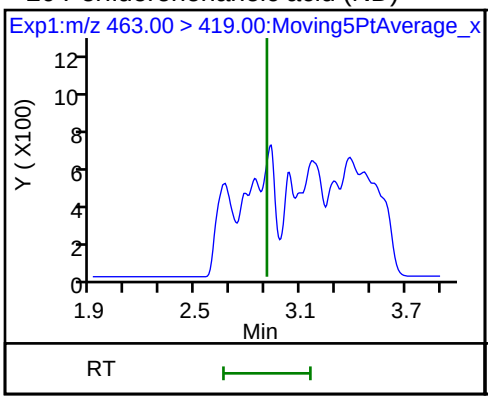
16 Perfluoroheptanesulfonic acid (ND)



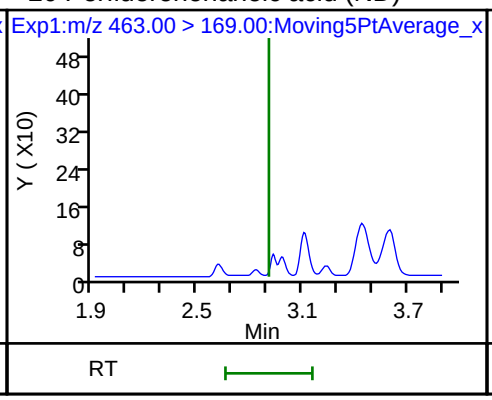
D 14 13C4 PFOA



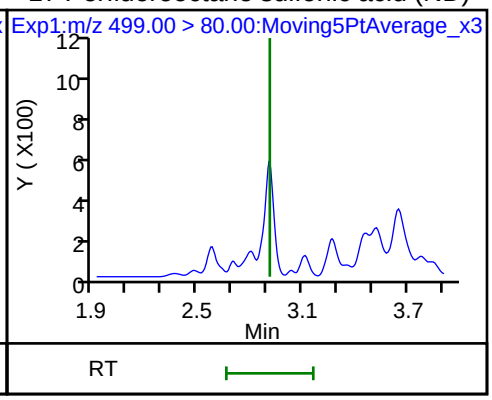
20 Perfluorononanoic acid (ND)



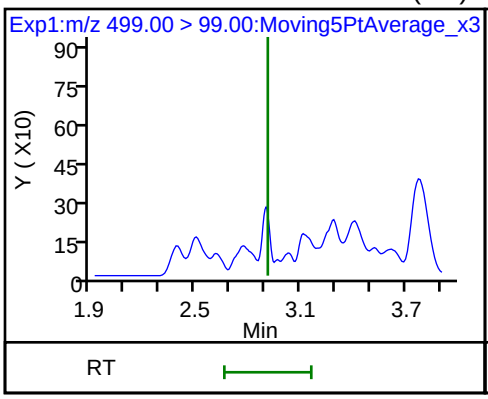
20 Perfluorononanoic acid (ND)



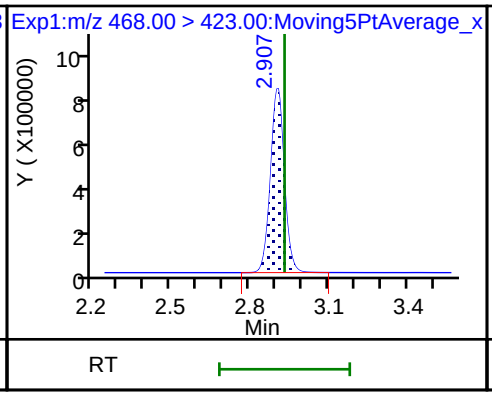
17 Perfluorooctane sulfonic acid (ND)



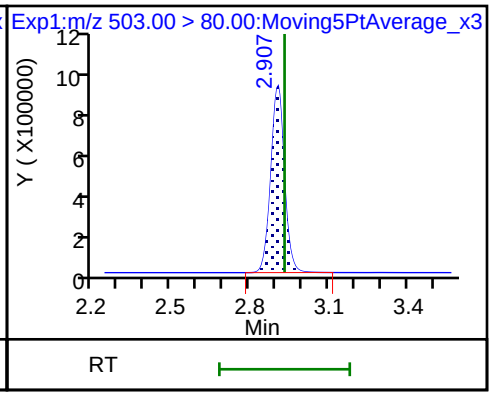
17 Perfluorooctane sulfonic acid (ND)



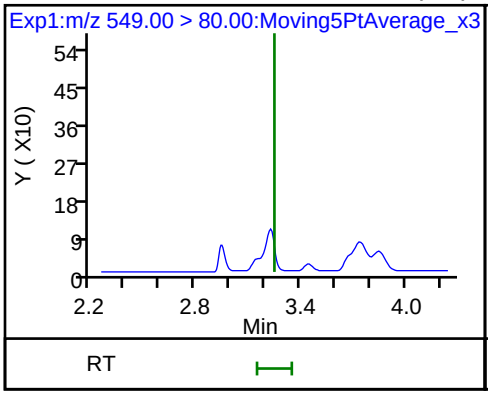
D 19 13C5 PFNA



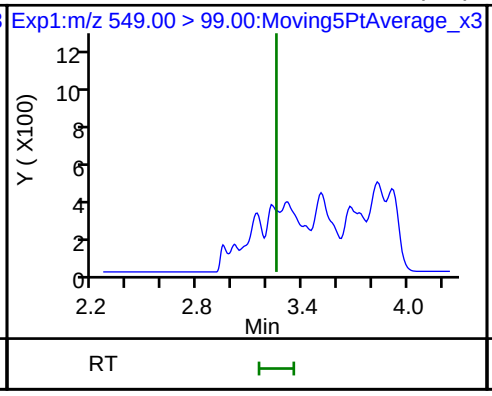
D 18 13C4 PFOS



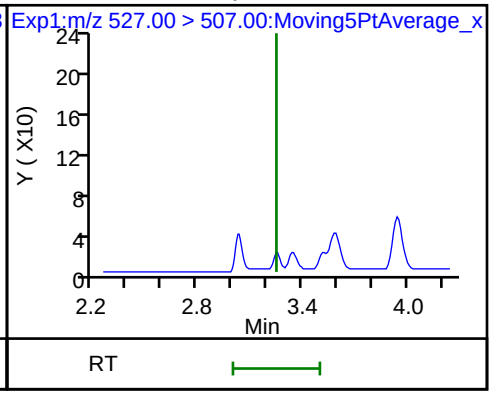
68 Perfluorononanesulfonic acid (ND)



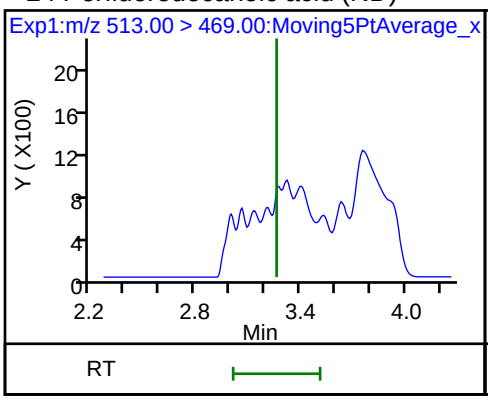
68 Perfluorononanesulfonic acid (ND)



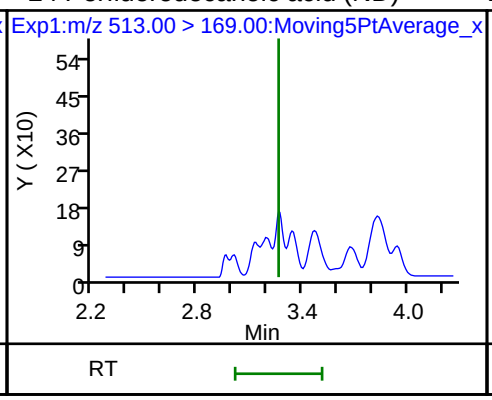
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



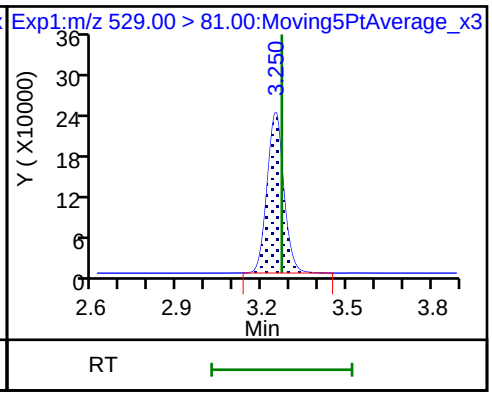
24 Perfluorodecanoic acid (ND)



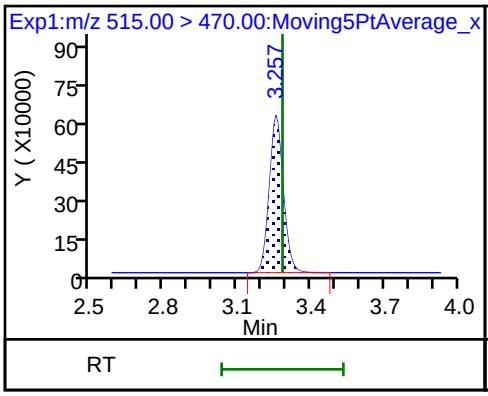
24 Perfluorodecanoic acid (ND)



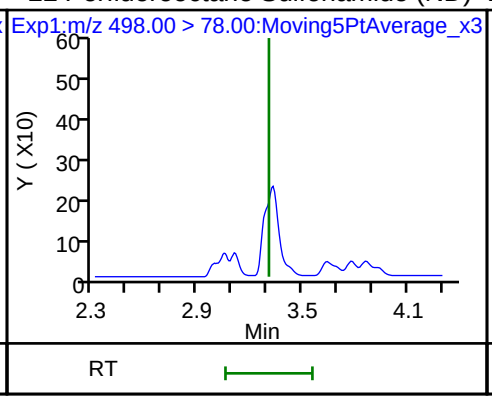
D 26 M2-8:2FTS



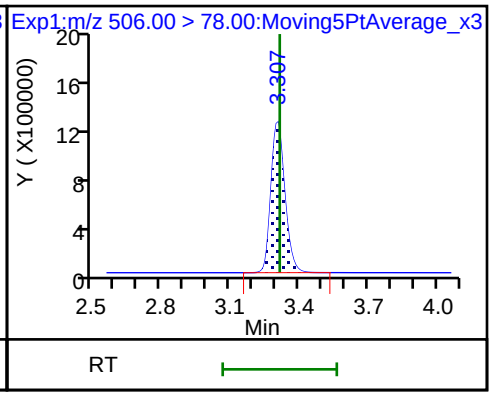
D 23 13C2 PFDA



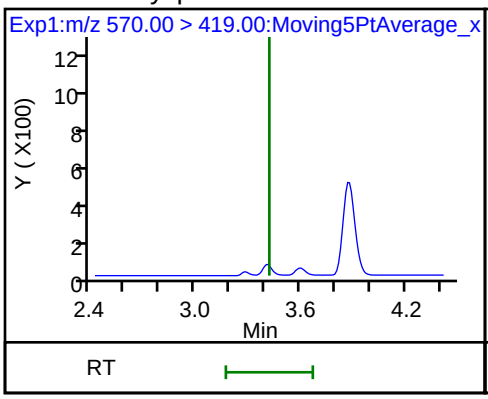
22 Perfluorooctane Sulfonamide (ND)



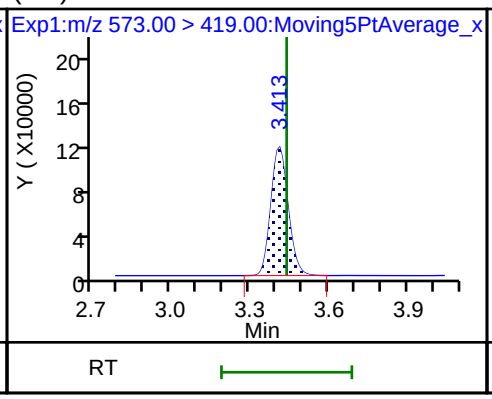
D 21 13C8 FOSA



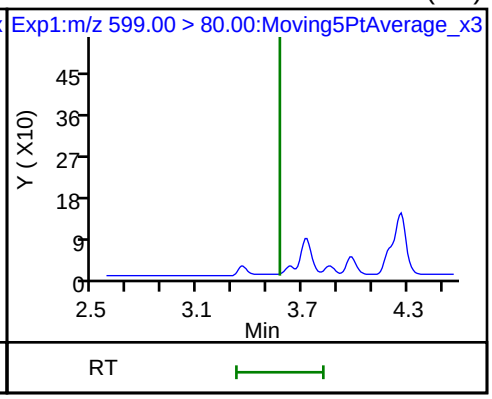
28 N-methyl perfluorooctane sulfonamid (ND)



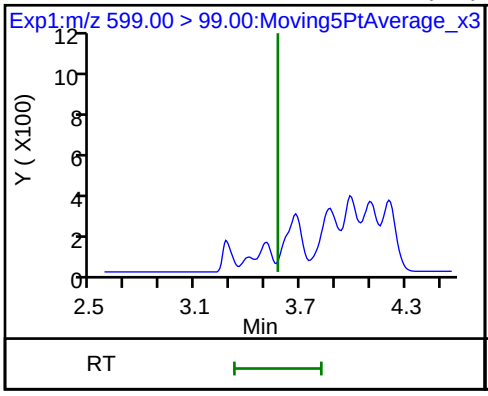
D 27 d3-NMeFOSAA



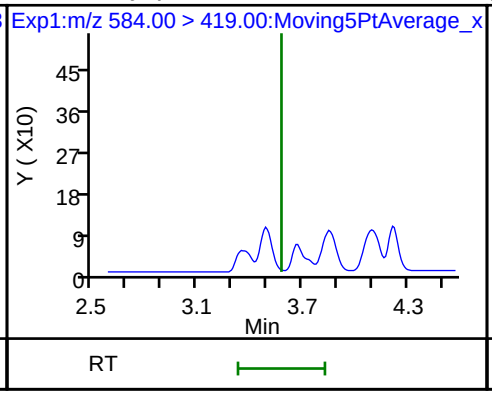
29 Perfluorodecane Sulfonic acid (ND)



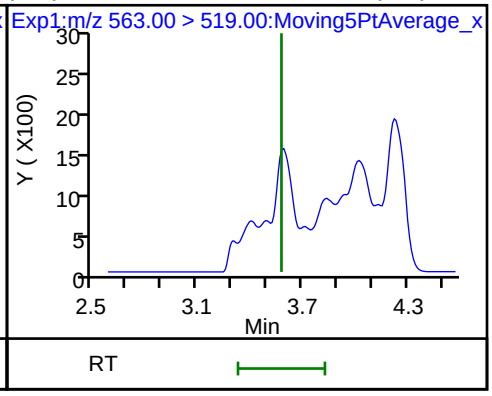
29 Perfluorodecane Sulfonic acid (ND)



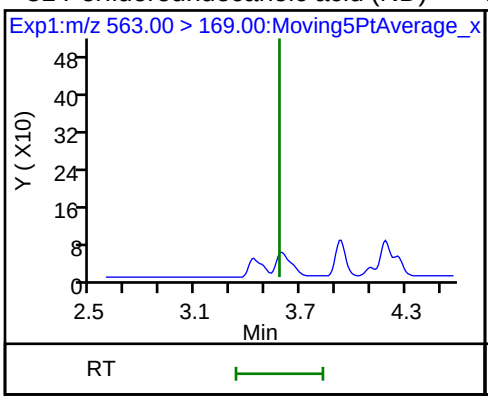
33 N-ethyl perfluorooctane sulfonamid (ND)



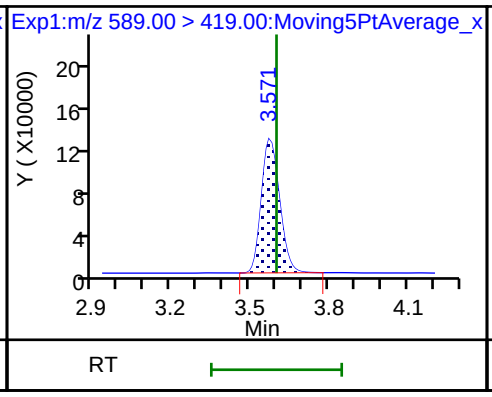
31 Perfluoroundecanoic acid (ND)



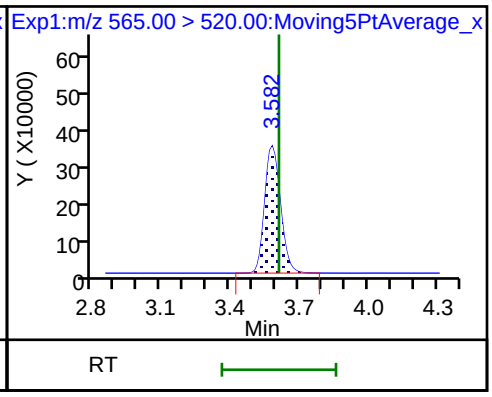
31 Perfluoroundecanoic acid (ND)



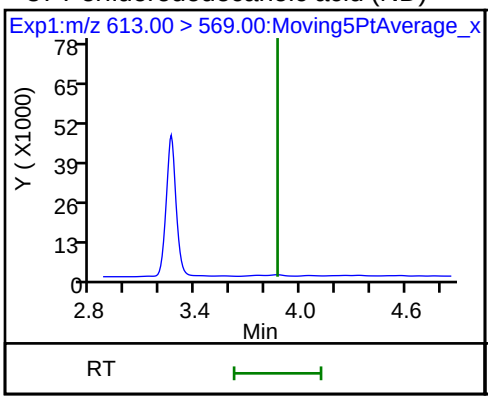
D 32 d5-NEtFOSAA



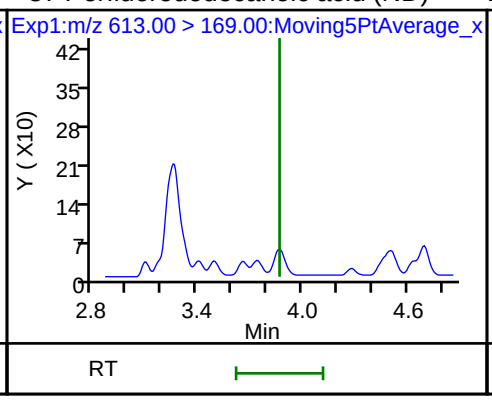
D 30 13C2 PFUnA



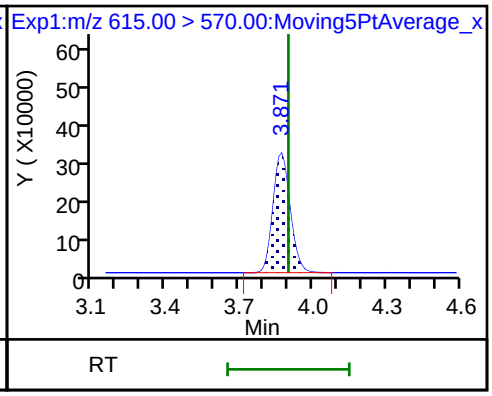
37 Perfluorododecanoic acid (ND)



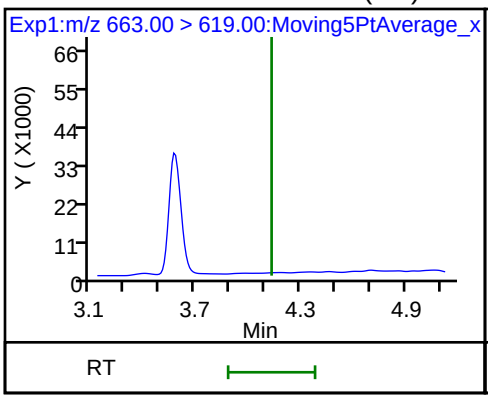
37 Perfluorododecanoic acid (ND)



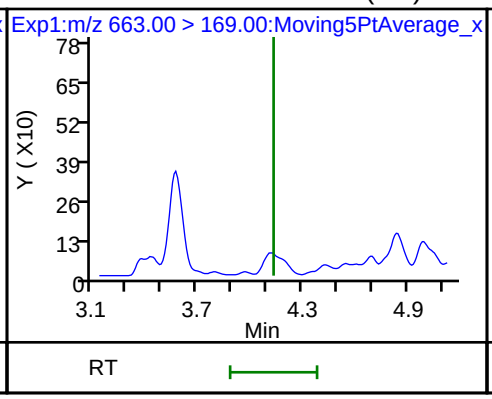
D 36 13C2 PFDoA



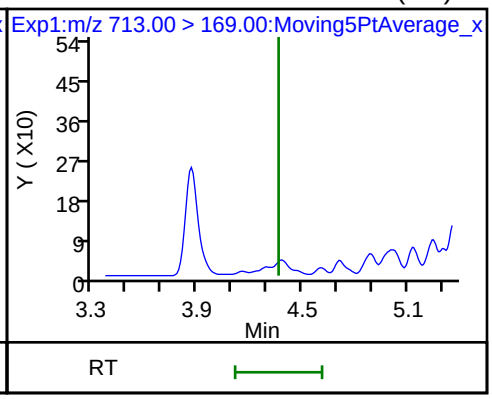
41 Perfluorotridecanoic acid (ND)



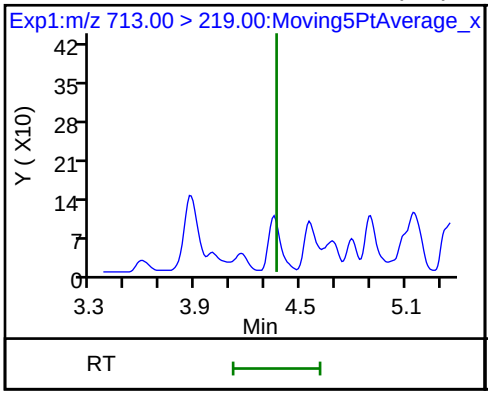
41 Perfluorotridecanoic acid (ND)



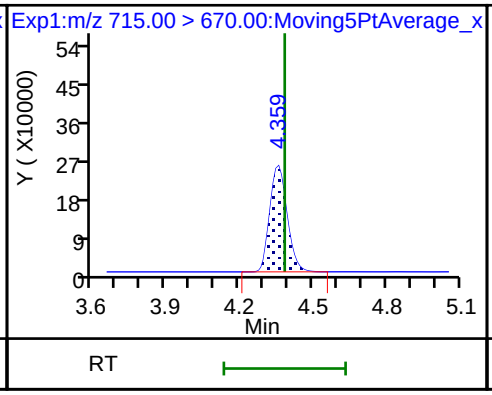
42 Perfluorotetradecanoic acid (ND)



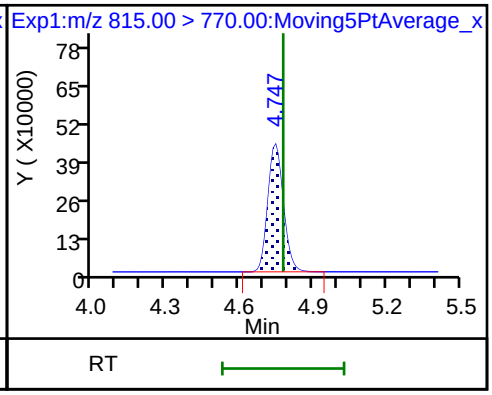
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

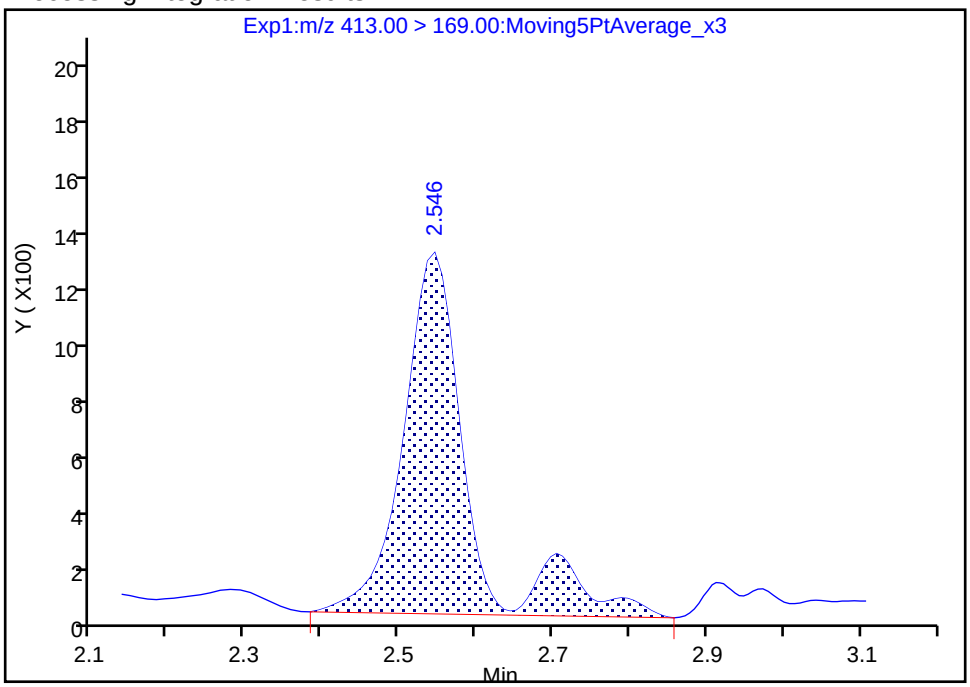
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180805-62175.b\2018.08.05LLA_004.d				
Injection Date:	05-Aug-2018 23:56:26	Instrument ID:	A8_N		
Lims ID:	CCB				
Client ID:					
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	20	Worklist Smp#:	1
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

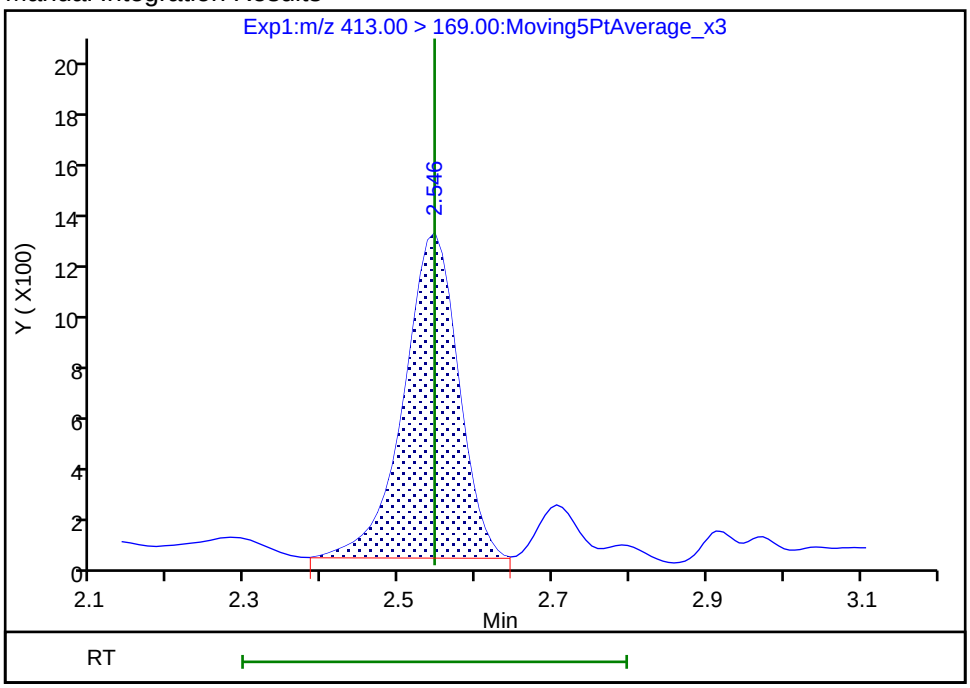
Processing Integration Results

RT: 2.55
Area: 7364
Amount: 0.003188
Amount Units: ng/ml



Manual Integration Results

RT: 2.55
Area: 6252
Amount: 0.003188
Amount Units: ng/ml



Reviewer: barnettj, 06-Aug-2018 17:03:03

Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: CCB 320-238519/1
Matrix: Water
Lab File ID: 2018.08.07LLB_004.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 08/07/2018 14:37
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 238519
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00610	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	102		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	100		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	100		50-150
STL00991	13C4 PFOS	99		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\2018.08.07LLB_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 07-Aug-2018 14:37:42 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 08-Aug-2018 08:32:24 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK048

First Level Reviewer: phomsophat Date: 07-Aug-2018 20:36:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.396	1.398	-0.002	0.544	5377682	2.40		95.8	8543	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.643	-0.003	0.639	3874750	2.51		100	9016	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.632	1.646	-0.014	0.995	8814	0.004998			0.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.684	-0.005	0.654	84604	2.37		102	349	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.880	-0.004	0.731	622735	NC			831	
D 7 13C2 PFHxA										
315.00 > 270.00	1.903	1.918	-0.015	0.741	4416865	2.52		101	6438	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.945	2.001	-0.056	0.974	1981	NC			1.1	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.997	2.012	-0.015	0.778	312515	NC			751	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.236	-0.011	0.867	4326986	2.51		100	6871	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.236	0.009	1.005	14636	0.006099			31.7	
399.00 > 99.00	2.234	2.236	-0.002	1.000	5994		2.44(1.50-4.49)		6.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.234	2.247	-0.013	0.870	5235051	2.37		100	4030	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.550	2.544	0.006	1.003	2347	0.003974			5.1	
D 12 M2-6:2FTS										
429.00 > 81.00	2.542	2.552	-0.010	0.990	891392	2.45		103	1916	
* 62 13C2-PFOA										
415.00 > 370.00	2.567	2.568	-0.001		4051776	2.50			6088	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.567	2.568	-0.001	1.000	13741	0.007705			1.3	
413.00 > 169.00	2.567	2.568	-0.001	1.000	6159		2.23(0.84-2.52)		10.2	
D 73 13C8 PFOA										
421.00 > 376.00	2.558	2.574	-0.016	0.997	7479538	NC			12056	
D 14 13C4 PFOA										
417.00 > 372.00	2.567	2.581	-0.014	1.000	3943199	2.49		99.6	5948	
D 19 13C5 PFNA										
468.00 > 423.00	2.928	2.941	-0.013	1.141	3619130	2.55		102	6676	
D 72 13C8 PFOS										
507.00 > 99.00	2.928	2.941	-0.013	1.141	1678202	NC			2477	
D 18 13C4 PFOS										
503.00 > 80.00	2.928	2.941	-0.013	1.141	3425497	2.36		98.6	4555	
D 26 M2-8:2FTS										
529.00 > 81.00	3.272	3.282	-0.010	1.275	1095739	2.50		104	3266	
D 23 13C2 PFDA										
515.00 > 470.00	3.278	3.296	-0.018	1.277	3295846	2.64		106	7417	
D 21 13C8 FOSA										
506.00 > 78.00	3.313	3.318	-0.005	1.291	4876935	2.53		101	4784	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.431	3.451	-0.020	1.337	1619221	2.54		102	2901	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.597	3.611	-0.014	1.402	1645300	2.49		99.6	1243	
D 30 13C2 PFUnA										
565.00 > 520.00	3.606	3.618	-0.012	1.405	2536102	2.53		101	4832	
D 36 13C2 PFDoA										
615.00 > 570.00	3.893	3.908	-0.015	1.517	2729511	2.57		103	5033	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.388	4.397	-0.009	1.709	3310582	2.45		98.0	6472	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.786	4.789	-0.003	1.000	54709	NC			24.4	
813.00 > 169.00	4.786	4.789	-0.003	1.000	10366		5.28(2.86-8.58)		146	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.786	4.796	-0.010	1.865	6330113	2.36		94.5	8490	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00008 Amount Added: 1.00 Units: mL

Report Date: 08-Aug-2018 08:36:03 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62287.b\2018.08.07LLB_004.d

Injection Date: 07-Aug-2018 14:37:42 Instrument ID: A8_N

Lims ID: CCB

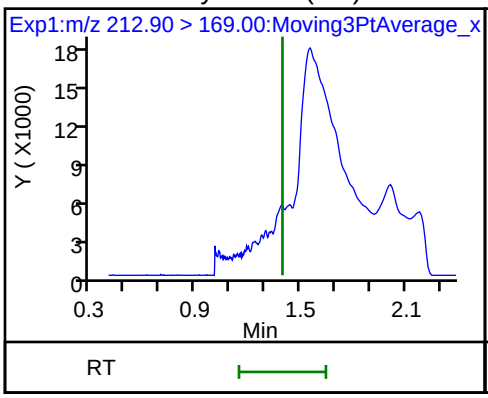
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 1

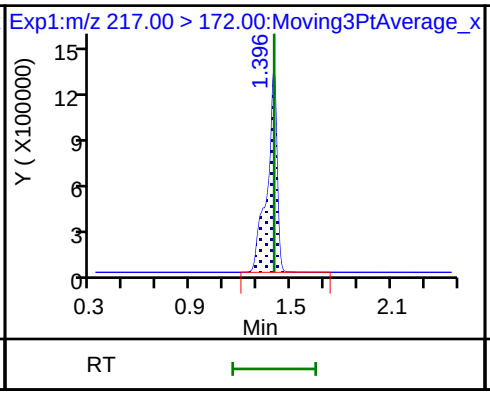
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

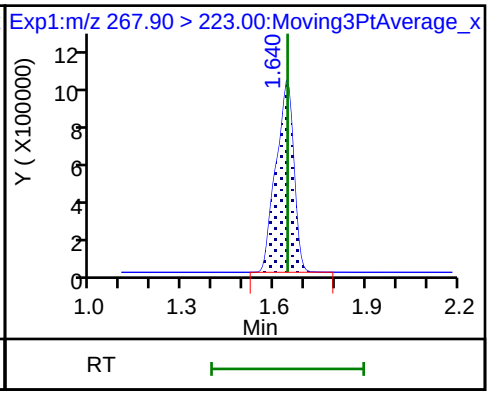
2 Perfluorobutyric acid (ND)



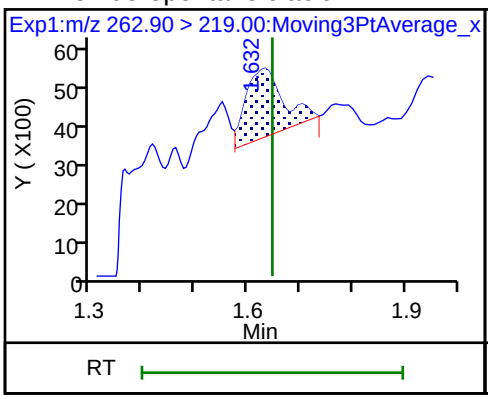
D 1 13C4 PFBA



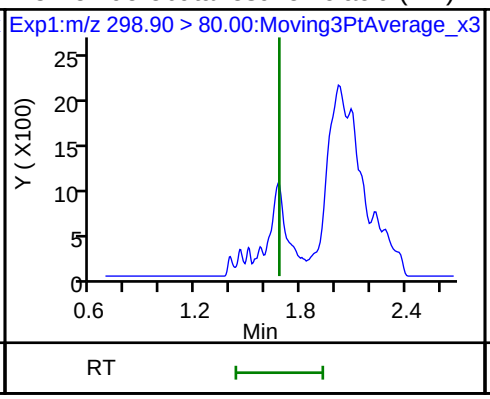
D 3 13C5-PFPeA



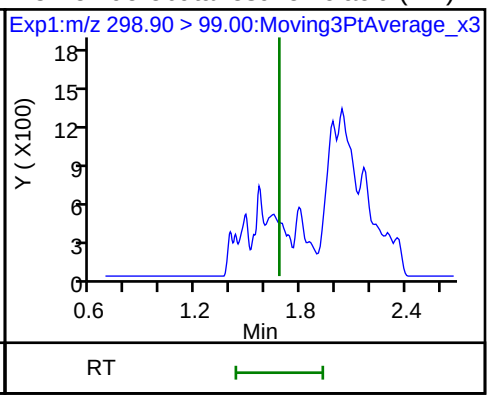
4 Perfluoropentanoic acid



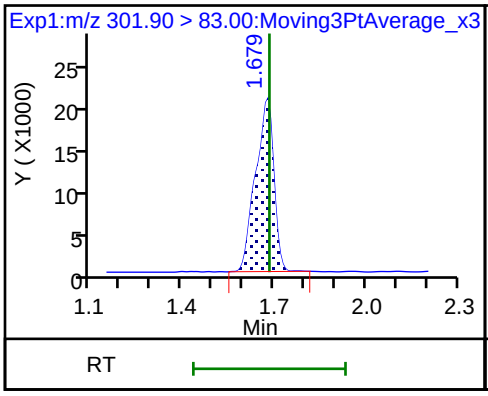
5 Perfluorobutanesulfonic acid (ND)



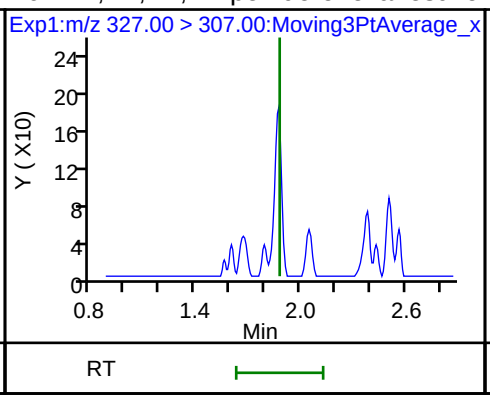
5 Perfluorobutanesulfonic acid (ND)



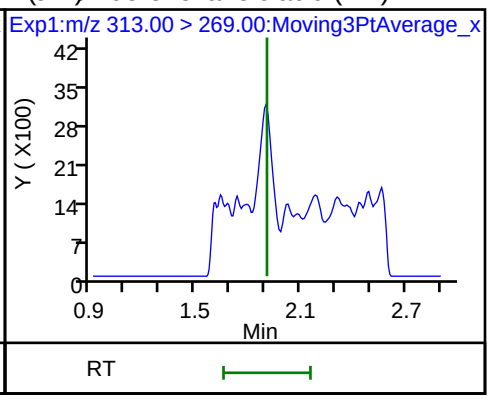
D 47 13C3-PFBS



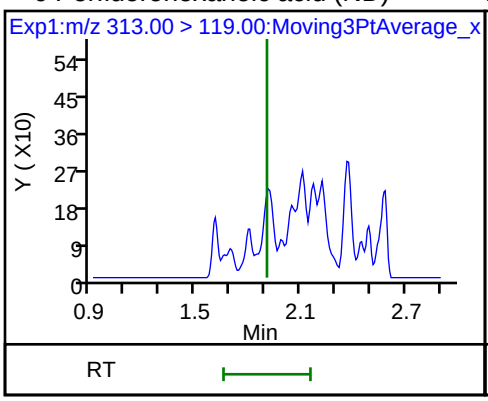
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



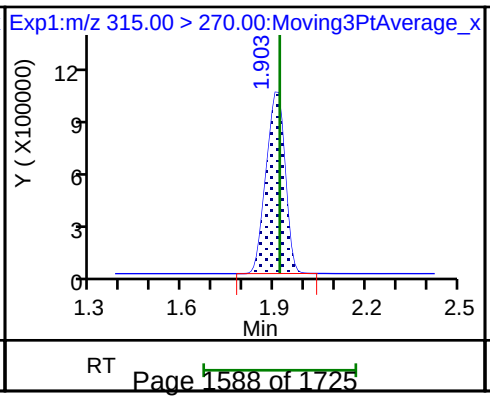
6 Perfluorohexanoic acid (ND)



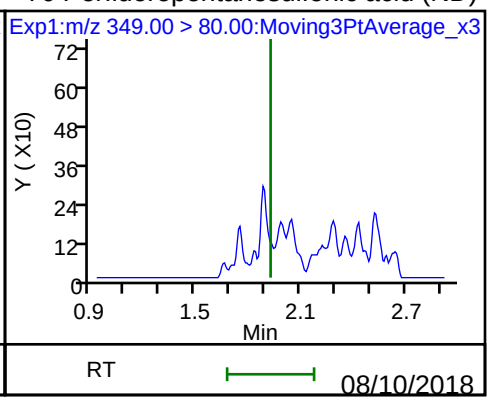
6 Perfluorohexanoic acid (ND)



D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid (ND)



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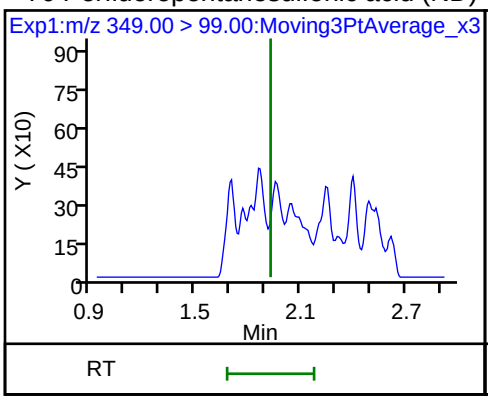
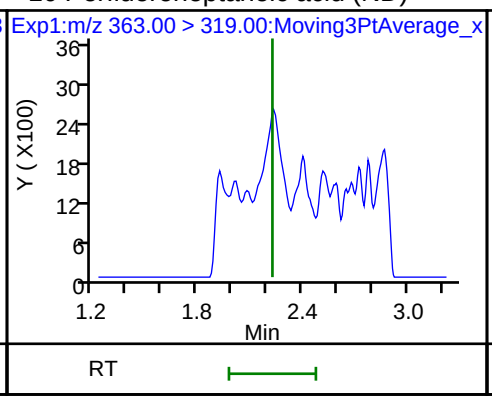


10 Perfluoroheptanoic acid (ND)



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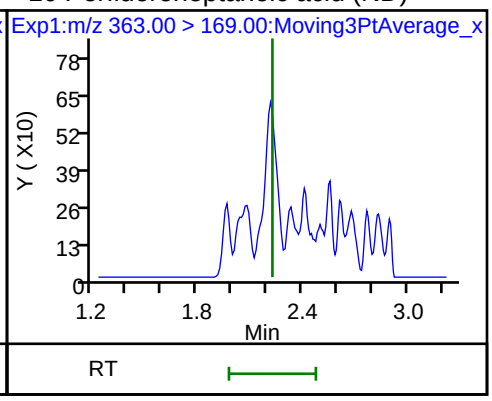
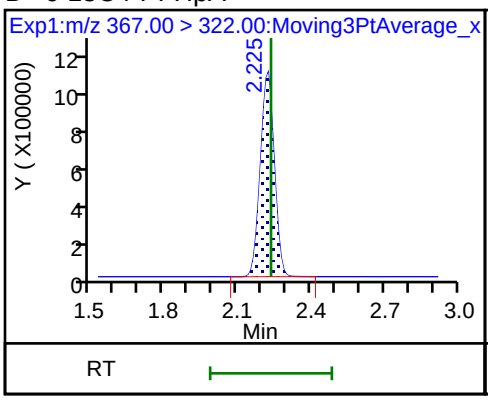
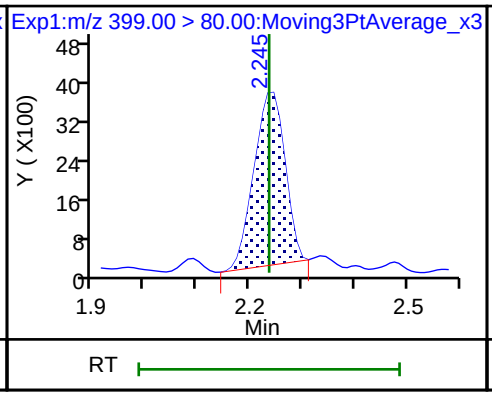


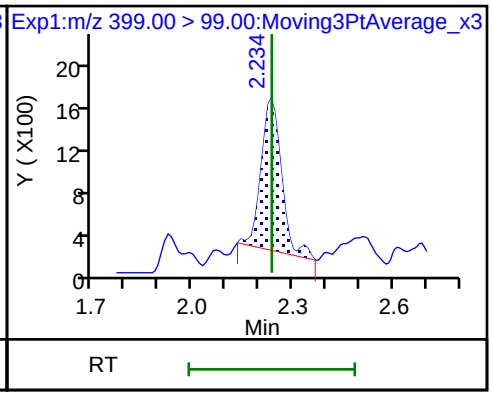
D 9 13C4-PFHpA



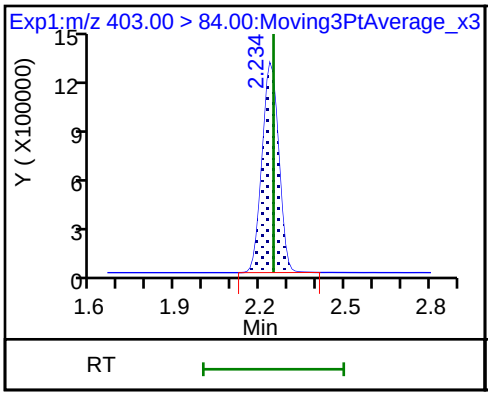
8 Perfluorohexanesulfonic acid



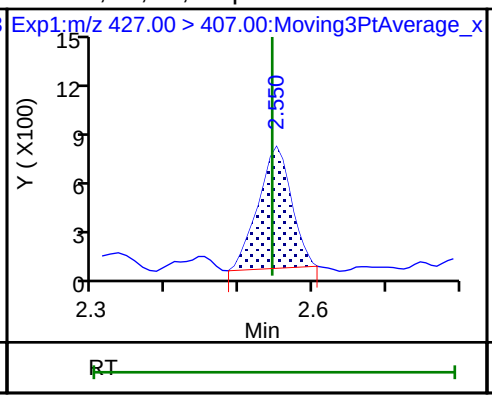
8 Perfluorohexanesulfonic acid



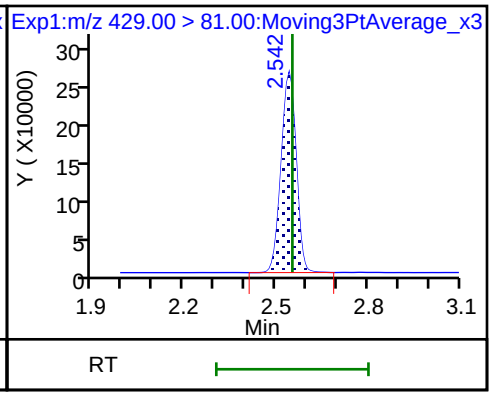
D 11 18O2 PFHxS



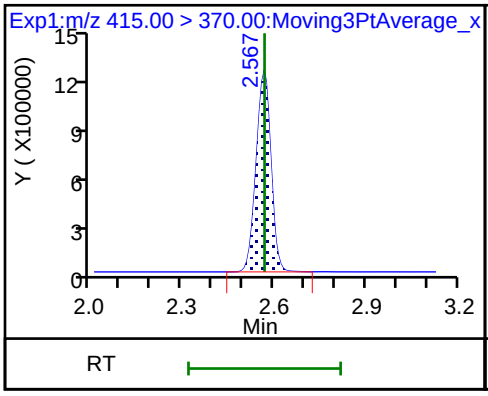
13 1H,1H,2H,2H-perfluorooctanesulfon



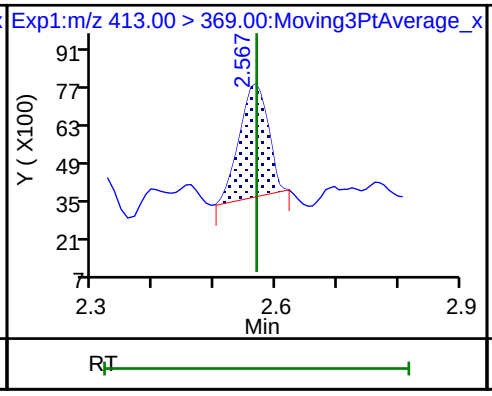
D 12 M2-6:2FTS



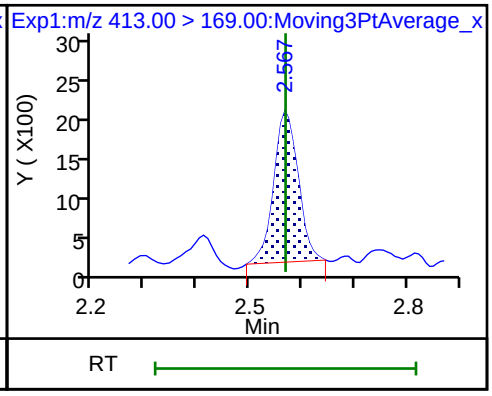
* 62 13C2-PFOA



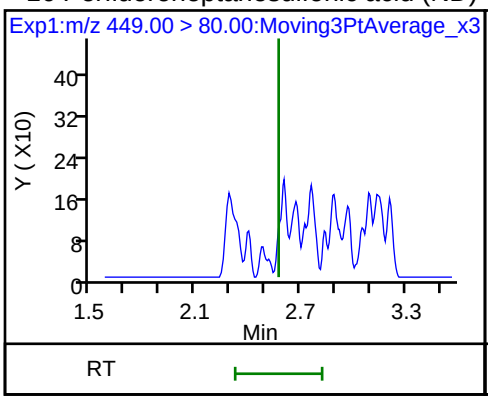
15 Perfluorooctanoic acid



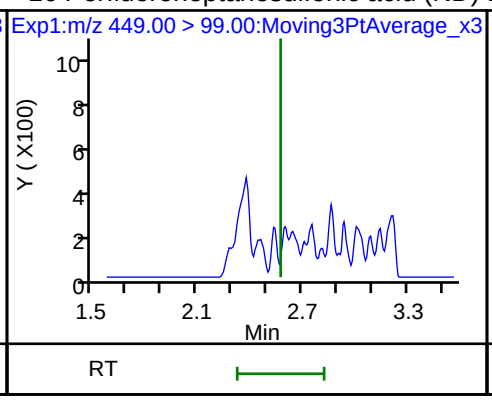
15 Perfluorooctanoic acid



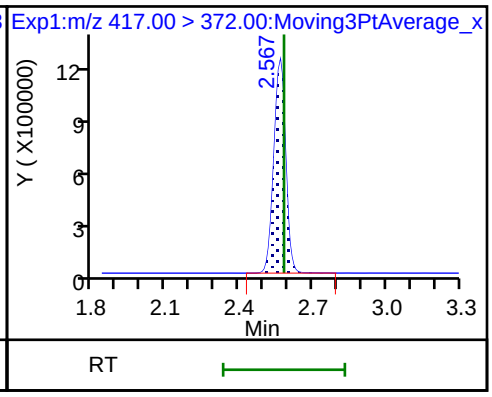
16 Perfluoroheptanesulfonic acid (ND)



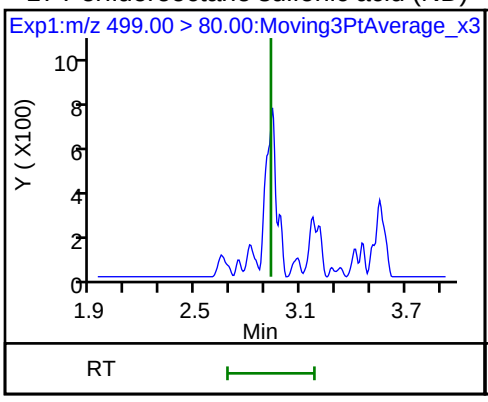
16 Perfluoroheptanesulfonic acid (ND)



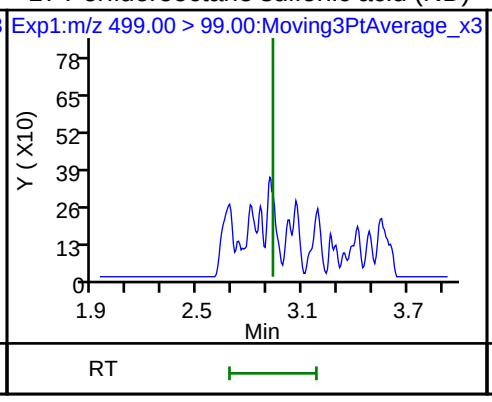
D 14 13C4 PFOA



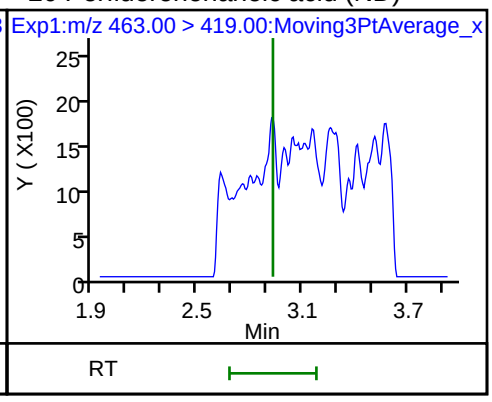
17 Perfluorooctane sulfonic acid (ND)



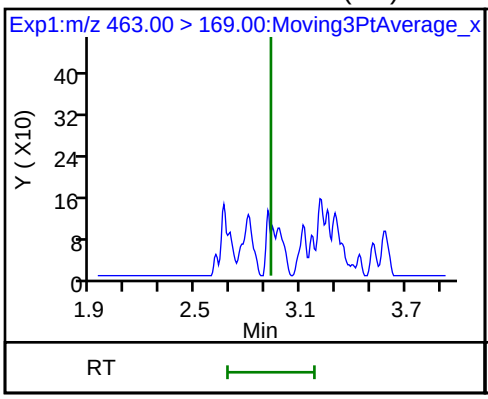
17 Perfluorooctane sulfonic acid (ND)



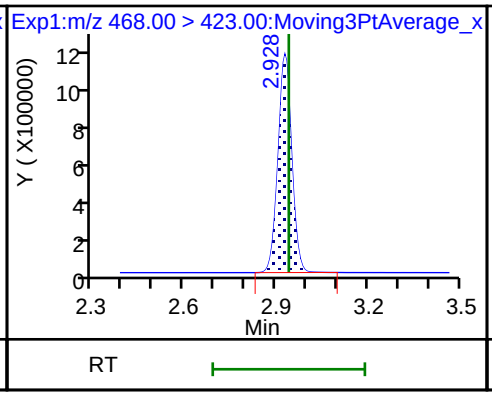
20 Perfluorononanoic acid (ND)



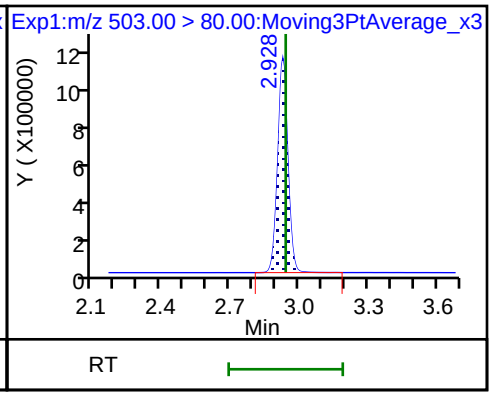
20 Perfluorononanoic acid (ND)



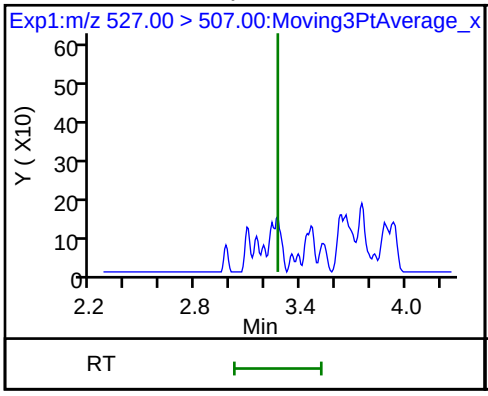
D 19 13C5 PFNA



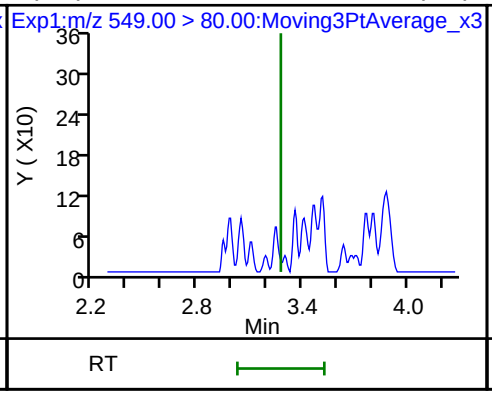
D 18 13C4 PFOS



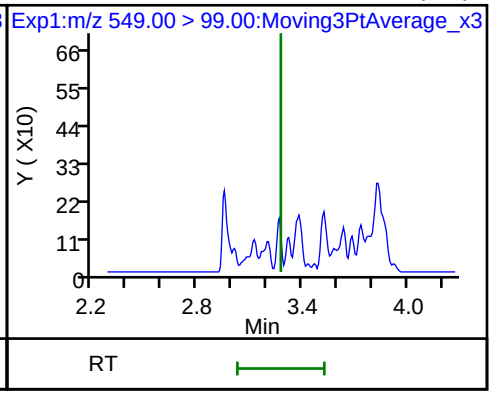
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



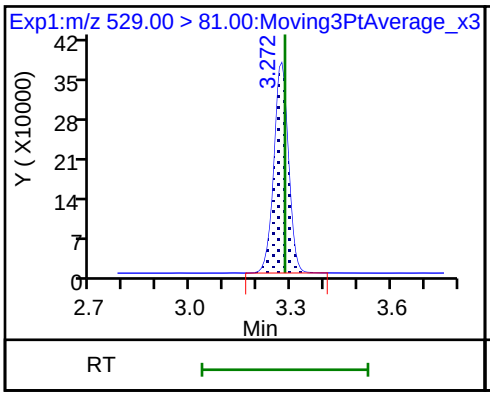
68 Perfluorononanesulfonic acid (ND)



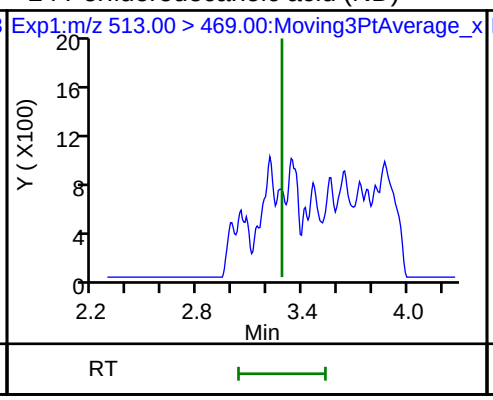
68 Perfluorononanesulfonic acid (ND)



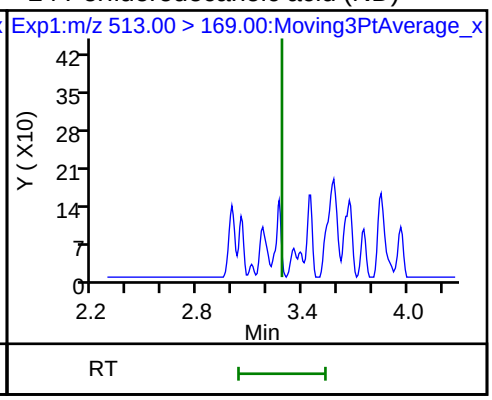
D 26 M2-8:2FTS



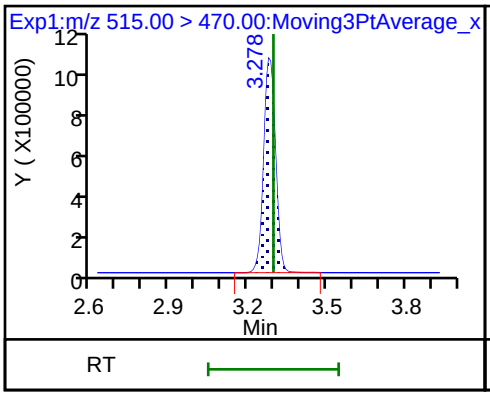
24 Perfluorodecanoic acid (ND)



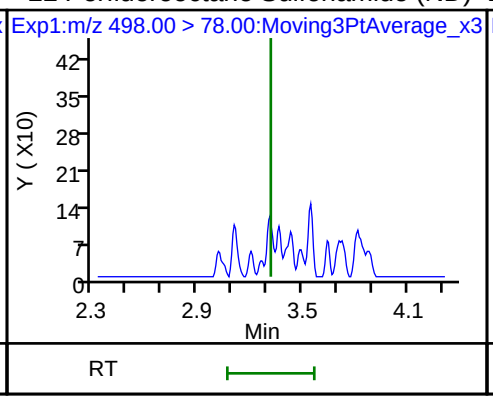
24 Perfluorodecanoic acid (ND)



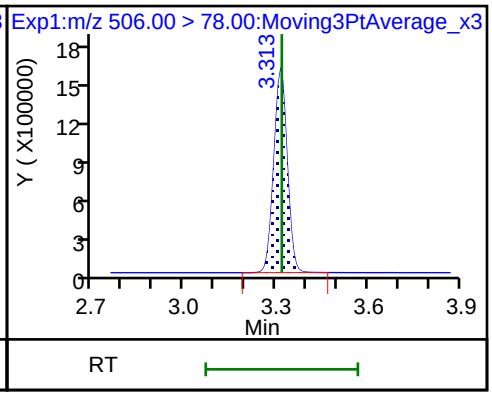
D 23 13C2 PFDA



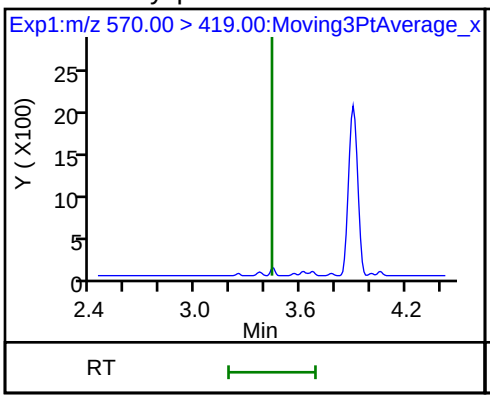
22 Perfluorooctane Sulfonamide (ND)



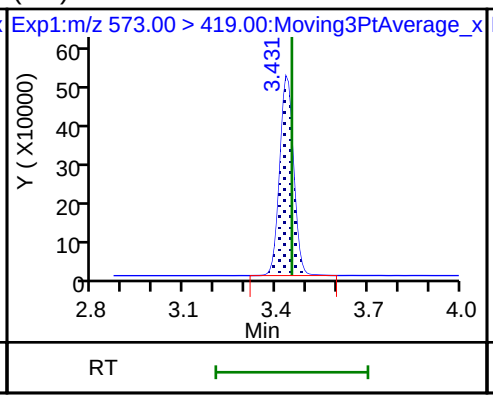
D 21 13C8 FOSA



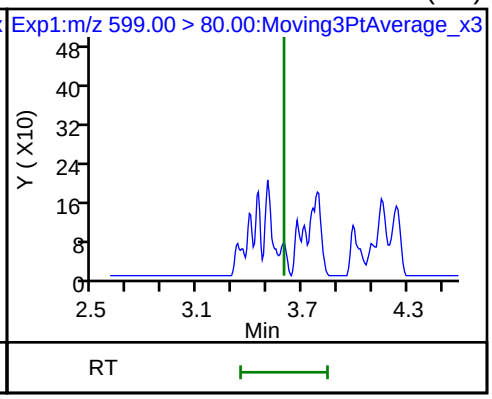
28 N-methyl perfluorooctane sulfonamid (ND)



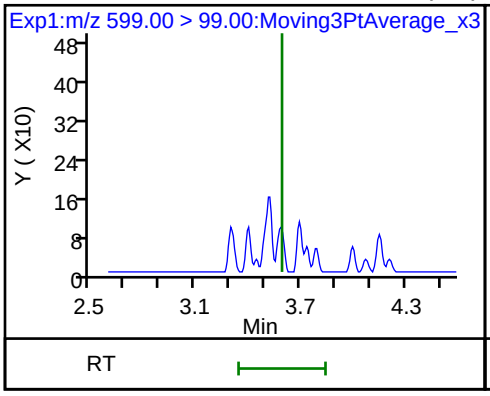
D 27 d3-NMeFOSAA



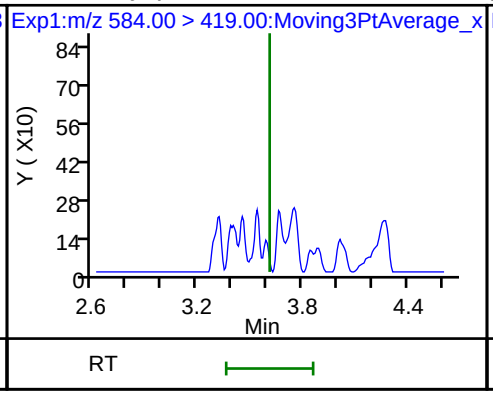
29 Perfluorodecane Sulfonic acid (ND)



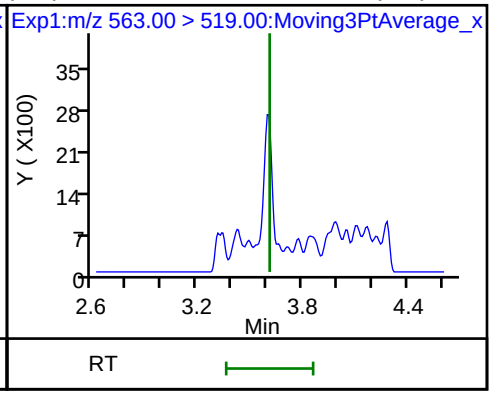
29 Perfluorodecane Sulfonic acid (ND)



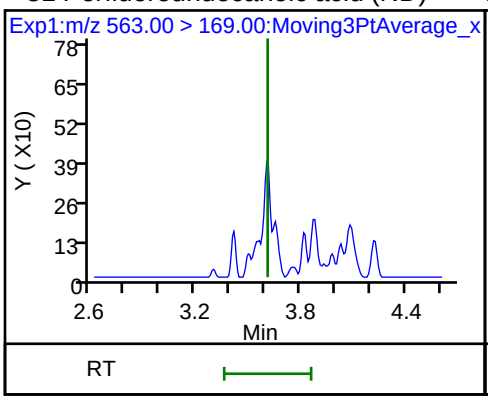
33 N-ethyl perfluorooctane sulfonamid (ND)



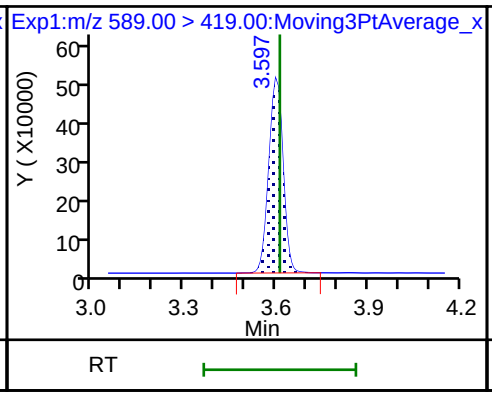
31 Perfluoroundecanoic acid (ND)



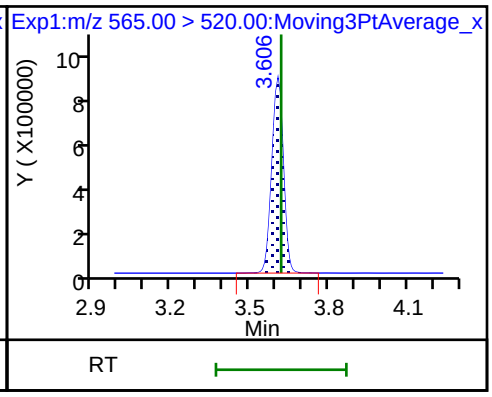
31 Perfluoroundecanoic acid (ND)



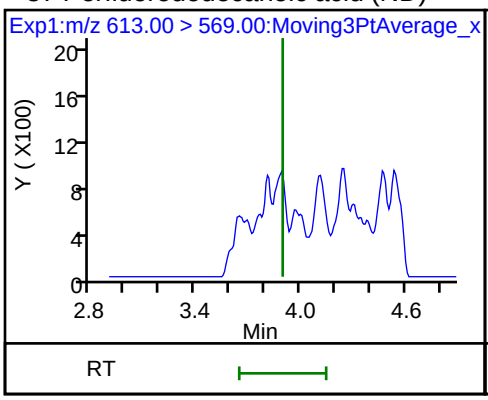
D 32 d5-NEtFOSAA



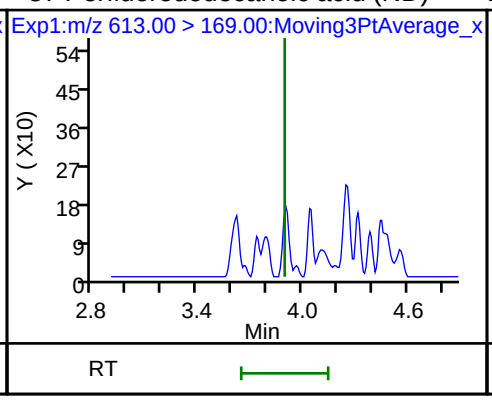
D 30 13C2 PFUnA



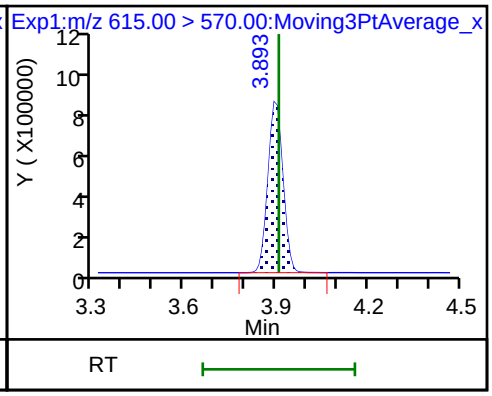
37 Perfluorododecanoic acid (ND)



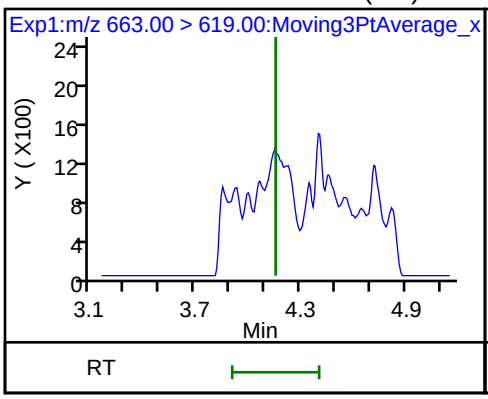
37 Perfluorododecanoic acid (ND)



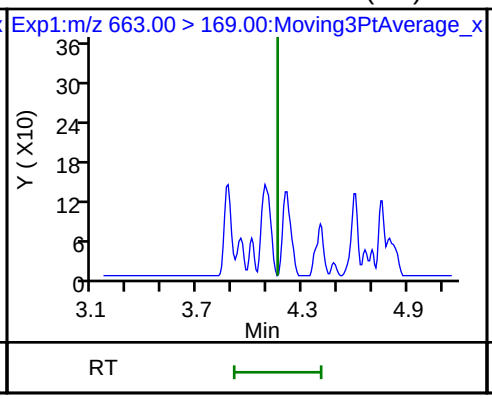
D 36 13C2 PFDoA



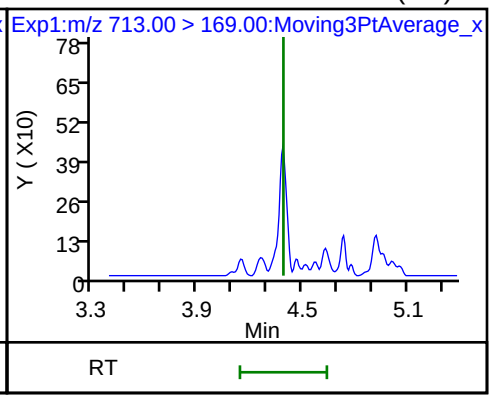
41 Perfluorotridecanoic acid (ND)



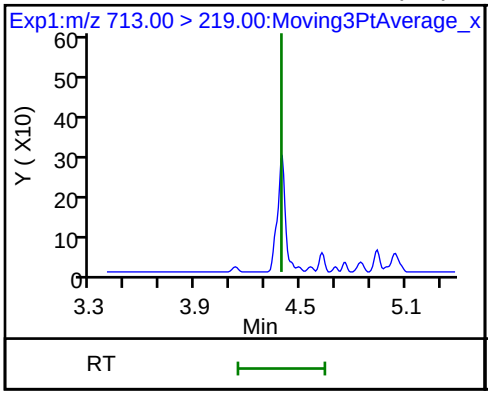
41 Perfluorotridecanoic acid (ND)



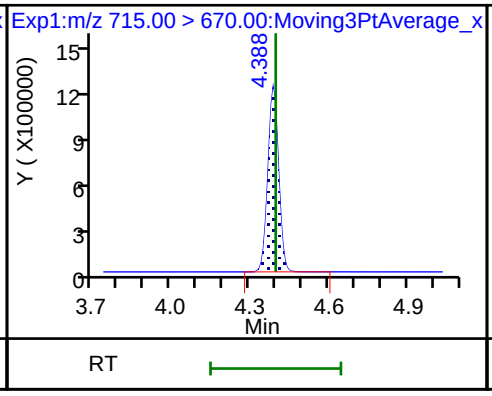
42 Perfluorotetradecanoic acid (ND)



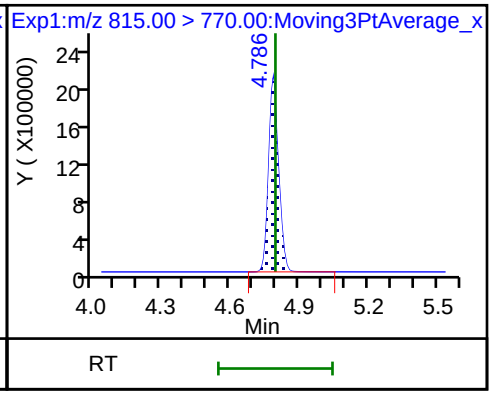
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: ICB 320-235668/9
Matrix: Water
Lab File ID: 2018.07.23LLICAL_009.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 07/23/2018 17:05
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235668
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00755	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	96		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	100		50-150
STL00995	13C5 PFNA	100		50-150
STL00994	18O2 PFHxS	98		50-150
STL00991	13C4 PFOS	97		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 23-Jul-2018 17:05:54 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Jul-2018 17:39:48 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 23-Jul-2018 17:28:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.398	-0.001	0.540	5145109	2.44		97.5	81007	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.638	0.002	0.634	3717952	2.52		101	64007	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.670	0.005	0.647	86346	2.23		96.1	615	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.877	-0.001	0.725	626187	NC			6042	
D 7 13C2 PFHxA										
315.00 > 270.00	1.916	1.909	0.007	0.740	4230282	2.45		97.9	92704	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.014	2.007	0.007	0.778	214697	NC			7333	
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.230	-0.001	0.861	4421489	2.48		99.3	83046	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.241	2.243	-0.002	0.994	19662	0.007552			46.6	
399.00 > 99.00	2.254	2.243	0.011	1.000	7162		2.75(1.50-4.49)		22.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.254	2.246	0.008	0.871	5277790	2.31		97.6	48716	
65 ADONA										
377.00 > 251.00	2.280	2.272	0.008	0.773	5598	NC			84.5	
377.00 > 85.00	2.280	2.272	0.008	0.773	2480		2.26(0.84-2.53)		14.1	
D 12 M2-6:2FTS										
429.00 > 81.00	2.564	2.559	0.005	0.991	1194990	2.40		101	16501	
D 14 13C4 PFOA										
417.00 > 372.00	2.588	2.585	0.003	1.000	4367968	2.51		100	61577	
* 62 13C2-PFOA										
415.00 > 370.00	2.588	2.585	0.003		4552759	2.50			54789	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.588	2.586	0.002	1.000	13835	0.006525			11.1	
413.00 > 169.00	2.588	2.586	0.002	1.000	6917		2.00(0.84-2.52)		38.9	
D 18 13C4 PFOS										
503.00 > 80.00	2.948	2.949	-0.001	1.139	3673563	2.31		96.6	37919	
D 19 13C5 PFNA										
468.00 > 423.00	2.948	2.950	-0.002	1.139	3746490	2.49		99.7	73288	
20 Perfluorononanoic acid										
463.00 > 419.00	2.948	2.950	-0.002	1.000	11444	0.006689			26.8	
463.00 > 169.00	2.954	2.950	0.004	1.002	2607		4.39(1.90-5.69)		97.1	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.164	3.161	0.003	1.073	5734	NC			54.5	
D 26 M2-8:2FTS										
529.00 > 81.00	3.291	3.296	-0.005	1.272	1425312	2.75		115	18720	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.291	3.297	-0.006	1.000	1982	0.002457			87.0	
D 23 13C2 PFDA										
515.00 > 470.00	3.307	3.309	-0.002	1.278	3139942	2.63		105	35453	
D 21 13C8 FOSA										
506.00 > 78.00	3.307	3.311	-0.004	1.278	5853837	2.51		100	43308	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.323	3.314	0.009	1.005	3457	0.001485			45.3	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.458	3.462	-0.004	1.336	913491	2.31		92.5	25050	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.631	3.635	-0.004	1.403	1073290	2.59		103	4762	
D 30 13C2 PFUnA										
565.00 > 520.00	3.631	3.638	-0.007	1.403	2415684	2.51		100	56729	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.640	3.638	0.002	1.003	10571	0.008816			37.3	M
563.00 > 169.00	3.640	3.638	0.002	1.003	2370		4.46(2.12-6.36)		30.9	M
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.640	3.639	0.001	1.003	4102	0.0102			47.3	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.795	3.800	-0.005	1.287	8408	NC			118	
D 36 13C2 PFDoA										
615.00 > 570.00	3.931	3.934	-0.003	1.519	2294139	2.51		100	17445	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.193	4.198	-0.005	1.067	3561	0.003694			1.3	
663.00 > 169.00	4.193	4.198	-0.005	1.067	1739		2.05(1.25-3.76)		20.1	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.427	4.435	-0.008	1.710	2211001	2.47		98.9	12431	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.833	4.840	-0.007	1.867	3242688	2.39		95.6	11215	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.833	4.840	-0.007	1.000	34086	NC			5.4	
813.00 > 169.00	4.833	4.840	-0.007	1.000	5784		5.89(2.86-8.58)		62.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.174	5.184	-0.010	1.070	8308	NC			1.8	
913.00 > 169.00	5.182	5.184	-0.002	1.072	967		8.59(3.83-11.48)		12.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 23-Jul-2018 17:41:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_009.d

Injection Date: 23-Jul-2018 17:05:54 Instrument ID: A8_N

Lims ID: ICB

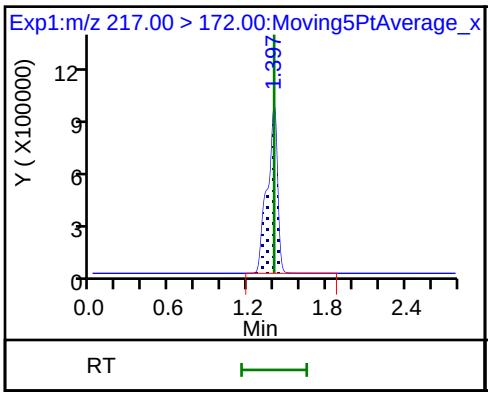
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9

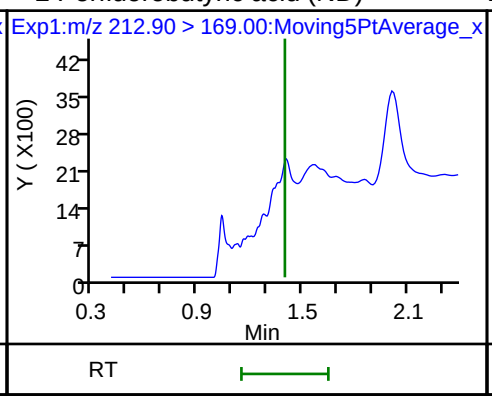
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

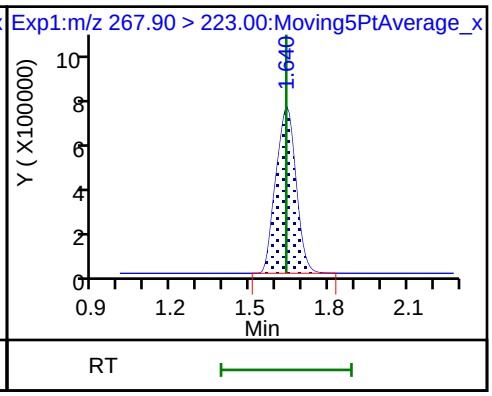
D 1 13C4 PFBA



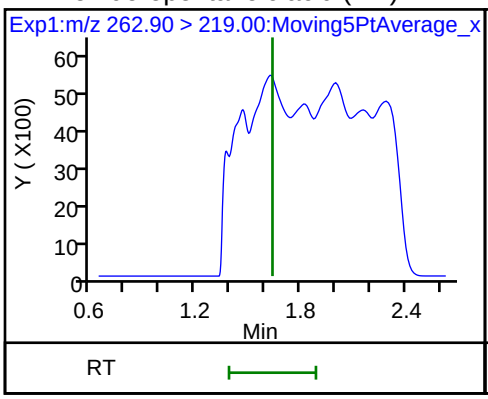
2 Perfluorobutyric acid (ND)



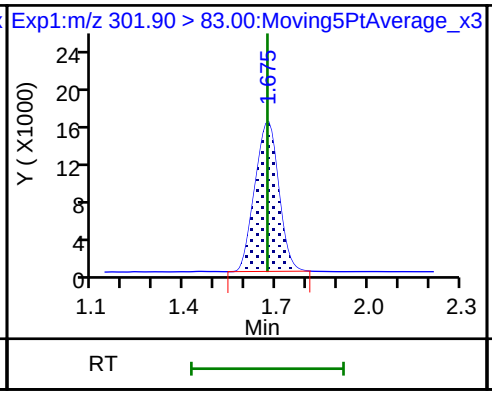
D 3 13C5-PFPeA



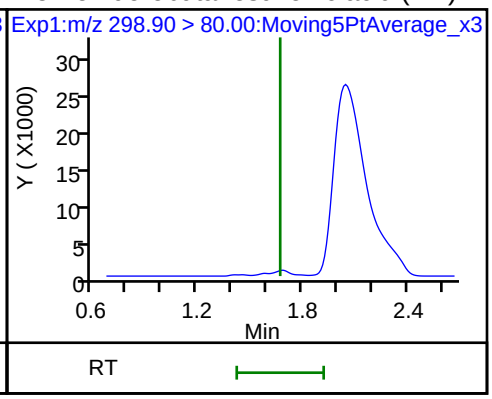
4 Perfluoropentanoic acid (ND)



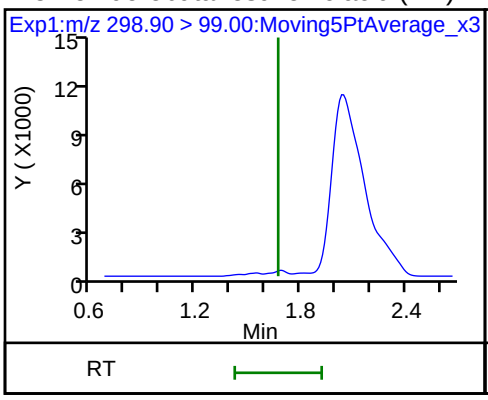
D 47 13C3-PFBS



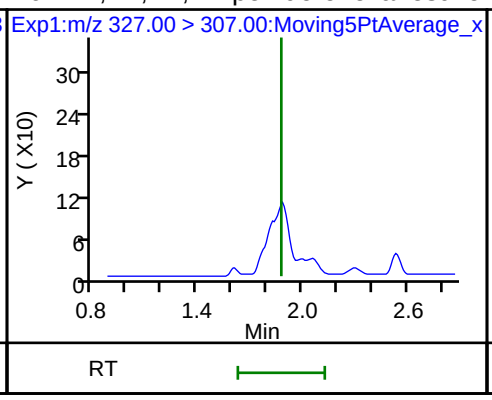
5 Perfluorobutanesulfonic acid (ND)



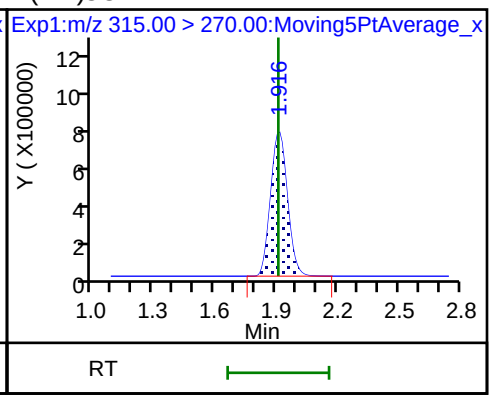
5 Perfluorobutanesulfonic acid (ND)



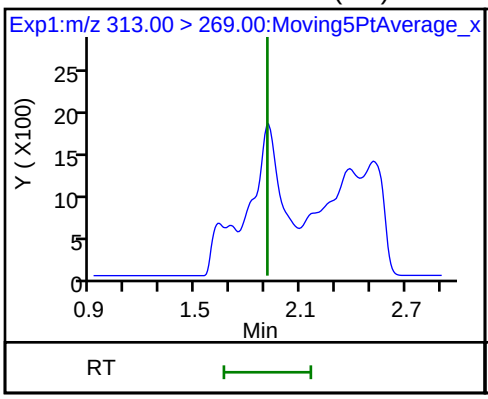
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



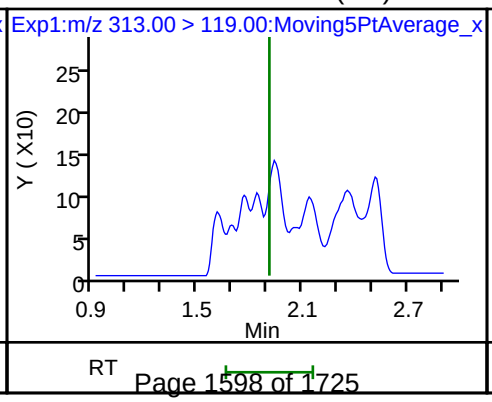
D 70 13C2 PFHxA



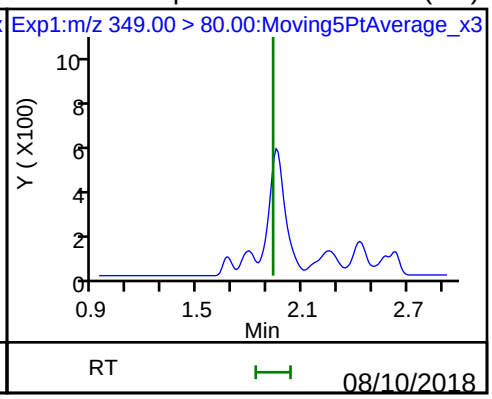
6 Perfluorohexanoic acid (ND)



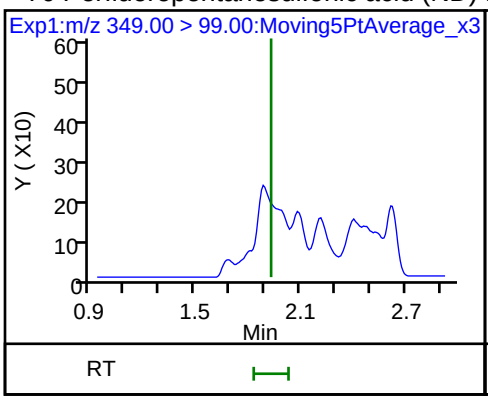
6 Perfluorohexanoic acid (ND)



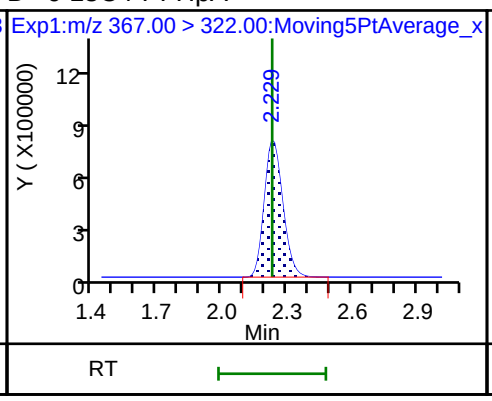
70 Perfluoropentanesulfonic acid (ND)



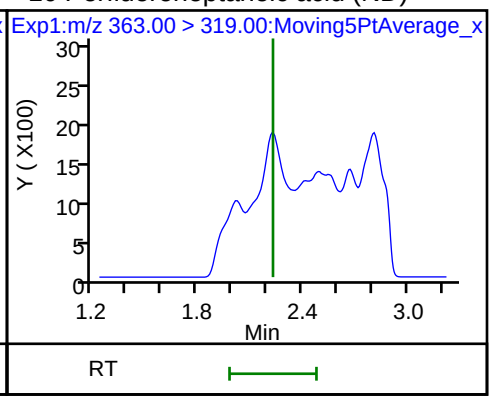
70 Perfluoropentanesulfonic acid (ND)



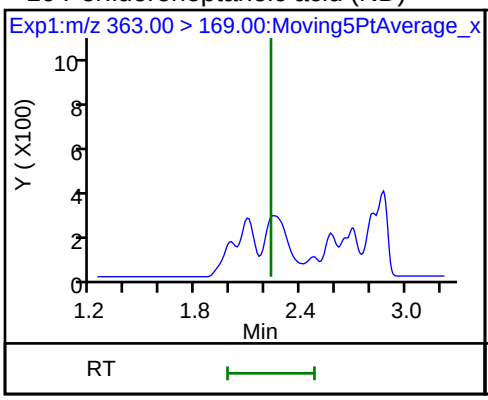
D 9 13C4-PFHpA



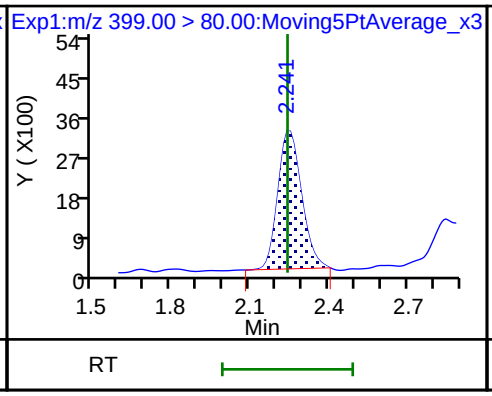
10 Perfluoroheptanoic acid (ND)



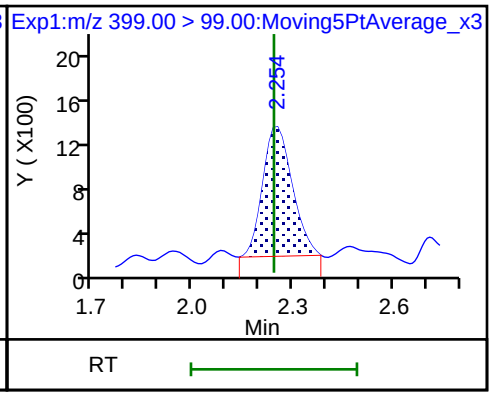
10 Perfluoroheptanoic acid (ND)



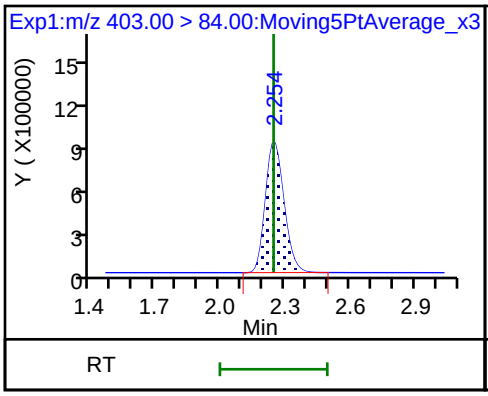
8 Perfluorohexanesulfonic acid



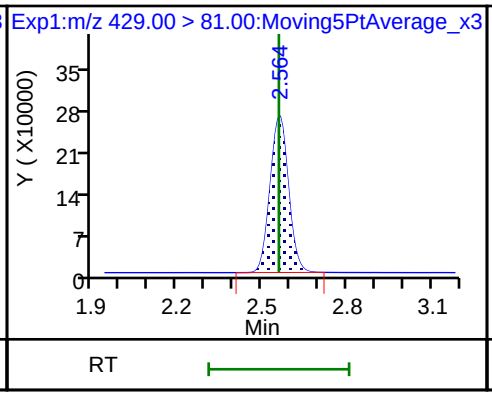
8 Perfluorohexanesulfonic acid



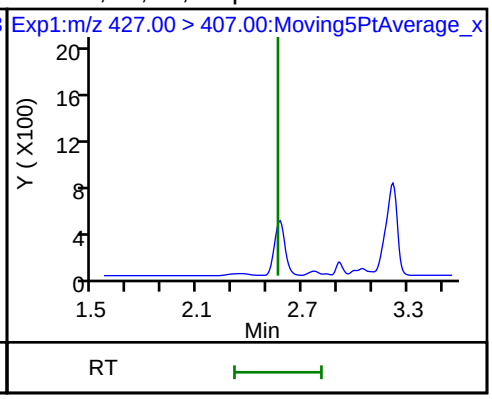
D 11 18O2 PFHxS



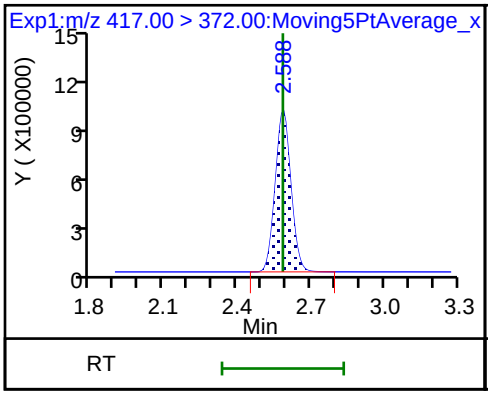
D 12 M2-6:2FTS



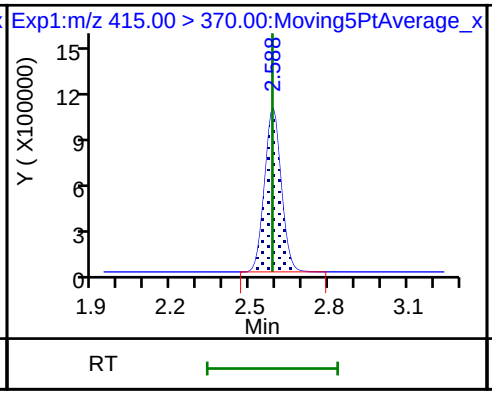
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



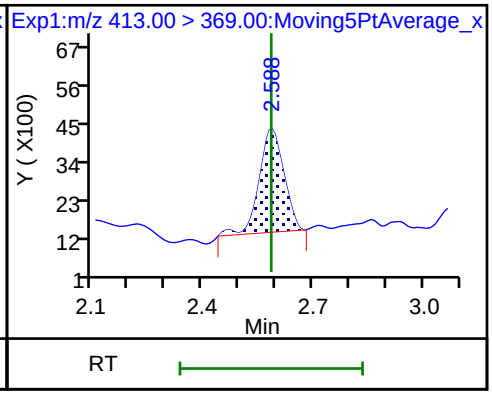
D 14 13C4 PFOA



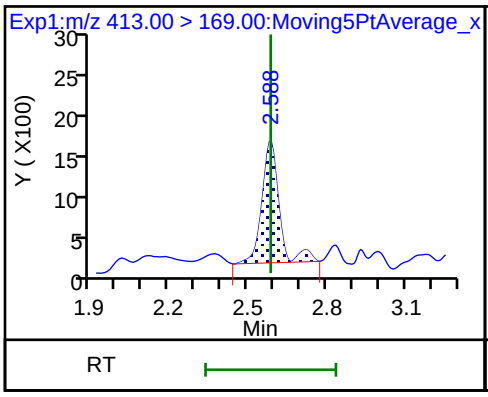
* 62 13C2-PFOA



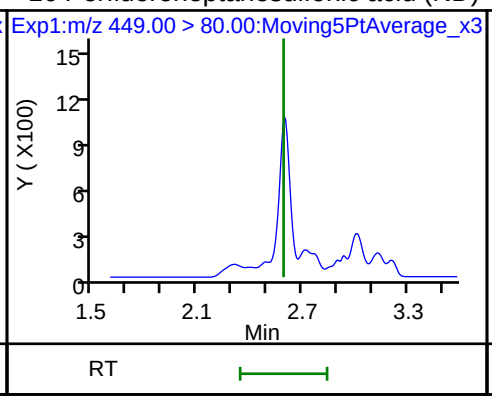
15 Perfluorooctanoic acid



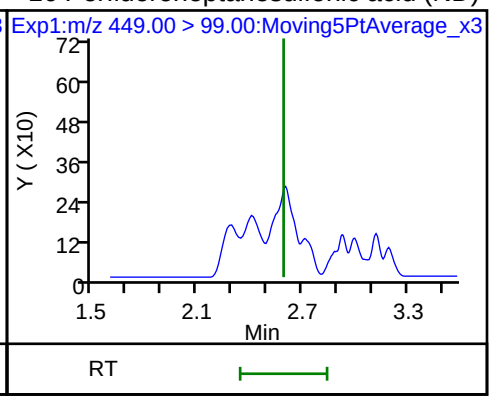
15 Perfluorooctanoic acid



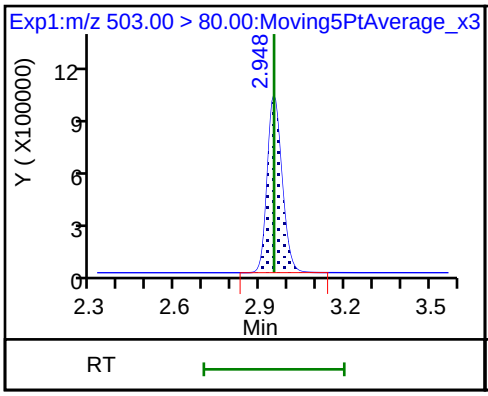
16 Perfluoroheptanesulfonic acid (ND)



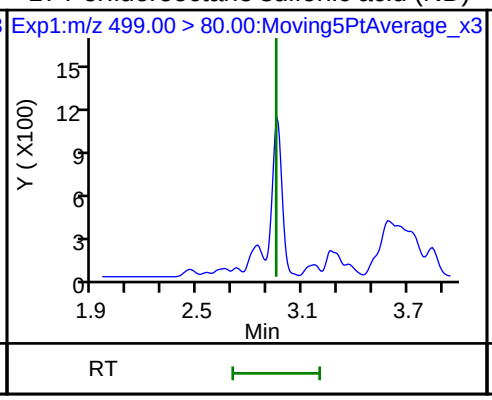
16 Perfluoroheptanesulfonic acid (ND)



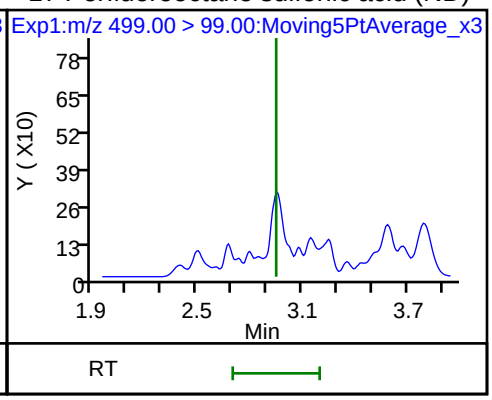
D 18 13C4 PFOS



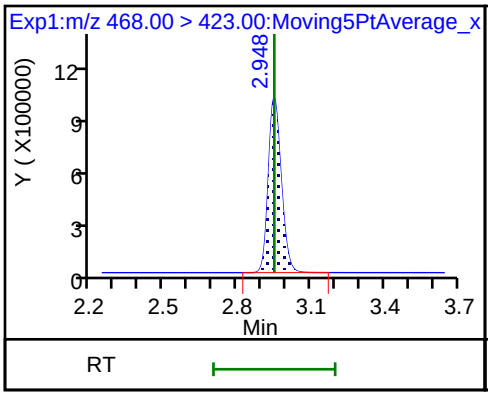
17 Perfluorooctane sulfonic acid (ND)



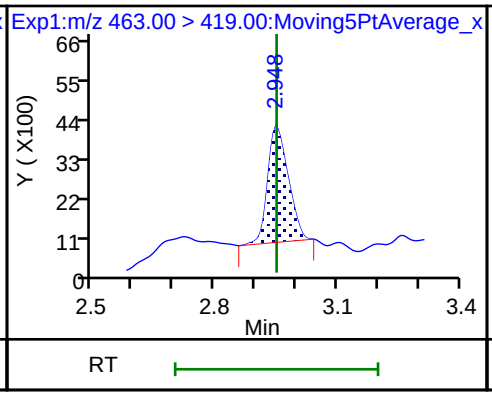
17 Perfluorooctane sulfonic acid (ND)



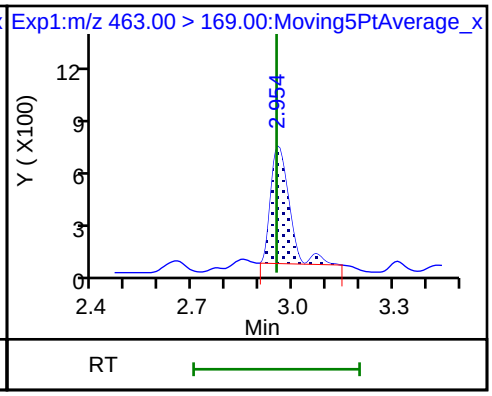
D 19 13C5 PFNA



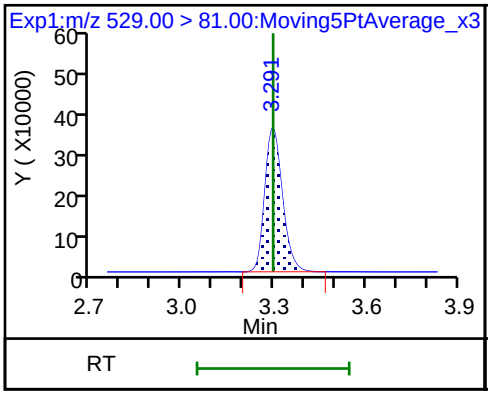
20 Perfluorononanoic acid



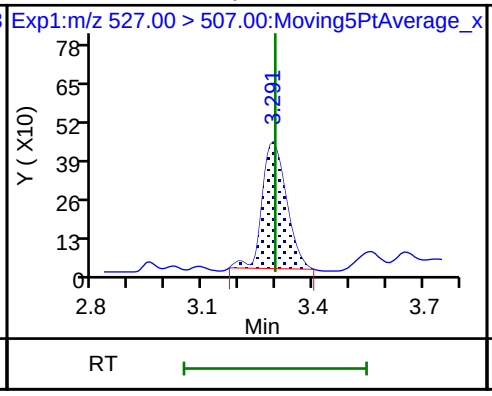
20 Perfluorononanoic acid



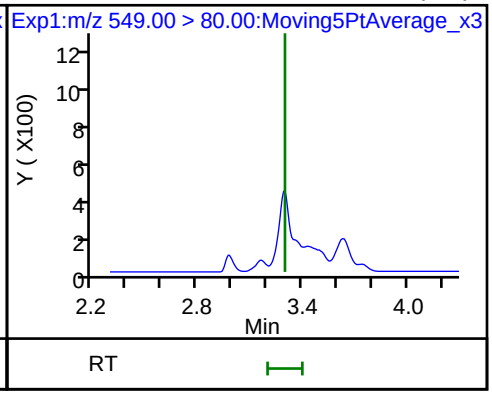
D 26 M2-8:2FTS



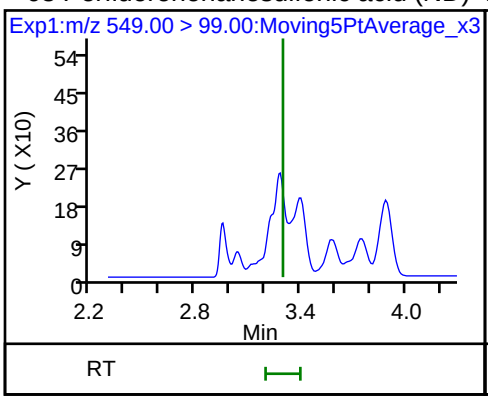
25 1H,1H,2H,2H-perfluorodecanesulfoni



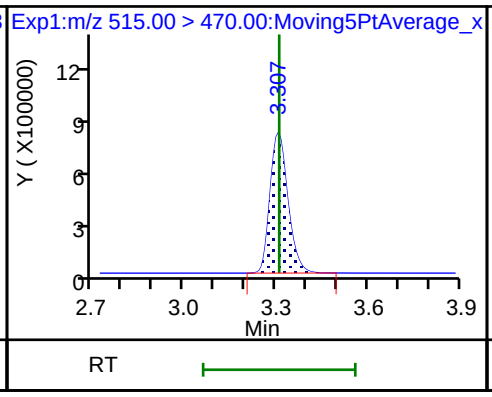
68 Perfluorononanesulfonic acid (ND)



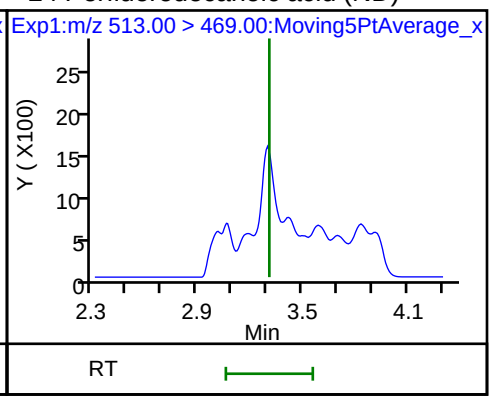
68 Perfluorononanesulfonic acid (ND)



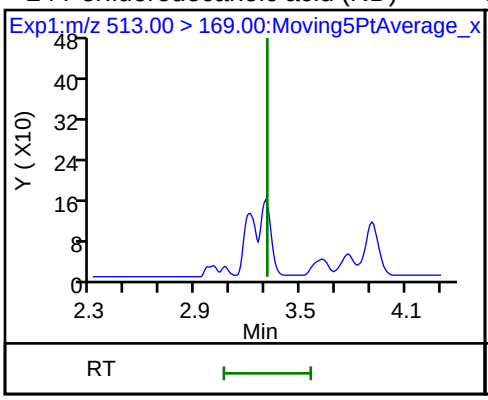
D 23 13C2 PFDA



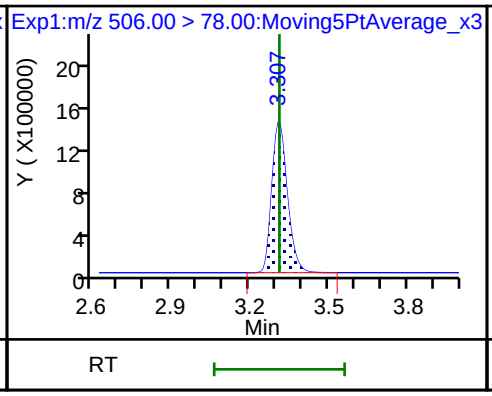
24 Perfluorodecanoic acid (ND)



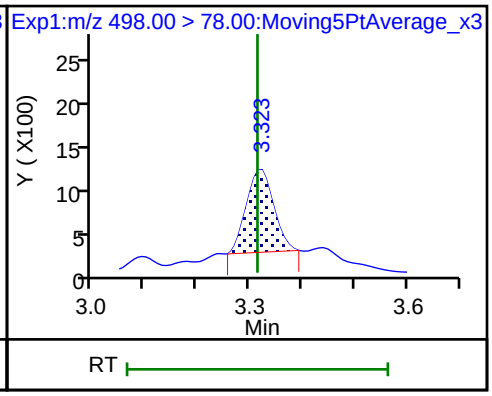
24 Perfluorodecanoic acid (ND)



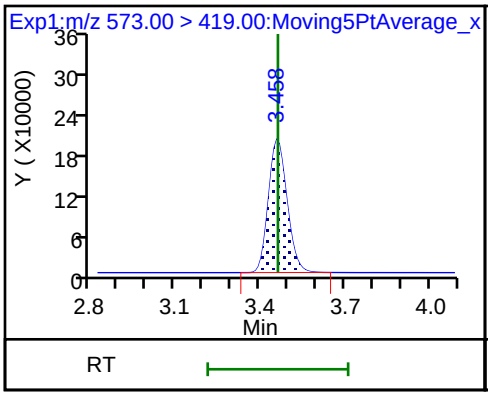
D 21 13C8 FOSA



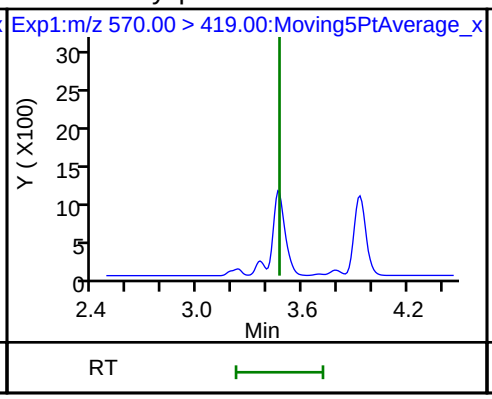
22 Perfluorooctane Sulfonamide



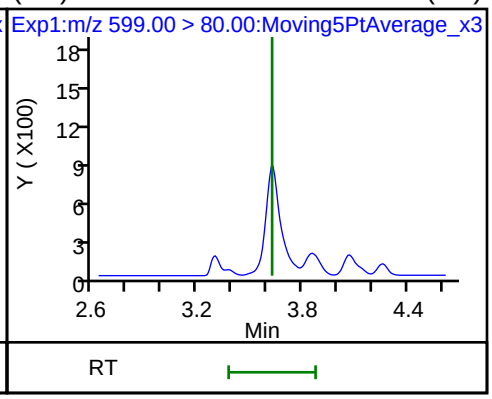
D 27 d3-NMeFOSAA



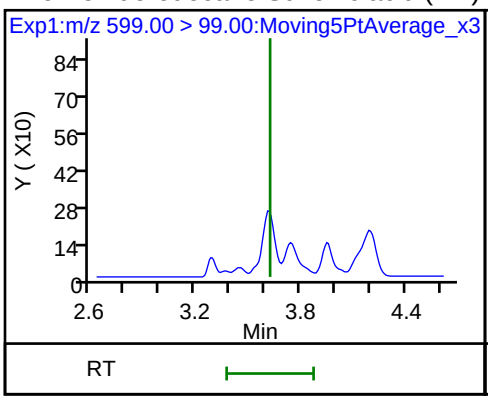
28 N-methyl perfluorooctane sulfonami (ND)



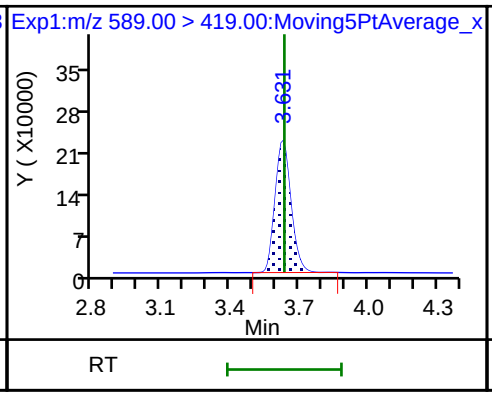
29 Perfluorodecane Sulfonic acid (ND)



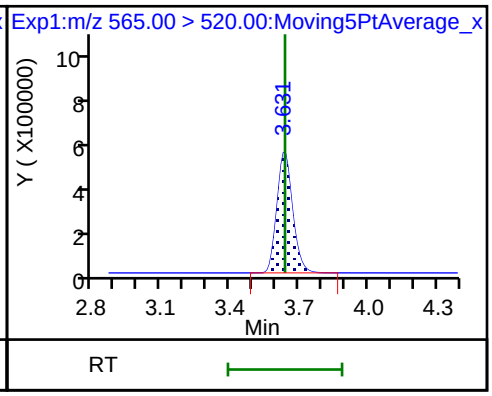
29 Perfluorodecane Sulfonic acid (ND)



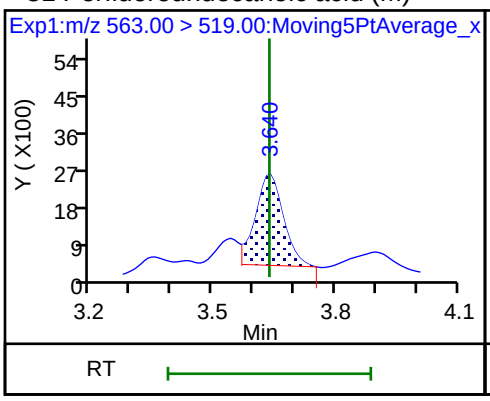
D 32 d5-NEtFOSAA



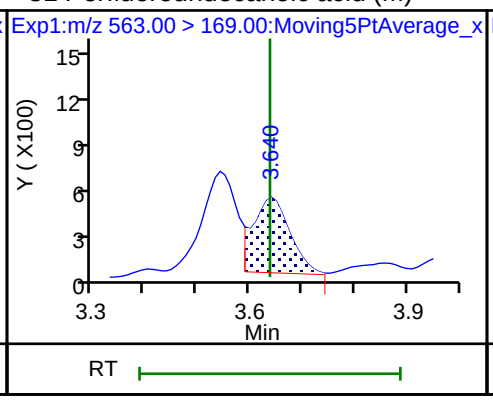
D 30 13C2 PFUnA



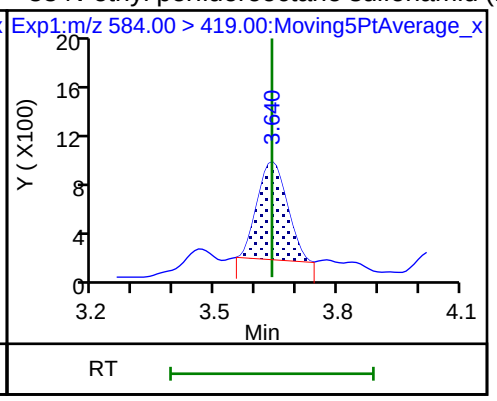
31 Perfluoroundecanoic acid (M)



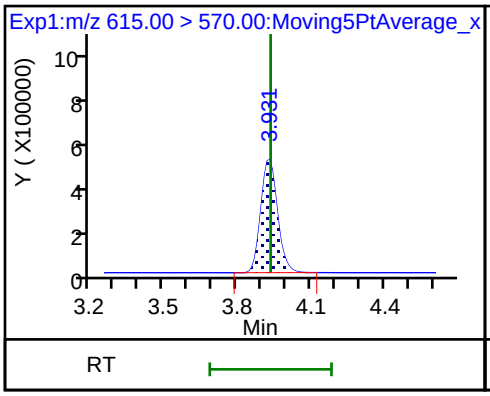
31 Perfluoroundecanoic acid (M)



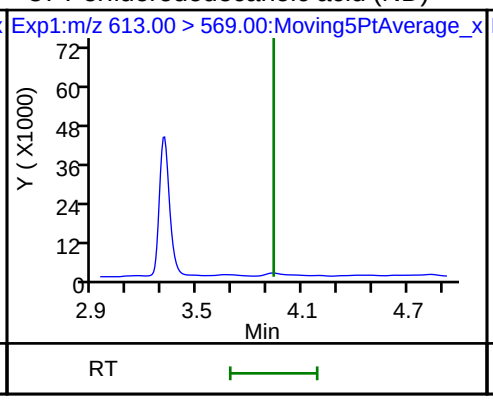
33 N-ethyl perfluorooctane sulfonamid (M)



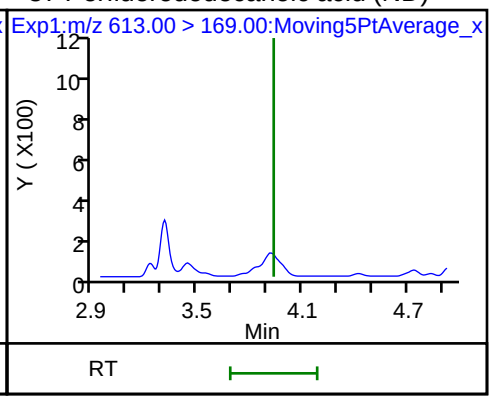
D 36 13C2 PFDoA



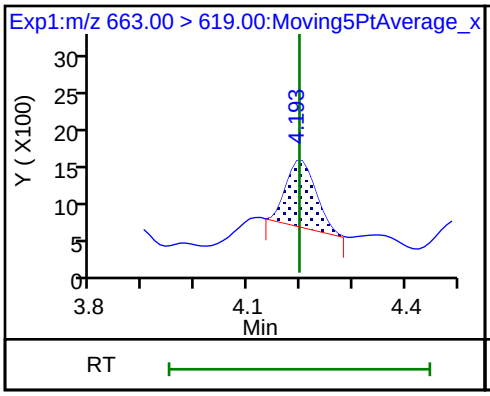
37 Perfluorododecanoic acid (ND)



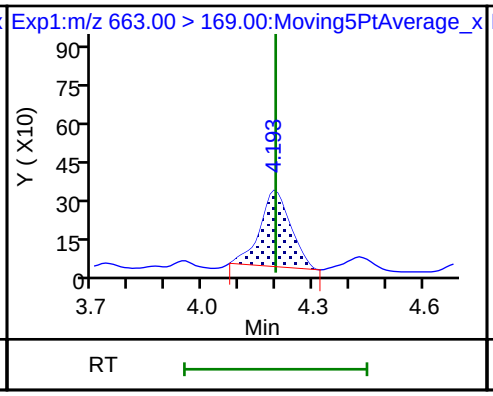
37 Perfluorododecanoic acid (ND)



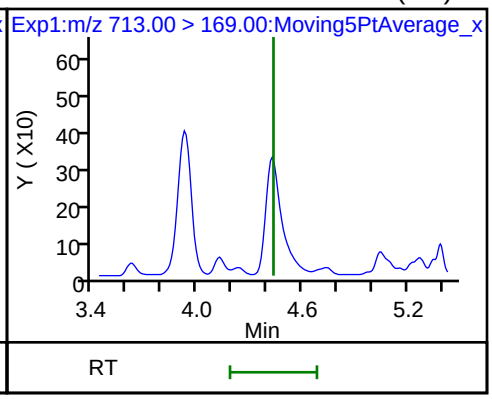
41 Perfluorotridecanoic acid



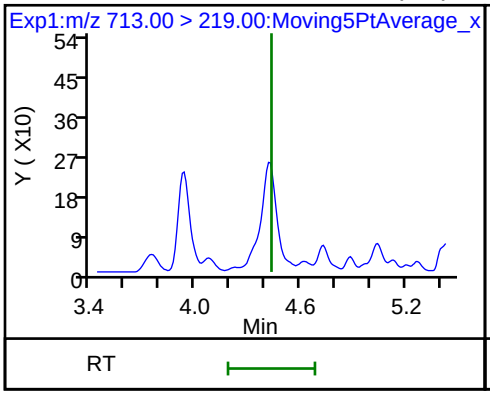
41 Perfluorotridecanoic acid



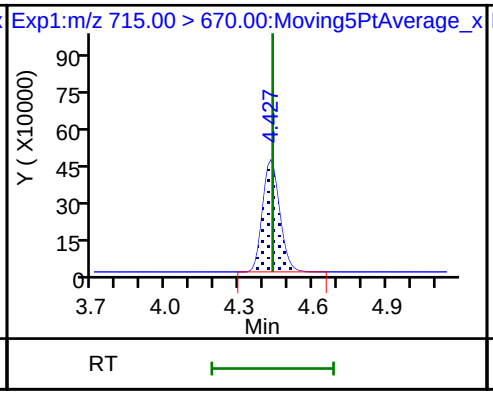
42 Perfluorotetradecanoic acid (ND)



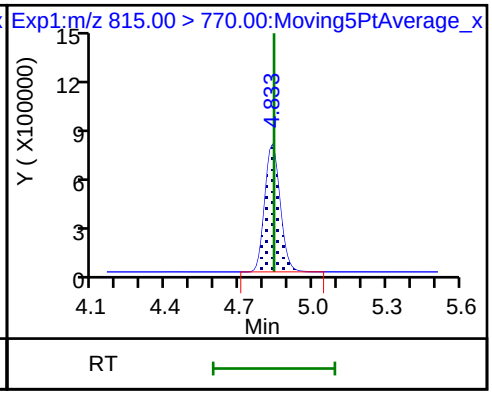
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: ICB 320-237402/9
Matrix: Water
Lab File ID: 2018.08.01LLICAL_009.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 08/01/2018 13:53
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237402
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0158	J	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0104	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	98		50-150
STL01892	13C4-PFHpA	101		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	102		50-150
STL00994	18O2 PFHxS	100		50-150
STL00991	13C4 PFOS	97		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 01-Aug-2018 13:53:52 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Aug-2018 14:58:46 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: roycea Date: 01-Aug-2018 14:38:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.389	1.395	-0.005	0.539	4889055	2.44		97.5	81516	
D 3 13C5-PFPeA										
267.90 > 223.00	1.629	1.636	-0.007	0.632	3248663	2.46		98.4	56732	
D 47 13C3-PFBS										
301.90 > 83.00	1.662	1.669	-0.007	0.645	86259	2.27		97.7	341	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.671	1.671	0.0	1.005	44905	0.0158			260	
298.90 > 99.00	1.671	1.671	0.0	1.005	18814		2.39(1.25-3.74)		82.1	
D 60 M2-4:2FTS										
329.00 > 81.00	1.873	1.872	0.001	0.726	633862	NC			6074	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.903	-0.001	0.738	3571587	2.50		99.9	70138	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.000	2.000	0.0	0.775	153812	NC			3245	
D 9 13C4-PFHpA										
367.00 > 322.00	2.226	2.225	0.001	0.863	3493904	2.52		101	53883	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.237	2.237	0.0	1.000	24894	0.0104			150	
399.00 > 99.00	2.237	2.237	0.0	1.000	6493		3.83(1.50-4.49)		11.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.237	2.238	-0.001	0.868	4899705	2.35		99.5	54829	
D 12 M2-6:2FTS										
429.00 > 81.00	2.554	2.556	-0.002	0.990	956795	2.36		99.2	12182	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.580	-0.001	1.000	3305316	2.47		98.8	45659	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.581	-0.002		3483672	2.50			38586	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.581	-0.002	1.000	4889	0.003198			3.2	
413.00 > 169.00	2.579	2.581	-0.002	1.000	5997		0.82(0.84-2.52)		30.1	
D 18 13C4 PFOS										
503.00 > 80.00	2.946	2.946	0.0	1.142	3348920	2.33		97.4	45767	
D 19 13C5 PFNA										
468.00 > 423.00	2.946	2.948	-0.002	1.142	2960639	2.54		102	57405	
20 Perfluorononanoic acid										R
463.00 > 419.00	2.946	2.949	-0.003	1.000	2315	0.001810			4.2	R
463.00 > 169.00	2.971	2.949	0.022	1.009	1905		1.22(1.90-5.69)		56.6	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.161	3.158	0.003	1.073	3830	NC			42.8	
D 26 M2-8:2FTS										
529.00 > 81.00	3.295	3.292	0.003	1.278	970764	2.45		102	15957	
D 23 13C2 PFDA										
515.00 > 470.00	3.303	3.306	-0.003	1.281	2210132	2.54		101	35772	
D 21 13C8 FOSA										
506.00 > 78.00	3.319	3.312	0.007	1.287	5456061	2.58		103	72425	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.313	0.006	1.000	5013	0.002327			46.0	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.459	-0.005	1.339	512783	2.42		97.0	12381	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.628	3.627	0.001	1.407	569737	2.51		100	5690	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.637	3.633	0.004	1.003	4030	0.0198			109	
D 30 13C2 PFUnA										
565.00 > 520.00	3.637	3.634	0.003	1.410	1678284	2.50		100.0	39198	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.803	3.792	0.011	1.291	7478	NC			127	
D 36 13C2 PFDoA										
615.00 > 570.00	3.928	3.925	0.003	1.523	1429719	2.46		98.4	18629	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.415	4.423	-0.008	1.712	1158919	2.37		95.0	5397	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.824	4.826	-0.002	1.870	2024012	2.41		96.3	2949	
45 Perfluorohexadecanoic acid										M
813.00 > 769.00	4.814	4.827	-0.013	0.998	16756	NC			1.1	M
813.00 > 169.00	4.814	4.827	-0.013	0.998	3720		4.50(2.86-8.58)		38.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007 Amount Added: 1.00 Units: mL

Report Date: 01-Aug-2018 14:58:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_009.d

Injection Date: 01-Aug-2018 13:53:52 Instrument ID: A8_N

Lims ID: ICB

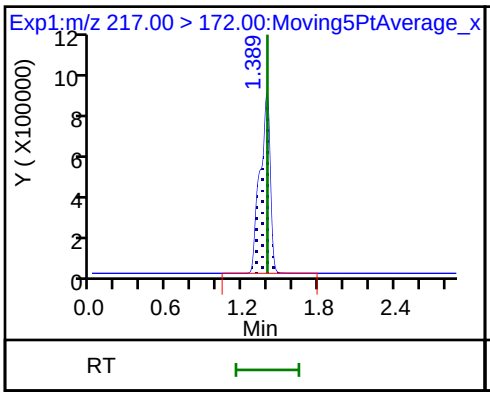
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 9

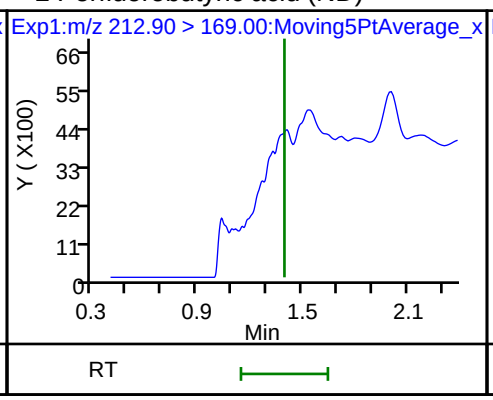
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

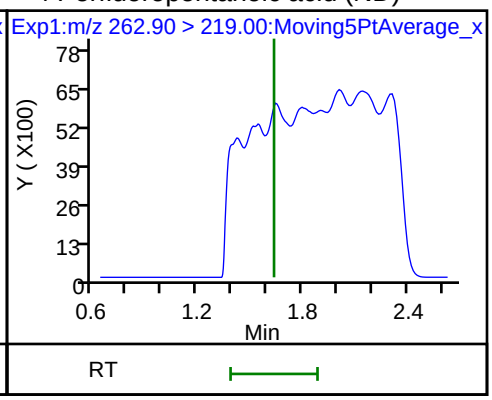
D 1 13C4 PFBA



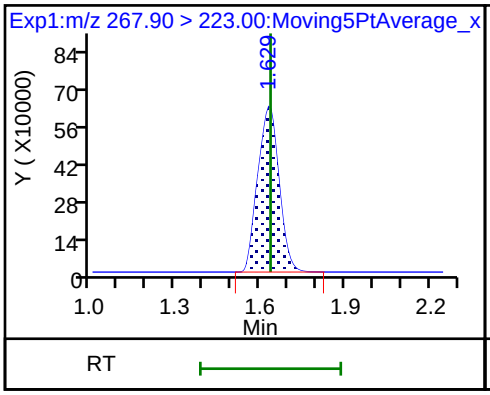
2 Perfluorobutyric acid (ND)



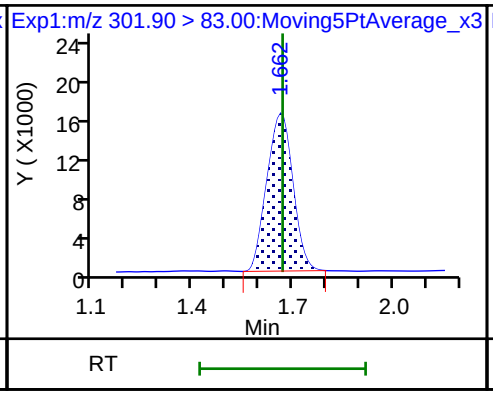
4 Perfluoropentanoic acid (ND)



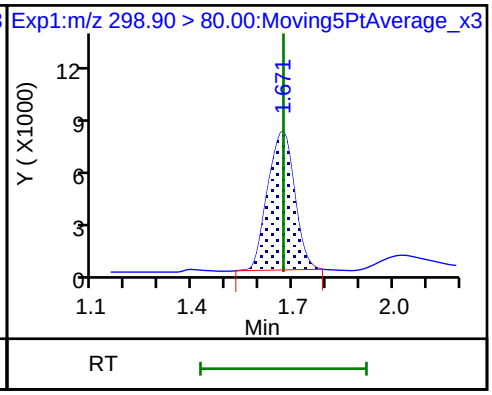
D 3 13C5-PFPeA



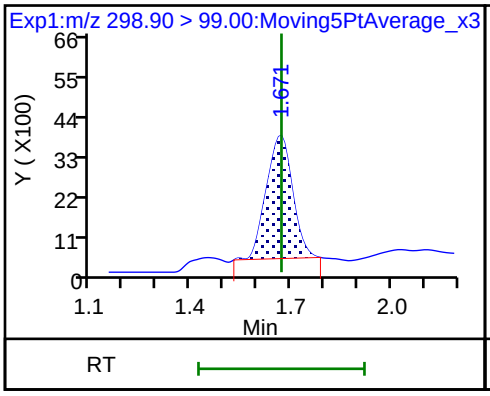
D 47 13C3-PFBS



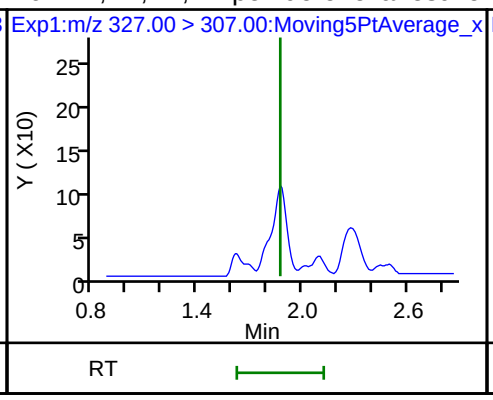
5 Perfluorobutanesulfonic acid



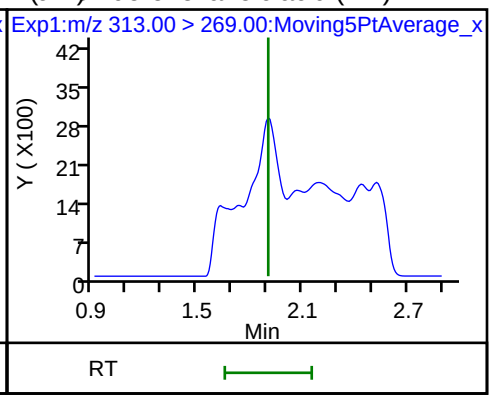
5 Perfluorobutanesulfonic acid



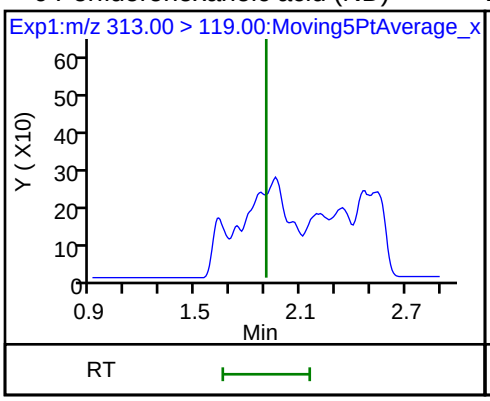
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



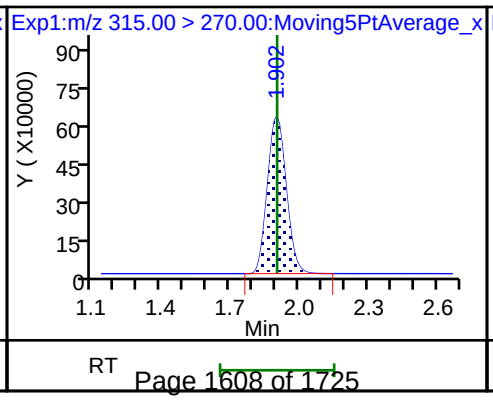
6 Perfluorohexanoic acid (ND)



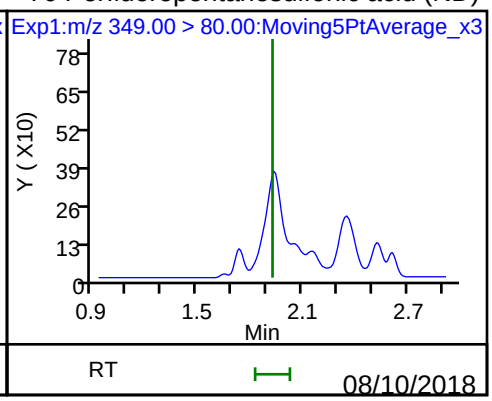
6 Perfluorohexanoic acid (ND)



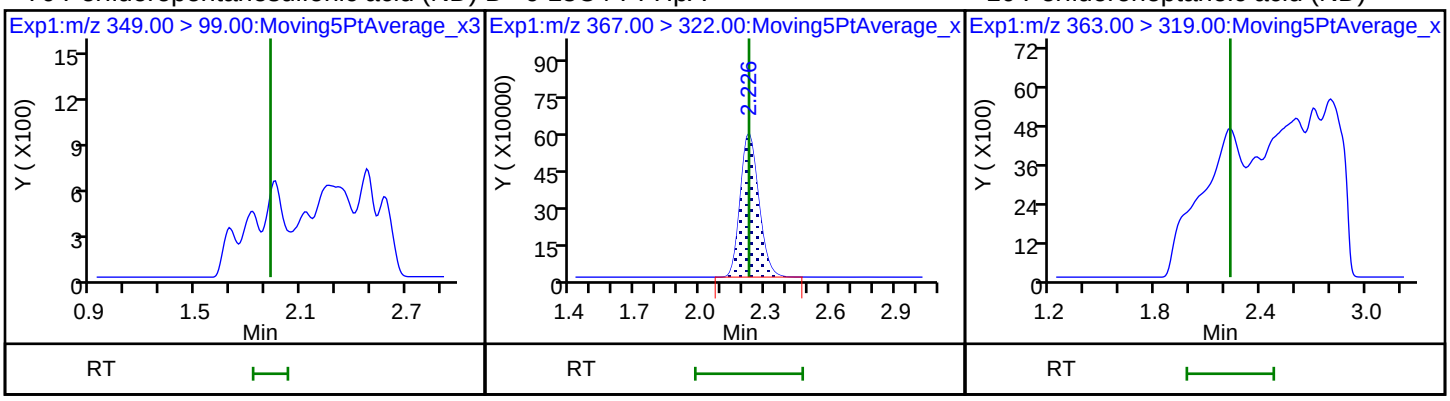
D 7 13C2 PFHxA



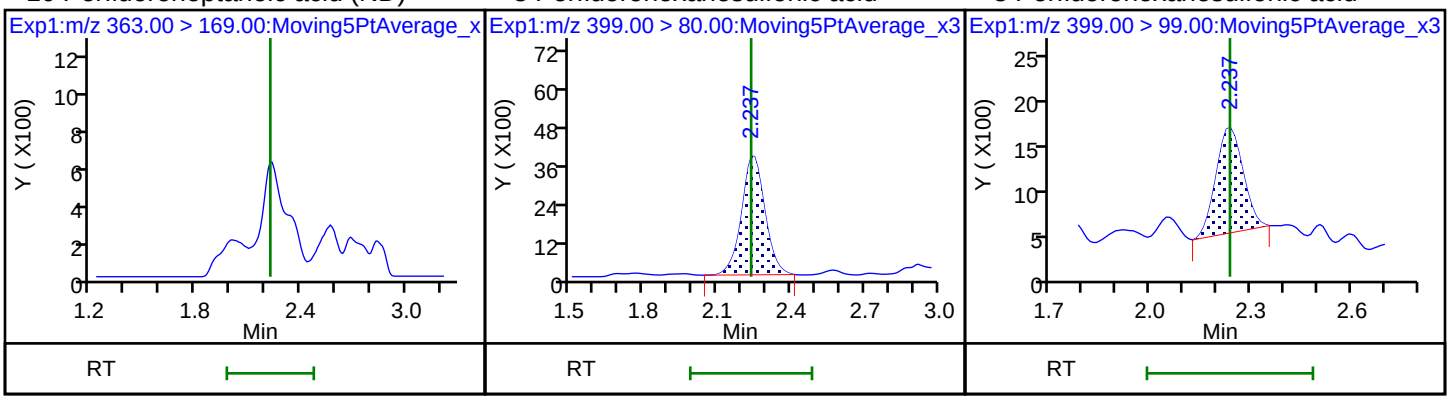
70 Perfluoropentanesulfonic acid (ND)



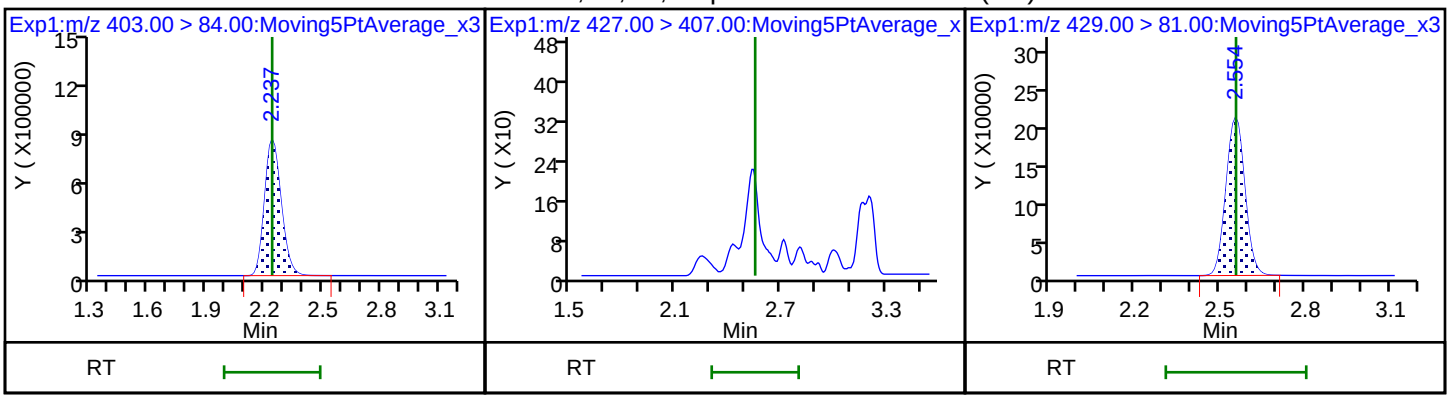
70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA 10 Perfluoroheptanoic acid (ND)



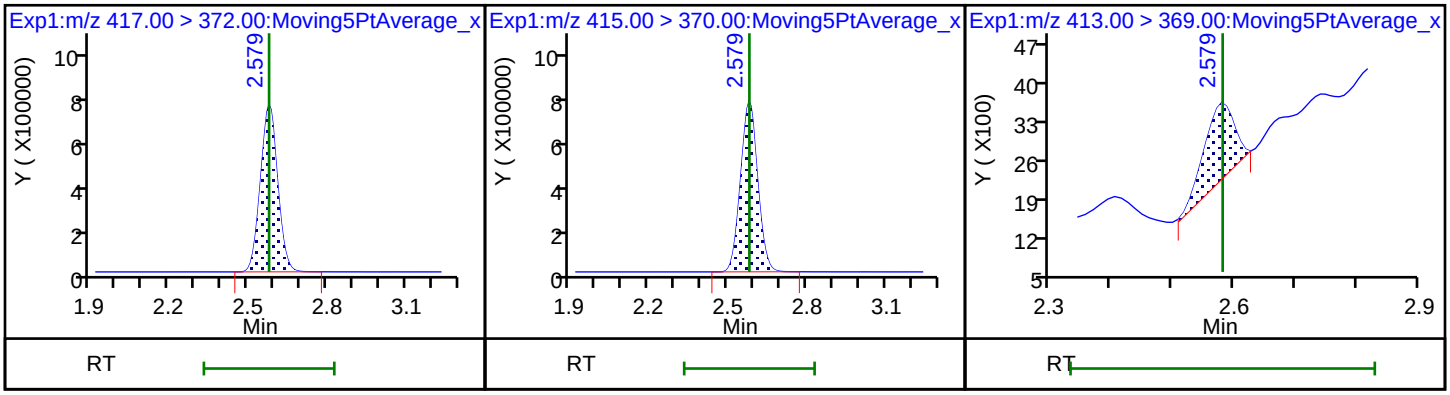
10 Perfluoroheptanoic acid (ND) 8 Perfluorohexanesulfonic acid 8 Perfluorohexanesulfonic acid



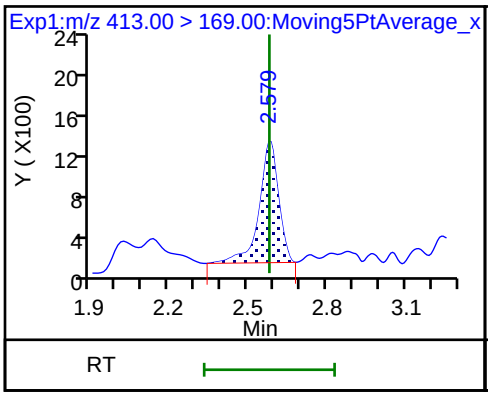
D 11 18O2 PFHxS 13 1H,1H,2H,2H-perfluorooctanesulfonD(N12)M2-6:2FTS



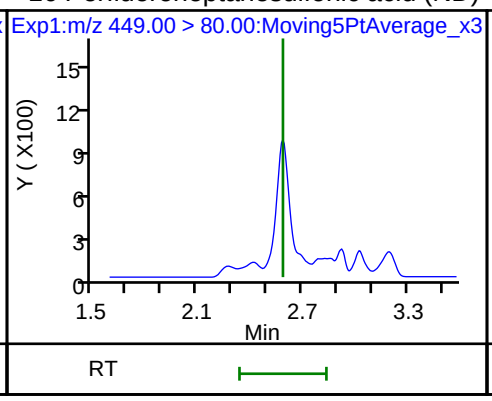
D 14 13C4 PFOA * 62 13C2-PFOA 15 Perfluorooctanoic acid



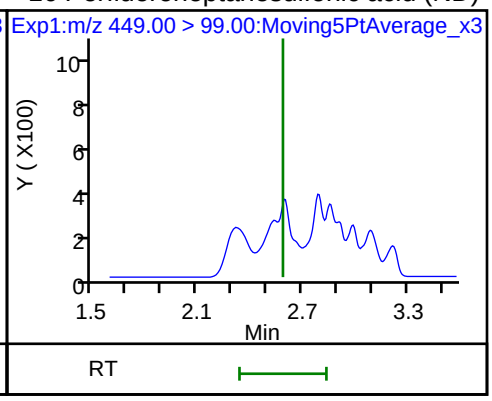
15 Perfluorooctanoic acid



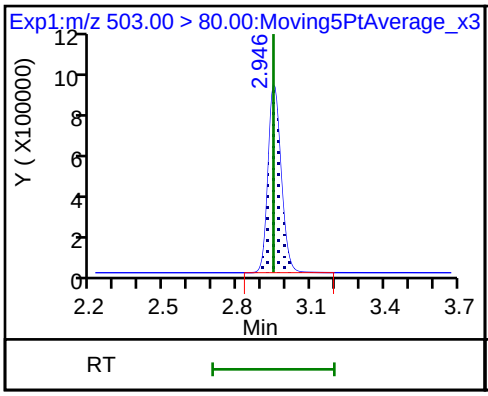
16 Perfluoroheptanesulfonic acid (ND)



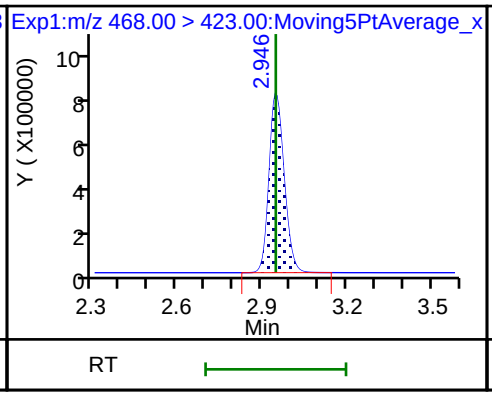
16 Perfluoroheptanesulfonic acid (ND)



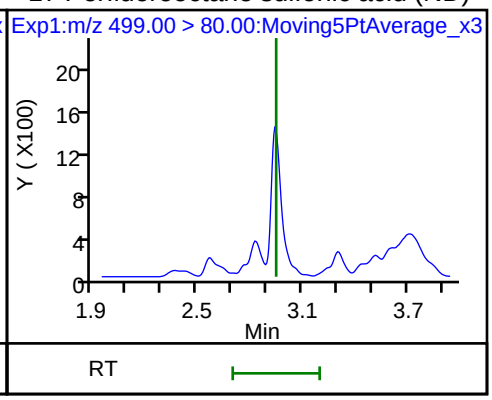
D 18 13C4 PFOS



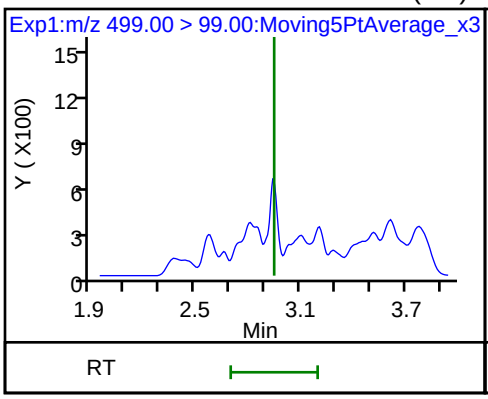
D 19 13C5 PFNA



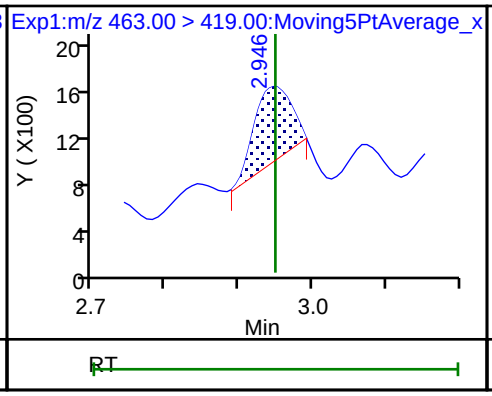
17 Perfluorooctane sulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)



20 Perfluorononanoic acid



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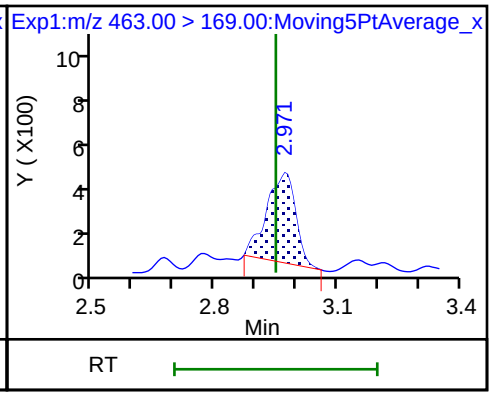
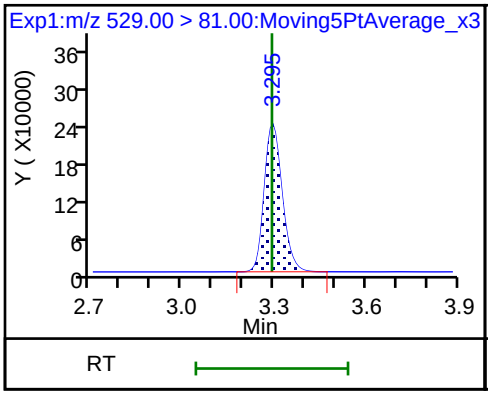
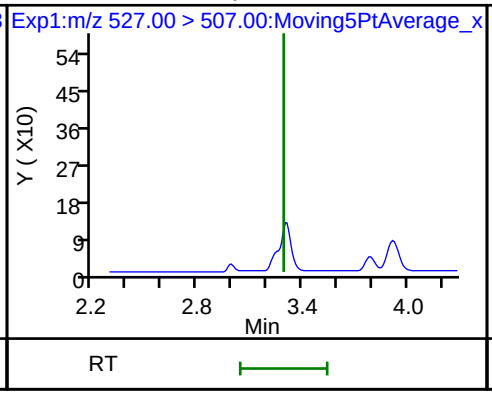


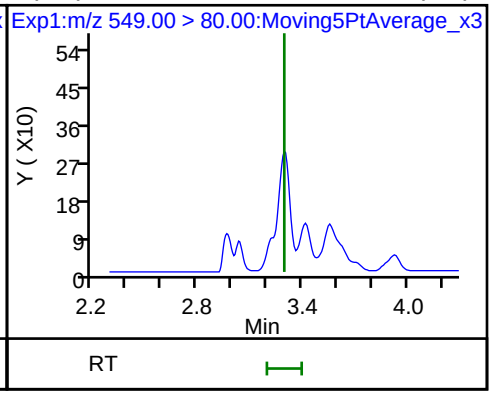
D 26 M2-8:2FTS



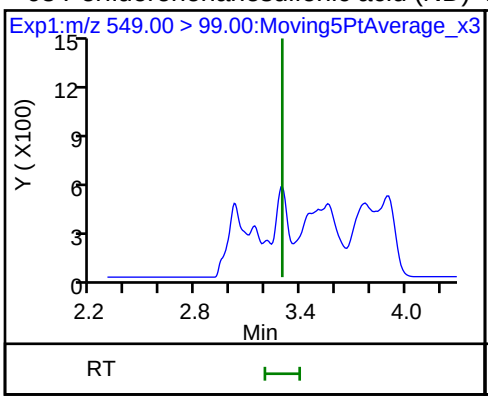
25 1H,1H,2H,2H-perfluorodecanesulfoni



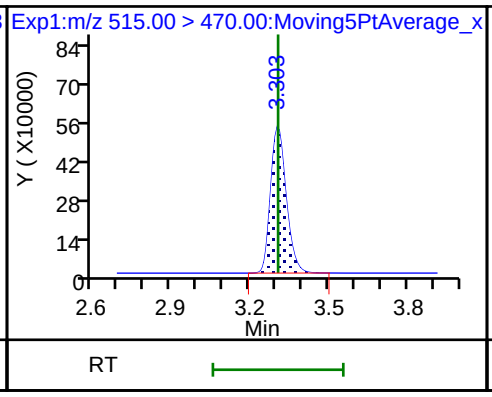
(ND) 68 Perfluorononanesulfonic acid (ND)



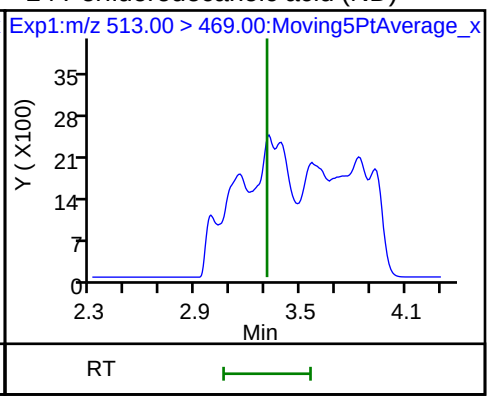
68 Perfluorononanesulfonic acid (ND)



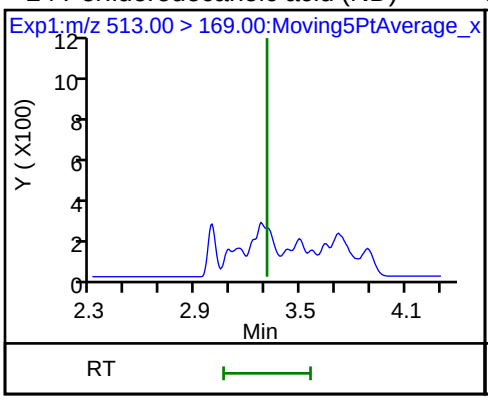
D 23 13C2 PFDA



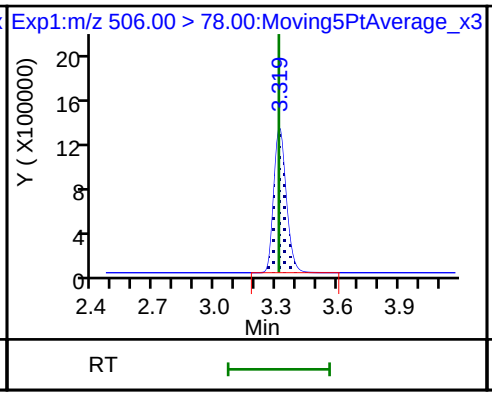
24 Perfluorodecanoic acid (ND)



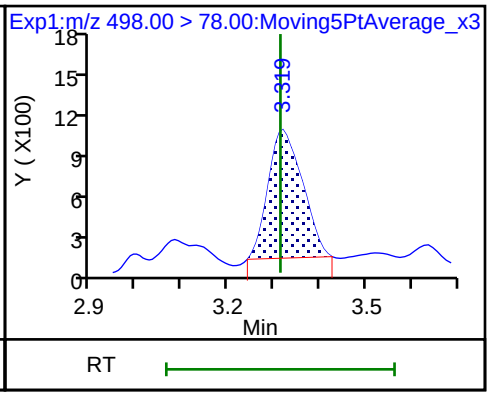
24 Perfluorodecanoic acid (ND)



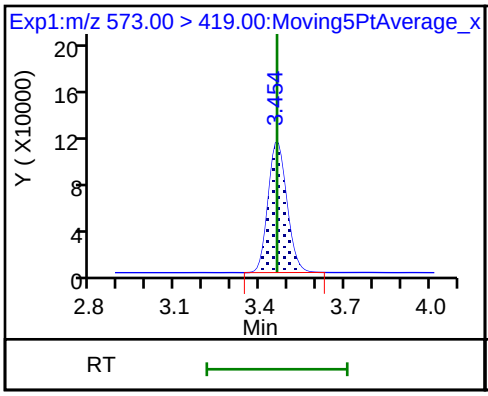
D 21 13C8 FOSA



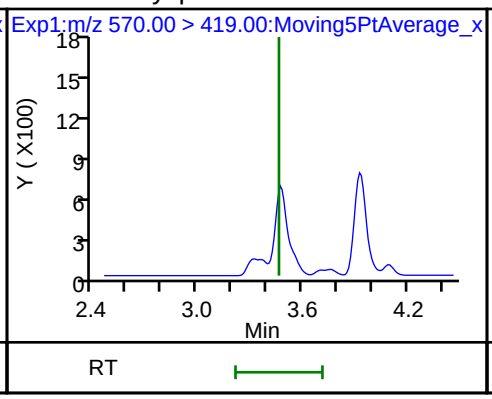
22 Perfluorooctane Sulfonamide



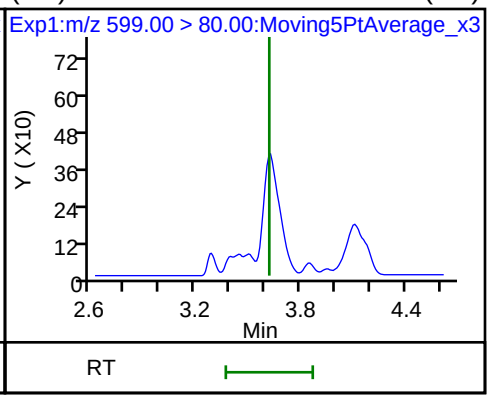
D 27 d3-NMeFOSAA



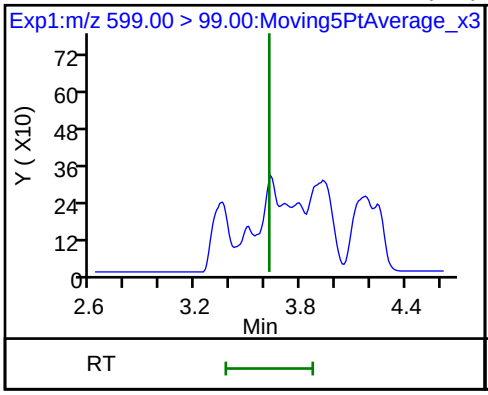
28 N-methyl perfluorooctane sulfonami (ND)



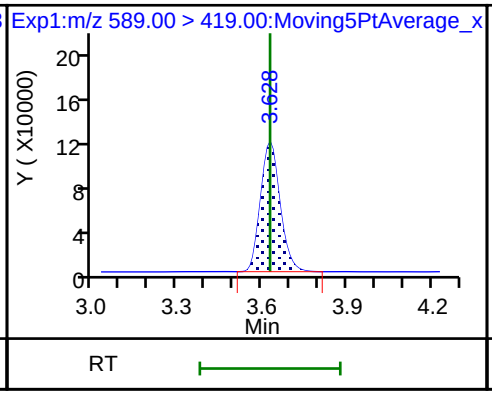
29 Perfluorodecane Sulfonic acid (ND)



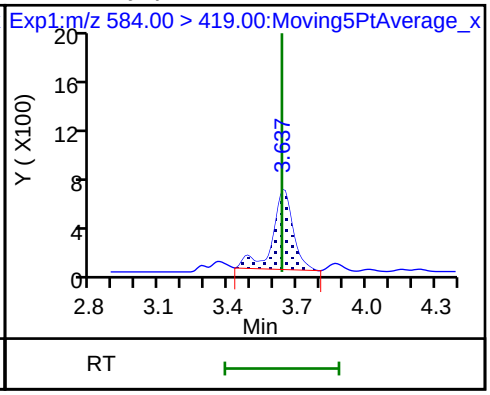
29 Perfluorodecane Sulfonic acid (ND)



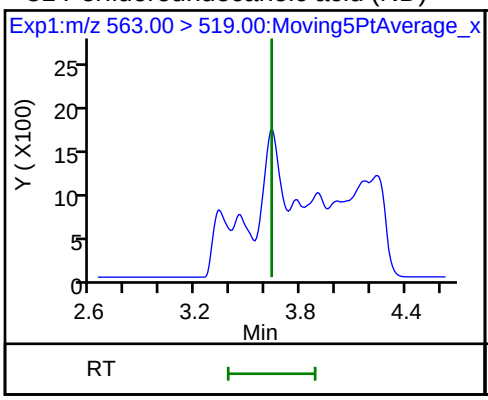
D 32 d5-NEtFOSAA



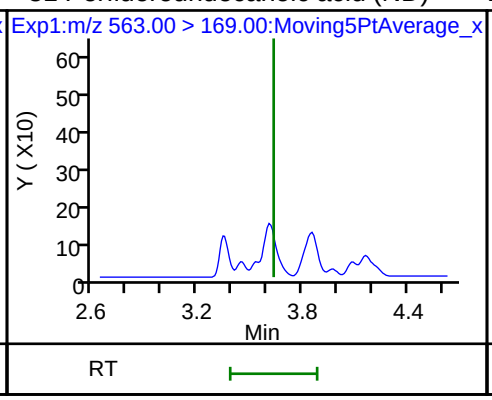
33 N-ethyl perfluorooctane sulfonamid



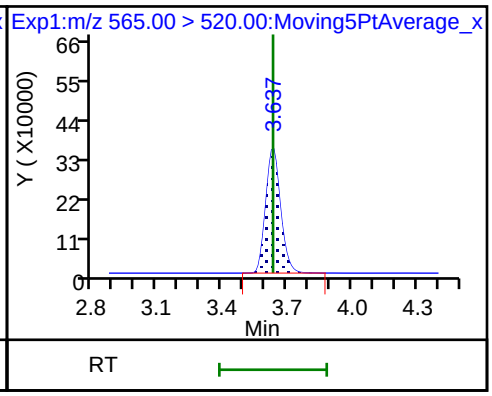
31 Perfluoroundecanoic acid (ND)



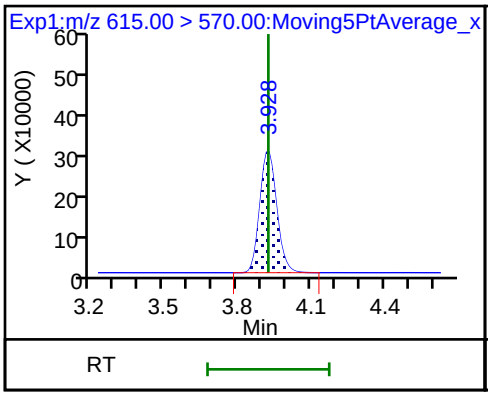
31 Perfluoroundecanoic acid (ND)



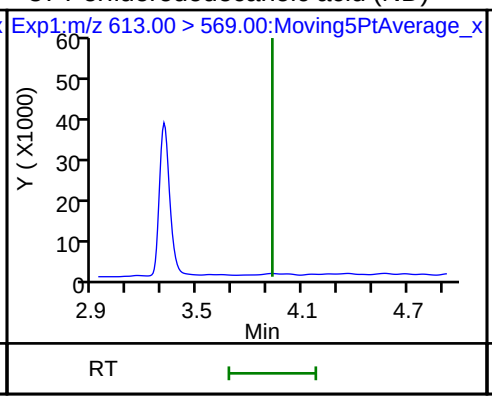
D 30 13C2 PFUnA



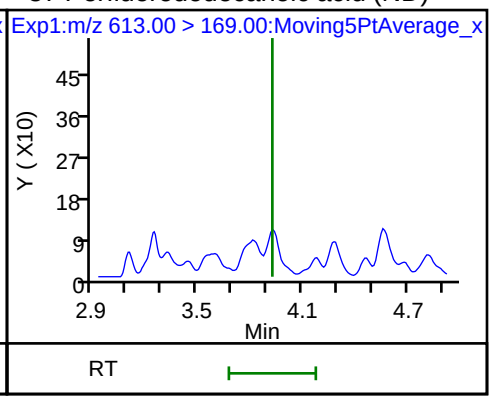
D 36 13C2 PFDoA



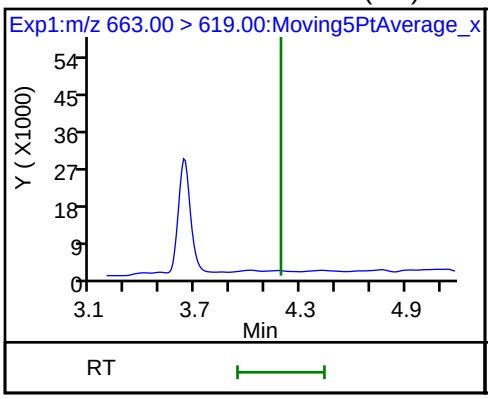
37 Perfluorododecanoic acid (ND)



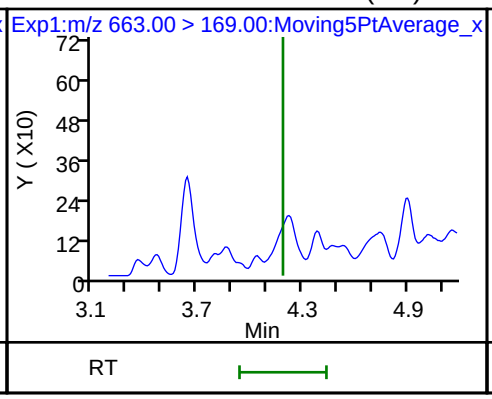
37 Perfluorododecanoic acid (ND)



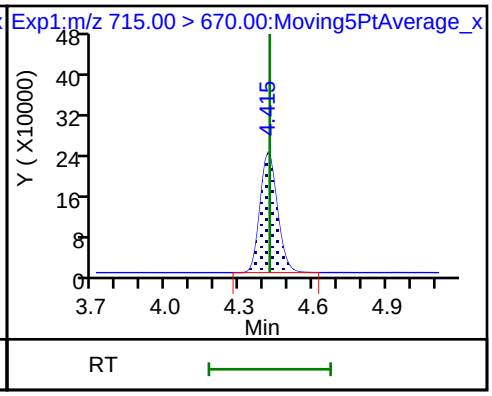
41 Perfluorotridecanoic acid (ND)



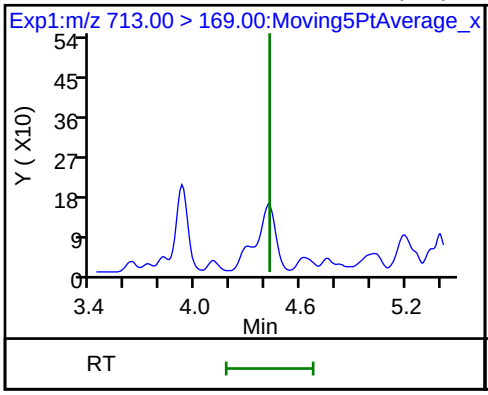
41 Perfluorotridecanoic acid (ND)



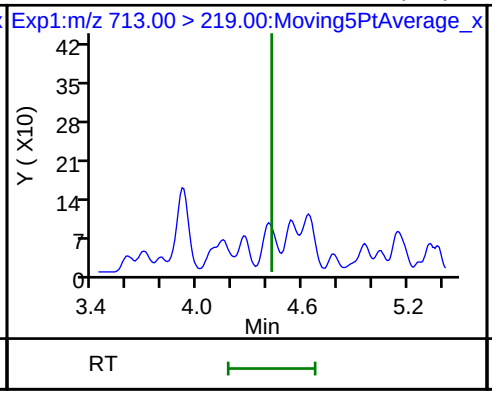
D 43 13C2-PFTeDA



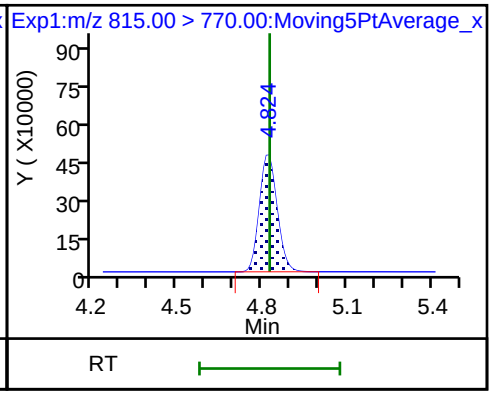
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: ICB 320-238193/9
Matrix: Water
Lab File ID: 2018.08.06LLICAL_009.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method:
Date Extracted:
Sample wt/vol: 1(mL)
Date Analyzed: 08/06/2018 12:04
Con. Extract Vol.:
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 238193
Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00720	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	92		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	100		50-150
STL00994	18O2 PFHxS	98		50-150
STL00991	13C4 PFOS	96		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 06-Aug-2018 12:04:46 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 07-Aug-2018 08:17:27 Calib Date: 06-Aug-2018 11:56:59
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 07-Aug-2018 14:31:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.394	1.395	-0.001	0.543	5417952	2.39		95.6	8558	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.399	1.397	0.002	1.004	4375	0.002150			0.7	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.636	1.639	-0.003	0.637	3664067	2.35		93.9	8446	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.644	1.643	0.001	1.005	7287	0.004370			0.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.653	77508	2.15		92.3	251	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.875	-0.003	0.729	594337	NC			1009	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.880	1.875	0.005	1.122	1226	0.002219			22.4	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	8935	0.005115			2.3	
313.00 > 119.00	1.918	1.908	0.010	1.005	754		11.85(5.03-15.10)		2.9	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.743	4278761	2.42		96.6	11236	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.939	1.930	0.009	1.157	2405	0.001047			9.0	
349.00 > 99.00	1.928	1.930	-0.002	1.151	1707		1.41(1.36-4.07)		2.3	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.779	336161	NC			1074	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.227	-0.008	0.864	4303531	2.47		98.7	8059	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.004	5830	0.003189			1.2	
363.00 > 169.00	2.236	2.228	0.008	1.008	1857		3.14(1.13-3.40)		4.7	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.871	5187045	2.32		98.1	5085	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	17118	0.007200			39.7	
399.00 > 99.00	2.236	2.239	-0.003	1.000	5835		2.93(1.50-4.49)		6.2	
65 ADONA										R
377.00 > 251.00	2.269	2.271	-0.002	0.774	3586	NC			11.7	R
377.00 > 85.00	2.269	2.271	-0.002	0.774	4359		0.82(0.84-2.53)		6.3	
D 12 M2-6:2FTS										
429.00 > 81.00	2.545	2.549	-0.004	0.991	905625	2.47		104	2373	
D 73 13C8 PFOA										
421.00 > 376.00	2.568	2.571	-0.003	1.000	7776992	NC			13090	
D 14 13C4 PFOA										
417.00 > 372.00	2.568	2.573	-0.005	1.000	3949383	2.47		98.7	6011	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.575	2.574	0.001	1.003	12278	0.006874			1.2	
413.00 > 169.00	2.561	2.574	-0.013	0.997	8571		1.43(0.84-2.52)		15.8	
* 62 13C2-PFOA										
415.00 > 370.00	2.568	2.575	-0.007		4092642	2.50			6084	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.582	2.583	-0.001	0.881	3026	0.001728			10.5	
449.00 > 99.00	2.582	2.583	-0.001	0.881	799		3.79(1.94-5.82)		2.8	
D 72 13C8 PFOS										
507.00 > 99.00	2.930	2.938	-0.008	1.141	1660661	NC			4227	
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.939	-0.004	1.143	3584430	2.50		99.9	9580	
D 18 13C4 PFOS										
503.00 > 80.00	2.930	2.939	-0.009	1.141	3377510	2.30		96.2	4110	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.143	3.150	-0.007	1.073	5715	NC			16.0	
D 26 M2-8:2FTS										
529.00 > 81.00	3.276	3.284	-0.008	1.276	1051210	2.37		99.0	2817	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.258	3.286	-0.028	0.995	553	0.000970			3.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.289	3.294	-0.005	1.281	3163657	2.51		100	7320	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.317	-0.006	1.289	4681486	2.41		96.2	5650	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.319	-0.008	1.000	7466	0.004095			20.4	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.444	3.448	-0.004	1.341	1549730	2.41		96.2	2197	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.444	3.453	-0.009	1.000	13486	0.0226			15.1	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.612	3.616	-0.004	1.406	1661269	2.49		99.6	1282	
D 30 13C2 PFUnA										
565.00 > 520.00	3.612	3.620	-0.008	1.406	2637070	2.60		104	6068	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.612	3.622	-0.010	1.000	14276	0.0120			8.5	R
563.00 > 169.00	3.612	3.622	-0.010	1.000	580		24.61(2.12-6.36)		4.8	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.619	3.623	-0.004	1.002	15358	0.0259			41.1	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.774	3.781	-0.007	1.288	10677	NC			30.5	
D 36 13C2 PFDoA										
615.00 > 570.00	3.908	3.913	-0.005	1.522	2631041	2.46		98.3	4515	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.898	3.913	-0.015	1.190	1968	NC			20.4	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.908	3.913	-0.005	1.000	7155	0.006110			3.0	
613.00 > 169.00	3.908	3.913	-0.005	1.000	1333		5.37(2.13-6.40)		8.4	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.167	4.173	-0.006	1.066	7296	0.006447			2.9	R
663.00 > 169.00	4.167	4.173	-0.006	1.066	1107		6.59(1.25-3.76)		8.7	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.398	4.399	-0.001	1.713	3356196	2.46		98.4	8014	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.398	4.400	-0.002	1.000	2496	0.007682			40.5	
713.00 > 219.00	4.390	4.400	-0.010	0.998	1232		2.03(0.71-2.13)		18.3	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.796	4.799	-0.003	1.868	6682185	2.47		98.7	8637	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.796	4.801	-0.005	1.000	74538	NC			30.0	
813.00 > 169.00	4.796	4.801	-0.005	1.000	11842		6.29(2.86-8.58)		90.2	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.132	5.136	-0.004	1.070	22386	NC			6.6	
913.00 > 169.00	5.132	5.136	-0.004	1.070	2634		8.50(3.83-11.48)		23.8	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00008 Amount Added: 1.00 Units: mL

Report Date: 07-Aug-2018 08:17:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_009.d

Injection Date: 06-Aug-2018 12:04:46 Instrument ID: A8_N

Lims ID: ICB

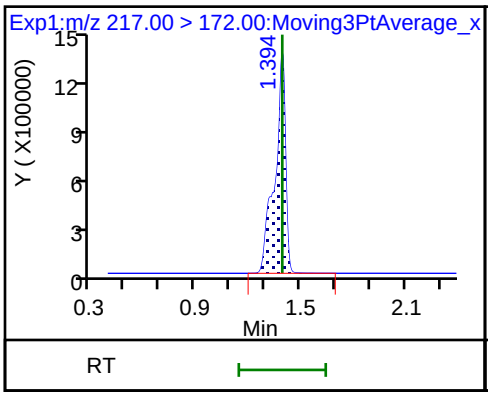
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 9

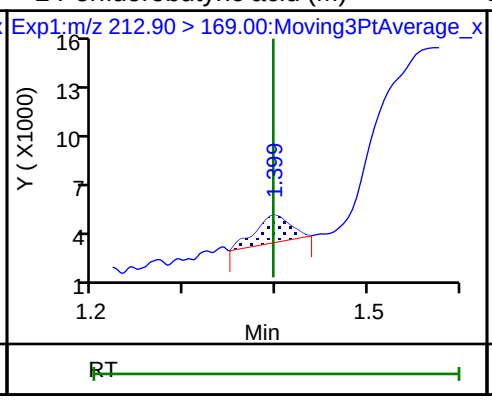
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

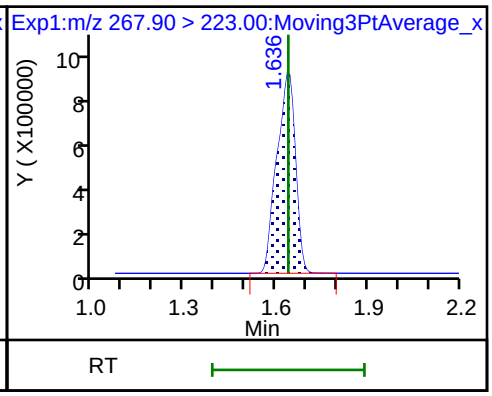
D 1 13C4 PFBA



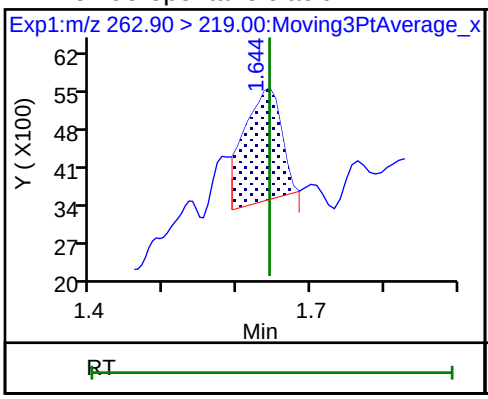
2 Perfluorobutyric acid (M)



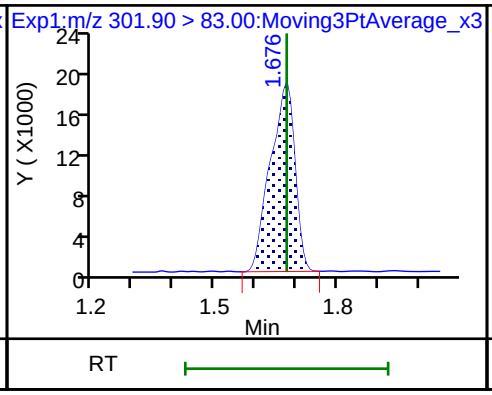
D 3 13C5-PFPeA



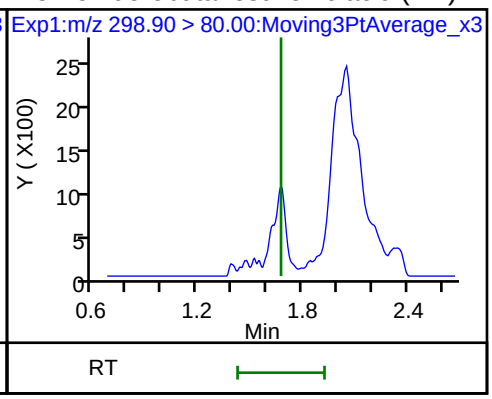
4 Perfluoropentanoic acid



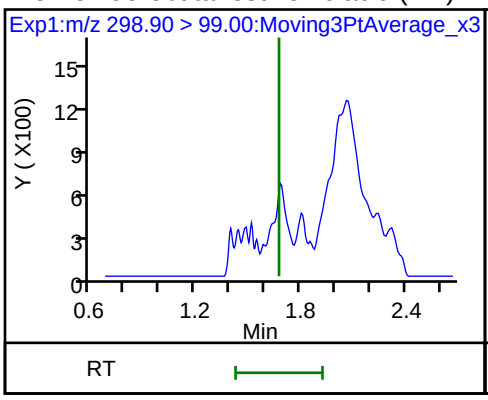
D 47 13C3-PFBS



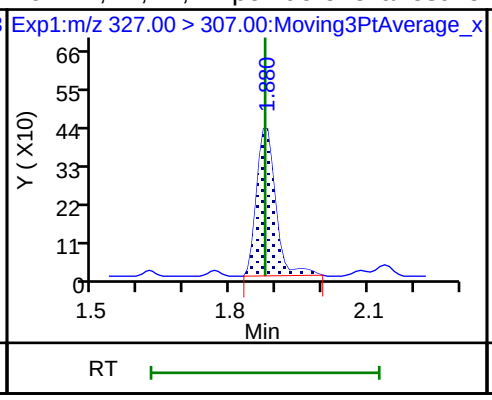
5 Perfluorobutanesulfonic acid (ND)



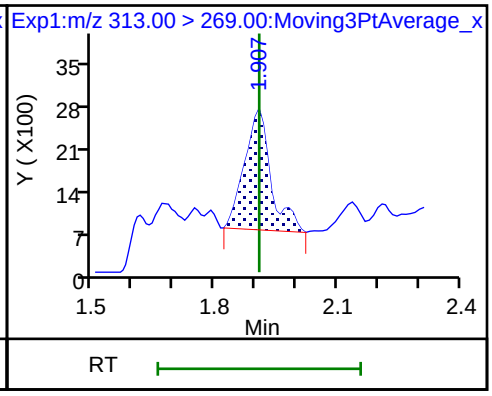
5 Perfluorobutanesulfonic acid (ND)



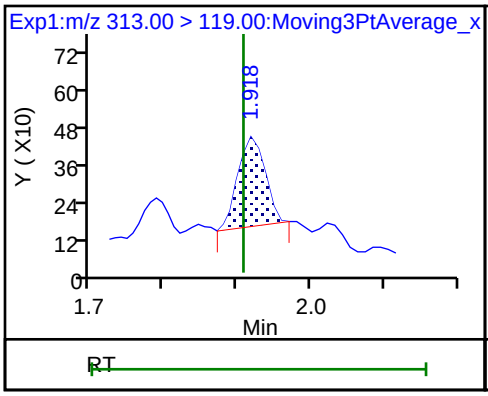
61 1H,1H,2H,2H-perfluorohexanesulfoni



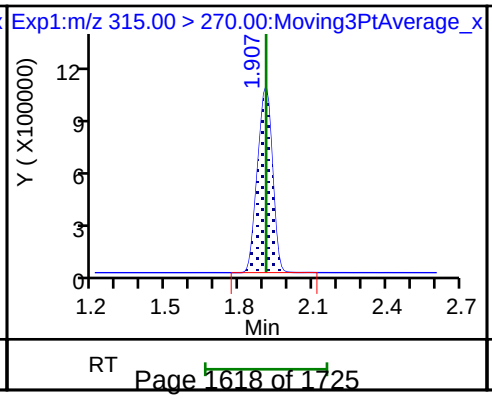
6 Perfluorohexanoic acid



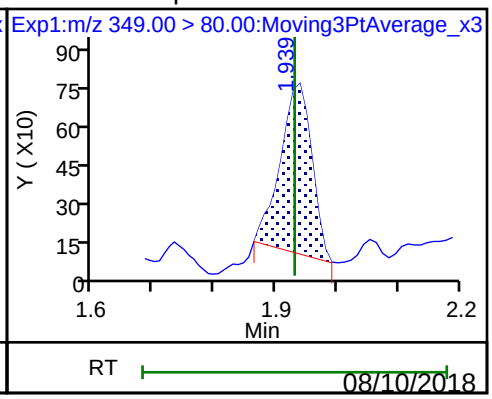
6 Perfluorohexanoic acid



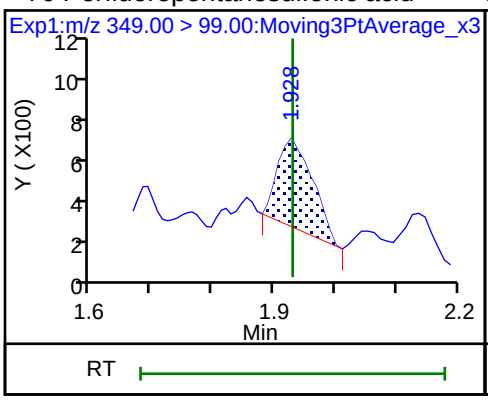
D 7 13C2 PFHxA



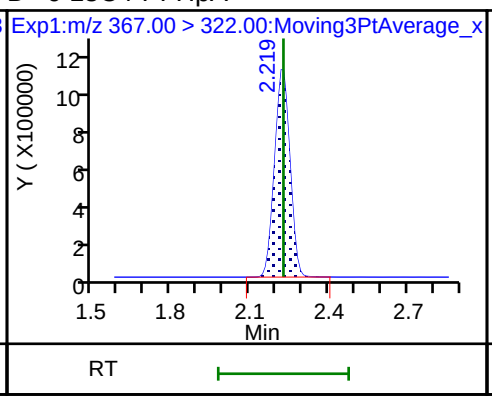
70 Perfluoropentanesulfonic acid



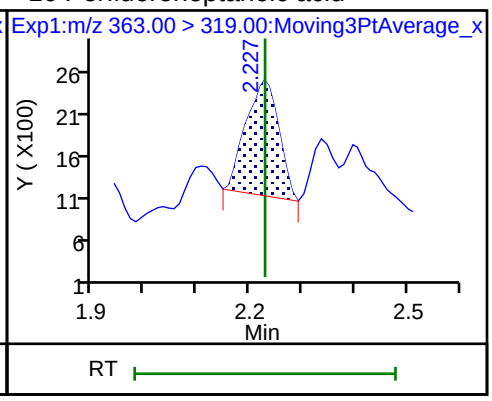
70 Perfluoropentanesulfonic acid



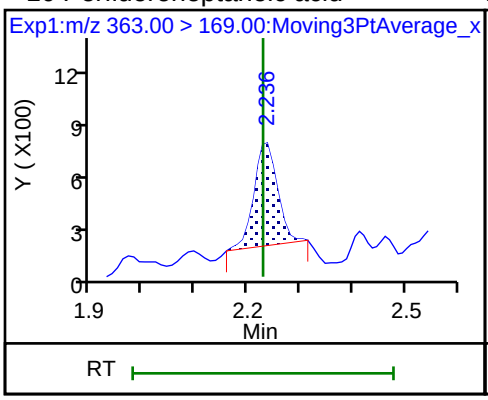
D 9 13C4-PFHpA



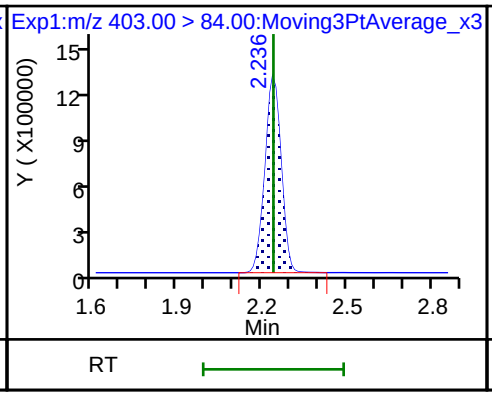
10 Perfluoroheptanoic acid



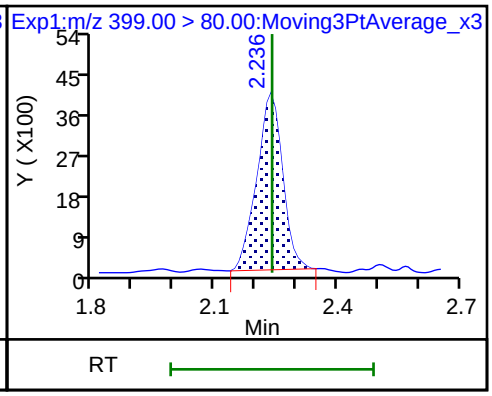
10 Perfluoroheptanoic acid



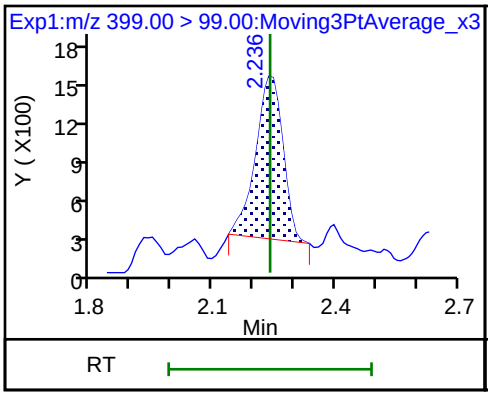
D 11 18O2 PFHxS



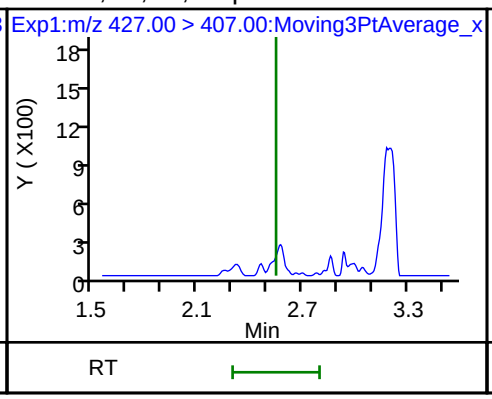
8 Perfluorohexanesulfonic acid



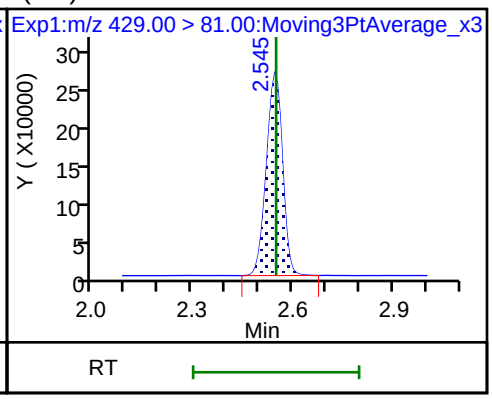
8 Perfluorohexanesulfonic acid



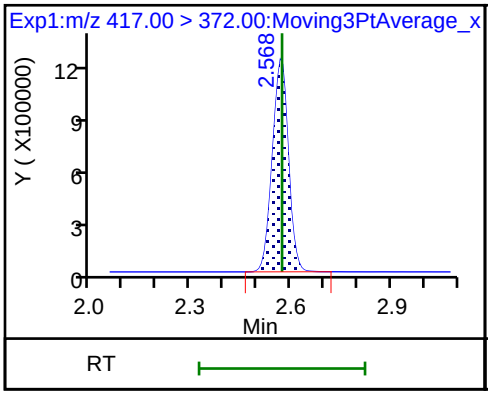
13 1H,1H,2H,2H-perfluorooctanesulfonic acid



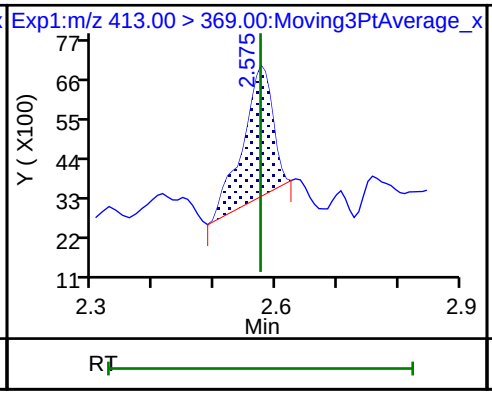
D(N12)M2-6:2FTS



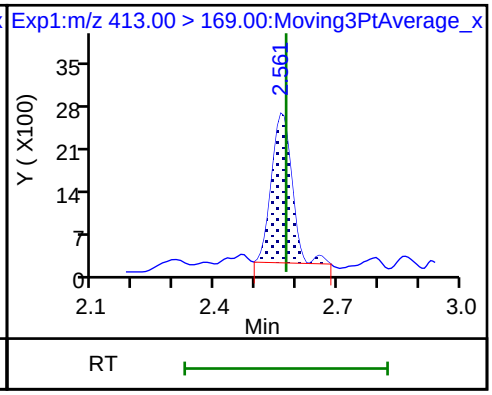
D 14 13C4 PFOA



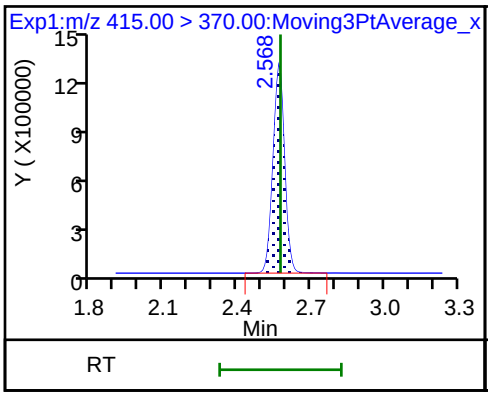
15 Perfluorooctanoic acid



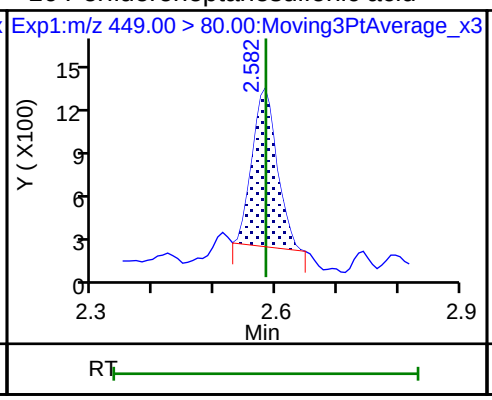
15 Perfluorooctanoic acid



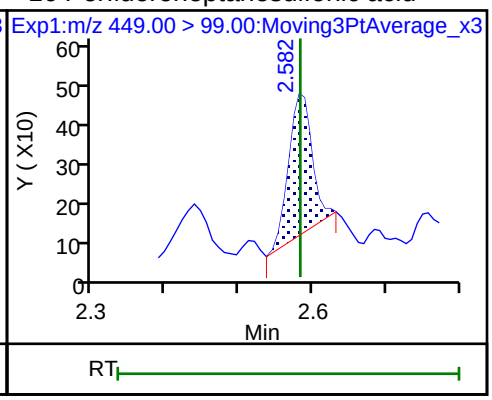
* 62 13C2-PFOA



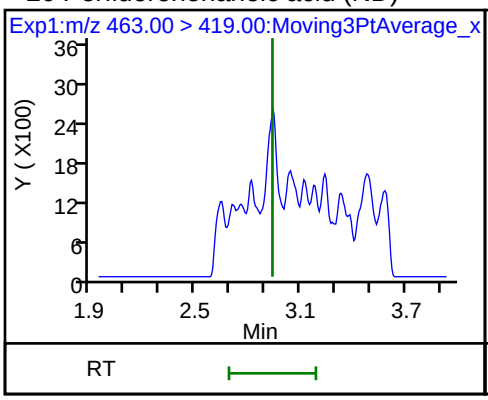
16 Perfluoroheptanesulfonic acid



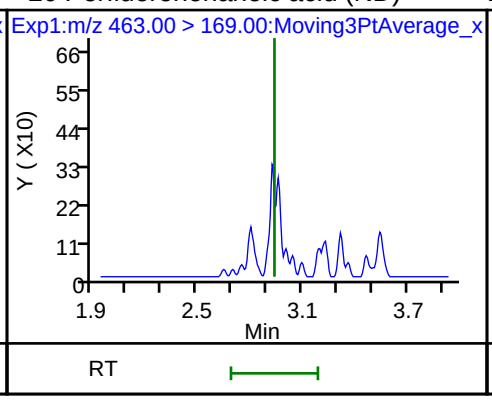
16 Perfluoroheptanesulfonic acid



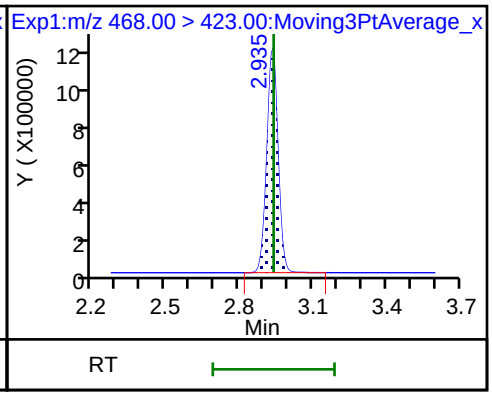
20 Perfluorononanoic acid (ND)



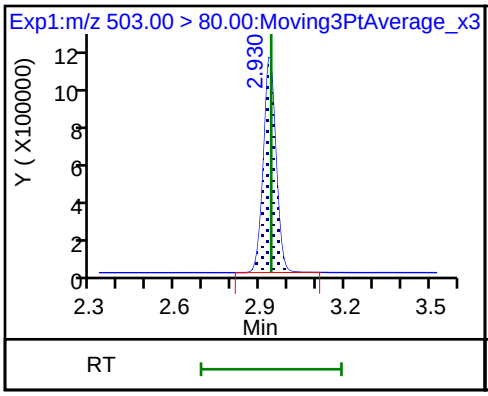
20 Perfluorononanoic acid (ND)



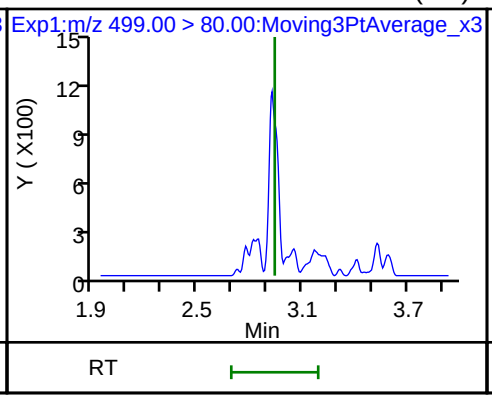
D 19 13C5 PFNA



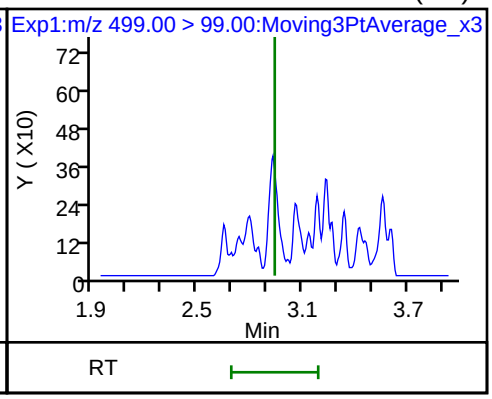
D 18 13C4 PFOS



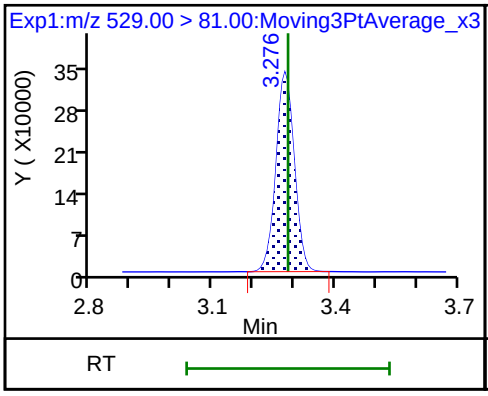
17 Perfluorooctane sulfonic acid (ND)



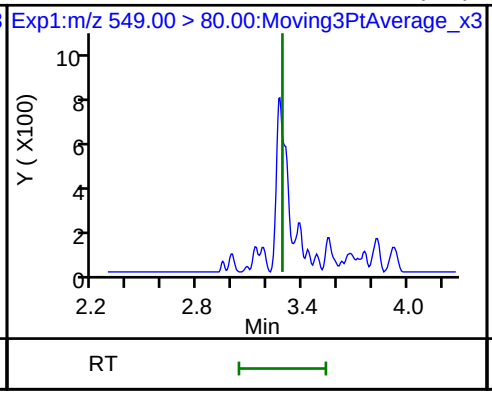
17 Perfluorooctane sulfonic acid (ND)



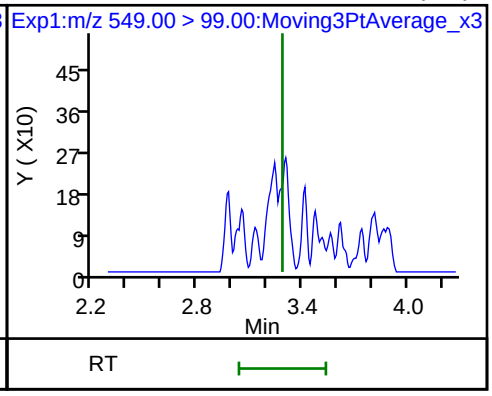
D 26 M2-8:2FTS



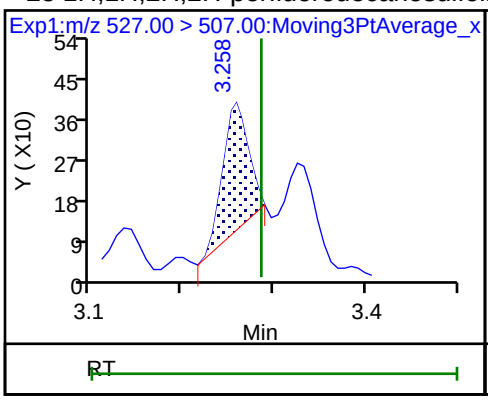
68 Perfluorononanesulfonic acid (ND)



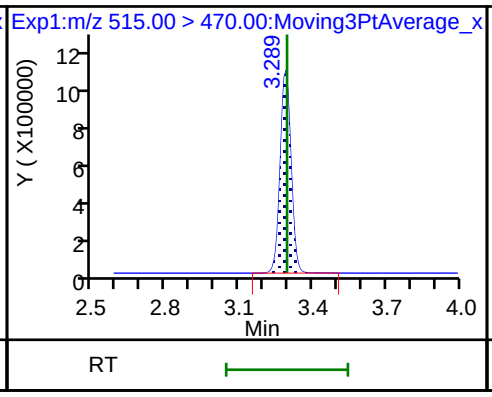
68 Perfluorononanesulfonic acid (ND)



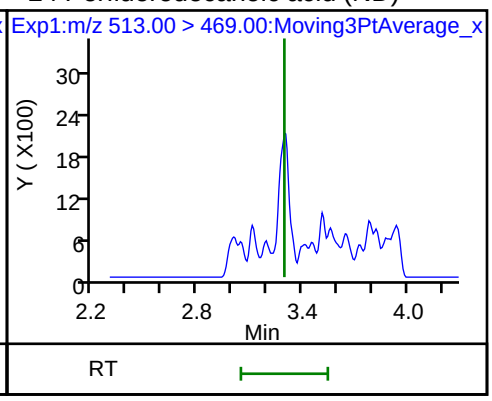
25 1H,1H,2H,2H-perfluorodecanesulfon



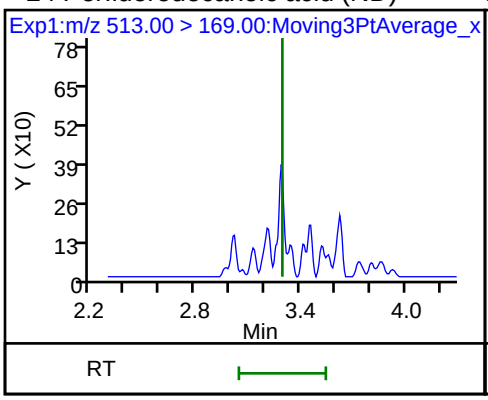
D 23 13C2 PFDA



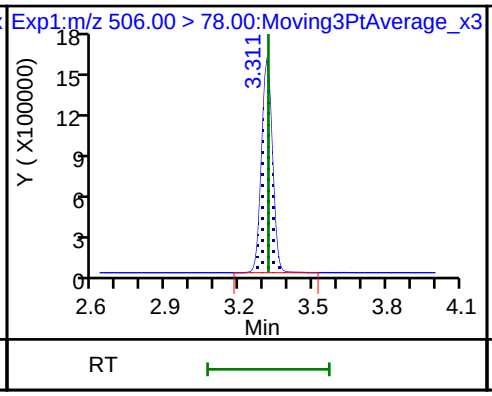
24 Perfluorodecanoic acid (ND)



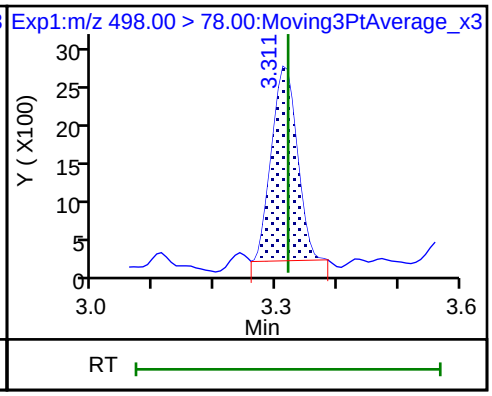
24 Perfluorodecanoic acid (ND)



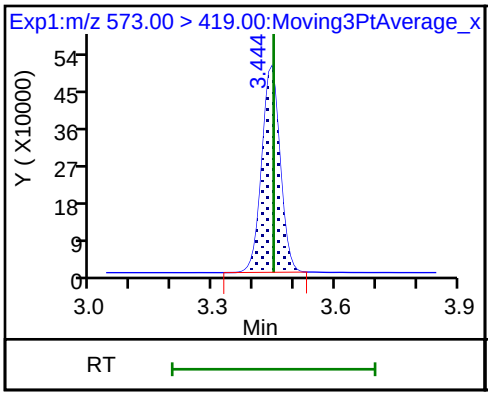
D 21 13C8 FOSA



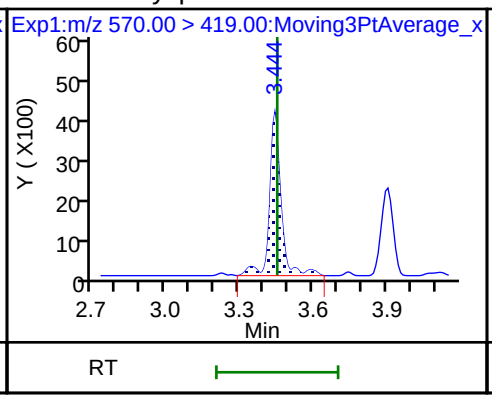
22 Perfluorooctane Sulfonamide



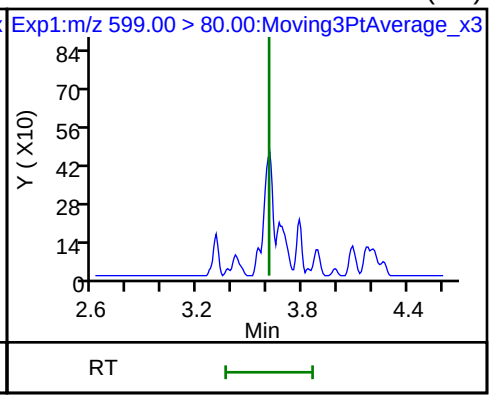
D 27 d3-NMeFOSAA



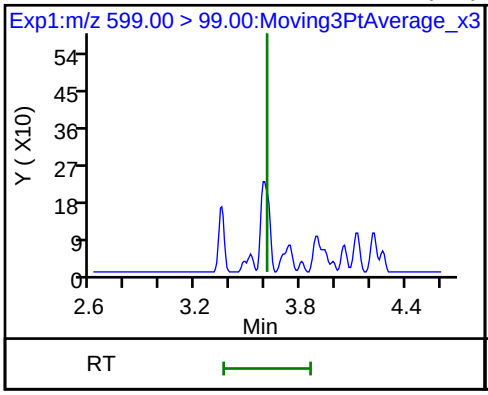
28 N-methyl perfluorooctane sulfonami



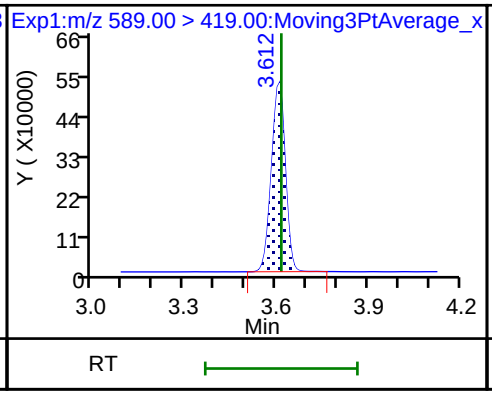
29 Perfluorodecane Sulfonic acid (ND)



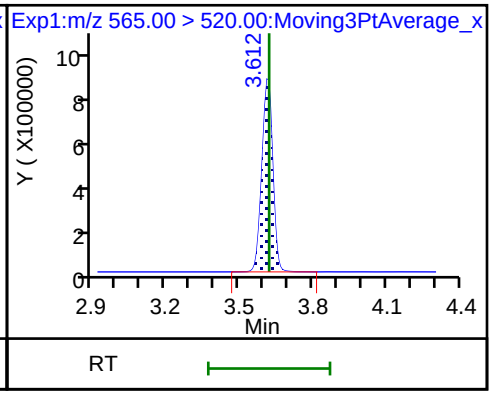
29 Perfluorodecane Sulfonic acid (ND)



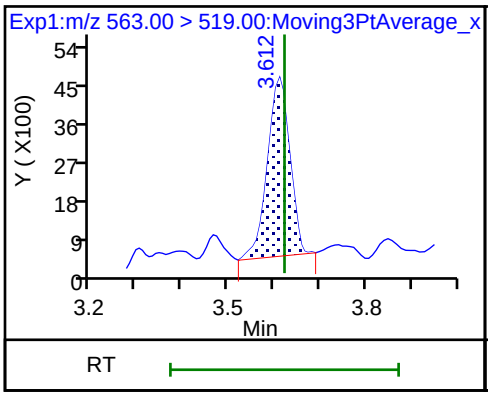
D 32 d5-NEtFOSAA



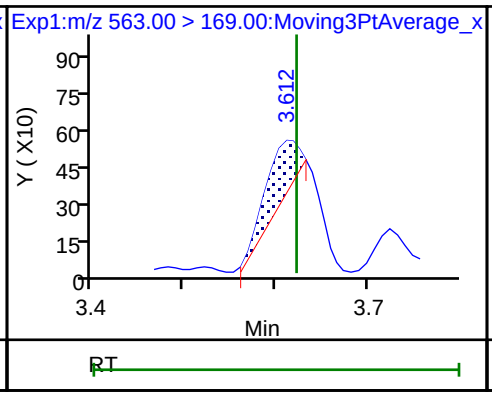
D 30 13C2 PFUnA



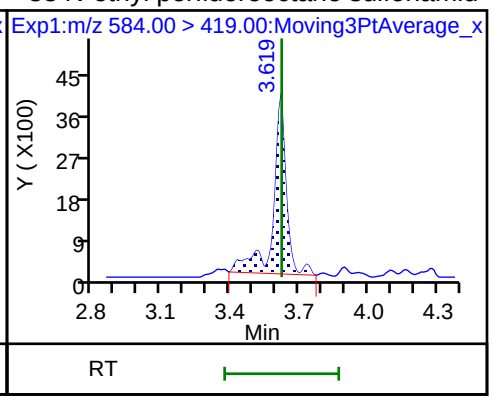
31 Perfluoroundecanoic acid



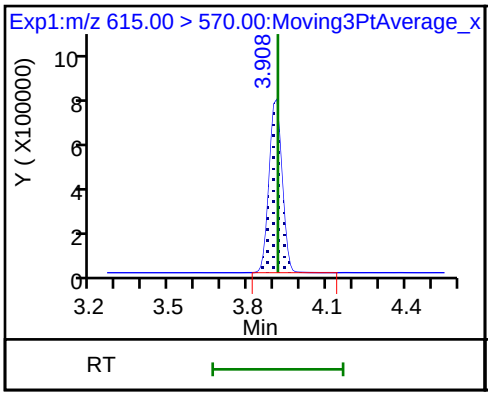
31 Perfluoroundecanoic acid



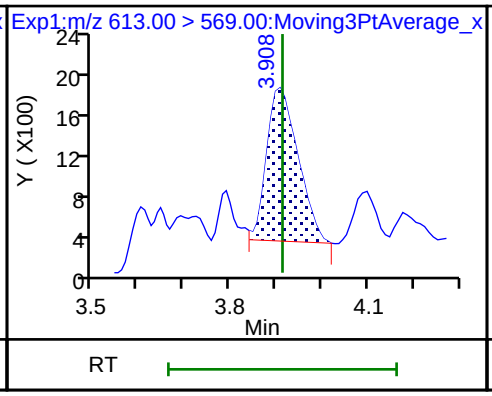
33 N-ethyl perfluorooctane sulfonamid



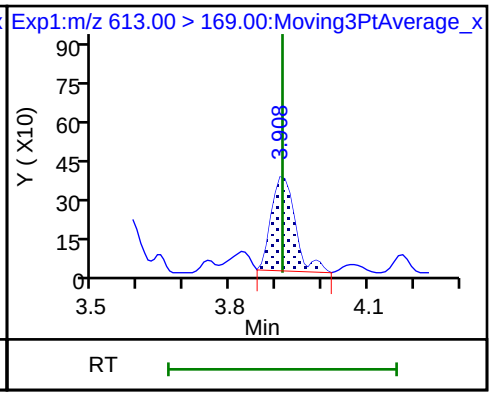
D 36 13C2 PFDoA



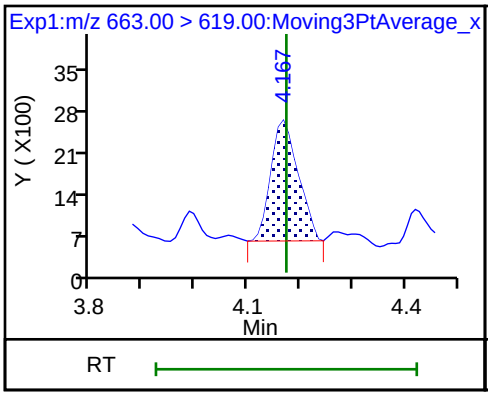
37 Perfluorododecanoic acid



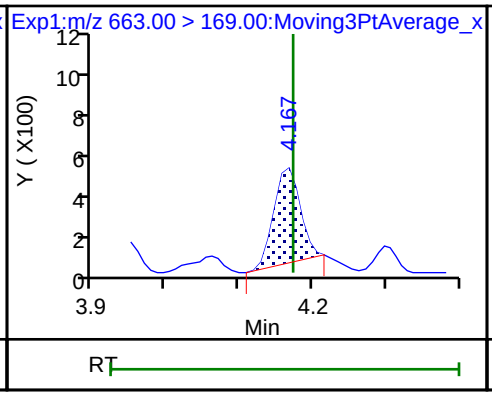
37 Perfluorododecanoic acid



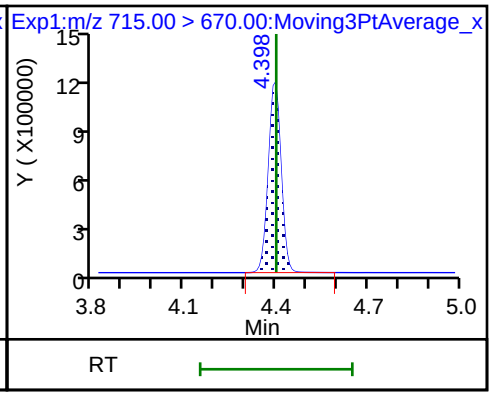
41 Perfluorotridecanoic acid



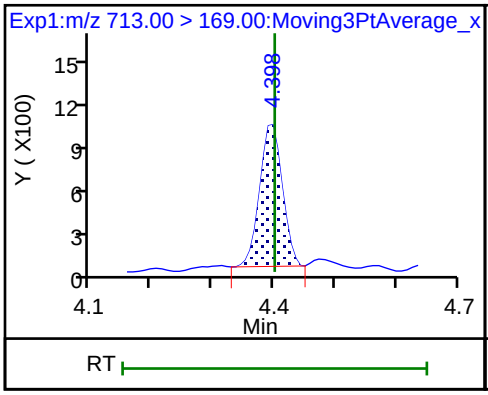
41 Perfluorotridecanoic acid



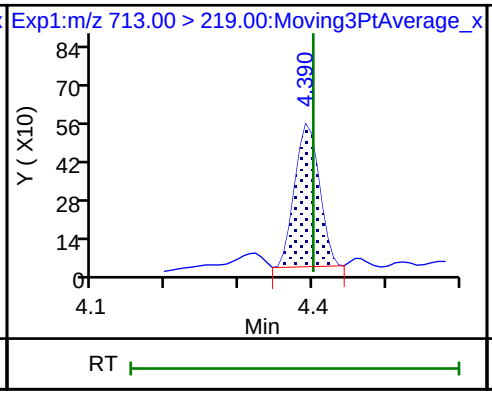
D 43 13C2-PFTeDA



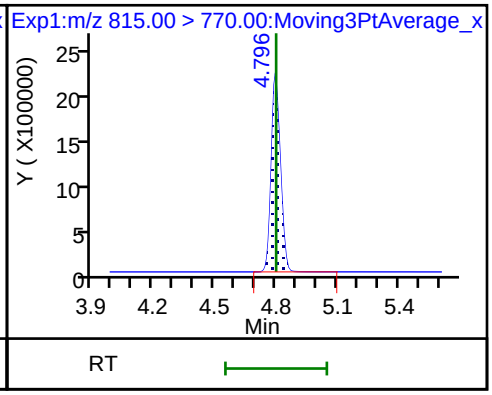
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-235966/2-A
Matrix: Water
Lab File ID: 2018.08.03LLA_014.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 250.00(mL)
Date Analyzed: 08/03/2018 06:32
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	39.4		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	39.2		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	38.7		2.0	1.5	0.52
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35.9		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	33.1		2.0	1.0	0.38
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	35.5		4.0	3.0	1.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	70		50-150
STL01892	13C4-PFHpA	75		50-150
STL00990	13C4 PFOA	77		50-150
STL00995	13C5 PFNA	75		50-150
STL00994	18O2 PFHxS	70		50-150
STL00991	13C4 PFOS	69		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_014.d
Lims ID: LCS 320-235966/2-A
Client ID:
Sample Type: LCS
Inject. Date: 03-Aug-2018 06:32:26 ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-235966/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:16:14 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:16:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.407	1.407	0.0	1.000	1791369	0.9678		96.8	884	
D 1 13C4 PFBA										
217.00 > 172.00	1.407	1.411	-0.004	0.541	4695533	1.88		75.3	103061	
D 3 13C5-PFPeA										
267.90 > 223.00	1.656	1.653	0.003	0.636	3169989	1.93		77.2	60237	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.656	1.656	0.0	1.000	1409158	0.9282		92.8	617	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.690	0.002	0.650	77368	1.64		70.4	508	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.692	1.692	0.0	1.000	2288012	0.8971		101	5997	
298.90 > 99.00	1.692	1.692	0.0	1.000	957342		2.39(1.25-3.74)		4563	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.895	1.894	0.001	1.119	584174	1.02		109	38247	
D 7 13C2 PFHxA										
315.00 > 270.00	1.937	1.935	0.003	0.744	3466928	1.95		78.0	72796	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.937	1.937	0.0	1.000	1376714	0.9414		94.1	4744	
313.00 > 119.00	1.937	1.937	0.0	1.000	125101		11.00(5.03-15.10)		2106	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.959	1.959	0.0	1.157	2137251	0.9493		101	36856	
349.00 > 99.00	1.959	1.959	0.0	1.157	797073		2.68(1.36-4.07)		8776	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.025	2.025	0.0	1.000	277438	NC			1854	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.025	2.033	-0.008	0.778	223022	NC			7076	
D 9 13C4-PFHpA										
367.00 > 322.00	2.254	2.251	0.003	0.866	3216288	1.87		74.7	80699	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.254	2.253	0.001	1.000	1468131	0.9841		98.4	882	
363.00 > 169.00	2.254	2.253	0.001	1.000	579508		2.53(1.13-3.40)		10240	
D 11 18O2 PFHxS										
403.00 > 84.00	2.267	2.264	0.003	0.871	4310333	1.66		70.4	68074	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.267	2.266	0.001	1.000	1742020	0.8268		90.9	7667	
399.00 > 99.00	2.267	2.266	0.001	1.000	593906		2.93(1.50-4.49)		1567	
65 ADONA										
377.00 > 251.00	2.293	2.305	-0.012	0.773	3649432	NC			44853	
377.00 > 85.00	2.293	2.305	-0.012	0.773	2115307		1.73(0.84-2.53)		8470	
D 12 M2-6:2FTS										
429.00 > 81.00	2.580	2.579	0.001	0.991	882884	1.75		73.6	15827	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.580	2.588	-0.008	1.000	1452875	2.36		249	34082	
D 14 13C4 PFOA										
417.00 > 372.00	2.603	2.602	0.001	1.000	3204831	1.93		77.1	55119	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.603	2.611	-0.008	1.000	1451166	0.9791		97.8	1070	
413.00 > 169.00	2.603	2.611	-0.008	1.000	750858		1.93(0.84-2.52)		5997	
* 62 13C2-PFOA										
415.00 > 370.00	2.603	2.611	-0.008		4332369	2.50			69602	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.611	2.619	-0.008	0.880	1601256	0.9431		99.1	20401	
449.00 > 99.00	2.611	2.619	-0.008	0.880	417860		3.83(1.94-5.82)		7232	
D 19 13C5 PFNA										
468.00 > 423.00	2.966	2.964	0.002	1.140	2704260	1.87		74.6	56943	
D 18 13C4 PFOS										
503.00 > 80.00	2.966	2.964	0.002	1.140	2935443	1.64		68.7	40666	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.966	2.973	-0.007	1.000	1223601	0.8874		95.6	12384	
499.00 > 99.00	2.966	2.973	-0.007	1.000	283682		4.31(2.31-6.93)		3265	
20 Perfluorononanoic acid										
463.00 > 419.00	2.966	2.979	-0.013	1.000	1129218	0.9667		96.7	5160	
463.00 > 169.00	2.966	2.979	-0.013	1.000	275216		4.10(1.90-5.69)		12645	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.171	3.187	-0.016	1.069	2013361	NC			26804	
D 26 M2-8:2FTS										
529.00 > 81.00	3.310	3.311	-0.001	1.272	893251	1.82		75.8	21606	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.310	3.322	-0.012	1.000	458264	0.9094		94.9	18494	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.310	3.322	-0.012	1.116	840297	0.9519		99.2	20996	
549.00 > 99.00	3.310	3.322	-0.012	1.116	345268		2.43(1.33-3.97)		2858	
D 23 13C2 PFDA										
515.00 > 470.00	3.318	3.327	-0.009	1.275	2186204	2.02		80.7	58427	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.318	3.330	-0.012	1.000	864560	0.9262		92.6	1525	
513.00 > 169.00	3.318	3.330	-0.012	1.000	153948		5.62(2.36-7.09)		4606	
D 21 13C8 FOSA										
506.00 > 78.00	3.334	3.343	-0.009	1.281	4153589	1.58		63.2	50546	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.343	3.355	-0.012	1.003	1688984	1.03		103	27948	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.472	3.473	-0.001	1.334	483058	1.84		73.4	15135	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.482	3.486	-0.004	1.003	180371	0.9182		91.8	2874	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.637	3.647	-0.010	1.397	515557	1.83		73.1	5623	
D 30 13C2 PFUnA										
565.00 > 520.00	3.647	3.647	0.0	1.401	1651181	1.98		79.1	39334	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.627	3.650	-0.023	1.223	722916	0.9050		93.9	30361	
599.00 > 99.00	3.627	3.650	-0.023	1.223	246301		2.94(1.39-4.16)		3985	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.647	3.659	-0.012	1.003	179984	0.9793		97.9	7840	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.647	3.659	-0.012	1.000	708979	0.8711		87.1	1601	
563.00 > 169.00	3.647	3.659	-0.012	1.000	134999		5.25(2.12-6.36)		4654	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.802	3.815	-0.013	1.282	2849879	NC			53899	
D 36 13C2 PFDoA										
615.00 > 570.00	3.938	3.943	-0.005	1.513	1339842	1.85		74.1	16531	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.938	3.951	-0.013	1.000	560663	0.9662		96.6	182	
613.00 > 169.00	3.938	3.951	-0.013	1.000	138334		4.05(2.13-6.40)		3228	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.192	4.203	-0.011	1.064	474031	0.9385		93.9	133	
663.00 > 169.00	4.192	4.203	-0.011	1.064	151781		3.12(1.25-3.76)		1837	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.426	4.433	-0.007	1.700	1005192	1.66		66.2	4318	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.426	4.437	-0.011	1.000	100007	0.9234		92.3	1698	
713.00 > 219.00	4.415	4.437	-0.022	0.998	74267		1.35(0.71-2.13)		1260	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.823	4.829	-0.006	1.853	1090931	1.04		41.7	1566	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.823	4.833	-0.010	1.000	432348	NC			21.6	
813.00 > 169.00	4.823	4.833	-0.010	1.000	68634		6.30(2.86-8.58)		932	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.157	5.166	-0.009	1.069	378360	NC			164	
913.00 > 169.00	5.157	5.166	-0.009	1.069	48208		7.85(3.83-11.48)		697	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 06-Aug-2018 11:16:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_014.d

Injection Date: 03-Aug-2018 06:32:26 Instrument ID: A8_N

Lims ID: LCS 320-235966/2-A

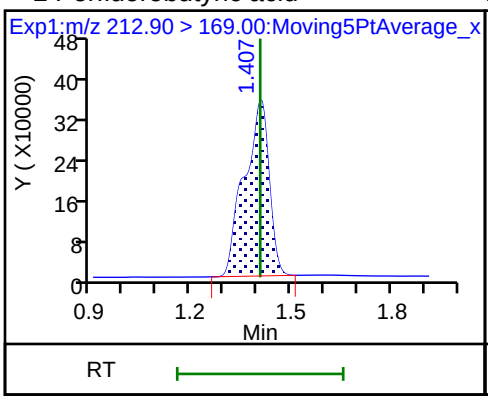
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 3

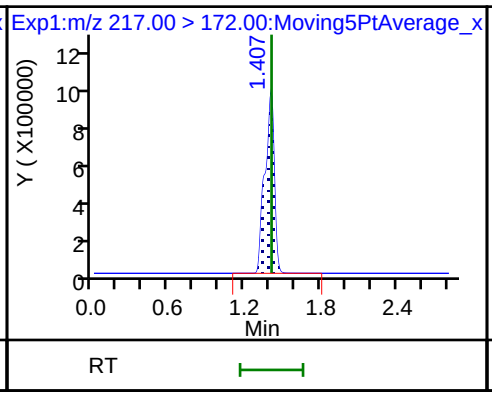
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid



D 1 13C4 PFBA



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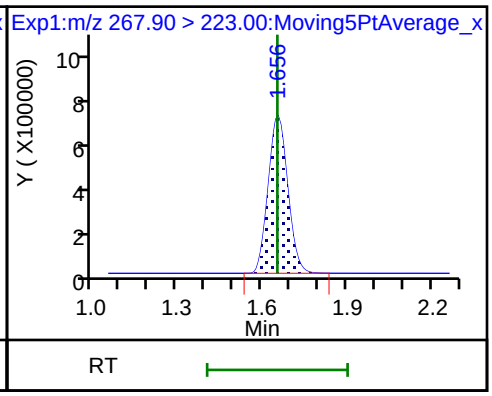
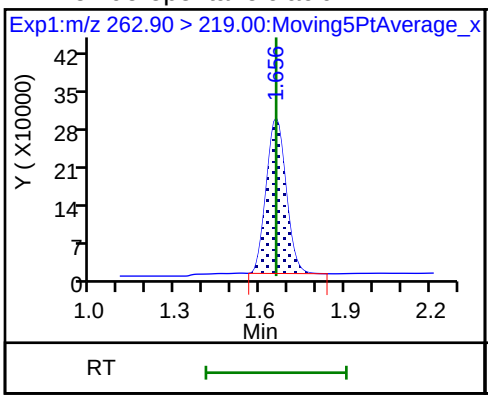
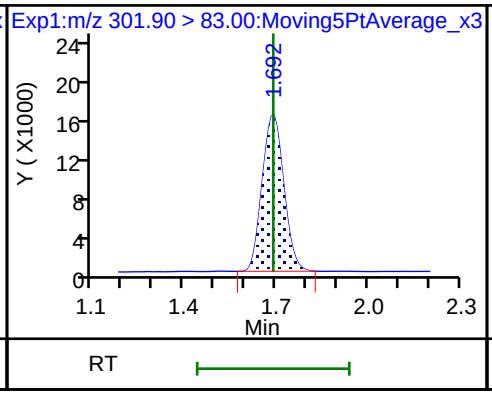


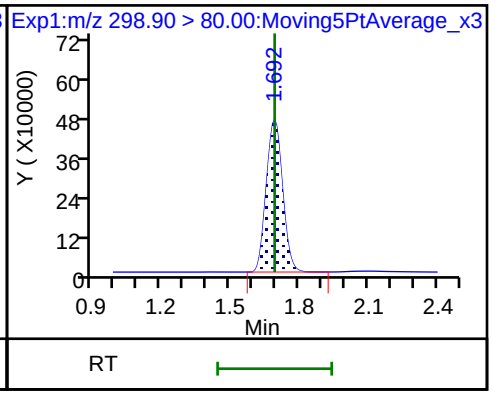
4 Perfluoropentanoic acid



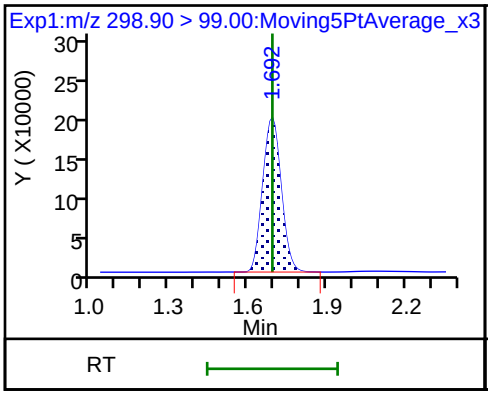
D 47 13C3-PFBS



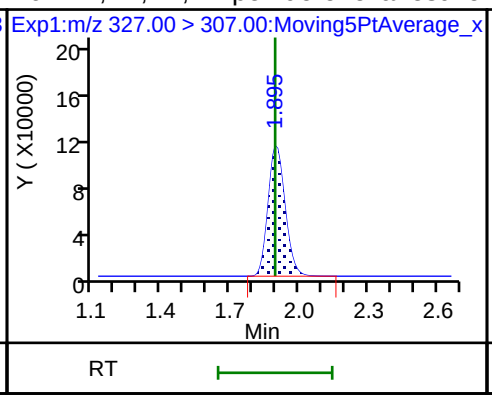
5 Perfluorobutanesulfonic acid



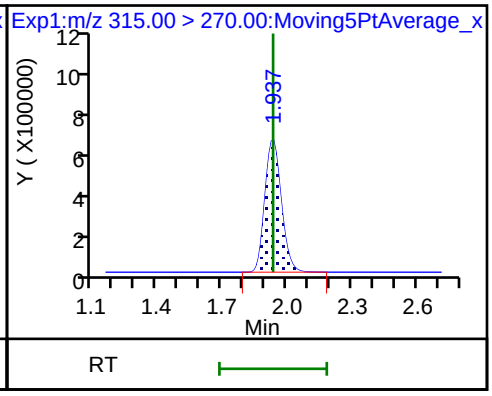
5 Perfluorobutanesulfonic acid



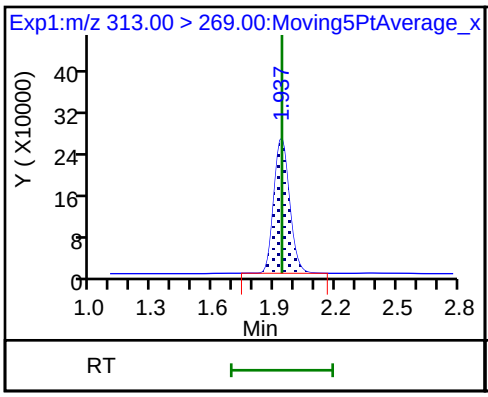
61 1H,1H,2H,2H-perfluorohexanesulfon



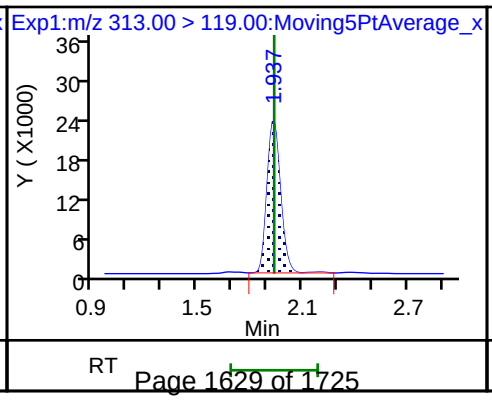
D 7 13C2 PFHxA



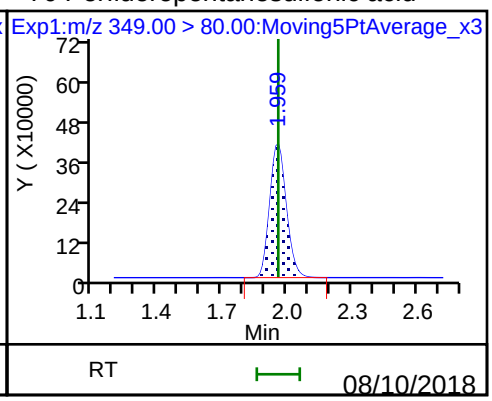
6 Perfluorohexanoic acid



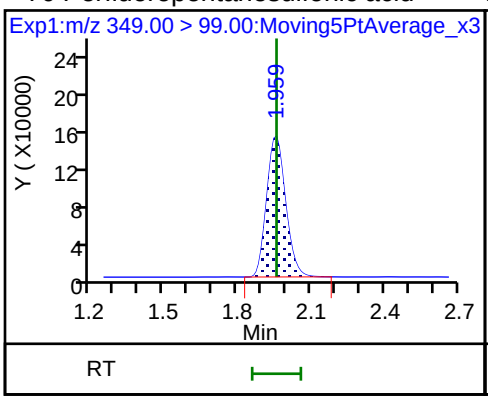
6 Perfluorohexanoic acid



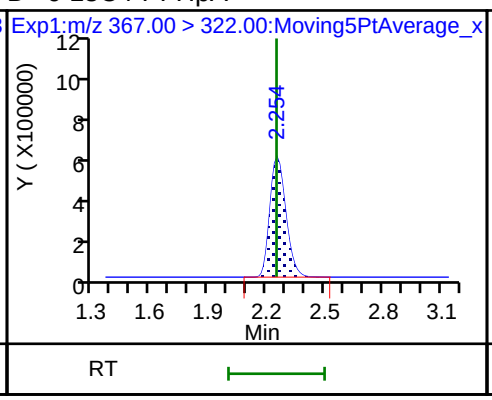
70 Perfluoropentanesulfonic acid



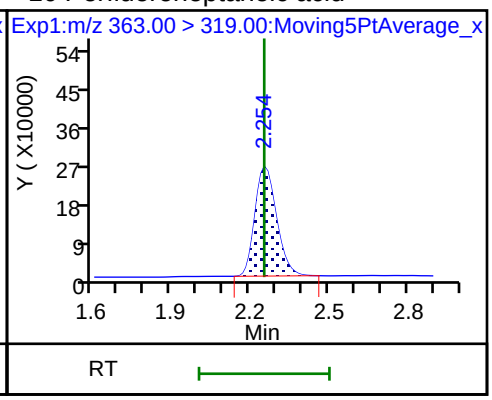
70 Perfluoropentanesulfonic acid



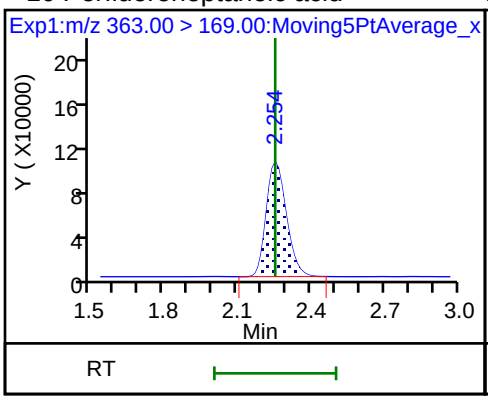
D 9 13C4-PFHpA



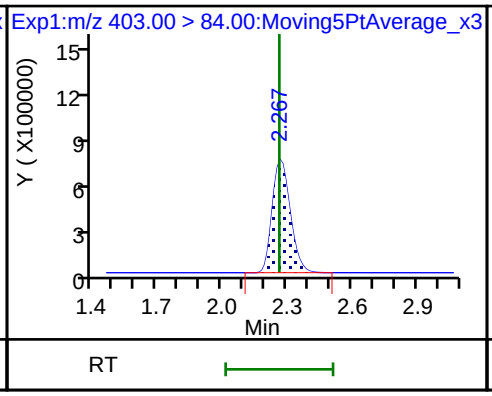
10 Perfluoroheptanoic acid



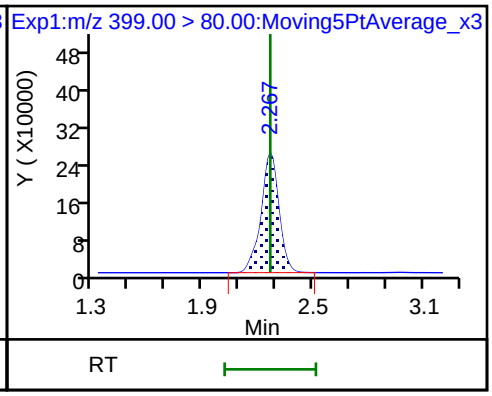
10 Perfluoroheptanoic acid



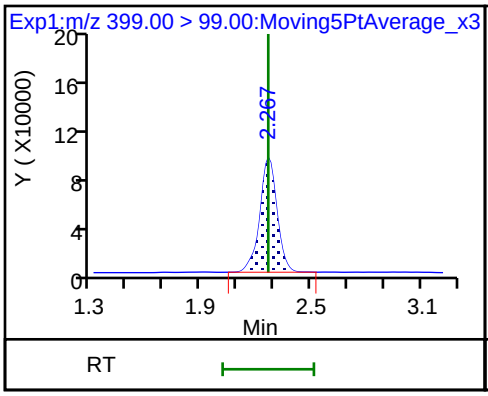
D 11 18O2 PFHxS



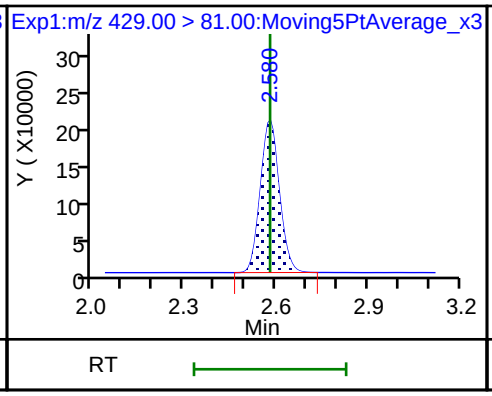
8 Perfluorohexanesulfonic acid



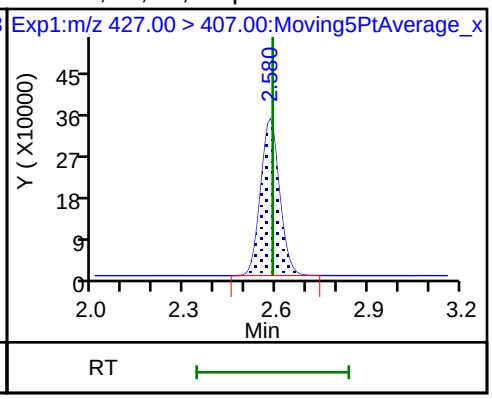
8 Perfluorohexanesulfonic acid



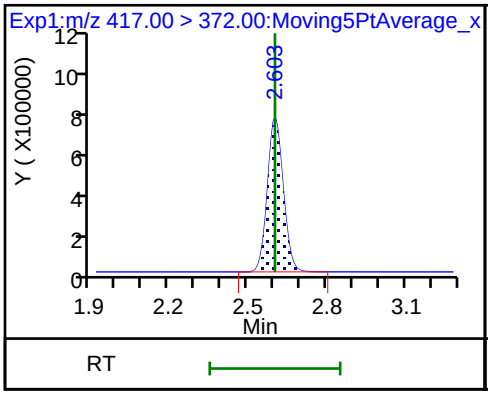
D 12 M2-6:2FTS



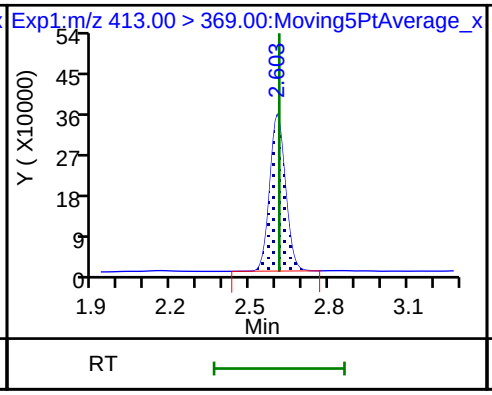
13 1H,1H,2H,2H-perfluorooctanesulfoni



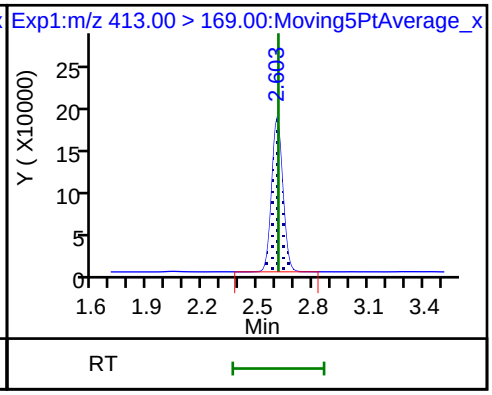
D 14 13C4 PFOA



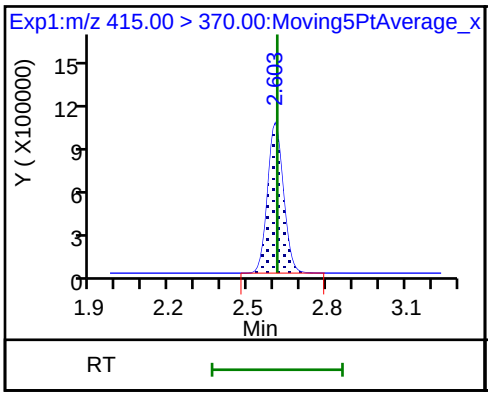
15 Perfluorooctanoic acid



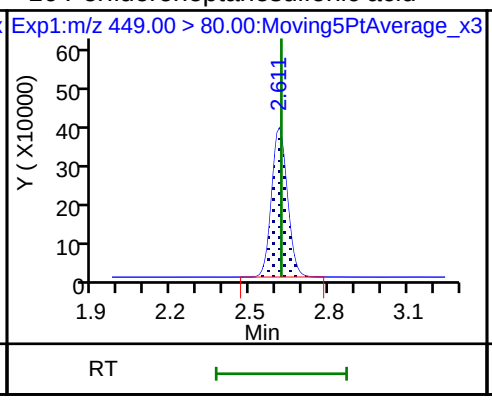
15 Perfluorooctanoic acid



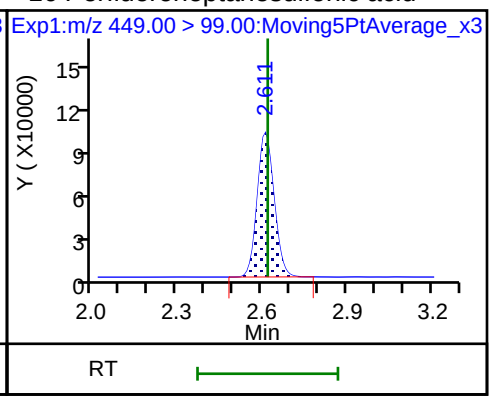
* 62 13C2-PFOA



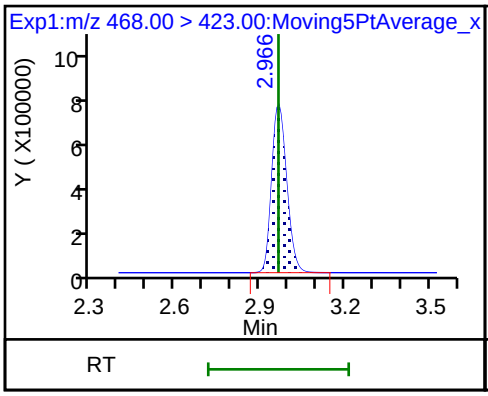
16 Perfluoroheptanesulfonic acid



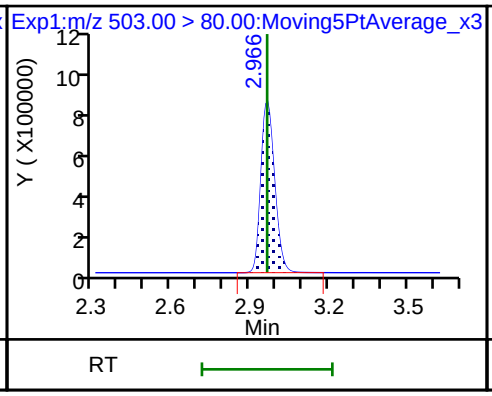
16 Perfluoroheptanesulfonic acid



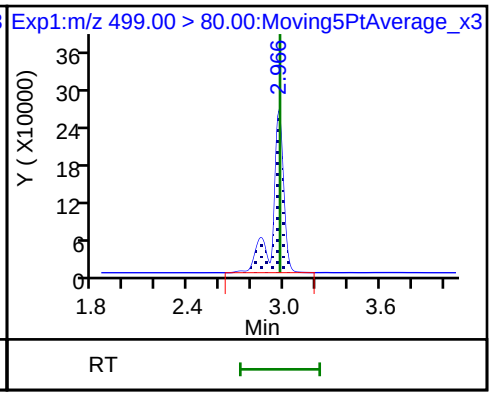
D 19 13C5 PFNA



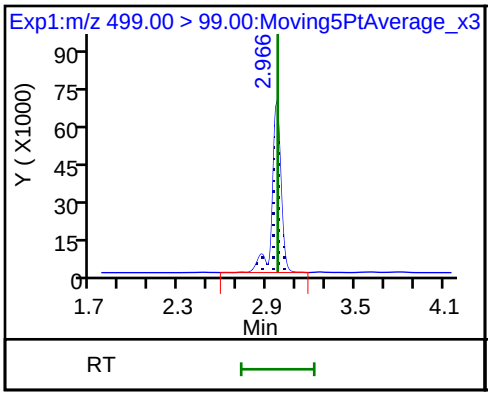
D 18 13C4 PFOS



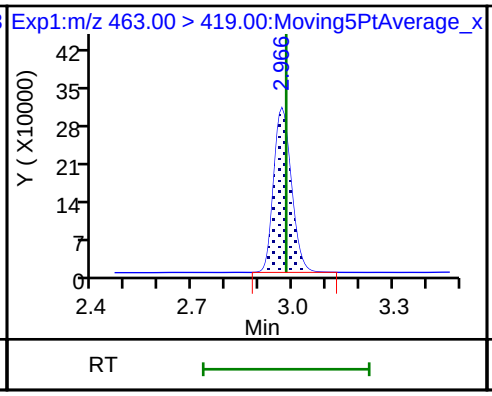
17 Perfluorooctane sulfonic acid



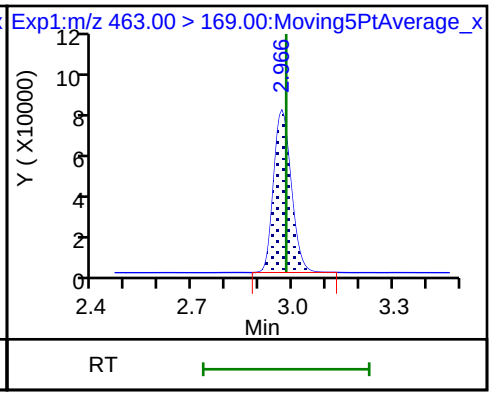
17 Perfluorooctane sulfonic acid



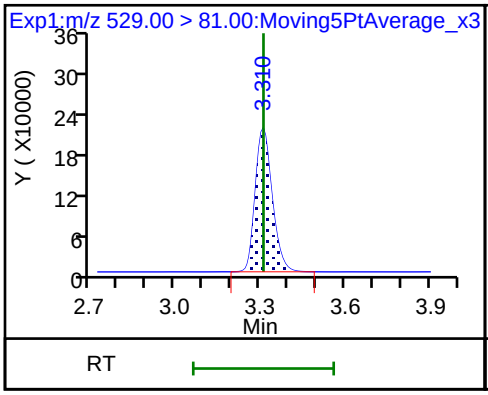
20 Perfluorononanoic acid



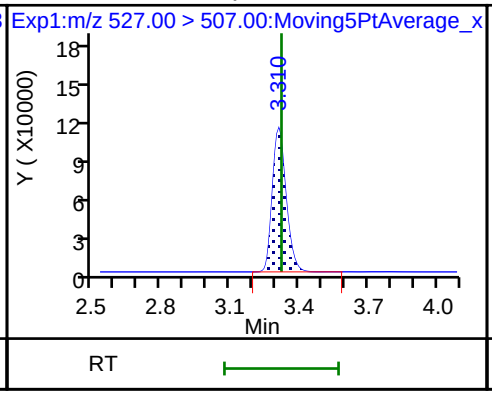
20 Perfluorononanoic acid



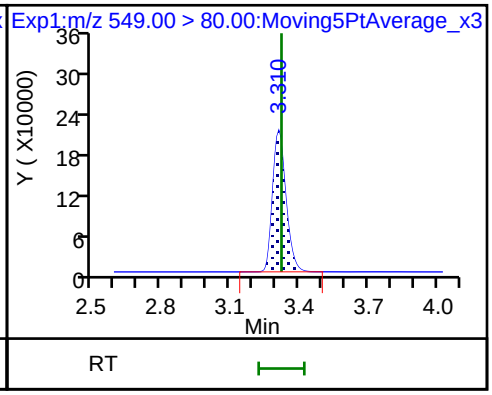
D 26 M2-8:2FTS



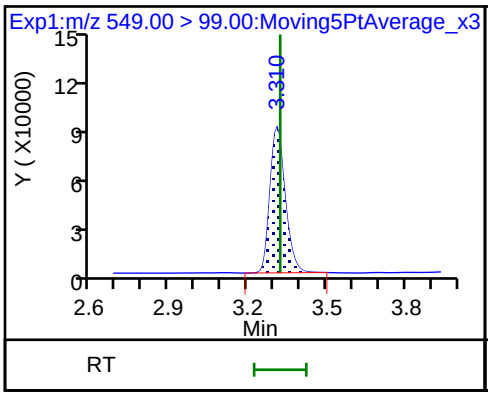
25 1H,1H,2H,2H-perfluorodecanesulfoni



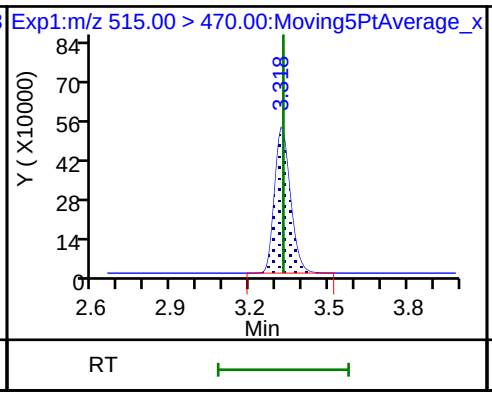
68 Perfluorononanesulfonic acid



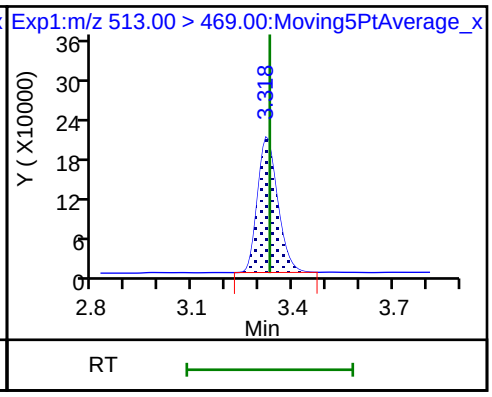
68 Perfluorononanesulfonic acid



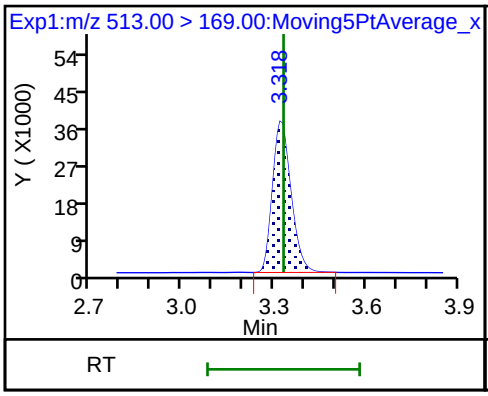
D 23 13C2 PFDA



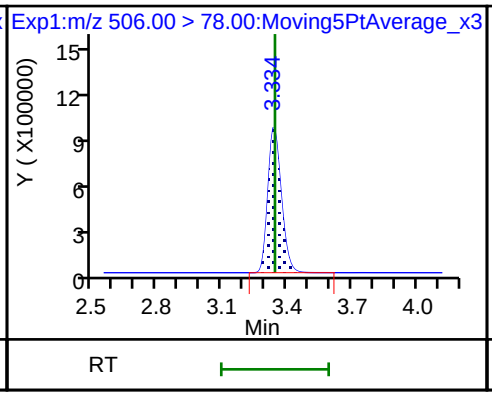
24 Perfluorodecanoic acid



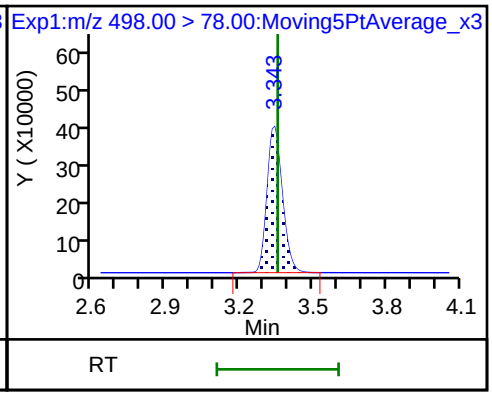
24 Perfluorodecanoic acid



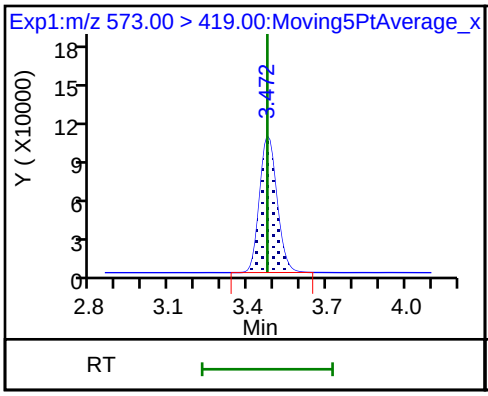
D 21 13C8 FOSA



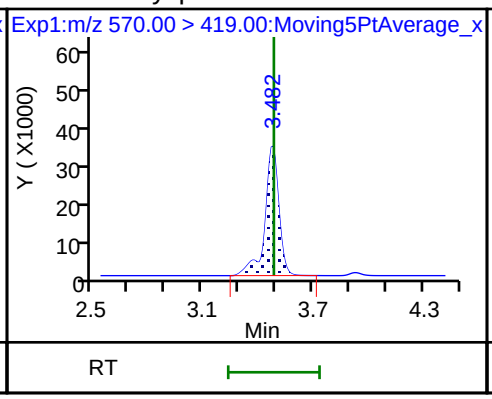
22 Perfluorooctane Sulfonamide



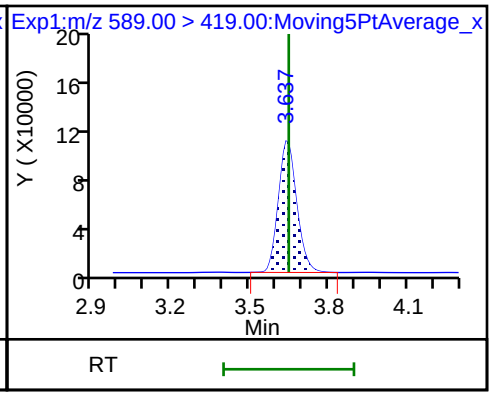
D 27 d3-NMeFOSAA



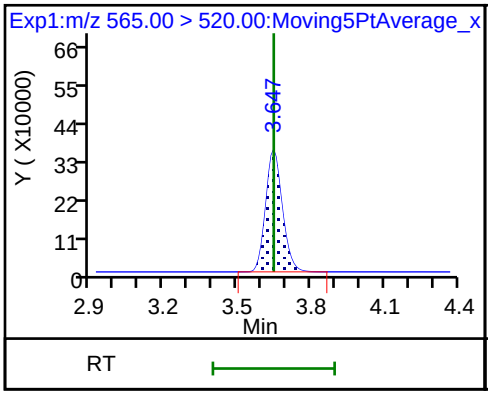
28 N-methyl perfluorooctane sulfonami



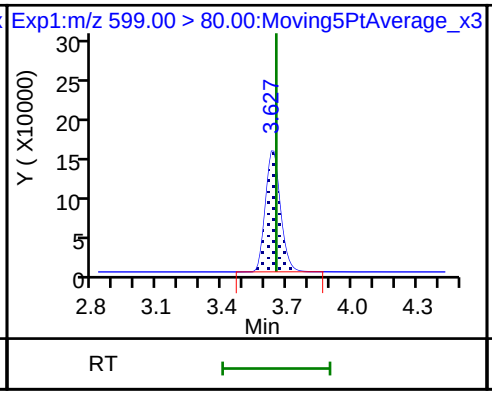
D 32 d5-NEtFOSAA



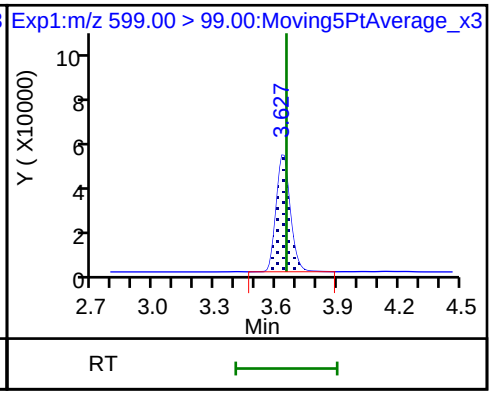
D 30 13C2 PFUnA



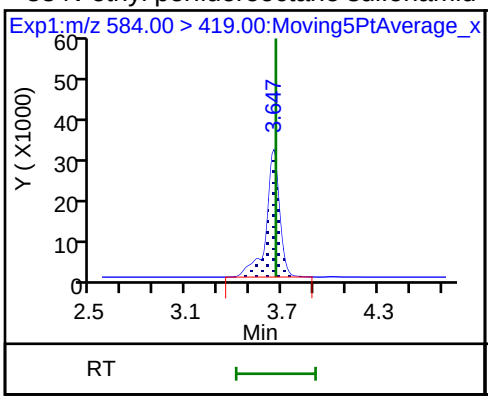
29 Perfluorodecane Sulfonic acid



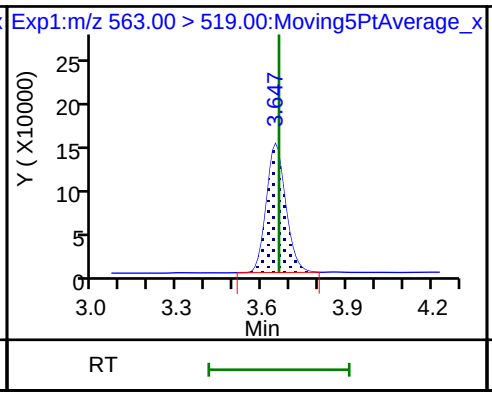
29 Perfluorodecane Sulfonic acid



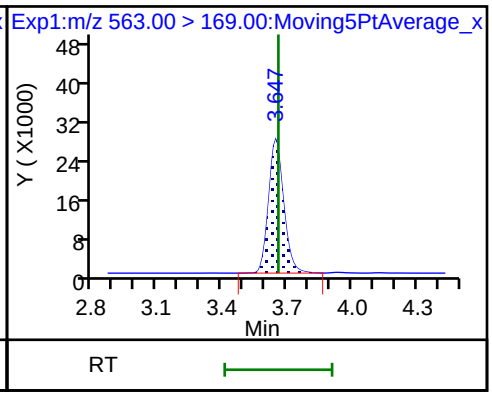
33 N-ethyl perfluorooctane sulfonamid



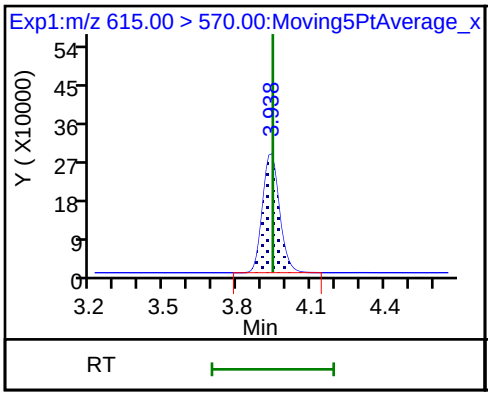
31 Perfluoroundecanoic acid



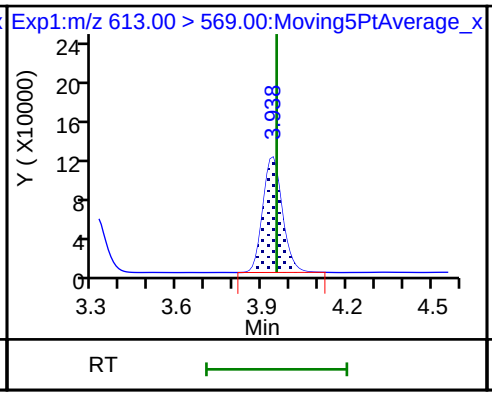
31 Perfluoroundecanoic acid



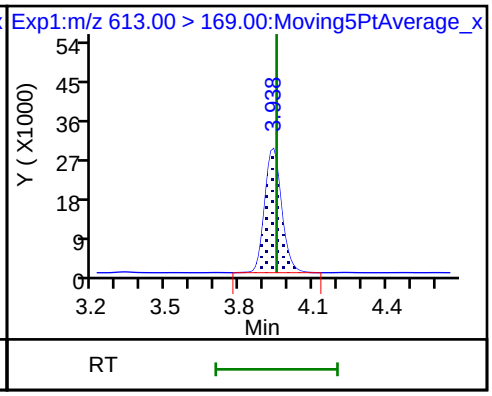
D 36 13C2 PFDoA



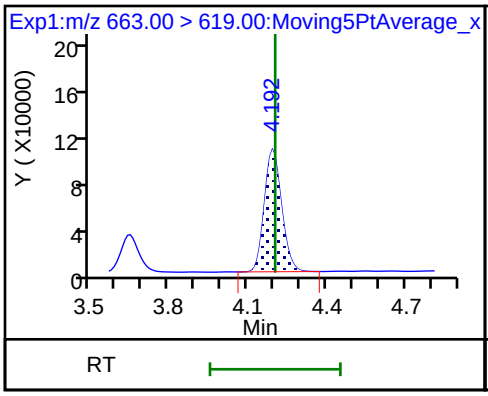
37 Perfluorododecanoic acid



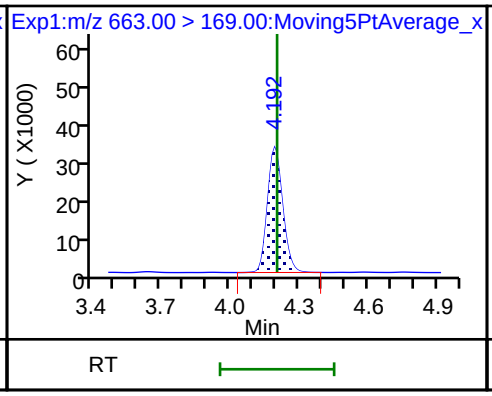
37 Perfluorododecanoic acid



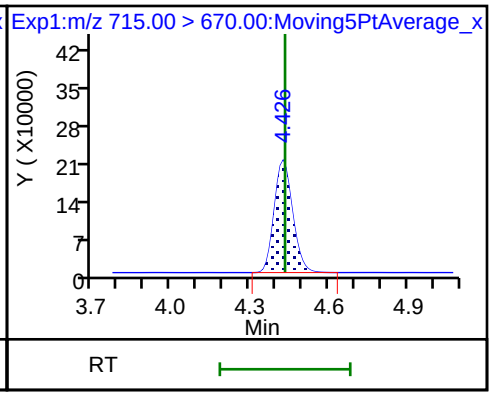
41 Perfluorotridecanoic acid



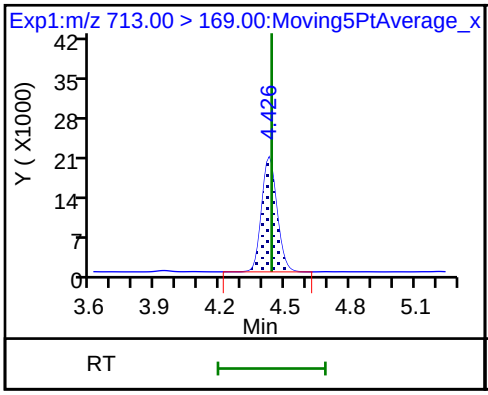
41 Perfluorotridecanoic acid



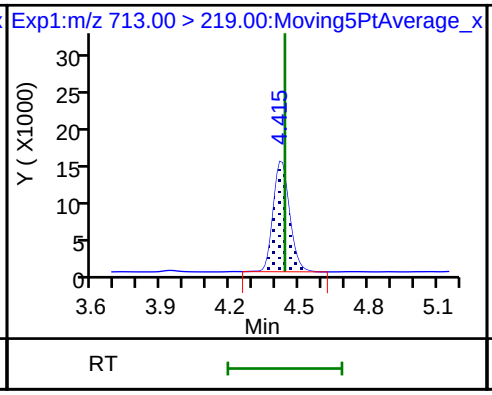
D 43 13C2-PFTeDA



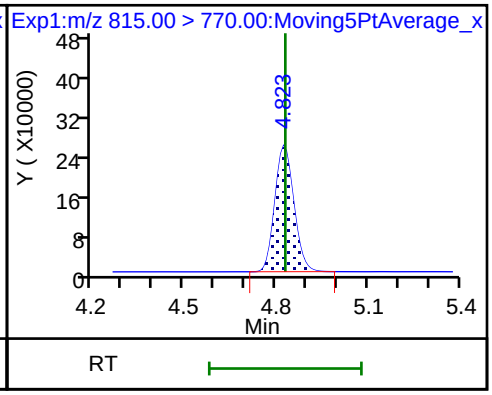
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-236486/2-A
Matrix: Solid
Lab File ID: 2018.08.05LLA_032.d
Analysis Method: EPA 537 (Mod)
Date Collected:
Extraction Method: SHAKE
Date Extracted: 07/27/2018 10:32
Sample wt/vol: 5.00(g)
Date Analyzed: 08/06/2018 03:35
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 238093
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.74		0.30	0.20	0.078
335-67-1	Perfluorooctanoic acid (PFOA)	1.80		0.30	0.20	0.10
375-95-1	Perfluorononanoic acid (PFNA)	1.82		0.30	0.20	0.081
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.73		0.40	0.18	0.059
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.54		0.30	0.20	0.062
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.77		1.0	0.50	0.24

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	74		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	81		50-150
STL00995	13C5 PFNA	84		50-150
STL00994	18O2 PFHxS	85		50-150
STL00991	13C4 PFOS	79		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_032.d
Lims ID: LCS 320-236486/2-A
Client ID:
Sample Type: LCS
Inject. Date: 06-Aug-2018 03:35:35 ALS Bottle#: 20 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-236486/2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 16:59:51 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 06-Aug-2018 16:35:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.386	1.385	0.001	0.544	4365241	1.86		74.6	69221	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.386	1.386	0.0	1.000	1522150	0.8846		88.5	335	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.625	1.624	0.001	0.638	3147635	2.04		81.6	67826	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.625	1.625	0.0	1.000	1439401	0.9548		95.5	635	
D 47 13C3-PFBS										
301.90 > 83.00	1.658	1.656	0.002	0.651	76528	1.73		74.2	438	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.658	1.657	0.001	1.000	2188119	0.8673		98.1	6153	
298.90 > 99.00	1.658	1.657	0.001	1.000	911075		2.40(1.25-3.74)		3530	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.858	1.857	0.001	1.121	561197	0.99		106	35955	
D 7 13C2 PFHxA										
315.00 > 270.00	1.886	1.885	0.001	0.741	3624963	2.17		86.9	98197	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.886	1.885	0.001	1.000	1389910	0.9090		90.9	2830	
313.00 > 119.00	1.886	1.885	0.001	1.000	135723		10.24(5.03-15.10)		2569	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.907	1.906	0.0	1.150	2093799	0.9402		100	30145	
349.00 > 99.00	1.907	1.906	0.0	1.150	778922		2.69(1.36-4.07)		9081	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.982	1.980	0.002	0.778	256842	NC			7950	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.982	1.981	0.001	1.000	272542	NC			809	
D 9 13C4-PFHpA										
367.00 > 322.00	2.208	2.206	0.002	0.867	3450612	2.13		85.3	77373	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.208	2.207	0.001	1.000	1394115	0.8710		87.1	1254	
363.00 > 169.00	2.208	2.207	0.001	1.000	537506		2.59(1.13-3.40)		11903	
D 11 18O2 PFHxS										
403.00 > 84.00	2.219	2.217	0.002	0.871	4862860	2.00		84.6	86832	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.219	2.218	0.001	1.000	1835421	0.7722		84.9	7610	
399.00 > 99.00	2.219	2.218	0.001	1.000	630678		2.91(1.50-4.49)		1781	
65 ADONA										
377.00 > 251.00	2.242	2.241	0.001	0.771	3656999	NC			42740	
377.00 > 85.00	2.242	2.241	0.001	0.771	2118944		1.73(0.84-2.53)		9023	
D 12 M2-6:2FTS										
429.00 > 81.00	2.520	2.527	-0.007	0.989	951821	2.01		84.6	17290	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.520	2.528	-0.008	1.000	597622	0.9017		95.1	12884	
* 62 13C2-PFOA										
415.00 > 370.00	2.547	2.547	0.0		4066543	2.50			70028	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.547	2.547	0.0	1.000	1308137	0.8995		89.9	963	
413.00 > 169.00	2.547	2.547	0.0	1.000	723207		1.81(0.84-2.52)		3489	
D 14 13C4 PFOA										
417.00 > 372.00	2.547	2.555	-0.008	1.000	3144729	2.01		80.6	100457	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.557	2.556	0.001	0.879	1531481	0.8396		88.2	18419	
449.00 > 99.00	2.557	2.556	0.001	0.879	414728		3.69(1.94-5.82)		8553	
20 Perfluorononanoic acid										
463.00 > 419.00	2.909	2.913	-0.004	1.000	1121457	0.9120		91.2	4902	
463.00 > 169.00	2.909	2.913	-0.004	1.000	273912		4.09(1.90-5.69)		11078	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.914	2.913	0.001	1.002	1307964	0.8829		95.1	15906	
499.00 > 99.00	2.909	2.913	-0.004	1.000	309759		4.22(2.31-6.93)		4094	
D 19 13C5 PFNA										
468.00 > 423.00	2.909	2.916	-0.007	1.142	2846790	2.09		83.7	62142	
D 18 13C4 PFOS										
503.00 > 80.00	2.909	2.916	-0.007	1.142	3153709	1.88		78.6	50521	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.118	3.124	-0.006	1.072	1970390	NC			27009	
D 26 M2-8:2FTS										
529.00 > 81.00	3.252	3.256	-0.004	1.277	980771	2.12		88.7	24518	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.252	3.257	-0.005	1.000	464256	0.8391		87.6	19766	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.252	3.257	-0.005	1.118	926280	0.9767		102	21977	
549.00 > 99.00	3.252	3.257	-0.005	1.118	366446		2.53(1.33-3.97)		3031	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.265	3.263	0.002	1.000	935343	0.9026		90.3	2723	
513.00 > 169.00	3.265	3.263	0.002	1.000	166828		5.61(2.36-7.09)		6089	
D 23 13C2 PFDA										
515.00 > 470.00	3.265	3.269	-0.004	1.282	2427175	2.39		95.4	89007	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.294	3.300	-0.006	1.000	1542742	0.9528		95.3	33768	
D 21 13C8 FOSA										
506.00 > 78.00	3.294	3.307	-0.013	1.293	4100943	1.66		66.5	58698	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.415	3.420	-0.005	1.340	494284	2.00		80.1	15503	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.415	3.422	-0.007	1.000	190381	0.9471		94.7	2814	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.573	3.571	0.002	1.228	736621	0.8583		89.0	22415	
599.00 > 99.00	3.573	3.571	0.002	1.228	255221		2.89(1.39-4.16)		3860	
D 30 13C2 PFUnA										
565.00 > 520.00	3.584	3.589	-0.005	1.407	1686964	2.15		86.1	59144	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.573	3.589	-0.016	1.403	534610	2.02		80.8	3554	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.584	3.593	-0.009	1.000	712199	0.8565		85.7	1542	
563.00 > 169.00	3.584	3.593	-0.009	1.000	123874		5.75(2.12-6.36)		4285	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.584	3.593	-0.009	1.003	169635	0.8901		89.0	4730	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.738	3.747	-0.009	1.285	3023687	NC			56529	
D 36 13C2 PFDoA										
615.00 > 570.00	3.874	3.878	-0.004	1.521	1533988	2.26		90.4	17728	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.874	3.883	-0.009	1.000	607116	0.9138		91.4	111	
613.00 > 169.00	3.874	3.883	-0.009	1.000	137977		4.40(2.13-6.40)		3627	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.131	4.139	-0.008	1.066	514706	0.8901		89.0	158	
663.00 > 169.00	4.131	4.139	-0.008	1.066	166804		3.09(1.25-3.76)		1887	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.361	4.371	-0.010	1.000	123284	0.9279		92.8	1575	
713.00 > 219.00	4.361	4.371	-0.010	1.000	83553		1.48(0.71-2.13)		1069	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.361	4.373	-0.012	1.712	1233051	2.16		86.6	5477	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.758	4.766	-0.008	1.000	613084	NC			31.7	
813.00 > 169.00	4.758	4.766	-0.008	1.000	99074		6.19(2.86-8.58)		1083	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.758	4.768	-0.010	1.868	1652171	1.68		67.3	3073	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.086	5.094	-0.008	1.069	649816	NC			257	
913.00 > 169.00	5.086	5.094	-0.008	1.069	80086		8.11(3.83-11.48)		693	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 06-Aug-2018 16:59:59 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180805-62176.b\2018.08.05LLA_032.d

Injection Date: 06-Aug-2018 03:35:35 Instrument ID: A8_N

Lims ID: LCS 320-236486/2-A

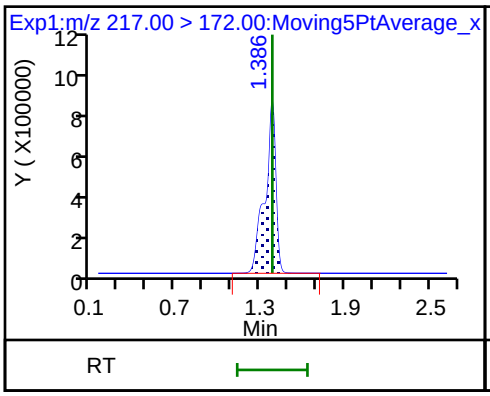
Client ID:

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 3

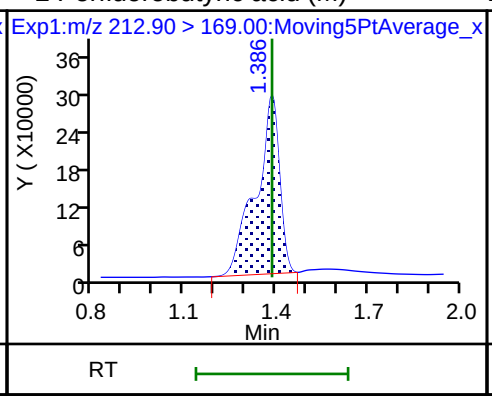
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

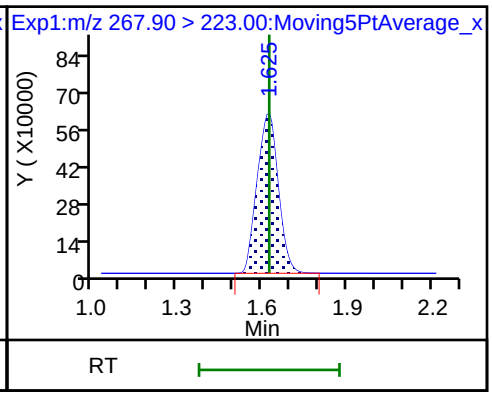
D 1 13C4 PFBA



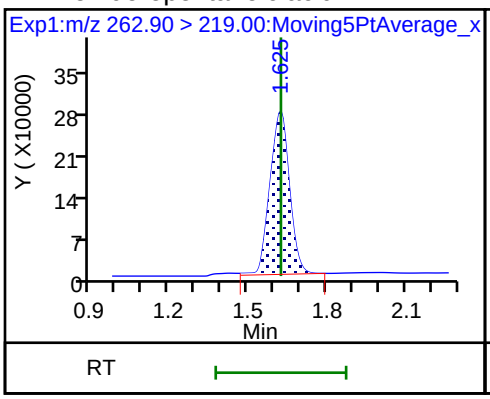
2 Perfluorobutyric acid (M)



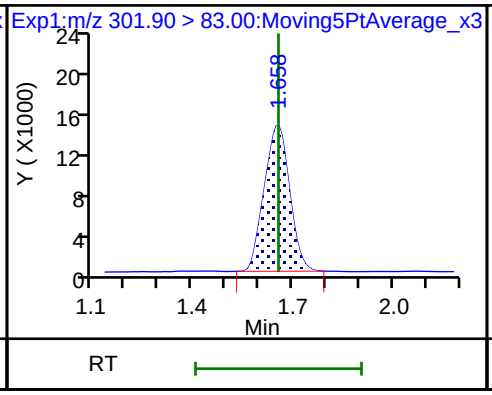
D 3 13C5-PFPeA



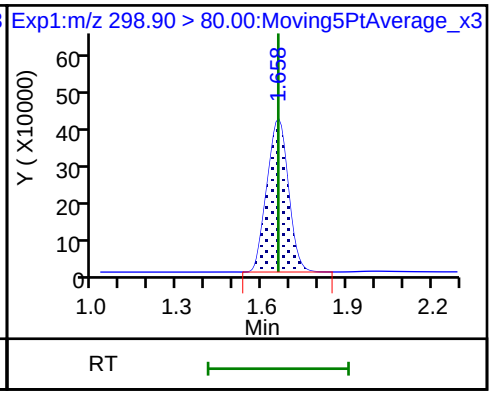
4 Perfluoropentanoic acid



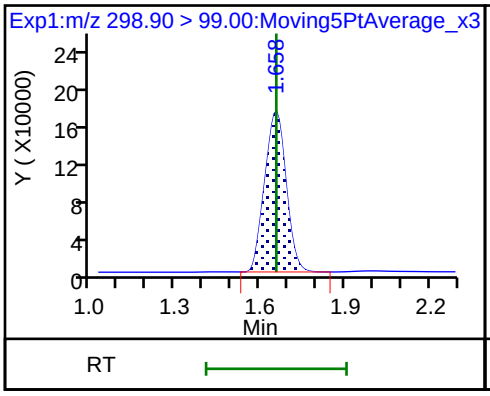
D 47 13C3-PFBS



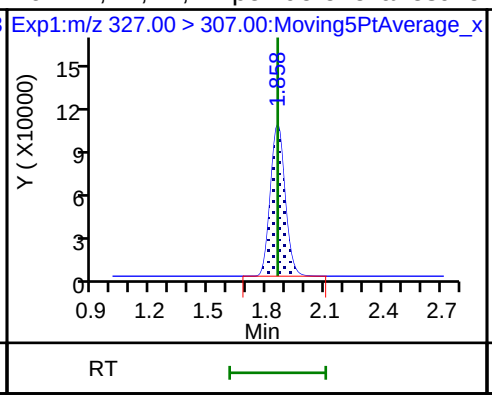
5 Perfluorobutanesulfonic acid



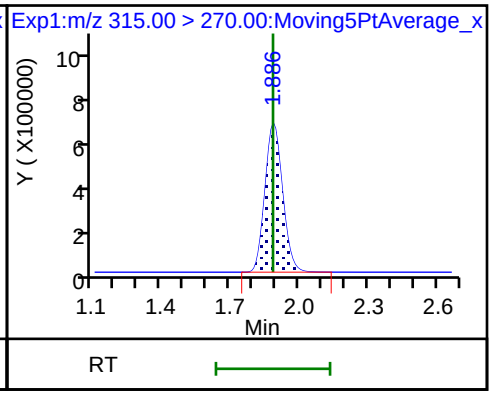
5 Perfluorobutanesulfonic acid



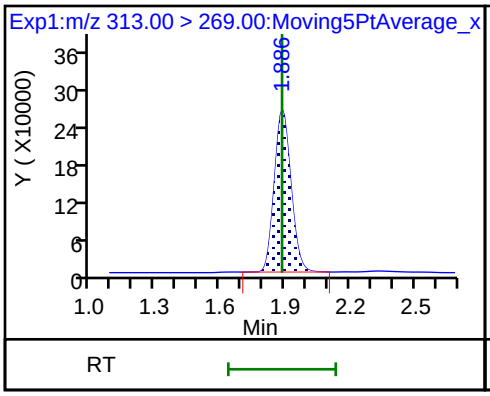
61 1H,1H,2H,2H-perfluorohexanesulfon



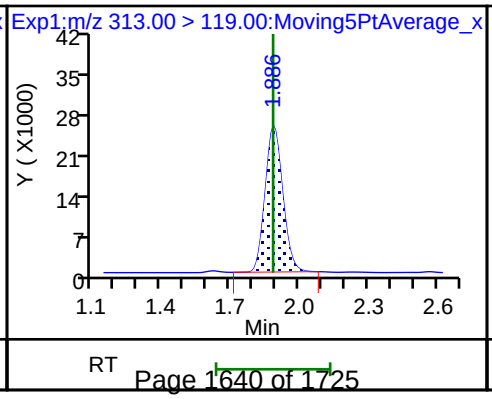
D 7 13C2 PFHxA



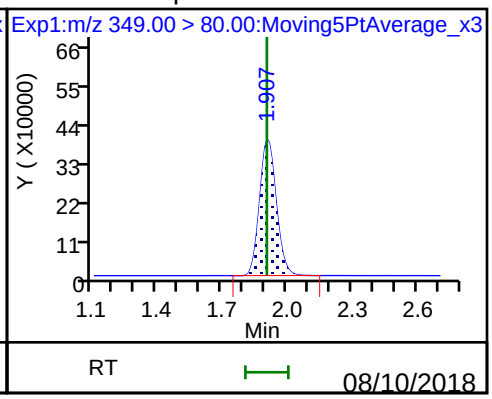
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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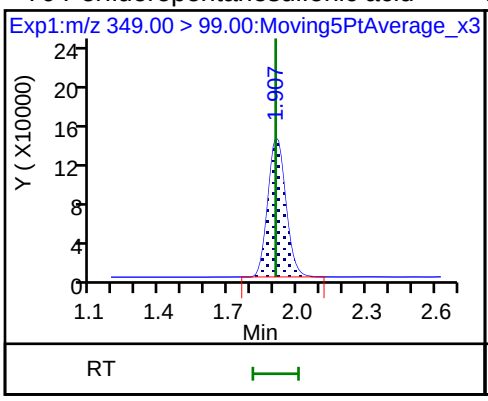
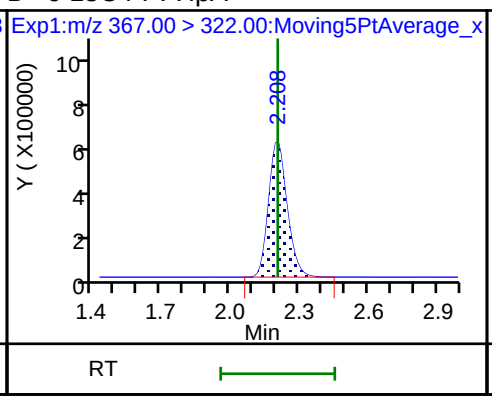
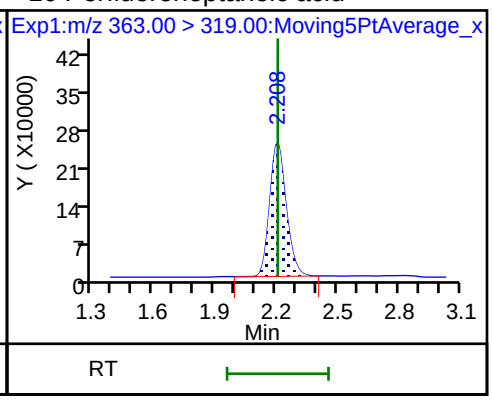


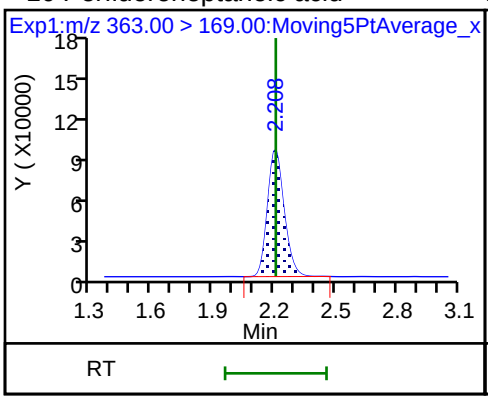
D 9 13C4-PFHpA



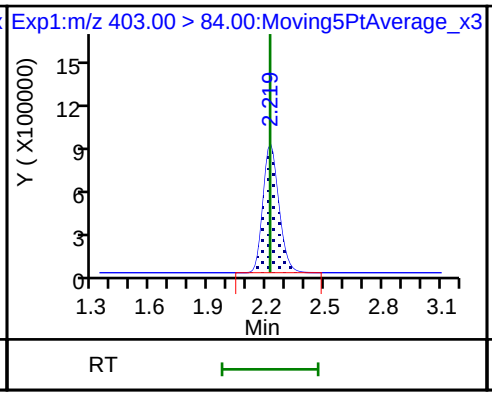
10 Perfluoroheptanoic acid



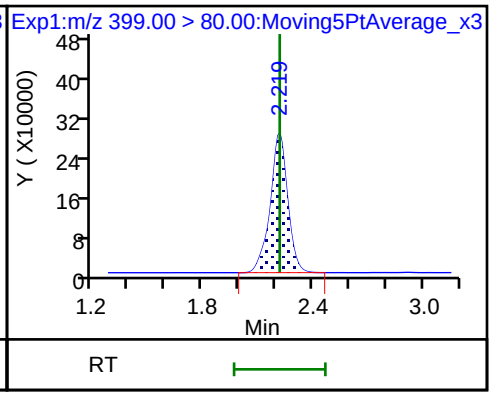
10 Perfluoroheptanoic acid



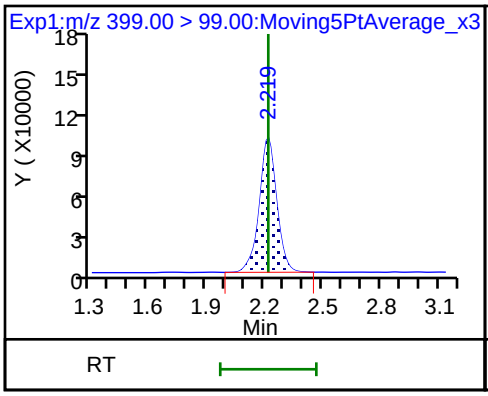
D 11 18O2 PFHxS



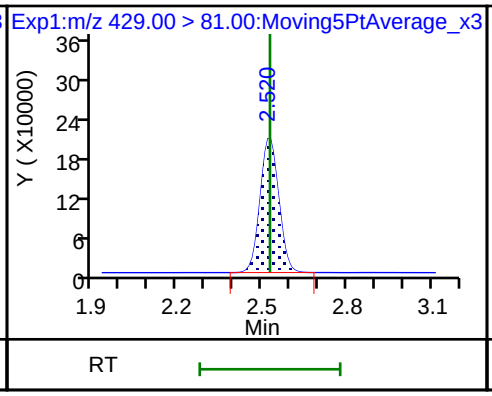
8 Perfluorohexanesulfonic acid



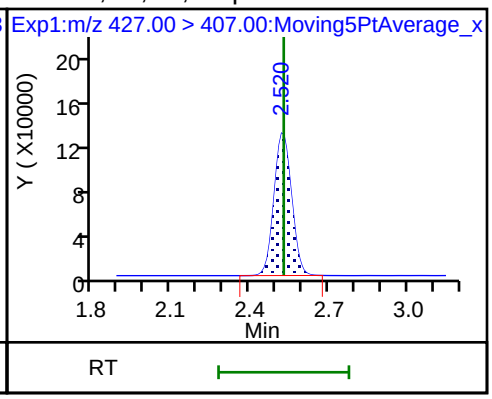
8 Perfluorohexanesulfonic acid



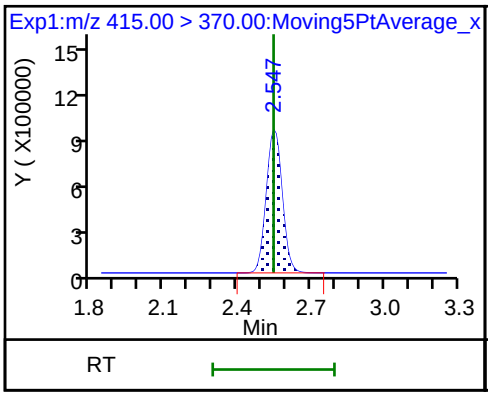
D 12 M2-6:2FTS



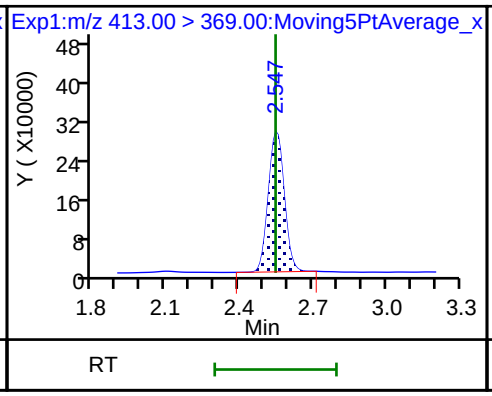
13 1H,1H,2H,2H-perfluorooctanesulfoni



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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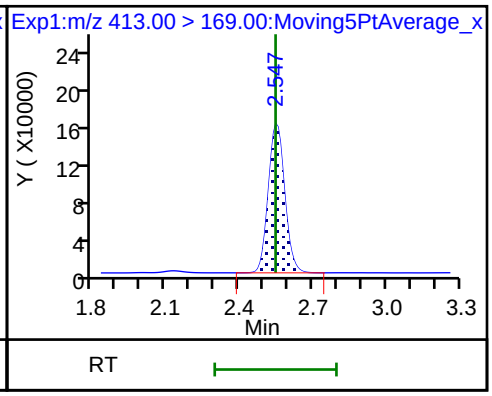
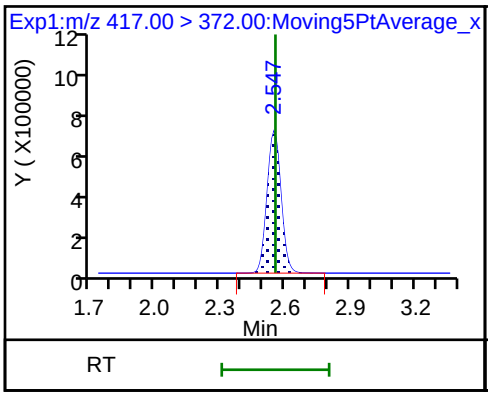
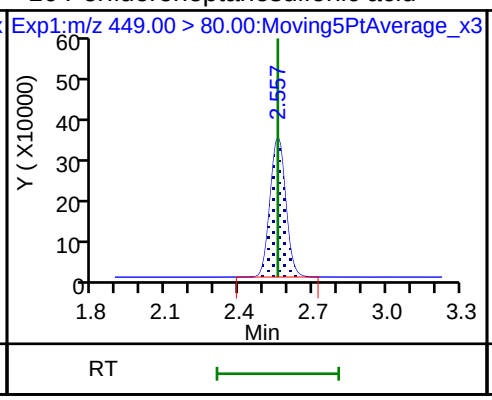


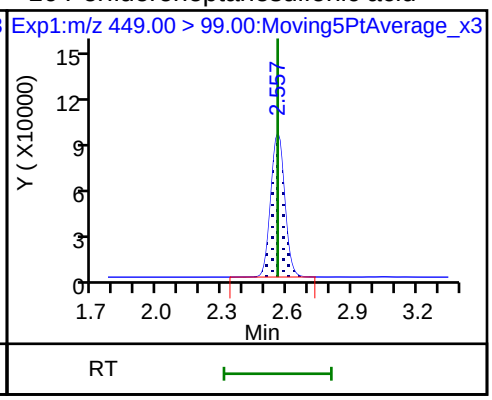
D 14 13C4 PFOA



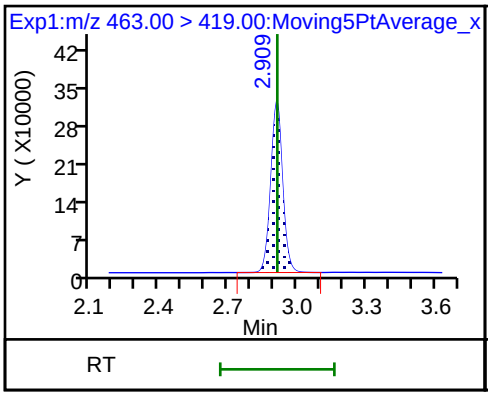
16 Perfluoroheptanesulfonic acid



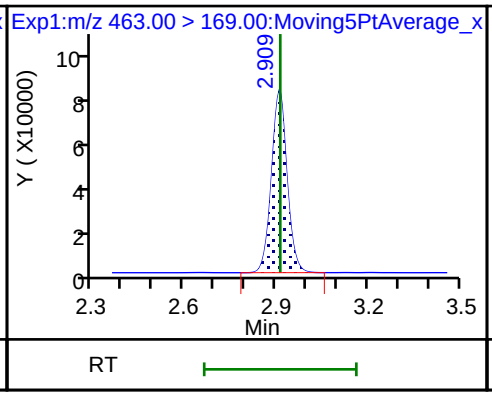
16 Perfluoroheptanesulfonic acid



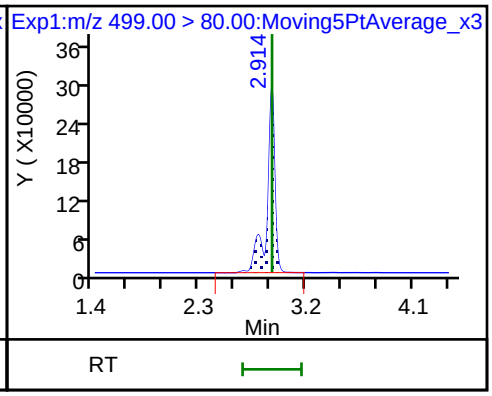
20 Perfluorononanoic acid



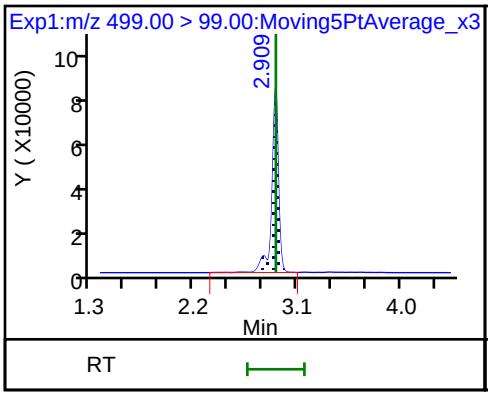
20 Perfluorononanoic acid



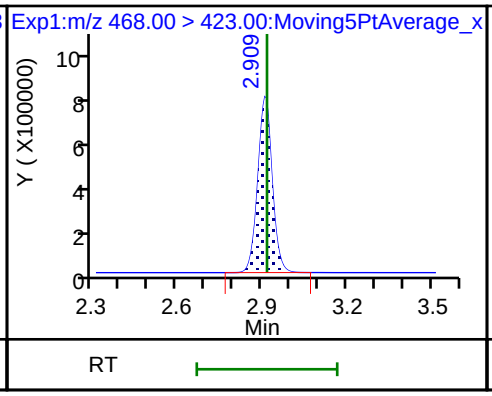
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



D 19 13C5 PFNA



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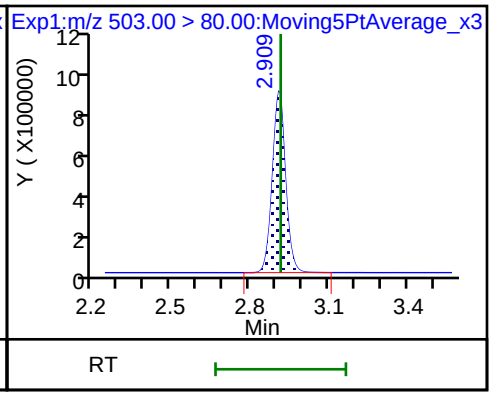
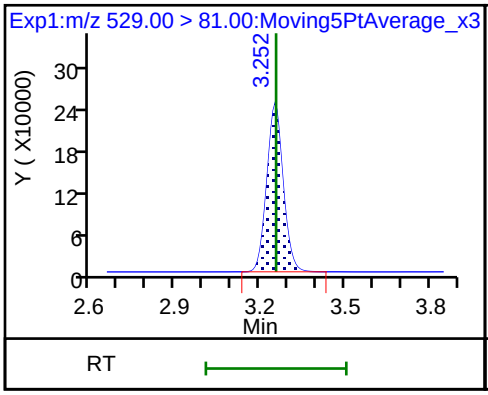
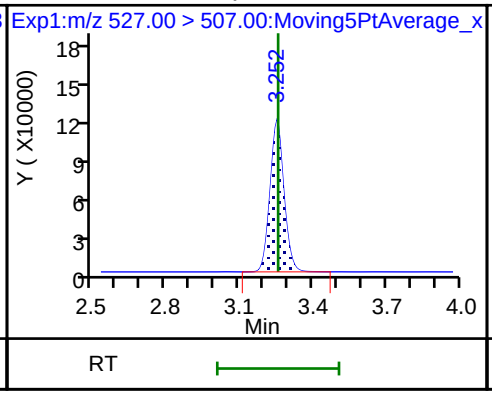


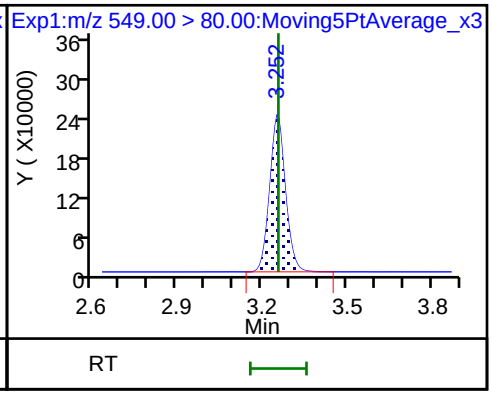
D 26 M2-8:2FTS



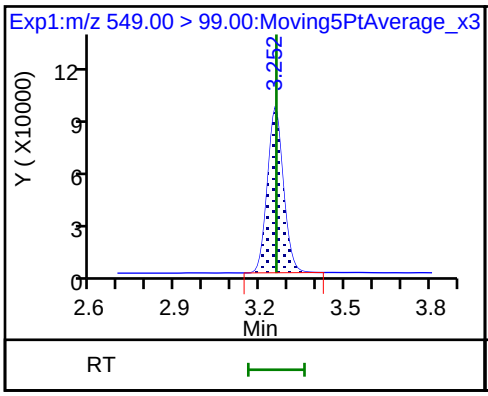
25 1H,1H,2H,2H-perfluorodecanesulfoni



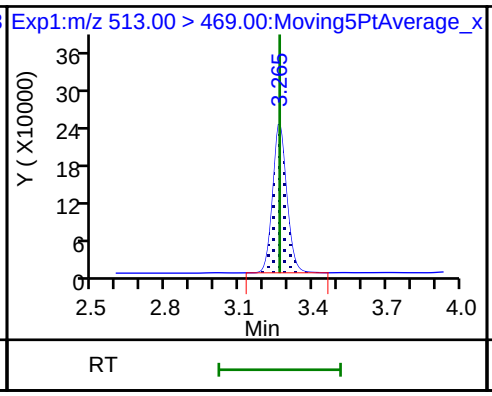
68 Perfluorononanesulfonic acid



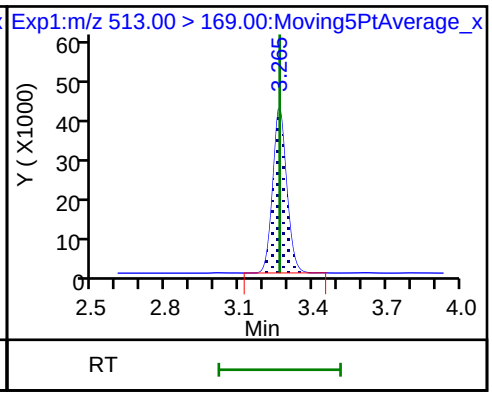
68 Perfluorononanesulfonic acid



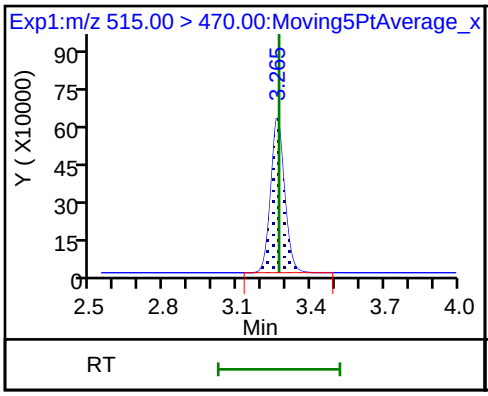
24 Perfluorodecanoic acid



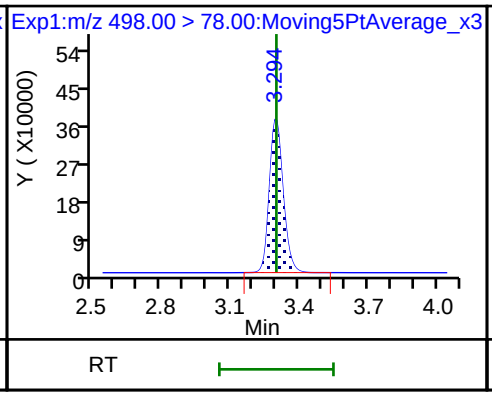
24 Perfluorodecanoic acid



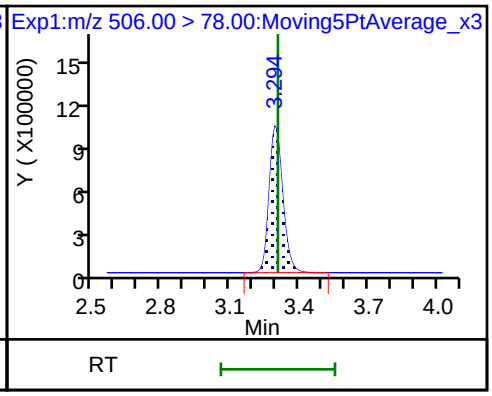
D 23 13C2 PFDA



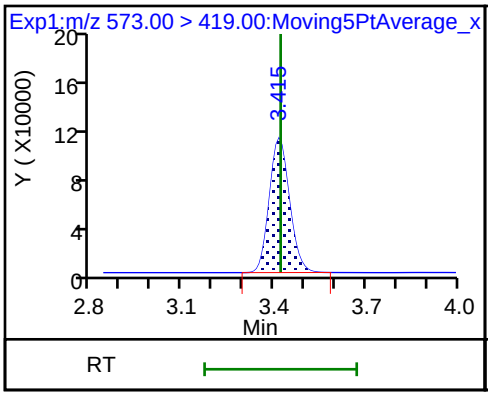
22 Perfluorooctane Sulfonamide



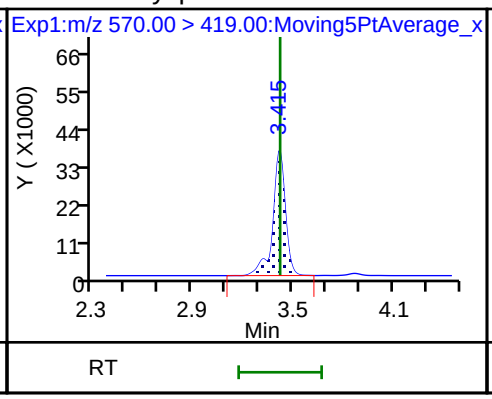
D 21 13C8 FOSA



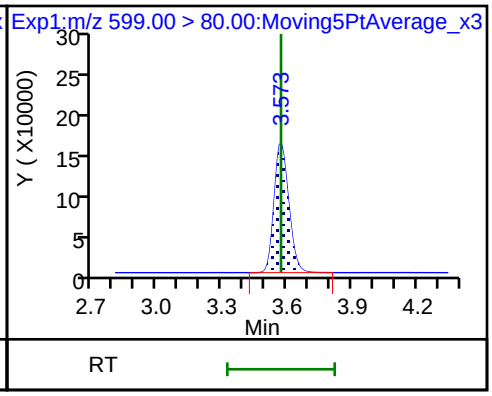
D 27 d3-NMeFOSAA



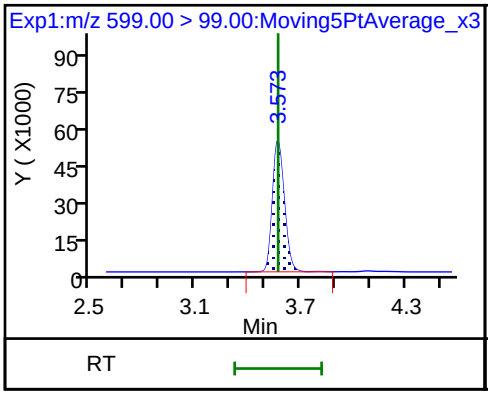
28 N-methyl perfluorooctane sulfonami



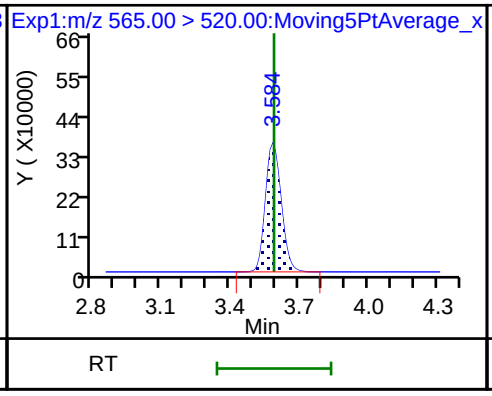
29 Perfluorodecane Sulfonic acid



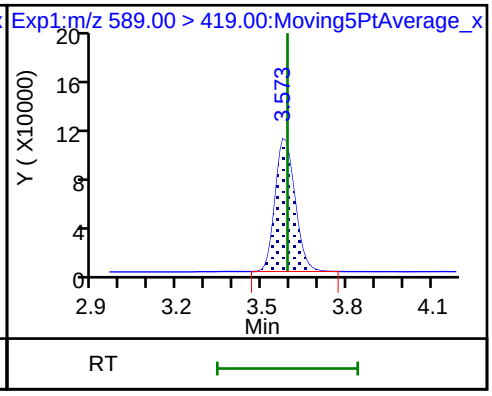
29 Perfluorodecane Sulfonic acid



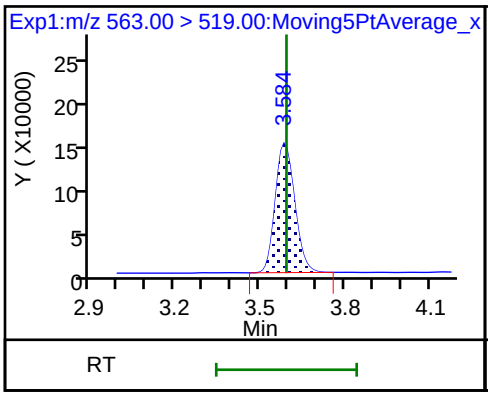
D 30 13C2 PFUnA



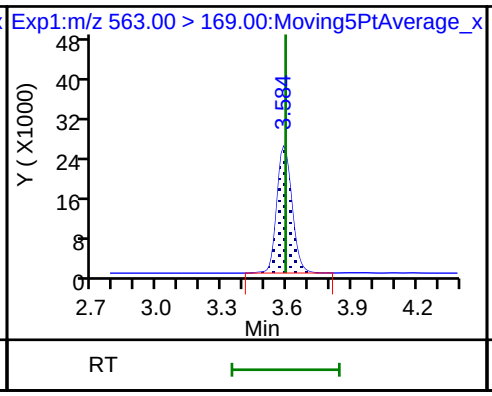
D 32 d5-NEtFOSAA



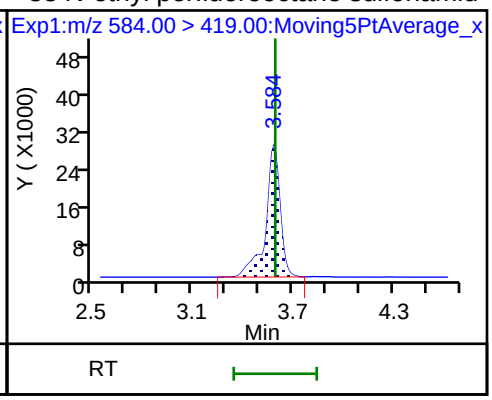
31 Perfluoroundecanoic acid



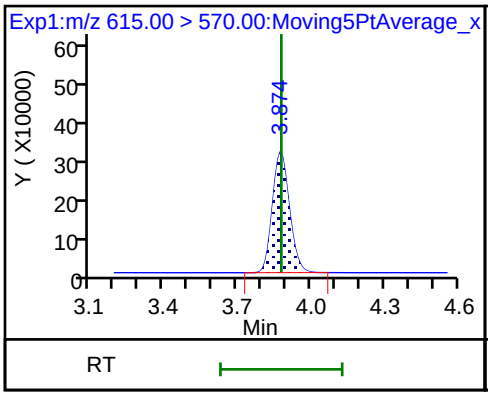
31 Perfluoroundecanoic acid



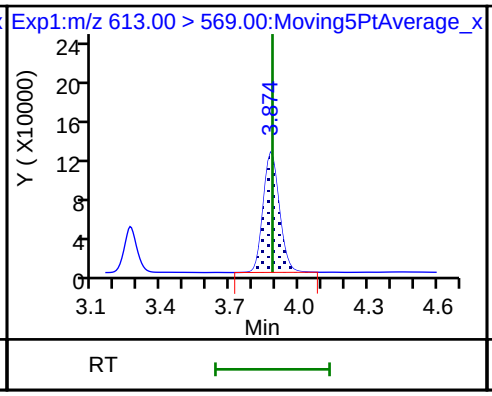
33 N-ethyl perfluorooctane sulfonamid



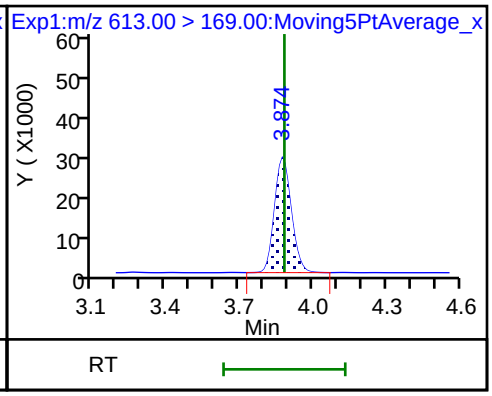
D 36 13C2 PFDoA



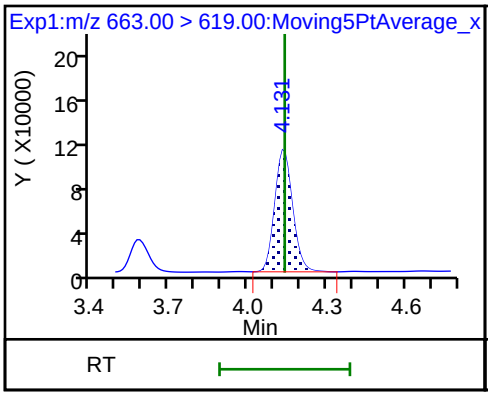
37 Perfluorododecanoic acid



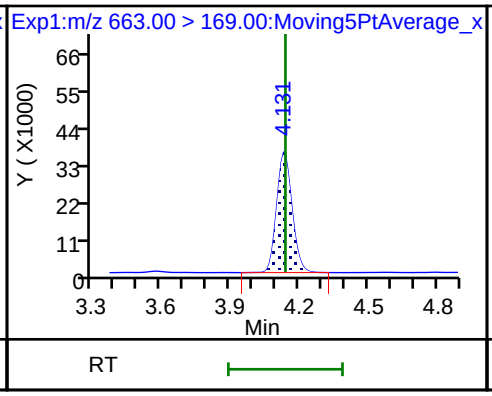
37 Perfluorododecanoic acid



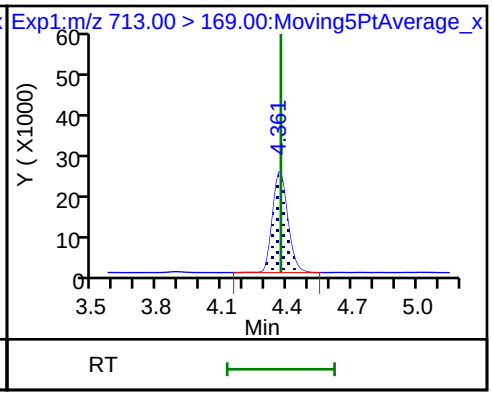
41 Perfluorotridecanoic acid



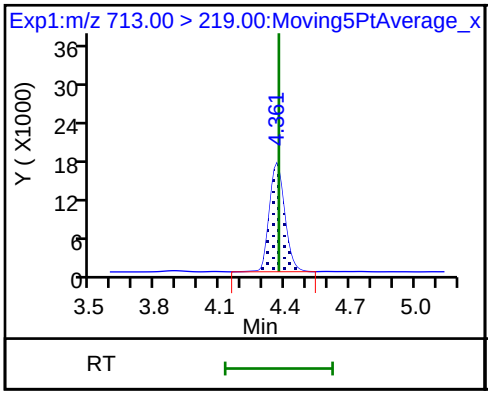
41 Perfluorotridecanoic acid



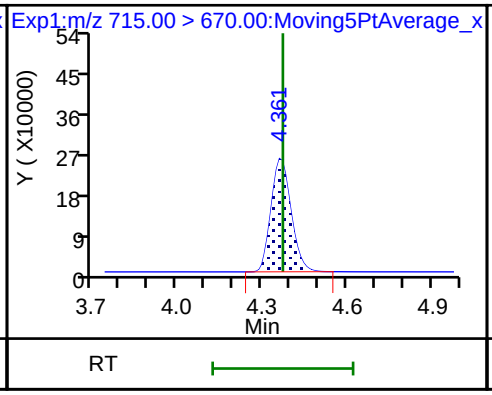
42 Perfluorotetradecanoic acid



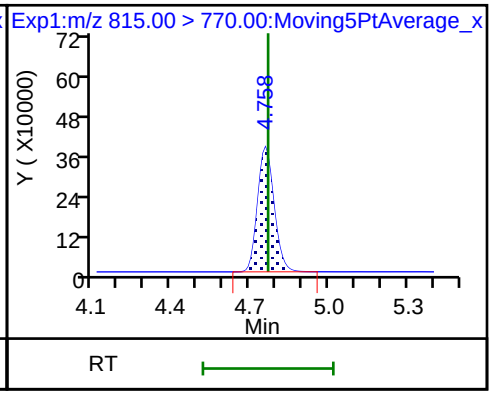
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 8-MW12-PRL03-01 MS | Lab Sample ID: 320-41333-5 MS

Matrix: Water | Lab File ID: 2018.07.28LLB_050.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 08:33

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 307.6(mL) | Date Analyzed: 07/29/2018 06:14

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*672*	*E 4*	*1.6*	1.2	*0.50*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*765*	*E 4*	*1.6*	1.2	*0.44*
375-95-1	Perfluorononanoic acid (PFNA)	82.7		1.6	1.2	0.42
375-73-5	Perfluorobutanesulfonic acid (PFBS)	158	4	1.6	0.81	0.37
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*1460*	*E 4*	*1.6*	0.81	*0.31*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*1070*	*E 4*	*3.3*	2.4	*0.89*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	96		50-150
STL01892	13C4-PFHpA	68		50-150
STL00990	13C4 PFOA	61		50-150
STL00995	13C5 PFNA	83		50-150
STL00994	18O2 PFHxS	75		50-150
STL00991	13C4 PFOS	91		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_050.d
Lims ID: 320-41333-A-5-B MS
Client ID: 8-MW12-PRL03-01
Sample Type: MS
Inject. Date: 29-Jul-2018 06:14:22 ALS Bottle#: 39 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-5-b ms
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:29:11 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:30:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.397	1.397	0.0	0.539	3673569	2.14		85.7	47417	
2 Perfluorobutyric acid										E
212.90 > 169.00	1.397	1.397	0.0	1.000	20355112	14.1		1410	8993	E
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.640	0.001	0.634	2565868	2.14		85.8	28781	
4 Perfluoropentanoic acid										E
262.90 > 219.00	1.641	1.641	0.0	1.000	44889266	36.5		3654	14523	E
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.675	0.0	0.647	70195	2.24		96.2	222	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.676	-0.001	1.000	11665345	4.87		551	4574	
298.90 > 99.00	1.675	1.676	-0.001	1.000	5150247		2.27(1.25-3.74)		9040	
D 60 M2-4:2FTS										
329.00 > 81.00	1.711	1.876	-0.165	0.661	48060	NC			34.2	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.877	1.877	0.0	1.120	1631961	3.16		339	41874	
D 7 13C2 PFHxA										
315.00 > 270.00	1.917	1.905	0.012	0.740	2782432	1.98		79.3	53965	
6 Perfluorohexanoic acid										E
313.00 > 269.00	1.917	1.917	0.0	1.000	40872917	34.6		3465	43871	E
313.00 > 119.00	1.917	1.917	0.0	1.000	4588938		8.91(5.03-15.10)		52300	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.938	1.939	-0.001	1.157	13843192	6.44		686	38156	
349.00 > 99.00	1.938	1.939	-0.001	1.157	5443288		2.54(1.36-4.07)		24482	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.015	2.003	0.012	0.778	329681	NC			7777	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.015	2.004	0.011	1.000	285464	NC			710	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.229	0.001	0.861	2464964	1.70		68.2	48647	
10 Perfluoroheptanoic acid										E
363.00 > 319.00	2.230	2.230	0.0	1.000	22477911	20.7		2068	34634	E
363.00 > 169.00	2.242	2.230	0.012	1.005	9406912		2.39(1.13-3.40)		78243	
D 11 18O2 PFHxS										
403.00 > 84.00	2.255	2.241	0.014	0.871	3277880	1.76		74.6	47690	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.255	2.242	0.013	1.000	72548507	44.9		4930	40769	E
399.00 > 99.00	2.255	2.242	0.013	1.000	31069249		2.34(1.50-4.49)		42135	
65 ADONA										
377.00 > 251.00	2.281	2.282	-0.001	0.772	3475343	NC			46961	
377.00 > 85.00	2.281	2.282	-0.001	0.772	2039799		1.70(0.84-2.53)		7052	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.566	2.557	0.009	1.000	63553919	141.3		14909	72385	E
D 12 M2-6:2FTS										
429.00 > 81.00	2.566	2.564	0.002	0.991	633057	1.57		66.0	5495	
D 14 13C4 PFOA										
417.00 > 372.00	2.590	2.588	0.002	1.000	2165073	1.53		61.2	39057	
* 62 13C2-PFOA										
415.00 > 370.00	2.590	2.590	0.0		3696449	2.50			43373	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.598	2.590	0.008	1.003	24734142	23.5		2351	28528	E
413.00 > 169.00	2.590	2.590	0.0	1.000	14198596		1.74(0.84-2.52)		41344	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.598	2.598	0.0	0.879	4462807	2.73		287	305	
449.00 > 99.00	2.598	2.598	0.0	0.879	1206293		3.70(1.94-5.82)		632	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.955	2.950	0.005	1.000	43102743	33.1		3563	52175	E
499.00 > 99.00	2.955	2.950	0.005	1.000	9453640		4.56(2.31-6.93)		41799	
20 Perfluorononanoic acid										
463.00 > 419.00	2.955	2.950	0.005	1.000	2952530	2.54		254	8707	
463.00 > 169.00	2.955	2.950	0.005	1.000	708269		4.17(1.90-5.69)		6677	
D 19 13C5 PFNA										
468.00 > 423.00	2.955	2.953	0.002	1.141	2542292	2.08		83.4	62974	
D 18 13C4 PFOS										
503.00 > 80.00	2.955	2.953	0.002	1.141	2819756	2.18		91.4	29465	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.166	3.158	0.008	1.071	2030793	NC			18818	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.301	3.294	0.007	1.000	2291043	4.29		448	50943	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.301	3.294	0.007	1.117	870860	0.9883		103	1801	
549.00 > 99.00	3.301	3.294	0.007	1.117	314531		2.77(1.33-3.97)		2068	
D 26 M2-8:2FTS										
529.00 > 81.00	3.301	3.299	0.002	1.275	943005	2.24		93.5	16878	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.309	3.310	-0.001	1.000	1078333	1.02		102	5468	
513.00 > 169.00	3.309	3.310	-0.001	1.000	195046		5.53(2.36-7.09)		5311	
D 23 13C2 PFDA										
515.00 > 470.00	3.309	3.315	-0.006	1.278	2582276	2.66		106	39365	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.317	3.317	0.0	1.000	1740336	1.02		102	2393	
D 21 13C8 FOSA										
506.00 > 78.00	3.317	3.322	-0.005	1.281	4283826	2.26		90.3	34747	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.461	3.467	-0.006	1.336	817376	2.55		102	25312	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.470	3.471	-0.001	1.003	322721	1.00		100	4776	
35 MeFOSA										
512.00 > 169.00	3.499	3.498	0.001		1784	NC			77.2	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.626	3.626	0.0	1.227	749114	0.9575		99.3	17808	
599.00 > 99.00	3.626	3.626	0.0	1.227	229971		3.26(1.39-4.16)		6963	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.635	3.636	-0.001	1.000	917094	0.8898		89.0	4389	
563.00 > 169.00	3.635	3.636	-0.001	1.000	156963		5.84(2.12-6.36)		8149	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.635	3.636	-0.001	1.000	300175	0.9006		90.1	12892	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.635	3.640	-0.005	1.404	893132	2.65		106	3240	
D 30 13C2 PFUnA										
565.00 > 520.00	3.635	3.640	-0.005	1.404	2076408	2.66		106	43843	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.800	3.801	-0.001	1.286	2825705	NC			48956	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.936	3.937	-0.001	1.000	764118	1.00		100	289	
613.00 > 169.00	3.936	3.937	-0.001	1.000	172241		4.44(2.13-6.40)		4010	
D 36 13C2 PFDoA										
615.00 > 570.00	3.936	3.941	-0.005	1.520	1759443	2.37		94.7	16855	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.200	4.200	0.0	1.067	653374	0.8839		88.4	212	
663.00 > 169.00	4.190	4.200	-0.010	1.064	197837		3.30(1.25-3.76)		3814	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.425	4.436	-0.011	1.000	128992	0.9778		97.8	2012	
713.00 > 219.00	4.425	4.436	-0.011	1.000	92184		1.40(0.71-2.13)		1893	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.425	4.437	-0.012	1.709	1315503	1.81		72.5	11241	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.841	4.837	0.004	1.002	430494	NC			104	
813.00 > 169.00	4.832	4.837	-0.005	1.000	69179		6.22(2.86-8.58)		691	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.832	4.842	-0.010	1.866	1187624	1.08		43.1	6109	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.181	5.184	-0.003	1.072	254568	NC			113	
913.00 > 169.00	5.181	5.184	-0.003	1.072	31030		8.20(3.83-11.48)		571	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 12:30:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_050.d

Injection Date: 29-Jul-2018 06:14:22 Instrument ID: A8_N

Lims ID: 320-41333-A-5-B MS

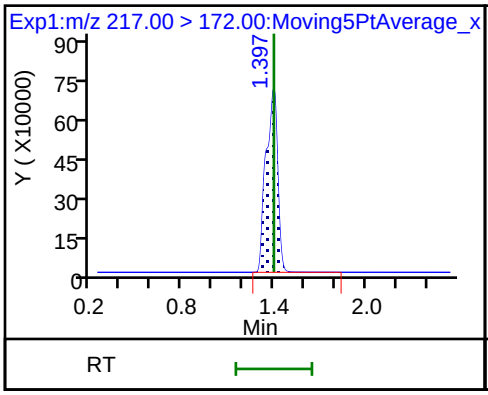
Client ID: 8-MW12-PRL03-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 39 Worklist Smp#: 11

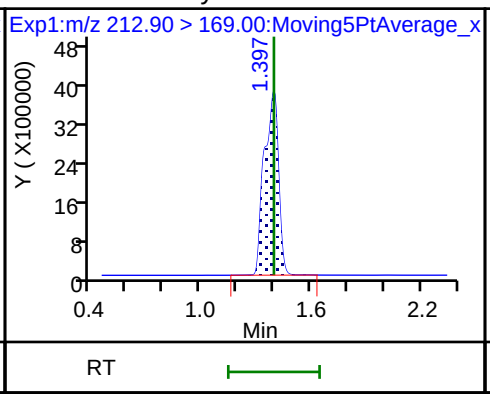
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

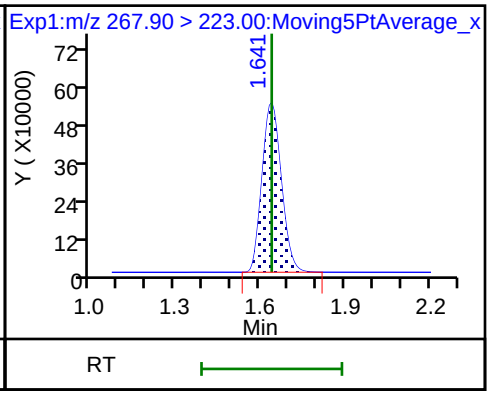
D 1 13C4 PFBA



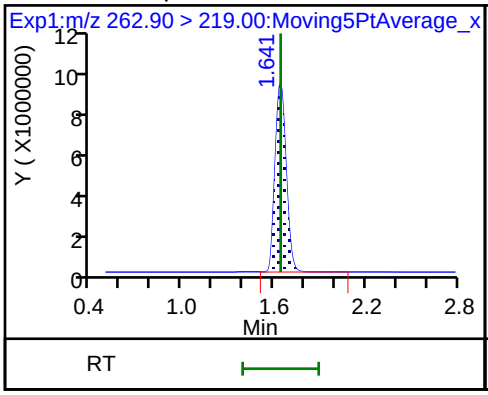
2 Perfluorobutyric acid



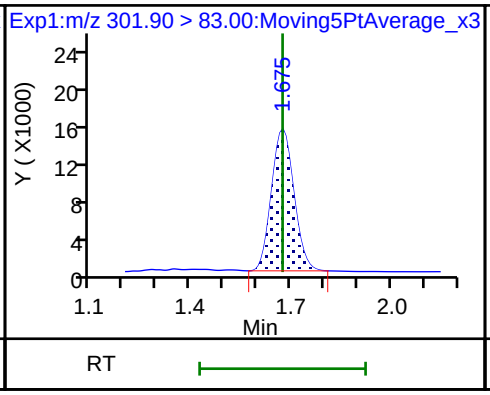
D 3 13C5-PFPeA



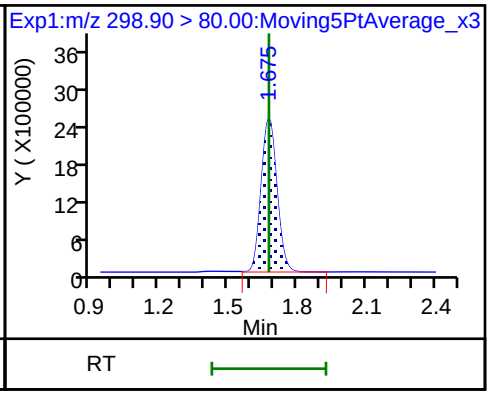
4 Perfluoropentanoic acid



D 47 13C3-PFBS



5 Perfluorobutanesulfonic acid



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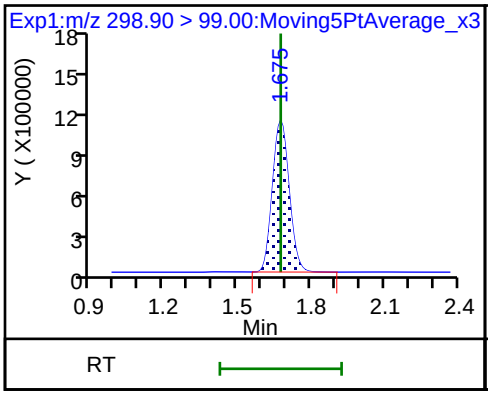
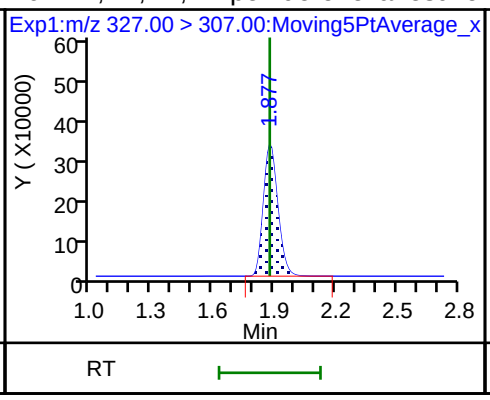
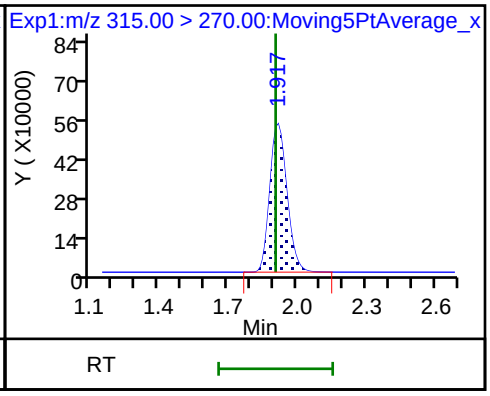


61 1H,1H,2H,2H-perfluorohexanesulfon



D 7 13C2 PFHxA



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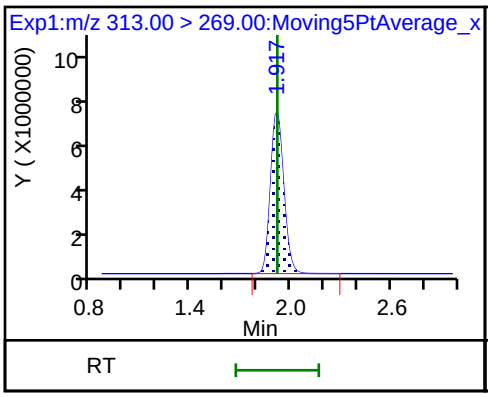
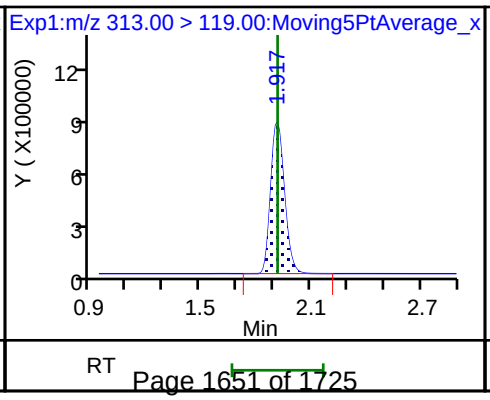
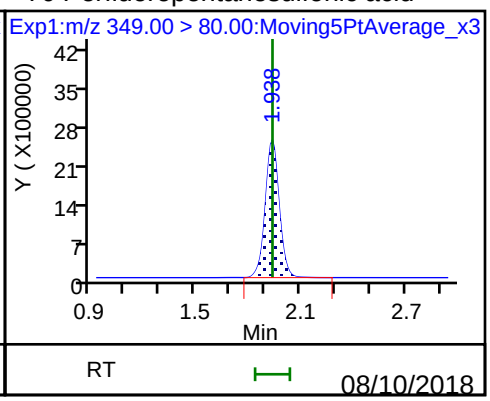


6 Perfluorohexanoic acid



70 Perfluoropentanesulfonic acid



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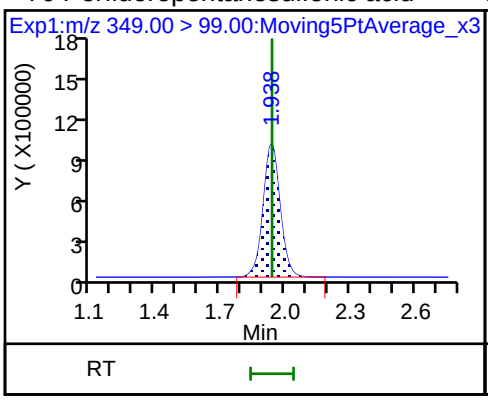
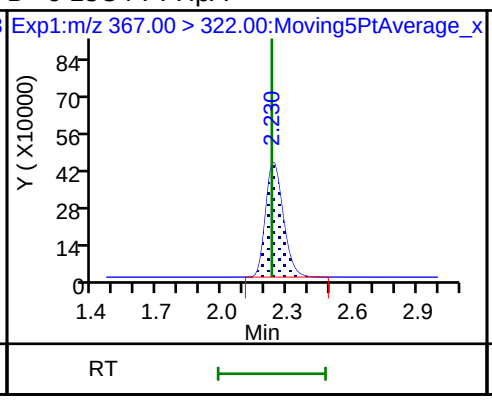
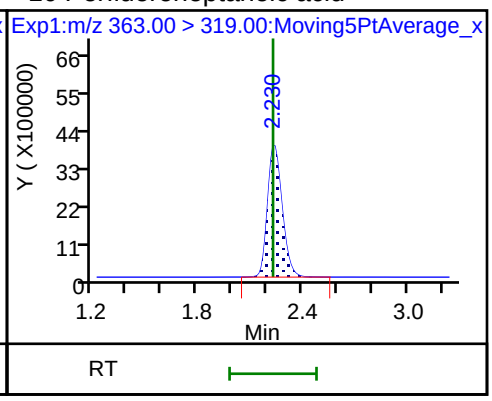


D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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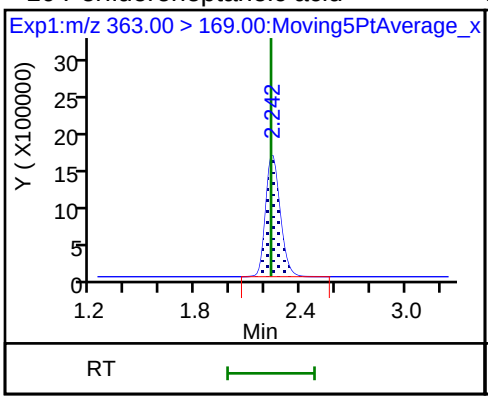
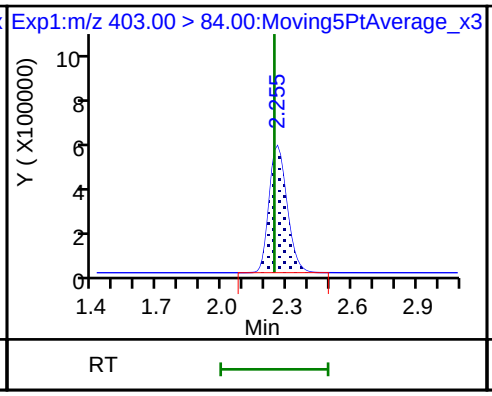
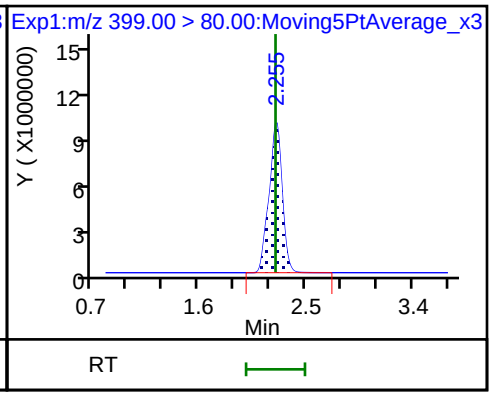


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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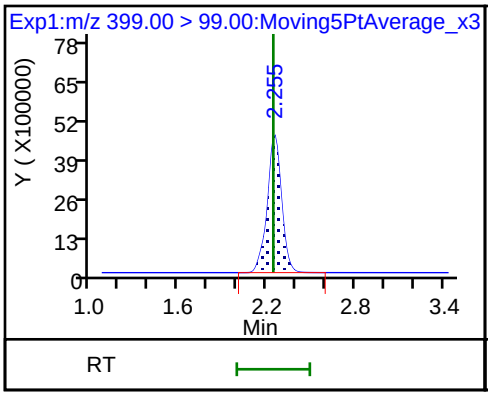
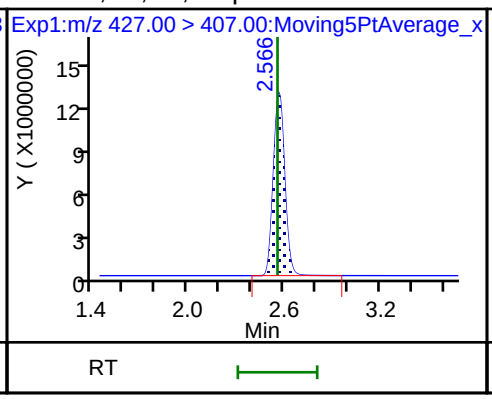
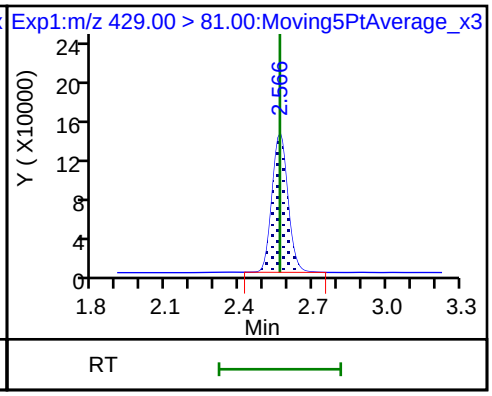


13 1H,1H,2H,2H-perfluorooctanesulfon



D 12 M2-6:2FTS



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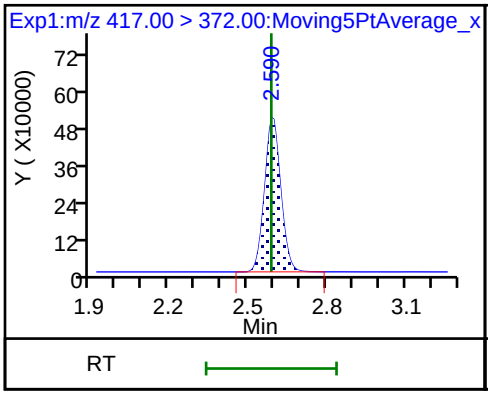
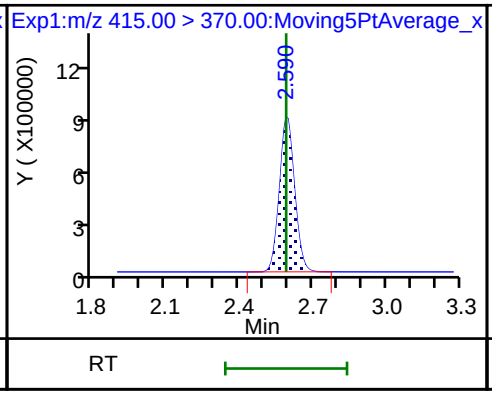
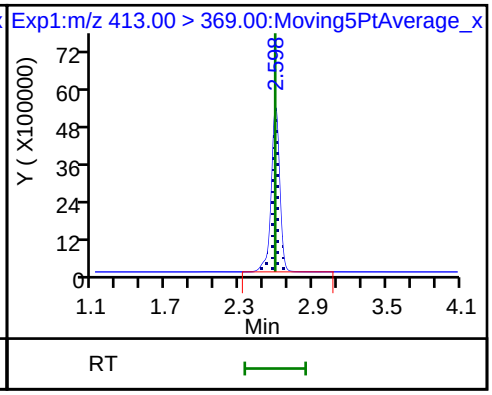


* 62 13C2-PFOA



15 Perfluorooctanoic acid



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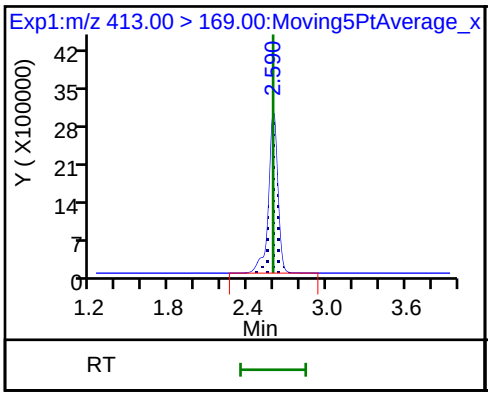
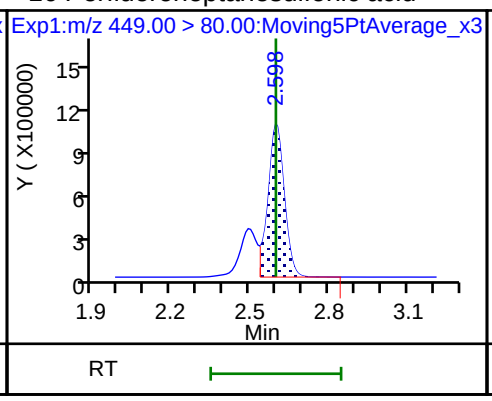


16 Perfluoroheptanesulfonic acid



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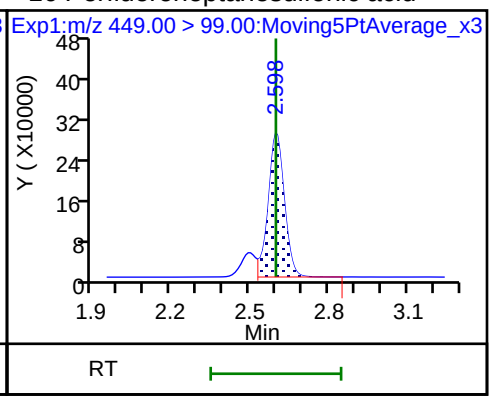
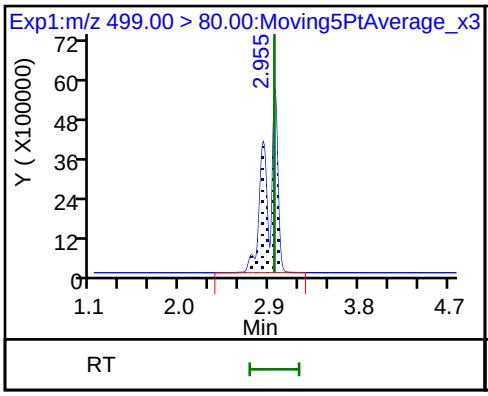


17 Perfluorooctane sulfonic acid



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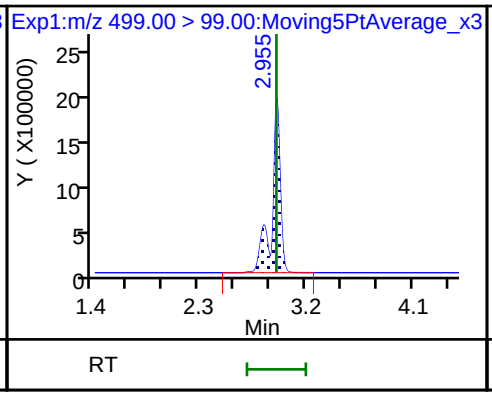
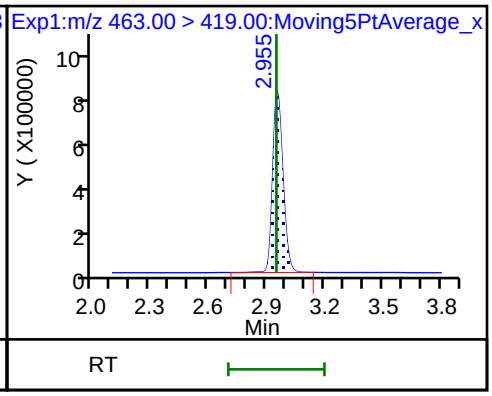


20 Perfluorononanoic acid



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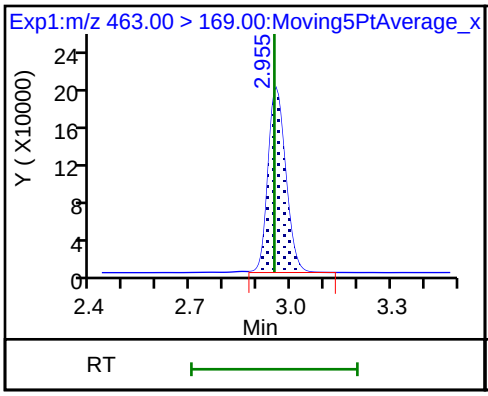
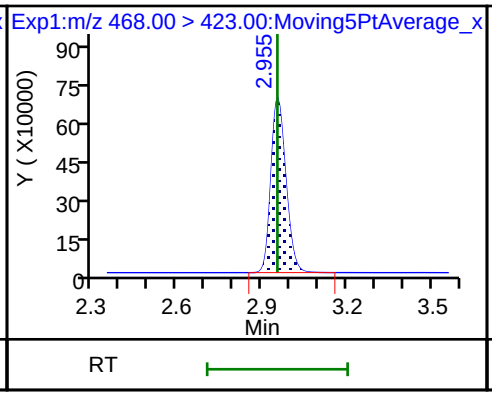
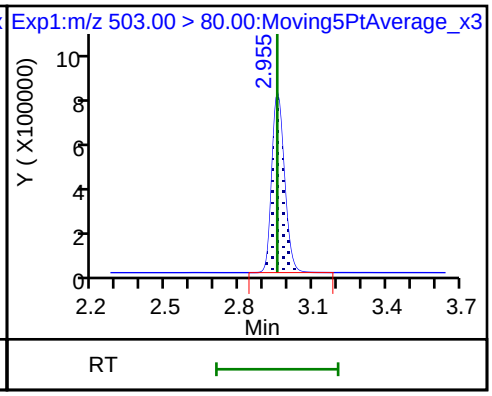


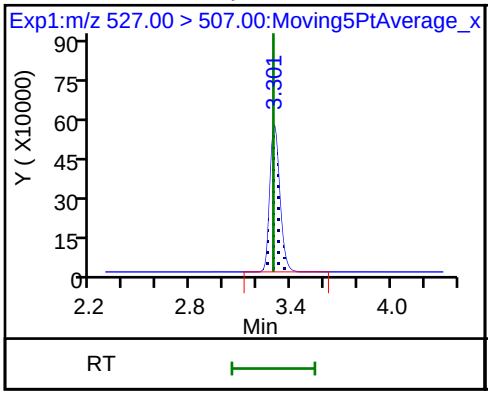
D 19 13C5 PFNA



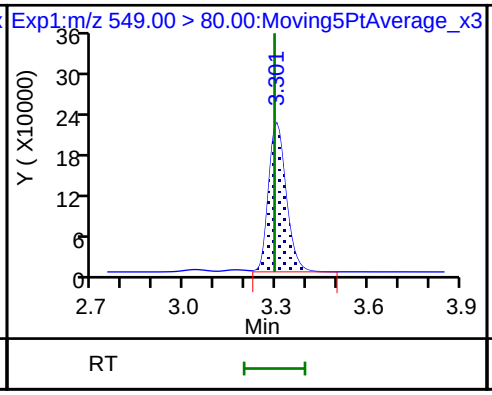
D 18 13C4 PFOS



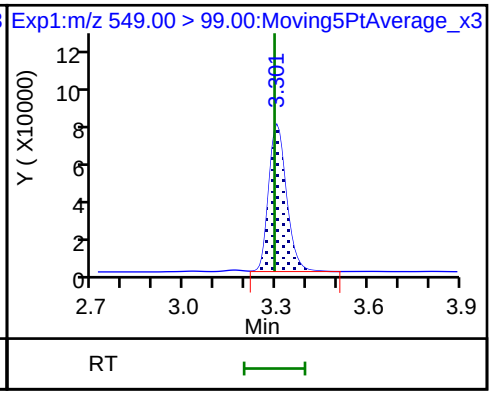
25 1H,1H,2H,2H-perfluorodecanesulfoni



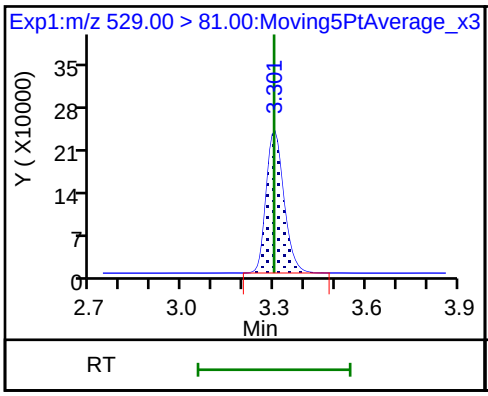
68 Perfluorononanesulfonic acid



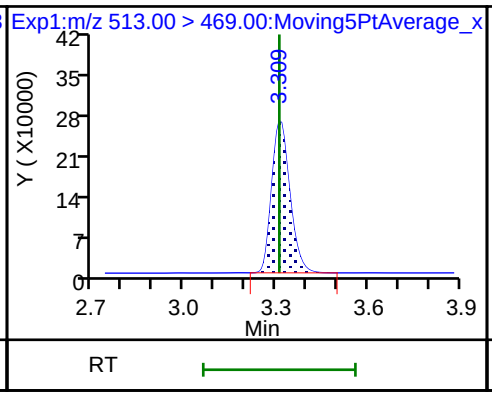
68 Perfluorononanesulfonic acid



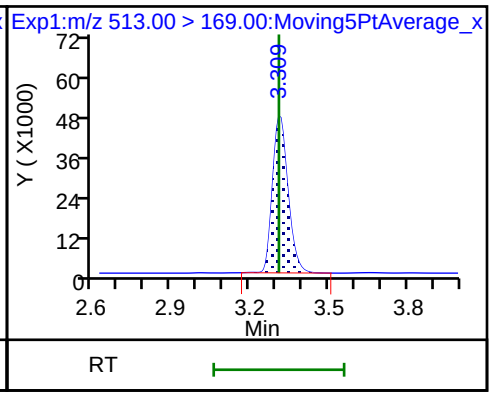
D 26 M2-8:2FTS



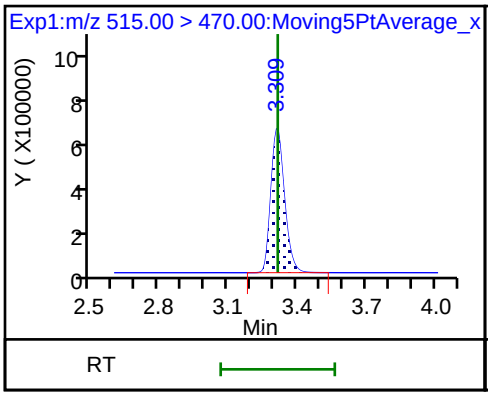
24 Perfluorodecanoic acid



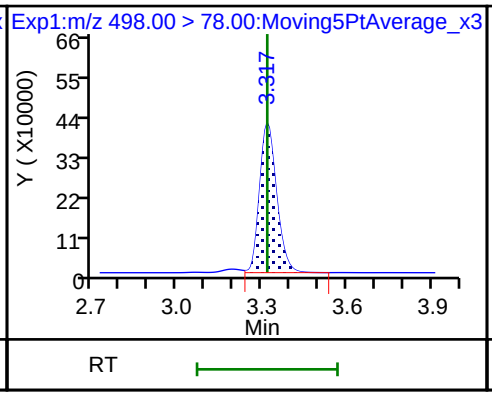
24 Perfluorodecanoic acid



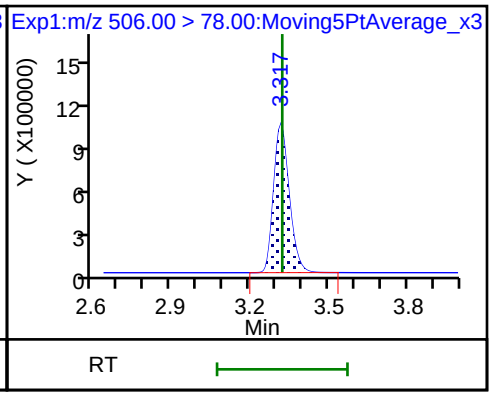
D 23 13C2 PFDA



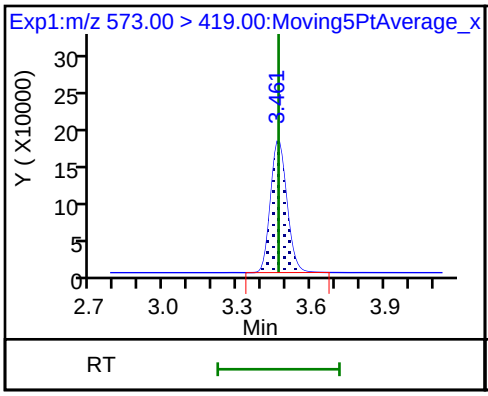
22 Perfluorooctane Sulfonamide



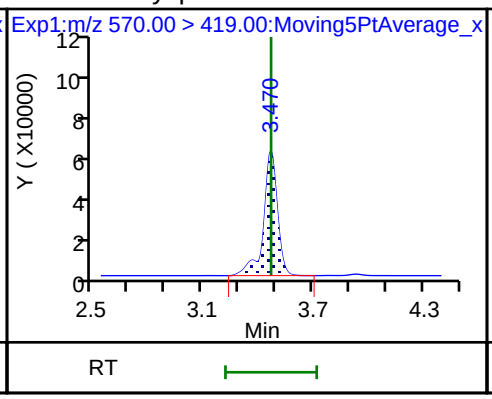
D 21 13C8 FOSA



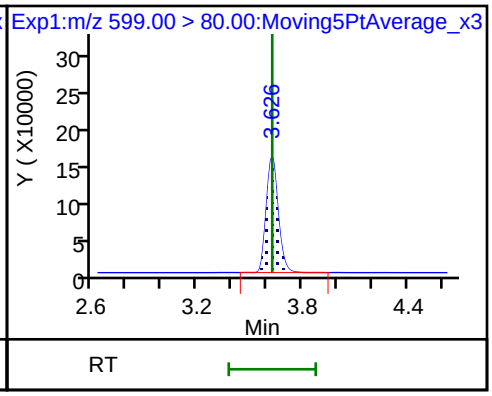
D 27 d3-NMeFOSAA



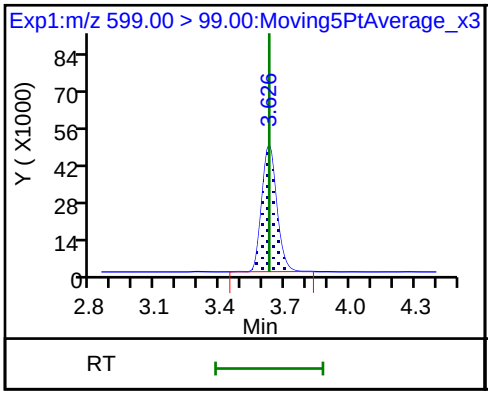
28 N-methyl perfluorooctane sulfonami



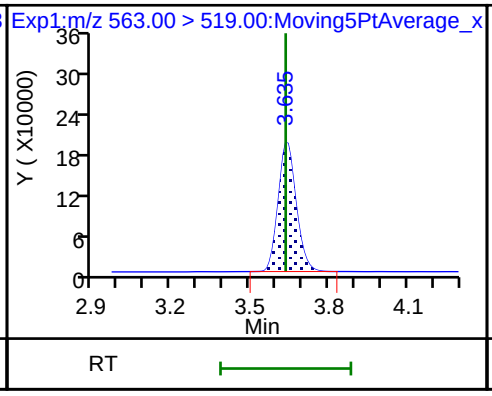
29 Perfluorodecane Sulfonic acid



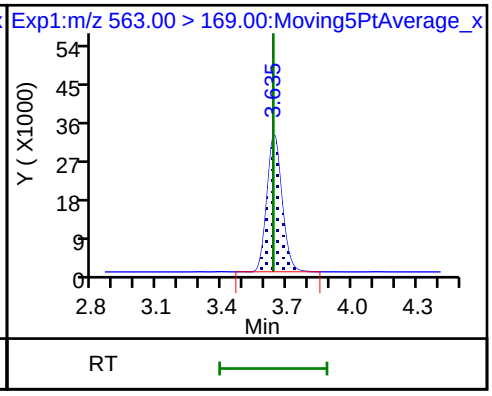
29 Perfluorodecane Sulfonic acid



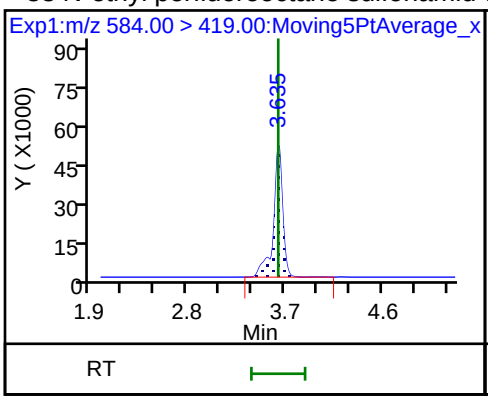
31 Perfluoroundecanoic acid



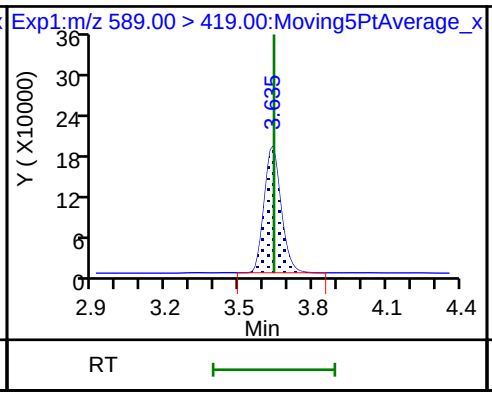
31 Perfluoroundecanoic acid



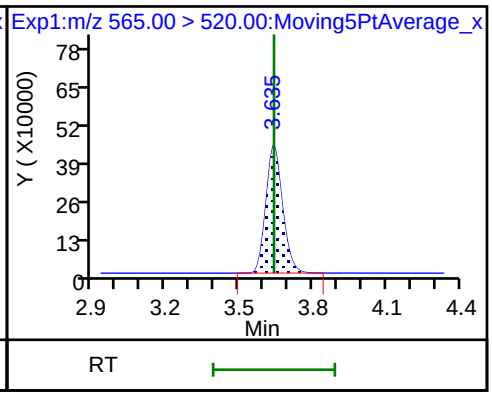
33 N-ethyl perfluorooctane sulfonamid



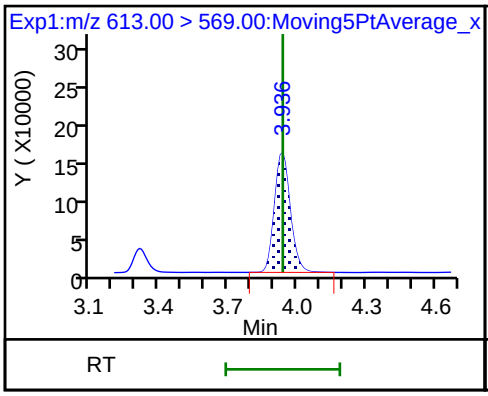
D 32 d5-NEtFOSAA



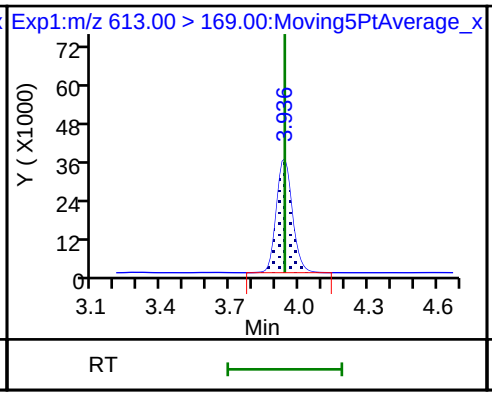
D 30 13C2 PFUnA



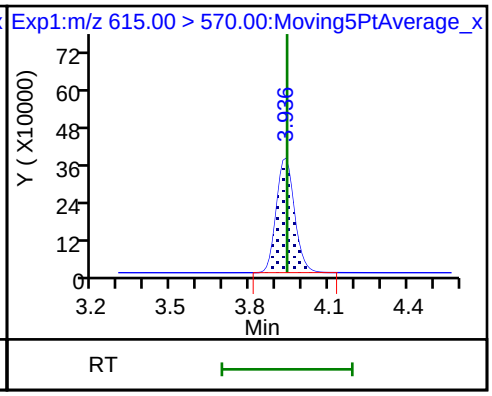
37 Perfluorododecanoic acid



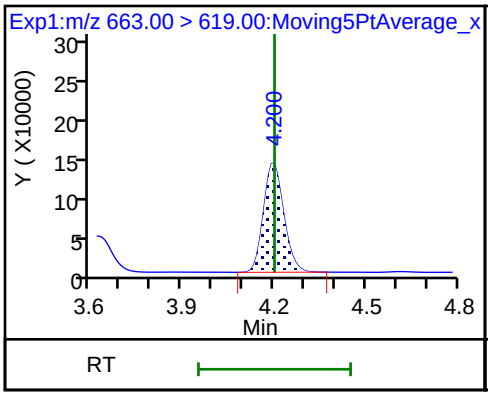
37 Perfluorododecanoic acid



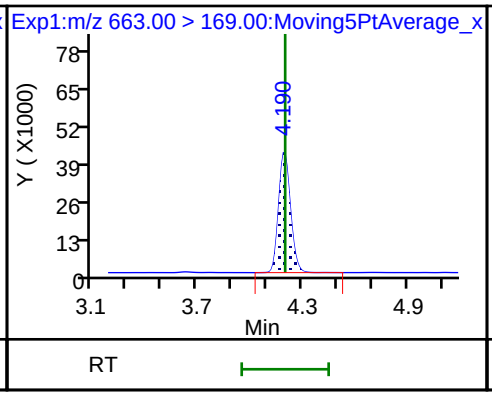
D 36 13C2 PFDoA



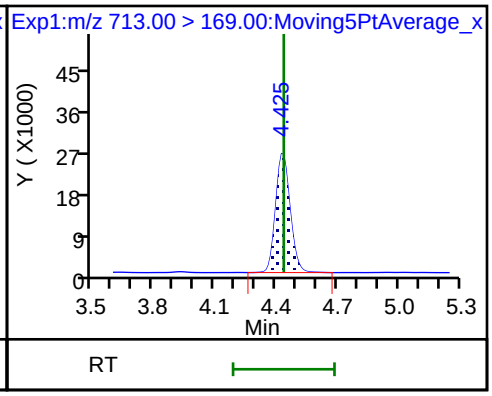
41 Perfluorotridecanoic acid



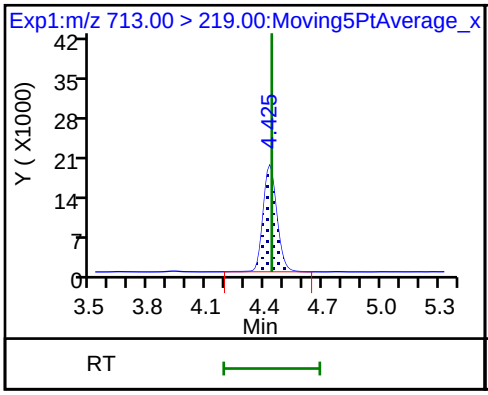
41 Perfluorotridecanoic acid



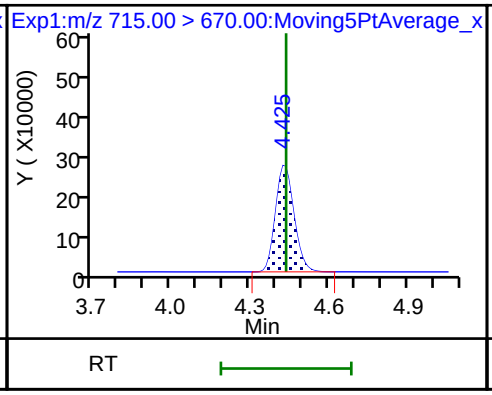
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



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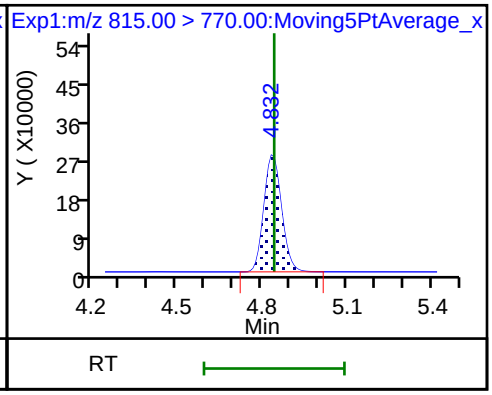


FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 8-MW12-PRL03-01 MS DL | Lab Sample ID: 320-41333-5 MS DL

Matrix: Water | Lab File ID: 2018.08.03LLA_020.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 08:33

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 307.6(mL) | Date Analyzed: 08/03/2018 07:19

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 237784 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	755	4 D	33	24	9.9
335-67-1	Perfluorooctanoic acid (PFOA)	866	4 D	33	24	8.8
375-95-1	*Perfluorononanoic acid (PFNA)*	*91.2*	*J1 D*	*33*	24	*8.5*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*158*	*4 D*	*33*	16	*7.5*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2100	4 D	33	16	6.2
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1160	4 D M	65	49	18

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	63		50-150
STL01892	13C4-PFHpA	62		50-150
STL00990	13C4 PFOA	63		50-150
STL00995	13C5 PFNA	64		50-150
STL00994	18O2 PFHxS	60		50-150
STL00991	13C4 PFOS	55		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_020.d
Lims ID: 320-41333-A-5-B MS
Client ID: 8-MW12-PRL03-01
Sample Type: MS
Inject. Date: 03-Aug-2018 07:19:31 ALS Bottle#: 27 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-41333-a-5-b ms 20X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:21:19 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:21:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.407	0.007	1.000	1406856	0.7350		1470	746	
D 1 13C4 PFBA										
217.00 > 172.00	1.414	1.411	0.003	0.540	242791	0.0765		61.2	4272	
D 3 13C5-PFPeA										
267.90 > 223.00	1.667	1.653	0.014	0.636	171679	0.0822		65.7	5694	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.667	1.656	0.011	1.000	4028411	2.45		4899	1850	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.690	0.004	0.646	4409	0.0734		63.1	29.1	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.703	1.692	0.011	1.005	705512	0.2427		549	1109	
298.90 > 99.00	1.703	1.692	0.011	1.005	311825		2.26(1.25-3.74)		1491	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.907	1.894	0.013	1.126	141189	0.2163		463	6608	
D 7 13C2 PFHxA										
315.00 > 270.00	1.950	1.935	0.016	0.744	183576	0.0812		64.9	8408	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.937	0.002	0.994	3486069	2.25		4502	13724	
313.00 > 119.00	1.950	1.937	0.013	1.000	312494		11.16(5.03-15.10)		4762	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.960	1.959	0.001	1.157	841809	0.3281		700	7245	
349.00 > 99.00	1.971	1.959	0.012	1.164	314688		2.68(1.36-4.07)		3599	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.038	2.025	0.013	1.000	17873	NC			108	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.038	2.033	0.005	0.778	10656	NC			275	
D 9 13C4-PFHpA										
367.00 > 322.00	2.269	2.251	0.018	0.866	169739	0.0774		62.0	5799	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.269	2.253	0.016	1.000	1829329	1.16		2323	1104	
363.00 > 169.00	2.269	2.253	0.016	1.000	659865		2.77(1.13-3.40)		10262	
D 11 18O2 PFHxS										
403.00 > 84.00	2.282	2.264	0.018	0.871	233777	0.0710		60.0	9867	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.282	2.266	0.016	1.000	7380386	3.23		7098	16501	
399.00 > 99.00	2.282	2.266	0.016	1.000	2380923		3.10(1.50-4.49)		5549	
65 ADONA										
377.00 > 251.00	2.308	2.305	0.003	0.774	191324	NC			2708	
377.00 > 85.00	2.308	2.305	0.003	0.774	116552		1.64(0.84-2.53)		479	
D 12 M2-6:2FTS										
429.00 > 81.00	2.597	2.579	0.018	0.991	86666	0.1350		114	1982	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.597	2.588	0.009	1.000	15394289	12.8		26910	120178	E
D 14 13C4 PFOA										
417.00 > 372.00	2.620	2.602	0.018	1.000	165939	0.0784		62.7	7911	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.620	2.611	0.009	1.000	2044555	1.33		2661	1942	
413.00 > 169.00	2.620	2.611	0.009	1.000	1104777		1.85(0.84-2.52)		10094	
* 62 13C2-PFOA										s
415.00 > 370.00	2.620	2.611	0.009		275534	0.1250			10962	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.620	2.619	0.001	0.879	318359	0.1842		387	355	
449.00 > 99.00	2.628	2.619	0.009	0.882	78357		4.06(1.94-5.82)		548	M
D 19 13C5 PFNA										
468.00 > 423.00	2.980	2.964	0.016	1.138	147989	0.0803		64.2	5577	
D 18 13C4 PFOS										
503.00 > 80.00	2.980	2.964	0.016	1.138	149381	0.0657		54.9	4996	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.980	2.973	0.007	1.000	2507538	1.79		3851	19001	
499.00 > 99.00	2.980	2.973	0.007	1.000	519693		4.83(2.31-6.93)		3777	M
20 Perfluorononanoic acid										
463.00 > 419.00	2.980	2.979	0.001	1.000	179277	0.1402		280	639	
463.00 > 169.00	2.980	2.979	0.001	1.000	39313		4.56(1.90-5.69)		1738	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.196	3.187	0.009	1.072	98636	NC			2026	
D 26 M2-8:2FTS										
529.00 > 81.00	3.323	3.311	0.012	1.268	47622	0.0761		63.5	1384	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.323	3.322	0.001	1.000	129344	0.2407		503	7666	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.331	3.322	0.009	1.118	45402	0.0505		105	776	
549.00 > 99.00	3.323	3.322	0.001	1.115	19748		2.30(1.33-3.97)		157	
D 23 13C2 PFDA										
515.00 > 470.00	3.340	3.327	0.013	1.275	117183	0.0850		68.0	6895	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.340	3.330	0.010	1.000	54019	0.0540		108	101	
513.00 > 169.00	3.340	3.330	0.010	1.000	8772		6.16(2.36-7.09)		197	
D 21 13C8 FOSA										
506.00 > 78.00	3.357	3.343	0.014	1.281	217855	0.0652		52.2	5055	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.355	0.002	1.000	91308	0.0531		106	1301	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.488	3.473	0.015	1.331	24905	0.0744		59.5	1338	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.497	3.486	0.011	1.003	8177	0.0404		80.7	309	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.653	3.647	0.006	1.394	25839	0.0720		57.6	351	
D 30 13C2 PFUnA										
565.00 > 520.00	3.662	3.647	0.015	1.398	78021	0.0735		58.8	2768	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.653	3.650	0.003	1.226	36641	0.0451		93.5	2569	
599.00 > 99.00	3.643	3.650	-0.007	1.222	16471		2.22(1.39-4.16)		193	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.662	3.659	0.003	1.003	11617	0.0631		126	202	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.662	3.659	0.003	1.000	35762	0.0465		93.0	80.1	
563.00 > 169.00	3.662	3.659	0.003	1.000	7158		5.00(2.12-6.36)		363	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.820	3.815	0.005	1.282	147682	NC			4435	
D 36 13C2 PFDoA										
615.00 > 570.00	3.955	3.943	0.012	1.510	68534	0.0745		59.6	1211	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.955	3.951	0.004	1.000	28063	0.0473		94.5	52.6	
613.00 > 169.00	3.955	3.951	0.004	1.000	5130		5.47(2.13-6.40)		217	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.209	4.203	0.006	1.064	22985	0.0445		89.0	12.8	
663.00 > 169.00	4.209	4.203	0.006	1.064	7091		3.24(1.25-3.76)		134	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.445	4.433	0.012	1.697	41751	0.0541		43.3	239	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.435	4.437	-0.002	0.998	4245	0.0472		94.4	94.4	
713.00 > 219.00	4.435	4.437	-0.002	0.998	3445		1.23(0.71-2.13)		64.7	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.831	4.829	0.002	1.844	32546	0.0245		19.6	55.5	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.840	4.833	0.007	1.002	14801	NC			0.6	R
813.00 > 169.00	4.840	4.833	0.007	1.002	1643		9.01(2.86-8.58)		22.2	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.172	5.166	0.006	1.071	11570	NC			5.8	
913.00 > 169.00	5.172	5.166	0.006	1.071	1070		10.81(3.83-11.48)		15.2	

QC Flag Legend

Processing Flags

- NC - Not Calibrated
- R - Failed Signal Ratio Test
- E - Exceeded Maximum Amount
- s - Failed ISTD Recovery Test

Review Flags

- M - Manually Integrated

Report Date: 06-Aug-2018 11:21:19 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_020.d

Injection Date: 03-Aug-2018 07:19:31 Instrument ID: A8_N

Lims ID: 320-41333-A-5-B MS

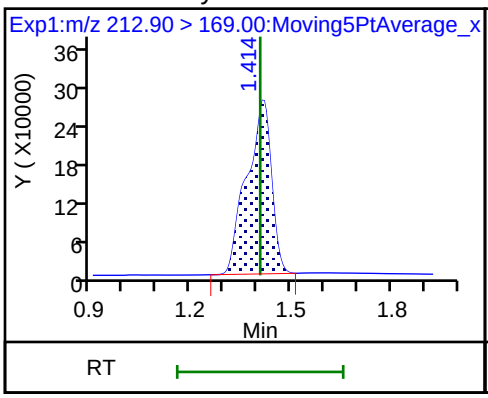
Client ID: 8-MW12-PRL03-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 27 Worklist Smp#: 9

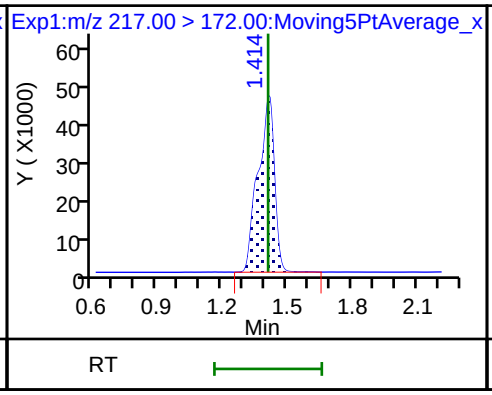
Injection Vol: 2.0 ul Dil. Factor: 20.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

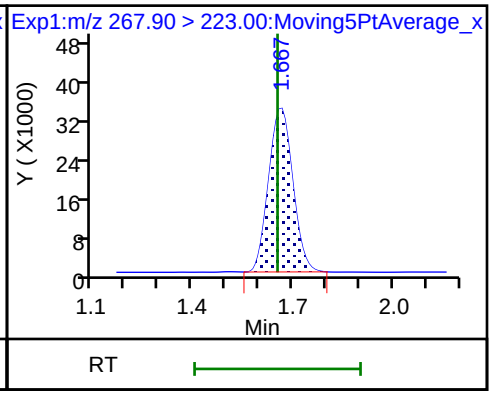
2 Perfluorobutyric acid



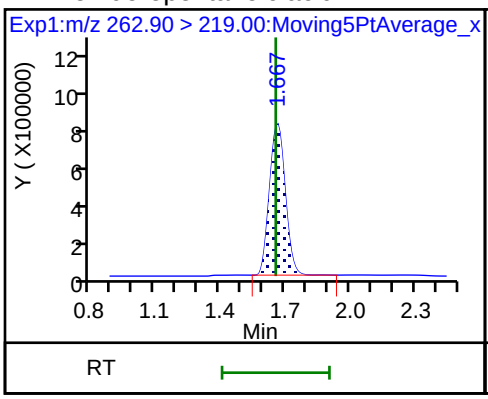
D 1 13C4 PFBA



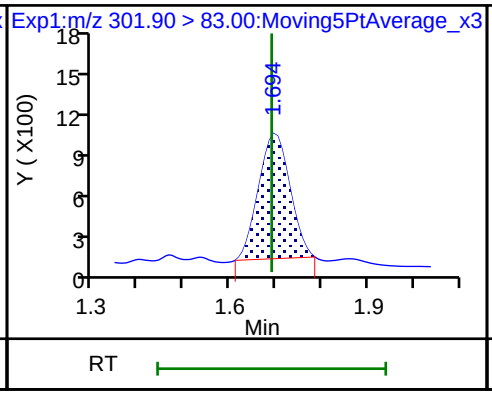
D 3 13C5-PFPeA



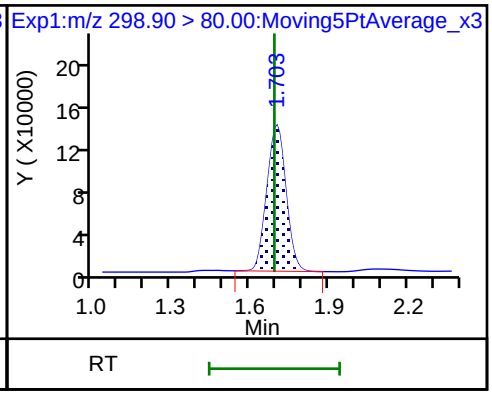
4 Perfluoropentanoic acid



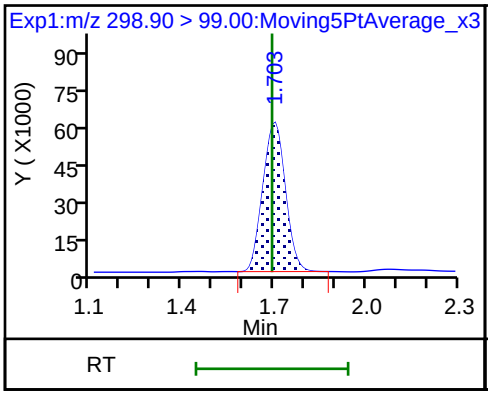
D 47 13C3-PFBS



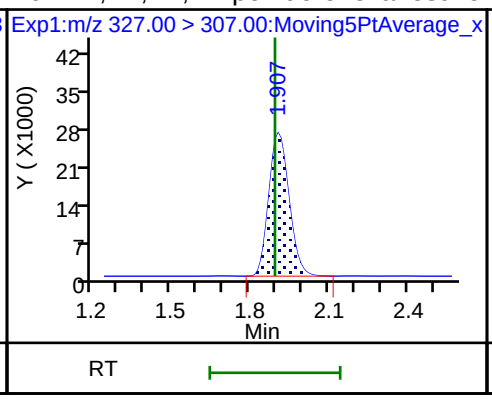
5 Perfluorobutanesulfonic acid



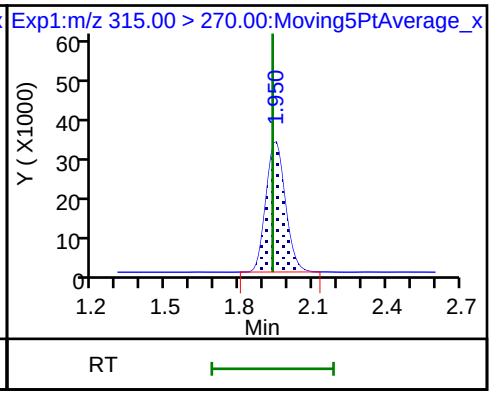
5 Perfluorobutanesulfonic acid



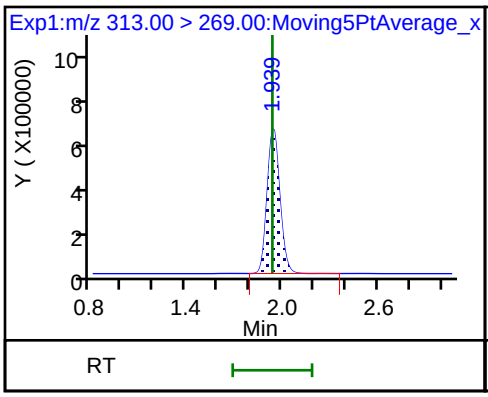
61 1H,1H,2H,2H-perfluorohexanesulfon



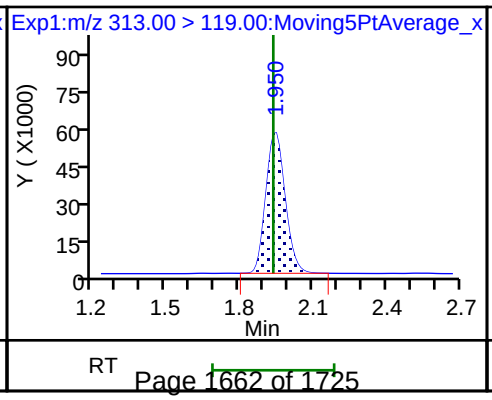
D 7 13C2 PFHxA



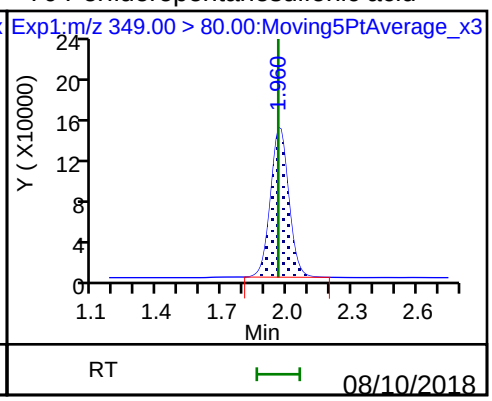
6 Perfluorohexanoic acid



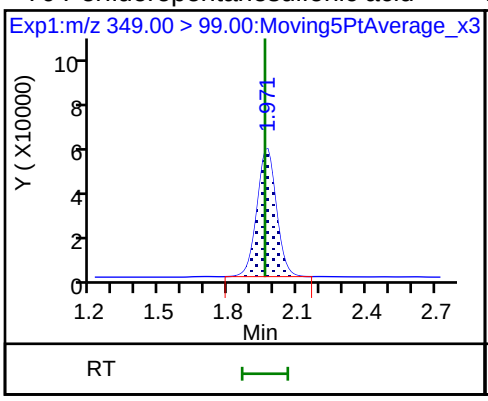
6 Perfluorohexanoic acid



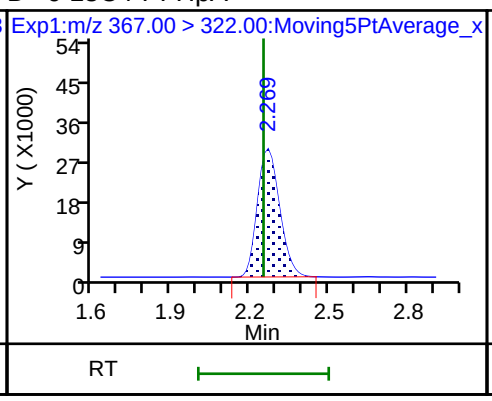
70 Perfluoropentanesulfonic acid



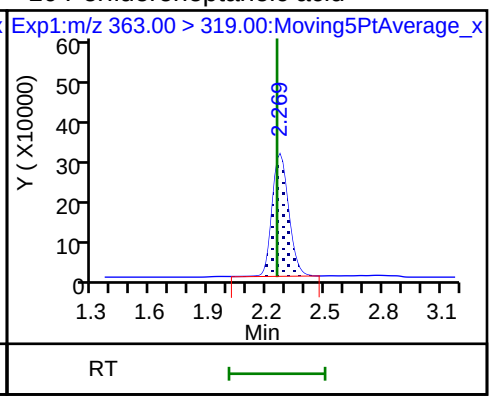
70 Perfluoropentanesulfonic acid



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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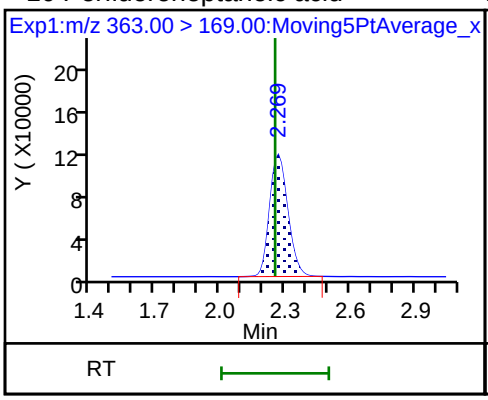
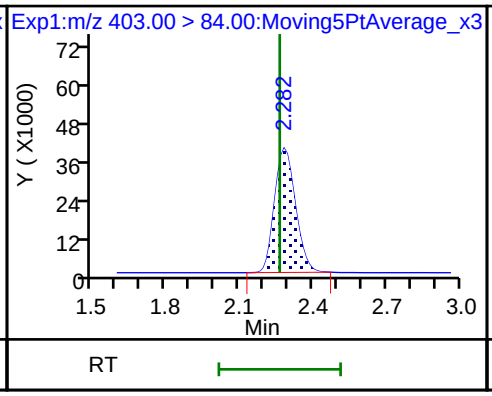
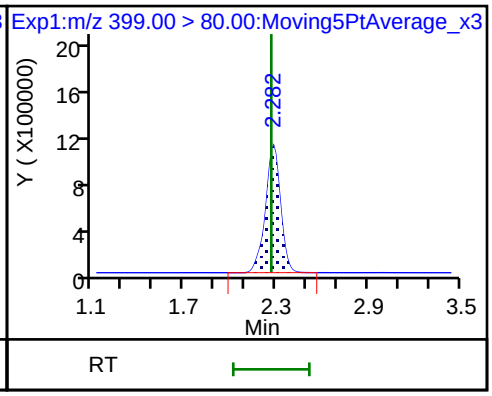


D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid



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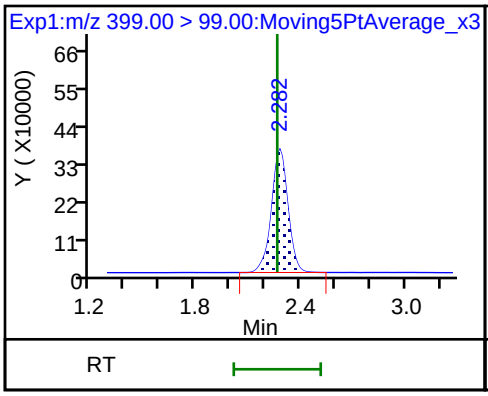
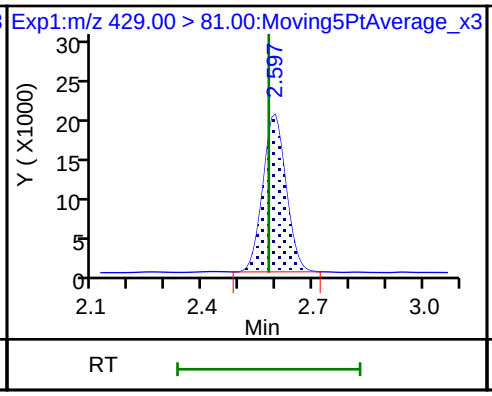
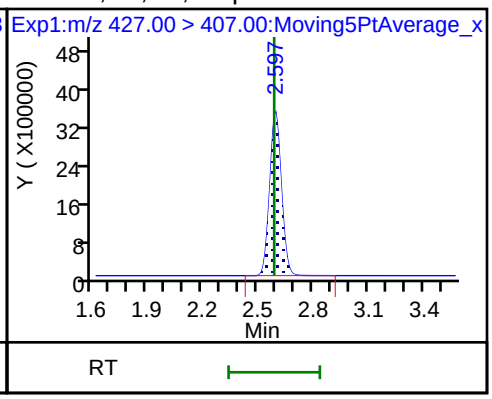


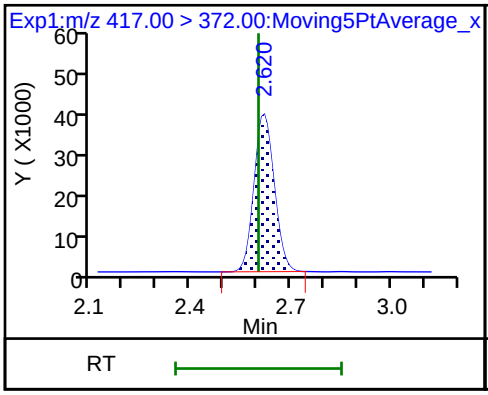
D 12 M2-6:2FTS



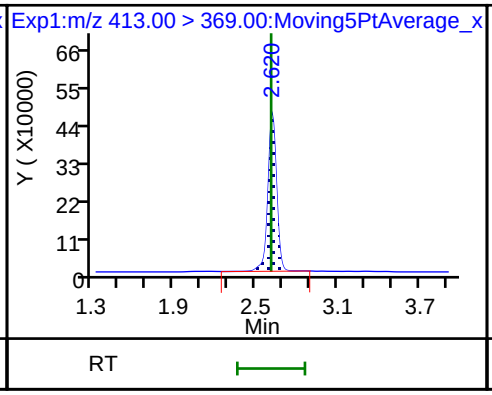
13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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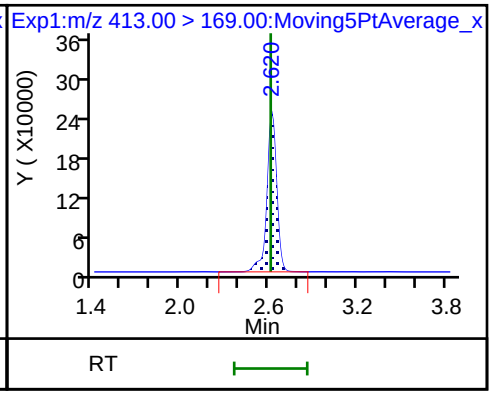
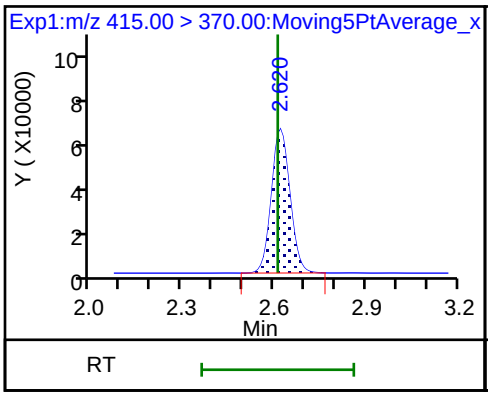
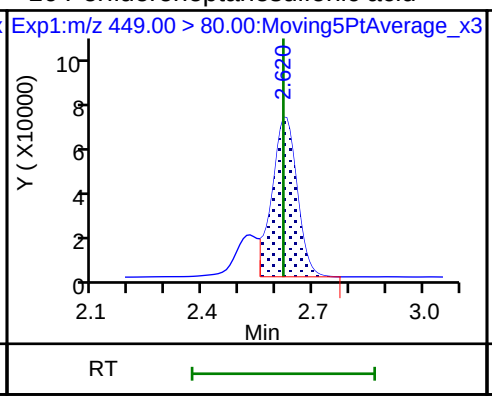


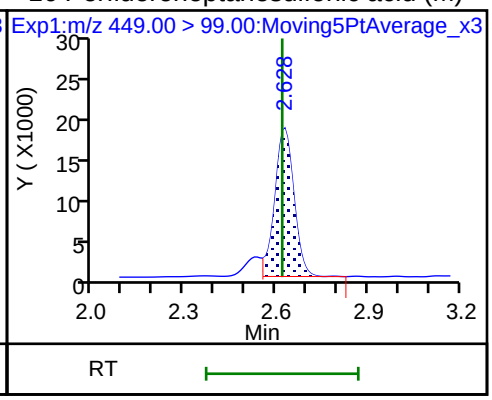
* 62 13C2-PFOA



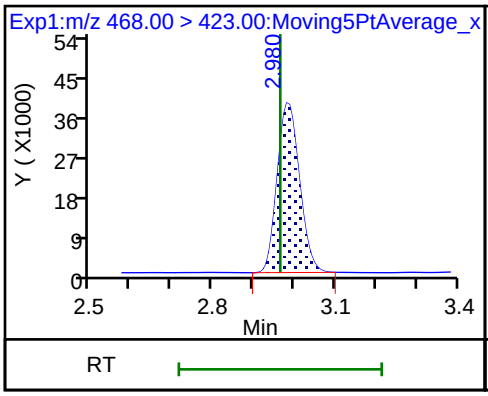
16 Perfluoroheptanesulfonic acid



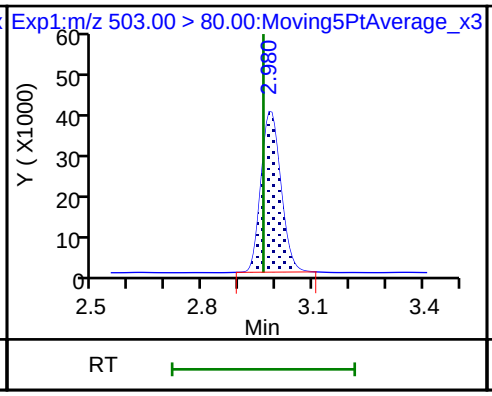
16 Perfluoroheptanesulfonic acid (M)



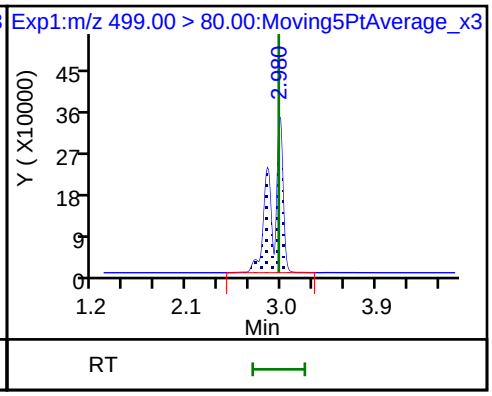
D 19 13C5 PFNA



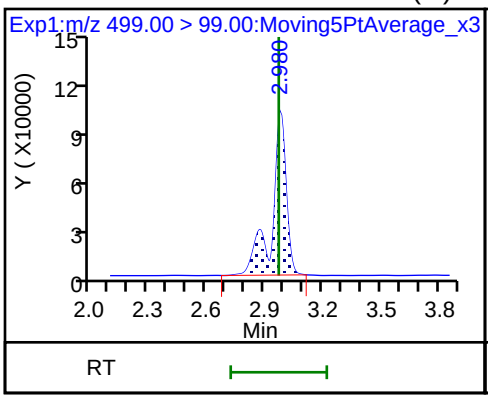
D 18 13C4 PFOS



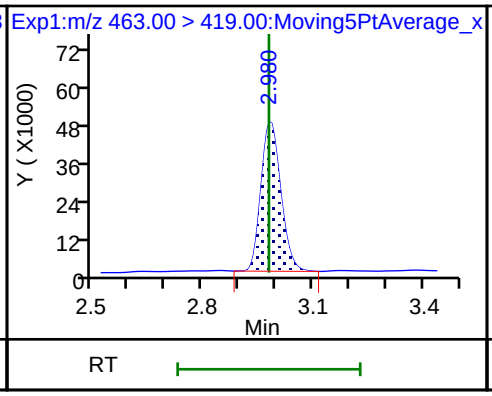
17 Perfluorooctane sulfonic acid



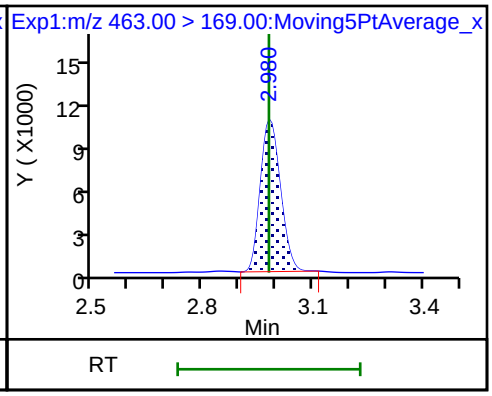
17 Perfluorooctane sulfonic acid (M)



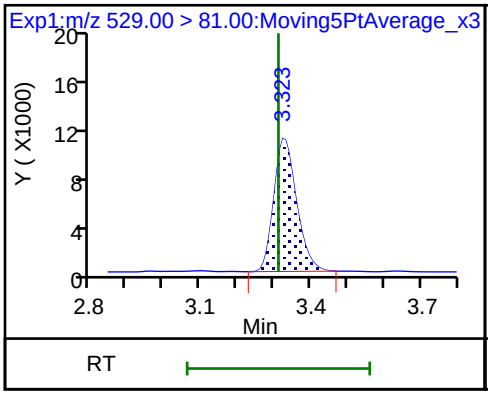
20 Perfluorononanoic acid



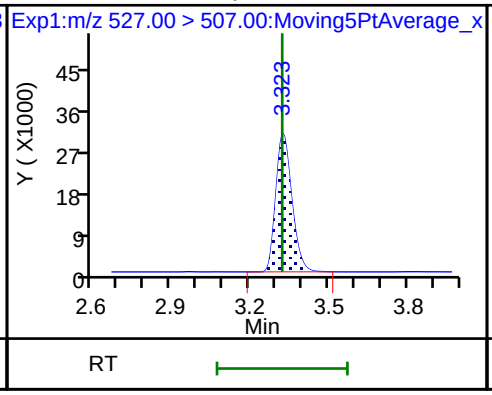
20 Perfluorononanoic acid



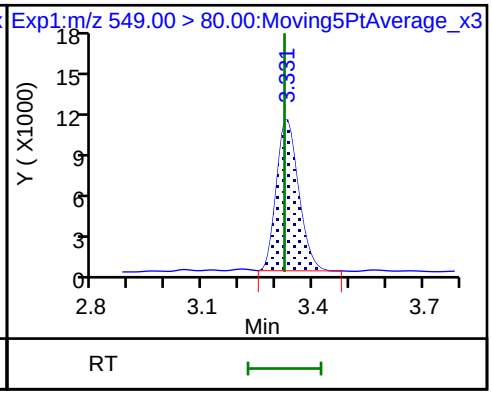
D 26 M2-8:2FTS



25 1H,1H,2H,2H-perfluorodecanesulfoni



68 Perfluorononanesulfonic acid



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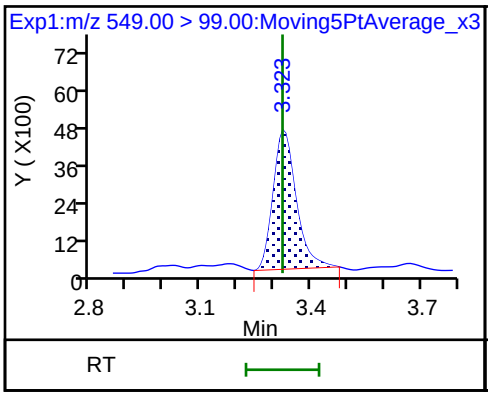
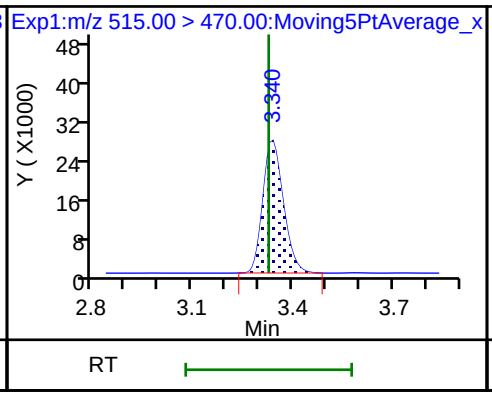
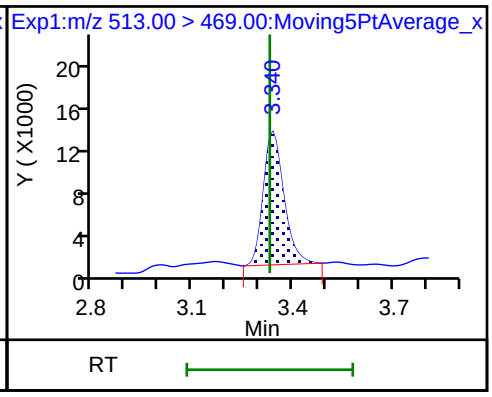


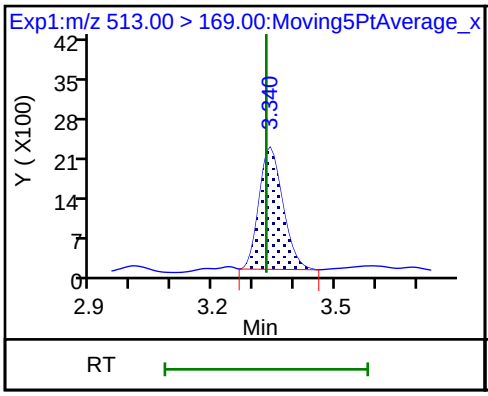
D 23 13C2 PFDA



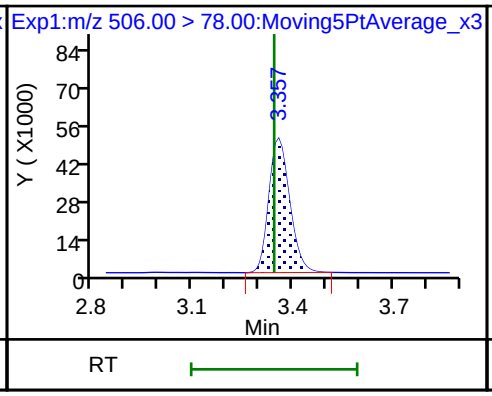
24 Perfluorodecanoic acid



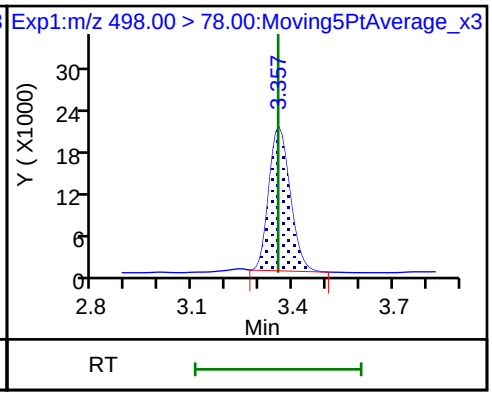
24 Perfluorodecanoic acid



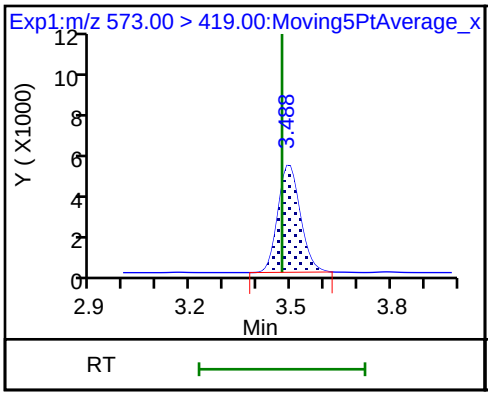
D 21 13C8 FOSA



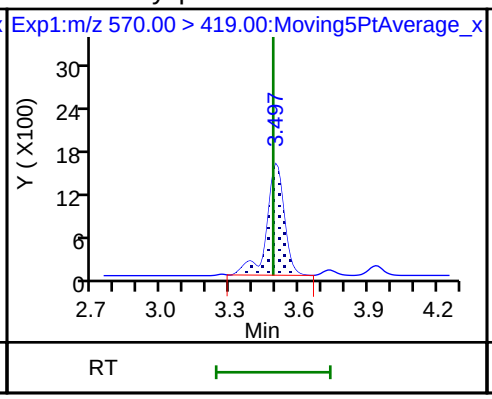
22 Perfluorooctane Sulfonamide



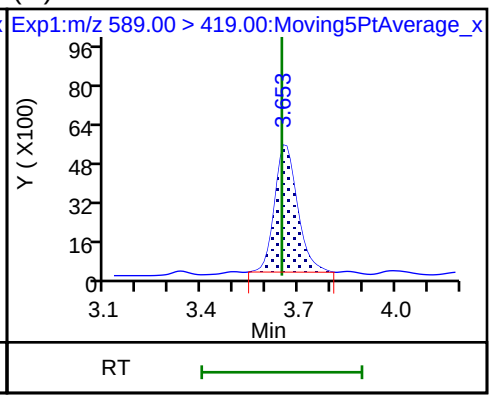
D 27 d3-NMeFOSAA



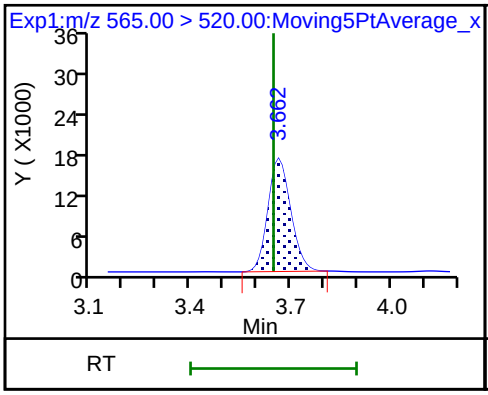
28 N-methyl perfluorooctane sulfonamid



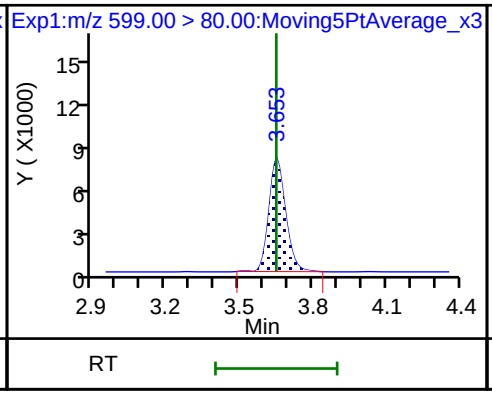
D 32 d5-NEtFOSAA



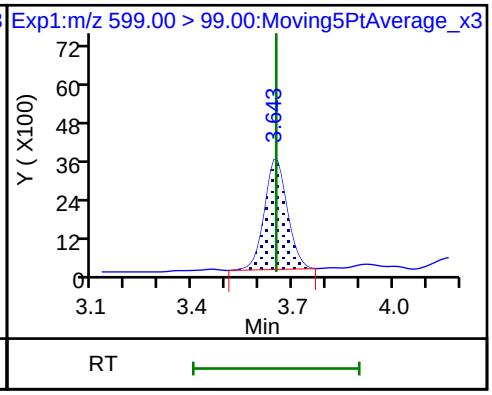
D 30 13C2 PFUnA



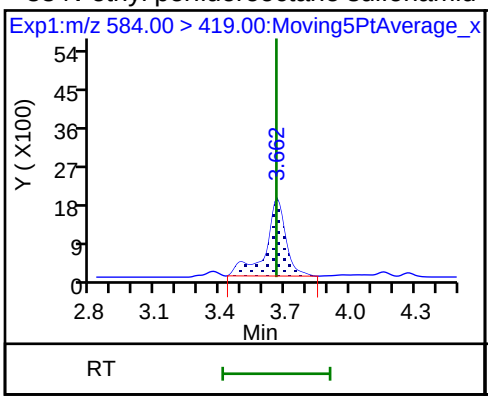
29 Perfluorodecane Sulfonic acid



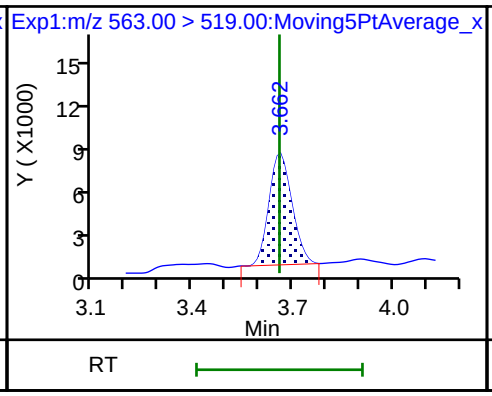
29 Perfluorodecane Sulfonic acid



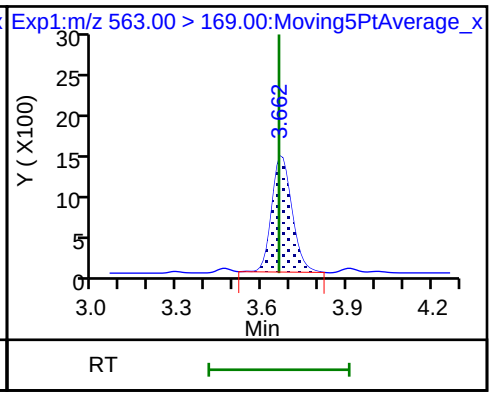
33 N-ethyl perfluorooctane sulfonamid



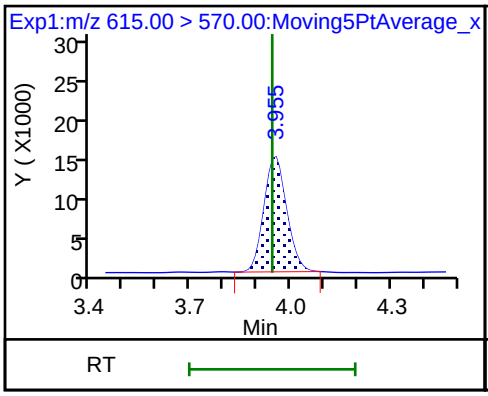
31 Perfluoroundecanoic acid



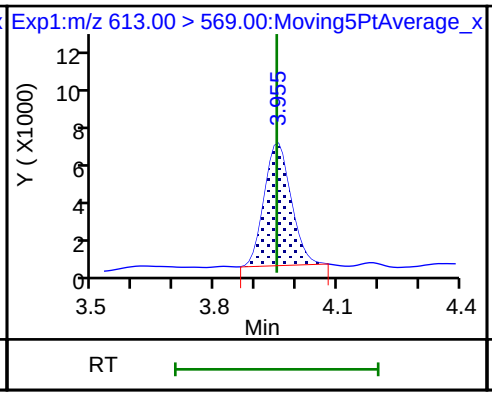
31 Perfluoroundecanoic acid



D 36 13C2 PFDoA



37 Perfluorododecanoic acid



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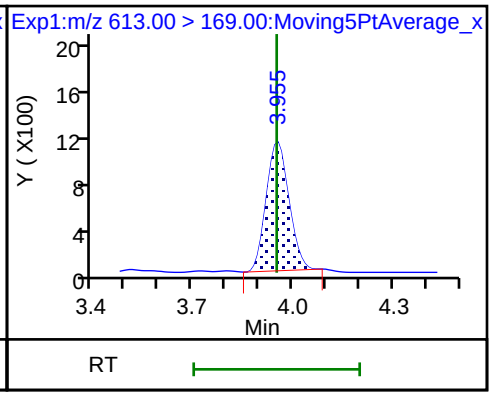
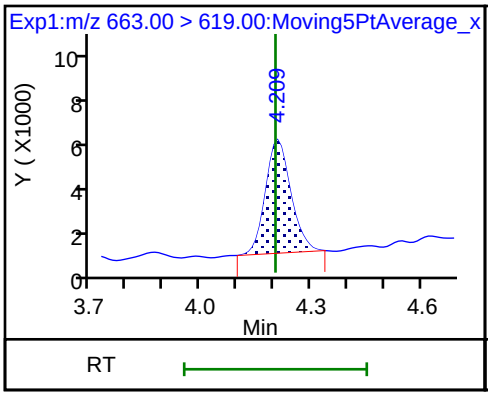
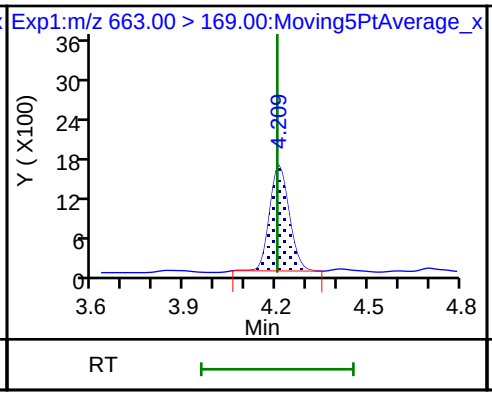


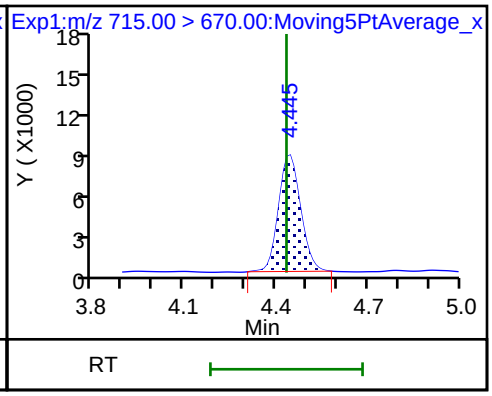
41 Perfluorotridecanoic acid



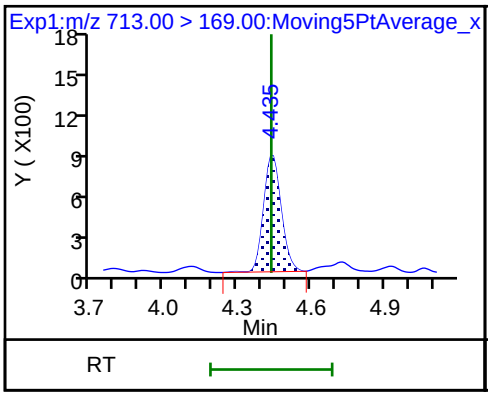
41 Perfluorotridecanoic acid



D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid



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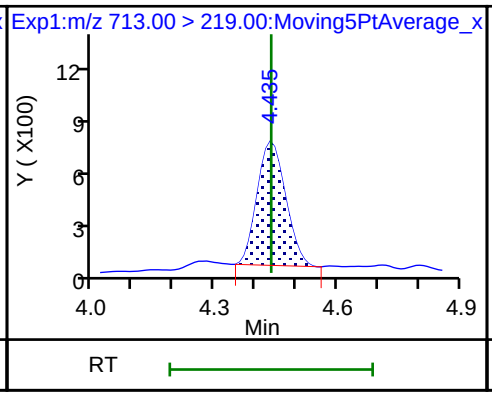

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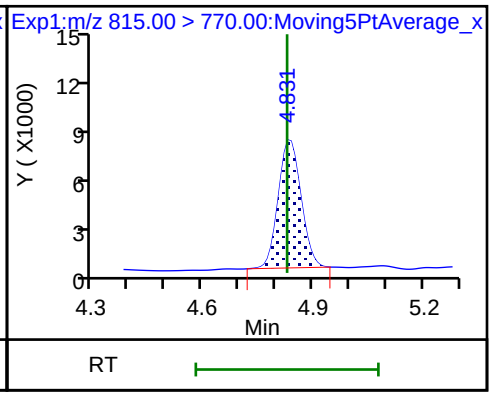

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

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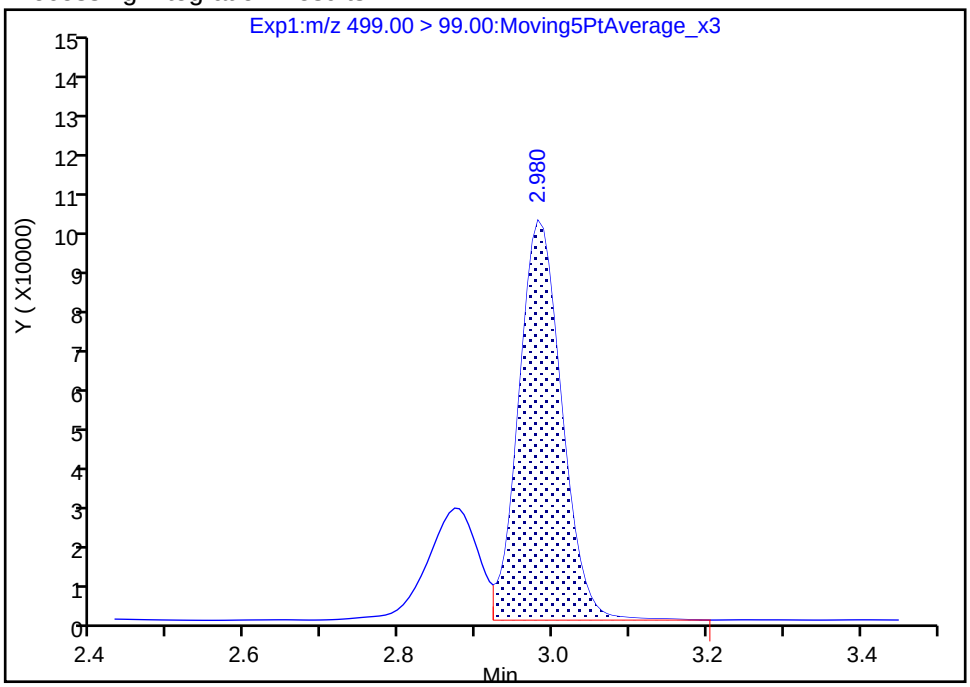
Lims ID:	320-41333-A-5-B MS				
Client ID:	8-MW12-PRL03-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	27	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

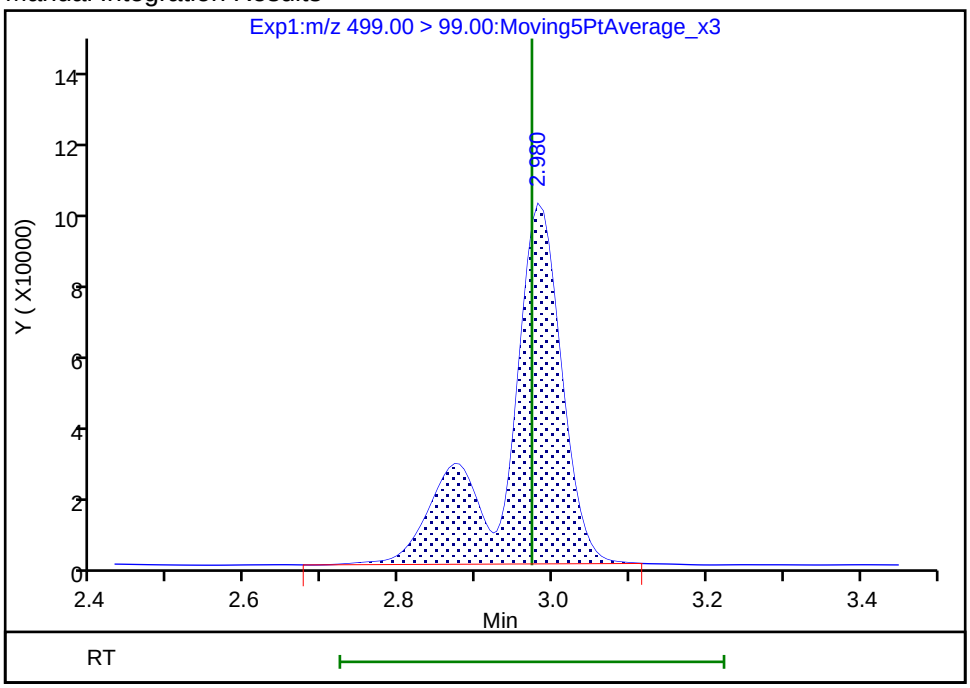
Processing Integration Results

RT: 2.98
Area: 395754
Amount: 1.786810
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 519693
Amount: 1.786810
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:20:50

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41333-1

SDG No.:

Client Sample ID: 8-MW12-PRL03-01 MSD | Lab Sample ID: 320-41333-5 MSD

Matrix: Water | Lab File ID: 2018.07.28LLB_051.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/17/2018 08:33

Extraction Method: 3535 | Date Extracted: 07/24/2018 17:51

Sample wt/vol: 305.4(mL) | Date Analyzed: 07/29/2018 06:22

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 236782 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*628*	*E 4*	*1.6*	1.2	*0.50*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*688*	*E 4*	*1.6*	1.2	*0.44*
375-95-1	Perfluorononanoic acid (PFNA)	92.7	J1	1.6	1.2	0.43
375-73-5	Perfluorobutanesulfonic acid (PFBS)	163	4	1.6	0.82	0.38
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*1370*	*E 4*	*1.6*	0.82	*0.31*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*997*	*E 4*	*3.3*	2.5	*0.90*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	96		50-150
STL01892	13C4-PFHpA	72		50-150
STL00990	13C4 PFOA	65		50-150
STL00995	13C5 PFNA	89		50-150
STL00994	18O2 PFHxS	78		50-150
STL00991	13C4 PFOS	97		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_051.d
Lims ID: 320-41333-A-5-C MSD
Client ID: 8-MW12-PRL03-01
Sample Type: MSD
Inject. Date: 29-Jul-2018 06:22:12 ALS Bottle#: 40 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41333-a-5-c msd
Misc. Info.: Plate: 1 Rack: 6
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 31-Jul-2018 12:29:11 Calib Date: 23-Jul-2018 16:58:07
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180723-61502.b\2018.07.23LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: mongkols Date: 31-Jul-2018 12:31:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.386	1.397	-0.011	0.537	3733168	2.14		85.5	72987	
2 Perfluorobutyric acid										E
212.90 > 169.00	1.391	1.397	-0.006	1.004	19494697	13.3		1328	8296	E
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.640	-0.007	0.633	2708445	2.22		88.9	30624	
4 Perfluoropentanoic acid										E
262.90 > 219.00	1.633	1.641	-0.008	1.000	44325907	34.2		3418	12706	E
D 47 13C3-PFBS										
301.90 > 83.00	1.666	1.675	-0.009	0.645	71467	2.24		96.2	183	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.666	1.676	-0.010	1.000	12157104	4.98		564	3941	
298.90 > 99.00	1.666	1.676	-0.010	1.000	5272941		2.31(1.25-3.74)		9423	
D 60 M2-4:2FTS										
329.00 > 81.00	1.693	1.876	-0.183	0.656	4191	NC			3.5	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.866	1.877	-0.011	1.120	1503873	2.86		306	43987	
D 7 13C2 PFHxA										
315.00 > 270.00	1.906	1.905	0.001	0.738	2982023	2.09		83.5	64637	
6 Perfluorohexanoic acid										E
313.00 > 269.00	1.906	1.917	-0.011	1.000	40395431	32.0		3195	41715	E
313.00 > 119.00	1.906	1.917	-0.011	1.000	4669670		8.65(5.03-15.10)		61293	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.927	1.939	-0.012	1.157	13384046	6.11		652	71650	
349.00 > 99.00	1.927	1.939	-0.012	1.157	5365505		2.49(1.36-4.07)		28372	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.003	2.003	0.0	0.776	312829	NC			6615	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.003	2.004	-0.001	1.000	306080	NC			668	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 9 13C4-PFHpA										
367.00 > 322.00	2.229	2.229	0.0	0.864	2639730	1.79		71.7	59193	
10 Perfluoroheptanoic acid										E
363.00 > 319.00	2.229	2.230	-0.001	1.000	22320850	19.2		1917	26577	E
363.00 > 169.00	2.229	2.230	-0.001	1.000	9122577		2.45(1.13-3.40)		77173	
D 11 18O2 PFHxS										
403.00 > 84.00	2.241	2.241	0.0	0.868	3506474	1.85		78.4	62148	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.241	2.242	-0.001	1.000	72231930	41.8		4589	40758	E
399.00 > 99.00	2.241	2.242	-0.001	1.000	30570074		2.36(1.50-4.49)		41096	
65 ADONA										
377.00 > 251.00	2.267	2.282	-0.015	0.771	3804110	NC			51553	
377.00 > 85.00	2.267	2.282	-0.015	0.771	2157544		1.76(0.84-2.53)		7417	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.556	2.557	-0.001	1.000	62296821	135.1		14256	91243	E
D 12 M2-6:2FTS										
429.00 > 81.00	2.556	2.564	-0.008	0.990	648950	1.58		66.4	4990	
D 14 13C4 PFOA										
417.00 > 372.00	2.581	2.588	-0.007	1.000	2345902	1.63		65.1	32214	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.590	-0.009		3765230	2.50			52076	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.581	2.590	-0.009	1.000	23942775	21.0		2100	18625	E
413.00 > 169.00	2.581	2.590	-0.009	1.000	13705177		1.75(0.84-2.52)		47591	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.589	2.598	-0.009	0.880	4350446	2.48		260	313	
449.00 > 99.00	2.589	2.598	-0.009	0.880	1215123		3.58(1.94-5.82)		658	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	2.943	2.950	-0.007	1.000	42700513	30.4		3280	47001	E
499.00 > 99.00	2.943	2.950	-0.007	1.000	9515530		4.49(2.31-6.93)		66886	
20 Perfluorononanoic acid										
463.00 > 419.00	2.943	2.950	-0.007	1.000	3559852	2.83		283	9569	
463.00 > 169.00	2.943	2.950	-0.007	1.000	834620		4.27(1.90-5.69)		9699	
D 19 13C5 PFNA										
468.00 > 423.00	2.943	2.953	-0.010	1.140	2753897	2.22		88.7	63310	
D 18 13C4 PFOS										
503.00 > 80.00	2.943	2.953	-0.010	1.140	3034447	2.31		96.5	25077	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.156	3.158	-0.002	1.073	2172514	NC			19262	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.294	-0.002	1.000	2537078	4.62		483	44858	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.294	-0.002	1.119	976250	1.03		107	2032	
549.00 > 99.00	3.292	3.294	-0.002	1.119	359591		2.71(1.33-3.97)		2467	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.299	-0.007	1.275	969265	2.26		94.4	12690	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.308	3.310	-0.002	1.002	1179927	1.02		102	6862	
513.00 > 169.00	3.308	3.310	-0.002	1.002	209187		5.64(2.36-7.09)		7329	
D 23 13C2 PFDA										
515.00 > 470.00	3.300	3.315	-0.015	1.278	2801701	2.83		113	52673	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.308	3.317	-0.009	1.000	1898542	1.02		102	2873	
D 21 13C8 FOSA										
506.00 > 78.00	3.308	3.322	-0.014	1.282	4657695	2.41		96.4	42244	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.459	3.467	-0.008	1.340	958013	2.93		117	23340	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.459	3.471	-0.012	1.000	371128	0.9827		98.3	5940	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.624	3.626	-0.002	1.231	804471	0.9555		99.1	9422	
599.00 > 99.00	3.624	3.626	-0.002	1.231	281391		2.86(1.39-4.16)		4198	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.634	3.636	-0.002	1.000	1027491	0.9248		92.5	5098	
563.00 > 169.00	3.634	3.636	-0.002	1.000	172044		5.97(2.12-6.36)		9136	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.634	3.636	-0.002	1.003	362257	0.9793		97.9	12623	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.624	3.640	-0.016	1.404	991276	2.89		115	4740	
D 30 13C2 PFUnA										
565.00 > 520.00	3.634	3.640	-0.006	1.408	2238447	2.81		112	59468	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.789	3.801	-0.013	1.287	3225187	NC			66959	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.924	3.937	-0.013	1.000	899307	1.05		105	314	
613.00 > 169.00	3.924	3.937	-0.013	1.000	197751		4.55(2.13-6.40)		3117	
D 36 13C2 PFDoA										
615.00 > 570.00	3.924	3.941	-0.017	1.520	1976593	2.61		104	20695	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.189	4.200	-0.011	1.067	834440	1.00		100	293	
663.00 > 169.00	4.189	4.200	-0.011	1.067	225633		3.70(1.25-3.76)		3742	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.424	4.436	-0.012	1.000	173210	0.9667		96.7	3229	
713.00 > 219.00	4.424	4.436	-0.012	1.000	119038		1.46(0.71-2.13)		2427	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.424	4.437	-0.013	1.714	1786851	2.42		96.7	14683	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.831	4.837	-0.006	1.000	711482	NC			146	
813.00 > 169.00	4.831	4.837	-0.006	1.000	111885		6.36(2.86-8.58)		1280	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.831	4.842	-0.011	1.872	1862545	1.66		66.4	8621	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.180	5.184	-0.004	1.072	465176	NC			133	
913.00 > 169.00	5.180	5.184	-0.004	1.072	55842		8.33(3.83-11.48)		944	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Report Date: 31-Jul-2018 12:31:01 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180728-61817.b\2018.07.28LLB_051.d

Injection Date: 29-Jul-2018 06:22:12 Instrument ID: A8_N

Lims ID: 320-41333-A-5-C MSD

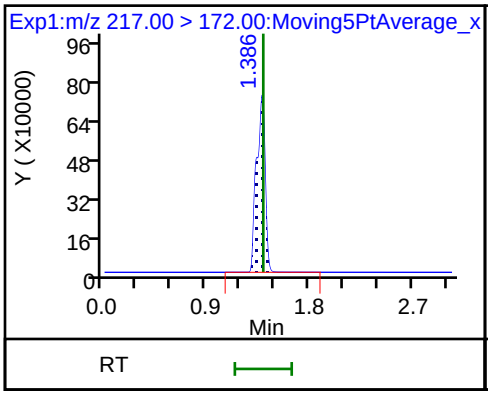
Client ID: 8-MW12-PRL03-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 40 Worklist Smp#: 12

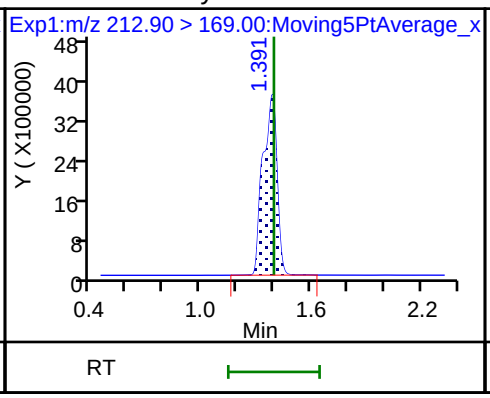
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

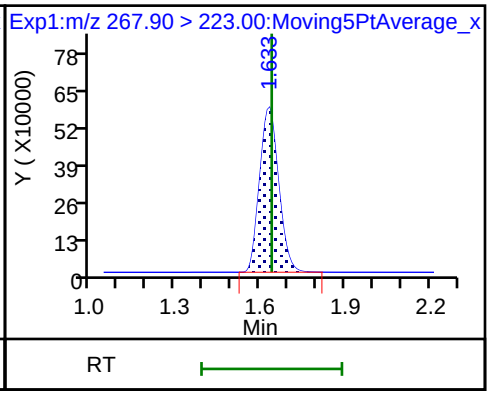
D 1 13C4 PFBA



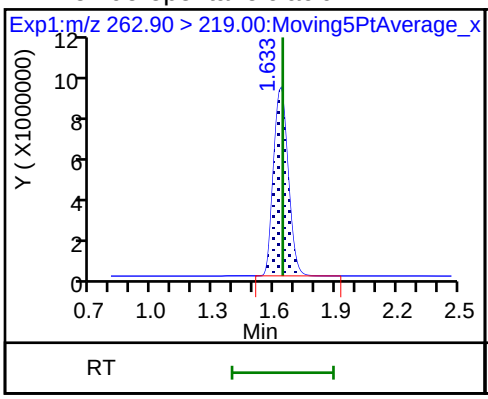
2 Perfluorobutyric acid



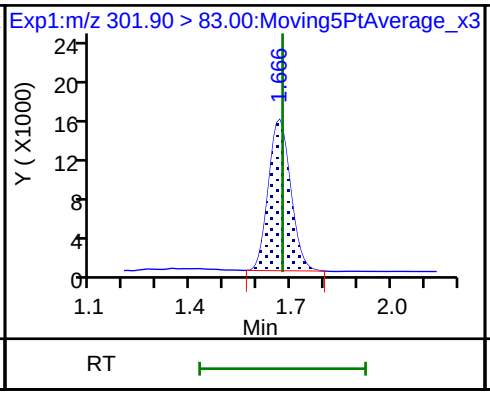
D 3 13C5-PFPeA



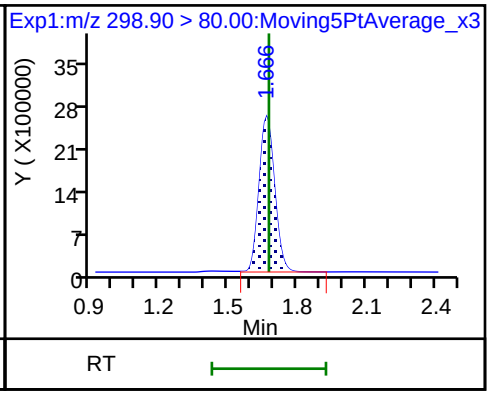
4 Perfluoropentanoic acid



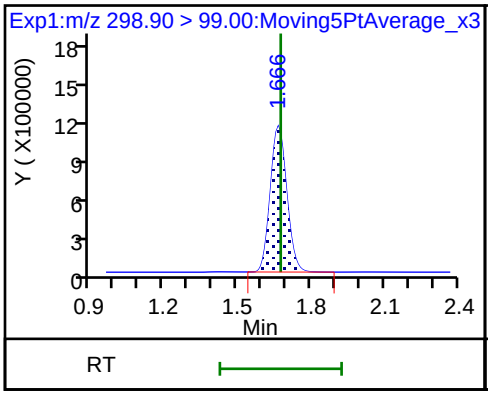
D 47 13C3-PFBS



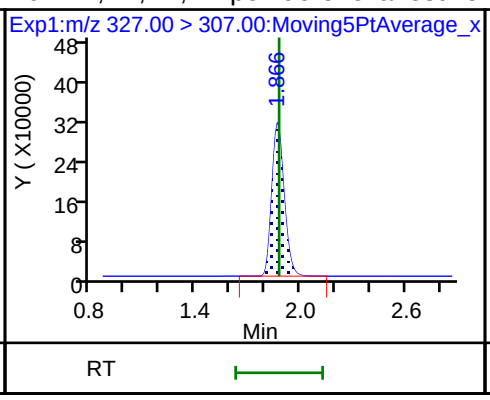
5 Perfluorobutanesulfonic acid



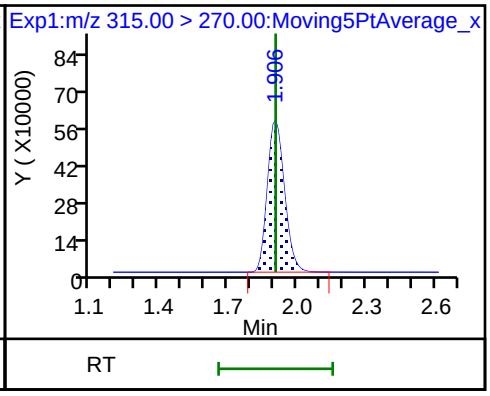
5 Perfluorobutanesulfonic acid



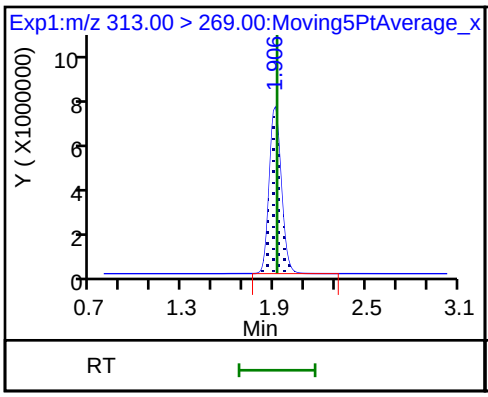
61 1H,1H,2H,2H-perfluorohexanesulfon



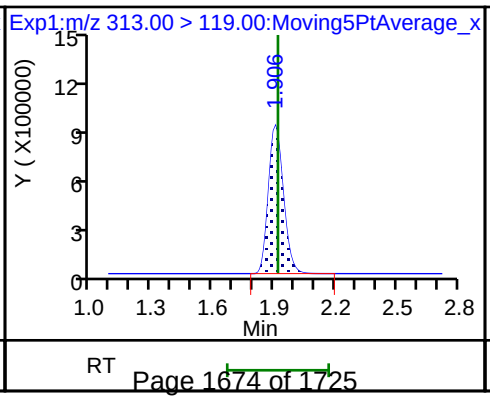
D 7 13C2 PFHxA



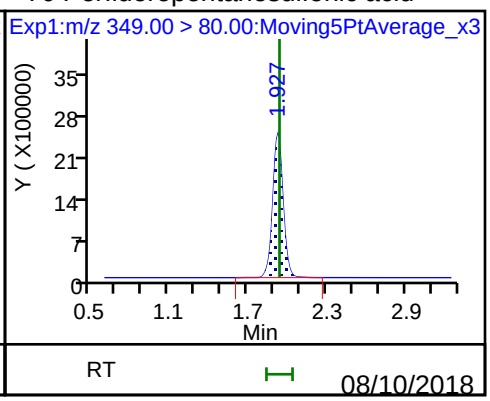
6 Perfluorohexanoic acid



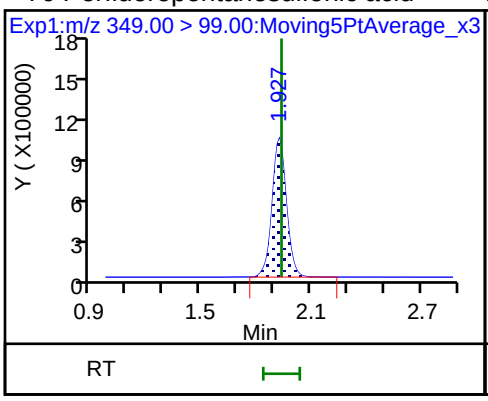
6 Perfluorohexanoic acid



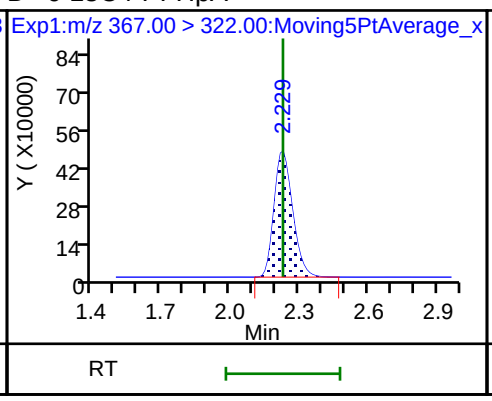
70 Perfluoropentanesulfonic acid



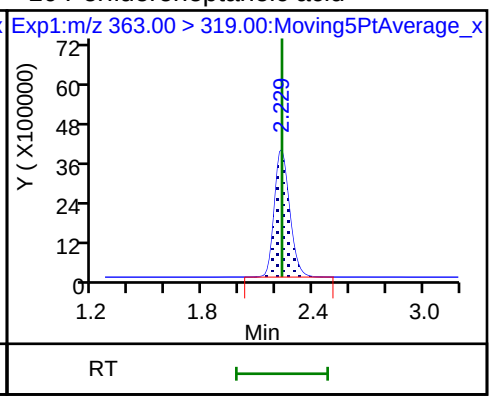
70 Perfluoropentanesulfonic acid



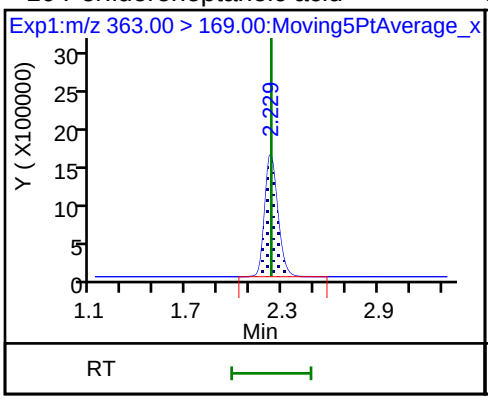
D 9 13C4-PFHpA



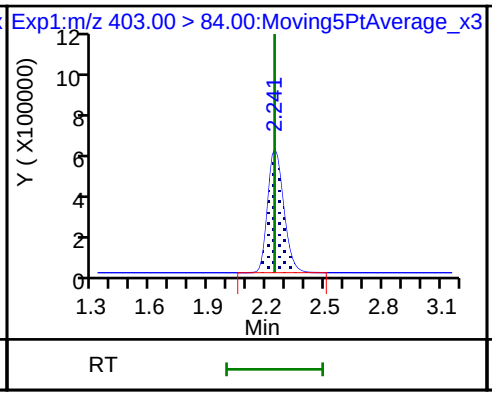
10 Perfluoroheptanoic acid



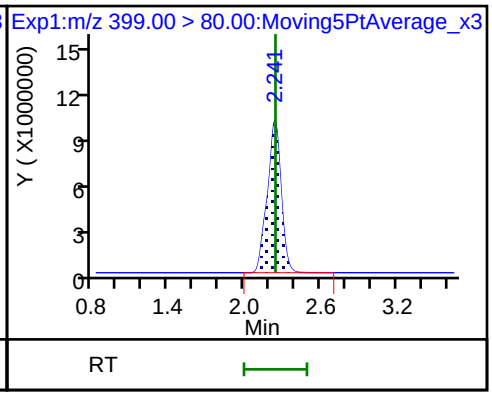
10 Perfluoroheptanoic acid



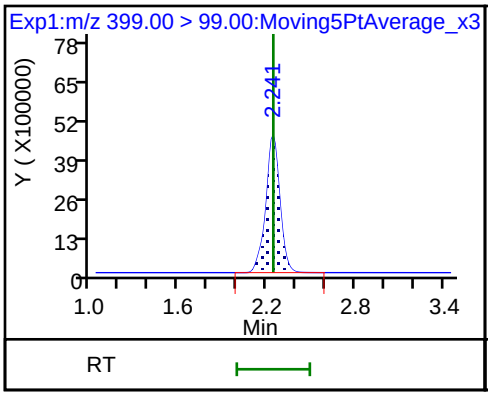
D 11 18O2 PFHxS



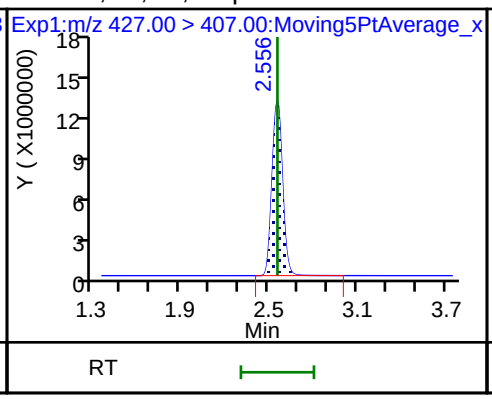
8 Perfluorohexanesulfonic acid



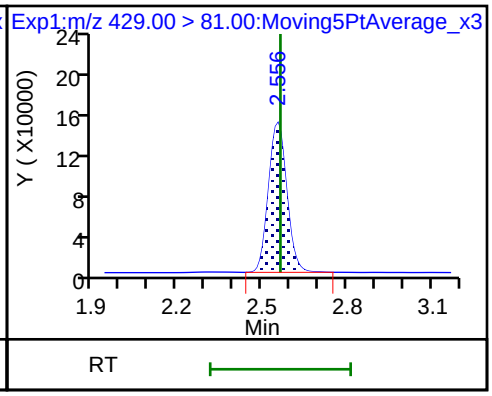
8 Perfluorohexanesulfonic acid



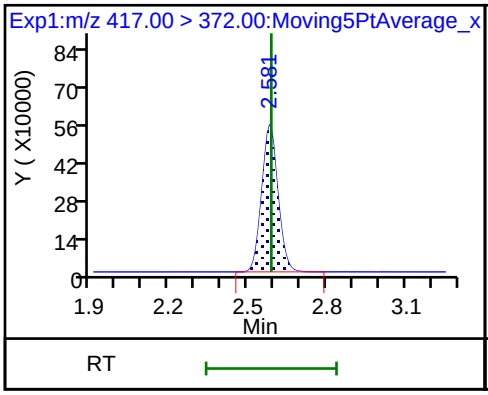
13 1H,1H,2H,2H-perfluorooctanesulfon



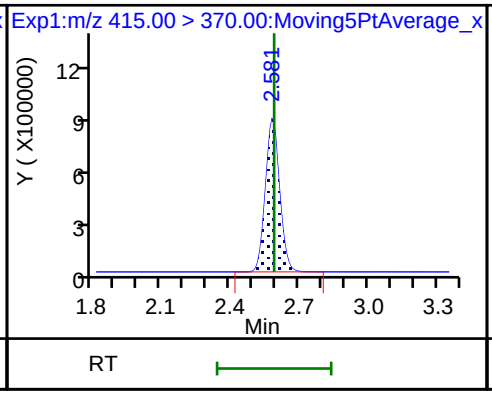
D 12 M2-6:2FTS



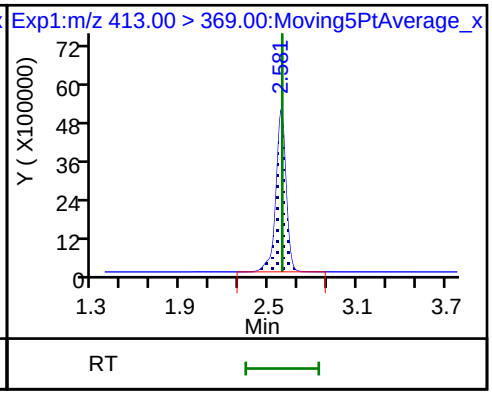
D 14 13C4 PFOA



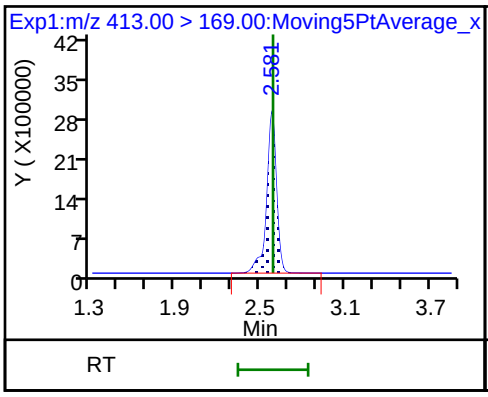
* 62 13C2-PFOA



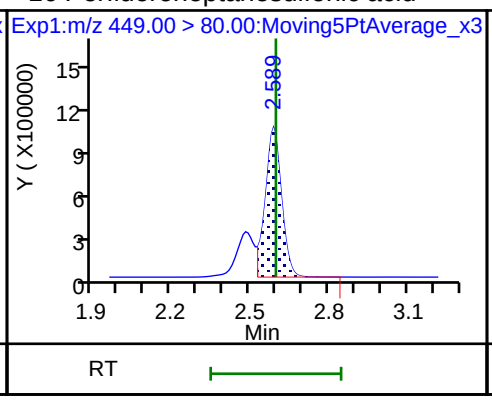
15 Perfluorooctanoic acid



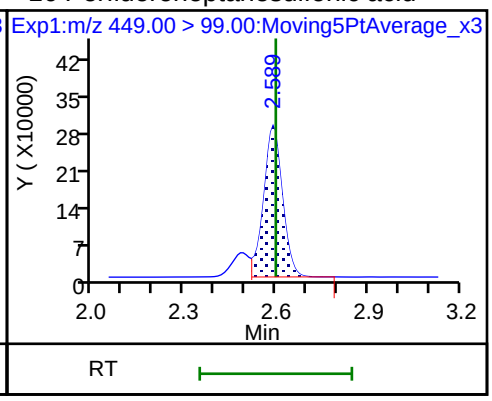
15 Perfluorooctanoic acid



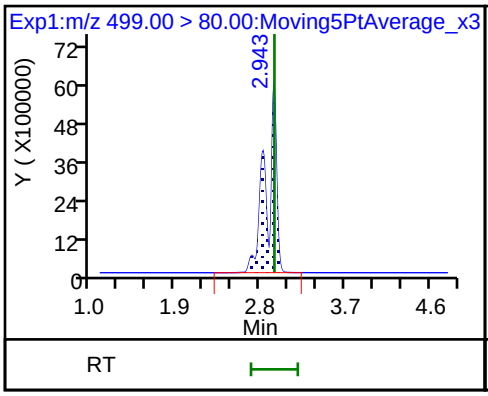
16 Perfluoroheptanesulfonic acid



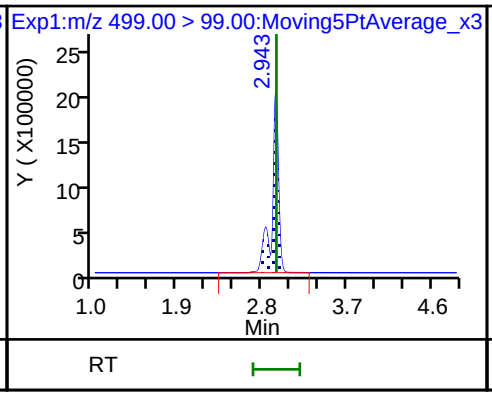
16 Perfluoroheptanesulfonic acid



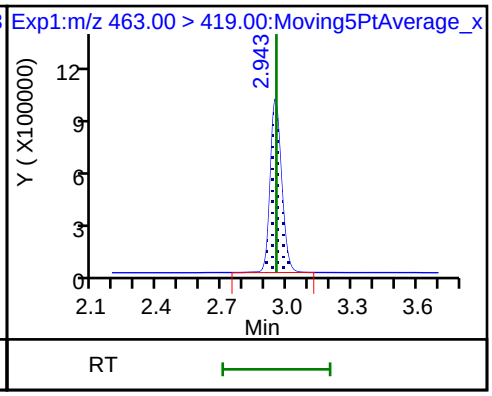
17 Perfluorooctane sulfonic acid



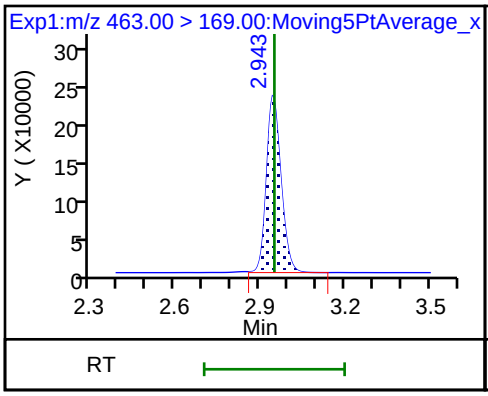
17 Perfluorooctane sulfonic acid



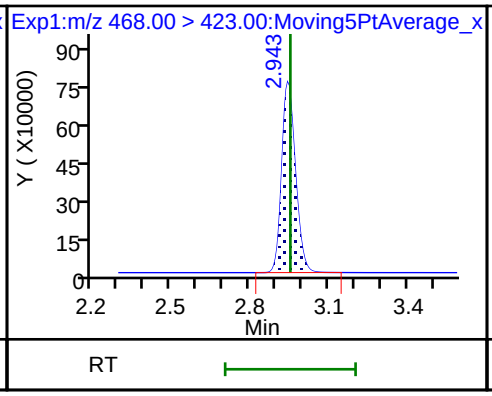
20 Perfluorononanoic acid



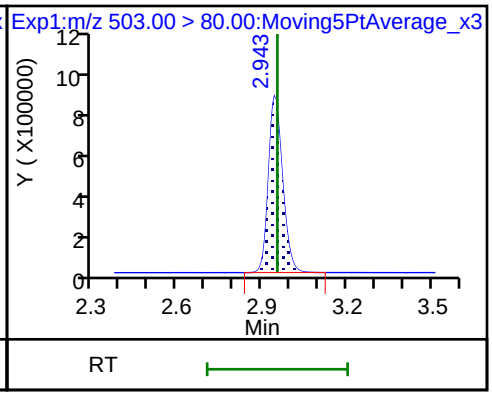
20 Perfluorononanoic acid



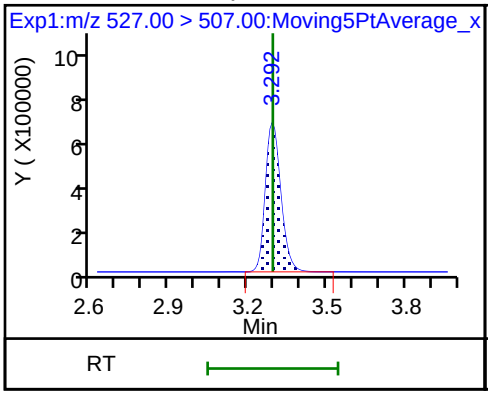
D 19 13C5 PFNA



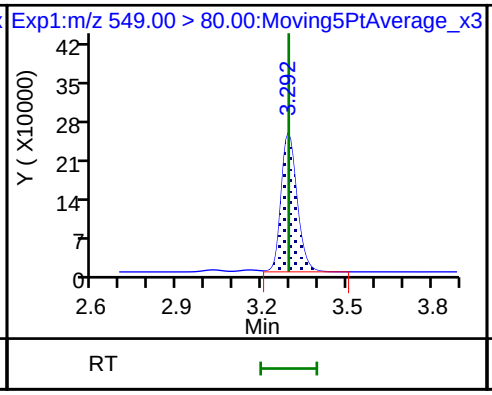
D 18 13C4 PFOS



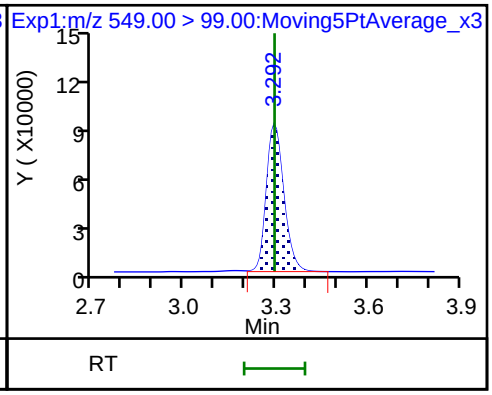
25 1H,1H,2H,2H-perfluorodecanesulfoni



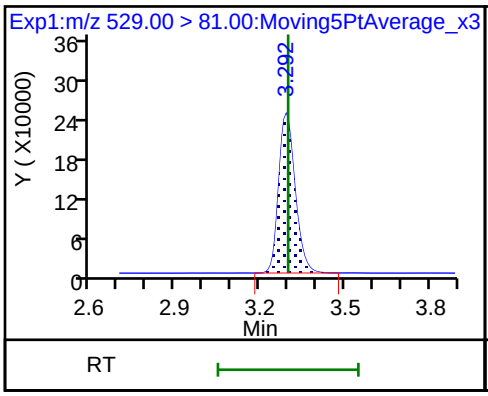
68 Perfluorononanesulfonic acid



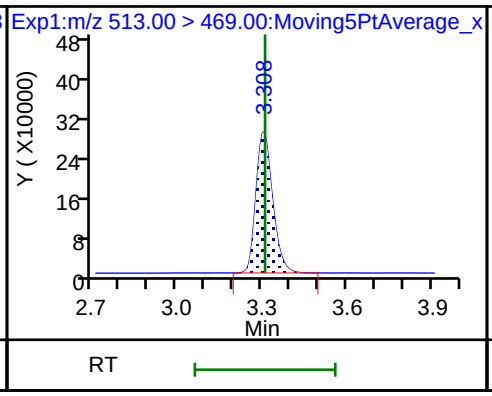
68 Perfluorononanesulfonic acid



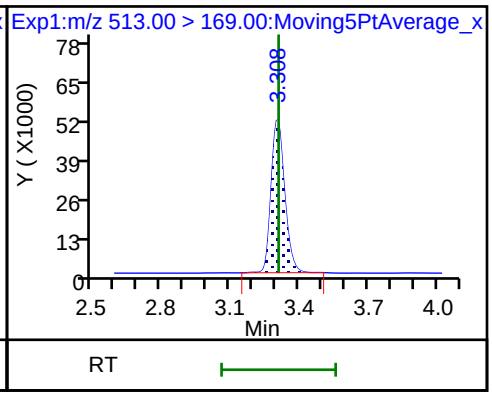
D 26 M2-8:2FTS



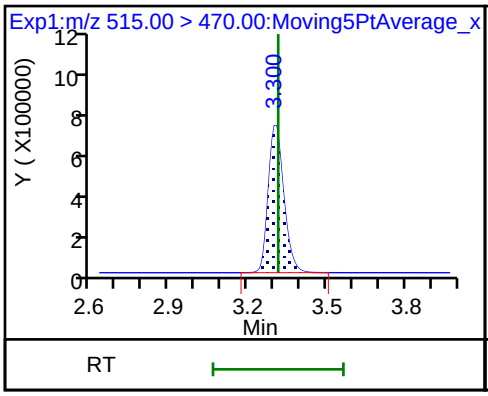
24 Perfluorodecanoic acid



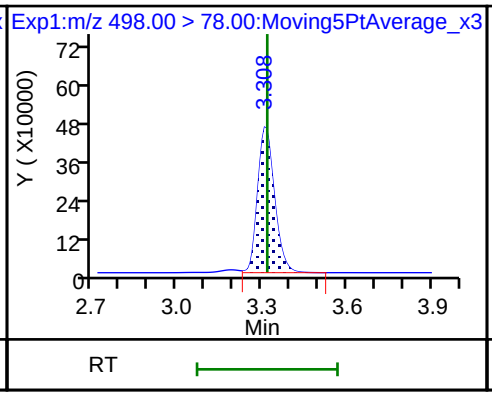
24 Perfluorodecanoic acid



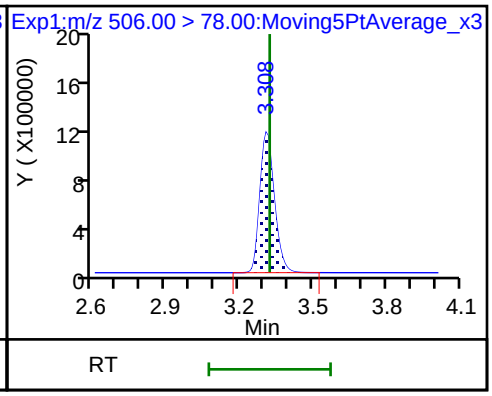
D 23 13C2 PFDA



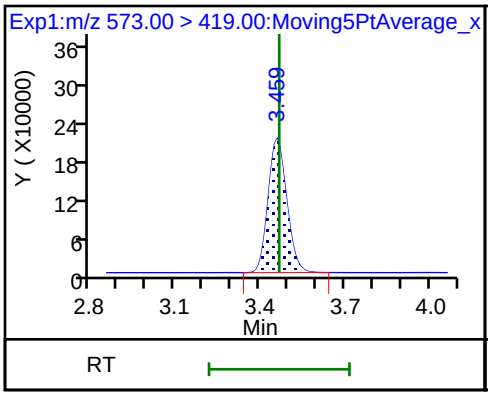
22 Perfluorooctane Sulfonamide



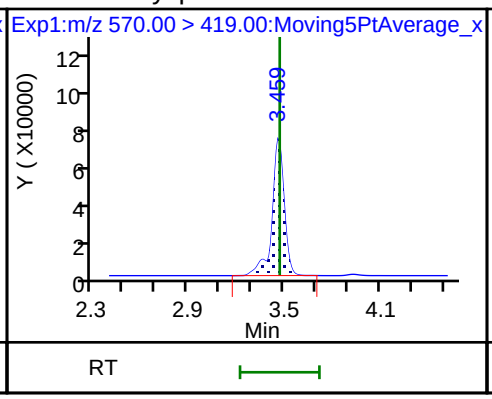
D 21 13C8 FOSA



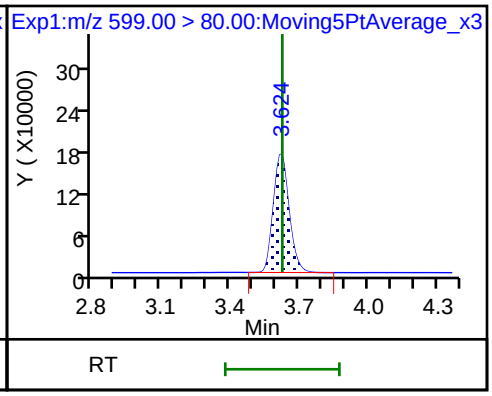
D 27 d3-NMeFOSAA



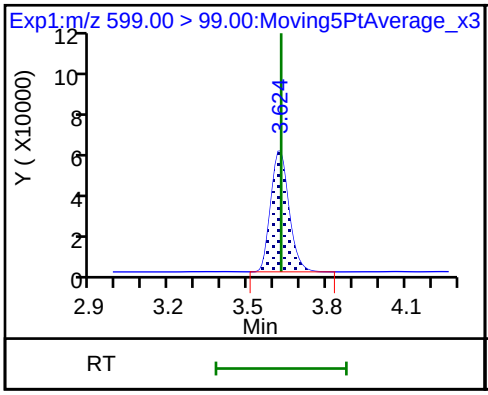
28 N-methyl perfluorooctane sulfonami



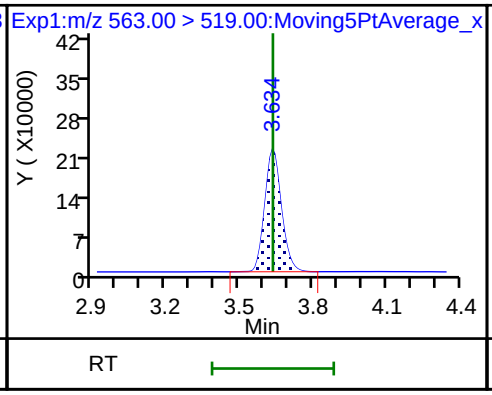
29 Perfluorodecane Sulfonic acid



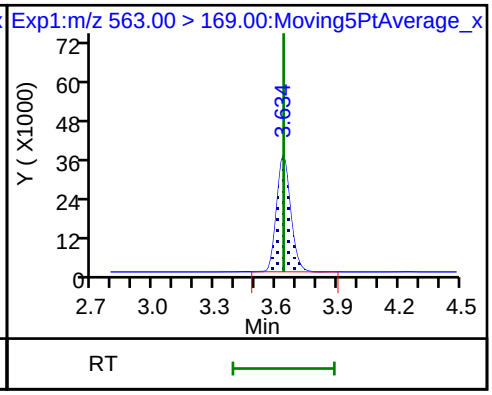
29 Perfluorodecane Sulfonic acid



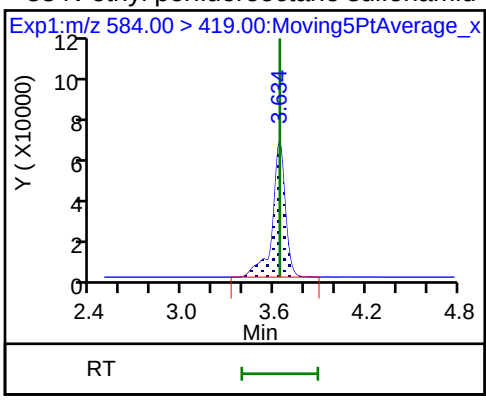
31 Perfluoroundecanoic acid



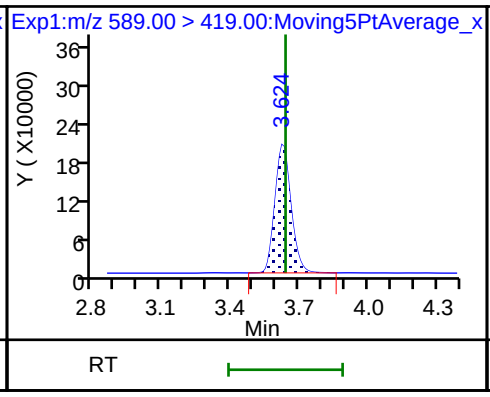
31 Perfluoroundecanoic acid



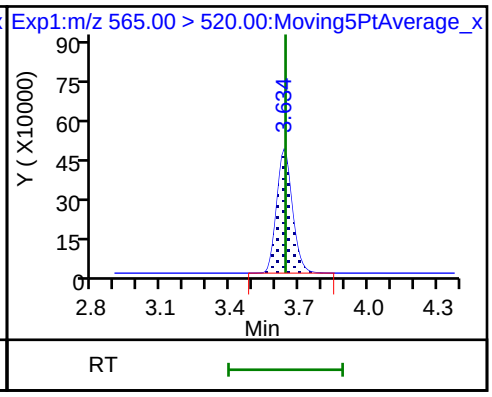
33 N-ethyl perfluorooctane sulfonamid



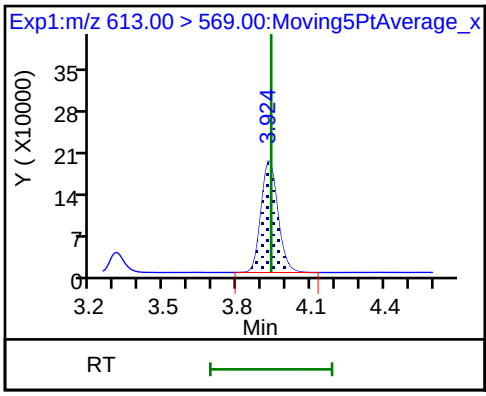
D 32 d5-NEtFOSAA



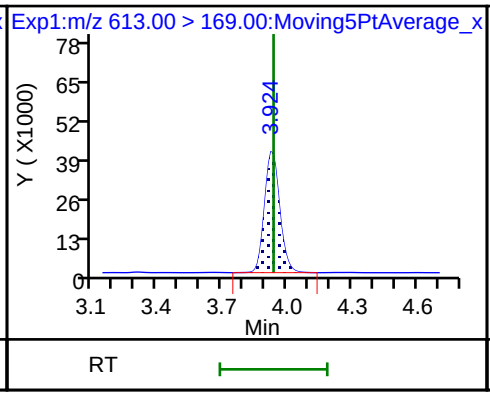
D 30 13C2 PFUnA



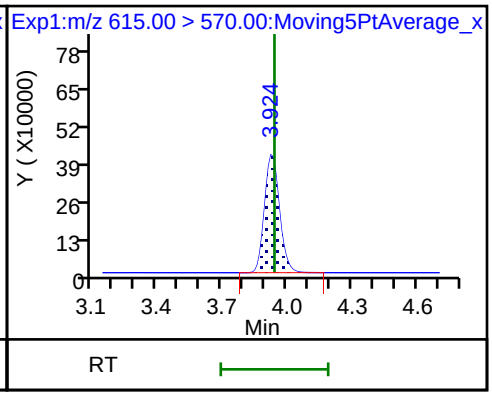
37 Perfluorododecanoic acid



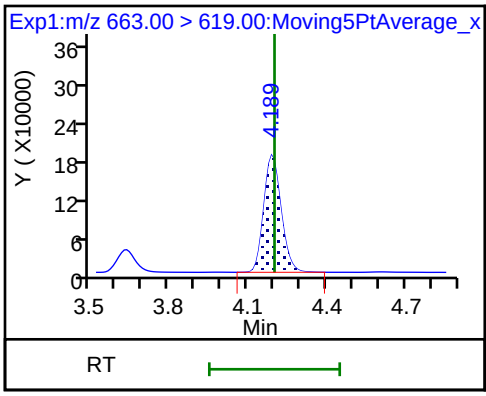
37 Perfluorododecanoic acid



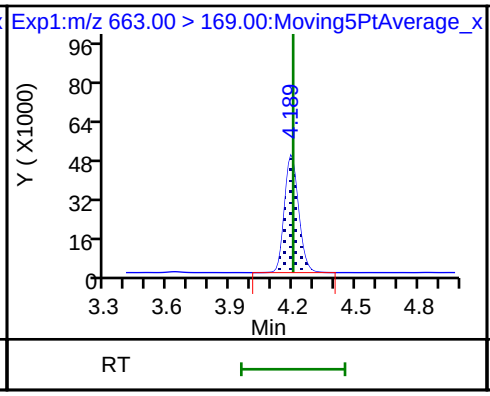
D 36 13C2 PFDoA



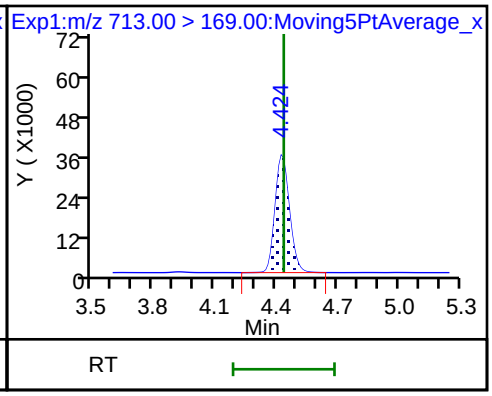
41 Perfluorotridecanoic acid



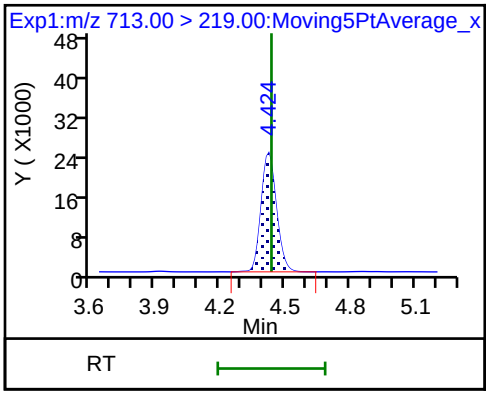
41 Perfluorotridecanoic acid



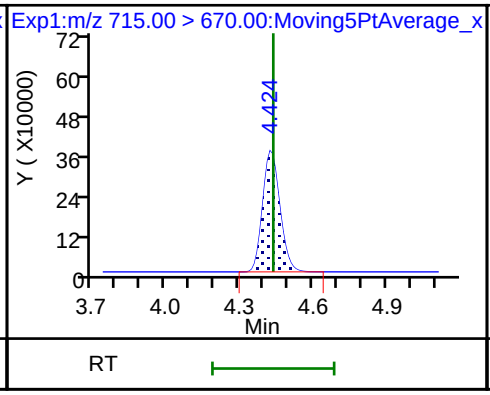
42 Perfluorotetradecanoic acid



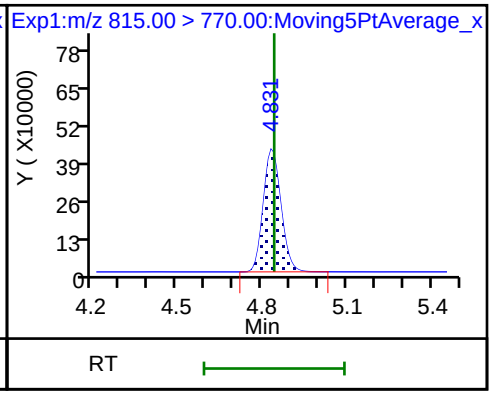
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41333-1
SDG No.:
Client Sample ID: 8-MW12-PRL03-01 MSD DL
Lab Sample ID: 320-41333-5 MSD DL
Matrix: Water
Lab File ID: 2018.08.03LLA_021.d
Analysis Method: EPA 537 (Mod)
Date Collected: 07/17/2018 08:33
Extraction Method: 3535
Date Extracted: 07/24/2018 17:51
Sample wt/vol: 305.4(mL)
Date Analyzed: 08/03/2018 07:27
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 20
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 237784
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	683	4 D	33	25	10
335-67-1	Perfluorooctanoic acid (PFOA)	792	4 D	33	25	8.8
375-95-1	*Perfluorononanoic acid (PFNA)*	*95.9*	*J1 D*	*33*	25	*8.5*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*169*	*4 D*	*33*	16	*7.5*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1940	4 D	33	16	6.2
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1070	4 D M	65	49	18

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL02337	13C3-PFBS	61	M	50-150
STL01892	13C4-PFHpA	65		50-150
STL00990	13C4 PFOA	68		50-150
STL00995	13C5 PFNA	66		50-150
STL00994	18O2 PFHxS	62		50-150
STL00991	13C4 PFOS	59		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_021.d
Lims ID: 320-41333-A-5-C MSD
Client ID: 8-MW12-PRL03-01
Sample Type: MSD
Inject. Date: 03-Aug-2018 07:27:19 ALS Bottle#: 28 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-41333-a-5-c msd 20X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 06-Aug-2018 11:22:17 Calib Date: 01-Aug-2018 13:46:01
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180801-61988.b\2018.08.01LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK008

First Level Reviewer: mongkols Date: 06-Aug-2018 11:22:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.417	1.407	0.010	1.000	1373168	0.6811		1362	702	
D 1 13C4 PFBA										
217.00 > 172.00	1.417	1.411	0.006	0.541	255735	0.0763		61.1	4827	
D 3 13C5-PFPeA										
267.90 > 223.00	1.663	1.653	0.010	0.635	183321	0.0831		66.5	4437	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.663	1.656	0.007	1.000	3983344	2.27		4537	1725	
D 47 13C3-PFBS										M
301.90 > 83.00	1.699	1.690	0.009	0.649	4479	0.0706		60.7	25.3	M
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.699	1.692	0.007	1.000	760379	0.2575		583	1021	
298.90 > 99.00	1.699	1.692	0.007	1.000	321434		2.37(1.25-3.74)		1314	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.903	1.894	0.009	1.120	143958	0.2171		465	6524	
D 7 13C2 PFHxA										
315.00 > 270.00	1.946	1.935	0.012	0.743	203912	0.0854		68.3	7249	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.946	1.937	0.009	1.000	3490495	2.03		4058	9936	
313.00 > 119.00	1.946	1.937	0.009	1.000	324710		10.75(5.03-15.10)		4163	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.967	1.959	0.008	1.158	810780	0.3110		663	4796	
349.00 > 99.00	1.967	1.959	0.008	1.158	318525		2.55(1.36-4.07)		3102	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.034	2.025	0.009	1.000	19236	NC			104	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.034	2.033	0.001	0.777	9722	NC			462	
D 9 13C4-PFHpA										
367.00 > 322.00	2.264	2.251	0.013	0.865	189209	0.0818		65.4	7919	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.264	2.253	0.011	1.000	1829663	1.04		2085	1181	
363.00 > 169.00	2.264	2.253	0.011	1.000	665372		2.75(1.13-3.40)		9182	
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.264	0.013	0.870	253117	0.0728		61.6	10456	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.277	2.266	0.011	1.000	7340963	2.97		6520	14600	
399.00 > 99.00	2.277	2.266	0.011	1.000	2361542		3.11(1.50-4.49)		4931	
65 ADONA										
377.00 > 251.00	2.303	2.305	-0.002	0.771	214894	NC			2734	
377.00 > 85.00	2.316	2.305	0.011	0.776	121635		1.77(0.84-2.53)		453	
D 12 M2-6:2FTS										
429.00 > 81.00	2.595	2.579	0.016	0.991	91382	0.1348		114	2548	
13 1H,1H,2H,2H-perfluorooctanesulfoni										E
427.00 > 407.00	2.595	2.588	0.007	1.000	15657554	12.3		25957	116478	E
D 14 13C4 PFOA										
417.00 > 372.00	2.619	2.602	0.017	1.000	189161	0.0847		67.7	8638	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.619	2.611	0.008	1.000	2115047	1.21		2415	1413	
413.00 > 169.00	2.619	2.611	0.008	1.000	1126358		1.88(0.84-2.52)		9679	
* 62 13C2-PFOA										s
415.00 > 370.00	2.619	2.611	0.008		290898	0.1250			11087	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.627	2.619	0.008	0.880	323673	0.1660		349	359	
449.00 > 99.00	2.627	2.619	0.008	0.880	85080		3.80(1.94-5.82)		553	
D 19 13C5 PFNA										
468.00 > 423.00	2.986	2.964	0.022	1.140	159893	0.0821		65.7	7072	
D 18 13C4 PFOS										
503.00 > 80.00	2.986	2.964	0.022	1.140	168559	0.0702		58.7	5544	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.986	2.973	0.013	1.000	2596155	1.64		3533	13383	M
499.00 > 99.00	2.986	2.973	0.013	1.000	541559		4.79(2.31-6.93)		3779	M
20 Perfluorononanoic acid										
463.00 > 419.00	2.986	2.979	0.007	1.000	202216	0.1464		293	737	
463.00 > 169.00	2.986	2.979	0.007	1.000	51188		3.95(1.90-5.69)		2722	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.194	3.187	0.007	1.070	122487	NC			2172	
D 26 M2-8:2FTS										
529.00 > 81.00	3.329	3.311	0.018	1.271	57122	0.0864		72.2	1898	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.329	3.322	0.007	1.000	151804	0.2355		492	5966	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.329	3.322	0.007	1.115	56972	0.0562		117	875	
549.00 > 99.00	3.329	3.322	0.007	1.115	20183		2.82(1.33-3.97)		149	
D 23 13C2 PFDA										
515.00 > 470.00	3.337	3.327	0.010	1.274	135728	0.0932		74.6	10530	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.345	3.330	0.015	1.003	54056	0.0466		93.3	96.4	
513.00 > 169.00	3.337	3.330	0.007	1.000	10171		5.31(2.36-7.09)		200	
D 21 13C8 FOSA										
506.00 > 78.00	3.363	3.343	0.020	1.284	258662	0.0733		58.6	7320	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.363	3.355	0.008	1.000	104219	0.0510		102	1843	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.494	3.473	0.021	1.334	28908	0.0818		65.5	1304	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.504	3.486	0.018	1.003	10406	0.0443		88.5	643	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.659	3.647	0.012	1.397	29595	0.0781		62.5	264	
D 30 13C2 PFUnA										
565.00 > 520.00	3.669	3.647	0.022	1.401	90614	0.0808		64.7	3806	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.649	3.650	-0.001	1.222	42144	0.0459		95.3	1748	
599.00 > 99.00	3.659	3.650	0.009	1.226	12976		3.25(1.39-4.16)		171	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.669	3.659	0.010	1.003	9190	0.0436		87.1	218	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.669	3.659	0.010	1.000	44231	0.0495		99.0	101	
563.00 > 169.00	3.669	3.659	0.010	1.000	7591		5.83(2.12-6.36)		393	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.825	3.815	0.010	1.281	167836	NC			4402	
D 36 13C2 PFDoA										
615.00 > 570.00	3.960	3.943	0.017	1.512	84804	0.0873		69.9	2249	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.951	3.951	0.0	0.998	37365	0.0509		102	67.0	
613.00 > 169.00	3.951	3.951	0.0	0.998	8784		4.25(2.13-6.40)		298	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.213	4.203	0.010	1.064	32110	0.0502		100	18.1	
663.00 > 169.00	4.213	4.203	0.010	1.064	10244		3.13(1.25-3.76)		219	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.448	4.433	0.015	1.698	59932	0.0735		58.8	299	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.437	4.437	0.0	0.998	6214	0.0481		96.2	176	
713.00 > 219.00	4.437	4.437	0.0	0.998	4608		1.35(0.71-2.13)		98.2	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.843	4.829	0.014	1.849	57227	0.0408		32.6	93.1	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.843	4.833	0.010	1.000	31180	NC			1.4	
813.00 > 169.00	4.843	4.833	0.010	1.000	3994		7.81(2.86-8.58)		53.3	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.174	5.166	0.008	1.068	18353	NC			10.2	
913.00 > 169.00	5.174	5.166	0.008	1.068	2343		7.83(3.83-11.48)		35.2	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

s - Failed ISTD Recovery Test

Review Flags

M - Manually Integrated

Report Date: 06-Aug-2018 11:22:17 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_021.d

Injection Date: 03-Aug-2018 07:27:19 Instrument ID: A8_N

Lims ID: 320-41333-A-5-C MSD

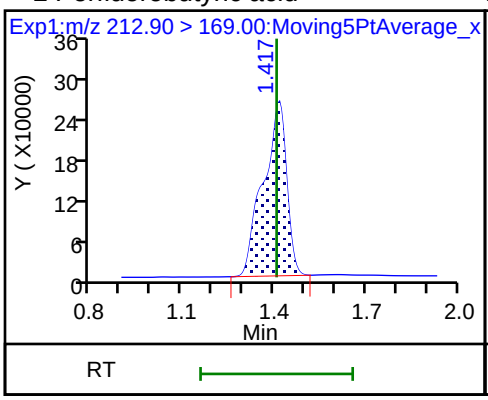
Client ID: 8-MW12-PRL03-01

Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 10

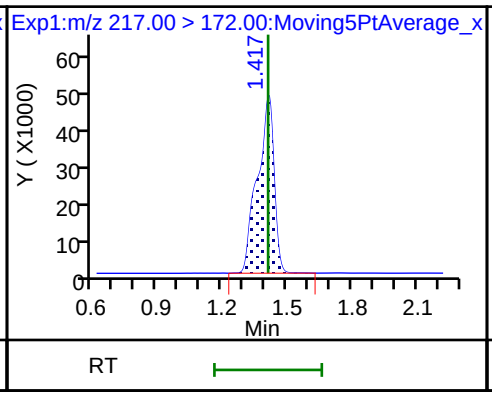
Injection Vol: 2.0 ul Dil. Factor: 20.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid



D 1 13C4 PFBA



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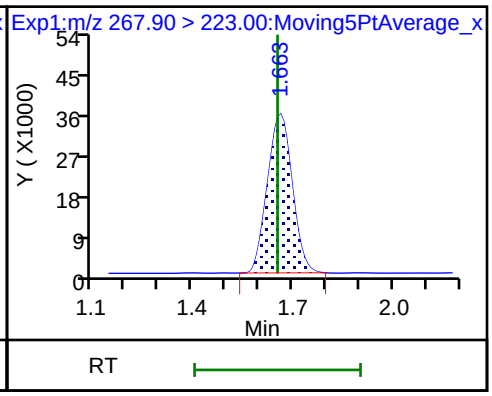
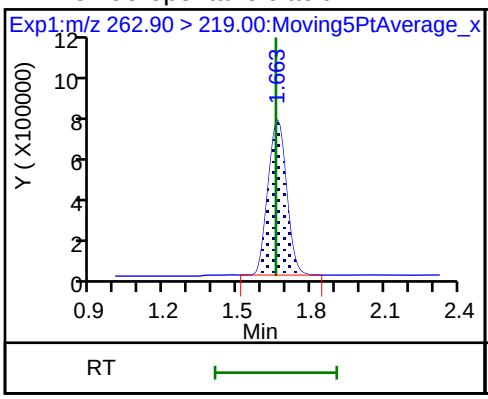
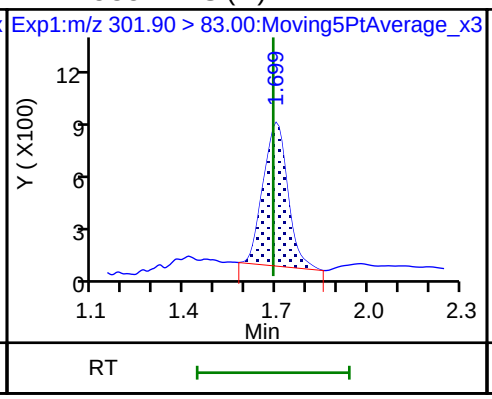


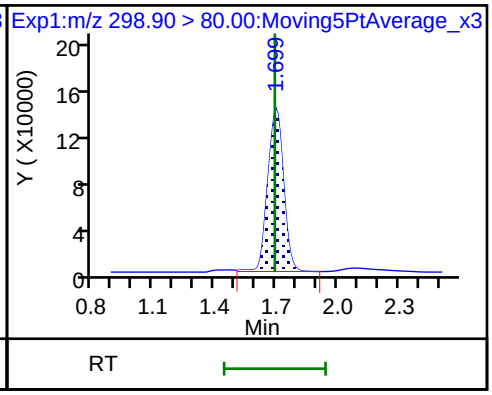
4 Perfluoropentanoic acid



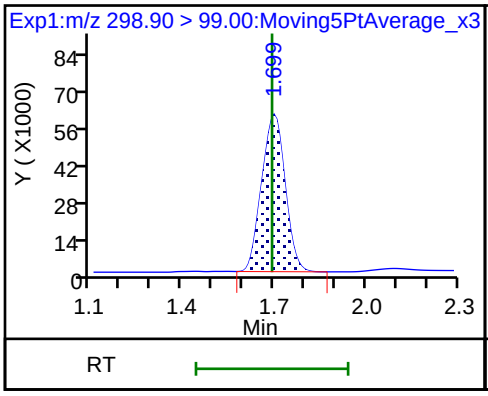
D 47 13C3-PFBS (M)



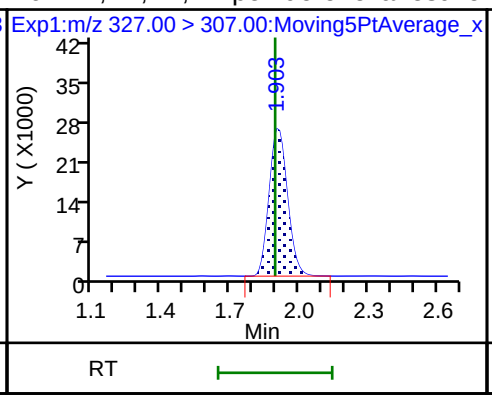
5 Perfluorobutanesulfonic acid



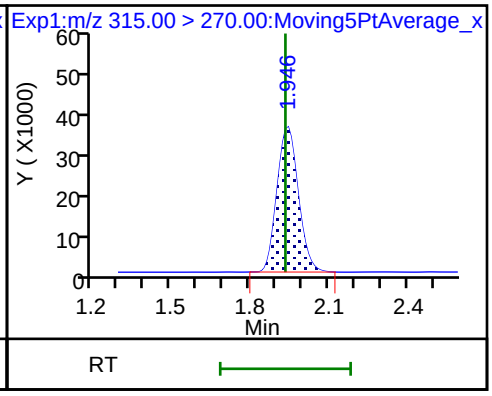
5 Perfluorobutanesulfonic acid



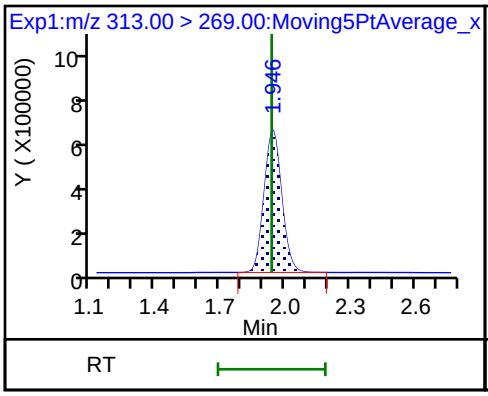
61 1H,1H,2H,2H-perfluorohexanesulfon



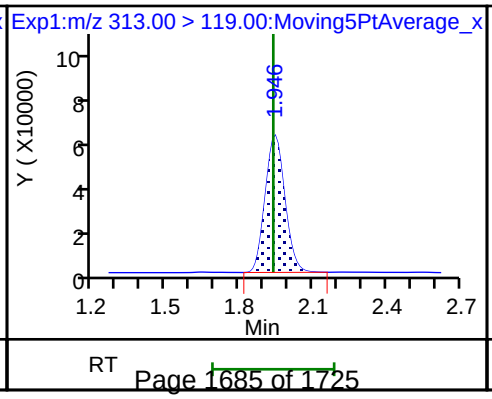
D 7 13C2 PFHxA



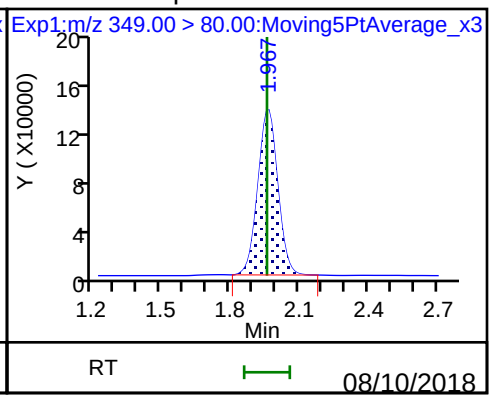
6 Perfluorohexanoic acid



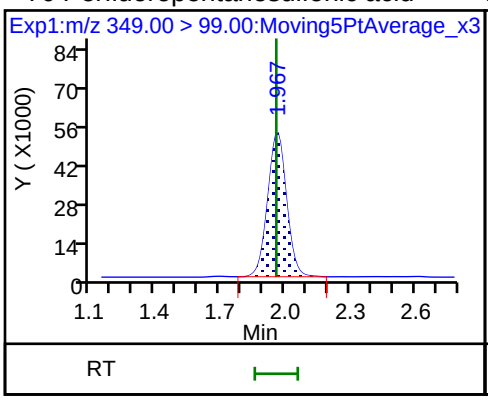
6 Perfluorohexanoic acid



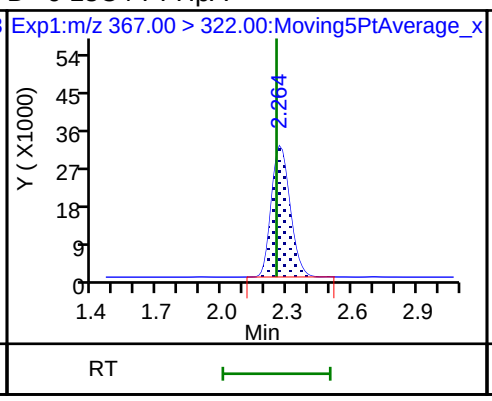
70 Perfluoropentanesulfonic acid



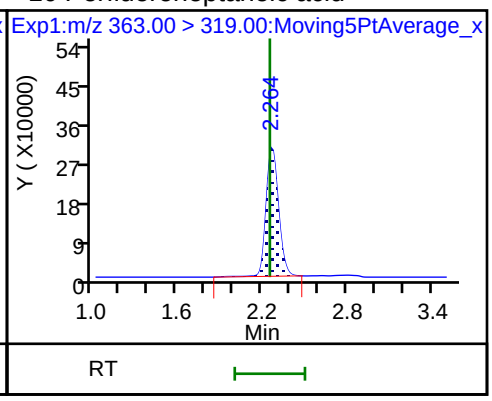
70 Perfluoropentanesulfonic acid



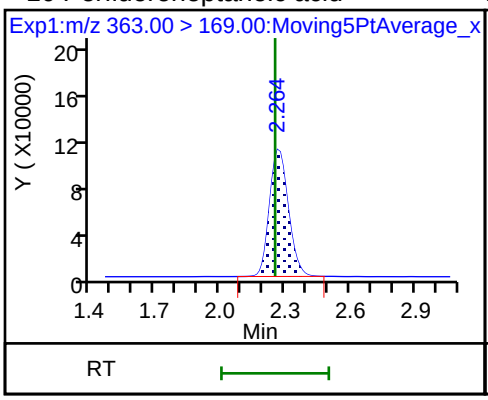
D 9 13C4-PFHpA



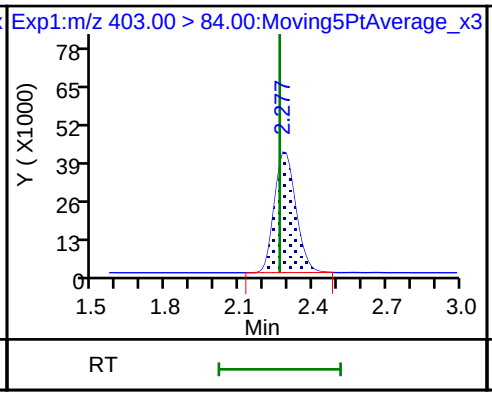
10 Perfluoroheptanoic acid



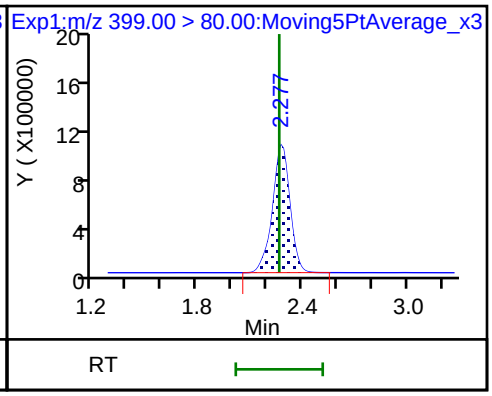
10 Perfluoroheptanoic acid



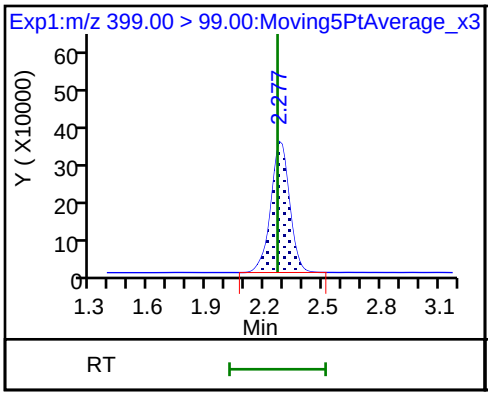
D 11 18O2 PFHxS



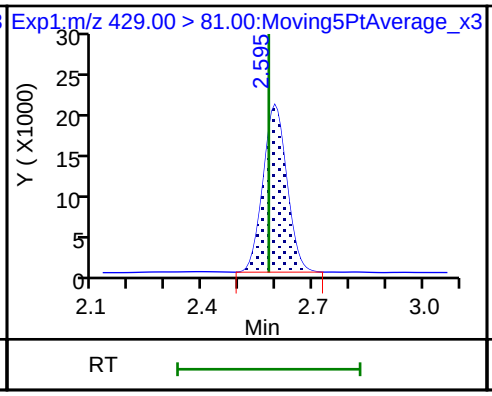
8 Perfluorohexanesulfonic acid



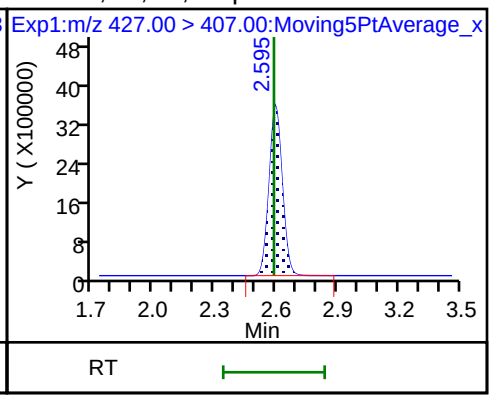
8 Perfluorohexanesulfonic acid



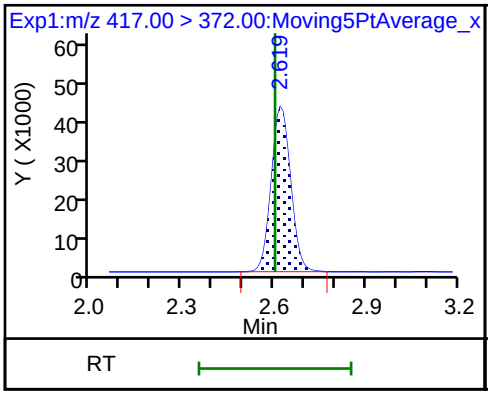
D 12 M2-6:2FTS



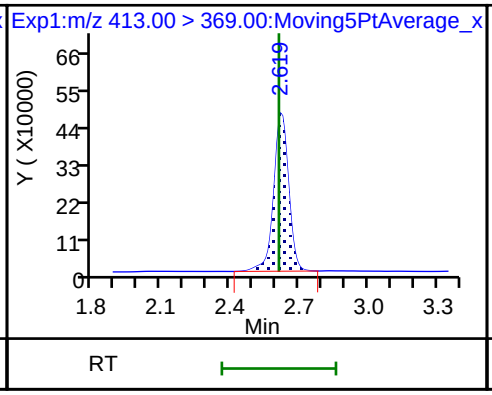
13 1H,1H,2H,2H-perfluorooctanesulfoni



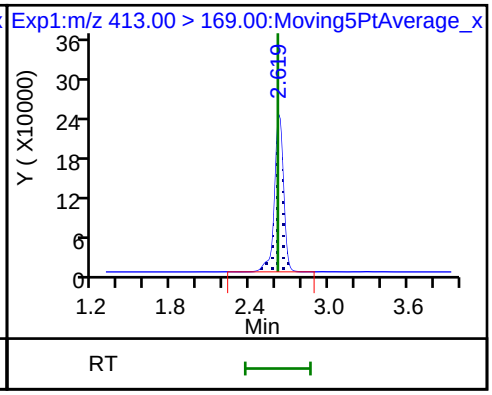
D 14 13C4 PFOA



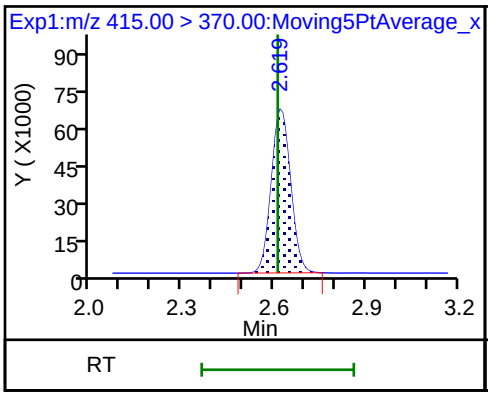
15 Perfluorooctanoic acid



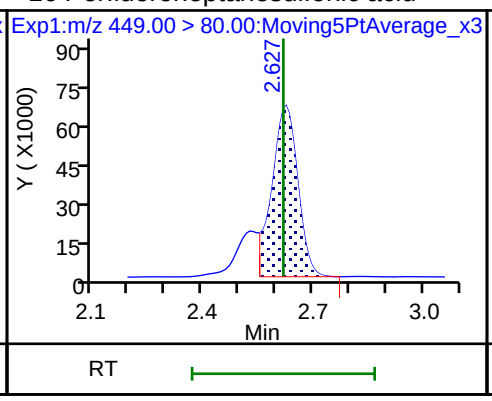
15 Perfluorooctanoic acid



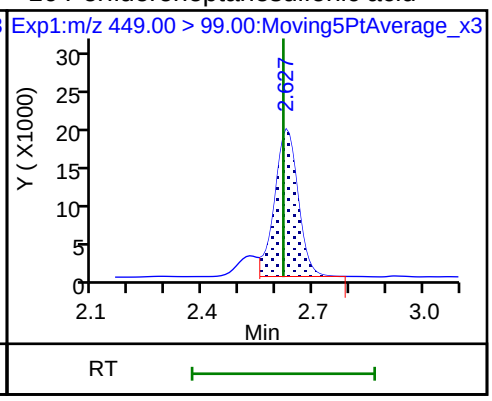
* 62 13C2-PFOA



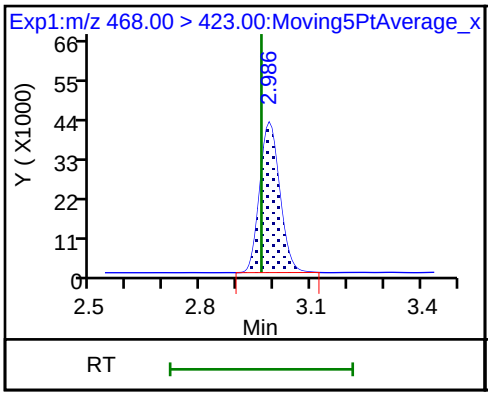
16 Perfluoroheptanesulfonic acid



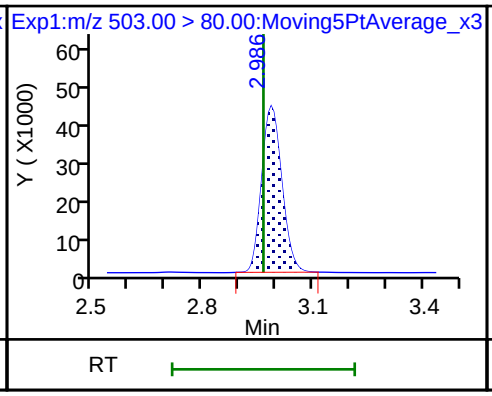
16 Perfluoroheptanesulfonic acid



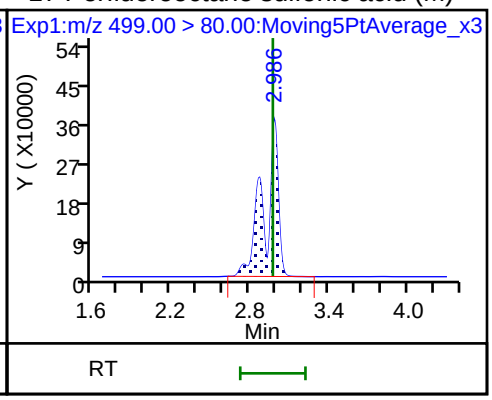
D 19 13C5 PFNA



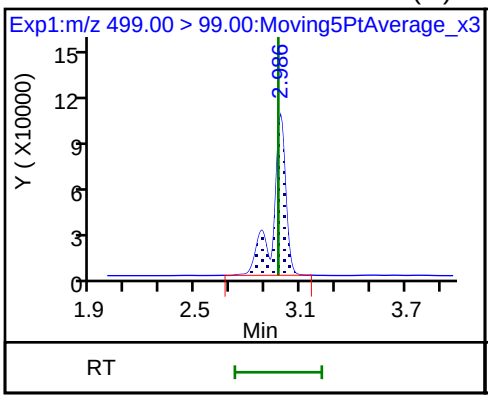
D 18 13C4 PFOS



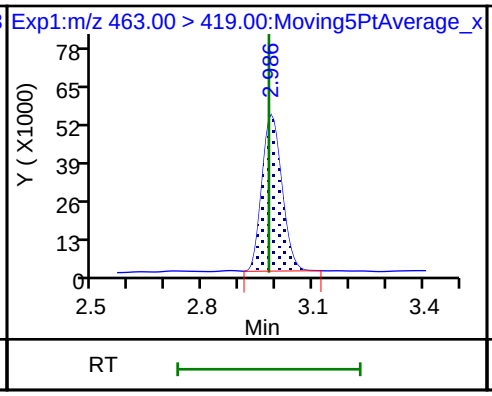
17 Perfluorooctane sulfonic acid (M)



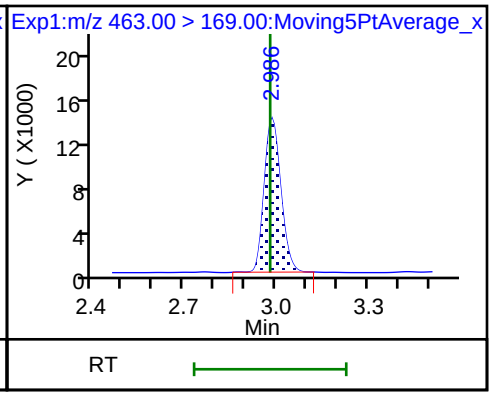
17 Perfluorooctane sulfonic acid (M)



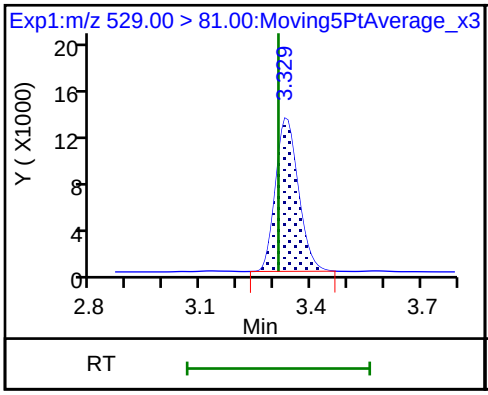
20 Perfluorononanoic acid



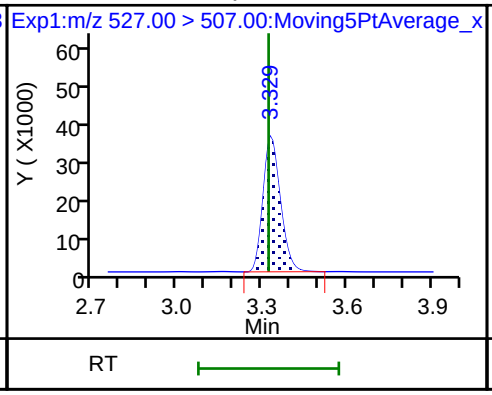
20 Perfluorononanoic acid



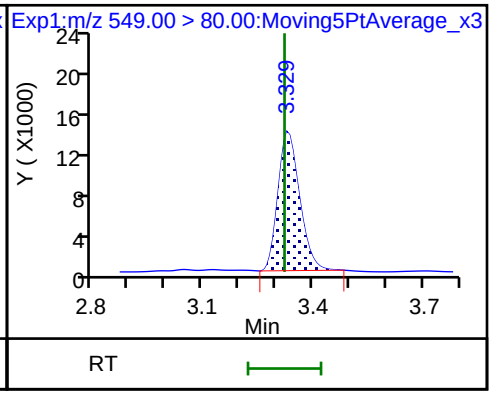
D 26 M2-8:2FTS



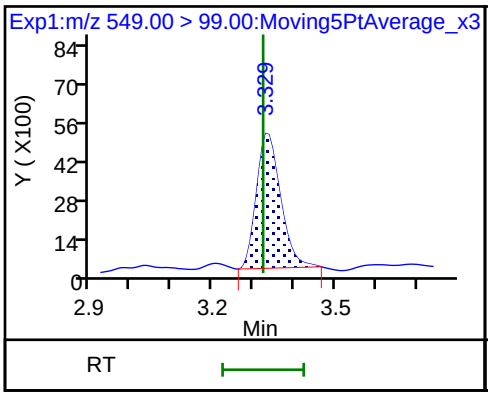
25 1H,1H,2H,2H-perfluorodecanesulfoni



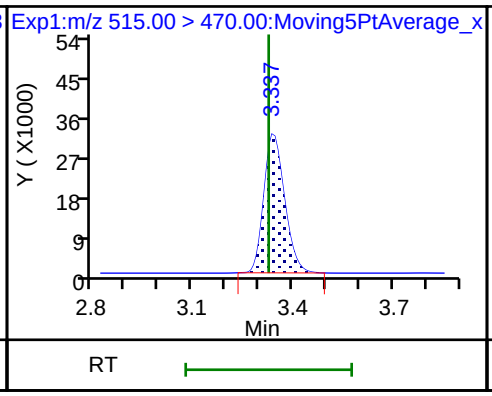
68 Perfluorononanesulfonic acid



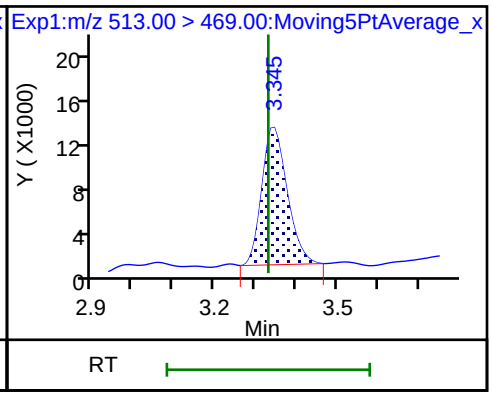
68 Perfluorononanesulfonic acid



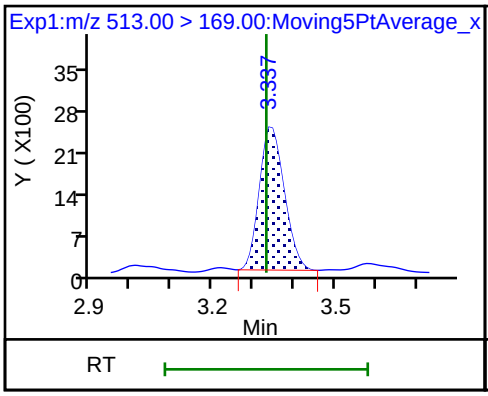
D 23 13C2 PFDA



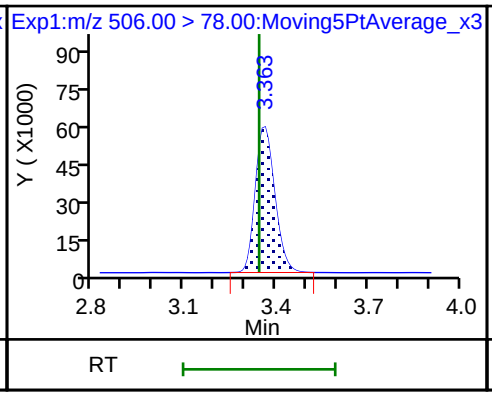
24 Perfluorodecanoic acid



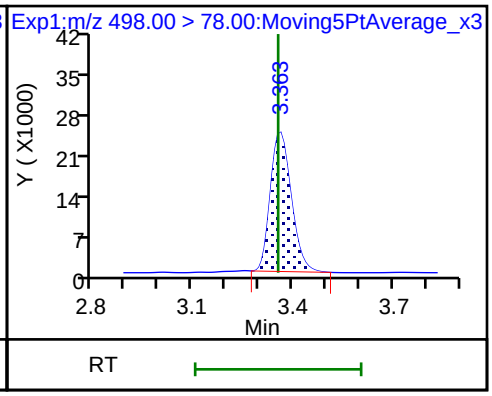
24 Perfluorodecanoic acid



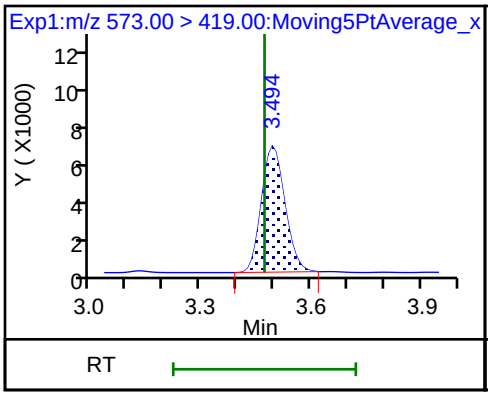
D 21 13C8 FOSA



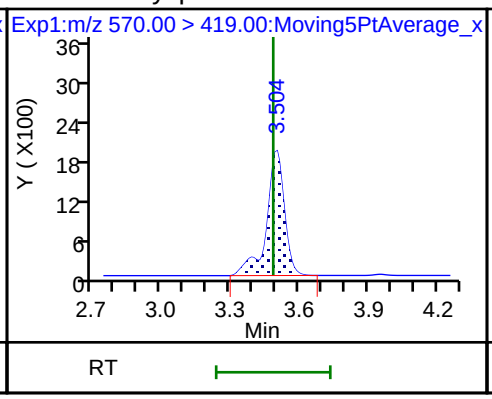
22 Perfluorooctane Sulfonamide



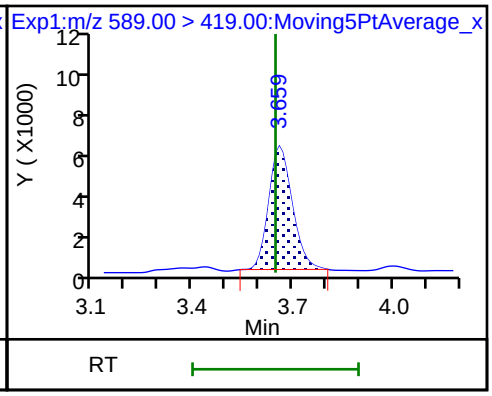
D 27 d3-NMeFOSAA



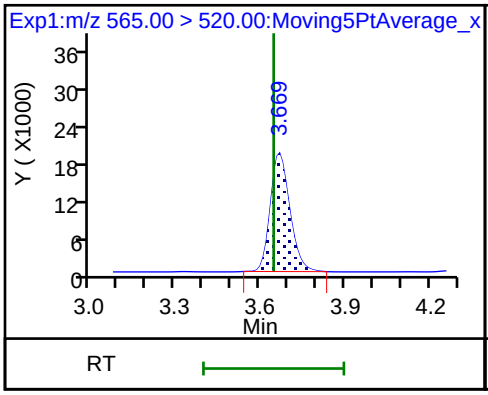
28 N-methyl perfluorooctane sulfonami



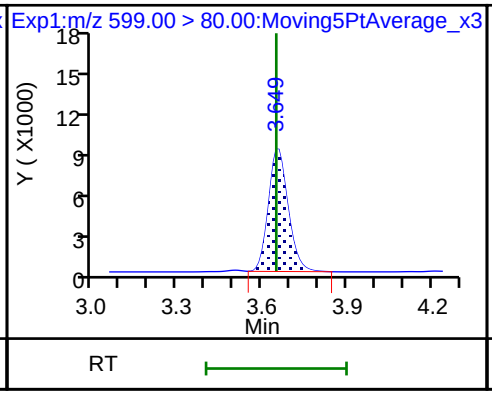
D 32 d5-NEtFOSAA



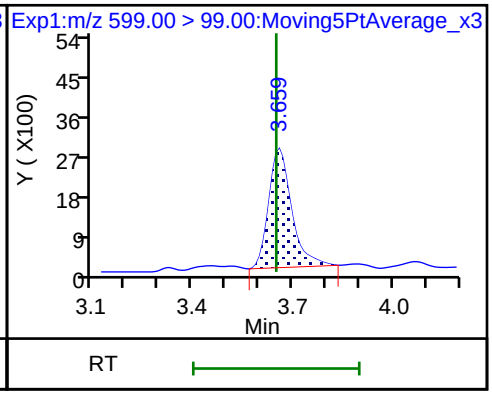
D 30 13C2 PFUnA



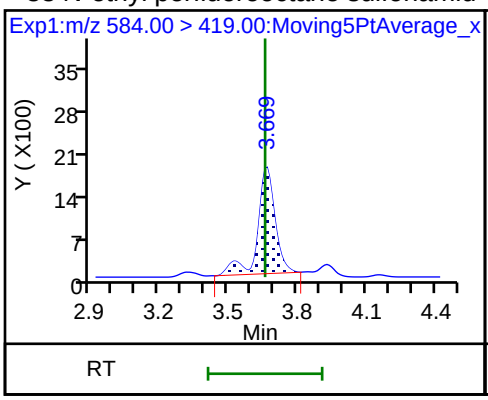
29 Perfluorodecane Sulfonic acid



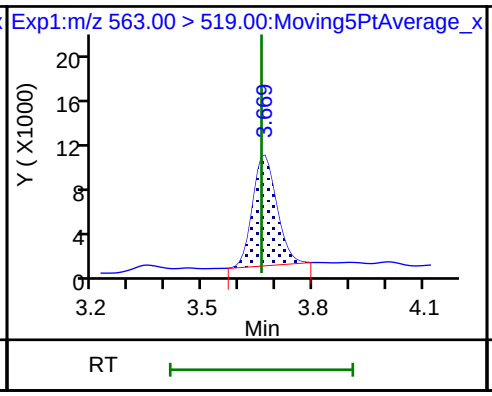
29 Perfluorodecane Sulfonic acid



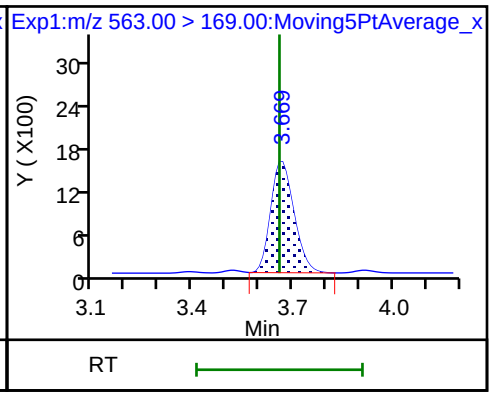
33 N-ethyl perfluorooctane sulfonamid



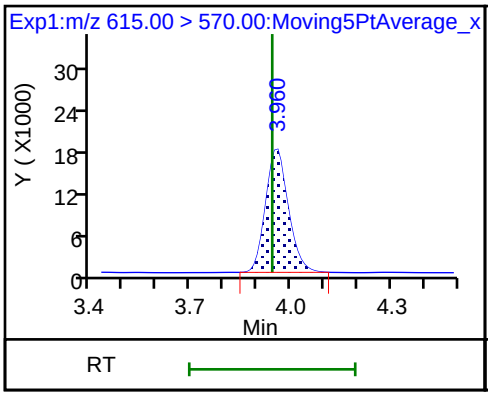
31 Perfluoroundecanoic acid



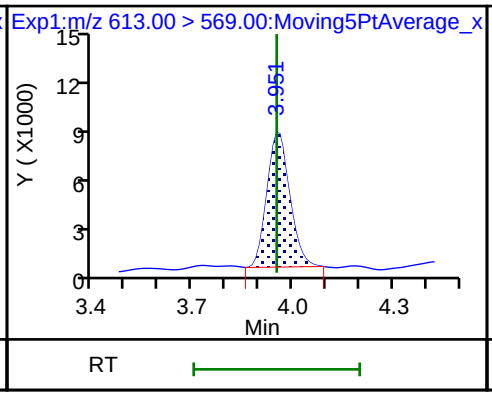
31 Perfluoroundecanoic acid



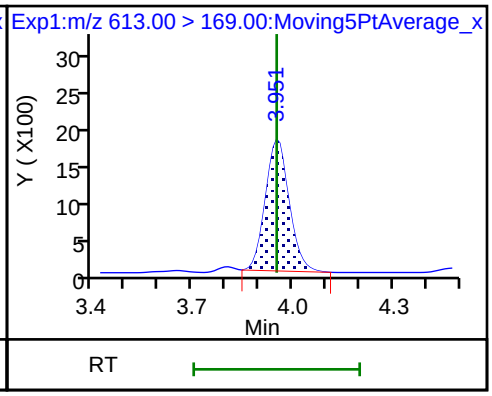
D 36 13C2 PFDoA



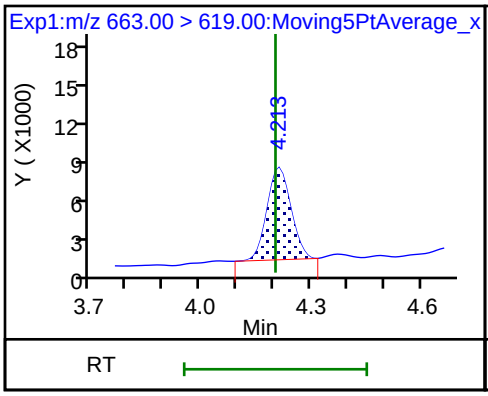
37 Perfluorododecanoic acid



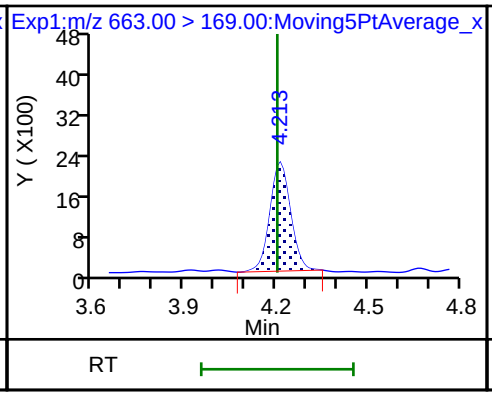
37 Perfluorododecanoic acid



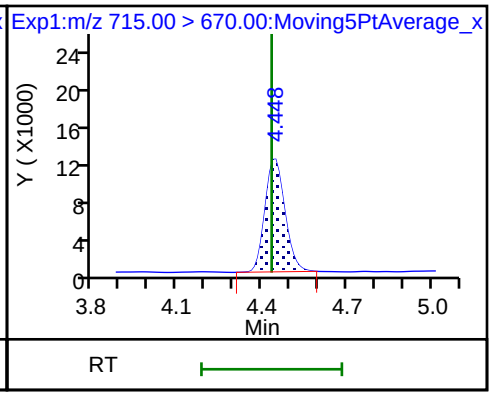
41 Perfluorotridecanoic acid



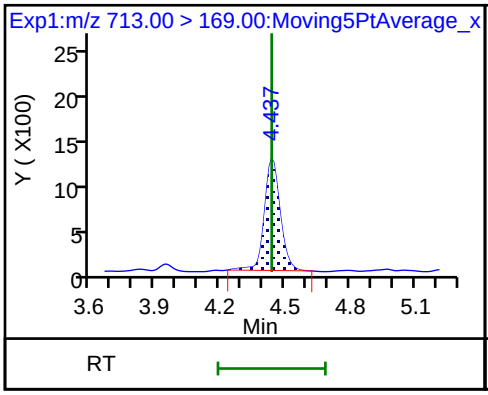
41 Perfluorotridecanoic acid



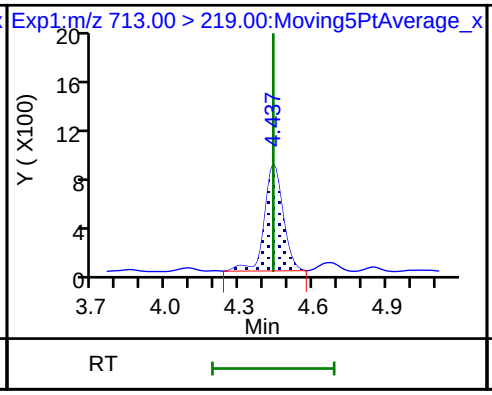
D 43 13C2-PFTeDA



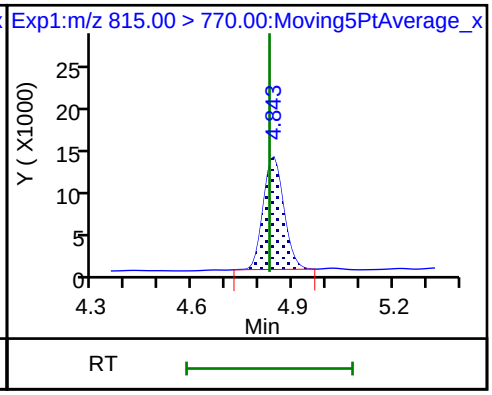
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

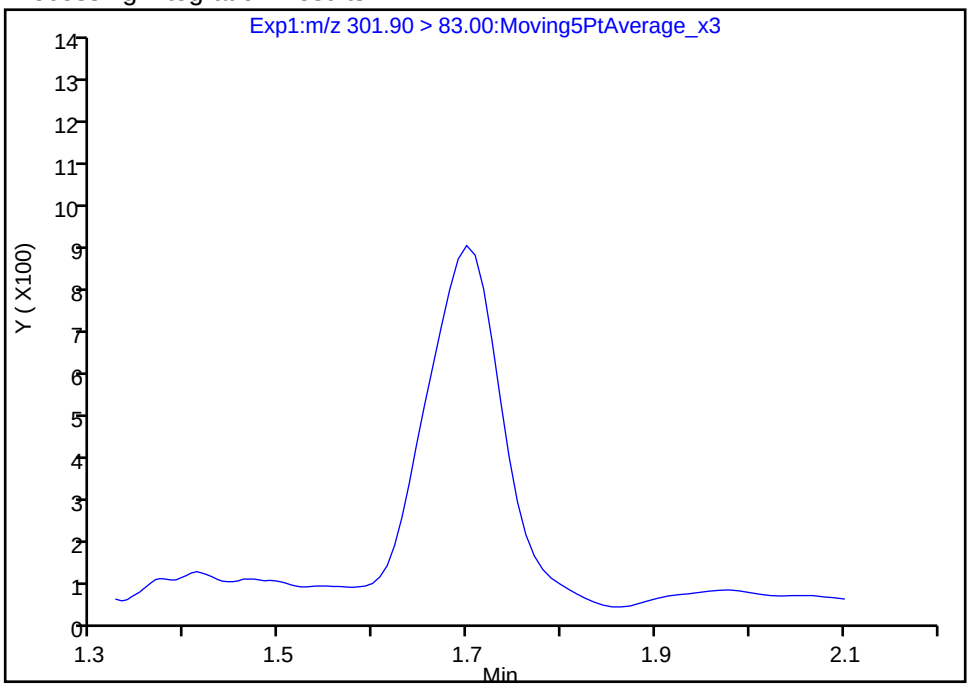
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_021.d				
Injection Date:	03-Aug-2018 07:27:19	Instrument ID:	A8_N		
Lims ID:	320-41333-A-5-C MSD				
Client ID:	8-MW12-PRL03-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

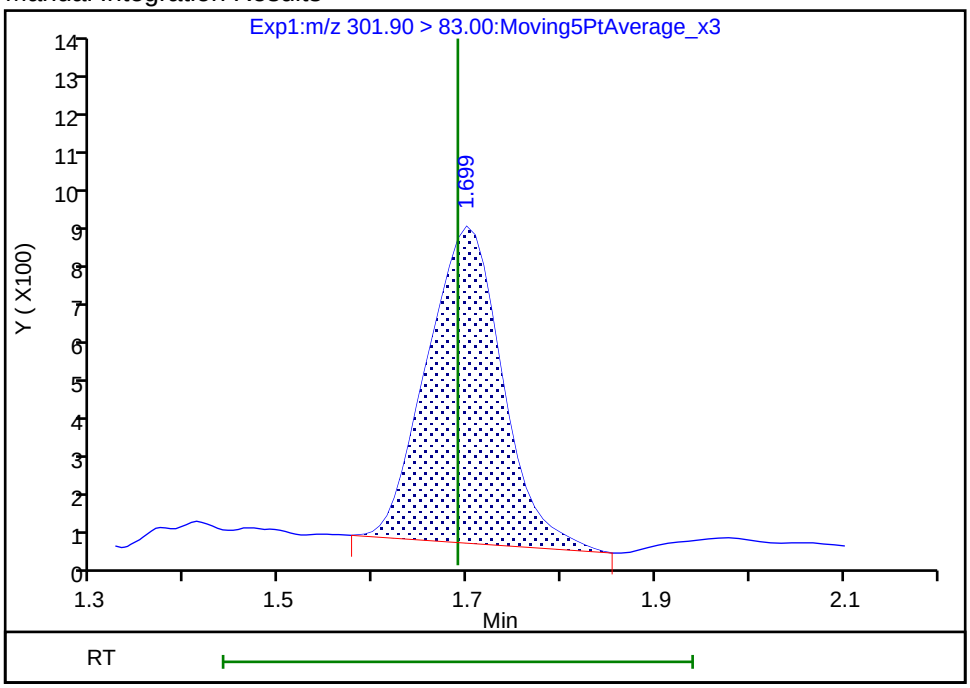
Processing Integration Results

Not Detected
Expected RT: 1.69



Manual Integration Results

RT: 1.70
Area: 4479
Amount: 0.070597
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:21:33
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

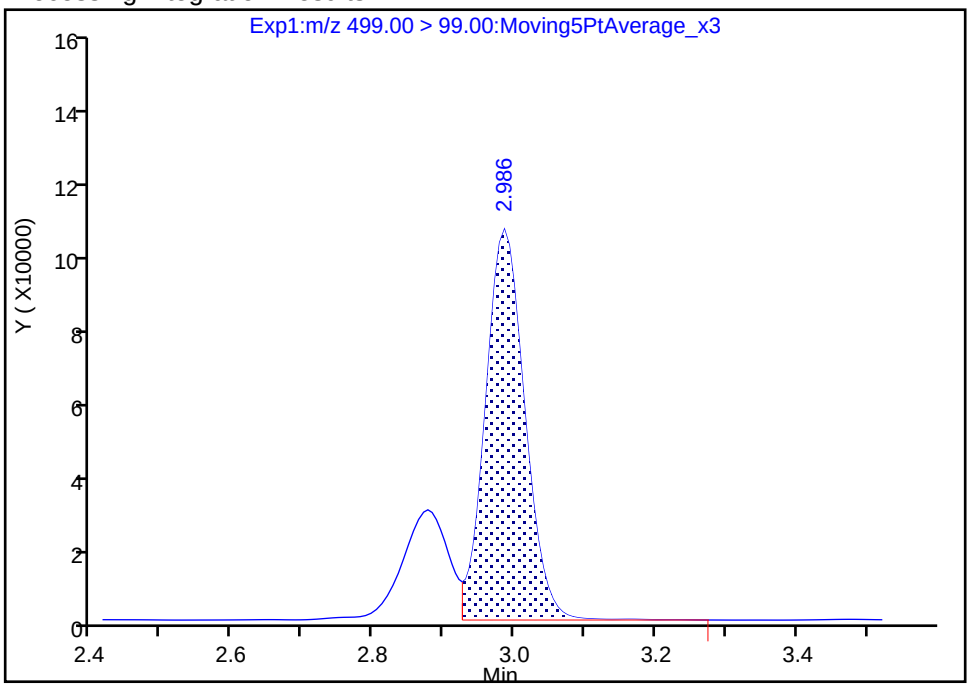
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_021.d				
Injection Date:	03-Aug-2018 07:27:19	Instrument ID:	A8_N		
Lims ID:	320-41333-A-5-C MSD				
Client ID:	8-MW12-PRL03-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

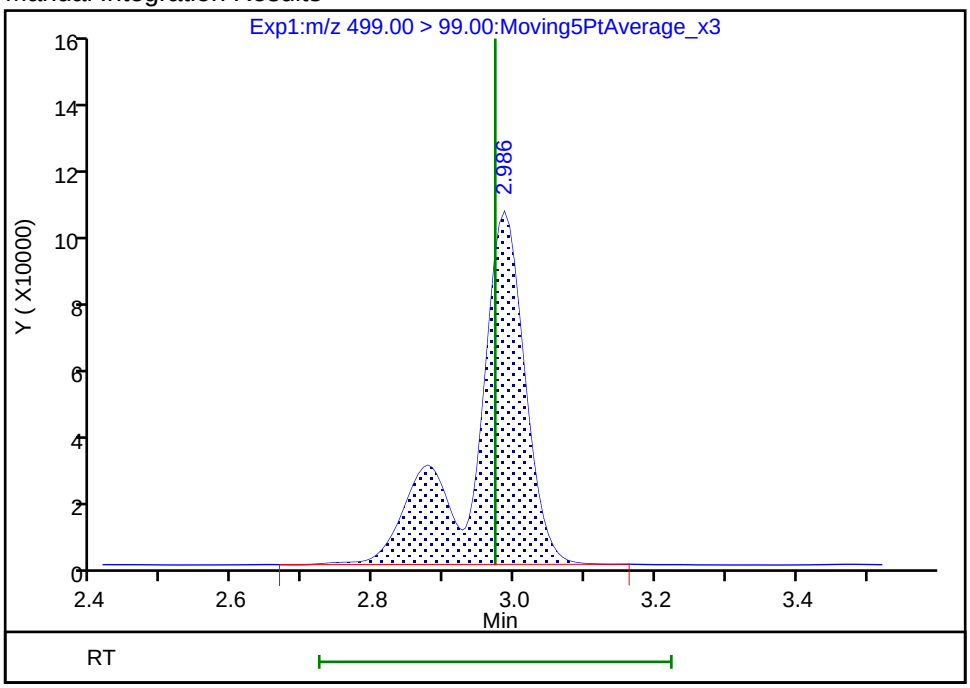
Processing Integration Results

RT: 2.99
Area: 410332
Amount: 0.879940
Amount Units: ng/ml



Manual Integration Results

RT: 2.99
Area: 541559
Amount: 1.639475
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:22:02

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

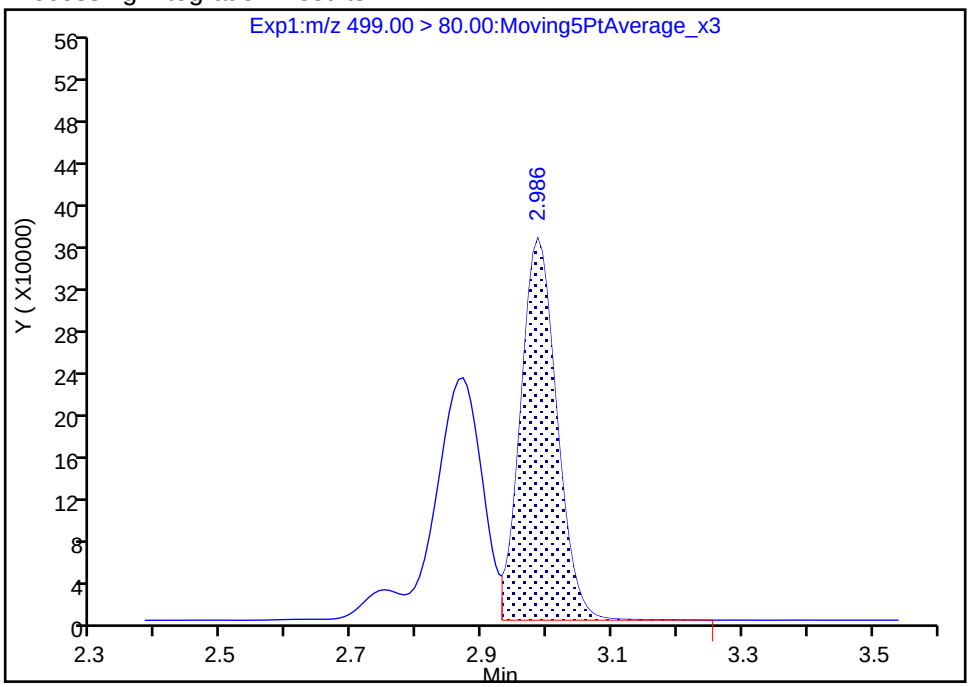
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180803-62080.b\2018.08.03LLA_021.d				
Injection Date:	03-Aug-2018 07:27:19	Instrument ID:	A8_N		
Lims ID:	320-41333-A-5-C MSD				
Client ID:	8-MW12-PRL03-01				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	28	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

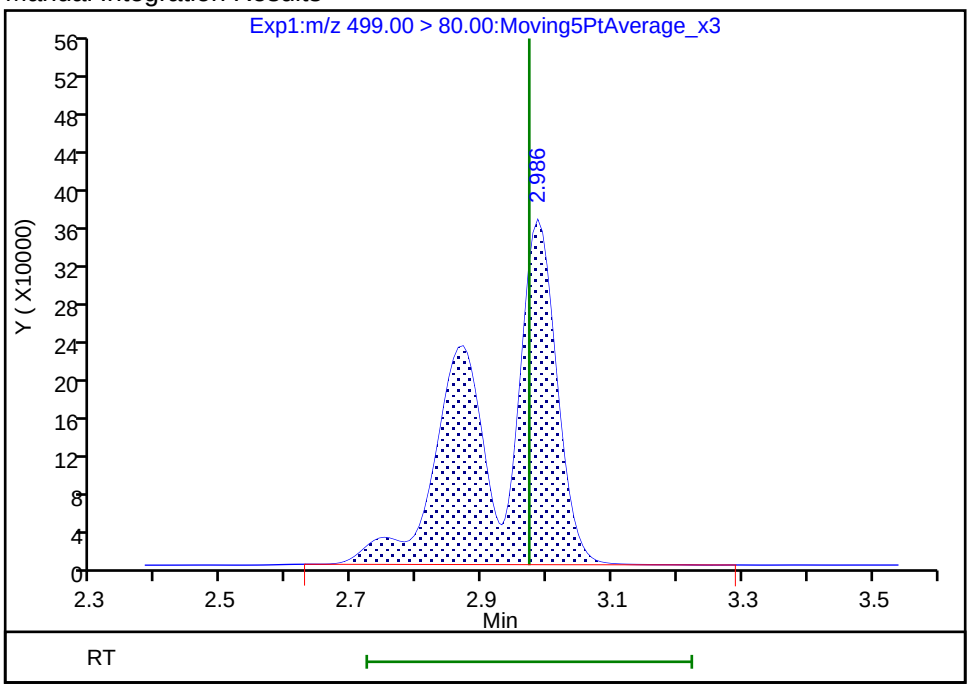
Processing Integration Results

RT: 2.99
Area: 1393410
Amount: 0.879940
Amount Units: ng/ml



Manual Integration Results

RT: 2.99
Area: 2596155
Amount: 1.639475
Amount Units: ng/ml



Reviewer: mongkols, 06-Aug-2018 11:22:05

Audit Action: Manually Integrated Audit Reason: Isomers

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 07/23/2018 16:11

Analysis Batch Number: 235668 End Date: 07/23/2018 17:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-235668/2		07/23/2018 16:11	1	2018.07.23LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-235668/3		07/23/2018 16:19	1	2018.07.23LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-235668/4		07/23/2018 16:26	1	2018.07.23LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-235668/5 ICIS		07/23/2018 16:34	1	2018.07.23LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-235668/6		07/23/2018 16:42	1	2018.07.23LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-235668/7		07/23/2018 16:50	1	2018.07.23LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-235668/8		07/23/2018 16:58	1	2018.07.23LLICAL 008.d	GeminiC18 3x100 3(mm)
ICB 320-235668/9		07/23/2018 17:05	1	2018.07.23LLICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-235668/10		07/23/2018 17:13	1	2018.07.23LLICAL 010.d	GeminiC18 3x100 3(mm)
CCB 320-235668/11		07/23/2018 17:21	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 07/29/2018 04:55

Analysis Batch Number: 236782 End Date: 07/29/2018 07:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-236782/1		07/29/2018 04:55	1	2018.07.28LLB_003.d	GeminiC18 3x100 3(mm)
CCVL 320-236782/2		07/29/2018 05:03	1	2018.07.28LLB_004.d	GeminiC18 3x100 3(mm)
CCV 320-236782/3 CCVIS		07/29/2018 05:11	1	2018.07.28LLB_042.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 05:19	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 05:27	1		GeminiC18 3x100 3(mm)
320-41333-1		07/29/2018 05:35	1	2018.07.28LLB_045.d	GeminiC18 3x100 3(mm)
320-41333-2		07/29/2018 05:43	1	2018.07.28LLB_046.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 05:50	1		GeminiC18 3x100 3(mm)
320-41333-4		07/29/2018 05:58	1	2018.07.28LLB_048.d	GeminiC18 3x100 3(mm)
320-41333-5		07/29/2018 06:06	1	2018.07.28LLB_049.d	GeminiC18 3x100 3(mm)
320-41333-5 MS		07/29/2018 06:14	1	2018.07.28LLB_050.d	GeminiC18 3x100 3(mm)
320-41333-5 MSD		07/29/2018 06:22	1	2018.07.28LLB_051.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 06:30	1		GeminiC18 3x100 3(mm)
CCV 320-236782/14		07/29/2018 06:37	1	2018.07.28LLB_053.d	GeminiC18 3x100 3(mm)
320-41333-7		07/29/2018 06:45	1	2018.07.28LLB_054.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 06:53	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 07:01	1		GeminiC18 3x100 3(mm)
320-41333-10		07/29/2018 07:09	1	2018.07.28LLB_057.d	GeminiC18 3x100 3(mm)
320-41333-12		07/29/2018 07:17	1	2018.07.28LLB_058.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 07:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 07:32	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/29/2018 07:40	1		GeminiC18 3x100 3(mm)
320-41333-17		07/29/2018 07:48	1	2018.07.28LLB_062.d	GeminiC18 3x100 3(mm)
CCV 320-236782/24		07/29/2018 07:56	1	2018.07.28LLB_063.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/01/2018 12:59

Analysis Batch Number: 237402 End Date: 08/01/2018 14:09

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-237402/2		08/01/2018 12:59	1	2018.08.01LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-237402/3		08/01/2018 13:06	1	2018.08.01LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-237402/4		08/01/2018 13:14	1	2018.08.01LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-237402/5 ICIS		08/01/2018 13:22	1	2018.08.01LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-237402/6		08/01/2018 13:30	1	2018.08.01LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-237402/7		08/01/2018 13:38	1	2018.08.01LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-237402/8		08/01/2018 13:46	1	2018.08.01LLICAL 008.d	GeminiC18 3x100 3(mm)
ICB 320-237402/9		08/01/2018 13:53	1	2018.08.01LLICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-237402/10		08/01/2018 14:01	1	2018.08.01LLICAL 010.d	GeminiC18 3x100 3(mm)
CCB 320-237402/11		08/01/2018 14:09	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/03/2018 05:14

Analysis Batch Number: 237767 End Date: 08/03/2018 06:08

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-237767/1		08/03/2018 05:14	1	2018.08.03LLA_004.d	GeminiC18 3x100 3(mm)
CCVL 320-237767/2		08/03/2018 05:22	1	2018.08.03LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-237767/3 CCVIS		08/03/2018 05:29	1	2018.08.03LLA_006.d	GeminiC18 3x100 3(mm)
CCV 320-237767/8		08/03/2018 06:08	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/03/2018 06:16

Analysis Batch Number: 237784 End Date: 08/03/2018 09:00

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-237784/1		08/03/2018 06:16	1	2018.08.03LLA_012.d	GeminiC18 3x100 3(mm)
MB 320-235966/1-A		08/03/2018 06:24	1	2018.08.03LLA_013.d	GeminiC18 3x100 3(mm)
LCS 320-235966/2-A		08/03/2018 06:32	1	2018.08.03LLA_014.d	GeminiC18 3x100 3(mm)
320-41333-1 DL		08/03/2018 06:40	20	2018.08.03LLA_015.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2018 06:48	100		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2018 06:56	10		GeminiC18 3x100 3(mm)
320-41333-3		08/03/2018 07:03	1	2018.08.03LLA_018.d	GeminiC18 3x100 3(mm)
320-41333-5 DL		08/03/2018 07:11	20	2018.08.03LLA_019.d	GeminiC18 3x100 3(mm)
320-41333-5 MS DL		08/03/2018 07:19	20	2018.08.03LLA_020.d	GeminiC18 3x100 3(mm)
320-41333-5 MSD DL		08/03/2018 07:27	20	2018.08.03LLA_021.d	GeminiC18 3x100 3(mm)
320-41333-6		08/03/2018 07:35	1	2018.08.03LLA_022.d	GeminiC18 3x100 3(mm)
CCV 320-237784/12		08/03/2018 07:42	1	2018.08.03LLA_023.d	GeminiC18 3x100 3(mm)
CCV 320-237784/13		08/03/2018 07:50	1	2018.08.03LLA_024.d	GeminiC18 3x100 3(mm)
320-41333-8		08/03/2018 07:58	1	2018.08.03LLA_025.d	GeminiC18 3x100 3(mm)
320-41333-9		08/03/2018 08:06	1	2018.08.03LLA_026.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2018 08:14	50		GeminiC18 3x100 3(mm)
320-41333-12 DL		08/03/2018 08:21	10	2018.08.03LLA_028.d	GeminiC18 3x100 3(mm)
320-41333-13		08/03/2018 08:29	1	2018.08.03LLA_029.d	GeminiC18 3x100 3(mm)
320-41333-14		08/03/2018 08:37	1	2018.08.03LLA_030.d	GeminiC18 3x100 3(mm)
320-41333-16		08/03/2018 08:45	1	2018.08.03LLA_031.d	GeminiC18 3x100 3(mm)
320-41333-17 DL		08/03/2018 08:53	5	2018.08.03LLA_032.d	GeminiC18 3x100 3(mm)
CCV 320-237784/22		08/03/2018 09:00	1	2018.08.03LLA_033.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/05/2018 23:56

Analysis Batch Number: 238089 End Date: 08/06/2018 03:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-238089/1		08/05/2018 23:56	1	2018.08.05LLA_004.d	GeminiC18 3x100 3(mm)
CCVL 320-238089/2		08/06/2018 00:04	1	2018.08.05LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-238089/3 CCVIS		08/06/2018 00:12	1	2018.08.05LLA_006.d	GeminiC18 3x100 3(mm)
CCV 320-238089/14		08/06/2018 01:38	1		GeminiC18 3x100 3(mm)
CCV 320-238089/26		08/06/2018 03:12	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/06/2018 03:19

Analysis Batch Number: 238093 End Date: 08/06/2018 06:51

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238093/1		08/06/2018 03:19	1	2018.08.05LLA_030.d	GeminiC18 3x100 3(mm)
MB 320-236486/1-A		08/06/2018 03:27	1	2018.08.05LLA_031.d	GeminiC18 3x100 3(mm)
LCS 320-236486/2-A		08/06/2018 03:35	1	2018.08.05LLA_032.d	GeminiC18 3x100 3(mm)
320-41333-11		08/06/2018 03:43	1	2018.08.05LLA_033.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 03:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 03:59	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 04:06	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 04:14	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 04:22	1		GeminiC18 3x100 3(mm)
CCV 320-238093/10		08/06/2018 04:30	1	2018.08.05LLA_039.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 04:38	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 04:46	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 04:53	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 05:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 05:09	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 05:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 05:25	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 05:32	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 05:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 05:48	1		GeminiC18 3x100 3(mm)
CCV 320-238093/21		08/06/2018 05:56	1	2018.08.05LLA_050.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 06:04	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 06:12	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 06:19	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 06:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 06:35	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/06/2018 06:43	1		GeminiC18 3x100 3(mm)
CCV 320-238093/28		08/06/2018 06:51	1		GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/06/2018 11:10

Analysis Batch Number: 238193 End Date: 08/06/2018 12:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-238193/2		08/06/2018 11:10	1	2018.08.06LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-238193/3		08/06/2018 11:17	1	2018.08.06LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-238193/4		08/06/2018 11:25	1	2018.08.06LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-238193/5 ICIS		08/06/2018 11:33	1	2018.08.06LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-238193/6		08/06/2018 11:41	1	2018.08.06LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-238193/7		08/06/2018 11:49	1	2018.08.06LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-238193/8		08/06/2018 11:56	1	2018.08.06LLICAL 008.d	GeminiC18 3x100 3(mm)
ICB 320-238193/9		08/06/2018 12:04	1	2018.08.06LLICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-238193/10		08/06/2018 12:12	1	2018.08.06LLICAL 010.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/07/2018 14:37

Analysis Batch Number: 238519 End Date: 08/07/2018 14:53

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-238519/1		08/07/2018 14:37	1	2018.08.07LLB_004.d	GeminiC18 3x100 3(mm)
CCVL 320-238519/2		08/07/2018 14:45	1	2018.08.07LLB_005.d	GeminiC18 3x100 3(mm)
CCV 320-238519/3 CCVIS		08/07/2018 14:53	1	2018.08.07LLB_006.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/07/2018 16:26

Analysis Batch Number: 238576 End Date: 08/07/2018 17:45

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238576/1		08/07/2018 16:26	1	2018.08.07LLBB_018.d	GeminiC18 3x100 3(mm)
320-41333-11 DL		08/07/2018 16:34	2	2018.08.07LLBB_019.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 16:42	5		GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 16:50	20		GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 16:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 17:06	10		GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 17:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 17:21	20		GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 17:29	20		GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 17:37	1		GeminiC18 3x100 3(mm)
CCV 320-238576/11		08/07/2018 17:45	1	2018.08.07LLBB_028.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: A8_N Start Date: 08/07/2018 22:42

Analysis Batch Number: 238595 End Date: 08/07/2018 23:06

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238595/1		08/07/2018 22:42	1	2018.08.07LLBB_066.d	GeminiC18 3x100 3(mm)
320-41333-2 DL		08/07/2018 22:50	100	2018.08.07LLBB_067.d	GeminiC18 3x100 3(mm)
320-41333-10 DL		08/07/2018 22:58	50	2018.08.07LLBB_068.d	GeminiC18 3x100 3(mm)
CCV 320-238595/4		08/07/2018 23:06	1	2018.08.07LLBB_069.d	GeminiC18 3x100 3(mm)

EPA 537 (Mod)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Batch Number: 235966 Batch Start Date: 07/24/18 17:51 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 07/25/18 15:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00087	LCPFC-IS 00059
MB 320-235966/1		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
LCS 320-235966/2		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
320-41333-A-1	7-MW28-PRL07-01	3535, EPA 537 (Mod)	T	331.19 g	28.31 g	302.9 mL	10.00 mL	500 uL	500 uL
320-41333-A-2	7-MW1-PRL06-01	3535, EPA 537 (Mod)	T	328.47 g	28.35 g	300.1 mL	10.00 mL	500 uL	500 uL
320-41333-A-3	8-MW14-PRL04-01	3535, EPA 537 (Mod)	T	317.06 g	29.04 g	288 mL	10.00 mL	500 uL	500 uL
320-41333-A-4	GRE-ER-MW-01	3535, EPA 537 (Mod)	T	318.33 g	29.05 g	289.3 mL	10.00 mL	500 uL	500 uL
320-41333-A-5	8-MW12-PRL03-01	3535, EPA 537 (Mod)	T	341.64 g	29.18 g	312.5 mL	10.00 mL	500 uL	500 uL
320-41333-A-5 MS	8-MW12-PRL03-01	3535, EPA 537 (Mod)	T	335.72 g	28.15 g	307.6 mL	10.00 mL	500 uL	500 uL
320-41333-A-5 MSD	8-MW12-PRL03-01	3535, EPA 537 (Mod)	T	334.23 g	28.81 g	305.4 mL	10.00 mL	500 uL	500 uL
320-41333-A-6	7-MW04-PRL04-01	3535, EPA 537 (Mod)	T	319.06 g	27.93 g	291.1 mL	10.00 mL	500 uL	500 uL
320-41333-A-7	7-MW04-PRL04-01D	3535, EPA 537 (Mod)	T	320.96 g	29.01 g	292 mL	10.00 mL	500 uL	500 uL
320-41333-A-8	GRE-ER-SD-01	3535, EPA 537 (Mod)	T	299.17 g	28.17 g	271 mL	10.00 mL	500 uL	500 uL
320-41333-A-9	GRE-ER-SW-01	3535, EPA 537 (Mod)	T	316.47 g	28.54 g	287.9 mL	10.00 mL	500 uL	500 uL
320-41333-A-10	GRE09-SW1-01	3535, EPA 537 (Mod)	T	284.65 g	28.25 g	256.4 mL	10.00 mL	500 uL	500 uL
320-41333-A-12	7-MW34-PRL06-01	3535, EPA 537 (Mod)	T	282.58 g	66.60 g	216 mL	10.00 mL	500 uL	500 uL
320-41333-A-13	MW-GRE10-01-01	3535, EPA 537 (Mod)	T	339.27 g	27.80 g	311.5 mL	10.00 mL	500 uL	500 uL
320-41333-A-14	MW-GRE03-01-01	3535, EPA 537 (Mod)	T	330.08 g	28.88 g	301.2 mL	10.00 mL	500 uL	500 uL
320-41333-A-16	GRE-RB-01	3535, EPA 537 (Mod)	T	298.87 g	28.13 g	270.7 mL	10.00 mL	500 uL	500 uL
320-41333-A-17	MW-GRE08-01-01	3535, EPA 537 (Mod)	T	342.72 g	27.91 g	314.8 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00161					

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Batch Number: 235966 Batch Start Date: 07/24/18 17:51 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 07/25/18 15:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00161					
MB 320-235966/1		3535, EPA 537 (Mod)							
LCS 320-235966/2		3535, EPA 537 (Mod)		500 uL					
320-41333-A-1	7-MW28-PRL07-01	3535, EPA 537 (Mod)	T						
320-41333-A-2	7-MW1-PRL06-01	3535, EPA 537 (Mod)	T						
320-41333-A-3	8-MW14-PRL04-01	3535, EPA 537 (Mod)	T						
320-41333-A-4	GRE-ER-MW-01	3535, EPA 537 (Mod)	T						
320-41333-A-5	8-MW12-PRL03-01	3535, EPA 537 (Mod)	T						
320-41333-A-5 MS	8-MW12-PRL03-01	3535, EPA 537 (Mod)	T	500 uL					
320-41333-A-5 MSD	8-MW12-PRL03-01	3535, EPA 537 (Mod)	T	500 uL					
320-41333-A-6	7-MW04-PRL04-01	3535, EPA 537 (Mod)	T						
320-41333-A-7	7-MW04-PRL04-01D	3535, EPA 537 (Mod)	T						
320-41333-A-8	GRE-ER-SD-01	3535, EPA 537 (Mod)	T						
320-41333-A-9	GRE-ER-SW-01	3535, EPA 537 (Mod)	T						
320-41333-A-10	GRE09-SW1-01	3535, EPA 537 (Mod)	T						
320-41333-A-12	7-MW34-PRL06-01	3535, EPA 537 (Mod)	T						
320-41333-A-13	MW-GRE10-01-01	3535, EPA 537 (Mod)	T						
320-41333-A-14	MW-GRE03-01-01	3535, EPA 537 (Mod)	T						
320-41333-A-16	GRE-RB-01	3535, EPA 537 (Mod)	T						
320-41333-A-17	MW-GRE08-01-01	3535, EPA 537 (Mod)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Batch Number: 235966 Batch Start Date: 07/24/18 17:51 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 07/25/18 15:30

Batch Notes	
Analyst ID - Aliquot Step	JER
Balance ID	QA-0078
Batch Comment	Sample labels match client IDs JER / EnviCarb: 103370
Analyst ID - Final Volume Step	JER
H2O ID	7/24/18
Hexane ID	1272462
Internal Standard ID#	1276589
Manifold ID	C
Methanol ID	1304119
Sodium Hydroxide ID	1302682
Pipette ID	146162G
Analyst ID - Reagent Drop	JER
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	AJC
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	TWL
Solvent Lot #	1302453
Solvent Name	0.3% NH4OH/MEOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003637254a

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Batch Number: 236486 Batch Start Date: 07/28/18 07:00 Batch Analyst: Arauz, Horacio J

Batch Method: SHAKE Batch End Date: 07/31/18 17:15

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00088	LCPFC-IS 00054	LCPFCSP 00161	
MB 320-236486/1		SHAKE, EPA 537 (Mod)		5.00 g	10.00 mL	500 uL	500 uL		
LCS 320-236486/2		SHAKE, EPA 537 (Mod)		5.00 g	10.00 mL	500 uL	500 uL	500 uL	
320-41333-A-11	GRE09-SD1-01	SHAKE, EPA 537 (Mod)	T	5.10 g	10.00 mL	500 uL	500 uL		

Batch Notes	
Acetic Acid ID	1289826
Analyst ID - Aliquot Step	TWL
Balance ID	QA-070
Batch Comment	Samples labels match with client ID KJP 7-26-18 ENVI Carb Lot # 103370
Analyst ID - Final Volume Step	TWL
Hexane ID	1313826
Internal Standard ID#	1265441
Manifold ID	K
Methanol ID	1313684
Methanolic Potassium Hydroxide ID	1306541
Millipore Water Dispense Date	07/31/18
Sodium Hydroxide ID	1313851
Ammonium Hydroxide/MeOH ID	1315176
pH Indicator ID	0818
Analyst ID - Reagent Drop Witness	KJP
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	SKD
Blank Sand Lot #	162639
SPE Cartridge Lot ID	018038142A
SPE Cartridge Type	WAX 150mg

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC_IDA

Analyst (Print Name) Quintin Phan **Reagent ID** LC_80:20_00010

Date 8/2/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-41333	1	10,000	15	300	20
	2		30	300	10
	2		15	1500	100
	5		15	300	20
	MS				
	MSD				
	10		30	1500	50
	12		30	300	10
	17		60	300	5

QUP 8/2/18

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA

Analyst (Print Name) Alyssa Hannigan **Reagent ID** LC 80:202-00011

Date 8/7/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-41333	2	10000	15	1500	100
"	10	"	30	"	50

ABH 8/7/18

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC - IDA

Analyst (Print Name) Quintin Phan

Reagent ID LC - 80:20 - 00011

Date 8/7/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-41333	11	10,000	100	200	2
320-41403	1		60	300	5
	2		15	300	20
	10		30		10
	17		15		20
	18		15		20

QVP 8/7/18

Comments:

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-41333-1

SDG No.:

Project: Phase III, ANG-Mutiple - Great Falls

Client Sample ID	Lab Sample ID
GRE09-SD1-01	320-41333-11

Comments:

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-41333-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: D 2216 DL Date: 01/01/2017 12:44

Analyte	Wavelength/ Mass	LOQ (%)	DL (%)
Percent Moisture		0.1	0.1
Percent Solids		0.1	0.1

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-41333-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: D 2216 XMDL Date: 01/01/2017 12:46

Analyte	Wavelength/ Mass	XRL (%)	XMDL (%)
Percent Moisture		0.1	0.1
Percent Solids		0.1	0.1

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: D 2216

Start Date: 07/26/2018 11:14 End Date: 07/26/2018 11:14

Lab Sample Id	D/F	Type	Time	Analytes																							
				% Sol	Moist																						
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
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ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
320-41333-11	1	T	11:14	X	X																						
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								
ZZZZZZ			11:14																								

Prep Types:
T = Total/NA

FORM XIII-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41333-1

SDG No.:

Batch Number: 236247 Batch Start Date: 07/26/18 11:14 Batch Analyst: Saechao, Tammy C

Batch Method: D 2216 Batch End Date: 07/27/18 10:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
320-41333-A-11	GRE09-SD1-01	D 2216	T	12	1.04 g	12.68 g	8.33 g		

Batch Notes	
Balance ID	QA-068
Date and Time Samples in Desiccator	07/27/2018 08:19
Date and Time Samples out of Desiccator	07/27/2018 10:55
Date samples were placed in the oven	07/26/2018
Oven Temp In	113 Degrees C
Time samples were place in the oven	11:14
Date samples were removed from oven	07/27/2018
Oven Temp Out	115 Degrees C
Time Samples were removed from oven	08:19
Oven ID	Soil Prep #1
Thermometer ID	151969626

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE KLIDZEJS	Lab PM: DAVID ALTUCKER	Carrier Tracking No(s): FEDEX: 711199859822	COC No: 320-22104-5001.5
Client Contact: Selvam Arunachalam	Phone: (615) 663-7485	E-Mail:		Page: MK 7/17/18 Page ~~5 of 7~~ 1 of 2
Company: Leidos, Inc.				Job #:
Address: 11951 Freedom Drive	Due Date Requested:			
City: Reston	TAT Requested (days):			
State, Zip: VA, 20190				
Phone:	PO #:			
Email: arunachalams@leidos.com	WO #: TAL project 32010804			
Project Name: Great Falls	Project #:			
Site:	SSOW#:			

Analysis Requested

320-41333 Chain of Custody

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA_DOD5.1 -	8260_DoD -	8260B -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
7-MW28-PRL07-01	7/16/18	1127	G	~~Water~~ Solid MK 7/16/18			2			2	
7-MW1-PRL06-01	↓	1357	G	Water			2			2	
8-MW14-PRL04-01	↓	1703	G	Water			2			2	
GRE-ER-MW-01	7/17/18	0715	G	Water			2			2	
8-MW12-PRL03-01	↓	0833	G	Water			2			2	
8-MW12-PRL03-01MS	↓	0833	G	Water		Y	2			2	FOR MS
8-MW12-PRL03-01MSD	↓	0833	G	Water		Y	2			2	FOR MSD
7-MW04-PRL04-01	↓	1243	G	Water			2			2	
7-MW04-PRL04-01D	↓	1243	G	Water			2			2	
GRE-ER-SD-01	↓	1610	G	Water			2			2	
GRE-ER-SW-01	↓	1615	G	Water			2			2	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FEDEX

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
MIKE KLIDZEJS	7/19/18 16:00	LEIDOS	N/A	7/19/18 1600	FEDEX
N/A		FEDEX		7/20/18 910	TAGM

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.1c

Ver: 08/04/2016

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE KNIDZEJS	Lab PM: DAVID ALTUCKER	Carrier Tracking No(s): FedEx: 7111 9985 9822	COC No: 320-22104-5001.7
Client Contact: Selvam Arunachalam	Phone: (615) 463-7485	E-Mail:		Page: MK 7/17/18 Page ~~7 of 9~~ 2 of 2
Company: Leidos, Inc.				Job #:
Address: 11951 Freedom Drive	Due Date Requested:			Preservation Codes:
City: Reston	TAT Requested (days):			
State, Zip: VA, 20190				
Phone:	PO #:			
Email: arunachalams@leidos.com	WO #: TAL project 32010804			
Project Name: Great Falls	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA_DOD5.1 -	8260_DoD - TCLP VOCs	8260B -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
GRE09-SW1-01	7/17/18	1617	G	Water			2			2	
* GRE09-SP1-01	↓	1630	G	Solid MK 7/17/18			2			2	OPEN W/ CARE. CONSISTENCY OF SLURRY.
7-MW34-PRL06-01	7/18/18	0813	G	Water			2			2	
MW-GRE10-01-01		1212	G	Water			2			2	
MW-GRE03-01-01		1348	G	Water			2			2	
GRE-10W-W-01		1500	G	Water				3		3	
GRE-RB-01	↓	1515	G	Water			2			2	TRIZMA PRESERVED
MW-GRE08-01-01	7/19/18	1435	G	Water			2			2	
				Solid							
						MK 7/19/18					

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FedEx

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
M. Knidzejs	7/19/18 14:00	Leidos	N/A	7/19/18 16:00	FedEx
N/A		FedEx		7/20/18 910	TA Sac

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.1c

Ver: 08/04/2016

* Received only 1/2 of containers KL 7/20/18

TestAmerica Denver

Sample Receiving Checklist
DV-QA-0003

Login #: 320-41333 Date/Time Received: 7-21-18 / 0845

Company Name & Sampling Site: TA Sacramento

Time Zone: • EDT/EST • CDT/CST • MDT/MST • PDT/PST • OTHER State: CA

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Temp 25 IR# 8 Temp___ IR#___ Temp___ IR#___ Temp___ IR#___

CF 0.0 Initials EB CF___ Initials___ CF___ Initials___ CF___ Initials___

Date 7-21-18 Date___ Date___ Date___

No seal Name or date

Initials TL

N/A	Yes	No		
☐	☐	☐	1.	Is radioactivity at or below background? BKG CPM:___ CPM Reading:___
☐	☑	☐	2a.	Is a custody seal present on the cooler?
☐	☐	☑	2b.	If yes, is the cooler's custody seal intact? Per CUV
☐	☑	☐	2c.	Do cooler or samples appear to not have been compromised or tampered with?
☐	☑	☐	3a.	Were samples received on ice?
☐	☑	☐	3b.	Is cooler temperature acceptable?
☐	☑	☐	3c.	Has temperature been recorded?
☐	☑	☐	4.	Is COC present; filled out in ink and legible; and filled out with all pertinent information?
☐	☑	☐	5.	Is the Field Sampler's name present on the COC?
☐	☑	☐	6a.	Are there no discrepancies between the **sample IDs** and/or **collection date and time** on the containers and the COC?
☐	☑	☐	6b.	Are there no discrepancies between the container types and those listed on the COC?
☐	☑	☐	7.	Are samples received within Holding Time?
☐	☑	☐	8.	Do sample containers have legible labels?
☐	☑	☐	9.	Are all sample containers intact (not broken or leaking)?
☐	☑	☐	10a.	Are appropriate sample containers used?
☑	☐	☐	10b.	Are sample bottles completely filled? (Perchlorate bottles ≥ 1/3 head space)
☐	☑	☐	10c.	Is sufficient vol. for all requested analyses, incl. any requested MS/MSDs provided?
☐	☑	☐	11.	No splitting or compositing of samples required?
☐	☑	☐	12.	Do all VOA sample vials have no headspace or bubbles >6 mm (1/4") in diameter?
☐	☑	☐	13.	Were VOA vials labeled as preserved? ☐ HCl ☑ 0-6°C ☐ Sodium Thiosulfate ☐ Ascorbic Acid ☐ Other
☐	☑	☐	14.	Are all samples single phase? (i.e., no multiphasic samples are present.)

Tracking: 4495 5409 3809

Login Checks: *Initials* [illegible]

☐	☐	☐	15.	Was a Priority Form completed for any short holds or quick TATs?
☐	☐	☐	16.	Were any tests logged for subcontract?
☐	☐	☐	17.	Were special archiving instructions and login instructions indicated in the Project Notes?

Note Archive Requirements: ___

☐	☐	☐	18.	Were multiple Series logged for this job?

Labeling and Storage Checks: *Initials* ___

pH Checks Required? ☐ Yes ☐ No Residual chlorine check required: ☐ Yes ☐ No Quarantined: ☐ Yes ☐ No

☐	☐	☐	19.	Was Sample Preservation verified and found to be correct? (excluding VOA, Oil & Grease, and TOC volumes)
☐	☐	☐	20.	Was Residual Chlorine checked and noted on the CUR if present?
☐	☐	☐	21.	If subcontract work was requested, was volume placed on sub shelf?
☐	☐	☐	22.	Were Terracore/Encores delivered to VOA lab?
☐	☐	☐	23.	Did the sample ID on TA label match the client's sample ID on container?
☐	☐	☐	24.	Were stickers for special archiving instructions affixed to each box?

320-41333 Chain of Custody

TestAmerica Denver
Condition Upon Receipt Anomaly Report (CUR)

Login No : 320-41333 Date/Time: 7/21/18 0845

Client : TA Sacramento Initiated by: TT

CONDITION/ANOMALY/VARIANCE (CHECK ALL THAT APPLY):

☐ **COOLERS** ☐Received, No Chain of Custody (COC) ☐Other:	☐ **CHAIN OF CUSTODY (COCs)** ☐Not relinquished by Client; No date/time Relinquished. ☐ Incomplete Information ☐Other:
☐ **CONTAINERS** ☐Leaking ☐Broken	☐ **TEMPERATURE (greater than 6° C)** ☐Cooler Temp
☐Without Labels ☐Extra ☐VOA Vials w/ Headspace or bubbles > 6 mm ☐Perchlorate without 1/3 headspace ☐Other:	☒ **CUSTODY SEALS (COOLER(S)/CONTAINER(S)** ☒None ☐ Not Intact ☐Other:

☐ **CONTAINER LABELS**
☐ Not the same ID/info as in COC ☐ ID COLLECTION ☐Time ☐Date ☐PRESERVATIVE
☐ Incomplete ☐ Markings/Info smeared or illegible ☐ Torn
☐ Other:

☐ **SAMPLES**
☐ Samples NOT RECEIVED but listed on COC
☐Samples received but NOT LISTED on COC
☐Logged based on Label Information
☐Logged based on info from other samples on COC
☐ Logged according to Work Plan
☐Logged on HOLD UNTIL FURTHER NOTICE
☐ Trip Blank received, not on COC, _____vials received
☐ Mislabeled as to tests, preservatives, etc.
☐ Holding time expired
☐ Improper container used
☐ Not preserved / Improper preservative used
☐ Improper pH _____ ☐ Lab to preserve sample
☐ Insufficient quantities for analysis
☐Other:

Comments: No custody seal on coolers

Sample Control Review: [signature] Date: 7/21/18

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Alltucker, David R	Carrier Tracking No(s):	COC No: 320-124396.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: david.alltucker@testamericainc.com	State of Origin: Virginia	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 320-41333-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 8/5/2018			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Phase III, ANG-Mutiple - Grat Falls	Project #: 32010804			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B_DOD5/1311_Z TCLP Volatile Organic Compounds	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GRE-IDW-W-01 (320-41333-15)	7/18/18	15:00 Eastern		Water			X	3	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 7-20-18 1630	Company: SPC	Received by: [signature]	Date/Time: 7-21-18 0845	Company: TA-Den
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 2-5 ER# 60.0		

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 320-41333-1

Login Number: 41333
List Number: 1
Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 320-41333-1

Login Number: 41333
List Number: 2
Creator: Lujan, Jacob P

List Source: TestAmerica Denver
List Creation: 07/21/18 01:08 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	False	Not present
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	