FINAL
Site Inspection Report
Helena Army Aviation Support Facility
Helena, Montana

Perfluorooctanesulfonic Acid (PFOS) and
Perfluorooctanoic Acid (PFOA) Impacted Sites
ARNG Installations, Nationwide

August 2021

Prepared for:

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Acronyms and Abbreviations

6:2 FTS	6:2 Fluorotelomer sulfonate
8:2 FTS	8:2 Fluorotelomer sulfonate
µg/Kg	micrograms per Kilogram
°C	degrees Celsius
°F	degrees Fahrenheit
%	percent
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	Area of Interest
ARNG	Army National Guard
bgs	below ground surface
btoc	below top of casing
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CoC	chain of custody
CSM	conceptual site model
DA	Department of the Army
DoD	Department of Defense
DO	dissolved oxygen
DQI	data quality indicator
DQO	data quality objective
DUA	data usability assessment
DVR	data validation report
EIS	extraction internal standards
ELAP	Environmental Laboratory Accreditation Program
EM	Engineers Manual
FedEx	Federal Express
HDPE	high-density polyethylene
HRAA	Helena Regional Airport Authority
HSA	hollow stem auger
IDW	investigation-derived waste
ITRC	Interstate Technology Regulatory Council
LC/MS/MS	liquid chromatography tandem mass spectrometry
LCS	laboratory control spike
LCSD	laboratory control spike duplicate
LOQ	limit of quantitation
MBMG	Montana Bureau of Mines and Geology
MDL	method detection limit
mph	miles per hour
MS	matrix spike
MSD	matrix spike duplicate
MTARNG	Montana Army National Guard
MTDEQ	Montana Department of Environmental Quality

NELAP	National Environmental Laboratory Accreditation Program
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid
ng/L	nanograms per liter
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
ORP	oxidation-reduction potential
OSD	Office of the Secretary of Defense
PA	Preliminary Assessment
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutyrate
PFBS	perfluorobutanesulfonic acid
PFCs	perfluorinated compounds
PFDA	perfluorodecanoic acid
PFDoA	perfluoroheptanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUdA	perfluoroundecanoic acid
PID	photoionization detector
Pioneer	Pioneer Technical Services, Inc
PPE	personal protective equipment
PQAPP	Programmatic UFP-QAPP
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality Systems Manual
RI	Remedial Investigation
RPD	relative percent differences
SI	Site Inspection
SL	screening level
SOP	standard operating procedure
TOC	total organic carbon
TPP	Technical Project Planning
UCMR	Unregulated Contaminant Monitoring Rule
UFP	Uniform Federal Policy
US	United States
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Executive Summary

The Army National Guard (ARNG) G9 is performing Preliminary Assessments (PAs) and Site Inspections (SIs) at per- and polyfluoroalkyl substances (PFAS)-impacted sites at ARNG facilities nationwide. The objective of the SI at each facility is to identify whether there has been a release to the environment from the Area of Interest (AOI) identified in the PA and determine the presence or absence of perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and perfluorobutanesulfonic acid (PFBS) at or above screening levels (SLs). An SI was completed at the Helena Army Aviation Support Facility (AASF) in Helena, Montana. The Helena AASF will be referred to as the "facility" throughout this document.

The facility is on a 75-acre parcel of land adjacent to the Helena Regional Airport in Lewis and Clark County. The AASF is on the eastern city limits of Helena, east of Interstate Highway 15, south of Canyon Ferry Road, and north of the Burlington Northern Railroad Tracks. The PFAS PA Report identified two potential release areas which were grouped into one AOI and investigated during the SI (AECOM, 2018c; AECOM, 2020b). The SI field activities were conducted from 6 to 13 July 2020 and included the collection of soil and groundwater samples.

To fulfill the project Data Quality Objectives (DQOs) set forth in the approved SI Quality Assurance Project Plan (QAPP) Addendum (AECOM, 2020b), samples were collected and analyzed for a subset of 18 PFAS by liquid chromatography tandem mass spectrometry (LC/MS/MS) compliant with Quality Systems Manual (QSM) 5.1 Table B-15. The 18 PFAS analyzed as part of the ARNG SI program are specified in **Section 5.7** of this Report.

The Department of Defense (DoD) has adopted a policy to retain facilities in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process based on risk-based SLs for soil and groundwater, as described in a memorandum from the Office of the Secretary of Defense (OSD) dated 15 October 2019 (Assistant Secretary of Defense, 2019). The ARNG PFAS SIs follow this DoD policy and, when the maximum site concentration for sampled media exceed the SLs, the site will proceed to a Remedial Investigation (RI), the next phase under CERCLA. The SLs apply to three compounds, PFOA, PFOS, and PFBS, for both soil and groundwater, as presented in **Table ES-1**. All other results presented in this Report are considered informational in nature and serve as an indication as to whether soil, groundwater, sediment, and surface water contain or do not contain the 18 PFAS analyzed within the boundaries of the facility.

Sample chemical analytical concentrations were compared against the project SLs as described in **Table ES-1**. A summary of the results of the SI data relative to the SLs is as follows:

- PFOA, PFOS, and PFBS were detected in groundwater at AOI 1 and PFOS exceeded the individual SL of 40 nanograms per liter (ng/L), with maximum concentrations of 775 ng/L (814 ng/L duplicate) and 175 ng/L at locations HAASF-MW005 and HAASF-MW003, respectively. Based on the results of the SI, further evaluation of AOI 1 is warranted in the RI.
- Based on the SL exceedances and well information from the Montana Bureau of Mines and Geology (MBMG) database, a potentially complete pathway exits to off-facility residential wells.
- The detected concentrations of PFOA, PFOS, and PFBS in soil samples from the AOI were below the SLs.

Table ES-2 summarizes the SI results for soil and groundwater at AOI 1: 60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area. Based on the conceptual site

model (CSM) developed and revised in light of the SI findings, there is potential for PFOS exposure to drinking water receptors caused by DoD activities.

Table ES-3 summarizes the rationale used to determine if an AOI should be considered for further investigation under CERCLA and undergo an RI. Based on the results of this SI, further evaluation is warranted in the RI for AOI 1: 60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area.

Table ES-1: Screening Levels (Soil and Groundwater)

Analyte	Residential (Soil) (µg/kg)[a,b] 0-2 feet bgs	Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a,b]	Tap Water (Groundwater) (ng/L)[a,b]
PFOA	130	1,600	40
PFOS	130	1,600	40
PFBS	130,000	1,600,000	40,000

Notes:

a.) Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ) = 0.1. 15 October 2019.

b.) USEPA, 2021. Risk Based Screening Levels Calculated for PFBS in Groundwater and Soil using USEPA's Regional Screening Level Calculator. HQ = 0.1. 8 April 2021.

Table ES-2: Summary of Site Inspection Findings

AOI	Potential PFAS Release Area	Soil – Source Area	Groundwater – Source Area	Groundwater – Facility Boundary
1	60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area	◐	●	●

Legend:

● = detected; exceedance of the screening levels

◐ = detected; no exceedance of the screening levels

○ = not detected

Table ES-3: Site Inspection Recommendations

AOI	Description	Rationale	Future Action
1	60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area	Exceedances of SLs in groundwater at source area and downgradient facility boundary. No exceedances of SLs in soil.	Proceed to RI

1. Introduction

1.1 Project Authorization

The Army National Guard (ARNG) G9 is the lead agency in performing *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Installations Nationwide*. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor, AECOM Technical Services, Inc. (AECOM), under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017. The ARNG performed this SI at Helena Army Aviation Support Facility (AASF) in Helena, Montana. The Helena AASF is referred to as the "facility" throughout this document.

The SI project elements were performed in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; US Environmental Protection Agency [USEPA], 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300; USEPA, 1994), and in compliance with US Department of the Army (DA) requirements and guidance for field investigations, including specific requirements for sampling for PFOA, PFOS, and perfluorobutanesulfonic acid (PFBS), and the group of related compounds known in the industry as per- and polyfluoroalkyl substances (PFAS). The term PFAS is used throughout this Report to encompass all PFAS chemicals being evaluated, including PFOA, PFOS, and PFBS, which are the key components of the suspected releases being evaluated, and the other 15 related compounds listed in the task order.

1.2 SI Purpose

A PA (AECOM, 2018c) that identified two potential PFAS release areas, which were grouped into one Area of Interest (AOI), was performed at the facility. The objective of the SI is to identify whether there has been a release to the environment from the AOI and determine the presence or absence of PFOA, PFOS, and PFBS at or above screening levels (SLs).

As stated in the *Federal Facilities Remedial Site Inspection Summary Guide* (USEPA, 2005), an SI has five goals:

1. Develop information to potentially eliminate a release from further consideration because it is determined that it poses no significant threat to human health or the environment;
2. Determine the potential need for a removal action;
3. Collect or develop data to evaluate potential release;
4. Collect data to better characterize the release for more effective and rapid initiation of a Remedial Investigation (RI), if determined necessary; and
5. Collect data to determine whether the release is more than likely the result of activities associated with the Department of Defense (DoD).

In addition to the USEPA-identified goals of an SI, the ARNG SI also identifies whether there are potential off-facility PFAS sources.

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2. Facility Background

2.1 Facility Location and Description

The AASF is adjacent to the Helena Regional Airport (**Figure 2-1**) in Lewis and Clark County in Helena, Montana. The AASF is on the eastern city limits of Helena, east of Interstate Highway 15, south of Canyon Ferry Road, and north of the Burlington Northern Railroad Tracks. The communities of Helena, East Helena, Clancy, and Jefferson City lie within 15 miles of the AASF (Montana ARNG [MTARNG], 1994).

In 1998, due to insufficient space, the AASF relocated to its present location on the north-central portion of the Helena Regional Airport property, approximately 750 feet north of Runway 9/27. The facility includes operation, maintenance, and repair for ARNG rotary-winged aircraft (60 Hangar and 47 Hangar), administrative offices, and classrooms (Helena Regional Airport Authority [HRAA], 2018). The two rotary-winged hangars are equipped with independent fire suppression systems. The facility also includes an armory and a fixed-wing aircraft hangar. The armory and the fixed-wing aircraft hangar does not have a fire suppression system or portable aqueous film forming foam (AFFF) extinguishers as of the date of this SI Report.

2.2 Facility Environmental Setting

The facility is located on the edge of the Helena Valley. The valley is bounded on the west by the Scratchgravel Hills, on the south by the Elkhorn Mountains, on the north by the Big Belt Mountains, and on the east by the Spokane Bench (MTARNG, 1994). The elevation of the facility is approximately 3,825 feet above mean sea level. The Continental Divide is located 15 miles west of the valley. The western part of the valley is gently sloping, while the eastern portion of the valley consists of low-rolling hills. The terrain around the AASF can be characterized as the transition between the rolling foothills of Mount Ascension and the flats of the Helena Valley (Pioneer Technical Services, Inc. [Pioneer], 2009).

2.2.1 Geology

Helena lies within the Northern Rocky Mountains physiographic province. Quaternary-age sediments fill the valley and form a northeast-sloping alluvial plain. The sedimentary plain is bounded by broad pediments and alluvial fans of the Elkhorn Mountains, the Scratchgravel Hills, and the Big Belt Mountains (Pioneer, 2009).

The AASF is situated on Quaternary-age alluvium derived from carbonate rocks and shale (Pioneer, 2009). A slope wash deposit, approximately 20 feet thick, underlies the soil at the AASF. This deposit consists of beds of coarse gravel interlayed with thin irregular beds and lenses of silt and clay. The gravel, in a matrix of sandy and silty clay, is composed of fragments of quartzite, shale, and limestone (US Geological Survey [USGS], 1986). Sedimentary bedrock from the Late Cretaceous to Middle Proterozoic Age underlies the slope wash and stream deposits. The bedrock layer is several thousand meters thick and is made up of sandstone, shale, limestone, and dolomite (MTARNG, 1994).

2.2.2 Hydrogeology

The facility is located along the southern boundary of the Helena Valley-Fill Aquifer System. This aquifer system is a major source of domestic water for local residents, with the majority of domestic water wells at a depth of less than 70 feet (MTARNG, 1994). Groundwater flow is generally from the southern, western, and northern margins of the valley, toward Lake Helena.

Based on a Helena AASF groundwater study (Pioneer, 2009), groundwater flow directions at the facility vary from due north to due east (**Figure 2-2**). During the SI, depth to water ranged from 40.91 feet below top of casing (btoc) to 56.78 feet btoc. Groundwater elevations were calculated, and an updated groundwater flow map indicated groundwater flows northeast (**Figure 2-3**).

Lateral discontinuity of fine-grained layers allows hydraulic interconnection of water-yielding zones that function as one complex aquifer (USGS, 1992). Aquifer recharge is through infiltration of streamflow, leakage from irrigation canals, infiltration of excess irrigation water, and inflow from fractures in bedrock. Discharge is through leakage to streams and drains, upward leakage to Lake Helena, and withdrawals from wells (MTARNG, 1994).

No potable water wells are located on the facility; however, a review of the Montana Bureau of Mines and Geology (MBMG) database indicated as many as 3,842 wells exist within a 4-mile radius of the facility (MBMG, 2020), as shown on **Figure 2-2**. A query of the MBMG database showed a public supply well on the eastern boundary of the AASF; however, the MTARNG has no knowledge of a well on the property boundary, and the well could not be located during the PA. The MBMG database classifies wells based on their use: domestic, commercial, or industrial. Of the 3,842 wells within 4 miles of the facility, 805 potential domestic wells exist in the downgradient direction of the facility (north of the facility), some as close as 0.5 miles from the facility boundary (MBMG, 2020). The majority of these downgradient domestic wells range in depth from 50 to over 100 feet below ground surface (bgs) and are cased off to the bottom of the well. However, a small percentage of the 805 domestic wells were screened shallower (less than 50 feet). Drinking water for the facility is supplied by the City of Helena. The City of Helena uses groundwater and surface water as water sources for its residents (Helena Water Utilities Public Water System, 2004). More information is provided in Section 2.2.3. Additionally, the City of Helena was selected to participate in the USEPA Third Unregulated Contaminant Monitoring Rule (UCMR) assessment monitoring. Results from the sampling indicated the six PFAS contaminants analyzed were below the method detection limit (USEPA, 2017a; MTDEQ, 2020).

2.2.3 Hydrology

Surface water was diverted around the AASF during construction; therefore, no surface water currently enters the facility. The largest stream and the closest to the facility is Prickly Pear Creek, about 2 miles to the east of the facility, which flows towards the north (**Figure 2-4**). A detention pond near the northeast corner of the AASF collects runoff from most of the facility. The detention pond was originally approximately 3 feet deep and seeded with vegetation (MTARNG, 1994). The detention pond was reconfigured once in 2005 or 2006 and recontoured during construction in 2017. If soil were removed during the 2005 or 2006 reconfiguration, the disposition of the soil would be unknown. Per the project manager for the 2017 construction, if soil were removed during the recontouring, it was likely re-used elsewhere at the facility during the construction project or removed by the contractor (Bullock Construction) and used at a construction yard in Boulder, Montana, or another construction site in Lakeside, Montana. Unprocessed surface water is used for irrigation in the fields near the facility, but exact details are currently unavailable on this water usage.

Regional surface water features include Lake Helena, the Missouri River, and the Helena Valley Reservoir. Surface water stored in the Helena Valley Reservoir provides one source of drinking and irrigation water used by the City of Helena (the other source includes groundwater). Water from the Reservoir is distributed across the city through the Helena Valley Canal. The Canal is 31.7 miles long and flows in a clockwise direction from the Helena Valley Reservoir to its termination at Lake Helena (US Bureau of Reclamation, 2017). The 31.7 miles of the canal is lined, with the exception of a 10.2 mile stretch. Information provided by the Helena Valley Irrigation District indicated that the section of canal immediately downgradient of the facility is lined with asphalt. The facility is not located within a mapped floodplain area.

2.2.4 Climate

The climate at the AASF is northern desert with large daily temperature fluctuations and an average temperature of 58.3 degrees Fahrenheit (°F). Seasonally, temperatures vary from summer highs of 86°F to winter lows of 14°F (World Climate, 2018). Average annual precipitation is 11.2 inches of rain and 38 inches of snow (World Climate, 2018). Factors affecting the climate include invasions of maritime air masses from the Pacific Ocean and drainage of cool air into the valley from the surrounding mountains. The prevailing wind is westerly, averaging 7 to 8 miles per hour (mph), with gust speeds of 55 to 65 mph.

2.2.5 Current and Future Land Use

The AASF is a controlled access facility with public roads and is adjacent to the Helena Regional Airport. The land is owned by the Department of the Army and leased to the State of Montana (MTARNG). The Helena Regional Airport is owned and operated by the HRAA and provides commercial and general air service to the Helena area and west-central Montana. The HRAA owns a number of land parcels that have been subdivided and zoned to allow for commercial development with restriction (HRAA, 2018). Future land use is not anticipated to change.

2.2.6 Critical Habitat and Threatened/ Endangered Species

The following birds, plants, mammals, and reptiles are federally endangered, threatened, proposed, and/or are listed as candidate species in Lewis and Clark County, Montana (US Fish and Wildlife Service [USFWS], 2020).

- **Mammals**: Grizzly Bear, *Ursus arctos horribilus* (threatened)
- **Mammals**: Canada Lynx, *Lynx canadensis* (threatened)
- **Mammals**: North American Wolverine, *Gulo luscus* (proposed threatened)
- **Fish**: Bull Trout, *Salvenlinus confluentus* (threatened)
- **Bird**: Red Knot, *Calidris canutus rufa* (threatened)
- **Plants**: Whitebark Pine, *Pinus albicaulis* (candidate)

2.3 History of PFAS Use

Four potential PFAS release areas were identified at the Helena AASF during the PA (AECOM, 2018c). Two potential releases were from fire suppression system tests performed at the 60 and 47 Hangar. The other two releases were from portable Tri-Max™ fire extinguishers that leaked or spilled onto the asphalt surrounding the AASF. The two Tri-Max™ releases occurred in the same general location. All four potential releases eventually entered the detention pond on the northeast side of the AASF through the storm water drain. Findings from the PA did not indicate any other activity at the facility contributed AFFF or PFAS-containing material to the environment. A more thorough description of the releases is presented in **Section 3**.

2.4 Potable Water Sampling

Due to the historical releases of AFFF, the potential exists for exposure to offsite drinking water receptors immediately north of the facility boundary. Though not included in the original scope, programmatic contingencies are in place to add off-facility sampling if SI results deem the sampling is warranted. Based on the magnitude and location of the groundwater exceedances, the project team agreed that off-facility sampling was necessary to evaluate the potential impact

to off-facility receptors. Prior to sampling, approval was obtained from the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health. Potable water samples were collected from five potable wells located in closest proximity to the facility boundary (downgradient of AOI 1). Sample results are provided below and in **Table 2-1**:

- PFOA – Detections ranged from non-detect to 1.94 J nanograms per liter (ng/L) (HAASF-POTABLE-04).
- PFOS – Detections ranged from non-detect to 8.57 ng/L (HAASF-POTABLE-04).
- PFBS – Detections ranged from non-detect to 4.81 ng/L (HAASF-POTABLE-04).

Table 2-1
PFAS Detections in Potable Wells
Site Inspection Report, Helena AASF

Area of Interest		POTABLE													
Sample ID		HAASF-POTABLE-01		HAASF-POTABLE-02		HAASF-POTABLE-02-DUP		HAASF-POTABLE-03		HAASF-POTABLE-04		HAASF-POTABLE-05		HAASF-POTABLE-05 DUP	
Sample Date		02/16/2021		02/16/2021		02/16/2021		04/29/2021		04/30/2021		04/29/2021		04/29/2021	
Analyte	USEPA HA [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Water, PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 (ng/L)															
6:2 FTS	-	ND		ND		ND		ND		ND		1.11	J	ND	
FOSA	-	1.49	J	1.18	J	ND	UJ	ND		1.66	J	1.38	J	1.18	J
NMeFOSAA	-	ND		ND		ND		ND		ND		1.07	J	ND	UJ
PFBS	-	ND		ND		ND		ND		4.81		0.907	J	ND	UJ
PFDA	-	ND		ND		ND		ND		ND		0.898	J	ND	UJ
PFHpA	-	ND		ND		ND		ND		1.46	J	1.02	J	ND	UJ
PFHxA	-	ND		ND		ND		ND		4.65		1.53	J	ND	UJ
PFHxS	-	1.04	J	ND		ND		ND		16.2		1.03	J	ND	UJ
PFNA	-	ND		ND		ND		ND		ND		0.834	J	ND	UJ
PFNS	-	ND		ND		ND		ND		ND		0.787	J	ND	UJ
PFOA	70	ND		ND		ND		ND		1.94	J	1.36	J	ND	UJ
PFOS	70	ND		ND		ND		0.984	J	8.57		2.57	J	ND	UJ
PFPeA	-	ND		ND		ND		ND		4.31		1.01	J	ND	UJ
PFPeS	-	ND		ND		ND		ND		3.32	J	0.883	J	ND	UJ
Total PFOA+PFOS	70	ND		ND		ND		0.984		10.5		3.93		ND	

Grey Fill — Detected concentration exceeded USEPA HA

References

a. United States Environmental Protection Agency. 2016. Drinking Water Health Advisory for PFOA. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-005. May 2016. / EPA. 2016. Drinking Water Health Advisory for PFOS. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-004. May 2016.

Interpreted Qualifiers

J = Estimated concentration

UJ = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL). However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
DUP	Duplicate
HA	Health Advisory
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
ND	Analyte not detected above the LOD
Qual	Interpreted Qualifier
USEPA	United States Environmental Protection Agency
ng/L	nanogram per liter
-	Not applicable

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
FOSA	Perfluorooctane sulfonamide
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFNS	perfluorononanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFPeS	perfluoropentanesulfonic acid

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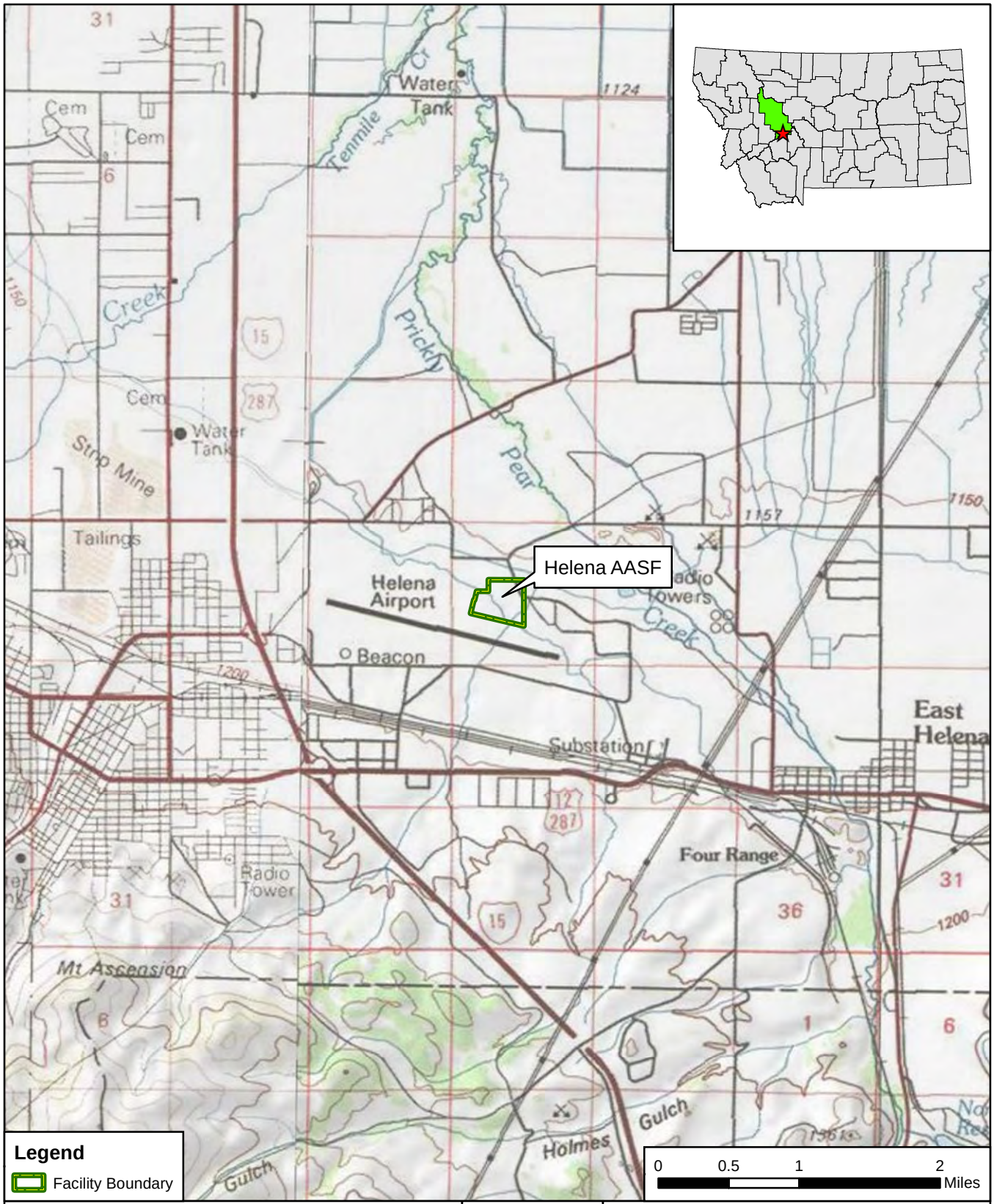

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NOTES	Site Inspection for PFAS at Helena AASF, MT			
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SCALE	1:63,360	CHK BY	AB	10/15/2020
Base Map: Copyright:© 2013 National Geographic Society, i-cubed		PM	RG	10/15/2020

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-1

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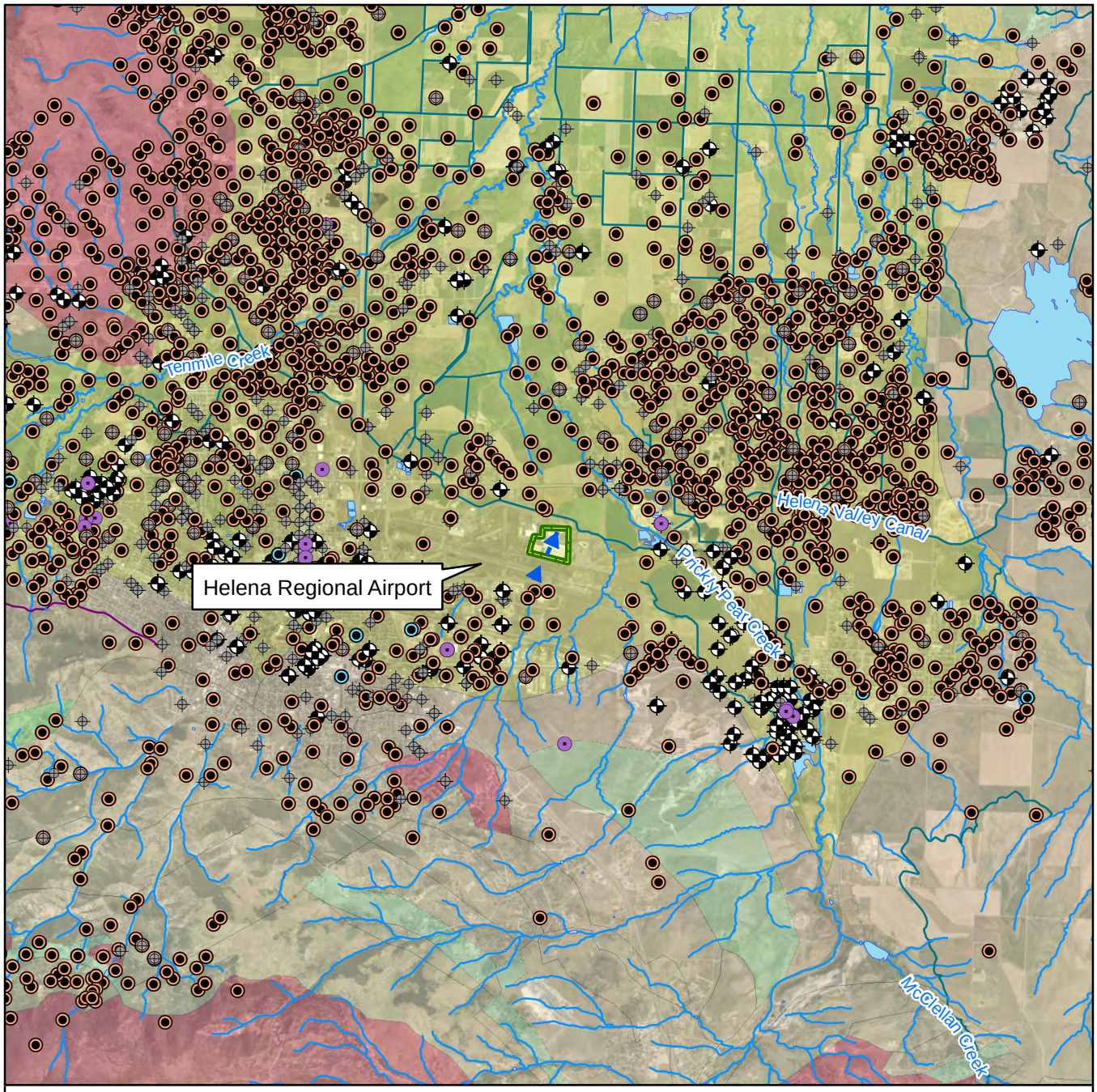

Facility Boundary
Water Body
Canal/Ditch
Pipeline
River/Stream
Groundwater Flow Direction

Geology
Alluvium
meta-argillite
quartz monzonite
quartzite
sandstone

Wells
Monitoring Well
Commercial Well
Domestic Well
Industrial Well
Other Well

0 0.75 1.5 3 Miles

CLIENT	ARNG			
NOTES	Site Inspection for PFAS at Helena AASF, MT			
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SCALE	1:95,040	CHK BY	AB	10/15/2020
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and		PM	RG	10/15/2020

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Groundwater Features

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Figure 2-2

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CLIENT	ARNG			
PROJECT	Site Inspection for PFAS at Helena AASF, MT			
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SCALE	1:3,000	CHK BY	AB	2/3/2021
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	CM	2/3/2021

- Soil Boring/Temporary Monitoring Well
- Storm Drain Inlet
- Storm Drain Line
- Facility Boundary
- Canal/Ditch
- Groundwater Contour
- Inferred Groundwater Contour
- Groundwater Flow Direction

N

Groundwater Elevation - July 12, 2020

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Figure 2-3

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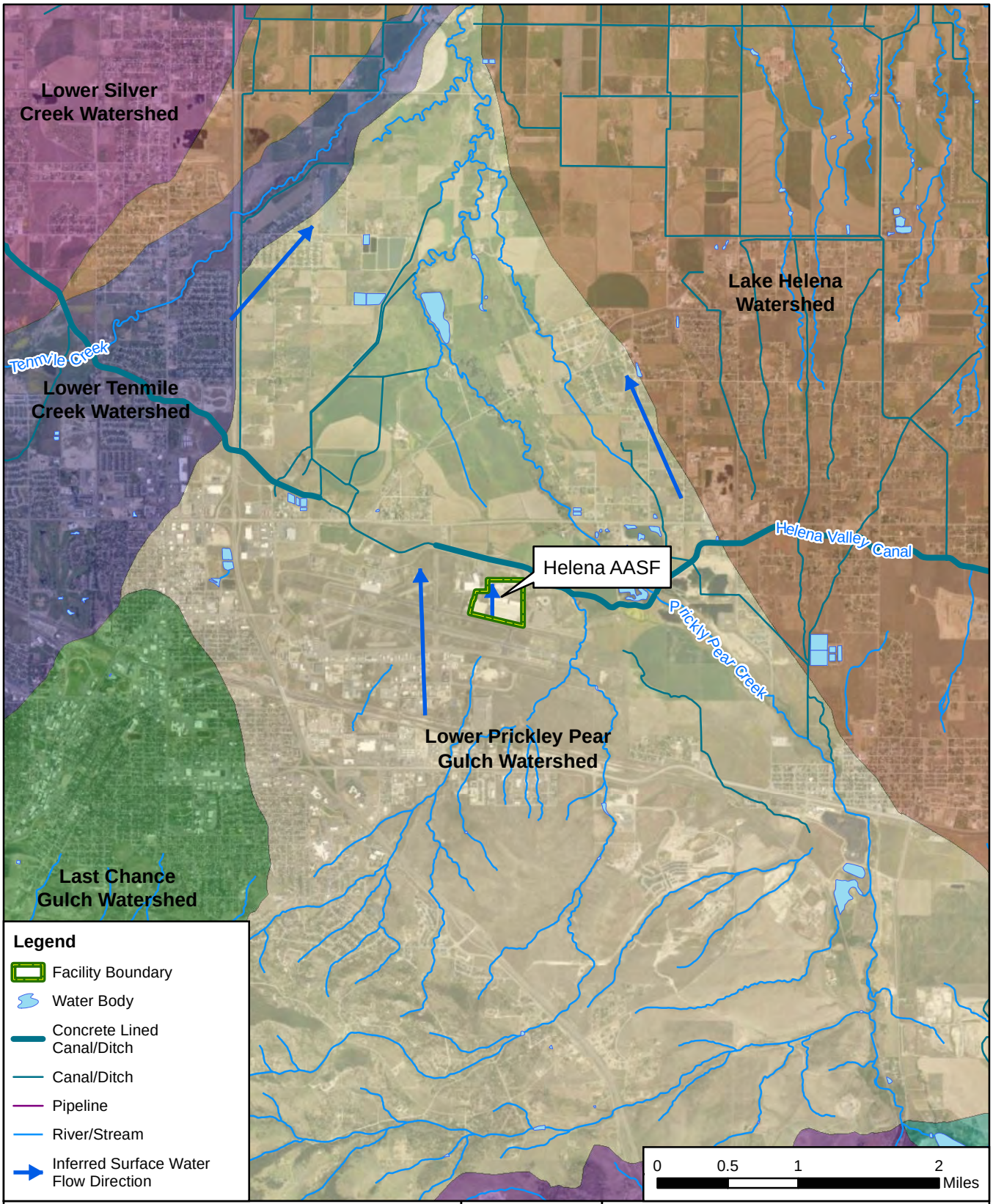

CLIENT	ARNG			
NOTES	Site Inspection for PFAS at Helena AASF, MT			
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SCALE	1:63,360	CHK BY	AB	2/3/2021
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and		PM	CM	2/3/2021

Surface Water Features

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Figure 2-4

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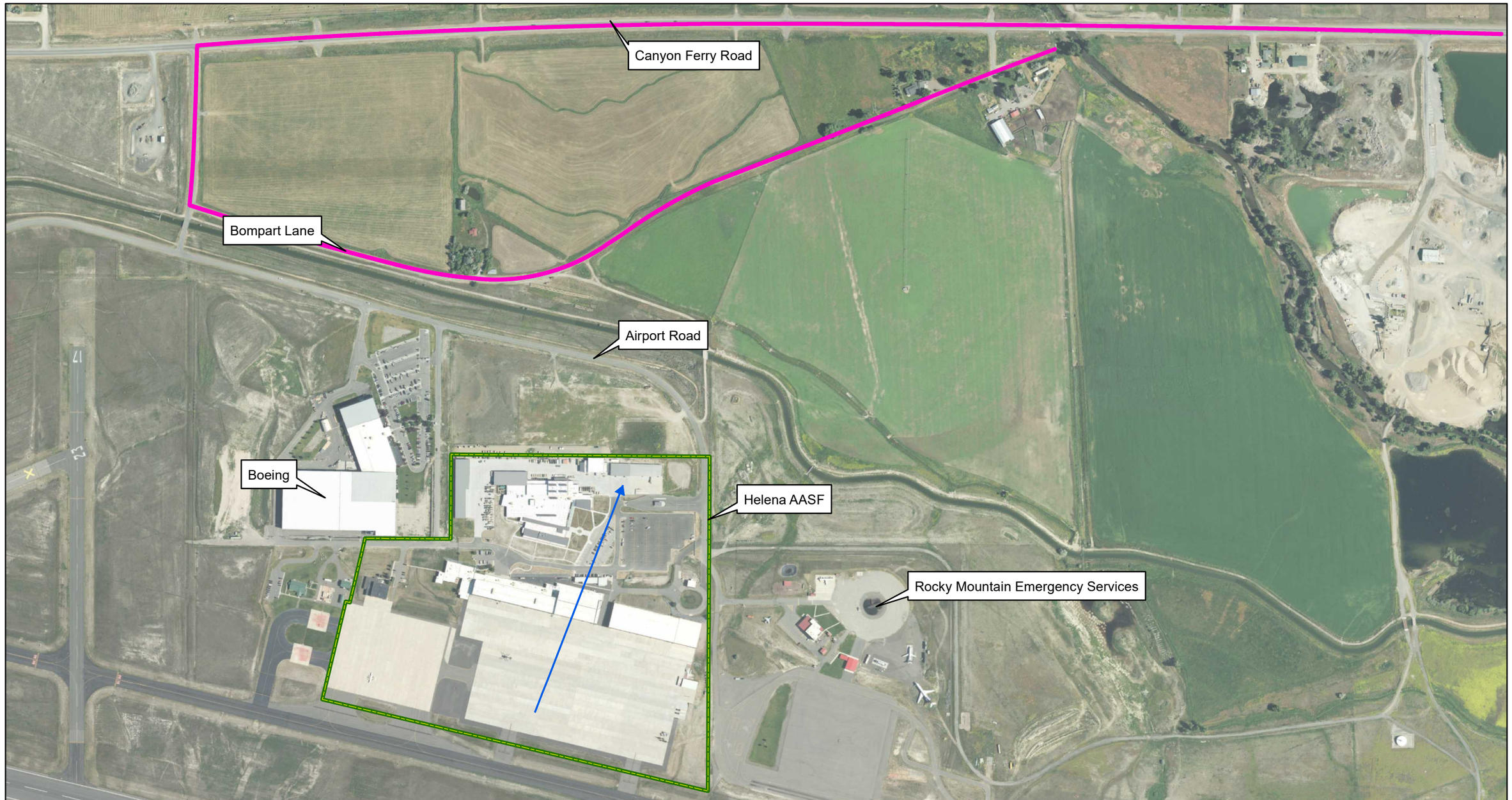

CLIENT	ARNG			
PROJECT	Site Inspection for PFAS at Helena AASF, MT			
REVISED	7/28/2021	GIS BY	MS	7/28/2021
SCALE	1:6,000	CHK BY	AB	7/28/2021
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	CM	7/28/2021

Legend

- Potable Well Sampling Area
- Facility Boundary
- Groundwater Flow Direction

0 250 500 1,000 Feet

N

Potable Well Sampling Area

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Figure 2-5

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3. Summary of Areas of Interest

This section presents a summary of each potential PFAS release area by AOI. The two potential PFAS release areas were grouped into one AOI (AOI 1) based on proximity and direction of groundwater flow (**Figure 3-1**).

3.1 AOI 1

AOI 1 consists of four potential PFAS release areas, as described below.

3.1.1 60 Hangar

The 60 Hangar is located on the western side of the AASF. The 60 Hangar was built in 1999 and houses rotary-winged aircraft. Originally, AFFF was stored at the 60 Hangar in a 400-gallon aboveground storage tank which supplied the fire suppression system. During the PA interviews, it was originally determined that no AFFF was released from the 60 Hangar. However, subsequent interviews were performed which revealed that the AFFF fire suppression system was tested shortly after installation. Specific details regarding the volume, chemical composition, and concentration of the AFFF released during the test are not known, but interviewees confirmed that after the test was completed, AFFF was coming out of the bay and settled on the apron in front of the 60 Hangar. It is believed that AFFF entered the floor drains inside the 60 Hangar which go to the Helena Publicly Owned Treatment Works and storm drains outside the 60 Hangar which flow to the onsite retention basin.

In 2011 the fire suppression system was retrofitted. During the renovation, the AFFF was removed by Tyco SimplexGrinnell and replaced with Jet-X High Expansion Foam. The Jet-X High Expansion Foam system was tested in 2012 during which all material from the new suppression system flowed into a floor drain that runs the length of the 60 Hangar and discharged to the Helena Publicly Owned Treatment Works.

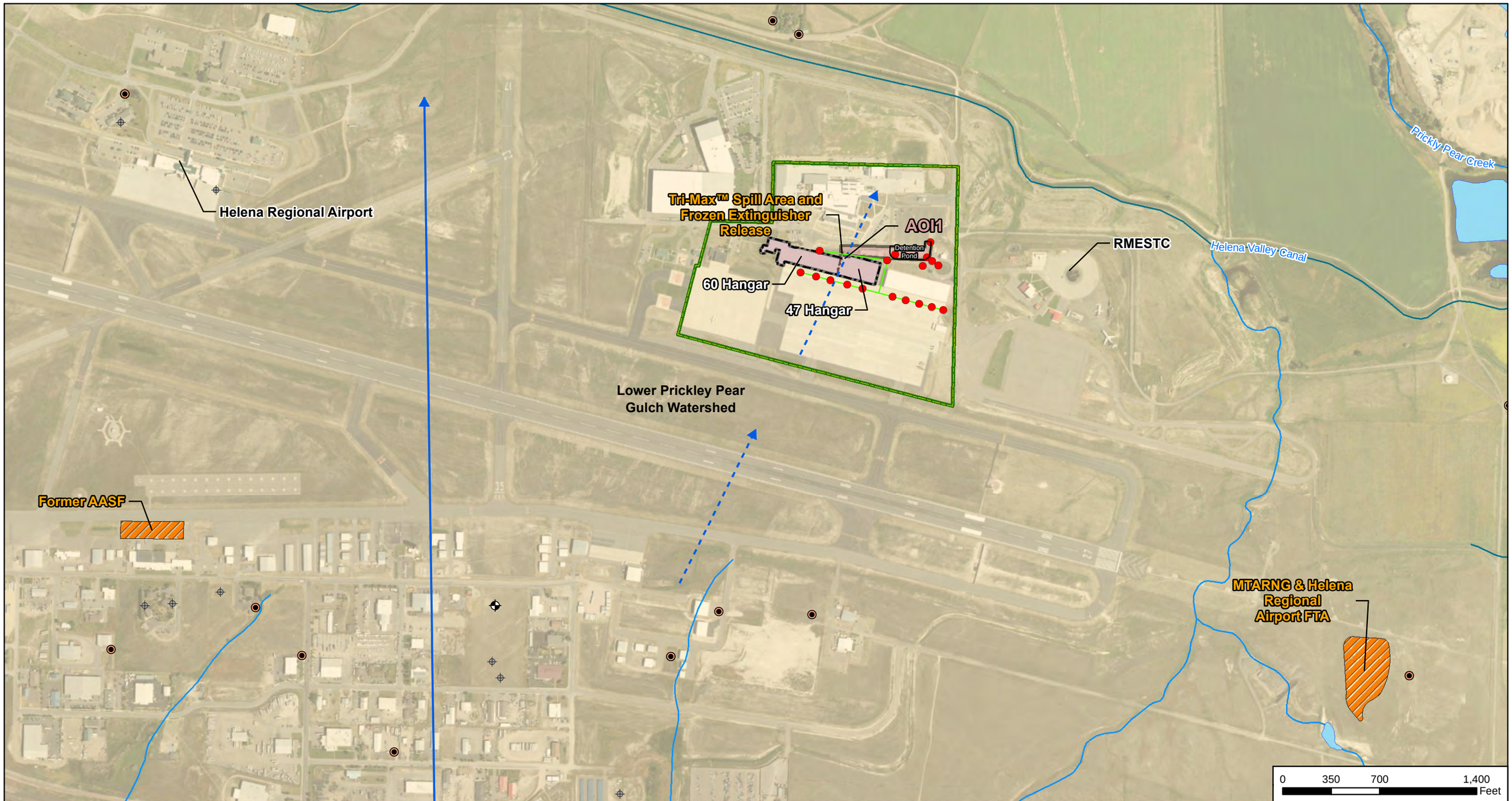
3.1.2 47 Hangar

The 47 Hangar is located adjacent to the 60 Hangar on the eastern side of the AASF. The 47 Hangar was constructed in 2006 and houses rotary-winged aircraft. According to interviewees, the 47 Hangar contains a fire suppression system supplied with Jet-X High Expansion Foam and was tested once in 2006. For the test, 60 gallons of Jet-X concentrate was mixed with 1940 gallons of water. All the released Jet-X High Expansion Foam flowed into a floor drain that runs the length of the 47 Hangar and discharged to the Helena Publicly Owned Treatment Works.

3.1.3 Tri-Max™ Spill Area and Frozen Extinguisher Release Area

PFAS were potentially released once to a concrete surface at AOI 1 by the MTARNG in the early-2000s. During filling of fire extinguishers, a 5-gallon jug of Tri-Max™ 30 spilled onto the concrete behind the most eastern end of the 60 Hangar. The spilled Tri-Max™ 30 possibly ran into a drain that empties into a detention pond to the northeast of the 47 Hangar. Additionally, a second release occurred during the winter of 1998 or 1999 in which a fire extinguisher stored outside froze, split, and released its contents. The exact location of this release is unknown, but it is assumed to have occurred in the same general location as the 5-gallon AFFF spill. A spill was not noted; however, it is likely the contents were released to the concrete surface. As a corrective action, fire extinguishers are now stored in the hangars. No specific information regarding the exact location, contents of the extinguisher, or the volume released was available at the time of the PA or SI. It is unknown if fire extinguishers with AFFF were used during training. Further, it is unknown how fire extinguishers at the AASF are emptied and/or disposed.

The detention pond is approximately 5 feet deep and collects runoff from most of the facility, including industrial stormwater runoff. Drainages have been diverted around the AASF, and unprocessed surface water is not used in the area, except for irrigation. Drinking water is supplied by the City of Helena; however, domestic wells are located downgradient of AOI 1, within 4 miles of the AASF.



CLIENT	ARNG			
PROJECT	Site Inspection for PFAS at Helena AASF, MT			
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SCALE	1:8,400	CHK BY	AB	12/7/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	12/7/2020

- Storm Drain Inlet
- Storm Drain Line
- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- Water body
- Canal/Ditch
- River/Stream
- Surface Water Flow Direction
- Groundwater Flow Direction
- Monitoring Well
- Domestic Well
- Other Well

N

Areas of Interest

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Figure 3-1

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4. Project Data Quality Objectives

Project Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality of data and define the level of certainty required to support project decision-making process. The specific DQOs established for this facility are described below. These DQOs were developed in accordance with the USEPA's seven-step iterative process (USEPA, 2006).

4.1 Problem Statement

The following problem statement was developed during project planning:

The presence of PFAS, which may pose a risk to human health or the environment, in environmental media at the facility is currently unknown. PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. The regulatory framework for managing PFAS at both the federal and state level continues to evolve.

The DoD has adopted a policy to retain facilities in the CERCLA process based on risk-based SLs for soil and groundwater, as described in a memorandum from the Office of the Secretary of Defense (OSD) dated 15 October 2019 (Assistant Secretary of Defense, 2019). The ARNG program under which this SI was performed follows this DoD policy. Should the maximum site concentration for sampled media exceed the SLs established in the OSD memorandum, the site will proceed to the next phase under CERCLA. The SLs established in the OSD memorandum apply to three compounds: PFOS, PFOA, and PFBS. The SLs are presented in **Section 6.1** of this Report.

The following quotes from the DA policy documents form the basis for this project (DA, 2016; DA, 2018):

- "The Army will research and identify locations where PFOS- and/or PFOA-containing products, such as AFFF, are known or suspected to have been used. Installations shall coordinate with installation/facility fire response or training offices to identify AFFF use or storage locations. The Army will consider fire training areas, AFFF storage locations, hangars/buildings with AFFF suppression systems, fire equipment maintenance areas, and areas where emergency response operations required AFFF use as possible source areas. In addition, metal plating operations, which used certain PFOS-containing mist suppressants, shall be considered possible source areas."
- "Based on a review of site records…determine whether a CERCLA PA is appropriate for identifying PFOS/PFOA release sites. If the PA determines a PFOS/PFOA release may have occurred, a CERCLA SI shall be conducted to determine presence/absence of contamination."
- "Identify sites where perfluorinated compounds are known or suspected to have been released, with the priority being those sites within 20 miles of the public systems that tested above USEPA HA levels." (USEPA, 2016a; USEPA, 2016b).

4.2 Goals of the Study

The following goals were established for this SI:

1. Determine the presence or absence of PFOA, PFOS, and PFBS at or above SLs.
2. Develop information to potentially eliminate a release from further consideration because it is determined that it poses no significant threat to human health or the environment.

3. Determine the potential need for a removal action.
4. Collect data to better characterize the release areas for more effective and rapid initiation of a RI.
5. Identify within 4 miles of the installation other potential PFAS sources (fire stations, major manufacturers, other DoD facilities) and receptors, including both groundwater and surface water receptors, to determine whether the ARNG is the likely source of PFAS, or whether there is an off-facility source of PFAS responsible for installation detections of PFAS (USEPA, 2005).
6. Determine whether a potentially complete pathway exists between the source and potential receptors and whether ARNG is the likely source of the contamination.

4.3 Information Inputs

Primary information inputs included the following:

- The PA for the Helena AASF (AECOM, 2018c);
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific Uniform Federal Policy (UFP)-Quality Assurance Project Plan (QAPP) Addendum (AECOM, 2020b); and
- Field data collected during the SI, including groundwater elevation and water quality parameters measured at the time of sampling.
- Analytical data from potable water samples collected from five potable wells located in closest proximity to the facility boundary downgradient of AOI1.

4.4 Study Boundaries

The scope of the SI was bounded by the property limits of the facility (**Figure 2-1**). Off-facility sampling was performed at potable wells within 0.5 miles of the facility boundary.

4.5 Analytical Approach

Samples were analyzed by Pace Analytical Gulf Coast, accredited under the DoD Environmental Laboratory Accreditation Program (ELAP; Accreditation Number 74960) and the National Environmental Laboratory Accreditation Program (NELAP; Certificate Number 01955). Data were compared to applicable SLs and decision rules as defined in the SI QAPP Addendum (AECOM, 2020b). These rules governed response actions based on the results of the SI sampling effort.

The decision rules described in the **Worksheet #11** of the SI QAPP Addendum identify actions based on the following:

Groundwater:

- Is there a human receptor within 4 miles of the facility?
- What is the concentration of PFOA, PFOS, and PFBS at the potential release areas?
- What is the concentration of PFOA, PFOS, and PFBS at the facility boundary upgradient and downgradient of the potential release areas?
- What does the conceptual site model (CSM) suggest in terms of source, pathway, and receptor?

Soil:

- What is the concentration of PFOA, PFOS, and PFBS in shallow surface soil (0 to 2 feet bgs)?
- What is the concentration of PFOA, PFOS, and PFBS in deep soil (i.e., capillary fringe)?
- What does the CSM suggest in terms of source, pathway, and receptor?

Soil and groundwater samples were collected from each of the potential release areas. Groundwater was encountered at approximately 40 to 56 feet bgs.

4.6 Data Usability Assessment

The Data Usability Assessment (DUA) is an evaluation at the conclusion of data collection activities that uses the results of both data verification and validation in the context of the overall project decisions or objectives. Using both quantitative and qualitative methods, the assessment determines whether project execution and the resulting data have met installation-specific DQOs. Both sampling and analytical activities are considered to assess whether the collected data are of the right type, quality, and quantity to support the decision-making (DoD, 2019a; DoD, 2019b; USEPA, 2017b).

Data Quality Indicators (DQIs) (Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity) are important components in assessing data usability. These DQIs were evaluated in the subsequent sections and demonstrate that the data presented in this SI Report are of high quality. Although the SI data are considered reliable, some degree of uncertainty can be associated with the data collected. Specific factors that may contribute to the uncertainty of the data evaluation are described below. The Data Validation Report (DVR) (**Appendix A**) presents explanations for all qualified data in greater detail.

4.6.1 Precision

Precision is the degree of agreement among repeated measurements of the same characteristic on the same sample or on separate samples collected as close as possible in time and place. Field sampling precision is measured with the field duplicate relative percent differences (RPD); laboratory precision is measured with calibration verification, internal standard recoveries, laboratory control spike (LCS) and matrix spike (MS) duplicate RPD.

Extraction internal standards (EIS) were added by the laboratory during sample extraction to measure relative responses of target analytes and used to correct for bias associated with matrix interferences and sample preparation efficiencies, injection volume variances, mass spectrometry ionization efficiencies, and other associated preparation and analytical anomalies. Several field samples displayed EIS area counts outside the quality control (QC) limits of 50-150 percent (%). The non-detect field sample results associated with EIS area counts less than 10% were initially flagged “X” but should be considered for inclusion in the data set. Since PFAS compounds are quantitated based on a normalized 100% internal standard percent recovery for this method and in MS pairs with low area counts and the target compounds were shown to be able to be recovered. The data points flagged “X” were non-detect results for perfluorotetradecanoic acid (PFTeDA) and perfluorotridecanoic (PFTrDA). The non-detect field sample results associated with the remaining EIS area counts less than the lower QC limit of 50% but greater than 20% were qualified “UJ”. The qualified field sample results associated with a negative bias should be considered usable as estimated values and as likely true negatives.

Calibration verifications were performed routinely to ensure that instrument responses for all calibrated analytes were within established QC criteria. The calibration verifications were within the project established precision limits presented in the SI QAPP Addendum (AECOM, 2020b).

LCS/LCS duplicate (LCSD) pairs were prepared by addition of known concentrations of each analyte in a matrix-free media known to be free of target analytes. LCS/LCSD pairs were analyzed for every analytical batch to demonstrate the ability of the laboratory to detect similar concentrations of a known quantity in matrix-free media. The LCS/LCSD samples were within the project established precision limits presented in the SI QAPP Addendum (AECOM, 2020b).

MS/MS duplicate (MSD) samples were prepared, analyzed, and reported for all preparation batches. MS/MSD samples demonstrated that the analytical system was in control for the matrix being tested. MS/MSD samples were submitted to the laboratory for analysis at a rate of 5%. The MS/MSD performed on parent sample AOI01-01-SB-55-57 displayed an RPD greater than the QC limit of 30% for PFTrDA at 63%. The associated parent sample result was non-detect; therefore, no data qualifying action was required, and the associated parent sample result should be considered usable as reported.

Field duplicate samples were collected at a rate of 10% to assess the overall sampling and measurement precision for this sampling effort. The field duplicate samples were analyzed for PFAS and general chemistry parameters. The field duplicate samples were within the project established precision limits presented in the SI QAPP Addendum (AECOM, 2020b).

Laboratory duplicate samples were prepared and analyzed to assess the overall laboratory analytical method and measurement precision for this sampling effort. The laboratory duplicates were analyzed for total organic carbon (TOC). The laboratory duplicate pair performed on samples AOI01-03-SB-20-22 and AOI01-03-SB-20-22-D displayed an RPD greater than the QC limit of 25% for TOC at 47% and 38%, respectively. The positive results in the associated batch were qualified “J” and should be considered as estimate.

4.6.2 Accuracy

Accuracy is a measure of confidence in a measurement. The smaller the difference between the measurement of a parameter and its "true" or expected value, the more accurate the measurement. The more precise or reproducible the result, the more reliable or accurate the result. Accuracy is measured through percent recoveries in the LCS/LCSD, MS/MSD, and surrogates.

LCS/LCSD samples were prepared by addition of known concentrations of each analyte in a matrix-free media known to be free of target analytes. LCS/LCSD samples were analyzed for every analytical batch and demonstrated that the analytical system was in control during sample preparation and analysis, with a limited number of exceptions. PFTrDA displayed an LCSD recovery outside the QC limits of 70%-130% at 68% for batch 688084. The field sample results associated with a negative bias were non-detect and were qualified “UJ”. The qualified field sample results should be considered usable as estimated values. The polyfluorinated compound 6:2 fluorotelomer sulfonate (6:2 FTS) displayed LCSD recovery outside the QC limits at 132% for batch 687724. The field sample results associated with a positive bias were non-detect; no data-qualifying action was required, and results should be considered usable as reported.

MS/MSD samples were prepared, analyzed, and reported at a rate of 5%. MS/MSD samples demonstrated that the analytical system was in control for the matrix being tested, with the following exceptions. The MS/MSD performed on parent sample AOI01-01-SB-55-57RE displayed percent recoveries less than the lower QC limit of 70% for PFTrDA at 63%. The parent sample results associated with a negative bias were qualified “UJ” and should be considered usable as estimated values with a negative bias. The MS/MSD performed on parent sample AOI01-01-SB-55-57 displayed percent recoveries greater than the upper QC limit of 130% for PFTrDA at 183%. The parent sample results associated with a positive bias were non-detect; no data-qualifying action was required, and the results should be considered usable as reported.

4.6.3 Representativeness

Representativeness qualitatively expresses the degree to which data accurately reflect site conditions. Factors that affect the representativeness of analytical data include appropriate sample population definitions, proper sample collection and preservation techniques, analytical holding times, use of standard analytical methods, and determination of matrix or analyte interferences.

Relating to the use of standard analytical methods, the laboratory followed the method as established in PFAS by liquid chromatography tandem mass spectrometry (LC/MS/MS) Compliant with Quality Systems Manual (QSM) 5.1 Table B-15, including the specific preparation requirements (i.e. ENVI-Carb or equivalent used), mass calibration, spectra, all the ion transitions identified in Table B-15 were monitored, standards that contained both branch and linear isomers when available were used, and isotopically-labeled standards were used for quantitation.

Field QC samples were collected to assess the representativeness of the data collected. Field duplicates were collected at a rate of 10% for all field samples, while MS/MSD samples were collected at a rate of 5%. All preservation techniques were followed by the field staff, and all technical and analytical holding times were met by the laboratory, with the exception of pH. For the pH analysis, the holding time is “immediate”. The associated field sample results were qualified “J” and should be considered usable as estimated values. The laboratory used approved standard methods in accordance with the SI QAPP Addendum (AECOM, 2020b) for all analyses.

Instrument blanks and method blanks were prepared by the laboratory in each batch as a negative control. All associated instrument blanks and method blanks were non-detect for all target analytes.

Equipment blanks and field blanks were also collected for groundwater and soil samples. All equipment blanks and field blanks were non-detect for all target analytes.

Overall, the data are usable for evaluating the presence or absence of PFAS at the facility. Sufficient usable data were obtained to meet the objectives of the SI.

4.6.4 Comparability

Comparability is the extent to which data from one study can be compared directly to either past data from the current project or data from another study. Using standardized sampling and analytical methods, units of reporting, and site selection procedures help ensure comparability. Standard field sampling and typical laboratory protocols were used during the SI and are considered comparable to ongoing investigations.

4.6.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount of data expected under normal conditions. The laboratory provided data meeting system QC acceptance criteria for all samples tested. Project completeness was determined by evaluating the planned versus actual quantities of data. Percent completeness per parameter is as follows and reflects the exclusion of “X” flagged data:

- PFAS in groundwater by LC/MS/MS compliant with QSM 5.1 Table B-15 at 100%;
- PFAS in soil by LC/MS/MS compliant with QSM 5.1 Table B-15 at 98.8%;
- pH in soil by USEPA Method 9045D at 100%; and
- TOC by USEPA Method 9060 at 100%

4.6.6 Sensitivity

Sensitivity is the capability of a test method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest. Examples of QC measures for determining sensitivity include laboratory fortified blanks, a method detection limit (MDL) study, and calibration standards at the limit of quantitation (LOQ). In order to meet the needs of the data users, project data must meet the measurement performance criteria for sensitivity and project LOQs specified in the SI QAPP Addendum (AECOM, 2020b). The laboratory provided the requested MDL studies and provided applicable calibration standards at the LOQ. In order to achieve the DQOs for sensitivity outlined in the SI QAPP Addendum (AECOM, 2020b), the laboratory reported all field sample results at the lowest possible dilution. Additionally, any analytes detected below the LOQ and above the MDL were reported and qualified “J” as estimated values by the laboratory.

5. Site Inspection Activities

This section describes the environmental investigation and sampling activities that occurred as part of the SI. The SI sampling approach was based on the findings of the PA and implemented in accordance with the following approved documents:

- *Final Preliminary Assessment Report Army Aviation Support Facility, Helena, Montana dated October 2018* (AECOM, 2018c).
- *Final Site Inspection Programmatic Uniform Federal Policy-Quality Assurance Project Plan dated March 2018* (AECOM, 2018a);
- *Final Site Inspection Quality Assurance Project Plan Addendum, Helena Army Aviation Support Facility, Helena, Montana dated July 2020* (AECOM, 2020b);
- *Final Programmatic Accident Prevention Plan dated July 2018* (AECOM, 2018b); and
- *Final Site Safety and Health Plan, Helena Army Aviation Support Facility, Helena, Montana dated June 2020* (AECOM, 2020a).

SI field activities were conducted from 6 to 13 July 2020 and included soil sampling, permanent groundwater monitoring well installation, development, and low-flow groundwater sampling. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2020b), except as noted in **Section 5.8**.

The following samples were collected during the SI and analyzed for a subset of 18 PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15 to fulfill the project DQOs:

- 17 soil grab samples from 7 boring locations; and
- 5 groundwater samples from 5 permanent monitoring well locations.

Figure 5-1 provides the sample locations for all media across the facility. **Table 5-1** presents the list of samples collected for each media. Field documentation is provided in **Appendix B**. A Log of Daily Notice of Field Activity was completed throughout the SI field activities, which is provided in **Appendix B1**. Additionally, a photographic log of field activities is provided in **Appendix C**.

5.1 Pre-Investigation Activities

In preparation for the SI field activities, project team members participated in Technical Project Planning (TPP) meetings, performed utility clearance, and sampled decontamination source water. Details for each of these activities are presented below.

5.1.1 Technical Project Planning

The USACE TPP Process, Engineers Manual (EM) 200-1-2 (USACE, 2016) defines four phases to project planning: 1.) defining the project phase; 2.) determining data needs; 3.) developing data collection strategies; and 4.) finalizing the data collection plan. The process encourages stakeholder involvement in the SI, beginning with defining overall project objectives, including quantitative and qualitative DQOs, and formulating a sampling approach to address the AOI identified in the PA.

A combined TPP Meeting 1 and 2 was held on 29 April 2020, prior to SI field activities. Meeting minutes are provided in **Appendix D**. TPP meetings 1 and 2 were conducted in general accordance with EM 200-1-2.

The stakeholders for this SI include the ARNG G9, MTARNG, USACE, and Montana Department of Environmental Quality (MTDEQ). Stakeholders were provided the opportunity to make comments on the technical sampling approach and methods at the combined TPP Meeting 1 and 2. The outcome of the combined TPP Meeting 1 and 2 was memorialized in the SI QAPP Addendum (AECOM, 2020b).

TPP Meeting 3 was held on 15 January 2021 to discuss the results of the SI. Meeting minutes for TPP 3 are included in **Appendix D** of this report. Future TPP meetings will provide an opportunity to discuss the results and findings, and future actions, where warranted.

5.1.2 Utility Clearance

Utility clearance was conducted by Montana811 and facilitated by MTARNG. MTARNG contacted Montana811 one-call utility clearance contractor to notify them of intrusive work. AECOM field staff were onsite during the utility locate. Additionally, the first 5 feet of each boring were advanced using hand augering methods to verify utility clearance in shallow subsurface where utilities would typically be encountered.

5.1.3 Source Water and PFAS Sampling Equipment Acceptability

Under normal circumstances, a potable water sample would have been collected from the facility during TPP Meeting 1 and 2; however, a virtual meeting was held instead. As a result, potable water used for decontamination of drilling equipment was taken from Fort William Henry Harrison which has been previously sampled and confirmed to be PFAS-free. The results of the potable well sample are provided in **Appendix F**.

Materials that were used within the sampling zone were confirmed as acceptable for use in the PFAS sampling environment. The checklist of acceptable materials for use in the PFAS sampling environment was provided in the Standard Operating Procedures (SOPs) appendix to the SI QAPP Addendum (AECOM, 2020b). Prior to the start of field work each day, a PFAS Sampling Checklist was completed as an additional layer of control. The checklist served as a daily reminder to each field team member regarding the allowable materials within the sampling environment.

5.2 Soil Borings and Soil Sampling

Soil samples were collected via hollow stem auger (HSA) in accordance with the SI QAPP Addendum (AECOM, 2020b). A CME-75 auger rig with 18-inch split-spoon was used to collect one core every 5 feet. A hand auger was used to collect soil from the top 5 feet of the boring to be compliant with utility clearance procedures.

Three discrete soil samples were collected from the vadose zone for chemical analysis from each soil boring. One surface soil sample and two subsurface soil samples (one approximately 1 foot above the groundwater table and one at the mid-point between the ground surface and the groundwater table) were collected at each boring using HSA.

The soil boring locations are shown on **Figure 5-1** and depths are provided **Table 5-1**. The soil boring locations were selected based on the AOI information as agreed on through TPP and SI QAPP Addendum review.

The soil cores were logged for lithological descriptions by a field geologist using the Unified Soil Classification System (USCS). A photoionization detector (PID) was used to screen the breathing zone during boring activities as part of personal safety requirements. Observations and measurements were recorded on sampling forms (**Appendix B2**) and in a non-treated field logbook (i.e., composition notebook). Depth interval, recovery thickness, moisture, relative

density, color (using a Munsell soil color chart), and texture (using the USCS) were recorded. The boring logs are provided in **Appendix E**.

Lithology observed during the SI was consistent with descriptions from previous investigations at the facility and surrounding area. Borings advanced in the subsurface consisted of sands, silts, and clays with lenses of small, subangular gravel. Sand layers varied from brown, yellow, and, gray; generally-poorly sorted; sub-angular to rounded grains. Silt and clay layers were encountered, but did not terminate drilling at any locations. Generally, silts and clays intervals were described as brown, cohesive, with low to medium plasticity and containing trace to some fine-grained sand. Calcium carbonate (derived from the surrounding sedimentary bedrock) was observed in most of the borings and confirmed by testing using dilute acid. Each soil sample was collected into laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via Federal Express (FedEx) under standard chain of custody (CoC) procedures to the laboratory and analyzed for PFAS (LC/MS/MS compliant with QSM 5.1 Table B-15), TOC (USEPA Method 9060A) and pH (USEPA Method 9045D) in accordance with the SI QAPP Addendum (AECOM, 2020b).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. MS/MSDs were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. In instances when non-dedicated sampling equipment was used, such as a hand auger for the shallow soil samples, equipment rinsate blanks were collected at a rate of 5% and analyzed for the same parameters as the soil samples. A temperature blank was placed in each cooler to ensure that samples were preserved at or below 4 degrees Celsius (°C) during shipment.

5.3 Permanent Well Installation and Groundwater Sampling

A CME-75 was used to install five 2-inch diameter monitoring wells. The monitoring wells were constructed with Schedule 40 polyvinyl chloride (PVC), flush threaded 10-foot sections of riser, 0.010-inch slotted well screen, and a threaded bottom cap. The location of the permanent wells were based on proximity to potential PFAS sources and to determine PFAS concentrations at the facility boundary. The depth of the permanent wells were determined in the field based on observations made by the field geologist, targeting zones where wet soils were observed. A filter pack of 20/40 silica sand was installed in the annulus around the well screen to a minimum of 2-foot above the well screen. A 2-foot thick bentonite seal was placed above the filter sand and hydrated with water. Bentonite chips were placed in the well annulus from the top of the bentonite seal to approximately 6 inches bgs and hydrated with water. All monitoring wells were completed with flush mount well vaults. Well construction diagrams are provided in **Appendix B3**. The screen interval of each of the groundwater monitoring wells is provided in **Table 5-2**.

Development and sampling of wells was completed in accordance with the SI QAPP Addendum (AECOM, 2020b). The newly installed monitoring wells were developed no sooner than 24 hours following installation by pumping and surging using a variable speed submersible pump. Well development records are provided in **Appendix B4**. Samples were collected no sooner than 24 hours following development via low-flow sampling methods using a Geotech bladder pump (using a polytetrafluoroethylene bladder) with disposable PFAS-free, HDPE tubing. New tubing and bladder was used at each well and the pumps were decontaminated between each well. The wells were purged at a rate determined in the field to reduce draw down prior to sampling. Water quality parameters (e.g., temperature, specific conductance, pH, dissolved oxygen [DO], oxidation-reduction potential [ORP], and turbidity) were measured using a water quality meter and recorded on the field sampling form (**Appendix B5**). Water levels were measured to the nearest 0.01 inch and recorded. Additionally, a subsample of each groundwater sample was collected in a separate container and a shaker test was completed to identify if there was any foaming. No foaming was noted in any of the groundwater samples.

Each sample was collected into laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard CoC procedures to the laboratory and analyzed for PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15 in accordance with the SI QAPP Addendum (AECOM, 2020b).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. MS/MSDs were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. One field reagent blank was collected in accordance with the programmatic QAPP (PQAPP) (AECOM, 2018a). A temperature blank was placed in each cooler to ensure that samples were preserved at or below 4°C during shipment.

5.4 Synoptic Water Level Measurements

A synoptic groundwater gauging event was performed on 12 July 2020. Depth to water measurements were collected from the 5 new monitoring wells from the northern side of the well casing. A groundwater flow contour map is provided in **Figure 2-3**. Calculated groundwater elevation data is provided in **Table 5-3**.

5.5 Surveying

The northern side of each well casing was surveyed by Montana-Licensed land surveyor following guidelines provided in the SI QAPP Addendum SOPs (AECOM, 2020b). Survey data from the newly installed wells on the facility were collected on 13 July 2020 in the North American Datum of 1983 Montana State Plane. The surveyed well data are provided in **Appendix B6**.

5.6 Investigation-Derived Waste

Soil investigation-derived waste (IDW) (i.e., soil cuttings) and liquid IDW (purge and decontamination water) generated during the SI activities were containerized in 24, separate 55-gallon drums (19 soil and 5 liquid) and stored on the facility. The soil and liquid IDW was not sampled and assumes the PFAS characteristics of the associated soil samples collected from that source location.

Other solids such as spent personal protective equipment (PPE), plastic sheeting, tubing, rope, unused monitoring well construction materials, and other environmental media generated during the field activities were disposed of at a licensed solid waste landfill.

5.7 Laboratory Analytical Methods

Samples were analyzed for a subset of 18 PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15 at Pace Analytical Gulf Coast in Baton Rouge, Louisiana, a DoD ELAP and NELAP certified laboratory. The 18 PFAS analyzed as part of the ARNG SI program include the following:

- 6:2 fluorotelomer sulfonic acid (6:2 FTS)
- 8:2 fluorotelomer sulfonic acid (8:2 FTS)
- N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)
- Perfluorohexanoic acid (PFHxA)
- Perfluorohexanesulfonic acid (PFHxS)
- Perfluorononanoic acid (PFNA)
- Perfluorooctanoic acid (PFOA)
- Perfluorooctanesulfonic acid (PFOS)
- Perfluoropentanoic acid (PFPeA)
- Perfluorotetradecanoic acid (PFTeDA)
- Perfluorotridecanoic acid (PFTrDA)

- N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)
- Perfluorobutyrate (PFBA)
- Perfluorobutanesulfonic acid (PFBS)
- Perfluorodecanoic acid (PFDA)
- Perfluorododecanoic acid (PFDoA)
- Perfluoroundecanoic acid (PFUdA)
- Perfluoroheptanoic acid (PFHpA)

Soil samples were also analyzed for TOC using USEPA Method 9060A and pH by USEPA Method 9045D.

5.8 Deviations from SI QAPP Addendum

One deviation was identified after completion of the field work during the reporting stage and therefore a Nonconformance and Corrective Action Report was not completed. The deviation from the SI QAPP Addendum is noted below:

- While advancing the borehole at HAASF-MW002, split-spoon samples were collected continuously the entire length of the borehole. Given that the depth to water was deeper than anticipated and in order to maintain the field schedule, the team determined that split-spoons would be collected once every five feet (one per five-foot auger run).

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Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Helena AASF

Sample Identification	Sample Collection Date	Sample Depth (feet bgs)	PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Comments
Soil Samples						
AOI01-01-SB-00-02	7/8/2020	0-2	x			
AOI01-01-SB-25-27	7/8/2020	25-27	x			
AOI01-01-SB-55-57	7/8/2020	55-57	x			
AOI01-02-SB-00-02	7/7/2020	0-2	x			
AOI01-02-SB-28-30	7/7/2020	28-30	x			
AOI01-02-SB-55-57	7/7/2020	55-57	x			
AOI01-03-SB-00-02	7/9/2020	0-2	x			
AOI01-03-SB-20-22	7/9/2020	20-22	x			
AOI01-03-SB-20-22-D	7/9/2020	20-22	x	x	x	Field Duplicate
AOI01-03-SB-44-46	7/9/2020	44-46	x			
AOI01-04-SB-00-02	7/8/2020	0-2	x			
AOI01-04-SB-20-22	7/8/2020	20-22	x			
AOI01-04-SB-39-41	7/8/2020	39-41	x			
AOI01-05-SB-00-02	7/9/2020	0-2	x			
AOI01-05-SB-25-27	7/9/2020	25-27	x			
AOI01-05-SB-50-52	7/9/2020	50-52	x			
AOI01-05-SB-50-52-D	7/9/2020	50-52	x			Field Duplicate
AOI01-06-SB-00-02	7/8/2020	0-2	x			
AOI01-06-SB-00-02-D	7/8/2020	0-2	x			Field Duplicate
AOI01-07-SB-00-02	7/8/2020	0-2	x			
Groundwater Samples						
HAASF-MW001	7/12/2020	58.5	x			
HAASF-MW002	7/11/2020	57.0	x			
HAASF-MW003	7/12/2020	45.0	x			
HAASF-MW004	7/12/2020	43.0	x			
HAASF-MW005	7/12/2020	51.5	x			
HAASF-MW005-D	7/12/2020	51.5	x			Field Duplicate

Notes:
AOI = Area of Interest
bgs = below ground surface
D = duplicate
HAASF = Helena Army Aviation Support Facility
MW = monitoring well
PFAS = per- and polyfluoroalkyl substances
pH = potential for hydrogen
SB = soil boring
TOC =total organic carbon
USEPA = United States Environmental Protection Agency

Table 5-2
Boring Depths and Permanent Well Screen Interval
Site Inspection Report, Helena AASF

Area of Interest	Soil Boring ID	Monitoring Well ID	Soil Boring Depth (feet bgs)	Permanent Well Screen Interval (feet bgs)
AOI 1	AOI01-01	HAASF-MW001	60.3	50.3-60.3
	AOI01-02	HAASF-MW002	62	52-62
	AOI01-03	HAASF-MW003	50	40-50
	AOI01-04	HAASF-MW004	44.1	34-44
	AOI01-05	HAASF-MW005	56.5	45-55
	AOI01-06	NA	2	NA
	AOI01-07	NA	2	NA

Notes:
AOI = Area of Interest
bgs = below ground surface
HAASF = Helena Army Aviation Support Facility
ID = identification
MW = monitoring well
NA = not applicable

Table 5-3
Depth to Water and Groundwater Elevation
Site Inspection Report, Helena AASF

Location ID	Ground Surface Elevation (ft amsl)	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
HAASF-MW001	3833.67	56.78	3776.89
HAASF-MW002	3812.79	44.22	3768.57
HAASF-MW003	3808.01	40.90	3767.11
HAASF-MW004	3808.36	40.71	3767.65
HAASF-MW005	3815.22	45.62	3769.60
AOI01-06	3808.62	NA	NA
AOI01-07	3807.94	NA	NA

Notes:

AOI = Area of Interest

amsl = above mean sea level

btoc = below top of casing

ft = feet

HAASF = Helena Army Aviation Support Facility

ID = identification

MW = monitoring well

NA = not applicable

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CLIENT	ARNG			
PROJECT	Site Inspection for PFAS at Helena AASF, MT			
REVISED	12/7/2020	GIS BY	MS	12/7/2020
SCALE	1:3,000	CHK BY	AB	12/7/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	12/7/2020

- Soil Boring/Permanent Monitoring Well
- Surface Soil Boings (via Hand Auger)
- Storm Drain Inlet
- Storm Drain Line
- Area of Interest
- Facility Boundary
- Canal/Ditch
- Inferred Surface Water Flow Direction
- Groundwater Flow Direction

N

Site Inspection Surveyed Sample Locations

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 5-1

C:\Users\stankevichm\OneDrive - AECOM Directory\ARNG_PFAS_GIS_60552172\MXDs\MT\Helena_AASF\Helena_AASF_SI_Figures\SI_Report\Fig_5-1_Helena_SI_Sample_Surveyed_Locations.mxd

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6. Site Inspection Results

This section presents the analytical results of the SI for each AOI. The SLs used in this evaluation are presented in **Section 6.1**. A discussion of the results for the AOI is provided in **Section 6.3**. **Table 6-2** through **Table 6-4** present PFAS results for samples with detections in soil or groundwater; only constituents detected in one or more samples are included. Tables that contain all results are provided in **Appendix F**, and the laboratory reports are provided in **Appendix G**.

6.1 Screening Levels

The DoD has adopted a policy to retain facilities in the CERCLA process based on risk-based SLs for soil and groundwater, as described in a memorandum from the OSD dated 15 October 2019 (Assistant Secretary of Defense, 2019). The ARNG program under which this SI was performed follows this DoD policy. Should the maximum site concentration for sampled media exceed the SLs established in the OSD memorandum, the site will proceed to an RI, the next phase under CERCLA. The SLs apply to three compounds, PFOA, PFOS, and PFBS, for both soil and groundwater, as presented in **Table 6-1**.

All other results presented in this Report are considered informational in nature and serve as an indication as to whether soil, groundwater, sediment, and surface water contain or do not contain PFAS within the boundaries of the facility.

Table 6-1: Screening Levels (Soil and Groundwater)

Analyte	Residential (Soil) (µg/kg)[a,b] 0-2 feet bgs	Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a,b]	Tap Water (Groundwater) (ng/L)[a,b]
PFOA	130	1,600	40
PFOS	130	1,600	40
PFBS	130,000	1,600,000	40,000

Notes:

a.) Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ) = 0.1. 15 October 2019.

b.) USEPA, 2021. Risk Based Screening Levels Calculated for PFBS in Groundwater and Soil using USEPA's Regional Screening Level Calculator. HQ = 0.1. 8 April 2021.

6.2 Soil Physicochemical Analyses

To provide basic soil parameter information, soil samples were analyzed for TOC and pH, which are important for evaluating transport through the soil medium. **Appendix F** contains the results of the TOC and pH sampling.

The data collected in this investigation will be used in subsequent investigations, where appropriate, to assess fate and transport of PFAS contaminants. According to the Interstate Technology Regulatory Council (ITRC), several important PFAS partitioning mechanisms include hydrophobic and lipophobic effects, electrostatic interactions, and interfacial behaviors. At relevant environmental pH values, certain PFAS are present as organic anions and are therefore relatively mobile in groundwater (Xiao et al., 2015), but tend to associate with the organic carbon fraction that may be present in soil or sediment (Higgins and Luthy 2006; Guelfo and Higgins, 2013). When sufficient organic carbon is present, organic carbon normalized distribution coefficients (K_{oc} values) can help in evaluating transport potential, though other geochemical

factors (for example, pH and presence of polyvalent cations) may also affect PFAS sorption to solid phases (ITRC, 2018).

6.3 AOI 1

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1, which includes the 60 and 47 Hangar Fire Suppression System Releases and the Tri-Max™ Spill/Release Area. The detected compounds in soil and groundwater are summarized on **Table 6-2** through **Table 6-4**. The detections of PFOS and PFOA in soil and groundwater are presented on **Figure 6-1** through **Figure 6-3**.

6.3.1 AOI 1 Soil Analytical Results

PFOA, PFOS, and PFBS did not exceed the SLs in soil at AOI 1. **Figure 6-1** and **Figure 6-2** present detections in soil for PFOS and PFOA. The detected compounds in soil are summarized on **Table 6-2** and **Table 6-3**.

Soil was sampled from seven locations at AOI 1, the shallow interval (0 to 2 feet bgs), intermediate interval (20 to 30 feet bgs), and deep interval (39 to 57 feet bgs) from boring locations HAASF-MW001 through HAASF-MW005. Additionally, two shallow interval (0 to 2 feet bgs) samples were collected from AOI01-06, and AOI01-07. PFOA and PFBS were not detected in any soil samples. PFOS were detected in soil at concentrations several orders of magnitude lower than the SLs. In the shallow interval, PFOS was detected at one location (HAASF-MW003) at a concentration of 0.208 J micrograms per Kilogram (µg/Kg). In the intermediate interval, PFOS was detected at one location (HAASF-MW005) at a concentration of 0.219 J µg/Kg. In the deep interval, PFOS was detected at one location (HAASF-MW005) at a concentration of 1.72 µg/Kg (2.37 µg/Kg duplicate). All the soil detections of PFOS occurred at locations HAASF-MW003 and HAASF-MW005 which correspond to the elevated detections of PFOS (175 ng/L and 775 ng/L [814 ng/L duplicate]) from the groundwater samples collected at the same locations.

6.3.2 AOI 1 Groundwater Analytical Results

PFOS exceeded the SLs in groundwater at AOI 1. PFOA and PFBS were detected in groundwater did not exceed the SLs at AOI 1. **Figure 6-3** present the ranges of detections for PFOS and PFOA. The detected compounds in groundwater are summarized in **Table 6-4**.

Groundwater at AOI 1 was sampled from five permanent monitoring well locations HAASF-MW001 through HAASF-MW0005. The SL of 40 ng/L for PFOS was exceeded at HAASF-MW003 and HAASF-MW005 at maximum concentrations of 175 ng/L and 775 ng/L (814 ng/L duplicate), respectively. PFOA was detected below the SL of 40 ng/L at three well locations, with concentrations ranging from 1.89 J ng/L to 9.59 J ng/L. PFBS was detected below the SL of 40,000 ng/L at four well locations, with concentrations ranging from 1.92 J ng/L to 3.61 J ng/L.

6.3.3 AOI 1 Conclusions

Based on the results of the SI, PFOS was detected in soil at AOI 1; however, the detected concentrations were several orders of magnitude lower than the soil SLs. PFOS was detected in groundwater at concentrations exceeding the individual SL of 40 ng/L at two well locations. PFOA and PFBS were detected in groundwater in several locations but at concentrations below SLs. Based on the exceedance of the SL for PFOS in groundwater, further evaluation at AOI 1 is warranted.

Table 6-2
PFAS Detections in Surface Soil
Site Inspection Report, Helena AASF

Area of Interest		AOI 1															
Sample ID		AOI01-01-SB-00-02		AOI01-02-SB-00-02		AOI01-03-SB-00-02		AOI01-04-SB-00-02		AOI01-05-SB-00-02		AOI01-06-SB-00-02		AOI01-06-SB-00-02-D		AOI01-07-SB-00-02	
Sample Date		07/08/2020		07/07/2020		07/09/2020		07/08/2020		07/09/2020		07/08/2020		07/08/2020		07/08/2020	
Depth		0 - 2 ft		0 - 2 ft		0 - 2 ft		0 - 2 ft		0 - 2 ft		0 - 2 ft		0 - 2 ft		0 - 2 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (µg/Kg)																	
PFOS	130	ND		ND	UJ	0.208	J	ND		ND		ND	UJ	ND		ND	

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 October 2019. Soil screening levels based on residential scenario for direct ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AOI	Area of Interest
D	Duplicate
DL	detection limit
ft	feet
HQ	Hazard quotient
ID	identification
LCMSMS	Liquid Chromatography Mass Spectrometry
ND	Analyte not detected above the LOD
OSD	Office of the Secretary of Defense
PFAS	per- and polyfluoroalkyl substances
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
SB	Soil boring
USEPA	United States Environmental Protection Agency
µg/Kg	micrograms per Kilogram

Table 6-3
PFAS Detections in Subsurface Soil
Site Inspection Report, Helena AASF

Area of Interest	AOI 1																					
Sample ID	AOI01-01-SB-25-27		AOI01-01-SB-55-57		AOI01-02-SB-28-30		AOI01-02-SB-55-57		AOI01-03-SB-20-22		AOI01-03-SB-44-46		AOI01-04-SB-20-22		AOI01-04-SB-39-41		AOI01-05-SB-25-27		AOI01-05-SB-50-52		AOI01-05-SB-50-52-D	
Sample Date	07/08/2020		07/08/2020		07/07/2020		07/07/2020		07/09/2020		07/09/2020		07/08/2020		07/08/2020		07/09/2020		07/09/2020		07/09/2020	
Depth	25 - 27 ft		55 - 57 ft		28 - 30 ft		55 - 57 ft		20 - 22 ft		44 - 46 ft		20 - 22 ft		39 - 41 ft		25 - 27 ft		50 - 52 ft		50 - 52 ft	
Analyte	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (µg/Kg)																						
PFOS	ND		ND		ND		ND		ND		ND		ND		ND		0.219	J	1.72		2.37	

Interpreted Qualifiers
J = Estimated concentration

Chemical Abbreviations

PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AOI	Area of Interest
D	Duplicate
ft	feet
ID	identification
LCMSMS	Liquid Chromatography Mass Spectrometry
ND	Analyte not detected above the LOD
PFAS	per- and polyfluoroalkyl substances
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
SB	Soil boring
µg/Kg	micrograms per Kilogram

Table 6-4
PFAS Detections in Groundwater
Site Inspection Report, Helena AASF

Area of Interest		AOI 1											
Sample ID		HAASF-MW001		HAASF-MW002		HAASF-MW003		HAASF-MW004		HAASF-MW005		HAASF-MW005-D	
Sample Date		07/12/2020		07/11/2020		07/12/2020		07/12/2020		07/12/2020		07/12/2020	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Water, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (ng/L)													
6:2 FTS	-	ND		ND		16.0		ND		13.2		16.8	
PFBA	-	2.84	J	2.24	J	9.11	J	2.91	J	19.6		20.0	
PFBS	40000	3.61	J	ND		1.96	J	3.12	J	1.92	J	1.80	J
PFHpA	-	ND		ND		11.6		ND		11.6		10.5	
PFHxA	-	3.23	J	4.01	J	15.9		7.85	J	30.1		31.1	
PFHxS	-	9.49	J	ND		74.2		26.4		36.7		37.8	
PFNA	-	ND		ND		ND		ND		2.40	J	2.50	J
PFOA	40	1.89	J	ND		9.07	J	ND		9.59	J	10.7	
PFOS	40	ND		ND		175		ND		775		814	
PFPeA	-	ND		3.33	J	4.14	J	6.23	J	21.3		21.7	

Grey Fill — Detected concentration exceeded OSD Screening Levels

References
a. Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 October 2019. Groundwater screening levels based on residential scenario for direct ingestion of groundwater.

Interpreted Qualifiers
J = Estimated concentration

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid

Acronyms and Abbreviations

D	Duplicate
HAASF	Helena Army Aviation Support Facility
HQ	Hazard quotient
ID	identification
LCMSMS	Liquid Chromatography Mass Spectrometry
MW	monitoring well
ND	Analyte not detected above the LOD
OSD	Office of the Secretary of Defense
PFAS	per- and polyfluoroalkyl substances
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
USEPA	United States Environmental Protection Agency
ng/L	nanogram per liter
-	Not applicable

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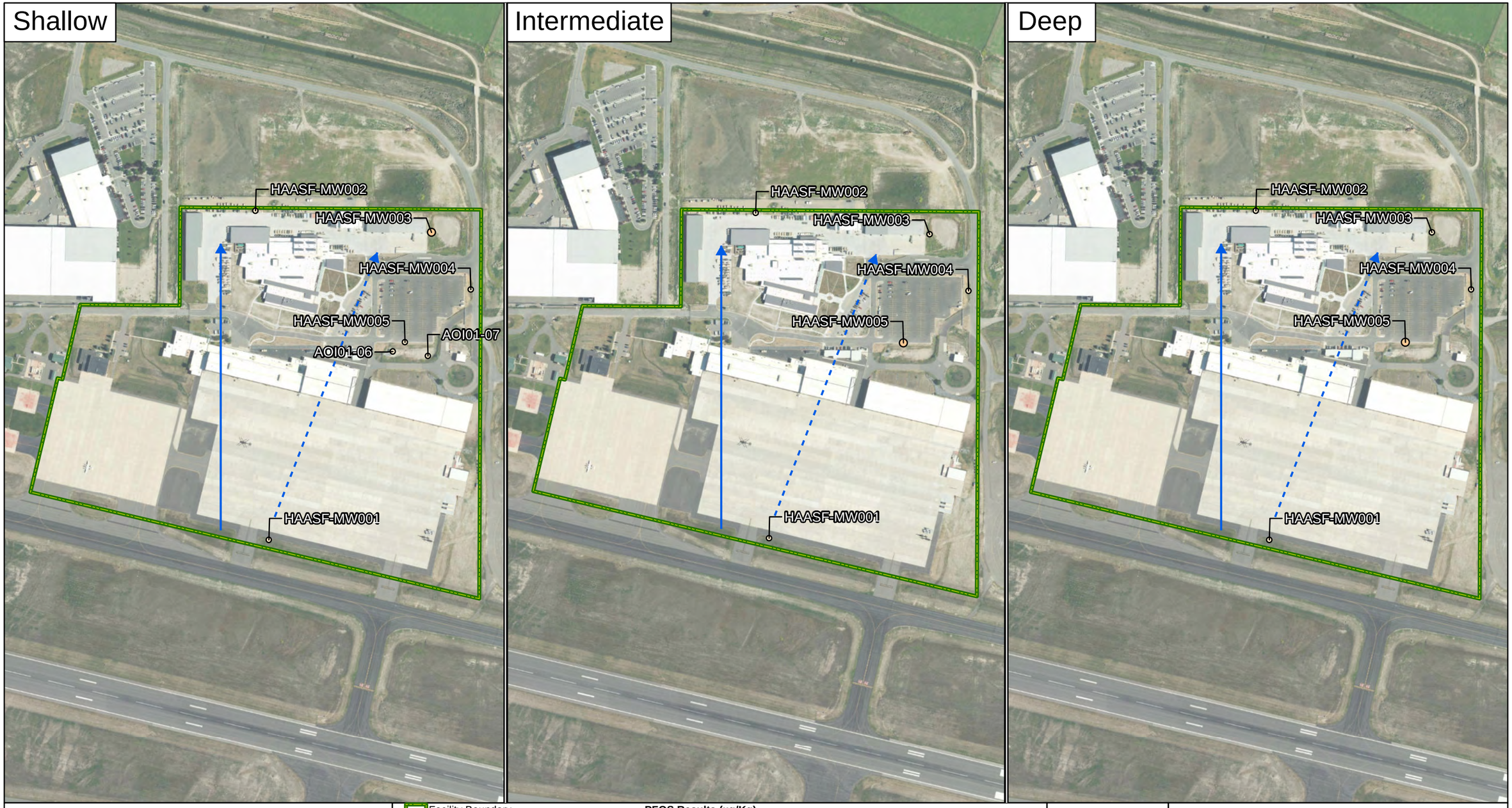


CLIENT	ARNG			
PROJECT	Site Inspection for PFAS at Helena AASF, MT			
REVISED	12/7/2020	GIS BY	MS	12/7/2020
SCALE	1:5,160	CHK BY	AB	12/7/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	CM	12/7/2020

Facility Boundary
Inferred Surface Water Flow Direction
Groundwater Flow Direction

PFOS Results (µg/Kg)
- ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

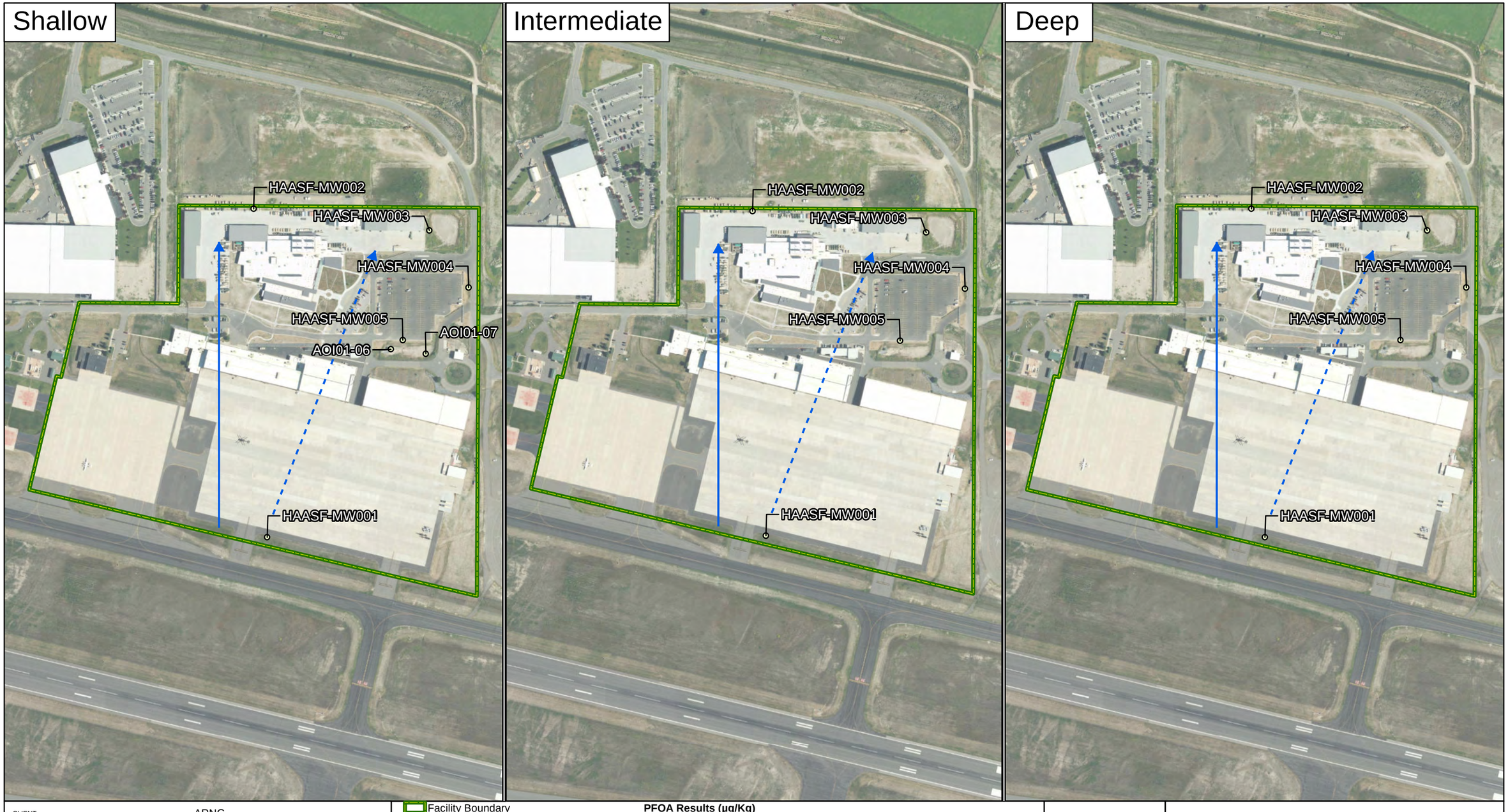
0 215 430 860 Feet

N

PFOS Detections in Soil

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-1



CLIENT	ARNG			
PROJECT	Site Inspection for PFAS at Helena AASF, MT			
REVISED	12/7/2020	GIS BY	MS	12/7/2020
SCALE	1:5,160	CHK BY	AB	12/7/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	CM	12/7/2020

Facility Boundary
Inferred Surface Water Flow Direction
Groundwater Flow Direction

PFOA Results (µg/Kg)
- ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

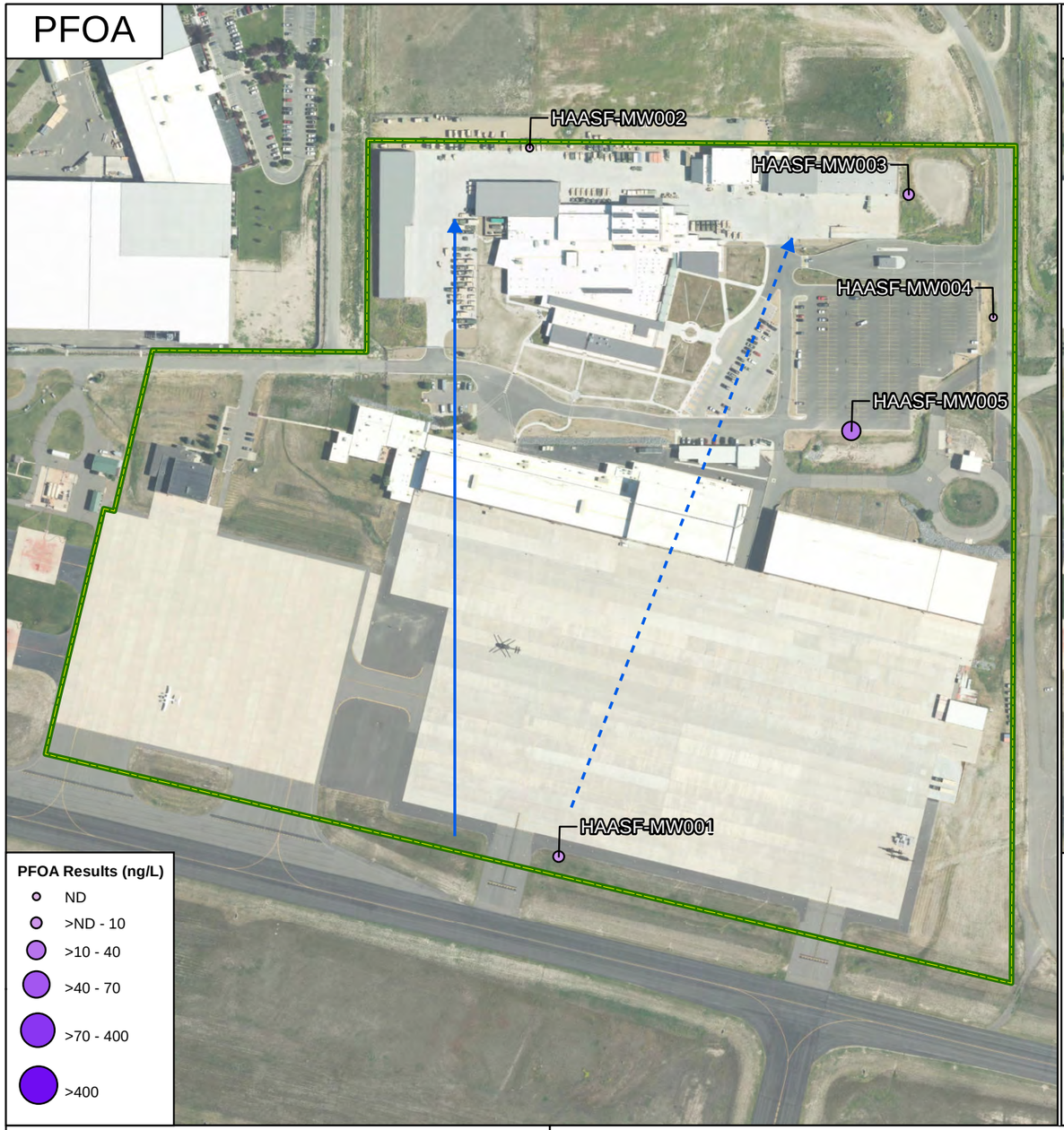
0 215 430 860 Feet

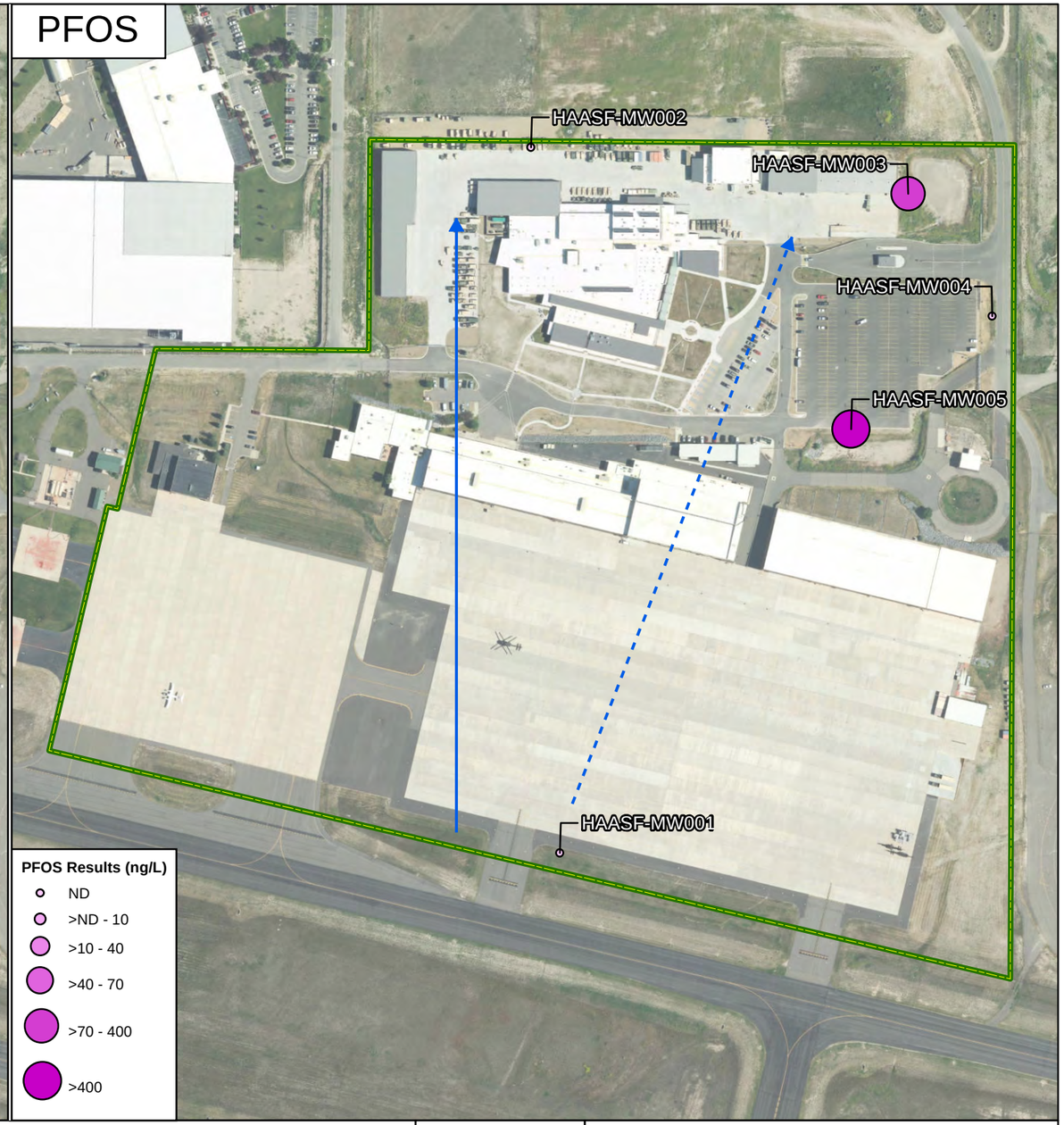
N

PFOA Detections in Soil

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-2





CLIENT	ARNG			
PROJECT	Site Inspection for PFAS at Helena AASF, MT			
REVISED	12/7/2020	GIS BY	MS	12/7/2020
SCALE	1:3,360	CHK BY	AB	12/7/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	CM	12/7/2020

Legend

- Facility Boundary
- Inferred Surface Water Flow Direction
- Groundwater Flow Direction

0 140 280 560 Feet

N

PFOA and PFOS Detections in Groundwater

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-3

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7. Exposure Pathways

The CSM for AOI 1, revised based on the SI findings, is presented on **Figure 7-1**. A CSM presents the current understanding of the site conditions with respect to known and suspected sources, potential transport mechanisms and migration pathways, and potentially exposed human receptors. A human exposure pathway is considered potentially complete when the following conditions are present:

1. Contaminant source;
2. Environmental fate and transport;
3. Exposure point;
4. Exposure route; and
5. Potentially exposed populations.

If any of these elements are missing, the pathway is incomplete. The CSM figure uses an empty circle symbol to represent an incomplete exposure pathway. Areas with an incomplete pathway generally warrant no further action. However, the pathway is considered potentially complete if PFOA, PFOS, or PFBS are detected, in which case the CSM figure uses a half-filled circle symbol to represent a potentially complete exposure pathway. Additionally, a completely filled circle symbol is used to indicate when a potentially complete exposure pathway has detections of PFOA, PFOS, or PFBS above the SLs. Areas with an identified potentially complete pathway may warrant further investigation.

In general, the potential PFAS exposure pathways are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of PFAS toxicological study. The receptors evaluated are consistent with those listed in USEPA guidance for risk screening (USEPA, 2001). Receptors at the facility include site workers (e.g., facility staff and visiting soldiers), construction workers, trespassers, residents outside the facility boundary, and recreational users outside of the facility boundary.

7.1 Soil Exposure Pathway

The SI results for PFOA, PFOS, and PFBS in soil were used to determine whether a potentially complete pathway exists between the source and potential receptors at AOI 1 based on the aforementioned criteria.

7.1.1 AOI 1

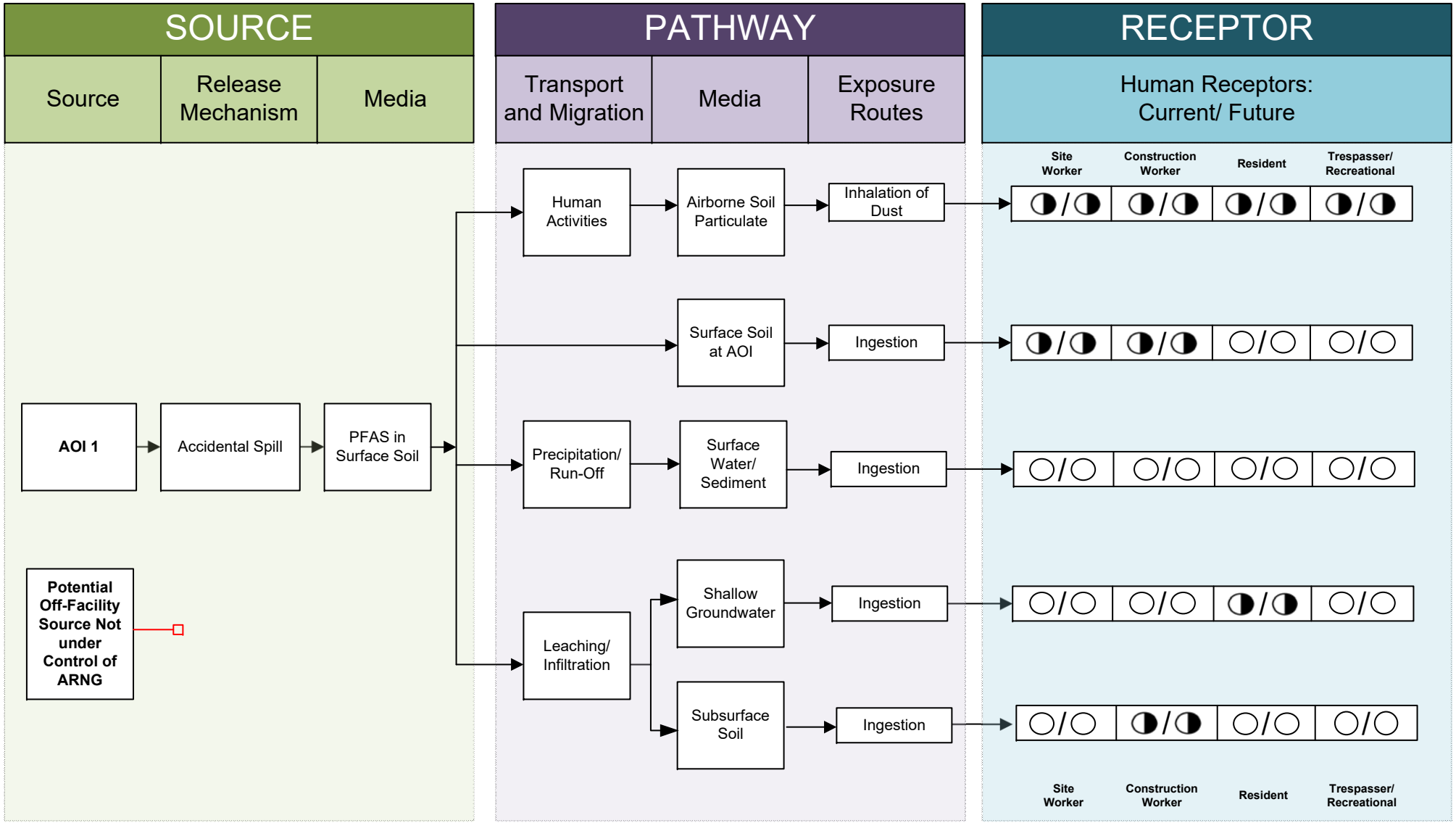
AFFF was released to soil from four separate releases/spills within AOI 1. PFOA and PFBS were not detected in soil. PFOS was detected in soil at AOI 1 and confirms the release of PFAS to soil in AOI 1. Ground-disturbing activities could potentially result in site worker and construction worker exposure to PFOS via inhalation of dust or ingestion of surface soil. Ground-disturbing activities could also potentially result in construction worker exposure to subsurface soil. Additionally, off-facility residents, off-facility recreational users (nearby walking path), and trespassers could potentially be exposed to PFOS via inhalation of dust caused by on-facility ground disturbing activities, although this exposure is likely insignificant. No construction is occurring at AOI 1. The CSM is presented on **Figure 7-1**.

7.2 Groundwater Exposure Pathway

The SI results for PFOA, PFOS, and PFBS in groundwater were used to determine whether a potentially complete pathway exists between the source and potential receptors at AOI 1 based on the aforementioned criteria.

7.2.1 AOI 1

PFOA, PFOS, and PFBS were detected in groundwater from permanent monitoring wells at AOI 1 and exceeded the SL for PFOS in two permanent monitoring wells (one source location, one facility boundary location). According to the MBMG database, approximately 805 domestic, commercial, or industrial wells exist within 4 miles of the facility in the downgradient direction, with some as close as 0.5 miles away. However, the database did not further classify domestic wells into subcategories for agriculture, ranching, or drinking water use. Due to these uncertainties, five potable wells downgradient of AOI 1 were sampled in 2021. PFOA, PFOS, and PFBS were detected in groundwater, but were below SLs. Therefore, the ingestion exposure pathway for groundwater is considered potentially complete for offsite residents. The facility is on city water, which has been tested and confirmed to be PFAS-free (see **Section 2.2.2**); therefore, the ingestion pathway is incomplete for site workers. Further, due to the depth of groundwater, the ingestion pathway for construction workers, off-facility recreational users, and trespassers is also considered incomplete. The CSM is presented on **Figure 7-1**.



LEGEND

- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of SL

NOTES:

1. The resident and recreational user receptors refer to an off-site resident or recreational user.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 7-1
Conceptual Site Model
AOI 1

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8. Summary and Outcome

This section summarizes SI activities and findings. The most significant findings are summarized in this section and are reproduced directly or extracted from information contained in this Report. The outcome provides general and comparative interpretations of the findings relative to the SLs.

8.1 SI Activities

SI field activities were conducted from 6 to 13 July 2020 and included soil sampling, permanent groundwater monitoring well installation, development, and low-flow groundwater sampling. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2020b), except as noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI QAPP Addendum (AECOM, 2020b), samples were collected and analyzed for a subset of PFAS by LC/MS/MS compliant with QSM Table B-15, as follows. The 18 PFAS analyzed as part of the ARNG SI program are specified in **Section 5.7** of this Report.

- 17 soil grab samples from 7 boring locations; and
- 5 groundwater samples from 5 permanent monitoring well locations.

The information gathered during this investigation was used to determine if PFOA, PFOS, and/or PFBS were present at or above SLs. Additionally, the CSM was refined to assess whether potentially complete pathways, which are described in **Section 7,** exist between the source and potential receptors for potential exposure to PFOA, PFOS, and PFBS at AOI 1.

8.2 SI Goals Evaluation

As described in **Section 4.2**, the SI activities were designed to achieve six main goals or DQOs. This section describes the SI goals and the conclusions that can be made for each based on the data collected during this investigation.

1. *Determine the presence or absence of PFOA, PFOS, and PFBS at or above SLs.*

   PFOA, PFOS, and PFBS were detected at the facility in soil and groundwater; however, only PFOS in groundwater exceeded the SL. PFOS was detected both at the source area, as well as at the facility boundary between source area and potential off-facility drinking water receptors. The detected concentrations of PFOA and PFBS in groundwater samples, as well as, PFOA, PFOS, and PFBS in soil samples from AOI 1 were below the SLs.

2. *Develop information to potentially eliminate a release from further consideration because it is determined that it poses no significant threat to human health or the environment.*

   PFOA, PFOS, and PFBS were detected in groundwater and PFOS exceeded the SL at the source area and facility boundary. The exceedance at the facility boundary is immediately downgradient of the AOI 1 source area. As a result, no release area can be eliminated from further consideration at this point in the investigation.

3. *Determine the potential need for a removal action.*

   As described in **Section 2.4**, in 2021, the offsite wells were sampled due to exceedances of SLs observed in groundwater in monitoring wells at the AASF during the SI. Five properties were selected to be sampled due to their proximity to the facility. PFOA, PFOS,

and PFBS were detected in groundwater, but were below SLs. A removal action is not needed at this time because the potable water sample results were below the SLs.

4. *Collect data to better characterize the release areas for more effective and rapid initiation of a RI.*

   The geological data collected as part of the SI indicate the facility is underlain by unconsolidated, heterogeneous valley fill deposits, dominated by well-graded sand with thin lenses of silt and clay and thin beds of small gravel.

   The observations from the borings advanced during the SI are consistent with the surficial geology of the area. The Helena Valley consists of material eroded from the surrounding mountains and hills. The sands, silts, and clays are yellow to brown, well-graded, and mixed with subangular gravel. Most of these deposits originate from the surrounding sedimentary bedrock. The interlayering of these lenses provides communication from the ground surface to the top of the valley aquifer.

   Depth to water at the facility ranged from approximately 40.71 to 56.78 feet bgs. Groundwater flow direction is north-northeast, towards Lake Helena and the Missouri River. These geologic and hydrogeologic observations inform development of technical approach for the RI.

5. *Identify within 4 miles of the installation other potential PFAS sources (fire stations, major manufacturers, other DoD facilities) and receptors, including both groundwater and surface water receptors, to determine whether the ARNG is the likely source of PFAS, or whether there is an off-facility source of PFAS responsible for installation detections of PFAS (USEPA, 2005).*

   Based upon the evaluation of groundwater and soil results in comparison to SLs, in combination with the groundwater flow direction analysis, the results of the SI indicate that the source of detected concentrations of PFOA, PFOS, and PFBS at the facility is likely attributable to ARNG activities. The two locations with PFOS exceedances in groundwater were found at the identified source area and immediately downgradient. Results of the PA did not find any other adjacent source that could have contributed to these groundwater results. Furthermore, the upgradient (HAASF-MW001) and cross-gradient (HAASF-MW004) monitoring wells installed did not suggest any adjacent contributing PFAS source potentially migrating within the boundaries of the facility. As such, ARNG will evaluate AOI 1 further in an RI.

6. *Determine whether a potentially complete pathway exists between the source and potential receptors and whether ARNG is the likely source of the contamination.*

   As described in **Section 2.4**, in 2021, offsite potable wells were sampled due to the exceedance of SLs observed in groundwater during the SI. Five properties were selected to be sampled due to their proximity to the facility. PFOA, PFOS, and PFBS were detected in groundwater, but were below SLs. A removal action is not needed at this time because the potable sample results were below the SLs. Based on these results, a potentially complete pathway exists to potential receptors.

8.3 Outcome

Based on the CSM developed and revised in light of the SI findings, there is potential for exposure to drinking water receptors from sources on the facility resulting from historical DoD activities at AOI 1. Sample chemical analytical concentrations collected during and after the SI were compared against the project SLs for PFOA, PFOS, and PFBS in soil and groundwater, as described in **Table 6-1**. The following bullets summarize the SI results:

- PFOA, PFOS, and PFBS were detected in groundwater at AOI 1 and PFOS exceeded the individual SL of 40 ng/L, with maximum concentrations of 775 ng/L (814 ng/L duplicate) and 175 ng/L at locations HAASF-MW005 and HAASF-MW003; respectively. Based on the results of the SI, further evaluation of AOI 1 is warranted in the RI.
- Offsite wells were sampled due to exceedances of SLs observed in groundwater in monitoring wells at the AASF during the SI and well information from the MBMG database, a potentially complete pathway exits to off-facility residential wells.
- The detected concentrations of PFOA, PFOS, and PFBS in soil samples from AOI 1 were below the SLs.

Table 8-1 summarizes the SI results for soil and groundwater. Based on the CSMs developed and revised in light of the SI findings, there is potential for exposure to drinking water receptors caused by DoD activities at or adjacent to the facility.

Table 8-2 summarizes the rationale used to determine if an AOI should be considered for further investigation under CERCLA and undergo an RI. Based on the results of this SI, further evaluation is warranted in the RI for AOI 1: 60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area.

Table 8-1: Summary of Site Inspection Findings

AOI	Potential PFAS Release Area	Soil – Source Area	Groundwater – Source Area	Groundwater – Facility Boundary
1	60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area	◐	●	●

Legend:
● = detected; exceedance of the screening levels
◐ = detected; no exceedance of the screening levels
○ = not detected

Table 8-2: Site Inspection Recommendations

AOI	Description	Rationale	Future Action
1	60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area	Exceedances of SLs in groundwater at source area and downgradient facility boundary. No exceedances of SLs in soil.	Proceed to RI

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9. References

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Appendix A
Data Validation Reports

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DATA VALIDATION REPORT - Level III Review

SDG No.:	**220071466 + 71035**	**Analysis:**	**Per- and Polyfluoroalkyl Substances**
Laboratory:	**GCAL**	**Project:**	**Helena AASF**
Reviewer:	**Tyler Bryant**	**Date:**	**September 22nd, 2020**

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied, data review worksheets, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the specifics of the analytical method referenced and provisions of the approved project-specific work plan; and, qualified according to the *Contract Laboratory Program National Functional Guidelines* (NFG) *for Superfund Organic Methods Data Review*, EPA-540-R-2017-002, January 2017, and DOD Data Validation Guidelines Module 3 QSM Table B-15, May 2020, Modifications reflect the level of review requested, the specifications of the project-specific QAPP, and the specifics of the analytical methods employed.

Major Anomalies: The following field and quality control (QC) samples displayed recoveries outside of the QC limits of 50%-150% for extracted internal standards (EIS):

Field Sample	EIS	Associated Target Compound(s)	Area Count (%)
LCS2062134	M_2PFTeDA	PFTeDA, PFTrDA	46
AOI01-01-SB-55-57			33
AOI01-01-SB-55-57-MS			3
AOI01-01-SB-55-57-MSD			1
AOI01-02-SB-55-57			7
AOI01-04-SB-39-41			1
AOI01-05-SB-50-52-D			42

The non-detect field sample results associated with EIS recoveries less than 10% were initially flagged X,i, but should be considered for inclusion in the data set since PFAS compounds are quantitated based on a normalized 100% internal standard percent recovery for this method and in matrix spike pairs (MS/MSD) with low area counts and the target compounds were shown to be able to be recovered. The non-detect field sample results associated with the remaining internal standard area counts less than the lower QC limit were qualified UJ,i.

Minor Anomalies: The laboratory control spike duplicate (LCSD) prepared in QC batch 688084 displayed a percent recovery less than the lower QC limits of 70% for PFTrDA at 68%. The associated field sample results were non-detect and were qualified UJ,l. The LCSD prepared in QC batch 687724 displayed a percent recovery greater than the upper QC limits for 6:2 FTS at 132%. The associated field sample results were non-detect; no data qualifying action was required. The initial matrix spike pair (MS/MSD) performed on field sample AOI01-01-SB-55-57 in QC batch 687723 a displayed percent recovery greater than the upper QC limit of 130% for PFTeDA at 183%. In addition, the MS/MSD displayed a relative percent difference (RPD) outside the QC limit of 30% for PFTeDA at 63%. The associated parent sample results were non-detect; no data qualifying action was taken. The MS/MSD performed on field sample AOI01-01-SB-55-57 was re-extracted in QC batch 688171 with a MS recovery less than the lower QC limit of 70% for PFTrDA

at 69%. The associated parent sample result was previously qualified due to an EIS recovery anomaly; no further data qualifying action was required.

During the total organic carbon (TOC) analysis, the lab duplicate pair performed on samples AOI01-03-SB-20-22 and AOI01-03-SB-20-22-D displayed RPD greater than the QC limit of 25% for TOC at 47% and 38%, respectively. The positive results in the associated batch were qualified J,ld.

For the pH analysis, the technical holding time from sampling to extraction is "immediate". The associated field sample results were qualified J,h.

Correctable Anomalies: The laboratory incorrectly identified the field sample AOI01-02-SB-55-57 as AOI01-02-SB-55-27. The lab provided a revised report to correct the error. The following samples were double spiked with injected internal standards (IIS) in analytical sequence 688831: MB2062133, LCS2062134, LCSD2062135, HAASF-MW001, HAASF-MW002, HAASF-MW003, HAASF-MW004, HAASF-MW005-D, HAASF-ERB-03, and HAASF-ERB-04. No data qualifying action was taken based on this anomaly, the field sample results are not quantitated using the IIS.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method, with the exception of anomalies discussed previously. If a given fraction was not discussed, all quality control criteria reviewed were within acceptable limits. All data are usable, as qualified, for their intended purposed based on the quality control data reviewed.

Signed: 

Tyler Bryant

Helena AASF

Laboratory: Pace Gulf Coast

Job: 60552172 SDG#: 220071466 & 220071035

Sample ID	Client ID	Sample Type	Sample Date	Matrix	PFAS - QSM B-15	TOC	pH
22007146601	HAASF-MW001	Field Sample	7/12/2020	Aqueous	x		
22007146602	HAASF-MW002	Field Sample	7/11/2020	Aqueous	x		
22007146605	HAASF-MW003	Field Sample	7/12/2020	Aqueous	x		
22007146606	HAASF-MW004	Field Sample	7/12/2020	Aqueous	x		
22007146607	HAASF-MW005	Field Sample	7/12/2020	Aqueous	x		
22007146608	HAASF-MW005-D	Field Duplicate	7/12/2020	Aqueous	x		
22007146609	HAASF-ERB-03	Eqiupment Blank	7/12/2020	Aqueous	x		
22007146610	HAASF-ERB-04	Equipment Blank	7/12/2020	Aqueous	x		
22007103501	HAASF-FRB-01	Field Rinse Blank	7/9/2020	Aqueous	x		
22007103502	HAASF-ERB-01	Equipment Blank	7/9/2020	Aqueous	x		
22007103503	HAASF-ERB-02	Equipment Blank	7/9/2020	Aqueous	x		
22007103504	AOI01-01-SB-00-02	Field Sample	7/8/2020	Soil	x		
22007103505	AOI01-01-SB-25-27	Field Sample	7/8/2020	Soil	x		
22007103506	AOI01-01-SB-55-57	Field Sample	7/8/2020	Soil	x		
22007103509	AOI01-02-SB-00-02	Field Sample	7/7/2020	Soil	x		
22007103510	AOI01-02-SB-28-30	Field Sample	7/7/2020	Soil	x		
22007103511	AOI01-02-SB-55-57	Field Sample	7/7/2020	Soil	x		
22007103512	AOI01-03-SB-00-02	Field Sample	7/9/2020	Soil	x		
22007103513	AOI01-03-SB-20-22	Field Sample	7/9/2020	Soil	x	x	x
22007103514	AOI01-03-SB-20-22-D	Field Duplicate	7/9/2020	Soil		x	x
22007103517	AOI01-03-SB-44-46	Field Sample	7/9/2020	Soil	x		
22007103518	AOI01-04-SB-00-02	Field Sample	7/8/2020	Soil	x		
22007103519	AOI01-04-SB-20-22	Field Sample	7/8/2020	Soil	x		
22007103520	AOI01-04-SB-39-41	Field Sample	7/8/2020	Soil	x		
22007103521	AOI01-05-SB-00-02	Field Sample	7/9/2020	Soil	x		
22007103522	AOI01-05-SB-25-27	Field Sample	7/9/2020	Soil	x		
22007103523	AOI01-05-SB-50-52	Field Sample	7/9/2020	Soil	x		
22007103524	AOI01-05-SB-50-52-D	Field Duplicate	7/9/2020	Soil	x		
22007103525	AOI01-06-SB-00-02	Field Sample	7/8/2020	Soil	x		
22007103526	AOI01-06-SB-00-02-D	Field Duplicate	7/8/2020	Soil	x		
22007103527	AOI01-07-SB-00-02	Field Sample	7/8/2020	Soil	x		

Helena AASF
Field Duplicates

Client Sample ID:				HAASF-MW005		HAASF-MW005-D					
Date Sampled:				7/12/20		7/12/20					
	Units	LOQ	5x LOQ	Sample Conc		Duplicate Conc		% RPD	Delta	2x LOQ	Pass/ Fail
6:2 FTS	ng/L	10	50	13.2		16.8		24%	3.6	20	Pass
PFBA	ng/L	10	50	19.6		20.0		2.0%	0.40	20	Pass
PFBS	ng/L	10	50	1.92	J	1.80	J	6.5%	0.12	20	Pass
PFHpA	ng/L	10	50	11.6		10.5		10%	1.1	20	Pass
PFHxA	ng/L	10	50	30.1		31.1		3.3%	1.0	20	Pass
PFHxS	ng/L	10	50	36.7		37.8		3.0%	1.1	20	Pass
PFNA	ng/L	10	50	2.40	J	2.50	J	4.1%	0.10	20	Pass
PFOA	ng/L	10	50	9.59	J	10.7		11%	1.1	20	Pass
PFOS	ng/L	10	50	775		814		4.9%	39	20	Pass
PFPeA	ng/L	10	50	21.3		21.7		1.9%	0.40	20	Pass

Client Sample ID:				AOI01-03-SB-20-22		AOI01-03-SB-20-22-D					
Date Sampled:				7/9/20		7/9/20					
	Units	LOQ	5x LOQ	Sample Conc		Duplicate Conc		% RPD	Delta	2x LOQ	Pass/ Fail
pH	SU	1.00	5.00	8.61		8.62		0.12%	0.010	2.00	Pass

Client Sample ID:				AOI01-03-SB-20-22		AOI01-03-SB-20-22-D					
Date Sampled:				7/9/20		7/9/20					
	Units	LOQ	5x LOQ	Sample Conc		Duplicate Conc		% RPD	Delta	2x LOQ	Pass/ Fail
TOC	mg/kg	250	1250	1230		1170		5.0%	60	500	Pass

Control limit [sample]>5xLOQ use 35%

[sample]<5xLOQ use Delta<2xLOQ

Client Sample ID:				HAASF-MW005		HAASF-MW005-D					
Date Sampled:				7/12/20		7/12/20					
	Units	LOQ	5x LOQ	Sample Conc		Duplicate Conc		% RPD	Delta	2x LOQ	Pass/ Fail
PFOS	µg/kg	1.42	7.10	1.72		2.37		32%	0.65	2.8	Pass

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	HAASF-FRB-01
Collect Date:	07/09/20 Time: 0805	GCAL Sample ID:	22007103501
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200721B_68.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/18/20	Analysis Date:	07/22/20 Time: 0727
Prep Batch:	687999	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	4.00	U	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.00	U	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	HAASF-ERB-01
Collect Date:	07/09/20 Time: 0845	GCAL Sample ID:	22007103502
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200721B_69.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/18/20	Analysis Date:	07/22/20 Time: 0741
Prep Batch:	687999	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	4.00	U	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.00	U	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	HAASF-ERB-02
Collect Date:	07/09/20 Time: 1215	GCAL Sample ID:	22007103503
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200721B_70.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/18/20	Analysis Date:	07/22/20 Time: 0756
Prep Batch:	687999	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	4.00	U	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.00	U	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-01-SB-00-02
Collect Date:	07/08/20 Time: 0855	GCAL Sample ID:	22007103504
Matrix:	Solid % Moisture: 12.9	Instrument ID:	QQQ2
Sample Amt:	5.04 g	Lab File ID:	2200715A_46.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0015
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.456	U	0.194	0.456	1.14
39108-34-4	8:2 Fluorotelomer sulfonate	0.456	U	0.296	0.456	1.14
2991-50-6	NEtFOSAA	0.456	U	0.217	0.456	1.14
2355-31-9	NMeFOSAA	0.456	U	0.319	0.456	1.14
375-73-5	Perfluorobutanesulfonic acid	0.456	U	0.137	0.456	1.14
375-22-4	Perfluorobutanoic acid	0.456	U	0.148	0.456	1.14
335-76-2	Perfluorodecanoic acid	0.456	U	0.137	0.456	1.14
307-55-1	Perfluorododecanoic acid	0.456	U	0.228	0.456	1.14
375-85-9	Perfluoroheptanoic acid	0.456	U	0.148	0.456	1.14
355-46-4	Perfluorohexanesulfonic acid	0.456	U	0.160	0.456	1.14
307-24-4	Perfluorohexanoic acid	0.456	U	0.171	0.456	1.14
375-95-1	Perfluorononanoic acid	0.456	U	0.103	0.456	1.14
1763-23-1	Perfluorooctanesulfonic acid	0.456	U	0.205	0.456	1.14
335-67-1	Perfluorooctanoic acid	0.456	U	0.171	0.456	1.14
2706-90-3	Perfluoropentanoic acid	0.456	U	0.171	0.456	1.14
376-06-7	Perfluorotetradecanoic acid	0.456	U	0.182	0.456	1.14
72629-94-8	Perfluorotridecanoic acid	0.456	U	0.251	0.456	1.14
2058-94-8	Perfluoroundecanoic acid	0.456	U	0.160	0.456	1.14

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-01-SB-25-27
Collect Date:	07/08/20 Time: 1050	GCAL Sample ID:	22007103505
Matrix:	Solid % Moisture: 4.2	Instrument ID:	QQQ2
Sample Amt:	5.12 g	Lab File ID:	2200715A_47.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0028
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.408	U	0.173	0.408	1.02
375-73-5	Perfluorobutanesulfonic acid	0.408	U	0.122	0.408	1.02
375-22-4	Perfluorobutanoic acid	0.408	U	0.133	0.408	1.02
335-76-2	Perfluorodecanoic acid	0.408	U	0.122	0.408	1.02
375-85-9	Perfluoroheptanoic acid	0.408	U	0.133	0.408	1.02
355-46-4	Perfluorohexanesulfonic acid	0.408	U	0.143	0.408	1.02
307-24-4	Perfluorohexanoic acid	0.408	U	0.153	0.408	1.02
375-95-1	Perfluorononanoic acid	0.408	U	0.092	0.408	1.02
1763-23-1	Perfluorooctanesulfonic acid	0.408	U	0.183	0.408	1.02
335-67-1	Perfluorooctanoic acid	0.408	U	0.153	0.408	1.02
2706-90-3	Perfluoropentanoic acid	0.408	U	0.153	0.408	1.02
2058-94-8	Perfluoroundecanoic acid	0.408	U	0.143	0.408	1.02

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-01-SB-25-27RE
Collect Date:	07/08/20 Time: 1050	GCAL Sample ID:	22007103505RE
Matrix:	Solid % Moisture: 4.2	Instrument ID:	QQQ2
Sample Amt:	5.06 g	Lab File ID:	2200721B_30.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/20/20	Analysis Date:	07/21/20 Time: 2228
Prep Batch:	688171	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
39108-34-4	8:2 Fluorotelomer sulfonate	0.413	U	0.268	0.413	1.03
2991-50-6	NEtFOSAA	0.413	U	0.196	0.413	1.03
2355-31-9	NMeFOSAA	0.413	U	0.289	0.413	1.03
307-55-1	Perfluorododecanoic acid	0.413	U	0.206	0.413	1.03
376-06-7	Perfluorotetradecanoic acid	0.413	U	0.165	0.413	1.03
72629-94-8	Perfluorotridecanoic acid	0.413	U	0.227	0.413	1.03

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-01-SB-55-57
Collect Date:	07/08/20 Time: 1040	GCAL Sample ID:	22007103506
Matrix:	Solid % Moisture: 28.5	Instrument ID:	QQQ2
Sample Amt:	5.01 g	Lab File ID:	2200715A_48.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0040
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.558	U	0.237	0.558	1.40
39108-34-4	8:2 Fluorotelomer sulfonate	0.558	U	0.363	0.558	1.40
2355-31-9	NMeFOSAA	0.558	U	0.391	0.558	1.40
375-73-5	Perfluorobutanesulfonic acid	0.558	U	0.168	0.558	1.40
375-22-4	Perfluorobutanoic acid	0.558	U	0.181	0.558	1.40
335-76-2	Perfluorodecanoic acid	0.558	U	0.168	0.558	1.40
375-85-9	Perfluoroheptanoic acid	0.558	U	0.181	0.558	1.40
355-46-4	Perfluorohexanesulfonic acid	0.558	U	0.195	0.558	1.40
307-24-4	Perfluorohexanoic acid	0.558	U	0.209	0.558	1.40
375-95-1	Perfluorononanoic acid	0.558	U	0.126	0.558	1.40
1763-23-1	Perfluorooctanesulfonic acid	0.558	U	0.251	0.558	1.40
335-67-1	Perfluorooctanoic acid	0.558	U	0.209	0.558	1.40
2706-90-3	Perfluoropentanoic acid	0.558	U	0.209	0.558	1.40
376-06-7	Perfluorotetradecanoic acid	0.558	U	0.223	0.558	1.40
2058-94-8	Perfluoroundecanoic acid	0.558	U	0.195	0.558	1.40

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-01-SB-55-57RE
Collect Date:	07/08/20 Time: 1040	GCAL Sample ID:	22007103506RE
Matrix:	Solid % Moisture: 28.5	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200721B_31.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/20/20	Analysis Date:	07/21/20 Time: 2242
Prep Batch:	688171	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
2991-50-6	NEtFOSAA	0.559	U	0.266	0.559	1.40
307-55-1	Perfluorododecanoic acid	0.559	U	0.280	0.559	1.40
72629-94-8	Perfluorotridecanoic acid	0.559	U	0.308	0.559	1.40

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-02-SB-00-02
Collect Date:	07/07/20 Time: 0915	GCAL Sample ID:	22007103509
Matrix:	Solid % Moisture: 5.7	Instrument ID:	QQQ2
Sample Amt:	5.04 g	Lab File ID:	2200715A_51.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0118
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.421	U	0.179	0.421	1.05
39108-34-4	8:2 Fluorotelomer sulfonate	0.421	U	0.274	0.421	1.05
2991-50-6	NEtFOSAA	0.421	U	0.200	0.421	1.05
2355-31-9	NMeFOSAA	0.421	U	0.295	0.421	1.05
375-73-5	Perfluorobutanesulfonic acid	0.421	U	0.126	0.421	1.05
375-22-4	Perfluorobutanoic acid	0.421	U	0.137	0.421	1.05
335-76-2	Perfluorodecanoic acid	0.421	U	0.126	0.421	1.05
307-55-1	Perfluorododecanoic acid	0.421	U	0.210	0.421	1.05
375-85-9	Perfluoroheptanoic acid	0.421	U	0.137	0.421	1.05
355-46-4	Perfluorohexanesulfonic acid	0.421	U	0.147	0.421	1.05
307-24-4	Perfluorohexanoic acid	0.421	U	0.158	0.421	1.05
375-95-1	Perfluorononanoic acid	0.421	U	0.095	0.421	1.05
1763-23-1	Perfluorooctanesulfonic acid	0.421	U	0.189	0.421	1.05
335-67-1	Perfluorooctanoic acid	0.421	U	0.158	0.421	1.05
2706-90-3	Perfluoropentanoic acid	0.421	U	0.158	0.421	1.05
376-06-7	Perfluorotetradecanoic acid	0.421	U	0.168	0.421	1.05
72629-94-8	Perfluorotridecanoic acid	0.421	U	0.231	0.421	1.05
2058-94-8	Perfluoroundecanoic acid	0.421	U	0.147	0.421	1.05

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-02-SB-28-30
Collect Date:	07/07/20 Time: 1450	GCAL Sample ID:	22007103510
Matrix:	Solid % Moisture: 6.7	Instrument ID:	QQQ2
Sample Amt:	5.03 g	Lab File ID:	2200715A_52.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0131
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.426	U	0.181	0.426	1.07
39108-34-4	8:2 Fluorotelomer sulfonate	0.426	U	0.277	0.426	1.07
2991-50-6	NEtFOSAA	0.426	U	0.202	0.426	1.07
2355-31-9	NMeFOSAA	0.426	U	0.298	0.426	1.07
375-73-5	Perfluorobutanesulfonic acid	0.426	U	0.128	0.426	1.07
375-22-4	Perfluorobutanoic acid	0.426	U	0.138	0.426	1.07
335-76-2	Perfluorodecanoic acid	0.426	U	0.128	0.426	1.07
307-55-1	Perfluorododecanoic acid	0.426	U	0.213	0.426	1.07
375-85-9	Perfluoroheptanoic acid	0.426	U	0.138	0.426	1.07
355-46-4	Perfluorohexanesulfonic acid	0.426	U	0.149	0.426	1.07
307-24-4	Perfluorohexanoic acid	0.426	U	0.160	0.426	1.07
375-95-1	Perfluorononanoic acid	0.426	U	0.096	0.426	1.07
1763-23-1	Perfluorooctanesulfonic acid	0.426	U	0.192	0.426	1.07
335-67-1	Perfluorooctanoic acid	0.426	U	0.160	0.426	1.07
2706-90-3	Perfluoropentanoic acid	0.426	U	0.160	0.426	1.07
376-06-7	Perfluorotetradecanoic acid	0.426	U	0.170	0.426	1.07
72629-94-8	Perfluorotridecanoic acid	0.426	U	0.234	0.426	1.07
2058-94-8	Perfluoroundecanoic acid	0.426	U	0.149	0.426	1.07

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-02-SB-55-27
Collect Date:	07/07/20 Time: 1455	GCAL Sample ID:	22007103511
Matrix:	Solid % Moisture: 28.5	Instrument ID:	QQQ2
Sample Amt:	5.16 g	Lab File ID:	2200715A_53.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0143
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.542	U	0.230	0.542	1.36
39108-34-4	8:2 Fluorotelomer sulfonate	0.542	U	0.352	0.542	1.36
2991-50-6	NEtFOSAA	0.542	U	0.258	0.542	1.36
2355-31-9	NMeFOSAA	0.542	U	0.380	0.542	1.36
375-73-5	Perfluorobutanesulfonic acid	0.542	U	0.163	0.542	1.36
375-22-4	Perfluorobutanoic acid	0.542	U	0.176	0.542	1.36
335-76-2	Perfluorodecanoic acid	0.542	U	0.163	0.542	1.36
307-55-1	Perfluorododecanoic acid	0.542	U	0.271	0.542	1.36
375-85-9	Perfluoroheptanoic acid	0.542	U	0.176	0.542	1.36
355-46-4	Perfluorohexanesulfonic acid	0.542	U	0.190	0.542	1.36
307-24-4	Perfluorohexanoic acid	0.542	U	0.203	0.542	1.36
375-95-1	Perfluorononanoic acid	0.542	U	0.122	0.542	1.36
1763-23-1	Perfluorooctanesulfonic acid	0.542	U	0.244	0.542	1.36
335-67-1	Perfluorooctanoic acid	0.542	U	0.203	0.542	1.36
2706-90-3	Perfluoropentanoic acid	0.542	U	0.203	0.542	1.36
376-06-7	Perfluorotetradecanoic acid	0.542	U	0.217	0.542	1.36
72629-94-8	Perfluorotridecanoic acid	0.542	U	0.298	0.542	1.36
2058-94-8	Perfluoroundecanoic acid	0.542	U	0.190	0.542	1.36

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-00-02
Collect Date:	07/09/20 Time: 0800	GCAL Sample ID:	22007103512
Matrix:	Solid % Moisture: 5.5	Instrument ID:	QQQ2
Sample Amt:	5.07 g	Lab File ID:	2200715A_54.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0156
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.418	U	0.177	0.418	1.04
39108-34-4	8:2 Fluorotelomer sulfonate	0.418	U	0.271	0.418	1.04
2991-50-6	NEtFOSAA	0.418	U	0.198	0.418	1.04
2355-31-9	NMeFOSAA	0.418	U	0.292	0.418	1.04
375-73-5	Perfluorobutanesulfonic acid	0.418	U	0.125	0.418	1.04
375-22-4	Perfluorobutanoic acid	0.418	U	0.136	0.418	1.04
335-76-2	Perfluorodecanoic acid	0.418	U	0.125	0.418	1.04
307-55-1	Perfluorododecanoic acid	0.418	U	0.209	0.418	1.04
375-85-9	Perfluoroheptanoic acid	0.418	U	0.136	0.418	1.04
355-46-4	Perfluorohexanesulfonic acid	0.418	U	0.146	0.418	1.04
307-24-4	Perfluorohexanoic acid	0.418	U	0.157	0.418	1.04
375-95-1	Perfluorononanoic acid	0.418	U	0.094	0.418	1.04
1763-23-1	Perfluorooctanesulfonic acid	0.208	J	0.188	0.418	1.04
335-67-1	Perfluorooctanoic acid	0.418	U	0.157	0.418	1.04
2706-90-3	Perfluoropentanoic acid	0.418	U	0.157	0.418	1.04
376-06-7	Perfluorotetradecanoic acid	0.418	U	0.167	0.418	1.04
72629-94-8	Perfluorotridecanoic acid	0.418	U	0.230	0.418	1.04
2058-94-8	Perfluoroundecanoic acid	0.418	U	0.146	0.418	1.04

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-20-22
Collect Date:	07/09/20 Time: 1015	GCAL Sample ID:	22007103513
Matrix:	Solid % Moisture: 10.7	Instrument ID:	QQQ2
Sample Amt:	5.18 g	Lab File ID:	2200715A_55.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0209
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.432	U	0.184	0.432	1.08
39108-34-4	8:2 Fluorotelomer sulfonate	0.432	U	0.281	0.432	1.08
2991-50-6	NEtFOSAA	0.432	U	0.205	0.432	1.08
2355-31-9	NMeFOSAA	0.432	U	0.303	0.432	1.08
375-73-5	Perfluorobutanesulfonic acid	0.432	U	0.130	0.432	1.08
375-22-4	Perfluorobutanoic acid	0.432	U	0.141	0.432	1.08
335-76-2	Perfluorodecanoic acid	0.432	U	0.130	0.432	1.08
307-55-1	Perfluorododecanoic acid	0.432	U	0.216	0.432	1.08
375-85-9	Perfluoroheptanoic acid	0.432	U	0.141	0.432	1.08
355-46-4	Perfluorohexanesulfonic acid	0.432	U	0.151	0.432	1.08
307-24-4	Perfluorohexanoic acid	0.432	U	0.162	0.432	1.08
375-95-1	Perfluorononanoic acid	0.432	U	0.097	0.432	1.08
1763-23-1	Perfluorooctanesulfonic acid	0.432	U	0.195	0.432	1.08
335-67-1	Perfluorooctanoic acid	0.432	U	0.162	0.432	1.08
2706-90-3	Perfluoropentanoic acid	0.432	U	0.162	0.432	1.08
376-06-7	Perfluorotetradecanoic acid	0.432	U	0.173	0.432	1.08
72629-94-8	Perfluorotridecanoic acid	0.432	U	0.238	0.432	1.08
2058-94-8	Perfluoroundecanoic acid	0.432	U	0.151	0.432	1.08

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-44-46
Collect Date:	07/09/20 Time: 1000	GCAL Sample ID:	22007103517
Matrix:	Solid % Moisture: 9.4	Instrument ID:	QQQ2
Sample Amt:	5.03 g	Lab File ID:	2200715A_56.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0221
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.439	U	0.186	0.439	1.10
39108-34-4	8:2 Fluorotelomer sulfonate	0.439	U	0.285	0.439	1.10
2991-50-6	NEtFOSAA	0.439	U	0.208	0.439	1.10
2355-31-9	NMeFOSAA	0.439	U	0.307	0.439	1.10
375-73-5	Perfluorobutanesulfonic acid	0.439	U	0.132	0.439	1.10
375-22-4	Perfluorobutanoic acid	0.439	U	0.143	0.439	1.10
335-76-2	Perfluorodecanoic acid	0.439	U	0.132	0.439	1.10
307-55-1	Perfluorododecanoic acid	0.439	U	0.219	0.439	1.10
375-85-9	Perfluoroheptanoic acid	0.439	U	0.143	0.439	1.10
355-46-4	Perfluorohexanesulfonic acid	0.439	U	0.154	0.439	1.10
307-24-4	Perfluorohexanoic acid	0.439	U	0.164	0.439	1.10
375-95-1	Perfluorononanoic acid	0.439	U	0.099	0.439	1.10
1763-23-1	Perfluorooctanesulfonic acid	0.439	U	0.197	0.439	1.10
335-67-1	Perfluorooctanoic acid	0.439	U	0.164	0.439	1.10
2706-90-3	Perfluoropentanoic acid	0.439	U	0.164	0.439	1.10
72629-94-8	Perfluorotridecanoic acid	0.439	U	0.241	0.439	1.10
2058-94-8	Perfluoroundecanoic acid	0.439	U	0.154	0.439	1.10

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-44-46RE
Collect Date:	07/09/20 Time: 1000	GCAL Sample ID:	22007103517RE
Matrix:	Solid % Moisture: 9.4	Instrument ID:	QQQ2
Sample Amt:	5.01 g	Lab File ID:	2200721B_35.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/20/20	Analysis Date:	07/21/20 Time: 2339
Prep Batch:	688171	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
376-06-7	Perfluorotetradecanoic acid	0.440	U	0.176	0.440	1.10

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-04-SB-00-02
Collect Date:	07/08/20 Time: 1310	GCAL Sample ID:	22007103518
Matrix:	Solid % Moisture: 10.3	Instrument ID:	QQQ2
Sample Amt:	5.2 g	Lab File ID:	2200715A_57.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0234
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.429	U	0.182	0.429	1.07
39108-34-4	8:2 Fluorotelomer sulfonate	0.429	U	0.279	0.429	1.07
2991-50-6	NEtFOSAA	0.429	U	0.204	0.429	1.07
2355-31-9	NMeFOSAA	0.429	U	0.300	0.429	1.07
375-73-5	Perfluorobutanesulfonic acid	0.429	U	0.129	0.429	1.07
375-22-4	Perfluorobutanoic acid	0.429	U	0.139	0.429	1.07
335-76-2	Perfluorodecanoic acid	0.429	U	0.129	0.429	1.07
307-55-1	Perfluorododecanoic acid	0.429	U	0.214	0.429	1.07
375-85-9	Perfluoroheptanoic acid	0.429	U	0.139	0.429	1.07
355-46-4	Perfluorohexanesulfonic acid	0.429	U	0.150	0.429	1.07
307-24-4	Perfluorohexanoic acid	0.429	U	0.161	0.429	1.07
375-95-1	Perfluorononanoic acid	0.429	U	0.096	0.429	1.07
1763-23-1	Perfluorooctanesulfonic acid	0.429	U	0.193	0.429	1.07
335-67-1	Perfluorooctanoic acid	0.429	U	0.161	0.429	1.07
2706-90-3	Perfluoropentanoic acid	0.429	U	0.161	0.429	1.07
376-06-7	Perfluorotetradecanoic acid	0.429	U	0.171	0.429	1.07
72629-94-8	Perfluorotridecanoic acid	0.429	U	0.236	0.429	1.07
2058-94-8	Perfluoroundecanoic acid	0.429	U	0.150	0.429	1.07

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-04-SB-20-22
Collect Date:	07/08/20 Time: 1510	GCAL Sample ID:	22007103519
Matrix:	Solid % Moisture: 6.7	Instrument ID:	QQQ2
Sample Amt:	5.16 g	Lab File ID:	2200715A_59.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0259
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.416	U	0.177	0.416	1.04
39108-34-4	8:2 Fluorotelomer sulfonate	0.416	U	0.270	0.416	1.04
2991-50-6	NEtFOSAA	0.416	U	0.197	0.416	1.04
2355-31-9	NMeFOSAA	0.416	U	0.291	0.416	1.04
375-73-5	Perfluorobutanesulfonic acid	0.416	U	0.125	0.416	1.04
375-22-4	Perfluorobutanoic acid	0.416	U	0.135	0.416	1.04
335-76-2	Perfluorodecanoic acid	0.416	U	0.125	0.416	1.04
307-55-1	Perfluorododecanoic acid	0.416	U	0.208	0.416	1.04
375-85-9	Perfluoroheptanoic acid	0.416	U	0.135	0.416	1.04
355-46-4	Perfluorohexanesulfonic acid	0.416	U	0.145	0.416	1.04
307-24-4	Perfluorohexanoic acid	0.416	U	0.156	0.416	1.04
375-95-1	Perfluorononanoic acid	0.416	U	0.093	0.416	1.04
1763-23-1	Perfluorooctanesulfonic acid	0.416	U	0.187	0.416	1.04
335-67-1	Perfluorooctanoic acid	0.416	U	0.156	0.416	1.04
2706-90-3	Perfluoropentanoic acid	0.416	U	0.156	0.416	1.04
376-06-7	Perfluorotetradecanoic acid	0.416	U	0.166	0.416	1.04
72629-94-8	Perfluorotridecanoic acid	0.416	U	0.229	0.416	1.04
2058-94-8	Perfluoroundecanoic acid	0.416	U	0.145	0.416	1.04

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-04-SB-39-41
Collect Date:	07/08/20 Time: 1515	GCAL Sample ID:	22007103520
Matrix:	Solid % Moisture: 25.3	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200715A_60.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0312
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.535	U	0.228	0.535	1.34
39108-34-4	8:2 Fluorotelomer sulfonate	0.535	U	0.348	0.535	1.34
2355-31-9	NMeFOSAA	0.535	U	0.375	0.535	1.34
375-73-5	Perfluorobutanesulfonic acid	0.535	U	0.161	0.535	1.34
375-22-4	Perfluorobutanoic acid	0.535	U	0.174	0.535	1.34
335-76-2	Perfluorodecanoic acid	0.535	U	0.161	0.535	1.34
375-85-9	Perfluoroheptanoic acid	0.535	U	0.174	0.535	1.34
355-46-4	Perfluorohexanesulfonic acid	0.535	U	0.187	0.535	1.34
307-24-4	Perfluorohexanoic acid	0.535	U	0.201	0.535	1.34
375-95-1	Perfluorononanoic acid	0.535	U	0.120	0.535	1.34
1763-23-1	Perfluorooctanesulfonic acid	0.535	U	0.241	0.535	1.34
335-67-1	Perfluorooctanoic acid	0.535	U	0.201	0.535	1.34
2706-90-3	Perfluoropentanoic acid	0.535	U	0.201	0.535	1.34
376-06-7	Perfluorotetradecanoic acid	0.535	U	0.214	0.535	1.34
2058-94-8	Perfluoroundecanoic acid	0.535	U	0.187	0.535	1.34

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-04-SB-39-41RE
Collect Date:	07/08/20 Time: 1515	GCAL Sample ID:	22007103520RE
Matrix:	Solid % Moisture: 25.3	Instrument ID:	QQQ2
Sample Amt:	5.04 g	Lab File ID:	2200721B_36.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/20/20	Analysis Date:	07/21/20 Time: 2353
Prep Batch:	688171	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
2991-50-6	NEtFOSAA	0.531	U	0.252	0.531	1.33
307-55-1	Perfluorododecanoic acid	0.531	U	0.266	0.531	1.33
72629-94-8	Perfluorotridecanoic acid	0.531	U	0.292	0.531	1.33

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-05-SB-00-02
Collect Date:	07/09/20 Time: 1325	GCAL Sample ID:	22007103521
Matrix:	Solid % Moisture: 4.5	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200715A_61.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0324
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.419	U	0.178	0.419	1.05
39108-34-4	8:2 Fluorotelomer sulfonate	0.419	U	0.272	0.419	1.05
2991-50-6	NEtFOSAA	0.419	U	0.199	0.419	1.05
2355-31-9	NMeFOSAA	0.419	U	0.293	0.419	1.05
375-73-5	Perfluorobutanesulfonic acid	0.419	U	0.126	0.419	1.05
375-22-4	Perfluorobutanoic acid	0.419	U	0.136	0.419	1.05
335-76-2	Perfluorodecanoic acid	0.419	U	0.126	0.419	1.05
307-55-1	Perfluorododecanoic acid	0.419	U	0.210	0.419	1.05
375-85-9	Perfluoroheptanoic acid	0.419	U	0.136	0.419	1.05
355-46-4	Perfluorohexanesulfonic acid	0.419	U	0.147	0.419	1.05
307-24-4	Perfluorohexanoic acid	0.419	U	0.157	0.419	1.05
375-95-1	Perfluorononanoic acid	0.419	U	0.094	0.419	1.05
1763-23-1	Perfluorooctanesulfonic acid	0.419	U	0.189	0.419	1.05
335-67-1	Perfluorooctanoic acid	0.419	U	0.157	0.419	1.05
2706-90-3	Perfluoropentanoic acid	0.419	U	0.157	0.419	1.05
376-06-7	Perfluorotetradecanoic acid	0.419	U	0.168	0.419	1.05
72629-94-8	Perfluorotridecanoic acid	0.419	U	0.230	0.419	1.05
2058-94-8	Perfluoroundecanoic acid	0.419	U	0.147	0.419	1.05

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-05-SB-25-27
Collect Date:	07/09/20 Time: 1425	GCAL Sample ID:	22007103522
Matrix:	Solid % Moisture: 6.2	Instrument ID:	QQQ2
Sample Amt:	5.14 g	Lab File ID:	2200715A_62.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0337
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.415	U	0.176	0.415	1.04
39108-34-4	8:2 Fluorotelomer sulfonate	0.415	U	0.270	0.415	1.04
2991-50-6	NEtFOSAA	0.415	U	0.197	0.415	1.04
2355-31-9	NMeFOSAA	0.415	U	0.290	0.415	1.04
375-73-5	Perfluorobutanesulfonic acid	0.415	U	0.124	0.415	1.04
375-22-4	Perfluorobutanoic acid	0.415	U	0.135	0.415	1.04
335-76-2	Perfluorodecanoic acid	0.415	U	0.124	0.415	1.04
307-55-1	Perfluorododecanoic acid	0.415	U	0.207	0.415	1.04
375-85-9	Perfluoroheptanoic acid	0.415	U	0.135	0.415	1.04
355-46-4	Perfluorohexanesulfonic acid	0.415	U	0.145	0.415	1.04
307-24-4	Perfluorohexanoic acid	0.415	U	0.155	0.415	1.04
375-95-1	Perfluorononanoic acid	0.415	U	0.093	0.415	1.04
1763-23-1	Perfluorooctanesulfonic acid	0.219	J	0.187	0.415	1.04
335-67-1	Perfluorooctanoic acid	0.415	U	0.155	0.415	1.04
2706-90-3	Perfluoropentanoic acid	0.415	U	0.155	0.415	1.04
376-06-7	Perfluorotetradecanoic acid	0.415	U	0.166	0.415	1.04
72629-94-8	Perfluorotridecanoic acid	0.415	U	0.228	0.415	1.04
2058-94-8	Perfluoroundecanoic acid	0.415	U	0.145	0.415	1.04

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-05-SB-50-52
Collect Date:	07/09/20 Time: 1430	GCAL Sample ID:	22007103523
Matrix:	Solid % Moisture: 32.2	Instrument ID:	QQQ2
Sample Amt:	5.2 g	Lab File ID:	2200715A_63.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0350
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.567	U	0.241	0.567	1.42
39108-34-4	8:2 Fluorotelomer sulfonate	0.567	U	0.369	0.567	1.42
2991-50-6	NEtFOSAA	0.567	U	0.269	0.567	1.42
2355-31-9	NMeFOSAA	0.567	U	0.397	0.567	1.42
375-73-5	Perfluorobutanesulfonic acid	0.567	U	0.170	0.567	1.42
375-22-4	Perfluorobutanoic acid	0.567	U	0.184	0.567	1.42
335-76-2	Perfluorodecanoic acid	0.567	U	0.170	0.567	1.42
307-55-1	Perfluorododecanoic acid	0.567	U	0.284	0.567	1.42
375-85-9	Perfluoroheptanoic acid	0.567	U	0.184	0.567	1.42
355-46-4	Perfluorohexanesulfonic acid	0.567	U	0.199	0.567	1.42
307-24-4	Perfluorohexanoic acid	0.567	U	0.213	0.567	1.42
375-95-1	Perfluorononanoic acid	0.567	U	0.128	0.567	1.42
1763-23-1	Perfluorooctanesulfonic acid	1.72		0.255	0.567	1.42
335-67-1	Perfluorooctanoic acid	0.567	U	0.213	0.567	1.42
2706-90-3	Perfluoropentanoic acid	0.567	U	0.213	0.567	1.42
376-06-7	Perfluorotetradecanoic acid	0.567	U	0.227	0.567	1.42
72629-94-8	Perfluorotridecanoic acid	0.567	U	0.312	0.567	1.42
2058-94-8	Perfluoroundecanoic acid	0.567	U	0.199	0.567	1.42

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-05-SB-50-52-D
Collect Date:	07/09/20 Time: 1430	GCAL Sample ID:	22007103524
Matrix:	Solid % Moisture: 31.7	Instrument ID:	QQQ2
Sample Amt:	5.04 g	Lab File ID:	2200715A_64.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0402
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.581	U	0.247	0.581	1.45
39108-34-4	8:2 Fluorotelomer sulfonate	0.581	U	0.378	0.581	1.45
2991-50-6	NEtFOSAA	0.581	U	0.276	0.581	1.45
2355-31-9	NMeFOSAA	0.581	U	0.407	0.581	1.45
375-73-5	Perfluorobutanesulfonic acid	0.581	U	0.174	0.581	1.45
375-22-4	Perfluorobutanoic acid	0.581	U	0.189	0.581	1.45
335-76-2	Perfluorodecanoic acid	0.581	U	0.174	0.581	1.45
307-55-1	Perfluorododecanoic acid	0.581	U	0.291	0.581	1.45
375-85-9	Perfluoroheptanoic acid	0.581	U	0.189	0.581	1.45
355-46-4	Perfluorohexanesulfonic acid	0.581	U	0.203	0.581	1.45
307-24-4	Perfluorohexanoic acid	0.581	U	0.218	0.581	1.45
375-95-1	Perfluorononanoic acid	0.581	U	0.131	0.581	1.45
1763-23-1	Perfluorooctanesulfonic acid	2.37		0.262	0.581	1.45
335-67-1	Perfluorooctanoic acid	0.581	U	0.218	0.581	1.45
2706-90-3	Perfluoropentanoic acid	0.581	U	0.218	0.581	1.45
376-06-7	Perfluorotetradecanoic acid	0.581	U	0.233	0.581	1.45
72629-94-8	Perfluorotridecanoic acid	0.581	U	0.320	0.581	1.45
2058-94-8	Perfluoroundecanoic acid	0.581	U	0.203	0.581	1.45

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-06-SB-00-02
Collect Date:	07/08/20 Time: 1400	GCAL Sample ID:	22007103525
Matrix:	Solid % Moisture: 10.2	Instrument ID:	QQQ2
Sample Amt:	5.06 g	Lab File ID:	2200715A_65.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0415
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.440	U	0.187	0.440	1.10
39108-34-4	8:2 Fluorotelomer sulfonate	0.440	U	0.286	0.440	1.10
2991-50-6	NEtFOSAA	0.440	U	0.209	0.440	1.10
2355-31-9	NMeFOSAA	0.440	U	0.308	0.440	1.10
375-73-5	Perfluorobutanesulfonic acid	0.440	U	0.132	0.440	1.10
375-22-4	Perfluorobutanoic acid	0.440	U	0.143	0.440	1.10
335-76-2	Perfluorodecanoic acid	0.440	U	0.132	0.440	1.10
307-55-1	Perfluorododecanoic acid	0.440	U	0.220	0.440	1.10
375-85-9	Perfluoroheptanoic acid	0.440	U	0.143	0.440	1.10
355-46-4	Perfluorohexanesulfonic acid	0.440	U	0.154	0.440	1.10
307-24-4	Perfluorohexanoic acid	0.440	U	0.165	0.440	1.10
375-95-1	Perfluorononanoic acid	0.440	U	0.099	0.440	1.10
1763-23-1	Perfluorooctanesulfonic acid	0.440	U	0.198	0.440	1.10
335-67-1	Perfluorooctanoic acid	0.440	U	0.165	0.440	1.10
2706-90-3	Perfluoropentanoic acid	0.440	U	0.165	0.440	1.10
376-06-7	Perfluorotetradecanoic acid	0.440	U	0.176	0.440	1.10
72629-94-8	Perfluorotridecanoic acid	0.440	U	0.242	0.440	1.10
2058-94-8	Perfluoroundecanoic acid	0.440	U	0.154	0.440	1.10

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-06-SB-00-02-D
Collect Date:	07/08/20 Time: 1400	GCAL Sample ID:	22007103526
Matrix:	Solid % Moisture: 8.5	Instrument ID:	QQQ2
Sample Amt:	5.06 g	Lab File ID:	2200715A_66.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/16/20 Time: 0428
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.432	U	0.184	0.432	1.08
39108-34-4	8:2 Fluorotelomer sulfonate	0.432	U	0.281	0.432	1.08
2991-50-6	NEtFOSAA	0.432	U	0.205	0.432	1.08
2355-31-9	NMeFOSAA	0.432	U	0.303	0.432	1.08
375-73-5	Perfluorobutanesulfonic acid	0.432	U	0.130	0.432	1.08
375-22-4	Perfluorobutanoic acid	0.432	U	0.140	0.432	1.08
335-76-2	Perfluorodecanoic acid	0.432	U	0.130	0.432	1.08
307-55-1	Perfluorododecanoic acid	0.432	U	0.216	0.432	1.08
375-85-9	Perfluoroheptanoic acid	0.432	U	0.140	0.432	1.08
355-46-4	Perfluorohexanesulfonic acid	0.432	U	0.151	0.432	1.08
307-24-4	Perfluorohexanoic acid	0.432	U	0.162	0.432	1.08
375-95-1	Perfluorononanoic acid	0.432	U	0.097	0.432	1.08
1763-23-1	Perfluorooctanesulfonic acid	0.432	U	0.194	0.432	1.08
335-67-1	Perfluorooctanoic acid	0.432	U	0.162	0.432	1.08
2706-90-3	Perfluoropentanoic acid	0.432	U	0.162	0.432	1.08
376-06-7	Perfluorotetradecanoic acid	0.432	U	0.173	0.432	1.08
72629-94-8	Perfluorotridecanoic acid	0.432	U	0.238	0.432	1.08
2058-94-8	Perfluoroundecanoic acid	0.432	U	0.151	0.432	1.08

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-07-SB-00-02
Collect Date:	07/08/20 Time: 1420	GCAL Sample ID:	22007103527
Matrix:	Solid % Moisture: 7.5	Instrument ID:	QQQ1
Sample Amt:	5.06 g	Lab File ID:	2200715A_28.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/11/20	Analysis Date:	07/15/20 Time: 2225
Prep Batch:	687724	Analytical Batch:	688129
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.427	U	0.182	0.427	1.07
39108-34-4	8:2 Fluorotelomer sulfonate	0.427	U	0.278	0.427	1.07
2991-50-6	NEtFOSAA	0.427	U	0.203	0.427	1.07
2355-31-9	NMeFOSAA	0.427	U	0.299	0.427	1.07
375-73-5	Perfluorobutanesulfonic acid	0.427	U	0.128	0.427	1.07
375-22-4	Perfluorobutanoic acid	0.427	U	0.139	0.427	1.07
335-76-2	Perfluorodecanoic acid	0.427	U	0.128	0.427	1.07
307-55-1	Perfluorododecanoic acid	0.427	U	0.214	0.427	1.07
375-85-9	Perfluoroheptanoic acid	0.427	U	0.139	0.427	1.07
355-46-4	Perfluorohexanesulfonic acid	0.427	U	0.150	0.427	1.07
307-24-4	Perfluorohexanoic acid	0.427	U	0.160	0.427	1.07
375-95-1	Perfluorononanoic acid	0.427	U	0.096	0.427	1.07
1763-23-1	Perfluorooctanesulfonic acid	0.427	U	0.192	0.427	1.07
335-67-1	Perfluorooctanoic acid	0.427	U	0.160	0.427	1.07
2706-90-3	Perfluoropentanoic acid	0.427	U	0.160	0.427	1.07
72629-94-8	Perfluorotridecanoic acid	0.427	U	0.235	0.427	1.07
2058-94-8	Perfluoroundecanoic acid	0.427	U	0.150	0.427	1.07

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-07-SB-00-02RE
Collect Date:	07/08/20 Time: 1420	GCAL Sample ID:	22007103527RE
Matrix:	Solid % Moisture: 7.5	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200721B_38.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/20/20	Analysis Date:	07/22/20 Time: 0021
Prep Batch:	688171	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
376-06-7	Perfluorotetradecanoic acid	0.432	U	0.173	0.432	1.08

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW001
Collect Date:	07/12/20 Time: 1340	GCAL Sample ID:	22007146601
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_45.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0558
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	3.61	J	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	2.84	J	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	9.49	J	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	3.23	J	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	1.89	J	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW001 (RE)
Collect Date:	07/12/20 Time: 1340	GCAL Sample ID:	22007146611
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_42.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2141
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW002
Collect Date:	07/11/20 Time: 1300	GCAL Sample ID:	22007146602
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_46.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0611
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	2.24	J	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.01	J	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	3.33	J	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW002 (RE)
Collect Date:	07/11/20 Time: 1300	GCAL Sample ID:	22007146612
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_44.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2207
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: *ng/L*

CAS	*ANALYTE*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW003
Collect Date:	07/12/20 Time: 1030	GCAL Sample ID:	22007146605
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_49.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0651
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	16.0		1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	1.96	J	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	9.11	J	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	11.6		1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	74.2		1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	15.9		1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	175		1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	9.07	J	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.14	J	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW003 (RE)
Collect Date:	07/12/20 Time: 1030	GCAL Sample ID:	22007146615
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_47.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2247
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW004
Collect Date:	07/12/20 Time: 1230	GCAL Sample ID:	22007146606
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_50.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0704
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	3.12	J	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	2.91	J	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	26.4		1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	7.85	J	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	6.23	J	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW004 (RE)
Collect Date:	07/12/20 Time: 1230	GCAL Sample ID:	22007146616
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_48.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2300
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW005
Collect Date:	07/12/20 Time: 1400	GCAL Sample ID:	22007146607
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_51.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0717
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	13.2		1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	1.92	J	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	19.6		2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	11.6		1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	36.7		1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	30.1		1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	2.40	J	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	775		1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	9.59	J	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	21.3		2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW005 (RE)
Collect Date:	07/12/20 Time: 1400	GCAL Sample ID:	22007146617
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_49.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2313
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW005-D
Collect Date:	07/12/20 Time: 1400	GCAL Sample ID:	22007146608
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_52.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0730
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	16.8		1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	1.80	J	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	20.0		2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	10.5		1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	37.8		1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	31.1		1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	2.50	J	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	814		1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	10.7		1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	21.7		2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-MW005-D (RE)
Collect Date:	07/12/20 Time: 1400	GCAL Sample ID:	22007146618
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_50.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2326
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-ERB-03
Collect Date:	07/12/20 Time: 1500	GCAL Sample ID:	22007146609
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_53.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0744
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	4.00	U	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.00	U	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-ERB-03 (RE)
Collect Date:	07/12/20 Time: 1500	GCAL Sample ID:	22007146619
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_51.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2340
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-ERB-04
Collect Date:	07/12/20 Time: 1455	GCAL Sample ID:	22007146610
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_54.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0757
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	4.00	U	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.00	U	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	HAASF-ERB-04 (RE)
Collect Date:	07/12/20 Time: 1455	GCAL Sample ID:	22007146620
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_52.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 2353
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

I

GENERAL CHEMISTRY ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-20-22
Collect Date:	07/09/20 1015	GCAL Sample ID:	22007103513
Matrix:	Solid	Instrument ID:	TOC6
% Solids:	NA	Analyst:	PLH
Sample Amt:	NA	Lab File ID:	NA
Prep Vol.:	NA	Dilution Factor:	1
Prep Date:	NA	Analysis Date:	07/20/20 1208
Prep Batch:	NA	Analytical Batch:	688325
Prep Method:	NA	Analytical Method:	EPA 9060A

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Total Organic Carbon	1230	mg/kg		153	200	250

FORM I - GENCHEM

I

GENERAL CHEMISTRY ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-20-22-D
Collect Date:	07/09/20 1015	GCAL Sample ID:	22007103514
Matrix:	Solid	Instrument ID:	TOC6
% Solids:	NA	Analyst:	PLH
Sample Amt:	NA	Lab File ID:	NA
Prep Vol.:	NA	Dilution Factor:	1
Prep Date:	NA	Analysis Date:	07/20/20 1258
Prep Batch:	NA	Analytical Batch:	688325
Prep Method:	NA	Analytical Method:	EPA 9060A

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Total Organic Carbon	1170	mg/kg		153	200	250

FORM I - GENCHEM

I

GENERAL CHEMISTRY ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-20-22
Collect Date:	07/09/20 1015	GCAL Sample ID:	22007103513
Matrix:	Solid	Instrument ID:	PH01
% Solids:	NA	Analyst:	SLL2
Sample Amt:	NA	Lab File ID:	NA
Prep Vol.:	NA	Dilution Factor:	1
Prep Date:	NA	Analysis Date:	07/10/20 1644
Prep Batch:	NA	Analytical Batch:	687669
Prep Method:	NA	Analytical Method:	EPA 9045D

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
pH	8.61	pH UNITS		1.00	1.00	1.00

FORM I - GENCHEM

I

GENERAL CHEMISTRY ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	AOI01-03-SB-20-22-D
Collect Date:	07/09/20 1015	GCAL Sample ID:	22007103514
Matrix:	Solid	Instrument ID:	PH01
% Solids:	NA	Analyst:	SLL2
Sample Amt:	NA	Lab File ID:	NA
Prep Vol.:	NA	Dilution Factor:	1
Prep Date:	NA	Analysis Date:	07/10/20 1646
Prep Batch:	NA	Analytical Batch:	687669
Prep Method:	NA	Analytical Method:	EPA 9045D

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
pH	8.62	pH UNITS		1.00	1.00	1.00

FORM I - GENCHEM

DATA VALIDATION WORKSHEET
Per- and Polyfluorinated Compounds by LC/MS/MS

Reviewer Tyler Bryant
Date: 9/11/2020
DV Level II **III** IV
Review Document:
__X__ National Functional Guidelines for Organic Data Review
__X__ DOD QSM 5.1, Table B-15
_____ Method 537 Rev. 1.1

Project Name: Helena AASF
Project Number: 60552172
Laboratory: GCAL
SDG No.: 220071466 + 71035
Test Name: PFAS

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	**X**		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?		**X**	
1.3	Do sample preservation, collection and storage condition meet method requirement? 4±2°C If samples were received with the cooler temperature exceeding 6°C, then flag J(+)/UJ(-). If >20°C, J(+)/	**X**		
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,		**X**	

Notes: FedEx failed to sign received by column in SDG 2200710466 COC.
AOI01-02-SB-55-27 was corrected to AOI01-02-SB-55-57

2.0 Holding Times		**Yes**	**No**	**NA**
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded?	**X**		
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/X(-) .		**X**	

Notes: For prep batch 688084 samples were re-extracted outside of holding time due to LCS/LCSD failures.

3.0 Blanks (Laboratory and Field)		**Yes**	**No**	**NA**
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per	**X**		
3.2	Do any instrument/method blanks have positive results?		**X**	
3.3	Do any field equipment blanks/trip blanks have positive results?		**X**	

Notes:

4.0 Initial and Continuing Calibration		**Yes**	**No**	**NA**
4.1	For each calibration standard, was each analyte calculated within 70%-130% of the true value, RSD	**X**		
4.2	Was the retention time window for each analyte and surrogate set using the midpoint standard of the	**X**		
4.3	Was the relative retention time of each analyte within laboratory control limits?	**X**		
4.4	Was a second source calibration verification (ICV) analyzed for each calibration curve? If no, flag "X".	**X**		
4.5	Were continuing calibration standards analyzed every ten samples and at the end of the sequence? If no,	**X**		
4.6	For each calibration standard used for quantitation, was the S/N Ratio ≥10:1 and for all analytes with	**X**		
For initial calibration: 70%-130%, RSD ≤20%, or r2≥0.99. J(+)/UJ(-)				
For ICV/CCV: %D>30%, Positive: J(+), Negative:J(+)/UJ(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		**Yes**	**No**	**NA**
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	**X**		
5.2	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits(lab default is 70%-130%)? Action: If Yes, for %R >130, J+(+) only; for %R 30%-70%, J-(+)/UJ(-), and %R<30%, J-(+)/X(-).		**X**	
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		**X**	

Notes: PFTrDA LCSD percent recovery is below LCL for batch 688084.
6:2 FTS LCSD percent recovery is above UCL for batch 687724

6.0 Surrogate Recovery/Internal Standard Area Count/Extracted Internal Standards (For Table B-15 Matr				**Yes**	**No**	**NA**
6.1	Are recoveries within acceptance criteria for all samples and method blanks?				**X**	
6.2	If No in Section 6.1, are these sample(s) or method blank(s) reanalyzed?			**X**		
6.3	If No in Section 6.2, is any sample dilution factor greater than 10? (recoveries may be diluted out.)				**X**	
6.4	Has the Extracted/Injected Standard area count been met for all quality control and field samples? (50%-				**X**	
		<20%	low	high		
	Positives	J+	J+	J-		
	Non-detects	X	UJ	None		

Notes: Some recoveries less than 10%, anything >10% was initially flagged "X" but non-detects were changed to "UJ"

X flagged results can be retained in the data set, MS/MSD show recovery associated with very low (2%) EIS recovery

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		**Yes**	**No**	**NA**
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits	X		
	%Recovery: <30% 30%-70% >130%			
	Action: J-(+)/X(-) J-(+)/UJ(-) J+(+) only			
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits? (±30%		X	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional			

Notes: PFTeDA recovered high in AOI01-01-SB-55-57. PFTrDA recovered low in AOI01-01-SB-55-57RE.
PFTeDA RPD exceeded in AOI01-01-SB-55-57.

8.0 Field/Laboratory Duplicates		**Yes**	**No**	**NA**
8.1	Acceptable field duplicate results? If no, J(+) parent sample/field duplicate only.	X		

Notes:

9.0 Instrument Sensitivity Check (ISC)		**Yes**	**No**	**NA**
9.1	Was an instrument sensitivity check analyzed prior to analysis and every 12 hours? If not X(+/-)	X		
9.2	Were analyte concentrations at the LOQ for the ISC and within ±30% of their true values? If not	X		

Notes:

10.0 Compound Identification/Tune and Detection Limit Verification		**Yes**	**No**	**NA**
10.1	Do detection limits meet those required by the project QAPP and were they properly adjusted for	X		
10.2	Was a mass calibration performed daily prior to analysis?	X		

Notes:

11.0 Data Completeness		**Yes**	**No**	**NA**
11.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	X		
11.1.1	Number of samples: 26			
11.1.2	Number of target compounds in each analysis: 18			
11.1.3	Number of results "X" flagged results: 16			

QQQ1 Run Log

Analyst:	BMH	Expiration:
Instrument:	QQQ1	
Batch:	2200715A	
Current ICAL Bath:	2200715ACAL/2200715ACALDW	
20mM Amm Acetate	012-34-2	7/17/2020
Methanol	2129224	3/31/2025
Calibration Std	012-33-4	1/13/2021
ICV Std	012-23-3	12/11/2020
EIS Mix	012-32-3	1/10/2021
IIS Mix	012-33-7	1/15/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2200715A_01.d	MeOH Shot	7/15/2020 17:07	BMH,QQQ1;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200715A_02.d	Cal	7/15/2020 17:19	BMH,QQQ1; Cal	1
1202	2200715A_03.d	Cal	7/15/2020 17:30	BMH,QQQ1; Cal	1
1203	2200715A_04.d	Cal	7/15/2020 17:42	BMH,QQQ1; Cal	1
1204	2200715A_05.d	Cal	7/15/2020 17:54	BMH,QQQ1; Cal	1
1205	2200715A_06.d	Cal	7/15/2020 18:06	BMH,QQQ1; Cal	1
1206	2200715A_07.d	Cal	7/15/2020 18:18	BMH,QQQ1; Cal	1
1207	2200715A_08.d	Cal	7/15/2020 18:30	BMH,QQQ1; Cal	1
MeOH Shot	2200715A_09.d	MeOH Shot	7/15/2020 18:41	BMH,QQQ1;MeOH SHOT/INSTRUMENT IDLE	1
1500	2200715A_10.d	Sample	7/15/2020 18:53	BMH,QQQ1	1
1600	2200715A_11.d	QC	7/15/2020 19:05	BMH,QQQ1	1
1450	2200715A_12.d	QC	7/15/2020 19:16	BMH,QQQ1	1
MeOH Shot	2200715A_13.d	MeOH Shot	7/15/2020 19:28	BMH,QQQ1;MeOH SHOT/INSTRUMENT IDLE	1
2061035	2200715A_14.d	Sample	7/15/2020 19:40	BMH,QQQ1;687881	1
2061036	2200715A_15.d	QC	7/15/2020 19:51	BMH,QQQ1;687881	1
2061037	2200715A_16.d	QC	7/15/2020 20:03	BMH,QQQ1;687881	1
22007071806	2200715A_17.d	Sample	7/15/2020 20:15	BMH,QQQ1;687881	1
22007071801	2200715A_18.d	Sample	7/15/2020 20:27	BMH,QQQ1;687881	1
22007071802	2200715A_19.d	Sample	7/15/2020 20:39	BMH,QQQ1;687881	1
22007071803	2200715A_20.d	Sample	7/15/2020 20:50	BMH,QQQ1;687881	1

22007071804	2200715A_21.d	Sample	7/15/2020 21:02	BMH,QQQ1;687881	1
22007071805	2200715A_22.d	Sample	7/15/2020 21:14	BMH,QQQ1;687881	1
MeOH Shot	2200715A_23.d	MeOH Shot	7/15/2020 21:26	BMH,QQQ1;MeOH SHOT/INSTRUMENT IDLE	1
1400	2200715A_24.d	QC	7/15/2020 21:37	BMH,QQQ1;CCV	1
2060317	2200715A_25.d	Sample	7/15/2020 21:49	BMH,QQQ1;687724	1
2060318	2200715A_26.d	QC	7/15/2020 22:01	BMH,QQQ1;687724	1
2060319	2200715A_27.d	QC	7/15/2020 22:13	BMH,QQQ1;687724	1
22007103527	2200715A_28.d	Sample	7/15/2020 22:25	BMH,QQQ1;687724	1
22007106601	2200715A_29.d	Sample	7/15/2020 22:37	BMH,QQQ1;687724	1
22007106602	2200715A_30.d	Sample	7/15/2020 22:48	BMH,QQQ1;687724	1
22007106603	2200715A_31.d	Sample	7/15/2020 23:00	BMH,QQQ1;687724	1
22007106604	2200715A_32.d	Sample	7/15/2020 23:12	BMH,QQQ1;687724	1
22007106605	2200715A_33.d	Sample	7/15/2020 23:24	BMH,QQQ1;687724	1
22007106606	2200715A_34.d	QC	7/15/2020 23:36	BMH,QQQ1;687724	1
22007106607	2200715A_35.d	QC	7/15/2020 23:48	BMH,QQQ1;687724	1
22007106608	2200715A_36.d	Sample	7/15/2020 23:59	BMH,QQQ1;687724	1
22007106609	2200715A_37.d	Sample	7/16/2020 0:11	BMH,QQQ1;687724	1
22007106610	2200715A_38.d	Sample	7/16/2020 0:23	BMH,QQQ1;687724	1
22007106611	2200715A_39.d	Sample	7/16/2020 0:35	BMH,QQQ1;687724	1
1400	2200715A_40.d	QC	7/16/2020 0:47	BMH,QQQ1;CCV	1
22007106612	2200715A_41.d	Sample	7/16/2020 0:59	BMH,QQQ1;687724	1
22007106613	2200715A_42.d	Sample	7/16/2020 1:11	BMH,QQQ1;687724	1
22007106614	2200715A_43.d	Sample	7/16/2020 1:23	BMH,QQQ1;687724	1
22007106615	2200715A_44.d	Sample	7/16/2020 1:34	BMH,QQQ1;687724	1
22007106616	2200715A_45.d	Sample	7/16/2020 1:46	BMH,QQQ1;687724	1
22007106617	2200715A_46.d	Sample	7/16/2020 1:58	BMH,QQQ1;687724	1
22007106501	2200715A_47.d	Sample	7/16/2020 2:10	BMH,QQQ1;687724	1
22007106502	2200715A_48.d	Sample	7/16/2020 2:22	BMH,QQQ1;687724	1
MeOH Shot	2200715A_49.d	MeOH Shot	7/16/2020 2:34	BMH,QQQ1;MeOH SHOT/INSTRUMENT IDLE	1
2060320	2200715A_50.d	Sample	7/16/2020 2:45	BMH,QQQ1;687725	1
2060321	2200715A_51.d	QC	7/16/2020 2:57	BMH,QQQ1;687725	1
2060322	2200715A_52.d	QC	7/16/2020 3:09	BMH,QQQ1;687725	1
22007106503	2200715A_53.d	Sample	7/16/2020 3:21	BMH,QQQ1;687725	1
22007106504	2200715A_54.d	Sample	7/16/2020 3:33	BMH,QQQ1;687725	1

1400	2200715A_55.d	QC	7/16/2020 3:44	BMH,QQQ1;CCV	1
22007106505	2200715A_56.d	Sample	7/16/2020 3:56	BMH,QQQ1;687725	1
22007106506	2200715A_57.d	Sample	7/16/2020 4:08	BMH,QQQ1;687725	1
MeOH Shot	2200715A_58.d	MeOH Shot	7/16/2020 4:20	BMH,QQQ1;MeOH SHOT/INSTRUMENT IDLE	1
2060522	2200715A_59.d	Sample	7/16/2020 4:31	BMH,QQQ1;687785	1
2060523	2200715A_60.d	QC	7/16/2020 4:43	BMH,QQQ1;687785	1
2060524	2200715A_61.d	QC	7/16/2020 4:55	BMH,QQQ1;687785	1
22007106618	2200715A_62.d	Sample	7/16/2020 5:07	BMH,QQQ1;687785	1
22007106619	2200715A_63.d	Sample	7/16/2020 5:19	BMH,QQQ1;687785	1
22007106620	2200715A_64.d	Sample	7/16/2020 5:31	BMH,QQQ1;687785	1
22007106621	2200715A_65.d	QC	7/16/2020 5:43	BMH,QQQ1;687785	1
22007106622	2200715A_66.d	QC	7/16/2020 5:55	BMH,QQQ1;687785	1
22007106623	2200715A_67.d	Sample	7/16/2020 6:07	BMH,QQQ1;687785	1
22007106624	2200715A_68.d	Sample	7/16/2020 6:18	BMH,QQQ1;687785	1
22007106625	2200715A_69.d	Sample	7/16/2020 6:30	BMH,QQQ1;687785	1
22007106626	2200715A_70.d	Sample	7/16/2020 6:42	BMH,QQQ1;687785	1
22007106627	2200715A_71.d	Sample	7/16/2020 6:54	BMH,QQQ1;687785	1
1450	2200715A_72.d	QC	7/16/2020 7:06	BMH,QQQ1;LLCCV	1
22007106628	2200715A_73.d	Sample	7/16/2020 7:18	BMH,QQQ1;687785	1
22007106629	2200715A_74.d	Sample	7/16/2020 7:30	BMH,QQQ1;687785	1
22007106630	2200715A_75.d	QC	7/16/2020 7:42	BMH,QQQ1;687785	1
22007106631	2200715A_76.d	QC	7/16/2020 7:54	BMH,QQQ1;687785	1
22007106632	2200715A_77.d	Sample	7/16/2020 8:05	BMH,QQQ1;687785	1
22007106633	2200715A_78.d	Sample	7/16/2020 8:17	BMH,QQQ1;687785	1
22007106634	2200715A_79.d	Sample	7/16/2020 8:29	BMH,QQQ1;687785	1
22007106635	2200715A_80.d	Sample	7/16/2020 8:41	BMH,QQQ1;687785	1
22007106636	2200715A_81.d	Sample	7/16/2020 8:53	BMH,QQQ1;687785	1
22007106637	2200715A_82.d	Sample	7/16/2020 9:04	BMH,QQQ1;687785	1
1400	2200715A_83.d	QC	7/16/2020 9:16	BMH,QQQ1;CCV	1

4I

ORGANICS INSTRUMENT BLANK

Report No:	220071035	Instrument ID:	QQQ1
Analysis Date:	07/15/2020 18:53	Lab File ID:	2200715A_10.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688129

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
6:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.79	4.00	10.0	
8:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.63	4.00	10.0	
NEtFOSAA	ng/L	8.00	U	5.38	8.00	10.0	
NMeFOSAA	ng/L	8.00	U	4.60	8.00	10.0	
Perfluorobutanesulfonic acid	ng/L	4.00	U	1.47	4.00	10.0	
Perfluorobutanoic acid	ng/L	4.00	U	2.13	4.00	10.0	
Perfluorodecanoic acid	ng/L	4.00	U	1.65	4.00	10.0	
Perfluorododecanoic acid	ng/L	4.00	U	2.45	4.00	10.0	
Perfluoroheptanoic acid	ng/L	4.00	U	1.85	4.00	10.0	
Perfluorohexanesulfonic acid	ng/L	4.00	U	1.64	4.00	10.0	
Perfluorohexanoic acid	ng/L	4.00	U	1.94	4.00	10.0	
Perfluorononanoic acid	ng/L	4.00	U	1.68	4.00	10.0	
Perfluorooctanesulfonic acid	ng/L	4.00	U	1.70	4.00	10.0	
Perfluorooctanoic acid	ng/L	4.00	U	1.80	4.00	10.0	
Perfluoropentanoic acid	ng/L	4.00	U	2.35	4.00	10.0	
Perfluorotetradecanoic acid	ng/L	4.00	U	2.76	4.00	10.0	
Perfluorotridecanoic acid	ng/L	4.00	U	2.56	4.00	10.0	
Perfluoroundecanoic acid	ng/L	4.00	U	1.86	4.00	10.0	

* - Result greater than 1/2 LOQ

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ1
Analysis Date:	07/15/2020 19:05	Lab File ID:	2200715A_11.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688129

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47400	57800	122	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	47900	52800	110	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	43000	86	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	45600	91	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50200	49800	99	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	50200	50500	101	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50100	53400	107	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50100	49300	98	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50100	45600	91	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50300	49600	99	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	50600	51700	102	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50100	47900	96	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50200	53700	107	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	50300	44000	87	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50700	51100	101	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50100	53700	107	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50100	46900	94	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50100	49300	98	70	130	

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071035	Instrument ID:	QQQ1
Analysis Date:	07/15/2020 19:16	Lab File ID:	2200715A_12.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688129

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	9.92	105	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	10.8	112	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	7.91	79	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	9.36	94	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.40	84	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	8.24	93	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	7.98	80	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	7.90	79	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	8.24	83	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.08	81	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	8.88	97	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	8.64	87	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	8.96	90	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	8.80	95	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	9.04	90	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	10.8	108	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	9.28	93	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	9.76	97	70	130	

FORM 7S - ORG

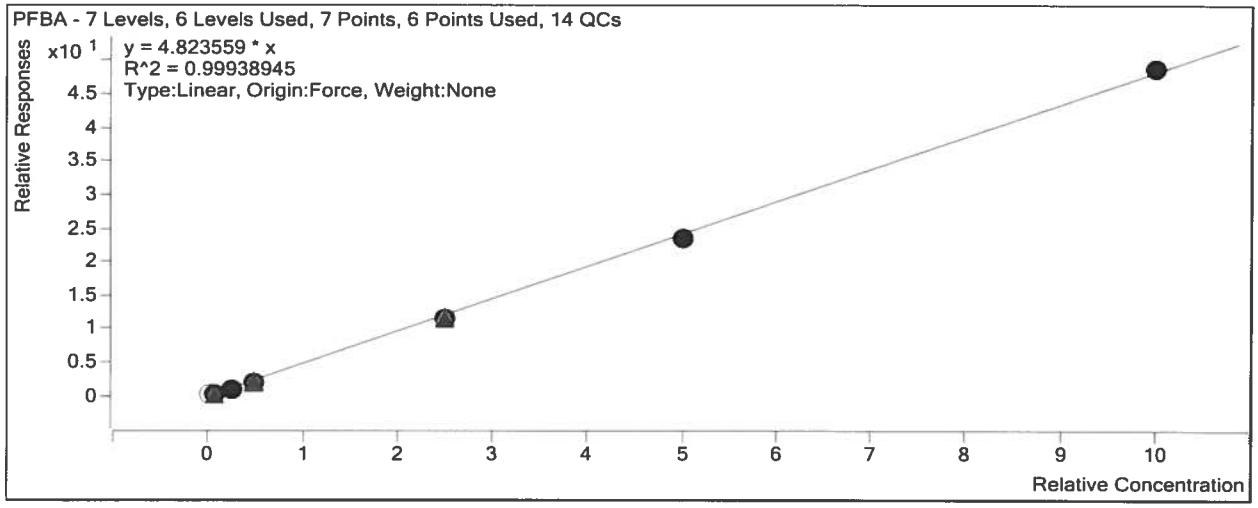
Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2200715ACAL\QuantResults\2200715A.batch.bin		
Analysis Time	7/17/2020 9:32 AM	**Analyst Name**	GCAL\lcms
Report Time	7/17/2020 9:42 AM	**Reporter Name**	GCAL\lcms
Last Calib Update	7/16/2020 1:52 PM	**Batch State**	Processed

Calibration Info

Target Compound *PFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	3787	0.5000	4.1763
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	9539	1.2500	3.9122
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	38487	5.0000	4.0579
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	80825	10.0000	4.2467
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	435310	50.0000	4.5702
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	879194	100.0000	4.7052
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1739001	200.0000	4.8709



Extracted ISTD *MPFBA*

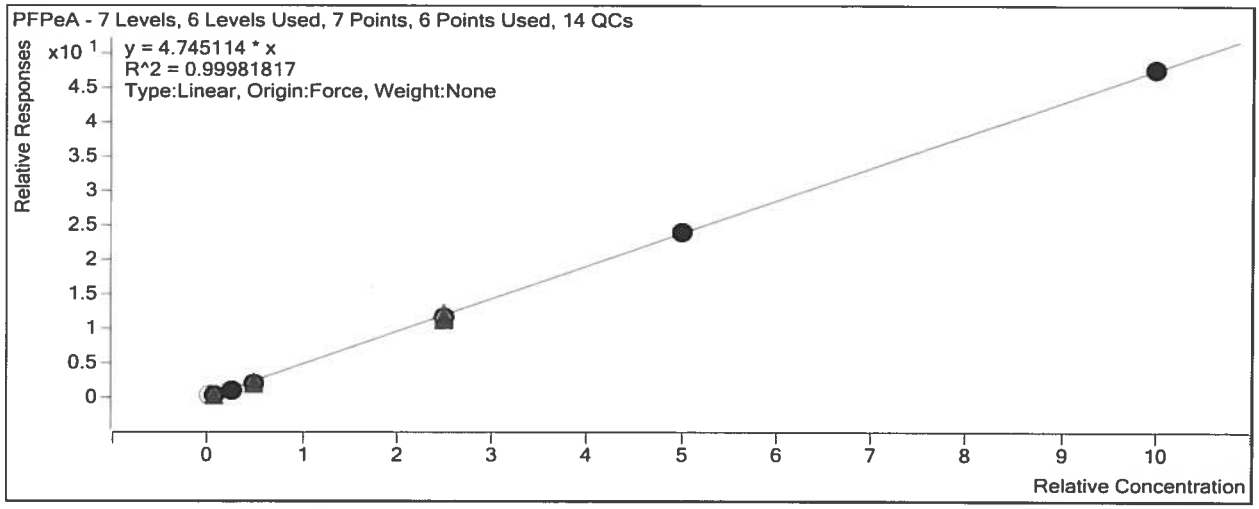
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	36270	20.0000	1813.4937
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	39014	20.0000	1950.6967
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	37938	20.0000	1896.8930
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	38064	20.0000	1903.2137
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	38099	20.0000	1904.9738
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	37371	20.0000	1868.5507
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	35702	20.0000	1785.0800

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	30667	20.0000	1533.3643
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	29194	20.0000	1459.6912
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	29018	20.0000	1450.9014
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	28433	20.0000	1421.6583

Target Compound *PFPeA*

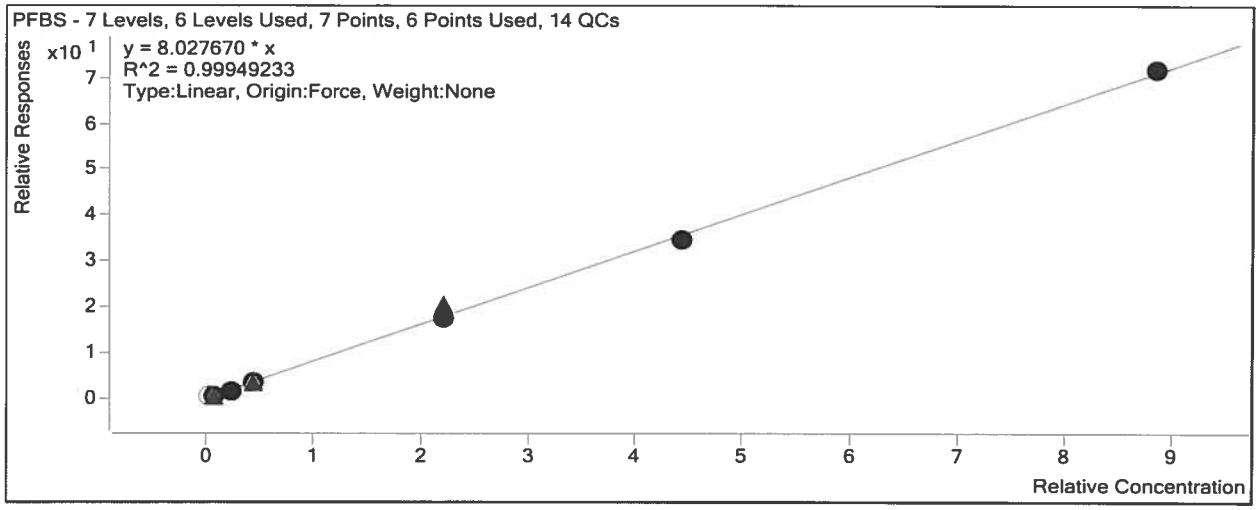
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	3386	0.5000	4.7094
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	8366	1.2500	4.3966
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	30644	5.0000	4.0453
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	62595	10.0000	4.0822
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	334770	50.0000	4.5869
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	691661	100.0000	4.7671
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1351034	200.0000	4.7516



Target Compound *PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	2795	0.4425	6.4447
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	7118	1.1100	6.9021
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	28836	4.4250	6.8269
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	60696	8.8500	7.4494

D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	319226	44.2500	7.8519
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	635718	88.5000	7.7771
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1217854	177.0000	8.1035



Extracted ISTD *M3PFBS*

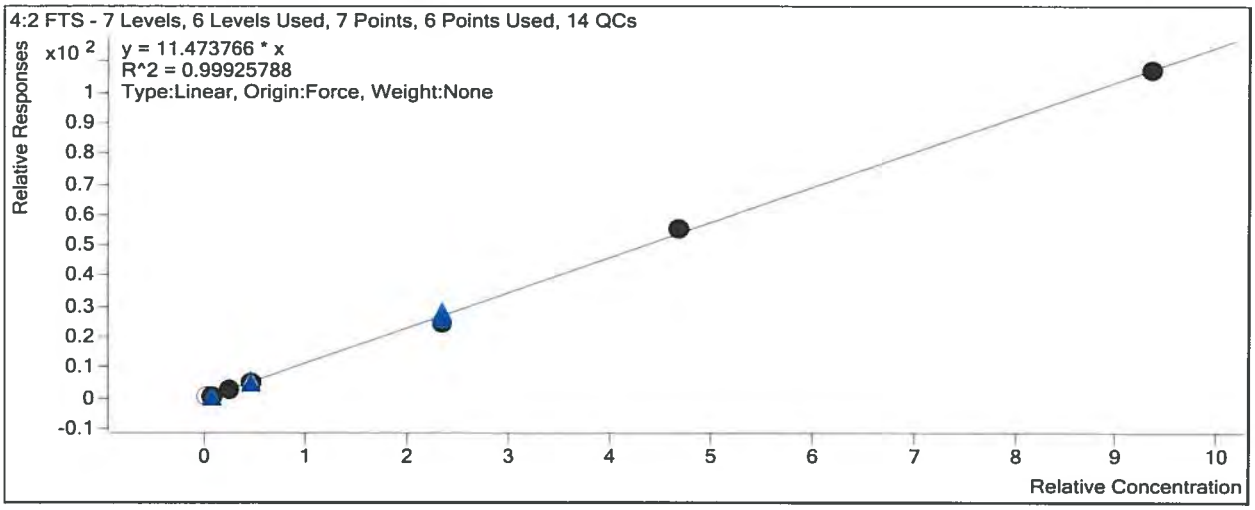
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	19598	20.0000	979.9156
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	18581	20.0000	929.0312
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	19091	20.0000	954.5341
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	18413	20.0000	920.6524
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	18376	20.0000	918.7831
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	18473	20.0000	923.6360
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	16982	20.0000	849.0784

Extracted ISTD *M2 4:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	20515	20.0000	1025.7392
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	20874	20.0000	1043.6789
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	19117	20.0000	955.8362
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	20157	20.0000	1007.8706
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	19194	20.0000	959.7101
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	16066	20.0000	803.3061
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	14598	20.0000	729.8993

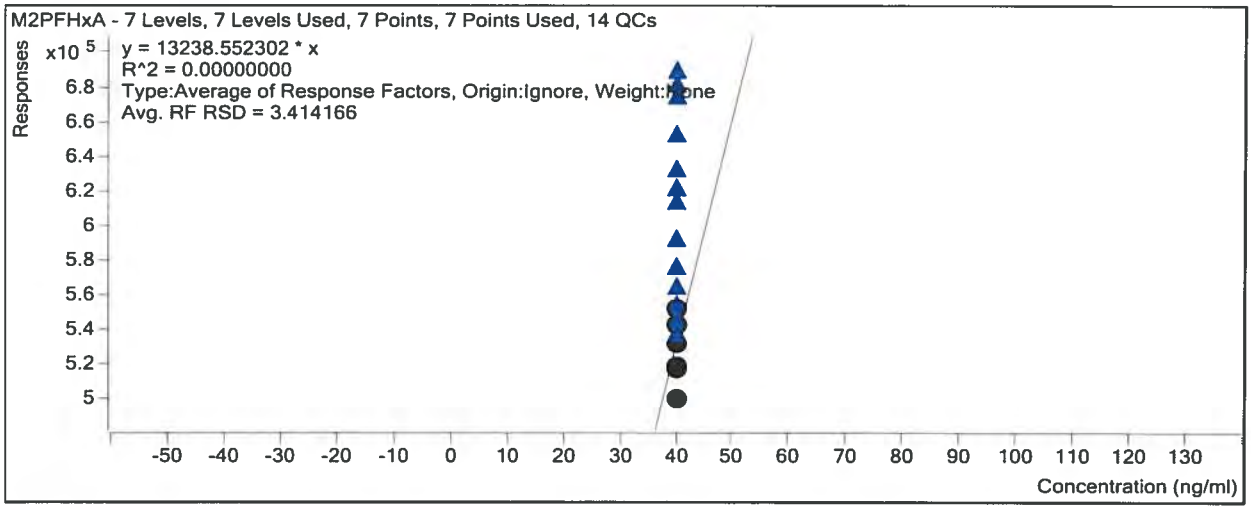
Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1562472	187.0000	11.4474



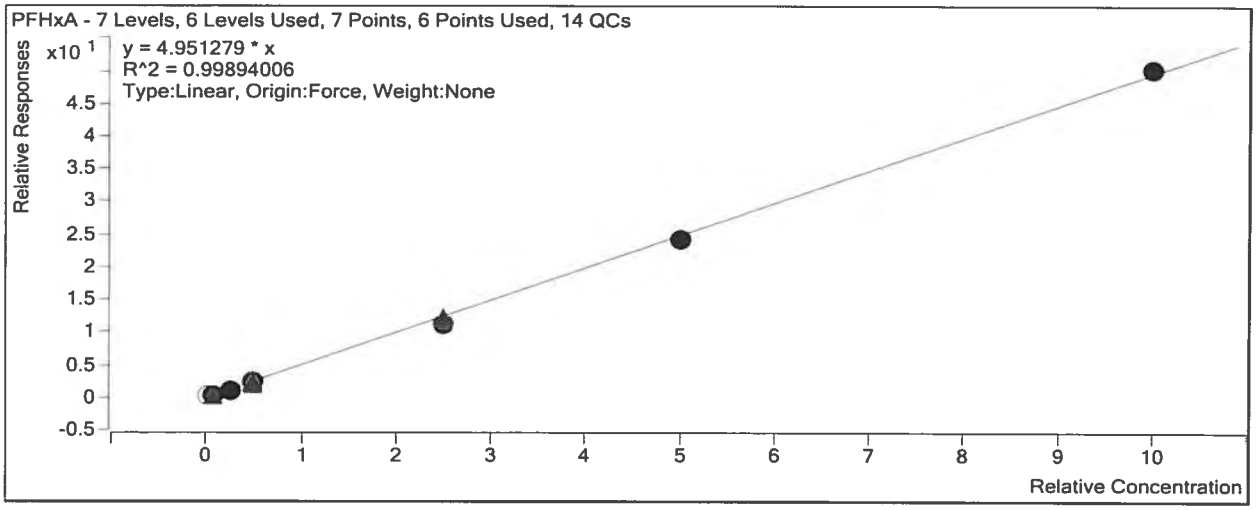
Instrument ISTD *M2PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	517422	40.0000	12935.5577
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	542961	40.0000	13574.0284
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	552043	40.0000	13801.0652
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	542692	40.0000	13567.2888
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	531902	40.0000	13297.5414
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	519292	40.0000	12982.3108
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	500483	40.0000	12512.0739



Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	128970	10.0000	4.4950
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	675486	50.0000	4.5023
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	1360063	100.0000	4.8347
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	2672595	200.0000	5.0100



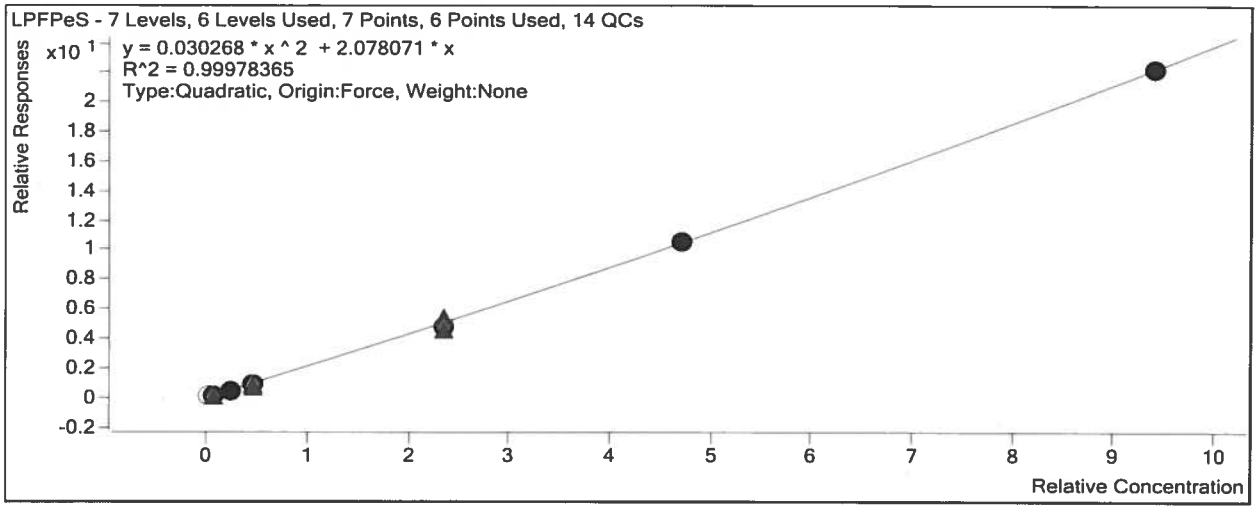
Extracted ISTD *M5PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	58144	20.0000	2907.1877
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	61519	20.0000	3075.9401
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	60822	20.0000	3041.1070
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	57384	20.0000	2869.2164
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	60013	20.0000	3000.6460
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	56262	20.0000	2813.1240
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	53345	20.0000	2667.2679

Target Compound *LPFPeS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	2721	0.4700	1.9917
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	6957	1.1800	1.9168
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	25446	4.7000	1.7803
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	55074	9.4000	2.0420

D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	290365	47.0000	2.0589
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	596745	94.0000	2.2567
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1183146	188.0000	2.3595



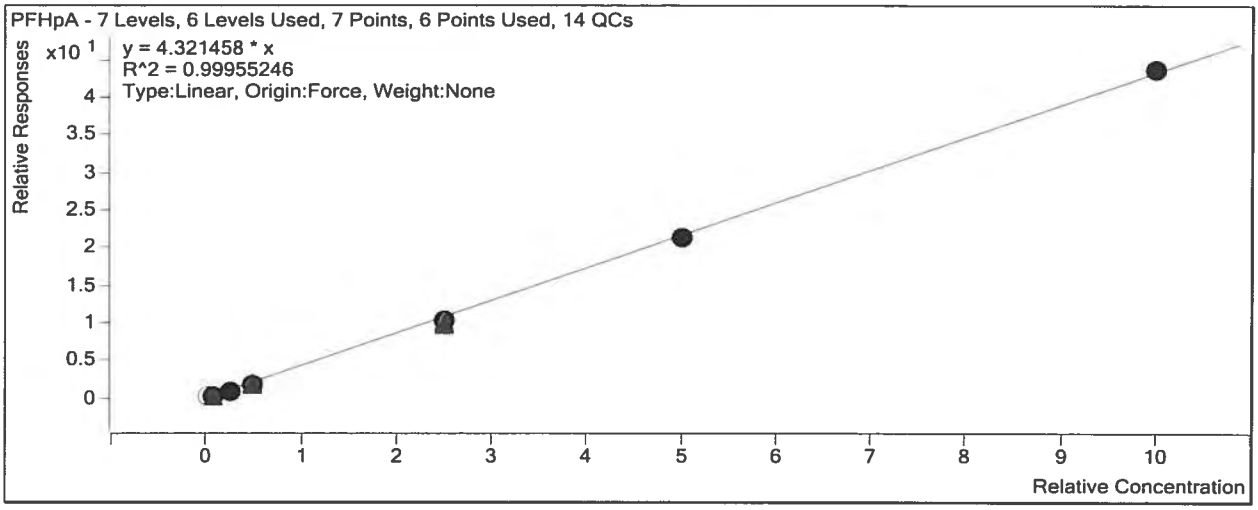
Extracted ISTD *M3HFPODA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	4607	40.0000	115.1727
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	4525	40.0000	113.1219
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	5130	40.0000	128.2547
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	4626	40.0000	115.6496
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	5116	40.0000	127.8950
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	5556	40.0000	138.8978
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	5881	40.0000	147.0281

Target Compound *HFPO-DA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	474	1.0000	4.1188
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	1750	2.5000	6.1871
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	6979	10.0000	5.4412
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	13019	20.0000	5.6285
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	69454	100.0000	5.4306
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	148750	200.0000	5.3547
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	295235	400.0000	5.0201

Quantitative Analysis Calibration Report



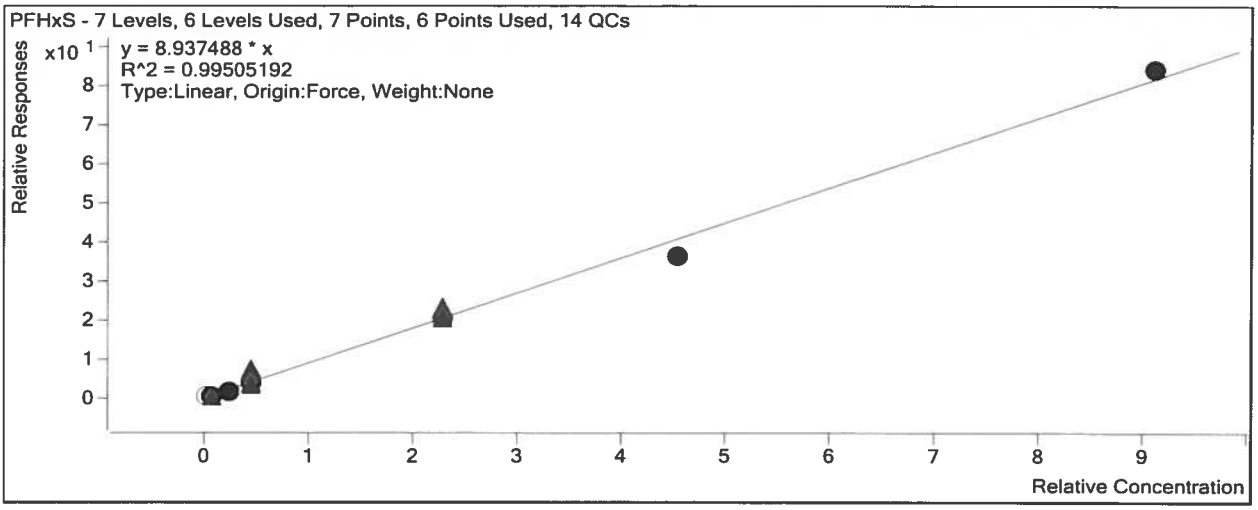
Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	13279	20.0000	663.9341
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	14475	20.0000	723.7423
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	13874	20.0000	693.6893
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	12077	20.0000	603.8389
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	12887	20.0000	644.3626
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	14542	20.0000	727.0980
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	12933	20.0000	646.6487

Target Compound *PFHxS*

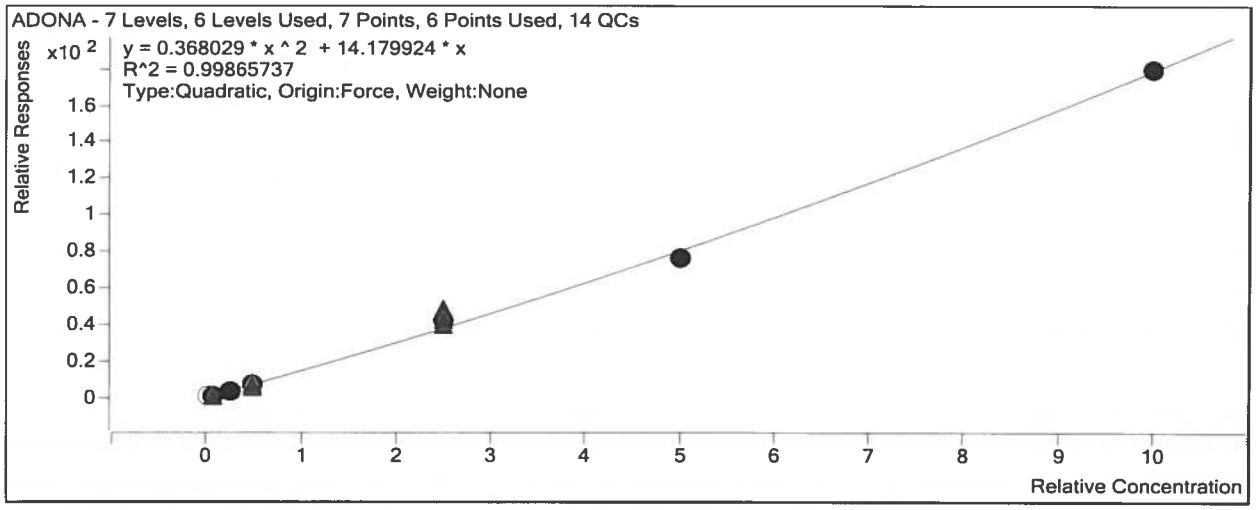
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	3277	0.4560	10.8249
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	5608	1.1400	6.7976
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	23494	4.5600	7.4273
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	46368	9.1200	8.4197
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	262017	45.6000	8.9173
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	527119	91.2000	7.9492
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1083731	182.4000	9.1882

Quantitative Analysis Calibration Report



Target Compound *ADONA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	11932	0.5000	12.5919
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	33605	1.2500	13.7391
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	131200	5.0000	14.8666
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	268440	10.0000	15.1024
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	1374665	50.0000	16.8788
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	2715604	100.0000	15.3362
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	5148483	200.0000	17.9178



Extracted ISTD *M2 6:2 FTS*

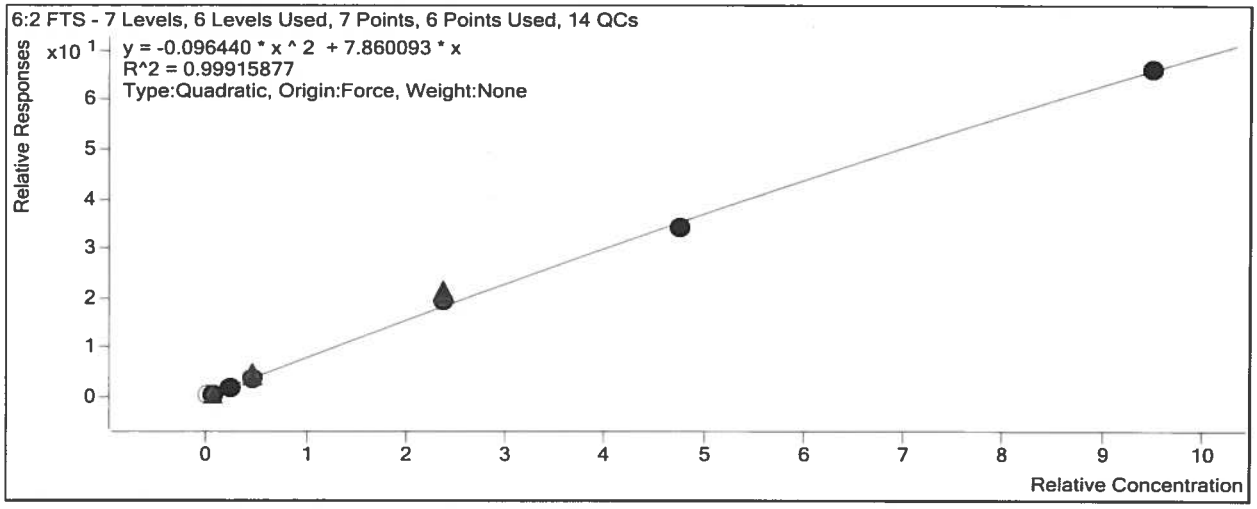
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	28709	20.0000	1435.4355

Target Compound *6:2 FTS*

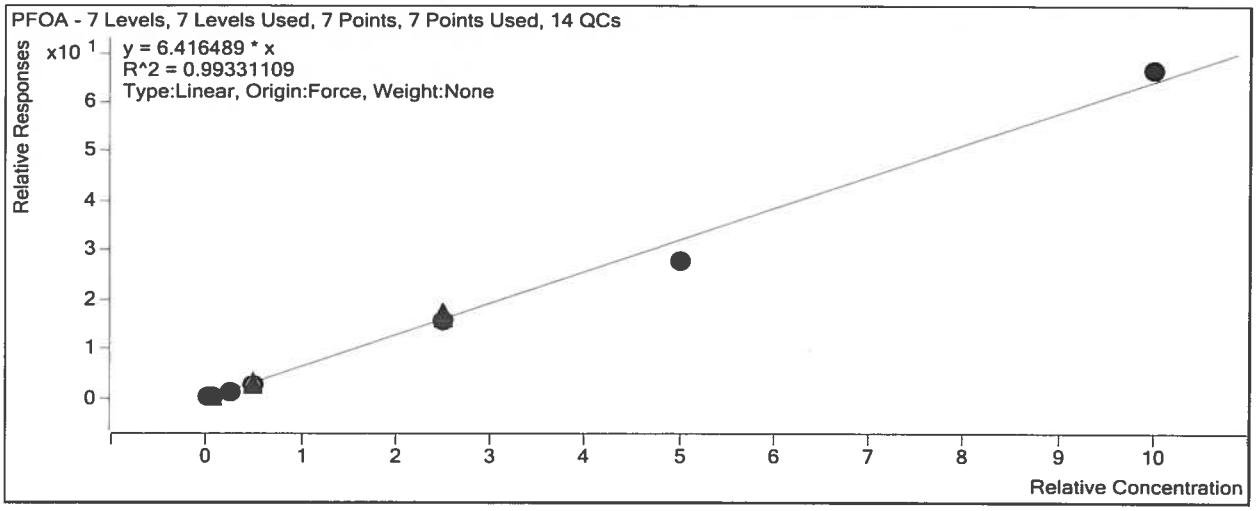
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	5577	0.4750	7.1409
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	14879	1.1900	7.8697
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	56470	4.7500	7.2829
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	119037	9.5000	7.9991
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	578079	47.5000	8.1863
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	1080961	95.0000	7.1930
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1898589	190.0000	6.9614



Extracted ISTD *M8PFOA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	37903	20.0000	1895.1713
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	39135	20.0000	1956.7488
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	35301	20.0000	1765.0252
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	35549	20.0000	1777.4629
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	32577	20.0000	1628.8690
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	35414	20.0000	1770.7097
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	28734	20.0000	1436.6951

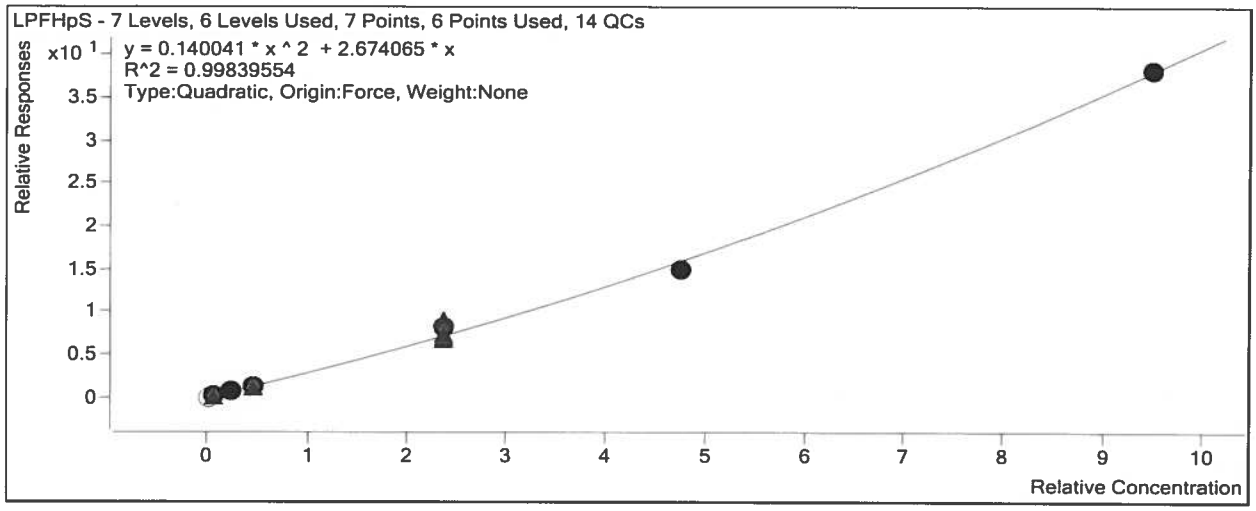
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	2288	0.4750	2.5419
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	6000	1.1900	2.5766
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	24057	4.7500	2.8694
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	49058	9.5000	2.9052
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	266372	47.5000	3.4428
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	533557	95.0000	3.1718
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1096950	190.0000	4.0185



Extracted ISTD *M9PFNA*

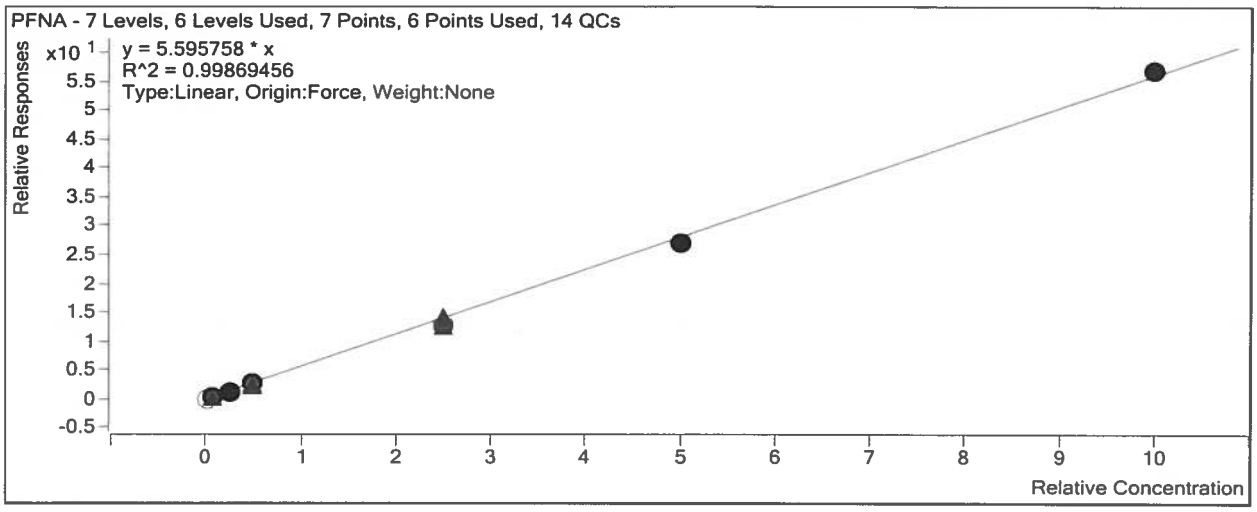
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	49086	20.0000	2454.3010
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	51594	20.0000	2579.6762
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	50104	20.0000	2505.2031
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	49188	20.0000	2459.3926
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	47185	20.0000	2359.2572
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	44919	20.0000	2245.9525
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	39414	20.0000	1970.6792

Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF



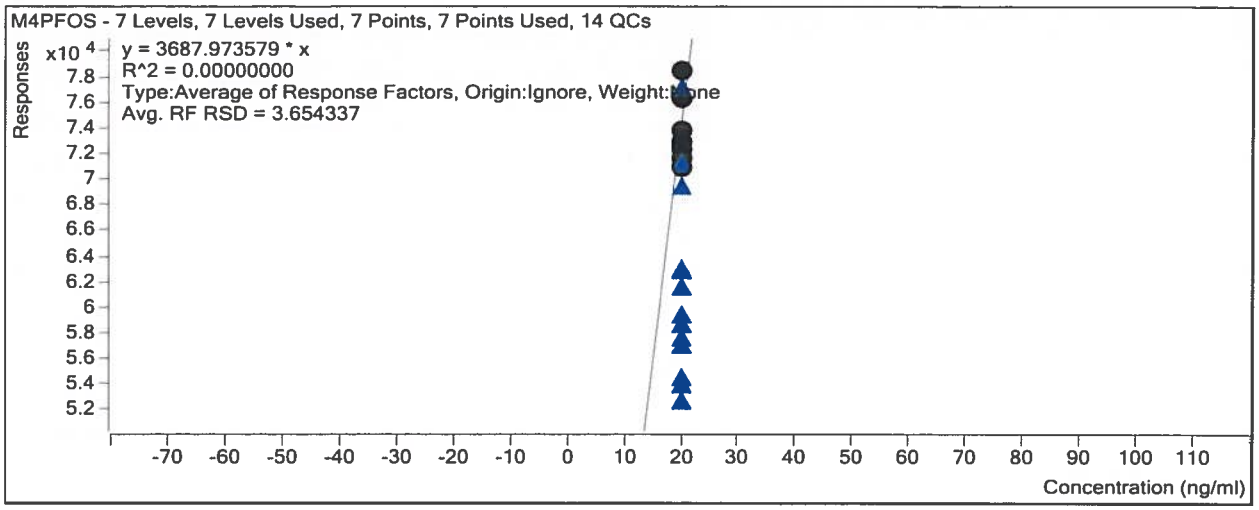
Extracted ISTD *M8PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	10818	20.0000	540.8943
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	9593	20.0000	479.6543
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	7800	20.0000	389.9963
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	9222	20.0000	461.1017
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	9318	20.0000	465.9203
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	8406	20.0000	420.2814
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	8182	20.0000	409.0863

Instrument ISTD *M4PFOS*

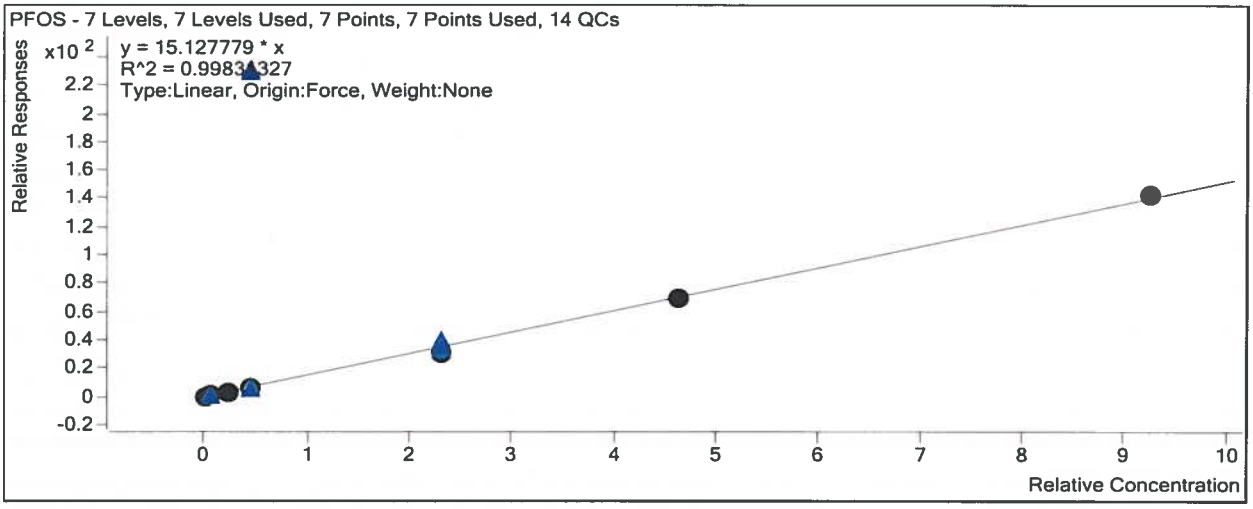
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	73762	20.0000	3688.0784
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	78415	20.0000	3920.7257
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	76346	20.0000	3817.2786
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	72288	20.0000	3614.4063
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	71003	20.0000	3550.1447
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	71572	20.0000	3578.5917
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	72932	20.0000	3646.5897

Quantitative Analysis Calibration Report



Target Compound *PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	3276	0.4628	13.0901
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	6941	1.1600	12.4755
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	28263	4.6280	15.6592
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	54659	9.2550	12.8082
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	281328	46.2800	13.0469
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	580383	92.5500	14.9210
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1159691	185.1000	15.3151

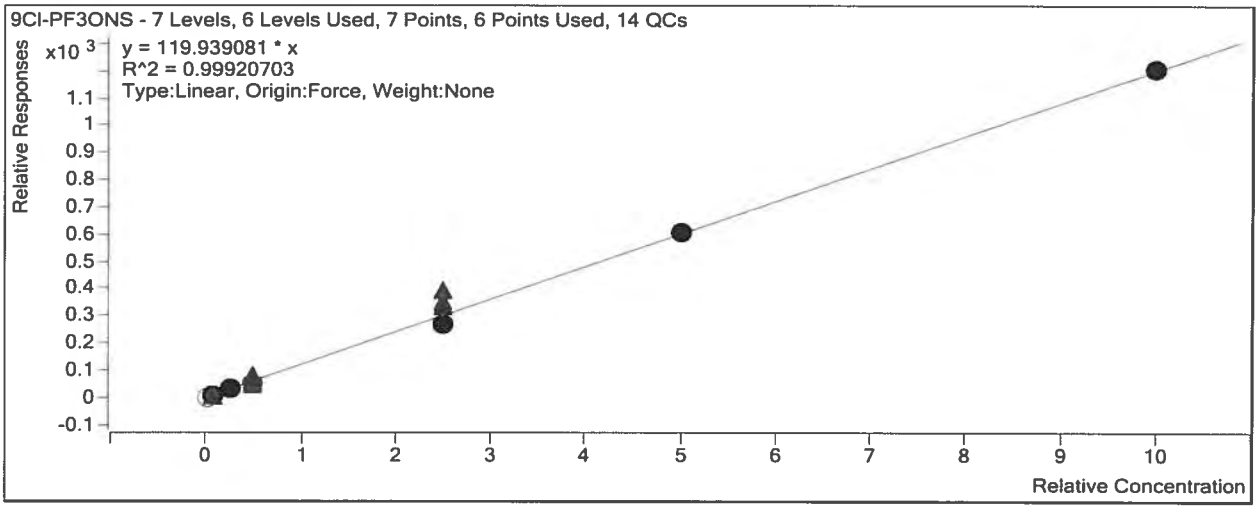


Target Compound *9CI-PF3ONS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

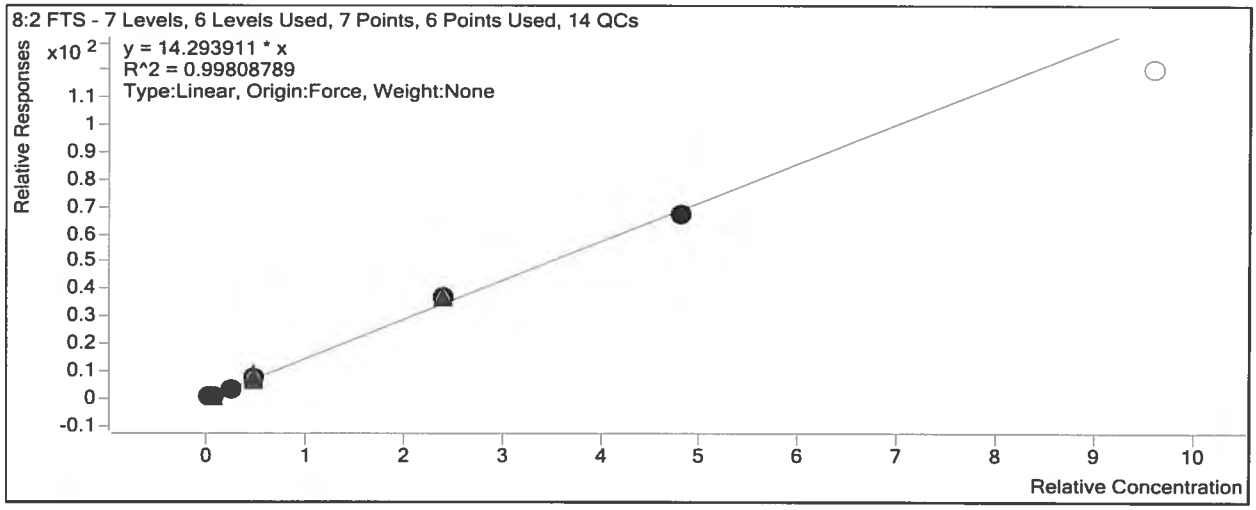
Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	9855090	200.0000	120.4525



Target Compound *8:2 FTS*

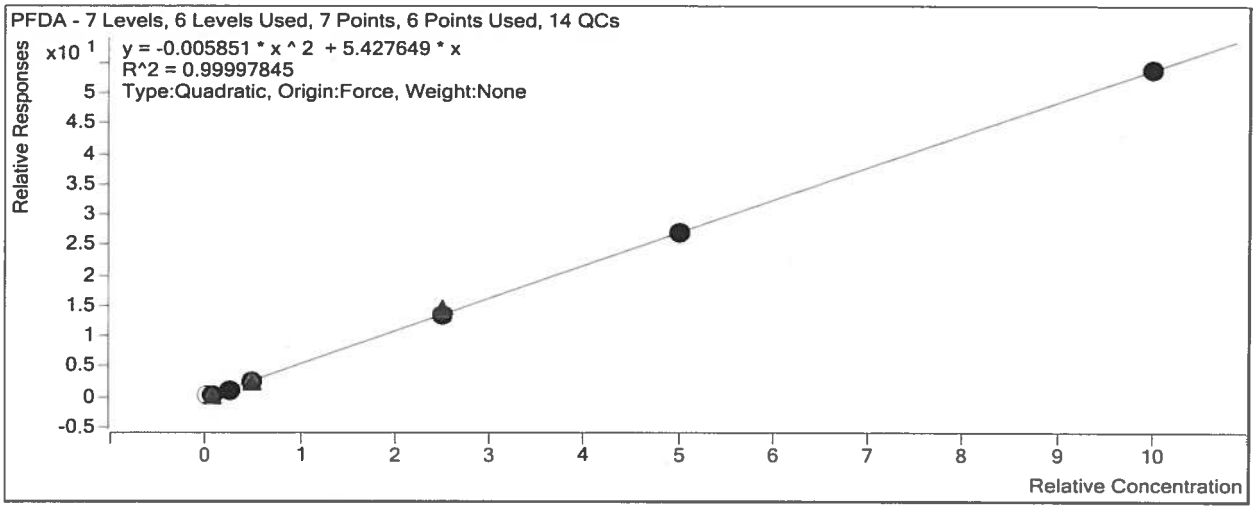
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	4923	0.4800	13.2136
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	16719	1.2000	16.1241
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	54438	4.8000	13.1796
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	118298	9.6000	16.0961
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	569978	48.0000	15.2128
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	1051148	96.0000	14.0487
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☐	1816171	192.0000	12.5141



Quantitative Analysis Calibration Report

Target Compound *PFDA*

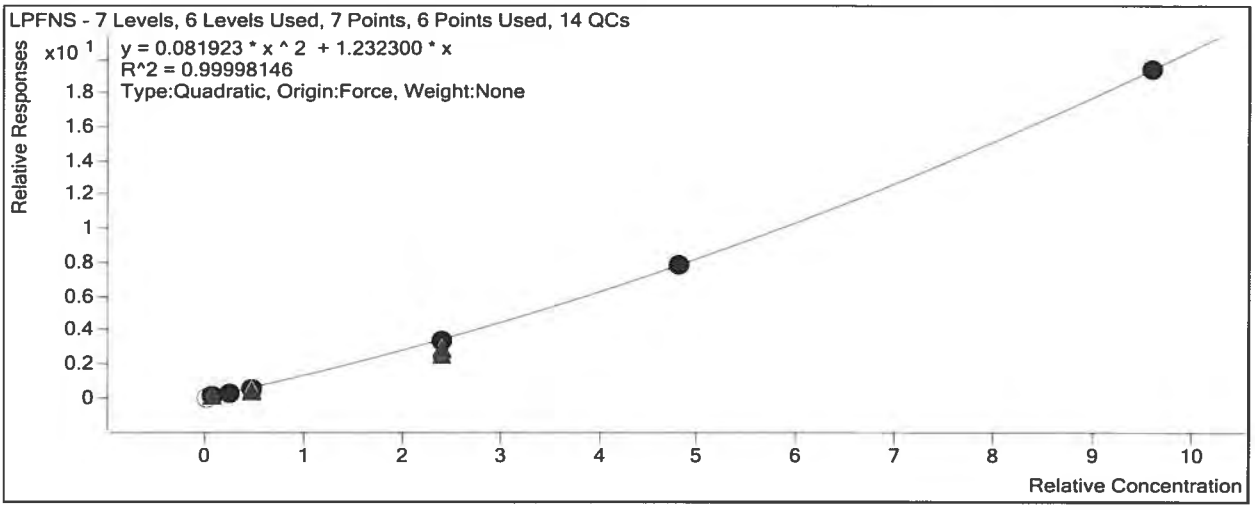
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	5787	0.5000	4.4826
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	14356	1.2500	4.5708
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	61996	5.0000	4.8245
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	121686	10.0000	5.1464
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	612102	50.0000	5.4324
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	1193136	100.0000	5.3996
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	2147066	200.0000	5.3687



Target Compound *LPFNS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	1034	0.4800	0.8781
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	3010	1.2000	0.9723
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	14095	4.8000	1.1721
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	26994	9.6000	1.1433
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	161143	48.0000	1.4230
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	351591	96.0000	1.6307
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	763637	192.0000	2.0182

Quantitative Analysis Calibration Report



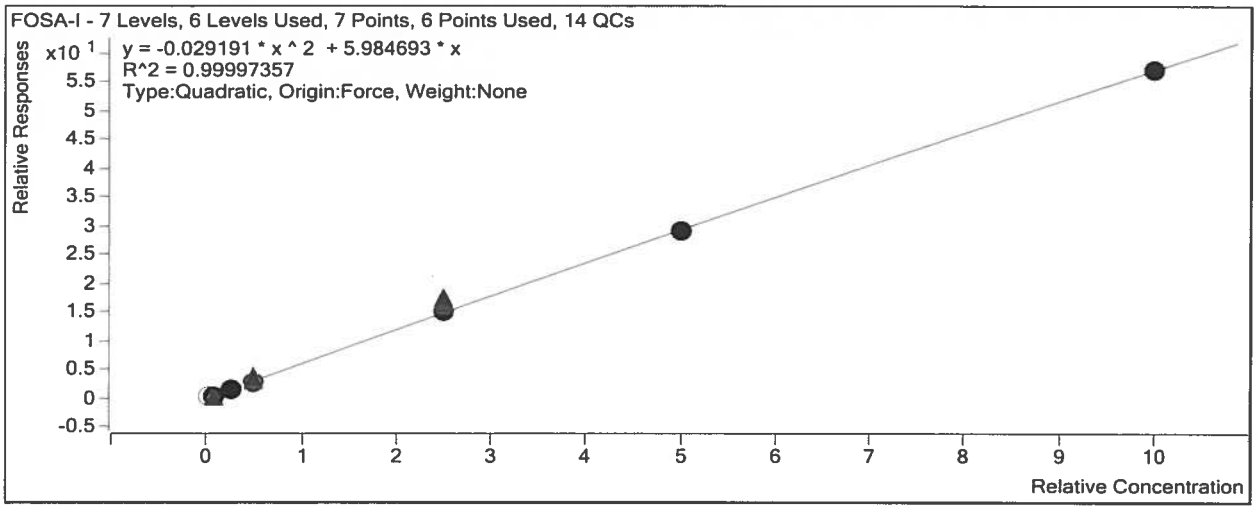
Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	42034	20.0000	2101.7057
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	46940	20.0000	2347.0095
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	46026	20.0000	2301.3068
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	45114	20.0000	2255.7092
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	44014	20.0000	2200.7144
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	45488	20.0000	2274.3914
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	45663	20.0000	2283.1380

Target Compound *FOSA-I*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	4641	0.5000	4.4162
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	12994	1.2500	4.4290
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	61211	5.0000	5.3196
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	128807	10.0000	5.7103
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	655060	50.0000	5.9532
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	1326384	100.0000	5.8318
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	2599600	200.0000	5.6930

Quantitative Analysis Calibration Report



Extracted ISTD *d3-NMeFOSAA*

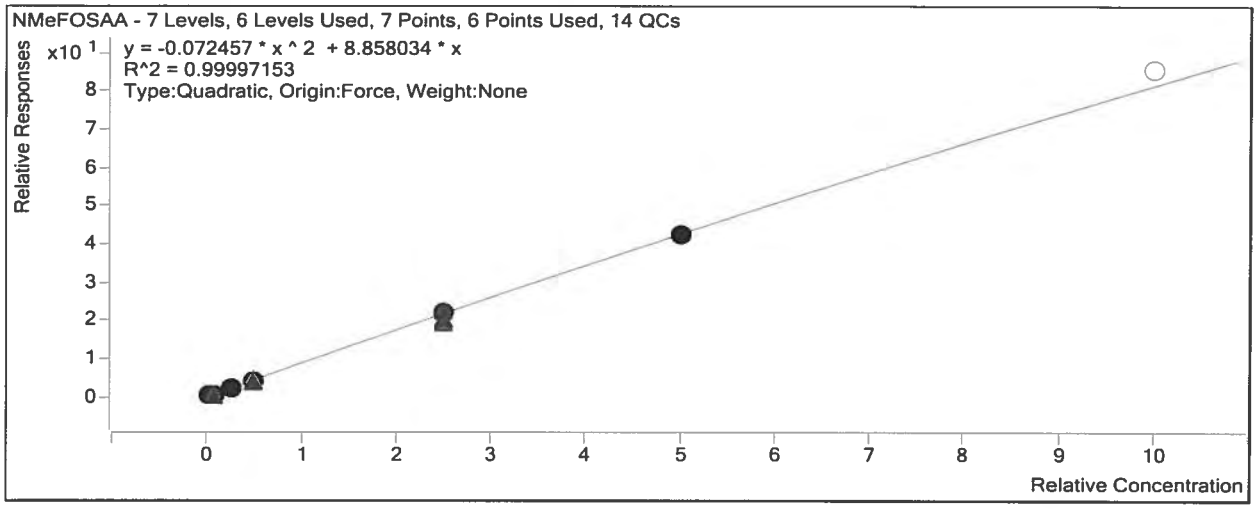
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	9535	20.0000	476.7457
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	9808	20.0000	490.4223
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	10401	20.0000	520.0505
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	11162	20.0000	558.0951
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	11276	20.0000	563.7840

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	11566	20.0000	578.3148
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	11134	20.0000	556.6915

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	2132	0.5000	8.9435
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	5564	1.2500	9.0757
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	21909	5.0000	8.4256
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	47490	10.0000	8.5093
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	245443	50.0000	8.7070
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	491125	100.0000	8.4924
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☐	951149	200.0000	8.5429

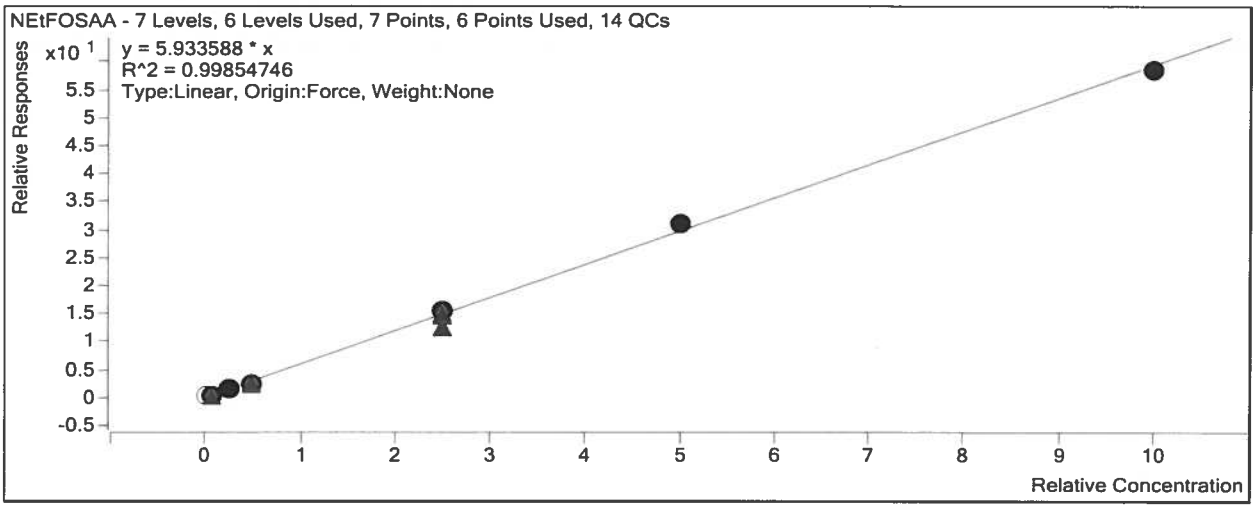


Extracted ISTD *d5-NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	18667	20.0000	933.3401
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	19998	20.0000	999.8777
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	18294	20.0000	914.6950
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	18689	20.0000	934.4263
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	15103	20.0000	755.1725
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	14597	20.0000	729.8383

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	24647	5.0000	5.3892
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	47358	10.0000	5.0681
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	234642	50.0000	6.2143
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	455235	100.0000	6.2375
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	772013	200.0000	5.8426



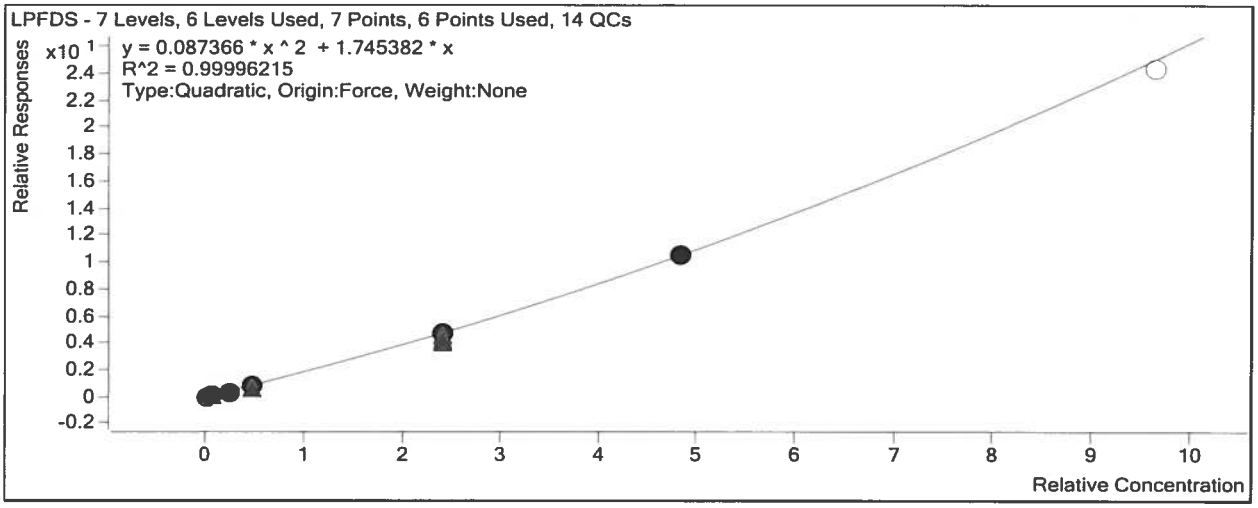
Extracted ISTD *M7PFUdA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	61728	20.0000	3086.4203
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	61164	20.0000	3058.2080
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	60476	20.0000	3023.7898
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	60340	20.0000	3016.9948
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	57954	20.0000	2897.6999
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	51446	20.0000	2572.2881
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	42097	20.0000	2104.8328

Target Compound *LPFDS*

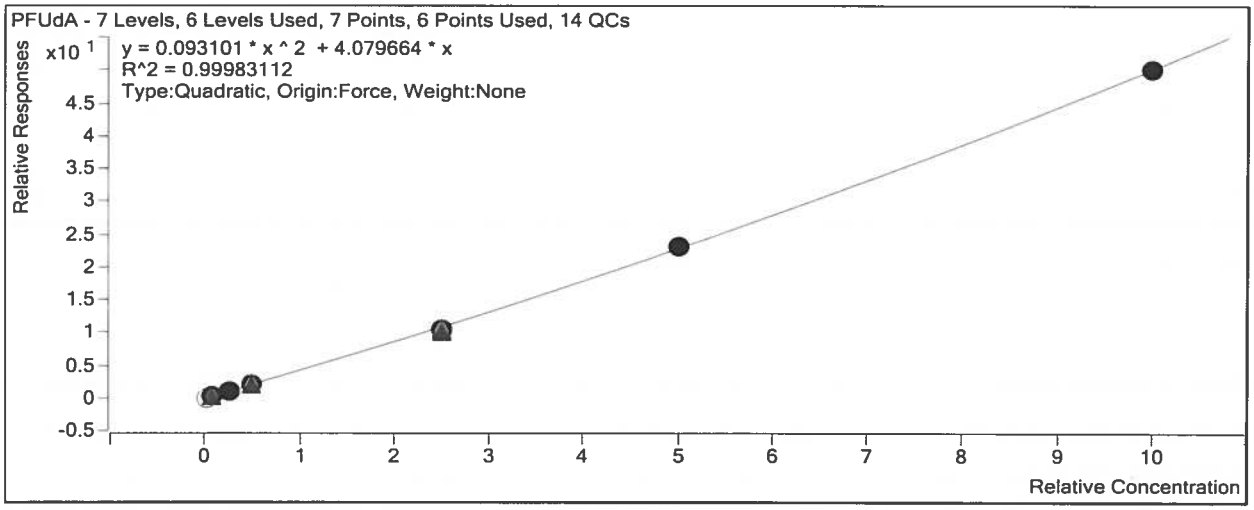
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	1656	0.4825	1.3293
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	4457	1.2100	1.4661
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	19366	4.8250	1.5617

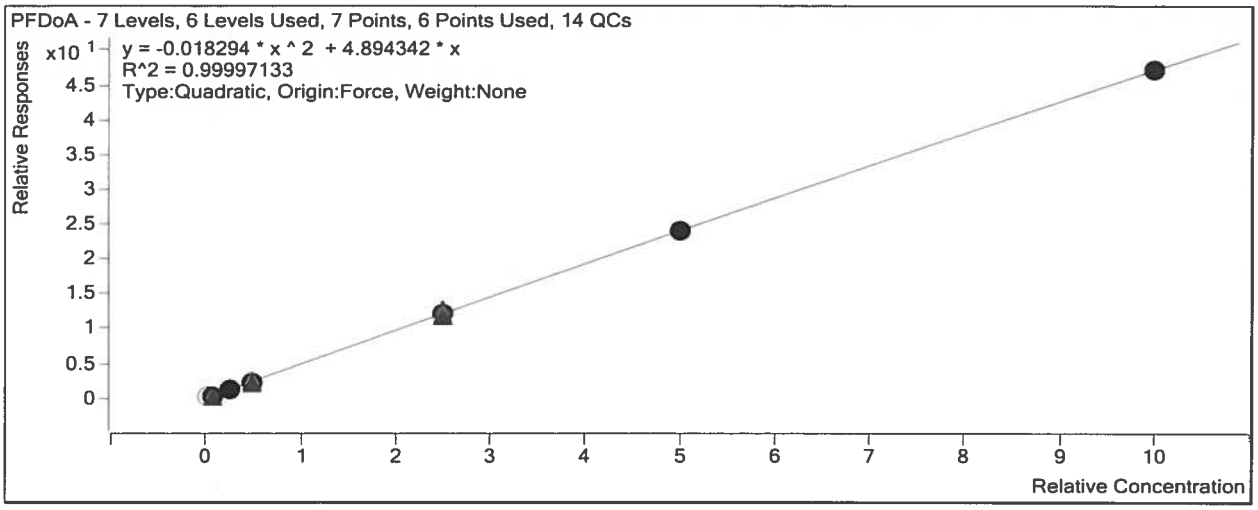
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	40118	9.6500	1.7582
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	213399	48.2500	1.9626
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	461898	96.5000	2.1662
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☐	970337	193.0000	2.5143



Target Compound *PFUdA*

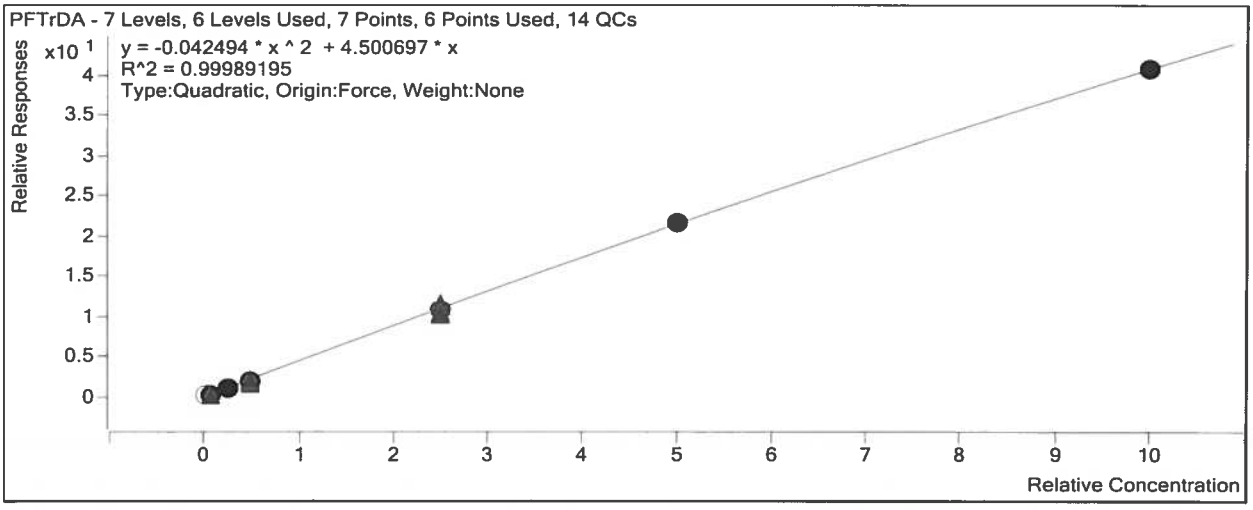
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	4934	0.5000	3.1976
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	13924	1.2500	3.6425
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	57908	5.0000	3.8302
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	121765	10.0000	4.0360
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	599459	50.0000	4.1375
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	1186841	100.0000	4.6139
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	2106863	200.0000	5.0048





Target Compound *PFTrDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	4634	0.5000	4.7294
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	10572	1.2500	4.2002
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	40923	5.0000	4.5214
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	79488	10.0000	4.0359
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	417438	50.0000	4.3090
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	825693	100.0000	4.3286
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1502962	200.0000	4.0721



Extracted ISTD *M2PFTeDA*

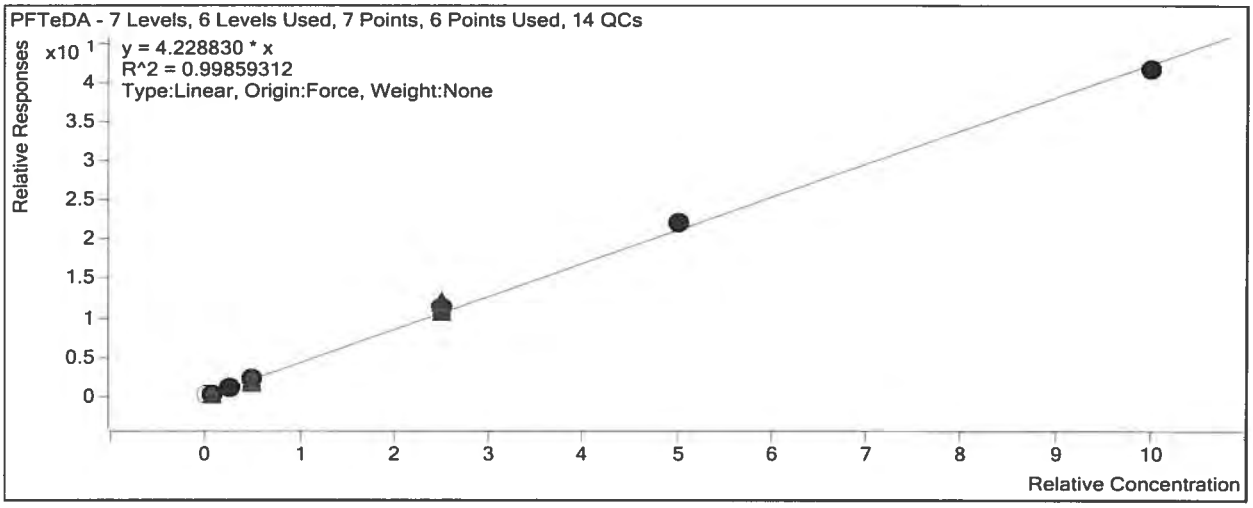
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	31411	20.0000	1570.5413

Target Compound *PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	2589	0.5000	3.5657
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	7312	1.2500	4.0520
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	29512	5.0000	4.1708
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	64466	10.0000	4.2656
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	341898	50.0000	4.5680
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	661811	100.0000	4.4005
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1308157	200.0000	4.1647



7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ1
Analysis Date:	07/15/2020 21:37	Lab File ID:	2200715A_24.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688129

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	53200	112	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	53400	111	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	50200	100	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	48000	96	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	47400	95	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	46400	105	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	54600	109	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	52500	105	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	46700	93	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	48300	97	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	50200	110	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	45200	90	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	52300	105	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	53300	115	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	47800	96	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	54000	108	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	52500	105	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	50700	101	70	130	

FORM 7E - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ1
Analysis Date:	07/16/2020 00:47	Lab File ID:	2200715A_40.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688129

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	53400	112	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	51800	108	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	49200	98	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	46300	93	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	47300	95	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	46000	104	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	53900	108	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	50700	101	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	48300	97	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	49200	98	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	45700	100	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	50600	101	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	50400	101	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	46500	101	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	49900	100	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	50900	102	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	51400	103	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	49000	98	70	130	

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	220071035	Standard ID:	1205 (ICAL Midpoint)
Analyst:	BMH	Instrument ID:	QQQ1
Analysis Date:	07/15/20 18:06	Lab File ID:	2200715A_06.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688129

	M2PFDA	M2PFHxA	M2PFOA	M4PFOS
	Area	*Area*	*Area*	*Area*
STANDARD	236447	531902	187093	71003

CLIENT SAMPLE ID	*GCAL SAMP ID*		#		#		#		#
MB2060317	2060317	287792		619015		219369		56857	
LCS2060318	2060318	290114		621699		236481		58650	
LCSD2060319	2060319	318825		689658		249421		69466	
AOI01-07-SB-00-02	22007103527	293235		619507		217910		57613	

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

FORM 8I - ORG

QQQ2 Run Log

Analyst:	BMH	Expiration:
Instrument:	QQQ2	
Batch:	2200715A	
Current ICAL Bath:	2200715ACAL/2200715ACALDW	
20mM Amm Acetate	012-34-3	7/17/2020
Methanol	2129224	3/31/2025
Calibration Std	012-33-4	1/13/2021
ICV Std	012-23-3	12/11/2020
EIS Mix	012-32-8	1/14/2021
IIS Mix	012-33-7	1/15/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2200715A_01.d	MeOH Shot	7/15/2020 14:45	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200715A_02.d	Cal	7/15/2020 14:58	BMH,QQQ2;Cal	1
1202	2200715A_03.d	Cal	7/15/2020 15:10	BMH,QQQ2;Cal	1
1203	2200715A_04.d	Cal	7/15/2020 15:23	BMH,QQQ2;Cal	1
1204	2200715A_05.d	Cal	7/15/2020 15:36	BMH,QQQ2;Cal	1
1205	2200715A_06.d	Cal	7/15/2020 15:48	BMH,QQQ2;Cal	1
1206	2200715A_07.d	Cal	7/15/2020 16:01	BMH,QQQ2;Cal	1
1207	2200715A_08.d	Cal	7/15/2020 16:13	BMH,QQQ2;Cal	1
MeOH Shot	2200715A_09.d	MeOH Shot	7/15/2020 16:26	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200715A_10.d	Cal	7/15/2020 16:39	RR not applicable: Was not used in initial Cal	1
MeOH Shot	2200715A_11.d	MeOH Shot	7/15/2020 16:51	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
MeOH Shot	2200715A_12.d	MeOH Shot	7/15/2020 17:06	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200715A_13.d	Cal	7/15/2020 17:18	RR not applicable: Was not used in initial Cal	1
MeOH Shot	2200715A_14.d	MeOH Shot	7/15/2020 17:31	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1500	2200715A_15.d	Sample	7/15/2020 17:43	BMH,QQQ2	1
1600	2200715A_16.d	QC	7/15/2020 17:56	BMH,QQQ2	1
1450	2200715A_17.d	QC	7/15/2020 18:09	BMH,QQQ2	1
MeOH Shot	2200715A_18.d	MeOH Shot	7/15/2020 18:21	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
2061035	2200715A_19.d	Sample	7/15/2020 18:34	BMH,QQQ2;687881	1
2061036	2200715A_20.d	QC	7/15/2020 18:47	BMH,QQQ2;687881	1

2061037	2200715A_21.d	QC	7/15/2020 18:59	BMH,QQQ2;687881	1
22007071806	2200715A_22.d	Sample	7/15/2020 19:12	BMH,QQQ2;687881	1
22007071801	2200715A_23.d	Sample	7/15/2020 19:25	BMH,QQQ2;687881	1
22007071802	2200715A_24.d	Sample	7/15/2020 19:37	BMH,QQQ2;687881	1
22007071803	2200715A_25.d	Sample	7/15/2020 19:50	BMH,QQQ2;687881	1
22007071804	2200715A_26.d	Sample	7/15/2020 20:02	BMH,QQQ2;687881	1
22007071805	2200715A_27.d	Sample	7/15/2020 20:15	BMH,QQQ2;687881	1
MeOH Shot	2200715A_28.d	MeOH Shot	7/15/2020 20:28	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1400	2200715A_29.d	QC	7/15/2020 20:40	BMH,QQQ2;CCV	1
22007071601	2200715A_30.d	Sample	7/15/2020 20:53	BMH,QQQ2;687881	1
22007071602	2200715A_31.d	Sample	7/15/2020 21:06	BMH,QQQ2;687881	1
22007071603	2200715A_32.d	Sample	7/15/2020 21:18	BMH,QQQ2;687881	1
MeOH Shot	2200715A_33.d	MeOH Shot	7/15/2020 21:31	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007071201 x10	2200715A_34.d	Sample	7/15/2020 21:43	BMH,QQQ2;687881	10
MeOH Shot	2200715A_35.d	MeOH Shot	7/15/2020 21:56	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007071301 x10	2200715A_36.d	Sample	7/15/2020 22:09	BMH,QQQ2;687881	10
MeOH Shot	2200715A_37.d	MeOH Shot	7/15/2020 22:21	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007080605 x5	2200715A_38.d	Sample	7/15/2020 22:34	BMH,QQQ2;687573	5
22007080607 x5	2200715A_39.d	Sample	7/15/2020 22:47	BMH,QQQ2;687573	5
22007080608	2200715A_40.d	Sample	7/15/2020 22:59	BMH,QQQ2;687574	1
22007080610	2200715A_41.d	Sample	7/15/2020 23:12	BMH,QQQ2;687574	1
1400	2200715A_42.d	QC	7/15/2020 23:24	BMH,QQQ2;CCV	1
2060314	2200715A_43.d	Sample	7/15/2020 23:37	BMH,QQQ2;687723	1
2060315	2200715A_44.d	QC	7/15/2020 23:50	BMH,QQQ2;687723	1
2060316	2200715A_45.d	QC	7/16/2020 0:02	BMH,QQQ2;687723	1
22007103504	2200715A_46.d	Sample	7/16/2020 0:15	BMH,QQQ2;687723	1
22007103505	2200715A_47.d	Sample	7/16/2020 0:28	BMH,QQQ2;687723	1
22007103506	2200715A_48.d	Sample	7/16/2020 0:40	BMH,QQQ2;687723	1
22007103507	2200715A_49.d	QC	7/16/2020 0:53	BMH,QQQ2;687723	1
22007103508	2200715A_50.d	QC	7/16/2020 1:06	BMH,QQQ2;687723	1
22007103509	2200715A_51.d	Sample	7/16/2020 1:18	BMH,QQQ2;687723	1
22007103510	2200715A_52.d	Sample	7/16/2020 1:31	BMH,QQQ2;687723	1
22007103511	2200715A_53.d	Sample	7/16/2020 1:43	BMH,QQQ2;687723	1
22007103512	2200715A_54.d	Sample	7/16/2020 1:56	BMH,QQQ2;687723	1

22007103513	2200715A_55.d	Sample	7/16/2020 2:09	BMH,QQQ2;687723	1
22007103517	2200715A_56.d	Sample	7/16/2020 2:21	BMH,QQQ2;687723	1
22007103518	2200715A_57.d	Sample	7/16/2020 2:34	BMH,QQQ2;687723	1
1400	2200715A_58.d	QC	7/16/2020 2:47	BMH,QQQ2;CCV	1
22007103519	2200715A_59.d	Sample	7/16/2020 2:59	BMH,QQQ2;687723	1
22007103520	2200715A_60.d	Sample	7/16/2020 3:12	BMH,QQQ2;687723	1
22007103521	2200715A_61.d	Sample	7/16/2020 3:24	BMH,QQQ2;687723	1
22007103522	2200715A_62.d	Sample	7/16/2020 3:37	BMH,QQQ2;687723	1
22007103523	2200715A_63.d	Sample	7/16/2020 3:50	BMH,QQQ2;687723	1
22007103524	2200715A_64.d	Sample	7/16/2020 4:02	BMH,QQQ2;687723	1
22007103525	2200715A_65.d	Sample	7/16/2020 4:15	BMH,QQQ2;687723	1
22007103526	2200715A_66.d	Sample	7/16/2020 4:28	BMH,QQQ2;687723	1
1400	2200715A_67.d	QC	7/16/2020 4:40	BMH,QQQ2;CCV	1

4I

ORGANICS INSTRUMENT BLANK

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/15/2020 17:43	Lab File ID:	2200715A_15.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
6:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.79	4.00	10.0	
8:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.63	4.00	10.0	
NEtFOSAA	ng/L	8.00	U	5.38	8.00	10.0	
NMeFOSAA	ng/L	8.00	U	4.60	8.00	10.0	
Perfluorobutanesulfonic acid	ng/L	4.00	U	1.47	4.00	10.0	
Perfluorobutanoic acid	ng/L	4.00	U	2.13	4.00	10.0	
Perfluorodecanoic acid	ng/L	4.00	U	1.65	4.00	10.0	
Perfluorododecanoic acid	ng/L	4.00	U	2.45	4.00	10.0	
Perfluoroheptanoic acid	ng/L	4.00	U	1.85	4.00	10.0	
Perfluorohexanesulfonic acid	ng/L	4.00	U	1.64	4.00	10.0	
Perfluorohexanoic acid	ng/L	4.00	U	1.94	4.00	10.0	
Perfluorononanoic acid	ng/L	4.00	U	1.68	4.00	10.0	
Perfluorooctanesulfonic acid	ng/L	4.00	U	1.70	4.00	10.0	
Perfluorooctanoic acid	ng/L	4.00	U	1.80	4.00	10.0	
Perfluoropentanoic acid	ng/L	4.00	U	2.35	4.00	10.0	
Perfluorotetradecanoic acid	ng/L	4.00	U	2.76	4.00	10.0	
Perfluorotridecanoic acid	ng/L	4.00	U	2.56	4.00	10.0	
Perfluoroundecanoic acid	ng/L	4.00	U	1.86	4.00	10.0	

* - Result greater than 1/2 LOQ

FORM 4I - ORG

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/15/2020 17:56	Lab File ID:	2200715A_16.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47400	51600	109	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	47900	49700	104	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	44600	89	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	54600	109	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50200	51400	102	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	50200	51100	102	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50100	53400	107	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50100	51200	102	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50100	48100	96	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50300	53000	105	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	50600	55800	110	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50100	61700	123	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50200	52400	104	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	50300	42500	84	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50700	52700	104	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50100	58600	117	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50100	44500	89	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50100	56900	114	70	130	

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/15/2020 18:09	Lab File ID:	2200715A_17.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	8.32	88	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	7.46	78	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	7.87	79	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	7.90	79	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.32	83	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	8.16	92	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.80	88	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	10.0	100	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	6.96	70	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.80	88	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	7.37	81	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	10.6	106	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	8.08	81	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.22	78	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	7.46	75	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	9.76	97	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	10.2	102	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	8.88	89	70	130	

FORM 7S - ORG

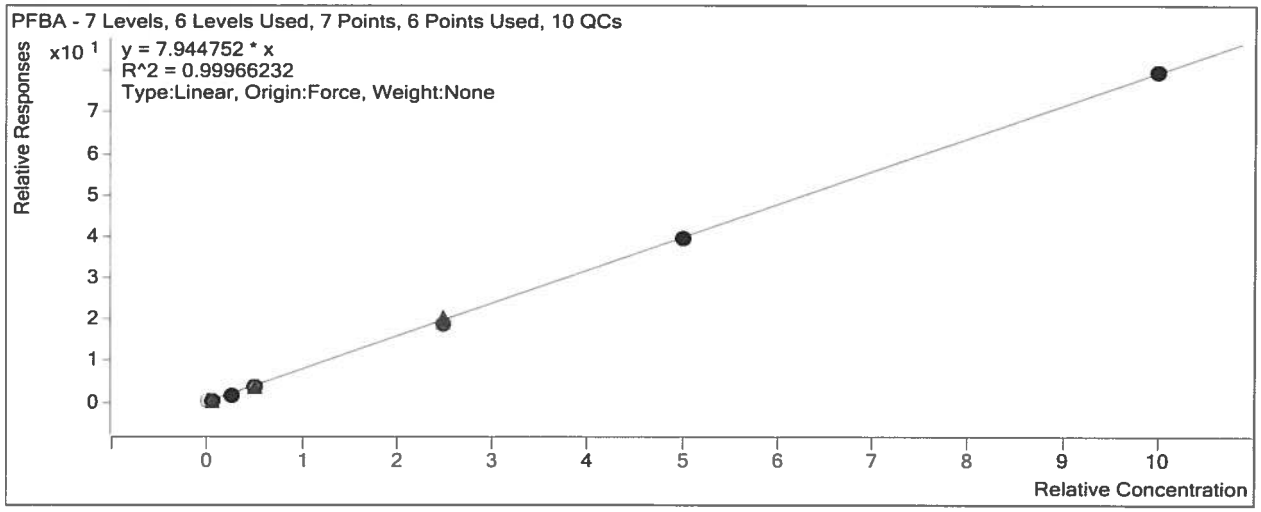
Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2200715ACAL\QuantResults\2200715A.batch.bin		
Analysis Time	7/17/2020 9:41 AM	**Analyst Name**	GCAL\lcms
Report Time	7/17/2020 9:44 AM	**Reporter Name**	GCAL\lcms
Last Calib Update	7/16/2020 3:54 PM	**Batch State**	Processed

Calibration Info

Target Compound *PFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	3967	0.5000	6.7729
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	9771	1.2500	6.3917
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	39695	5.0000	6.5682
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	84276	10.0000	6.9209
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	454480	50.0000	7.5463
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	933885	100.0000	7.8882
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1835517	200.0000	7.9873

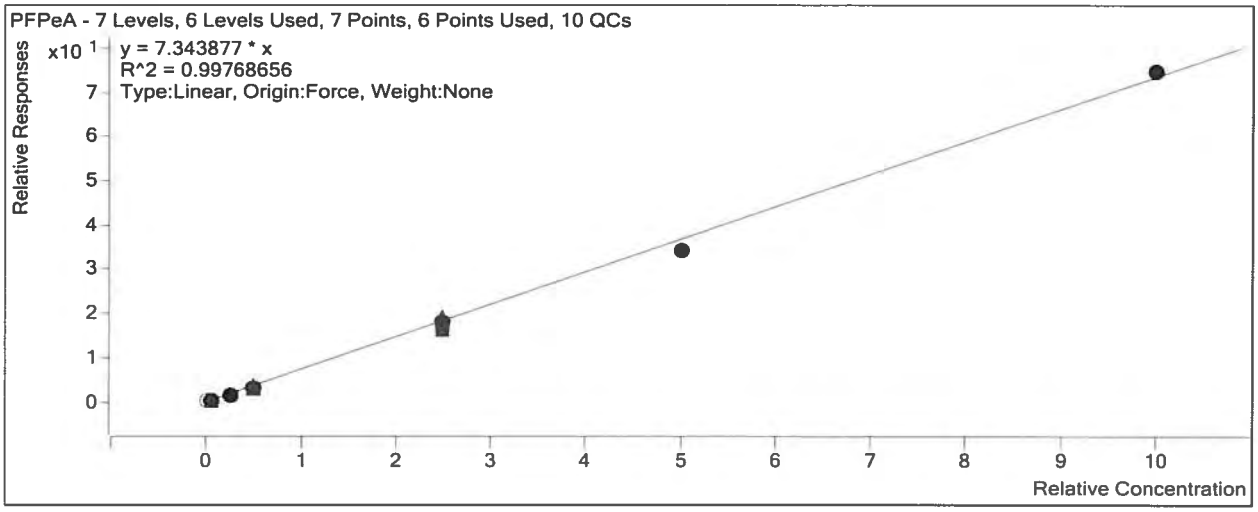


Extracted ISTD *MPFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	23429	20.0000	1171.4586
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	24458	20.0000	1222.9110
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	24174	20.0000	1208.6882
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	24354	20.0000	1217.7031
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	24090	20.0000	1204.5073
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	23678	20.0000	1183.9040
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	22981	20.0000	1149.0254

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	45687	10.0000	6.3368
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	251207	50.0000	7.1374
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	510912	100.0000	6.8183
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1004503	200.0000	7.4916



Extracted ISTD *M5PFPeA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	14090	20.0000	704.4924
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	14520	20.0000	725.9848
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	14459	20.0000	722.9290
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	14420	20.0000	720.9835
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	14078	20.0000	703.9130
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	14986	20.0000	749.3202
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	13408	20.0000	670.4201

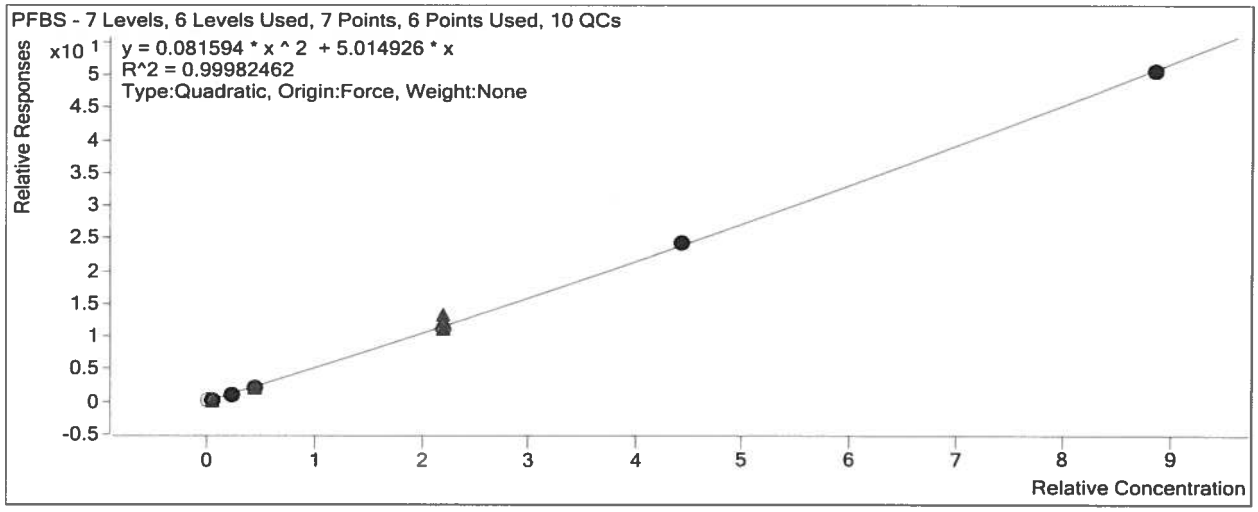
Extracted ISTD *M3PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	8550	20.0000	427.4938
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	10138	20.0000	506.9073
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	9269	20.0000	463.4688
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	9007	20.0000	450.3433

Quantitative Analysis Calibration Report

Target Compound *PFBS*

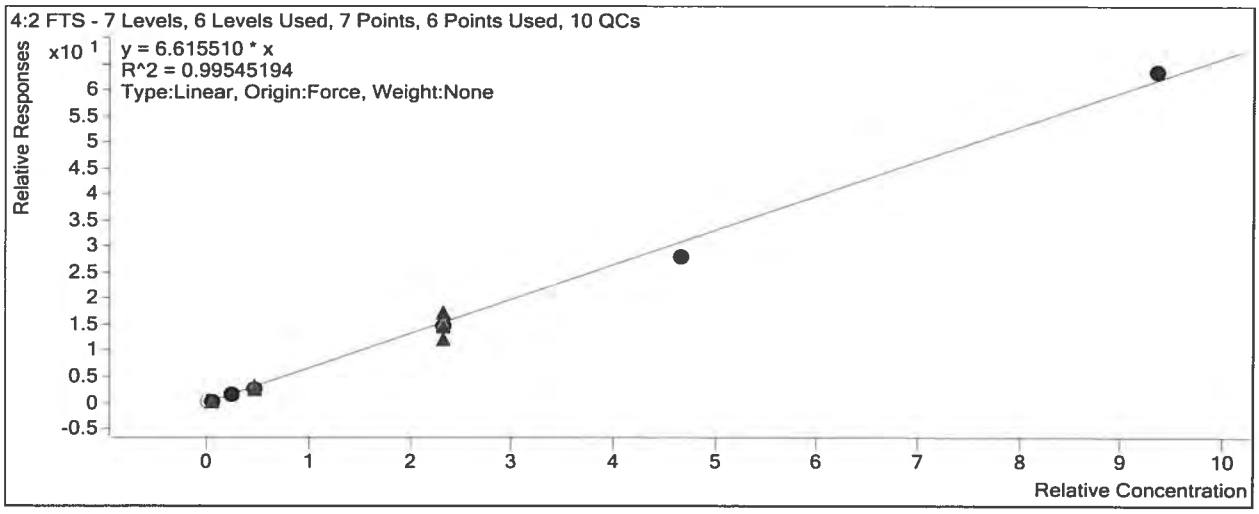
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	669	0.4425	3.5360
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2388	1.1100	4.2436
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	9128	4.4250	4.4511
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	18815	8.8500	4.7208
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	102400	44.2500	5.0070
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	206967	88.5000	5.4560
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	396983	177.0000	5.7300



Target Compound *4:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	248	0.4675	4.5583
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	897	1.1700	5.3426
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	3460	4.6700	5.9876
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	7163	9.3500	5.8694
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	36796	46.7500	6.1866
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	71040	93.5000	5.9625
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	137115	187.0000	6.8079

Quantitative Analysis Calibration Report



Extracted ISTD *M2 4:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	2331	20.0000	116.5326
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2871	20.0000	143.5434
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	2475	20.0000	123.7306
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	2611	20.0000	130.5303
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	2545	20.0000	127.2255
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	2549	20.0000	127.4277
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	2154	20.0000	107.7037

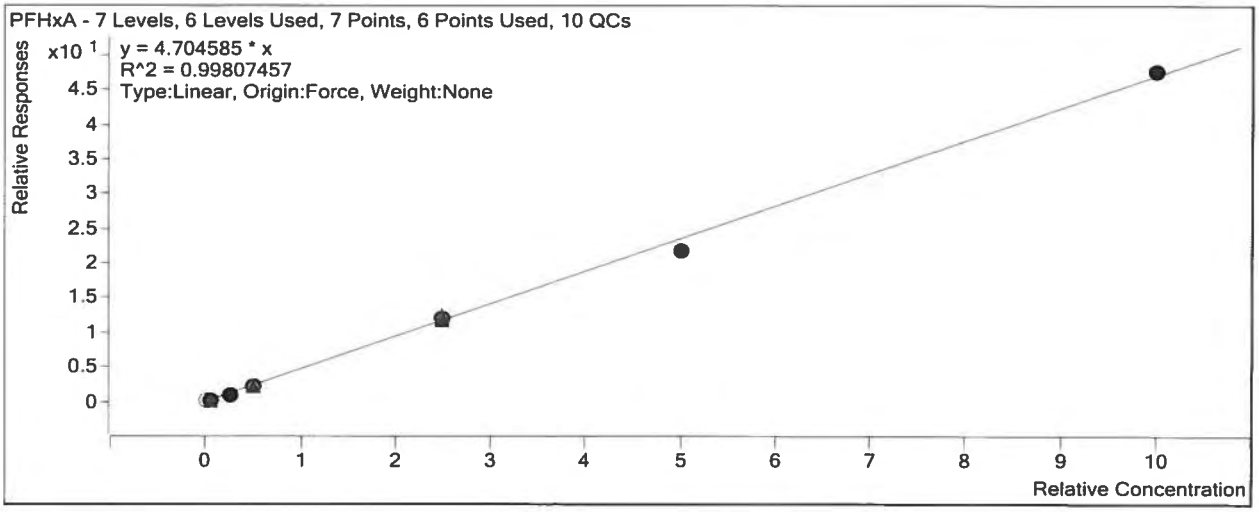
Extracted ISTD *M5PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	15983	20.0000	799.1551
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	16118	20.0000	805.8750
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	17157	20.0000	857.8664
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	16219	20.0000	810.9644
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	15917	20.0000	795.8292
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	18001	20.0000	900.0518
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	15918	20.0000	795.8842

Target Compound *PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

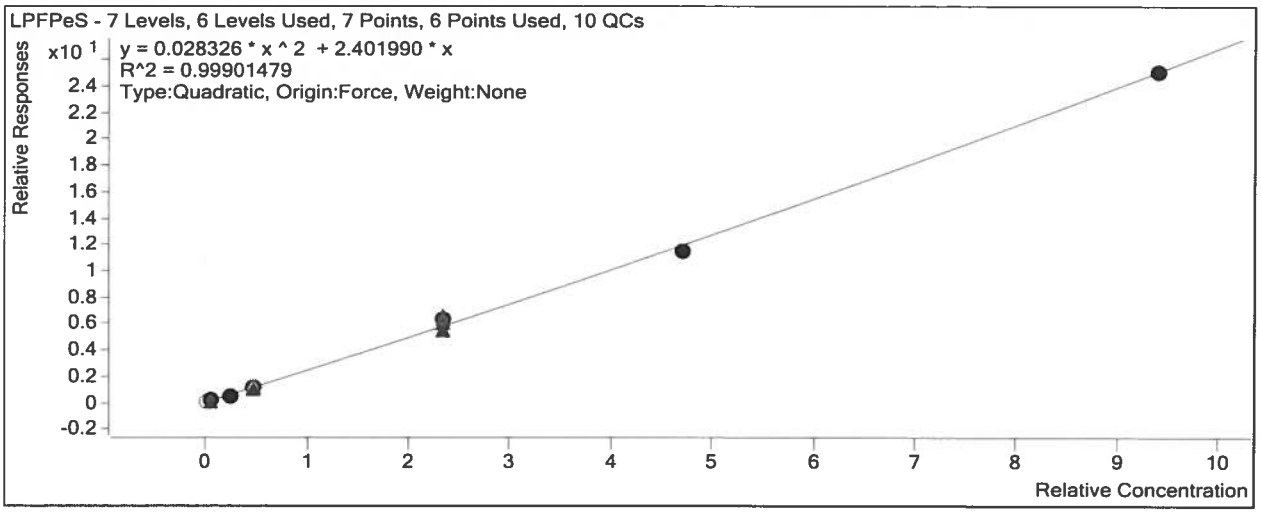
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	1786	0.5000	4.4709
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	4140	1.2500	4.1099
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	16284	5.0000	3.7964
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	35091	10.0000	4.3271
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	191628	50.0000	4.8158
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	394609	100.0000	4.3843
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	760744	200.0000	4.7792



Instrument ISTD *M2PFHxA*

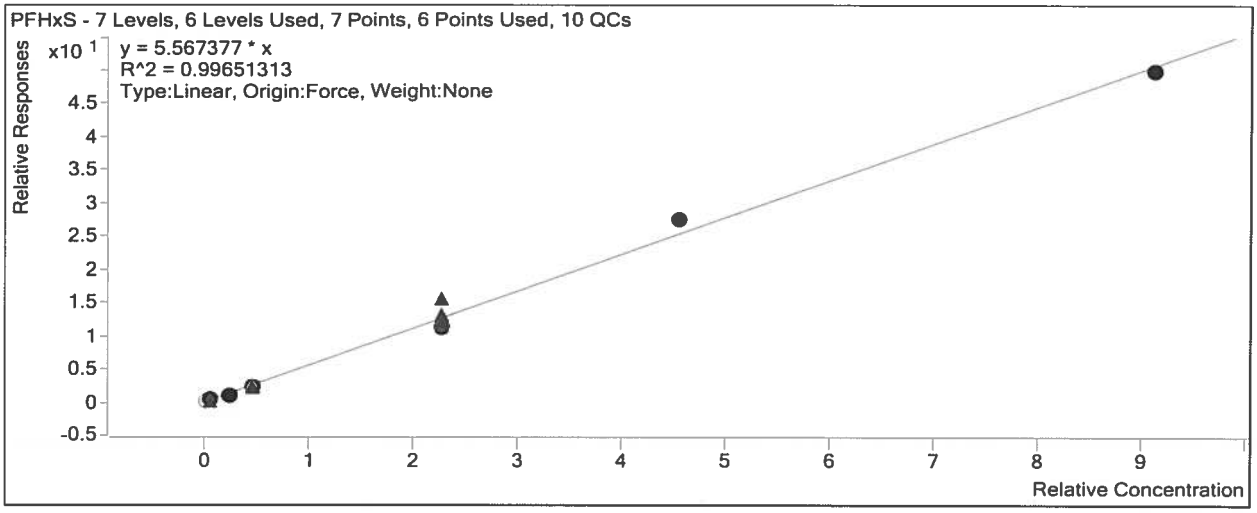
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	141253	40.0000	3531.3209
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	152203	40.0000	3805.0703
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	152571	40.0000	3814.2662
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	151586	40.0000	3789.6602
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	152663	40.0000	3816.5688
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	150819	40.0000	3770.4761
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	137622	40.0000	3440.5589

Quantitative Analysis Calibration Report



Target Compound *PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	704	0.4560	3.9720
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2611	1.1400	5.4278
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	9487	4.5600	4.7473
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	19592	9.1200	5.1928
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	106941	45.6000	4.9060
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	212725	91.2000	6.0138
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	417291	182.4000	5.4985

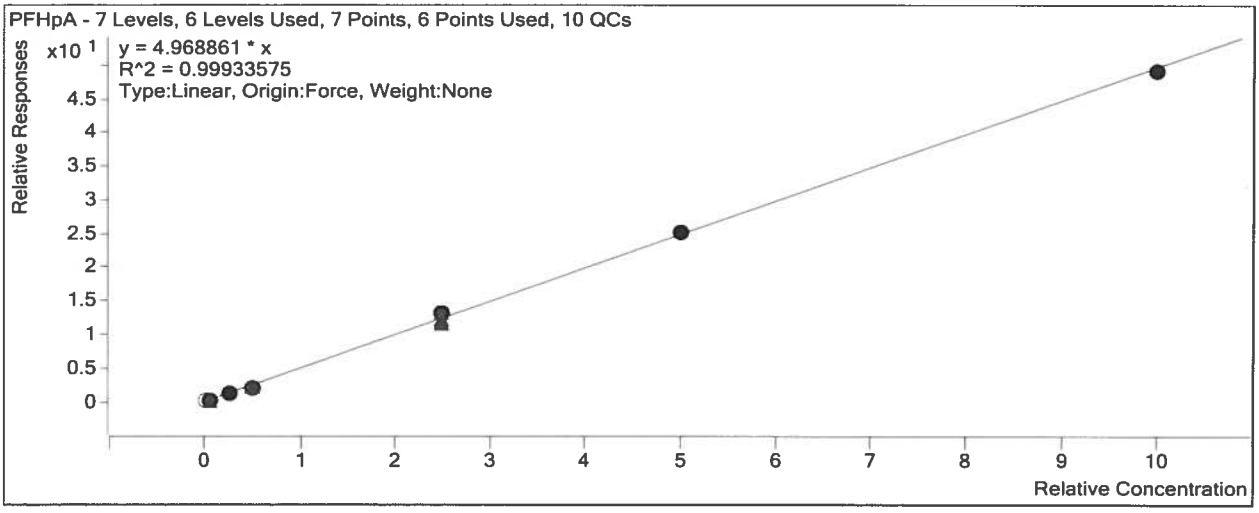


Target Compound *PFHpA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	713410	200.0000	4.9292



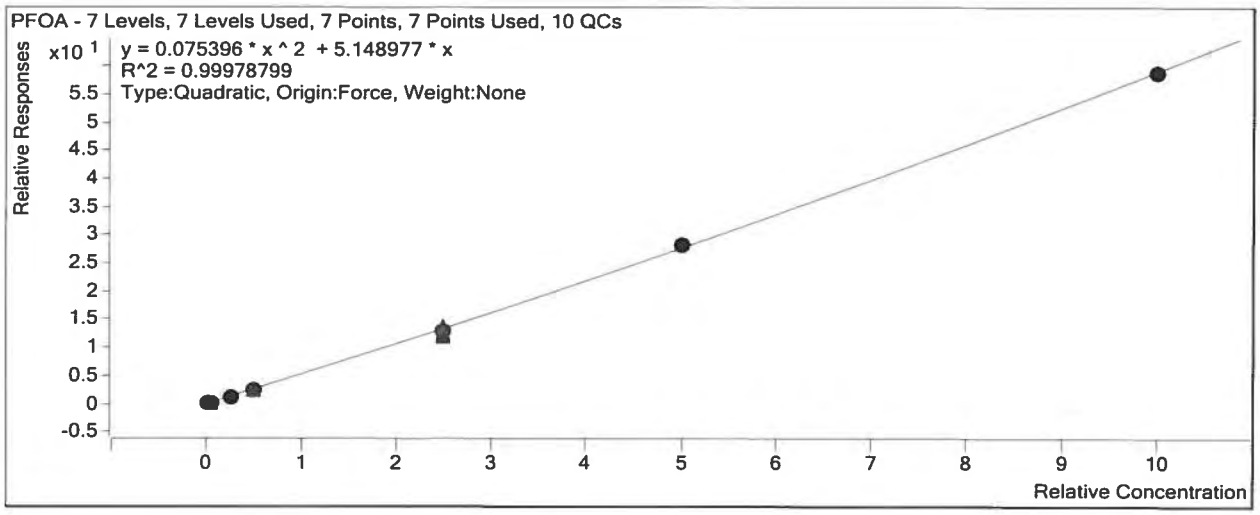
Extracted ISTD *M4PFHpA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	13249	20.0000	662.4624
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	14973	20.0000	748.6589
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	13305	20.0000	665.2547
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	15211	20.0000	760.5602
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	13424	20.0000	671.1886
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	14632	20.0000	731.5792
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	14473	20.0000	723.6577

Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	7772	20.0000	388.6248
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	8439	20.0000	421.9540
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	8765	20.0000	438.2486
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	8274	20.0000	413.6898
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	9560	20.0000	478.0225
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	7757	20.0000	387.8576
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	8321	20.0000	416.0699

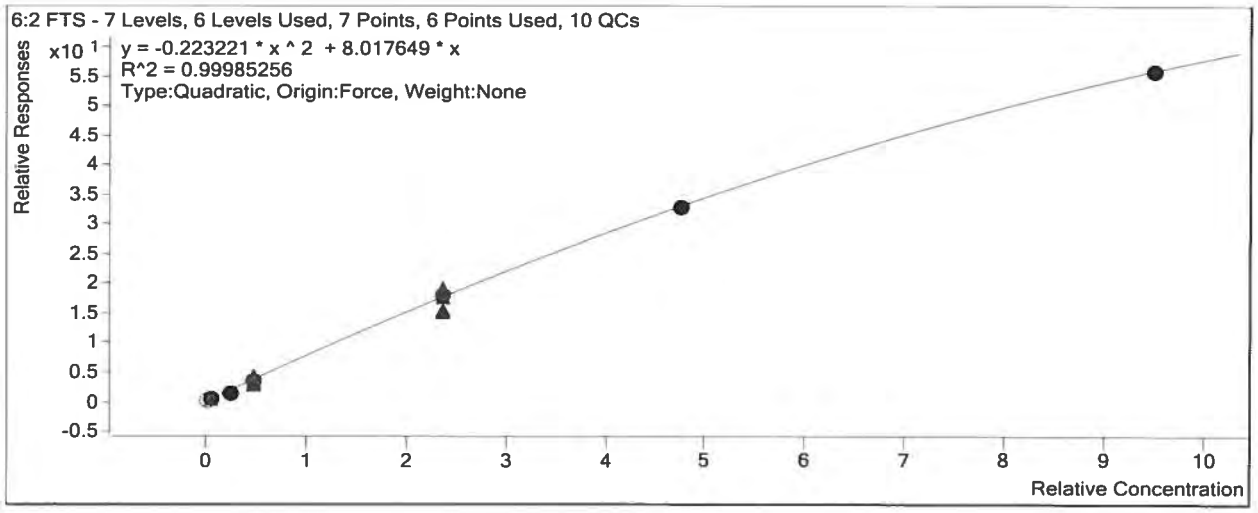
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *6:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	739	0.4750	8.7363
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	1450	1.1900	6.3777
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	5495	4.7500	5.8783
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	12422	9.5000	7.4566
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	63474	47.5000	7.5857
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	130972	95.0000	6.9398
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	239687	190.0000	5.8978



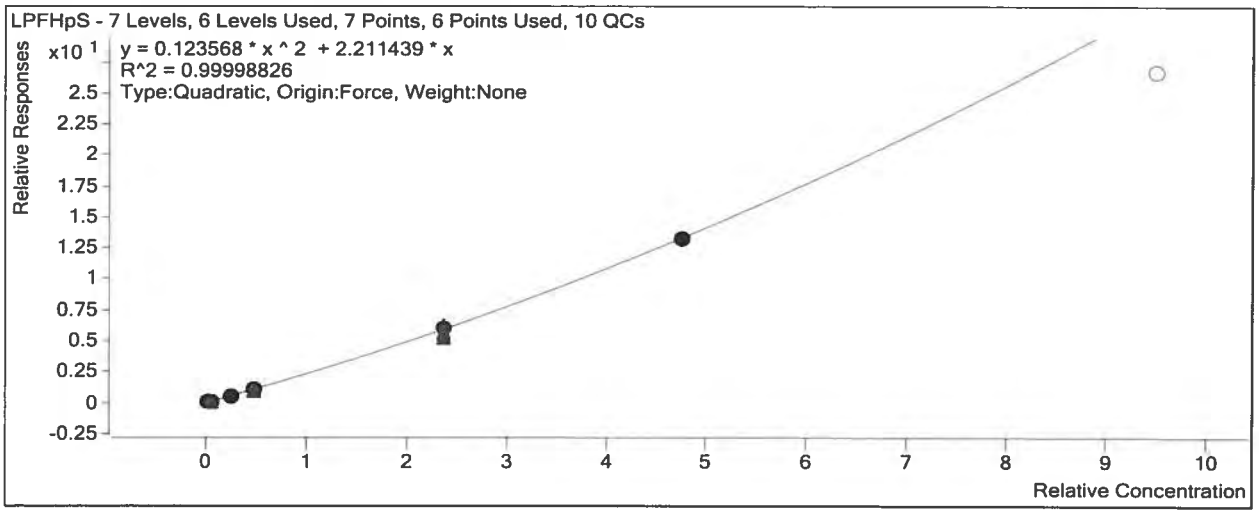
Extracted ISTD *M2 6:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	3562	20.0000	178.1187
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	3821	20.0000	191.0606
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	3936	20.0000	196.7897
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	3507	20.0000	175.3626
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	3523	20.0000	176.1588
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	3973	20.0000	198.6576
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	4278	20.0000	213.8953

Extracted ISTD *M8PFOA*

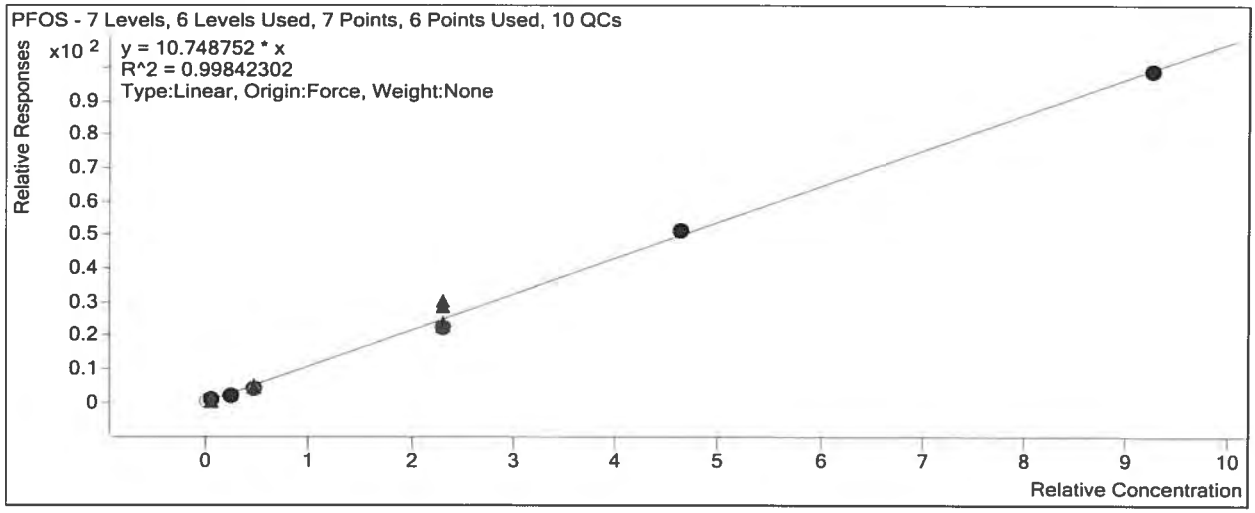
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



Target Compound *PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	1652	0.4628	14.5839
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	3890	1.1600	10.0082
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	12124	4.6280	8.0153
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	26401	9.2550	8.1660
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	140641	46.2800	9.6026
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	291147	92.5500	11.1361
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	579534	185.1000	10.7318

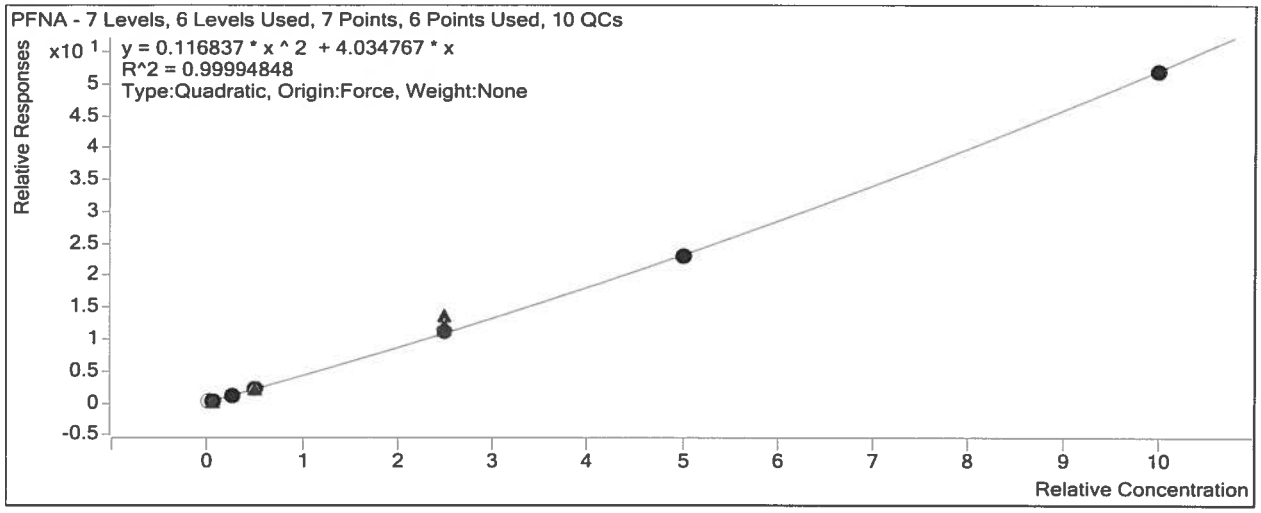


Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	827912	200.0000	5.2064



Extracted ISTD *M9PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	18740	20.0000	936.9797
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	18211	20.0000	910.5319
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	18642	20.0000	932.0930
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	17848	20.0000	892.3863
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	18898	20.0000	944.9109
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	18208	20.0000	910.4165
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	15902	20.0000	795.0968

Extracted ISTD *M8PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	4894	20.0000	244.6955
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	6701	20.0000	335.0410
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	6537	20.0000	326.8481
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	6986	20.0000	349.3244
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	6329	20.0000	316.4695
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	5650	20.0000	282.4885
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	5835	20.0000	291.7440

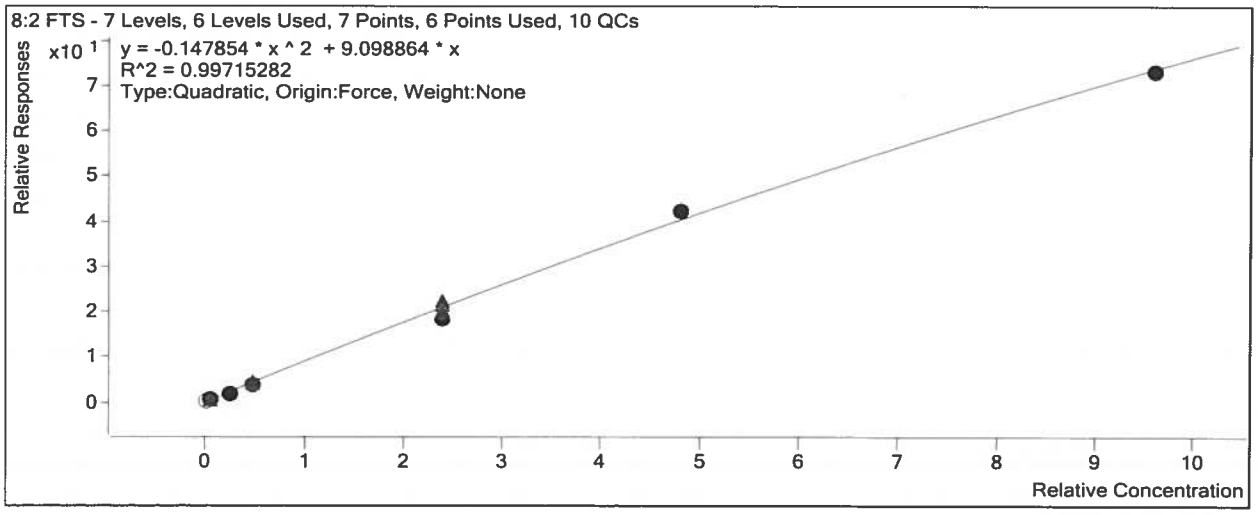
Quantitative Analysis Calibration Report

Extracted ISTD *M2 8:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	3308	20.0000	165.3790
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	3224	20.0000	161.2040
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	3366	20.0000	168.3032
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	3695	20.0000	184.7748
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	3468	20.0000	173.3850
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	3201	20.0000	160.0587
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	3358	20.0000	167.9029

Target Compound *8:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	609	0.4800	7.6694
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2233	1.2000	11.5425
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	5913	4.8000	7.3195
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	13290	9.6000	7.4920
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	63771	48.0000	7.6625
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	135704	96.0000	8.8316
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	246334	192.0000	7.6413

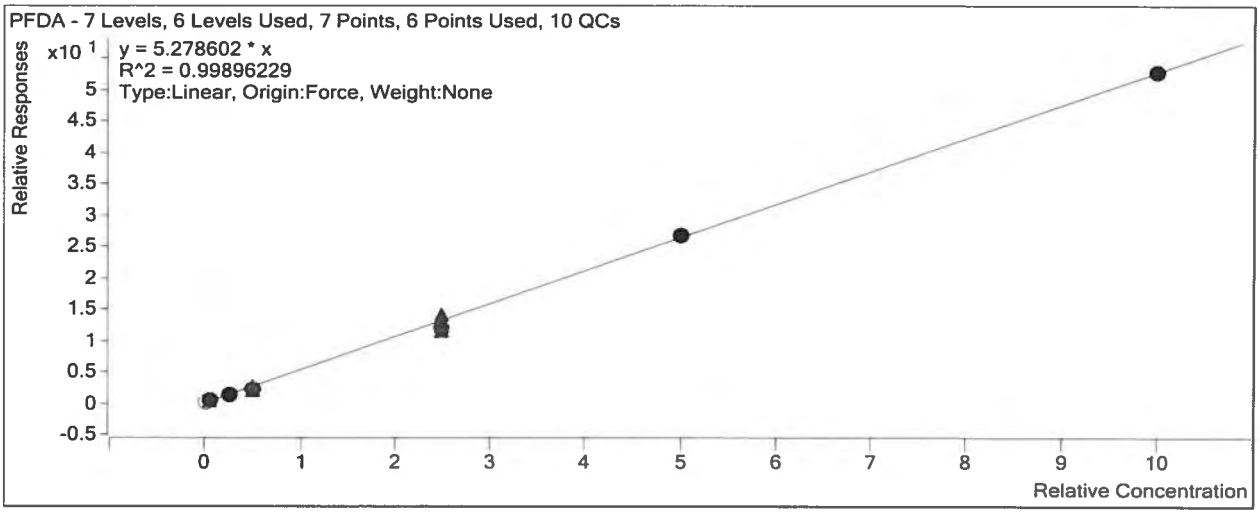


Target Compound *PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

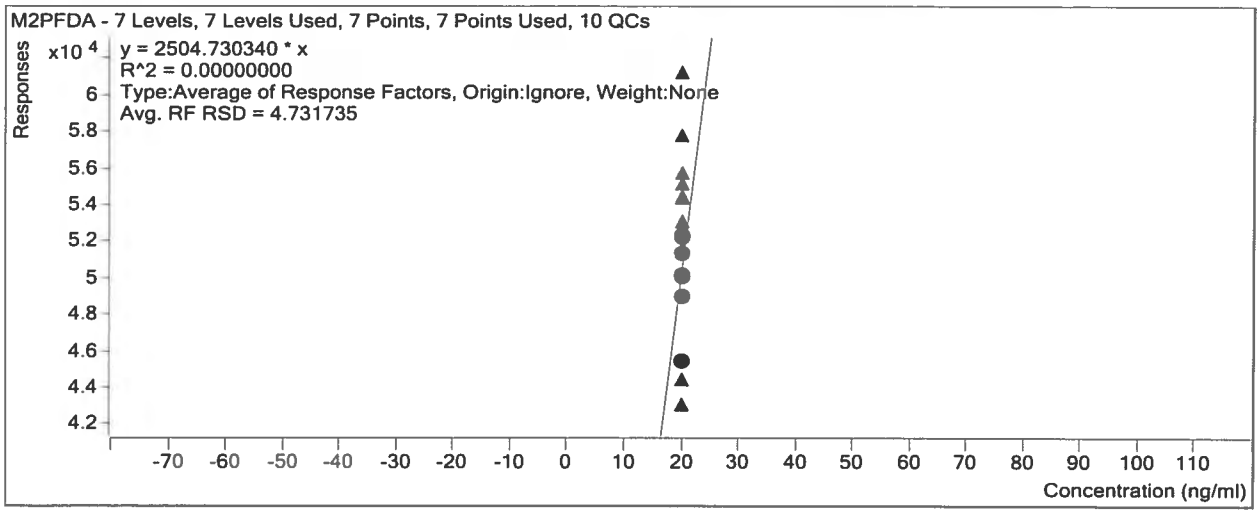


Extracted ISTD *M6PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	10365	20.0000	518.2625
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	10104	20.0000	505.1988
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	10385	20.0000	519.2538
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	10343	20.0000	517.1309
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	10213	20.0000	510.6384
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	9905	20.0000	495.2549
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	9466	20.0000	473.3035

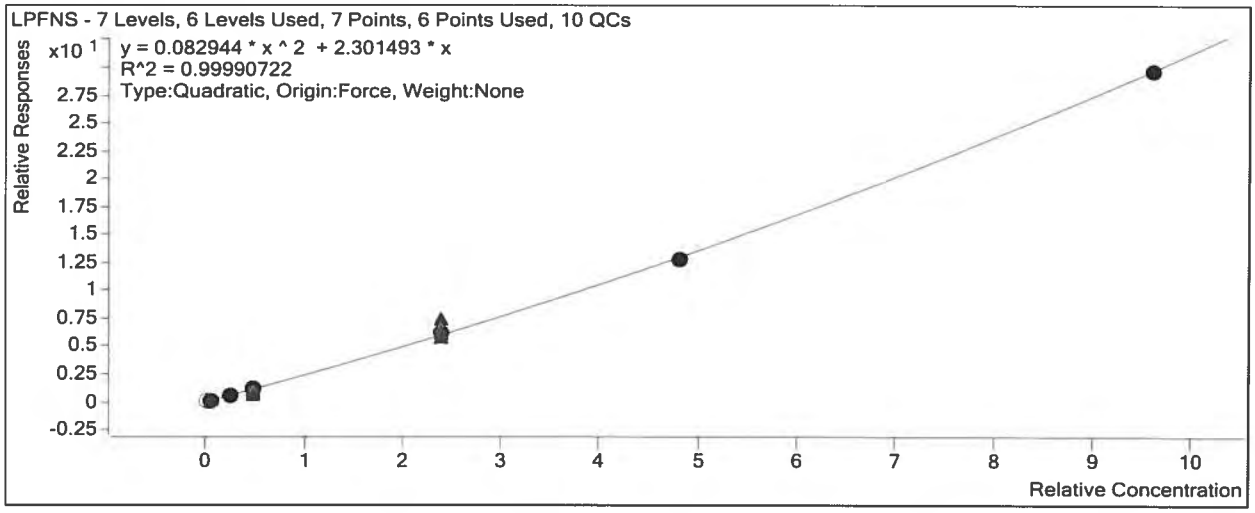
Instrument ISTD *M2PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	52195	20.0000	2609.7469
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	50185	20.0000	2509.2481
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	50085	20.0000	2504.2696
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	52355	20.0000	2617.7466
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	51393	20.0000	2569.6304
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	48960	20.0000	2448.0184
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	45489	20.0000	2274.4524



Target Compound *LPFNS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	1160	0.4800	2.5786
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2817	1.2000	2.5784
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	10440	4.8000	2.3335
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	22291	9.6000	2.6019
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	116379	48.0000	2.5659
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	233360	96.0000	2.6700
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	473303	192.0000	3.1004

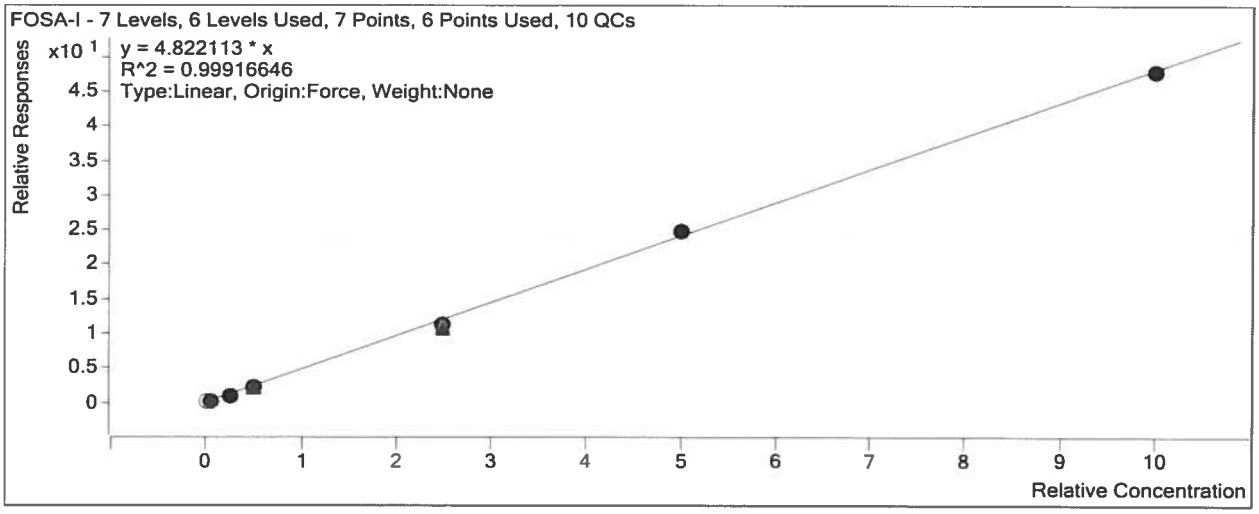


Target Compound *FOSA-I*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	525113	200.0000	4.8040



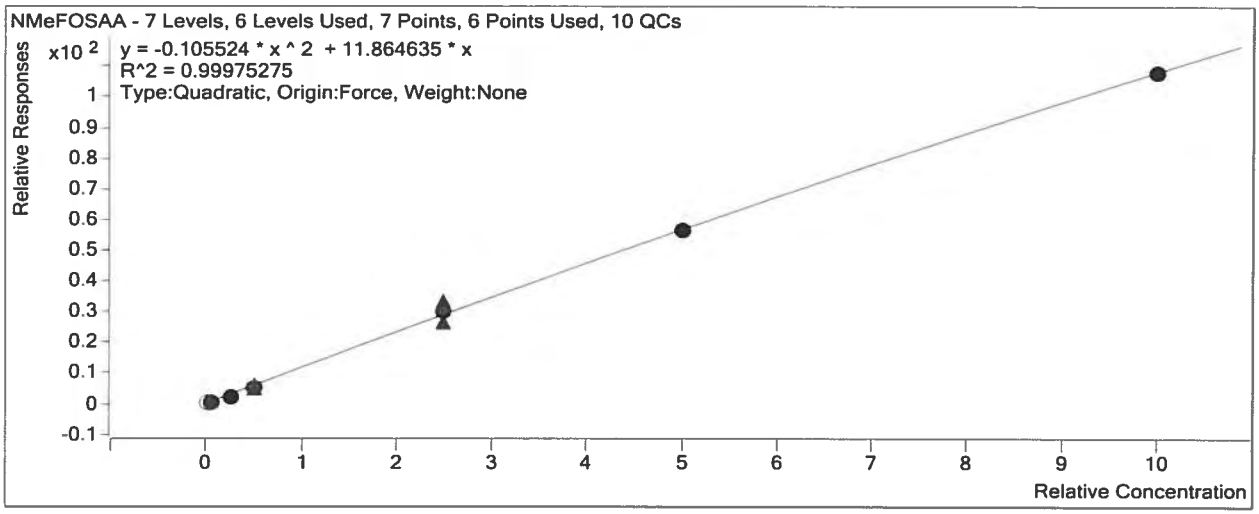
Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	10801	20.0000	540.0266
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	11461	20.0000	573.0674
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	11307	20.0000	565.3343
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	10136	20.0000	506.7998
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	11066	20.0000	553.2780
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	10286	20.0000	514.2768
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	10931	20.0000	546.5398

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	2008	0.5000	11.5681
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	3995	1.2500	9.2988
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	15943	5.0000	8.8133
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	35031	10.0000	10.4547
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	191798	50.0000	11.9801
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	390406	100.0000	11.2361
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	774969	200.0000	10.8163

Quantitative Analysis Calibration Report



Extracted ISTD *d3-NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	6943	20.0000	347.1361
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	6874	20.0000	343.6777
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	7236	20.0000	361.8008
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	6701	20.0000	335.0719
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	6404	20.0000	320.1947
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	6949	20.0000	347.4566
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	7165	20.0000	358.2416

Extracted ISTD *d5-NEtFOSAA*

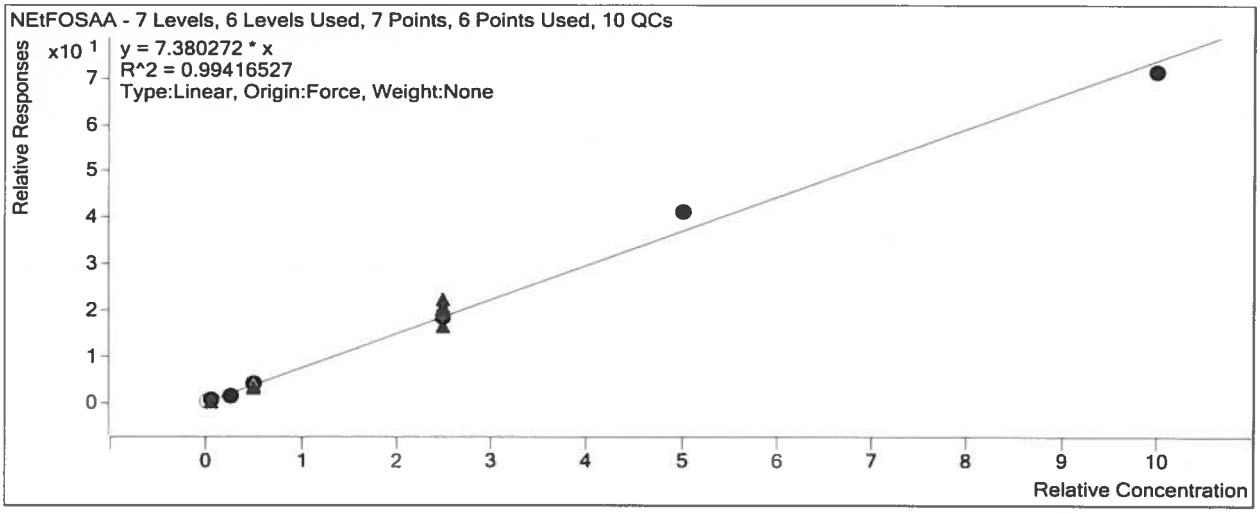
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	8839	20.0000	441.9648
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	8542	20.0000	427.0840
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	9919	20.0000	495.9368
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	8174	20.0000	408.7167
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	8730	20.0000	436.5011
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	8076	20.0000	403.8202
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	8773	20.0000	438.6483

Target Compound *NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	628274	200.0000	7.1615



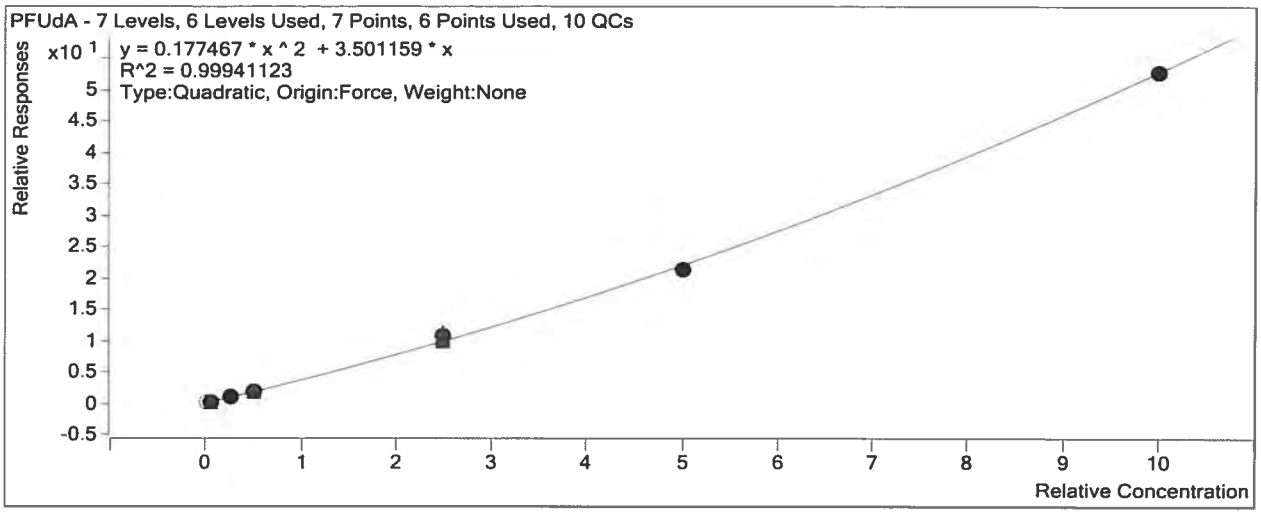
Extracted ISTD *M7PFUdA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	11436	20.0000	571.8089
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	10878	20.0000	543.8854
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	11090	20.0000	554.4877
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	11977	20.0000	598.8641
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	11323	20.0000	566.1520
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	11166	20.0000	558.3114
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	8743	20.0000	437.1374

Target Compound *PFUdA*

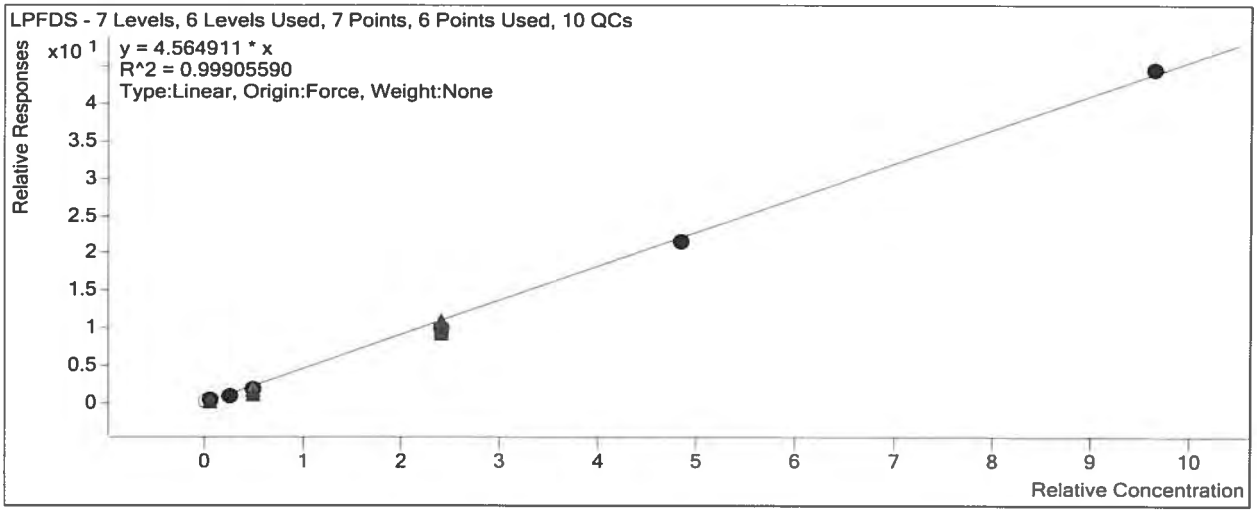
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	1212	0.5000	4.2395
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2706	1.2500	3.9802
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	11173	5.0000	4.0301
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	20757	10.0000	3.4661
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	121560	50.0000	4.2943
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	237690	100.0000	4.2573
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	462209	200.0000	5.2868

Quantitative Analysis Calibration Report



Target Compound *LPFDS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	1005	0.4825	4.0201
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2585	1.2100	4.2281
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	9560	4.8250	3.8157
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	18939	9.6500	3.7952
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	102987	48.2500	4.1800
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	214022	96.5000	4.4782
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	421391	193.0000	4.6131

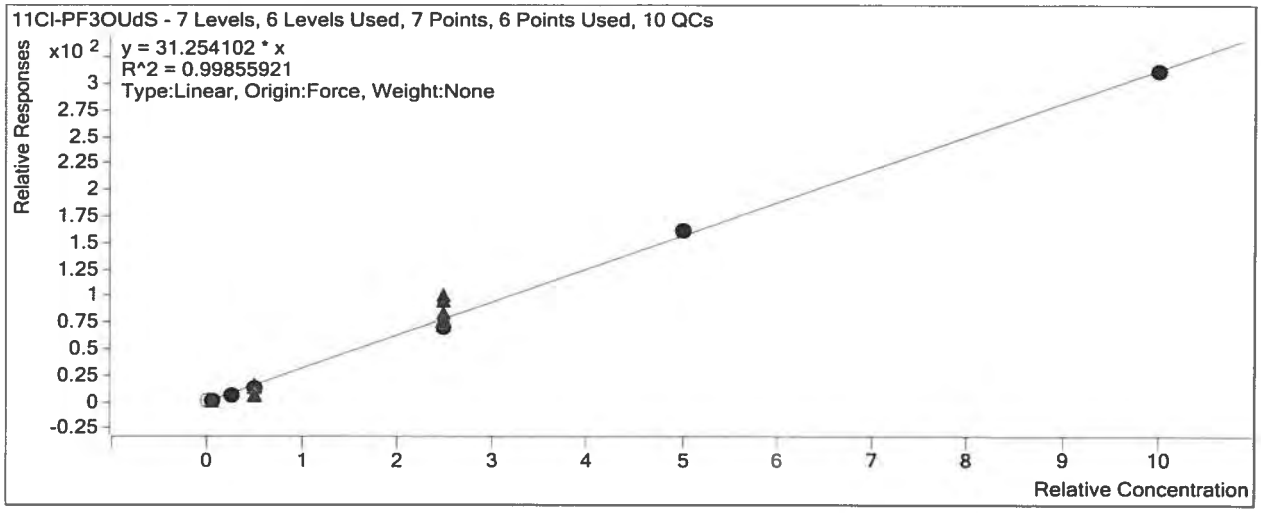


Target Compound *11Cl-PF3OUdS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

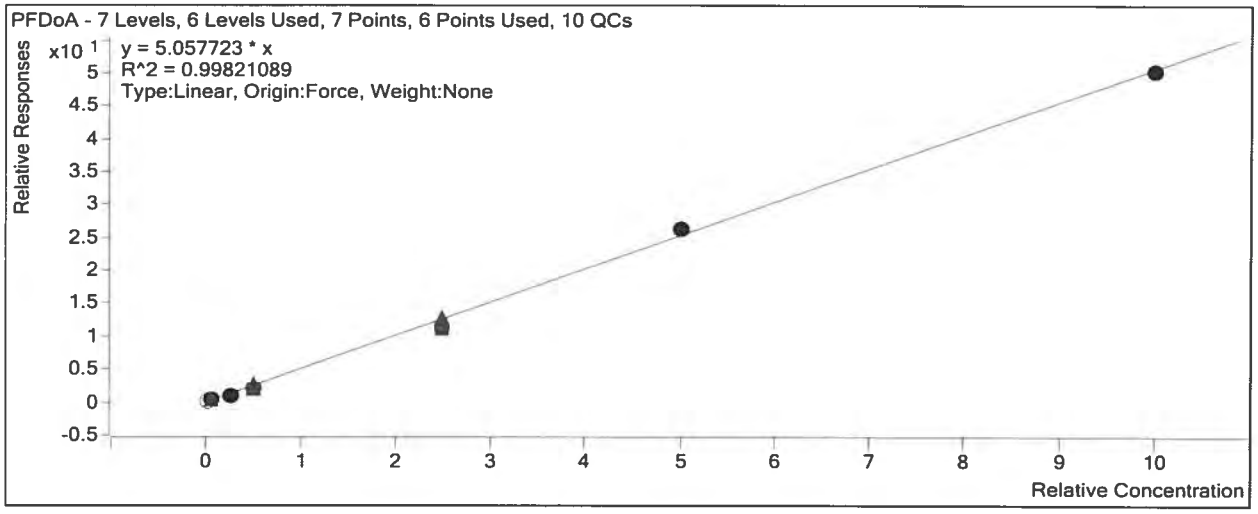
Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	1823573	200.0000	31.2530



Target Compound *PFDoA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	824	0.5000	3.9164
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	2120	1.2500	4.4303
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	7737	5.0000	3.6757
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	16106	10.0000	4.2445
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	89001	50.0000	4.5010
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	185612	100.0000	5.2839
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	377058	200.0000	5.0389

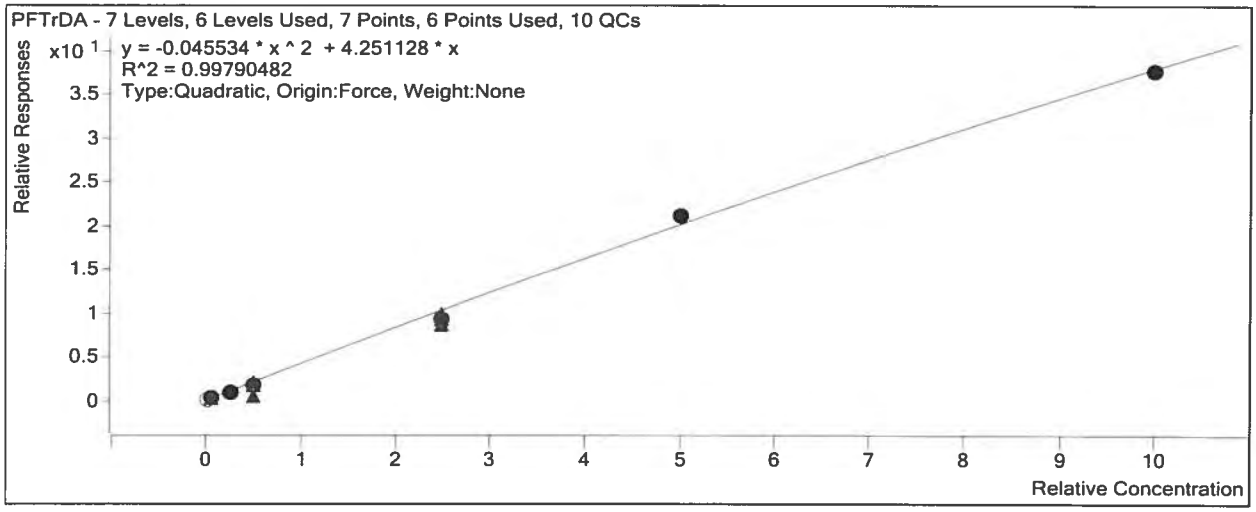


Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	7589	20.0000	379.4694
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	7909	20.0000	395.4676
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	7026	20.0000	351.2767
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	7483	20.0000	374.1483

Target Compound *PFTrDA*

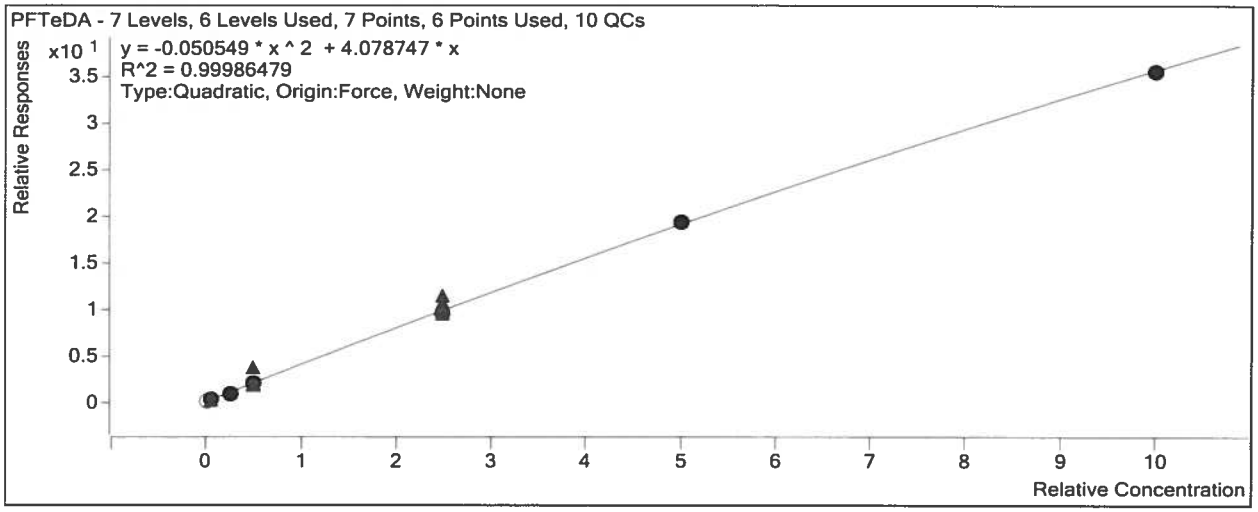
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	646	0.5000	3.0721
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	1645	1.2500	3.4373
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	7091	5.0000	3.3689
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	13712	10.0000	3.6133
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	72780	50.0000	3.6807
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	147917	100.0000	4.2109
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	282826	200.0000	3.7796



Target Compound *PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☐	597	0.5000	4.4743
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	1170	1.2500	3.4475
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	4832	5.0000	3.5038
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	10740	10.0000	3.8909

D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	56976	50.0000	3.8555
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	114247	100.0000	3.8683
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	236044	200.0000	3.5695



Extracted ISTD *M2PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200715ACAL\2200715A_02.d	Calibration	1	☑	5336	20.0000	266.8179
D:\MassHunter\Data\2200715ACAL\2200715A_03.d	Calibration	2	☑	5431	20.0000	271.5355
D:\MassHunter\Data\2200715ACAL\2200715A_04.d	Calibration	3	☑	5516	20.0000	275.8017
D:\MassHunter\Data\2200715ACAL\2200715A_05.d	Calibration	4	☑	5521	20.0000	276.0322
D:\MassHunter\Data\2200715ACAL\2200715A_06.d	Calibration	5	☑	5911	20.0000	295.5513
D:\MassHunter\Data\2200715ACAL\2200715A_07.d	Calibration	6	☑	5907	20.0000	295.3393
D:\MassHunter\Data\2200715ACAL\2200715A_08.d	Calibration	7	☑	6613	20.0000	330.6393

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/15/2020 20:40	Lab File ID:	2200715A_29.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	47400	100	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	51500	107	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	56200	112	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	57700	115	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	48900	98	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	45300	102	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	46200	92	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	44300	89	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	50100	100	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	51000	102	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	46400	102	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	52000	104	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	46000	92	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	44400	96	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	48700	97	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	52700	105	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	41900	84	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	50100	100	70	130	

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/15/2020 23:24	Lab File ID:	2200715A_42.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	40600	85	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	46800	98	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	60500	121	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	46000	92	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	49300	99	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	43500	98	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	44500	89	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	47800	96	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	53100	106	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	51200	102	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	47700	105	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	55500	111	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	47100	94	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	53700	116	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	44800	90	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	48000	96	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	45200	90	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	54000	108	70	130	

FORM 7E - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/16/2020 02:47	Lab File ID:	2200715A_58.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	49700	105	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	51600	108	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	53000	106	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	57000	114	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	49400	99	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	47600	108	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	48100	96	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	51000	102	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	46600	93	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	51900	104	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	41900	92	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	54900	110	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	47800	96	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	56900	123	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	46900	94	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	49400	99	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	47600	95	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	52800	106	70	130	

FORM 7E - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/16/2020 04:40	Lab File ID:	2200715A_67.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	40900	86	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	46100	96	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	53600	107	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	46200	92	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	49100	98	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	43100	97	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	48600	97	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	48600	97	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	48400	97	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	50000	100	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	43700	96	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	54200	108	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	45200	90	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	43800	95	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	49900	100	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	54000	108	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	44900	90	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	53700	107	70	130	

FORM 7E - ORG

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	220071035	Standard ID:	1205 (ICAL Midpoint)
Analyst:	BMH	Instrument ID:	QQQ2
Analysis Date:	07/15/20 15:48	Lab File ID:	2200715A_06.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

	M2PFDA	M2PFHxA	M2PFOA	M4PFOS
	Area	*Area*	*Area*	*Area*
STANDARD	51393	152663	55741	46018

CLIENT SAMPLE ID	*GCAL SAMP ID*		#		#		#		#
MB2060314	2060314	60270		181285		64973		48354	
LCS2060315	2060315	61310		179444		65666		48335	
LCSD2060316	2060316	51635		146696		54148		38996	
AOI01-01-SB-00-02	22007103504	61553		170005		63712		45011	
AOI01-01-SB-25-27	22007103505	62381		180150		66944		49611	
AOI01-01-SB-55-57	22007103506	57132		167028		58970		47560	
AOI01-01-SB-55-57-MS	22007103507	44518		156175		55491		34576	
AOI01-01-SB-55-57-MSD	22007103508	43154		158327		59373		38226	
AOI01-02-SB-00-02	22007103509	66457		175333		63458		46992	
AOI01-02-SB-28-30	22007103510	64383		176960		63313		50201	
AOI01-02-SB-55-27	22007103511	54625		175185		62272		41872	
AOI01-03-SB-00-02	22007103512	65176		178076		68398		49297	
AOI01-03-SB-20-22	22007103513	61103		173527		62618		45079	
AOI01-03-SB-44-46	22007103517	56666		169021		59456		43423	
AOI01-04-SB-00-02	22007103518	63065		179131		66337		47638	
AOI01-04-SB-20-22	22007103519	70967		184841		69584		48841	
AOI01-04-SB-39-41	22007103520	47335		170621		56535		38069	
AOI01-05-SB-00-02	22007103521	63989		181387		66803		49706	
AOI01-05-SB-25-27	22007103522	61067		177781		65695		47490	
AOI01-05-SB-50-52	22007103523	58999		167731		62509		45306	
AOI01-05-SB-50-52-D	22007103524	62235		183544		68881		48607	
AOI01-06-SB-00-02	22007103525	62232		180803		64650		47317	
AOI01-06-SB-00-02-D	22007103526	65597		186990		70603		50474	

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

FORM 8I - ORG

QQQ2 Run Log

Analyst:	BMH	Expiration:
Instrument:	QQQ2	
Batch:	2200721A	
Current ICAL Bath:	2200721ACAL	
20mM Amm Acetate	012-36-5	7/23/2020
Methanol	2129224	3/31/2025
Calibration Std	012-35-6	1/21/2021
ICV Std	012-23-3	12/11/2020
EIS Mix	012-36-2	1/20/2021
IIS Mix	012-36-3	1/20/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2200721B_01.d	MeOH Shot	7/21/2020 15:36	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200721B_02.d	Cal	7/21/2020 15:47	BMH,QQQ2;Cal	1
1202	2200721B_03.d	Cal	7/21/2020 16:01	BMH,QQQ2;Cal	1
1203	2200721B_04.d	Cal	7/21/2020 16:16	BMH,QQQ2;Cal	1
1204	2200721B_05.d	Cal	7/21/2020 16:30	BMH,QQQ2;Cal	1
1205	2200721B_06.d	Cal	7/21/2020 16:44	BMH,QQQ2;Cal	1
1206	2200721B_07.d	Cal	7/21/2020 16:58	BMH,QQQ2;Cal	1
1207	2200721B_08.d	Cal	7/21/2020 17:12	BMH,QQQ2;Cal	1
MeOH Shot	2200721B_09.d	MeOH Shot	7/21/2020 17:27	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1500	2200721B_10.d	Sample	7/21/2020 17:41	BMH,QQQ2	1
1600	2200721B_11.d	QC	7/21/2020 17:55	BMH,QQQ2	1
1450	2200721B_12.d	QC	7/21/2020 18:09	BMH,QQQ2	1
MeOH Shot	2200721B_13.d	MeOH Shot	7/21/2020 18:26	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
2063498	2200721B_14.d	Sample	7/21/2020 18:40	BMH,QQQ2;688318	1
2063499	2200721B_15.d	QC	7/21/2020 18:55	BMH,QQQ2;688318	1
2063500	2200721B_16.d	QC	7/21/2020 19:09	BMH,QQQ2;688318	1
22007164801 5xDIA	2200721B_17.d	Sample	7/21/2020 19:23	BMH,QQQ2;688318	1
22007164805 5xDIA	2200721B_18.d	Sample	7/21/2020 19:37	BMH,QQQ2;688318	1
22007164802 5xDIA	2200721B_19.d	Sample	7/21/2020 19:51	BMH,QQQ2;688318	1
22007164806 5xDIA	2200721B_20.d	Sample	7/21/2020 20:06	BMH,QQQ2;688318	1

22007164803 5xDIA	2200721B_21.d	Sample	7/21/2020 20:20	BMH,QQQ2;688318	1
22007164807 5xDIA	2200721B_22.d	Sample	7/21/2020 20:34	BMH,QQQ2;688318	1
22007164804 5xDIA	2200721B_23.d	Sample	7/21/2020 20:48	BMH,QQQ2;688318	1
22007164808 5xDIA	2200721B_24.d	Sample	7/21/2020 21:02	BMH,QQQ2;688318	1
22007164809 5xDIA	2200721B_25.d	Sample	7/21/2020 21:17	BMH,QQQ2;688318	1
1400	2200721B_26.d	QC	7/21/2020 21:31	BMH,QQQ2;CCV	1
2062569	2200721B_27.d	Sample	7/21/2020 21:45	BMH,QQQ2;688171	1
2062570	2200721B_28.d	QC	7/21/2020 21:59	BMH,QQQ2;688171	1
2062571	2200721B_29.d	QC	7/21/2020 22:13	BMH,QQQ2;688171	1
22007103505	2200721B_30.d	Sample	7/21/2020 22:28	BMH,QQQ2;688171	1
22007103506	2200721B_31.d	Sample	7/21/2020 22:42	BMH,QQQ2;688171	1
22007103507	2200721B_32.d	QC	7/21/2020 22:56	BMH,QQQ2;688171	1
22007103508	2200721B_33.d	QC	7/21/2020 23:10	BMH,QQQ2;688171	1
22007103511	2200721B_34.d	Sample	7/21/2020 23:24	BMH,QQQ2;688171	1
22007103517	2200721B_35.d	Sample	7/21/2020 23:39	BMH,QQQ2;688171	1
22007103520	2200721B_36.d	Sample	7/21/2020 23:53	BMH,QQQ2;688171	1
22007103524	2200721B_37.d	Sample	7/22/2020 0:07	BMH,QQQ2;688171	1
22007103527	2200721B_38.d	Sample	7/22/2020 0:21	BMH,QQQ2;688171	1
22007106505	2200721B_39.d	Sample	7/22/2020 0:35	BMH,QQQ2;688171	1
1400	2200721B_40.d	QC	7/22/2020 0:50	BMH,QQQ2;CCV	1
2062572	2200721B_41.d	Sample	7/22/2020 1:04	BMH,QQQ2;688172	1
2062573	2200721B_42.d	QC	7/22/2020 1:18	BMH,QQQ2;688172	1
2062574	2200721B_43.d	QC	7/22/2020 1:32	BMH,QQQ2;688172	1
22007106601	2200721B_44.d	Sample	7/22/2020 1:46	BMH,QQQ2;688172	1
22007106602	2200721B_45.d	Sample	7/22/2020 2:01	BMH,QQQ2;688172	1
22007106603	2200721B_46.d	Sample	7/22/2020 2:15	BMH,QQQ2;688172	1
22007106604	2200721B_47.d	Sample	7/22/2020 2:29	BMH,QQQ2;688172	1
22007106605	2200721B_48.d	Sample	7/22/2020 2:43	BMH,QQQ2;688172	1
22007106606	2200721B_49.d	QC	7/22/2020 2:57	BMH,QQQ2;688172	1
22007106607	2200721B_50.d	QC	7/22/2020 3:12	BMH,QQQ2;688172	1
22007106608	2200721B_51.d	Sample	7/22/2020 3:26	BMH,QQQ2;688172	1
22007106609	2200721B_52.d	Sample	7/22/2020 3:40	BMH,QQQ2;688172	1
22007106610	2200721B_53.d	Sample	7/22/2020 3:54	BMH,QQQ2;688172	1
1450	2200721B_54.d	QC	7/22/2020 4:08	BMH,QQQ2;CCV	1

22007106611	2200721B_55.d	Sample	7/22/2020 4:22	BMH,QQQ2;688172	1
22007106612	2200721B_56.d	Sample	7/22/2020 4:37	BMH,QQQ2;688172	1
22007106613	2200721B_57.d	Sample	7/22/2020 4:51	BMH,QQQ2;688172	1
22007106614	2200721B_58.d	Sample	7/22/2020 5:05	BMH,QQQ2;688172	1
22007106615	2200721B_59.d	Sample	7/22/2020 5:19	BMH,QQQ2;688172	1
22007106616	2200721B_60.d	Sample	7/22/2020 5:34	BMH,QQQ2;688172	1
22007106617	2200721B_61.d	Sample	7/22/2020 5:48	BMH,QQQ2;688172	1
22007106501	2200721B_62.d	Sample	7/22/2020 6:02	BMH,QQQ2;688172	1
22007106502	2200721B_63.d	Sample	7/22/2020 6:16	BMH,QQQ2;688172	1
1400	2200721B_64.d	QC	7/22/2020 6:30	BMH,QQQ2;CCV	1
2061702	2200721B_65.d	Sample	7/22/2020 6:45	BMH,QQQ2;687999	1
2061703	2200721B_66.d	QC	7/22/2020 6:59	BMH,QQQ2;687999	1
2061704	2200721B_67.d	QC	7/22/2020 7:13	BMH,QQQ2;687999	1
22007103501	2200721B_68.d	Sample	7/22/2020 7:27	BMH,QQQ2;687999	1
22007103502	2200721B_69.d	Sample	7/22/2020 7:41	BMH,QQQ2;687999	1
22007103503	2200721B_70.d	Sample	7/22/2020 7:56	BMH,QQQ2;687999	1
1400	2200721B_71.d	QC	7/22/2020 8:10	BMH,QQQ2;CCV	1

4I

ORGANICS INSTRUMENT BLANK

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/21/2020 17:41	Lab File ID:	2200721B_10.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
6:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.79	4.00	10.0	
8:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.63	4.00	10.0	
NEtFOSAA	ng/L	8.00	U	5.38	8.00	10.0	
NMeFOSAA	ng/L	8.00	U	4.60	8.00	10.0	
Perfluorobutanesulfonic acid	ng/L	4.00	U	1.47	4.00	10.0	
Perfluorobutanoic acid	ng/L	4.00	U	2.13	4.00	10.0	
Perfluorodecanoic acid	ng/L	4.00	U	1.65	4.00	10.0	
Perfluorododecanoic acid	ng/L	4.00	U	2.45	4.00	10.0	
Perfluoroheptanoic acid	ng/L	4.00	U	1.85	4.00	10.0	
Perfluorohexanesulfonic acid	ng/L	4.00	U	1.64	4.00	10.0	
Perfluorohexanoic acid	ng/L	4.00	U	1.94	4.00	10.0	
Perfluorononanoic acid	ng/L	4.00	U	1.68	4.00	10.0	
Perfluorooctanesulfonic acid	ng/L	4.00	U	1.70	4.00	10.0	
Perfluorooctanoic acid	ng/L	4.00	U	1.80	4.00	10.0	
Perfluoropentanoic acid	ng/L	4.00	U	2.35	4.00	10.0	
Perfluorotetradecanoic acid	ng/L	4.00	U	2.76	4.00	10.0	
Perfluorotridecanoic acid	ng/L	4.00	U	2.56	4.00	10.0	
Perfluoroundecanoic acid	ng/L	4.00	U	1.86	4.00	10.0	

* - Result greater than 1/2 LOQ

FORM 4I - ORG

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/21/2020 17:55	Lab File ID:	2200721B_11.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47400	60300	127	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	47900	58300	122	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	45200	90	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	50300	101	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50200	54200	108	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	50200	52400	104	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50100	59900	120	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50100	52600	105	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50100	53000	106	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50300	56100	112	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	50600	55100	109	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50100	55300	110	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50200	55700	111	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	50300	45900	91	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50700	53100	105	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50100	61700	123	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50100	45600	91	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50100	52300	104	70	130	

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/21/2020 18:09	Lab File ID:	2200721B_12.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	8.56	90	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	8.32	87	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	8.80	88	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	10.1	100	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.40	84	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	6.89	78	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.48	85	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	7.61	76	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	9.12	91	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.88	89	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	7.03	77	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	8.16	81	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	7.46	75	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.40	80	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	8.00	80	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	9.12	91	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	10.2	102	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	8.32	83	70	130	

FORM 7S - ORG

Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2200721BCAL\QuantResults\2200721B.batch.bin		
Analysis Time	7/23/2020 10:15 AM	**Analyst Name**	GCAL\lcms
Report Time	7/23/2020 12:03 PM	**Reporter Name**	GCAL\lcms
Last Calib Update	7/22/2020 7:12 PM	**Batch State**	Processed

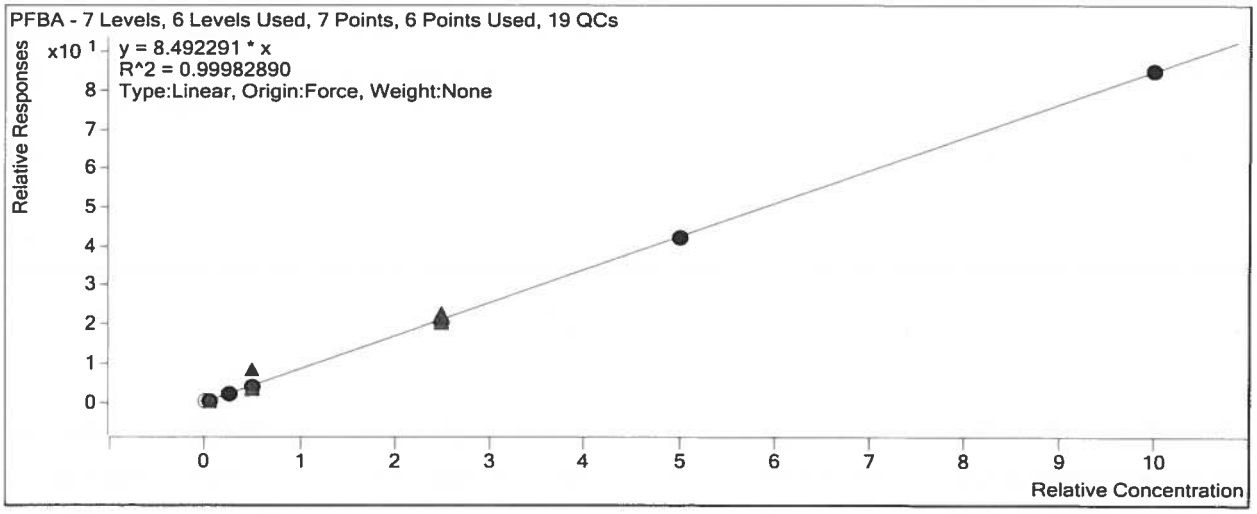
Calibration Info

Extracted ISTD *MPFBA*

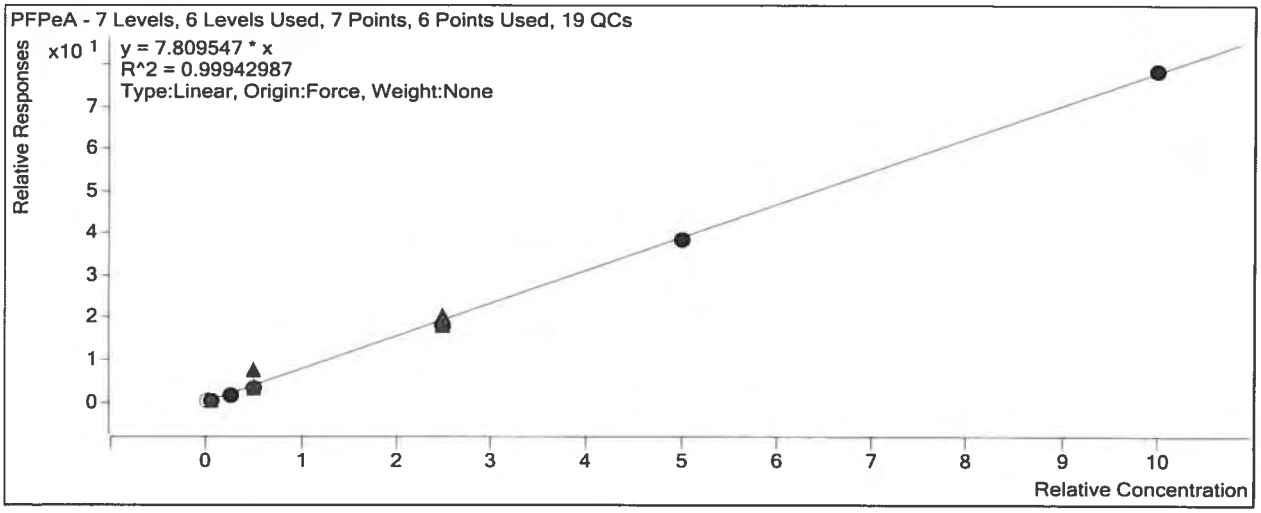
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	42991	20.0000	2149.5424
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	43868	20.0000	2193.4008
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	45108	20.0000	2255.3879
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	43224	20.0000	2161.1908
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	42307	20.0000	2115.3434
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	41737	20.0000	2086.8357
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	39980	20.0000	1998.9941

Target Compound *PFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	7507	0.5000	6.9851
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	19388	1.2500	7.0715
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	84572	5.0000	7.4996
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	168387	10.0000	7.7914
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	865807	50.0000	8.1860
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	1762346	100.0000	8.4451
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	3408554	200.0000	8.5257



D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	464444	50.0000	7.3151
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	949686	100.0000	7.7014
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1848026	200.0000	7.8714



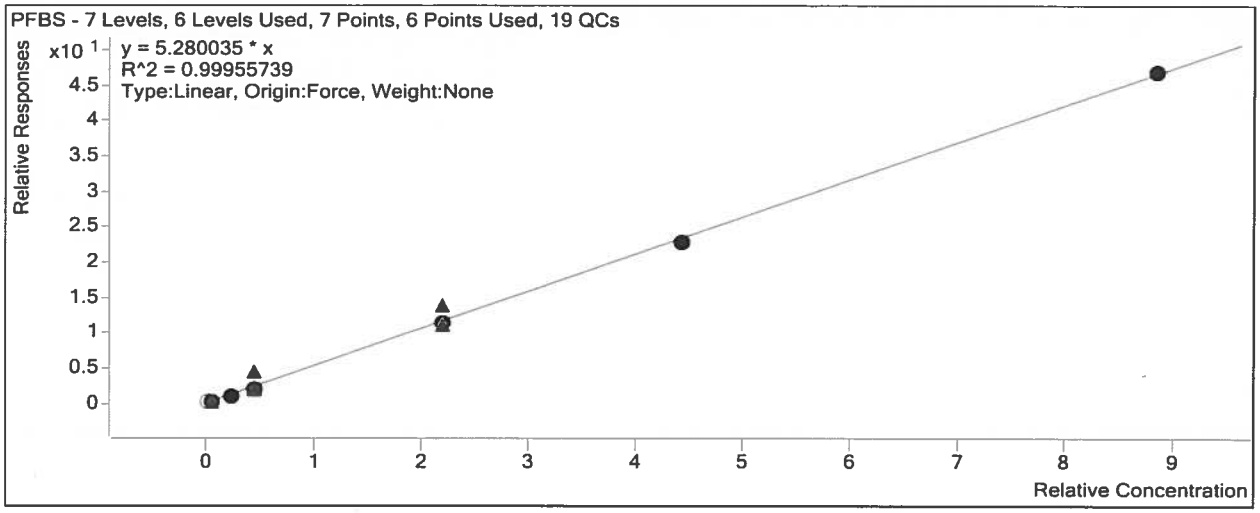
Extracted ISTD *M3PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	20754	20.0000	1037.6770
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	20911	20.0000	1045.5609
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	22078	20.0000	1103.9247
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	20760	20.0000	1038.0128
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	19648	20.0000	982.3756
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	19501	20.0000	975.0684
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	17944	20.0000	897.1791

Target Compound *PFBS*

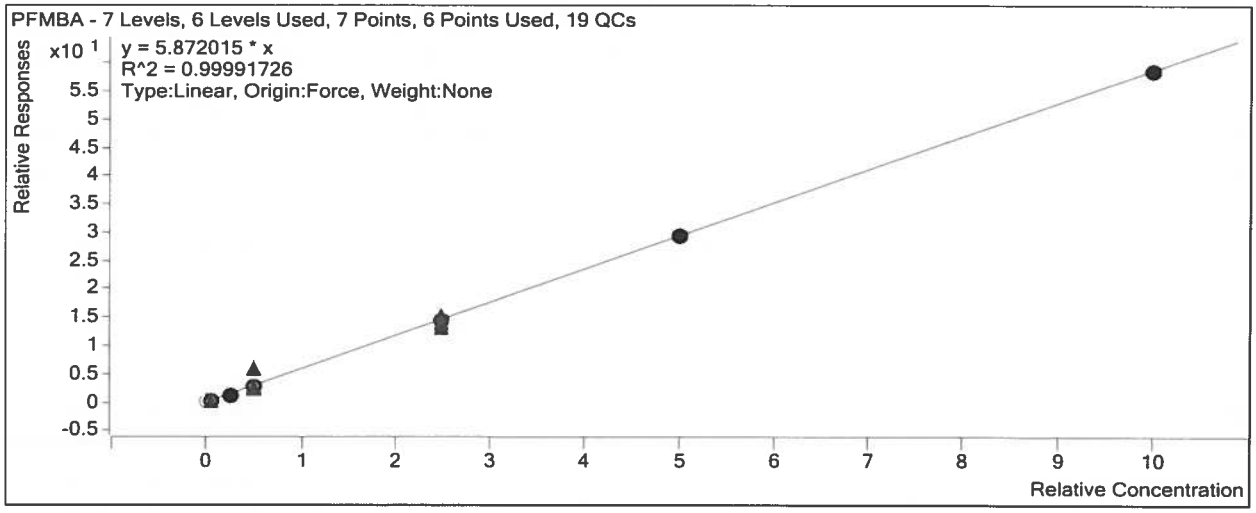
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2056	0.4425	4.4770
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	5237	1.1100	4.5123
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	21187	4.4250	4.3373
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	42288	8.8500	4.6033
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	221574	44.2500	5.0971
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	445078	88.5000	5.1577
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	845511	177.0000	5.3244

Quantitative Analysis Calibration Report



Target Compound *PFMBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	3880	0.5000	4.6283
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	10298	1.2500	4.9148
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	45129	5.0000	4.9856
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	91504	10.0000	5.1820
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	476294	50.0000	5.8110
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	940159	100.0000	5.9021
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1835450	200.0000	5.8706



Target Compound *PFEESA*

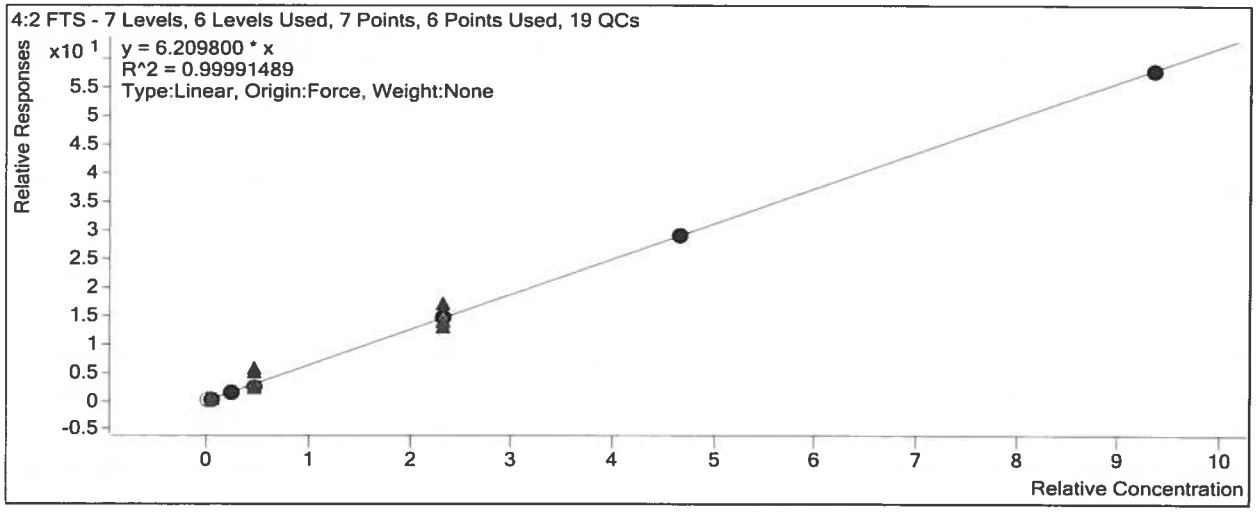
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	8839	20.0000	441.9554
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	7698	20.0000	384.8780
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	6960	20.0000	347.9987
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	6042	20.0000	302.1196

Target Compound *4:2 FTS*

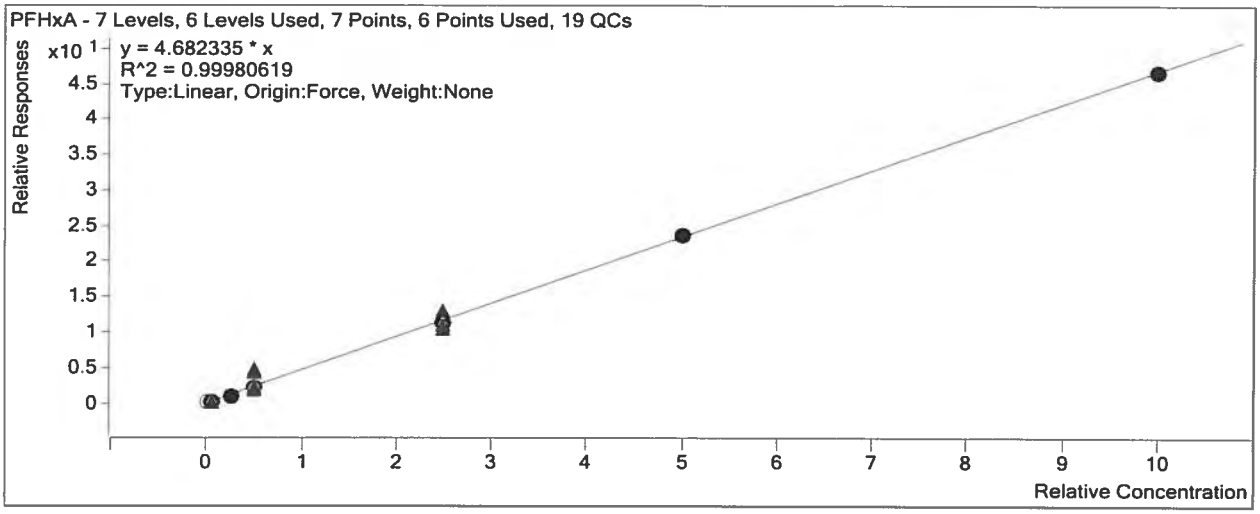
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	1100	0.4675	4.5316
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	2933	1.1700	4.8937
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	11736	4.6700	5.4221
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	22159	9.3500	5.3624
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	111280	46.7500	6.1846
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	202989	93.5000	6.2385
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	350665	187.0000	6.2069



Extracted ISTD *M5PFHxA*

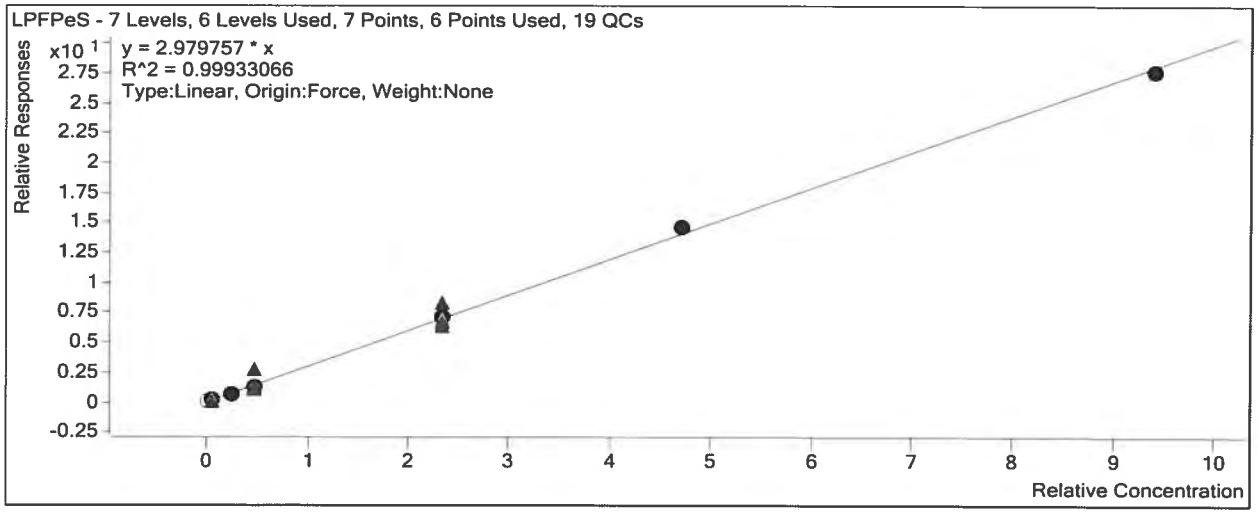
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	33533	20.0000	1676.6269
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	33524	20.0000	1676.2209
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	36208	20.0000	1810.3809
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	35316	20.0000	1765.8167

Quantitative Analysis Calibration Report



Target Compound *LPFPeS*

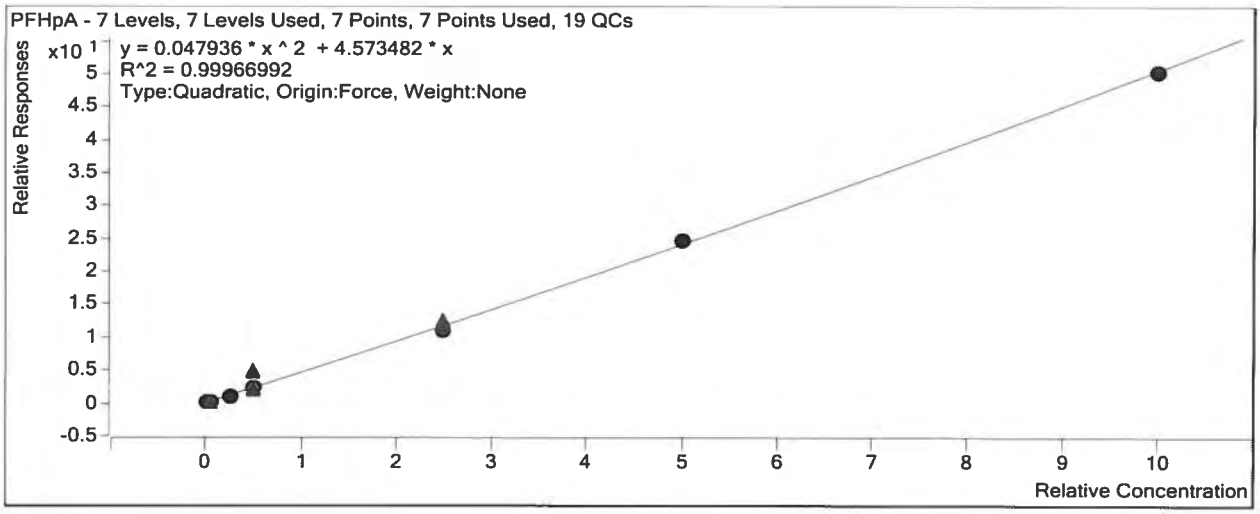
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2386	0.4700	3.0283
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	5314	1.1800	2.6868
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	22753	4.7000	2.6741
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	45843	9.4000	2.7619
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	232687	47.0000	3.0201
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	463313	94.0000	3.0942
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	866793	188.0000	2.9494



Extracted ISTD *M3HFPODA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1375301	200.0000	5.0443



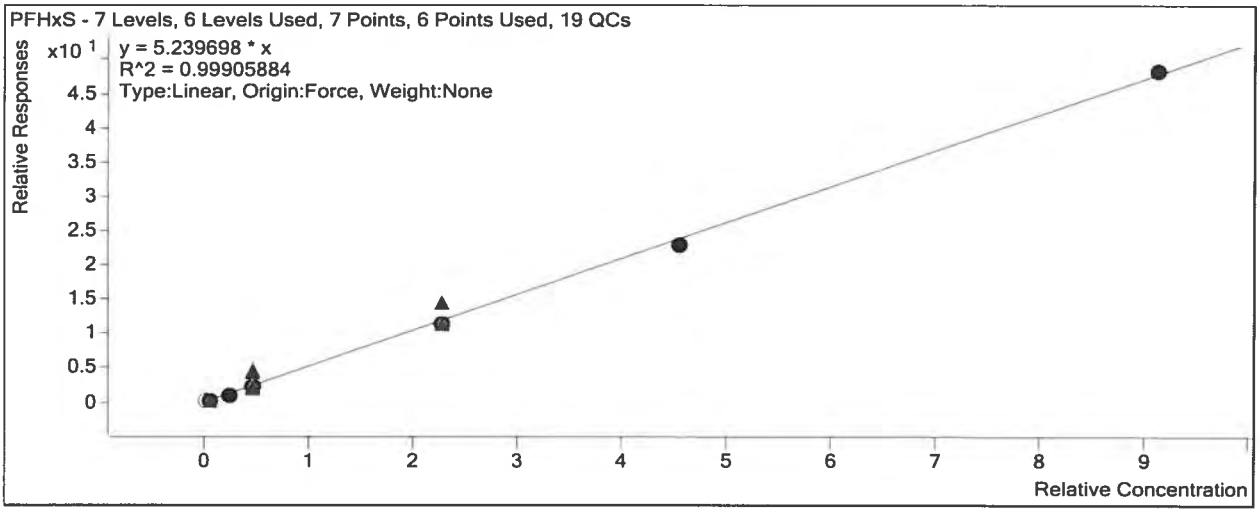
Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	23221	20.0000	1161.0357
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	24021	20.0000	1201.0258
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	23973	20.0000	1198.6703
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	23446	20.0000	1172.3132
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	21836	20.0000	1091.8023
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	21608	20.0000	1080.3933
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	18707	20.0000	935.3742

Target Compound *PFHxS*

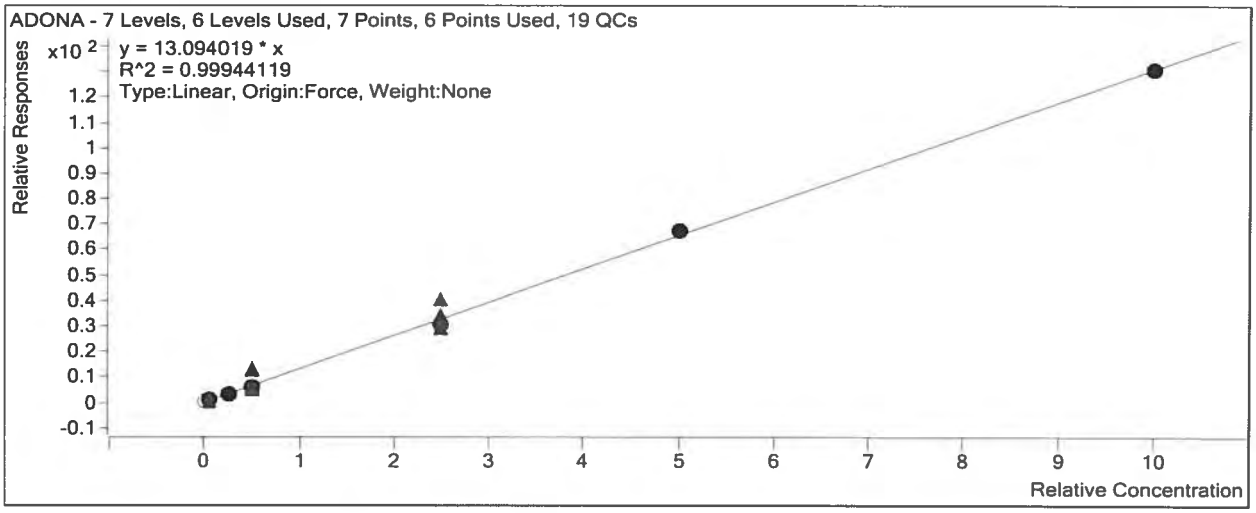
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2328	0.4560	4.3975
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	5644	1.1400	4.1223
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	24163	4.5600	4.4206
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	49470	9.1200	4.6270
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	246987	45.6000	4.9610
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	497357	91.2000	5.0477
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	905475	182.4000	5.3072

Quantitative Analysis Calibration Report



Target Compound *ADONA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	11760	0.5000	10.2678
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	34193	1.2500	11.3839
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	150150	5.0000	12.3815
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	296360	10.0000	12.2681
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	1446752	50.0000	12.3523
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	2969822	100.0000	13.4660
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	5420092	200.0000	13.0500



Extracted ISTD *M2 6:2 FTS*

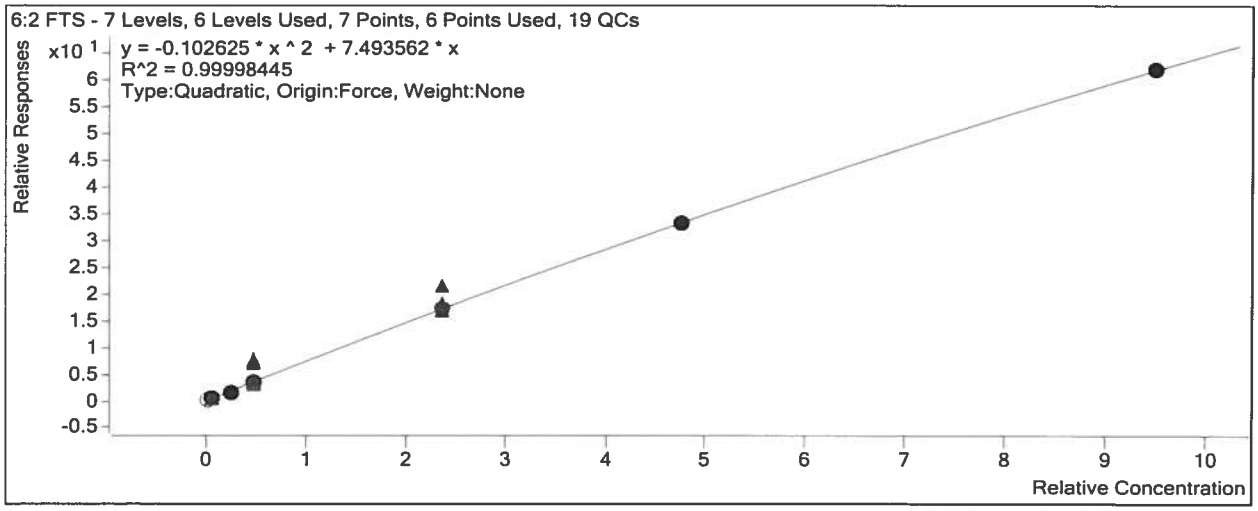
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	12843	20.0000	642.1656

Target Compound *6:2 FTS*

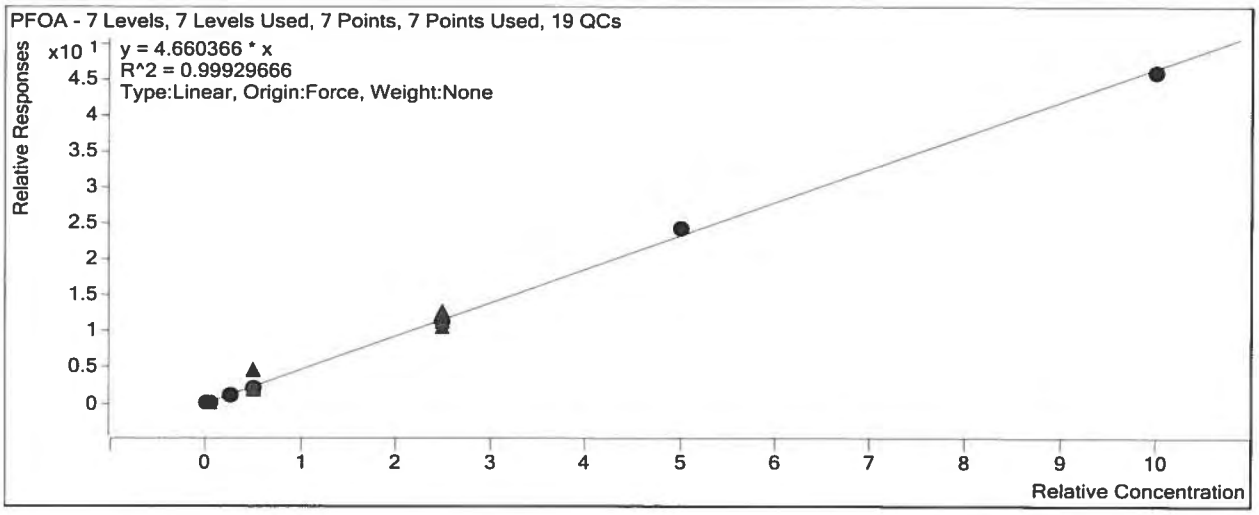
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2706	0.4750	6.1702
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	7274	1.1900	6.9415
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	27660	4.7500	6.7939
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	54644	9.5000	7.1804
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	257328	47.5000	7.2734
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	474288	95.0000	7.0058
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	795313	190.0000	6.5183



Extracted ISTD *M8PFOA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	45815	20.0000	2290.7421
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	48058	20.0000	2402.8818
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	48508	20.0000	2425.3851
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	48314	20.0000	2415.6915
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	46850	20.0000	2342.4895
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	44109	20.0000	2205.4289
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	41533	20.0000	2076.6684

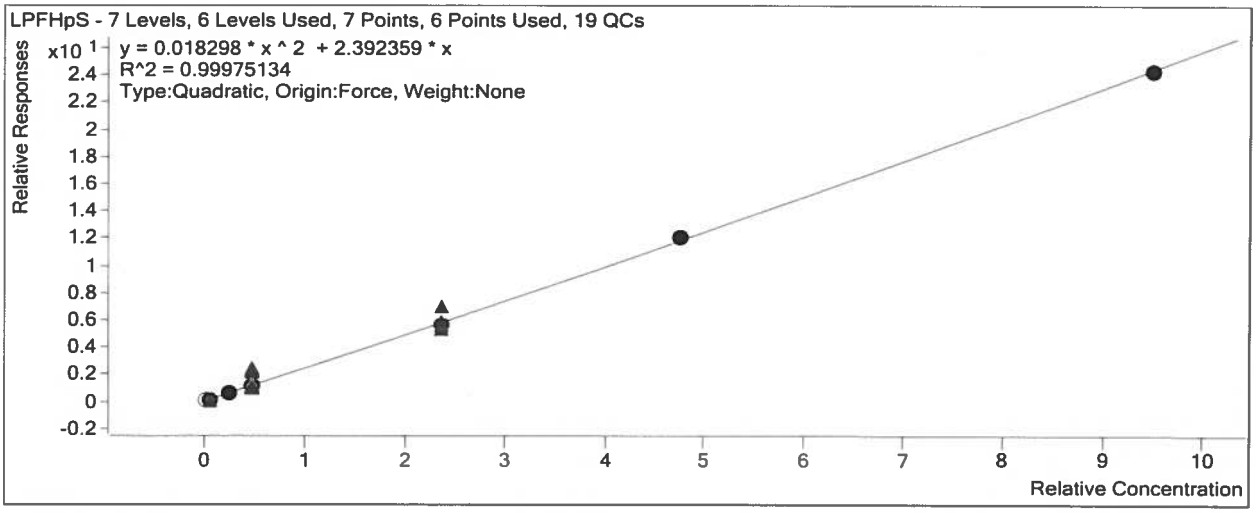
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2262	0.4750	2.0787
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	5901	1.1900	2.0636
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	26611	4.7500	2.3099
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	52450	9.5000	2.2855
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	259057	47.5000	2.3282
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	528471	95.0000	2.5223
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1011078	190.0000	2.5625



Extracted ISTD *M9PFNA*

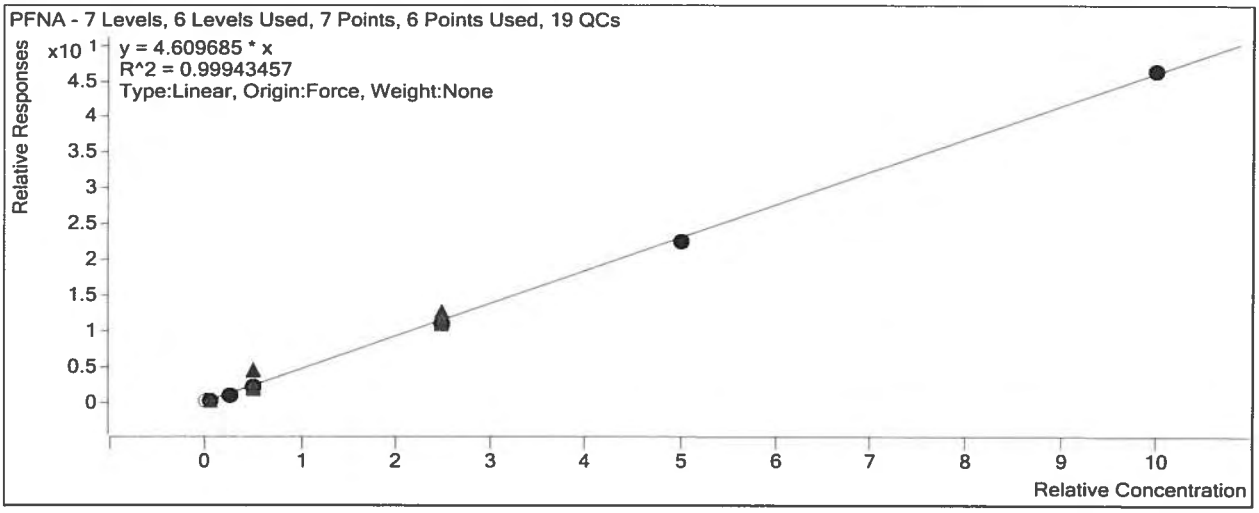
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	40888	20.0000	2044.3786
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	38596	20.0000	1929.7799
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	40010	20.0000	2000.4959
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	38262	20.0000	1913.1206
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	38800	20.0000	1939.9935
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	38798	20.0000	1939.9018
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	34348	20.0000	1717.4020

Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

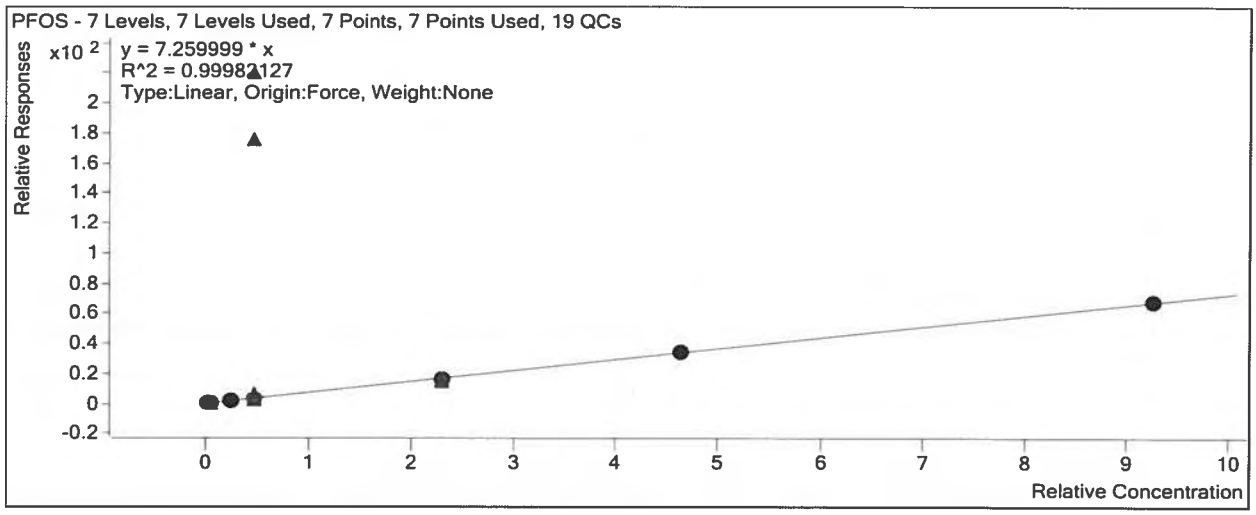
Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF



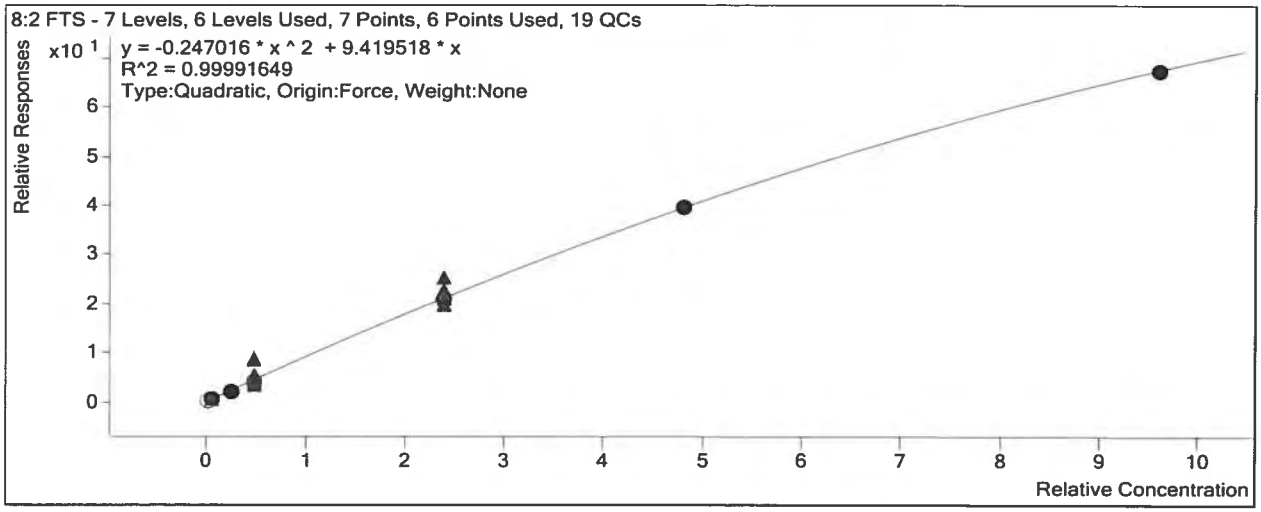
Target Compound *PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	3027	0.4628	5.7055
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	7772	1.1600	6.1259
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	32151	4.6280	5.9478
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	65285	9.2550	6.2554
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	337518	46.2800	7.0089
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	678782	92.5500	7.2893
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1303071	185.1000	7.2717



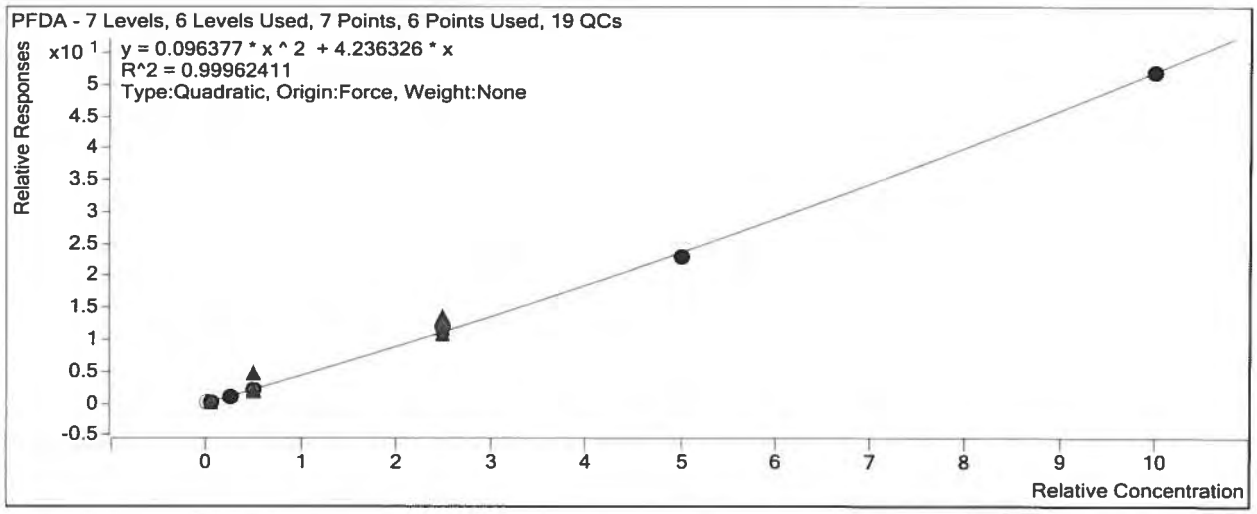
Extracted ISTD *M8PFOS*

Quantitative Analysis Calibration Report



Target Compound *PFDA*

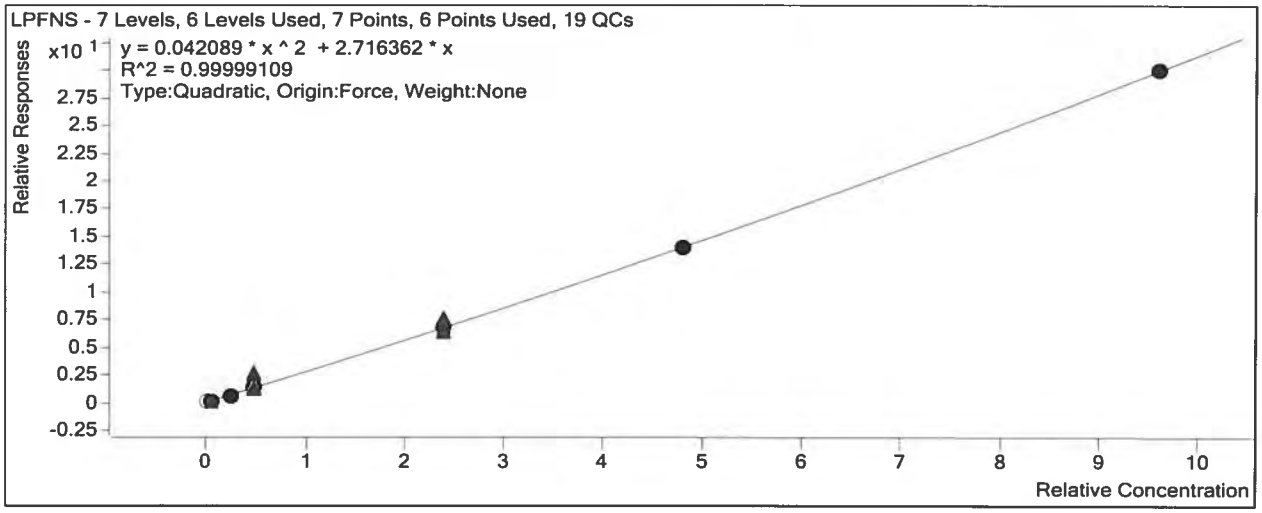
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	1988	0.5000	3.5727
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	5680	1.2500	3.8568
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	23868	5.0000	4.2634
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	49871	10.0000	4.3898
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	257013	50.0000	4.7527
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	502566	100.0000	4.6130
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	929757	200.0000	5.2089



Extracted ISTD *M6PFDA*

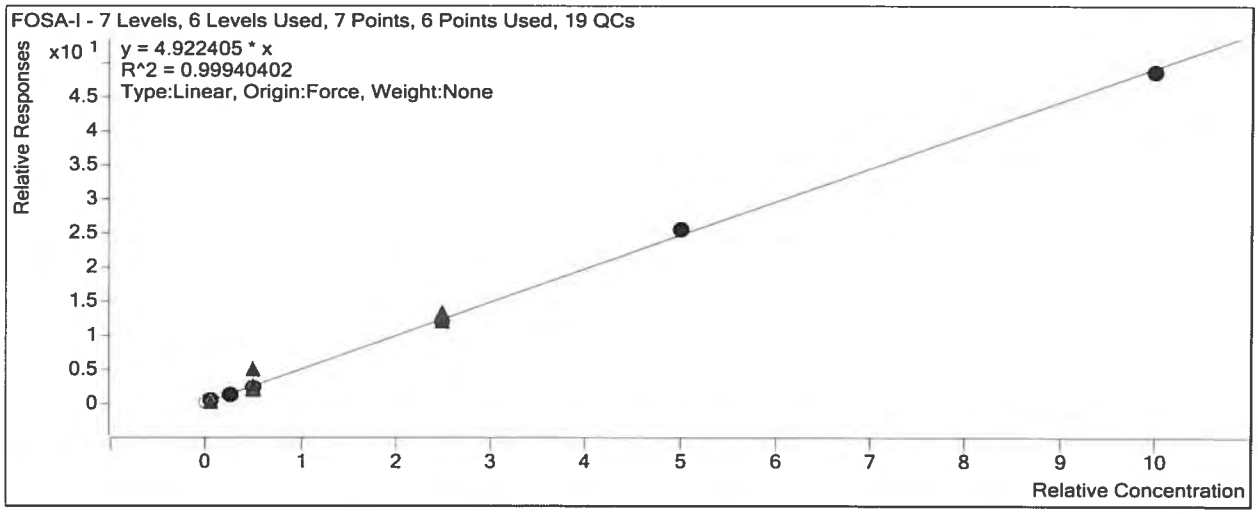
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



Target Compound *FOSA-I*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2608	0.5000	4.2814
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	6783	1.2500	4.3024
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	26772	5.0000	4.2558
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	54245	10.0000	4.4156
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	289028	50.0000	4.8508
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	603275	100.0000	5.1033
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1174304	200.0000	4.8834



Extracted ISTD *M8FOSA*

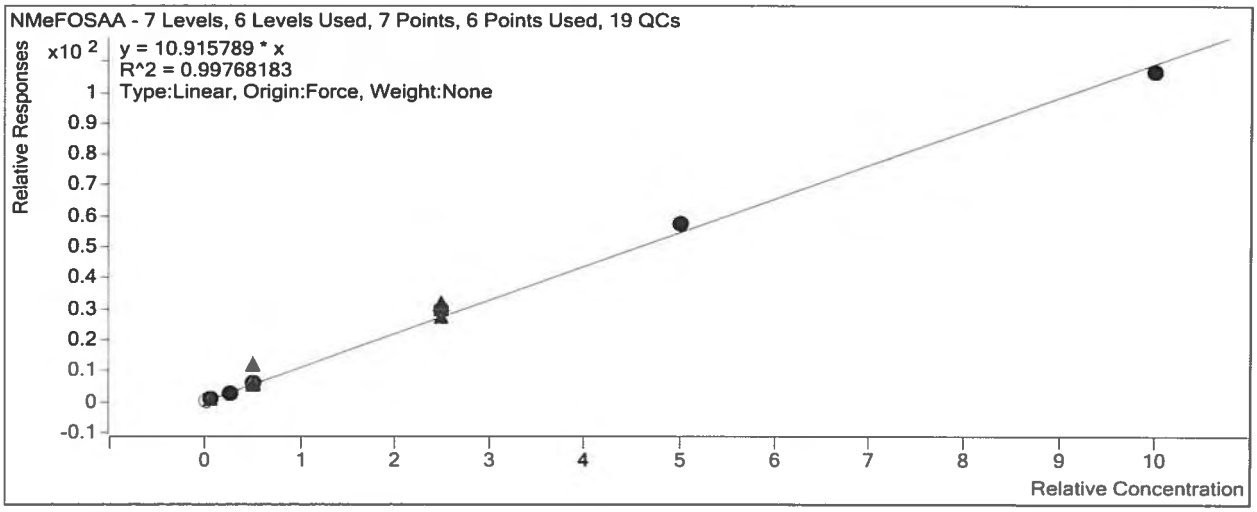
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	24047	20.0000	1202.3490

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	3926	0.5000	11.3608
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	8317	1.2500	9.4691
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	37596	5.0000	10.5895
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	81724	10.0000	11.8970
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	420967	50.0000	11.8460
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	838713	100.0000	11.5471
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1641971	200.0000	10.6976



Extracted ISTD *d3-NMeFOSAA*

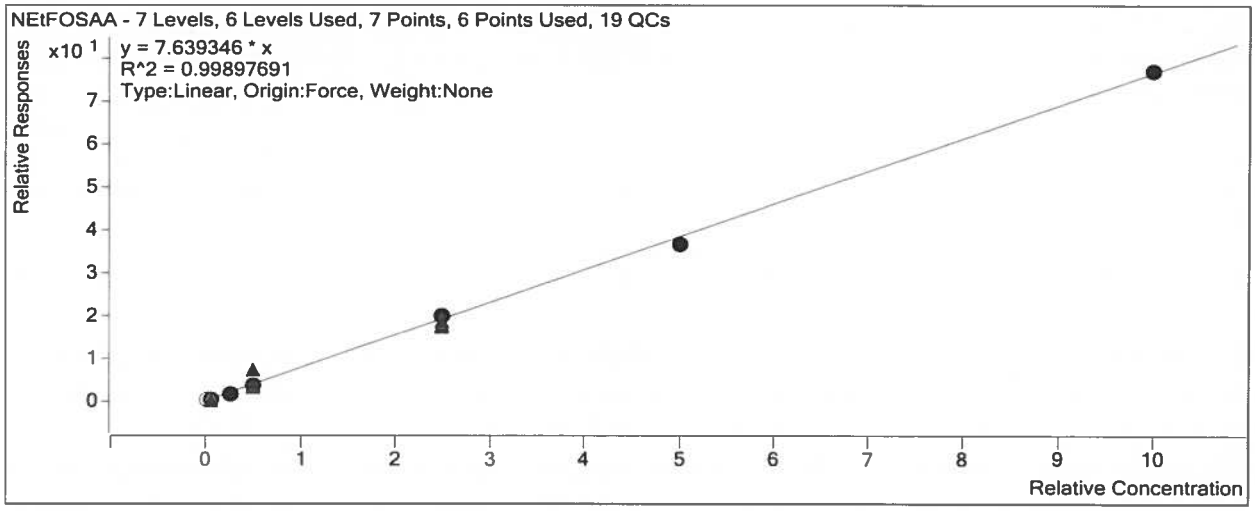
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	13822	20.0000	691.0795
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	14053	20.0000	702.6590
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	14201	20.0000	710.0640
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	13739	20.0000	686.9285
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	14215	20.0000	710.7314
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	14527	20.0000	726.3415
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	15349	20.0000	767.4457

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	20647	20.0000	1032.3323
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	17635	20.0000	881.7713
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	19424	20.0000	971.2209
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	16693	20.0000	834.6424

Target Compound *NEtFOSAA*

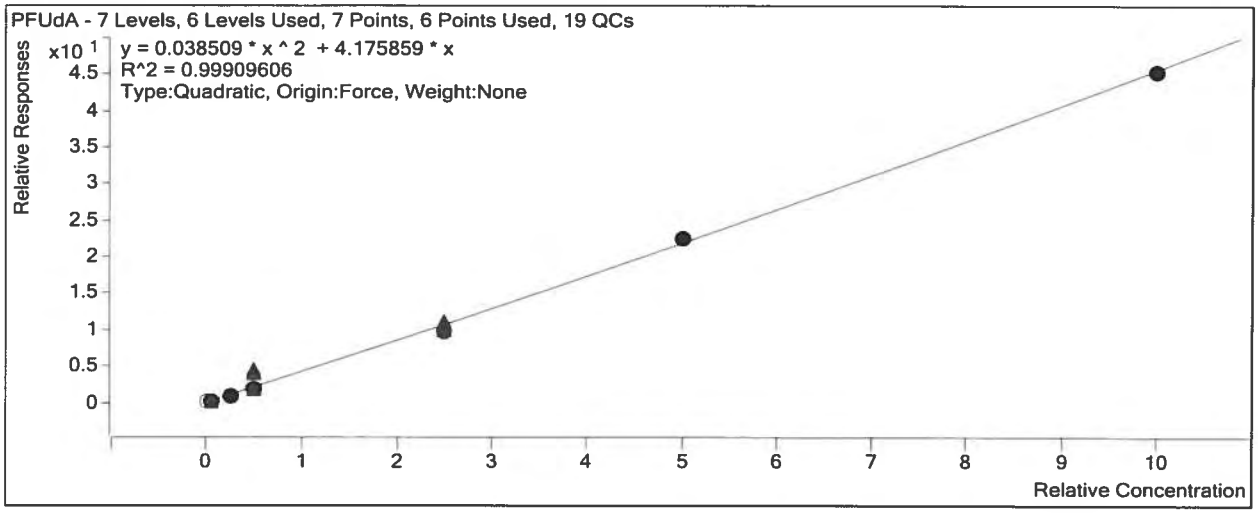
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	3173	0.5000	5.9925
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	7852	1.2500	6.0001
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	34387	5.0000	6.6275
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	72251	10.0000	6.9988
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	351268	50.0000	7.9673
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	707154	100.0000	7.2811
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	1287137	200.0000	7.7107



Target Compound *PFUdA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	1602	0.5000	2.5471
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	5299	1.2500	3.4964
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	21742	5.0000	3.4457
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	45313	10.0000	3.6008

D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	223329	50.0000	3.9225
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	475876	100.0000	4.5146
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	873433	200.0000	4.5482



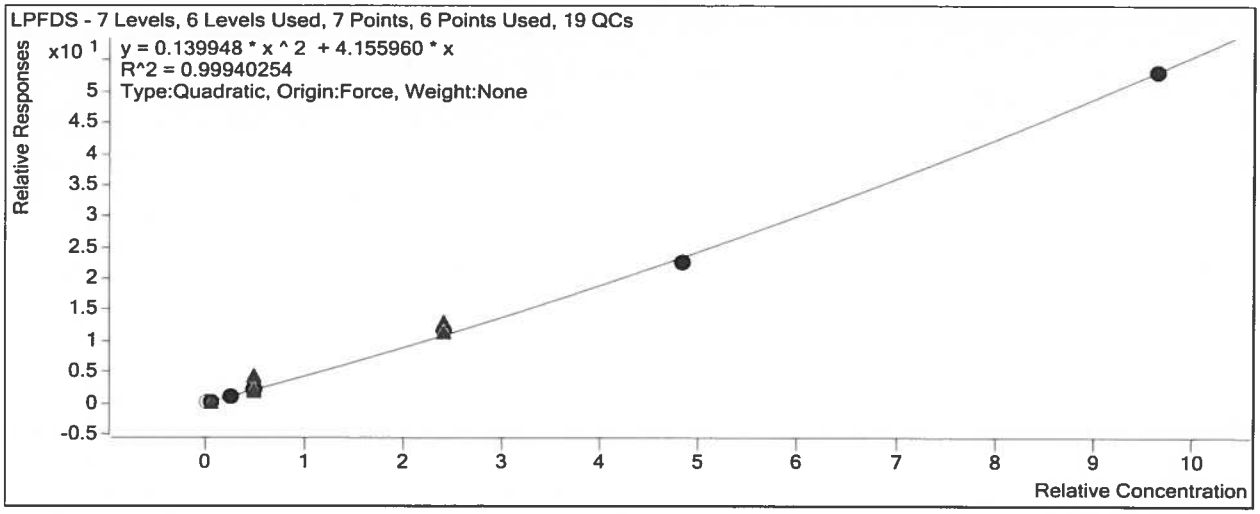
Extracted ISTD *M7PFUdA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	25155	20.0000	1257.7521
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	24251	20.0000	1212.5354
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	25240	20.0000	1262.0214
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	25168	20.0000	1258.3876
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	22774	20.0000	1138.7004
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	21082	20.0000	1054.0790
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	19204	20.0000	960.1925

Target Compound *LPFDS*

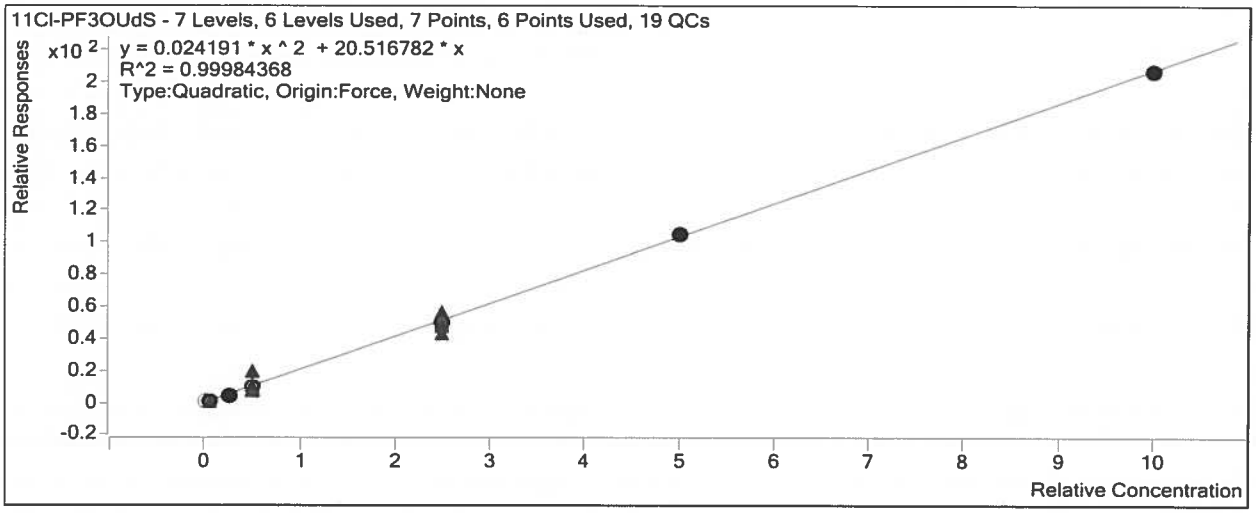
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2075	0.4825	3.8644
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	6186	1.2100	4.3388
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	24090	4.8250	4.4591
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	47646	9.6500	4.3460
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	253577	48.2500	4.8592
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	493111	96.5000	4.6904
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	950510	193.0000	5.5183

Quantitative Analysis Calibration Report



Target Compound *11Cl-PF3OUdS*

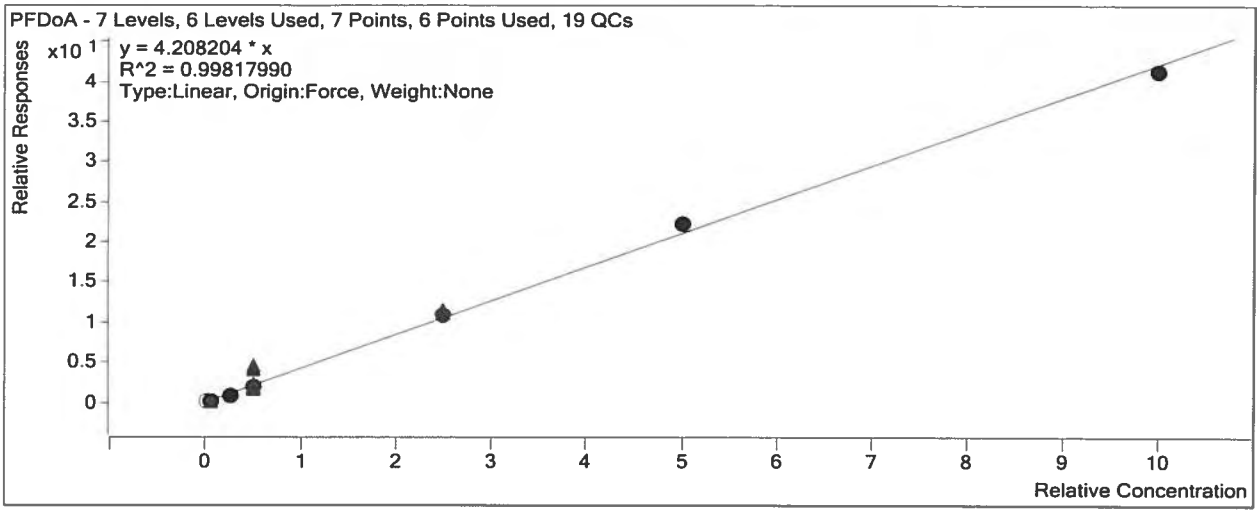
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	7811	0.5000	13.6259
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	20842	1.2500	15.2449
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	94357	5.0000	16.1568
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	204547	10.0000	18.1389
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	1048708	50.0000	20.1574
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	2099204	100.0000	20.8635
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	4015199	200.0000	20.7374



Target Compound *10:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



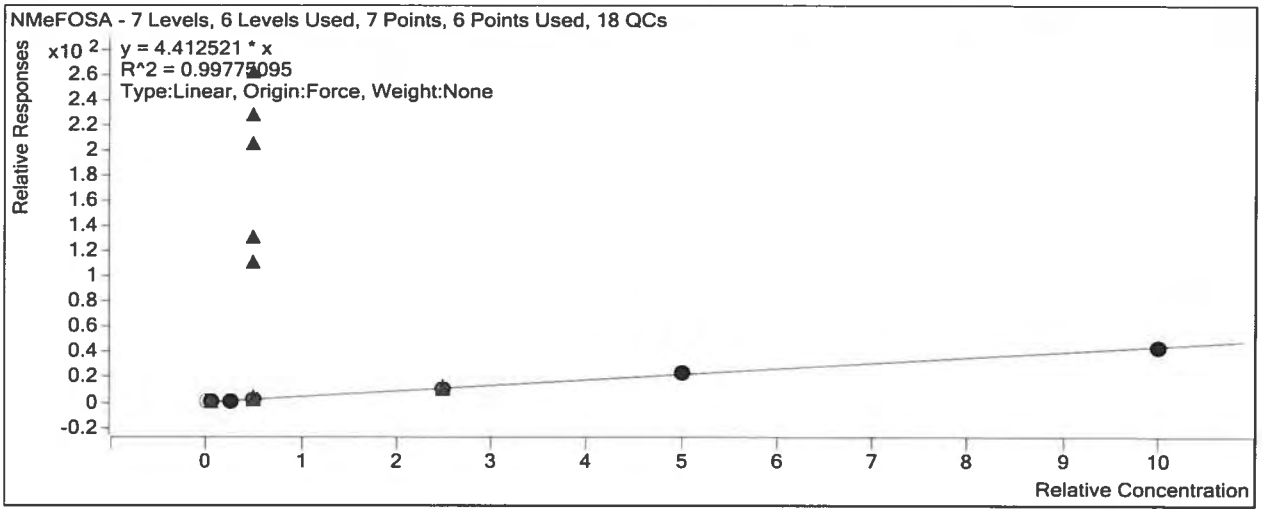
Extracted ISTD *d-NMeFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	14856	20.0000	742.7848
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	13609	20.0000	680.4366
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	13847	20.0000	692.3470
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	13478	20.0000	673.9006
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	13930	20.0000	696.5142
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	13499	20.0000	674.9454
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	14652	20.0000	732.6129

Target Compound *NMeFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	1277	0.5000	3.4386
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	3303	1.2500	3.8833
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	14042	5.0000	4.0564
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	26374	10.0000	3.9137
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	157967	50.0000	4.5359
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	318785	100.0000	4.7231
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	634245	200.0000	4.3287

Quantitative Analysis Calibration Report



Extracted ISTD *d7-NMeFOSE*

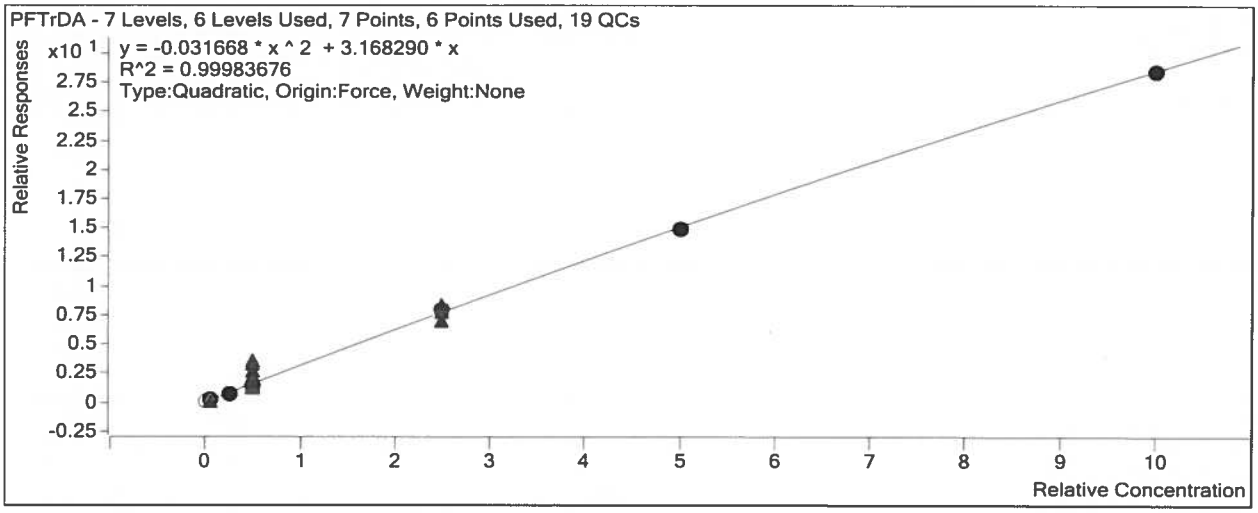
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	17446	20.0000	872.2958
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	17212	20.0000	860.5789
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	16835	20.0000	841.7516
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	16560	20.0000	827.9849
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	16654	20.0000	832.6964
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	16217	20.0000	810.8454
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	14473	20.0000	723.6564

Target Compound *NMeFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	1821	0.5000	4.1745
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	4994	1.2500	4.6421
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	19335	5.0000	4.5941
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	41076	10.0000	4.9610
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	213427	50.0000	5.1262
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	429996	100.0000	5.3031
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	872861	200.0000	6.0309

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	485532	200.0000	2.8533



Extracted ISTD *d9-NEtFOSE*

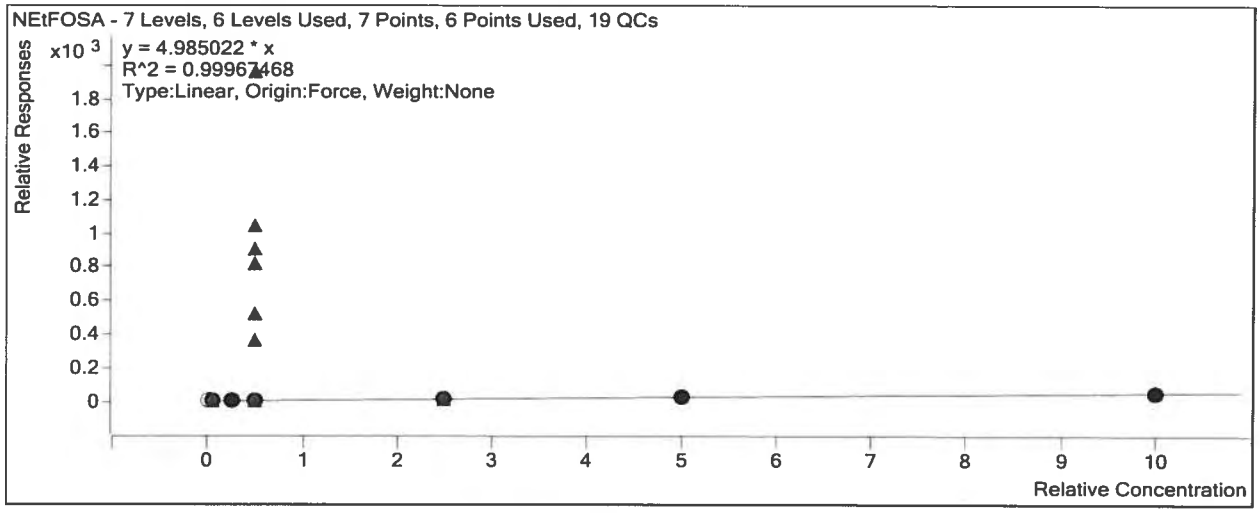
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	20864	20.0000	1043.2183
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	21003	20.0000	1050.1398
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	21573	20.0000	1078.6488
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	21597	20.0000	1079.8626
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	20331	20.0000	1016.5536
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	20747	20.0000	1037.3458
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	18838	20.0000	941.9181

Extracted ISTD *d-NEtFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	14149	20.0000	707.4678
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	13860	20.0000	692.9771
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	14450	20.0000	722.5016
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	14456	20.0000	722.7936
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	14314	20.0000	715.7217
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	14055	20.0000	702.7401
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	13369	20.0000	668.4262

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	30230	10.0000	4.1824
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	170295	50.0000	4.7587
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	347546	100.0000	4.9456
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	669964	200.0000	5.0115



Target Compound *NEtFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	2267	0.5000	4.3453
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	5377	1.2500	4.0965
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	22464	5.0000	4.1653
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	47451	10.0000	4.3942
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	249844	50.0000	4.9155
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	501829	100.0000	4.8376
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	946161	200.0000	5.0225

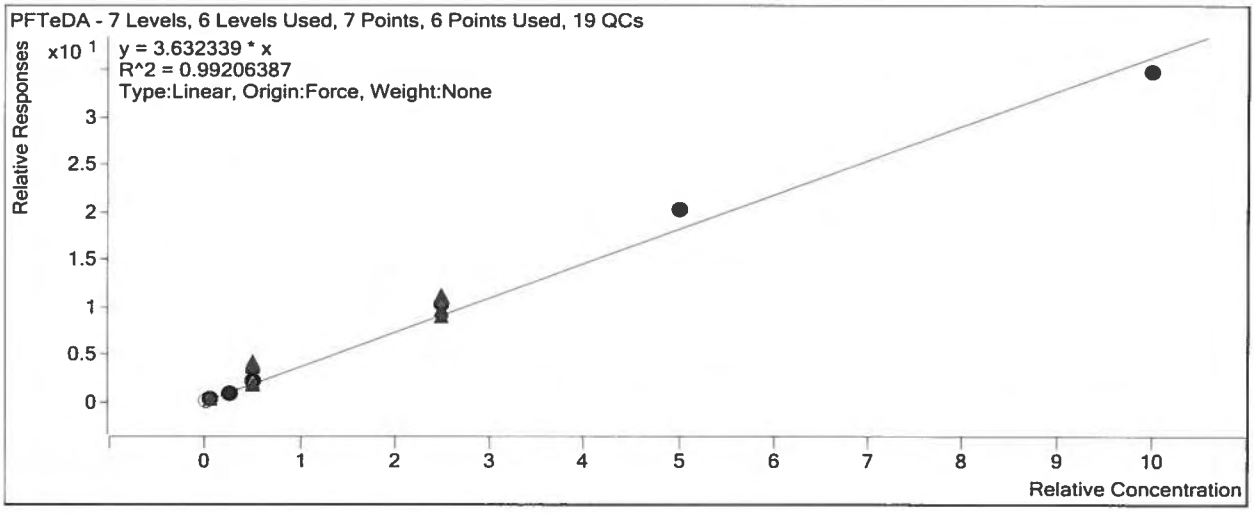
Quantitative Analysis Calibration Report

Extracted ISTD *M2PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☑	11815	20.0000	590.7749
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	11882	20.0000	594.1144
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	11923	20.0000	596.1280
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	10357	20.0000	517.8576
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	11569	20.0000	578.4496
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	12288	20.0000	614.4132
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	13863	20.0000	693.1406

Target Compound *PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200721BCAL\2200721B_02.d	Calibration	1	☐	1069	0.5000	3.6185
D:\MassHunter\Data\2200721BCAL\2200721B_03.d	Calibration	2	☑	2921	1.2500	3.9337
D:\MassHunter\Data\2200721BCAL\2200721B_04.d	Calibration	3	☑	10431	5.0000	3.4997
D:\MassHunter\Data\2200721BCAL\2200721B_05.d	Calibration	4	☑	22292	10.0000	4.3046
D:\MassHunter\Data\2200721BCAL\2200721B_06.d	Calibration	5	☑	118288	50.0000	4.0898
D:\MassHunter\Data\2200721BCAL\2200721B_07.d	Calibration	6	☑	248823	100.0000	4.0498
D:\MassHunter\Data\2200721BCAL\2200721B_08.d	Calibration	7	☑	484891	200.0000	3.4978



Extracted ISTD *M2PFHxDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/21/2020 21:31	Lab File ID:	2200721B_26.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	47300	100	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	51700	108	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	46600	93	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	54900	110	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	48600	97	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	42300	96	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	54600	109	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	54200	108	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	53900	108	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	47500	95	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	43000	94	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	47800	96	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	49000	98	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	44000	95	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	47500	95	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	59500	119	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	50300	101	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	49000	98	70	130	

FORM 7E - ORG

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ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/22/2020 00:50	Lab File ID:	2200721B_40.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	47100	99	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	44700	93	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	45000	90	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	55200	110	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	48900	98	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	42200	95	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	48200	96	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	55000	110	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	51700	103	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	47200	94	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	44400	97	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	47500	95	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	46000	92	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	39900	86	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	46000	92	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	49500	99	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	54600	109	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	47100	94	70	130	

FORM 7E - ORG

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/22/2020 04:08	Lab File ID:	2200721B_54.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	8.64	91	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	7.42	77	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	7.79	78	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	8.80	88	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.24	82	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	7.14	81	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.08	81	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	8.32	83	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	7.10	71	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.40	84	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	6.83	75	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	7.68	77	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	7.31	73	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	8.08	87	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	8.08	81	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	8.72	88	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	7.66	77	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	7.33	73	70	130	

FORM 7S - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/22/2020 06:30	Lab File ID:	2200721B_64.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	49700	105	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	48500	101	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	46100	92	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	55700	111	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	48000	96	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	42600	96	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	56300	113	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	53400	107	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	49600	99	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	48300	97	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	43200	95	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	47300	95	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	49400	99	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	44700	97	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	47500	95	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	52200	104	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	52700	105	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	47300	95	70	130	

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	QQQ2
Analysis Date:	07/22/2020 08:10	Lab File ID:	2200721B_71.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	50600	106	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	47800	100	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	48800	98	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	58700	117	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	49500	99	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	41700	94	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	52500	105	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	52300	105	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	49400	99	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	44700	89	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	43300	95	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	48600	97	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	51000	102	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	44700	96	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	47000	94	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	53600	107	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	45400	91	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	49700	99	70	130	

FORM 7E - ORG

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	220071035	Standard ID:	1205 (ICAL Midpoint)
Analyst:	BMH	Instrument ID:	QQQ2
Analysis Date:	07/21/20 16:44	Lab File ID:	2200721B_06.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

	M2PFDA	M2PFHxA	M2PFOA	M4PFOS
	Area	*Area*	*Area*	*Area*
STANDARD	112280	329063	113378	119175

CLIENT SAMPLE ID	*GCAL SAMP ID*		#		#		#		#
MB2061702	2061702	121053		328754		126846		121776	
LCS2061703	2061703	107261		305040		111923		106515	
LCSD2061704	2061704	111312		315139		120825		114302	
MB2062569	2062569	124322		354637		130960		127679	
LCS2062570	2062570	134213		356694		134323		135084	
LCSD2062571	2062571	106008		299214		108373		106287	
HAASF-FRB-01	22007103501	116442		331424		125454		123350	
HAASF-ERB-01	22007103502	109136		323185		120631		114953	
HAASF-ERB-02	22007103503	113068		320486		116782		111340	
AOI01-01-SB-25-27RE	22007103505RE	121182		344844		124273		126601	
AOI01-01-SB-55-57RE	22007103506RE	100553		287080		108490		103407	
AOI01-01-SB-55-57-MSRE	22007103507RE	109883		310788		113115		113038	
AOI01-01-SB-55-57-MSDRE	22007103508RE	103332		305119		112065		107988	
AOI01-03-SB-44-46RE	22007103517RE	111179		334646		115553		116537	
AOI01-04-SB-39-41RE	22007103520RE	104014		307753		107831		103179	
AOI01-07-SB-00-02RE	22007103527RE	117198		327313		126519		121256	

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

FORM 8I - ORG

QQQ2 Run Log

Analyst:	BMH	Expiration:
Instrument:	QQQ2	
Batch:	2200724C	
Current ICAL Bath:	2200724BCAL/2200724BCALDW	
20mM Amm Acetate	012-37-5	7/26/2020
Methanol	2129224	3/31/2025
Calibration Std	012-35-6	1/21/2021
ICV Std	012-23-3	12/11/2020
EIS Mix	012-36-2	1/20/2021
IIS Mix	012-37-3	1/23/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2200724B_01.d	MeOH Shot	7/24/2020 19:58	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200724B_02.d	Cal	7/24/2020 20:12	BMH,QQQ2;Cal	1
1202	2200724B_03.d	Cal	7/24/2020 20:25	BMH,QQQ2;Cal	1
1203	2200724B_04.d	Cal	7/24/2020 20:38	BMH,QQQ2;Cal	1
1204	2200724B_05.d	Cal	7/24/2020 20:51	BMH,QQQ2;Cal	1
1205	2200724B_06.d	Cal	7/24/2020 21:04	BMH,QQQ2;Cal	1
1206	2200724B_07.d	Cal	7/24/2020 21:18	BMH,QQQ2;Cal	1
1207	2200724B_08.d	Cal	7/24/2020 21:31	BMH,QQQ2;Cal	1
MeOH Shot	2200724B_09.d	MeOH Shot	7/24/2020 21:53	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1500	2200724B_10.d	Sample	7/24/2020 22:06	BMH,QQQ2	1
1600	2200724B_11.d	QC	7/24/2020 22:19	BMH,QQQ2	1
1450	2200724B_12.d	QC	7/24/2020 22:33	BMH,QQQ2	1
MeOH Shot	2200724B_13.d	MeOH Shot	7/24/2020 22:56	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
2065024	2200724B_14.d	Sample	7/24/2020 23:09	BMH,QQQ2;688614	1
2065025	2200724B_15.d	QC	7/24/2020 23:22	BMH,QQQ2;688614	1
2065026	2200724B_16.d	QC	7/24/2020 23:36	BMH,QQQ2;688614	1
22007241401 x20	2200724B_17.d	Sample	7/24/2020 23:49	BMH,QQQ2;688614	20
22007241402 x20	2200724B_18.d	Sample	7/25/2020 0:02	BMH,QQQ2;688614	20
22007241403 x20	2200724B_19.d	Sample	7/25/2020 0:15	BMH,QQQ2;688614	20
22007142313 x5	2200724B_20.d	Sample	7/25/2020 0:28	BMH,QQQ2;687950	5

22007142314 x5	2200724B_21.d	Sample	7/25/2020 0:42	BMH,QQQ2;687950	5
22007142315 x5	2200724B_22.d	Sample	7/25/2020 0:55	BMH,QQQ2;687950	5
1400	2200724B_23.d	QC	7/25/2020 1:08	BMH,QQQ2;CCV	1
2061705	2200724B_24.d	Sample	7/25/2020 1:21	BMH,QQQ2;688000 DW	1
2061706	2200724B_25.d	QC	7/25/2020 1:35	BMH,QQQ2;688000 DW	1
2061707	2200724B_26.d	QC	7/25/2020 1:48	BMH,QQQ2;688000 DW	1
22007092101	2200724B_27.d	Sample	7/25/2020 2:01	BMH,QQQ2;688000 DW	1
22007092102	2200724B_28.d	Sample	7/25/2020 2:14	BMH,QQQ2;688000 DW	1
22007092103	2200724B_29.d	Sample	7/25/2020 2:27	BMH,QQQ2;688000 DW	1
22007092104	2200724B_30.d	Sample	7/25/2020 2:41	BMH,QQQ2;688000 DW	1
22007092105	2200724B_31.d	Sample	7/25/2020 2:54	BMH,QQQ2;688000 DW	1
22007092106	2200724B_32.d	Sample	7/25/2020 3:07	BMH,QQQ2;688000 DW	1
22007092107	2200724B_33.d	Sample	7/25/2020 3:20	BMH,QQQ2;688000 DW	1
22007092108	2200724B_34.d	Sample	7/25/2020 3:33	BMH,QQQ2;688000 DW	1
22007092109	2200724B_35.d	Sample	7/25/2020 3:47	BMH,QQQ2;688000 DW	1
22007092110	2200724B_36.d	Sample	7/25/2020 4:00	BMH,QQQ2;688000 DW	1
1400	2200724B_37.d	QC	7/25/2020 4:13	BMH,QQQ2;CCV	1
22007092111	2200724B_38.d	Sample	7/25/2020 4:26	BMH,QQQ2;688000 DW	1
22007092112	2200724B_39.d	QC	7/25/2020 4:39	BMH,QQQ2;688000 DW	1
22007092113	2200724B_40.d	QC	7/25/2020 4:52	BMH,QQQ2;688000 DW	1
2062133	2200724B_41.d	Sample	7/25/2020 5:06	BMH,QQQ2;688084	1
2062134	2200724B_42.d	QC	7/25/2020 5:19	BMH,QQQ2;688084	1
2062135	2200724B_43.d	QC	7/25/2020 5:32	BMH,QQQ2;688084	1
22007146513	2200724B_44.d	Sample	7/25/2020 5:45	BMH,QQQ2;688084	1
22007146601	2200724B_45.d	Sample	7/25/2020 5:58	BMH,QQQ2;688084	1
22007146602	2200724B_46.d	Sample	7/25/2020 6:11	BMH,QQQ2;688084	1
22007146603	2200724B_47.d	QC	7/25/2020 6:25	BMH,QQQ2;688084	1
22007146604	2200724B_48.d	QC	7/25/2020 6:38	BMH,QQQ2;688084	1
22007146605	2200724B_49.d	Sample	7/25/2020 6:51	BMH,QQQ2;688084	1
22007146606	2200724B_50.d	Sample	7/25/2020 7:04	BMH,QQQ2;688084	1
22007146607	2200724B_51.d	Sample	7/25/2020 7:17	BMH,QQQ2;688084	1
22007146608	2200724B_52.d	Sample	7/25/2020 7:30	BMH,QQQ2;688084	1
22007146609	2200724B_53.d	Sample	7/25/2020 7:44	BMH,QQQ2;688084	1
22007146610	2200724B_54.d	Sample	7/25/2020 7:57	BMH,QQQ2;688084	1

1400	2200724B_55.d	QC	7/25/2020 8:10	BMH,QQQ2;CCV	1
2061702	2200724B_56.d	Sample	7/25/2020 8:23	BMH,QQQ2;687999	1
2061703	2200724B_57.d	QC	7/25/2020 8:36	BMH,QQQ2;687999	1
2061704	2200724B_58.d	QC	7/25/2020 8:50	BMH,QQQ2;687999	1
22007103443 x5	2200724B_59.d	Sample	7/25/2020 9:03	BMH,QQQ2;687999	5
22007103443 x1	2200724B_60.d	Sample	7/25/2020 9:16	BMH,QQQ2;687999	1
MeOH Shot	2200724B_61.d	MeOH Shot	7/25/2020 9:29	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007103444 x5	2200724B_62.d	Sample	7/25/2020 9:42	BMH,QQQ2;687999	5
22007103444 x1	2200724B_63.d	Sample	7/25/2020 9:55	BMH,QQQ2;687999	1
MeOH Shot	2200724B_64.d	MeOH Shot	7/25/2020 10:09	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1450	2200724B_65.d	QC	7/25/2020 10:22	BMH,QQQ2;LLCCV	1
22007103445 x5	2200724B_66.d	Sample	7/25/2020 10:35	BMH,QQQ2;687999	5
22007103445 x1	2200724B_67.d	Sample	7/25/2020 10:48	BMH,QQQ2;687999	1
MeOH Shot	2200724B_68.d	MeOH Shot	7/25/2020 11:01	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007103446 x5	2200724B_69.d	Sample	7/25/2020 11:14	BMH,QQQ2;687999	5
22007103446 x1	2200724B_70.d	Sample	7/25/2020 11:28	BMH,QQQ2;687999	1
MeOH Shot	2200724B_71.d	MeOH Shot	7/25/2020 11:41	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007103447 x5	2200724B_72.d	Sample	7/25/2020 11:54	BMH,QQQ2;687999	5
22007103447 x1	2200724B_73.d	Sample	7/25/2020 12:07	BMH,QQQ2;687999	1
MeOH Shot	2200724B_74.d	MeOH Shot	7/25/2020 12:20	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007103448 x5	2200724B_75.d	Sample	7/25/2020 12:33	BMH,QQQ2;687999	5
22007103448 x1	2200724B_76.d	Sample	7/25/2020 12:47	BMH,QQQ2;687999	1
MeOH Shot	2200724B_77.d	MeOH Shot	7/25/2020 13:00	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1400	2200724B_78.d	QC	7/25/2020 13:13	BMH,QQQ2;CCV	1
22007146502	2200724B_79.d	Sample	7/25/2020 13:26	BMH,QQQ2;688084	1
22007146503	2200724B_80.d	Sample	7/25/2020 13:39	BMH,QQQ2;688084	1
22007146504	2200724B_81.d	Sample	7/25/2020 13:53	BMH,QQQ2;688084	1
22007146505	2200724B_82.d	QC	7/25/2020 14:06	BMH,QQQ2;688084	1
22007146506	2200724B_83.d	QC	7/25/2020 14:19	BMH,QQQ2;688084	1
22007146507	2200724B_84.d	Sample	7/25/2020 14:32	BMH,QQQ2;688084	1
22007146508	2200724B_85.d	Sample	7/25/2020 14:45	BMH,QQQ2;688084	1
22007146510	2200724B_86.d	Sample	7/25/2020 14:59	BMH,QQQ2;688084	1
2063514	2200724B_87.d	Sample	7/25/2020 15:12	BMH,QQQ2;688322	1
2063515	2200724B_88.d	QC	7/25/2020 15:25	BMH,QQQ2;688322	1

2063516	2200724B_89.d	QC	7/25/2020 15:38	BMH,QQQ2;688322	1
22007182302	2200724B_90.d	Sample	7/25/2020 15:51	BMH,QQQ2;688322	1
22007182303	2200724B_91.d	Sample	7/25/2020 16:05	BMH,QQQ2;688322	1
1400	2200724B_92.d	QC	7/25/2020 16:18	BMH,QQQ2;CCV	1
22007180801	2200724B_93.d	Sample	7/25/2020 16:31	BMH,QQQ2;688322	1
22007180802	2200724B_94.d	QC	7/25/2020 16:44	BMH,QQQ2;688322	1
22007180803	2200724B_95.d	QC	7/25/2020 16:57	BMH,QQQ2;688322	1
22007180804	2200724B_96.d	Sample	7/25/2020 17:11	BMH,QQQ2;688322	1
22007180805	2200724B_97.d	Sample	7/25/2020 17:24	BMH,QQQ2;688322	1
22007146512	2200724B_98.d	Sample	7/25/2020 17:37	BMH,QQQ2;688322	1
22007146501	2200724B_99.d	Sample	7/25/2020 17:50	BMH,QQQ2;688322	1
22007146511	2200724B_100.d	Sample	7/25/2020 18:03	BMH,QQQ2;688322	1
22007182301	2200724B_101.d	Sample	7/25/2020 18:16	BMH,QQQ2;688322	1
1400	2200724B_102.d	QC	7/25/2020 18:30	BMH,QQQ2;CCV	1

4I

ORGANICS INSTRUMENT BLANK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/24/2020 22:06	Lab File ID:	2200724B_10.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688721

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
6:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.79	4.00	10.0	
NEtFOSAA	ng/L	8.00	U	5.38	8.00	10.0	
NMeFOSAA	ng/L	8.00	U	4.60	8.00	10.0	
Perfluorobutanesulfonic acid	ng/L	4.00	U	1.47	4.00	10.0	
Perfluorobutanoic acid	ng/L	4.00	U	2.13	4.00	10.0	
Perfluorodecanoic acid	ng/L	4.00	U	1.65	4.00	10.0	
Perfluorododecanoic acid	ng/L	4.00	U	2.45	4.00	10.0	
Perfluoroheptanoic acid	ng/L	4.00	U	1.85	4.00	10.0	
Perfluorohexanesulfonic acid	ng/L	4.00	U	1.64	4.00	10.0	
Perfluorohexanoic acid	ng/L	4.00	U	1.94	4.00	10.0	
Perfluorononanoic acid	ng/L	4.00	U	1.68	4.00	10.0	
Perfluorooctanesulfonic acid	ng/L	4.00	U	1.70	4.00	10.0	
Perfluorooctanoic acid	ng/L	4.00	U	1.80	4.00	10.0	
Perfluoropentanoic acid	ng/L	4.00	U	2.35	4.00	10.0	
Perfluorotetradecanoic acid	ng/L	4.00	U	2.76	4.00	10.0	
Perfluoroundecanoic acid	ng/L	4.00	U	1.86	4.00	10.0	

* - Result greater than 1/2 LOQ

FORM 4I - ORG

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/24/2020 22:19	Lab File ID:	2200724B_11.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688721

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47400	46900	99	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	47900	44500	93	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	49600	99	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	56100	112	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50200	52400	104	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	50200	52900	105	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50100	55200	110	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50100	56500	113	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50100	49000	98	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50300	52000	103	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	50600	53100	105	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50100	58800	117	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50200	50000	100	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	50300	45000	89	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50700	54100	107	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50100	57100	114	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50100	46300	92	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50100	45800	91	70	130	

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/24/2020 22:33	Lab File ID:	2200724B_12.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688721

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	7.85	83	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	8.88	93	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	9.76	98	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	9.92	99	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.80	88	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	7.16	81	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.96	90	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	7.13	71	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	8.00	80	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	9.04	91	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	6.54	72	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	8.56	86	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	7.78	78	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.06	76	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	8.00	80	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	11.3	113	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	8.08	80	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	9.28	93	70	130	

Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2200724BCAL\QuantResults\2200724B.batch.bin		
Analysis Time	7/26/2020 11:12 AM	**Analyst Name**	GCAL\lcms
Report Time	7/26/2020 12:18 PM	**Reporter Name**	GCAL\lcms
Last Calib Update	7/26/2020 11:12 AM	**Batch State**	Processed

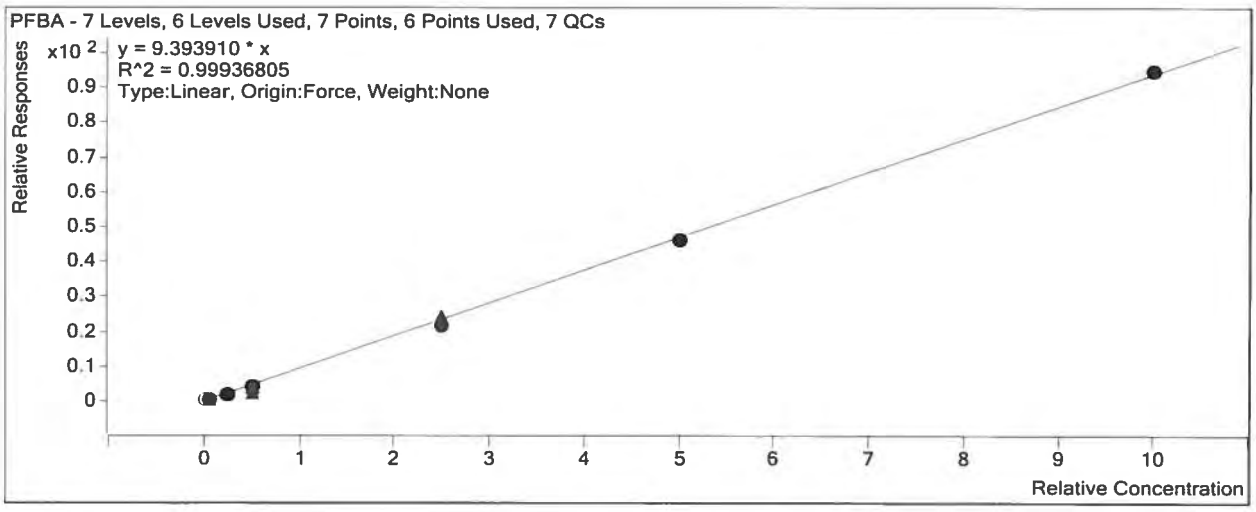
Calibration Info

Extracted ISTD *MPFBA*

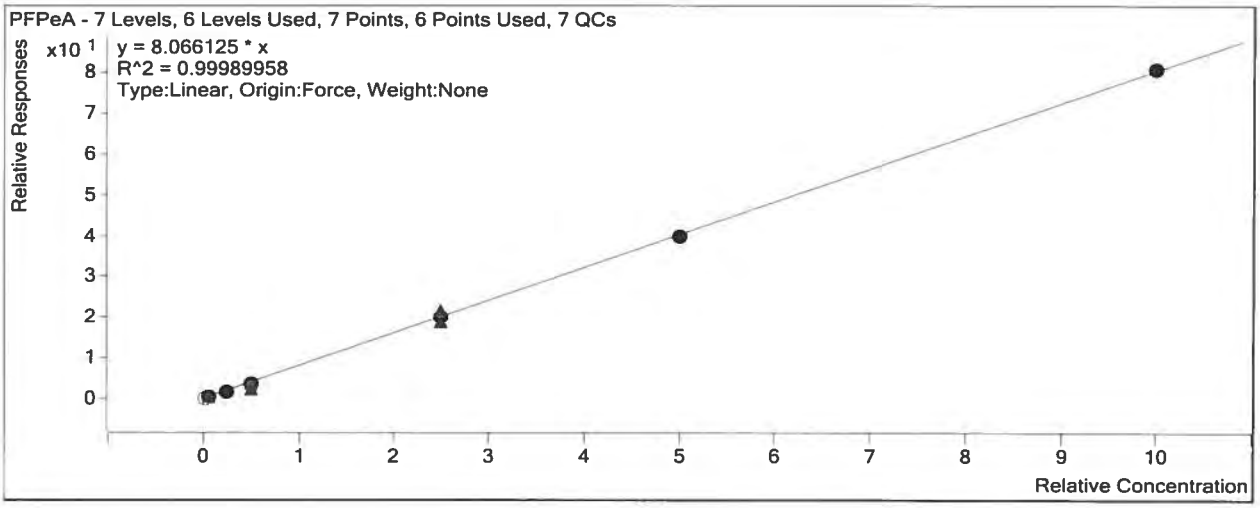
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	33785	20.0000	1689.2402
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	33522	20.0000	1676.1195
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	33432	20.0000	1671.6094
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	33741	20.0000	1687.0561
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	34243	20.0000	1712.1356
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	31127	20.0000	1556.3549
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	30335	20.0000	1516.7359

Target Compound *PFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	10446	0.5000	12.3680
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	17565	1.2500	8.3835
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	67389	5.0000	8.0628
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	147880	10.0000	8.7656
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	745719	50.0000	8.7110
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	1439591	100.0000	9.2498
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	2874237	200.0000	9.4751

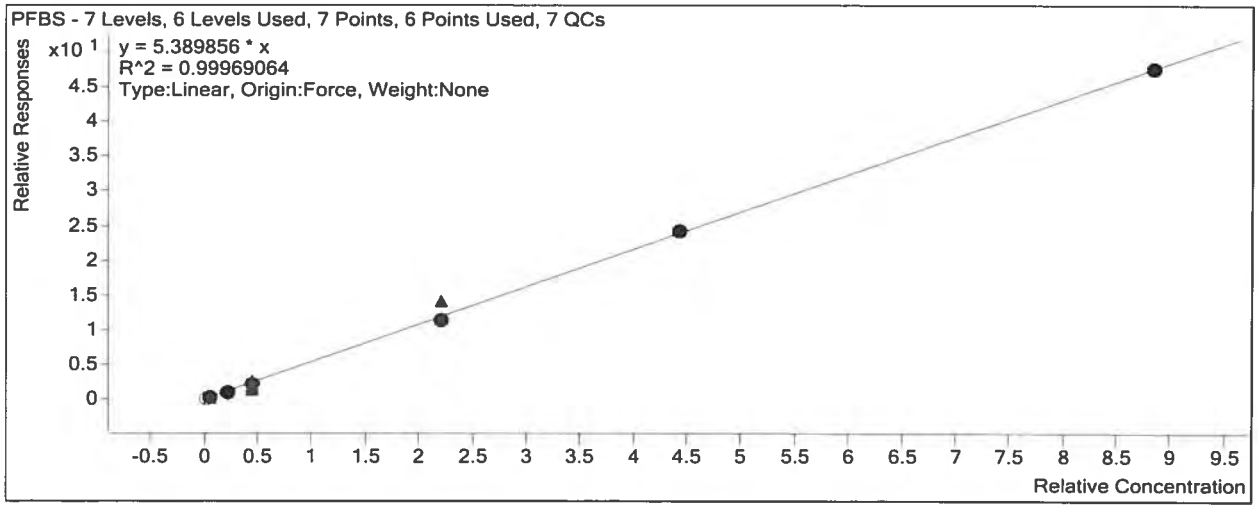


D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	438299	50.0000	7.9789
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	841961	100.0000	7.9845
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	1660248	200.0000	8.0945



Target Compound *PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1584	0.4425	4.3932
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	4179	1.1100	4.6554
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	16526	4.4250	4.7177
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	35295	8.8500	5.0151
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	185558	44.2500	5.1396
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	357645	88.5000	5.4848
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	686664	177.0000	5.3832

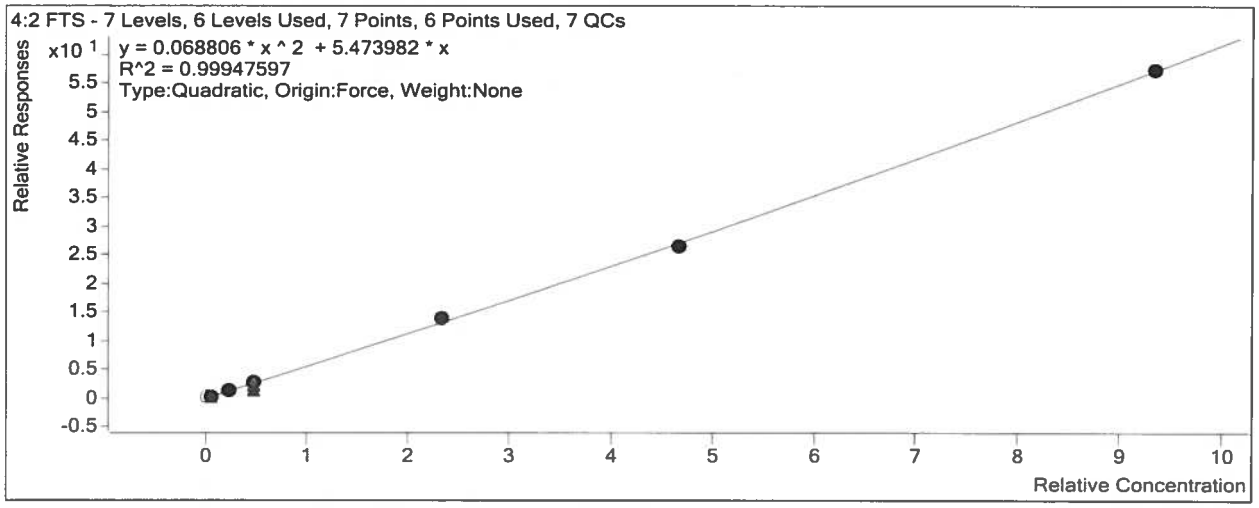


Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	1478	20.0000	73.8759

Target Compound *4:2 FTS*

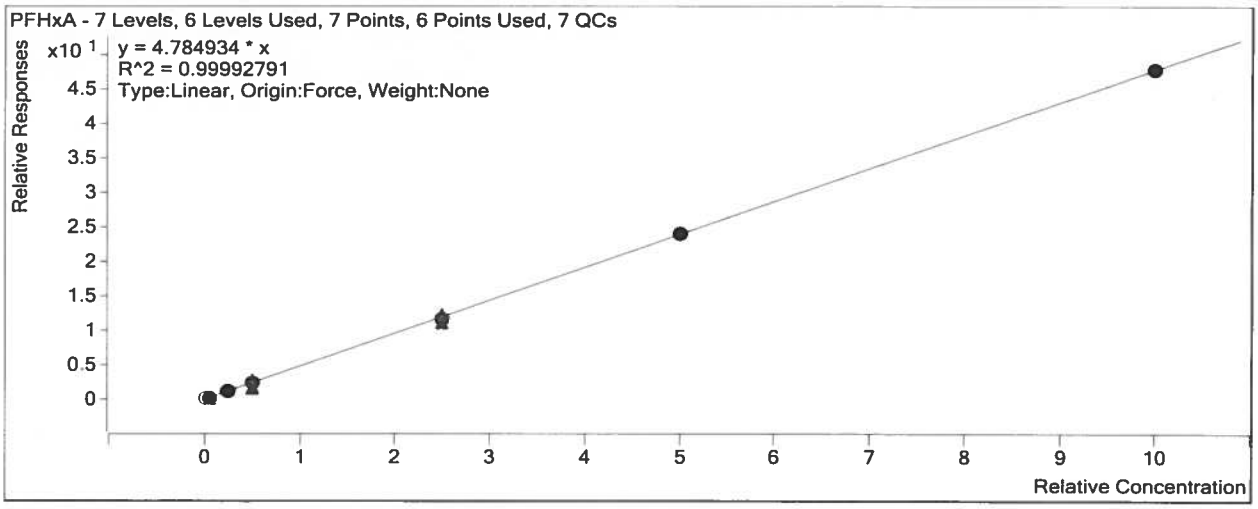
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	229	0.4675	6.0639
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	491	1.1700	5.5993
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	2028	4.6700	6.1598
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	4446	9.3500	6.0798
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	20098	46.7500	5.9909
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	42453	93.5000	5.6479
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	84687	187.0000	6.1301



Extracted ISTD *M5PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	29638	20.0000	1481.9212
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	28949	20.0000	1447.4337
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	28138	20.0000	1406.9099
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	28054	20.0000	1402.7225
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	27338	20.0000	1366.9156
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	26279	20.0000	1313.9603
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	25853	20.0000	1292.6449

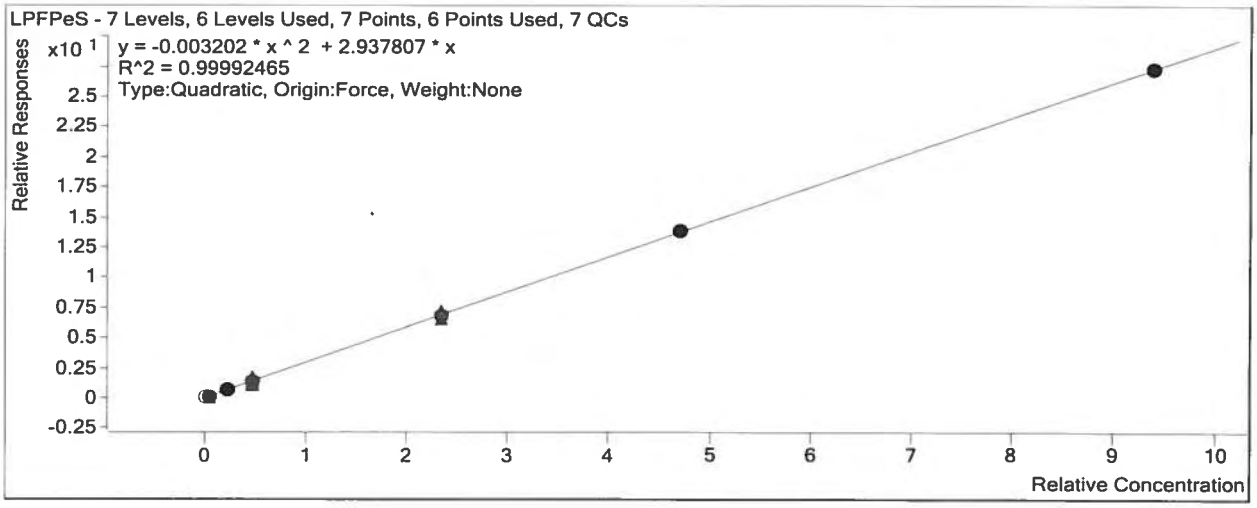
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFPeS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1917	0.4700	2.7520
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	4193	1.1800	2.4548
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	17068	4.7000	2.5811
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	36283	9.4000	2.7517
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	185014	47.0000	2.8798
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	364000	94.0000	2.9471
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	706083	188.0000	2.9055



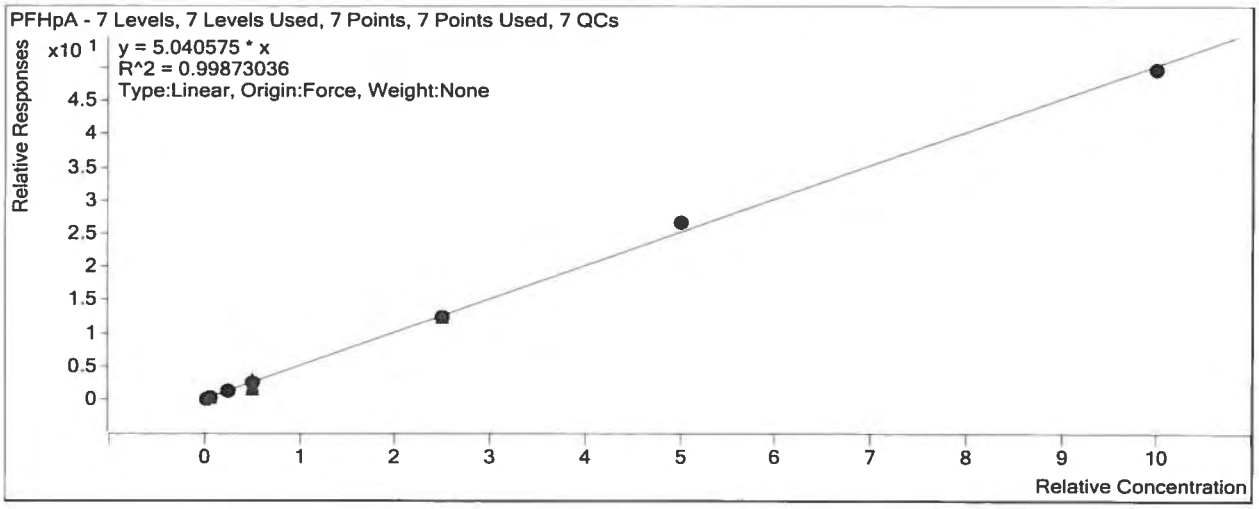
Extracted ISTD *M3HFPODA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	1575	40.0000	39.3800
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	1217	40.0000	30.4180
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	983	40.0000	24.5735
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	1175	40.0000	29.3697
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	1257	40.0000	31.4184
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	1567	40.0000	39.1823
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	1420	40.0000	35.5114

Target Compound *HFPO-DA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



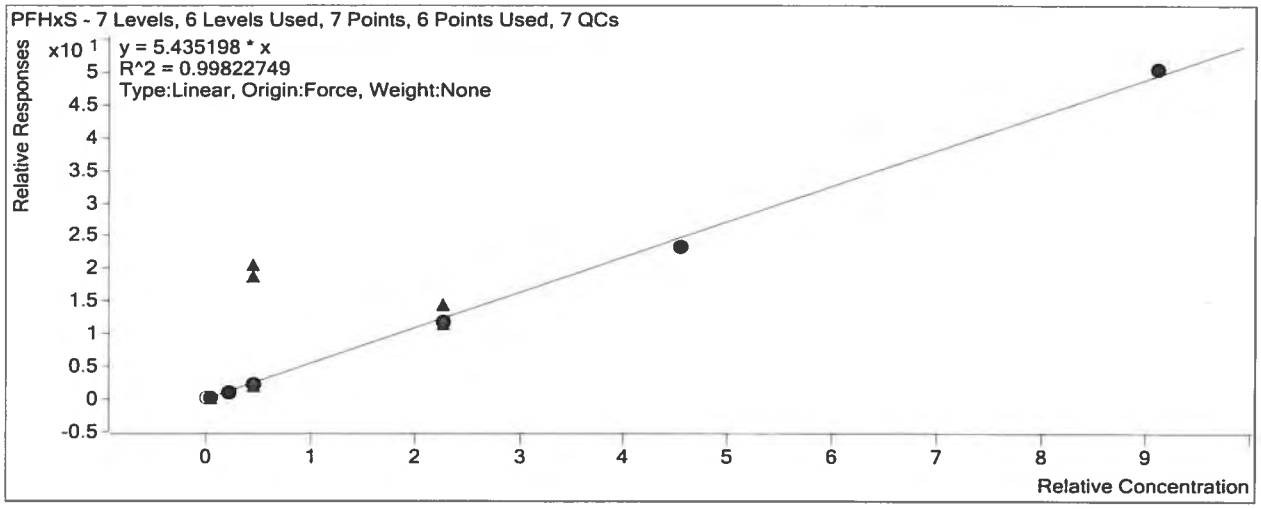
Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	17120	20.0000	856.0143
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	17218	20.0000	860.8766
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	17089	20.0000	854.4508
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	17162	20.0000	858.0946
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	16298	20.0000	814.8939
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	15594	20.0000	779.6861
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	14318	20.0000	715.8976

Target Compound *PFHxS*

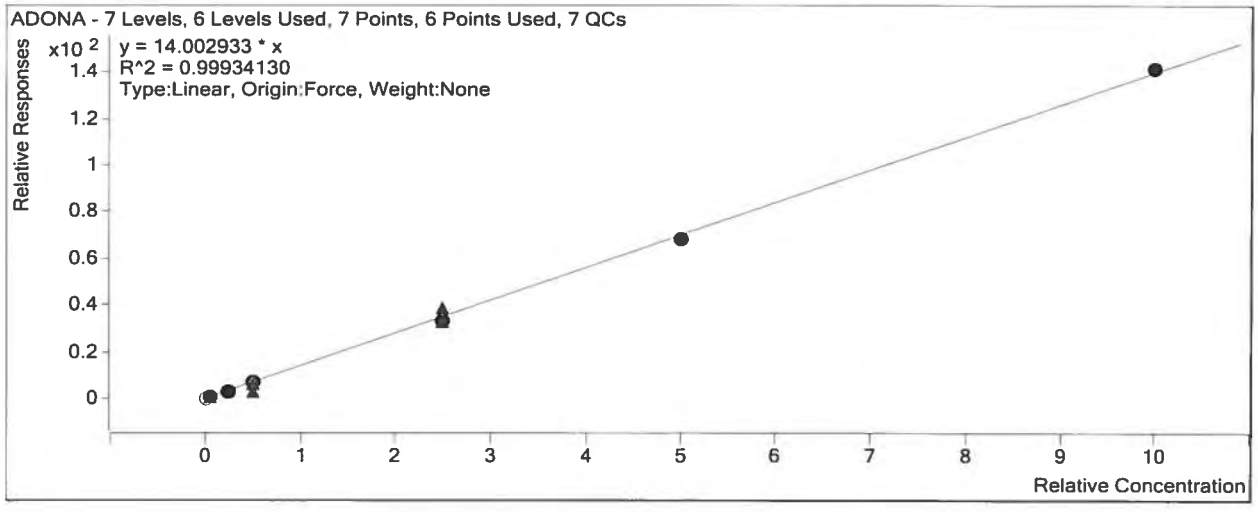
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1897	0.4560	4.8597
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	4702	1.1400	4.7912
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	17525	4.5600	4.4978
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	38604	9.1200	4.9329
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	191856	45.6000	5.1631
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	363881	91.2000	5.1173
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	722568	182.4000	5.5335

Quantitative Analysis Calibration Report



Target Compound *ADONA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	10873	0.5000	11.2987
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	27711	1.2500	10.3433
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	117668	5.0000	12.1986
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	244919	10.0000	13.2711
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	1240716	50.0000	13.2116
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	2360416	100.0000	13.6274
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	4632466	200.0000	14.1494



Extracted ISTD *M2 6:2 FTS*

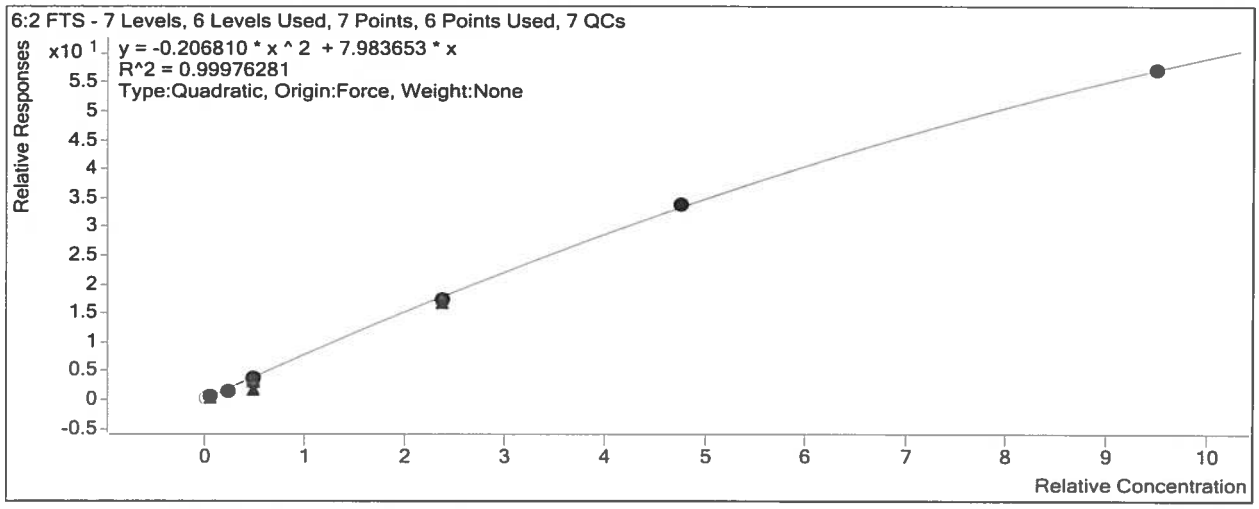
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	3250	20.0000	162.5241

Target Compound *6:2 FTS*

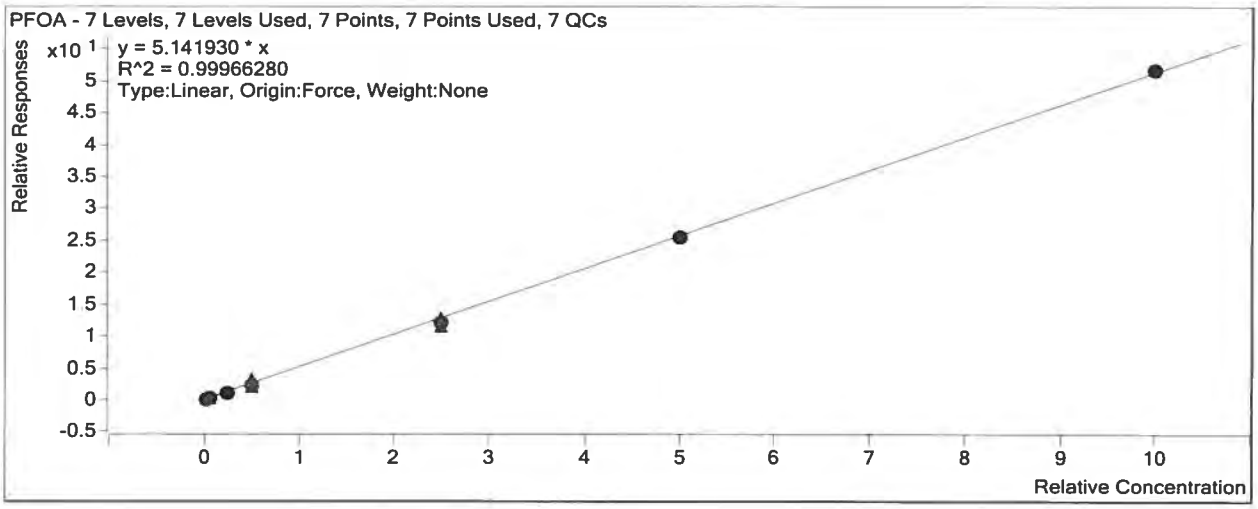
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	439	0.4750	6.1927
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	1288	1.1900	7.1422
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	4454	4.7500	6.3171
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	10096	9.5000	7.9484
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	49153	47.5000	7.2735
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	97977	95.0000	7.0904
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	185625	190.0000	6.0113



Extracted ISTD *M8PFOA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	38494	20.0000	1924.6878
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	42866	20.0000	2143.3087
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	38584	20.0000	1929.1924
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	36910	20.0000	1845.5020
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	37564	20.0000	1878.2228
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	34642	20.0000	1732.1072
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	32740	20.0000	1636.9869

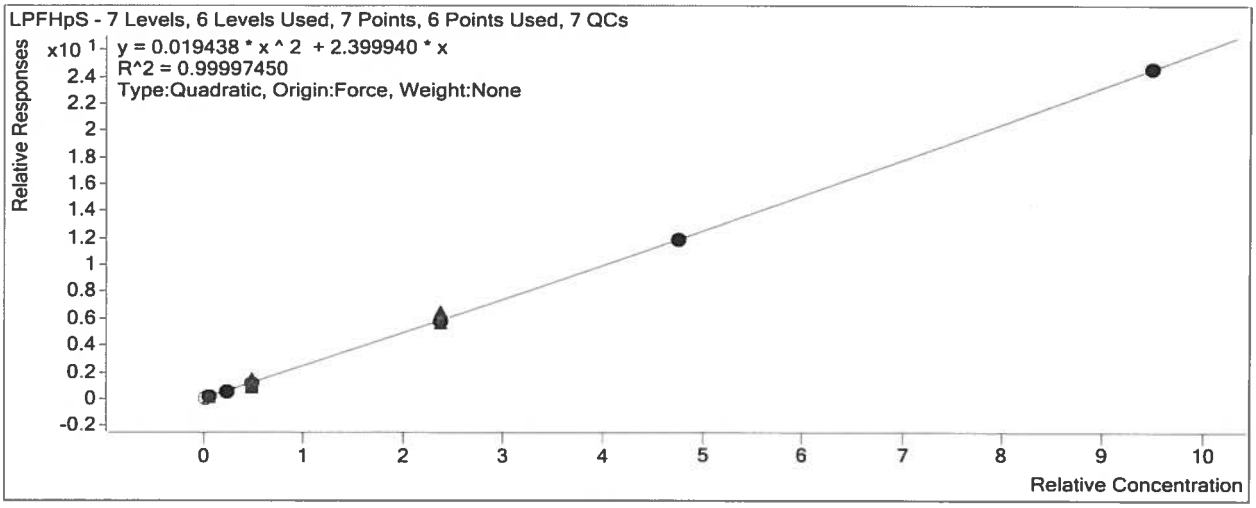
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1540	0.4750	1.6847
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	4583	1.1900	1.7970
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	19440	4.7500	2.1214
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	42448	9.5000	2.4212
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	216077	47.5000	2.4220
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	411813	95.0000	2.5027
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	803595	190.0000	2.5837



Extracted ISTD *M9PFNA*

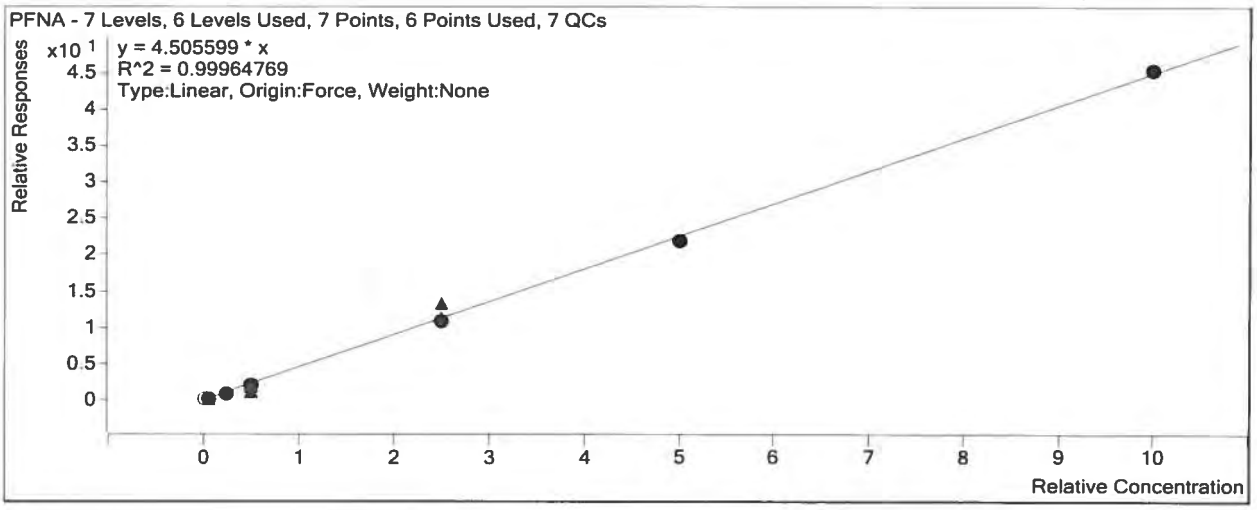
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	32196	20.0000	1609.8126
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	33139	20.0000	1656.9570
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	32114	20.0000	1605.6963
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	31851	20.0000	1592.5356
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	31927	20.0000	1596.3740
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	30905	20.0000	1545.2377
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	29072	20.0000	1453.6017

Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF



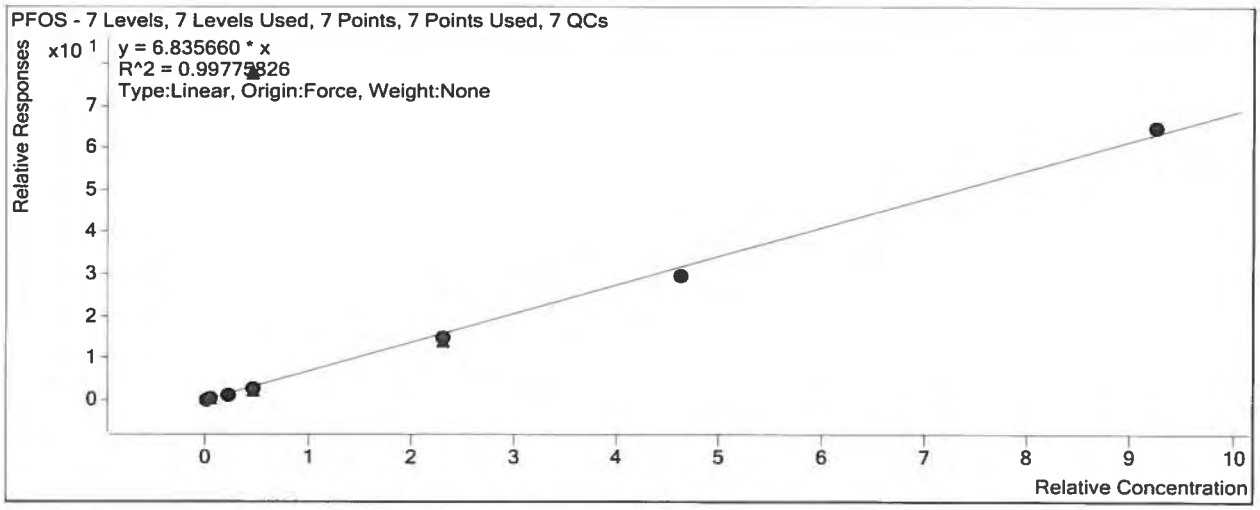
Extracted ISTD *M8PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	17909	20.0000	895.4256
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	17816	20.0000	890.8078
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	17711	20.0000	885.5368
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	18253	20.0000	912.6423
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	17661	20.0000	883.0360
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	17402	20.0000	870.0958
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	15735	20.0000	786.7341

Target Compound *PFOS*

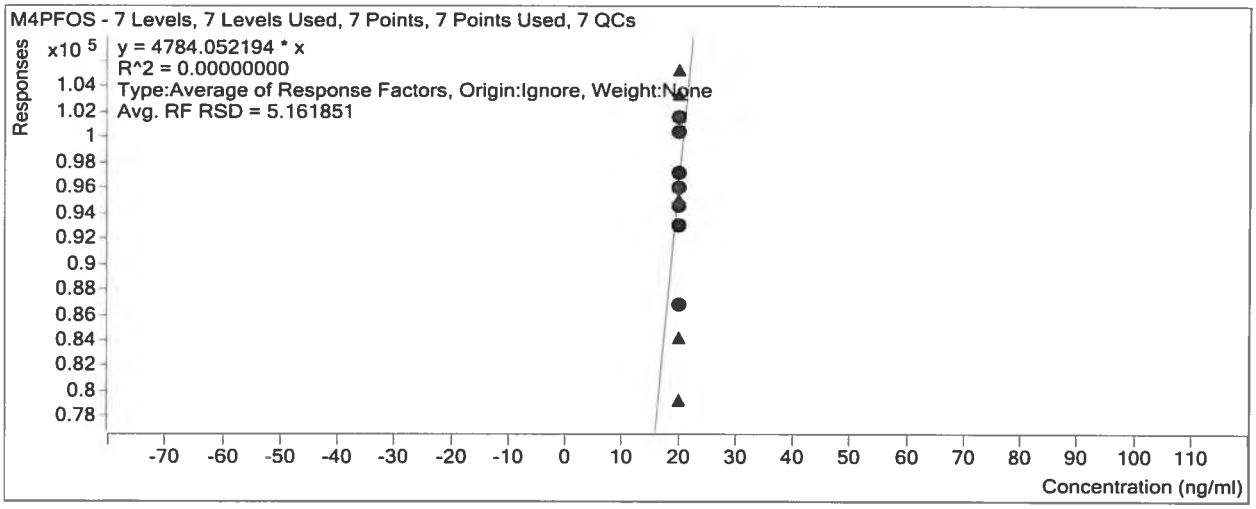
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	2271	0.4628	5.4817
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	5670	1.1600	5.4870
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	23024	4.6280	5.6180
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	51642	9.2550	6.1140
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	261929	46.2800	6.4093
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	512762	92.5500	6.3676
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	1016745	185.1000	6.9820

Quantitative Analysis Calibration Report



Instrument ISTD *M4PFOS*

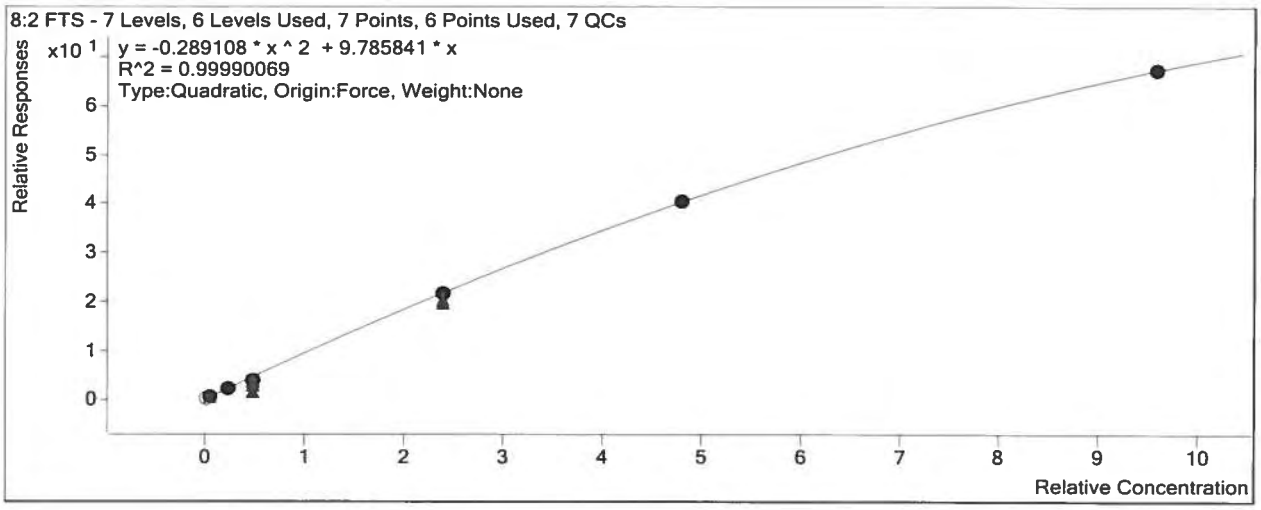
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	100435	20.0000	5021.7574
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	101571	20.0000	5078.5278
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	96002	20.0000	4800.1082
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	94623	20.0000	4731.1592
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	97248	20.0000	4862.4195
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	93071	20.0000	4653.5682
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	86817	20.0000	4340.8250



Target Compound *9Cl-PF3ONS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



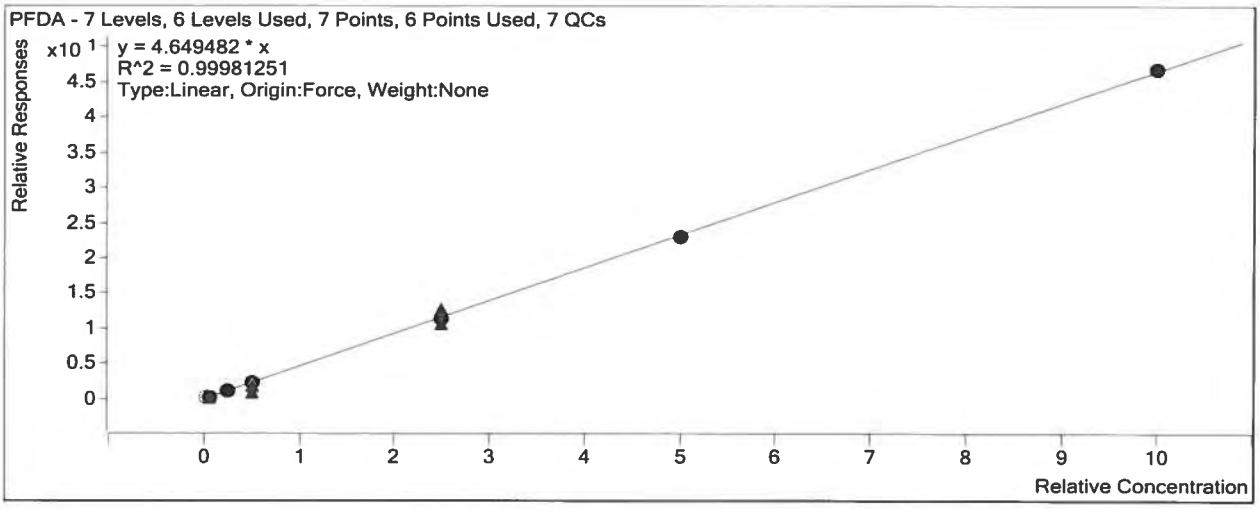
Extracted ISTD *M6PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	16988	20.0000	849.3896
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	18981	20.0000	949.0471
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	17587	20.0000	879.3385
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	17126	20.0000	856.2923
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	17518	20.0000	875.9086
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	16956	20.0000	847.8053
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	15794	20.0000	789.6995

Target Compound *PFDA*

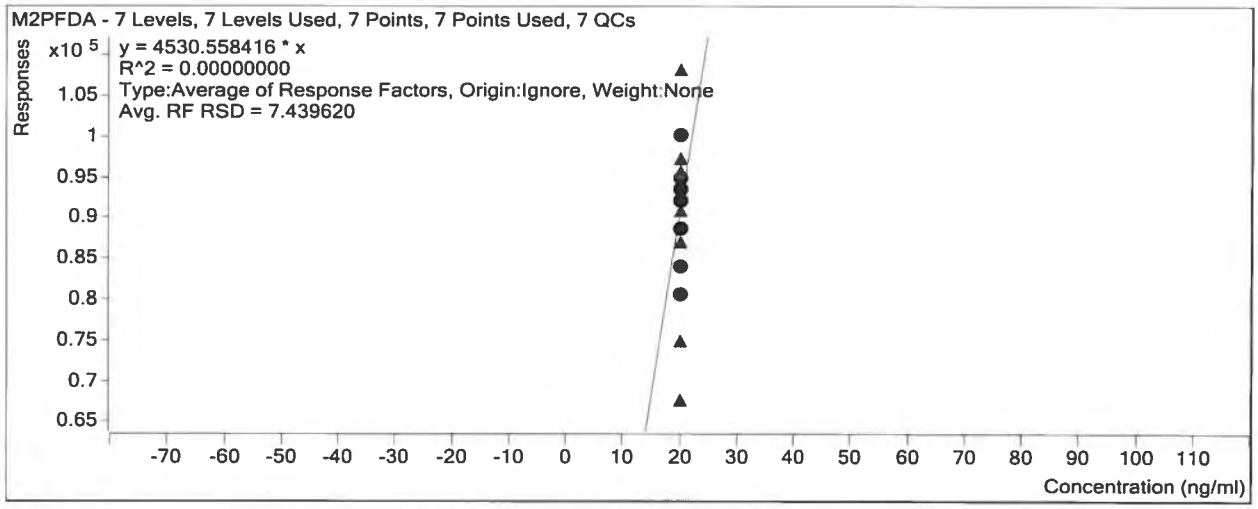
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	2174	0.5000	5.1184
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	4382	1.2500	3.6938
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	18130	5.0000	4.1236
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	37818	10.0000	4.4165
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	197985	50.0000	4.5207
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	388618	100.0000	4.5838
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	738353	200.0000	4.6749

Quantitative Analysis Calibration Report



Instrument ISTD *M2PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	100275	20.0000	5013.7650
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	95023	20.0000	4751.1564
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	93519	20.0000	4675.9251
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	92177	20.0000	4608.8269
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	88783	20.0000	4439.1353
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	83949	20.0000	4197.4385
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	80553	20.0000	4027.6617

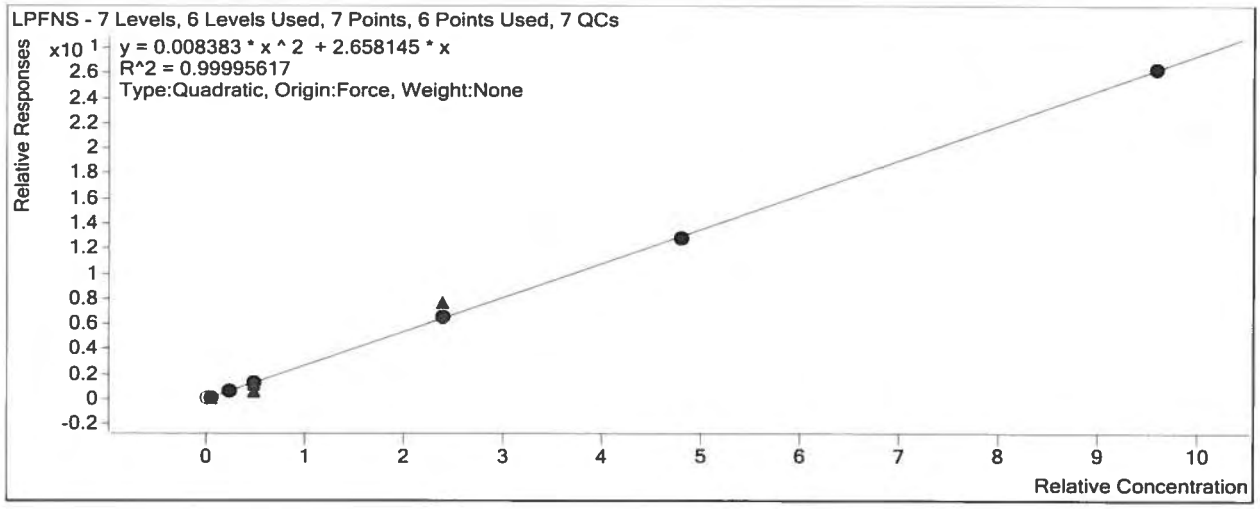


Target Compound *LPFNS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	764674	192.0000	2.7399



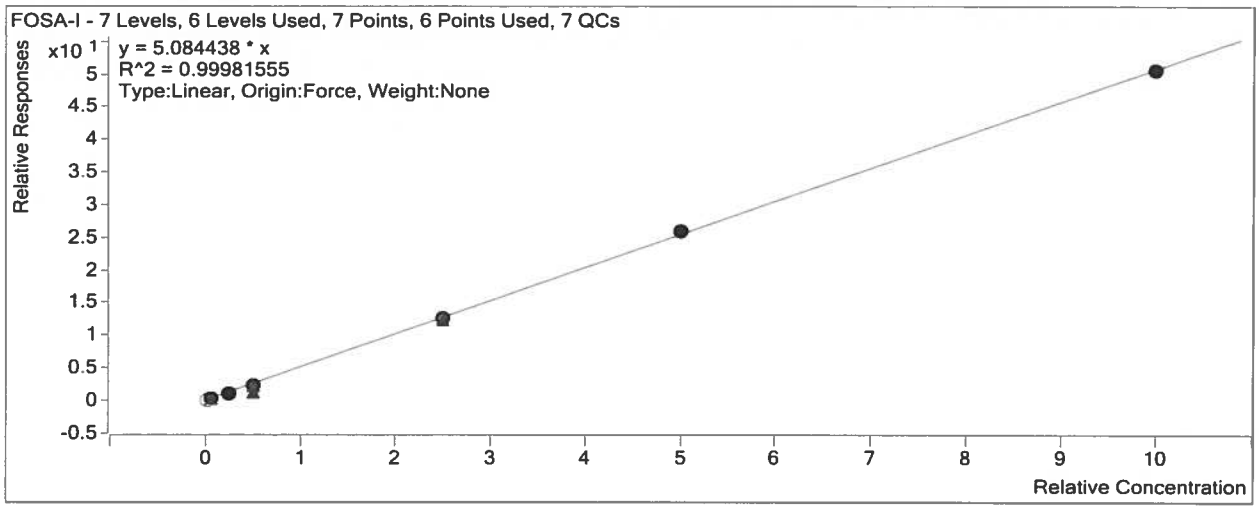
Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	23209	20.0000	1160.4528
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	24525	20.0000	1226.2591
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	24168	20.0000	1208.3934
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	23750	20.0000	1187.5207
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	23551	20.0000	1177.5557
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	22036	20.0000	1101.8165
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	22401	20.0000	1120.0648

Target Compound *FOSA-I*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	2363	0.5000	4.0724
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	6298	1.2500	4.1088
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	25869	5.0000	4.2815
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	55709	10.0000	4.6912
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	297735	50.0000	5.0568
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	570817	100.0000	5.1807
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	1134318	200.0000	5.0636

Quantitative Analysis Calibration Report



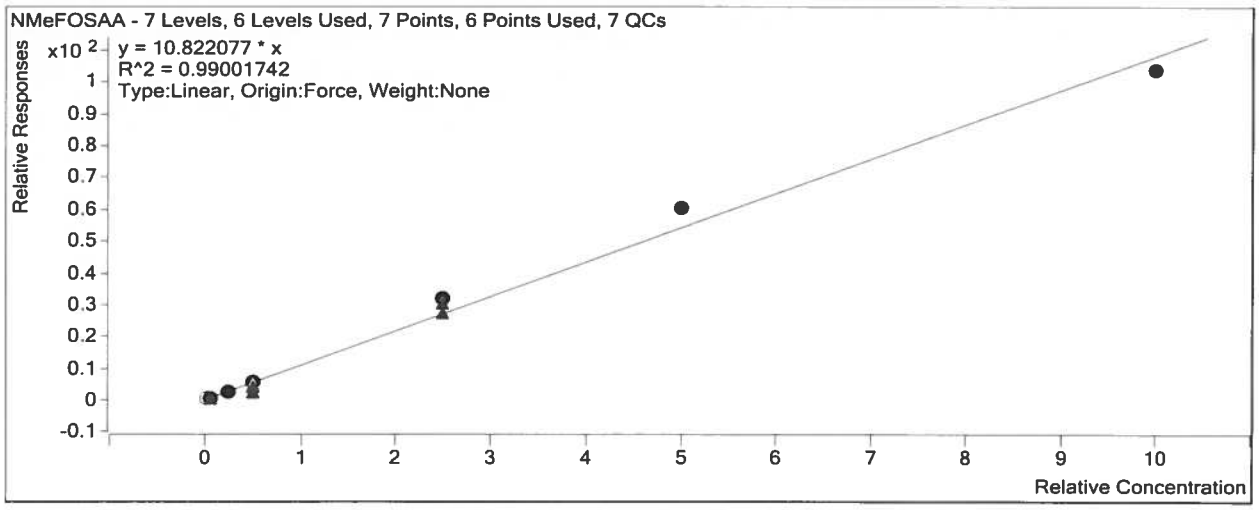
Extracted ISTD *d3-NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	7652	20.0000	382.5771
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	7850	20.0000	392.4789
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	7147	20.0000	357.3399
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	7714	20.0000	385.6857
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	7385	20.0000	369.2352
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	7560	20.0000	377.9834
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	8819	20.0000	440.9507

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	2004	0.5000	10.4776
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	4676	1.2500	9.5306
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	19446	5.0000	10.8837
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	44159	10.0000	11.4494
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	235048	50.0000	12.7316
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	458003	100.0000	12.1170
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	915188	200.0000	10.3774

Quantitative Analysis Calibration Report



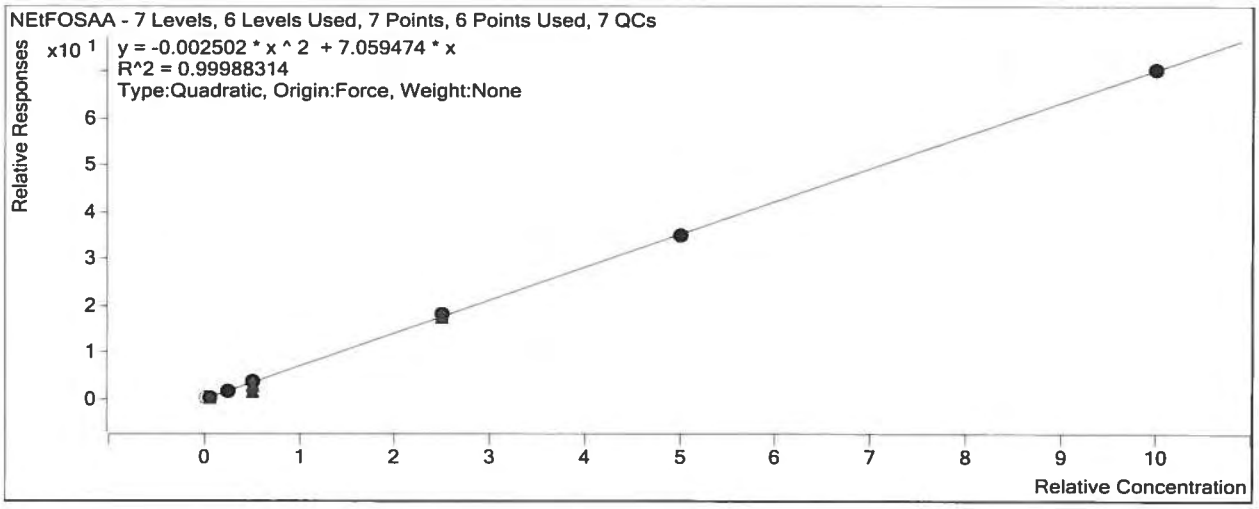
Extracted ISTD *d5-NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	10219	20.0000	510.9641
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	11166	20.0000	558.3014
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	11672	20.0000	583.5824
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	10012	20.0000	500.5843
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	10767	20.0000	538.3554
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	10849	20.0000	542.4730
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	10121	20.0000	506.0470

Target Compound *NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	2071	0.5000	8.1064
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	3925	1.2500	5.6245
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	18384	5.0000	6.3004
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	37991	10.0000	7.5894
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	194562	50.0000	7.2280
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	378400	100.0000	6.9755
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	712575	200.0000	7.0406

Quantitative Analysis Calibration Report



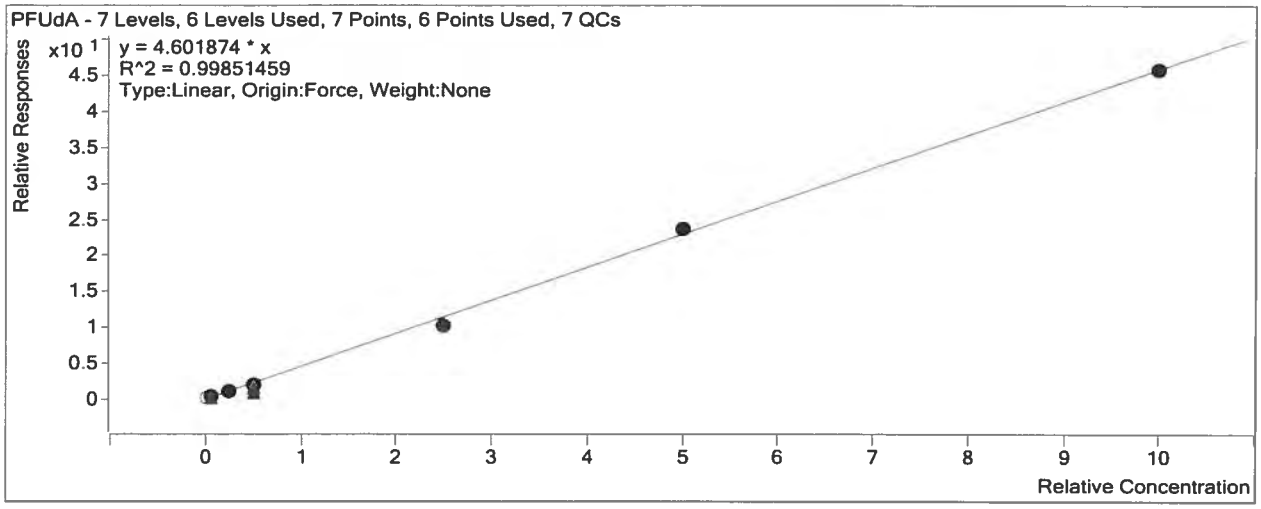
Extracted ISTD *M7PFUdA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	17029	20.0000	851.4740
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	17545	20.0000	877.2520
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	17476	20.0000	873.7800
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	16566	20.0000	828.2953
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	17193	20.0000	859.6315
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	14900	20.0000	745.0182
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	14341	20.0000	717.0282

Target Compound *PFUdA*

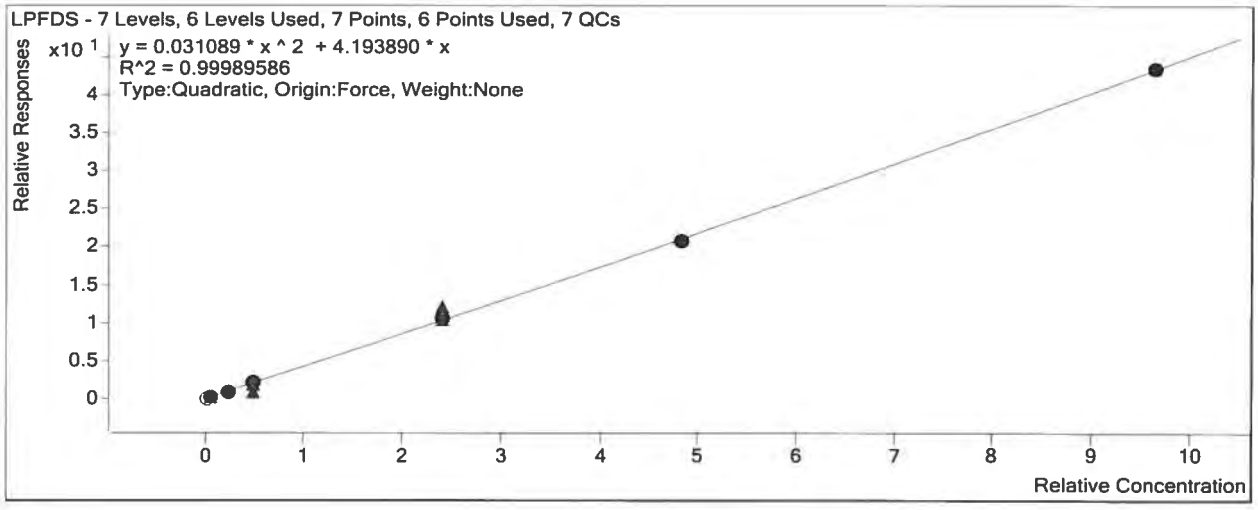
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	2207	0.5000	5.1847
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	5694	1.2500	5.1925
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	18170	5.0000	4.1590
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	33758	10.0000	4.0756
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	175935	50.0000	4.0933
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	355422	100.0000	4.7706
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	658667	200.0000	4.5930

Quantitative Analysis Calibration Report



Target Compound *LPFDS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1366	0.4825	3.3335
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	3568	1.2100	3.1070
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	16050	4.8250	3.7830
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	36828	9.6500	4.4568
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	185123	48.2500	4.3803
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	351779	96.5000	4.2998
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	685495	193.0000	4.4976



Target Compound *11Cl-PF3OUdS*

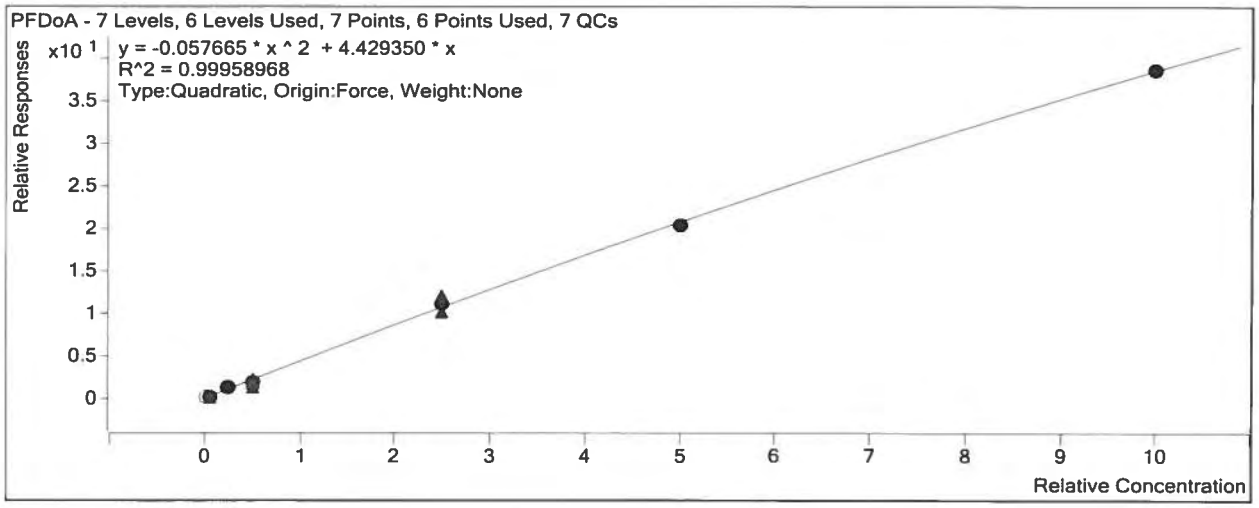
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	13579	20.0000	678.9397
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	11797	20.0000	589.8575
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	12642	20.0000	632.0798
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	13690	20.0000	684.5180

Target Compound *PFDoA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1470	0.5000	5.0040
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	3304	1.2500	3.7998
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	13926	5.0000	5.1372
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	26566	10.0000	3.9129
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	132266	50.0000	4.4847
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	257393	100.0000	4.0722
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	528207	200.0000	3.8582



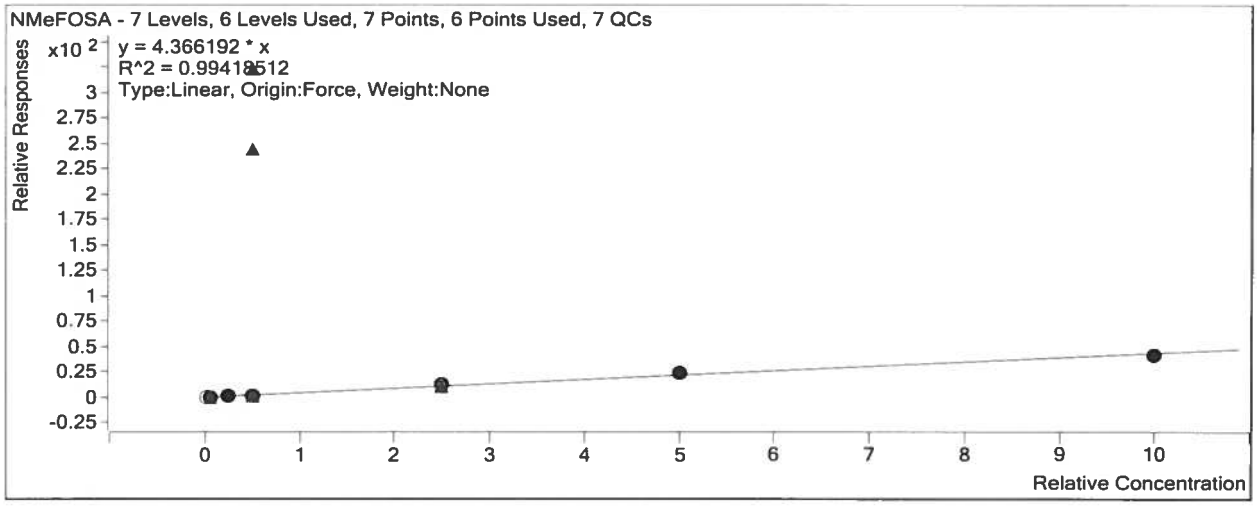
Extracted ISTD *d-NMeFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	11314	20.0000	565.6954
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	11190	20.0000	559.4896
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	11094	20.0000	554.6787
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	10696	20.0000	534.7812

Quantitative Analysis Calibration Report

Target Compound *NMeFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1037	0.5000	3.6670
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	2865	1.2500	4.0962
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	12706	5.0000	4.5814
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	24055	10.0000	4.4982
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	131700	50.0000	4.7876
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	266689	100.0000	4.8162
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	531174	200.0000	4.2269



Extracted ISTD *d7-NMeFOSE*

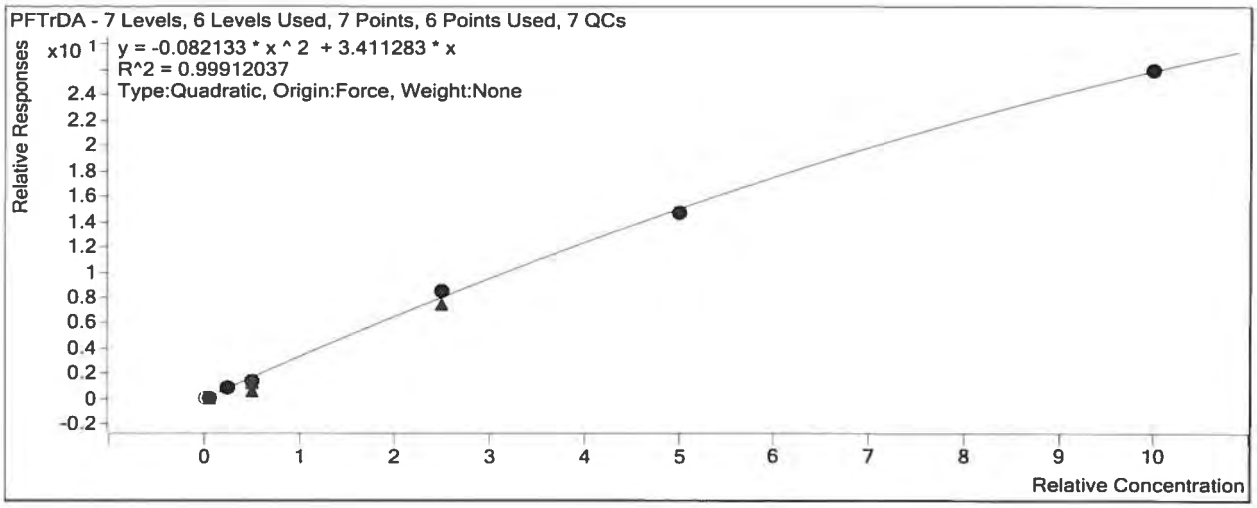
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	14032	20.0000	701.6185
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	13594	20.0000	679.6802
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	13285	20.0000	664.2373
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	13914	20.0000	695.6870
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	13140	20.0000	657.0113
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	13328	20.0000	666.4116
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	12517	20.0000	625.8275

Target Compound *NMeFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	100505	50.0000	3.4078
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	185649	100.0000	2.9371
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	355240	200.0000	2.5948



Extracted ISTD *d9-NEtFOSE*

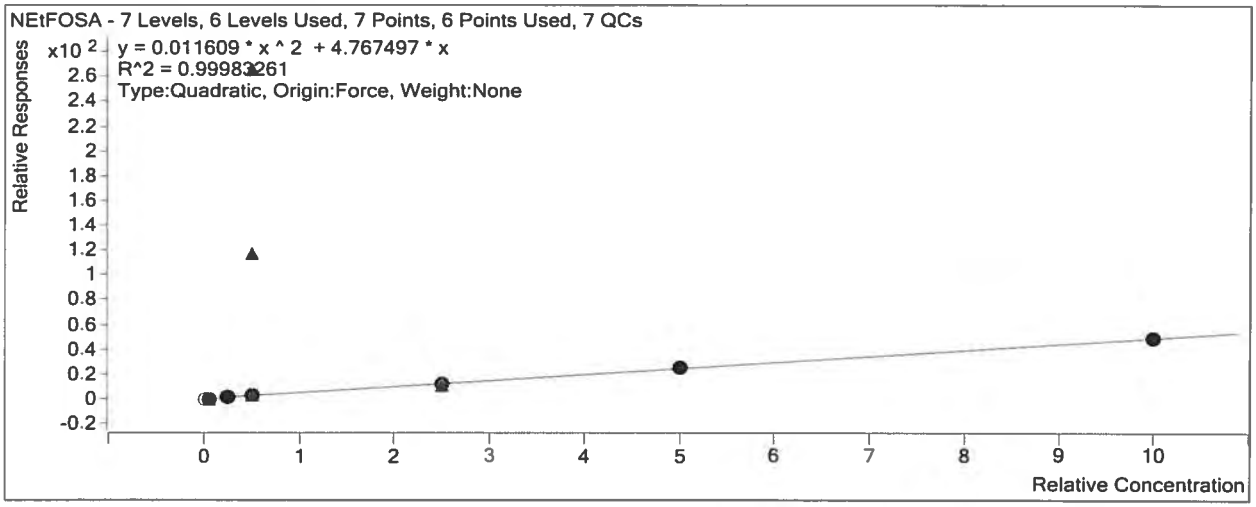
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	18249	20.0000	912.4353
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	18085	20.0000	904.2340
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	16743	20.0000	837.1396
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	18032	20.0000	901.6207
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	18304	20.0000	915.2015
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	17277	20.0000	863.8510
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	17296	20.0000	864.7960

Extracted ISTD *d-NEtFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	12791	20.0000	639.5383
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	11879	20.0000	593.9693
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	11174	20.0000	558.7133
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	12245	20.0000	612.2594
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	12020	20.0000	600.9918

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	2960	1.2500	3.9871
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	12048	5.0000	4.3127
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	27102	10.0000	4.4265
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	139551	50.0000	4.6440
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	283438	100.0000	4.8918
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	557190	200.0000	4.8777



Target Compound *NEtFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1913	0.5000	4.1933
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	4827	1.2500	4.2703
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	18723	5.0000	4.4731
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	42779	10.0000	4.7447
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	222095	50.0000	4.8535
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	422356	100.0000	4.8892
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	835000	200.0000	4.8277

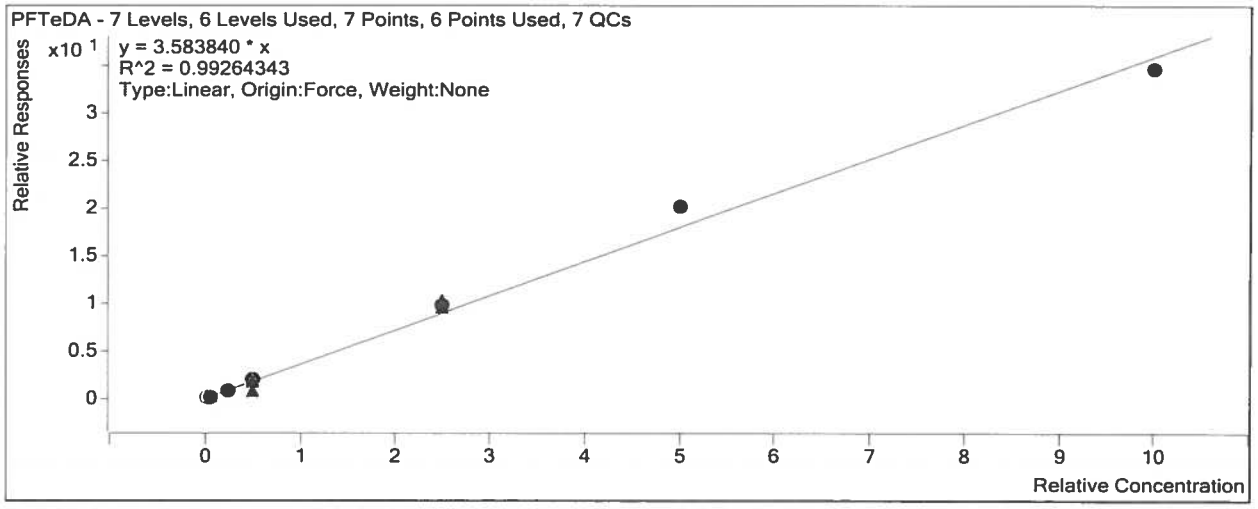
Quantitative Analysis Calibration Report

Extracted ISTD *M2PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☑	10165	20.0000	508.2449
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	9883	20.0000	494.1654
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	8730	20.0000	436.5052
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	8611	20.0000	430.5272
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	9097	20.0000	454.8482
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	8967	20.0000	448.3703
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	9802	20.0000	490.1191

Target Compound *PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200724BCAL\2200724B_02.d	Calibration	1	☐	1441	0.5000	5.6718
D:\MassHunter\Data\2200724BCAL\2200724B_03.d	Calibration	2	☑	2259	1.2500	3.6574
D:\MassHunter\Data\2200724BCAL\2200724B_04.d	Calibration	3	☑	7920	5.0000	3.6290
D:\MassHunter\Data\2200724BCAL\2200724B_05.d	Calibration	4	☑	16951	10.0000	3.9372
D:\MassHunter\Data\2200724BCAL\2200724B_06.d	Calibration	5	☑	89397	50.0000	3.9309
D:\MassHunter\Data\2200724BCAL\2200724B_07.d	Calibration	6	☑	179635	100.0000	4.0064
D:\MassHunter\Data\2200724BCAL\2200724B_08.d	Calibration	7	☑	338731	200.0000	3.4556



Extracted ISTD *M2PFHxDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/25/2020 04:13	Lab File ID:	2200724B_37.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688831

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	49500	104	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	50700	106	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	50800	102	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	57700	115	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	48500	97	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	43200	98	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	49200	98	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	51900	104	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	48600	97	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	49400	99	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	42700	94	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	49800	100	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	46000	92	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	40800	88	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	47700	95	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	63700	127	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	47200	94	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	45000	90	70	130	

FORM 7E - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/25/2020 08:10	Lab File ID:	2200724B_55.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688831

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	42200	89	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	49300	103	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	53500	107	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	56700	113	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	47100	94	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	41600	94	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	60100	120	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	46700	93	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	49800	100	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	48000	96	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	40200	88	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	48400	97	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	44700	89	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	43800	95	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	48000	96	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	53900	108	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	46200	92	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	44900	90	70	130	

FORM 7E - ORG

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/25/2020 10:22	Lab File ID:	2200724B_65.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688831

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	7.78	82	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	7.46	78	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	10.8	108	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	9.20	92	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.88	89	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	6.98	79	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.32	83	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	12.0	120	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	7.90	79	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.72	87	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	7.59	83	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	8.08	81	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	8.56	85	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.94	86	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	8.32	83	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	9.36	93	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	9.68	97	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	8.80	88	70	130	

FORM 7S - ORG

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	220071466	Standard ID:	1450 (ISC)
Analyst:	BMH	Instrument ID:	QQQ2
Analysis Date:	07/25/20 10:22	Lab File ID:	2200724B_65.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688831

	M2PFDA	M2PFHxA	M2PFOA	M4PFOS
	Area	*Area*	*Area*	*Area*
STANDARD	112804	352195	121318	110315

CLIENT SAMPLE ID	*GCAL SAMP ID*		#		#		#		#
MB2062133	2062133	195876	*	663741	*	231936	*	204896	*
LCS2062134	2062134	182848	*	608879	*	208127	*	188898	*
LCSD2062135	2062135	196471	*	612155	*	219911	*	194020	*
HAASF-MW001	22007146601	193596	*	610166	*	210328	*	189219	*
HAASF-MW002	22007146602	195209	*	637713	*	218863	*	199186	*
HAASF-MW002-MS	22007146603	95143		307650		104618		97609	
HAASF-MW002-MSD	22007146604	101280		344887		116272		108246	
HAASF-MW003	22007146605	192175	*	641421	*	220911	*	197735	*
HAASF-MW004	22007146606	207669	*	659762	*	241775	*	208916	*
HAASF-MW005	22007146607	103056		353144		118647		105329	
HAASF-MW005-D	22007146608	199340	*	637171	*	219924	*	192535	*
HAASF-ERB-03	22007146609	204361	*	645681	*	221948	*	204824	*
HAASF-ERB-04	22007146610	181390	*	588669	*	199453	*	188335	*

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

*for monitoring only-double spiked with IIS solution

FORM 8I - ORG

QQQ2 Run Log

Analyst:	BMH	Expiration:
Instrument:	QQQ2	
Batch:	2200727A	
Current ICAL Bath:	2200727ACAL/2200727ACALDW	
20mM Amm Acetate	012-38-5	7/29/2020
Methanol	2129224	3/31/2025
Calibration Std	012-38-6	1/27/2021
ICV Std	012-38-3	1/25/2021
EIS Mix	012-38-2	1/25/2021
IIS Mix	012-37-3	1/23/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2200727A_01.d	MeOH Shot	7/27/2020 13:28	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200727A_02.d	Cal	7/27/2020 13:41	BMH,QQQ2;Cal	1
1202	2200727A_03.d	Cal	7/27/2020 13:54	BMH,QQQ2;Cal	1
1203	2200727A_04.d	Cal	7/27/2020 14:07	BMH,QQQ2;Cal	1
1204	2200727A_05.d	Cal	7/27/2020 14:21	BMH,QQQ2;Cal	1
1205	2200727A_06.d	Cal	7/27/2020 14:34	BMH,QQQ2;RR due to IIS	1
1206	2200727A_07.d	Cal	7/27/2020 14:47	BMH,QQQ2;Cal	1
1207	2200727A_08.d	Cal	7/27/2020 15:00	BMH,QQQ2;Cal	1
MeOH Shot	2200727A_09.d	MeOH Shot	7/27/2020 15:20	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1205	2200727A_10.d	Cal	7/27/2020 15:33	BMH,QQQ2;Cal	1
MeOH Shot	2200727A_11.d	MeOH Shot	7/27/2020 15:53	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1500	2200727A_12.d	Sample	7/27/2020 16:06	BMH,QQQ2	1
1600	2200727A_13.d	QC	7/27/2020 16:20	BMH,QQQ2	1
1450	2200727A_14.d	QC	7/27/2020 16:33	BMH,QQQ2	1
MeOH Shot	2200727A_15.d	MeOH Shot	7/27/2020 16:55	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
2062133	2200727A_16.d	Sample	7/27/2020 17:08	BMH,QQQ2;688084	1
2062134	2200727A_17.d	QC	7/27/2020 17:21	BMH,QQQ2;688084	1
2062135	2200727A_18.d	QC	7/27/2020 17:34	BMH,QQQ2;688084	1
22007142313 x5	2200727A_19.d	Sample	7/27/2020 17:47	BMH,QQQ2;687950	5
22007142314 x5	2200727A_20.d	QC	7/27/2020 18:00	BMH,QQQ2;687950	5

22007142315 x5	2200727A_21.d	QC	7/27/2020 18:14	BMH,QQQ2;687950	5
2063514	2200727A_22.d	Sample	7/27/2020 18:27	BMH,QQQ2;688322	1
2063515	2200727A_23.d	QC	7/27/2020 18:40	BMH,QQQ2;688322	1
2063516	2200727A_24.d	QC	7/27/2020 18:53	BMH,QQQ2;688322	1
22007182302	2200727A_25.d	Sample	7/27/2020 19:06	BMH,QQQ2;688322	1
MeOH Shot	2200727A_26.d	MeOH Shot	7/27/2020 19:21	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1400	2200727A_27.d	QC	7/27/2020 19:34	BMH,QQQ2;CCV	1
2063511	2200727A_28.d	Sample	7/27/2020 19:48	BMH,QQQ2;688321	1
2063512	2200727A_29.d	QC	7/27/2020 20:01	BMH,QQQ2;688321	1
2063513	2200727A_30.d	QC	7/27/2020 20:14	BMH,QQQ2;688321	1
22007163604	2200727A_31.d	Sample	7/27/2020 20:27	BMH,QQQ2;688321	1
22007163603	2200727A_32.d	Sample	7/27/2020 20:40	BMH,QQQ2;688321	1
22007163602	2200727A_33.d	Sample	7/27/2020 20:54	BMH,QQQ2;688321	1
22007163601	2200727A_34.d	Sample	7/27/2020 21:07	BMH,QQQ2;688321	1
MeOH Shot	2200727A_35.d	MeOH Shot	7/27/2020 21:20	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007171202	2200727A_36.d	Sample	7/27/2020 21:33	BMH,QQQ2;688321	1
22007171207	2200727A_37.d	Sample	7/27/2020 21:46	BMH,QQQ2;688321	1
22007171201	2200727A_38.d	Sample	7/27/2020 21:59	BMH,QQQ2;688321	1
22007171203	2200727A_39.d	Sample	7/27/2020 22:12	BMH,QQQ2;688321	1
22007171204	2200727A_40.d	Sample	7/27/2020 22:26	BMH,QQQ2;688321	1
22007171205	2200727A_41.d	Sample	7/27/2020 22:39	BMH,QQQ2;688321	1
1400	2200727A_42.d	QC	7/27/2020 22:52	BMH,QQQ2;CCV	1
22007171206	2200727A_43.d	Sample	7/27/2020 23:05	BMH,QQQ2;688321	1
22007171208	2200727A_44.d	Sample	7/27/2020 23:19	BMH,QQQ2;688321	1
22007182303	2200727A_45.d	Sample	7/27/2020 23:32	BMH,QQQ2;688322	1
22007182301	2200727A_46.d	Sample	7/27/2020 23:45	BMH,QQQ2;688322	1
2065741	2200727A_47.d	Sample	7/27/2020 23:58	BMH,QQQ2;688730 DW	1
2065742	2200727A_48.d	QC	7/28/2020 0:11	BMH,QQQ2;688730 DW	1
2065743	2200727A_49.d	QC	7/28/2020 0:24	BMH,QQQ2;688730 DW	1
22007080703	2200727A_50.d	Sample	7/28/2020 0:38	BMH,QQQ2;688730 DW	1
22007080706	2200727A_51.d	Sample	7/28/2020 0:51	BMH,QQQ2;688730 DW	1
22007080707	2200727A_52.d	Sample	7/28/2020 1:04	BMH,QQQ2;688730 DW	1
22007080709	2200727A_53.d	Sample	7/28/2020 1:17	BMH,QQQ2;688730 DW	1
22007080710	2200727A_54.d	Sample	7/28/2020 1:30	BMH,QQQ2;688730 DW	1

22007080711	2200727A_55.d	QC	7/28/2020 1:43	BMH,QQQ2;688730 DW	1
22007080712	2200727A_56.d	QC	7/28/2020 1:57	BMH,QQQ2;688730 DW	1
1400	2200727A_57.d	QC	7/28/2020 2:10	BMH,QQQ2;CCV	1
2064269	2200727A_58.d	Sample	7/28/2020 2:23	BMH,QQQ2;688472	1
2064270	2200727A_59.d	QC	7/28/2020 2:36	BMH,QQQ2;688472	1
2064271	2200727A_60.d	QC	7/28/2020 2:49	BMH,QQQ2;688472	1
22007214801	2200727A_61.d	Sample	7/28/2020 3:03	BMH,QQQ2;688472	1
22007214802	2200727A_62.d	Sample	7/28/2020 3:16	BMH,QQQ2;688472	1
1450	2200727A_63.d	QC	7/28/2020 3:29	BMH,QQQ2;CCV	1
2064524	2200727A_64.d	Sample	7/28/2020 3:42	BMH,QQQ2;688525	1
2064525	2200727A_65.d	QC	7/28/2020 3:55	BMH,QQQ2;688525	1
2064526	2200727A_66.d	QC	7/28/2020 4:08	BMH,QQQ2;688525	1
22007210801	2200727A_67.d	Sample	7/28/2020 4:22	BMH,QQQ2;688525	1
22007210901	2200727A_68.d	Sample	7/28/2020 4:35	BMH,QQQ2;688525	1
22007211001	2200727A_69.d	Sample	7/28/2020 4:48	BMH,QQQ2;688525	1
22007211002	2200727A_70.d	Sample	7/28/2020 5:01	BMH,QQQ2;688525	1
22007211003	2200727A_71.d	Sample	7/28/2020 5:14	BMH,QQQ2;688525	1
22007211101	2200727A_72.d	Sample	7/28/2020 5:27	BMH,QQQ2;688525	1
22007211102	2200727A_73.d	Sample	7/28/2020 5:41	BMH,QQQ2;688525	1
22007211501	2200727A_74.d	Sample	7/28/2020 5:54	BMH,QQQ2;688525	1
22007211502	2200727A_75.d	Sample	7/28/2020 6:07	BMH,QQQ2;688525	1
22007211601	2200727A_76.d	Sample	7/28/2020 6:20	BMH,QQQ2;688525	1
1400	2200727A_77.d	QC	7/28/2020 6:33	BMH,QQQ2;CCV	1

4I

ORGANICS INSTRUMENT BLANK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/27/2020 16:06	Lab File ID:	2200727A_12.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688835

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
6:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.79	4.00	10.0	
NEtFOSAA	ng/L	8.00	U	5.38	8.00	10.0	
NMeFOSAA	ng/L	8.00	U	4.60	8.00	10.0	
Perfluorobutanesulfonic acid	ng/L	4.00	U	1.47	4.00	10.0	
Perfluorobutanoic acid	ng/L	4.00	U	2.13	4.00	10.0	
Perfluorodecanoic acid	ng/L	4.00	U	1.65	4.00	10.0	
Perfluorododecanoic acid	ng/L	4.00	U	2.45	4.00	10.0	
Perfluoroheptanoic acid	ng/L	4.00	U	1.85	4.00	10.0	
Perfluorohexanesulfonic acid	ng/L	4.00	U	1.64	4.00	10.0	
Perfluorohexanoic acid	ng/L	4.00	U	1.94	4.00	10.0	
Perfluorononanoic acid	ng/L	4.00	U	1.68	4.00	10.0	
Perfluorooctanesulfonic acid	ng/L	4.00	U	1.70	4.00	10.0	
Perfluorooctanoic acid	ng/L	4.00	U	1.80	4.00	10.0	
Perfluoropentanoic acid	ng/L	4.00	U	2.35	4.00	10.0	
Perfluorotetradecanoic acid	ng/L	4.00	U	2.76	4.00	10.0	
Perfluoroundecanoic acid	ng/L	4.00	U	1.86	4.00	10.0	

* - Result greater than 1/2 LOQ

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/27/2020 16:20	Lab File ID:	2200727A_13.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688835

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47400	53500	113	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	47900	54200	113	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	42100	84	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	41700	83	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50200	49000	98	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	50200	52600	105	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50100	51400	103	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50100	41700	83	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50100	51300	102	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50300	48000	95	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	50600	52600	104	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50100	54900	110	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50200	52400	104	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	50300	42600	85	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50700	45700	90	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50100	45600	91	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50100	36400	73	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50100	46300	92	70	130	

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ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/27/2020 16:33	Lab File ID:	2200727A_14.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688835

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	9.28	98	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	10.3	107	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	8.72	87	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	8.96	89	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.24	83	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	8.08	92	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.72	87	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	8.32	83	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	9.12	91	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.56	86	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	7.66	84	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	9.04	91	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	8.72	87	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.41	80	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	7.63	76	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	8.40	84	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	9.20	92	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	7.64	76	70	130	

Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2200727ACAL\QuantResults\2200727A.batch.bin		
Analysis Time	7/30/2020 6:24 PM	**Analyst Name**	GCAL\lcms
Report Time	7/30/2020 6:29 PM	**Reporter Name**	GCAL\lcms
Last Calib Update	7/30/2020 6:24 PM	**Batch State**	Processed

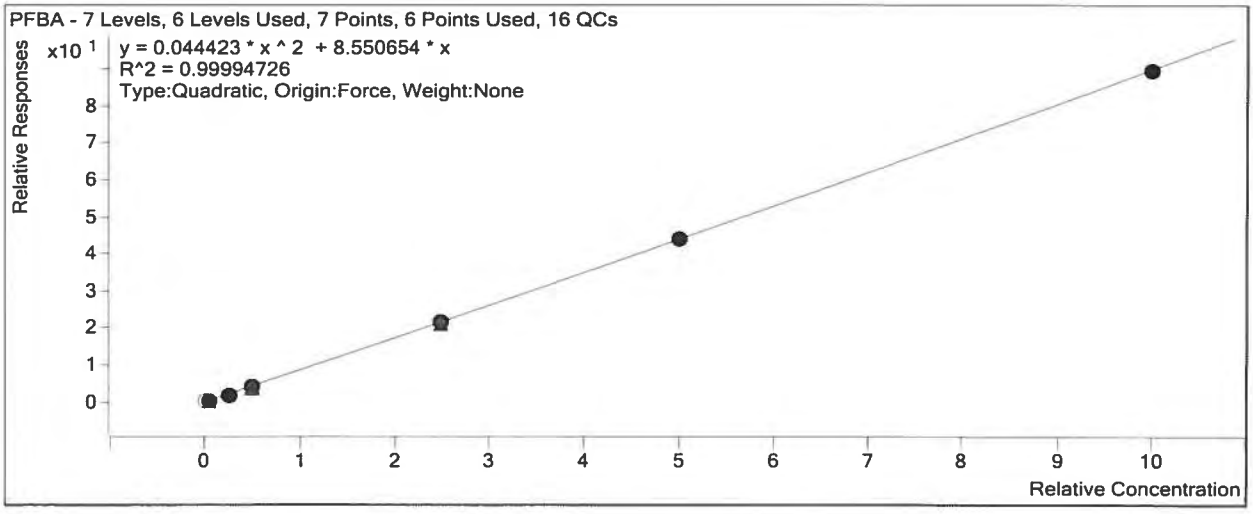
Calibration Info

Extracted ISTD *MPFBA*

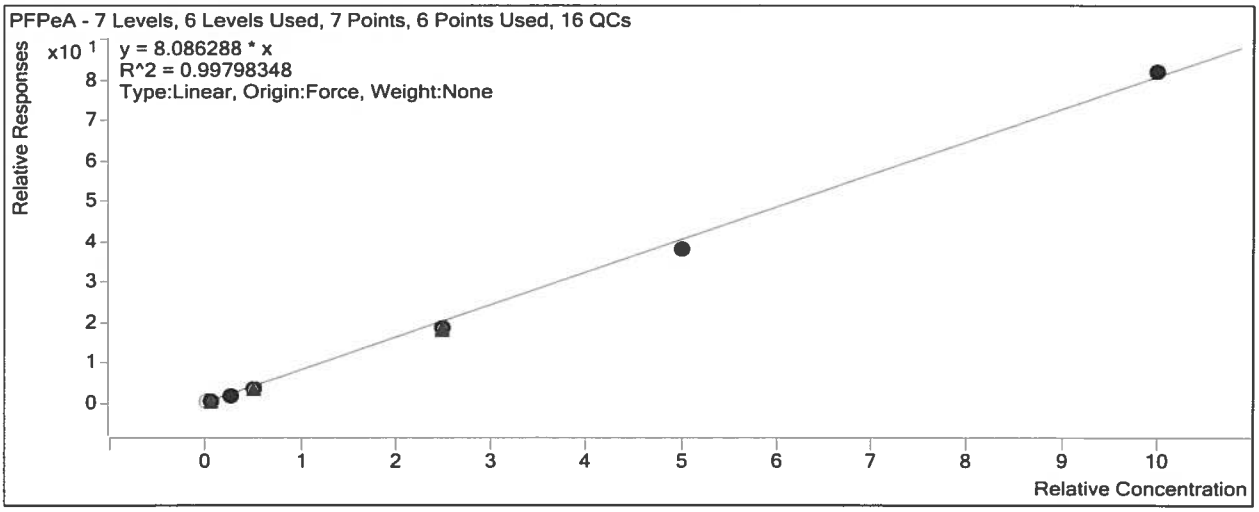
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	29382	20.0000	1469.1227
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	29609	20.0000	1480.4744
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	29251	20.0000	1462.5302
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	29176	20.0000	1458.8243
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	29456	20.0000	1472.7892
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	28894	20.0000	1444.6944
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	27575	20.0000	1378.7453

Target Compound *PFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	5357	0.5000	7.2926
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	13216	1.2500	7.1417
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	55224	5.0000	7.5519
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	116233	10.0000	7.9676
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	629800	50.0000	8.5525
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	1275750	100.0000	8.8306
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	2478833	200.0000	8.9895

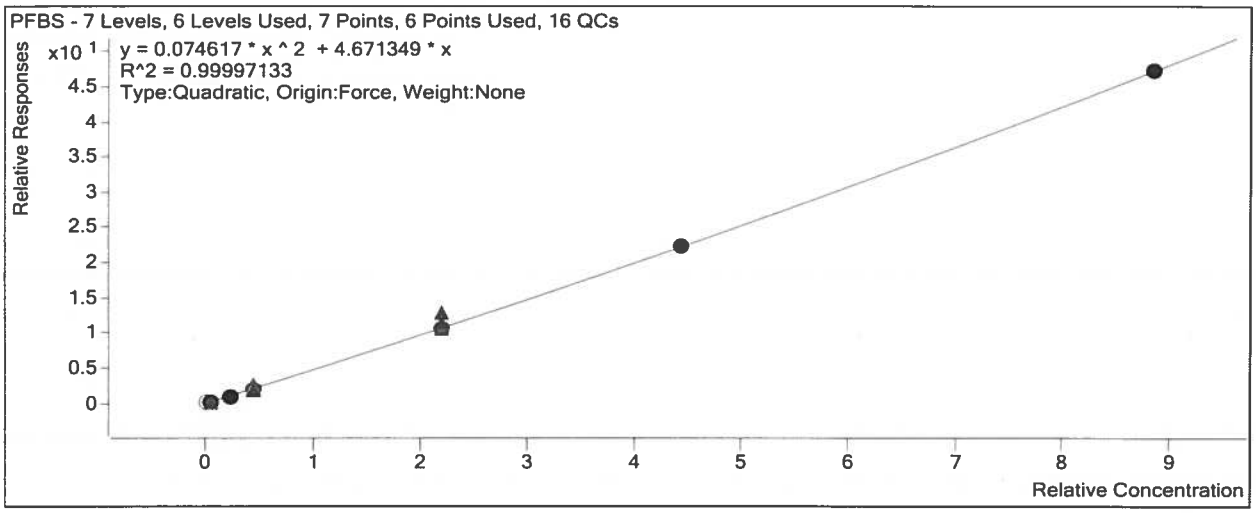


D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	365541	50.0000	7.4563
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	730691	100.0000	7.6467
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	1417846	200.0000	8.2401



Target Compound *PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1267	0.4425	3.9767
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	3232	1.1100	4.0551
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	13598	4.4250	4.4756
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	28262	8.8500	4.3105
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	158296	44.2500	4.8032
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	312804	88.5000	5.0227
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	603652	177.0000	5.3296

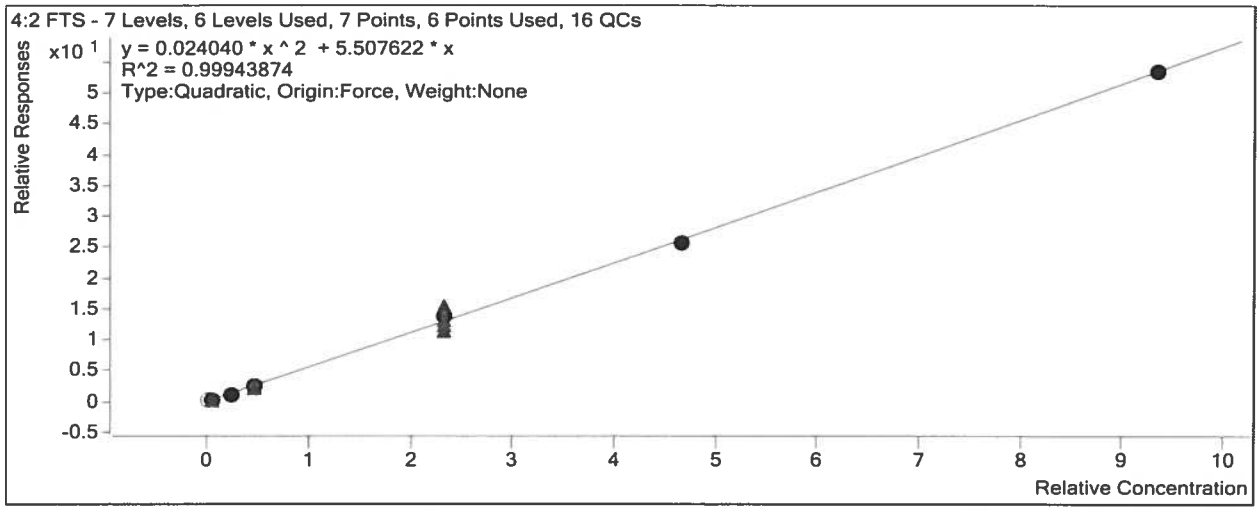


Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	3893	20.0000	194.6358

Target Compound *4:2 FTS*

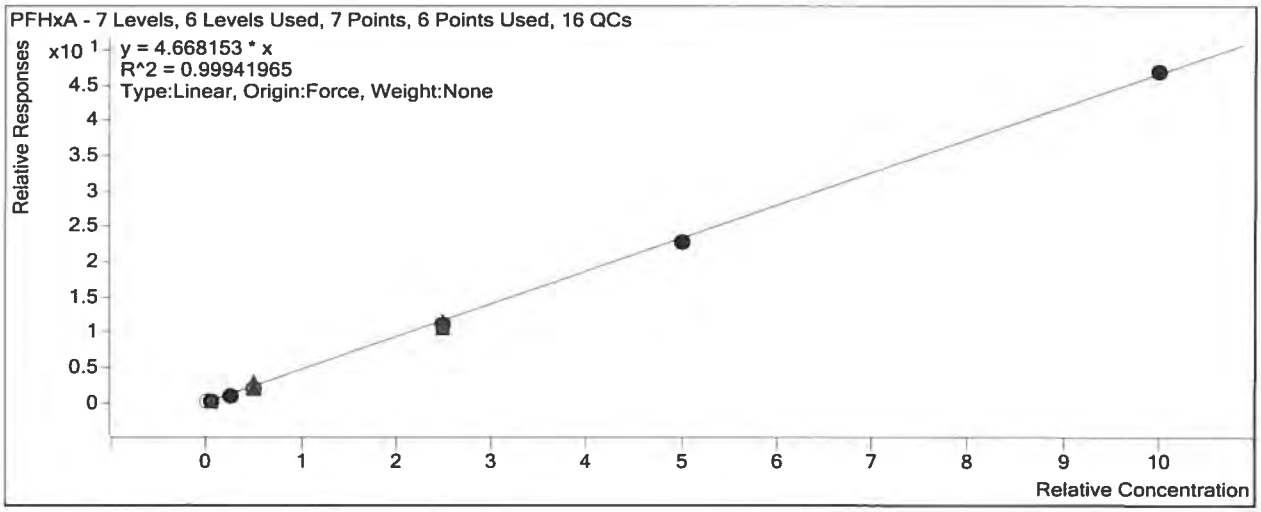
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	600	0.4675	6.4450
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	1186	1.1700	4.7750
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	4493	4.6700	4.6124
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	10378	9.3500	5.1137
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	63063	46.7500	5.9389
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	111541	93.5000	5.4917
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	209015	187.0000	5.7426



Extracted ISTD *M5PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	25387	20.0000	1269.3403
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	26300	20.0000	1314.9994
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	26827	20.0000	1341.3500
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	26410	20.0000	1320.4971
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	26737	20.0000	1336.8650
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	25639	20.0000	1281.9443
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	23878	20.0000	1193.9231

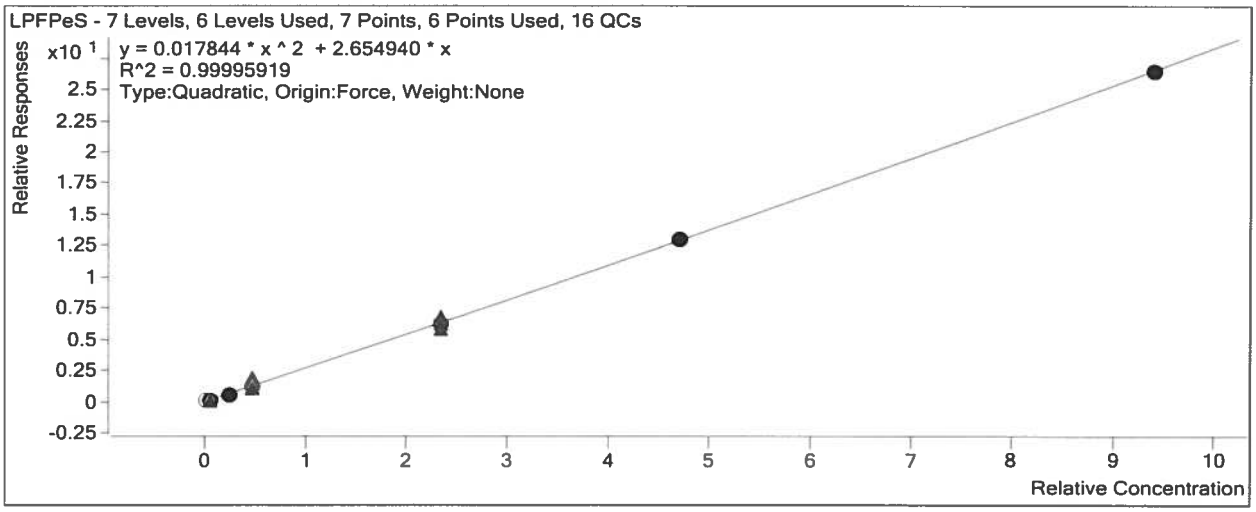
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFPeS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1678	0.4700	2.8120
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	3482	1.1800	2.2443
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	14305	4.7000	2.2691
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	31238	9.4000	2.5166
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	167880	47.0000	2.6719
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	331744	94.0000	2.7530
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	633265	188.0000	2.8213



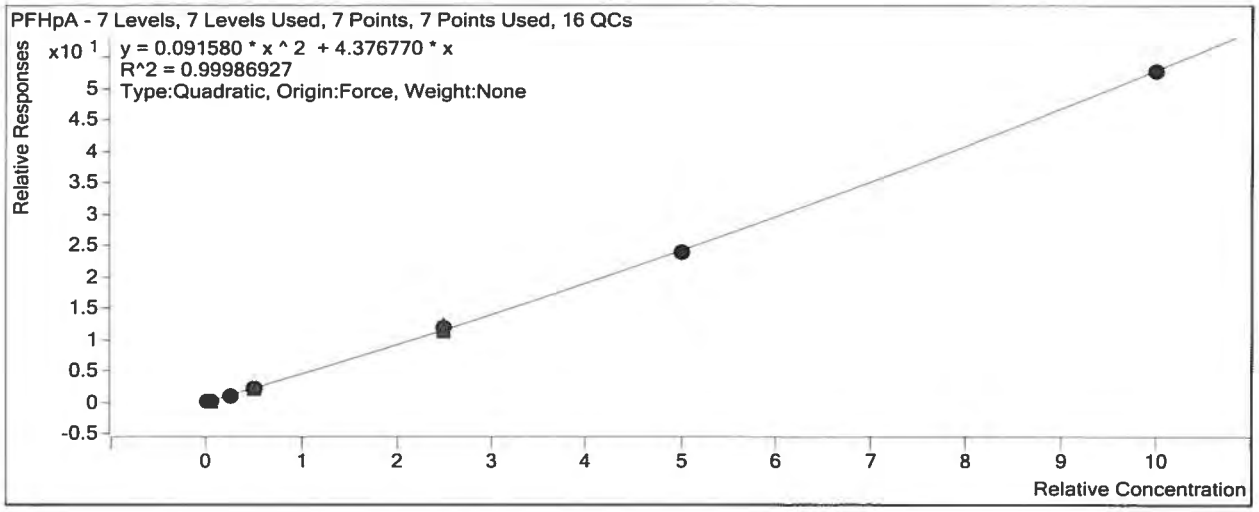
Extracted ISTD *M3HFPODA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	1192	40.0000	29.7893
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	1291	40.0000	32.2644
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	1345	40.0000	33.6362
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	1205	40.0000	30.1370
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	1126	40.0000	28.1472
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	1279	40.0000	31.9858
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	1222	40.0000	30.5402

Target Compound *HFPO-DA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



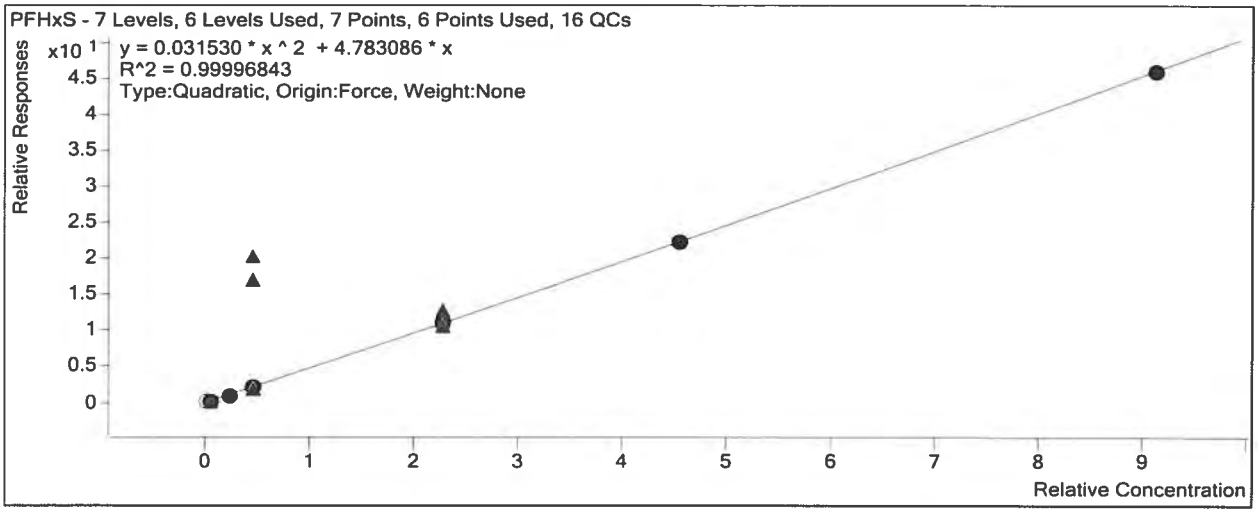
Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	15367	20.0000	768.3555
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	16277	20.0000	813.8545
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	16250	20.0000	812.5208
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	15986	20.0000	799.3064
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	15494	20.0000	774.6997
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	15410	20.0000	770.4859
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	14315	20.0000	715.7574

Target Compound *PFHxS*

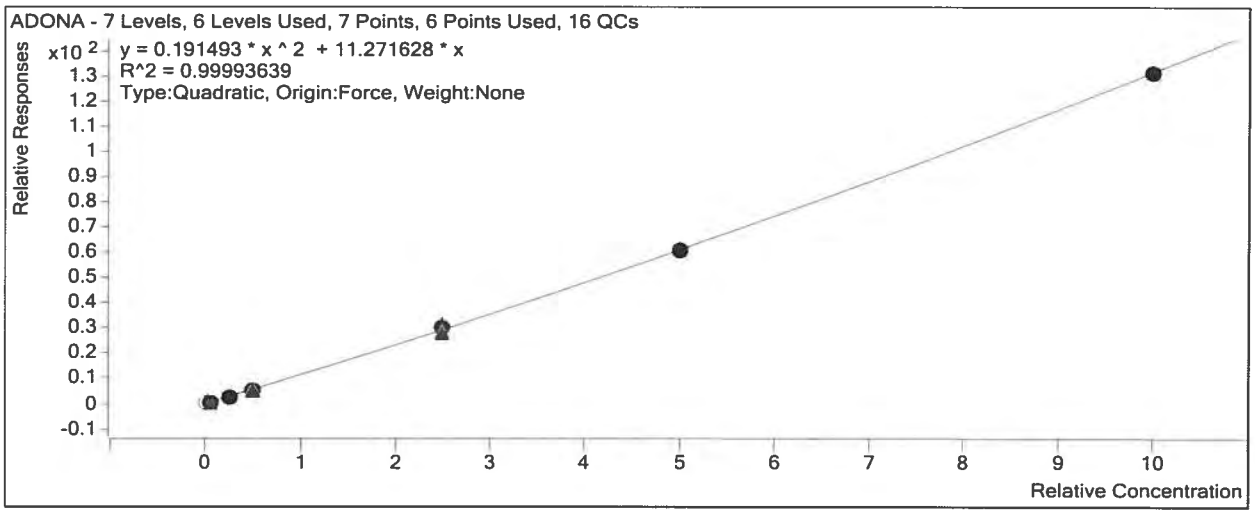
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1200	0.4560	3.4251
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	3903	1.1400	4.2063
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	15462	4.5600	4.1732
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	32353	9.1200	4.4382
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	172423	45.6000	4.8809
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	346223	91.2000	4.9272
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	661942	182.4000	5.0702

Quantitative Analysis Calibration Report



Target Compound *ADONA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	9307	0.5000	9.6626
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	24745	1.2500	10.9200
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	107223	5.0000	11.1755
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	220261	10.0000	11.0177
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	1141607	50.0000	12.0424
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	2267876	100.0000	12.1270
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	4325132	200.0000	13.1948



Extracted ISTD *M2 6:2 FTS*

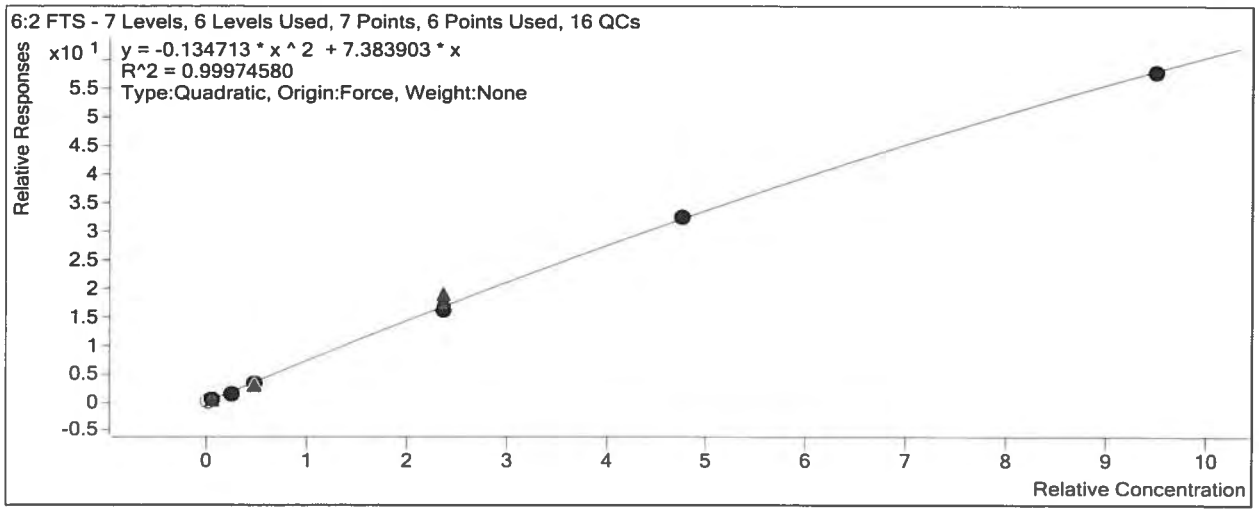
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	9735	20.0000	486.7560

Target Compound *6:2 FTS*

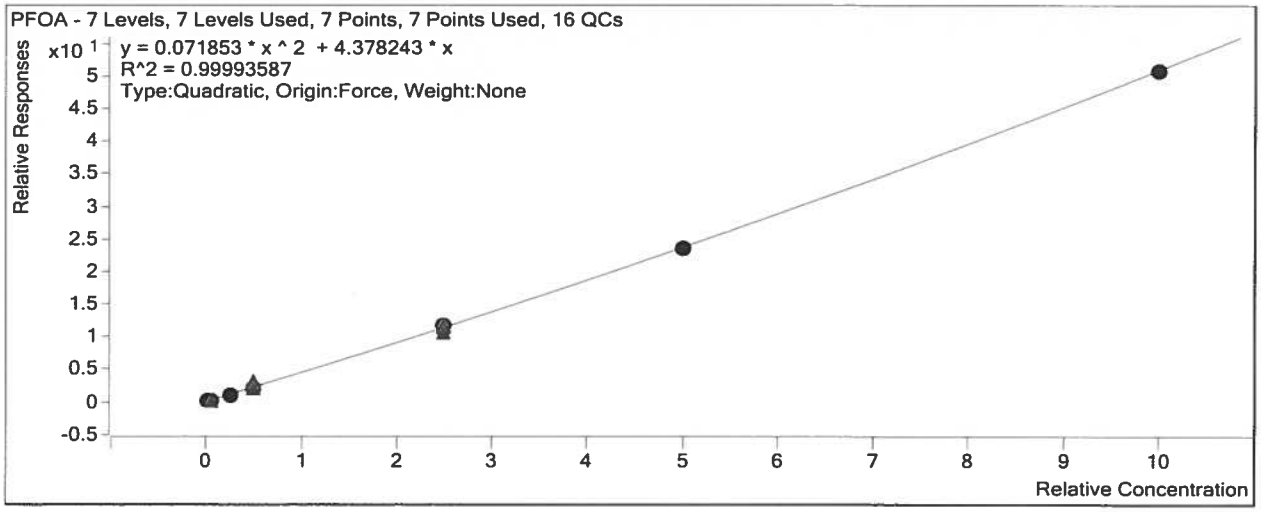
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1289	0.4750	5.7872
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	3176	1.1900	6.0493
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	15450	4.7500	6.5676
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	35095	9.5000	7.2193
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	181962	47.5000	6.8068
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	327978	95.0000	6.8466
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	563720	190.0000	6.0954



Extracted ISTD *M8PFOA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	38526	20.0000	1926.3233
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	36256	20.0000	1812.8178
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	38378	20.0000	1918.8826
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	39983	20.0000	1999.1464
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	37920	20.0000	1895.9830
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	37402	20.0000	1870.0976
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	32779	20.0000	1638.9529

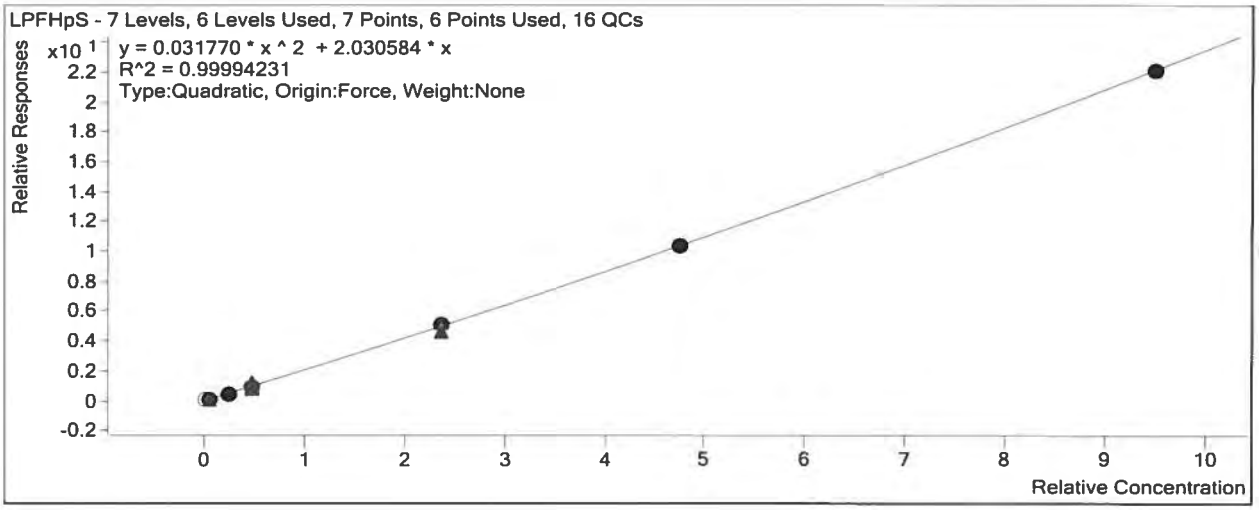
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1497	0.4750	1.6363
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	3902	1.1900	1.8088
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	16236	4.7500	1.7813
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	36156	9.5000	1.9038
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	193429	47.5000	2.1478
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	385493	95.0000	2.1698
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	726567	190.0000	2.3332



Extracted ISTD *M9PFNA*

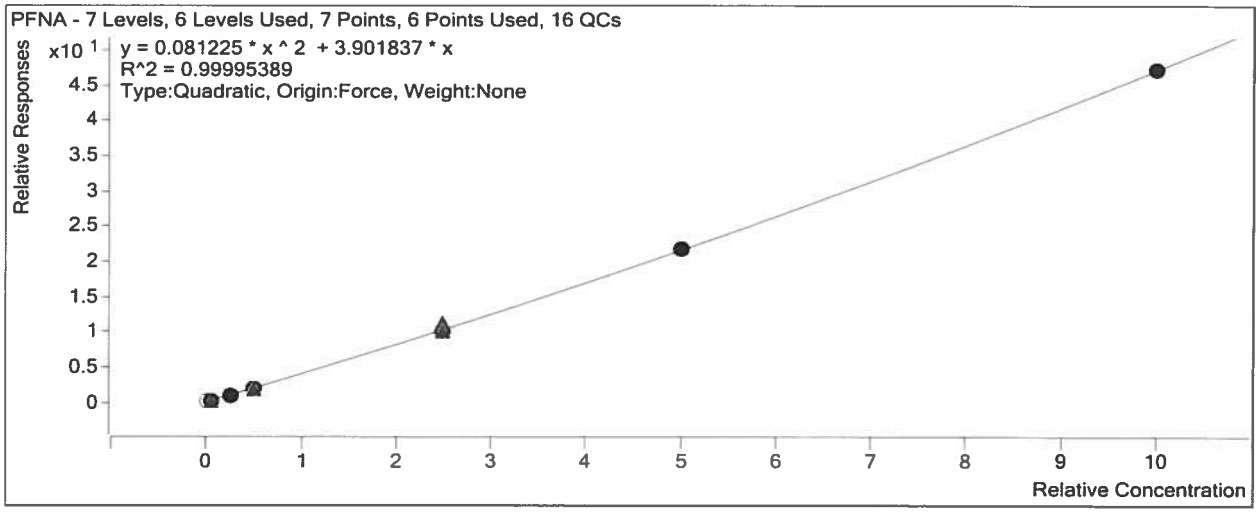
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	33356	20.0000	1667.7994
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	33946	20.0000	1697.3181
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	33881	20.0000	1694.0259
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	33431	20.0000	1671.5684
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	35116	20.0000	1755.8195
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	32085	20.0000	1604.2648
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	28617	20.0000	1430.8492

Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

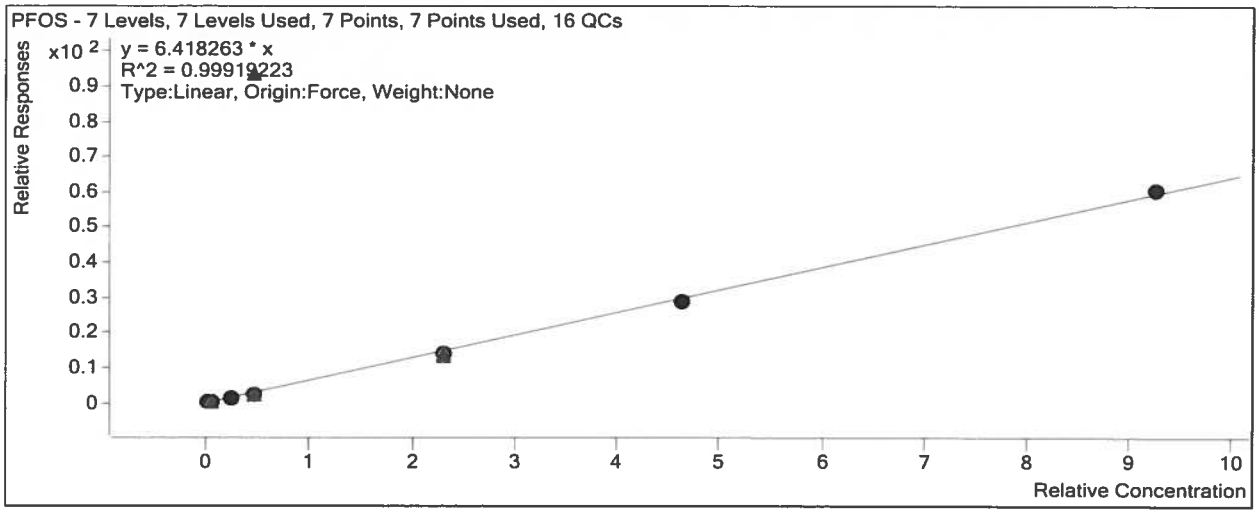


Extracted ISTD *M8PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	16850	20.0000	842.4842
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	16171	20.0000	808.5609
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	17719	20.0000	885.9315
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	17805	20.0000	890.2455
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	16453	20.0000	822.6742
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	17291	20.0000	864.5364
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	15814	20.0000	790.7126

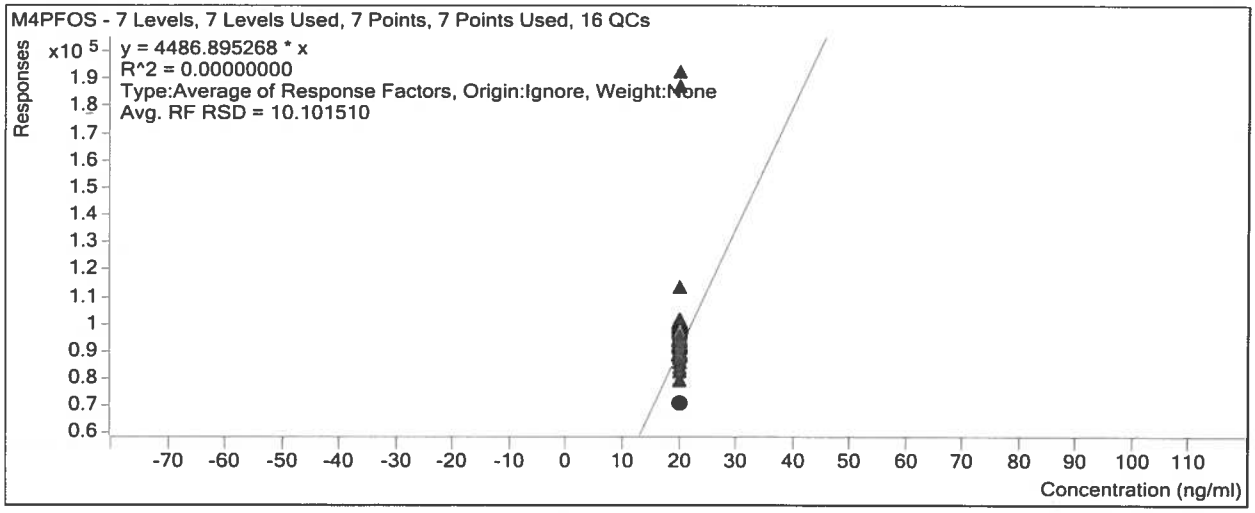
Target Compound *PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	1975	0.4628	5.0654
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	4981	1.1600	5.3104
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	21637	4.6280	5.2773
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	44264	9.2550	5.3723
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	234027	46.2800	6.1467
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	494705	92.5500	6.1828
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	950976	185.1000	6.4975



Instrument ISTD *M4PFOS*

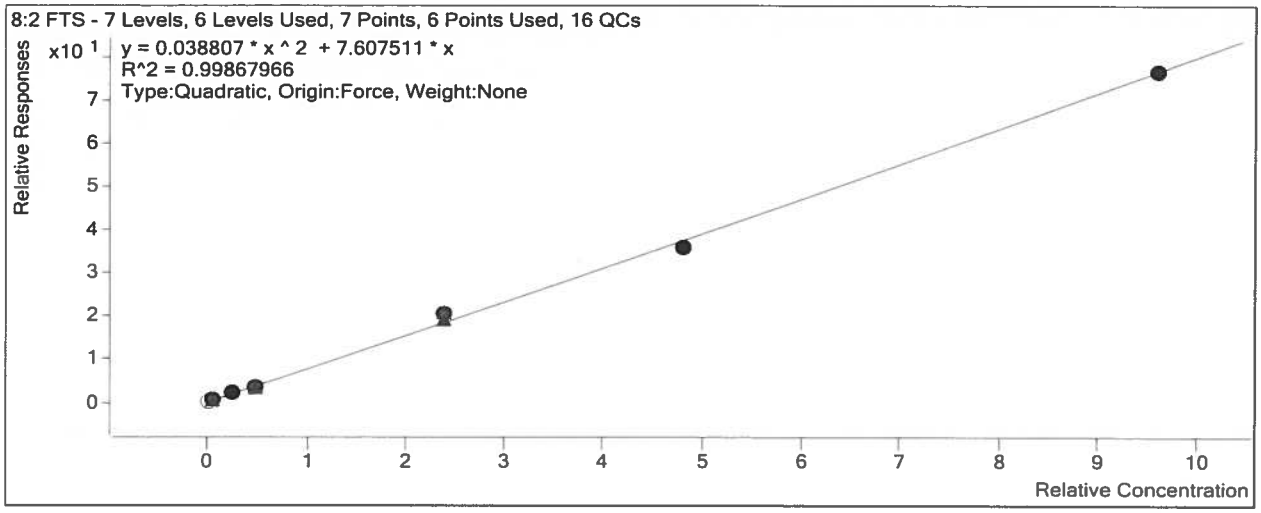
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	90069	20.0000	4503.4639
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	96632	20.0000	4831.6176
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	97556	20.0000	4877.7839
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	94444	20.0000	4722.2186
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	86414	20.0000	4320.7067
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	91921	20.0000	4596.0485
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	71129	20.0000	3556.4279



Target Compound *9CI-PF3ONS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



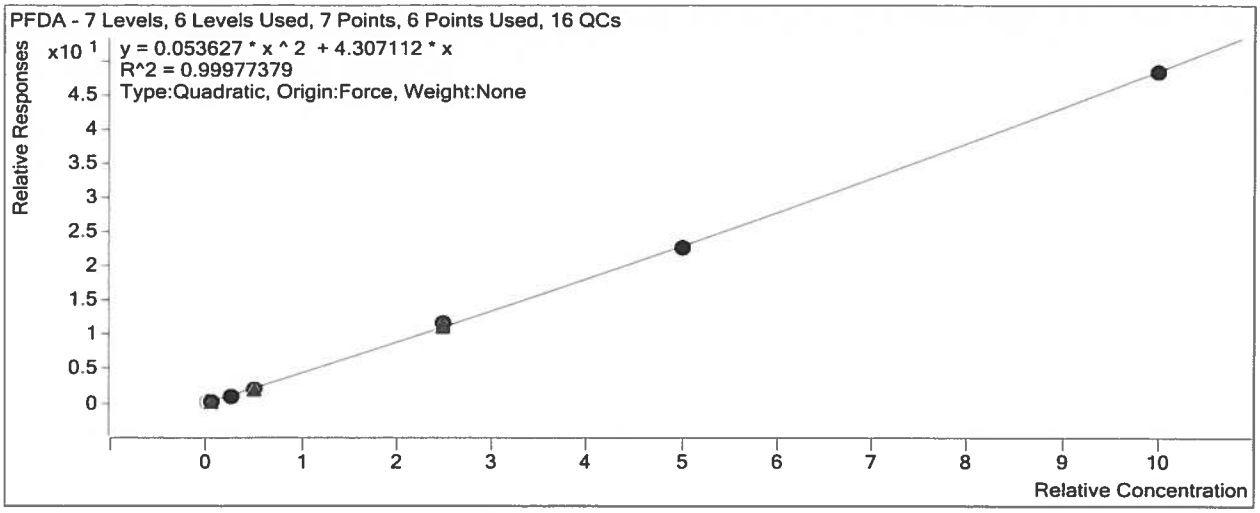
Extracted ISTD *M6PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	16310	20.0000	815.5156
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	18059	20.0000	902.9412
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	19281	20.0000	964.0419
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	19000	20.0000	949.9846
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	17343	20.0000	867.1650
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	18002	20.0000	900.0846
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	15412	20.0000	770.6166

Target Compound *PFDA*

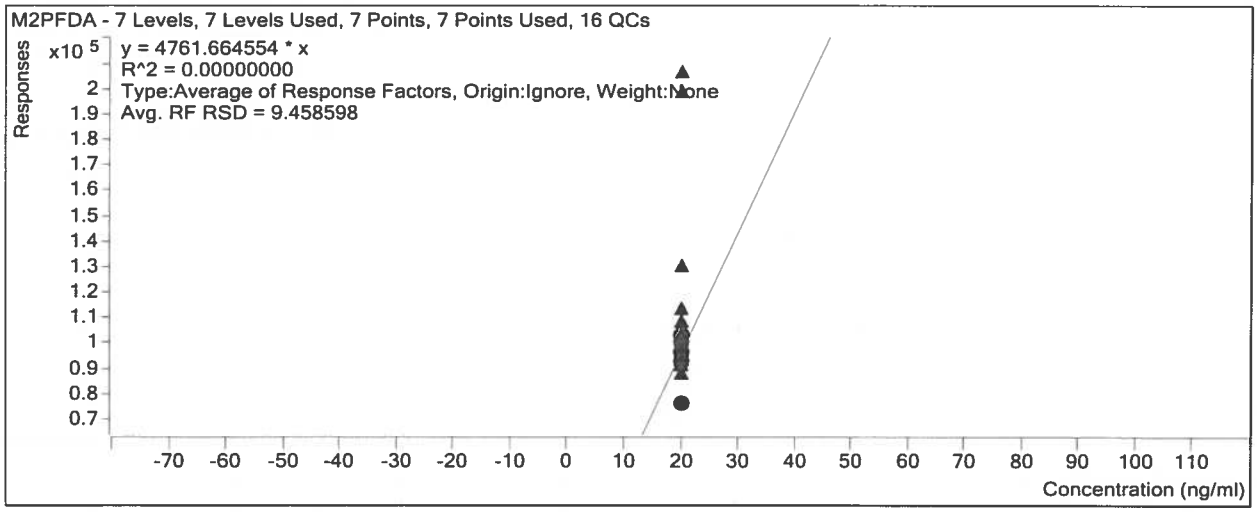
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1616	0.5000	3.9621
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	4728	1.2500	4.1889
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	17249	5.0000	3.5786
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	38125	10.0000	4.0132
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	201018	50.0000	4.6362
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	406105	100.0000	4.5119
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	747238	200.0000	4.8483

Quantitative Analysis Calibration Report



Instrument ISTD *M2PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	96063	20.0000	4803.1278
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	101432	20.0000	5071.5833
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	103285	20.0000	5164.2255
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	100256	20.0000	5012.7879
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	92263	20.0000	4613.1395
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	96721	20.0000	4836.0424
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	76615	20.0000	3830.7455

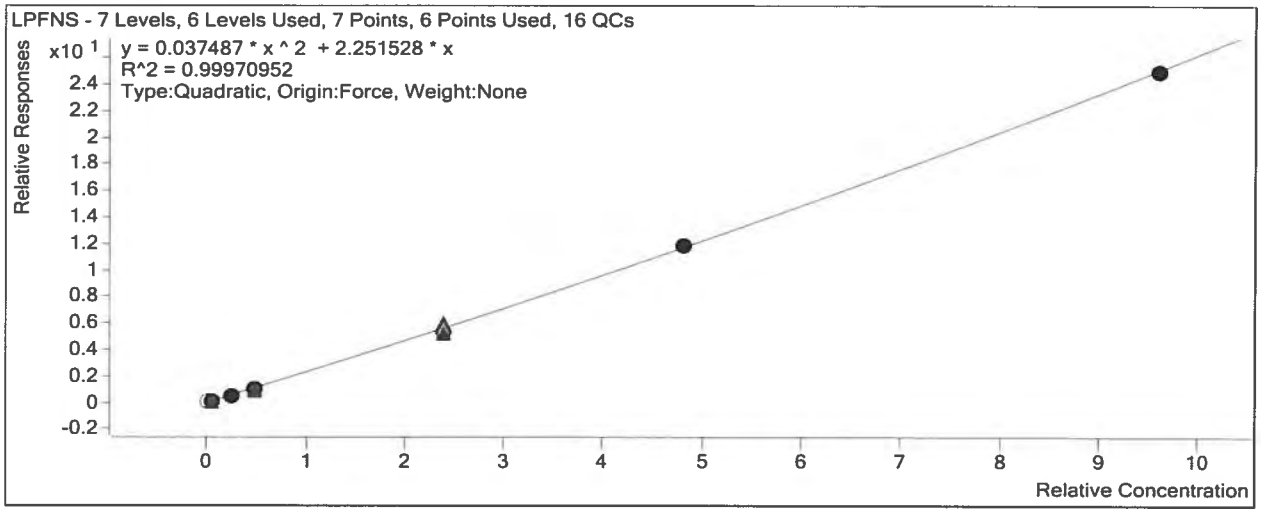


Target Compound *LPFNS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	716327	192.0000	2.6074



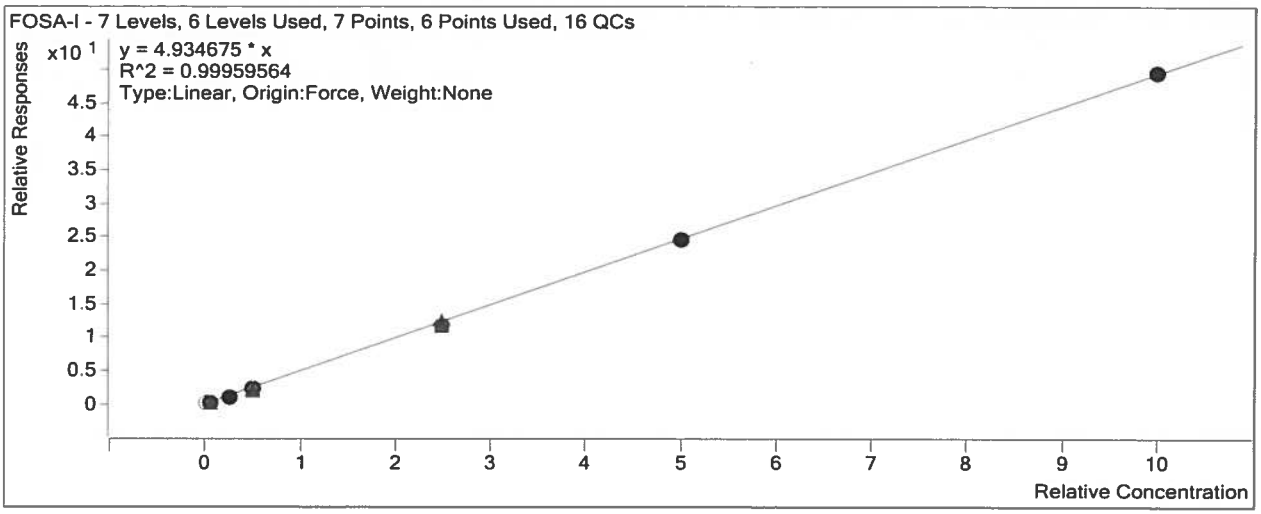
Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	17216	20.0000	860.7867
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	17174	20.0000	858.6912
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	17904	20.0000	895.2011
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	17672	20.0000	883.5883
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	17759	20.0000	887.9512
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	17525	20.0000	876.2581
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	16907	20.0000	845.3579

Target Compound *FOSA-I*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1516	0.5000	3.5216
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	4472	1.2500	4.1666
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	17935	5.0000	4.0069
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	38213	10.0000	4.3247
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	206430	50.0000	4.6496
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	429634	100.0000	4.9030
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	839023	200.0000	4.9625

Quantitative Analysis Calibration Report



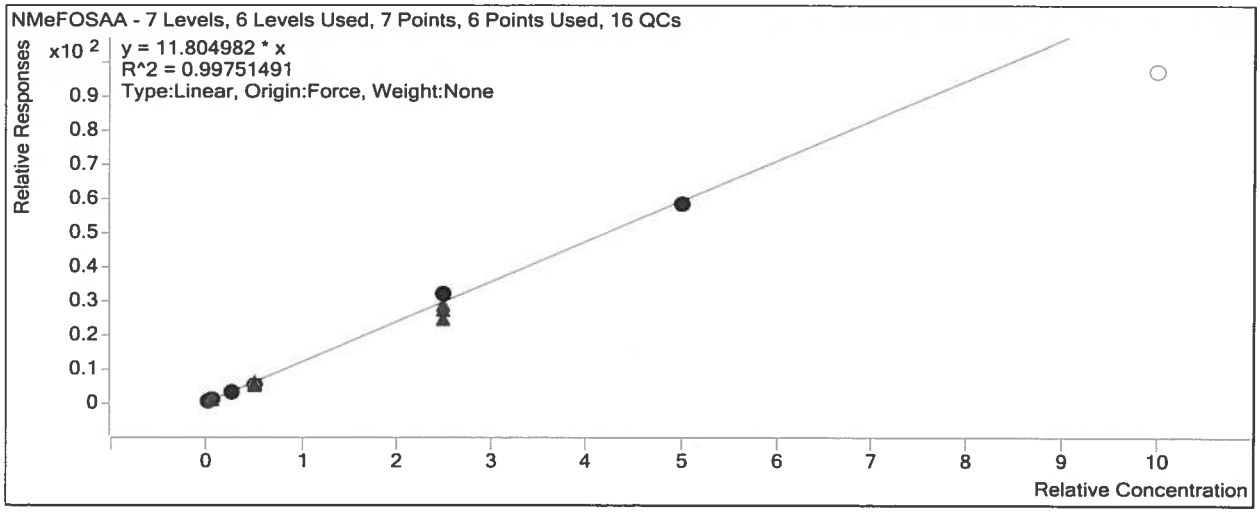
Extracted ISTD *d3-NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	8878	20.0000	443.9197
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	10561	20.0000	528.0665
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	8631	20.0000	431.5361
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	9638	20.0000	481.8871
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	9153	20.0000	457.6441
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	10346	20.0000	517.3000
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	11910	20.0000	595.4782

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	2102	0.5000	9.4696
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	5563	1.2500	8.4281
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	25217	5.0000	11.6872
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	50565	10.0000	10.4932
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	291144	50.0000	12.7236
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	599516	100.0000	11.5893
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☐	1160405	200.0000	9.7435

Quantitative Analysis Calibration Report



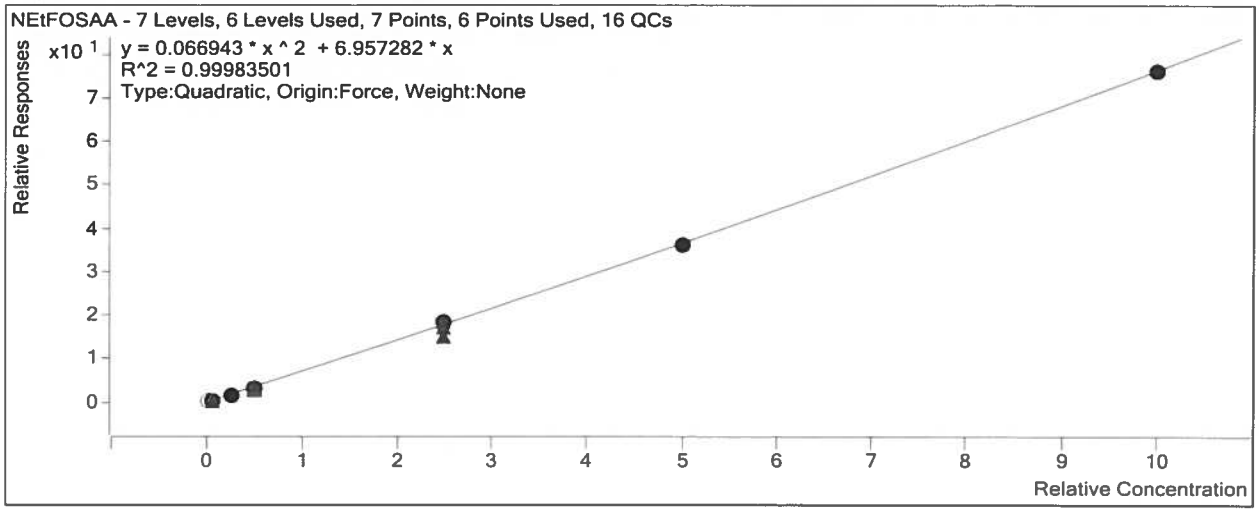
Extracted ISTD *d5-NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	12721	20.0000	636.0726
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	14702	20.0000	735.1127
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	13652	20.0000	682.5793
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	15928	20.0000	796.4141
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	13765	20.0000	688.2303
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	14078	20.0000	703.9001
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	12287	20.0000	614.3374

Target Compound *NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	2012	0.5000	6.3266
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	5340	1.2500	5.8118
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	21083	5.0000	6.1773
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	48213	10.0000	6.0537
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	253307	50.0000	7.3611
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	508594	100.0000	7.2254
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	937660	200.0000	7.6315

Quantitative Analysis Calibration Report



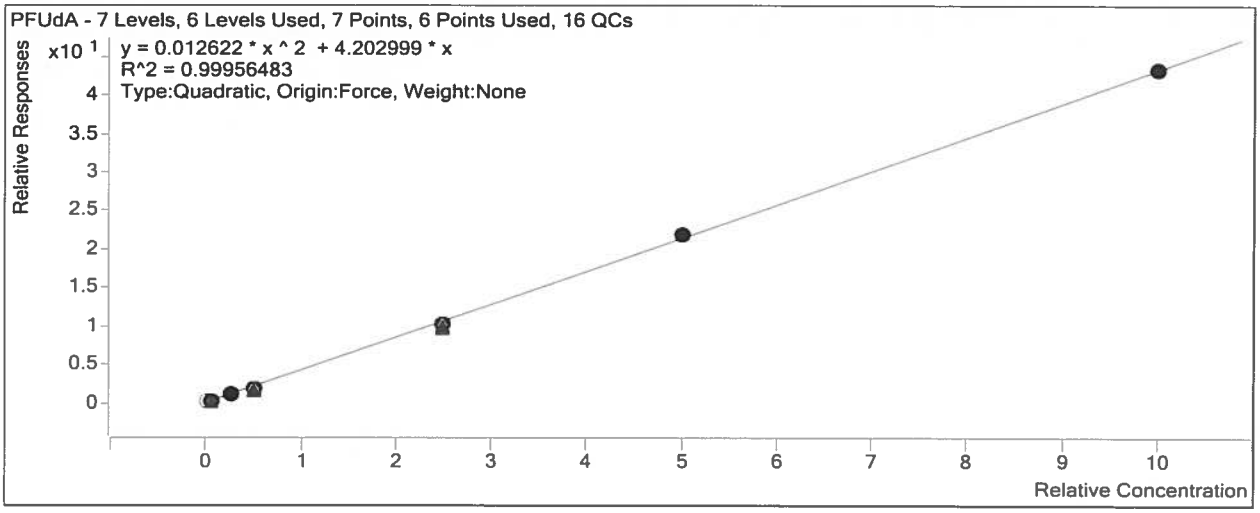
Extracted ISTD *M7PFUdA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	18714	20.0000	935.7196
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	19588	20.0000	979.3942
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	17652	20.0000	882.5787
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	19798	20.0000	989.9195
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	18674	20.0000	933.6789
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	17781	20.0000	889.0261
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	16507	20.0000	825.3517

Target Compound *PFUdA*

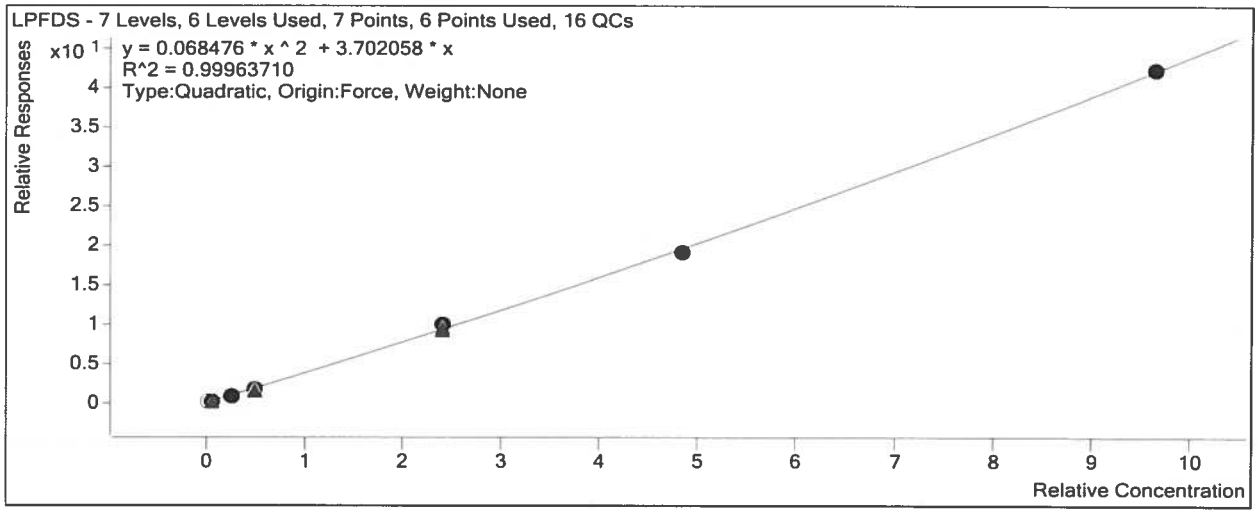
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1672	0.5000	3.5741
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	4349	1.2500	3.5525
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	16702	5.0000	3.7848
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	35002	10.0000	3.5358
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	187935	50.0000	4.0257
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	387570	100.0000	4.3595
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	713253	200.0000	4.3209

Quantitative Analysis Calibration Report



Target Compound *LPFDS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1487	0.4825	3.7788
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	3465	1.2100	3.1718
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	15255	4.8250	3.2796
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	32047	9.6500	3.4958
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	171438	48.2500	4.0974
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	343351	96.5000	3.9530
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	649830	193.0000	4.3692



Target Compound *11Cl-PF3OUdS*

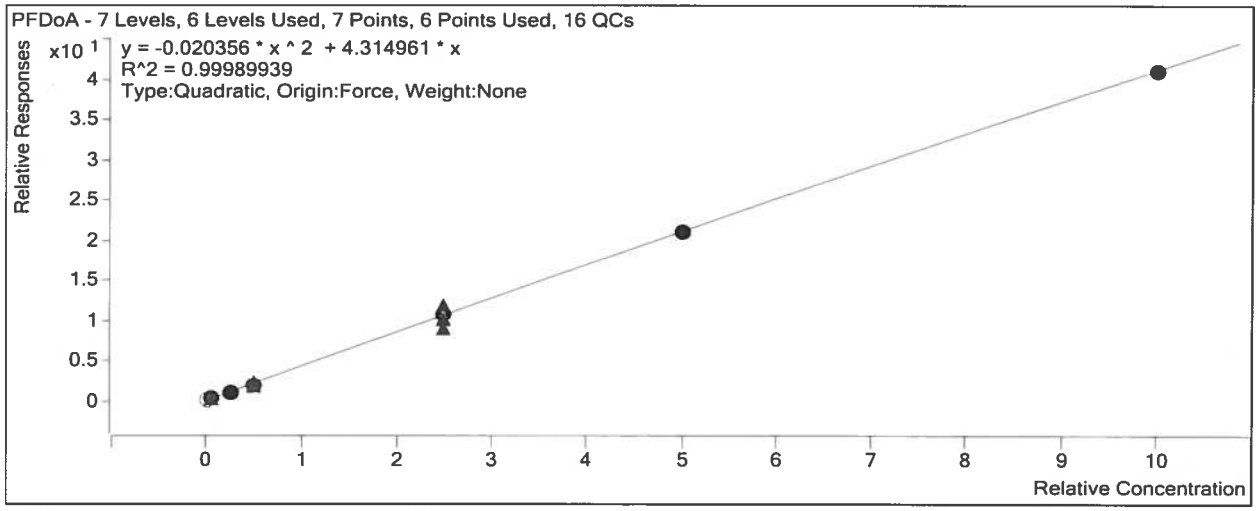
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	13967	20.0000	698.3554
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	13977	20.0000	698.8264
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	13865	20.0000	693.2627
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	14025	20.0000	701.2673

Target Compound *PFDoA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	1312	0.5000	3.8182
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	3368	1.2500	4.0102
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	13946	5.0000	4.1963
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	25399	10.0000	3.6370
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	150775	50.0000	4.3151
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	291683	100.0000	4.2074
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	576641	200.0000	4.1114

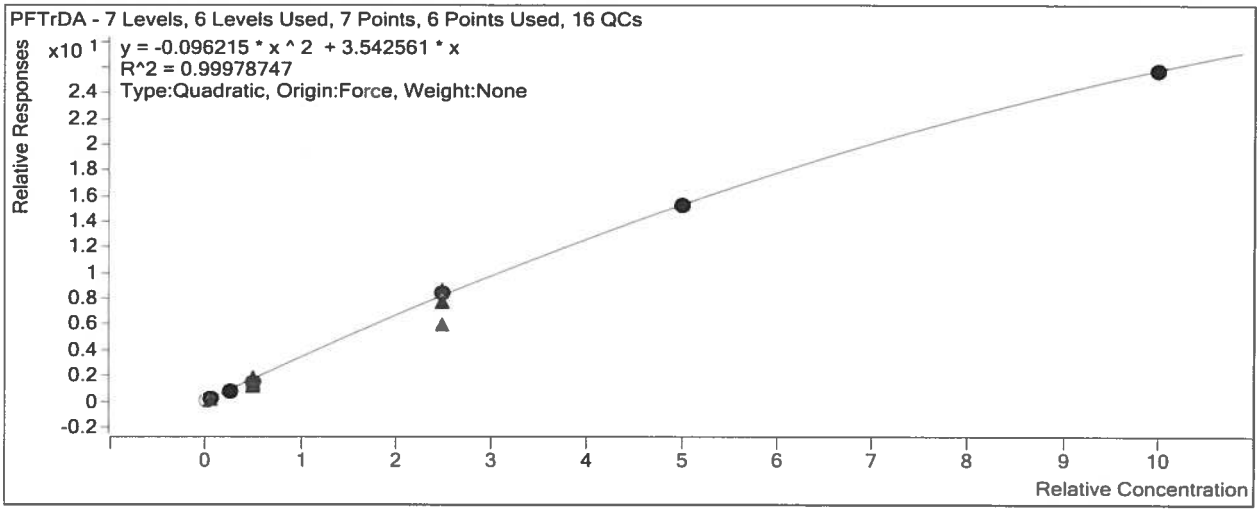


Extracted ISTD *d-NMeFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	9884	20.0000	494.2233
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	10131	20.0000	506.5586
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	10730	20.0000	536.4996
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	10538	20.0000	526.8963

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	117581	50.0000	3.3651
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	211449	100.0000	3.0501
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	361983	200.0000	2.5809



Extracted ISTD *d9-NEtFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	16898	20.0000	844.8827
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	16372	20.0000	818.5773
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	16366	20.0000	818.2757
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	16897	20.0000	844.8583
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	17166	20.0000	858.3020
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	16501	20.0000	825.0466
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	15052	20.0000	752.5775

Extracted ISTD *d-NEtFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	10322	20.0000	516.1165
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	10579	20.0000	528.9373
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	10508	20.0000	525.3769
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	10607	20.0000	530.3479
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	10936	20.0000	546.7803

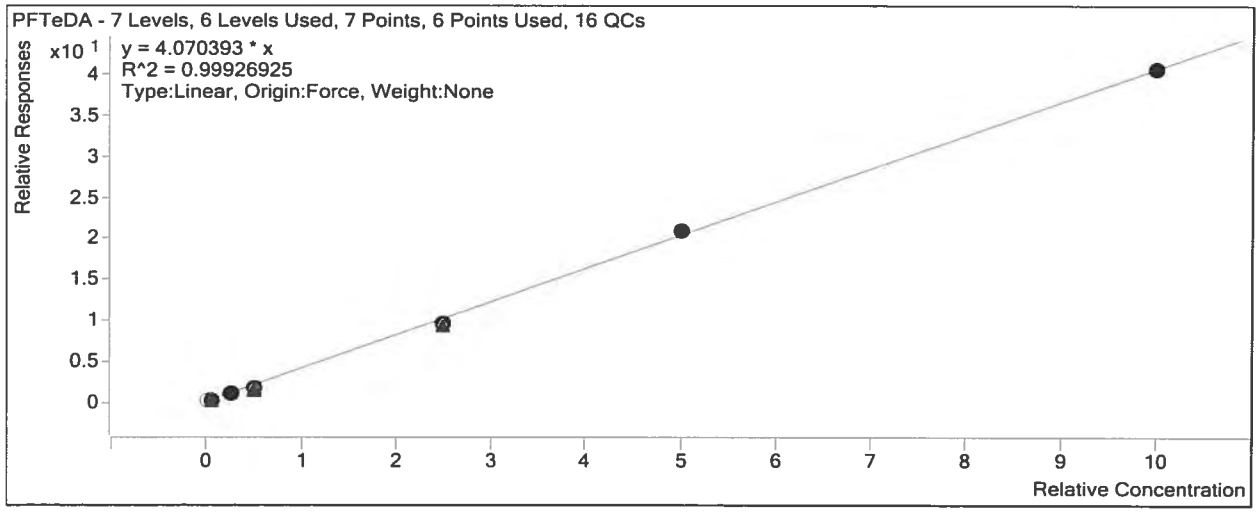
Quantitative Analysis Calibration Report

Extracted ISTD *M2PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☑	9999	20.0000	499.9628
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	9900	20.0000	495.0029
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	9481	20.0000	474.0628
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	10845	20.0000	542.2525
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	10947	20.0000	547.3314
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	10344	20.0000	517.2233
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	9892	20.0000	494.5803

Target Compound *PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200727ACAL\2200727A_02.d	Calibration	1	☐	883	0.5000	3.5325
D:\MassHunter\Data\2200727ACAL\2200727A_03.d	Calibration	2	☑	2011	1.2500	3.2506
D:\MassHunter\Data\2200727ACAL\2200727A_04.d	Calibration	3	☑	8656	5.0000	3.6518
D:\MassHunter\Data\2200727ACAL\2200727A_05.d	Calibration	4	☑	18974	10.0000	3.4991
D:\MassHunter\Data\2200727ACAL\2200727A_10.d	Calibration	5	☑	103793	50.0000	3.7927
D:\MassHunter\Data\2200727ACAL\2200727A_07.d	Calibration	6	☑	216574	100.0000	4.1872
D:\MassHunter\Data\2200727ACAL\2200727A_08.d	Calibration	7	☑	401625	200.0000	4.0603



Extracted ISTD *M2PFHxDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/27/2020 19:34	Lab File ID:	2200727A_27.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688835

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	50900	107	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	54000	112	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	47900	96	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	46400	93	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	49300	99	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	43600	99	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	50600	101	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	56200	112	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	49100	98	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	44900	90	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	46500	102	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	50400	101	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	50300	101	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	43400	94	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	46600	93	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	46300	93	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	53000	106	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	47700	95	70	130	

FORM 7E - ORG

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/28/2020 03:29	Lab File ID:	2200727A_63.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688835

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	8.96	95	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	8.80	92	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	8.40	84	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	8.88	89	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	8.40	84	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	8.08	92	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.64	86	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	8.72	87	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	7.82	78	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	7.75	77	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	7.26	80	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	8.56	86	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	9.12	91	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.71	83	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	7.90	79	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	9.28	92	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	7.77	78	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	7.93	79	70	130	

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	220071466	Standard ID:	1205 (ICAL Midpoint)
Analyst:	AWG	Instrument ID:	QQQ2
Analysis Date:	07/27/20 15:33	Lab File ID:	2200727A_10.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688835

	M2PFDA	M2PFHxA	M2PFOA	M4PFOS
	Area	*Area*	*Area*	*Area*
STANDARD	92263	261755	93068	86414

CLIENT SAMPLE ID	*GCAL SAMP ID*		#		#		#		#
MB2062133RE	2062133RE	227299	*	610015	*	226640	*	199575	*
LCS2062134RE	2062134RE	199096	*	587600	*	211583	*	187519	*
LCSD2062135RE	2062135RE	207243	*	600405	*	228160	*	193163	*

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

*for monitoring only-double spiked with IIS solution

FORM 8I - ORG

QQQ2 Run Log

Analyst:	BMH	Expiration:
Instrument:	QQQ2	
Batch:	2200728A	
Current ICAL Bath:	2200728ACAL	
20mM Amm Acetate	012-38-8	7/30/2020
Methanol	2129224	3/31/2025
Calibration Std	012-38-6	1/27/2021
ICV Std	012-38-3	1/25/2021
EIS Mix	012-38-2	1/25/2021
IIS Mix	012-37-3	1/23/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2200728A_01.d	MeOH Shot	7/28/2020 12:36	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2200728A_02.d	Cal	7/28/2020 12:50	BMH,QQQ2;Cal	1
1202	2200728A_03.d	Cal	7/28/2020 13:03	BMH,QQQ2;Cal	1
1203	2200728A_04.d	Cal	7/28/2020 13:16	BMH,QQQ2;Cal	1
1204	2200728A_05.d	Cal	7/28/2020 13:29	BMH,QQQ2;Cal	1
1205	2200728A_06.d	Cal	7/28/2020 13:42	BMH,QQQ2;Cal	1
1206	2200728A_07.d	Cal	7/28/2020 13:55	BMH,QQQ2;Cal	1
1207	2200728A_08.d	Cal	7/28/2020 14:09	BMH,QQQ2;Cal	1
MeOH Shot	2200728A_09.d	MeOH Shot	3/20/2005 14:30	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1500	2200728A_10.d	Sample	7/28/2020 14:35	BMH,QQQ2	1
1600	2200728A_11.d	QC	7/28/2020 14:48	BMH,QQQ2	1
1450	2200728A_12.d	QC	7/28/2020 15:02	BMH,QQQ2	1
MeOH Shot	2200728A_13.d	MeOH Shot	7/28/2020 15:15	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
22007163601 x20	2200728A_14.d	Sample	7/28/2020 15:28	BMH,QQQ2;688321	20
22007171201	2200728A_15.d	Sample	7/28/2020 15:41	BMH,QQQ2;688321	1
1400	2200728A_16.d	QC	7/28/2020 15:54	BMH,QQQ2;CCV	1
22007171202	2200728A_17.d	Sample	7/28/2020 16:07	BMH,QQQ2;688321	1
22007171203	2200728A_18.d	Sample	7/28/2020 16:21	BMH,QQQ2;688321	1
22007171204	2200728A_19.d	Sample	7/28/2020 16:34	BMH,QQQ2;688321	1
22007171205	2200728A_20.d	Sample	7/28/2020 16:47	BMH,QQQ2;688321	1

22007171206 X10	2200728A_21.d	Sample	7/28/2020 17:00	BMH,QQQ2;688321	10
22007171206	2200728A_22.d	Sample	7/28/2020 17:13	BMH,QQQ2;688321	1
22007171207 X5	2200728A_23.d	Sample	7/28/2020 17:27	BMH,QQQ2;688321	5
22007171207	2200728A_24.d	Sample	7/28/2020 17:40	BMH,QQQ2;688321	1
22007171208	2200728A_25.d	Sample	7/28/2020 17:53	BMH,QQQ2;688321	1
22007171209	2200728A_26.d	Sample	7/28/2020 18:06	BMH,QQQ2;688321	1
1400	2200728A_27.d	QC	7/28/2020 18:19	BMH,QQQ2;CCV	1
22007146505 x5	2200728A_28.d	Sample	7/28/2020 18:33	BMH,QQQ2;687999	5
22007146506 x5	2200728A_29.d	Sample	7/28/2020 18:46	BMH,QQQ2;687999	5
22007146508 X10	2200728A_30.d	Sample	7/28/2020 18:59	BMH,QQQ2;687999	10
2065745	2200728A_31.d	Sample	7/28/2020 19:12	BMH,QQQ2;688732	1
MeOH Shot	2200728A_32.d	MeOH Shot	7/28/2020 19:29	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
2065745	2200728A_33.d	Sample	7/28/2020 19:42	BMH,QQQ2; RR, no vial present when injecting	1
2065746	2200728A_34.d	QC	7/28/2020 19:55	BMH,QQQ2;688732	1
2065747	2200728A_35.d	QC	7/28/2020 20:08	BMH,QQQ2;688732	1
22007146513	2200728A_36.d	Sample	7/28/2020 20:22	BMH,QQQ2;688732	1
22007146503	2200728A_37.d	Sample	7/28/2020 20:35	BMH,QQQ2;688732	1
22007146506	2200728A_38.d	Sample	7/28/2020 20:48	BMH,QQQ2;688732	1
22007146507	2200728A_39.d	Sample	7/28/2020 21:01	BMH,QQQ2;688732	1
22007146508	2200728A_40.d	Sample	7/28/2020 21:15	BMH,QQQ2;688732	1
22007146510	2200728A_41.d	Sample	7/28/2020 21:28	BMH,QQQ2;688732	1
22007146601	2200728A_42.d	Sample	7/28/2020 21:41	BMH,QQQ2;688732	1
1400	2200728A_43.d	QC	7/28/2020 21:54	BMH,QQQ2;CCV	1
22007146602	2200728A_44.d	Sample	7/28/2020 22:07	BMH,QQQ2;688732	1
22007146603	2200728A_45.d	QC	7/28/2020 22:20	BMH,QQQ2;688732	1
22007146604	2200728A_46.d	QC	7/28/2020 22:34	BMH,QQQ2;688732	1
22007146605	2200728A_47.d	Sample	7/28/2020 22:47	BMH,QQQ2;688732	1
22007146606	2200728A_48.d	Sample	7/28/2020 23:00	BMH,QQQ2;688732	1
22007146607	2200728A_49.d	Sample	7/28/2020 23:13	BMH,QQQ2;688732	1
22007146608	2200728A_50.d	Sample	7/28/2020 23:26	BMH,QQQ2;688732	1
22007146609	2200728A_51.d	Sample	7/28/2020 23:39	BMH,QQQ2;688732	1
22007146610	2200728A_52.d	Sample	7/28/2020 23:53	BMH,QQQ2;688732	1
1400	2200728A_53.d	QC	7/29/2020 0:06	BMH,QQQ2;CCV	1
DW MB 1	2200728A_54.d	Sample	7/29/2020 0:19	BMH,QQQ2;DW MDL	1

DW MB 2	2200728A_55.d	Sample	7/29/2020 0:32	BMH,QQQ2;DW MDL	1
DW MB 3	2200728A_56.d	Sample	7/29/2020 0:45	BMH,QQQ2;DW MDL	1
DW MDL 1	2200728A_57.d	Sample	7/29/2020 0:59	BMH,QQQ2;DW MDL	1
DW MDL 2	2200728A_58.d	Sample	7/29/2020 1:12	BMH,QQQ2;DW MDL	1
DW MDL 3	2200728A_59.d	Sample	7/29/2020 1:25	BMH,QQQ2;DW MDL	1
DW LCS 1	2200728A_60.d	QC	7/29/2020 1:38	BMH,QQQ2;DW MDL	1
DOD MB 1	2200728A_61.d	Sample	7/29/2020 1:51	BMH,QQQ2;DoD_W Stacked	1
DOD MB 2	2200728A_62.d	Sample	7/29/2020 2:04	BMH,QQQ2;DoD_W Stacked	1
DOD MB 3	2200728A_63.d	Sample	7/29/2020 2:18	BMH,QQQ2;DoD_W Stacked	1
1450	2200728A_64.d	QC	7/29/2020 2:31	BMH,QQQ2;CCV	1
DOD MDL 1	2200728A_65.d	Sample	7/29/2020 2:44	BMH,QQQ2;DoD_W Stacked	1
DOD MDL 2	2200728A_66.d	Sample	7/29/2020 2:57	BMH,QQQ2;DoD_W Stacked	1
DOD MDL 3	2200728A_67.d	Sample	7/29/2020 3:10	BMH,QQQ2;DoD_W Stacked	1
Soil Stack LCS 1	2200728A_68.d	Sample	7/29/2020 3:24	BMH,QQQ2;Soil Stack test	1
Soil Stack LCS 2	2200728A_69.d	Sample	7/29/2020 3:37	BMH,QQQ2;Soil Stack test	1
2063502	2200728A_70.d	Sample	7/29/2020 3:50	BMH,QQQ2;688319	1
2063503	2200728A_71.d	QC	7/29/2020 4:03	BMH,QQQ2;688319	1
2063504	2200728A_72.d	QC	7/29/2020 4:16	BMH,QQQ2;688319	1
22007171502 5xDIA	2200728A_73.d	Sample	7/29/2020 4:29	BMH,QQQ2;688319	1
22007171520 5xDIA	2200728A_74.d	Sample	7/29/2020 4:43	BMH,QQQ2;688319	1
22007171521 5xDIA	2200728A_75.d	QC	7/29/2020 4:56	BMH,QQQ2;688319	1
22007171504 5xDIA	2200728A_76.d	Sample	7/29/2020 5:09	BMH,QQQ2;688319	1
22007171524 5xDIA	2200728A_77.d	Sample	7/29/2020 5:22	BMH,QQQ2;688319	1
22007171505 5xDIA	2200728A_78.d	Sample	7/29/2020 5:35	BMH,QQQ2;688319	1
22007171525 5xDIA	2200728A_79.d	Sample	7/29/2020 5:48	BMH,QQQ2;688319	1
22007171506 5xDIA	2200728A_80.d	Sample	7/29/2020 6:02	BMH,QQQ2;688319	1
22007171526 5xDIA	2200728A_81.d	Sample	7/29/2020 6:15	BMH,QQQ2;688319	1
22007171507 5xDIA	2200728A_82.d	Sample	7/29/2020 6:28	BMH,QQQ2;688319	1
22007171527 5xDIA	2200728A_83.d	Sample	7/29/2020 6:41	BMH,QQQ2;688319	1
1400	2200728A_84.d	QC	7/29/2020 6:54	BMH,QQQ2;CCV	1

ORGANICS INSTRUMENT BLANK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/28/2020 14:35	Lab File ID:	2200728A_10.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688919

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
6:2 Fluorotelomer sulfonate	ng/L	4.00	U	1.79	4.00	10.0	
NEtFOSAA	ng/L	8.00	U	5.38	8.00	10.0	
NMeFOSAA	ng/L	8.00	U	4.60	8.00	10.0	
Perfluorobutanesulfonic acid	ng/L	4.00	U	1.47	4.00	10.0	
Perfluorobutanoic acid	ng/L	4.00	U	2.13	4.00	10.0	
Perfluorodecanoic acid	ng/L	4.00	U	1.65	4.00	10.0	
Perfluorododecanoic acid	ng/L	4.00	U	2.45	4.00	10.0	
Perfluoroheptanoic acid	ng/L	4.00	U	1.85	4.00	10.0	
Perfluorohexanesulfonic acid	ng/L	4.00	U	1.64	4.00	10.0	
Perfluorohexanoic acid	ng/L	4.00	U	1.94	4.00	10.0	
Perfluorononanoic acid	ng/L	4.00	U	1.68	4.00	10.0	
Perfluorooctanesulfonic acid	ng/L	4.00	U	1.70	4.00	10.0	
Perfluorooctanoic acid	ng/L	4.00	U	1.80	4.00	10.0	
Perfluoropentanoic acid	ng/L	4.00	U	2.35	4.00	10.0	
Perfluorotetradecanoic acid	ng/L	4.00	U	2.76	4.00	10.0	
Perfluoroundecanoic acid	ng/L	4.00	U	1.86	4.00	10.0	

* - Result greater than 1/2 LOQ

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/28/2020 14:48	Lab File ID:	2200728A_11.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688919

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47400	57200	121	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	47900	49100	102	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	42500	85	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	45000	90	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50200	50100	100	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	50200	50000	100	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50100	53900	108	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50100	47700	95	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50100	46800	93	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50300	46600	93	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	50600	55600	110	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50100	53600	107	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50200	51500	103	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	50300	43000	85	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50700	45700	90	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50100	53600	107	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50100	43000	86	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50100	52800	105	70	130	

FORM 6I - ORG

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/28/2020 15:02	Lab File ID:	2200728A_12.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688919

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	9.04	95	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	9.36	97	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	7.46	75	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	9.44	94	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	9.44	95	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	7.48	85	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	9.44	94	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	11.0	109	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	7.46	75	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.32	83	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	8.48	93	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	7.66	77	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	7.55	75	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.27	79	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	8.00	80	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	9.76	98	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	12.0	120	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	8.40	84	70	130	

Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2200728ACAL\QuantResults\2200728A.batch.bin		
Analysis Time	7/29/2020 10:58 AM	**Analyst Name**	GCAL\mra
Report Time	7/29/2020 2:41 PM	**Reporter Name**	GCAL\lcms
Last Calib Update	7/29/2020 7:16 AM	**Batch State**	Processed

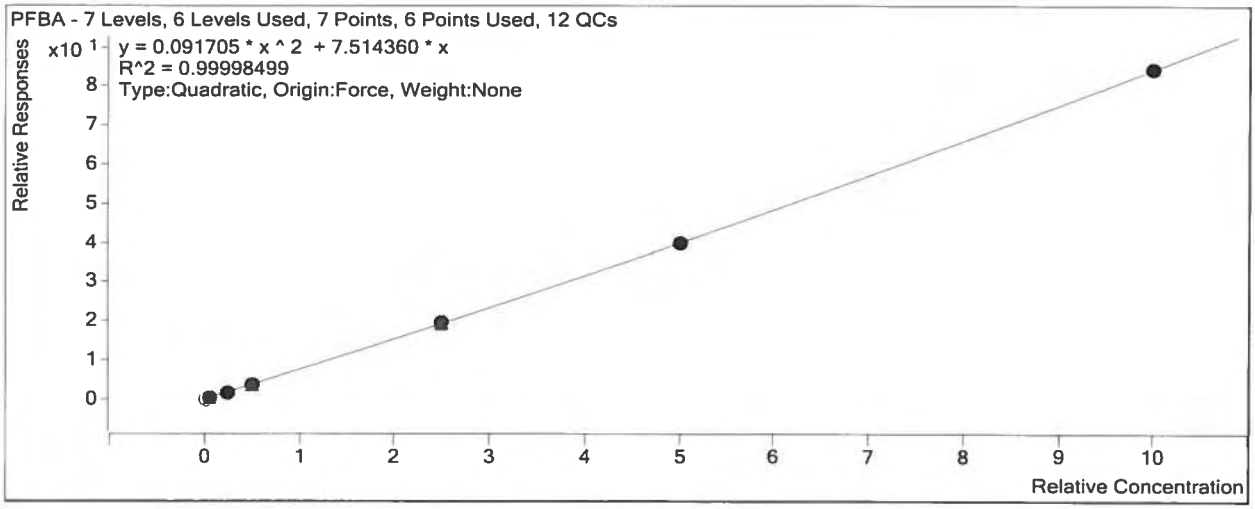
Calibration Info

Extracted ISTD *MPFBA*

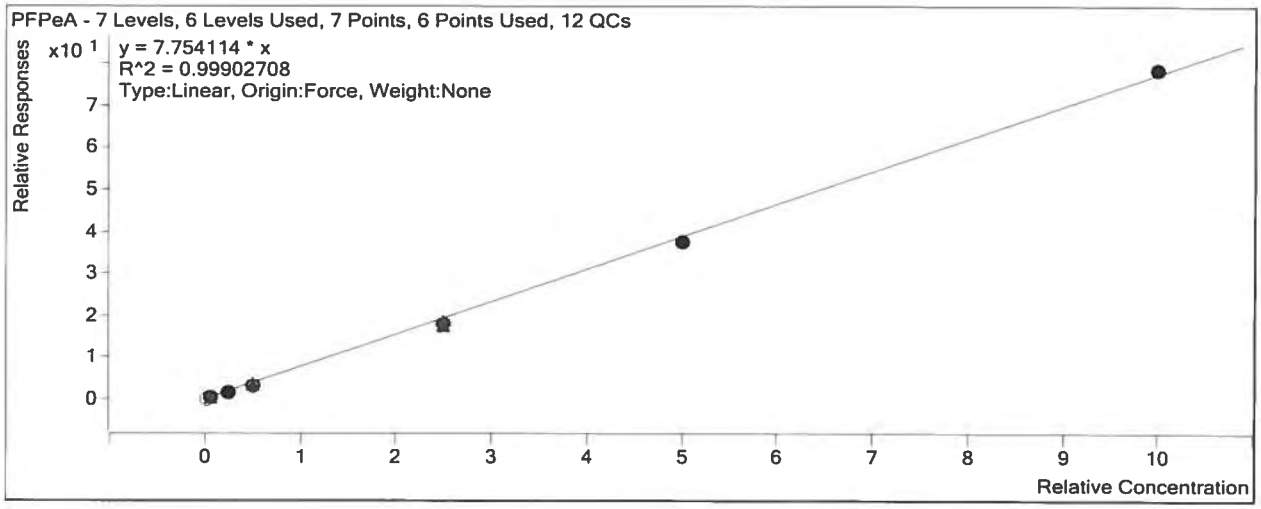
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	37069	20.0000	1853.4708
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	37752	20.0000	1887.5961
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	37781	20.0000	1889.0400
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	36738	20.0000	1836.8820
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	36720	20.0000	1835.9980
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	36132	20.0000	1806.6131
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	34165	20.0000	1708.2740

Target Compound *PFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	6398	0.5000	6.9036
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	16205	1.2500	6.8679
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	66210	5.0000	7.0099
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	134625	10.0000	7.3290
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	717871	50.0000	7.8200
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	1436515	100.0000	7.9514
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	2881152	200.0000	8.4329

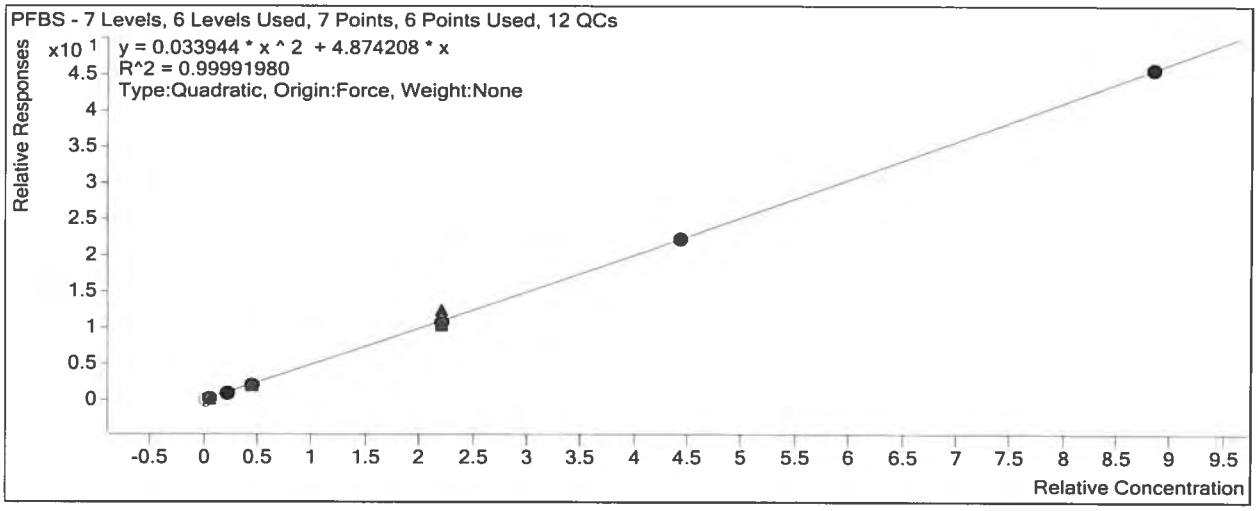


D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	386313	50.0000	7.2029
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	780979	100.0000	7.5262
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	1551738	200.0000	7.8493



Target Compound *PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1587	0.4425	4.1645
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	3982	1.1100	3.9154
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	17125	4.4250	4.2327
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	33634	8.8500	4.4260
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	183879	44.2500	4.8730
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	361146	88.5000	5.0653
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	716073	177.0000	5.1708

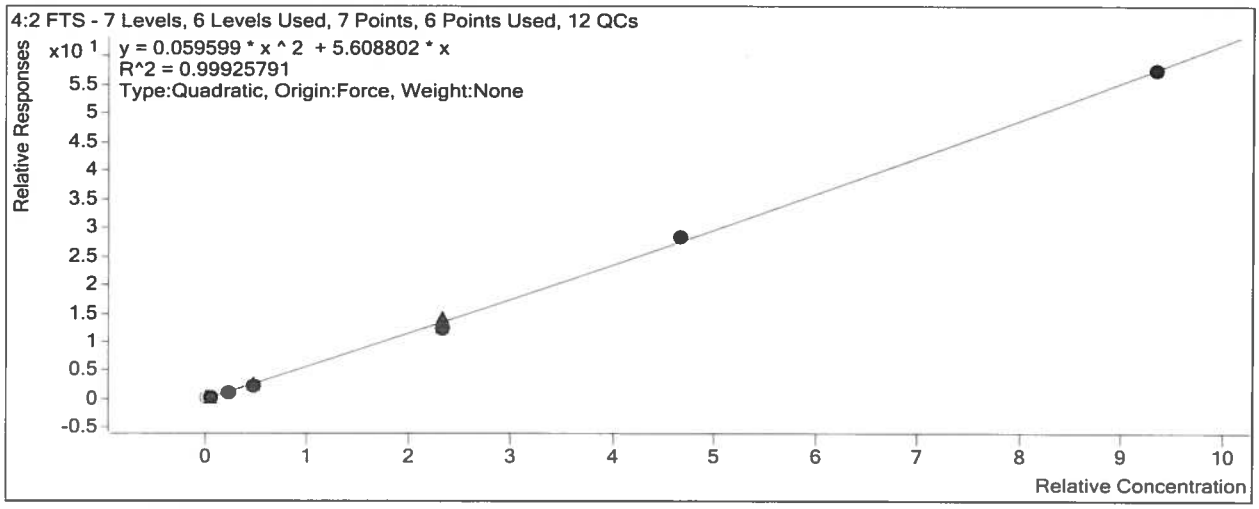


Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	4261	20.0000	213.0475

Target Compound *4:2 FTS*

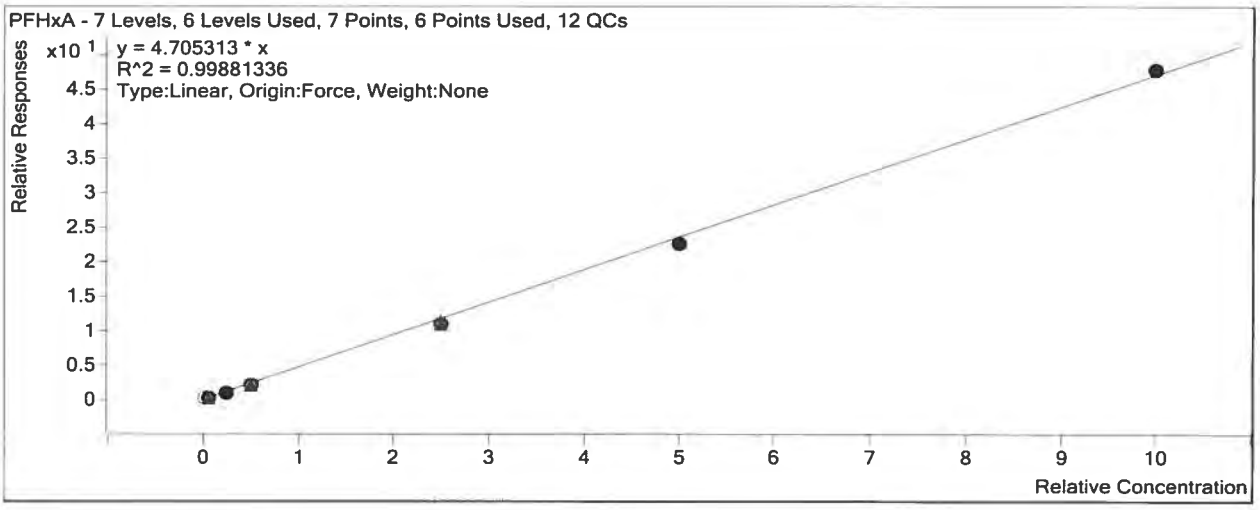
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	667	0.4675	5.5488
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	1693	1.1700	5.6027
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	6783	4.6700	5.1430
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	12444	9.3500	5.0094
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	65418	46.7500	5.3080
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	127294	93.5000	6.0667
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	245039	187.0000	6.1506



Extracted ISTD *M5PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	25666	20.0000	1283.3192
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	27669	20.0000	1383.4258
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	28214	20.0000	1410.6753
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	27261	20.0000	1363.0562
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	27088	20.0000	1354.3954
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	26000	20.0000	1299.9813
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	24211	20.0000	1210.5417

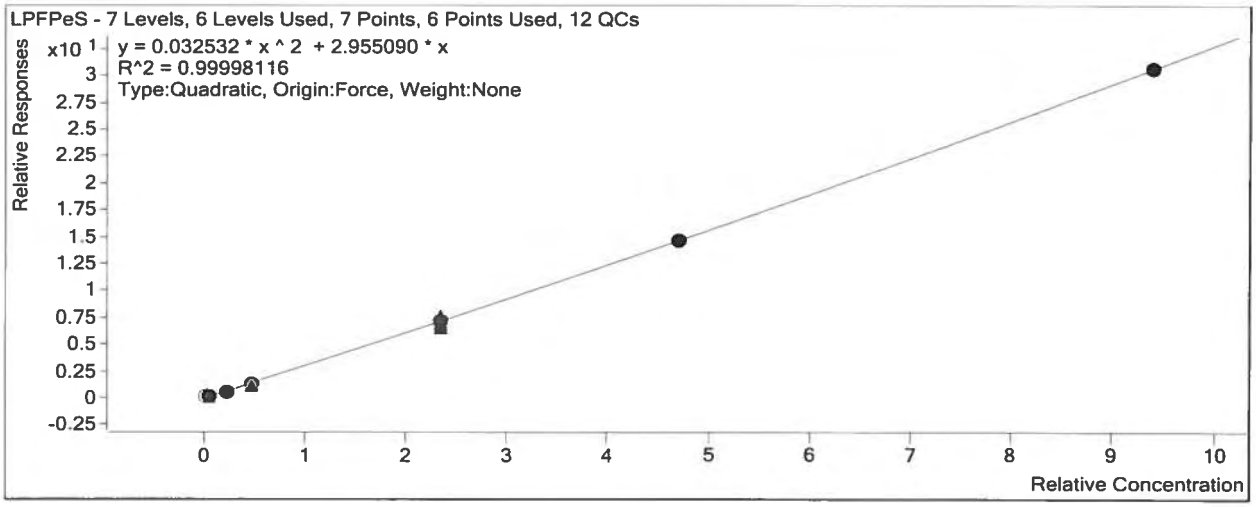
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFPeS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1756	0.4700	2.9107
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	4090	1.1800	2.5056
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	18016	4.7000	2.7173
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	35525	9.4000	2.7727
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	193697	47.0000	3.0428
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	379895	94.0000	3.1088
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	742061	188.0000	3.2606



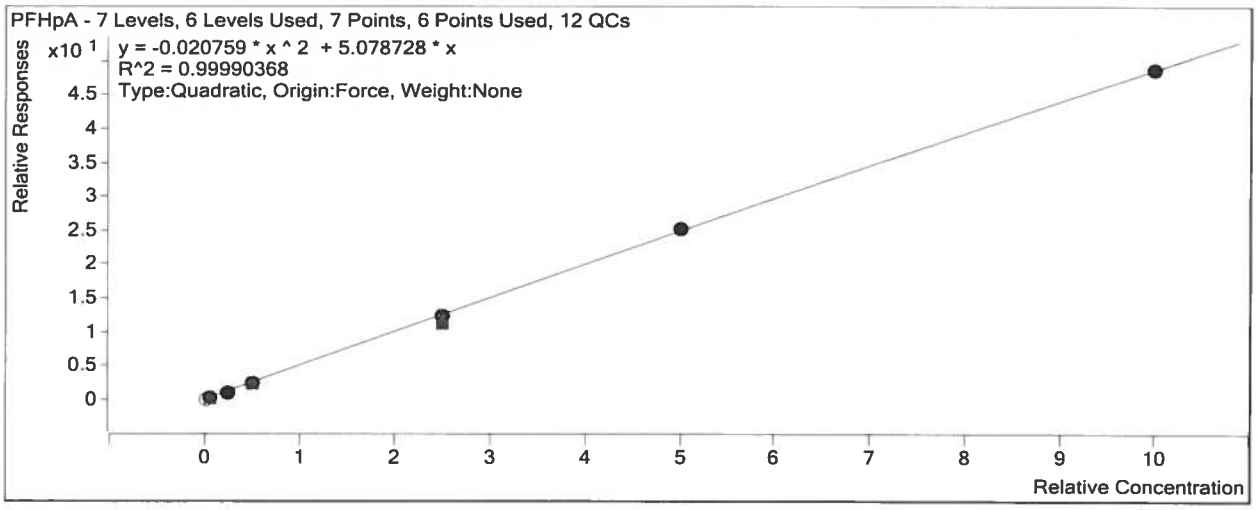
Extracted ISTD *M3HFPODA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	1190	40.0000	29.7543
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	1318	40.0000	32.9532
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	1456	40.0000	36.4035
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	1513	40.0000	37.8362
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	1380	40.0000	34.4909
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	1720	40.0000	43.0079
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	1395	40.0000	34.8705

Target Compound *HFPO-DA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



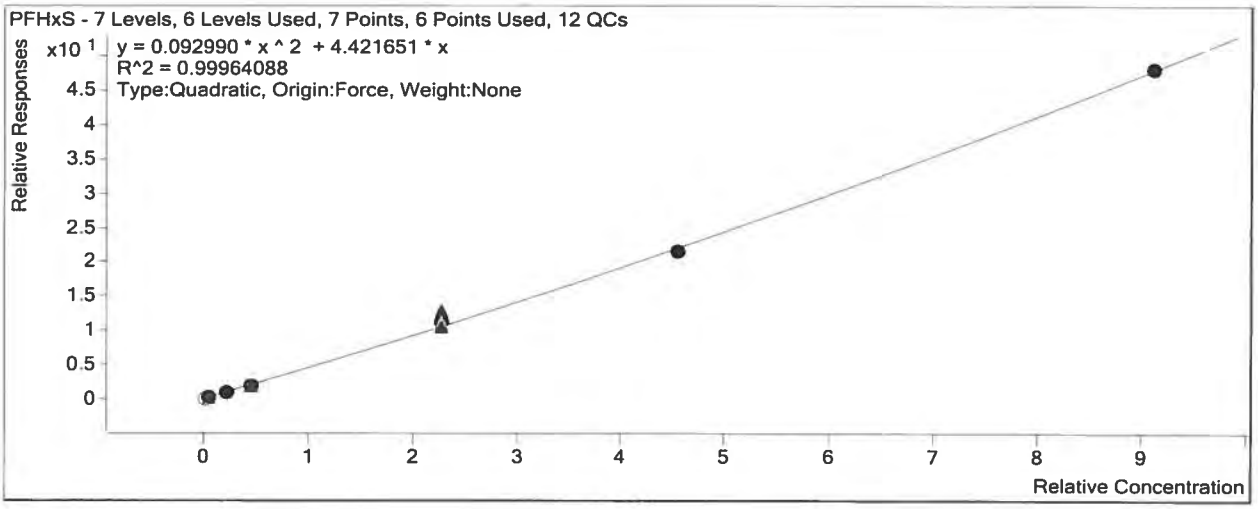
Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	18370	20.0000	918.5054
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	19247	20.0000	962.3672
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	19424	20.0000	971.1968
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	18317	20.0000	915.8732
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	17669	20.0000	883.4418
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	17623	20.0000	881.1626
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	15677	20.0000	783.8460

Target Compound *PFHxS*

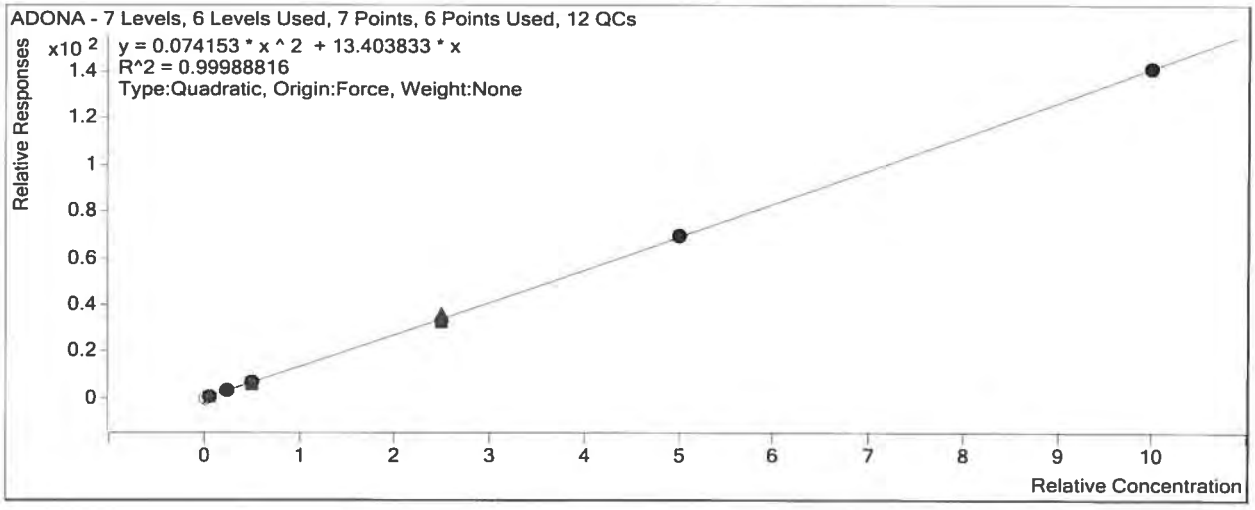
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1750	0.4560	4.1771
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	4047	1.1400	3.6890
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	17638	4.5600	3.9827
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	36441	9.1200	4.3628
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	197815	45.6000	4.9104
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	381423	91.2000	4.7463
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	754592	182.4000	5.2778

Quantitative Analysis Calibration Report



Target Compound *ADONA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	9830	0.5000	11.0847
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	25049	1.2500	11.2602
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	110169	5.0000	12.4584
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	219393	10.0000	13.3482
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	1164888	50.0000	13.1912
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	2256769	100.0000	13.9310
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	4406800	200.0000	14.1321



Extracted ISTD *M2 6:2 FTS*

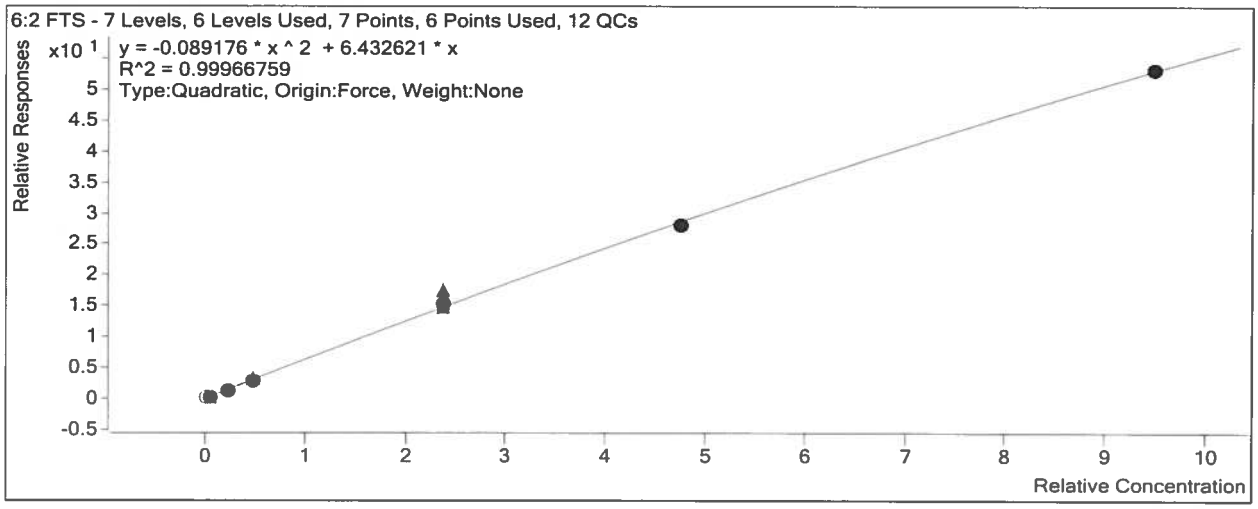
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	8026	20.0000	401.2815

Target Compound *6:2 FTS*

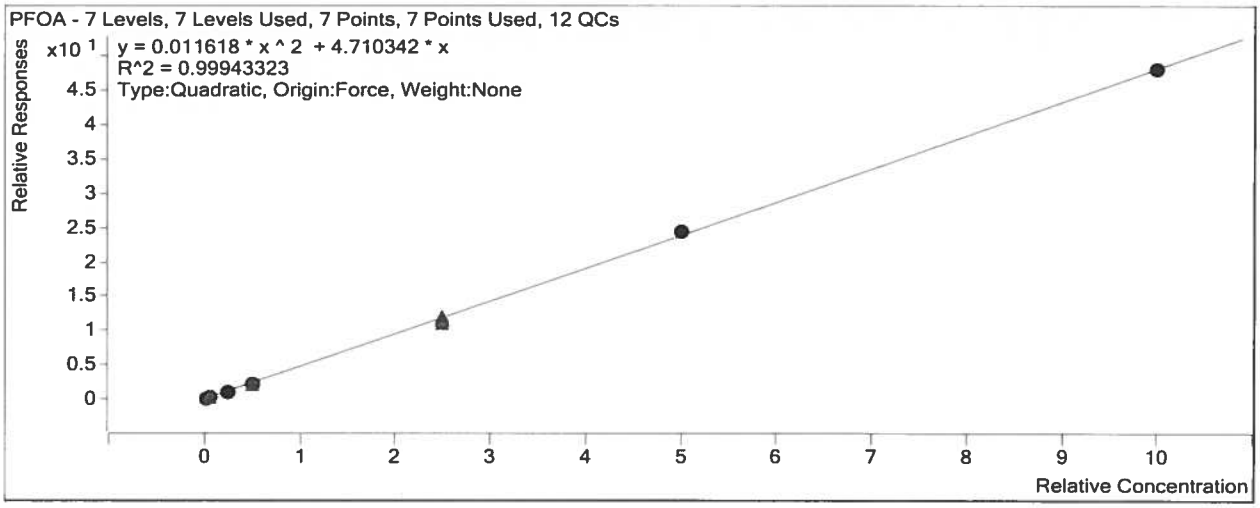
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1311	0.4750	7.7440
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	2566	1.1900	5.4633
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	11936	4.7500	5.7906
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	22806	9.5000	5.9589
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	122046	47.5000	6.5018
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	221568	95.0000	5.9152
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	426419	190.0000	5.5929



Extracted ISTD *M8PFOA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	35472	20.0000	1773.5906
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	35593	20.0000	1779.6712
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	35372	20.0000	1768.5827
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	32872	20.0000	1643.6127
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	35323	20.0000	1766.1565
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	32399	20.0000	1619.9650
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	31183	20.0000	1559.1500

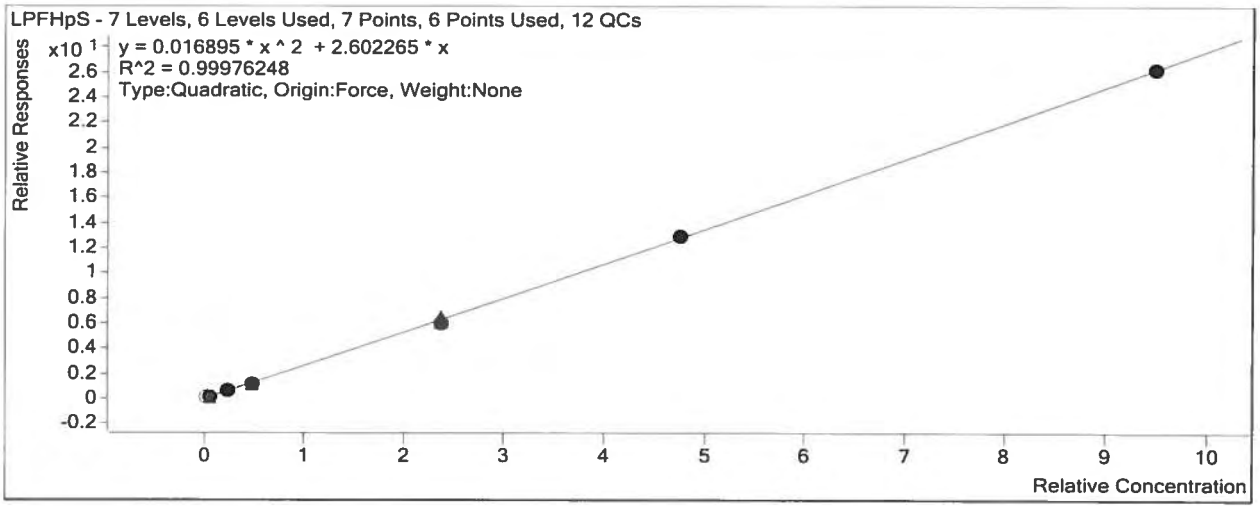
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *LPFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1992	0.4750	2.3641
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	5015	1.1900	2.3681
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	20674	4.7500	2.4609
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	39996	9.5000	2.5615
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	211989	47.5000	2.5269
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	419758	95.0000	2.7275
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	817308	190.0000	2.7590



Extracted ISTD *M9PFNA*

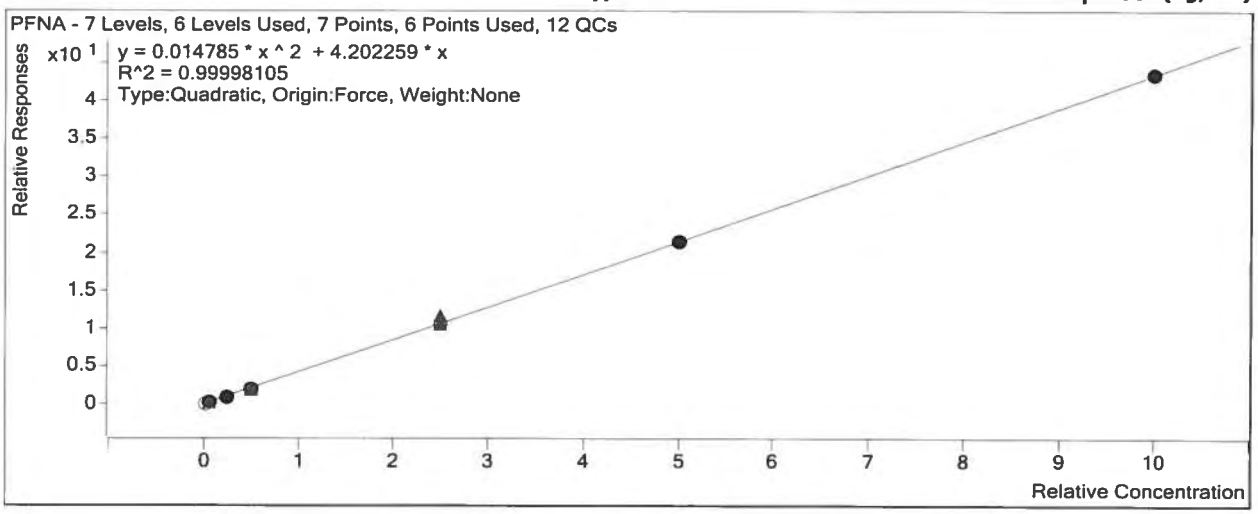
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	32131	20.0000	1606.5595
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	30360	20.0000	1517.9847
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	32606	20.0000	1630.3205
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	29056	20.0000	1452.7931
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	31285	20.0000	1564.2562
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	29238	20.0000	1461.9233
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	27481	20.0000	1374.0332

Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF



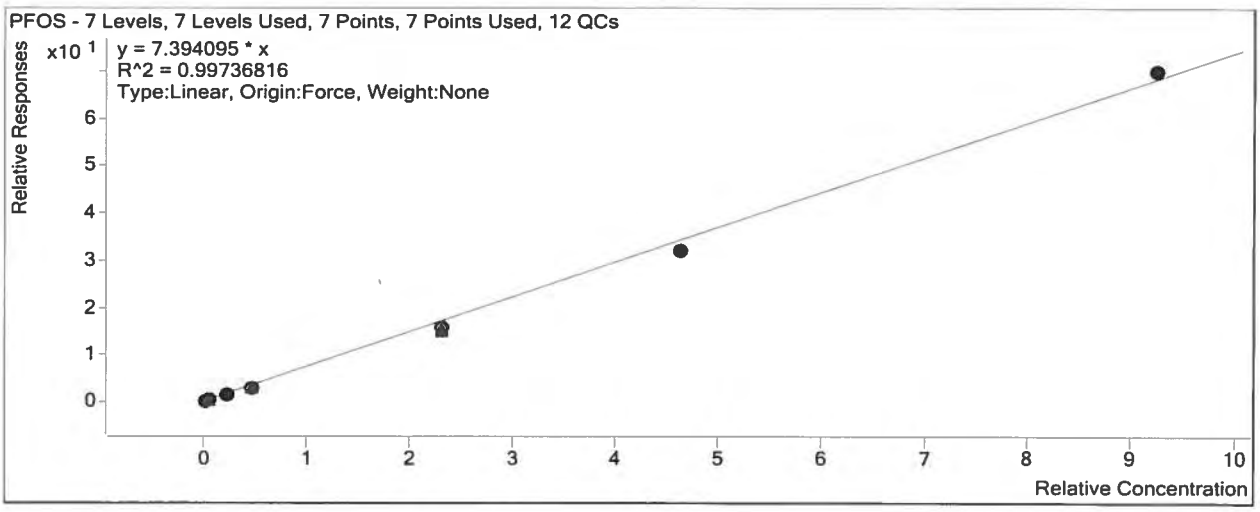
Extracted ISTD *M8PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	17686	20.0000	884.2997
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	17509	20.0000	875.4327
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	17969	20.0000	898.4548
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	18047	20.0000	902.3399
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	17030	20.0000	851.5109
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	16584	20.0000	829.2186
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	15119	20.0000	755.9476

Target Compound *PFOS*

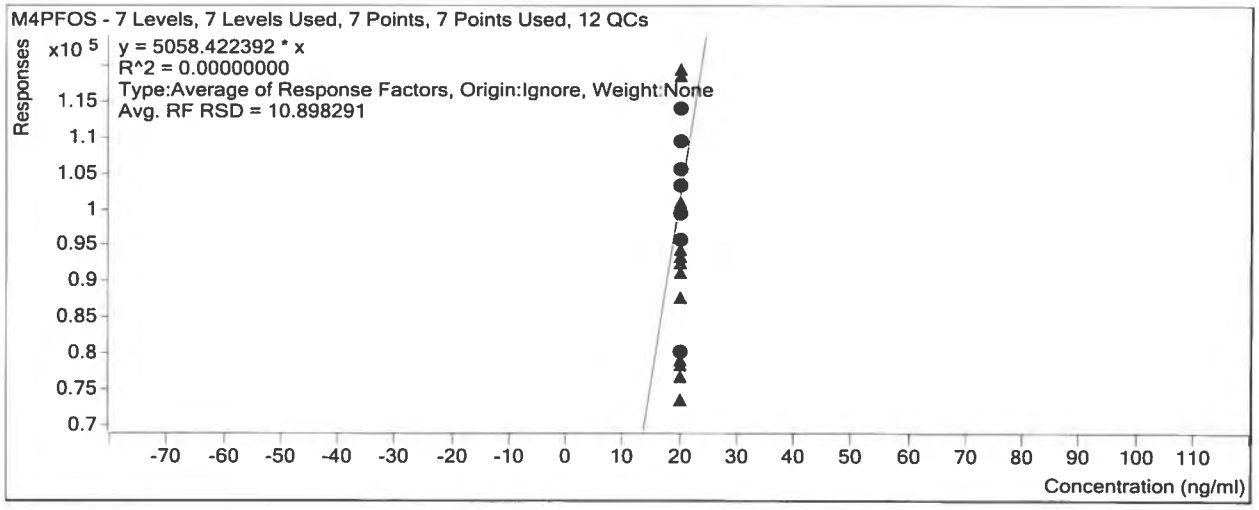
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	2138	0.4628	5.2251
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	5919	1.1600	5.8288
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	24119	4.6280	5.8005
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	47952	9.2550	5.7420
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	266961	46.2800	6.7743
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	528925	92.5500	6.8921
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	1058337	185.1000	7.5636

Quantitative Analysis Calibration Report



Instrument ISTD *M4PFOS*

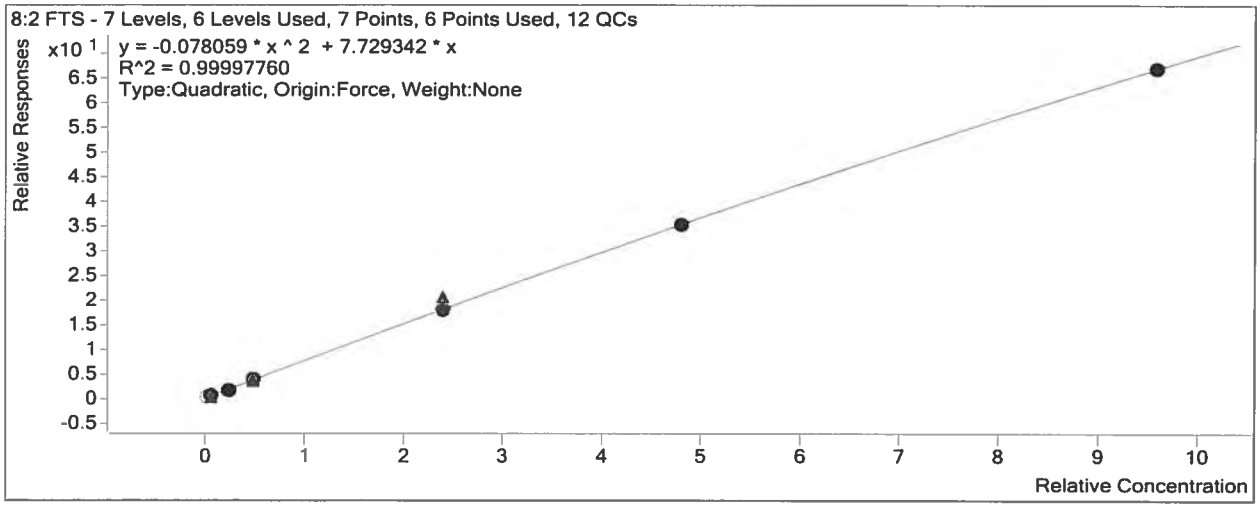
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	105642	20.0000	5282.1004
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	109475	20.0000	5473.7736
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	114016	20.0000	5700.8015
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	103430	20.0000	5171.4854
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	95900	20.0000	4795.0181
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	99516	20.0000	4975.8216
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	80199	20.0000	4009.9563



Target Compound *9Cl-PF3ONS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report



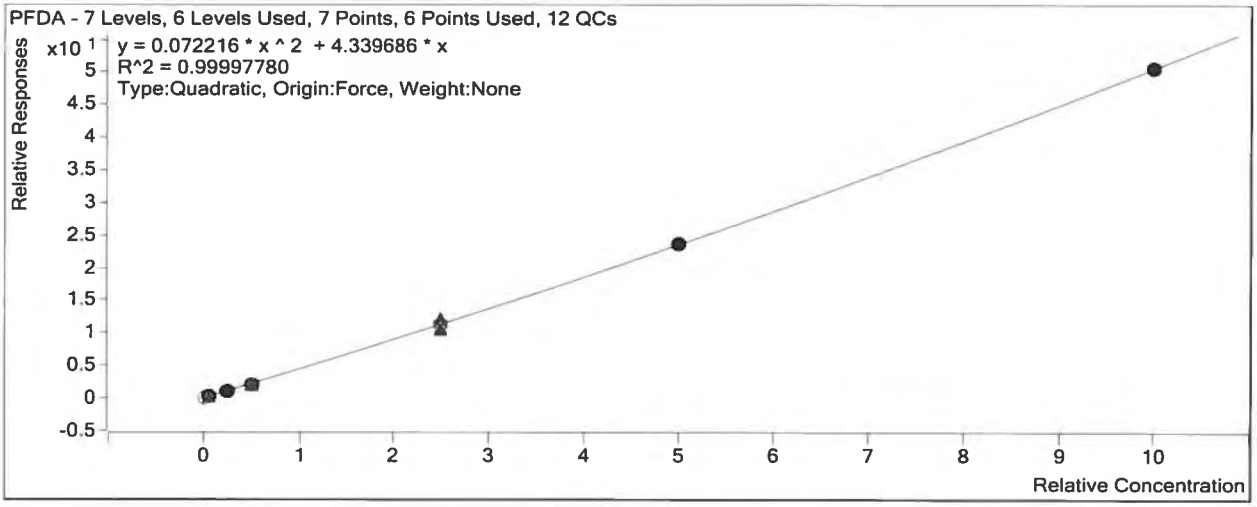
Extracted ISTD *M6PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	18348	20.0000	917.4010
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	17984	20.0000	899.1948
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	17462	20.0000	873.1182
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	17548	20.0000	877.3827
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	17363	20.0000	868.1701
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	16113	20.0000	805.6363
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	13939	20.0000	696.9303

Target Compound *PFDA*

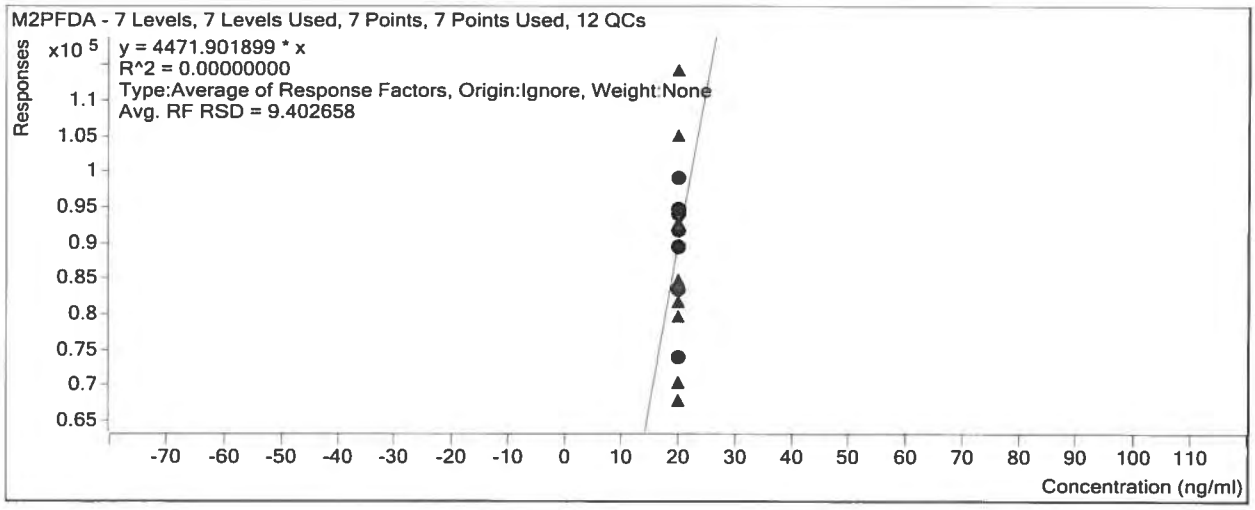
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1715	0.5000	3.7384
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	4488	1.2500	3.9932
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	17251	5.0000	3.9515
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	35682	10.0000	4.0668
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	195379	50.0000	4.5009
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	379935	100.0000	4.7160
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	705335	200.0000	5.0603

Quantitative Analysis Calibration Report



Instrument ISTD *M2PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	94647	20.0000	4732.3670
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	94086	20.0000	4704.3111
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	99048	20.0000	4952.3839
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	89330	20.0000	4466.4767
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	83335	20.0000	4166.7690
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	91702	20.0000	4585.0831
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	73918	20.0000	3695.9225

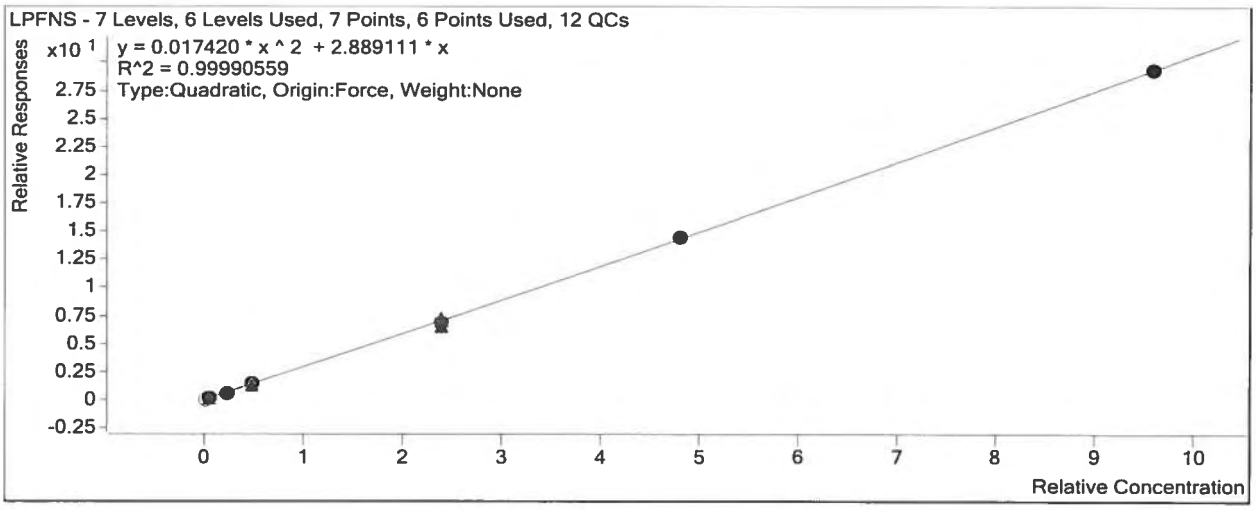


Target Compound *LPFNS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	805631	192.0000	3.0538



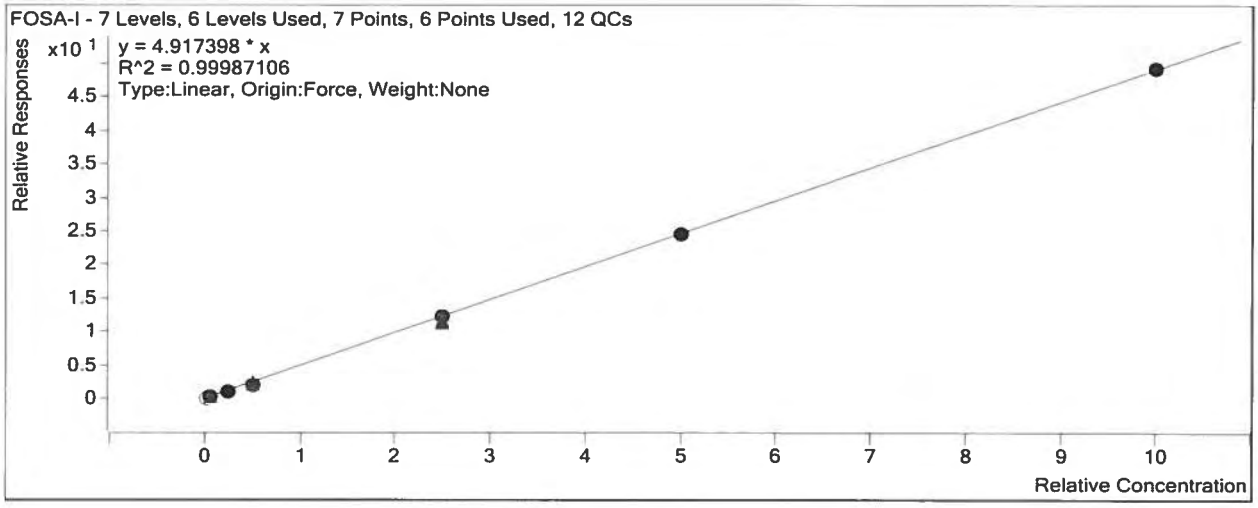
Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	18924	20.0000	946.2226
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	20263	20.0000	1013.1744
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	20958	20.0000	1047.8951
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	19708	20.0000	985.3757
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	19312	20.0000	965.6223
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	19010	20.0000	950.4786
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	18747	20.0000	937.3454

Target Compound *FOSA-I*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1917	0.5000	4.0530
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	4996	1.2500	3.9449
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	20718	5.0000	3.9541
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	40633	10.0000	4.1236
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	235403	50.0000	4.8757
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	466397	100.0000	4.9070
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	923330	200.0000	4.9252

Quantitative Analysis Calibration Report



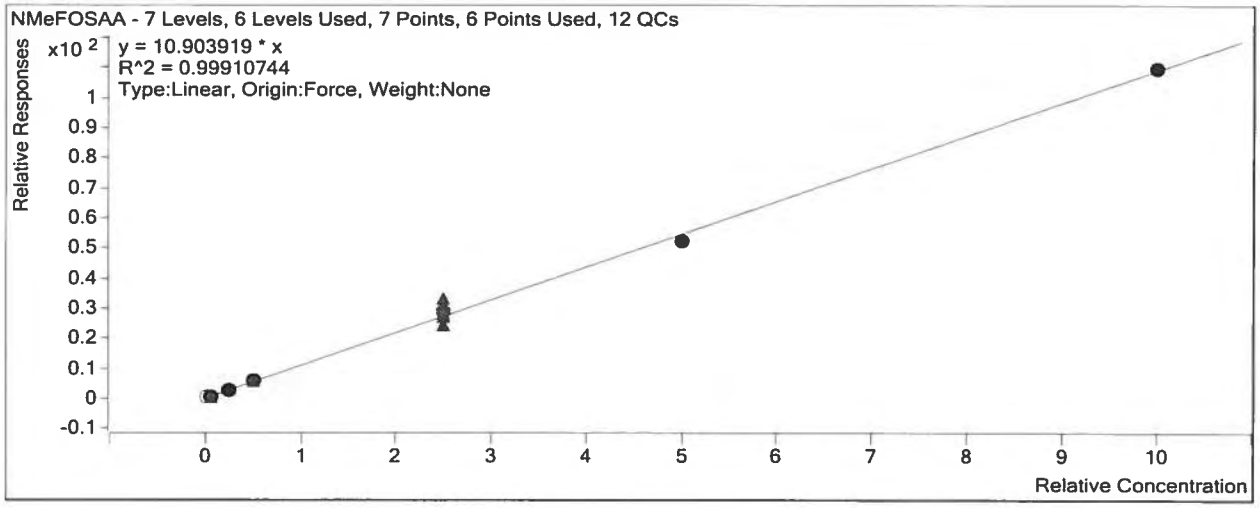
Extracted ISTD *d3-NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	8680	20.0000	433.9913
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	8647	20.0000	432.3264
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	9210	20.0000	460.5002
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	7861	20.0000	393.0401
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	8946	20.0000	447.3138
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	10167	20.0000	508.3336
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	9209	20.0000	460.4351

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	2300	0.5000	10.5983
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	5747	1.2500	10.6354
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	24887	5.0000	10.8088
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	46237	10.0000	11.7640
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	260398	50.0000	11.6427
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	533662	100.0000	10.4983
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	1009005	200.0000	10.9571

Quantitative Analysis Calibration Report



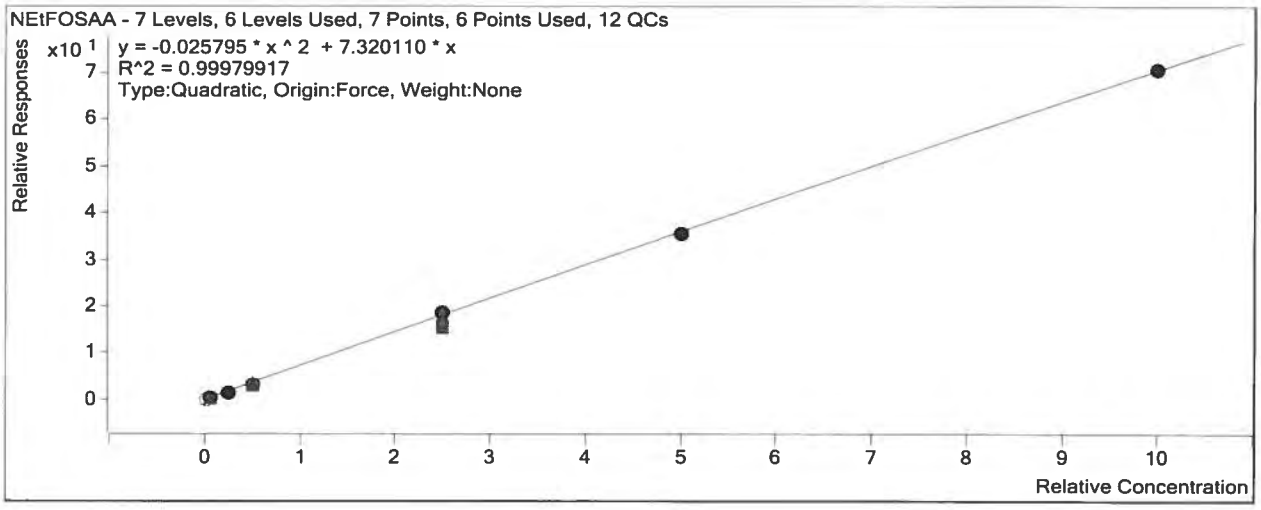
Extracted ISTD *d5-NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	12122	20.0000	606.0822
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	13270	20.0000	663.5242
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	13765	20.0000	688.2504
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	12221	20.0000	611.0520
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	12059	20.0000	602.9492
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	12396	20.0000	619.8001
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	11809	20.0000	590.4671

Target Compound *NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1556	0.5000	5.1330
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	4721	1.2500	5.6925
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	20135	5.0000	5.8509
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	39310	10.0000	6.4332
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	225681	50.0000	7.4859
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	441857	100.0000	7.1290
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	834502	200.0000	7.0665

Quantitative Analysis Calibration Report



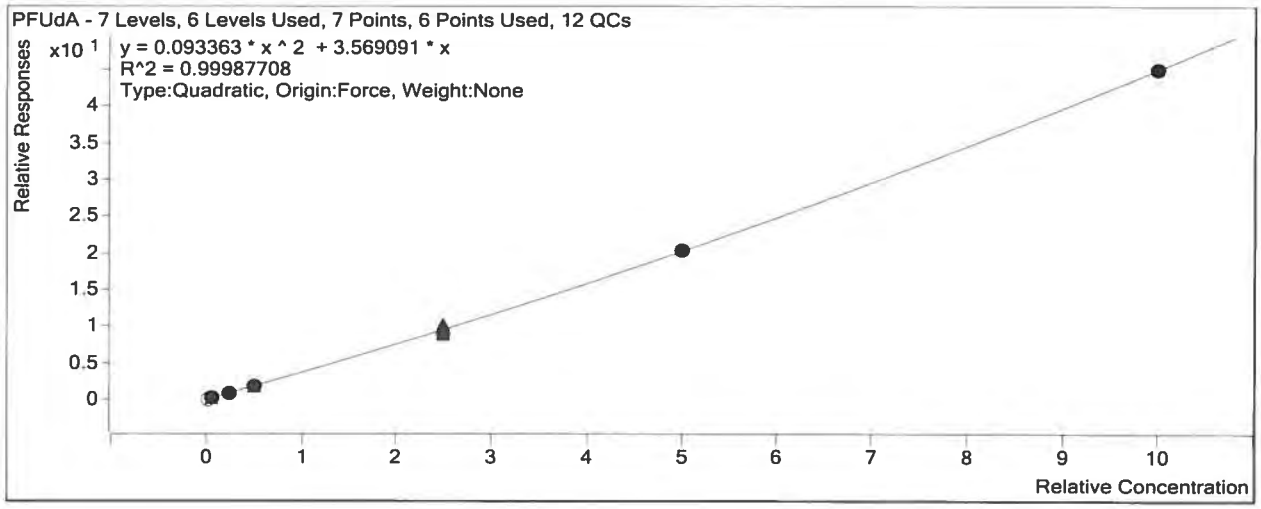
Extracted ISTD *M7PFUdA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	18993	20.0000	949.6335
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	17747	20.0000	887.3610
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	18828	20.0000	941.4041
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	17889	20.0000	894.4705
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	18346	20.0000	917.2890
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	17115	20.0000	855.7312
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	14764	20.0000	738.1989

Target Compound *PFUdA*

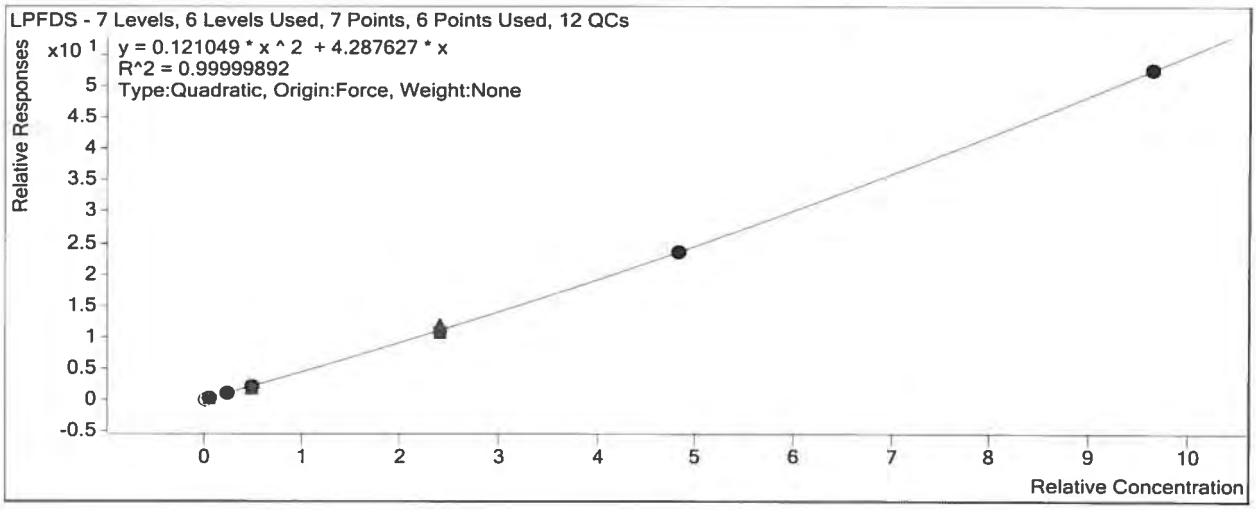
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1323	0.5000	2.7858
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	3823	1.2500	3.4462
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	15491	5.0000	3.2911
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	31819	10.0000	3.5573
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	168298	50.0000	3.6695
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	349858	100.0000	4.0884
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	664121	200.0000	4.4983

Quantitative Analysis Calibration Report



Target Compound *LPFDS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1723	0.4825	3.8920
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	4497	1.2100	4.1330
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	18893	4.8250	4.4847
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	36543	9.6500	4.3160
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	191589	48.2500	4.5737
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	378902	96.5000	4.8737
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	733817	193.0000	5.4556



Target Compound *11Cl-PF3OUdS*

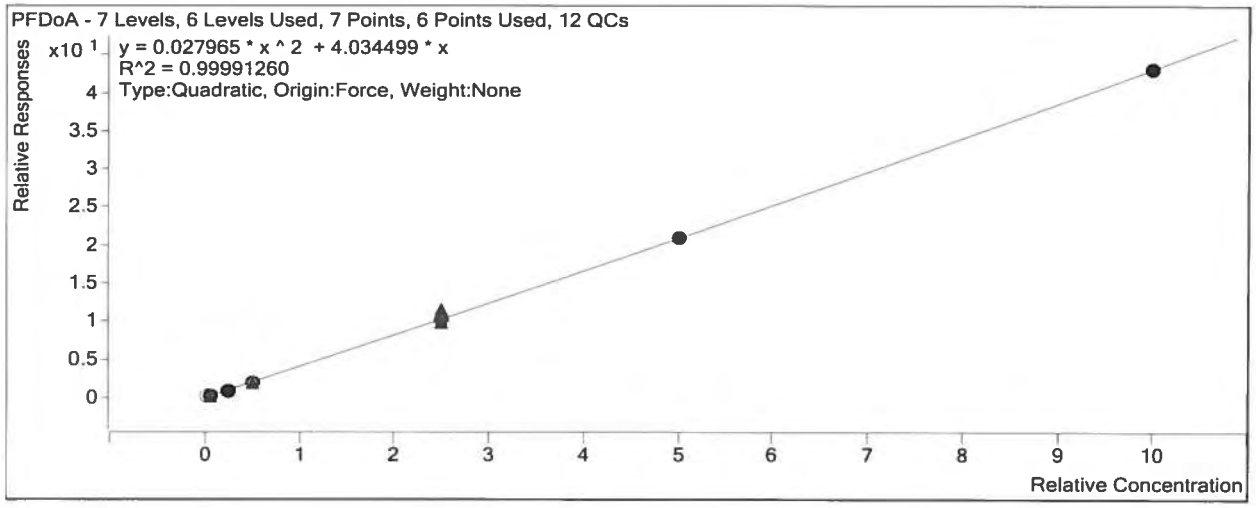
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	11965	20.0000	598.2391
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	12494	20.0000	624.6925
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	12516	20.0000	625.8162
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	12245	20.0000	612.2460

Target Compound *PFDoA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1365	0.5000	4.1456
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	3336	1.2500	4.0815
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	11340	5.0000	3.7358
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	22266	10.0000	3.7219
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	125454	50.0000	4.0165
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	263779	100.0000	4.2150
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	527815	200.0000	4.3105



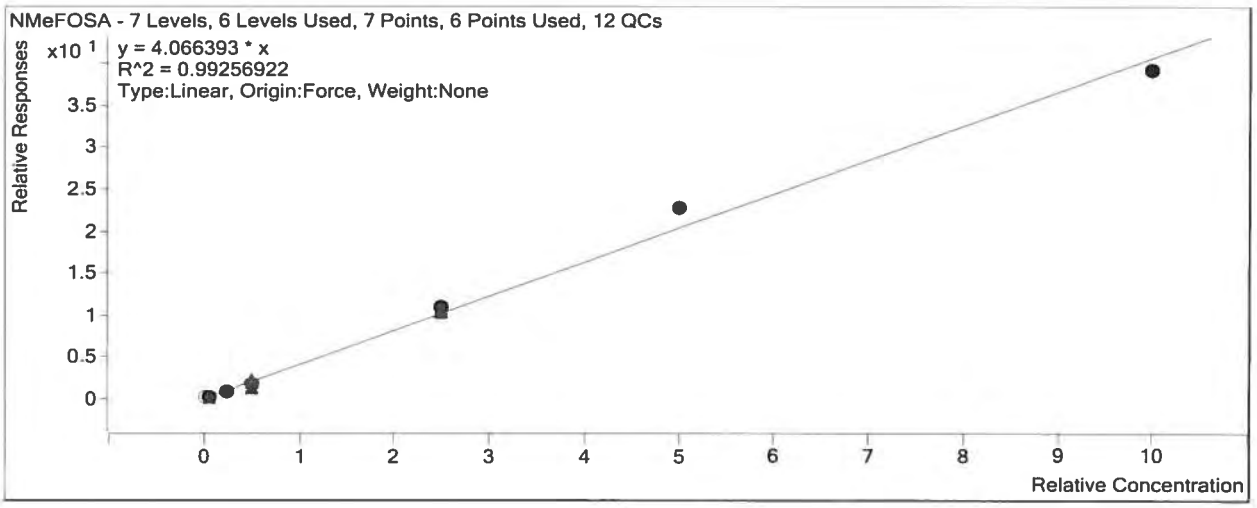
Extracted ISTD *d-NMeFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	10447	20.0000	522.3745
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	10680	20.0000	533.9950
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	10834	20.0000	541.7118
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	10901	20.0000	545.0450

Quantitative Analysis Calibration Report

Target Compound *NMeFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	956	0.5000	3.6588
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	2540	1.2500	3.8047
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	9411	5.0000	3.4746
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	19650	10.0000	3.6052
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	113113	50.0000	4.3640
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	229408	100.0000	4.5726
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	469155	200.0000	3.9228



Extracted ISTD *d7-NMeFOSE*

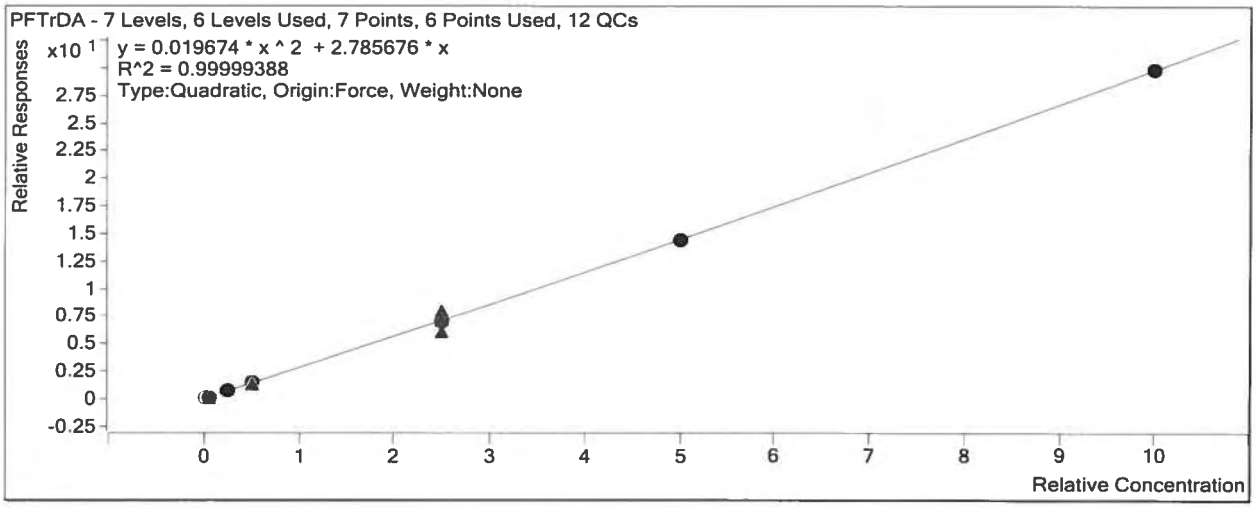
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	14893	20.0000	744.6704
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	15229	20.0000	761.4489
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	15604	20.0000	780.1793
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	13995	20.0000	699.7484
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	15047	20.0000	752.3535
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	13777	20.0000	688.8364
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	13700	20.0000	685.0165

Target Compound *NMeFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	87953	50.0000	2.8159
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	180861	100.0000	2.8900
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	365138	200.0000	2.9820



Extracted ISTD *d9-NEtFOSE*

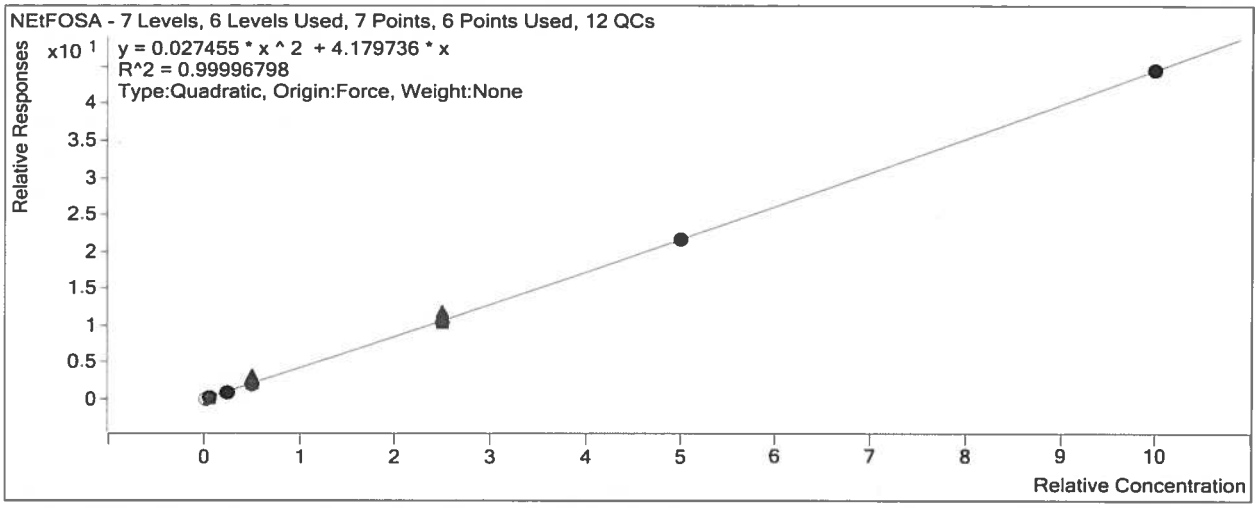
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	21367	20.0000	1068.3513
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	19331	20.0000	966.5483
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	20158	20.0000	1007.8871
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	18413	20.0000	920.6347
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	19740	20.0000	986.9795
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	18785	20.0000	939.2408
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	17268	20.0000	863.4183

Extracted ISTD *d-NEtFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	10864	20.0000	543.2136
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	10669	20.0000	533.4645
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	10840	20.0000	542.0110
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	10809	20.0000	540.4267
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	11443	20.0000	572.1626

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	2734	1.2500	4.1002
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	10577	5.0000	3.9030
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	22213	10.0000	4.1104
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	119774	50.0000	4.1867
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	241612	100.0000	4.3431
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	489553	200.0000	4.4520



Target Compound *NEtFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1429	0.5000	2.6746
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	4562	1.2500	3.7763
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	19719	5.0000	3.9130
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	38323	10.0000	4.1626
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	217351	50.0000	4.4044
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	422949	100.0000	4.5031
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	838879	200.0000	4.8579

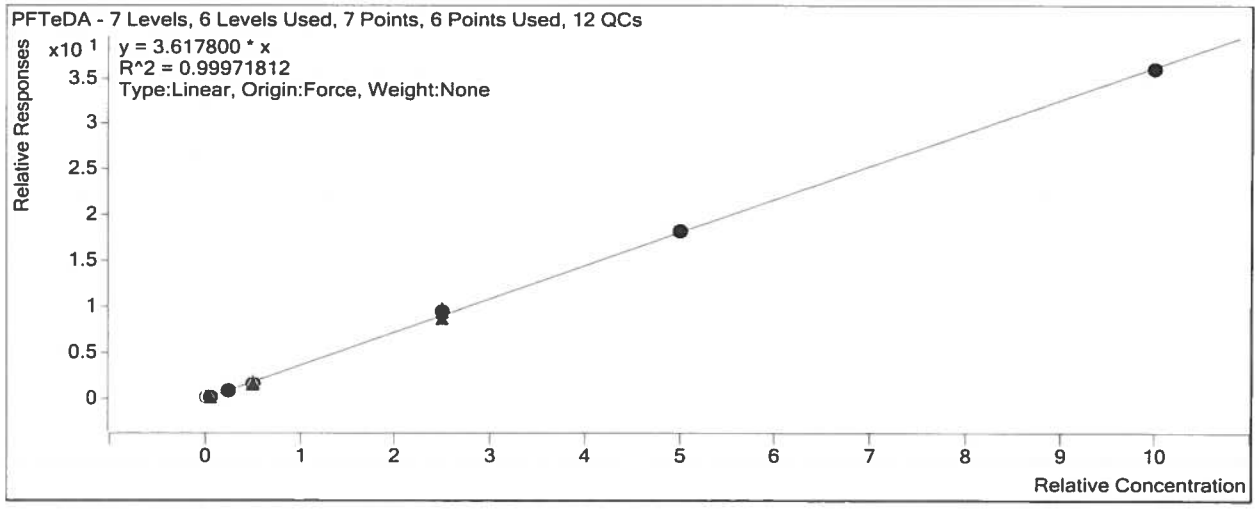
Quantitative Analysis Calibration Report

Extracted ISTD *M2PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☑	8862	20.0000	443.1121
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	8983	20.0000	449.1406
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	9144	20.0000	457.1912
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	9536	20.0000	476.7957
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	8872	20.0000	443.6166
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	9236	20.0000	461.7989
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	8839	20.0000	441.9587

Target Compound *PFTeDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	905	0.5000	4.0850
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	1956	1.2500	3.4834
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	7360	5.0000	3.2198
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	15295	10.0000	3.2079
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	83350	50.0000	3.7577
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	169405	100.0000	3.6684
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	318006	200.0000	3.5977



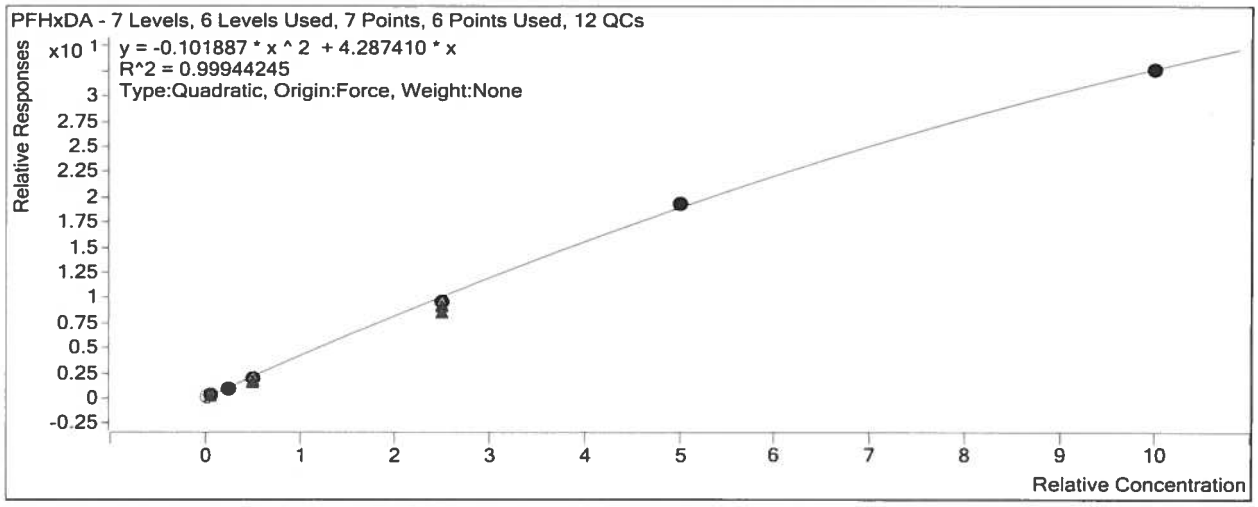
Extracted ISTD *M2PFHxDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
Target Compound	*PFHxDA*					

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	1093	0.5000	4.0597
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	2660	1.2500	3.9999
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	9903	5.0000	3.6282
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	19955	10.0000	3.9137
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	106391	50.0000	3.8371
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	214082	100.0000	3.8606
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	410062	200.0000	3.2613



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
Target Compound	*PFODA*					

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2200728ACAL\2200728A_02.d	Calibration	1	☐	375	0.5000	1.3923
D:\MassHunter\Data\2200728ACAL\2200728A_03.d	Calibration	2	☑	1145	1.2500	1.7223
D:\MassHunter\Data\2200728ACAL\2200728A_04.d	Calibration	3	☑	4476	5.0000	1.6397
D:\MassHunter\Data\2200728ACAL\2200728A_05.d	Calibration	4	☑	9048	10.0000	1.7746
D:\MassHunter\Data\2200728ACAL\2200728A_06.d	Calibration	5	☑	53633	50.0000	1.9343
D:\MassHunter\Data\2200728ACAL\2200728A_07.d	Calibration	6	☑	108247	100.0000	1.9521
D:\MassHunter\Data\2200728ACAL\2200728A_08.d	Calibration	7	☑	218266	200.0000	1.7359

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	220071466	Standard ID:	1205 (ICAL Midpoint)
Analyst:	AWG	Instrument ID:	QQQ2
Analysis Date:	07/28/20 13:42	Lab File ID:	2200728A_06.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688919

	M2PFDA	M2PFHxA	M2PFOA	M4PFOS
	Area	*Area*	*Area*	*Area*
STANDARD	83335	271954	96324	95900

CLIENT SAMPLE ID	*GCAL SAMP ID*		#		#		#		#
MB2065745	2065745	75094		215669		75074		76074	
LCS2065746	2065746	70442		232714		80208		79250	
LCSD2065747	2065747	68010		220243		78554		76776	
HAASF-MW001 (RE)	22007146611	70718		225455		81089		79126	
HAASF-MW002 (RE)	22007146612	71370		231975		79181		79120	
HAASF-MW002-MS (RE)	22007146613	70424		224817		80057		78455	
HAASF-MW002-MSD (RE)	22007146614	68040		215129		79296		73698	
HAASF-MW003 (RE)	22007146615	73855		221218		80716		77934	
HAASF-MW004 (RE)	22007146616	70596		217423		78290		75420	
HAASF-MW005 (RE)	22007146617	72286		228531		80749		76677	
HAASF-MW005-D (RE)	22007146618	75199		227827		81594		77851	
HAASF-ERB-03 (RE)	22007146619	67230		222320		81745		76181	
HAASF-ERB-04 (RE)	22007146620	69077		210224		73392		75716	

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

FORM 8I - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/28/2020 18:19	Lab File ID:	2200728A_27.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688919

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	47800	101	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	49300	103	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	44500	89	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	52300	105	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	51200	102	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	44100	100	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	49400	99	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	56400	113	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	47200	94	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	46000	92	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	45000	99	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	52400	105	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	49400	99	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	40500	87	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	47100	94	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	52000	104	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	56300	113	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	54100	108	70	130	

FORM 7E - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/28/2020 21:54	Lab File ID:	2200728A_43.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	688919

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	47500	50200	106	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	48000	49300	103	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	50000	48700	97	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	50000	49500	99	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	50000	51300	103	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	44300	43900	99	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	50000	53100	106	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	50000	51700	103	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	50000	46900	94	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	50000	47200	94	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	45600	47100	103	70	130	
Perfluorononanoic acid (PFNA)	ng/L	50000	50800	102	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	50000	50500	101	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	46300	41500	90	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	50000	46200	92	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	50000	48900	98	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	50000	49900	100	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	50000	48200	96	70	130	

FORM 7E - ORG

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	220071466	Instrument ID:	QQQ2
Analysis Date:	07/29/2020 02:31	Lab File ID:	2200728A_64.d
Analytical Method:	EPA 537 Modified	Analytical Batch:	689002

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
6:2 Fluorotelomer sulfonate (6:2 FTS)	ng/L	9.52	9.20	96	70	130	
8:2 Fluorotelomer sulfonate (8:2 FTS)	ng/L	9.60	8.72	91	70	130	
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	10.0	7.69	77	70	130	
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	10.0	9.76	98	70	130	
Perfluorobutanoic acid (PFBA)	ng/L	10.0	9.20	92	70	130	
Perfluorobutanesulfonic acid (PFBS)	ng/L	8.88	7.45	84	70	130	
Perfluorodecanoic acid (PFDA)	ng/L	10.0	8.96	89	70	130	
Perfluorododecanoic acid (PFDoA)	ng/L	10.0	11.3	113	70	130	
Perfluoroheptanoic acid (PFHpA)	ng/L	10.0	7.64	76	70	130	
Perfluorohexanoic acid (PFHxA)	ng/L	10.0	8.08	81	70	130	
Perfluorohexanesulfonic acid (PFHxS)	ng/L	9.12	8.24	90	70	130	
Perfluorononanoic acid (PFNA)	ng/L	10.0	8.16	82	70	130	
Perfluorooctanoic acid (PFOA)	ng/L	10.0	8.16	82	70	130	
Perfluorooctanesulfonic acid (PFOS)	ng/L	9.28	7.35	79	70	130	
Perfluoropentanoic acid (PFPeA)	ng/L	10.0	7.70	77	70	130	
Perfluorotetradecanoic acid (PFTeDA)	ng/L	10.0	10.4	104	70	130	
Perfluorotridecanoic acid (PFTrDA)	ng/L	10.0	11.2	112	70	130	
Perfluoroundecanoic acid (PFUdA)	ng/L	10.0	9.20	92	70	130	

FORM 7S - ORG

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071035 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
HAASF-FRB-01	22007103501	92		97		102		113		118		124		120	
HAASF-ERB-01	22007103502	108		107		105		121		125		126		127	
HAASF-ERB-02	22007103503	104		105		69		124		120		124		131	
AOI01-01-SB-00-02	22007103504	101		69		74		102		100		107		110	
AOI01-01-SB-25-27	22007103505	53						80		78		87		86	
AOI01-01-SB-25-27RE	22007103505			94		73									
AOI01-01-SB-55-57	22007103506	110		104		33	*	121		117		121		135	
AOI01-01-SB-55-57RE	22007103506														
AOI01-01-SB-55-57-MS	22007103507	102		56		3	*	110		103		105		102	
AOI01-01-SB-55-57-MSRE	22007103507														

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
HAASF-FRB-01	22007103501	121		120		117		125		113		120		117	
HAASF-ERB-01	22007103502	131		128		118		134		123		131		126	
HAASF-ERB-02	22007103503	131		128		125		136		113		137		125	
AOI01-01-SB-00-02	22007103504	112		112		117		112		94		111		109	
AOI01-01-SB-25-27	22007103505	82		90		74		82		74		82		81	
AOI01-01-SB-25-27RE	22007103505														
AOI01-01-SB-55-57	22007103506	125		136		146		145		135		139		125	
AOI01-01-SB-55-57RE	22007103506														
AOI01-01-SB-55-57-MS	22007103507	111		89		66		113		90		108		105	
AOI01-01-SB-55-57-MSRE	22007103507														

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#
HAASF-FRB-01	22007103501	115		112		125	
HAASF-ERB-01	22007103502	112		111		122	
HAASF-ERB-02	22007103503	102		109		134	
AOI01-01-SB-00-02	22007103504	108		111		117	
AOI01-01-SB-25-27	22007103505						
AOI01-01-SB-25-27RE	22007103505	108		95		119	
AOI01-01-SB-55-57	22007103506			137			
AOI01-01-SB-55-57RE	22007103506	91				85	
AOI01-01-SB-55-57-MS	22007103507			70			
AOI01-01-SB-55-57-MSRE	22007103507	75				78	

EIS1: M2 6:2 FTS EIS2: M2 8:2 FTS EIS3: M2PFTeDA EIS4: M3PFBS

EIS5: M3PFHxS EIS6: M4PFHpA EIS7: M5PFHxA EIS8: M5PFPeA

EIS9: M6PFDA EIS10: M7PFUdA EIS11: M8PFOA EIS12: M8PFOS

EIS13: M9PFNA EIS14: MPFBA EIS15: MPFDoA EIS16: d3-NMeFOSAA

EIS17: d5-NEtFOSAA

FORM 8E - ORG

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EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071035 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
AOI01-01-SB-55-57-MSD	22007103508	94		59		1	*	108		99		108		114	
AOI01-01-SB-55-57-MSDRE	22007103508														
AOI01-02-SB-00-02	22007103509	90		92		107		110		106		109		110	
AOI01-02-SB-28-30	22007103510	88		68		106		110		111		108		106	
AOI01-02-SB-55-27	22007103511	89		79		7	*	115		100		114		111	
AOI01-03-SB-00-02	22007103512	94		82		100		106		110		111		109	
AOI01-03-SB-20-22	22007103513	94		95		103		113		119		121		113	
AOI01-03-SB-44-46	22007103517	79		89				100		96		110		99	
AOI01-03-SB-44-46RE	22007103517					67									
AOI01-04-SB-00-02	22007103518	87		81		89		105		105		112		112	

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
AOI01-01-SB-55-57-MSD	22007103508	112		85		61		107		84		110		110	
AOI01-01-SB-55-57-MSDRE	22007103508														
AOI01-02-SB-00-02	22007103509	114		114		134		121		103		109		106	
AOI01-02-SB-28-30	22007103510	110		124		120		128		91		122		115	
AOI01-02-SB-55-27	22007103511	110		101		96		119		83		101		112	
AOI01-03-SB-00-02	22007103512	113		113		127		127		97		123		111	
AOI01-03-SB-20-22	22007103513	118		122		128		123		111		107		111	
AOI01-03-SB-44-46	22007103517	108		114		103		110		94		107		104	
AOI01-03-SB-44-46RE	22007103517														
AOI01-04-SB-00-02	22007103518	118		118		123		124		102		121		112	

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#
AOI01-01-SB-55-57-MSD	22007103508			55			
AOI01-01-SB-55-57-MSDRE	22007103508	90				85	
AOI01-02-SB-00-02	22007103509	120		105		119	
AOI01-02-SB-28-30	22007103510	94		101		107	
AOI01-02-SB-55-27	22007103511	56		78		89	
AOI01-03-SB-00-02	22007103512	112		106		121	
AOI01-03-SB-20-22	22007103513	110		105		108	
AOI01-03-SB-44-46	22007103517	97		83		101	
AOI01-03-SB-44-46RE	22007103517						
AOI01-04-SB-00-02	22007103518	106		108		100	

EIS1: M2 6:2 FTS
EIS2: M2 8:2 FTS
EIS3: M2PFTeDA
EIS4: M3PFBS
EIS5: M3PFHxS
EIS6: M4PFHpA
EIS7: M5PFHxA
EIS8: M5PFPeA
EIS9: M6PFDA
EIS10: M7PFUdA
EIS11: M8PFOA
EIS12: M8PFOS
EIS13: M9PFNA
EIS14: MPFBA
EIS15: MPFDoA
EIS16: d3-NMeFOSAA
EIS17: d5-NEtFOSAA

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071035 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
AOI01-04-SB-20-22	22007103519	85		71		102		101		108		100		120	
AOI01-04-SB-39-41	22007103520	82		82		1	*	107		114		93		102	
AOI01-04-SB-39-41RE	22007103520														
AOI01-05-SB-00-02	22007103521	92		82		111		113		118		117		113	
AOI01-05-SB-25-27	22007103522	84		69		100		105		108		119		106	
AOI01-05-SB-50-52	22007103523	87		75		56		119		107		121		106	
AOI01-05-SB-50-52-D	22007103524	85		84		42	*	121		108		116		112	
AOI01-06-SB-00-02	22007103525	80		84		106		110		111		105		119	
AOI01-06-SB-00-02-D	22007103526	102		89		68		119		105		114		119	
AOI01-07-SB-00-02	22007103527	106		93				96		89		114		109	

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
AOI01-04-SB-20-22	22007103519	110		120		129		134		108		119		108	
AOI01-04-SB-39-41	22007103520	112		86		64		109		76		97		105	
AOI01-04-SB-39-41RE	22007103520														
AOI01-05-SB-00-02	22007103521	110		120		130		122		104		112		112	
AOI01-05-SB-25-27	22007103522	112		120		128		114		107		126		108	
AOI01-05-SB-50-52	22007103523	114		101		113		131		104		113		114	
AOI01-05-SB-50-52-D	22007103524	117		123		107		130		89		115		111	
AOI01-06-SB-00-02	22007103525	112		119		130		120		107		123		108	
AOI01-06-SB-00-02-D	22007103526	112		118		126		123		103		114		106	
AOI01-07-SB-00-02	22007103527	108		103		107		102		74		95		103	

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#
AOI01-04-SB-20-22	22007103519	116		90		106	
AOI01-04-SB-39-41	22007103520			55			
AOI01-04-SB-39-41RE	22007103520	79				99	
AOI01-05-SB-00-02	22007103521	106		105		99	
AOI01-05-SB-25-27	22007103522	114		101		112	
AOI01-05-SB-50-52	22007103523	92		99		100	
AOI01-05-SB-50-52-D	22007103524	104		95		113	
AOI01-06-SB-00-02	22007103525	105		88		105	
AOI01-06-SB-00-02-D	22007103526	105		100		103	
AOI01-07-SB-00-02	22007103527	107		73		74	

EIS1: M2 6:2 FTS
EIS2: M2 8:2 FTS
EIS3: M2PFTeDA
EIS4: M3PFBS
EIS5: M3PFHxS
EIS6: M4PFHpA
EIS7: M5PFHxA
EIS8: M5PFPeA
EIS9: M6PFDA
EIS10: M7PFUdA
EIS11: M8PFOA
EIS12: M8PFOS
EIS13: M9PFNA
EIS14: MPFBA
EIS15: MPFDoA
EIS16: d3-NMeFOSAA
EIS17: d5-NEtFOSAA

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071035 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
AOI01-07-SB-00-02RE	22007103527					76									
MB2060314	2060314	83		90		110		106		114		101		111	
LCS2060315	2060315	92		80		90		111		104		121		105	
LCSD2060316	2060316	75		89		63		108		103		110		105	
MB2060317	2060317	97		99				98		91		116		108	
LCS2060318	2060318	94		111				97		96		108		100	
LCSD2060319	2060319	102		109				111		92		118		114	
MB2061702	2061702	103		109		104		122		118		122		122	
LCS2061703	2061703	102		101		104		118		121		116		131	
LCSD2061704	2061704	100		99		107		117		116		129		130	

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
AOI01-07-SB-00-02RE	22007103527														
MB2060314	2060314	112		112		120		125		114		120		109	
LCS2060315	2060315	115		115		121		123		101		118		109	
LCSD2060316	2060316	101		131		136		129		93		110		106	
MB2060317	2060317	108		105		111		104		71		100		105	
LCS2060318	2060318	102		99		112		96		74		100		103	
LCSD2060319	2060319	119		116		122		108		89		117		112	
MB2061702	2061702	128		131		124		127		116		134		123	
LCS2061703	2061703	121		120		121		127		113		127		123	
LCSD2061704	2061704	124		128		114		130		122		129		123	

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#
AOI01-07-SB-00-02RE	22007103527						
MB2060314	2060314	128		105		112	
LCS2060315	2060315	118		97		104	
LCSD2060316	2060316	96		88		108	
MB2060317	2060317	108		109		108	
LCS2060318	2060318	101		88		88	
LCSD2060319	2060319	112		111		110	
MB2061702	2061702	117		119		124	
LCS2061703	2061703	114		107		126	
LCSD2061704	2061704	117		115		124	

EIS1: M2 6:2 FTS EIS2: M2 8:2 FTS EIS3: M2PFTeDA EIS4: M3PFBS

EIS5: M3PFHxS EIS6: M4PFHpA EIS7: M5PFHxA EIS8: M5PFPeA

EIS9: M6PFDA EIS10: M7PFUdA EIS11: M8PFOA EIS12: M8PFOS

EIS13: M9PFNA EIS14: MPFBA EIS15: MPFDoA EIS16: d3-NMeFOSAA

FORM 8E - ORG

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071035 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
MB2062569	2062569			94		95									
LCS2062570	2062570			102		100									
LCSD2062571	2062571			85		78									

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
MB2062569	2062569														
LCS2062570	2062570														
LCSD2062571	2062571														

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#								
MB2062569	2062569	101		105		101									
LCS2062570	2062570	109		101		111									
LCSD2062571	2062571	89		82		90									

EIS1: M2 6:2 FTS EIS2: M2 8:2 FTS EIS3: M2PFTeDA EIS4: M3PFBS

EIS5: M3PFHxS EIS6: M4PFHpA EIS7: M5PFHxA EIS8: M5PFPeA

EIS9: M6PFDA EIS10: M7PFUdA EIS11: M8PFOA EIS12: M8PFOS

EIS13: M9PFNA EIS14: MPFBA EIS15: MPFDoA EIS16: d3-NMeFOSAA

EIS17: d5-NEtFOSAA

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071466 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
HAASF-MW001	22007146601	85		87		90		103		107		109		105	
HAASF-MW002	22007146602	94		90		81		106		110		109		108	
HAASF-MW002-MS	22007146603	101		87		82		113		114		113		108	
HAASF-MW002-MSD	22007146604	88		92		92		113		119		119		121	
HAASF-MW003	22007146605	82		81		77		107		108		106		107	
HAASF-MW004	22007146606	87		80		66		115		121		117		115	
HAASF-MW005	22007146607	104		109		98		116		118		119		113	
HAASF-MW005-D	22007146608	78		99		68		105		113		110		103	
HAASF-ERB-03	22007146609	88		86		84		106		112		112		106	
HAASF-ERB-04	22007146610	87		82		83		107		113		113		112	

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
HAASF-MW001	22007146601	102		100		92		108		102		100		100	
HAASF-MW002	22007146602	110		99		107		104		106		103		105	
HAASF-MW002-MS	22007146603	111		111		101		109		111		108		106	
HAASF-MW002-MSD	22007146604	115		104		109		118		115		118		110	
HAASF-MW003	22007146605	106		97		100		108		98		98		106	
HAASF-MW004	22007146606	111		106		106		117		107		120		113	
HAASF-MW005	22007146607	107		111		112		121		117		120		112	
HAASF-MW005-D	22007146608	105		103		98		103		98		102		111	
HAASF-ERB-03	22007146609	113		108		106		104		108		111		110	
HAASF-ERB-04	22007146610	108		110		109		106		112		109		110	

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#
HAASF-MW001	22007146601	90		85		86	
HAASF-MW002	22007146602	103		90		99	
HAASF-MW002-MS	22007146603	94		94		103	
HAASF-MW002-MSD	22007146604	96		94		94	
HAASF-MW003	22007146605	97		98		107	
HAASF-MW004	22007146606	90		98		101	
HAASF-MW005	22007146607	104		114		114	
HAASF-MW005-D	22007146608	95		96		92	
HAASF-ERB-03	22007146609	92		98		103	
HAASF-ERB-04	22007146610	101		102		99	

EIS1: M2 6:2 FTS EIS2: M2 8:2 FTS EIS3: M2PFTeDA EIS4: M3PFBS

EIS5: M3PFHxS EIS6: M4PFHpA EIS7: M5PFHxA EIS8: M5PFPeA

EIS9: M6PFDA EIS10: M7PFUdA EIS11: M8PFOA EIS12: M8PFOS

EIS13: M9PFNA EIS14: MPFBA EIS15: MPFDoA EIS16: d3-NMeFOSAA

EIS17: d5-NEtFOSAA

FORM 8E - ORG

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071466 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
HAASF-MW001 (RE)	22007146611														
HAASF-MW002 (RE)	22007146612														
HAASF-MW002-MS (RE)	22007146613														
HAASF-MW002-MSD (RE)	22007146614														
HAASF-MW003 (RE)	22007146615														
HAASF-MW004 (RE)	22007146616														
HAASF-MW005 (RE)	22007146617														
HAASF-MW005-D (RE)	22007146618														
HAASF-ERB-03 (RE)	22007146619														
HAASF-ERB-04 (RE)	22007146620														

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
HAASF-MW001 (RE)	22007146611														
HAASF-MW002 (RE)	22007146612														
HAASF-MW002-MS (RE)	22007146613														
HAASF-MW002-MSD (RE)	22007146614														
HAASF-MW003 (RE)	22007146615														
HAASF-MW004 (RE)	22007146616														
HAASF-MW005 (RE)	22007146617														
HAASF-MW005-D (RE)	22007146618														
HAASF-ERB-03 (RE)	22007146619														
HAASF-ERB-04 (RE)	22007146620														

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#
HAASF-MW001 (RE)	22007146611	92					
HAASF-MW002 (RE)	22007146612	87					
HAASF-MW002-MS (RE)	22007146613	90					
HAASF-MW002-MSD (RE)	22007146614	84					
HAASF-MW003 (RE)	22007146615	89					
HAASF-MW004 (RE)	22007146616	76					
HAASF-MW005 (RE)	22007146617	85					
HAASF-MW005-D (RE)	22007146618	85					
HAASF-ERB-03 (RE)	22007146619	73					
HAASF-ERB-04 (RE)	22007146620	62					

EIS1: M2 6:2 FTS
EIS2: M2 8:2 FTS
EIS3: M2PFTeDA
EIS4: M3PFBS
EIS5: M3PFHxS
EIS6: M4PFHpA
EIS7: M5PFHxA
EIS8: M5PFPeA
EIS9: M6PFDA
EIS10: M7PFUdA
EIS11: M8PFOA
EIS12: M8PFOS
EIS13: M9PFNA
EIS14: MPFBA
EIS15: MPFDoA
EIS16: d3-NMeFOSAA
EIS17: d5-NEtFOSAA

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 220071466 Recovery Limits: 50 - 150

Client Sample ID	GCAL SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
MB2062133	2062133	92				92		118		115		125		119	
MB2062133RE	2062133			127											
LCS2062134	2062134	96				46	*	112		111		107		108	
LCS2062134RE	2062134			107											
LCSD2062135	2062135	92				58		105		110		111		108	
LCSD2062135RE	2062135			105											
MB2065745	2065745														
LCS2065746	2065746														
LCSD2065747	2065747														

Client Sample ID	GCAL SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
MB2062133	2062133	116		125		113		120		115		113		120	
MB2062133RE	2062133														
LCS2062134	2062134	109		100		108		111		101		107		109	
LCS2062134RE	2062134														
LCSD2062135	2062135	112		99		104		108		110		112		113	
LCSD2062135RE	2062135														
MB2065745	2065745														
LCS2065746	2065746														
LCSD2065747	2065747														

Client Sample ID	GCAL SampleID	EIS15	#	EIS16	#	EIS17	#
MB2062133	2062133	107		104		97	
MB2062133RE	2062133	107					
LCS2062134	2062134	106		92		94	
LCS2062134RE	2062134	94					
LCSD2062135	2062135	95		89		102	
LCSD2062135RE	2062135	98					
MB2065745	2065745	100					
LCS2065746	2065746	88					
LCSD2065747	2065747	85					

EIS1: M2 6:2 FTS
EIS2: M2 8:2 FTS
EIS3: M2PFTeDA
EIS4: M3PFBS
EIS5: M3PFHxS
EIS6: M4PFHpA
EIS7: M5PFHxA
EIS8: M5PFPeA
EIS9: M6PFDA
EIS10: M7PFUdA
EIS11: M8PFOA
EIS12: M8PFOS
EIS13: M9PFNA
EIS14: MPFBA
EIS15: MPFDoA
EIS16: d3-NMeFOSAA
EIS17: d5-NEtFOSAA

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	220071035	Method Blank ID:	2060317
Matrix:	Solid	Instrument ID:	QQQ1
Sample Amt:	5 g	Lab File ID:	2200715A_25.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/11/20	Analysis Date:	07/15/20 Time: 2149
Prep Batch:	687724	Analytical Batch:	688129
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2060318	2060318	2200715A_26.d	07/15/20	2201
2.	LCSD2060319	2060319	2200715A_27.d	07/15/20	2213
3.	AOI01-07-SB-00-02	22007103527	2200715A_28.d	07/15/20	2225
4.	LCS2060318RE	2060318RE	2200716A_21.d	07/16/20	1811
5.	LCSD2060319RE	2060319RE	2200716A_22.d	07/16/20	1823

LCS/LCSD RE are not applicble to samples in this report

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	MB2060317
Collect Date:	NA Time: NA	GCAL Sample ID:	2060317
Matrix:	Solid % Moisture: NA	Instrument ID:	QQQ1
Sample Amt:	5 g	Lab File ID:	2200715A_25.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/11/20	Analysis Date:	07/15/20 Time: 2149
Prep Batch:	687724	Analytical Batch:	688129
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.400	U	0.170	0.400	1.00
39108-34-4	8:2 Fluorotelomer sulfonate	0.400	U	0.260	0.400	1.00
2991-50-6	NEtFOSAA	0.400	U	0.190	0.400	1.00
2355-31-9	NMeFOSAA	0.400	U	0.280	0.400	1.00
375-73-5	Perfluorobutanesulfonic acid	0.400	U	0.120	0.400	1.00
375-22-4	Perfluorobutanoic acid	0.400	U	0.130	0.400	1.00
335-76-2	Perfluorodecanoic acid	0.400	U	0.120	0.400	1.00
307-55-1	Perfluorododecanoic acid	0.400	U	0.200	0.400	1.00
375-85-9	Perfluoroheptanoic acid	0.400	U	0.130	0.400	1.00
355-46-4	Perfluorohexanesulfonic acid	0.400	U	0.140	0.400	1.00
307-24-4	Perfluorohexanoic acid	0.400	U	0.150	0.400	1.00
375-95-1	Perfluorononanoic acid	0.400	U	0.090	0.400	1.00
1763-23-1	Perfluorooctanesulfonic acid	0.400	U	0.180	0.400	1.00
335-67-1	Perfluorooctanoic acid	0.400	U	0.150	0.400	1.00
2706-90-3	Perfluoropentanoic acid	0.400	U	0.150	0.400	1.00
72629-94-8	Perfluorotridecanoic acid	0.400	U	0.220	0.400	1.00
2058-94-8	Perfluoroundecanoic acid	0.400	U	0.140	0.400	1.00

FORM I SV-1

3D

SOIL SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071035

Prep Method: EPA 537 Mod Prep

Prep Batch: 687724

Analytical Method: EPA 537 Modified

Analytical Batch: 688129

GCAL QC ID: 2060318

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
6:2 Fluorotelomer sulfonate	ug/kg	1.9	0	2.31	122		70 - 130
8:2 Fluorotelomer sulfonate	ug/kg	1.92	0	2	104		70 - 130
NEtFOSAA	ug/kg	2	0	1.94	97		70 - 130
NMeFOSAA	ug/kg	2	0	2.11	106		70 - 130
Perfluorobutanesulfonic acid	ug/kg	1.77	0	1.9	107		70 - 130
Perfluorobutanoic acid	ug/kg	2	0	1.86	93		70 - 130
Perfluorodecanoic acid	ug/kg	2	0	2.23	111		70 - 130
Perfluorododecanoic acid	ug/kg	2	0	2.06	103		70 - 130
Perfluoroheptanoic acid	ug/kg	2	0	1.92	96		70 - 130
Perfluorohexanesulfonic acid	ug/kg	1.82	0	1.54	84		70 - 130
Perfluorohexanoic acid	ug/kg	2	0	2.07	103		70 - 130
Perfluorononanoic acid	ug/kg	2	0	1.93	96		70 - 130
Perfluorooctanesulfonic acid	ug/kg	1.85	0	1.98	107		70 - 130
Perfluorooctanoic acid	ug/kg	2	0	2.12	106		70 - 130
Perfluoropentanoic acid	ug/kg	2	0	1.91	96		70 - 130
Perfluorotridecanoic acid	ug/kg	2	0	1.62	81		70 - 130
Perfluoroundecanoic acid	ug/kg	2	0	1.98	99		70 - 130

RPD : 0 out of 17 outside limits

Spike Recovery: 1 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-2

3D

SOIL SEMIVOLATILE LCS/LCSD RECOVERY

Report No:	220071035		
Prep Method:	EPA 537 Mod Prep	Prep Batch:	687724
Analytical Method:	EPA 537 Modified	Analytical Batch:	688129

GCAL QC ID: 2060319

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	*#*	*% RPD*	*#*	*QC LIMITS REC*	*QC LIMITS RPD*
6:2 Fluorotelomer sulfonate	ug/kg	1.9	2.5	132	*	8		70 - 130	0 - 30
8:2 Fluorotelomer sulfonate	ug/kg	1.92	2.22	116		10		70 - 130	0 - 30
NEtFOSAA	ug/kg	2	1.94	97		.1		70 - 130	0 - 30
NMeFOSAA	ug/kg	2	1.98	99		7		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ug/kg	1.77	1.74	99		8		70 - 130	0 - 30
Perfluorobutanoic acid	ug/kg	2	1.85	93		.5		70 - 130	0 - 30
Perfluorodecanoic acid	ug/kg	2	2.01	100		10		70 - 130	0 - 30
Perfluorododecanoic acid	ug/kg	2	2.01	100		3		70 - 130	0 - 30
Perfluoroheptanoic acid	ug/kg	2	1.89	95		2		70 - 130	0 - 30
Perfluorohexanesulfonic acid	ug/kg	1.82	1.84	101		18		70 - 130	0 - 30
Perfluorohexanoic acid	ug/kg	2	1.98	99		5		70 - 130	0 - 30
Perfluorononanoic acid	ug/kg	2	1.86	93		4		70 - 130	0 - 30
Perfluorooctanesulfonic acid	ug/kg	1.85	1.72	93		14		70 - 130	0 - 30
Perfluorooctanoic acid	ug/kg	2	2	100		6		70 - 130	0 - 30
Perfluoropentanoic acid	ug/kg	2	1.79	89		7		70 - 130	0 - 30
Perfluorotridecanoic acid	ug/kg	2	1.89	95		16		70 - 130	0 - 30
Perfluoroundecanoic acid	ug/kg	2	1.93	97		2		70 - 130	0 - 30

RPD : 0 out of 17 outside limits

Spike Recovery: 1 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-2

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	220071035	Method Blank ID:	2060314
Matrix:	Solid	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200715A_43.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/15/20 Time: 2337
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2060315	2060315	2200715A_44.d	07/15/20	2350
2.	LCSD2060316	2060316	2200715A_45.d	07/16/20	0002
3.	AOI01-01-SB-00-02	22007103504	2200715A_46.d	07/16/20	0015
4.	AOI01-01-SB-25-27	22007103505	2200715A_47.d	07/16/20	0028
5.	AOI01-01-SB-55-57	22007103506	2200715A_48.d	07/16/20	0040
6.	AOI01-01-SB-55-57-MS	22007103507	2200715A_49.d	07/16/20	0053
7.	AOI01-01-SB-55-57-MSD	22007103508	2200715A_50.d	07/16/20	0106
8.	AOI01-02-SB-00-02	22007103509	2200715A_51.d	07/16/20	0118
9.	AOI01-02-SB-28-30	22007103510	2200715A_52.d	07/16/20	0131
10.	AOI01-02-SB-55-27	22007103511	2200715A_53.d	07/16/20	0143
11.	AOI01-03-SB-00-02	22007103512	2200715A_54.d	07/16/20	0156
12.	AOI01-03-SB-20-22	22007103513	2200715A_55.d	07/16/20	0209
13.	AOI01-03-SB-44-46	22007103517	2200715A_56.d	07/16/20	0221
14.	AOI01-04-SB-00-02	22007103518	2200715A_57.d	07/16/20	0234
15.	AOI01-04-SB-20-22	22007103519	2200715A_59.d	07/16/20	0259
16.	AOI01-04-SB-39-41	22007103520	2200715A_60.d	07/16/20	0312
17.	AOI01-05-SB-00-02	22007103521	2200715A_61.d	07/16/20	0324
18.	AOI01-05-SB-25-27	22007103522	2200715A_62.d	07/16/20	0337
19.	AOI01-05-SB-50-52	22007103523	2200715A_63.d	07/16/20	0350
20.	AOI01-05-SB-50-52-D	22007103524	2200715A_64.d	07/16/20	0402
21.	AOI01-06-SB-00-02	22007103525	2200715A_65.d	07/16/20	0415
22.	AOI01-06-SB-00-02-D	22007103526	2200715A_66.d	07/16/20	0428

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	MB2060314
Collect Date:	NA Time: NA	GCAL Sample ID:	2060314
Matrix:	Solid % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200715A_43.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/12/20	Analysis Date:	07/15/20 Time: 2337
Prep Batch:	687723	Analytical Batch:	688138
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	0.400	U	0.170	0.400	1.00
39108-34-4	8:2 Fluorotelomer sulfonate	0.400	U	0.260	0.400	1.00
2991-50-6	NEtFOSAA	0.400	U	0.190	0.400	1.00
2355-31-9	NMeFOSAA	0.400	U	0.280	0.400	1.00
375-73-5	Perfluorobutanesulfonic acid	0.400	U	0.120	0.400	1.00
375-22-4	Perfluorobutanoic acid	0.400	U	0.130	0.400	1.00
335-76-2	Perfluorodecanoic acid	0.400	U	0.120	0.400	1.00
307-55-1	Perfluorododecanoic acid	0.400	U	0.200	0.400	1.00
375-85-9	Perfluoroheptanoic acid	0.400	U	0.130	0.400	1.00
355-46-4	Perfluorohexanesulfonic acid	0.400	U	0.140	0.400	1.00
307-24-4	Perfluorohexanoic acid	0.400	U	0.150	0.400	1.00
375-95-1	Perfluorononanoic acid	0.400	U	0.090	0.400	1.00
1763-23-1	Perfluorooctanesulfonic acid	0.400	U	0.180	0.400	1.00
335-67-1	Perfluorooctanoic acid	0.400	U	0.150	0.400	1.00
2706-90-3	Perfluoropentanoic acid	0.400	U	0.150	0.400	1.00
376-06-7	Perfluorotetradecanoic acid	0.400	U	0.160	0.400	1.00
72629-94-8	Perfluorotridecanoic acid	0.400	U	0.220	0.400	1.00
2058-94-8	Perfluoroundecanoic acid	0.400	U	0.140	0.400	1.00

FORM I SV-1

3D

SOIL SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071035

Prep Method: EPA 537 Mod Prep

Prep Batch: 687723

Analytical Method: EPA 537 Modified

Analytical Batch: 688138

GCAL QC ID: 2060315

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
6:2 Fluorotelomer sulfonate	ug/kg	1.9	0	1.69	89		70 - 130
8:2 Fluorotelomer sulfonate	ug/kg	1.92	0	1.89	99		70 - 130
NEtFOSAA	ug/kg	2	0	2.03	101		70 - 130
NMeFOSAA	ug/kg	2	0	2.08	104		70 - 130
Perfluorobutanesulfonic acid	ug/kg	1.77	0	1.7	96		70 - 130
Perfluorobutanoic acid	ug/kg	2	0	1.92	96		70 - 130
Perfluorodecanoic acid	ug/kg	2	0	1.99	99		70 - 130
Perfluorododecanoic acid	ug/kg	2	0	1.71	85		70 - 130
Perfluoroheptanoic acid	ug/kg	2	0	1.87	93		70 - 130
Perfluorohexanesulfonic acid	ug/kg	1.82	0	1.74	95		70 - 130
Perfluorohexanoic acid	ug/kg	2	0	2.05	102		70 - 130
Perfluorononanoic acid	ug/kg	2	0	2.22	111		70 - 130
Perfluorooctanesulfonic acid	ug/kg	1.85	0	1.83	99		70 - 130
Perfluorooctanoic acid	ug/kg	2	0	1.89	94		70 - 130
Perfluoropentanoic acid	ug/kg	2	0	1.82	91		70 - 130
Perfluorotetradecanoic acid	ug/kg	2	0	2	100		70 - 130
Perfluorotridecanoic acid	ug/kg	2	0	1.64	82		70 - 130
Perfluoroundecanoic acid	ug/kg	2	0	2.19	110		70 - 130

RPD : 0 out of 18 outside limits

Spike Recovery: 0 out of 36 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-2

3D

SOIL SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071035

Prep Method: EPA 537 Mod Prep | Prep Batch: 687723

Analytical Method: EPA 537 Modified | Analytical Batch: 688138

GCAL QC ID: 2060316

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*QC LIMITS RPD*
6:2 Fluorotelomer sulfonate	ug/kg	1.9	2.16	114		24		70 - 130	0 - 30
8:2 Fluorotelomer sulfonate	ug/kg	1.92	1.81	94		5		70 - 130	0 - 30
NEtFOSAA	ug/kg	2	1.98	99		2		70 - 130	0 - 30
NMeFOSAA	ug/kg	2	2.16	108		3		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ug/kg	1.77	1.77	100		4		70 - 130	0 - 30
Perfluorobutanoic acid	ug/kg	2	2.02	101		5		70 - 130	0 - 30
Perfluorodecanoic acid	ug/kg	2	1.57	79		23		70 - 130	0 - 30
Perfluorododecanoic acid	ug/kg	2	2.18	109		24		70 - 130	0 - 30
Perfluoroheptanoic acid	ug/kg	2	1.92	96		2		70 - 130	0 - 30
Perfluorohexanesulfonic acid	ug/kg	1.82	1.79	98		3		70 - 130	0 - 30
Perfluorohexanoic acid	ug/kg	2	2.05	103		.3		70 - 130	0 - 30
Perfluorononanoic acid	ug/kg	2	2.26	113		2		70 - 130	0 - 30
Perfluorooctanesulfonic acid	ug/kg	1.85	1.91	103		4		70 - 130	0 - 30
Perfluorooctanoic acid	ug/kg	2	1.75	87		7		70 - 130	0 - 30
Perfluoropentanoic acid	ug/kg	2	2.06	103		12		70 - 130	0 - 30
Perfluorotetradecanoic acid	ug/kg	2	1.86	93		8		70 - 130	0 - 30
Perfluorotridecanoic acid	ug/kg	2	1.95	98		18		70 - 130	0 - 30
Perfluoroundecanoic acid	ug/kg	2	2.02	101		8		70 - 130	0 - 30

RPD : 0 out of 18 outside limits

Spike Recovery: 0 out of 36 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-2

3D

SOIL SEMIVOLATILE MS/MSD RECOVERY

Report No:	220071035	Parent Sample ID:	AOI01-01-SB-55-57
Prep Method:	EPA 537 Mod Prep	Prep Batch:	687723
Analytical Method:	EPA 537 Modified	Analytical Batch:	688138

GCAL QC ID: 22007103507

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	MS RESULT	MS % REC	#	QC LIMITS
6:2 Fluorotelomer sulfonate	ug/kg	2.6	.00331	1.96	75		70 - 130
8:2 Fluorotelomer sulfonate	ug/kg	2.63	.00411	2.88	109		70 - 130
NMeFOSAA	ug/kg	2.74	.0015	2.31	84		70 - 130
Perfluorobutanesulfonic acid	ug/kg	2.43	.012	2.35	97		70 - 130
Perfluorobutanoic acid	ug/kg	2.74	.022	2.55	92		70 - 130
Perfluorodecanoic acid	ug/kg	2.74	.00643	2.27	83		70 - 130
Perfluoroheptanoic acid	ug/kg	2.74	.00373	2.55	93		70 - 130
Perfluorohexanesulfonic acid	ug/kg	2.5	.000631	2.43	97		70 - 130
Perfluorohexanoic acid	ug/kg	2.74	.025	2.83	102		70 - 130
Perfluorononanoic acid	ug/kg	2.74	.012	2.81	102		70 - 130
Perfluorooctanesulfonic acid	ug/kg	2.53	.0046	2.41	95		70 - 130
Perfluorooctanoic acid	ug/kg	2.74	.018	2.59	93		70 - 130
Perfluoropentanoic acid	ug/kg	2.74	.00969	2.38	86		70 - 130
Perfluorotetradecanoic acid	ug/kg	2.74	.011	2.66	97		70 - 130
Perfluoroundecanoic acid	ug/kg	2.74	.00909	3.37	123		70 - 130

GCAL QC ID: 22007103508

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
6:2 Fluorotelomer sulfonate	ug/kg	2.63	2.31	88		17		70 - 130	0 - 30
8:2 Fluorotelomer sulfonate	ug/kg	2.66	2.91	109		1		70 - 130	0 - 30
NMeFOSAA	ug/kg	2.77	2.43	88		6		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ug/kg	2.46	2.46	99		4		70 - 130	0 - 30
Perfluorobutanoic acid	ug/kg	2.77	2.57	92		1		70 - 130	0 - 30
Perfluorodecanoic acid	ug/kg	2.77	2.39	86		5		70 - 130	0 - 30
Perfluoroheptanoic acid	ug/kg	2.77	2.67	96		5		70 - 130	0 - 30
Perfluorohexanesulfonic acid	ug/kg	2.53	2.39	95		2		70 - 130	0 - 30
Perfluorohexanoic acid	ug/kg	2.77	2.6	93		8		70 - 130	0 - 30
Perfluorononanoic acid	ug/kg	2.77	2.9	104		3		70 - 130	0 - 30
Perfluorooctanesulfonic acid	ug/kg	2.57	2.29	89		5		70 - 130	0 - 30
Perfluorooctanoic acid	ug/kg	2.77	2.84	101		9		70 - 130	0 - 30
Perfluoropentanoic acid	ug/kg	2.77	2.45	88		3		70 - 130	0 - 30
Perfluorotetradecanoic acid	ug/kg	2.77	5.09	183	*	63	*	70 - 130	0 - 30
Perfluoroundecanoic acid	ug/kg	2.77	2.94	105		14		70 - 130	0 - 30

RPD : 1 out of 15 outside limits

Spike Recovery: 1 out of 30 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-2

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	220071035	Method Blank ID:	2062569
Matrix:	Solid	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200721B_27.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/20/20	Analysis Date:	07/21/20 Time: 2145
Prep Batch:	688171	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2062570	2062570	2200721B_28.d	07/21/20	2159
2.	LCSD2062571	2062571	2200721B_29.d	07/21/20	2213
3.	AOI01-01-SB-25-27RE	22007103505RE	2200721B_30.d	07/21/20	2228
4.	AOI01-01-SB-55-57RE	22007103506RE	2200721B_31.d	07/21/20	2242
5.	AOI01-01-SB-55-57-MSRE	22007103507RE	2200721B_32.d	07/21/20	2256
6.	AOI01-01-SB-55-57-MSDRE	22007103508RE	2200721B_33.d	07/21/20	2310
7.	AOI01-03-SB-44-46RE	22007103517RE	2200721B_35.d	07/21/20	2339
8.	AOI01-04-SB-39-41RE	22007103520RE	2200721B_36.d	07/21/20	2353
9.	AOI01-07-SB-00-02RE	22007103527RE	2200721B_38.d	07/22/20	0021

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	MB2062569
Collect Date:	NA Time: NA	GCAL Sample ID:	2062569
Matrix:	Solid % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	5 g	Lab File ID:	2200721B_27.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/20/20	Analysis Date:	07/21/20 Time: 2145
Prep Batch:	688171	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
39108-34-4	8:2 Fluorotelomer sulfonate	0.400	U	0.260	0.400	1.00
2991-50-6	NEtFOSAA	0.400	U	0.190	0.400	1.00
2355-31-9	NMeFOSAA	0.400	U	0.280	0.400	1.00
307-55-1	Perfluorododecanoic acid	0.400	U	0.200	0.400	1.00
376-06-7	Perfluorotetradecanoic acid	0.400	U	0.160	0.400	1.00
72629-94-8	Perfluorotridecanoic acid	0.400	U	0.220	0.400	1.00

FORM I SV-1

3D

SOIL SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071035

Prep Method: EPA 537 Mod Prep

Prep Batch: 688171

Analytical Method: EPA 537 Modified

Analytical Batch: 688374

GCAL QC ID: 2062570

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	*#*	*QC LIMITS*
8:2 Fluorotelomer sulfonate	ug/kg	3.84	0	3.85	100		70 - 130
NEtFOSAA	ug/kg	4	0	3.9	97		70 - 130
NMeFOSAA	ug/kg	4	0	4.56	114		70 - 130
Perfluorododecanoic acid	ug/kg	4	0	4.35	109		70 - 130
Perfluorotetradecanoic acid	ug/kg	4	0	4.38	110		70 - 130
Perfluorotridecanoic acid	ug/kg	4	0	4.22	106		70 - 130

GCAL QC ID: 2062571

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	*#*	*% RPD*	*#*	*QC LIMITS REC*	*QC LIMITS RPD*
8:2 Fluorotelomer sulfonate	ug/kg	3.84	3.91	102		2		70 - 130	0 - 30
NEtFOSAA	ug/kg	4	3.81	95		2		70 - 130	0 - 30
NMeFOSAA	ug/kg	4	4.64	116		2		70 - 130	0 - 30
Perfluorododecanoic acid	ug/kg	4	4.34	109		.1		70 - 130	0 - 30
Perfluorotetradecanoic acid	ug/kg	4	4.74	119		8		70 - 130	0 - 30
Perfluorotridecanoic acid	ug/kg	4	4.54	114		7		70 - 130	0 - 30

RPD : 0 out of 6 outside limits

Spike Recovery: 0 out of 12 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-2

3D

SOIL SEMIVOLATILE MS/MSD RECOVERY

Report No:	220071035	Parent Sample ID:	AOI01-01-SB-55-57RE
Prep Method:	EPA 537 Mod Prep	Prep Batch:	688171
Analytical Method:	EPA 537 Modified	Analytical Batch:	688374

GCAL QC ID: 22007103507

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	MS RESULT	MS % REC	#	QC LIMITS
NEtFOSAA	ug/kg	5.45	.00775	5.06	93		70 - 130
Perfluorododecanoic acid	ug/kg	5.45	.00376	6	110		70 - 130
Perfluorotridecanoic acid	ug/kg	5.45	.00772	3.76	69	*	70 - 130

GCAL QC ID: 22007103508

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
NEtFOSAA	ug/kg	5.57	5.44	98		7		70 - 130	0 - 30
Perfluorododecanoic acid	ug/kg	5.57	5.58	100		7		70 - 130	0 - 30
Perfluorotridecanoic acid	ug/kg	5.57	4.87	87		26		70 - 130	0 - 30

RPD : 0 out of 3 outside limits

Spike Recovery: 1 out of 6 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-2

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	220071035	Method Blank ID:	2061702
Matrix:	Water	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200721B_65.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/18/20	Analysis Date:	07/22/20 Time: 0645
Prep Batch:	687999	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2061703	2061703	2200721B_66.d	07/22/20	0659
2.	LCSD2061704	2061704	2200721B_67.d	07/22/20	0713
3.	HAASF-FRB-01	22007103501	2200721B_68.d	07/22/20	0727
4.	HAASF-ERB-01	22007103502	2200721B_69.d	07/22/20	0741
5.	HAASF-ERB-02	22007103503	2200721B_70.d	07/22/20	0756
6.	LCS2061703RE	2061703RE	2200728B_16.d	07/28/20	2004
7.	LCSD2061704RE	2061704RE	2200728B_17.d	07/28/20	2018

LCS/LCSD RE are not applicble to samples in this report

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071035	Client Sample ID:	MB2061702
Collect Date:	NA Time: NA	GCAL Sample ID:	2061702
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200721B_65.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/18/20	Analysis Date:	07/22/20 Time: 0645
Prep Batch:	687999	Analytical Batch:	688374
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	4.00	U	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.00	U	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071035

Prep Method: EPA 537 Mod Prep

Prep Batch: 687999

Analytical Method: EPA 537 Modified

Analytical Batch: 688374

GCAL QC ID: 2061703

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	*#*	*QC LIMITS*
6:2 Fluorotelomer sulfonate	ng/L	76	0	71.1	94		70 - 130
8:2 Fluorotelomer sulfonate	ng/L	76.8	0	66.2	86		70 - 130
NEtFOSAA	ng/L	80	0	64.1	80		70 - 130
NMeFOSAA	ng/L	80	0	84.6	106		70 - 130
Perfluorobutanesulfonic acid	ng/L	70.8	0	60.7	86		70 - 130
Perfluorobutanoic acid	ng/L	80	0	69.4	87		70 - 130
Perfluorodecanoic acid	ng/L	80	0	79.4	99		70 - 130
Perfluorododecanoic acid	ng/L	80	0	69.2	87		70 - 130
Perfluoroheptanoic acid	ng/L	80	0	77.1	96		70 - 130
Perfluorohexanesulfonic acid	ng/L	73	0	60.1	82		70 - 130
Perfluorohexanoic acid	ng/L	80	0	63.8	80		70 - 130
Perfluorononanoic acid	ng/L	80	0	65	81		70 - 130
Perfluorooctanesulfonic acid	ng/L	74	0	63	85		70 - 130
Perfluorooctanoic acid	ng/L	80	0	69.8	87		70 - 130
Perfluoropentanoic acid	ng/L	80	0	68.2	85		70 - 130
Perfluorotetradecanoic acid	ng/L	80	0	75.7	95		70 - 130
Perfluorotridecanoic acid	ng/L	80	0	65.4	82		70 - 130
Perfluoroundecanoic acid	ng/L	80	0	66.5	83		70 - 130

RPD : 0 out of 18 outside limits

Spike Recovery: 0 out of 36 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071035

Prep Method: EPA 537 Mod Prep

Prep Batch: 687999

Analytical Method: EPA 537 Modified

Analytical Batch: 688374

GCAL QC ID: 2061704

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*QC LIMITS RPD*
6:2 Fluorotelomer sulfonate	ng/L	76	70.7	93		.5		70 - 130	0 - 30
8:2 Fluorotelomer sulfonate	ng/L	76.8	67.7	88		2		70 - 130	0 - 30
NEtFOSAA	ng/L	80	67.6	85		5		70 - 130	0 - 30
NMeFOSAA	ng/L	80	79.1	99		7		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ng/L	70.8	55.2	78		10		70 - 130	0 - 30
Perfluorobutanoic acid	ng/L	80	67.6	85		3		70 - 130	0 - 30
Perfluorodecanoic acid	ng/L	80	73.4	92		8		70 - 130	0 - 30
Perfluorododecanoic acid	ng/L	80	67.7	85		2		70 - 130	0 - 30
Perfluoroheptanoic acid	ng/L	80	66.6	83		15		70 - 130	0 - 30
Perfluorohexanesulfonic acid	ng/L	73	60.6	83		.8		70 - 130	0 - 30
Perfluorohexanoic acid	ng/L	80	65.4	82		2		70 - 130	0 - 30
Perfluorononanoic acid	ng/L	80	65.6	82		1		70 - 130	0 - 30
Perfluorooctanesulfonic acid	ng/L	74	56.7	77		10		70 - 130	0 - 30
Perfluorooctanoic acid	ng/L	80	66.7	83		5		70 - 130	0 - 30
Perfluoropentanoic acid	ng/L	80	65.4	82		4		70 - 130	0 - 30
Perfluorotetradecanoic acid	ng/L	80	75.1	94		.7		70 - 130	0 - 30
Perfluorotridecanoic acid	ng/L	80	67.4	84		3		70 - 130	0 - 30
Perfluoroundecanoic acid	ng/L	80	68.6	86		3		70 - 130	0 - 30

RPD : 0 out of 18 outside limits

Spike Recovery: 0 out of 36 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	220071466	Method Blank ID:	2062133
Matrix:	Water	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_41.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0506
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2062134	2062134	2200724B_42.d	07/25/20	0519
2.	LCSD2062135	2062135	2200724B_43.d	07/25/20	0532
3.	HAASF-MW001	22007146601	2200724B_45.d	07/25/20	0558
4.	HAASF-MW002	22007146602	2200724B_46.d	07/25/20	0611
5.	HAASF-MW002-MS	22007146603	2200724B_47.d	07/25/20	0625
6.	HAASF-MW002-MSD	22007146604	2200724B_48.d	07/25/20	0638
7.	HAASF-MW003	22007146605	2200724B_49.d	07/25/20	0651
8.	HAASF-MW004	22007146606	2200724B_50.d	07/25/20	0704
9.	HAASF-MW005	22007146607	2200724B_51.d	07/25/20	0717
10.	HAASF-MW005-D	22007146608	2200724B_52.d	07/25/20	0730
11.	HAASF-ERB-03	22007146609	2200724B_53.d	07/25/20	0744
12.	HAASF-ERB-04	22007146610	2200724B_54.d	07/25/20	0757
13.	LCS2062134RE	2062134RE	2200727A_17.d	07/27/20	1721
14.	LCSD2062135RE	2062135RE	2200727A_18.d	07/27/20	1734

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	MB2062133
Collect Date:	NA Time: NA	GCAL Sample ID:	2062133
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200724B_41.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:	07/16/20	Analysis Date:	07/25/20 Time: 0506
Prep Batch:	688084	Analytical Batch:	688831
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
27619-97-2	6:2 Fluorotelomer sulfonate	4.00	U	1.79	4.00	10.0
2991-50-6	NEtFOSAA	8.00	U	5.38	8.00	10.0
2355-31-9	NMeFOSAA	8.00	U	4.60	8.00	10.0
375-73-5	Perfluorobutanesulfonic acid	4.00	U	1.47	4.00	10.0
375-22-4	Perfluorobutanoic acid	4.00	U	2.13	4.00	10.0
335-76-2	Perfluorodecanoic acid	4.00	U	1.65	4.00	10.0
307-55-1	Perfluorododecanoic acid	4.00	U	2.45	4.00	10.0
375-85-9	Perfluoroheptanoic acid	4.00	U	1.85	4.00	10.0
355-46-4	Perfluorohexanesulfonic acid	4.00	U	1.64	4.00	10.0
307-24-4	Perfluorohexanoic acid	4.00	U	1.94	4.00	10.0
375-95-1	Perfluorononanoic acid	4.00	U	1.68	4.00	10.0
1763-23-1	Perfluorooctanesulfonic acid	4.00	U	1.70	4.00	10.0
335-67-1	Perfluorooctanoic acid	4.00	U	1.80	4.00	10.0
2706-90-3	Perfluoropentanoic acid	4.00	U	2.35	4.00	10.0
376-06-7	Perfluorotetradecanoic acid	4.00	U	2.76	4.00	10.0
2058-94-8	Perfluoroundecanoic acid	4.00	U	1.86	4.00	10.0

FORM I SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071466

Prep Method: EPA 537 Mod Prep | Prep Batch: 688084

Analytical Method: EPA 537 Modified | Analytical Batch: 688831

GCAL QC ID: 2062134

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
6:2 Fluorotelomer sulfonate	ng/L	76	0	60.3	79		70 - 130
NEtFOSAA	ng/L	80	0	70.9	89		70 - 130
NMeFOSAA	ng/L	80	0	79.6	99		70 - 130
Perfluorobutanesulfonic acid	ng/L	70.8	0	57.3	81		70 - 130
Perfluorobutanoic acid	ng/L	80	0	66.7	83		70 - 130
Perfluorodecanoic acid	ng/L	80	0	74.6	93		70 - 130
Perfluorododecanoic acid	ng/L	80	0	60.6	76		70 - 130
Perfluoroheptanoic acid	ng/L	80	0	69.7	87		70 - 130
Perfluorohexanesulfonic acid	ng/L	73	0	59.7	82		70 - 130
Perfluorohexanoic acid	ng/L	80	0	67	84		70 - 130
Perfluorononanoic acid	ng/L	80	0	69	86		70 - 130
Perfluorooctanesulfonic acid	ng/L	74	0	62	84		70 - 130
Perfluorooctanoic acid	ng/L	80	0	63.3	79		70 - 130
Perfluoropentanoic acid	ng/L	80	0	68.4	85		70 - 130
Perfluorotetradecanoic acid	ng/L	80	0	73.4	92		70 - 130
Perfluoroundecanoic acid	ng/L	80	0	59.9	75		70 - 130

RPD : 0 out of 16 outside limits

Spike Recovery: 0 out of 32 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071466

Prep Method: EPA 537 Mod Prep

Prep Batch: 688084

Analytical Method: EPA 537 Modified

Analytical Batch: 688831

GCAL QC ID: 2062135

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*QC LIMITS RPD*
6:2 Fluorotelomer sulfonate	ng/L	76	63.3	83		5		70 - 130	0 - 30
NEtFOSAA	ng/L	80	65.7	82		8		70 - 130	0 - 30
NMeFOSAA	ng/L	80	82.8	104		4		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ng/L	70.8	58.5	83		2		70 - 130	0 - 30
Perfluorobutanoic acid	ng/L	80	64.7	81		3		70 - 130	0 - 30
Perfluorodecanoic acid	ng/L	80	69.9	87		7		70 - 130	0 - 30
Perfluorododecanoic acid	ng/L	80	68.9	86		13		70 - 130	0 - 30
Perfluoroheptanoic acid	ng/L	80	68.3	85		2		70 - 130	0 - 30
Perfluorohexanesulfonic acid	ng/L	73	58.1	80		3		70 - 130	0 - 30
Perfluorohexanoic acid	ng/L	80	65.8	82		2		70 - 130	0 - 30
Perfluorononanoic acid	ng/L	80	67.6	84		2		70 - 130	0 - 30
Perfluorooctanesulfonic acid	ng/L	74	57.3	77		8		70 - 130	0 - 30
Perfluorooctanoic acid	ng/L	80	64.6	81		2		70 - 130	0 - 30
Perfluoropentanoic acid	ng/L	80	64.5	81		6		70 - 130	0 - 30
Perfluorotetradecanoic acid	ng/L	80	63.3	79		15		70 - 130	0 - 30
Perfluoroundecanoic acid	ng/L	80	65.3	82		9		70 - 130	0 - 30

RPD : 0 out of 16 outside limits

Spike Recovery: 0 out of 32 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE MS/MSD RECOVERY

Report No:	220071466	Parent Sample ID:	HAASF-MW002
Prep Method:	EPA 537 Mod Prep	Prep Batch:	688084
Analytical Method:	EPA 537 Modified	Analytical Batch:	688831

GCAL QC ID: 22007146603

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*MS RESULT*	*MS % REC*	#	*QC LIMITS*
6:2 Fluorotelomer sulfonate	ng/L	76	.065	60.8	80		70 - 130
8:2 Fluorotelomer sulfonate	ng/L	76.8	.158	67	87		70 - 130
NEtFOSAA	ng/L	80	.261	63.8	79		70 - 130
NMeFOSAA	ng/L	80	.04	75.2	94		70 - 130
Perfluorobutanesulfonic acid	ng/L	70.8	1.08	56.2	78		70 - 130
Perfluorobutanoic acid	ng/L	80	2.24	68.3	83		70 - 130
Perfluorodecanoic acid	ng/L	80	0	62.4	78		70 - 130
Perfluorododecanoic acid	ng/L	80	0	65.5	82		70 - 130
Perfluoroheptanoic acid	ng/L	80	1.35	68.4	84		70 - 130
Perfluorohexanesulfonic acid	ng/L	73	1.12	62.2	84		70 - 130
Perfluorohexanoic acid	ng/L	80	4.01	77.4	92		70 - 130
Perfluorononanoic acid	ng/L	80	.176	66.3	83		70 - 130
Perfluorooctanesulfonic acid	ng/L	74	.609	64.9	87		70 - 130
Perfluorooctanoic acid	ng/L	80	1.12	69.9	86		70 - 130
Perfluoropentanoic acid	ng/L	80	3.33	70.3	84		70 - 130
Perfluorotetradecanoic acid	ng/L	80	0	68.5	86		70 - 130
Perfluorotridecanoic acid	ng/L	80	0	59.5	74		70 - 130
Perfluoroundecanoic acid	ng/L	80	.429	65	81		70 - 130

RPD : 0 out of 18 outside limits

Spike Recovery: 0 out of 36 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE MS/MSD RECOVERY

Report No:	220071466	Parent Sample ID:	HAASF-MW002
Prep Method:	EPA 537 Mod Prep	Prep Batch:	688084
Analytical Method:	EPA 537 Modified	Analytical Batch:	688831

GCAL QC ID: 22007146604

ANALYTE	*UNITS*	*SPIKE ADDED*	*MSD RESULT*	*MSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*QC LIMITS RPD*
6:2 Fluorotelomer sulfonate	ng/L	76	72.7	96		18		70 - 130	0 - 30
8:2 Fluorotelomer sulfonate	ng/L	76.8	71	92		6		70 - 130	0 - 30
NEtFOSAA	ng/L	80	82.3	103		25		70 - 130	0 - 30
NMeFOSAA	ng/L	80	86.3	108		14		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ng/L	70.8	63.1	88		12		70 - 130	0 - 30
Perfluorobutanoic acid	ng/L	80	71.5	87		5		70 - 130	0 - 30
Perfluorodecanoic acid	ng/L	80	69.4	87		11		70 - 130	0 - 30
Perfluorododecanoic acid	ng/L	80	68.1	85		4		70 - 130	0 - 30
Perfluoroheptanoic acid	ng/L	80	71.8	88		5		70 - 130	0 - 30
Perfluorohexanesulfonic acid	ng/L	73	60.6	82		3		70 - 130	0 - 30
Perfluorohexanoic acid	ng/L	80	71.2	84		8		70 - 130	0 - 30
Perfluorononanoic acid	ng/L	80	69.5	87		5		70 - 130	0 - 30
Perfluorooctanesulfonic acid	ng/L	74	62.4	83		4		70 - 130	0 - 30
Perfluorooctanoic acid	ng/L	80	66	81		6		70 - 130	0 - 30
Perfluoropentanoic acid	ng/L	80	73.7	88		5		70 - 130	0 - 30
Perfluorotetradecanoic acid	ng/L	80	76.9	96		12		70 - 130	0 - 30
Perfluorotridecanoic acid	ng/L	80	68	85		13		70 - 130	0 - 30
Perfluoroundecanoic acid	ng/L	80	65.4	81		.6		70 - 130	0 - 30

RPD : 0 out of 18 outside limits

Spike Recovery: 0 out of 36 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	220071466	Method Blank ID:	2062133
Matrix:	Water	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200727A_16.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/16/20	Analysis Date:	07/27/20 Time: 1708
Prep Batch:	688084	Analytical Batch:	688835
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2062134	2062134	2200724B_42.d	07/25/20	0519
2.	LCSD2062135	2062135	2200724B_43.d	07/25/20	0532
3.	HAASF-MW001	22007146601	2200724B_45.d	07/25/20	0558
4.	HAASF-MW002	22007146602	2200724B_46.d	07/25/20	0611
5.	HAASF-MW002-MS	22007146603	2200724B_47.d	07/25/20	0625
6.	HAASF-MW002-MSD	22007146604	2200724B_48.d	07/25/20	0638
7.	HAASF-MW003	22007146605	2200724B_49.d	07/25/20	0651
8.	HAASF-MW004	22007146606	2200724B_50.d	07/25/20	0704
9.	HAASF-MW005	22007146607	2200724B_51.d	07/25/20	0717
10.	HAASF-MW005-D	22007146608	2200724B_52.d	07/25/20	0730
11.	HAASF-ERB-03	22007146609	2200724B_53.d	07/25/20	0744
12.	HAASF-ERB-04	22007146610	2200724B_54.d	07/25/20	0757
13.	LCS2062134RE	2062134RE	2200727A_17.d	07/27/20	1721
14.	LCSD2062135RE	2062135RE	2200727A_18.d	07/27/20	1734

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	MB2062133RE
Collect Date:	NA Time: NA	GCAL Sample ID:	2062133RE
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200727A_16.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/16/20	Analysis Date:	07/27/20 Time: 1708
Prep Batch:	688084	Analytical Batch:	688835
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
39108-34-4	8:2 Fluorotelomer sulfonate	4.00	U	1.63	4.00	10.0
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071466

Prep Method: EPA 537 Mod Prep

Prep Batch: 688084

Analytical Method: EPA 537 Modified

Analytical Batch: 688835

GCAL QC ID: 2062134

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	*#*	*QC LIMITS*
8:2 Fluorotelomer sulfonate	ng/L	76.8	0	82.1	107		70 - 130
Perfluorotridecanoic acid	ng/L	80	0	56.6	71		70 - 130

GCAL QC ID: 2062135

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	*#*	*% RPD*	*#*	*QC LIMITS REC*	*QC LIMITS RPD*
8:2 Fluorotelomer sulfonate	ng/L	76.8	79.2	103		4		70 - 130	0 - 30
Perfluorotridecanoic acid	ng/L	80	54.8	68	*	3		70 - 130	0 - 30

RPD : 0 out of 2 outside limits

Spike Recovery: 1 out of 4 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	220071466	Method Blank ID:	2065745
Matrix:	Water	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_33.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 1942
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2065746	2065746	2200728A_34.d	07/28/20	1955
2.	LCSD2065747	2065747	2200728A_35.d	07/28/20	2008
3.	HAASF-MW001 (RE)	22007146611	2200728A_42.d	07/28/20	2141
4.	HAASF-MW002 (RE)	22007146612	2200728A_44.d	07/28/20	2207
5.	HAASF-MW002-MS (RE)	22007146613	2200728A_45.d	07/28/20	2220
6.	HAASF-MW002-MSD (RE)	22007146614	2200728A_46.d	07/28/20	2234
7.	HAASF-MW003 (RE)	22007146615	2200728A_47.d	07/28/20	2247
8.	HAASF-MW004 (RE)	22007146616	2200728A_48.d	07/28/20	2300
9.	HAASF-MW005 (RE)	22007146617	2200728A_49.d	07/28/20	2313
10.	HAASF-MW005-D (RE)	22007146618	2200728A_50.d	07/28/20	2326
11.	HAASF-ERB-03 (RE)	22007146619	2200728A_51.d	07/28/20	2340
12.	HAASF-ERB-04 (RE)	22007146620	2200728A_52.d	07/28/20	2353

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	220071466	Client Sample ID:	MB2065745
Collect Date:	NA Time: NA	GCAL Sample ID:	2065745
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2200728A_33.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: AWG
Prep Date:	07/28/20	Analysis Date:	07/28/20 Time: 1942
Prep Batch:	688732	Analytical Batch:	688919
Prep Method:	EPA 537 Mod Prep	Analytical Method:	EPA 537 Modified

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
72629-94-8	Perfluorotridecanoic acid	4.00	U	2.56	4.00	10.0

FORM I SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 220071466

Prep Method: EPA 537 Mod Prep

Prep Batch: 688732

Analytical Method: EPA 537 Modified

Analytical Batch: 688919

GCAL QC ID: 2065746

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
Perfluorotridecanoic acid	ng/L	80	0	88.6	111		70 - 130

GCAL QC ID: 2065747

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*QC LIMITS RPD*
Perfluorotridecanoic acid	ng/L	80	83.6	104		6		70 - 130	0 - 30

RPD : 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE MS/MSD RECOVERY

Report No:	220071466	Parent Sample ID:	HAASF-MW002 (RE)
Prep Method:	EPA 537 Mod Prep	Prep Batch:	688732
Analytical Method:	EPA 537 Modified	Analytical Batch:	688919

GCAL QC ID: 22007146613

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	MS RESULT	MS % REC	#	QC LIMITS
Perfluorotridecanoic acid	ng/L	80	0	83.3	104		70 - 130

GCAL QC ID: 22007146614

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
Perfluorotridecanoic acid	ng/L	80	78.9	99		5		70 - 130	0 - 30

RPD : 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

XIV

ANALYSIS RUN LOG

Report No:	220071035	Analytical Batch:	687669	Start Date:	07/10/20
Instrument ID:	PH METER WATERS	Analytical Method:	EPA 9045D	End Date:	07/10/20

CLIENT SAMPLE ID	*GCAL SAMPLE ID*	*DILUTION*	*TIME*	*ANALYTES* pH
ICV	1600	1	1624	X
AOI01-03-SB-20-22	22007103513	1	1644	X
AOI01-03-SB-20-22-D	22007103514	1	1646	X
CCV	1800	1	1650	X

FORM XIV - GENCHEM

Pace Analytical

PH Analysis Soil

687669

ANALYST/ TECH	SLL2	START DATE/TIME	7/10/2020 15:00	END DATE/TIME	7/10/2020 17:00	BATCH	687669

#	CLIENT	TYPE	LAB ID	Weight (20±0.1g)	DI Volume (20 mL)	Shaking Start	Shaking End	Settling Start	Settling End	Result (pH units)	Sample Temp (°C)	Result Time	STANDARDS\ REAGENTS
1	QC	ICV	1600	20.0	20	15:15	15:20	15:20	16:20	7.98	22.3	16:24	Buffer 1 Lot
2	9000	SAMP	22007024701	20.0	20	15:15	15:20	15:20	16:20	5.47	23.2	16:26	2128983
3	QC	DUP	2059953	20.0	20	15:15	15:20	15:20	16:20	5.46	23.3	16:28	Buffer 1 Exp
4	9000	SAMP	22007100201	20.1	20	15:15	15:20	15:20	16:20	5.29	23.2	16:34	01/13/21
5	0042	SAMP	22007097501	20.0	20	15:15	15:20	15:20	16:20	7.06	23.4	16:38	Buffer 4 Lot
6	0042	SAMP	22007097502	20.0	20	15:15	15:20	15:20	16:20	7.34	23.7	16:39	2128990
7	4437	SAMP	22007097601	20.1	20	15:15	15:20	15:20	16:20	10.78	23.0	16:43	Buffer 4 Exp
8	4838	SAMP	22007103513	20.1	20	15:15	15:20	15:20	16:20	8.61	24.0	16:44	08/31/21
9	4838	FD	22007103514	20.1	20	15:15	15:20	15:20	16:20	8.62	23.3	16:46	Buffer 7 Lot
10	4271	SAMP	22007104701	20.0	20	15:15	15:20	15:20	16:20	6.38	23.9	16:48	2128980
11	0080	CCV	1800	20.0	20	15:15	15:20	15:20	16:20	7.99	22.0	16:50	Buffer 7 Exp
12													12/31/21
13													Buffer 10 Lot
14													2128927
15													Buffer 10 Exp
16													02/25/21
17													Buffer 13 Lot
18													2128961
19													Buffer 13 Exp
20													01/20/21
21													Buffer 8 (QC) Lot
22													2128955
23													Buffer 8 (QC) Exp
24													01/31/21
25													
26													
27													
28													
29													
30													

EQUIPMENT\CONDITIONS

pH Meter ID	Calibration Slope	Balance ID
PH01	96.7	BAL11

NOTES

XIV

ANALYSIS RUN LOG

Report No:	220071035	Analytical Batch:	688325	Start Date:	07/20/20
Instrument ID:	TOC6	Analytical Method:	EPA 9060A	End Date:	07/20/20

CLIENT SAMPLE ID	GCAL SAMPLE ID	DILUTION	TIME	ANALYTES TOC
CCV	1800	1	1046	X
MB2063578	2063578	1	1055	X
LCS2063579	2063579	1	1129	X
AOI01-03-SB-20-22	22007103513	1	1208	X
AOI01-03-SB-20-22DUP	2063580	1	1220	X
AOI01-03-SB-20-22DUP	2063581	1	1231	X
AOI01-03-SB-20-22DUP	2063582	1	1244	X
AOI01-03-SB-20-22-D	22007103514	1	1258	X
AOI01-03-SB-20-22-MS	22007103515	1	1313	X
AOI01-03-SB-20-22-MSD	22007103516	1	1515	X
CCV	1800	1	1551	X
CCB	1900	1	1601	X

FORM XIV - GENCHEM

II

CONTINUING CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	TOC6
Analysis Date:	07/20/20 1046	Lab File ID:	8491
Analytical Method:	EPA 9060A	Analytical Batch:	688325

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
Total Organic Carbon	mg/kg	10000	10600	106	90	110	

FORM II - GENCHEM

III

METHOD BLANK

Report No:	220071035	Blank ID:	MB2063578
Matrix:	Solid	Instrument ID:	TOC6
Analysis Date:	07/20/20 1055	Lab File ID:	8491
Analytical Method:	EPA 9060A	Analytical Batch:	688325

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Total Organic Carbon	200	mg/kg	U	153	200	250

VII

LABORATORY CONTROL SPIKE

Report No:	220071035	GCAL ID:	LCS2063579
Matrix:	Solid	Instrument ID:	TOC6
Analyst:	PLH	Lab File ID:	8491
Prep Date:	NA	Analysis Date:	07/20/20 1129
Prep Batch:	NA	Analytical Batch:	688325
Prep Method:	NA	Analytical Method:	EPA 9060A

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*%REC*	*Q*	*% REC LIMITS*
Total Organic Carbon	mg/kg	2000	1990	100		69 - 128

FORM VII - GENCHEM

VI

DUPLICATES

Report No:	220071035	Parent Sample ID:	AOI01-03-SB-20-22
Prep Method:	NA	Parent GCAL ID:	22007103513
Prep Date:	NA	Prep Batch:	NA
Analytical Method:	EPA 9060A	Analytical Batch:	688325

GCAL QC ID:	**2063580 DUP**	Instrument ID:	TOC6
Analyst:	PLH	Lab File ID:	NA
Analysis Date:	07/20/20 1220	Dilution:	1

ANALYTE	*UNITS*	*SAMPLE RESULT*	*Q*	*DUP RESULT*	*Q*	*RPD*	*#*	*RPD LIMITS*
Total Organic Carbon	mg/kg	1230		1970		47	*	0 - 25

FORM VI - GENCHEM

VI

DUPLICATES

Report No:	220071035	Parent Sample ID:	AOI01-03-SB-20-22
Prep Method:	NA	Parent GCAL ID:	22007103513
Prep Date:	NA	Prep Batch:	NA
Analytical Method:	EPA 9060A	Analytical Batch:	688325

GCAL QC ID:	**2063581 DUP**	Instrument ID:	TOC6
Analyst:	PLH	Lab File ID:	NA
Analysis Date:	07/20/20 1231	Dilution:	1

ANALYTE	*UNITS*	*SAMPLE RESULT*	*Q*	*DUP RESULT*	*Q*	*RPD*	*#*	*RPD LIMITS*
Total Organic Carbon	mg/kg	1230		1160		6		0 - 25

FORM VI - GENCHEM

VI

DUPLICATES

Report No:	220071035	Parent Sample ID:	AOI01-03-SB-20-22
Prep Method:	NA	Parent GCAL ID:	22007103513
Prep Date:	NA	Prep Batch:	NA
Analytical Method:	EPA 9060A	Analytical Batch:	688325

GCAL QC ID:	**2063582 DUP**	Instrument ID:	TOC6
Analyst:	PLH	Lab File ID:	NA
Analysis Date:	07/20/20 1244	Dilution:	1

ANALYTE	*UNITS*	*SAMPLE RESULT*	*Q*	*DUP RESULT*	*Q*	*RPD*	*#*	*RPD LIMITS*
Total Organic Carbon	mg/kg	1230		1810		38	*	0 - 25

FORM VI - GENCHEM

V

MS/MSD RECOVERY

Report No:	220071035	Parent Sample ID:	AOI01-03-SB-20-22
Prep Date:	NA	Parent GCAL ID:	22007103513
Prep Batch:	NA	Analytical Batch:	688325
Prep Method:	NA	Analytical Method:	EPA 9060A

GCAL QC ID:	**22007103515 MS**	Instrument ID:	TOC6
Analyst:	PLH	Lab File ID:	8491
Analysis Date:	07/20/20 1313	Dilution:	1

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*MS RESULT*	*MS % REC*	*#*	*QC LIMITS*
Total Organic Carbon	mg/kg	22400	1380	21200	100		69 - 128

GCAL QC ID:	**22007103516 MSD**	Instrument ID:	TOC6
Analyst:	PLH	Lab File ID:	8491
Analysis Date:	07/20/20 1515	Dilution:	1

ANALYTE	*UNITS*	*SPIKE ADDED*	*MSD RESULT*	*MSD % REC*	*#*	*% RPD*	*#*	*%REC LIMITS*	*RPD LIMITS*
Total Organic Carbon	mg/kg	22400	19900	93		6		69 - 128	0 - 20

FORM V - GENCHEM

II

CONTINUING CALIBRATION VERIFICATION

Report No:	220071035	Instrument ID:	TOC6
Analysis Date:	07/20/20 1551	Lab File ID:	8491
Analytical Method:	EPA 9060A	Analytical Batch:	688325

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
Total Organic Carbon	mg/kg	10000	10700	107	90	110	

FORM II - GENCHEM

III

CONTINUING CALIBRATION BLANK

Report No:	220071035	Blank ID:	CCB for HBN 688325
Matrix:	Solid	Instrument ID:	TOC6
Analysis Date:	07/20/20 1601	Lab File ID:	8491
Analytical Method:	EPA 9060A	Analytical Batch:	688325

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Total Organic Carbon	200	mg/kg	U	153	200	250

FORM III - GENCHEM

Sample Summary

LAB ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
22007103501	HAASF-FRB-01	Water	07/09/2020 08:05	07/10/2020 10:10
22007103502	HAASF-ERB-01	Water	07/09/2020 08:45	07/10/2020 10:10
22007103503	HAASF-ERB-02	Water	07/09/2020 12:15	07/10/2020 10:10
22007103504	AOI01-01-SB-00-02	Solid	07/08/2020 08:55	07/10/2020 10:10
22007103505	AOI01-01-SB-25-27	Solid	07/08/2020 10:50	07/10/2020 10:10
22007103506	AOI01-01-SB-55-57	Solid	07/08/2020 10:40	07/10/2020 10:10
22007103507	AOI01-01-SB-55-57-MS	Solid	07/08/2020 10:40	07/10/2020 10:10
22007103508	AOI01-01-SB-55-57-MSD	Solid	07/08/2020 10:40	07/10/2020 10:10
22007103509	AOI01-02-SB-00-02	Solid	07/07/2020 09:15	07/10/2020 10:10
22007103510	AOI01-02-SB-28-30	Solid	07/07/2020 14:50	07/10/2020 10:10
22007103511	AOI01-02-SB-55-27	Solid	07/07/2020 14:55	07/10/2020 10:10
22007103512	AOI01-03-SB-00-02	Solid	07/09/2020 08:00	07/10/2020 10:10
22007103513	AOI01-03-SB-20-22	Solid	07/09/2020 10:15	07/10/2020 10:10
22007103514	AOI01-03-SB-20-22-D	Solid	07/09/2020 10:15	07/10/2020 10:10
22007103515	AOI01-03-SB-20-22-MS	Solid	07/09/2020 10:15	07/10/2020 10:10
22007103516	AOI01-03-SB-20-22-MSD	Solid	07/09/2020 10:15	07/10/2020 10:10
22007103517	AOI01-03-SB-44-46	Solid	07/09/2020 10:00	07/10/2020 10:10
22007103518	AOI01-04-SB-00-02	Solid	07/08/2020 13:10	07/10/2020 10:10
22007103519	AOI01-04-SB-20-22	Solid	07/08/2020 15:10	07/10/2020 10:10
22007103520	AOI01-04-SB-39-41	Solid	07/08/2020 15:15	07/10/2020 10:10
22007103521	AOI01-05-SB-00-02	Solid	07/09/2020 13:25	07/10/2020 10:10
22007103522	AOI01-05-SB-25-27	Solid	07/09/2020 14:25	07/10/2020 10:10
22007103523	AOI01-05-SB-50-52	Solid	07/09/2020 14:30	07/10/2020 10:10
22007103524	AOI01-05-SB-50-52-D	Solid	07/09/2020 14:30	07/10/2020 10:10
22007103525	AOI01-06-SB-00-02	Solid	07/08/2020 14:00	07/10/2020 10:10
22007103526	AOI01-06-SB-00-02-D	Solid	07/08/2020 14:00	07/10/2020 10:10
22007103527	AOI01-07-SB-00-02	Solid	07/08/2020 14:20	07/10/2020 10:10

Sample Summary

LAB ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
22007146601	HAASF-MW001	Water	07/12/2020 13:40	07/14/2020 09:45
22007146602	HAASF-MW002	Water	07/11/2020 13:00	07/14/2020 09:45
22007146603	HAASF-MW002-MS	Water	07/11/2020 13:00	07/14/2020 09:45
22007146604	HAASF-MW002-MSD	Water	07/11/2020 13:00	07/14/2020 09:45
22007146605	HAASF-MW003	Water	07/12/2020 10:30	07/14/2020 09:45
22007146606	HAASF-MW004	Water	07/12/2020 12:30	07/14/2020 09:45
22007146607	HAASF-MW005	Water	07/12/2020 14:00	07/14/2020 09:45
22007146608	HAASF-MW005-D	Water	07/12/2020 14:00	07/14/2020 09:45
22007146609	HAASF-ERB-03	Water	07/12/2020 15:00	07/14/2020 09:45
22007146610	HAASF-ERB-04	Water	07/12/2020 14:55	07/14/2020 09:45
22007146611	HAASF-MW001 (RE)	Water	07/12/2020 13:40	07/14/2020 09:45
22007146612	HAASF-MW002 (RE)	Water	07/11/2020 13:00	07/14/2020 09:45
22007146613	HAASF-MW002-MS (RE)	Water	07/11/2020 13:00	07/14/2020 09:45
22007146614	HAASF-MW002-MSD (RE)	Water	07/11/2020 13:00	07/14/2020 09:45
22007146615	HAASF-MW003 (RE)	Water	07/12/2020 10:30	07/14/2020 09:45
22007146616	HAASF-MW004 (RE)	Water	07/12/2020 12:30	07/14/2020 09:45
22007146617	HAASF-MW005 (RE)	Water	07/12/2020 14:00	07/14/2020 09:45
22007146618	HAASF-MW005-D (RE)	Water	07/12/2020 14:00	07/14/2020 09:45
22007146619	HAASF-ERB-03 (RE)	Water	07/12/2020 15:00	07/14/2020 09:45
22007146620	HAASF-ERB-04 (RE)	Water	07/12/2020 14:55	07/14/2020 09:45

Case Narrative

Client: AECOM **Report:** 220071035

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.1.1 as specified in the contract.

SEMI-VOLATILES MASS SPECTROMETRY

In the EPA 537 Modified analysis for prep batch 688171, the MS/MSD exhibited recovery failures. All LCS/LCSD recoveries are acceptable.

In the EPA 537 Modified analysis for prep batch 687723, the MS/MSD exhibited recovery and RPD failures. All LCS/LCSD recoveries and RPDs are acceptable.

In the EPA 537 Modified analysis for prep batch 687724, the LCS and/or LCSD recoveries are above the upper control limits for 6:2 FTS. This analyte was not detected in the associated samples.

In the EPA 537 Modified analysis, the recoveries for extracted internal standards are outside control limits for samples 22007103506 (AOI01-01-SB-55-57), 22007103507 (AOI01-01-SB-55-57-MS), 22007103508 (AOI01-01-SB-55-57-MSD), 22007103511 (AOI01-02-SB-55-27), 22007103520 (AOI01-04-SB-39-41) and 22007103524 (AOI01-05-SB-50-52-D) . These samples were re-extracted and analyzed with similar recoveries for these EIS.

MISCELLANEOUS

PFAS Abbreviations
6:2 FTS - 6:2 Fluorotelomer sulfonate
8:2 FTS - 8:2 Fluorotelomer sulfonate
FOSA - Perfluorooctane Sulfonamide
PFBA - Perfluorobutanoic acid
PFBS - Perfluorobutanesulfonic acid
PFDA - Perfluorodecanoic acid
PFDS - Perfluorodecane Sulfonate
PFDoA - Perfluorododecanoic acid
PFHpA - Perfluoroheptanoic acid
PFHpS - Perfluoro-1-heptanesulfonate
PFHxA - Perfluorohexanoic acid
PFHxS - Perfluorohexanesulfonic acid
PFNA - Perfluorononanoic acid
PFOA - Perfluorooctanoic acid
PFOS - Perfluorooctanesulfonic acid
PFPeA - Perfluoropentanoic acid
PFTeDA - Perfluorotetradecanoic acid
PFTrDA - Perfluorotridecanoic acid
PFUdA - Perfluoroundecanoic acid

Case Narrative

Client: AECOM **Report:** 220071466

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.1.1 as specified in the contract.

SEMI-VOLATILES MASS SPECTROMETRY

In the EPA 537 Modified analysis for prep batch 688084, the following samples were double spiked with injected internal standards: the method blank, LCS, LCSD, 22007146601 (HAASF-MW001), 22007146602 (HAASF-MW002), 22007146605 (HAASF-MW003), 22007146606 (HAASF-MW004), 22007146608 (HAASF-MW005-D), 22007146609 (HAASF-ERB-03), and 22007146610 (HAASF-ERB-04). Injected internal standards are not used for quantification of results.

In the EPA 537 Modified analysis for prep batch 688084, the LCSD recovery is outside below the lower control limit for Perfluorotridecanoic acid. The LCS recovery is acceptable. Associated samples were re-extracted outside holding time in prep batch 688732 and analyzed with an acceptable LCS/LCSD recoveries for this analyte. The data for the second extract is reported as samples 22007146611-22007146120 with (RE) added to the client ID. The recovery for the extracted internal standard, M2PFTeDA is outside control limits for the LCS (2062134). The spike recovery for the associated target analyte is acceptable.

MISCELLANEOUS

PFAS Abbreviations
6:2 FTS - 6:2 Fluorotelomer sulfonate
8:2 FTS - 8:2 Fluorotelomer sulfonate
FOSA - Perfluorooctane Sulfonamide
PFBA - Perfluorobutanoic acid
PFBS - Perfluorobutanesulfonic acid
PFDA - Perfluorodecanoic acid
PFDS - Perfluorodecane Sulfonate
PFDoA - Perfluorododecanoic acid
PFHpA - Perfluoroheptanoic acid
PFHpS - Perfluoro-1-heptanesulfonate
PFHxA - Perfluorohexanoic acid
PFHxS - Perfluorohexanesulfonic acid
PFNA - Perfluorononanoic acid
PFOA - Perfluorooctanoic acid
PFOS - Perfluorooctanesulfonic acid
PFPeA - Perfluoropentanoic acid
PFTeDA - Perfluorotetradecanoic acid
PFTrDA - Perfluorotridecanoic acid
PFUdA - Perfluoroundecanoic acid

Pace Analytical

SAMPLE RECEIVING CHECKLIST

220071035

SAMPLE DELIVERY GROUP 220071035	
Client PM AEC 4838 - AECOM	**Transport Method** FEDEX
Profile Number 285948	**Received By** McCune, Dodie N.
Line Item(s) 1 - Soil - 18 compounds 2 - GW-18 compound 537 Mod.	**Receive Date(s)** 07/10/20

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E26	Temp °C
902276228820		2.4

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

Pace Analytical

SAMPLE RECEIVING CHECKLIST

220071466

SAMPLE DELIVERY GROUP 220071466	
Client PM AEC 4838 - AECOM	**Transport Method** FEDEX
Profile Number 285948	**Received By** McQune, Dodie N.
Line Item(s) 2 - GW-18 compound 537 Mod.	**Receive Date(s)** 07/14/20

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E26	Temp °C
902276228830		0.8

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

Pace Analytical
www.paclabs.com

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225.769.4900 | www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4838 - AECOM
SDG: 220071035
PM: AEC

Report To:	Bill To:
Client: AECOM	Client: AECOM
Address: 12420 Milestone Center Dr. Germantown, MD 20876	Address: 12420 Milestone Center Dr. Germantown, MD 20876
Contact: Naoum Tavantzis	Contact: Claire Mitchell
Phone: 919-461-1178	Phone: 703-682-9098
Email: naoum.tavantzis@aecom.com	Email: claire.mitchell@aecom.com

P.O. Number:

Project Name/Number: 60552172.0006 St Helena AASF

Sampled By: Andrew Borden

Custody Seal: Used: Y Yes ☐ No; Intact: Y Yes ☐ No

Temperature: 2.4 ECP

☐ Dissolved Analysis Requested
☐ Field Filtered
☐ Lab Filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No. of Containers	PFAS (LC/MS/MS QSM 5.1 Table B-15)	TOC + pH (EPA 9060A/9045D)	Grain size (ASTM D422/CA-551)	← Preservative / Notes ↓	GCAL ID
WQ	7/9/20	0905		X	HAASF-FRB-01	2	2				1
WQ	7/9/20	0845		X	HAASF-ERB-01	2	2				2
WQ	7/9/20	1215		X	HAASF-ERB-02	2	2				3
SO	7/8/20	0855		X	AOI01-01-SB-00-02	1	1				4
SO	7/8/20	1050		X	AOI01-01-SB-25-27	1	1				5
SO	7/8/20	1040		X	AOI01-01-SB-55-57	1	1				6
SO	7/8/20	1040		X	AOI01-01-SB-55-57-MS	1	1			MS	7
SO	7/8/20	1040		X	AOI01-01-SB-55-57-MSD	1	1			MSD	8
SO	7/7/20	0915		X	AOI01-02-SB-00-02	1	1				9
SO	7/7/20	1450		X	AOI01-02-SB-28-30	1	1				10
SO	7/7/20	1455		X	AOI01-02-SB-55-57	1	1				11
SO	7/9/20	0800		X	AOI01-03-SB-00-02	1	1				12

Airbill Number: 9022 7622 8820

Turn Around Time(Business Days): ☐ RUSH* ____ Day ☑ Standard (per contract/quote)

Relinquished by: (Signature)	Date/Time:	Received by: (Signature)	Date/Time:
[signature]	7/9/20 1730	Drop @ FedEx	7/9/20 1730
FedEx	7-10-20 10:10	Doreen McClure	7-10-20 10:10

Notes: 1 of 3

[1]Matrix: W = Water, S=Solid, L=Liquid, T=Tissue.

*- Requires prior approval, Rush charges may apply. We cannot accept verbal changes. Please email written changes to your PAGC Project Manager.

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CHAIN OF CUSTODY RECORD

Client ID: 4838 - AECOM
SDG: 220071035
PM: AEC

Report To:	Bill To:
Client: AECOM	Client: AECOM
Address: 12420 Milestone Center Dr. Germantown, MD 20876	Address: 12420 Milestone Center Dr. Germantown, MD 20876
Contact: Naoum Tavantzis	Contact: Claire Mitchell
Phone: 919-461-1178	Phone: 703-682-9098
Email: naoum.tavantzis@aecom.com	Email: claire.mitchell@aecom.com

P.O. Number:

Project Name/Number: 60552172.0006 St Helena AASF

Sampled By: Andrew Borden

Custody Seal: Used: [X] Yes [ ] No Intact: [X] Yes [ ] No

Temperature: 24 Fed

[ ] Dissolved Analysis Requested
[ ] Field Filtered
[ ] Lab Filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No. of Containers	PFAS (LC/MS/MS QSM 5.1 Table B-15)	TOC + pH (EPA 9060A/9045D)	Grain size (ASTM D422/CA-551)	← Preservative / Notes ↓	GCAL ID
SO	7/9/20	1015		X	AOI01-03-SB-20-22	2	1	1		13	12
SO	7/9/20	1015		X	AOI01-03-SB-20-22-D	1		1		14	13
SO	7/9/20	1015		X	AOI01-03-SB-20-22-MS	1		1		MS 15	14
SO	7/9/20	1015		X	AOI01-03-SB-20-22-MSD	1		1		MSD 16	15
SO	7/9/20	1000		X	AOI01-03-SB-44-46	1	1			17	16
SO	7/8/20	1310		X	AOI01-04-SB-00-02	1	1			18	17
SO	7/8/20	1510		X	AOI01-04-SB-20-22	1	1			19	18
SO	7/8/20	1545		X	AOI01-04-SB-39-41	1	1			20	19
SO	7/9/20	1325		X	AOI01-05-SB-00-02	1	1			21	20
SO	7/9/20	1425		X	AOI01-05-SB-25-27	1	1			22	21
SO	7/9/20	1430		X	AOI01-05-SB-50-52	1	1			23	22
SO	7/9/20	1430		X	AOI01-05-SB-50-52-D	1	1			24	23

DNS

Airbill Number: 9022 7622 8820

Turn Around Time(Business Days): [ ] RUSH* ___ Day [✓] Standard (per contract/quote)

Relinquished by: (Signature)	Date/Time:	Received by: (Signature)	Date/Time:
Andrew Borden	7/9/20 1730	Andrew Borden	7/9/20 1815
Andrew Borden	7/9/20 1730	Drop to FedEx	7/9/20 1730
FedEx	7-10-20 10:10	Dodie McEwen	7-10-20 10:10

Notes: 2 of 3

[1]Matrix: W = Water, S=Solid, L=Liquid, T=Tissue.

*- Requires prior approval, Rush charges may apply. We cannot accept verbal changes. Please email written changes to your PAGC Project Manager.

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225.769.4900 | www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4838 - AECOM
SDG: 220071035
PM: AEC

Report To:	Bill To:
Client: AECOM	Client: AECOM
Address: 12420 Milestone Center Dr. Germantown, MD 20876	Address: 12420 Milestone Center Dr. Germantown, MD 20876
Contact: Naoum Tavantzis	Contact: Claire Mitchell
Phone: 919-461-1178	Phone: 703-682-9098
Email: naoum.tavantzis@aecom.com	Email: claire.mitchell@aecom.com

P.O. Number:
Project Name/Number: 60552172.0006 SI Helena AASF
Sampled By: Andrew Borden

Custody Seal: Used: ☑ Yes ☐ No; Intact: ☑ Yes ☐ No
Temperature: 2.4 E26

☐ Dissolved Analysis Requested
☐ Field Filtered
☐ Lab Filtered

Analytical Requests & Method

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No. of Containers	PFAS (LC/MS/MS QSM 5.1 Table B-15)	TOC + pH (EPA 9060A/9045D)	Grain size (ASTM D422/CA-551)	← Preservative / Notes ↓	GCAL ID
							NA	NA			
SO	7/8/20	1400		X	AOI01-06-SB-00-02	1	1				25
SO	7/8/20	1400		X	AOI01-06-SB-00-02-D	1	1				26
SO	7/8/20	1420		X	AOI01-07-SB-00-02	1	1				27

AKB 7/9/20

Airbill Number: 9022 7622 8820

Turn Around Time(Business Days): ☐ RUSH* ____ Day ☑ Standard (per contract/quote)

Relinquished by: (Signature)	Date/Time:	Received by: (Signature)	Date/Time:
Andrew Borden	7/9/20 1730	Drop @ FedEx	7/9/20 1730
FedEx	7-10-20 10:10	[signature] 7-10-20	10:10

Notes: 3 of 3

[1]Matrix: W = Water, S=Solid, L=Liquid, T=Tissue.

*- Requires prior approval, Rush charges may apply. We cannot accept verbal changes. Please email written changes to your PAGC Project Manager.

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CHAIN OF CUSTODY RECORD

Client ID: 4838 - AECOM
SDG: 220071466
PM: AEC

Report To:	Bill To:
Client: AECOM	Client: AECOM
Address: 12420 Milestone Center Dr. Germantown, MD 20876	Address: 12420 Milestone Center Dr. Germantown, MD 20876
Contact: Naoum Tavantzis	Contact: Claire Mitchell
Phone: 919-461-1178	Phone: 703-682-9098
Email: naoum.tavantzis@aecom.com	Email: claire.mitchell@aecom.com

P.O. Number:

Project Name/Number: 60552172.0006 SI Helena AASF

Sampled By: BRAD RUFF & MIKE GLINSKI

Custody Seal: Used: ☒ Yes ☐ No Intact: ☒ Yes ☐ No

Temperature: 0.8 FDV

☐ Dissolved Analysis Requested
☐ Field Filtered
☐ Lab Filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No. of Containers	PFAS (LC/MS/MS QSM 5.1 Table B-15)	TOC + pH (EPA 9060A/9045D)	Grain size (ASTM D422/CA-551)	← Preservative / Notes ↓	GCAL ID
WG	7-12-20	1340		X	HAASF-MW001	2	2				1
WG	7-11-20	1300		X	HAASF-MW002	2	2				2
WG	7-11-20	1300		X	HAASF-MW002-MS	2	2			MS/MSD	3
WG	7-11-20	1300		X	HAASF-MW002-MSD	2	2			MS/MSD	4
WG	7-12-20	1030		X	HAASF-MW003	2	2				5
WG	7-12-20	1230		X	HAASF-MW004	2	2				6
WG	7-12-20	1400		X	HAASF-MW005	2	2				7
WG	7-12-20	1400		X	HAASF-MW005-D	2	2				8
WQ	7-12-20	1500		X	HAASF-ERB-03	2	2				9
WQ	7-12-20	1455		X	HAASF-ERB-04	2	2				10

Airbill Number: 9022 7622 8830

Turn Around Time(Business Days): ☐ RUSH* ____ Day ☑ Standard (per contract/quote)

Relinquished by: (Signature)	Date/Time:	Received by: (Signature)	Date/Time:	Notes:
	7/13/20 1530			
FedEX	7-14-20 9:45	Dodie McClure	7-14-20 9:45	

[1]Matrix: W = Water, S=Solid, L=Liquid, T=Tissue.

*- Requires prior approval, Rush charges may apply. We cannot accept verbal changes. Please email written changes to your PAGC Project Manager.

DATA VALIDATION REPORT - Level III Review

SDG No.:	**221022515**	**Analysis:**	**Per- and Polyfluorinated Alkyl Substances**
Laboratory:	**Pace Gulf Coast**	**Project:**	**Helena AASF**
Reviewer:	**Tyler Bryant**	**Date:**	**March 25th, 2021**

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied, data review worksheets, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the specifics of the analytical method referenced and provisions of the approved project-specific work plan; and, qualified according to the *Contract Laboratory Program National Functional Guidelines* (NFG) *for Superfund Organic Methods Data Review*, EPA-540-R-2017-002, January 2017, Modifications reflect the level of review requested, the specifications of the project-specific QAPP, and the specifics of the analytical methods employed.

Major Anomalies: None.

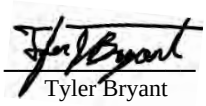
Minor Anomalies: The following laboratory blanks displayed target analyte concentrations greater than the detection limit:

Sample ID	Sequence	Analyte	Concentration (ng/L)
2210302A_11.d	705119	6:2 FTS	1.12
MB2155526RE	705663	NMeFOSAA	1.15

The associated field sample results were all non-detect, no data qualifying action was required. In the field duplicate pair, parent sample HAASF-POTABLE-02 displayed a positive result for FOSA at 1.18 ng/L and a non-detect in the field duplicate. The positive parent sample was qualified J,fd, while the field duplicate was qualified UJ,fd.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method, with the exception of anomalies discussed previously. If a given fraction was not discussed, all quality control criteria reviewed were within acceptable limits. All data are usable, as qualified, for their intended purposed based on the quality control data reviewed.

Signed: 
Tyler Bryant

Helena AASF

Laboratory: Pace Gulf Coast

Job: 60591182 SDG#: 221022515

Sample ID	Client ID	Sample Type	Sample Date	Matrix	PFAS - Method 537M
22102251501	HAASF-POTABLE-01	Field Sample	2/16/2021	Drinking Water	X
22102251501	HAASF-POTABLE-02	Field Sample	2/16/2021	Drinking Water	X
22102251501	HAASF-POTABLE-02-DUP	Field Duplicate	2/16/2021	Drinking Water	X

Helena AASF
Field Duplicate

Client Sample ID:				HAASF-POTABLE-02		HAASF-POTABLE-02-DUP					
Date Sampled:				2/16/21		2/16/21					
	Units	LOQ	5x LOQ	Sample Conc		Duplicate Conc		% RPD	Delta	2x LOQ	Pass/ Fail
Perfluorinated Alkyl Substances											
FOSA	ng/L	4.0	20	1.18	J	2.00	U	51.6%	0.82	8.0	Pass

Control limit [sample]>5xLOQ use 35%
[sample]<5xLOQ use Delta<2xLOQ

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	HAASF-POTABLE-01
Collect Date:	02/16/21 Time: 1305	GCAL Sample ID:	22102251501
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2210302A_80.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:		Analysis Date:	03/03/21 Time: 0448
Prep Batch:	705832	Analytical Batch:	705119
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	2.00	U	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	2.00	U	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	2.00	U	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	1.04	J	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	2.00	U	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	1.49	J	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	2.00	U	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	2.00	U	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	2.00	U	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	2.00	U	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	HAASF-POTABLE-01RE
Collect Date:	02/16/21 Time: 1305	GCAL Sample ID:	22102251501RE
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ1
Sample Amt:	125 mL	Lab File ID:	2210310A_43.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:		Analysis Date:	03/10/21 Time: 1937
Prep Batch:	705832	Analytical Batch:	705663
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	*ANALYTE*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	HAASF-POTABLE-02
Collect Date:	02/16/21 Time: 1330	GCAL Sample ID:	22102251502
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2210302A_81.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:		Analysis Date:	03/03/21 Time: 0501
Prep Batch:	705832	Analytical Batch:	705119
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	2.00	U	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	2.00	U	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	2.00	U	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	2.00	U	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	2.00	U	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	1.18	J	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	2.00	U	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	2.00	U	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	2.00	U	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	2.00	U	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	HAASF-POTABLE-02RE
Collect Date:	02/16/21 Time: 1330	GCAL Sample ID:	22102251502RE
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ1
Sample Amt:	125 mL	Lab File ID:	2210310A_44.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:		Analysis Date:	03/10/21 Time: 1952
Prep Batch:	705832	Analytical Batch:	705663
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	HAASF-POTABLE-02-DUP
Collect Date:	02/16/21 Time: 1330	GCAL Sample ID:	22102251503
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2210302A_82.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:		Analysis Date:	03/03/21 Time: 0514
Prep Batch:	705832	Analytical Batch:	705119
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	2.00	U	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	2.00	U	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	2.00	U	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	2.00	U	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	2.00	U	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	2.00	U	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	2.00	U	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	2.00	U	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	2.00	U	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	2.00	U	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	HAASF-POTABLE-02-DUPRE
Collect Date:	02/16/21 Time: 1330	GCAL Sample ID:	22102251503RE
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ1
Sample Amt:	125 mL	Lab File ID:	2210310A_45.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:		Analysis Date:	03/10/21 Time: 2006
Prep Batch:	705832	Analytical Batch:	705663
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00

FORM I SV-1

DATA VALIDATION WORKSHEET

Per- and Polyfluorinated Compounds by LC/MS/MS

Reviewer: Tyler Bryant
Date: 3/30/2021
DV Level: II **III** IV
Review Document:
__X__ National Functional Guidelines for Organic Data Review
__X__ DOD QSM 5.1, Table B-15
_____ Method 537 Rev. 1.1

Project Name: Helena AASF
Project Number: 60552172
Laboratory: Pace Gulf Coast
SDG No.: 221022515
Test Name: PFAS

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	**X**		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	**X**		
1.3	Do sample preservation, collection and storage condition meet method requirement? 4±2°C If samples were received with the cooler temperature exceeding 6°C, then flag J(+)/UJ(-). If >20°C, J(+)/X(-)	**X**		
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		**X**	

Notes:

2.0 Holding Times		**Yes**	**No**	**NA**
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: 14 days; Analysis: 40 days.		**X**	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/X(-) .		**X**	

Notes:

3.0 Blanks (Laboratory and Field)		**Yes**	**No**	**NA**
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	**X**		
3.2	Do any instrument/method blanks have positive results?	**X**		
3.3	Do any field equipment blanks/trip blanks have positive results?		**X**	

Notes: The method blank MB2155526RE and laboratory blank 2210302A_11.d displayed concentrations for 6:2FTS and NMeFOSAA greater than the detection limit, respectively. The associated sample results were non-detect.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	For each calibration standard, was each analyte calculated within 70%-130% of the true value, RSD ≤20%, or r^2≥0.99?	X		
4.2	Was the retention time window for each analyte and surrogate set using the midpoint standard of the curve?	X		
4.3	Was the relative retention time of each analyte within laboratory control limits?	X		
4.4	Was a second source calibration verification (ICV) analyzed for each calibration curve? If no, flag "X".	X		
4.5	Were continuing calibration standards analyzed every ten samples and at the end of the sequence? If no, flag "X".	X		
4.6	For each calibration standard used for quantitation, was the S/N Ratio ≥10:1 and for all analytes with promulgated standards was the confirmation ion at a S/N at 3:1? (Table B-15, non-DW matrices)			X
For initial calibration: 70%-130%, RSD ≤20%, or r2≥0.99. J(+)/UJ(-)				
For ICV/CCV: %D>30%, Positive: J(+), Negative:J(+)/UJ(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
5.2	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits(lab default is 70%-130%)?		X	
	Action: If Yes, for %R >130, J+(+) only; for %R 30%-70%, J-(+)/UJ(-), and %R<30%, J-(+)/X(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		X	

Notes:

6.0 Surrogate Recovery/Internal Standard Area Count/Extracted Internal Standards (For Table B-15 Matrices)					Yes	No	NA
6.1	Are recoveries within acceptance criteria for all samples and method blanks?				X		
6.2	If No in Section 6.1, are these sample(s) or method blank(s) reanalyzed?				X		
6.3	If No in Section 6.2, is any sample dilution factor greater than 10? (recoveries may be diluted out.)				X		
		<10%	low	high			
	Positives	J-	J-	J+			
	Non-detects	X	UJ	None			
6.4	Has the Extracted/Injected Standard area count been met for all quality control and field samples? (50%-150%) If				X		
		<20%	low	high			
	Positives	J+	J+	J-			
	Non-detects	X	UJ	None			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		X	
	%Recovery: <30% 30%-70% >130%			
	Action: J-(+)/X(-) J-(+)/UJ(-) J+(+) only			
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits? (±30%)		X	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes:

8.0 Field/Laboratory Duplicates		Yes	No	NA
8.1	Acceptable field duplicate results? If no, J(+) parent sample/field duplicate only.		X	

Notes: The parent sample HAASF-POTABLE-02 displayed a positive result for FOSA while the associated duplicate sample was non-detect.

9.0 Instrument Sensitivity Check (ISC)		Yes	No	NA
9.1	Was an instrument sensitivity check analyzed prior to analysis and every 12 hours? If not X(+/-)	X		
9.2	Were analyte concentrations at the LOQ for the ISC and within ±30% of their true values? If not (J(+)/UJ(-)	X		

Notes:

10.0 Compound Identification/Tune and Detection Limit Verification		Yes	No	NA
10.1	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		
10.2	Was a mass calibration performed daily prior to analysis?	X		

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	X		
11.1.1	Number of samples: 3			
11.1.2	Number of target compounds in each analysis: 28			
11.1.3	Number of results "X" or "R" flagged results: 0			

QQQ2 Run Log

Analyst:	MRA	Expiration:
Instrument:	QQQ2	
Batch:	2210302A	
Current ICAL Bath:	2210302ACAL	
20mM Amm Acetate	016-32-1	3/4/2021
Methanol	2130000	6/30/2025
Calibration Std	016-29-2	8/24/2021
ICV Std	016-21-3	8/2/2021
EIS Mix	016-27-9	6/11/2021
IIS Mix	016-30-3	8/25/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2210302A_01.d	MeOH Shot	3/2/2021 10:54	MRA,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1207 RT Check	2210302A_02.d	QC	3/2/2021 11:07	MRA,QQQ2;Test	1
MeOH Shot	2210302A_03.d	MeOH Shot	3/2/2021 11:20	MRA,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1201	2210302A_04.d	Cal	3/2/2021 11:33	MRA,QQQ2;Cal	1
1202	2210302A_05.d	Cal	3/2/2021 11:46	MRA,QQQ2;Cal	1
1203	2210302A_06.d	Cal	3/2/2021 11:59	MRA,QQQ2;Cal	1
1204	2210302A_07.d	Cal	3/2/2021 12:12	MRA,QQQ2;Cal	1
1205	2210302A_08.d	Cal	3/2/2021 12:25	MRA,QQQ2;Cal	1
1206	2210302A_09.d	Cal	3/2/2021 12:38	MRA,QQQ2;Cal	1
MeOH Shot	2210302A_10.d	MeOH Shot	3/2/2021 13:03	MRA,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1500	2210302A_11.d	Sample	3/2/2021 13:16	MRA,QQQ2;Cal	1
1600	2210302A_12.d	Sample	3/2/2021 13:29	MRA,QQQ2;Cal	1
1450	2210302A_13.d	QC	3/2/2021 13:43	MRA,QQQ2;Cal	1
1450	2210302A_14.d	QC	3/2/2021 13:56	MRA,QQQ2;Cal	1
MeOH Shot	2210302A_15.d	MeOH Shot	3/2/2021 14:21	MRA,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1600	2210302A_16.d	Sample	3/2/2021 14:34	BMH,QQQ2;RR to confirm low PFTrDA recovery	1
1450	2210302A_17.d	QC	3/2/2021 14:47	BMH,QQQ2;RR to confirm low PFUnA recovery	1
MeOH Shot	2210302A_18.d	MeOH Shot	3/2/2021 15:07	MRA,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
1450	2210302A_19.d	QC	3/2/2021 15:20	BMH,QQQ2;RR due to injection error	1
MeOH Shot	2210302A_20.d	MeOH Shot	3/2/2021 15:45	MRA,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1

2150637	2210302A_21.d	Sample	3/2/2021 15:58	BMH,QQQ2;704963	1
2150638	2210302A_22.d	QC	3/2/2021 16:11	BMH,QQQ2;704963	1
2150639	2210302A_23.d	QC	3/2/2021 16:24	BMH,QQQ2;704963	1
22103020301	2210302A_24.d	Sample	3/2/2021 16:37	BMH,QQQ2;704963	1
1400	2210302A_25.d	QC	3/2/2021 16:50	BMH,QQQ2;CCV	1
2146253	2210302A_26.d	Sample	3/2/2021 17:04	BMH,QQQ2;704198	1
2146254	2210302A_27.d	QC	3/2/2021 17:17	BMH,QQQ2;704198	1
2146255	2210302A_28.d	QC	3/2/2021 17:30	BMH,QQQ2;704198	1
22102186501 x50	2210302A_29.d	Sample	3/2/2021 17:43	BMH,QQQ2;704198	50
22102186501 x5	2210302A_30.d	Sample	3/2/2021 17:56	BMH,QQQ2;704198	5
MeOH Shot	2210302A_31.d	MeOH Shot	3/2/2021 18:09	MRA,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
2146103	2210302A_32.d	Sample	3/2/2021 18:22	BMH,QQQ2;704149	1
2146104	2210302A_33.d	QC	3/2/2021 18:35	BMH,QQQ2;704149	1
2147787	2210302A_34.d	QC	3/2/2021 18:48	BMH,QQQ2;704149	1
22102191109 x250 DAI	2210302A_35.d	Sample	3/2/2021 19:01	BMH,QQQ2;704149	1
22102191110 x250 DAI	2210302A_36.d	Sample	3/2/2021 19:14	BMH,QQQ2;704149	1
22102191111 x250 DAI	2210302A_37.d	Sample	3/2/2021 19:27	BMH,QQQ2;704149	1
22102191112 x250 DAI	2210302A_38.d	Sample	3/2/2021 19:40	BMH,QQQ2;704149	1
22102191109 x250 DUP	2210302A_39.d	Sample	3/2/2021 19:53	BMH,QQQ2;704149	1
22102191110 x250 DUP	2210302A_40.d	Sample	3/2/2021 20:06	BMH,QQQ2;704149	1
22102191111 x250 DUP	2210302A_41.d	Sample	3/2/2021 20:19	BMH,QQQ2;704149	1
22102191112 x250 DUP	2210302A_42.d	Sample	3/2/2021 20:32	BMH,QQQ2;704149	1
1400	2210302A_43.d	QC	3/2/2021 20:45	BMH,QQQ2;CCV	1
22102191109 x50	2210302A_44.d	Sample	3/2/2021 20:58	BMH,QQQ2;704149	50
22102191110 x50	2210302A_45.d	Sample	3/2/2021 21:11	BMH,QQQ2;704149	50
22102191111 x50	2210302A_46.d	Sample	3/2/2021 21:24	BMH,QQQ2;704149	50
22102191112 x50	2210302A_47.d	Sample	3/2/2021 21:38	BMH,QQQ2;704149	50
2147396	2210302A_48.d	Sample	3/2/2021 21:51	BMH,QQQ2;704433	1
2147397	2210302A_49.d	QC	3/2/2021 22:04	BMH,QQQ2;704433	1
2147398	2210302A_50.d	QC	3/2/2021 22:17	BMH,QQQ2;704433	1
22102191101 x1000 DAI	2210302A_51.d	Sample	3/2/2021 22:30	BMH,QQQ2;704433	1
22102191101 x1000 DUP	2210302A_52.d	Sample	3/2/2021 22:43	BMH,QQQ2;704433	1
22102191102 x1000 DAI	2210302A_53.d	Sample	3/2/2021 22:56	BMH,QQQ2;704433	1
22102191102 x1000 DUP	2210302A_54.d	Sample	3/2/2021 23:09	BMH,QQQ2;704433	1

22102191103 x1000 DAI	2210302A_55.d	Sample	3/2/2021 23:22	BMH,QQQ2;704433	1
22102191103 x1000 DUP	2210302A_56.d	Sample	3/2/2021 23:35	BMH,QQQ2;704433	1
1400	2210302A_57.d	QC	3/2/2021 23:48	BMH,QQQ2;CCV	1
22102191104 x1000 DAI	2210302A_58.d	Sample	3/3/2021 0:01	BMH,QQQ2;704433	1
22102191104 x1000 DUP	2210302A_59.d	Sample	3/3/2021 0:14	BMH,QQQ2;704433	1
22102191101 x50	2210302A_60.d	Sample	3/3/2021 0:27	BMH,QQQ2;704433	50
22102191102 x50	2210302A_61.d	Sample	3/3/2021 0:40	BMH,QQQ2;704433	50
22102191103 x50	2210302A_62.d	Sample	3/3/2021 0:53	BMH,QQQ2;704433	50
22102191104 x50	2210302A_63.d	Sample	3/3/2021 1:06	BMH,QQQ2;704433	50
22102191105	2210302A_64.d	Sample	3/3/2021 1:19	BMH,QQQ2;704433	1
22102191106	2210302A_65.d	Sample	3/3/2021 1:32	BMH,QQQ2;704433	1
22102191107	2210302A_66.d	Sample	3/3/2021 1:45	BMH,QQQ2;704433	1
22102191108	2210302A_67.d	Sample	3/3/2021 1:58	BMH,QQQ2;704433	1
1400	2210302A_68.d	QC	3/3/2021 2:11	BMH,QQQ2;CCV	1
22102255401 x10	2210302A_69.d	Sample	3/3/2021 2:24	BMH,QQQ2;704596	10
Basic MeOH 016-31-7	2210302A_70.d	Sample	3/3/2021 2:37	BMH,QQQ2;Test	1
Basic MeOH 016-31-8	2210302A_71.d	Sample	3/3/2021 2:51	BMH,QQQ2;Test	1
Basic MeOH 016-31-9	2210302A_72.d	Sample	3/3/2021 3:04	BMH,QQQ2;Test	1
1450	2210302A_73.d	QC	3/3/2021 3:17	BMH,QQQ2;CCV	1
2148271/2155526	2210302A_74.d	Sample	3/3/2021 3:30	BMH,QQQ2;704580	1
2148272/2155527	2210302A_75.d	QC	3/3/2021 3:43	BMH,QQQ2;704580	1
2148273/2155528	2210302A_76.d	QC	3/3/2021 3:56	BMH,QQQ2;704580	1
22102247105	2210302A_77.d	Sample	3/3/2021 4:09	BMH,QQQ2;704580	1
22102247106	2210302A_78.d	Sample	3/3/2021 4:22	BMH,QQQ2;704580	1
22102247102	2210302A_79.d	Sample	3/3/2021 4:35	BMH,QQQ2;704580	1
22102251501	2210302A_80.d	Sample	3/3/2021 4:48	BMH,QQQ2;704580	1
22102251502	2210302A_81.d	Sample	3/3/2021 5:01	BMH,QQQ2;704580	1
22102251503	2210302A_82.d	Sample	3/3/2021 5:14	BMH,QQQ2;704580	1
22102247101 x10	2210302A_83.d	Sample	3/3/2021 5:27	BMH,QQQ2;704580	10
22102247101 x1	2210302A_84.d	Sample	3/3/2021 5:40	BMH,QQQ2;704580	1
22102247103 x10	2210302A_85.d	Sample	3/3/2021 5:53	BMH,QQQ2;704580	10
22102247103 x1	2210302A_86.d	Sample	3/3/2021 6:06	BMH,QQQ2;704580	1
1400	2210302A_87.d	QC	3/3/2021 6:19	BMH,QQQ2;CCV	1
22102247104 x20	2210302A_88.d	Sample	3/3/2021 6:32	BMH,QQQ2;704580	20

22102247104 x1	2210302A_89.d	Sample	3/3/2021 6:45	BMH,QQQ2;704580	1
MeOH Shot	2210302A_90.d	MeOH Shot	3/3/2021 6:58	BMH,QQQ2;MeOH SHOT/INSTRUMENT IDLE	1
2149318	2210302A_91.d	Sample	3/3/2021 7:11	BMH,QQQ2;704733	1
2149319	2210302A_92.d	QC	3/3/2021 7:24	BMH,QQQ2;704733	1
2149320	2210302A_93.d	QC	3/3/2021 7:37	BMH,QQQ2;704733	1
22102265207	2210302A_94.d	Sample	3/3/2021 7:51	BMH,QQQ2;704733	1
1400	2210302A_95.d	QC	3/3/2021 8:04	BMH,QQQ2;CCV	1

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	221022515	Instrument ID:	QQQ2
Analysis Date:	03/02/2021 15:20	Lab File ID:	2210302A_19.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705119

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	3.75	4.49	120	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	3.81	3.74	98	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	3.84	4.42	115	70	130	
Perfluorooctane Sulfonamide	ng/L	4.00	4.20	105	70	130	
NEtFOSA	ng/L	4.00	4.10	102	70	130	
NEtFOSAA	ng/L	4.00	3.10	77	70	130	
NEtFOSE	ng/L	4.00	3.64	91	70	130	
NMeFOSA	ng/L	4.00	5.06	126	70	130	
NMeFOSAA	ng/L	4.00	3.74	93	70	130	
NMeFOSE	ng/L	4.00	5.18	130	70	130	
Perfluorobutanoic acid	ng/L	4.00	3.90	97	70	130	
Perfluorobutanesulfonic acid	ng/L	3.55	3.89	110	70	130	
Perfluorodecanoic acid	ng/L	4.00	4.43	111	70	130	
Perfluorodecane sulfonic acid	ng/L	3.86	3.37	87	70	130	
Perfluorododecanoic acid	ng/L	4.00	4.46	111	70	130	
Perfluoroheptanoic acid	ng/L	4.00	4.15	104	70	130	
Perfluoroheptanesulfonic acid	ng/L	3.82	4.06	106	70	130	
Perfluorohexanoic acid	ng/L	4.00	4.69	117	70	130	
Perfluorohexanesulfonic acid	ng/L	3.66	4.05	111	70	130	
Perfluorononanoic acid	ng/L	4.00	4.38	109	70	130	
Perfluorononanesulfonic acid	ng/L	3.85	3.56	93	70	130	
Perfluorooctanoic acid	ng/L	4.00	4.19	105	70	130	
Perfluorooctanesulfonic acid	ng/L	3.71	3.54	95	70	130	
Perfluoropentanoic acid	ng/L	4.00	4.57	114	70	130	
Perfluoropentanesulfonic acid	ng/L	3.77	3.65	97	70	130	
Perfluorotetradecanoic acid	ng/L	4.00	4.15	104	70	130	
Perfluorotridecanoic acid	ng/L	4.00	3.67	92	70	130	
Perfluoroundecanoic acid	ng/L	4.00	3.91	98	70	130	

FORM 7S - ORG

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	221022515	Instrument ID:	QQQ2
Analysis Date:	03/02/2021 14:34	Lab File ID:	2210302A_16.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705119

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	10000	7880	79	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	10000	8340	83	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	10100	8010	79	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	8400	84	70	130	
NEtFOSA	ng/L	10000	9680	97	70	130	
NEtFOSAA	ng/L	10000	8830	88	70	130	
NEtFOSE	ng/L	10000	8550	85	70	130	
NMeFOSA	ng/L	10000	9050	90	70	130	
NMeFOSAA	ng/L	10000	9060	91	70	130	
NMeFOSE	ng/L	10000	8560	86	70	130	
Perfluorobutanoic acid	ng/L	10000	8530	85	70	130	
Perfluorobutanesulfonic acid	ng/L	10000	8260	83	70	130	
Perfluorodecanoic acid	ng/L	10000	8140	81	70	130	
Perfluorodecane sulfonic acid	ng/L	10100	7840	78	70	130	
Perfluorododecanoic acid	ng/L	10000	7950	80	70	130	
Perfluoroheptanoic acid	ng/L	10000	8350	84	70	130	
Perfluoroheptanesulfonic acid	ng/L	10000	8000	80	70	130	
Perfluorohexanoic acid	ng/L	10100	8420	83	70	130	
Perfluorohexanesulfonic acid	ng/L	10000	8420	84	70	130	
Perfluorononanoic acid	ng/L	10000	8890	89	70	130	
Perfluorononanesulfonic acid	ng/L	10100	8190	81	70	130	
Perfluorooctanoic acid	ng/L	10100	8400	83	70	130	
Perfluorooctanesulfonic acid	ng/L	10000	7320	73	70	130	
Perfluoropentanoic acid	ng/L	10100	8480	84	70	130	
Perfluoropentanesulfonic acid	ng/L	10000	8980	90	70	130	
Perfluorotetradecanoic acid	ng/L	10000	10000	100	70	130	
Perfluorotridecanoic acid	ng/L	10000	7360	74	70	130	
Perfluoroundecanoic acid	ng/L	10000	7880	79	70	130	

FORM 6I - ORG

4I

ORGANICS INSTRUMENT BLANK

Report No:	221022515	Instrument ID:	QQQ2
Analysis Date:	03/02/2021 13:16	Lab File ID:	2210302A_11.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705119

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
4:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.85	2.00	4.00	
6:2 Fluorotelomersulfonic acid	ng/L	1.12	J	0.94	2.00	4.00	
8:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.90	2.00	4.00	
NEtFOSA	ng/L	4.00	U	0.96	4.00	8.00	
NEtFOSAA	ng/L	4.00	U	0.97	4.00	8.00	
NEtFOSE	ng/L	4.00	U	0.90	4.00	8.00	
NMeFOSA	ng/L	4.00	U	0.97	4.00	8.00	
NMeFOSAA	ng/L	4.00	U	0.91	4.00	8.00	
NMeFOSE	ng/L	4.00	U	0.87	4.00	8.00	
Perfluorobutanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorobutanoic acid	ng/L	2.00	U	0.90	2.00	4.00	
Perfluorodecane sulfonic acid	ng/L	2.00	U	0.80	2.00	4.00	
Perfluorodecanoic acid	ng/L	2.00	U	0.86	2.00	4.00	
Perfluorododecanoic acid	ng/L	2.00	U	0.88	2.00	4.00	
Perfluoroheptanesulfonic acid	ng/L	2.00	U	0.84	2.00	4.00	
Perfluoroheptanoic acid	ng/L	2.00	U	0.48	2.00	4.00	
Perfluorohexanesulfonic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluorohexanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluorononanesulfonic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorononanoic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorooctane Sulfonamide	ng/L	2.00	U	0.96	2.00	4.00	
Perfluorooctanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorooctanoic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluoropentanesulfonic acid	ng/L	2.00	U	0.69	2.00	4.00	
Perfluoropentanoic acid	ng/L	2.00	U	0.85	2.00	4.00	
Perfluorotetradecanoic acid	ng/L	2.00	U	0.98	2.00	4.00	
Perfluorotridecanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluoroundecanoic acid	ng/L	2.00	U	0.95	2.00	4.00	

* - Result greater than 1/2 LOQ

Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2210302ACAL\QuantResults\2210302A.batch.bin		
Analysis Time	3/11/2021 11:37 AM	**Analyst Name**	GCAL\lcms
Report Time	3/11/2021 11:40 AM	**Reporter Name**	GCAL\lcms
Last Calib Update	3/2/2021 3:08 PM	**Batch State**	Processed

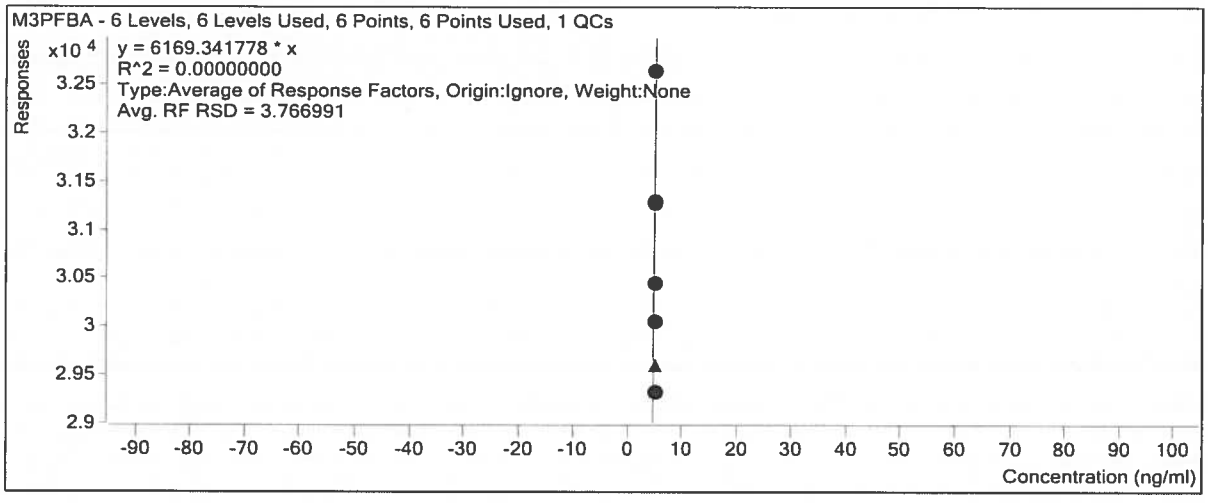
Calibration Info

Extracted ISTD *MPFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	24664	5.0000	4932.7460
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	24821	5.0000	4964.2989
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	25187	5.0000	5037.4023
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	27574	5.0000	5514.7913
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	24215	5.0000	4843.0284
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	24048	5.0000	4809.6224

Instrument ISTD *M3PFBA*

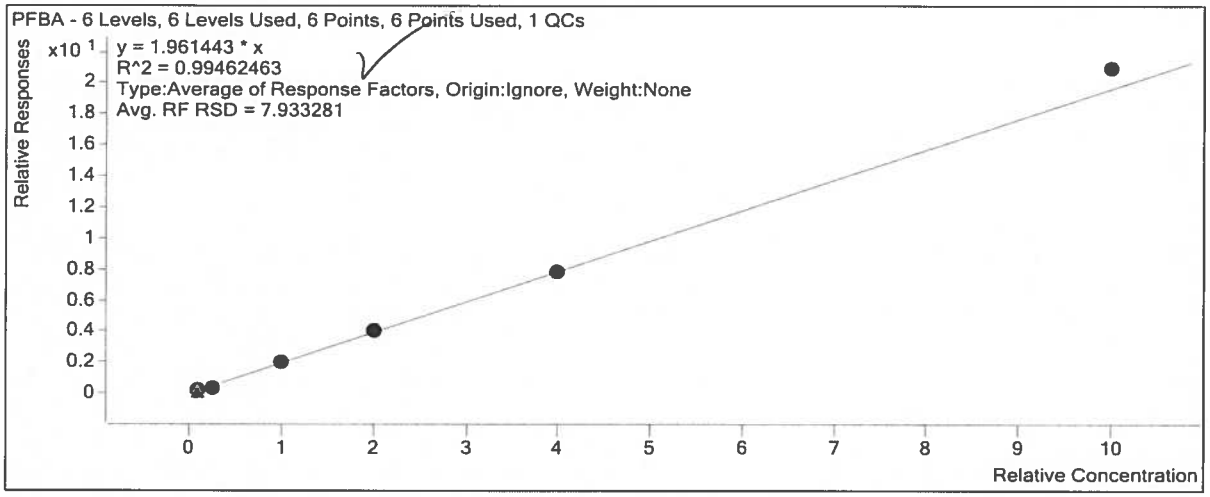
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	29332	5.0000	5866.3133
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	30452	5.0000	6090.3935
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	30055	5.0000	6011.0947
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	31279	5.0000	6255.8836
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	32657	5.0000	6531.3513
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	31305	5.0000	6261.0143



Target Compound *PFBA*

Quantitative Analysis Calibration Report

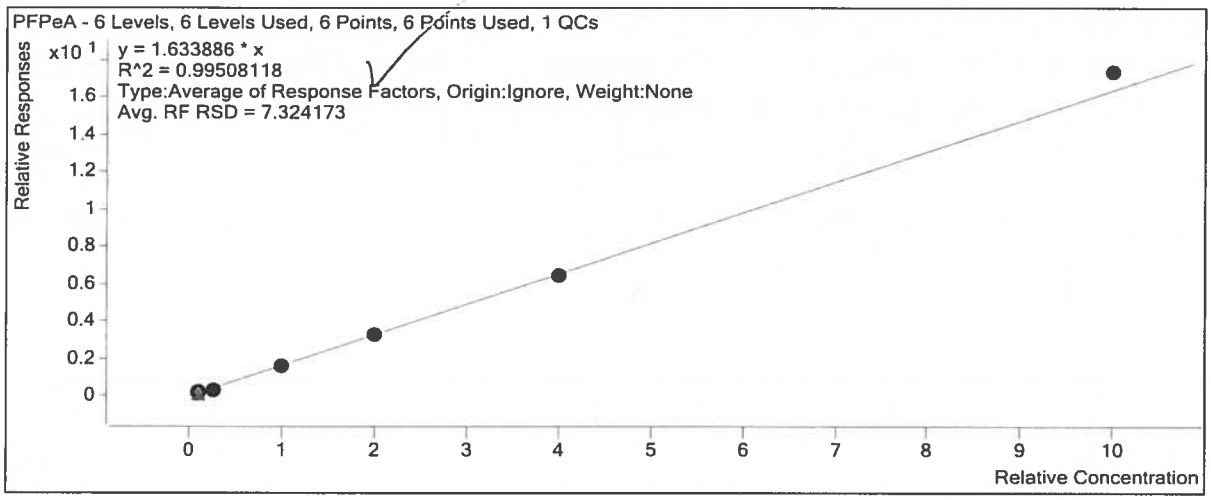
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	4942	0.5000	2.0037
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	10267	1.2500	1.6545
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	51254	5.0000	2.0349
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	111293	10.0000	2.0181
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	190620	20.0000	1.9680
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	502488	50.0000	2.0895



Target Compound *PFMPA*

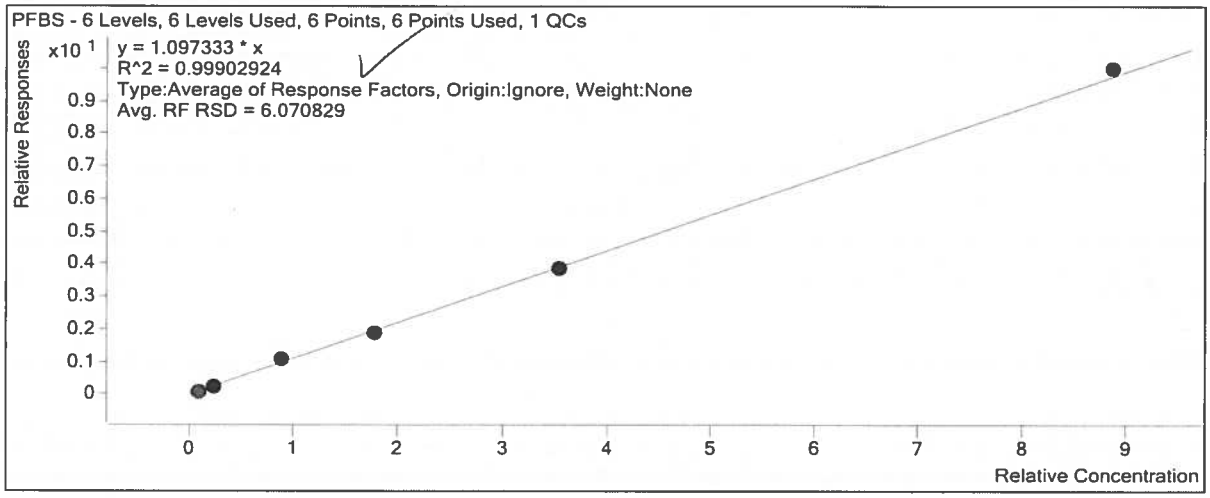
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	2409	0.5000	1.4168
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	5269	1.2500	1.2330
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	24637	5.0000	1.3807
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	53198	10.0000	1.3797
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	90628	20.0000	1.3367
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	238116	50.0000	1.4358

Quantitative Analysis Calibration Report



Target Compound *PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1151	0.4435	1.0618
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	2608	1.1088	1.0254
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	12585	4.4350	1.2171
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	24922	8.8700	1.0741
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	43740	17.7400	1.0826
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	114795	44.3500	1.1230



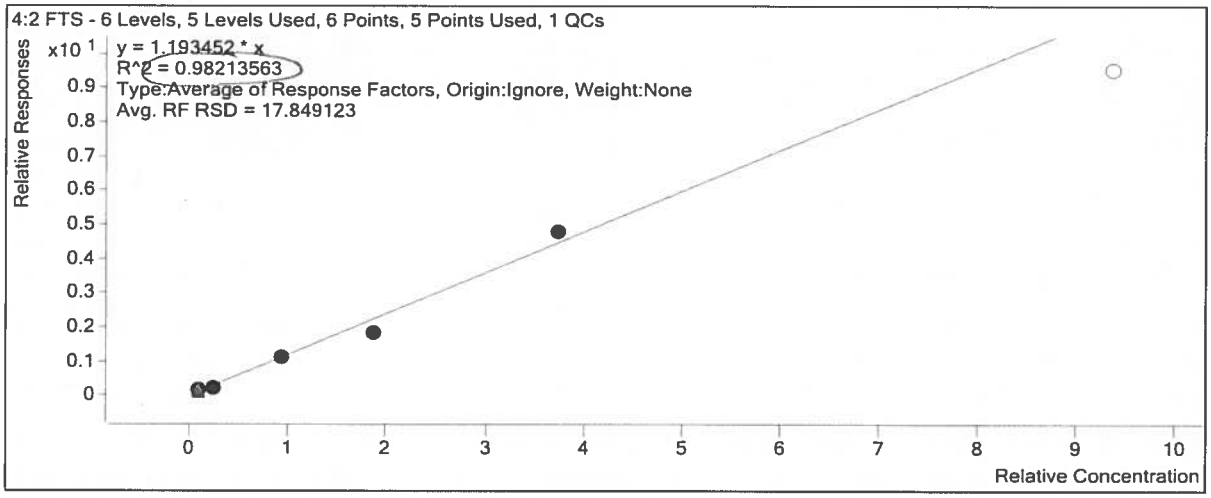
Extracted ISTD *M3PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	12219	5.0000	2443.8245

D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	3313	5.0000	662.6190
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	3051	5.0000	610.1110
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	3755	5.0000	750.9617
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	2543	5.0000	508.5235
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	3111	5.0000	622.2158

Target Compound *4:2 FTS*

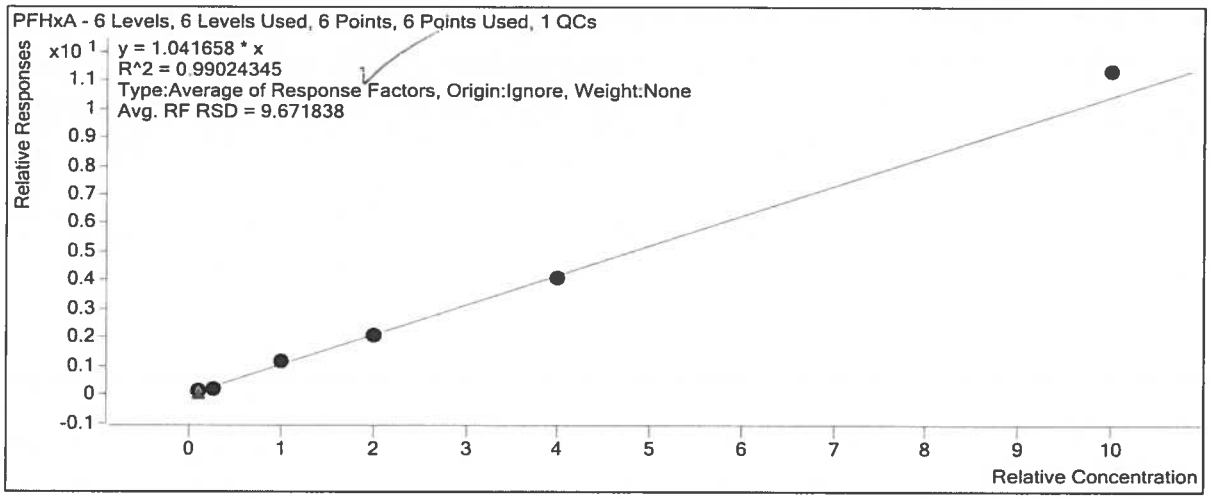
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	444	0.4685	1.4947
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	775	1.1713	0.9987
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	3484	4.6850	1.2189
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	6896	9.3700	0.9800
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	12149	18.7400	1.2749
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☐	29715	46.8500	1.0194



Extracted ISTD *M5PFHxA*

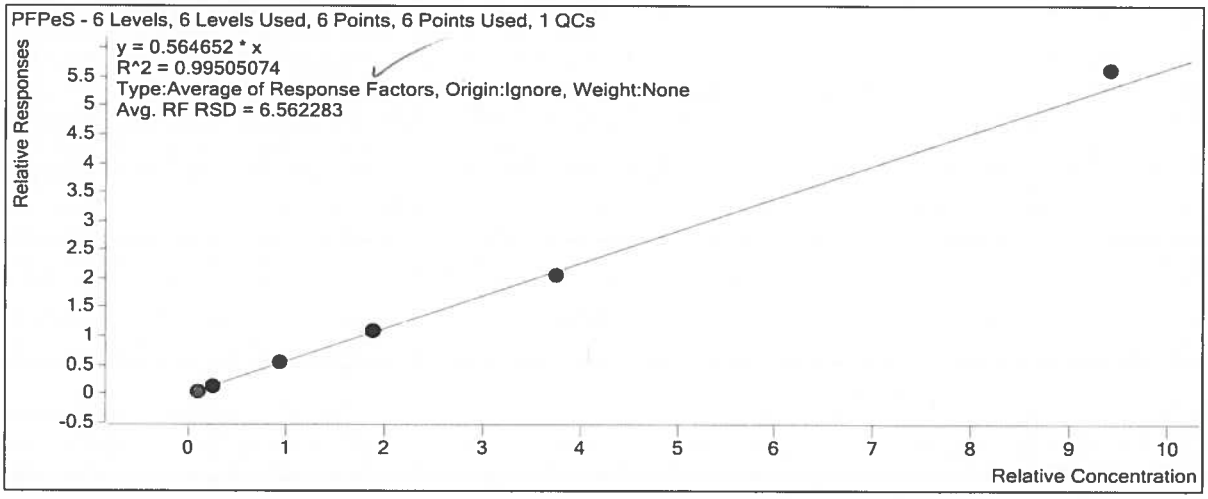
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	22421	5.0000	4484.1894
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	22908	5.0000	4581.6489
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	20649	5.0000	4129.7268
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	23614	5.0000	4722.7286
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	20646	5.0000	4129.1446
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	20414	5.0000	4082.7959

Quantitative Analysis Calibration Report



Target Compound *PFPeS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1159	0.4705	0.5492
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	2731	1.1763	0.5067
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	11640	4.7050	0.5991
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	26153	9.4100	0.5885
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	42414	18.8200	0.5458
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	115002	47.0500	0.5987



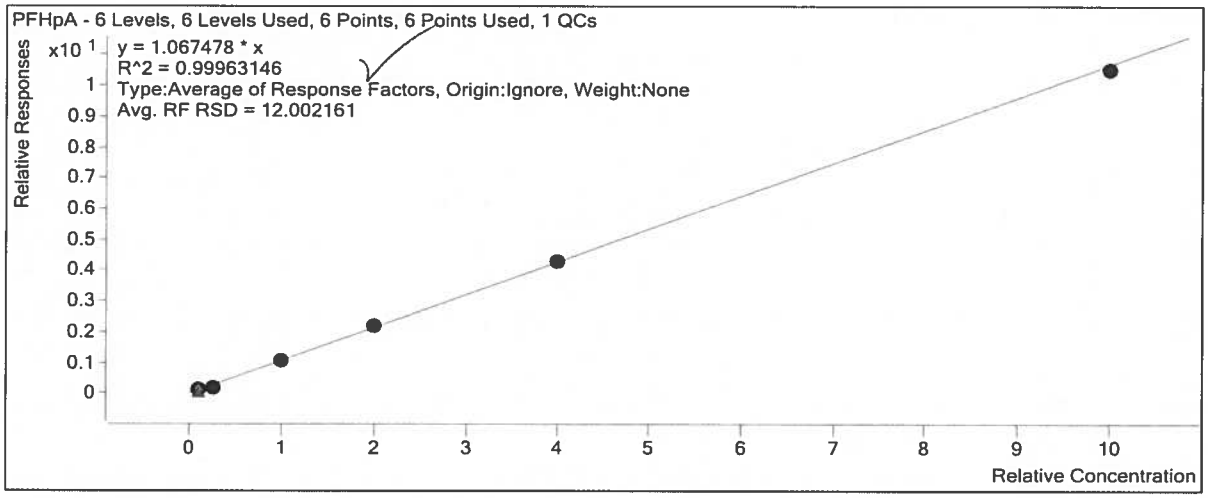
Extracted ISTD *M3HFPODA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1037	10.0000	103.6643

Quantitative Analysis Calibration Report

Target Compound *PFHpA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	2491	0.5000	1.2211
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	4207	1.2500	0.8334
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	21919	5.0000	1.1160
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	46868	10.0000	1.0992
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	78665	20.0000	1.0805
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	202325	50.0000	1.0547



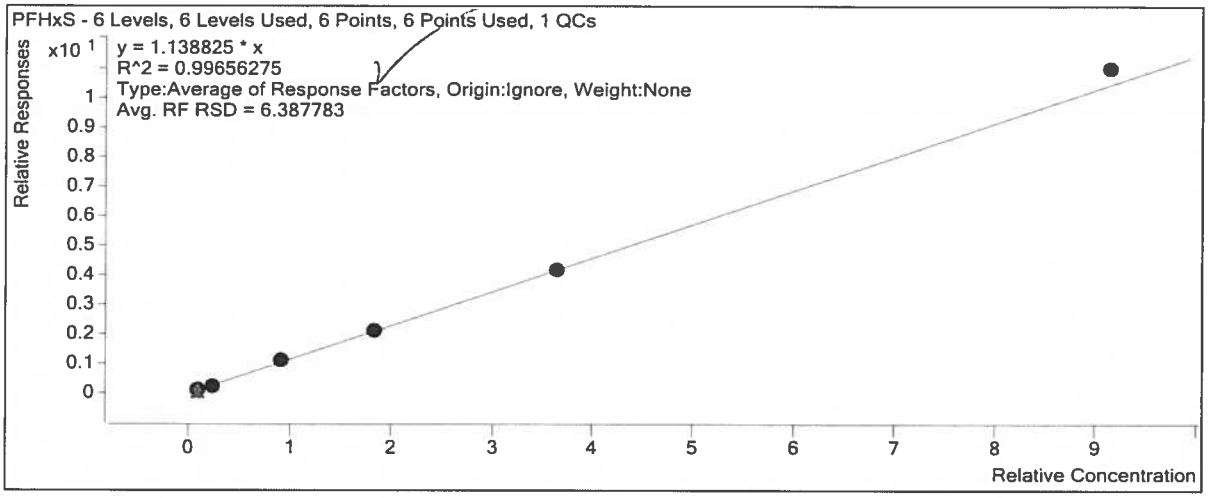
Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	12383	5.0000	2476.5173
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	12048	5.0000	2409.5827
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	12277	5.0000	2455.4802
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	13644	5.0000	2728.8798
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	11313	5.0000	2262.5368
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	11387	5.0000	2277.3995

Target Compound *PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1247	0.4570	1.1020

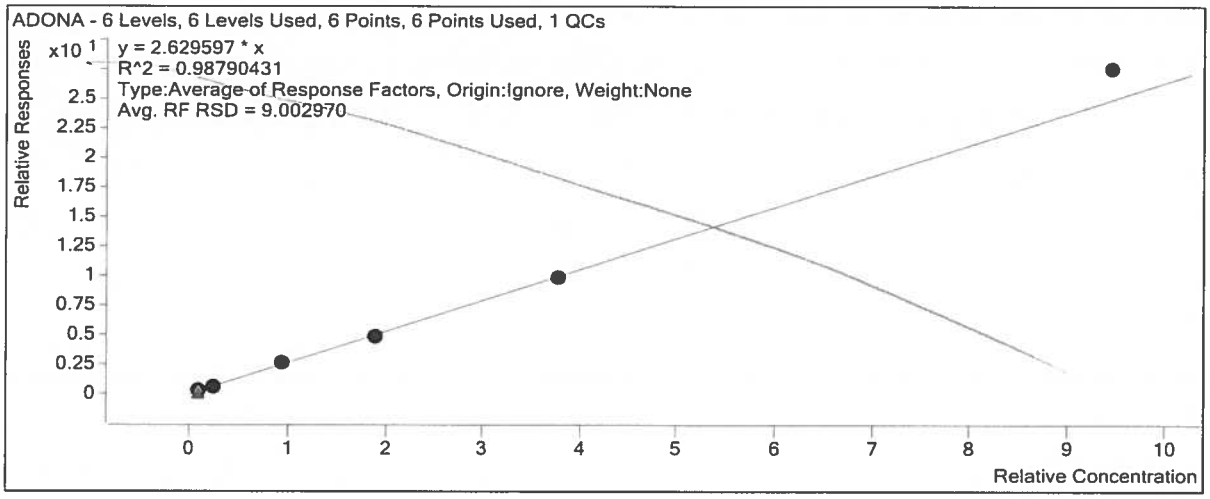
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	2791	1.1425	1.0139
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	13610	4.5700	1.2129
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	29023	9.1400	1.1636
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	47290	18.2800	1.1434
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	124591	45.7000	1.1971



Target Compound *ADONA*

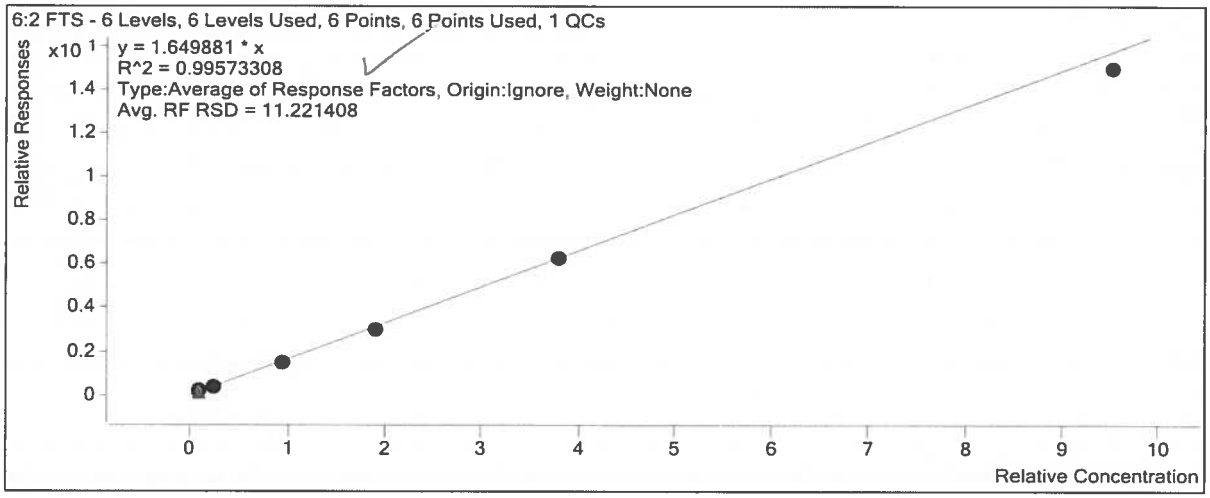
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	8567	0.4725	2.6226
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	17785	1.1813	2.2508
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	95122	4.7250	2.8669
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	197510	9.4500	2.5352
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	332969	18.9000	2.6062
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	866605	47.2500	2.8959

Quantitative Analysis Calibration Report



Target Compound *6:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	998	0.4755	2.0203
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	1896	1.1888	1.5714
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	8653	4.7550	1.5265
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	19443	9.5100	1.5746
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	30230	19.0200	1.6405
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	79413	47.5500	1.5659



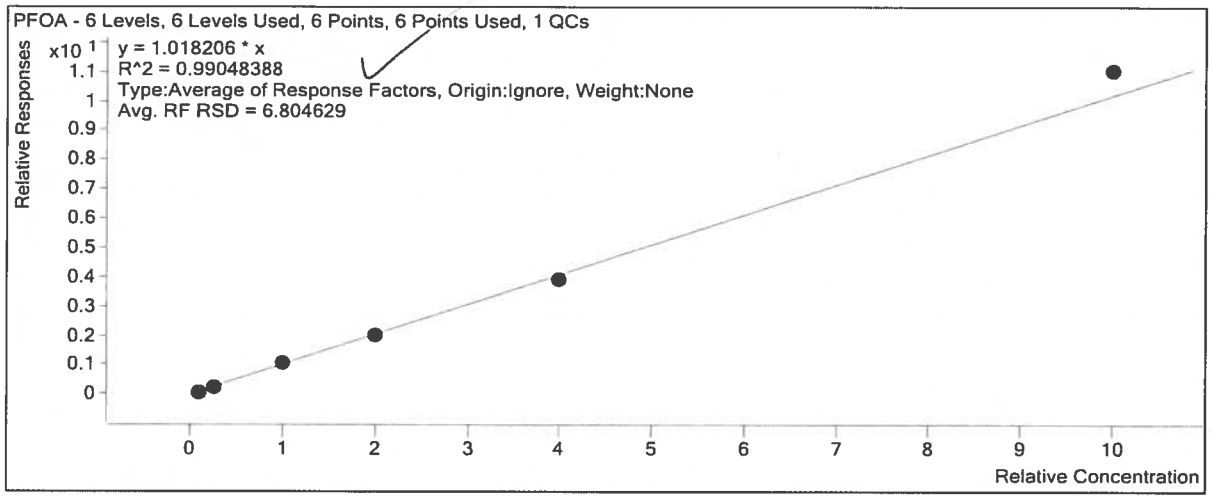
Extracted ISTD *M2 6:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	5193	5.0000	1038.5619

Quantitative Analysis Calibration Report

Target Compound *PFOA*

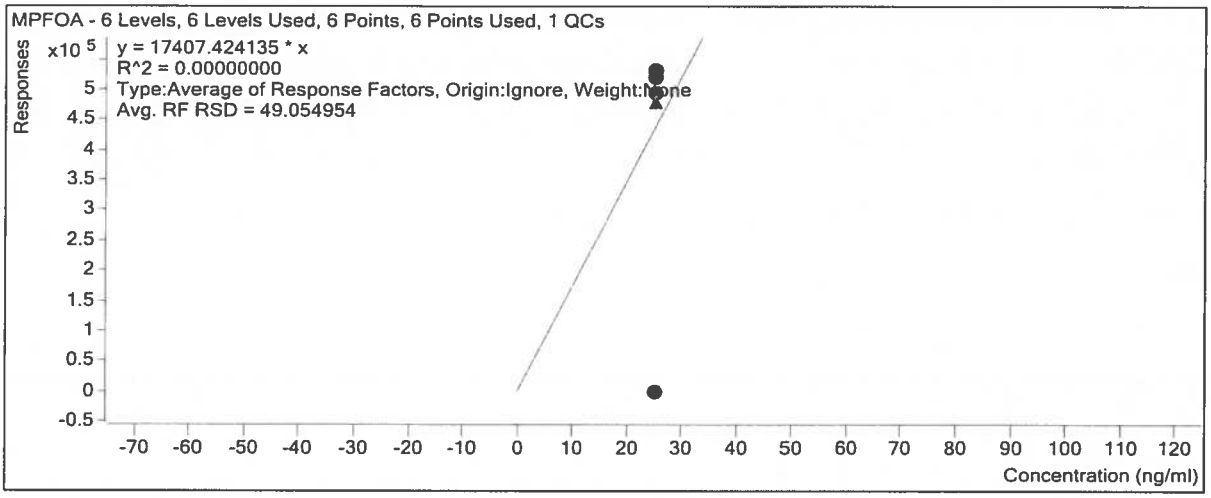
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	3543	0.5000	1.0249
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	7594	1.2500	0.9082
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	37399	5.0000	1.0652
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	84570	10.0000	1.0258
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	132177	20.0000	0.9777
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	350686	50.0000	1.1074



Instrument ISTD *MPFOA*

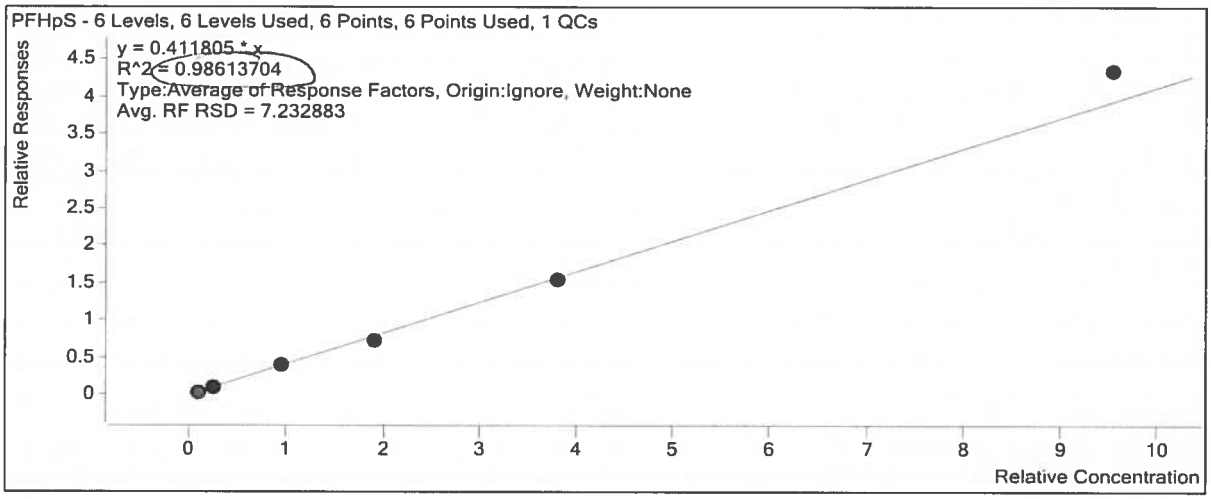
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	494509	25.0000	19780.3754
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	531038	25.0000	21241.5127
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	533144	25.0000	21325.7402
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	432	25.0000	17.2716
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	520415	25.0000	20816.6177
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	531576	25.0000	21263.0272

Quantitative Analysis Calibration Report



Target Compound *PFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1382	0.4765	0.4194
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	3007	1.1913	0.3774
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	14332	4.7650	0.4283
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	30026	9.5300	0.3822
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	52418	19.0600	0.4068
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	137829	47.6500	0.4567



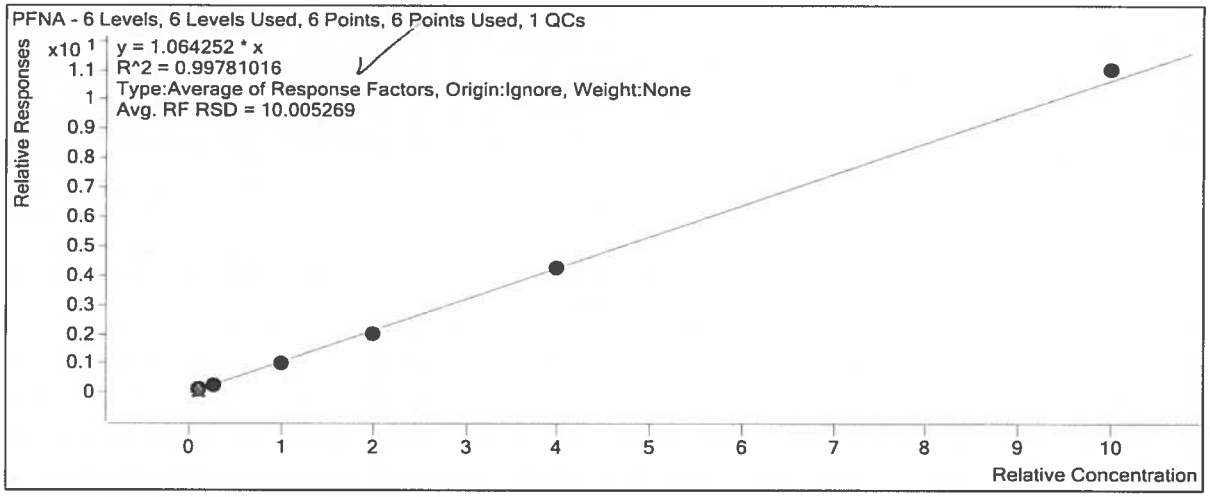
Extracted ISTD *M9PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	30418	5.0000	6083.6915

D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	31333	5.0000	6266.5510
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	30797	5.0000	6159.3735
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	33360	5.0000	6671.9116
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	28280	5.0000	5655.9224
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	27007	5.0000	5401.4337

Target Compound *PFNA*

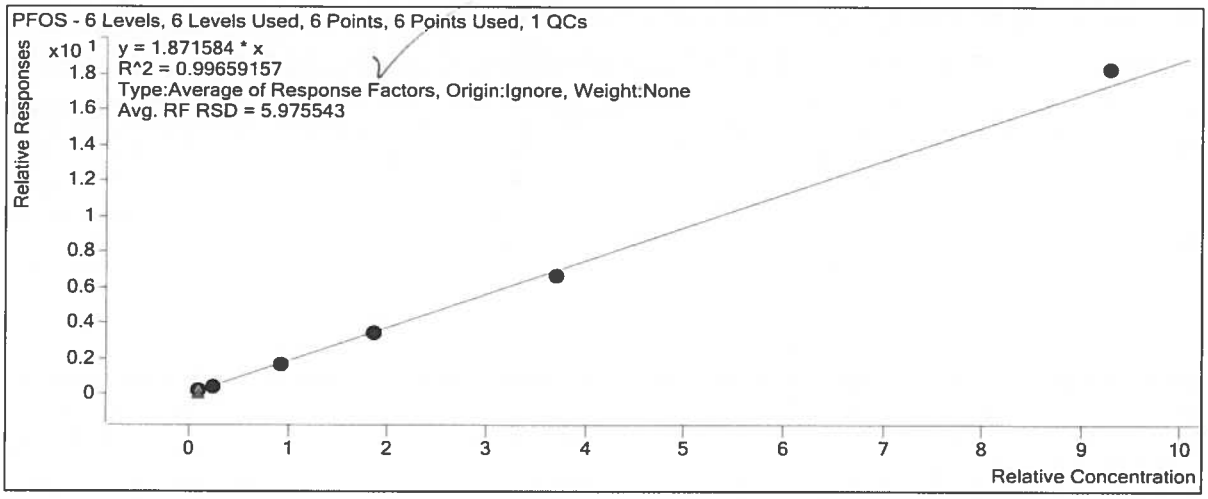
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	3789	0.5000	1.2456
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	7295	1.2500	0.9313
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	31413	5.0000	1.0200
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	67755	10.0000	1.0155
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	120642	20.0000	1.0665
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	298828	50.0000	1.1065



Target Compound *PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1788	0.4640	2.0413
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	4028	1.1600	1.7380
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	17399	4.6400	1.8521
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	36498	9.2800	1.8467
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	60060	18.5600	1.7895
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	160716	46.4000	1.9619

Quantitative Analysis Calibration Report



Extracted ISTD *M8PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	9438	5.0000	1887.6513
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	9989	5.0000	1997.8316
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	10123	5.0000	2024.5582
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	10649	5.0000	2129.7560
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	9042	5.0000	1808.3670
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	8827	5.0000	1765.4592

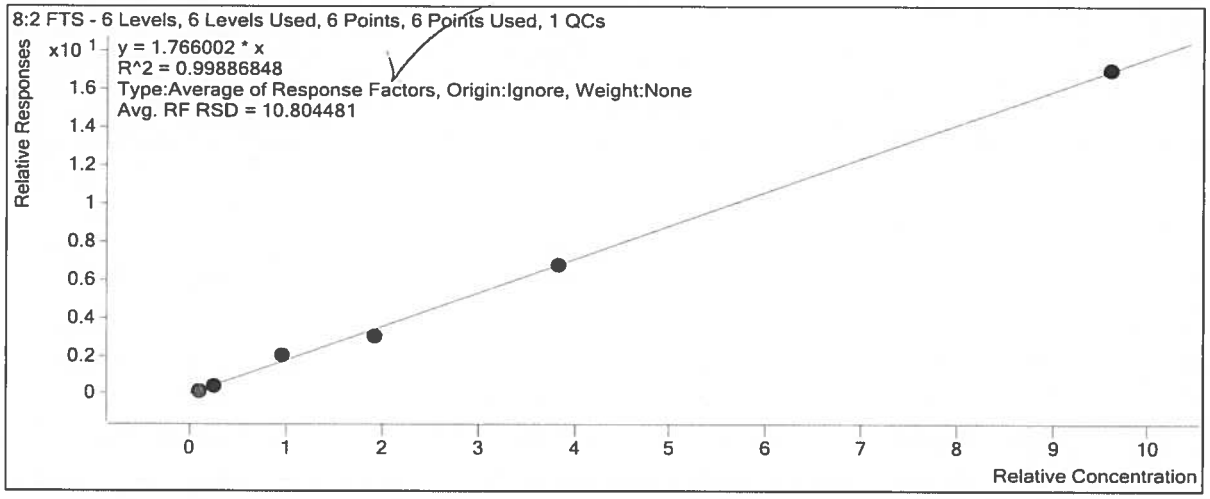
Instrument ISTD *M4PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	62220	20.0000	3111.0091
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	66190	20.0000	3309.4944
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	63799	20.0000	3189.9266
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	65362	20.0000	3268.0765
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	69482	20.0000	3474.1127
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	67168	20.0000	3358.3940

D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	4628	5.0000	925.5868
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	4591	5.0000	918.1016
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	5891	5.0000	1178.2430
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	4570	5.0000	913.9857
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	4570	5.0000	914.0399

Target Compound *8:2 FTS*

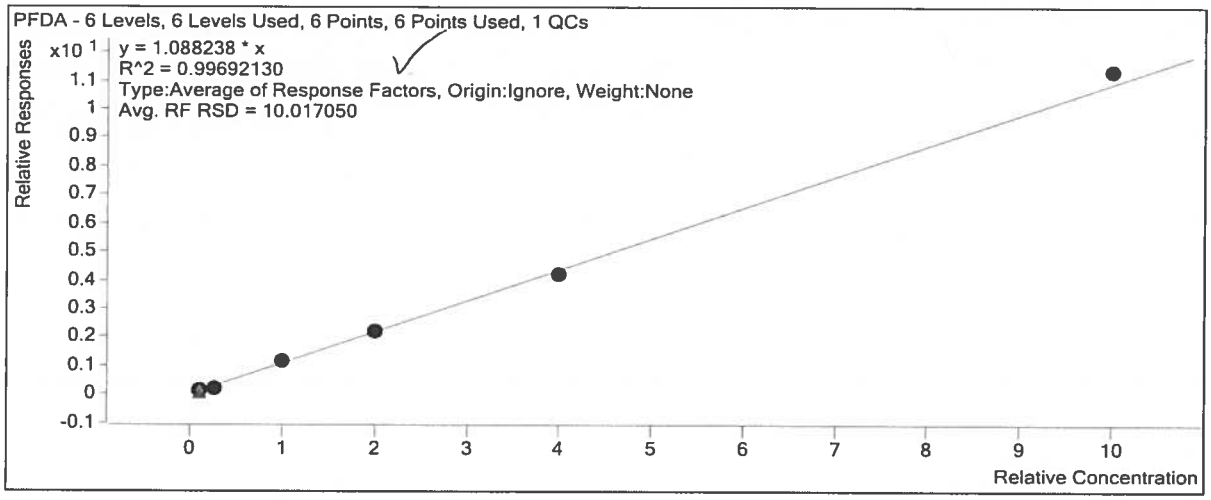
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	827	0.4800	1.8205
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	1734	1.2000	1.5612
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	9200	4.8000	2.0877
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	17906	9.6000	1.5830
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	30994	19.2000	1.7662
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	77982	48.0000	1.7774



Extracted ISTD *M6PFDA*

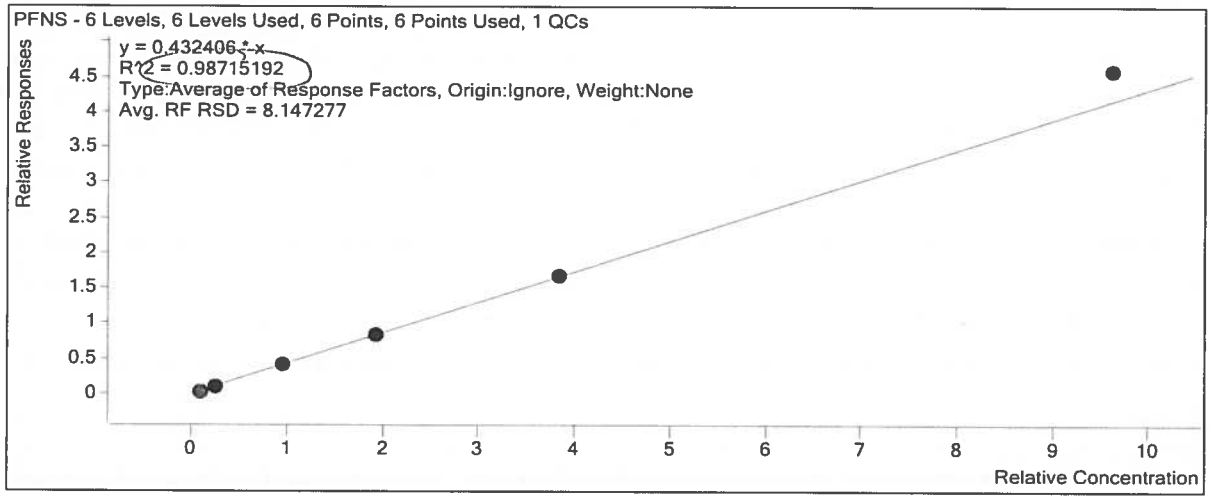
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	16239	5.0000	3247.7243
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	17054	5.0000	3410.8245
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	16494	5.0000	3298.8633
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	18849	5.0000	3769.8741
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	15581	5.0000	3116.2613
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	14981	5.0000	2996.1195

Quantitative Analysis Calibration Report



Target Compound *PFNS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1080	0.4810	0.3691
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	3309	1.2025	0.4391
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	12799	4.8100	0.4320
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	28245	9.6200	0.4401
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	47460	19.2400	0.4361
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	124199	48.1000	0.4780

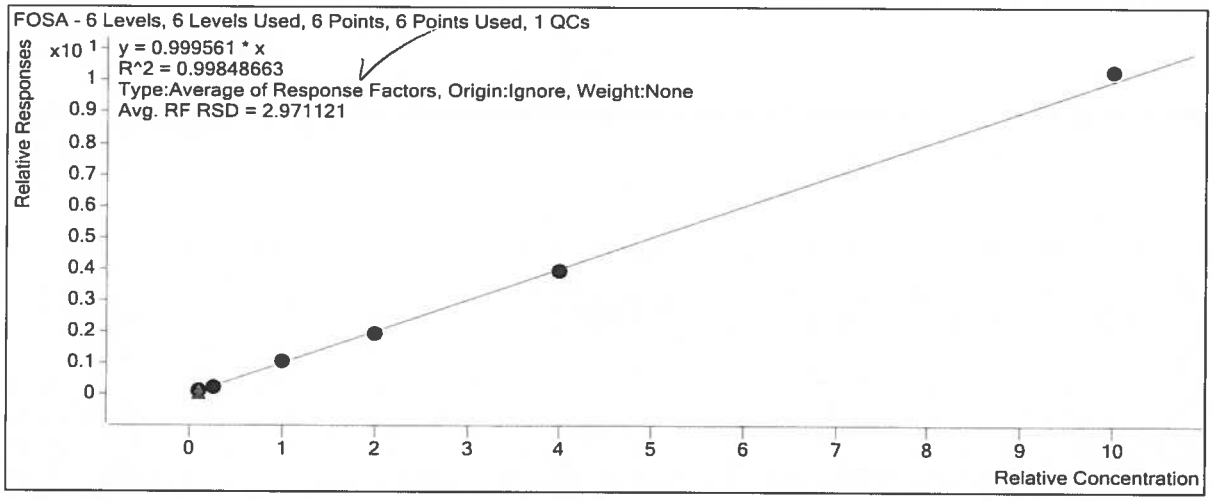


Target Compound *FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1909	0.5000	1.0046

Quantitative Analysis Calibration Report

D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	4380	1.2500	0.9614
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	20171	5.0000	1.0343
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	41459	10.0000	0.9780
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	70786	20.0000	0.9865
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	189372	50.0000	1.0325



Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	19001	5.0000	3800.2086
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	18224	5.0000	3644.7805
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	19501	5.0000	3900.2236
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	21195	5.0000	4239.0749
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	17938	5.0000	3587.6704
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	18341	5.0000	3668.2811

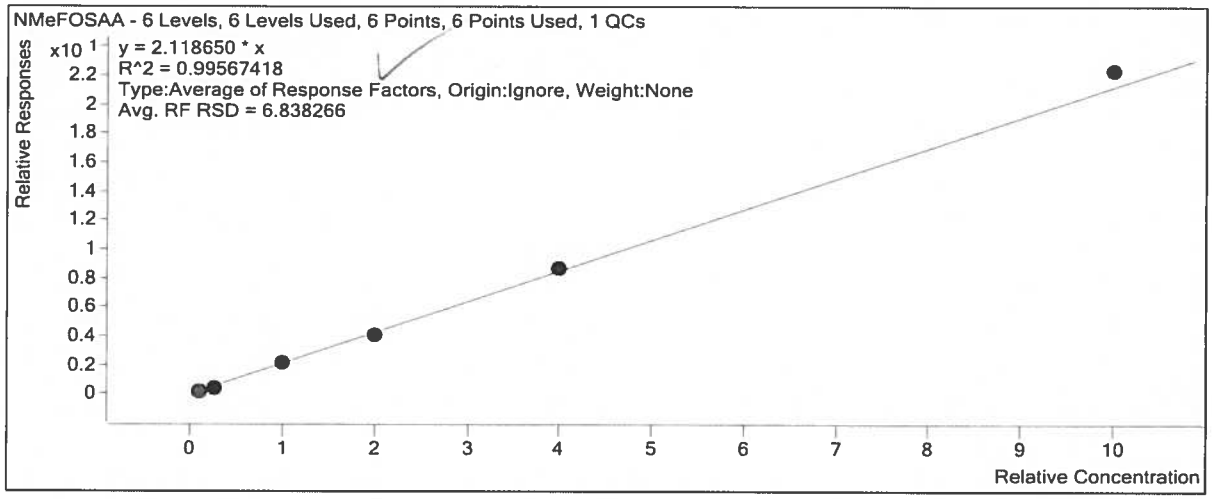
Extracted ISTD *d3-NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	8353	5.0000	1670.6365
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	8013	5.0000	1602.6351
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	8867	5.0000	1773.3709
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	9881	5.0000	1976.1870
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	7881	5.0000	1576.1117
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	8170	5.0000	1633.9758

Quantitative Analysis Calibration Report

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1865	0.5000	2.2326
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	3709	1.2500	1.8515
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	19036	5.0000	2.1469
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	40925	10.0000	2.0709
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	68378	20.0000	2.1692
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	183075	50.0000	2.2409



Extracted ISTD *d5-NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	11752	5.0000	2350.4162
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	12162	5.0000	2432.3146
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	12061	5.0000	2412.2334
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	13073	5.0000	2614.5162
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	11392	5.0000	2278.4990
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	10769	5.0000	2153.7733

Target Compound *NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1778	0.5000	1.5126

Quantitative Analysis Calibration Report

D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	3575	1.2500	1.1758
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	17354	5.0000	1.4389
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	36370	10.0000	1.3911
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	61855	20.0000	1.3574
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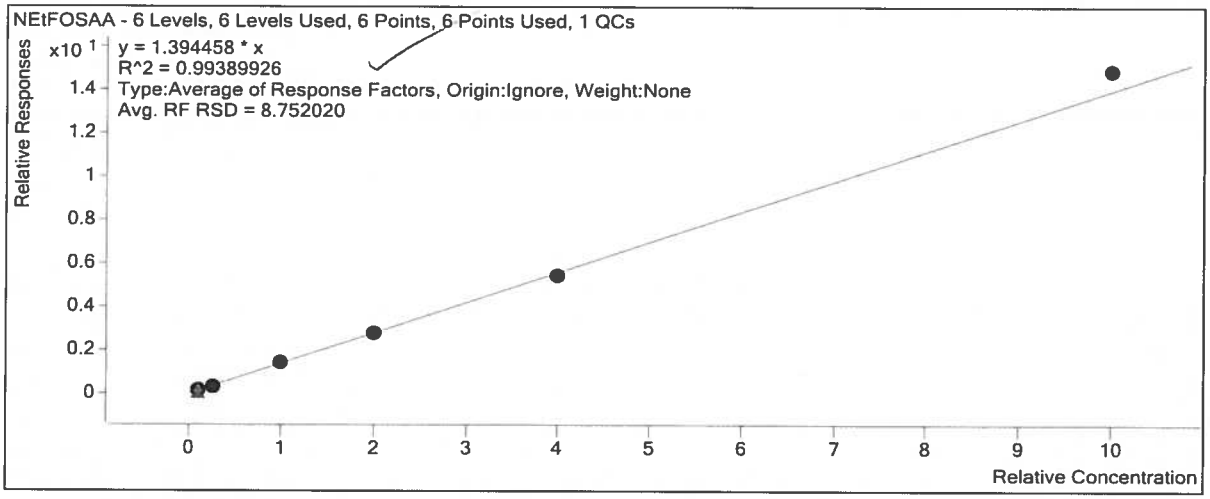
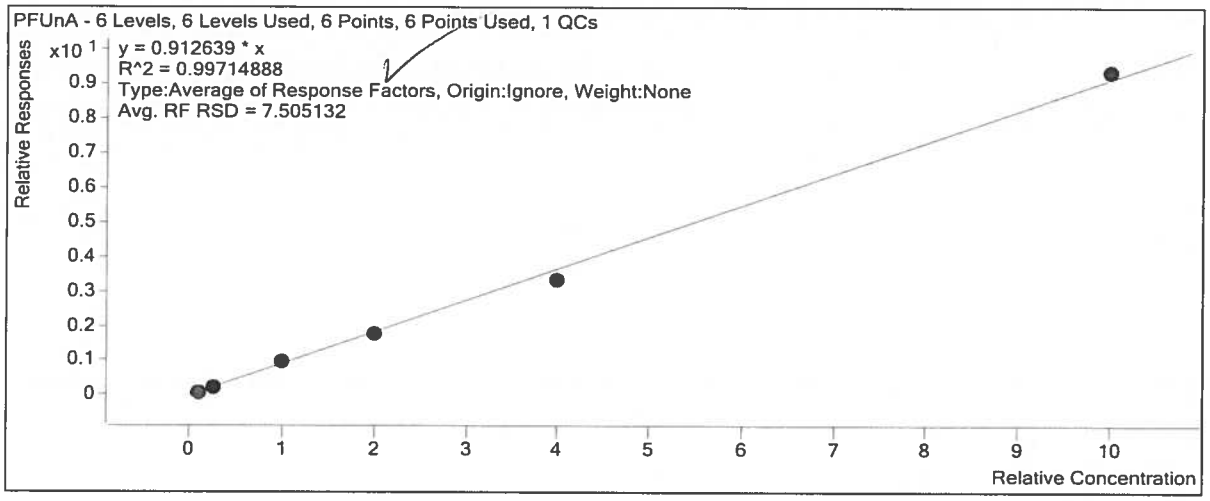


Target Compound *PFUnA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1864	0.5000	0.9700
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	3716	1.2500	0.8408
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	18030	5.0000	0.9991
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	35850	10.0000	0.8986
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	59413	20.0000	0.8304
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	160224	50.0000	0.9368

Quantitative Analysis Calibration Report



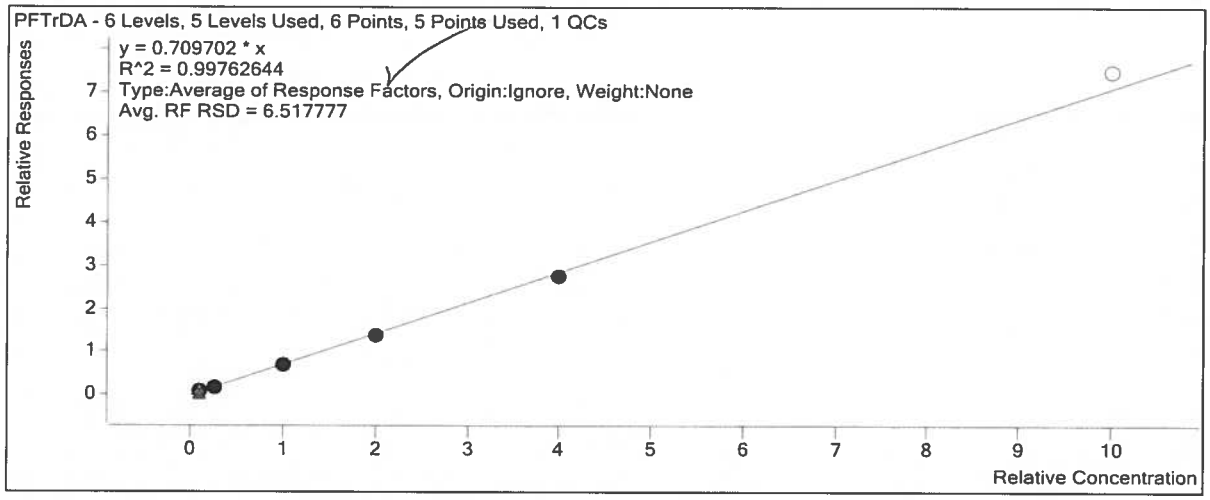
Extracted ISTD *M7PFUnA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	19214	5.0000	3842.7475
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	17678	5.0000	3535.5016
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	18047	5.0000	3609.4161
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	19947	5.0000	3989.3361
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	17886	5.0000	3577.2938
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	17102	5.0000	3420.4992

Target Compound *PFDS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	1247	0.4825	0.7955
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	2555	1.2063	0.6211
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	12626	4.8250	0.7933
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	25924	9.6500	0.7126
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	41512	19.3000	0.6902
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	109508	48.2500	0.7575

D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	2192	1.2500	0.6995
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	9338	5.0000	0.6880
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	19231	10.0000	0.6818
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	33555	20.0000	0.6877
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☐	87968	50.0000	0.7511



Extracted ISTD *d-NEtFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	7726	5.0000	1545.2264
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	7809	5.0000	1561.8857
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	7917	5.0000	1583.3383
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	8745	5.0000	1748.9324
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	7264	5.0000	1452.7445
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	7506	5.0000	1501.2785

Extracted ISTD *d9-NEtFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210302ACAL\2210302A_04.d	Calibration	1	☑	11078	5.0000	2215.6808
D:\MassHunter\Data\2210302ACAL\2210302A_05.d	Calibration	2	☑	11770	5.0000	2353.9474
D:\MassHunter\Data\2210302ACAL\2210302A_06.d	Calibration	3	☑	11372	5.0000	2274.4153
D:\MassHunter\Data\2210302ACAL\2210302A_07.d	Calibration	4	☑	13473	5.0000	2694.5361
D:\MassHunter\Data\2210302ACAL\2210302A_08.d	Calibration	5	☑	11564	5.0000	2312.7119
D:\MassHunter\Data\2210302ACAL\2210302A_09.d	Calibration	6	☑	9779	5.0000	1955.8215

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	221022515	Instrument ID:	QQQ2
Analysis Date:	03/03/2021 02:11	Lab File ID:	2210302A_68.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705119

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	9370	9790	104	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	9510	9830	103	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	9600	9130	95	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	10100	101	70	130	
NEtFOSA	ng/L	10000	10100	101	70	130	
NEtFOSAA	ng/L	10000	9150	92	70	130	
NEtFOSE	ng/L	10000	10000	100	70	130	
NMeFOSA	ng/L	10000	10600	106	70	130	
NMeFOSAA	ng/L	10000	9660	97	70	130	
NMeFOSE	ng/L	10000	9130	91	70	130	
Perfluorobutanoic acid	ng/L	10000	10300	103	70	130	
Perfluorobutanesulfonic acid	ng/L	8870	8810	99	70	130	
Perfluorodecanoic acid	ng/L	10000	10400	104	70	130	
Perfluorodecane sulfonic acid	ng/L	9650	9100	94	70	130	
Perfluorododecanoic acid	ng/L	10000	10400	104	70	130	
Perfluoroheptanoic acid	ng/L	10000	9500	95	70	130	
Perfluoroheptanesulfonic acid	ng/L	9530	8360	88	70	130	
Perfluorohexanoic acid	ng/L	10000	9550	96	70	130	
Perfluorohexanesulfonic acid	ng/L	9140	9190	101	70	130	
Perfluorononanoic acid	ng/L	10000	9560	96	70	130	
Perfluorononanesulfonic acid	ng/L	9620	9630	100	70	130	
Perfluorooctanoic acid	ng/L	10000	9790	98	70	130	
Perfluorooctanesulfonic acid	ng/L	9280	8980	97	70	130	
Perfluoropentanoic acid	ng/L	10000	10200	102	70	130	
Perfluoropentanesulfonic acid	ng/L	9410	8730	93	70	130	
Perfluorotetradecanoic acid	ng/L	10000	9210	92	70	130	
Perfluorotridecanoic acid	ng/L	10000	9780	98	70	130	
Perfluoroundecanoic acid	ng/L	10000	9730	97	70	130	

FORM 7E - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	221022515	Instrument ID:	QQQ2
Analysis Date:	03/03/2021 06:19	Lab File ID:	2210302A_87.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705119

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	9370	8490	91	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	9510	9830	103	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	9600	10800	113	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	9910	99	70	130	
NEtFOSA	ng/L	10000	8750	88	70	130	
NEtFOSAA	ng/L	10000	10400	104	70	130	
NEtFOSE	ng/L	10000	9480	95	70	130	
NMeFOSA	ng/L	10000	10900	109	70	130	
NMeFOSAA	ng/L	10000	10100	101	70	130	
NMeFOSE	ng/L	10000	9920	99	70	130	
Perfluorobutanoic acid	ng/L	10000	10300	103	70	130	
Perfluorobutanesulfonic acid	ng/L	8870	8810	99	70	130	
Perfluorodecanoic acid	ng/L	10000	9850	98	70	130	
Perfluorodecane sulfonic acid	ng/L	9650	8970	93	70	130	
Perfluorododecanoic acid	ng/L	10000	10400	104	70	130	
Perfluoroheptanoic acid	ng/L	10000	9300	93	70	130	
Perfluoroheptanesulfonic acid	ng/L	9530	8960	94	70	130	
Perfluorohexanoic acid	ng/L	10000	9240	92	70	130	
Perfluorohexanesulfonic acid	ng/L	9140	9570	105	70	130	
Perfluorononanoic acid	ng/L	10000	9750	98	70	130	
Perfluorononanesulfonic acid	ng/L	9620	9920	103	70	130	
Perfluorooctanoic acid	ng/L	10000	10600	106	70	130	
Perfluorooctanesulfonic acid	ng/L	9280	8910	96	70	130	
Perfluoropentanoic acid	ng/L	10000	10100	101	70	130	
Perfluoropentanesulfonic acid	ng/L	9410	8320	88	70	130	
Perfluorotetradecanoic acid	ng/L	10000	8910	89	70	130	
Perfluorotridecanoic acid	ng/L	10000	10600	106	70	130	
Perfluoroundecanoic acid	ng/L	10000	10100	101	70	130	

FORM 7E - ORG

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	221022515	Standard ID:	1205 (ICAL Midpoint)
Analyst:	BMH	Instrument ID:	QQQ2
Analysis Date:	03/02/21 12:25	Lab File ID:	2210302A_08.d
Analytical Method:	PFAS Isotope Dilution QSM B15	Analytical Batch:	705119

		M2PFDA		M2PFHxA		M2PFOA		M4PFOS	
		Area		*Area*		*Area*		*Area*	
STANDARD		88050		224539		87707		69482	
CLIENT SAMPLE ID	***LAB SAMP ID***	✓	#	✓	#	✓	#	✓	#
MB2155526	2155526	78731		203597		79818		57351	
LCS2155527	2155527	76170		202310		81022		60940	
LCSD2155528	2155528	75633		196545		81600		59405	
HAASF-POTABLE-01	22102251501	79766		202395		78979		58347	
HAASF-POTABLE-02	22102251502	74588		196038		80445		60220	
HAASF-POTABLE-02-DUP	22102251503	83526		197237		79705		57365	

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

FORM 8I - ORG

QQQ1 Run Log

Analyst:	MRA	Expiration:
Instrument:	QQQ1	
Batch:	2210310A	
Current ICAL Bath:	2210310ACAL	
20mM Amm Acetate	016-35-1	3/12/2021
Methanol	2130000	6/30/2025
Calibration Std	016-33-2	8/4/2021
ICV Std	016-21-3	8/2/2021
EIS Mix	016-32-4	9/2/2021
IIS Mix	016-33-3	9/4/2021

Name	Data File	Type	Acq. Date-Time	Comment	Dil.
MeOH Shot	2210310A_01.d	MeOH Shot	3/10/2021 9:21	MRA,MeOH SHOT/INSTRUMENT IDLE	1
1207 RT Check	2210310A_02.d	QC	3/10/2021 9:35	MRA,QQQ1;Cal	1
MeOH Shot	2210310A_03.d	MeOH Shot	3/10/2021 9:49	MRA,MeOH SHOT/INSTRUMENT IDLE	1
1201	2210310A_04.d	Cal	3/10/2021 10:03	MRA,QQQ1;Cal	1
1202	2210310A_05.d	Cal	3/10/2021 10:17	MRA,QQQ1;Cal	1
1203	2210310A_06.d	Cal	3/10/2021 10:31	MRA,QQQ1;Cal	1
1204	2210310A_07.d	Cal	3/10/2021 10:45	MRA,QQQ1;Cal	1
1205	2210310A_08.d	Cal	3/10/2021 11:00	MRA,QQQ1;Cal	1
1206	2210310A_09.d	Cal	3/10/2021 11:14	MRA,QQQ1;Cal	1
MeOH Shot	2210310A_10.d	MeOH Shot	3/10/2021 11:35	BMH,MeOH SHOT/INSTRUMENT IDLE	1
1500	2210310A_11.d	Sample	3/10/2021 11:48	MRA,QQQ1	1
1600	2210310A_12.d	Sample	3/10/2021 12:03	MRA,QQQ1	1
1450	2210310A_13.d	QC	3/10/2021 12:17	MRA,QQQ1	1
1450	2210310A_14.d	QC	3/10/2021 12:32	MRA,QQQ1	1
MeOH Shot	2210310A_15.d	MeOH Shot	3/10/2021 12:54	BMH,MeOH SHOT/INSTRUMENT IDLE	1
1450	2210310A_16.d	QC	3/10/2021 13:08	MRA,QQQ1	1
MeOH Shot	2210310A_17.d	MeOH Shot	3/10/2021 13:25	BMH,MeOH SHOT/INSTRUMENT IDLE	1
2152283	2210310A_18.d	Sample	3/10/2021 13:39	MRA,QQQ1;705258	1
2152284	2210310A_19.d	QC	3/10/2021 13:53	MRA,QQQ1;705258	1
2152285	2210310A_20.d	QC	3/10/2021 14:08	MRA,QQQ1;705258	1

22103054001 x10	2210310A_21.d	Sample	3/10/2021 14:22	MRA,QQQ1;705258	10
22103054002 x10	2210310A_22.d	Sample	3/10/2021 14:36	MRA,QQQ1;705258; IIS double spiked	10
22103054003 x10	2210310A_23.d	Sample	3/10/2021 14:51	MRA,QQQ1;705258	10
22103020203 x50	2210310A_24.d	Sample	3/10/2021 15:05	MRA,QQQ1;705050	50
2152863	2210310A_25.d	Sample	3/10/2021 15:19	MRA,QQQ1;705374	1
2152864	2210310A_26.d	QC	3/10/2021 15:34	MRA,QQQ1;705374	1
2152865	2210310A_27.d	QC	3/10/2021 15:48	MRA,QQQ1;705374	1
22103061001	2210310A_28.d	Sample	3/10/2021 16:02	MRA,QQQ1;705374	1
1400	2210310A_29.d	QC	3/10/2021 16:17	MRA,QQQ1;CCV	1
22103062301	2210310A_30.d	Sample	3/10/2021 16:31	MRA,QQQ1;705374	1
22103062302	2210310A_31.d	Sample	3/10/2021 16:45	MRA,QQQ1;705374	1
2152875	2210310A_32.d	Sample	3/10/2021 16:59	MRA,QQQ1;705378	1
2152876	2210310A_33.d	QC	3/10/2021 17:14	MRA,QQQ1;705378	1
2152877	2210310A_34.d	QC	3/10/2021 17:28	MRA,QQQ1;705378	1
22102265207	2210310A_35.d	Sample	3/10/2021 17:43	MRA,QQQ1;705378	1
22103061601	2210310A_36.d	Sample	3/10/2021 17:57	MRA,QQQ1;705378	1
22102251501	2210310A_37.d	Sample	3/10/2021 18:11	MRA,QQQ1;705378	1
22102251502	2210310A_38.d	Sample	3/10/2021 18:26	MRA,QQQ1;705378	1
22102251503	2210310A_39.d	Sample	3/10/2021 18:40	MRA,QQQ1;705378	1
2148271/2155526	2210310A_40.d	Sample	3/10/2021 18:54	MRA,QQQ1;704580	1
2148272/2155527	2210310A_41.d	QC	3/10/2021 19:08	MRA,QQQ1;704580	1
2148273/2155528	2210310A_42.d	QC	3/10/2021 19:23	MRA,QQQ1;704580	1
22102251501	2210310A_43.d	Sample	3/10/2021 19:37	MRA,QQQ1;704580	1
22102251502	2210310A_44.d	Sample	3/10/2021 19:52	MRA,QQQ1;704580	1
22102251503	2210310A_45.d	Sample	3/10/2021 20:06	MRA,QQQ1;704580	1
1400	2210310A_46.d	QC	3/10/2021 20:20	MRA,QQQ1;CCV	1
2151798	2210310A_47.d	QC	3/10/2021 20:35	MRA,QQQ1;705171	1
2151797	2210310A_48.d	Sample	3/10/2021 20:49	MRA,QQQ1;705171	1
2151799	2210310A_49.d	QC	3/10/2021 21:03	MRA,QQQ1;705171	1
22102276502	2210310A_50.d	Sample	3/10/2021 21:18	MRA,QQQ1;705171	1
2152253	2210310A_51.d	Sample	3/10/2021 21:32	MRA,QQQ1;705252	1
2152254	2210310A_52.d	QC	3/10/2021 21:46	MRA,QQQ1;705252	1
2152255	2210310A_53.d	QC	3/10/2021 22:01	MRA,QQQ1;705252	1
22102265801 x1 DAI	2210310A_54.d	Sample	3/10/2021 22:15	MRA,QQQ1;705252	1

22102265802 x1 DAI	2210310A_55.d	Sample	3/10/2021 22:29	MRA,QQQ1;705252	1
22102265803 x1 DAI	2210310A_56.d	Sample	3/10/2021 22:44	MRA,QQQ1;705252	1
22102265804 x5 DAI	2210310A_57.d	Sample	3/10/2021 22:58	MRA,QQQ1;705252	1
22102265805 x1 DAI	2210310A_58.d	Sample	3/10/2021 23:13	MRA,QQQ1;705252	1
22102265806 x1 DAI	2210310A_59.d	Sample	3/10/2021 23:27	MRA,QQQ1;705252	1
22102265807 x1 DAI	2210310A_60.d	Sample	3/10/2021 23:41	MRA,QQQ1;705252	1
22102265808 x5 DAI	2210310A_61.d	Sample	3/10/2021 23:55	MRA,QQQ1;705252	1
22102265809 x5 DAI	2210310A_62.d	Sample	3/11/2021 0:10	MRA,QQQ1;705252	1
1450	2210310A_63.d	QC	3/11/2021 0:24	MRA,QQQ1;CCV	1
22102265810 x5 DAI	2210310A_64.d	Sample	3/11/2021 0:39	MRA,QQQ1;705252	1
22102265811 x5 DAI	2210310A_65.d	Sample	3/11/2021 0:53	MRA,QQQ1;705252	1
2151801	2210310A_66.d	Sample	3/11/2021 1:07	MRA,QQQ1;705172/705253	1
2151802	2210310A_67.d	QC	3/11/2021 1:22	MRA,QQQ1;705172/705253	1
2151803	2210310A_68.d	QC	3/11/2021 1:36	MRA,QQQ1;705172/705253	1
22102276503 x5	2210310A_69.d	Sample	3/11/2021 1:50	MRA,QQQ1;705172/705253	5
1400	2210310A_70.d	QC	3/11/2021 2:05	MRA,QQQ1;CCV	1
MeOH Shot	2210310A_71.d	MeOH Shot	3/11/2021 2:19	BMH,MeOH SHOT/INSTRUMENT IDLE	1

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	221022515	Instrument ID:	QQQ1
Analysis Date:	03/10/2021 13:08	Lab File ID:	2210310A_16.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705663

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	3.75	3.17	84	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	3.81	2.87	75	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	3.84	3.14	82	70	130	
Perfluorooctane Sulfonamide	ng/L	4.00	3.76	94	70	130	
NEtFOSA	ng/L	4.00	3.93	98	70	130	
NEtFOSAA	ng/L	4.00	3.54	89	70	130	
NEtFOSE	ng/L	4.00	3.36	84	70	130	
NMeFOSA	ng/L	4.00	4.42	110	70	130	
NMeFOSAA	ng/L	4.00	3.41	85	70	130	
NMeFOSE	ng/L	4.00	3.26	82	70	130	
Perfluorobutanoic acid	ng/L	4.00	3.15	79	70	130	
Perfluorobutanesulfonic acid	ng/L	3.55	3.13	88	70	130	
Perfluorodecanoic acid	ng/L	4.00	3.13	78	70	130	
Perfluorodecane sulfonic acid	ng/L	3.86	2.96	77	70	130	
Perfluorododecanoic acid	ng/L	4.00	3.21	80	70	130	
Perfluoroheptanoic acid	ng/L	4.00	3.11	78	70	130	
Perfluoroheptanesulfonic acid	ng/L	3.82	3.11	82	70	130	
Perfluorohexanoic acid	ng/L	4.00	3.87	97	70	130	
Perfluorohexanesulfonic acid	ng/L	3.66	3.30	90	70	130	
Perfluorononanoic acid	ng/L	4.00	3.36	84	70	130	
Perfluorononanesulfonic acid	ng/L	3.85	2.72	71	70	130	
Perfluorooctanoic acid	ng/L	4.00	3.26	82	70	130	
Perfluorooctanesulfonic acid	ng/L	3.71	3.34	90	70	130	
Perfluoropentanoic acid	ng/L	4.00	3.44	86	70	130	
Perfluoropentanesulfonic acid	ng/L	3.77	3.21	85	70	130	
Perfluorotetradecanoic acid	ng/L	4.00	3.37	84	70	130	
Perfluorotridecanoic acid	ng/L	4.00	3.42	86	70	130	
Perfluoroundecanoic acid	ng/L	4.00	3.31	83	70	130	

FORM 7S - ORG

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	221022515	Instrument ID:	QQQ1
Analysis Date:	03/10/2021 12:03	Lab File ID:	2210310A_12.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705663

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	10000	10000	100	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	10000	9920	99	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	10100	10700	106	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	10500	105	70	130	
NEtFOSA	ng/L	10000	11800	118	70	130	
NEtFOSAA	ng/L	10000	10400	104	70	130	
NEtFOSE	ng/L	10000	10400	104	70	130	
NMeFOSA	ng/L	10000	10300	103	70	130	
NMeFOSAA	ng/L	10000	9660	97	70	130	
NMeFOSE	ng/L	10000	10200	102	70	130	
Perfluorobutanoic acid	ng/L	10000	9750	97	70	130	
Perfluorobutanesulfonic acid	ng/L	10000	9930	99	70	130	
Perfluorodecanoic acid	ng/L	10000	11500	115	70	130	
Perfluorodecane sulfonic acid	ng/L	10100	10100	100	70	130	
Perfluorododecanoic acid	ng/L	10000	9620	96	70	130	
Perfluoroheptanoic acid	ng/L	10000	10700	107	70	130	
Perfluoroheptanesulfonic acid	ng/L	10000	10900	109	70	130	
Perfluorohexanoic acid	ng/L	10100	10000	99	70	130	
Perfluorohexanesulfonic acid	ng/L	10000	11300	113	70	130	
Perfluorononanoic acid	ng/L	10000	13000	130	70	130	
Perfluorononanesulfonic acid	ng/L	10100	10200	101	70	130	
Perfluorooctanoic acid	ng/L	10100	10200	101	70	130	
Perfluorooctanesulfonic acid	ng/L	10000	9820	98	70	130	
Perfluoropentanoic acid	ng/L	10100	9840	97	70	130	
Perfluoropentanesulfonic acid	ng/L	10000	11100	111	70	130	
Perfluorotetradecanoic acid	ng/L	10000	11400	114	70	130	
Perfluorotridecanoic acid	ng/L	10000	8440	84	70	130	
Perfluoroundecanoic acid	ng/L	10000	9830	98	70	130	

FORM 6I - ORG

4I

ORGANICS INSTRUMENT BLANK

Report No:	221022515	Instrument ID:	QQQ1
Analysis Date:	03/10/2021 11:48	Lab File ID:	2210310A_11.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705663

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
4:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.85	2.00	4.00	
6:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.94	2.00	4.00	
8:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.90	2.00	4.00	
NEtFOSA	ng/L	4.00	U	0.96	4.00	8.00	
NEtFOSAA	ng/L	4.00	U	0.97	4.00	8.00	
NEtFOSE	ng/L	4.00	U	0.90	4.00	8.00	
NMeFOSA	ng/L	4.00	U	0.97	4.00	8.00	
NMeFOSAA	ng/L	4.00	U	0.91	4.00	8.00	
NMeFOSE	ng/L	4.00	U	0.87	4.00	8.00	
Perfluorobutanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorobutanoic acid	ng/L	2.00	U	0.90	2.00	4.00	
Perfluorodecane sulfonic acid	ng/L	2.00	U	0.80	2.00	4.00	
Perfluorodecanoic acid	ng/L	2.00	U	0.86	2.00	4.00	
Perfluorododecanoic acid	ng/L	2.00	U	0.88	2.00	4.00	
Perfluoroheptanesulfonic acid	ng/L	2.00	U	0.84	2.00	4.00	
Perfluoroheptanoic acid	ng/L	2.00	U	0.48	2.00	4.00	
Perfluorohexanesulfonic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluorohexanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluorononanesulfonic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorononanoic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorooctane Sulfonamide	ng/L	2.00	U	0.96	2.00	4.00	
Perfluorooctanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorooctanoic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluoropentanesulfonic acid	ng/L	2.00	U	0.69	2.00	4.00	
Perfluoropentanoic acid	ng/L	2.00	U	0.85	2.00	4.00	
Perfluorotetradecanoic acid	ng/L	2.00	U	0.98	2.00	4.00	
Perfluorotridecanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluoroundecanoic acid	ng/L	2.00	U	0.95	2.00	4.00	

* - Result greater than 1/2 LOQ

FORM 4I - ORG

Quantitative Analysis Calibration Report

Batch Data Path	D:\MassHunter\Data\2210310ACAL\QuantResults\2210310A.batch.bin		
Analysis Time	3/15/2021 9:08 AM	**Analyst Name**	GCAL\lcms
Report Time	3/15/2021 9:13 AM	**Reporter Name**	GCAL\lcms
Last Calib Update	3/10/2021 3:21 PM	**Batch State**	Processed

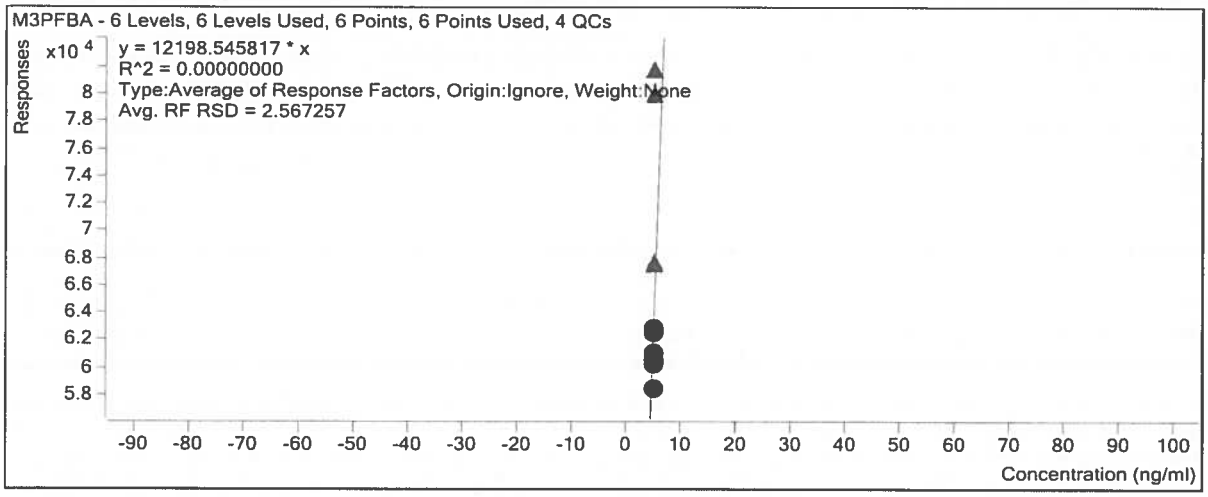
Calibration Info

Extracted ISTD *MPFBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	56338	5.0000	11267.6866
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	53454	5.0000	10690.8710
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	57533	5.0000	11506.5915
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	56953	5.0000	11390.6430
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	53469	5.0000	10693.8240
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	54623	5.0000	10924.6058

Instrument ISTD *M3PFBA*

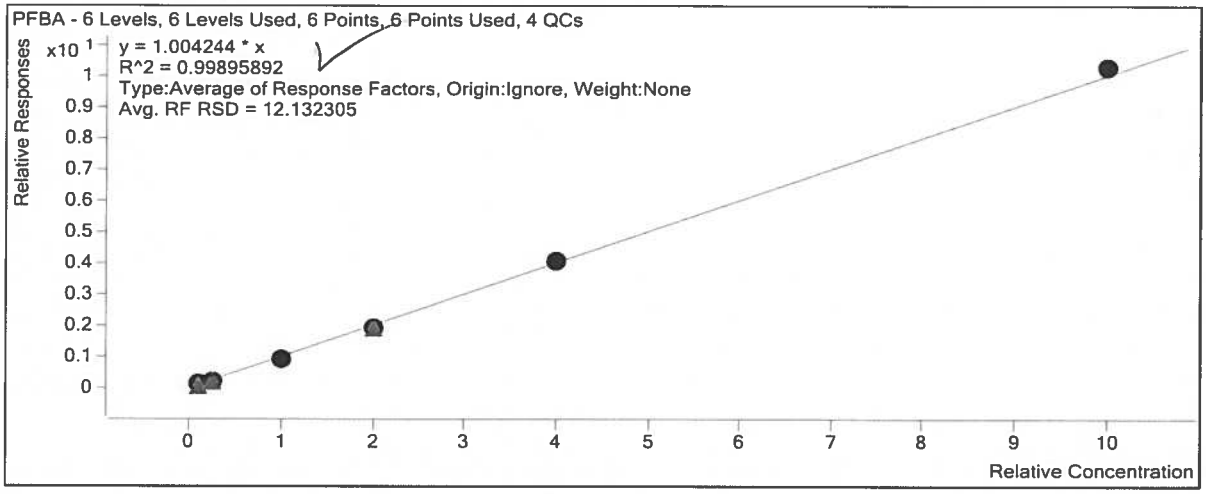
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	60348	5.0000	12069.5686
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	61156	5.0000	12231.1481
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	60609	5.0000	12121.7365
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	62483	5.0000	12496.6566
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	58530	5.0000	11705.9081
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	62831	5.0000	12566.2570



Target Compound *PFBA*

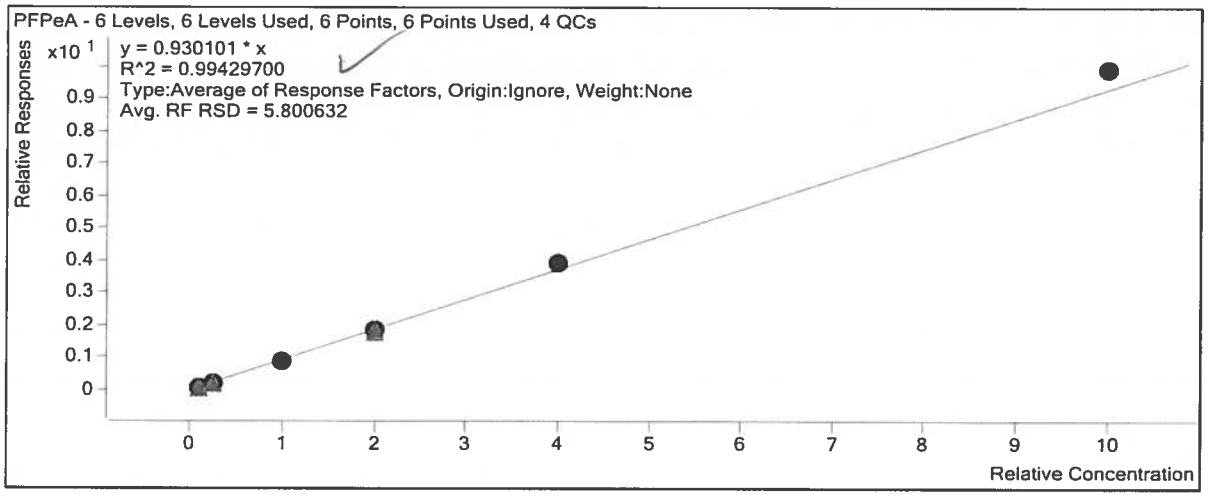
Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	6863	0.5000	1.2182
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	11709	1.2500	0.8762
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	51882	5.0000	0.9018
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	111502	10.0000	0.9789
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	218526	20.0000	1.0217
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	561862	50.0000	1.0286



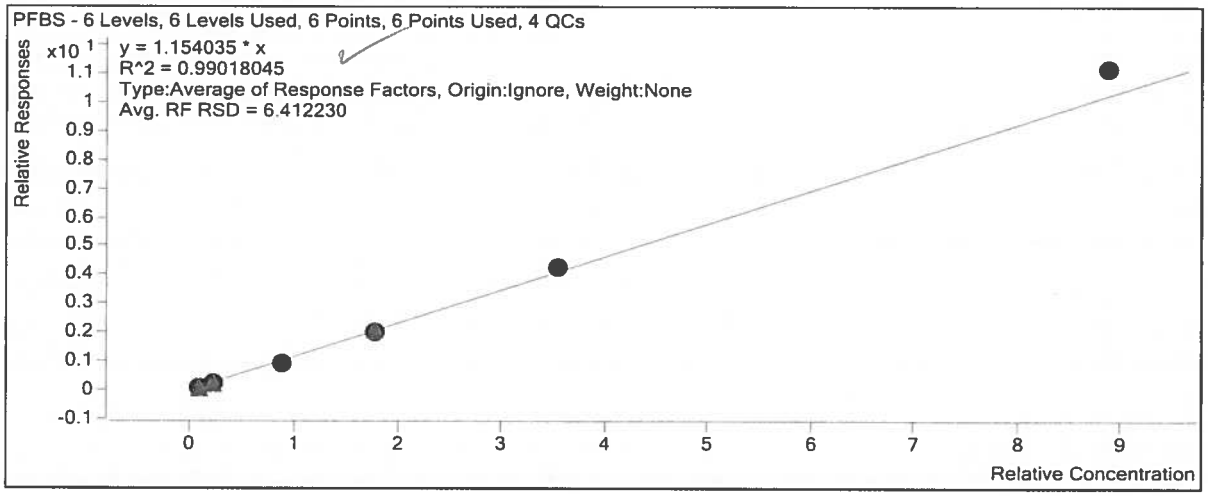
Target Compound *PFMPA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	4717	0.5000	1.4868
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	9048	1.2500	1.2250
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	39846	5.0000	1.2347
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	87590	10.0000	1.3675
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	170753	20.0000	1.4321
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	435402	50.0000	1.4486



Target Compound *PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	1818	0.4435	1.1724
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	4237	1.1088	1.0745
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	18507	4.4350	1.0674
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	38820	8.8700	1.1481
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	77682	17.7400	1.2046
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	198520	44.3500	1.2572

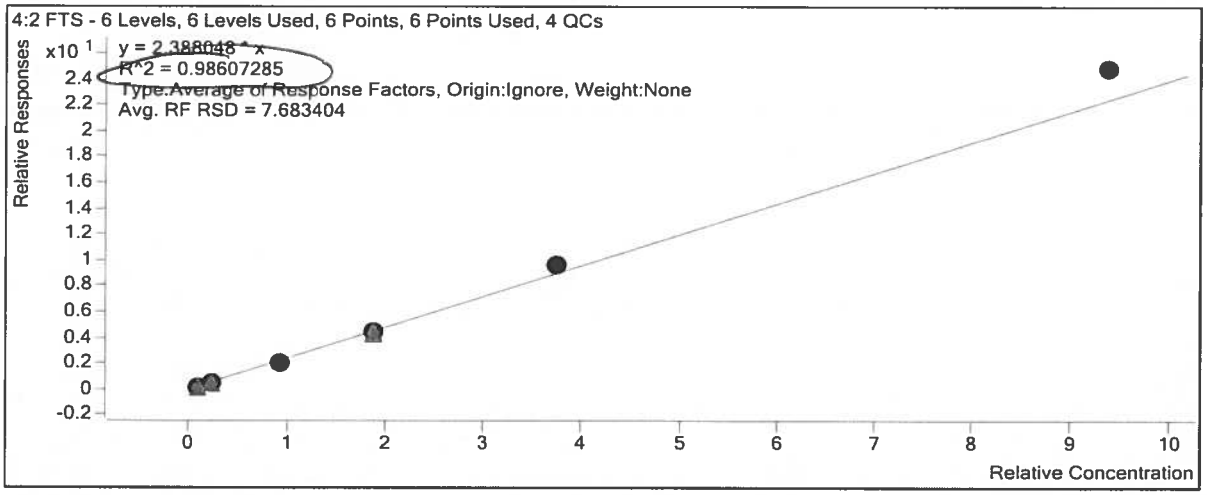


Extracted ISTD *M3PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	17478	5.0000	3495.6271

Quantitative Analysis Calibration Report

D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	6425	1.1713	2.2932
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	27167	4.6850	2.1706
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	59163	9.3700	2.3963
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	117610	18.7400	2.5653
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	288771	46.8500	2.6419



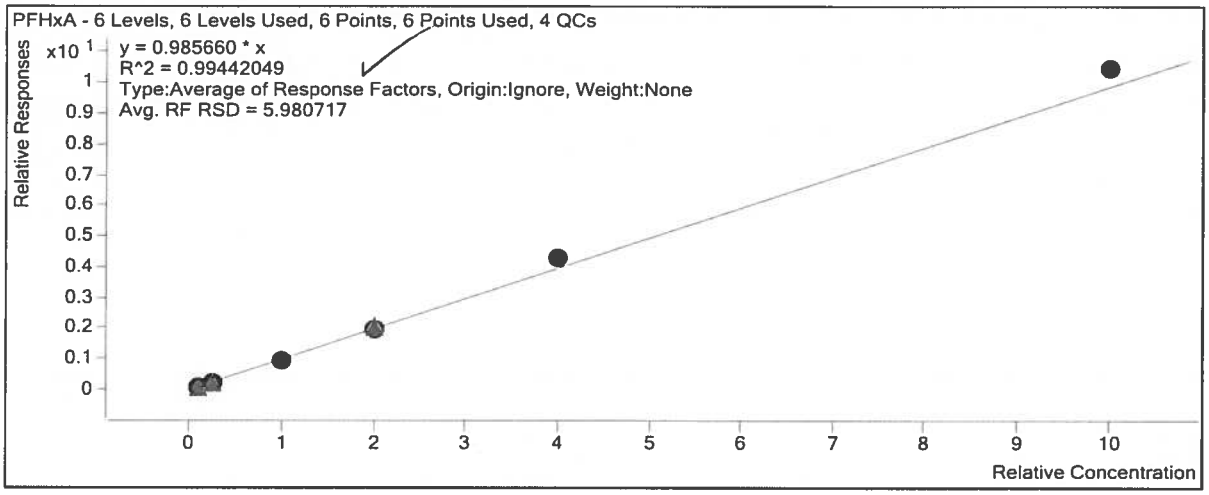
Extracted ISTD *M2 4:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	12923	5.0000	2584.5812
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	11960	5.0000	2391.9935
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	13357	5.0000	2671.4068
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	13175	5.0000	2634.9015
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	12232	5.0000	2446.4431
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	11666	5.0000	2333.1113

Extracted ISTD *M5PFHxA*

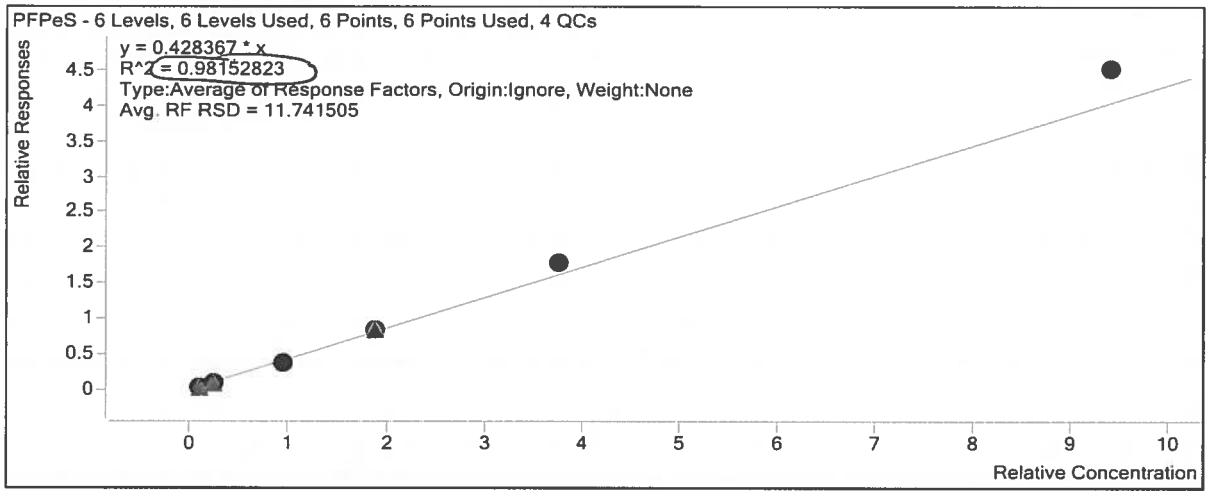
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	61206	5.0000	12241.2518
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	54856	5.0000	10971.2225
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	59841	5.0000	11968.2097
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	60246	5.0000	12049.1006
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	54496	5.0000	10899.2817
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	55553	5.0000	11110.6476

Quantitative Analysis Calibration Report



Target Compound *PFPeS*

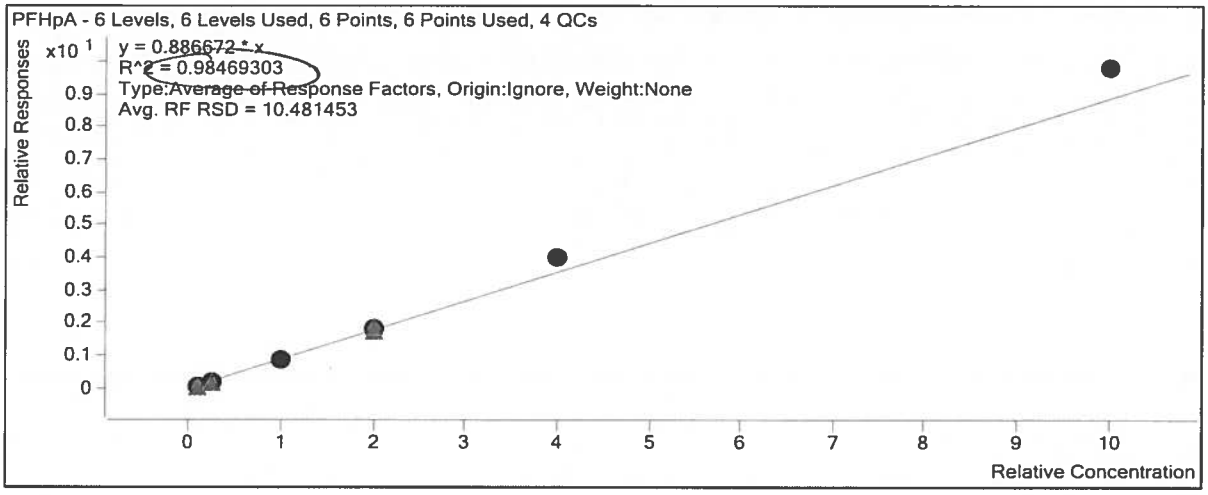
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	2000	0.4705	0.3472
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	5328	1.1763	0.4128
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	22837	4.7050	0.4056
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	50956	9.4100	0.4494
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	97409	18.8200	0.4749
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	251082	47.0500	0.4803



Target Compound *HFPO-DA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☐	503	1.0000	1.1045

Quantitative Analysis Calibration Report



Extracted ISTD *M4PFHpA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	65641	5.0000	13128.1132
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	63351	5.0000	12670.2989
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	65821	5.0000	13164.2542
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	65841	5.0000	13168.2873
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	60920	5.0000	12183.9051
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	62807	5.0000	12561.3072

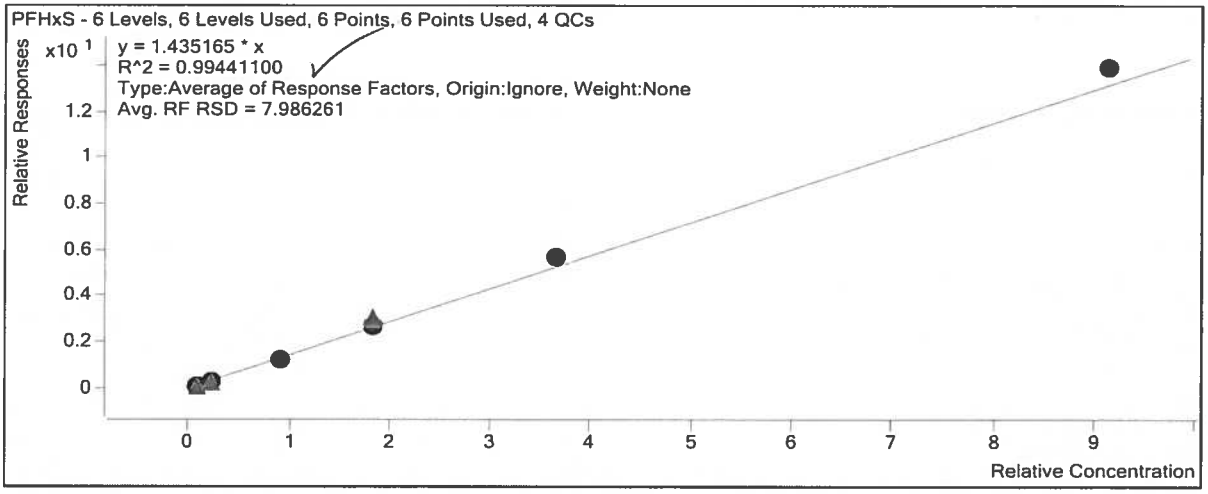
Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	19912	5.0000	3982.4467
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	16713	5.0000	3342.6999
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	19689	5.0000	3937.7539
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	19436	5.0000	3887.2744
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	18378	5.0000	3675.5186
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	18938	5.0000	3787.6950

Target Compound *PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	2279	0.4570	1.2520

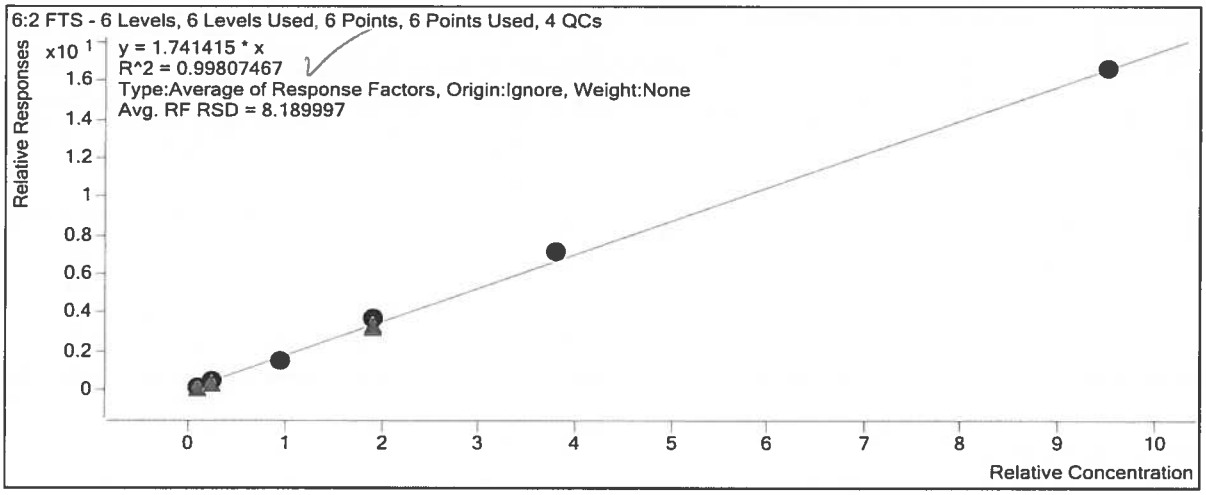
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	5530	1.1425	1.4479
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	24273	4.5700	1.3489
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	52844	9.1400	1.4873
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	104707	18.2800	1.5584
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	262501	45.7000	1.5165



Target Compound *ADONA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	11552	0.4725	2.8297
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	29436	1.1813	3.1215
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	131351	4.7250	3.2114
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	278636	9.4500	3.5328
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	551914	18.9000	3.6884
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	1346937	47.2500	3.5819

Quantitative Analysis Calibration Report



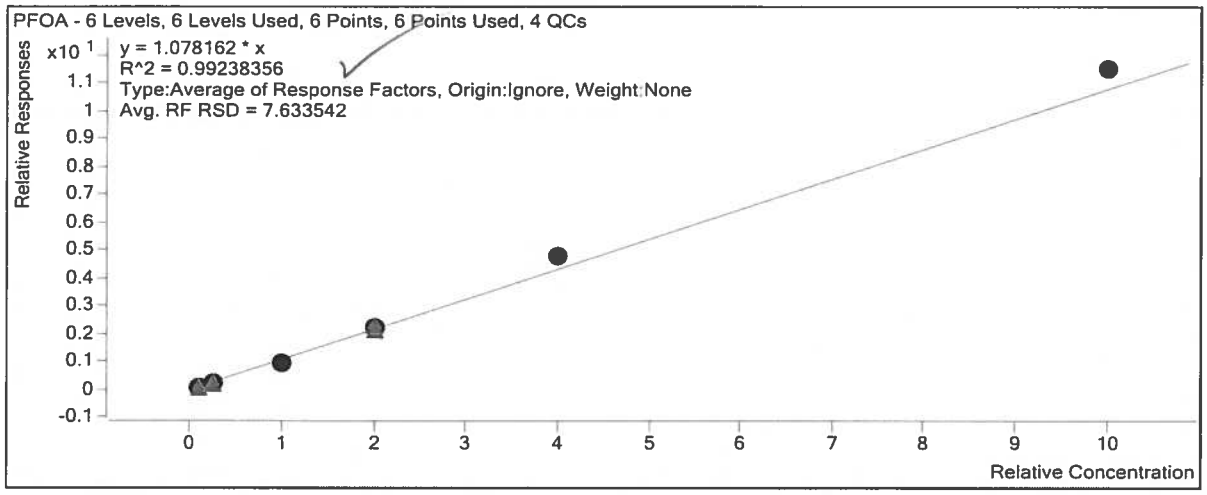
Extracted ISTD *M8PFOA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	43200	5.0000	8640.0166
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	39914	5.0000	7982.7274
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	43283	5.0000	8656.5179
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	41731	5.0000	8346.2364
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	39586	5.0000	7917.1304
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	39793	5.0000	7958.5022

Instrument ISTD *MPFOA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	1256269	25.0000	50250.7734
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	1352767	25.0000	54110.6911
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	1394574	25.0000	55782.9435
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	1379310	25.0000	55172.4132
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	1383118	25.0000	55324.7348
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	1349857	25.0000	53994.2640

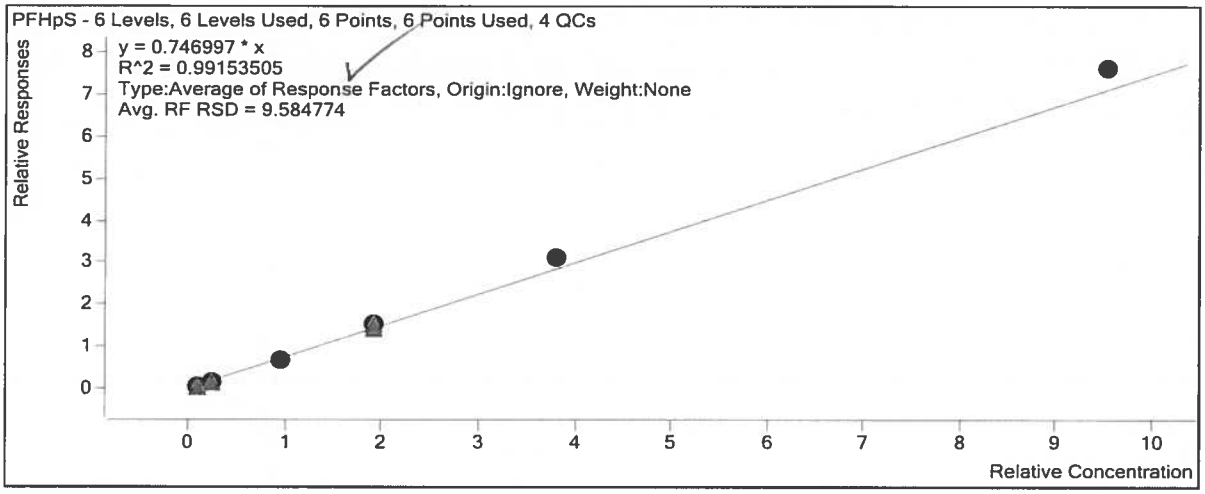
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	10219	1.2500	1.0241
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	42246	5.0000	0.9760
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	91692	10.0000	1.0986
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	188525	20.0000	1.1906
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	457509	50.0000	1.1497



Target Compound *PFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	2622	0.4765	0.6369
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	6847	1.1913	0.7200
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	29085	4.7650	0.7051
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	63414	9.5300	0.7973
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	124042	19.0600	0.8220
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	303629	47.6500	0.8007

Quantitative Analysis Calibration Report



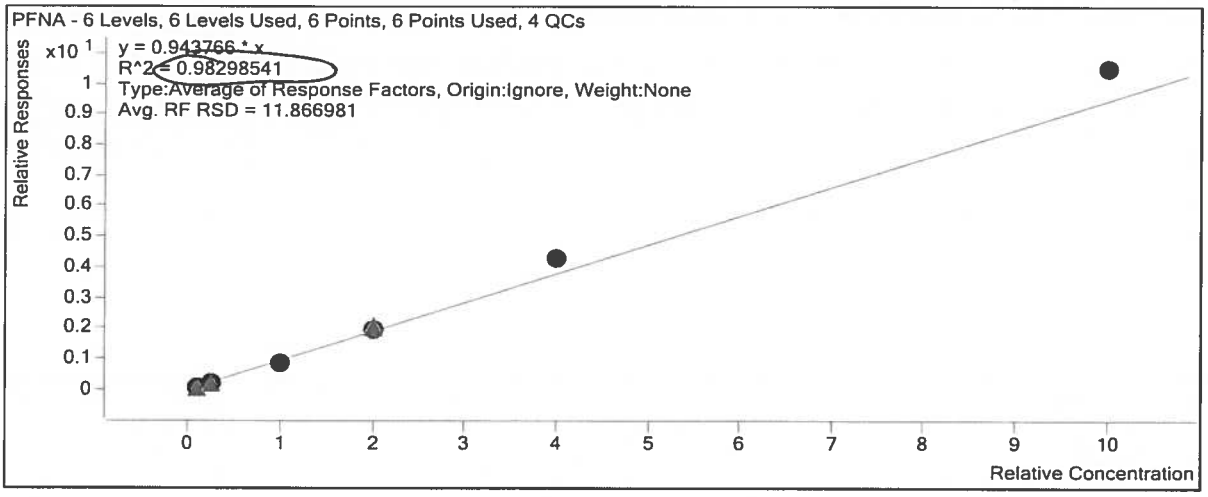
Extracted ISTD *M9PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	55258	5.0000	11051.5815
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	51867	5.0000	10373.3004
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	55187	5.0000	11037.4283
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	53975	5.0000	10795.0051
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	50176	5.0000	10035.1944
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	48990	5.0000	9798.0344

Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	4344	0.5000	0.7861
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	11420	1.2500	0.8807
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	48790	5.0000	0.8841
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	106649	10.0000	0.9879
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	216260	20.0000	1.0775
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	512534	50.0000	1.0462

Quantitative Analysis Calibration Report



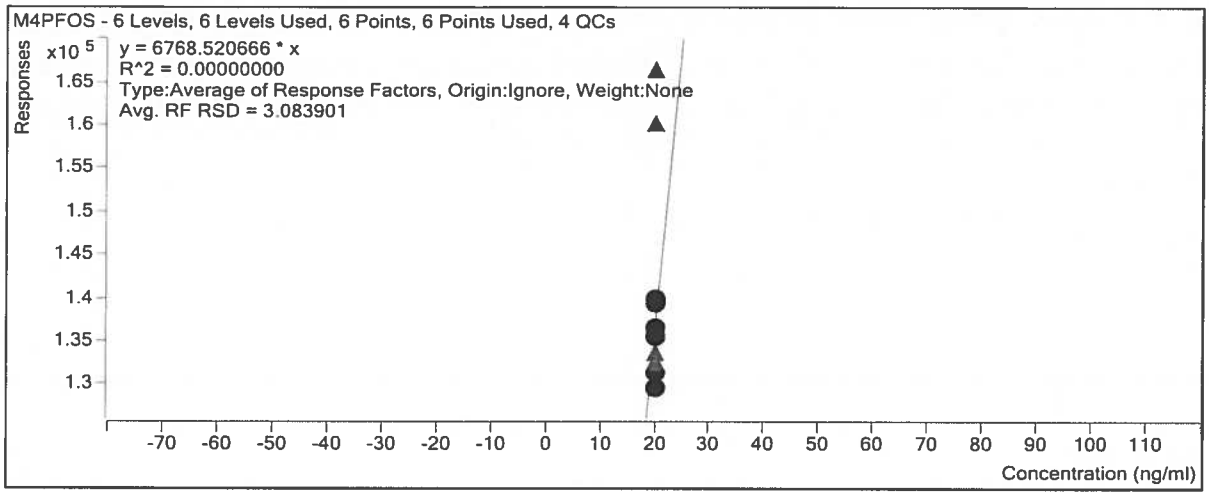
Extracted ISTD *M8PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	13014	5.0000	2602.7707
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	11352	5.0000	2270.4164
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	11626	5.0000	2325.1531
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	11150	5.0000	2229.9387
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	11265	5.0000	2252.9913
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	11244	5.0000	2248.8478

Instrument ISTD *M4PFOS*

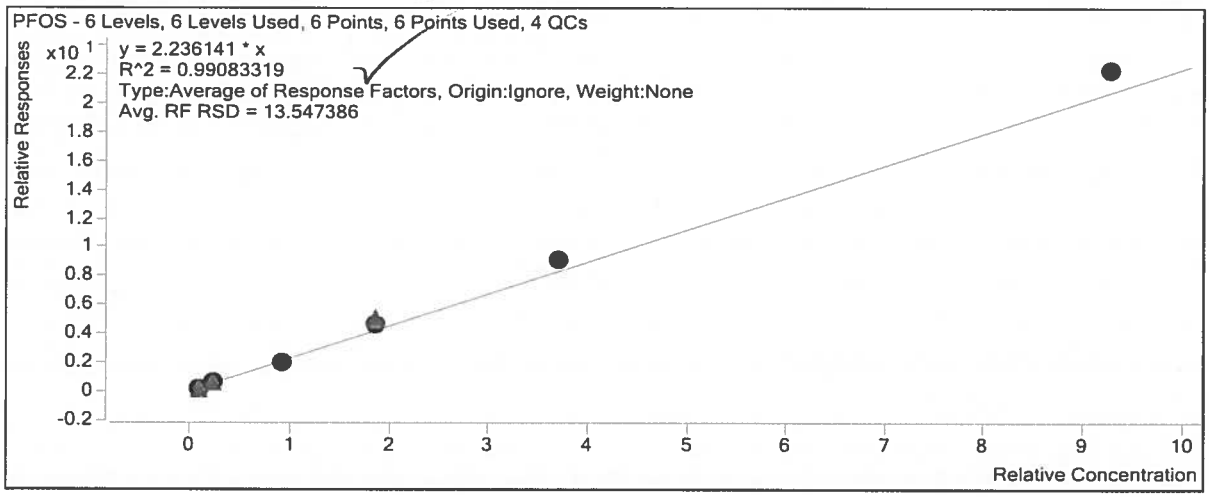
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	139483	20.0000	6974.1483
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	135495	20.0000	6774.7422
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	129617	20.0000	6480.8369
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	139827	20.0000	6991.3505
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	131358	20.0000	6567.9206
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	136443	20.0000	6822.1256

Quantitative Analysis Calibration Report



Target Compound *PFOS*

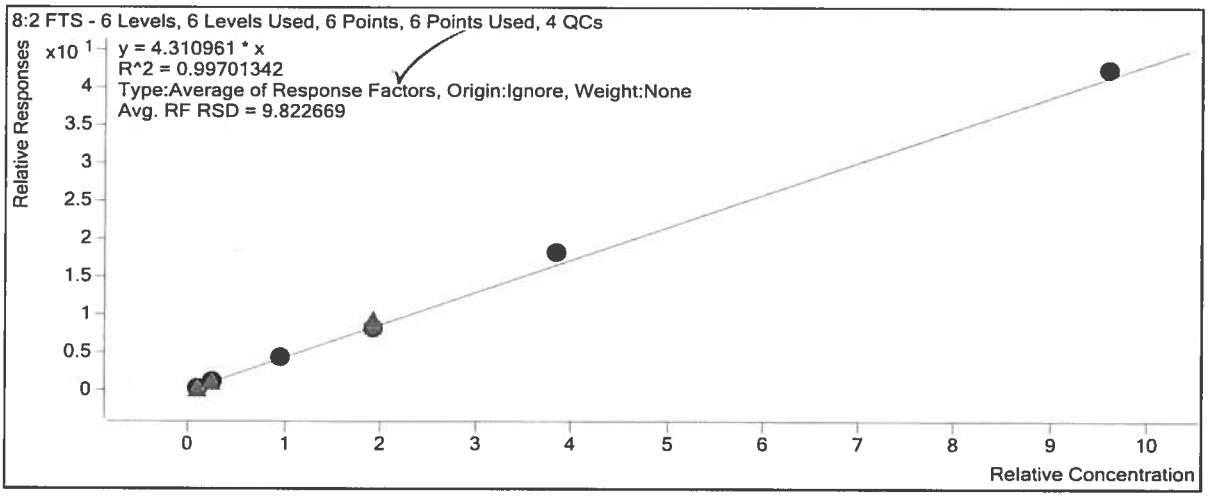
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	2032	0.4640	1.6824
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	5796	1.1600	2.2006
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	23465	4.6400	2.1750
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	52008	9.2800	2.5132
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	102130	18.5600	2.4424
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	250773	46.4000	2.4033



Target Compound *9Cl-PF3ONS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	21629	0.4665	17.8133

Quantitative Analysis Calibration Report



Extracted ISTD *M2 8:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	13492	5.0000	2698.4334
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	11365	5.0000	2273.0634
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	11141	5.0000	2228.2851
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	12789	5.0000	2557.7226
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	11045	5.0000	2209.0171
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	11073	5.0000	2214.5295

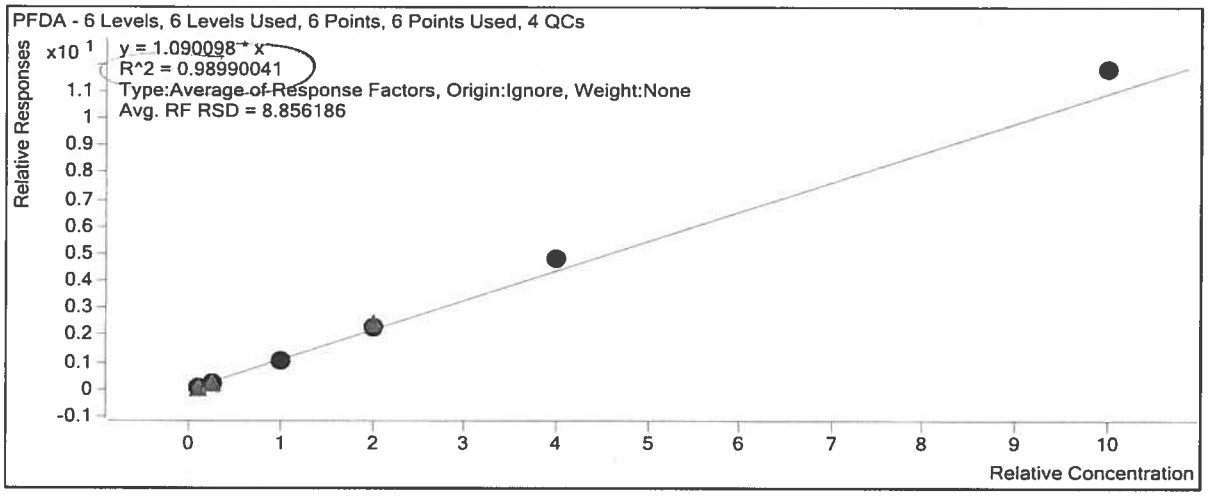
Extracted ISTD *M6PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	52849	5.0000	10569.7049
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	47679	5.0000	9535.7108
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	48548	5.0000	9709.6811
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	50574	5.0000	10114.8234
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	45492	5.0000	9098.3342
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	46348	5.0000	9269.6226

Instrument ISTD *M2PFDA*

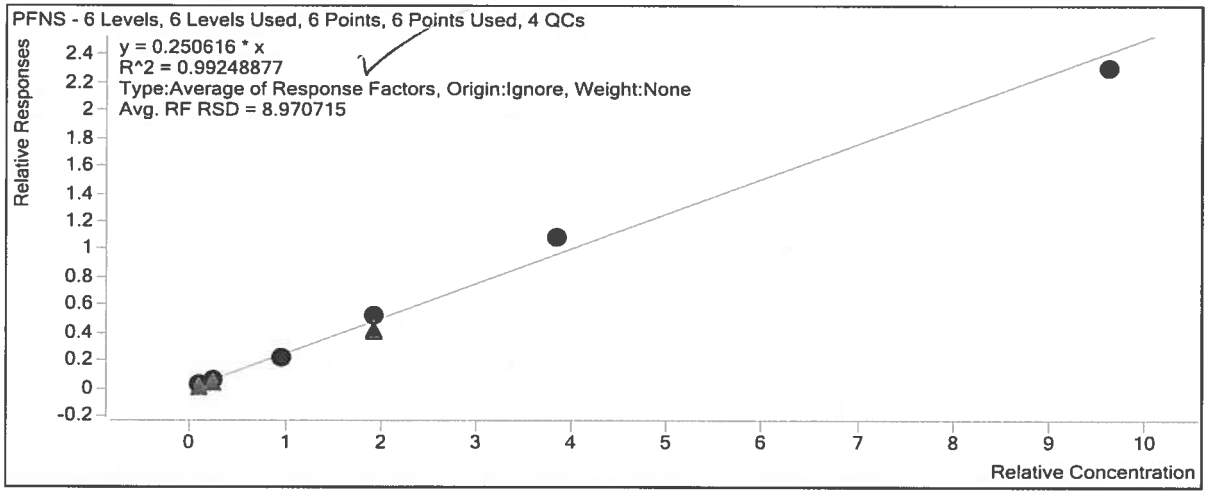
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	266980	20.0000	13349.0116

Quantitative Analysis Calibration Report



Target Compound *PFNS*

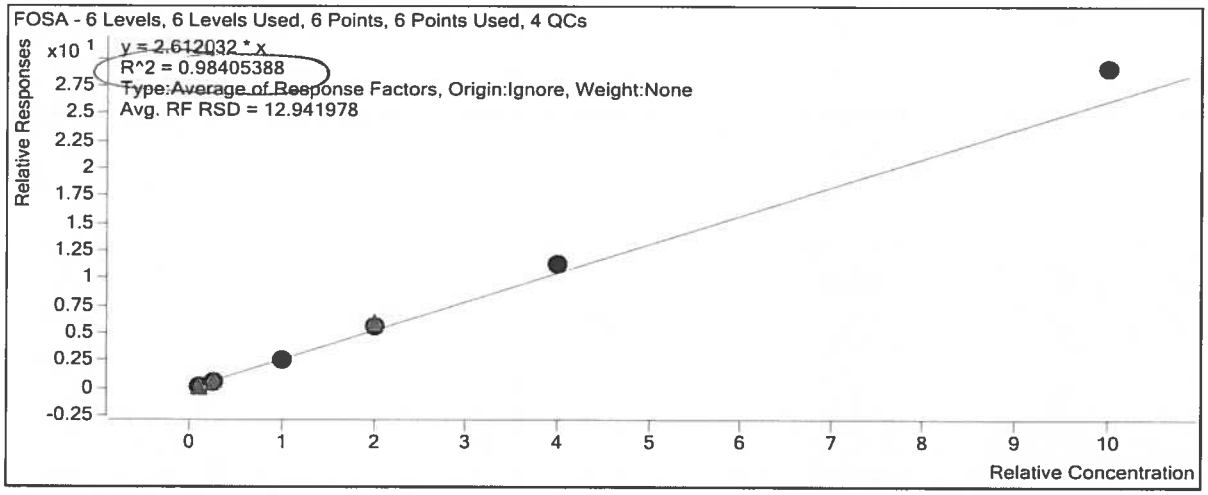
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	1199	0.4810	0.2255
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	3146	1.2025	0.2522
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	12360	4.8100	0.2328
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	28134	9.6200	0.2709
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	54614	19.2400	0.2829
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	112817	48.1000	0.2394



Target Compound *FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	4443	0.5000	1.9827

D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	12488	1.2500	2.5255
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	53179	5.0000	2.6348
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	111757	10.0000	2.7902
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	217966	20.0000	2.8314
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	554186	50.0000	2.9077



Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	22409	5.0000	4481.7073
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	19779	5.0000	3955.7698
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	20183	5.0000	4036.6867
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	20027	5.0000	4005.3943
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	19245	5.0000	3849.0229
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	19059	5.0000	3811.8663

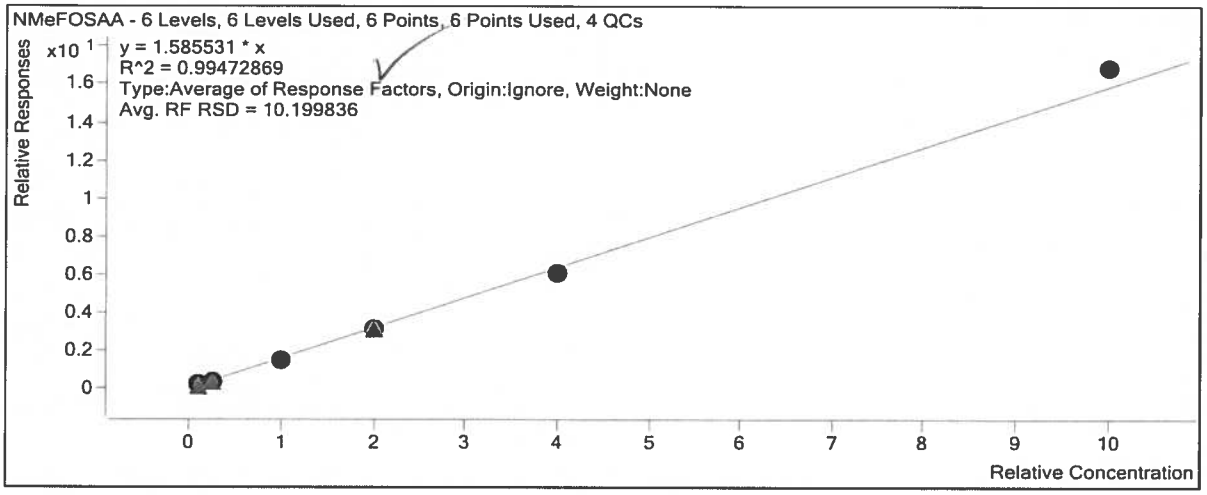
Extracted ISTD *d3-NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	12539	5.0000	2507.7434
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	13081	5.0000	2616.1934
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	13160	5.0000	2631.9870
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	13722	5.0000	2744.4138
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	13498	5.0000	2699.5618
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	12466	5.0000	2493.1268

Quantitative Analysis Calibration Report

Target Compound *NMeFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	2329	0.5000	1.8577
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	4612	1.2500	1.4102
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	19464	5.0000	1.4791
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	42851	10.0000	1.5614
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	82089	20.0000	1.5204
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	209975	50.0000	1.6844



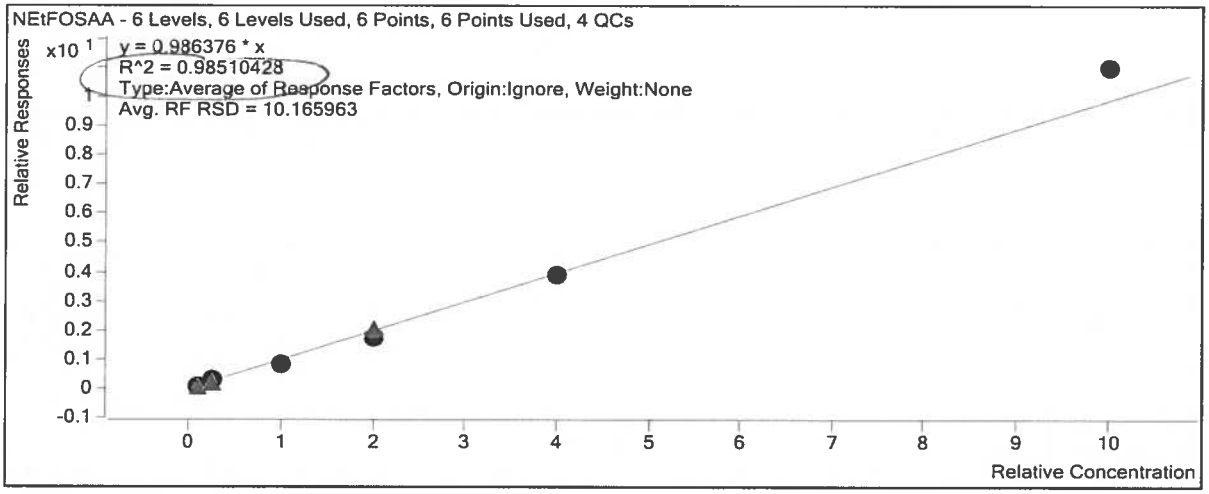
Extracted ISTD *d5-NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	26340	5.0000	5268.0616
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	21737	5.0000	4347.4246
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	25752	5.0000	5150.3687
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	23897	5.0000	4779.4643
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	23265	5.0000	4652.9792
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	19708	5.0000	3941.6873

Target Compound *NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	2777	0.5000	1.0543

D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	5756	1.2500	1.0591
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	21895	5.0000	0.8502
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	42546	10.0000	0.8902
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	90033	20.0000	0.9675
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	216194	50.0000	1.0970



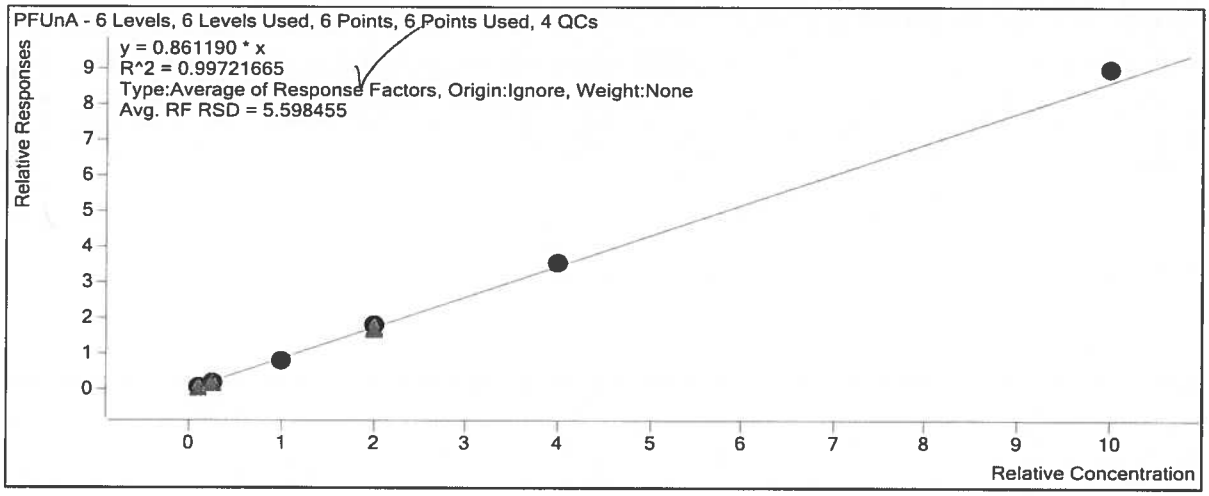
Extracted ISTD *M7PFUnA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	64318	5.0000	12863.6023
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	58018	5.0000	11603.5965
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	63832	5.0000	12766.4350
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	59462	5.0000	11892.4365
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	60856	5.0000	12171.2282
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	57043	5.0000	11408.6250

Target Compound *PFUnA*

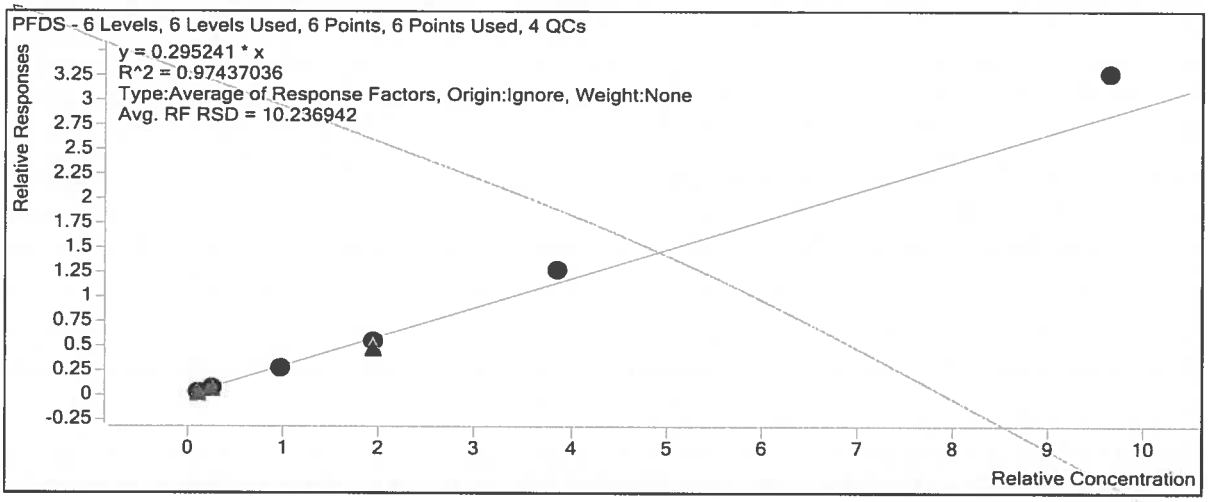
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	5503	0.5000	0.8556
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	11577	1.2500	0.7982
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	51827	5.0000	0.8119
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	109216	10.0000	0.9184
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	215466	20.0000	0.8851
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	512204	50.0000	0.8979

Quantitative Analysis Calibration Report



Target Compound *PFDS*

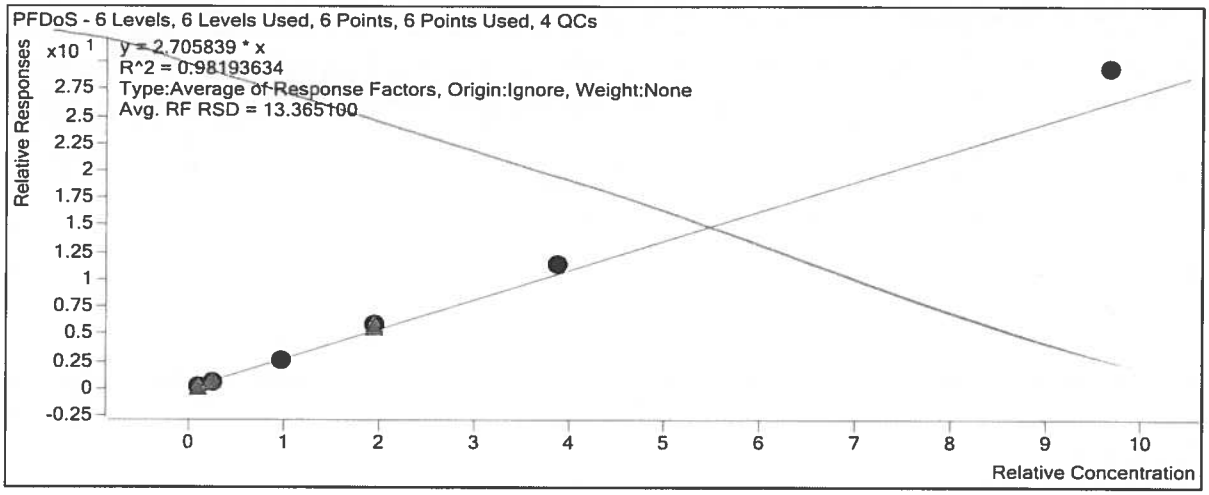
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	1377	0.4825	0.2700
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	3137	1.2063	0.2727
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	13176	4.8250	0.2812
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	27367	9.6500	0.2804
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	57531	19.3000	0.3276
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	151836	48.2500	0.3395



Target Compound *11Cl-PF3OUdS*

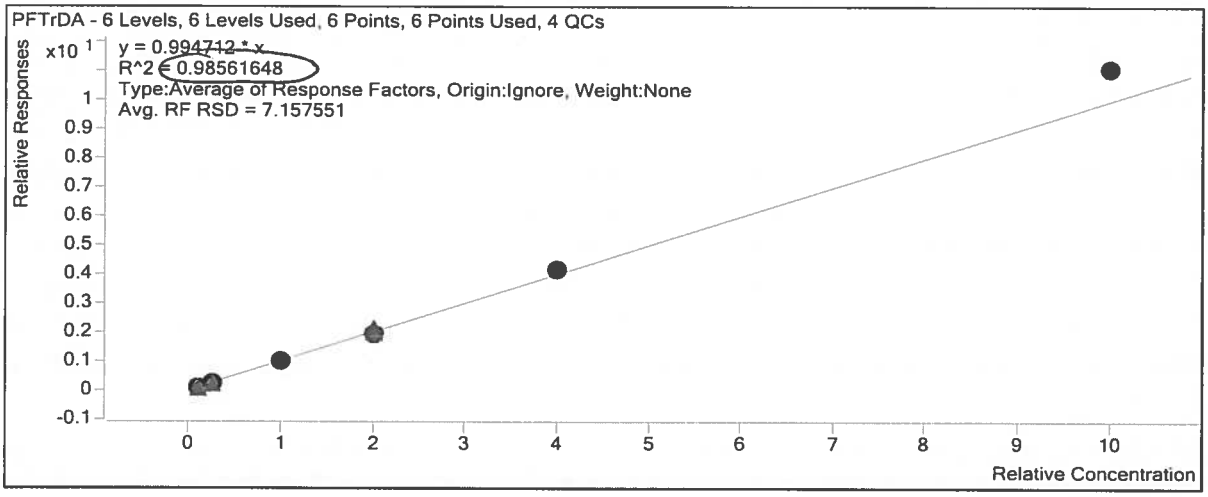
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	7219	0.4715	5.8827

Quantitative Analysis Calibration Report



Target Compound *PFTrDA*

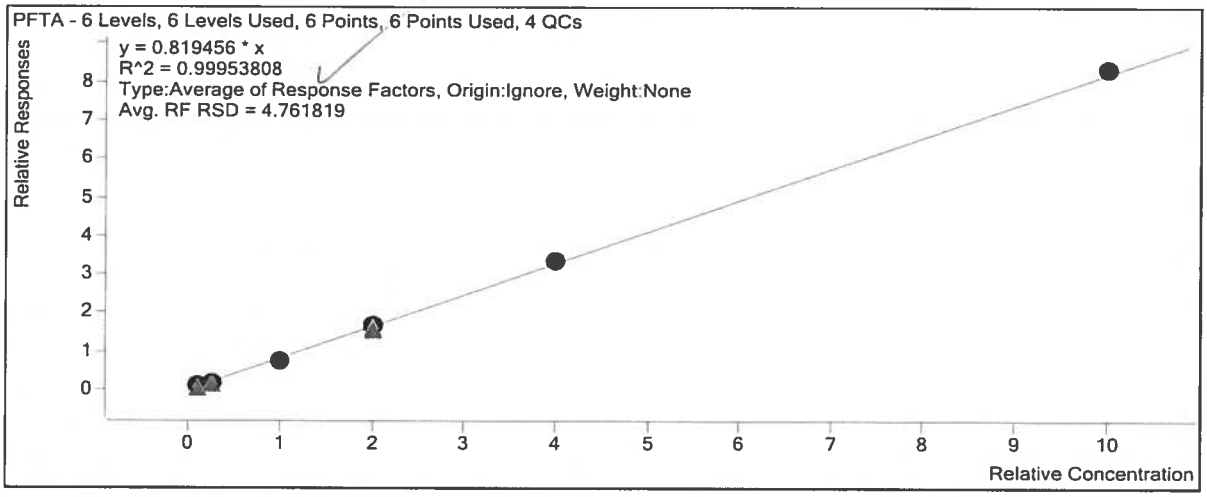
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	4433	0.5000	0.9941
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	9743	1.2500	0.8969
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	42732	5.0000	0.9698
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	85480	10.0000	0.9634
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	173138	20.0000	1.0388
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	429430	50.0000	1.1053



Extracted ISTD *d-NEtFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	15587	5.0000	3117.4797

D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	6745	1.2500	0.7676
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	28403	5.0000	0.7752
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	60410	10.0000	0.8460
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	119959	20.0000	0.8329
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	304986	50.0000	0.8317



Target Compound *PFHxDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
D:\MassHunter\Data\2210310ACAL\2210310A_04.d	Calibration	1	☑	3363	0.5000	0.9440
D:\MassHunter\Data\2210310ACAL\2210310A_05.d	Calibration	2	☑	7464	1.2500	0.8654
D:\MassHunter\Data\2210310ACAL\2210310A_06.d	Calibration	3	☑	30422	5.0000	0.8196
D:\MassHunter\Data\2210310ACAL\2210310A_07.d	Calibration	4	☑	65457	10.0000	0.8714
D:\MassHunter\Data\2210310ACAL\2210310A_08.d	Calibration	5	☑	126753	20.0000	0.9379
D:\MassHunter\Data\2210310ACAL\2210310A_09.d	Calibration	6	☑	321462	50.0000	0.9111

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	221022515	Instrument ID:	QQQ1
Analysis Date:	03/10/2021 16:17	Lab File ID:	2210310A_29.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705663

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	9370	8110	87	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	9510	9510	100	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	9600	10000	105	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	11700	117	70	130	
NEtFOSA	ng/L	10000	10900	109	70	130	
NEtFOSAA	ng/L	10000	10200	102	70	130	
NEtFOSE	ng/L	10000	10600	106	70	130	
NMeFOSA	ng/L	10000	10400	104	70	130	
NMeFOSAA	ng/L	10000	9540	95	70	130	
NMeFOSE	ng/L	10000	10500	105	70	130	
Perfluorobutanoic acid	ng/L	10000	9850	99	70	130	
Perfluorobutanesulfonic acid	ng/L	8870	9180	104	70	130	
Perfluorodecanoic acid	ng/L	10000	10600	106	70	130	
Perfluorodecane sulfonic acid	ng/L	9650	8790	91	70	130	
Perfluorododecanoic acid	ng/L	10000	9850	98	70	130	
Perfluoroheptanoic acid	ng/L	10000	10000	100	70	130	
Perfluoroheptanesulfonic acid	ng/L	9530	10900	115	70	130	
Perfluorohexanoic acid	ng/L	10000	10100	101	70	130	
Perfluorohexanesulfonic acid	ng/L	9140	11000	120	70	130	
Perfluorononanoic acid	ng/L	10000	10600	106	70	130	
Perfluorononanesulfonic acid	ng/L	9620	8610	90	70	130	
Perfluorooctanoic acid	ng/L	10000	10400	104	70	130	
Perfluorooctanesulfonic acid	ng/L	9280	10600	115	70	130	
Perfluoropentanoic acid	ng/L	10000	10000	100	70	130	
Perfluoropentanesulfonic acid	ng/L	9410	9570	102	70	130	
Perfluorotetradecanoic acid	ng/L	10000	9810	98	70	130	
Perfluorotridecanoic acid	ng/L	10000	9460	95	70	130	
Perfluoroundecanoic acid	ng/L	10000	10100	101	70	130	

FORM 7E - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	221022515	Instrument ID:	QQQ1
Analysis Date:	03/10/2021 20:20	Lab File ID:	2210310A_46.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	705663

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	9370	8160	87	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	9510	8860	93	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	9600	8440	88	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	12700	127	70	130	
NEtFOSA	ng/L	10000	10600	106	70	130	
NEtFOSAA	ng/L	10000	10000	100	70	130	
NEtFOSE	ng/L	10000	10300	103	70	130	
NMeFOSA	ng/L	10000	10500	105	70	130	
NMeFOSAA	ng/L	10000	8840	88	70	130	
NMeFOSE	ng/L	10000	10200	102	70	130	
Perfluorobutanoic acid	ng/L	10000	9690	97	70	130	
Perfluorobutanesulfonic acid	ng/L	8870	9170	103	70	130	
Perfluorodecanoic acid	ng/L	10000	11500	115	70	130	
Perfluorodecane sulfonic acid	ng/L	9650	9660	100	70	130	
Perfluorododecanoic acid	ng/L	10000	10000	100	70	130	
Perfluoroheptanoic acid	ng/L	10000	10300	103	70	130	
Perfluoroheptanesulfonic acid	ng/L	9530	11700	123	70	130	
Perfluorohexanoic acid	ng/L	10000	10400	104	70	130	
Perfluorohexanesulfonic acid	ng/L	9140	10300	112	70	130	
Perfluorononanoic acid	ng/L	10000	10900	109	70	130	
Perfluorononanesulfonic acid	ng/L	9620	9120	95	70	130	
Perfluorooctanoic acid	ng/L	10000	10500	105	70	130	
Perfluorooctanesulfonic acid	ng/L	9280	10600	114	70	130	
Perfluoropentanoic acid	ng/L	10000	9920	99	70	130	
Perfluoropentanesulfonic acid	ng/L	9410	10700	113	70	130	
Perfluorotetradecanoic acid	ng/L	10000	9720	97	70	130	
Perfluorotridecanoic acid	ng/L	10000	9550	96	70	130	
Perfluoroundecanoic acid	ng/L	10000	10200	102	70	130	

FORM 7E - ORG

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	221022515	Standard ID:	1205 (ICAL Midpoint)
Analyst:	MRA	Instrument ID:	QQQ1
Analysis Date:	03/10/21 11:00	Lab File ID:	2210310A_08.d
Analytical Method:	PFAS Isotope Dilution QSM B15	Analytical Batch:	705663

		M2PFDA		M2PFHxA		M2PFOA		M4PFOS	
		Area		*Area*		*Area*		*Area*	
STANDARD		239474		525668		215176		131358	
CLIENT SAMPLE ID	***LAB SAMP ID***		*#*		*#*		*#*		*#*
MB2155526RE	2155526RE	295013		618821		256369		146974	
LCS2155527RE	2155527RE	266677		591158		246006		142407	
LCSD2155528RE	2155528RE	265934		594080		240247		142791	
HAASF-POTABLE-01RE	22102251501RE	264795		595018		234829		144819	
HAASF-POTABLE-02RE	22102251502RE	279782		596997		244701		144521	
HAASF-POTABLE-02-DUPRE	22102251503RE	282189		589596		251162		145895	

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	221022515	Method Blank ID:	2155526
Matrix:	Water	Instrument ID:	QQQ1
Sample Amt:	125 mL	Lab File ID:	2210310A_40.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:		Analysis Date:	03/10/21 Time: 1854
Prep Batch:	705832	Analytical Batch:	705663
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2155527	2155527	2210302A_75.d	03/03/21	0343
2.	LCSD2155528	2155528	2210302A_76.d	03/03/21	0356
3.	HAASF-POTABLE-01	22102251501	2210302A_80.d	03/03/21	0448
4.	HAASF-POTABLE-02	22102251502	2210302A_81.d	03/03/21	0501
5.	HAASF-POTABLE-02-DUP	22102251503	2210302A_82.d	03/03/21	0514
6.	LCS2155527RE	2155527RE	2210310A_41.d	03/10/21	1908
7.	LCSD2155528RE	2155528RE	2210310A_42.d	03/10/21	1923
8.	HAASF-POTABLE-01RE	22102251501RE	2210310A_43.d	03/10/21	1937
9.	HAASF-POTABLE-02RE	22102251502RE	2210310A_44.d	03/10/21	1952
10.	HAASF-POTABLE-02-DUPRE	22102251503RE	2210310A_45.d	03/10/21	2006

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	MB2155526
Collect Date:	NA Time: NA	GCAL Sample ID:	2155526
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ2
Sample Amt:	125 mL	Lab File ID:	2210302A_74.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: BMH
Prep Date:		Analysis Date:	03/03/21 Time: 0330
Prep Batch:	705832	Analytical Batch:	705119
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	2.00	U	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	2.00	U	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	2.00	U	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	2.00	U	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	2.00	U	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	2.00	U	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	2.00	U	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	2.00	U	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	2.00	U	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	2.00	U	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 221022515

Prep Method: PFAS ID QSM B15 Prep Prep Batch: 705832

Analytical Method: PFAS Isotope Dilution QSM B15 Analytical Batch: 705119

GCAL QC ID: 2155527

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	LCS RESULT	LCS % REC	#	QC LIMITS
4:2 Fluorotelomersulfonic acid	ng/L	75	0	86.1	115		63 - 143
6:2 Fluorotelomersulfonic acid	ng/L	76.1	0	78.9	104		64 - 140
8:2 Fluorotelomersulfonic acid	ng/L	76.8	0	87.1	113		67 - 138
NEtFOSAA	ng/L	80	0	70.1	88		61 - 135
NEtFOSE	ng/L	80	0	77.9	97		70 - 130
NMeFOSAA	ng/L	80	0	83	104		65 - 136
NMeFOSE	ng/L	80	0	64.5	81		70 - 130
Perfluorobutanesulfonic acid	ng/L	71	0	70.1	99		72 - 130
Perfluorobutanoic acid	ng/L	80	0	81.1	101		73 - 129
Perfluorodecane sulfonic acid	ng/L	77.2	0	67.3	87		53 - 142
Perfluorodecanoic acid	ng/L	80	0	73.4	92		71 - 129
Perfluorododecanoic acid	ng/L	80	0	74.7	93		72 - 134
Perfluoroheptanesulfonic acid	ng/L	76.2	0	66.9	88		69 - 134
Perfluoroheptanoic acid	ng/L	80	0	83.4	104		72 - 130
Perfluorohexanesulfonic acid	ng/L	73.1	0	70.6	97		68 - 131
Perfluorohexanoic acid	ng/L	80	0	73.2	92		72 - 129
Perfluorononanesulfonic acid	ng/L	77	0	67.6	88		69 - 127
Perfluorononanoic acid	ng/L	80	0	65.7	82		69 - 130
Perfluorooctane Sulfonamide	ng/L	80	0	77.5	97		67 - 137
Perfluorooctanesulfonic acid	ng/L	74.2	0	73.1	98		65 - 140
Perfluorooctanoic acid	ng/L	80	0	79.2	99		71 - 133
Perfluoropentanesulfonic acid	ng/L	75.3	0	68.2	91		71 - 127
Perfluoropentanoic acid	ng/L	80	0	79.5	99		72 - 129
Perfluorotetradecanoic acid	ng/L	80	0	77.5	97		71 - 132
Perfluorotridecanoic acid	ng/L	80	0	71	89		65 - 144
Perfluoroundecanoic acid	ng/L	80	0	86	107		69 - 133

RPD : 0 out of 26 outside limits

Spike Recovery: 0 out of 52 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 221022515

Prep Method: PFAS ID QSM B15 Prep

Prep Batch: 705832

Analytical Method: PFAS Isotope Dilution QSM B15

Analytical Batch: 705119

GCAL QC ID: 2155528

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*QC LIMITS RPD*
4:2 Fluorotelomersulfonic acid	ng/L	75	72.4	97		17		63 - 143	0 - 30
6:2 Fluorotelomersulfonic acid	ng/L	76.1	65.4	86		19		64 - 140	0 - 30
8:2 Fluorotelomersulfonic acid	ng/L	76.8	81	105		7		67 - 138	0 - 30
NEtFOSAA	ng/L	80	75.7	95		8		61 - 135	0 - 30
NEtFOSE	ng/L	80	80.5	101		3		70 - 130	0 - 30
NMeFOSAA	ng/L	80	76.5	96		8		65 - 136	0 - 30
NMeFOSE	ng/L	80	80.5	101		22		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ng/L	71	72.9	103		4		72 - 130	0 - 30
Perfluorobutanoic acid	ng/L	80	82.5	103		2		73 - 129	0 - 30
Perfluorodecane sulfonic acid	ng/L	77.2	62.3	81		8		53 - 142	0 - 30
Perfluorodecanoic acid	ng/L	80	72.5	91		1		71 - 129	0 - 30
Perfluorododecanoic acid	ng/L	80	83.9	105		12		72 - 134	0 - 30
Perfluoroheptanesulfonic acid	ng/L	76.2	74.1	97		10		69 - 134	0 - 30
Perfluoroheptanoic acid	ng/L	80	74.9	94		11		72 - 130	0 - 30
Perfluorohexanesulfonic acid	ng/L	73.1	73.7	101		4		68 - 131	0 - 30
Perfluorohexanoic acid	ng/L	80	79.7	100		8		72 - 129	0 - 30
Perfluorononanesulfonic acid	ng/L	77	67.7	88		.07		69 - 127	0 - 30
Perfluorononanoic acid	ng/L	80	74.5	93		13		69 - 130	0 - 30
Perfluorooctane Sulfonamide	ng/L	80	81.6	102		5		67 - 137	0 - 30
Perfluorooctanesulfonic acid	ng/L	74.2	74.6	101		2		65 - 140	0 - 30
Perfluorooctanoic acid	ng/L	80	87.1	109		10		71 - 133	0 - 30
Perfluoropentanesulfonic acid	ng/L	75.3	69.3	92		2		71 - 127	0 - 30
Perfluoropentanoic acid	ng/L	80	81.6	102		3		72 - 129	0 - 30
Perfluorotetradecanoic acid	ng/L	80	71.7	90		8		71 - 132	0 - 30
Perfluorotridecanoic acid	ng/L	80	75.3	94		6		65 - 144	0 - 30
Perfluoroundecanoic acid	ng/L	80	77.2	96		11		69 - 133	0 - 30

RPD : 0 out of 26 outside limits

Spike Recovery: 0 out of 52 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	221022515	Method Blank ID:	2155526
Matrix:	Water	Instrument ID:	QQQ1
Sample Amt:	125 mL	Lab File ID:	2210310A_40.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:		Analysis Date:	03/10/21 Time: 1854
Prep Batch:	705832	Analytical Batch:	705663
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	LCS2155527	2155527	2210302A_75.d	03/03/21	0343
2.	LCSD2155528	2155528	2210302A_76.d	03/03/21	0356
3.	HAASF-POTABLE-01	22102251501	2210302A_80.d	03/03/21	0448
4.	HAASF-POTABLE-02	22102251502	2210302A_81.d	03/03/21	0501
5.	HAASF-POTABLE-02-DUP	22102251503	2210302A_82.d	03/03/21	0514
6.	LCS2155527RE	2155527RE	2210310A_41.d	03/10/21	1908
7.	LCSD2155528RE	2155528RE	2210310A_42.d	03/10/21	1923
8.	HAASF-POTABLE-01RE	22102251501RE	2210310A_43.d	03/10/21	1937
9.	HAASF-POTABLE-02RE	22102251502RE	2210310A_44.d	03/10/21	1952
10.	HAASF-POTABLE-02-DUPRE	22102251503RE	2210310A_45.d	03/10/21	2006

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221022515	Client Sample ID:	MB2155526RE
Collect Date:	NA Time: NA	GCAL Sample ID:	2155526RE
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ1
Sample Amt:	125 mL	Lab File ID:	2210310A_40.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:		Analysis Date:	03/10/21 Time: 1854
Prep Batch:	705832	Analytical Batch:	705663
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
31506-32-8	NMeFOSA	1.15	J	0.970	4.00	8.00

FORM I SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 221022515

Prep Method: PFAS ID QSM B15 Prep

Prep Batch: 705832

Analytical Method: PFAS Isotope Dilution QSM B15

Analytical Batch: 705663

GCAL QC ID: 2155527

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	*#*	*QC LIMITS*
NEtFOSA	ng/L	80	0	88	110 ✓		70 - 130
NMeFOSA	ng/L	80	0	79.8	100 ✓		68 - 141

GCAL QC ID: 2155528

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	*#*	*% RPD*	*#*	*QC LIMITS REC*	*QC LIMITS RPD*
NEtFOSA	ng/L	80	87.1	109 ✓		1 ✓		70 - 130	0 - 30
NMeFOSA	ng/L	80	79	99 ✓		1 ✓		68 - 141	0 - 30

RPD : 0 out of 2 outside limits

Spike Recovery: 0 out of 4 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 221022515 Recovery Limits: 50 - 150

Client Sample ID	LAB SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
HAASF-POTABLE-01	22102251501	87		82		78		86		80		88		83	
HAASF-POTABLE-01RE	22102251501														
HAASF-POTABLE-02	22102251502	83		86		74		77		87		84		84	
HAASF-POTABLE-02RE	22102251502														
HAASF-POTABLE-02-DUP	22102251503	85		95		76		78		77		62		89	
HAASF-POTABLE-02-DUPRE	22102251503														
MB2155526	2155526	98		91		90		90		92		78		89	
MB2155526RE	2155526														
LCS2155527	2155527	83		89		78		86		80		65		89	
LCS2155527RE	2155527														

Client Sample ID	LAB SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
HAASF-POTABLE-01	22102251501	87		93		93		86		95		86		72	
HAASF-POTABLE-01RE	22102251501														
HAASF-POTABLE-02	22102251502	82		88		93		88		92		94		82	
HAASF-POTABLE-02RE	22102251502														
HAASF-POTABLE-02-DUP	22102251503	82		91		90		86		101		82		78	
HAASF-POTABLE-02-DUPRE	22102251503														
MB2155526	2155526	90		85		92		85		97		90		80	
MB2155526RE	2155526														
LCS2155527	2155527	90		92		96		90		98		87		83	
LCS2155527RE	2155527														

Client Sample ID	LAB SampleID	EIS15	#	EIS16	#	EIS17	#	EIS18	#	EIS19	#	EIS20	#	EIS21	#
HAASF-POTABLE-01	22102251501	98		95		88		82		80					
HAASF-POTABLE-01RE	22102251501											51		61	
HAASF-POTABLE-02	22102251502	100		94		93		84		78					
HAASF-POTABLE-02RE	22102251502											65		78	
HAASF-POTABLE-02-DUP	22102251503	99		86		89		84		91					
HAASF-POTABLE-02-DUPRE	22102251503											53		64	
MB2155526	2155526	93		86		92		85		102					
MB2155526RE	2155526											76		81	
LCS2155527	2155527	99		89		102		86		99					
LCS2155527RE	2155527											86		92	

Client Sample ID	LAB SampleID	EIS22	#	EIS23	#	EIS24	#	EIS25	#
HAASF-POTABLE-01	22102251501	87		84		65		67	
HAASF-POTABLE-01RE	22102251501								
HAASF-POTABLE-02	22102251502	85		90		79		74	
HAASF-POTABLE-02RE	22102251502								
HAASF-POTABLE-02-DUP	22102251503	88		90		66		66	
HAASF-POTABLE-02-DUPRE	22102251503								

MB2155526	2155526	92		85		73		70											
MB2155526RE	2155526																		
LCS2155527	2155527	90		98		86		72											
LCS2155527RE	2155527																		

EIS1: M2 4:2 FTS EIS2: M2 6:2 FTS EIS3: M2 8:2 FTS EIS4: M2PFHxDA
EIS5: M2PFTA EIS6: M3HFPODA EIS7: M3PFBS EIS8: M3PFHxS
EIS9: M4PFHpA EIS10: M5PFHxA EIS11: M5PFPeA EIS12: M6PFDA
EIS13: M7PFUnA EIS14: M8FOSA EIS15: M8PFOA EIS16: M8PFOS
EIS17: M9PFNA EIS18: MPFBA EIS19: MPFDoA EIS20: d-NEtFOSA
EIS21: d-NMeFOSA EIS22: d3-NMeFOSAA EIS23: d5-NEtFOSAA EIS24: d7-NMeFOSE
EIS25: d9-NEtFOSE

FORM 8E - ORG

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 221022515 Recovery Limits: 50 - 150

Client Sample ID	*LAB SampleID*	*EIS1*	#	*EIS2*	#	*EIS3*	#	*EIS4*	#	*EIS5*	#	*EIS6*	#	*EIS7*	#
LCSD2155528	2155528	88		98		83		85		88		92		85	
LCSD2155528RE	2155528														

Client Sample ID	*LAB SampleID*	*EIS8*	#	*EIS9*	#	*EIS10*	#	*EIS11*	#	*EIS12*	#	*EIS13*	#	*EIS14*	#
LCSD2155528	2155528	88		93		94		88		100		93		81	
LCSD2155528RE	2155528														

Client Sample ID	*LAB SampleID*	*EIS15*	#	*EIS16*	#	*EIS17*	#	*EIS18*	#	*EIS19*	#	*EIS20*	#	*EIS21*	#
LCSD2155528	2155528	90		83		96		85		86					
LCSD2155528RE	2155528											82		87	

Client Sample ID	*LAB SampleID*	*EIS22*	#	*EIS23*	#	*EIS24*	#	*EIS25*	#
LCSD2155528	2155528	93		90		71		74	
LCSD2155528RE	2155528								

EIS1: M2 4:2 FTS EIS2: M2 6:2 FTS EIS3: M2 8:2 FTS EIS4: M2PFHxDA
EIS5: M2PFTA EIS6: M3HFPODA EIS7: M3PFBS EIS8: M3PFHxS
EIS9: M4PFHpA EIS10: M5PFHxA EIS11: M5PFPeA EIS12: M6PFDA
EIS13: M7PFUnA EIS14: M8FOSA EIS15: M8PFOA EIS16: M8PFOS
EIS17: M9PFNA EIS18: MPFBA EIS19: MPFDoA EIS20: d-NEtFOSA
EIS21: d-NMeFOSA EIS22: d3-NMeFOSAA EIS23: d5-NEtFOSAA EIS24: d7-NMeFOSE
EIS25: d9-NEtFOSE

Sample Summary

LAB ID	Client ID	Matrix	Collect Date	Receive Date
22102251501	HAASF-POTABLE-01	Water	02/16/2021 13:05	02/24/2021 12:30
22102251502	HAASF-POTABLE-02	Water	02/16/2021 13:30	02/24/2021 12:30
22102251503	HAASF-POTABLE-02-DUP	Water	02/16/2021 13:30	02/24/2021 12:30

Case Narrative

Client: AECOM **Report:** 221022515

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.1.1 as specified in the contract.

No anomalies were found with the analyzed sample(s).

MISCELLANEOUS

PFAS Abbreviations

Abbreviation	Analyte Name
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDS	Perfluorodecane sulfonic acid
PFDoA	Perfluorododecanoic acid
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid
PFHpA	Perfluoroheptanoic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFMBA	Perfluoro-4-methoxybutanoic acid
PFMPA	Perfluoro-3-methoxypropanoic acid
PFNA	Perfluorononanoic acid
PFNS	Perfluorononanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFPeA	Perfluoropentanoic acid
PFPeS	Perfluoropentanesulfonic acid
PFTA	Perfluorotetradecanoic acid
PFTeDA	Perfluorotetradecanoic acid
PFTrDA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid

Abbreviation	Analyte Name
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
4:2 FTS	4:2 Fluorotelomer sulfonic acid
6:2 FTS	6:2 Fluorotelomer sulfonic acid
8:2 FTS	8:2 Fluorotelomer sulfonic acid
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
FOSA	Perfluorooctane Sulfonamide
HFPO-DA	Perfluoro-2-proxypropanoic acid
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid

Pace Analytical

SAMPLE RECEIVING CHECKLIST

* 2 2 1 0 2 2 5 1 5 *

SAMPLE DELIVERY GROUP 221022515	
Client PM AEC 4838 - AECOM	**Transport Method** FEDEX
Profile Number 285948	**Received By** McCune, Dodie N.
Line Item(s) 2 - GW-18 compound 537 Mod.	**Receive Date(s)** 02/24/21

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E26	Temp °C
951757989183		0.8

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Wor

Client ID: 4838 - AECOM

ALL SHAI

SDG: 221022515

Container Preservative T

PM: AEC

** Preservative Types: (1) nitric acid, (2) sul
(6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate,
(C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Company: AECOM	Billing Information: AECOM 12420 MILESTONE CENTER DR. GERMANTOWN, MD 20876
Address: 12420 MILESTONE CENTER DR.	
Report To: NAOUM TAVANTZIS	Email To: JACQUELYN.HARRINGTON@AECOM.COM
Copy To: JADY HARRINGTON	Site Collection Info/Address:
Customer Project Name/Number: 60591182.2700.02	State: MT County/City: LEWIS & CLARK Time Zone Collected: [ ] PT [X] MT [ ] CT [ ] ET
Phone: Email:	Site/Facility ID #:
Collected By (print): BRAD RUFF	Purchase Order #: Quote #:
Collected By (signature):	Turnaround Date Required:
Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Compliance Monitoring? [ ] Yes [ ] No

DW PWS ID #: DW Location Code

Immediately Packed on Ice: [X] Yes [ ] No

Field Filtered (if applicable): [ ] Yes [X] No

Analysis: _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	PFAS (EPA Method 537 Rev 1.1) Drinking Water
HAASF-POTABLE-01	DW	G	2/16/21	1305					X
HAASF-POTABLE-02	DW	G	2/16/21	1330					X
HAASF-POTABLE-02-DUP	DW	G	2/16/21	1330					X

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips: _____	
Sample pH Acceptable	Y N NA
pH Strips: _____	
Sulfide Present	Y N NA
Lead Acetate Strips: _____	

LAB USE ONLY:
Lab Sample # / Comments:

1
2
3

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used: 9517 5798 9188

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2607186

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: _____
Cooler 1 Temp Upon Receipt: _____oC
Cooler 1 Therm Corr. Factor: _____oC
Cooler 1 Corrected Temp: _____oC
Comments:
0.8 EA

Relinquished by/Company: (Signature) BRAD RUFF / AECOM	Date/Time: 2/27/21 1600	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature) FedEx	Date/Time: 2-24-21 12:30	Received by/Company: (Signature) Dodie McClure	Date/Time: 2-24-21 12:30
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: _____ of: _____

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Contract Laboratory Program National Functional Guidelines for Organic (August 2014) Data Review and the USEPA Region III Guidelines for Organic (September 1994) for blank qualifications only.

Data Validation Flags

Flag	Interpretation
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
B	The analyte was analyzed for, but not detected at a level greater than or equal to the level of the adjusted Detection Limit (DL) for sample and method.
J+	Reported value may not be accurate or precise, but the result may be biased high.
J-	Reported value may not be accurate or precise, but the result may be biased low.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the Limit of Detection (LOD).
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
UJ	The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.
C	This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by gas Chromatograph/Mass Spectrometer (GC/MS)
X	This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.

The other type of code used by AECOM is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

Code	*Description*	*Code*	*Description*
a	Tracer recovery (radiochemical data only)	**ld**	Laboratory duplicate RPDs (matrix duplicate, MSD, LCSD)
be	Equipment blank contamination	**lp**	Laboratory control sample/laboratory control sample duplicate RPDs
bf	Field blank contamination	**m**	Matrix spike recovery
bi	Bias indeterminate	**md**	Matrix spike/matrix spike duplicate RPD
bl	Laboratory blank contamination	**nb**	Negative laboratory blank contamination
bm	Missing Blank Information	**p**	Chemical preservation issue
bt	Trip Blank	**pe**	Post Extraction Spike
c	Calibration issue	**ps**	Performance Evaluation Sample
cl	Clean-up standard recovery	**q**	Quantitation issue
cp	Insufficient in growth (radiochemical data only)	**r**	Dual column RPD
cr	Chromatographic resolution	**rp**	Re-extraction precision issue [PAHs only]
d	Reporting limit raised due to chromatographic interference	**rt**	SIM ions not within + 2 seconds
dt	Dissolved result > total over limit	**s**	Surrogate recovery
e	Ether interference	**sc**	Sample collection issues
fd	Field duplicate RPDs	**sp**	Sample preparation issue
h	Holding times	**su**	Evidence of ion suppression
hs	Sample headspace did not meet receiving requirements	**t**	Temperature Preservation Issue
i	Internal standard areas	**u**	High combined sample result uncertainty (radiochemical data only)
ii	Injection internal standard area or retention time exceedance	**v**	Compound identification issue
k	Estimated Maximum Possible Concentrations	**x**	Low % solids
l	LCS recoveries	**y**	Serial dilution results
lc	Labeled compound recovery	**z**	ICS results

DATA VALIDATION REPORT - Level III Review

SDG No.:	**221050108**	**Analysis:**	**Per- and Polyfluorinated Alkyl Substances**
Laboratory:	**Pace Gulf Coast**	**Project:**	**Helena AASF**
Reviewer:	**Naoum Tavantzis**	**Date:**	**June 1st, 2021**

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied, data review worksheets, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the specifics of the analytical method referenced and provisions of the approved project-specific work plan; and, qualified according to the *Contract Laboratory Program National Functional Guidelines* (NFG) *for Superfund Organic Methods Data Review*, EPA-540-R-2017-002, January 2017, Modifications reflect the level of review requested, the specifications of the project-specific QAPP, and the specifics of the analytical methods employed.

Major Anomalies: None.

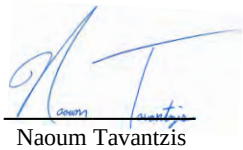
Minor Anomalies: The following laboratory blanks analyzed in sequence 710369 displayed concentrations greater than the detection limit for PFBA:

Sample ID	Concentration (ng/L)
2210503A_9	1.24
2210505A_3	1.25

The positive associated field sample results were less than five times the concentrations found in the blanks and were qualified U,bl. When appropriate, the concentration detected was raised to the limit of detection (LOD) or the LOD was raised to the concentration detected. The field duplicate pair performed on field sample HAASF-POTABLE-05 displayed several positive results in the primary sample and non-detects in the field duplicate. The positive parent sample results were qualified J,fd, while the non-detect field duplicate results were qualified UJ,fd.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method, with the exception of anomalies discussed previously. If a given fraction was not discussed, all quality control criteria reviewed were within acceptable limits. All data are usable, as qualified, for their intended purposed based on the quality control data reviewed.

Signed: 

Naoum Tavantzis

Helena AASF

Laboratory: Pace Gulf Coast

Job: 60591182 SDG#: 221050108

Sample ID	Client ID	Sample Type	Sample Date	Matrix	PFAS by QSM Table B-15
22105010801	HAASF-POTABLE-03	Field Sample	4/29/2021	Drinking Water	X
22105010802	HAASF-POTABLE-05	Field Sample	4/29/2021	Drinking Water	X
22105010803	HAASF-POTABLE-05 DUP	Field Duplicate	4/29/2021	Drinking Water	X
22105010806	HAASF-POTABLE-04	Field Sample	4/30/2021	Drinking Water	X

Helena AASF
Field Duplicate

Client Sample ID:				HAASF-POTABLE-05		HAASF-POTABLE-02-DUP						
Date Sampled:				4/29/21		4/29/21						
	Units	LOQ	5x LOQ	Sample Conc		Duplicate Conc		% RPD	Delta	2x LOQ	Pass/ Fail	Matching
4:2 FTS	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass
6:2 FTS	ng/L	4.00	20.0	1.11	J	2.00	U	57.2%	0.890	8.00	Pass	Fail
8:2 FTS	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass
FOSA	ng/L	4.00	20.0	1.38	J	1.18	J	15.6%	0.200	8.00	Pass	Pass
NEtFOSA	ng/L	4.00	20.0	4.00	U	4.00	U	0.0%	0.0	8.00	Pass	Pass
NEtFOSAA	ng/L	4.00	20.0	4.00	U	4.00	U	0.0%	0.0	8.00	Pass	Pass
N-EtFOSE	ng/L	4.00	20.0	4.00	U	4.00	U	0.0%	0.0	8.00	Pass	Pass
NMEFOSA	ng/L	4.00	20.0	4.00	U	4.00	U	0.0%	0.0	8.00	Pass	Pass
NMeFOSAA	ng/L	4.00	20.0	1.07	J	4.00	U	115.6%	2.93	8.00	Pass	Fail
NMeFOSE	ng/L	4.00	20.0	4.00	U	4.00	U	0.0%	0.0	8.00	Pass	Pass
PFBA	ng/L	4.00	20.0	1.06	J	2.00	U	61.4%	0.940	8.00	Pass	Fail
PFBS	ng/L	4.00	20.0	0.907	J	2.00	U	75.2%	1.09	8.00	Pass	Fail
PFDA	ng/L	4.00	20.0	0.898	J	2.00	U	76.1%	1.10	8.00	Pass	Fail
PFDoA	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass
PFDS	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass
PFHpA	ng/L	4.00	20.0	1.02	J	2.00	U	64.9%	0.980	8.00	Pass	Fail
PFHpS	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass
PFHxA	ng/L	4.00	20.0	1.53	J	2.00	U	26.6%	0.470	8.00	Pass	Fail
PFHxS	ng/L	4.00	20.0	1.03	J	2.00	U	64.0%	0.970	8.00	Pass	Fail
PFNA	ng/L	4.00	20.0	0.834	J	2.00	U	82.3%	1.17	8.00	Pass	Fail
PFNS	ng/L	4.00	20.0	0.787	J	2.00	U	87.0%	1.21	8.00	Pass	Fail
PFOA	ng/L	4.00	20.0	1.36	J	2.00	U	38.1%	0.640	8.00	Pass	Fail
PFOS	ng/L	4.00	20.0	2.57	J	2.00	U	24.9%	0.570	8.00	Pass	Fail
PFPeA	ng/L	4.00	20.0	1.01	J	2.00	U	65.8%	0.990	8.00	Pass	Fail
PFPeS	ng/L	4.00	20.0	0.883	J	2.00	U	77.5%	1.12	8.00	Pass	Fail
PFTeDA	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass
PFTrDA	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass
PFUnDA	ng/L	4.00	20.0	2.00	U	2.00	U	0.0%	0.0	8.00	Pass	Pass

Control limit [sample]>5xLOQ use 35%
[sample]<5xLOQ use Delta<2xLOQ

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221050108	Client Sample ID:	HAASF-POTABLE-03
Collect Date:	04/29/21 Time: 1540	GCAL Sample ID:	22105010801
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ3
Sample Amt:	125 mL	Lab File ID:	2210505A_16.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:	05/03/21	Analysis Date:	05/05/21 Time: 1505
Prep Batch:	710037	Analytical Batch:	710369
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: *ng/L*

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	2.00	U	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	2.00	U	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	2.00	U	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	2.00	U	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	2.00	U	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	2.00	U	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	0.984	J	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	2.00	U	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	2.00	U	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	2.00	U	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221050108	Client Sample ID:	HAASF-POTABLE-05
Collect Date:	04/29/21 Time: 1515	GCAL Sample ID:	22105010802
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ3
Sample Amt:	125 mL	Lab File ID:	2210505A_17.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:	05/03/21	Analysis Date:	05/05/21 Time: 1520
Prep Batch:	710037	Analytical Batch:	710369
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	1.11	J	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00
2355-31-9	NMeFOSAA	1.07	J	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	0.907	J	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	1.06	J	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	0.898	J	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	1.02	J	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	1.03	J	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	1.53	J	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	0.787	J	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	0.834	J	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	1.38	J	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	2.57	J	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	1.36	J	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	0.883	J	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	1.01	J	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

FORM I SV-1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221050108	Client Sample ID:	HAASF-POTABLE-05 DUP
Collect Date:	04/29/21 Time: 1515	GCAL Sample ID:	22105010803
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ3
Sample Amt:	125 mL	Lab File ID:	2210505A_18.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:	05/03/21	Analysis Date:	05/05/21 Time: 1534
Prep Batch:	710037	Analytical Batch:	710369
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	2.00	U	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	2.00	U	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	2.00	U	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	2.00	U	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	2.00	U	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	1.18	J	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	2.00	U	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	2.00	U	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	2.00	U	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	2.00	U	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221050108	Client Sample ID:	HAASF-POTABLE-04
Collect Date:	04/30/21 Time: 1205	GCAL Sample ID:	22105010806
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ3
Sample Amt:	125 mL	Lab File ID:	2210505A_21.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: MRA
Prep Date:	05/03/21	Analysis Date:	05/05/21 Time: 1618
Prep Batch:	710037	Analytical Batch:	710369
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	4.81		0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	3.25	J	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	1.46	J	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	16.2		0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	4.65		0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	1.66	J	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	8.57		0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	1.94	J	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	3.32	J	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	4.31		0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

FORM I SV-1

DATA VALIDATION WORKSHEET

Per- and Polyfluorinated Compounds by LC/MS/MS

Reviewer: Tyler Bryant
Date: 6/1/2021
DV Level: II III IV

Review Document:

__X__ National Functional Guidelines for Organic Data Review
__X__ DOD QSM 5.1, Table B-15
_____ Method 537 Rev. 1.1

Project Name: Helena AASF
Project Number: 60552172
Laboratory: Pace Gulf Coast
SDG No.: 221050108
Test Name: PFAS

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do sample preservation, collection and storage condition meet method requirement? 4±2°C If samples were received with the cooler temperature exceeding 6°C, then flag J(+)/UJ(-). If >20°C, J(+)/X(-)	X		
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	

Notes:

2.0 Holding Times		**Yes**	**No**	**NA**
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: 14 days; Analysis: 40 days.		X	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/X(-) .		X	

Notes:

3.0 Blanks (Laboratory and Field)		**Yes**	**No**	**NA**
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any instrument/method blanks have positive results?	X		
3.3	Do any field equipment blanks/trip blanks have positive results?		X	

Notes: 2 estimate PFBA detections flagged for PFBA detections in the instrument blank

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	For each calibration standard, was each analyte calculated within 70%-130% of the true value, RSD ≤20%, or r^2≥0.99?	X		
4.2	Was the retention time window for each analyte and surrogate set using the midpoint standard of the curve?	X		
4.3	Was the relative retention time of each analyte within laboratory control limits?	X		
4.4	Was a second source calibration verification (ICV) analyzed for each calibration curve? If no, flag "X".	X		
4.5	Were continuing calibration standards analyzed every ten samples and at the end of the sequence? If no, flag "X".	X		
4.6	For each calibration standard used for quantitation, was the S/N Ratio ≥10:1 and for all analytes with promulgated standards was the confirmation ion at a S/N at 3:1? (Table B-15, non-DW matrices)			X
For initial calibration: 70%-130%, RSD ≤20%, or r2≥0.99. J(+)/UJ(-)				
For ICV/CCV: %D>30%, Positive: J(+), Negative:J(+)/UJ(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
5.2	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits(lab default is 70%-130%)?		X	
	Action: If Yes, for %R >130, J+(+) only; for %R 30%-70%, J-(+)/UJ(-), and %R<30%, J-(+)/X(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		X	

Notes:

6.0 Surrogate Recovery/Internal Standard Area Count/Extracted Internal Standards (For Table B-15 Matrices)					Yes	No	NA
6.1	Are recoveries within acceptance criteria for all samples and method blanks?				X		
6.2	If No in Section 6.1, are these sample(s) or method blank(s) reanalyzed?				X		
6.3	If No in Section 6.2, is any sample dilution factor greater than 10? (recoveries may be diluted out.)				X		
		<10%	low	high			
	Positives	J-	J-	J+			
	Non-detects	X	UJ	None			
6.4	Has the Extracted/Injected Standard area count been met for all quality control and field samples? (50%-150%) If				X		
		<20%	low	high			
	Positives	J+	J+	J-			
	Non-detects	X	UJ	None			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		X	
	%Recovery: <30% 30%-70% >130%			
	Action: J-(+)/X(-) J-(+)/UJ(-) J+(+) only			
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits? (±30%)		X	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes:

8.0 Field/Laboratory Duplicates		Yes	No	NA
8.1	Acceptable field duplicate results? If no, J(+) parent sample/field duplicate only.		X	

Notes: Several results were positve in the parent sample but non-detect in the field duplicate sample was non-detect.

9.0 Instrument Sensitivity Check (ISC)		Yes	No	NA
9.1	Was an instrument sensitivity check analyzed prior to analysis and every 12 hours? If not X(+/-)	X		
9.2	Were analyte concentrations at the LOQ for the ISC and within ±30% of their true values? If not (J(+)/UJ(-)	X		

Notes:

10.0 Compound Identification/Tune and Detection Limit Verification		Yes	No	NA
10.1	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		
10.2	Was a mass calibration performed daily prior to analysis?	X		

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	X		
11.1.1	Number of samples: 4			
11.1.2	Number of target compounds in each analysis: 28			
11.1.3	Number of results "X" or "R" flagged results: 0			

Instrument:	QQQ3	HBN: 710369
Batch:	2210505A	
Current ICAL Bath:	2210503ACAL	
20mM Amm Acetate	016-66-4	5/7/2021
Methanol	2130147	6/30/2025
Calibration Std	016-64-4	8/24/2021
ICV Std	016-21-3	8/2/2021
EIS Mix	016-64-3	10/23/2021
IIS Mix	016-64-5	10/26/2021

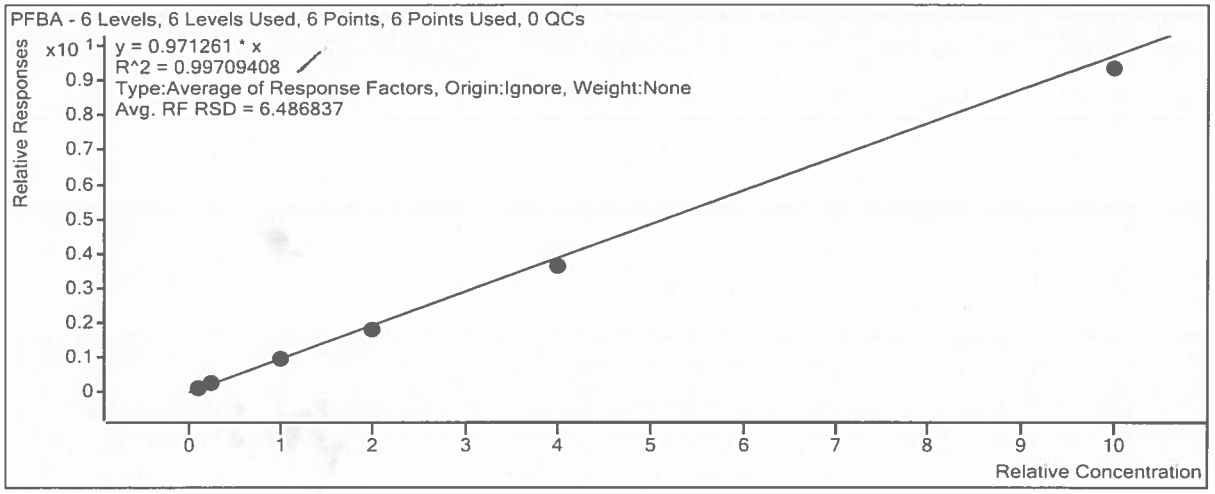
Name	Data File	Type	Acq. Date-Time	Comment	Dil.
IB	2210503A_1.d	Blank	5/3/2021 17:14	RXJ,QQQ3, Instrument blank/Instrument Idle	1
1201	2210503A_2.d	Cal	5/3/2021 17:28	RXJ,QQQ3,Cal point	1
1202	2210503A_3.d	Cal	5/3/2021 17:43	RXJ,QQQ3,Cal point	1
1203	2210503A_4.d	Cal	5/3/2021 17:58	RXJ,QQQ3,Cal point	1
1204	2210503A_5.d	Cal	5/3/2021 18:12	RXJ,QQQ3,Cal point	1
1205	2210503A_6.d	Cal	5/3/2021 18:27	RXJ,QQQ3,Cal point	1
1206	2210503A_7.d	Cal	5/3/2021 18:42	RXJ,QQQ3,Cal point	1
IB	2210503A_8.d	Blank	5/3/2021 19:09	RXJ,QQQ3, Instrument blank/Instrument Idle	1
1500	2210503A_9.d	Blank	5/3/2021 19:23	RXJ,QQQ3,BLANK	1
1600	2210503A_10.d	Sample	5/3/2021 19:38	RXJ,QQQ3, ICV	1
1450	2210503A_11.d	QC	5/3/2021 19:53	RXJ,QQQ3, CCV	1
IB	2210505A_1.d	Sample	5/5/2021 12:21	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_2.d	Sample	5/5/2021 12:36	RXJ,QQQ3, Instrument blank/Instrument Idle	1
1500	2210505A_3.d	Sample	5/5/2021 12:50	RXJ,QQQ3,BLANK	1
1450	2210505A_4.d	QC	5/5/2021 13:05	MRA,QQQ3,CCV	1
1204test	2210505A_5.d	Sample	5/5/2021 13:20	MRA,QQQ3,test	1
IB	2210505A_6.d	Sample	5/5/2021 14:39	RXJ,QQQ3, Instrument blank/Instrument Idle	1
2179810	2210505A_7.d	Sample	5/5/2021 14:54	MRA,QQQ3,710037	1
2179811	2210505A_8.d	QC	5/5/2021 15:08	MRA,QQQ3,710037	1
2179812	2210505A_9.d	QC	5/5/2021 15:23	MRA,QQQ3,710037	1
22104223501 10x	2210505A_10.d	Sample	5/5/2021 15:38	MRA,QQQ3,710037	10
22104223502 10x	2210505A_11.d	QC	5/5/2021 15:52	MRA,QQQ3,710037	10
22104223503 10x	2210505A_12.d	QC	5/5/2021 16:07	MRA,QQQ3,710037	10

22104260614	2210505A_13.d	Sample	5/5/2021 16:21	MRA,QQQ3,710037	1
1400	2210505A_14.d	QC	5/5/2021 16:36	MRA,QQQ3,CCV	1
22104305901	2210505A_15.d	Sample	5/5/2021 16:51	MRA,QQQ3,710037	1
22105010801	2210505A_16.d	Sample	5/5/2021 17:05	MRA,QQQ3,710037	1
22105010802	2210505A_17.d	Sample	5/5/2021 17:20	MRA,QQQ3,710037	1
22105010803	2210505A_18.d	Sample	5/5/2021 17:34	MRA,QQQ3,710037	1
22105010804	2210505A_19.d	QC	5/5/2021 17:49	MRA,QQQ3,710037	1
22105010805	2210505A_20.d	QC	5/5/2021 18:04	MRA,QQQ3,710037	1
22105010806	2210505A_21.d	Sample	5/5/2021 18:18	MRA,QQQ3,710037	1
22104302644	2210505A_22.d	Sample	5/5/2021 18:33	MRA,QQQ3,710037	1
22104302645	2210505A_23.d	Sample	5/5/2021 18:47	MRA,QQQ3,710037	1
22105041147	2210505A_24.d	Sample	5/5/2021 19:02	MRA,QQQ3,710037	1
1400	2210505A_25.d	QC	5/5/2021 19:17	MRA,QQQ3,CCV	1
22104302647	2210505A_26.d	Sample	5/5/2021 19:31	MRA,QQQ3,710037	1
22104302648	2210505A_27.d	QC	5/5/2021 19:46	MRA,QQQ3,710037	1
22104302649	2210505A_28.d	QC	5/5/2021 20:01	MRA,QQQ3,710037	1
22104302650	2210505A_29.d	Sample	5/5/2021 20:15	MRA,QQQ3,710037	1
22104302651	2210505A_30.d	Sample	5/5/2021 20:30	MRA,QQQ3,710037	1
22104302652	2210505A_31.d	Sample	5/5/2021 20:44	MRA,QQQ3,710037	1
2180348	2210505A_32.d	Sample	5/5/2021 20:59	MRA,QQQ3,710145	1
2180349	2210505A_33.d	QC	5/5/2021 21:14	MRA,QQQ3,710145	1
2180350	2210505A_34.d	QC	5/5/2021 21:28	MRA,QQQ3,710145	1
22104260102	2210505A_35.d	Sample	5/5/2021 21:43	MRA,QQQ3,710145	1
1400	2210505A_36.d	QC	5/5/2021 21:57	MRA,QQQ3,CCV	1
22104260103	2210505A_37.d	Sample	5/5/2021 22:12	MRA,QQQ3,710145	1
22104260114	2210505A_38.d	Sample	5/5/2021 22:27	MRA,QQQ3,710145	1
22104260117	2210505A_39.d	Sample	5/5/2021 22:41	MRA,QQQ3,710145	1
22104283101	2210505A_40.d	Sample	5/5/2021 22:56	MRA,QQQ3,710145	1
22104283102	2210505A_41.d	Sample	5/5/2021 23:10	MRA,QQQ3,710145	1
22104283103	2210505A_42.d	Sample	5/5/2021 23:25	MRA,QQQ3,710145	1
22104283104	2210505A_43.d	Sample	5/5/2021 23:40	MRA,QQQ3,710145	1
22104283105	2210505A_44.d	Sample	5/5/2021 23:54	MRA,QQQ3,710145	1
22104283106	2210505A_45.d	Sample	5/6/2021 0:09	MRA,QQQ3,710145	1
22104283107	2210505A_46.d	Sample	5/6/2021 0:23	MRA,QQQ3,710145	1

1400	2210505A_47.d	QC	5/6/2021 0:38	MRA,QQQ3,CCV	1
22104283108	2210505A_48.d	Sample	5/6/2021 0:53	MRA,QQQ3,710145	1
22104283109	2210505A_49.d	Sample	5/6/2021 1:07	MRA,QQQ3,710145	1
22104283110	2210505A_50.d	Sample	5/6/2021 1:22	MRA,QQQ3,710145	1
22104273301	2210505A_51.d	Sample	5/6/2021 1:36	MRA,QQQ3,710145	1
22104273302	2210505A_52.d	Sample	5/6/2021 1:51	MRA,QQQ3,710145	1
22104273303	2210505A_53.d	Sample	5/6/2021 2:06	MRA,QQQ3,710145	1
22104273304	2210505A_54.d	Sample	5/6/2021 2:20	MRA,QQQ3,710145	1
22104273305	2210505A_55.d	Sample	5/6/2021 2:35	MRA,QQQ3,710145	1
22104273306	2210505A_56.d	Sample	5/6/2021 2:49	MRA,QQQ3,710145	1
22104273307	2210505A_57.d	Sample	5/6/2021 3:04	MRA,QQQ3,710145	1
1400	2210505A_58.d	QC	5/6/2021 3:19	MRA,QQQ3,CCV	1
1400	2210505A_60.d	QC	5/6/2021 3:34	MRA,QQQ3,CCV	1
IB	2210505A_61.d	Sample	5/6/2021 3:48	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_62.d	Sample	5/6/2021 4:03	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_63.d	Sample	5/6/2021 4:18	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_64.d	Sample	5/6/2021 4:32	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_65.d	Sample	5/6/2021 4:47	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_66.d	Sample	5/6/2021 5:02	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_67.d	Sample	5/6/2021 5:16	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_68.d	Sample	5/6/2021 5:31	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_69.d	Sample	5/6/2021 5:45	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_70.d	Sample	5/6/2021 6:00	RXJ,QQQ3, Instrument blank/Instrument Idle	1
IB	2210505A_71.d	Sample	5/6/2021 6:15	RXJ,QQQ3, Instrument blank/Instrument Idle	1

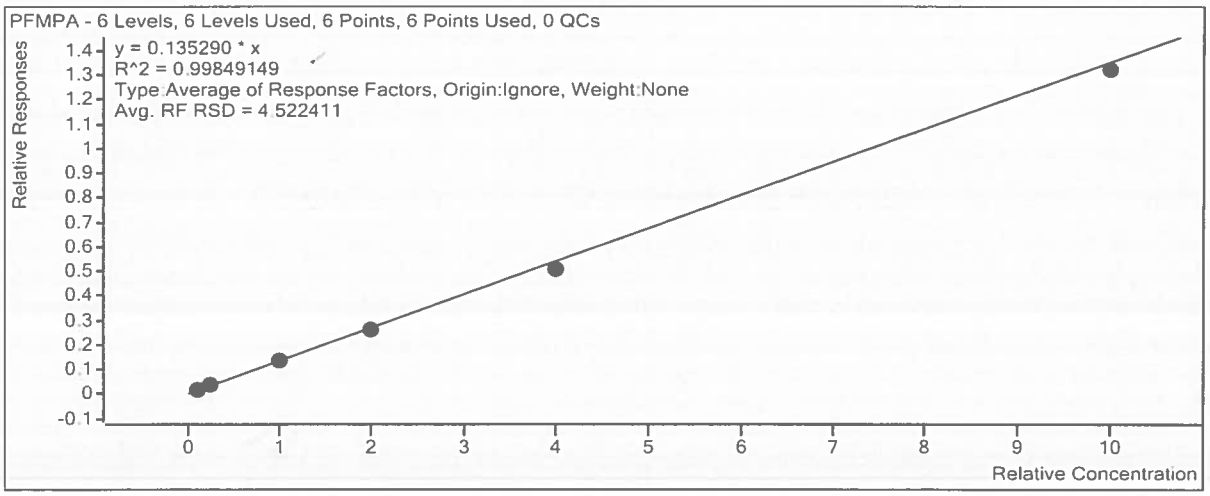
Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	228769	50.0000	0.9373



Target Compound *PFMPA*

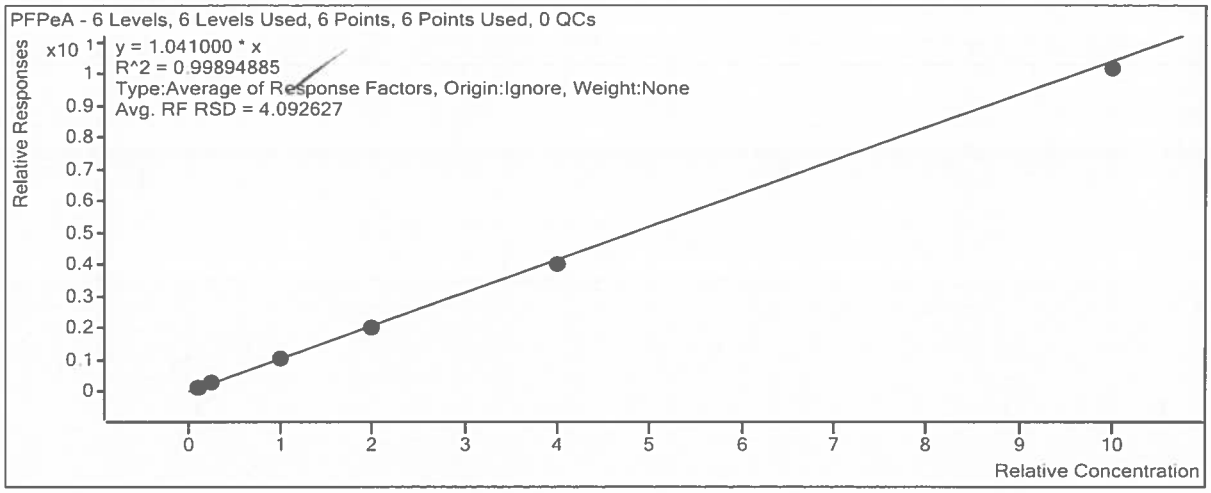
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	408	0.5000	0.1436
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	984	1.2500	0.1382
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	3962	5.0000	0.1394
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	7417	10.0000	0.1305
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	15155	20.0000	0.1275
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	38396	50.0000	0.1325



Target Compound *PFPeA*

Quantitative Analysis Calibration Report

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	119038	20.0000	1.0012
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	295433	50.0000	1.0196



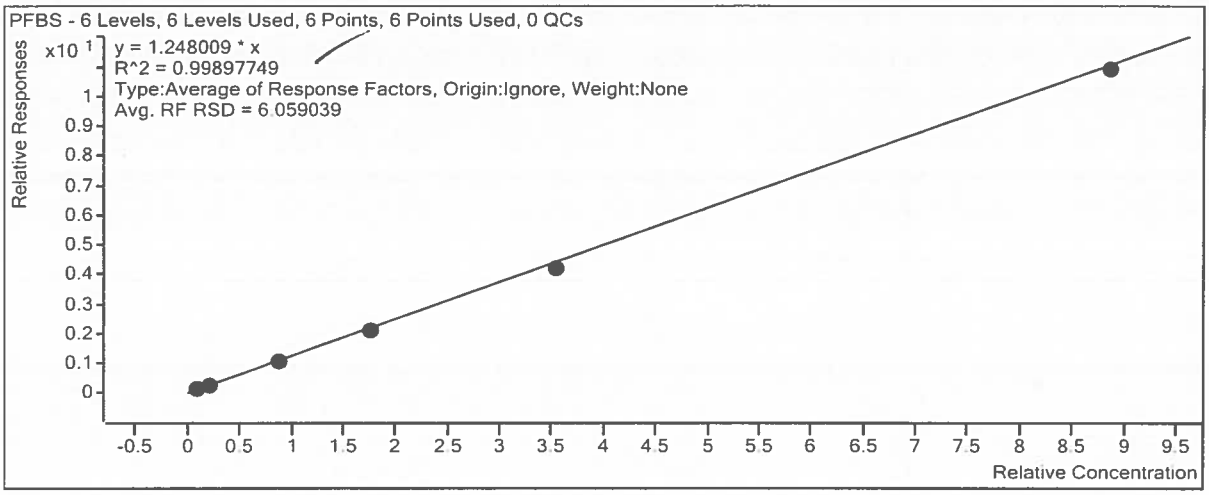
Extracted ISTD *M5PFPeA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	28389	5.0000	5677.8552
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	28487	5.0000	5697.3235
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	28414	5.0000	5682.8994
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	28414	5.0000	5682.7203
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	29725	5.0000	5944.9305
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	28976	5.0000	5795.2127

Target Compound *PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	1076	0.4435	1.3795
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2504	1.1088	1.2883
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	9611	4.4350	1.2239
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	18629	8.8700	1.1810
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	38263	17.7400	1.1816
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	95378	44.3500	1.2337

Quantitative Analysis Calibration Report



Extracted ISTD *M3PFBS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	8794	5.0000	1758.7130
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	8764	5.0000	1752.7379
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	8853	5.0000	1770.5662
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	8891	5.0000	1778.2700
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	9127	5.0000	1825.3239
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	8716	5.0000	1743.2513

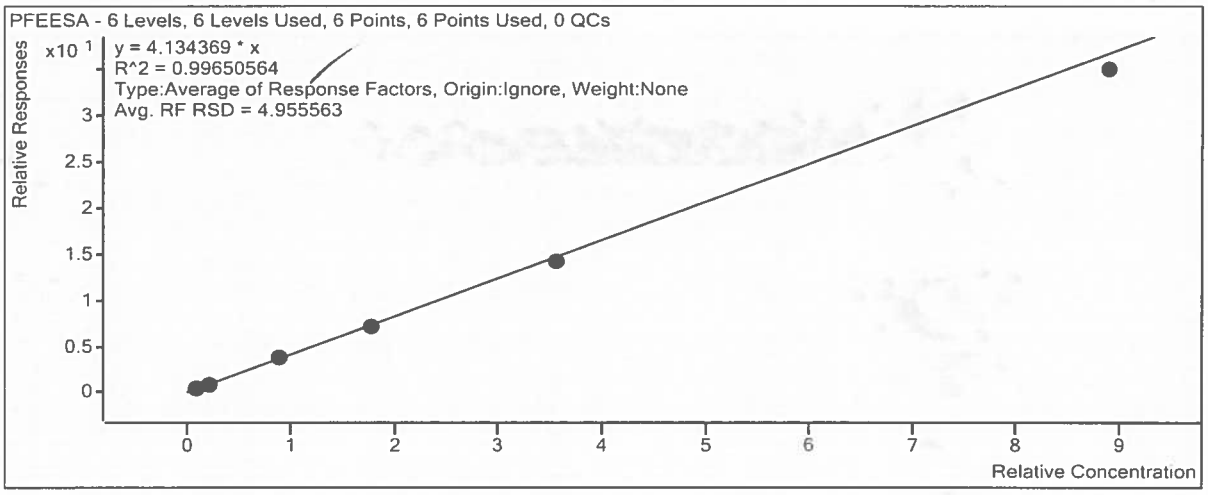
Target Compound *PFMBA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	2133	0.5000	0.5993
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	5202	1.2500	0.5623
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	20959	5.0000	0.5744
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	39703	10.0000	0.5415
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	81378	20.0000	0.5414
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	203901	50.0000	0.5515

Quantitative Analysis Calibration Report

Target Compound *PFEESA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	2756	0.4450	4.4632
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	6455	1.1125	4.1108
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	26570	4.4500	4.2964
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	50019	8.9000	3.9742
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	102604	17.8000	4.0139
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	251141	44.5000	3.9478



Target Compound *NFDHA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	2039	0.5000	0.4752
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	5102	1.2500	0.4687
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	19905	5.0000	0.4621
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	38191	10.0000	0.4360
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	80827	20.0000	0.4481
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	201990	50.0000	0.4602

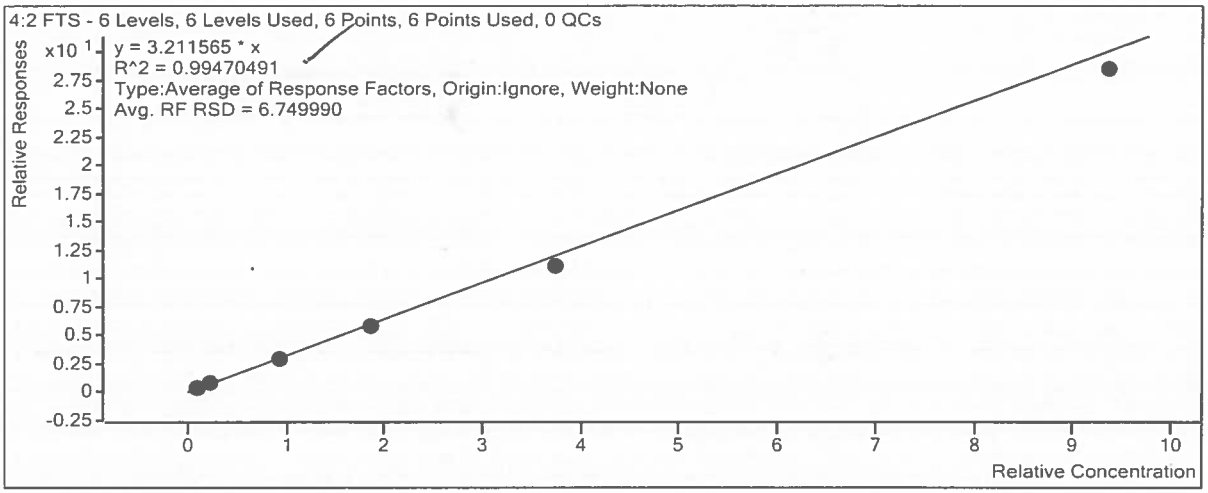
Quantitative Analysis Calibration Report

Extracted ISTD *M2 4:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	2407	5.0000	481.4250
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2185	5.0000	436.9816
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	2209	5.0000	441.7827
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	2161	5.0000	432.1932
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	2311	5.0000	462.1702
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	2206	5.0000	441.1289

Target Compound *4:2 FTS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	773	0.4685	3.4267
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1806	1.1713	3.5284
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	6537	4.6850	3.1586
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	12634	9.3700	3.1198
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	25859	18.7400	2.9856
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	63040	46.8500	3.0503



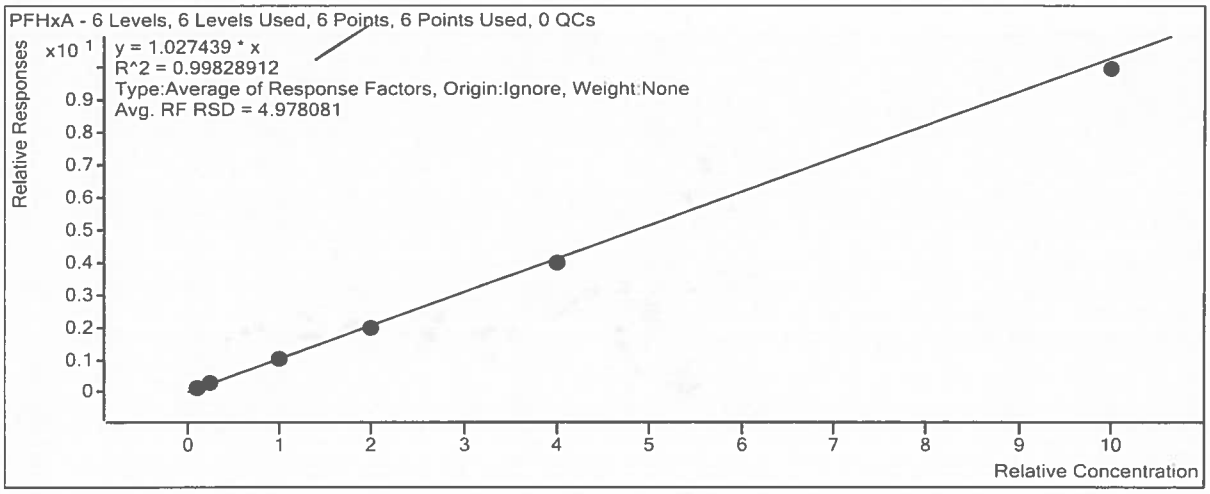
Extracted ISTD *M5PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	35589	5.0000	7117.8487
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	37009	5.0000	7401.7072

Quantitative Analysis Calibration Report

Target Compound *PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	3977	0.5000	1.1174
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	9778	1.2500	1.0568
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	37060	5.0000	1.0157
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	72037	10.0000	0.9825
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	149664	20.0000	0.9958
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	368403	50.0000	0.9965



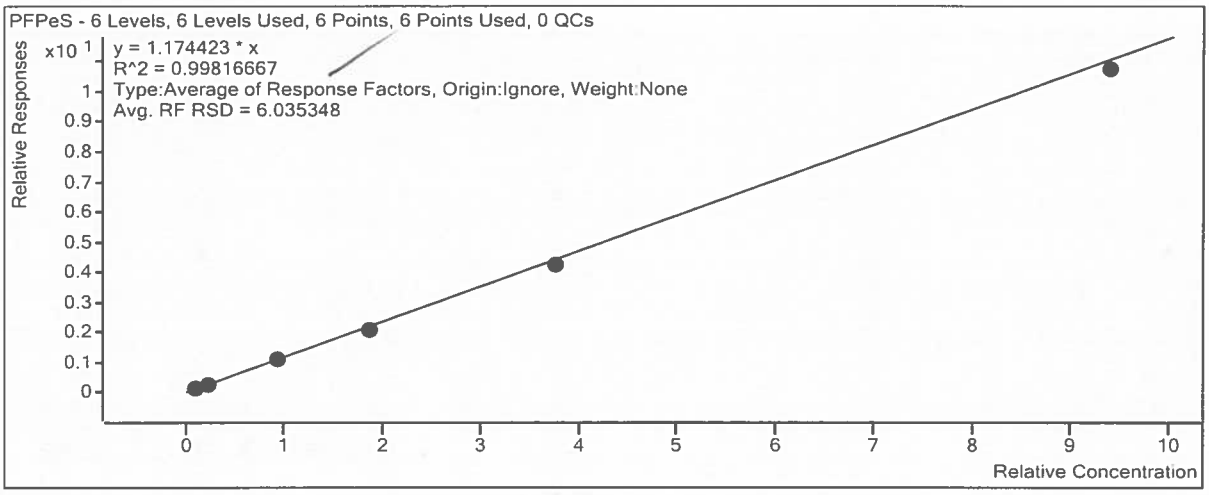
Instrument ISTD *M2PFHxA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	321254	40.0000	8031.3397
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	323245	40.0000	8081.1244
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	326657	40.0000	8166.4283
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	299067	40.0000	7476.6776
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	327393	40.0000	8184.8249
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	286834	40.0000	7170.8615

Quantitative Analysis Calibration Report

Target Compound *PFPeS*

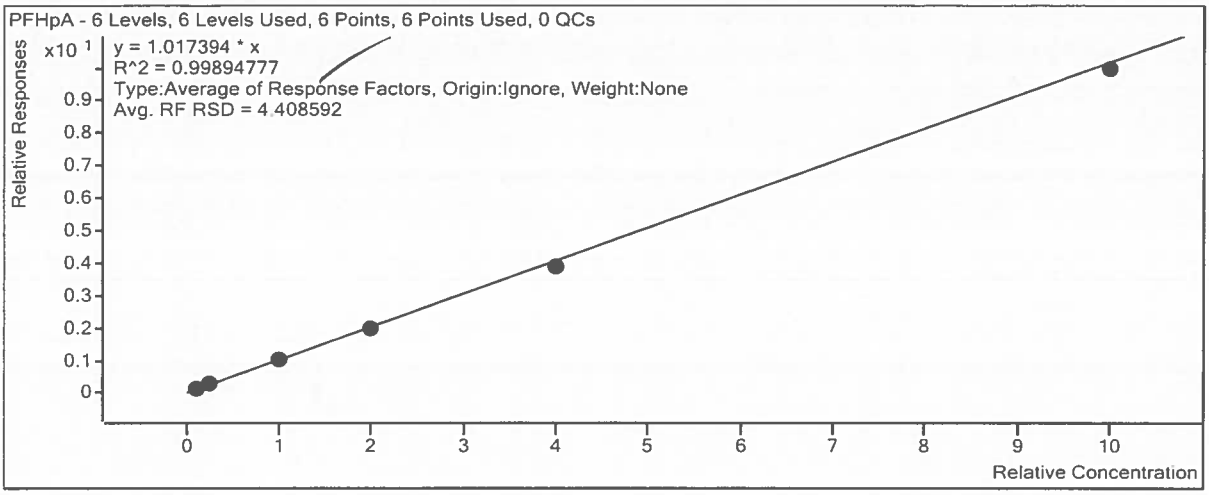
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	1073	0.4705	1.2961
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2481	1.1763	1.2035
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	9856	4.7050	1.1832
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	18404	9.4100	1.0998
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	38522	18.8200	1.1214
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	93714	47.0500	1.1426



Target Compound *HFPO-DA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	967	1.0000	1.1527
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2324	2.5000	1.1007
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	8430	10.0000	0.9575
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	17549	20.0000	1.0428
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	36443	40.0000	1.0129
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	87184	100.0000	0.9615

Quantitative Analysis Calibration Report



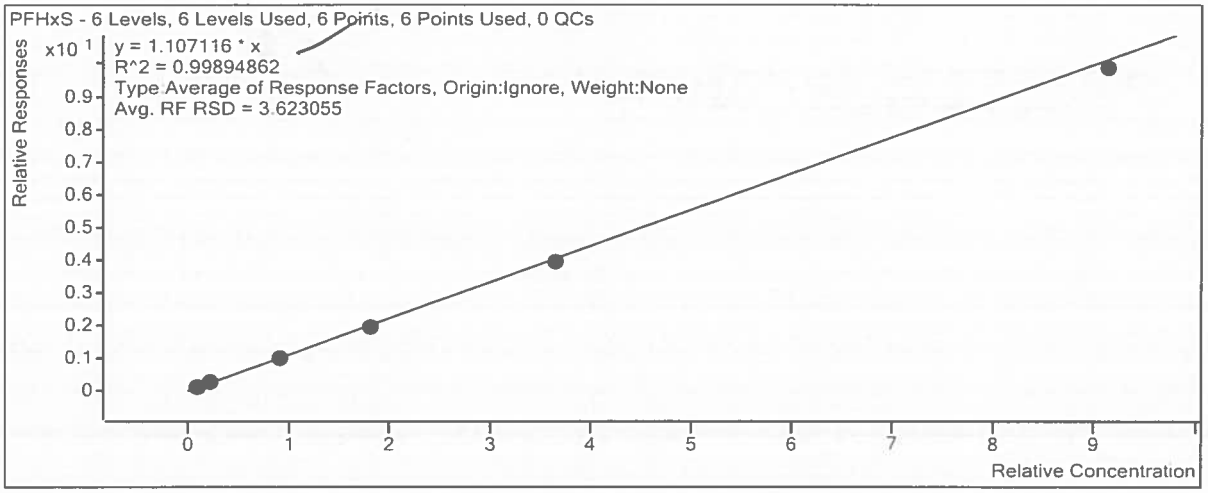
Quantitative Analysis Calibration Report

Extracted ISTD *M3PFHxS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	6938	5.0000	1387.5695
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	7057	5.0000	1411.4044
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	6949	5.0000	1389.7506
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	7071	5.0000	1414.1511
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	7180	5.0000	1436.0721
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	7148	5.0000	1429.5653

Target Compound *PFHxS*

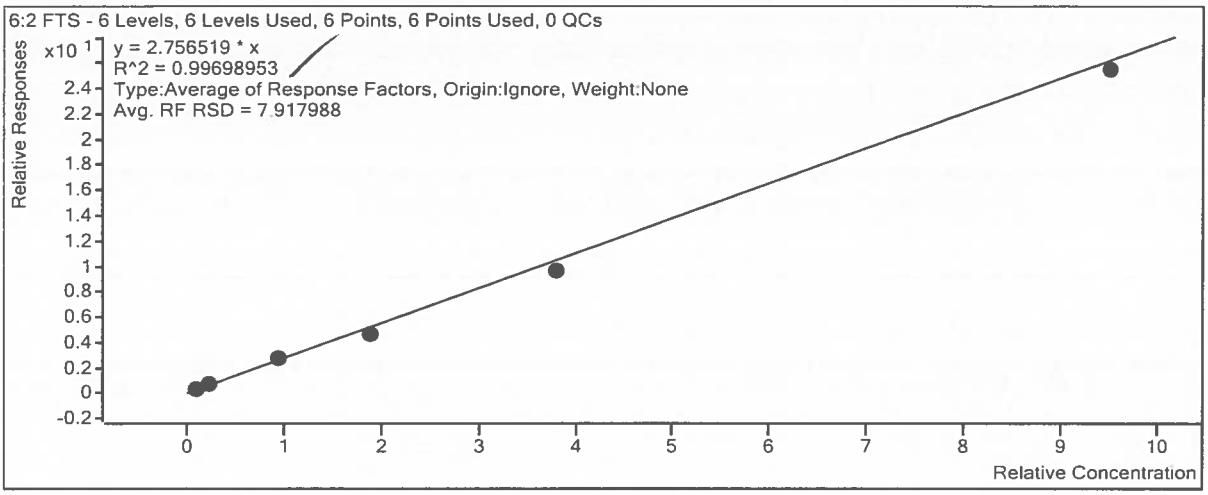
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	715	0.4570	1.1269
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1877	1.1425	1.1643
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	7183	4.5700	1.1310
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	13658	9.1400	1.0567
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	28416	18.2800	1.0824
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	70648	45.7000	1.0814



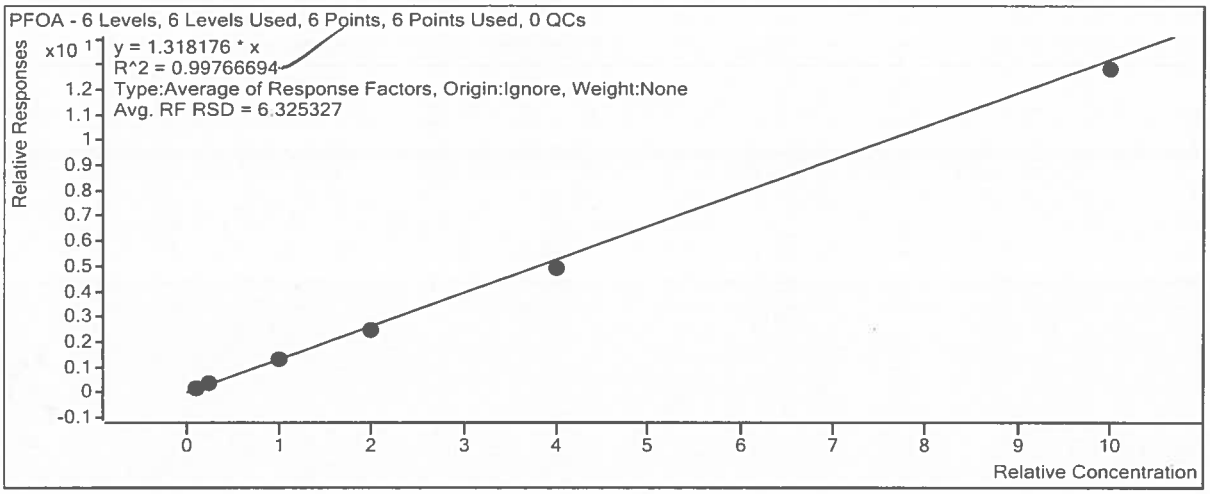
Target Compound *ADONA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	7153	0.4725	2.0669
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	18177	1.1813	2.0834

Quantitative Analysis Calibration Report

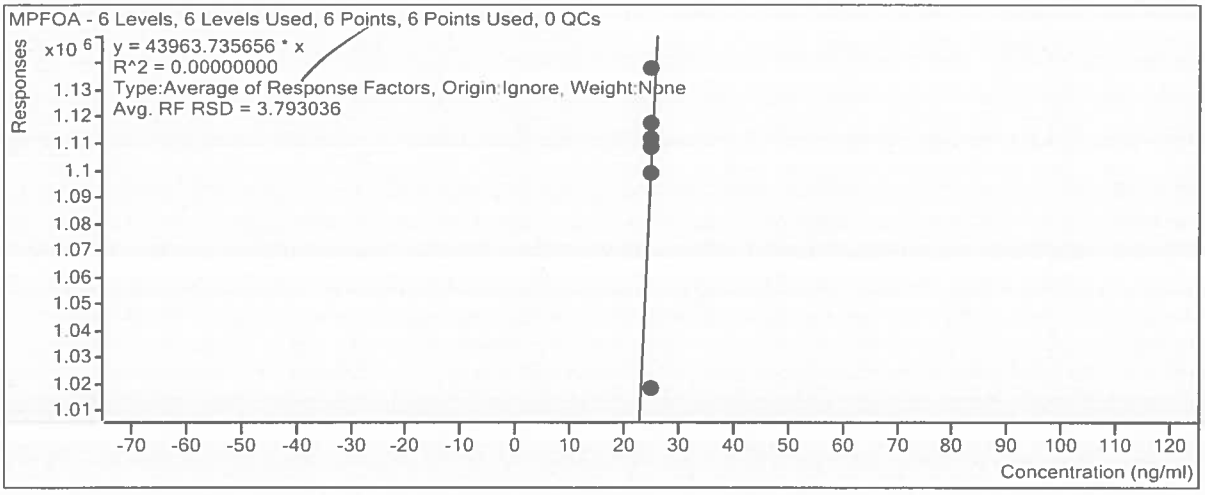


K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	49113	5.0000	1.3246
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	94025	10.0000	1.2541
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	191208	20.0000	1.2270
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	478534	50.0000	1.2835



Instrument ISTD *MPFOA*

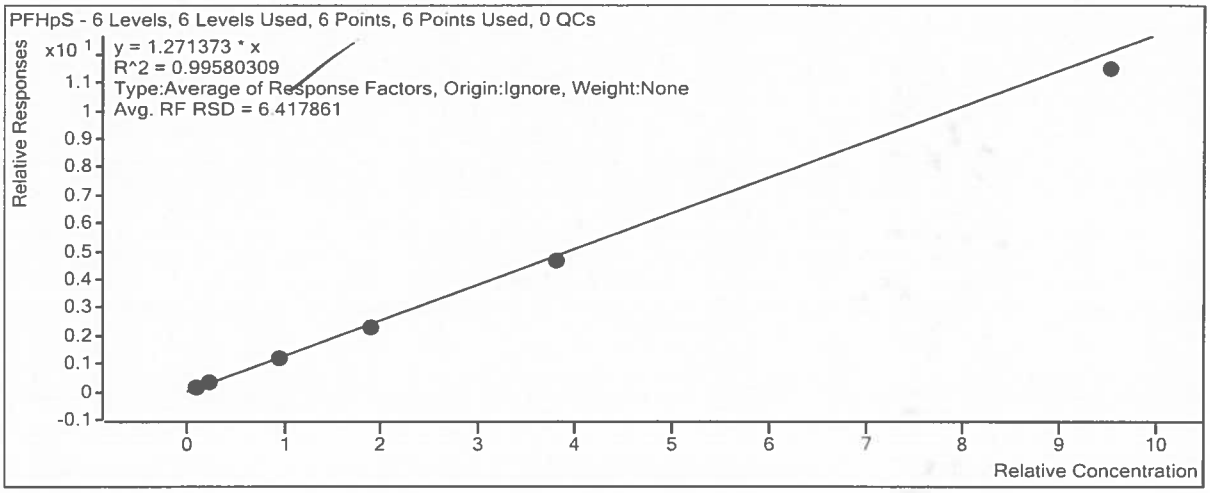
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	1112031	25.0000	44481.2490
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1099345	25.0000	43973.8075
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	1117924	25.0000	44716.9506
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	1108402	25.0000	44336.0740
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	1138542	25.0000	45541.6895
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	1018316	25.0000	40732.6434



Quantitative Analysis Calibration Report

Target Compound *PFHpS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	925	0.4765	1.3993
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2247	1.1913	1.3366
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	8379	4.7650	1.2654
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	15993	9.5300	1.1867
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	33680	19.0600	1.2305
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	82413	47.6500	1.2098



Extracted ISTD *M9PFNA*

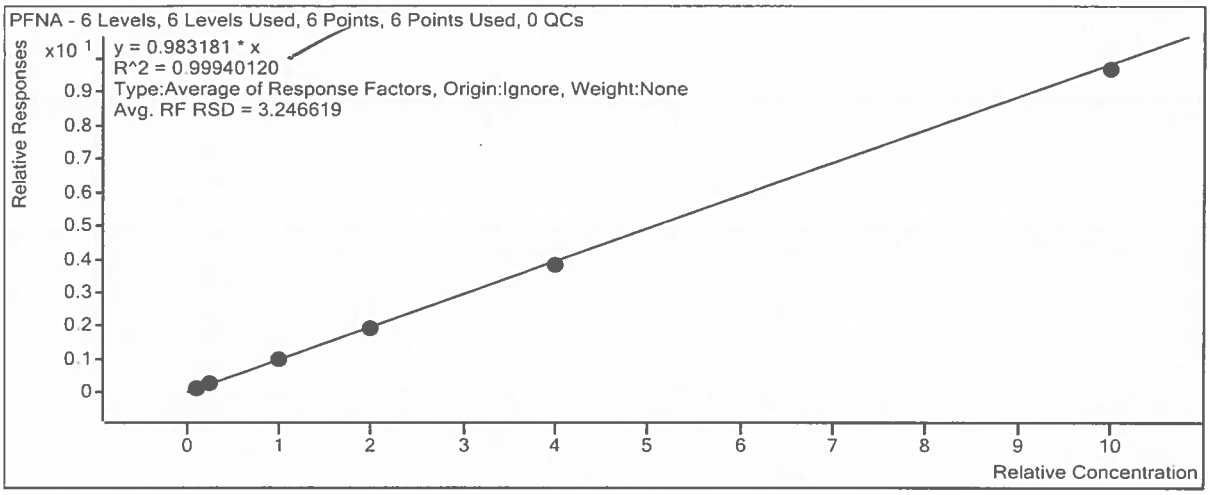
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	49347	5.0000	9869.3952
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	49750	5.0000	9950.0053
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	49356	5.0000	9871.2466
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	49515	5.0000	9902.9225
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	50450	5.0000	10089.9722
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	48688	5.0000	9737.6926

Target Compound *PFNA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	5087	0.5000	1.0309

Quantitative Analysis Calibration Report

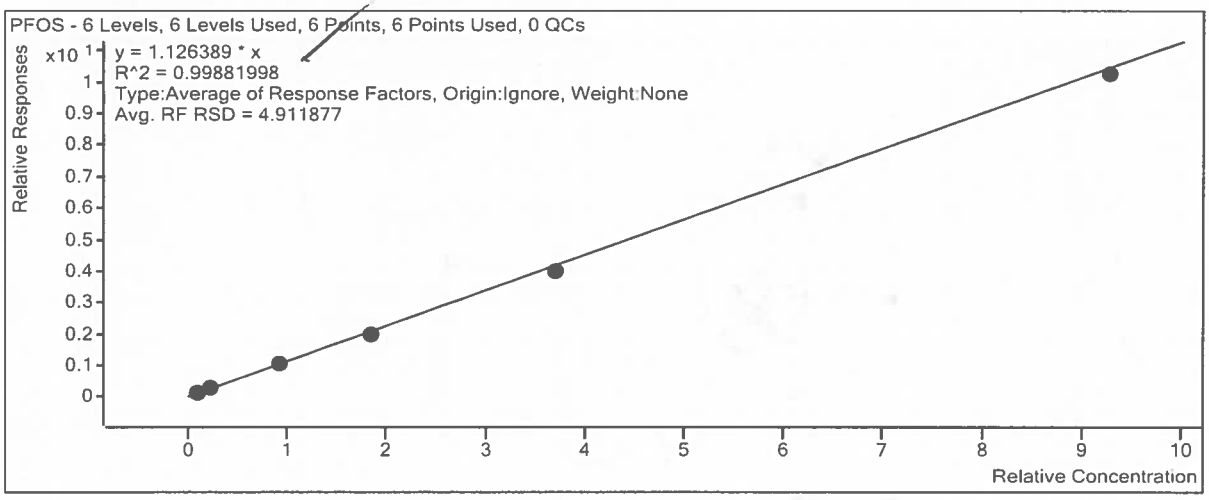
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	12421	1.2500	0.9986
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	49300	5.0000	0.9989
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	94155	10.0000	0.9508
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	191703	20.0000	0.9500
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	472228	50.0000	0.9699



Quantitative Analysis Calibration Report

Target Compound *PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	828	0.4640	1.1980
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2119	1.1600	1.1815
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	8013	4.6400	1.1346
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	15123	9.2800	1.0670
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	31242	18.5600	1.0700
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	76571	46.4000	1.1072



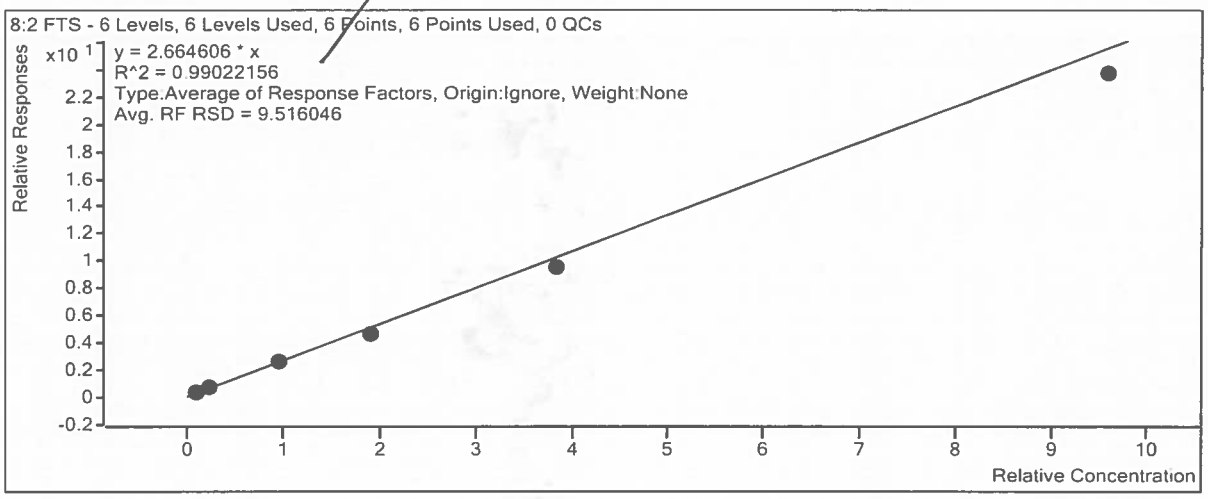
Instrument ISTD *M4PFOS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	32723	20.0000	1636.1316
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	33053	20.0000	1652.6636
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	33080	20.0000	1653.9827
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	30461	20.0000	1523.0378
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	33012	20.0000	1650.6203
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	28402	20.0000	1420.0969

Quantitative Analysis Calibration Report

Target Compound *8:2 FTS*

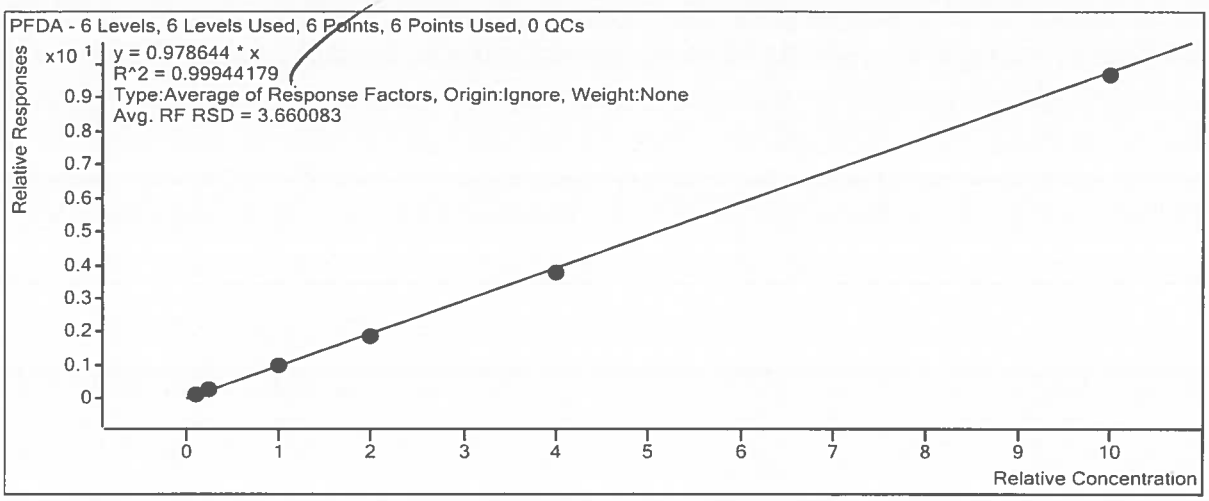
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	571	0.4800	3.0380
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1438	1.2000	2.9011
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	4976	4.8000	2.6615
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	9465	9.6000	2.4156
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	19141	19.2000	2.4943
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	44271	48.0000	2.4773



Target Compound *PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	5108	0.5000	1.0252
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	12681	1.2500	1.0064
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	48857	5.0000	0.9924
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	93544	10.0000	0.9369
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	191448	20.0000	0.9402
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	467227	50.0000	0.9707

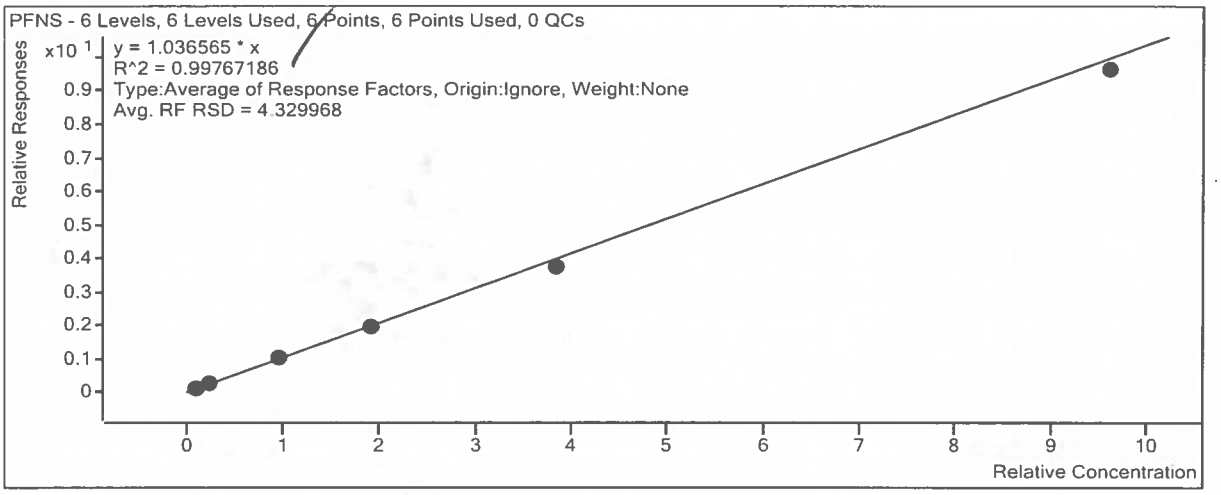
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *PFNS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	776	0.4810	1.0830
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2018	1.2025	1.0852
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	7747	4.8100	1.0582
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	14849	9.6200	1.0106
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	29626	19.2400	0.9788
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	71952	48.1000	1.0037



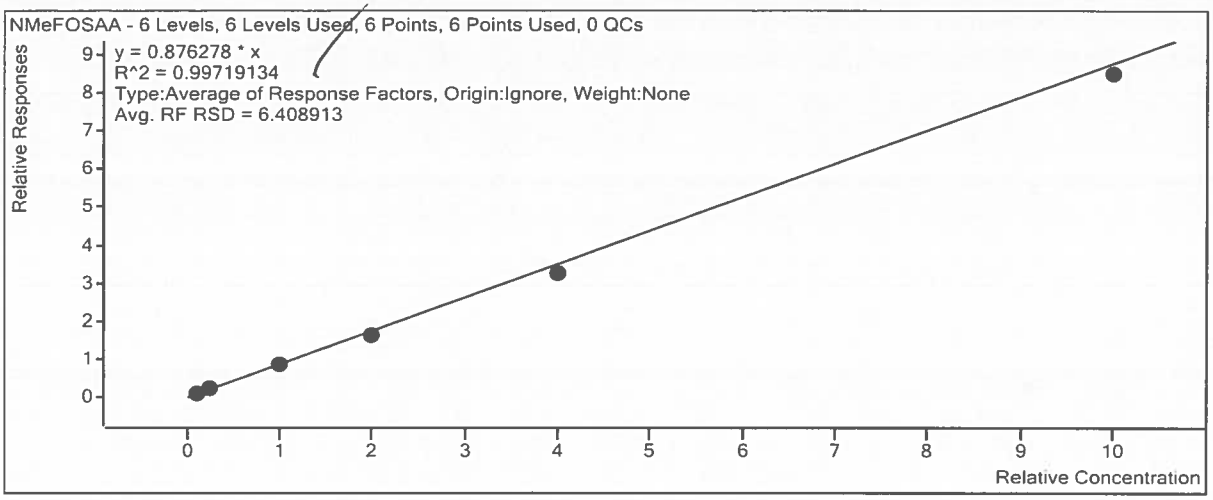
Extracted ISTD *M6PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	49826	5.0000	9965.2757
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	50401	5.0000	10080.2250
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	49229	5.0000	9845.8353
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	49925	5.0000	9984.9134
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	50905	5.0000	10181.0944
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	48131	5.0000	9626.2912

Instrument ISTD *M2PFDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	208493	20.0000	10424.6606
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	210262	20.0000	10513.1199

Quantitative Analysis Calibration Report



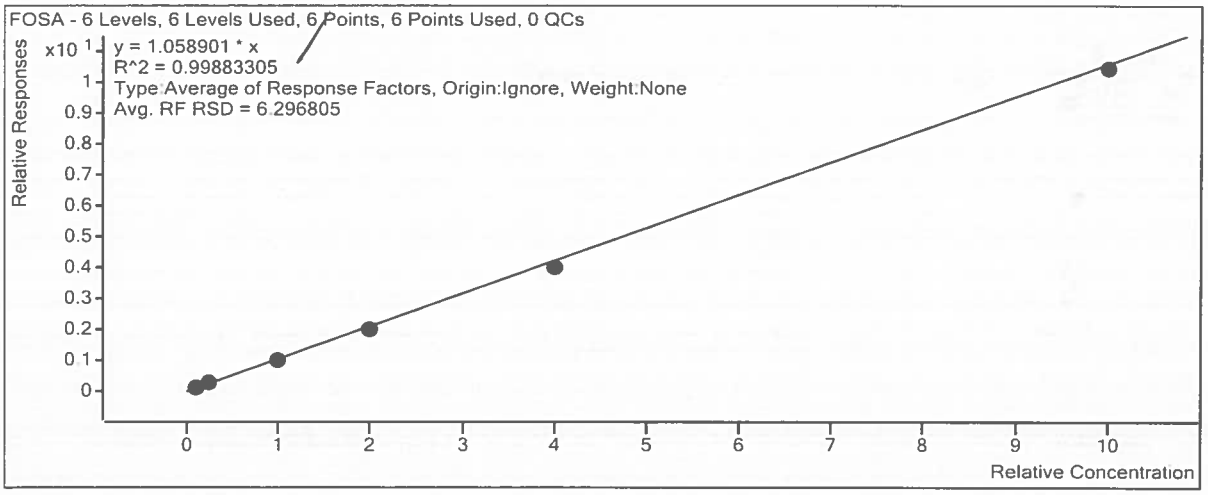
Quantitative Analysis Calibration Report

Extracted ISTD *M8FOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	17437	5.0000	3487.4289
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	17044	5.0000	3408.7136
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	17757	5.0000	3551.3100
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	17297	5.0000	3459.4456
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	17921	5.0000	3584.1826
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	16827	5.0000	3365.3601

Target Compound *FOSA*

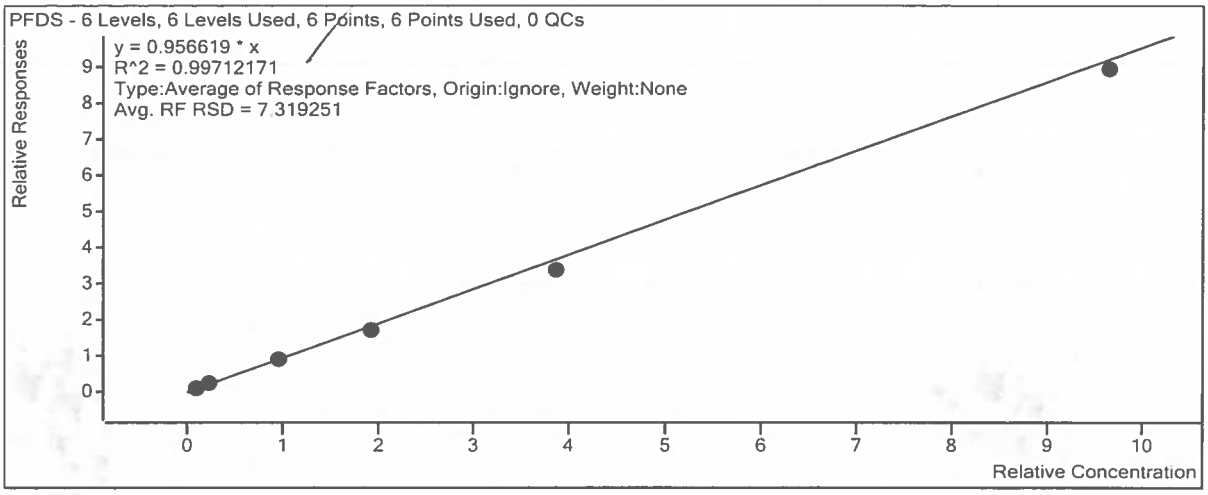
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	2027	0.5000	1.1623
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	4760	1.2500	1.1171
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	18282	5.0000	1.0296
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	34590	10.0000	0.9999
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	71587	20.0000	0.9987
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	175990	50.0000	1.0459



Target Compound *PFDS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	766	0.4825	1.0659
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1879	1.2063	1.0071

K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	7031	4.8250	0.9574
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	13261	9.6500	0.8997
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	26666	19.3000	0.8783
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	66974	48.2500	0.9313



Extracted ISTD *d5-NEtFOSAA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	10068	5.0000	2013.6919
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	9903	5.0000	1980.5473
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	9714	5.0000	1942.8429
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	9655	5.0000	1930.9859
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	9840	5.0000	1968.0069
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	9106	5.0000	1821.1466

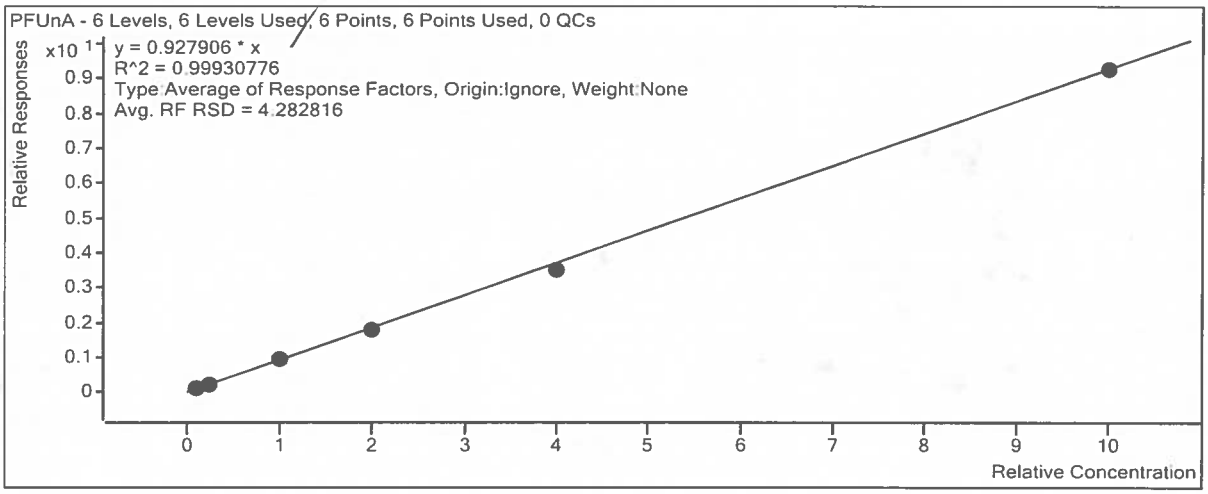
Extracted ISTD *M7PFUnA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	56817	5.0000	11363.4372
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	57684	5.0000	11536.7042
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	56985	5.0000	11397.0840
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	57121	5.0000	11424.1848
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	57932	5.0000	11586.4971
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	54855	5.0000	10970.9068

Quantitative Analysis Calibration Report

Target Compound *PFUnA*

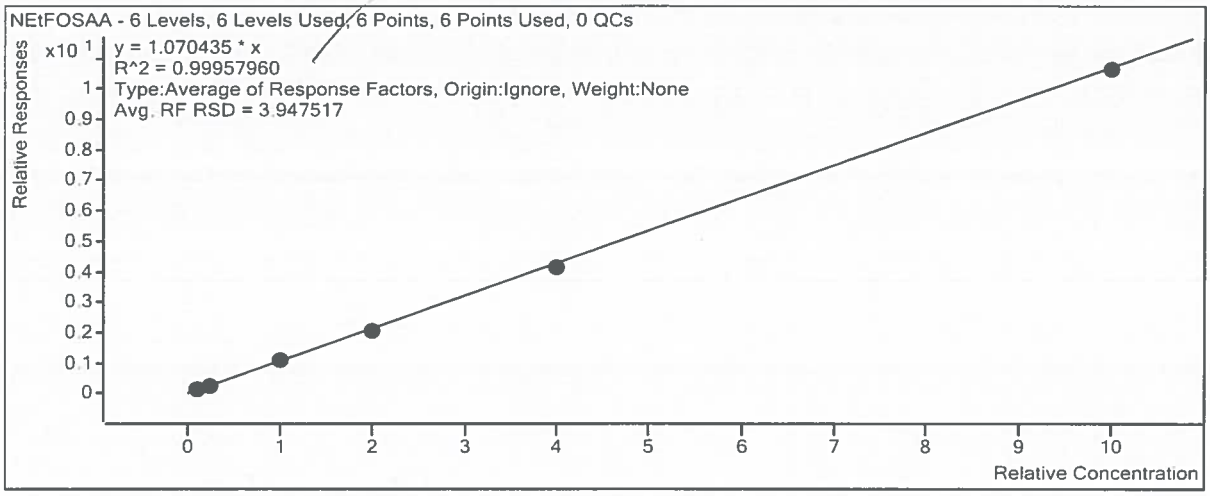
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	5643	0.5000	0.9931
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	13521	1.2500	0.9376
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	53317	5.0000	0.9356
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	102116	10.0000	0.8939
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	203844	20.0000	0.8797
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	508792	50.0000	0.9275



Target Compound *NEtFOSAA*

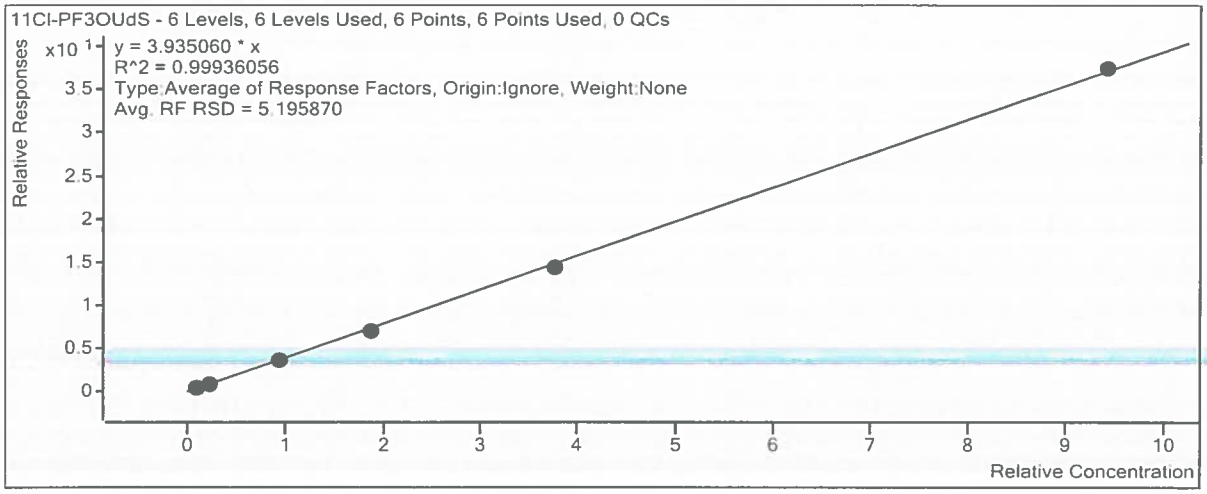
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	1145	0.5000	1.1377
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	2709	1.2500	1.0943
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	10399	5.0000	1.0705
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	19710	10.0000	1.0207
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	40687	20.0000	1.0337
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	97042	50.0000	1.0657

Quantitative Analysis Calibration Report



Target Compound *11Cl-PF3OUdS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	3015	0.4715	4.2935
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	7149	1.1788	3.9219
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	28211	4.7150	3.9309
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	53164	9.4300	3.6913
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	112644	18.8600	3.7965
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	279422	47.1500	3.9762



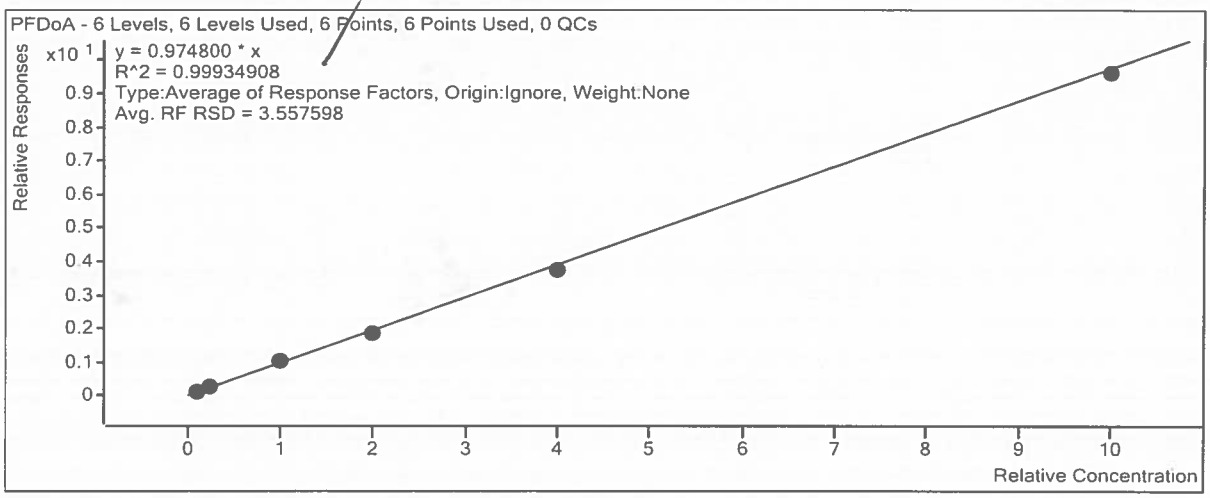
Extracted ISTD *MPFDoA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	61983	5.0000	12396.5861

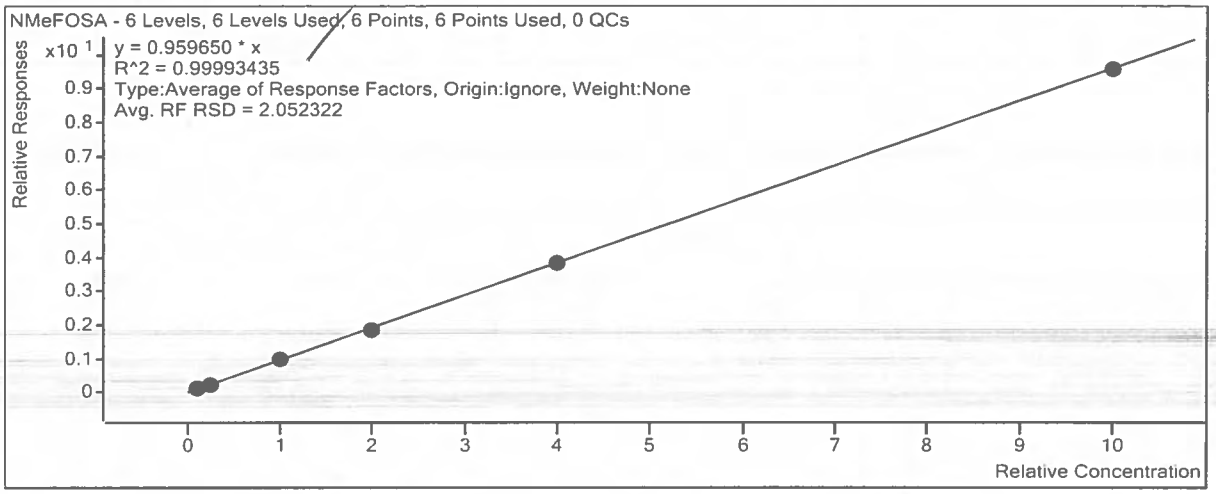
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	64785	5.0000	12956.9986
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	62942	5.0000	12588.4761
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	64149	5.0000	12829.7477
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	65807	5.0000	13161.3780
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	64278	5.0000	12855.5001

Target Compound *PFDoA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	6227	0.5000	1.0046
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	16119	1.2500	0.9952
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	63826	5.0000	1.0140
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	119525	10.0000	0.9316
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	247643	20.0000	0.9408
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	618699	50.0000	0.9625



K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	4347	5.0000	0.9743
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	8582	10.0000	0.9296
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	18108	20.0000	0.9552
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	44215	50.0000	0.9585



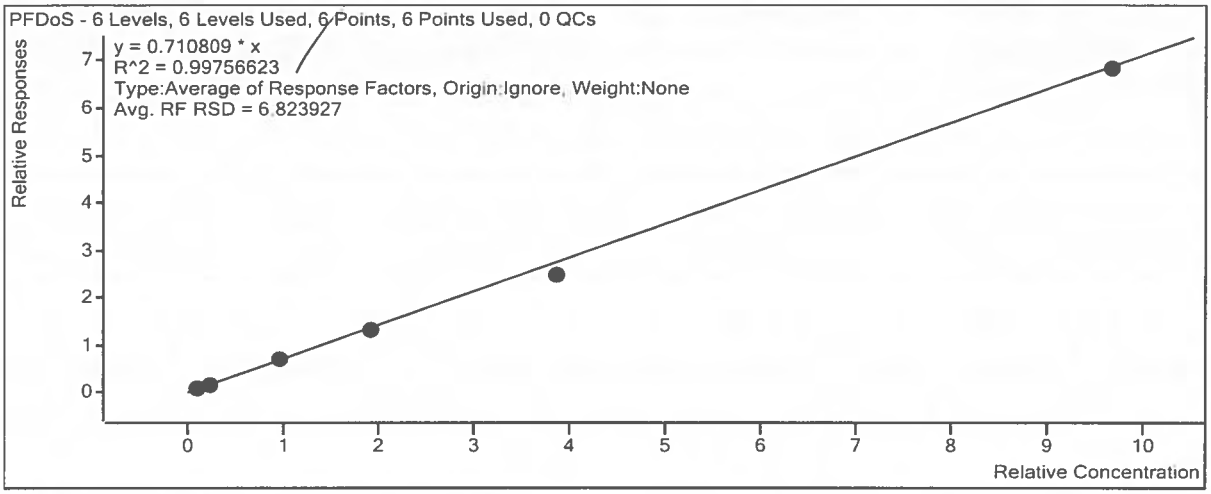
Extracted ISTD *d7-NMeFOSE*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	3694	5.0000	738.8715
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	3620	5.0000	724.0275
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	3639	5.0000	727.7072
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	3587	5.0000	717.4094
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	3658	5.0000	731.6058
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	3458	5.0000	691.6443

Target Compound *PFDoS*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	565	0.4840	0.7836
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1338	1.2100	0.7151
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	5420	4.8400	0.7358
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	10097	9.6800	0.6829
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	19489	19.3600	0.6399
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	51037	48.4000	0.7075

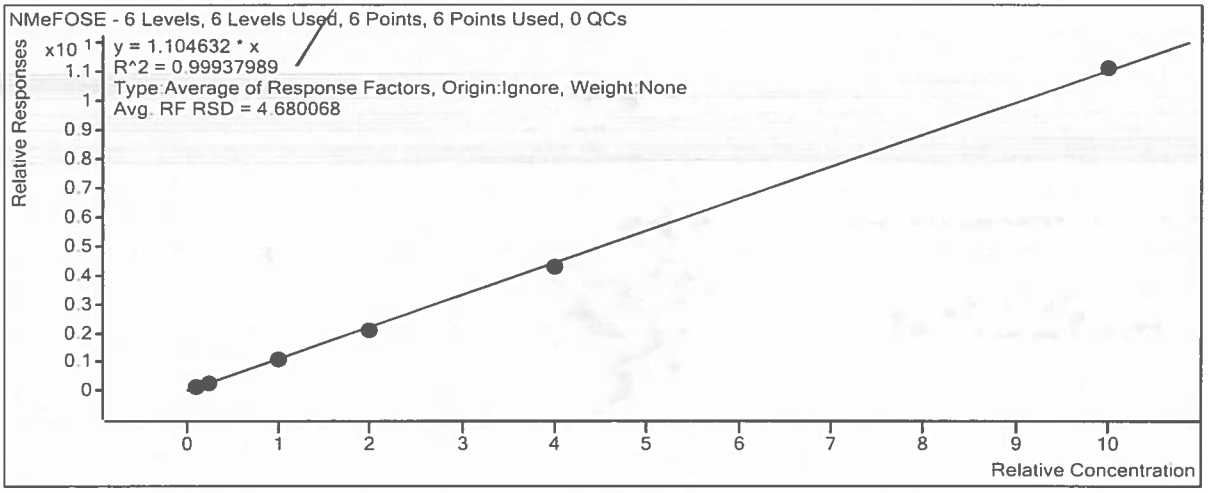
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *NMeFOSE*

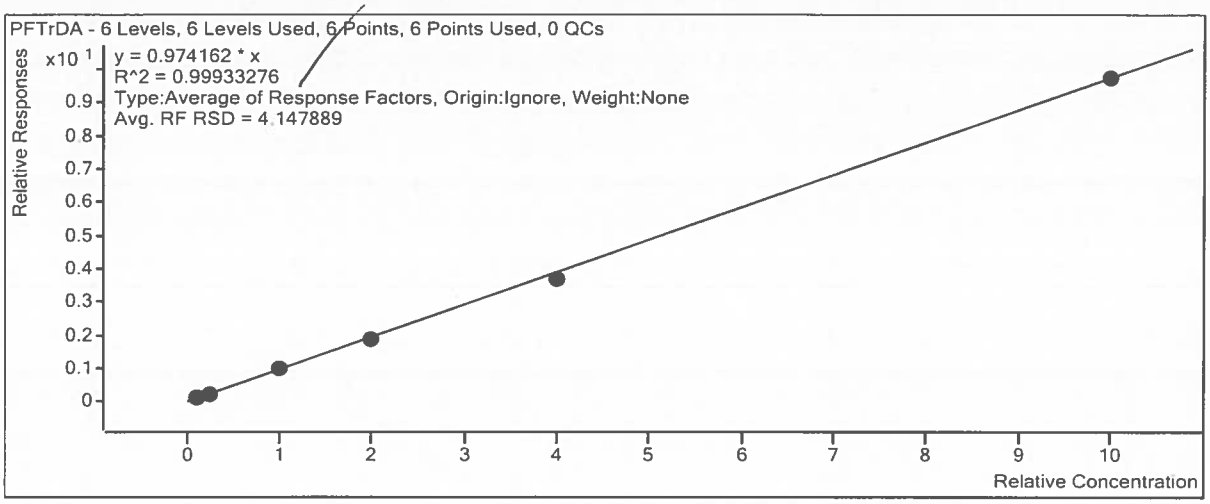
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	440	0.5000	1.1918
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1008	1.2500	1.1143
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	4004	5.0000	1.1004
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	7483	10.0000	1.0431
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	15553	20.0000	1.0629
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	38571	50.0000	1.1153



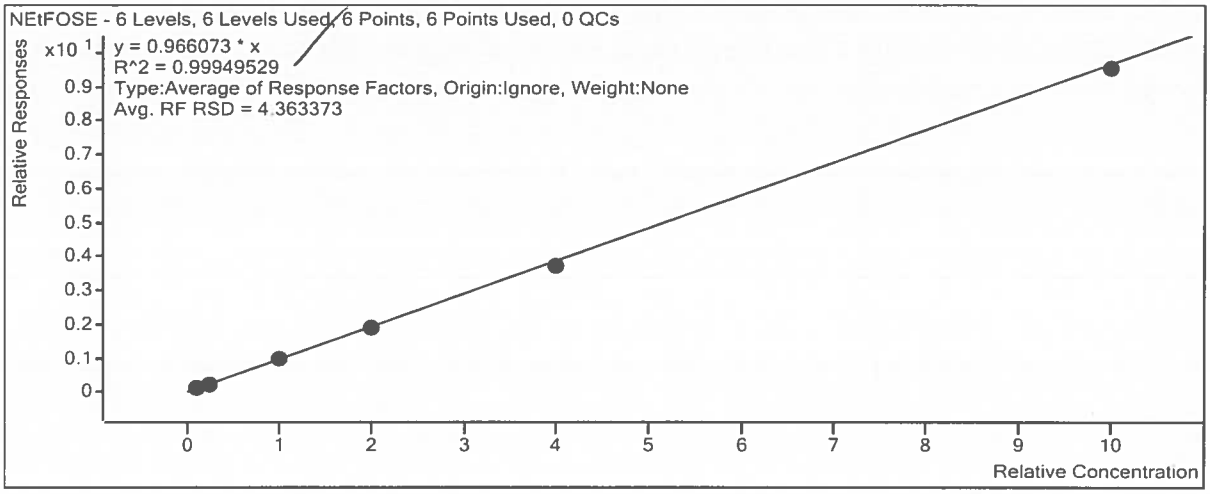
Target Compound *PFTrDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	6412	0.5000	1.0345
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	16022	1.2500	0.9892
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	62179	5.0000	0.9879
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	119580	10.0000	0.9321
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	243717	20.0000	0.9259
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	626963	50.0000	0.9754

Quantitative Analysis Calibration Report



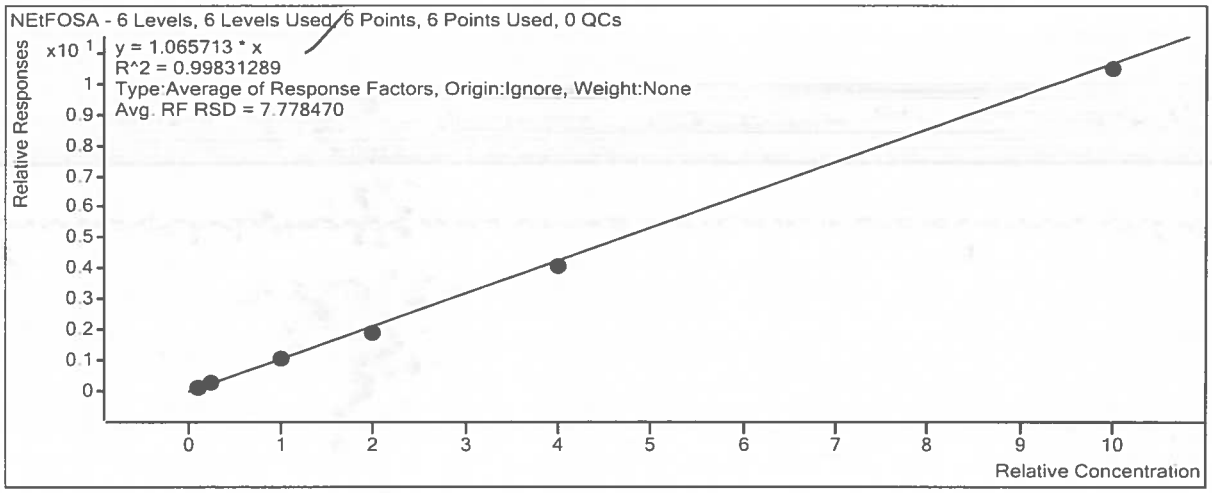
Quantitative Analysis Calibration Report



Quantitative Analysis Calibration Report

Target Compound *NEtFOSA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	538	0.5000	1.1060
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	1413	1.2500	1.1830
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	5307	5.0000	1.0987
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	9791	10.0000	0.9437
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	20899	20.0000	1.0133
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	51952	50.0000	1.0497



Extracted ISTD *M2PFTA*

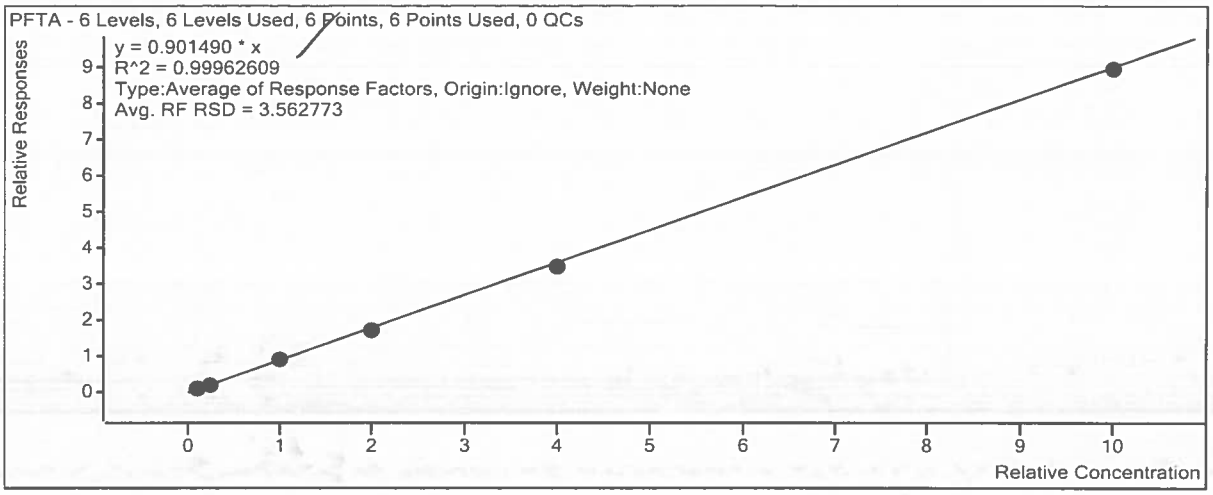
Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	66693	5.0000	13338.5650
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	68018	5.0000	13603.5543
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	66898	5.0000	13379.6609
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	67919	5.0000	13583.7614
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	69673	5.0000	13934.6181
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	68746	5.0000	13749.2438

Target Compound *PFTA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	6332	0.5000	0.9494
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	15178	1.2500	0.8926

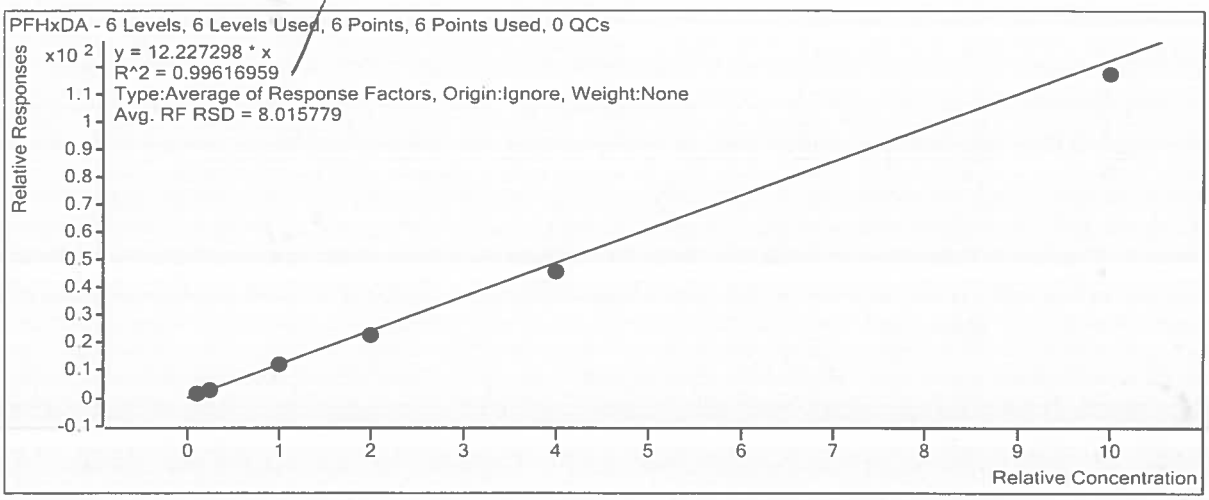
Quantitative Analysis Calibration Report

K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	62183	5.0000	0.9295
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	117985	10.0000	0.8686
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	242920	20.0000	0.8716
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	616782	50.0000	0.8972



Target Compound *PFHxDA*

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc (ng/mL)	RF
K:\MassHunter\Data\2210510ACAL\2210510A_05.d	Calibration	1	☑	6851	0.5000	13.9652
K:\MassHunter\Data\2210510ACAL\2210510A_06.d	Calibration	2	☑	16124	1.2500	12.6000
K:\MassHunter\Data\2210510ACAL\2210510A_07.d	Calibration	3	☑	64333	5.0000	12.2763
K:\MassHunter\Data\2210510ACAL\2210510A_08.d	Calibration	4	☑	121017	10.0000	11.3908
K:\MassHunter\Data\2210510ACAL\2210510A_09.d	Calibration	5	☑	240508	20.0000	11.3836
K:\MassHunter\Data\2210510ACAL\2210510A_10.d	Calibration	6	☑	622634	50.0000	11.7479



4I

ORGANICS INSTRUMENT BLANK

Report No:	221050108	Instrument ID:	QQQ3
Analysis Date:	05/03/2021 17:23	Lab File ID:	2210503A_9.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	710369

ANALYTE	UNITS	RESULT	Q	DL	LOD	LOQ	#
4:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.85	2.00	4.00	
6:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.94	2.00	4.00	
8:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.90	2.00	4.00	
NEtFOSA	ng/L	4.00	U	0.96	4.00	8.00	
NEtFOSAA	ng/L	4.00	U	0.97	4.00	8.00	
NEtFOSE	ng/L	4.00	U	0.90	4.00	8.00	
NMeFOSA	ng/L	4.00	U	0.97	4.00	8.00	
NMeFOSAA	ng/L	4.00	U	0.91	4.00	8.00	
NMeFOSE	ng/L	4.00	U	0.87	4.00	8.00	
Perfluorobutanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorobutanoic acid	ng/L	1.24	J	0.90	2.00	4.00	
Perfluorodecane sulfonic acid	ng/L	2.00	U	0.80	2.00	4.00	
Perfluorodecanoic acid	ng/L	2.00	U	0.86	2.00	4.00	
Perfluorododecanoic acid	ng/L	2.00	U	0.88	2.00	4.00	
Perfluoroheptanesulfonic acid	ng/L	2.00	U	0.84	2.00	4.00	
Perfluoroheptanoic acid	ng/L	2.00	U	0.48	2.00	4.00	
Perfluorohexanesulfonic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluorohexanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluorononanesulfonic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorononanoic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorooctane Sulfonamide	ng/L	2.00	U	0.96	2.00	4.00	
Perfluorooctanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorooctanoic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluoropentanesulfonic acid	ng/L	2.00	U	0.69	2.00	4.00	
Perfluoropentanoic acid	ng/L	2.00	U	0.85	2.00	4.00	
Perfluorotetradecanoic acid	ng/L	2.00	U	0.98	2.00	4.00	
Perfluorotridecanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluoroundecanoic acid	ng/L	2.00	U	0.95	2.00	4.00	

* - Result greater than 1/2 LOQ

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ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	221050108	Instrument ID:	QQQ3
Analysis Date:	05/03/2021 17:38	Lab File ID:	2210503A_10.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	710194

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	10000	10700	107	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	10000	10700	107	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	10100	11600	115	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	10400	104	70	130	
NEtFOSA	ng/L	10000	10200	102	70	130	
NEtFOSAA	ng/L	10000	11300	113	70	130	
NEtFOSE	ng/L	10000	9850	99	70	130	
NMeFOSA	ng/L	10000	9860	99	70	130	
NMeFOSAA	ng/L	10000	10800	108	70	130	
NMeFOSE	ng/L	10000	9920	99	70	130	
Perfluorobutanoic acid	ng/L	10000	10900	109	70	130	
Perfluorobutanesulfonic acid	ng/L	10000	10900	109	70	130	
Perfluorodecanoic acid	ng/L	10000	11800	118	70	130	
Perfluorodecane sulfonic acid	ng/L	10100	11200	111	70	130	
Perfluorododecanoic acid	ng/L	10000	10900	109	70	130	
Perfluoroheptanoic acid	ng/L	10000	11100	111	70	130	
Perfluoroheptanesulfonic acid	ng/L	10000	11100	111	70	130	
Perfluorohexanoic acid	ng/L	10100	11000	109	70	130	
Perfluorohexanesulfonic acid	ng/L	10000	11100	111	70	130	
Perfluorononanoic acid	ng/L	10000	12600	126	70	130	
Perfluorononanesulfonic acid	ng/L	10100	11100	110	70	130	
Perfluorooctanoic acid	ng/L	10100	11400	113	70	130	
Perfluorooctanesulfonic acid	ng/L	10000	9660	97	70	130	
Perfluoropentanoic acid	ng/L	10100	11000	109	70	130	
Perfluoropentanesulfonic acid	ng/L	10000	11500	115	70	130	
Perfluorotetradecanoic acid	ng/L	10000	12900	129	70	130	
Perfluorotridecanoic acid	ng/L	10000	9910	99	70	130	
Perfluoroundecanoic acid	ng/L	10000	10900	109	70	130	

FORM 6I - ORG

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	221050108	Instrument ID:	QQQ3
Analysis Date:	05/03/2021 17:53	Lab File ID:	2210503A_11.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	710369

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	3.75	3.98	106	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	3.81	4.04	106	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	3.84	3.90	101	70	130	
Perfluorooctane Sulfonamide	ng/L	4.00	4.02	101	70	130	
NEtFOSA	ng/L	4.00	4.30	108	70	130	
NEtFOSAA	ng/L	4.00	3.83	96	70	130	
NEtFOSE	ng/L	4.00	3.87	97	70	130	
NMeFOSA	ng/L	4.00	4.80	120	70	130	
NMeFOSAA	ng/L	4.00	3.75	94	70	130	
NMeFOSE	ng/L	4.00	3.90	97	70	130	
Perfluorobutanoic acid	ng/L	4.00	4.31	108	70	130	
Perfluorobutanesulfonic acid	ng/L	3.55	3.77	106	70	130	
Perfluorodecanoic acid	ng/L	4.00	4.15	104	70	130	
Perfluorodecane sulfonic acid	ng/L	3.86	4.06	105	70	130	
Perfluorododecanoic acid	ng/L	4.00	4.10	103	70	130	
Perfluoroheptanoic acid	ng/L	4.00	4.17	104	70	130	
Perfluoroheptanesulfonic acid	ng/L	3.82	4.26	112	70	130	
Perfluorohexanoic acid	ng/L	4.00	4.22	105	70	130	
Perfluorohexanesulfonic acid	ng/L	3.66	4.14	113	70	130	
Perfluorononanoic acid	ng/L	4.00	4.08	102	70	130	
Perfluorononanesulfonic acid	ng/L	3.85	4.03	105	70	130	
Perfluorooctanoic acid	ng/L	4.00	4.34	108	70	130	
Perfluorooctanesulfonic acid	ng/L	3.71	3.89	105	70	130	
Perfluoropentanoic acid	ng/L	4.00	4.20	105	70	130	
Perfluoropentanesulfonic acid	ng/L	3.77	3.85	102	70	130	
Perfluorotetradecanoic acid	ng/L	4.00	4.07	102	70	130	
Perfluorotridecanoic acid	ng/L	4.00	4.04	101	70	130	
Perfluoroundecanoic acid	ng/L	4.00	3.98	99	70	130	

4I

ORGANICS INSTRUMENT BLANK

Report No:	221050108	Instrument ID:	QQQ3
Analysis Date:	05/05/2021 10:50	Lab File ID:	2210505A_3.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	710369

ANALYTE	*UNITS*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*	*#*
4:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.85	2.00	4.00	
6:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.94	2.00	4.00	
8:2 Fluorotelomersulfonic acid	ng/L	2.00	U	0.90	2.00	4.00	
NEtFOSA	ng/L	4.00	U	0.96	4.00	8.00	
NEtFOSAA	ng/L	4.00	U	0.97	4.00	8.00	
NEtFOSE	ng/L	4.00	U	0.90	4.00	8.00	
NMeFOSA	ng/L	4.00	U	0.97	4.00	8.00	
NMeFOSAA	ng/L	4.00	U	0.91	4.00	8.00	
NMeFOSE	ng/L	4.00	U	0.87	4.00	8.00	
Perfluorobutanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorobutanoic acid	ng/L	1.25	J	0.90	2.00	4.00	
Perfluorodecane sulfonic acid	ng/L	2.00	U	0.80	2.00	4.00	
Perfluorodecanoic acid	ng/L	2.00	U	0.86	2.00	4.00	
Perfluorododecanoic acid	ng/L	2.00	U	0.88	2.00	4.00	
Perfluoroheptanesulfonic acid	ng/L	2.00	U	0.84	2.00	4.00	
Perfluoroheptanoic acid	ng/L	2.00	U	0.48	2.00	4.00	
Perfluorohexanesulfonic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluorohexanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluorononanesulfonic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorononanoic acid	ng/L	2.00	U	0.78	2.00	4.00	
Perfluorooctane Sulfonamide	ng/L	2.00	U	0.96	2.00	4.00	
Perfluorooctanesulfonic acid	ng/L	2.00	U	0.81	2.00	4.00	
Perfluorooctanoic acid	ng/L	2.00	U	0.95	2.00	4.00	
Perfluoropentanesulfonic acid	ng/L	2.00	U	0.69	2.00	4.00	
Perfluoropentanoic acid	ng/L	2.00	U	0.85	2.00	4.00	
Perfluorotetradecanoic acid	ng/L	2.00	U	0.98	2.00	4.00	
Perfluorotridecanoic acid	ng/L	2.00	U	0.99	2.00	4.00	
Perfluoroundecanoic acid	ng/L	2.00	U	0.95	2.00	4.00	

* - Result greater than 1/2 LOQ

7S

ORGANICS INSTRUMENT SENSITIVITY CHECK

Report No:	221050108	Instrument ID:	QQQ3
Analysis Date:	05/05/2021 11:05	Lab File ID:	2210505A_4.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	710369

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	3.75	3.70	99	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	3.81	3.95	104	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	3.84	3.57	93	70	130	
Perfluorooctane Sulfonamide	ng/L	4.00	4.18	104	70	130	
NEtFOSA	ng/L	4.00	3.89	97	70	130	
NEtFOSAA	ng/L	4.00	3.99	100	70	130	
NEtFOSE	ng/L	4.00	3.62	90	70	130	
NMeFOSA	ng/L	4.00	4.29	107	70	130	
NMeFOSAA	ng/L	4.00	4.64	116	70	130	
NMeFOSE	ng/L	4.00	3.87	97	70	130	
Perfluorobutanoic acid	ng/L	4.00	4.23	106	70	130	
Perfluorobutanesulfonic acid	ng/L	3.55	3.58	101	70	130	
Perfluorodecanoic acid	ng/L	4.00	4.12	103	70	130	
Perfluorodecane sulfonic acid	ng/L	3.86	4.09	106	70	130	
Perfluorododecanoic acid	ng/L	4.00	3.99	100	70	130	
Perfluoroheptanoic acid	ng/L	4.00	4.05	101	70	130	
Perfluoroheptanesulfonic acid	ng/L	3.82	4.06	107	70	130	
Perfluorohexanoic acid	ng/L	4.00	4.35	109	70	130	
Perfluorohexanesulfonic acid	ng/L	3.66	3.77	103	70	130	
Perfluorononanoic acid	ng/L	4.00	4.05	101	70	130	
Perfluorononanesulfonic acid	ng/L	3.85	3.86	100	70	130	
Perfluorooctanoic acid	ng/L	4.00	4.32	108	70	130	
Perfluorooctanesulfonic acid	ng/L	3.71	4.14	112	70	130	
Perfluoropentanoic acid	ng/L	4.00	4.12	103	70	130	
Perfluoropentanesulfonic acid	ng/L	3.77	3.97	105	70	130	
Perfluorotetradecanoic acid	ng/L	4.00	4.15	104	70	130	
Perfluorotridecanoic acid	ng/L	4.00	3.94	99	70	130	
Perfluoroundecanoic acid	ng/L	4.00	4.14	103	70	130	

FORM 7S - ORG

7E

ORGANICS CALIBRATION VERIFICATION

Report No:	221050108	Instrument ID:	QQQ3
Analysis Date:	05/05/2021 14:36	Lab File ID:	2210505A_14.d
Analytical Method:	EPA 537 Mod Isotope Dilution	Analytical Batch:	710369

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
4:2 Fluorotelomersulfonic acid	ng/L	9370	9730	104	70	130	
6:2 Fluorotelomersulfonic acid	ng/L	9510	9930	104	70	130	
8:2 Fluorotelomersulfonic acid	ng/L	9600	10300	107	70	130	
Perfluorooctane Sulfonamide	ng/L	10000	10500	105	70	130	
NEtFOSA	ng/L	10000	10100	101	70	130	
NEtFOSAA	ng/L	10000	10500	105	70	130	
NEtFOSE	ng/L	10000	10300	103	70	130	
NMeFOSA	ng/L	10000	11000	110	70	130	
NMeFOSAA	ng/L	10000	10800	108	70	130	
NMeFOSE	ng/L	10000	10400	104	70	130	
Perfluorobutanoic acid	ng/L	10000	10500	105	70	130	
Perfluorobutanesulfonic acid	ng/L	8870	9330	105	70	130	
Perfluorodecanoic acid	ng/L	10000	10800	108	70	130	
Perfluorodecane sulfonic acid	ng/L	9650	10100	105	70	130	
Perfluorododecanoic acid	ng/L	10000	11000	110	70	130	
Perfluoroheptanoic acid	ng/L	10000	10500	105	70	130	
Perfluoroheptanesulfonic acid	ng/L	9530	10200	107	70	130	
Perfluorohexanoic acid	ng/L	10000	10500	105	70	130	
Perfluorohexanesulfonic acid	ng/L	9140	9610	105	70	130	
Perfluorononanoic acid	ng/L	10000	10700	107	70	130	
Perfluorononanesulfonic acid	ng/L	9620	10600	110	70	130	
Perfluorooctanoic acid	ng/L	10000	10600	106	70	130	
Perfluorooctanesulfonic acid	ng/L	9280	9800	106	70	130	
Perfluoropentanoic acid	ng/L	10000	10800	108	70	130	
Perfluoropentanesulfonic acid	ng/L	9410	9970	106	70	130	
Perfluorotetradecanoic acid	ng/L	10000	10600	106	70	130	
Perfluorotridecanoic acid	ng/L	10000	10600	106	70	130	
Perfluoroundecanoic acid	ng/L	10000	11000	110	70	130	

FORM 7E - ORG

8I

INJECTION INTERNAL STANDARD AREA SUMMARY

Report No:	221050108	Standard ID:	1205 (ICAL Midpoint)
Analyst:	RXJ	Instrument ID:	QQQ3
Analysis Date:	05/03/21 16:27	Lab File ID:	2210503A_6.d
Analytical Method:	PFAS Isotope Dilution QSM B15	Analytical Batch:	710369

		M2PFDA		M2PFHxA		M2PFOA		M4PFOS	
		Area		*Area*		*Area*		*Area*	
STANDARD		199382		317435		170526		31515	
CLIENT SAMPLE ID	*LAB SAMP ID*		#		#		#		#
HAASF-POTABLE-03	22105010801	186098		298899		151987		28672	
HAASF-POTABLE-05	22105010802	187696		300888		154567		29184	
HAASF-POTABLE-05 DUP	22105010803	188265		303466		152558		29175	
HAASF-POTABLE-05 MS	22105010804	186021		303915		154432		28546	
HAASF-POTABLE-05 MSD	22105010805	193275		310593		156796		29457	
HAASF-POTABLE-04	22105010806	185528		298274		147835		28460	

AREA UPPER LIMIT = +50% of internal standard area

AREA LOWER LIMIT = -50% of internal standard area

Column used to flag values outside QC limits

* Value outside QC limits

8E

EXTRACTED INTERNAL STANDARD RECOVERY

Report No: 221050108 Recovery Limits: 50 - 150

Client Sample ID	LAB SampleID	EIS1	#	EIS2	#	EIS3	#	EIS4	#	EIS5	#	EIS6	#	EIS7	#
HAASF-POTABLE-03	22105010801	98		106		90		77		85		85		83	
HAASF-POTABLE-05	22105010802	94		98		91		75		82		83		83	
HAASF-POTABLE-05 DUP	22105010803	88		93		82		75		82		80		82	
HAASF-POTABLE-05 MS	22105010804	88		98		85		77		84		82		85	
HAASF-POTABLE-05 MSD	22105010805	91		94		90		77		83		81		84	
HAASF-POTABLE-04	22105010806	95		93		86		71		81		81		81	
MB2179810	2179810	120		119		105		107		122		118		122	
LCS2179811	2179811	108		105		93		95		113		106		112	
LCSD2179812	2179812	116		120		100		108		120		118		119	

Client Sample ID	LAB SampleID	EIS8	#	EIS9	#	EIS10	#	EIS11	#	EIS12	#	EIS13	#	EIS14	#
HAASF-POTABLE-03	22105010801	81		81		82		78		80		87		82	
HAASF-POTABLE-05	22105010802	80		80		81		77		80		87		79	
HAASF-POTABLE-05 DUP	22105010803	81		80		79		78		77		86		78	
HAASF-POTABLE-05 MS	22105010804	83		83		83		78		81		89		79	
HAASF-POTABLE-05 MSD	22105010805	83		82		82		79		80		88		78	
HAASF-POTABLE-04	22105010806	81		80		79		76		77		85		77	
MB2179810	2179810	126		128		118		112		101		129		115	
LCS2179811	2179811	115		117		110		105		90		118		104	
LCSD2179812	2179812	121		127		117		114		107		127		114	

Client Sample ID	LAB SampleID	EIS15	#	EIS16	#	EIS17	#	EIS18	#	EIS19	#	EIS20	#	EIS21	#
HAASF-POTABLE-03	22105010801	82		80		78		56		57		75		76	
HAASF-POTABLE-05	22105010802	81		78		77		51		54		77		78	
HAASF-POTABLE-05 DUP	22105010803	80		80		78		61		64		73		79	
HAASF-POTABLE-05 MS	22105010804	83		82		78		60		60		80		79	
HAASF-POTABLE-05 MSD	22105010805	82		82		79		64		62		81		80	
HAASF-POTABLE-04	22105010806	80		79		74		55		56		80		76	
MB2179810	2179810	121		127		106		87		84		105		104	
LCS2179811	2179811	110		118		98		24	*	28	*	98		100	
LCSD2179812	2179812	119		124		108		85		82		104		104	

Client Sample ID	LAB SampleID	EIS22	#	EIS23	#
HAASF-POTABLE-03	22105010801	71		78	
HAASF-POTABLE-05	22105010802	65		74	
HAASF-POTABLE-05 DUP	22105010803	72		79	
HAASF-POTABLE-05 MS	22105010804	75		82	
HAASF-POTABLE-05 MSD	22105010805	75		86	
HAASF-POTABLE-04	22105010806	72		80	
MB2179810	2179810	90		89	
LCS2179811	2179811	66		63	
LCSD2179812	2179812	89		92	

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Report No:	221050108	Method Blank ID:	2179810
Matrix:	Water	Instrument ID:	QQQ3
Sample Amt:	125 mL	Lab File ID:	2210513A_07.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: RXJ
Prep Date:	05/03/21	Analysis Date:	05/13/21 Time: 1559
Prep Batch:	710037	Analytical Batch:	711161
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1.	HAASF-POTABLE-03	22105010801	2210505A_16.d	05/05/21	1505
2.	HAASF-POTABLE-05	22105010802	2210505A_17.d	05/05/21	1520
3.	HAASF-POTABLE-05 DUP	22105010803	2210505A_18.d	05/05/21	1534
4.	HAASF-POTABLE-05 MS	22105010804	2210505A_19.d	05/05/21	1549
5.	HAASF-POTABLE-05 MSD	22105010805	2210505A_20.d	05/05/21	1604
6.	HAASF-POTABLE-04	22105010806	2210505A_21.d	05/05/21	1618
7.	LCS2179811	2179811	2210513A_08.d	05/13/21	1614
8.	LCSD2179812	2179812	2210513A_09.d	05/13/21	1628

FORM IV SV

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Report No:	221050108	Client Sample ID:	MB2179810
Collect Date:	NA Time: NA	GCAL Sample ID:	2179810
Matrix:	Water % Moisture: NA	Instrument ID:	QQQ3
Sample Amt:	125 mL	Lab File ID:	2210513A_07.d
Injection Vol.:	1.0 (µL)	GC Column:	ACC-C18-30M ID 2.1 (mm)
Prep Final Vol.:	1000 (µL)	Dilution Factor:	1 Analyst: RXJ
Prep Date:	05/03/21	Analysis Date:	05/13/21 Time: 1559
Prep Batch:	710037	Analytical Batch:	711161
Prep Method:	PFAS ID QSM B15 Prep	Analytical Method:	PFAS Isotope Dilution QSM B15

CONCENTRATION UNITS: ng/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
757124-72-4	4:2 Fluorotelomersulfonic acid	2.00	U	0.850	2.00	4.00
27619-97-2	6:2 Fluorotelomersulfonic acid	2.00	U	0.940	2.00	4.00
39108-34-4	8:2 Fluorotelomersulfonic acid	2.00	U	0.900	2.00	4.00
4151-50-2	NEtFOSA	4.00	U	0.960	4.00	8.00
2991-50-6	NEtFOSAA	4.00	U	0.970	4.00	8.00
1691-99-2	NEtFOSE	4.00	U	0.900	4.00	8.00
31506-32-8	NMeFOSA	4.00	U	0.970	4.00	8.00
2355-31-9	NMeFOSAA	4.00	U	0.910	4.00	8.00
24448-09-7	NMeFOSE	4.00	U	0.870	4.00	8.00
375-73-5	Perfluorobutanesulfonic acid	2.00	U	0.810	2.00	4.00
375-22-4	Perfluorobutanoic acid	2.00	U	0.900	2.00	4.00
335-77-3	Perfluorodecane sulfonic acid	2.00	U	0.800	2.00	4.00
335-76-2	Perfluorodecanoic acid	2.00	U	0.860	2.00	4.00
307-55-1	Perfluorododecanoic acid	2.00	U	0.880	2.00	4.00
375-92-8	Perfluoroheptanesulfonic acid	2.00	U	0.840	2.00	4.00
375-85-9	Perfluoroheptanoic acid	2.00	U	0.480	2.00	4.00
355-46-4	Perfluorohexanesulfonic acid	2.00	U	0.950	2.00	4.00
307-24-4	Perfluorohexanoic acid	2.00	U	0.990	2.00	4.00
68259-12-1	Perfluorononanesulfonic acid	2.00	U	0.780	2.00	4.00
375-95-1	Perfluorononanoic acid	2.00	U	0.780	2.00	4.00
754-91-6	Perfluorooctane Sulfonamide	2.00	U	0.960	2.00	4.00
1763-23-1	Perfluorooctanesulfonic acid	2.00	U	0.810	2.00	4.00
335-67-1	Perfluorooctanoic acid	2.00	U	0.950	2.00	4.00
2706-91-4	Perfluoropentanesulfonic acid	2.00	U	0.690	2.00	4.00
2706-90-3	Perfluoropentanoic acid	2.00	U	0.850	2.00	4.00
376-06-7	Perfluorotetradecanoic acid	2.00	U	0.980	2.00	4.00
72629-94-8	Perfluorotridecanoic acid	2.00	U	0.990	2.00	4.00
2058-94-8	Perfluoroundecanoic acid	2.00	U	0.950	2.00	4.00

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 221050108

Prep Method: PFAS ID QSM B15 Prep Prep Batch: 710037

Analytical Method: PFAS Isotope Dilution QSM B15 Analytical Batch: 711161

GCAL QC ID: 2179811 ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	LCS RESULT	LCS % REC	#	QC LIMITS
4:2 Fluorotelomersulfonic acid	ng/L	75	0	62.5	83		63 - 143
6:2 Fluorotelomersulfonic acid	ng/L	76.1	0	67.2	88		64 - 140
8:2 Fluorotelomersulfonic acid	ng/L	76.8	0	65.9	86		67 - 138
NEtFOSA	ng/L	80	0	76.9	96		70 - 130
NEtFOSAA	ng/L	80	0	64.4	81		61 - 135
NEtFOSE	ng/L	80	0	75.4	94		70 - 130
NMeFOSA	ng/L	80	0	84.2	105		68 - 141
NMeFOSAA	ng/L	80	0	67.4	84		65 - 136
NMeFOSE	ng/L	80	0	75.4	94		70 - 130
Perfluorobutanesulfonic acid	ng/L	71	0	56.8	80		72 - 130
Perfluorobutanoic acid	ng/L	80	0	65	81		73 - 129
Perfluorodecane sulfonic acid	ng/L	77.2	0	57.8	75		53 - 142
Perfluorodecanoic acid	ng/L	80	0	67.2	84		71 - 129
Perfluorododecanoic acid	ng/L	80	0	67.8	85		72 - 134
Perfluoroheptanesulfonic acid	ng/L	76.2	0	61.6	81		69 - 134
Perfluoroheptanoic acid	ng/L	80	0	66.1	83		72 - 130
Perfluorohexanesulfonic acid	ng/L	73.1	0	62	85		68 - 131
Perfluorohexanoic acid	ng/L	80	0	65.1	81		72 - 129
Perfluorononanesulfonic acid	ng/L	77	0	63.9	83		69 - 127
Perfluorononanoic acid	ng/L	80	0	66.3	83		69 - 130
Perfluorooctane Sulfonamide	ng/L	80	0	68.3	85		67 - 137
Perfluorooctanesulfonic acid	ng/L	74.2	0	62.2	84		65 - 140
Perfluorooctanoic acid	ng/L	80	0	64.8	81		71 - 133
Perfluoropentanesulfonic acid	ng/L	75.3	0	58.3	77		71 - 127
Perfluoropentanoic acid	ng/L	80	0	67	84		72 - 129
Perfluorotetradecanoic acid	ng/L	80	0	68.6	86		71 - 132
Perfluorotridecanoic acid	ng/L	80	0	66.8	84		65 - 144
Perfluoroundecanoic acid	ng/L	80	0	66.7	83		69 - 133

RPD : 0 out of 28 outside limits

Spike Recovery: 0 out of 56 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE LCS/LCSD RECOVERY

Report No: 221050108

Prep Method: PFAS ID QSM B15 Prep Prep Batch: 710037

Analytical Method: PFAS Isotope Dilution QSM B15 Analytical Batch: 711161

GCAL QC ID: 2179812

ANALYTE	UNITS	SPIKE ADDED	LCSD RESULT	LCSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
4:2 Fluorotelomersulfonic acid	ng/L	75	69.7	93		11		63 - 143	0 - 30
6:2 Fluorotelomersulfonic acid	ng/L	76.1	72.2	95		7		64 - 140	0 - 30
8:2 Fluorotelomersulfonic acid	ng/L	76.8	76	99		14		67 - 138	0 - 30
NEtFOSA	ng/L	80	92	115		18		70 - 130	0 - 30
NEtFOSAA	ng/L	80	72.5	91		12		61 - 135	0 - 30
NEtFOSE	ng/L	80	82	103		8		70 - 130	0 - 30
NMeFOSA	ng/L	80	92.7	116		10		68 - 141	0 - 30
NMeFOSAA	ng/L	80	74.9	94		11		65 - 136	0 - 30
NMeFOSE	ng/L	80	86.5	108		14		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ng/L	71	64.8	91		13		72 - 130	0 - 30
Perfluorobutanoic acid	ng/L	80	72.3	90		11		73 - 129	0 - 30
Perfluorodecane sulfonic acid	ng/L	77.2	67.6	88		16		53 - 142	0 - 30
Perfluorodecanoic acid	ng/L	80	74.9	94		11		71 - 129	0 - 30
Perfluorododecanoic acid	ng/L	80	74.8	94		10		72 - 134	0 - 30
Perfluoroheptanesulfonic acid	ng/L	76.2	68.6	90		11		69 - 134	0 - 30
Perfluoroheptanoic acid	ng/L	80	74	92		11		72 - 130	0 - 30
Perfluorohexanesulfonic acid	ng/L	73.1	68.4	94		10		68 - 131	0 - 30
Perfluorohexanoic acid	ng/L	80	74.2	93		13		72 - 129	0 - 30
Perfluorononanesulfonic acid	ng/L	77	69.3	90		8		69 - 127	0 - 30
Perfluorononanoic acid	ng/L	80	74	92		11		69 - 130	0 - 30
Perfluorooctane Sulfonamide	ng/L	80	73.7	92		8		67 - 137	0 - 30
Perfluorooctanesulfonic acid	ng/L	74.2	68.1	92		9		65 - 140	0 - 30
Perfluorooctanoic acid	ng/L	80	72.5	91		11		71 - 133	0 - 30
Perfluoropentanesulfonic acid	ng/L	75.3	66.7	89		13		71 - 127	0 - 30
Perfluoropentanoic acid	ng/L	80	73.9	92		10		72 - 129	0 - 30
Perfluorotetradecanoic acid	ng/L	80	74.3	93		8		71 - 132	0 - 30
Perfluorotridecanoic acid	ng/L	80	74.4	93		11		65 - 144	0 - 30
Perfluoroundecanoic acid	ng/L	80	74.3	93		11		69 - 133	0 - 30

RPD : 0 out of 28 outside limits

Spike Recovery: 0 out of 56 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE MS/MSD RECOVERY

Report No:	221050108	Parent Sample ID:	HAASF-POTABLE-05
Prep Method:	PFAS ID QSM B15 Prep	Prep Batch:	710037
Analytical Method:	PFAS Isotope Dilution QSM B15	Analytical Batch:	710369

GCAL QC ID: 22105010804 ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	MS RESULT	MS % REC	#	QC LIMITS
4:2 Fluorotelomersulfonic acid	ng/L	75	.651	80.7	107		63 - 143
6:2 Fluorotelomersulfonic acid	ng/L	76.1	1.11	78.7	102		64 - 140
8:2 Fluorotelomersulfonic acid	ng/L	76.8	.623	85.5	110		67 - 138
NEtFOSA	ng/L	80	.666	87	108		70 - 130
NEtFOSAA	ng/L	80	.88	85	105		61 - 135
NEtFOSE	ng/L	80	.722	74.1	92		70 - 130
NMeFOSA	ng/L	80	.773	95	118		68 - 141
NMeFOSAA	ng/L	80	1.07	84.8	105		65 - 136
NMeFOSE	ng/L	80	.718	83.2	103		70 - 130
Perfluorobutanesulfonic acid	ng/L	71	.907	75	104		72 - 130
Perfluorobutanoic acid	ng/L	80	1.06	83.6	103		73 - 129
Perfluorodecane sulfonic acid	ng/L	77.2	.494	79.9	103		53 - 142
Perfluorodecanoic acid	ng/L	80	.898	84.5	105		71 - 129
Perfluorododecanoic acid	ng/L	80	.814	86.7	107		72 - 134
Perfluoroheptanesulfonic acid	ng/L	76.2	.662	80.4	105		69 - 134
Perfluoroheptanoic acid	ng/L	80	1.02	84.3	104		72 - 130
Perfluorohexanesulfonic acid	ng/L	73.1	1.03	78.4	106		68 - 131
Perfluorohexanoic acid	ng/L	80	1.53	84.2	103		72 - 129
Perfluorononanesulfonic acid	ng/L	77	.787	82.3	106		69 - 127
Perfluorononanoic acid	ng/L	80	.834	86.5	107		69 - 130
Perfluorooctane Sulfonamide	ng/L	80	1.38	85.3	105		67 - 137
Perfluorooctanesulfonic acid	ng/L	74.2	2.57	78	102		65 - 140
Perfluorooctanoic acid	ng/L	80	1.36	84.4	104		71 - 133
Perfluoropentanesulfonic acid	ng/L	75.3	.883	79	104		71 - 127
Perfluoropentanoic acid	ng/L	80	1.01	86.3	107		72 - 129
Perfluorotetradecanoic acid	ng/L	80	.77	86	107		71 - 132
Perfluorotridecanoic acid	ng/L	80	.81	86.3	107		65 - 144
Perfluoroundecanoic acid	ng/L	80	.833	85.5	106		69 - 133

RPD : 0 out of 28 outside limits

Spike Recovery: 0 out of 56 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

3C

WATER SEMIVOLATILE MS/MSD RECOVERY

Report No:	221050108	Parent Sample ID:	HAASF-POTABLE-05
Prep Method:	PFAS ID QSM B15 Prep	Prep Batch:	710037
Analytical Method:	PFAS Isotope Dilution QSM B15	Analytical Batch:	710369

GCAL QC ID: 22105010805

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
4:2 Fluorotelomersulfonic acid	ng/L	75	77.3	102		4		63 - 143	0 - 30
6:2 Fluorotelomersulfonic acid	ng/L	76.1	84.4	109		7		64 - 140	0 - 30
8:2 Fluorotelomersulfonic acid	ng/L	76.8	81.2	105		5		67 - 138	0 - 30
NEtFOSA	ng/L	80	87.9	109		1		70 - 130	0 - 30
NEtFOSAA	ng/L	80	85.4	106		.4		61 - 135	0 - 30
NEtFOSE	ng/L	80	72.3	90		2		70 - 130	0 - 30
NMeFOSA	ng/L	80	96.6	120		2		68 - 141	0 - 30
NMeFOSAA	ng/L	80	86.6	107		2		65 - 136	0 - 30
NMeFOSE	ng/L	80	85.1	105		2		70 - 130	0 - 30
Perfluorobutanesulfonic acid	ng/L	71	77.4	108		3		72 - 130	0 - 30
Perfluorobutanoic acid	ng/L	80	85.2	105		2		73 - 129	0 - 30
Perfluorodecane sulfonic acid	ng/L	77.2	82.8	107		4		53 - 142	0 - 30
Perfluorodecanoic acid	ng/L	80	88.1	109		4		71 - 129	0 - 30
Perfluorododecanoic acid	ng/L	80	88.7	110		2		72 - 134	0 - 30
Perfluoroheptanesulfonic acid	ng/L	76.2	85	111		6		69 - 134	0 - 30
Perfluoroheptanoic acid	ng/L	80	85.7	106		2		72 - 130	0 - 30
Perfluorohexanesulfonic acid	ng/L	73.1	79.9	108		2		68 - 131	0 - 30
Perfluorohexanoic acid	ng/L	80	85.5	105		1		72 - 129	0 - 30
Perfluorononanesulfonic acid	ng/L	77	85.7	110		4		69 - 127	0 - 30
Perfluorononanoic acid	ng/L	80	88.5	110		2		69 - 130	0 - 30
Perfluorooctane Sulfonamide	ng/L	80	87	107		2		67 - 137	0 - 30
Perfluorooctanesulfonic acid	ng/L	74.2	82.4	107		5		65 - 140	0 - 30
Perfluorooctanoic acid	ng/L	80	86.8	107		3		71 - 133	0 - 30
Perfluoropentanesulfonic acid	ng/L	75.3	81.6	107		3		71 - 127	0 - 30
Perfluoropentanoic acid	ng/L	80	87.2	108		1		72 - 129	0 - 30
Perfluorotetradecanoic acid	ng/L	80	88	109		2		71 - 132	0 - 30
Perfluorotridecanoic acid	ng/L	80	88.7	110		3		65 - 144	0 - 30
Perfluoroundecanoic acid	ng/L	80	88.8	110		4		69 - 133	0 - 30

RPD : 0 out of 28 outside limits

Spike Recovery: 0 out of 56 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III SV-1

Sample Summary

LAB ID	Client ID	Matrix	Collect Date	Receive Date
22105010801	HAASF-POTABLE-03	Water	04/29/2021 15:40	05/01/2021 09:45
22105010802	HAASF-POTABLE-05	Water	04/29/2021 15:15	05/01/2021 09:45
22105010803	HAASF-POTABLE-05 DUP	Water	04/29/2021 15:15	05/01/2021 09:45
22105010804	HAASF-POTABLE-05 MS	Water	04/29/2021 15:15	05/01/2021 09:45
22105010805	HAASF-POTABLE-05 MSD	Water	04/29/2021 15:15	05/01/2021 09:45
22105010806	HAASF-POTABLE-04	Water	04/30/2021 12:05	05/01/2021 09:45

Case Narrative

Client: AECOM **Report:** 221050108

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.3 as specified in the contract.

SEMI-VOLATILES MASS SPECTROMETRY

In the PFAS Isotope Dilution QSM B15 analysis, the recovery for the extracted internal standard d-NEtFOSA and d-NMeFOSA are outside the control limits for sample 2179811 (LCS for HBN 710037 [LCMS/3471]) .

MISCELLANEOUS

PFAS Abbreviations

Abbreviation	Analyte Name
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDS	Perfluorodecane sulfonic acid
PFDoA	Perfluorododecanoic acid
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid
PFHpA	Perfluoroheptanoic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFMBA	Perfluoro-4-methoxybutanoic acid
PFMPA	Perfluoro-3-methoxypropanoic acid
PFNA	Perfluorononanoic acid
PFNS	Perfluorononanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFPeA	Perfluoropentanoic acid
PFPeS	Perfluoropentanesulfonic acid
PFTA	Perfluorotetradecanoic acid
PFTeDA	Perfluorotetradecanoic acid
PFTrDA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid

Abbreviation	Analyte Name
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
4:2 FTS	4:2 Fluorotelomer sulfonic acid
6:2 FTS	6:2 Fluorotelomer sulfonic acid
8:2 FTS	8:2 Fluorotelomer sulfonic acid
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
FOSA	Perfluorooctane Sulfonamide
HFPO-DA	Perfluoro-2-proxypropanoic acid
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid

Pace Analytical

SAMPLE RECEIVING CHECKLIST

221050108

SAMPLE DELIVERY GROUP 221050108	
Client PM AEC 4838 - AECOM	**Transport Method** FEDEX
Profile Number 290377	**Received By** Kirby, Jessica R
Line Item(s) 2 - GW - 18 compounds	**Receive Date(s)** 05/01/21

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS		
Airbill	**Thermometer ID:** E34	**Temp °C**
7866 2809 3744		2.0

DISCREPANCIES	LAB PRESERVATIONS
None	None

NOTES	

Revision 1.6

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Drive | Baton Rouge, LA 70820-7402
(225) 769-4900 | www.gcal.com

CHAIN OF CUSTODY RECC

Client ID: 4838 - AECOM
SDG: 221050108
PM: AEC

Report To:		Bill To:	
Client:	AECOM	Client:	AECOM
Address:	12420 Milestone Center Dr.	Address:	12420 Milestone Center Dr.
	Germantown, MD 20876		Germantown, MD 20876
Contact:	Naoum Tavantzis	Contact:	Claire Mitchell
Phone:	919-461-1178	Phone:	301-820-3000
Email:	naoum.tavantzis@aecom.com	Email:	claire.mitchell@aecom.com

P.O. Number: 104397

Project Name/Number: 60591182.2700.02-MT-Helena [Residential Sampling]

Sampled By: Jack Hollingsworth

Analytical Requests & Method

Custody Seal: Used: ☐ yes ☐ no Intact: ☐ yes ☐ no

Temperature(°C): 2.0 E34 48 CPM

☐ Dissolved Analysis Requested ☐ Field Filtered ☐ Lab Filtered

Matrix	Date	Time (2400)	Comp	Grab	Sample Description	No. of Containers	PFAS (LC/MS/MS, QSM 5.3 Table B-15)	Remarks:	GCAL ID
W	4/29/21	1540		X	HAASF-POTABLE-03	2	X	GENERAL COMMENT: 1 Cooler	
W		1515		X	HAASF-POTABLE-05	2	X		
W		1515		X	HAASF-POTABLE-05-DUP	2	X		
W		1515		X	HAASF-POTABLE-05-MS	2	X		
W		1515		X	HAASF-POTABLE-05-MSD	2	X		
W	4/30/21	1205		X	HAASF-POTABLE-04	2	X		

Air Bill No:

Turn Around Time(Business Days): ☐ 24 hr* ☐ 48 hr* ☐ 3 days* ☑ 1 week* ☑ Standard(per contract/quote) *- Requires prior approval, Rush charges may apply.

Relinquished by: (Signature)	Date/Time:	Received by: (Signature)	Date/Time:
	4/30/21 1245	Fed Ex	
Relinquished by: (Signature)	Date/Time:	Received by: (Signature)	Date/Time:
Fed Ex	5/1/21 0545		5/1/21 0545
Relinquished by: (Signature)	Date/Time:	Received by: (Signature)	Date/Time:

Note: 7866 2809 3744

PFAS via LC/MS/MS compliant with QSM 5.3 Table B-15

By submitting these samples, you agree to GCAL's most recent terms and conditions.

Matrix: W = Water, S=Solid, L=Liquid, T=Tissue.

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Contract Laboratory Program National Functional Guidelines for Organic (August 2014) Data Review and the USEPA Region III Guidelines for Organic (September 1994) for blank qualifications only.

Data Validation Flags

Flag	Interpretation
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
B	The analyte was analyzed for, but not detected at a level greater than or equal to the level of the adjusted Detection Limit (DL) for sample and method.
J+	Reported value may not be accurate or precise, but the result may be biased high.
J-	Reported value may not be accurate or precise, but the result may be biased low.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the Limit of Detection (LOD).
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
UJ	The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.
C	This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by gas Chromatograph/Mass Spectrometer (GC/MS)
X	This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.

The other type of code used by AECOM is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

Code	*Description*	*Code*	*Description*
a	Tracer recovery (radiochemical data only)	**ld**	Laboratory duplicate RPDs (matrix duplicate, MSD, LCSD)
be	Equipment blank contamination	**lp**	Laboratory control sample/laboratory control sample duplicate RPDs
bf	Field blank contamination	**m**	Matrix spike recovery
bi	Bias indeterminate	**md**	Matrix spike/matrix spike duplicate RPD
bl	Laboratory blank contamination	**nb**	Negative laboratory blank contamination
bm	Missing Blank Information	**p**	Chemical preservation issue
bt	Trip Blank	**pe**	Post Extraction Spike
c	Calibration issue	**ps**	Performance Evaluation Sample
cl	Clean-up standard recovery	**q**	Quantitation issue
cp	Insufficient in growth (radiochemical data only)	**r**	Dual column RPD
cr	Chromatographic resolution	**rp**	Re-extraction precision issue [PAHs only]
d	Reporting limit raised due to chromatographic interference	**rt**	SIM ions not within + 2 seconds
dt	Dissolved result > total over limit	**s**	Surrogate recovery
e	Ether interference	**sc**	Sample collection issues
fd	Field duplicate RPDs	**sp**	Sample preparation issue
h	Holding times	**su**	Evidence of ion suppression
hs	Sample headspace did not meet receiving requirements	**t**	Temperature Preservation Issue
i	Internal standard areas	**u**	High combined sample result uncertainty (radiochemical data only)
ii	Injection internal standard area or retention time exceedance	**v**	Compound identification issue
k	Estimated Maximum Possible Concentrations	**x**	Low % solids
l	LCS recoveries	**y**	Serial dilution results
lc	Labeled compound recovery	**z**	ICS results

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Appendix B
Field Documentation

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Appendix B1
Logs of Daily Notice of Field Activities

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Log of Daily Notice of Field Activity
ARNG PFAS, Site Inspection
Helena AASF, Helena, Montana

Date	AECOM Personnel	Weather	Summary Daily Activities	Issues	Progress to Date	Subcontractor(s)/ Visitors
7/13/2020	- Bradley Ruff	Partly sunny, high 76°F, low 47°F, light winds 5-10 mph	-AECOM coordinated access to HAASF-MW001 through the AASF gate and borrowed an HRAA handheld radio for communication with the tower while the survey was completed. - AECOM surveyed the last monitoring well (HAAS-MW001). - AECOM shipped one cooler with all groundwater samples, including QC samples. - AECOM return the gate key to MTARNG before mobilizing offsite.	- None	- Soil Borings: 5/5 - Soil HA Locations: 2/2 - Soil Samples: 17/17 - Permanent Wells: 5/5 - Developed Wells: 5/5 - Groundwater Samples: 5/5	-None
7/12/2020	- Mike Glinski (SS/SSHO) - Bradley Ruff	Partly sunny, high 84°F, low 59°F, breezy winds 15-20 mph	- AECOM coordinated access to HAASF-MW001 (along the taxiway) with the HRAA and borrowed a handheld radio for communication while groundwater sampling occurred. - AECOM low-flow sampled HAASF-MW001, HAASF-MW003, HAASF-MW004, and HAASF-MW0005 until water quality stabilization criteria were met. A duplicate was collected from HAASF-MW005. - AECOM managed IDW waste and inventoried the additional liquid IDW generated. All drums were labeled and marked with permanent ink and left in the staging area. - AECOM surveyed four monitoring wells. The GPS unit battery died before completing the survey.	- None	- Soil Borings: 5/5 - Soil HA Locations: 2/2 - Soil Samples: 17/17 - Permanent Wells: 5/5 - Developed Wells: 5/5 - Groundwater Samples: 5/5	-None
7/11/2020	- Mike Glinski (SS/SSHO) - Bradley Ruff	Sunny, high 85°F, low 59°F, light winds 5-10 mph	- AECOM coordinated access to HAASF-MW001 (along the taxiway) with the HRAA and borrowed a handheld radio for communication while development occurred. - AECOM developed HAASF-MW001. Minimum volume requirements and water quality stabilization criteria were met prior to completion. - AECOM low-flow sampled HAASF-MW002 until water quality stabilization criteria were met. An MS/MSD was collected at this location. - AECOM managed IDW waste and inventoried the additional liquid IDW generated. Labels and markings were added to the drums in permanent ink and paint pen.	- None	- Soil Borings: 5/5 - Soil HA Locations: 2/2 - Soil Samples: 17/17 - Permanent Wells: 5/5 - Developed Wells: 5/5 - Groundwater Samples: 1/5	-None
7/10/2020	- Mike Glinski (SS/SSHO) - Bradley Ruff	Sunny, warm 85°F, winds 15-20 mph	- AECOM developed HAASF-MW002, HAASF-MW003, HAASF-MW004, and HAASF-MW005. Minimum volume requirements and water quality stabilization criteria were met prior to completion. - AECOM managed IDW waste and inventoried the additional liquid IDW generated.	- None	- Soil Borings: 5/5 - Soil HA Locations: 2/2 - Soil Samples: 17/17 - Permanent Wells: 5/5 - Developed Wells: 4/5 - Groundwater Samples: 0/5	-None

Log of Daily Notice of Field Activity
ARNG PFAS, Site Inspection
Helena AASF, Helena, Montana

Date	AECOM Personnel	Weather	Summary Daily Activities	Issues	Progress to Date	Subcontractor(s)/ Visitors
7/9/2020	- Andrew Borden (SSHO) - Mike Glinski (SS) - Bradley Ruff	Sunny, warm 82°F, winds 5 mph	- CTS pre-cleared AOI01-03 (HAASF-MW003) to 5 ft bgs and advanced boring via HSA to 50 ft bgs. Three soil samples were collected from AOI01-01: 0-2 ft bgs, 20-22 ft bgs, and 44-46 ft bgs. - CTS pre-cleared AOI01-05 (HAASF-MW005) to 5 ft bgs and advanced boring via HSA to 55 ft bgs. Three soil samples were collected from AOI01-05: 0-2 ft bgs, 25-27 ft bgs, and 50-52 ft bgs. A duplicate was collected from 50-52 ft bgs. - AECOM began developing HAASF-MW002, but did not reach stabilization prior to the end of the day. - HAASF-MW003 was constructed with a 10 ft screen (40-50 ft bgs), filter pack (38-50 ft bgs), and bentonite chips to surface. The surface completion was a 2 ft x 2 ft concrete pad with 8 inch monitoring well cover and skirt. -HAASF-MW005 was constructed with a 10 ft screen (45-55 ft bgs), filter pack (43-55 ft bgs), and bentonite chips to surface. The surface completion was a 2 ft x 2 ft concrete pad with 8 inch monitoring well cover and skirt. - IDW was inventoried and staged in the parking lot. There are 21 drums: 18 soil and 2 liquid. - One cooler was shipped with all soil samples, including QC samples. - CTS mobilized offsite.	- None	- Soil Borings: 5/5 - Soil HA Locations: 2/2 - Soil Samples: 17/17 - Permanent Wells: 5/5 - Developed Wells: 0/5 - Groundwater Samples: 0/5	- CTS (James, Wesley, Josh)
7/8/2020	- Andrew Borden (SSHO) - Mike Glinski (SS) - Bradley Ruff	Sunny, warm 80°F, winds 10-15 mph	- AECOM met Jim Crawford (HRAA) and got a radio to communicate with the HRAA tower for the installation of AOI01-01 (HAASF-MW001). SPC McHugh acted as liaison between AECOM/CTS and the HRAA tower for this work. - CTS pre-cleared AOI01-01 (HAASF-MW001) to 5 ft bgs and advanced boring via HSA to 60 ft bgs. Three soil samples were collected from AOI01-01: 0-2 ft bgs, 25-27 ft bgs, and 55-57 ft bgs. An MS/MSD was collected from the 55-57 ft bgs interval. - CTS pre-cleared AOI01-04 (HAASF-MW004) to 5 ft bgs and advanced boring via HSA to 44 ft bgs. Three soil samples were collected from AOI01-04: 0-2 ft bgs, 20-22 ft bgs, and 39-41 ft bgs.. - AECOM collected two hand auger surface borings (0-2 ft bgs) from the retention basin: AOI01-06 and AOI01-07. A duplicate was collected at AOI01-06. - HAASF-MW001 was constructed with a 10 ft screen (50-60 ft bgs), filter pack (46-62 ft bgs), and bentonite chips to surface. The surface completion was a 2 ft x 2 ft concrete pad with 8 inch monitoring well cover and skirt. -HAASF-MW004 was constructed with a 10 ft screen (34-44 ft bgs), filter pack (32-44 ft bgs), and bentonite chips to surface. The surface completion was a 2 ft x 2 ft concrete pad with 8 inch monitoring well cover and skirt. - IDW was staged in the parking lot.	- None	- Soil Borings: 3/5 - Soil HA Locations: 2/2 - Soil Samples: 11/17 - Permanent Wells: 3/5 - Developed Wells: 0/5 - Groundwater Samples: 0/5	- CTS (James, Wesley, Josh) - Wade Juntunen (MTARNG) - LTC Adel Johnson (MTARNG) - SPC McHugh (MTARNG)

Log of Daily Notice of Field Activity
ARNG PFAS, Site Inspection
Helena AASF, Helena, Montana

Date	AECOM Personnel	Weather	Summary Daily Activities	Issues	Progress to Date	Subcontractor(s)/ Visitors
7/7/2020	- Andrew Borden (SSHO) - Mike Glinski (SS) - Bradley Ruff	Partly sunny, warm 78°F, scattered showers and thunderstorms	- CTS on-site - Filled water totes on drill rig and support truck at FWHH for drilling and equipment decontamination. - CTS pre-cleared AOI01-02 (HAASF-MW002) to 5 ft bgs and advanced boring via HSA to 62 ft bgs. - Three soil samples were collected: 0-2 ft bgs, 28-30 ft bgs, and 55-57 ft bgs for PFAS analysis. - HAASF-MW002 was constructed with a 10 ft screen (52-62 ft bgs), filter pack (50-62 ft bgs), and bentonite chips to surface. The surface completion was a 2 ft x 2 ft concrete pad with 8 inch monitoring well cover and skirt. - CTS began precleaning AOI01-03 (HAASF-MW003), but stopped at ~3 ft bgs.	- AOI01-03 (HAASF-MW03) was relocated from behind Building D due to access issues of getting a drill rig behind the building. It was relocated immediately east of Building D next to a retention basin. - Depth to water encountered at AOI01-02/HAASF-MW002 was deeper than anticipated.	- Soil Borings: 1/5 - Soil HA Locations: 0/2 - Soil Samples: 3/17 - Permanent Wells: 1/5 - Developed Wells: 0/5 - Groundwater Samples: 0/5	- CTS (James, Wesley, Josh) - Scott Gestring (MTDEQ) - Wade Juntunen (MTARNG) - Virgil Kaiser (MTARNG)
7/6/2020	- Bradley Ruff	Sunny, warm, 82°F	- Performed site walk with Mark Leeper (NGB), Wade Juntunen (MTARNG), and Scott Gestring (MDEQ) to review sample locations and utility mark-outs. - One location (HAASF-MW003) had to be moved from behind the building due to drill rig access limitations. It was moved to the northeast corner of the building. - No other locations were found to be near utilities. - AECOM complete the pre-investigation utility mark-out checklist and submitted it for internal review and signature.	- None	- Soil Borings: 0/5 - Soil HA Locations: 0/2 - Soil Samples: 0/17 - Permanent Wells: 0/5 - Developed Wells: 0/5 - Groundwater Samples: 0/5	- Scott Gestring, Montana Department of Environmental Quality

Notes
AOI = area of interest
bgs = below ground surface
CTS = Cascade Technical Services
ft = feet
GPS = global positioning system
HA = hand auger
HRAA = Helena Regional Airport Authority
HSA = hollow stem auger
LTC = Lieutenant Colonel
MTARNG = Montana Army National Guard
NGB = National Guard Bureau
PFAS = per- and polyfluoroalkyl substances
SH&E = Safety, Health, and Environment
SPC = Specialist
SS = Site Supervisor
SSHO = Site Safety and Health Officer

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Appendix B2
Well Construction Logs

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WELL CONSTRUCTION LOG (FLUSH MOUNT COMPLETION)

Site: Helena AASF	LocID: AOI01-SB01	Date/Time Started: 7/8/20 1050
Project Name:	Project Number: 60552172	Date/Time Completed:
Drilling Contractor: Cascade	Drilling Equipment: CME 75	Logged By: M. Glinski
Driller: J. Goble	Borehole Diameter (in.): 8	Checked By:

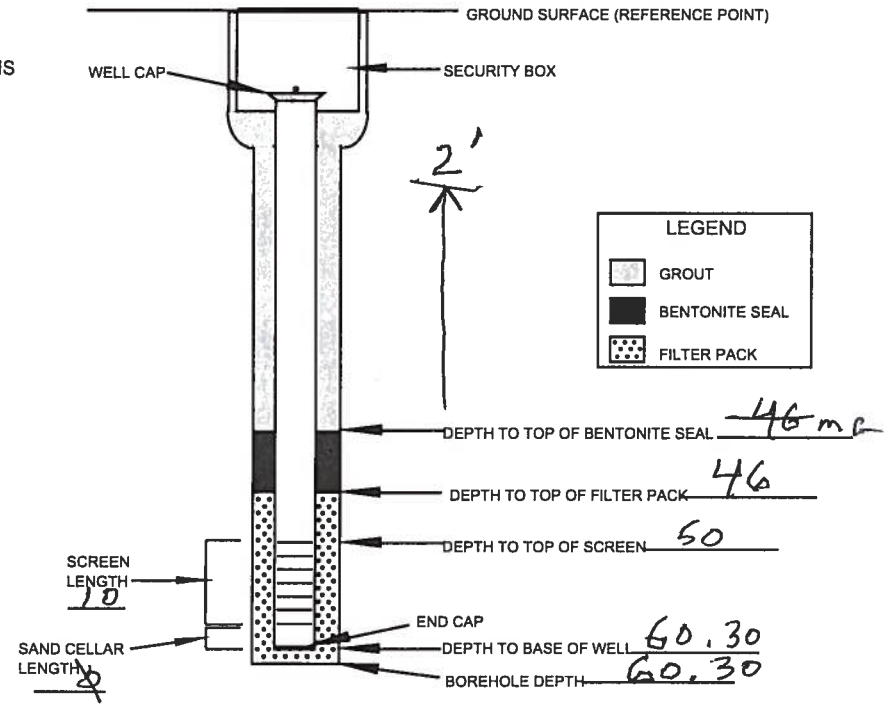
FILTER PACK
- Type & Size of Filter Pack: #2/12 sand
- Amount of Filter Pack Used (lbs): 600
- Filter Pack Manufacturer: Cemex

BENTONITE SEAL
- Type & Size of Bentonite: medium chips
- Amount of Bentonite Used (lbs): 950
- Bentonite Manufacturer: Cetco PureGold

GROUT
- Type of Cement: High Strength
- Cement Manufacturer: Quikrete
- Amount of Cement Used (lbs): 250
- Bentonite Powder Type: ~~/~~
- Bentonite Powder Manufacturer: NA
- Amount of Bentonite Powder Used (lbs): ~~/~~

WELL DETAILS
- Screen/Casing Diameter (in): 2
- Screen Material/Manufacturer: Sch 40 PVC/Johnson
- Screened Interval (ft): 50-60 bgs
- Depth to Water (ft): ~57'
- Water Added During Construction (gal): NONE
- Casing Material/Manufacturer: Sch 40 PVC/Johnson
- Type of Well Cap/Manufacturer: J-plug/Hole
- Type of End Cap/Manufacturer: Sch 40 PVC
- Dimensions of Security Box: 8" diameter round (Morris)

SPECIAL CONDITIONS (describe and draw)



NOT TO SCALE

WELL CONSTRUCTION LOG (FLUSH MOUNT COMPLETION)

Site: Helena AASF	LocID: AOI01 – SB02	Date/Time Started: 7/7/20 1500
Project Name:	Project Number: 60552172	Date/Time Completed: 7/7/20 1700
Drilling Contractor: Cascade	Drilling Equipment: CME 75	Logged By: M Glinski
Driller: J. Goble	Borehole Diameter (in.): 8	Checked By:

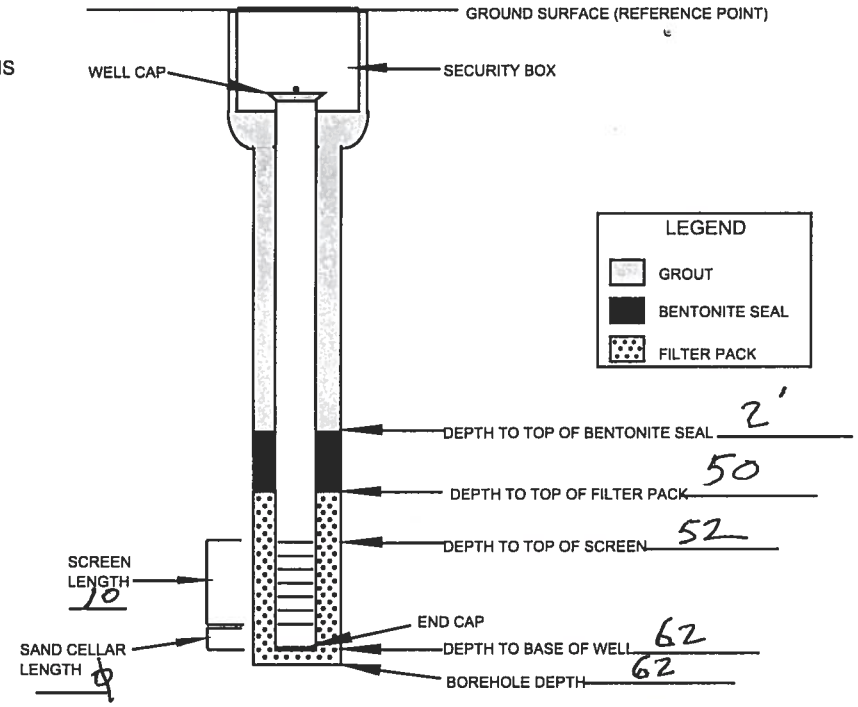
FILTER PACK
Type & Size of Filter Pack: #2/12 sand
Amount of Filter Pack Used (lbs): 400
Filter Pack Manufacturer: Cemex

BENTONITE SEAL
Type & Size of Bentonite: medium chips
Amount of Bentonite Used (lbs): 1000
Bentonite Manufacturer: Cetco Pure Gold

GROUT
Type of Cement: High Strength
Cement Manufacturer: Quikrete
Amount of Cement Used (lbs): 300
Bentonite Powder Type:
Bentonite Powder Manufacturer: NA
Amount of Bentonite Powder Used (lbs):

WELL DETAILS
Screen/Casing Diameter (in): 2
Screen Material/Manufactuer: 10-slot, Sch 40 PVC
Screened Interval (ft): 52 – 62' bgs
Depth to Water (ft):
Water Added During Construction (gal): 5.0
Casing Material/Manufactuer: Sch. 40 PVC
Type of Well Cap/Manufactuer: Hole J-plug
Type of End Cap/Manufactuer: Sch 40 PVC
Dimensions of Security Box: 8" diameter round (Morris)

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

WELL CONSTRUCTION LOG (FLUSH MOUNT COMPLETION)

Site: Helena AASF	LocID: AOI01-SB03	Date/Time Started: 7/9/20 0945
Project Name:	Project Number: 60552172	Date/Time Completed: ↓ 1140
Drilling Contractor: Cascade	Drilling Equipment: CME 75	Logged By:
Driller: J. Goble	Borehole Diameter (in.): 8	Checked By:

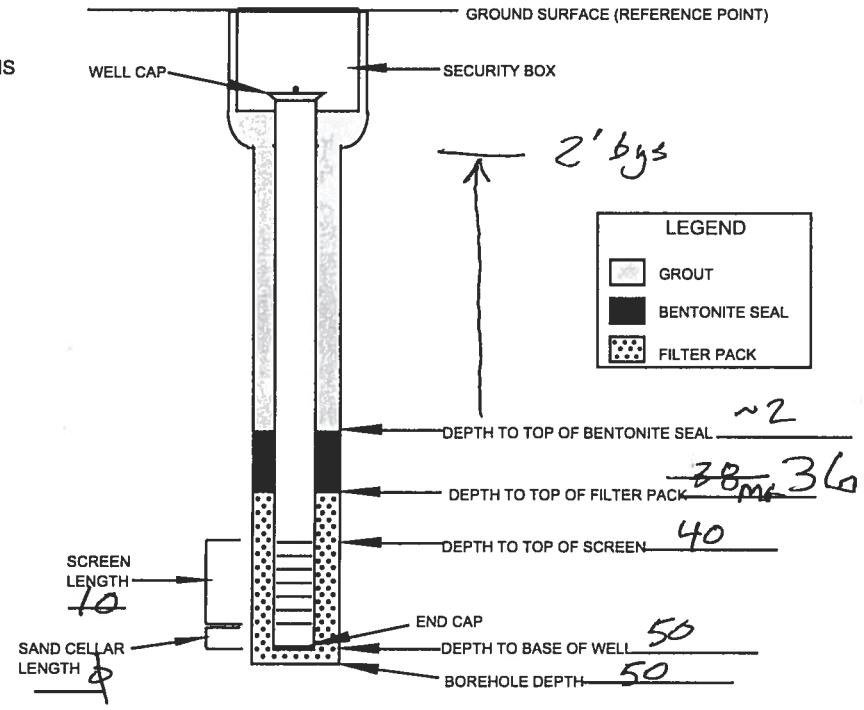
FILTER PACK
Type & Size of Filter Pack: #2/12 sand
Amount of Filter Pack Used (lbs): 450
Filter Pack Manufacturer: Cemex

BENTONITE SEAL
Type & Size of Bentonite: medium chips (3/8")
Amount of Bentonite Used (lbs): 750
Bentonite Manufacturer: Cetco PureGold / Baroid Hole Plug

GROUT
Type of Cement: High Strength
Cement Manufacturer: Quikrete
Amount of Cement Used (lbs): 300
Bentonite Powder Type:
Bentonite Powder Manufacturer: NA
Amount of Bentonite Powder Used (lbs):

WELL DETAILS
Screen/Casing Diameter (in): Sch 40 PVC 2"
Screen Material/Manufactuer: Johnson
Screened Interval (ft): 40-30 bgs
Depth to Water (ft): ~45' bgs
Water Added During Construction (gal): NONE
Casing Material/Manufactuer: Sch 40 PVC / Johnson
Type of Well Cap/Manufactuer: J-Plug / Hole
Type of End Cap/Manufactuer:
Dimensions of Security Box: 8" diameter round (Morris)

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

WELL CONSTRUCTION LOG (FLUSH MOUNT COMPLETION)

Site: Helena AASF	LocID: AOI01 – SB04	Date/Time Started: 7/8/20 1504
Project Name:	Project Number: 60552172	Date/Time Completed:
Drilling Contractor: Cascade	Drilling Equipment: CME 75	Logged By: M. Glinski
Driller: J. Goble	Borehole Diameter (in.): 8	Checked By:

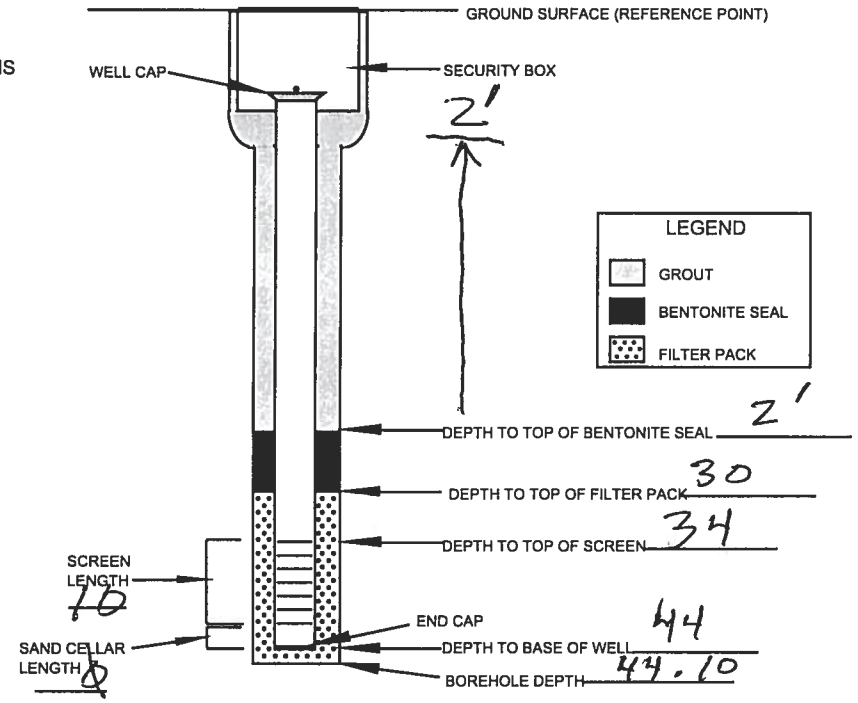
FILTER PACK
Type & Size of Filter Pack: #2/12 sand
Amount of Filter Pack Used (lbs): 650
Filter Pack Manufacturer: Cemex

BENTONITE SEAL
Type & Size of Bentonite: medium chips
Amount of Bentonite Used (lbs): 600
Bentonite Manufacturer: Cetco PureGold

GROUT
Type of Cement: High Strength
Cement Manufacturer: Quikrete
Amount of Cement Used (lbs): 300
Bentonite Powder Type: NA
Bentonite Powder Manufacturer:
Amount of Bentonite Powder Used (lbs):

WELL DETAILS
Screen/Casing Diameter (in): 2
Screen Material/Manufactuer: Sch 40 PVC/Johnson
Screened Interval (ft): 34-44 bgs
Depth to Water (ft): 41'
Water Added During Construction (gal): NONE
Casing Material/Manufactuer: Sch 40 PVC/Johnson
Type of Well Cap/Manufactuer: J-Plug/Hole
Type of End Cap/Manufactuer:
Dimensions of Security Box: 8" diameter round (Morris)

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

WELL CONSTRUCTION LOG (FLUSH MOUNT COMPLETION)

Site: Helena AASF	LocID: AOI01-SB05	Date/Time Started: 7/9/20 1419
Project Name:	Project Number: 60552172	Date/Time Completed: 1640
Drilling Contractor: Cascade	Drilling Equipment: CME 75	Logged By: M. Glinski
Driller: J. Goble	Borehole Diameter (in.): 8	Checked By:

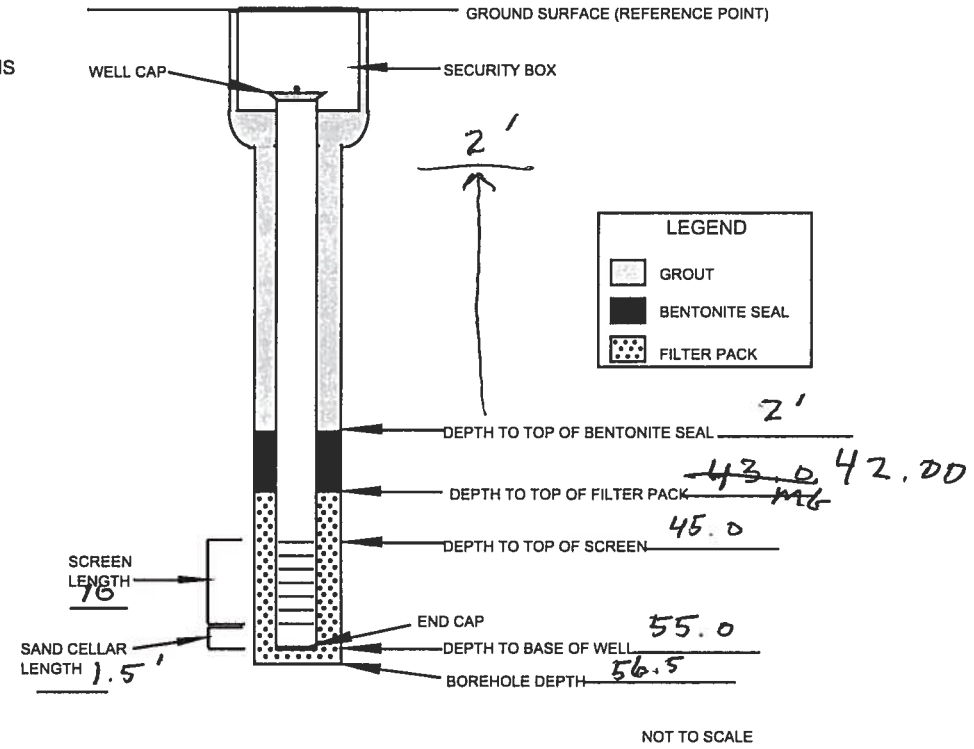
FILTER PACK
Type & Size of Filter Pack: #2/12 sand
Amount of Filter Pack Used (lbs): 550
Filter Pack Manufacturer: Cemex

BENTONITE SEAL
Type & Size of Bentonite: 3/8" chips
Amount of Bentonite Used (lbs): 850
Bentonite Manufacturer: Baroid Hole Plug

GROUT
Type of Cement: High Strength
Cement Manufacturer: Quikrete
Amount of Cement Used (lbs): 250
Bentonite Powder Type:
Bentonite Powder Manufacturer: NA
Amount of Bentonite Powder Used (lbs):

WELL DETAILS
Screen/Casing Diameter (in): 2" Sch 40 PVC
Screen Material/Manufacturer: Johnson
Screened Interval (ft): 45-55 bgs
Depth to Water (ft):
Water Added During Construction (gal): 4
Casing Material/Manufacturer: Sch 40 PVC / Johnson
Type of Well Cap/Manufacturer: J-plug / Hole
Type of End Cap/Manufacturer:
Dimensions of Security Box: 8" diameter round (Morris)

SPECIAL CONDITIONS
(describe and draw)



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Appendix B3
Well Development Forms

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AECOM

Monitoring Well Development Form

LOCATION	Site: MARING AASF	LocID: HAASF-MW001	Date: 7/11/20
	Project Name: HELENA AASF	Project Number:	Recorded By: BR Checked By:
EQUIPMENT	Development Equipment: PROACTIVE TEMPEST		
	Water Level Indicator Type/ID#: GEOTECH	Water Quality Meter Type: YSI PRODSS	
	PID Type/ID#:	Equipment Decon:	
WELL INFO	Casing ID (inches) [a]: 2"	Unit Casing Volume (gallon/linear foot) [b]: 0.163	Initial Depth to Water (FT BTOC) [c]: 56.93
	Total Well Depth (FT BTOC) [d]: 59.85	Water Column Thickness (FT) [d-c]: 2.92	Well Volume (gallon) {[d-c] x b}: 0.48
	Ground Condition of Well:		

CASING INFO												
Casing ID (inches) [a]:	1.5	**2.0**	2.2	3.0	**4.0**	4.3	5.0	6.0	7.0	8.0	Ambient PID (ppm):
Unit Casing Volume (gal/linear foot) [b]:	0.09	**0.16**	0.20	0.37	**0.65**	0.75	1.0	1.5	2.0	2.6	Well Head PID (ppm):

Date (MM/DD/YY)	Time (24 hr)	Method (pump, surge, bail)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	pH	DO (mg/L)	Turbidity (NTU)	Sediment (mL/L)	Comment
7/11/20	0925	PUMP	58.40	~2	1.5	——	NO READINGS	WHILE	SURGING	——		
	0935	"	57.90	~5	1.2			"				
	0955	"	57.43	~7	0.8	13.0	1311	8.12	7.48	5870		
	1000	"	57.46	~8.5	0.8	12.4	1150	7.92	7.27	632		PUMPING RATE
	1005	"	57.41	~9	"	12.5	1060	7.78	7.26	231		ERATIC.
	1010	"	57.18	9.5	0.4	12.4	1036	7.72	7.21	183		
	1015	"	57.10	10	0.4	12.6	1024	7.73	7.24	110		
	1020	"	57.11	10.5	0.4	13.2	994	7.71	7.28	21		
	1025	"	57.09	11	0.3	13.4	997	7.71	7.21	17		
	1030	"	57.07	11.5	0.3	13.4	1004	7.72	7.21	13		

DEVELOPMENT CRITERIA: Measurements: every 5 minutes; Development is considered complete if water added during boring and well construction is removed and parameters are within the following criteria for 3 consecutive readings: **± 1°C, ± 5% Conductivity; ± 0.1 pH; Turbidity ± 10 NTU for 30 minutes or < 50 NTU and sediment <0.75 mL/L**

AECOM

Monitoring Well Development Form

LOCATION	Site: MT ARNG AASF	LocID: HAASF-MW002	Date: 7/9/2020
	Project Name: MT ARNG	Project Number:	Recorded By: BR Checked By:
EQUIPMENT	Development Equipment: PROACTIVE TEMPEST		
	Water Level Indicator Type/ID#: GEOTECH	Water Quality Meter Type: YSI PRO DSS	
	PID Type/ID#:	Equipment Decon:	
WELL INFO	Casing ID (inches) [a]: 2"	Unit Casing Volume (gallon/linear foot) [b]: 0.163	Initial Depth to Water (FT BTOC) [c]: 44.40
	Total Well Depth (FT BTOC) [d]: 61'	Water Column Thickness (FT) [d-c]: 16.6'	Well Volume (gallon) {[d-c] x b}: 2.71 GAL
	Ground Condition of Well: EXCELENT		

CASING INFO												
Casing ID (inches) [a]:	1.5	**2.0**	2.2	3.0	**4.0**	4.3	5.0	6.0	7.0	8.0	Ambient PID (ppm):
Unit Casing Volume (gal/linear foot) [b]:	0.09	**0.16**	0.20	0.37	**0.65**	0.75	1.0	1.5	2.0	2.6	Well Head PID (ppm):

Date (MM/DD/YY)	Time (24 hr)	Method (pump, surge, bail)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (GPM ~~(Lpm)~~)	Temp (°C)	Specific Conductivity (mS/cm)	pH	DO (mg/L)	Turbidity (NTU)	Sediment (mL/L)	Comment
07/09/20	0945	PUMP	50'	1.0	~~1~~ 1.0	13.1	1826	8.05	7.72	1406		
	1000	PUMP	50'	5.0	0.3	12.0	1862	7.92	7.76	7700		
	1015	"	50'	10.0	0.3	12.2	1553	7.83	7.32	7870		
	1030	"	"	12.5	0.16	11.7	1565	7.78	6.95	7500		
	1045	"	"	15.0	0.16	11.7	1422	7.78	7.92	2300		
	1100	"	50'	17.5	0.16	11.5	1379	7.76	8.35	815		
	1115	"	50"	20.0	0.16	11.5	1391	7.76	8.29	734		
	1215	"	44.25	22.5	0.16	11.6	1394	7.89	8.11	118		
07/10/20	1250	"	47.20	25.0	500 LPM	13.2	1445	7.64	6.80	89		
	1255	"	46.45	25.5	500	13.8	1418	7.65	6.99	80		
	1300	"	45.95	26.0	500	14.0	1401	7.65	7.07	60		
	1305	"	45.80	26.5	500	14.3	1379	7.62	7.42	40		
	1310	"	45.55	27.0	500	15.0	1373	7.63	7.57	27		
	TD after development - 61.40' BTOC											

DEVELOPMENT CRITERIA: Measurements: every 5 minutes; Development is considered complete if water added during boring and well construction is removed and parameters are within the following criteria for 3 consecutive readings: ± 1°C, ± 5% Conductivity; ± 0.1 pH; Turbidity ± 10 NTU for 30 minutes or < 50 NTU and sediment <0.75 mL/L

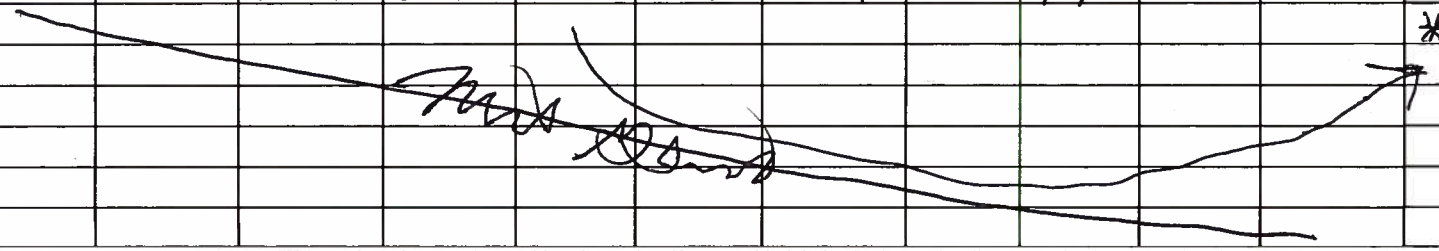
AECOM

Monitoring Well Development Form

LOCATION	Site: Helena SI AASF	LocID: HAASF-MW003	Date: 7/10/20
	Project Name:	Project Number: 60552172	Recorded By: MG Checked By:
EQUIPMENT	Development Equipment: Proactive Tempest / Twister # 019253 Controller W11697		
	Water Level Indicator Type/ID#: Solinst 101 #223102	Water Quality Meter Type: YSI ProDSS	
	PID Type/ID#: NA	Equipment Decon: Liquinox / DI H_2O	
WELL INFO	Casing ID (inches) [a]: 2	Unit Casing Volume (gallon/linear foot) [b]: 0.16	Initial Depth to Water (FT BTOC) [c]: 40.93
	Total Well Depth (FT BTOC) [d]: 49.40	Water Column Thickness (FT) [d-c]: 8.47	Well Volume (gallon) {[d-c] x b}: 1.36
	Ground Condition of Well: NEW		4 gal = 3 volumes

CASING INFO												
Casing ID (inches) [a]:	1.5	**2.0**	2.2	3.0	**4.0**	4.3	5.0	6.0	7.0	8.0	Ambient PID (ppm): NA
Unit Casing Volume (gal/linear foot) [b]:	0.09	**0.16**	0.20	0.37	**0.65**	0.75	1.0	1.5	2.0	2.6	Well Head PID (ppm):

Date (MM/DD/YY)	Time (24 hr)	Method (pump, surge, bail)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate* (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	pH	DO (mg/L)	Turbidity (NTU)	Sediment (mL/L)	Comment
07/10/20	1304	pump	44.86	3.5	2.7							surged periodically
	1311		45.52	5.0	1.4							
	1320		46.21	9.0	1.4							
	13.28		46.01	12.0	1.4							
	1340		—	15.0	—	PAUSE TO PUMP WATER						
	1412		44.75	20.0	0.520							
	1420		44.92	22.0	1.5	12.2	1.068	7.98	9.71	72.1	—	no surging
	1425		43.55	24.0	0.800	12.9	0.986	8.01	9.66	125.4		
	1430		43.10	25.5		12.9	1.000	8.00	9.64	112.5		
	1435				0.650	12.9	1.035	7.98	9.84	47.2		
	1440		42.78			13.1	1.048	8.00	9.88	23.3		
	1445		42.78			13.0	1.057	8.01	9.92	10.3		
	1450		42.75			13.0	1.066	8.02	9.91	5.4		
	1455		43.04			12.7	1.026	8.03	9.97	5.7		
	1500		43.06	30.0		12.8	0.989	8.05	9.98	10.8		
												* erratic



DEVELOPMENT CRITERIA: Measurements: every 5 minutes; Development is considered complete if water added during boring and well construction is removed and parameters are within the following criteria for 3 consecutive readings: ± 1°C, ± 5% Conductivity; ± 0.1 pH; Turbidity ± 10 NTU for 30 minutes or < 50 NTU and sediment <0.75 mL/L

AECOM

Monitoring Well Development Form

LOCATION	Site: Helena SI AASF		LocID: HAASF-004	Date: 7/10/20	
	Project Name:		Project Number: 60552172	Recorded By: MG	Checked By:
EQUIPMENT	Development Equipment: Proactive Tempest / Twister # D19253			Controller W11697	
	Water Level Indicator Type/ID#: Solinst 101 # 223102		Water Quality Meter Type: YSI ProDSS		
	PID Type/ID#: NA		Equipment Decon: Liquinox / DI H_2O		
WELL INFO	Casing ID (inches) [a]: 2		Unit Casing Volume (gallon/linear foot) [b]: 0.76	Initial Depth to Water (FT BTOC) [c]: 40.78	
	Total Well Depth (FT BTOC) [d]: 43.44		Water Column Thickness (FT) [d-c]: 2.66	Well Volume (gallon) {[d-c] x b}: 0.43	
	Ground Condition of Well: NEW			1.28 = 3 volumes	

CASING INFO												
Casing ID (inches) [a]:	1.5	**2.0**	2.2	3.0	**4.0**	4.3	5.0	6.0	7.0	8.0	Ambient PID (ppm):
Unit Casing Volume (gal/linear foot) [b]:	0.09	**0.16**	0.20	0.37	**0.65**	0.75	1.0	1.5	2.0	2.6	Well Head PID (ppm):

Date (MM/DD/YY)	Time (24 hr)	Method (pump, surge, bail)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	pH	DO (mg/L)	Turbidity (NTU)	Sediment (mL/L)	Comment
07/10/20	1545	Pump	DRY	2.4		WELL DRY						
	1623		41.80	6.5	0.720	12.8	0.938	7.77	8.28	45.7	—	
	1630		41.71	7.5		12.8	0.871	7.58	8.47	61.2	—	
	1635		41.70	8.25	0.760	12.7	0.856	7.59	8.46	33.0	—	
	1640		41.70			12.5	0.839	7.60	8.46	20.6	—	
	1645		41.71	10.00		12.6	0.829	7.59	8.46	9.7	—	
	1650		41.73	11.00		12.4	0.820	7.59	8.47	4.8	—	

DEVELOPMENT CRITERIA: Measurements: every 5 minutes; Development is considered complete if water added during boring and well construction is removed and parameters are within the following criteria for 3 consecutive readings: ± 1°C, ± 5% Conductivity; ± 0.1 pH; Turbidity ± 10 NTU for 30 minutes or < 50 NTU and sediment <0.75 mL/L

AECOM

Monitoring Well Development Form

LOCATION	Site: HAASF	LocID: HAASF-MW005	Date: 7/10/20
	Project Name: MT ARNG HAASF	Project Number:	Recorded By: TSK Checked By:
EQUIPMENT	Development Equipment: PROACTIVE TEMPEST		
	Water Level Indicator Type/ID#: GEOTECH	Water Quality Meter Type: YSI PRODSS	
	PID Type/ID#:	Equipment Decon:	
WELL INFO	Casing ID (inches) [a]: 2"	Unit Casing Volume (gallon/linear foot) [b]: 0.163	Initial Depth to Water (FT BTOC) [c]: 45.55
	Total Well Depth (FT BTOC) [d]: 54.43	Water Column Thickness (FT) [d-c]: 8.88	Well Volume (gallon) {[d-c] x b}: 1.45
	Ground Condition of Well: EXCELLENT		

CASING INFO												
Casing ID (inches) [a]:	1.5	**2.0**	2.2	3.0	**4.0**	4.3	5.0	6.0	7.0	8.0	Ambient PID (ppm):
Unit Casing Volume (gal/linear foot) [b]:	0.09	**0.16**	0.20	0.37	**0.65**	0.75	1.0	1.5	2.0	2.6	Well Head PID (ppm):

Date (MM/DD/YY)	Time (24 hr)	Method (pump, surge, bail)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	pH	DO (mg/L)	Turbidity (NTU)	Sediment (mL/L)	Comment
	15:10	PUMP	45.95	16	500	15.7	628	7.93	5.02	3150		WELL DOES NOT PURGE
	15:15	"	45.95	16.5	500	16.2	608	7.93	4.80	2170		DRY @ FLOW RATE OF
	15:20	"	45.93	17	500	15.8	570	7.92	4.77	1800		~ 1 GPM.
	15:25	"	45.94	18.5	500	15.9	542	7.90	4.50	1190		
	15:30	"	45.94	19	500	15.7	536	7.90	4.48	1090		
	15:35	"	45.95	20	500	15.0	508	7.89	4.40	744		
	15:40	"	45.95	20.5	500	14.9	482.2	7.88	4.33	440		
	15:45	"	45.94	21	500	15.0	480.3	7.87	4.34	450		
	15:50	"	45.93	21.5	500	15.0	471.0	7.84	4.34	238		
	15:55	"	45.91	22.	500	15.3	465.8	7.87	4.31	252		
	16:00	"	45.91	22.5	500	15.2	465.0	7.86	4.33	208		
	16:05	"	45.90	23	500	15.3	456.2	7.86	4.29	71.0		
	16:10	"	45.90	23.5	500	15.6	482.7	7.85	4.35	89.5		
	16:15	"	45.90	24.	500	15.3	494.4	7.85	4.40	33.4		
	16:20	"	45.90	25	500	14.7	494.8	7.84	4.39	25.5		
												DTB AFTER DEVELOPMENT.
												55.04
												+ 0.61'

DEVELOPMENT CRITERIA: Measurements: every 5 minutes; Development is considered complete if water added during boring and well construction is removed and parameters are within the following criteria for 3 consecutive readings: ± 1°C, ± 5% Conductivity; ± 0.1 pH; Turbidity ± 10 NTU for 30 minutes or < 50 NTU and sediment <0.75 mL/L

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Appendix B4
Groundwater Sampling Forms

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AECOM

Monitoring Well Sample Collection Form

LOCATION	Site: MT ARNG AASF	LocID: HAASF-MW001	Date: 7/12/20
	Project Name: MARNG AASF	Project Number:	Recorded By: BR Checked By:
EQUIPMENT	Sampling Equipment - Pump: GEOTECH BLADDER PUMP #1201	Controller: GEOTECH GEO CONTROL	Compressor: GEOTECH GEO CONTROL
	Water Level Indicator Type/ID#: GEOTECH	Water Quality Meter Type: YSI PRODSS Sonde ID:	Handset ID:
	PID Type/ID#:	Equipment Decon:	
WELL & SAMPLING INFO	Description:	Screen Interval (BTOC): 50-60'	Initial Depth to Water (BTOC): 56.78
	Historic Pump Settings: NEW WELL		Pump Inlet Depth (BTOC): 58.5
	Condition of Well/Comments: NEW		Height of stick-up (ft): FLUSH
	NOTE: DTB: 59.84		

Date (MM/DD/YY)	Time (24 hr)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	+/- 3% Temp (°C)	±3% Specific Conductivity (mS/cm)	±10% DO (mg/L)	±0.1 pH	±10 ORP (mV)	±10% Turbidity (NTU)	Pump Refill/ Discharge (seconds)	Pump Pressure (PSI)	Comment
07/12/20	1245	56.78	0.25	150	19.6	1368	6.74	7.89	165.7	138.3	30/15	32	
	1250	56.78	0.75	250	16.7	1317	6.66	7.94	156.8	78.7	30/15	32	
	1255	56.78	1.0	250	16.4	1255	7.47	7.92	155.9	60.2	30/15	32	
	1300	56.78	1.25	250	16.3	1237	7.59	7.91	154.8	53.5	30/15	32	
	1305	56.78	1.5	250	19.7	1204	7.88	7.93	157.1	40.0	30/15	32	
	1310	56.78	1.75	250	21.2	1196	7.71	7.84	156.9	35.1	30/15	32	
	1315	56.78	2.00	250	22.4	1203	7.55	7.83	156.2	29.8	30/15	32	
	1320	56.78	2.25	250	19.1	1211	7.71	7.83	157.8	25.1	30/15	32	
	1325	56.78	2.5	250	15.9	1163	7.76	7.84	156.1	12.5	30/15	32	
	1330	56.78	2.75	250	15.8	1157	7.64	7.86	154.6	14.0	30/15	32	
	1330	56.78	3.0	250	16.0	1144	7.58	7.84	153.9	14.1	30/15	32	

Pumping Rate: ≤ 0.5L/min; **Measurements:** every 3 - 5 minutes; **Stabilization is defined as the following for three consecutive readings:** ± 3% Temp, ± 3% Conductivity; + 10% DO; ± 0.1 pH; ± 10mV ORP; 10% Turb

Sample ID Numbers and Sample Time	Container Count, Volume & Type	Preservative	Parameter(s)
~~DUP~~ HAASF-MW001 ~~(1340)~~ (1340)	125 mL HDPE (2)	NONE.	PFAS.

AECOM

Monitoring Well Sample Collection Form

LOCATION	Site: AOI01	LocID: HAASF-MW002	Date: 7/11/20
	Project Name: Helena AASF SI	Project Number:	Recorded By: MG Checked By:
EQUIPMENT	Sampling Equipment - Pump: Geotech bladder #319	Controller: Geocontrol PRO	Compressor: NA
	Water Level Indicator Type/ID#: Solinst 101 #223102	Water Quality Meter Type: YSI Sonde ID: ~~03417~~ 16868 MG	Handset ID: 039544
	PID Type/ID#: NA	Equipment Decon: Liquinox / DI H2O	
WELL & SAMPLING INFO	Description:	Screen Interval (BTOC): 52-62'	Initial Depth to Water (BTOC): 44.28
	Historic Pump Settings: NA		Pump Inlet Depth (BTOC): 57.0'
	Condition of Well/Comments: NEW		Height of stick-up (ft): NA
	NOTE: TD: 61.40 BTOC		Ambient PID (ppm): NA
			Well Head PID (ppm):

Date (MM/DD/YY)	Time (24 hr)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Pump Refill/ Discharge (seconds)	Pump Pressure (PSI)	Comment
07/11/20	1215	44.86	—	0.180	14.4	1.566	7.18	7.89	115.7	14.9	10/15	30	
	1220	45.11		0.250	12.9	1.530	8.45	7.90	108.0	9.1			
	1225	45.16			13.0	1.530	7.42	7.90	107.4	11.4			
	1230	45.19			12.9	1.514	7.31	7.91	105.1	12.2			
	1235	45.19			12.7	1.500	7.44	7.90	105.3	18.0			
	1240	45.20			12.6	1.490	7.48	7.90	105.8	21.3			
	1245	45.20			13.0	1.491	7.50	7.90	105.7	28.5			
	1250	45.20			13.0	1.482	7.54	7.89	105.9	35.8			
	1255	45.20	3.5		12.8	1.477	7.82	7.88	105.8	19.4			

Pumping Rate: ≤ 0.5L/min; **Measurements:** every 3 - 5 minutes; **Stabilization is defined as the following for three consecutive readings:** ± 3% Temp, ± 3% Conductivity; + 10% DO; ± 0.1 pH; ± 10mV ORP; 10% Turb

Sample ID Numbers and Sample Time	Container Count, Volume & Type	Preservative	Parameter(s)
HAASF-MW002/MS/MSD @1300	6x 125ml poly	NONE	PFAS

AECOM

Monitoring Well Sample Collection Form

LOCATION	Site: AOI01	LocID: HAASF - MW003	Date: 7/12/20
	Project Name: Helena HAASF	Project Number:	Recorded By: MG Checked By:
EQUIPMENT	Sampling Equipment - Pump: Geotech ~~Tempest~~ #319	Controller: Geocontrol	Compressor: NA
	Water Level Indicator Type/ID#: Solinst 101 #223102	Water Quality Meter Type: YSI Pro DSS Sonde ID: 46868	Handset ID: 39544
	PID Type/ID#: NA	Equipment Decon: Liquinox / DI H2O	
WELL & SAMPLING INFO	Description:	Screen Interval (BTOC): 40-50	Initial Depth to Water (BTOC): 40.90 Ambient PID (ppm): NA
	Historic Pump Settings: NA	Pump Inlet Depth (BTOC): 45'	Well Head PID (ppm): NA
	Condition of Well/Comments: NEW	Height of stick-up (ft): NA	
	NOTE:		

Date (MM/DD/YY)	Time (24 hr)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Pump Refill/ Discharge (seconds)	Pump Pressure (PSI)	Comment
07/12/20	0920	41.25	—	0.250	12.9	1.416	9.62	8.12	87.2	368	10/15	30	
↓	0925	41.38		↓	13.0	1.436	9.52	8.06	93.1	370	10/10	30	
↓	0930	41.38		↓	13.0	1.379	9.55	8.09	94.8	247	↓	↓	
↓	0935	41.38		↓	12.7	1.369	9.53	8.09	95.1	153	↓	↓	
↓	0940	41.38		↓	12.6	1.277	9.50	8.09	94.9	132	↓	↓	
↓	0945	41.38		↓	12.7	1.243	9.47	8.09	95.1	115			
↓	0950	41.39		↓	12.6	1.212	9.45	8.09	94.4	92.3			
↓	0955	41.38		↓	12.5	1.182	9.44	8.08	93.6	82.7			
↓	1000	41.38		↓	12.6	1.159	9.43	8.07	92.3	75.2			
↓	1005	41.38		↓	12.7	1.132	9.36	8.07	90.9	73.9			
↓	1010	41.38		↓	12.6	1.121	9.34	8.07	89.8	76.9			

Pumping Rate: ≤ 0.5L/min; **Measurements:** every 3 - 5 minutes; **Stabilization is defined as the following for three consecutive readings:** ± 3% Temp, ± 3% Conductivity; + 10% DO; ± 0.1 pH; ± 10mV ORP; 10% Turb

Sample ID Numbers and Sample Time	Container Count, Volume & Type	Preservative	Parameter(s)
HAASF - MW003 1030	2 X 125 ml poly	NONE	PFAS

Monitoring Well Sample Collection Form

LOCATION	Site: AOI 01	LocID: HAASF- MW003	Date: 7/12/20
	Project Name: Helena AASF	Project Number:	Recorded By: MG Checked By:

Date (MM/DD/YY)	Time (24 hr)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Pump Refill/ Discharge (seconds)	Pump Pressure (PSI)	Comment
7/12/20	1015	41.38		0.250	12.7	1.100	9.37	8.07	88.4	83.2	10/15	30	
	1020	41.38			12.8	1.090	9.35	8.07	87.3	87.6			
	1025	41.38	5.0		12.6	1.079	9.37	8.06	86.6	90.4			

Pumping Rate: ≤ 0.5L/min; **Measurements:** every 3 - 5 minutes; **Stabilization is defined as the following for three consecutive readings:** ± 3% Temp, + 3% Conductivity; + 10% DO; + 0.1 pH; + 10mV ORP; 10% Turb

AECOM

Monitoring Well Sample Collection Form

LOCATION	Site: AOI01 Helena AASF SI	LocID: HAASF-MW004	Date: 7/12/20
	Project Name:	Project Number:	Recorded By: MG Checked By:

EQUIPMENT	Sampling Equipment - Pump: Geotech ~~Tempest~~ #319	Controller:	Compressor: NA	
	Water Level Indicator Type/ID#: Solinst 101 223102	Water Quality Meter Type: YSI Pro DSS	Sonde ID: 468B8	Handset ID: 39544
	PID Type/ID#: NA	Equipment Decon: Liquinox / DI H2O		

WELL & SAMPLING INFO	Description:	Screen Interval (BTOC): 34-44	Initial Depth to Water (BTOC): 40.71	Ambient PID (ppm): NA
	Historic Pump Settings: NA		Pump Inlet Depth (BTOC): 43.0'	Well Head PID (ppm):
	Condition of Well/Comments: NEW		Height of stick-up (ft): NA	
	NOTE:			

Date (MM/DD/YY)	Time (24 hr)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Pump Refill/ Discharge (seconds)	Pump Pressure (PSI)	Comment
07/12/20	1140	40.95	→	.470	14.1	0.905	8.31	7.78	37.5	368	10/7	30	
	1145				13.3	0.923	8.06	7.76	38.0	71.3			
	1150	41.04			13.1	0.912	8.16	7.72	39.1	30.4			
	1155			0.160	14.5	0.903	8.16	7.70	40.8	20.1	10/5	30	
	1200	40.98			15.5	0.904	8.16	7.64	41.1	13.1			
	1205	40.95			15.4	0.893	8.00	7.68	33.3	10.7			
	1210	40.95			15.7	0.877	8.09	7.65	36.8	10.0			
	1215	40.92			15.7	0.880	8.13	7.65	38.5	8.0			
	1220	40.92			16.2	0.884	8.18	7.65	40.7	7.6			
↓	1225	40.92	3.0		16.7	0.879	8.10	7.64	40.6	7.4			
			MW BH										

Pumping Rate: ≤ 0.5L/min; **Measurements:** every 3 - 5 minutes; **Stabilization is defined as the following for three consecutive readings:** ± 3% Temp, ± 3% Conductivity; + 10% DO; ± 0.1 pH; ± 10mV ORP; 10% Turb

Sample ID Numbers and Sample Time	Container Count, Volume & Type	Preservative	Parameter(s)
HAASF-MW004 1230	2x125 ml poly	None	PFAS

AECOM

Monitoring Well Sample Collection Form

LOCATION	Site: AOI01	LocID: HAASF-MW005	Date: 7/12/20
	Project Name: Helena AASF SI	Project Number:	Recorded By: MG Checked By:
EQUIPMENT	Sampling Equipment - Pump: Geotech bladder #319	Controller:	Compressor:
	Water Level Indicator Type/ID#: Solinst 101 #223102	Water Quality Meter Type: YSI Pro Sonde ID: 468638	Handset ID: 034 544
	PID Type/ID#: NA	Equipment Decon: Liquinox/DDS DI H2O	
WELL & SAMPLING INFO	Description:	Screen Interval (BTOC):	Initial Depth to Water (BTOC): ~~54.62~~ 45.62 mG Ambient PID (ppm): NA
	Historic Pump Settings: NA		Pump Inlet Depth (BTOC): 51.5 Well Head PID (ppm):
	Condition of Well/Comments: NEW		Height of stick-up (ft): NA
	NOTE:		

Date (MM/DD/YY)	Time (24 hr)	Depth to Water (BTOC)	Volume Removed (gallons)	Pumping Rate (Lpm)	Temp (°C)	Specific Conductivity (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Pump Refill/ Discharge (seconds)	Pump Pressure (PSI)	Comment
07/12/20	1310		—	0.160	17.8	0.732	6.94	8.08	110.0	133	10/5	30	
	1315	45.69			17.2	0.652	5.40	8.02	98.4	89.2			
	1320	45.66			17.2	0.621	5.22	8.03	97.7	91.4			
	1325	45.68			16.8	0.601	5.09	8.02	98.6	76.1			
	1330	45.68			17.4	0.586	4.98	8.02	99.5	77.6			
	1335	45.68			17.4	0.571	4.94	8.01	101.6	51.9			
	1340	45.68			18.0	0.564	4.87	8.01	102.4	46.2			
	1345	45.68			17.9	0.555	4.80	8.00	103.5	41.2			
	1350	45.68			17.6	0.555	4.83	7.99	105.3	40.7			
	1355	45.68			17.5	0.554	4.80	7.99	105.5	41.5			
—	—	MW DW											

Pumping Rate: ≤ 0.5L/min; **Measurements:** every 3 - 5 minutes; **Stabilization is defined as the following for three consecutive readings:** ± 3% Temp, ± 3% Conductivity; + 10% DO; ± 0.1 pH; ± 10mV ORP; 10% Turb

Sample ID Numbers and Sample Time	Container Count, Volume & Type	Preservative	Parameter(s)
HAASF-MW005/DUP	4 x 125 ml poly	NONE	PFAS
1400			

Appendix B5
Survey Data

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Location ID	Northing	Easting	Top of Casing Elevation	Ground Elevation	DTW	GW Elevation
HAASF-CP001	870251.424	1348677.192	NS	3806.512	--	--
HAASF-CP002	870006.114	1348665.777	NS	3808.496	--	--
HAASF-MW001	868973.887	1347769.171	3833.278	3833.668	56.78	3776.50
HAASF-MW002	870434.543	1347737.268	3812.585	3812.792	44.22	3768.37
HAASF-MW003	870323.258	1348515.826	3807.883	3808.006	40.9	3766.98
HAASF-MW004	870066.655	1348685.2	3808.194	3808.355	40.71	3767.48
HAASF-MW005	869838.729	1348388.73	3814.93	3815.223	45.62	3769.31
AOI01-06	869798.819	1348334.353	NS	3808.615	--	--
AOI01-07	869775.644	1348489.587	NS	3807.936	--	--

Survey data collected in the North American Datum of 1983 Montana State Plane

CP - control point

NS - not surveyed

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Appendix C
Photographic Log

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Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 01

Date 7/7/2020

Time

Description:
Soil recovered from HAASF-MW002, 11-24.5 feet bgs.

Orientation:

Photograph No. 02

Date 7/7/2020

Time

Description:
Soil recovered from HAASF-MW002, 24-30.5 feet bgs.

Orientation:

Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 03

Date 7/7/2020

Time

Description:
Soil recovered from HAASF-MW002, 30.5-36.5 feet bgs.

Orientation:

Photograph No. 04

Date 7/7/2020

Time

Description:
Soil recovered from HAASF-MW002, 36.5-43.5 feet bgs.

Orientation:

Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 05

Date 7/7/2020

Time

Description:
Soil recovered from HAASF-MW002, 43.5-50.5 feet bgs.

Orientation:

Photograph No. 06

Date 7/7/2020

Time

Description:
Soil recovered from HAASF-MW002, 50.5-57 feet bgs.

Orientation:

Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 07

Date 7/10/2020

Time

Description:
Soil recovered from HAASF-MW003, 6.5-31.5 feet bgs.

Orientation:

Photograph No. 08

Date 7/10/2020

Time

Description:
Soil recovered from HAASF-MW003, 36.5-49 feet bgs.

Orientation:

Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 09

Date 7/9/2020

Time

Description:
Soil recovered from HAASF-MW004, 6.5-21.5 feet bgs.

Orientation:

Photograph No. 10

Date 7/10/2020

Time

Description:
Soil recovered from HAASF-MW005, 6.5-26.5 feet bgs.

Orientation:

Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 11

Date 7/10/2020

Time

Description:
Soil recovered from HAASF-MW005, 26.5-51 feet bgs.

Orientation:

Photograph No. 12

Date 7/8/2020

Time

Description:
Cascade drill team sets rig at HAASF-MW004.

Orientation:

Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 13

Date 7/8/2020

Time

Description:
Cascade decon trailer used for pressure washing augers, split-spoons, and other sampling equipment.

Orientation:

Photograph No. 14

Date 7/9/2020

Time

Description:
Drilling HAASF-MW005. AECOM team staged away from the rig for safety.

Orientation:

Appendix C - Photographic Log

Site Inspection for PFAS	Helena Army Aviation Support Facility	Helena, Montana

Photograph No. 15

Date 7/10/2020

Time

Description:

Beginning HAASF-MW005 well construction. All IDW generated was containerized in 55-gallon drums.

Orientation:

Appendix D
TPP Meeting Minutes/Montana DEQ Memorandum

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Meeting Minutes
Helena AASF – Site Inspection (SI)
Virtual Technical Project Planning (TPP) – Meeting 1 and 2
Preliminary Assessments and Site Inspections (PA/SIs) for Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites
Contract No. W912DR-12-D-0014, DO W912DR17F0192
Wednesday, 29 April 2020
1300-1500 EST

Participants			
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Jacquelyn Harrington	AECOM	402.952.2533	jacquelyn.harrington@aecom.com

** Notes: NGB-National Guard Bureau; USACE-United States Army Corps of Engineers; MTARNG-Montana Army National Guard; DEQ-Department of Environmental Quality*

Mr. Andrew Borden (AECOM) welcomed participants and reviewed the purpose of the meeting, outlined the agenda, and lead a roundtable of introductions for everyone on the virtual Technical Project Planning (TPP) Meeting 1 and 2. An attendance sheet is included as **Attachment A** to these meeting minutes. The meeting was a combination of TPP1 and TPP2 with the purpose of discussing the Army National Guard (ARNG) Per- and Polyfluoroalkyl Substance (PFAS) Preliminary Assessment (PA)/Site Inspection (SI) program, the Helena Army Aviation Support Facility (AASF) PA findings, and proposed SI approach.

Presentation slides were provided to participants prior to the meeting and are included in **Attachment B**. Key points that supplement the presentation are summarized below.

A safety moment was provided to the participants which covered the safety procedures established in the USACE Engineering Manual (EM) 385-1-1. A Programmatic Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP) have been be prepared in accordance with EM 385-1-1. The site-specific SSHP was developed concurrently with the Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) so that as risks related to the proposed sampling approach were identified, mitigation strategies were developed and documented in the SSHP.

Programmatic Discussion (Slides 5–8):

- The ARNG PA/SI program is contracted through the Baltimore District of the United States Army Corps of Engineers (USACE) with support from other districts, but is managed by the ARNG.
- The first step in the ARNG PFAS PA/SI program began with performing PAs at approximately 200 facilities across the country to determine the likelihood of release and whether any complete pathways existed to drinking water receptors. The final results of the PAs determine whether a specific site would move to the SI-phase or be recommended for No Further Action, per the Comprehensive Environmental Restoration and Liability Act (CERCLA) process.
- The primary goal of the SI is to determine the presence or absence of PFAS at the source areas and facility boundary; nature and extent would be determined during a Remedial Investigation (RI).
- Participants for TPP1 and TPP2 included ARNG, USACE, MTARNG, Montana DEQ, and AECOM; participants for the future TPP3 meeting will include the addition of other local stakeholders to be determined once the SI reporting phase has begun.

Helena AASF PA Findings (Slides 9-13):

- The PA findings for the Helena AASF were presented. Information reported in the PA was collected through in-person interviews and a visual site inspection during a one-day site visit in 2018. One area of interest (AOI) was identified, which contains two potential PFAS release areas related to the storage and re-filling of Tri-Max™ 30 extinguishers.
- In the early-2000s, during normal re-filling of a Tri-Max™ 30, approximately 5 gallons of aqueous film forming foam (AFFF) was spilled.
- A second release occurred in 1998-1999. A Tri-Max™ 30 froze and cracked releasing its contents to the asphalt. The type of material release, exact volume, and fate and transport is unknown.
- It is believed that in both releases, the AFFF/Tri-Max™ 30 contents were released to an asphalt surface and flowed into a storm drain on the north side of Hangar 60. These storm drains released to a detention pond to the northeast of Hangar 47.
- In addition to the AASF, several adjacent sources were identified during the PA, including: the former MTARNG AASF, the MTARNG and Helena Regional Airport Fire Training Area, and the Rocky Mountain Emergency Services Training Center (RMESTC).

Helena AASF Overview (Slides 14-17):

- Data quality objectives (DQOs) were presented for the SI. The primary DQOs were to confirm the presence or absence of a PFAS release at a potential source area and to gather data to refine the conceptual site model (CSM). Secondary goals are to determine the presence/absence at the ARNG facility boundary.
- The preliminary CSM presented the surrounding surface water flow direction. LTC Adel Johnson (MTARNG) indicated that the nearest surface water feature to the facility is the Helena Valley Canal, located north of the facility. The Helena Valley Canal flows to Prickly Pear Creek, approximately two miles northeast of the facility.
- Additionally, the preliminary CSM presented the inferred groundwater flow direction to the north-northeast. Mr. William Gardiner (USACE) asked what information was used to create the inferred groundwater flow direction. Mr. Borden indicated that a groundwater evaluation was performed in 2017. During this investigation, borings were advanced surrounding the AASF and an inferred groundwater direction was developed based on groundwater elevations measured from these borings.
- The current understanding of the CSM is that there are potentially complete pathways between the potential source area and human receptors (mainly site and construction workers) via inhalation of dust, ingestion of surface soil, ingestion of surface water/sediment (when water is present in the retention pond), and ingestion of subsurface soil. A potentially complete pathway also exists for off-facility residents via ingestion of shallow groundwater.

Helena AASF SI Approach (Slides 18-22):

- The scope of work for the SI was presented. Soil borings will be installed at locations within primary and secondary release areas as well as downgradient of the potential source area at the facility boundary. Five soil borings are proposed and will be converted to temporary monitoring wells. Both soil and groundwater samples will be collected. No surface water and sediment samples are proposed since the retention pond is mainly for storm flow/snow melt and is not always saturated. Two surface soil samples will be collected within the retention pond (one at the inlet and one at the outlet).
- Prior to abandoning the temporary monitoring wells, a local surveyor will collect top of casing and ground surface elevations to be used in the development of a groundwater surface contour map.
- The PFAS analyte list, which includes 18 PFAS compounds, was presented. Analysis will be completed by an Environmental Laboratory Accreditation (ELAP)/National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory. All data will undergo Level III data review.
- A general outline of the schedule was presented. The Final UFP-QAPP will be provided with the responses to Montana DEQ comments in May 2020. The field investigation is tentatively planned for June 2020.
- Under normal circumstances, the team would field verify the proposed locations; however, that is not possible given the current travel restrictions. This portion of the SI process will be performed during the mark-out and utility clearing.

- AECOM mentioned that hollow-stem auger (HSA) is being evaluated to replace direct-push as the preferred drilling method for the SI. This is still being discussed internally, but the team will be made aware of any changes prior to finalizing the UFP-QAPP.

Open Discussion (Slide 23):

- Scott Gestring (Montana DEQ) asked if potential data quality issues were a concern with collecting grab groundwater samples from temporary monitoring wells and whether the installation of permanent wells was a possibility. Additionally, Ms. Kristin Addis (USACE) indicated that if HSA would potentially be used at the facility, then installing permanent monitoring wells would not take much more effort. Ms. Jacquelyn Harrington (AECOM) indicated that there were no data quality concerns, but regardless would evaluate whether permanent monitoring wells could be installed rather than temporary monitoring wells.
- Mr. Borden asked if MTARNG was aware of the utility mark-out procedures in place at the AASF. Mr. Wade Juntunen (MTARNG) indicated that he would call 811 to request a Dig Safe ticket and could be on-site to show the utility locator the proposed locations if AECOM staff had yet to mobilize. Post Engineers would provide additional markings not covered by the 811 Dig Safe ticket.
- The team discussed the need to coordinate with the Helena Regional Airport when installing point AOI01-01 since it is close to the taxiway and runway. AECOM will work with MTARNG to identify a point-of-contact at the airport and provide the necessary details.
- Finally, the team discussed document distribution for the Final SI UFP-QAPP.

The presentation ended at 1445 and the phone line was closed.

Attachment A - TPP 1 & 2 Sign-In Sheet

Attachment B - TPP 1 & 2 Briefing Slides

Helena Army Aviation Support Facility (AASF)
Helena, MT
Site Inspection
Montana Army National Guard

Technical Project Planning (TPP) Meeting 1 & 2

Preliminary Assessments and Site Inspections (PA/SI) for Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites

29 April 2020

Agenda

- Introductions
- Safety Moment
- TPP Meeting Goals
- Army National Guard (ARNG) PA/SI Overview
- Helena AASF ARNG PA Results
- Helena AASF SI Overview
- Stakeholder Involvement
- Questions and Open Discussion

Introductions

- ARNG-Installation and Environment Division (IED), Cleanup Branch
  - MAJ Pamela Hess, Toxic Release Program Manager
  - Bonnie Packer, Nationwide Project Manager
  - Mark Leeper, SI Project Manager
- United States Army Corps of Engineers (USACE)
  - Tim Peck, Program Manager
  - Briana Niestrom, SI Project Manager
- Montana Army National Guard (MTARNG)
  - LTC Adel Johnson, Environmental Program Chief
  - Wade Juntunen, Remediation Project Manager
- Montana Department of Environmental Quality (Montana DEQ)
  - Scott Gestring, DSMOA Project Officer, Cleanup, Protection, and Redevelopment Section
- AECOM Technical Services, Inc.
  - Andrew Borden, SI Task Manager
  - Jacquelyn Harrington, SI Senior Lead

Safety Moment
Site Safety Procedures

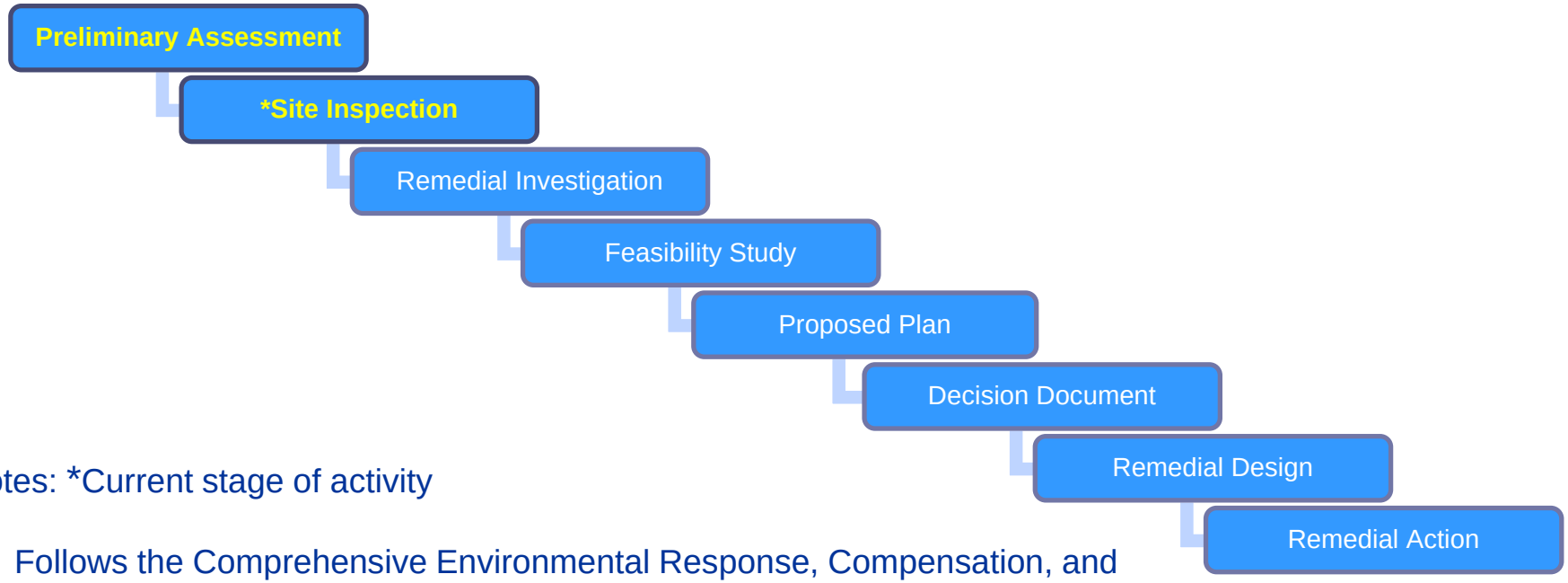
- SI will follow USACE Engineering Manual (EM) 385-1-1 requirements:
  - Accident Prevention Plan addresses all component plans for EM 385-1-1, including Construction Support during drilling operations
  - Site Specific Health and Safety Plan addresses project participants, training, and hazard identification and mitigation
- Planning documents were prepared during SI Work Plan phase

TPP Meeting Goals

- TPP1:
  - Provide an overview of the ARNG PA/SI Program
    - Regulatory framework
  - Discuss PA Findings
  - Define objectives for SI data collection
  - Encourage stakeholder involvement
  - Review project schedule
  - Capture action items
- TPP2: Discuss proposed SI approach
- TPP3: Discuss SI findings
- Participants:
  - TPP1 and 2: ARNG, USACE, Montana DEQ
  - TPP3: ARNG, USACE, Montana DEQ, other local stakeholders

ARNG PA/SI Overview

Work Phases



Notes: *Current stage of activity

- Follows the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Process
- An interim removal action can be conducted or a No Further Action determination can be made at any phase

ARNG PA/SI Overview

- Activities centrally contracted through USACE and managed by ARNG-IED
  - USACE Baltimore manages the contract, with technical project support from Louisville, Omaha, Sacramento, and Seattle Districts
  - Project support: chemistry, geology, risk screening
- PA ranking (~200 facilities) - state ARNG input
  - Likelihood of release
  - Complete pathway to drinking water receptor
- Priority assigned to facilities with highest likelihood of release near drinking water intake
- PA – facility-wide; SI – areas of interest (AOIs)

ARNG PA/SI Overview

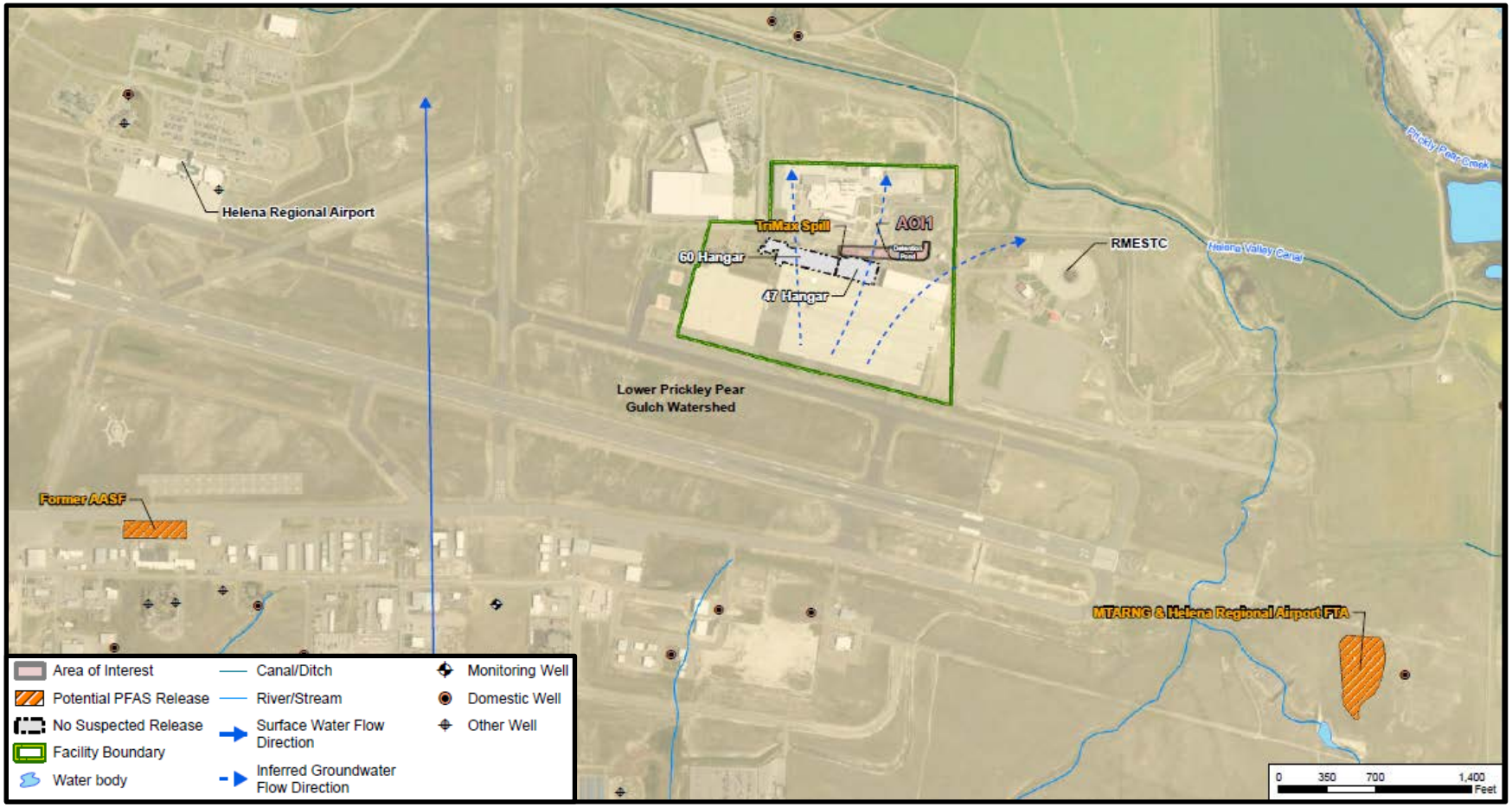
- ARNG / MTARNG
  - Identify potential per- and polyfluoroalkyl substances (PFAS) release locations
  - Provide facility access and points of contact
  - Gather and provide appropriate documents
  - Identify/schedule personnel to interview
  - Supply final PA to the regulatory agencies
- SI Regulatory Involvement
  - CERCLA SI conducted in conjunction with the appropriate regulatory agency

Helena AASF
ARNG PA Results

- Potential release area: 1 identified during the PA
- PFAS release attributed to Trimax™ 30 Extinguisher spill:
  - Aqueous film forming foam (AFFF) released during extinguisher refilling in the early-2000s
  - Spill likely flowed into a drain that emptied into a detention pond; potential release to soil and groundwater

Helena AASF

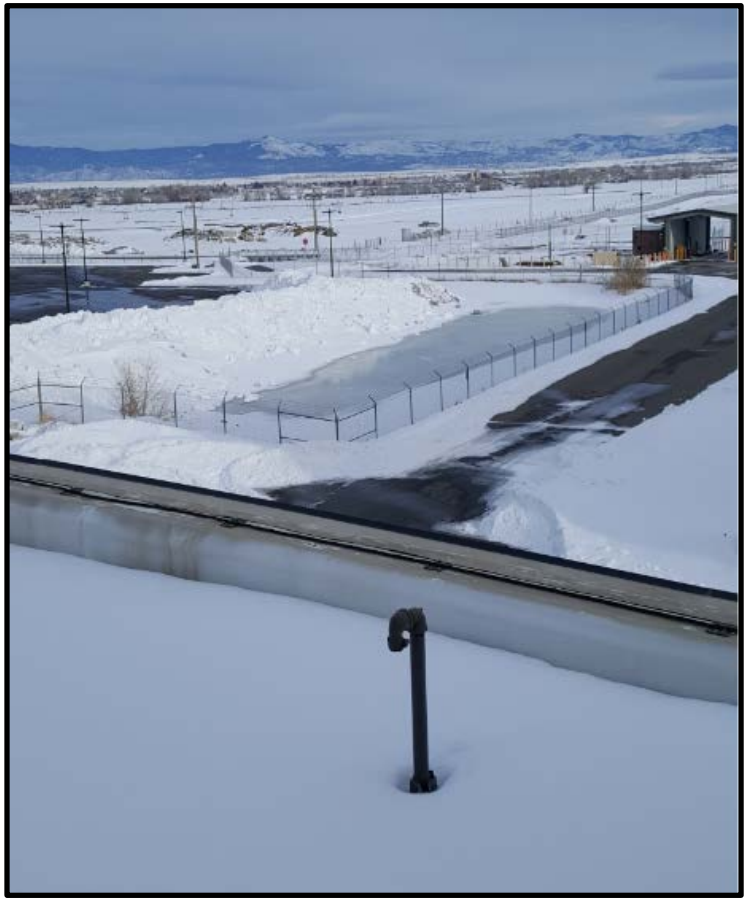
Summary of Findings and AOIs



*Domestic well are classified for any use other than commercial or industrial purposes

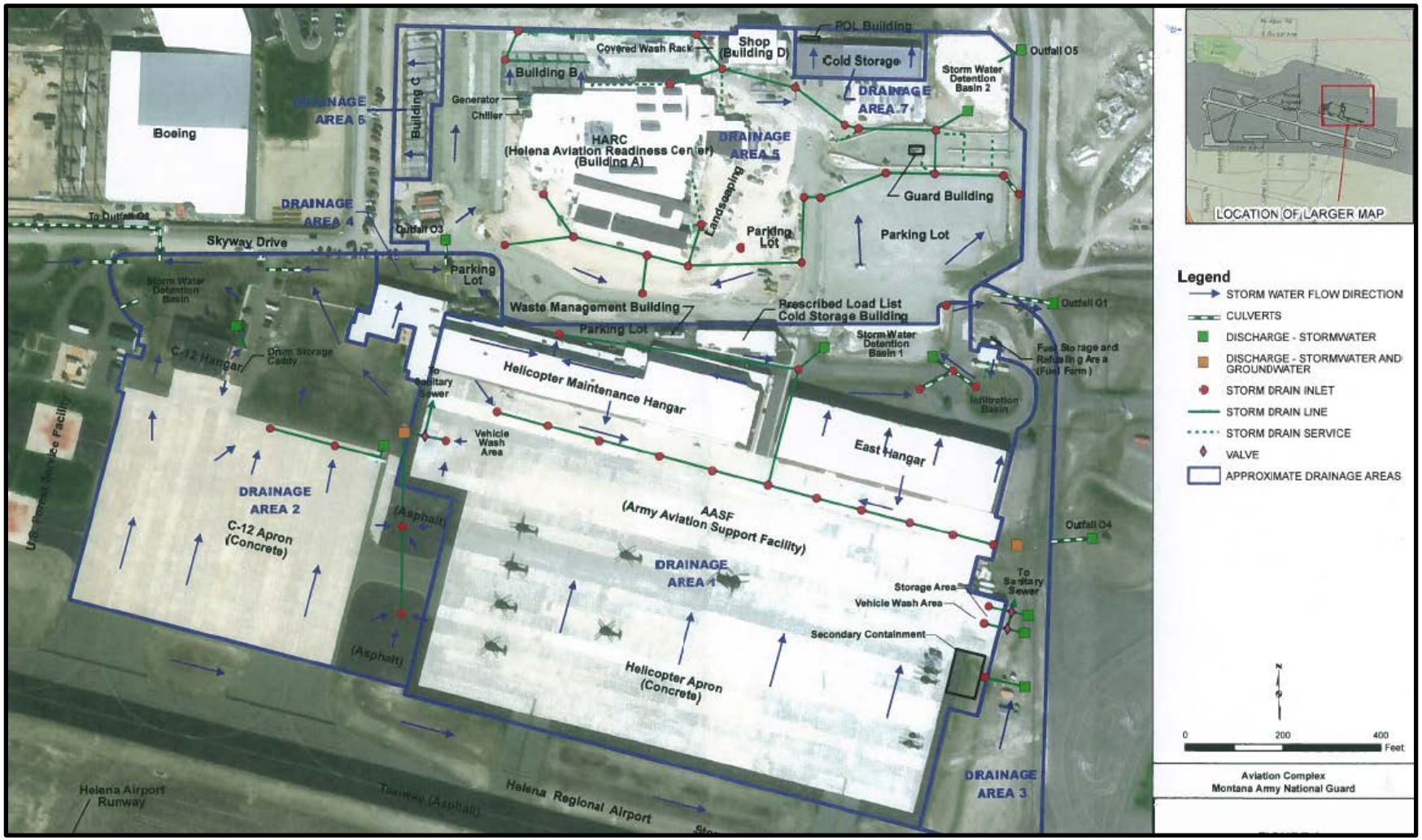
Helena AASF PA Findings
Trimax™ Spill Area

- Prior to construction of Hangar 47, Trimax™ 30 extinguishers were stored outside behind the eastern end of Hangar 60
- Approximately 5 gallons of 3% AFFF was spilled during re-filling of a Trimax™ 30 extinguisher in the early-2000s
  - The spill possibly flowed into a drain that empties into a detention pond on the northeast corner of Hangar 47
  - Detention pond has been and re-worked since this time
    - Reconfiguring 2005-2006
    - Recontouring 2017
  - Final disposition of soil generated is unknown: potentially used as on-facility fill and/or taken off-facility in 2017
- Fire extinguisher froze and cracked in 1998-1999
  - Contents released, but fate and transport unknown



Helena AASF PA Findings

Stormwater/ Drain Network



Helena AASF PA Findings
Adjacent Sources

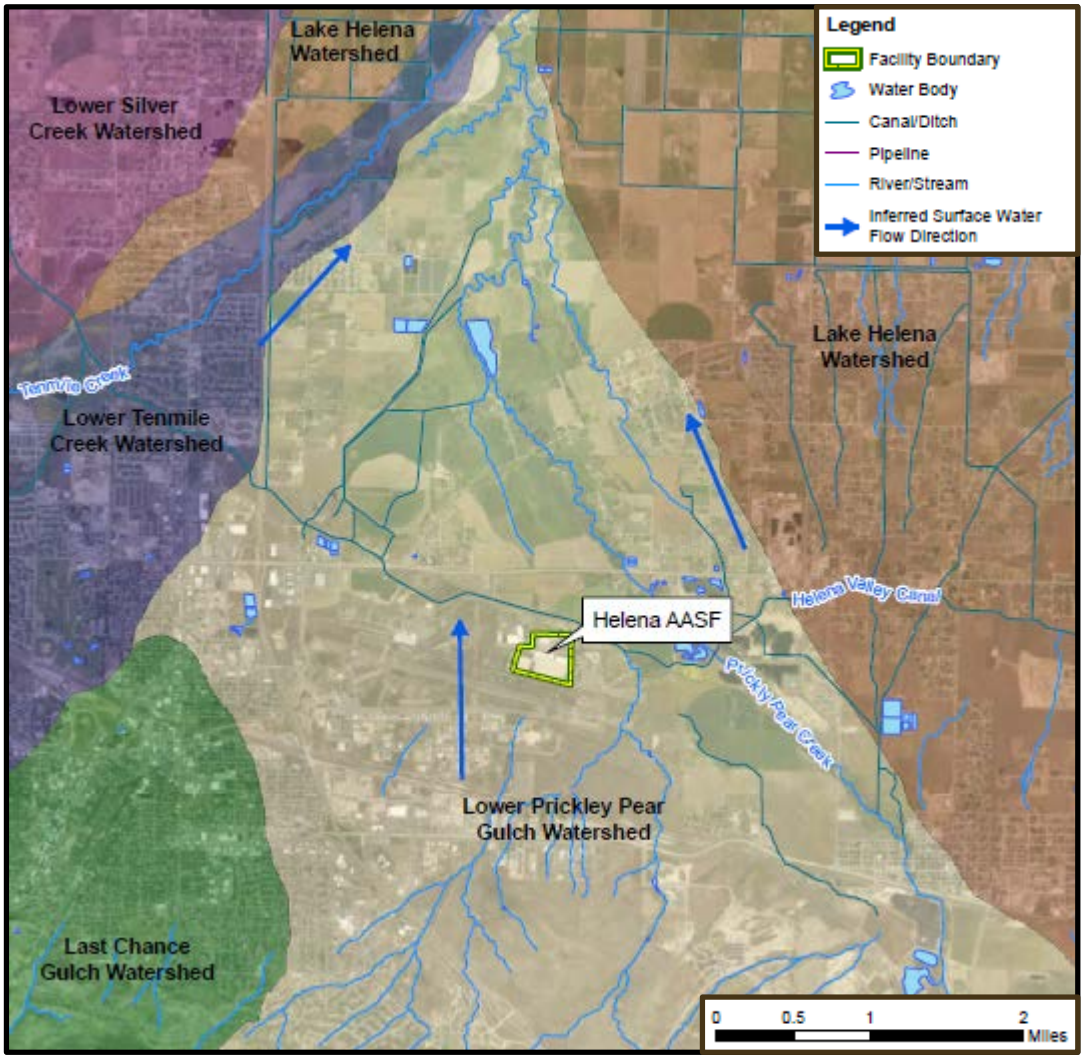
- Former AASF
  - Used by MTARNG from 1958-1998
  - Periodic AFFF training behind red brick building at this location
  - No specific information recovered during the PA
- MTARNG and Helena Regional Airport Fire Training Area
  - MTARNG 1049th Engineer Detachment coordinated fire training with the Helena Regional Airport once per year from 1982 until the early-2000s
  - Fuels and solvents used during training; no specific information regarding the concentration or amount of AFFF used
- Rocky Mountain Emergency Services Training Center (RMESTC)
  - Use since 1996 by the Helena Regional Airport Authority
  - Contains a variety of fire training scenarios with an 8,800 square foot fire pit
  - No information on the use of AFFF at RMESTC

Helena AASF SI Overview
Data Quality Objectives (DQOs)

- Primary SI DQOs
  - Confirm the presence/absence of a release
  - Gather data for conceptual site model (CSM)
    - Understanding of Source-Pathway-Receptor relationships required for establishing sampling strategy
- Extended SI DQOs
  - Determine the presence/absence at facility boundary
  - Check for alternate sources, up- or downgradient
  - Measure PFAS at/near receptor, if warranted

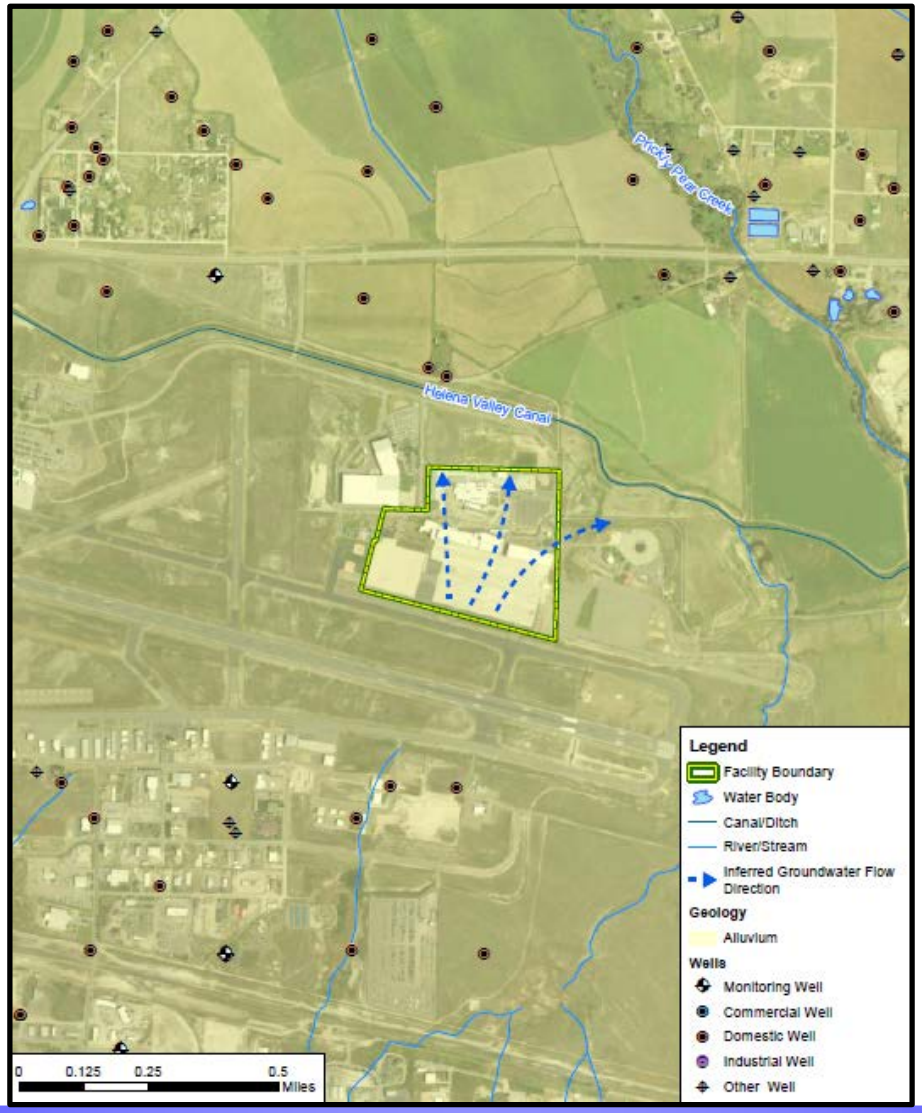
Helena AASF SI Overview

CSM – Surface Water Features

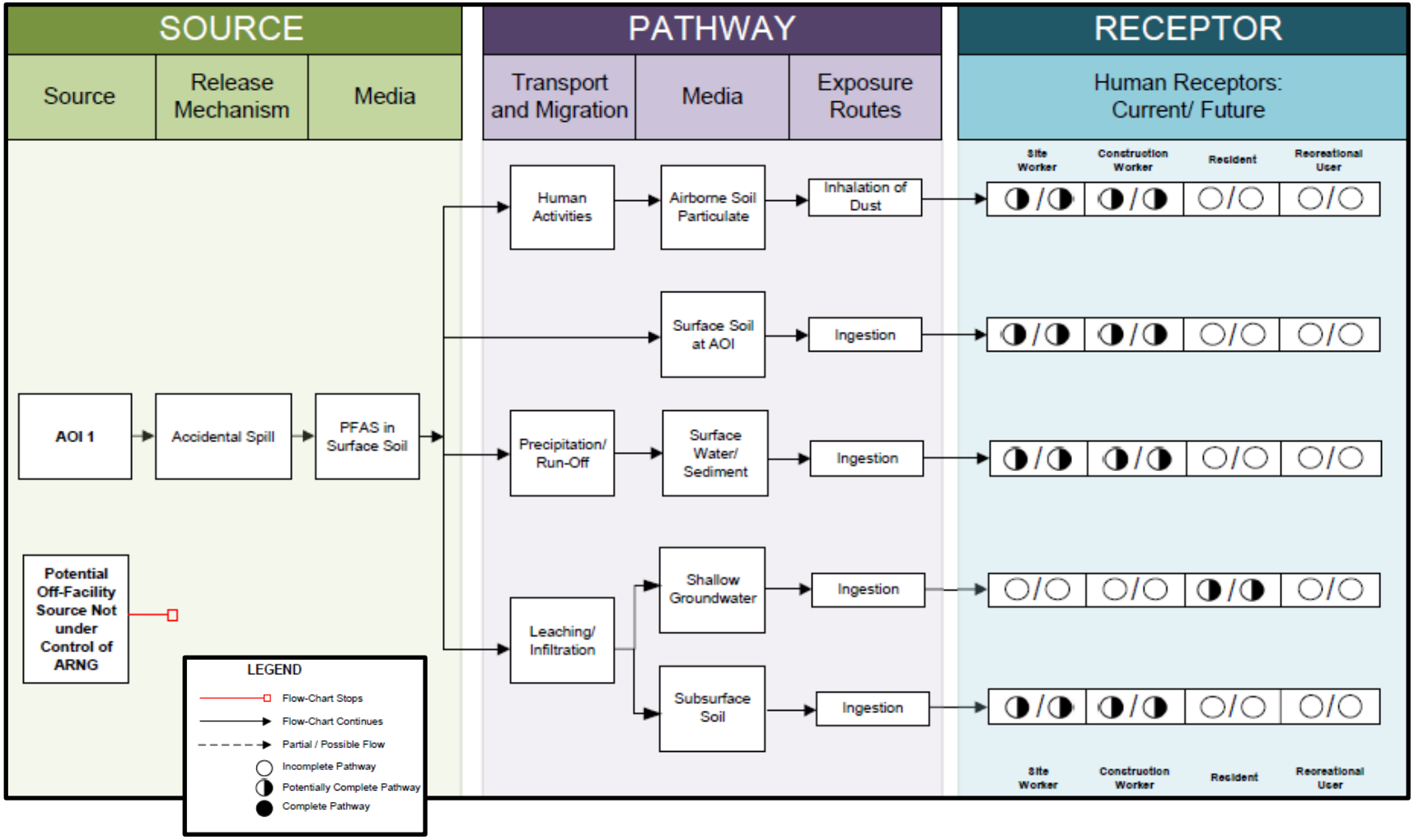


Helena AASF SI Overview

CSM – Groundwater Features



Helena AASF SI Overview
CSM



Helena AASF SI Overview

Planning and Sampling

- Finalize Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) Addendum
  - Draft Final submitted on 24 March 2020
  - Final to be submitted following the TPP 1&2 meeting
- Continuous soil cores to target depth
  - Soil samples collected at surface, mid point, above water table for new temporary well locations
- Collect a groundwater sample from each temporary well
- Collect surface soil samples from retention pond

Helena AASF SI Overview

Proposed Sampling Locations

Helena AASF SI Overview

AOI	# of Boring Locations	Target Depth(s) for Borings	Soil Samples	Target Interval(s) for GW samples	Groundwater Samples	Surface Soil Samples	Decontamination Water Samples
1	5	30 ft	15	Mid-screen	5	2	1

- Sample locations will be refined in the field
  - Confirm placement is accessible and will meet DQOs prior to the utility mark-out and locate

Helena AASF SI Overview

Analytical Parameters

Perfluorooctanesulfonic acid (PFOS)	Perfluoroheptanoic acid (PFHpA)
Perfluorohexanesulfonic acid (PFHxS)	Perfluorononanoic acid (PFNA)
Perfluorooctanoic acid (PFOA)	Perfluorobutanesulfonic acid (PFBS)
Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPA)
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)
Perfluorodecanoic acid (PFDA)	Perfluorotetradecanoic acid (PFTA)
Perfluorododecanoic acid (PFDoA)	Perfluorohexanoic acid (PFHxA)
Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnA)
6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)

- Analysis completed by ELAP/NELAP-certified laboratory
- Requirement for state-certified laboratory?
- Data will undergo Level III data validation

Stakeholder Involvement

- Use TPPs and open communication to encourage stakeholder involvement
- Key involvement topics
  - Proposed approaches
  - Document review time for Montana DEQ and other stakeholders
- Schedule:
  - Address remaining comments and issue Final UFP-QAPP Addendum: May 2020
  - Field Investigation: May-June 2020

Questions and Open Discussion

- Coordination
  - Data transfer
  - Utility mark-out process
  - Report distribution (paper, electronic, portable document format)
  - Stakeholder relations
- Schedule
- PA findings

Acronyms

- AASF – Army Aviation Support Facility
- AFFF – Aqueous film forming foam
- AOI – areas of interest
- ARNG – Army National Guard
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
- CSM – Conceptual Site Model
- DEQ – Department of Environmental Quality
- DQO – Data Quality Objective
- DSMOA – Defense and State Memorandum of Agreement
- ELAP – Environmental Laboratory Accreditation Program
- EM – Engineering Manual
- IED – Installation and Environment Division
- MTARNG – Montana Army National Guard
- NELAP – National Environmental Laboratory Accreditation Program
- PA – Preliminary Assessment
- PFAS – Per- and Polyfluorinated Alkyl Substances
- PFOS – Perfluorooctanesulfonic Acid
- PFOA – Perfluorooctanoic Acid
- RMESTC – Rocky Mountain Emergency Services Training Center
- SI – Site Inspection
- TPP – Technical Project Planning
- UFP-QAPP – Uniform Federal Policy-Quality Assurance Project Plan
- USACE – United States Army Corps of Engineers

Meeting Minutes
Helena Army Aviation Support Facility (AASF) – Site Inspection (SI)
Technical Project Planning (TPP) – Meeting 3
Preliminary Assessments and Site Inspections (PA/SIs) for Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanic Acid (PFOA) Impacted Sites
Contract No. W912DR-12-D-0014, DO W912DR17F0192
Friday, 15 January 2021
1300 to 1400 hrs EST.

Participants			
Name	**Affiliation**	**Phone**	**E-Mail**
Mark Leeper	ARNG G9	804-516-3529	mark.s.leeper.civ@mail.mil
Briana Niestrom	USACE	206-472-5611	briana.c.niestrom@usace.army.mil
Kristin Addis	USACE	NA	kristin.l.addis@usace.army.mil
LTC Adel Johnson	MTARNG	406-324-3089	adel.m.johnson.mil@mail.mil
Wade Juntunen	MTARNG	406-324-3088	wade.m.juntunen.ctr@mail.mil
Scott Gestring	MDEP	406-444-6471	sgestring@mt.gov
Jacquelyn Harrington	AECOM	402-952-2500	jacquelyn.harrington@aecom.com
Andrew Borden	AECOM	978-905-2405	andrew.borden@aecom.com

ARNG – Army National Guard; MTARNG – Montana Army National Guard; MDEQ – Montana Department of Environmental Quality; USACE – United States Army Corps of Engineers

Andrew Borden (AECOM) welcomed participants and began the meeting at 1300 with introductions. The meeting focused on the results of the Site Inspection (SI) for potential per- and polyfluoroalkyl substances (PFAS) releases at the Helena Army Aviation Support Facility (AASF). Briefing slides are included as **Attachment A**. Key points discussed during the presentation are provided below.

Mr. Borden presented a safety moment regarding snowblower use and operation during the winter season. Many potential hazards exist using this equipment and several reminders were presented to reinforce safe behavior while operating the equipment.

The Technical Project Planning (TPP) meeting goals and overview of work phases were presented.

- TPP 1 and 2 reviewed the Army National Guard (ARNG) Preliminary Assessment (PA)/ Site Inspection (SI) program and approach for the Helena AASF
- TPP 3 discusses SI findings after the SI field effort and future actions
- The Final PA was issued in October 2018
- SI fieldwork was completed in July 2020
- The Draft Final SI Report was transmitted to the Montana Department of Environment Quality (MDEQ) in December 2020

PA – Summary of Findings:

- A brief overview of the PA findings were presented. During the PA, four potential source areas were identified and grouped into one Area of Interest (AOI 1).
- Potential PFAS releases areas were attributed to releases of aqueous film forming foam (AFFF) from the two fire suppression systems on the facility and the accidental release from portable fire extinguishers.
- The first release occurred from the 60 Hangar during the initial testing of the fire suppression system. During the test, AFFF was released inside the hangar and eventually settled outside the

hangar bay doors on the apron. It is believed the AFFF entered the storm drains outside the hangar and migrated to the onsite retention basin through storm drains.

- The second potential PFAS release area was attributed to the initial fire suppression system testing at the 47 Hangar. This system uses Jet-X High Expansion Foam (HEF). Information from the PA and SI did not indicate the Jet-X HEF entered the storm drains or retention basin.
- The third potential release is from an accidental spill which occurred during the refilling of a Tri-Max fire extinguisher. Approximately 5-gallons of AFFF was released to the ground surface (concrete) behind the eastern end of the 60 Hangar during the refilling of a Tri-Max unit. It is likely the AFFF flowed into a storm drain that empties into the onsite retention basin.
- The fourth potential release is from another mobile fire extinguisher which froze and split, releasing its contents to the ground surface (concrete). No specific details regarding the location of the release, contents, or volume was found during the PA. It was assumed this occurred in the general area of the 5-gallon AFFF release.

SI – Data Quality Objectives/Summary of Approach:

- During the PA and SI planning phase, data quality objectives (DQOs) were established in order to determine the presence or absence of PFAS in soil and groundwater, as well as, collect the appropriate data to refine the conceptual site model (CSM).
- Fieldwork involved the installation of soil borings/permanent monitoring wells using hollow stem auger (HSA) and the collection of soil and groundwater samples.
    - Five borings were advanced across the facility and three soil samples were collected from each boring: a surface sample (0-2 feet below ground surface [bgs]), an intermediate sample (20 to 30 feet bgs), and a deep sample (39 to 57 feet bgs).
    - Two additional surface soil samples were collected via hand auger from within the retention basin.
    - Permanent monitoring wells were installed in each of the five borings using two inch PVC. Low-flow groundwater samples were collected 24-hours after development.
    - All permanent wells were surveyed (latitude, longitude, ground surface, and top of casing) to develop a groundwater contour map and refine the groundwater flow direction.
- In total, 17 soil samples were collected from seven borings and five groundwater samples were collected from the five permanent monitoring wells.
- Data for three compounds (PFOS, PFOA, and perfluorobutanesulfonic acid [PFBS]) were compared to the Office of the Secretary of Defense (OSD) Screening Levels (SLs) for soil and groundwater. Exceedances of the OSD SLs determine if an AOI proceeds to a Remedial Investigation (RI).

SI – Summary of Findings:

- PFOA and PFBS were not detected in any soil samples. PFOS detections in soil were below the SLs.
- PFOS was detected in groundwater and exceeded SLs at two locations (MW-005 and MW-003). The highest detection of PFOS was 814 nanograms per liter (ng/L). Detected concentrations of PFOA and PFBS were lower with maximum detections of 10.7 ng/L and 3.61 ng/L, respectively.
- PFOA, PFOS, and PFBS detections in the one upgradient well do not indicate an off-facility impact contributing to detections at the facility.
- Based on the OSD exceedances in groundwater, drinking water sampling has been proposed for properties within a 0.5 mile radius of the facility boundary. Drinking water sampling is tentatively scheduled for January 2021. Ms. Briana Niestrom (USACE) stated that the Seattle District has thus far received two of the five right of entry (ROE) forms submitted.
- A revised CSM was presented for AOI 1.
    - There is a potentially complete pathway to site workers, construction workers, off-facility residents, and trespasser/recreational users via inhalation of dust from PFOS in surface soil.

- There is a potentially complete pathway to site workers and construction workers via ingestion of PFOS in surface soil.
- There is a potentially complete pathway to construction workers via ingestion of PFOS in subsurface soil.
- There is a potentially complete pathway (with an exceedance) to off-facility residents via ingestion of PFOS in groundwater.

Next Steps:

- AECOM will generate responses to MDEQ comments and a Backcheck Draft Final SI Report will be prepared in the coming weeks. After concurrence, a Final version of the SI Report will be issued.
- Based on the results of the SI, the recommendation is the Helena AASF proceed to a RI.

Open Discussion:

- Scott Gestring (MDEQ) indicated that comments on the Draft Final SI Report would be provided in the coming days.
- Mr. Gestring did indicate that one comment will request that concentration data be posted to the results figures.
- Wade Juntunen (MTARNG) indicated that the Draft Final SI Report is with the MTARNG Operational Security (OPSEC) and Public Affairs Office (PAO) for review and concurrence. Mr. Juntunen also indicated that he received the drinking water bottles for the up-coming drinking water sampling. Mr. Jacquelyn Harrington (AECOM) mentioned that new bottles will have to be provided as the method for analyzing drinking water samples has recently changed from the United States Environmental Protection Agency (USEPA) Method 537.1 to PFAS by LC/MS/MS compliant with Quality Systems Manual (QSM) 5.1 Table B-15 (standard groundwater method).
- Mr. Gestring asked if Jet-X HEF has PFAS and, if so, specifically which compounds. Ms. Harrington stated that previous investigations under the ARNG program have not found PFAS in media from releases of Jet-X HEF; however, this release was identified and included for completeness.
- Mr. Gestring asked if PFAS have specific chemical behaviors that would assist in scoping future sampling and understanding of fate and transport. Mr. Mark Leeper (ARNG G9) offered to send the latest Interstate Technology & Regulatory Council (ITRC) guidance document which provides a section on the behavior of PFAS in the subsurface. Ms. Harrington added that questions like these would be considered during the RI scoping and planning.

Attachment A- TPP 3 Briefing Slides

Helena Army Aviation Support Facility (AASF)
Site Inspection
Montana Army National Guard (MTARNG)

Technical Project Planning (TPP) Meeting 3

Preliminary Assessments and Site Inspections (PA/SI) for Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites

15 January 2021

Agenda

- Introductions
- Safety Moment
- TPP Meeting Goals
- Army National Guard (ARNG) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Process Overview
- PA Overview
- SI Results
- Next Steps
- Questions and Open Discussion

Introductions

ARNG G9

- Dave Connolly, per- and polyfluoroalkyl substances (PFAS) Program Manager
- Bonnie Packer, Nationwide Project Manager
- Mark Leeper, ARNG Project Manager

United States Army Corps of Engineers (USACE)

- Tim Peck, Nationwide Program Manager, Baltimore District
- Briana Niestrom, Project Manager, Seattle District
- Kristin Addis, Seattle District

MTARNG

- LTC Adel Johnson, Environmental Program Manager
- Wade Juntunen, Remediation Project Manager

Montana Department of Environmental Quality (Montana DEQ)

- Scott Gestring, DSMOA Project Officer, Cleanup, Protection, and Redevelopment Section
- Terri Mavencamp

AECOM Technical Services, Inc.

- Jacquelyn Harrington, SI Senior Lead
- Andrew Borden, SI Task Manager

Safety Moment
Snowblower Safety

- Avoid wearing loose clothes and wear sturdy footwear with good traction
- Start machine outside
- Protect your ears
- Think about where the snow is blowing
  - Avoid people, traffic, or property
- If blower becomes clogged
  - Turn engine OFF!
  - Use a clearing tool, NEVER use your hand or feet

Meeting Goals

TPP 1/2 Review

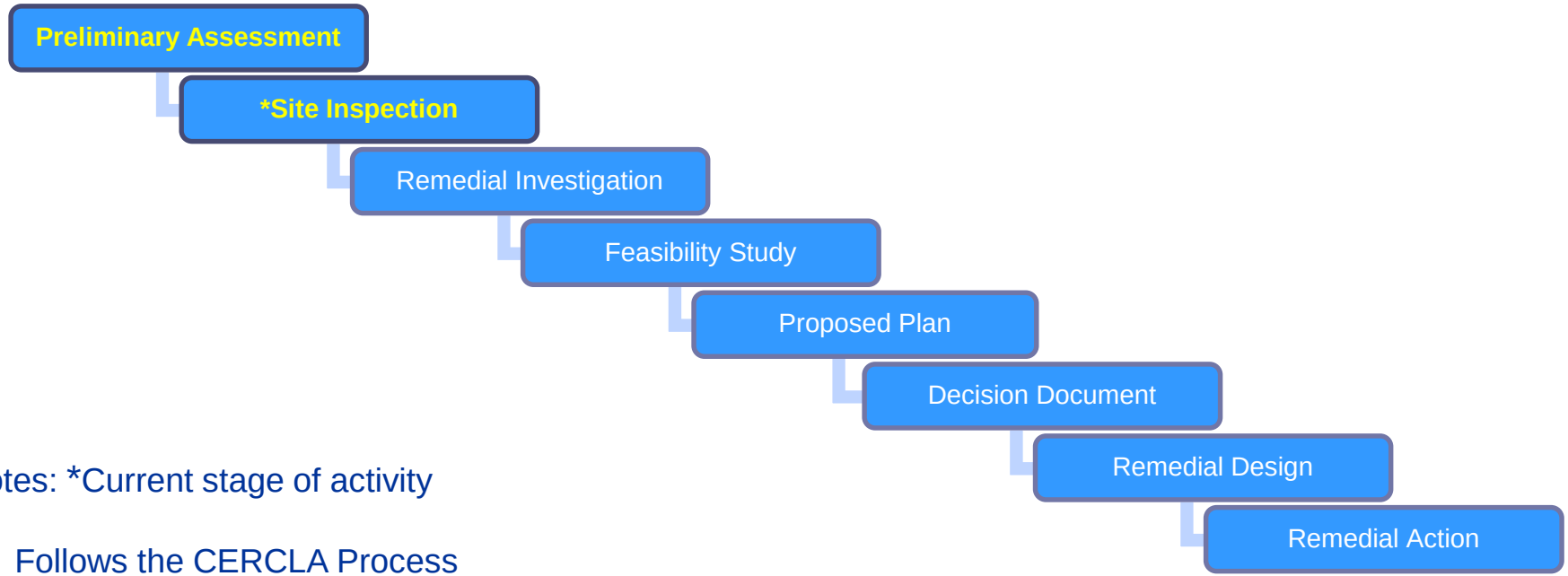
- Provided an overview of ARNG PA/SI Program
- Defined objectives for SI data collection
- Encouraged stakeholder involvement
- Reviewed project schedule
- Captured action items
- Discussed proposed SI approach

TPP 3

- ARNG CERCLA program overview
- Revisit the PA findings
- Present SI Results and revise conceptual site model (CSM)
- Resolve comments/concerns and gain concurrence on presentation of findings in Draft Final SI Report
- Discuss future actions at the site

ARNG PA/SI Overview

Work Phases



Notes: *Current stage of activity

- Follows the CERCLA Process
- An interim removal action can be conducted or a No Further Action determination can be made at any phase

ARNG CERCLA Status Overview

- PA Report for the Helena AASF was completed by ARNG in October 2018
- SI fieldwork completed in July 2020
- Draft Final SI Report provided to Montana DEQ on 14 December 2020; results presented today

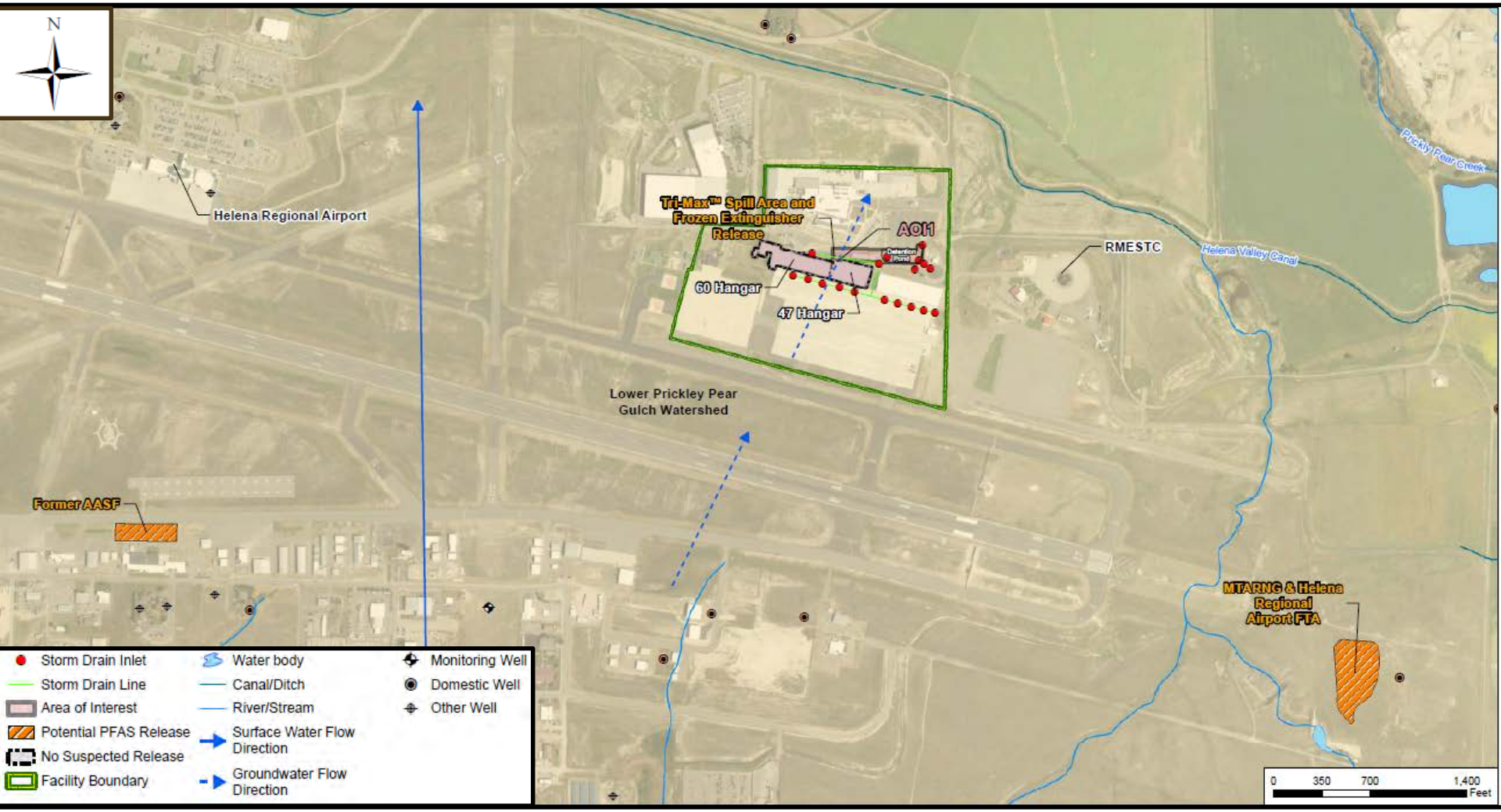
PA – Summary of Findings

- Potential Release Areas: 4 identified during the PA and SI grouped into 1 area of Interest (AOI)
- PFAS releases attributed to aqueous film forming foam (AFFF) releases from hangar fire suppression systems and portable Tri-max™ units

PA – Summary of Findings

- AOI 1
  - 60 Hangar fire suppression system release
    - AFFF released during initial system test in 1998
    - Eventually entered storm drains in front of bay doors, flow to retention basin
  - 47 Hangar fire suppression system release
    - Jet-X released during initial system test in 2006
  - Tri-max™ spill area
    - ~5 gallons of AFFF released to storm drain
  - Frozen extinguisher release area
    - Unknown material or volume released

PA – Summary of Findings



SI – Data Quality Objectives (DQOs)

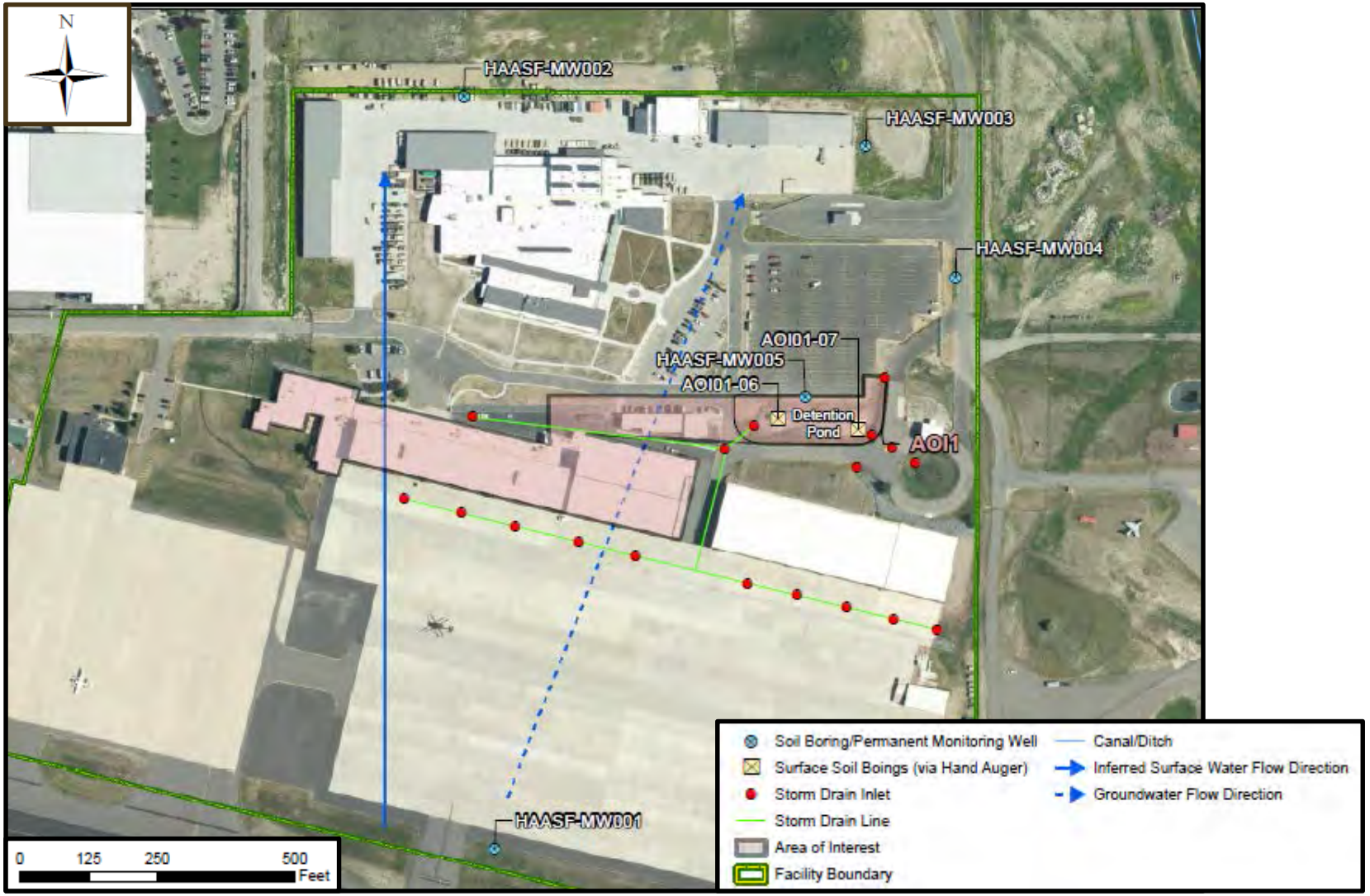
- Primary SI DQOs
  - Confirm the presence / absence of a release at a potential source area
  - Gather data for refinement of CSM:
    - Source-Pathway-Receptor relationships
- Enhanced SI DQOs
  - Determine the presence/absence at the facility boundary
  - Check for alternate sources, up- or downgradient

SI – Summary of Approach

- Approach
  - Soil samples collected from each boring location: surface (0 to 2 feet below ground surface [bgs]), intermediate (20-30 feet bgs), and deep (39-57 feet bgs)
  - Permanent monitoring wells installed for groundwater samples (wells screened between 34 to 62 ft bgs)
- Total Samples
  - 17 soil grab samples from 7 boring locations
  - 5 groundwater samples from 5 permanent well locations

SI – Summary of Approach

SI Locations



SI – Summary of Approach

- Data compared to Office of the Secretary of Defense (OSD) Screening Levels (SLs) for soil and groundwater
  - Memorandum from the OSD dated 15 October 2019
  - OSD SLs adopted for ARNG PFAS program in June 2019
- Sites exceeding OSD SLs will proceed to the next phase under CERCLA (i.e., Remedial Investigation [RI])
  - Soil from 0-2 feet compared to Residential SL, 2-15 feet compared to Industrial SL, >15 feet not compared to either SL

Analyte	Residential (Soil) (µg/kg)a,b	Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a,b]	Tap Water (Groundwater) (ng/L)[a,b]
PFOA	130	1,600	40
PFOS	130	1,600	40
PFBS	130,000	1,600,000	40,000

Notes:

a.) Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. HQ=0.1. 15 October 2019.

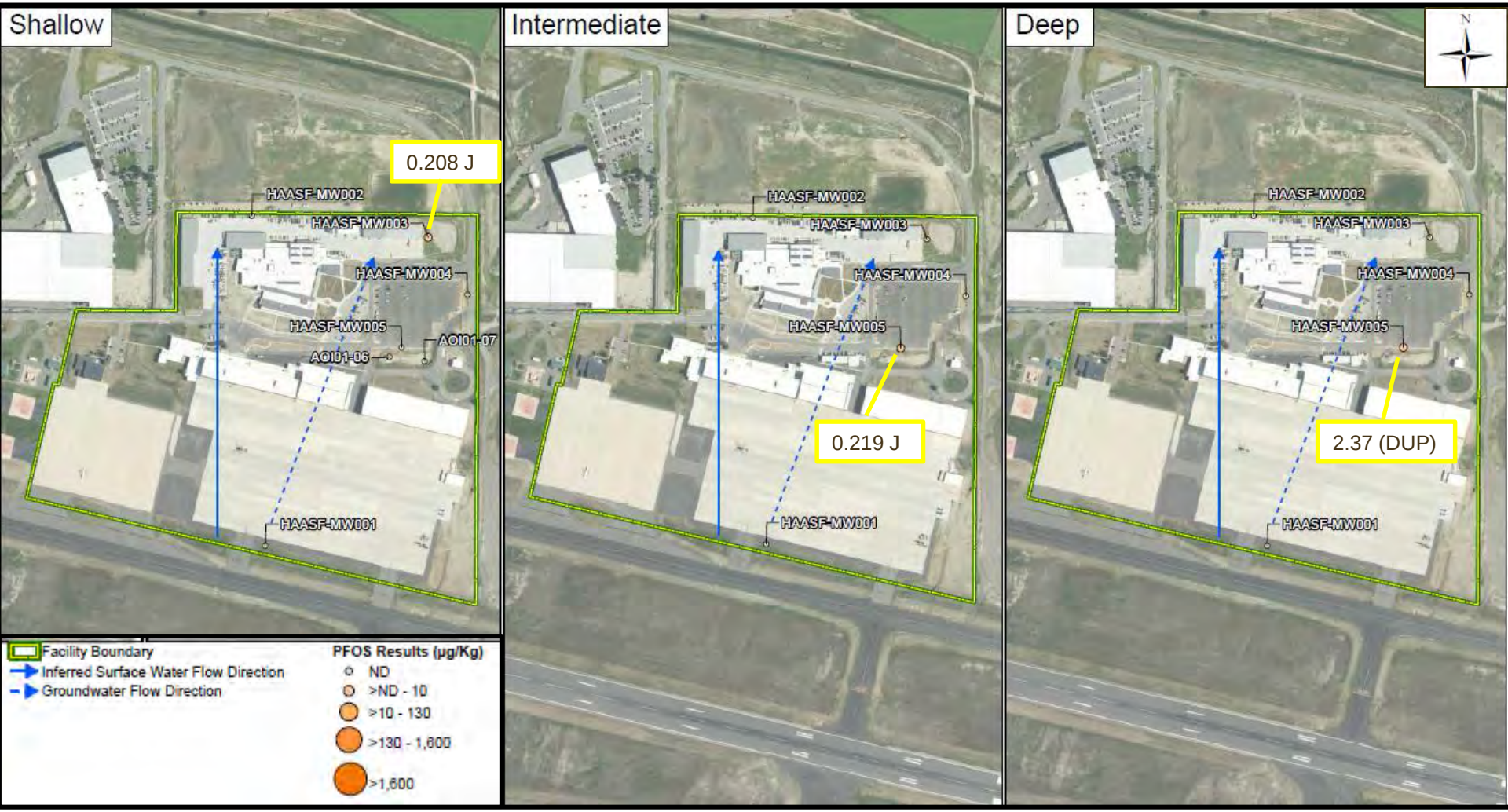
b.) If only one PFAS is present, a Hazard Quotient (HQ) of 1 applies and the values presented would increase by a factor of x10.

SI – Summary of Findings

- PFAS in soil and groundwater confirmed at the source area (retention basin) and facility boundary
- Soil Findings
  - PFOS detected in soil, but at concentrations several orders of magnitude below the SLs
  - PFOA and perfluorobutanesulfonic acid (PFBS) not detected in soil
- Groundwater Findings
  - Detections of PFOA, PFOS, PFBS in the upgradient monitoring well were below SLs; no obvious indication of off-facility impacts contributing to detections at the facility
  - PFOS in groundwater >40 nanogram per liter (ng/L) at source area and facility boundary; highest detection of PFOS in groundwater was 814 ng/L (duplicate)
  - PFOA (10.7 ng/L) and PFBS (3.61 J ng/L) were detected below the SL

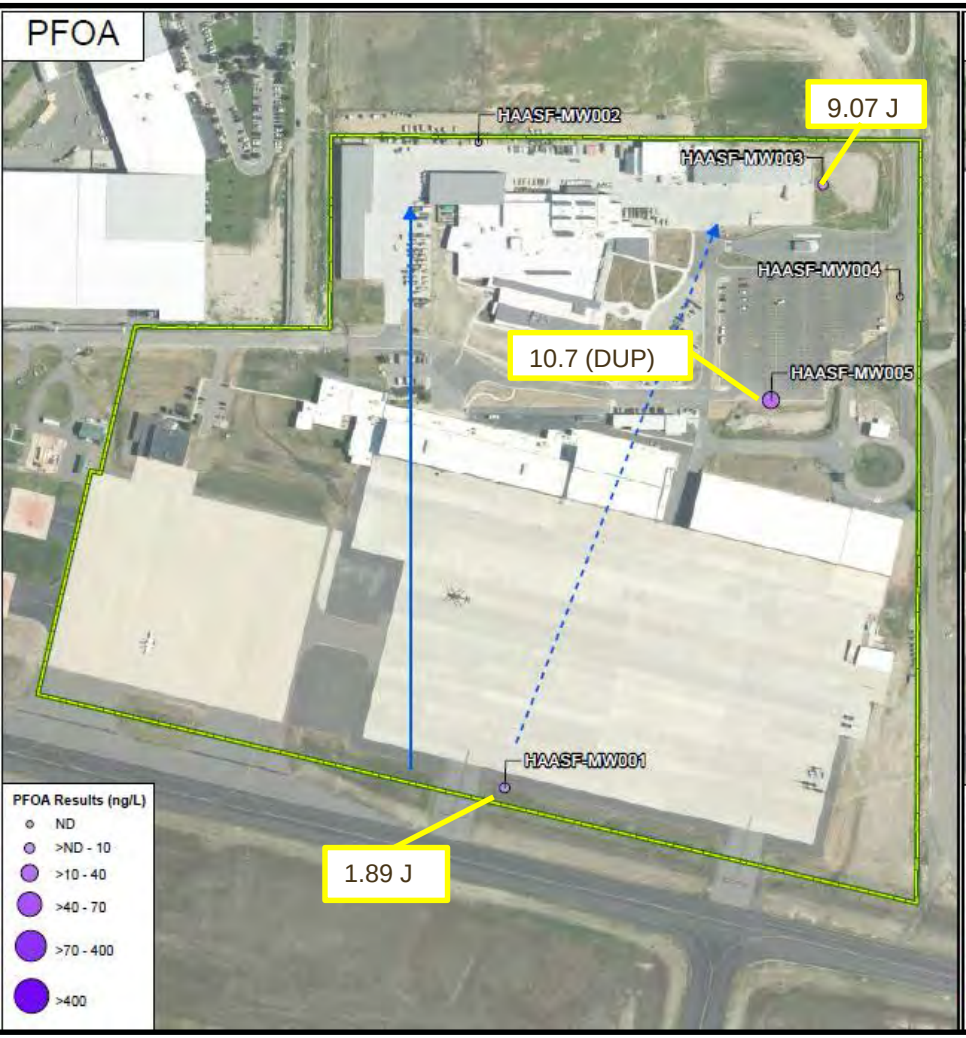
SI – Summary of Findings

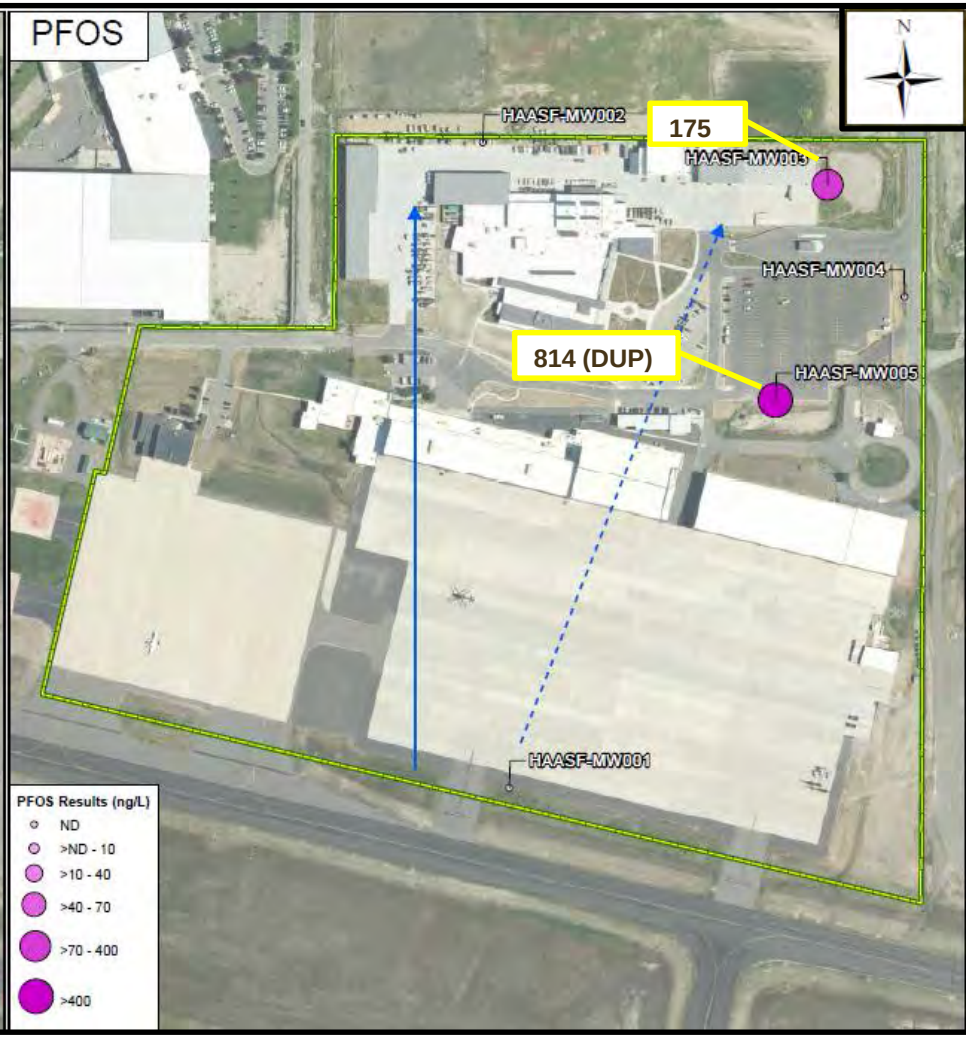
PFOS in Soil



SI – Summary of Findings

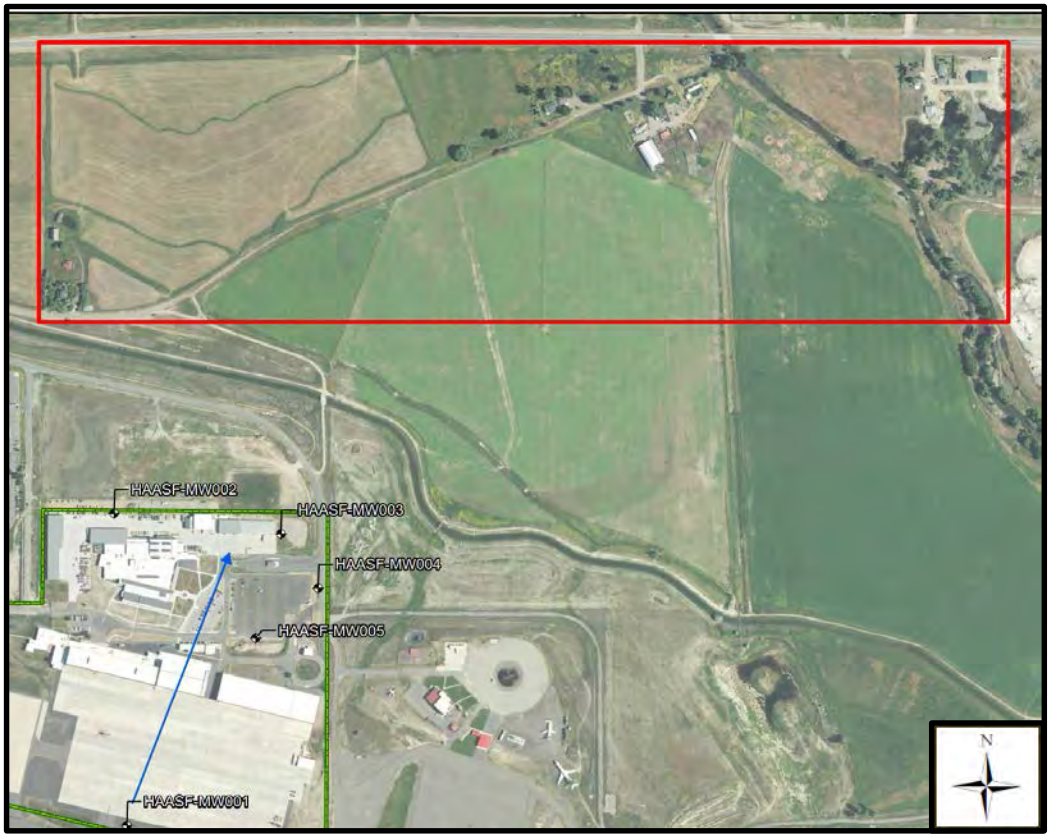
PFAS Detections in Groundwater





SI – Summary of Findings

Potential Drinking Water Receptors



- Domestic wells downgradient of facility within 0.5 miles
- Properties located within the red box were identified for drinking water sampling
- Anticipate sampling January 2021

SI – Summary of Findings

AOI	Potential PFAS Release Area	Soil – Source Area	Groundwater – Source Area	Groundwater – Facility Boundary
1	60 and 47 Hangar Fire Suppression System Release and Tri-Max™ Spill/Release Area	◐	●	●

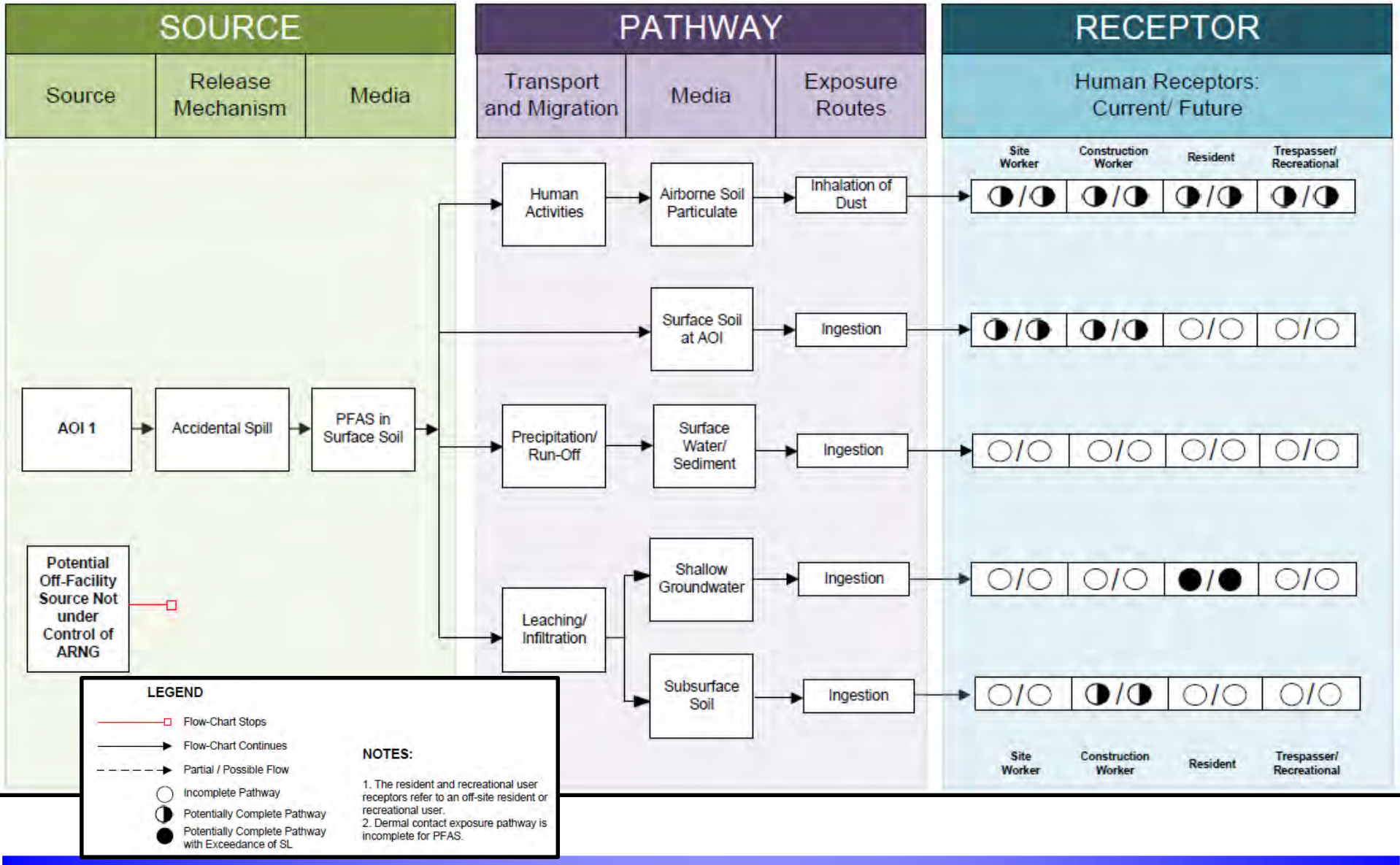
Legend:

● = detected; exceedance of the screening levels

◐ = detected; no exceedance of the screening levels

○ = not detected

SI – Summary of Findings



Next Steps

- Finalize SI Report
  - Address comments from Montana DEQ
  - Schedule
- Initiate next step in CERCLA process: RI

Open Discussion

Acronyms

- AAAF – aqueous film forming foam
- AASF – Army Aviation Support Facility
- AOI – area of interest
- ARNG – Army National Guard
- bgs – below ground surface
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
- CSM – conceptual site model
- DEQ – Department of Environmental Quality
- DoD – US Department of Defense
- DQO – data quality objective
- MTARNG – Montana Army National Guard
- ng/L – nanograms per liter
- OSD – Office of the Secretary of Defense
- PA – Preliminary Assessment
- PFAS – per- and polyfluoroalkyl substances
- PFBS – perfluorobutanesulfonic acid
- PFOA – perfluorooctanoic acid
- PFOS – perfluorooctanesulfonic acid
- RI – Remedial Investigation
- SI – Site Inspection
- SL – screening level
- TPP – Technical Project Planning
- US – United States
- UFP-QAPP – Uniform Federal Policy- Quality Assurance Project Plan
- USACE – U.S. Army Corp of Engineers

August 24, 2021

Mark Leeper P.G., MBA
Remediation Project Manager
ARNG Cleanup & Restoration Branch
111 South George Mason Drive
Arlington, VA 22204

Subject: **Review of the August 2021 Backcheck Draft Final Site Inspection Report for the Helena Army Aviation Support Facility Helena, Montana**

Dear Mr. Leeper:

On behalf of The Montana Department of Environmental Quality (DEQ) I would like to thank you for providing the August 2021 Backcheck Draft Final Site Inspection (SI) Report Helena Army Aviation Support Facility (HAASF) Helena, Montana. On August 11, 2021, DEQ received an electronic version of the Backcheck Draft Final SI Report along with AECOM's responses to DEQ's July 26, 2021 comments on the Revised Draft Final SI Report. DEQ personnel have reviewed the Backcheck Draft Final SI Report and AECOM has adequately addressed DEQ's comments. DEQ notes that groundwater monitoring wells HAASF-MW005 and HAASF-MW003 exceed both the Department of Defense screening levels and the Circular DEQ-7 (DEQ-7) Montana Numeric Water Quality Standard for PFOS. HAASF-MW005 reported PFOS at a concentration of 775 ng/L and PFAS at an estimated concentration of 9.59 ng/L. Groundwater monitoring well HAASF-MW003 reported 175 ng/L PFOS and an estimated PFOA concentration of 9.07 ng/L.

Please finalize the Backcheck SI report and provide DEQ with a hard copy and an electronic copy of the Final SI Report for the HAASF.

If you have any questions, please contact me at (406) 444-6471 or at sgestring@mt.gov.

Sincerely,

Scott Gestring

Scott Gestring
DSMOA Project Officer
DEQ Cleanup, Protection and Redevelopment Section

Ec. Mark Leeper, P.G. RPM
Adele Johnson, LTC, MTARNG Environmental Program Manager
Wade Juntunen, MTARNG Remediation/UXO Project Manager
Katie Morris, DEQ CPR Section Manager
Scott Gestring, DEQ CPR PM
Lee McKenna, DEQ Legal
Andrew Borden, AECOM
Laurel Riek, Lewis & Clark County R.S.
Kathy Moore, Lewis & Clark County Environmental DA
Peter Schade, Lewis & Clark County

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Appendix E
Boring Logs and Well Construction Diagrams

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WELL NUMBER HAASF-MW001

AECOM AECOM

TOTAL DEPTH 60.3 FT BGS

CLIENT ARNG, USACE Baltimore District
PROJECT NAME ARNG PFAS
PROJECT NUMBER 60552172
SITE NAME AOI 1
DATE STARTED 7/8/20 **COMPLETED** 7/8/20
EASTING 1347769.171 **NORTHING** 868973.887
DRILLING CONTRACTOR Cascade
GROUND ELEVATION 3833.67 ft **HOLE SIZE** 8 inches
DRILLING EQUIPMENT CME 75
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING 58.00 ft / Elev 3775.67 ft
LOGGED BY M Glinski **CHECKED BY** J. Hollingsworth
AT TIME OF SAMPLING 57.17 ft / Elev 3776.50 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA	WELL DIAGRAM
0				SP-SM		0.0 POORLY GRADED SAND WITH SILT, dry, brown (7.5YR 5/2), fine-grained, cohesive with 5-10% silt. 3833.7	AOI01-01-SB-00-02	Annular Seal Top: 2 ft bgs Bottom: 46 ft bgs
5	SS	100	3-4-5 (9)					
						6.5 NOT SAMPLED. 3827.2		
10	SS		9-10-11 (21)	ML		10.0 SANDY SILT, dry, very pale brown (10YR 7/3), medium density, cohesive with >30% fine-grained sand and trace amounts of fine gravel. 3823.7		
						11.5 NOT SAMPLED. 3822.2		Well Casing Type: Schedule 40 PVC Diameter: 2 in Top: 0 ft bgs Bottom: 50.3 ft bgs
15	SS	100	12-10-10 (20)	SM		15.0 SILTY SAND WITH GRAVEL, dry, very pale brown (10YR 7/3), dense with 20% subangular to subrounded gravel ranging up to 40 mm in diameter. 3818.7		
						16.5 NOT SAMPLED. 3817.2		
20	SS	100	21-24-24 (48)	ML		20.0 SANDY SILT with >30% fine-grained sand and no gravel. 3813.7		
						21.5 NOT SAMPLED. 3812.2		
25								

(Continued Next Page)

WELL NUMBER HAASF-MW001

AECOM AECOM

TOTAL DEPTH 60.3 FT BGS

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA	WELL DIAGRAM
25	SS		29-30-30 (60)	SM		25.0 (3808.7) SILTY SAND WITH GRAVEL, dry, brown (7.5YR 5/4), fine- to medium-grained, medium density with 30% angular gravel ranging up to 20 mm in diameter. 26.5 (3807.2) NOT SAMPLED.	AOI01-01-SB-25-27	
30	SS	100	13-15-15 (30)	ML		30.0 (3803.7) SILT WITH SAND, dry, strong brown (7.5YR 5/6), dense with 15% fine-grained sand with 5% angular gravel and trace light greenish gray gravel fragments. 31.5 (3802.2) NOT SAMPLED		
35	SS	100	13-11-13 (24)			35.0 (3798.7) Changes to medium density, very cohesive with no gravel. 36.5 (3797.2) NOT SAMPLED		**Well Casing** Type: Schedule 40 PVC Diameter: 2 in Top: 0 ft bgs Bottom: 50.3 ft bgs
40	SS	100	15-16-16 (32)			40.0 (3793.7) Same as above. 41.5 (3792.2) NOT SAMPLED		
45	SS	100				45.0 (3788.7) SILT, dry, strong brown (7.5YR 5/6), low plasticity, medium density, very cohesive with trace amounts of fine-grained sand. 46.5 (3787.2) NOT SAMPLED		**Filter Pack** Type: #2 Filter Sand Top: 46 ft bgs Bottom: 60.3 ft bgs
50	SS	100	22-25-29 (54)			50.0 (3783.7) Same as above. 51.5 (3782.2) NOT SAMPLED		**Well Screen** Type: Schedule 40 PVC Slot Size: 0.01 in Top: 50.3 ft bgs Bottom: 60.3 ft bgs

(Continued Next Page)

WELL NUMBER HAASF-MW001

AECOM AECOM

TOTAL DEPTH 60.3 FT BGS

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA	WELL DIAGRAM
						51.5 NOT SAMPLED *(continued)* 3782.2		
55								
	SS	100				55.0 Same as above. 3778.7	AOI01-01-SB-55-57	**Well Screen** Type: Schedule 40 PVC Slot Size: 0.01 in Top: 50.3 ft bgs Bottom: 60.3 ft bgs
						56.5 NOT SAMPLED 3777.2		
	SS	100				57.5 ▽ Same as above. 3776.2 58.0 Changes to wet. 3775.7	HAASF-MW001	
						59.0 NOT SAMPLED 3774.7		
60								

Bottom of borehole at 60.3 feet.

Notes:

1. Headspace screening values represent total volatile organic vapors (referenced to an isobutylene standard) measured with a Photoionization Detector (PID) with 10.6 eV lamp.
2. Coordinates and elevation data in NAVD88 for vertical datum and NAD83/91 for horizontal datum in Montana State Plane.
3. Top 5 feet cleared with hand auger.

WELL NUMBER HAASF-MW002

AECOM AECOM

TOTAL DEPTH 62 FT BGS

CLIENT ARNG, USACE Baltimore District
PROJECT NAME ARNG PFAS
PROJECT NUMBER 60552172
SITE NAME AOI 1
DATE STARTED 7/7/20 **COMPLETED** 7/7/20
EASTING 1347737.268 **NORTHING** 870434.543
DRILLING CONTRACTOR Cascade
GROUND ELEVATION 3812.79 ft **HOLE SIZE** 8 inches
DRILLING EQUIPMENT CME 75
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING 57.00 ft / Elev 3755.79 ft
LOGGED BY M Glinski **CHECKED BY** J. Hollingsworth
AT TIME OF SAMPLING 44.49 ft / Elev 3768.30 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		ENVIRONMENTAL DATA	WELL DIAGRAM
0				SP		0.0 POORLY GRADED SAND WITH GRAVEL, dry, strong brown (7.5YR 5/6), loose, with 25% subangular gravel ranging up to 20 mm in diameter.	3812.8	AOI01-02-SB-00-02	
		100				1.5 Grades to brown (10YR 5/3), cohesive with gravel ranging up to 40 mm in diameter.	3811.3		**Annular Seal** Top: 2 ft bgs Bottom: 50 ft bgs
				SM		3.0 SILTY SAND WITH GRAVEL with >15% sand and >15% gravel.	3809.8		
5									
		100	9-10-9 (19)						
		100	11-10-14 (24)			7.5 Changes to trace amounts of gravel.	3805.3		
		100	10-12-12 (24)	ML		8.5 SILT	3804.3		
10									
		100	8-7-7 (14)			10.5 Changes to contain 10% subangular to subrounded gravel ranging up to 30 mm in diameter.	3802.3		**Well Casing** Type: Schedule 40 PVC Diameter: 2 in Top: 0 ft bgs Bottom: 52 ft bgs
		100	8-9-9 (18)						
		100	8-8-19 (27)						
15						14.0 SANDY SILT WITH GRAVEL with >15% sand and >15% subangular gravel ranging up to 30 mm in diameter.	3798.8		
		100	13-19-19 (38)						
		100	15-12-17 (29)						
		100	12-17-19 (36)						
		100	15-16-15 (31)	SM		18.5 SILTY SAND WITH GRAVEL, dry, pale brown (10YR 6/3), dense with >15% silt and 25% angular gravel.	3794.3		
20									
		100	23-25-25 (50)						
		100	23-25-29 (54)						
		100	13-15-19 (34)						
25									

(Continued Next Page)

WELL NUMBER HAASF-MW002

AECOM AECOM

TOTAL DEPTH 62 FT BGS

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		ENVIRONMENTAL DATA	WELL DIAGRAM
25		100	41-31-30 (61)	SM		18.5 SILTY SAND WITH GRAVEL, dry, pale brown (10YR 6/3), dense with >15% silt and 25% angular gravel. *(continued)* Changes to contain 20% pulverized angular gravel.	3794.3		
		100	16-19-24 (43)			25.0	3787.8		
		100	20-24-27 (51)			28.0 Decreasing gravel to 5%.	3784.8		
		100	21-19-24 (43)	ML		28.5 SANDY SILT, light yellowish brown (10YR 6/4) with >30% sand.	3784.3	AOI01-02-SB-28-30	
30		100	29-32-34 (66)			30.5 Angular pulverized gravel present.	3782.3		
		100	30-33-32 (65)	SP		32.5 POORLY GRADED SAND WITH GRAVEL, dry, light yellowish brown, loose with 25% subangular gravel ranging up to 30 mm in diameter and trace amounts of red gravel (10R 6/6).	3780.3		
		100	33-35-35 (70)						
35		100	35-36-39 (75)						
		100	39-31-41 (72)						
		100	39-50-5 (55)						
40		100	29-35-31 (66)						
		100		CL		41.0 LEAN CLAY, dry, brown (7.5YR 5/4), low plasticity, stiff.	3771.8		
		100	15-19-22 (41)						
45		100				44.5 Changes to brown (7.5YR 4/4).	3768.3		
		100	16-12-15 (27)						
		100	16-15-2 (17)						
		100	36-39-40 (79)	ML		49.0 SILT, very stiff, cohesive.	3763.8		
50		100	29-56						
		100	33-56						

Well Casing
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 52 ft bgs

Filter Pack
Type: #2 Filter Sand
Top: 50 ft bgs
Bottom: 62 ft bgs

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WELL NUMBER HAASF-MW002

AECOM AECOM

TOTAL DEPTH 62 FT BGS

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		ENVIRONMENTAL DATA	WELL DIAGRAM
		100	35-33-37 (70)	ML		49.0 SILT, very stiff, cohesive. *(continued)*	3763.8		
55		100	13-20-24 (44)					AOI01-02-SB-55-57	
		100	23-21-25 (46)			▽		HAASF-MW002	**Well Screen** Type: Schedule 40 PVC Slot Size: 0.01 in Top: 52 ft bgs Bottom: 62 ft bgs
		100	23-20-20 (40)			58.5 Trace amounts of light pink (5R 8/2) minerals present.	3754.3		
60		100				59.5 Changes to wet.	3753.3		
		100							

Bottom of borehole at 62.0 feet.

Notes:

1. Headspace screening values represent total volatile organic vapors (referenced to an isobutylene standard) measured with a Photoionization Detector (PID) with 10.6 eV lamp.
2. Coordinates and elevation data in NAVD88 for vertical datum and NAD83/91 for horizontal datum in Montana State Plane.
3. Top 5 feet cleared with hand auger.

WELL NUMBER HAASF-MW003

AECOM AECOM

TOTAL DEPTH 50 FT BGS

CLIENT ARNG, USACE Baltimore District
PROJECT NAME ARNG PFAS
PROJECT NUMBER 60552172
SITE NAME AOI 1
DATE STARTED 7/9/20 **COMPLETED** 7/9/20
EASTING 1348515.826 **NORTHING** 870323.258
DRILLING CONTRACTOR Cascade
GROUND ELEVATION 3808.01 ft **HOLE SIZE** 8 inches
DRILLING EQUIPMENT CME 75
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING 45.00 ft / Elev 3763.01 ft
LOGGED BY M Glinski **CHECKED BY** J. Hollingsworth
AT TIME OF SAMPLING 41.02 ft / Elev 3766.99 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		ENVIRONMENTAL DATA	WELL DIAGRAM
0				ML		0.0 SILT WITH GRAVEL, dry, pale brown (10YR 6/3) with 20% subangular gravel ranging up to 40 mm in diameter.	3808.0	AOI01-03-SB-00-02	
5		100							**Annular Seal** Top: 2 ft bgs Bottom: 36 ft bgs
	SS	100	31-25-12 (37)	GP		5.0 POORLY GRADED GRAVEL WITH SAND, dry, light yellowish brown (10YR 6/4), angular (pulverized) with >15% sand.	3803.0		
						6.5 NOT SAMPLED.	3801.5		
10	SS	100	12-9-10 (19)	ML		10.0 SILT WITH SAND, dry, pale brown (10YR 6/3), medium stiffness, slightly cohesive with 15-25% sand and trace amounts of pulverized black gravel.	3798.0		
						11.5 NOT SAMPLED.	3796.5		**Well Casing** Type: Schedule 40 PVC Diameter: 2 in Top: 0 ft bgs Bottom: 40 ft bgs
15	SS	100	8-8-10 (18)			15.0 Same as above.	3793.0		
						16.5 NOT SAMPLED.	3791.5		
20	SS	100	7-8-10 (18)			20.0 Changes to loose, cohesive.	3788.0	AOI01-03-SB-20-22	
						21.5 NOT SAMPLED.	3786.5		
25									

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WELL NUMBER HAASF-MW003

AECOM AECOM

TOTAL DEPTH 50 FT BGS
PAGE 2 OF 2

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		ENVIRONMENTAL DATA	WELL DIAGRAM
25	SS	100	16-21-20 (41)	SM		25.0 SILTY SAND, dry, light yellowish brown (10YR 6/4), fine- to medium-grained, medium density with >15% silt and greenish and reddish nodules.	3783.0		
						26.5 NOT SAMPLED.	3781.5		
30	SS	47	60-4-6 (10)			30.0 Same as above. Pulverized gravel present.	3778.0		
						31.5 NOT SAMPLED.	3776.5		
35	SS		39-50			35.0 Same as above. White (10YR 8.5/1) laminations present.	3773.0		
						36.5 NOT SAMPLED.	3771.5		
40	SS		13-19-19 (38)	ML		40.0 SANDY SILT, dry, brown (7.5YR 4/4), loose, cohesive, non-plastic with >15% fine-grained sand.	3768.0		
						41.5 NOT SAMPLED.	3766.5		
45	SS		31-30-30 (60)			▽ 45.0 Changes to wet. 8 cm white lense present.	3763.0	AOI01-03-SB-44-46 HAASF-MW003	
						46.5 NOT SAMPLED.	3761.5		
	SS		21-20-25 (45)			47.5 Changes to dry. 2 cm white lamination present.	3760.5		
50						49.0 NOT SAMPLED.	3759.0		

Well Casing
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 40 ft bgs

Filter Pack
Type: #2 Filter Sand
Top: 36 ft bgs
Bottom: 50 ft bgs

Well Screen
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 40 ft bgs
Bottom: 50 ft bgs

Bottom of borehole at 50.0 feet.

Notes:
1. Headspace screening values represent total volatile organic vapors (referenced to an isobutylene standard) measured with a Photoionization Detector (PID) with 10.6 eV lamp.
2. Coordinates and elevation data in NAVD88 for vertical datum and NAD83/91 for horizontal datum in Montana State Plane.
3. Top 5 feet cleared with hand auger. Poor recovery at 30 feet likely due to gravel jamming the spoons.

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WELL NUMBER HAASF-MW004

AECOM AECOM

TOTAL DEPTH 44.1 FT BGS

CLIENT ARNG, USACE Baltimore District
PROJECT NAME ARNG PFAS
PROJECT NUMBER 60552172
SITE NAME AOI 1
DATE STARTED 7/8/20 **COMPLETED** 7/8/20
EASTING 1348685.2 **NORTHING** 870066.655
DRILLING CONTRACTOR Cascade
GROUND ELEVATION 3808.36 ft **HOLE SIZE** 8 inches
DRILLING EQUIPMENT CME 75
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING 40.00 ft / Elev 3768.36 ft
LOGGED BY M Glinski **CHECKED BY** J. Hollingsworth
AT TIME OF SAMPLING 40.87 ft / Elev 3767.49 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		ENVIRONMENTAL DATA	WELL DIAGRAM
0				ML		0.0 SILT WITH SAND, dry, brown (10YR 5/3), loose, cohesive with 20% fine-grained sand.	3808.4	AOI01-04-SB-00-02	Annular Seal Top: 2 ft bgs Bottom: 30 ft bgs
		100							
5	SS	100	5-5-11 (16)			5.0 SILT, dry, olive brown (2.5Y 4/3), low plasticity, cohesive.	3803.4		
						6.5 NOT SAMPLED.	3801.9		
10	SS	100	12-17-19 (36)			10.0 Changes to pale brown (10YR 6/3), dense, non-plastic, cohesive with 10% fine-grained sand.	3798.4		
						11.5 NOT SAMPLED.	3796.9		Well Casing Type: Schedule 40 PVC Diameter: 2 in Top: 0 ft bgs Bottom: 34 ft bgs
15	SS	67	15-15-18 (33)	SP		15.0 POORLY GRADED SAND WITH GRAVEL, dry, light yellowish brown (10YR 6/4), fine- to medium-grained, loose, with 30% subangular gravel ranging up to 20 mm in diameter.	3793.4		
						16.5 NOT SAMPLED.	3791.9		
20	SS	100	17-17-18 (35)			20.0 Same as above.	3788.4	AOI01-04-SB-20-22	
						21.5 NOT SAMPLED.	3786.9		
25									

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WELL NUMBER HAASF-MW004

AECOM AECOM

TOTAL DEPTH 44.1 FT BGS
PAGE 2 OF 2

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA	WELL DIAGRAM
25	SS	67	39-54-6 (60)			25.0 (3783.4) POORLY GRADED SAND WITH GRAVEL, dry, light yellowish brown (10YR 6/4), loose with 40% white, red, and black subangular to angular gravel ranging up to approximately 20 mm in diameter. 26.5 (3781.9) NOT SAMPLED.		
30	SS	100	30-34-30 (64)	ML		30.0 (3778.4) SILT WITH SAND, dry, light yellowish brown (10YR 6/4), non-plastic, loose, slightly cohesive with 20% fine-grained sand. 31.5 (3776.9) NOT SAMPLED.		
35	SS	100	29-54-6 (60)			35.0 (3773.4) Same as above. Trace amounts of white laminations. 36.5 (3771.9) NOT SAMPLED.		
40	SS		21-27-30 (57)	SW		40.0 (3768.4) WELL-GRADED SAND, wet, brown (7.5YR 5/4), angular to subangular, fine- to coarse-grained, loose. Various colored grained (red, green, black, and white) present. 41.5 (3766.9) NOT SAMPLED.	AOI01-04-SB-39-41	
	SS		37-54-6 (60)	SP		42.5 (3765.9) POORLY GRADED SAND, wet.	HAASF-MW004	
				SW		43.5 (3764.9) WELL-GRADED SAND WITH GRAVEL, 25% gravel ranging up to 20 mm in diameter. Bottom of borehole at 44.1 feet.		

Well Casing
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 34 ft bgs

Filter Pack
Type: #2 Filter Sand
Top: 30 ft bgs
Bottom: 44 ft bgs

Well Screen
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 34 ft bgs
Bottom: 44 ft bgs

Backfill
Top: 44 ft bgs
Bottom: 44.1 ft bgs

Notes:
1. Headspace screening values represent total volatile organic vapors (referenced to an isobutylene standard) measured with a Photoionization Detector (PID) with 10.6 eV lamp.
2. Coordinates and elevation data in NAVD88 for vertical datum and NAD83/91 for horizontal datum in Montana State Plane.
3. Top 5 feet cleared with hand auger.

WELL NUMBER HAASF-MW005

AECOM AECOM

TOTAL DEPTH 56.5 FT BGS

CLIENT ARNG, USACE Baltimore District
PROJECT NAME ARNG PFAS
PROJECT NUMBER 60552172
SITE NAME AOI 1
DATE STARTED 7/9/20 **COMPLETED** 7/9/20
EASTING 1348388.73 **NORTHING** 869838.729
DRILLING CONTRACTOR Cascade
GROUND ELEVATION 3815.22 ft **HOLE SIZE** 8 inches
DRILLING EQUIPMENT CME 75
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING 54.00 ft / Elev 3761.22 ft
LOGGED BY M Glinski **CHECKED BY** J. Hollingsworth
AT TIME OF SAMPLING 45.91 ft / Elev 3769.31 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		ENVIRONMENTAL DATA	WELL DIAGRAM
0				SP-SM		0.0 SAND WITH SILT AND GRAVEL, dry, light brown (7.5YR 6/3), fine- to medium-grained, loose with <15% silt and 20% subangular gravel ranging up to 10 mm in diameter.	3815.2	AOI01-05-SB-00-02	Annular Seal Top: 2 ft bgs Bottom: 42 ft bgs
		100							
5	SS	100	6-12-12 (24)			5.0 Gravel size increases up to 30 mm. Slightly cohesive.	3810.2		
						6.5 NOT SAMPLED.	3808.7		
10	SS	100	14-19-20 (39)			10.0 Same as above.	3805.2		
						11.5 NOT SAMPLED.	3803.7		Well Casing Type: Schedule 40 PVC Diameter: 2 in Top: 0 ft bgs Bottom: 45 ft bgs
15	SS	100	23-23-19 (42)			15.0 SAND WITH SILT, dry, light brown (7.5YR 6/3), fine- to medium-grained, loose with <15% silt and 10% gravel. 10 mm thick reddish brown (2.5YR 4/3) lens present.	3800.2		
						16.5 NOT SAMPLED.	3798.7		
20	SS	100	10-10-10 (20)			20.0 Changes to contain no gravel. Trace amounts of red and black grains.	3795.2		
						21.5 NOT SAMPLED.	3793.7		
25									

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WELL NUMBER HAASF-MW005

AECOM AECOM

TOTAL DEPTH 56.5 FT BGS

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
25	SS	100	13-13-15 (28)	SP		25.0 POORLY GRADED SAND, dry, light brown (7.5YR 6/4), fine- to medium-grained, loose with 5% fines. 3790.2	AOI01-05-SB-25-27
						26.5 NOT SAMPLED. 3788.7	
30	SS	100	39-54-6 (60)	ML		30.0 SILT, dry, brown (7.5YR 5/4), medium density, cohesive. 3785.2	
						31.5 NOT SAMPLED. 3783.7	
35	SS	100	19-21-21 (42)			35.0 Same as above. 3780.2	
						36.5 NOT SAMPLED. 3778.7	
40	SS	100	27-30-30 (60)			40.0 Changes to dense. 3775.2	
						41.5 NOT SAMPLED. 3773.7	
45	SS	100	21-39-41 (80)			45.0 Changes to brown (10YR 4/3), loose, slightly cohesive, non-plastic. 3770.2	
				CL		46.0 LEAN CLAY, dry, yellowish brown (10YR 5/4), medium plasticity, soft. 3769.2	
						46.5 NOT SAMPLED. 3768.7	
50	SS	100	21-29-35 (64)	ML		50.0 SILT, dry, brown (10YR 4/3), loose, slightly cohesive, non-plastic. 3765.2	AOI01-05-SB-50-52
						51.5 NOT SAMPLED. 3763.7	HAASF-MW005

WELL DIAGRAM

Well Casing
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 45 ft bgs

Filter Pack
Type: #2 Filter Sand
Top: 42 ft bgs
Bottom: 55 ft bgs

Well Screen
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 45 ft bgs
Bottom: 55 ft bgs

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WELL NUMBER HAASF-MW005

AECOM AECOM

TOTAL DEPTH 56.5 FT BGS

CLIENT ARNG, USACE Baltimore District **PROJECT NAME** ARNG PFAS

PROJECT NUMBER 60552172 **SITE NAME** AOI 1

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA	WELL DIAGRAM
						51.5 ▽ NOT SAMPLED. *(continued)* 3763.7 54.0 Cuttings wet. 3761.2		
55	SS	100	31-54-6 (60)			55.0 Same as above. Changes to wet. 3760.2		**Backfill** Top: 55 ft bgs Bottom: 56.5 ft bgs

Bottom of borehole at 56.5 feet.

Notes:
1. Headspace screening values represent total volatile organic vapors (referenced to an isobutylene standard) measured with a Photoionization Detector (PID) with 10.6 eV lamp.
2. Coordinates and elevation data in NAVD88 for vertical datum and NAD83/91 for horizontal datum in Montana State Plane.
3. Top 5 feet cleared with hand auger.

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Appendix F
Analytical Results

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Appendix F Laboratory Data
Decontamination Water
Site Inspection Report, Helena AASF

Area of Interest	QC																							
Sample ID	HAASF-ERB-01				HAASF-ERB-02				HAASF-ERB-03				HAASF-ERB-04				HAASF-FRB-01				FTWHH-DECON			
Sample Date	07/09/2020				07/09/2020				07/12/2020				07/12/2020				07/09/2020				11/8/2018			
Analyte	**Result**	**LOD**	**LOQ**	**Qual**	**Result**	**LOD**	**LOQ**	**Qual**	**Result**	**LOD**	**LOQ**	**Qual**	**Result**	**LOD**	**LOQ**	**Qual**	**Result**	**LOD**	**LOQ**	**Qual**	**Result**	**LOD**	**LOQ**	**Qual**
Water, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (ng/L)																								
6:2 FTS	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
8:2 FTS	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
NEtFOSAA	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	6.67	8.33	U
NMeFOSAA	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	6.67	8.33	U
PFBA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFBS	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFDA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFDoA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFHpA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFHxA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFHxS	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFNA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFOA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFOS	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFPeA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFTeDA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U
PFTrDA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	UJ	<	4.00	10.0	UJ	<	4.00	10.0	U	<	3.33	8.33	U
PFUnDA	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	3.33	8.33	U

Interpreted Qualifiers

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
NEtFOSAA	N-ethyl perfluorooctane- sulfonamidoacetic acid
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations

ERB	Equipment rinsate blank
FRB	Field rinsate blank
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
QC	Quality control
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
ng/L	nanogram per liter
<	analyte not detected above the LOD

Appendix F Laboratory Data
Deep Subsurface Soil
Site Inspection Report, Helena AASF

Area of Interest	HAASF-MW001								HAASF-MW002								HAASF-MW003								HAASF-MW004			
Sample ID	AOI01-01-SB-25-27				AOI01-01-SB-55-57				AOI01-02-SB-28-30				AOI01-02-SB-55-57				AOI01-03-SB-20-22				AOI01-03-SB-44-46				AOI01-04-SB-20-22			
Sample Date	07/08/2020				07/08/2020				07/07/2020				07/07/2020				07/09/2020				07/09/2020				07/08/2020			
Depth	25 - 27 ft				55 - 57 ft				28 - 30 ft				55 - 57 ft				20 - 22 ft				44 - 46 ft				20 - 22 ft			
Analyte	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
Soil, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (ug/Kg)																												
6:2 FTS	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
8:2 FTS	<	0.413	1.03	U	<	0.558	1.40	UJ	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
NEtFOSAA	<	0.413	1.03	U	<	0.559	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
NMeFOSAA	<	0.413	1.03	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFBA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFBS	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFDA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFDoA	<	0.413	1.03	U	<	0.559	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFHpA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFHxA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFHxS	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFNA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFOA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFOS	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFPeA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFTeDA	<	0.413	1.03	U	<	0.558	1.40	UJ	<	0.426	1.07	U	<	0.542	1.36	UJ	<	0.432	1.08	U	<	0.440	1.10	U	<	0.416	1.04	U
PFTrDA	<	0.413	1.03	U	<	0.559	1.40	UJ	<	0.426	1.07	U	<	0.542	1.36	UJ	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U
PFUnDA	<	0.408	1.02	U	<	0.558	1.40	U	<	0.426	1.07	U	<	0.542	1.36	U	<	0.432	1.08	U	<	0.439	1.10	U	<	0.416	1.04	U

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
NEtFOSAA	N-ethyl perfluorooctane- sulfonamidoacetic acid
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations

AOI	Area of Interest
D	Duplicate
ft	feet
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
SB	Soil boring
ug/Kg	micrograms per Kilogram
<	analyte not detected above the LOD

Appendix F Laboratory Data
Deep Subsurface Soil
Site Inspection Report, Helena AASF

Area of Interest	HAASF-MW004				HAASF-MW005											
Sample ID	AOI01-04-SB-39-41				AOI01-05-SB-25-27				AOI01-05-SB-50-52				AOI01-05-SB-50-52-D			
Sample Date	07/08/2020				07/09/2020				07/09/2020				07/09/2020			
Depth	39 - 41 ft				25 - 27 ft				50 - 52 ft				50 - 52 ft			
Analyte	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
Soil, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (ug/Kg)																
6:2 FTS	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
8:2 FTS	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	UJ
NEtFOSAA	<	0.531	1.33	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
NMeFOSAA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFBA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFBS	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFDA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFDoA	<	0.531	1.33	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFHpA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFHxA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFHxS	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFNA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFOA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFOS	<	0.535	1.34	U	0.219	0.415	1.04	J	1.72	0.567	1.42		2.37	0.581	1.45	
PFPeA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U
PFTeDA	<	0.535	1.34	UJ	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	UJ
PFTrDA	<	0.531	1.33	UJ	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	UJ
PFUnDA	<	0.535	1.34	U	<	0.415	1.04	U	<	0.567	1.42	U	<	0.581	1.45	U

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

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PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations

AOI	Area of Interest
D	Duplicate
ft	feet
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
SB	Soil boring
ug/Kg	micrograms per Kilogram
<	analyte not detected above the LOD

Appendix F Laboratory Data
Surface Soil
Site Inspection Report, Helena AASF

Area of Interest		HAASF-MW001				HAASF-MW002				HAASF-MW003				HAASF-MW004				HAASF-MW005				AOI01-06							
Sample ID		AOI01-01-SB-00-02				AOI01-02-SB-00-02				AOI01-03-SB-00-02				AOI01-04-SB-00-02				AOI01-05-SB-00-02				AOI01-06-SB-00-02				AOI01-06-SB-00-02-D			
Sample Date		07/08/2020				07/07/2020				07/09/2020				07/08/2020				07/09/2020				07/08/2020				07/08/2020			
Depth		0 - 2 ft				0 - 2 ft				0 - 2 ft				0 - 2 ft				0 - 2 ft				0 - 2 ft				0 - 2 ft			
Analyte	OSD Screening Level [a]	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
Soil, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (ug/Kg)																													
6:2 FTS	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
8:2 FTS	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
NEtFOSAA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
NMeFOSAA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFBA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFBS	130000	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFDA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFDoA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFHpA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFHxA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFHxS	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFNA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFOA	130	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFOS	130	<	0.456	1.14	U	<	0.421	1.05	UJ	0.208	0.418	1.04	J	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	UJ	<	0.432	1.08	U
PFPeA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFTeDA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFTrDA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U
PFUnDA	-	<	0.456	1.14	U	<	0.421	1.05	U	<	0.418	1.04	U	<	0.429	1.07	U	<	0.419	1.05	U	<	0.440	1.10	U	<	0.432	1.08	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 October 2019. Soil screening levels based on residential scenario for direct ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
NEtFOSAA	N-ethyl perfluorooctane- sulfonamidoacetic acid
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations

AOI	Area of Interest
D	Duplicate
ft	feet
HQ	Hazard quotient
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
SB	Soil boring
USEPA	United States Environmental Protection Agency
ug/Kg	micrograms per Kilogram
-	Not applicable
<	analyte not detected above the LOD

Area of Interest	AOI01-07				
Sample ID	AOI01-07-SB-00-02				
Sample Date	07/08/2020				
Depth	0 - 2 ft				
Analyte	**OSD Screening Level [a]**	**Result**	**LOD**	**LOQ**	**Qual**
Soil, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (ug/Kg)					
6:2 FTS	-	<	0.427	1.07	U
8:2 FTS	-	<	0.427	1.07	U
NEtFOSAA	-	<	0.427	1.07	U
NMeFOSAA	-	<	0.427	1.07	U
PFBA	-	<	0.427	1.07	U
PFBS	130000	<	0.427	1.07	U
PFDA	-	<	0.427	1.07	U
PFDoA	-	<	0.427	1.07	U
PFHpA	-	<	0.427	1.07	U
PFHxA	-	<	0.427	1.07	U
PFHxS	-	<	0.427	1.07	U
PFNA	-	<	0.427	1.07	U
PFOA	130	<	0.427	1.07	U
PFOS	130	<	0.427	1.07	U
PFPeA	-	<	0.427	1.07	U
PFTeDA	-	<	0.432	1.08	U
PFTrDA	-	<	0.427	1.07	U
PFUnDA	-	<	0.427	1.07	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 October 2019. Soil screening levels based on residential scenario for direct ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
NEtFOSAA	N-ethyl perfluorooctane- sulfonamidoacetic acid
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations

AOI	Area of Interest
D	Duplicate
ft	feet
HQ	Hazard quotient
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
SB	Soil boring
USEPA	United States Environmental Protection Agency
ug/Kg	micrograms per Kilogram
-	Not applicable
<	analyte not detected above the LOD
-	Not applicable
<	analyte not detected above the LOD

Appendix F Laboratory Data
TOC and pH
Site Inspection Report, Helena AASF

Area of Interest	HAASF-MW003							
Sample ID	AOI01-03-SB-20-22				AOI01-03-SB-20-22-D			
Sample Date	07/09/2020				07/09/2020			
Depth	20 - 22 ft				20 - 22 ft			
Analyte	**Result**	**LOD**	**LOQ**	**Qual**	**Result**	**LOD**	**LOQ**	**Qual**
pH	8.61	1.00	1.00	J	8.62	1.00	1.00	J
Total Organic Carbon (mg/kg)	1230	200	250	J	1170	200	250	J

Acronyms and Abbreviations

AOI	Area of Interest
D	Duplicate
ft	ft
LOD	Limit of Detection
LOQ	Limit of Quantitation
Qual	Interpreted Qualifier
mg/kg	milligram per kilogram
SB	Soil boring

Interpreted Qualifiers

J = Estimated concentration

Appendix F Laboratory Data
Groundwater
Site Inspection Report, Helena AASF

	Area of Interest	HAASF-MW001				HAASF-MW002				HAASF-MW003				HAASF-MW004				HAASF-MW005							
	Sample ID	HAASF-MW001				HAASF-MW002				HAASF-MW003				HAASF-MW004				HAASF-MW005				HAASF-MW005-D			
	Sample Date	07/12/2020				07/11/2020				07/12/2020				07/12/2020				07/12/2020				07/12/2020			
Analyte	OSD Screening Level [a]	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
Water, PFAS by LCMSMS Compliant with QSM 5.1 Table B-15 (ng/L)																									
6:2 FTS	-	<	4.00	10.0	U	<	4.00	10.0	U	16.0	4.00	10.0		<	4.00	10.0	U	13.2	4.00	10.0		16.8	4.00	10.0	
8:2 FTS	-	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U
NEtFOSAA	-	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U
NMeFOSAA	-	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U	<	8.00	10.0	U
PFBA	-	2.84	4.00	10.0	J	2.24	4.00	10.0	J	9.11	4.00	10.0	J	2.91	4.00	10.0	J	19.6	4.00	10.0		20.0	4.00	10.0	
PFBS	40000	3.61	4.00	10.0	J	<	4.00	10.0	U	1.96	4.00	10.0	J	3.12	4.00	10.0	J	1.92	4.00	10.0	J	1.80	4.00	10.0	J
PFDA	-	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U
PFDoA	-	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U
PFHpA	-	<	4.00	10.0	U	<	4.00	10.0	U	11.6	4.00	10.0		<	4.00	10.0	U	11.6	4.00	10.0		10.5	4.00	10.0	
PFHxA	-	3.23	4.00	10.0	J	4.01	4.00	10.0	J	15.9	4.00	10.0		7.85	4.00	10.0	J	30.1	4.00	10.0		31.1	4.00	10.0	
PFHxS	-	9.49	4.00	10.0	J	<	4.00	10.0	U	74.2	4.00	10.0		26.4	4.00	10.0		36.7	4.00	10.0		37.8	4.00	10.0	
PFNA	-	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	2.40	4.00	10.0	J	2.50	4.00	10.0	J
PFOA	40	1.89	4.00	10.0	J	<	4.00	10.0	U	9.07	4.00	10.0	J	<	4.00	10.0	U	9.59	4.00	10.0	J	10.7	4.00	10.0	
PFOS	40	<	4.00	10.0	U	<	4.00	10.0	U	175	4.00	10.0		<	4.00	10.0	U	775	4.00	10.0		814	4.00	10.0	
PFPeA	-	<	4.00	10.0	U	3.33	4.00	10.0	J	4.14	4.00	10.0	J	6.23	4.00	10.0	J	21.3	4.00	10.0		21.7	4.00	10.0	
PFTeDA	-	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U
PFTrDA	-	<	4.00	10.0	UJ	<	4.00	10.0	UJ	<	4.00	10.0	UJ	<	4.00	10.0	UJ	<	4.00	10.0	UJ	<	4.00	10.0	UJ
PFUnDA	-	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U	<	4.00	10.0	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 October 2019. Groundwater screening levels based on residential scenario for direct ingestion of groundwater.

Interpreted Qualifiers

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Chemical Abbreviations

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PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
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PFHxS	perfluorohexanesulfonic acid
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PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations

D	Duplicate
HQ	Hazard quotient
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	Interpreted Qualifier
USEPA	United States Environmental Protection Agency
ng/L	nanogram per liter
-	Not applicable
<	analyte not detected above the LOD

Appendix F Laboratory Data
Residential Drinking Water Results
Site Inspection Report, Helena AASF

Area of Interest		POTABLE																									
Sample ID		HAASF-POTABLE-01				HAASF-POTABLE-02				HAASF-POTABLE-02-DUP				HAASF-POTABLE-03				HAASF-POTABLE-04				HAASF-POTABLE-05				HAASF-POTABLE-05 DUP			
Sample Date		02/16/2021				02/16/2021				02/16/2021				04/29/2021				04/30/2021				04/29/2021				04/29/2021			
Analyte	USEPA HA [a]	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
Water, PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 (ng/L)																													
4:2 FTS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	UJ	<	2.00	4.00	UJ
6:2 FTS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	1.11	2.00	4.00	J	<	2.00	4.00	U
8:2 FTS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U
FOSA	-	1.49	2.00	4.00	J	1.18	2.00	4.00	J	<	2.00	4.00	UJ	<	2.00	4.00	U	1.66	2.00	4.00	J	1.38	2.00	4.00	J	1.18	2.00	4.00	J
NEtFOSA	-	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U
NEtFOSAA	-	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U
N-EtFOSE	-	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U
NMEFOSA	-	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U
NMeFOSAA	-	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	1.07	4.00	8.00	J	<	4.00	8.00	UJ
NMeFOSE	-	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U	<	4.00	8.00	U
PFBA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	3.25	4.00	U	<	2.00	4.00	U	<	2.00	4.00	UJ
PFBS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	4.81	2.00	4.00		0.907	2.00	4.00	J	<	2.00	4.00	UJ
PFDA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	0.898	2.00	4.00	J	<	2.00	4.00	UJ
PFDoA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U
PFDS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U
PFHpA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	1.46	2.00	4.00	J	1.02	2.00	4.00	J	<	2.00	4.00	UJ
PFHpS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U
PFHxA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	4.65	2.00	4.00		1.53	2.00	4.00	J	<	2.00	4.00	UJ
PFHxS	-	1.04	2.00	4.00	J	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	16.2	2.00	4.00		1.03	2.00	4.00	J	<	2.00	4.00	UJ
PFNA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	0.834	2.00	4.00	J	<	2.00	4.00	UJ
PFNS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	0.787	2.00	4.00	J	<	2.00	4.00	UJ
PFOA	70	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	1.94	2.00	4.00	J	1.36	2.00	4.00	J	<	2.00	4.00	UJ
PFOS	70	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	0.984	2.00	4.00	J	8.57	2.00	4.00		2.57	2.00	4.00	J	<	2.00	4.00	UJ
PFPeA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	4.31	2.00	4.00		1.01	2.00	4.00	J	<	2.00	4.00	UJ
PFPeS	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	3.32	2.00	4.00	J	0.883	2.00	4.00	J	<	2.00	4.00	UJ
PFTeDA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U
PFTrDA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U
PFUnDA	-	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U	<	2.00	4.00	U
Total PFOA+PFOS	70	<	2		U	<	2		U	<	2		U	0.984	2			10.5	2			3.93	2			<	2		U

Grey Fill — Detected concentration exceeded USEPA HA

References

a. United States Environmental Protection Agency. 2016. Drinking Water Health Advisory for PFOA. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-005. May 2016. / EPA. 2016. Drinking Water Health Advisory for PFOS. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-004. May 2016.

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
DUP	Duplicate
HA	Health Advisory
LCMSMS	Liquid Chromatography Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
Qual	Interpreted Qualifier
USEPA	United States Environmental Protection Agency
ng/l	nanogram per liter
-	Not applicable
<	analyte not detected above the LOD

Chemical Abbreviations

4:2 FTS	4:2 fluorotelomer sulfonate
6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
FOSA	Perfluorooctane sulfonamide
NEtFOSA	N-ethyl perfluorooctane sulfonamide
NEtFOSAA	2-(N-Ethylperfluorooctanesulfonamido) acetic acid
N-EtFOSE	N-ethyl perfluorooctane sulfonamido ethanol
NMEFOSA	N-methyl perfluorooctane sulfonamide
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
NMeFOSE	N-methyl perfluorooctane sulfonamido ethanol
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFDS	perfluorodecanesulfonic acid
PFHpA	perfluoroheptanoic acid
PFHpS	perfluoroheptanesulfonic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFNS	perfluorononanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFPeS	perfluoropentanesulfonic acid
PFTeDA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Appendix G
Laboratory Reports

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Due to file size, laboratory reports are provided electronically (CD) or can be requested.