REPORT OF CONFIRMATION SAMPLING
BOLKE RESIDENCE FUEL OIL RELEASE SITE
PLENTYWOOD, MONTANA

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1.0 INTRODUCTION

Hydrometrics, Inc. (Hydrometrics) prepared this report for Montana Department of Environmental Quality (DEQ) to document the methods and results of confirmation soil, groundwater, and air sampling conducted during 2016 and 2017 at the Bolke Residence Fuel Oil Release site in Plentywood, Montana (Site). The objective of sampling was to document whether contaminant concentrations are below applicable standards and screening levels to allow for closure of the Site, including well abandonment.

Hydrometrics entered into Task Order No. 12 in July 2016, pursuant to DEQ Contract No. 414019. The Task Order included ten tasks:

- Task 1 – Initial Coordination;
- Task 2 – Weekly Communication;
- Task 3 – Field Logs;
- Task 4 - Access Arrangements;
- Task 5 – Confirmation sampling of the one-time landfarm;
- Task 6 – Two rounds of groundwater sampling;
- Task 7 – Two rounds of vapor intrusion sampling;
- Task 8 – Validate analytical data;
- Task 9 – Abandon monitoring wells; and
- Task 10 – Prepare summary report.

Based on results of the second round of air samples collected in January 2017, the Task Order was amended in March 2017 (Modification A) which allowed for additional tasks that included:

- a third round of air sampling;
- inspection of the Bolke's home for assessing alternatives for indoor air mitigation; and
- sealing of the basement sumps.

2.0 BACKGROUND

In June 1999, the Bolke family removed a heating oil underground storage tank from their property in Plentywood, Sheridan County after they noticed strong fuel odors in their basement and saw petroleum in their basement sump. The tank was removed and the accessible contaminated soil (less than 50 cubic yards) was excavated and landfarmed on the Bolke's farm located north of Plentywood (see attached Figure 1). Some contaminated soil remained beneath the driveway and foundation of the home. The basement sump was cleaned and replaced, and odors subsided after excavation and cleaning. The release was reported to the program that is now the Montana Department of Environmental Quality (DEQ) Petroleum Tank Cleanup Section (PTC). At the time the release was reported, it was not regulated by PTC and was not eligible for reimbursement through the Montana Petroleum Tank Release Cleanup Fund. PTC referred the release to DEQ's Groundwater Remediation Program (GRP) in August, 1999.

In 2001, the Bolke's consultant, Tyler Geo-Consulting, LLC (Tyler), installed and sampled three monitoring wells, one of which was located in the former tank basin (Bolke-1 – identified as PBR-1 in this report and shown on Figure 2). Groundwater samples were analyzed for extractable petroleum hydrocarbons (EPH) screen only. The results showed that PBR-1 had total extractable hydrocarbons (TEH) at 2,400 micrograms per liter (µg/L), while the other two wells did not have detectable TEH. The groundwater sample from PBR-1 was not analyzed for EPH fractions.

In October 2002, DEQ personnel inspected the Site and conducted groundwater sampling from the Site's three monitoring wells (PBR-1, -2, and -3) for EPH Screen and volatile petroleum hydrocarbons (VPH). If an EPH screen result exceeded 1,000 µg/L, then the sample was further analyzed for EPH fractions and polynuclear aromatic hydrocarbons (PAHs). In October 2004, DEQ personnel sampled Bolke-1 for EPH screen only. In September 2005, DEQ personnel sampled Bolke-1 for EPH and VPH. EPH screen results have shown that TEH from well PBR-1 (Bolke-1) exceed the Risk-Based Corrective Action

(DEQ, 2016) "ceiling limit" of 1,000 micrograms per liter (µg/L), but EPH fractionation of the samples showed no detectable EPH fractions during these previous sampling events. VPH results were less than detection limits in monitor wells PBR-2 and -3. The PRB-1 well's VPH results showed benzene at 1.5 and 0.44 µg/L in 2002 and 2005, respectively. The last three groundwater sampling events each occurred in fall during low groundwater. No additional groundwater sampling has been conducted since 2005.

Prior to 2016, the soil at the landfarm had not been sampled to confirm whether it could be closed. Additionally, the indoor air in the Bolke residence had not been sampled prior to 2016.

Work conducted on this project for DEQ in 2016 and 2017 was funded through monies appropriated by the Montana legislature in 2015 through Senate Bill 96.

3.0 LANDFARM SAMPLING

The Bolke one-time landfarm was used to treat petroleum impacted soil materials that were removed from around the leaking heating oil underground storage tank in 1999. The landfarm is located north of Plentywood as shown on Figure 1. A composite sample was collected during August 2016. At the time DEQ planned the landfarm sampling, the surface area of the landfarm was not known. DEQ's Solid Waste Management Program landfarming guidelines specify that contaminated soils are to be sampled at a rate of one sample per 200 cubic meters. Since the Bolke landfarm treated no more than 50 cubic yards of contaminated soil, DEQ determined that one composite confirmation sample with one duplicate sample would be sufficient for confirmation sampling purposes. As indicated below, the sampling effort found that the landfarm covered approximately 1,000 square feet of surface area. DEQ's State Superfund Unit generally requires that one confirmation sample be collected for every 625 square feet of an excavation or other soil surface. However, because the amount of soil treated in the landfarm was 50 cubic yards, DEQ determined that one composite sample (plus one duplicate sample) was adequate.

3.1 METHODOLOGY

On August 4, 2016, Mr. Don Bolke, DEQ, and Hydrometrics drove to the location of the landfarm to collect confirmation soil samples. Mr. Bolke identified the landfarm area. The location of the landfarm was verified by the presence of dispersed pieces of concrete. The concrete pieces were from the Bolke's front sidewalk that was demolished during the excavation of contaminated soil. The landfarm soils showed no staining, odors, or other signs of petroleum contamination. The landfarm is plowed and farmed as part of a larger wheat field. A six point composite soil sample was collected from the Bolke's one-time landfarm. Six subsample points were utilized rather than the standard five-point composite because, after collecting the five subsamples, the amount of fine soil collected appeared to be inadequate to fill the sample containers. The six sub-samples were collected from the 0 – 6 inch depth over an approximate area of 1,000 square feet using a decontaminated stainless steel trowel. The sub-samples were combined using a decontaminated stainless steel bowl.

Once combined, the sample was split into two samples – the primary sample and a duplicate. These samples were placed in labeled laboratory supplied jars, placed on ice and hand-delivered to Energy Laboratory in Billings, Montana under chain-of-custody. The samples were analyzed for Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) using the 2004 Massachusetts Methods (MADEP, 2004a and 2004b).

Generally, for composite sampling of volatile compounds in soil samples, DEQ requires that equal quantities of soil from each subsample location be placed directly into an appropriate sample container to prevent loss of volatiles, for subsequent compositing by the laboratory. The VPH results collected from the Bolke landfarm are expected to be biased low due to compositing in the field.

3.2 ANALYTICAL RESULTS

Both the primary and duplicate samples were non-detect for all VPH compounds. The EPH screening results for the primary sample were non-detect and the duplicate reported 13 mg/kg of total EPH. Therefore, fractionation was not performed at the laboratory as the results were below the threshold of 200 mg/kg EPH screen.

Table 1 contains a summary of the analytical results. Energy Laboratory reports are attached in Appendix A. All landfarm soil results were less than applicable DEQ Tier 1 Risk-Based Screening Levels for residential surface soil. Although the VPH results may be biased low due to compositing in the field, non-detect results were expected because the Bolke's tilled and fertilized the landfarm at least annually as part of their farming operations. This would enhance the natural biodegradation of VPH and EPH compounds. The contaminated soil (less than 50 cubic yards) was spread at the landfarm in 1999; therefore, approximately 16 years of attenuation occurred prior to sampling in August 2016. This information supports closure of the landfarm.

4.0 CONFIRMATION GROUNDWATER SAMPLING

The confirmation groundwater sampling events were planned for high groundwater (summer 2016) and low groundwater (late fall 2016 or winter 2017). The summer 2016 event was conducted in August 2016 as planned. However, inclement winter weather, deep snow cover and equipment failure resulted in the second round of groundwater samples being collected in April 2017. Additionally, one of the three monitoring wells could not be located, so only two wells (PBR-1 and PBR-2) were sampled during each event. PBR-1 is located in the former tank excavation footprint on the west side of the house, and PBR-2 is located south of the house and downgradient of the former tank based on previous static water level readings (Tyler, 2001). Well locations are shown on Figure 2. Groundwater sampling methodology and results are discussed in the following sections of the report.

4.1 METHODOLOGY

Prior to well purging and sample collection, water levels were measured in each well using an electronic oil water interface probe. The interface probe was decontaminated between well measurements using a solution of Alconox and water followed with a water rinse. Since the third monitoring well could not be located, groundwater flow direction was not calculated for these events. Groundwater at this Site is assumed to flow generally to the southeast, based upon a groundwater flow map from the July 2001 Report of Remedial Excavation (Tyler, 2001), and local topography. Depth to water in PBR-1 was measured at 4.6 feet bgs in August 2016 and 3.87 feet bgs in April 2017. Water depths in PBR-2 were 30.15 ft. bgs in August 2016 and 29.17 ft. bgs in April 2017.

Wells were purged and sampled using low-flow minimal drawdown methodology in accordance with DEQ's low flow guidance: http://deq.mt.gov/Portals/112/Land/StateSuperfund/Documents/srs_lowflow_memo.pdf. A bladder pump was employed to purge water from the well prior to sample collection. Groundwater field parameters (specific conductance, pH, temperature, oxidation reduction

potential, turbidity, and dissolved oxygen) were measured during purging. All measurements were recorded on groundwater sampling field forms included in Appendix B.

After well purging, samples were collected in laboratory provided containers and preserved appropriately with laboratory-supplied preservatives (see Appendix B). Although the preservation information is not indicated in the April 2017 groundwater sampling field forms, the samples were preserved properly, as evidenced by the samples arriving at proper pH at the laboratory (see laboratory work order receipt checklist in Appendix A). All samples were stored on ice in a cooler and were delivered to Energy Laboratories by the sampler under chain of custody. Samples were analyzed for VPH and EPH using the 2004 Massachusetts Methods. Samples exceeding the EPH screening threshold of 1,000 µg/L were further analyzed for EPH fractions and for semi-volatile organic compounds (SVOCs) via Method 8270.

Blind duplicate samples were collected at PBR-1 during both sampling events. One rinsate blank was collected during the April 2017 event by running deionized water through the decontaminated pump and a length of new, unused tubing.

4.2 ANALYTICAL RESULTS

Groundwater levels measured during April 2017 were about a foot higher than when measured in August 2016, reflecting influence from recent snow melt and precipitation during early 2017. As a result, the anticipated high groundwater confirmation sample that had been planned for summer 2016, was actually collected in April 2017. The August 2016 sample represents low groundwater level conditions.

Groundwater analytical results are summarized in Table 2 and the Energy Laboratory reports are included in Appendix A. Analytical results for PBR-1, the well located in the former tank basin, reported detectable VPH compounds (C9-C10 aromatics and C9-C12 aliphatics) during both sampling events, but at levels below Montana Risk-Based Screening Levels (RBSLs) and DEQ-7 (DEQ, 2012) Human Health Standards for Groundwater (Table 2). The

total EPH screen exceeded the threshold of 1000 µg/L during both events, hence the samples were fractionated. However, no fractions or SVOCs exceeded Montana RBSLs in these samples and those detected were at very low levels.

Samples from PBR-2 were found to have no exceedances of the Montana RBSLs for VPH or EPH. The VPH results from PBR-2 were all less than detection limits. The EPH screen result from PBR-2 was 332 µg/L, which is less than the 1,000 µg/L threshold for further analysis. Since sampling results from two consecutive groundwater monitoring events (one at low and one at high groundwater) do not indicate any exceedances of Montana RBSLs, no additional groundwater monitoring is required and the wells were properly abandoned according to ARM 36.21.810 as discussed in Section 9.

5.0 VAPOR INTRUSION SAMPLING

Two rounds of air sampling were planned for the Bolke Residence, one during high water in summer 2016 and one in late fall or early winter 2017. The sampling event during summer high water was planned to coincide with a potential worst-case time for vapor intrusion, representing conditions when high groundwater might bring contaminants in contact with the foundation of the home. The second round of sampling was planned to represent potential worst-case vapor intrusion conditions when the ground is frozen. Based on the results of the air samples collected during January 2017, a third round of samples was collected in March 2017.

5.1 SAMPLING METHODOLOGY

During the first two sampling events, samples were collected from sub-slab vapor, basement and main floor indoor air, and outside/ambient air. During the third event in March 2017, no sub-slab or outdoor samples were collected because it was determined that a third set of sample results would be similar to the first two events where sub-slab vapor showed elevated EPH fraction concentrations, and where outside air showed no detectable compounds; therefore, a third sample would have provided no new information. During the March 2017 event, an air sample was collected inside the Bolke's attached garage to gather additional data to aid in the "multiple lines of evidence" assessment. During each of the three rounds of sampling, duplicate samples were collected of basement indoor air. Samples were collected in accordance with MDEQ's Montana Vapor Intrusion Guide (http://deq.mt.gov/Land/statesuperfund/viguide).

Samples were collected using individually cleaned and certified six-liter Summa canisters and flow controllers (inside and ambient air) or critical orifices (sub-slab). Summa canisters were paired with calibrated flow devices in the laboratory and field personnel were careful to maintain the paired sampling devices as provided by the laboratory. The initial vacuum (negative pressure) for each canister, as measured on digital vacuum gauges supplied by the laboratory, was recorded upon receipt of the canisters. Sample container integrity was

established when the initial pressure was between -25 and -29 inches mercury. Containers that did not meet the criteria were returned to the laboratory for replacement. As noted in the canister check-in sheet, prior to the first round sampling event, one canister and one flow controller were replaced after initial vacuum checks identified concerns with operation or criteria. During the third round sampling event, one canister was not used after a field check indicated loss of vacuum, and discussions with DEQ resulted in the decision to not collect the outdoor air sample in favor of collecting a duplicate since there was not adequate time to obtain a replacement canister from the laboratory. Canister and gauge identification numbers were documented appropriately.

All sample canisters were shipped to ALS Laboratory in Simi Valley, California in accordance with laboratory specifications and under chain-of-custody for analysis of Air-Phase Petroleum Hydrocarbons (APH) and for an abbreviated (petroleum only) list of Method TO-15. The two sub-slab samples were also analyzed for helium.

5.1.1 Sub-Slab Soil Vapor

For the sub-slab sample, a Vapor Pin™ was installed in the basement floor through a hole drilled with a rotary hammer. The pin was placed in the northern portion of the basement (see Figure 3). The vapor pin was capped and left in place between sampling events, but was removed and the hole sealed with concrete after final samples were collected. Photographs of the Vapor Pin™ and sealed hole in slab are included in Appendix D.

Leak checks (tracer test) were performed on the probe to verify the integrity of the soil vapor probe seal prior to sampling. To perform the probe leak check, approximately 16 inches of Teflon tubing (1/4" ID) were connected to the probe and capped. A helium meter and photoionization detector (PID) were turned on. A shroud was constructed (i.e., plastic transparent bag weighted at the ground surface) around the surface of the sub-slab probe with the end of the sample tubing extending outside of the shroud. The tubing from the helium meter and hose from the helium canister were placed beneath the shroud. The shroud was filled with a minimum of 20% helium gas (ultra-high purity) and allowed to stabilize before

purging. A 60 milliliter (ml) syringe was attached to the sample tubing and used to purge the sampling train. The purge volume was determined by calculating three times the volume of the tubing plus the volume of the 5/8" hole below the probe. This minimum purge volume was removed from the sampling train by drawing 60 ml over a 20 second interval to minimize potential disturbance to sub-slab soils. Following purging activities, the helium meter was carefully removed from the shroud and allowed to zero. The helium meter was then connected to the sampling train in place of the syringe. If a leak was apparent (the concentration of helium in the sampling train was greater than 10% of the minimum concentration beneath the shroud), the apparatus was resealed and the test repeated until a suitable seal was observed. The sub-slab vapor probe passed leak testing prior to sample collection during both rounds of sampling.

After passing the probe leak tests, sub-slab samples were collected. A 6-liter canister, inline vacuum gauge, and critical orifice (i.e., flow controller) were connected and fittings secured with a wrench. Identification numbers of each piece of the assembly were recorded on field forms (see Appendix C). Sample tubing from the probe was connected to the critical orifice and secured. The entire sample train was placed beneath the shroud and edges weighted. The shroud was filled to a minimum of 20% helium for the duration of sampling. Summa canisters were opened and initial vacuum was recorded on field forms included in Appendix C. Flow controllers for sub-slab sampling were calibrated in the laboratory to 150 ml/min (approximately 45 minutes). Sampling was considered complete when the vacuum on the in-line gauge read -5 inches mercury. Photographs of sub-slab sampling are included in Appendix D.

5.1.2 Indoor and Ambient Air

Prior to sub-slab sampling, indoor air sampling was performed. Air samples were collected using certified clean Summa canisters over a 24-hour time period. The canisters were placed in the breathing zone (3 to 5 feet above the floor) for each of the indoor and ambient air samples. To begin sampling, the valve was opened on the canister and initial vacuum recorded on field forms (see Appendix C). Sampling was considered complete when the

vacuum on the in-line gauge read approximately -5 inches mercury. Photographs of the sampling locations of each of the indoor and ambient air samples are included in Appendix D.

5.2 VAPOR INTRUSION ANALYTICAL RESULTS

All Bolke residence air sample results are summarized in Table 3 and the ALS Laboratory reports are included in Appendix E. Table 3 also includes DEQ's Unadjusted Air Phase Hydrocarbon (APH) Residential Vapor Intrusion Screening Levels and DEQ-Adjusted APH Residential screening levels (site-specific screening levels). The site-specific screening levels were calculated using DEQ's APH Vapor Intrusion Screening Level Calculator (DEQ, 2016). A copy of the APH Calculator output is included as Figure 4.

5.2.1 Sub-Slab Vapor

Petroleum impacts are apparent in the two sub-slab samples (PBR-BSSA1) which had elevated levels of C5-C8 aliphatics, C9-C12 aliphatics and C9 – C10 aromatics. The elevated concentrations of these APH fractions resulted in elevated detection limits for the method TO-15 sample results. The method TO-15 results did not report detectable concentrations of benzene, toluene, ethylbenzene, xylene, and naphthalene, but the detection limits for most of these compounds were above the applicable screening levels. The presence of elevated APH compounds in sub-slab vapor is not unexpected, because some contaminated soil remains under the foundation of the home; the contaminated soil could not be removed without affecting the structural integrity of the home. The C9-C12 aliphatics fraction had the highest relative concentrations of the three APH fractions, with 890,000 and 670,000 micrograms per cubic meter (ug/m^3) detected in August 2016 and January 2017, respectively.

Sub-slab vapor samples collected during the August 2016 and January 2017 events also reported helium concentrations of 3,600 parts per million by volume (ppmv) (August 2016) and 2,700 ppmv (January 2017). These results indicate that some leakage from the above-slab atmosphere to the sub-slab sample did occur during both events. The leakage means the

sub-slab samples were diluted by less than one percent of the total volume of sample collected. For the purposes of this investigation, these results are acceptable.

5.2.2 Indoor and Ambient Air

The results of all three air sampling events were analyzed using the approach specified in DEQ's Vapor Intrusion General Decision-Making Process flowchart, which is included in DEQ's Montana Vapor Intrusion Guide (DEQ, 2011). Results for the three sampling events along with calculated screening levels are also displayed on Figure 5.

All analyzed constituents were non-detect in the outdoor ambient air samples. Outdoor air appears to be clean, and therefore it is not likely contributing to indoor air concentrations at the Bolke residence.

In August 2016, the C9-C12 aliphatics fraction (73 ug/m^3 and 64 ug/m^3 in the duplicate sample) in basement air was the only analyte that exceeded its site-specific screening level (52 ug/m^3). The air in the main level of the home contained C9-C12 aliphatics at 24 ug/m^3. Based on these results, and the elevated sub-slab concentration of this compound, the potential exists for the vapor intrusion pathway to be complete for the C9-C12 aliphatics fraction.

In January 2017, the site-specific screening levels were exceeded for C9-12 aliphatics, C5-C8 aliphatics, and benzene in the main level and basement air samples. The C9-C12 aliphatics fraction (100 ug/m^3) in basement air was higher than the concentration in the main level (72 ug/m^3), suggesting that vapor intrusion may be responsible for this fraction, similar to the analysis of this fraction's concentration gradient in the August 2016 sampling event. However, the main level concentrations of C5-C8 aliphatics (480 ug/m^3) and benzene (3.5 ug/m^3) were higher than the concentrations of those compounds found in the basement air, which had C5-C8 aliphatics (400 ug/m^3) and benzene (2.9 ug/m^3). The higher concentrations of C5-C8 aliphatics and benzene in the main level air suggest that these compounds may not be attributable to vapor intrusion, but may potentially be related to an

indoor air source since the concentration gradient indicates that contaminants would be moving from the main level to the basement. If vapor intrusion were occurring for C5-C8 aliphatics and benzene, then the contaminant concentrations should be higher in the basement.

In March 2017, an air sample was collected from the attached garage of the Bolke residence, in addition to the main level and basement, in order to evaluate potential influences the attached garage may have on the indoor air concentrations; see DEQ's Vapor Intrusion Decision-Making Process flowchart (DEQ, 2011). Potential sources of contaminants were not removed from the garage prior to sampling, in order to measure concentrations that may be emitted from those potential sources. The garage air had five compounds at or above site-specific screening levels: C9-C12 aliphatics (52 ug/m^3), C5-C8 aliphatics (1,400 ug/m^3), benzene (15 ug/m^3), ethylbenzene (13 ug/m^3), and naphthalene (1.2 ug/m^3). The air sample from the main level of the home had three compounds above screening levels: C9-C12 aliphatics (71 ug/m^3), benzene (2.3 ug/m^3), and naphthalene (1.3 ug/m^3). The basement air sample had C9-C12 aliphatics (54 ug/m^3 and 61 ug/m^3 in the duplicate sample) and benzene (1.4 ug/m^3 and 1.5 ug/m^3 in the duplicate sample) above screening levels. Based on the concentration gradients for C5-C8 aliphatics, benzene, ethylbenzene, and naphthalene, it appears that the attached garage is a source of contamination for those compounds in the indoor air. In this sampling event, the C9-C12 aliphatics results were inconclusive, showing the highest levels in the main level air (71 ug/m^3), followed by the basement air (61 ug/m^3), with the garage air having the lowest level (52 ug/m^3).

Overall, based upon a cumulative analysis of the results of the three sampling events, the vapor intrusion pathway is most likely complete for the C9-C12 aliphatics fraction. This compound is present at high concentrations under the foundation of the home, tends to have higher concentrations in the basement air than the main level air, and does not appear to be coming from the garage.

The open unsealed sumps in the Bolke basement are a preferential pathway for sub-slab vapors to enter the basement air. For this reason, DEQ directed Hydrometrics to design and install airtight seals on the two basement sumps. The sump seals are discussed further in Section 8. DEQ plans to resample the Bolke indoor air in the winter of 2018 to determine whether the seals are effective in reducing indoor air concentrations of C9-C12 aliphatics.

6.0 DATA VALIDATION

All data associated with the sampling tasks were validated and data quality objectives were reviewed to examine the validity (based on data validation) and usability (based on project objectives) of soil, air and groundwater analytical data collected at the Bolke Residence and one-time landfarm.

6.1 QUALITY CONTROL SAMPLES

QC samples were analyzed in conjunction with soil, groundwater and air samples and consisted of both field QC samples and laboratory QC samples. Field QC consisted of field duplicates, equipment (rinsate) blanks, leak-checking of sub-slab vapor samples, and trip blanks. Laboratory QC included holding times, laboratory blanks, surrogate recoveries for organics, laboratory control samples, laboratory control sample duplicates (LCS/LCSD), matrix spikes, matrix spike duplicates (MS/MSD), and/or laboratory duplicates (as applicable to specific analytical methods); all of which were analyzed at the proper frequency of 5% or as required by method.

All samples were received by the laboratories at the appropriate temperature (if applicable), at the appropriate pH (if applicable), in good condition, and with complete chain-of-custody forms. Soil and water samples were hand-delivered by Hydrometrics to Energy Labs in Billings, Montana. Air samples were submitted in accordance with laboratory guidelines to ALS in Simi Valley, California. All samples were analyzed within the method-specified holding times.

6.2 VALIDATION SUMMARY

Data validation followed DEQ's Data Validation Guidelines (DEQ November 2016) in conjunction with USEPA Functional Guidelines (USEPA, Aug. 2014). Validation summaries were prepared for each sample delivery group. These reports are located in Appendix F, and the analytical data packages are located in Appendix A (soil and groundwater) and Appendix E (air). The data were found to be of acceptable quality for the

purposes of this investigation. No data were rejected. All RPDs for field duplicate samples were within control limits with the exception of samples collected in August 2016 that include one analyte for groundwater and one for the air sample duplicate. Trip blanks for groundwater samples collected in April 2017 had low levels of toluene, m+p xylene and total xylene. However qualification of these data was not necessary because raw samples did not report values greater than the detection limit for these analytes. Helium analysis of the sub-slab samples indicated some leakage from the ambient atmosphere occurred, but at less than 1 percent of the volume of the sample. Some samples had elevated detection limits due to high concentrations in the sample/matrix. In some cases, this resulted in detection limits being higher than the screening level/RBSL for certain constituents. The data validation process flagged a few data points as estimated, and these were given J flags. Data validation and laboratory flags are shown in the results tables (Tables 1 through 3). Additional detail about the individual sample qualification is provided in the data validation summaries in Appendix F.

6.3 SAMPLING SUMMARY

Soil samples consisted of a six point composite and a duplicate, collected on August 4, 2016.

Groundwater samples collected on August 4, 2016 included two samples and one duplicate. No rinsate blanks or trip blanks were submitted to the laboratory during the August event. Therefore potential contamination from sampling equipment or during sample transport could not be evaluated. Groundwater samples collected on April 26, 2017 included a total of two samples, one equipment blank, one duplicate and two trip blanks.

Air samples collected on August 4, 2016, January 18, 2017 and March 21, 2017 included a total of two sub-slab vapor samples, two ambient air samples, seven indoor air samples, and three duplicates. No out-door air sample was collected during the March 2017 event. Therefore, it is assumed that any contamination was sourcing from the release or from other indoor, including garage, sources.

7.0 VAPOR INTRUSION ASSESSMENT OF BOLKE BASEMENT

Based on results of the January 2017 indoor air sampling, DEQ requested that Hydrometrics conduct an inspection of the Bolke basement to assess vapor intrusion pathways. The inspection was completed on March 20, 2017 and consisted of measuring organic vapors; photographing floors, walls and the sumps; and interviewing Mr. Bolke. Mr. Bolke also completed portions of DEQ's Occupied Dwelling Questionnaire, a copy of which is attached as Appendix G.

The Bolke residence is a two-level single-family home with an attached garage. Each level is approximately 1,500 square feet. The lower level is a full basement with concrete slab walls. The basement floor is painted. The home is within Plentywood city limits, and is hooked up to water and sewer. The home was built in 1980. Heat is provided by a natural-gas powered complete heat forced air furnace. Air ducts from the furnace are routed to the main floor and basement rooms to convey the heated air.

Volatile organic vapors were measured at various places in the basement using a PID capable of sensing part per billion (ppb) concentrations of vapors. Measurements were taken at the sumps (before and after opening), the vapor pin point, in each of the basement rooms, and near the basement windows. The measurements were recorded and are included on the schematic of the basement included on Figure 3.

The highest reading (7500 ppb) of organic vapors was observed at the vapor pin, used for collection of sub-slab samples. The vapor pin was ultimately removed and the hole plugged with concrete. Other elevated readings were observed at the sub-grade basement window on the west side of the house. This window is near the former heating oil storage basin as shown on Figure 3. Vapor readings at Sump #1, were higher (930 ppb) after the cover was removed than when it was in place (524 ppb). The cover was sealed with weather stripping around the bottom. Based on the readings, the sump cover appears to be somewhat effective at providing a seal to limit vapors from entering the living space from below the slab. Sump

#2 is only loosely covered with a board, with no seal. The PID readings at this sump were lower than at Sump #1, possibly a result of the location (further from the former tank basin) and the fact that the loose cover allows it to constantly vent. Sump locations and the PID readings are depicted in Figure 3. Photographs of the sumps are included in Appendix H.

Based on the inspection conducted in March 2017, Hydrometrics prepared an evaluation of vapor mitigation options that included a sub-slab depressurization system, a fresh air exchange system and sealing the concrete slab. A report of that evaluation was prepared and is included as Appendix I.

8.0 SUMP MITIGATION

Hydrocarbon vapors that may escape from below the slab via the sumps were mitigated by installation of sump covers. On May 9, 2017, Hydrometrics installed prefabricated radon sump covers over the sumps. The covers were secured by bolting to the concrete and caulking around the base of the cover. The discharge hose and electrical cord were routed out the top of the cover, through orifices that were also sealed with silicon caulk. Photographs of the sump cover installation are included in Appendix H.

9.0 WELL ABANDONMENT

Based on results of the two rounds of groundwater sampling, both monitoring wells, PBR-1 and PBR-1, were plugged and abandoned on May 9, 2017. The wells were plugged by slowly pouring ¾ inch bentonite chips to within one foot of the top of the casing. The chips were hydrated with potable water. The PVC casing was cut approximately 1.5 feet below ground surface. Topsoil was used to fill the remaining hole. Hydrometrics' staff member, Gary Hoffman, abandoned the wells under the direction of Hydrometrics staff member, Al Hilty. Mr. Hilty is a Montana licensed monitoring well installer (License #201). Well abandonment reports have been sent to Montana's Groundwater Information Center and a copy of those reports are included in Appendix J along with photographs of the wells before and after abandonment.

10.0 REFERENCES

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-----, November 2016. MDEQ Validation Guidelines for Evaluating Analytical Data.

Tyler, July 2001. Report of Remedial Investigation, Don and Diane Bolke Residence, Plentywood, Montana

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TABLES

TABLE 1 BOLKE RESIDENCE-ONE TIME LANDFARM SURFACE SOILS

			Date Sample Code Sample ID	EPA RSLs - Direct Contact Resident Soil [1]	Leaching to Groundwater Screening Level [2]	MDEQ Tier 1 RBSLs For Surface Soil - Residential [3]	8/4/2016 PBR-S1 BLK-1608-300	8/4/2016 PBR-S1 BLK-1608-301 Duplicate
analytic_method	Parameter	Meas Base	Unit					
SW3550C	MOISTURE % BY WT.	NO MEAS	%	-	-	-	4.5	4.6
MA-VPH	C5-C8 ALIPHATICS	VPH	mg/kg	-	-	60	< 2.1	< 2.1
MA-VPH	C9-C10 AROMATICS	VPH	mg/kg	-	-	100	< 2.1	< 2.1
MA-VPH	C9-C12 ALIPHATICS	VPH	mg/kg	-	-	100	< 2.1	< 2.1
MA-VPH	TOTAL PURGEABLE HYDROCARBONS	VPH	mg/kg	-	-	-	< 2.1	< 2.1
MA-VPH	BENZENE	VPH	mg/kg	-	-	0.04	< 0.052	< 0.052
MA-VPH	ETHYLBENZENE	VPH	mg/kg	-	-	6	< 0.052	< 0.052
MA-VPH	METHYL TERT-BUTYL ETHER	VPH	mg/kg	-	-	0.08	< 0.10	< 0.10
MA-VPH	M-P XYLENE	VPH	mg/kg	55	100	-	< 0.052	< 0.052
MA-VPH	NAPHTHALENE	VPH	mg/kg	-	-	4	< 0.10	< 0.10
MA-VPH	O-XYLENE	VPH	mg/kg	65	100	-	< 0.052	< 0.052
MA-VPH	TOLUENE	VPH	mg/kg	-	-	10	< 0.052	< 0.052
MA-VPH	TOTAL XYLENE	VPH	mg/kg	-	-	70	< 0.052	< 0.052
SW8015M	TOT EXTRACTABLE HYDROCARBON(EPHscr)	EPH	mg/kg	-	-	200	< 10	13

NOTES:

1360	Exceeds EPA RSL - Direct Contact Resident Soil
3.1	Exceeds Leaching to Groundwater Screening Level
1.79	Exceeds MDEQ Tier 1 RBSL For Surface Soil - Residential
<0.53	Non-Detect Result that Exceeds an Associated Screening Level

(1) EPA RSL - Direct Contact Resident Soil, updated May 2016

(2) Level derived from MDEQ's Attachment C, Part 2 -Soil Screening Process, Leaching to Groundwater, revised October 2013

(3) MDEQ Table 1, Tier 1 Surface Soil RBSLs, updated September 2016

TABLE 2 BOLKE RESIDENCE-GROUNDWATER

			Date	Montana DEQ-7 - GW Human Health Standards/MDEQ Groundwater RBSL	8/4/2016	8/4/2016	4/26/2017	4/26/2017	8/4/2016	4/26/2017
			Sample Code		PBR-1	PBR-1	PBR-1	PBR-1	PBR-2	PBR-2
			Sample ID		BLK-1608-201	BLK-1608-202 Duplicate	BLK-1704-101	BLK-1704-1002 Duplicate	BLK-1608-200	BLK-1704-100
Analytical Method	Parameter	Meas Base	Unit		RESULT	RESULT	RESULT	RESULT	RESULT	
FIELD	DEPTH TO WATER LEVEL	NO MEAS	ft	-	4.6		3.87		30.15	29.17
FIELD	OXIDATION REDUCTION POTENTIAL	NO MEAS	mV	-	-75.9		-61.9		133.5	176.9
FIELD	OXYGEN (O) (FLD)	NO MEAS	mg/L	-	0.58		1.17		0.52	1.48
FIELD	PH - FLD	NO MEAS	s.u.	-	6.99		6.73		7.33	6.97
FIELD	SC (UMHOS/CM AT 25 C) (FLD)	NO MEAS	umhos/cm	-	6187		5418		6571	6498
FIELD	TURBIDITY (NTU) (FLD)	NO MEAS	NTU	-	0		3.7		0	4.05
FIELD	WATER TEMPERATURE (FLD)	NO MEAS	C	-	15.5		6.6		11.6	9
MA-VPH	BENZENE	VPH	ug/L	5	0.39 J	0.38 J	< 0.50	< 0.50	< 0.50	< 0.50
MA-VPH	C5-C8 ALIPHATICS	VPH	ug/L	700	< 20	< 20	< 20	< 20	< 20	< 20
MA-VPH	C9-C10 AROMATICS	VPH	ug/L	1000	60	56	58	50	< 20	< 20
MA-VPH	C9-C12 ALIPHATICS	VPH	ug/L	1000	52	49	16 J	15 J	< 20	< 20
MA-VPH	ETHYLBENZENE	VPH	ug/L	700	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
MA-VPH	METHYL TERT-BUTYL ETHER	VPH	ug/L	30	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MA-VPH	M-P XYLENE	VPH	ug/L	10000	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
MA-VPH	NAPHTHALENE	VPH	ug/L	100	< 2.5 D	< 2.0 D	1.4	0.97 J	< 1.0	< 1.0
MA-VPH	O-XYLENE	VPH	ug/L	10000	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
MA-VPH	TOLUENE	VPH	ug/L	1000	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
MA-VPH	TOTAL PURGEABLE HYDROCARBONS	VPH	ug/L	1000	140	130	77	67	< 20	< 20
MA-VPH	TOTAL XYLENE	VPH	ug/L	10000	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
SW8015M	TOT EXTRACTABLE HYDROCARBON (EPHscr)	EPH	ug/L	1000	2050 *	1710 *	1620 *	1100 *	332	< 300
MA-EPH	C11-C22 AROMATICS	EPH	ug/L	1000	< 300	< 300	< 300	< 300		
MA-EPH	C19-C36 ALIPHATICS	EPH	ug/L	1000	< 300	< 300	< 300	< 300		
MA-EPH	C9-C18 ALIPHATICS	EPH	ug/L	1000	< 300	< 300	< 300	< 300		
MA-EPH	TOT EXTRACTABLE HYDROCARBON(EPH)	EPH	ug/L	1000	< 300	< 300	< 300	< 300		
SW8270C	1-METHYLNAPHTHALENE	NO MEAS	ug/L	-			< 0.19	< 0.19		
SW8270C	2-METHYLNAPHTHALENE	NO MEAS	ug/L	-	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	ACENAPHTHENE	NO MEAS	ug/L	670	0.84 **J**	0.35	< 0.19	< 0.19		
SW8270C	ACENAPHTHYLENE	NO MEAS	ug/L	-	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	ANTHRACENE	NO MEAS	ug/L	2100	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	BENZO (A) ANTHRACENE	NO MEAS	ug/L	0.5	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	BENZO (A) PYRENE	NO MEAS	ug/L	0.05	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	BENZO (B) FLUORANTHENE	NO MEAS	ug/L	0.5	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	BENZO (GHI) PERYLENE	NO MEAS	ug/L	-	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	BENZO (K) FLUORANTHENE	NO MEAS	ug/L	5	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	CHRYSENE	NO MEAS	ug/L	50	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	DIBENZ (A,H) ANTHRACENE	NO MEAS	ug/L	0.05	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	FLUORANTHENE	NO MEAS	ug/L	130	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	FLUORENE	NO MEAS	ug/L	1100	0.58	< 0.19	< 0.19	< 0.19		
SW8270C	INDENO (1,2,3-C,D) PYRENE	NO MEAS	ug/L	0.5	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	NAPHTHALENE	NO MEAS	ug/L	100	< 0.20	< 0.19	< 0.19	< 0.19		
SW8270C	PHENANTHRENE	NO MEAS	ug/L	-	0.30 B **U**	0.23 B	< 0.19	< 0.19		
SW8270C	PYRENE	NO MEAS	ug/L	830	< 0.20	< 0.19	< 0.19	< 0.19		

NOTES:

2.5 Exceeds MDEQ-7 Human Health Level for Groundwater or MDEQ Groundwater RBSl

LQs - Lab Qualifiers
* - Result exceeds the fractionation criteria.
B - The analyte was detected in the method blank.
D - Analyte Reporting Limit increased due to sample matrix.
J - Estimated value. The analyte was present but less than the reporting limit.

VQs - Validator Qualifiers (Bold font)
J - Associated numerical value is an estimated quantity because quality control criteria were not met.
U - Blank Exceedance. Associated value may be less than reported value or not detected due to blank contamination.

TABLE 3 BOLKE RESIDENCE-AIR (AUG 2016-MAR 2017)

Site Descriptions					Basement Sub-Slab	Basement Sub-Slab	Basement Air	Basement Air Duplicate	Basement Air	Basement Air Duplicate	Basement Air	Basement Air Duplicate	Main Level Air	Main Level Air	Main Level Air	Garage Air	Outdoor Air	Outdoor Air
		Date			8/4/2016	1/17/2017	8/4/2016	8/4/2016	1/18/2017	1/18/2017	3/21/2017	3/21/2017	8/4/2016	1/18/2017	3/21/2017	3/21/2017	8/4/2016	1/18/2017
		Sample Code			PBR-BSSA1	PBR-BSSA1	PBR-BA1	PBR-BA1	PBR-BA1	PBR-BA1	PBR-BA1	PBR-BA1	PBR-MLA1	PBR-MLA1	PBR-MLA1	PBR-GA1	PBR-OA1	PBR-OA1
		Sample ID			BLK-1608-104	BLK-1701-100	BLK-1608-100	BLK-1608-101	BLK-1701-101	BLK-1701-102	B1-170320-AA3	B1-170320-AA3D	BLK-1608-102	BLK-1701-103	B1-170320-AA1	B1-170320-AA2	BLK-1608-103	BLK-1701-104
			EPA RSL APH SL for Residential Air(1)	DEQ Adjusted APH SL(2)				Duplicate		Duplicate		Duplicate						
analytic_method	Parameter	Unit			RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
3C MODIFIED	HELIUM	PPMV	-	-	3600	2700												
MADEP APH 1.0	C5-C8 ALIPHATICS	UG/M3	94	310	410000	320000	87	56	370	420	130	140	< 38 U	480	160	1400	< 34 U	< 32 U
MADEP APH 1.0	C9-C12 ALIPHATICS	UG/M3	44	52	890000	670000	73	64	82	100	54	61	24	72	71	52	< 17 U	< 16 U
MADEP APH 1.0	C9-C10 AROMATICS	UG/M3	10.4	100	24000	12000	10	8.7	25	27	16	16	< 4.7 U	27	19	75	< 4.3 U	< 4.0 U
TO-15	BENZENE	UG/M3	1.3	1.3	< 280 U	< 180 U	< 0.91 U	< 0.94 U	2.8	2.9	1.4	1.5	< 0.95 U	3.5	2.3	15	< 0.85 U	< 0.80 U
TO-15	TOLUENE	UG/M3	520	5200	< 280 U **J**	< 180 U	3.5 **J**	1.3	17	18	8.0	8.4	1.4 **J**	22	12	83	< 0.85 U **J**	< 0.80 U
TO-15	ETHYLBENZENE	UG/M3	1.2	4.1	< 280 U	< 180 U	< 0.91 U	< 0.94 U	2.8	3.2	1.2	1.3	< 0.95 U	3.5	1.7	13	< 0.85 U	< 0.80 U
TO-15	M-P XYLENE	UG/M3	10	100	< 570 U	< 360 U	< 1.8 U	< 1.9 U	11	12	4.7	4.9	< 1.9 U	14	6.7	49	< 1.7 U	< 1.6 U
TO-15	O-XYLENE	UG/M3	10	100	< 280 U	< 180 U	< 0.91 U	< 0.94 U	3.7	4.1	1.6	1.7	< 0.95 U	4.5	2.2	16	< 0.85 U	< 0.80 U
TO-15	NAPHTHALENE	UG/M3	0.39	0.39	< 280 U	< 180 U	< 0.91 U	< 0.94 U	< 0.99	< 0.67 U	< 0.85 U	< 0.88 U	< 0.95 U	< 0.98 U	1.3	1.2	< 0.85 U	< 0.80 U

NOTES:

TOT - Total
PPMV - part per million by volume

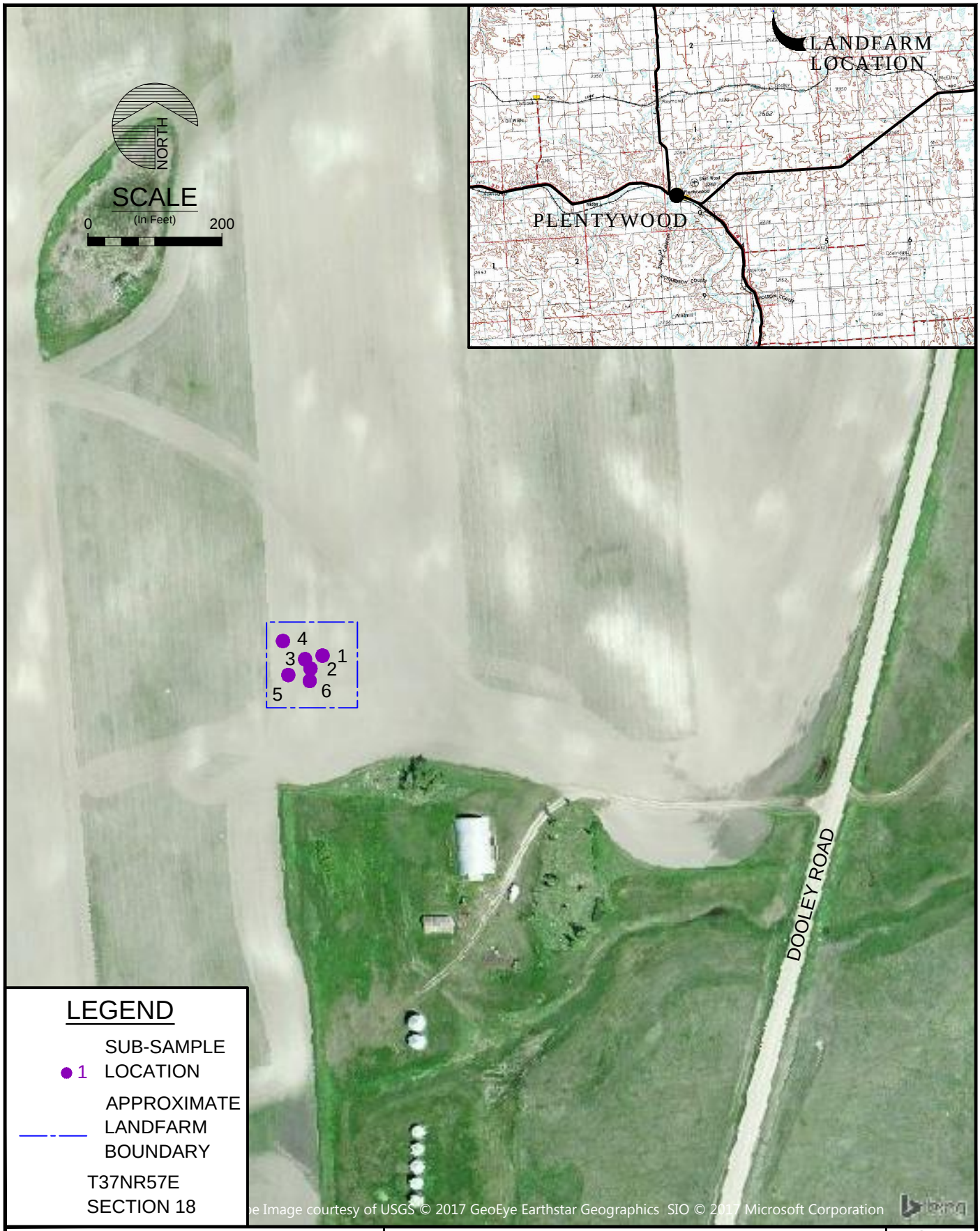
65	Exceeds EPA Generic Air Phase Hydrocarbons Screening Level (SL) for Residential Air
205	Exceeds DEQ Adjusted Air Phase Hydrocarbons SL for Residential Air
<0.53	Non-Detect Result that Exceeds an Associated Screening Level

(1) EPA Regional Screening Level (RSL) for Air Phase Petroleum Hydrocarbons (APH), Updated May 2016
(2) DEQ-Adjusted APH Screening Level, April 2017

LQs - Lab Qualifiers
U - Compound was analyzed for, but not detected above the laboratory detection limit.

VQs - Validator Qualifiers (Bold Font)
J - Associated numerical value is an estimated quantity because quality control criteria were not met.

FIGURES



BOLKE RESIDENCE CONFIRMATION SAMPLING	**LANDFARM LOCATION MAP**	FIGURE **1**

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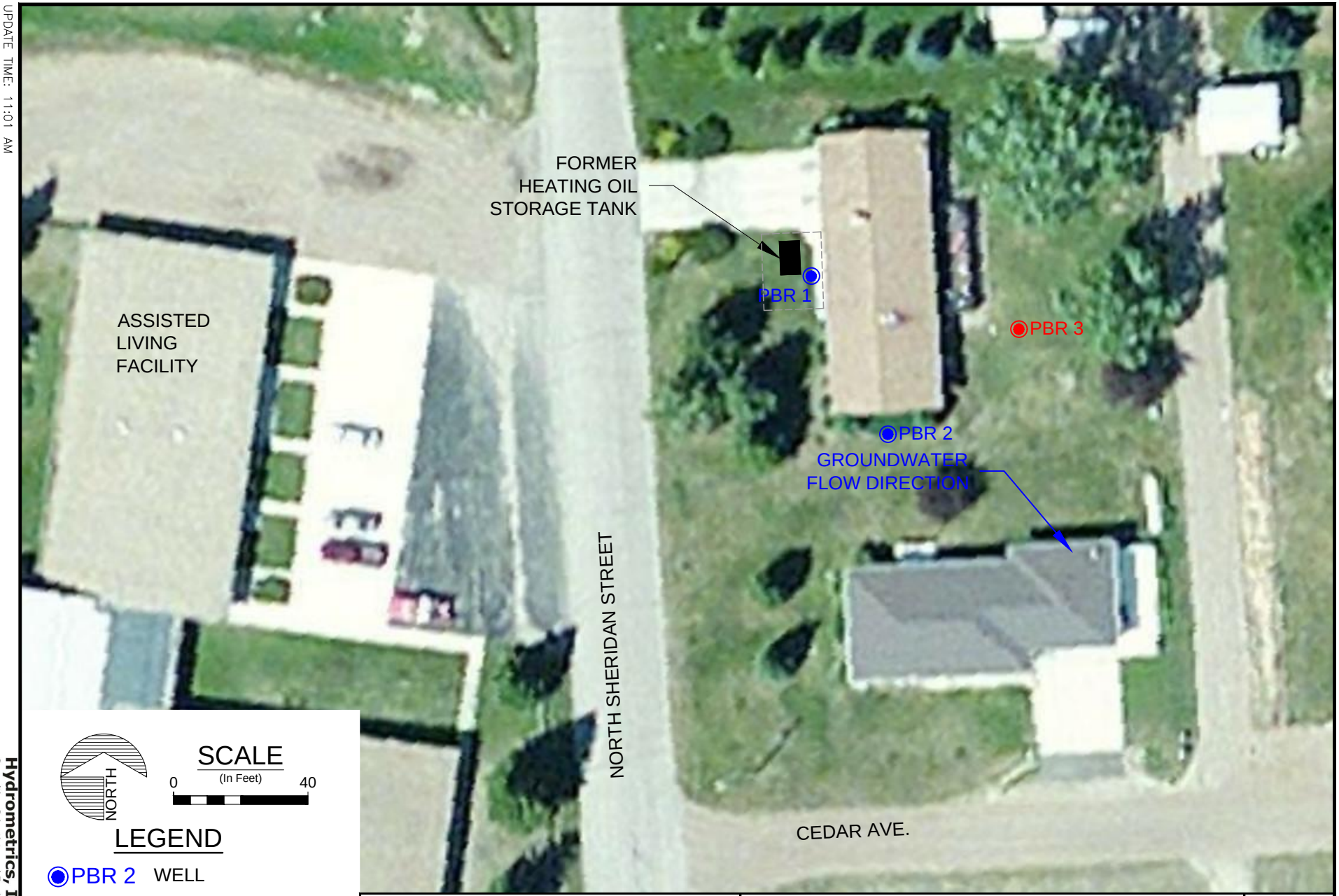
Hydrometrics, Inc.
Consulting Scientists and Engineers



BOLKE RESIDENCE
CONFIRMATION SAMPLING

BOLKE RESIDENCE
704 SHERIDAN AVE
PLENTYWOOD, MT

FIGURE
2

UPDATE TIME: 11:01 AM
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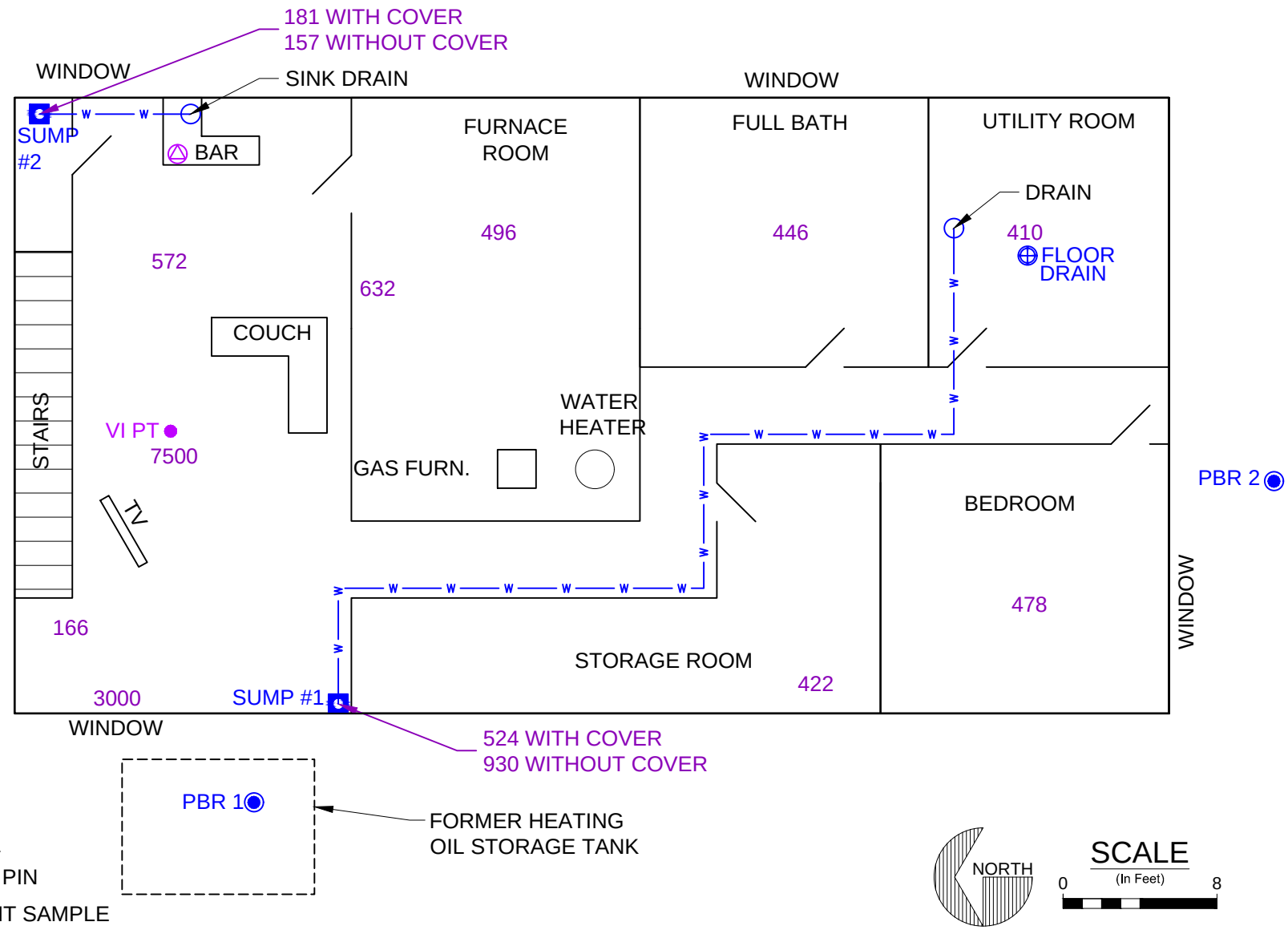
Hydrometrics, Inc.
Consulting Scientists and Engineers



LEGEND

VI PT ●	VAPOR PIN
△	AMBIENT SAMPLE LOCATION
PBR 1 ◉	WELL
166	PID READING (PPB)
—— w ——	SUMP DISCHARGE HOSE

MDEQ TASK ORDER 12A,
CONTRACT 414019
BOLKE RESIDENCE

BASEMENT LAYOUT OF BOLKE RESIDENCE PLENTYWOOD, MT

FIGURE

3

Hydrometrics, Inc.
Consulting Scientists and Engineers

UPDATE TIME: 3:26 PM
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Figure 4

Bolke Fuel Oil Release Site

APH VI Screening Level Calculator

Instructions: 1. Compare your analytical results to DEQ/EPA RSL Screening value in Table 1.
2. All compounds that exceed the Table 1: DEQ/EPA RSL Screening values must be added to the to drop down boxes under "Chemical" in Table 2 to view the adjusted screening value.

Table 1

Chemical	DEQ/EPA RSL Screen (µg/m^3)* Residential	Industrial
1,2 Dichloroethane (DCA)	0.23	0.52
1,3 Butadiene	0.1	0.46
Aliphatic (C5-C8)	94	260
Aliphatic (C9-C12)	44	44
Aromatic (C9-C10)	10	44
Benzene	1.3	1.8
Ethylbenzene	1.2	5.5
Ethylene Dibromide (EDB)	0.0052	0.022
MTBE	12	52
Naphthalene	0.39	0.4
Toluene	520	2200
Xylenes (mix of mp & o)	10	44

Table 2

	Chemical	Adjusted RSL (µg/m^3)** Residential	Industrial
1	Aliphatic (C5-C8)	**310**	**1300**
2	Aliphatic (C9-C12)	**52**	**220**
3	Aromatic (C9-C10)	**100**	**440**
4	Benzene	**1.3**	**5.9**
5	Ethylbenzene	**4.1**	**18**
6	Xylenes (mix of mp & o)	**100**	**440**
7	Naphthalene	**0.39**	**1.3**
8			
9			
10			
11			
12			

*DEQ/EPA RSL Screening values are based on a cancer risk of 1 x 10^{-6} (adjusted for 78-year lifespan) and a hazard index of 0.1 for non-carcinogens.
**Adjusted RSL values are based on a cumulative cancer risk of 1 x 10^{-5} (adjusted for 78-year lifespan) and a cumulative hazard index of 1.0 (non-carcinogens) for only those chemicals selected.
Please see DEQ's VI APH Calculator Discussion document for additional information.

FIGURE 5
Bolke Residence Indoor Air Sampling - August 2016, January 2017 and March 2017
704 North Sheridan Ave, Plentywood, Montana

ground surface

Garage

	MARCH 2017
Benzene	**15**
Ethlybenzene	**13**
Xylenes	49
Naphthalene	**1.2**
C5-C8 Aliphatics	**1400**
C9-C12 Aliphatics	52
C9-C10 Aliphatics	75

ground level (kitchen)

	AUGUST 2016	JANUARY 2017	MARCH 2017
Benzene	< 0.95	**3.5**	**2.3**
Ethlybenzene	< 0.95	3.5	1.7
Xylenes	< 0.95	14	6.7
Naphthalene	**< 0.95**	**< 0.98**	**1.3**
C5-C8 Aliphatics	< 38	**480**	160
C9-C12 Aliphatics	24	**72**	**71**
C9-C10 Aliphatics	< 4.7	27	19

basement

	AUGUST 2016	JANUARY 2017	MARCH 2017
Benzene	< 0.91 / < 0.94	**2.8 / 2.9**	**1.4 /1.5**
Ethlybenzene	< 0.91 / < 0.94	2.8 / 3.2	1.2 /1.3
Xylenes	< 1.8 / < 1.9	11 / 12	4.7 /4.9
Naphthalene	< 0.91 / < 0.94	< 0.99 / <0.67	<0.983
C5-C8 Aliphatics	87 / 56	**370 / 420**	130 / 140
C9-C12 Aliphatics	**73 /64**	**82 /100**	**54 /61**
C9-C10 Aliphatics	10 /8.7	25 /27	16 /16

subslab

	AUGUST 2016	JANUARY 2017
Benzene	< 280	< 180
Ethlybenzene	< 280	< 180
Xylenes	< 280	< 180
Naphthalene	0.993	<0.983
C5-C8 Aliphatics	410000	320000
C9-C12 Aliphatics	890000	670000
C9-C10 Aliphatics	24000	12000

DEQ Adjusted APH Screening Levels	
1.3	Benzene
4.1	Ethlybenzene
100	Xylenes (mix of mp & o)
0.39	Naphthalene
310	C5-C8 Aliphatics
52	C9-C12 Aliphatics
100	C9-C10 Aliphatics

	Ambient (Outside)	
	AUGUST 2016	JANUARY 2017
Benzene	<0.85	<0.80
Ethlybenzene	<0.85	<0.80
Xylenes (mix of mp & o)	<1.7	<1.6
Naphthalene	<0.85	<0.80
C5-C8 Aliphatics	<34	<32
C9-C12 Aliphatics	<17	<16
C9-C10 Aliphatics	< 4.3	< 4.0

NOTES:
All concentrations shown in micrograms per cubic meter (ug/m^3).
Bolded concentrations exceed the DEQ adjusted screening level.
J3 - estimated value because relative percent difference between normal and field duplicate result greater than 30%
Subslab and outdoor air not sampled in March 2017.

APPENDIX A

ENERGY LABORATORY ANALYTICAL REPORTS

ANALYTICAL SUMMARY REPORT

August 18, 2016

Hydrometrics Inc
5602 Hesper Rd
Billings, MT 59106

Work Order: B16080577

Project Name: Bolke Residence Fuel Oil Release

Energy Laboratories Inc Billings MT received the following 5 samples for Hydrometrics Inc on 8/5/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B16080577-001	BLK-1608-200	08/04/16 10:10	08/05/16	Aqueous	EPH-Liquid-Liquid Extraction Hydrocarbons, Extractable Petroleum Screen Volatile Petroleum Hydrocarbons
B16080577-002	BLK-1608-201	08/04/16 12:04	08/05/16	Aqueous	EPH-Liquid-Liquid Extraction EPH Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum Screen Volatile Petroleum Hydrocarbons Separatory Funnel Liquid-Liquid Ext. Low Level PAH
B16080577-003	BLK-1608-202	08/04/16 12:10	08/05/16	Aqueous	Same As Above
B16080577-004	BLK-1608-300	08/04/16 15:55	08/05/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture Moisture Prep Percent Moisture
B16080577-005	BLK-1608-301	08/04/16 16:00	08/05/16	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Report Date: 08/18/16

CASE NARRATIVE

Fractionation with PAHs was added to the following sample(s) per Shari Endy on 8/10/16:

B16080577-002 BLK-1608-201

B16080577-003 BLK-1608-202

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Lab ID: B16080577-001
Client Sample ID: BLK-1608-200

Report Date: 08/18/16
Collection Date: 08/04/16 10:10
DateReceived: 08/05/16
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	08/08/16 16:18 / bw
Benzene	ND	ug/L		0.50	5	MA-VPH	08/08/16 16:18 / bw
Toluene	ND	ug/L		0.50	1000	MA-VPH	08/08/16 16:18 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	08/08/16 16:18 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	08/08/16 16:18 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	08/08/16 16:18 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	08/08/16 16:18 / bw
Naphthalene	ND	ug/L		1.0	100	MA-VPH	08/08/16 16:18 / bw
C9 to C10 Aromatics	ND	ug/L		20	1000	MA-VPH	08/08/16 16:18 / bw
C5 to C8 Aliphatics	ND	ug/L		20	700	MA-VPH	08/08/16 16:18 / bw
C9 to C12 Aliphatics	ND	ug/L		20	1000	MA-VPH	08/08/16 16:18 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20	1000	MA-VPH	08/08/16 16:18 / bw
Surr: VPH Aromatics Surrogate	92.0	%REC		70-130		MA-VPH	08/08/16 16:18 / bw
Surr: VPH Aliphatics Surrogate	94.0	%REC		70-130		MA-VPH	08/08/16 16:18 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	332	ug/L		300	1000	SW8015M	08/10/16 00:06 / tmc
Surr: o-Terphenyl	59.0	%REC		40-140		SW8015M	08/10/16 00:06 / tmc

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Lab ID: B16080577-002
Client Sample ID: BLK-1608-201

Report Date: 08/18/16
Collection Date: 08/04/16 12:04
DateReceived: 08/05/16
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	08/08/16 17:27 / bw
Benzene	0.39	ug/L	J	0.50	5	MA-VPH	08/08/16 17:27 / bw
Toluene	ND	ug/L		0.50	1000	MA-VPH	08/08/16 17:27 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	08/08/16 17:27 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	08/08/16 17:27 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	08/08/16 17:27 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	08/08/16 17:27 / bw
Naphthalene	ND	ug/L	D	2.5	100	MA-VPH	08/08/16 17:27 / bw
C9 to C10 Aromatics	60	ug/L		20	1000	MA-VPH	08/08/16 17:27 / bw
C5 to C8 Aliphatics	ND	ug/L		20	700	MA-VPH	08/08/16 17:27 / bw
C9 to C12 Aliphatics	52	ug/L		20	1000	MA-VPH	08/08/16 17:27 / bw
Total Purgeable Hydrocarbons	140	ug/L		20	1000	MA-VPH	08/08/16 17:27 / bw
Surr: VPH Aromatics Surrogate	81.0	%REC		70-130		MA-VPH	08/08/16 17:27 / bw
Surr: VPH Aliphatics Surrogate	83.0	%REC		70-130		MA-VPH	08/08/16 17:27 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The sample was received in the laboratory with a pH > 2. The pH was 4.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	2050	ug/L	*	300	1000	SW8015M	08/10/16 00:50 / tmc
Surr: o-Terphenyl	79.0	%REC		40-140		SW8015M	08/10/16 00:50 / tmc

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	ND	ug/L		300	1000	MA-EPH	08/12/16 02:18 / tmc
C19 to C36 Aliphatics	ND	ug/L		300	1000	MA-EPH	08/12/16 02:18 / tmc
Surr: 1-Chloro-octadecane	54.0	%REC		40-140		MA-EPH	08/12/16 02:18 / tmc
C11 to C22 Aromatics	ND	ug/L		300	1000	MA-EPH	08/12/16 03:02 / tmc
Total Extractable Hydrocarbons	ND	ug/L		300	1000	MA-EPH	08/12/16 03:02 / tmc
Surr: 2-Bromonaphthalene	89.0	%REC		40-140		MA-EPH	08/12/16 03:02 / tmc
Surr: 2-Fluorobiphenyl	85.0	%REC		40-140		MA-EPH	08/12/16 03:02 / tmc
Surr: o-Terphenyl	68.0	%REC		40-140		MA-EPH	08/12/16 03:02 / tmc

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons.

SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
2-Methylnaphthalene	ND	ug/L		0.20		SW8270C	08/12/16 00:25 / dsm
Acenaphthene	0.84	ug/L		0.20	670	SW8270C	08/12/16 00:25 / dsm
Acenaphthylene	ND	ug/L		0.20		SW8270C	08/12/16 00:25 / dsm
Anthracene	ND	ug/L		0.20	2110	SW8270C	08/12/16 00:25 / dsm
Benzo(a)anthracene	ND	ug/L		0.20	0.5	SW8270C	08/12/16 00:25 / dsm
Benzo(a)pyrene	ND	ug/L		0.20	0.05	SW8270C	08/12/16 00:25 / dsm
Benzo(b)fluoranthene	ND	ug/L		0.20	0.5	SW8270C	08/12/16 00:25 / dsm

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Lab ID: B16080577-002
Client Sample ID: BLK-1608-201

Report Date: 08/18/16
Collection Date: 08/04/16 12:04
DateReceived: 08/05/16
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
Benzo(g,h,i)perylene	ND	ug/L		0.20		SW8270C	08/12/16 00:25 / dsm
Benzo(k)fluoranthene	ND	ug/L		0.20	5	SW8270C	08/12/16 00:25 / dsm
Chrysene	ND	ug/L		0.20	50	SW8270C	08/12/16 00:25 / dsm
Dibenzo(a,h)anthracene	ND	ug/L		0.20	0.05	SW8270C	08/12/16 00:25 / dsm
Fluoranthene	ND	ug/L		0.20	130	SW8270C	08/12/16 00:25 / dsm
Fluorene	0.58	ug/L		0.20	1100	SW8270C	08/12/16 00:25 / dsm
Indeno(1,2,3-cd)pyrene	ND	ug/L		0.20	0.5	SW8270C	08/12/16 00:25 / dsm
Naphthalene	ND	ug/L		0.20	100	SW8270C	08/12/16 00:25 / dsm
Phenanthrene	0.30	ug/L	B	0.20		SW8270C	08/12/16 00:25 / dsm
Pyrene	ND	ug/L		0.20	830	SW8270C	08/12/16 00:25 / dsm
Surr: 2-Fluorobiphenyl	71.0	%REC		40-140		SW8270C	08/12/16 00:54 / dsm
Surr: o-Terphenyl	51.0	%REC		40-140		SW8270C	08/12/16 00:54 / dsm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
B - The analyte was detected in the method blank.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Lab ID: B16080577-003
Client Sample ID: BLK-1608-202

Report Date: 08/18/16
Collection Date: 08/04/16 12:10
DateReceived: 08/05/16
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	08/08/16 18:36 / bw
Benzene	0.38	ug/L	J	0.50	5	MA-VPH	08/08/16 18:36 / bw
Toluene	ND	ug/L		0.50	1000	MA-VPH	08/08/16 18:36 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	08/08/16 18:36 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	08/08/16 18:36 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	08/08/16 18:36 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	08/08/16 18:36 / bw
Naphthalene	ND	ug/L	D	2.0	100	MA-VPH	08/08/16 18:36 / bw
C9 to C10 Aromatics	56	ug/L		20	1000	MA-VPH	08/08/16 18:36 / bw
C5 to C8 Aliphatics	ND	ug/L		20	700	MA-VPH	08/08/16 18:36 / bw
C9 to C12 Aliphatics	49	ug/L		20	1000	MA-VPH	08/08/16 18:36 / bw
Total Purgeable Hydrocarbons	130	ug/L		20	1000	MA-VPH	08/08/16 18:36 / bw
Surr: VPH Aromatics Surrogate	92.0	%REC		70-130		MA-VPH	08/08/16 18:36 / bw
Surr: VPH Aliphatics Surrogate	93.0	%REC		70-130		MA-VPH	08/08/16 18:36 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The sample was received in the laboratory with a pH > 2. The pH was 3.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	1710	ug/L	*	300	1000	SW8015M	08/10/16 01:34 / tmc
Surr: o-Terphenyl	74.0	%REC		40-140		SW8015M	08/10/16 01:34 / tmc

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	ND	ug/L		300	1000	MA-EPH	08/12/16 00:08 / tmc
C19 to C36 Aliphatics	ND	ug/L		300	1000	MA-EPH	08/12/16 00:08 / tmc
Surr: 1-Chloro-octadecane	54.0	%REC		40-140		MA-EPH	08/12/16 00:08 / tmc
C11 to C22 Aromatics	ND	ug/L		300	1000	MA-EPH	08/12/16 00:51 / tmc
Total Extractable Hydrocarbons	ND	ug/L		300	1000	MA-EPH	08/12/16 00:51 / tmc
Surr: 2-Bromonaphthalene	83.0	%REC		40-140		MA-EPH	08/12/16 00:51 / tmc
Surr: 2-Fluorobiphenyl	87.0	%REC		40-140		MA-EPH	08/12/16 00:51 / tmc
Surr: o-Terphenyl	71.0	%REC		40-140		MA-EPH	08/12/16 00:51 / tmc

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons.

SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
2-Methylnaphthalene	ND	ug/L		0.19		SW8270C	08/12/16 01:23 / dsm
Acenaphthene	0.35	ug/L		0.19	670	SW8270C	08/12/16 01:23 / dsm
Acenaphthylene	ND	ug/L		0.19		SW8270C	08/12/16 01:23 / dsm
Anthracene	ND	ug/L		0.19	2110	SW8270C	08/12/16 01:23 / dsm
Benzo(a)anthracene	ND	ug/L		0.19	0.5	SW8270C	08/12/16 01:23 / dsm
Benzo(a)pyrene	ND	ug/L		0.19	0.05	SW8270C	08/12/16 01:23 / dsm
Benzo(b)fluoranthene	ND	ug/L		0.19	0.5	SW8270C	08/12/16 01:23 / dsm

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Lab ID: B16080577-003
Client Sample ID: BLK-1608-202

Report Date: 08/18/16
Collection Date: 08/04/16 12:10
DateReceived: 08/05/16
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
Benzo(g,h,i)perylene	ND	ug/L		0.19		SW8270C	08/12/16 01:23 / dsm
Benzo(k)fluoranthene	ND	ug/L		0.19	5	SW8270C	08/12/16 01:23 / dsm
Chrysene	ND	ug/L		0.19	50	SW8270C	08/12/16 01:23 / dsm
Dibenzo(a,h)anthracene	ND	ug/L		0.19	0.05	SW8270C	08/12/16 01:23 / dsm
Fluoranthene	ND	ug/L		0.19	130	SW8270C	08/12/16 01:23 / dsm
Fluorene	ND	ug/L		0.19	1100	SW8270C	08/12/16 01:23 / dsm
Indeno(1,2,3-cd)pyrene	ND	ug/L		0.19	0.5	SW8270C	08/12/16 01:23 / dsm
Naphthalene	ND	ug/L		0.19	100	SW8270C	08/12/16 01:23 / dsm
Phenanthrene	0.23	ug/L	B	0.19		SW8270C	08/12/16 01:23 / dsm
Pyrene	ND	ug/L		0.19	830	SW8270C	08/12/16 01:23 / dsm
Surr: 2-Fluorobiphenyl	71.0	%REC		40-140		SW8270C	08/12/16 01:52 / dsm
Surr: o-Terphenyl	57.0	%REC		40-140		SW8270C	08/12/16 01:52 / dsm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
B - The analyte was detected in the method blank.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Lab ID: B16080577-004
Client Sample ID: BLK-1608-300

Report Date: 08/18/16
Collection Date: 08/04/16 15:55
DateReceived: 08/05/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	4.5	wt%		0.2		SW3550C	08/05/16 12:01 / amn
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.10	0.08	MA-VPH	08/09/16 22:10 / bw
Benzene	ND	mg/kg-dry		0.052	0.04	MA-VPH	08/09/16 22:10 / bw
Toluene	ND	mg/kg-dry		0.052	10	MA-VPH	08/09/16 22:10 / bw
Ethylbenzene	ND	mg/kg-dry		0.052	6	MA-VPH	08/09/16 22:10 / bw
m+p-Xylenes	ND	mg/kg-dry		0.052		MA-VPH	08/09/16 22:10 / bw
o-Xylene	ND	mg/kg-dry		0.052		MA-VPH	08/09/16 22:10 / bw
Xylenes, Total	ND	mg/kg-dry		0.052	70	MA-VPH	08/09/16 22:10 / bw
Naphthalene	ND	mg/kg-dry		0.10	4	MA-VPH	08/09/16 22:10 / bw
C9 to C10 Aromatics	ND	mg/kg-dry		2.1	100	MA-VPH	08/09/16 22:10 / bw
C5 to C8 Aliphatics	ND	mg/kg-dry		2.1	60	MA-VPH	08/09/16 22:10 / bw
C9 to C12 Aliphatics	ND	mg/kg-dry		2.1	100	MA-VPH	08/09/16 22:10 / bw
Total Purgeable Hydrocarbons	ND	mg/kg-dry		2.1	100	MA-VPH	08/09/16 22:10 / bw
Surr: VPH Aromatics Surrogate	96.0	%REC		70-130		MA-VPH	08/09/16 22:10 / bw
Surr: VPH Aliphatics Surrogate	96.0	%REC		70-130		MA-VPH	08/09/16 22:10 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	ND	mg/kg-dry		10	200	SW8015M	08/06/16 07:57 / mdw
Surr: o-Terphenyl	86.0	%REC		40-140		SW8015M	08/06/16 07:57 / mdw

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release
Lab ID: B16080577-005
Client Sample ID: BLK-1608-301

Report Date: 08/18/16
Collection Date: 08/04/16 16:00
DateReceived: 08/05/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	4.6	wt%		0.2		SW3550C	08/05/16 12:06 / amn
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.10	0.08	MA-VPH	08/09/16 23:18 / bw
Benzene	ND	mg/kg-dry		0.052	0.04	MA-VPH	08/09/16 23:18 / bw
Toluene	ND	mg/kg-dry		0.052	10	MA-VPH	08/09/16 23:18 / bw
Ethylbenzene	ND	mg/kg-dry		0.052	6	MA-VPH	08/09/16 23:18 / bw
m+p-Xylenes	ND	mg/kg-dry		0.052		MA-VPH	08/09/16 23:18 / bw
o-Xylene	ND	mg/kg-dry		0.052		MA-VPH	08/09/16 23:18 / bw
Xylenes, Total	ND	mg/kg-dry		0.052	70	MA-VPH	08/09/16 23:18 / bw
Naphthalene	ND	mg/kg-dry		0.10	4	MA-VPH	08/09/16 23:18 / bw
C9 to C10 Aromatics	ND	mg/kg-dry		2.1	100	MA-VPH	08/09/16 23:18 / bw
C5 to C8 Aliphatics	ND	mg/kg-dry		2.1	60	MA-VPH	08/09/16 23:18 / bw
C9 to C12 Aliphatics	ND	mg/kg-dry		2.1	100	MA-VPH	08/09/16 23:18 / bw
Total Purgeable Hydrocarbons	ND	mg/kg-dry		2.1	100	MA-VPH	08/09/16 23:18 / bw
Surr: VPH Aromatics Surrogate	97.0	%REC		70-130		MA-VPH	08/09/16 23:18 / bw
Surr: VPH Aliphatics Surrogate	97.0	%REC		70-130		MA-VPH	08/09/16 23:18 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	13	mg/kg-dry		10	200	SW8015M	08/06/16 08:39 / mdw
Surr: o-Terphenyl	88.0	%REC		40-140		SW8015M	08/06/16 08:39 / mdw

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 101553
Lab ID: LCS-101553	Laboratory Control Sample				Run: VARIAN1_160808B				08/09/16 18:44
1,2,4-Trimethylbenzene	2.60	mg/kg	0.10	104	70	130			
2,2,4-Trimethylpentane	2.59	mg/kg	0.10	104	70	130			
2-Methylpentane	2.38	mg/kg	0.10	95	70	130			
n-Butylcyclohexane	2.59	mg/kg	0.10	104	70	130			
n-Decane	2.41	mg/kg	0.10	97	70	130			
n-Pentane	2.04	mg/kg	0.10	82	70	130			
Methyl tert-butyl ether (MTBE)	2.38	mg/kg	0.10	95	70	130			
Benzene	2.47	mg/kg	0.050	99	70	130			
Toluene	2.44	mg/kg	0.050	98	70	130			
Ethylbenzene	2.46	mg/kg	0.050	99	70	130			
m+p-Xylenes	5.05	mg/kg	0.050	101	70	130			
o-Xylene	2.48	mg/kg	0.050	99	70	130			
Naphthalene	2.59	mg/kg	0.10	104	70	130			
Total Purgeable Hydrocarbons	37.2	mg/kg	2.0	99	70	130			
Surr: VPH Aromatics Surrogate			0.10	104	70	130			
Surr: VPH Aliphatics Surrogate			0.10	104	70	130			
Lab ID: MB-101553	Method Blank				Run: VARIAN1_160808B				08/09/16 21:36
Methyl tert-butyl ether (MTBE)	ND	mg/kg	0.10						
Benzene	ND	mg/kg	0.050						
Toluene	ND	mg/kg	0.050						
Ethylbenzene	ND	mg/kg	0.050						
m+p-Xylenes	ND	mg/kg	0.050						
o-Xylene	ND	mg/kg	0.050						
Xylenes, Total	ND	mg/kg	0.050						
Naphthalene	ND	mg/kg	0.10						
C9 to C10 Aromatics	ND	mg/kg	2.0						
C5 to C8 Aliphatics	ND	mg/kg	2.0						
C9 to C12 Aliphatics	ND	mg/kg	2.0						
Total Purgeable Hydrocarbons	ND	mg/kg	2.0						
Surr: VPH Aromatics Surrogate			0.10	99	70	130			
Surr: VPH Aliphatics Surrogate			0.10	98	70	130			
Lab ID: B16080577-004AMS	Sample Matrix Spike				Run: VARIAN1_160810A				08/10/16 12:29
Methyl tert-butyl ether (MTBE)	2.34	mg/kg-dry	0.10	90	70	130			
Benzene	2.40	mg/kg-dry	0.052	92	70	130			
Toluene	2.36	mg/kg-dry	0.052	90	70	130			
Ethylbenzene	2.41	mg/kg-dry	0.052	92	70	130			
m+p-Xylenes	4.94	mg/kg-dry	0.052	95	70	130			
o-Xylene	2.42	mg/kg-dry	0.052	93	70	130			
Naphthalene	2.47	mg/kg-dry	0.10	95	70	130			
Total Purgeable Hydrocarbons	36.6	mg/kg-dry	2.1	93	70	130			
Surr: VPH Aromatics Surrogate			0.10	96	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release

Report Date: 08/18/16
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 101553
Lab ID: B16080577-004AMS	Sample Matrix Spike				Run: VARIAN1_160810A				08/10/16 12:29
Surr: VPH Aliphatics Surrogate			0.10	94	70	130			
Lab ID: B16080577-004AMSD	Sample Matrix Spike Duplicate				Run: VARIAN1_160810A				08/10/16 13:03
Methyl tert-butyl ether (MTBE)	2.36	mg/kg-dry	0.10	90	70	130	0.6	20	
Benzene	2.46	mg/kg-dry	0.052	94	70	130	2.5	20	
Toluene	2.44	mg/kg-dry	0.052	93	70	130	3.2	20	
Ethylbenzene	2.46	mg/kg-dry	0.052	94	70	130	2.1	20	
m+p-Xylenes	5.08	mg/kg-dry	0.052	97	70	130	2.8	20	
o-Xylene	2.51	mg/kg-dry	0.052	96	70	130	3.8	20	
Naphthalene	2.59	mg/kg-dry	0.10	99	70	130	4.7	20	
Total Purgeable Hydrocarbons	38.1	mg/kg-dry	2.1	97	70	130	3.9	20	
Surr: VPH Aromatics Surrogate			0.10	98	70	130			
Surr: VPH Aliphatics Surrogate			0.10	95	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release

Report Date: 08/18/16
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Analytical Run: R265191
Lab ID: CCV_0808VAR04r-W	Continuing Calibration Verification Standard								08/08/16 11:03
1,2,4-Trimethylbenzene	25.3	ug/L	1.0	101	75	125			
2,2,4-Trimethylpentane	26.3	ug/L	1.0	105	75	125			
2-Methylpentane	27.1	ug/L	1.0	109	75	125			
n-Butylcyclohexane	26.3	ug/L	1.0	105	75	125			
n-Decane	25.4	ug/L	1.0	102	75	125			
Methyl tert-butyl ether (MTBE)	24.8	ug/L	1.0	99	75	125			
Benzene	24.9	ug/L	0.50	100	75	125			
Toluene	24.5	ug/L	0.50	98	75	125			
Ethylbenzene	24.6	ug/L	0.50	98	75	125			
m+p-Xylenes	49.7	ug/L	0.50	99	75	125			
o-Xylene	24.5	ug/L	0.50	98	75	125			
Naphthalene	25.8	ug/L	1.0	103	75	125			
n-Pentane	28.2	ug/L	1.0	113	75	125			
Surr: VPH Aromatics Surrogate			1.0	97	75	125			
Surr: VPH Aliphatics Surrogate			1.0	98	75	125			
Method: MA-VPH									Batch: R265191
Lab ID: LCS_0808VAR05r	Laboratory Control Sample				Run: VARIAN1_160808A				08/08/16 11:37
1,2,4-Trimethylbenzene	26.0	ug/L	1.0	104	70	130			
2,2,4-Trimethylpentane	25.8	ug/L	1.0	103	70	130			
2-Methylpentane	24.5	ug/L	1.0	98	70	130			
n-Butylcyclohexane	27.8	ug/L	1.0	111	70	130			
n-Decane	25.8	ug/L	1.0	103	70	130			
Methyl tert-butyl ether (MTBE)	24.5	ug/L	1.0	98	70	130			
Benzene	25.0	ug/L	0.50	100	70	130			
Toluene	24.5	ug/L	0.50	98	70	130			
Ethylbenzene	24.9	ug/L	0.50	100	70	130			
m+p-Xylenes	51.1	ug/L	0.50	102	70	130			
o-Xylene	25.0	ug/L	0.50	100	70	130			
Naphthalene	26.4	ug/L	1.0	106	70	130			
Total Purgeable Hydrocarbons	387	ug/L	20	103	70	130			
n-Pentane	23.8	ug/L	1.0	95	70	130			
Surr: VPH Aromatics Surrogate			1.0	101	70	130			
Surr: VPH Aliphatics Surrogate			1.0	102	70	130			
Lab ID: MBLK_0808VAR09r	Method Blank				Run: VARIAN1_160808A				08/08/16 14:01
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Benzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release

Report Date: 08/18/16
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: R265191
Lab ID: MBLK_0808VAR09r	Method Blank				Run: VARIAN1_160808A				08/08/16 14:01
Naphthalene	ND	ug/L	1.0						
C9 to C10 Aromatics	ND	ug/L	20						
C5 to C8 Aliphatics	ND	ug/L	20						
C9 to C12 Aliphatics	ND	ug/L	20						
Total Purgeable Hydrocarbons	ND	ug/L	20						
Surr: VPH Aromatics Surrogate			1.0	98	70	130			
Surr: VPH Aliphatics Surrogate			1.0	98	70	130			
Lab ID: B16080577-002BMS	Sample Matrix Spike				Run: VARIAN1_160808A				08/09/16 15:53
Methyl tert-butyl ether (MTBE)	25.0	ug/L	1.0	100	70	130			
Benzene	24.9	ug/L	0.50	98	70	130			
Toluene	24.1	ug/L	0.50	96	70	130			
Ethylbenzene	24.7	ug/L	0.50	99	70	130			
m+p-Xylenes	50.1	ug/L	0.50	100	70	130			
o-Xylene	24.8	ug/L	0.50	99	70	130			
Naphthalene	28.7	ug/L	1.0	107	70	130			
Total Purgeable Hydrocarbons	510	ug/L	20	99	70	130			
Surr: VPH Aromatics Surrogate			1.0	96	70	130			
Surr: VPH Aliphatics Surrogate			1.0	94	70	130			
- The sample was received in the laboratory with a pH > 2. The pH was 5.									
Lab ID: B16080577-002BMSD	Sample Matrix Spike Duplicate				Run: VARIAN1_160808A				08/09/16 16:27
Methyl tert-butyl ether (MTBE)	24.7	ug/L	1.0	99	70	130	1.2	20	
Benzene	24.8	ug/L	0.50	97	70	130	0.8	20	
Toluene	24.0	ug/L	0.50	96	70	130	0.6	20	
Ethylbenzene	24.5	ug/L	0.50	98	70	130	0.7	20	
m+p-Xylenes	49.9	ug/L	0.50	100	70	130	0.5	20	
o-Xylene	24.7	ug/L	0.50	99	70	130	0.4	20	
Naphthalene	29.9	ug/L	1.0	111	70	130	4.2	20	
Total Purgeable Hydrocarbons	529	ug/L	20	104	70	130	3.6	20	
Surr: VPH Aromatics Surrogate			1.0	95	70	130			
Surr: VPH Aliphatics Surrogate			1.0	95	70	130			
- The sample was received in the laboratory with a pH > 2. The pH was 5.									

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Analytical Run: R265261
Lab ID: CCV_0808VAR32r-S	Continuing Calibration Verification Standard								08/09/16 10:06
1,2,4-Trimethylbenzene	2.48	mg/kg	0.10	99	75	125			
2,2,4-Trimethylpentane	2.63	mg/kg	0.10	105	75	125			
2-Methylpentane	2.71	mg/kg	0.10	108	75	125			
n-Butylcyclohexane	2.63	mg/kg	0.10	105	75	125			
n-Decane	2.59	mg/kg	0.10	104	75	125			
n-Pentane	2.83	mg/kg	0.10	113	75	125			
Methyl tert-butyl ether (MTBE)	2.51	mg/kg	0.10	100	75	125			
Benzene	2.47	mg/kg	0.050	99	75	125			
Toluene	2.43	mg/kg	0.050	97	75	125			
Ethylbenzene	2.44	mg/kg	0.050	98	75	125			
m+p-Xylenes	4.90	mg/kg	0.050	98	75	125			
o-Xylene	2.43	mg/kg	0.050	97	75	125			
Naphthalene	2.43	mg/kg	0.10	97	75	125			
Surr: VPH Aromatics Surrogate			0.10	94	75	125			
Surr: VPH Aliphatics Surrogate			0.10	96	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

BLK-1608-200

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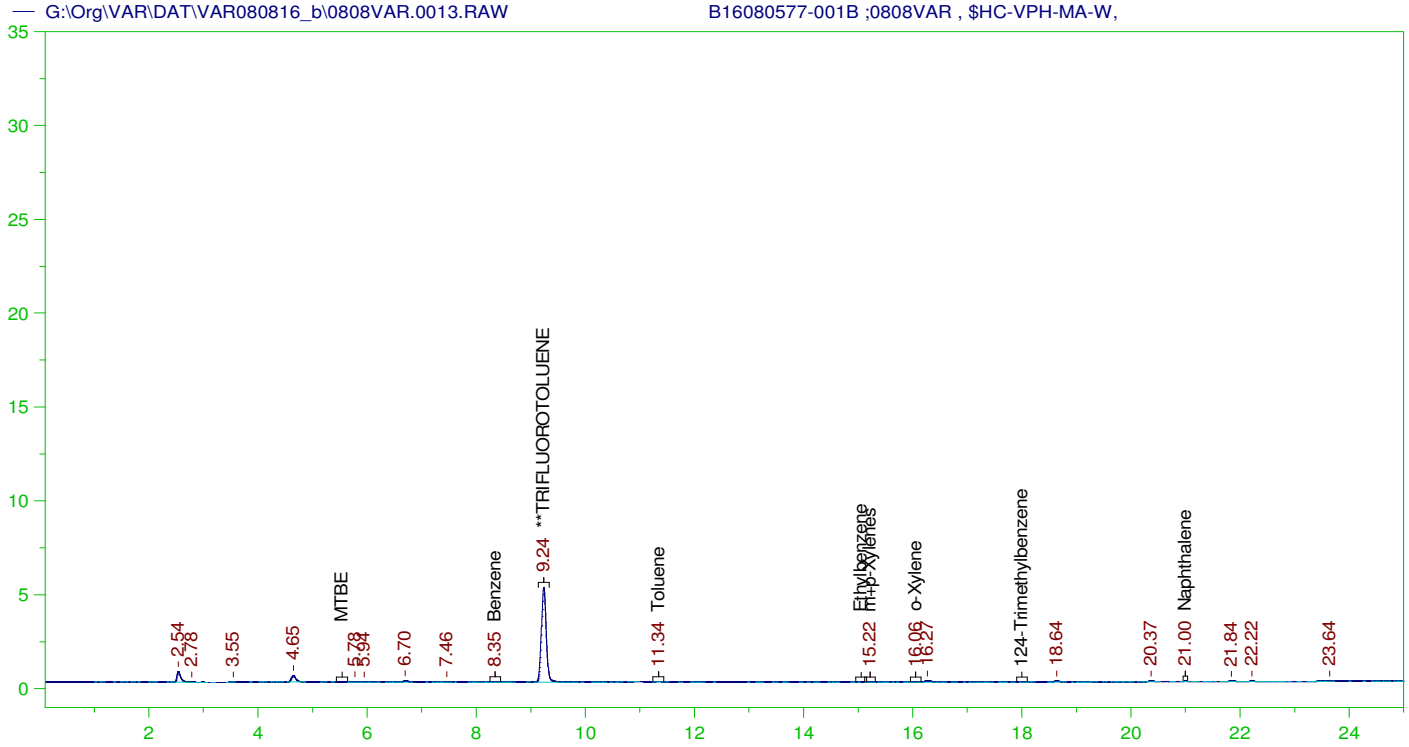

VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-001B ;0808VAR , $HC-VPH-MA-W,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VAR.0013.RAW
Date & Time Acquired: 8/8/2016 4:18:35 PM
Method File: G:\Org\VAR\Methods\160714VARV577-1.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 627.5101
Rt range for C9 to C10 Aromatics: 16.155 to 20.956
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1668.041 C9-C10 Aromatics Amount: 0.5316378

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	8.349	8.349	8.349	155	.5	U
Toluene	11.345	11.345	11.345	151	.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	15.225	15.225	15.225	116	.5	U
o-Xylene	16.056	16.056	16.056	108	.5	U
124-Trimethylbenzene	.	.	.		.5	U
Naphthalene	20.999	20.999	20.999	96	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.238	25.	23.094	92.38	70-130

BLK-1608-200

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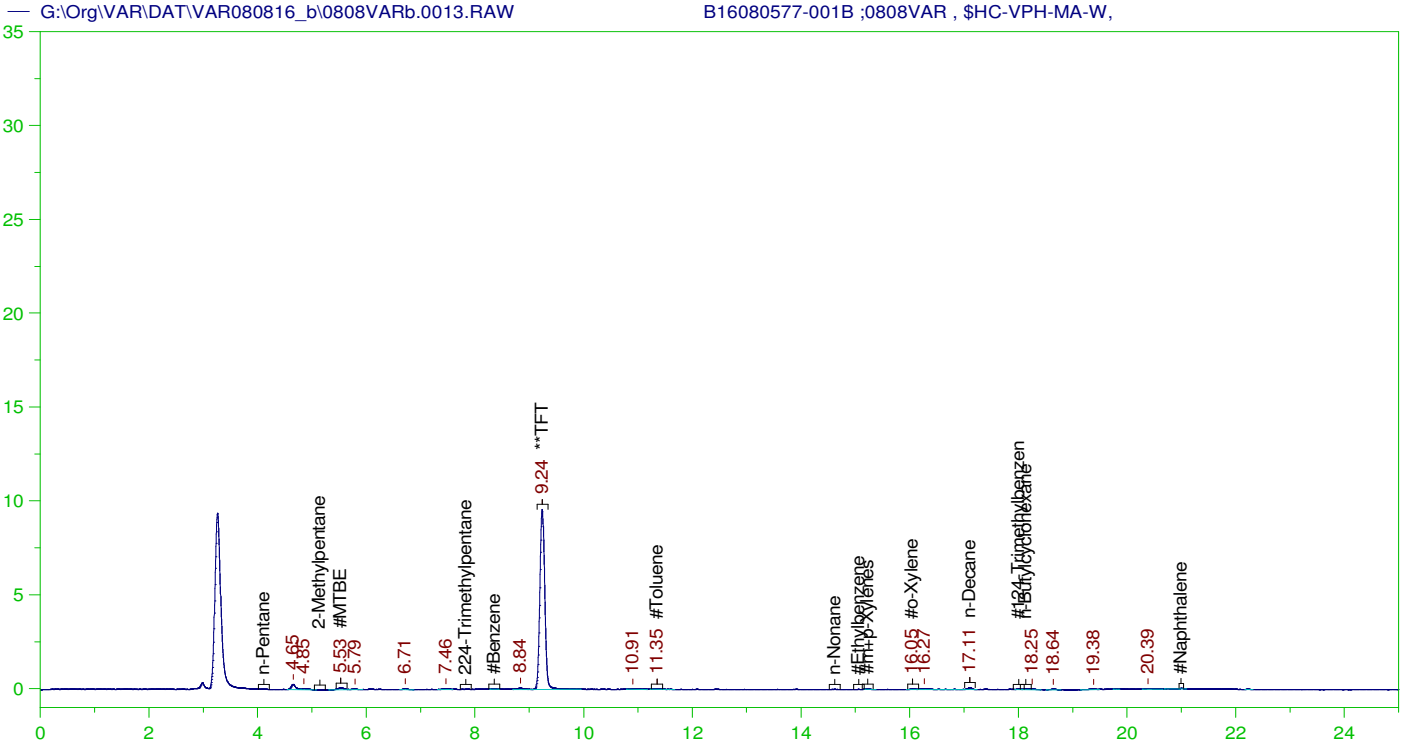

VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-001B ;0808VAR , $HC-VPH-MA-W,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VARb.0013.RAW
Date & Time Acquired: 8/8/2016 4:18:35 PM
Method File: G:\Org\VAR\Methods\160714VARV577-1B.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 502.4956
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 537.0638
Mean RF for all calibrated compounds: 668.7858
Rt range for Gasoline Range Organics: 5.046 to 17.209
Rt range for C5 to C8 Aliphatic Hydrocarbons: 4.016 to 14.52
Rt range for C9 to C12 Aliphatic Hydrocarbons: 14.57 to 20.957

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	9.239	25.	23.409	93.64 -

GRO Area:4476.082 GRO Amount: 1.33857
TPH Area:8256.719 TPH Amount: 2.469167

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:5050.352 C5-C8 Amount: 2.010108
C9-C12 Area:2987.996 C9-C12 Amount: 1.112715

BLK-1608-201

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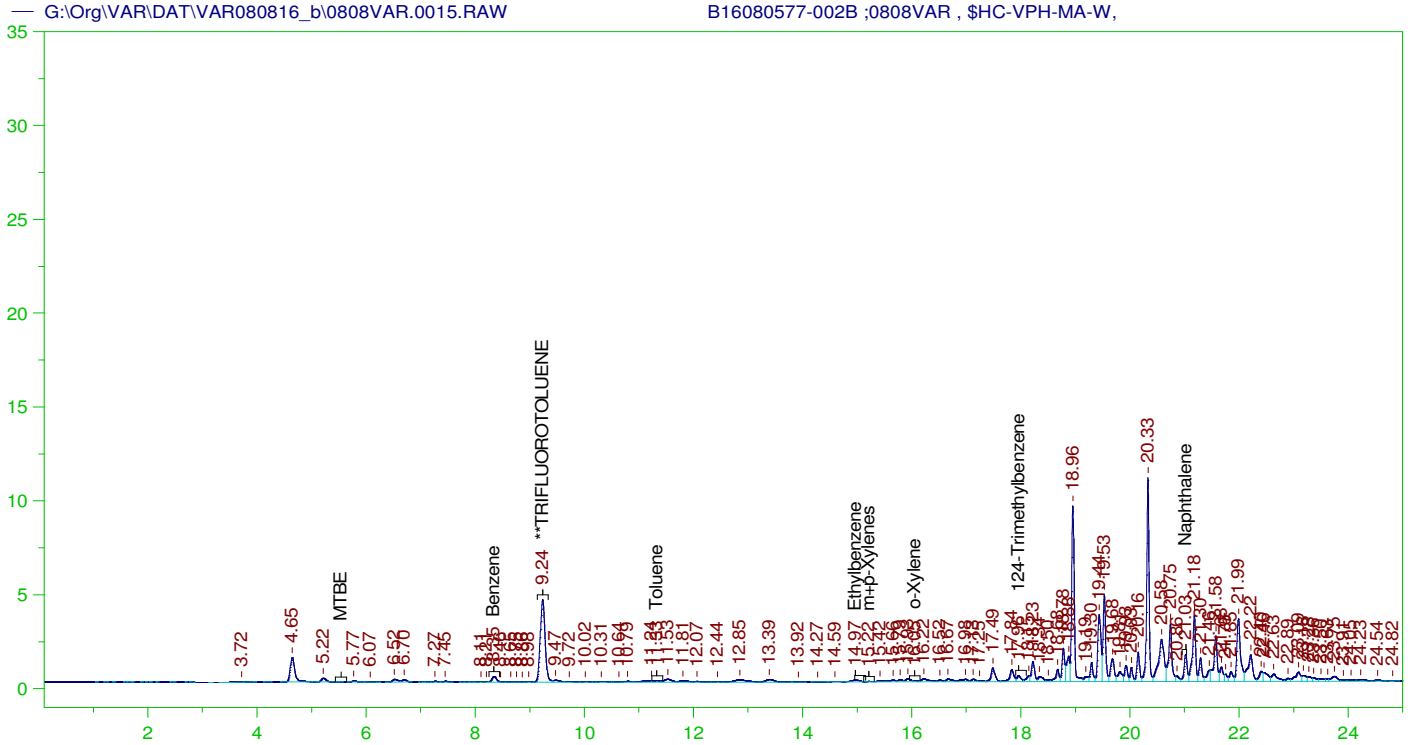

VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-002B ;0808VAR , $HC-VPH-MA-W,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VAR.0015.RAW
Date & Time Acquired: 8/8/2016 5:27:29 PM
Method File: G:\Org\VAR\Methods\160714VARV577-2.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 627.5101
Rt range for C9 to C10 Aromatics: 16.155 to 20.956
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:189303.8 C9-C10 Aromatics Amount: 60.33488

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	8.345	.89	.89	1764	.39	J
Toluene	11.328	11.328	11.328	627	.5	U
Ethylbenzene	14.968	14.968	14.968	948	.5	U
m+p-Xylenes	15.217	15.217	15.217	142	.5	U
o-Xylene	16.055	16.055	16.055	363	.5	U
124-Trimethylbenzene	17.959	-8.765	-8.723	1724	.58	
Naphthalene	21.026	-11.758	-11.79	5621	~~2.041~~	< 2.5 Bw8/10/16

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.235	25.	20.181	80.72	70-130

BLK-1608-201

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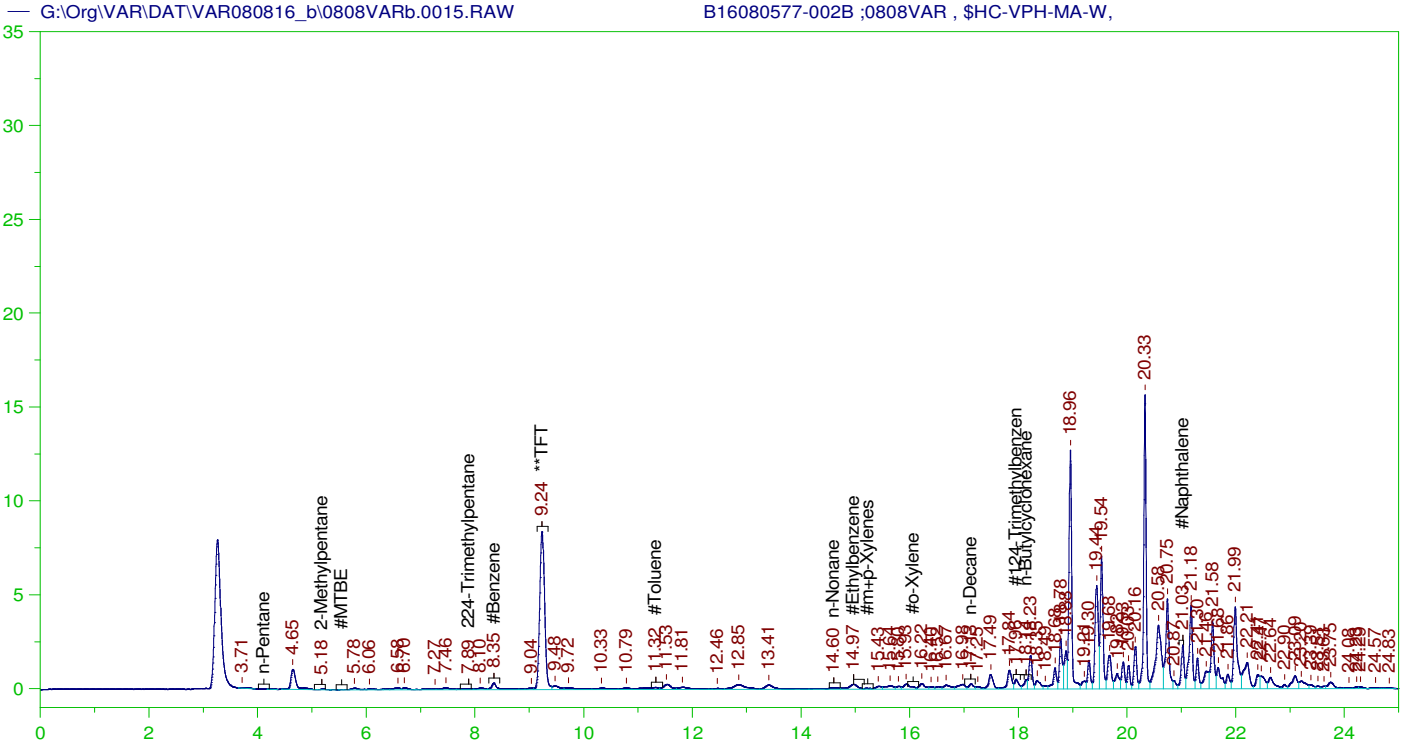

VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-002B ;0808VAR , $HC-VPH-MA-W,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VARb.0015.RAW
Date & Time Acquired: 8/8/2016 5:27:29 PM
Method File: G:\Org\VAR\Methods\160714VARV577-2B.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 502.4956
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 537.0638
Mean RF for all calibrated compounds: 668.7858
Rt range for Gasoline Range Organics: 5.046 to 17.209
Rt range for C5 to C8 Aliphatic Hydrocarbons: 4.016 to 14.52
Rt range for C9 to C12 Aliphatic Hydrocarbons: 14.57 to 20.957

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	9.236	25.	20.628	82.51 -

GRO Area:51291.79 GRO Amount: 15.33878
TPH Area:466501.9 TPH Amount: 139.5071

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:36610.52 C5-C8 Amount: 14.57148
C9-C12 Area:300653.9 C9-C12 Amount: 111.9621

BLK-1608-202

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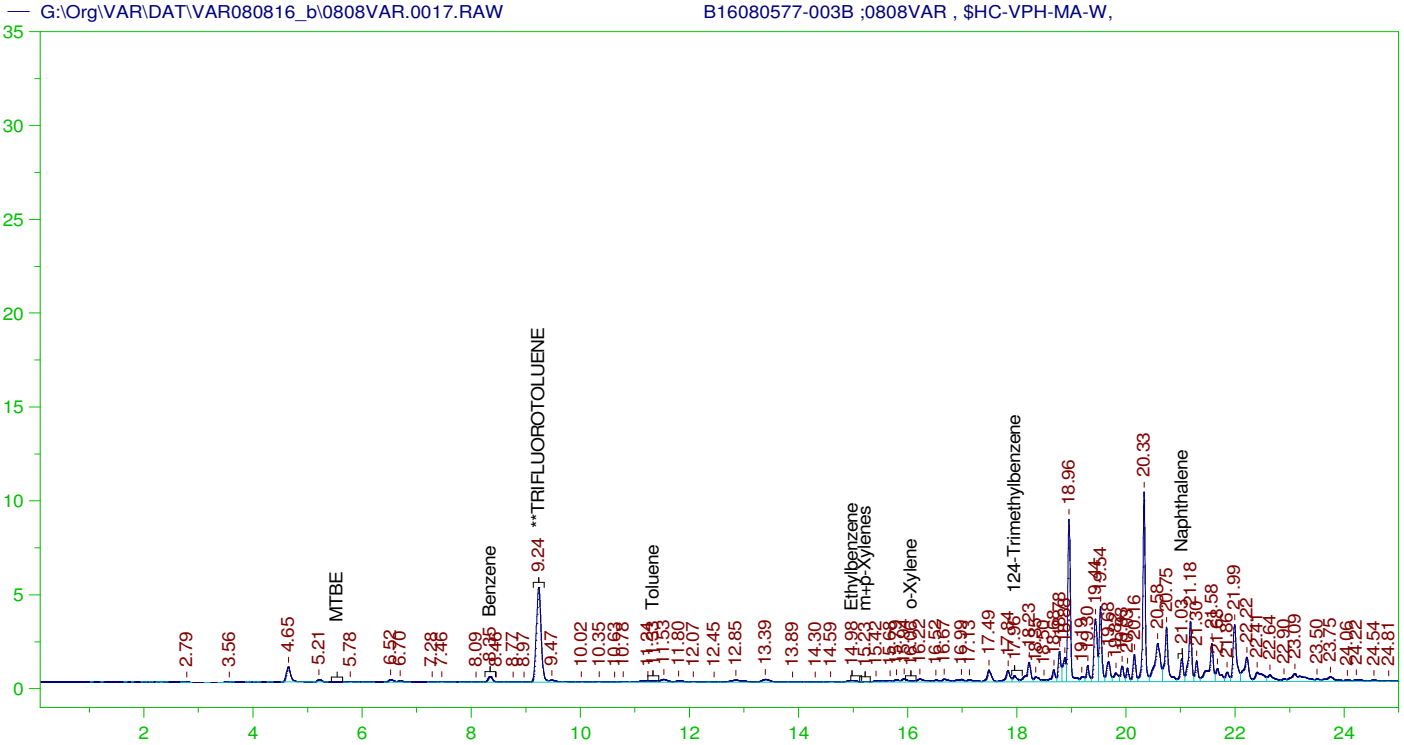

VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-003B ;0808VAR , $HC-VPH-MA-W,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VAR.0017.RAW
Date & Time Acquired: 8/8/2016 6:36:24 PM
Method File: G:\Org\VAR\Methods\160714VARV577-3.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 627.5101
Rt range for C9 to C10 Aromatics: 16.155 to 20.956
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:175363.8 C9-C10 Aromatics Amount: 55.89196

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	8.346	.89	.891	1738	.384	J
Toluene	11.333	11.333	11.333	608	.5	U
Ethylbenzene	14.982	14.982	14.982	892	.5	U
m+p-Xylenes	15.225	15.225	15.225	188	.5	U
o-Xylene	16.06	16.06	16.06	388	.5	U
124-Trimethylbenzene	17.96	-8.765	-8.724	1665	.56	
Naphthalene	21.028	-11.758	-11.791	4857	~~1.764~~	< 2.0 Bw8/10/16

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.237	25.	22.922	91.69	70-130

BLK-1608-202

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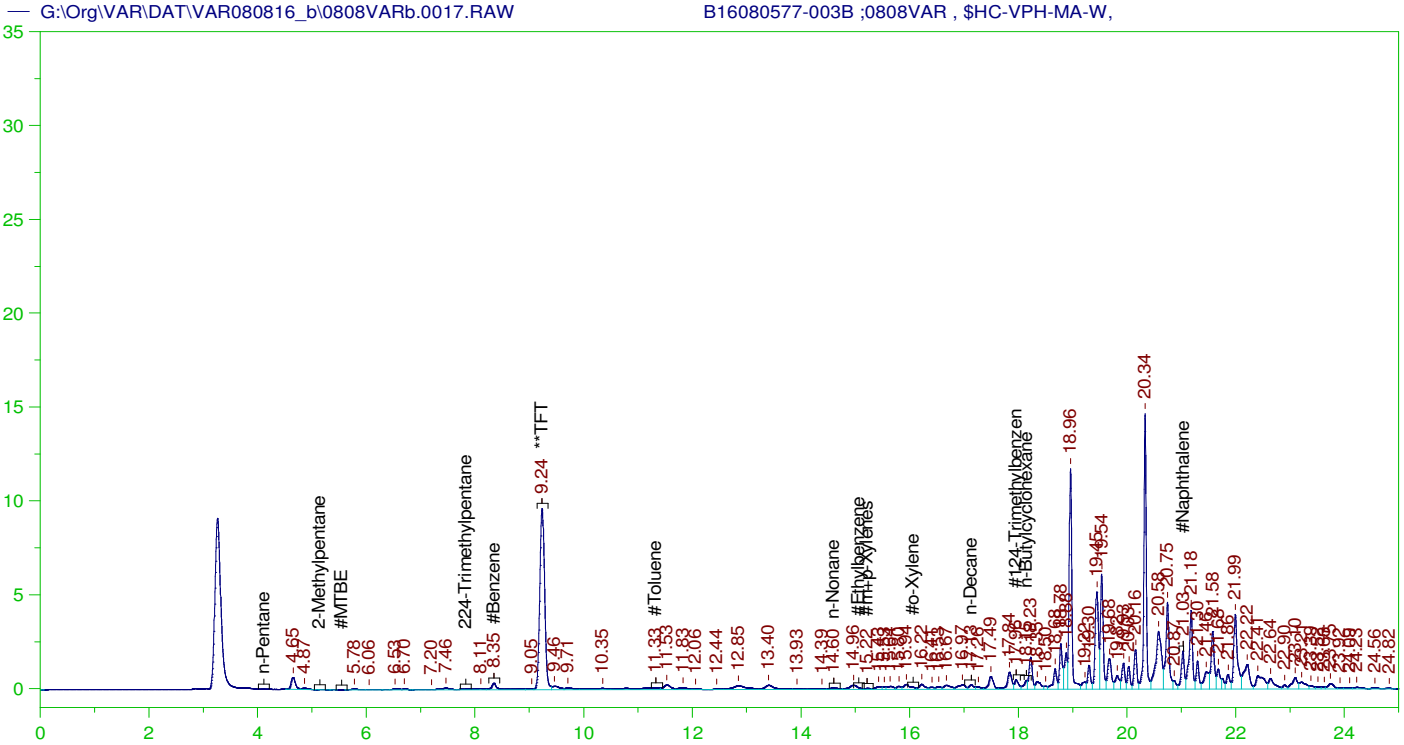


VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-003B ;0808VAR , $HC-VPH-MA-W,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VARb.0017.RAW
Date & Time Acquired: 8/8/2016 6:36:24 PM
Method File: G:\Org\VAR\Methods\160714VARV577-3aB.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 502.4956
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 537.0638
Mean RF for all calibrated compounds: 668.7858
Rt range for Gasoline Range Organics: 5.046 to 17.209
Rt range for C5 to C8 Aliphatic Hydrocarbons: 4.016 to 14.52
Rt range for C9 to C12 Aliphatic Hydrocarbons: 14.57 to 20.957

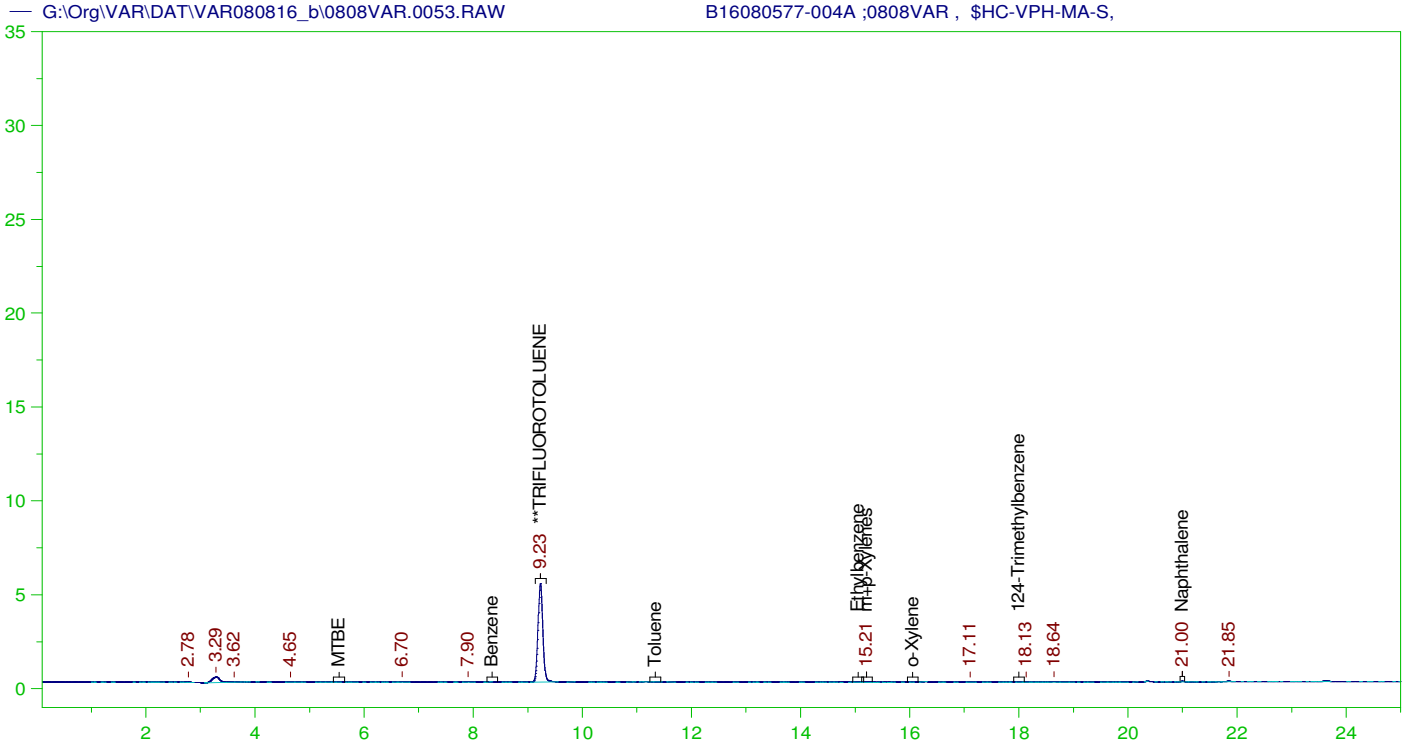
SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	9.237	25.	23.286	93.14 -

GRO Area:49141.24 GRO Amount: 14.69566
TPH Area:433776.8 TPH Amount: 129.7207

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:31917.14 C5-C8 Amount: 12.70345
C9-C12 Area:282731.3 C9-C12 Amount: 105.2878

BLK-1608-300 Batch ID: 101553

G:\Org\VAR\DAT\VAR080816_b\0808VAR.0053.RAW B16080577-004A ;0808VAR , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-004A ;0808VAR , $HC-VPH-MA-S,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VAR.0053.RAW
Date & Time Acquired: 8/9/2016 10:10:28 PM
Method File: G:\Org\VAR\Methods\160714VARV577-4.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPH.CAL
Sample Weight: 50 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 627.5101
Rt range for C9 to C10 Aromatics: 16.155 to 20.956
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:754.5935 C9-C10 Aromatics Amount: 0.0240504

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.1	U
Benzene	.	.	.		.05	U
Toluene	.	.	.		.05	U
Ethylbenzene	.	.	.		.05	U
m+p-Xylenes	15.212	15.212	15.212	117	.05	U
o-Xylene	.	.	.		.05	U
124-Trimethylbenzene	.	.	.		.05	U
Naphthalene	20.996	20.996	20.996	94	.1	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.231	2.5	2.387	95.49	70-130

BLK-1608-300 Batch ID: 101553

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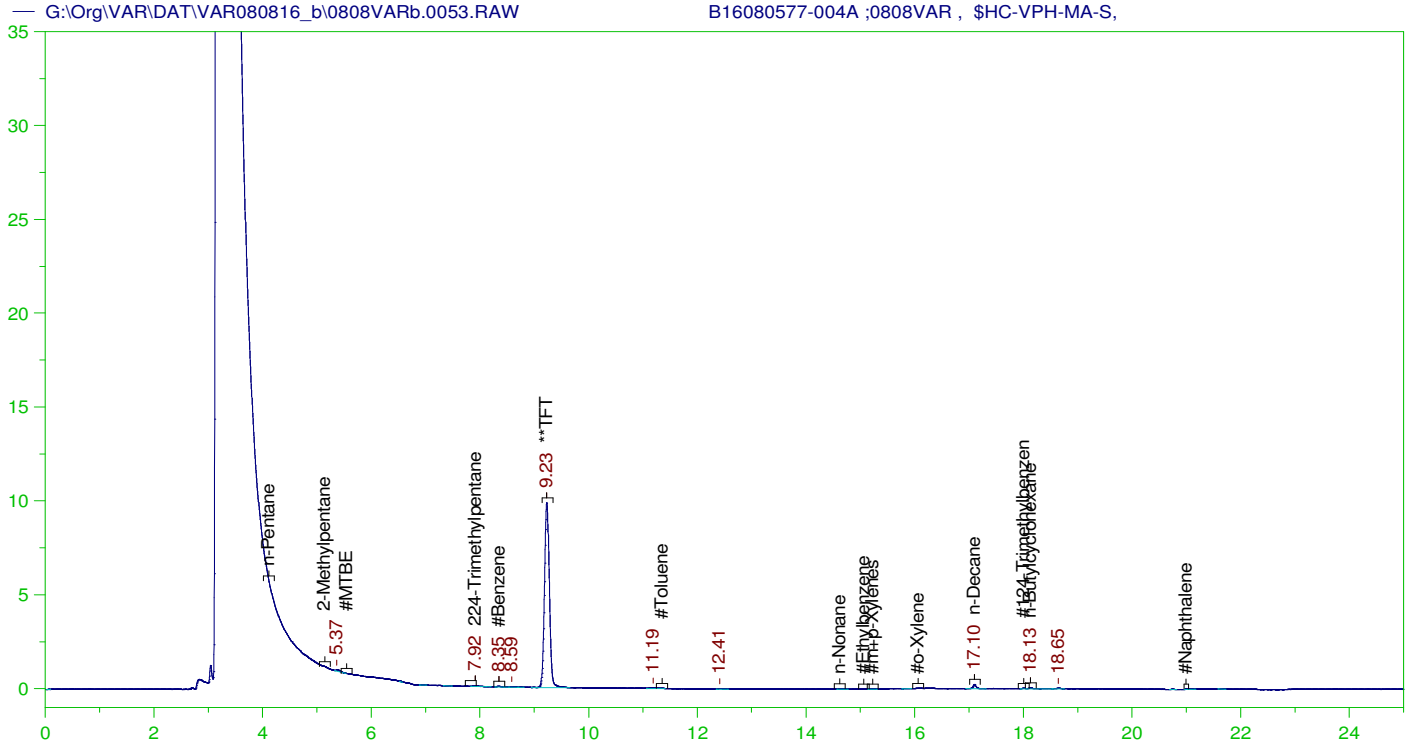


VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-004A ;0808VAR , $HC-VPH-MA-S,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VARb.0053.RAW
Date & Time Acquired: 8/9/2016 10:10:28 PM
Method File: G:\Org\VAR\Methods\160714VARV577-4B.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPHb.CAL
Sample Weight: 50 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 502.4956
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 537.0638
Mean RF for all calibrated compounds: 668.7858
Rt range for Gasoline Range Organics: 5.046 to 17.209
Rt range for C5 to C8 Aliphatic Hydrocarbons: 4.016 to 14.52
Rt range for C9 to C12 Aliphatic Hydrocarbons: 14.57 to 20.957

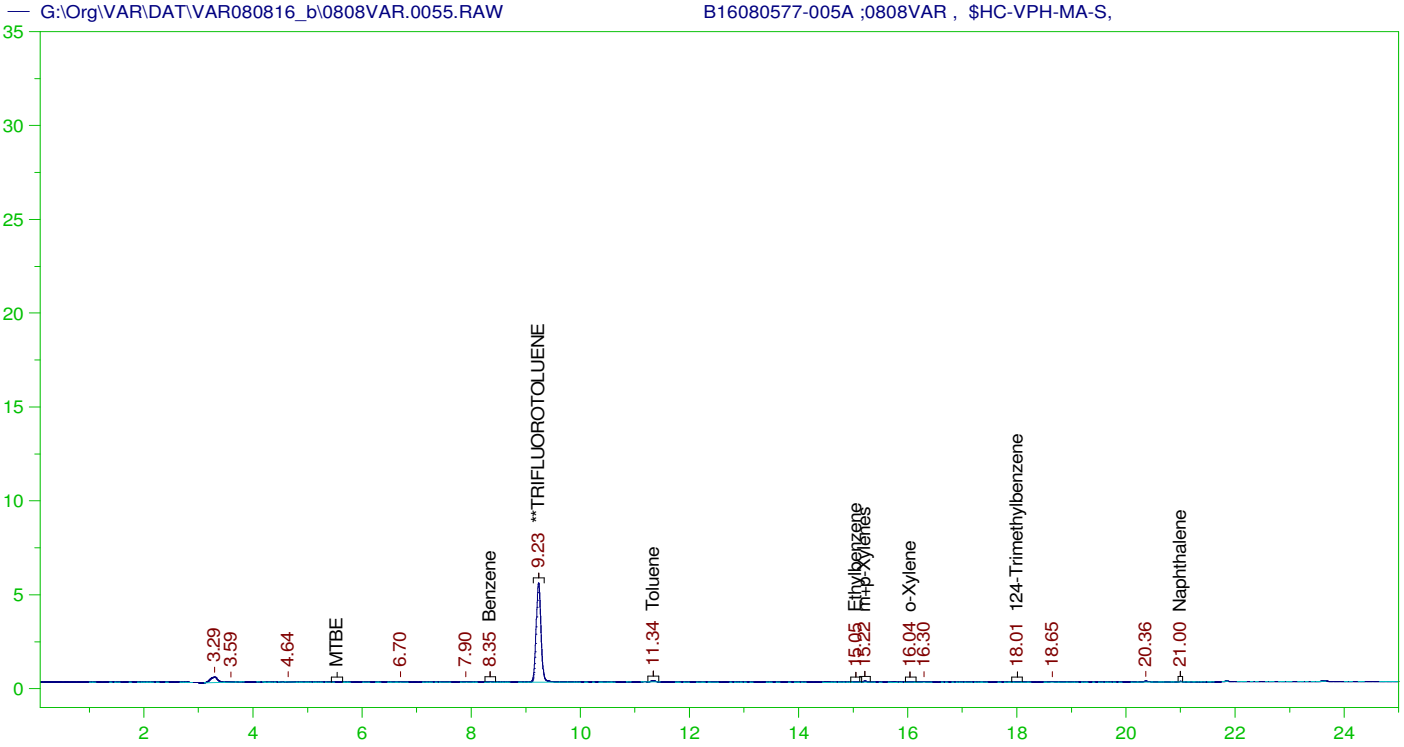
SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	9.232	2.5	2.386	95.45 -

GRO Area:3356.641 GRO Amount: 0.1003801
TPH Area:4355.789 TPH Amount: 0.1302596

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:1929.715 C5-C8 Amount: 7.680524E-02
C9-C12 Area:2208.908 C9-C12 Amount: 8.225867E-02

BLK-1608-301 Batch ID: 101553

G:\Org\VAR\DAT\VAR080816_b\0808VAR.0055.RAW B16080577-005A ;0808VAR , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-005A ;0808VAR , $HC-VPH-MA-S,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VAR.0055.RAW
Date & Time Acquired: 8/9/2016 11:18:25 PM
Method File: G:\Org\VAR\Methods\160714VARV577-5.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPH.CAL
Sample Weight: 50 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 627.5101
Rt range for C9 to C10 Aromatics: 16.155 to 20.956
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1141.404 C9-C10 Aromatics Amount: 3.637883E-02

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.1	U
Benzene	8.346	8.346	8.346	152	.05	U
Toluene	11.338	11.338	11.338	307	.05	U
Ethylbenzene	15.051	15.051	15.051	67	.05	U
m+p-Xylenes	15.216	15.216	15.216	317	.05	U
o-Xylene	16.043	16.043	16.043	96	.05	U
124-Trimethylbenzene	18.006	18.006	18.006	67	.05	U
Naphthalene	21.	21.	21.	81	.1	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.234	2.5	2.413	96.54	70-130

BLK-1608-301 Batch ID: 101553

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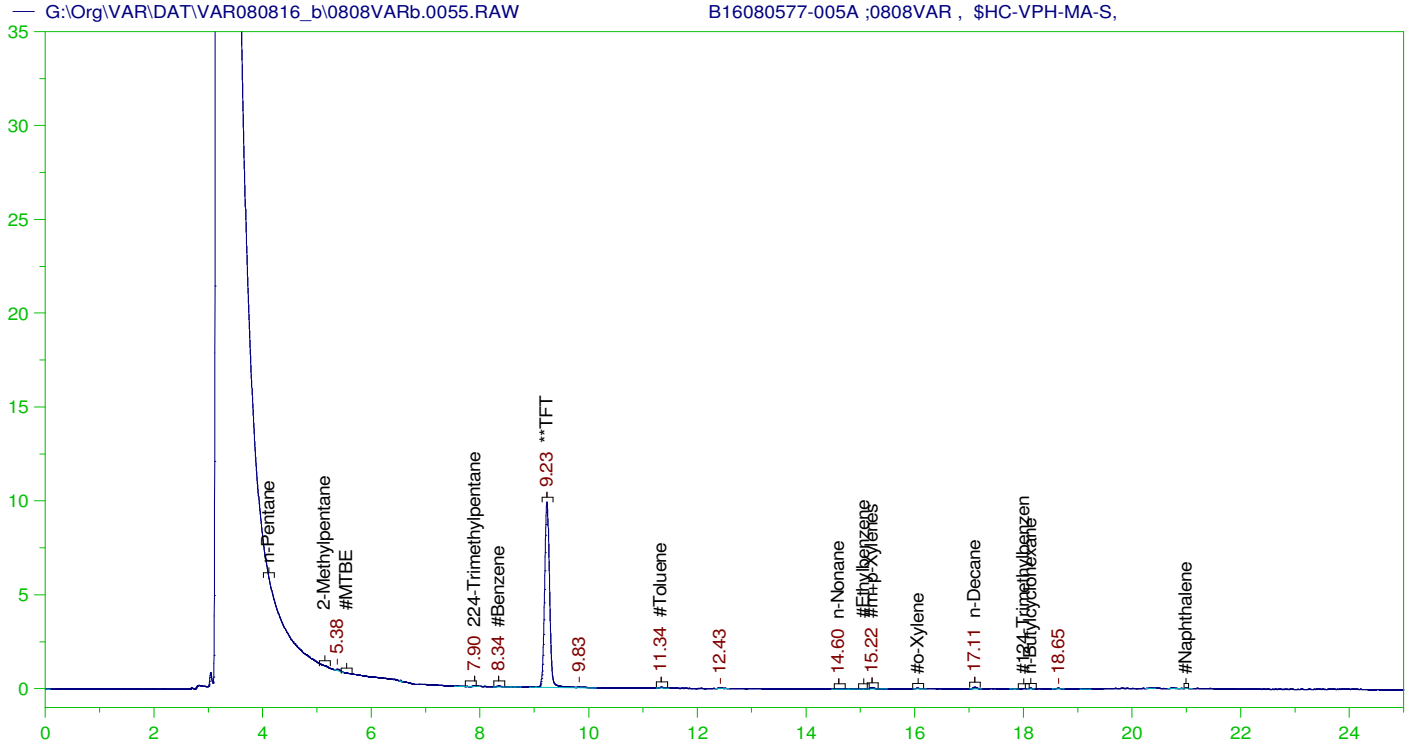

VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B16080577-005A ;0808VAR , $HC-VPH-MA-S,
Raw File: G:\Org\VAR\DAT\VAR080816_b\0808VARb.0055.RAW
Date & Time Acquired: 8/9/2016 11:18:25 PM
Method File: G:\Org\VAR\Methods\160714VARV577-5B.MET
Calibration File: G:\Org\VAR\Cals\160714VARVPHb.CAL
Sample Weight: 50 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 502.4956
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 537.0638
Mean RF for all calibrated compounds: 668.7858
Rt range for Gasoline Range Organics: 5.046 to 17.209
Rt range for C5 to C8 Aliphatic Hydrocarbons: 4.016 to 14.52
Rt range for C9 to C12 Aliphatic Hydrocarbons: 14.57 to 20.957

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	9.234	2.5	2.408	96.33 -

GRO Area:3527.125 GRO Amount: 0.1054785
TPH Area:4387.477 TPH Amount: 0.1312072

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2009.727 C5-C8 Amount: 7.998981E-02
C9-C12 Area:2257.265 C9-C12 Amount: 8.405948E-02

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release

Report Date: 08/18/16
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Batch: 101499
Lab ID: MB-101499	Method Blank				Run: GCFID-HP4-B_160805C				08/05/16 20:41
Total Extractable Hydrocarbons	ND	mg/kg	10						
Surr: o-Terphenyl			0.17	83	40	140			
Lab ID: LCS-101499	Laboratory Control Sample				Run: GCFID-HP4-B_160805C				08/05/16 21:24
Total Extractable Hydrocarbons	180	mg/kg	10	88	60	140			
Surr: o-Terphenyl			0.17	82	40	140			
Lab ID: B16080514-004AMS	Sample Matrix Spike				Run: GCFID-HP4-B_160805C				08/05/16 22:48
Total Extractable Hydrocarbons	189	mg/kg-dry	10	89	60	140			
Surr: o-Terphenyl			0.18	84	40	140			
Lab ID: B16080514-004AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP4-B_160805C				08/05/16 23:31
Total Extractable Hydrocarbons	196	mg/kg-dry	10	92	60	140	3.5	20	
Surr: o-Terphenyl			0.18	84	40	140			
Method: SW8015M									Batch: 101557
Lab ID: LCS-101557	Laboratory Control Sample				Run: GCFID-HP3-B_160808B				08/09/16 16:44
Total Extractable Hydrocarbons	5660	ug/L	300	91	60	140			
Surr: o-Terphenyl				94	40	140			
Lab ID: MB-101557	Method Blank				Run: GCFID-HP3-B_160808B				08/09/16 17:28
Total Extractable Hydrocarbons	ND	ug/L	300						
Surr: o-Terphenyl				88	40	140			
Lab ID: B16080660-001AMS	Sample Matrix Spike				Run: GCFID-HP3-B_160808B				08/09/16 18:57
Total Extractable Hydrocarbons	10900	ug/L	570	93	60	140			
Surr: o-Terphenyl				96	40	140			
Lab ID: B16080660-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP3-B_160808B				08/09/16 19:41
Total Extractable Hydrocarbons	13400	ug/L	570	114	60	140	21	20	R
Surr: o-Terphenyl				95	40	140			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release

Report Date: 08/18/16
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Analytical Run: R265088
Lab ID: CCV_0805HP430r-S	Continuing Calibration Verification Standard								08/06/16 06:32
n-Nonane	6.75	mg/kg		101	75	125			
n-Decane	6.90	mg/kg		104	75	125			
n-Dodecane	6.93	mg/kg		104	75	125			
n-Tetradecane	7.03	mg/kg		105	75	125			
n-Hexadecane	7.02	mg/kg		105	75	125			
n-Octadecane	7.03	mg/kg		105	75	125			
n-Nonadecane	7.11	mg/kg		107	75	125			
n-Eicosane	7.10	mg/kg		107	75	125			
n-Docosane	7.11	mg/kg		107	75	125			
n-Tetracosane	7.12	mg/kg		107	75	125			
n-Hexacosane	7.05	mg/kg		106	75	125			
n-Octacosane	6.61	mg/kg		99	75	125			
n-Triacontane	7.26	mg/kg		109	75	125			
n-Hexatriacontane	7.29	mg/kg		109	75	125			
Surr: o-Terphenyl			0.17	98	75	125			
Method: SW8015M									Analytical Run: R265208
Lab ID: CCV_0808HP337r-W	Continuing Calibration Verification Standard								08/09/16 15:15
n-Nonane	216	ug/L		108	75	125			
n-Decane	214	ug/L		107	75	125			
n-Dodecane	214	ug/L		107	75	125			
n-Tetradecane	217	ug/L		109	75	125			
n-Hexadecane	216	ug/L		108	75	125			
n-Octadecane	214	ug/L		107	75	125			
n-Nonadecane	215	ug/L		107	75	125			
n-Eicosane	215	ug/L		107	75	125			
n-Docosane	212	ug/L		106	75	125			
n-Tetracosane	212	ug/L		106	75	125			
n-Hexacosane	213	ug/L		107	75	125			
n-Octacosane	200	ug/L		100	75	125			
n-Triacontane	212	ug/L		106	75	125			
n-Hexatriacontane	213	ug/L		106	75	125			
Surr: o-Terphenyl				106	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

BLK-1608-200 Batch ID: 101557

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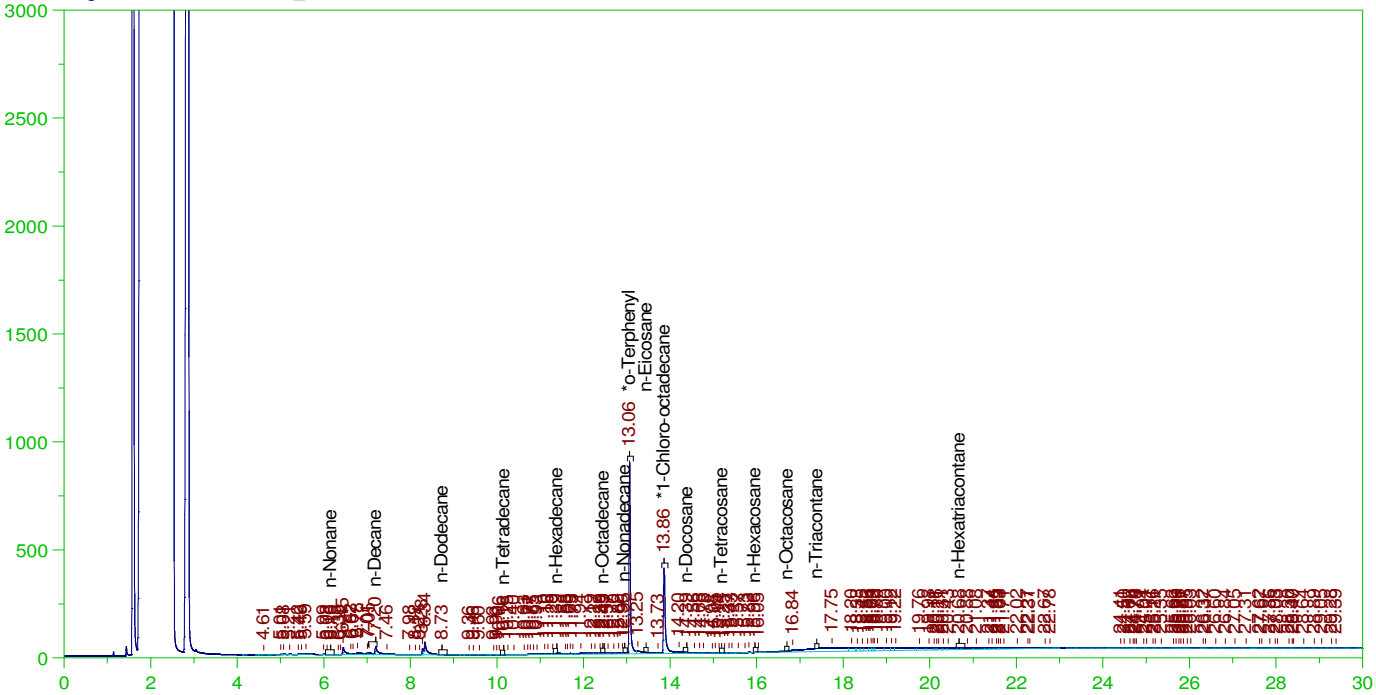


EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B16080577-001A ;0808HP3 , $HC-EPH-SCRN-W, V49
Raw File: G:\org\HP3\DAT\HP3080816_b\0808HP3.0049.RAW
Date & Time Acquired: 8/10/2016 12:06:07 AM
Method File: g:\org\HP3\Methods\SR_SCN-080845-PK-L%.met
Calibration File: G:\Org\HP3\Cals\SC160411PK.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

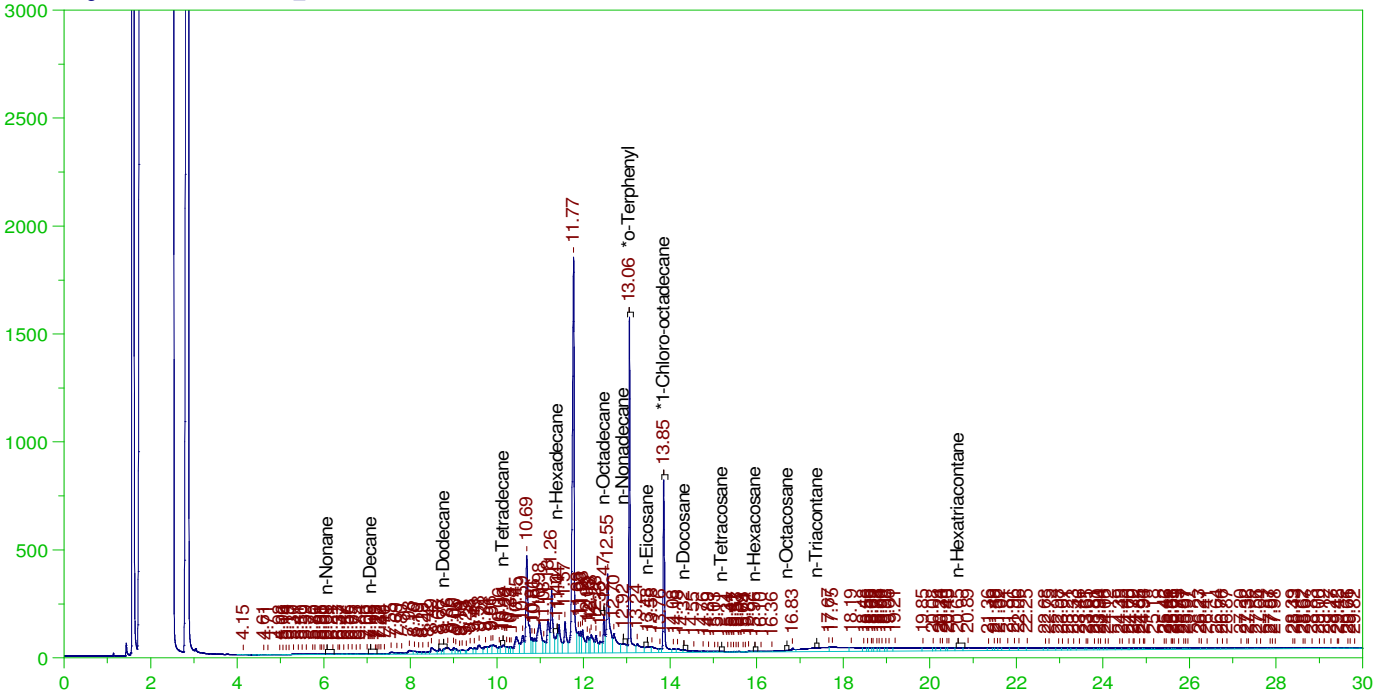
Mean RF for C9 to C18 Hydrocarbons: 29407.9
Mean RF for C19 to C36 Hydrocarbons: 29605.02
Mean RF for Total Extractable Hydrocarbons: 29506.46
Rt range for Diesel Range Organics: 7.031 to 17.442
Rt range for C9 to C18 Hydrocarbons: 6.041 to 13.019
Rt range for C19 to C36 Hydrocarbons: 13.054 to 20.812

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.065	1947748	192.308	114.478	59.53	-
*1-Chloro-octadecane	13.862	1119415	192.308	82.814	43.06	-

DRO Area:1597415 DRO Amount: 104.1112
TEH Area:5101168 TEH Amount: 332.4675
C9-C18 Area:1364825 C9-C18 Amount: 89.25026
C19-C36 Area:3197141 C19-C36 Amount: 207.6792

BLK-1608-201 Batch ID: 101557

G:\org\HP3\DAT\HP3080816_b\0808HP3.0050.RAW B16080577-002A ;0808HP3 , $HC-EPH-SCRN-W, V50



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B16080577-002A ;0808HP3 , $HC-EPH-SCRN-W, V50
Raw File: G:\org\HP3\DAT\HP3080816_b\0808HP3.0050.RAW
Date & Time Acquired: 8/10/2016 12:50:08 AM
Method File: g:\org\HP3\Methods\S3_SCN-PK-L%.met
Calibration File: G:\Org\HP3\Cals\SC160411PK.CAL
Sample Weight: 1.01 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 29407.9
Mean RF for C19 to C36 Hydrocarbons: 29605.02
Mean RF for Total Extractable Hydrocarbons: 29506.46
Rt range for Diesel Range Organics: 7.031 to 17.442
Rt range for C9 to C18 Hydrocarbons: 6.041 to 13.019
Rt range for C19 to C36 Hydrocarbons: 13.054 to 20.812

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.06	2983820	198.02	180.581	91.19	-
*1-Chloro-octadecane	13.855	1651350	198.02	125.796	63.53	-

DRO Area:2.384654E+07 DRO Amount: 1600.357
TEH Area:3.057555E+07 TEH Amount: 2051.945
C9-C18 Area:2.220922E+07 C9-C18 Amount: 1495.471
C19-C36 Area:5057484 C19-C36 Amount: 338.2811

BLK-1608-202 Batch ID: 101557

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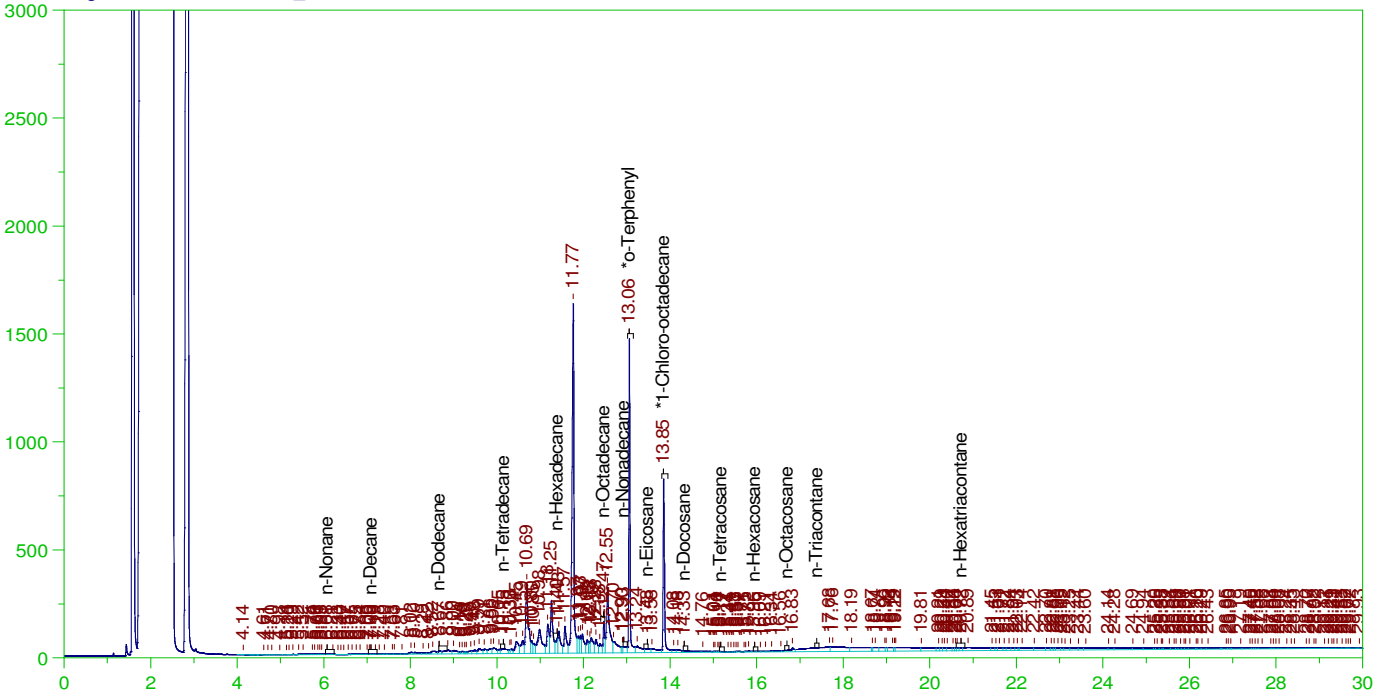


EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B16080577-003A ;0808HP3 , $HC-EPH-SCRN-W, V51
Raw File: G:\org\HP3\DAT\HP3080816_b\0808HP3.0051.RAW
Date & Time Acquired: 8/10/2016 1:34:08 AM
Method File: g:\org\HP3\Methods\S3_SCN-PK-L%.met
Calibration File: G:\Org\HP3\Cals\SC160411PK.CAL
Sample Weight: 1.03 Dilution: 2 S.A.: 1

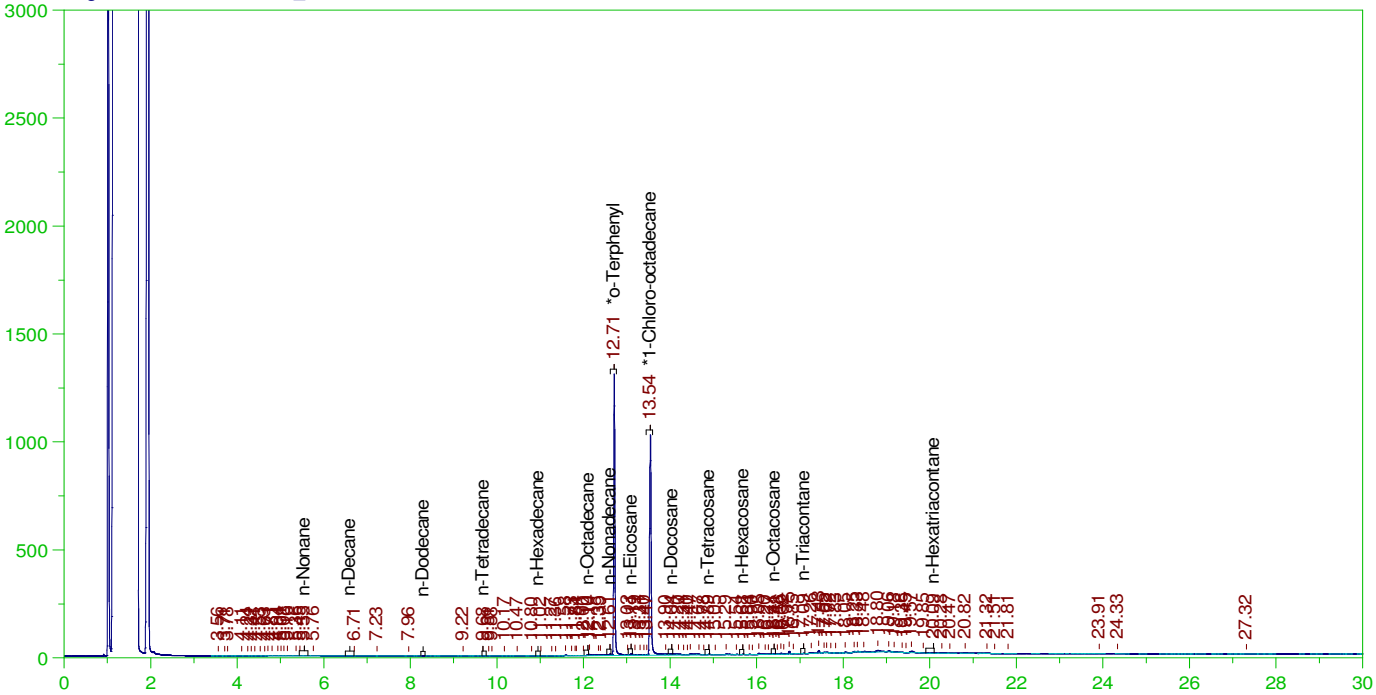
Mean RF for C9 to C18 Hydrocarbons: 29407.9
Mean RF for C19 to C36 Hydrocarbons: 29605.02
Mean RF for Total Extractable Hydrocarbons: 29506.46
Rt range for Diesel Range Organics: 7.031 to 17.442
Rt range for C9 to C18 Hydrocarbons: 6.041 to 13.019
Rt range for C19 to C36 Hydrocarbons: 13.054 to 20.812

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.059	2714522	194.175	161.093	82.96	-
*1-Chloro-octadecane	13.854	1660474	194.175	124.035	63.88	-

DRO Area:1.875063E+07 DRO Amount: 1233.933
TEH Area:2.593899E+07 TEH Amount: 1706.981
C9-C18 Area:1.728126E+07 C9-C18 Amount: 1141.049
C19-C36 Area:5181822 C19-C36 Amount: 339.8676

BLK-1608-300 Batch ID: 101499

G:\org\HP4\DAT\HP4080516_b\0805HP4.0032.RAW B16080577-004A ;0805HP4 , $HC-EPH-SCRN-S, V32



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B16080577-004A ;0805HP4 , $HC-EPH-SCRN-S, V32
Raw File: G:\org\HP4\DAT\HP4080516_b\0805HP4.0032.RAW
Date & Time Acquired: 8/6/2016 7:57:08 AM
Method File: g:\org\HP4\Methods\SR_SCN-HJ-L%.met
Calibration File: G:\Org\HP4\Cals\SC140904HJ.CAL
Sample Weight: 29.98 Dilution: 2 S.A.: 1

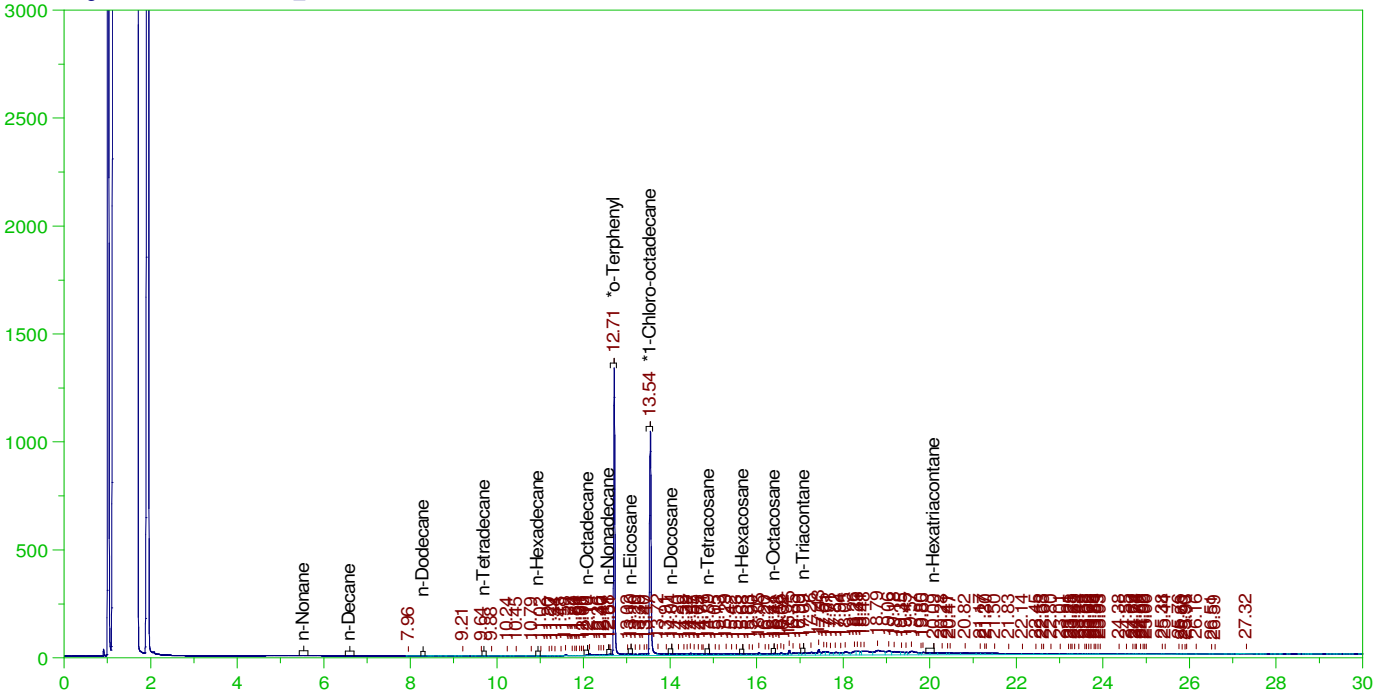
Mean RF for C9 to C18 Hydrocarbons: 25784.72
Mean RF for C19 to C36 Hydrocarbons: 26045.53
Mean RF for Total Extractable Hydrocarbons: 25915.13
Rt range for Diesel Range Organics: 6.499 to 17.12
Rt range for C9 to C18 Hydrocarbons: 5.434 to 12.622
Rt range for C19 to C36 Hydrocarbons: 12.657 to 20.103

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.71	2649680	6.671	5.756	86.28	-
*1-Chloro-octadecane	13.542	2302784	6.671	6.579	98.62	-

DRO Area:553275.5 DRO Amount: 1.424251
TEH Area:1049723 TEH Amount: 2.702214
C9-C18 Area:222896.2 C9-C18 Amount: 0.5766849
C19-C36 Area:685594 C19-C36 Amount: 1.756031

BLK-1608-301 Batch ID: 101499

G:\org\HP4\DAT\HP4080516_b\0805HP4.0033.RAW B16080577-005A ;0805HP4 , $HC-EPH-SCRN-S, V33



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B16080577-005A ;0805HP4 , $HC-EPH-SCRN-S, V33
Raw File: G:\org\HP4\DAT\HP4080516_b\0805HP4.0033.RAW
Date & Time Acquired: 8/6/2016 8:39:14 AM
Method File: g:\org\HP4\Methods\SR_SCN-080533-HJ-L%.met
Calibration File: G:\Org\HP4\Cals\SC140904HJ.CAL
Sample Weight: 30.03 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 25784.72
Mean RF for C19 to C36 Hydrocarbons: 26045.53
Mean RF for Total Extractable Hydrocarbons: 25915.13
Rt range for Diesel Range Organics: 6.499 to 17.12
Rt range for C9 to C18 Hydrocarbons: 5.434 to 12.622
Rt range for C19 to C36 Hydrocarbons: 12.657 to 20.103

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.71	2706094	6.66	5.869	88.12	-
*1-Chloro-octadecane	13.542	2314287	6.66	6.601	99.11	-

DRO Area:1663560 DRO Amount: 4.275234
TEH Area:4988210 TEH Amount: 12.81935
C9-C18 Area:198726.1 C9-C18 Amount: 0.513295
C19-C36 Area:3660411 C19-C36 Amount: 9.359901

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 101683
Lab ID: LCS-101683-101557	Laboratory Control Sample				Run: GCFID-HP3-B_160811A				08/11/16 14:40
C9 to C18 Aliphatics	813	ug/L	300	68	40	140			
C19 to C36 Aliphatics	1630	ug/L	300	102	40	140			
n-Nonane	62.4	ug/L	5.0	31	30	140			
n-Decane	97.0	ug/L	5.0	48	40	140			
n-Dodecane	126	ug/L	5.0	63	40	140			
n-Tetradecane	139	ug/L	5.0	70	40	140			
n-Hexadecane	166	ug/L	5.0	82	40	140			
n-Octadecane	183	ug/L	5.0	91	40	140			
n-Nonadecane	195	ug/L	5.0	97	40	140			
n-Eicosane	196	ug/L	5.0	97	40	140			
n-Docosane	202	ug/L	5.0	100	40	140			
n-Tetracosane	206	ug/L	5.0	102	40	140			
n-Hexacosane	209	ug/L	5.0	104	40	140			
n-Octacosane	195	ug/L	5.0	98	40	140			
n-Triacontane	216	ug/L	5.0	108	40	140			
n-Hexatriacontane	196	ug/L	5.0	98	40	140			
Surr: 1-Chloro-octadecane			5.0	98	40	140			
Lab ID: MB-101683-101557	Method Blank				Run: GCFID-HP3-B_160811A				08/11/16 16:07
C9 to C18 Aliphatics	ND	ug/L	300						
C19 to C36 Aliphatics	ND	ug/L	300						
Surr: 1-Chloro-octadecane			5.0	88	40	140			
Lab ID: B16080660-001AMS	Sample Matrix Spike				Run: GCFID-HP3-B_160811A				08/11/16 19:02
C9 to C18 Aliphatics	1560	ug/L	570	69	40	140			
C19 to C36 Aliphatics	2950	ug/L	570	98	40	140			
n-Nonane	121	ug/L	5.0	32	30	140			
n-Decane	187	ug/L	5.0	50	40	140			
n-Dodecane	245	ug/L	5.0	65	40	140			
n-Tetradecane	271	ug/L	5.0	72	40	140			
n-Hexadecane	317	ug/L	5.0	84	40	140			
n-Octadecane	339	ug/L	5.0	90	40	140			
n-Nonadecane	358	ug/L	5.0	95	40	140			
n-Eicosane	358	ug/L	5.0	94	40	140			
n-Docosane	365	ug/L	5.0	96	40	140			
n-Tetracosane	371	ug/L	5.0	98	40	140			
n-Hexacosane	376	ug/L	5.0	99	40	140			
n-Octacosane	351	ug/L	5.0	93	40	140			
n-Triacontane	388	ug/L	5.0	103	40	140			
n-Hexatriacontane	355	ug/L	5.0	94	40	140			
Surr: 1-Chloro-octadecane			9.4	95	40	140			
Lab ID: B16080660-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP3-B_160811A				08/11/16 20:30
C9 to C18 Aliphatics	1980	ug/L	570	88	40	140	24	20	R

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 101683
Lab ID: B16080660-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP3-B_160811A			08/11/16 20:30	
C19 to C36 Aliphatics	3830	ug/L	570	127	40	140	26	20	R
n-Nonane	159	ug/L	5.0	42	30	140	27	30	
n-Decane	214	ug/L	5.0	57	40	140	13	20	
n-Dodecane	305	ug/L	5.0	81	40	140	22	20	R
n-Tetradecane	348	ug/L	5.0	92	40	140	25	20	R
n-Hexadecane	406	ug/L	5.0	108	40	140	25	20	R
n-Octadecane	438	ug/L	5.0	116	40	140	26	20	R
n-Nonadecane	467	ug/L	5.0	124	40	140	26	20	R
n-Eicosane	465	ug/L	5.0	123	40	140	26	20	R
n-Docosane	474	ug/L	5.0	125	40	140	26	20	R
n-Tetracosane	482	ug/L	5.0	127	40	140	26	20	R
n-Hexacosane	488	ug/L	5.0	129	40	140	26	20	R
n-Octacosane	456	ug/L	5.0	121	40	140	26	20	R
n-Triacontane	504	ug/L	5.0	134	40	140	26	20	R
n-Hexatriacontane	461	ug/L	5.0	122	40	140	26	20	R
Surr: 1-Chloro-octadecane			9.4	101	40	140			
Lab ID: LCS-101683-101557	Laboratory Control Sample				Run: GCFID-HP3-B_160811A			08/11/16 15:24	
C11 to C22 Aromatics	3240	ug/L	300	95	40	140			
Total Extractable Hydrocarbons	5720	ug/L	300	92	40	140			
Naphthalene	115	ug/L	5.0	57	40	140			
2-MethylNaphthalene	131	ug/L	5.0	66	40	140			
Acenaphthylene	136	ug/L	5.0	68	40	140			
Acenaphthene	153	ug/L	5.0	77	40	140			
Fluorene	154	ug/L	5.0	77	40	140			
Phenanthrene	175	ug/L	5.0	87	40	140			
Anthracene	191	ug/L	5.0	95	40	140			
Fluoranthene	206	ug/L	5.0	103	40	140			
Pyrene	210	ug/L	5.0	105	40	140			
Benzo(a)Anthracene	216	ug/L	5.0	108	40	140			
Chrysene	221	ug/L	5.0	111	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	438	ug/L	5.0	110	40	140			
Benzo(a)Pyrene	219	ug/L	5.0	110	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	428	ug/L	5.0	107	40	140			
Benzo(g,h,I)perylene	207	ug/L	5.0	104	40	140			
Surr: 2-Bromonaphthalene			5.0	94	40	140			
Surr: 2-Fluorobiphenyl			5.0	108	40	140			
Surr: o-Terphenyl			5.0	98	40	140			
Lab ID: MB-101683-101557	Method Blank				Run: GCFID-HP3-B_160811A			08/11/16 16:51	
C11 to C22 Aromatics	ND	ug/L	300						
Total Extractable Hydrocarbons	ND	ug/L	300						
Naphthalene	ND	ug/L	5.0						

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 101683
Lab ID: MB-101683-101557	Method Blank				Run: GCFID-HP3-B_160811A				08/11/16 16:51
2-MethylNaphthalene	ND	ug/L	5.0						
Acenaphthylene	ND	ug/L	5.0						
Acenaphthene	ND	ug/L	5.0						
Fluorene	ND	ug/L	5.0						
Phenanthrene	ND	ug/L	5.0						
Anthracene	ND	ug/L	5.0						
Fluoranthene	ND	ug/L	5.0						
Pyrene	ND	ug/L	5.0						
Benzo(a)Anthracene	ND	ug/L	5.0						
Chrysene	ND	ug/L	5.0						
Benzo(b)Fluoranthene/Benzo(k)Fluoran	ND	ug/L	5.0						
Benzo(a)Pyrene	ND	ug/L	5.0						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	ND	ug/L	5.0						
Benzo(g,h,I)perylene	ND	ug/L	5.0						
Surr: 2-Bromonaphthalene			5.0	89	40	140			
Surr: 2-Fluorobiphenyl			5.0	109	40	140			
Surr: o-Terphenyl			5.0	87	40	140			
Lab ID: B16080660-001AMS	Sample Matrix Spike				Run: GCFID-HP3-B_160811A				08/11/16 19:46
C11 to C22 Aromatics	5910	ug/L	570	92	40	140			
Total Extractable Hydrocarbons	10500	ug/L	570	89	40	140			
Naphthalene	209	ug/L	9.4	55	40	140			
2-MethylNaphthalene	241	ug/L	9.4	64	40	140			
Acenaphthylene	256	ug/L	9.4	68	40	140			
Acenaphthene	289	ug/L	9.4	77	40	140			
Fluorene	297	ug/L	9.4	79	40	140			
Phenanthrene	333	ug/L	9.4	88	40	140			
Anthracene	361	ug/L	9.4	96	40	140			
Fluoranthene	378	ug/L	9.4	100	40	140			
Pyrene	384	ug/L	9.4	102	40	140			
Benzo(a)Anthracene	386	ug/L	9.4	102	40	140			
Chrysene	398	ug/L	9.4	105	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	782	ug/L	9.4	104	40	140			
Benzo(a)Pyrene	390	ug/L	9.4	103	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	762	ug/L	9.4	101	40	140			
Benzo(g,h,I)perylene	366	ug/L	9.4	97	40	140			
Surr: 2-Bromonaphthalene			9.4	81	40	140			
Surr: 2-Fluorobiphenyl			9.4	97	40	140			
Surr: o-Terphenyl			9.4	96	40	140			
Lab ID: B16080660-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP3-B_160811A				08/11/16 21:13
C11 to C22 Aromatics	7600	ug/L	570	118	40	140	25	20	R
Total Extractable Hydrocarbons	13500	ug/L	570	115	40	140	25	20	R

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH								Batch: 101683	
Lab ID: B16080660-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP3-B_160811A			08/11/16 21:13	
Naphthalene	284	ug/L	9.4	75	40	140	31	20	R
2-MethylNaphthalene	326	ug/L	9.4	86	40	140	30	20	R
Acenaphthylene	342	ug/L	9.4	91	40	140	29	20	R
Acenaphthene	372	ug/L	9.4	99	40	140	25	20	R
Fluorene	385	ug/L	9.4	102	40	140	26	20	R
Phenanthrene	433	ug/L	9.4	115	40	140	26	20	R
Anthracene	454	ug/L	9.4	120	40	140	23	20	R
Fluoranthene	483	ug/L	9.4	128	40	140	24	20	R
Pyrene	488	ug/L	9.4	129	40	140	24	20	R
Benzo(a)Anthracene	499	ug/L	9.4	132	40	140	25	20	R
Chrysene	502	ug/L	9.4	133	40	140	23	20	R
Benzo(b)Fluoranthene/Benzo(k)Fluoran	1000	ug/L	9.4	133	40	140	25	20	R
Benzo(a)Pyrene	499	ug/L	9.4	132	40	140	25	20	R
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	976	ug/L	9.4	129	40	140	25	20	R
Benzo(g,h,I)perylene	469	ug/L	9.4	124	40	140	25	20	R
Surr: 2-Bromonaphthalene			9.4	94	40	140			
Surr: 2-Fluorobiphenyl			9.4	105	40	140			
Surr: o-Terphenyl			9.4	100	40	140			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release

Report Date: 08/18/16
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R265368
Lab ID: CCV_0811HP316r-W	Continuing Calibration Verification Standard								08/11/16 21:57
n-Nonane	205	ug/L	5.0	102	75	125			
n-Decane	194	ug/L	5.0	97	75	125			
n-Dodecane	215	ug/L	5.0	107	75	125			
n-Tetradecane	208	ug/L	5.0	104	75	125			
n-Hexadecane	212	ug/L	5.0	106	75	125			
n-Octadecane	211	ug/L	5.0	106	75	125			
n-Nonadecane	213	ug/L	5.0	106	75	125			
n-Eicosane	211	ug/L	5.0	105	75	125			
n-Docosane	211	ug/L	5.0	105	75	125			
n-Tetracosane	211	ug/L	5.0	105	75	125			
n-Hexacosane	212	ug/L	5.0	106	75	125			
n-Octacosane	203	ug/L	5.0	102	75	125			
n-Triacontane	212	ug/L	5.0	106	75	125			
n-Hexatriacontane	215	ug/L	5.0	107	75	125			
Surr: 1-Chloro-octadecane			5.0	106	75	125			
Lab ID: CCV_0811HP317r-W	Continuing Calibration Verification Standard								08/11/16 22:40
Naphthalene	207	ug/L	5.0	104	75	125			
2-MethylNaphthalene	208	ug/L	5.0	104	75	125			
Acenaphthylene	205	ug/L	5.0	102	75	125			
Acenaphthene	201	ug/L	5.0	100	75	125			
Fluorene	204	ug/L	5.0	102	75	125			
Phenanthrene	209	ug/L	5.0	105	75	125			
Anthracene	203	ug/L	5.0	102	75	125			
Fluoranthene	205	ug/L	5.0	103	75	125			
Pyrene	205	ug/L	5.0	103	75	125			
Benzo(a)Anthracene	209	ug/L	5.0	104	75	125			
Chrysene	205	ug/L	5.0	103	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	413	ug/L	5.0	103	75	125			
Benzo(a)Pyrene	206	ug/L	5.0	103	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	416	ug/L	5.0	104	75	125			
Benzo(g,h,I)perylene	206	ug/L	5.0	103	75	125			
Surr: 2-Bromonaphthalene			5.0	105	75	125			
Surr: 2-Fluorobiphenyl			5.0	108	75	125			
Surr: o-Terphenyl			5.0	104	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

BLK-1608-201 Batch ID: 101683

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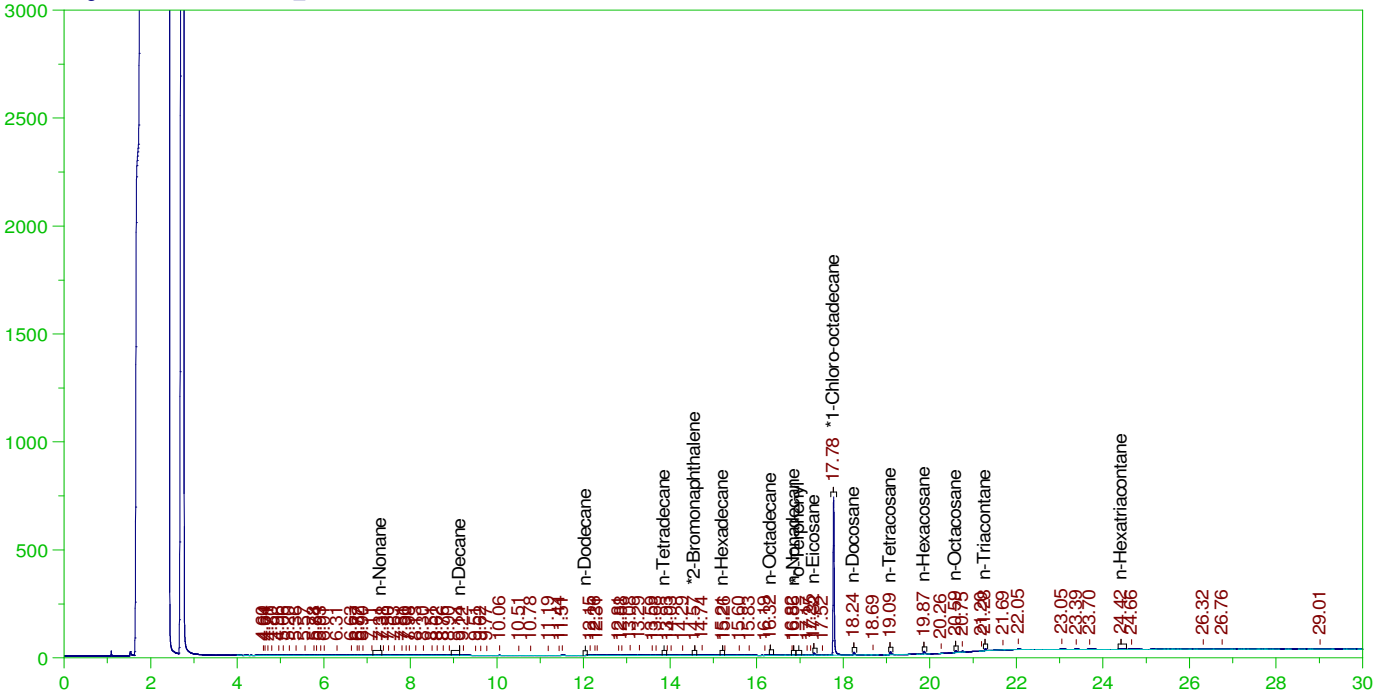

EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: B16080577-002A ;0811HP3 , $HC-ALI-GRP-W, V22
Raw File: G:\org\HP3\DAT\HP3081116_b\0811HP3.0022.RAW
Date & Time Acquired: 8/12/2016 2:18:49 AM
Method File: g:\org\HP3\Methods\LR_EPH-PI-L%.met
Calibration File: G:\Org\HP3\Cals\AL160411PI.CAL
Sample Weight: 1.01 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 29080.81
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 29127.51
Mean RF for Total Extractable Hydrocarbons: 29107.49
Rt range for Diesel Range Organics: 8.941 to 20.654
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.14 to 16.807
Rt range for C19 to C36 Aliphatic Hydrocarbons: 16.832 to 24.552

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	17.778	198.02	106.379	53.72	-

DRO Area:392657.8 DRO Amount: 26.71271
TEH Area:635039.8 TEH Amount: 43.20209

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:283541 C9-C18 Amount: 19.30714
C19-C36 Area:252666.4 C19-C36 Amount: 17.17722

BLK-1608-201 Batch ID: 101683

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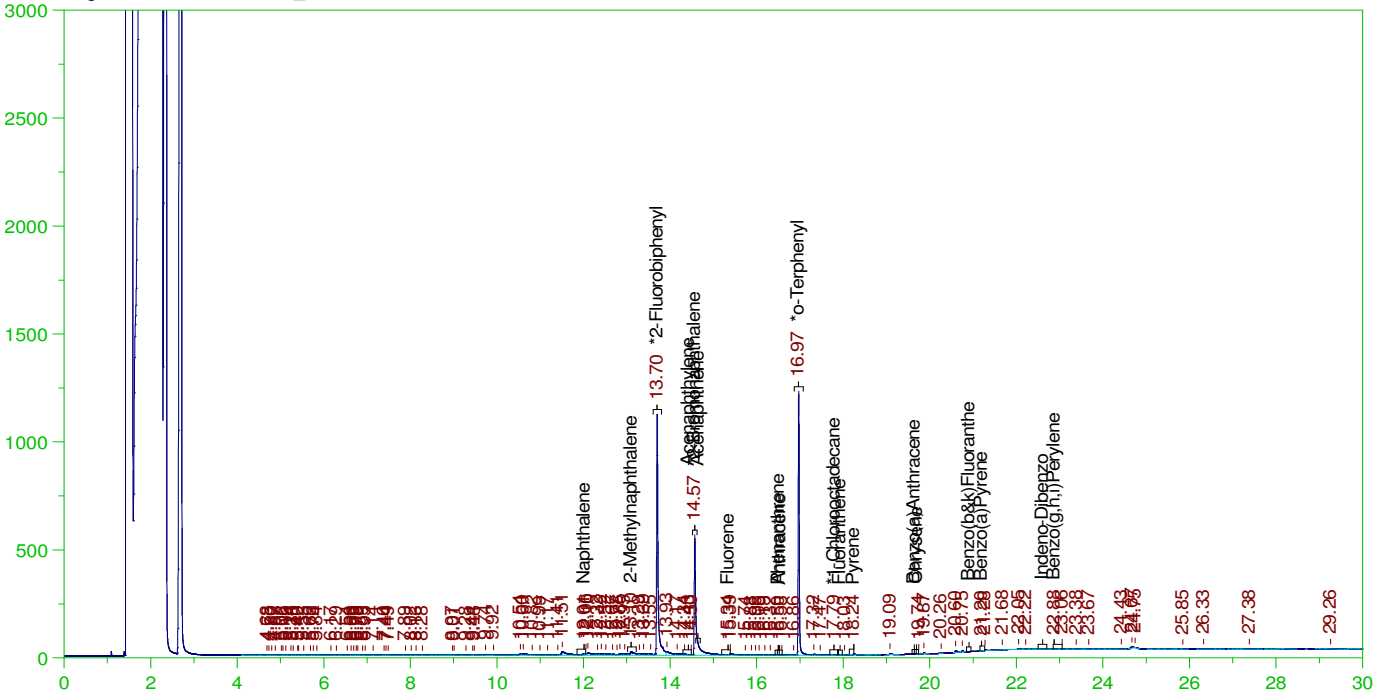

EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: B16080577-002A ;0811HP3 , $HC-ARO-GRP-W, V23
Raw File: G:\org\HP3\DAT\HP3081116_b\0811HP3.0023.RAW
Date & Time Acquired: 8/12/2016 3:02:17 AM
Method File: g:\org\HP3\Methods\RR_EPH-PI-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PI.CAL
Sample Weight: 1.01 Dilution: 2 S.A.: 1

Mean RF EPH Aromatics: 31913.8
Rt range for EPH C11 to C22 Aromatics: 11.855 to 23.059

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	13.701	198.02	177.338	89.56	-
*2-Bromonaphthalene	14.567	198.02	184.626	93.24	-
*o-Terphenyl	16.969	198.02	134.612	67.98	-
*1-Chlorooctadecane	17.789	198.02	.77	.39	-

C11-C22 Aromatics Area:960598.4 C11-C22 Aromatics Amount: 59.60352
EPH Aromatics total Area:1496002 EPH Aromatics Total Amount: 92.82439

BLK-1608-201 Batch ID: 101683

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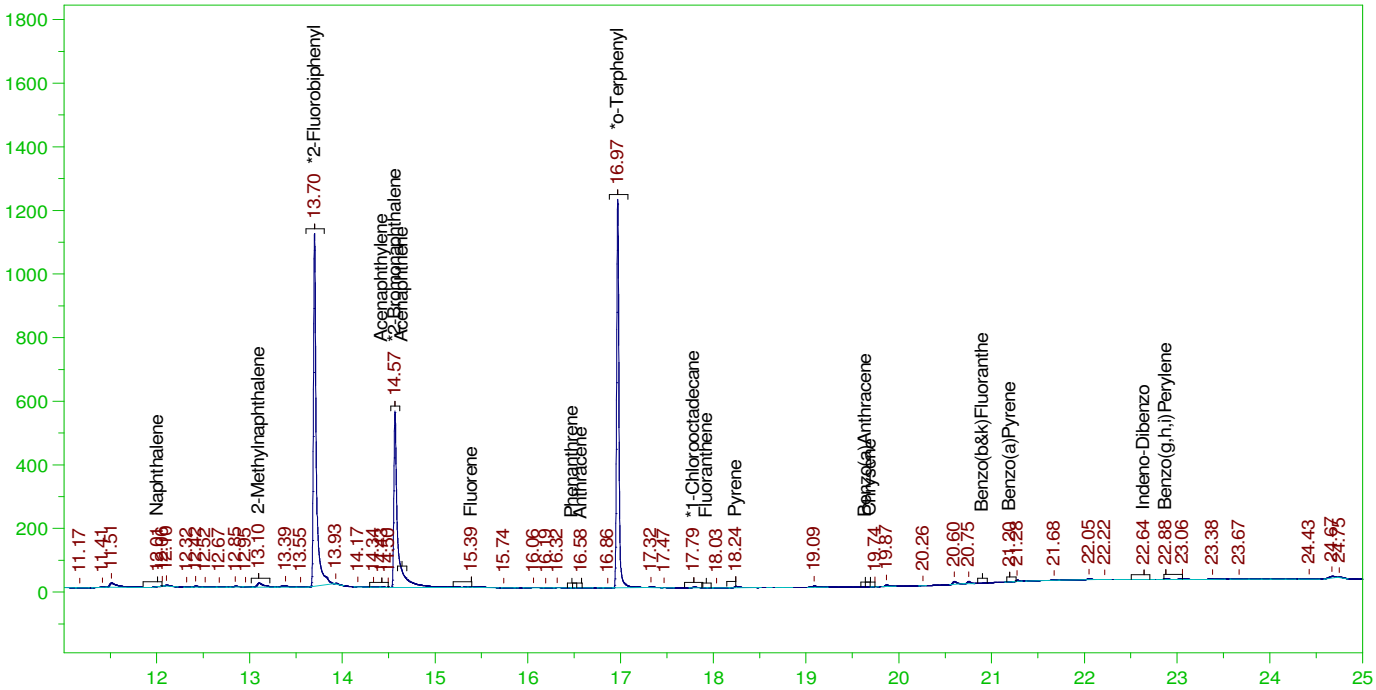

EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

Sample Name: B16080577-002A ;0811HP3 , $HC-ARO-GRP-W, V23
Raw File: G:\org\HP3\DAT\HP3081116_b\0811HP3.0023.RAW
Date & Time Acquired: 8/12/2016 3:02:17 AM
Method File: g:\org\HP3\Methods\RS_EPH-PI-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PI.CAL
Sample Weight: 1.01 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.011	12.011	12.011	1996	1.98	U
2-Methylnaphthalene	13.1	1.452	1.466	59461	3.836	
Acenaphthylene	14.425	14.425	14.425	835	1.98	U
Acenaphthene	.	.	.		1.98	U
Fluorene	15.393	15.393	15.393	18752	1.98	U
Phenanthrene	.	.	.		1.98	U
Anthracene	16.578	16.578	16.578	844	1.98	U
Fluoranthene	.	.	.		1.98	U
Pyrene	18.243	18.243	18.243	18103	1.98	U
Benzo(a)Anthracene	.	.	.		1.98	U
Chrysene	.	.	.		1.98	U
Benzo(b&k)Fluoranthe	.	.	.		3.96	U
Benzo(a)Pyrene	21.196	21.196	21.196	1760	1.98	U
Indeno-Dibenzo	22.644	22.644	22.644	1235	3.96	U
Benzo(g,h,i)Perylene	22.881	22.881	22.881	1977	1.98	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	13.701	198.02	167.442	84.56	40-140
*2-Bromonaphthalene	14.567	198.02	176.582	89.17	40-140
*o-Terphenyl	16.969	198.02	133.775	67.56	40-140
*1-Chlorooctadecane	17.789	198.02	.733	.37	40-140

BLK-1608-202 Batch ID: 101683

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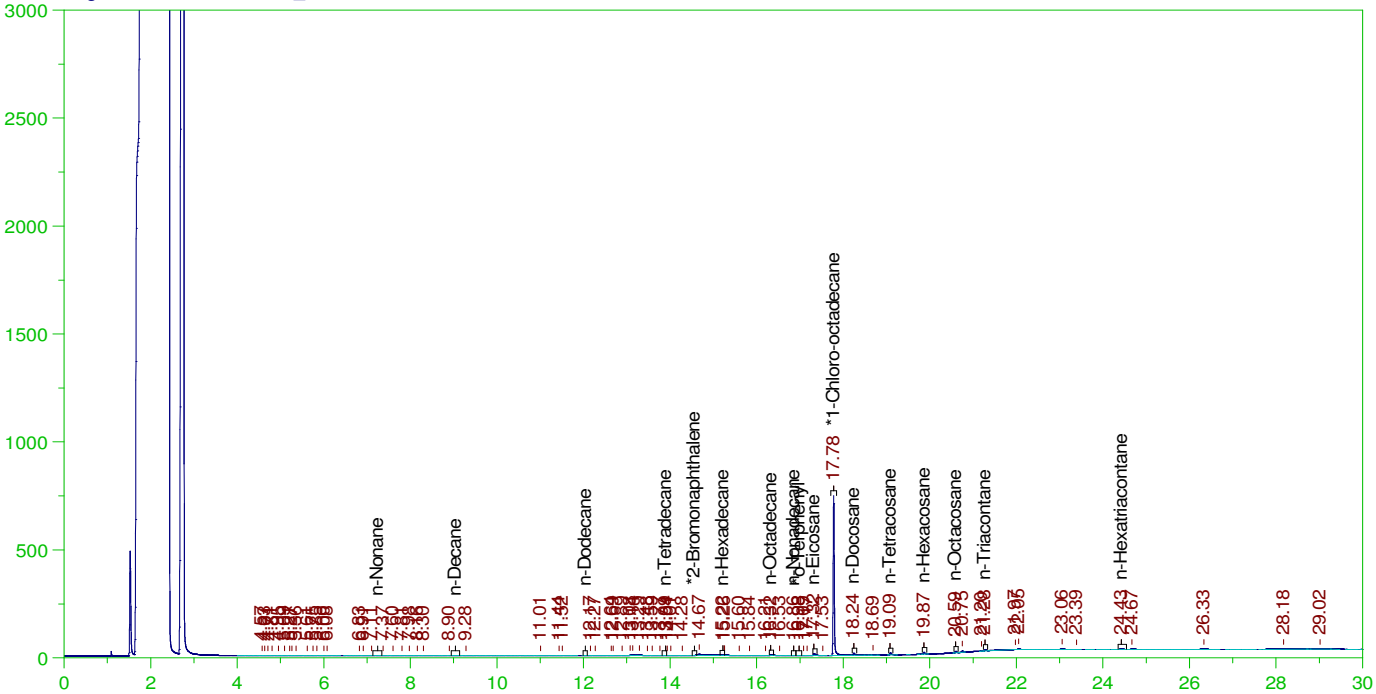


EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: B16080577-003A ;0811HP3 , $HC-ALI-GRP-W, V19
Raw File: G:\org\HP3\DAT\HP3081116_b\0811HP3.0019.RAW
Date & Time Acquired: 8/12/2016 12:08:00 AM
Method File: g:\org\HP3\Methods\LR_EPH-PI-L%.met
Calibration File: G:\Org\HP3\Cals\AL160411PI.CAL
Sample Weight: 1.03 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 29080.81
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 29127.51
Mean RF for Total Extractable Hydrocarbons: 29107.49
Rt range for Diesel Range Organics: 8.941 to 20.654
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.14 to 16.807
Rt range for C19 to C36 Aliphatic Hydrocarbons: 16.832 to 24.552

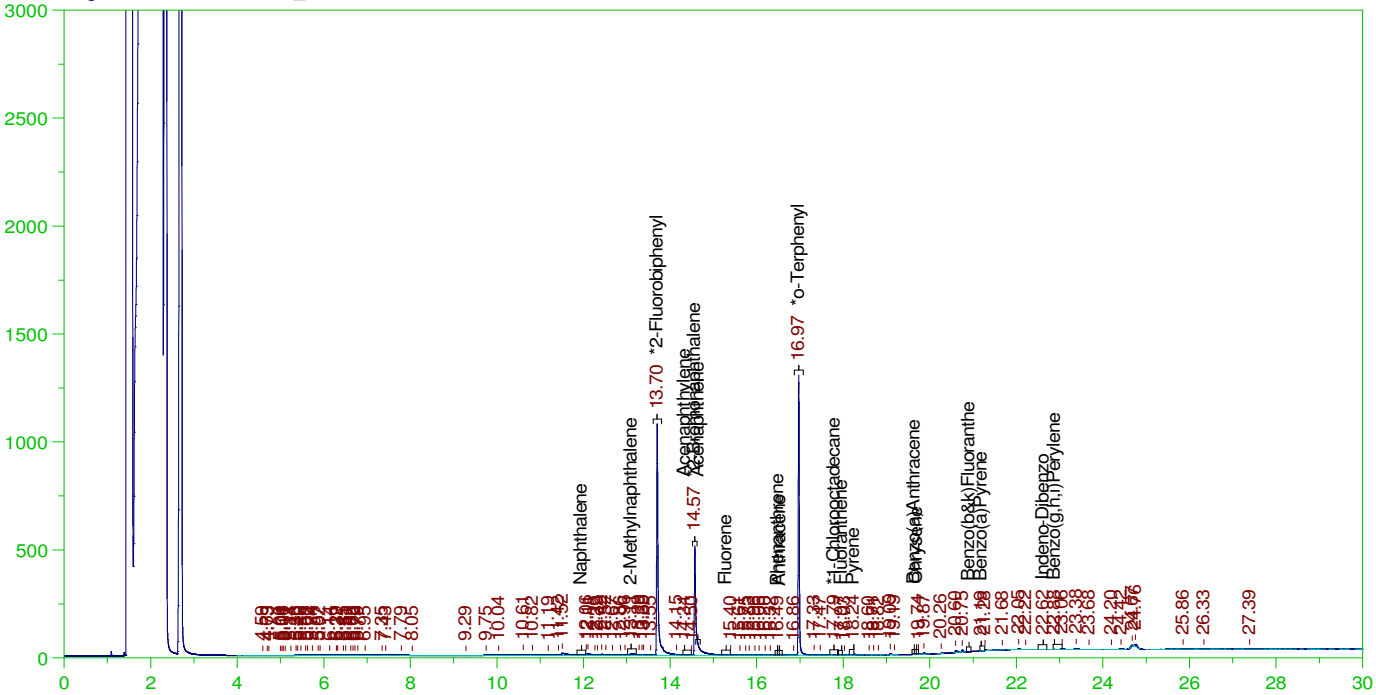
SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	17.779	194.175	105.678	54.42	-

DRO Area:359102.1 DRO Amount: 23.95554
TEH Area:534504.3 TEH Amount: 35.65653

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:247175.3 C9-C18 Amount: 16.50408
C19-C36 Area:214985.9 C19-C36 Amount: 14.33176

BLK-1608-202 Batch ID: 101683

G:\org\HP3\DAT\HP3081116_b\0811HP3.0020.RAW B16080577-003A ;0811HP3 , $HC-ARO-GRP-W, V20



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: B16080577-003A ;0811HP3 , $HC-ARO-GRP-W, V20
Raw File: G:\org\HP3\DAT\HP3081116_b\0811HP3.0020.RAW
Date & Time Acquired: 8/12/2016 12:51:37 AM
Method File: g:\org\HP3\Methods\RR_EPH-PI-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PI.CAL
Sample Weight: 1.03 Dilution: 2 S.A.: 1

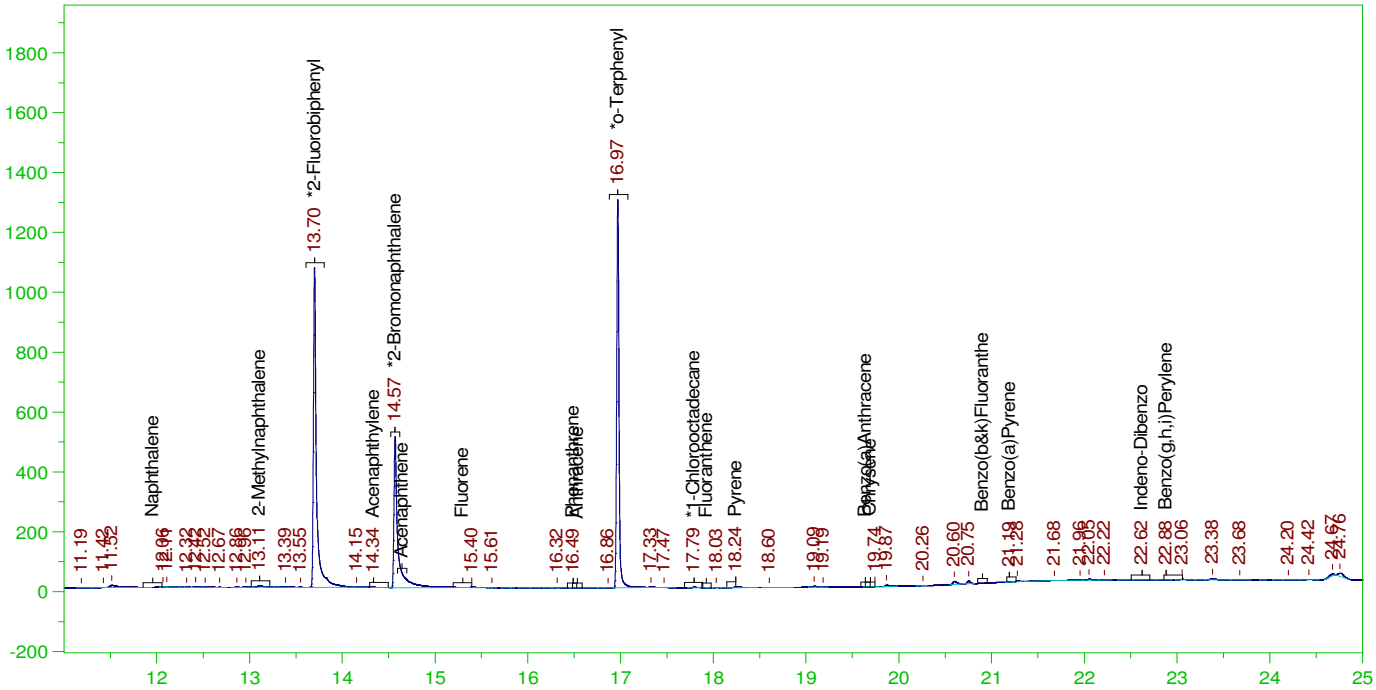
Mean RF EPH Aromatics: 31913.8
Rt range for EPH C11 to C22 Aromatics: 11.855 to 23.059

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	13.701	194.175	174.519	89.88	-
*2-Bromonaphthalene	14.568	194.175	167.036	86.02	-
*o-Terphenyl	16.97	194.175	138.976	71.57	-
*1-Chlorooctadecane	17.79	194.175	.582	.3	-

C11-C22 Aromatics Area:550834.8 C11-C22 Aromatics Amount: 33.51472
EPH Aromatics total Area:961967.3 EPH Aromatics Total Amount: 58.52946

BLK-1608-202 Batch ID: 101683

G:\org\HP3\DAT\HP3081116_b\0811HP3.0020.RAW B16080577-003A ;0811HP3 , $HC-ARO-GRP-W, V20



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

Sample Name: B16080577-003A ;0811HP3 , $HC-ARO-GRP-W, V20
Raw File: G:\org\HP3\DAT\HP3081116_b\0811HP3.0020.RAW
Date & Time Acquired: 8/12/2016 12:51:37 AM
Method File: g:\org\HP3\Methods\RS_EPH-PI-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PI.CAL
Sample Weight: 1.03 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	.	.	.		1.942	U
2-Methylnaphthalene	13.105	1.452	1.463	31945	2.021	
Acenaphthylene	14.337	14.337	14.337	1230	1.942	U
Acenaphthene	.	.	.		1.942	U
Fluorene	.	.	.		1.942	U
Phenanthrene	16.492	16.492	16.492	2817	1.942	U
Anthracene	.	.	.		1.942	U
Fluoranthene	.	.	.		1.942	U
Pyrene	18.244	18.244	18.244	15571	1.942	U
Benzo(a)Anthracene	.	.	.		1.942	U
Chrysene	.	.	.		1.942	U
Benzo(b&k)Fluoranthe	.	.	.		3.883	U
Benzo(a)Pyrene	21.194	21.194	21.194	1629	1.942	U
Indeno-Dibenzo	22.624	22.624	22.624	1146	3.883	U
Benzo(g,h,i)Perylene	22.884	22.884	22.884	1016	1.942	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	13.701	194.175	169.478	87.28	40-140
*2-Bromonaphthalene	14.568	194.175	160.963	82.9	40-140
*o-Terphenyl	16.97	194.175	138.021	71.08	40-140
*1-Chlorooctadecane	17.79	194.175	.579	.3	40-140

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: 101698
Lab ID: MB-101698-101683-1015	Method Blank				Run: SV5973N.I_160811A				08/11/16 21:29
2-Methylnaphthalene	ND	ug/L	0.20						
Acenaphthene	ND	ug/L	0.20						
Acenaphthylene	ND	ug/L	0.20						
Anthracene	ND	ug/L	0.20						
Benzo(a)anthracene	ND	ug/L	0.20						
Benzo(a)pyrene	ND	ug/L	0.20						
Benzo(b)fluoranthene	ND	ug/L	0.20						
Benzo(g,h,i)perylene	ND	ug/L	0.20						
Benzo(k)fluoranthene	ND	ug/L	0.20						
Chrysene	ND	ug/L	0.20						
Dibenzo(a,h)anthracene	ND	ug/L	0.20						
Fluoranthene	ND	ug/L	0.20						
Fluorene	ND	ug/L	0.20						
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.20						
Naphthalene	ND	ug/L	0.20						
Phenanthrene	0.240	ug/L	0.20						
Pyrene	ND	ug/L	0.20						
Lab ID: MB-101698-101683-1015	Method Blank				Run: SV5973N.I_160811A				08/11/16 21:59
Surr: 2-Fluorobiphenyl			4.0	87	40	140			
Surr: o-Terphenyl			4.0	71	40	140			
Lab ID: LCS-101698	Laboratory Control Sample				Run: SV5973N.I_160811A				08/11/16 22:28
2-Methylnaphthalene	104	ug/L	4.0	52	40	140			
Acenaphthene	125	ug/L	4.0	63	40	140			
Acenaphthylene	110	ug/L	4.0	55	40	140			
Anthracene	157	ug/L	4.0	79	40	140			
Benzo(a)anthracene	186	ug/L	4.0	93	40	140			
Benzo(a)pyrene	168	ug/L	4.0	84	40	140			
Benzo(b)fluoranthene	165	ug/L	4.0	83	40	140			
Benzo(g,h,i)perylene	179	ug/L	4.0	89	40	140			
Benzo(k)fluoranthene	189	ug/L	4.0	94	40	140			
Chrysene	177	ug/L	4.0	88	40	140			
Dibenzo(a,h)anthracene	170	ug/L	4.0	85	40	140			
Fluoranthene	181	ug/L	4.0	90	40	140			
Fluorene	130	ug/L	4.0	65	40	140			
Indeno(1,2,3-cd)pyrene	164	ug/L	4.0	82	40	140			
Naphthalene	94.0	ug/L	4.0	47	40	140			
Phenanthrene	146	ug/L	4.0	73	40	140			
Pyrene	176	ug/L	4.0	88	40	140			
Surr: 2-Fluorobiphenyl			4.0	86	40	140			
Surr: o-Terphenyl			4.0	78	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: Bolke Residence Fuel Oil Release

Report Date: 08/18/16
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: 101698
Lab ID: B16080660-001AMS	Sample Matrix Spike				Run: SV5973N.I_160811A				08/11/16 23:26
2-Methylnaphthalene	207	ug/L	7.5	55	40	140			
Acenaphthene	249	ug/L	7.5	66	40	140			
Acenaphthylene	226	ug/L	7.5	60	40	140			
Anthracene	313	ug/L	7.5	83	40	140			
Benzo(a)anthracene	343	ug/L	7.5	91	40	140			
Benzo(a)pyrene	349	ug/L	7.5	92	40	140			
Benzo(b)fluoranthene	289	ug/L	7.5	76	40	140			
Benzo(g,h,i)perylene	366	ug/L	7.5	97	40	140			
Benzo(k)fluoranthene	353	ug/L	7.5	93	40	140			
Chrysene	333	ug/L	7.5	88	40	140			
Dibenzo(a,h)anthracene	396	ug/L	7.5	105	40	140			
Fluoranthene	345	ug/L	7.5	91	40	140			
Fluorene	269	ug/L	7.5	71	40	140			
Indeno(1,2,3-cd)pyrene	347	ug/L	7.5	92	40	140			
Naphthalene	182	ug/L	7.5	48	40	140			
Phenanthrene	291	ug/L	7.5	77	40	140			
Pyrene	333	ug/L	7.5	88	40	140			
Surr: 2-Fluorobiphenyl			7.5	84	40	140			
Surr: o-Terphenyl			7.5	79	40	140			
Lab ID: B16080660-001AMSD	Sample Matrix Spike				Run: SV5973N.I_160811A				08/11/16 23:55
2-Methylnaphthalene	253	ug/L	7.5	67	40	140	20	40	
Acenaphthene	301	ug/L	7.5	80	40	140	19	40	
Acenaphthylene	274	ug/L	7.5	73	40	140	19	40	
Anthracene	367	ug/L	7.5	97	40	140	16	40	
Benzo(a)anthracene	427	ug/L	7.5	113	40	140	22	40	
Benzo(a)pyrene	437	ug/L	7.5	115	40	140	22	40	
Benzo(b)fluoranthene	390	ug/L	7.5	103	40	140	30	40	
Benzo(g,h,i)perylene	372	ug/L	7.5	98	40	140	1.4	40	
Benzo(k)fluoranthene	422	ug/L	7.5	112	40	140	18	40	
Chrysene	396	ug/L	7.5	105	40	140	17	40	
Dibenzo(a,h)anthracene	437	ug/L	7.5	116	40	140	10.0	40	
Fluoranthene	409	ug/L	7.5	108	40	140	17	40	
Fluorene	309	ug/L	7.5	82	40	140	14	40	
Indeno(1,2,3-cd)pyrene	429	ug/L	7.5	113	40	140	21	40	
Naphthalene	227	ug/L	7.5	60	40	140	22	40	
Phenanthrene	353	ug/L	7.5	93	40	140	19	40	
Pyrene	398	ug/L	7.5	105	40	140	18	40	
Surr: 2-Fluorobiphenyl			7.5	83	40	140			
Surr: o-Terphenyl			7.5	78	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 08/18/16
Project: Bolke Residence Fuel Oil Release
Work Order: B16080577

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Analytical Run: R265397
Lab ID: 11-Aug-16_CCV_9	Initial Calibration Verification Standard								08/11/16 20:31
2-Methylnaphthalene	2.29	ug/L	0.10	115	70	130			
Acenaphthene	2.15	ug/L	0.10	107	70	130			
Acenaphthylene	2.00	ug/L	0.10	100	70	130			
Anthracene	2.12	ug/L	0.10	106	70	130			
Benzo(a)anthracene	2.12	ug/L	0.10	106	70	130			
Benzo(a)pyrene	1.65	ug/L	0.10	83	70	130			
Benzo(b)fluoranthene	1.80	ug/L	0.10	90	70	130			
Benzo(g,h,i)perylene	2.28	ug/L	0.10	114	70	130			
Benzo(k)fluoranthene	2.12	ug/L	0.10	106	70	130			
Chrysene	2.09	ug/L	0.10	104	70	130			
Dibenzo(a,h)anthracene	1.84	ug/L	0.10	92	70	130			
Fluoranthene	2.13	ug/L	0.10	106	70	130			
Fluorene	2.15	ug/L	0.10	107	70	130			
Indeno(1,2,3-cd)pyrene	1.87	ug/L	0.10	94	70	130			
Naphthalene	2.08	ug/L	0.10	104	70	130			
Phenanthrene	2.01	ug/L	0.10	100	70	130			
Pyrene	2.16	ug/L	0.10	108	70	130			
Surr: 2-Fluorobiphenyl			0.10	104	70	130			
Surr: Nitrobenzene-d5			0.10	102	70	130			
Surr: Terphenyl-d14			0.10	100	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Work Order Receipt Checklist

Hydrometrics Inc

B16080577

Login completed by:	Gina McCartney	Date Received:	8/5/2016
Reviewed by:	BL2000\lcadreau	Received by:	hmr
Reviewed Date:	8/8/2016	Carrier name:	Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	1.3°C On Ice		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	Not Applicable ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name: Hydrometrics Inc.

Project Name, PWS, Permit, Etc.: Boike Residence Fuel Oil Release

Sample Origin State: Montana

EPA/State Compliance: Yes ☐ No ☐

Report Mail Address (Required): 5602 Harper Rd, Billings MT 59106

Contact Name: Heidi Kaiser, Laura Alvey

Phone/Fax: (406) 656-1172

Cell: (406) 697-0410, (406) 459-5043

Sampler: (Please Print) Tyler Swant (406) 291-6446

☐ No Hard Copy Email:

Invoice Contact & Phone: Heidi Kaiser (406) 656-1172 HKaiser@Hydrometrics.com

Purchase Order:

Quote/Bottle Order:

Invoice Address (Required): Same as above

☐ No Hard Copy Email:

Special Report/Formats:

☐ DW ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format:
☐ State: ☐ LEVEL IV
☐ Other: ☐ NELAC

ANALYSIS REQUESTED

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	EPH	VPH	SVOC (8270)	SEE ATTACHED	Standard Turnaround (TAT)	RUSH	Comments
1 BLK-1608-200	8/4/16	10:10	7W	X	X	X		X		*
2 BLK-1608-201		12:04	7W	X	X	X		X		*
3 BLK-1608-202		12:10	7W	X	X	X		X		*
4 BLK-1608-300		15:55	2S	X	X	X		X		**
5 BLK-1608-301		16:00	2S	X	X	X		X		**
6										
7										
8										
9										
10										

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:
* Run SVOC water samples only if EPH screen is greater than 1,000 ug/L
** Run SVOC soil only if EPH screen is greater than 200 mg/kg

LABORATORY USE ONLY

Shipped by:

Cooler ID(s):

Receipt Temp 1.3 °C

On Ice: (Y) N

Custody Seal: On Bottle Y N; On Cooler Y N; Intact Y N; Signature Match Y N

8160857001
002
003
004
005

Custody Record MUST be Signed

Relinquished by (print): Tyler Swant Date/Time: 8/5/16 8:40 Signature:

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by Laboratory: Heather Rein Date/Time: 8-5-16 8:40 Signature:

Sample Disposal: Return to Client: Lab Disposal:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ANALYTICAL SUMMARY REPORT

May 05, 2017

Hydrometrics Inc
5602 Hesper Rd
Billings, MT 59106

Work Order: B17042303

Project Name: 16043, Bolke Residence

Energy Laboratories Inc Billings MT received the following 6 samples for Hydrometrics Inc on 4/28/2017 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B17042303-001	BLK-1704-100	04/26/17 8:28	04/28/17	Aqueous	EPH-Liquid-Liquid Extraction Hydrocarbons, Extractable Petroleum Screen Volatile Petroleum Hydrocarbons
B17042303-002	BLK-1704-101	04/26/17 10:49	04/28/17	Aqueous	EPH-Liquid-Liquid Extraction EPH Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum Screen Volatile Petroleum Hydrocarbons Separatory Funnel Liquid-Liquid Ext. Low Level PAH
B17042303-003	BLK-1704-102	04/26/17 11:30	04/28/17	Aqueous	Same As Above
B17042303-004	BLK-1704-103	04/26/17 10:15	04/28/17	Aqueous	EPH-Liquid-Liquid Extraction Hydrocarbons, Extractable Petroleum Screen Volatile Petroleum Hydrocarbons
B17042303-005	Trip Blank 1 Lot 022410 TS SHP0246	04/26/17 8:28	04/28/17	Trip Blank	Volatile Petroleum Hydrocarbons
B17042303-006	Trip Blank 2 Lot 022610 TS SHP0246	04/26/17 10:15	04/28/17	Trip Blank	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16043, Bolke Residence
Work Order: B17042303

Report Date: 05/05/17

CASE NARRATIVE

RUSH Fractionation with PAHs was added to the following sample(s) per comments per phone call on 5/3/17:

B17042303-002 BLK-1704-101

B17042303-003 BLK-1704-102

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-001
Client Sample ID: BLK-1704-100

Report Date: 05/05/17
Collection Date: 04/26/17 08:28
DateReceived: 04/28/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	05/01/17 15:38 / bw
Benzene	ND	ug/L		0.50	5	MA-VPH	05/01/17 15:38 / bw
Toluene	ND	ug/L		0.50	1000	MA-VPH	05/01/17 15:38 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	05/01/17 15:38 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	05/01/17 15:38 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	05/01/17 15:38 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	05/01/17 15:38 / bw
Naphthalene	ND	ug/L		1.0	100	MA-VPH	05/01/17 15:38 / bw
C9 to C10 Aromatics	ND	ug/L		20	1100	MA-VPH	05/01/17 15:38 / bw
C5 to C8 Aliphatics	ND	ug/L		20	650	MA-VPH	05/01/17 15:38 / bw
C9 to C12 Aliphatics	ND	ug/L		20	1400	MA-VPH	05/01/17 15:38 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20		MA-VPH	05/01/17 15:38 / bw
Surr: VPH Aromatics Surrogate	100	%REC		70-130		MA-VPH	05/01/17 15:38 / bw
Surr: VPH Aliphatics Surrogate	95.0	%REC		70-130		MA-VPH	05/01/17 15:38 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	ND	ug/L		300	1000	SW8015M	05/02/17 13:16 / mdw
Surr: o-Terphenyl	60.0	%REC		40-140		SW8015M	05/02/17 13:16 / mdw

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-002
Client Sample ID: BLK-1704-101

Report Date: 05/05/17
Collection Date: 04/26/17 10:49
DateReceived: 04/28/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	05/01/17 16:11 / bw
Benzene	ND	ug/L		0.50	5	MA-VPH	05/01/17 16:11 / bw
Toluene	ND	ug/L		0.50	1000	MA-VPH	05/01/17 16:11 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	05/01/17 16:11 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	05/01/17 16:11 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	05/01/17 16:11 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	05/01/17 16:11 / bw
Naphthalene	1.4	ug/L		1.0	100	MA-VPH	05/01/17 16:11 / bw
C9 to C10 Aromatics	58	ug/L		20	1100	MA-VPH	05/01/17 16:11 / bw
C5 to C8 Aliphatics	ND	ug/L		20	650	MA-VPH	05/01/17 16:11 / bw
C9 to C12 Aliphatics	16	ug/L	J	20	1400	MA-VPH	05/01/17 16:11 / bw
Total Purgeable Hydrocarbons	77	ug/L		20		MA-VPH	05/01/17 16:11 / bw
Surr: VPH Aromatics Surrogate	104	%REC		70-130		MA-VPH	05/01/17 16:11 / bw
Surr: VPH Aliphatics Surrogate	97.0	%REC		70-130		MA-VPH	05/01/17 16:11 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The sample was received in the laboratory with a pH > 2. The pH was 7.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	1620	ug/L	*	300	1000	SW8015M	05/02/17 15:40 / mdw
Surr: o-Terphenyl	81.0	%REC		40-140		SW8015M	05/02/17 15:40 / mdw

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	ND	ug/L		300	1400	MA-EPH	05/04/17 02:28 / amn
C19 to C36 Aliphatics	ND	ug/L		300	1000	MA-EPH	05/04/17 02:28 / amn
Surr: 1-Chloro-octadecane	77.0	%REC		40-140		MA-EPH	05/04/17 02:28 / amn
C11 to C22 Aromatics	ND	ug/L		300	1100	MA-EPH	05/04/17 03:11 / amn
Total Extractable Hydrocarbons	ND	ug/L		300	1000	MA-EPH	05/04/17 03:11 / amn
Surr: 2-Bromonaphthalene	79.0	%REC		40-140		MA-EPH	05/04/17 03:11 / amn
Surr: 2-Fluorobiphenyl	85.0	%REC		40-140		MA-EPH	05/04/17 03:11 / amn
Surr: o-Terphenyl	69.0	%REC		40-140		MA-EPH	05/04/17 03:11 / amn

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons.

SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
1-Methylnaphthalene	ND	ug/L		0.19	11	SW8270C	05/04/17 19:58 / dsm
2-Methylnaphthalene	ND	ug/L		0.19	36	SW8270C	05/04/17 19:58 / dsm
Acenaphthene	ND	ug/L		0.19	670	SW8270C	05/04/17 19:58 / dsm
Acenaphthylene	ND	ug/L		0.19		SW8270C	05/04/17 19:58 / dsm
Anthracene	ND	ug/L		0.19	2100	SW8270C	05/04/17 19:58 / dsm
Benzo(a)anthracene	ND	ug/L		0.19	0.5	SW8270C	05/04/17 19:58 / dsm
Benzo(a)pyrene	ND	ug/L		0.19	0.05	SW8270C	05/04/17 19:58 / dsm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-002
Client Sample ID: BLK-1704-101

Report Date: 05/05/17
Collection Date: 04/26/17 10:49
DateReceived: 04/28/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
Benzo(b)fluoranthene	ND	ug/L		0.19	0.5	SW8270C	05/04/17 19:58 / dsm
Benzo(g,h,i)perylene	ND	ug/L		0.19		SW8270C	05/04/17 19:58 / dsm
Benzo(k)fluoranthene	ND	ug/L		0.19	5	SW8270C	05/04/17 19:58 / dsm
Chrysene	ND	ug/L		0.19	50	SW8270C	05/04/17 19:58 / dsm
Dibenzo(a,h)anthracene	ND	ug/L		0.19	0.05	SW8270C	05/04/17 19:58 / dsm
Fluoranthene	ND	ug/L		0.19	130	SW8270C	05/04/17 19:58 / dsm
Fluorene	ND	ug/L		0.19	1100	SW8270C	05/04/17 19:58 / dsm
Indeno(1,2,3-cd)pyrene	ND	ug/L		0.19	0.5	SW8270C	05/04/17 19:58 / dsm
Naphthalene	ND	ug/L		0.19	100	SW8270C	05/04/17 19:58 / dsm
Phenanthrene	ND	ug/L		0.19		SW8270C	05/04/17 19:58 / dsm
Pyrene	ND	ug/L		0.19	830	SW8270C	05/04/17 19:58 / dsm
Surr: 2-Fluorobiphenyl	74.0	%REC		40-140		SW8270C	05/04/17 20:31 / dsm
Surr: o-Terphenyl	44.0	%REC		40-140		SW8270C	05/04/17 20:31 / dsm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-003
Client Sample ID: BLK-1704-102

Report Date: 05/05/17
Collection Date: 04/26/17 11:30
DateReceived: 04/28/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	05/01/17 18:55 / bw
Benzene	ND	ug/L		0.50	5	MA-VPH	05/01/17 18:55 / bw
Toluene	ND	ug/L		0.50	1000	MA-VPH	05/01/17 18:55 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	05/01/17 18:55 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	05/01/17 18:55 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	05/01/17 18:55 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	05/01/17 18:55 / bw
Naphthalene	0.97	ug/L	J	1.0	100	MA-VPH	05/01/17 18:55 / bw
C9 to C10 Aromatics	50	ug/L		20	1100	MA-VPH	05/01/17 18:55 / bw
C5 to C8 Aliphatics	ND	ug/L		20	650	MA-VPH	05/01/17 18:55 / bw
C9 to C12 Aliphatics	15	ug/L	J	20	1400	MA-VPH	05/01/17 18:55 / bw
Total Purgeable Hydrocarbons	67	ug/L		20		MA-VPH	05/01/17 18:55 / bw
Surr: VPH Aromatics Surrogate	100	%REC		70-130		MA-VPH	05/01/17 18:55 / bw
Surr: VPH Aliphatics Surrogate	94.0	%REC		70-130		MA-VPH	05/01/17 18:55 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The sample was received in the laboratory with a pH > 2. The pH was 4.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	1100	ug/L	*	300	1000	SW8015M	05/03/17 09:20 / mdw
Surr: o-Terphenyl	64.0	%REC		40-140		SW8015M	05/03/17 09:20 / mdw

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	ND	ug/L		300	1400	MA-EPH	05/03/17 22:55 / amn
C19 to C36 Aliphatics	ND	ug/L		300	1000	MA-EPH	05/03/17 22:55 / amn
Surr: 1-Chloro-octadecane	55.0	%REC		40-140		MA-EPH	05/03/17 22:55 / amn
C11 to C22 Aromatics	ND	ug/L		300	1100	MA-EPH	05/03/17 23:38 / amn
Total Extractable Hydrocarbons	ND	ug/L		300	1000	MA-EPH	05/03/17 23:38 / amn
Surr: 2-Bromonaphthalene	82.0	%REC		40-140		MA-EPH	05/03/17 23:38 / amn
Surr: 2-Fluorobiphenyl	85.0	%REC		40-140		MA-EPH	05/03/17 23:38 / amn
Surr: o-Terphenyl	54.0	%REC		40-140		MA-EPH	05/03/17 23:38 / amn

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons.

SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
1-Methylnaphthalene	ND	ug/L		0.19	11	SW8270C	05/04/17 21:03 / dsm
2-Methylnaphthalene	ND	ug/L		0.19	36	SW8270C	05/04/17 21:03 / dsm
Acenaphthene	ND	ug/L		0.19	670	SW8270C	05/04/17 21:03 / dsm
Acenaphthylene	ND	ug/L		0.19		SW8270C	05/04/17 21:03 / dsm
Anthracene	ND	ug/L		0.19	2100	SW8270C	05/04/17 21:03 / dsm
Benzo(a)anthracene	ND	ug/L		0.19	0.5	SW8270C	05/04/17 21:03 / dsm
Benzo(a)pyrene	ND	ug/L		0.19	0.05	SW8270C	05/04/17 21:03 / dsm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-003
Client Sample ID: BLK-1704-102

Report Date: 05/05/17
Collection Date: 04/26/17 11:30
DateReceived: 04/28/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
Benzo(b)fluoranthene	ND	ug/L		0.19	0.5	SW8270C	05/04/17 21:03 / dsm
Benzo(g,h,i)perylene	ND	ug/L		0.19		SW8270C	05/04/17 21:03 / dsm
Benzo(k)fluoranthene	ND	ug/L		0.19	5	SW8270C	05/04/17 21:03 / dsm
Chrysene	ND	ug/L		0.19	50	SW8270C	05/04/17 21:03 / dsm
Dibenzo(a,h)anthracene	ND	ug/L		0.19	0.05	SW8270C	05/04/17 21:03 / dsm
Fluoranthene	ND	ug/L		0.19	130	SW8270C	05/04/17 21:03 / dsm
Fluorene	ND	ug/L		0.19	1100	SW8270C	05/04/17 21:03 / dsm
Indeno(1,2,3-cd)pyrene	ND	ug/L		0.19	0.5	SW8270C	05/04/17 21:03 / dsm
Naphthalene	ND	ug/L		0.19	100	SW8270C	05/04/17 21:03 / dsm
Phenanthrene	ND	ug/L		0.19		SW8270C	05/04/17 21:03 / dsm
Pyrene	ND	ug/L		0.19	830	SW8270C	05/04/17 21:03 / dsm
Surr: 2-Fluorobiphenyl	75.0	%REC		40-140		SW8270C	05/04/17 21:36 / dsm
Surr: o-Terphenyl	60.0	%REC		40-140		SW8270C	05/04/17 21:36 / dsm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-004
Client Sample ID: BLK-1704-103

Report Date: 05/05/17
Collection Date: 04/26/17 10:15
DateReceived: 04/28/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	05/01/17 17:51 / bw
Benzene	ND	ug/L		0.50	5	MA-VPH	05/01/17 17:51 / bw
Toluene	ND	ug/L		0.50	1000	MA-VPH	05/01/17 17:51 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	05/01/17 17:51 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	05/01/17 17:51 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	05/01/17 17:51 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	05/01/17 17:51 / bw
Naphthalene	ND	ug/L		1.0	100	MA-VPH	05/01/17 17:51 / bw
C9 to C10 Aromatics	ND	ug/L		20	1100	MA-VPH	05/01/17 17:51 / bw
C5 to C8 Aliphatics	ND	ug/L		20	650	MA-VPH	05/01/17 17:51 / bw
C9 to C12 Aliphatics	ND	ug/L		20	1400	MA-VPH	05/01/17 17:51 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20		MA-VPH	05/01/17 17:51 / bw
Surr: VPH Aromatics Surrogate	102	%REC		70-130		MA-VPH	05/01/17 17:51 / bw
Surr: VPH Aliphatics Surrogate	96.0	%REC		70-130		MA-VPH	05/01/17 17:51 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN							
Total Extractable Hydrocarbons	ND	ug/L		300	1000	SW8015M	05/02/17 17:12 / mdw
Surr: o-Terphenyl	80.0	%REC		40-140		SW8015M	05/02/17 17:12 / mdw

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-005
Client Sample ID: Trip Blank 1 Lot 022410 TS SHP0246

Report Date: 05/05/17
Collection Date: 04/26/17 08:28
DateReceived: 04/28/17
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	05/01/17 15:06 / bw
Benzene	ND	ug/L		0.50	5	MA-VPH	05/01/17 15:06 / bw
Toluene	0.41	ug/L	J	0.50	1000	MA-VPH	05/01/17 15:06 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	05/01/17 15:06 / bw
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	05/01/17 15:06 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	05/01/17 15:06 / bw
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	05/01/17 15:06 / bw
Naphthalene	ND	ug/L		1.0	100	MA-VPH	05/01/17 15:06 / bw
C9 to C10 Aromatics	ND	ug/L		20	1100	MA-VPH	05/01/17 15:06 / bw
C5 to C8 Aliphatics	ND	ug/L		20	650	MA-VPH	05/01/17 15:06 / bw
C9 to C12 Aliphatics	ND	ug/L		20	1400	MA-VPH	05/01/17 15:06 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20		MA-VPH	05/01/17 15:06 / bw
Surr: VPH Aromatics Surrogate	100	%REC		70-130		MA-VPH	05/01/17 15:06 / bw
Surr: VPH Aliphatics Surrogate	95.0	%REC		70-130		MA-VPH	05/01/17 15:06 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence
Lab ID: B17042303-006
Client Sample ID: Trip Blank 2 Lot 022610 TS SHP0246

Report Date: 05/05/17
Collection Date: 04/26/17 10:15
DateReceived: 04/28/17
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	05/01/17 14:31 / bw
Benzene	ND	ug/L		0.50	5	MA-VPH	05/01/17 14:31 / bw
Toluene	0.62	ug/L		0.50	1000	MA-VPH	05/01/17 14:31 / bw
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	05/01/17 14:31 / bw
m+p-Xylenes	0.52	ug/L		0.50		MA-VPH	05/01/17 14:31 / bw
o-Xylene	ND	ug/L		0.50		MA-VPH	05/01/17 14:31 / bw
Xylenes, Total	0.52	ug/L		0.50	10000	MA-VPH	05/01/17 14:31 / bw
Naphthalene	ND	ug/L		1.0	100	MA-VPH	05/01/17 14:31 / bw
C9 to C10 Aromatics	ND	ug/L		20	1100	MA-VPH	05/01/17 14:31 / bw
C5 to C8 Aliphatics	ND	ug/L		20	650	MA-VPH	05/01/17 14:31 / bw
C9 to C12 Aliphatics	ND	ug/L		20	1400	MA-VPH	05/01/17 14:31 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20		MA-VPH	05/01/17 14:31 / bw
Surr: VPH Aromatics Surrogate	102	%REC		70-130		MA-VPH	05/01/17 14:31 / bw
Surr: VPH Aliphatics Surrogate	98.0	%REC		70-130		MA-VPH	05/01/17 14:31 / bw

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Analytical Run: R279167
Lab ID: CCV_0501VA204r-W	Continuing Calibration Verification Standard								05/01/17 11:00
1,2,4-Trimethylbenzene	27.3	ug/L	1.0	109	75	125			
2,2,4-Trimethylpentane	25.0	ug/L	1.0	100	75	125			
2-Methylpentane	25.7	ug/L	1.0	103	75	125			
n-Butylcyclohexane	24.1	ug/L	1.0	96	75	125			
n-Decane	25.5	ug/L	1.0	102	75	125			
Methyl tert-butyl ether (MTBE)	26.7	ug/L	1.0	107	75	125			
Benzene	27.2	ug/L	0.50	109	75	125			
Toluene	27.5	ug/L	0.50	110	75	125			
Ethylbenzene	27.6	ug/L	0.50	110	75	125			
m+p-Xylenes	53.5	ug/L	0.50	107	75	125			
o-Xylene	27.1	ug/L	0.50	108	75	125			
Naphthalene	26.8	ug/L	1.0	107	75	125			
n-Pentane	26.1	ug/L	1.0	104	75	125			
Surr: VPH Aromatics Surrogate			1.0	100	75	125			
Surr: VPH Aliphatics Surrogate			1.0	95	75	125			
Method: MA-VPH									Batch: R279167
Lab ID: LCS_0501VA205r	Laboratory Control Sample				Run: VARIAN2_170501A				05/01/17 11:32
1,2,4-Trimethylbenzene	23.8	ug/L	1.0	95	70	130			
2,2,4-Trimethylpentane	22.2	ug/L	1.0	89	70	130			
2-Methylpentane	22.2	ug/L	1.0	89	70	130			
n-Butylcyclohexane	22.1	ug/L	1.0	88	70	130			
n-Decane	23.2	ug/L	1.0	93	70	130			
Methyl tert-butyl ether (MTBE)	23.4	ug/L	1.0	94	70	130			
Benzene	23.4	ug/L	0.50	93	70	130			
Toluene	23.4	ug/L	0.50	94	70	130			
Ethylbenzene	23.5	ug/L	0.50	94	70	130			
m+p-Xylenes	46.7	ug/L	0.50	93	70	130			
o-Xylene	23.5	ug/L	0.50	94	70	130			
Naphthalene	23.6	ug/L	1.0	94	70	130			
Total Purgeable Hydrocarbons	339	ug/L	20	90	70	130			
n-Pentane	22.8	ug/L	1.0	91	70	130			
Surr: VPH Aromatics Surrogate			1.0	98	70	130			
Surr: VPH Aliphatics Surrogate			1.0	97	70	130			
Lab ID: MBLK_0501VA209r	Method Blank				Run: VARIAN2_170501A				05/01/17 13:49
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Benzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

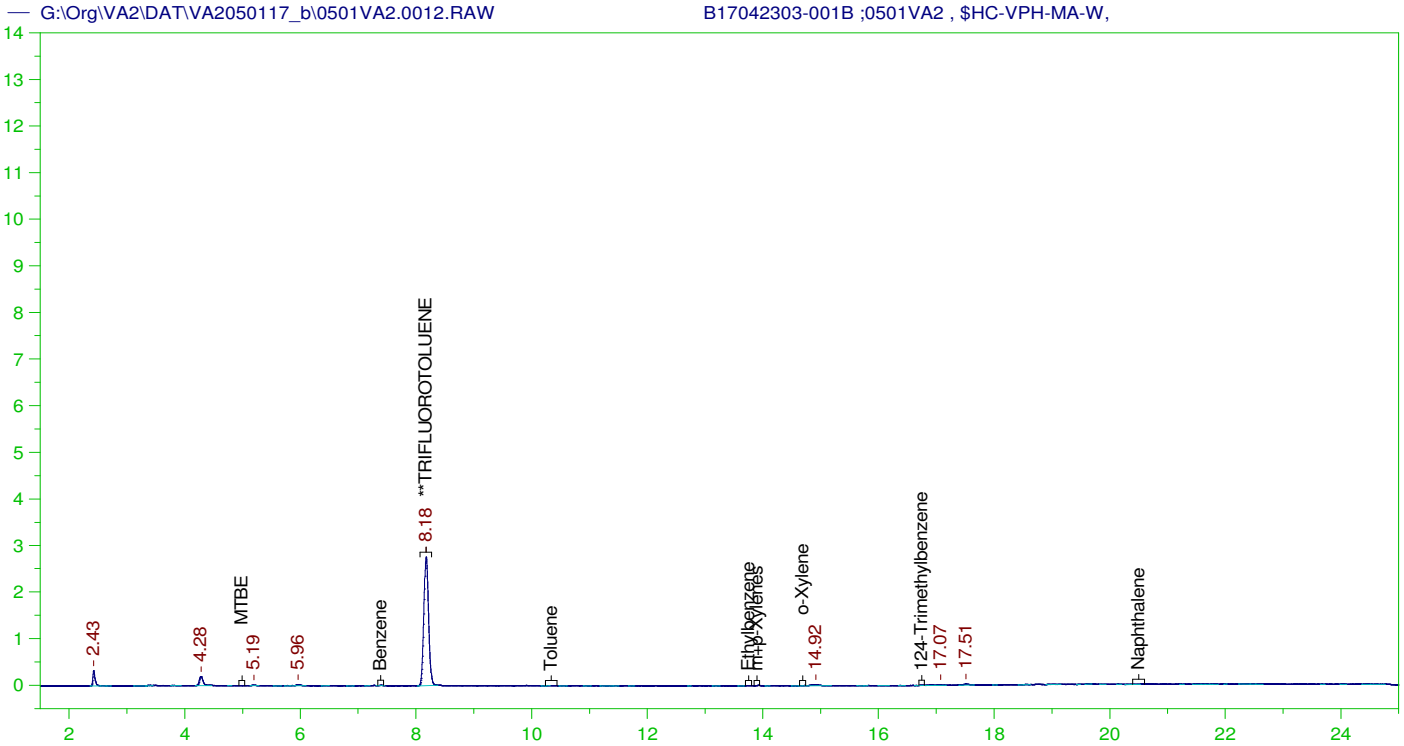
Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: R279167
Lab ID: MBLK_0501VA209r	Method Blank				Run: VARIAN2_170501A				05/01/17 13:49
Naphthalene	ND	ug/L	1.0						
C9 to C10 Aromatics	ND	ug/L	20						
C5 to C8 Aliphatics	ND	ug/L	20						
C9 to C12 Aliphatics	ND	ug/L	20						
Total Purgeable Hydrocarbons	ND	ug/L	20						
Surr: VPH Aromatics Surrogate			1.0	100	70	130			
Surr: VPH Aliphatics Surrogate			1.0	98	70	130			
Lab ID: B17042303-002BMS	Sample Matrix Spike				Run: VARIAN2_170501A				05/02/17 13:50
Methyl tert-butyl ether (MTBE)	25.3	ug/L	1.0	101	70	130			
Benzene	25.4	ug/L	0.50	102	70	130			
Toluene	25.5	ug/L	0.50	102	70	130			
Ethylbenzene	25.8	ug/L	0.50	103	70	130			
m+p-Xylenes	50.4	ug/L	0.50	101	70	130			
o-Xylene	25.6	ug/L	0.50	103	70	130			
Naphthalene	26.0	ug/L	1.0	98	70	130			
Total Purgeable Hydrocarbons	456	ug/L	20	101	70	130			
Surr: VPH Aromatics Surrogate			1.0	103	70	130			
Surr: VPH Aliphatics Surrogate			1.0	100	70	130			
Lab ID: B17042303-002BMSD	Sample Matrix Spike Duplicate				Run: VARIAN2_170501A				05/02/17 14:23
Methyl tert-butyl ether (MTBE)	22.5	ug/L	1.0	90	70	130	12	20	
Benzene	21.6	ug/L	0.50	86	70	130	16	20	
Toluene	21.9	ug/L	0.50	88	70	130	15	20	
Ethylbenzene	22.0	ug/L	0.50	88	70	130	16	20	
m+p-Xylenes	44.4	ug/L	0.50	89	70	130	13	20	
o-Xylene	22.5	ug/L	0.50	90	70	130	13	20	
Naphthalene	24.3	ug/L	1.0	92	70	130	6.8	20	
Total Purgeable Hydrocarbons	434	ug/L	20	95	70	130	4.9	20	
Surr: VPH Aromatics Surrogate			1.0	90	70	130			
Surr: VPH Aliphatics Surrogate			1.0	93	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

BLK-1704-100



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-001B ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2.0012.RAW
Date & Time Acquired: 5/1/2017 3:38:09 PM
Method File: G:\Org\VA2\Methods\170301VA2V2303-1.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 366.7145
Rt range for C9 to C10 Aromatics: 14.74 to 20.399
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:705.0788 C9-C10 Aromatics Amount: 0.3845383

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		.5	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	8.176	25.	24.968	99.87	70-130

BLK-1704-100

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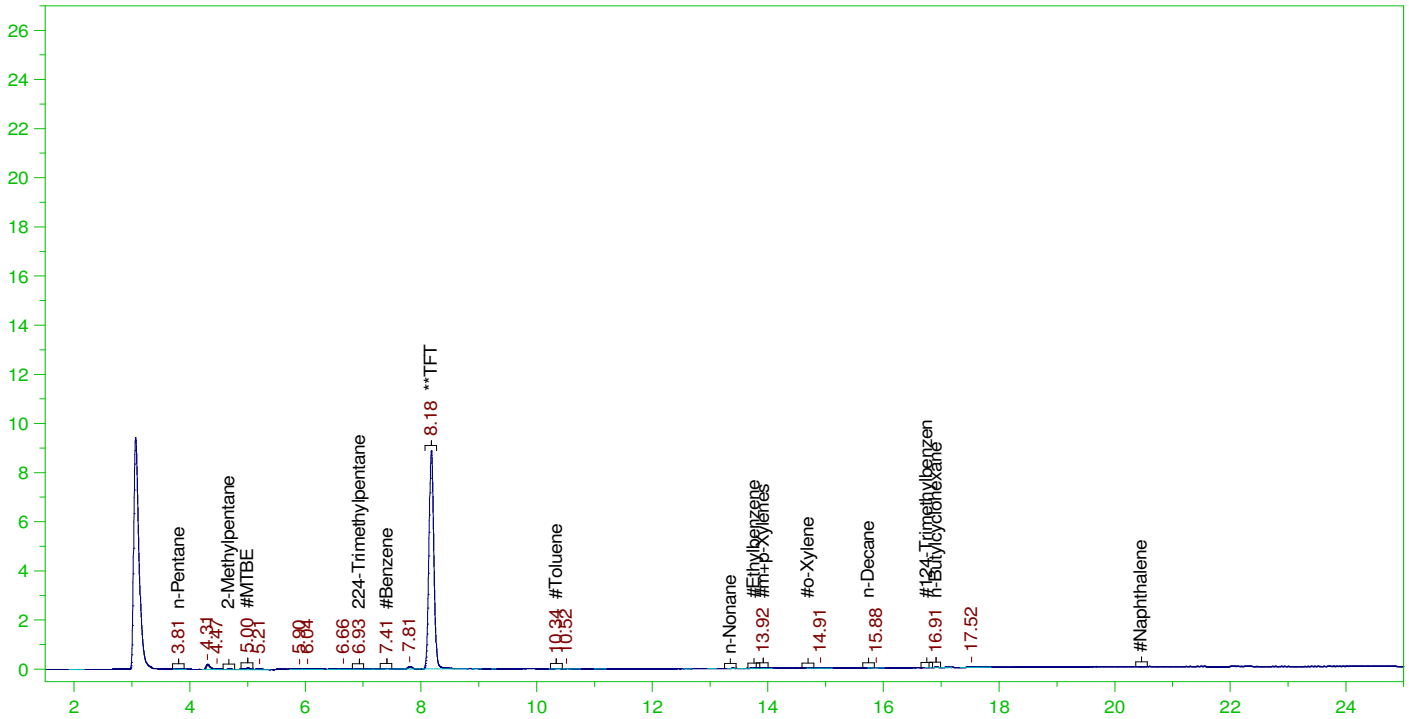

VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-001B ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2b.0012.RAW
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Method File: G:\Org\VA2\Methods\170301VA2V2303-1B.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 457.2002
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 390.8903
Mean RF for all calibrated compounds: 561.369
Rt range for Gasoline Range Organics: 4.576 to 15.843
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.705 to 13.251
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.301 to 20.362

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	8.179	25.	23.853	95.41 -

GRO Area:2768.133 GRO Amount: 0.9862081
TPH Area:4798.25 TPH Amount: 1.709482

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:3835.969 C5-C8 Amount: 1.678026
C9-C12 Area:891.0937 C9-C12 Amount: 0.4559303

BLK-1704-101

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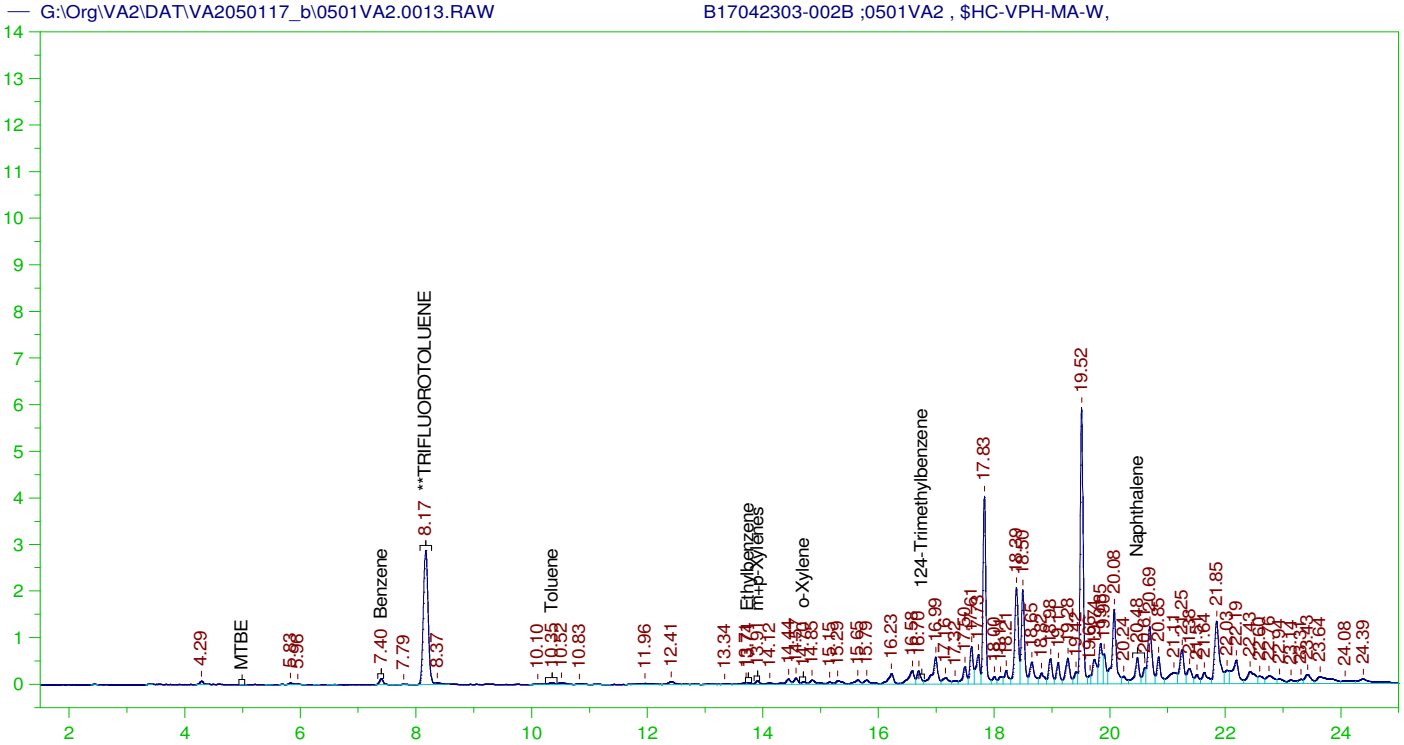

VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-002B ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2.0013.RAW
Date & Time Acquired: 5/1/2017 4:11:59 PM
Method File: G:\Org\VA2\Methods\170301VA2V2303-2.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 366.7145
Rt range for C9 to C10 Aromatics: 14.74 to 20.399
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:105684.8 C9-C10 Aromatics Amount: 57.63871

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	7.398	7.398	7.398	631	.5	U
Toluene	10.353	10.353	10.353	312	.5	U
Ethylbenzene	13.745	13.745	13.745	161	.5	U
m+p-Xylenes	13.908	13.908	13.908	409	.5	U
o-Xylene	14.703	14.703	14.703	311	.5	U
124-Trimethylbenzene	.	.	.		.5	U
Naphthalene	20.481	-12.332	-12.312	3057	1.362	

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	8.169	25.	26.026	104.1	70-130

BLK-1704-101

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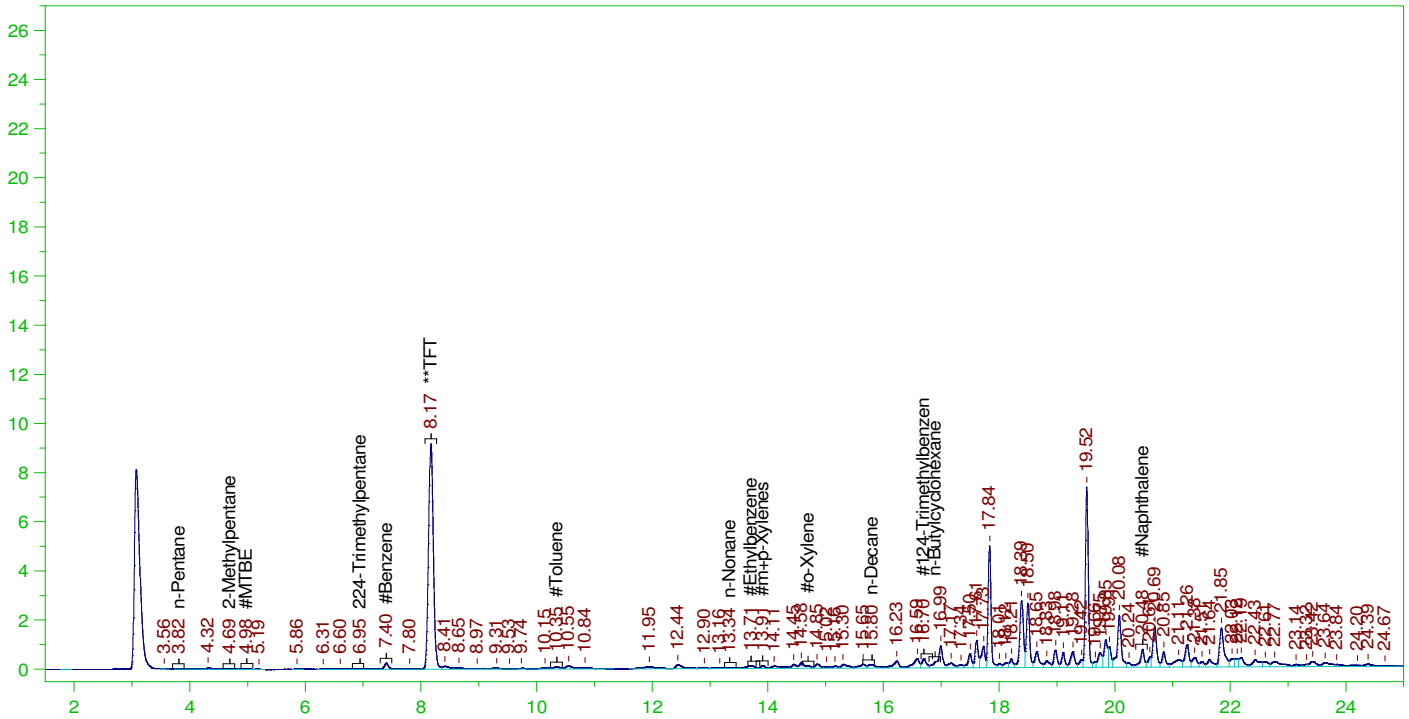

VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-002B ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2b.0013.RAW
Date & Time Acquired: 5/1/2017 4:11:59 PM
Method File: G:\Org\VA2\Methods\170301VA2V2303-2B.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 457.2002
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 390.8903
Mean RF for all calibrated compounds: 561.369
Rt range for Gasoline Range Organics: 4.576 to 15.843
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.705 to 13.251
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.301 to 20.362

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	8.172	25.	24.302	97.21 -

GRO Area:23534.8 GRO Amount: 8.38479
TPH Area:214853.8 TPH Amount: 76.54639

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:12152.02 C5-C8 Amount: 5.315844
C9-C12 Area:144053.6 C9-C12 Amount: 73.70536

BLK-1704-102

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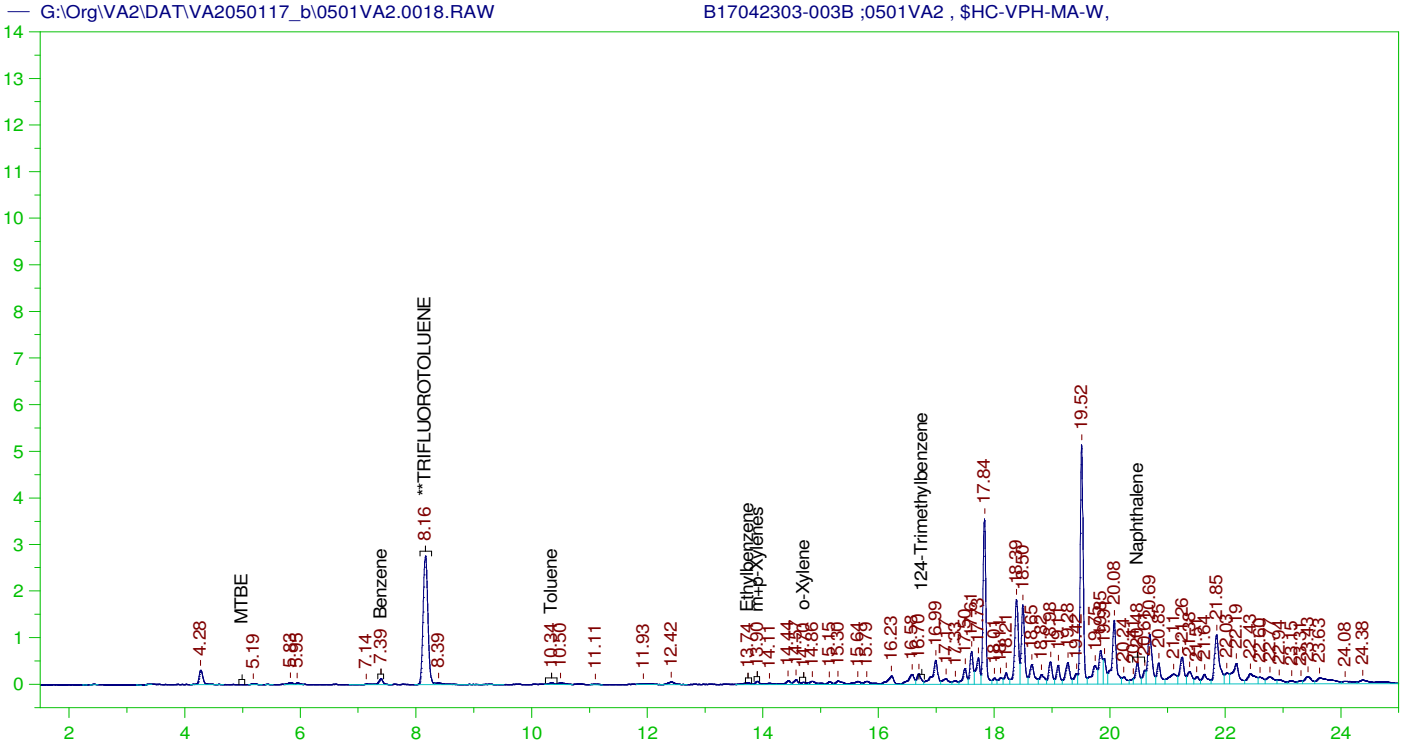

VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-003B ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2.0018.RAW
Date & Time Acquired: 5/1/2017 6:55:54 PM
Method File: G:\Org\VA2\Methods\170301VA2V2303-3.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 366.7145
Rt range for C9 to C10 Aromatics: 14.74 to 20.399
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:90960.06 C9-C10 Aromatics Amount: 49.60811

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	7.394	7.394	7.394	609	.5	U
Toluene	10.342	10.342	10.342	187	.5	U
Ethylbenzene	13.741	13.741	13.741	285	.5	U
m+p-Xylenes	13.902	13.902	13.902	344	.5	U
o-Xylene	14.705	14.705	14.705	290	.5	U
124-Trimethylbenzene	.	.	.		.5	U
Naphthalene	20.482	-12.332	-12.318	2177	.97	J

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	8.164	25.	24.968	99.87	70-130

BLK-1704-102

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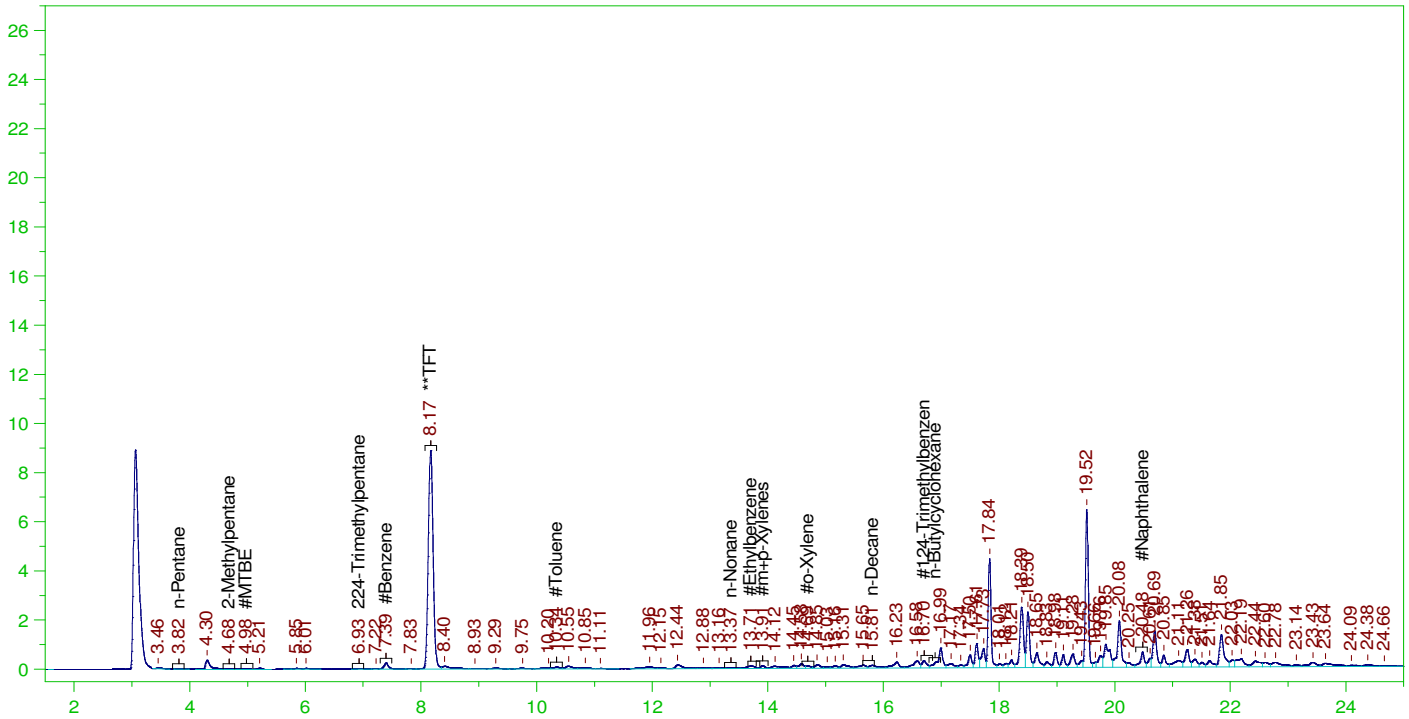

VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-003B ;0501VA2 , $HC-VPH-MA-W,
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Calibration File: G:\Org\VA2\Cals\170301VA2VPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

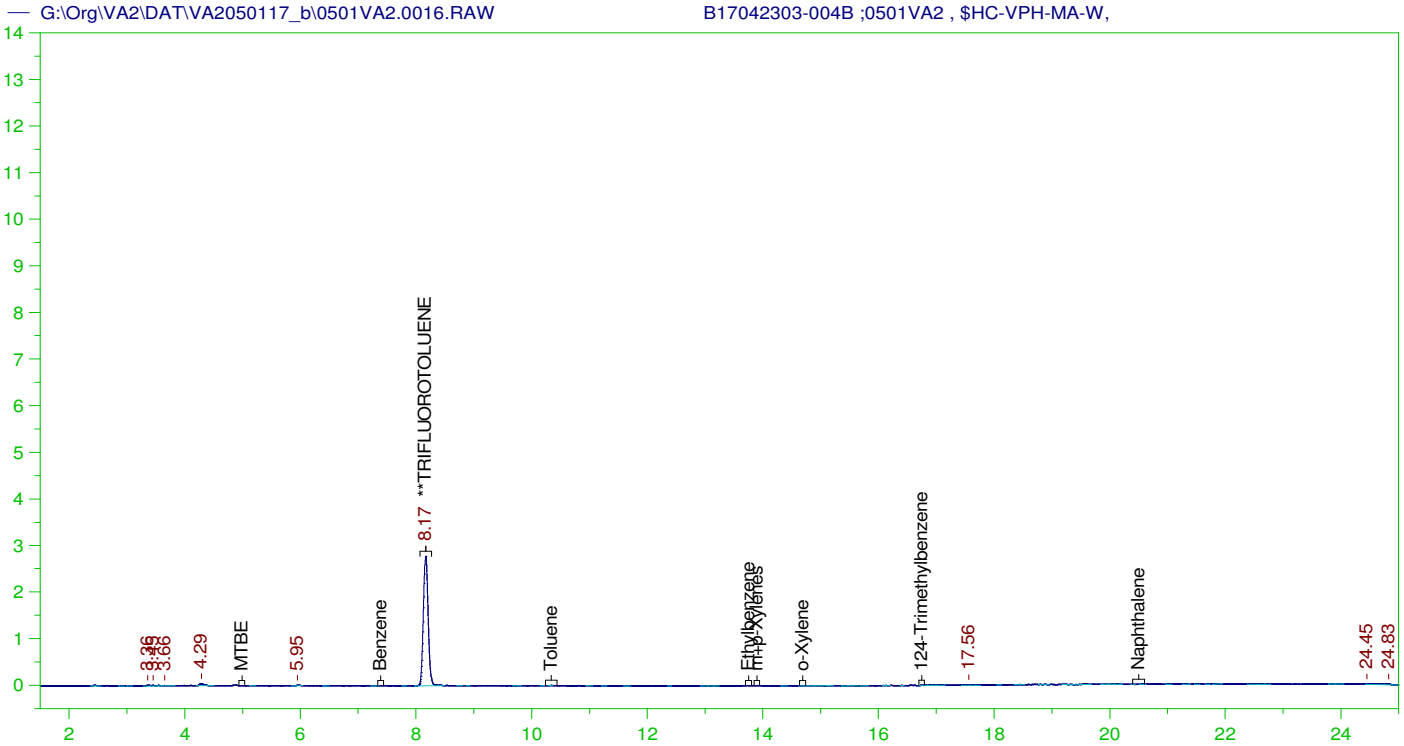
Mean RF for C5 to C8 Aliphatic Hydrocarbons: 457.2002
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 390.8903
Mean RF for all calibrated compounds: 561.369
Rt range for Gasoline Range Organics: 4.576 to 15.843
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.705 to 13.251
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.301 to 20.362

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	8.168	25.	23.59	94.36 -

GRO Area:20621.58 GRO Amount: 7.346889
TPH Area:189230 TPH Amount: 67.41733

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:13023.95 C5-C8 Amount: 5.697261
C9-C12 Area:126310.6 C9-C12 Amount: 64.62714

BLK-1704-103



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-004B ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2.0016.RAW
Date & Time Acquired: 5/1/2017 5:51:57 PM
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Calibration File: G:\Org\VA2\Cals\170301VA2VPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 366.7145
Rt range for C9 to C10 Aromatics: 14.74 to 20.399
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:492.0805 C9-C10 Aromatics Amount: 0.2683725

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		.5	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	8.169	25.	25.393	101.57	70-130

BLK-1704-103

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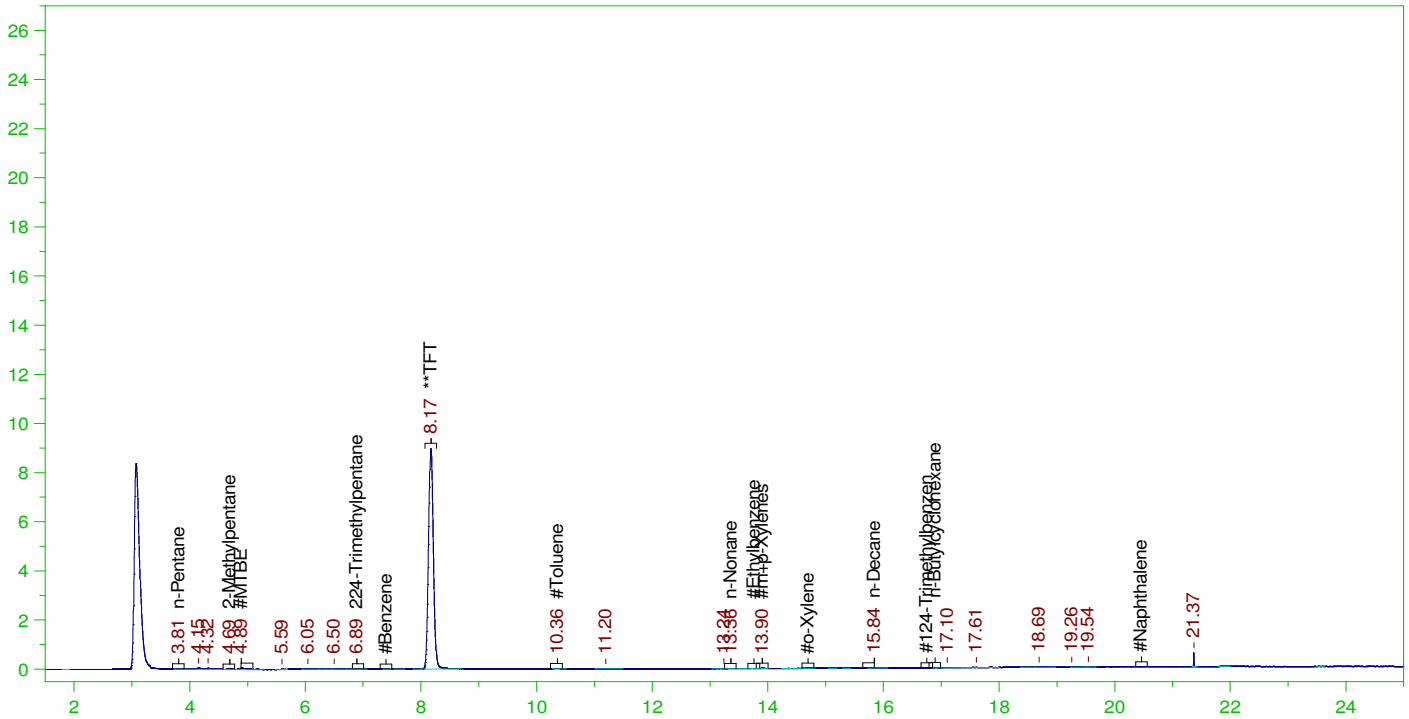

VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-004B ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2b.0016.RAW
Date & Time Acquired: 5/1/2017 5:51:57 PM
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Calibration File: G:\Org\VA2\Cals\170301VA2VPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

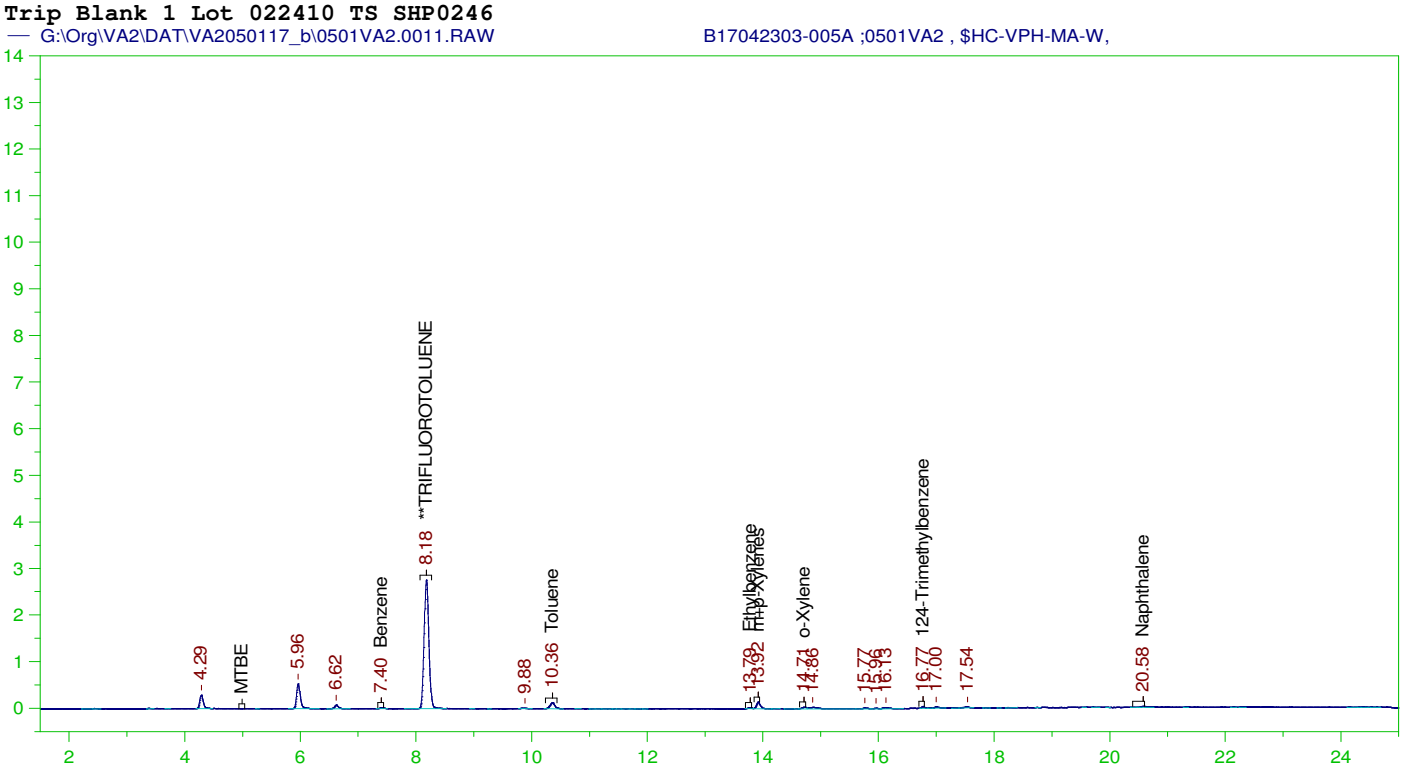
Mean RF for C5 to C8 Aliphatic Hydrocarbons: 457.2002
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 390.8903
Mean RF for all calibrated compounds: 561.369
Rt range for Gasoline Range Organics: 4.576 to 15.843
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.705 to 13.251
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.301 to 20.362

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	8.172	25.	24.077	96.31 -

GRO Area:1837.324 GRO Amount: 0.654587
TPH Area:3787.258 TPH Amount: 1.349294

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2094.82 C5-C8 Amount: 0.916369
C9-C12 Area:1043.023 C9-C12 Amount: 0.5336652

Trip Blank 1 Lot 022410 TS SHP0246



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-005A ;0501VA2 , $HC-VPH-MA-W,
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Method File: G:\Org\VA2\Methods\170301VA2V2303-5.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 366.7145
Rt range for C9 to C10 Aromatics: 14.74 to 20.399
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1413.862 C9-C10 Aromatics Amount: 0.7710969

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	7.402	7.402	7.402	111	.5	U
Toluene	10.361	-2.17	-2.18	765	.414	J
Ethylbenzene	13.785	13.785	13.785	94	.5	U
m+p-Xylenes	13.923	13.923	13.923	693	.5	U
o-Xylene	14.711	14.711	14.711	187	.5	U
124-Trimethylbenzene	16.775	16.775	16.775	148	.5	U
Naphthalene	20.578	20.578	20.578	152	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	8.181	25.	25.09	100.36	70-130

Trip Blank 1 Lot 022410 TS SHP0246

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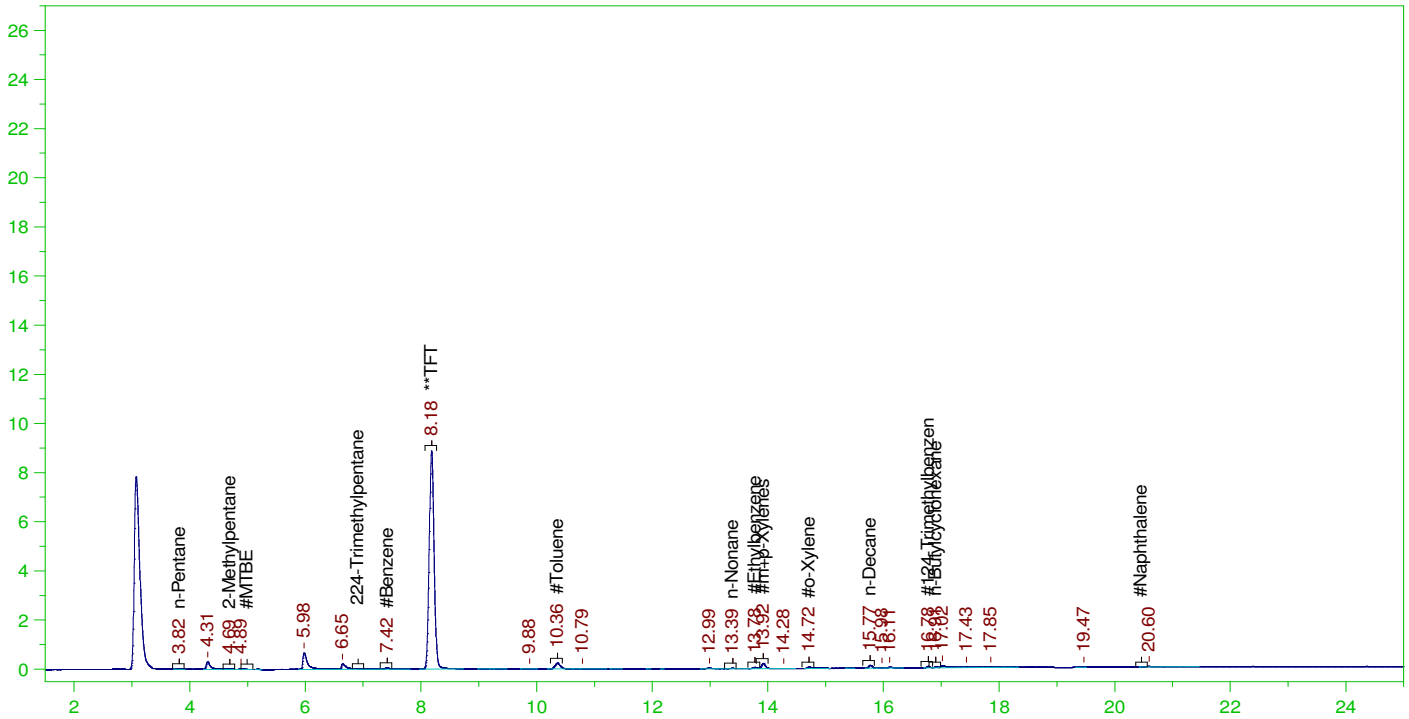


VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-005A ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2b.0011.RAW
Date & Time Acquired: 5/1/2017 3:06:04 PM
Method File: G:\Org\VA2\Methods\170301VA2V2303-5B.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

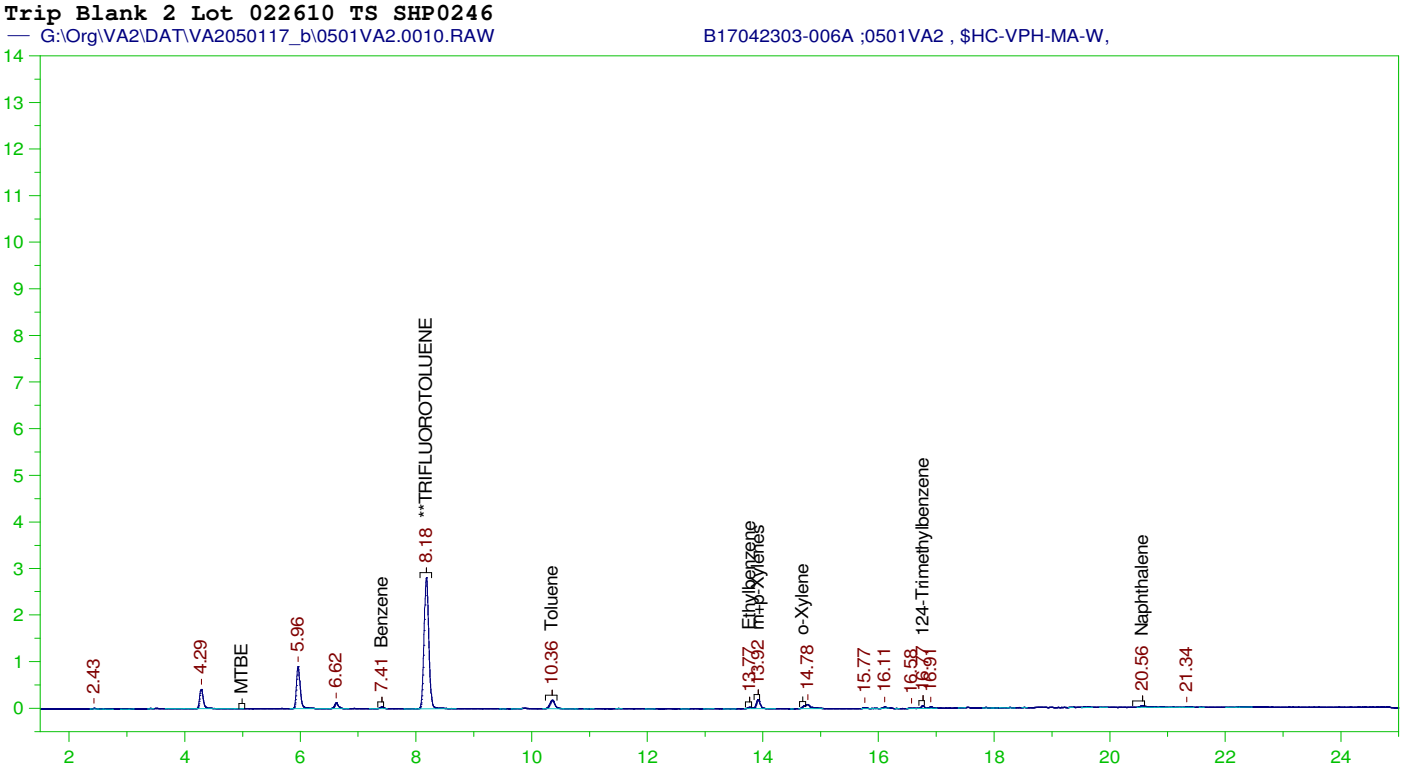
Mean RF for C5 to C8 Aliphatic Hydrocarbons: 457.2002
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 390.8903
Mean RF for all calibrated compounds: 561.369
Rt range for Gasoline Range Organics: 4.576 to 15.843
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.705 to 13.251
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.301 to 20.362

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	8.185	25.	23.806	95.22 -

GRO Area:10827.41 GRO Amount: 3.857503
TPH Area:15263.07 TPH Amount: 5.437803

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:9776.641 C5-C8 Amount: 4.276744
C9-C12 Area:4583.946 C9-C12 Amount: 2.345387

Trip Blank 2 Lot 022610 TS SHP0246



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-006A ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2.0010.RAW
Date & Time Acquired: 5/1/2017 2:31:32 PM
Method File: G:\Org\VA2\Methods\170301VA2V2303-6.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPH.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

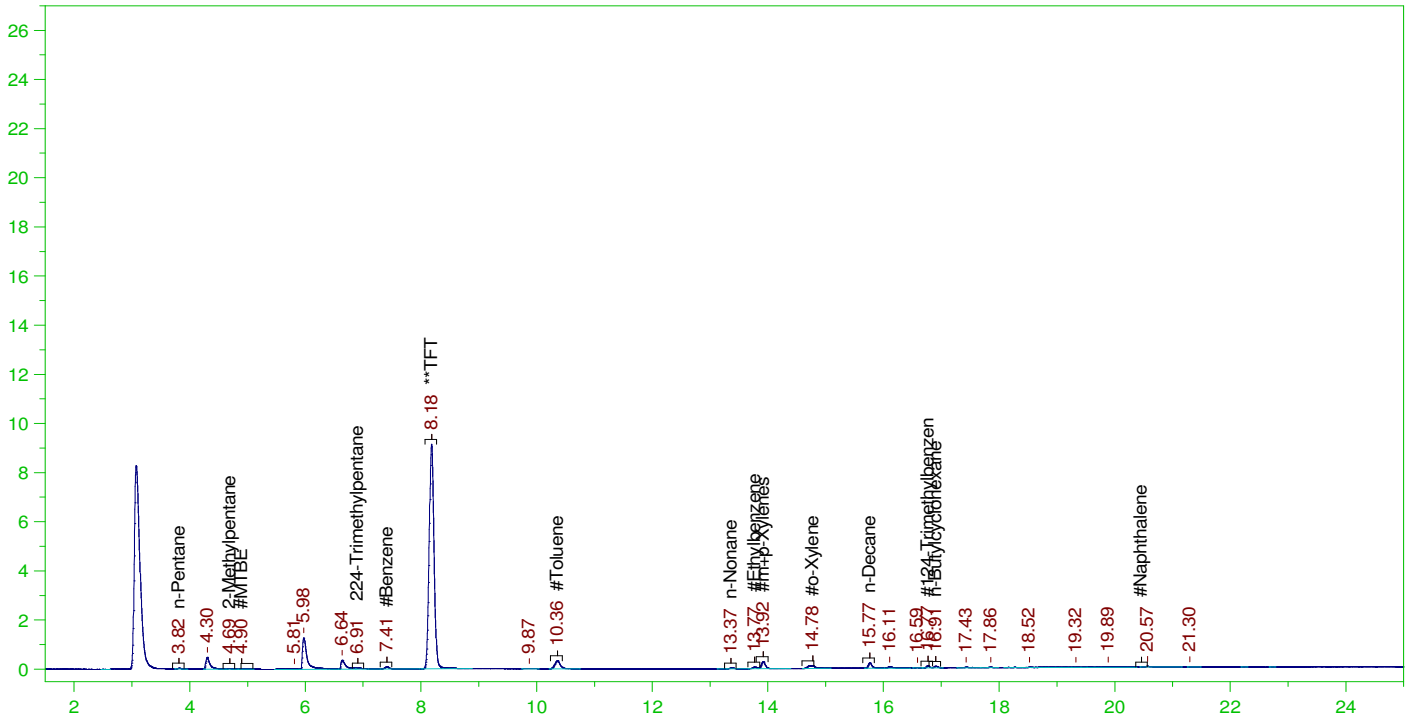
Mean RF for C9 to C10 Aromatic Hydrocarbons: 366.7145
Rt range for C9 to C10 Aromatics: 14.74 to 20.399
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1572.464 C9-C10 Aromatics Amount: 0.8575958

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	7.409	7.409	7.409	151	.5	U
Toluene	10.356	-2.17	-2.176	1138	.616	
Ethylbenzene	13.769	13.769	13.769	142	.5	U
m+p-Xylenes	13.919	-5.73	-5.74	966	.515	
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	16.773	16.773	16.773	234	.5	U
Naphthalene	20.564	20.564	20.564	286	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	8.18	25.	25.522	102.09	70-130

Trip Blank 2 Lot 022610 TS SHP0246

— G:\Org\VA2\DAT\VA2050117_b\0501VA2b.0010.RAW B17042303-006A ;0501VA2 , $HC-VPH-MA-W,



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: B17042303-006A ;0501VA2 , $HC-VPH-MA-W,
Raw File: G:\Org\VA2\DAT\VA2050117_b\0501VA2b.0010.RAW
Date & Time Acquired: 5/1/2017 2:31:32 PM
Method File: G:\Org\VA2\Methods\170301VA2V2303-6B.MET
Calibration File: G:\Org\VA2\Cals\170301VA2VPHb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 457.2002
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 390.8903
Mean RF for all calibrated compounds: 561.369
Rt range for Gasoline Range Organics: 4.576 to 15.843
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.705 to 13.251
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.301 to 20.362

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**TFT	8.183	25.	24.411	97.64 -

GRO Area:17347.43 GRO Amount: 6.180402
TPH Area:22424.27 TPH Amount: 7.989139

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:15814.54 C5-C8 Amount: 6.917993
C9-C12 Area:6046.599 C9-C12 Amount: 3.093757

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Batch: 109032
Lab ID: LCS-109032	Laboratory Control Sample				Run: GCFID-HP2-B_170501B				05/02/17 11:42
Total Extractable Hydrocarbons	5790	ug/L	300	91	60	140			
Surr: o-Terphenyl				86	40	140			
Lab ID: B17042303-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP2-B_170501B				05/02/17 14:53
Total Extractable Hydrocarbons	9870	ug/L	570	82	60	140	1.2	20	
Surr: o-Terphenyl				66	40	140			
Lab ID: MB-109032	Method Blank				Run: GCFID-HP2-B_170501B				05/03/17 07:49
Total Extractable Hydrocarbons	ND	ug/L	300						
Surr: o-Terphenyl				86	40	140			
Lab ID: B17042303-001AMS	Sample Matrix Spike				Run: GCFID-HP2-B_170501B				05/03/17 08:34
Total Extractable Hydrocarbons	9750	ug/L	570	81	60	140			
Surr: o-Terphenyl				76	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Analytical Run: R279143
Lab ID: CCV_0501HP230r-W	Continuing Calibration Verification Standard								05/02/17 10:08
n-Nonane	209	ug/L		104	75	125			
n-Decane	206	ug/L		103	75	125			
n-Dodecane	207	ug/L		103	75	125			
n-Tetradecane	201	ug/L		101	75	125			
n-Hexadecane	207	ug/L		104	75	125			
n-Octadecane	207	ug/L		104	75	125			
n-Nonadecane	210	ug/L		105	75	125			
n-Eicosane	206	ug/L		103	75	125			
n-Docosane	210	ug/L		105	75	125			
n-Tetracosane	209	ug/L		104	75	125			
n-Hexacosane	210	ug/L		105	75	125			
n-Octacosane	203	ug/L		101	75	125			
n-Triacontane	210	ug/L		105	75	125			
n-Hexatriacontane	207	ug/L		104	75	125			
Surr: o-Terphenyl				103	75	125			
Lab ID: CCV_0501HP242r-W	Continuing Calibration Verification Standard								05/03/17 07:04
n-Nonane	207	ug/L		104	75	125			
n-Decane	201	ug/L		101	75	125			
n-Dodecane	209	ug/L		105	75	125			
n-Tetradecane	204	ug/L		102	75	125			
n-Hexadecane	210	ug/L		105	75	125			
n-Octadecane	210	ug/L		105	75	125			
n-Nonadecane	214	ug/L		107	75	125			
n-Eicosane	210	ug/L		105	75	125			
n-Docosane	213	ug/L		107	75	125			
n-Tetracosane	211	ug/L		106	75	125			
n-Hexacosane	212	ug/L		106	75	125			
n-Octacosane	205	ug/L		103	75	125			
n-Triacontane	213	ug/L		106	75	125			
n-Hexatriacontane	210	ug/L		105	75	125			
Surr: o-Terphenyl				105	75	125			

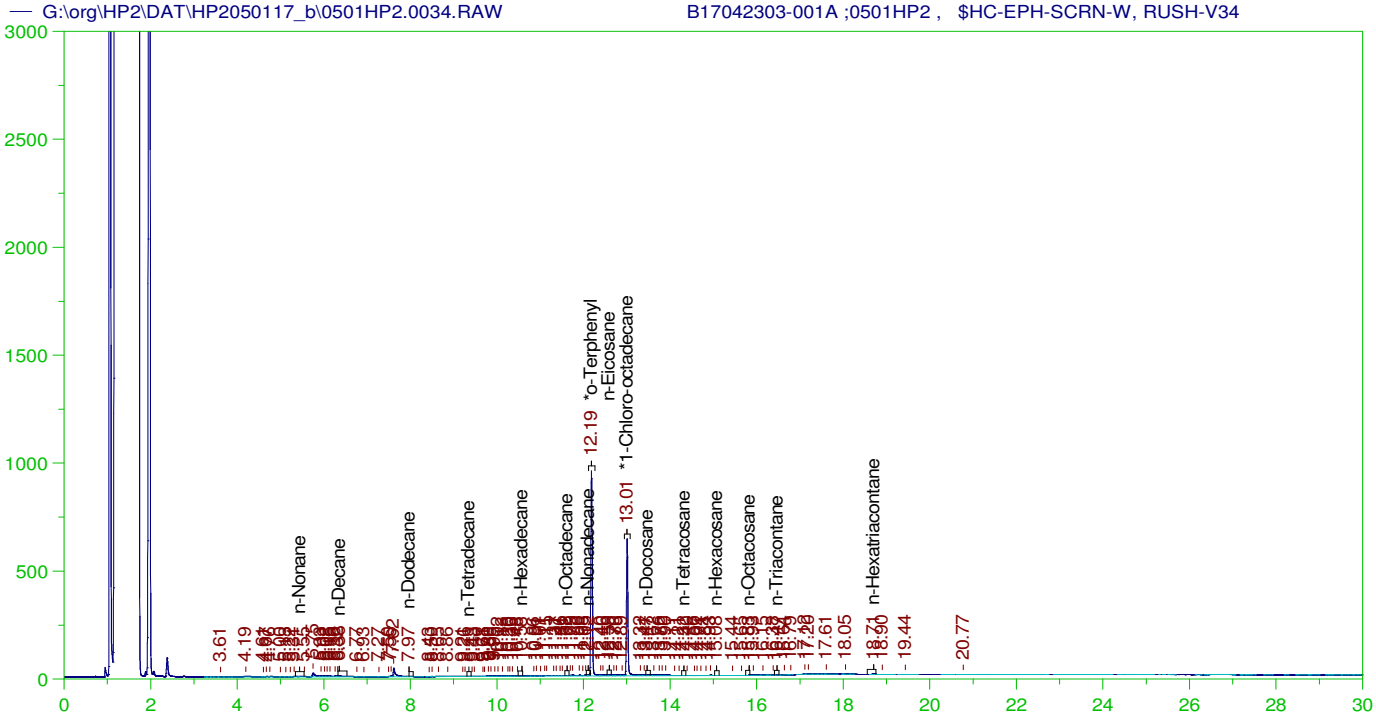
Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

BLK-1704-100 Batch ID: 109032

— G:\org\HP2\DAT\HP2050117_b\0501HP2.0034.RAW B17042303-001A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-V34



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B17042303-001A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-V34
Raw File: G:\org\HP2\DAT\HP2050117_b\0501HP2.0034.RAW
Date & Time Acquired: 5/2/2017 1:16:52 PM
Method File: g:\org\HP2\Methods\SR_SCN-BG-L%.met
Calibration File: G:\Org\HP2\Cals\SC170323Bg.CAL
Sample Weight: 1.05 Dilution: 2 S.A.: 1

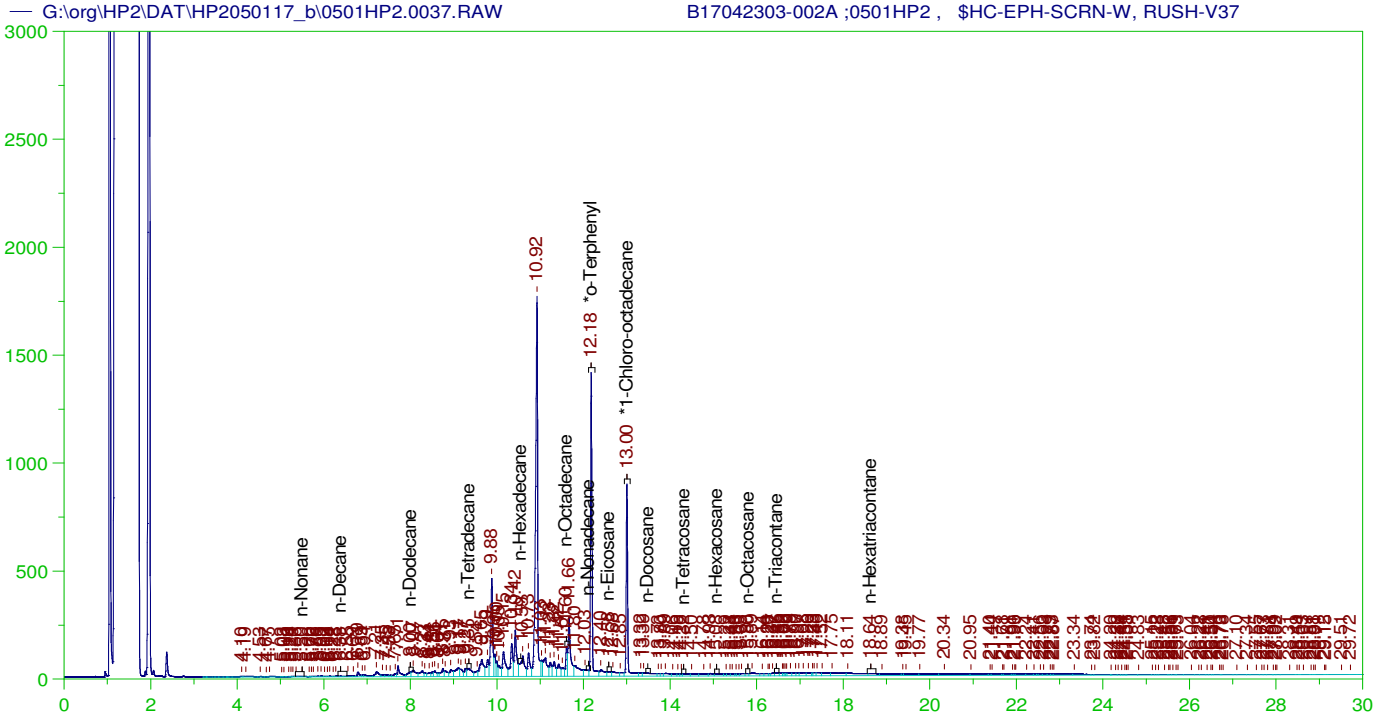
Mean RF for C9 to C18 Hydrocarbons: 29477.12
Mean RF for C19 to C36 Hydrocarbons: 30327.64
Mean RF for Total Extractable Hydrocarbons: 29902.38
Rt range for Diesel Range Organics: 6.331 to 16.516
Rt range for C9 to C18 Hydrocarbons: 5.343 to 12.121
Rt range for C19 to C36 Hydrocarbons: 12.156 to 18.757

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.186	1983329	190.476	113.386	59.53	-
*1-Chloro-octadecane	13.007	1512885	190.476	106.447	55.88	-

DRO Area:957096.6 DRO Amount: 60.96643
TEH Area:1226282 TEH Amount: 78.11334
C9-C18 Area:744757.9 C9-C18 Amount: 48.12501
C19-C36 Area:371620.5 C19-C36 Amount: 23.34005

BLK-1704-101 Batch ID: 109032

— G:\org\HP2\DAT\HP2050117_b\0501HP2.0037.RAW B17042303-002A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-V37



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B17042303-002A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-V37
Raw File: G:\org\HP2\DAT\HP2050117_b\0501HP2.0037.RAW
Date & Time Acquired: 5/2/2017 3:40:14 PM
Method File: g:\org\HP2\Methods\S3_SCN-BG-L%.met
Calibration File: G:\Org\HP2\Cals\SC170323Bg.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

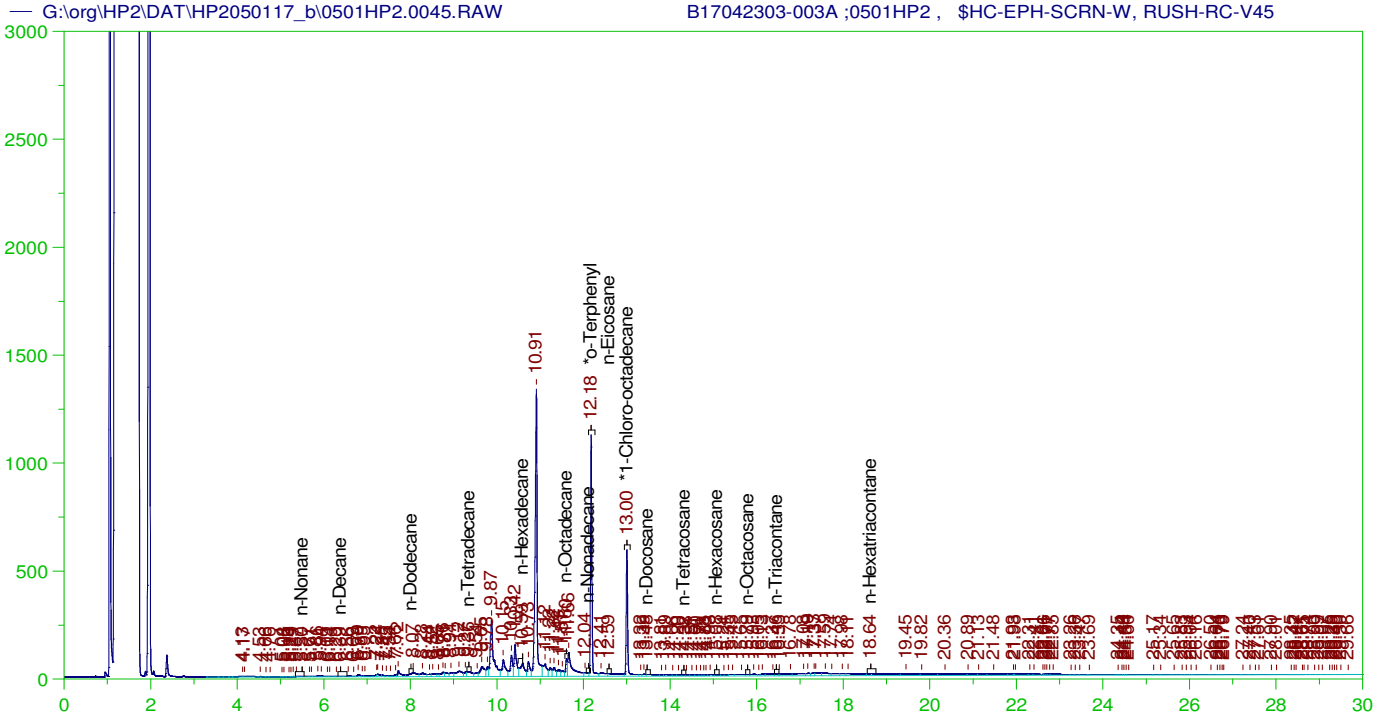
Mean RF for C9 to C18 Hydrocarbons: 29477.12
Mean RF for C19 to C36 Hydrocarbons: 30327.64
Mean RF for Total Extractable Hydrocarbons: 29902.38
Rt range for Diesel Range Organics: 6.331 to 16.516
Rt range for C9 to C18 Hydrocarbons: 5.343 to 12.121
Rt range for C19 to C36 Hydrocarbons: 12.156 to 18.757

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.18	3023887	192.308	174.536	90.76	-
*1-Chloro-octadecane	13.001	2178591	192.308	154.759	80.47	-

DRO Area:2.136454E+07 DRO Amount: 1373.993
TEH Area:2.524209E+07 TEH Amount: 1623.365
C9-C18 Area:1.88297E+07 C9-C18 Amount: 1228.443
C19-C36 Area:4162502 C19-C36 Amount: 263.9445

BLK-1704-102 Batch ID: 109032

— G:\org\HP2\DAT\HP2050117_b\0501HP2.0045.RAW B17042303-003A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-RC-V45



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B17042303-003A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-RC-V45
Raw File: G:\org\HP2\DAT\HP2050117_b\0501HP2.0045.RAW
Date & Time Acquired: 5/3/2017 9:20:22 AM
Method File: g:\org\HP2\Methods\S3_SCN-BG-L%.met
Calibration File: G:\Org\HP2\Cals\SC170323Bg.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

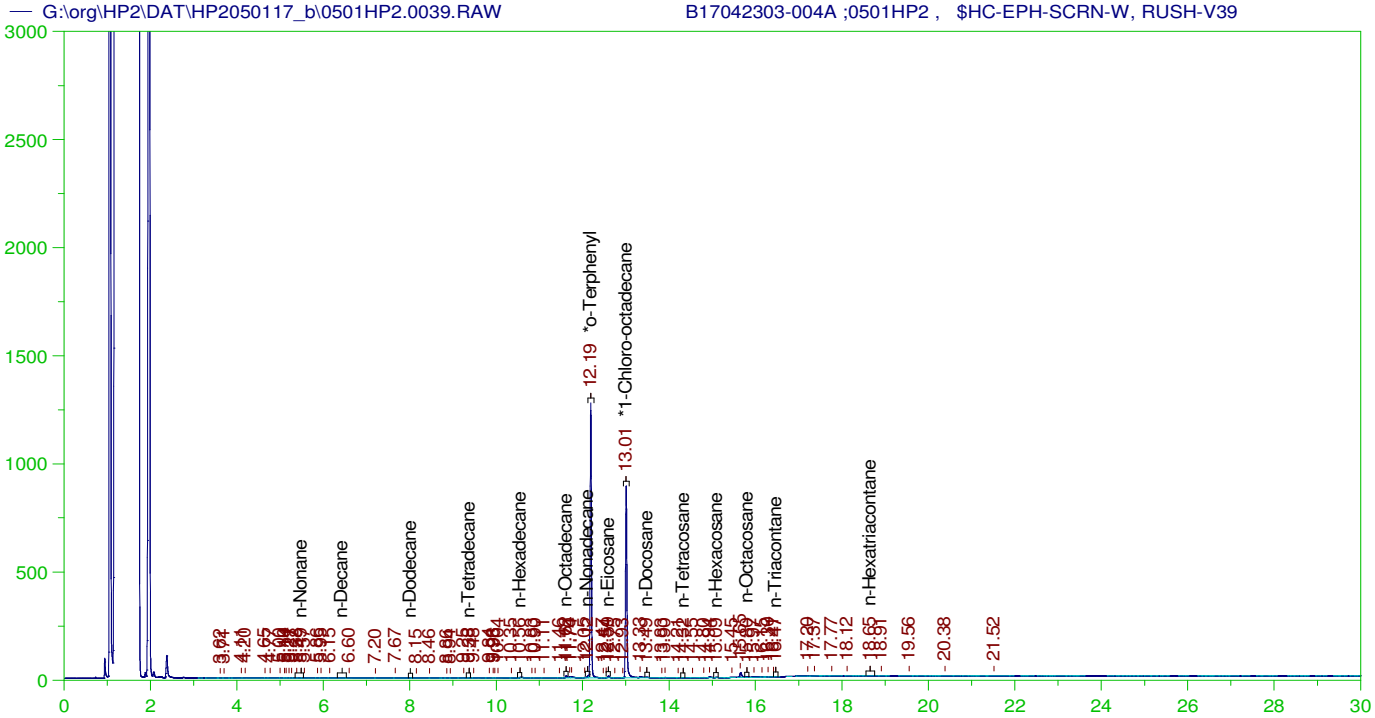
Mean RF for C9 to C18 Hydrocarbons: 29477.12
Mean RF for C19 to C36 Hydrocarbons: 30327.64
Mean RF for Total Extractable Hydrocarbons: 29902.38
Rt range for Diesel Range Organics: 6.331 to 16.516
Rt range for C9 to C18 Hydrocarbons: 5.343 to 12.121
Rt range for C19 to C36 Hydrocarbons: 12.156 to 18.757

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.179	2316498	192.308	133.706	69.53	-
*1-Chloro-octadecane	13.	1436159	192.308	102.02	53.05	-

DRO Area:1.373572E+07 DRO Amount: 883.3695
TEH Area:1.710975E+07 TEH Amount: 1100.359
C9-C18 Area:1.234551E+07 C9-C18 Amount: 805.4166
C19-C36 Area:2904246 C19-C36 Amount: 184.1584

BLK-1704-103 Batch ID: 109032

— G:\org\HP2\DAT\HP2050117_b\0501HP2.0039.RAW B17042303-004A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-V39



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: B17042303-004A ;0501HP2 , $HC-EPH-SCRN-W, RUSH-V39
Raw File: G:\org\HP2\DAT\HP2050117_b\0501HP2.0039.RAW
Date & Time Acquired: 5/2/2017 5:12:10 PM
Method File: g:\org\HP2\Methods\SR_SCN-BG-L%.met
Calibration File: G:\Org\HP2\Cals\SC170323Bg.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 29477.12
Mean RF for C19 to C36 Hydrocarbons: 30327.64
Mean RF for Total Extractable Hydrocarbons: 29902.38
Rt range for Diesel Range Organics: 6.331 to 16.516
Rt range for C9 to C18 Hydrocarbons: 5.343 to 12.121
Rt range for C19 to C36 Hydrocarbons: 12.156 to 18.757

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.186	2661575	192.308	153.624	79.88	-
*1-Chloro-octadecane	13.007	2100071	192.308	149.182	77.57	-

DRO Area:431425.5 DRO Amount: 27.74577
TEH Area:676822 TEH Amount: 43.52767
C9-C18 Area:331873 C9-C18 Amount: 21.65128
C19-C36 Area:211592 C19-C36 Amount: 13.41706

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 109133
Lab ID: LCS-109133-109032	Laboratory Control Sample				Run: GCFID-HP5-B_170503A				05/03/17 15:11
C9 to C18 Aliphatics	891	ug/L	300	74	40	140			
C19 to C36 Aliphatics	1700	ug/L	300	106	40	140			
n-Nonane	83.4	ug/L	5.0	42	30	140			
n-Decane	114	ug/L	5.0	57	40	140			
n-Dodecane	139	ug/L	5.0	70	40	140			
n-Tetradecane	159	ug/L	5.0	80	40	140			
n-Hexadecane	175	ug/L	5.0	88	40	140			
n-Octadecane	194	ug/L	5.0	97	40	140			
n-Nonadecane	198	ug/L	5.0	99	40	140			
n-Eicosane	208	ug/L	5.0	104	40	140			
n-Docosane	213	ug/L	5.0	107	40	140			
n-Tetracosane	216	ug/L	5.0	108	40	140			
n-Hexacosane	219	ug/L	5.0	109	40	140			
n-Octacosane	215	ug/L	5.0	107	40	140			
n-Triacontane	211	ug/L	5.0	105	40	140			
n-Hexatriacontane	206	ug/L	5.0	103	40	140			
Surr: 1-Chloro-octadecane			5.0	105	40	140			
Lab ID: MB-109133-109032	Method Blank				Run: GCFID-HP5-B_170503A				05/03/17 16:35
C9 to C18 Aliphatics	ND	ug/L	300						
C19 to C36 Aliphatics	ND	ug/L	300						
Surr: 1-Chloro-octadecane			5.0	98	40	140			
Lab ID: B17042303-001AMS	Sample Matrix Spike				Run: GCFID-HP5-B_170503A				05/03/17 19:24
C9 to C18 Aliphatics	1570	ug/L	570	69	40	140			
C19 to C36 Aliphatics	3310	ug/L	570	110	40	140			
n-Nonane	133	ug/L	5.0	35	30	140			
n-Decane	189	ug/L	5.0	50	40	140			
n-Dodecane	221	ug/L	5.0	59	40	140			
n-Tetradecane	269	ug/L	5.0	71	40	140			
n-Hexadecane	338	ug/L	5.0	90	40	140			
n-Octadecane	379	ug/L	5.0	100	40	140			
n-Nonadecane	384	ug/L	5.0	102	40	140			
n-Eicosane	402	ug/L	5.0	107	40	140			
n-Docosane	415	ug/L	5.0	110	40	140			
n-Tetracosane	421	ug/L	5.0	112	40	140			
n-Hexacosane	426	ug/L	5.0	113	40	140			
n-Octacosane	419	ug/L	5.0	111	40	140			
n-Triacontane	411	ug/L	5.0	109	40	140			
n-Hexatriacontane	412	ug/L	5.0	109	40	140			
Surr: 1-Chloro-octadecane			9.4	89	40	140			
Lab ID: B17042303-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP5-B_170503A				05/03/17 20:48
C9 to C18 Aliphatics	1530	ug/L	570	68	40	140	2.5	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 109133
Lab ID: B17042303-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP5-B_170503A				05/03/17 20:48
C19 to C36 Aliphatics	3100	ug/L	570	103	40	140	6.6	20	
n-Nonane	135	ug/L	5.0	36	30	140	1.8	30	
n-Decane	190	ug/L	5.0	50	40	140	0.7	20	
n-Dodecane	230	ug/L	5.0	61	40	140	4.3	20	
n-Tetradecane	266	ug/L	5.0	70	40	140	1.4	20	
n-Hexadecane	312	ug/L	5.0	83	40	140	8.1	20	
n-Octadecane	349	ug/L	5.0	92	40	140	8.2	20	
n-Nonadecane	357	ug/L	5.0	95	40	140	7.1	20	
n-Eicosane	377	ug/L	5.0	100	40	140	6.5	20	
n-Docosane	388	ug/L	5.0	103	40	140	6.5	20	
n-Tetracosane	395	ug/L	5.0	105	40	140	6.5	20	
n-Hexacosane	399	ug/L	5.0	106	40	140	6.5	20	
n-Octacosane	392	ug/L	5.0	104	40	140	6.5	20	
n-Triacontane	386	ug/L	5.0	102	40	140	6.4	20	
n-Hexatriacontane	387	ug/L	5.0	103	40	140	6.2	20	
Surr: 1-Chloro-octadecane			9.4	65	40	140			
Lab ID: LCS-109133-109032	Laboratory Control Sample				Run: GCFID-HP5-B_170503A				05/03/17 15:53
C11 to C22 Aromatics	3330	ug/L	300	93	40	140			
Total Extractable Hydrocarbons	5960	ug/L	300	93	40	140			
Naphthalene	117	ug/L	5.0	59	40	140			
2-MethylNaphthalene	128	ug/L	5.0	64	40	140			
Acenaphthylene	138	ug/L	5.0	69	40	140			
Acenaphthene	145	ug/L	5.0	72	40	140			
Fluorene	154	ug/L	5.0	77	40	140			
Phenanthrene	172	ug/L	5.0	86	40	140			
Anthracene	190	ug/L	5.0	95	40	140			
Fluoranthene	205	ug/L	5.0	103	40	140			
Pyrene	206	ug/L	5.0	103	40	140			
Benzo(a)Anthracene	216	ug/L	5.0	108	40	140			
Chrysene	219	ug/L	5.0	110	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	435	ug/L	5.0	109	40	140			
Benzo(a)Pyrene	219	ug/L	5.0	110	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	430	ug/L	5.0	107	40	140			
Benzo(g,h,I)perylene	204	ug/L	5.0	102	40	140			
Surr: 2-Bromonaphthalene			5.0	89	40	140			
Surr: 2-Fluorobiphenyl			5.0	97	40	140			
Surr: o-Terphenyl			5.0	91	40	140			
Lab ID: MB-109133-109032	Method Blank				Run: GCFID-HP5-B_170503A				05/03/17 17:17
C11 to C22 Aromatics	ND	ug/L	300						
Total Extractable Hydrocarbons	ND	ug/L	300						
Naphthalene	ND	ug/L	5.0						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 109133
Lab ID: MB-109133-109032	Method Blank				Run: GCFID-HP5-B_170503A				05/03/17 17:17
2-MethylNaphthalene	ND	ug/L	5.0						
Acenaphthylene	ND	ug/L	5.0						
Acenaphthene	ND	ug/L	5.0						
Fluorene	ND	ug/L	5.0						
Phenanthrene	ND	ug/L	5.0						
Anthracene	ND	ug/L	5.0						
Fluoranthene	ND	ug/L	5.0						
Pyrene	ND	ug/L	5.0						
Benzo(a)Anthracene	ND	ug/L	5.0						
Chrysene	ND	ug/L	5.0						
Benzo(b)Fluoranthene/Benzo(k)Fluoran	ND	ug/L	5.0						
Benzo(a)Pyrene	ND	ug/L	5.0						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	ND	ug/L	5.0						
Benzo(g,h,I)perylene	ND	ug/L	5.0						
Surr: 2-Bromonaphthalene			5.0	80	40	140			
Surr: 2-Fluorobiphenyl			5.0	84	40	140			
Surr: o-Terphenyl			5.0	76	40	140			
Lab ID: B17042303-001AMS	Sample Matrix Spike				Run: GCFID-HP5-B_170503A				05/03/17 20:06
C11 to C22 Aromatics	4890	ug/L	570	72	40	140			
Total Extractable Hydrocarbons	9840	ug/L	570	81	40	140			
Naphthalene	154	ug/L	9.4	41	40	140			
2-MethylNaphthalene	171	ug/L	9.4	45	40	140			
Acenaphthylene	186	ug/L	9.4	49	40	140			
Acenaphthene	206	ug/L	9.4	54	40	140			
Fluorene	238	ug/L	9.4	63	40	140			
Phenanthrene	280	ug/L	9.4	74	40	140			
Anthracene	313	ug/L	9.4	83	40	140			
Fluoranthene	311	ug/L	9.4	82	40	140			
Pyrene	311	ug/L	9.4	82	40	140			
Benzo(a)Anthracene	327	ug/L	9.4	87	40	140			
Chrysene	359	ug/L	9.4	95	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	647	ug/L	9.4	86	40	140			
Benzo(a)Pyrene	195	ug/L	9.4	52	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	633	ug/L	9.4	84	40	140			
Benzo(g,h,I)perylene	353	ug/L	9.4	93	40	140			
Surr: 2-Bromonaphthalene			9.4	79	40	140			
Surr: 2-Fluorobiphenyl			9.4	84	40	140			
Surr: o-Terphenyl			9.4	77	40	140			
Lab ID: B17042303-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP5-B_170503A				05/03/17 21:31
C11 to C22 Aromatics	5430	ug/L	570	80	40	140	10	20	
Total Extractable Hydrocarbons	10200	ug/L	570	84	40	140	3.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 109133
Lab ID: B17042303-001AMSD	Sample Matrix Spike Duplicate				Run: GCFID-HP5-B_170503A			05/03/17 21:31	
Naphthalene	183	ug/L	9.4	48	40	140	17	20	
2-MethylNaphthalene	206	ug/L	9.4	54	40	140	18	20	
Acenaphthylene	217	ug/L	9.4	57	40	140	15	20	
Acenaphthene	233	ug/L	9.4	62	40	140	12	20	
Fluorene	256	ug/L	9.4	68	40	140	7.4	20	
Phenanthrene	288	ug/L	9.4	76	40	140	2.8	20	
Anthracene	319	ug/L	9.4	85	40	140	1.9	20	
Fluoranthene	336	ug/L	9.4	89	40	140	7.5	20	
Pyrene	338	ug/L	9.4	89	40	140	8.1	20	
Benzo(a)Anthracene	357	ug/L	9.4	95	40	140	8.7	20	
Chrysene	381	ug/L	9.4	101	40	140	6.0	20	
Benzo(b)Fluoranthene/Benzo(k)Fluoran	711	ug/L	9.4	94	40	140	9.4	20	
Benzo(a)Pyrene	335	ug/L	9.4	89	40	140	53	20	R
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	701	ug/L	9.4	93	40	140	10	20	
Benzo(g,h,I)perylene	319	ug/L	9.4	85	40	140	10	20	
Surr: 2-Bromonaphthalene			9.4	87	40	140			
Surr: 2-Fluorobiphenyl			9.4	92	40	140			
Surr: o-Terphenyl			9.4	68	40	140			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Project: 16043, Bolke Residence

Report Date: 05/05/17
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R279242
Lab ID: CCV_0503HP502r-W	Continuing Calibration Verification Standard								05/03/17 13:05
n-Nonane	205	ug/L	5.0	102	75	125			
n-Decane	205	ug/L	5.0	103	75	125			
n-Dodecane	204	ug/L	5.0	102	75	125			
n-Tetradecane	205	ug/L	5.0	103	75	125			
n-Hexadecane	201	ug/L	5.0	101	75	125			
n-Octadecane	202	ug/L	5.0	101	75	125			
n-Nonadecane	200	ug/L	5.0	100	75	125			
n-Eicosane	204	ug/L	5.0	102	75	125			
n-Docosane	203	ug/L	5.0	102	75	125			
n-Tetracosane	202	ug/L	5.0	101	75	125			
n-Hexacosane	204	ug/L	5.0	102	75	125			
n-Octacosane	206	ug/L	5.0	103	75	125			
n-Triacontane	206	ug/L	5.0	103	75	125			
n-Hexatriacontane	202	ug/L	5.0	101	75	125			
Surr: 1-Chloro-octadecane			5.0	106	75	125			
Lab ID: CCV_0503HP518r-W	Continuing Calibration Verification Standard								05/04/17 00:20
n-Nonane	210	ug/L	5.0	105	75	125			
n-Decane	212	ug/L	5.0	106	75	125			
n-Dodecane	212	ug/L	5.0	106	75	125			
n-Tetradecane	214	ug/L	5.0	107	75	125			
n-Hexadecane	209	ug/L	5.0	104	75	125			
n-Octadecane	211	ug/L	5.0	105	75	125			
n-Nonadecane	210	ug/L	5.0	105	75	125			
n-Eicosane	213	ug/L	5.0	106	75	125			
n-Docosane	212	ug/L	5.0	106	75	125			
n-Tetracosane	211	ug/L	5.0	106	75	125			
n-Hexacosane	214	ug/L	5.0	107	75	125			
n-Octacosane	216	ug/L	5.0	108	75	125			
n-Triacontane	216	ug/L	5.0	108	75	125			
n-Hexatriacontane	211	ug/L	5.0	106	75	125			
Surr: 1-Chloro-octadecane			5.0	111	75	125			
Lab ID: CCV_0503HP503r-W	Continuing Calibration Verification Standard								05/03/17 13:47
Naphthalene	211	ug/L	5.0	106	75	125			
2-MethylNaphthalene	207	ug/L	5.0	104	75	125			
Acenaphthylene	207	ug/L	5.0	103	75	125			
Acenaphthene	201	ug/L	5.0	101	75	125			
Fluorene	209	ug/L	5.0	105	75	125			
Phenanthrene	209	ug/L	5.0	104	75	125			
Anthracene	208	ug/L	5.0	104	75	125			
Fluoranthene	210	ug/L	5.0	105	75	125			
Pyrene	210	ug/L	5.0	105	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hydrometrics Inc
Report Date: 05/05/17
Project: 16043, Bolke Residence
Work Order: B17042303

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R279242
Lab ID: CCV_0503HP503r-W	Continuing Calibration Verification Standard								05/03/17 13:47
Benzo(a)Anthracene	208	ug/L	5.0	104	75	125			
Chrysene	208	ug/L	5.0	104	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	424	ug/L	5.0	106	75	125			
Benzo(a)Pyrene	212	ug/L	5.0	106	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	424	ug/L	5.0	106	75	125			
Benzo(g,h,I)perylene	210	ug/L	5.0	105	75	125			
Surr: 2-Bromonaphthalene			5.0	103	75	125			
Surr: 2-Fluorobiphenyl			5.0	102	75	125			
Surr: o-Terphenyl			5.0	103	75	125			
Lab ID: CCV_0503HP519r-W	Continuing Calibration Verification Standard								05/04/17 01:03
Naphthalene	216	ug/L	5.0	108	75	125			
2-MethylNaphthalene	213	ug/L	5.0	106	75	125			
Acenaphthylene	212	ug/L	5.0	106	75	125			
Acenaphthene	206	ug/L	5.0	103	75	125			
Fluorene	214	ug/L	5.0	107	75	125			
Phenanthrene	214	ug/L	5.0	107	75	125			
Anthracene	214	ug/L	5.0	107	75	125			
Fluoranthene	219	ug/L	5.0	109	75	125			
Pyrene	218	ug/L	5.0	109	75	125			
Benzo(a)Anthracene	215	ug/L	5.0	107	75	125			
Chrysene	215	ug/L	5.0	107	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	438	ug/L	5.0	110	75	125			
Benzo(a)Pyrene	218	ug/L	5.0	109	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	439	ug/L	5.0	110	75	125			
Benzo(g,h,I)perylene	217	ug/L	5.0	109	75	125			
Surr: 2-Bromonaphthalene			5.0	105	75	125			
Surr: 2-Fluorobiphenyl			5.0	104	75	125			
Surr: o-Terphenyl			5.0	107	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

BLK-1704-101 Batch ID: 109133

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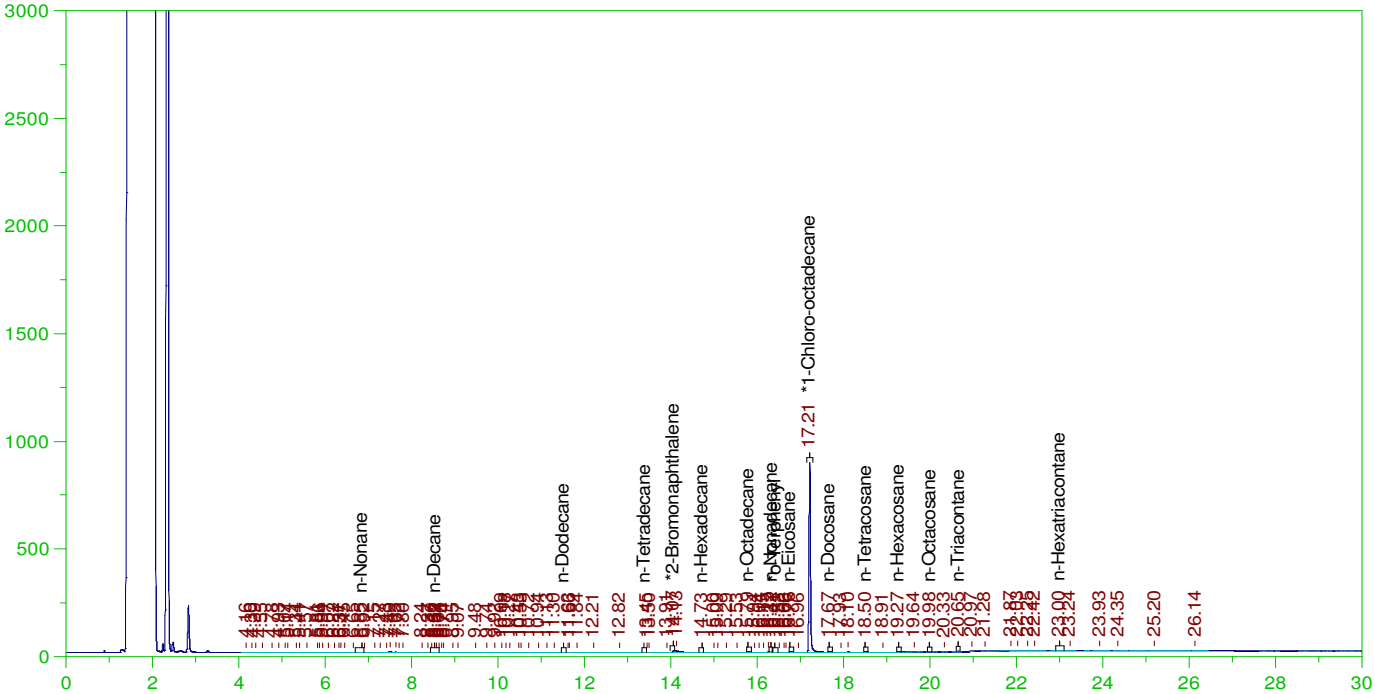

EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: B17042303-002A ;0503HP5 , $HC-ALI-GRP-W, RUSH-V21
Raw File: G:\org\HP5\DAT\HP5050317_b\0503HP5.0021.RAW
Date & Time Acquired: 5/4/2017 2:28:33 AM
Method File: g:\org\HP5\Methods\LR_EPH-BN-L%.met
Calibration File: G:\Org\HP5\Cals\AL151028BN.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 28665.79
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 29239.57
Mean RF for Total Extractable Hydrocarbons: 28993.67
Rt range for Diesel Range Organics: 8.434999 to 20.038
Rt range for C9 to C18 Aliphatic Hydrocarbons: 6.691 to 16.269
Rt range for C19 to C36 Aliphatic Hydrocarbons: 16.294 to 23.112

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	17.213	192.308	149.591	77.79	-

DRO Area:207700 DRO Amount: 13.77622
TEH Area:389679.2 TEH Amount: 25.84644

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:245535.2 C9-C18 Amount: 16.472
C19-C36 Area:76608 C19-C36 Amount: 5.038483

BLK-1704-101 Batch ID: 109133

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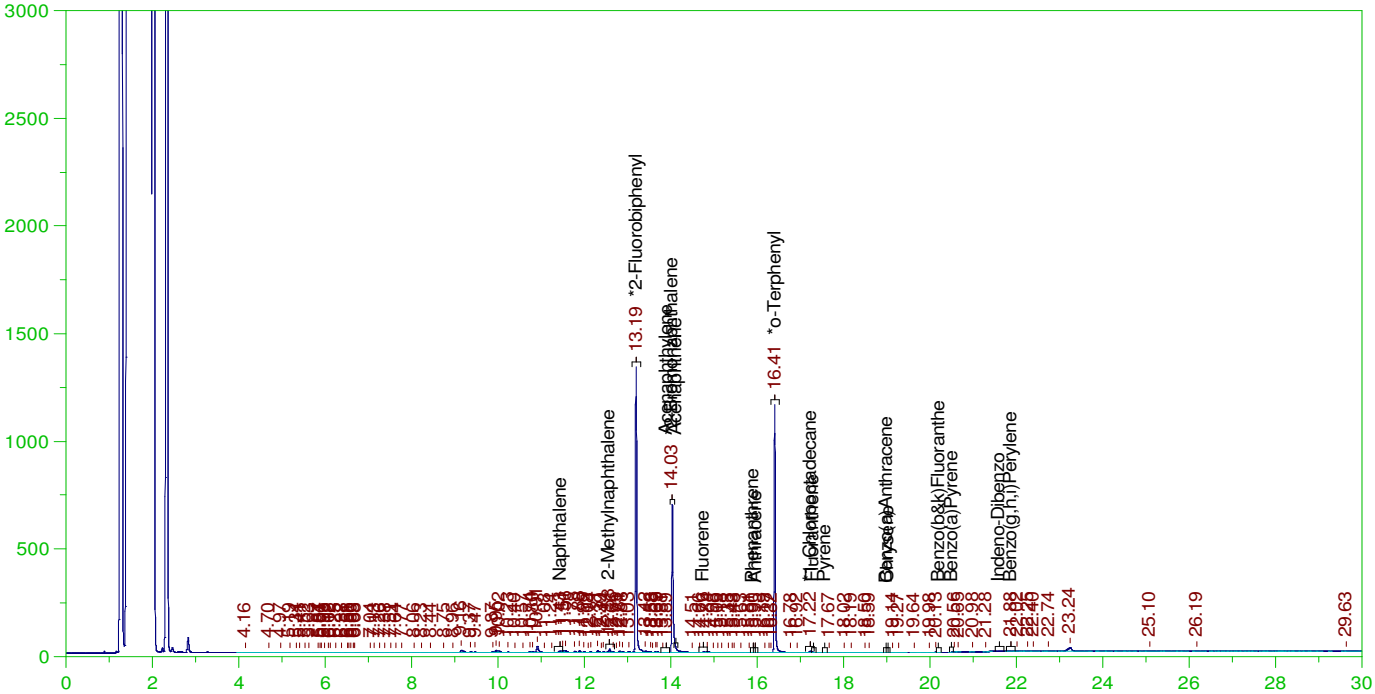

EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: B17042303-002A ;0503HP5 , $HC-ARO-GRP-W, RUSH-V22
Raw File: G:\org\HP5\DAT\HP5050317_b\0503HP5.0022.RAW
Date & Time Acquired: 5/4/2017 3:11:10 AM
Method File: g:\org\HP5\Methods\RR_EPH-BN-L%.met
Calibration File: G:\Org\HP5\Cals\AR151028BN.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

Mean RF EPH Aromatics: 33505.56
Rt range for EPH C11 to C22 Aromatics: 11.296 to 21.97

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	13.194	192.308	166.804	86.74	-
*2-Bromonaphthalene	14.034	192.308	155.411	80.81	-
*o-Terphenyl	16.406	192.308	133.341	69.34	-
*1-Chlorooctadecane	17.224	192.308	2.33	1.21	-

C11-C22 Aromatics Area:593461.5 C11-C22 Aromatics Amount: 34.06217
EPH Aromatics total Area:1179441 EPH Aromatics Total Amount: 67.69488

BLK-1704-101 Batch ID: 109133

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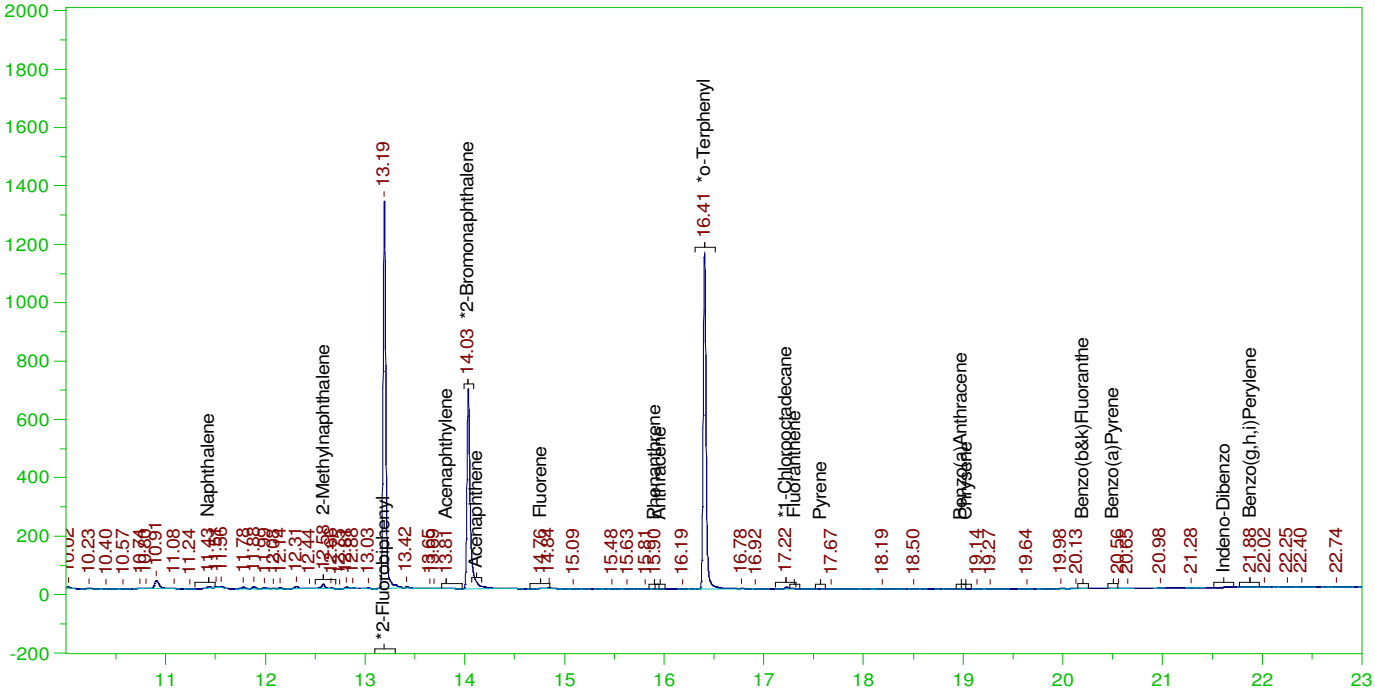

EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

Sample Name: B17042303-002A ;0503HP5 , $HC-ARO-GRP-W, RUSH-V22
Raw File: G:\org\HP5\DAT\HP5050317_b\0503HP5.0022.RAW
Date & Time Acquired: 5/4/2017 3:11:10 AM
Method File: g:\org\HP5\Methods\RS_EPH-BN-L%.met
Calibration File: G:\Org\HP5\Cals\AR151028BN.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	11.434	11.434	11.434	10196	1.923	U
2-Methylnaphthalene	12.579	1.44	1.455	40597	2.389	
Acenaphthylene	13.813	13.813	13.813	1322	1.923	U
Acenaphthene	.	.	.		1.923	U
Fluorene	14.761	14.761	14.761	3791	1.923	U
Phenanthrene	15.903	15.903	15.903	951	1.923	U
Anthracene	.	.	.		1.923	U
Fluoranthene	.	.	.		1.923	U
Pyrene	.	.	.		1.923	U
Benzo(a)Anthracene	.	.	.		1.923	U
Chrysene	.	.	.		1.923	U
Benzo(b&k)Fluoranthe	.	.	.		3.846	U
Benzo(a)Pyrene	.	.	.		1.923	U
Indeno-Dibenzo	.	.	.		3.846	U
Benzo(g,h,i)Perylene	21.875	21.875	21.875	1366	1.923	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	13.194	192.308	164.232	85.4	40-140
*2-Bromonaphthalene	14.034	192.308	151.802	78.94	40-140
*o-Terphenyl	16.406	192.308	132.043	68.66	40-140
*1-Chlorooctadecane	17.224	192.308	1.841	.96	40-140

BLK-1704-102 Batch ID: 109133

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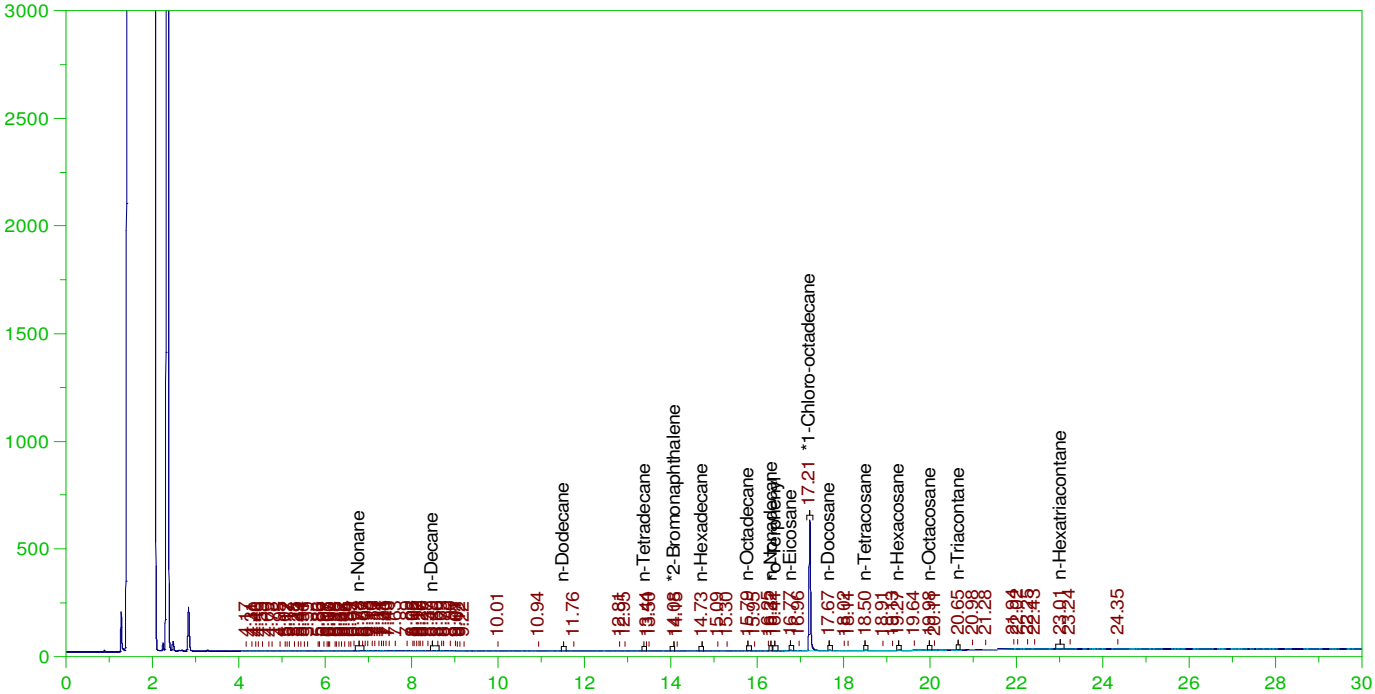

EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: B17042303-003A ;0503HP5 , $HC-ALI-GRP-W, RUSH-V16
Raw File: G:\org\HP5\DAT\HP5050317_b\0503HP5.0016.RAW
Date & Time Acquired: 5/3/2017 10:55:38 PM
Method File: g:\org\HP5\Methods\LR_EPH-BN-L%.met
Calibration File: G:\Org\HP5\Cals\AL151028BN.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 28665.79
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 29239.57
Mean RF for Total Extractable Hydrocarbons: 28993.67
Rt range for Diesel Range Organics: 8.434999 to 20.038
Rt range for C9 to C18 Aliphatic Hydrocarbons: 6.691 to 16.269
Rt range for C19 to C36 Aliphatic Hydrocarbons: 16.294 to 23.112

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	17.215	192.308	105.704	54.97	-

DRO Area:128186.2 DRO Amount: 8.502265
TEH Area:344355.9 TEH Amount: 22.84026

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:186038.1 C9-C18 Amount: 12.48057
C19-C36 Area:81992.3 C19-C36 Amount: 5.392607

BLK-1704-102 Batch ID: 109133

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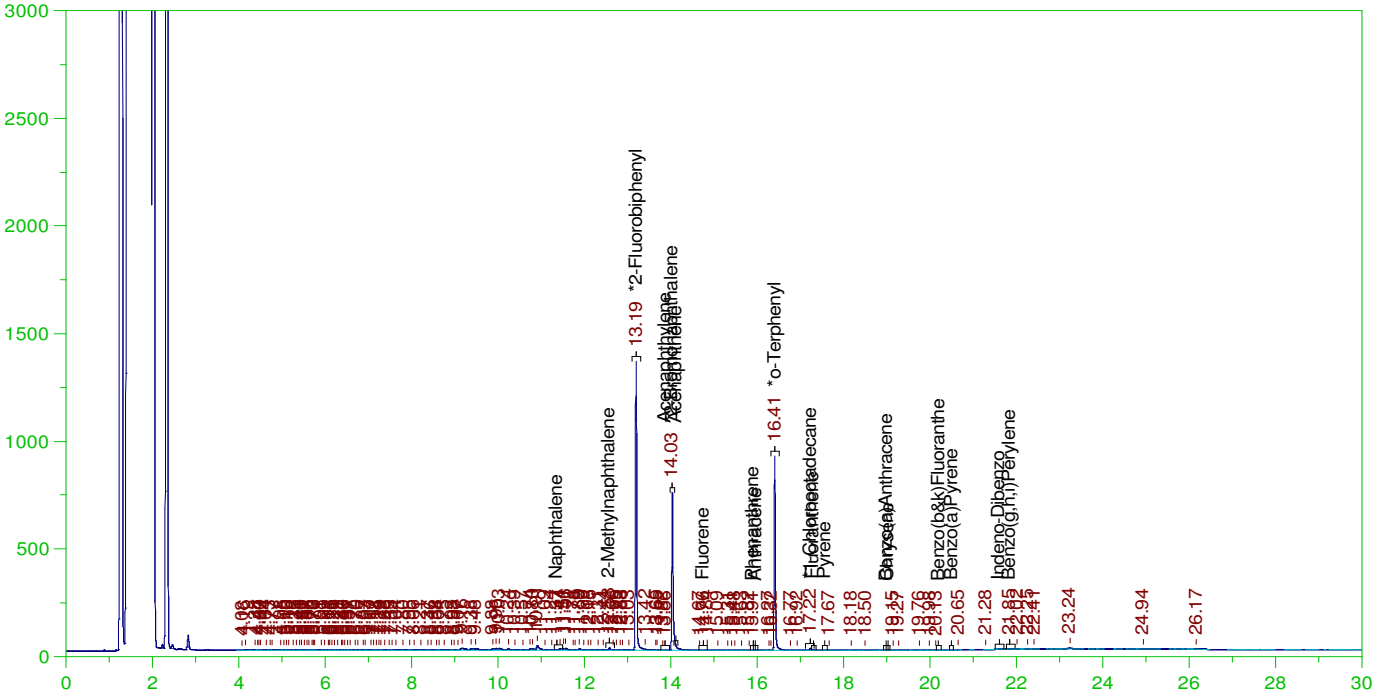

EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: B17042303-003A ;0503HP5 , $HC-ARO-GRP-W, RUSH-V17
Raw File: G:\org\HP5\DAT\HP5050317_b\0503HP5.0017.RAW
Date & Time Acquired: 5/3/2017 11:38:15 PM
Method File: g:\org\HP5\Methods\RR_EPH-BN-L%.met
Calibration File: G:\Org\HP5\Cals\AR151028BN.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

Mean RF EPH Aromatics: 33505.56
Rt range for EPH C11 to C22 Aromatics: 11.296 to 21.97

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	13.194	192.308	166.078	86.36	-
*2-Bromonaphthalene	14.035	192.308	160.232	83.32	-
*o-Terphenyl	16.406	192.308	104.509	54.34	-
*1-Chlorooctadecane	17.222	192.308	3.134	1.63	-

C11-C22 Aromatics Area:509484.4 C11-C22 Aromatics Amount: 29.24224
EPH Aromatics total Area:1769705 EPH Aromatics Total Amount: 101.5735

BLK-1704-102 Batch ID: 109133

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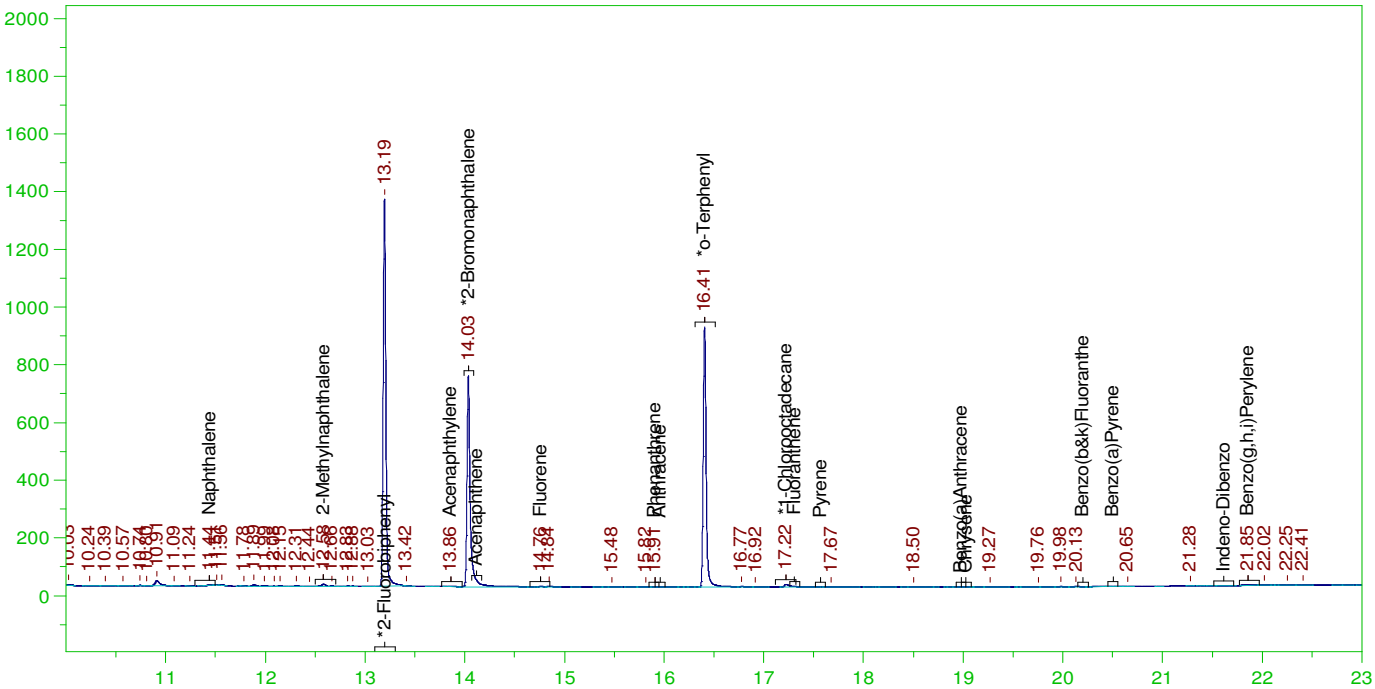

EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

Sample Name: B17042303-003A ;0503HP5 , $HC-ARO-GRP-W, RUSH-V17
Raw File: G:\org\HP5\DAT\HP5050317_b\0503HP5.0017.RAW
Date & Time Acquired: 5/3/2017 11:38:15 PM
Method File: g:\org\HP5\Methods\RS_EPH-BN-L%.met
Calibration File: G:\Org\HP5\Cals\AR151028BN.CAL
Sample Weight: 1.04 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	11.439	11.439	11.439	4541	1.923	U
2-Methylnaphthalene	12.58	12.58	12.58	21173	1.923	U
Acenaphthylene	13.862	13.862	13.862	893	1.923	U
Acenaphthene	.	.	.		1.923	U
Fluorene	14.761	14.761	14.761	974	1.923	U
Phenanthrene	15.906	15.906	15.906	4144	1.923	U
Anthracene	.	.	.		1.923	U
Fluoranthene	.	.	.		1.923	U
Pyrene	.	.	.		1.923	U
Benzo(a)Anthracene	.	.	.		1.923	U
Chrysene	.	.	.		1.923	U
Benzo(b&k)Fluoranthe	.	.	.		3.846	U
Benzo(a)Pyrene	.	.	.		1.923	U
Indeno-Dibenzo	.	.	.		3.846	U
Benzo(g,h,i)Perylene	21.855	21.855	21.855	1339	1.923	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	13.194	192.308	163.326	84.93	40-140
*2-Bromonaphthalene	14.035	192.308	156.833	81.55	40-140
*o-Terphenyl	16.406	192.308	103.598	53.87	40-140
*1-Chlorooctadecane	17.222	192.308	2.808	1.46	40-140

Work Order Receipt Checklist

Hydrometrics Inc

B17042303

Login completed by:	Kathi Renier	Date Received:	4/28/2017
Reviewed by:	BL2000\tedwards	Received by:	wcj
Reviewed Date:	5/1/2017	Carrier name:	Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	°C On Ice		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

The Temperature Blank temperature for shipping container 1 was 1.4°C, shipping container 2 was 0.1°C, shipping container 3 was 0.4°C, shipping container 4 was 0.2°C, shipping container 5 was 0.1°C, shipping container 6 was 0.5°C, shipping container 7 was 1.6°C, shipping container 8 was 0.6°C, shipping container 9 was 0.5°C, shipping container 10 was 0.0°C, shipping container 11 was 0.1°C, and shipping container12 was 0.4°C.

ENERGY LAB
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information (Billing information)

Company/Name	Hydrometrics, Inc.
Contact	Heidi Kaiser
Phone	406-656-1172
Mailing Address	5602 Hesper Rd.
City, State, Zip	Billings, MT 59106
Email	hkaiser@hydrometrics.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	11458
Quote	
Bottle Order	110771

Report Information (if different than Account Information)

Company/Name	Same
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats: ☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other

Comments

*Please have all results for all samples needed by May 3.

If EPH screen results in extractable hydrocarbons greater than 1,000 micrograms then analyze sample for EPH fractions, for SVOCs via Method 8270

Project Information

Project Name, PWSID, Permit, etc.	16043, Bolke Residence.
Sampler Name	Charles Lanz
Sampler Phone	406-670-8304
Sample Origin State	MT
EPA/State Compliance	☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Hydrocarbons, Extractable Aero. Screen SW8015M	VPH, MA-VPH	SVOCs, SW8270C							See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
TB1	1 BLK-1704-100	4/26/17	0828	7	W	X	X	X									B17042303-1
TB1	2 BLK-1704-101	↓	1049	↓	↓	X	X	X									2
TB2	3 BLK-1704-102		1130			X	X	X									3
TB2	4 BLK-1704-103	↓	1015	↓	↓	X	X	X									4
	5 Trip Blank 1 - Lot ~~022410~~ 022410 TS SHP 0246																5
	6 Trip Blank 2 - Lot 022610 TS SHP 0246																6
	7																
	8																
	9																
	10																

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Charles Lanz	4/28/17 0802	[signature]	[signature]	4/28/17 0802	
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

APPENDIX B

LANDFARM SAMPLING FIELD NOTES AND GROUNDWATER SAMPLING FIELD FORMS

T. Sicant 8/4/16

ORP (mV)	DO (mg/L)	pH	SC (mS/cm)	Tur (ntu)	Temp (°C)	Fill	DS
133.5	0.52	7.33	6571	0.00	11.6	55	12
-75.9	0.58	6.99	6187	0.00	15.5	60	7
	"			"		"	"

15:30 Left Bolke Residence

15:50 Arrived at Bolke's Farm
Collected 6 point composit soil
sample and Dup

Sample ID	Time	
Blk-1608-300	15:55	PBRS1
Blk-1608-301	16:00	PBRS1-Dup

Composit locations

Point	Northing	Easting	Point	Northing	Easting
001	48.96740	-104.38073	004	48.96747	-104.38097
002	48.96735	-104.38091	005	48.96733	-104.38095
003	48.96731	-104.38084	006	48.96730	-104.38082

16:10 Left site

Rite in the Rain

Water Sampling Form ~~ HF-430

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: Bolke Residence Investigation
Project Code: 16043
Sample Team Member(s): JBS
Laboratory Used: Energy Lab

Site Designation: PBR-1
Sample Code Number: BLK-1608-201
Sample Date: 8/4/16
Sample Time: 12:04 (military)

If Duplicate Sample Collected, Please Record Below

Duplicate Sample Code #: BLK-1608-202
Duplicate Sample Time: 12:10

Site Conditions

New Site: (Yes) No Photo taken: (Yes) No
Site Type: DRY surface water process water
(monitoring well) domestic well adit seep
spring other:
Weather Conditions: calm breeze (windy)
(no precip.) rain snow
clear p. cloudy (overcast)
Air Temperature: °C °F

For Groundwater Samples

		Comments
well volume formula:	V = (TD-SWL)x(Dia.^{2}) / 25	
TD (ft):	15	
SWL (ft):	4.60	
Casing Diameter (I.D.")	2"	
Water Volume (V) (gal):	1.7	
x 3=(gal.)	5.1	
Actual Vol. Removed (gal.)	~1/2 gal	
Water Level Recovery:	slow moderate rapid	

For Low Flow

Pumping Rate (Ml/Minute): 1/0
Fill (Sec): ~~55~~ 60 Discharge (sec): 7
Post Pump SWL: 4.36 Pump Depth(ft): 14'

Field Parameter Stabilization

Time (military)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temperature (°C)	Additional Parameters or Notes SWL
11:39	-33.0	1.23	7.19	6955	0.48	14.1	4.68
11:44	-36.9	1.26	7.05	6572	0.00	14.1	4.81
11:49	-55.1	0.79	7.00	6027	0.00	14.3	5.03
11:54	-74.5	0.61	6.99	6070	0.00	15.7	5.17
11:59	-75.8	0.60	6.99	6014	0.00	15.6	5.23
12:04	-75.9	0.58	6.99	6187	0.00	15.5	5.35

Turbidity: (circle) (clear) slight moderate very

Sample Method: (describe) grab composite (pump) bailer other
2" bladder Pump

Field Parameters

	Sample	Duplicate
ORP (mV)	-75.9	-75.9
DO (mg/l)	0.58	0.58
pH	6.99	6.99
SC (µmhos/cm)	6187	6187
Turbidity (ntu)	0.00	0.00
H_2O Tmp. (°C)	15.5	15.5
Color	clear	
Other:		

Bottles Collected

Quantity	Size	Filter or Unfilt.	Preservative	Parameter	Additional Notes
2	1000 mL	UF	RAW	SVOC	
2	1000 mL	UF	H_2SO_4	HPH	
3	40 mL	UF	HCl	VPH	

Comments: Pump on @ 11:34 ; SWL did not stabilize

Sample Team Member Signature: [signature] Page of

Water Sampling Form ~~ HF-430

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: Bolka Residence Investigation
Project Code: 16043
Sample Team Member(s): T.S. L
Laboratory Used: Energy Labs

Site Designation: PBR-2
Sample Code Number: BLK-1608-200
Sample Date: 8/4/16
Sample Time: 10:10 (military)

If Duplicate Sample Collected, Please Record Below

Duplicate Sample Code #:
Duplicate Sample Time:

For Groundwater Samples

		Comments
well volume formula:	V = (TD-SWL)x(Dia.^{2}) / 25	
TD (ft):	37'	
SWL (ft):	30.15	
Casing Diameter (I.D.")	2"	
Water Volume (V) (gal):	1.1	
x 3=(gal.)	3.3	
Actual Vol. Removed (gal.)	~3/4 gal	
Water Level Recovery:	slow moderate rapid	

Site Conditions

New Site: (Yes) No Photo taken: Yes (No)
Site Type: DRY surface water process water (monitoring well) domestic well adit seep spring other:
Weather Conditions: calm breeze (windy) (no precip) rain snow clear p. cloudy (overcast)
Air Temperature: °C 70 °F

For Low Flow

Pumping Rate (Ml/Minute): 120
Fill (Sec): 55 Discharge (sec): 12
Post Pump SWL: 30.13 Pump Depth(ft): 34'

Field Parameter Stabilization

Time (military)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temperature (°C)	Additional Parameters or Notes SWL
9:20	224.6	~~6.65~~ 3.27	7.48	6638	2.69	16.6	30.27
9:25	207.5	1.15	7.29	6549	1.16	12.1	30.30
9:30	191.4	1.08	7.29	6550	0.06	11.9	30.34
9:35	184.3	1.00	7.31	6557	0.00	11.9	30.38
9:40	177.4	1.14	7.32	6550	0.00	11.8	30.39
9:45	167.8	1.17	7.32	6551	0.00	12.0	30.40
9:50	155.6	0.95	7.32	6555	0.00	12.0	30.46

Turbidity: (circle) (clear) slight moderate very

Sample Method: (describe) grab composite (pump) bailer other
2" bladder pump

Field Parameters

	Sample	Duplicate
ORP (mV)	133.5	
DO (mg/l)	0.52	
pH	7.33	
SC (µmhos/cm)	6571	
Turbidity (ntu)	0.00	
H_2O Tmp. (°C)	11.6	
Color	clear	
Other:		

Bottles Collected

Quantity	Size	Filter or Unfilt.	Preservative	Parameter	Additional Notes
2	1000 mL	UF	RAW	5VOC	
2	1000 mL	UF	H_2SO_4	HPH	
3	40 mL	UF	HCL	VPH	

Comments: Pump on @ 9:25

Sample Team Member Signature: [signature] Page of

Water Sampling Form ~~ HF-430

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: Bolke Residence
Project Code: 16053
Sample Team Member(s): C. Lanz
Laboratory Used: Energy Lab

Site Designation: PBR-2
Sample Code Number: BLK-1704-100
Sample Date: 4/26/17
Sample Time: 0828 (military)

If Duplicate Sample Collected, Please Record Below

Duplicate Sample Code #:
Duplicate Sample Time:

Site Conditions

New Site: Yes (No) Photo taken: Yes (No)
Site Type: DRY surface water process water
(monitoring well) domestic well adit seep
spring other:
Weather Conditions: calm (breeze) windy
(no precip.) rain snow
clear (p. cloudy) overcast
Air Temperature: °C 28 °F

For Groundwater Samples

well volume formula: V = (TD-SWL)x(Dia.^{2}) / 25 — Comments

TD (ft): 37
SWL (ft): 29.17
Casing Diameter (I.D.") 2.0
Water Volume (V) (gal):
x 3=(gal.)
Actual Vol. Removed (gal.)
Water Level Recovery: slow moderate rapid

For Low Flow

Pumping Rate (Ml/Min): 110 ml Cycles per min: 1
Fill (Sec): 55 Discharge (sec): 10
QED PSI (gauge): QED Depth (gauge):
purge pump and tubing prior to paramaters and sample

Field Parameter Stabilization

Time (military)	ORP (mV)	DO (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temp (°C)	SWL	OTHER	ML
0728	213.6	2.14	7.06	6353	40.6	7.6	29.24		
0733	205.9	1.19	6.98	6451	31.5	8.6			
0738	199.9	1.44	6.98	6458	28.7	8.7	29.26		
0743	195.9	1.87	6.98	6468	19.8	8.7			
0748	193.2	1.84	6.99	6455	19.1	8.7	29.27		
0753	190.5	1.60	6.99	6461	10.80	8.6			
0758	187.8	1.61	6.98	6479	8.92	8.6	29.28		
0803	185.8	1.61	6.98	6469	7.19	8.7			
0808	183.5	1.56	6.98	6464	6.13	8.6	29.29		
0813	181.5	1.53	6.98	6469	4.79	8.9			

Turbidity: (circle) clear moderate slight very

Sample Method: (describe) (grab) composite (pump) bailer other
Bladder Pump

Field Parameters

	Sample	Stabilization
ORP (mV)	176.9	± 10 mV
DO (mg/l)	1.48	± 0.3 mg/L
pH	6.97	± 0.1 pH unit
SC (µmhos/cm)	6498	± 3% (SC>100)
Turbidity (ntu)	4.05	F > 10 NTU
H_2O Tmp. (°C)	9.0	± 0.2°C
Color	—	
Other:	Turbidity at sample	

Bottles Collected

Quantity	Size	Filter or Unfilt.	Preservative	Parameter	Additional Notes
3	40 ml				
2	1 liter				
2	1 liter				

Comments: Pump On @ 0723, Post Pump WL: 29.15

Sample Team Member Signature: Page of

Water Sampling Form ~~ HF-430

Field Parameter Stabilization

Time (military)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temperature (°C)	Additional Parameters or Notes
0818	179.9	1.51	6.97	6461	4.13	8.9	
0823	178.4	1.49	6.97	6455	4.17	8.9	
0828	176.9	1.48	6.97	6498	4.05	9.0	

Water Sampling Form ~~ HF-430

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: Bolke Residence
Project Code: 16053
Sample Team Member(s): C. Lanz
Laboratory Used: Energy Lab

Site Designation: PBR-1
Sample Code Number: BLK-1704-101
Sample Date: 4/26/17
Sample Time: 1049 (military)

If Duplicate Sample Collected, Please Record Below

Duplicate Sample Code #: BLK-1704-102
Duplicate Sample Time: 1130

For Groundwater Samples

well volume formula: V = (TD-SWL)x(Dia.^{2}) / 25

Comments

TD (ft): 15
SWL (ft): 3.87
Casing Diameter (I.D.") 2.0
Water Volume (V) (gal):
x 3=(gal.)
Actual Vol. Removed (gal.)
Water Level Recovery: slow moderate rapid

Site Conditions

New Site: Yes (No) Photo taken: Yes (No)
Site Type: DRY surface water process water
(monitoring well) domestic well adit seep
spring other:
Weather Conditions: calm (breeze) windy
(no precip.) rain snow
clear (p. cloudy) overcast
Air Temperature: °C °F

For Low Flow

Pumping Rate (Ml/Min): Cycles per min: 1
Fill (Sec): 60 Discharge (sec): 7
QED PSI (gauge): QED Depth (gauge):
purge pump and tubing prior to paramaters and sample

Field Parameter Stabilization

Time (military)	ORP (mV)	DO (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temp (°C)	SWL	OTHER	ML
0934			No	Water					
0939	143.7	9.02	7.57	2775		4.0	3.80		
0944	-27.9	3.90	6.81	5814	6.87	5.1	3.88		
0949	-38.2	3.05	6.74	6084	6.00	5.8			
0954	-49.4	4.54	6.74	5879	7.88	6.0	4.09		
0959	-56.2	3.35	6.73	5708	7.11	6.2			
1004	-60.0	2.49	6.73	5658	7.51	6.2	4.25		
1009	-62.4	2.24	6.73	5643	5.79	6.3			
1014	-66.4	1.69	6.73	5585	4.44	6.3	4.41		
1019	-61.8	2.45	6.73	5512	5.09	6.3			

Turbidity: (circle) clear moderate slight very

Sample Method: (grab) composite (pump) bailer other
(describe) Bladder Pump

Field Parameters

	Sample	Stabilization
ORP (mV)	-61.9	± 10 mV
DO (mg/l)	1.17	± 0.3 mg/L
pH	6.73	± 0.1 pH unit
SC (µmhos/cm)	5418	± 3% (SC>100)
Turbidity (ntu)	3.70	F > 10 NTU
H_2O Tmp. (°C)	6.6	± 0.2°C
Color	—	
Other:	Turbidity at sample	

Bottles Collected

Quantity	Size	Filter or Unfilt.	Preservative	Parameter	Additional Notes
3	40 ml				
2	1 liter				
2	1 liter				

Comments: Pump On- 0929, Post Pump WL- 3.68

Sample Team Member Signature: [signature] Page of

Water Sampling Form ~~ HF-430

Field Parameter Stabilization

Time (military)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temperature (°C)	Additional Parameters or Notes
1024	-67.4	1.73	6.73	5508	4.26	6.2	4.60
1029	-66.5	1.75	6.73	5507	3.92	6.4	
1034	-65.3	1.58	6.74	5489	4.09	6.6	
1039	-64.2	1.18	6.74	5462	3.72	6.6	4.83
1044	-62.9	1.21	6.73	5445	3.41	6.6	
1049	-61.9	1.17	6.73	5418	3.70	6.6	5.02

Water Sampling Form ~~ HF-430

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: Bolke Residence
Project Code: 16053
Sample Team Member(s): C. Lanz
Laboratory Used: Energy Lab

Site Designation: Rinsate Blank
Sample Code Number: BLK-1704-103
Sample Date: 4/26/17
Sample Time: 1015 (military)

If Duplicate Sample Collected, Please Record Below

Duplicate Sample Code #:
Duplicate Sample Time:

Site Conditions

New Site: Yes (No) Photo taken: Yes (No)
Site Type: DRY surface water process water
(monitoring well) domestic well adit seep
spring other:
Weather Conditions: calm breeze windy
no precip. rain snow
clear p. cloudy overcast
Air Temperature: °C °F

For Groundwater Samples

well volume formula: V = (TD-SWL)x(Dia.^{2}) / 25

Comments

TD (ft):
SWL (ft):
Casing Diameter (I.D.")
Water Volume (V) (gal):
x 3=(gal.)
Actual Vol. Removed (gal.)
Water Level Recovery: slow moderate rapid

CJL

For Low Flow

Pumping Rate (Ml/Min): Cycles per min:
Fill (Sec): Discharge (sec):
QED PSI (gauge): QED Depth (gauge):
purge pump and tubing prior to paramaters and sample

Field Parameter Stabilization

Time (military)	ORP (mV)	DO (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temp (°C)	SWL	OTHER	ML

CJL

Turbidity: (circle) clear moderate slight very

Sample Method: (describe) (grab) composite (pump) bailer other
Rinsate Blank.

Field Parameters

	Sample	Stabilization
ORP (mV)		± 10 mV
DO (mg/l)		± 0.3 mg/L
pH		± 0.1 pH unit
SC (µmhos/cm)		± 3% (SC>100)
Turbidity (ntu)		F > 10 NTU
H_2O Tmp. (°C)		± 0.2°C
Color		
Other:	Turbidity at sample	

CJL

Bottles Collected

Quantity	Size	Filter or Unfilt.	Preservative	Parameter	Additional Notes
3	40 ml				
2	1 liter				
2	1 liter				

Comments: Rinsate Blank used m-Scope tip. Poured DI H_2O over tip while filling bottles

Sample Team Member Signature: Page of

APPENDIX C

AIR SAMPLING FIELD FORMS

Soil Vapor Sub-Slab Sampling (Source)

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: Bilke Residence Investigation
Project Code: 16043
Sample Team Member(s): Tyler Swant
Laboratory Used: ALS

Site Designation: Basement sub-slab
Sample Code Number: BWK-1608-104
Sample Date: 8/4/16
Sample Time: 14:43 (military)

Weather Conditions

Weather Conditions: calm breeze windy
Day Night no precip. rain snow
clear p. cloudy overcast

Outside Air Temp- Start: 70 °F **End:** 70 °F
Barometric Pressure- Start: 30.0 in. **End:** 30.0 in.
Photo Taken: (Yes) No

Duplicate Sample

~~Duplicate Sample Code:~~
~~Duplicate Sample Time:~~

Canister Description			***Duplicate***
Shut In Test Check:	(Yes) No	/	Yes (No)
Canister ID:	A5008011	/	
Flow Controler:	0401033	/	
Vacuum Gauge:	N/A	/	

Leak Test

Sample Line Purge 180Ml: (Y) / N
He % in Shroud: 38.2
He in Sample line (ppm): 0.325%
PID Reading (ppm): 517.1

Note: Purge minimum of 3 times volume of sample line: 1/4" ID tubing = 9.652 ml/ft plus 60.30 ml per foot of hole (5/8" dia.)

Helium % During Sample

Time	He %
14:20	38.9
14:30	37.3

Sample Results

	Start		End
Date:	8/4/16	/	8/4/16
Time:	13:55	/	14:43
Vac:	-25 psi	/	-4 psi
Dupe Vac:	N/A	/	N/A
He%:	46.4	/	37.2
Temp °F:	69	/	69

This Space Left For Sketchs, Ect:

Comments:

Sample Team Member Signature: [signature]

Page of

Vapor Intrusion Investigation Sampling Equipment Tracking Log

Date Received: 8/3/16

Pr[illegible] Name:

Date Checked in: 8/3/16

Checked in by: Tyler Swant

Canisters and Flow Controllers from ALS Labs

Digital Vacuum Gauge ID #: DVG00252

	Canister ID #	Flow Controller ID #	Analog Vacuum Gauge ID #	Analog Vacuum reading on arrival	Digital Vacuum reading on arrival	Canister Pressure Check (Pass/Fail)	Vacuum reading after collection	Comments/ Notes
1	A500811	OA01033	N/A	-25	-27.84	Pass	-4	45min Sub slab
2	A500416	FCR00122	N/A	-28	-27.62	Pass	-9	ambient
3	AC01854	FCR00099	N/A	~~+~~30+	-27.62	Pass	-20	ambient, no gauge in gauge zero @ -12
4	A501135	FCR00149	N/A	-27	-26.64	Pass	-6	ambient
5	A500728	FCR00197	N/A	-27	-27.60	Pass	-8	ambient
6								
7								
8								
9								
10								
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Ambient Air Sampling - Field Data Sheet

Page _____ of _____

Project Name:	Bolke Residence Investigation	**Start Weather:**	Clear + windy
Project Code:	16043	**Start Outdoor Air Temp:**	83°F
Location ID:		**Start Barometric Pressure:**	29.7
Date(s):	8/3/16 - 8/4/16	**End Weather:**	Partly Cloudy + windy
Field Personnel:	Tyler Sweet	**End Outdoor Air Temp:**	70°F
Recorded by:	Tyler Sweet	**End Barometric Pressure:**	30.04

Sampling Device and Sample Information:

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Indoor Air (°F) Pre-Sample Temp	Indoor Air (°F) Post-Sample Temp
8/3/16	17:45	8/4/16	15:00	BLK-1608-100	AS00416	FCR00132	N/A	-28	-9	68	69
	17:45		15:00	BLK-1608-101	AC01854	FCR00099	N/A	-30+	-20	68	69
	17:52		15:03	BLK-1608-102	AS000728	FCR00197	N/A	-27	-8	68	69
	17:53		15:04	BLK-1608-103	AS01135	FCR00149	N/A	-27	-6	68	69
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								

Comments, Description of Sample Locations, ect.:
BLK-1608-100 = Basement Ambient
BLK-1608-101 = Basement Ambient Duplicate
BLK-1608-102 = Main Level Ambient
BLK-1608-103 = Outdoor Ambient

Soil Vapor Sub-Slab Sampling (Source)

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: Bolke Residence Invest.
Project Code: 16043
Sample Team Member(s): CL
Laboratory Used: ALS

Site Designation: Basement Sub Slab
Sample Code Number: BLK-1701-100
Sample Date: 1/17/17
Sample Time: 1614 (military)

Weather Conditions

Weather Conditions: calm breeze windy
Day Night no precip. rain snow
clear p. cloudy overcast

Outside Air Temp- Start: 35 °F **End:** 34 °F
Barometric Pressure- Start: 29.6 in. **End:** 29.7 in.
Photo Taken: Yes No

Duplicate Sample

Duplicate Sample Code:
Duplicate Sample Time:

Canister Description			***Duplicate***
Shut In Test Check:	Yes No	/	Yes No
Canister ID:	0C01734	/	
Flow Controler:	0A00728	/	
Vacuum Gauge:	AV604457	/	

Leak Test

Sample Line Purge 180Ml:	Y / N
He % in Shroud:	36.0
He in Sample line (ppm):	0%
PID Reading (ppm):	508.1

Note: Purge minimum of 3 times volume of sample line: 1/4" ID tubing = 9.652 ml/ft plus 60.30 ml per foot of hole (5/8" dia.)

Helium % During Sample

Time	He %
1545	29.7
1600	26.4
1610	22.1

Sample Results

	Start		End
Date:	1/17/17	/	1/17/17
Time:	1535	/	1614
Vac:	-26	/	-5
Dupe Vac:		/	
He%:	~~-28~~ 33.7	/	~~-27~~ 21.1
Temp °F:	66°F	/	66°F

This Space Left For Sketchs, Ect:

Comments:

Sample Team Member Signature:

Page of

Vapor Intrusion Investigation Sampling Equipment Tracking Log

Date Received: 12/9/16

Project Name: ~~YOSD VI Mitigation~~ Plentywood 16043

Date Checked in: 12/13/16 Checked in by: C. Johnson

Canisters and Flow Controllers from ALS Labs

Digital Vacuum Gauge ID #: 00282

	Canister ID #	Flow Controller ID #	AVG - Analog Vacuum Gauge ID #	Analog Vacuum reading on arrival	Digital Vacuum reading on arrival	Canister Pressure Check (Pass/Fail)	Vacuum reading after collection	Comments/ Notes
1	SC00104	F220485	None	-26	-26.75	Pass		Ambient
2		FCA00707 →	sticker nearly illeagable.					
3								
4	AC01932	FCA00817	04470	-27	-26.72	Pass		
5	AS01001	FCA01041	None	-28.5	-26.73	Pass		
6	AS00929	FCA00667	04404	-25	-26.67	Pass		
7								
8	SC01734	OA00728	04457	-25.5	-26.80	Pass		Source
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

Ambient Air Sampling - Field Data Sheet

Project Name:	Plentywood DEQ	**Start Weather:**	Calm, PC
Project Code:	16043	**Start Outdoor Air Temp:**	35°F
Location ID:	Basement	**Start Barometric Pressure:**	29.7
Date(s):	1/17/17-	**End Weather:**	PC, Calm
Field Personnel:	CL	**End Outdoor Air Temp:**	29°F
Recorded by:	CL	**End Barometric Pressure:**	29.7

Sampling Device and Sample Information:

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Indoor Air (°F) Pre-Sample Temp	Indoor Air (°F) Post-Sample Temp
1/17/17	16:33	1/18/17	11:00	BLK-1701-101	A501001	FCA01041	N/A.	-29.5	-9	66°F	66°F
1/17/17	16:33	1/18/17	07:00	BLK-1701-102	AC01932	FCA00817	AV604470	-28.0	-1.0	66°F	↓
1/17/17	16:34	1/18/17	10:45	BLK-1701-103	A500929	FCA00667	AV604404	-26.0	-5.5	66°F	↓
1/17/17	16:34	1/18/17	08:00	BLK-1701-104	SC00104	CA00707	N/A	-26.5	-5.0	66°F	29°F Outside Te
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								

Comments, Description of Sample Locations, ect.:

BLK-1701-100 - Basement Sub Slab
BLK-1701-101 - Basement Ambient
BLK-1701-102 - Basement Ambient Dup.
BLK-1701-103 - Main Level Ambient
BLK-1701-104 - Outdoor Ambient.

Indoor Ambient Air Sampling - Field Data Sheet

Project Name:	~~Lewistown MDT VI Sampling~~	**Start Weather:**	
Project Code:	~~12035.16~~ 16043 Boike Residence	**Start Outdoor Air Temp:**	
Location ID:		**Start Barometric Pressure:**	
Date(s):	3/20-3/21/17	**End Weather:**	
Field Personnel:	CL	**End Outdoor Air Temp:**	
Recorded by:	CL	**End Barometric Pressure:**	

Sampling Device and Sample Information:

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Indoor Air (°F) Pre-Sample Temp	Indoor Air (°F) Post-Sample Temp
3/20/17	15:20	3/21/17	15:40	B1-170320-AA1	A5007914	FC200185	N/A	-29	-6	68	68
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								

Comments: Ambient Can placed on kitchen ~~sink~~ counter

Indoor Ambient Air Sampling - Field Data Sheet

Project Name:	~~Lewistown MDT VI Sampling~~	**Start Weather:**	PC, Windy
Project Code:	16043 ~~12035.17~~ Bolke Residence (Plentywood)	**Start Outdoor Air Temp:**	46°F
Location ID:		**Start Barometric Pressure:**	
Date(s):	3/20 - 3/21/17	**End Weather:**	
Field Personnel:	CL	**End Outdoor Air Temp:**	
Recorded by:	CL	**End Barometric Pressure:**	

Sampling Device and Sample Information:

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Indoor Air (°F) Pre-Sample Temp	Indoor Air (°F) Post-Sample Temp
3/20/17	15:21		15:25	B1-170320-AA2	AC02074	FCA01081	N/A	-26	-7	34	36 ~~34~~
	:		15:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								
	:		:								

Comments, Description of Sample Locations, ect.: Garage Ambient Can, Placed on work bench
Gas for snowblower under work bench

Indoor Ambient Air Sampling - Field Data Sheet

Project Name:	~~Lewistown MDT VI Sampling~~	**Start Weather:**	
Project Code:	1203517 Plentywood Beike Residence.	**Start Outdoor Air Temp:**	
Location ID:		**Start Barometric Pressure:**	
Date(s):		**End Weather:**	
Field Personnel:	CL	**End Outdoor Air Temp:**	
Recorded by:	CL	**End Barometric Pressure:**	

Sampling Device and Sample Information:

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Indoor Air (°F) Pre-Sample Temp	Indoor Air (°F) Post-Sample Temp
3/20/17	15:19	3/21/17	15:30	B1-170320-AA3	5C02151	FCR00048	N/A	-26	-6.5	68	68
	:	↓	15:30	B1-170320-AA3D	AC01101	FCR00052	N/A	-26.5	-7.5	68	68
	:		:								
	:		:								
	:		:								
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	:		:								
	:		:								
	:		:								

Comments, Description of Sample Locations, ect.: Basement can set on Bar.

Vapor Intrusion Investigation Sampling Equipment Tracking Log

Date Received: 12/9/16

Project Name: [redacted] Plentywood 16043

Date Checked in: 12/13/16

Checked in by: C. Johnson

Canisters and Flow Controllers from ALS Labs

Digital Vacuum Gauge ID #: 00282

	Canister ID #	Flow Controller ID #	AVG - Analog Vacuum Gauge ID #	Analog Vacuum reading on arrival	Digital Vacuum reading on arrival	Canister Pressure Check (Pass/Fail)	Vacuum reading after collection	Comments/ Notes
1	SC00104	F220485	None	-26	-26.75	Pass		Ambient
2		FCA00707 → sticker nearly illeagable.						
3								
4	AC01932	FCA00817	04470	-27	-26.72	Pass		
5	AS01001	FCA01041	None	-28.5	-26.73	Pass		
6	AS00929	FCA00667	04404	-25	-26.67	Pass		
7								
8	SC01734	OA00728	04457	-25.5	-26.80	Pass		Source
9								
10	3/16/17 → Cannisters arrived and checked in CJ						DVG:	DVG00101
11								
12	AC02074	FCA01081	NONE	-26	-26.40	Pass		
13	AS0091	FCR00098	None	-26.5	-24.60	Fail		Dig. gauge not zero-ing
14	SC02151	FCR00048	None	-26	-26.38	Pass		
15	AS00944	FCR00185	None	-29	-26.35	Pass		Gauge zero @ -2
16	AC01101	FCR00052	None	-26.5	-26.41	Pass		
17								
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APPENDIX D

AIR SAMPLING PHOTOS

Appendix D – Air Sampling Photos – Bolke Residence

Sub-Slab Sampling

Basement Ambient Sample Location

Appendix D – Air Sampling Photos – Bolke Residence

Main Floor Ambient Sample Location

Outdoor Ambient Sample Location

Appendix D – Air Sampling Photos – Bolke Residence

Garage Ambient Sample Location

Appendix D – Air Sampling Photos – Bolke Residence

Vapor Pin and sub slab borehole, before and after sealing.

APPENDIX E

ALS LABORATORY REPORTS

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
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F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

August 24, 2016

Heidi Kaiser
Hydrometrics, Inc.
5602 Hesper Road
Billings, MT 59106

RE: Bolke Residence Fuel Oil Release / 16043.00

Dear Heidi:

Enclosed are the results of the samples submitted to our laboratory on August 10, 2016. For your reference, these analyses have been assigned our service request number P1603928.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko
By Kate Kaneko at 12:55 pm, 08/24/16

Kate Kaneko
Project Manager

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Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Hydrometrics, Inc. Service Request No: P1603928
Project: Bolke Residence Fuel Oil Release / 16043.00

CASE NARRATIVE

The samples were received intact under chain of custody on August 10, 2016 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Helium Analysis

Sample BLK-1608-104 (P1603928-005) was analyzed for helium according to modified EPA Method 3C (single injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP, LLC scope of accreditation.

Air-Phase Petroleum Hydrocarbons (APH) Analysis

All of the samples were analyzed for total aliphatic and aromatic gasoline range hydrocarbons by gas chromatography/mass spectrometry according to the Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Massachusetts Department of Environmental Protection, Revision 1, December, 2009. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP, LLC accreditation.

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present. Any internal/tuning standards and target APH analytes eluting in the hydrocarbon ranges are also subtracted. Additionally, C_9-C_{10} Aromatic Hydrocarbons are excluded from the C_9-C_{12} Aliphatic Hydrocarbon range.

Volatile Organic Compound Analysis

All of the samples were also analyzed for selected volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation, however it is not part of the AIHA-LAP, LLC accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

2655 Park Center Dr., Suite A
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www.alsglobal.com

Client: Hydrometrics, Inc.
Project: Bolke Residence Fuel Oil Release / 16043.00

Service Request No: P1603928

CASE NARRATIVE

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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T: +1 805 526 7161
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www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA-LAP, LLC	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272016-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Hydrometrics, Inc. Service Request: P1603928

Project ID: Bolke Residence Fuel Oil Release / 16043.00

Date Received: 8/10/2016

Time Received: 09:39

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	MA APH 1.0 - MA VOC PH Can	TO-15 - VOC Cans	3C Modified - Helium Can
BLK-1608-100	P1603928-001	Air	8/4/2016	15:00	AS00416	-4.60	3.71	X	X	
BLK-1608-101	P1603928-002	Air	8/4/2016	15:00	AC01854	-4.41	4.52	X	X	
BLK-1608-102	P1603928-003	Air	8/4/2016	15:03	AS00728	-4.73	4.17	X	X	
BLK-1608-103	P1603928-004	Air	8/4/2016	15:04	AS01135	-3.80	3.78	X	X	
BLK-1608-104	P1603928-005	Air	8/4/2016	14:43	AS00811	-3.60	4.18	X	X	X

Air - Chain of Custody Record & Analytical Service Request

ALS
2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No: 1603928

Company Name & Address (Reporting Information): Hydrometrics Inc. 5602 Hesper Rd Billings, MT 59106

Project Name: Bolke Residence Fuel Oil Release

Project Number: 16043.00

Project Manager: Heidi Kaiser

P.O. # / Billing Information: Hydrometrics Inc. 5602 Hesper Rd Billings, MT 59106

Phone: (406) 656-1172

Fax: (406) 656-8912

Email Address for Result Reporting: Hkaiser@hydrometrics.com

Sampler (Print & Sign): Tyler Suzant

ALS Contact:

Analysis Method

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	APH and for an abbreviated (petroleum-only) list of Method TO-15	Helium	Comments e.g. Actual Preservative or specific instructions
BLK-1608-100	1	8/4/16	15:00	AS00416	FCR00132	-28	-9		x		
BLK-1608-101	2	↓	15:00	AC01854	FCD00099	-30+	-20		x		
BLK-1608-102	3		15:03	AS00728	FCR00197	-27	-8		x		
BLK-1608-103	4		15:04	AS01135	FCD00149	-27	-6		x		
BLK-1608-104	5	↓	14:43	AS00811	OA01033	-25	-4		x	x	

Report Tier Levels - please select

Tier I - Results (Default in not specified) _____
Tier II (Results + QC Summaries _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Date Validation Package) 10% Surcharge _____

EDD required YES / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature) Tyler F. Suzant	Date: 8/5/16	Time: 11:00	Received by: (Signature)	Date: 8/10/16	Time: 0939

Cooler / Blank Temperature _____°C

ALS Environmental
Sample Acceptance Check Form

Client: Hydrometrics, Inc. Work order: P1603928

Project: Bolke Residence Fuel Oil Release / 16043.00

Sample(s) received on: 8/10/16 Date opened: 8/10/16 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Box sealing. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1603928-001.01	6.0 L Silonite Can					
P1603928-002.01	6.0 L Ambient Can					
P1603928-003.01	6.0 L Silonite Can					
P1603928-004.01	6.0 L Silonite Can					
P1603928-005.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Project ID: P1603928

Helium

Test Code: EPA 3C Modified
Instrument ID: HP5890 II/GC8/TCD Date(s) Collected: 8/4/16
Analyst: Adam McAfee Date Received: 8/10/16
Sample Type: 6.0 L Silonite Canister(s) Date Analyzed: 8/15/16
Test Notes:

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Canister Dilution Factor	**Result ppmV**	MRL ppmV	Data Qualifier
BLK-1608-104	P1603928-005	1.00	1.70	**3,600**	43	
Method Blank	P160815-MB	1.00	1.00	ND	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P160815-LCS

Test Code: EPA 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/TCD Date Received: NA
Analyst: Adam McAfee Date Analyzed: 8/15/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS Acceptance Limits	Data Qualifier
7440-59-7	Helium	10,000	**10,600**	**106**	75-124	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1608-100**	ALS Project ID:	P1603928
Client Project ID:	**Bolke Residence Fuel Oil Release / 16043.00**	ALS Sample ID:	P1603928-001
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	8/4/16
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	8/10/16
Analyst:	Lusine Hakobyan	Date Analyzed:	8/15/16
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AS00416		

Initial Pressure (psig): -4.60 Final Pressure (psig): 3.71

Canister Dilution Factor: 1.82

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**87**	36	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**73**	18	
C_9 - C_{10} Aromatic Hydrocarbons	**10**	4.6	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1608-101**	ALS Project ID:	P1603928
Client Project ID:	**Bolke Residence Fuel Oil Release / 16043.00**	ALS Sample ID:	P1603928-002
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	8/4/16
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	8/10/16
Analyst:	Lusine Hakobyan	Date Analyzed:	8/15/16
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AC01854		

Initial Pressure (psig): -4.41 Final Pressure (psig): 4.52

Canister Dilution Factor: 1.87

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**56**	37	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**64**	19	
C_9 - C_{10} Aromatic Hydrocarbons	**8.7**	4.7	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1608-102** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P1603928-003

Test Code: Massachusetts APH, Revision 1, December 2009 Date Collected: 8/4/16
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 8/10/16
Analyst: Lusine Hakobyan Date Analyzed: 8/15/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00728

Initial Pressure (psig): -4.73 Final Pressure (psig): 4.17

Canister Dilution Factor: 1.89

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	ND	38	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**24**	19	
C_9 - C_{10} Aromatic Hydrocarbons	ND	4.7	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.
[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.
[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.
[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.
ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1608-103**	ALS Project ID:	P1603928
Client Project ID:	**Bolke Residence Fuel Oil Release / 16043.00**	ALS Sample ID:	P1603928-004
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	8/4/16
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	8/10/16
Analyst:	Lusine Hakobyan	Date Analyzed:	8/16/16
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AS01135		

Initial Pressure (psig): -3.80 Final Pressure (psig): 3.78

Canister Dilution Factor: 1.70

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	ND	34	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	ND	17	
C_9 - C_{10} Aromatic Hydrocarbons	ND	4.3	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1608-104**	ALS Project ID:	P1603928
Client Project ID:	**Bolke Residence Fuel Oil Release / 16043.00**	ALS Sample ID:	P1603928-005
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	8/4/16
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	8/10/16
Analyst:	Lusine Hakobyan	Date Analyzed:	8/15/16
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	0.0030 Liter(s)
Test Notes:			
Container ID:	AS00811		

Initial Pressure (psig): -3.60 Final Pressure (psig): 4.18

Canister Dilution Factor: 1.70

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**410,000**	11,000	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**890,000**	5,700	
C_9 - C_{10} Aromatic Hydrocarbons	**24,000**	1,400	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**Method Blank**	ALS Project ID:	P1603928
Client Project ID:	**Bolke Residence Fuel Oil Release / 16043.00**	ALS Sample ID:	P160815-MB
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	NA
Analyst:	Lusine Hakobyan	Date Analyzed:	8/15/16
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	ND	20	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	ND	10	
C_9 - C_{10} Aromatic Hydrocarbons	ND	2.5	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**Method Blank**	ALS Project ID:	P1603928
Client Project ID:	**Bolke Residence Fuel Oil Release / 16043.00**	ALS Sample ID:	P160816-MB
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	NA
Analyst:	Lusine Hakobyan	Date Analyzed:	8/16/16
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	ND	20	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	ND	10	
C_9 - C_{10} Aromatic Hydrocarbons	ND	2.5	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P160815-LCS

Test Code: Massachusetts APH, Revision 1, December 2009 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 8/15/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
C5 - C8 Aliphatic Hydrocarbons	216	**202**	**94**	70-130	
C9 - C12 Aliphatic Hydrocarbons	202	**204**	**101**	70-130	
C9 - C10 Aromatic Hydrocarbons	422	**419**	**99**	70-130	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P160816-LCS

Test Code: Massachusetts APH, Revision 1, December 2009 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 8/16/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
C5 - C8 Aliphatic Hydrocarbons	216	**199**	**92**	70-130	
C9 - C12 Aliphatic Hydrocarbons	202	**198**	**98**	70-130	
C9 - C10 Aromatic Hydrocarbons	422	**405**	**96**	70-130	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1608-100** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P1603928-001

Test Code: EPA TO-15 Date Collected: 8/4/16
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 8/10/16
Analyst: Lusine Hakobyan Date Analyzed: #REF!
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00416

Initial Pressure (psig): -4.60 Final Pressure (psig): 3.71

Canister Dilution Factor: 1.82

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.91	ND	0.28	
108-88-3	Toluene	**3.5**	0.91	**0.94**	0.24	
100-41-4	Ethylbenzene	ND	0.91	ND	0.21	
179601-23-1	m,p-Xylenes	ND	1.8	ND	0.42	
95-47-6	o-Xylene	ND	0.91	ND	0.21	
91-20-3	Naphthalene	ND	0.91	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1608-101** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P1603928-002

Test Code: EPA TO-15 Date Collected: 8/4/16
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 8/10/16
Analyst: Lusine Hakobyan Date Analyzed: #REF!
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01854

Initial Pressure (psig): -4.41 Final Pressure (psig): 4.52

Canister Dilution Factor: 1.87

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.94	ND	0.29	
108-88-3	Toluene	**1.3**	0.94	**0.34**	0.25	
100-41-4	Ethylbenzene	ND	0.94	ND	0.22	
179601-23-1	m,p-Xylenes	ND	1.9	ND	0.43	
95-47-6	o-Xylene	ND	0.94	ND	0.22	
91-20-3	Naphthalene	ND	0.94	ND	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1608-102** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P1603928-003

Test Code: EPA TO-15 Date Collected: 8/4/16
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 8/10/16
Analyst: Lusine Hakobyan Date Analyzed: #REF!
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00728

Initial Pressure (psig): -4.73 Final Pressure (psig): 4.17

Canister Dilution Factor: 1.89

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.95	ND	0.30	
108-88-3	Toluene	**1.4**	0.95	**0.38**	0.25	
100-41-4	Ethylbenzene	ND	0.95	ND	0.22	
179601-23-1	m,p-Xylenes	ND	1.9	ND	0.44	
95-47-6	o-Xylene	ND	0.95	ND	0.22	
91-20-3	Naphthalene	ND	0.95	ND	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1608-103** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P1603928-004

Test Code: EPA TO-15 Date Collected: 8/4/16
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 8/10/16
Analyst: Lusine Hakobyan Date Analyzed: #REF!
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01135

Initial Pressure (psig): -3.80 Final Pressure (psig): 3.78

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.85	ND	0.27	
108-88-3	Toluene	ND	0.85	ND	0.23	
100-41-4	Ethylbenzene	ND	0.85	ND	0.20	
179601-23-1	m,p-Xylenes	ND	1.7	ND	0.39	
95-47-6	o-Xylene	ND	0.85	ND	0.20	
91-20-3	Naphthalene	ND	0.85	ND	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1608-104** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P1603928-005

Test Code: EPA TO-15 Date Collected: 8/4/16
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 8/10/16
Analyst: Lusine Hakobyan Date Analyzed: #REF!
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0030 Liter(s)
Test Notes:
Container ID: AS00811

Initial Pressure (psig): -3.60 Final Pressure (psig): 4.18

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	280	ND	89	
108-88-3	Toluene	ND	280	ND	75	
100-41-4	Ethylbenzene	ND	280	ND	65	
179601-23-1	m,p-Xylenes	ND	570	ND	130	
95-47-6	o-Xylene	ND	280	ND	65	
91-20-3	Naphthalene	ND	280	ND	54	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**

Client Sample ID: **Method Blank** ALS Project ID: P1603928

Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P160815-MB

Test Code: EPA TO-15 Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA

Analyst: Lusine Hakobyan Date Analyzed: 8/15/16

Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
91-20-3	Naphthalene	ND	0.50	ND	0.095	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P160816-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 8/16/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
91-20-3	Naphthalene	ND	0.50	ND	0.095	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **Hydrometrics, Inc.**
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Project ID: P1603928

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date(s) Collected: 8/4/16
Analyst: Lusine Hakobyan Date(s) Received: 8/10/16
Sample Type: 6.0 L Silonite Canister(s) Date(s) Analyzed: 8/15 - 8/16/16
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P160815-MB	**102**	**100**	**97**	70-130	
Method Blank	P160816-MB	**103**	**99**	**99**	70-130	
Lab Control Sample	P160815-LCS	**96**	**101**	**102**	70-130	
Lab Control Sample	P160816-LCS	**96**	**98**	**104**	70-130	
BLK-1608-100	P1603928-001	**100**	**97**	**101**	70-130	
BLK-1608-101	P1603928-002	**100**	**97**	**101**	70-130	
BLK-1608-102	P1603928-003	**102**	**98**	**100**	70-130	
BLK-1608-103	P1603928-004	**103**	**100**	**97**	70-130	
BLK-1608-104	P1603928-005	**100**	**90**	**97**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P160815-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 8/15/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
71-43-2	Benzene	226	**219**	**97**	61-110	
108-88-3	Toluene	218	**214**	**98**	67-117	
100-41-4	Ethylbenzene	218	**222**	**102**	69-123	
179601-23-1	m,p-Xylenes	428	**446**	**104**	67-125	
95-47-6	o-Xylene	210	**216**	**103**	67-124	
91-20-3	Naphthalene	218	**229**	**105**	56-158	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1603928
Client Project ID: **Bolke Residence Fuel Oil Release / 16043.00** ALS Sample ID: P160816-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 8/16/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
71-43-2	Benzene	226	**220**	**97**	61-110	
108-88-3	Toluene	218	**206**	**94**	67-117	
100-41-4	Ethylbenzene	218	**215**	**99**	69-123	
179601-23-1	m,p-Xylenes	428	**422**	**99**	67-125	
95-47-6	o-Xylene	210	**210**	**100**	67-124	
91-20-3	Naphthalene	218	**222**	**102**	56-158	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

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LABORATORY REPORT

January 31, 2017

Heidi Kaiser
Hydrometrics, Inc.
5602 Hesper Road
Billings, MT 59106

RE: Plentywood Bolke Residence Release / 16043

Dear Heidi:

Enclosed are the results of the samples submitted to our laboratory on January 24, 2017. For your reference, these analyses have been assigned our service request number P1700307.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko
By Kate Kaneko at 3:25 pm, 01/31/17

Kate Kaneko
Project Manager

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Client: Hydrometrics, Inc. Service Request No: P1700307
Project: Plentywood Bolke Residence Release / 16043

CASE NARRATIVE

The samples were received intact under chain of custody on January 24, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Helium Analysis

One of the samples was analyzed for helium according to modified EPA Method 3C (single injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This method is not included on the laboratory's NELAP or DoD-ELAP scope of accreditation.

Air-Phase Petroleum Hydrocarbons (APH) Analysis

All of the samples were analyzed for total aliphatic and aromatic gasoline range hydrocarbons by gas chromatography/mass spectrometry according to the Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Massachusetts Department of Environmental Protection, Revision 1, December, 2009. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP accreditation.

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present. Any internal/tuning standards and target APH analytes eluting in the hydrocarbon ranges are also subtracted. Additionally, C_9-C_{10} Aromatic Hydrocarbons are excluded from the C_9-C_{12} Aliphatic Hydrocarbon range.

Volatile Organic Compound Analysis

All of the samples were also analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

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Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272016-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Hydrometrics, Inc.

Service Request: P1700307

Project ID: Plentywood Bolke Residence Release / 16043

Date Received: 1/24/2017

Time Received: 09:38

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	3C Modified - Helium Can	MA APH 1.0 - MA VOC PH Can	TO-15 - VOC Cans
BLK-1701-100	P1700307-001	Air	1/17/2017	16:14	SC01734	-4.22	3.99	X	X	X
BLK-1701-101	P1700307-002	Air	1/18/2017	11:00	AS01001	-5.41	3.60		X	X
BLK-1701-102	P1700307-003	Air	1/18/2017	07:00	AC01932	-0.93	3.80		X	X
BLK-1701-103	P1700307-004	Air	1/18/2017	10:45	AS00929	-5.27	3.66		X	X
BLK-1701-104	P1700307-005	Air	1/18/2017	08:00	SC00104	-2.90	4.04		X	X

Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No: P1700307

ALS Contact:

Company Name & Address (Reporting Information): Hydrometrics, Inc.

Project Name: Plentywood Bolke Residence Release

Project Number: 16043

Project Manager: Heidi Kaiser

P.O. # / Billing Information: 16043

Phone: 406-656-1172

Fax:

Email Address for Result Reporting: hkaiser@hydrometrics.com

Sampler (Print & Sign): Charles Lanz 406-670-8304

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Analysis Method: Air-Phase Petroleum Hydrocarbons	Analysis Method: MTBE Method TO-15 (Petroleum Only)	Comments e.g. Actual Preservative or specific instructions
BLK-1701-100	1	1/17/17	1614	AC01734	CA00728	-26	-5	6.0	X	X	X
BLK-1701-101	2	1/18/17	1100	AS01001	FCA01041	-29.5	-9	6.0	X	X	
BLK-1701-102	3	1/18/17	0700	AC01932	FCA00817	-28.0	-1.0	6.0	X	X	
BLK-1701-103	4	1/18/17	1045	AS00929	FCA00667	-26.0	-5.5	6.0	X	X	
BLK-1701-104	5	1/18/17	0800	SC00104	CA00707	-26.5	-5.0	6.0	X	X	

Comments: Helium

Report Tier Levels - please select

Tier I - Results (Default in not specified) _____
Tier II (Results + QC Summaries _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Date Validation Package) 10% Surcharge _____

EDD required YES / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 1/19/17	Time: 1200	Received by: (Signature)	Date: 1/24/17	Time: 0938
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature _____°C

ALS Environmental
Sample Acceptance Check Form

Client: Hydrometrics, Inc. Work order: P1700307

Project: Plentywood Bolke Residence Release / 16043

Sample(s) received on: 1/24/17 Date opened: 1/24/17 by: KKELPE

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? sealing box Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1700307-001.01	6.0 L Source Can					
P1700307-002.01	6.0 L Silonite Can					
P1700307-003.01	6.0 L Ambient Can					
P1700307-004.01	6.0 L Silonite Can					
P1700307-005.01	6.0 L Source Can					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Project ID: P1700307

Helium

Test Code: EPA 3C Modified
Instrument ID: HP5890 II/GC8/TCD Date(s) Collected: 1/17/17
Analyst: Mike Conejo Date Received: 1/24/17
Sample Type: 6.0 L Summa Canister(s) Date Analyzed: 1/26/17
Test Notes:

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Canister Dilution Factor	**Result ppmV**	MRL ppmV	Data Qualifier
BLK-1701-100	P1700307-001	1.00	1.78	**2,700**	45	
Method Blank	P170126-MB	1.00	1.00	ND	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P170126-LCS

Test Code: EPA 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/TCD Date Received: NA
Analyst: Mike Conejo Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	**Compound**	Spike Amount ppmV	**Result ppmV**	**% Recovery**	ALS Acceptance Limits	Data Qualifier
7440-59-7	Helium	10,000	**9,610**	**96**	75-124	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1701-100**	ALS Project ID:	P1700307
Client Project ID:	**Plentywood Bolke Residence Release / 16043**	ALS Sample ID:	P1700307-001
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	1/17/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	1/24/17
Analyst:	Lusine Hakobyan	Date Analyzed:	1/26/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.0050 Liter(s)
Test Notes:			
Container ID:	SC01734		

Initial Pressure (psig): -4.22 Final Pressure (psig): 3.99

Canister Dilution Factor: 1.78

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**320,000**	7,100	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**670,000**	3,600	
C_9 - C_{10} Aromatic Hydrocarbons	**12,000**	890	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1701-101**	ALS Project ID:	P1700307
Client Project ID:	**Plentywood Bolke Residence Release / 16043**	ALS Sample ID:	P1700307-002
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	1/18/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	1/24/17
Analyst:	Lusine Hakobyan	Date Analyzed:	1/26/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AS01001		

Initial Pressure (psig): -5.41 Final Pressure (psig): 3.60

Canister Dilution Factor: 1.97

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**370**	39	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**82**	20	
C_9 - C_{10} Aromatic Hydrocarbons	**25**	4.9	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1701-102**	ALS Project ID:	P1700307
Client Project ID:	**Plentywood Bolke Residence Release / 16043**	ALS Sample ID:	P1700307-003
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	1/18/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	1/24/17
Analyst:	Lusine Hakobyan	Date Analyzed:	1/26/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AC01932		

Initial Pressure (psig): -0.93 Final Pressure (psig): 3.80

Canister Dilution Factor: 1.34

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**420**	27	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**100**	13	
C_9 - C_{10} Aromatic Hydrocarbons	**27**	3.4	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1701-103**	ALS Project ID:	P1700307
Client Project ID:	**Plentywood Bolke Residence Release / 16043**	ALS Sample ID:	P1700307-004
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	1/18/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	1/24/17
Analyst:	Lusine Hakobyan	Date Analyzed:	1/26/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AS00929		

Initial Pressure (psig): -5.27 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.95

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**480**	39	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**72**	20	
C_9 - C_{10} Aromatic Hydrocarbons	**27**	4.9	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**BLK-1701-104**	ALS Project ID:	P1700307
Client Project ID:	**Plentywood Bolke Residence Release / 16043**	ALS Sample ID:	P1700307-005
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	1/18/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	1/24/17
Analyst:	Lusine Hakobyan	Date Analyzed:	1/26/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	SC00104		

Initial Pressure (psig): -2.90 Final Pressure (psig): 4.04

Canister Dilution Factor: 1.59

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	ND	32	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	ND	16	
C_9 - C_{10} Aromatic Hydrocarbons	ND	4.0	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**Method Blank**	ALS Project ID:	P1700307
Client Project ID:	**Plentywood Bolke Residence Release / 16043**	ALS Sample ID:	P170126-MB
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	NA
Analyst:	Lusine Hakobyan	Date Analyzed:	1/26/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	ND	20	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	ND	10	
C_9 - C_{10} Aromatic Hydrocarbons	ND	2.5	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**Lab Control Sample**	ALS Project ID:	P1700307
Client Project ID:	**Plentywood Bolke Residence Release / 16043**	ALS Sample ID:	P170126-LCS
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	NA
Analyst:	Lusine Hakobyan	Date Analyzed:	1/26/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.125 Liter(s)
Test Notes:			

Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
C5 - C8 Aliphatic Hydrocarbons	213	**199**	**93**	70-130	
C9 - C12 Aliphatic Hydrocarbons	213	**207**	**97**	70-130	
C9 - C10 Aromatic Hydrocarbons	425	**350**	**82**	70-130	

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1701-102** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P1700307-003DUP

Test Code: Massachusetts APH, Revision 1, December 2009 Date Collected: 1/18/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 1/24/17
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01932

Initial Pressure (psig): -0.93 Final Pressure (psig): 3.80

Canister Dilution Factor: 1.34

Compound	Sample Result µg/m³	Duplicate Sample Result µg/m³	Average µg/m³	**% RPD**	RPD Limit	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	420	405	412.5	**4**	30	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	104	92.9	98.45	**11**	30	
C_9 - C_{10} Aromatic Hydrocarbons	27.4	27.1	27.25	**1**	30	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.
[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.
[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.
[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.
ND = Compound was analyzed for, but not detected.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1701-100** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P1700307-001

Test Code: EPA TO-15 Date Collected: 1/17/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 1/24/17
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.0050 Liter(s)
Test Notes:
Container ID: SC01734

Initial Pressure (psig): -4.22 Final Pressure (psig): 3.99

Canister Dilution Factor: 1.78

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	180	ND	56	
108-88-3	Toluene	ND	180	ND	47	
100-41-4	Ethylbenzene	ND	180	ND	41	
179601-23-1	m,p-Xylenes	ND	360	ND	82	
95-47-6	o-Xylene	ND	180	ND	41	
91-20-3	Naphthalene	ND	180	ND	34	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1701-101** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P1700307-002

Test Code: EPA TO-15 Date Collected: 1/18/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 1/24/17
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01001

Initial Pressure (psig): -5.41 Final Pressure (psig): 3.60

Canister Dilution Factor: 1.97

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	**2.8**	0.99	**0.89**	0.31	
108-88-3	Toluene	**17**	0.99	**4.5**	0.26	
100-41-4	Ethylbenzene	**2.8**	0.99	**0.66**	0.23	
179601-23-1	m,p-Xylenes	**11**	2.0	**2.5**	0.45	
95-47-6	o-Xylene	**3.7**	0.99	**0.85**	0.23	
91-20-3	Naphthalene	ND	0.99	ND	0.19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1701-102** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P1700307-003

Test Code: EPA TO-15 Date Collected: 1/18/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 1/24/17
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01932

Initial Pressure (psig): -0.93 Final Pressure (psig): 3.80

Canister Dilution Factor: 1.34

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	**2.9**	0.67	**0.92**	0.21	
108-88-3	Toluene	**18**	0.67	**4.8**	0.18	
100-41-4	Ethylbenzene	**3.2**	0.67	**0.74**	0.15	
179601-23-1	m,p-Xylenes	**12**	1.3	**2.8**	0.31	
95-47-6	o-Xylene	**4.1**	0.67	**0.95**	0.15	
91-20-3	Naphthalene	ND	0.67	ND	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1701-103** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P1700307-004

Test Code: EPA TO-15 Date Collected: 1/18/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 1/24/17
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00929

Initial Pressure (psig): -5.27 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.95

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	**3.5**	0.98	**1.1**	0.31	
108-88-3	Toluene	**22**	0.98	**5.7**	0.26	
100-41-4	Ethylbenzene	**3.5**	0.98	**0.81**	0.22	
179601-23-1	m,p-Xylenes	**14**	2.0	**3.1**	0.45	
95-47-6	o-Xylene	**4.5**	0.98	**1.0**	0.22	
91-20-3	Naphthalene	ND	0.98	ND	0.19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1701-104** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P1700307-005

Test Code: EPA TO-15 Date Collected: 1/18/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 1/24/17
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: SC00104

Initial Pressure (psig): -2.90 Final Pressure (psig): 4.04

Canister Dilution Factor: 1.59

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.80	ND	0.25	
108-88-3	Toluene	ND	0.80	ND	0.21	
100-41-4	Ethylbenzene	ND	0.80	ND	0.18	
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.37	
95-47-6	o-Xylene	ND	0.80	ND	0.18	
91-20-3	Naphthalene	ND	0.80	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P170126-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
91-20-3	Naphthalene	ND	0.50	ND	0.095	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **Hydrometrics, Inc.**
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Project ID: P1700307

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date(s) Collected: 1/17 - 1/18/17
Analyst: Lusine Hakobyan Date(s) Received: 1/24/17
Sample Type: 6.0 L Summa Canister(s) / 6.0 L Silonite Canister(s) Date(s) Analyzed: 1/26/17
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P170126-MB	**93**	**101**	**98**	70-130	
Lab Control Sample	P170126-LCS	**93**	**100**	**97**	70-130	
BLK-1701-100	P1700307-001	**94**	**90**	**89**	70-130	
BLK-1701-101	P1700307-002	**94**	**99**	**97**	70-130	
BLK-1701-102	P1700307-003	**93**	**98**	**97**	70-130	
BLK-1701-102	P1700307-003DUP	**94**	**99**	**98**	70-130	
BLK-1701-103	P1700307-004	**93**	**97**	**98**	70-130	
BLK-1701-104	P1700307-005	**95**	**98**	**98**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P170126-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
71-43-2	Benzene	212	**193**	**91**	65-107	
108-88-3	Toluene	212	**189**	**89**	59-118	
100-41-4	Ethylbenzene	212	**195**	**92**	68-122	
179601-23-1	m,p-Xylenes	424	**379**	**89**	68-123	
95-47-6	o-Xylene	212	**188**	**89**	68-122	
91-20-3	Naphthalene	214	**238**	**111**	62-136	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Hydrometrics, Inc.**
Client Sample ID: **BLK-1701-102** ALS Project ID: P1700307
Client Project ID: **Plentywood Bolke Residence Release / 16043** ALS Sample ID: P1700307-003DUP

Test Code: EPA TO-15 Date Collected: 1/18/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 1/24/17
Analyst: Lusine Hakobyan Date Analyzed: 1/26/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01932

Initial Pressure (psig): -0.93 Final Pressure (psig): 3.80

Canister Dilution Factor: 1.34

Compound	Sample Result µg/m³	Sample Result ppbV	**Duplicate Sample Result µg/m³**	**Duplicate Sample Result** ppbV	Average µg/m³	**% RPD**	RPD Limit	**Data Qualifier**
Benzene	2.94	0.921	2.89	0.903	2.915	**2**	25	
Toluene	18.0	4.78	17.7	4.71	17.85	**2**	25	
Ethylbenzene	3.19	0.736	3.12	0.720	3.155	**2**	25	
m,p-Xylenes	12.3	2.84	12.1	2.78	12.2	**2**	25	
o-Xylene	4.13	0.950	4.04	0.931	4.085	**2**	25	
Naphthalene	ND	ND	ND	ND	-	-	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

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LABORATORY REPORT

April 11, 2017

Heidi Kaiser
Hydrometrics, Inc.
5602 Hesper Road
Billings, MT 59106

RE: Plentywood Bolke Residence Investigation / 16043

Dear Heidi:

Enclosed are the results of the samples submitted to our laboratory on March 28, 2017. For your reference, these analyses have been assigned our service request number P1701482.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Samantha Henningsen at 5:15 pm, Apr 11, 2017

For Kate Kaneko
Project Manager

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F: +1 805 526 7270
www.alsglobal.com

Client: Hydrometrics, Inc. Service Request No: P1701482
Project: Plentywood Bolke Residence Investigation / 16043

CASE NARRATIVE

The samples were received intact under chain of custody on March 28, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Air-Phase Petroleum Hydrocarbons (APH) Analysis

The samples were analyzed for total aliphatic and aromatic gasoline range hydrocarbons by gas chromatography/mass spectrometry according to the Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Massachusetts Department of Environmental Protection, Revision 1, December, 2009. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP accreditation.

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present. Any internal/tuning standards and target APH analytes eluting in the hydrocarbon ranges are also subtracted. Additionally, C_9-C_{10} Aromatic Hydrocarbons are excluded from the C_9-C_{12} Aliphatic Hydrocarbon range.

Volatile Organic Compound Analysis

The samples were also analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272016-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Hydrometrics, Inc.

Service Request: P1701482

Project ID: Plentywood Bolke Residence Investigation / 16043

Date Received: 3/28/2017

Time Received: 09:53

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	MA APH 1.0 - MA VOC PH Can	TO-15 - VOC Cans
B1-170320-AA1	P1701482-001	Air	3/21/2017	15:40	AS00794	-4.84	3.65	X	X
B1-170320-AA2	P1701482-002	Air	3/21/2017	15:25	AC02074	-3.44	3.70	X	X
B1-170320-AA3	P1701482-003	Air	3/21/2017	15:30	SC02151	-3.76	3.75	X	X
B1-170320-AA3D	P1701482-004	Air	3/21/2017	15:30	AC01101	-4.27	3.53	X	X

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

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Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No P1701482

Company Name & Address (Reporting Information): Hydrometrics, Inc.

Project Name: Plentywood Bolke Residence Investigation

Project Number: 16043

ALS Contact: Kate Kaneko

Project Manager: Heidi Kaiser

P.O. # / Billing Information: 5602 Hesper Rd. Billings, MT 59106.

Phone: 406-656-1172

Fax:

Email Address for Result Reporting: hkaiser@hydrometrics.com

Sampler (Print & Sign): Charles Lanz

Analysis Method: MAAPH w/ TO-15 (0.50 ug/m3 BTEX, Naphthalene)

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	MAAPH w/ TO-15 (0.50 ug/m3 BTEX, Naphthalene)		Comments e.g. Actual Preservative or specific instructions
~~B1-170320-AA1~~	CL	3/21/17									
B1-170320-AA1	1	3/21/17	1540	AC00794	FC00185	-29	-6	6L	X		
B1-170320-AA2	2	↓	1525	AC02074	FCA01081	-26	-7	↓	↓		
B1-170320-AA3	3	↓	1530	SC02151	FC300048	-26	-6.5	↓	↓		
B1-170320-AA3D	4	↓	1530	AC01101	FC00052	-26.5	-7.5	↓	↓		

Report Tier Levels - please select

Tier I - Results (Default in not specified) _____
Tier II (Results + QC Summaries _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Date Validation Package) 10% Surcharge _____

EDD required YES / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 3/21/17	Time: 2100	Received by: (Signature)	Date: 3/22/17	Time: 0953
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature _____°C

ALS Environmental
Sample Acceptance Check Form

Client: Hydrometrics, Inc. Work order: P1701482

Project: Plentywood Bolke Residence Investigation / 16043

Sample(s) received on: 3/28/17 Date opened: 3/28/17 by: KKELPE

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1701482-001.01	6.0 L Silonite Can					
P1701482-002.01	6.0 L Ambient Can					
P1701482-003.01	6.0 L Source Can					
P1701482-004.01	6.0 L Ambient Can					
P1701482-005.02	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**B1-170320-AA1**	ALS Project ID:	P1701482
Client Project ID:	**Plentywood Bolke Residence Investigation / 16043**	ALS Sample ID:	P1701482-001
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	3/21/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	3/28/17
Analyst:	Lusine Hakobyan	Date Analyzed:	4/5/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AS00794		

Initial Pressure (psig): -4.84 Final Pressure (psig): 3.65

Canister Dilution Factor: 1.86

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**160**	37	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**71**	19	
C_9 - C_{10} Aromatic Hydrocarbons	**19**	4.7	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**B1-170320-AA2**	ALS Project ID:	P1701482
Client Project ID:	**Plentywood Bolke Residence Investigation / 16043**	ALS Sample ID:	P1701482-002
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	3/21/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	3/28/17
Analyst:	Lusine Hakobyan	Date Analyzed:	4/5/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AC02074		

Initial Pressure (psig): -3.44 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.63

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**1,400**	33	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**52**	16	
C_9 - C_{10} Aromatic Hydrocarbons	**75**	4.1	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**B1-170320-AA3**	ALS Project ID:	P1701482
Client Project ID:	**Plentywood Bolke Residence Investigation / 16043**	ALS Sample ID:	P1701482-003
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	3/21/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	3/28/17
Analyst:	Lusine Hakobyan	Date Analyzed:	4/5/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	SC02151		

Initial Pressure (psig): -3.76 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.69

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**130**	34	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**54**	17	
C_9 - C_{10} Aromatic Hydrocarbons	**16**	4.2	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**B1-170320-AA3D**	ALS Project ID:	P1701482
Client Project ID:	**Plentywood Bolke Residence Investigation / 16043**	ALS Sample ID:	P1701482-004
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	3/21/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	3/28/17
Analyst:	Lusine Hakobyan	Date Analyzed:	4/5/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			
Container ID:	AC01101		

Initial Pressure (psig): -4.27 Final Pressure (psig): 3.53

Canister Dilution Factor: 1.75

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	**140**	35	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	**61**	18	
C_9 - C_{10} Aromatic Hydrocarbons	**16**	4.4	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client:	**Hydrometrics, Inc.**		
Client Sample ID:	**Method Blank**	ALS Project ID:	P1701482
Client Project ID:	**Plentywood Bolke Residence Investigation / 16043**	ALS Sample ID:	P170404-MB
Test Code:	Massachusetts APH, Revision 1, December 2009	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	NA
Analyst:	Lusine Hakobyan	Date Analyzed:	4/4/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			

Compound	**Result µg/m³**	MRL µg/m³	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	ND	20	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	ND	10	
C_9 - C_{10} Aromatic Hydrocarbons	ND	2.5	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.

[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P170404-LCS

Test Code: Massachusetts APH, Revision 1, December 2009 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 4/4/17
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
C5 - C8 Aliphatic Hydrocarbons	213	**199**	**93**	70-130	
C9 - C12 Aliphatic Hydrocarbons	213	**195**	**92**	70-130	
C9 - C10 Aromatic Hydrocarbons	425	**337**	**79**	70-130	

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Hydrometrics, Inc.**
Client Sample ID: **B1-170320-AA2** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P1701482-002DUP

Test Code: Massachusetts APH, Revision 1, December 2009 Date Collected: 3/21/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/28/17
Analyst: Lusine Hakobyan Date Analyzed: 4/5/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02074

Initial Pressure (psig): -3.44 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.63

Compound	Sample Result µg/m³	Duplicate Sample Result µg/m³	Average µg/m³	**% RPD**	RPD Limit	**Data Qualifier**
C_5 - C_8 Aliphatic Hydrocarbons[1,2]	1,360	1,340	1350	**1**	30	
C_9 - C_{12} Aliphatic Hydrocarbons[1,3]	51.9	50.6	51.25	**3**	30	
C_9 - C_{10} Aromatic Hydrocarbons	74.5	74.3	74.4	**0.3**	30	

Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas when present.
[1]Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.
[2]C_5-C_8 Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.
[3]C_9-C_{12} Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C_9-C_{10} Aromatic Hydrocarbons.
ND = Compound was analyzed for, but not detected.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **B1-170320-AA1** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P1701482-001

Test Code: EPA TO-15 Date Collected: 3/21/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/28/17
Analyst: Lusine Hakobyan Date Analyzed: 4/5/17
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00794

Initial Pressure (psig): -4.84 Final Pressure (psig): 3.65

Canister Dilution Factor: 1.86

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	**2.3**	0.93	**0.73**	0.29	
108-88-3	Toluene	**12**	0.93	**3.1**	0.25	
100-41-4	Ethylbenzene	**1.7**	0.93	**0.39**	0.21	
179601-23-1	m,p-Xylenes	**6.7**	1.9	**1.5**	0.43	
95-47-6	o-Xylene	**2.2**	0.93	**0.51**	0.21	
91-20-3	Naphthalene	**1.3**	0.93	**0.24**	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **B1-170320-AA2** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P1701482-002

Test Code: EPA TO-15 Date Collected: 3/21/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/28/17
Analyst: Lusine Hakobyan Date Analyzed: 4/5/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02074

Initial Pressure (psig): -3.44 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.63

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	**15**	0.82	**4.7**	0.26	
108-88-3	Toluene	**83**	0.82	**22**	0.22	
100-41-4	Ethylbenzene	**13**	0.82	**3.0**	0.19	
179601-23-1	m,p-Xylenes	**49**	1.6	**11**	0.38	
95-47-6	o-Xylene	**16**	0.82	**3.7**	0.19	
91-20-3	Naphthalene	**1.2**	0.82	**0.23**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **B1-170320-AA3** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P1701482-003

Test Code: EPA TO-15 Date Collected: 3/21/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/28/17
Analyst: Lusine Hakobyan Date Analyzed: 4/5/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: SC02151

Initial Pressure (psig): -3.76 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.69

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	**1.4**	0.85	**0.43**	0.26	
108-88-3	Toluene	**8.0**	0.85	**2.1**	0.22	
100-41-4	Ethylbenzene	**1.2**	0.85	**0.28**	0.19	
179601-23-1	m,p-Xylenes	**4.7**	1.7	**1.1**	0.39	
95-47-6	o-Xylene	**1.6**	0.85	**0.37**	0.19	
91-20-3	Naphthalene	ND	0.85	ND	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **B1-170320-AA3D** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P1701482-004

Test Code: EPA TO-15 Date Collected: 3/21/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/28/17
Analyst: Lusine Hakobyan Date Analyzed: 4/5/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01101

Initial Pressure (psig): -4.27 Final Pressure (psig): 3.53

Canister Dilution Factor: 1.75

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	**1.5**	0.88	**0.45**	0.27	
108-88-3	Toluene	**8.4**	0.88	**2.2**	0.23	
100-41-4	Ethylbenzene	**1.3**	0.88	**0.30**	0.20	
179601-23-1	m,p-Xylenes	**4.9**	1.8	**1.1**	0.40	
95-47-6	o-Xylene	**1.7**	0.88	**0.39**	0.20	
91-20-3	Naphthalene	ND	0.88	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Hydrometrics, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P170404-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 4/4/17
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
91-20-3	Naphthalene	ND	0.50	ND	0.095	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **Hydrometrics, Inc.**
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Project ID: P1701482

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date(s) Collected: 3/21/17
Analyst: Lusine Hakobyan Date(s) Received: 3/28/17
Sample Type: 6.0 L Silonite Canister(s) Date(s) Analyzed: 4/4 - 4/5/17
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P170404-MB	**94**	**98**	**91**	70-130	
Lab Control Sample	P170404-LCS	**90**	**98**	**95**	70-130	
B1-170320-AA1	P1701482-001	**88**	**99**	**93**	70-130	
B1-170320-AA2	P1701482-002	**86**	**98**	**95**	70-130	
B1-170320-AA2	P1701482-002DUP	**87**	**99**	**95**	70-130	
B1-170320-AA3	P1701482-003	**88**	**99**	**93**	70-130	
B1-170320-AA3D	P1701482-004	**88**	**99**	**93**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Hydrometrics, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P170404-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 4/4/17
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
71-43-2	Benzene	212	**197**	**93**	65-107	
108-88-3	Toluene	212	**187**	**88**	59-118	
100-41-4	Ethylbenzene	212	**190**	**90**	68-122	
179601-23-1	m,p-Xylenes	424	**361**	**85**	68-123	
95-47-6	o-Xylene	212	**179**	**84**	68-122	
91-20-3	Naphthalene	214	**229**	**107**	62-136	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Hydrometrics, Inc.**
Client Sample ID: **B1-170320-AA2** ALS Project ID: P1701482
Client Project ID: **Plentywood Bolke Residence Investigation / 16043** ALS Sample ID: P1701482-002DUP

Test Code: EPA TO-15 Date Collected: 3/21/17
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/28/17
Analyst: Lusine Hakobyan Date Analyzed: 4/5/17
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02074

Initial Pressure (psig): -3.44 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.63

Compound	Sample Result µg/m³	Sample Result ppbV	**Duplicate Sample Result µg/m³**	**Duplicate Sample Result** ppbV	Average µg/m³	**% RPD**	RPD Limit	**Data Qualifier**
Benzene	15.1	4.73	15.1	4.74	15.1	**0**	25	
Toluene	82.8	22.0	83.0	22.0	82.9	**0.2**	25	
Ethylbenzene	13.0	3.00	13.2	3.03	13.1	**2**	25	
m,p-Xylenes	49.4	11.4	49.7	11.4	49.55	**0.6**	25	
o-Xylene	16.2	3.73	16.3	3.75	16.25	**0.6**	25	
Naphthalene	1.22	0.234	1.11	0.213	1.165	**9**	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

APPENDIX F

DATA VALIDATION REPORTS

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: Plentywood-Bolke Residence	**Laboratory: Energy Laboratories**
Project Reference: MDEQ Investigation	**Sample Matrix: Groundwater**
Project No.: 16043	**Sample Start Date: 08/04/2016**
Verified By/Date Verified: Angela Roddy 08/26/2016	**Sample End Date: 08/04/2016**

Samples Analyzed

	Matrix	Site Code	Sample ID	Date Sampled	Lab Project No.	Lab Sample ID
1	Groundwater	BR-2	BLK-1608-200	8/4/2016	B16080577	B16080577-001
2	Groundwater	BR-1	BLK-1608-201	8/4/2016	B16080577	B16080577-002
3	Groundwater-Duplicate	BR-1	BLK-1608-202	8/4/2016	B16080577	B16080577-003

- *Groundwater: Methods and Parameter Groups Verified: Field Parameters; Total Purgeable Hydrocarbons - MA-VPH; Total Extractable Petroleum Hydrocarbons and Screen-SW8015M/MA-EPH; Semi-Volatile Organic Compounds-low conc-SW8270.*

- *Laboratory Project Ids: B16080577*

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

PRECISION, ACCURACY, REPRESENTATIVENES, COMPARABILITY, & COMPLETENESS ASSESSMENT						
Precision:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Precision is the measure of variability of individual sample measurements. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD limits referenced EPA published QC limits, laboratory control charted QC limits, or as specified in the Quality Assurance Project Plan (QAPP). Overall the laboratory precision is acceptable. Precision measurements are reviewed in items 16, 17, and 18.						
Accuracy:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Laboratory accuracy, a measure of the system bias, was measured by evaluating standard reference, laboratory fortified blank (LFB), or laboratory control sample and laboratory control sample duplicate (LCS, LCSD), matrix spike and matrix spike duplicates (MS, MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). Standard reference, LCS, and LCSD %Rs demonstrated the overall performance of the analysis. MS %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. These measurements were compared to data validation and laboratory control charted QC limits. Accuracy measurements are reviewed in items 14, 15, and 16.						
Representativeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Representativeness is the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter sampling point, or an environmental condition that they are intended to represent. Representative data are achieved through careful selection of sampling locations and frequencies, and proper sampling and analytical procedures.						
Completeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, and laboratory case narratives. Completeness also included 100% review of the laboratory sample data results and QC summary reports. All of the data received by the laboratory are usable with qualification. Completeness is reviewed through items 2, 3, 5, 6, 7, and 9.						
Comparability:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Comparability is the degree to which two or more data sets from the same location are generated using consistent procedures. Discrete data sets may differ as a result of non-random (bias sampling, variability in sampling techniques and variations in methods of analysis. Comparability is achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data.						
COMPLIANCE ASSESSMENT						
Method Compliance:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. No data required qualification based on holding time limits and overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, and 13.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

VERIFICATION CRITERIA CHECK

Laboratory qualifiers used in this review:

*	The result exceeds the MCL.
B	The analyte was detected in the method blank.
D	RL increased due to sample matrix.
J	Estimated value. The analyte was present but less than the reporting limit.
R	RPD exceeds advisory limit.

Validation qualifiers used in this review:

J	QC Exceedance
U	Blank Exceedance

The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this checklist).

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	AR	Initials
Comments: Yes. Any non-conformances are discussed in the appropriate sections of this document.						
2. Were sample Chain-of-Custody forms complete?	**X**	Yes		No	AR	Initials
Comments: Sample Chain-of-Custody forms were complete.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	AR	Initials
Comments: All analyses requested for the samples on the COC were completed by the laboratory						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	AR	Initials
Comments: All samples were received at the appropriate temperature. Custody seals for all coolers were not present.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	AR	Initials
Comments: Reported methods were in compliance with those requested on the COC records or the reported methods are comparable and appropriate for the analysis requested and the sample matrix.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

6. Were detection limits in accordance with WP/QAPP, permit, or method?	**X**	Yes		No	AR	Initials
Comments: Reported detection limits are achievable by the quoted methods. Some samples required dilution due to high sample concentration or sample matrix. The reporting limits for diluted results were raised appropriately.						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	AR	Initials
Comments: The laboratory reports included only those constituents requested to be reported.						
8. Were sample holding times met?	**X**	Yes		No	AR	Initials
Comments: All sample holding times were met.						
9. Were correct concentration units reported?	**X**	Yes		No	AR	Initials
Comments: Correct concentration units were reported.						
10. Were the reporting requirements for flagged data met?	**X**	Yes		No	AR	Initials
Comments: Reporting requirements for flagged data were met.						
11. Laboratory Blanks						
Were laboratory blank samples free of target analyte contamination?		Yes	**X**	No	AR	Initials
Comments: Phenanthrene (Method SW8270C) was detected in Method Blank MB-101698-101683-1015. A laboratory qualifier "B" was placed on raw samples with detections <5x the reporting limit. A validation qualifier "U" was also placed the applicable raw sample.						
Were laboratory blank samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
12. Field Blanks						
Were field blank samples free of target analyte contamination?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples or trip blanks were not submitted with this batch of data. Laboratory blank samples were used as QC for this batch of data.						
Were field blank samples analyzed at the proper frequency (minimum 5% or as required by method)?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples were not submitted with this batch of data.						
13. Were instrument calibrations within method or data validation control limits?		Yes	**X**	NA	AR	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.						
14. Were surrogate recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: Surrogate recoveries were within control limits.						
15. Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)						
Were laboratory control samples prepared in the same way as associated samples?	**X**	Yes		No	AR	Initials
Was the reference material of the correct matrix and concentration?	**X**	Yes		No	AR	Initials

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Were LCS/LCSD recoveries within control limits of 70-130% for VPH, 40-140% for EPH, and 80-120% for inorganics, and were within laboratory control charted QC limits for all target analytes, or within 95% confidence limit of known value?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD recoveries were within control limits.						
Were LCS/LCDS RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All LCS/LCSD % RPDs were within control limits.						
Were LCS/LCSD samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD samples were analyzed at the proper frequency.						
16. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)						
Were MS/MSD % recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD % recoveries were within control limits.						
Were MS/MSD RPDs within control limits?		Yes	**X**	No	AR	Initials
Comments: QC sample B16080660-001AMSD was flagged with laboratory qualifier "R" for the RPD of the analytes Total Extractable Hydrocarbons (SW8015M) and most of the MA-EPH fractions for being just above control limits and could be related to the sample matrix because of the concentration. A validation qualifier was not necessary because the LCS was within limits for these methods. The raw samples were non-detect for EPH fractions and are not affected by MS/MSD RPDs above control limits. SW8015M is a screening method and should not be flagged based on an RPD outside of the control limits by one percentage point.						
Were MS/MSD analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: The MS/MSD samples were ran at the proper frequency.						
17. Laboratory Duplicates						
Were laboratory duplicate RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All laboratory duplicate RPDs were within control limits as required by the QAPP.						
Were laboratory duplicates analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD and laboratory duplicate samples were within control limits or were not applicable due to undetected results in both samples.						
18. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	**X**	Yes		No	AR	Initials
Comments: Groundwater: Sample BLK-1608-201 and its duplicate BLK-1608-200 had RPDs within control limits with the exception of Acenaphthene (Method SW8270C).						
19. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		NA	AR	Initials
Comments: 100% of the EDD concentrations and reporting limits were the same as hardcopy data reports.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

General Comments: Data were evaluated based on validation criteria set forth in:

- Montana Department of Environmental Quality Data Validation Guidelines for Evaluating Analytical Data (August 2016)
- USEPA Contract Laboratory Program National Functional Guidelines for Organic/Inorganic Data Review, document numbers EPA540/R-014/02 and EPA540/R-13/001 of August 2014 as they applied to the reported methodology.

Validator Qualified Results

Site ID	Sample ID	Matrix	Lab Sample ID	Method	Anlayte	Fraction	Result	Units	Flag	Comments
PBR-1	BLK-1608-201	Water	B16080577-002	SW8270C	ACENAPHTHENE	NO MEAS	0.84	ug/L	J	Field RPD
PBR-1	BLK-1608-201	Water	B16080577-002	SW8270C	PHENANTHRENE	NO MEAS	0.30	ug/L	U	Method Blank
	Validation Qualifer Definitions:									
	J	QC Exceedance								
	U	Blank Exceedance								

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: Plentywood-Bolke Residence	**Laboratory: Energy Laboratories**
Project Reference: MDEQ Investigation	**Sample Matrix: Surface Soil**
Project No.: 16043	**Sample Start Date: 08/04/2016**
Verified By/Date Verified: Angela Roddy 08/26/2016	**Sample End Date: 08/04/2016**

Samples Analyzed						
	Matrix	Site Code	Sample ID	Date Sampled	Lab Project No.	Lab Sample ID
1	Surface Soil Composite	PBR-S1	BLK-1608-300	8/4/2016	B16080577	B16080577-004
2	Surface Soil Composite Duplicate	PBR-S1	BLK-1608-301	8/4/2016	B16080577	B16080577-005

- *Surface Soil: Methods and Parameter Groups Verified: Moisture % by Weight – SW3550C; Total Purgeable Hydrocarbons - MA-VPH; Total Extractable Petroleum Hydrocarbons Screen -SW8015M.*

- *Laboratory Project Ids: B16080577*

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

PRECISION, ACCURACY, REPRESENTATIVENES, COMPARABILITY, & COMPLETENESS ASSESSMENT						
Precision:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Precision is the measure of variability of individual sample measurements. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD limits referenced EPA published QC limits, laboratory control charted QC limits, or as specified in the Quality Assurance Project Plan (QAPP). Overall the laboratory precision is acceptable. Precision measurements are reviewed in items 16, 17, and 18.						
Accuracy:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Laboratory accuracy, a measure of the system bias, was measured by evaluating standard reference, laboratory fortified blank (LFB), or laboratory control sample and laboratory control sample duplicate (LCS, LCSD), matrix spike and matrix spike duplicates (MS, MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). Standard reference, LCS, and LCSD %Rs demonstrated the overall performance of the analysis. MS %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. These measurements were compared to data validation and laboratory control charted QC limits. Accuracy measurements are reviewed in items 14, 15, and 16.						
Representativeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Representativeness is the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter sampling point, or an environmental condition that they are intended to represent. Representative data are achieved through careful selection of sampling locations and frequencies, and proper sampling and analytical procedures.						
Completeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, and laboratory case narratives. Completeness also included 100% review of the laboratory sample data results and QC summary reports. All of the data received by the laboratory are usable without qualification. Completeness is reviewed through items 2, 3, 5, 6, 7, and 9.						
Comparability:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Comparability is the degree to which two or more data sets from the same location are generated using consistent procedures. Discrete data sets may differ as a result of non-random (bias sampling, variability in sampling techniques and variations in methods of analysis. Comparability is achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data.						
COMPLIANCE ASSESSMENT						
Method Compliance:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. No data required qualification based on holding time limits and overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, and 13.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

VERIFICATION CRITERIA CHECK

Laboratory qualifiers used in this review:

N/A

Validation qualifiers used in this review:

N/A

The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this checklist). (N/A)

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	AR	Initials
Comments: Yes. Any non-conformances are discussed in the appropriate sections of this document.						
2. Were sample Chain-of-Custody forms complete?	**X**	Yes		No	AR	Initials
Comments: Sample Chain-of-Custody forms were complete.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	AR	Initials
Comments: All analyses requested for the samples on the COC were completed by the laboratory						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	AR	Initials
Comments: All samples were received at the appropriate temperature. Custody seals for all coolers were not present.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	AR	Initials
Comments: Reported methods were in compliance with those requested on the COC records or the reported methods are comparable and appropriate for the analysis requested and the sample matrix.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	**X**	Yes		No	AR	Initials
Comments: Reported detection limits are achievable by the quoted methods.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	AR	Initials
Comments: The laboratory reports included only those constituents requested to be reported.						
8. Were sample holding times met?	**X**	Yes		No	AR	Initials
Comments: All sample holding times were met.						
9. Were correct concentration units reported?	**X**	Yes		No	AR	Initials
Comments: Correct concentration units were reported.						
10. Were the reporting requirements for flagged data met?	**X**	Yes		No	AR	Initials
Comments: Reporting requirements for flagged data were met.						
11. Laboratory Blanks						
Were laboratory blank samples free of target analyte contamination?	**X**	Yes		No	AR	Initials
Comments: Laboratory blank samples were free of target analytes.						
Were laboratory blank samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
12. Field Blanks						
Were field blank samples free of target analyte contamination?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples or trip blanks were not submitted with this batch of data.						
Were field blank samples analyzed at the proper frequency (minimum 5% or as required by method)?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples or trip blanks were not submitted with this batch of data.						
13. Were instrument calibrations within method or data validation control limits?		Yes	**X**	NA	AR	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.						
14. Were surrogate recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: Surrogate recoveries were within control limits.						
15. Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)						
Were laboratory control samples prepared in the same way as associated samples?	**X**	Yes		No	AR	Initials
Was the reference material of the correct matrix and concentration?	**X**	Yes		No	AR	Initials
Were LCS/LCSD recoveries within control limits of 70-130% for VPH, 40-140% for EPH, and 80-120% for inorganics, and were within laboratory control charted QC limits for all target analytes, or within 95% confidence limit of known value?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD recoveries were within control limits.						
Were LCS/LCDS RPDs within control limits?	**X**	Yes		No	AR	Initials

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Comments: All LCS/LCSD % RPDs were within control limits.						
Were LCS/LCSD samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD samples were analyzed at the proper frequency.						
16. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)						
Were MS/MSD % recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD % recoveries were within control limits.						
Were MS/MSD RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD RPDs were within control limits.						
Were MS/MSD analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: The MS/MSD samples were ran at the proper frequency.						
17. Laboratory Duplicates						
Were laboratory duplicate RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All laboratory duplicate RPDs were within control limits as required by the QAPP.						
Were laboratory duplicates analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD and laboratory duplicate samples were within control limits or were not applicable due to undetected results in both samples.						
18. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	**X**	Yes		No	AR	Initials
Comments: Surface Soil: Sample BLK-1608-300 and its duplicate BLK-1608-301 had RPDs within control limits.						
19. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		NA	AR	Initials
Comments: 100% of the EDD concentrations and reporting limits were the same as hardcopy data reports.						

General Comments: Data were evaluated based on validation criteria set forth in:

- Montana Department of Environmental Quality Data Validation Guidelines for Evaluating Analytical Data (August 2016)
- USEPA Contract Laboratory Program National Functional Guidelines for Organic/Inorganic Data Review, document numbers EPA540/R-014/02 and EPA540/R-13/001 of August 2014 as they applied to the reported methodology.

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: Plentywood-Bolke Residence	**Laboratory: ALS**
Project Reference: MDEQ Investigation	**Sample Matrix: Vapor Intrusion-Air**
Project No.: 16043	**Sample Start Date: 08/04/2016**
Verified By/Date Verified: Angela Roddy 08/26/2016	**Sample End Date: 08/04/2016**

Samples Analyzed						
	Matrix	Site Code	Sample ID	Date Sampled	Lab Project No.	Lab Sample ID
1	Air	PBR-BA1	BLK-1608-100	8/4/2016	P1603928	P1603928-001
2	Air-Duplicate	PBR-BA1	BLK-1608-101	8/4/2016	P1603928	P1603928-002
3	Air	PBR-MLA1	BLK-1608-102	8/4/2016	P1603928	P1603928-003
4	Air	PBR-OA1	BLK-1608-103	8/4/2016	P1603928	P1603928-004
5	Air	PBR-BSSA1	BLK-1608-104	8/4/2016	P1603928	P1603928-005

- *Air: Methods and Parameter Groups Verified: Air-Phase Petroleum Hydrocarbons-MA-APH 1.0-; Volatile Organic Compounds-EPA TO-15; Helium-EPA 3C Modified.*
- *Laboratory Project Ids: P1603928*

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

PRECISION, ACCURACY, REPRESENTATIVENES, COMPARABILITY, & COMPLETENESS ASSESSMENT						
Precision:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Precision is the measure of variability of individual sample measurements. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD limits referenced EPA published QC limits, laboratory control charted QC limits, or as specified in the Quality Assurance Project Plan (QAPP). Overall the laboratory precision is acceptable. Precision measurements are reviewed in items 16, 17, and 18.						
Accuracy:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Laboratory accuracy, a measure of the system bias, was measured by evaluating standard reference, laboratory fortified blank (LFB), or laboratory control sample and laboratory control sample duplicate (LCS, LCSD), matrix spike and matrix spike duplicates (MS, MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). Standard reference, LCS, and LCSD %Rs demonstrated the overall performance of the analysis. MS %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. These measurements were compared to data validation and laboratory control charted QC limits. Accuracy measurements are reviewed in items 14, 15, and 16.						
Representativeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Representativeness is the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter sampling point, or an environmental condition that they are intended to represent. Representative data are achieved through careful selection of sampling locations and frequencies, and proper sampling and analytical procedures.						
Completeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, and laboratory case narratives. Completeness also included 100% review of the laboratory sample data results and QC summary reports. All of the data received by the laboratory are usable without qualification. Completeness is reviewed through items 2, 3, 5, 6, 7, and 9.						
Comparability:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Comparability is the degree to which two or more data sets from the same location are generated using consistent procedures. Discrete data sets may differ as a result of non-random (bias sampling, variability in sampling techniques and variations in methods of analysis. Comparability is achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data.						
COMPLIANCE ASSESSMENT						
Method Compliance:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. No data required qualification based on holding time limits and overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, and 13.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

VERIFICATION CRITERIA CHECK

Laboratory qualifiers used in this review:

N/A

Validation qualifiers used in this review:

J QC Exceedance

The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this checklist).

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	AR	Initials
Comments: Yes. Any non-conformances are discussed in the appropriate sections of this document.						
2. Were sample Chain-of-Custody forms complete?	**X**	Yes		No	AR	Initials
Comments: Sample Chain-of-Custody forms were complete.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	AR	Initials
Comments: All analyses requested for the samples on the COC were completed by the laboratory						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	AR	Initials
Comments: All samples were received at the appropriate temperature. Custody seals for all coolers were not present.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	AR	Initials
Comments: Reported methods were in compliance with those requested on the COC records or the reported methods are comparable and appropriate for the analysis requested and the sample matrix.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	**X**	Yes		No	AR	Initials
Comments: Reported detection limits are achievable by the quoted methods. Some samples required dilution due to high sample concentration or sample matrix. The reporting limits for diluted results were raised appropriately.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	AR	Initials
Comments: The laboratory reports included only those constituents requested to be reported.						
8. Were sample holding times met?	**X**	Yes		No	AR	Initials
Comments: All sample holding times were met.						
9. Were correct concentration units reported?	**X**	Yes		No	AR	Initials
Comments: Correct concentration units were reported.						
10. Were the reporting requirements for flagged data met?	**X**	Yes		No	AR	Initials
Comments: Reporting requirements for flagged data were met.						
11. Laboratory Blanks						
Were laboratory blank samples free of target analyte contamination?	**X**	Yes		No	AR	Initials
Comments: Laboratory blank samples were free of target analyte contamination.						
Were laboratory blank samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
12. Field Blanks						
Were field blank samples free of target analyte contamination?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples were not submitted with this batch of data.						
Were field blank samples analyzed at the proper frequency (minimum 5% or as required by method)?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples were not submitted with this batch of data.						
13. Were instrument calibrations within method or data validation control limits?		Yes	**X**	NA	AR	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.						
14. Were surrogate recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: Surrogate recoveries were within control limits.						
15. Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)						
Were laboratory control samples prepared in the same way as associated samples?	**X**	Yes		No	AR	Initials
Was the reference material of the correct matrix and concentration?	**X**	Yes		No	AR	Initials
Were LCS/LCSD recoveries within control limits of 70-130% for VPH, 40-140% for EPH, and 80-120% for inorganics, and were within laboratory control charted QC limits for all target analytes, or within 95% confidence limit of known value?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD recoveries were within control limits.						
Were LCS/LCDS RPDs within control limits?	**X**	Yes		No	AR	Initials

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Comments: All LCS/LCSD % RPDs were within control limits.						
Were LCS/LCSD samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD samples were analyzed at the proper frequency.						
16. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)						
Were MS/MSD % recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD % recoveries were within control limits.						
Were MS/MSD RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD RPDs were within control limits.						
Were MS/MSD analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: The MS/MSD samples were ran at the proper frequency.						
17. Laboratory Duplicates						
Were laboratory duplicate RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All laboratory duplicate RPDs were within control limits as required by the QAPP.						
Were laboratory duplicates analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD and laboratory duplicate samples were within control limits or were not applicable due to undetected results in both samples.						
18. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	**X**	Yes		No	AR	Initials
Comments: Air: Sample BLK-1608-100 and its duplicate BLK-1608-100 had RPDs within control limits with the exception of Toluene (Method TO-15). A validation qualifier "J" was placed on raw samples for analytes Acenaphthene (Method SW8270C) and Toluene (Method TO-15) indicating bias.						
19. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		NA	AR	Initials
Comments: 100% of the EDD concentrations and reporting limits were the same as hardcopy data reports.						

General Comments: Data were evaluated based on validation criteria set forth in:

- Montana Department of Environmental Quality Data Validation Guidelines for Evaluating Analytical Data (August 2016)
- USEPA Contract Laboratory Program National Functional Guidelines for Organic/Inorganic Data Review, document numbers EPA540/R-014/02 and EPA540/R-13/001 of August 2014 as they applied to the reported methodology.

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Validator Qualified Results										
Site ID	Sample ID	Matrix	Lab Sample ID	Method	Anlayte	Fraction	Result	Units	Flag	Comments
PBR-BA1	BLK-1608-100	Air	P1603928-001	TO-15	TOLUENE	TOT	3.5	UG/M3	J	Field RPD
PBR-MLA1	BLK-1608-102	Air	P1603928-003	TO-15	TOLUENE	TOT	1.4	UG/M3	J	Field RPD
PBR-OA1	BLK-1608-103	Air	P1603928-004	TO-15	TOLUENE	TOT	< 0.85	UG/M3	J	Field RPD
PBR-BSSA1	BLK-1608-104	Air	P1603928-005	TO-15	TOLUENE	TOT	< 280	UG/M3	J	Field RPD
	Validation Qualifer Definitions:									
	J	QC Exceedance								

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: Plentywood-Bolke Residence	**Laboratory: ALS**
Project Reference: MDEQ Investigation	**Sample Matrix: Air**
Project No.: 16043	**Sample Start Date: 01/17/2017**
Verified By/Date Verified: Angela Roddy 04/18/2017	**Sample End Date: 01/18/2017**

Samples Analyzed						
	Matrix	Site Code	Sample ID	Date Sampled	Lab Project No.	Lab Sample ID
1	Air	PBR-BSSA1	BLK-1701-100	1/17/2017	P1700307	P1700307-001
2	Air	PBR-BA1	BLK-1701-101	1/18/2017	P1700307	P1700307-002
3	Air-Duplicate	PBR-BA1	BLK-1701-102	1/18/2017	P1700307	P1700307-003
4	Air	PBR-MLA1	BLK-1701-103	1/18/2017	P1700307	P1700307-004
5	Air	PBR-OA1	BLK-1701-104	1/18/2017	P1700307	P1700307-005

- *Methods and Parameter Groups Verified: Air-Phase Petroleum Hydrocarbons- MA-APH 1.0-; Volatile Organic Compounds-EPA TO-15; Helium-EPA 3C Modified.*

- *Laboratory Project Ids: B1700307*

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

PRECISION, ACCURACY, REPRESENTATIVENES, COMPARABILITY, & COMPLETENESS ASSESSMENT						
Precision:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Precision is the measure of variability of individual sample measurements. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD limits referenced EPA published QC limits, laboratory control charted QC limits. Overall the laboratory precision is acceptable. Precision measurements are reviewed in items 16, 17, and 18.						
Accuracy:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Laboratory accuracy, a measure of the system bias, was measured by evaluating standard reference, laboratory fortified blank (LFB), or laboratory control sample and laboratory control sample duplicate (LCS, LCSD), matrix spike and matrix spike duplicates (MS, MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). Standard reference, LCS, and LCSD %Rs demonstrated the overall performance of the analysis. MS %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. These measurements were compared to data validation and laboratory control charted QC limits. Accuracy measurements are reviewed in items 14, 15, and 16.						
Representativeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Representativeness is the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter sampling point, or an environmental condition that they are intended to represent. Representative data are achieved through careful selection of sampling locations and frequencies, and proper sampling and analytical procedures.						
Completeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, and laboratory case narratives. Completeness also included 100% review of the laboratory sample data results and QC summary reports. All of the data received by the laboratory are usable *without* qualification. Completeness is reviewed through items 2, 3, 5, 6, 7, and 9.						
Comparability:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Comparability is the degree to which two or more data sets from the same location are generated using consistent procedures. Discrete data sets may differ as a result of non-random (bias sampling, variability in sampling techniques and variations in methods of analysis. Comparability is achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data.						
COMPLIANCE ASSESSMENT						
Method Compliance:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. No data required qualification based on holding time limits and overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, and 13.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

VERIFICATION CRITERIA CHECK

Laboratory qualifiers used in this review:

N/A

Validation qualifiers used in this review:

N/A

The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this checklist-N/A).

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	AR	Initials
Comments: Yes. Any non-conformances are discussed in the appropriate sections of this document.						
2. Were sample Chain-of-Custody forms complete?	**X**	Yes		No	AR	Initials
Comments: Sample Chain-of-Custody forms were complete.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	AR	Initials
Comments: All analyses requested for the samples on the COC were completed by the laboratory						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	AR	Initials
Comments: All samples were received at the appropriate temperature and in good condition.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	AR	Initials
Comments: Reported methods were in compliance with those requested on the COC records or the reported methods are comparable and appropriate for the analysis requested and the sample matrix.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	**X**	Yes		No	AR	Initials
Comments: Reported detection limits are achievable by the quoted methods. Some samples required dilution due to high sample concentration or sample matrix. The reporting limits for diluted results were raised appropriately.						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	AR	Initials
Comments: The laboratory reports included only those constituents requested to be reported.						
8. Were sample holding times met?	**X**	Yes		No	AR	Initials
Comments: All sample holding times were met.						
9. Were correct concentration units reported?	**X**	Yes		No	AR	Initials
Comments: Correct concentration units were reported.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

10. Were the reporting requirements for flagged data met?	**X**	Yes		No	AR	Initials
Comments: Reporting requirements for flagged data were met.						
11. Laboratory Blanks						
Were laboratory blank samples free of target analyte contamination?	**X**	Yes		No	AR	Initials
Comments: Laboratory blank samples were free of target analyte contamination.						
Were laboratory blank samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
12. Field Blanks						
Were field blank samples free of target analyte contamination?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples were not submitted with this batch of data.						
Were field blank samples analyzed at the proper frequency (minimum 5% or as required by method)?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples were not submitted with this batch of data.						
13. Were instrument calibrations within method or data validation control limits?		Yes	**X**	NA	AR	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.						
14. Were surrogate recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: Surrogate recoveries were within control limits.						
15. Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)						
Were laboratory control samples prepared in the same way as associated samples?	**X**	Yes		No	AR	Initials
Was the reference material of the correct matrix and concentration?	**X**	Yes		No	AR	Initials
Were LCS/LCSD recoveries within control limits of 70-130% for VPH, 40-140% for EPH, and 80-120% for inorganics, and were within laboratory control charted QC limits for all target analytes, or within 95% confidence limit of known value?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD recoveries were within control limits.						
Were LCS/LCDS RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All LCS/LCSD % RPDs were within control limits.						
Were LCS/LCSD samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD samples were analyzed at the proper frequency.						
16. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)						
Were MS/MSD % recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments:						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Were MS/MSD RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD RPDs were within control limits.						
Were MS/MSD analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: The MS/MSD samples were ran at the proper frequency.						
17. Laboratory Duplicates						
Were laboratory duplicate RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All laboratory duplicate RPDs were within control limits.						
Were laboratory duplicates analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD and laboratory duplicate samples were within control limits or were not applicable due to undetected results in both samples.						
18. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	**X**	Yes		No	AR	Initials
Comments: Sample BLK-1701-101 and its duplicate BLK-1701-102 had RPDs within control limits.						
19. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		NA	AR	Initials
Comments: 100% of the EDD concentrations and reporting limits were the same as hardcopy data reports.						

General Comments: Data were evaluated based on validation criteria set forth in:

- Montana Department of Environmental Quality Data Validation Guidelines for Evaluating Analytical Data (August 2016)
- USEPA Contract Laboratory Program National Functional Guidelines for Organic/Inorganic Data Review, document numbers EPA540/R-014/02 and EPA540/R-13/001 of August 2014 as they applied to the reported methodology.

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: Plentywood-Bolke Residence	**Laboratory: ALS**
Project Reference: MDEQ Investigation	**Sample Matrix: Air**
Project No.: 16043	**Sample Start Date: 03/21/2017**
Verified By/Date Verified: Angela Roddy 04/18/2017	**Sample End Date: 03/21/2017**

Samples Analyzed						
	Matrix	Site Code	Sample ID	Date Sampled	Lab Project No.	Lab Sample ID
1	Air	PBR-MLA1	B1-170320-AA1	3/21/2017	P1701482	P1701482-001
2	Air	PBR-GA1	B1-170320-AA2	3/21/2017	P1701482	P1701482-002
3	Air	PBR-BA1	B1-170320-AA3	3/21/2017	P1701482	P1701482-003
4	Air-Duplicate	PBR-BA1	B1-170320-AA3D	3/21/2017	P1701482	P1701482-004

- *Methods and Parameter Groups Verified: Air-Phase Petroleum Hydrocarbons- MA-APH 1.0-; Volatile Organic Compounds-EPA TO-15.*
- *Laboratory Project Ids: B1701482*

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

PRECISION, ACCURACY, REPRESENTATIVENES, COMPARABILITY, & COMPLETENESS ASSESSMENT						
Precision:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Precision is the measure of variability of individual sample measurements. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD limits referenced EPA published QC limits, laboratory control charted QC limits. Overall the laboratory precision is acceptable. Precision measurements are reviewed in items 16, 17, and 18.						
Accuracy:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Laboratory accuracy, a measure of the system bias, was measured by evaluating standard reference, laboratory fortified blank (LFB), or laboratory control sample and laboratory control sample duplicate (LCS, LCSD), matrix spike and matrix spike duplicates (MS, MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). Standard reference, LCS, and LCSD %Rs demonstrated the overall performance of the analysis. MS %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. These measurements were compared to data validation and laboratory control charted QC limits. Accuracy measurements are reviewed in items 14, 15, and 16.						
Representativeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Representativeness is the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter sampling point, or an environmental condition that they are intended to represent. Representative data are achieved through careful selection of sampling locations and frequencies, and proper sampling and analytical procedures.						
Completeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, and laboratory case narratives. Completeness also included 100% review of the laboratory sample data results and QC summary reports. All of the data received by the laboratory are usable *without* qualification. Completeness is reviewed through items 2, 3, 5, 6, 7, and 9.						
Comparability:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Comparability is the degree to which two or more data sets from the same location are generated using consistent procedures. Discrete data sets may differ as a result of non-random (bias sampling, variability in sampling techniques and variations in methods of analysis. Comparability is achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data.						
COMPLIANCE ASSESSMENT						
Method Compliance:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. No data required qualification based on holding time limits and overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, and 13.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

VERIFICATION CRITERIA CHECK

Laboratory qualifiers used in this review:

N/A

Validation qualifiers used in this review:

N/A

The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this checklist-N/A).

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	AR	Initials
Comments: Yes. Any non-conformances are discussed in the appropriate sections of this document.						
2. Were sample Chain-of-Custody forms complete?	**X**	Yes		No	AR	Initials
Comments: Sample Chain-of-Custody forms were complete.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	AR	Initials
Comments: All analyses requested for the samples on the COC were completed by the laboratory						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	AR	Initials
Comments: All samples were received at the appropriate temperature and in good condition.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	AR	Initials
Comments: Reported methods were in compliance with those requested on the COC records or the reported methods are comparable and appropriate for the analysis requested and the sample matrix.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	**X**	Yes		No	AR	Initials
Comments: Reported detection limits are achievable by the quoted methods. Some samples required dilution due to high sample concentration or sample matrix. The reporting limits for diluted results were raised appropriately.						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	AR	Initials
Comments: The laboratory reports included only those constituents requested to be reported.						
8. Were sample holding times met?	**X**	Yes		No	AR	Initials
Comments: All sample holding times were met.						
9. Were correct concentration units reported?	**X**	Yes		No	AR	Initials
Comments: Correct concentration units were reported.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

10. Were the reporting requirements for flagged data met?	**X**	Yes		No	AR	Initials
Comments: Reporting requirements for flagged data were met.						
11. Laboratory Blanks						
Were laboratory blank samples free of target analyte contamination?	**X**	Yes		No	AR	Initials
Comments: Laboratory blank samples were free of target analyte contamination.						
Were laboratory blank samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
12. Field Blanks						
Were field blank samples free of target analyte contamination?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples were not submitted with this batch of data.						
Were field blank samples analyzed at the proper frequency (minimum 5% or as required by method)?		Yes	**X**	NA	AR	Initials
Comments: Field blank samples were not submitted with this batch of data.						
13. Were instrument calibrations within method or data validation control limits?		Yes	**X**	NA	AR	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.						
14. Were surrogate recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: Surrogate recoveries were within control limits.						
15. Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)						
Were laboratory control samples prepared in the same way as associated samples?	**X**	Yes		No	AR	Initials
Was the reference material of the correct matrix and concentration?	**X**	Yes		No	AR	Initials
Were LCS/LCSD recoveries within control limits of 70-130% for VPH, 40-140% for EPH, and 80-120% for inorganics, and were within laboratory control charted QC limits for all target analytes, or within 95% confidence limit of known value?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD recoveries were within control limits.						
Were LCS/LCDS RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All LCS/LCSD % RPDs were within control limits.						
Were LCS/LCSD samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD samples were analyzed at the proper frequency.						
16. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)						
Were MS/MSD % recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments:						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Were MS/MSD RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD RPDs were within control limits.						
Were MS/MSD analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: The MS/MSD samples were ran at the proper frequency.						
17. Laboratory Duplicates						
Were laboratory duplicate RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All laboratory duplicate RPDs were within control.						
Were laboratory duplicates analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD and laboratory duplicate samples were within control limits or were not applicable due to undetected results in both samples.						
18. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	**X**	Yes		No	AR	Initials
Comments: Sample B1-170320-AA3 and its duplicate B1-170320-AA3D had RPDs within control limits.						
19. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		NA	AR	Initials
Comments: 100% of the EDD concentrations and reporting limits were the same as hardcopy data reports.						

General Comments: Data were evaluated based on validation criteria set forth in:

- Montana Department of Environmental Quality Data Validation Guidelines for Evaluating Analytical Data (August 2016)
- USEPA Contract Laboratory Program National Functional Guidelines for Organic/Inorganic Data Review, document numbers EPA540/R-014/02 and EPA540/R-13/001 of August 2014 as they applied to the reported methodology.

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: Plentywood-Bolke Residence	**Laboratory: Energy Laboratories**
Project Reference: MDEQ Investigation	**Sample Matrix: Groundwater**
Project No.: 16043	**Sample Start Date: 04/26/2017**
Verified By/Date Verified: Angela Roddy 05/09/2017	**Sample End Date: 04/26/2017**

	Matrix	Site Code	Sample ID	Date Sampled	Lab Project No.	Lab Sample ID
1	Groundwater	PBR-2	BLK-1704-100	4/26/2017	B17042303	B17042303-001
2	Groundwater	PBR-1	BLK-1704-101	4/26/2017	B17042303	B17042303-002
3	Groundwater-Duplicate	PBR-1	BLK-1704-102	4/26/2017	B17042303	B17042303-003
4	Rinsate Blank	-	BLK-1704-103	4/26/2017	B17042303	B17042303-004
5	Trip Blank	-	Trip Blank 1 Lot 022410 TS SHP0246	4/26/2017	B17042303	B17042303-005
6	Trip Blank	-	Trip Blank 2 Lot 022610 TS SHP0246	4/26/2017	B17042303	B17042303-006

- *Groundwater: Methods and Parameter Groups Verified: Field Parameters; Total Purgeable Hydrocarbons - MA-VPH; Total Extractable Petroleum Hydrocarbons and Screen-SW8015M/MA-EPH; Low Level Semi-Volatile Organic Compounds-SW8270C.*

- *Laboratory Project ID: B17042303*

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

PRECISION, ACCURACY, REPRESENTATIVENES, COMPARABILITY, & COMPLETENESS ASSESSMENT						
Precision:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Precision is the measure of variability of individual sample measurements. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD limits referenced EPA published QC limits, laboratory control charted QC limits, or as specified in the Quality Assurance Project Plan (QAPP). Overall the laboratory precision is acceptable. Precision measurements are reviewed in items 16, 17, and 18.						
Accuracy:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Laboratory accuracy, a measure of the system bias, was measured by evaluating standard reference, laboratory fortified blank (LFB), or laboratory control sample and laboratory control sample duplicate (LCS, LCSD), matrix spike and matrix spike duplicates (MS, MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). Standard reference, LCS, and LCSD %Rs demonstrated the overall performance of the analysis. MS %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. These measurements were compared to data validation and laboratory control charted QC limits. Accuracy measurements are reviewed in items 14, 15, and 16.						
Representativeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Representativeness is the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter sampling point, or an environmental condition that they are intended to represent. Representative data are achieved through careful selection of sampling locations and frequencies, and proper sampling and analytical procedures.						
Completeness:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, and laboratory case narratives. Completeness also included 100% review of the laboratory sample data results and QC summary reports. All of the data received by the laboratory are usable with qualification. Completeness is reviewed through items 2, 3, 5, 6, 7, and 9.						
Comparability:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Comparability is the degree to which two or more data sets from the same location are generated using consistent procedures. Discrete data sets may differ as a result of non-random (bias sampling, variability in sampling techniques and variations in methods of analysis. Comparability is achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data.						
COMPLIANCE ASSESSMENT						
Method Compliance:	**X**	Acceptable		Unacceptable	AR	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. No data required qualification based on holding time limits and overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, and 13.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

VERIFICATION CRITERIA CHECK

Laboratory qualifiers used in this review:

*	The result exceeds the MCL.
J	Estimated value. The analyte was present but less than the reporting limit.
R	RPD exceeds advisory limit.

Validation qualifiers used in this review:

N/A

The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this checklist).

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	AR	Initials
Comments: Yes. Any non-conformances are discussed in the appropriate sections of this document.						
2. Were sample Chain-of-Custody forms complete?	**X**	Yes		No	AR	Initials
Comments: Sample Chain-of-Custody forms were complete.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	AR	Initials
Comments: All analyses requested for the samples on the COC were completed by the laboratory						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	AR	Initials
Comments: All samples were received at the appropriate temperature. Custody seals for all coolers were not present. However, the coolers were hand-delivered.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	AR	Initials
Comments: Reported methods were in compliance with those requested on the COC records or the reported methods are comparable and appropriate for the analysis requested and the sample matrix.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	**X**	Yes		No	AR	Initials
Comments: Reported detection limits are achievable by the quoted methods.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	AR	Initials
Comments: The laboratory reports included only those constituents requested to be reported.						
8. Were sample holding times met?	**X**	Yes		No	AR	Initials
Comments: All sample holding times were met.						
9. Were correct concentration units reported?	**X**	Yes		No	AR	Initials
Comments: Correct concentration units were reported.						
10. Were the reporting requirements for flagged data met?	**X**	Yes		No	AR	Initials
Comments: Reporting requirements for flagged data were met.						
11. Laboratory Blanks						
Were laboratory blank samples free of target analyte contamination?	**X**	Yes		No	AR	Initials
Comments: Laboratory blank samples were free of target analytes.						
Were laboratory blank samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
12. Field Blanks						
Were field blank samples free of target analyte contamination?		Yes	**X**	No	AR	Initials
Comments: Toluene, m+p xylene, and Total xylene was detected in Trip Blank 1 and Toluene was detected in Trip Blank 2 (Method MA-VPH). A validation qualifier was not necessary because all raw samples did not report values greater than the detection limit for these analytes.						
Were field blank samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: Field blank samples were analyzed at the proper frequency.						
13. Were instrument calibrations within method or data validation control limits?		Yes	**X**	NA	AR	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.						
14. Were surrogate recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: Surrogate recoveries were within control limits.						
15. Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)						
Were laboratory control samples prepared in the same way as associated samples?	**X**	Yes		No	AR	Initials
Was the reference material of the correct matrix and concentration?	**X**	Yes		No	AR	Initials
Were LCS/LCSD recoveries within control limits of 70-130% for VPH, 40-140% for EPH, and 80-120% for inorganics, and were within laboratory control charted QC limits for all target analytes, or within 95% confidence limit of known value?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD recoveries were within control limits.						

ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Were LCS/LCDS RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All LCS/LCSD % RPDs were within control limits.						
Were LCS/LCSD samples analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: LCS/LCSD samples were analyzed at the proper frequency.						
16. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)						
Were MS/MSD % recoveries within control limits?	**X**	Yes		No	AR	Initials
Comments: MS/MSD recoveries were within control limits.						
Were MS/MSD RPDs within control limits?		Yes	**X**	No	AR	Initials
Comments: QC sample B17042303-001AMSD was flagged with laboratory qualifier "R" for the RPD of the analyte Benzo(a)pyrene (SW8270C) for being above control limits. A validation qualifier was not necessary because the LCS was within limits for this method. The raw samples also both reported values below the detection limit.						
Were MS/MSD analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: The MS/MSD samples were ran at the proper frequency.						
17. Laboratory Duplicates						
Were laboratory duplicate RPDs within control limits?	**X**	Yes		No	AR	Initials
Comments: All laboratory duplicate RPDs were within control limits as required by the QAPP.						
Were laboratory duplicates analyzed at the proper frequency (minimum 5% or as required by method)?	**X**	Yes		No	AR	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD and laboratory duplicate samples were within control limits or were not applicable due to undetected results in both samples.						
18. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	**X**	Yes		No	AR	Initials
Comments: Groundwater: Sample BLK-1704-101 and its duplicate BLK-1704-102 had RPDs within control limits.						
19. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		NA	AR	Initials
Comments: 100% of the EDD concentrations and reporting limits were the same as hardcopy data reports.						

General Comments: Data were evaluated based on validation criteria set forth in:

- Montana Department of Environmental Quality Data Validation Guidelines for Evaluating Analytical Data (August 2016).
- USEPA Contract Laboratory Program National Functional Guidelines for Organic/Inorganic Data Review, document numbers EPA540/R-014/02 and EPA540/R-13/001 of August 2014 as they applied to the reported methodology.

APPENDIX G

OCCUPIED DWELLING QUESTIONNAIRE

Department of Environmental Quality
Hazardous Waste Site Cleanup Bureau P.O. Box 200901 Helena MT 59620-0901 (406) 841-5000

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 3-20-17

1. Name: Don Bolke Ann Bolke

   Address: 204 Sheridan St.
   Plentywood, Mont.

   Home Phone: _____ Work Phone: _____

2. What is the best time to call to speak with you? _____ At: Work ☐ or Home ☑?

3. Are you the Owner ☑, Renter ☐, Other ☐ (please specify) _____ of this Home/Structure? If you are not the owner, please provide owner contact information _____

4. Total number of occupants/persons at this location? 2 :
   Number of Children 0 Ages _____

5. How long have you lived at this location? 37 yrs.

General Home Description

6. Type of Home/Structure (check only one): Single Family Home ☑, Duplex ☐, Apartment ☐, Townhouse ☐ Other _____

7. Home/Structure Description:
   Number of floors: 2
   Basement ☑
   Crawlspace ☐
   Partial Crawlspace/Basement ☐ % of each _____
   Slab On Grade ☐
   Other ☐ _____

8. Age of Home/Structure: 37 years, Not Sure/Unknown ☐

9. General Above-Ground Home/Structure construction (check all that apply):
   Wood ☑, Brick ☑, Concrete ☑, Cement block ☐, Other ☐ _____

10. Foundation Construction (check all that apply):
    Concrete Slab ☑
    Fieldstone ☐
    Concrete Block ☐
    Elevated Above Ground/Grade ☐
    Other ☐ _____

11. Do you have Private Well ☐ or Cistern ☐? No
If yes, please describe location, use, and current condition _____

12. Do you have a Septic System? Yes ☐ No ☑ Not Used ☐ Unknown ☐ City Sewer
If yes, what is the construction type? _____
Where is it located? _____
When was the last time it was serviced? _____
Do you (or have you ever) use(d) any degreaser for your septic system? Yes ☐ No ☐
If yes, when was the last application? _____

13. Do you have standing water outside of your home? (pond, ditch, etc.) Yes ☐ No ☑

Basement Description (please check all boxes that apply):

14. Is the basement Finished ☑ or Unfinished ☐?

15. If finished, how many rooms are in the basement? 4
What are rooms used for? Bedrooms ☐ Family Room ☐ Storage ☑
Other _____

16. If not finished, do you plan on finishing in the future? Yes ☐ No ☑

17. Is the basement floor (check all that apply) Concrete ☑, Tile ☐, Carpeted ☐, Dirt ☐,
Other ☐ _____

18. Are the basement walls Poured Concrete ☑, Cement Block ☐, Stone ☐, Wood ☐,
Brick ☐, Other ☐ _____

19. Does the basement have a moisture problem?
Yes, frequently (3 or more times/year) ☐
Yes, occasionally (1-2 times/year) ☐
Yes, rarely (less that 1 time/year) ☑
No ☐

Describe the moisture problem Runoff from spring depending on snow cover

20. Does the basement ever flood?

Yes, frequently (3 or more times/year) ☐

Yes, occasionally (1-2 times/year) ☐

Yes, rarely (less that 1 time/year) ☐

No ☑

21. Does the basement have any of the following? Floor Cracks ☐, Wall Cracks ☐, Sump ☑,
Floor Drain ☐, Other Hole/Opening In Floor ☐
Describe_____

22. Are any of the following used or stored in the basement (check all that apply):
Paint ☐ Paint Stripper/Remover ☐ Paint Thinner ☐ Metal Degreaser/Cleaner ☐
Gasoline ☐ Diesel Fuel ☐ Solvents ☐ Glue ☐ Laundry Spot Removers ☐
Drain Cleaners ☐ Pesticides ☐
Other equipment with fuel tanks (chain saw, lawn mower, snow blower, etc.) ☐,
Other products with/containing Volatile Organic Compounds, describe: _____
_____

23. Have you recently (within the last six months) done any painting or remodeling in your home?
Yes ☐ No ☐
If yes, specify what was done, where in the home, and what month:
_____
_____

24. Have you installed new carpeting in your home within the last year? Yes ☐ No ☐
If yes, when and where? _____

25. Do you regularly use or work in a dry cleaning service?
Yes, use dry-cleaning regularly (at least weekly) ☐
Yes, use dry-cleaning infrequently (monthly or less) ☐
Yes, work at a dry cleaning service ☐
No ☐

26. Does anyone in your home use solvents at work?
Yes ☐ If yes, how many persons?
No ☐ If no, go to question 28

27. If yes for question 26, are the work clothes washed at home? Yes ☐ No ☐

28. Where is the washer/dryer located?
Basement ☐
Upstairs Utility Room ☑ / Bathroom
Kitchen ☐
Garage ☐
Use a Laundromat ☐
Other, please specify ☐ _____

29. If you have a dryer, is it vented to the outdoors? Yes ☑ No ☐

30. What type (s) of home heating do you have (check all that apply)
Fuel type: Gas ☑, Oil ☐, Electric ☐, Wood ☐, Coal ☐,
Other ☐ _____

Heat conveyance system:
Forced Hot Air ☑
Forced Hot Water ☐
Steam ☐
Radiant Floor Heat ☐
Wood Stove ☐
Coal Furnace ☐
Fireplace ☐
Other ☐ _____

31. Does your home have (or had in the past) a storage tank for storage of Taken out 15 yrs. ago
Gasoline ☐, Fuel Oil ☑, Propane ☐
If yes, where is/was it located? Front yard by driveway
How is/was the tank filled? Through the top
Is there staining near the tank? Yes ☐ No ☑

32. Do you have air conditioning? Yes ☑ No ☐
Central Air Conditioning ☑
Window Air Conditioning Unit(s) ☐
Other (please specify) _____

33. Do you use any of the following? Room Fans ☑, Ceiling Fans ☐, Attic Fan ☑

34. Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes ☐ No ☑

35. Has your home had termite or other pesticide treatment? Yes ☐ No ☐ Unknown ☐
If yes, please specify type of pest controlled _____
And approximate date of service _____

36. Water heater type: Gas ☑, Electric ☐, by Furnace ☐,
Other (please describe) _____

37. Water heater location: Basement ☑, Upstairs Utility Room ☐, Garage ☐,
Other (please specify) _____

38. What type of cooking appliance do you have? Electric ☑, Gas ☐
Other (please describe) _____

39. Is there a stove exhaust hood present? Yes ☑ No ☐
Does it vent to the outdoors? Yes ☐ No ☑

40. Smoking in Home:
None ☐, Rare (only guests) ☐, Moderate (residents, light smokers) ☐,
Heavy (at least one heavy smoker in household) ☐

41. If yes to question 40, what is smoked?
Cigarettes ☐ Cigars ☐
Pipe ☐ Other ☐

42. Do you regularly use air fresheners? Yes ☐ No ☐

43. Does anyone in the home have indoor home hobbies or crafts involving:
Heating ☐, Soldering ☐, Welding ☐, Model Glues ☐, Paints ☐,
Spray Paint ☐, Wood Finishing ☐, Other ☐ _____

44. General family/home use of consumer products (please circle appropriate). Assume that: Never = never used, Hardly ever = less than once/month, Occasionally = about once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use				
Spray-on deodorant	Never	Hardly ever	Occasionally	Regularly	Often
Aerosol deodorizers	Never	Hardly ever	Occasionally	Regularly	Often
Insecticides	Never	Hardly ever	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	Regularly	Often
Window cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Nail polish remover	Never	Hardly ever	Occasionally	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	Regularly	Often
Candles	Never	Hardly ever	Occasionally	Regularly	Often
Incense	Never	Hardly ever	Occasionally	Regularly	Often

45. Please check weekly household cleaning practices:

Dusting ☐

Dry Sweeping ☐

Vacuuming ☐

Polishing (furniture, etc.) ☐

Washing/Waxing Floors ☐

Other (describe) ☐ _____

46. Other comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

47. Chemical Inventory/Summary

Chemical/Chemical Product (consumer name)	Amount present in home
a)	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	
j)	
k)	
l)	
m)	
n)	
o)	

APPENDIX H

BASEMENT INSPECTION PHOTOGRAPHS

Appendix H – Basement Inspection Photos – Bolke Residence

Sump #1 - cover in place.

Sump #1 – cover removed

Appendix H – Basement Inspection Photos – Bolke Residence

Sump #2 – cover in place

Sump #2 – cover removed

Appendix H – Basement Inspection Photos – Bolke Residence

Sump # 1 – Before sealing with cover on May 9, 2017

Sump #2 with cover in place and sealed.

Appendix H – Basement Inspection Photos – Bolke Residence

Sump #2 with cover anchored and sealed to slab, before placing top cap.

Sump #2 with cover in place and sealed.

APPENDIX I

EVALUATION OF THE BOLKE RESIDENCE INDOOR AIR AND ALTERNATIVE ASSESSMENT FOR INDOOR AIR MITIGATION

Hydrometrics, Inc.
Consulting Scientists and Engineers

5602 Hesper Rd.
Billings, MT 59106-3236
(406) 656-1172
Fax: (406) 656-8912
www.hydrometrics.com

May 9, 2017

Ms. Laura Alvey
Remediation Division
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RE: Evaluation of the Bolke Residence Indoor Air and Alternative Assessment for Indoor Air Mitigation, 704 Sheridan Avenue, Plentywood, MT.

Dear Ms. Alvey,

Hydrometrics has prepared the following report of the inspection of the Bolke Residence in Plentywood, Montana as requested by the Montana Department of Environmental Quality (DEQ). This work was conducted under Contract 414019 Task Order Modification 12A.

INTRODUCTION

In response to elevated levels of petroleum vapors in the main basement living space of the Bolke Residence during January 2017, an additional round of air samples were collected. This third round of indoor air samples, as well as an air sample from the Bolke's garage, was collected March 20 and 21st, 2017. An inspection of the Bolke's home was also conducted at that time. The inspection included documentation of the overall construction and layout of the home, the condition of the basement sumps and basement slab, and a survey of volatile organic vapors in the basement using a photoionization detector (PID). The homeowner also answered questions included in DEQ's "Occupied Dwelling Questionnaire". In addition, a local HVAC contractor (Sheridan Heating and Cooling) met with Hydrometrics to discuss options for installation of an air exchange system. This memorandum summarizes the findings of that visit as well as proposed plans for sealing the two basement sumps.

BOLKE HOME INSPECTION SUMMARY

The inspection consisted of documentation of house layout; interviewing Mr. Bolke; measuring and photographing floors, walls, sumps and outside of house; and measuring levels of organic vapors. Photographs take in and outside the house are included in Attachment 1. A copy of the questionnaire filled out by Mr. Bolke is included as Attachment 2.

The Bolke's have resided in their house at 704 Sheridan Avenue in Plentywood since 1980. The concrete foundation is a full basement 8 feet tall, with 6-inch thick walls and slab and measures 32 feet x 55 feet in length. The basement floor is painted concrete. Cracks observed in the slab have been sealed. Two sumps have been cut in the concrete to allow for pumping groundwater to keep it from entering the basement through seams and cracks during high precipitation events. Wayne 1/3 HP sump pumps with level activated switches are situated in both sumps. The pump in Sump #1 (see Figure 1) runs around once a day for about a minute, usually in the spring and during periods of high precipitation. Sump #2 rarely operates (see Figure 1). Discharge from the sumps is directed to the drain of either the bar sink (Sump #2 discharge) or bathroom sink (Sump #1 discharge) with garden hoses (see photos in Attachment 1).

The house is heated with a propane furnace installed about 15 years ago. The hot water heater is also propane. There is a propane fireplace on the main floor. All bathrooms have exhaust vents. The washer and dryer are located in the downstairs bathroom.

The house has an attached garage that is not heated. Oil stains are present on the concrete slab floor of the garage. The door from the garage opens into the house where you can either go down a hallway to the basement stair or into the kitchen.

Organic Vapor Survey

Volatile organic vapors were measured at various places in the basement using a PID capable of sensing parts per billion (ppb) concentrations of vapors. Measurements were taken at the sumps (before and after removing sump lids), at the vapor pin, in each of the basement rooms, and near the basement windows. The measurements were recorded and are included on the schematic of the basement included on Figure 1.

The highest reading (7,500 ppb) of organic vapors was observed at the vapor pin, used for collection of sub-slab samples. The vapor pin was ultimately removed and the hole plugged with concrete. Other elevated readings were observed at the sub-grade basement window on the west side of the house. This window is near the former heating oil storage basin as shown on Figure 1 and in a photograph included in Attachment 1. Vapor readings at Sump #1 were higher (930 ppb) after the cover was removed than when it was in place (524 ppb). The cover was sealed with weather stripping around the bottom. Based on the readings it appears to be somewhat effective at providing a seal for vapors to enter the living space from below the slab. Sump #2 is only loosely covered with a board, with no seal. The PID readings at this sump were lower than at Sump #1, possibly a result of the location (further from the former tank basin) and the fact that the loose cover allows it to constantly vent. Photographs of the sumps are included in Attachment 1.

VAPOR INTRUSION MITIGATION OPTIONS

Air Exchanger

Hydrometrics met with Sheridan Heating and Cooling representative, Rob Knick, at the Bolke Residence. Mr. Knick had installed the Bolke's current furnace. He also examined their home for the possibility of installing an air exchanger and concluded such an installation would be relatively easy. He recommended a 20 min/hour, 160 cfm air exchange unit that can be unplugged when not in use (i.e., summer months).

The cost to purchase and install the air exchanger is $2600 based on the quote from Sheridan Heating and Cooling (Attachment 3). Operational costs, according to Mr. Knick, are equal to having a operation of a 60 watt light bulb.

Seals for Basement Sumps

As requested by DEQ, Hydrometrics researched methods to mitigate the escape of organic vapors from the basement sumps. Several prefabricated sump covers are available on the market. To provide easy access to the sump and pump by Mr. Bolke, and for ease of installation and durability, Hydrometrics chose a product manufactured for radon mitigation sumps. However, the cover is also designed appropriately for sealing the sumps in the Bolke basement. The product is the Everlast™ Radon Mitigation Cover with ports on top of the cover that can be modified to provide a seal for the discharge hose. The cover will be attached to the concrete floor with anchor bolts and a silicon gasket will form a seal between the cover and the floor. Photos and specifications for the cover are included in Attachment 4.

Estimated cost for purchase and installation of covers for both sumps is approximately $800, including bolts and other miscellaneous fittings and equipment but exclusive of travel. No maintenance is required of the covers once installed, other than checking seals periodically.

Sub-slab Depressurization

One method of preventing vapor intrusion into a building is the installation of a sub-slab depressurization (SSD) system. SSD systems are commonly used in radon mitigation programs and have been shown to be effective in mitigating organic vapors in existing buildings (EPA, 1993). The objective of a SSD system is to create a "barrier" between sub-surface contaminants and the indoor environment, preventing soil gas from entering a building and effectively protecting the indoor air quality and occupants. The "barrier" is created by establishing a negative pressure field (relative to the indoor pressure) beneath the building and around the foundation using suction, or extraction, points attached to a venting system powered by a fan. Since air flow moves toward the zone of low pressure, air moves from the building into the soil preventing flow into the building. Any volatile organic compounds (VOCs) rising from the sub-surface into this negative pressure field are collected and piped to a point outside of the building for discharge. A treatment system, such as activated carbon, may be necessary prior to discharging the effluent to ambient air.

The system is designed such that suction pipes are inserted into the aggregate or soil beneath the slab either vertically down through the slab or horizontally through a foundation wall below the slab. Suction is drawn on the pipes using a fan and collected soil gas in vented outdoors. SSD system design is guided by on-site diagnostic testing (a.k.a. communication tests or pressure field extension tests) that are used to determine the air flow characteristics beneath the slab and the capacity to create a sub-slab vacuum. Characteristics are driven by the permeability of in-place sub-slab material and building construction (i.e., size of building, location of sub-slab walls). The diagnostics are used to determine pressure and flow conditions and location and number of suction points that are required to maintain adequate vacuum.

Specific details of the system, such as locations of the suction pit(s), riser pipe, fan and electrical tie-ins, are determined at time of installation of the system. A fan or blower selected for the system is determined with input from the HVAC contractor and will have performance characteristics suited for the application in question.

The estimated costs to install a SSD system may range from $5000 to $15,000 with additional operational costs that may include change out of carbon filters.

Retro-Coat™ Application

An alternative mitigation technology by which a chemical-resistant coating is applied directly onto concrete slabs of existing buildings may also be an option. Developed by Land Science Technologies, Retro-Coat™ has been shown to effectively mitigate vapor intrusion from petroleum hydrocarbons. Application of Retro-Coat™ would be in addition to installing the sump covers.

Retro-Coat™ is most easily applied in buildings with limited interior walls (which may inhibit the coating from covering the entire surface of the concrete slab), buildings without any surface coverings (i.e., carpet, hard flooring, etc.), and buildings with no or limited drains, cracks, or conduits to the subsurface. It is necessary to clean the concrete slab and to seal any cracks in the concrete floor and other potential vapor intrusion entry points (such as the sumps) prior to installation of the coating by certified applicators. A standard Retro-Coat™ application consists of a 6 mil primer and 20 mil (.02 inch) surface coating. An aggregate may be added for enhanced slip resistance. Depending on scheduling with the owner/occupant, this application process may take from several days to a week to complete.

Estimated costs to apply the Retro-Coat™ range from $20 to $30 per square foot. There are no operational costs for the coating. However, maintenance would range from repairing damage periodically to recoating in the future, depending on degree of traffic in the basement.

.

SELECTED ALTERNATIVE

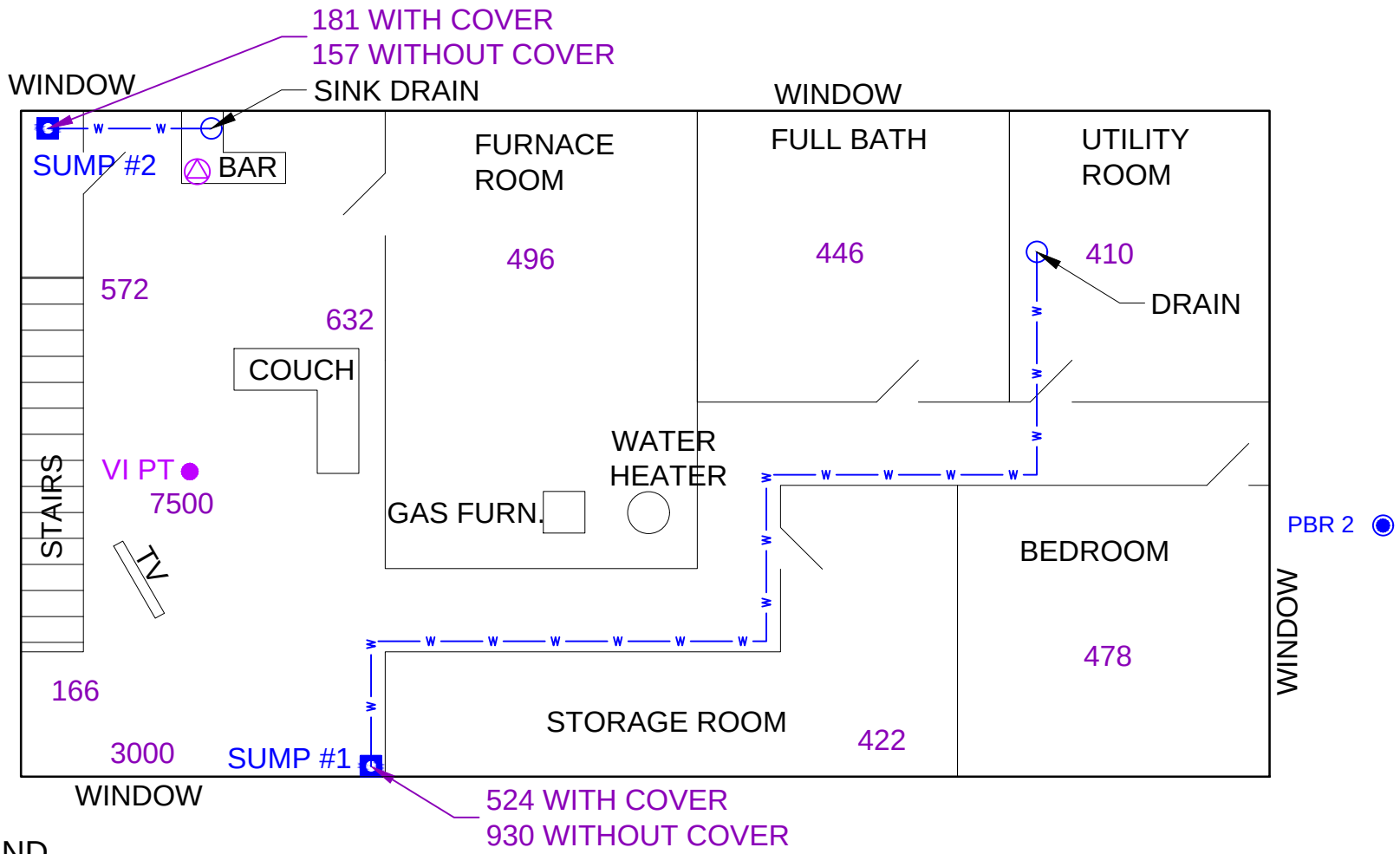
Based on the degree of impacts present in the Bolke basement, ease of implementation, low cost and lack of operation and maintenance costs, the proposed alternative is installation of the sump covers. Hydrometrics has discussed the possible installation of the covers on the sumps with Mr. Bolke and he is agreeable with the approach.

If you have any comments or questions regarding this report please do not hesitate to contact me at (406) 656-1172 ext. 306.

Sincerely,
Hydrometrics, Inc.

Heidi Kaiser P.G
Sr. Geologist
Hydrometrics File 16043

Attachments:
Figure 1. Basement Layout of Bolke Residence
Attachment 1. Photographs
Attachment 2. DEQ's Indoor Air Assessment Survey
Attachment 3. Sheridan Heating & Cooling Quote
Attachment 4. Sump Cover Specifications



LEGEND

● VI PT	VAPOR PIN
△	AMBIENT SAMPLE LOCATION
PBR 1 ◉	WELL
166	PID READING (PPB)
—— w ——	SUMP DISCHARGE HOSE

PBR 1 ◉

HEATING OIL STORAGE TANK

NORTH

SCALE (In Feet) 0 8

MDEQ TASK ORDER 12A, CONTRACT 414019 BOLKE RESIDENCE	**BASEMENT LAYOUT OF BOLKE RESIDENCE PLENTYWOOD, MT**	FIGURE **1**

Hydrometrics, Inc. Consulting Scientists and Engineers

UPDATE TIME: 11:20 AM
JBERGIN\BILL\20170427\I:\LAND PROJECTS\MDEQ\1604317B002.DWG

Attachment 1 – Bolke House Inspection Photos

Sump #1 - cover in place.

Sump #1 – cover removed

Attachment 1 – Bolke House Inspection Photos

Discharge hose from Sump #1

Discharge from Sump #1 tied into drain.

Attachment 1 – Bolke House Inspection Photos

Sump #2 – cover in place

Sump #2 – cover removed

Attachment 1 – Bolke House Inspection Photos

Water staining on basement floor along west wall.

View of west side of house near monitoring well PBR-1 and former oil storage tank basin.

Attachment 2

Department of Environmental Quality
Hazardous Waste Site Cleanup Bureau P.O. Box 200901 Helena MT 59620-0901 (406) 841-5000

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 3-20-17

1. Name: Don Boke
   Address: 204 Sheridan St.
   Plentywood, Mont.
   Home Phone: _____ Work Phone: _____

2. What is the best time to call to speak with you? _____ At: Work ☐ or Home ☑?

3. Are you the Owner ☑, Renter ☐, Other ☐ (please specify) _____ of this Home/Structure? If you are not the owner, please provide owner contact information _____

4. Total number of occupants/persons at this location? 2
   Number of Children 0 Ages _____

5. How long have you lived at this location? 37 yrs.

General Home Description

6. Type of Home/Structure (check only one): Single Family Home ☑, Duplex ☐, Apartment ☐, Townhouse ☐ Other _____

7. Home/Structure Description:
   Number of floors: 2
   Basement ☑
   Crawlspace ☐
   Partial Crawlspace/Basement ☐ % of each _____
   Slab On Grade ☐
   Other ☐ _____

8. Age of Home/Structure: 37 years, Not Sure/Unknown ☐

9. General Above-Ground Home/Structure construction (check all that apply):
   Wood ☑, Brick ☑, Concrete ☑, Cement block ☐, Other ☐ _____

10. Foundation Construction (check all that apply):
    Concrete Slab ☑
    Fieldstone ☐
    Concrete Block ☐
    Elevated Above Ground/Grade ☐
    Other ☐ _____

11. Do you have Private Well ☐ or Cistern ☐? No
If yes, please describe location, use, and current condition _____

12. Do you have a Septic System? Yes ☐ No ☑ Not Used ☐ Unknown ☐ City Sewer
If yes, what is the construction type? _____
Where is it located? _____
When was the last time it was serviced? _____
Do you (or have you ever) use(d) any degreaser for your septic system? Yes ☐ No ☐
If yes, when was the last application? _____

13. Do you have standing water outside of your home? (pond, ditch, etc.) Yes ☐ No ☑

Basement Description (please check all boxes that apply):

14. Is the basement Finished ☑ or Unfinished ☐?

15. If finished, how many rooms are in the basement? 4
What are rooms used for? Bedrooms ☐ Family Room ☐ Storage ☑
Other _____

16. If not finished, do you plan on finishing in the future? Yes ☐ No ☑

17. Is the basement floor (check all that apply) Concrete ☑, Tile ☐, Carpeted ☐, Dirt ☐,
Other ☐ _____

18. Are the basement walls Poured Concrete ☑, Cement Block ☐, Stone ☐, Wood ☐,
Brick ☐, Other ☐ _____

19. Does the basement have a moisture problem?
Yes, frequently (3 or more times/year) ☐
Yes, occasionally (1-2 times/year) ☐
Yes, rarely (less that 1 time/year) ☑
No ☐
Describe the moisture problem Runoff from spring depending on snow melt

20. Does the basement ever flood?
Yes, frequently (3 or more times/year) ☐
Yes, occasionally (1-2 times/year) ☐
Yes, rarely (less that 1 time/year) ☐
No ☑

21. Does the basement have any of the following? Floor Cracks ☐, Wall Cracks ☐, Sump ☑,
Floor Drain ☐, Other Hole/Opening In Floor ☐
Describe_____

22. Are any of the following used or stored in the basement (check all that apply):
Paint ☐ Paint Stripper/Remover ☐ Paint Thinner ☐ Metal Degreaser/Cleaner ☐
Gasoline ☐ Diesel Fuel ☐ Solvents ☐ Glue ☐ Laundry Spot Removers ☐
Drain Cleaners ☐ Pesticides ☐
Other equipment with fuel tanks (chain saw, lawn mower, snow blower, etc.) ☐,
Other products with/containing Volatile Organic Compounds, describe: _____
_____

23. Have you recently (within the last six months) done any painting or remodeling in your home?
Yes ☐ No ☐
If yes, specify what was done, where in the home, and what month:
_____
_____

24. Have you installed new carpeting in your home within the last year? Yes ☐ No ☐
If yes, when and where? _____

25. Do you regularly use or work in a dry cleaning service?
Yes, use dry-cleaning regularly (at least weekly) ☐
Yes, use dry-cleaning infrequently (monthly or less) ☐
Yes, work at a dry cleaning service ☐
No ☐

26. Does anyone in your home use solvents at work?
Yes ☐ If yes, how many persons?
No ☐ If no, go to question 28

27. If yes for question 26, are the work clothes washed at home? Yes ☐ No ☐

28. Where is the washer/dryer located?
Basement ☐
Upstairs Utility Room ☑ / Bathroom
Kitchen ☐
Garage ☐
Use a Laundromat ☐
Other, please specify ☐ _____

29. If you have a dryer, is it vented to the outdoors? Yes ☑ No ☐

30. What type (s) of home heating do you have (check all that apply)
Fuel type: Gas ☑, Oil ☐, Electric ☐, Wood ☐, Coal ☐,
Other ☐ _____

Heat conveyance system:
Forced Hot Air ☑
Forced Hot Water ☐
Steam ☐
Radiant Floor Heat ☐
Wood Stove ☐
Coal Furnace ☐
Fireplace ☐
Other ☐ _____

31. Does your home have (or had in the past) a storage tank for storage of Taken out 15yrs ago
Gasoline ☐, Fuel Oil ☑, Propane ☐
If yes, where is/was it located? Front yard by driveway
How is/was the tank filled? Through the stop
Is there staining near the tank? Yes ☐ No ☑

32. Do you have air conditioning? Yes ☑ No ☐
Central Air Conditioning ☑
Window Air Conditioning Unit(s) ☐
Other (please specify) _____

33. Do you use any of the following? Room Fans ☑, Ceiling Fans ☐, Attic Fan ☑

34. Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes ☐ No ☑

35. Has your home had termite or other pesticide treatment? Yes ☐ No ☐ Unknown ☐
If yes, please specify type of pest controlled _____
And approximate date of service _____

36. Water heater type: Gas ☑, Electric ☐, by Furnace ☐,
Other (please describe) _____

37. Water heater location: Basement ☑, Upstairs Utility Room ☐, Garage ☐,
Other (please specify) _____

38. What type of cooking appliance do you have? Electric ☑, Gas ☐
Other (please describe) _____

39. Is there a stove exhaust hood present? Yes ☑ No ☐
Does it vent to the outdoors? Yes ☐ No ☑

40. Smoking in Home:
None ☐, Rare (only guests) ☐, Moderate (residents, light smokers) ☐,
Heavy (at least one heavy smoker in household) ☐

41. If yes to question 40, what is smoked?
Cigarettes ☐ Cigars ☐
Pipe ☐ Other ☐

42. Do you regularly use air fresheners? Yes ☐ No ☐

43. Does anyone in the home have indoor home hobbies or crafts involving:
Heating ☐, Soldering ☐, Welding ☐, Model Glues ☐, Paints ☐,
Spray Paint ☐, Wood Finishing ☐, Other ☐ _____

44. General family/home use of consumer products (please circle appropriate). Assume that: Never = never used, Hardly ever = less than once/month, Occasionally = about once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use				
Spray-on deodorant	Never	Hardly ever	Occasionally	Regularly	Often
Aerosol deodorizers	Never	Hardly ever	Occasionally	Regularly	Often
Insecticides	Never	Hardly ever	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	Regularly	Often
Window cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Nail polish remover	Never	Hardly ever	Occasionally	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	Regularly	Often
Candles	Never	Hardly ever	Occasionally	Regularly	Often
Incense	Never	Hardly ever	Occasionally	Regularly	Often

45. Please check weekly household cleaning practices:

Dusting ☐

Dry Sweeping ☐

Vacuuming ☐

Polishing (furniture, etc.) ☐

Washing/Waxing Floors ☐

Other (describe) ☐ _____

46. Other comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

47. Chemical Inventory/Summary

Chemical/Chemical Product (consumer name)	Amount present in home
a)	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	
j)	
k)	
l)	
m)	
n)	
o)	

Attachment 3

Proposal

Sheridan Heating and Cooling
116 First Avenue East
PO Box 542
Plentywood, MT 59254
Phone (406) 765-2244 Fax: (406) 765-2236

Date
3/21/2017

Hydrometrics
5602 Hesper Rd
Billings, MT 59106

Description	
Don Bolke, 704 N. Sheridan, Plentywood, MT FanTech Model VHR150R Heat Recovery Ventilator, 159 CFM 24-hour Timer Intake and Exhaust Hoods All Sheet Metal duct, fittings and materials for complete installation Total	2,650.00

Total $2,650.00

All material guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Worker's Compensation Insurance. If proposal is accepted, customer agrees to all prices, specifications and conditions outlined herein.

Authorized Signature *Rob Knick*

You are authorized to do the work as specified. Payment will be made as outlined above

Customer Signature _____ Date _____

Attachment 4 – Proposed Sump Covers

Product Overview

The Everbilt Radon Mitigation Basin Cover serves two pressing needs; the need for a universal gas-tight cover to serve the radon mitigation market and the need for a cover to retrofit failing sump and sewage basin covers. The Everbilt Radon Mitigation Basin Cover is designed to cover an existing basin, providing a new heavy duty cover to properly contain and vent radon gas and odors. There is no reason to dig up your basement or garage floor to remove the existing sump or sewage basin. Simply remove old cover and install the Everbilt Radon Mitigation Basin Cover over the opening, to create a new, sealed system. The Everbilt Radon Mitigation Basin Cover is adaptable with a variety of spaces for different connections and comes with a full range of flanges that fit every size pipe. The removable cover allows for easy access to the pump and has a clear view removable inspection plate.

- Contains and properly vents radon gas and odors
- Fits over any 18 in. to 24 in. opening
- Retro fit old, failing covers
- Provides safety for children and pets
- Features a clear view removable inspection plate
- Comes with the following fittings: 1-1/4 in. flange, 1-1/2 in. flange, 2 in. flange, 2 in. vent flange, 3 in. vent flange, cord grommet, 1-1/4 in. side hub,1-1/2 in. side hub, 2 in. side hub, blank/solid flange, 1-1/4 in. reducer plate and a drill template
- Features 5 side locations for inlets, discharge or vents
- Has a built in floor drain plug
- Heavy duty structural foam injection molded construction
- Supports 1,000 lbs.
- Easy to install
- Made in the USA

Specifications

Dimensions

Assembled Depth (in.)	28.00 in	Product Depth (in.)	28 in
Assembled Height (in.)	4.50 in	Product Height (in.)	4 in
Assembled Width (in.)	28.00 in	Product Width (in.)	28 in

Details

Brand compatibility	Works with all sump and sewage basins up to 24 in. diameter	Returnable	90-Day
Product Weight (lb.)	12 lb		

Warranty / Certifications

Manufacturer Warranty	Warranted to the original consumer purchaser to be free from defects in material and workmanship for a period of one-year from the date of purchase.

APPENDIX J

WELL ABANDONMENT LOGS AND PHOTOGRAPHS

MONTANA WELL ABANDONMENT REPORT PBR-1

1. **EXISTING GWICID:** 21238

2. **WELL OWNER:**

Name Don Bolke

Mailing address 704 N. Sheridan

Plentywood MT 59254

3. **WELL LOCATION:** List ¼ from smallest to largest

_____ ¼ SW ¼ SW ¼ SW ¼, Section 17

Township 35 N/S Range N55E/W County Sheridan

Lot _____ , Tract/Blk ____ Subdivision Name _____

Well Address _____

GPS ☐ Yes ☐ No

Latitude _____ Longitude _____

Error as reported by GPS locator (+ feet) _____

Horizontal datum ☐ NAD27 ☐ WGS84

4. **WELL USE:** ☐ Domestic ☐ Stock ☐ Irrigation

☐ Public water supply X Monitoring Well

☐ Geothermal ☐ Closed System ☐ Open System

☐ Reinjection ☐ Extraction ☐ Other: _____

5. **TYPE OF WELL BEING ABANDONDED:**

X Drilled ☐ Bored ☐ Jetted ☐ Hand Dug ☐ Other: _____

6. **TYPE OF CASING:**

☐ Steel Dia._____in.

X Plastic (PVC) Dia. 2 in.

☐ Concrete Dia._____in.

☐ Other Dia._____in.

If other, type :_____

Was any casing removed? X yes ☐ no

If yes, type (steel, pvc, etc.) (PVC)

Amount removed 1.5 ft.

If more than one type: NA

Amount removed _____ft.

Was casing driven down ward? ☐ yes X no

If yes, feet below ground surface _____ ft.

Was casing Ripped or Perforated? ☐ yes X no

7. **WELL DATA:**

Depth of well: 15 ft.

Static water level 5 ft.

Closed-in artesian pressure NA psi.

Was well disinfected before decommissioning? ☐ yes X no

If yes, type and amount of disinfectant used:_____

_____

8. **WELL LOG:** Record sealing material used and depth(s)

Depth, Feet		Material type of material used to seal well (example: neat cement, bentonite chips, naturally occurring soils).
From	To	
		☐ Neat Cement
		☐ High-solids Bentonite Grout
15	1.5	X Bentonite Chips
		☐ Other (describe under remarks)

9. **DATE WELL DECOMMISSIONED:** May 9, 2017

10. **REMARKS:** _____

11. **DRILLER/CONTRACTOR:**

All work performed and reported in this decommissioning log is in compliance with the Montana well abandonment standards. This report is true to the best of my knowledge.

Name, firm, or corporation (print) Al Hilty - Hydrometrics, Inc.

Address 5602 Hesper Rd., Billings, MT 59106

Signature _____

Date 5/15/17 License no. 201

License type: X MWC ☐ WWC ☐ WWD

This report can be emailed to GWIC@mtech.edu, faxed to the GWIC office at (406) 496-4343, or sent to:

Ground Water Information Center
1300 W. Park St.
Butte, MT 59701-8997

Montana Bureau of Mines and Geology
The University of Montana
1300 West Park Street
Butte, MT 59701

MONTANA WELL ABANDONMENT REPORT PBR-2

1. **EXISTING GWICID:** 21239

2. **WELL OWNER:**

Name Don Bolke

Mailing address 704 N. Sheridan

Plentywood MT 59254

3. **WELL LOCATION:** List ¼ from smallest to largest

____ ¼ SW ¼ SW ¼ SW ¼, Section 17

Township 35 N/S Range N55E/W County Sheridan

Lot ____ , Tract/Blk ____ Subdivision Name ____

Well Address ____

GPS ☐ Yes ☐ No

Latitude ____ Longitude ____

Error as reported by GPS locator (+ feet) ____

Horizontal datum ☐ NAD27 ☐ WGS84

4. **WELL USE:** ☐ Domestic ☐ Stock ☐ Irrigation

☐ Public water supply ☒ Monitoring Well

☐ Geothermal ☐ Closed System ☐ Open System

☐ Reinjection ☐ Extraction ☐ Other: ____

5. **TYPE OF WELL BEING ABANDONDED:**

☒ Drilled ☐ Bored ☐ Jetted ☐ Hand Dug ☐ Other: ____

6. **TYPE OF CASING:**

☐ Steel Dia.____in.

☒ Plastic (PVC) Dia. 2 in.

☐ Concrete Dia.____in.

☐ Other Dia.____in.

If other, type : ____

Was any casing removed? ☒ yes ☐ no

If yes, type (steel, pvc, etc.) PVC

Amount removed 1.5 ft.

If more than one type: NA

Amount removed ____ ft.

Was casing driven down ward? ☐ yes ☒ no

If yes, feet below ground surface ____ ft.

Was casing Ripped or Perforated? ☐ yes ☒ no

7. **WELL DATA:**

Depth of well: 37 ft.

Static water level 30 ft.

Closed-in artesian pressure NA psi.

Was well disinfected before decommissioning? ☐ yes ☒ no

If yes, type and amount of disinfectant used: ____

8. **WELL LOG:** Record sealing material used and depth(s)

Depth, Feet		Material type of material used to seal well (example: neat cement, bentonite chips, naturally occurring soils).
From	To	
		☐ Neat Cement
		☐ High-solids Bentonite Grout
37	1.5	☒ Bentonite Chips
		☐ Other (describe under remarks)

9. **DATE WELL DECOMMISSIONED:** May 9, 2017

10. **REMARKS:** ____

11. **DRILLER/CONTRACTOR:**

All work performed and reported in this decommissioning log is in compliance with the Montana well abandonment standards. This report is true to the best of my knowledge.

Name, firm, or corporation (print) Al Hilty - Hydrometrics, Inc.

Address 5602 Hesper Rd., Billings, MT 59106

Signature ____

Date 5-15-2017 License no. 201

License type: ☒ MWC ☐ WWC ☐ WWD

This report can be emailed to GWIC@mtech.edu, faxed to the GWIC office at (406) 496-4343, or sent to:

Ground Water Information Center
1300 W. Park St.
Butte, MT 59701-8997

Appendix J – Well Abandonment – Bolke Residence

PBR-1 – before abandonment.

PBR-1 after filling with bentonite chips and cutting PVC riser.

Appendix J – Well Abandonment – Bolke Residence

PBR-1 after abandoment complete.

PBR-2 – before abandonment.

Appendix J – Well Abandonment – Bolke Residence

PBR-2 after filling with bentonite and prior to cutting off pipe.

PBR-2 after abandonment is complete.