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Design-Build • Construction • Environmental • Staff Augmentation

March 9, 2023

Ms. Laurie Butler
Environmental Manager
Menzies Aviation
6000 De Havilland Avenue
Anchorage, AK 99502

Subject: Final 2019 Site Characterization and Well Decommissioning Report
AFSC Off-Airport Fueling Facility
Port of Anchorage, Alaska
ADEC File Number 2100.38.243, Hazard ID 25946

Dear Ms. Butler:

This letter presents the Ahtna Engineering Services, LLC (Ahtna) report for site characterization, groundwater sampling, and well decommissioning at the Anchorage Fueling and Service Company (AFSC) Off-Airport Fuel Facility (OAFF) site located at the Port of Alaska in Anchorage, Alaska (Figures 1 and 2).

This report describes site characterization activities which included a passive soil gas survey, soil sampling, monitoring well installation, groundwater sampling, and storm water sampling. Additionally, four monitoring wells which were no longer used for groundwater monitoring purposes were decommissioned.

WORK PERFORMED

This project was managed by Alex Geilich and overseen by Nino Muniz on behalf of Menzies. The project manager and field scientists performing the sampling met the definition of "qualified environmental professional" as per 18 Alaska Administrative Code (AAC) 75.333.

Passive Soil Gas Survey

Ahtna installed passive soil gas samplers to the west of the OAFF site (Figures 3, 4, and 5). Samplers were installed on a 50-foot grid in an approximately 150- by 600-foot area.

The field team used a hammer drill to create an approximately 1½ inch diameter hole to a depth of 2 feet. For locations with asphalt/concrete surfacing, the upper 12 inches of the hole were sleeved with a pre-cleaned metal pipe. The passive soil gas sampler was installed in the upper portion of the hole, which is sealed with an aluminum foil plug and covered with soil or for locations through asphalt/concrete surfacing with a thin concrete patch. The samplers were left in place for two weeks before they were retrieved. Samplers were sent to Beacon Environmental Services for analysis via Method 8260C. Four duplicate samples were designated for analysis.

Soil Borings and Monitoring Well Installation

On October 30, 2019, Ahtna personnel direct-push drilled three soil borings and installed three monitoring wells (MW-10, MW-11, and MW-12), as shown on Figure 2 on the west side of the site. Drilling work was performed with a Geoprobe 7822DT direct push drill rig, operated by Discovery Drilling. The installation locations of monitoring wells MW-10, MW-11, and MW-12 were chosen based on areas with data gaps and guided by the passive soil gas survey. Proposed locations were discussed with and approved by Alaska Department of Environmental Conservation (ADEC) prior to installation.

In order to determine depth to groundwater and potential soil impacts, a soil boring was advanced at each location. Each soil boring was advanced to 15 feet below ground surface (bgs). Soil boring logs are provided in Attachment 2. A photoionization detector (PID) was used to screen each soil boring core in 1-foot increments as they were removed from the ground. From each soil boring, one analytical sample was collected from the groundwater interface and a second analytical sample was collected from the location of the highest PID reading. Samples were collected for analysis of:

- Fuel-related volatile organic compounds (FR-VOCs) by the United States Environmental Protection Agency (EPA) Method 8260C
- Gasoline-range organics (GRO) by Alaska Method (AK) 101
- Diesel-range organics (DRO) by AK 102
- Polycyclic aromatic hydrocarbons (PAH) by EPA Method 8270D- selected ion monitoring (SIM)

After soil sample collection, the soil borings were completed as groundwater monitoring wells. Each monitoring well was constructed of 2-inch diameter, Schedule 40 polyvinyl chloride (PVC). All wells were installed with 10-foot-long screen. A sand pack was installed around the well screen and extended to 2 feet above the screen. A bentonite seal was positioned above the sand pack to the surface. Wells were completed at the surface as flush mount wells with a concrete surface seal.

Monitoring Well Development

The goal of well development is to ensure proper hydraulic connection to the surrounding aquifer, allowing for free flow of formation water into the well for sampling. Well development is the agitation of the adjacent formation and pulling of the fines into the well. Well development consisted of repeatedly surging the well with a surge block followed by purging groundwater with a bailer. Well development (surging and purging) was continued until five well casing volumes were removed. All wells were purged dry during purging due to low yield. Each well was allowed to recharge to 80% of its original volume, at which point, additional rounds of purging were conducted. Monitoring well development forms are provided in Attachment 2. Well development purge water was collected in a 55- gallon drum.

Monitoring Well Sampling

Groundwater samples were collected from seven monitoring wells (MW-1, MW-3, MW-4R, MW-6, MW-10, MW-11, and MW-12).

Prior to sampling, water was purged using low-flow (minimal drawdown) techniques that included a stainless-steel submersible bladder pump and flow-through cell. Purging continued until groundwater parameters stabilized in accordance with the work plan. Well sampling logs are provided in Attachment 2.

All samples collected during the field event were delivered to SGS North America Inc. (SGS) located in Anchorage, Alaska. A field duplicate was collected from well MW-6.

The following analytical methods were used for laboratory analyses of the groundwater samples:

- FR-VOCs by EPA SW Method 8260C;
- GRO by AK101;
- DRO by AK102;
- PAH by EPA SW Method 8270D-SIM.

Monitoring Well Decommissioning

On October 31 and November 1, 2019, Ahtna personnel decommissioned four monitoring wells (MW-5, MW-7, MW-8, and MW-9) at the OAFF site. Monitoring wells were decommissioned according to the procedure outlined below.

- The protective monument was removed from the ground after digging down to the secondary containment liner and cutting it back.
- Bentonite chips were added into the monitoring well to the groundwater surface.
- The top most section of PVC well riser was unscrewed and removed from the ground.
- Additional bentonite was added to the well borehole up to the surface of the secondary containment liner.

The PVC well riser, aluminum protective monuments, and concrete were disposed of as non-hazardous waste at the Anchorage Central Transfer Station. After Ahtna performed well decommissioning, Menzies arranged for Pemco Corp. to patch the secondary containment liner.

Exceptions to the above procedure were:

- At monitoring well MW-5, the entire protective monument was able to be removed.
- MW-9 was located outside of the secondary containment liner area, so patching was not performed at that location.

Storm Water Sampling

On November 15th, 2019, Ahtna personnel collected samples from the storm water system at three locations to the west of the OAFF site (Figure 8). Samples were collected with a disposable bailer through manhole openings and were delivered to SGS, located in Anchorage, Alaska. A field duplicate was collected from the southern manhole opening, SD-3. Water in the storm water drain system was noted to be generally at the same elevation as groundwater in the area.

The following analytical methods were used for laboratory analyses of the storm water samples:

- FR-VOCs by EPA SW Method 8260C;
- GRO by AK101;
- DRO by AK102;

- PAH by EPA SW Method 8270D-SIM.

Site Survey

On November 8, 2019, a survey of monitoring wells at the site was performed by Mammoth Consulting, LLC, a licensed Professional Land Surveyor. Horizontal positions of the wells and elevations of the top of casing were surveyed to standards stated in the ADEC *Monitoring Well Guidance* (ADEC, 2013). The survey report is provided as Attachment 5.

Waste Disposal

Soil cuttings and water generated during monitoring well development and installation were each contained in a 55-gallon drum and temporarily stored behind the locked fence at the OAFF site.

On January 17th, 2020, ADEC requested that the waste be sampled for perfluorinated alkylated substances (PFAS) based on the potential for PFAS contamination to be present from historical fire suppression system testing at OAFF. Sampling of the purge water and soil cuttings was conducted on January 24th, 2020. Samples were submitted to SGS for analysis of PFAS compounds by EPA Method 537. Sampling results indicate that PFAS compounds were below the applicable action levels in both soil and water. Laboratory reports are provided in Attachment 4. A Contaminated Media Transport and Treatment or Disposal Approval Form was approved by ADEC on February 10, 2020. Waste transport and disposal are pending. Waste manifests will be provided in the in the Final Report.

RESULTS

Passive Soil Gas

Passive soil gas sampling results are provided in Attachment 6. In addition, results for total petroleum hydrocarbons (TPH) in the C4 to C9 range, TPH C10-15, and benzene, toluene, ethylbenzene, and xylenes (BTEX) are presented in Figures 3, 4, and 5. Results for TPH C4-C9 are somewhat comparable to GRO, which covers the C6 to C10 range. Results for TPH C10-15 cover the lighter end of the DRO range, which is defined as the C10 to C25 range.

Passive soil gas data was used in this project as a screening tool to cover a large area to the west of the OAFF in order to help identify any data gaps, guide monitoring well placement, and to determine trends in the plume extent.

Passive soil gas data identified higher concentrations of BTEX on the southwest side of the site. The plume is fairly limited in extent and near MW-4R, which is an area with known impacts of benzene and ethylbenzene. The C4 to C9 data indicated impacts on the southwest side of the site to the west of MW-4R and also to the west of MW-3. C10-C15 was identified to the west of MW-4R. In general, the extent of contamination did not extend past Tidewater Road to the west. There is no soil gas data along the southern property boundary to indicate whether or not contamination has migrated offsite in that direction though the generalized groundwater flow direction appears to indicate that southward contaminant migration is unlikely.

Soil Borings

Soil Logging and Screening

Soil cores were logged for soil composition, presence of VOCs, and water level as they were removed from the bore holes at MW-10, MW-11, and MW-12. Complete information on soil lithology and recorded observations are shown on Soil Boring Logs, available in Attachment 2. In general, silty sand with gravel was encountered in the top 4 to 5 feet of the soil horizon. Below this the soil transitioned to clay with lenses of silty sand, sand, and gravel. The lenses of more permeable material were moist and expected to produce water, but a discrete water level in the soil boring was not possible to determine.

PID results and notes on fuel odors are summarized below:

- In MW-10, PID readings reached at maximum of 2.9 parts per million (ppm) at 5-6 feet bgs; no fuel odor was noted in this boring.
- In MW-11, PID readings reached at maximum of 0.5 ppm at 8-9 feet bgs; a slight fuel odor was noted at this depth.
- In MW-12, PID readings reached at maximum of 0.4 ppm at 11-12 feet bgs; no fuel odor was noted in this boring.

Soil Analytical Results

Analytical results for soil are presented in Table 1. Naphthalene was detected above cleanup level, at 12 feet bgs in the MW-12 soil boring. All other analytical results for all soil borings were below the most stringent cleanup level. DRO and GRO were detected in all samples collected from the soil borings, but at concentrations below the cleanup level. Various other PAHs were detected in samples, all at levels below cleanup levels. No FR-VOCs, other than naphthalene, were detected.

In various samples, the limit of detection (LOD) for 1,2-dibromoethane, benzene, and naphthalene exceeded the migration to groundwater cleanup level. Further discussion on LOD exceedances is provided in the Data Quality Review, provided as Attachment 4.

Groundwater Sampling

Groundwater sample concentrations were evaluated against the ADEC groundwater cleanup levels as stated in 18 AAC 75.345 Table C. Analytical results and all applicable cleanup levels for groundwater are presented in Table 2. Laboratory reports are provided in Attachment 4.

Groundwater elevation contours were calculated and are provided in Figure 6. Groundwater flow is to the southeast on the southern half of the site and to the northwest on the northern half of the site. Sampling results show that concentrations in groundwater are above cleanup levels in two separate areas of the site (Figure 7). On the northwest side of the site, at monitoring well MW-03, groundwater exceeds cleanup levels for DRO, 1-methylnapthelene, 2-methylnapthlene, naphthalene, and 1,2,4-trimethylbenzene. Further to the northwest, which is downgradient, DRO and naphthalene exceed cleanup levels in MW-12. On the southern side of the site, at MW-4R, DRO, 1-methylnaphthalene, naphthalene, 1,2,4-trimethylbenzene, benzene, and ethylbenzene exceed cleanup levels.

Other analytes which were detected at site wells but did not exceed cleanup levels include GRO, acenaphthene, fluoranthene, fluorene, 1,2-dichloroethane, 1,3,5-trimethylbenzene, cumene, n-butylbenzene, sec-butylbenzene, toluene, and xylenes.

Storm Water Sampling

Sample results for the storm drain system were evaluated against both the Water Quality Standards (WQS) listed in 18 AAC 70.020, and the ADEC groundwater cleanup levels in 18 AAC 75.345 Table C. The results are provided in Table 3. Water was observed in the storm drain system at a level similar to that of groundwater in the area. The storm drain system is likely in connection with groundwater, but this is not known for certain. If it is in connection with groundwater, it is not known if the storm drain system receives from or discharges to groundwater.

Sample results from the storm drain system indicate presence of GRO, DRO, and various PAH and VOC compounds. The only analyte which was above groundwater cleanup levels was naphthalene in SD-4, the southernmost storm drain location. This location is assumed to be an upgradient location since the discharge of the system is located to the north. The sample from SD-4 was also the only sample to exceeded WQS for total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH).

Laboratory Data Quality Review

The laboratory data quality review and ADEC laboratory data review checklists are provided in Attachment 4.

Based on the review completed on the laboratory sample delivery groups, no data were rejected.

All sample results are valid with data qualifiers assigned as necessary. All analytical data is considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants.

CONCLUSIONS AND RECCOMENDATIONS

Calculated groundwater flow at the site ranges from southeast to northwest. It is possible that confining layers in the soil surrounding the newly installed wells are causing groundwater elevation anomalies. Historically, groundwater flow at the site has been measured to flow to the northwest.

Impacted groundwater exists at the site in wells MW-3 and MW-12 on the northwest side of the site and at MW-4R at the south side of the site. Passive soil gas data and monitoring well sampling results indicate that impacts at MW-4R have not migrated off site. It is unclear if impacts observed at MW-12 are a result of migration from the OAFF site, as the analyte concentrations are not consistent. While DRO concentrations are similar between MW-12 and MW-3, concentrations of VOCs are orders of magnitude lower at MW-12. While the site of MW-12 is currently a grassy field, it has had other uses in the past. Additionally, the Andeavor petroleum storage area is located directly to the east.

Sampling results for the storm drain system are generally consistent with the land use from the surrounding area. It is not known if storm water drains are connected to groundwater, and if so, to

what extent. However, results from the storm drain samples differed from those of the nearest groundwater samples. Additionally, the only storm drain location which showed an exceedance of ADEC cleanup levels or WQS was from the upgradient location. These results suggest that the OAFF site is not contributing to impacts to the water with the storm drain system.

Ahtna recommends sampling of MW-1, MW-3, MW-4R, MW-10, MW-11, and MW-12 in 2020 to confirm sample results from 2019.

Sincerely,

Ahtna Engineering Services, LLC

Luke Hoffmann
Project Manager

Attachments:
1. Figures
2. Field Notes and Forms
3. Tables
4. Laboratory Reports, Data Quality Reviews & ADEC Laboratory Data Review Checklists
5. Survey Report
6. Passive Soil Gas Survey Report

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ATTACHMENT 1

FIGURES

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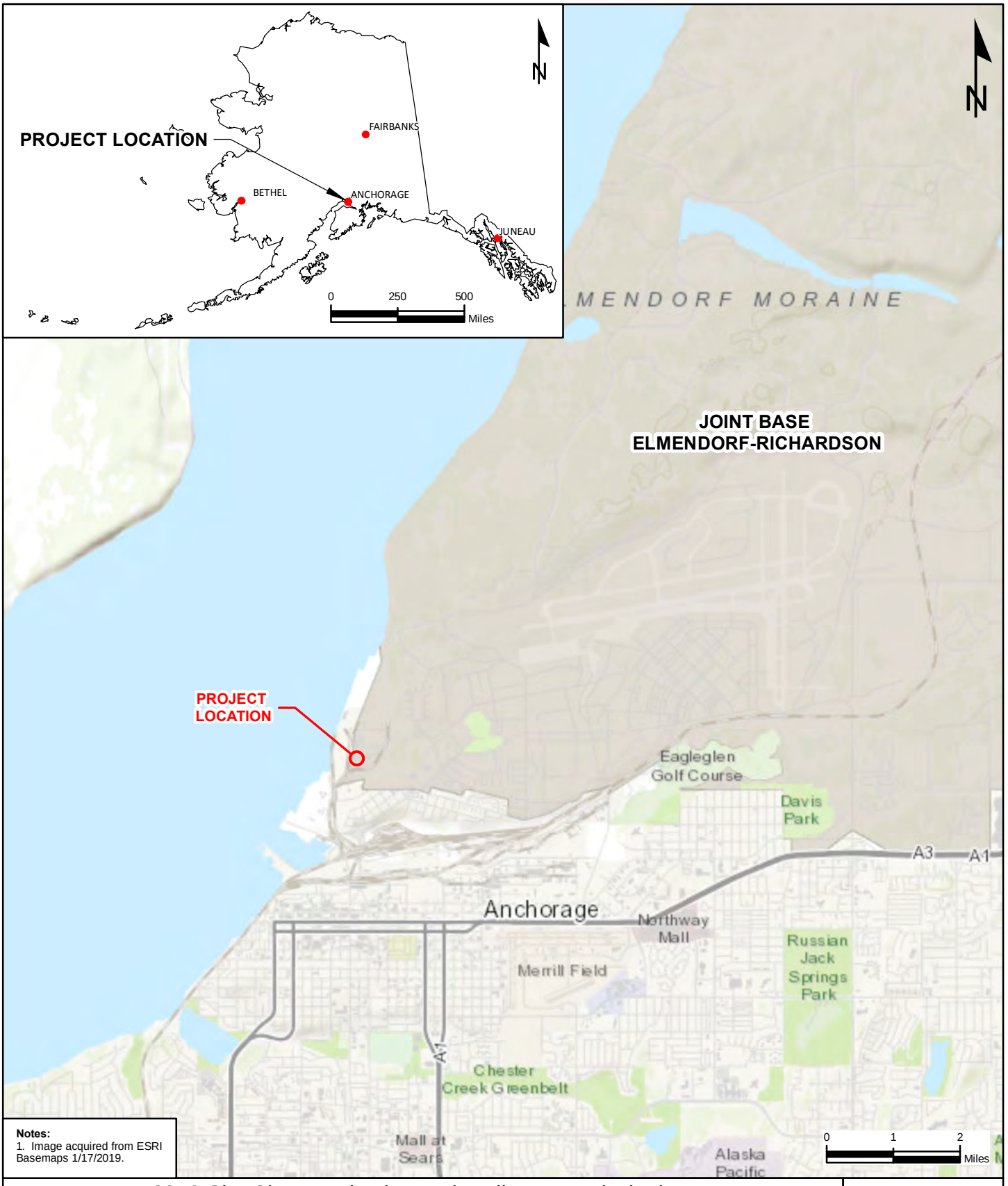

Notes:
1. Image acquired from ESRI Basemaps 1/17/2019.

2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Ahtna Engineering Services, LLC

State and Site Vicinity Maps

Project Number:	Figure Number:
20204.041	1
Date: 1/17/2020	
Drafted By: M.E.	

Prepared by mebert, 1/17/2020; H:\GIS DB\OAFF\F1AFSCSamplingReport2017.mxd

LEGEND

- MonitoringWell
- Decommissioned Monitoring Well

Notes:
1. All locations are approximate.
2. Image acquired from ESRI Basemaps 1/17/2020

2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Ahtna Engineering Services, LLC

Site Layout

Project Number:	Figure Number:
20204.041	2
Date: 1/21/2020	
Drafted By: M.E.	

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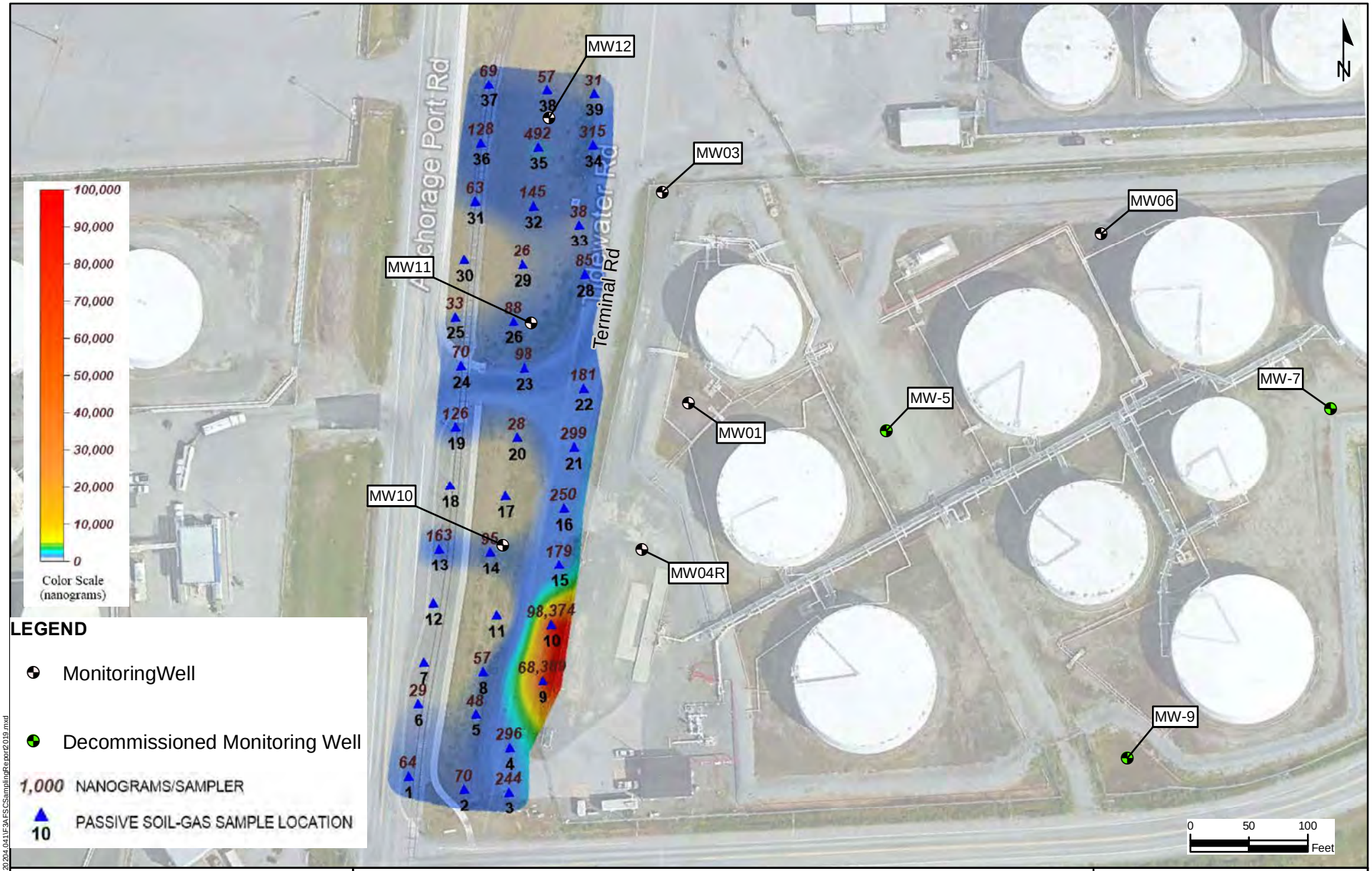


Notes:
1. All locations are approximate.
2. Image acquired from ESRI Basemaps 1/17/2020

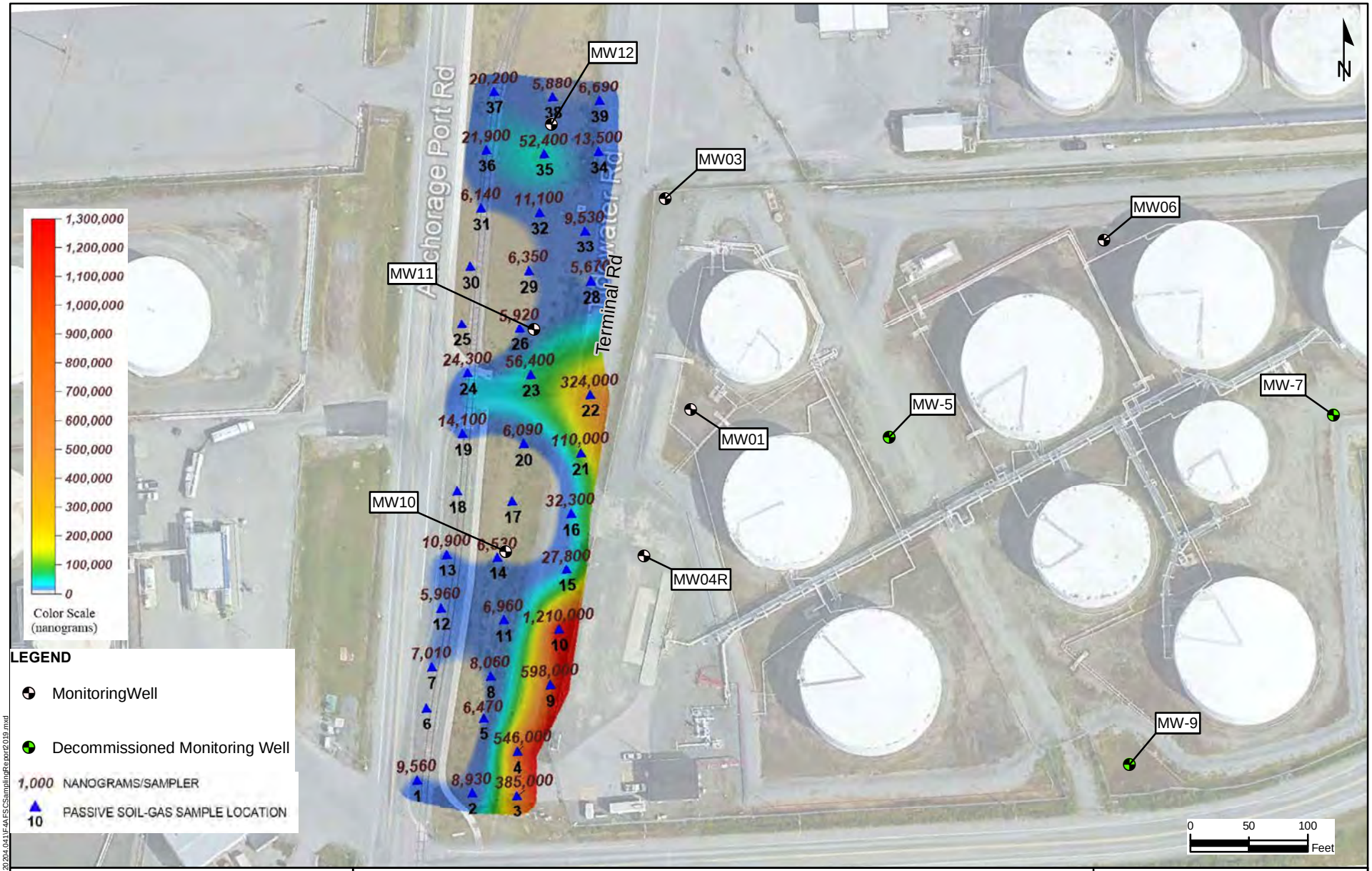
2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Passive Soil-Gas Survey
BTEX

Ahtna Engineering Services, LLC

Project Number:	Figure Number:
20204.041	3
Date: 2/5/2020	
Drafted By: M.E.	

Document Path: I:\Anchorage\20204\GIS\MXD\20204.041\FAFSCSamplingReport2019.mxd



LEGEND

- MonitoringWell
- Decommissioned Monitoring Well
- 1,000 NANOGRAMS/SAMPLER
- 10 PASSIVE SOIL-GAS SAMPLE LOCATION

Notes:
1. All locations are approximate.
2. Image acquired from ESRI Basemaps 1/17/2020

2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Passive Soil-Gas Survey
TPH C4-C9

Ahtna Engineering Services, LLC

Project Number:	Figure Number:
20204.041	4
Date: 2/5/2020	
Drafted By: M.E.	

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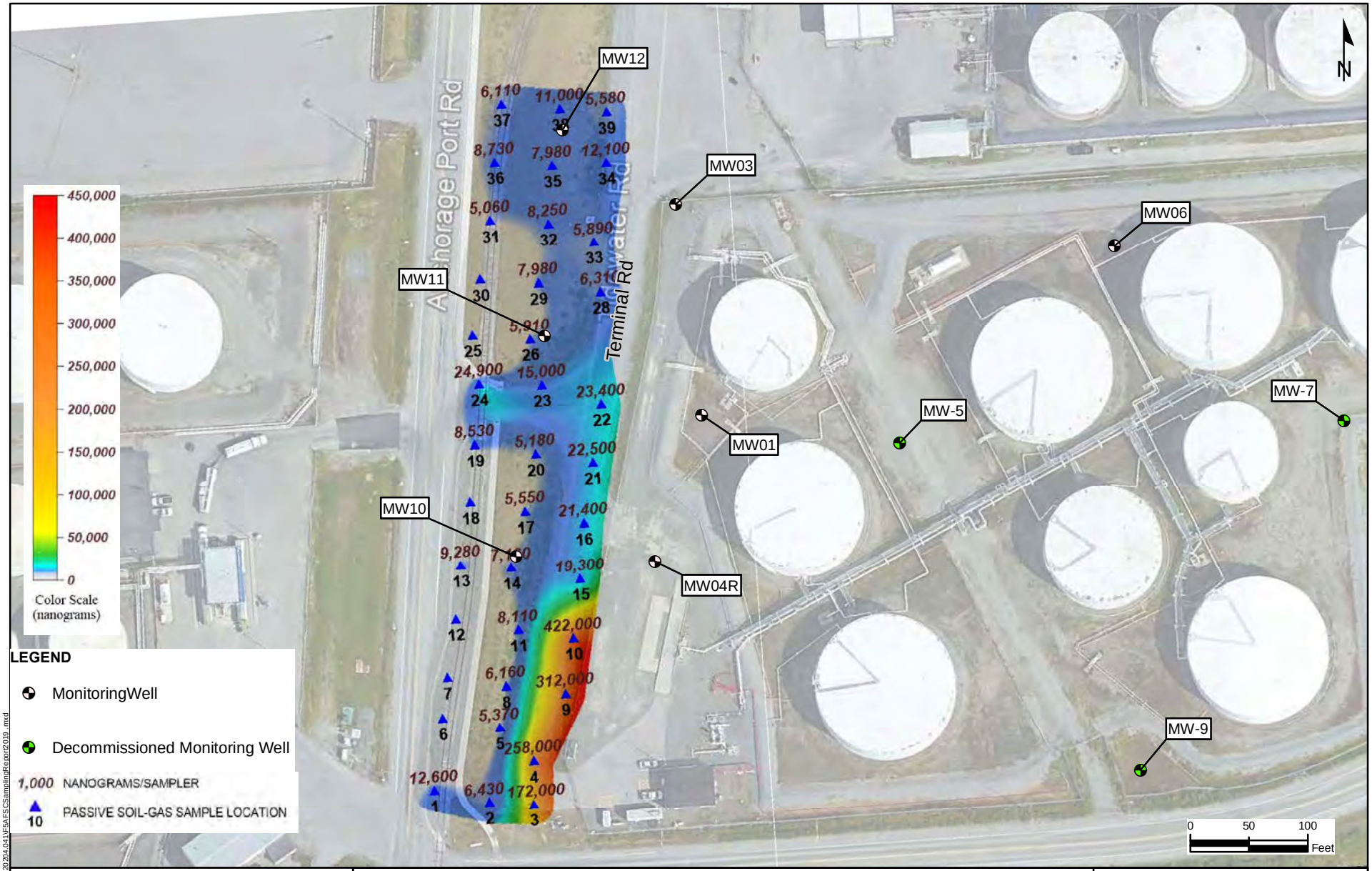

LEGEND

- MonitoringWell
- Decommissioned Monitoring Well
- 1,000 NANOGRAMS/SAMPLER
- 10 PASSIVE SOIL-GAS SAMPLE LOCATION

Notes:
1. All locations are approximate.
2. Image acquired from ESRI Basemaps 1/17/2020

2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Passive Soil-Gas Survey
TPH C10-C15

Ahtna Engineering Services, LLC

Project Number:	Figure Number:
20204.041	6
Date: 2/5/2020	
Drafted By: M.E.	

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Notes:
1. All locations are approximate.
2. Image acquired from ESRI Basemaps 1/17/2020

2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Ahtna Engineering Services, LLC

Groundwater Elevation Contours

Project Number:	Figure Number:
20204.041	6
Date: 2/4/2020	
Drafted By: M.E.	

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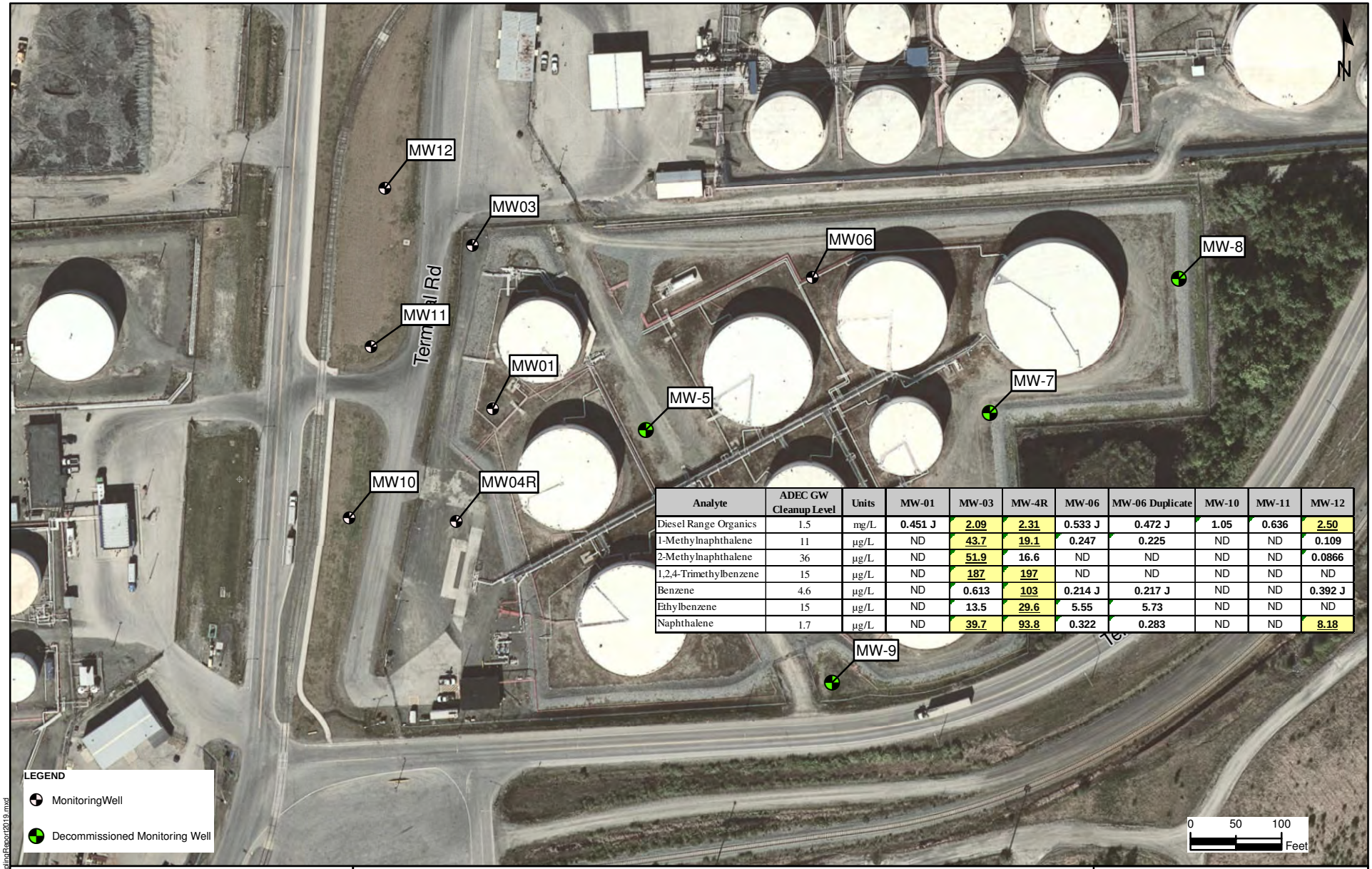

Analyte	ADEC GW Cleanup Level	Units	MW-01	MW-03	MW-4R	MW-06	MW-06 Duplicate	MW-10	MW-11	MW-12
Diesel Range Organics	1.5	mg/L	**0.451 J**	**2.09**	**2.31**	**0.533 J**	**0.472 J**	**1.05**	**0.636**	**2.50**
1-Methylnaphthalene	11	µg/L	ND	**43.7**	**19.1**	**0.247**	**0.225**	ND	ND	**0.109**
2-Methylnaphthalene	36	µg/L	ND	**51.9**	**16.6**	ND	ND	ND	ND	**0.0866**
1,2,4-Trimethylbenzene	15	µg/L	ND	**187**	**197**	ND	ND	ND	ND	ND
Benzene	4.6	µg/L	ND	**0.613**	**103**	**0.214 J**	**0.217 J**	ND	ND	**0.392 J**
Ethylbenzene	15	µg/L	ND	**13.5**	**29.6**	**5.55**	**5.73**	ND	ND	ND
Naphthalene	1.7	µg/L	ND	**39.7**	**93.8**	**0.322**	**0.283**	ND	ND	**8.18**

Notes:
1. All locations are approximate.
2. Image acquired from ESRI Basemaps 1/17/2020

ADEC - Alaska Department of Environmental Conservation
ND - analyte not detected
µg/L - micrograms per liter
mg/L - milligrams per liter

2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Sampling Locations and Analytical Results

Ahtna Engineering Services, LLC

Project Number:	Figure Number:
20204.041	7
Date: 1/21/2020	
Drafted By: M.E.	

Document Path: H:\GIS DB\OAFF\F7AFSCSamplingReport2019.mxd

Notes:
1. All locations are approximate.
2. Image acquired from ESRI Basemaps 1/17/2020

2019 Site Characterization and Well Decommissioning
AFSC Off-Airport Fuel Facility
Anchorage, AK

Ahtna Engineering Services, LLC

Storm Water Sample Locations

Project Number:	Figure Number:
20204.041	8
Date: 1/21/2020	
Drafted By: M.E.	

Document Path: H:\GIS DB\OAFF\FR&AFSC\SamplingReport2019.mxd

ATTACHMENT 2

FIELD NOTES AND FORMS

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A Golich
M Records

OAFF

8/12/19
Sunny

0730 On site at OAFF. Begin drilling locations for passive soil gas. Safety meeting conducted. Begin installation of passive soil gas samplers. Details of installation time are on chain of custody.

1215 Off site for lunch.

1700 back on site to finish installation

1500 Back at office. Installation finished.

AG

M Records
N Simmons

OAFF

8/29/19

1130 On-site at OAFF. Check in with security and conduct safety meeting.

1145 Begin removal of passive gas soil samplers

1300 off site for lunch.

1400 Back on site to finish removal of passive soil gas samplers.

1600 off-site and finished removal of passive soil gas samplers. Could not retrieve sample OAFF-19-SG-26.

Rite in the Rain

1000 Arrive at Anchorage Port. Check in w/ security. Meet Discovery Drilling

1010 Receive port pass. Drive to AFSC site.

1015 Check in at AFSC office. Discovery begins unloading equipment. Autumn Gould (AG) AES, calibrates PID.

1020 PID # PID06. Calibration w/ 100 ppm isobutylene gas.
~~zero~~ = 0.0 ppm
cal = 100.0 ppm
bump = 99.8 ppm
Calibration good.

1040 Conduct safety meeting w/ Driller (Coffi Makitele) & Laborer (Sol Vahoukelo) from Discovery drilling (See tailgate sheet).

1050 Begin ~~drilling~~ AG soil boring at MW-10 (#14).

1130 Soil bore down to 15' bgs. PID every 1-foot section. Call Alex Geilich for guidance on where to set well.

1140 Will set MW-10 ~~well~~ screen at 4'-14' bgs.

AMG 10/30/19

1145 Collect sample OAFF-19-MW-10-~~1.5~~ 2.0 at GW interface.

1150 Collect soil sample OAFF-19-MW-10-5.5 at highest PID reading (2.9 ppm) Required 2 x MeOH.

1155 Begin installing MW-10. Set screen from 4' bgs - 14' bgs. See MW installation form.

1240 Finished installing MW-10. Pack up equipment & move to MW-11 location.

1245 Drillers begin setting up to complete soil boring at MW-11 location.

1255 Begin direct point push soil boring at MW-11 location. See soil boring log.

1315 Collect sample OAFF-19-MW-11-3.5 ~~3.5~~ at GW interface. (where soil becomes moist

1320 Collect OAFF-19-MW-11-~~5.0~~ 5.5 at highest PID reading.

1330 Begin installing MW-11. Set screen from 3.5' bgs to 13.5' bgs. See MW installation form.

1350 Finished installing MW-11. Packing up & moving to MW-12 location.

10/30/19 AMG

10/30/19 OAFF A. Gould

1400 Arrive at MW-12 location. Drillers setting up to direct pointpush drill.

1410 Begin drilling at MW12 location.

1430 Collect soil sample OAFF-19-MW-12-4.0 (plus duplicate OAFF-19-MW-12-15)

1435 Collect soil sample OAFF-19-MW-12-11 at highest PID reading (10.4 ppm).

1440 Drillers begin installing MW-12. Screen set at 3.5' bgs to 13.5' bgs. See MW installation report. See soil boring log for lithology.

1510 Finished installing MW-12. Drillers begin packing up.

1530 Drillers packed up. Autumn Gould gets permission to leave 55-gal drum of soil cuttings along South side of AFSC building while soil samples are pending analysis.

1535 Stage 55-gal drum along AFSC building pending analysis.

1540 Autumn Gould & Discovery Drilling depart site.

1555 Arrive at Ahtna office. Begin labeling samples & preparing COC.

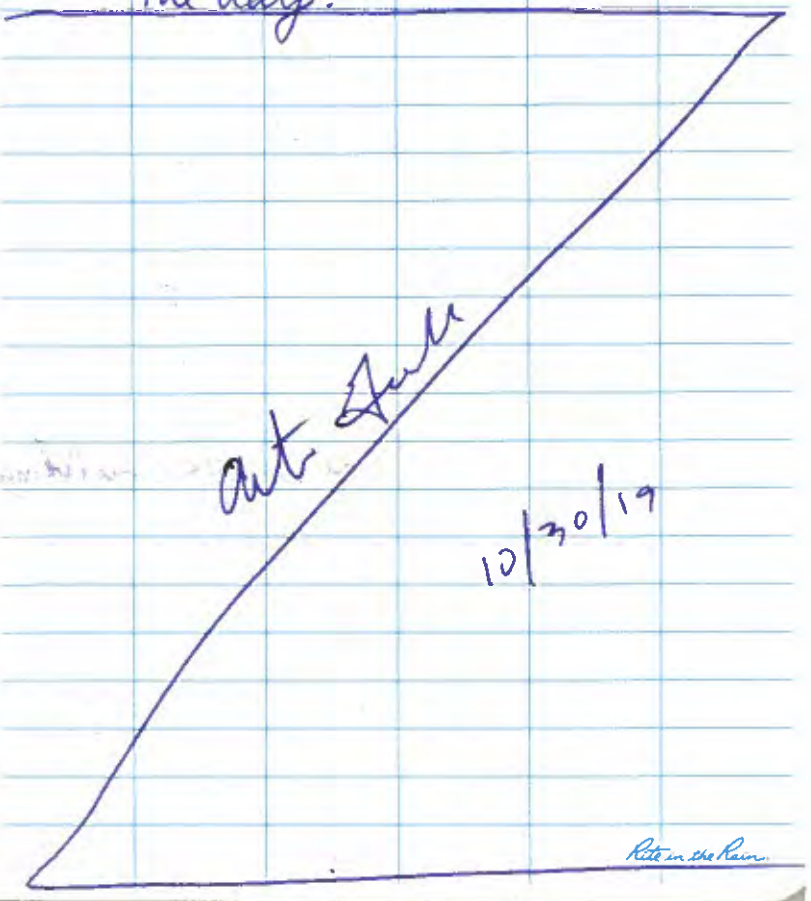
AMG 10/30/19

10/30/19 OAFF A. Gould

1630 Sample's labeled & COC made. Will deliver samples to SGS tomorrow (10/31/19). Samples will be held in an Ahtna sample fridge overnight.

1645 Depart Ahtna office for warehouse to drop off equipment.

1730 Back at Ahtna office. Done for the day.



0930 Arrive at OAFF w/ B Lenhart to decom wells. Check in w/ site personell and get hot work permit.

1010 Set up at MW-8. Dig down to expose secondary containment liner. Cut liner and then cut aluminum protective monument below liner. Pour bentonite down monitoring well casing and check depth as it is added. Add chips to just below liner. Unscrew top section of riser.

1050 Move to MW-7. Use same procedure as at MW-8 to decom well.

1125 Move to MW-9 which is outside of secondary containment area (wrong location depicted on map). Protective monument is able to be pulled out of ground. Pour bentonite chips in riser to ~6 in below ground surface. Unscrew top section of riser.

1145 Move to MW-5. Dig to liner, cut, then remove monument. Add bentonite to well casing, then remove riser.

1200 Talk to PEMCO. They are repairing cut liner at MW-8, MW-7, and MW-5

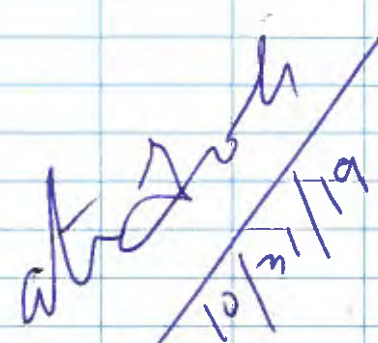
1215 Check out with OAFF personell, demob

AG

Rite in the Rain

12 10/31/19 OAFF A. Gould

1030 Deliver sample cooler to SGS. Done for the day.



10/31/19

10/31/19 OAFF A Gulick 13

0915 Arrive at OAFF to begin decommissioning of 4 wells. Sign in at office and meet PEMCO who will patch liner after it is cut for well removal.

0945 Begin work at MW-8. Attempt to pull protective monument out of ground with jack. Monument buried deeper than usual & jack fails to pull monument. Discuss with Laurie Butler (Menzies) and decide to cut monument below secondary containment liner. Due to fueling activities currently occurring, this task will need to wait when a Hot Work Permit can be issued. Decide to come back tomorrow morning to finish task.

1045 Leave site

AG

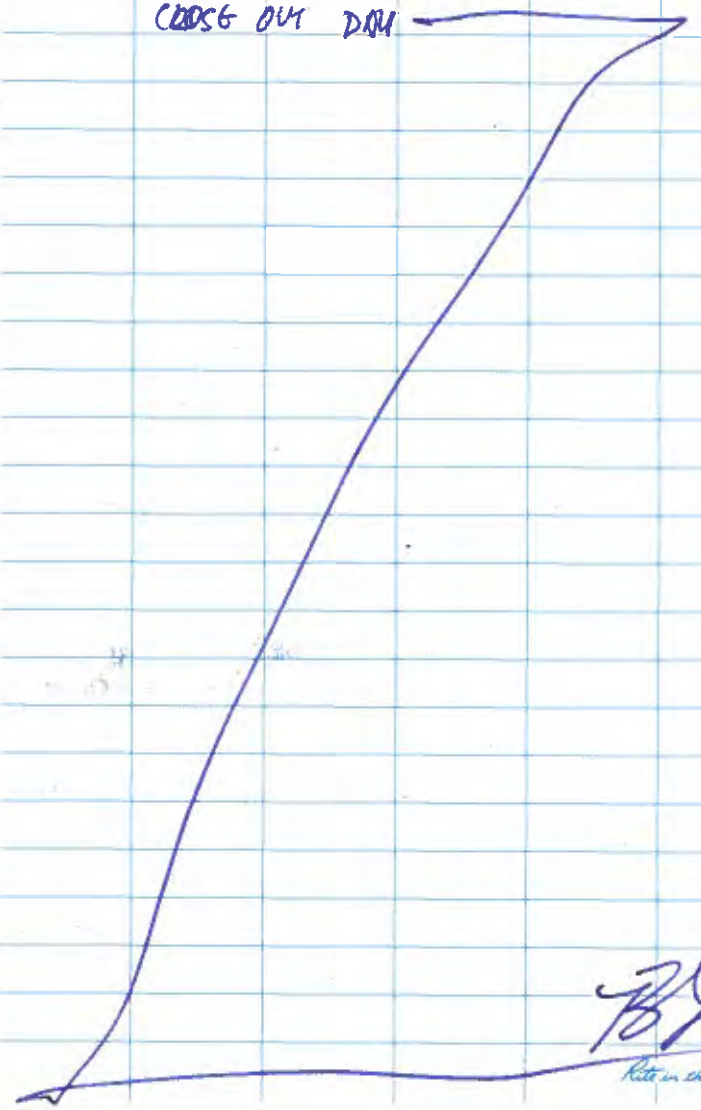
Rite in the Rain

11/15/19 OAFF

0830	BL AND MR LEAVE AHTNA OFFICE FOR UNITECH TO PICK UP 55 GALLON DRUM FOR PURGE WATER
0845	BL AND MR GO TO AHTNA WAREHOUSE TO COLLECT FIELD EQUIPMENT.
0915	BL AND MR DEPART FOR PORT OF ANCHORAGE
1028	BL AND MR CHECK IN WITH MENZIES PERSONELL
1045	BEGIN TO DEVELOP WELLS MW-10, MW-11 MW-12, SEE DEVELOPMENT LOGS FOR INFO
1135	BREAK FOR LUNCH AND TO GET CRESENT WRENCH TO OPEN PURGE WATER DRUM
1245	RETURN TO SITE AND CONTINUE DEVELOPING WELLS
1410	COLLECT OAFF-19-SD-1 AT NORTHERNMOST STORM DRAIN FOR VOC, DRO, GRO, PAH
1420	COLLECT DUPLICATE SAMPLE OAFF-19-SD-2 AT NORTHERNMOST STORM DRAIN
1450	COLLECT OAFF-19-SD-3 AT MIDDLE STORM DRAIN FOR VOC, GRO, DRO, PAH.
1510	COLLECT OAFF-19-SD-4 AT SOUTHERN STORM DRAIN FOR VOC, GRO, DRO, PAH
1525	CONTINUE DEVELOPING WELLS MW-10, MW-11, MW-12 AS THEY CONTINUE TO RUN DRY

1600	PUT PURGE DRUM WITHIN FENCE AND SIGN OUT WITH MENZIES STAFF. HEADING TO OFFICE TO REFRIDGERATE SAMPLES

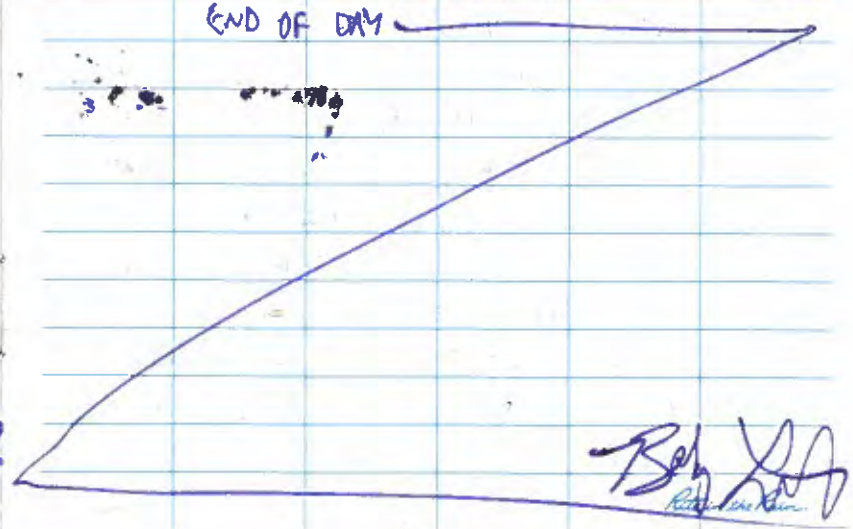
CLOSE OUT DAY



0815	BL AND MR DEPART OFFICE
1025	ACQUIRE SNOW SHOVEL FROM HOME DEPOT FOR NEWLY ACCUMULATED SNOW
1040	DEPART FOR PORT
1100	ARRIVE AT PORT AND CHECK IN W/ SECURITY AND MENZIES PERSONELL
1108	BEGIN COMPLETING DEVELOPING WELLS FROM LAST WEEK, STARTING AT MW-10.
1140	MW-12 IS CONSIDERED DEVELOPED AFTER 5 WELL VOLUMES ARE PURGED, WELL IS PURGED DRY WILL RETURN TOMORROW AFTER 80% RECHARGE TO COLLECT SAMPLE.
1200	BREAK FOR LUNCH
1300	MW-10 DEVELOPED W/ 5 WELL VOLUMES PURGED, WELL IS PURGED DRY, WILL RETURN TOMORROW AFTER 80% RECHARGE TO COLLECT SAMPLE.
1310	MW-11 DEVELOPED W/ 5 WELL VOLUMES PURGED. WELL IS PURGED DRY. WILL RETURN TOMORROW AFTER 80% RECHARGE TO SAMPLE
1330	SEARCH FOR WELLS TO SAMPLE WILL RETURN W/ SURVEYOR FOR ONES THAT CANNOT BE FOUND
1400	GET LET THROUGH GATE TO ACCESS MW-6

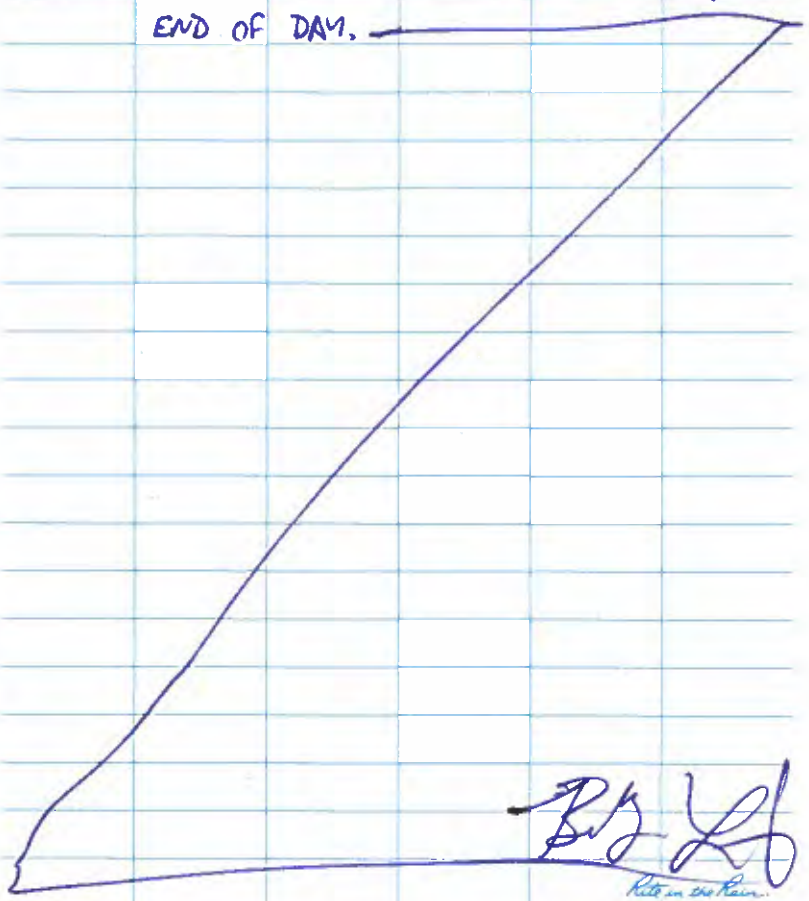
1425	BEGIN PURGING MW-6
1510	COLLECT SAMPLE OAFF-19-MW-06 FOR GRO, DRO, VOCs, PAH
1515	COLLECT DUPLICATE SAMPLE OAFF-19-MW-60 FOR GRO, DRO, VOCs, PAH
1530	CHECK ON ABANDONED WELL SPOTS. MW-7 HAD LINER SHOWING, SURROUNDING FILL KICKED IN HOLE
1600	START SETTING UP ON MW-3
1625	BEGIN PURGING MW-3
1650	COLLECT OAFF-19-MW-03 FOR GRO, DRO, VOCs, PAH
1710	PACK UP FIELD GEAR AND CHECK OUT W/ MENZIES PERSONNEL.
1735	ARRIVE AT OFFICE, REFRIGERATE SAMPLES

END OF DAY



0830	DEPART OFFICE TO PICK UP ADDITIONAL FIELD MATERIALS FROM WAREHOUSE
0850	COLLECT BUCKETS AND TOOLS FROM WAREHOUSE, MAGNETIC LOCATOR IS IN FAIRBANKS,
0915	ARRIVE AT ITT AND RENT METAL DETECTOR
0945	ARRIVE AT PORT AND CHECK IN W/ SECURITY AND MENZIES PERSONNEL. SEARCH FOR MW-4R W/ METAL DETECTOR.
1036	BEGIN SETTING UP ON MW-4R
1102	BEGIN PURGING MW-4R
1125	COLLECT SAMPLE OAFF-19-MW-4R FOR GRO, DRO, VOCs, PAH
1140	BEGIN SETTING UP ON MW-1
1156	BEGIN PURGING MW-1
1215	COLLECT SAMPLE OAFF-19-MW-01 FOR GRO, DRO, VOCs, PAH
1230	BREAK FOR LUNCH
1315	CHECK IN WITH PORT SECURITY
1340	COLLECT OAFF19-MW-11 FOR GRO, DRO, VOCs, PAH. SINCE WELL WAS PURGED DRY YESTERDAY, WAITED FOR 80% RECHARGE AND SAMPLED
1410	COLLECT OAFF-19-MW-12 FOR GRO, DRO, VOCs, PAH. SINCE WELL WAS PURGED DRY YESTERDAY, WAITED FOR 80% RECHARGE AND SAMPLED

1500	COLLECT OAFF-19-MW-10 FOR GRO, DRO, VOCs, PAH. WELL WAS PURGED DRY YESTERDAY AND HAS BEEN ALLOWED TO RECHARGE OVER 24 HOURS. ONLY 60% RECHARGE OBTAINED.
1515	DRAW PURGE WATER INTO DRUM ON SITE AWAITING ANALYSIS
1540	ARRIVE AT OFFICE, UNLOAD SAMPLES, END OF DAY.



24-January-2020 AFSC OAFF PFAS Cold, Clear Mike Records

1100 Arrived @ Port and checked in with security

1115 On-site @ AFSC and prepped ~~for~~ sampling

30 Collected soil sample 19-OAFF-Soil-PFAs

145 Collected water sample 19-OAFF ~~Soil~~ MKR Water-PFAs

200 closed drums, cleaned up, checked out, and off-site

Mike Records
24-January-2020

SOIL BORING LOG

Boring Number: MW-10
Project Number: 20204.041

Project Name 2019 Site Characterization
Site OAFF
Client Menzies Aviation
Field Scientist/Engineer Autumn Gould
Date 10/30/2019
Weather Partly sunny
Total Depth 15 feet

Recovery Device
Device Diameter N/A
# of Samples 2
Drilling Company Discovery Drilling
Rig Type Geoprobe 6610
Boring Size 4.5 -inch

X/Y Coordinates 2643005.6/1660235.91
X/Y Datum AK State Plane Zone 4
Ground Elevation 26.9
Elevation Datum NAVD88
Extra Field Notes:
Top of Casing Eleveation: 26.67 feet

PID (ppm) In-Situ /Headspace	ANALYTICAL SAMPLES	WATER LEVEL	DEPTH (ft)	SOIL GRAPHIC	SOIL DESCRIPTION AND NOTES	WELL GRAPHIC	WELL DESCRIPTION
			0				
0					(NO CORE); no recovery..		10/20 Sand backfill
0					Brown; dry; top soil.		
	OAFF-19-MW-10-2.0				SILTY SAND WITH GRAVEL (SM); dark gray to dark brown; dry; no odor.		Hydrated bentonite seal
0					(SM); dark gray; no odor.		
0							
0					CLAY WITH WITH INTERBEDDED SANDY SILT LAYERS. (CL); dark gray; no odor; with interbedded sandy silt layers..		
			5				
2.9	OAFF-19-MW-10-5.5				CLAY WITH INTERBEDDED ORGANICS (CH); gray; organic odor.		
0.8							
0					CLAY WITH INTERBEDDED GRAVEL LENSES (CL); gray; no odor.		10/20 Sand filter pack
0							Well Screen
0.1					SILTY SAND WITH GRAVEL (SM); dark brown; dry; slight odor.		
			10		(NO CORE); No recovery.		
0					CLAY (CL); dark gray; moist; no odor.		
0							
0							
0							
0.1			15		CLAY WITH INTERBEDDED ORGAINCS (WOOD) (CL); dark gray; no odor.		

End of Boring: 15 feet bgs.

Ahtna Engineering Services, LLC

SOIL BORING LOG

Boring Number: MW-11
Project Number: 20204.041

Project Name 2019 Site Characterization
Site OAFF
Client Menzies Aviation
Field Scientist/Engineer Autumn Gould
Date 10/30/2019
Weather Partly sunny
Total Depth 15 feet

Recovery Device
Device Diameter N/A
# of Samples 2
Drilling Company Discovery Drilling
Rig Type Geoprobe 6610
Boring Size 4.5 -inch

X/Y Coordinates 2643191.62/1660271.51
X/Y Datum AK State Plane Zone 4
Ground Elevation 27.2
Elevation Datum NAVD88
Extra Field Notes:
Top of Casing Eleveation: 26.89 feet

PID (ppm) In-Situ /Headspace	ANALYTICAL SAMPLES	WATER LEVEL	DEPTH (ft)	SOIL GRAPHIC	SOIL DESCRIPTION AND NOTES	WELL GRAPHIC	WELL DESCRIPTION
			0				
					(NO CORE); no recovery.		10/20 Sand backfill
0					Dark brown; no odor; top soil.		Hydrated bentonite seal
0					SANDY SILT WITH GRAVEL (SM); dark brown; dry; no odor.		
0.2	OAFF-19-MW-11-3.5				SILTY SAND WITH GRAVEL (SM); dark brown; dry; no odor.		
0					SAND WITH GRAVEL (SW); dark gray; moist; no odor.		
			5				
0					(NO CORE); no recovery.		
0					CLAY WITH ORGANICS (WOOD) (CL); dark gray; moist; no odor.		
0.3							
0.5	OAFF-19-MW-11-8.5				CLAY WITH ORGANICS (WOOD) (CL); dark gray; no odor.		10/20 Sand filter pack Well Screen
0.3					CLAY WITH ORGANICS (WOOD) (CL); dark gray; slight fuel odor.		
			10				
0.1					CLAY WITH ORGANICS (WOOD) (CL); no odor; with silty sand layer..		
0							
0					CLAY (CL); gray; moist; no odor.		
0							
0							
			15				

End of Boring: 15 feet bgs.

SOIL BORING LOG

Boring Number: MW-12
Project Number: 20204.041

Project Name 2019 Site Characterization
Site OAFF
Client Menzies Aviation
Field Scientist/Engineer Autumn Gould
Date 10/30/2019
Weather Partly sunny
Total Depth 15 feet

Recovery Device Macro Core
Device Diameter N/A
# of Samples 3
Drilling Company Discovery Drilling
Rig Type Geoprobe 6610
Boring Size 4.5 -inch

X/Y Coordinates 2643364.26/1660297.1
X/Y Datum AK State Plane Zone 4
Ground Elevation 28.6
Elevation Datum NAVD88
Extra Field Notes:
Top of Casing Eleveation: 28.26 feet

PID (ppm) In-Situ /Headspace	ANALYTICAL SAMPLES	WATER LEVEL	DEPTH (ft)	SOIL GRAPHIC	SOIL DESCRIPTION AND NOTES	WELL GRAPHIC	WELL DESCRIPTION
			0				
0					(NO CORE); no recovery.		10/20 Sand backfill
0					Brown; dry; no odor; top soil..		Hydrated bentonite seal
0					SILTY SAND WITH GRAVEL (SM); dark gray; dry; no odor.		
0					SAND WITH SILT (SM); dark gray; dry; no odor.		
0	OAFF-19-MW-12-15				SILTY SAND WITH GRAVEL (SM); dark gray; dry; no odor.		
0	OAFF-19-MW-12-4.0		5		SAND WITH GRAVEL (SW); dark gray; dry; no odor.		
0.1					CLAY WITH INTERMIXED OGANICS (ROOTS AND WOOD) (CL); dark gray; no odor.		
0							
0							
0							10/20 Sand filter pack
0							Well Screen
0			10		CLAY WITH INTERBEDDED SAND AND GRAVEL (CL); dark gray; moist; no odor.		
0	OAFF-19-MW-12-11						
0.4					CLAY WITH INTERBEDDED SAND AND GRAVEL (CL); dark gray; moist; no odor.		
0.3							
0							
0			15		CLAY (CL); dark gray; moist; no odor.		

End of Boring: 15 feet bgs.

Ahtna Engineering Services, LLC

WELL DEVELOPMENT LOG

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-10

SHEET: 1 of 1

PROJECT NAME	OAFF FALL 2019	PUMP TYPE	bailer
CLIENT	MENZIES AVIATION	DEPTH TO WATER (FROM TOC)	5.41 ft
DATE	11/15/19	DEPTH TO BASE (FROM TOC)	13.39 ft
SITE	FUEL FACILITY	HEIGHT OF WATER COLUMN	7.98 ft
GEOLOGIST	Records, Lenhart	WELL VOLUME	(7.98 ft)(0.17 gal/ft) = 1.36 gal
WEATHER/ TEMPERATURE	mostly cloudy 35 F	TOTAL WATER TO PURGE	6.8 gal
WIND	5 mph N	DECON PROCEDURE	alconox + DI + dedicated bailer

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
2"	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66
6"	6.625"	6.065"	1.50
8"	8.625"	7.981"	2.60

FIELD WATER QUALITY PARAMETERS

Time	Purged Volume (gal)	Water Level	Odor	Appearance	Other Notes
1045	0	5.41'	none	brown	Purging began
1105	3.5	13.39'	none	brown	purged dry, 1hr to recover.
1330	3.7	12.36'	none	gray	purged dry, 1hr to recover.
1525	3.9	12.42'	NONE	gray	purged dry, 1hr to recover.
1105 11/18/19	6.4	6.19'	none	light gray	purged dry, 1hr to recover.
1300	6.8 ✓	11.75	none	light gray	5 well volumes purged

Additional Notes:

well surged for 10 minutes prior to purging.

development complete once 5 well volumes of water removed

Ahtna Engineering Services, LLC

WELL DEVELOPMENT LOG

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-11

SHEET: 1 of 1

PROJECT NAME	AFF FALL 2019
CLIENT	MENZIES AVIATION
DATE	11/15/19
SITE	FUEL FACILITY
GEOLOGIST	Records, Lenhart
WEATHER/ TEMPERATURE	mostly cloudy, 35 F
WIND	5 mph N
PUMP TYPE	bailer
DEPTH TO WATER (FROM TOC)	2.85 ft
DEPTH TO BASE (FROM TOC)	11.36 ft
HEIGHT OF WATER COLUMN	8.51 ft
WELL VOLUME	(8.51 ft)(0.17 gal/ft) = 1.45 gal
TOTAL WATER TO PURGE	7.3 gal
DECON PROCEDURE	alconox + DI + dedicated bailer

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
2"	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66
6"	6.625"	6.065"	1.50
8"	8.625"	7.981"	2.60

FIELD WATER QUALITY PARAMETERS

Time	Purged Volume (gal)	Water Level	Odor	Appearance	Other Notes
1125	0	2.85'	organic	gray	purging begun
1145	2.5	11.36'	organic	gray	purged dry, left to recover
1335	3.2	9.18'	organic	gray	purged dry, left to recover
1530	3.8	8.40	organic	gray	purged dry, left to recover
1122 11/18/19	6.8	3.10'	organic	light brown	purged dry, left to recover
1310	7.3	7.68'	organic	light brown	5 well volumes purged

Additional Notes:

well surged for 10 min prior to purging/

development complete once 5 well volumes of water removed

Ahtna Engineering Services, LLC

WELL DEVELOPMENT LOG

PROJECT NUMBER: 20204.044

WELL NUMBER: MW-12

SHEET: 1 of 1

PROJECT NAME	OAFF FALL 2019	PUMP TYPE	bailer
CLIENT	MENZIES AVIATION	DEPTH TO WATER (FROM TOC)	5.66 ft
DATE	11/15/19	DEPTH TO BASE (FROM TOC)	11.20 ft
SITE	FUEL FACILITY	HEIGHT OF WATER COLUMN	5.54 ft
GEOLOGIST	Records, Lenhart	WELL VOLUME	(5.54)(0.17) = 0.94 gal
WEATHER/ TEMPERATURE	mostly cloudy, 35 F	TOTAL WATER TO PURGE	4.71 gal
WIND	5 mph N	DECON PROCEDURE	alconox + DI + dedicated bailer

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66
6"	6.625"	6.065"	1.50
8"	8.625"	7.981"	2.60

FIELD WATER QUALITY PARAMETERS

Time	Purged Volume (gal)	Water Level	Odor	Appearance	Other Notes
1315	0	5.66'	organic	gray	purging begun
1325	1.5	11.20'	organic	gray	purged til dry, left to recharge
1350	3.8	7.76'	organic	gray	purged til dry, left to recharge
1535	3.8	6.09'	organic	gray	purged til dry, left to recharge
1140 11/18/19	4.7 ✓	5.33'	organic	gray	5 well volumes purged

Additional Notes: well surged for 10 min prior to purging
development complete once 5 well volumes of water removed

Ahtna Engineering Services, LLC

GROUNDWATER SAMPLING FORM

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-1

SHEET: 1 of 1

PROJECT NAME	OAFF FALL 2019
CLIENT	MENZIES AVIATION
DATE	11/19/19
AOC	FUEL FACILITY
SCIENTIST	Records, Lenhart
WEATHER/ TEMPERATURE	Snowing
WIND	N 5 mph
WELL CONDITION	good
DAMAGE PRESENT	none
DEPTH TO BASE (FROM TOC)	19.95'
DEPTH TO WATER (FROM TOC)	1.79'
HEIGHT OF WATER COLUMN	18.2'
WELL VOLUME	6.9 gal
3 WELL VOLUMES	20.7 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
~~2"~~ MW	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

DEPTH OF PUMP INTAKE: ~1 ft below water surface

SAMPLE COLLECTED WITH: __ Bailer; ✓ Pump, Type: Gedder; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI w/ dedicated tubing

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) free product, orange color, POL odor

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[c]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1156		250	1.72	0.00	3.3	2,067	2.50	6.10	120.6	—	orange	Petroleum
1200			1.98		4.8	1910	0.71	6.59	124.1	—	"	"
1204			2.35		5.6	1454	0.33	~~5.97~~ 6.04	121.1	—	"	"
1208			2.59		5.6	1465	0.28	6.69	119.4	—	"	"
1212			2.78		4.8	1457	0.37	6.68	120.9	—	"	"
						✓		✓	✓			

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
OAFF-19-MW-01	1215	(DRO) RRO (GRO) BTEX (PAH) (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes: turbidity not measured, ~~filled~~ used three 250 ml jars w/ HCl, and one 250 ml jar w/o preservative

Ahtna Engineering Services, LLC

GROUNDWATER SAMPLING FORM

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-3

SHEET: 1 of 1

PROJECT NAME	OAFF FALL 2019	WELL CONDITION	Good
CLIENT	MENZIES AVIATION	DAMAGE PRESENT	No
DATE	11/18/19	DEPTH TO BASE (FROM TOC)	14.72'
AOC	FUEL FACILITY	DEPTH TO WATER (FROM TOC)	3.45'
SCIENTIST	Records & Lenhart	HEIGHT OF WATER COLUMN	11.27'
WEATHER/ TEMPERATURE	cloudy, 33	WELL VOLUME	(0.17)(11.27) = 1.9 gal
WIND	calm	3 WELL VOLUMES	5.7 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

DEPTH OF PUMP INTAKE: ~1 ft below water surface

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: Bladder; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: alconox+DI w/ dedicated tubing

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) light gray w/ POL odor

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[c]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1625		250	3.45'	0.00	6.2	274.7	1.15	6.8	-35.5	—	clear/light gray	petroleum
1629		250	3.48'	0.03	7.1	317.9	0.57	6.55	-30.8	—	light gray	petroleum
1633		250	3.51'	0.06	7.3	377.9	0.44	6.43	-31.3	—	light gray	petroleum
1637		250	3.51'	0.06	7.3	424.9	0.37	6.42	-36.4	—	light gray	petroleum
1641		250	3.51'	0.06	7.3	431.4	0.33	6.43	-40.0	—	"	"
1645		250	3.51'	0.06	7.3	444.8	0.35	6.43	-42.4	—	"	"
1649		250	3.51'	0.06	7.3	456.5	0.34	6.44	-44.5	—	"	"
~~1654~~							✓	✓	✓			

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
OAFF-19-MW-03	1650	(DRO) RRO (GRO) BTEX (PAH) (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes: Turbidity not read

Ahtna Engineering Services, LLC

GROUNDWATER SAMPLING FORM

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-41R

SHEET: 1 of 1

PROJECT NAME: OAFF FALL 2019
CLIENT: MENZIES AVIATION
DATE: 11/19/19
AOC: FUEL FACILITY
SCIENTIST: Records & Leonhart
WEATHER/ TEMPERATURE: Snowing
WIND: N 5 mph

WELL CONDITION: good
DAMAGE PRESENT: none
DEPTH TO BASE (FROM TOC): 13.55'
DEPTH TO WATER (FROM TOC): 1.44'
HEIGHT OF WATER COLUMN: 12.11'
WELL VOLUME: 2.1 gal
3 WELL VOLUMES: 6.3 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

DEPTH OF PUMP INTAKE: ~1 ft below water surface

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: bladder; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI w/ dedicated tubing

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) light brown w/ PO odor

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[C]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1102		250	1.44	0.00	4.9	1016	2.45	5.15	176	—	light brown	petroleum
1106		250	1.44	0.00	6.0	970	3.43	6.07	47.5	—	"	"
1110		250	1.44	0.00	6.1	968	3.42	6.24	27.5	—	"	"
1114		250	1.44	0.00	6.2	972	3.43	6.34	14.3	—	"	"
1118		250	1.44	0.00	6.2	977	3.23	6.36	10.4	—	"	"
1122		250	1.44	0.00	6.2	977	3.37	6.38	8.5	—	"	"
						✓	✓	✓				

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
OAFF-19-MW-41R	1125	(DRO) RRO (GRO) BTEX (PAH) (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes: turbidity not measured

Ahtna Engineering Services, LLC

GROUNDWATER SAMPLING FORM

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-6

SHEET: 1 of 1

PROJECT NAME	OAFF FALL 2019
CLIENT	MENZIES AVIATION
DATE	11/18/19
AOC	FUEL FACILITY
SCIENTIST	Records & Leyhart
WEATHER/ TEMPERATURE	PARTLY CLOUDY, 35° F
WIND	calm
WELL CONDITION	FAIR
DAMAGE PRESENT	FROST JACK
DEPTH TO BASE (FROM TOC)	13.05
DEPTH TO WATER (FROM TOC)	3.16'
HEIGHT OF WATER COLUMN	9.89'
WELL VOLUME	1.68 gal
3 WELL VOLUMES	5.04 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

DEPTH OF PUMP INTAKE: ~1 ft below water surface

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: BLADDER; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: ALCONOX & DI w/ DEDICATED TUBING

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear, no odor

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[C]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1432		250	3.15	-0.01	4.2	453.0	1.83	6.72	53.1	—	CLEAR	NONE
1436		250	3.15	-0.01	4.7	527.6	1.11	6.77	-2.7	—	CLEAR	NONE
1440		250	3.15	-0.01	5.0	574.8	~~0.91~~	6.81	-15.9	—	CLEAR	NONE
1444		250	3.15	-0.01	5.1	625.6	0.69	6.83	-26.4	—	CLEAR	NONE
1448		250	3.15	-0.01	5.2	654.2	0.87	6.84	-32.6	—	CLEAR	NONE
1452		250	3.15	-0.01	5.1	689.0	0.78	6.84	-36.8	—	CLEAR	NONE
1456		250	3.15	-0.01	5.2	709.9	0.61	6.84	-41.7	—	CLEAR	NONE
1500		250	3.15	-0.01	5.2	720.7	0.51	6.84	-44.4	—	CLEAR	NONE
1504		250	3.15	-0.01	5.2	730.5	0.51	6.84	-46.9	—	CLEAR	NONE
						✓		✓	✓			

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
OAFF-19-MW-06	1510	(DRO) RRO (GRO) BTEX (PAH) (VOCs) PEST HERB
OAFF-19-MW-60	1515	(DRO) RRO (GRO) BTEX (PAH) (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes: TURBIDITY NOT READ DUPLICATE TAKEN

Ahtna Engineering Services, LLC

GROUNDWATER SAMPLING FORM

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-10

SHEET: 1 of 1

PROJECT NAME: OAFF FALL 2019
CLIENT: MENZIES AVIATION
DATE: 11/19/19
AOC: FUEL FACILITY
SCIENTIST: Records, Lenhart
WEATHER/ TEMPERATURE: overcast rain/snow showers
WIND: North 10 Mph

WELL CONDITION: good
DAMAGE PRESENT: none
DEPTH TO BASE (FROM TOC): 13.39'
DEPTH TO WATER (FROM TOC): 8.40'
HEIGHT OF WATER COLUMN: 4.99'
WELL VOLUME: 0.85 gal
3 WELL VOLUMES: 2.5 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
2"	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

DEPTH OF PUMP INTAKE: ~1 ft below top of water

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: bladder; __ Other, Specify:

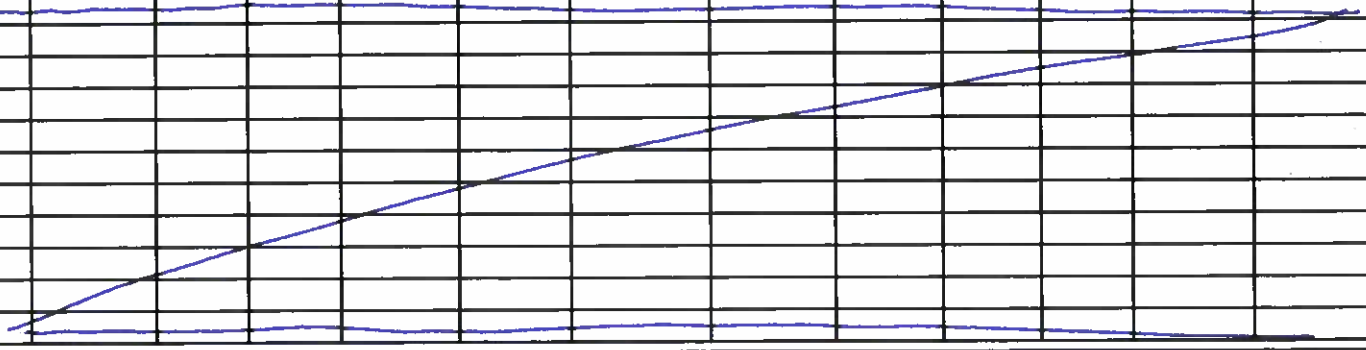
MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: alconox + DI w/ dedicated tubing

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity): yellow, no odor

FIELD WATER QUALITY PARAMETERS

Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Stabilization Requirements (3 must be stable) Spec. Cond. (µS/cm)[c] 3%	D.O. (mg/L) 10%	pH 0.1	ORP (mV) 10 mV	Turbidity (NTU) 10%	Color	Odor



ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
OAFF-19-MW-10	1500	DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes:

~~turbidity not~~ MR measured

Sampling performed after well development on 11/15 - 11/18 and allowed to recover. Recovery not to 80% but not realistic to wait longer due to impending freezing.

Only used one 250 ml jar w/ HCl, instead of the

Ahtna Engineering Services, LLC

GROUNDWATER SAMPLING FORM

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-11

SHEET: 1 of 1

PROJECT NAME	OAFF FALL 2019
CLIENT	MENZIES AVIATION
DATE	11/19/19
AOC	FUEL FACILITY
SCIENTIST	Reed, Lenhart
WEATHER/ TEMPERATURE	freezing rain
WIND	10 mph N
WELL CONDITION	Good
DAMAGE PRESENT	None
DEPTH TO BASE (FROM TOC)	11.36 ft
DEPTH TO WATER (FROM TOC)	3.06'
HEIGHT OF WATER COLUMN	8.3'
WELL VOLUME	1.4 gal
3 WELL VOLUMES	4.2 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

DEPTH OF PUMP INTAKE: ~1 ft below water surface

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: bladder; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: alconox and DI w/ dedicated tubing

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear, no odor

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[C]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
											Clr	

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
OAFF - ~~MW~~ 19 - MW-11	1340	(DRO) RRO (GRO) BTEX (PAH) (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes: sampling performed after well developed on 11/15-11/18, and allowed to recover to 80% of initial wl

Ahtna Engineering Services, LLC

GROUNDWATER SAMPLING FORM

PROJECT NUMBER: 20204.041

WELL NUMBER: MW-12

SHEET: 1 of 1

PROJECT NAME	OAFF FALL 2019
CLIENT	MENZIES AVIATION
DATE	11/19/19
AOC	FUEL FACILITY
SCIENTIST	Lenhart, Records
WEATHER/ TEMPERATURE	freezing rain
WIND	North 8 mph
WELL CONDITION	good
DAMAGE PRESENT	none
DEPTH TO BASE (FROM TOC)	11.20'
DEPTH TO WATER (FROM TOC)	5.14'
HEIGHT OF WATER COLUMN	6.06'
WELL VOLUME	1.03 gal
3 WELL VOLUMES	3.1 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
2"	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

DEPTH OF PUMP INTAKE: ~1 ft below top of water

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: Hydra; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI w/ dedicated tubing

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) gray color, light organic odor

FIELD WATER QUALITY PARAMETERS

Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Stabilization Requirements (3 must be stable) Spec. Cond. (µS/cm)[c] 3%	D.O. (mg/L) 10%	pH 0.1	ORP (mV) 10 mV	Turbidity (NTU) 10%	Color	Odor

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
OAFF-19-MW-12	1410	(DRO) RRO (GRO) BTEX (PAH) (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes: MR ~~Turbidity not measured~~ Sampling performed after well developed on 11/15-11/18, and allowed to recover to 80% of initial WL.

ATTACHMENT 3

TABLES

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Table 1- Soil Analytical Results
AFSC OAFF 2019 Site Characterization and Well Decommissioning

			Soil Cell:	MW-10		MW-11		MW-12			Trip Blank
			Sample Name:	OAFF-19-MW-10-02	OAFF-19-MW-10-5.5	OAFF-19-MW-11-3.5	OAFF-19-MW-11-8.5	OAFF-19-MW-12-04	OAFF-19-MW-12-15	OAFF-19-MW-12-11	TB-10302019
			Date/Time Collected:	9/13/2019	9/13/2019	9/13/2019	9/13/2019	9/25/2019	9/27/2019	9/27/2019	9/27/2019
			Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	Human Health: 18AAC 75 Tables B1 and B2 Under 40" (mg/kg)	**Migration to Groundwater: 18AAC75 Tables B1 and B2 (mg/kg)**									
AK Fuel Methods AK101, AK102											
Gasoline Range Organics	1400	300	**1.15** B	**6.02** B	**1.12** B	**5.13** B	**1.08** B	**1.05** B	**1.58** B	**0.917** B
Diesel Range Organics	10250	250	**51.5**	**117**	**20.0** J	**216**	**17.5** J	**17.9** J	**34.2**	
PAH Method 8270D SIM LV											
1-Methylnaphthalene	68	0.41	0.068 U	0.027 U	0.0134 U	**0.0945**	0.0131 U	0.0132 U	**0.00967** J	-
2-Methylnaphthalene	310	1.3	0.068 U	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	**0.0091** J	-
Acenaphthene	4600	37	**0.0513** J	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Acenaphthylene	2300	18	0.068 U	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Anthracene	23000	390	**0.118** J	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Benzo(a)Anthracene	14	0.7	**0.28**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Benzo[a]pyrene	1.5	1.9	**0.29**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Benzo[b]Fluoranthene	15	20	**0.353**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Benzo[g,h,i]perylene	2300	15000	**0.18**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Benzo[k]fluoranthene	150	190	**0.122** J	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Chrysene	1500	600	**0.276**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Dibenzo[a,h]anthracene	1.5	6.3	**0.0444** J	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Fluoranthene	3100	590	**0.7**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	**0.00834** J	-
Fluorene	3100	36	**0.0442** J	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Indeno[1,2,3-c,d] pyrene	15	65	**0.161**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	0.0144 U	-
Naphthalene	29	0.038	0.0545 U	**0.0256** J	0.0107 U	0.0219 U	0.0105 U	0.0106 U	**0.311**	-
Phenanthrene	2300	39	**0.398**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	**0.00787** J	-
Pyrene	2300	87	**0.55**	0.027 U	0.0134 U	0.0273 U	0.0131 U	0.0132 U	**0.00765** J	-
Fuel Related VOC Method SW8260 C											
1,2,4-Trimethylbenzene	43	0.61	0.0323 U	0.175 U	0.0323 U	0.153 U	0.0306 U	0.0297 U	0.0465 U	0.025 U
1,2-Dibromoethane	0.42	0.00024	0.000645 U	0.0035 U	0.000645 U	0.00306 U	0.00061 U	0.000595 U	0.00093 U	0.0005 U
1,2-Dichloropropane	17	0.03	0.00129 U	0.007 U	0.00129 U	0.0061 U	0.00123 U	0.00119 U	0.00186 U	0.001 U
1,3,5-Trimethylbenzene	37	0.66	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	0.0232 U	0.0125 U
Benzene	11	0.022	0.00805 U	0.0437 U	0.00805 U	0.0382 U	0.00765 U	0.00745 U	0.0116 U	0.00625 U
Ethylbenzene	49	0.13	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	0.0232 U	0.0125 U
Isopropylbenzene (Cumene)	54	5.6	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	0.0232 U	0.0125 U
Methyl-t-butyl ether	670	0.4	0.0645 U	0.35 U	0.0645 U	0.306 U	0.061 U	0.0595 U	0.093 U	0.05 U
Naphthalene	29	0.038	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	**0.307**	0.0125 U
Toluene	200	6.7	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	0.0232 U	0.0125 U
Xylenes (total)	57	1.5	0.0484 U	0.263 U	0.0484 U	0.229 U	0.0459 U	0.0446 U	0.0695 U	0.0375 U
n-Butylbenzene	20	23	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	0.0232 U	0.0125 U
sec-Butylbenzene	28	42	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	0.0232 U	0.0125 U
tert-Butylbenzene	36	11	0.0161 U	0.0875 U	0.0161 U	0.0765 U	0.0153 U	0.0149 U	0.0232 U	0.0125 U

Note: detected results are **bolded.** Results greater than ADEC cleanup levels are **underlined & shaded yellow.** Instances in which the LOD is above the most stringent cleanup level are highlighted orange.

Key:

"-" - Not applicable

AAC = Alaska Administrative Code

ADEC - Alaska Department of Environmental Conservation

AK = Alaska

mg/kg = milligrams per kilogram

J = The quantitation is an estimation

B= Analyte detected in blank. Sample result may be biased high due to blank contamination

LV = low volume

PAH = polycyclic aromatic hydrocarbon

SIM = selected ion monitoring

U=Analyte not detected at the reporting limit shown.

VOC = volatile organic compound

Ahtna Engineering Services, LLC

Table 2- Groundwater Analytical Results
AFSC OAFF 2019 Site Characterization and Well Decommissioning

Analyte	ADEC Groundwater Cleanup Level	Units	Sample Name	OAFF-19-MW-01		OAFF-19-MW-03		OAFF-19-MW-4R		OAFF-19-MW-06		OAFF-19-MW-60		OAFF-19-MW-10		OAFF-19-MW-11		OAFF-19-MW-12	
			Location	MW-01		MW-03		MW-4R		MW-06		MW-06 Duplicate		MW-10		MW-11		MW-12	
			Sample Date	10/14/2019		10/11/2019		10/11/2019		10/11/2019		10/11/2019		10/11/2019		10/11/2019		10/11/2019	
AK Fuel Methods AK101, AK102																			
Gasoline Range Organics	2.2	mg/L		0.0500	U	**1.08**		**1.66**	**QH**	**0.0807**	**B**	**0.0731**	**B**	0.0500	U	0.0500	U	0.0326	B
Diesel Range Organics	1.5	mg/L		**0.451**	**J**	**2.09**		**2.31**		**0.533**	**J**	**0.472**	**J**	**1.05**		**0.636**		**2.50**	
PAH Method 8270D SIM LV																			
1-Methylnaphthalene	11	µg/L		0.0255	U	**43.7**		**19.1**		**0.247**		**0.225**		0.0245	U	0.0245	U	**0.109**	
2-Methylnaphthalene	36	µg/L		0.0255	U	**51.9**		**16.6**		0.0240	U	0.0240	U	0.0245	U	0.0245	U	**0.0866**	
Acenaphthene	530	µg/L		0.0255	U	**0.407**		**0.299**		0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Acenaphthylene	260	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Anthracene	434	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Benz[a]anthracene	0.3	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Benzo(a)pyrene	0.25	µg/L		0.0102	U	0.00960	U	0.00925	U	0.00960	U	0.00960	U	0.00980	U	0.00980	U	0.00945	U
Benzo(b)fluoranthene	2.5	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Benzo[g,h,i]perylene	0.8	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Benzo(k)fluoranthene	0.264	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Chrysene	2	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Dibenz[a,h]anthracene	0.25	µg/L		0.0102	U	0.00960	U	0.00925	U	0.00960	U	0.00960	U	0.00980	U	0.00980	U	0.00945	U
Fluoranthene	2604	µg/L		0.0255	U	**0.151**		**0.186**		0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Fluorene	290	µg/L		0.0255	U	**0.714**		**0.284**		0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Indeno(1,2,3-cd)pyrene	0.194	µg/L		0.0255	U	0.0240	U	0.0232	U	0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Naphthalene	1.7	µg/L		0.0510	U	**38.8**		**37.1**		**0.322**		**0.283**		0.0490	U	0.0490	U	**6.16**	
Phenanthrene	170	µg/L		0.0255	U	**0.355**		**0.282**		0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Pyrene	120	µg/L		0.0255	U	**0.133**		**0.135**		0.0240	U	0.0240	U	0.0245	U	0.0245	U	0.0236	U
Fuel Related VOC Method SW8260 C																			
1,2,4-Trimethylbenzene	15	µg/L		0.500	U	**187**		**197**		0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
1,2-Dibromoethane	0.075	µg/L		0.0375	U	0.0375	U	0.0375	U	0.0375	U	0.0375	U	0.0375	U	0.0375	U	0.0375	U
1,2-Dichloroethane	1.7	µg/L		0.250	U	**1.12**		0.250	U	0.250	U	0.250	U	0.250	U	0.250	U	0.250	U
1,3,5-Trimethylbenzene	120	µg/L		0.500	U	**28.1**		**96.5**		**0.612**	**J**	**0.627**	**J**	0.500	U	0.500	U	0.500	U
Benzene	4.6	µg/L		0.200	U	**0.613**		**103**		**0.214**	**J**	**0.217**	**J**	0.200	U	0.125	J	**0.392**	**J**
Cumene	450	µg/L		0.500	U	**5.02**		**89.3**		0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Ethylbenzene	15	µg/L		0.500	U	**13.5**		**29.6**		**5.55**		**5.73**		0.500	U	0.500	U	0.500	U
Methyl-tert-butyl ether (MTBE)	140	µg/L		5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Naphthalene	1.7	µg/L		0.500	U	**39.7**		**93.8**		0.500	U	0.500	U	0.500	U	0.500	U	**8.18**	
n-Butylbenzene	1000	µg/L		0.500	U	**0.447**	**J**	**0.558**	**J**	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
sec-Butylbenzene	2000	µg/L		1.50	U	**22.4**		**347**		1.50	U	1.50	U	1.50	U	1.50	U	1.50	U
tert-Butylbenzene	690	µg/L		0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Toluene	1100	µg/L		0.500	U	**8.74**		**12.0**		**2.72**		**2.83**		0.500	U	0.500	U	0.500	U
Xylenes	190	µg/L		0.500	U	0.500	U	0.500	U	**0.339**	**J**	**0.346**	**J**	0.500	U	0.500	U	0.500	U

Note: detected results are **bolded.** Results greater than ADEC cleanup levels are **underlined & shaded yellow.**

Key:

"-" - Not applicable

ADEC - Alaska Department of Environmental Conservation

AK = Alaska

mg/kg = milligrams per kilogram

J = The quantitation is an estimation

B= Analyte detected in blank. Sample result may be biased high due to blank contamination

LV = low volume

PAH = polycyclic aromatic hydrocarbon

SIM = selected ion monitoring

U=Analyte not detected at the reporting limit shown.

µg/L = micrograms per liter

VOC = volatile organic compound

Ahtna Engineering Services, LLC

Table 3- Storm Water Analytical Results
AFSC OAFF 2019 Site Characterization and Well Decommissioning

Analyte	ADEC Groundwater Cleanup Level or Water Quality Standard	Sample Name	OAFF-19-SD-1	OAFF-19-SD-2	OAFF-19-SD-3	OAFF-19-SD-4
		Location	Northwest/ Downgradient	Northwest/ Downgradient Duplicate	West/ Downgradient	South/ Upgradient
		Sample Date	10/14/2019	10/11/2019	10/11/2019	10/11/2019
		Units				
AK Fuel Methods AK101, AK102						
Gasoline Range Organics	2.2	mg/L	**0.0465 B**	**0.0428 B**	0.0500 U	**0.0692 B**
Diesel Range Organics	1.5	mg/L	**1.19**	**1.29**	**0.899**	**0.723**
PAH Method 8270D SIM LV						
1-Methylnaphthalene	11	µg/L	0.261 U	0.245 U	0.0245 U	**4.99**
2-Methylnaphthalene	36	µg/L	0.261 U	0.245 U	0.0245 U	**0.142**
Acenaphthene	530	µg/L	0.261 U	0.245 U	0.0245 U	0.0245 U
Acenaphthylene	260	µg/L	0.261 U	0.245 U	0.0245 U	0.0245 U
Anthracene	434	µg/L	0.261 U	0.245 U	0.0245 U	0.0245 U
Benz[a]anthracene	0.3	µg/L	0.261 U	**0.459 J**	0.0245 U	0.0245 U
Benzo(a)pyrene	0.25	µg/L	0.104 U	0.0980 U	0.00980 U	0.00980 U
Benzo(b)fluoranthene	2.5	µg/L	**0.663**	**0.586**	0.0245 U	0.0245 U
Benzo[g,h,i]perylene	0.8	µg/L	0.261 U	0.245 U	0.0245 U	0.0245 U
Benzo(k)fluoranthene	0.264	µg/L	0.261 U	0.245 U	0.0245 U	0.0245 U
Chrysene	2	µg/L	**0.685**	**0.662**	0.0245 U	0.0245 U
Dibenz[a,h]anthracene	0.25	µg/L	0.104 U	0.0980 U	0.00980 U	0.00980 U
Fluoranthene	2604	µg/L	**0.943**	**1.03**	**0.0476 J**	0.0245 U
Fluorene	290	µg/L	0.261 U	0.245 U	**0.0284 J**	0.0245 U
Indeno(1,2,3-cd)pyrene	0.194	µg/L	0.261 U	0.245 U	0.0245 U	0.0245 U
Naphthalene	1.7	µg/L	**0.553 J**	0.490 U	**0.0398 J**	**2.99**
Phenanthrene	170	µg/L	**0.383 J**	0.245 U	**0.0264 J**	0.0245 U
Pyrene	120	µg/L	**1.01**	**1.09**	**0.0386 J**	0.0245 U
Fuel Related VOC Method SW8260 C						
1,2,4-Trimethylbenzene	15	µg/L	0.500 U	0.500 U	0.500 U	**5.18**
1,2-Dibromoethane	0.075	µg/L	0.0375 U	0.0375 U	0.0375 U	0.0375 U
1,2-Dichloroethane	1.7	µg/L	0.250 U	**0.182 J**	0.250 U	0.250 U
1,3,5-Trimethylbenzene	120	µg/L	0.500 U	0.500 U	0.500 U	**3.44**
Benzene	4.6	µg/L	**1.44**	**1.25**	0.200 U	**0.421**
Cumene	450	µg/L	0.500 U	0.500 U	0.500 U	**0.457 J**
Ethylbenzene	15	µg/L	0.500 U	0.500 U	0.500 U	**10.8**
Methyl-tert-butyl ether (MTBE)	140	µg/L	5.00 U	5.00 U	5.00 U	5.00 U
Naphthalene	1.7	µg/L	0.500 U	0.500 U	0.500 U	**10.2**
n-Butylbenzene	1000	µg/L	0.500 U	0.500 U	0.500 U	0.500 U
sec-Butylbenzene	2000	µg/L	1.50 U	1.50 U	1.50 U	**3.86**
tert-Butylbenzene	690	µg/L	0.500 U	0.500 U	0.500 U	**0.949 J**
Toluene	1100	µg/L	0.500 U	0.500 U	0.500 U	**4.11**
Xylenes	190	µg/L	0.500 U	0.500 U	0.500 U	**0.577 J**
TAH and TAqH						
TAH	10	µg/L	**2.94**	**2.75**	**1.70**	**15.91**
TAqH	15	µg/L	**10.00**	**9.71**	**2.17**	**24.37**

Note: detected results are **bolded.** Results greater than ADEC cleanup levels are **underlined & shaded yellow.**

Key:

"-" - Not applicable

ADEC - Alaska Department of Environmental Conservation

AK = Alaska

B= Analyte detected in blank. Sample result may be biased high due to blank contamination

J = The quantitation is an estimation

LV = low volume

mg/kg = milligrams per kilogram

PAH = polycyclic aromatic hydrocarbon

SIM = selected ion monitoring

TAH = total aromatic hydrocarbons

TAqH = total aqueous hydrocarbons

U=Analyte not detected at the reporting limit shown.

µg/L = micrograms per liter

ATTACHMENT 4

LABORATORY REPORT,

DATA QUALITY REPORT,

&

ADEC LABORATORY DATA REVIEW CHECKLIST

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Laboratory Report of Analysis

To: Ahtna Engineering Svs
110 West 38th Ave Ste 200A
Anchorage, AK 99503

Report Number: **1196543**

Client Project: **20204.041 AFSC OAFF GW 2019**

Dear Alex Geilich,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

Revised Report - This report has been reissued to revise sample ID's, per the attached change order.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Ahtna Engineering Svs**
SGS Project: **1196543**
Project Name/Site: **20204.041 AFSC OAFF GW 2019**
Project Contact: **Alex Geilich**

Refer to sample receipt form for information on sample condition.

1196548002MS (1542945) MS

8260C - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. Sample was analyzed twice and results were confirmed.

1196548002MSD (1542946) MSD

8260C - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. Sample was analyzed twice and results were confirmed.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1196543001	OAFF-19-MW-10-02	XMS11850	Benzo[k]fluoranthene	RP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Print Date: 11/20/2019 3:55:57PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
OAFF-19-MW-10-02	1196543001	10/30/2019	10/31/2019	Soil/Solid (dry weight)
OAFF-19-MW-10-5.5	1196543002	10/30/2019	10/31/2019	Soil/Solid (dry weight)
OAFF-19-MW-11-3.5	1196543003	10/30/2019	10/31/2019	Soil/Solid (dry weight)
OAFF-19-MW-11-8.5	1196543004	10/30/2019	10/31/2019	Soil/Solid (dry weight)
OAFF-19-MW-12-04	1196543005	10/30/2019	10/31/2019	Soil/Solid (dry weight)
OAFF-19-MW-12-15	1196543006	10/30/2019	10/31/2019	Soil/Solid (dry weight)
OAFF-19-MW-12-11	1196543007	10/30/2019	10/31/2019	Soil/Solid (dry weight)
TB-10302019	1196543008	10/30/2019	10/31/2019	Soil/Solid (dry weight)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel Range Organics (S)
AK101	Gasoline Range Organics (S)
SM21 2540G	Percent Solids SM2540G
SW8260C	VOC 8260 (S) Field Extracted

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Detectable Results Summary

Client Sample ID: **OAFF-19-MW-10-02**
Lab Sample ID: 1196543001

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Acenaphthene	51.3J	ug/Kg
	Anthracene	118J	ug/Kg
	Benzo(a)Anthracene	280	ug/Kg
	Benzo[a]pyrene	290	ug/Kg
	Benzo[b]Fluoranthene	353	ug/Kg
	Benzo[g,h,i]perylene	180	ug/Kg
	Benzo[k]fluoranthene	122J	ug/Kg
	Chrysene	276	ug/Kg
	Dibenzo[a,h]anthracene	44.4J	ug/Kg
	Fluoranthene	700	ug/Kg
	Fluorene	44.2J	ug/Kg
	Indeno[1,2,3-c,d] pyrene	161	ug/Kg
	Phenanthrene	398	ug/Kg
	Pyrene	550	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	51.5	mg/Kg
Volatile Fuels	Gasoline Range Organics	1.15J	mg/Kg

Client Sample ID: **OAFF-19-MW-10-5.5**
Lab Sample ID: 1196543002

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Naphthalene	25.6J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	117	mg/Kg
Volatile Fuels	Gasoline Range Organics	6.02J	mg/Kg

Client Sample ID: **OAFF-19-MW-11-3.5**
Lab Sample ID: 1196543003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	20.0J	mg/Kg
Volatile Fuels	Gasoline Range Organics	1.12J	mg/Kg

Client Sample ID: **OAFF-19-MW-11-8.5**
Lab Sample ID: 1196543004

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	94.5	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	216	mg/Kg
Volatile Fuels	Gasoline Range Organics	5.13J	mg/Kg

Client Sample ID: **OAFF-19-MW-12-04**
Lab Sample ID: 1196543005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	17.5J	mg/Kg
Volatile Fuels	Gasoline Range Organics	1.08J	mg/Kg

Client Sample ID: **OAFF-19-MW-12-15**
Lab Sample ID: 1196543006

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	17.9J	mg/Kg
Volatile Fuels	Gasoline Range Organics	1.05J	mg/Kg

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Detectable Results Summary

Client Sample ID: **OAFF-19-MW-12-11**
Lab Sample ID: 1196543007

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	9.67J	ug/Kg
	2-Methylnaphthalene	9.10J	ug/Kg
	Fluoranthene	8.34J	ug/Kg
	Naphthalene	311	ug/Kg
	Phenanthrene	7.87J	ug/Kg
	Pyrene	7.65J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	34.2	mg/Kg
Volatile Fuels	Gasoline Range Organics	1.58J	mg/Kg
Volatile GC/MS- Petroleum VOC Group	Naphthalene	307	ug/Kg

Client Sample ID: **TB-10302019**
Lab Sample ID: 1196543008

	Parameter	Result	Units
Volatile Fuels	Gasoline Range Organics	0.917J	mg/Kg

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Results of **OAFF-19-MW-10-02**

Client Sample ID: **OAFF-19-MW-10-02**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543001
Lab Project ID: 1196543

Collection Date: 10/30/19 11:45
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):90.7
Location: MW-10

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	68.0	U	136	34.0	ug/Kg	5		11/06/19 16:00
2-Methylnaphthalene	68.0	U	136	34.0	ug/Kg	5		11/06/19 16:00
Acenaphthene	51.3	J	136	34.0	ug/Kg	5		11/06/19 16:00
Acenaphthylene	68.0	U	136	34.0	ug/Kg	5		11/06/19 16:00
Anthracene	118	J	136	34.0	ug/Kg	5		11/06/19 16:00
Benzo(a)Anthracene	280		136	34.0	ug/Kg	5		11/06/19 16:00
Benzo[a]pyrene	290		136	34.0	ug/Kg	5		11/06/19 16:00
Benzo[b]Fluoranthene	353		136	34.0	ug/Kg	5		11/06/19 16:00
Benzo[g,h,i]perylene	180		136	34.0	ug/Kg	5		11/06/19 16:00
Benzo[k]fluoranthene	122	J	136	34.0	ug/Kg	5		11/06/19 16:00
Chrysene	276		136	34.0	ug/Kg	5		11/06/19 16:00
Dibenzo[a,h]anthracene	44.4	J	136	34.0	ug/Kg	5		11/06/19 16:00
Fluoranthene	700		136	34.0	ug/Kg	5		11/06/19 16:00
Fluorene	44.2	J	136	34.0	ug/Kg	5		11/06/19 16:00
Indeno[1,2,3-c,d] pyrene	161		136	34.0	ug/Kg	5		11/06/19 16:00
Naphthalene	54.5	U	109	27.2	ug/Kg	5		11/06/19 16:00
Phenanthrene	398		136	34.0	ug/Kg	5		11/06/19 16:00
Pyrene	550		136	34.0	ug/Kg	5		11/06/19 16:00
Surrogates								
2-Methylnaphthalene-d10 (surr)	82		58-103		%	5		11/06/19 16:00
Fluoranthene-d10 (surr)	87.2		54-113		%	5		11/06/19 16:00

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/06/19 16:00
Container ID: 1196543001-A

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/05/19 12:30
Prep Initial Wt./Vol.: 22.77 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-10-02**

Client Sample ID: **OAFF-19-MW-10-02**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543001
Lab Project ID: 1196543

Collection Date: 10/30/19 11:45
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):90.7
Location: MW-10

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	51.5		21.9	6.77	mg/Kg	1		11/07/19 18:09
Surrogates								
5a Androstane (surr)	95.6		50-150		%	1		11/07/19 18:09

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 11/07/19 18:09
Container ID: 1196543001-A

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/01/19 12:32
Prep Initial Wt./Vol.: 30.265 g
Prep Extract Vol: 5 mL

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Results of **OAFF-19-MW-10-02**

Client Sample ID: **OAFF-19-MW-10-02**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543001
Lab Project ID: 1196543

Collection Date: 10/30/19 11:45
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):90.7
Location: MW-10

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.15	J	3.22	0.967	mg/Kg	1		11/01/19 15:35
Surrogates								
4-Bromofluorobenzene (surr)	78.8		50-150		%	1		11/01/19 15:35

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 15:35
Container ID: 1196543001-B

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 11:45
Prep Initial Wt./Vol.: 50.773 g
Prep Extract Vol: 29.7098 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-10-02**

Client Sample ID: **OAFF-19-MW-10-02**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543001
Lab Project ID: 1196543

Collection Date: 10/30/19 11:45
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):90.7
Location: MW-10

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	32.3	U	64.5	19.3	ug/Kg	1		11/08/19 12:38
1,2-Dibromoethane	0.645	U	1.29	0.400	ug/Kg	1		11/08/19 12:38
1,2-Dichloroethane	1.29	U	2.58	0.800	ug/Kg	1		11/08/19 12:38
1,3,5-Trimethylbenzene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
Benzene	8.05	U	16.1	5.03	ug/Kg	1		11/08/19 12:38
Ethylbenzene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
Isopropylbenzene (Cumene)	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
Methyl-t-butyl ether	64.5	U	129	40.0	ug/Kg	1		11/08/19 12:38
Naphthalene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
n-Butylbenzene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
o-Xylene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
P & M -Xylene	32.3	U	64.5	19.3	ug/Kg	1		11/08/19 12:38
sec-Butylbenzene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
tert-Butylbenzene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
Toluene	16.1	U	32.2	10.1	ug/Kg	1		11/08/19 12:38
Xylenes (total)	48.4	U	96.7	29.4	ug/Kg	1		11/08/19 12:38
Surrogates								
1,2-Dichloroethane-D4 (surr)	113		71-136		%	1		11/08/19 12:38
4-Bromofluorobenzene (surr)	120		55-151		%	1		11/08/19 12:38
Toluene-d8 (surr)	97.9		85-116		%	1		11/08/19 12:38

Batch Information

Analytical Batch: VMS19639
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/08/19 12:38
Container ID: 1196543001-B

Prep Batch: VXX35210
Prep Method: SW5035A
Prep Date/Time: 10/30/19 11:45
Prep Initial Wt./Vol.: 50.773 g
Prep Extract Vol: 29.7098 mL

Results of **OAFF-19-MW-10-5.5**

Client Sample ID: **OAFF-19-MW-10-5.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543002
Lab Project ID: 1196543

Collection Date: 10/30/19 11:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):46.0
Location: MW-10

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
2-Methylnaphthalene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Acenaphthene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Acenaphthylene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Anthracene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Benzo(a)Anthracene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Benzo[a]pyrene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Benzo[b]Fluoranthene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Benzo[g,h,i]perylene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Benzo[k]fluoranthene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Chrysene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Dibenzo[a,h]anthracene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Fluoranthene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Fluorene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Indeno[1,2,3-c,d] pyrene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Naphthalene	25.6	J	43.2	10.8	ug/Kg	1		11/06/19 16:21
Phenanthrene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Pyrene	27.0	U	54.0	13.5	ug/Kg	1		11/06/19 16:21
Surrogates								
2-Methylnaphthalene-d10 (surr)	77.9		58-103		%	1		11/06/19 16:21
Fluoranthene-d10 (surr)	79.1		54-113		%	1		11/06/19 16:21

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/06/19 16:21
Container ID: 1196543002-A

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/05/19 12:30
Prep Initial Wt./Vol.: 22.668 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-10-5.5**

Client Sample ID: **OAFF-19-MW-10-5.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543002
Lab Project ID: 1196543

Collection Date: 10/30/19 11:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):46.0
Location: MW-10

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	117		43.5	13.5	mg/Kg	1		11/07/19 18:19
Surrogates								
5a Androstane (surr)	77.2		50-150		%	1		11/07/19 18:19

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 11/07/19 18:19
Container ID: 1196543002-A

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/01/19 12:32
Prep Initial Wt./Vol.: 30.006 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-10-5.5**

Client Sample ID: **OAFF-19-MW-10-5.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543002
Lab Project ID: 1196543

Collection Date: 10/30/19 11:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):46.0
Location: MW-10

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	6.02	J	17.5	5.25	mg/Kg	1		11/01/19 15:53
Surrogates								
4-Bromofluorobenzene (surr)	82.9		50-150		%	1		11/01/19 15:53

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 15:53
Container ID: 1196543002-B

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 11:50
Prep Initial Wt./Vol.: 46.822 g
Prep Extract Vol: 75.2906 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-10-5.5**

Client Sample ID: **OAFF-19-MW-10-5.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543002
Lab Project ID: 1196543

Collection Date: 10/30/19 11:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):46.0
Location: MW-10

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	175	U	350	105	ug/Kg	1		11/08/19 23:43
1,2-Dibromoethane	3.50	U	6.99	2.17	ug/Kg	1		11/08/19 23:43
1,2-Dichloroethane	7.00	U	14.0	4.34	ug/Kg	1		11/08/19 23:43
1,3,5-Trimethylbenzene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
Benzene	43.7	U	87.4	27.3	ug/Kg	1		11/08/19 23:43
Ethylbenzene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
Isopropylbenzene (Cumene)	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
Methyl-t-butyl ether	350	U	699	217	ug/Kg	1		11/08/19 23:43
Naphthalene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
n-Butylbenzene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
o-Xylene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
P & M -Xylene	175	U	350	105	ug/Kg	1		11/08/19 23:43
sec-Butylbenzene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
tert-Butylbenzene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
Toluene	87.5	U	175	54.5	ug/Kg	1		11/08/19 23:43
Xylenes (total)	263	U	525	159	ug/Kg	1		11/08/19 23:43
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		11/08/19 23:43
4-Bromofluorobenzene (surr)	129		55-151		%	1		11/08/19 23:43
Toluene-d8 (surr)	98.9		85-116		%	1		11/08/19 23:43

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/08/19 23:43
Container ID: 1196543002-B

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 10/30/19 11:50
Prep Initial Wt./Vol.: 46.822 g
Prep Extract Vol: 75.2906 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-3.5**

Client Sample ID: **OAFF-19-MW-11-3.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543003
Lab Project ID: 1196543

Collection Date: 10/30/19 13:15
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):92.0
Location: MW-11

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
2-Methylnaphthalene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Acenaphthene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Acenaphthylene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Anthracene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Benzo(a)Anthracene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Benzo[a]pyrene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Benzo[b]Fluoranthene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Benzo[g,h,i]perylene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Benzo[k]fluoranthene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Chrysene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Dibenzo[a,h]anthracene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Fluoranthene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Fluorene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Indeno[1,2,3-c,d] pyrene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Naphthalene	10.7	U	21.4	5.34	ug/Kg	1		11/06/19 16:41
Phenanthrene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Pyrene	13.4	U	26.7	6.68	ug/Kg	1		11/06/19 16:41
Surrogates								
2-Methylnaphthalene-d10 (surr)	82.7		58-103		%	1		11/06/19 16:41
Fluoranthene-d10 (surr)	84.2		54-113		%	1		11/06/19 16:41

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/06/19 16:41
Container ID: 1196543003-A

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/05/19 12:30
Prep Initial Wt./Vol.: 22.891 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-3.5**

Client Sample ID: **OAFF-19-MW-11-3.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543003
Lab Project ID: 1196543

Collection Date: 10/30/19 13:15
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):92.0
Location: MW-11

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	20.0	J	21.4	6.64	mg/Kg	1		11/07/19 18:29
Surrogates								
5a Androstane (surr)	96.4		50-150		%	1		11/07/19 18:29

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 11/07/19 18:29
Container ID: 1196543003-A

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/01/19 12:32
Prep Initial Wt./Vol.: 30.439 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-3.5**

Client Sample ID: **OAFF-19-MW-11-3.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543003
Lab Project ID: 1196543

Collection Date: 10/30/19 13:15
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):92.0
Location: MW-11

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.12	J	3.23	0.968	mg/Kg	1		11/01/19 16:10
Surrogates								
4-Bromofluorobenzene (surr)	79.8		50-150		%	1		11/01/19 16:10

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 16:10
Container ID: 1196543003-B

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 13:15
Prep Initial Wt./Vol.: 48.677 g
Prep Extract Vol: 28.9053 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-3.5**

Client Sample ID: **OAFF-19-MW-11-3.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543003
Lab Project ID: 1196543

Collection Date: 10/30/19 13:15
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):92.0
Location: MW-11

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	32.3	U	64.6	19.4	ug/Kg	1		11/08/19 23:58
1,2-Dibromoethane	0.645	U	1.29	0.400	ug/Kg	1		11/08/19 23:58
1,2-Dichloroethane	1.29	U	2.58	0.801	ug/Kg	1		11/08/19 23:58
1,3,5-Trimethylbenzene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
Benzene	8.05	U	16.1	5.04	ug/Kg	1		11/08/19 23:58
Ethylbenzene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
Isopropylbenzene (Cumene)	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
Methyl-t-butyl ether	64.5	U	129	40.0	ug/Kg	1		11/08/19 23:58
Naphthalene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
n-Butylbenzene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
o-Xylene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
P & M -Xylene	32.3	U	64.6	19.4	ug/Kg	1		11/08/19 23:58
sec-Butylbenzene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
tert-Butylbenzene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
Toluene	16.1	U	32.3	10.1	ug/Kg	1		11/08/19 23:58
Xylenes (total)	48.4	U	96.8	29.4	ug/Kg	1		11/08/19 23:58
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		11/08/19 23:58
4-Bromofluorobenzene (surr)	125		55-151		%	1		11/08/19 23:58
Toluene-d8 (surr)	102		85-116		%	1		11/08/19 23:58

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/08/19 23:58
Container ID: 1196543003-B

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 10/30/19 13:15
Prep Initial Wt./Vol.: 48.677 g
Prep Extract Vol: 28.9053 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-8.5**

Client Sample ID: **OAFF-19-MW-11-8.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543004
Lab Project ID: 1196543

Collection Date: 10/30/19 13:20
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):45.1
Location: MW-11

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	94.5		54.6	13.7	ug/Kg	1		11/06/19 17:43
2-Methylnaphthalene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Acenaphthene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Acenaphthylene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Anthracene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Benzo(a)Anthracene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Benzo[a]pyrene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Benzo[b]Fluoranthene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Benzo[g,h,i]perylene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Benzo[k]fluoranthene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Chrysene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Dibenzo[a,h]anthracene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Fluoranthene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Fluorene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Indeno[1,2,3-c,d] pyrene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Naphthalene	21.9	U	43.7	10.9	ug/Kg	1		11/06/19 17:43
Phenanthrene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Pyrene	27.3	U	54.6	13.7	ug/Kg	1		11/06/19 17:43
Surrogates								
2-Methylnaphthalene-d10 (surr)	69.5		58-103		%	1		11/06/19 17:43
Fluoranthene-d10 (surr)	69.4		54-113		%	1		11/06/19 17:43

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/06/19 17:43
Container ID: 1196543004-A

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/05/19 12:30
Prep Initial Wt./Vol.: 22.818 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-8.5**

Client Sample ID: **OAFF-19-MW-11-8.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543004
Lab Project ID: 1196543

Collection Date: 10/30/19 13:20
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):45.1
Location: MW-11

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	216		44.0	13.6	mg/Kg	1		11/07/19 18:59
Surrogates								
5a Androstane (surr)	65.8		50-150		%	1		11/07/19 18:59

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 11/07/19 18:59
Container ID: 1196543004-A

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/01/19 12:32
Prep Initial Wt./Vol.: 30.248 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-8.5**

Client Sample ID: **OAFF-19-MW-11-8.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543004
Lab Project ID: 1196543

Collection Date: 10/30/19 13:20
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):45.1
Location: MW-11

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	5.13	J	15.3	4.58	mg/Kg	1		11/01/19 16:28
Surrogates								
4-Bromofluorobenzene (surr)	70.5		50-150		%	1		11/01/19 16:28

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 16:28
Container ID: 1196543004-B

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 13:20
Prep Initial Wt./Vol.: 30.145 g
Prep Extract Vol: 41.5468 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-11-8.5**

Client Sample ID: **OAFF-19-MW-11-8.5**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543004
Lab Project ID: 1196543

Collection Date: 10/30/19 13:20
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):45.1
Location: MW-11

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	153	U	306	91.7	ug/Kg	1		11/09/19 00:13
1,2-Dibromoethane	3.06	U	6.11	1.89	ug/Kg	1		11/09/19 00:13
1,2-Dichloroethane	6.10	U	12.2	3.79	ug/Kg	1		11/09/19 00:13
1,3,5-Trimethylbenzene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
Benzene	38.2	U	76.4	23.8	ug/Kg	1		11/09/19 00:13
Ethylbenzene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
Isopropylbenzene (Cumene)	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
Methyl-t-butyl ether	306	U	611	189	ug/Kg	1		11/09/19 00:13
Naphthalene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
n-Butylbenzene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
o-Xylene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
P & M -Xylene	153	U	306	91.7	ug/Kg	1		11/09/19 00:13
sec-Butylbenzene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
tert-Butylbenzene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
Toluene	76.5	U	153	47.7	ug/Kg	1		11/09/19 00:13
Xylenes (total)	229	U	458	139	ug/Kg	1		11/09/19 00:13
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		71-136		%	1		11/09/19 00:13
4-Bromofluorobenzene (surr)	106		55-151		%	1		11/09/19 00:13
Toluene-d8 (surr)	99.9		85-116		%	1		11/09/19 00:13

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/09/19 00:13
Container ID: 1196543004-B

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 10/30/19 13:20
Prep Initial Wt./Vol.: 30.145 g
Prep Extract Vol: 41.5468 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-04**

Client Sample ID: **OAFF-19-MW-12-04**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543005
Lab Project ID: 1196543

Collection Date: 10/30/19 14:30
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location: MW-12

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
2-Methylnaphthalene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Acenaphthene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Acenaphthylene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Anthracene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Benzo(a)Anthracene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Benzo[a]pyrene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Benzo[b]Fluoranthene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Benzo[g,h,i]perylene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Benzo[k]fluoranthene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Chrysene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Dibenzo[a,h]anthracene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Fluoranthene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Fluorene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Indeno[1,2,3-c,d] pyrene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Naphthalene	10.5	U	21.0	5.25	ug/Kg	1		11/06/19 18:04
Phenanthrene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Pyrene	13.1	U	26.2	6.56	ug/Kg	1		11/06/19 18:04
Surrogates								
2-Methylnaphthalene-d10 (surr)	78.6		58-103		%	1		11/06/19 18:04
Fluoranthene-d10 (surr)	79.1		54-113		%	1		11/06/19 18:04

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/06/19 18:04
Container ID: 1196543005-A

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/05/19 12:30
Prep Initial Wt./Vol.: 22.994 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-04**

Client Sample ID: **OAFF-19-MW-12-04**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543005
Lab Project ID: 1196543

Collection Date: 10/30/19 14:30
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location: MW-12

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	17.5	J	21.4	6.63	mg/Kg	1		11/07/19 19:09
Surrogates								
5a Androstane (surr)	85.4		50-150		%	1		11/07/19 19:09

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 11/07/19 19:09
Container ID: 1196543005-A

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/01/19 12:32
Prep Initial Wt./Vol.: 30.088 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-04**

Client Sample ID: **OAFF-19-MW-12-04**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543005
Lab Project ID: 1196543

Collection Date: 10/30/19 14:30
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location: MW-12

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.08	J	3.06	0.918	mg/Kg	1		11/01/19 16:46
Surrogates								
4-Bromofluorobenzene (surr)	79.2		50-150		%	1		11/01/19 16:46

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 16:46
Container ID: 1196543005-B

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 14:30
Prep Initial Wt./Vol.: 49.665 g
Prep Extract Vol: 28.3385 mL

Results of **OAFF-19-MW-12-04**

Client Sample ID: **OAFF-19-MW-12-04**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543005
Lab Project ID: 1196543

Collection Date: 10/30/19 14:30
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):93.3
Location: MW-12

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	30.6	U	61.2	18.4	ug/Kg	1		11/09/19 00:29
1,2-Dibromoethane	0.610	U	1.22	0.379	ug/Kg	1		11/09/19 00:29
1,2-Dichloroethane	1.23	U	2.45	0.759	ug/Kg	1		11/09/19 00:29
1,3,5-Trimethylbenzene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
Benzene	7.65	U	15.3	4.77	ug/Kg	1		11/09/19 00:29
Ethylbenzene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
Isopropylbenzene (Cumene)	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
Methyl-t-butyl ether	61.0	U	122	37.9	ug/Kg	1		11/09/19 00:29
Naphthalene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
n-Butylbenzene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
o-Xylene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
P & M -Xylene	30.6	U	61.2	18.4	ug/Kg	1		11/09/19 00:29
sec-Butylbenzene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
tert-Butylbenzene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
Toluene	15.3	U	30.6	9.54	ug/Kg	1		11/09/19 00:29
Xylenes (total)	45.9	U	91.8	27.9	ug/Kg	1		11/09/19 00:29
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		71-136		%	1		11/09/19 00:29
4-Bromofluorobenzene (surr)	124		55-151		%	1		11/09/19 00:29
Toluene-d8 (surr)	100		85-116		%	1		11/09/19 00:29

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/09/19 00:29
Container ID: 1196543005-B

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 10/30/19 14:30
Prep Initial Wt./Vol.: 49.665 g
Prep Extract Vol: 28.3385 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-15**

Client Sample ID: **OAFF-19-MW-12-15**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543006
Lab Project ID: 1196543

Collection Date: 10/30/19 14:35
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location: MW-12

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
2-Methylnaphthalene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Acenaphthene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Acenaphthylene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Anthracene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Benzo(a)Anthracene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Benzo[a]pyrene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Benzo[b]Fluoranthene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Benzo[g,h,i]perylene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Benzo[k]fluoranthene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Chrysene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Dibenzo[a,h]anthracene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Fluoranthene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Fluorene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Indeno[1,2,3-c,d] pyrene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Naphthalene	10.6	U	21.1	5.27	ug/Kg	1		11/06/19 18:25
Phenanthrene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Pyrene	13.2	U	26.4	6.59	ug/Kg	1		11/06/19 18:25
Surrogates								
2-Methylnaphthalene-d10 (surr)	81.8		58-103		%	1		11/06/19 18:25
Fluoranthene-d10 (surr)	85.5		54-113		%	1		11/06/19 18:25

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/06/19 18:25
Container ID: 1196543006-A

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/05/19 12:30
Prep Initial Wt./Vol.: 22.651 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-15**

Client Sample ID: **OAFF-19-MW-12-15**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543006
Lab Project ID: 1196543

Collection Date: 10/30/19 14:35
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location: MW-12

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	17.9	J	21.1	6.55	mg/Kg	1		11/07/19 19:19
Surrogates								
5a Androstane (surr)	94.3		50-150		%	1		11/07/19 19:19

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 11/07/19 19:19
Container ID: 1196543006-A

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/01/19 12:32
Prep Initial Wt./Vol.: 30.157 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-15**

Client Sample ID: **OAFF-19-MW-12-15**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543006
Lab Project ID: 1196543

Collection Date: 10/30/19 14:35
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location: MW-12

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.05	J	2.97	0.892	mg/Kg	1		11/01/19 17:03
Surrogates								
4-Bromofluorobenzene (surr)	76.5		50-150		%	1		11/01/19 17:03

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 17:03
Container ID: 1196543006-B

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 14:35
Prep Initial Wt./Vol.: 49.836 g
Prep Extract Vol: 27.8985 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-15**

Client Sample ID: **OAFF-19-MW-12-15**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543006
Lab Project ID: 1196543

Collection Date: 10/30/19 14:35
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location: MW-12

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	29.7	U	59.4	17.8	ug/Kg	1		11/09/19 00:44
1,2-Dibromoethane	0.595	U	1.19	0.369	ug/Kg	1		11/09/19 00:44
1,2-Dichloroethane	1.19	U	2.38	0.737	ug/Kg	1		11/09/19 00:44
1,3,5-Trimethylbenzene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
Benzene	7.45	U	14.9	4.64	ug/Kg	1		11/09/19 00:44
Ethylbenzene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
Isopropylbenzene (Cumene)	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
Methyl-t-butyl ether	59.5	U	119	36.9	ug/Kg	1		11/09/19 00:44
Naphthalene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
n-Butylbenzene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
o-Xylene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
P & M -Xylene	29.7	U	59.4	17.8	ug/Kg	1		11/09/19 00:44
sec-Butylbenzene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
tert-Butylbenzene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
Toluene	14.9	U	29.7	9.27	ug/Kg	1		11/09/19 00:44
Xylenes (total)	44.6	U	89.2	27.1	ug/Kg	1		11/09/19 00:44
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		71-136		%	1		11/09/19 00:44
4-Bromofluorobenzene (surr)	123		55-151		%	1		11/09/19 00:44
Toluene-d8 (surr)	99.4		85-116		%	1		11/09/19 00:44

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/09/19 00:44
Container ID: 1196543006-B

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 10/30/19 14:35
Prep Initial Wt./Vol.: 49.836 g
Prep Extract Vol: 27.8985 mL

Results of **OAFF-19-MW-12-11**

Client Sample ID: **OAFF-19-MW-12-11**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543007
Lab Project ID: 1196543

Collection Date: 10/30/19 14:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):85.6
Location: MW-12

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	9.67	J	28.7	7.18	ug/Kg	1		11/06/19 18:45
2-Methylnaphthalene	9.10	J	28.7	7.18	ug/Kg	1		11/06/19 18:45
Acenaphthene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Acenaphthylene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Anthracene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Benzo(a)Anthracene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Benzo[a]pyrene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Benzo[b]Fluoranthene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Benzo[g,h,i]perylene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Benzo[k]fluoranthene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Chrysene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Dibenzo[a,h]anthracene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Fluoranthene	8.34	J	28.7	7.18	ug/Kg	1		11/06/19 18:45
Fluorene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Indeno[1,2,3-c,d] pyrene	14.4	U	28.7	7.18	ug/Kg	1		11/06/19 18:45
Naphthalene	311		23.0	5.75	ug/Kg	1		11/06/19 18:45
Phenanthrene	7.87	J	28.7	7.18	ug/Kg	1		11/06/19 18:45
Pyrene	7.65	J	28.7	7.18	ug/Kg	1		11/06/19 18:45
Surrogates								
2-Methylnaphthalene-d10 (surr)	74.6		58-103		%	1		11/06/19 18:45
Fluoranthene-d10 (surr)	75.9		54-113		%	1		11/06/19 18:45

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/06/19 18:45
Container ID: 1196543007-A

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/05/19 12:30
Prep Initial Wt./Vol.: 22.863 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-11**

Client Sample ID: **OAFF-19-MW-12-11**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543007
Lab Project ID: 1196543

Collection Date: 10/30/19 14:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):85.6
Location: MW-12

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	34.2		23.0	7.13	mg/Kg	1		11/07/19 19:29
Surrogates								
5a Androstane (surr)	76.8		50-150		%	1		11/07/19 19:29

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 11/07/19 19:29
Container ID: 1196543007-A

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/01/19 12:32
Prep Initial Wt./Vol.: 30.476 g
Prep Extract Vol: 5 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-11**

Client Sample ID: **OAFF-19-MW-12-11**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543007
Lab Project ID: 1196543

Collection Date: 10/30/19 14:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):85.6
Location: MW-12

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.58	J	4.64	1.39	mg/Kg	1		11/01/19 17:21
Surrogates								
4-Bromofluorobenzene (surr)	50.1		50-150		%	1		11/01/19 17:21

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 17:21
Container ID: 1196543007-B

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 14:50
Prep Initial Wt./Vol.: 38.374 g
Prep Extract Vol: 30.5151 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **OAFF-19-MW-12-11**

Client Sample ID: **OAFF-19-MW-12-11**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543007
Lab Project ID: 1196543

Collection Date: 10/30/19 14:50
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):85.6
Location: MW-12

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	46.5	U	92.9	27.9	ug/Kg	1		11/09/19 01:00
1,2-Dibromoethane	0.930	U	1.86	0.576	ug/Kg	1		11/09/19 01:00
1,2-Dichloroethane	1.86	U	3.71	1.15	ug/Kg	1		11/09/19 01:00
1,3,5-Trimethylbenzene	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
Benzene	11.6	U	23.2	7.24	ug/Kg	1		11/09/19 01:00
Ethylbenzene	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
Isopropylbenzene (Cumene)	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
Methyl-t-butyl ether	93.0	U	186	57.6	ug/Kg	1		11/09/19 01:00
Naphthalene	307		46.4	14.5	ug/Kg	1		11/09/19 01:00
n-Butylbenzene	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
o-Xylene	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
P & M -Xylene	46.5	U	92.9	27.9	ug/Kg	1		11/09/19 01:00
sec-Butylbenzene	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
tert-Butylbenzene	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
Toluene	23.2	U	46.4	14.5	ug/Kg	1		11/09/19 01:00
Xylenes (total)	69.5	U	139	42.3	ug/Kg	1		11/09/19 01:00
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		71-136		%	1		11/09/19 01:00
4-Bromofluorobenzene (surr)	77.9		55-151		%	1		11/09/19 01:00
Toluene-d8 (surr)	99.3		85-116		%	1		11/09/19 01:00

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/09/19 01:00
Container ID: 1196543007-B

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 10/30/19 14:50
Prep Initial Wt./Vol.: 38.374 g
Prep Extract Vol: 30.5151 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **TB-10302019**

Client Sample ID: **TB-10302019**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543008
Lab Project ID: 1196543

Collection Date: 10/30/19 08:00
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):
Location: Trip Blank

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.917	J	2.50	0.749	mg/Kg	1		11/01/19 14:42
Surrogates								
4-Bromofluorobenzene (surr)	72.5		50-150		%	1		11/01/19 14:42

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/01/19 14:42
Container ID: 1196543008-A

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 10/30/19 08:00
Prep Initial Wt./Vol.: 50.048 g
Prep Extract Vol: 25 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Results of **TB-10302019**

Client Sample ID: **TB-10302019**
Client Project ID: **20204.041 AFSC OAFF GW 2019**
Lab Sample ID: 1196543008
Lab Project ID: 1196543

Collection Date: 10/30/19 08:00
Received Date: 10/31/19 10:48
Matrix: Soil/Solid (dry weight)
Solids (%):
Location: Trip Blank

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	25.0	U	50.0	15.0	ug/Kg	1		11/08/19 23:12
1,2-Dibromoethane	0.500	U	0.999	0.310	ug/Kg	1		11/08/19 23:12
1,2-Dichloroethane	1.00	U	2.00	0.619	ug/Kg	1		11/08/19 23:12
1,3,5-Trimethylbenzene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
Benzene	6.25	U	12.5	3.90	ug/Kg	1		11/08/19 23:12
Ethylbenzene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
Isopropylbenzene (Cumene)	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
Methyl-t-butyl ether	50.0	U	99.9	31.0	ug/Kg	1		11/08/19 23:12
Naphthalene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
n-Butylbenzene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
o-Xylene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
P & M -Xylene	25.0	U	50.0	15.0	ug/Kg	1		11/08/19 23:12
sec-Butylbenzene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
tert-Butylbenzene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
Toluene	12.5	U	25.0	7.79	ug/Kg	1		11/08/19 23:12
Xylenes (total)	37.5	U	74.9	22.8	ug/Kg	1		11/08/19 23:12
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		11/08/19 23:12
4-Bromofluorobenzene (surr)	110		55-151		%	1		11/08/19 23:12
Toluene-d8 (surr)	99.7		85-116		%	1		11/08/19 23:12

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 11/08/19 23:12
Container ID: 1196543008-A

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 10/30/19 08:00
Prep Initial Wt./Vol.: 50.048 g
Prep Extract Vol: 25 mL

Print Date: 11/20/2019 3:56:03PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1801766 [SPT/10927]
Blank Lab ID: 1541561

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10927
Analytical Method: SM21 2540G
Instrument:
Analyst: M.M
Analytical Date/Time: 10/31/2019 3:11:00PM

Print Date: 11/20/2019 3:56:05PM

Duplicate Sample Summary

Original Sample ID: 1196543001
Duplicate Sample ID: 1541562
Analysis Date: 10/31/2019 15:11
Matrix: Soil/Solid (dry weight)

QC for Samples:

1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	90.7	91.5	%	0.89	(< 15)

Batch Information

Analytical Batch: SPT10927
Analytical Method: SM21 2540G
Instrument:
Analyst: M.M

Print Date: 11/20/2019 3:56:06PM

Duplicate Sample Summary

Original Sample ID: 1196544005
Duplicate Sample ID: 1541563
Analysis Date: 10/31/2019 15:11
Matrix: Soil/Solid (dry weight)

QC for Samples:

1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.5	93.3	%	0.21	(< 15)

Batch Information

Analytical Batch: SPT10927
Analytical Method: SM21 2540G
Instrument:
Analyst: M.M

Print Date: 11/20/2019 3:56:06PM

Method Blank

Blank ID: MB for HBN 1801829 [VXX/35182]
Blank Lab ID: 1541911

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007, 1196543008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.949J	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	82.7	50-150		%

Batch Information

Analytical Batch: VFC15025
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 11/1/2019 12:56:00PM

Prep Batch: VXX35182
Prep Method: SW5035A
Prep Date/Time: 11/1/2019 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196543 [VXX35182]
Blank Spike Lab ID: 1541912
Date Analyzed: 11/01/2019 12:21

Spike Duplicate ID: LCSD for HBN 1196543 [VXX35182]
Spike Duplicate Lab ID: 1541913
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007, 1196543008

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	12.8	102	12.5	12.7	102	(60-120)	0.39	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	85.4	85	1.25	86.6	87	(50-150)	1.40	

Batch Information

Analytical Batch: **VFC15025**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX35182**
Prep Method: **SW5035A**
Prep Date/Time: **11/01/2019 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1802030 [VXX/35210]
Blank Lab ID: 1542847

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196543001

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/Kg
Benzene	6.25U	12.5	3.90	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	12.5U	25.0	7.80	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	109	71-136		%
4-Bromofluorobenzene (surr)	99.4	55-151		%
Toluene-d8 (surr)	99.3	85-116		%

Batch Information

Analytical Batch: VMS19639
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/8/2019 8:42:00AM

Prep Batch: VXX35210
Prep Method: SW5035A
Prep Date/Time: 11/8/2019 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196543 [VXX35210]
Blank Spike Lab ID: 1542848
Date Analyzed: 11/08/2019 08:58

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196543001

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	862	115	(75-123)
1,2-Dibromoethane	750	770	103	(78-122)
1,2-Dichloroethane	750	744	99	(73-128)
1,3,5-Trimethylbenzene	750	816	109	(73-124)
Benzene	750	810	108	(77-121)
Ethylbenzene	750	836	111	(76-122)
Isopropylbenzene (Cumene)	750	822	110	(68-134)
Methyl-t-butyl ether	1130	1240	111	(73-125)
Naphthalene	750	785	105	(62-129)
n-Butylbenzene	750	849	113	(70-128)
o-Xylene	750	828	110	(77-123)
P & M -Xylene	1500	1690	113	(77-124)
sec-Butylbenzene	750	822	110	(73-126)
tert-Butylbenzene	750	808	108	(73-125)
Toluene	750	807	108	(77-121)
Xylenes (total)	2250	2520	112	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	96.2	96	(71-136)
4-Bromofluorobenzene (surr)	750	92.6	93	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS19639**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **KAJ**

Prep Batch: **VXX35210**
Prep Method: **SW5035A**
Prep Date/Time: **11/08/2019 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/20/2019 3:56:15PM

Matrix Spike Summary

Original Sample ID: 1542846
MS Sample ID: 1542849 MS
MSD Sample ID: 1542850 MSD

Analysis Date: 11/08/2019 12:38
Analysis Date: 11/08/2019 10:27
Analysis Date: 11/08/2019 10:43
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1196543001

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	24.6U	739	786	106	739	838	113	75-123	6.40	(< 20)
1,2-Dibromoethane	0.492U	739	728	99	739	768	104	78-122	5.40	(< 20)
1,2-Dichloroethane	0.985U	739	714	97	739	743	101	73-128	4.00	(< 20)
1,3,5-Trimethylbenzene	12.3U	739	741	100	739	807	109	73-124	8.50	(< 20)
Benzene	6.15U	739	763	103	739	798	108	77-121	4.50	(< 20)
Ethylbenzene	12.3U	739	764	103	739	821	111	76-122	7.10	(< 20)
Isopropylbenzene (Cumene)	12.3U	739	735	100	739	805	109	68-134	9.00	(< 20)
Methyl-t-butyl ether	49.3U	1110	1170	106	1110	1250	113	73-125	6.90	(< 20)
Naphthalene	12.3U	739	716	97	739	789	107	62-129	9.60	(< 20)
n-Butylbenzene	12.3U	739	765	104	739	836	113	70-128	8.90	(< 20)
o-Xylene	12.3U	739	771	104	739	816	111	77-123	5.70	(< 20)
P & M -Xylene	24.6U	1480	1570	106	1480	1690	114	77-124	7.30	(< 20)
sec-Butylbenzene	12.3U	739	730	99	739	803	109	73-126	9.50	(< 20)
tert-Butylbenzene	12.3U	739	720	98	739	785	106	73-125	8.50	(< 20)
Toluene	12.3U	739	747	101	739	802	109	77-121	7.20	(< 20)
Xylenes (total)	37.0U	2220	2340	106	2220	2500	113	78-124	6.80	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		739	729	99	739	732	99	71-136	0.38	
4-Bromofluorobenzene (surr)		1230	1050	85	1230	1090	88	55-151	3.60	
Toluene-d8 (surr)		739	748	101	739	751	102	85-116	0.43	

Batch Information

Analytical Batch: VMS19639
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 11/8/2019 10:27:00AM

Prep Batch: VXX35210
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 11/8/2019 6:00:00AM
Prep Initial Wt./Vol.: 50.77g
Prep Extract Vol: 25.00mL

Print Date: 11/20/2019 3:56:17PM

Method Blank

Blank ID: MB for HBN 1802055 [VXX/35220]
Blank Lab ID: 1542943

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007, 1196543008

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/Kg
Benzene	6.25U	12.5	3.90	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	12.5U	25.0	7.80	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	102	71-136		%
4-Bromofluorobenzene (surr)	111	55-151		%
Toluene-d8 (surr)	102	85-116		%

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: KAJ
Analytical Date/Time: 11/8/2019 8:58:00PM

Prep Batch: VXX35220
Prep Method: SW5035A
Prep Date/Time: 11/8/2019 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196543 [VXX35220]
Blank Spike Lab ID: 1542944
Date Analyzed: 11/08/2019 21:14

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007, 1196543008

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	790	105	(75-123)
1,2-Dibromoethane	750	864	115	(78-122)
1,2-Dichloroethane	750	821	109	(73-128)
1,3,5-Trimethylbenzene	750	794	106	(73-124)
Benzene	750	842	112	(77-121)
Ethylbenzene	750	836	111	(76-122)
Isopropylbenzene (Cumene)	750	839	112	(68-134)
Methyl-t-butyl ether	1130	1240	110	(73-125)
Naphthalene	750	750	100	(62-129)
n-Butylbenzene	750	752	100	(70-128)
o-Xylene	750	817	109	(77-123)
P & M -Xylene	1500	1690	112	(77-124)
sec-Butylbenzene	750	760	101	(73-126)
tert-Butylbenzene	750	778	104	(73-125)
Toluene	750	817	109	(77-121)
Xylenes (total)	2250	2500	111	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	103	103	(71-136)
4-Bromofluorobenzene (surr)	750	102	102	(55-151)
Toluene-d8 (surr)	750	99.8	100	(85-116)

Batch Information

Analytical Batch: **VMS19650**
Analytical Method: **SW8260C**
Instrument: **VRA Agilent GC/MS 7890B/5977A**
Analyst: **KAJ**

Prep Batch: **VXX35220**
Prep Method: **SW5035A**
Prep Date/Time: **11/08/2019 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/20/2019 3:56:21PM

Matrix Spike Summary

Original Sample ID: 1196548002
MS Sample ID: 1542945 MS
MSD Sample ID: 1542946 MSD

Analysis Date: 11/08/2019 23:27
Analysis Date: 11/08/2019 21:54
Analysis Date: 11/08/2019 22:10
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007, 1196543008

Results by **SW8260C**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		RPD (%)	RPD CL
1,2,4-Trimethylbenzene	55.7U	657	705	107		657	708	108	75-123	0.56	(< 20)
1,2-Dibromoethane	1.11U	657	726	111		657	768	117	78-122	5.70	(< 20)
1,2-Dichloroethane	2.23U	657	701	107		657	727	111	73-128	3.60	(< 20)
1,3,5-Trimethylbenzene	27.8U	657	706	107		657	716	109	73-124	1.50	(< 20)
Benzene	28.4	657	762	112		657	767	112	77-121	0.74	(< 20)
Ethylbenzene	27.8U	657	740	113		657	765	116	76-122	3.20	(< 20)
Isopropylbenzene (Cumene)	27.8U	657	720	110		657	756	115	68-134	5.00	(< 20)
Methyl-t-butyl ether	111U	985	1037	105		985	1088	110	73-125	4.80	(< 20)
Naphthalene	27.8U	657	547	83		657	664	101	62-129	19.30	(< 20)
n-Butylbenzene	27.8U	657	639	97		657	671	102	70-128	4.80	(< 20)
o-Xylene	27.8U	657	713	108		657	752	115	77-123	5.40	(< 20)
P & M -Xylene	55.7U	1309	1465	112		1309	1510	115	77-124	2.70	(< 20)
sec-Butylbenzene	27.8U	657	642	98		657	670	102	73-126	4.30	(< 20)
tert-Butylbenzene	27.8U	657	685	104		657	701	107	73-125	2.30	(< 20)
Toluene	27.8U	657	732	107		657	758	111	77-121	3.60	(< 20)
Xylenes (total)	83.5U	1969	2181	111		1969	2260	115	78-124	3.60	(< 20)
Surrogates											
1,2-Dichloroethane-D4 (surr)		657	652	99		657	671	102	71-136	2.90	
4-Bromofluorobenzene (surr)		1094	484	44	*	1094	482	44	* 55-151	0.63	
Toluene-d8 (surr)		657	654	100		657	662	101	85-116	1.20	

Batch Information

Analytical Batch: VMS19650
Analytical Method: SW8260C
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: KAJ
Analytical Date/Time: 11/8/2019 9:54:00PM

Prep Batch: VXX35220
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 11/8/2019 6:00:00AM
Prep Initial Wt./Vol.: 63.88g
Prep Extract Vol: 25.00mL

Print Date: 11/20/2019 3:56:22PM

Method Blank

Blank ID: MB for HBN 1801776 [XXX/42549]
Blank Lab ID: 1541595

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	102	60-120		%

Batch Information

Analytical Batch: XFC15463
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: JMG
Analytical Date/Time: 11/7/2019 11:33:00AM

Prep Batch: XXX42549
Prep Method: SW3550C
Prep Date/Time: 11/1/2019 12:32:52PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196543 [XXX42549]
Blank Spike Lab ID: 1541596
Date Analyzed: 11/07/2019 12:13

Spike Duplicate ID: LCSD for HBN 1196543 [XXX42549]
Spike Duplicate Lab ID: 1541597
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	833	860	103	833	862	103	(75-125)	0.24	(< 20)
Surrogates									
5a Androstane (surr)	16.7	109	109	16.7	109	109	(60-120)	0.27	

Batch Information

Analytical Batch: **XFC15463**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **JMG**

Prep Batch: **XXX42549**
Prep Method: **SW3550C**
Prep Date/Time: **11/01/2019 12:32**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1801899 [XXX/42558]
Blank Lab ID: 1542226

Matrix: Soil/Solid (dry weight)

QC for Samples:
1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
Acenaphthene	12.5U	25.0	6.25	ug/Kg
Acenaphthylene	12.5U	25.0	6.25	ug/Kg
Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/Kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/Kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/Kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/Kg
Chrysene	12.5U	25.0	6.25	ug/Kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/Kg
Fluoranthene	12.5U	25.0	6.25	ug/Kg
Fluorene	12.5U	25.0	6.25	ug/Kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/Kg
Naphthalene	10.0U	20.0	5.00	ug/Kg
Phenanthrene	12.5U	25.0	6.25	ug/Kg
Pyrene	12.5U	25.0	6.25	ug/Kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	80.1	58-103		%
Fluoranthene-d10 (surr)	86.2	54-113		%

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 11/6/2019 3:19:00PM

Prep Batch: XXX42558
Prep Method: SW3550C
Prep Date/Time: 11/5/2019 12:30:41PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196543 [XXX42558]
Blank Spike Lab ID: 1542227
Date Analyzed: 11/06/2019 15:40

Matrix: Soil/Solid (dry weight)

QC for Samples: 1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **8270D SIM (PAH)**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	90.6	82	(43-111)
2-Methylnaphthalene	111	89.7	81	(39-114)
Acenaphthene	111	91.8	83	(44-111)
Acenaphthylene	111	95.7	86	(39-116)
Anthracene	111	91.8	83	(50-114)
Benzo(a)Anthracene	111	97.2	87	(54-122)
Benzo[a]pyrene	111	92.5	83	(50-125)
Benzo[b]Fluoranthene	111	95.9	86	(53-128)
Benzo[g,h,i]perylene	111	93.9	85	(49-127)
Benzo[k]fluoranthene	111	96.3	87	(56-123)
Chrysene	111	98.8	89	(57-118)
Dibenzo[a,h]anthracene	111	94.6	85	(50-129)
Fluoranthene	111	103	93	(55-119)
Fluorene	111	93.9	85	(47-114)
Indeno[1,2,3-c,d] pyrene	111	101	91	(49-130)
Naphthalene	111	91.1	82	(38-111)
Phenanthrene	111	92.4	83	(49-113)
Pyrene	111	106	96	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111	81.5	82	(58-103)
Fluoranthene-d10 (surr)	111	88	88	(54-113)

Batch Information

Analytical Batch: **XMS11850**
Analytical Method: **8270D SIM (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **DSD**

Prep Batch: **XXX42558**
Prep Method: **SW3550C**
Prep Date/Time: **11/05/2019 12:30**
Spike Init Wt./Vol.: 111 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/20/2019 3:56:30PM

Matrix Spike Summary

Original Sample ID: 1196543003
MS Sample ID: 1542228 MS
MSD Sample ID: 1542229 MSD

Analysis Date: 11/06/2019 16:41
Analysis Date: 11/06/2019 17:02
Analysis Date: 11/06/2019 17:23
Matrix: Soil/Solid (dry weight)

QC for Samples: 1196543001, 1196543002, 1196543003, 1196543004, 1196543005, 1196543006, 1196543007

Results by **8270D SIM (PAH)**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	13.4U	120	102	85	120	96.5	81	43-111	5.60	(< 20)
2-Methylnaphthalene	13.4U	120	101	84	120	95.3	80	39-114	5.50	(< 20)
Acenaphthene	13.4U	120	99.9	83	120	95.7	80	44-111	4.30	(< 20)
Acenaphthylene	13.4U	120	111	93	120	104	87	39-116	6.80	(< 20)
Anthracene	13.4U	120	103	86	120	97.3	81	50-114	5.50	(< 20)
Benzo(a)Anthracene	13.4U	120	103	86	120	98.5	82	54-122	4.30	(< 20)
Benzo[a]pyrene	13.4U	120	103	86	120	98.9	83	50-125	4.30	(< 20)
Benzo[b]Fluoranthene	13.4U	120	101	84	120	100	84	53-128	0.45	(< 20)
Benzo[g,h,i]perylene	13.4U	120	99.9	83	120	95.4	80	49-127	4.60	(< 20)
Benzo[k]fluoranthene	13.4U	120	103	86	120	95.7	80	56-123	7.30	(< 20)
Chrysene	13.4U	120	103	86	120	99.2	83	57-118	4.10	(< 20)
Dibenzo[a,h]anthracene	13.4U	120	101	84	120	96.5	81	50-129	4.60	(< 20)
Fluoranthene	13.4U	120	106	89	120	104	87	55-119	1.80	(< 20)
Fluorene	13.4U	120	103	86	120	99.7	83	47-114	3.80	(< 20)
Indeno[1,2,3-c,d] pyrene	13.4U	120	107	89	120	102	85	49-130	4.20	(< 20)
Naphthalene	10.7U	120	103	86	120	98.4	82	38-111	4.50	(< 20)
Phenanthrene	13.4U	120	99.9	83	120	95.7	80	49-113	4.40	(< 20)
Pyrene	13.4U	120	112	93	120	108	90	55-117	3.60	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		120	101	84	120	95.9	80	58-103	5.00	
Fluoranthene-d10 (surr)		120	103	86	120	100	84	54-113	3.10	

Batch Information

Analytical Batch: XMS11850
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 11/6/2019 5:02:00PM

Prep Batch: XXX42558
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 11/5/2019 12:30:41PM
Prep Initial Wt./Vol.: 22.67g
Prep Extract Vol: 5.00mL

Print Date: 11/20/2019 3:56:32PM

Nelson, Justin (Anchorage)

From: Lexie Lucassen <llucassen@ahtna.net>
Sent: Wednesday, November 20, 2019 3:42 PM
To: Nelson, Justin (Anchorage)
Cc: Alex Geilich; Ahtna Lab
Subject: [EXTERNAL] SDG 1196543 sample name change request

Hi Justin,

In this SDG, the cooler check-in receipt noted that there were two samples where the writing on the lids of the sample jars did not match the labels. The samples were logged in according to the labels, but I verified with Alex that the labels were actually wrong. Could you please change these sample names in the report? The current sample **OAFF-19-MW-12-11** should be renamed **OAFF-19-MW-12-15**, and vice versa.

Thank you!

-Lexie Lucassen

SGS

CH 1196543 D

Profile: 362607JKJ

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Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page _1___ of __1__

Section 1

CLIENT: Ahtna Engineering			
CONTACT: Alex Geilich	PHONE #: 907-433-0728		
PROJECT NAME: AFSC OAFF GW 2019	PROJECT/ PWSID/ PERMIT#: 20204.041		
REPORTS TO: Alex Geilich	E-MAIL: ahtnalab@ahtna.net	Profile #:	
INVOICE TO: Ahtna Engineering	QUOTE #:	P.O. #:	

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Preservative: MeOH / None — Analysis*: AK101/8260C - GRO/Petro VOC	AK102/8270D SIM - DRO/PAH	REMARKS/LOC ID
1 AB	OAFF-19-MW-10-02	10/30/2019	1145	soil	2	Grab	x	x	MW-10
2 AB	OAFF-19-MW-10-5.5	10/30/2019	1150	soil	2	Grab	x	x	MW-10. 2 x MeOH
3 AB	OAFF-19-MW-11-3.5	10/30/2019	1315	soil	2	Grab	x	x	MW-11
4 AB	OAFF-19-MW-11-8.5	10/30/2019	1320	soil	2	Grab	x	x	MW-11
5 AB	OAFF-19-MW-12-04	10/30/2019	1430	soil	2	Grab	x	x	MW-12
6 AB	OAFF-19-MW-12-11	10/30/2019	1435	soil	2	Grab	x	x	MW-12
7 AB	OAFF-19-MW-12-15	10/30/2019	1450	soil	2	Grab	x	x	MW-12
8 A	TB-10302019	10/30/2019	800	soil	1	TB	x		Trip Blank

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 5

Relinquished By: (1) Autumn Gould	Date 10/30/19	Time 1630	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date 10/31/19	Time 10:48	Received For Laboratory By:

Section 4

DOD Project? Yes / No

Data Deliverable Requirements:

Cooler ID: _10302019-01_____

Requested Turnaround Time and/or Special Instructions:

Standard TAT

Temp Blank °C: 1.1° IDS9

or Ambient [ ]

Chain of Custody Seal: (Circle) 1F 1B

INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

http://www.sgs.com/terms-and-conditions

Revised Report - Revision 1

e-Sample Receipt Form

Revised Report - Revision 1

SGS Workorder #: **1196543**

1196543

Review Criteria	Condition (Yes, No, N/A)	1196536
Chain of Custody / Temperature Requirements		N/A Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F 1B
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 10302019-01 @ 1.1 °C Therm. ID: D59
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	Lids of samples 12-11 and 12-15 indicate 12-15 and 11 respectively, using jar body label as ID for login
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
		N/A ***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1196543001-A	No Preservative Required	OK			
1196543001-B	Methanol field pres. 4 C	OK			
1196543002-A	No Preservative Required	OK			
1196543002-B	2x Methanol field pres. 4 C	OK			
1196543003-A	No Preservative Required	OK			
1196543003-B	Methanol field pres. 4 C	OK			
1196543004-A	No Preservative Required	OK			
1196543004-B	Methanol field pres. 4 C	OK			
1196543005-A	No Preservative Required	OK			
1196543005-B	Methanol field pres. 4 C	OK			
1196543006-A	No Preservative Required	OK			
1196543006-B	Methanol field pres. 4 C	OK			
1196543007-A	No Preservative Required	OK			
1196543007-B	Methanol field pres. 4 C	OK			
1196543008-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

Laboratory Data Review Checklist

Completed By:

Marty Brewer

Title:

Project Chemist

Date:

12/17/19

Consultant Firm:

Ahtna Engineering Services, LLC

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

ADEC File Number:

2100.38.243

Hazard Identification Number:

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   No samples were transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

   GRO, DRO, Fuel-Related VOCs, and PAHs

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   1.1C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

There were no issues reported with the sample conditions.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☒ No☐ N/A☐ Comments:

The writing on the lids of samples OAFF-19-MW-12-11 and OAFF-19-MW-12-15 did not match the labels. The samples were logged in per the writing on the labels.
The report was later revised upon request by Ahtna to use the sample IDs presented on the COC.

e. Data quality or usability affected?

Comments:

Data quality/usability not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☐ No☐ N/A☐ Comments:

1196548002MS (1542945) MS
8260C - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. Sample was analyzed twice and results were confirmed.

1196548002MSD (1542946) MSD
8260C - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. Sample was analyzed twice and results were confirmed.

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Samples were analyzed twice and results were confirmed.

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Usability is not affected. 4-Bromofluorobenzene surrogate recoveries in all field samples were within QC control limits.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

GRO, DRO, Fuel-VOCs, and PAHs

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☐ No☒ N/A☐ Comments:

OAFF-19-MW-10-02 - Naphthalene LOD by SW8260C met human health cleanup standard, but exceeded migration to groundwater cleanup level. SW8270D SIM method LOD for naphthalene was adequate and it was reported as ND in both methods.

1,2-Dibromoethane by SW8260C was reported as ND in all soil samples with LODs exceeding the migration to groundwater cleanup level. 1,2-dibromomethane was not detected in any groundwater samples with LODs below the groundwater cleanup standard (see SDG 1196986 for groundwater results).

LOD for benzene in soil samples OAFF-19-MW-10-5.5 and OAFF-19-MW-11-8.5 met the human health cleanup standard, but exceeded the migration to groundwater cleanup level. GRO was detected in these soil samples, but significantly below the cleanup standard. Neither GRO or benzene were detected in the associated groundwater samples for monitoring well 10 (MW10) or monitoring well 11 (MW11). (see SDG 1196986 for groundwater results).

LOD for napthlalene by SW8270D SIM in soil samples OAFF-19-MW-10-5.5 and OAFF-19-MW-11-8.5 met the human health cleanup standard, but exceeded the migration to groundwater cleanup level. However, the LOD per SW8260C was adequate in both samples.

e. Data quality or usability affected?

Data quality/usability not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

No method blank detections > LOQ, but GRO method blank 1541911 had detection > LOD at 0.949mg/kg.

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No method blank detections >LOQ, but GRO method blank 1541911 had detection > LOD at 0.949mg/kg.
Associated GRO sample results within 10X method blank include:

- OAFF-19-MW-10-02
- OAFF-19-MW-10-5.5
- OAFF-19-MW-11-3.5
- OAFF-19-MW-11-8.5
- OAFF-19-MW-12-04
- OAFF-19-MW-12-11
- OAFF-19-MW-12-15
- TB-10302019

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☒ N/A☐ Comments:

v. Data quality or usability affected?

Comments:

Associated GRO sample results within 10X method blank should be qualified "B"

- OAFF-19-MW-10-02
- OAFF-19-MW-10-5.5
- OAFF-19-MW-11-3.5
- OAFF-19-MW-11-8.5
- OAFF-19-MW-12-04
- OAFF-19-MW-12-11
- OAFF-19-MW-12-15
- TB-10302019

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No metals analyses

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA. %R and RPD within limits

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

%R and RPD within limits

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality/ usability not affected by LCS/LCSD.
GRO results “B” qualified, but still usable

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☐ Comments:

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☐ No☒ N/A☐ Comments:

1196548002MS/MSD 4-bromofluorobenzene surrogate recoveries outside limits.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☒ N/A☐ Comments:

Not project specific samples

iv. Data quality or usability affected?

Comments:

Data quality/usability not affected by surrogate recoveries

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

No trip blank detections >LOQ, but FRO detected >LOD at 0.917mg/kg.

v. Data quality or usability affected?

Comments:

GRO was also detected in the method blank at similar concentration
Associated GRO results should be qualified "B"

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☐ N/A☐ Comments:

OAFF-19-MW-12-04 and OAFF-19-MW-12-15

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

GRO RPD 2.8%
DRO RPD 2.3%

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality/usability not affected by duplicate precision

1196543

Laboratory Report Date:

11/15/19

CS Site Name:

OAFF Groundwater Monitoring

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

No decontamination/equipment blank submitted. Disposable sampling equipment used.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No decontamination/equipment blank submitted.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA. No decontamination/equipment blank submitted.

iii. Data quality or usability affected?

Comments:

NA. No decontamination/equipment blank submitted.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

Laboratory Data Review Checklist

Completed By:

Lexie Lucassen

Title:

OAFF Groundwater

Date:

12/18/2019

Consultant Firm:

Ahtna Engineering Services, LLC

Laboratory Name:

SGS North America, Inc. – Anchorage

Laboratory Report Number:

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

ADEC File Number:

2100.38.243

Hazard Identification Number:

25946

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

   All samples submitted for PAH, Fuel-VOCs, DRO, and GRO analysis

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Cooler 1 was 0.1 °C
   Cooler 2 was 0.2 °C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☒ N/A☐ Comments:

   Sample OAFF-19-MW-01 had 3 HCl-preserved 250-mL bottles and 1 unpreserved 250-mL bottle (should have had 2 of each), and sample OAFF-19-MW-010 was missing one 250-mL HCl-preserved bottle. For the single HCl-preserved bottle of OAFF-19-MW-010, the preservative was added in-house at the laboratory.

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☒ No☐ N/A☐ Comments:

The preservative discrepancy for OAFF-19-MW-01 and missing bottle for OAFF-19-MW-010 were noted on the COC and cooler check-in receipt

e. Data quality or usability affected?

Comments:

No. OAFF-19-M-01 was analyzed for PAH with the limited preserved sample volume provided

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

OAFF-19-MW-03 (1196986002) PS
8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 does not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was within QC criteria and results are comparable. The in-hold data is reported.

OAFF-19-MW-4R (1196986003) PS
AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

OAFF-19-MW-11 (1196986007) PS
8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 does not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was within QC criteria and results are comparable. The in-hold data is reported.

OAFF-19-SD-1 (1196986009) PS
8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 and Fluoranthene-d10 do not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was not within QC criteria and results are comparable. The in-hold data is reported.

OAFF-19-SD-2 (1196986010) PS
8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 does not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was not within QC criteria and results are comparable. The in-hold data is reported.

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

As described above

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality/usability not affected.

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

No soil samples submitted on this SDG

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☐ No☒ N/A☐ Comments:

e. Data quality or usability affected?

Data quality/usability not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

No method blank detections >LOQ, but GRO was detected >LOD at 0.0430mg/L in method blank 1544775.

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

All project sample results were within 10X of method blank detection

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☒ N/A☐ Comments:

v. Data quality or usability affected?

Comments:

All project sample results were within 10X of method blank detection and should be qualified "B"

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No metals analyses on this SDG

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA. No %R or RPDs outside limits

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No %R or RPDs outside limits

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality/usability not affected by lab QC

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☐ No☒ N/A☐ Comments:

SW8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 did not QC criteria in the groundwater samples OAFF-19-MW-03 and OAFF-19-MW-11. Samples were reanalyzed with surrogates in control & PAH results comparable.

SW8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 and Fluoranthene-d10 did not meet QC criteria in stormwater sample OAFF-19-SD-1. Reanalysis demonstrated comparable PAH results.

SW8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 did not meet QC criteria in stormwater sample OAFF-19-SD-2. Reanalysis demonstrated comparable PAH results.

AK101 surrogate 4-bromofluorobenzene exceeded criteria high in sample OAFF-19-MW-4R due to matrix interference.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

iv. Data quality or usability affected?

Comments:

Reanalysis results were comparable for PAHs.
GRO should be qualified QH for OAFF-19-MW-4R.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☒ N/A☐ Comments:

A water trip blank was not included for analysis.

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA. No water trip blank submitted.

v. Data quality or usability affected?

Comments:

No water trip blank submitted for analysis. Potential for field contamination cannot be assessed.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

Groundwater OAFF-19-MW-06 & OAFF-19-MW-60

Stormwater OAFF-19-SD-1 & OAFF-19-SD-2

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality/usability not affected by duplicate precision

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

No decontamination/equipment blank submitted for analysis. Disposable sampling equipment used.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No decontamination/equipment blank submitted for analysis.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA. No decontamination/equipment blank submitted for analysis.

iii. Data quality or usability affected?

Comments:

NA.

1196986

Laboratory Report Date:

12/12/2019

CS Site Name:

AFSC Off-Airport Fuel Facility - Port of Anchorage

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

Laboratory Report of Analysis

To: Ahtna Engineering Svs
110 West 38th Ave Ste 200A
Anchorage, AK 99503

Report Number: **1196986**

Client Project: **OAFF**

Dear Alex Geilich,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

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Case Narrative

SGS Client: **Ahtna Engineering Svs**
SGS Project: **1196986**
Project Name/Site: **OAFF**
Project Contact: **Alex Geilich**

Refer to sample receipt form for information on sample condition.

OAFF-19-MW-03 (1196986002) PS

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 does not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was within QC criteria and results are comparable. The in-hold data is reported.

OAFF-19-MW-4R (1196986003) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

OAFF-19-MW-11 (1196986007) PS

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 does not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was within QC criteria and results are comparable. The in-hold data is reported.

OAFF-19-SD-1 (1196986009) PS

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 and Fluoranthene-d10 do not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was not within QC criteria and results are comparable. The in-hold data is reported.

OAFF-19-SD-2 (1196986010) PS

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 does not meet QC criteria. The sample was re-extracted past hold time. Surrogate recovery was not within QC criteria and results are comparable. The in-hold data is reported.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
OAFF-19-MW-01	1196986001	11/19/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-MW-03	1196986002	11/18/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-MW-4R	1196986003	11/19/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-MW-06	1196986004	11/18/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-MW-60	1196986005	11/18/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-MW-10	1196986006	11/19/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-MW-11	1196986007	11/19/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-MW-12	1196986008	11/19/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-SD-1	1196986009	11/15/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-SD-2	1196986010	11/15/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-SD-3	1196986011	11/15/2019	11/21/2019	Water (Surface, Eff., Ground)
OAFF-19-SD-4	1196986012	11/15/2019	11/21/2019	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS Liq/Liq ext. LV
AK102	DRO Low Volume (W)
AK101	Gasoline Range Organics (W)
SW8260C	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **OAFF-19-MW-01**
Lab Sample ID: 1196986001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.451J	mg/L

Client Sample ID: **OAFF-19-MW-03**
Lab Sample ID: 1196986002

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	43.7	ug/L
	2-Methylnaphthalene	51.9	ug/L
	Acenaphthene	0.407	ug/L
	Fluoranthene	0.151	ug/L
	Fluorene	0.714	ug/L
	Naphthalene	38.8	ug/L
	Phenanthrene	0.355	ug/L
	Pyrene	0.133	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	2.09	mg/L
Volatile Fuels	Gasoline Range Organics	1.08	mg/L
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	187	ug/L
	1,2-Dichloroethane	1.12	ug/L
	1,3,5-Trimethylbenzene	28.1	ug/L
	Benzene	0.613	ug/L
	Ethylbenzene	5.02	ug/L
	Isopropylbenzene (Cumene)	13.5	ug/L
	Naphthalene	39.7	ug/L
	o-Xylene	0.741J	ug/L
	P & M -Xylene	21.7	ug/L
	sec-Butylbenzene	8.74	ug/L
	Toluene	0.447J	ug/L
	Xylenes (total)	22.4	ug/L

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Detectable Results Summary

Client Sample ID: **OAFF-19-MW-4R**
Lab Sample ID: 1196986003

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	19.1	ug/L
	2-Methylnaphthalene	16.6	ug/L
	Acenaphthene	0.299	ug/L
	Fluoranthene	0.186	ug/L
	Fluorene	0.284	ug/L
	Naphthalene	37.1	ug/L
	Phenanthrene	0.282	ug/L
	Pyrene	0.135	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	2.31	mg/L
Volatile Fuels	Gasoline Range Organics	1.66	mg/L
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	197	ug/L
	1,3,5-Trimethylbenzene	96.5	ug/L
	Benzene	103	ug/L
	Ethylbenzene	89.3	ug/L
	Isopropylbenzene (Cumene)	29.6	ug/L
	Naphthalene	93.8	ug/L
	o-Xylene	1.06	ug/L
	P & M -Xylene	346	ug/L
	sec-Butylbenzene	12.0	ug/L
	Toluene	0.558J	ug/L
	Xylenes (total)	347	ug/L

Client Sample ID: **OAFF-19-MW-06**
Lab Sample ID: 1196986004

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.247	ug/L
	Naphthalene	0.322	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.533J	mg/L
Volatile Fuels	Gasoline Range Organics	0.0807J	mg/L
Volatile GC/MS- Petroleum VOC Group	1,3,5-Trimethylbenzene	0.612J	ug/L
	Benzene	0.214J	ug/L
	Isopropylbenzene (Cumene)	5.55	ug/L
	sec-Butylbenzene	2.72	ug/L
	tert-Butylbenzene	0.339J	ug/L

Client Sample ID: **OAFF-19-MW-60**
Lab Sample ID: 1196986005

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.225	ug/L
	Naphthalene	0.283	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.472J	mg/L
Volatile Fuels	Gasoline Range Organics	0.0731J	mg/L
Volatile GC/MS- Petroleum VOC Group	1,3,5-Trimethylbenzene	0.627J	ug/L
	Benzene	0.217J	ug/L
	Isopropylbenzene (Cumene)	5.73	ug/L
	sec-Butylbenzene	2.83	ug/L
	tert-Butylbenzene	0.346J	ug/L

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Detectable Results Summary

Client Sample ID: **OAFF-19-MW-10**			
Lab Sample ID: 1196986006	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.05	mg/L
Client Sample ID: **OAFF-19-MW-11**			
Lab Sample ID: 1196986007	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.636	mg/L
Volatile GC/MS- Petroleum VOC Group	Benzene	0.125J	ug/L
Client Sample ID: **OAFF-19-MW-12**			
Lab Sample ID: 1196986008	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.109	ug/L
	2-Methylnaphthalene	0.0866	ug/L
	Naphthalene	6.16	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	2.50	mg/L
Volatile Fuels	Gasoline Range Organics	0.0326J	mg/L
Volatile GC/MS- Petroleum VOC Group	Benzene	0.392J	ug/L
	Naphthalene	8.18	ug/L
Client Sample ID: **OAFF-19-SD-1**			
Lab Sample ID: 1196986009	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Benzo[b]Fluoranthene	0.663	ug/L
	Chrysene	0.685	ug/L
	Fluoranthene	0.943	ug/L
	Naphthalene	0.553J	ug/L
	Phenanthrene	0.383J	ug/L
	Pyrene	1.01	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	1.19	mg/L
Volatile Fuels	Gasoline Range Organics	0.0465J	mg/L
Volatile GC/MS- Petroleum VOC Group	Benzene	1.44	ug/L
Client Sample ID: **OAFF-19-SD-2**			
Lab Sample ID: 1196986010	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Benzo(a)Anthracene	0.459J	ug/L
	Benzo[b]Fluoranthene	0.586	ug/L
	Chrysene	0.662	ug/L
	Fluoranthene	1.03	ug/L
	Pyrene	1.09	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	1.29	mg/L
Volatile Fuels	Gasoline Range Organics	0.0428J	mg/L
Volatile GC/MS- Petroleum VOC Group	1,2-Dichloroethane	0.182J	ug/L
	Benzene	1.25	ug/L

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Detectable Results Summary

Client Sample ID: **OAFF-19-SD-3**
Lab Sample ID: 1196986011

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Fluoranthene	0.0476J	ug/L
	Fluorene	0.0284J	ug/L
	Naphthalene	0.0398J	ug/L
	Phenanthrene	0.0264J	ug/L
	Pyrene	0.0386J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.899	mg/L

Client Sample ID: **OAFF-19-SD-4**
Lab Sample ID: 1196986012

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	4.99	ug/L
	2-Methylnaphthalene	0.142	ug/L
	Naphthalene	2.99	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.723	mg/L
Volatile Fuels	Gasoline Range Organics	0.0692J	mg/L
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	5.18	ug/L
	1,3,5-Trimethylbenzene	3.44	ug/L
	Benzene	0.421	ug/L
	Ethylbenzene	0.457J	ug/L
	Isopropylbenzene (Cumene)	10.8	ug/L
	Naphthalene	10.2	ug/L
	n-Butylbenzene	0.949J	ug/L
	P & M -Xylene	3.86	ug/L
	sec-Butylbenzene	4.11	ug/L
	tert-Butylbenzene	0.577J	ug/L
	Xylenes (total)	3.86	ug/L

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Results of **OAFF-19-MW-01**

Client Sample ID: **OAFF-19-MW-01**
Client Project ID: **OAFF**
Lab Sample ID: 1196986001
Lab Project ID: 1196986

Collection Date: 11/19/19 12:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
2-Methylnaphthalene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Acenaphthene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Acenaphthylene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Anthracene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Benzo(a)Anthracene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Benzo[a]pyrene	0.0102	U	0.0204	0.00633	ug/L	1		11/27/19 15:38
Benzo[b]Fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Benzo[g,h,i]perylene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Benzo[k]fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Chrysene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Dibenzo[a,h]anthracene	0.0102	U	0.0204	0.00633	ug/L	1		11/27/19 15:38
Fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Fluorene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Indeno[1,2,3-c,d] pyrene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Naphthalene	0.0510	U	0.102	0.0316	ug/L	1		11/27/19 15:38
Phenanthrene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Pyrene	0.0255	U	0.0510	0.0153	ug/L	1		11/27/19 15:38
Surrogates								
2-Methylnaphthalene-d10 (surr)	62.5		47-106		%	1		11/27/19 15:38
Fluoranthene-d10 (surr)	63.3		24-116		%	1		11/27/19 15:38

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 15:38
Container ID: 1196986001-D

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Results of **OAFF-19-MW-01**

Client Sample ID: **OAFF-19-MW-01**
Client Project ID: **OAFF**
Lab Sample ID: 1196986001
Lab Project ID: 1196986

Collection Date: 11/19/19 12:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.451	J	0.630	0.189	mg/L	1		12/02/19 13:16
Surrogates								
5a Androstane (surr)	88.4		50-150		%	1		12/02/19 13:16

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/02/19 13:16
Container ID: 1196986001-A

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/19 10:28
Prep Initial Wt./Vol.: 238 mL
Prep Extract Vol: 1 mL

Results of **OAFF-19-MW-01**

Client Sample ID: **OAFF-19-MW-01**
Client Project ID: **OAFF**
Lab Sample ID: 1196986001
Lab Project ID: 1196986

Collection Date: 11/19/19 12:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		11/22/19 14:48
Surrogates								
4-Bromofluorobenzene (surr)	78.3		50-150		%	1		11/22/19 14:48

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 14:48
Container ID: 1196986001-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-01**

Client Sample ID: **OAFF-19-MW-01**
Client Project ID: **OAFF**
Lab Sample ID: 1196986001
Lab Project ID: 1196986

Collection Date: 11/19/19 12:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 12:34
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 12:34
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
Benzene	0.200	U	0.400	0.120	ug/L	1		11/25/19 12:34
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 12:34
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 12:34
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:34
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 12:34
Surrogates								
1,2-Dichloroethane-D4 (surr)	112		81-118		%	1		11/25/19 12:34
4-Bromofluorobenzene (surr)	104		85-114		%	1		11/25/19 12:34
Toluene-d8 (surr)	106		89-112		%	1		11/25/19 12:34

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 12:34
Container ID: 1196986001-H

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **OAFF-19-MW-03**

Client Sample ID: **OAFF-19-MW-03**
Client Project ID: **OAFF**
Lab Sample ID: 1196986002
Lab Project ID: 1196986

Collection Date: 11/18/19 16:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	43.7		0.481	0.144	ug/L	10		12/02/19 13:53
2-Methylnaphthalene	51.9		0.481	0.144	ug/L	10		12/02/19 13:53
Acenaphthene	0.407		0.0481	0.0144	ug/L	1		11/27/19 15:59
Acenaphthylene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Anthracene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Benzo(a)Anthracene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Benzo[a]pyrene	0.00960 U		0.0192	0.00596	ug/L	1		11/27/19 15:59
Benzo[b]Fluoranthene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Benzo[g,h,i]perylene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Benzo[k]fluoranthene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Chrysene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Dibenzo[a,h]anthracene	0.00960 U		0.0192	0.00596	ug/L	1		11/27/19 15:59
Fluoranthene	0.151		0.0481	0.0144	ug/L	1		11/27/19 15:59
Fluorene	0.714		0.0481	0.0144	ug/L	1		11/27/19 15:59
Indeno[1,2,3-c,d] pyrene	0.0240 U		0.0481	0.0144	ug/L	1		11/27/19 15:59
Naphthalene	38.8		0.962	0.298	ug/L	10		12/02/19 13:53
Phenanthrene	0.355		0.0481	0.0144	ug/L	1		11/27/19 15:59
Pyrene	0.133		0.0481	0.0144	ug/L	1		11/27/19 15:59
Surrogates								
2-Methylnaphthalene-d10 (surr)	41.8	*	47-106		%	1		11/27/19 15:59
Fluoranthene-d10 (surr)	37.6		24-116		%	1		11/27/19 15:59

Batch Information

Analytical Batch: XMS11880
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 12/02/19 13:53
Container ID: 1196986002-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 15:59
Container ID: 1196986002-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-03**

Client Sample ID: **OAFF-19-MW-03**
Client Project ID: **OAFF**
Lab Sample ID: 1196986002
Lab Project ID: 1196986

Collection Date: 11/18/19 16:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.09		0.625	0.188	mg/L	1		12/02/19 13:26
Surrogates								
5a Androstane (surr)	88.4		50-150		%	1		12/02/19 13:26

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/02/19 13:26
Container ID: 1196986002-A

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/19 10:28
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Results of **OAFF-19-MW-03**

Client Sample ID: **OAFF-19-MW-03**
Client Project ID: **OAFF**
Lab Sample ID: 1196986002
Lab Project ID: 1196986

Collection Date: 11/18/19 16:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.08		0.100	0.0310	mg/L	1		11/22/19 15:06
Surrogates								
4-Bromofluorobenzene (surr)	137		50-150		%	1		11/22/19 15:06

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 15:06
Container ID: 1196986002-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-MW-03**

Client Sample ID: **OAFF-19-MW-03**
Client Project ID: **OAFF**
Lab Sample ID: 1196986002
Lab Project ID: 1196986

Collection Date: 11/18/19 16:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	187		10.0	3.10	ug/L	10		11/25/19 20:06
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 12:49
1,2-Dichloroethane	1.12		0.500	0.150	ug/L	1		11/25/19 12:49
1,3,5-Trimethylbenzene	28.1		1.00	0.310	ug/L	1		11/25/19 12:49
Benzene	0.613		0.400	0.120	ug/L	1		11/25/19 12:49
Ethylbenzene	5.02		1.00	0.310	ug/L	1		11/25/19 12:49
Isopropylbenzene (Cumene)	13.5		1.00	0.310	ug/L	1		11/25/19 12:49
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 12:49
Naphthalene	39.7		1.00	0.310	ug/L	1		11/25/19 12:49
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:49
o-Xylene	0.741	J	1.00	0.310	ug/L	1		11/25/19 12:49
P & M -Xylene	21.7		2.00	0.620	ug/L	1		11/25/19 12:49
sec-Butylbenzene	8.74		1.00	0.310	ug/L	1		11/25/19 12:49
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 12:49
Toluene	0.447	J	1.00	0.310	ug/L	1		11/25/19 12:49
Xylenes (total)	22.4		3.00	1.00	ug/L	1		11/25/19 12:49
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		11/25/19 12:49
4-Bromofluorobenzene (surr)	109		85-114		%	1		11/25/19 12:49
Toluene-d8 (surr)	108		89-112		%	1		11/25/19 12:49

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 12:49
Container ID: 1196986002-H

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 20:06
Container ID: 1196986002-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-4R**

Client Sample ID: **OAFF-19-MW-4R**
Client Project ID: **OAFF**
Lab Sample ID: 1196986003
Lab Project ID: 1196986

Collection Date: 11/19/19 11:25
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	19.1		0.231	0.0694	ug/L	5		12/02/19 14:13
2-Methylnaphthalene	16.6		0.231	0.0694	ug/L	5		12/02/19 14:13
Acenaphthene	0.299		0.0463	0.0139	ug/L	1		11/27/19 16:19
Acenaphthylene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Anthracene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Benzo(a)Anthracene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Benzo[a]pyrene	0.00925 U		0.0185	0.00574	ug/L	1		11/27/19 16:19
Benzo[b]Fluoranthene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Benzo[g,h,i]perylene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Benzo[k]fluoranthene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Chrysene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Dibenzo[a,h]anthracene	0.00925 U		0.0185	0.00574	ug/L	1		11/27/19 16:19
Fluoranthene	0.186		0.0463	0.0139	ug/L	1		11/27/19 16:19
Fluorene	0.284		0.0463	0.0139	ug/L	1		11/27/19 16:19
Indeno[1,2,3-c,d] pyrene	0.0232 U		0.0463	0.0139	ug/L	1		11/27/19 16:19
Naphthalene	37.1		0.463	0.144	ug/L	5		12/02/19 14:13
Phenanthrene	0.282		0.0463	0.0139	ug/L	1		11/27/19 16:19
Pyrene	0.135		0.0463	0.0139	ug/L	1		11/27/19 16:19
Surrogates								
2-Methylnaphthalene-d10 (surr)	61.2		47-106		%	1		11/27/19 16:19
Fluoranthene-d10 (surr)	51.9		24-116		%	1		11/27/19 16:19

Batch Information

Analytical Batch: XMS11880
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 12/02/19 14:13
Container ID: 1196986003-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 16:19
Container ID: 1196986003-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-4R**

Client Sample ID: **OAFF-19-MW-4R**
Client Project ID: **OAFF**
Lab Sample ID: 1196986003
Lab Project ID: 1196986

Collection Date: 11/19/19 11:25
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.31		0.615	0.184	mg/L	1		12/02/19 13:36
Surrogates								
5a Androstane (surr)	83		50-150		%	1		12/02/19 13:36

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/02/19 13:36
Container ID: 1196986003-A

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/19 10:28
Prep Initial Wt./Vol.: 244 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-4R**

Client Sample ID: **OAFF-19-MW-4R**
Client Project ID: **OAFF**
Lab Sample ID: 1196986003
Lab Project ID: 1196986

Collection Date: 11/19/19 11:25
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.66		0.100	0.0310	mg/L	1		11/22/19 15:24
Surrogates								
4-Bromofluorobenzene (surr)	204	*	50-150		%	1		11/22/19 15:24

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 15:24
Container ID: 1196986003-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-MW-4R**

Client Sample ID: **OAFF-19-MW-4R**
Client Project ID: **OAFF**
Lab Sample ID: 1196986003
Lab Project ID: 1196986

Collection Date: 11/19/19 11:25
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	197		10.0	3.10	ug/L	10		11/25/19 20:20
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		11/25/19 13:03
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		11/25/19 13:03
1,3,5-Trimethylbenzene	96.5		1.00	0.310	ug/L	1		11/25/19 13:03
Benzene	103		0.400	0.120	ug/L	1		11/25/19 13:03
Ethylbenzene	89.3		1.00	0.310	ug/L	1		11/25/19 13:03
Isopropylbenzene (Cumene)	29.6		1.00	0.310	ug/L	1		11/25/19 13:03
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/25/19 13:03
Naphthalene	93.8		1.00	0.310	ug/L	1		11/25/19 13:03
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 13:03
o-Xylene	1.06		1.00	0.310	ug/L	1		11/25/19 13:03
P & M -Xylene	346		2.00	0.620	ug/L	1		11/25/19 13:03
sec-Butylbenzene	12.0		1.00	0.310	ug/L	1		11/25/19 13:03
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 13:03
Toluene	0.558 J		1.00	0.310	ug/L	1		11/25/19 13:03
Xylenes (total)	347		3.00	1.00	ug/L	1		11/25/19 13:03
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		11/25/19 13:03
4-Bromofluorobenzene (surr)	109		85-114		%	1		11/25/19 13:03
Toluene-d8 (surr)	108		89-112		%	1		11/25/19 13:03

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 13:03
Container ID: 1196986003-H

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 20:20
Container ID: 1196986003-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-MW-06**

Client Sample ID: **OAFF-19-MW-06**
Client Project ID: **OAFF**
Lab Sample ID: 1196986004
Lab Project ID: 1196986

Collection Date: 11/18/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.247		0.0481	0.0144	ug/L	1		11/27/19 16:40
2-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Benzo[a]pyrene	0.00960	U	0.0192	0.00596	ug/L	1		11/27/19 16:40
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Dibenzo[a,h]anthracene	0.00960	U	0.0192	0.00596	ug/L	1		11/27/19 16:40
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Naphthalene	0.322		0.0962	0.0298	ug/L	1		11/27/19 16:40
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 16:40
Surrogates								
2-Methylnaphthalene-d10 (surr)	67.3		47-106		%	1		11/27/19 16:40
Fluoranthene-d10 (surr)	58.4		24-116		%	1		11/27/19 16:40

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 16:40
Container ID: 1196986004-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-06**

Client Sample ID: **OAFF-19-MW-06**
Client Project ID: **OAFF**
Lab Sample ID: 1196986004
Lab Project ID: 1196986

Collection Date: 11/18/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.533	J	0.588	0.176	mg/L	1		12/02/19 13:46
Surrogates								
5a Androstane (surr)	91.4		50-150		%	1		12/02/19 13:46

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/02/19 13:46
Container ID: 1196986004-A

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/19 10:28
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-06**

Client Sample ID: **OAFF-19-MW-06**
Client Project ID: **OAFF**
Lab Sample ID: 1196986004
Lab Project ID: 1196986

Collection Date: 11/18/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0807	J	0.100	0.0310	mg/L	1		11/22/19 15:41
Surrogates								
4-Bromofluorobenzene (surr)	107		50-150		%	1		11/22/19 15:41

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 15:41
Container ID: 1196986004-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-06**

Client Sample ID: **OAFF-19-MW-06**
Client Project ID: **OAFF**
Lab Sample ID: 1196986004
Lab Project ID: 1196986

Collection Date: 11/18/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:38
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 18:38
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 18:38
1,3,5-Trimethylbenzene	0.612	J	1.00	0.310	ug/L	1		11/25/19 18:38
Benzene	0.214	J	0.400	0.120	ug/L	1		11/25/19 18:38
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:38
Isopropylbenzene (Cumene)	5.55		1.00	0.310	ug/L	1		11/25/19 18:38
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 18:38
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:38
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:38
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:38
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 18:38
sec-Butylbenzene	2.72		1.00	0.310	ug/L	1		11/25/19 18:38
tert-Butylbenzene	0.339	J	1.00	0.310	ug/L	1		11/25/19 18:38
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:38
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 18:38
Surrogates								
1,2-Dichloroethane-D4 (surr)	113		81-118		%	1		11/25/19 18:38
4-Bromofluorobenzene (surr)	102		85-114		%	1		11/25/19 18:38
Toluene-d8 (surr)	106		89-112		%	1		11/25/19 18:38

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 18:38
Container ID: 1196986004-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-MW-60**

Client Sample ID: **OAFF-19-MW-60**
Client Project ID: **OAFF**
Lab Sample ID: 1196986005
Lab Project ID: 1196986

Collection Date: 11/18/19 15:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.225		0.0481	0.0144	ug/L	1		11/27/19 17:00
2-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Benzo[a]pyrene	0.00960	U	0.0192	0.00596	ug/L	1		11/27/19 17:00
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Dibenzo[a,h]anthracene	0.00960	U	0.0192	0.00596	ug/L	1		11/27/19 17:00
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Naphthalene	0.283		0.0962	0.0298	ug/L	1		11/27/19 17:00
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/27/19 17:00
Surrogates								
2-Methylnaphthalene-d10 (surr)	60.5		47-106		%	1		11/27/19 17:00
Fluoranthene-d10 (surr)	52.3		24-116		%	1		11/27/19 17:00

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 17:00
Container ID: 1196986005-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-60**

Client Sample ID: **OAFF-19-MW-60**
Client Project ID: **OAFF**
Lab Sample ID: 1196986005
Lab Project ID: 1196986

Collection Date: 11/18/19 15:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.472	J	0.577	0.173	mg/L	1		12/02/19 13:56
Surrogates								
5a Androstane (surr)	82.3		50-150		%	1		12/02/19 13:56

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/02/19 13:56
Container ID: 1196986005-A

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/19 10:28
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **OAFF-19-MW-60**

Client Sample ID: **OAFF-19-MW-60**
Client Project ID: **OAFF**
Lab Sample ID: 1196986005
Lab Project ID: 1196986

Collection Date: 11/18/19 15:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0731	J	0.100	0.0310	mg/L	1		11/22/19 15:59
Surrogates								
4-Bromofluorobenzene (surr)	105		50-150		%	1		11/22/19 15:59

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 15:59
Container ID: 1196986005-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-60**

Client Sample ID: **OAFF-19-MW-60**
Client Project ID: **OAFF**
Lab Sample ID: 1196986005
Lab Project ID: 1196986

Collection Date: 11/18/19 15:15
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:53
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 18:53
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 18:53
1,3,5-Trimethylbenzene	0.627	J	1.00	0.310	ug/L	1		11/25/19 18:53
Benzene	0.217	J	0.400	0.120	ug/L	1		11/25/19 18:53
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:53
Isopropylbenzene (Cumene)	5.73		1.00	0.310	ug/L	1		11/25/19 18:53
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 18:53
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:53
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:53
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:53
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 18:53
sec-Butylbenzene	2.83		1.00	0.310	ug/L	1		11/25/19 18:53
tert-Butylbenzene	0.346	J	1.00	0.310	ug/L	1		11/25/19 18:53
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 18:53
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 18:53
Surrogates								
1,2-Dichloroethane-D4 (surr)	111		81-118		%	1		11/25/19 18:53
4-Bromofluorobenzene (surr)	103		85-114		%	1		11/25/19 18:53
Toluene-d8 (surr)	106		89-112		%	1		11/25/19 18:53

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 18:53
Container ID: 1196986005-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-MW-10**

Client Sample ID: **OAFF-19-MW-10**
Client Project ID: **OAFF**
Lab Sample ID: 1196986006
Lab Project ID: 1196986

Collection Date: 11/19/19 15:00
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		11/27/19 17:21
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		11/27/19 17:21
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		11/27/19 17:21
Phenanthrene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 17:21
Surrogates								
2-Methylnaphthalene-d10 (surr)	52.8		47-106		%	1		11/27/19 17:21
Fluoranthene-d10 (surr)	49.1		24-116		%	1		11/27/19 17:21

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 17:21
Container ID: 1196986006-B

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-10**

Client Sample ID: **OAFF-19-MW-10**
Client Project ID: **OAFF**
Lab Sample ID: 1196986006
Lab Project ID: 1196986

Collection Date: 11/19/19 15:00
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.05		0.556	0.167	mg/L	1		12/02/19 14:06
Surrogates								
5a Androstane (surr)	95.2		50-150		%	1		12/02/19 14:06

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/02/19 14:06
Container ID: 1196986006-A

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/19 10:28
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-10**

Client Sample ID: **OAFF-19-MW-10**
Client Project ID: **OAFF**
Lab Sample ID: 1196986006
Lab Project ID: 1196986

Collection Date: 11/19/19 15:00
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		11/22/19 16:16
Surrogates								
4-Bromofluorobenzene (surr)	73.7		50-150		%	1		11/22/19 16:16

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 16:16
Container ID: 1196986006-D

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-10**

Client Sample ID: **OAFF-19-MW-10**
Client Project ID: **OAFF**
Lab Sample ID: 1196986006
Lab Project ID: 1196986

Collection Date: 11/19/19 15:00
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		11/25/19 19:08
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		11/25/19 19:08
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
Benzene	0.200 U		0.400	0.120	ug/L	1		11/25/19 19:08
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/25/19 19:08
Naphthalene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/25/19 19:08
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
Toluene	0.500 U		1.00	0.310	ug/L	1		11/25/19 19:08
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/25/19 19:08
Surrogates								
1,2-Dichloroethane-D4 (surr)	112		81-118		%	1		11/25/19 19:08
4-Bromofluorobenzene (surr)	106		85-114		%	1		11/25/19 19:08
Toluene-d8 (surr)	104		89-112		%	1		11/25/19 19:08

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 19:08
Container ID: 1196986006-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **OAFF-19-MW-11**

Client Sample ID: **OAFF-19-MW-11**
Client Project ID: **OAFF**
Lab Sample ID: 1196986007
Lab Project ID: 1196986

Collection Date: 11/19/19 13:40
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
2-Methylnaphthalene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Acenaphthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Acenaphthylene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Anthracene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Benzo(a)Anthracene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Benzo[a]pyrene	0.00980 U		0.0196	0.00608	ug/L	1		11/27/19 17:41
Benzo[b]Fluoranthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Benzo[g,h,i]perylene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Benzo[k]fluoranthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Chrysene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Dibenzo[a,h]anthracene	0.00980 U		0.0196	0.00608	ug/L	1		11/27/19 17:41
Fluoranthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Fluorene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Indeno[1,2,3-c,d] pyrene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Naphthalene	0.0490 U		0.0980	0.0304	ug/L	1		11/27/19 17:41
Phenanthrene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Pyrene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 17:41
Surrogates								
2-Methylnaphthalene-d10 (surr)	41	*	47-106		%	1		11/27/19 17:41
Fluoranthene-d10 (surr)	40.6		24-116		%	1		11/27/19 17:41

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 17:41
Container ID: 1196986007-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-11**

Client Sample ID: **OAFF-19-MW-11**
Client Project ID: **OAFF**
Lab Sample ID: 1196986007
Lab Project ID: 1196986

Collection Date: 11/19/19 13:40
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.636		0.610	0.183	mg/L	1		12/02/19 14:16
Surrogates								
5a Androstane (surr)	85.7		50-150		%	1		12/02/19 14:16

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/02/19 14:16
Container ID: 1196986007-A

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/19 10:28
Prep Initial Wt./Vol.: 246 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-11**

Client Sample ID: **OAFF-19-MW-11**
Client Project ID: **OAFF**
Lab Sample ID: 1196986007
Lab Project ID: 1196986

Collection Date: 11/19/19 13:40
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		11/22/19 16:34
Surrogates								
4-Bromofluorobenzene (surr)	74.6		50-150		%	1		11/22/19 16:34

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 16:34
Container ID: 1196986007-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-11**

Client Sample ID: **OAFF-19-MW-11**
Client Project ID: **OAFF**
Lab Sample ID: 1196986007
Lab Project ID: 1196986

Collection Date: 11/19/19 13:40
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 19:22
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 19:22
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
Benzene	0.125	J	0.400	0.120	ug/L	1		11/25/19 19:22
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 19:22
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 19:22
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:22
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 19:22
Surrogates								
1,2-Dichloroethane-D4 (surr)	111		81-118		%	1		11/25/19 19:22
4-Bromofluorobenzene (surr)	105		85-114		%	1		11/25/19 19:22
Toluene-d8 (surr)	105		89-112		%	1		11/25/19 19:22

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 19:22
Container ID: 1196986007-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-MW-12**

Client Sample ID: **OAFF-19-MW-12**
Client Project ID: **OAFF**
Lab Sample ID: 1196986008
Lab Project ID: 1196986

Collection Date: 11/19/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.109		0.0472	0.0142	ug/L	1		11/27/19 18:02
2-Methylnaphthalene	0.0866		0.0472	0.0142	ug/L	1		11/27/19 18:02
Acenaphthene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Acenaphthylene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Anthracene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Benzo(a)Anthracene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Benzo[a]pyrene	0.00945 U		0.0189	0.00585	ug/L	1		11/27/19 18:02
Benzo[b]Fluoranthene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Benzo[g,h,i]perylene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Benzo[k]fluoranthene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Chrysene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Dibenzo[a,h]anthracene	0.00945 U		0.0189	0.00585	ug/L	1		11/27/19 18:02
Fluoranthene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Fluorene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Indeno[1,2,3-c,d] pyrene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Naphthalene	6.16		0.0943	0.0292	ug/L	1		11/27/19 18:02
Phenanthrene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Pyrene	0.0236 U		0.0472	0.0142	ug/L	1		11/27/19 18:02
Surrogates								
2-Methylnaphthalene-d10 (surr)	52.8		47-106		%	1		11/27/19 18:02
Fluoranthene-d10 (surr)	53.1		24-116		%	1		11/27/19 18:02

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 18:02
Container ID: 1196986008-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-12**

Client Sample ID: **OAFF-19-MW-12**
Client Project ID: **OAFF**
Lab Sample ID: 1196986008
Lab Project ID: 1196986

Collection Date: 11/19/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.50		0.600	0.180	mg/L	1		12/09/19 20:40
Surrogates								
5a Androstane (surr)	84.7		50-150		%	1		12/09/19 20:40

Batch Information

Analytical Batch: XFC15497
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 12/09/19 20:40
Container ID: 1196986008-A

Prep Batch: XXX42642
Prep Method: SW3520C
Prep Date/Time: 12/02/19 11:02
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-12**

Client Sample ID: **OAFF-19-MW-12**
Client Project ID: **OAFF**
Lab Sample ID: 1196986008
Lab Project ID: 1196986

Collection Date: 11/19/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0326	J	0.100	0.0310	mg/L	1		11/22/19 16:52
Surrogates								
4-Bromofluorobenzene (surr)	74.9		50-150		%	1		11/22/19 16:52

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 16:52
Container ID: 1196986008-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-MW-12**

Client Sample ID: **OAFF-19-MW-12**
Client Project ID: **OAFF**
Lab Sample ID: 1196986008
Lab Project ID: 1196986

Collection Date: 11/19/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 14:31
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 14:31
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
Benzene	0.392	J	0.400	0.120	ug/L	1		11/25/19 14:31
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 14:31
Naphthalene	8.18		1.00	0.310	ug/L	1		11/25/19 14:31
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 14:31
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 14:31
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 14:31
Surrogates								
1,2-Dichloroethane-D4 (surr)	110		81-118		%	1		11/25/19 14:31
4-Bromofluorobenzene (surr)	103		85-114		%	1		11/25/19 14:31
Toluene-d8 (surr)	105		89-112		%	1		11/25/19 14:31

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 14:31
Container ID: 1196986008-H

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-SD-1**

Client Sample ID: **OAFF-19-SD-1**
Client Project ID: **OAFF**
Lab Sample ID: 1196986009
Lab Project ID: 1196986

Collection Date: 11/15/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
2-Methylnaphthalene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Acenaphthene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Acenaphthylene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Anthracene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Benzo(a)Anthracene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Benzo[a]pyrene	0.104	U	0.208	0.0646	ug/L	10		11/27/19 18:22
Benzo[b]Fluoranthene	0.663		0.521	0.156	ug/L	10		11/27/19 18:22
Benzo[g,h,i]perylene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Benzo[k]fluoranthene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Chrysene	0.685		0.521	0.156	ug/L	10		11/27/19 18:22
Dibenzo[a,h]anthracene	0.104	U	0.208	0.0646	ug/L	10		11/27/19 18:22
Fluoranthene	0.943		0.521	0.156	ug/L	10		11/27/19 18:22
Fluorene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Indeno[1,2,3-c,d] pyrene	0.261	U	0.521	0.156	ug/L	10		11/27/19 18:22
Naphthalene	0.553	J	1.04	0.323	ug/L	10		11/27/19 18:22
Phenanthrene	0.383	J	0.521	0.156	ug/L	10		11/27/19 18:22
Pyrene	1.01		0.521	0.156	ug/L	10		11/27/19 18:22
Surrogates								
2-Methylnaphthalene-d10 (surr)	43.9	*	47-106		%	10		11/27/19 18:22
Fluoranthene-d10 (surr)	13.5	*	24-116		%	10		11/27/19 18:22

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 18:22
Container ID: 1196986009-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-1**

Client Sample ID: **OAFF-19-SD-1**
Client Project ID: **OAFF**
Lab Sample ID: 1196986009
Lab Project ID: 1196986

Collection Date: 11/15/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.19		0.652	0.196	mg/L	1		11/26/19 21:27
Surrogates								
5a Androstane (surr)	86.1		50-150		%	1		11/26/19 21:27

Batch Information

Analytical Batch: XFC15485
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/26/19 21:27
Container ID: 1196986009-A

Prep Batch: XXX42623
Prep Method: SW3520C
Prep Date/Time: 11/25/19 11:30
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-1**

Client Sample ID: **OAFF-19-SD-1**
Client Project ID: **OAFF**
Lab Sample ID: 1196986009
Lab Project ID: 1196986

Collection Date: 11/15/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0465	J	0.100	0.0310	mg/L	1		11/22/19 17:10
Surrogates								
4-Bromofluorobenzene (surr)	74		50-150		%	1		11/22/19 17:10

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 17:10
Container ID: 1196986009-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-1**

Client Sample ID: **OAFF-19-SD-1**
Client Project ID: **OAFF**
Lab Sample ID: 1196986009
Lab Project ID: 1196986

Collection Date: 11/15/19 14:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 19:37
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 19:37
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
Benzene	1.44		0.400	0.120	ug/L	1		11/25/19 19:37
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 19:37
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 19:37
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:37
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 19:37
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		81-118		%	1		11/25/19 19:37
4-Bromofluorobenzene (surr)	104		85-114		%	1		11/25/19 19:37
Toluene-d8 (surr)	105		89-112		%	1		11/25/19 19:37

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 19:37
Container ID: 1196986009-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-2**

Client Sample ID: **OAFF-19-SD-2**
Client Project ID: **OAFF**
Lab Sample ID: 1196986010
Lab Project ID: 1196986

Collection Date: 11/15/19 14:20
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
2-Methylnaphthalene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Acenaphthene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Acenaphthylene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Anthracene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Benzo(a)Anthracene	0.459 J		0.490	0.147	ug/L	10		11/27/19 18:43
Benzo[a]pyrene	0.0980 U		0.196	0.0608	ug/L	10		11/27/19 18:43
Benzo[b]Fluoranthene	0.586		0.490	0.147	ug/L	10		11/27/19 18:43
Benzo[g,h,i]perylene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Benzo[k]fluoranthene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Chrysene	0.662		0.490	0.147	ug/L	10		11/27/19 18:43
Dibenzo[a,h]anthracene	0.0980 U		0.196	0.0608	ug/L	10		11/27/19 18:43
Fluoranthene	1.03		0.490	0.147	ug/L	10		11/27/19 18:43
Fluorene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Indeno[1,2,3-c,d] pyrene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Naphthalene	0.490 U		0.980	0.304	ug/L	10		11/27/19 18:43
Phenanthrene	0.245 U		0.490	0.147	ug/L	10		11/27/19 18:43
Pyrene	1.09		0.490	0.147	ug/L	10		11/27/19 18:43
Surrogates								
2-Methylnaphthalene-d10 (surr)	39.6	*	47-106		%	10		11/27/19 18:43
Fluoranthene-d10 (surr)	13.4	*	24-116		%	10		11/27/19 18:43

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 18:43
Container ID: 1196986010-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-2**

Client Sample ID: **OAFF-19-SD-2**
Client Project ID: **OAFF**
Lab Sample ID: 1196986010
Lab Project ID: 1196986

Collection Date: 11/15/19 14:20
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.29		0.600	0.180	mg/L	1		11/26/19 21:37
Surrogates								
5a Androstane (surr)	80.4		50-150		%	1		11/26/19 21:37

Batch Information

Analytical Batch: XFC15485
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/26/19 21:37
Container ID: 1196986010-A

Prep Batch: XXX42623
Prep Method: SW3520C
Prep Date/Time: 11/25/19 11:30
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-2**

Client Sample ID: **OAFF-19-SD-2**
Client Project ID: **OAFF**
Lab Sample ID: 1196986010
Lab Project ID: 1196986

Collection Date: 11/15/19 14:20
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0428	J	0.100	0.0310	mg/L	1		11/22/19 17:28
Surrogates								
4-Bromofluorobenzene (surr)	76		50-150		%	1		11/22/19 17:28

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 17:28
Container ID: 1196986010-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-2**

Client Sample ID: **OAFF-19-SD-2**
Client Project ID: **OAFF**
Lab Sample ID: 1196986010
Lab Project ID: 1196986

Collection Date: 11/15/19 14:20
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 19:51
1,2-Dichloroethane	0.182	J	0.500	0.150	ug/L	1		11/25/19 19:51
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
Benzene	1.25		0.400	0.120	ug/L	1		11/25/19 19:51
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 19:51
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 19:51
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 19:51
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 19:51
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		81-118		%	1		11/25/19 19:51
4-Bromofluorobenzene (surr)	103		85-114		%	1		11/25/19 19:51
Toluene-d8 (surr)	106		89-112		%	1		11/25/19 19:51

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 19:51
Container ID: 1196986010-F

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-3**

Client Sample ID: **OAFF-19-SD-3**
Client Project ID: **OAFF**
Lab Sample ID: 1196986011
Lab Project ID: 1196986

Collection Date: 11/15/19 14:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		11/27/19 19:03
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		11/27/19 19:03
Fluoranthene	0.0476	J	0.0490	0.0147	ug/L	1		11/27/19 19:03
Fluorene	0.0284	J	0.0490	0.0147	ug/L	1		11/27/19 19:03
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		11/27/19 19:03
Naphthalene	0.0398	J	0.0980	0.0304	ug/L	1		11/27/19 19:03
Phenanthrene	0.0264	J	0.0490	0.0147	ug/L	1		11/27/19 19:03
Pyrene	0.0386	J	0.0490	0.0147	ug/L	1		11/27/19 19:03
Surrogates								
2-Methylnaphthalene-d10 (surr)	65.3		47-106		%	1		11/27/19 19:03
Fluoranthene-d10 (surr)	51.3		24-116		%	1		11/27/19 19:03

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 19:03
Container ID: 1196986011-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-3**

Client Sample ID: **OAFF-19-SD-3**
Client Project ID: **OAFF**
Lab Sample ID: 1196986011
Lab Project ID: 1196986

Collection Date: 11/15/19 14:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.899		0.638	0.191	mg/L	1		11/26/19 21:47
Surrogates								
5a Androstane (surr)	78.4		50-150		%	1		11/26/19 21:47

Batch Information

Analytical Batch: XFC15485
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/26/19 21:47
Container ID: 1196986011-A

Prep Batch: XXX42623
Prep Method: SW3520C
Prep Date/Time: 11/25/19 11:30
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-3**

Client Sample ID: **OAFF-19-SD-3**
Client Project ID: **OAFF**
Lab Sample ID: 1196986011
Lab Project ID: 1196986

Collection Date: 11/15/19 14:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		11/22/19 17:45
Surrogates								
4-Bromofluorobenzene (surr)	74.5		50-150		%	1		11/22/19 17:45

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 17:45
Container ID: 1196986011-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OAFF-19-SD-3**

Client Sample ID: **OAFF-19-SD-3**
Client Project ID: **OAFF**
Lab Sample ID: 1196986011
Lab Project ID: 1196986

Collection Date: 11/15/19 14:50
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 15:14
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 15:14
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
Benzene	0.200	U	0.400	0.120	ug/L	1		11/25/19 15:14
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 15:14
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/25/19 15:14
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:14
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/25/19 15:14
Surrogates								
1,2-Dichloroethane-D4 (surr)	110		81-118		%	1		11/25/19 15:14
4-Bromofluorobenzene (surr)	103		85-114		%	1		11/25/19 15:14
Toluene-d8 (surr)	105		89-112		%	1		11/25/19 15:14

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 15:14
Container ID: 1196986011-H

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-4**

Client Sample ID: **OAFF-19-SD-4**
Client Project ID: **OAFF**
Lab Sample ID: 1196986012
Lab Project ID: 1196986

Collection Date: 11/15/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	4.99		0.0490	0.0147	ug/L	1		11/27/19 19:24
2-Methylnaphthalene	0.142		0.0490	0.0147	ug/L	1		11/27/19 19:24
Acenaphthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Acenaphthylene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Anthracene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Benzo(a)Anthracene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Benzo[a]pyrene	0.00980 U		0.0196	0.00608	ug/L	1		11/27/19 19:24
Benzo[b]Fluoranthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Benzo[g,h,i]perylene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Benzo[k]fluoranthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Chrysene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Dibenzo[a,h]anthracene	0.00980 U		0.0196	0.00608	ug/L	1		11/27/19 19:24
Fluoranthene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Fluorene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Indeno[1,2,3-c,d] pyrene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Naphthalene	2.99		0.0980	0.0304	ug/L	1		11/27/19 19:24
Phenanthrene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Pyrene	0.0245 U		0.0490	0.0147	ug/L	1		11/27/19 19:24
Surrogates								
2-Methylnaphthalene-d10 (surr)	74.6		47-106		%	1		11/27/19 19:24
Fluoranthene-d10 (surr)	76.5		24-116		%	1		11/27/19 19:24

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/27/19 19:24
Container ID: 1196986012-C

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/19 09:21
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-4**

Client Sample ID: **OAFF-19-SD-4**
Client Project ID: **OAFF**
Lab Sample ID: 1196986012
Lab Project ID: 1196986

Collection Date: 11/15/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.723		0.600	0.180	mg/L	1		11/26/19 21:57
Surrogates								
5a Androstane (surr)	91		50-150		%	1		11/26/19 21:57

Batch Information

Analytical Batch: XFC15485
Analytical Method: AK102
Analyst: DSD
Analytical Date/Time: 11/26/19 21:57
Container ID: 1196986012-A

Prep Batch: XXX42623
Prep Method: SW3520C
Prep Date/Time: 11/25/19 11:30
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-4**

Client Sample ID: **OAFF-19-SD-4**
Client Project ID: **OAFF**
Lab Sample ID: 1196986012
Lab Project ID: 1196986

Collection Date: 11/15/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0692	J	0.100	0.0310	mg/L	1		11/22/19 18:03
Surrogates								
4-Bromofluorobenzene (surr)	117		50-150		%	1		11/22/19 18:03

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 11/22/19 18:03
Container ID: 1196986012-E

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Results of **OAFF-19-SD-4**

Client Sample ID: **OAFF-19-SD-4**
Client Project ID: **OAFF**
Lab Sample ID: 1196986012
Lab Project ID: 1196986

Collection Date: 11/15/19 15:10
Received Date: 11/21/19 10:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	5.18		1.00	0.310	ug/L	1		11/25/19 15:29
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/25/19 15:29
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/25/19 15:29
1,3,5-Trimethylbenzene	3.44		1.00	0.310	ug/L	1		11/25/19 15:29
Benzene	0.421		0.400	0.120	ug/L	1		11/25/19 15:29
Ethylbenzene	0.457	J	1.00	0.310	ug/L	1		11/25/19 15:29
Isopropylbenzene (Cumene)	10.8		1.00	0.310	ug/L	1		11/25/19 15:29
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/25/19 15:29
Naphthalene	10.2		1.00	0.310	ug/L	1		11/25/19 15:29
n-Butylbenzene	0.949	J	1.00	0.310	ug/L	1		11/25/19 15:29
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:29
P & M -Xylene	3.86		2.00	0.620	ug/L	1		11/25/19 15:29
sec-Butylbenzene	4.11		1.00	0.310	ug/L	1		11/25/19 15:29
tert-Butylbenzene	0.577	J	1.00	0.310	ug/L	1		11/25/19 15:29
Toluene	0.500	U	1.00	0.310	ug/L	1		11/25/19 15:29
Xylenes (total)	3.86		3.00	1.00	ug/L	1		11/25/19 15:29
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		81-118		%	1		11/25/19 15:29
4-Bromofluorobenzene (surr)	103		85-114		%	1		11/25/19 15:29
Toluene-d8 (surr)	107		89-112		%	1		11/25/19 15:29

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 11/25/19 15:29
Container ID: 1196986012-H

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:39AM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1802512 [VXX/35269]
Blank Lab ID: 1544775

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007, 1196986008, 1196986009, 1196986010, 1196986011, 1196986012

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0430J	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	79.4	50-150		%

Batch Information

Analytical Batch: VFC15045
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 11/22/2019 11:34:00AM

Prep Batch: VXX35269
Prep Method: SW5030B
Prep Date/Time: 11/22/2019 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196986 [VXX35269]
Blank Spike Lab ID: 1544776
Date Analyzed: 11/22/2019 12:09

Spike Duplicate ID: LCSD for HBN 1196986 [VXX35269]
Spike Duplicate Lab ID: 1544777
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007, 1196986008, 1196986009, 1196986010, 1196986011, 1196986012

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.06	106	1.00	1.15	115	(60-120)	8.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	93.2	93	0.0500	85.3	85	(50-150)	8.80	

Batch Information

Analytical Batch: **VFC15045**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX35269**
Prep Method: **SW5030B**
Prep Date/Time: **11/22/2019 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 12/12/2019 10:25:45AM

Method Blank

Blank ID: MB for HBN 1802571 [VXX/35273]
Blank Lab ID: 1544976

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007, 1196986008, 1196986009, 1196986010, 1196986011, 1196986012

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	115	81-118		%
4-Bromofluorobenzene (surr)	105	85-114		%
Toluene-d8 (surr)	106	89-112		%

Batch Information

Analytical Batch: VMS19690
Analytical Method: SW8260C
Instrument: VPA 780/5975 GC/MS
Analyst: NRB
Analytical Date/Time: 11/25/2019 11:07:00AM

Prep Batch: VXX35273
Prep Method: SW5030B
Prep Date/Time: 11/25/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196986 [VXX35273]
Blank Spike Lab ID: 1544977
Date Analyzed: 11/25/2019 11:21

Spike Duplicate ID: LCSD for HBN 1196986 [VXX35273]
Spike Duplicate Lab ID: 1544978
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007, 1196986008, 1196986009, 1196986010, 1196986011, 1196986012

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	30	33.7	112	30	34.6	115	(79-124)	2.80	(< 20)
1,2-Dibromoethane	30	31.1	104	30	31.3	104	(77-121)	0.61	(< 20)
1,2-Dichloroethane	30	29.6	99	30	30.2	101	(73-128)	2.10	(< 20)
1,3,5-Trimethylbenzene	30	33.8	113	30	34.7	116	(75-124)	2.70	(< 20)
Benzene	30	30.4	101	30	31.0	103	(79-120)	2.00	(< 20)
Ethylbenzene	30	32.7	109	30	33.2	111	(79-121)	1.30	(< 20)
Isopropylbenzene (Cumene)	30	33.4	111	30	34.1	114	(72-131)	1.90	(< 20)
Methyl-t-butyl ether	45	47.0	104	45	47.6	106	(71-124)	1.20	(< 20)
Naphthalene	30	27.2	91	30	30.7	102	(61-128)	12.30	(< 20)
n-Butylbenzene	30	32.4	108	30	33.6	112	(75-128)	3.40	(< 20)
o-Xylene	30	32.9	110	30	32.8	109	(78-122)	0.34	(< 20)
P & M -Xylene	60	66.0	110	60	66.7	111	(80-121)	1.10	(< 20)
sec-Butylbenzene	30	33.2	111	30	34.8	116	(77-126)	4.60	(< 20)
tert-Butylbenzene	30	33.0	110	30	34.1	114	(78-124)	3.10	(< 20)
Toluene	30	32.1	107	30	32.8	109	(80-121)	2.10	(< 20)
Xylenes (total)	90	98.9	110	90	99.5	111	(79-121)	0.61	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	102	102	30	102	102	(81-118)	0.69	
4-Bromofluorobenzene (surr)	30	102	102	30	102	102	(85-114)	0.06	
Toluene-d8 (surr)	30	108	108	30	108	108	(89-112)	0.10	

Batch Information

Analytical Batch: **VMS19690**
Analytical Method: **SW8260C**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **NRB**

Prep Batch: **VXX35273**
Prep Method: **SW5030B**
Prep Date/Time: **11/25/2019 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1802459 [XXX/42618]
Blank Lab ID: 1544579

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007, 1196986008, 1196986009, 1196986010, 1196986011, 1196986012

Results by **8270D SIM LV (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	71.5	47-106		%
Fluoranthene-d10 (surr)	75	24-116		%

Batch Information

Analytical Batch: XMS11878
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 11/27/2019 1:35:00PM

Prep Batch: XXX42618
Prep Method: SW3520C
Prep Date/Time: 11/22/2019 9:21:18AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196986 [XXX42618]
Blank Spike Lab ID: 1544580
Date Analyzed: 11/27/2019 13:56

Spike Duplicate ID: LCSD for HBN 1196986 [XXX42618]
Spike Duplicate Lab ID: 1544581
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007, 1196986008, 1196986009, 1196986010, 1196986011, 1196986012

Results by **8270D SIM LV (PAH)**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.61	81	2	1.39	70	(41-115)	14.80	(< 20)
2-Methylnaphthalene	2	1.59	80	2	1.37	68	(39-114)	15.30	(< 20)
Acenaphthene	2	1.60	80	2	1.34	67	(48-114)	17.20	(< 20)
Acenaphthylene	2	1.71	86	2	1.46	73	(35-121)	16.00	(< 20)
Anthracene	2	1.59	79	2	1.33	67	(53-119)	17.50	(< 20)
Benzo(a)Anthracene	2	1.61	80	2	1.41	70	(59-120)	13.20	(< 20)
Benzo[a]pyrene	2	1.52	76	2	1.30	65	(53-120)	15.20	(< 20)
Benzo[b]Fluoranthene	2	1.61	80	2	1.41	71	(53-126)	12.80	(< 20)
Benzo[g,h,i]perylene	2	1.48	74	2	1.26	63	(44-128)	15.70	(< 20)
Benzo[k]fluoranthene	2	1.59	80	2	1.37	69	(54-125)	14.70	(< 20)
Chrysene	2	1.64	82	2	1.42	71	(57-120)	14.50	(< 20)
Dibenzo[a,h]anthracene	2	1.40	70	2	1.16	58	(44-131)	18.90	(< 20)
Fluoranthene	2	1.74	87	2	1.48	74	(58-120)	16.30	(< 20)
Fluorene	2	1.61	81	2	1.37	68	(50-118)	16.30	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.57	79	2	1.38	69	(48-130)	13.50	(< 20)
Naphthalene	2	1.71	86	2	1.46	73	(43-114)	16.10	(< 20)
Phenanthrene	2	1.57	79	2	1.31	66	(53-115)	17.90	(< 20)
Pyrene	2	1.79	89	2	1.53	76	(53-121)	15.70	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	77	77	2	64.8	65	(47-106)	17.30	
Fluoranthene-d10 (surr)	2	79.1	79	2	69.3	69	(24-116)	13.20	

Batch Information

Analytical Batch: **XMS11878**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **DSD**

Prep Batch: **XXX42618**
Prep Method: **SW3520C**
Prep Date/Time: **11/22/2019 09:21**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Print Date: 12/12/2019 10:25:56AM

Method Blank

Blank ID: MB for HBN 1802516 [XXX/42623]
Blank Lab ID: 1544797

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1196986009, 1196986010, 1196986011, 1196986012

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	95.4	60-120		%

Batch Information

Analytical Batch: XFC15485
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: DSD
Analytical Date/Time: 11/26/2019 3:59:00PM

Prep Batch: XXX42623
Prep Method: SW3520C
Prep Date/Time: 11/25/2019 11:30:45AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196986 [XXX42623]
Blank Spike Lab ID: 1544798
Date Analyzed: 11/26/2019 16:28

Spike Duplicate ID: LCSD for HBN 1196986 [XXX42623]
Spike Duplicate Lab ID: 1544799
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1196986009, 1196986010, 1196986011, 1196986012

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	20.3	101	20	19.5	98	(75-125)	3.80	(< 20)
Surrogates									
5a Androstane (surr)	0.4	110	110	0.4	108	108	(60-120)	2.40	

Batch Information

Analytical Batch: **XFC15485**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **DSD**

Prep Batch: **XXX42623**
Prep Method: **SW3520C**
Prep Date/Time: **11/25/2019 11:30**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 12/12/2019 10:26:02AM

Method Blank

Blank ID: MB for HBN 1802594 [XXX/42630]
Blank Lab ID: 1545040

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	92.1	60-120		%

Batch Information

Analytical Batch: XFC15488
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: JMG
Analytical Date/Time: 12/2/2019 12:17:00PM

Prep Batch: XXX42630
Prep Method: SW3520C
Prep Date/Time: 11/27/2019 10:28:57AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1196986 [XXX42630]
Blank Spike Lab ID: 1545041
Date Analyzed: 12/02/2019 12:26

Spike Duplicate ID: LCSD for HBN 1196986 [XXX42630]
Spike Duplicate Lab ID: 1545042
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1196986001, 1196986002, 1196986003, 1196986004, 1196986005, 1196986006, 1196986007

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	20.0	100	20	20.1	101	(75-125)	0.31	(< 20)
Surrogates									
5a Androstane (surr)	0.4	105	105	0.4	107	107	(60-120)	1.30	

Batch Information

Analytical Batch: **XFC15488**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **JMG**

Prep Batch: **XXX42630**
Prep Method: **SW3520C**
Prep Date/Time: **11/27/2019 10:28**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 12/12/2019 10:26:08AM

Method Blank

Blank ID: MB for HBN 1802664 [XXX/42642]
Blank Lab ID: 1545348

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1196986008

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	86	60-120		%

Batch Information

Analytical Batch: XFC15497
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: JMG
Analytical Date/Time: 12/9/2019 6:40:00PM

Prep Batch: XXX42642
Prep Method: SW3520C
Prep Date/Time: 12/2/2019 11:02:46AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1196986 [XXX42642]
Blank Spike Lab ID: 1545349
Date Analyzed: 12/09/2019 19:20

Spike Duplicate ID: LCSD for HBN 1196986 [XXX42642]
Spike Duplicate Lab ID: 1545350
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1196986008

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	18.8	94	20	18.4	92	(75-125)	2.20	(< 20)
Surrogates									
5a Androstane (surr)	0.4	104	104	0.4	103	103	(60-120)	0.50	

Batch Information

Analytical Batch: **XFC15497**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **JMG**

Prep Batch: **XXX42642**
Prep Method: **SW3520C**
Prep Date/Time: **12/02/2019 11:02**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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1196986

Profile: 362607 JKJ

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Section 1

CLIENT: Ahtna Engineering

CONTACT: Alex Geilich | PHONE #: 907-771-4431

PROJECT NAME: OAFF | PROJECT/ PWSID/ PERMIT#: 20204.041

REPORTS TO: Alex Geilich | E-MAIL: ageilich@ahtna.net | Profile #:

INVOICE TO: Ahtna Engineering | QUOTE #: | P.O. #: 20204.041

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 3 — Preservative

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis* 8260C - Petroleum VOC (HCl)	AK101 - GRO (HCl)	AK102 - DRO (HCl)	8270D SIM - PAH (None)							REMARKS/LOC ID
(1) AJ	OAFF-19-MW-01	11/19/2019	1215	W	4	Grab	X	X	X	X							Used three 250 mL jars w/ HCL, and one 250 ml jar w/o preservative
(2) AJ	OAFF-19-MW-03	11/18/2019	1650	W	4	Grab	X	X	X	X							
(3) AJ	OAFF-19-MW-4R	11/19/2019	1125	W	4	Grab	X	X	X	X							
(4) AJ	OAFF-19-MW-06	11/18/2019	1510	W	4	Grab	X	X	X	X							
(5) AJ	OAFF-19-MW-60	11/18/2019	1515	W	4	Grab	X	X	X	X							
(6) AJ	OAFF-19-MW-10	11/19/2019	1500	W	3	Grab	X	X	X	X							Only used one 250 mL jar w/ HCL
(7) AJ	OAFF-19-MW-11	11/19/2019	1340	W	4	Grab	X	X	X	X							
(8) AJ	OAFF-19-MW-12	11/19/2019	1410	W	4	Grab	X	X	X	X							
(9) AJ	OAFF-19-SD-1	11/15/2019	1410	W	4	Grab	X	X	X	X							
(10) AJ	OAFF-19-SD-2	11/15/2019	1420	W	4	Grab	X	X	X	X							
(11) AJ	OAFF-19-SD-3	11/15/2019	1450	W	4	Grab	X	X	X	X							
(12) AJ	OAFF-19-SD-4	11/15/2019	1510	W	4	Grab	X	X	X	X							

*The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 5

	Date	Time	
Relinquished By: (1) Bailey Kurtz	11/21/19	0930	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	11/21/19	10:15	Received For Laboratory By: JKJ

Section 4

DOD Project? No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Standard TAT

Temp Blank °C: 0.2 D60, 0.1 D45 or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [X]

D63, 0.2°C
D63, -0.6°C

e-Sample Receipt Form

SGS Workorder #: **1196986**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 0.2 °C Therm. ID: D60
	Yes	Cooler ID: 2 @ 0.1 °C Therm. ID: D45
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	No	Container 6A was preserved in house with 2mL of HCl, Lot# LW09-0463-15-15
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	No	No trip blanks received
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1196986001-A	HCL to pH < 2	OK	1196986006-A	HCL to pH < 2	OK
1196986001-B	HCL to pH < 2	OK	1196986006-B	No Preservative Required	OK
1196986001-C	HCL to pH < 2	OK	1196986006-C	No Preservative Required	OK
1196986001-D	No Preservative Required	OK	1196986006-D	HCL to pH < 2	OK
1196986001-E	HCL to pH < 2	OK	1196986006-E	HCL to pH < 2	OK
1196986001-F	HCL to pH < 2	OK	1196986006-F	HCL to pH < 2	OK
1196986001-G	HCL to pH < 2	OK	1196986006-G	HCL to pH < 2	OK
1196986001-H	HCL to pH < 2	OK	1196986006-H	HCL to pH < 2	OK
1196986001-I	HCL to pH < 2	OK	1196986006-I	HCL to pH < 2	OK
1196986001-J	HCL to pH < 2	OK	1196986007-A	HCL to pH < 2	OK
1196986002-A	HCL to pH < 2	OK	1196986007-B	HCL to pH < 2	OK
1196986002-B	HCL to pH < 2	OK	1196986007-C	No Preservative Required	OK
1196986002-C	No Preservative Required	OK	1196986007-D	No Preservative Required	OK
1196986002-D	No Preservative Required	OK	1196986007-E	HCL to pH < 2	OK
1196986002-E	HCL to pH < 2	OK	1196986007-F	HCL to pH < 2	OK
1196986002-F	HCL to pH < 2	OK	1196986007-G	HCL to pH < 2	OK
1196986002-G	HCL to pH < 2	OK	1196986007-H	HCL to pH < 2	OK
1196986002-H	HCL to pH < 2	OK	1196986007-I	HCL to pH < 2	OK
1196986002-I	HCL to pH < 2	OK	1196986007-J	HCL to pH < 2	OK
1196986002-J	HCL to pH < 2	OK	1196986008-A	HCL to pH < 2	OK
1196986003-A	HCL to pH < 2	OK	1196986008-B	HCL to pH < 2	OK
1196986003-B	HCL to pH < 2	OK	1196986008-C	No Preservative Required	OK
1196986003-C	No Preservative Required	OK	1196986008-D	No Preservative Required	OK
1196986003-D	No Preservative Required	OK	1196986008-E	HCL to pH < 2	OK
1196986003-E	HCL to pH < 2	OK	1196986008-F	HCL to pH < 2	OK
1196986003-F	HCL to pH < 2	OK	1196986008-G	HCL to pH < 2	OK
1196986003-G	HCL to pH < 2	OK	1196986008-H	HCL to pH < 2	OK
1196986003-H	HCL to pH < 2	OK	1196986008-I	HCL to pH < 2	OK
1196986003-I	HCL to pH < 2	OK	1196986008-J	HCL to pH < 2	OK
1196986003-J	HCL to pH < 2	OK	1196986009-A	HCL to pH < 2	OK
1196986004-A	HCL to pH < 2	OK	1196986009-B	HCL to pH < 2	OK
1196986004-B	HCL to pH < 2	OK	1196986009-C	No Preservative Required	OK
1196986004-C	No Preservative Required	OK	1196986009-D	No Preservative Required	OK
1196986004-D	No Preservative Required	OK	1196986009-E	HCL to pH < 2	OK
1196986004-E	HCL to pH < 2	OK	1196986009-F	HCL to pH < 2	OK
1196986004-F	HCL to pH < 2	OK	1196986009-G	HCL to pH < 2	OK
1196986004-G	HCL to pH < 2	OK	1196986009-H	HCL to pH < 2	OK
1196986004-H	HCL to pH < 2	OK	1196986009-I	HCL to pH < 2	OK
1196986004-I	HCL to pH < 2	OK	1196986009-J	HCL to pH < 2	OK
1196986004-J	HCL to pH < 2	OK	1196986010-A	HCL to pH < 2	OK
1196986005-A	HCL to pH < 2	OK	1196986010-B	HCL to pH < 2	OK
1196986005-B	HCL to pH < 2	OK	1196986010-C	No Preservative Required	OK
1196986005-C	No Preservative Required	OK	1196986010-D	No Preservative Required	OK
1196986005-D	No Preservative Required	OK	1196986010-E	HCL to pH < 2	OK
1196986005-E	HCL to pH < 2	OK	1196986010-F	HCL to pH < 2	OK
1196986005-F	HCL to pH < 2	OK	1196986010-G	HCL to pH < 2	OK
1196986005-G	HCL to pH < 2	OK	1196986010-H	HCL to pH < 2	OK
1196986005-H	HCL to pH < 2	OK	1196986010-I	HCL to pH < 2	OK
1196986005-I	HCL to pH < 2	OK	1196986010-J	HCL to pH < 2	OK
1196986005-J	HCL to pH < 2	OK	1196986011-A	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1196986011-B	HCL to pH < 2	OK			
1196986011-C	No Preservative Required	OK			
1196986011-D	No Preservative Required	OK			
1196986011-E	HCL to pH < 2	OK			
1196986011-F	HCL to pH < 2	OK			
1196986011-G	HCL to pH < 2	OK			
1196986011-H	HCL to pH < 2	OK			
1196986011-I	HCL to pH < 2	OK			
1196986011-J	HCL to pH < 2	OK			
1196986012-A	HCL to pH < 2	OK			
1196986012-B	HCL to pH < 2	OK			
1196986012-C	No Preservative Required	OK			
1196986012-D	No Preservative Required	OK			
1196986012-E	HCL to pH < 2	OK			
1196986012-F	HCL to pH < 2	OK			
1196986012-G	HCL to pH < 2	OK			
1196986012-H	HCL to pH < 2	OK			
1196986012-I	HCL to pH < 2	OK			
1196986012-J	HCL to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

DATA QUALITY REVIEW

Date: 12/13/19

Project : Menzies OAFF Groundwater Monitoring 2019

Laboratory: Beacon Environmental Services, Inc. Fort Hill, Maryland
SGS North America, Inc. Anchorage, Alaska

Work Orders: 0004658 (Soil Gas)
1196543 (Soil)
1196986 (Groundwater and stormwater)

Reviewer Name: Marty Brewer, Ahtna
Reviewer Title: Project Chemist

INTRODUCTION

Eight soil samples including one trip blank and one field duplicate pair were collected and reported from one laboratory sample delivery group (SDG) 1196543. Eight groundwater samples including one field duplicate pair and four storm drain samples were collected and reported on SDG 1196986. Forty-three soil gas samples were collected including one trip blank and four field duplicate pairs were collected and reported on SDG 0004658. Table 1 lists by matrix the field sample numbers, corresponding laboratory numbers, and identifies quality control (QC) samples.

DATA QUALIFIER DEFINITIONS

For the purpose of this Data Quality Review (DQR) the following code letters and associated definitions are provided for use by the project chemist to summarize the data quality.

R Reported value is "rejected." Resampling or reanalysis may be necessary to verify the presence or absence of the compound.

Q The result is qualified due to quality control criteria not being met. Potential bias indicated as high (QH), low (QL), or unknown (QN).

B Analyte detected in blank. Sample result may be biased high due to blank contamination.

TABLE 1: SAMPLE SUMMARY TABLE

Matrix	Field Sample ID	Lab Sample ID	Quality Control
Soil	OAFF-19-MW-10-02	1196543001	
	OAFF-19-MW-10-5.5	1196543002	
	OAFF-19-MW-11-3.5	1196543003	
	OAFF-19-MW-11-8.5	1196543004	
	OAFF-19-MW-12-04	1196543005	
	OAFF-19-MW-12-15	1196543006	Duplicate
	OAFF-19-MW-12-11	1196543007	
	TB-10302019	1196543008	Trip Blank
Groundwater	OAFF-19-MW-01	1196986001	
	OAFF-19-MW-03	1196986002	
	OAFF-19-MW-4R	1196986003	
	OAFF-19-MW-06	1196986004	
	OAFF-19-MW-60	1196986005	Duplicate
	OAFF-19-MW-10	1196986006	
	OAFF-19-MW-11	1196986007	
	OAFF-19-MW-12	1196986008	
Stormwater	OAFF-19-SD-1	1196986009	
	OAFF-19-SD-2	1196986010	Duplicate
	OAFF-19-SD-3	1196986011	
	OAFF-19-SD-4	1196986012	
Soil Gas	Trip-1	0004658-01	Trip Blank
	OAFF-19-SG-01	0004658-02	
	OAFF-19-SG-02	0004658-03	
	OAFF-19-SG-03	0004658-04	
	OAFF-19-SG-03 DUP	0004658-05	Duplicate
	OAFF-19-SG-04	0004658-06	
	OAFF-19-SG-04 DUP	0004658-07	Duplicate
	OAFF-19-SG-05	0004658-08	
	OAFF-19-SG-06	0004658-09	
	OAFF-19-SG-07	0004658-10	
	OAFF-19-SG-08	0004658-11	
	OAFF-19-SG-09	0004658-12	
	OAFF-19-SG-10	0004658-13	
	OAFF-19-SG-11	0004658-14	
	OAFF-19-SG-12	0004658-15	
	OAFF-19-SG-13	0004658-16	
	OAFF-19-SG-14	0004658-17	
	OAFF-19-SG-14 DUP	0004658-18	Duplicate
	OAFF-19-SG-15	0004658-19	
	OAFF-19-SG-16	0004658-20	
	OAFF-19-SG-17	0004658-21	
	OAFF-19-SG-18	0004658-22	
	OAFF-19-SG-19	0004658-23	
	OAFF-19-SG-20	0004658-24	
	OAFF-19-SG-20 DUP	0004658-25	Duplicate
	OAFF-19-SG-21	0004658-26	
	OAFF-19-SG-22	0004658-27	
	OAFF-19-SG-23	0004658-28	
	OAFF-19-SG-24	0004658-29	
	OAFF-19-SG-25	0004658-30	
	OAFF-19-SG-26	0004658-31	
	OAFF-19-SG-28	0004658-32	
	OAFF-19-SG-29	0004658-33	
	OAFF-19-SG-30	0004658-34	
	OAFF-19-SG-31	0004658-35	
	OAFF-19-SG-32	0004658-36	
	OAFF-19-SG-33	0004658-37	
	OAFF-19-SG-34	0004658-38	
	OAFF-19-SG-35	0004658-39	
	OAFF-19-SG-36	0004658-40	
	OAFF-19-SG-37	0004658-41	
	OAFF-19-SG-38	0004658-42	
	OAFF-19-SG-39	0004658-43	

DATA REVIEW

This DQR includes a review, where appropriate, of the following parameters:

- Data completeness
- Chain of Custody (COC) and Cooler Receipt Forms
- Holding times and preservation
- Analytical reporting limits (limits of quantitation [LOQ] and method detection limits [DL])
- Blank analysis results
- Surrogate recoveries (organics only)
- Field duplicates
- Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results

Each analysis that was performed is evaluated in the following subsections of this report, and only the criteria exceedances that impact data qualification or require assessment beyond laboratory documentation are discussed.

Validation was conducted in accordance with the USEPA document "*Test Methods for Evaluating Solid Wastes, SW-846, revision 6*" (July, 2014 and updates), USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic* (January, 2017) *and Organic* (January, 2017 *Review*, where and when applicable.

Sample Receipt Conditions

Eight soil samples including one field duplicate set and one trip blank were submitted to SGS North America, Inc. (SGS) located in Anchorage, Alaska. Soil sample results were reported in sample delivery group (SDG) 1196543. A sample labeling discrepancy between the COC and sample labels was noted by the lab for samples OAFF-19-MW-12-11 and OAFF-19-MW-12-15. The Antha project manager confirmed the COC was correct and the lab was requested to revise their sample IDs accordingly.

Forty-three soil gas samples were submitted to Beacon Environmental Services, Inc. located in Fort Hill, Maryland including one trip blank and four field soil gas duplicate pairs. Samples were received in good condition. Soil gas sample OAFF-19-SG-27 could not be collected and was not analyzed as noted on the chain of custody. The soil gas data was reported in SDG 0004658.

Eight groundwater samples including one field duplicate set and four stormwater samples including one duplicate were submitted to SGS. Water sample results were reported in SDG 1196986. No water trip blank was submitted for analysis in association with the groundwater and stormwater samples for volatiles analyses.

Holding Times and Preservatives

All samples were received within hold times and with proper preservation with the following exceptions.

- Several SW8270D SIM groundwater and stormwater samples were reanalyzed outside method hold time to confirm the original results. The re-analyses confirmed the PAH results and data from the initial run was reported by the lab. Therefore, were no data qualifications made for hold time violations.

- Sample OAFF-19-MW-01 had three HCl-preserved 250-mL bottles and 1 unpreserved 250-mL bottle whereas there should have been two if each. OAFF-19-M-01 was analyzed for PAH with the limited preserved sample volume provided

- Sample OAFF-19-MW-010 was missing one 250-mL HCl-preserved bottle. For the single HCl-preserved bottle of OAFF-19-MW-010, the preservative was added at the laboratory.

PRECISION

Field Duplicates

Relative percent difference (RPD) was calculated for each primary and field duplicate sample as a measure of precision. RPDs were calculated using the following equation for the primary and duplicate field samples when analytes were detected in both the primary and duplicate samples.

EQUATION 1 – RELATIVE PERCENT DIFFERENCE

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Table 2 presents the calculated relative percent differences for the field duplicate pairs by matrix, analytical method, and analyte.

One soil field duplicate pair was submitted for GRO, DRO, PAH, and petroleum related VOCs analyses. All soil duplicate RPDs were within limits.

- OAFF-19-MW-12-04 and OAFF-19-MW-12-15

Four soil gas field duplicate pairs were submitted for volatiles analysis by SW8206C.

- OAFF-19-SG-03 and OAFF-19-SG-03 DUP
- OAFF-19-SG-04 and OAFF-19-SG-04 DUP
- OAFF-19-SG-14 and OAFF-19-SG-14 DUP
- OAFF-19-SG-20 and OAFF-19-SG-20 DUP

Soil gas field duplicate RPDs were within limits with the following exceptions:

- Soil gas duplicate RPDs for benzene, toluene, m&p-xylene, and total petroleum hydrocarbon (TPH) carbon range 10-15 (C_{10}-C_{15}) exceeded the recommended 25% in samples OAFF-19-SG-03 and OAFF-19-SG-03-DUP. Associated sample results were qualified "QN" as estimated with unknown bias.

- The 1,3,5-Trimethylbenzene RPD exceeded the recommended 25% in soil gas samples OAFF-19-SG-04 and OAFF-19-SG-04-DUP. Associated sample results were qualified "QN" as estimated with unknown bias.

One groundwater field duplicate pair (OAFF-19-MW-06 and OAFF-19-MW-60) was submitted for GRO, DRO, PAH, and petroleum related VOCs analyses. All groundwater duplicate RDPs were within limits.

One stormwater field duplicate set (OAFF-19-SD-1 and OAFF-19-SD-2) was submitted for GRO, DRO, PAH, and petroleum related VOCs analyses. All stormwater duplicate RPDs were within limits.

TABLE 2. FIELD DUPLICATE RELATIVE PERCENT DIFFERENCE

Soil					
Method	**Analyte**	**Units**	**OAFF-19-MW-12-04**	**OAFF-19-MW-12-15**	**RPD**
AK101	Gasoline Range Organics	mg/kg	1.08	1.05	2.8
AK102	Diesel Range Organics	mg/kg	17.5	17.9	2.3
Soil Gas					
Method	**Analyte**	**Units**	**OAFF-19-SG-03**	**OAFF-19-SG-03 DUP**	**RPD**
SW8260C	1,2,4-Trimethylbenzene	ng	268	228	16
SW8260C	1,3,5-Trimethylbenzene	ng	92	75	20
SW8260C	Benzene	ng	59	40	**38**
SW8260C	m&p-Xylene	ng	67	47	**35**
SW8260C	Toluene	ng	60	39	**42**
SW8260C	TPH C10-C15	ng	172,000	111,000	**43.110**
SW8260C	TPH C4-C9	ng	385,000	392,000	1.802
Method	**Analyte**	**Units**	**OAFF-19-SG-04**	**OAFF-19-SG-04 DUP**	**RPD**
SW8260C	1,2,4-Trimethylbenzene	ng	269	226	17
SW8260C	1,3,5-Trimethylbenzene	ng	98	72	**31**
SW8260C	Benzene	ng	178	158	12
SW8260C	Isopropylbenzene	ng	63	56	12
SW8260C	m&p-Xylene	ng	58	68	16
SW8260C	Toluene	ng	60	55	9
SW8260C	TPH C10-C15	ng	258,000	213,000	19.1083
SW8260C	TPH C4-C9	ng	546,000	552,000	1.0929
SW8260C	trans-1,2-Dichloroethene	ng	14	13	7
Method	**Analyte**	**Units**	**OAFF-19-SG-14**	**OAFF-19-SG-14 DUP**	**RPD**
SW8260C	1,2,4-Trimethylbenzene	ng	47	42	11
SW8260C	Toluene	ng	68	70	3
SW8260C	TPH C10-C15	ng	7,160	6,740	6.04
SW8260C	TPH C4-C9	ng	6,530	6,190	5.35
Method	**Analyte**	**Units**	**OAFF-19-SG-20**	**OAFF-19-SG-20 DUP**	**RPD**
SW8260C	Toluene	ng	28	29	4
SW8260C	TPH C10-C15	ng	5,180	5,060	2.34
SW8260C	TPH C4-C9	ng	6,090	7,190	16.6
SW8260C	trans-1,2-Dichloroethene	ng	17	14	19
Groundwater					
Method	**Analyte**	**Units**	**OAFF-19-MW-06**	**OAFF-19-MW-60**	**RPD**
AK101	Gasoline Range Organics	mg/L	0.0807	0.0731	9.88
AK102	Diesel Range Organics	mg/L	0.533	0.472	12
SW8270D SIM	1-methylnaphthalene	µg/L	0.247	0.225	9.3
SW8270D SIM	Naphthalene	µg/L	0.322	0.283	13
SW8260C	1,3,5-trimethylbenzene	µg/L	0.612	0.627	2.4
SW8260C	Benzene	µg/L	0.214	0.217	1.4
SW8260C	Isopropylbenzene	µg/L	5.55	5.73	3.2
SW8260C	sec-butylbenzene	µg/L	2.72	2.83	4.0
SW8260C	tert-butylbenzene	µg/L	0.339	0.346	2.0
Stormwater					
Method	**Analyte**	**Units**	**OAFF-19-SD-1**	**OAFF-19-SD-2**	**RPD**
AK101	Gasoline Range Organics	mg/L	0.0465	0.0428	8.29
AK102	Diesel Range Organics	mg/L	1.19	1.29	8.1
SW8270D SIM	Benzo(b)fluoranthene	µg/L	0.663	0.586	12
SW8270D SIM	Chrysene	µg/L	0.685	0.662	3.4
SW8270D SIM	Fluoranthene	µg/L	0.943	1.03	8.8
SW8270D SIM	Pyrene	µg/L	1.01	1.09	7.6
SW8260C	Benzene	µg/L	1.44	1.25	14

Laboratory Control Samples/Duplicates and Internal Standards

No qualifications were made.

ACCURACY

Laboratory Control Samples/Duplicates and Internal Standards

No samples results were qualified due to LCS/LCSD or internal standards.

Surrogate Recovery

All surrogate recoveries were within necessary limits with the following exceptions.

- SW8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 did not QC criteria in the groundwater samples OAFF-19-MW-03 and OAFF-19-MW-11. The samples were reanalyzed outside method hold time with surrogate recoveries within limits and comparable PAH results. The in-hold data was reported, and no data qualifications were made.

- SW8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 and Fluoranthene-d10 did not meet QC criteria in stormwater sample OAFF-19-SD-1. The sample was re-extracted past hold time whereby the surrogate recoveries were not within QC criteria and PAH results were comparable. The in-hold data was reported with not data qualifications for surrogate recoveries.

- SW8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene d10 did not meet QC criteria in stormwater sample OAFF-19-SD-2. The sample was re-extracted past hold time with the surrogate recovery not within QC criteria and PAH results comparable. The in-hold data was reported, and no data qualifications were applied.

- AK101 surrogate 4-bromofluorobenzene exceeded criteria high in sample OAFF-19-MW-4R due to matrix interference. The GRO result was qualified QH.

REPRESENTATIVENESS

All samples were collected in accordance with the work plan with the exception of not submitting a trip blank for the volatiles' analyses of water samples. Samples collected are generally considered representative of conditions and meet data quality objectives discussed in the work plan.

COMPARABILITY

SGS North America, Inc. located in Anchorage, Alaska was used for the soil and water analyses. Beacon Environmental Services, Inc. located in Forest Hill, Maryland analyzed the soil gas samples. The results, methods, procedures, quantitation units, and format of the work order are comparable in quality and data validity to all applicable regulations.

COMPLETENESS

All data necessary to complete the data validation was provided from the analytical laboratories. No data were rejected, so 100% of the results are usable.

SENSITIVITY

All sample results were evaluated to their limits of detection (LODs). All water LODs were below the Alaska Department of Environmental Conservation (ADEC) 18 Alaska Administrative Code (AAC) 75 Table C groundwater cleanup levels. However, the LODs for several analytes in soils exceeded their respective migration to groundwater cleanup levels.

- The LOD for naphthalene by SW8260C met the human health criteria in soil sample OAFF-19-MW-10-02, but it exceeded the migration to groundwater criteria. However, the SW8270D SIM method LOD for naphthalene was adequate. Naphthalene was not detected in sample OAFF-19-MW-10-02 by either method.

- 1,2-Dibromoethane by SW8260C was reported as non-detect in all soil samples with LODs exceeding the migration to groundwater cleanup level. 1,2-dibromomethane was not detected in any groundwater samples with LODs below the groundwater cleanup standard.

- The LOD for benzene in soil samples OAFF-19-MW-10-5.5 and OAFF-19-MW-11-8.5 met the human health cleanup standard, but exceeded the migration to groundwater cleanup level. GRO was detected in these soil samples, but significantly below the cleanup standard. Neither GRO or benzene were detected in the associated groundwater samples for monitoring well 10 (MW10) or monitoring well 11 (MW11).

- The LOD for napthlalene by SW8270D SIM in soil samples OAFF-19-MW-10-5.5 and OAFF-19-MW-11-8.5 met the human health cleanup standard, but exceeded the migration to groundwater cleanup level. However, the LOD per SW8260C was adequate in both samples.

Trip Blanks

One soil trip blank and one soil gas trip blanks were analyzed with associated samples for volatiles analyses. No soil or soil gas blank detections were reported above the LOD.

No water trip blanks were submitted for analysis associated with groundwater and stormwater samples. Potential for field contamination could not be assessed for these matrices.

Method Blanks

There were no laboratory method blank detections above the LOQ, but two GRO method blank detections were reported above the LOD.

GRO was detected in water method blank 1802512 below the LOQ at 0.0430mg/L. Associated sample results were within ten times the method blank detection and were there "B" qualified.

- OAFF-19-MW-06
- OAFF-19-MW-60
- OAFF-19-MW-12
- OAFF-19-SD-1
- OAFF-19-SD-2
- OAFF-19-SD-4

GRO was detected in soil method blank 1541911 below the LOQ at 0.949mg/kg. Associated sample results were within ten times the method blank detection and were there "B" qualified.

- OAFF-19-MW-10-02
- OAFF-19-MW-10-5.5
- OAFF-19-MW-11-3.5
- OAFF-19-MW-11-8.5
- OAFF-19-MW-12-04
- OAFF-19-MW-12-11
- OAFF-19-MW-12-15
- TB-10302019

OVERALL ASSESSMENT

Based on the data review completed, minimal data was qualified, and no data were rejected. All analytical data is considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants.

Laboratory Report of Analysis

To: Ahtna Engineering Svs
110 West 38th Ave Ste 200A
Anchorage, AK 99503

Report Number: **1200330**

Client Project: **AFSC OAFF**

Dear Alex Geilich,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Ahtna Engineering Svs**
SGS Project: **1200330**
Project Name/Site: **AFSC OAFF**
Project Contact: **Alex Geilich**

Refer to sample receipt form for information on sample condition.

19-OAFF-Soil-PFAS (1200330001) PS

EPA 537.1 Compound List was analyzed by SGS of Orlando, FL.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
19-OAFF-Soil-PFAS	1200330001	01/24/2020	01/24/2020	Solid/Soil (Wet Weight)
19-OAFF-Water-PFAS	1200330002	01/24/2020	01/24/2020	Water (Surface, Eff., Ground)

Method	Method Description

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1200330

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Indiana
West Virginia	Kentucky

www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 1

CLIENT: Ahtna Engineering

CONTACT: Alex Geilich PHONE NO: 907-433-0728

PROJECT NAME: AFSC OAFF PROJECT/ PWSID/ PERMIT#: 20204.041.02

REPORTS TO: Alex Geilich E-MAIL: ahtnalab@ahtna.net

INVOICE TO: Ahtna Engineering QUOTE #:

P.O. #: 20204.041.02

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: PFAS - Full List EPA 537	REMARKS/ LOC ID
1A	19-OAFF-Soil-PFAS	1/24/20	11:30	S	1		X	
2AB	19-OAFF-Water-PFAS	1/24/20	11:45	W	2		X	

Section 5

	Date	Time	
Relinquished By: (1) Mike Records	1/24/20	1300	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	01/24/20	14:42	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Standard TAT Profile#365284

Temp Blank °C: 8.5 °C

or Ambient [ ] DLS

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) IF, IB

(INTACT) BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

e-Sample Receipt Form

SGS Workorder #: **1200330**

1 2 0 0 3 3 0

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F,1B
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
Yes **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	No	Cooler ID: 1 @ 8.5 °C Therm. ID: D45
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	Yes	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1200330001-A	No Preservative Required	OK			
1200330002-A	No Preservative Required	OK			
1200330002-B	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

SGS North America, Inc

1200330

SGS Job Number: FA72031

Sampling Date: 01/24/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report: 33

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

Sections: 1 2 3 4 5 6

Table of Contents

Sample Summary

SGS North America, Inc

1200330

Job No: FA72031

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA72031-1	01/24/20	11:30		01/28/20	SO	Soil	19-OAFF-SOIL-PFAS
FA72031-2	01/24/20	11:45		01/28/20	AQ	Water	19-OAFF-WATER-PFAS

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS North America, Inc **Job No:** FA72031

Site: 1200330 **Report Date** 2/6/2020 10:58:07

2 Samples were collected on 01/24/2020 and were received at SGS North America Inc - Orlando on 01/28/2020 properly preserved, at 4.9 Deg. C and intact. These Samples received an SGS Orlando job number of FA72031. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537M BY ID

Matrix: AQ **Batch ID:** OP78769

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA72115-1MS, FA72115-2DUP were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Matrix: SO **Batch ID:** OP78778

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA72067-1MS, FA72067-1MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

General Chemistry By Method SM19 2540G

Matrix: SO **Batch ID:** GN84252

Sample(s) FA72051-1DUP were used as the QC samples for Solids, Percent.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

_____

Ariel Hartney, Client Services *(Signature on file)*

Summary of Hits

Job Number: FA72031
Account: SGS North America, Inc
Project: 1200330
Collected: 01/24/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA72031-1	**19-OAFF-SOIL-PFAS**					
No hits reported in this sample.						
FA72031-2	**19-OAFF-WATER-PFAS**					
Perfluorohexanoic acid		0.0604	0.0080	0.0040	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0366	0.0080	0.0040	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0245	0.0080	0.0040	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0054 J	0.0080	0.0040	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0025 J	0.0080	0.0040	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0197	0.0080	0.0040	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0866	0.0080	0.0040	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0300	0.0080	0.0040	ug/l	EPA 537M BY ID

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	19-OAFF-SOIL-PFAS		
Lab Sample ID:	FA72031-1	**Date Sampled:**	01/24/20
Matrix:	SO - Soil	**Date Received:**	01/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	79.9
Project:	1200330		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q43526.D	1	02/04/20 19:09	NAF	02/03/20 07:30	OP78778	S2Q659
Run #2							

	Initial Weight	Final Volume
Run #1	2.31 g	1.0 ml
Run #2		

EPA 537.1 Method List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.00054 U	0.0011	0.00054	0.00022	mg/kg	
375-85-9	Perfluoroheptanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
335-76-2	Perfluorodecanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
2058-94-8	Perfluoroundecanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
307-55-1	Perfluorododecanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
72629-94-8	Perfluorotridecanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
376-06-7	Perfluorotetradecanoic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
PERFLUOROALKYLSULFONATES							
375-73-5	Perfluorobutanesulfonic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS							
2355-31-9	MeFOSAA	0.0011 U	0.0027	0.0011	0.00054	mg/kg	
2991-50-6	EtFOSAA	0.0011 U	0.0027	0.0011	0.00054	mg/kg	
NEXT GENERATION PFAS ANALYTES							
13252-13-6	HFPO-DA (GenX)	0.0027 U	0.0054	0.0027	0.0014	mg/kg	
919005-14-4	ADONA	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.00054 U	0.0011	0.00054	0.00027	mg/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.00054 U	0.0011	0.00054	0.00027	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C5-PFHxA	75%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	79%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	19-OAFF-SOIL-PFAS		
Lab Sample ID:	FA72031-1	**Date Sampled:**	01/24/20
Matrix:	SO - Soil	**Date Received:**	01/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	79.9
Project:	1200330		

EPA 537.1 Method List

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	81%		50-150%
	13C2-PFDoDA	76%		50-150%
	13C2-PFTeDA	83%		50-150%
	13C3-PFBS	78%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	78%		50-150%
	d3-MeFOSAA	86%		50-150%
	13C3-HFPO-DA	69%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 19-OAFF-WATER-PFAS
Lab Sample ID: FA72031-2
Matrix: AQ - Water
Method: EPA 537M BY ID EPA 537 MOD
Project: 1200330

Date Sampled: 01/24/20
Date Received: 01/28/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q16042.D	1	02/05/20 04:38	NG	01/31/20 11:45	OP78769	S3Q258
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

EPA 537.1 Method List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0604	0.0080	0.0040	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0366	0.0080	0.0040	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	0.0245	0.0080	0.0040	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0054	0.0080	0.0040	0.0020	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0025	0.0080	0.0040	0.0020	ug/l	J
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	0.0040 U	0.0080	0.0040	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOROALKYLSULFONATES							
375-73-5	Perfluorobutanesulfonic acid	0.0197	0.0080	0.0040	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0866	0.0080	0.0040	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0300	0.0080	0.0040	0.0030	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS							
2355-31-9	MeFOSAA	0.016 U	0.016	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U	0.016	0.016	0.0080	ug/l	
NEXT GENERATION PFAS ANALYTES							
13252-13-6	HFPO-DA (GenX)	0.020 U	0.040	0.020	0.010	ug/l	
919005-14-4	ADONA	0.0080 U	0.016	0.0080	0.0040	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.0080 U	0.016	0.0080	0.0040	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.0080 U	0.016	0.0080	0.0040	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C5-PFHxA	68%		50-150%
	13C4-PFHpA	70%		50-150%
	13C8-PFOA	76%		50-150%
	13C9-PFNA	73%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	19-OAFF-WATER-PFAS		
Lab Sample ID:	FA72031-2	**Date Sampled:**	01/24/20
Matrix:	AQ - Water	**Date Received:**	01/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	1200330		

EPA 537.1 Method List

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C6-PFDA	74%		50-150%
	13C7-PFUnDA	69%		50-150%
	13C2-PFDoDA	60%		50-150%
	13C2-PFTeDA	74%		40-150%
	13C3-PFBS	74%		50-150%
	13C3-PFHxS	73%		50-150%
	13C8-PFOS	67%		50-150%
	d3-MeFOSAA	94%		50-150%
	13C3-HFPO-DA	56%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
ADONA	919005-14-4	EPA 537M BY ID	SO	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	SO	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	SO	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	SO	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	SO	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

FA72031

SGS North America Inc.
CHAIN OF CUSTODY RECORD

Locations Nationwide
Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana
www.us.sgs.com

CLIENT:	SGS North America Inc. - Alaska Division	SGS Reference:	SGS Orlando FL
CONTACT:	Julie Shumway	PHONE NO:	(907) 562-2343
PROJECT NAME:	1200330	PWSID#:	
		NPDL#:	
REPORTS TO: Julie Shumway		E-MAIL:	Julie.Shumway@sgs.com; Env.Alaska.RefLabTeam@sgs.com
INVOICE TO:	SGS - Alaska	QUOTE #:	
		P.O. #:	1200330

Additional Comments: All soils report out in dry weight unless

Page 1 of 1

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX CODE	# CONTAINERS	Preserv-ative Used: NONE	TYPE C = COMP G = GRAB MI = Multi Incre-mental Soils	EPA 537.1 Compound List	MS	MSD	SGS lab #	Location ID
	19-OAFF-Soil-PFAS	01/24/2020	11:30:00	Solid	1			X			1200330001	
	19-OAFF-Water-PFAS	01/24/2020	11:45:00	Water	2			X			1200330002	

Relinquished By: (1)	Date: 1/27/2020	Time: 1056	Received By:
Relinquished By: (2)	Date:	Time:	Received By:
Relinquished By: (3)	Date:	Time:	Received By:
Relinquished By: (4)	Date: 1/28/20	Time: 9:00	Received For Laboratory By:

DOD Project? NO
Report to DL (J Flags)? YES
If J- Report as DL/LOD/LOQ.
Data Deliverable Requirements: Level II + DV
Cooler ID:
Requested Turnaround Time and-or Special Instructions:
Temp Blank °C: or Ambient [ ]
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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F088_COC_REF_LAB_20190411

5.2 5

FA72031: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA72031 **Client:** SGS NORTH AMERICA INC. - ALASKA DI **Project:** 1200330

Date / Time Received: 1/28/2020 9:00:00 AM **Delivery Method:** FED EX **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (5.7);

Cooler Temps (Corrected) °C: Cooler 1: (4.9);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: TRINITYM Date: 1/28/2020 9:00:00 AM Reviewer: _____ Date: _____

FA72031: Chain of Custody
Page 2 of 2

MS Semi-volatiles

6

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-MB	3Q16040.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	Compound	Result	RL	MDL	Units	Q
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0020	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0030	ug/l	
2355-31-9	MeFOSAA	ND	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	ND	0.016	0.0080	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.040	0.010	ug/l	
919005-14-4	ADONA	ND	0.016	0.0040	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.016	0.0040	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.016	0.0040	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	92%	30-140%
	13C5-PFPeA	89%	40-140%
	13C5-PFHxA	92%	50-150%
	13C4-PFHpA	94%	50-150%
	13C8-PFOA	98%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	89%	50-150%
	13C2-PFDoDA	81%	50-150%
	13C2-PFTeDA	85%	40-150%
	13C3-PFBS	93%	50-150%
	13C3-PFHxS	97%	50-150%
	13C8-PFOS	90%	50-150%
	13C8-FOSA	98%	30-140%

Method Blank Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-MB	3Q16040.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	ID Standard Recoveries		Limits
	d3-MeFOSAA	96%	50-150%
	13C2-4:2FTS	93%	50-150%
	13C2-6:2FTS	96%	50-150%
	13C2-8:2FTS	90%	50-150%

Method Blank Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78778-MB	2Q43515.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-1

CAS No.	Compound	Result	RL	MDL	Units	Q
307-24-4	Perfluorohexanoic acid	ND	1.0	0.20	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	1.0	0.25	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	1.0	0.25	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	1.0	0.25	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	1.0	0.25	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	
2355-31-9	MeFOSAA	ND	2.5	0.50	ug/kg	
2991-50-6	EtFOSAA	ND	2.5	0.50	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	5.0	1.3	ug/kg	
919005-14-4	ADONA	ND	1.0	0.25	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	1.0	0.25	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	80%	50-150%
	13C5-PFPeA	80%	50-150%
	13C5-PFHxA	81%	50-150%
	13C4-PFHpA	82%	50-150%
	13C8-PFOA	84%	50-150%
	13C9-PFNA	83%	50-150%
	13C6-PFDA	84%	50-150%
	13C7-PFUnDA	83%	50-150%
	13C2-PFDoDA	82%	50-150%
	13C2-PFTeDA	85%	50-150%
	13C3-PFBS	81%	50-150%
	13C3-PFHxS	82%	50-150%
	13C8-PFOS	81%	50-150%
	13C8-FOSA	85%	50-150%

Method Blank Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78778-MB	2Q43515.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-1

CAS No.	ID Standard Recoveries		Limits
	d3-MeFOSAA	84%	50-150%
	13C2-4:2FTS	76%	50-150%
	13C2-6:2FTS	79%	50-150%
	13C2-8:2FTS	78%	50-150%

Instrument Blank

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q258-IBLK	3Q15898.D	1	02/03/20	NG	n/a	n/a	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA72031-2

CAS No.	Compound	Result	RL	MDL	Units	Q
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0020	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0030	ug/l	
2355-31-9	MeFOSAA	ND	0.040	0.0080	ug/l	
2991-50-6	EtFOSAA	ND	0.040	0.0080	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.040	0.010	ug/l	
919005-14-4	ADONA	ND	0.016	0.0040	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.016	0.0040	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.016	0.0040	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	99%	50-150%
	13C5-PFPeA	98%	50-150%
	13C5-PFHxA	99%	50-150%
	13C4-PFHpA	100%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	100%	50-150%
	13C6-PFDA	102%	50-150%
	13C7-PFUnDA	101%	50-150%
	13C2-PFDoDA	100%	50-150%
	13C2-PFTeDA	99%	50-150%
	13C3-PFBS	98%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	100%	50-150%
	13C8-FOSA	109%	50-150%

Instrument Blank

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q258-IBLK	3Q15898.D	1	02/03/20	NG	n/a	n/a	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA72031-2

CAS No.	ID Standard Recoveries		Limits
	d3-MeFOSAA	105%	50-150%
	13C2-4:2FTS	94%	50-150%
	13C2-6:2FTS	96%	50-150%
	13C2-8:2FTS	97%	50-150%

Instrument Blank

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q659-IBLK	2Q43510.D	1	02/04/20	NAF	n/a	n/a	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA72031-1

CAS No.	Compound	Result	RL	MDL	Units	Q
307-24-4	Perfluorohexanoic acid	ND	1.0	0.20	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	1.0	0.25	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	1.0	0.25	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	1.0	0.25	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	1.0	0.25	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	
2355-31-9	MeFOSAA	ND	2.5	0.50	ug/kg	
2991-50-6	EtFOSAA	ND	2.5	0.50	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	5.0	1.3	ug/kg	
919005-14-4	ADONA	ND	1.0	0.25	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	1.0	0.25	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	98%	50-150%
	13C5-PFPeA	97%	50-150%
	13C5-PFHxA	98%	50-150%
	13C4-PFHpA	99%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	100%	50-150%
	13C6-PFDA	102%	50-150%
	13C7-PFUnDA	100%	50-150%
	13C2-PFDoDA	99%	50-150%
	13C2-PFTeDA	100%	50-150%
	13C3-PFBS	97%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	102%	50-150%

Instrument Blank

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q659-IBLK	2Q43510.D	1	02/04/20	NAF	n/a	n/a	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA72031-1

CAS No.	ID Standard Recoveries		Limits
	d3-MeFOSAA	100%	50-150%
	13C2-4:2FTS	92%	50-150%
	13C2-6:2FTS	94%	50-150%
	13C2-8:2FTS	94%	50-150%

Blank Spike Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-BS	3Q16039.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
307-24-4	Perfluorohexanoic acid	0.16	0.157	98	70-130
375-85-9	Perfluoroheptanoic acid	0.16	0.162	101	71-130
335-67-1	Perfluorooctanoic acid	0.16	0.162	101	74-130
375-95-1	Perfluorononanoic acid	0.16	0.158	99	76-130
335-76-2	Perfluorodecanoic acid	0.16	0.163	102	70-130
2058-94-8	Perfluoroundecanoic acid	0.16	0.166	104	70-130
307-55-1	Perfluorododecanoic acid	0.16	0.158	99	70-130
72629-94-8	Perfluorotridecanoic acid	0.16	0.166	104	70-139
376-06-7	Perfluorotetradecanoic acid	0.16	0.152	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.16	0.158	99	73-130
355-46-4	Perfluorohexanesulfonic acid	0.16	0.165	103	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.16	0.156	98	70-130
2355-31-9	MeFOSAA	0.16	0.156	98	70-130
2991-50-6	EtFOSAA	0.16	0.159	99	70-130
13252-13-6	HFPO-DA (GenX)	0.16	0.173	108	60-140
919005-14-4	ADONA	0.16	0.153	96	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.16	0.155	97	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.16	0.166	104	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	86%	30-140%
	13C5-PFPeA	84%	40-140%
	13C5-PFHxA	87%	50-150%
	13C4-PFHpA	88%	50-150%
	13C8-PFOA	91%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	85%	50-150%
	13C7-PFUnDA	85%	50-150%
	13C2-PFDoDA	79%	50-150%
	13C2-PFTeDA	81%	40-150%
	13C3-PFBS	87%	50-150%
	13C3-PFHxS	92%	50-150%
	13C8-PFOS	85%	50-150%
	13C8-FOSA	88%	30-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-BS	3Q16039.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	ID Standard Recoveries	BSP	Limits
	d3-MeFOSAA	92%	50-150%
	13C2-4:2FTS	93%	50-150%
	13C2-6:2FTS	94%	50-150%
	13C2-8:2FTS	89%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78778-BS	2Q43514.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
307-24-4	Perfluorohexanoic acid	10	10.6	106	63-130
375-85-9	Perfluoroheptanoic acid	10	10.6	106	63-122
335-67-1	Perfluorooctanoic acid	10	10.6	106	71-128
375-95-1	Perfluorononanoic acid	10	10.4	104	66-124
335-76-2	Perfluorodecanoic acid	10	10.9	109	68-127
2058-94-8	Perfluoroundecanoic acid	10	10.8	108	61-137
307-55-1	Perfluorododecanoic acid	10	10.6	106	71-126
72629-94-8	Perfluorotridecanoic acid	10	10.5	105	60-137
376-06-7	Perfluorotetradecanoic acid	10	10.5	105	61-131
375-73-5	Perfluorobutanesulfonic acid	10	10.7	107	70-135
355-46-4	Perfluorohexanesulfonic acid	10	10.5	105	72-129
1763-23-1	Perfluorooctanesulfonic acid	10	10.8	108	69-125
2355-31-9	MeFOSAA	10	10.3	103	71-124
2991-50-6	EtFOSAA	10	10.2	102	63-129
13252-13-6	HFPO-DA (GenX)	10	11.4	114	60-140
919005-14-4	ADONA	10	9.9	99	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	10	10.1	101	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	10	10.2	102	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	79%	50-150%
	13C5-PFPeA	79%	50-150%
	13C5-PFHxA	80%	50-150%
	13C4-PFHpA	80%	50-150%
	13C8-PFOA	81%	50-150%
	13C9-PFNA	80%	50-150%
	13C6-PFDA	80%	50-150%
	13C7-PFUnDA	80%	50-150%
	13C2-PFDoDA	81%	50-150%
	13C2-PFTeDA	83%	50-150%
	13C3-PFBS	79%	50-150%
	13C3-PFHxS	79%	50-150%
	13C8-PFOS	78%	50-150%
	13C8-FOSA	81%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78778-BS	2Q43514.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-1

CAS No.	ID Standard Recoveries	BSP	Limits
	d3-MeFOSAA	82%	50-150%
	13C2-4:2FTS	79%	50-150%
	13C2-6:2FTS	80%	50-150%
	13C2-8:2FTS	81%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-MS	3Q16048.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258
FA72115-1	3Q16047.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	Compound	FA72115-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
307-24-4	Perfluorohexanoic acid	ND		0.16	0.153	96	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.16	0.156	98	71-130
335-67-1	Perfluorooctanoic acid	ND		0.16	0.156	98	74-130
375-95-1	Perfluorononanoic acid	ND		0.16	0.150	94	76-130
335-76-2	Perfluorodecanoic acid	ND		0.16	0.154	96	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.16	0.158	99	70-130
307-55-1	Perfluorododecanoic acid	ND		0.16	0.148	93	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.16	0.158	99	70-139
376-06-7	Perfluorotetradecanoic acid	ND		0.16	0.143	89	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.16	0.152	95	73-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.16	0.159	99	74-130
1763-23-1	Perfluorooctanesulfonic acid	ND		0.16	0.146	91	70-130
2355-31-9	MeFOSAA	ND		0.16	0.151	94	70-130
2991-50-6	EtFOSAA	ND		0.16	0.152	95	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.16	0.169	106	60-140
919005-14-4	ADONA	ND		0.16	0.149	93	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.16	0.142	89	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.16	0.150	94	60-140

CAS No.	ID Standard Recoveries	MS	FA72115-1	Limits
	13C4-PFBA	101%	86%	30-140%
	13C5-PFPeA	100%	85%	40-140%
	13C5-PFHxA	103%	86%	50-150%
	13C4-PFHpA	102%	82%	50-150%
	13C8-PFOA	106%	82%	50-150%
	13C9-PFNA	100%	72%	50-150%
	13C6-PFDA	91%	61%	50-150%
	13C7-PFUnDA	90%	56%	50-150%
	13C2-PFDoDA	86%	54%	50-150%
	13C2-PFTeDA	89%	63%	40-150%
	13C3-PFBS	102%	85%	50-150%
	13C3-PFHxS	106%	79%	50-150%
	13C8-PFOS	89%	59%	50-150%
	13C8-FOSA	98%	69%	30-140%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-MS	3Q16048.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258
FA72115-1	3Q16047.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	ID Standard Recoveries	MS	FA72115-1	Limits
	d3-MeFOSAA	100%	64%	50-150%
	13C2-4:2FTS	111%	88%	50-150%
	13C2-6:2FTS	109%	81%	50-150%
	13C2-8:2FTS	95%	61%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78778-MS	2Q43530.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659
OP78778-MSD	2Q43531.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659
FA72067-1	2Q43529.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-1

CAS No.	Compound	FA72067-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
307-24-4	Perfluorohexanoic acid	0.94	U	10.1	10.4	103	9.15	9.6	105	8	63-130/30
375-85-9	Perfluoroheptanoic acid	0.94	U	10.1	10.4	103	9.15	9.6	105	8	63-122/30
335-67-1	Perfluorooctanoic acid	0.94	U	10.1	10.5	104	9.15	9.7	106	8	71-128/30
375-95-1	Perfluorononanoic acid	0.94	U	10.1	10.3	102	9.15	9.5	104	8	66-124/30
335-76-2	Perfluorodecanoic acid	0.94	U	10.1	10.4	103	9.15	9.6	105	8	68-127/30
2058-94-8	Perfluoroundecanoic acid	0.94	U	10.1	10.3	102	9.15	9.6	105	7	61-137/30
307-55-1	Perfluorododecanoic acid	0.94	U	10.1	10.5	104	9.15	9.6	105	9	71-126/30
72629-94-8	Perfluorotridecanoic acid	0.94	U	10.1	10.3	102	9.15	9.5	104	8	60-137/30
376-06-7	Perfluorotetradecanoic acid	0.94	U	10.1	10.2	101	9.15	9.4	103	8	61-131/30
375-73-5	Perfluorobutanesulfonic acid	0.94	U	10.1	10.4	103	9.15	9.6	105	8	70-135/30
355-46-4	Perfluorohexanesulfonic acid	0.94	U	10.1	10.3	102	9.15	9.5	104	8	72-129/30
1763-23-1	Perfluorooctanesulfonic acid	0.94	U	10.1	10.2	101	9.15	9.6	105	6	69-125/30
2355-31-9	MeFOSAA	2.3	U	10.1	10.5	104	9.15	9.9	108	6	71-124/30
2991-50-6	EtFOSAA	2.3	U	10.1	10.3	102	9.15	9.5	104	8	63-129/30
13252-13-6	HFPO-DA (GenX)	4.7	U	10.1	11.3	112	9.15	10.3	113	9	60-140/30
919005-14-4	ADONA	0.94	U	10.1	9.6	95	9.15	8.9	97	8	60-140/30
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.94	U	10.1	9.8	97	9.15	9.1	99	7	60-140/30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.94	U	10.1	9.7	96	9.15	9.1	99	6	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA72067-1	Limits
	13C4-PFBA	72%	84%		50-150%
	13C5-PFPeA	72%	83%		50-150%
	13C5-PFHxA	73%	84%	74%	50-150%
	13C4-PFHpA	73%	83%	74%	50-150%
	13C8-PFOA	74%	84%	76%	50-150%
	13C9-PFNA	75%	85%	78%	50-150%
	13C6-PFDA	73%	83%	74%	50-150%
	13C7-PFUnDA	74%	85%	76%	50-150%
	13C2-PFDoDA	74%	85%	75%	50-150%
	13C2-PFTeDA	74%	85%	75%	50-150%
	13C3-PFBS	74%	85%	75%	50-150%
	13C3-PFHxS	74%	84%	75%	50-150%
	13C8-PFOS	74%	85%	78%	50-150%
	13C8-FOSA	66%	76%		50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78778-MS	2Q43530.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659
OP78778-MSD	2Q43531.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659
FA72067-1	2Q43529.D	1	02/04/20	NAF	02/03/20	OP78778	S2Q659

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-1

CAS No.	ID Standard Recoveries	MS	MSD	FA72067-1	Limits
	d3-MeFOSAA	75%	85%	79%	50-150%
	13C2-4:2FTS	73%	84%		50-150%
	13C2-6:2FTS	74%	86%		50-150%
	13C2-8:2FTS	75%	87%		50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-DUP	3Q16052.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258
FA72115-2	3Q16051.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	Compound	FA72115-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
307-24-4	Perfluorohexanoic acid	ND		ND		nc	30
375-85-9	Perfluoroheptanoic acid	ND		ND		nc	30
335-67-1	Perfluorooctanoic acid	ND		ND		nc	30
375-95-1	Perfluorononanoic acid	ND		ND		nc	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0113		0.0112		1	30
355-46-4	Perfluorohexanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA72115-2	Limits
	13C4-PFBA	85%	79%	30-140%
	13C5-PFPeA	86%	79%	40-140%
	13C5-PFHxA	88%	81%	50-150%
	13C4-PFHpA	88%	81%	50-150%
	13C8-PFOA	92%	82%	50-150%
	13C9-PFNA	85%	72%	50-150%
	13C6-PFDA	76%	66%	50-150%
	13C7-PFUnDA	70%	64%	50-150%
	13C2-PFDoDA	64%	59%	50-150%
	13C2-PFTeDA	61%	55%	40-150%
	13C3-PFBS	87%	80%	50-150%
	13C3-PFHxS	90%	81%	50-150%
	13C8-PFOS	74%	64%	50-150%
	13C8-FOSA	75%	64%	30-140%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72031
Account: SGSAKA SGS North America, Inc
Project: 1200330

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP78769-DUP	3Q16052.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258
FA72115-2	3Q16051.D	1	02/05/20	NG	01/31/20	OP78769	S3Q258

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA72031-2

CAS No.	ID Standard Recoveries	DUP	FA72115-2	Limits
	d3-MeFOSAA	76%	68%	50-150%
	13C2-4:2FTS	90%	83%	50-150%
	13C2-6:2FTS	90%	81%	50-150%
	13C2-8:2FTS	76%	66%	50-150%

* = Outside of Control Limits.

Laboratory Data Review Checklist

Completed By:

Marty Brewer

Title:

Project Chemist

Date:

02/10/20

Consultant Firm:

Ahtna Engineering Services, LLC

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

ADEC File Number:

Hazard Identification Number:

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   SGS North America, Inc. Anchorage & SGS, North America, Inc, Orlando, Florida

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☒ No☐ N/A☐ Comments:

   SGS Anchorage transferred samples to SGS Orlando

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

   PFAS by EPA 537.1M

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Samples were collected in Anchorage, Alaska and hand-carried to SGS Anchorage on January 24, 2020.
   Samples were transferred to SGS Orlando on January 27 & received on January at 4.9C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies noted

e. Data quality or usability affected?

Comments:

Data quality/usability not affected by sample receipt conditions.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☐ No☒ N/A☐ Comments:

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No discrepancies warranting corrective actions

d. What is the effect on data quality/usability according to the case narrative?

Comments:

No impacts to data quality/usability according to case narratve

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

79.9% Solids

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality/usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No method blank detections

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No method blank detections

v. Data quality or usability affected?

Comments:

Data quality/usability not affected by method blanks

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No metals analyses

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No qualifications

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality/usability not affected by lab QC samples

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☒ No☐ N/A☐ Comments:

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

iv. Data quality or usability affected?

Comments:

Data quality/usability not affected

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatiles samples

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

No volatiles samples

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatiles samples

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

No volatiles samples

v. Data quality or usability affected?

Comments:

NA No volatiles samples

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

No field duplicate collected for waste characterization samples

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

ii. Submitted blind to lab?

Yes☐ No☐ N/A☒ Comments:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

NA

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☒ N/A☐ Comments:

No decontamination/equipment blank submitted. Disposable sampling equipment used.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA

iii. Data quality or usability affected?

Comments:

Na

1200330

Laboratory Report Date:

02/06/20

CS Site Name:

Menzies AFCS OAFF

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☐ No☒ N/A☐ Comments:

DATA QUALITY REVIEW

Date: 02/10/20

Project : Menzies OAFF Waste Sampling 2020

Laboratory: SGS North America, Inc. Anchorage, Alaska

Work Orders: 1200330

Reviewer Name: Marty Brewer, Ahtna
Reviewer Title: Project Chemist

INTRODUCTION

One waste characterization soil and one wastewater sample were collected January 24, 2020 for per- and polyfluoroalkyl substances (PFAS) analysis. Samples were hand-carried to SGS, North America Inc. located in Anchorage, Alaska (SGS Anchorage). Samples were transferred to SGS, North America, Inc. located in Orlando, Florida (SGS Orlando) for analysis under chain of custody and intact custody seals. Results were reported in one laboratory sample delivery group (SDG) 120330 from SGS. Table 1 lists by matrix the field sample numbers, and corresponding laboratory numbers.

DATA QUALIFIER DEFINITIONS

For the purpose of this Data Quality Review (DQR) the following code letters and associated definitions are provided for use by the project chemist to summarize the data quality.

R Reported value is "rejected." Resampling or reanalysis may be necessary to verify the presence or absence of the compound.

Q The result is qualified due to quality control criteria not being met. Potential bias indicated as high (QH), low (QL), or unknown (QN).

B Analyte detected in blank. Sample result may be biased high due to blank contamination.

TABLE 1: SAMPLE SUMMARY TABLE

Matrix	Field ID	SGS Anchorage Lab ID	SGS Orlando Lab ID
Soil	19-OAFF-Soil-PFAS	1200330001	FA-72031-1
Wastewater	19-OAFF-Water-PFAS	1200330002	FA-72031-2

DATA REVIEW

This DQR includes a review, where appropriate, of the following parameters:

- Data completeness
- Chain of Custody (COC) and Cooler Receipt Forms
- Holding times and preservation
- Analytical reporting limits (limits of quantitation [LOQ] and method detection limits [DL])
- Blank analysis results
- Surrogate recoveries (organics only)
- Field duplicates
- Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- Matrix Spike (MS)/Matrix Spike Duplicate (MSD)
- Laboratory duplicates

Each analysis that was performed is evaluated in the following subsections of this report, and only the criteria exceedances that impact data qualification or require assessment beyond laboratory documentation are discussed.

Validation was conducted in accordance with the USEPA document "*Test Methods for Evaluating Solid Wastes, SW-846, revision 6*" (July, 2014 and updates), USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic* (January, 2017) *and Organic* (January, 2017 *Review*, USEPA's *Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFAS) Analyzed Using EPA Method 537* (November 2018) and Alaska Department of Environmental Conservation's (ADEC's) *Minimum Quality Assurance Requirements for Sample Handling, Reports, and Laboratory Data Technical Memorandum* (October 2019) where and when applicable. where and when applicable.

Sample Receipt Conditions

Samples were hand-carried to SGS Anchorage by the field sampler on January 24, 2020. Samples were transferred by SGS Anchorage on January 27, 2020 to SGS Orlando. Samples were received intact on January 28, 2020 by SGS Orlando within temperature 4.9 degrees Celsius (°C).

Holding Times and Preservatives

All samples were received within hold times and with proper preservation.

PRECISION

Field Duplicates

No field duplicates were collected for this sampling event as these samples were for waste characterization only.

Laboratory Control Samples/Duplicates and Internal Standards

No qualifications were made based upon the LCS.

ACCURACY

Laboratory Control Samples/Duplicates and Internal Standards

No samples results were qualified due to LCS or internal standards.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No project specific MS/MSD were submitted for analysis for this sampling event. The laboratory analyzed a non-project related samples for MS/MSD analyses. No data were qualified.

Laboratory Duplicates

Non-project specific laboratory duplicates were analyzed. No data were qualified.

Surrogate Recovery

All surrogate recoveries were within necessary limits.

REPRESENTATIVENESS

All samples were collected in accordance with the work plan. Samples collected are generally considered representative of conditions and meet data quality objectives discussed in the work plan.

COMPARABILITY

SGS North America, Inc. located in Orlando, Florida was used for the soil and water analyses. The results, methods, procedures, quantitation units, and format of the work order are comparable in quality and data validity to all applicable regulations.

COMPLETENESS

All data necessary to complete the data validation was provided from the analytical laboratories. No data were rejected, so 100% of the results are usable.

SENSITIVITY

All sample results were evaluated to their limits of detection (LODs). Wastewater results were compared to the United States Environmental Protection Agency (US EPA) Lifetime Health Advisory (LHA) Level of 0.07 micrograms per liter (µg/L) as the sum of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), (EPA, 2016). The Alaska Department of Environmental Conservation (ADEC) adopted this level through an updated Technical Memorandum dated October 2, 2019 (ADEC, 2019). Soil sample results were compared to the most conservative 18AAC 75 Method Two, Over 40-Inch Zone Soil Cleanup Levels from Table

B1 (ADEC, 2019) for perfluorooctanesulfonic acid (PFOS) of [0.0030 milligrams per kilogram (mg/kg)]) and perfluorooctanoic acid (PFOA) of 0.0017 mg/kg.

Trip Blanks

No trip blanks were submitted for analysis.

Method Blanks

There were no laboratory method blank detections.

Instrument Blanks

There were no instrument blank detections.

OVERALL ASSESSMENT

Based on the data review completed, no data were qualified, and no data were rejected. All analytical data is considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants.

ATTACHMENT 5

2019 SURVEY REPORT

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Mammoth Consulting, L.L.C.
Land Research ♦ Surveying ♦ Mapping
11001 Ridgecrest Drive Anchorage, Alaska 99516
Tele. (907) 346-3767

November 27, 2019

Ahtna Engineering Services, LLC
110 West 38th Avenue, Suite 200A
Anchorage AK 99503

Attn: Alex Geilich

Re: Menzies/AFSC Off-Airport Fuel Facility

Dear Alex:

Submitted herewith is the data for the monitoring well survey conducted for the Menzies 2019 Site Characterization & Well Decommissioning, AFSC Off-Airport Fueling Facility in Anchorage, Alaska. The survey was conducted on November 8, 2019, and was done using a combination of Realtime Kinematic (RTK) GPS and conventional surveying methods.

GPS Base Station: The basis of control for this survey was a 3" aluminum monument encased in a 4" PVC pipe located in the grass strip across the street from the tank farm and designated as "THERMO." Results from static GPS observations of this monument in 2009, 2010, and 2011 were shared by others on the NGS's Online Positioning User Service (OPUS). The coordinate and elevation from the most recent of these (2011) were used for this survey. The shared solution for "THERMO" (NGS PID No. BBBH31) is attached. The horizontal datum is NAD83(2011)(2010), and the vertical datum is NAVD88 using GEOID12B. Note this is the same control used for the 2016 monitoring well survey at this site.

Location Survey: Realtime Kinematic (RTK) GPS was used to determine coordinates for the seven (7) monitoring wells. The coordinates are at the measuring marks on the PVC pipes. A nearby monument, a 3 ½" brass cap set flush in a 6' x 7' concrete pad with an ML&P manhole cover and designated as "5920G" was used as a check shot. A shot was taken at the beginning and end of the RTK session.

Elevation Survey: Precise elevations of the monitoring well measuring marks were determined using a total station and trig leveling techniques. The wells were tied to each other and to "THERMO" by a closed loop level survey. The error of closure was 0.00 foot.

Deliverables: Deliverables for this survey are a stamped survey report (this document) that includes a point plot and a coordinate list. This is being sent via e-mail along with an Excel spreadsheet file of the coordinate data.

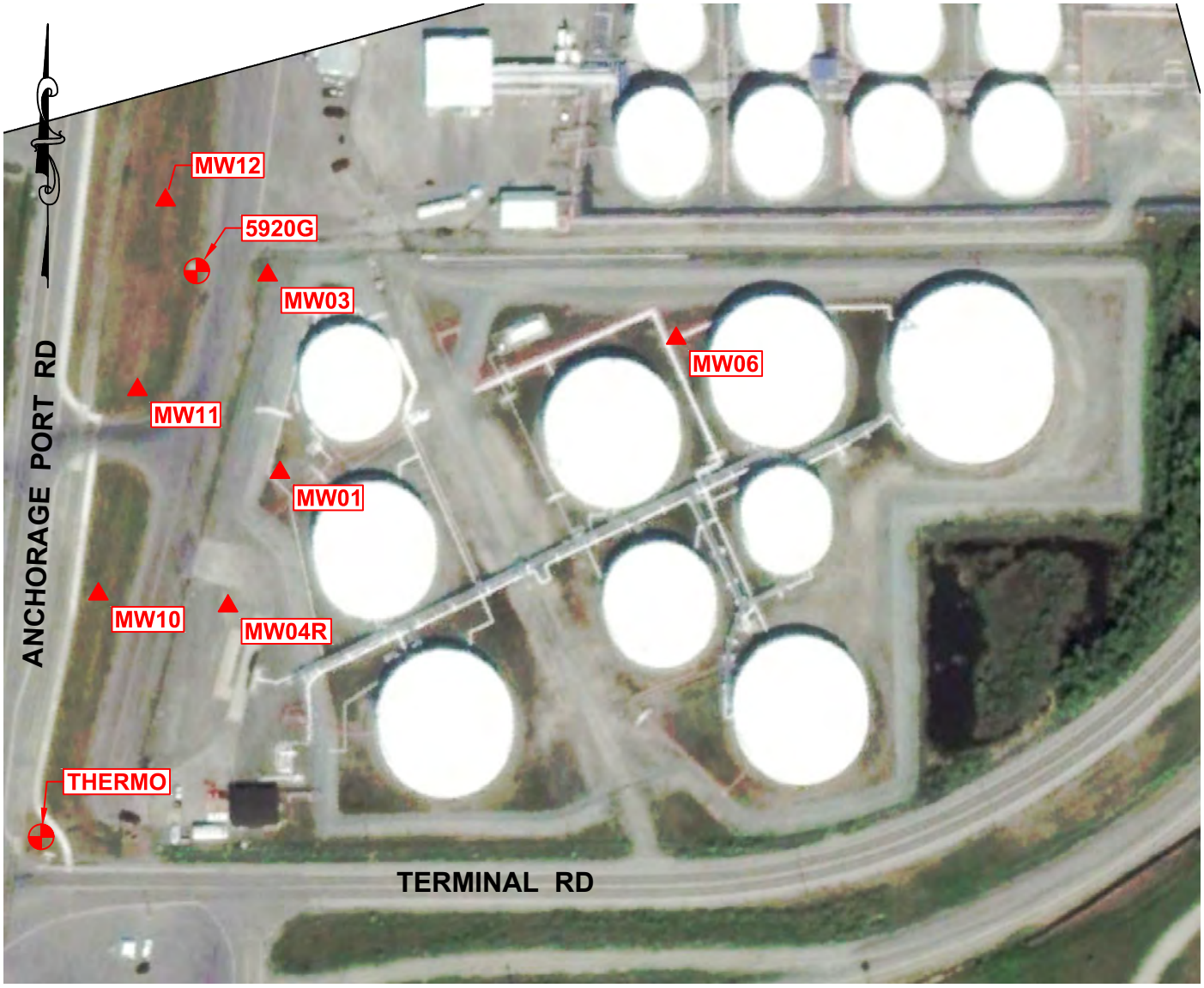
Thank you for the opportunity to perform this work. Please call if you have any questions or need additional information.

Sincerely,

Shelley Williams, P.L.S.

Attachments:

- Point Plot
- Coordinate List
- 2011 NGS Shared OPUS Solution for PID No. BBBH31



Source of background image is Google Earth Pro.
Date of background image is June 2010.
Image registration is APPROXIMATE.

0 300 ft

SCALE

Control Point

Monitoring Well

Point Plot of Monitoring Well Survey for
Menzies 2019 Site Characterization & Well Decommissioning
at AFSC Off-Airport Fueling Facility, Anchorage AK
conducted November 8, 2019

Prepared By:	**Mammoth Consulting, LLC**	Scale:	**1" = 150 ft**
For:	**Ahtna Engineering Services, LLC**	Date:	**November 27, 2019**

Coordinate List for
Monitoring Well Survey for Menzies 2019 Site Characterization & Well Decommissioning, AFSC Off-Airport Fueling Facility
conducted November 8, 2019 by Mammoth Consulting

	NAD83(2011)(2010.0000)		NAD83(2011)(2010.0000)		NAVD88 w/GEOID12B												
	AK State Plane Zone 4															No. of Satellites	
Pt No.	Northing	Easting	Latitude (N)	Longitude (W)	Elevation		Description	Survey	Date	Time	HRMS	VRMS	PDOP	HDOP	VDOP	GPS	GLONASS
	U.S. Survey Feet		Decimal Degrees		U.S. Ft			Method		(local)	U.S. Ft	U.S. Ft					
Survey Control																	
1	2642784.74	1660183.84	61.23351004	149.88781102	26.55		"THERMO" = GPS Base Station, recovered 3 " alum. cap mon. encased in 4" PVC pipe	NGS - OPUS Shared Sol'n #BBBH31	6/10/2011								
2	2643299.71	1660325.37	61.23491810	149.88678777	26.68		5920G-11-02-16_Mean	RTK	11/2/2016								
3	2643299.70	1660325.38	61.23491808	-149.88700266	26.65		5920G-11-08-19-1=chk shot	RTK	11/8/2019	11:11:56	0.004	0.007	1.262	0.697	1.052	10	8
4	2643299.71	1660325.40	61.23491811	-149.88700254	26.64		5920G-11-08-19-2=chk shot	RTK	11/8/2019	14:50:07	0.004	0.007	1.758	0.801	1.564	8	7
Monitoring Wells - coord's are at measuring marks of PVC pipes																	
					PVC Meas. Mark	Ground											
5	2643116.22	1660401.25	61.23441580	-149.88657384	26.34	25.8	MW01	coord's are from RTK survey; meas mark elev's from level survey, gnd elev's from stick-up data	11/8/2019	12:04:26	0.005	0.008	1.429	0.785	1.194	9	6
6	2643295.83	1660390.02	61.23490719	-149.88663581	26.78	25.7	MW03		11/8/2019	12:09:59	0.006	0.009	1.751	0.923	1.488	9	6
7	2642994.73	1660353.94	61.23408368	-149.88684355	26.00	26.4	MW04R		11/8/2019	11:57:29	0.004	0.007	1.352	0.727	1.140	9	7
8	2643238.34	1660761.92	61.23474814	-149.88452558	27.90	25.6	MW06		11/8/2019	12:14:12	0.006	0.011	2.184	1.055	1.912	8	5
9	2643005.60	1660235.91	61.23411398	-149.88751334	26.67	26.9	MW10		11/8/2019	11:28:54	0.004	0.007	1.754	0.904	1.503	7	8
10	2643191.62	1660271.51	61.23462268	-149.88730947	26.89	27.2	MW11		11/8/2019	11:24:23	0.004	0.007	1.560	0.832	1.320	8	8
11	2643364.26	1660297.10	61.23509482	-149.88716254	28.26	28.6	MW12		11/8/2019	11:18:01	0.005	0.008	1.300	0.728	1.077	9	8

EQUIPMENT USED: Two GRX-2 dual frequency receivers with with integrated antennae and a Topcon FC500 field controller with MAGNET Field software (ver.5.2.1) were used for the RTK positioning.
A Topcon GTS-701 total station (2-second theodolite, 2mm + 2ppm electronic distance meter) was used for the elevation survey.

Shar **ed Solution**

PID:	BBBH31
Designation:	9455920 THERMO 1
Stamping:	5920 THERMO 1 1988
Stability:	Monument will probably hold position well
Setting:	Unspecified deep unsleeved setting (10FT+ or 3.048M+)
Mark Condition:	G
Description:	
Observed:	2011-06-10T16:24:00Z See Also 2010-07-13 See Also Original
Source:	OPUS - page5 1209.04

Close-up **V**iew

REF_FRAME: NAD_83(2011)	EPOCH: 2010.0000	SOURCE: NAVD88 (Computed using GEOID12B)	UNITS: m	SET PROFILE	DETAILS

LAT:	61° 14' 0.63615"	± 0.007 m
LON:	-149° 53' 16.11966"	± 0.003 m
ELL **H**T:	14.663	± 0.013 m
X:	-2662048.553	± 0.003 m
Y:	-1543892.283	± 0.003 m
Z:	5567923.928	± 0.014 m
ORTHO **H**T:	8.092 26.55 Ft	± 0.022 m

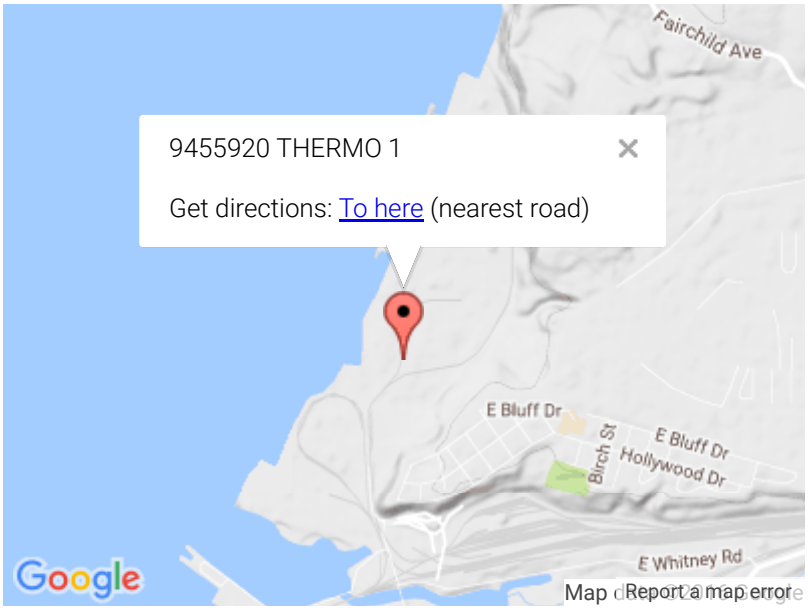
	UTM 6	SPC 5004(AK 4)	
NORTHING:	6792222.496m	805522.399m	2642784.74 U.S. Feet
EASTING:	344993.433m	506025.047m	1660183.84
CONVERGENCE:	-2.53192000°	0.09834358°	
POINT **S**CALE:	0.99989438	0.99990044	
COMBINED **F**ACTOR:	0.99989209	0.99989815	

CONTRIBUTED **B**Y

clyde.kakazu

National Oceanic and Atmospheric Administration

Horizon **V**iew



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

ATTACHMENT 6

PASSIVE SOIL GAS SURVEY REPORT

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Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA
1.410.838.8780

CERTIFICATE OF ANALYSIS

Beacon Proposal No.: 4658

Beacon Project No.: 0004658

Project Description:
Project Site: OAFF
Port of Anchorage, Anchorage, AK

Client PO No.: PO 20023272

Prepared for:
Alex Geilich
Ahtna Engineering Services
110 W 38th Avenue, Suite 200A
Anchorage, AK 99503

Ryan W. Schneider
Senior Project Manager

September 25, 2019

All data meet requirements as specified in the Beacon Environmental Services, Inc. Quality Assurance Project Plan and the results relate only to the samples reported. The work performed was in accordance with ISO/IEC 17025:2005 requirements, except samples were analyzed within a 24-hour tune window and TPH is not included in BEACON's scope of accreditation. This report shall not be reproduced, except in full, without written approval of the laboratory. Release of the data contained in this data package has been authorized by the Laboratory Director or his signee, as verified by the following signatures:

Steven C. Thornley
Laboratory Director

Peter B. Kelly
Interim Quality Manager

2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA
1.410.838.8780

Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-02 — **OAFF-19-SG-01** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**14**		10	C19090406.D
Benzene	71-43-2	**35**		25	C19090406.D
Toluene	108-88-3	**29**		25	C19090406.D
TPH C4-C9		**9,560**		5000	C19090406.D
TPH C10-C15		**12,600**		5000	C19090406.D

Lab Sample ID: 0004658-03 — **OAFF-19-SG-02** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**21**		10	C19090407.D
Benzene	71-43-2	**26**		25	C19090407.D
Toluene	108-88-3	**44**		25	C19090407.D
TPH C4-C9		**8,930**		5000	C19090407.D
TPH C10-C15		**6,430**		5000	C19090407.D

Lab Sample ID: 0004658-04 — **OAFF-19-SG-03** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Benzene	71-43-2	**59**		25	C19090408.D
Toluene	108-88-3	**60**		25	C19090408.D
Ethylbenzene	100-41-4	**30**		25	C19090408.D
p & m-Xylene	108-38-3	**67**		25	C19090408.D
o-Xylene	95-47-6	**28**		25	C19090408.D
Isopropylbenzene	98-82-8	**30**		25	C19090408.D
1,3,5-Trimethylbenzene	108-67-8	**92**		25	C19090408.D
1,2,4-Trimethylbenzene	95-63-6	**268**		25	C19090408.D
TPH C4-C9		**385,000**		5000	C19090408.D
TPH C10-C15		**172,000**		5000	C19090408.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-05 — **OAFF-19-SG-03 DUP** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Benzene	71-43-2	**40**		25	C19090409.D
Toluene	108-88-3	**39**		25	C19090409.D
p & m-Xylene	108-38-3	**47**		25	C19090409.D
1,3,5-Trimethylbenzene	108-67-8	**75**		25	C19090409.D
1,2,4-Trimethylbenzene	95-63-6	**228**		25	C19090409.D
TPH C4-C9		**392,000**		5000	C19090409.D
TPH C10-C15		**111,000**		5000	C19090409.D

Lab Sample ID: 0004658-06 — **OAFF-19-SG-04** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**14**		10	C19090410.D
Benzene	71-43-2	**178**		25	C19090410.D
Toluene	108-88-3	**60**		25	C19090410.D
p & m-Xylene	108-38-3	**58**		25	C19090410.D
Isopropylbenzene	98-82-8	**63**		25	C19090410.D
1,3,5-Trimethylbenzene	108-67-8	**98**		25	C19090410.D
1,2,4-Trimethylbenzene	95-63-6	**269**		25	C19090410.D
TPH C4-C9		**546,000**		5000	C19090410.D
TPH C10-C15		**258,000**		5000	C19090410.D

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1.410.838.8780

Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-07 — **OAFF-19-SG-04 DUP** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**13**		10	C19090411.D
Benzene	71-43-2	**158**		25	C19090411.D
Toluene	108-88-3	**55**		25	C19090411.D
p & m-Xylene	108-38-3	**68**		25	C19090411.D
Isopropylbenzene	98-82-8	**56**		25	C19090411.D
1,3,5-Trimethylbenzene	108-67-8	**72**		25	C19090411.D
1,2,4-Trimethylbenzene	95-63-6	**226**		25	C19090411.D
TPH C4-C9		**552,000**		5000	C19090411.D
TPH C10-C15		**213,000**		5000	C19090411.D

Lab Sample ID: 0004658-08 — **OAFF-19-SG-05** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Toluene	108-88-3	**48**		25	C19090412.D
Tetrachloroethene	127-18-4	**21**		10	C19090412.D
TPH C4-C9		**6,470**		5000	C19090412.D
TPH C10-C15		**5,370**		5000	C19090412.D

Lab Sample ID: 0004658-09 — **OAFF-19-SG-06** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Toluene	108-88-3	**29**		25	C19090413.D

Lab Sample ID: 0004658-10 — **OAFF-19-SG-07** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
TPH C4-C9		**7,010**		5000	C19090414.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-11 — **OAFF-19-SG-08** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Toluene	108-88-3	**57**		25	C19090415.D
TPH C4-C9		**8,060**		5000	C19090415.D
TPH C10-C15		**6,160**		5000	C19090415.D

Lab Sample ID: 0004658-12 — **OAFF-19-SG-09** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Benzene	71-43-2	**1,020**		25	C19090416.D
Toluene	108-88-3	**475**		25	C19090416.D
Ethylbenzene	100-41-4	**27,500**		25	C19090416.D
p & m-Xylene	108-38-3	**39,000**		25	C19090416.D
o-Xylene	95-47-6	**394**		25	C19090416.D
Isopropylbenzene	98-82-8	**2,230**		25	C19090416.D
1,3,5-Trimethylbenzene	108-67-8	**15,800**		25	C19090416.D
1,2,4-Trimethylbenzene	95-63-6	**19,100**		25	C19090416.D
Naphthalene	91-20-3	**1,830**		25	C19090416.D
2-Methylnaphthalene	91-57-6	**965**		25	C19090416.D
TPH C4-C9		**598,000**		5000	C19090416.D
TPH C10-C15		**312,000**		5000	C19090416.D

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Forest Hill, MD 21050 USA
1.410.838.8780

Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-13 — **OAFF-19-SG-10** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**15**		10	C19090417.D
Benzene	71-43-2	**11,500**		25	C19090417.D
Toluene	108-88-3	**283**		25	C19090417.D
Ethylbenzene	100-41-4	**34,900**		25	C19090417.D
p & m-Xylene	108-38-3	**50,700**		25	C19090417.D
o-Xylene	95-47-6	**991**		25	C19090417.D
Isopropylbenzene	98-82-8	**1,640**		25	C19090417.D
1,3,5-Trimethylbenzene	108-67-8	**27,500**		25	C19090417.D
1,2,4-Trimethylbenzene	95-63-6	**25,400**		25	C19090417.D
Naphthalene	91-20-3	**1,090**		25	C19090417.D
2-Methylnaphthalene	91-57-6	**442**		25	C19090417.D
TPH C4-C9		**1,210,000**		5000	C19090417.D
TPH C10-C15		**422,000**		5000	C19090417.D

Lab Sample ID: 0004658-14 — **OAFF-19-SG-11** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,2,4-Trimethylbenzene	95-63-6	**26**		25	C19090905.D
TPH C4-C9		**6,960**		5000	C19090418.D
TPH C10-C15		**8,110**		5000	C19090418.D

Lab Sample ID: 0004658-15 — **OAFF-19-SG-12** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
TPH C4-C9		**5,960**		5000	C19090419.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-16 — **OAFF-19-SG-13** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**35**		10	C19090420.D
Toluene	108-88-3	**163**		25	C19090420.D
TPH C4-C9		**10,900**		5000	C19090420.D
TPH C10-C15		**9,280**		5000	C19090420.D

Lab Sample ID: 0004658-17 — **OAFF-19-SG-14** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Toluene	108-88-3	**68**		25	C19090421.D
p & m-Xylene	108-38-3	**27**		25	C19090421.D
1,2,4-Trimethylbenzene	95-63-6	**47**		25	C19090421.D
TPH C4-C9		**6,530**		5000	C19090421.D
TPH C10-C15		**7,160**		5000	C19090421.D

Lab Sample ID: 0004658-18 — **OAFF-19-SG-14 DUP** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Toluene	108-88-3	**70**		25	C19090422.D
1,2,4-Trimethylbenzene	95-63-6	**42**		25	C19090422.D
TPH C4-C9		**6,190**		5000	C19090422.D
TPH C10-C15		**6,740**		5000	C19090422.D

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Forest Hill, MD 21050 USA
1.410.838.8780

Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-19 — **OAFF-19-SG-15** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**19**		10	C19090423.D
Benzene	71-43-2	**31**		25	C19090423.D
Toluene	108-88-3	**74**		25	C19090423.D
p & m-Xylene	108-38-3	**44**		25	C19090423.D
o-Xylene	95-47-6	**30**		25	C19090423.D
1,3,5-Trimethylbenzene	108-67-8	**123**		25	C19090423.D
1,2,4-Trimethylbenzene	95-63-6	**429**		25	C19090423.D
TPH C4-C9		**27,800**		5000	C19090423.D
TPH C10-C15		**19,300**		5000	C19090423.D

Lab Sample ID: 0004658-20 — **OAFF-19-SG-16** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**42**		10	C19090424.D
Benzene	71-43-2	**35**		25	C19090424.D
Toluene	108-88-3	**85**		25	C19090424.D
Tetrachloroethene	127-18-4	**18**		10	C19090424.D
Ethylbenzene	100-41-4	**32**		25	C19090424.D
p & m-Xylene	108-38-3	**65**		25	C19090424.D
o-Xylene	95-47-6	**33**		25	C19090424.D
1,3,5-Trimethylbenzene	108-67-8	**176**		25	C19090424.D
1,2,4-Trimethylbenzene	95-63-6	**538**		25	C19090424.D
TPH C4-C9		**32,300**		5000	C19090424.D
TPH C10-C15		**21,400**		5000	C19090424.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-21 — **OAFF-19-SG-17** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
TPH C10-C15		**5,550**		5000	C19090425.D

Lab Sample ID: 0004658-23 — **OAFF-19-SG-19** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**60**		10	C19090427.D
Toluene	108-88-3	**98**		25	C19090427.D
p & m-Xylene	108-38-3	**28**		25	C19090427.D
TPH C4-C9		**14,100**		5000	C19090427.D
TPH C10-C15		**8,530**		5000	C19090427.D

Lab Sample ID: 0004658-24 — **OAFF-19-SG-20** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**17**		10	C19090428.D
Toluene	108-88-3	**28**		25	C19090428.D
TPH C4-C9		**6,090**		5000	C19090428.D
TPH C10-C15		**5,180**		5000	C19090428.D

Lab Sample ID: 0004658-25 — **OAFF-19-SG-20 DUP** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**14**		10	C19090429.D
Toluene	108-88-3	**29**		25	C19090429.D
TPH C4-C9		**7,190**		5000	C19090429.D
TPH C10-C15		**5,060**		5000	C19090429.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-26 — **OAFF-19-SG-21** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**10**		10	C19090430.D
Benzene	71-43-2	**156**		25	C19090430.D
Toluene	108-88-3	**74**		25	C19090430.D
p & m-Xylene	108-38-3	**43**		25	C19090430.D
o-Xylene	95-47-6	**26**		25	C19090430.D
1,3,5-Trimethylbenzene	108-67-8	**123**		25	C19090430.D
1,2,4-Trimethylbenzene	95-63-6	**372**		25	C19090430.D
TPH C4-C9		**110,000**		5000	C19090430.D
TPH C10-C15		**22,500**		5000	C19090430.D

Lab Sample ID: 0004658-27 — **OAFF-19-SG-22** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**14**		10	C19090431.D
Benzene	71-43-2	**111**		25	C19090431.D
Toluene	108-88-3	**39**		25	C19090431.D
p & m-Xylene	108-38-3	**31**		25	C19090431.D
1,3,5-Trimethylbenzene	108-67-8	**101**		25	C19090431.D
1,2,4-Trimethylbenzene	95-63-6	**351**		25	C19090431.D
TPH C4-C9		**324,000**		5000	C19090431.D
TPH C10-C15		**23,400**		5000	C19090431.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-28 — **OAFF-19-SG-23** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Benzene	71-43-2	**63**		25	C19090432.D
Toluene	108-88-3	**35**		25	C19090432.D
TPH C4-C9		**56,400**		5000	C19090432.D
TPH C10-C15		**15,000**		5000	C19090432.D

Lab Sample ID: 0004658-29 — **OAFF-19-SG-24** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Toluene	108-88-3	**35**		25	C19090433.D
p & m-Xylene	108-38-3	**35**		25	C19090433.D
1,3,5-Trimethylbenzene	108-67-8	**266**		25	C19090433.D
1,2,4-Trimethylbenzene	95-63-6	**850**		25	C19090433.D
TPH C4-C9		**24,300**		5000	C19090433.D
TPH C10-C15		**24,900**		5000	C19090433.D

Lab Sample ID: 0004658-30 — **OAFF-19-SG-25** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Toluene	108-88-3	**33**		25	C19090434.D

Lab Sample ID: 0004658-31 — **OAFF-19-SG-26** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Benzene	71-43-2	**29**		25	C19090435.D
Toluene	108-88-3	**59**		25	C19090435.D
TPH C4-C9		**5,920**		5000	C19090435.D
TPH C10-C15		**5,910**		5000	C19090435.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-32 — **OAFF-19-SG-28** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**12**		10	C19090436.D
Benzene	71-43-2	**26**		25	C19090436.D
Toluene	108-88-3	**59**		25	C19090436.D
Tetrachloroethene	127-18-4	**26**		10	C19090436.D
TPH C4-C9		**5,670**		5000	C19090436.D
TPH C10-C15		**6,310**		5000	C19090436.D

Lab Sample ID: 0004658-33 — **OAFF-19-SG-29** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**12**		10	C19090437.D
Toluene	108-88-3	**26**		25	C19090437.D
TPH C4-C9		**6,350**		5000	C19090437.D
TPH C10-C15		**7,980**		5000	C19090437.D

Lab Sample ID: 0004658-35 — **OAFF-19-SG-31** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**13**		10	C19090439.D
Benzene	71-43-2	**26**		25	C19090439.D
Toluene	108-88-3	**37**		25	C19090439.D
TPH C4-C9		**6,140**		5000	C19090439.D
TPH C10-C15		**5,060**		5000	C19090439.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-36 — **OAFF-19-SG-32** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**42**		10	C19090440.D
Benzene	71-43-2	**45**		25	C19090440.D
Toluene	108-88-3	**100**		25	C19090440.D
TPH C4-C9		**11,100**		5000	C19090440.D
TPH C10-C15		**8,250**		5000	C19090440.D

Lab Sample ID: 0004658-37 — **OAFF-19-SG-33** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**19**		10	C19090441.D
Toluene	108-88-3	**38**		25	C19090441.D
Tetrachloroethene	127-18-4	**49**		10	C19090441.D
TPH C4-C9		**9,530**		5000	C19090441.D
TPH C10-C15		**5,890**		5000	C19090441.D

Lab Sample ID: 0004658-38 — **OAFF-19-SG-34** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**32**		10	C19090442.D
1,2-Dichloroethane	107-06-2	**31**		10	C19090442.D
Toluene	108-88-3	**282**		25	C19090442.D
p & m-Xylene	108-38-3	**33**		25	C19090442.D
TPH C4-C9		**13,500**		5000	C19090442.D
TPH C10-C15		**12,100**		5000	C19090442.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-39 — **OAFF-19-SG-35** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**20**		10	C19090443.D
Benzene	71-43-2	**354**		25	C19090443.D
Toluene	108-88-3	**79**		25	C19090443.D
Ethylbenzene	100-41-4	**25**		25	C19090443.D
p & m-Xylene	108-38-3	**34**		25	C19090443.D
TPH C4-C9		**52,400**		5000	C19090443.D
TPH C10-C15		**7,980**		5000	C19090443.D

Lab Sample ID: 0004658-40 — **OAFF-19-SG-36** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,2-Trichlorotrifluoroethane (Fr.113)	76-13-1	**11**		10	C19090444.D
trans-1,2-Dichloroethene	156-60-5	**83**		10	C19090444.D
Benzene	71-43-2	**39**		25	C19090444.D
Toluene	108-88-3	**89**		25	C19090444.D
TPH C4-C9		**21,900**		5000	C19090444.D
TPH C10-C15		**8,730**		5000	C19090444.D

Lab Sample ID: 0004658-41 — **OAFF-19-SG-37** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**14**		10	C19090445.D
Benzene	71-43-2	**42**		25	C19090445.D
Toluene	108-88-3	**27**		25	C19090445.D
TPH C4-C9		**20,200**		5000	C19090445.D
TPH C10-C15		**6,110**		5000	C19090445.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Summary of Compound Detections- Mass

Lab Sample ID: 0004658-42 — **OAFF-19-SG-38** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Benzene	71-43-2	**28**		25	C19090446.D
Toluene	108-88-3	**29**		25	C19090446.D
TPH C4-C9		**5,880**		5000	C19090446.D
TPH C10-C15		**11,000**		5000	C19090446.D

Lab Sample ID: 0004658-43 — **OAFF-19-SG-39** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
trans-1,2-Dichloroethene	156-60-5	**19**		10	C19090447.D
Toluene	108-88-3	**31**		25	C19090447.D
TPH C4-C9		**6,690**		5000	C19090447.D
TPH C10-C15		**5,580**		5000	C19090447.D

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Map Report

Ahtna Engineering Services	**Project Site:** OAFF	**Beacon Proposal:** 4658
110 W 38th Avenue, Suite 200A	**Project Location:** Port of Anchorage, Anchorage, AK	**Beacon Project No.:** 0004658
Anchorage, AK 99503	**Project Manager:** Alex Geilich	**Reported:** 09/25/2019

Map Data Summary Table

Sample locations are shown on **Figure 1**. The following table lists frequency of detections from the current survey based on the number of field samples analyzed, the reporting limit, and the maximum value for each mapped compound. The table also includes the transformation and interpolation method for the compound distribution maps provided.

Figure No.	Compound	Frequency	LOQ (ng)	Max Value (ng)	Transformation Method	Interpolation Method
2	BTEX, Total	32	25	98,400	Log	Kriging
3	TPH C4-C9	33	5,000	1,210,000	Log	Kriging
4	TPH C10-C15	32	5,000	422,000	Log	Kriging

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Beacon Project No. 4658, September 2019

LEGEND

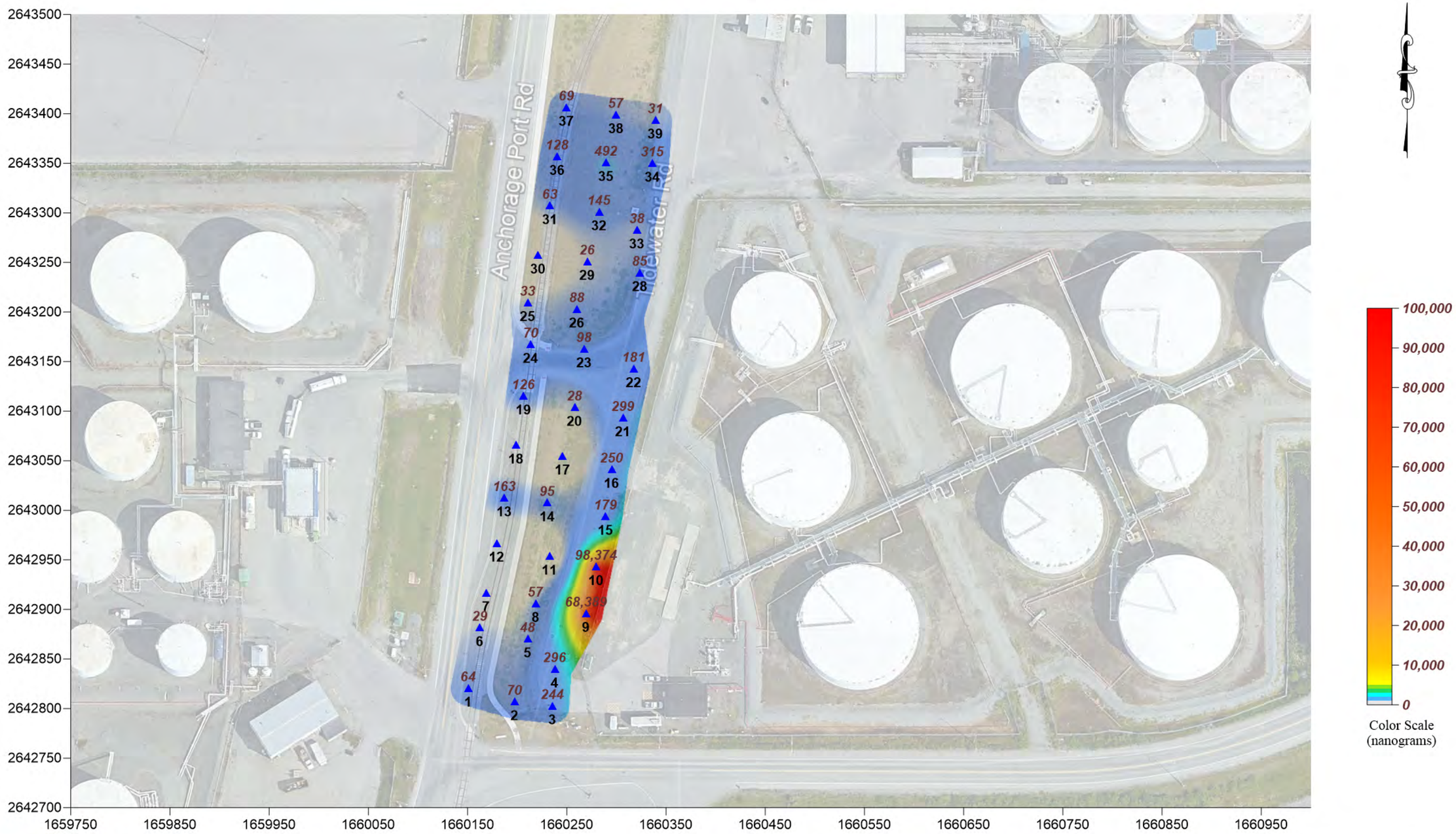
▲ 10 PASSIVE SOIL-GAS SAMPLE LOCATION

System:	State Plane
Zone:	Alaska Zone 4 FIPS 5004
Datum:	NAD 1983
Coordinate Units:	Feet

Scale in Feet
0 100 200

Figure 1
Passive Soil-Gas Survey
Sample Locations

OAFF Site
Port of Anchorage, Anchorage, AK



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Beacon Project No. 4658, September 2019

LEGEND

1,000 NANOGRAMS/SAMPLER

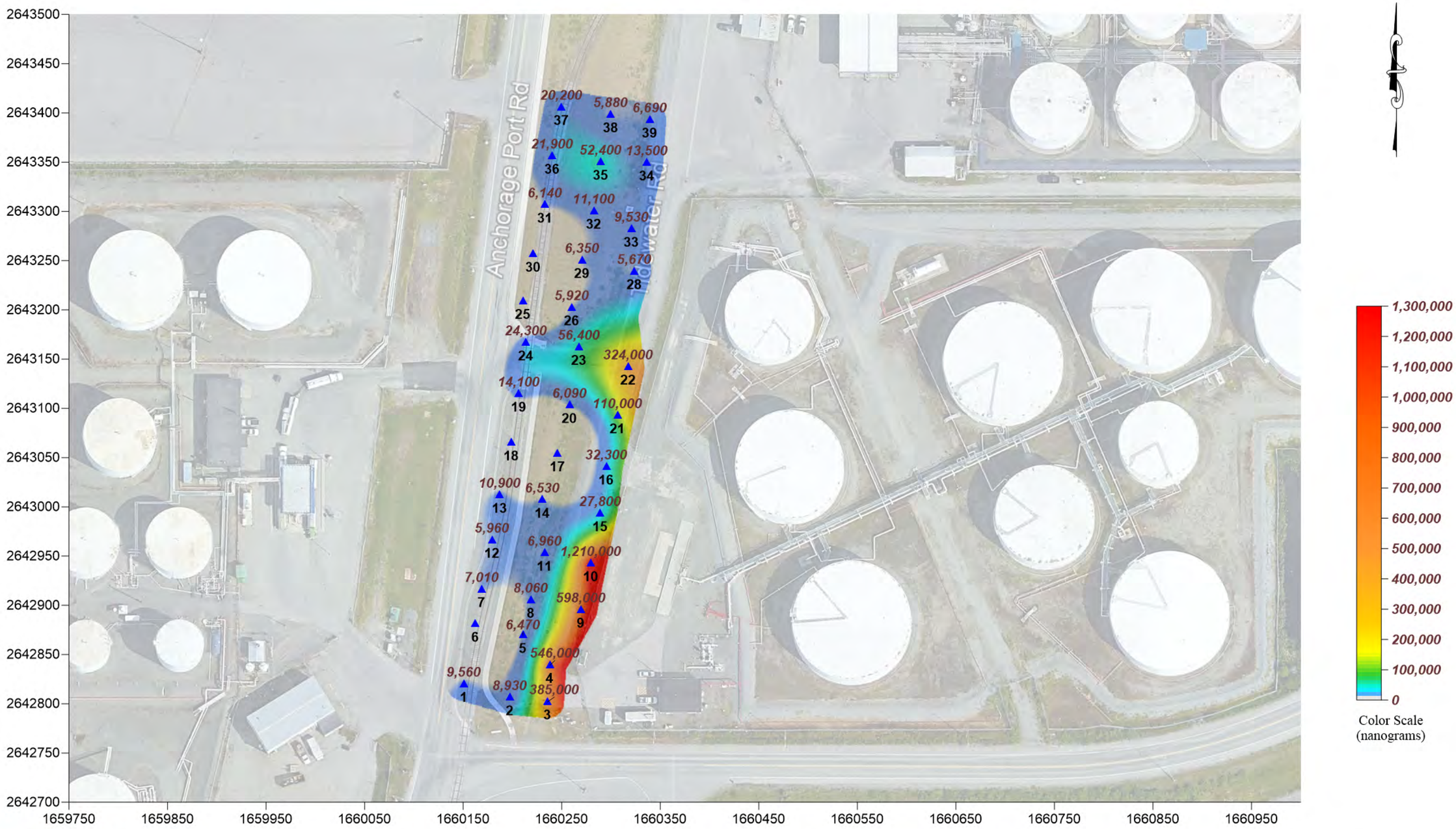
10 PASSIVE SOIL-GAS SAMPLE LOCATION

System:	State Plane
Zone:	Alaska Zone 4 FIPS 5004
Datum:	NAD 1983
Coordinate Units:	Feet

Scale in Feet
0 100 200

Figure 2
Passive Soil-Gas Survey
BTEX

OAFF Site
Port of Anchorage, Anchorage, AK



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Beacon Project No. 4658, September 2019

LEGEND

1,000 NANOGRAMS/SAMPLER

▲ 10 PASSIVE SOIL-GAS SAMPLE LOCATION

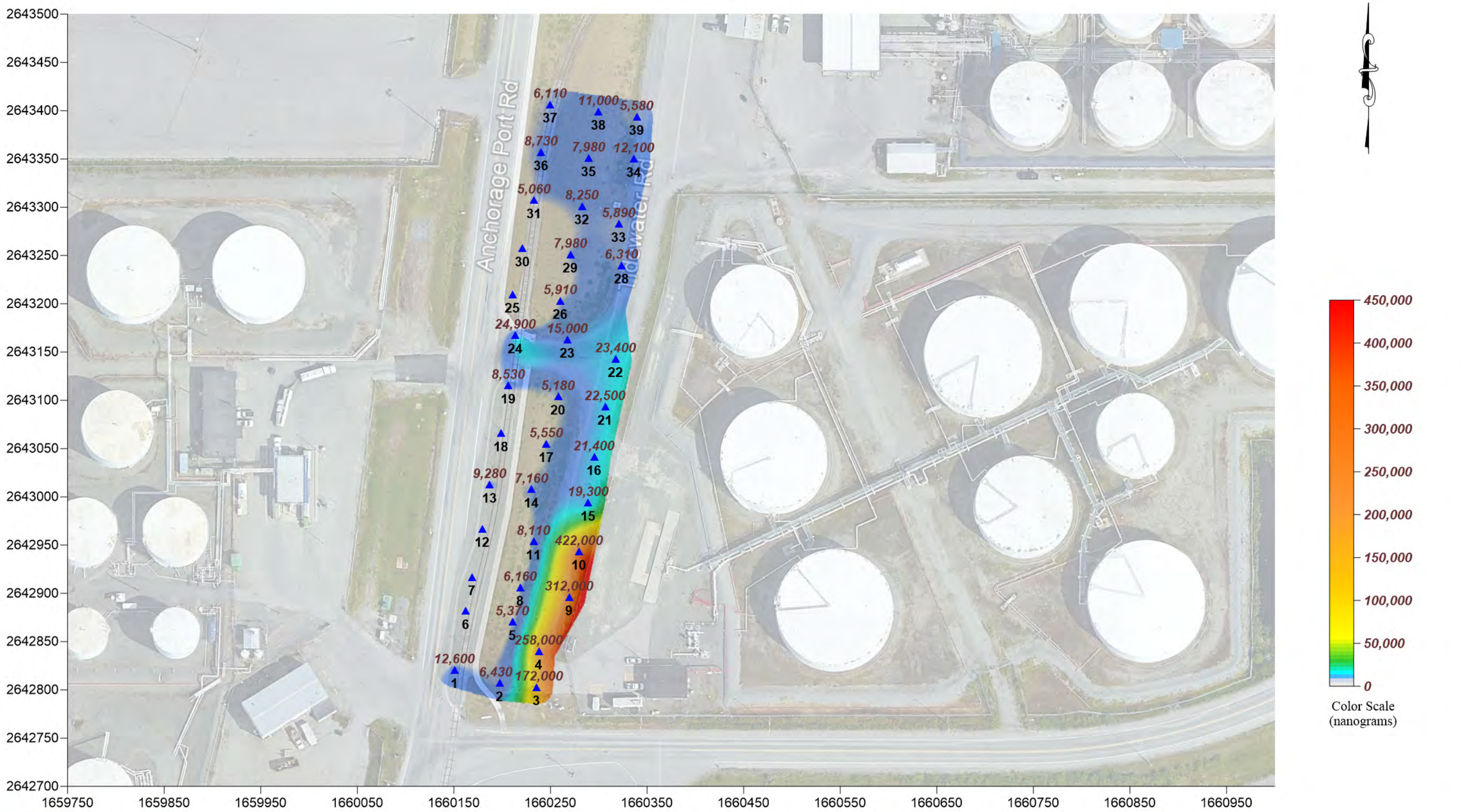
System:	State Plane
Zone:	Alaska Zone 4 FIPS 5004
Datum:	NAD 1983
Coordinate Units:	Feet

Scale in Feet

0 100 200

Figure 3
Passive Soil-Gas Survey
TPH C4-C9

OAFF Site
Port of Anchorage, Anchorage, AK



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LEGEND

1,000 NANOGRAMS/SAMPLER

10 PASSIVE SOIL-GAS SAMPLE LOCATION

System:	State Plane
Zone:	Alaska Zone 4 FIPS 5004
Datum:	NAD 1983
Coordinate Units:	Feet

Scale in Feet

0 100 200

Figure 4
Passive Soil-Gas Survey
TPH C10-C15

OAFF Site
Port of Anchorage, Anchorage, AK

Laboratory Data Review Checklist for Air Samples

Completed by:	Lexie Lucassen		
Title:	Environmental Scientist	Date:	11/4/2019
CS Report Name:	2019 OAFF Site Characterization and Well Decommissioning	Report Date:	9/13/2019
Consultant Firm:	Ahtna Engineering Services, LLC		
Laboratory Name:	Beacon Environmental Services, Inc.	Laboratory Report Number:	0004658
ADEC File Number:	2100.38.243	ADEC Haz ID:	25946

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

Beacon Environmental Services, Inc.

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were not transferred

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

○ Yes ○ No ◉ NA (Please explain) Comments:

Samples were collected using BeSure Sample Collection KitsTM, which aren't pressurized and therefore don't require a pressure check. ADEC guidance doesn't comment on the kits, however, data is being used to assist in well placement determination only. No deficiencies were noted.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

◉ Yes ○ No ○ NA (Please explain) Comments:

One sample, OAFF-19-SG-27, could not be retrieved and therefore was not analyzed. Documented on COC

c. Data quality or usability affected? (Please explain.)

◉ Yes ○ No ○ NA (Please explain) Comments:

No data for sample OAFF-19-SG-27

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

No corrective actions were required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability are not affected.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Target screening levels are not established for soil gas, and no minimum required detection levels established for the project

d. Data quality or usability affected?

Comments:

No

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

( ) Yes (•) No ( ) NA (Please explain) Comments:

2 method blanks reported for 43 samples (including 1 trip blank and 4 duplicates)

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

NA. No method blank detections

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

No method blank detections. No samples were affected.

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality/usability not affected by method blanks.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

( ) Yes (•) No ( ) NA (Please explain) Comments:

No LCS/LCSD was reported

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

○ Yes ○ No ◉ NA (Please explain) Comments:

No LCS/LCSD

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

○ Yes ○ No ◉ NA (Please explain) Comments:

No LCS/LCSD

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

No LCS/LCSD

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No ○ NA (Please explain) Comments:

Detected sample results should be J flagged as estimated due to the absence of LCS/LCSD analyses

vi. Data quality or usability affected? (Please explain.)

Comments:

For the purpose of this data as a screening tool to assist in locating the best position to install groundwater monitoring wells, data usability is not affected

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

○ Yes ◉ No ○ NA (Please explain) Comments:

No surrogates reported

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

○ Yes ○ No ◉ NA (Please explain) Comments:

No surrogates reported

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ○ NA (Please explain) Comments:

No surrogates reported

iv. Data quality or usability affected? (Please explain.)

Comments:

For the purpose of this data as a screening tool to assist in locating the best position to install groundwater monitoring wells, data usability is not affected

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

4 duplicates submitted with 38 primary samples

ii. Submitted blind to lab?

( ) Yes (●) No ( ) NA (Please explain) Comments:

Duplicates are indicated as "DUP" in the sample names

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

( ) Yes (●) No ( ) NA (Please explain) Comments:

RPDs>25% for benzene, toluene, p&m xylene, and TPH C10-15 in samples OAFF-19-SG-03/ OAFF-19-SG-03-DUP
1,3,5-Trimethylbenzene RPD>25% in OAFF-19-SG-04/OAFF-19-SG-04-DUP

iv. Data quality or usability affected? (Please explain.) Comments:

Usable as qualified QN for poor precision with an unknown bias

e. Field Blank (If not used explain why).

( ) Yes (●) No ( ) NA (Please explain) Comments:

Not required by the project work plan

i. All results less than PQL?

( ) Yes ( ) No (●) NA (Please explain) Comments:

No filed blank collected

ii. If above PQL, what samples are affected? Comments:

NA. No field blank collected.

iii. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability are not affected

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain) Comments:

No other data flags/qualifiers used other than those described in this checklist

Reset Form

Updated: 2/2015