

March 9, 2023

Laurie Butler  
Environmental Manager  
Menzies Aviation  
6000 De Havilland Drive  
Anchorage, AK 99502

**Subject: Final 2022 Groundwater Monitoring Report  
AFSC Off-Airport Fuel Facility at the Port of Alaska, Anchorage, Alaska**

Dear Ms. Butler:

This letter presents the Ahtna Engineering Services, LLC, (Ahtna) report for groundwater monitoring activities at the Anchorage Fueling and Service Company (AFSC) Off-Airport Fuel Facility (OAFF) site located at the Port of Alaska in Anchorage (Figure 1, Attachment 1). Ahtna conducted the work in accordance with the 2022 Alaska Department of Environmental Conservation (ADEC) *Field Sampling Guidance*.

### **WORK PERFORMED**

This project was managed by Luke Hoffmann and overseen by Nino Muniz on behalf of Menzies. The project manager and field scientists performing the sampling met the ADEC definition of "qualified environmental professional" as per Title 18 Alaska Administrative Code (AAC) Chapter 75.333 (18 AAC 75; updated in 2021).

### **Mobilization**

Prior to mobilizing to the field in both July and September, Ahtna coordinated with personnel from Menzies Aviation (AFSC's operator) for site access and to schedule a purge water collection drum to be provided at the site. A site map with locations of the monitoring wells is provided in Figures 2–4, Attachment 1.

### **Static Groundwater Level Measurements**

On July 12, 2022, prior to purging and sampling groundwater, site wells MW01, MW03, MW4R, MW06, MW10, MW11, and MW12 were gauged for static water level, the presence/thickness of light non-aqueous-phase liquids (LNAPLs), and total well depth using an electronic oil/water interface probe. These wells were gauged a second time in 2022 on September 28.

## **Groundwater Sampling**

Groundwater samples were collected from monitoring wells MW01, MW03, MW4R, MW10, MW11, and MW12 during the July 2022 event only. These six wells were purged with a bladder pump using low-flow, minimal-drawdown sampling techniques. In accordance with the 2022 ADEC *Field Sampling Guidance*, Ahtna collected and documented water quality parameters every four minutes using a Hach® 2100Q turbidimeter and a YSI Pro Plus water meter with a flow-through cell. Field notes and groundwater sampling forms are provided in Attachment 2.

Samples were hand delivered to SGS North America Laboratories, Inc., (SGS) located in Anchorage, Alaska, under standard chain-of-custody procedures for analysis of fuel-related volatile organic compounds (FR-VOCs), gasoline-range organics (GRO), diesel-range organics (DRO), and polycyclic aromatic hydrocarbons (PAHs). A duplicate sample was collected from MW-4R with a sample name of 22-OAFF-MW-4RD.

All wells outside the security fence were locked upon completion of sampling.

## **Waste Disposal**

All purge water was contained in a 55-gallon drum and temporarily stored behind the locked fence at the OAFF site. On July 14, 2022, ADEC representative Shawn Tisdell provided a signed ADEC Contaminated Media Transport and Treatment or Disposal Approval Form for the purge water disposal. On July 18, 2022, US Ecology picked up the 55-gallon drum from OAFF and disposed of the contents at its Viking Facility located in Anchorage. The signed ADEC Contaminated Media Transport and Treatment or Disposal Approval Form and waste manifest have been provided in Attachment 6.

## **INVESTIGATION RESULTS**

All groundwater level measurement results and groundwater analytical sample results are described in this section. Laboratory results are provided in Table 1 of Attachment 3. The laboratory report, laboratory data quality review, and ADEC laboratory data review checklists are provided in Attachment 5.

### **Static Groundwater Level Measurements Results**

#### ***Summer Static Groundwater Level Measurement Results***

During the July 12, 2022, water level gauging event, no LNAPL was observed in any of the seven gauged wells. Observed groundwater levels were inconsistent with previous measurements from 2019 because the depth to groundwater in all the wells was ~1–2 feet lower than previously observed. Depth to water measured in monitoring well MW01 was observed to be significantly lower (0.75–1.38 feet) than nearby wells during the July 2022 event, which is greater than the difference between the wells farthest apart from each other at the site (MW06 and MW10, which showed a difference between them of 1.30 feet, and they are much farther apart). Groundwater

contours calculated utilizing field measurements collected during the July event indicate that general groundwater flow is to the west toward Knik Arm, however it appeared that groundwater may be flowing on site from the north and south toward an inferred topographic low point present near MW01 and a topographic groundwater high point present near MW12. The groundwater potentiometric surface calculated in July 2022 is shown on Figure 2, Attachment 1.

Prior to the collection of the July 2022 measurements, Anchorage received less than 1 inch of precipitation during the 3 months preceding (March 12–July 12), which is significantly lower than the average accumulation of 3.10 inches of precipitation over the same timeframe (NOAA Online Weather Data: <https://nowdata.rcc-acis.org/pafc/>) and is the driest Anchorage has ever been over this timeframe, as indicated in the NOAA Data Tables included in Attachment 4.

### ***Fall Static Groundwater Level Measurement Results***

On September 28, 2022, Ahtna returned to OAFF to collect static water levels in all seven wells gauged in July. Groundwater levels observed in September 2022 were on average 2.20 feet higher in September than those observed in July 2022 and were the highest groundwater level measurements recorded since 2001, when available records indicated groundwater monitoring commenced at this site. Groundwater contours calculated utilizing field measurements collected during the September event indicate that the general groundwater flow is to the west toward Knik Arm (as did the July data). MW01 still appears to be a topographic low point, and a topographic groundwater high point is present near MW12, which is causing groundwater from the site to flow directly north to slightly southwest. The groundwater potentiometric surface calculated in September 2022 is shown on Figure 3.

Prior to the collection of the September 2022 measurements, Anchorage received 15.54 inches of precipitation during the 2.5 months preceding (July 12–September 28), which is significantly higher than the average accumulation of 7.03 inches of precipitation over the same timeframe (NOAA Online Weather Data: <https://nowdata.rcc-acis.org/pafc/>) and significantly greater than normal precipitation for Anchorage over this timeframe, as indicated in the NOAA Data Tables included in Attachment 4.

### **Groundwater Sampling Results**

Drawdown observed while purging the groundwater monitor wells during the 2022 sampling event was greater and recharge was much slower than observed during previous years.

Groundwater sampling results indicate that concentrations of contaminants of concern (COCs) in groundwater at OAFF are above the ADEC Table C Groundwater Cleanup Levels (18 AAC 75, updated in 2021) in four monitoring wells (MW03, MW04R, MW11, and MW12). Groundwater in monitoring well MW03 exceeded cleanup levels for DRO, 1,2,4-trimethylbenzene, naphthalene, 1-methylnaphthelene, and 2-methylnaphthelene. Groundwater in monitoring well MW4R exceeded cleanup levels for GRO, DRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, ethylbenzene, naphthalene, total xylenes, and 1-methylnaphthelene. Groundwater in monitoring

well MW11 exceeded the cleanup level for DRO. Groundwater in monitoring well MW12 exceeded cleanup levels for DRO and naphthalene.

Multiple PAH and FR-VOC analytes were detected below the cleanup level, and several were flagged “J” because they were detected between the limit of detection and the limit of quantitation.

### **Laboratory Data Quality Review**

Based on the data quality review of the key data quality indicators of precision, accuracy, representativeness, comparability, completeness, and sensitivity performed by an Ahtna chemist, no data were rejected. All sample results are valid with data qualifiers assigned as necessary. All analytical data are considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Groundwater Contour and Flow Assessment**

Calculated groundwater flow direction at the site appears to vary significantly based on precipitation driven water levels. For the measurement events conducted in July and September 2022, the direction of flow ranged from southeast to north and ultimately flows off the site to the northwest. During very low water periods, groundwater contours suggest that there may be a component of flow onto the OAFF property from the adjacent property to the north.

Historically, groundwater flow at the site has been measured to flow to the northwest and drawdown has been minimal, and parameters stabilized in a relatively short period of time. During the July 2022 sampling event, observed amount of drawdown and water quality parameter stabilization time was greater than typical sampling events conducted at OAFF.

Review of the historical soil boring logs from all site wells, both existing (MW01, MW03, MW04R, MW06, MW10, MW11, and MW12) and former (MW02, MW05, MW08, and MW09), indicated the presence of a consistent near-surface layer of silty sand extending from 3 to 5 feet below ground surface (bgs) across the site. Underneath this relatively permeable near-surficial layer of soil, inconsistent silty clay confining layers interbedded with thinner sandy silt layers extend to 5–10 feet bgs with a consistent massive silty clay layer present below this depth to the bottom of the borehole at ~15 feet bgs. Additionally, sampling at the site has historically been conducted early in the year (May) or later in the year (September or October) during normally higher water-level timeframes for southcentral Alaska. During low-water time periods, it is likely that lower permeability layers in the soil surrounding site wells are causing groundwater elevation anomalies due to low conductivity between wells. The lower permeability layers are also likely the cause of the greater drawdowns/parameter stabilization times observed during sampling.

**Groundwater Analytical Conclusions and Recommendations**

Impacted groundwater exists at the site in wells MW-3, MW11, and MW-12 on the northwest side of the site and at MW-4R at the south side of the site. Monitoring well sampling results at MW-10 indicate that impacts observed at MW-4R have not migrated off site directly to the west. It appears that volatile components in groundwater observed at MW04R and MW03 decrease in the direction of groundwater flow toward MW11 and MW12, where analysis indicates that most volatile fuel constituents are no longer observed or are below cleanup levels.

A separate petroleum storage area with known impacts to groundwater is located directly to the northeast of the OAFF facility, and may be contributing to contamination observed at MW11, MW12, and MW3. At this time, it is not known if there are specific fuel constituents present at the site to the north that could be used to determine the source of contamination in wells at OAFF. If any analytes are identified by ADEC in the future, it is suggested that these analytes be added to sample analysis in the future to determine if impacted groundwater is migrating across property boundaries.

Ahtna recommends the continued sampling of MW1, MW3, MW4R, MW10, MW11, and MW12 in July 2023 during July, the perceived seasonally low groundwater. The objective of the continued sampling would be to begin to build an analytical dataset for these site wells to calculate possible trends in contaminant concentration. Ahtna also recommends that in 2023, three temporary well points be installed and sampled to better delineate the potential extent of groundwater impacts at this site. One well point is recommended to the north of MW-12 and 2 well points are recommended in the area south MW-4R.

Ahtna also recommends continued seasonal static water-level survey measurements be collected at all onsite monitoring wells (MW1, MW3, MW4R, MW10, MW11, MW12, and MW6) during early (April/May), mid (June/July), and late (Sept/Oct) 2023, preferably correlating to seasonally high and low groundwater levels. These data should be used to generate potentiometric surface maps indicating flow directions at the site during each timeframe and determine if offsite COCs may be trespassing onto OAFF from an upgradient source during different groundwater conditions.

**LIMITATIONS**

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same and similar localities, at the time that the work was performed. It is intended for the exclusive use of AFSC/Menzies.

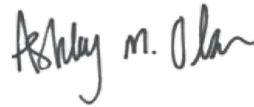
Ahtna trusts that this is sufficient for Menzies' needs at this time. Should there be any questions regarding this report or if additional clarification is required, please don't hesitate to contact the undersigned at (907) 868-8215.

Sincerely,

**Ahtna Engineering Services, LLC**



Luke Hoffmann  
Program Manager



Ashley Olson  
Program Manager

Attachments:

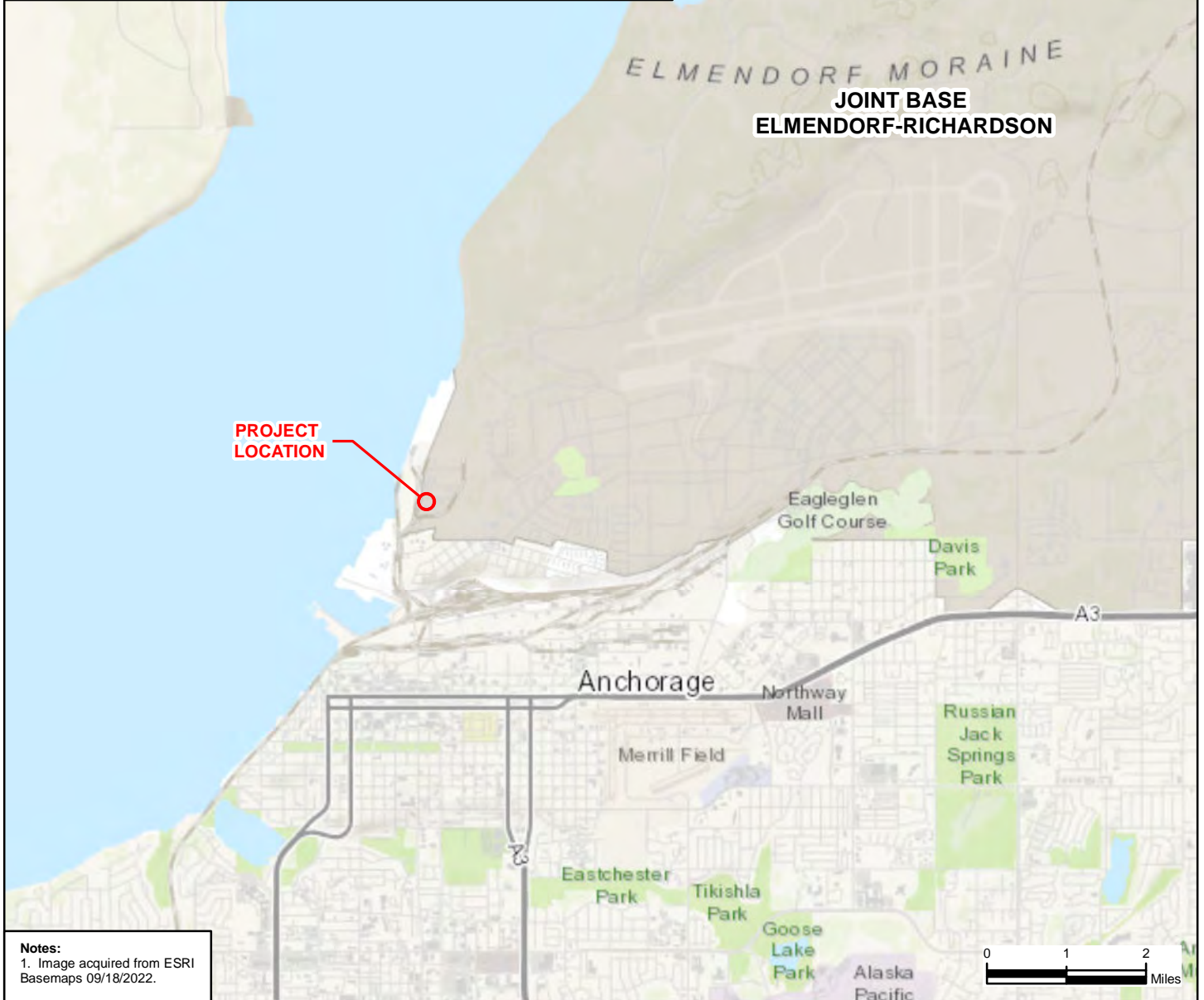
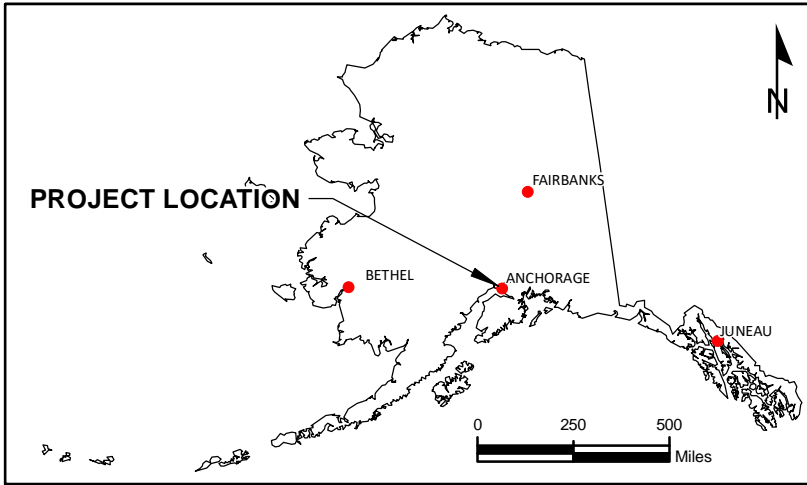
1. Figures
2. Field Notes and Sampling Forms
3. Table 1: Groundwater Analytical Results
4. NOAA Anchorage Precipitation Data: March–July 2022 and July–September 2022
5. Laboratory Report, Data Quality Review, and ADEC Laboratory Data Review Checklist
6. Waste Disposal Documentation
7. ADEC Approval (Final Draft Only)

**ATTACHMENT 1**

**FIGURES**

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**Notes:**  
1. Image acquired from ESRI Basemaps 09/18/2022.

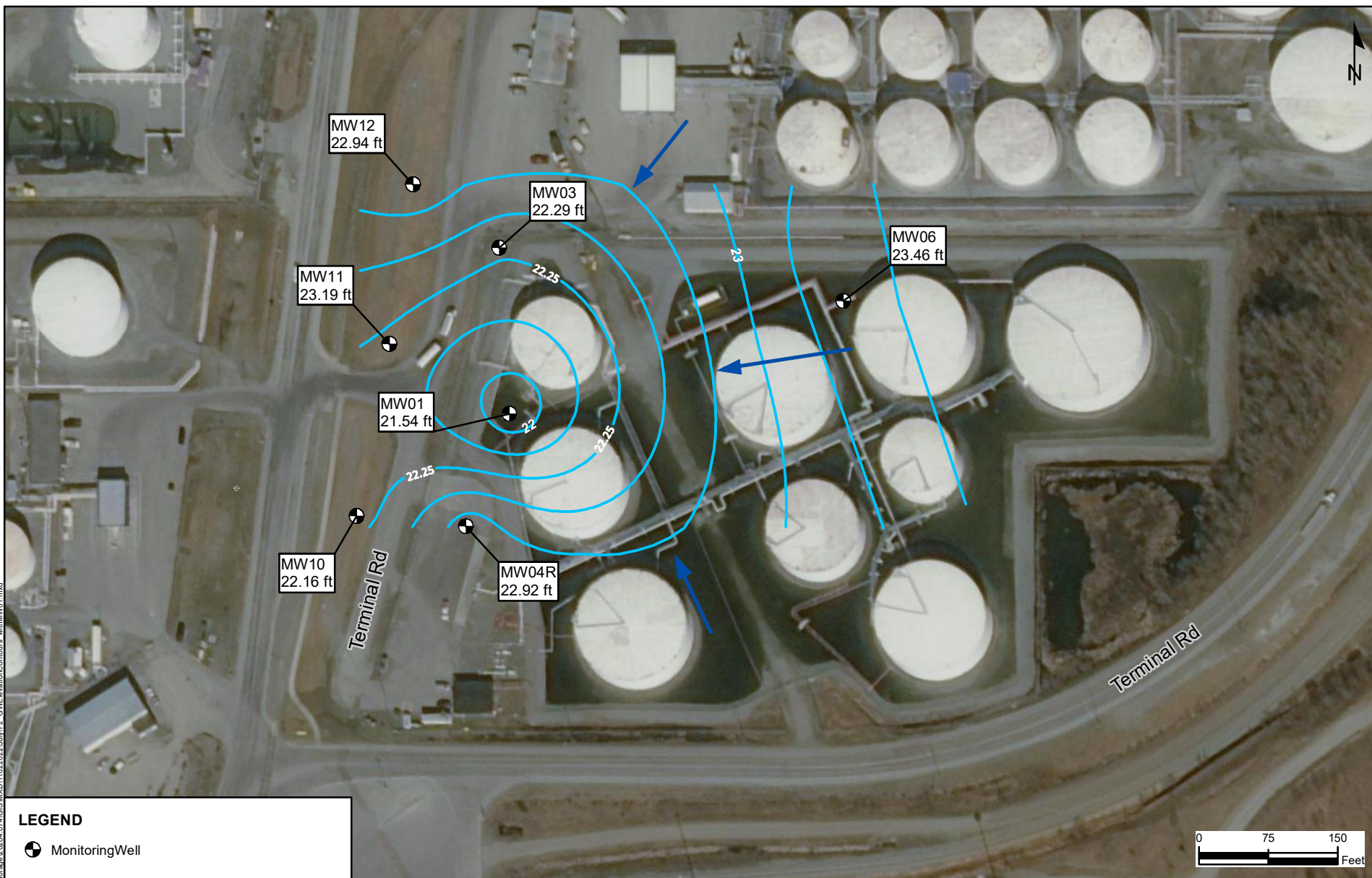
2022 Groundwater Monitoring  
AFSC Off-Airport Fuel Facility  
Anchorage, AK



**State and Site Vicinity Maps**

Project Number: 20204.074	Figure Number:
Date: 9/19/2022	<b>1</b>
Drafted By: RH	

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2022 Groundwater Monitoring  
 AFSC Off-Airport Fuel Facility  
 Anchorage, AK



**LEGEND**

- Monitoring Well
- Decommissioned Monitoring Well
- July Groundwater Contours - with MW01
- Approximate Groundwater Flow Direction

**Notes:**

1. All locations are approximate.
2. Image acquired from ESRI Basemaps 11/07/2022.

Project Number: 20204.074	Figure Number: <b>2</b>
Date: 11/7/2022	
Drafted By: RH	

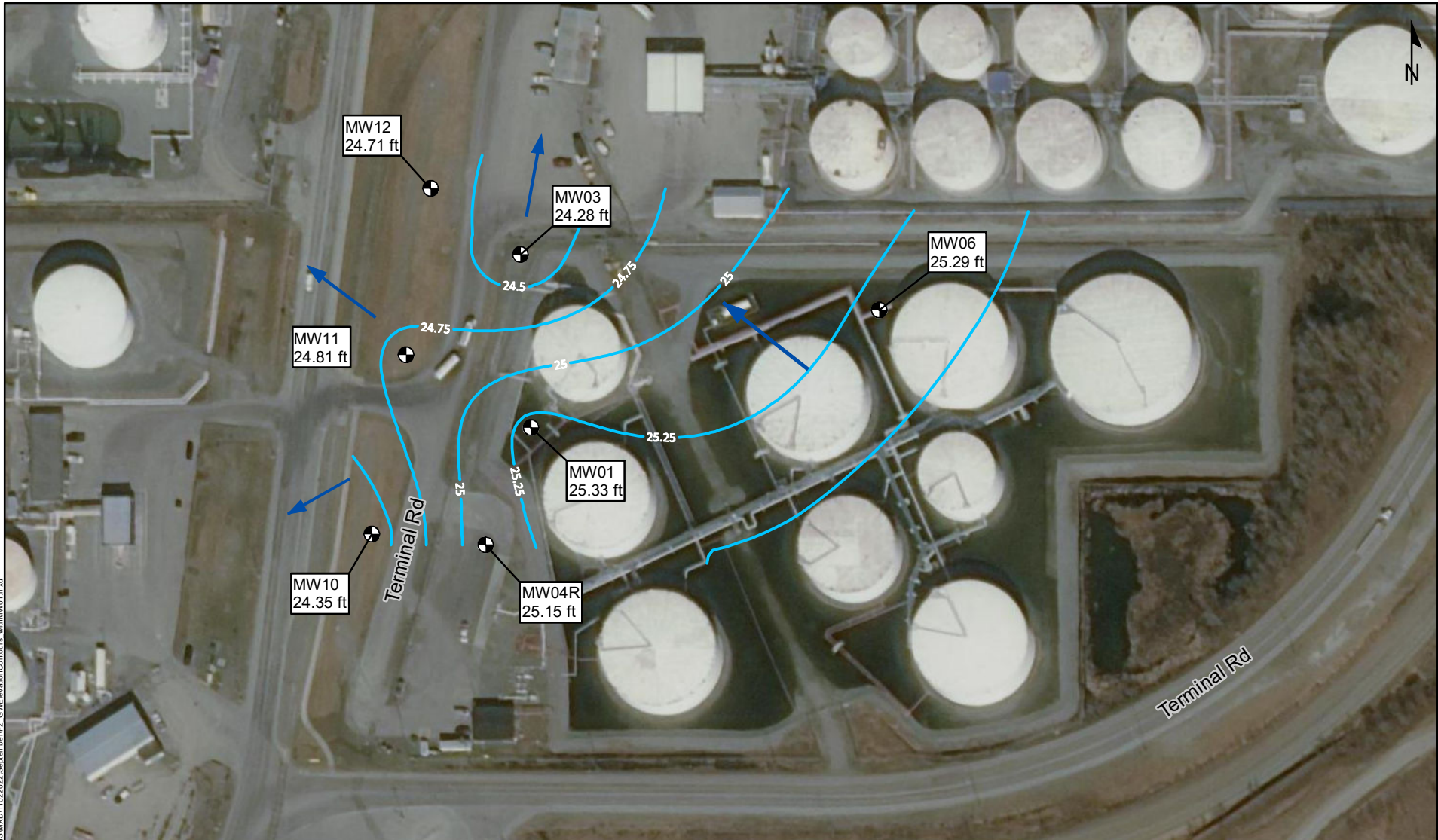
**July Groundwater Elevation Contours**

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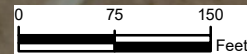
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**LEGEND**

-  Monitoring Well
-  Decommissioned Monitoring Well
-  September Groundwater Contour - with MW01
-  Approximate Groundwater Flow Direction

**Notes:**  
 1. All locations are approximate.  
 2. Image acquired from ESRI Basemaps 11/07/2022.



2022 Groundwater Monitoring  
 AFSC Off-Airport Fuel Facility  
 Anchorage, AK



**September Groundwater Elevation Contours**

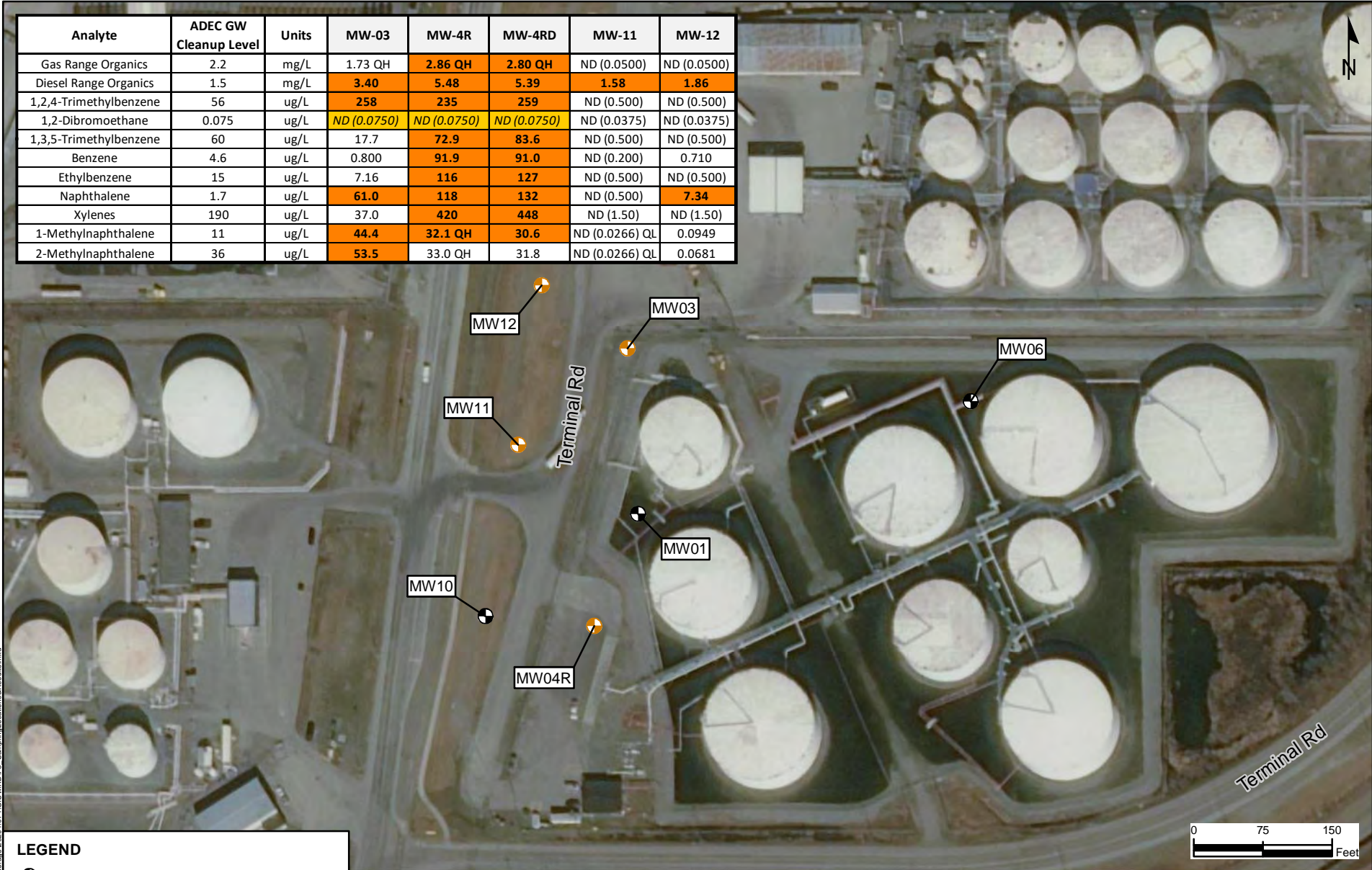
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11/7/2022  
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RH

Figure Number:  
**3**

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Analyte	ADEC GW Cleanup Level	Units	MW-03	MW-4R	MW-4RD	MW-11	MW-12
Gas Range Organics	2.2	mg/L	1.73 QH	2.86 QH	2.80 QH	ND (0.0500)	ND (0.0500)
Diesel Range Organics	1.5	mg/L	3.40	5.48	5.39	1.58	1.86
1,2,4-Trimethylbenzene	56	ug/L	258	235	259	ND (0.500)	ND (0.500)
1,2-Dibromoethane	0.075	ug/L	ND (0.0750)	ND (0.0750)	ND (0.0750)	ND (0.0375)	ND (0.0375)
1,3,5-Trimethylbenzene	60	ug/L	17.7	72.9	83.6	ND (0.500)	ND (0.500)
Benzene	4.6	ug/L	0.800	91.9	91.0	ND (0.200)	0.710
Ethylbenzene	15	ug/L	7.16	116	127	ND (0.500)	ND (0.500)
Naphthalene	1.7	ug/L	61.0	118	132	ND (0.500)	7.34
Xylenes	190	ug/L	37.0	420	448	ND (1.50)	ND (1.50)
1-Methylnaphthalene	11	ug/L	44.4	32.1 QH	30.6	ND (0.0266) QL	0.0949
2-Methylnaphthalene	36	ug/L	53.5	33.0 QH	31.8	ND (0.0266) QL	0.0681



**LEGEND**

- Monitoring Well
- Monitoring Well Exceedances

**Notes:**  
 1. All locations are approximate.  
 2. Image acquired from ESRI Basemaps 09/22/2022.  
 ADEC - Alaska Department of Environmental Conservation  
 ND - analyte not detected  
 ug/L - micrograms per liter  
 mg/L - milligrams per liter

2022 Groundwater Monitoring  
 AFSC Off-Airport Fuel Facility  
 Anchorage, AK

**Sampling Locations and  
 Analytical Results**



Project Number:  
20204.074  
 Date:  
9/23/2022  
 Drafted By:  
RH

Figure Number:  
**4**

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**ATTACHMENT 2**

**FIELD NOTES AND SAMPLING FORMS**

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22 6/26/20

OAFF additional catch  
basin sampling A Geilich

1130 Gather supplies and arrive at OAFF  
check in with office personnel  
proceed to catch basin 9 open  
grate, organic sheen and algae present  
No. fuel odor noted.

1205 Collect sample via dipping bottle  
Close grate, check out, leave  
~~End of Day AG~~

1245 Drop off samples, end of day

Note:

Sample name = OAFF-20-CB9  
AG

AG

7/12/22  
Ben Suranovic  
Greg Mammakunian  
0700

OAFF GW 2022

60°F  
Cloudy 23

ARRIVE AT WAREHOUSE to gather  
supplies. Calibrated YSI and  
turbidimeter.

YSI Calibration:

	Original	Set Setting	Final
DO	98.0	100	99.5
Conduct.	1032	1359	1355
PT 7	8.06	7.01	6.96
10	9.70	10.01	10.04
4	4.16	4.00	4.00
ORP	239.8	240	240.1

0830 ARRIVE at Port Security and check  
in at Menzies office on site.

0910 Arrive at MW-4R. Begin setting up  
sampling materials. 4R was dirtiest  
well from 2019 sampling.

0930 Moving to MW-01. Mistaken, supposed  
to sample cleanest well first. MW-01 is  
cleanest from 2019 sampling.

0937 Take groundwater level measurements at  
MW-06.

Well	Time	GW Level	Total Depth Well	LNAPL
06	0937	4.44 ft	13.45 ft	NONE
11	1035	3.70 ft	11.61 ft	NONE
10	1138	4.51 ft	13.71 ft	None
01	1445	4.80 ft	21.75 ft	None
03	1550	4.49 ft	14.98 ft	None
4R	1645	3.08 ft	13.85 ft	None
12	1815	5.32 ft	11.51 ft	None

None  
in the rain

BS  
6m 7/12/22

OAFF GW 2022

65°F  
Cloudy

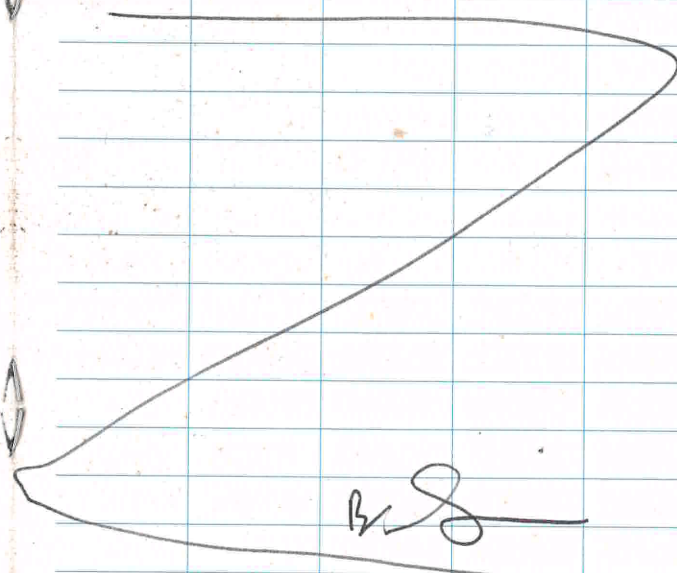
- 1030 Spent ~1 hr looking for wells MW 10, 11, and 12. Cannot locate MW-10.
- 1035 Arrive at MW-11 and begin setting up sampling equipment.
- 1047 Begin purging groundwater at MW-11
- 1104 Parameters stabilize
- 1107 Collect sample OAFF-22-MW-11
- 1225 Located MW-10
- 1227 Begin setting up sampling equipment at MW-10
- 1230 Begin purging groundwater @ MW-10
- 1308 Parameters stabilize @ MW-10.
- 1315 Collect sample OAFF-22-MW-10
- 1443 Arrive at MW-01 and set up sampling equipment.
- 1514 Parameters stabilize
- 1517 Collect sample OAFF-22-MW-01
- 1540 Arrive at well MW-03 and set up sampling equipment.
- 1553 Begin purging groundwater
- 1619 Parameters stabilize
- 1620 Collect sample OAFF-22-MW-03
- 1640 Arrive at MW-4R and begin setting up sampling equipment.
- ~~1732~~ 1655 Begin purging well
- 1732 Parameters stabilize

BS  
6m 7/12/22

OAFF GW 2022

65°F  
Cloudy 25

- 1735 Collect sample OAFF-22-MW-4R and duplicate sample OAFF-22-MW-4RD at 1740
- 1803 Arrive at MW-12 and begin setting up sampling equipment.
- 1815 Begin purging well
- 1840 Parameters stabilize
- 1845 Collect sample OAFF-22-MW-12
- 1905 Empty ~10 gal of purgewater into 55 gal drum staged at site.
- 1910 Depart OAFF site.
- 1930 Arrive back at warehouse
- 2000 Leave warehouse. EOD







# GROUNDWATER SAMPLING FORM

PROJECT NUMBER:  
26264.074

WELL NUMBER:  
MW-01

SHEET:  
1 of 1

PROJECT NAME <u>OAFF 2022</u>	WELL CONDITION <u>Good</u>	NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
CLIENT <u>Munzies</u>	DEPTH TO BASE (ft FROM TOC) <u>21.75</u>	1"	1.315"	1.049"	0.04
DATE <u>7/12/22</u>	DEPTH TO WATER (ft FROM TOC) <u>4.80</u>	1.5"	1.9"	1.610"	0.11
AOC <u>OAFF</u>	HEIGHT OF WATER COLUMN (ft) <u>16.95</u>	2"	2.375"	2.067"	0.17
SCIENTIST <u>Bin Swarnik</u>	WELL VOLUME (gal) <u>11.19</u>	3"	3.5"	3.068"	0.38
WEATHER/TEMPERATURE <u>65°F Cloudy</u>	3 WELL VOLUMES (gal) <u>33.5</u>	4"	4.5"	4.026"	0.66
WIND <u>5mph</u>					

### SAMPLING DATA

DEPTH OF PUMP INTAKE 6 ft

SAMPLE COLLECTED WITH:  Bailer  Pump, Type: Bladder  Other, Specify: \_\_\_\_\_

MADE OF:  Stainless Steel  PVC  Teflon  Disposable LDPE  Other, Specify: \_\_\_\_\_

SAMPLING DECON PROCEDURE: Alicona + Di Water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear, 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)					Color	Odor
						± 3%	± 10%	± 0.1	± 10 mV	± 10%		
						Spec. Cond. (µS/cm) <sup>c</sup>	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)		
1502	0.1	200	5.02	—	18.0	2788	1.61	7.09	85.1	25.8	clear	None
1506	0.3	200	5.37	0.35	18.1	2774	1.62	7.02	41.3	21.9	clear	None
1510	0.5	200	5.60	0.80	18.2	2771	1.64	7.08	18.4	20.2	clear	None
1514	0.7	200	5.72	0.92	18.3	2770	1.69	7.12	10.2	18.3	clear	None

### ANALYTICAL SAMPLE INFORMATION

Sample ID <u>OAFF-22-MW-01</u>	Time <u>1517</u>	Analytes <u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	Sampling Notes: <u>Intake placed 0.2ft lower than due to well draw down</u>
		DRO RRO GRO BTEX PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	



# GROUNDWATER SAMPLING FORM

PROJECT NUMBER:  
**20204.074**

WELL NUMBER:  
**MW-03**

SHEET:  
**1 of 1**

PROJECT NAME <b>O AFF 2022</b>	WELL CONDITION <b>Good</b>	NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
CLIENT <b>Munzies</b>	DEPTH TO BASE (ft FROM TOC) <b>14.98</b>	1"	1.315"	1.049"	0.04
DATE <b>7/12/22</b>	DEPTH TO WATER (ft FROM TOC) <b>4.49</b>	1.5"	1.9"	1.610"	0.11
AOC <b>O AFF</b>	HEIGHT OF WATER COLUMN (ft) <b>10.49</b>	<b>2"</b>	2.375"	2.067"	<b>0.17</b>
SCIENTIST <b>Rsn Suranovic</b>	WELL VOLUME (gal) <b>1.78</b>	3"	3.5"	3.068"	0.38
WEATHER/TEMPERATURE <b>65°F, Cloudy</b>	3 WELL VOLUMES (gal) <b>5.35</b>	4"	4.5"	4.026"	0.66
WIND <b>5mph</b>					

### SAMPLING DATA

DEPTH OF PUMP INTAKE **5.7ft**

SAMPLE COLLECTED WITH:  Bailer  Pump, Type: **Bladder**  Other, Specify: \_\_\_\_\_

MADE OF:  Stainless Steel  PVC  Teflon  Disposable LDPE  Other, Specify: \_\_\_\_\_

SAMPLING DECON PROCEDURE: **Alconox + DI Water**

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) **Clear, fuel 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)					Color	Odor	
						± 3%	± 10%	± 0.1	± 10 mV	± 10%			
						Spec. Cond. (µS/cm) <sup>c</sup>	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)			
<del>1555</del>													
1555	0.2	200	4.59	0.10	16.9	389.7	0.84	7.20	53.6	34.0	Clear	fuel	
1559	0.4	200	4.54	0.05	16.3	474.4	0.55	6.94	31.2	23.3	Clear	fuel	
1603	0.6	200	4.54	0.05	15.7	561.3	0.43	6.91	19.5	11.9	Clear	fuel	
1607	0.8	200	4.54	0.05	15.3	639	0.37	6.88	12.8	7.89	Clear	fuel	
1611	1	200	4.54	0.05	15.0	672	0.32	6.84	8.4	4.74	Clear	fuel	
1615	1.2	200	4.54	0.05	14.8	683	0.28	6.81	5.4	5.54	Clear	fuel	
1619	1.4	200	4.54	0.05	14.7	686	0.25	6.81	3.2	5.17	Clear	fuel	

### ANALYTICAL SAMPLE INFORMATION

Sample ID <b>O AFF-22-MW-03</b>	Time <b>1620</b>	Analytes <b>DRO RRO GRO BTEX PAH VOCs PEST HERB</b>	Sampling Notes: <b>Intake placed 0.2 ft lower due to well drawdown potential</b>
		<b>DRO RRO GRO BTEX PAH VOCs PEST HERB</b>	
		<b>DRO RRO GRO BTEX PAH VOCs PEST HERB</b>	



# GROUNDWATER SAMPLING FORM

PROJECT NUMBER:  
20204.074

WELL NUMBER:  
MW-4R

SHEET:  
1 of 1

PROJECT NAME <u>OAFF 2022</u>	WELL CONDITION <u>Good</u>	NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
CLIENT <u>Menzies</u>	DEPTH TO BASE (ft FROM TOC) <u>13.85</u>	1"	1.315"	1.049"	0.04
DATE <u>7/12/22</u>	DEPTH TO WATER (ft FROM TOC) <u>3.88</u>	1.5"	1.9"	1.610"	0.11
AOC <u>OAFF</u>	HEIGHT OF WATER COLUMN (ft) <u>10.77</u>	2"	2.375"	2.067"	0.17
SCIENTIST <u>Ben Swanovic</u>	WELL VOLUME (gal) <u>1.83</u>	3"	3.5"	3.068"	0.38
WEATHER/TEMPERATURE <u>60°F, Cloudy</u>	3 WELL VOLUMES (gal) <u>5.49</u>	4"	4.5"	4.026"	0.66
WIND <u>5mph</u>					

### SAMPLING DATA

DEPTH OF PUMP INTAKE 4.3ft

SAMPLE COLLECTED WITH: Bailer  Pump, Type: Bladder  Other, Specify: \_\_\_\_\_

MADE OF: Stainless Steel  PVC  Disposable LDPE  Other, Specify: \_\_\_\_\_

SAMPLING DECON PROCEDURE: Alconox + DI Water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear, fuel 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)					Color	Odor
						± 3%	± 10%	± 0.1	± 10 mV	± 10%		
						Spec. Cond. (µS/cm) <sup>c</sup>	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)		
1656	0.1	200	3.41	0.33	19.1	809	1.51	6.46	91.7	55.8	Clear	fuel
1700	0.3	200	3.41	0.33	18.9	830	0.72	6.45	60.1	42.6	clear	fuel
1704	0.5	200	3.41	0.33	18.5	852	0.52	6.46	37.3	35.5	clear	fuel
1708	0.7	200	3.41	0.33	18.1	894	0.42	6.47	24.0	24.0	clear	fuel
1712	0.9	200	3.41	0.33	17.8	966	0.42	6.50	16.0	18.8	clear	fuel
1716	1.1	200	3.41	0.33	17.4	1067	0.36	6.56	9.6	17.8	clear	fuel
1720	1.3	200	3.41	0.33	17.2	1152	0.33	6.64	2.3	14.4	clear	fuel
1724	1.5	200	3.41	0.33	17.0	1196	0.34	6.70	-2.9	12.7	clear	fuel
1728	1.7	200	3.41	0.33	16.9	1212	0.31	6.70	-6.4	11.9	clear	fuel
1732	1.9	200	3.41	0.33	16.8	1226	0.32	6.69	-8.7	9.8	clear	fuel

### ANALYTICAL SAMPLE INFORMATION

Sample ID <u>OAFF-22-MW-4R</u>	Time <u>1735</u>	Analytes <u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	Sampling Notes: <u>Intake place 0.2 ft lower due to draw down possibility</u>
Sample ID <u>OAFF-22-MW-4RD</u>	Time <u>1740</u>	Analytes <u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	
		Analytes <u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	





# GROUNDWATER SAMPLING FORM

PROJECT NUMBER:  
20204.074

WELL NUMBER:  
MW-10

SHEET:  
1 of 1

PROJECT NAME <u>OAFF 2022</u>	WELL CONDITION <u>Good</u>	NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
CLIENT <u>Munzies</u>	DEPTH TO BASE (ft FROM TOC) <u>13.71</u>	1"	1.315"	1.049"	0.04
DATE <u>7/12/22</u>	DEPTH TO WATER (ft FROM TOC) <u>4.51</u>	1.5"	1.9"	1.610"	0.11
AOC <u>OAFF</u>	HEIGHT OF WATER COLUMN (ft) <u>9.2</u>	<u>2"</u>	2.375"	2.067"	<u>0.17</u>
SCIENTIST <u>Ben Swarnick</u>	WELL VOLUME (gal) <u>1.56</u>	3"	3.5"	3.068"	0.38
WEATHER/TEMPERATURE <u>65°F Cloudy</u>	3 WELL VOLUMES (gal) <u>4.69</u>	4"	4.5"	4.026"	0.66
WIND <u>5mph</u>					

### SAMPLING DATA

DEPTH OF PUMP INTAKE 5.5 ft

SAMPLE COLLECTED WITH:  Bailer  Pump, Type: Bladder  Other, Specify: \_\_\_\_\_

MADE OF:  Stainless Steel  PVC  Teflon  Disposable LDPE  Other, Specify: \_\_\_\_\_

SAMPLING DECON PROCEDURE: Alconox + DI water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) Clear, 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)					Color	Odor
						± 3%	± 10%	± 0.1	± 10 mV	± 10%		
						Spec. Cond. (µS/cm) <sup>c</sup>	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)		
1232	0.15	400	—	—	11.2	9151	4.18	6.96	129.9	5.58	Clear	None
1236	0.46	300	5.80	—	11.7	8258	1.05	6.97	114.6	7.96	Clear	None
1240	0.70	300	6.15	0.35	10.8	10605	1.67	6.87	101.1	10.6	Clear	None
1244	1	300	6.57	0.42	10.7	11391	1.67	6.87	77.1	8.36	Clear	None
1248	1.25	300	6.82	0.25	10.1	12019	2.61	6.66	68.2	7.15	Clear	None
1252	1.5	300	7.21	0.39	10.0	12284	1.41	6.82	50.5	10.2	Clear	None
1256	1.7	200	7.39	0.18	9.9	12674	1.17	6.83	39.6	4.76	Clear	None
1300	2	200	7.52	0.13	10.9	12577	0.75	6.80	28.4	4.52	Clear	None
1304	2.2	200	7.62	0.10	11.3	12591	0.69	6.78	21.3	3.89	Clear	None
1308	2.4	200	7.67	0.05	11.1	12608	0.68	6.76	16.1	—	Clear	None
						✓	✓	✓				

### ANALYTICAL SAMPLE INFORMATION

Sample ID <u>OAFF-22-MW-10</u>	Time <u>1315</u>	Analytes <u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	Sampling Notes: <u>Well had little to no recharge</u>
		DRO RRO GRO BTEX PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	





# GROUNDWATER SAMPLING FORM

PROJECT NUMBER:  
20204.074

WELL NUMBER:  
MW-11

SHEET:  
1 of 1

PROJECT NAME <u>ORFF 2022</u>	WELL CONDITION <u>Good</u>	NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
CLIENT <u>Munzies</u>	DEPTH TO BASE (ft FROM TOC) <u>11.61</u>	1"	1.315"	1.049"	0.04
DATE <u>7/12/22</u>	DEPTH TO WATER (ft FROM TOC) <u>3.70</u>	1.5"	1.9"	1.610"	0.11
AOC <u>ORFF</u>	HEIGHT OF WATER COLUMN (ft) <u>7.91</u>	<u>2"</u>	2.375"	2.067"	<u>0.17</u>
SCIENTIST <u>Ben Swarovic</u>	WELL VOLUME (gal) <u>1.3</u>	3"	3.5"	3.068"	0.38
WEATHER/TEMPERATURE <u>65°F, Cloudy</u>	3 WELL VOLUMES (gal) <u>3.9</u>	4"	4.5"	4.026"	0.66
WIND <u>5 mph</u>					

### SAMPLING DATA

DEPTH OF PUMP INTAKE 4.70 ft

SAMPLE COLLECTED WITH:  Bailer  Pump, Type: Bladder  Other, Specify: \_\_\_\_\_

MADE OF:  Stainless Steel  PVC  Teflon  Disposable LDPE  Other, Specify: \_\_\_\_\_

SAMPLING DECON PROCEDURE: Alconox + DI Water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) Clear, 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)					Color	Odor
						± 3%	± 10%	± 0.1	± 10 mV	± 10%		
						Spec. Cond. (µS/cm) <sup>c</sup>	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)		
1052	0.25	100	—	—	12.3	4833	15.0	6.15	-26.6	44.8	clear	organic
1056	0.40	100	3.9	—	12.7	4811	15.8	6.14	-20.2	20.2	clear	organic
1100	0.55	100	4.1	0.2	11.4	4803	16.9	6.25	-13.7	19.8	clear	organic
1104	0.70	100	4.3	0.2	12.2	4818	15.3	6.27	-10.3	16.7	clear	organic

### ANALYTICAL SAMPLE INFORMATION

Sample ID <u>ORFF-22-MW-11</u>	Time <u>1107</u>	Analytes <u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	Sampling Notes: <u>Well had little to no recharge</u>
		<u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	
		<u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	



# GROUNDWATER SAMPLING FORM

PROJECT NUMBER:  
2024.074

WELL NUMBER:  
MW-12

SHEET:  
1 of 1

PROJECT NAME <u>OAFF 2022</u>	WELL CONDITION <u>Good</u>	NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
CLIENT <u>Manzies</u>	DEPTH TO BASE (ft FROM TOC) <u>11.51</u>	1"	1.315"	1.049"	0.04
DATE <u>7/12/22</u>	DEPTH TO WATER (ft FROM TOC) <u>5.32</u>	1.5"	1.9"	1.610"	0.11
AOC <u>OAFF</u>	HEIGHT OF WATER COLUMN (ft) <del>11.51</del> <u>6.19</u>	<u>2"</u>	2.375"	2.067"	<u>0.17</u>
SCIENTIST <u>Ben Suranovic</u>	WELL VOLUME (gal) <del>6.19</del> <u>1.05</u>	3"	3.5"	3.068"	0.38
WEATHER/TEMPERATURE <u>65°F, Cloudy</u>	3 WELL VOLUMES (gal) <u>3.15</u>	4"	4.5"	4.026"	0.66
WIND <u>5mph</u>					

### SAMPLING DATA

DEPTH OF PUMP INTAKE 6.5ft

SAMPLE COLLECTED WITH:  Bailer  Pump, Type: Bladder  Other, Specify: \_\_\_\_\_

MADE OF:  Stainless Steel  PVC  Teflon  Disposable LDPE  Other, Specify: \_\_\_\_\_

SAMPLING DECON PROCEDURE: Alconox + DI Water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) Clear, Slight fuel 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)					Color	Odor
						± 3%	± 10%	± 0.1	± 10 mV	± 10%		
						Spec. Cond. (µS/cm) <sup>c</sup>	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)		
1818	0.05	200	5.40	0.08	13.5	5266	1.43	6.64	88.9	14.3	clear	fuel
1822	0.25	200	5.58	0.26	12.8	5301	0.81	6.75	44.4	9.72	clear	slight fuel
1826	0.45	200	5.79	0.47	12.7	5303	0.68	6.81	27.2	9.04	clear	slight fuel
1830	0.65	200	5.96	0.64	12.5	5308	0.60	6.83	14.2	12.0	clear	slight fuel
1834	0.85	200	6.09	0.77	12.5	5299	0.55	6.87	4.6	10.6	clear	slight fuel
1837	1.1	200	6.21	0.89	12.5	5298	0.54	6.89	-1.1	10.0	clear	slight fuel
1840	1.15	200	6.30	1.08	12.5	5295	0.50	6.91	-2.8	9.8	clear	slight fuel
						✓	✓	✓	✓			

### ANALYTICAL SAMPLE INFORMATION

Sample ID <u>OAFF-22-MW-12</u>	Time <u>1845</u>	Analytes <u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	Sampling Notes: <u>Intake placed 0.2ft lower due to possibility of draw down. Well had little to no recharge.</u>
		<u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	
		<u>DRO RRO GRO BTEX PAH VOCs PEST HERB</u>	

**ATTACHMENT 3**

**TABLE 1: GROUNDWATER ANALYTICAL RESULTS**

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**Table 1: Groundwater Analytical Results  
AFSC OAFF 2022 Groundwater Sampling**

		Sample Name:	OAFF-22-MW-01	OAFF-22-MW-03	OAFF-22-MW-4R	OAFF-22-MW-4RD	OAFF-22-MW-10	OAFF-22-MW-11	OAFF-22-MW-12	OAFF-TB-22-01	OAFF-TB-22-02		
		Sample Date:	7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022		
		Sample Type:	Primary	Primary	Primary	Duplicate	Primary	Primary	Primary	Trip Blank	Trip Blank		
		Parent Sample:	--	--	--	OAFF-22-MW-4R	--	--	--	--	--		
		LNAPL Presence	None	None	None	None	None	None	None	None	None		
		Depth to Water (ft below TOC)	4.80	4.49	3.08	3.08	4.51	3.70	5.32	--	--		
Method	CAS ID	Analyte	CUL	Units	Result	Result	Result	Result	Result	Result	Result	Result	
AK101	GRO	Gas Range Organics	2.2	mg/L	ND (0.0500)	1.73 QH	2.86 QH	2.80 QH	ND (0.0500)	ND (0.0500)	ND (0.0500)	--	ND (0.0500)
AK102	DRO	Diesel Range Organics	1.5	mg/L	0.568 J	3.40	5.48	5.39	0.573 J	1.58	1.86	--	--
SW8260D	95-63-6	1,2,4-Trimethylbenzene	56	ug/L	0.400 J	258	235	259	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.500)	--
SW8260D	106-93-4	1,2-Dibromoethane	0.075	ug/L	ND (0.0375)	ND (0.0750)	ND (0.0750)	ND (0.0750)	ND (0.0375)	ND (0.0375)	ND (0.0375)	ND (0.0375)	--
SW8260D	107-06-2	1,2-Dichloroethane	1.7	ug/L	ND (0.250)	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.250)	ND (0.250)	ND (0.250)	ND (0.250)	--
SW8260D	108-67-8	1,3,5-Trimethylbenzene	60	ug/L	ND (0.500)	17.7	72.9	83.6	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.500)	--
SW8260D	71-43-2	Benzene	4.6	ug/L	ND (0.200)	0.800	91.9	91.0	ND (0.200)	ND (0.200)	0.710	ND (0.200)	--
SW8260D	98-82-8	Cumene	450	ug/L	ND (0.500)	15.0	26.3	27.3	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.500)	--
SW8260D	100-41-4	Ethylbenzene	15	ug/L	ND (0.500)	7.16	116	127	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.500)	--
SW8260D	1634-04-4	Methyl-tert-butyl ether (MTBE)	140	ug/L	ND (5.00)	ND (10.0)	ND (10.0)	ND (10.0)	ND (5.00)	ND (5.00)	ND (5.00)	ND (5.00)	--
SW8260D	91-20-3	Naphthalene	1.7	ug/L	ND (0.500)	61.0	118	132	ND (0.500)	ND (0.500)	7.34	ND (0.500)	--
SW8260D	104-51-8	n-Butylbenzene	1000	ug/L	ND (0.500)	7.08	6.00	6.64	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.500)	--
SW8260D	135-98-8	sec-Butylbenzene	2000	ug/L	ND (0.500)	11.0	10.2	11.0	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.500)	--
SW8260D	98-06-6	tert-Butylbenzene	690	ug/L	ND (0.500)	1.10 J	1.02 J	1.10 J	ND (0.500)	ND (0.500)	ND (0.500)	ND (0.500)	--
SW8260D	108-88-3	Toluene	1100	ug/L	ND (0.500)	0.620 J	ND (1.00)	ND (1.00)	ND (0.500)	0.390 J	0.620 J	ND (0.500)	--
SW8260D	1330-20-7	Xylenes	190	ug/L	ND (1.50)	37.0	420	448	ND (1.50)	ND (1.50)	ND (1.50)	ND (1.50)	--
SW8270D SIM PAH	90-12-0	1-Methylnaphthalene	11	ug/L	0.0946	44.4	32.1 QH	30.6	ND (0.0272) QL	ND (0.0266) QL	0.0949	--	--
SW8270D SIM PAH	91-57-6	2-Methylnaphthalene	36	ug/L	0.0360 J	53.5	33.0 QH	31.8	ND (0.0272) QL	ND (0.0266) QL	0.0681	--	--
SW8270D SIM PAH	83-32-9	Acenaphthene	530	ug/L	ND (0.0250)	0.606	0.404 QH	0.364	ND (0.0272) QL	ND (0.0266) QL	0.0589	--	--
SW8270D SIM PAH	208-96-8	Acenaphthylene	260	ug/L	ND (0.0250)	ND (0.0245)	ND (0.0250)	ND (0.0250)	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	120-12-7	Anthracene	43	ug/L	ND (0.0250)	0.0733	0.0724 QH	0.0708	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	56-55-3	Benzo[a]anthracene	0.30	ug/L	0.0338 J	0.0418 J	ND (0.0250)	ND (0.0250)	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	50-32-8	Benzo[a]pyrene	0.25	ug/L	0.0127 J	0.0306	ND (0.0100)	ND (0.0100)	ND (0.0109) QL	ND (0.0107) QL	ND (0.00980)	--	--
SW8270D SIM PAH	205-99-2	Benzo[b]fluoranthene	2.5	ug/L	0.0331 J	0.0545	ND (0.0250)	ND (0.0250)	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	207-08-9	Benzo[k]fluoranthene	0.8	ug/L	0.0249 J	0.0212 J	ND (0.0250)	ND (0.0250)	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	191-24-2	Benzo[g,h,i]perylene	0.26	ug/L	ND (0.0250)	0.0187 J	ND (0.0250)	ND (0.0250)	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	218-01-9	Chrysene	2	ug/L	0.0323 J	0.0554	ND (0.0250)	ND (0.0250)	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	53-70-3	Dibenz[a,h]anthracene	0.25	ug/L	0.0154 J	ND (0.00980)	ND (0.0100)	ND (0.0100)	ND (0.0109) QL	ND (0.0107) QL	ND (0.00980)	--	--
SW8270D SIM PAH	206-44-0	Fluoranthene	260	ug/L	0.0213 J	0.249	0.159 QH	0.156	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	86-73-7	Fluorene	290	ug/L	0.0208 J	1.10	0.486 QH	0.453	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	193-39-5	Indeno(1,2,3-cd)pyrene	0.19	ug/L	0.0170 J	0.0172 J	ND (0.0250)	ND (0.0250)	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--
SW8270D SIM PAH	91-20-3	Naphthalene	1.7	ug/L	0.0971 J	32.1	66.1 QH	63.5	ND (0.0545) QL	ND (0.0530) QL	5.06	--	--
SW8270D SIM PAH	85-01-8	Phenanthrene	170	ug/L	ND (0.0500)	0.604	0.450 QH	0.428	ND (0.0545) QL	ND (0.0530) QL	ND (0.0490)	--	--
SW8270D SIM PAH	129-00-0	Pyrene	120	ug/L	0.0199 J	0.177	0.0998 QH	0.0978	ND (0.0272) QL	ND (0.0266) QL	ND (0.0245)	--	--

**Notes**

ADEC CUL based on 18 AAC 75, Table C Groundwater Cleanup Levels (ADEC, 2021)

**Bold** and highlighted Result exceeds the CUL

*Italicized* and highlighted Result is not detected but reporting limit matches the CUI

**Acronyms**

-- = no data/not applicable

ADEC = Alaska Department of Environmental Conservation

CUL = cleanup level

J = estimated result detected between LOD and LOQ

LOD = limit of detection

LOQ = limit of quantitation

mg/L = milligrams per liter

ND = not-detected (LOD in parentheses)

ug/L = micrograms per liter

QH = Result is considered an estimated value with a high bias because quality control criteria were not met

QL = Result is considered an estimated value with a low bias because quality control criteria were not met

TOC = top of casing

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**ATTACHMENT 4**

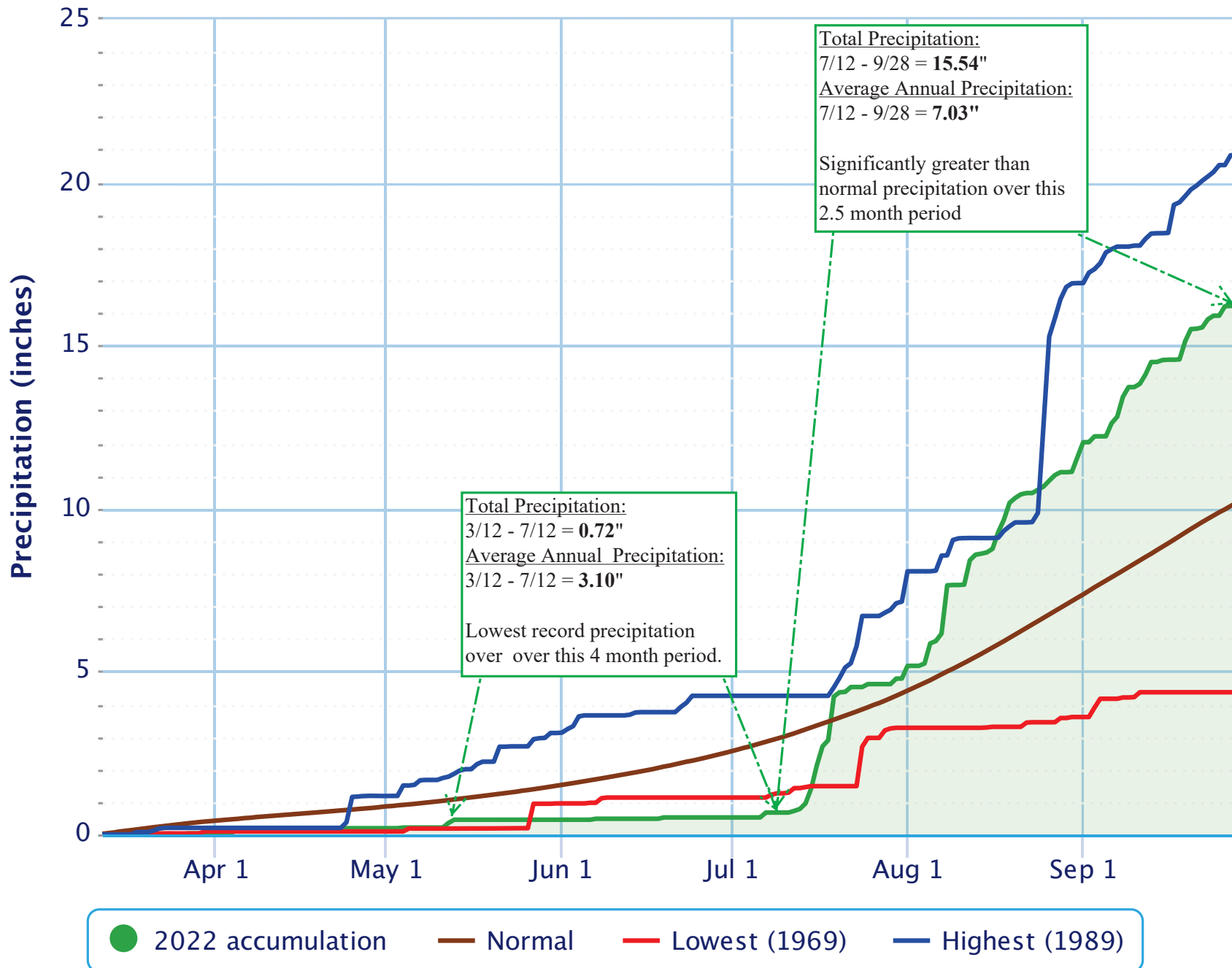
**NOAA ANCHORAGE PRECIPITATION DATA**

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# Accumulated Precipitation – Anchorage Area, AK (ThreadEx)

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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**ATTACHMENT 5**

**LABORATORY REPORT, DATA QUALITY REPORT, AND ADEC LABORATORY  
DATA REVIEW CHECKLIST**

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**Laboratory Data Review Checklist**

Completed By:

Keather McLoone

Title:

Project Chemist

Date:

7/29/22

Consultant Firm:

Ahtna

Laboratory Name:

SGS North America

Laboratory Report Number:

1223906

Laboratory Report Date:

7/28/22

CS Site Name:

OAFF GW

ADEC File Number:

2100.38.321

Hazard Identification Number:

605

1223906

Laboratory Report Date:

7/28/22

CS Site Name:

OAFF GW

**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, Alaska

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 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:

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 temperature was 3.0° C.

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

Yes  No  N/A  Comments:

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Laboratory Report Date:

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CS Site Name:

OAFF GW

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:

Case narrative noted: AK101- Sample has a pH greater than two; however, the sample was analyzed within 7 days from collection.

e. Data quality or usability affected?

Comments:

Data quality/usability not affected by sample receipt.

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:

None necessary.

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

Comments:

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CS Site Name:

OAFF GW

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 soils.

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:



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Laboratory Report Date:

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CS Site Name:

OAFF GW

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:

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:

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:

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OAFF GW

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 LCS/LCSD recovery or RPD failures.

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

Comments:

Data quality/usability not affected.

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:

Project specific MS/MSD not required.

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?

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.

Yes  No  N/A  Comments:

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CS Site Name:

OAFF GW

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 for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes  No  N/A  Comments:

OAFF-22-MW-11 and OAFF-22-MW-10 had 8270D SIM - PAH surrogate recovery for fluoranthene-d10 was below acceptance criteria; therefore, the associated sample results were flagged QL.  
OAFF-22-MW-03, OAFF-22-MW-4R, and OAFF-22-MW-4RD had AK101 surrogate recovery for 4-bromofluorobenzene above acceptance criteria; therefore, the associated sample results were flagged QH.  
OAFF-22-MW-4R had 8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 above acceptance criteria; therefore, the associated, detected sample results (nine compounds) were flagged QH.  
OAFF-TB-22-01 8260D had surrogate recovery for 1,2-dichloroethane-D4 was above acceptance criteria; however, there were no associated sample detections. Therefore, no qualifications were necessary on the basis of this recovery.  
There was also a lab blank with a surrogate recovery outside acceptance limits; however, no qualifications of project samples were made on the basis of this recovery.

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CS Site Name:

OAFF GW

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:

QL flagged results should be considered estimated with a low bias. QH flagged results should be considered estimated with a high bias.

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:

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.

v. Data quality or usability affected?

Comments:

Data quality/usability not affected.

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7/28/22

CS Site Name:

OAFF GW

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-22-MW-4R and OAFF-22-MW-4RD.

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

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

Where R<sub>1</sub> = Sample Concentration  
R<sub>2</sub> = 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:

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 analyzed. Disposable sampling equipment used.

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

Yes  No  N/A  Comments:

1223906

Laboratory Report Date:

7/28/22

CS Site Name:

OAFF GW

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

Comments:

NA

iii. Data quality or usability affected?

Comments:

NA

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 (AES)  
110 West 38th Ave Suite 200B  
Anchorage, AK 99503

Report Number: **1223906**

Client Project: **20204.074 OAFF GW 2022**

Dear Luke Hoffmann,

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  
Project Manager  
Justin.Nelson@sgs.com

Date

### Case Narrative

SGS Client: **Ahtna Engineering Svs (AES)**  
 SGS Project: **1223906**  
 Project Name/Site: **20204.074 OAFF GW 2022**  
 Project Contact: **Luke Hoffmann**

Refer to sample receipt form for information on sample condition.

**OAFF-22-MW-11 (1223906001) PS**

AK101- Sample has a pH greater than two; however, the sample was analyzed within 7 days from collection.  
 8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria.

**OAFF-22-MW-10 (1223906002) PS**

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria.

**OAFF-22-MW-03 (1223906004) PS**

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

**OAFF-22-MW-4R (1223906005) PS**

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.  
 8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to matrix interference.

**OAFF-22-MW-4RD (1223906006) PS**

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

**OAFF-TB-22-01 (1223906008) TB**

8260D - Surrogate recovery for 1,2-dichloroethane-D4 does not meet QC criteria. The analytes associated with this surrogate are not reported above the LOQ.

**MB for HBN 1840219 [VXX/38906] (1674801) MB**

8260D - Surrogate recovery for 1,2-dichloroethane-D4 does not meet QC criteria.

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

Print Date: 08/01/2022 3:50:56PM



**Report of Manual Integrations**

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
<b>8270D SIM LV (PAH)</b>				
1223906004	OAFF-22-MW-03	XMS13244	Benzo[k]fluoranthene	RP
<b>SW8260D</b>				
1223906004	OAFF-22-MW-03	VMS21806	n-Butylbenzene	SP
1223906005	OAFF-22-MW-4R	VMS21806	n-Butylbenzene	SP
1223906006	OAFF-22-MW-4RD	VMS21806	n-Butylbenzene	SP

**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: 08/01/2022 3:50:57PM

### 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, indemnification 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, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 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
TNTC	Too Numerous To Count
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**

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
OAFF-22-MW-11	1223906001	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-22-MW-10	1223906002	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-22-MW-01	1223906003	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-22-MW-03	1223906004	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-22-MW-4R	1223906005	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-22-MW-4RD	1223906006	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-22-MW-12	1223906007	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-TB-22-01	1223906008	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)
OAFF-TB-22-02	1223906009	07/12/2022	07/13/2022	Water (Surface, Eff., Ground)

Method

8270D SIM LV (PAH)  
 AK102  
 AK101  
 SW8260D

Method Description

8270 PAH SIM GC/MS LV  
 DRO Low Volume (W)  
 Gasoline Range Organics (W)  
 Volatile Organic Compounds (W) FULL

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**Detectable Results Summary**

 Client Sample ID: **OAFF-22-MW-11**

Lab Sample ID: 1223906001

**Semivolatile Organic Fuels**
**Volatile GC/MS- Petroleum VOC Group**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.58	mg/L
Toluene	0.390J	ug/L

 Client Sample ID: **OAFF-22-MW-10**

Lab Sample ID: 1223906002

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.573J	mg/L

 Client Sample ID: **OAFF-22-MW-01**

Lab Sample ID: 1223906003

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	
1-Methylnaphthalene	0.0946	ug/L	
2-Methylnaphthalene	0.0360J	ug/L	
Benzo(a)Anthracene	0.0338J	ug/L	
Benzo[a]pyrene	0.0127J	ug/L	
Benzo[b]Fluoranthene	0.0331J	ug/L	
Benzo[k]fluoranthene	0.0249J	ug/L	
Chrysene	0.0323J	ug/L	
Dibenzo[a,h]anthracene	0.0154J	ug/L	
Fluoranthene	0.0213J	ug/L	
Fluorene	0.0208J	ug/L	
Indeno[1,2,3-c,d] pyrene	0.0170J	ug/L	
Naphthalene	0.0971J	ug/L	
Pyrene	0.0199J	ug/L	
<b>Semivolatile Organic Fuels</b>	Diesel Range Organics	0.568J	mg/L
<b>Volatile GC/MS- Petroleum VOC Group</b>	1,2,4-Trimethylbenzene	0.400J	ug/L

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**Detectable Results Summary**

 Client Sample ID: **OAFF-22-MW-03**

Lab Sample ID: 1223906004

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	44.4	ug/L
2-Methylnaphthalene	53.5	ug/L
Acenaphthene	0.606	ug/L
Anthracene	0.0733	ug/L
Benzo(a)Anthracene	0.0418J	ug/L
Benzo[a]pyrene	0.0306	ug/L
Benzo[b]Fluoranthene	0.0545	ug/L
Benzo[g,h,i]perylene	0.0187J	ug/L
Benzo[k]fluoranthene	0.0212J	ug/L
Chrysene	0.0554	ug/L
Fluoranthene	0.249	ug/L
Fluorene	1.10	ug/L
Indeno[1,2,3-c,d] pyrene	0.0172J	ug/L
Naphthalene	32.1	ug/L
Phenanthrene	0.604	ug/L
Pyrene	0.177	ug/L
<b>Semivolatile Organic Fuels</b>		
Diesel Range Organics	3.40	mg/L
<b>Volatile Fuels</b>		
Gasoline Range Organics	1.73	mg/L
<b>Volatile GC/MS- Petroleum VOC Group</b>		
1,2,4-Trimethylbenzene	258	ug/L
1,3,5-Trimethylbenzene	17.7	ug/L
Benzene	0.800	ug/L
Ethylbenzene	7.16	ug/L
Isopropylbenzene (Cumene)	15.0	ug/L
Naphthalene	61.0	ug/L
n-Butylbenzene	7.08	ug/L
o-Xylene	1.24J	ug/L
P & M -Xylene	35.7	ug/L
sec-Butylbenzene	11.0	ug/L
tert-Butylbenzene	1.10J	ug/L
Toluene	0.620J	ug/L
Xylenes (total)	37.0	ug/L

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**Detectable Results Summary**

 Client Sample ID: **OAFF-22-MW-4R**

Lab Sample ID: 1223906005

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	32.1	ug/L
2-Methylnaphthalene	33.0	ug/L
Acenaphthene	0.404	ug/L
Anthracene	0.0724	ug/L
Fluoranthene	0.159	ug/L
Fluorene	0.486	ug/L
Naphthalene	66.1	ug/L
Phenanthrene	0.450	ug/L
Pyrene	0.0998	ug/L

**Semivolatile Organic Fuels**
**Volatile Fuels**
**Volatile GC/MS- Petroleum VOC Group**

Diesel Range Organics	5.48	mg/L
Gasoline Range Organics	2.86	mg/L
1,2,4-Trimethylbenzene	235	ug/L
1,3,5-Trimethylbenzene	72.9	ug/L
Benzene	91.9	ug/L
Ethylbenzene	116	ug/L
Isopropylbenzene (Cumene)	26.3	ug/L
Naphthalene	118	ug/L
n-Butylbenzene	6.00	ug/L
o-Xylene	1.14J	ug/L
P & M -Xylene	419	ug/L
sec-Butylbenzene	10.2	ug/L
tert-Butylbenzene	1.02J	ug/L
Xylenes (total)	420	ug/L

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**Detectable Results Summary**

 Client Sample ID: **OAFF-22-MW-4RD**

Lab Sample ID: 1223906006

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	30.6	ug/L
2-Methylnaphthalene	31.8	ug/L
Acenaphthene	0.364	ug/L
Anthracene	0.0708	ug/L
Fluoranthene	0.156	ug/L
Fluorene	0.453	ug/L
Naphthalene	63.5	ug/L
Phenanthrene	0.428	ug/L
Pyrene	0.0978	ug/L
<b>Semivolatile Organic Fuels</b>		
Diesel Range Organics	5.39	mg/L
<b>Volatile Fuels</b>		
Gasoline Range Organics	2.80	mg/L
<b>Volatile GC/MS- Petroleum VOC Group</b>		
1,2,4-Trimethylbenzene	259	ug/L
1,3,5-Trimethylbenzene	83.6	ug/L
Benzene	91.0	ug/L
Ethylbenzene	127	ug/L
Isopropylbenzene (Cumene)	27.3	ug/L
Naphthalene	132	ug/L
n-Butylbenzene	6.64	ug/L
o-Xylene	1.26J	ug/L
P & M -Xylene	447	ug/L
sec-Butylbenzene	11.0	ug/L
tert-Butylbenzene	1.10J	ug/L
Xylenes (total)	448	ug/L

 Client Sample ID: **OAFF-22-MW-12**

Lab Sample ID: 1223906007

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.0949	ug/L
2-Methylnaphthalene	0.0681	ug/L
Acenaphthene	0.0589	ug/L
Naphthalene	5.06	ug/L
<b>Semivolatile Organic Fuels</b>		
Diesel Range Organics	1.86	mg/L
<b>Volatile GC/MS- Petroleum VOC Group</b>		
Benzene	0.710	ug/L
Naphthalene	7.34	ug/L
o-Xylene	0.470J	ug/L
Toluene	0.620J	ug/L

Print Date: 08/01/2022 3:51:01PM

**Results of OAFF-22-MW-11**

Client Sample ID: **OAFF-22-MW-11**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906001  
 Lab Project ID: 1223906

Collection Date: 07/12/22 11:07  
 Received Date: 07/13/22 10:22  
 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	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
2-Methylnaphthalene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Acenaphthene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Acenaphthylene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Anthracene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Benzo(a)Anthracene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Benzo[a]pyrene	0.0107 U	0.0213	0.00660	ug/L	1		07/24/22 02:14
Benzo[b]Fluoranthene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Benzo[g,h,i]perylene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Benzo[k]fluoranthene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Chrysene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Dibenzo[a,h]anthracene	0.0107 U	0.0213	0.00660	ug/L	1		07/24/22 02:14
Fluoranthene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Fluorene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Indeno[1,2,3-c,d] pyrene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
Naphthalene	0.0530 U	0.106	0.0330	ug/L	1		07/24/22 02:14
Phenanthrene	0.0530 U	0.106	0.0330	ug/L	1		07/24/22 02:14
Pyrene	0.0266 U	0.0532	0.0160	ug/L	1		07/24/22 02:14
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	55	42-86		%	1		07/24/22 02:14
Fluoranthene-d10 (surr)	49.2 *	50-97		%	1		07/24/22 02:14

**Batch Information**

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/24/22 02:14  
 Container ID: 1223906001-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 235 mL  
 Prep Extract Vol: 1 mL



**Results of OAFF-22-MW-11**

Client Sample ID: **OAFF-22-MW-11**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906001  
 Lab Project ID: 1223906

Collection Date: 07/12/22 11:07  
 Received Date: 07/13/22 10:22  
 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	1.58		0.652	0.217	mg/L	1		07/19/22 15:45
<b>Surrogates</b>								
5a Androstane (surr)	80.2		50-150		%	1		07/19/22 15:45

**Batch Information**

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Analyst: MDT  
 Analytical Date/Time: 07/19/22 15:45  
 Container ID: 1223906001-G

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 07/18/22 16:13  
 Prep Initial Wt./Vol.: 230 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-11

Client Sample ID: **OAFF-22-MW-11**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906001  
 Lab Project ID: 1223906

Collection Date: 07/12/22 11:07  
 Received Date: 07/13/22 10:22  
 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	0.0450	mg/L	1		07/13/22 19:03
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	78.2	50-150		%	1		07/13/22 19:03

### Batch Information

Analytical Batch: VFC16171  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/13/22 19:03  
 Container ID: 1223906001-D

Prep Batch: VXX38871  
 Prep Method: SW5030B  
 Prep Date/Time: 07/13/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-11**

Client Sample ID: **OAFF-22-MW-11**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906001  
 Lab Project ID: 1223906

Collection Date: 07/12/22 11:07  
 Received Date: 07/13/22 10:22  
 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		07/15/22 20:07
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		07/15/22 20:07
1,2-Dichloroethane	0.250 U	0.500	0.200	ug/L	1		07/15/22 20:07
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
Benzene	0.200 U	0.400	0.120	ug/L	1		07/15/22 20:07
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		07/15/22 20:07
Naphthalene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
o-Xylene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		07/15/22 20:07
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:07
Toluene	0.390 J	1.00	0.310	ug/L	1		07/15/22 20:07
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		07/15/22 20:07
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	108	81-118		%	1		07/15/22 20:07
4-Bromofluorobenzene (surr)	104	85-114		%	1		07/15/22 20:07
Toluene-d8 (surr)	93.8	89-112		%	1		07/15/22 20:07

**Batch Information**

Analytical Batch: VMS21802  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/15/22 20:07  
 Container ID: 1223906001-A

Prep Batch: VXX38887  
 Prep Method: SW5030B  
 Prep Date/Time: 07/15/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-10**

Client Sample ID: **OAFF-22-MW-10**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906002  
 Lab Project ID: 1223906

Collection Date: 07/12/22 13:15  
 Received Date: 07/13/22 10:22  
 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	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
2-Methylnaphthalene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Acenaphthene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Acenaphthylene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Anthracene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Benzo(a)Anthracene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Benzo[a]pyrene	0.0109 U	0.0217	0.00674	ug/L	1		07/24/22 02:35
Benzo[b]Fluoranthene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Benzo[g,h,i]perylene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Benzo[k]fluoranthene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Chrysene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Dibenzo[a,h]anthracene	0.0109 U	0.0217	0.00674	ug/L	1		07/24/22 02:35
Fluoranthene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Fluorene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Indeno[1,2,3-c,d] pyrene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
Naphthalene	0.0545 U	0.109	0.0337	ug/L	1		07/24/22 02:35
Phenanthrene	0.0545 U	0.109	0.0337	ug/L	1		07/24/22 02:35
Pyrene	0.0272 U	0.0543	0.0163	ug/L	1		07/24/22 02:35
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	51.2	42-86		%	1		07/24/22 02:35
Fluoranthene-d10 (surr)	46.4 *	50-97		%	1		07/24/22 02:35

**Batch Information**

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/24/22 02:35  
 Container ID: 1223906002-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 230 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-10

Client Sample ID: **OAFF-22-MW-10**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906002  
 Lab Project ID: 1223906

Collection Date: 07/12/22 13:15  
 Received Date: 07/13/22 10:22  
 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	0.573 J	0.652	0.217	mg/L	1		07/19/22 15:56
<b>Surrogates</b>							
5a Androstane (surr)	72.8	50-150		%	1		07/19/22 15:56

### Batch Information

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Analyst: MDT  
 Analytical Date/Time: 07/19/22 15:56  
 Container ID: 1223906002-G

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 07/18/22 16:13  
 Prep Initial Wt./Vol.: 230 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-10

Client Sample ID: **OAFF-22-MW-10**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906002  
 Lab Project ID: 1223906

Collection Date: 07/12/22 13:15  
 Received Date: 07/13/22 10:22  
 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	0.0450	mg/L	1		07/13/22 19:21
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	76.1	50-150		%	1		07/13/22 19:21

### Batch Information

Analytical Batch: VFC16171  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/13/22 19:21  
 Container ID: 1223906002-D

Prep Batch: VXX38871  
 Prep Method: SW5030B  
 Prep Date/Time: 07/13/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-10**

Client Sample ID: **OAFF-22-MW-10**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906002  
 Lab Project ID: 1223906

Collection Date: 07/12/22 13:15  
 Received Date: 07/13/22 10:22  
 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		07/15/22 20:22
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		07/15/22 20:22
1,2-Dichloroethane	0.250 U	0.500	0.200	ug/L	1		07/15/22 20:22
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
Benzene	0.200 U	0.400	0.120	ug/L	1		07/15/22 20:22
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		07/15/22 20:22
Naphthalene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
o-Xylene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		07/15/22 20:22
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
Toluene	0.500 U	1.00	0.310	ug/L	1		07/15/22 20:22
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		07/15/22 20:22
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	112	81-118		%	1		07/15/22 20:22
4-Bromofluorobenzene (surr)	104	85-114		%	1		07/15/22 20:22
Toluene-d8 (surr)	94.2	89-112		%	1		07/15/22 20:22

**Batch Information**

Analytical Batch: VMS21802  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/15/22 20:22  
 Container ID: 1223906002-A

Prep Batch: VXX38887  
 Prep Method: SW5030B  
 Prep Date/Time: 07/15/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-01**

Client Sample ID: **OAFF-22-MW-01**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906003  
 Lab Project ID: 1223906

Collection Date: 07/12/22 15:17  
 Received Date: 07/13/22 10:22  
 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	0.0946	0.0500	0.0150	ug/L	1		07/24/22 02:56
2-Methylnaphthalene	0.0360 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Acenaphthene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 02:56
Acenaphthylene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 02:56
Anthracene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 02:56
Benzo(a)Anthracene	0.0338 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Benzo[a]pyrene	0.0127 J	0.0200	0.00620	ug/L	1		07/24/22 02:56
Benzo[b]Fluoranthene	0.0331 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Benzo[g,h,i]perylene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 02:56
Benzo[k]fluoranthene	0.0249 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Chrysene	0.0323 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Dibenzo[a,h]anthracene	0.0154 J	0.0200	0.00620	ug/L	1		07/24/22 02:56
Fluoranthene	0.0213 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Fluorene	0.0208 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Indeno[1,2,3-c,d] pyrene	0.0170 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
Naphthalene	0.0971 J	0.100	0.0310	ug/L	1		07/24/22 02:56
Phenanthrene	0.0500 U	0.100	0.0310	ug/L	1		07/24/22 02:56
Pyrene	0.0199 J	0.0500	0.0150	ug/L	1		07/24/22 02:56
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	63.1	42-86		%	1		07/24/22 02:56
Fluoranthene-d10 (surr)	70.4	50-97		%	1		07/24/22 02:56

**Batch Information**

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/24/22 02:56  
 Container ID: 1223906003-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL



### Results of OAFF-22-MW-01

Client Sample ID: **OAFF-22-MW-01**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906003  
 Lab Project ID: 1223906

Collection Date: 07/12/22 15:17  
 Received Date: 07/13/22 10:22  
 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	0.568 J	0.588	0.196	mg/L	1		07/19/22 16:06
<b>Surrogates</b>							
5a Androstane (surr)	74.5	50-150		%	1		07/19/22 16:06

### Batch Information

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Analyst: MDT  
 Analytical Date/Time: 07/19/22 16:06  
 Container ID: 1223906003-G

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 07/18/22 16:13  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-01

Client Sample ID: **OAFF-22-MW-01**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906003  
 Lab Project ID: 1223906

Collection Date: 07/12/22 15:17  
 Received Date: 07/13/22 10:22  
 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	0.0450	mg/L	1		07/13/22 19:40
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	77.8	50-150		%	1		07/13/22 19:40

### Batch Information

Analytical Batch: VFC16171  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/13/22 19:40  
 Container ID: 1223906003-D

Prep Batch: VXX38871  
 Prep Method: SW5030B  
 Prep Date/Time: 07/13/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

### Results of OAFF-22-MW-01

Client Sample ID: **OAFF-22-MW-01**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906003  
 Lab Project ID: 1223906

Collection Date: 07/12/22 15:17  
 Received Date: 07/13/22 10:22  
 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	0.400 J	1.00	0.310	ug/L	1		07/19/22 21:03
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		07/19/22 21:03
1,2-Dichloroethane	0.250 U	0.500	0.200	ug/L	1		07/19/22 21:03
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
Benzene	0.200 U	0.400	0.120	ug/L	1		07/19/22 21:03
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		07/19/22 21:03
Naphthalene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
o-Xylene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		07/19/22 21:03
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
Toluene	0.500 U	1.00	0.310	ug/L	1		07/19/22 21:03
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		07/19/22 21:03
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	115	81-118		%	1		07/19/22 21:03
4-Bromofluorobenzene (surr)	109	85-114		%	1		07/19/22 21:03
Toluene-d8 (surr)	95	89-112		%	1		07/19/22 21:03

### Batch Information

Analytical Batch: VMS21806  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/19/22 21:03  
 Container ID: 1223906003-A

Prep Batch: VXX38896  
 Prep Method: SW5030B  
 Prep Date/Time: 07/19/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-03**

Client Sample ID: **OAFF-22-MW-03**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906004  
 Lab Project ID: 1223906

Collection Date: 07/12/22 16:20  
 Received Date: 07/13/22 10:22  
 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	44.4	0.490	0.147	ug/L	10		07/25/22 22:24
2-Methylnaphthalene	53.5	0.490	0.147	ug/L	10		07/25/22 22:24
Acenaphthene	0.606	0.0490	0.0147	ug/L	1		07/25/22 06:45
Acenaphthylene	0.0245 U	0.0490	0.0147	ug/L	1		07/25/22 06:45
Anthracene	0.0733	0.0490	0.0147	ug/L	1		07/25/22 06:45
Benzo(a)Anthracene	0.0418 J	0.0490	0.0147	ug/L	1		07/25/22 06:45
Benzo[a]pyrene	0.0306	0.0196	0.00608	ug/L	1		07/25/22 06:45
Benzo[b]Fluoranthene	0.0545	0.0490	0.0147	ug/L	1		07/25/22 06:45
Benzo[g,h,i]perylene	0.0187 J	0.0490	0.0147	ug/L	1		07/25/22 06:45
Benzo[k]fluoranthene	0.0212 J	0.0490	0.0147	ug/L	1		07/25/22 06:45
Chrysene	0.0554	0.0490	0.0147	ug/L	1		07/25/22 06:45
Dibenzo[a,h]anthracene	0.00980 U	0.0196	0.00608	ug/L	1		07/25/22 06:45
Fluoranthene	0.249	0.0490	0.0147	ug/L	1		07/25/22 06:45
Fluorene	1.10	0.0490	0.0147	ug/L	1		07/25/22 06:45
Indeno[1,2,3-c,d] pyrene	0.0172 J	0.0490	0.0147	ug/L	1		07/25/22 06:45
Naphthalene	32.1	0.980	0.304	ug/L	10		07/25/22 22:24
Phenanthrene	0.604	0.0980	0.0304	ug/L	1		07/25/22 06:45
Pyrene	0.177	0.0490	0.0147	ug/L	1		07/25/22 06:45
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	55.4	42-86		%	1		07/25/22 06:45
Fluoranthene-d10 (surr)	58	50-97		%	1		07/25/22 06:45

**Batch Information**

Analytical Batch: XMS13244  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/25/22 06:45  
 Container ID: 1223906004-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL

Analytical Batch: XMS13245  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/25/22 22:24  
 Container ID: 1223906004-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL

**Results of OAFF-22-MW-03**

Client Sample ID: **OAFF-22-MW-03**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906004  
 Lab Project ID: 1223906

Collection Date: 07/12/22 16:20  
 Received Date: 07/13/22 10:22  
 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	3.40		0.588	0.196	mg/L	1		07/19/22 16:17
<b>Surrogates</b>								
5a Androstane (surr)	75.2		50-150		%	1		07/19/22 16:17

**Batch Information**

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Analyst: MDT  
 Analytical Date/Time: 07/19/22 16:17  
 Container ID: 1223906004-G

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 07/18/22 16:13  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL

**Results of OAFF-22-MW-03**

Client Sample ID: **OAFF-22-MW-03**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906004  
 Lab Project ID: 1223906

Collection Date: 07/12/22 16:20  
 Received Date: 07/13/22 10:22  
 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	1.73		0.100	0.0450	mg/L	1		07/13/22 19:59
<b>Surrogates</b>								
4-Bromofluorobenzene (surr)	189	*	50-150		%	1		07/13/22 19:59

**Batch Information**

Analytical Batch: VFC16171  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/13/22 19:59  
 Container ID: 1223906004-D

Prep Batch: VXX38871  
 Prep Method: SW5030B  
 Prep Date/Time: 07/13/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

### Results of OAFF-22-MW-03

Client Sample ID: **OAFF-22-MW-03**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906004  
 Lab Project ID: 1223906

Collection Date: 07/12/22 16:20  
 Received Date: 07/13/22 10:22  
 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	258	2.00	0.620	ug/L	2		07/19/22 23:46
1,2-Dibromoethane	0.0750 U	0.150	0.0360	ug/L	2		07/19/22 23:46
1,2-Dichloroethane	0.500 U	1.00	0.400	ug/L	2		07/19/22 23:46
1,3,5-Trimethylbenzene	17.7	2.00	0.620	ug/L	2		07/19/22 23:46
Benzene	0.800	0.800	0.240	ug/L	2		07/19/22 23:46
Ethylbenzene	7.16	2.00	0.620	ug/L	2		07/19/22 23:46
Isopropylbenzene (Cumene)	15.0	2.00	0.620	ug/L	2		07/19/22 23:46
Methyl-t-butyl ether	10.0 U	20.0	6.20	ug/L	2		07/19/22 23:46
Naphthalene	61.0	2.00	0.620	ug/L	2		07/19/22 23:46
n-Butylbenzene	7.08	2.00	0.620	ug/L	2		07/19/22 23:46
o-Xylene	1.24 J	2.00	0.620	ug/L	2		07/19/22 23:46
P & M -Xylene	35.7	4.00	1.24	ug/L	2		07/19/22 23:46
sec-Butylbenzene	11.0	2.00	0.620	ug/L	2		07/19/22 23:46
tert-Butylbenzene	1.10 J	2.00	0.620	ug/L	2		07/19/22 23:46
Toluene	0.620 J	2.00	0.620	ug/L	2		07/19/22 23:46
Xylenes (total)	37.0	6.00	2.00	ug/L	2		07/19/22 23:46
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	108	81-118		%	2		07/19/22 23:46
4-Bromofluorobenzene (surr)	103	85-114		%	2		07/19/22 23:46
Toluene-d8 (surr)	96.7	89-112		%	2		07/19/22 23:46

### Batch Information

Analytical Batch: VMS21806  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/19/22 23:46  
 Container ID: 1223906004-A

Prep Batch: VXX38896  
 Prep Method: SW5030B  
 Prep Date/Time: 07/19/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-4R**

Client Sample ID: **OAFF-22-MW-4R**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906005  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:35  
 Received Date: 07/13/22 10:22  
 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	32.1		0.500	0.150	ug/L	10		07/25/22 20:42
2-Methylnaphthalene	33.0		0.500	0.150	ug/L	10		07/25/22 20:42
Acenaphthene	0.404		0.0500	0.0150	ug/L	1		07/24/22 03:37
Acenaphthylene	0.0250	U	0.0500	0.0150	ug/L	1		07/24/22 03:37
Anthracene	0.0724		0.0500	0.0150	ug/L	1		07/24/22 03:37
Benzo(a)Anthracene	0.0250	U	0.0500	0.0150	ug/L	1		07/24/22 03:37
Benzo[a]pyrene	0.0100	U	0.0200	0.00620	ug/L	1		07/24/22 03:37
Benzo[b]Fluoranthene	0.0250	U	0.0500	0.0150	ug/L	1		07/24/22 03:37
Benzo[g,h,i]perylene	0.0250	U	0.0500	0.0150	ug/L	1		07/24/22 03:37
Benzo[k]fluoranthene	0.0250	U	0.0500	0.0150	ug/L	1		07/24/22 03:37
Chrysene	0.0250	U	0.0500	0.0150	ug/L	1		07/24/22 03:37
Dibenzo[a,h]anthracene	0.0100	U	0.0200	0.00620	ug/L	1		07/24/22 03:37
Fluoranthene	0.159		0.0500	0.0150	ug/L	1		07/24/22 03:37
Fluorene	0.486		0.0500	0.0150	ug/L	1		07/24/22 03:37
Indeno[1,2,3-c,d] pyrene	0.0250	U	0.0500	0.0150	ug/L	1		07/24/22 03:37
Naphthalene	66.1		1.00	0.310	ug/L	10		07/25/22 20:42
Phenanthrene	0.450		0.100	0.0310	ug/L	1		07/24/22 03:37
Pyrene	0.0998		0.0500	0.0150	ug/L	1		07/24/22 03:37
<b>Surrogates</b>								
2-Methylnaphthalene-d10 (surr)	88	*	42-86		%	1		07/24/22 03:37
Fluoranthene-d10 (surr)	63.9		50-97		%	1		07/24/22 03:37

**Batch Information**

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/24/22 03:37  
 Container ID: 1223906005-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

Analytical Batch: XMS13245  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/25/22 20:42  
 Container ID: 1223906005-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL



**Results of OAFF-22-MW-4R**

Client Sample ID: **OAFF-22-MW-4R**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906005  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:35  
 Received Date: 07/13/22 10:22  
 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	5.48		0.600	0.200	mg/L	1		07/19/22 16:27
<b>Surrogates</b>								
5a Androstane (surr)	90.5		50-150		%	1		07/19/22 16:27

**Batch Information**

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Analyst: MDT  
 Analytical Date/Time: 07/19/22 16:27  
 Container ID: 1223906005-G

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 07/18/22 16:13  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-4R

Client Sample ID: **OAFF-22-MW-4R**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906005  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:35  
 Received Date: 07/13/22 10:22  
 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	2.86		0.100	0.0450	mg/L	1		07/13/22 20:17
<b>Surrogates</b>								
4-Bromofluorobenzene (surr)	257	*	50-150		%	1		07/13/22 20:17

### Batch Information

Analytical Batch: VFC16171  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/13/22 20:17  
 Container ID: 1223906005-D

Prep Batch: VXX38871  
 Prep Method: SW5030B  
 Prep Date/Time: 07/13/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-4R**

Client Sample ID: **OAFF-22-MW-4R**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906005  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:35  
 Received Date: 07/13/22 10:22  
 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	235	2.00	0.620	ug/L	2		07/20/22 00:01
1,2-Dibromoethane	0.0750 U	0.150	0.0360	ug/L	2		07/20/22 00:01
1,2-Dichloroethane	0.500 U	1.00	0.400	ug/L	2		07/20/22 00:01
1,3,5-Trimethylbenzene	72.9	2.00	0.620	ug/L	2		07/20/22 00:01
Benzene	91.9	0.800	0.240	ug/L	2		07/20/22 00:01
Ethylbenzene	116	2.00	0.620	ug/L	2		07/20/22 00:01
Isopropylbenzene (Cumene)	26.3	2.00	0.620	ug/L	2		07/20/22 00:01
Methyl-t-butyl ether	10.0 U	20.0	6.20	ug/L	2		07/20/22 00:01
Naphthalene	118	2.00	0.620	ug/L	2		07/20/22 00:01
n-Butylbenzene	6.00	2.00	0.620	ug/L	2		07/20/22 00:01
o-Xylene	1.14 J	2.00	0.620	ug/L	2		07/20/22 00:01
P & M -Xylene	419	4.00	1.24	ug/L	2		07/20/22 00:01
sec-Butylbenzene	10.2	2.00	0.620	ug/L	2		07/20/22 00:01
tert-Butylbenzene	1.02 J	2.00	0.620	ug/L	2		07/20/22 00:01
Toluene	1.00 U	2.00	0.620	ug/L	2		07/20/22 00:01
Xylenes (total)	420	6.00	2.00	ug/L	2		07/20/22 00:01
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	108	81-118		%	2		07/20/22 00:01
4-Bromofluorobenzene (surr)	104	85-114		%	2		07/20/22 00:01
Toluene-d8 (surr)	96.5	89-112		%	2		07/20/22 00:01

**Batch Information**

Analytical Batch: VMS21806  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/20/22 00:01  
 Container ID: 1223906005-A

Prep Batch: VXX38896  
 Prep Method: SW5030B  
 Prep Date/Time: 07/19/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-4RD**

Client Sample ID: **OAFF-22-MW-4RD**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906006  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:40  
 Received Date: 07/13/22 10:22  
 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	30.6	0.500	0.150	ug/L	10		07/25/22 20:21
2-Methylnaphthalene	31.8	0.500	0.150	ug/L	10		07/25/22 20:21
Acenaphthene	0.364	0.0500	0.0150	ug/L	1		07/24/22 03:57
Acenaphthylene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 03:57
Anthracene	0.0708	0.0500	0.0150	ug/L	1		07/24/22 03:57
Benzo(a)Anthracene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 03:57
Benzo[a]pyrene	0.0100 U	0.0200	0.00620	ug/L	1		07/24/22 03:57
Benzo[b]Fluoranthene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 03:57
Benzo[g,h,i]perylene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 03:57
Benzo[k]fluoranthene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 03:57
Chrysene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 03:57
Dibenzo[a,h]anthracene	0.0100 U	0.0200	0.00620	ug/L	1		07/24/22 03:57
Fluoranthene	0.156	0.0500	0.0150	ug/L	1		07/24/22 03:57
Fluorene	0.453	0.0500	0.0150	ug/L	1		07/24/22 03:57
Indeno[1,2,3-c,d] pyrene	0.0250 U	0.0500	0.0150	ug/L	1		07/24/22 03:57
Naphthalene	63.5	1.00	0.310	ug/L	10		07/25/22 20:21
Phenanthrene	0.428	0.100	0.0310	ug/L	1		07/24/22 03:57
Pyrene	0.0978	0.0500	0.0150	ug/L	1		07/24/22 03:57
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	80.4	42-86		%	1		07/24/22 03:57
Fluoranthene-d10 (surr)	63.2	50-97		%	1		07/24/22 03:57

**Batch Information**

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/24/22 03:57  
 Container ID: 1223906006-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

Analytical Batch: XMS13245  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/25/22 20:21  
 Container ID: 1223906006-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-4RD

Client Sample ID: **OAFF-22-MW-4RD**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906006  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:40  
 Received Date: 07/13/22 10:22  
 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	5.39		0.600	0.200	mg/L	1		07/19/22 16:38
<b>Surrogates</b>								
5a Androstane (surr)	91.9		50-150		%	1		07/19/22 16:38

### Batch Information

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Analyst: MDT  
 Analytical Date/Time: 07/19/22 16:38  
 Container ID: 1223906006-G

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 07/18/22 16:13  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-4RD

Client Sample ID: **OAFF-22-MW-4RD**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906006  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:40  
 Received Date: 07/13/22 10:22  
 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	2.80		0.100	0.0450	mg/L	1		07/13/22 20:36
<b>Surrogates</b>								
4-Bromofluorobenzene (surr)	257	*	50-150		%	1		07/13/22 20:36

### Batch Information

Analytical Batch: VFC16171  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/13/22 20:36  
 Container ID: 1223906006-D

Prep Batch: VXX38871  
 Prep Method: SW5030B  
 Prep Date/Time: 07/13/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

### Results of OAFF-22-MW-4RD

Client Sample ID: **OAFF-22-MW-4RD**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906006  
 Lab Project ID: 1223906

Collection Date: 07/12/22 17:40  
 Received Date: 07/13/22 10:22  
 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	259	2.00	0.620	ug/L	2		07/20/22 00:16
1,2-Dibromoethane	0.0750 U	0.150	0.0360	ug/L	2		07/20/22 00:16
1,2-Dichloroethane	0.500 U	1.00	0.400	ug/L	2		07/20/22 00:16
1,3,5-Trimethylbenzene	83.6	2.00	0.620	ug/L	2		07/20/22 00:16
Benzene	91.0	0.800	0.240	ug/L	2		07/20/22 00:16
Ethylbenzene	127	2.00	0.620	ug/L	2		07/20/22 00:16
Isopropylbenzene (Cumene)	27.3	2.00	0.620	ug/L	2		07/20/22 00:16
Methyl-t-butyl ether	10.0 U	20.0	6.20	ug/L	2		07/20/22 00:16
Naphthalene	132	2.00	0.620	ug/L	2		07/20/22 00:16
n-Butylbenzene	6.64	2.00	0.620	ug/L	2		07/20/22 00:16
o-Xylene	1.26 J	2.00	0.620	ug/L	2		07/20/22 00:16
P & M -Xylene	447	4.00	1.24	ug/L	2		07/20/22 00:16
sec-Butylbenzene	11.0	2.00	0.620	ug/L	2		07/20/22 00:16
tert-Butylbenzene	1.10 J	2.00	0.620	ug/L	2		07/20/22 00:16
Toluene	1.00 U	2.00	0.620	ug/L	2		07/20/22 00:16
Xylenes (total)	448	6.00	2.00	ug/L	2		07/20/22 00:16
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	109	81-118		%	2		07/20/22 00:16
4-Bromofluorobenzene (surr)	103	85-114		%	2		07/20/22 00:16
Toluene-d8 (surr)	95.6	89-112		%	2		07/20/22 00:16

### Batch Information

Analytical Batch: VMS21806  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/20/22 00:16  
 Container ID: 1223906006-A

Prep Batch: VXX38896  
 Prep Method: SW5030B  
 Prep Date/Time: 07/19/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-22-MW-12**

Client Sample ID: **OAFF-22-MW-12**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906007  
 Lab Project ID: 1223906

Collection Date: 07/12/22 18:45  
 Received Date: 07/13/22 10:22  
 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	0.0949	0.0490	0.0147	ug/L	1		07/24/22 04:18
2-Methylnaphthalene	0.0681	0.0490	0.0147	ug/L	1		07/24/22 04:18
Acenaphthene	0.0589	0.0490	0.0147	ug/L	1		07/24/22 04:18
Acenaphthylene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Anthracene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Benzo(a)Anthracene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Benzo[a]pyrene	0.00980 U	0.0196	0.00608	ug/L	1		07/24/22 04:18
Benzo[b]Fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Benzo[g,h,i]perylene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Benzo[k]fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Chrysene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Dibenzo[a,h]anthracene	0.00980 U	0.0196	0.00608	ug/L	1		07/24/22 04:18
Fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Fluorene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Indeno[1,2,3-c,d] pyrene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
Naphthalene	5.06	0.0980	0.0304	ug/L	1		07/24/22 04:18
Phenanthrene	0.0490 U	0.0980	0.0304	ug/L	1		07/24/22 04:18
Pyrene	0.0245 U	0.0490	0.0147	ug/L	1		07/24/22 04:18
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	61.1	42-86		%	1		07/24/22 04:18
Fluoranthene-d10 (surr)	63.4	50-97		%	1		07/24/22 04:18

**Batch Information**

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: NRB  
 Analytical Date/Time: 07/24/22 04:18  
 Container ID: 1223906007-I

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/22 15:42  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL



### Results of OAFF-22-MW-12

Client Sample ID: **OAFF-22-MW-12**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906007  
 Lab Project ID: 1223906

Collection Date: 07/12/22 18:45  
 Received Date: 07/13/22 10:22  
 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	1.86		0.600	0.200	mg/L	1		07/19/22 16:48
<b>Surrogates</b>								
5a Androstane (surr)	80.9		50-150		%	1		07/19/22 16:48

### Batch Information

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Analyst: MDT  
 Analytical Date/Time: 07/19/22 16:48  
 Container ID: 1223906007-G

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 07/18/22 16:13  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

### Results of OAFF-22-MW-12

Client Sample ID: **OAFF-22-MW-12**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906007  
 Lab Project ID: 1223906

Collection Date: 07/12/22 18:45  
 Received Date: 07/13/22 10:22  
 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	0.0450	mg/L	1		07/15/22 22:13
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	64.3	50-150		%	1		07/15/22 22:13

### Batch Information

Analytical Batch: VFC16177  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/15/22 22:13  
 Container ID: 1223906007-E

Prep Batch: VXX38891  
 Prep Method: SW5030B  
 Prep Date/Time: 07/15/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

### Results of OAFF-22-MW-12

Client Sample ID: **OAFF-22-MW-12**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906007  
 Lab Project ID: 1223906

Collection Date: 07/12/22 18:45  
 Received Date: 07/13/22 10:22  
 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		07/21/22 20:39
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		07/21/22 20:39
1,2-Dichloroethane	0.250 U	0.500	0.200	ug/L	1		07/21/22 20:39
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/21/22 20:39
Benzene	0.710	0.400	0.120	ug/L	1		07/21/22 20:39
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/21/22 20:39
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		07/21/22 20:39
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		07/21/22 20:39
Naphthalene	7.34	1.00	0.310	ug/L	1		07/21/22 20:39
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/21/22 20:39
o-Xylene	0.470 J	1.00	0.310	ug/L	1		07/21/22 20:39
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		07/21/22 20:39
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/21/22 20:39
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/21/22 20:39
Toluene	0.620 J	1.00	0.310	ug/L	1		07/21/22 20:39
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		07/21/22 20:39
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	112	81-118		%	1		07/21/22 20:39
4-Bromofluorobenzene (surr)	104	85-114		%	1		07/21/22 20:39
Toluene-d8 (surr)	97.1	89-112		%	1		07/21/22 20:39

### Batch Information

Analytical Batch: VMS21813  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/21/22 20:39  
 Container ID: 1223906007-B

Prep Batch: VXX38906  
 Prep Method: SW5030B  
 Prep Date/Time: 07/21/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

**Results of OAFF-TB-22-01**

Client Sample ID: **OAFF-TB-22-01**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906008  
 Lab Project ID: 1223906

Collection Date: 07/12/22 08:00  
 Received Date: 07/13/22 10:22  
 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		07/19/22 20:04
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		07/19/22 20:04
1,2-Dichloroethane	0.250 U	0.500	0.200	ug/L	1		07/19/22 20:04
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
Benzene	0.200 U	0.400	0.120	ug/L	1		07/19/22 20:04
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		07/19/22 20:04
Naphthalene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
o-Xylene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		07/19/22 20:04
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
Toluene	0.500 U	1.00	0.310	ug/L	1		07/19/22 20:04
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		07/19/22 20:04
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	119	*	81-118	%	1		07/19/22 20:04
4-Bromofluorobenzene (surr)	105		85-114	%	1		07/19/22 20:04
Toluene-d8 (surr)	97.4		89-112	%	1		07/19/22 20:04

**Batch Information**

Analytical Batch: VMS21806  
 Analytical Method: SW8260D  
 Analyst: AZL  
 Analytical Date/Time: 07/19/22 20:04  
 Container ID: 1223906008-A

Prep Batch: VXX38896  
 Prep Method: SW5030B  
 Prep Date/Time: 07/19/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

### Results of OAFF-TB-22-02

Client Sample ID: **OAFF-TB-22-02**  
 Client Project ID: **20204.074 OAFF GW 2022**  
 Lab Sample ID: 1223906009  
 Lab Project ID: 1223906

Collection Date: 07/12/22 08:00  
 Received Date: 07/13/22 10:22  
 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	0.0450	mg/L	1		07/13/22 18:44
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	59.1	50-150		%	1		07/13/22 18:44

### Batch Information

Analytical Batch: VFC16171  
 Analytical Method: AK101  
 Analyst: PHK  
 Analytical Date/Time: 07/13/22 18:44  
 Container ID: 1223906009-A

Prep Batch: VXX38871  
 Prep Method: SW5030B  
 Prep Date/Time: 07/13/22 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

## Method Blank

Blank ID: MB for HBN 1839944 [VXX/38871]  
Blank Lab ID: 1673563

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1223906001, 1223906002, 1223906003, 1223906004, 1223906005, 1223906006, 1223906009

## Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	80	50-150		%

## Batch Information

Analytical Batch: VFC16171  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: PHK  
Analytical Date/Time: 7/13/2022 1:33:00PM

Prep Batch: VXX38871  
Prep Method: SW5030B  
Prep Date/Time: 7/13/2022 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 08/01/2022 3:51:05PM

### Blank Spike Summary

Blank Spike ID: LCS for HBN 1223906 [VXX38871]  
 Blank Spike Lab ID: 1673564  
 Date Analyzed: 07/13/2022 14:29

Spike Duplicate ID: LCSD for HBN 1223906 [VXX38871]  
 Spike Duplicate Lab ID: 1673565  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1223906001, 1223906002, 1223906003, 1223906004, 1223906005, 1223906006, 1223906009

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.19	119	1.00	1.11	111	( 60-120 )	7.00	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	0.0500		85	0.0500		84	( 50-150 )	0.76	

### Batch Information

Analytical Batch: **VFC16171**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **PHK**

Prep Batch: **VXX38871**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **07/13/2022 06:00**  
 Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

Print Date: 08/01/2022 3:51:08PM

### Method Blank

Blank ID: MB for HBN 1840077 [VXX/38887]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1674222

QC for Samples:

1223906001, 1223906002

### Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	0.200	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
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	109	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	93.5	89-112		%

### Batch Information

Analytical Batch: VMS21802  
 Analytical Method: SW8260D  
 Instrument: Agilent 7890-75MS  
 Analyst: AZL  
 Analytical Date/Time: 7/15/2022 3:23:00PM

Prep Batch: VXX38887  
 Prep Method: SW5030B  
 Prep Date/Time: 7/15/2022 6:00:00AM  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL



## Blank Spike Summary

Blank Spike ID: LCS for HBN 1223906 [VXX38887]  
 Blank Spike Lab ID: 1674223  
 Date Analyzed: 07/15/2022 16:53

Spike Duplicate ID: LCSD for HBN 1223906  
 [VXX38887]  
 Spike Duplicate Lab ID: 1674224  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1223906001, 1223906002

## Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	30	30.2	101	30	29.7	99	( 79-124 )	1.80	(< 20 )
1,2-Dibromoethane	30	30.3	101	30	29.9	100	( 77-121 )	1.10	(< 20 )
1,2-Dichloroethane	30	31.4	105	30	30.3	101	( 73-128 )	3.60	(< 20 )
1,3,5-Trimethylbenzene	30	31.0	103	30	30.4	101	( 75-124 )	2.00	(< 20 )
Benzene	30	30.4	101	30	29.3	98	( 79-120 )	3.70	(< 20 )
Ethylbenzene	30	29.7	99	30	28.6	95	( 79-121 )	3.50	(< 20 )
Isopropylbenzene (Cumene)	30	30.4	101	30	29.2	97	( 72-131 )	4.00	(< 20 )
Methyl-t-butyl ether	45	45.5	101	45	44.4	99	( 71-124 )	2.40	(< 20 )
Naphthalene	30	24.2	81	30	26.1	87	( 61-128 )	7.40	(< 20 )
n-Butylbenzene	30	30.1	100	30	29.5	98	( 75-128 )	2.20	(< 20 )
o-Xylene	30	29.5	98	30	28.4	95	( 78-122 )	3.70	(< 20 )
P & M -Xylene	60	60.3	101	60	57.9	96	( 80-121 )	4.10	(< 20 )
sec-Butylbenzene	30	30.2	101	30	29.6	99	( 77-126 )	1.90	(< 20 )
tert-Butylbenzene	30	30.3	101	30	29.6	99	( 78-124 )	2.50	(< 20 )
Toluene	30	28.2	94	30	27.7	93	( 80-121 )	1.80	(< 20 )
Xylenes (total)	90	89.8	100	90	86.3	96	( 79-121 )	4.00	(< 20 )
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	30		103	30		102	( 81-118 )	1.60	
4-Bromofluorobenzene (surr)	30		103	30		104	( 85-114 )	0.52	
Toluene-d8 (surr)	30		94	30		95	( 89-112 )	1.80	

## Batch Information

Analytical Batch: **VMS21802**  
 Analytical Method: **SW8260D**  
 Instrument: **Agilent 7890-75MS**  
 Analyst: **AZL**

Prep Batch: **VXX38887**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **07/15/2022 06:00**  
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 08/01/2022 3:51:12PM

### Method Blank

Blank ID: MB for HBN 1840099 [VXX/38891]  
 Blank Lab ID: 1674314

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
 1223906007

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	72.8	50-150		%

### Batch Information

Analytical Batch: VFC16177  
 Analytical Method: AK101  
 Instrument: Agilent 7890 PID/FID  
 Analyst: PHK  
 Analytical Date/Time: 7/15/2022 11:58:00AM

Prep Batch: VXX38891  
 Prep Method: SW5030B  
 Prep Date/Time: 7/15/2022 6:00:00AM  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 08/01/2022 3:51:14PM

### Blank Spike Summary

Blank Spike ID: LCS for HBN 1223906 [VXX38891]  
 Blank Spike Lab ID: 1674317  
 Date Analyzed: 07/15/2022 12:53

Spike Duplicate ID: LCSD for HBN 1223906 [VXX38891]  
 Spike Duplicate Lab ID: 1674318  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1223906007

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.02	102	1.00	1.06	106	( 60-120 )	4.20	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	0.0500		89	0.0500		84	( 50-150 )	6.50	

### Batch Information

Analytical Batch: **VFC16177**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890 PID/FID**  
 Analyst: **PHK**

Prep Batch: **VXX38891**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **07/15/2022 06:00**  
 Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

Print Date: 08/01/2022 3:51:16PM

### Method Blank

Blank ID: MB for HBN 1840131 [VXX/38896]  
 Blank Lab ID: 1674473

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
 1223906003, 1223906004, 1223906005, 1223906006, 1223906007, 1223906008

### Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	0.200	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
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	116	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	96.9	89-112		%

### Batch Information

Analytical Batch: VMS21806  
 Analytical Method: SW8260D  
 Instrument: Agilent 7890-75MS  
 Analyst: AZL  
 Analytical Date/Time: 7/19/2022 4:21:00PM

Prep Batch: VXX38896  
 Prep Method: SW5030B  
 Prep Date/Time: 7/19/2022 6:00:00AM  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1223906 [VXX38896]  
 Blank Spike Lab ID: 1674474  
 Date Analyzed: 07/19/2022 17:35

Spike Duplicate ID: LCSD for HBN 1223906 [VXX38896]  
 Spike Duplicate Lab ID: 1674475  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1223906003, 1223906004, 1223906005, 1223906006, 1223906007, 1223906008

## Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	30	32.5	108	30	31.7	106	( 79-124 )	2.60	(< 20 )
1,2-Dibromoethane	30	30.1	100	30	31.2	104	( 77-121 )	3.30	(< 20 )
1,2-Dichloroethane	30	30.4	101	30	30.2	101	( 73-128 )	0.69	(< 20 )
1,3,5-Trimethylbenzene	30	33.1	110	30	32.1	107	( 75-124 )	2.90	(< 20 )
Benzene	30	30.5	102	30	28.5	95	( 79-120 )	7.00	(< 20 )
Ethylbenzene	30	30.7	102	30	29.8	100	( 79-121 )	2.80	(< 20 )
Isopropylbenzene (Cumene)	30	31.4	105	30	30.8	103	( 72-131 )	1.80	(< 20 )
Methyl-t-butyl ether	45	44.5	99	45	44.8	99	( 71-124 )	0.54	(< 20 )
Naphthalene	30	24.4	81	30	27.3	91	( 61-128 )	11.30	(< 20 )
n-Butylbenzene	30	31.9	106	30	31.1	104	( 75-128 )	2.80	(< 20 )
o-Xylene	30	30.5	102	30	29.7	99	( 78-122 )	2.70	(< 20 )
P & M -Xylene	60	62.1	104	60	60.6	101	( 80-121 )	2.50	(< 20 )
sec-Butylbenzene	30	32.3	108	30	31.4	105	( 77-126 )	2.80	(< 20 )
tert-Butylbenzene	30	32.3	108	30	31.3	104	( 78-124 )	3.30	(< 20 )
Toluene	30	28.6	95	30	28.3	95	( 80-121 )	0.95	(< 20 )
Xylenes (total)	90	92.7	103	90	90.3	100	( 79-121 )	2.60	(< 20 )
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	30		103	30		104	( 81-118 )	0.55	
4-Bromofluorobenzene (surr)	30		105	30		104	( 85-114 )	0.61	
Toluene-d8 (surr)	30		95	30		96	( 89-112 )	0.91	

## Batch Information

Analytical Batch: **VMS21806**  
 Analytical Method: **SW8260D**  
 Instrument: **Agilent 7890-75MS**  
 Analyst: **AZL**

Prep Batch: **VXX38896**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **07/19/2022 06:00**  
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 08/01/2022 3:51:20PM

### Method Blank

Blank ID: MB for HBN 1840219 [VXX/38906]  
 Blank Lab ID: 1674801

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
 1223906007

### Results by SW8260D

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	0.200	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
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	119*	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	97.8	89-112		%

### Batch Information

Analytical Batch: VMS21813  
 Analytical Method: SW8260D  
 Instrument: Agilent 7890-75MS  
 Analyst: AZL  
 Analytical Date/Time: 7/21/2022 3:12:00PM

Prep Batch: VXX38906  
 Prep Method: SW5030B  
 Prep Date/Time: 7/21/2022 6:00:00AM  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

### Blank Spike Summary

Blank Spike ID: LCS for HBN 1223906 [VXX38906]  
 Blank Spike Lab ID: 1674802  
 Date Analyzed: 07/21/2022 15:57

Spike Duplicate ID: LCSD for HBN 1223906 [VXX38906]  
 Spike Duplicate Lab ID: 1674803  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1223906007

### Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	30	31.8	106	30	31.5	105	( 79-124 )	0.66	(< 20 )
1,2-Dibromoethane	30	30.6	102	30	30.5	102	( 77-121 )	0.36	(< 20 )
1,2-Dichloroethane	30	29.9	100	30	29.9	100	( 73-128 )	0.17	(< 20 )
1,3,5-Trimethylbenzene	30	32.2	107	30	32.2	107	( 75-124 )	0.09	(< 20 )
Benzene	30	29.1	97	30	29.1	97	( 79-120 )	0.17	(< 20 )
Ethylbenzene	30	30.1	100	30	30.0	100	( 79-121 )	0.10	(< 20 )
Isopropylbenzene (Cumene)	30	30.7	102	30	30.6	102	( 72-131 )	0.13	(< 20 )
Methyl-t-butyl ether	45	43.2	96	45	42.8	95	( 71-124 )	0.93	(< 20 )
Naphthalene	30	24.4	81	30	27.0	90	( 61-128 )	10.10	(< 20 )
n-Butylbenzene	30	31.4	105	30	31.2	104	( 75-128 )	0.64	(< 20 )
o-Xylene	30	29.9	100	30	29.8	99	( 78-122 )	0.64	(< 20 )
P & M -Xylene	60	60.7	101	60	60.8	101	( 80-121 )	0.21	(< 20 )
sec-Butylbenzene	30	31.7	106	30	31.3	104	( 77-126 )	1.20	(< 20 )
tert-Butylbenzene	30	32.0	107	30	31.6	105	( 78-124 )	1.30	(< 20 )
Toluene	30	28.9	96	30	28.6	95	( 80-121 )	0.97	(< 20 )
Xylenes (total)	90	90.6	101	90	90.6	101	( 79-121 )	0.07	(< 20 )
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	30		104	30		104	( 81-118 )	0.29	
4-Bromofluorobenzene (surr)	30		105	30		104	( 85-114 )	1.20	
Toluene-d8 (surr)	30		98	30		98	( 89-112 )	0.44	

### Batch Information

Analytical Batch: **VMS21813**  
 Analytical Method: **SW8260D**  
 Instrument: **Agilent 7890-75MS**  
 Analyst: **AZL**

Prep Batch: **VXX38906**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **07/21/2022 06:00**  
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

### Method Blank

Blank ID: MB for HBN 1839983 [XXX/46630]  
 Blank Lab ID: 1673718

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1223906001, 1223906002, 1223906003, 1223906004, 1223906005, 1223906006, 1223906007

### 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	0.0500U	0.100	0.0310	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
<b>Surrogates</b>				
2-Methylnaphthalene-d10 (surr)	59.5	42-86		%
Fluoranthene-d10 (surr)	67.9	50-97		%

### Batch Information

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Instrument: Agilent GC 7890B/5977A SWA  
 Analyst: NRB  
 Analytical Date/Time: 7/24/2022 12:52:00AM

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 7/15/2022 3:42:43PM  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL



## Blank Spike Summary

Blank Spike ID: LCS for HBN 1223906 [XXX46630]  
 Blank Spike Lab ID: 1673719  
 Date Analyzed: 07/24/2022 01:13

Spike Duplicate ID: LCSD for HBN 1223906 [XXX46630]  
 Spike Duplicate Lab ID: 1673720  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1223906001, 1223906002, 1223906003, 1223906004, 1223906005, 1223906006, 1223906007

## Results by 8270D SIM LV (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	2	1.38	69	2	1.24	62	( 41-115 )	10.30	(< 20 )
2-Methylnaphthalene	2	1.36	68	2	1.20	60	( 39-114 )	12.60	(< 20 )
Acenaphthene	2	1.50	75	2	1.42	71	( 48-114 )	5.60	(< 20 )
Acenaphthylene	2	1.54	77	2	1.44	72	( 35-121 )	6.50	(< 20 )
Anthracene	2	1.61	81	2	1.48	74	( 53-119 )	8.50	(< 20 )
Benzo(a)Anthracene	2	1.51	75	2	1.32	66	( 59-120 )	13.00	(< 20 )
Benzo[a]pyrene	2	1.62	81	2	1.43	71	( 53-120 )	12.80	(< 20 )
Benzo[b]Fluoranthene	2	1.57	79	2	1.38	69	( 53-126 )	13.40	(< 20 )
Benzo[g,h,i]perylene	2	1.79	90	2	1.64	82	( 44-128 )	8.80	(< 20 )
Benzo[k]fluoranthene	2	1.71	86	2	1.52	76	( 54-125 )	12.30	(< 20 )
Chrysene	2	1.58	79	2	1.41	71	( 57-120 )	11.40	(< 20 )
Dibenzo[a,h]anthracene	2	1.76	88	2	1.61	81	( 44-131 )	8.80	(< 20 )
Fluoranthene	2	1.54	77	2	1.40	70	( 58-120 )	9.40	(< 20 )
Fluorene	2	1.61	80	2	1.44	72	( 50-118 )	10.70	(< 20 )
Indeno[1,2,3-c,d] pyrene	2	1.76	88	2	1.57	79	( 48-130 )	11.30	(< 20 )
Naphthalene	2	1.37	68	2	1.21	60	( 43-114 )	12.20	(< 20 )
Phenanthrene	2	1.69	84	2	1.53	76	( 53-115 )	10.10	(< 20 )
Pyrene	2	1.54	77	2	1.42	71	( 53-121 )	8.40	(< 20 )
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	2		66	2		60	( 42-86 )	10.40	
Fluoranthene-d10 (surr)	2		75	2		71	( 50-97 )	5.50	

## Batch Information

Analytical Batch: XMS13243  
 Analytical Method: 8270D SIM LV (PAH)  
 Instrument: Agilent GC 7890B/5977A SWA  
 Analyst: NRB

Prep Batch: XXX46630  
 Prep Method: SW3535A  
 Prep Date/Time: 07/15/2022 15:42  
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL  
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

### Method Blank

Blank ID: MB for HBN 1840050 [XXX/46642]  
 Blank Lab ID: 1674047

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1223906001, 1223906002, 1223906003, 1223906004, 1223906005, 1223906006, 1223906007

### Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.200	mg/L
<b>Surrogates</b>				
5a Androstane (surr)	75	60-120		%

### Batch Information

Analytical Batch: XFC16289  
 Analytical Method: AK102  
 Instrument: Agilent 7890B R  
 Analyst: MDT  
 Analytical Date/Time: 7/19/2022 3:14:00PM

Prep Batch: XXX46642  
 Prep Method: SW3520C  
 Prep Date/Time: 7/18/2022 4:13:13PM  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

Print Date: 08/01/2022 3:51:31PM

### Blank Spike Summary

Blank Spike ID: LCS for HBN 1223906 [XXX46642]  
 Blank Spike Lab ID: 1674048  
 Date Analyzed: 07/19/2022 15:24

Spike Duplicate ID: LCSD for HBN 1223906 [XXX46642]  
 Spike Duplicate Lab ID: 1674049  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1223906001, 1223906002, 1223906003, 1223906004, 1223906005, 1223906006, 1223906007

### Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	18.1	90	20	18.5	93	( 75-125 )	2.60	(< 20 )
<b>Surrogates</b>									
5a Androstane (surr)	0.4		93	0.4		97	( 60-120 )	4.20	

### Batch Information

Analytical Batch: **XFC16289**  
 Analytical Method: **AK102**  
 Instrument: **Agilent 7890B R**  
 Analyst: **MDT**

Prep Batch: **XXX46642**  
 Prep Method: **SW3520C**  
 Prep Date/Time: **07/18/2022 16:13**  
 Spike Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL  
 Dupe Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL

Print Date: 08/01/2022 3:51:33PM



SGS North America Inc.  
CHAIN OF CUSTODY RECORD

Revised Report Register  
**1223906**

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Profile #: 367666 Int.: QM

CLIENT: Ahnta Engineering Services					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page <u>1</u> of <u>1</u>		
CONTACT: Luke Hoffmann			PHONE #: 907.868.8215		Section 3		Preservative										
PROJECT NAME: OAFF Groundwater 2022			Project/Permit Number: 20204.074		CONTAINERS	/ / / / / / / / / / / / / / / /										NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS	
REPORTS TO: Luke Hoffmann			E-MAIL: ahtnalab@ahnta.net lhoffmann@ahnta.net			Sample Type	Analysis*										
INVOICE TO: Ahnta Engineering Services			QUOTE #:			Comp											
			P.O. #:			Grab											
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE		FR-VOC 8260C	GRO AK101	DRO AK102	PAH 8270D-SIM								REMARKS/LOC ID
① AJ	OAFF-22-MW-11	7/12/2022	1107	W	10	Grab	X	X	X	X							level 2A QC
② AJ	OAFF-22-MW-10	7/12/2022	1315	W	10	Grab	X	X	X	X							level 2A QC
③ AJ	OAFF-22-MW-01	7/12/2022	1517	W	10	Grab	X	X	X	X							level 2A QC
④ AJ	OAFF-22-MW-03	7/12/2022	1620	W	10	Grab	X	X	X	X							level 2A QC
⑤ AS	OAFF-22-MW-4R	7/12/2022	1735	W	10	Grab	X	X	X	X							level 2A QC
⑥ AT	OAFF-22-MW-4RD	7/12/2022	1740	W	10	Grab	X	X	X	X							Duplicate/level 2A QC
⑦ AJ	OAFF-22-MW-12	7/12/2022	1845	W	10	Grab	X	X	X	X							level 2A QC
⑧ AC	OAFF-TB-22-01	7/12/2022	800	W	3	Grab	X										Trip Blank
⑨ AC	OAFF-TB-22-02	7/12/2022	800	W	3	Grab		X									Trip Blank

Comments:  
**NO SEDD, PER MARTY. 9/17/13.**

DOD Project? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		Turnaround Time Requested			SGS Sample Receipt (Lab Use Only)			
Data Deliverables Requested		Standard <input checked="" type="checkbox"/> Rush			Delivery Method: Client Commercial		Chain of Custody Seal Condition:	
DataView Level 4		Requested Rush Report Date: _____			Did each cooler have a corresponding COC? Yes No		INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT <input type="checkbox"/>	
SEDD <input checked="" type="checkbox"/> ERPIMS <input checked="" type="checkbox"/> EQUIS <input checked="" type="checkbox"/> Other: _____							COC Seal Location(s): _____	
RELINQUISHED BY: Ben Suranovic <i>BS</i>		DATE: 7/13/2022	TIME: 1030	RECEIVED BY: <i>[Signature]</i>		Cooler ID	Temperature (°C)	Therm. ID
							3.0	054
		7/13/22	10:22	<i>[Signature]</i>		Note: If temp. is outside 0-6° and samples were not taken <8 hours ago OR are waste samples, Client or PM should initial here or attach an email change order to proceed with analysis. If ice is present, note on form F102B.		Initials: <i>MV</i>

Laboratory Use Only

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

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SGS Workorder #:

1223906

1223906

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
-----------------	--------------------------	------------------------

<b>Chain of Custody / Temperature Requirements</b>	Note: Temperature and COC seal information is found on the chain of custody form	
--	--	--

DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any containers received at non-compliant temperature:  (Use form FS-0029 if more space is needed)		

<b>Holding Time / Documentation / Sample Condition Requirement</b>	Note: Refer to form F-083 "Sample Guide" for specific holding times and sample containers.	
--	--	--

Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies.	Yes	
<b>Note:</b> If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.		
Were analytical requests clear? <i>(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)</i>	Yes	
Were proper containers (type/mass/volume/preservative) used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	

<b>Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)</b>		
---	--	--

Were all soil VOAs received with a corresponding % solids container?	N/A	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with Methanol+BFB?	N/A	

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

<b>Additional notes (if applicable):</b>
--

### Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1223906001-A	HCL to pH < 2	OK	1223906005-J	No Preservative Required	OK
1223906001-B	HCL to pH < 2	OK	1223906006-A	HCL to pH < 2	OK
1223906001-C	HCL to pH < 2	OK	1223906006-B	HCL to pH < 2	OK
1223906001-D	HCL to pH < 2	OK	1223906006-C	HCL to pH < 2	OK
1223906001-E	HCL to pH < 2	OK	1223906006-D	HCL to pH < 2	OK
1223906001-F	HCL to pH < 2	OK	1223906006-E	HCL to pH < 2	OK
1223906001-G	HCL to pH < 2	OK	1223906006-F	HCL to pH < 2	OK
1223906001-H	HCL to pH < 2	OK	1223906006-G	HCL to pH < 2	OK
1223906001-I	No Preservative Required	OK	1223906006-H	HCL to pH < 2	OK
1223906001-J	No Preservative Required	OK	1223906006-I	No Preservative Required	OK
1223906002-A	HCL to pH < 2	OK	1223906006-J	No Preservative Required	OK
1223906002-B	HCL to pH < 2	OK	1223906007-A	HCL to pH < 2	OK
1223906002-C	HCL to pH < 2	OK	1223906007-B	HCL to pH < 2	OK
1223906002-D	HCL to pH < 2	OK	1223906007-C	HCL to pH < 2	OK
1223906002-E	HCL to pH < 2	OK	1223906007-D	HCL to pH < 2	OK
1223906002-F	HCL to pH < 2	OK	1223906007-E	HCL to pH < 2	OK
1223906002-G	HCL to pH < 2	OK	1223906007-F	HCL to pH < 2	OK
1223906002-H	HCL to pH < 2	OK	1223906007-G	HCL to pH < 2	OK
1223906002-I	No Preservative Required	OK	1223906007-H	HCL to pH < 2	OK
1223906002-J	No Preservative Required	OK	1223906007-I	No Preservative Required	OK
1223906003-A	HCL to pH < 2	OK	1223906007-J	No Preservative Required	OK
1223906003-B	HCL to pH < 2	OK	1223906008-A	HCL to pH < 2	OK
1223906003-C	HCL to pH < 2	OK	1223906008-B	HCL to pH < 2	OK
1223906003-D	HCL to pH < 2	OK	1223906008-C	HCL to pH < 2	OK
1223906003-E	HCL to pH < 2	OK	1223906009-A	HCL to pH < 2	OK
1223906003-F	HCL to pH < 2	OK	1223906009-B	HCL to pH < 2	OK
1223906003-G	HCL to pH < 2	OK	1223906009-C	HCL to pH < 2	OK
1223906003-H	HCL to pH < 2	OK			
1223906003-I	No Preservative Required	OK			
1223906003-J	No Preservative Required	OK			
1223906004-A	HCL to pH < 2	OK			
1223906004-B	HCL to pH < 2	OK			
1223906004-C	HCL to pH < 2	OK			
1223906004-D	HCL to pH < 2	OK			
1223906004-E	HCL to pH < 2	OK			
1223906004-F	HCL to pH < 2	OK			
1223906004-G	HCL to pH < 2	OK			
1223906004-H	HCL to pH < 2	OK			
1223906004-I	No Preservative Required	OK			
1223906004-J	No Preservative Required	OK			
1223906005-A	HCL to pH < 2	OK			
1223906005-B	HCL to pH < 2	OK			
1223906005-C	HCL to pH < 2	OK			
1223906005-D	HCL to pH < 2	OK			
1223906005-E	HCL to pH < 2	OK			
1223906005-F	HCL to pH < 2	OK			
1223906005-G	HCL to pH < 2	OK			
1223906005-H	HCL to pH < 2	OK			
1223906005-I	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.

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# DATA QUALITY REVIEW

Date: 07/29/2022

Project: Menzies OAFF Groundwater Sampling 2022

Laboratory: SGS North America, Inc.

Work Orders: 1223906

Reviewer Name: Keather McLoone, Ahtna

Reviewer Title: Project Chemist

## 1.0 INTRODUCTION

A Stage 2A data review was conducted accordance with the United States Environmental Protection Agency (USEPA) document *Test Methods for Evaluating Solid Wastes, SW-846*, revision 8 (July 2014 and updates), *USEPA Contract Laboratory Program National Functional Guidelines for Organic* (January 2017) *Methods Data Review*, 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.

The key data quality indicators (DQIs) of precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS) of the project data were evaluated in this Data Quality Review (DQR) by reviewing, where appropriate, the following parameters:

- Chain of Custody (COC) and Sample Receipt Conditions
- Holding times and preservation
- Analytical reporting limits (limits of quantitation [LOQ] and limits of detection [LOD])
- Blank analysis results
- Surrogate recoveries (organics only)
- Field duplicates
- Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results

## 1.1 Data Qualifier Definitions

For the purpose of this DQR the following code letters and associated definitions are provided for use by the project chemist to summarize the data quality.

- B Result is considered biased high due to blank contamination (method, trip, or equipment blank).
- J Result is considered estimated because it was detected above detection limit (DL), but below LOQ.
- Q Result is considered an estimated value because quality control (QC) criteria were not met; may be biased high (QH) or low (QL) or unknown (QN).

- R Result is rejected and unusable.
- U Analyte is reported as not detected at the LOD.

In the case where a sample result was affected by more than one sample-handling anomaly or QC failure that would result in differing qualifiers, a determination was made as to which qualifier was most conservative, and only that qualifier was retained and reported with the results. The ranking of the qualifiers is generally as follows: R>B>Q>J>U.

## 1.2 Chain of Custody (CoC) and Sample Receipt Condition

Samples were submitted to SGS, North America, Inc. located in Anchorage, Alaska. Four water samples, including one duplicate, and a trip blank were submitted in under intact custody seals. Data was reported on SDG 1223906. The sample summary table presents field and sample identification (ID) and sampling details.

Table 1 summarizes field quality control samples by matrix and analyses.

**TABLE 1: FIELD QUALITY CONTROL SAMPLES**

Field ID	Lab ID	Analyses	Quality Control
OAFF-22-MW-11	1223906001	VOC, GRO, DRO, PAH	Primary
OAFF-22-MW-10	1223906002	VOC, GRO, DRO, PAH	Primary
OAFF-22-MW-01	1223906003	VOC, GRO, DRO, PAH	Primary
OAFF-22-MW-03	1223906004	VOC, GRO, DRO, PAH	Primary
OAFF-22-MW-4R	1223906005	VOC, GRO, DRO, PAH	Primary
OAFF-22-MW-4RD	1223906006	VOC, GRO, DRO, PAH	Duplicate of OAFF-22-MW-4R
OAFF-22-MW-12	1223906007	VOC, GRO, DRO, PAH	Primary
OAFF-TB-22-01	1223906008	VOC	Trip Blank
OAFF-TB-22-02	1223906009	GRO	Trip Blank

**Key:**

DRO– diesel range organics  
GRO– gasoline range organics  
PAH – polynuclear aromatic hydrocarbons  
VOC – volatile organic carbons

### **1.3 Holding Times and Preservation**

Samples were received in good condition, within acceptable temperature range, properly preserved, and within the method specified hold times.

### **1.4 Analytical Reporting Limits**

Analytical reporting limits were compared to project action/screening limits to determine if the lab had adequate analytical sensitivity to support project data quality objectives. Project action limits were based upon 18 AAC 75 Table C Groundwater Cleanup Levels.

### **1.5 Blanks**

#### **1.5.1 Trip Blanks**

A trip blank accompanied the sample cooler that contained samples for volatiles analyses. There were no trip blank detections.

#### **1.5.2 Method Blanks**

No analytes were detected in the method blanks.

#### **1.5.3 Equipment Blanks**

No equipment blanks were submitted. Disposable sampling equipment was used during field sample collection.

### **1.6 Surrogates**

Surrogate spike recoveries were evaluated as a measure of analytical accuracy and assessment of potential matrix effects. All surrogate recoveries were within quality control criteria except for the following:

- OAFF-22-MW-11 and OAFF-22-MW-10 had 8270D SIM - PAH surrogate recovery for fluoranthene-d10 was below acceptance criteria; therefore, the associated sample results were flagged QL.
- OAFF-22-MW-03, OAFF-22-MW-4R, and OAFF-22-MW-4RD had AK101 surrogate recovery for 4-bromofluorobenzene above acceptance criteria; therefore, the associated sample results were flagged QH.
- OAFF-22-MW-4R had 8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 above acceptance criteria; therefore, the associated, detected sample results (nine compounds) were flagged QH.

- OAFF-TB-22-01 8260D had surrogate recovery for 1,2-dichloroethane-D4 was above acceptance criteria; however, there were no associated sample detections. Therefore, no qualifications were necessary on the basis of this recovery.
- There was also a lab blank with a surrogate recovery outside acceptance limits; however, no qualifications of project samples were made on the basis of this recovery.

QL flagged results should be considered estimated with a low bias. QH flagged results should be considered estimated with a high bias.

## **1.7 Field Duplicates**

Field duplicates were collected at the required frequency as specified in the work plan. Samples OAFF-22-MW-4R and OAFF-22-MW-4RD were submitted as the field duplicate pair. The relative percent difference (RPD) between the primary and field duplicate sample results were evaluated as a measure of field precision. Duplicate RPDs were calculated when a given analyte was detected in both samples with duplicate RPDs compared to the 30% criteria for waters. There were no exceedances of RPD criteria.

## **1.8 Laboratory Control Spike/Laboratory Control Spike Duplicate (LCS/LCSD)**

Percent recoveries of spiked analyte concentrations were evaluated for the Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (LCSD) samples as a measure of analytical accuracy. RPDs of LCS/LCSD analyte concentrations were evaluated to assess analytical precision. All LCS/LCSD recoveries and RPDs were within quality control criteria.

## **1.9 Matrix Spikes/Matrix Spike Duplicate (MS/MSD)**

No project specific MS/MSD were analyzed.

## **2.0 OVERALL ASSESSMENT**

All data necessary to complete this review were provided. Based on the data review completed, minimal data were qualified, and project completeness goal was met. All sample results are valid with data qualifiers assigned. All samples were collected in accordance with the workplan and considered representative of site conditions. All analytical data is considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants.

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### **3.0 REFERENCES**

Alaska Department of Environmental Conservation (ADEC), 2019. *Field Sampling Guidance for Contaminated Sites and Leaking Underground Storage Tank Sites.*

ADEC. 2019. *Minimum Quality Assurance Requirements for Sample Handling, Reports, and Laboratory Data.*

EPA, 2017. *National Functional Guidelines for Organic Superfund Methods Data Review (SOM02.4).*

EPA, 2014. *SW-846 Update V: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.*

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**ATTACHMENT 6**

**WASTE DISPOSAL DOCUMENTATION**

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**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SPILL PREVENTION AND RESPONSE  
Contaminated Sites and Prevention and Emergency Response Programs  
Transport, Treatment, & Disposal Approval Form for Contaminated Media**

<b>DEC HAZARD/SPILL ID #</b>	<b>NAME OF SPILL OR CONTAMINATED SITE</b>		
2100.38.243	AFSC Off-Airport Fuel Facility		
<b>SITE OR SPILL LOCATION</b>			
AFSC Off-Airport Fuel Facility at the Port of Alaska			
<b>CURRENT LOCATION AND TYPE OF CONTAMINATED MEDIA</b>		<b>SOURCE OF THE CONTAMINATION</b>	
AFSC Off-Airport Fuel Facility - Fuel Impacted Purge Water from monitoring wells		Fuel releases	
<b>COMPOUNDS OF CONCERN</b>	<b>ESTIMATED VOLUME</b>	<b>DATE(S) GENERATED</b>	
GRO/DRO/PAH's/VOC's	15 gallons	7/12/2022	
<b>POST TREATMENT ANALYSIS REQUIRED</b> (such as GRO, DRO, RRO, BTEX, and/or Chlorinated Solvents)			
N/A			
<b>COMMENTS</b>			
Disposal at US Ecology Viking Facility based upon nature of release as jet fuel and no free product noted.			

**Facility Accepting the Contaminated Media**

<b>NAME OF THE FACILITY</b>	<b>PHYSICAL ADDRESS/PHONE NUMBER</b>
US Ecology Viking Facility	2020 Viking Dr, Anchorage, AK 99501 - 907-258-1558

**Responsible Party and Contractor Information**

<b>BUSINESS/NAME</b>	<b>ADDRESS/PHONE NUMBER</b>
Ahtna Engineering Services	110 W 38th Ave Anchorage, AK - 907-947-6011

**Luke Hoffmann**

Name of the Person Requesting Approval (printed)

Signature

**Project Manager/Ahtna**

Title/Association

**7/13/2022**

Date

**907-947-6011**

Phone Number

**-----DEC USE ONLY-----**

Based on the information provided, ADEC approves transport of the above-described media for treatment in accordance with the approved facility operations plan. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight/volume receipts of the loads transported to the facility and a post treatment analytical report. If the media is contaminated soil, it shall be transported as a covered load in compliance with 18 AAC 60.015.

**Shawn Tisdell**

DEC Project Manager Name (printed)

Signature

Digitally signed by Shawn Tisdell  
Date: 2022.07.14 15:48:10 -08'00'

**Environmental Program Specialist**

Project Manager Title

**7/14/2022**

Date

**907-451-2752**

Phone Number

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# NON-HAZARDOUS WASTE MANIFEST

180970-MA

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>VSQG</b>		Manifest Document No. <b>180970A</b>	2. Page 1 of 1		
3. Generator's Name and Mailing Address <b>MENZIES AVIATION 6000 DE HAVILLAND AVENUE ANCHORAGE, AK 99502</b>			MENZIES AVIATION 1331 TIDEWATER ROAD ANCHORAGE, AK 99501		<b>IN CASE OF EMERGENCY CALL</b>  <b>800-899-4672</b>		
4. Generator's Phone ( <b>907-947-6011</b>							
5. Transporter 1 Company Name <b>US ECOLOGY</b>		6. US EPA ID Number <b>MIK593743838</b>		A. State Transporter's ID			
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone			
9. Designated Facility Name and Site Address <b>US ECOLOGY ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501</b>		10. US EPA ID Number  <b>AKR000004184</b>		C. State Transporter's ID			
				D. Transporter 2 Phone			
				E. State Facility's ID			
				F. Facility's Phone <b>907-258-1558</b>			
11. WASTE DESCRIPTION				Containers			
				No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. <b>HM</b> <b>MATERIAL NOT REGULATED BY D.O.T.</b>				<b>1</b>	<b>DM</b>		<b>P</b>
b.							
c.							
d.							
G. Additional Descriptions for Materials Listed Above <b>1) EA0301 POL WATER WITH JET FUEL</b>				H. Handling Codes for Wastes Listed Above <b>D43486</b>			
15. Special Handling Instructions and Additional Information <b>Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation</b>							
<b>NON-HAZARDOUS WASTE</b>							
16. <b>GENERATOR'S CERTIFICATION:</b> I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name				Signature		Date Month Day Year	
17. Transporter 1 Acknowledgement of Receipt of Materials				Signature		Date Month Day Year	
Printed/Typed Name				Signature		Date Month Day Year	
18. Transporter 2 Acknowledgement of Receipt of Materials				Signature		Date Month Day Year	
Printed/Typed Name				Signature		Date Month Day Year	
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.							
Printed/Typed Name				Signature		Date Month Day Year	

**NON-HAZARDOUS WASTE**

**GENERATOR**

**TRANSPORTER**

**FACILITY**

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**ATTACHMENT 7**

ADEC APPROVAL (FINAL VERSION ONLY)

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